



20 September 2024

Ben Watkin

By email

Tēnā koe Ben,

Official Information Act request.

I refer to your request for information under the Official Information Act 1982 (OIA) dated 22 August 2024 where you requested:

1. Any information your department has pertaining to geo-engineering, weather modification and Solar Radiation Management/Mitigation (SRM) with particular emphasis on cloud seeding, marine cloud brightening/engineering/seeding and Stratospheric Aerosol Injection (SAI). If this still proves too broad of a request, please provide the same requested information for the time period from 1 Jan 2019 to 20 Aug 2024.

This clarification was still too broad of a request. However, when narrowed to your suggested timeframe, a smaller number of files was returned. As a result, please find attached any information MetService has pertaining to geo-engineering, weather modification and Solar Radiation Management/Mitigation (SRM) with particular emphasis on cloud seeding, marine cloud brightening/engineering/seeding and Stratospheric Aerosol Injection (SAI) between 1 January 2019 and 20 August 2024. Please note, some documents have been withheld under s 9(2)(i) of the Official Information Act.

You have the right to seek an investigation and review by the Ombudsman of this decision. Information about how to make a complaint is available at www.ombudsman.parliament.nz or freephone 0800 802 602.



Level 2, 110 Featherston
Street, Wellington 6011



PO Box 722
Wellington 6140



Ph: 04 470 0700
Fax: 04 473 5231



If you wish to discuss this decision with us, please feel free to get in touch.

Ngā mihi

Nick Fagerlund
Legal Counsel and Company Secretary



Level 2, 110 Featherston
Street, Wellington 6011



PO Box 722
Wellington 6140



Ph: 04 470 0700
Fax: 04 473 5231

From: [AGU](#)
To: [Nicholas Zachar](#)
Subject: AGUiverse: #AGU20 Fall Meeting: What you need to know
Date: Friday, 16 October 2020 10:35:49 am

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elections



AGU



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15 October 2020

Get behind the scenes details on creating the #AGU20 virtual experience

virtual meeting



Everyone is new to this year's Fall Meeting because it's the first one that's 100% online. From the design, time zones, technology and privacy and security details, there was a collective effort to creating our #AGU20 virtual experience. Success depends on having the full meeting content available, session chairs and presenters helping lead discussions, and on everyone being more proactive and flexible in engaging with colleagues around the world. Thank you for helping design and make the 2020 meeting successful and for creating the meeting of the future.

[Details](#)

person



News

Hurry to use early bird discount or free registration

#AGU20 is offering an early bird registration discount to anyone who registers by 30 October. If you are from a [low/low-middle income country](#) as well as a member who is a K-12 educator or undergraduate student, you qualify for free #AGU20 registration.

[Register](#)

News



Create your #AGU20 Fall Meeting schedule

Create your personalized #AGU20 schedule by selecting from 1,800+ sessions; 100+ town halls; 20+ workshops and numerous networking and career development opportunities. After you customize your schedule, share the sessions you're looking forward to on social media using #AGU20!

[Create](#)



News

World-leading experts to be #AGU20 plenary speakers and panelists

#AGU20 features an exciting array of plenary talks and panels covering a diverse range of Earth and space sciences and science-society topics. World-leading scientists and administrators will speak about shaping the future of science -- from public-science efforts to highlighting how to expand diversity, equity and inclusion, from the future of universities to new areas of convergent science -- and about the development of AGU's new strategic plan.

[View](#)



News

#AGU20 will help Shape the Future of Science

This year's Fall Meeting theme is Shaping the Future of Science, designed to focus on how the decisions we make today will affect tomorrow. Each week of #AGU20 is designed around this core theme and will hit on major areas outlined in AGU's strategic plan and its vision for the next 10 years.

[Learn](#)

"Super excited to be giving an oral presentation of my Ph.D. research at this year's @theAGU meeting, in

twitter



the 'Plasma Energization, Particle Acceleration, and High-Energy Emission in Solar Flares' session! (Virtually though, of course). #AGU20"

- Ryan French, Twitter

Register

PUBLICATIONS

cliff



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Election



UPCOMING EVENTS & DEADLINES

21
Oct

Two approaches for mitigating global climate change: Solar radiation management and greenhouse gas emissions reduction

2020

12:00 PM EDT

22
Oct
2020

Sagan Lecture Seminar Series: Biodiversity and Planetary Sustainability

4:00 PM EDT

5
Nov
2020

Webinar: Mastering the virtual presentation & making the most of an e-lighting poster

2:00 - 3:30 PM EST

12
Nov
2020

Sagan Lecture Seminar Series: Biodiversity and Planetary Sustainability

4:00 PM EST

BLOGOSPHERE

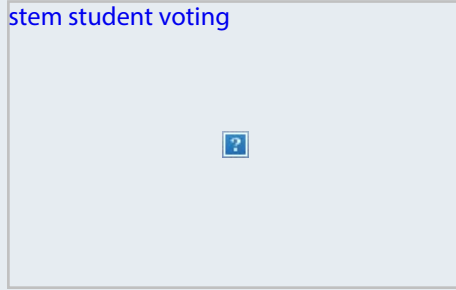
[pacific west](#)



Post wildfire mudslide potential in the Pacific West of the United States

The Field, 8 October

[stem student voting](#)



How faculty can help increase STEM student voter turnout (and turnout across all disciplines)

The Field, 12 October

AGU IN THE NEWS

After More Than a Year on the Ice, the Biggest Arctic Research Mission Is Complete

Gizmodo, 12 October

New Study Casts Doubt On The Climate Benefits Of Natural Gas Power Plants

Yahoo News, 9 October

Faraway Magma Reservoirs Complicate Volcano Monitoring

Scientific American, 7 October

Cat 4 Hurricane Delta expected to approach the Gulf Coast as large Cat 3 storm

Miami Herald, 6 October

NASA Mars probes discover billion-year-old dune fields frozen in time

CNET, 6 October



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2000 Florida Avenue, NW, Washington, DC 20009-1277



From: [AGU](#)
To: [João De Souza](#)
Subject: AGUiverse: #AGU20 scientific program is live
Date: Friday, 9 October 2020 10:22:00 am

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[hobonet soil moisture sensor](#)



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8 October 2020

[agu fall meeting](#)



#AGU20 Fall Meeting scientific program is live

The AGU Fall Meeting scientific program is now available so you can create an #AGU20 attendee schedule that works for you. Don't forget to register before 30 October for the early bird discount!

[View](#)

[honors 2020](#)



News

Congratulations to the 2020 section award/lecture honorees

AGU congratulates the 85 award/lecture recipients who were recognized by 22 sections for their contributions to the Earth and space sciences community.

[2020 Honorees](#)

News

Read the Eos October issue: Critical Zone Science

This issue features an overview of what critical zone science is, several articles

[eos critical zone](#)

from Critical Zone Observatory researchers and an opinion from a CZ research network aiming to diversify the field.

[Read](#)

[earth call for papers](#)



News

Submit your machine learning research for an AGU special collection

JGR Solid Earth, G-Cubed, Tectonics and Earth and Space Science invite you to submit a paper to the newly opened special collection? "Machine learning for Solid Earth observation, modeling and understanding."

Submissions are open until **August 2021**.

[Call for papers](#)

UPCOMING EVENTS & DEADLINES

9
Oct
2020

AGU/AGI webinar: Tools and strategies for finding programmatic strengths and weaknesses

1:00 PM EDT

13
Oct
2020

Scientific advocacy and Congressional powers: a conversation with Climate Science Legal Defense Fund

2:00 - 3:00 PM EDT

21
Oct
2020

Two approaches for mitigating global climate change: Solar radiation management and greenhouse gas emissions reduction

12:00 PM EDT

22
Oct
2020

Sagan Lecture Seminar Series: Biodiversity and Planetary Sustainability

4:00 PM EDT

5
Nov
2020

Webinar: Mastering the virtual presentation

2:00 - 3:00 PM EDT

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Election



2020 AGU Election

"This year marks a turning point for AGU, with probably the most diverse slate of candidates ever presented for the Board of Directors and AGU officers."

Eric Davidson
Past President, AGU

Learn more about the candidates and vote today. Eligible AGU members have received an email with their ballot.

[Read](#)

PUBLICATIONS

lake ice



BLOGOSPHERE

saint martin



Saint-Martin-Vesubie: Planet Labs images of the aftermath of the extraordinary flooding from Storm Alex

The Field, 6 October

tic tac toe



Remote student collaboration via Google Jamboard

The Field, 1 October

AGU IN THE NEWS

Refugees in their own country as wildfire destroys California towns

Reuters, 2 October

What wobbling rocks can tell us about nuclear safety

BBC News, 1 October

Calling on amateur astronomers: Observe Venus!

Sky & Telescope, 1 October

Study links high-intensity fire and accelerating snowmelt in Cascades

The Columbian, 30 September

Unicorns Of The Sea Share Their Secrets

St. Louis Post-Dispatch, 29 September



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2000 Florida Avenue, NW, Washington, DC 20009-1277



From: [AGU](#)
To: [Nicholas Zachar](#)
Subject: AGUiverse: OSPA Winners
Date: Friday, 28 February 2020 10:46:58 am


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[Submit an Honors nomination](#)




AGU



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[Poster presentation at Fall Meeting 2019](#)



Outstanding Student Presentation Award Winners

This year, 169 students representing institutions from around the world were **recognized with an Outstanding Student Presentation Award** (OSPA) for effectively presenting quality research at Fall Meeting 2019.

[VIEW WINNERS](#)

Trending

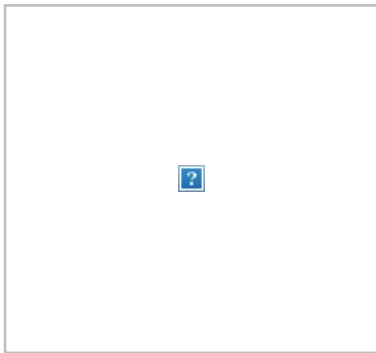
Recognize a Colleague

In 2019, AGU recognized distinguished men and



women for their significant contributions to the Earth and space sciences. We had the opportunity to [sit down with some of the 2019 honorees](#) to talk about the importance of being recognized by their peers. [Submit a nomination](#) for a 2020 Union Honor.

[WATCH VIDEOS](#)



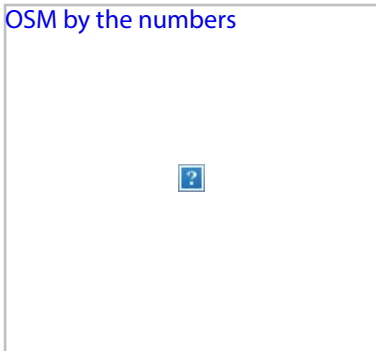
Trending

Design Your Own Chapman Conference

Have a challenging question in your field of work that you'd like to solve with like-minded scientists? Or an idea for designing a measurement that would yield exciting results? Grab a colleague in your field and [propose a Chapman conference](#). View a [sample proposal](#) and create your ideal conference today.

[PROPOSE CHAPMAN](#)

OSM by the numbers



Events

Ocean Sciences Meeting 2020

We had a great time at the [Ocean Sciences Meeting 2020](#), and so did the 6,000+ attendees! Mark your calendars for the next Ocean Sciences Meeting, 27 February – 4 March 2022 in Honolulu, Hawaii.

[Submit an Honors nomination](#)

Barbara Dutrow, a Louisiana State University geology professor and part of the AGU community, is known for her contributions to mineral science and research on tourmalines—so much so that a recently discovered tourmaline variety was named "dutrowite" after her by the International Mineralogical Association.

PUBLICATIONS

[Greenland Ice Sheet Response to Stratospheric Aerosol Injection Geoengineering](#)



BLOGOSPHERE

[The 1954 Niagara Falls rockfall.](#)



The 1954 Prospect Point Rockfall at Niagara Falls

The Landslide Blog, 26 February

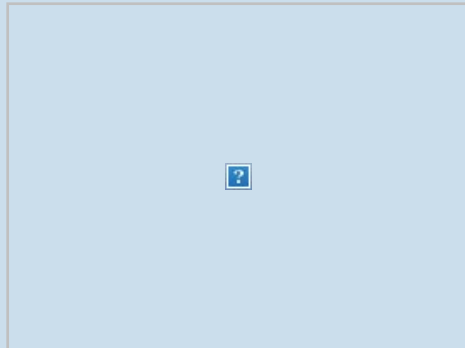
[image of dinosaurs](#)



Dinosaurs Under the Tundra, Part 1: Talking about Climate Change with a Climate Skeptic

The Plainspoken Scientist, 24 February

EOS



Searching for Mount Meager's Geothermal Heart

Science Update, 25 February

[Graphic of Earth's global carbon cycle](#)



The Future of the Carbon Cycle in a Changing Climate

Feature, 20 February

AGU IN THE NEWS

Alien-life hunters are eyeing icy ocean moons Europa and Enceladus

Space.com, 25 February

Microbies Point the Way to Shipwrecks

The New York Times, 21 February

Climate change could kill all of Earth's coral reefs by 2100, scientists warn

CNN, 20 February

Kilometers of "Dark Cable" Form the Newest Seismic Sensors

Scientific American, 19 February

Driven By Climate Change, Desalination Researchers Seek Solutions To Water Scarcity

WBUR, 18 February

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[Submit an Honors nomination](#)



IMPORTANT DATES & DEADLINES

16–20
Mar 2020

Chapman Conference on Distributed Volcanism and Distributed Volcanic Hazards

Flagstaff, Arizona, USA

2–4
Jun 2020

AGU-SEG Workshop on Advances in Distributed Sensing for Geophysics

Houston, Texas, USA

Abstract submission deadline: 2 March 2020

7–11
Dec 2020

Fall Meeting 2020

San Francisco, California, USA



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From: [MetSoc Secretary \(NZMetSoc\)](#)
To: [Jonathan Tunster](#)
Cc: [MetSocNews](#)
Subject: Clips to 7 May
Date: Thursday, 7 May 2020 4:10:32 pm

New Zealand weather and climate news

Tribute to Brett Mullan (thanks to John Maunder and Neil Gordon for the link and Susan for the words))

https://fairfaxmedianz.pressreader.com/@Neil_GORDON.1/csb_IQ3Fs9F8nXzmjGqNfvsC4oZwumlvxk_IkhhEXrf7WdwVu7_t_vi4QmeEtOjLrtJ

MetService mentions

Courtesy of MerService Library

[After stormy spell, sun out across much of the country and expected to hang around](#)

After several days of cold, windy, wet weather across much of the country, the sun was shining for many on Wednesday with the promise of a lengthy settled spell.

[Weather: Close to freezing temperatures in North Island](#)

New Zealand Herald

Parts of the North Island dropped to the low single digits overnight thanks to a dying southwesterly, MetService said. Taupo is shivering at 1C at 6am ...

[Trees fall on to cars as wild weather lashes Bay of Plenty](#)

New Zealand Herald

MetService meteorologist Tui McInnes said wind gusts of just under 60km/h were recorded in Tauranga Airport about midnight. At Rotorua Airport ...

[140 lightning strikes in two hours and more coming](#)

Winter is coming with lightning, hail, snow, and heavy rain lashing parts of New Zealand.

At 11am on Tuesday the lightning was centred off the coast near Taranaki and the South Island West Coast, MetService meteorologist Andy Best said.

[Post-war ketch survives fire and hurricane; sinks in Wellington harbour](#)

A much-loved postwar ketch that was restored and brought to New Zealand has sunk to the bottom of Wellington's Clyde Quay marina.

[Thunderstorms and rain hit Whanganui, but more rain needed](#)

Whanganui's skies were hit with thunder on Sunday night, along with some much-needed rain for the district.

MetService's Tui McInnes said rainfall in the Whanganui area "probably wasn't as big as some people would have thought".

[Weather: Scattered showers across the north this afternoon while the south braces for cold snap](#)

The tail end of a wet and windy storm continues to lash the top of the North Island this afternoon while the south braces for a chilly snap.

[Weather: Snow, hail, thunder, lightning as cold front batters New Zealand](#)

New Zealand Herald

MetService has warned of snow flurries on the summit of Lewis Pass in Canterbury until 7pm, and brief flurries on the Desert Road in the North Island ...

[Weather: Blustery front expected to deliver much-needed rain to drought-hit Northland](#)

A blustery front whipping across New Zealand should bring much-needed rain and welcome relief to the drought-stricken north today.

[Weather: Wild weather on way to New Zealand from Australia](#)

Now it's expected to bring rain, wind and thunderstorms to New Zealand.

The system was being generated by a broad, complex trough, with an active front ahead of it, MetService meteorologist Andy Best said.

[More wet weather on the way for North Island](#)

RNZ

Parts of the North Island are in for rain and thunderstorms today, with the centre of the island bearing the brunt. Wet weather in Wellington.

Photo: RNZ .

[Auckland drought: Water levels hit lowest in 25 years](#)

Auckland continues to struggle with drought despite being drenched with rain at the weekend.

[Auckland drought: Council likely to impose water restrictions from next week](#)

Auckland councillors will decide today whether to [enforce water restrictions](#) for the first time in 26 years as drought depletes the supply to almost-unprecedented lows.

[Auckland drought: 'Huge rainfall' in Hunua Ranges but more needed](#)

Heavy downpours saw "huge rainfall" in [Auckland's Hunua Ranges](#) on Sunday, contributing to an increase in the city's water stocks.

[Drought: Rainfall 'lowest ever' in much of North Island](#)

The [North Island drought](#) — the worst in 50 years in some [parts of Northland](#) — has prompted thousands to seek financial help.

[Weather: Auckland rain makes little difference to water supply levels](#)

New Zealand Herald

MetService meteorologist Rob Kerr said between 10pm yesterday and 1am today a band of heavy rain brought downpours of 15-25mm in just one .

[Dry autumn puts pressure on North Canterbury farmers](#)

Stuff.co.nz

MetService figures show Culverden recorded 6.4 millimetres of rain in April, compared to 95.2mm during the same month last year. March was 91mm ...

[Snow on hills and frost forecast in Hawke's Bay](#)

New Zealand Herald

But MetService meteorologist Andy Best said despite the cold, which saw snow fall to 1000 metre overnight, it'll be a while before it appears again.

[Snowfall warning for Desert Road](#)

SunLive

The MetService says this should clear in the evening, with westerly winds hanging around. "Brief snow flurries are likely about the top of the Desert ...

[Snow on Nelson hills sign of winter's approach](#)

Snow on the hills behind Nelson city and single-digit temperatures have provided a chilly reminder that the cooler months are just around the

corner.

[Snow-capped Alps overlook Tekapo on Tuesday](#)

Snow-capped mountains overlooked Tekapo on Tuesday but it is hard to say how much fell, or how long the white stuff will last, a MetService meteorologist says.

[Southern skifields get dusting of snow](#)

MetService meteorologist Andy Best said snow was down to 500 metres and could continue to fall into the early afternoon.

[Look up tonight, for the Eta Aquarids meteor shower](#)

Stuff.co.nz

MetService forecaster Sonja Farmer said it will be "pot luck" if skies clear in time for the shower. "It's really not looking too good at all. "The North Island's ...

[Supermoon 2020: Eastern regions have best chance to see 'Flower Moon' on Thursday](#)

Stuff.co.nz

But MetService meteorologist Andy Best said some bad weather in western parts of both the North Island and the South Island may hinder some ...

[After stormy spell, sun out across much of the country and expected to hang around](#)

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Photo: RNZ .

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Stuff.co.nz

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New Zealand Herald

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MetOcean

[Wave warning system introduced after huge swell hit Wellington](#)

Residents on Wellington's south coast say the swift introduction of a wave warning system is a victory for people power.

[Wellington's new wave warning system a "sea-level" change in communication](#)

A new wave warning system for Wellington's south coast had its first test just days after it was introduced.

The system, which allows for easy communication between MetService, Wellington Regional Emergency Management Office, and Wellington City Council (WCC), was introduced after residents were not warned about massive waves heading towards the south coast on April 15.

[Wellington's new wave warning system a "sea-level" change in communication](#)

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NIWA

[Drought hits hard, far and wide](#)

Analysis of drought conditions across New Zealand this year shows it is one of the most severe on record for some regions.

[Scientists seek smoke sniffers](#)

NIWA scientists are seeking help to sniff out smoke in a bid to help improve air quality in New Zealand.

ECMWF

[Cyclone Amphan will grow to a very severe cyclonic storm: Europe Met Model](#)

Odisha Television Ltd.

As per the ECMWF (European Center for Medium Range Weather Forecast), the LOPAR will develop into a very severe cyclonic storm. The system ...

Volcano alert/watch

[Ruapehu volcano \(North Island, New Zealand\): lake temperature is cooling again](#)

VolcanoDiscovery

The volcano is still a very active volcano with the potential of little or no warning. Both the Volcanic Alert Level (level 1) and Aviation Code (Green) ...

Extreme weather (and other news) – Australia and the Pacific

[Multiple flooding sources threaten Honolulu's infrastructure](#)

Posted: 04 May 2020 01:57 PM PDT

Researchers found in the next few decades, sea level rise will likely cause large and increasing percentages of land area to be impacted simultaneously by the three flood mechanisms. Further, they found direct marine inundation represents the least extensive -- only three percent of the predicted flooding, while groundwater inundation represents the most extensive flood source.

[Australia: Farmers in Victoria celebrate new weather radar](#)

Aljazeera.com

Wimmera, in Victoria, has long been considered a black hole for weather predictions as the nearest stations in Mildura and Mount Gambier are too

Extreme weather (and other news) – Americas and Europe

[Drought-hit Argentina faces water worries amid coronavirus pandemic](#)

The worst drought in 50 years in northeast Argentina is hitting hydropower and tourism and threatening drinking water

[UK meteorologists confirm April as sunniest on record](#)

The Guardian

Meteorologists have confirmed a new UK record was set for the sunniest April, with an average 224.5 hours of sunshine, beating the previous record ...

["Spanish Plume" sets stage for severe weather in France and Spain](#)

AccuWeather.com

These ingredients can set the stage for severe weather as storm systems approach from the Atlantic. Thunderstorms are expected to first develop on ...

International news and research

[Climate change has been influencing where tropical cyclones rage](#)

Posted: 04 May 2020 12:52 PM PDT

While the global average number of tropical cyclones each year has not budged from 86 over the last four decades, climate change has been influencing the locations of where these deadly storms occur, according to new research.

[Decoding the skies: The impact of water vapor on afternoon rainfall](#)

Posted: 05 May 2020 04:05 PM PDT

On days when wind blows in little atmospheric moisture, afternoon rainfall is more likely to occur over wetter soils or higher relative humidity. On days when wind introduces lots of atmospheric moisture, afternoon rainfall is more likely over drier soils or lower relative humidity. The team also found that for both conditions, afternoon rainfall occurrence is more likely with warmer morning soil or air temperature.

[Simulations forecast US nationwide increase in human exposure to extreme climate events](#)

Posted: 05 May 2020 09:26 AM PDT

Using the now-decommissioned Titan supercomputer, a team of researchers estimated the combined consequences of many different extreme climate events at the county level, a unique approach that provided unprecedented regional and national climate projections that identified the areas most likely to face climate-related challenges.

[Bacterial behavior influences cloud formation](#)

Phys.Org

Meteorologists have known for almost 50 years that the proverbial flapping of a butterfly's wings can trigger a hurricane in a completely different ...

[Ask the Weather Guys: When did computer-based weather forecasts begin?](#)

Madison.com

A: Immediately after World War II, it became fashionable to imagine technologies that might allow human beings to control the weather. In fact, one ...

America's Cup (and sailing)

[Covid-19 sails off with NZ's America's Cup income](#)

New Zealand is expected to miss out on about \$150 million of income because half the superyachts due to follow the America's Cup next year have pulled out.

Aviation

[Civil Aviation Authority chief executive Graeme Harris retires](#)

The chief executive of the Civil Aviation Authority has retired.

Business/Insurance

[Standing on the Shoulders of Giants: The Key to Innovation](#)

Innovation doesn't occur in a vacuum. Doers and thinkers from Shakespeare to Jobs, liberally "stole" inspiration from the doers and thinkers who came before. Here's how to do it right.

Climate change / global warming

[Budget 2020 spending for climate change could lessen coronavirus' blow](#)

Climate change solutions could mitigate future pandemics and public health risks, health professionals say.

[Six New Zealands of climate change: Which one are you?](#)

Baby boomers are six times more likely to dismiss climate change than members of Gen Z, and twice as likely to vote, an in-depth survey has found.

[Extreme heat to affect more than 3 billion by 2070: study](#)

Up to 3.5 billion people could be struggling to survive in conditions of extreme heat in 50 years' time, if the world fails to curb greenhouse gas

emissions, a major new Dutch study has found.

Covid-19 / Business

[Business-led group will investigate how to safely reopen NZ-Australian border](#)

A new business-led group will investigate and recommend how to safely reopen the borders between Australia and New Zealand after both countries committed to introduce a "Covid-safe" travel zone as soon as it is safe.

[After COVID-19: Australia and the world rebuild \(Volume 1\)](#)

Australian Strategic Policy Institute

2 May 2020 | Book | Economics, Health, Natural environment

This publication offers a policy-focused analysis of the world Australia will face once the pandemic has passed. It analyses 26 key topics, countries and themes, ranging from Australia's domestic situation through to the global balance of power, climate and technology issues.

[Pandemic disruption creates economic opportunity, KPMG leader says](#)

A report from the business advisory firm KPMG says New Zealand is well-placed to develop greater domestic food production, for its own resilience, and also as a way to market itself as a trusted and reliable exporter.

Cloud seeding / Geoengineering

[PH Air Force bares cloud-seeding operations in parts of Luzon](#)

INQUIRER.net

MANILA, Philippines—Some parts of Luzon have experienced rainfall in recent days, partly because of the cloud seeding operations conducted by the ...

Energy and Mining

[Solar and wind energy sites mapped globally for the first time](#)

Researchers have mapped the global locations of major renewable energy sites, providing a valuable resource to help assess their potential environmental impact.

[AEMO updates COVID19 demand impact summary](#)

Energy Magazine

All regions except Queensland are expected to see a lift in maximum and minimum demands during the cold weather. AEMO said it will continue to ...

Government (regional and national)

[Coronavirus: Prime Minister downplays Budget spending, says Government will still be 'careful and balanced](#)

Prime Minister Jacinda Ardern has downplayed the level of spending likely to be unveiled in her Government's Budget next week.

History

[How a brutal cold stretch led to Frankenstein, a new religion and the invention of bikes](#)

AccuWeather.com

"What's so unusual is to get that large of an area of possible snow this late in the year," said AccuWeather senior meteorologist Alex Sosnowski.

[Why weather forecasts stopped: The 75th anniversary of VE Day](#)

AccuWeather.com

... Allies knew the weather upstream over the Atlantic Ocean and across the United Kingdom," said AccuWeather Founder and CEO Dr. Joel N. Myers

Hydrology / Flooding

[Nearly \\$20m paid out after Southland flooding](#)

Insurers have paid out almost \$20 million as a result of February's flooding in Southland.

Infrastructure

[Mayors with long wishlists chase 'shovel-ready' project funding](#)

Mayors around the country have filed shopping lists of 'shovel-ready' projects they hope will get a share of government cash aimed at boosting the post-Covid economy.

[Projects of \\$100m-plus approved by council](#)

Invercargill city councillors have given the nod to five "shovel-ready" projects totalling more than \$100million to stimulate the economy.

[\\$8m project at Timaru's port to start next month](#)

A multi-million dollar upgrade to the log yard at Timaru's port will go ahead in June.

PrimePort chief executive Phil Melhopt told Stuff the project, which would cost in the region of \$8 million, would involve the sealing off of four hectares of the log yard, plus the haul and access roads in and around it.

['We are starting to see some hope': Forestry back up and running in Gisborne area](#)

The heart of the Gisborne economy is beating again as the forestry industry is back in full swing under alert level 3.

Lightning

[Lightning strike causes power cut in Hāwera](#)

Power has been restored to about 420 Hāwera customers after a lightning strike took out the electricity supply earlier today.

Outdoor recreation

[Mt Taranaki snowfall could see early start to ski season](#)

A timely dumping of snow on Mt Taranaki has local skifield operators rubbing their hands for an early start to the ski season.

Transport/roading/shipping/freight

[Seven-month delay to Christchurch Southern Motorway](#)

Another major roading project has been delayed for at least seven months due to the Covid-19 shutdown.

Transport

[Seven-month delay to Christchurch Southern Motorway](#)

Another major roading project has been delayed for at least seven months due to the Covid-19 shutdown.

[Transmission Gully project a 'circus', sections to be re-laid](#)

The Transport Agency has admitted that sections of Wellington's billion-dollar project, Transmission Gully, need to be re-laid after an error.

Innovation and technologies and AI

[Coronavirus crisis spurs IT innovation](#)

The coronavirus crisis sees CIOs accelerating their adoption of automation, analytics and new processes to cope with the pandemic's disruptions and steer the enterprise forward in uncertain times.

Safety/ wellbeing

[Open Polytechnic of NZ launches free course on infection prevention](#)

The Open Polytechnic of New Zealand Ltd, the country's largest specialist provider of vocational distance learning, has launched a free self-directed course on infection prevention in response to the COVID-19 pandemic.

Journal and articles online

Quarterly Journal of the Royal Meteorological Society, Vol. 146, No. 728, April 2020 Part A

[Hourly 4D-Var in the Met Office UKV operational forecast model](#)

Marco Milan, Bruce Macpherson, Robert Tubbs, Gareth Dow, Gordon Inverarity, Marion Mittermaier, Gemma Halloran, Graeme Kelly, Dingmin Li, Adam Maycock, Tim Payne, Chiara Piccolo, Laura Stewart, Marek Wlasak

Pages: 1281-1301 | First Published: 26 December 2019

In this paper we describe the hourly cycling four-dimensional variational data assimilation (4D-Var) implemented operationally in the Met Office's convective-scale UKV forecast model. The new operational system extends this capability to the full UK and surrounding area (shown in the figure), delivering outputs suitable for blending into nowcasting products and for general forecasting of a full range of meteorological variables.

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Welcome to AMS News You Can Use.

Each week, we send out a sampling of recent news and items of interest in meteorology and related fields, as covered by various media outlets.

[How the coronavirus has changed air quality and what it could mean for the weather](#)

EurekAlert! - May 4, 2020

The change in air pollution in China from January to February as stay-at-home orders were put into place to stop the spread of the coronavirus has intrigued Louisiana State University meteorologist Paul Miller.

['Gargantuan' hail in Argentina may have smashed world record](#)

Phys.org - April 30, 2020

A supercell thunderstorm pelted a city center in Argentina a few years ago with hailstones so large scientists suggested a new category to describe them—gargantuan hail.

[Climate Crisis: The \\$600B Problem One Company Is Trying To Weather](#)

Forbes - May 1, 2020

Even while we work as a country to address the novel coronavirus pandemic, there's another large crisis bearing down — climate change.

[Arctic 'shorefast' sea ice threatened by climate change](#)

ScienceDaily - May 4, 2020

A new study shows that coastal sea ice used by Arctic residents for hunting and fishing will be reduced as the planet warms.

[More accurate prediction of scale and impact of weather events](#)

Phys.org - May 1, 2020

Large-scale weather events, such as monsoons and tropical cyclones, can now be more accurately predicted, findings from a joint India-UK research project show.

[The National Weather Service is working to revolutionize severe storm warnings](#)

The Washington Post - May 3, 2020

New technology will help forecasters constantly update, fine tune and focus warnings.

[Building satellites amid COVID-19](#)

Phys.org - May 5, 2020

One might assume that like many industries, the construction and testing of satellites has been put on hold, but engineers and scientists are finding ways of continuing to prepare Europe's upcoming satellite missions such as the next Copernicus Sentinels.


[Hurricane Season Starts June 1st - 4 Lessons From The Coronavirus Pandemic To Apply](#)

Forbes - May 3, 2020

Hurricane season is a month away. Are you prepared even as the coronavirus pandemic continues?

=====

Weather Eye with John Maunder


	Tauranga April Rainfalls 1898-2020 Weather Eye with John Maunder From January 1898 to December 1904, the observation site was described as the Tauranga ... sunlive.co.nz
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Thanks to our regular contributors.

 **MetSoc Secretary**

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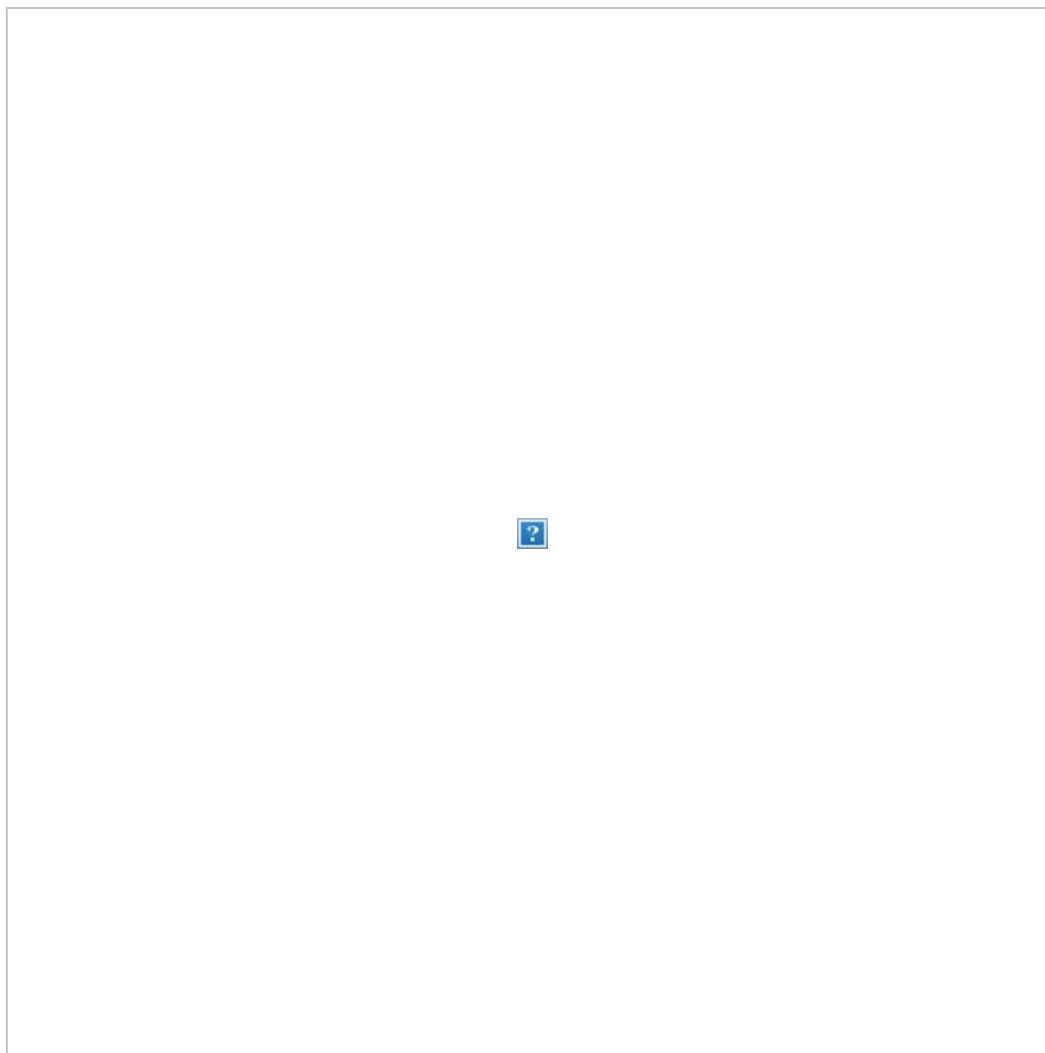
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From: [Metsoc](#)
To: [Trevor McGavin](#)
Subject: Clips 9Jan2020
Date: Thursday, 9 January 2020 2:13:25 pm

New Zealand weather and climate news

[View this email in your browser](#)



First: an email from Don Grainger of Otago Uni (now working in Oxford, England): xxx.xxxxxxxx@xxxxxx.xx.xx.xx

Let him know if you can help:

I wondered if you could circulate the following request to Met Soc Members. It is a bit of a long shot ...

I am seeking samples of ashfall from the Australian bushfires. If you could collect a sample of the ash and send it to me then that would be very helpful. My interest is in the composition and ageing of the aerosol.

To collect material when it is settling then put out a clean sheet of something like newspaper or plastic (that the particles won't stick to) then decant the powder into a small clean plastic phial. Please record the type and size of the sheet, its location and how long it was left out for. Please keep the sample dry.

Samples can be sent to

Don Grainger
Clarendon Laboratory
Parks Road
Oxford OX1 3PU
UK

I'm afraid I can't pay the postage but next time I'm in NZ I'm happy to look you up and buy you a coffee/beer as thanks.

Thanks

Don

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New Zealand weather and climate news

Courtesy of MetService Library

MetService mentions

Unseasonable chill set to give way to weekend warmth

Much of the country is experiencing unseasonably cold weather today, with parts of the South Island up to 6C below average, but things are expected to warm up by the weekend.

[Tree blown onto power line starts fire in Marlborough](#)

Stuff.co.nz

MetService meteorologist Lisa Murray said there were "persistent" winds across the country, with the station in Woodbourne, just north of Renwick, ...

[Crews working to reconnect power in towns throughout region](#)

New Zealand Herald

MetService meteorologist Lisa Murray said gusts of 78km/h were recorded in Whanganui on Sunday night and gusts of 83km/h were recorded at ...

[Record temperature in Ranfurly as smoke from Australian fires arrives above New Zealand](#)

New Zealand Herald

As Ranfurly recorded its hottest ever December temperature on Tuesday, MetService has warned that smoke from Australia's bush fires is coming our ...

[Power companies work on restoring lines after heavy winds](#)

Power has been restored to thousands of homes in Dunedin, Manawatū and Whanganui, where strong or severe winds downed trees and power lines yesterday.

[Falling tree injures woman and roofs lift off houses as high winds batter Dunedin](#)

A woman has been taken to hospital with serious injuries after a tree fell on her in Dunedin.

[Severe winds lift roofs, cut power across in Dunedin](#)

TVNZ

While winds have eased over Southland and Clutha, MetService says severe gales are forecast for exposed parts of the South Island and lower North ...

[More wild winds could hit South](#)

The cleanup continued for Dunedin yesterday after wild winds caused damage across the city.

Trees were cleared and power was restored to more than 2500 homes. Debris from the storm was scattered citywide.

[Weather: 'Widespread damage' as Manawatū hit with gale-force winds](#)

Powerlines across Manawatū are down as strong winds blast through the region, causing widespread damage and loss of electricity.

[Light at the end of the \(wind\) tunnel for Taranaki](#)

The capital may be known as Windy Wellington, but Taranaki has come close to challenging for the title.

Over the last month, average hourly wind speed in the region has regularly been over 20-30 kilometres per hour - a higher figure than last year - and ticked over 30 or 40kmh several times, even hitting 52kmh on January 4.

[Snow falls on hills in Southland](#)

Southlanders could be forgiven for thinking it was the middle of winter as they woke to snow on the hills on Monday morning.

[Unseasonable chill not likely to hang around](#)

Otago Daily Times

MetService meteorologist Lewis Ferris said much of the South Island was below the average for January, with Queenstown and Wanaka standing out ...

[Mid-summer frost possible for Otago this week](#)

Stuff.co.nz

MetService meteorologist Lisa Murray said the below average temperatures, caused by a cool southwesterly, were "unusual" and "spring like".

[Central Otago fire danger level reaches extreme](#)

People in Central Otago are being urged to postpone lighting fires as the danger level reaches extreme.

[Weather: Low 'bigger than Australia' bringing New Zealand a cold, windy week](#)

Newshub

MetService advises people to factor in the wind chill when making outdoor plans. "The cool southwest flow is really making itself known, dropping the

['That's ridiculous': Huge 196km/h gust near Hawke's Bay stuns meteorologist](#)

Newstalk ZB

A windy landmark at the southernmost point of Hawke's Bay is already a challenger for strongest gust of the year after a blow of 196km/h on Sunday.

MetOcean (and oceanmet, marine weather etc)

[The Story Of A Wave: From Wind-Blown Ripples To Breaking On The Beach](#)

Gizmodo Australia

Around 20 million Australians live within 50 kilometres of the coast. As summer temperatures soar, we flock to the ocean to splash, swim, surf, paddle, ...

[GNS asks the public to help it find earthquake equipment lost at sea](#)

GNS Science is asking the public to help it find five important earthquake recording instruments lost at sea.

NIWA

[NIWA reveals New Zealand's wildest weather moments of the 2010 - 2019 decade](#)

Newshub

The decade is drawing to a close and it's had with its extreme highs and lows - in temperatures, that is.

Meteorologists at NIWA have compiled a list of ...

[Places in New Zealand for which 2019 was the warmest year on record](#)

Parts of New Zealand experienced their warmest year on record in 2019, with some records going back more than a 150 years.

University of Tasmania research associate and former NIWA climate scientist Jim Salinger, said warmer years were becoming more frequent as the Earth continued to experience the effects of greenhouse gas emissions.

[Otago-Southland prominent in Niwa's extreme weather review](#)

Many of New Zealand's most extreme weather events over the past decade have been recorded in Otago and Southland.

Niwa climate scientists have compiled the "stand out" weather statistics of the past 10 years, which shows the hottest, coldest, wettest and windiest places across the country.

ECMWF

[ECMWF scientists to simulate global weather at 1 km resolution](#)

ECMWF

A group of ECMWF scientists have been awarded time on the world's most powerful supercomputer to carry out ground-breaking global weather and ...

WeatherWatch

[WeatherWatch's 3 biggest moments of 2019 - and list our positive plans for 2020](#)

WeatherWatch.co.nz

Commerce Commission (ComCom) launches investigation into Government Agencies Niwa and MetService. As many of you know (and are rightfully ...

Volcano alert/watch

[Whakaari/White Island remains active, no-go zone reduced](#)

Whakaari/White Island remains active, with hot gas and steam coming from vents opened by the December eruption.

Extreme weather (and other news) – Australia and Pacific

[How Fires In Australia Could Alter Weather Elsewhere Too](#)

Forbes

El Nino is associated with anomalously warm waters in the equatorial Pacific Ocean. This surface “heat source” and associated changes in ...

[Rains bring very temporary relief to Australia's fires](#)

Phys.Org

NASA satellite data continues to provide a look at the smoke and aerosols ... with a vengeance by Thursday when hot, dry weather and winds return.

[Australians Should Brace for Protracted Summer of Catastrophic Fires | Voice of America - English](#)

Voice of America

GENEVA - The World Meteorological Organization warns Australians should brace for a protracted ... A report by the Australian Bureau of Meteorology says climate change is causing temperatures to rise and ... East Asia Pacific.

[Australia weather bureau says no sign of cooler weather or rain on horizon](#)

CNA

The Sydney Opera House and Sydney Harbour Bridge are seen through smoke haze from bushfires as passengers ride a ferry in Sydney, Australia, ...

[Cyclone warnings issued in the Northern Territory as tropical low intensifies](#)

A tropical low intensifying in the Arafura Sea is expected to develop into a tropical cyclone in the early hours of Thursday morning, with several Northern Territory communities predicted to be affected by severe weather.

[Tropical Cyclone Blake forms off coast of WA, but fire relief in the east unlikely](#)

Tropical Cyclone Blake, the first for the Australian cyclone season, has formed off Western Australia's West Kimberley coast.

[Christmas day hail storm destroys crops in PNG Highlands](#)

More than 3000 people in the Western Highlands of Papua New Guinea could soon be starving after a freak hail storm destroyed their food gardens on Christmas day.

[Weather and ocean monitoring systems boost Tonga's disaster preparedness](#)

The installation of new automated weather stations and two sea level monitors in Tonga is expected to boost disaster preparedness and climate resilience in the kingdom.

Extreme weather (and other news) – Asia and the Middle East, Africa

[Indonesia succeeds in modifying weather to stop flooding](#)

Independent Online

Authorities started cloud-seeding operations by shooting salt flares at clouds on the Java Sea and the Sunda Strait to induce rain over waters off Java ...

[China offers receiving station for meteorological data to Mozambique](#)

Macaclub

China has donated a reception station for data collected by the meteorological satellite Fengyun – 2H to Mozambique, to help the country to follow the ...

Extreme weather (and other news) – Americas and Europe

[Smoke From Australian Wildfires Reaches Southern Brazil – Meteorologists](#)

Sputnik International

MOSCOW (Sputnik) – Smoke from devastating bushfires in Australia that have led to the death of over two dozen people has reached southern Brazil, ...

[BBC Weather: Extreme snowstorm risks Europe travel chaos amid freak Mediterranean freeze](#)

Express.co.uk

The BBC weather presenter said: “We have had some really strong winds, some heavy rain and snow across Croatia and Greece. “And that is moving ...

International news and research

[Israeli, German Scientists Double El Niño Warning Time, Predict Storm in 2020](#)

Haaretz

Weather havoc is likely to hit around Christmas 2020, say scientists after identifying correlation between warming events around the world.

[First Alert Meteorologist Brandon Beck looks at leaps in weather technology in the 2010s](#)

KY3

Perhaps the greatest leap in our technology in detecting real-time weather is dual polarity Doppler radar. This is a step up from “regular” Doppler, ...

[20 Experts Predict The Most Significant Weather And Climate Advances Of The Next Decade](#)

Forbes

Phased-array weather radar systems will also gain traction. Satellite ... That would be a significant leap for the climate research community. Dr. Victor ...

[Applying physics principle yields grim prediction on hurricane destruction in era of global warming](#)

Global warming could well lead to hurricanes more powerful than meteorologists currently forecast. A physicist noticed that one of the principles of physics -- phase transition -- did not appear in the scientific literature of meteorology. Using 60 years of published data, he demonstrated that the destructive power of tropical hurricanes increased linearly and rapidly as water temperature increased. The destructive energy could therefore treble if water temperatures rise by 2 degrees.

[Deep and crisp and living: How snow sustains amazing hidden life](#)

Snow may look pristine but even the freshly fallen variety is teeming with microscopic life. This vast and mysterious ecosystem could have a big impact on Earth

[Craig Kelly apologises to UK meteorologist he dubbed 'ignorant Pommy weather girl'](#)

SBS

A UK meteorologist has hit back at Liberal backbencher Craig Kelly for calling her an "ignorant Pommy weather girl" following an interview about ...

Weather companies

[Global Weather teams with Here for forecasts](#)

just-auto.com

Here Technologies says the Global Weather Corporation (GWC) has joined its Marketplace option to provide RoadWX weather data service, ...

[ClimaCell Announces Collaboration With Google Cloud on Weather Forecasting With 5X Jump in ...](#)

PRNewswire (press release)

ClimaCell is committed to making critical data free and accessible, fostering innovation. Starting in India, ClimaCell's models will be available to the ...

[Irish consultancy boosts offshore wind team](#)

reNEWS

Bonar will work on advanced design of floating substructures and optimisation of mooring and anchor systems, as well as work on metocean analysis ...

Air quality / air pollution

[Smokey orange skies: The health effects and science behind it](#)

New Zealand is unlikely to be much affected by ash from Australia's bushfires but vulnerable people should be sensible, and care should be taken around untreated drinking water, a physicist says.

Fire

[National fire risk assessment requested to prevent disaster like Australia](#)

Defence Minister Ron Mark has asked the Defence Force for a national fire risk assessment to prevent a disaster like [Australia's bushfires](#).

[Australia's bushfire crisis is so big that it's useless trying to predict how blazes will behave. incident controller says](#)

Scientific modelling used to predict how bushfires will behave is "not coping" with the current fire situation in south-eastern Australia because the fires are so big, an incident controller says.

[Rain isn't always helpful fighting bushfires. so what will it take to put them out?](#)

The heavens have reluctantly opened, bringing a few millimetres of rain to the scorched south-east, but authorities say it can actually hinder their efforts to fight bushfires.

[Fires misinformation being spread through social media](#)

Australia's bushfire emergency is being exploited on social media, as misinformation is spread through cyberspace via hundreds of thousands of posts.

[Australian bushfires: How climate change and other factors worsen fires](#)

Stuff.co.nz

Australia bushfires: Severe losses loom as fire conditions ease ... likely Australian fires start and spread from lightning and human-caused ignition, ...

[Understanding bushfire-triggered thunderstorms may save lives](#)

Phys.Org

With more extreme weather predicted to result from climate change, the team's findings highlighted the importance of combining weather radar and ...

Health

[Scientists link La Niña climate cycle to increased diarrhea](#)

A study finds that spikes in cases of life-threatening diarrhea in young children are associated with La Niña climate conditions. The findings could provide the basis for an early-warning system that would allow public health officials to prepare for periods of increased diarrhea cases as long as seven months ahead of time.

Lightning

[Uluru lookout lightning strike injures six people](#)

The Guardian

Six people have been injured including two women who were hospitalised when lightning struck a sunset lookout area at the Ayers Rock Resort.

[Two struck by lightning 'extraordinary' Sydney storm](#)

9News

"Water is a great conductor of electricity as you can imagine, so it's quite dangerous to be in any type of water when we do have lightning strikes," ...

[Heroic Brother Saves Surfer Struck By Lightning](#)

10 daily

A man was struck by a lightning bolt while getting out of the water at Sydney's Dee Why beach on Monday afternoon, one of two people struck by ...

Weather in pictures

[The magic of the perfect surf photo – in pictures](#)

The Guardian

We study wind and wave charts like meteorologists. We factor in family and jobs, dropping responsibilities more than we should when conditions are ...

Journal and articles online

Pressure dependence of reference deep-ocean thermometers

Wukchul Joung, Keesool Gam, Jonathan V. Pearce

Version of Record online: 17 December 2019

In this work, the pressure dependence of the temperature readings of reference deep-ocean thermometers (i.e. SBE 35, Sea-Bird Electronics) was investigated in a thermostatically controlled and pressurized environment. The results indicated that the pressure dependence of the reference deep-ocean thermometers is significant, and the pressure dependence is not the same for all SBE 35 devices but specific to each individual device.

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Welcome to AMS News You Can Use. Each week, we send out a sampling of recent news and items of interest in meteorology and related fields, as covered by various media outlets.

January 7, 2020

News

Understanding bushfire-triggered thunderstorms may save lives

January 6, 2020 - Phys.org

Researchers say a better understanding of the dangerous yet surprisingly common phenomenon of wildfires triggering supercell thunderstorms could reduce risk to life and property.

Boston Hosts America's Largest Weather Conference Next Week - Is That Risky Weatherwise?

January 4, 2020 - Forbes

One of the world's largest gatherings of meteorologists is in Boston next week. Will weather spoil the 100th AMS meeting?

Read MORE

Australia's massive fires, as seen from space

January 3, 2020 - Vox

Maps and images show where the fires are, and how much smoke they've created.

Read MORE

China's space contractor plans more than 40 launches in 2020

January 3, 2020 - SpaceNews

Other activities will include launches of the Apstar-6D communications satellite based on a new DFH-4E bus, Hongyan low-Earth orbit internet satellites, remote sensing and weather satellites and commercial payloads.

Read MORE

These are the biggest climate wins of the decade

January 3, 2020 - Fast Company

Fighting the climate crisis can feel like a losing battle. There's still an incredible amount of work to be done, but it's good to look to the successes of the past for inspiration.

Read MORE

Study confirms climate change impacted Hurricane Florence's precipitation and size

January 3, 2020 - Phys.org

A study led by Kevin Reed, Ph.D., Assistant Professor in the School of Marine and Atmospheric Sciences (SoMAS) at Stony Brook University, and published in Science Advances, found that Hurricane Florence produced more extreme rainfall and was spatially larger due to human-induced climate change.

Read MORE

Tests measure solar panel performance beyond established standards

January 2, 2020 - EurekAlert!

In a series of tests over five years, key parameters in solar panel performance were measured, producing data for better error correction factors and for choosing the most efficient panel.

Read MORE

NASA finds heavy rain potential in Tropical Cyclone Blake

January 6, 2020 - Phys.org

NASA's Aqua satellite provided a near visible image and analyzed the cloud top temperatures in Tropical Cyclone Blake, located along the northern coast of Western Australia.

Read MORE

Australian bushfire cloud visible in Chile and Argentina

January 6, 2020 - Yahoo! News

NASA's Aqua satellite provided a near visible image and analyzed the cloud top temperatures in Tropical Cyclone Blake, located along the northern coast of Western Australia.

Read MORE

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Thanks to all our contributors

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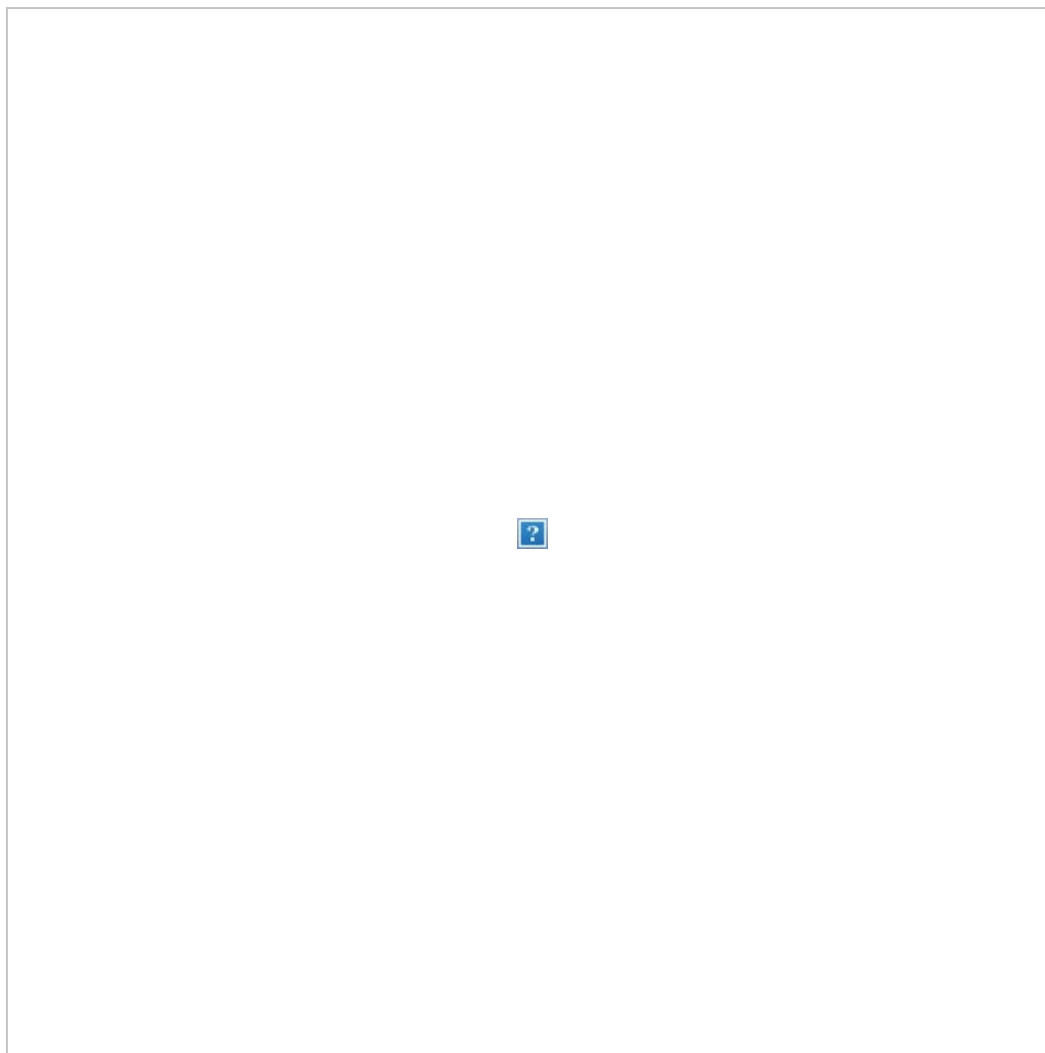
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The Meteorological Society of New Zealand · NIWA · Wellington, Wgn 6021 · New Zealand



From: [Metsoc](#)
To: [Bridget Chater](#)
Subject: Clips 18 July
Date: Thursday, 18 July 2019 8:30:33 pm

New Zealand weather and climate news

[View this email in your browser](#)



New Zealand weather and climate news

MetService- Thanks to their Library

Rain and snow batters south

7:12 AM Heavy rain is expected and a major tourist route is closed due to forecast snow.

Holidaymakers delighted with snowy Tekapo

Stuff.co.nz

Tekapo woke to a dusting of snow on Wednesday morning. MetService meteorologist **April Clark** said while the agency doesn't have an automatic ...

Mostly dry July for Timaru but wet weekend expected as school holidays end

Stuff.co.nz

"You guys have fared a lot better than those kids on the West Coast and in the North Island," **MetService** meteorologist **April Clark** said, on Wednesday ...

Heavy rain showers drench Palmerston North

Stuff.co.nz

MetService meteorologist **April Clark** said there was a moderate thunderstorm risk in Manawatū on Wednesday and the type of clouds that had formed ...

Snow closes South Island's Lewis Pass

Stuff.co.nz

The MetService issued a road snowfall warning on their website on Wednesday afternoon. It said up to 2 centimetres of snow may settle near the ...

Lightning hits retirement village as 5500 bolts hit New Zealand in heavy weather

Lightning striking a retirement village in Levin was one of 5500 lightning bolts that were recorded over central New Zealand on Sunday.

MetService meteorologist **Hannah Moes** said an active front was moving over the upper South Island and lower North Island early on Sunday morning.

[More than 4500 lightning strikes hit New Zealand over 24 hours](#)

New Zealand Herald

You could be forgiven for thinking the country has been stuck in an AC/DC music video with all the lightning strikes which hit over the weekend.

[Dunedin-bound flight hit by lightning](#)

Otago Daily Times

According to MetService, in the North Island there were scores of lightning strikes this morning, mostly around Wellington and Taranaki, while in the ...

[Happy weather day: Take a day off from wild weather, New Zealand, but reprieve short-lived](#)

New Zealand Herald

MetService meteorologist **Andy Best** said a "train of lightning strikes" passed across Northland's west coast at Baylys Beach between 12.45pm and ...

[Northland lightning strike shatters windscreen of family car](#)

Meteorologist **Peter Little** said lightning strikes to cars were extremely uncommon. The more usual places for strikes were trees, buildings or open fields.

[Wild weather in Taranaki brings highway slip and power outages](#)

Wild weather in Taranaki caused power outages and a road slip that blocked the main state highway for northbound traffic.

[Two buildings, trees, trampoline damaged by Taranaki tornado](#)

A tornado has torn through a New Plymouth suburb, damaging two buildings in its path.

[Mt Ruapehu eruption alarms triggered by earthquakes and wind gusts](#)

A "perfect storm" of earthquakes and high winds triggered Mt Ruapehu's eruption alarms on Sunday.

'Front after front': Wild week set to bring snow, downpours, gales

Another round of stormy weather is closing in, bringing snow to low levels, downpours, gales and possible tornadoes to some areas - and yet another battering from the elements is due later in the week.

WMO

[Climate Action is central to Sustainable Development Goals](#)

Posted:

A new report has been published on the progress towards meeting the targets of the 17 Sustainable Development Goals or SDGs, which commit countries to mobilize efforts to end all forms of poverty,...

[Unprecedented wildfires in the Arctic](#)

Posted:

Unusually hot and dry conditions in parts of the northern hemisphere have been conducive to fires raging from the Mediterranean to – in particular – the Arctic. Climate change, with rising...

ECMWF

[Natural Gas - Weather Model Disagreement Creates Opportunity](#)

Seeking Alpha

ECMWF-EPS is far more bullish than GFS-ENS, which is going to create an opportunity going forward. We believe "king euro" is likely to be correct, ...

[Extreme weather \(and other news\) – Asia and the Middle East, Africa](#)

[More than 100 dead, millions displaced in floods across South Asia](#)

A deadly monsoon is wreaking havoc across South Asia, leaving more than 100 people dead and displacing millions more.

['They ask us if we can make it stop raining or make it rain': Life as a weather forecaster in Singapore](#)

CNA

SINGAPORE: Nestled in a corner of Changi Airport, sheltered from the hubbub of one of the world's busiest airports, is the Meteorological Service's ...

[Tropical Storm Danas to bring flood risk to Philippines, Taiwan: China, South Korea and Japan ...](#)

AccuWeather.com

"At this point, AccuWeather **meteorologists** believe it will remain a tropical storm and not achieve typhoon status," according to AccuWeather Senior ...

[Extreme weather \(and other news\) – Americas and Europe](#)

[Barry could cause up to \\$10B in storm damage, meteorologists predict](#)

New York Post

Experts estimate that the total damage and economic loss caused by Tropical Storm Barry — which is set to deliver a punishing blow to the Gulf Coast ...

[US officials to make disaster warnings faster, clearer about life-threatening events](#)

Washington Post

"Sometimes **meteorologists** will criticize people for looking outside for a sign of the storm, but that's a very natural instinct." Floods, tornadoes, wildfires ...

[Greek storms kill six as 'extremely unusual' weather prompts state of emergency](#)

Six people, including two children, have been killed and more than 100 others injured after gale-force winds, rain and hailstorms struck northern Greece, uprooting trees and collapsing roofs.

[UK weather forecast – Three-month heatwave to start with 27C scorcher this week and warm ...](#)

The Sun

Claire Kennedy-Edwards, senior meteorologist for The **Weather Company**, told Sun Online: "It is a much more settled outlook across the UK with ...

[International news and research](#)

[Embry-Riddle Aeronautic University Chooses Baron for Weather Tracking](#)

Campus Safety Magazine

Baron, a leading provider of critical weather solutions, announces that ... analysis and forecasting, **aviation weather**, and tropical meteorology classes.

[Ammonia from agriculture influences cloud formation over Asia](#)

Science Codex

Ammonia from agriculture influences cloud formation over **Asia** ... Sensing Division of KIT's Institute of **Meteorology** and Climate Research (IMK-ASF).

[The Weather Is Worse, but Forecasts Keep Getting Better](#)

Slate Magazine

Nothing is more banal than talking about the **weather**. ... In the current one, he turns his eye toward the **satellites**, equations, and algorithms—and, yes, ...

Indian Ocean causes drought and heatwaves in South America

Researchers have revealed that atmospheric waves originating from convection over the Indian Ocean had a dramatic impact on climate conditions over South America and South Atlantic, leading to drought and marine heatwaves. Importantly, these conditions are not a one-off and are likely to happen again.

Andrew Blum: The Weather Machine How we See into the Future

An accurate weather forecast can change history. The ability to get the weather right is getting better all the time with advances in computer simulations, satellites and global cooperation. But the outlook for access to that vital information is not so sunny. Journalist, author and weather geek Andrew Blum explains how weather prediction works and why it's under threat in his new book, *The Weather Machine How we See into the Future*

Ask the Weather Guys: Did the moon landing influence weather forecasting?

Madison.com

With specific respect to **weather forecasting**, the space race was responsible for enormous advances in satellite **technology** that now provide the ...

Aviation

Sudden turbulence that injured dozens on Sydney-bound flight is hard to predict

Stuff.co.nz

Pilots rely on data from weather balloons and other pilots to predict turbulence but there is less information on conditions over the ocean than for over ...

Why the turbulence that injured passengers on an Air Canada flight is hard to predict

Boston.com

The plane may have run into clear air turbulence, which is caused by wind ... Pilots rely on data from weather balloons and other pilots to predict ...

'Sudden and severe' turbulence wreaks havoc on Emirates flight from Auckland

Passengers were terrified, vomiting and injured following severe turbulence on an Emirates flight from Auckland to Dubai.

The "sudden and severe turbulence" left the business class cabin in tatters with Champagne bottles on the floor, food carts overturned, and even a fallen exit sign.

Meteorologists say airplane turbulence can strike out of the blue

Texarkana Gazette

NEW YORK—They literally don't see it coming. "Clear-air turbulence," which evidently jolted an Air Canada flight Thursday over the Pacific Ocean,

The Best Defense Against Clear Air Turbulence Injuries Like Those Aboard Air Canada Flight Is ...

Forbes

While airlines and pilots plan their flight paths to avoid weather systems that could cause a risk to passengers, clear air turbulence, known as CAT, ...

China's civil aviation industry sees steady growth in H1

Xinhua

Amid increasing flights and extreme weather conditions, the flight on-time performance reached 80.35 percent. In the first half of 2019, the total ...

Business/Insurance

Insurers will manage, survive climate change risks – expert

Insurance Business New Zealand

Recent reports have projected extreme **weather** events and flooding could ... Chapman Tripp believes it will be beyond the control of **business**. It noted ...

Unlikely Industries That Use Weather To Make Business Decisions

Forbes

It influences peoples' moods, behaviors and performance, which is why the information and data that **meteorologists** can provide business owners ...

Energy and Mining

Last summer's heatwave made electricity price forecasts look foolish. Will it happen again?

RenewEconomy

Last summer's heatwave made **electricity** price forecasts look foolish. In the end, unsurprisingly, neither **weather** or **demand** forecasting is that ...

Natural Gas Rises on Weather, Storm-Induced Disruptions

Yahoo Finance

The U.S. **Energy** Department's weekly inventory release showed a ... industrial sector **demand** even as the usage of natural gas-fired **power** to run ...

Farming/horticulture/Aquaculture

Vic Government details farm IoT trial technologies

IoTAustralia (blog)

Vic Government details farm IoT trial **technologies** ... Monitor **weather** conditions including air temperature, relative humidity, barometric pressure, wind ...

King Salmon seeks consent to farm in Cook Strait next year

King Salmon has lodged a consent application to begin salmon farming in Cook Strait to escape the warming inner-shore waters.

Government (regional and national)

Government boosts R&D funding for pre-profit firms

Stuff.co.nz

... funding, the Minister for Research Science and Innovation, **Megan Woods**, has announced. ... **New Zealand** cannot afford not to innovate.

Hydrology / Flooding

Flood prediction model developed

The duration of floods can be determined by river flow, precipitation and atmospheric blocking. Now an international team of researchers is offering a novel physically based Bayesian network model for inference and prediction of flood duration. The model also accurately examines the timescales of flooding.

Lightning

Tracking Lightning To Prevent Fire

KDRV

stormwatch 12 **meteorologists** track storms and lightning through forecast models, radars and weather cams. but to prevent fires, our chief ...

[Fatal lightning strikes down this year. but don't let your guard down](#)

Atlanta Journal Constitution

There's no obvious reason, **meteorologists** say. It could be that there's more public awareness to the dangers of lightning, or the technology advances, ...

Satellites and radar

[Soyuz Rocket Launches Russia's Weather Satellite](#)

Market Reports

Russia has been launching such **weather satellite** into space. The first one which was called Meteor-M No1 was launched by Russia in the year 2009.

[Fresh \\$18.7 million funding round puts PlanetIQ weather constellation back on track](#)

SpaceNews

WASHINGTON — After years of delays, PlanetIQ says its constellation of commercial **weather satellites** will be ready to start launching in January ...

Transport/roading/shipping/freight

[CSIR Signs Weather-Monitoring Deal With Transnet](#)

Railways Africa (press release)

The CSIR recently announced the signing of a three-year, multimillion-rand contract with Transnet National Ports Authority (TNPA) for the maintenance ...

Thicker pavement is more cost effective down the road

Posted: 10 Jul 2019 10:20 AM PDT

Pavements, which are vulnerable to increased temperatures and excessive flooding due to sea level rise, can crack and crumble. Climate change can be a major contributor and as greenhouse gas emissions continue these issues are projected to accelerate. Researchers say because of this one of the best ways to extend the life cycle of roads, and keep future costs down, is to increase the thickness of asphalt on certain roads.

Road to Zero road safety plan needs strong government investment to work - AA

The government needs to commit to spending serious money if it wants its plan to radically cut the road toll to work, the Automobile Association says.

[Drones will help economy take off](#)

Scoop.co.nz

Drones are estimated to be worth up to \$7.9 billion to the economy, **Transport Minister Phil Twyford** said at the launch of the Government's plan for ...

Climate change / global warming / sea level rise

2050 climate: Wellington becomes Auckland. Auckland becomes Sydney

Wellington's 2050 climate will resemble Auckland's today – while Auckland will feel more like Sydney, scientists say.

David Attenborough on climate change

The UK must take radical action to meet its climate change targets, David Attenborough told a UK parliamentary committee this week. But he warned that ministers must carry the public with them because of the financial cost of meeting the goals. [Read more](#)

How climate change is affecting what we grow and eat

Farmers and scientists are finding new ways to keep food on the table as rainfall patterns move and heatwaves increase.

Cloud seeding / Geoengineering

[Indonesian Government Plans To Create Manmade Rain To Solve Air Pollution Problem](#)

VICE

"In 2015, Thailand successfully conducted a **cloud-seeding** test run in response to air pollution in Bangkok, removing the inversion layer," Seto told ...

Emergency preparedness / disaster planning / resilience

Heatwave guide for cities

16 Jul 2019

[Red Cross Red Crescent Climate Centre](#)

International Federation of Red Cross and Red Crescent Societies

This example shows that cities can rise to the challenge of coping with more frequent and extreme heatwaves. Cities have a unique potential to adapt to changing heat risks through effective risk management at multiple levels within a city; connecting policies and incentives; and strengthening community adaptation capacity. All of these facets make it extremely important for cities to undertake heat-related risk analyses and to devise plans for reducing and managing risks. This guide is intended to be a basic introduction to this topic and a resource for cities to start planning for extreme heat.

Killer heat in the United States: climate choices and the future of dangerously hot days

16 Jul 2019

[Kristina Dahl](#), [Erika Spanger-Siegrfried](#), [Rachel Licker](#), [Astrid Caldas](#), [John Abatzoglou](#), [Nicholas Mailloux](#), [Rachel Cleetus](#), [Shana Udvardy](#), [Juan Declet-Barreto](#), [Pamela Worth](#)

[Union of Concerned Scientists](#)

For this national analysis, extreme heat is measured according to the heat index, the combination of temperature and humidity that creates the "feels like" temperature.

The analysis includes four different heat index thresholds, each of which brings increasingly dangerous health risks: above 90°F, above 100°F, above 105°F, and "off the charts." (Off-the-charts days are so extreme they exceed the upper limits of the National Weather Service heat index scale, which starts topping out at or above a heat index of 127°F, depending on the combination of temperature and humidity.)

The report features three time frames—historical, midcentury, and late century—and three different scenarios of climate action.

Journal and articles online

Quarterly Journal of the Royal Meteorological Society

[Relative contribution of soil moisture, boundary layer and microphysical perturbations on convective predictability in different weather regimes](#)

Christian Keil, Florian Baur, Kevin Bachmann, Stephan Rasp, Linda Schneider, Christian Barthlott

First Published: 06 July 2019

[Polar low variability and future projections for the Nordic and Barents Seas](#)

Oskar A. Landgren, Yurii Batrak, Jan Erik Haugen, Eivind Støylen, Trond Iversen

First Published: 06 July 2019

[Summertime mid-latitude weather and climate extremes induced by moisture intrusions to the west of Greenland](#)

Cory Baggett, Sukyoung Lee

First Published: 06 July 2019

[A Simple Ensemble Approach for More Robust Process-Based Sensitivity Analysis of Case Studies in Convection-Permitting Models](#)

David L. A. Flack, Suzanne L. Gray, Robert S. Plant

First Published: 06 July 2019

[Wind turning in the atmospheric boundary layer over land](#)

Jenny Lindvall, Gunilla Svensson

First Published: 04 July 2019

[Towards a more reliable historical reanalysis: Improvements for version 3 of the Twentieth Century Reanalysis system](#)

Laura C. Slivinski, Gilbert P. Compo, Jeffrey S. Whitaker, Prashant D. Sardeshmukh, Benjamin S. Giese, Chesley

McColl, Rob Allan, Xungang Yin, Russell Vose, Holly Titchner, John Kennedy, Lawrence J. Spencer, Linden

Ashcroft, Stefan Brönnimann, Manola Brunet, Dario Camuffo, Richard Cornes, Thomas A. Cram, Richard

Crouthamel, Fernando Domínguez-Castro, J. Eric Freeman, Joëlle Gergis, Ed Hawkins, Philip D. Jones, Sylvie

Jourdain, Alexey Kaplan, Hisayuki Kubota, Frank Le Blancq, Tsz-Cheung Lee, Andrew Lorrey, Jürg Luterbacher,

Maurizio Maugeri, Cary J. Mock, G.W. Kent Moore, Rajmund Przybylak, Christa Pudmenzky, Chris Reason, Victoria

C. Slonosky, Cathy Smith, Birger Tinz, Blair Trewin, Maria Antónia Valente, Xiaolan L. Wang, Clive Wilkinson, Kevin

Wood, Przemysław Wyszynski

First Published: 03 July 2019

[Routes to long-term atmospheric predictability in coupled ocean-atmosphere systems – Impact of the ocean basin boundary conditions](#)

Stéphane Vannitsem, Roman Solé-Pomies, Lesley De Cruz

First Published: 02 July 2019

[Quantifying the global impact of tropical cyclone-associated gravity waves using HIRDLS, MLS, SABER and IBTrACS](#)

Corwin J Wright

First Published: 02 July 2019

[Relationship between atmospheric blocking and warm season thunderstorms over western and central Europe](#)

Susanna Mohr, Jan Wandel, Sina Lenggenhager, Olivia Martius

First Published: 02 July 2019

[Internal interannual variability of the winter polar vortex in a simple model of the seasonally evolving stratosphere](#)

L. A. Hatfield, R. K. Scott

First Published: 02 July 2019

[Processes determining heat waves across different European climates](#)

Philipp Zschenderlein, Andreas H. Fink, Stephan Pfahl, Heini Wernli

First Published: 02 July 2019

[Extreme rainfall sensitivity in convective-scale ensemble modelling over Singapore](#)

Aurore N. Porson, Susanna Hagelin, Douglas F.A. Boyd, Nigel M. Roberts, Rachel North, Stuart Webster, LO Jeff

Chun-Fung

First Published: 02 July 2019

[Trends in and closure of the Atmospheric Angular Momentum budget in the 20th century in ERA-20C](#)

Menno A. Veerman, Chiel C. van Heerwaarden

First Published: 02 July 2019

[On the sensitivity of a 4D-Var analysis system to satellite observations located at different times within the assimilation window](#)

A.P. McNally

First Published: 01 July 2019

[Dutch Fog: On the Observed Spatio-Temporal Variability of Fog in the Netherlands](#)

Jonathan G. Izett, Bas J. H. van de Wiel, Peter Baas, J. Antoon van Hooff, Ruben B. Schulte

First Published: 01 July 2019

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Having trouble viewing this email? [View Online](#)

Welcome to AMS News You Can Use. Each week, we send out a sampling of recent news and items of interest in meteorology and related fields, as covered by various media outlets.

July 16, 2019

Get Connected

News

[Weather Blog: Could the Atlantic Tropical Season Get Busier?](#)

July 15, 2019 - News 13

The latest outlook shows that the El Niño phase that we have been in over the past several months may come to an end in another month or two.

[Read MORE](#)

[Flying With the Hurricane Hunters Into Barry's Heart](#)

July 14, 2019 - MSN.com

Like doctors taking a CT scan, the hurricane hunters from the National Oceanic and Atmospheric Administration, based in Lakeland, Florida, and their partners went to get a snapshot of the storm's insides on Thursday.

[Read MORE](#)

[Alexa, what's the weather like today?](#)

July 12, 2019 - Medium

Can Alexa predict the next thunderstorm and save us from the next global crisis?

[Read MORE](#)

[The Gathering Storm Over How Hurricanes Are Measured](#)

July 12, 2019 - The Washington Post

A number of destructive storms have underscored the inherent weaknesses in the Saffir-Simpson Hurricane Wind Scale, and efforts continue to try to replace it with something more useful.

[Read MORE](#)

[Colorado's Hail Storms Were The Most Expensive In The Country Last Year. You Could Pay the Price](#)

July 12, 2019 - Colorado Public Radio

It's become a regular summer event on the Front Range: Ink-black clouds sweep through and unleash hail on homes, cars and unsuspecting people.

[Read MORE](#)

[The Weather Is Worse, but Forecasts Keep Getting Better](#)

July 11, 2019 - Slate

How weather-prediction models improve—and why they haven't made the weatherman obsolete.

[Read MORE](#)

[Fresh \\$18.7 million funding round puts PlanetIQ weather constellation back on track](#)

July 11, 2019 - SpaceNews

After years of delays, PlanetIQ says its constellation of commercial weather satellites will be ready to start launching in January thanks to \$18.7 million in new capital.

[Read MORE](#)

[Through Smoke and Fire, NASA Searches for Answers](#)

July 11, 2019 - NASA

While NASA keeps an eye on today's fires, it also tackles the big-picture questions that help fire managers plan for the future.

[Read MORE](#)

[Ammonia from agriculture influences cloud formation over Asia](#)

July 11, 2019 - EurekAlert!

Climate researchers of KIT solve the puzzle of a huge aerosol layer in the atmosphere -- results will improve climate models.

[Read MORE](#)

[D.C.'s 'Historic' Flash Flood May Soon Be Normal](#)

July 10, 2019 - CityLab

One-hundred-year storms, of the kind that wreaked havoc on the nation's capital Monday, are expected to become 1-in-25-year events by mid-century.

[Read MORE](#)

[How Much Water Do Snowpacks Hold? A Better Way to Answer the Question](#)

July 15, 2019 - Phys.org

Oregon State University researchers have developed a new computer model for calculating the water content of snowpacks, providing an important tool for water resource managers and avalanche forecasters as well as scientists.

[Read MORE](#)

[The World's Largest Iceberg Is 2 Years Old Today, and Already Drifting Toward Its Doom](#)

July 12, 2019 - Live Science

Eighteen months of satellite images show iceberg A68 — currently the world's largest iceberg (and the 6th largest ever recorded) — drifting 150 miles north toward the currents of the Southern Atlantic Ocean.

[Read MORE](#)

[Why Barry dropped much less rain on the Gulf coast than forecasters expected](#)

July 16, 2019 - Vox

We can anticipate where storms will go, but their rain and wind are far more difficult to predict.

[Read MORE](#)

[The Long, Strange Trip to Becoming Hurricane Barry](#)

July 16, 2019 - Weather Underground

By the time we're finished with Barry, it will have traced a fascinating loop from its birth as a disturbance in the Plains to its last breaths as a remnant in the Midwest in over 10 days' time.

[Read MORE](#)

[Adrift in a melting Arctic](#)

July 13, 2019 - The Week Magazine

What the scientists discover during their year in the frozen north will help them forecast the future of the entire planet.

[Read MORE](#)

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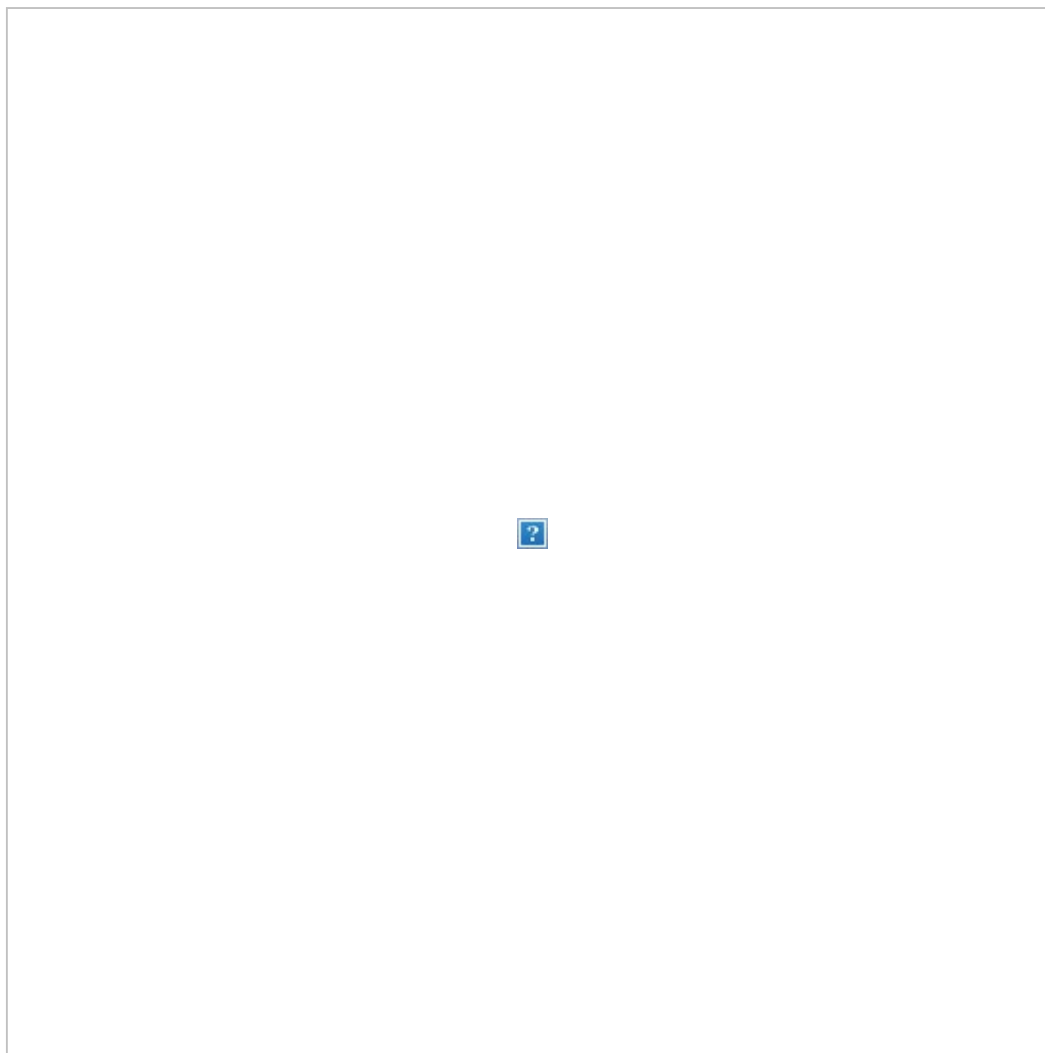
Thanks to our regular contributors



From: [Metsoc](#)
To: [Robert Kerr](#)
Subject: Clips 21 March
Date: Thursday, 21 March 2019 9:04:20 pm

New Zealand weather and climate news

[View this email in your browser](#)



First, We ask all Met Society members to look up at the sky and observe two minutes of silence this **Friday** to remember the victims of last Friday's senseless crime against humanity in Christchurch.

See

<https://www.stuff.co.nz/national/christchurch-shooting/111469453/two-minutes-of-silence-for-shooting-victims-what-you-need-to-know>

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New Zealand weather and climate news

(MetService focus)

Polar vortex helping forecasters predict New Zealand weather

MetService meteorologist Georgina Griffiths said the good news this week was SAM was likely to remain mostly positive for the next couple of weeks. It was difficult to get a clear signal of Sam's intentions beyond that.

An indecisive weather front bringing rain across the central South Island

MetService meteorologist Angus Hines said the reversing front situation was certainly "a bit unique".

Cyclones and other natural disasters hit hard in the Pacific

Lisa Murray, Head of Weather Communication at Met Service says that until 1953, only female names were used by the US National Weather Service.

Muggy days to stick around for Rotorua

New Zealand Herald

According to MetService meteorologist April Clark, the warm, moist air creating the muggy conditions is being brought down the North Island from the ...

Muggy nights in store for Tauranga

New Zealand Herald

According to MetService meteorologist Andy Best, the moist air creating the muggy conditions is being brought

down the North Island from the Pacific.

Others

'Bone' cloud appears above Whangarei

Newshub

A bizarre 'bone' cloud seen above Whangarei last weekend has meteorologists baffled. One photo, taken by Sharron Cleary at 5:30pm on Sunday ...

Extreme weather (and other news) – Antarctica and offshore

Hanergy's Thin-film Solar Panels to Aid Meteorology Research in Antarctic

APN News

The signing ceremony was held at Chinese Academy of Meteorological ... further down for a wider application of thin-film solar power technologies.

Extreme weather (and other news) – Australia and Pacific

Flash flooding kills 50 in Papuan capital

As many as 50 people have died as a result of flash flooding in Papua.

The deaths have been recorded in Jayapura regency, near Indonesia's border with Papua New Guinea.

'Monster' El Nino a chance later this year, pointing to extended dry times

The Sydney Morning Herald

They considered parallel years, such as 2014 when a near-El Nino was reached before conditions revived a year later, creating one of the three most ...

Vanished wet season of 1952 has eerie similarities to NT's current dry spell

The Northern Territory's wet season, or lack thereof, may be one for the record books.

The Bureau of Meteorology believes Darwin could be on track for its driest wet season on record, measuring 890 millimetres of rainfall — just over half the average.

Heatwatch: increasing extreme heat in Townsville

20 Mar 2019

Mark Ogge, Bill Browne, Travis Hughes

The Australia Institute

Increasing extreme heat will have profound impacts on people, industries and ecosystems in Townsville. CSIRO and Bureau of Meteorology projections estimate that the average number of days over 35 degrees each year could increase fivefold by 2030 and reach over one hundred days per year by 2090 without strong climate policies. Almost two hundred nights per year could remain above 25 degrees by 2090, a level considered dangerous to human health.

Death toll from Papua flooding rises, amid fears for children

Indonesian officials say the death toll from flooding and landslides in Papua has risen to 89, while dozens of people remain missing.

Australia: Tropical Cyclone Trevor forms, on track to target northern Queensland this week

AccuWeather.com

Newly formed Tropical Cyclone Trevor is expected to take aim and bring dangers to the Cape York Peninsula in northern Queensland, Australia, this ...

Cyclone Veronica forms off WA coast, with warning 'strong system' set to reach Pilbara

A low-pressure system to the north of Western Australia has rapidly intensified into a category two cyclone, with a blue alert issued for a stretch of the Pilbara coast.

Extreme weather (and other news) – Asia and the Middle East, Africa

Why is it raining so much in the UAE? Here's the answer

Khaleej Times

The recent spate of downpours can be attributed to the success of cloud seeding, a process of enhancing the amount of precipitation in clouds and to ...

Air Force participates in royal rainmaking operation

ThaiVisa News

BANGKOK, 15 March 2019 (NNT) - The Air Force has sent cloud-seeding planes to participate in a royal rainmaking operation for 2019 to relieve the ...

Never seen so much rain': Zimbabweans struggle with storm floods

Death toll rises as cyclone Idai wrecks roads, bridges in Zimbabwe, leaving passengers stranded and villagers isolated.

Cyclone Idai: Mozambique survivors desperate for help

Mozambique's port city of Beira is reeling from the damage inflicted by Cyclone Idai.

A new UAE rain study is focusing on fog

Abu Dhabi World

An initiative led by a UAE Research Program for Rain Enhancement Science awardee will study local fog and clouds to potentially enhance rainfall in ...

Extreme weather (and other news) – Americas and Europe

Canada's Earliest Heat Wave Ever Is Forecasted To Hit This Week

MTL Blog (blog)

According to The Weather Network, Canada is set to see the earliest heat wave on record this week, with some provinces expected to see a couple ...

Nebraska Flooding Seen from Space in Dramatic Detail

A new series of before-and-after images shows the ongoing flooding in Nebraska in jaw-dropping detail.

The images, created by the European Union's Earth-observation program, Copernicus, show rivers turned to lakes and farms and towns underwater. The record flooding is the result of a "bomb cyclone" that struck the central U.S. last week. The term refers to a storm that forms outside of the tropics in which atmospheric pressure drops very rapidly.

International news and research

Rising CO2 Levels Could Wipe Out Stratocumulus Clouds, Accelerating Climate Change

Stratocumulus clouds spread out like puffy cotton balls in orderly rows above the ocean in the sub-tropics. The low-hovering clouds provide the planet shade and help keep Earth cool. But in a new study published this week, researchers say that rising carbon dioxide levels in the atmosphere could wipe out these clouds. The discovery means that, under "business as usual" emissions scenarios, Earth could heat up 14 degrees Fahrenheit within a century.

We're The Geeks Who Have Protected the Public From Weather Extremes For 100 Years

Newsweek

In the 21st century, the societal impact of the meteorology community is vast, extending well beyond the daily "should I take my umbrella today?"

The 'Frozen Chosen': What's it like to live, work in the northernmost permanently inhabited place on Earth?

Not many people could imagine braving a location situated in a climate so extreme that it is considered unsuitable for human habitation.

Once you factor in the snow that falls all year round, the 24 hours of darkness during frigid winter months and the mere 508-mile distance from the North Pole, it's no wonder that so few people live and work in the northernmost permanently inhabited settlement on Earth – Alert, located in the most northerly Canadian territory of Nunavut.

When does a winter storm become a bomb cyclone?

The Conversation US

What, then, distinguishes a "bomb" from a run-of-the-mill cyclone? The term was coined by famed meteorologists Fred Sanders and John Gyakum in a ...

How Bomb Cyclones Are Changing The Way We Talk About Weather

Texas Standard

"What I think has happened is that you have a lot of meteorologists that you see interacting on Twitter or different social media platforms, and now ...

How Analytics Is Ushering In A Smart Weather Forecasting Industry In India

Analytics India Magazine

The data needed for weather forecasting is the data like barometric ... Himanshu Goyal of The Weather Company said at Cypher 2018, "After few ...

Meteorologists Are Among Female Scientists Wearing Purple On Pi Day. Here's Why?

Forbes

NWA along with the American Meteorological Society (AMS) are critical actors in the U.S. weather enterprise. The NWA Twitter site explained ...

Top 10 weird weather and science words and phrases

WKRG News 5

Polar Vortex is a real weather term that's been used by meteorologists for dozens of years, since way before the Internet. It's a band of very high wind ...

Leeds most common weather phrases revealed: Which do you use?

Yorkshire Evening Post

The British Science Association has partnered with Operation Weather Rescue to tap into our passion for the weather with a citizen science project ...

The Trinity Tests: When Atomic Development Meant Betting Whether Earth Would Catch On Fire

Newsweek

Teams of meteorologists were called in; smoke experiments were conducted; flocks of brightly-colored weather balloons were released and observed ...

Launching a weather balloon in a snow storm isn't glamorous

The Weather Network

A hapless scientist struggled to launch a weather balloon in the middle of a blizzard sweeping through Rapid City, South Dakota Wednesday.

Why are cyclone paths so difficult to predict?

Some cyclones seem to hurtle straight into the coast while others drunkenly stagger about, stalling, changing direction and even going back upon themselves.

National Weather Service offering free local weather spotter training classes

Kearney Hub

Meteorologists who predict the weather use a variety of technologies to help make those forecasts. They also rely on a human aspect to fill in the ...

WMO

WMO supports Sustainable Climate Information Services

As the recognition of the dependence between climate change and variability and human welfare grows, climate action continues gaining importance on the global development agenda

World Meteorological Day celebrates the Sun, the Earth and the Weather

The Sun, the Earth and the Weather is the theme of this year's World Meteorological Day. It highlights the role of the Sun in delivering the energy that powers all life on Earth, and drives the...

Art

Art and climate roadshow tackles the big stuff

"The arts can be a disrupter, successfully challenging incumbent values and ideas, including how we innovate technology and sustainable urban design as well as re-imagining the fundamental systems we base the way we make and consume things with disregard for planetary boundaries."

On a practical level that means taking to the road with climate scientists, Professors James Renwick and Dr Tim Naish, from Victoria University and then inviting local artists and educators to join a panel discussion.

Aviation

Space port 'could be feasible' in NZ in 10 years

New Zealand is positioning itself to be a leader when it comes to space tourism.

Business Facts Today (blog)

According to this study, over the next five years the Aviation Weather Forecasting Services market will register a xx% CAGR in terms of revenue, the ...

Communications/social media

KTBS 3 unveils the Mega 3 Storm Team Jr. Weather Watchers Center at Sci-Port

KTBS

The center is for all ages and place where children can interact by watching themselves live on TV with weather graphics, experience the tornado ...

Apps We Love: Weather Apps

CPAPracticeAdvisor.com

We surveyed the CPA Practice Advisor community this month to find out which apps our friends use when they're trying to stay on top of the weather.

Energy and Mining

\$9 million funding to enhance short term forecasting of wind and solar farms

Mirage News

The portfolio of 11 projects will involve a range of weather forecasting technologies including onsite cloud cameras that can predict the timing and ...

Vestas team forecasts more precision in Australia

reNEWS

Vestas and its wholly-owned energy analytics solution provider Utopus ... weather forecasts and meteorological data to deliver more accurate energy ... system stability by balancing the energy supply and demand in the market.

History

150 Women in 150 Words 1918–1967 Edith Farkas

Meteorologist (1921-1993)

A female pioneer in the largely male field of meteorology, Edith Farkas came to New Zealand as a Hungarian refugee after the Second World War. Her qualifications weren't recognised, and she had to return to university for a MSc in physics before she could begin work at the New Zealand Meteorological Service.1

<https://royalsociety.org.nz/150th-anniversary/150-women-in-150-words/1918-1967/edith-farkas/>

Satellites and radar

Weather Radar will Fulfill Public Safety Missions

i-HLS - Israel Homeland Security

The model combines, for the first time, two weather radar technologies – the one that reads data quickly and the one that reads data in great detail, ...

Transport/roading/shipping/freight

Weather's Biggest Blind Spot: Helios in Transportation

Harris Geospatial Solutions

To resolve this weather blind spot, Helios creates a new foundational weather sensor network from CCTV traffic cameras to detect "road weather".

France battling to contain six-mile fuel slick after cargo ship carrying 2000 cars sinks

The Independent

The ship was carrying over 2,000 vehicles, 365 shipping containers, metric tonnes of oil were spilled when a ship broke up in stormy weather.

An Analysis of MSC Zoe's Container Loss

The Maritime Executive

The six hourly published Sea Surface weather charts from 31.12.2018 00:00 UTC to 02.1.2019 06:00 UTC from metoffice.gov.uk are available to me ...

Roads vs extreme weather: how to design more resilient roads

Infrastructure Magazine

Roads vs extreme weather: how to design more resilient roads ... weather, and some of the new sustainable materials and technologies we can use.

Innovation and technologies (inc data and new products)

Meteorological Agency starts development of AI-based system to predict windy events in Japan

The Japan Times

The Meteorological Agency's research arm recently began developing an artificial intelligence-based system to predict high-wind events severe ...

5G cell service may come at price of weather safety in US

The Weather Network

5G cell service may come at price of weather safety in U.S. that useage of those transmission frequencies will interfere with satellites' ability to track ...

Technology Reveal: How Does ClimaCell Predict the Weather More Accurately

PRNewswire (press release)

ClimaCell's proprietary weather forecasting systems are being used by blue-chip companies, emerging technologies, and software developers alike.

[Weather startup ClimaCell out to prove IoT can make forecasts accurate. save lives.](#)

Firstpost

All this data feeds into real-time weather forecasts that ClimaCell metes out to its customers — from airlines to rideshare launch companies like ...

Weather in pictures

What the historic Midwest floods look like from space — and from the ground

"This really is the most devastating flooding we've probably ever had in our state's history," Nebraska's governor said.

Climate change / global warming / sea level rise

Climate change: Call to tackle future risk to Auckland's poorest communities now

Community leaders want an early focus on protecting Auckland's poorer suburbs, which new reports show are the most vulnerable to climate change risks.

Extreme heat, disease and rising seas: how climate change threatens Auckland

Aucklanders could be suffering an equivalent of three months of extra-hot days within only a century's time - with residents in southern and western suburbs likely to be hit the hardest.

Dramtic rainfall changes for key crops predicted even with reduced greenhouse gas emissions

Posted: 11 Mar 2019 02:31 PM PDT

Even if humans radically reduce greenhouse gas emissions soon, important crop-growing regions of the world can expect changes to rainfall patterns by 2040. In fact, some regions are already experiencing new climatic regimes compared with just a generation ago. The study warns that up to 14 percent of land dedicated to wheat, maize, rice and soybean will be drier, while up to 31 percent will be wetter.

Cloud seeding / Geoengineering

How does cloud seeding work?

ABS-CBN News

As water shortage in the country worsens due to a prevailing dry spell, the agriculture chief has ordered regional offices to conduct cloud-seeding ...

Professional interest

Sea Level Rise & New Zealand's Future

How much land will we lose to the rising ocean, and what will it cost us? Local Government New Zealand has recently released its report, Vulnerable: The quantum of local government owned infrastructure exposed to sea level rise, which quantifies the replacement value of local government infrastructure exposed to sea level rise. The study details the type, the quantity and the replacement value of infrastructure exposed with different levels of rise

severity, from half a meter to three metres. How bad could it get? Very bad: more than \$14 billion of local government owned assets are exposed at a 3.0 metre increment of sea level rise.

LGNZ's report is intended to result in stakeholders working together to ensure the long-term resilience of critical infrastructure. At its core, this analysis is about turning a challenge into an opportunity. Study co-author Thomas Simonson will present these findings in detail at a lunch time lecture, and take questions from the audience.

When: Thursday April 18th 12:30pm – 1:30pm

Where: Rutherford House lecture theatre 2 (RHLT2)

Journal and articles online

Meteorological Applications

Accepted Articles

Accepted, unedited articles published online and citable. The final edited and typeset Version of Record will appear in the future.

Spatial Distribution of Secular Trends in Rainfall Indices of Peninsular Malaysia in the Presence of Long-Term Persistence

Najeebullah Khan, Sahar Hadi Pour, Shamsuddin Shahid, Tarmizi Ismail, Kamal Ahmed, Eun-Sung Chung, Nadeem Nawaz, Xiao-Jun Wang

First Published: 14 March 2019

Observed changes in climate extremes in Nigeria

Imoleayo E. Gbode, Oluwafemi E. Adeyeri, Kaah P. Menang, Joseph D. K. Intsiful, Vincent O. Ajayi, Jerome A. Omotosho, Akintomide A. Akinsanola

First Published: 12 March 2019

Quarterly Journal of the Royal Meteorological Society

Early View

Online Version of Record before inclusion in an issue

Examining relationships between cloud-resolving model parameters and total flash rates to generate lightning density maps

Christophe Bovalo, Christelle Barthe, Jean-Pierre Pinty

Version of Record online: 05 March 2019

Lightning density maps are produced in a cloud-resolving model using two methods: with an explicit lightning scheme and based on calibrated proxies. These proxies (graupel mass, updraught volume for $w > 10$ m/s, precipitating and non-precipitating ice mass flux product and maximum updraught) are related to lightning rate densities through linear relationships. Results are illustrated on the 24 September 2012 case over France. It shows that the total graupel mass is a good estimator of lightning activity.

Quarterly Journal of the Royal Meteorological Society

Accepted Articles

Accepted, unedited articles published online and citable. The final edited and typeset Version of Record will appear in the future.

Statistical post-processing of dual-resolution ensemble forecasts

Sándor Baran, Martin Leutbecher, Marianna Szabó, Zied Ben Bouallègue

First Published: 07 March 2019

A spatially explicit and temporally highly resolved analysis of variations in fog occurrence over Europe

Sebastian Egli, Boris Thies, Jörg Bendix

First Published: 07 March 2019

Occurrence and Detection of Impact Multipath Simulations of Bending Angle

Xiaolei Zou, Hui Liu, Ying-Hwa "Bill" Kuo

First Published: 06 March 2019

Statistical generation of SST perturbations with spatio-temporally coherent growing patterns

Daisuke Hotta, Yoichiro Ota

First Published: 04 March 2019

The impact of spin up and resolution on the representation of a clear convective boundary layer over London in order 100m grid-length versions of the Met Office Unified Model.

H.W. Lean, J.F. Barlow, C.H. Halios

First Published: 04 March 2019

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Heat Waves in Florida: Climatology, Trends, and Related Precipitation Events

Shealynn R. Cloutier-Bisbee, Ajay Raghavendra, and Shawn M. Milrad

Gamma Drop Size Distribution Assumptions in Bulk Model Parameterizations and Radar Polarimetry and Their Impact on Polarimetric Radar Moments

Katharina Schinagl, Petra Friederichs, Silke Trömel, and Clemens Simmer

Meteorological Impacts on Commercial Aviation Delays and Cancellations in the Continental United States

Christopher J. Goodman and Jennifer D. Small Griswold

Past and Projected Freezing/Thawing Indices in the Northern Hemisphere

Xiaoqing Peng, Tingjun Zhang, Yijing Liu, and Jing Luo

The Application of an Evolutionary Programming Process to a Simulation of the ETEX Large-Scale Airborne Dispersion Experiment

David Werth, Grace Maze, Robert Buckley, and Steven Chiswell

Regional Decadal Climate Predictions Using an Ensemble of WRF Parameterizations Driven by the MIROC5 GCM

Ehud Strobach and Golan Bel

Evaluation of the Ventilation Index in Complex Terrain: A Dispersion Modeling Study

Michael T. Kiefer, Joseph J. Charney, Shiyuan Zhong, Warren E. Heilman, Xindi Bian, John L. Hom, and Matthew Patterson

Turbulence Variations in the Upper Troposphere in Tropical Cyclones from NOAA G-IV Flight-Level Vertical Acceleration Data

John Molinari, Michaela Rosenmayer, David Vollaro, and Sarah D. Ditchek

Weather Simulation Uncertainty Estimation Using Bayesian Hierarchical Models

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[An Investigation of Cold-Season Short-Wave Troughs in the Great Lakes Region and Their Concurrence with Lake-Effect Clouds](#)

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[Trends in Instrument Flight Rules \(IFR\) Conditions at Major Airports in the United States](#)

[Quality and Value of Seasonal Precipitation Forecasts Issued by the West African Regional Climate Outlook Forum](#)

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[Tornado Debris from the 23 May 2017 "Tybee Tornado"](#)

Alan W. Black, John A. Knox, Jared A. Rackley, and Nicholas S. Grondin

ESSAY

[Is Precipitation a Good Metric for Model Performance?](#)

Francisco J. Tapiador, Rémy Roca, Anthony Del Genio, Boris Dewitte, Walt Petersen, and Fuqing Zhang

ARTICLES

[The Northern California Wildfires of 8–9 October 2017: The Role of a Major Downslope Wind Event](#)

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[A Call for the Evaluation of Web-Based Climate Data and Analysis Tools](#)

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[A Scale to Characterize the Strength and Impacts of Atmospheric Rivers](#)

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[The Ozone Water–Land Environmental Transition Study: An Innovative Strategy for Understanding Chesapeake](#)

[Bay Pollution Events](#)

John T. Sullivan, Timothy Berkoff, Guillaume Gronoff, Travis Knepp, Margaret Pippin, Danette Allen, Laurence Twigg, Robert Swap, Maria Tzortziou, Anne M. Thompson, Ryan M. Stauffer, Glenn M. Wolfe, James Flynn, Sally E. Pusede, Laura M. Judd, William Moore, Barry D. Baker, Jay Al-Saadi, and Thomas J. McGee

[Partnering Research, Education, and Operations via a Cool Season Severe Weather Soundings Program](#)

Keith D. Sherburn, Matthew D. Parker, Casey E. Davenport, Richard A. Sirico, Jonathan L. Blaes, Brandon Black,

Shaelyn E. McLamb, Michael C. Mugrage, and Ryan M. Rackliffe

[NCAR's Real-Time Convection-Allowing Ensemble Project](#)

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[Polar Low Workshop](#)

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[Defining Uncertainties through Comparison of Atmospheric River Tracking Methods](#)

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[Data-Driven Scientific Workflows: A Summary of New Technologies and Datasets Explored at the Unidata 2018](#)

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Kevin H. Goebbert, John T. Allen, Victor A. Gensini, and Mohan Ramamurthy

Weather

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March 2019

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[Cover Information](#)

First Published: 14 March 2019

In this issue of Weather

[In this issue of Weather](#)

Paul Knightley

Pages: E1 | First Published: 14 March 2019

Weather news

[Weather news](#)

Pages: 78 | First Published: 14 March 2019

Editorial

[Editorial](#)

Paul Knightley

Pages: 79 | First Published: 14 March 2019

Special Issue Article

[Atmospheric analysis of the cold late February and early March 2018 over the UK](#)

Katie Greening, Amy Hodgson

Pages: 79-85 | First Published: 14 March 2019

Mean 850hPa temperatures (K) from 21 to 28 February (Source: Physical Sciences Division, NOAA/ESRL.)

Research Article

[The very deep cold pool of 27 February–1 March 2018 – historical precedents and perspective](#)

Edward Graham, Jonathan D. C. Webb

Pages: 85-91 | First Published: 14 March 2019

Short Article

[A study of freezing precipitation in Devon](#)

Keith Fenwick

Pages: 92-93 | First Published: 01 November 2018

Cross section of solid precipitation that fell on Thursday 1 March into Friday 2 March in Uffculme, Devon.

Photographs

[Snow and ice in March 2018](#)

Pages: 94 | First Published: 14 March 2019

[Snow and ice in March 2018](#)

Pages: 95 | First Published: 14 March 2019

Weather images

[Weather images](#)

Pages: 96 | First Published: 14 March 2019

Weather log

[January 2019 Dry with seasonable temperatures; sunny in north, dull in southwest.](#)

Pages: i-iv | First Published: 14 March 2019

Short Article

[A hair ice observation in Devon](#)

James Robbins, Philip Gill

Pages: 97 | First Published: 20 April 2018

Hair ice

Research Article

[Severe weather and snow conditions on Cairngorm summit in February to March 2018](#)

Mike Kendon, Mark Diggins

Pages: 98-103 | First Published: 01 November 2018

Instruments on Cairngorm summit, showing ultrasonic anemometers, whip and screen-mounted thermistors and humidity sensors in housing tubes.

Special Issue Article

[Snow cover and low temperatures in February and March 2018](#)

Jim Galvin, Mike Kendon, Mark McCarthy

Pages: 104-110 | First Published: 14 March 2019

This article examines snow depths and low temperatures during the two snowy outbreaks of February and March 2018 in the United Kingdom and Ireland. In both nations, the cold spell was a very significant event. This report was compiled from information supplied by the Met Office and Met Éireann.

Short Article

[The cold outbreak of 26 February to 3 March 2018](#)

Andy Matthews

Pages: 111-115 | First Published: 14 March 2019

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Inside Cover Photographs

[A tractor attempts to clear snow from the A523 near Bosley, Cheshire](#)

Pages: E2 | First Published: 14 March 2019

[A dusting of snow surrounds the Dart Estuary at Dartmouth, Devon](#)

Pages: E3 | First Published: 14 March 2019

[Following heavy snowfall, freezing rain during the night of 1–2 March 2018 over south Devon produced some unusual effects](#)

Pages: E4 | First Published: 14 March 2019

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Welcome to AMS News You Can Use.

Each week, we send out a sampling of recent news and items of interest in meteorology and related fields, as covered by various media outlets.

March 19, 2019

News

["It Was a Little Surreal": Forecasters Flee as Tornado and Flood Target National Weather Service Offices](#)

March 19, 2019 - The Washington Post

Twice last week, local Weather Service offices were forced to go offline to escape Mother Nature's fury.

[Read MORE](#)

[Mozambique Destruction 'Massive and Horrifying' After Cyclone Idai; Hundreds Dead, Thousands of Homes Destroyed](#)

March 19, 2019 - The Weather Channel

Mozambique's central port city of Beira continues to pick up the pieces days after it was battered by tropical Cyclone Idai. The cyclone has killed hundreds across three countries: Mozambique, Malawi and Zimbabwe, the Associated Press reports. Hundreds more are missing.

[Read MORE](#)

[Four Lessons from "Bomb Cyclone" Flooding in the Great Plains](#)

March 19, 2019 - Forbes

A panel of experts was convened to gather perspective on the forecast, the messaging, and perceptions about this event. Four lessons emerged.

[Read MORE](#)

[Most of Nebraska Under State of Emergency as "Historic" Floodwaters Ravage Midwest](#)

March 19, 2019 - The Washington Post

Nebraska, Iowa and Wisconsin have declared states of emergency after the most powerful late-winter storm in a decade unleashed torrents of rain that melted snow, overtaking rivers and levees in powerful surges.

[Read MORE](#)

[Flooded U.S. Air Force base underscores climate risk to security: experts](#)

March 18, 2019 - Yahoo! News

Flooding at a U.S. Air Force base in Nebraska that damaged buildings and forced the removal of a plane integral to the nation's nuclear attack response highlight the risks climate change poses to national security, experts said on Monday.

[Read MORE](#)

[Volunteers sought 'to fill in weather puzzle' to help variety of public, private fields](#)

March 17, 2019 - Tulsa World

Organizers of a grass-roots weather observation network are seeking volunteers to measure precipitation — an

effort, they say, that could help everyone from insurance adjusters to farmers to emergency management officials.

[Read MORE](#)

[Around the world in 34 pictures: Young people march for action on climate change](#)

March 15, 2019 - Quartz

Young people skipped school and took the streets in more than 100 countries, begging leaders for action on climate change.

[Read MORE](#)

[Air Pollution Kills More People Than Smoking](#)

March 14, 2019 - Pacific Standard

A new study, published this week in the European Heart Journal, has found that it also kills twice as many people as previously thought—surpassing even smoking-related deaths.

[Read MORE](#)

[Traces of Radioactive Particles From Massive Solar Storm Discovered in Greenland Ice](#)

March 13, 2019 - The Epoch Times

Evidence of an unusually huge solar storm that battered the Earth, showering it in radioactive particles more than 2,500 years ago, has been discovered by scientists beneath the Greenland ice sheet.

[Read MORE](#)

[When Will A Massive Solar Storm Knockout Our High-Tech Society? That Depends On Who You Ask](#)

March 13, 2019 - Forbes

In the past, a massive once-a-century solar storm could pass without incident, but now it could knock out the electrical grid, communication systems, and satellites.

[Read MORE](#)

[We're The Geeks Who Have Protected the Public From Weather Extremes For 100 Years](#)

March 13, 2019 - Newsweek

In the 21st century, the societal impact of the meteorology community is vast, extending well beyond the daily "should I take my umbrella today?" Meteorologists today come from a wide array of disciplines, together working to observe, understand, and predict the behavior of the weather, water, and climate system that surrounds us.

[Read MORE](#)

[Particulate matter pollutes the air above Africa](#)

March 12, 2019 - EurekAlert!

Explosive population growth, urbanization and a growing economy - the air over West Africa is exposed to a lot of stress.

[Read MORE](#)

[What Happens When a Cyclone Becomes a 'Bomb'?](#)

March 13, 2019 - Pacific Standard

Blizzards in March, when our thoughts start turning to spring, are never good news. But warnings of "bomb cyclones" take the intensity to a new level.

[Read MORE](#)

[Meteorologists Are Among Female Scientists Wearing Purple On Pi Day - Here's Why?](#)

March 14, 2019 - Forbes

March 14 is Pi Day, which celebrates the mathematical constant π (pi). In 2019, many women rallied around the day as #DressForStem Day. What is that, and why is it so important?

[Read MORE](#)

[Flood disaster likely just beginning over central US with troublesome season expected](#)

March 18, 2019 - AccuWeather.com

Flooding will continue in waves and varying degrees of severity over the central United States, including a large part of the Mississippi River watershed, through the spring.

[Read MORE](#)

[Another Superstorm? How the 2019 Bomb Cyclone Compared to the March 1993 Superstorm](#)

March 19, 2019 - The Weather Channel

The central U.S. was slammed by a powerful bomb cyclone, Winter Storm Ulmer, bringing to mind similarities to other intense systems, including the March 1993 Superstorm.

[Read MORE](#)

My Latest WeatherEye Blogs by John Maunder

<https://www.sunlive.co.nz/blogs/13091-sunspots-and-sun.html>

<https://www.sunlive.co.nz/blogs/13067-global-temperatures-1996-january-2019.html>

<https://www.sunlive.co.nz/blogs/13035-tropospheric-temperatures-1979-to-january-2019.html>

<https://www.sunlive.co.nz/blogs/13000-tauranga-january-rainfalls-18982019.html>

<https://www.sunlive.co.nz/blogs/12968-tauranga-january-average-afternoon-temperatures-19142019.html>

Thanks to our regular contributors

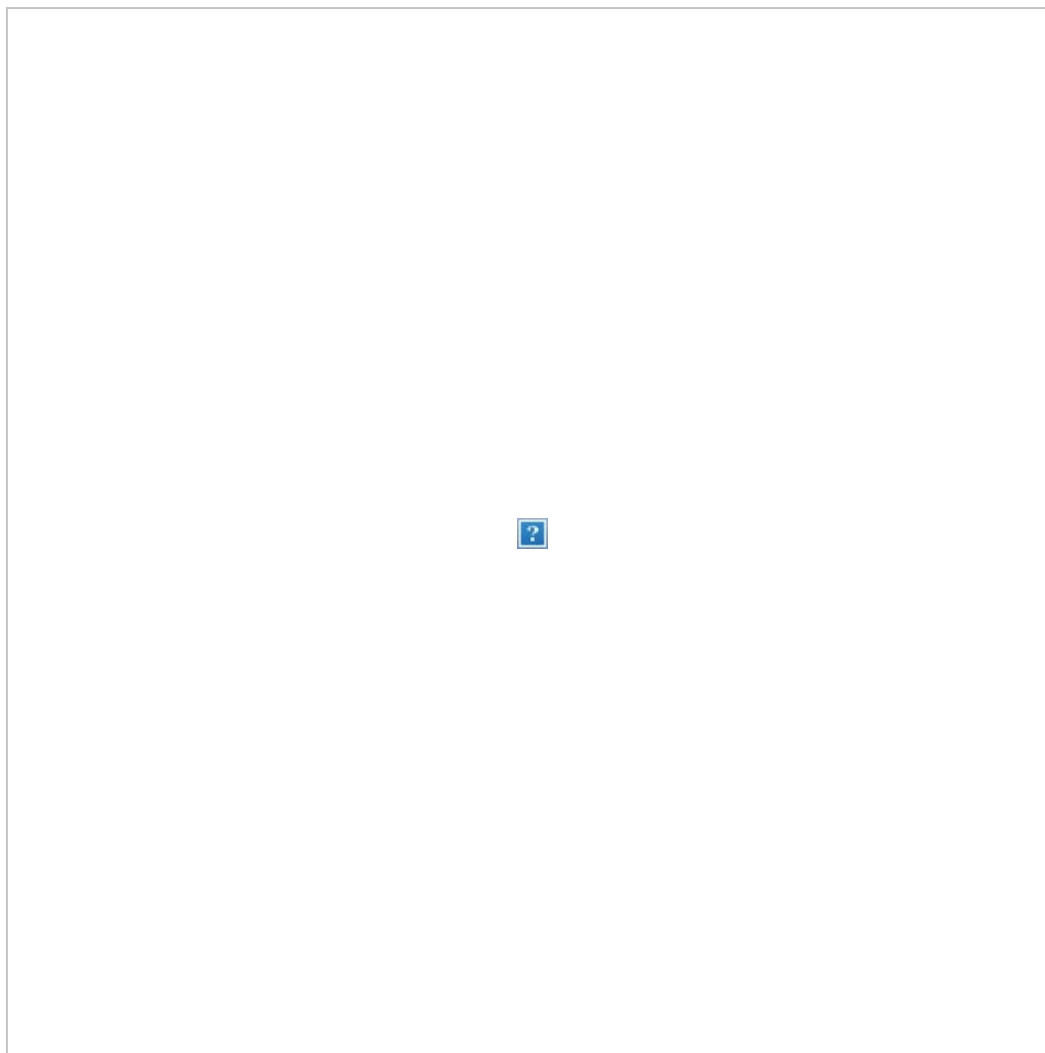
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From: [Metsoc](#)
To: [Hannah Moes](#)
Subject: Clips to 12 Sep
Date: Thursday, 12 September 2019 4:46:31 pm

New Zealand weather and climate news

[View this email in your browser](#)



New Zealand weather and climate news

These clips come Courtesy of MetService Library

(MetService focus)

[Coromandel Peninsula flooding: Highways remain closed after downpours](#)

Stuff.co.nz

... business as usual by daylight tomorrow." People are asked to check-in on their neighbours once the weather has eased and make sure they are ok.

[Coromandel flooding: properties damaged, cows swept to sea, sheep drowned](#)

As floodwater recedes, Garrick Simpson plans to scour the coastline for his missing cows and bury a friend's flock of drowned sheep.

[Spring welcomes thunderstorms, snow and 'chunky cloud' to New Zealand](#)

Stuff.co.nz

MetService meteorologist Tuporo Marsters said an active front was crossing the top of the country, bringing rain to much of the North Island, including ...

[Weird weather: Spring-ter: Why NZ's in for a miserable few months](#)

New Zealand Herald

On top of that, MetService said the weather system sweeping in from the Tasman this weekend had also collected smoke and dust from bushfires in ...

[Whanganui one of six unusually warm places during August](#)

New Zealand Herald

Whanganui's daytime temperatures never dropped below 11C in August, MetService meteorologist Rob Kerr said. The lowest daytime temperature ...

[Snow risk to North Island high routes: temperatures plummet in south](#)

"We have quite a cold flow of air from the deep south at the moment, it's come up over New Zealand," MetService meteorologist Matthew Ford said.

[Little Shoal Bay: Rising sea levels and storm surges cause flooding on Auckland's North Shore](#)

It's not just pukeko and kingfisher that flock to Little Shoal Bay when it floods - protective locals and campaigning politicians also come to observe the rising sea level on Auckland's North Shore.

[Storm takes a grim toll](#)

New Zealand Herald

According to the MetService, Saturday night's storm sparked 13,000 lightning strikes in the 12 hours to 8am on Sunday, with 841 of those on land.

[Sunny, warm and wet - it's spring](#)

Otago Daily Times

Following snow in some places around Otago and Southland last Sunday, much of Otago may get its first taste of summer tomorrow. MetService has ...

[Riding the storm of inaccurate weather forecasting](#)

Stuff.co.nz

In other words, a speedy return to winter after a tantalising taste of spring. This got me wondering how the MetService could have got the forecast so ...

[Meteorologist Chester Lampkin leaving KSDK, heading to DC](#)

STLtoday.com

KSDK (Channel 5) meteorologist and St. Louis native Chester Lampkin will ankle the station later this year to take a job in Washington, sources said.

MetOcean

[Navimeteo opens an office in Falmouth, Cornwall](#)

Seatrade Cruise News

Chiavari, Italy-based Navimeteo, experts in marine weather data and ... the official weather and marine operations provider for more than 50 ports and ...

[Reliable technique to estimate near-bed kinematics for optimal design of coastal and shallow water structures](#)

A paper detailing a new method developed by MetOcean Solutions' Senior Physical Oceanographer, Dr Séverin Thiébaud, is being presented at the [Australasian Coasts & Ports 2019](#) Conference, held this week in Hobart, Australia.

WMO

[New international coalition to combat sand and dust storms](#)

A new international coalition has been launched to strengthen coordinated action on sand and dust storms, which have damaging impacts on human health, the environment and key economic sectors in many...

[Invest in early warning to deliver climate adaptation](#)

Investing in early warning services is critical if countries and communities are to meet the challenge of climate change, the World Meteorological Organization's Secretary-General Petteri Taalas said...

ECMWF

[Europe is battling with the US in a race to predict the weather](#)

Wired.co.uk

The European Centre for Medium-Range Weather Forecasts (ECMWF), currently based in Reading, divides the globe into nine kilometre boxes, with ...

Volcano alert

[New volcanic eruption forecasting technique](#)

Volcanic eruptions and their ash clouds pose a significant hazard to population centers and air travel, especially those that show few to no signs of unrest beforehand. Geologists are now using a technique traditionally used in weather and climate forecasting to develop new eruption forecasting models. By testing if the models are able to capture the likelihood of past eruptions, the researchers are making strides in the science of volcanic forecasting.

Extreme weather (and other news) – Antarctica and offshore

September - October, Various locations (NZ)

[Choosing the Future of Antarctica](#)

In this national lecture series, Professor Tim Naish FRSNZ will present two narratives on the future of Antarctica, looking forward 50 and 300 years: the first in which greenhouse gas emissions remain unchecked; the other involving ambitious action to limit greenhouse gas emissions.

Extreme weather (and other news) – Australia and Pacific

[Bushfires out of control in NSW and Queensland, expected to increase](#)

Authorities are labelling Queensland's bushfire emergency as historic, as crews continue to battle dozens of blazes.

[More than climate change driving Queensland fires, explain climatologists](#)

The record drought has combined with a record warm winter to fuel this year's grim fire outlook, according to climatologists and bushfire experts.

[Climate change is bringing a new world of bushfires](#)

Spring has barely arrived, and bushfires are burning [across Australia's eastern seaboard](#). More than 50 fires are currently burning in New South Wales, and some 15,000 hectares have burned in Queensland since late last week.

[The danger of heat and cold across Australia](#)

Cold temperatures are not nearly as deadly as heat, with around 2% of all deaths in Australia related to heat, according to new research.

Extreme weather (and other news) – Asia and the Middle East, Africa

[Malaysia looking into cloud seeding as haze worsens](#)

The Straits Times

Deputy Prime Minister Wan Azizah Wan Ismail said yesterday that the meteorology department, MetMalaysia, ... THE STAR/ASIA NEWS NETWORK.

[Stay or go? Asian nations mull options as seas rise, cities sink](#)

Hellenic Shipping News Worldwide

"But more places are becoming uninhabitable because of land degradation, rising sea levels or other weather

impacts, and there is no choice but to ...

[Floods Cause 16 Deaths, Affect 102,074 Households in Thailand](#)

Chiang Rai Times

Department officials will closely monitor the situation and prepare to provide timely aid to affected residents. He urged people to follow weather reports ...

[Rugby World Cup: The ugly weather scenario that could impact the All Blacks](#)

It's Steve Hansen's worst nightmare – a gimme Rugby World Cup pool game against Namibia, Canada or Italy is cancelled because of bad weather and declared a draw.

[Expert reaction: Climate change in Asia](#)

Asia is home to more than half of the world's population, and the billions of people there are deeply vulnerable to the effects of climate change. By the end of the century, India is expected to be the world's most populous country with nearly 1.5 billion people. By that point, estimates have China's population at just under 1.1 billion and Pakistan with 403 million. Asian countries are also rapidly urbanising and industrialising, with China, India and Japan making up three of the world's top polluters. Adding to the mix, the Asia-Pacific already experiences more natural disasters than any other region in the world. These factors mean that climate change is already having a huge impact on the region.

[Haze Threat Looms Over Singapore as Indonesia Forest Fires Rage](#)

Bloomberg

Indonesia's weather agency said the hotspots were also detected in ... the Philippines, Papua New Guinea, Vietnam, Timor Leste and Thailand.

[Extreme weather \(and other news\) – Americas and Europe](#)

[European summer heatwave killed 1,500 in France. Minister says](#)

The European summer heatwaves caused close to 1,500 deaths in France, according to the country's Health Minister.

[Met Office teams up with Dutch weather officials to name next batch of storms](#)

Herald Publicist

Are you braced for Storm Girda or Atiyah? Met Workplace groups up with Dutch climate officers to present subsequent batch of gales numerous names.

[Dublin weather: Respected forecasters MetAlert Ireland predict heatwave for Ireland by end of next ...](#)

Dublin Live

Met Alerts Ireland posted weather model image from the European Centre for Medium Range Weather Forecasts (ECMWF), adding the headline ...

International news and research

[Here's Why US Law Prohibits Claiming That a 'Counterfeit Weather Forecast' Is Official](#)

TIME

Nowadays, the commercial opportunities in weather forecasting seem limitless as technology improves and climate change makes for more extreme ...

['Sharpiegate': meteorologists upset as weather agency defends Trump's Alabama claim](#)

The Guardian

'Sharpiegate': meteorologists upset as weather agency defends Trump's ... potentially hitting Alabama, upsetting meteorologists around the country.

[Anger Among Public and Meteorologists after False Unsigned NOAA Statement](#)

AGU Blogosphere

Broadcast meteorologists wear two hats. Scientist and science journalist. If I had ignored this, I would have been guilty of not covering a story because ...

[NOAA orders Gulfstream G550 to support weather forecasting/research](#)

FinancialNews.co.uk (blog)

Gulfstream Aerospace Corp., a General Dynamics company, has announced it has established a contract with the National Oceanic and Atmospheric ...

[The Bigger Reason Trump's Fight with a Weather Forecast Worries Meteorologists](#)

Livescience.com

Meteorologists found themselves at the center of a political storm this month, and some are worried that it could have long-term consequences for their ...

[Then Trump Came For The Scientists - WBUR](#)

[White House Pressed Agency to Repudiate Weather Forecasters Who Contradicted Trump](#)

The New York Times

The House Committee on Science, Space and Technology, which is ... administration is committed to the important mission of weather forecasting," Dr.

[Storm names don't begin with Q, U, X, Y or Z and there's a good reason why](#)

Bristol Live

The reasoning was explained in a name chart released by the Met Office, Irish forecaster Met Éireann and Dutch national weather forecasting service ...

[From Atiyah to Willow: how UK storms get their names - Moose Gazette](#)

[Machine learning and its radical application to severe weather prediction](#)

University of Wisconsin-Madison

Now, the rapidly developing technology is making its mark in weather prediction. The fields of atmospheric science and satellite meteorology are ...

[Hurricane Dorian: scientists explain the causes of the disaster](#)

[www.MICETimes.asia](#) (press release)

According to the forecasts of meteorologists, global warming may lead to more frequent hurricanes fourth and fifth category in the Atlantic ocean twice.

[Solutions to urban heat differ between tropical and drier climates](#)

In summer heat, cities may swelter more than nearby suburbs and rural areas. And while the size of this urban heat island effect varies widely among the world's cities, heat island intensity can largely be explained by a city's population and precipitation level, researchers have reported. The analysis suggests that cooling cities by planting more vegetation may be more effective in drier regions than in wetter ones.

5G network

[Hurricane Dorian's Impact Stokes Fears of 5G Network Effect on Future Weather Forecasting](#)

Sputnik International

... signals given off by 5G networks are hindering the ability of weather satellites to monitor and track the progression of potentially dangerous storms.

Aviation

Could There Be Less Turbulence in Our Flying Future?

AFAR Media

For the first time, airlines plan to share more accurate turbulence data with the ... air around mountains, cold or warm weather fronts or thunderstorms.

Air Chathams starts flights to Norfolk Island

Air links from New Zealand to Norfolk Island have been launched today.

Energy and Mining

North Sea Power Hub team picks permitting expert

reNEWS

... selection and characterisation, feasibility studies, metocean assessments, and risk management for a variety of offshore renewable developments.

Farming/horticulture/Aquaculture

Warm weather, rain wreaks havoc on vege growers over winter

New Zealand vegetable growers are struggling financially after a disastrous winter.

Health

Many Older Americans Aren't Equipped to Weather Hurricanes Like Dorian

HealthDay

Many Older Americans Aren't Equipped to Weather Hurricanes Like Dorian ... information in a crisis, according to the National Poll on Healthy Aging by the Institute Healthcare Policy and Innovation at the University of Michigan.

Extreme weather events linked to poor mental health

Posted: 05 Sep 2019 05:01 AM PDT

People with homes damaged by extreme weather events are more likely to experience mental health issues such as depression and anxiety even when the damage is relatively minor and does not force them to leave their homes, a new study suggests.

History

Snowstorm relief sought

yesterday's meeting of the Otago Land Board a petition was received from some 18 runholders in the Lakes district asking for some relief on account of the loss sustained by the snowstorm, experienced in the spring of last year.

1816: The Year Without Summer

Thanks to a huge volcanic eruption folks in 1816 had a good excuse to complain about the weather. Worldwide famine, floods and disease -all thanks to enough toxic ash in the sky to turn summer into winter.

Lightning

Lightning 'superbolts' form over oceans from November to February

Lightning superbolts -- which unleash a thousand times more low-frequency energy than regular lightning bolts -- occur in dramatically different patterns than regular lightning, according to a new, nine-year survey of these rare events.

Transport/roading/shipping/freight

Shipping Companies Have A New Weather Forecast Tool Using Space Tech

Forbes

Spire Global announced a new weather forecast tool specialized for maritime companies, providing information to help ports, ships and shipping ...

What do Increased Weather Risks Combined with New IMO 2020 Sulphur Regulations Mean for ...

Hellenic Shipping News Worldwide

The gradual increase of severe weather conditions produces significant ... When combined with weather statistics for more than two thousand ports ...

Innovation and technologies and AI

Launch of AccuWeatherIQ™ brings weather targeting to industry leading data platforms. enables ...

PRNewswire (press release)

"AccuWeatherIQ answers a critical need identified by our many advertising clients, which is to efficiently and effectively extend weather-based ...

Time for a Better Forecast: ClimaCell Launches its Consumer Weather App

New Kerala

ClimaCell takes a new approach to weather forecasting we combine ... aviation to construction, drones, transportation, utilities and outdoor events.

Cloud seeding / Geoengineering

Royal Rainmakers called in to replenish Phuket reservoirs

The Phuket News

Cloud seeding will be conducted by the Southern Royal Rainmaking Operation Center based in Surat Thani. The center will use a CN-235 turboprop ...

As haze worsens, Malaysia looking into cloud-seeding

The Straits Times

KUALA LUMPUR (THE STAR/ASIA NEWS NETWORK) - Malaysia is ... on Saturday (Sept 7) that the Meteorology Department (MetMalaysia) would ...

Te reo

14 September, Wellington

Whānua Storytelling with Te Reo Wainene o Tua

Celebrate Te Wiki o Te Reo Māori by bringing your whānau to hear captivating bilingual kōrero from Joe Harawira of Te Reo Wainene o Tua, a te reo Māori storytelling collective.

When | Āhea Sat 14 Sep 2019, 1.00pm–2.00pm

Where | Ki hea Te Marae, Level 4

Cost | Te utu Free event

Te reo Māori activity book Te reo Māori pukapuka mahi

A free downloadable activity book for kids.

Celebrate Māori language by learning Māori words and phrases through simple activities that kids love – word searches, colouring pages, crosswords, and stories.

Whakanuia te reo Māori mā te ako i ngā kupu me ngā kīanga Māori mā ngā mahi māmā e arohatia e ngā tamariki – rapunga kupu, kauruku i ngā whārangi, me ngā pūrākau.

<https://www.tepapa.govt.nz/learn/for-educators/teaching-resources/te-reo-maori-language-week-activity-book>

[Too old to learn Māori? It's not your brain that's holding you back](#)

PPTA president Jack Boyle has been learning Māori for three years. He's working hard at it and says becoming fluent is the 30-year plan.

He may be partly joking, but the effort Boyle has to make to learn te reo is in marked contrast to the ease with which young children soak up languages.

[Three-minute power te reo Māori lesson: Five words every Kiwi should know](#)

You don't need to learn how to speak perfect, formal te reo Māori to help normalise the language of Aotearoa - you can do it one word at a time.

Professional interest

[The forecast calls for ...](#)

Your weather report: Clear, sunny skies, mild temperatures and a 100 percent chance of atmospheric TED Talks.

Journal and articles online

[The ECMWF ensemble prediction system: Looking back \(more than\) 25 years and projecting forward 25 years](#)

Tim Palmer

Pages: 12-24 | First Published: 26 August 2018

Although Lorenz himself developed his iconic 1963 model to show the impossibility of deterministic long-range forecasting, it can also be used to illustrate the existence of an intermittent butterfly effect within the limit of deterministic predictability. (a) Weak growth of initial uncertainty. (b) Moderate growth of initial uncertainty. (c) Explosive growth of initial uncertainty. For users to have confidence in forecasts within this deterministic limit, it is necessary to flag situations where this intermittent explosive growth is active, and to predict plausible alternative weather scenarios probabilistically – more generally to predict flow-dependent uncertainty. This means abandoning the deterministic paradigm that has guided the development of numerical weather prediction over many years.

[Historical perspective: earlier ensembles and forecasting forecast skill](#)

Eugenia Kalnay

Pages: 25-34 | First Published: 28 June 2019

Schematic of the first two practical ensemble-forecasting methods: Monte Carlo (MC, Leith, 1974b) forecasts (left) and Lagged Average Forecasts (LAF, Hoffman and Kalnay, 1983, right). The crosses represent the analyses at the initial time, and the dots are Monte Carlo perturbations. The MC ensemble average with m members reduces the long-term forecast error covariance compared to the error covariance of a climatological forecast from 2 to $(1 + 1/m)$. LAF takes advantage of operational available forecasts, and thus the LAF initial perturbations include "errors of the day", which improves forecast of the skill compared to MC initial perturbations.

[Using the hybrid gain algorithm to sample data assimilation uncertainty](#)

Pieter Leopold Houtekamer, Mark Buehner, Michèle De La Chevrotière

Pages: 35-56 | First Published: 11 November 2018

A new configuration of the hybrid gain algorithm combines the Canadian global ensemble Kalman filter and ensemble variational analyses in a single multi-analysis system. The two analysis systems behave most differently in the stratosphere, where the biggest improvements are seen. The substantial improvement in the spread-skill relationship for the highest peaking AMSU-A channel is shown here.

[The scale dependence of initial-condition sensitivities in simulations of convective systems over the southeastern United States](#)

Jonathan A. Weyn, Dale R. Durran

Pages: 57-74 | First Published: 27 June 2018

High-resolution ensemble numerical weather simulations for widely-ranging severe weather events, like the ones shown above, show that convection in weakly-forced events is less predictable and more sensitive to small-scale initial errors than that associated with strong synoptic systems.

[Treatment of model uncertainty from radiation by the Stochastically Perturbed Parametrization Tendencies \(SPPT\) scheme and associated revisions in the ECMWF ensembles](#)

Sarah-Jane Lock, Simon T. K. Lang, Martin Leutbecher, Robin J. Hogan, Frederic Vitart

Pages: 75-89 | First Published: 12 June 2019

In its current form, the Stochastically Perturbed Parametrization Tendencies (SPPT) scheme generates ensemble spread that implies greater model uncertainty over the night-time globe in clear-sky conditions than over the daytime globe (left-hand figure). There is no physically plausible explanation for such behaviour. In this work, we propose a revised formulation of SPPT that removes this day–night contrast in the description of model uncertainty (right-hand figure).

[Convection-permitting ensembles: Challenges related to their design and use](#)

Inger-Lise Frogner, Andrew T. Singleton, Morten Ø. Køltzow, Ulf Andrae

Pages: 90-106 | First Published: 11 March 2019

Added value: Brier Skill Score of IFSSENS ensemble with IFSSENS control as reference forecast (black), MEPS ensemble with MEPS control as reference forecast (blue), MEPS control with IFSSENS control as reference (light blue) and MEPS ensemble with IFSSENS ensemble as reference forecasts (red). Challenges related to the design and use of CPEPSs are discussed; the predictability for scales smaller than ~60 km is lost rapidly within the first 6 h with the smallest predictable scale growing more slowly to ~100 km over the following 18–24 h. For precipitation there is added value of CPEPS over deterministic forecasts and coarser resolution EPSs for precipitation events, although the added value is higher in summer compared to winter and for shorter lead times compared to longer lead times.

[Ensemble size: How suboptimal is less than infinity?](#)

Martin Leutbecher

Pages: 107-128 | First Published: 25 July 2018

The ensemble mean and other quantities derived from ensemble forecasts can be viewed as random variables. Shown are ensemble mean seven-day forecasts of 500 hPa height obtained from 20 alternative realizations of an eight-member ensemble. The article looks at the impact of finite ensemble size on probabilistic skill and implications

for the ensemble configuration used in research and development to test changes affecting ensemble forecasts.

[The ensemble-adjusted Ignorance Score for forecasts issued as normal distributions](#)

Stefan Siegert, Christopher A. T. Ferro, David B. Stephenson, Martin Leutbecher

Pages: 129-139 | First Published: 04 December 2018

Ensemble forecasts are routinely used as a basis for probabilistic predictions. The skill of probabilistic predictions derived from ensemble forecasts depends on the number of ensemble members. We derive a new verification score, called the ensemble-adjusted Ignorance Score, which can correct for the effect of limited ensemble size and therefore allows for a more robust comparison of forecasts based on different ensemble sizes.

The unadjusted Ignorance Score (solid line) depends on the ensemble size m , assigning higher (worse) scores to smaller ensembles drawn from the same forecast distribution. The ensemble-adjusted Ignorance Score (dashed line) proposed here does not depend on ensemble size and thus allows for a fair comparison of equivalent ensembles of different sizes.

[How confident are predictability estimates of the winter North Atlantic Oscillation?](#)

Antje Weisheimer, Damien Decremier, David MacLeod, Christopher O'Reilly, Tim N. Stockdale, Stephanie Johnson, Tim N. Palmer

Pages: 140-159 | First Published: 28 November 2018

Because of the non-stationary character of the North Atlantic atmospheric flow on time-scales of several decades, short hindcast periods are not sufficiently representative for the longer-term behaviour of the climate system, and small sample sizes can lead to skill estimates, in particular of correlation, that are not robust. Our findings provide a simple but plausible explanation for the apparently conflicting findings of under- and overconfidence over parts of the North Atlantic.

[Uncertainty and scale interactions in ocean ensembles: From seasonal forecasts to multidecadal climate predictions](#)

L. Zanna, J. M. Brankart, M. Huber, S. Leroux, T. Penduff, P. D. Williams

Pages: 160-175 | First Published: 09 October 2018

The ocean plays an important role in the climate system on time-scales of weeks to centuries. Despite improvements in ocean models, dynamical processes involving multiscale interactions remain poorly represented, leading to errors in forecasts. We present recent advances in understanding, quantifying, and representing physical and numerical sources of uncertainty in novel regional and global ocean ensembles at different horizontal resolutions.

[Current state of the global operational aerosol multi-model ensemble: An update from the International Cooperative for Aerosol Prediction \(ICAP\)](#)

Peng Xian, Jeffrey S. Reid, Edward J. Hyer, Charles R. Sampson, Juli I. Rubin, Melanie Ades, Nicole Asencio, Sara Basart, Angela Benedetti, Partha S. Bhattacharjee, Malcolm E. Brooks, Peter R. Colarco, Arlindo M. da Silva, Tom F. Eck, Jonathan Guth, Oriol Jorba, Rostislav Kouznetsov, Zak Kipling, Mikhail Sofiev, Carlos Perez Garcia-Pando, Yaswant Pradhan, Taichu Tanaka, Jun Wang, Douglas L. Westphal, Keiya Yumimoto, Jianglong Zhang

Pages: 176-209 | First Published: 04 February 2019

International Cooperative for Aerosol Predictions (ICAP) model 550 nm total AOD RMSE of the 72 h forecast versus corresponding mean AODs for AERONET sites listed in Table 2. Large black dots are ICAP multi-model ensemble consensus means. Individual models are in small coloured dots. Validation of fine- and coarse-modal AODs and dust AOD is also available in Figure 2.

[Promoting the use of probabilistic weather forecasts through a dialogue between scientists, developers and end-users](#)

Vanessa J. Fundel, Nadine Fleischhut, Stefan M. Herzog, Martin Göber, Renate Hagedorn

Pages: 210-231 | First Published: 28 January 2019

Ensemble predictions provide reliable and sharp probabilistic forecasts, yet these are still rarely communicated to end-users. We present three approaches to introducing probabilistic weather forecasts – and illustrate three key insights: (a) to make informed decisions, users need probabilistic forecasts; (b) users can understand forecast uncertainty if representations follow best practices from risk communication; and (c) users need to experience probabilistic forecasts in their day-to-day practice to evaluate their benefit. With these insights and practical pointers, we hope to support future efforts to integrate probabilistic forecasts into everyday decision making and to encourage everyone to seek interdisciplinary collaborations.

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[Welcome to AMS News You Can Use.](#)

Each week, we send out a sampling of recent news and items of interest in meteorology and related fields, as covered by various media outlets.

September 10, 2019

News

[American Meteorological Society Response to NOAA Statement](#)

September 7, 2019 - SpaceRef

Read the full statement here.

[Read MORE](#)

[Poll: Most Americans see weather disasters worsening](#)

September 5, 2019 - Phys.org

Nearly three-quarters of Americans see weather disasters, like Hurricane Dorian, worsening and most of them blame global warming to some extent, a new poll finds. And scientists say they're right.

[Read MORE](#)

[The Development of a Weather-based Crop Disaster Program](#)

September 9, 2019 - SFGate

Floods, tornados, hurricanes and many other natural disasters can be detrimental to American farmland. Is there a way for producer to save money when partaking in a crop insurance program even if the weather is not cooperating?

[Read MORE](#)

[Satellites reveal peatland fire susceptibility](#)

September 9, 2019 - Phys.org

In 2015, the haze from peatland fires was fatal, responsible for more than 100,000 premature deaths in Indonesia, Malaysia and Singapore.

[Read MORE](#)

[Machine learning and its radical application to severe weather prediction](#)

September 9, 2019 - Tech Xplore
The rapidly developing technology is making its mark in weather prediction.
[Read MORE](#)

[A Tale of Two Hurricane Forecasts](#)

September 8, 2019 - Medium
To refocus us, I thought I'd compare and contrast the forecasts for Dorian and another hurricane that threatened south Florida: Hurricane Cleo in 1964.
[Read MORE](#)

[See NASA's animation of Hurricane Dorian made with a satellite 'the size of a cereal box'](#)

September 6, 2019 - CNBC
The animation is generated with data from an "experimental" satellite used to track weather patterns, NASA says in a statement published Wednesday.
[Read MORE](#)

[New climate model for the IPCC](#)

September 6, 2019 - Phys.org
Researchers from the Alfred Wegener Institute now, for the first time, feed the results from their global models directly into the Intergovernmental Panel on Climate Change database.
[Read MORE](#)

[Watch forecasters launch weather balloons into Dorian from the North Carolina coast](#)

September 6, 2019 - Miami Herald
As soon as they pulled the large balloon from the building, Dorian's winds picked it up and carried it off into the storm.
[Read MORE](#)

[Watch hurricane hunters shoot through Dorian's stadium-like eye](#)

September 5, 2019 - Mashable
National Oceanic and Atmospheric Administration (NOAA) hurricane hunters flew through Hurricane Dorian's eye on Thursday morning, revealing the "stadium-like" phenomena at the storm's core.
[Read MORE](#)

[Hurricane tracking technology is about to regress 30 years, thanks to 5G cell networks](#)

September 4, 2019 - Salon.com
What does a cellular network have to do with weather forecasting? It turns out quite a lot, as one signal interferes with the other.
[Read MORE](#)

[Tiny airborne particles from wildfires have climate change implications](#)

September 5, 2019 - Phys.org
The smoke from BB events produces large amounts of aerosol particles and gases. These emissions can cause major problems for visibility and health, as well as for local and global climate.
[Read MORE](#)

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My latest WeatherEye from John Maunder
<https://www.sunlive.co.nz/blogs/13764-tauranga-august-average-afternoon-temperatures-19132019.html>

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Thanks to our regular contributors

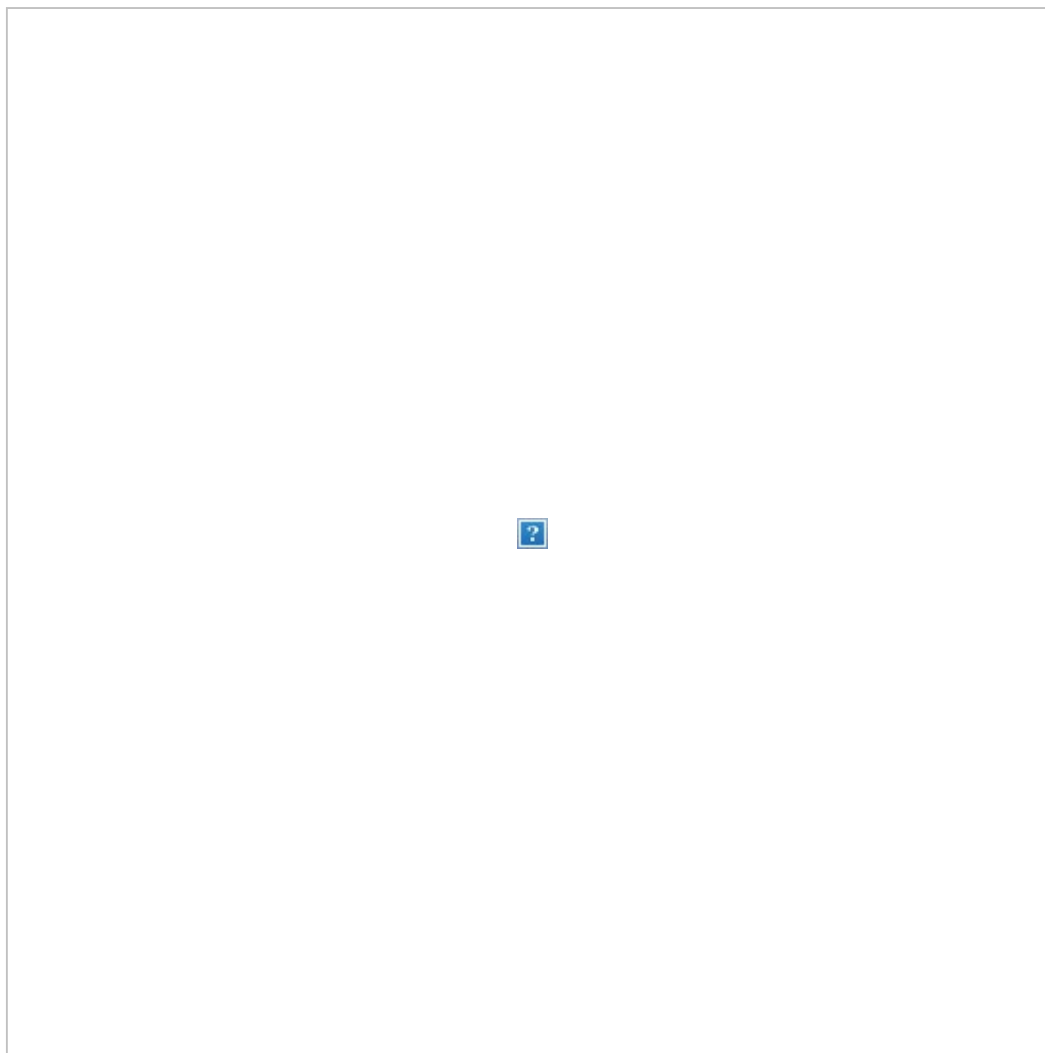
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To: [Tahlia Crabtree](#)
Subject: Clips to 31 Oct
Date: Saturday, 2 November 2019 2:43:40 pm

New Zealand weather and climate news

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New Zealand weather and climate news

MetService mentions

[Vietnam, New Zealand sign MoU on providing weather-related data](#)

New Straits Times Online

Vietnam's HYMETEC signed a MoU with New Zealand's MetService to work closely on providing weather-related information for broadcast and online ...

[Funding two bodies to produce the same weather forecast](#)

There are storm clouds hanging over the future of New Zealand's weather forecasting services.

[STOP: DOC launches new warnings on Tongariro Alpine Crossing amid concerns](#)

"In the last seven years, we've grown from a search and rescue one in every 5000 participants that are going on the Tongariro Alpine Crossing to now ...

[Wild weather working its way up South Island](#)

MetService meteorologist Angus Hines said the front went through Oamaru about 4pm, causing temperatures to drop from 22C to 9.6C within an hour

[South cops more wild weather](#)

Otago Daily Times

MetService said there was a moderate risk of thunderstorms from Clutha to Christchurch through the afternoon, which could be accompanied by brief ...

[Stars align in Wairarapa for astro-tourism business](#)

Stuff.co.nz

Whitby estimated that they would get clear weather 60 per cent of the time and the dry air in that part of the country also helped viewing clarity.

[Hot weather: Bay temperatures to jump close to 30C this weekend](#)

New Zealand Herald

MetService meteorologist Peter Little said the weather coming to the Bay was looking "pretty nice" and would be a pleasant treat after a cold October.

MetOcean

[Alice Goward-Brown joins MetOcean Solutions](#)

We are delighted to welcome Dr Alice Goward-Brown to MetOcean Solutions. Alice is a physical oceanographer and will be joining our marine project consultancy team, based in New Plymouth.

[Dr Ocean Mercier - Moana Project Researcher- awarded 2019 Callaghan Medal](#)

Congratulations to Dr Ocean Mercier who last week was awarded the Callaghan Medal from the Royal Society Te Apārangi for her pioneering work to engage audiences in science and mātauranga Māori.

[Fugro enters Korean offshore wind market](#)

reNEWS

... UST21's local hydrography capacity to provide site characterisation services, including geotechnical, geophysical and offshore metocean solutions.

[GLOBAL: Enginei EFMS portal adds metocean map overlays](#)

Bunkerspot

Royston's Enginei electronic fuel management system now includes detailed map overlays from Tidetech to facilitate more accurate vessel tracking ...

[Research on large storm waves could help lessen their impact on coasts](#)

An international team of researchers has analyzed months of data of large nearshore waves to provide new insights that could help improve the designs of a variety of coastal structures from seaports to seawalls to better withstand destructive waves.

[Water Safety NZ partners with Māori to save lives](#)

On average Māori account for over 20 percent of all preventable and non-preventable drowning fatalities, despite comprising only 15 percent of the nation's population. To stem the tide of tragedy, Water Safety New Zealand (Haumarū Wai O Aotearoa) knows that working with Māori is key. To fund their partnerships, ACC have granted Water Safety \$1 million for a two year pilot scheme.

[Uni students invent buoy to detect riptides](#)

Victoria University students Chamonix Stuart & Hannah Tilsley have designed a system to help prevent drownings in rip currents.

[Enginei EFMS Portal Incorporates Detailed Metocean Map Overlays](#)

Hellenic Shipping News Worldwide

Metocean map overlays showing air temperature, cloud cover, sea currents, wind speed and direction, and wind conditions are now fully integrated ...

WMO

[High Mountain Summit seeks to boost climate and disaster resilience](#)

The world's highest peaks, ranging from the Andes to the Alps and the Third Pole to the tropics, are being hit hard by climate change, and the impacts of this are cascading down to some of Earth's...

[WMO-IMO Symposium addresses extreme maritime weather](#)

WMO and the International Maritime Organization (IMO) held the first joint Symposium on Extreme Maritime Weather: Towards Safety of Life at Sea and a Sustainable Blue Economy

[Antarctic ozone hole is smallest on record](#)

In 2019, the hole that developed in the ozone layer over Antarctica was the smallest on record since the ozone hole was first discovered, according to U.S. scientists.

[WMO calls for protection of radio frequencies vital to weather forecasts](#)

Posted:

The World Meteorological Organization is calling on governments to protect radio frequencies allocated to Earth observation services which are vital for weather forecasts and long-term climate change...

[Papua New Guinea National Weather Service launched Strategic Plan](#)

Posted:

Mr Roy Mumu, Secretary for the Department of Transport officially launched the National Weather Service's Strategic Plan (2019-2023). The launching event is part of the Second Workshop of the CREWS...

ECMWF

[Weather forecasts will be improved with exascale systems - Tiago Quintino from ECMWF explains ...](#)

Primeur Magazine

Tiago Quintino explained in his presentation that ECMWF runs several simulation models that run weather forecasts on their supercomputer.

Volcano alert/watch

[Scientists keep close watch on White Island rumbles](#)

Scientists are keeping a close eye on rumbles at New Zealand's most active volcano – with two key indicators of unrest at their highest level in three years.

Extreme weather (and other news) – Antarctica and offshore

[The Antarctic ozone hole is the smallest since it was discovered](#)

WRAL.com

The ozone is monitored by NASA and NOAA through a variety of instruments, including satellites and weather balloons. NOAA's balloons carry ...

Extreme weather (and other news) – Australia and Pacific

[Bureau of Meteorology continues security push](#)

Computerworld Australia

The Bureau of Meteorology is working on integrating an upgrade to its HPC infrastructure into a major multi-year ICT transformation program that is ...

[Sufferers of asthma and respiratory disease stuck indoors on windy days as NSW drought intensifies](#)

People with asthma and respiratory diseases are advised to prepare for potentially more dust storms as the drought intensifies in parts of New South Wales.

Extreme weather (and other news) – Asia and the Middle East, Africa

[Norway helps Vietnam improve marine forecast capacity](#)

<http://en.vietnamplus.vn/> (press release)

According to Cuong, the VMHA and meteorological and hydrological stations in coastal areas have applied technologies to forecast tidal surges

[Category 4 Kyarr is the strongest cyclone over the Arabian Sea in 12 years](#)

Washington Post

The Indian Ocean beast — dubbed a top-tier “super cyclonic storm” by the India Meteorological Department — is the first storm of such intensity to rage ...

[Why Fewer Typhoons Are Reaching Normally Hard-Hit Parts of Asia | Voice of America - English](#)

Voice of America

Why Fewer Typhoons Are Reaching Normally Hard-Hit Parts of Asia ... Jason Nicholls, senior meteorologist with American forecasting service ...

International news and research

[New Navy Weather Models Will Revolutionize Forecasting](#)

DVIDS (press release)

... breakthrough technologies into these models, which will improve the science of weather forecasting for many years. By coupling the Navy's weather, ...

['Climate change is happening': The storm chaser who defends science in the White House](#)

Washington Examiner

It puts him at the heart of an administration frequently condemned as anti-science, a meteorologist and extreme weather expert working for a president ...

[Satellite data used to calculate snow depth in mountain ranges](#)

Bioscience engineers have developed a method to measure the snow depth in all mountain ranges in the Northern Hemisphere using satellites. This technique makes it possible to study areas that cannot be accessed for local measurements, such as the Himalayas.

[Climate warming promises more frequent extreme El Niño events](#)

New research, based on 33 historical El Niño events from 1901 to 2017, show climate change effects have shifted the El Niño onset location from the eastern Pacific to the western Pacific and caused more frequent extreme El Niño events since the 1970's. Continued warming over the western Pacific warm pool, driven by anthropogenic climate change, promises conditions that will trigger more extreme events in the future.

[A Guide to Understanding Satellite Images of Hurricanes](#)

WeatherNation

A Guide to Understanding Satellite Images of Hurricanes ... Institute for Meteorological Satellite Studies at the University of Wisconsin-Madison.

5G network

[Will 5G impact weather forecasting? A UN conference aims to find out](#)

Android Central

... predictions than modern technology, a UN summit in Egypt is now convening to determine the future spectrum usage of 5G technology worldwide.

[Australian Mobile Carriers Won't Get Really Fast 5G Millimetre Wave Spectrum til mid 2021](#)

Ausdroid

The Australian Federal government has commenced the process to auction spectrum in the 26 GHz band to support the next stage of 5G coverage ...

Aviation

[New era for Air New Zealand's International Network](#)

Air New Zealand is accelerating its ambitions for North America and will launch a non-stop service between Auckland and New York using its 787-9 Dreamliner in October 2020.

[Wellington Airport expansion plan baffles climate change experts](#)

Despite messages to reduce air travel, Wellington Airport is planning for 25 per cent more flights by 2040.

[DFW Airport. American Airlines Offering Non-Stop Service To New Zealand](#)

CBS Dallas / Fort Worth

Today DFW Airport and American Airlines announced the addition of non-stop service to Auckland, New Zealand. Katie Johnston reports. 6 hours ago ...

Business/Insurance

[Why weather now means business and how it affects you](#)

Down To Earth Magazine

Every day at Weather Co's office in Brookhaven, in the US state of Georgia, some 600 meteorologists, data analysts and a supercomputer analyse ...

Farming/horticulture/Aquaculture

[Horticulture NZ already working with growers on climate](#)

Horticulture New Zealand has welcomed the Government's endorsement of the Primary Sector Climate Change Commitment, saying it has already started working with its growers on the challenges associated with climate change.

Health

[Los Alamos AI model wins flu forecasting challenge](#)

EurekAlert (press release)

"Accurately forecasting diseases is similar to weather forecasting in that you need to feed computer models large amounts of data so they can 'learn' ...

History

[Decades of detailed weather reports pulled from old maritime logs](#)

National Geographic

Decades of detailed weather reports pulled from old maritime logs ... of the Old Weather: Arctic project, a citizen science-fuelled effort to digitise and

Satellites and radar

[Weather Cannot Hide From Honeywell's New Advanced Radar System](#)

PRNewswire (press release)

The latest, most advanced addition to the IntuVue family expands Honeywell's advanced weather radar capabilities to more aircraft, helping pilots ...

Transport/roading/shipping/freight

[Colorado to use hyperlocal weather forecasting for road maintenance operations](#)

Traffic Technology Today

The cloud-based platform will provide CDOT decision makers with an easy-to-use display for effectively managing road weather issues.

Weather in pictures

[Satellite captures rarely seen atmospheric gravity wave phenomenon off WA's north](#)

Satellite images have captured a usually invisible phenomenon known as atmospheric gravity waves pulsing through clouds off Western Australia's north-west.

[Met Office explains reason behind rare 'upside-down rainbow' seen over Hull](#)

HullLive

A rare 'upside-down rainbow' has been spotted in the sky above Hull. Lee Middleton was walking near Swinderby Garth in Bransholme on Tuesday ...

[Stunning skylines and lighting storms feature in Weather Photographer of the Year 2019](#)

Yahoo New Zealand News

The winning entries in the Weather Photographer of the Year 2019 competition showcase the most amazing pictures of skylines, lightning storms and ...

Climate change / global warming / sea level rise

[Why we won't be heading into an ice age any time soon](#)

Professor James Renwick from the School of Geography, Environment, and Earth Sciences explains the science behind the warming and cooling of Earth and how it relates to current climate change.

[Climate explained: how volcanoes influence climate and how their emissions compare to what we produce](#)

Everyone is going on about reducing our carbon footprint, zero emissions, planting sustainable crops for biodiesel etc. Is it true what the internet posts say that a volcano eruption for a few weeks will make all our efforts null and void?

[Homes of 240,000 Kiwis in way of worst case 2100 sea level rise, study indicates](#)

Sea level rise could be affecting the homes of around quarter of a million New Zealanders by the end of the century, in a possible worst case scenario, according to US researchers.

[Climate change a financial and investment risk - report](#)

A report from a group of business leaders has found climate change has become a financial and investment risk, which requires strong leadership and urgent attention.

[The Government plans to pass a law requiring companies to disclose climate-change risks](#)

Listed New Zealand companies could soon be required by law to make any climate change-related risks to their businesses known to their shareholders.

Cloud seeding / Geoengineering

[China has built up its muscle on how to turn weather into a weapon. Can India match up to it?](#)

Defence Aviation Post

Just before the opening ceremony of the Beijing Olympics in 2008, China's weather-modification office — yes, the Chinese have something like that ...

Te reo

[Digital platform to ease access of te reo Māori for 21st century conversations](#)

New Zealanders could soon be saying 'kia ora' to their smartphone voice assistants, like Siri and Alexa, thanks to new funding from the government.

Emergency preparedness / disaster planning / resilience

[Tasman forest fire review proposes recommendations to Fire and Emergency](#)

Fire and Emergency New Zealand should develop a nationally consistent framework for tactical fire planning, an independent review of the Tasman forest fire response has recommended.

Journal and articles online

RESEARCH ARTICLES

[Quantifying the potential for improved management of weather risk using sub-seasonal forecasting: The case of UK telecommunications infrastructure](#)

David J. Brayshaw, Alan Halford, Stefan Smith, Kjeld Jensen

Version of Record online: 21 October 2019

In the United Kingdom, the telecommunication network provides an estimated net annual economic contribution of over £30 billion, yet it is exposed to considerable weather risk. This paper provides an end-to-end demonstration of the potential for skilful sub-seasonal meteorological forecasts to improve decision-making in telecommunication infrastructure management. Meteorological forecast skill is argued to be a necessary rather than a sufficient condition, with explicit modelling required to demonstrate utility to users in complex decision environments.

Welcome to AMS News You Can Use.

Each week, we send out a sampling of recent news and items of interest in meteorology and related fields, as covered by various media outlets.

October 29, 2019

News

[Are infamous Diablo winds responsible for recent wildfires?](#)

October 29, 2019 - San Francisco Chronicle

In recent years, autumn fires paired with strong winds have been even more relentless.

[Read MORE](#)

[Who has the advantage in colder weather -- the pitchers or the hitters?](#)

October 29, 2019 - Yahoo

Lower temperatures, humidity, barometric pressure, wind speed and altitude all can affect a baseball's trajectory, players' performances and the outcomes of games, according to research from a variety of sources, including the American Meteorological Society.
[Read MORE](#)

[NASA finds Arabian sea tropical cyclone Kyarr's heavy rainfall](#)

October 28, 2019 - Phys.org
Tropical Cyclone Kyarr is moving through the central Arabian Sea and NASA provided forecasters with an analysis of rainfall rates occurring in the powerful tropical cyclone.
[Read MORE](#)

[The False Comfort of Higher Seawalls](#)

October 29, 2019 - New Republic
What high-risk communities really need to do to protect themselves from catastrophe.
[Read MORE](#)

[California's getting scorched again. Here's how these fires compare to previous years](#)

October 28, 2019 - CNN.com International
In the past two years, California has experienced the deadliest and most destructive wildfires in its history, according to the California Department of Forestry and Fire Protection.
[Read MORE](#)

[Category 4 Kyarr is the strongest cyclone over the Arabian Sea in 12 years](#)

October 28, 2019 - SFGate
The Indian Ocean beast - dubbed a top-tier "super cyclonic storm" by the India Meteorological Department - is the first storm of such intensity to rage in the Arabian Sea in 12 years.
[Read MORE](#)

[Boulder's NCAR targets improved forecasting at Lake Victoria](#)

October 27, 2019 - Boulder DailyCamera.com
As many as 5,000 people each year lose their lives in severe weather on East Africa's Lake Victoria, and scientists at Boulder's National Center for Atmospheric Research are heading toward the finish line of a project aimed at changing that.
[Read MORE](#)

[Forecasters: Prepare for snow. Probably.](#)

October 26, 2019 - KOIN.com
Highlights from the 27th Annual Winter Weather Forecast Conference, sponsored by the Oregon Chapter of the American Meteorological Society, which took place at OMSI on Saturday, October 26.
[Read MORE](#)

[Freshwater reserves under the sea](#)

October 24, 2019 - Phys.org
Research at Flinders University is investigating and locating vital freshwater hidden beneath the sea.
[Read MORE](#)

[NCAR Climate Model Dataset Available On The Cloud](#)

October 24, 2019 - UCAR
A significant portion of NCAR's CESM Large Ensemble project is now available on the cloud.
[Read MORE](#)

[Should some hurricanes be designated Category 6? Some forecasters say Dorian could've been.](#)

October 24, 2019 - The Post and Courier
If the traditional Saffir-Simpson scale of hurricane intensity were extended to its next logical step, Dorian, with winds reaching 185 miles per hour, would have qualified for the new category.
[Read MORE](#)

[Plant physiology will be major contributor to future river flooding](#)

October 24, 2019 - Watts Up With That
The next time a river overflows its banks, don't just blame the rain clouds. Earth system scientists from the University of California, Irvine have identified another culprit: leafy plants.
[Read MORE](#)

[3 Reasons Tornado Threats Warrant Immediate TV Coverage](#)

October 22, 2019 - Forbes
3 reasons an EF3 tornado always warrants coverage no matter what's on TV.
[Read MORE](#)

American Meteorological Society
45 Beacon Street, Boston, MA, 02108-3693
[Staff Email & Phone Directory](#)
617-227-2425

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My latest WeatherEye from John Maunder
<https://www.sunlive.co.nz/blogs/13972-tropospheric-temperatures-1979-to-september-2019.html>
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Thanks to all our regular contributors

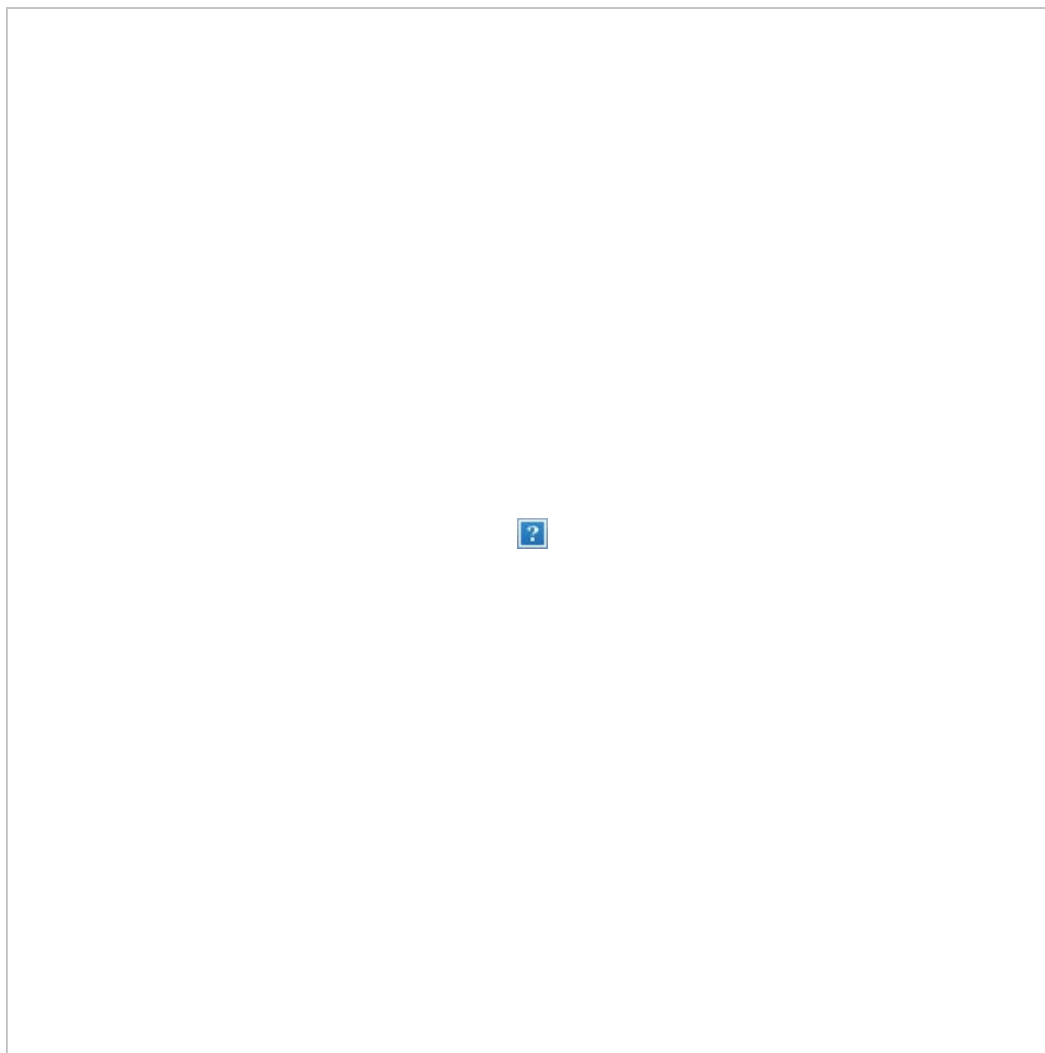
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The Meteorological Society of New Zealand · NIWA · Wellington, Wgn 6021 · New Zealand



From: [Metsoc](#)
To: [Ramon Oosterkamp](#)
Subject: Clips to 17Feb
Date: Monday, 17 February 2020 9:57:19 pm

New Zealand weather and climate news

[View this email in your browser](#)



New Zealand weather and climate news

MetService mentions

Courtesy of MetService Library

Weather: Uesi nothing out of the ordinary, lack of rain an ongoing concern

There were warnings about the wet weather ex-tropical cyclone Uesi would bring to the West Coast over the weekend - but other parts of New Zealand have seen barely any rain in weeks.

Something's on the horizon

Otago Daily Times

Good things take time, they used to say in those wonderful Mainland Cheese television ads. If that is the case, the confirmation MetService is finally ...

Smattering of rain brings no reprieve to Northland

New Zealand Herald

MetService meteorologist Kyle Lee said parts of the Northland region received rain, mainly from sunrise through to around 8am on Sunday, followed ...

Timaru hotter than average for February

Stuff.co.nz

The highest recorded February temperature for Timaru was in 1998 when it reached 37.8 degrees, MetService weather communication advisor Sonja ...

South Island weather: Ex-Tropical Cyclone Uesi brings heavy rain and wind

Stuff.co.nz

Heavy rain and strong winds are set to hit parts of the South Island on Sunday. MetService has issued heavy rain warnings for Buller, Westland, ...

Ex-Tropical Cyclone Uesi still an 'intense weather system' headed towards South Island

Stuff.co.nz

On Friday morning MetService issued a heavy rain warning for Westland south of Otira from 4am Sunday until 4am Monday. Accumulative rainfall of ...

[Weather: Big dry continues for Auckland despite a few drops of rain](#)

New Zealand Herald

If you woke up with a sprinkling of rain on your car this morning - don't get too excited. MetService says the rain was so light Auckland Airport's rain ...

World Weather

Erick Brenstrum joins us once again to take a look at the best and the worst of world weather.

[Northland drought conditions classified 'adverse event' by government](#)

The drought conditions in Northland have been classified as an "adverse event" for the primary sector, meaning government funding can be accessed to help out farmers.

[Farmers in Waikato hope for rain as extreme dry takes hold](#)

Farmers in parts of Waikato are looking skyward hoping at least 100 millimetres of rain will fall within the next fortnight as an extreme dry takes hold in the region.

[Some weather events 'impossible to plan for' - Agriculture Minister Damien O'Connor](#)

Agriculture Minister Damien O'Connor is confident Northland farmers and growers will survive a record-breaking drought.

[NZ's Big Dry: Five key questions answered](#)

New Zealand Herald

In both seasons, the tropical Pacific has been in an El Niño-Southern Oscillation (Enso) neutral state - meaning that neither El Niño or La Niña patterns ...

[Another scorcher: Napier hits 34.2C as heat cranks up again](#)

New Zealand Herald

The relentless Hawke's Bay summer sun is going nowhere fast. MetService meteorologist Lewis Serris said Thursday's maximum in Hawke's Bay was ...

MetOcean

Stephen M. Chiswell & Philip J. H. Sutton (2020) Relationships between long-term ocean warming, marine heat waves and primary production in the New Zealand region, New Zealand Journal of Marine and Freshwater Research, DOI: [10.1080/00288330.2020.1713181](#)

We test the paradigm that in a future warmer ocean, shallower winter mixing will lead to less net primary production (NPP), by investigating whether warming between 2002 and 2018 led to changes in NPP in the Tasman Sea/New Zealand region. The 2002–18 trend in sea surface temperature (SST) was positive over most of the region, and was driven by increasingly warmer summers and marine heat waves (MHWs) rather than year-round warming. In contrast, the trends in sea surface chlorophyll (SSC) and NPP were generally positive over the Subtropical Front (STF) and in a subtropical band north-east of New Zealand, but negative elsewhere. Regressions between SSC and SST, and between spring SSC and the coldest SST during the preceding winter, show similar spatial patterns to the SSC trend. We suggest these findings reflect different ecosystem functioning in the subtropical and subantarctic biomes that are separated by the STF. We conclude that any future warming is likely to lead to less production in the Tasman Sea, but more production over the STF. Three recent MHWs had different impacts on production, but generally led to less surface biomass north of the STF and more biomass south of the front.

Volcano alert/watch

[Project to focus on adapting to living with ongoing volcanic activity](#)

The next eruption on Mt Taranaki could last for decades and cost the country billions a year, volcanologists say.

Extreme weather (and other news) – Antarctica and offshore

[The Antarctica factor: Model uncertainties reveal upcoming sea level risk](#)

Within this century already, due to Antarctica alone global sea level might rise up to three times as much as it did in the last century. This is a finding of an exceptionally comprehensive comparison of state-of-the-art computer models from around the world.

[Climate change: Highest-ever temperature of over 20°C recorded in Antarctica](#)

An El Niño is a weather event, which can cause extreme weather around the world. An El Niño comes along about every two to seven years as part of ...

Extreme weather (and other news) – Australia and Pacific

[Weather systems off Samoa group and Tuvalu could become cyclones](#)

The Samoa Meteorological Service says there are two weather systems which are of concern to Samoa.

A Tropical Disturbance near Tuvalu, TD07F, and a developing low pressure system near Samoa.

[Missing Bendigo weather pod keeps transmitting data in suspected captivity](#)

Bendigo Advertiser

The apparent theft of a weather pod has sparked La Trobe University Technology Innovation Lab head Dr Simon Egerton's curiosity.

Extreme weather (and other news) – Asia and the Middle East, Africa

[Saudi Arabia shivers in worst cold spell](#)

The Siasat Daily

Riyadh: Saudi Arabia is experiencing its coldest weather since 2016, meteorologists said Thursday, with overnight temperatures dropping below zero ...

[Penang, Kedah facing imminent water crisis as key dams dry up](#)

Free Malaysia Today

PBA CEO Jaseni Maidinsa said cloud-seeding operations must be urgently intensified to induce rain at the key Beris and Muda dams in Kedah so that ...

[Local Solutions Prepare South Asia for Searing Heat](#)

Natural Resources Defense Council

This week, a regional summit of heat experts in South Asia focuses attention ... (NDMA), the India Meteorological Department, and other local partners.

[Baghdad wakes up to first snow in a decade to lighten mood after months of unrest](#)

Iraq's capital of Baghdad woke on Tuesday (local time) to a sight not seen in more than a decade — snow.
[What's behind Kenya's strange weather?](#)

Phys.Org

This event is similar to the El Niño Southern Oscillation that occurs in the tropical Pacific Ocean. Sea surface temperatures are measured by the ...

[Thailand: Growth risks intensifying amid coronavirus outbreak - ANZ](#)

FXStreet

Thailand: Growth risks intensifying amid coronavirus outbreak - ANZ ... stemming from the coronavirus outbreak and inclement weather conditions.

Extreme weather (and other news) – Americas and Europe

[Storm Dennis triggers Red rain warning](#)

The Met Office issued a Red Warning for rain – the highest level of warning - for parts of south Wales on Sunday morning.

[Storm Ciara expected to cost up to £200m in insurance claims](#)

Experts at PwC say Storm Dennis likely to add to damage with 140mm of rain predicted

[Twin bomb cyclones to merge into one of strongest-ever storms in North Atlantic](#)

A potentially unprecedented scenario is unfolding in the North Atlantic on Friday (local time), as a bomb cyclone batters Iceland with hurricane-force winds and blizzard conditions, just as another bomb cyclone, known as Storm Dennis, rapidly intensifies behind it.

[January was the most unusually warm month ever recorded without an El Niño](#)

Washington Post

January was the most unusually warm month on record to occur in the absence of an El Niño event in the tropical Pacific Ocean, in another ...

[California could go through all of February without a significant storm for the first time since 1864. A ...](#)

Business Insider UK

NOAA's Cooperative Institute for Meteorological Satellite Studies (CIMSS) shared the image on Twitter. "Can you spot the high pressure???" it wrote.

[It's so cold the ground is exploding in Toronto. Here's what you need to know about 'frost quakes'](#)

Toronto Star

... will expand, putting pressure on surrounding soil and rock until an explosion is caused, said Kelly Sonnenburg, a Weather Network meteorologist.

[Water boards up taxes to tackle changing weather patterns](#)

DutchNews.nl

Water boards up taxes to tackle changing weather patterns ... A farmer with a business worth €400,000 can expect to pay €2,526 which represents a ...

International news and research

[Computer-based weather forecast: New algorithm outperforms mainframe computer systems](#)

Posted: 13 Feb 2020 09:42 AM PST

The exponential growth in computer processing power seen over the past 60 years may soon come to a halt.

Complex systems such as those used in weather forecast, for example, require high computing capacities, but the costs for running supercomputers to process large quantities of data can become a limiting factor. Researchers have recently unveiled an algorithm that can solve complex problems with remarkable facility -- even on a personal computer.

[Twin Dangers of Scorching Days and Sweltering Nights Are on the Rise](#)

The combination of day and night extreme heat will only get more frequent—and hotter—in the future

[Meteorology 101: Rules For Building A Better Forecast](#)

Forbes

It holds that the accuracy of the weather forecast improves by one day every ... and Atmospheric Administration's Earth Prediction Innovation Center.

[Which forecast models do meteorologists use most?](#)

WOODTV.com

(WOOD) — If you spend enough time listening to weather reports on the air, at one point or another you'll likely hear broadcast meteorologists make ...

[Weather Source uses Snowflake to keep ahead of extreme weather](#)

ComputerWeekly.com

... if accurate weather forecasting is not built into their business assumptions, ... Weather Source provides enterprise clients with meteorological data to ...

[SERB Scientist Rajeev Mahajan calls for nodal IMD agency for climate services at ICCS-6, Pune](#)

Indus Dictum

Dr. Mehajan highlighted that the India Meteorological Department (IMD) ... weather-ready (already unparalleled in South Asia) and climate-smart ...

Aviation

[Rocket Lab wins Nasa contract to provide 'ride to the moon' for small satellite mission](#)

Stuff.co.nz

Rocket Lab has won a \$15.5 million Nasa contract to launch a small satellite to the moon next year. The tech company will send a satellite into the ...

[Climate Change is Making it Harder for Planes to Get in the Air, New Study Says](#)

The Weather Channel

Williams and his fellow researchers studied 60 years of weather and aircraft data from Greek airports to see how warmer air temperatures and ...

[Small altitude changes could cut climate impact of aircraft by up to 59%](#)

Posted: 12 Feb 2020 09:19 AM PST

Altering the altitudes of less than 2% of flights could reduce contrail-linked climate change by 59%, says a new study.

Business/Insurance

[Southland still in state of emergency with repairs set to cost millions](#)

Feb 15, 2020 06:04 am

It's too early to count the cost of last week's flooding, but it'll be significant with the repairs to Milford Road alone

costing millions of dollars to fix, authorities say.

[Weather Forecasting for Business Market Booming Worldwide| Accuweather, BMT ARGOSS ...](#)

News Parents (press release)

Latest Study on Industrial Growth of Global Weather Forecasting for Business Market 2019-2025. A detailed study accumulated to offer Latest insights ...

Lightning

[New Study Hints at Bespoke Future of Lightning Forecasting](#)

Eos

Weather forecasting has come a long way since the days of the Apollo ... colleagues describe training a machine learning algorithm on data from 12 ...

Climate change / global warming / sea level rise

[January 2020: Earth's Warmest January on Record](#)

The month was our planet's warmest ever recorded without an El Niño being present

Cloud seeding / Geoengineering

[Cloud-seeding plan aims to increase rainfall in Saudi Arabia by 20 percent](#)

The Rahnuma Daily (press release)

RIYADH (Rahnuma): The Saudi cabinet has approved a cloud-seeding program that aims to increase rainfall in the Kingdom by almost 20 percent.

Emergency preparedness / disaster planning / resilience

[How NZ would fare during a world catastrophe](#)

Insight - The current coronavirus outbreak is serving as a real time test of New Zealand's emergency plans. But public health experts warn there are even bigger threats out there that we should also be preparing for. John Gerritsen investigates if we could cope in a global catastrophe.

Library

['Weed in the dead of night': A librarian shares the secrets of book-culling](#)

Librarian Rebecca Hastie with a crash course on the fraught task of "weeding", the systematic removal of resources from a library collection.

Writer and reviewer David Larsen [wrote an article the other week](#) conveying his immense displeasure and concern that the National Library is removing 600,000 books from its collection. David's piece, along with the inevitable Nazi book burning comparisons in the comments section, is very much par for the course when a library begins a weeding project. For librarians, though, weeding is a crucial aspect of our professional duty to maintain collections that best serve the needs of our communities.

Journal and articles online

Reremoana Theodore, Melinda Webber, Richard Blaikie & Wendy Larner (2019) [Rethinking our shared futures](#).

Journal of the Royal Society of New Zealand, 49:sup1, 1-3, DOI: [10.1080/03036758.2019.1687531](#)

The Royal Society Te Apārangi asked a number of experts to contribute papers around rethinking our shared futures, to be included in this open access supplement of the Journal of the Royal Society New Zealand. The papers cover a range of topics including business, hauora, culture, society, environment, history and even reflections on research practice itself. They have been presented here to encourage reflection and discussion, and to help us broaden our shared understandings of the purpose, process and impact of research for everyone in Aotearoa.

[Determination of automatic weather station self-heating originating from accompanying electronics](#)

P. Pavlasek, A. Merlone, F. Sanna, G. Coppa, C. G. Izquierdo, J. Palencar, S. Duris

e1844 | First Published: 30 September 2019

This study focuses on the most commonly used temperature sensors within automatic weather stations, with a specific focus on evaluating the self-heating effect, which originates not only from the temperature sensor itself but also from the electrical components housed together within. The results of overall self-heating indicated a 0.07°C increase in temperature for the tested sensors when using the manufacturers' minimum recommended electric current supply. The use of elevated voltage levels up to 80% of recommended values shows a temperature increase as high as 0.32°C.

[Quantifying the potential for improved management of weather risk using sub-seasonal forecasting: The case of UK telecommunications infrastructure](#)

David J. Brayshaw, Alan Halford, Stefan Smith, Kjeld Jensen

e1849 | First Published: 06 October 2019

In the United Kingdom, the telecommunication network provides an estimated net annual economic contribution of over £30 billion, yet it is exposed to considerable weather risk. This paper provides an end-to-end demonstration of the potential for skilful sub-seasonal meteorological forecasts to improve decision-making in telecommunication infrastructure management. Meteorological forecast skill is argued to be a necessary rather than a sufficient condition, with explicit modelling required to demonstrate utility to users in complex decision environments.

[Major factors affecting the snow simulations by the JULES in New Zealand](#)

Yang Yang, Michael Uddstrom, Richard Turner, Mike Revell

e1837 | First Published: 19 August 2019

Snow frequently occurs over New Zealand in a maritime climate. The seasonal snow accumulation can be 3,000–4,000 mm deep in early spring at some locations. Owing to sparse snow observations, modelling and verification was limited. The major factors affect snow simulation over New Zealand are not well known. In the present study, major factors affecting snow simulation over New Zealand were identified and discussed. The maritime climate of New Zealand may make the snow simulation more sensitive to radiation, snow albedos and precipitation phase determination than for continents.

[An intuitive metric to quantify and communicate tropical cyclone rainfall hazard](#)

An intuitive rainfall hazard metric – the "Extreme Rainfall Multiplier" (ERM) – is used to describe extreme rainfall from past tropical cyclones and could improve the communication of future extreme rainfall events.

Recent tropical cyclones (TCs) have highlighted the hazards that TC rainfall poses to human life and property.

These hazards are not adequately conveyed by the commonly-used Saffir-Simpson scale. Additionally, while recurrence intervals (or, their inverse, annual exceedance probabilities) are sometimes used in the popular media to

convey the magnitude and likelihood of extreme rainfall and floods, these concepts are often misunderstood by the public and have important statistical limitations. We introduce an alternative metric – the “extreme rain multiplier” (ERM), which expresses TC rainfall as a multiple of the climatologically-derived two-year rainfall value. ERM allows individuals to connect (“anchor,” in cognitive psychology terms) the magnitude of a TC rainfall event to the magnitude of rain events that are more typically experienced in their area. A retrospective analysis of ERM values for TCs from 1948 to 2017 demonstrates the utility of the metric as a hazard quantification and communication tool. Hurricane Harvey (2017) had the highest ERM value during this period, underlining the storm’s extreme nature. ERM correctly identifies damaging historical TC rainfall events that would have been classified as “weak” using wind-based metrics. The analysis also reveals that the distribution of ERM maxima is similar throughout regions of the eastern United States, allowing for both the accurate identification of locally extreme rainfall events and the development of regional-scale (rather than local-scale) recurrence interval estimates for extreme TC rainfall. Lastly, an analysis of precipitation forecast data for Hurricane Florence (2018) demonstrates ERM’s ability to characterize Florence’s extreme rainfall hazard in the days preceding landfall.

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Weather Eye with John Mauder
<https://www.sunlive.co.nz/blogs/14376-auranga-annual-rainfalls-18982019.html>

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Thanks to our regular contributors
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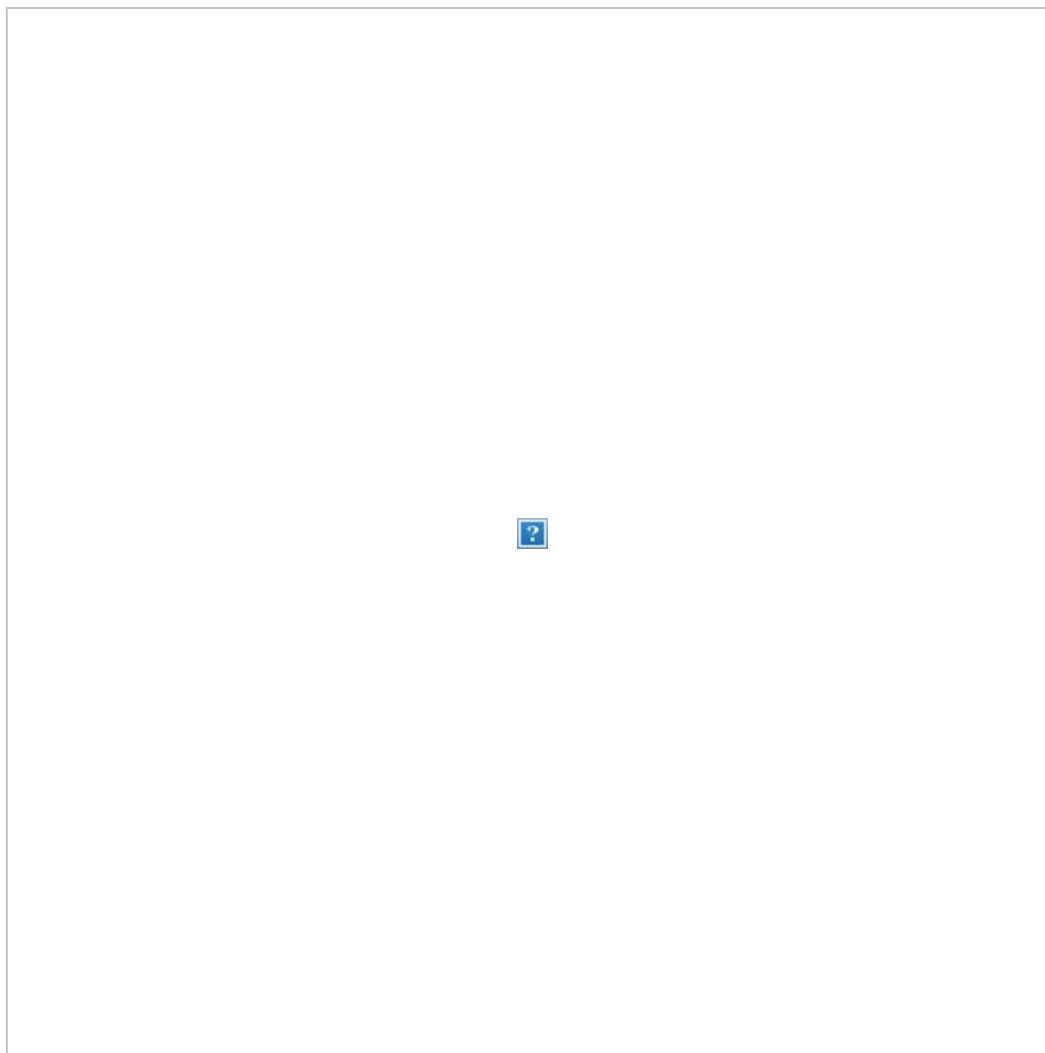
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From: [Metsoc](#)
To: [Bridget Chater](#)
Subject: Clips to 21Nov
Date: Thursday, 21 November 2019 5:57:24 pm

New Zealand weather and climate news

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Our good wishes to those attending Our Annual Conference 25-27 November at VUW, Wellington.

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From Kevin Trenberth

News release issued today: New research reveals insights into ocean heat flows. (no links available yet)

Please note that I will be talking about this work on Monday next at the NZ Meteorological Society Conference .

<https://conference-nzmetsoc-2019.lilregie.com/booking/attendees/new>

Enjoy

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New Zealand weather and climate news

These clips are courtesy of MetService Library, thanks

MetService

Thunderstorms set to wallop South Island as cold front hits NZ

Newshub

... Wednesday afternoon. The good news is that they won't be as severe as they were on Monday, according to MetService meteorologist Claire Nixon.

Giant hail stones hammer Timaru as storm moves up the country

Timaru has been hammered by a hail storm causing damage to buildings, closing some businesses and stretching emergency services

Lightning and thunder hits Canterbury 'like a sledgehammer'

More than 1500 lightning strikes hit the South Island during a six-hour storm that pelted Canterbury with damaging hailstones.

Two injured after tornado strikes Christchurch causing roof to collapse

A violent storm has torn up the east coast of the South Island causing damage and injuries.

Two people sustained moderate injuries after a mini tornado caused a roof to cave in at the Savemart in the Christchurch suburb of Sydenham, St John says.

[Destructive Christchurch tornado very weak, could have been worse](#)

Stuff.co.nz

MetService meteorologist Lewis Ferris said the thundercloud was 12 kilometres tall, right up to the top of the troposphere, the lowest level of the ...

[12km-tall thunderstorm cloud 'spawned' destructive Christchurch tornado](#)

Stuff.co.nz

MetService meteorologist Lewis Ferris said the thundercloud was 12 kilometres tall, right up to the top of the troposphere, the lowest level of the ...

[House reportedly struck by lightning in Palmerston, Otago](#)

A house in Palmerston, Otago has reportedly been struck by lightning, blowing fuses and and power plugs off the walls.

Firefighters were called to a property on Hampden-Palmerston Rd on State Highway 1, just north of the township, about 1.10pm on Monday.

[Nights After Dinner Speaker](#)

Nights Meteorology expert Erick Brenstrum has the stratosphere on his mind! He joins Bryan to discuss that particular part of the atmosphere, typhoons, hurricanes and wildfires. He also has a review of The Collapse of the Eastern Mediterranean by Ronnie Ellenblum.

[Hawke's Bay summer won't be marred by a few spots of showers and rain](#)

New Zealand Herald

Cloud cover, a southerly change, and a few spots of rain will not spoil the warm weather being experienced by Hawke's Bay residents. MetService ...

[Risk of avalanches as fronts bring wild weather](#)

A series of fronts bringing wild weather is increasing the risk of avalanches this week.

[Sunshine captured in analog at mall](#)

Otago Daily Times

The Burn Time exhibition has been in Dunedin for the past two weeks and its centrepiece is a replica of a Victorian meteorological machine called the ...

MetOcean

[Historical and Future Storm Surge around New Zealand](#)

MetOcean Solutions' physical oceanographer, Dr Jorge Perez, was part of the team led by the University of Auckland (Giovanni Coco and Laura Cagigal) that, together with the University of Cantabria (Spain), developed a new storm surge database for New Zealand.

[Going with the floe: Sea ice movements trace dynamics transforming the new Arctic](#)

Scientists have used MODIS satellite imagery to understand long-term ocean movements from sea ice dynamics. The engineers used image-processing algorithms to remove clouds, sharpen details, and separate individual floes. Image analysis algorithms mapped the floe movement over a period of days. The resulting ocean current maps were about as accurate as maps made using traditional methods. Tracking sea ice will help scientists better understand the sources driving sea ice transport.

NIWA

[Climate scientists from NIWA will clean up beaches during strike](#)

Weather forecasters and environment scientists from National Institute of Water and Atmospheric Research (NIWA) will strike on Thursday saying management has "backed them into a corner".

WMO

[Workshop calls for more investment in Flash Flood Guidance System](#)

Flash floods cause more than 5,000 deaths worldwide annually, exceeding any other weather-related event. As the global population increases, especially in urban areas, and societies continue to...

Volcano alert/watch

[Volcanic alert level rises on White Island](#)

The volcanic alert on Whakaaro - White Island in the Eastern Bay of Plenty - has been raised due to increased activity.

[White Island volcano \(New Zealand\) activity update: background activity increases further](#)

VolcanoDiscovery

Volcanic unrest continues at Whakaari/White Island and some monitored parameters show further increases in activity. Hazards on the island are now ...

[Satellite Shows Ash Plume From Russian Volcano Streaking Across the Pacific](#)

The Weather Channel

The Sheveluch volcano ash plume (in brighter green) was lofted as high as 33,000 feet by early Tuesday morning as it traveled over extreme western ...

[White Island's volcanic alert level raised to two](#)

Newshub

An increase in volcanic activity has led to a rise in White Island/Whakaari's alert level. The island now has an alert level of two, with an aviation colour ...

Extreme weather (and other news) – Australia and Pacific

[Cyclone early warning system for Pacific goes live](#)

The Pacific's first cyclone early warning system will go live in Fiji this week.

[Weather an enduring fascination for meteorologist](#)

The Sydney Morning Herald

For many Australians "bushfire weather" is a warning to prepare for the worst, even to evacuate their homes. For Grace Legge, too, it means dropping ...

[Bushfire threat set to continue through Christmas and New Year as December is expected to be ...](#)

Daily Mail

'The next few months until the middle of summer are forecast to be drier than average' Weatherzone meteorologist

Sam Brown told Daily Mail ...

[NASA Space Image Reveals Vast Amounts of Smoke Being Produced by Devastating Australia ...](#)

Newsweek

... including very dry air, high winds, dry lightning and hot temperatures. ... Several fires have also broken out in the state of Western Australia on the ...

[Climate change will make fire storms more likely in southeastern Australia](#)

Temperatures across many regions of Australia are set to exceed 40°C this week, including [heatwaves](#) forecast throughout parts of eastern Australia, raising the spectre of more devastating bushfires.

[Australia Warned to Expect More Fire Tornadoes](#)

Insurance Journal

Fire tornadoes are set to become a more common feature of the Australian ... The increased risk from fire tornadoes will affect Australia's capital city, ... and west coasts this week look set to worsen as lightning strikes from dry storms ...

[Record-smashing heat: Melbourne temperatures set to soar towards 40C as cold front slows](#)

It was already forecast to be blisteringly hot across southern Australia over the next few days. Now it's getting worse.

Conditions are set to deteriorate with the potential for a November temperature record that's stood for 125 years to be broken in Melbourne tomorrow.

[Bushfire threat spreads to Victoria as first Code Red declared since 2010](#)

A Code Red fire danger day has been declared in Victoria for the first time in almost a decade, as emergency services warn people in parts of the state's north to consider evacuating their homes.

[Sunshine Coast hail storm declared 'catastrophe' as Insurance Council estimates \\$40 million in damage](#)

The Insurance Council of Australia has declared Sunday's hail storm on the Sunshine Coast a "catastrophe" after receiving more than 5,000 claims and a damage bill reaching \$40 million.

Extreme weather (and other news) – Asia and the Middle East, Africa

[Prince Charles Visits IMD: Praises Its Weather Advisory Services](#)

The Weather Channel

Prince Charles Visits IMD; Praises Its Weather Advisory Services ... These member nations include Thailand, Myanmar, Bangladesh, Sri Lanka, ...

['Accumulation of particulate matter' causes hazy skies, unhealthy air quality in Singapore](#)

The Independent

In 1997 and 2015, haze intensified due to a prolonged dry period as well as the El Nino phenomenon, which sees a warming of the central and ...

[Typhoon Kalmaegi to make landfall over Luzon, Philippines soon](#)

Skymet Weather

In fact, Kalmaegi will move over to South China Sea. The system is expected to weaken into a tropical storm. After that also, it will continue to weaken ...

Extreme weather (and other news) – Americas and Europe

[UK weather: More than 100 flood warnings in place with parts of country close to wettest autumn on ...](#)

The Independent

UK weather: More than 100 flood warnings in place with parts of country be eligible for immediate relief on their council tax and business rates.

[Future rainfall could far outweigh current climate predictions in UK](#)

Posted: 14 Nov 2019 04:55 AM PST

Scientists analyzed rainfall records from the 1870s to the present day with their findings showing there could be large divergence in projected rainfall by the mid to late 21st century.

[Corruption and delay drown Venice as it loses its fight against flooding](#)

A set of barriers that could have stopped near-record floods in Venice have long been delayed, leaving the ancient city exposed to disastrous water levels

International news and research

[Beijing Meteorological Service Selects 200 Gigabit HDR InfiniBand to Accelerate New ...](#)

Yahoo Finance

SUPERCOMPUTING CONFERENCE – Mellanox Technologies, Ltd. ... the weather forecasting information needs of the China 2022 Winter Olympics.

[PredictWind's forecast accuracy verified in worldwide study](#)

Sail World

PredictWind has made significant improvements to their weather models. 10 years of development has culminated in the release of the most accurate ...

[Automation hasn't required high-end hardware in one NOAA office](#)

FedScoop

NESDIS, he notes, works with all the big public and private weather-forecasting services, including the National Weather Service, AccuWeather and ...

[New datasets to understand wildfires and river flows](#)

The Parliament Magazine

Francesca Di Giuseppe and Christel Prudhomme, from the European Centre for Medium Range Weather Forecasts (ECMWF), explain how new data ...

[When Will Weather Forecasting Technology Be Accurate?](#)

Now. Powered by Northrop Grumman. (blog)

Weather forecasting data comes from different sources. NASA's Earth-sensing mission AQUA and other satellite-based sensors provide water-related

[Beyond 'Siri, what's the weather?' The pocket guide to forecasting from your phone.](#)

Washington Post

With the power to predict short-term weather on the device in your pocket, it's helpful to know what your best options are for weather apps. They're not ...

[Heat networks in focus as EU cities confront building emissions](#)

Last year, the European Union embarked on a mission to decarbonise the building sector, currently responsible for 40% of the bloc's energy use. And cities with district heat networks have a head start when it comes to integrating new low-carbon energy sources.

Bacteria from the ocean floor could be influencing Arctic weather

The Ledger

"They regulate the surface and atmospheric temperatures, affecting sea ice, ecology, shipping, Arctic climate, and weather. And we just have a really ...

IBM makes higher quality weather forecasts available worldwide

Express Computer (press release) (blog)

... outages; logistics companies can plan better with on-road weather forecast for just in time needs of industry – impact of IBM GRAF is boundless."

Rolex And National Geographic Society Install The World's Highest Weather Station On Mount ...

Singapore Tatler

Besides installing five weather stations, Rolex and National Geographic Society collect precious scientific data during the Perpetual Planet Extreme ...

We cant change meteorology, we need to curb emissions: Forecast scientist

Hindustan Times

The model developed by Pune based Indian Institute of Tropical Meteorology (IITM) has the capability of apportioning other sources also. The team ...

Climate change expected to shift location of East Asian Monsoons

Posted: 13 Nov 2019 04:51 AM PST

More than a billion people in Asia depend on seasonal monsoons for their water needs. The Asian monsoon is closely linked to a planetary-scale tropical air flow which, according to a new study, will most likely shift geographically as the climate continues to warm, resulting in less rainfall in certain regions.

Stalled weather patterns will get bigger due to climate change

Posted: 13 Nov 2019 04:51 AM PST

Climate change will increase the size of stalled high-pressure systems that can cause heat waves, droughts and other extreme weather, according to a new study.

Contributors needed! The newly-launched Meteorological Technology International news website (<https://lnkd.in/gpcgGK2>) is looking for industry-experts to write opinion articles for the site. Do you have something interesting to say about the latest meteorological or hydrological forecasting techniques or have an opinion on the next big trend, challenge or technology in the met world? Then get in touch! We are looking for 600-800-word articles, which will be featured on our site and in our weekly newsletter! Contact me, xxxxx.xxxxxx@xxxxxxxxxxxxxxx.xxx, for more information. [hashtag#meteorology](#) [hashtag#weatherforecast](#) [hashtag#hydrology](#) [hashtag#weather](#) [hashtag#forecasting](#)

Others

Atos delivers two new BullSequana supercomputers to Météo-France to boost weather forecasting ...

GlobeNewswire (press release)

... two supercomputers based on its latest BullSequana XH2000 technology. ... it to achieve several scientific breakthroughs in weather forecasting.

AV software leader teams up with weather company to beat Tesla

Digital Journal

AV innovator Renovo has partnered with Vaisala , a leading weather tech company. This partnership will help to integrate weather and road surface ...

5G network

Spark announces 5G roll out plans into 2020 and network vendors

- 5G roll out for further heartland regional and major centres in 2020
- Roster of technology vendors confirmed in line with multi-vendor strategy

Could 5G Technology Disrupt Ability To Predict Severe Storms?

CBS Denver

Weather satellites and 5G signals both use electromagnetic radiation waves. CBS4 meteorologist Dave Aguilera says the 23.8GHz spectrum is where ...

Heartland regions to get Spark's 5G broadband first

Five South Island regions will get an early Christmas present of 5G wireless broadband.

Aviation

Space sector contributes \$1.7 billion to NZ economy

The space sector has contributed almost \$1.7 billion to New Zealand's economy in the past financial year.

Air NZ cancels 82 international flights over Christmas period due to engines

Air New Zealand has cancelled some of its international flights due to ongoing issues with its Rolls-Royce engines.

Beyond Weather Forecasting: ClimaCell Launches Insights Dashboard That Can Predict How ...

PRNewswire (press release)

The aviation industry can use Insights Dashboard's hyper-accurate forecasts to help crews prepare for deicing events, enabling them to decide which ...

Business/Insurance

Leaders who stand out...

Gulf Digital News

One example of using technology is their focus on weather forecasting. There are 14 regions around the UK where the weather is forecast to make ...

Munich Re Syndicate to leverage ClimaCell's exclusive weather data

Reinsurance News

By utilising ClimaCell's Insights Dashboard technology, it's expected that ... AI and Weather-Of-Things data to produce accurate weather forecasting.

Energy and Mining

Natural Gas: Massive Weather Model Divergence Presents Excellent Trading Setup

Seeking Alpha

ECMWF-EPS and GFS-ENS have very different views at the moment for where the weather is trending. For GFS-ENS, the blocking pattern in Canada ...

Climate impact of hydropower varies widely

Hydropower is broadly considered to be much more environmentally friendly than electricity generated from fossil fuels, and in many cases this is true. However, a new study reveals that the climate impact of hydropower facilities varies widely throughout the world and over time, with some facilities emitting more greenhouse gases than those burning fossil fuels.

[Is renewable energy too weather-dependent?](#)

Buffalo News

Fossil-fueled power plants cause pollution and climate problems, true ... Iowa reports they now generate 40% of their energy from wind turbine farms. ... achieving a \$500,000 savings in a one-hour period during peak demand.

Fire

[Australia bushfires to 'worsen' this week, says fire commissioner](#)

National Post

MELBOURNE, Nov 17 (Reuters) — Rising temperatures, lightning strikes and erratic winds are set to fan wildfires in Australia in the week ahead, ...

[Climate change-fueled US wildfires take toll on those who fight them](#)

"You have 200 homes destroyed. Five years ago, that would have been crazy. Losing 200 now was a win. It was a victory that no one died," says one firefighter

[NZ's wildfire future: which regions are most at risk?](#)

New Zealand's fast-rising fire danger has prompted questions about how prepared our communities are for big blazes - and whether development should even be allowed in highest-risk places.

[10 ways climate change can make bushfires worse](#)

NEWS.com.au

The current fires, however, are not influenced by an El Nino event. Unmanageable intensity. Climate change not only boosts the likelihood of wildfires, ...

Health

[9 ways the climate crisis is killing you \(right now\)](#)

Wherever you live, the climate crisis is having an impact on your health. Here are nine charts that show how it is damaging the collective health of humanity

[Consumer NZ says nine out of 20 sunscreens don't provide protection they claim](#)

Cancer Society sunblock has failed to live up to its sun-protection claims for the second year running, Consumer NZ says.

History

[D-Day: How meteorologists helped win the war](#)

Yahoo News Canada

"No models, no satellites," Weather Network meteorologist Dr. Doug Gillham says of the methods at the time. "It just came down to an understanding of ...

[Lightning strikes almost doomed the 1969 Apollo 12 Moon mission](#)

The Weather Network

Thursday, November 14th 2019, 8:00 pm - Fifty years ago, two bolts of lightning struck Apollo 12 seconds after launch, but quick thinking saved the ...

[How AI is about to take us back into NZ's weather past](#)

A world-first project could dramatically improve what we know about New Zealand's weather, by using artificial intelligence to trawl through handwritten records stretching back more than 150 years

Hydrology / Flooding

[Water rising as Lake Wakatipu's alert level looms](#)

Twenty years almost to the day of the worst floods in Queenstown's history, Lake Wakatipu's level is nearing its "high" alert threshold.

[Climate explained: Why coastal floods are becoming more frequent as seas rise](#)

I saw an article claiming that "king tides" will increase in frequency as sea level rises. I am sceptical. What is the physics behind such a claim and how is it related to climate change? My understanding is that a king tide is a purely tidal effect, related to Moon, Sun and Earth axis tilt, and is quite different from a storm surge.

Lightning

[As lightning strikes surge, Bangladesh plants a defence](#)

Climate shifts are leading to more deadly lightning - but an effort to plant palm trees could cut the risks

[This is how most bushfires in Australia start, and how we know](#)

ABC News

As fires continue to burn in different parts of Australia, investigators work to ... "Positively charged lightning is far more likely to start a fire," he said.

Satellites and radar

[Arianespace to launch Taiwan-developed satellite Triton in 2021](#)

Focus Taiwan News Channel

Taipei, Nov. 15 (CNA) A locally developed weather satellite is expected to be launched by France-based

Arianespace in 2021, a source said Friday.

Transport/roading/shipping/freight

[Iteris ClearPath Weather Chosen by Oklahoma Department of Transportation for Road ...](#)

Associated Press

... selected Iteris' ClearPath Weather® solution to provide weather forecasting services ... "Vital data insights from ClearPath Weather will allow Oklahoma DOT to ... application programming interfaces (APIs) to access weather data.

Innovation and technologies and AI

[Deep neural networks speed up weather and climate models](#)

Science Daily

"We used 20 years of computer-generated data from the WRF model to train the neural networks and two years of

data to evaluate whether they could ...

[Why are weather apps still so unreliable?](#)

Mic

"There are many sources of potential differences," he tells Mic. "They may be caused by the use of different data sources ... quality control of the data, ...

[Climate change / global warming / sea level rise](#)

[FACTBOX-Heat is on to bring cooling to 1 billion people without it](#)

As global temperatures continue to creep upward as a result of climate change, a little over 1 billion people face threats because they lack cooling methods

[For some urban areas, a warming climate is only half the threat](#)

A new study projects that the growth of urban areas in the coming decades will trigger "extra" warming due to a phenomenon known as the urban heat island effect (UHI). According to their findings, urban expansion will cause the average summer temperature in these areas to increase about 0.5 to 0.6 degrees C -- but up to 3 degrees C in some locations.

[Wildfires, disease and food loss predicted for world's climate future - research](#)

A newborn today faces a future transformed by climate change, first by lack of food and then extreme weather, researchers say.

[Climate change leaves 52 million hungry in Africa](#)

The Southern Times

Oxfam says some areas were facing a second extreme drought in four years and worse than that sparked by El Nino in 1981. "In the south, parts of ...

[Cloud seeding / Geoengineering](#)

[Royal rainmakers halt Phuket cloud-seeding operations](#)

The Phuket News

PHUKET: The royal rainmaking division for Southern Thailand has ceased its operations to seed clouds over Phuket to fill the island's main reservoirs ...

[Cloud seeding not an option for drought-ravaged Australia](#)

7NEWS

When torrential rains flooded downtown Dubai earlier this month, the United Arab Emirates' zealous embrace of cloud seeding was blamed by some.

[Journal and articles online](#)

[Downstream influence of mesoscale convective systems. Part 1: influence on forecast evolution](#)

Samantha J. Clarke, Suzanne L. Gray, Nigel M. Roberts

Pages: 2933-2952 | First Published: 28 June 2019

Potential vorticity (PV) anomalies produced in a convection-permitting simulation of a mesoscale convective system (MCS) can persist after coarse graining to convection-parametrizing resolution. Perturbing a convection-parametrizing simulation to include these coarse-grained anomalies produces synoptic-scale forecast differences (compared to the unperturbed forecast) that cover the entire northern hemisphere after a few days and are largest at upper-tropospheric levels. Therefore, misrepresentation of PV structures associated with MCSs in convection-parametrizing simulations are a potential source of forecast error.

[Downstream influence of mesoscale convective systems. Part 2: Influence on ensemble forecast skill and spread](#)

Samantha J. Clarke, Suzanne L. Gray, Nigel M. Roberts

Pages: 2953-2972 | First Published: 12 July 2019

Perturbing convection-parametrizing simulations to include potential vorticity anomalies from convection-permitting simulations of a mesoscale convective system (MCS) produces systematic impacts on the downstream forecast in an ensemble, leading to alternate realizations of the forecast. The root mean square difference analysis shown here demonstrates that the effects of localized MCS perturbations are smaller than those of global operationally generated initial condition perturbations. Despite this, the combined ensemble spread is enhanced when including MCS perturbations, so they could be useful operationally.

[Determination of automatic weather station self-heating originating from accompanying electronics](#)

P. Pavlasek, A. Merlone, F. Sanna, G. Coppa, C. G. Izquierdo, J. Palencar, S. Duris

Version of Record online: 13 November 2019

This study focuses on the most commonly used temperature sensors within automatic weather stations, with a specific focus on evaluating the self-heating effect, which originates not only from the temperature sensor itself but also from the electrical components housed together within. The results of overall self-heating indicated a 0.07°C increase in temperature for the tested sensors when using the manufacturers' minimum recommended electric current supply. The use of elevated voltage levels up to 80% of recommended values shows a temperature increase as high as 0.32°C.

=====

Welcome to AMS News You Can Use. Each week, we send out a sampling of recent news and items of interest in meteorology and related fields, as covered by various media outlets.

November 19, 2019

[Are atmospheric rivers the reason for Northern California's extreme weather?](#)

November 19, 2019 - The Press Democrat

It's been a tough few years for Northern California, disaster-wise. The north state has been hammered in quick succession by catastrophic drought, intense flooding and rampaging wildfires. While it's reassuring to know such extreme events are historically uncommon, they're also not simply a result of bad luck.

[Read MORE](#)

[Arctic in hot water: Sea ice minimal in Chukchi, Bering seas](#)

November 19, 2019 - Phys.org

The U.S. research vessel Sikuliaq can break through ice as thick as 2.5 feet (0.76 meters). In the Chukchi Sea northwest of Alaska this month, which should be brimming with floes, its limits likely won't be tested.

[Read MORE](#)

[Renewable energy: climate crisis 'may have triggered faster wind speeds'](#)

November 19, 2019 - [MSN.com](#)

The global climate crisis could lead to more renewable electricity being generated by spurring faster wind speeds for the world's growing number of windfarms, according to research.

[Read MORE](#)

[Regional weather patterns are viewed through partisan lenses, poll finds](#)

November 18, 2019 - SFGate

People from North Carolina to Texas's Gulf Coast agree that their areas have been hard hit by extreme storms and hurricanes in recent years. But they disagree with one another on whether climate change is a major factor - and political allegiances make up the dividing line.

[Read MORE](#)

[IBM launches supercomputer-powered global weather forecasting](#)

November 18, 2019 - [Techhq.com](#)

The computing giant has launched an hourly-updating global weather model, providing accurate forecasts down to a 2-mile radius across the globe.

[Read MORE](#)

[Bacteria from the ocean floor could be influencing Arctic weather](#)

November 17, 2019 - Anchorage Daily News

Scientists have identified a surprising new mechanism that could be impacting cloud formation and weather patterns in the Arctic — bacteria from the ocean floor.

[Read MORE](#)

[Sustainable living lessons from Antarctica's first zero-emission research station](#)

November 16, 2019 - Fast Company

The Princess Elisabeth station uses 100% renewable energy supplied by the sun, the wind, and plentiful frozen water.

[Read MORE](#)

[NASA gets an eyeful of Typhoon Fengshen](#)

November 15, 2019 - [Phys.org](#)

NASA's Terra satellite captured an image of Typhoon Fengshen after its eye opened as Fengshen had strengthened from a tropical storm to a typhoon and developed an eye.

[Read MORE](#)

[A surprising answer to a hot question: Controlled burns often fail to slow a bushfire](#)

November 15, 2019 - [Phys.org](#)

As sure as night follows day, this week's bushfires prompted inevitable debate about whether fire authorities should have carried out more hazard reduction burning, and whether opposition from conservationists prevented this.

[Read MORE](#)

[New Moon-Seeking Sensor Aims to Improve Earth Observations](#)

November 14, 2019 - NASA

A new instrument with its eye on the Moon is taking off aboard a high-altitude NASA plane to measure the Moon's brightness and eventually help Earth observing sensors make more accurate measurements.

[Read MORE](#)

[NOAA releases new strategies to apply emerging science and technology](#)

November 14, 2019 - NOAA

NOAA today is announcing new strategies to dramatically expand the agency's application of four emerging science and technology focus areas — NOAA Unmanned Systems, Artificial Intelligence, 'Omics, and the Cloud — to guide transformative advancements in the quality and timeliness of NOAA science, products and services.

[Read MORE](#)

[Combining satellites, radar provides path for better forecasts](#)

November 11, 2019 - ScienceDaily

Every minute counts when it comes to predicting severe weather. Combining data from cutting-edge geostationary satellites and traditional weather radar created a path toward earlier, more accurate warnings, according to researchers who studied supercell thunderstorms in the Midwest.

[Read MORE](#)

Enjoy NYCU? Continue to receive this member benefit by [renewing your AMS Membership for 2020!](#)

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American Meteorological Society

My latest WeatherEye from John Maunder

<https://www.sunlive.co.nz/blogs/14068-the-southern-oscillation-index.html>

<https://www.sunlive.co.nz/blogs/13972-tropospheric-temperatures-1979-to-september-2019.html>

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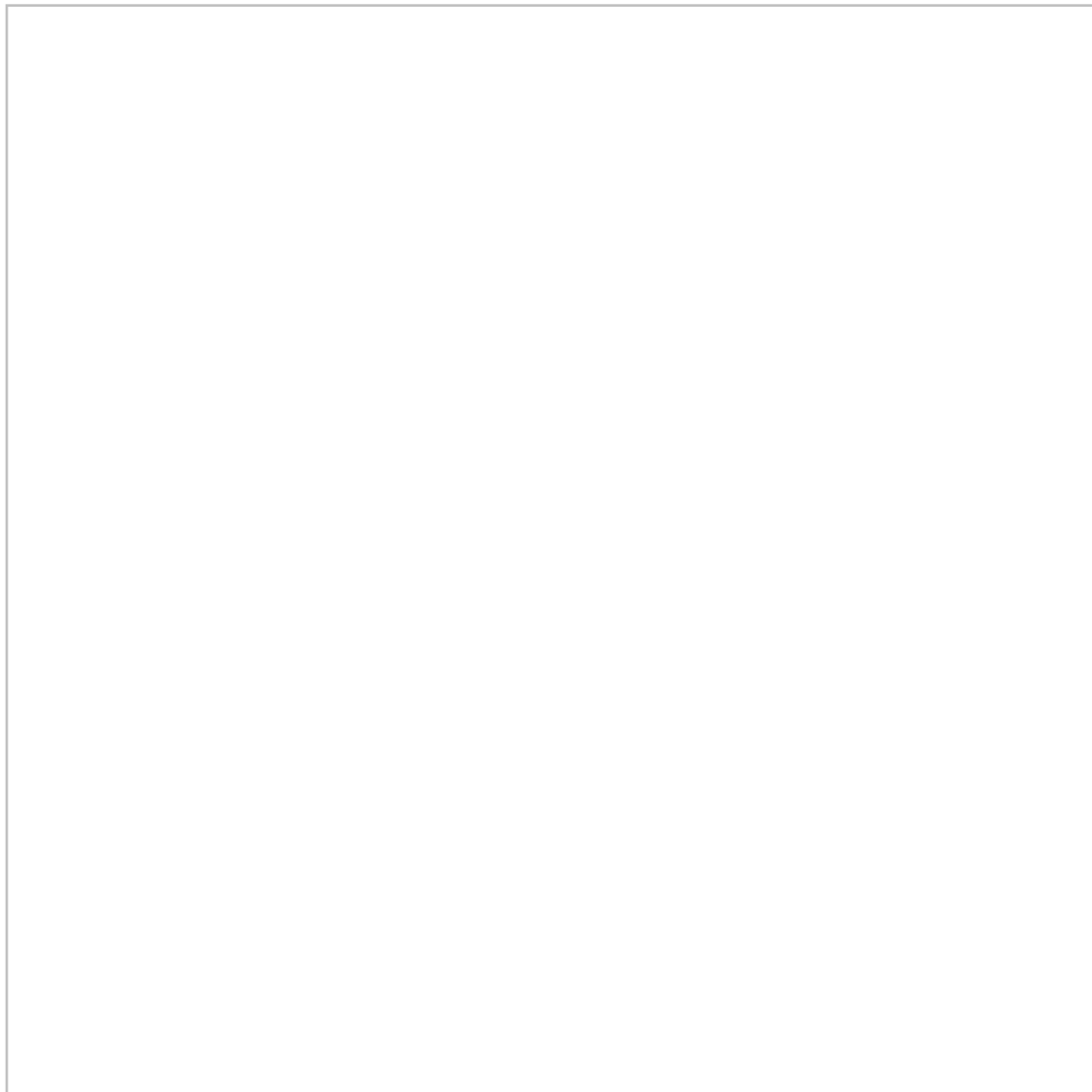
From: [NZ Herald Premium - News Briefing](#)
To: [Andrea Tandy](#)
Subject: Critical incidents put rugby on edge
Date: Monday, 26 June 2023 6:36:18 am

96



Hi Andrea

Welcome to your Monday briefing. Here's what you need to know to start your week.



Two Auckland rugby players suffer critical injuries in consecutive weeks

Two promising players from Auckland's Suburbs Rugby Football Club have been rushed to hospital in a critical condition after suffering separate on-field medical events in the space of a week.

On June 17, in the closing minutes of the Auckland club premier rugby match between Suburbs and Ponsonby, midfielder Adrian Lole was seen stumbling back to the try line before collapsing.

He was rushed to hospital and underwent surgery to remove a blood clot from his brain.

On Saturday, just a week after Lole was critically injured, another player from

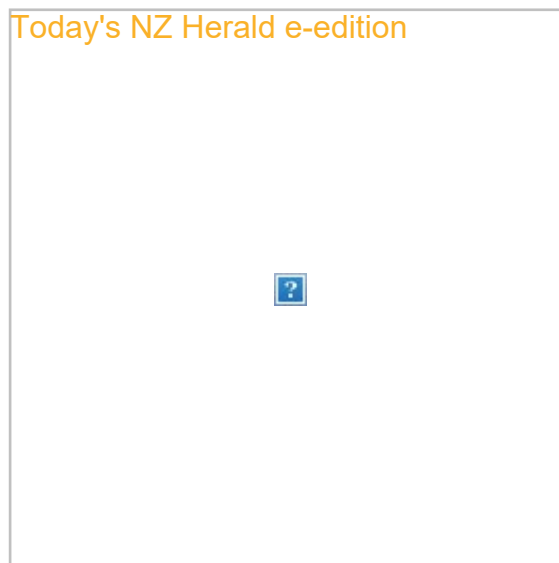
the Suburbs rugby club experienced a medical event at Shadbolt Park.

The player was transported to Auckland Hospital to receive treatment after the Premier Development match between Suburbs and Manukau.

The Auckland Rugby Union praised those who rushed to the player's aid and whose quick response "no doubt contributed to him now thankfully being in a stable condition".

The events come after Bay of Plenty rugby league player Tere Livingstone and a rugby union player from Ruatoria both died after on-field incidents. [Read more >](#)

Today's NZ Herald e-edition (click on the image to read):



What we're keeping an eye on

- **Crime:** Christopher Luxon has unveiled National's [key law and order policies](#), including limiting sentence discounts and scrapping cultural reports.
- **China:** Prime Minister Chris Hipkins touched down on Beijing in the early hours of this morning, beginning a [week-long tour of China](#).
- **Russia:** The head of the powerful Wagner paramilitary group [called off a march on Moscow](#) after negotiations with the Putin regime.

- **Courts:** A former international rugby player is alleged to have [sold guns to a gang member](#) and then faked a burglary to cover his tracks.
 - **Weather:** Eastern parts of the North Island are still being disrupted by [slips, significant road damage and floods](#).
 - **Roads:** More than [211,000 potholes](#) have been reported on New Zealand state highways over the past five years - a quarter of them in 2022.
 - **Healthcare:** Half of the surgeons who were assessed on their ability to use surgical mesh [did not meet a minimum standard](#) set by the Ministry of Health.
 - **Rugby:** Chiefs coach Clayton McMillan has spoken out about a [pivotal call](#) during his side's Super Rugby Pacific final loss to the Crusaders.
-

Today's cartoon

Guy Body's cartoon - June 26, 2023



Opinion: Luxon plays to the crowd with 'red meat' conference pitch

The fumes of possible victory fuelled the most buoyant National Party conference in years, writes Claire Trevett. [Read more >](#)

Popular in Premium

- An NZEI survey has found that 47 per cent of new principals intend to [leave their role](#) within the next five years.
- Research into [Gen Z's investment habits](#) shows the younger generation has made a good start to their KiwiSaver contributions.

- Angry residents in a small Northland town have started a petition against plans for [community housing](#) in the middle of the main shopping area.
 - Act leader David Seymour and National's Christopher Luxon have been spotted [deep in conversation](#) at an Auckland cafe.
 - Rubbish and cigarettes have been thrown from an award-winning 20-level Auckland apartment tower, sparking a [warning from management](#).
 - The European Union has waded for the first time into the highly controversial debate on [geo-engineering](#).
 - The time has come for the All Blacks to recast Sam Whitelock [in a new role](#), writes Gregor Paul.
 - Do kids make us miserable? Dr Justin Coulson looks at the research on [parenting and happiness](#).
-

'I just like the fight, man'

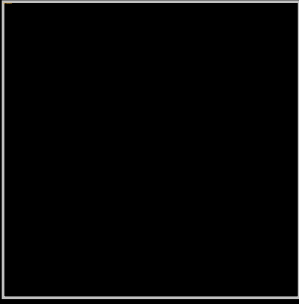
Green MP Chlöe Swarbrick

Chlöe Swarbrick on family, abuse, tax and why she won't be in Parliament forever

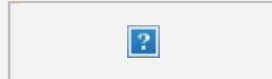
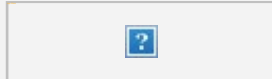
Swarbrick was puzzled and bemused by Sir Ian Taylor's open letter over the Greens' wealth tax plans. [Read more >](#)

Thanks for reading. We'll see you again tomorrow.





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From: [EDF Economics](#)
To: [Peter Fisher](#)
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Date: Saturday, 13 April 2024 4:01:10 am

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Econ @ EDF Newsletter - Launching into 2024



Highlights

Short on time? Check out our top highlights:

- [Economists weigh in on MethaneSAT data](#), and how methane leaks waste royalties

- Dive into the [NCS Crediting Handbook](#), an intro to the world of natural climate solutions (NCS) crediting
 - Watch Dr. Oleg Lugovoy speak on [Modeling the Energy Transition](#) with NYU
-

Going to Space: A New Era in Methane Transparency, Accountability and Economic Research possibilities: MethaneSAT Launch

On March 4th, EDF went to space: [The launch of MethaneSAT](#) is a testament to EDF's commitment to enhancing transparency and accountability in environmental monitoring. This cutting-edge satellite will revolutionize our understanding of methane emissions by detecting both large and small sources of methane across the globe. With this comprehensive map of global emissions, we'll gain invaluable insights into the progress of methane reduction efforts worldwide.

What can we do with these new data? The EDF Market Forces blog, [How Economists Can Leverage MethaneSAT Data for Climate Action](#), co-authored by [Maureen Lackner](#) and [Lauren Beatty](#), explores how MethaneSAT data can help economists and policymakers inform policy design, evaluate the effectiveness of policies, and enhance enforcement. This thought-provoking piece underscores the critical intersection of technological innovation and economic analysis in driving forward climate action.

[Suzi Kerr](#) delves into the significance of New Zealand's \$29 million investment in MethaneSAT in her [interview with The New Zealand Herald](#) and on [1News](#), Kerr emphasized that New Zealand's contribution to the global methane reduction effort and the potential use the satellite to help with agricultural livestock methane. For New Zealanders, including Kerr herself, this initiative represents a crucial contribution towards cutting global methane pollution.

More on Methane Economics

There's even more to this methane moment. In early February, the EDF Econ team hosted a [Methane Policy Research Workshop](#), sparking collaborative efforts among economics and public policy scholars to explore new research avenues using methane emissions data, notably from MethaneSAT. The workshop boasted enlightening presentations from experts like [Alba Lorrente](#), [Mark Omara](#), and others, under [Maureen Lackner](#)'s skilled coordination.

[Maureen Lackner](#) and [Aaron Wolfe](#) played a pivotal role in developing EDF's response to Canada's proposed federal methane regulations, submitted on February 14th. Their analysis highlighted the advantages of accelerating the implementation of these rules and used methane emissions data to argue for greater emissions reductions. A key part of EDF's submission was Aaron's examination of the economic impacts of methane emissions in Alberta, which he explores further in the EDF blog '[Wasted Gas, Wasted Royalties – How Common-Sense Climate Policy Can Put Money Back in People's Pockets.](#)' co-authored with [Scott Seymour](#). Their blog illuminates the significant opportunities for policy to drive both resource conservation and economic benefits.

The NCS Crediting Handbook: Unlocking the Potential of Natural Climate Solutions

Dive into the [NCS Crediting Handbook](#), a guide that provides readers with a clear introduction to the world of natural climate solutions (NCS) crediting. This handbook, co-authored by EDF's Chief Economist [Suzi Kerr](#) and drawing on experts from [Conservation International](#), [Global Green Growth Institute](#), [Resources for the Future](#), [Instituto de Pesquisa Ambiental da Amazônia](#), [The World Bank](#), [World Resources Institute](#) and many others, serves as an essential resource for designing high integrity crediting systems that support NCS initiatives. The handbook offers readers insights into navigating the intricacies of NCS crediting and supports their decision making. It is not just a manual; it's a gateway to equitable and ambitious climate action. Check out this groundbreaking publication and be among the first to harness its potential. Discover more about this pivotal resource [here](#).

For further insights, don't miss the EDF Climate 411 blog post, '[Want to understand Natural Climate Solutions Crediting? We have a handbook for that.](#)' authored by [Christine Gerbode](#), EDF's Manager of Jurisdictional Alliances, and [Britta Johnston](#), formerly Senior Policy Analyst for Natural Climate Solutions at EDF, is now the Senior Program Manager for Jurisdictional REDD+ at Conservation International.

What we've been doing!

Filling the Finance Gap: Presenting Holistic Strategies for Climate Finance

What do guacamole and climate finance have in common? Avocados. EDF's

[Suzi Kerr](#) shared transformative insights in her presentation on February 5th at the University of the Andes in Bogotá, Colombia, emphasizing the critical need for a comprehensive approach to climate finance using the "Mitigation Avocado" model. She demonstrated how combining individual projects with supportive infrastructure and policies can create a fertile environment for investment in climate action. Suzi argued for leveraging diverse funding sources, including public funds, private investments, and carbon markets, to address the climate finance gap. Her presentation, aimed at catalyzing holistic strategies for economic development and climate stability, underscored EDF's leadership in advocating for integrated solutions to environmental challenges. Watch the [recording here](#).

Modeling the Energy Transition

How do we model a clean energy future while the energy system of today is changing rapidly? On February 7th, [Oleg Lugovoy](#), formerly Lead Senior Economist at the Environmental Defense Fund, presented at a webinar on 'Modeling the Energy Transition,' hosted by the [Institute for Policy Integrity at NYU School of Law](#). The event focused on the critical role of modeling in guiding policymakers through the complexities of evolving electric power generation and distribution systems. Dr. Lugovoy presented initial findings from the EDF-led U.S. Model Intercomparison Project. This project has brought together leading open models for the U.S. power system, including Princeton University's GenX, Carnegie Mellon and NCSU's TEMOA model, and EDF's [Switch](#) and [USENSYS](#) models. It aims to discern the conditions under which proposed pathways diverge and to understand the reasons for these differences. One key finding has been that these models perform very similarly if configured with similar assumptions (i.e., differences have more to do with study design than model code). Further, the models agree on many findings, such as that deep emission reductions (> 90%) are possible at a marginal cost below \$200/tCO₂ and that current policies may only lead to about 30% emission reductions, possibly bouncing back by about 15% after the provisions of the Inflation Reduction Act expire. Such insights are invaluable for policymakers to select the most effective analytical tools and to gain a consensus understanding of potential changes in the energy system, including the costs associated with decarbonization.

The webinar featured a distinguished panel of experts, including [Dr. Zane Selvans](#) of the Catalyst Cooperative, [Dr. Wei Peng](#) from Princeton University, and [Jignasa Gadani](#), Director at the Federal Energy Regulatory Commission, with [Christoph Graf](#) of the Institute for Policy Integrity moderating.

Don't miss the opportunity to access the insights shared by Dr. Lugovoy and his fellow panelists. Watch the [full recording here](#). Learn more on EDF's efforts on the [Economics of the Energy Transition here](#). And check out the Policy Integrity at NYU Law's blog post summarizing key takeaways from the event [here](#).

Revolutionizing Air Quality Standards in Brazil: A Comprehensive EDF Initiative

The Environmental Defense Fund (EDF) is at the forefront of an impactful initiative to update Brazil's air quality standards, with a comprehensive strategy presented to the Ministry of Environment and Climate Change. This pivotal project, aligning with WHO guidelines, is set to transform Brazil's approach to air quality by the year's end, fulfilling a mandate from the nation's Supreme Court. Spearheaded by [Sergio Sanchez](#), Senior Policy Director of Global Clean Air, the strategy encompasses ambitious emission reduction goals, the integration of advanced monitoring systems, and a suite of public health initiatives aimed at combating air pollution comprehensively.

Under Sergio's leadership, and with key insights from senior analyst, [Abhinand Krishnashankar](#), the EDF team has crafted a detailed implementation plan. Abhinand, serving as the interim policy manager, has been instrumental in designing governance frameworks that prioritize equity and public welfare. His contributions, alongside expert consultation from Armando Retama, have enriched a draft recommendations report that details Brazil's air quality management strategy. This collaborative effort also extends to analyzing the health and economic impacts of air pollution, drawing from global best practices to propose a tailored approach for Brazil. As the EDF team moves to develop technical guides and resources for Brazil's air quality monitoring and solution design, this initiative marks a significant step towards ensuring cleaner air and healthier lives for millions. Learn more in [this Global Clean Air blog post](#). For more information or to explore collaboration opportunities, please contact xxxxxxxx@xxx.xxx and xxxxxxxxxxxxxxxxxxxx@xxx.xxx

Charting the Energy Transition with OpenIRP

[Matthias Fripp](#), Associate Vice President of Modeling, Mapping, and Analytics within our Economics team has been named a member of the Core Working Group for the Open Integrated Resource Planning (OpenIRP) initiative.

Led by [GridLab](#) with support from [Breakthrough Energy](#), the OpenIRP collaborative is working to transform how utilities plan for the future, bridging the gap between today's industry practices – which are often not well suited for

incorporating renewable energy and storage – and the innovative, sustainable planning methodologies developed in academia, national labs and non-governmental organizations. (Examples include EDF's [Switch](#), of which Dr. Matthias Fripp is the lead author, and [USENSYS](#).)

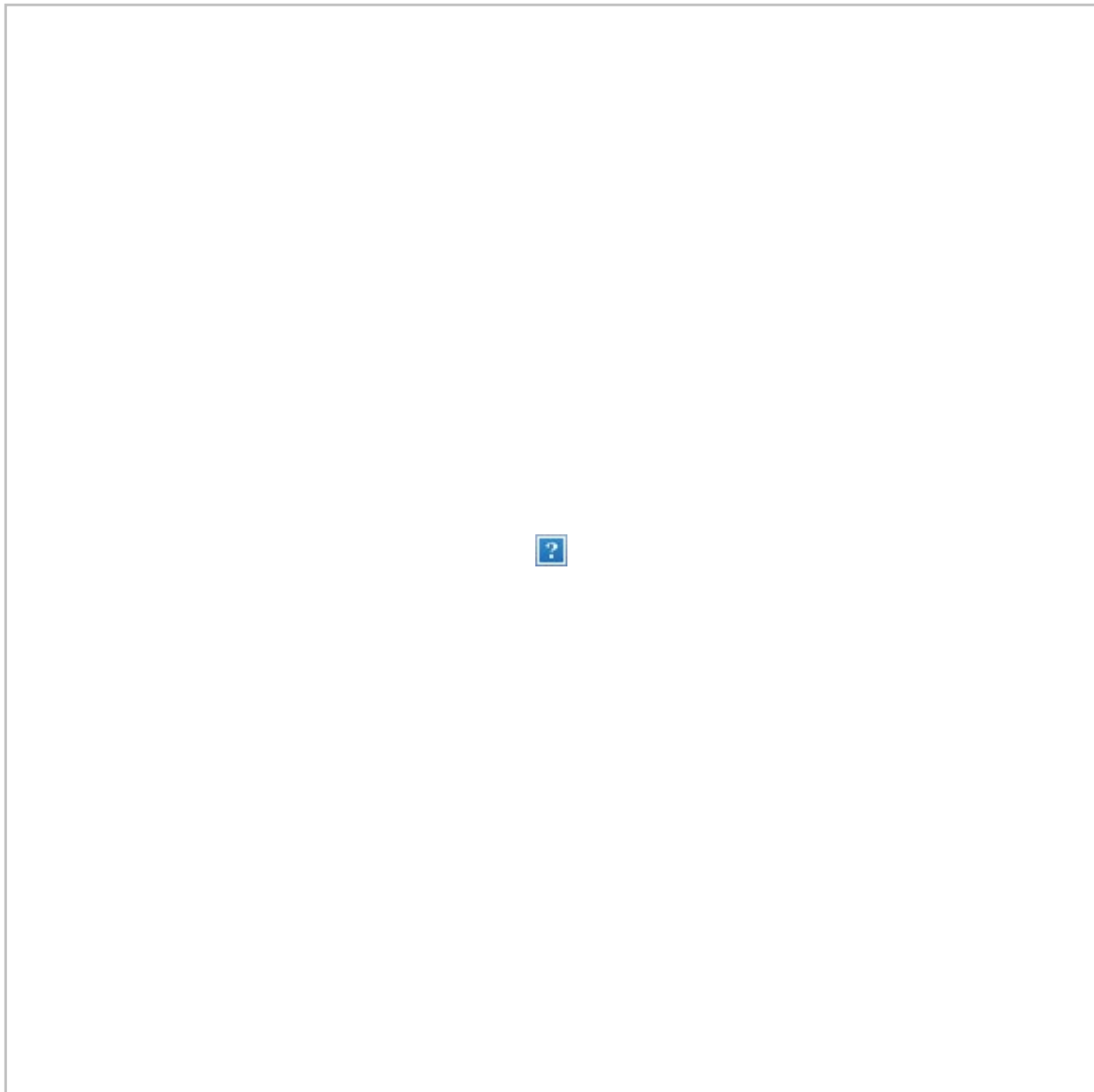
This initiative focuses on crafting an open, accessible toolkit to assist utilities and other stakeholders in developing low-cost, reliable, and low-carbon energy plans, aligning with EDF's mission to foster cost-effective environmental solutions. Matthias Fripp's participation underscores EDF's influential role in advancing energy policy and planning, reflecting our commitment to a sustainable and equitable energy future. For more details on the challenges and foundational work that paved the way for the OpenIRP collaborative, revealing the critical need for such an initiative, view the E-Lab Open-Source Modeling Report [here](#).

Fostering the search for collaborative energy solutions: open-source energy modeling seminar in Chile

The seminar marked a pivotal advancement in energy modeling in Chile. It brought together academia, public agencies including the Ministry of Energy and the National Energy Commission of Chile, and the private sector, all rallying for open modeling alternatives. The event gave impetus to a collective shift towards transparent energy planning, and highlighted the open-source tool, [Switch](#), which has been globally used to support decision-making in various aspects of energy transition. In Chile, Switch has been applied in studies involving [CSP-TES generation](#), detailed [water network modeling](#), [wood heating electrification](#), [flexibility requirements](#) and [energy consumption flexibility in desalination](#). It has also facilitated [discussions on decarbonization and cost-effective strategies for meeting and going beyond national electric sector goals](#). The seminar was hosted by the Department of Electrical Engineering at the Pontifical Catholic University of Chile (PUC) and the consultancy firm Vinken within the framework of the EDF coordinated Multi-Country Electricity Transition (MCET) project.

The event featured presentations by [Matthias Fripp](#), [Patricia Hidalgo](#) and [Matías Negrete-Pincetic](#) and concluded with a panel that explored the challenges and opportunities in electric system planning, as well as the potential that tools like Switch have to address these planning challenges, in a context where significant technological transformation is taking place. There was enthusiasm for the idea of establishing a national and international modeler's network. This gathering not only promoted transparent methodologies but also highlighted the importance of

introducing new technologies and sectors to models.



Modeling Decarbonization Options for Chile Seminar, April 2024

EDF economists making headlines

- **The Louisiana Illuminator:** [Louisiana's insurance crisis is a climate crisis](#), commentary written by Carolyn Kousky | April 2, 2024
- **The Financial Times:** [US housing market belatedly wakes up to flood risk: Insurance premiums and adaptation measures have not kept pace with climate change](#), featuring Jesse Gourevitch | March 21, 2024
- **BBC:** [Climate change is fuelling the US insurance problem](#), featuring Jesse Gourevitch | March 18, 2024

- **U.S. News:** [How Climate Resilience Can Curb a Crisis in Homeowners' Insurance: Better building practices can keep homeowners safer – and insurable.](#) featuring Carolyn Kousky | March 9, 2024
 - **RNZ:** [New Zealand-backed MethaneSAT reaches orbit successfully.](#) featuring Suzi Kerr | March 5, 2024
 - **1News New Zealand:** [NZ launches first state-funded satellite to monitor methane emissions.](#) featuring Suzi Kerr | March 5, 2024
 - **NZ Herald:** [MethaneSAT becomes NZ's first Government-funded space mission - backers defend \\$29m spend.](#) featuring Suzi Kerr | March 4, 2024
 - **Earth.org:** [Op-Ed: Why We Need to Fix Disaster Insurance Markets this Year and How to Do It.](#) written by Carolyn Kousky | March 4, 2024
 - **The City NYC:** [Fickle Rainfall Floods Leave NYC Insurance Pilot With No Payouts.](#) featuring Carolyn Kousky | January 26, 2024
-

Blog bytes: insights and perspectives

What Climate-related Financial Risk Means for Communities: A Three-Part Series

Climate change is impacting more than just the environment; it's challenging the financial stability of communities across the U.S. through its effects on insurance, real estate, and community banking. Our three-part series dives into these critical areas, analyzing how climate risks pose significant threats to our economic well-being and outlining the steps needed to mitigate these challenges. Join us as we explore the intersection of climate change and financial stability, highlighting the importance of proactive measures to safeguard communities.

[Part 1: Insurance](#)

[Karina French](#) sheds light on the burgeoning challenges within the property insurance market, exacerbated by climate change-driven events like floods, hurricanes, and wildfires. Her blog discusses the significant shifts in insurance costs and availability, emphasizing the need for sustainable policy reforms to mitigate these risks. It underscores the role of the Environmental Defense Fund in fostering resilience and financial stability through advocacy for climate-aware insurance systems.

[Part 2: Housing & Mortgage Markets](#)

[Jesse Gourevitch](#) examines the overlooked climate risks within the housing and mortgage markets, highlighting the potential for a housing bubble spurred by unaccounted climate threats. His blog reveals the cascading effects on homeowners, local economies, and financial markets, advocating for balanced policies that address climate risks to ensure market resilience and protect vulnerable communities.

[Part 3: Community Banking](#)

[Elle Stephens](#) focuses on the challenges community banks and credit unions face due to climate change, including operational disruptions and increased borrower default risks. As essential components of local economies, these institutions are pivotal in maintaining economic stability. Her blog calls attention to regulatory efforts and EDF's advocacy for resilient financial systems that safeguard against climate-related financial risks.

Recent publications

- [Advancing Effective and Equitable Crediting: Natural Climate Solutions Crediting Handbook](#), Environmental Defense Fund, EDF Lead Co-Authors: [Suzi Kerr](#), [Christine Gerbode](#), [Britta Johnston](#) (February 1, 2024)
 - [Leveraging insurance for decarbonization](#), Journal of Catastrophe Risk and Resilience EDF Author: [Carolyn Kousky](#) (February 7, 2024)
 - [Design Concerns for Agricultural Soil Carbon Markets: An Economic Research Agenda](#), EDF Economics Discussion Paper Series, EDF Author: [Kelsey Larson](#), Doctoral Intern (January 28, 2024)
 - [The Finance Gap Challenge: Mobilizing Opportunities for Clean Energy Growth](#), South African Reserve Bank Special Occasional Bulletin of Economic Notes, Co-Authors: [Suzi Kerr](#) and [Xian Hu](#), Doctoral Intern (February 2024)
-

Upcoming events

We've launched a new email list for our **economics seminars series**, sharing monthly updates on our schedule. Make sure you stay updated on our [schedule](#)

of [seminars](#) by signing up for the [email list here](#).

The Economics of Solar Radiation Management

When: Thursday, April 18, 2024, 10:00–11:00 AM Eastern Time (EDT)

Where: Zoom Webinar

[Register Here](#)

To avoid extreme climate damage, it's possible that we might want to use solar geoengineering. How do we balance the benefits of geoengineering with the risks? How do we encourage cooperation and coordination across countries? Join us for a seminar with Columbia Business School Professor, [Gernot Wagner](#) and the Director of the European Institute on Economics and the Environment, [Massimo Tavoni](#), for a discussion of the economics of solar geoengineering.

Methane Emissions from the Oil and Gas Sector in Malaysia

When: Wednesday, April 25, 2024, 10:00 AM Central European Time (CET)

Where: Zoom Webinar

[Register Here](#)

Join EDF Economics for a seminar with [Dr. Viknesh Andiappan Murugappan](#), Associate Professor at the Swinburne University of Technology Sarawak Campus, to learn about his research on the marginal abatement cost of methane in Malaysia. With the Malaysian government targeting carbon neutrality by 2050, it's crucial to develop sector-wide strategies. The oil and gas sector, a significant methane emitter due to fugitive emissions, faces the challenge of reporting and managing these emissions efficiently. Recently, Malaysia's leading oil company, PETRONAS, joined the UNEP's Oil and Gas Methane Partnership 2.0 (OGMP2.0), highlighting the urgency of mitigating methane emissions. A research team led by Dr. Viknesh Andiappan recently completed the development of marginal abatement cost analysis for potential emission abatement technology. This presentation will share perspectives, findings and opportunities related to their marginal abatement cost analysis.

Implications of U.S. LNG Exports

When: Wednesday, May 22, 2024, 4:00–5:00 PM Eastern Time (EDT)

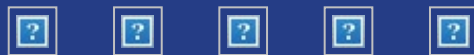
Where: Zoom Webinar

[Register Here](#)

Join EDF Economics for a seminar with [Matt Zaragoza-Watkins](#), faculty at the U.C. Davis Graduate School of Management, to learn more about his research and its policy implications. On January 26, 2024, the Biden Administration paused approvals for LNG export facilities, and is seeking clarity regarding LNG's impacts on U.S. energy prices and greenhouse gas emissions. Recent analysis focused on the domestic impacts of U.S. exports finds that, since 2016, the rise of LNG exports has increased U.S. gas, and by extension coal, prices to match world prices. These price increases are comparable to a carbon tax on natural gas of \$30 per metric ton (MT) of CO2 emissions, and a carbon tax on coal of \$20/MT.

Thank you for reading!

We applaud the ongoing efforts of our economists and their partners and their commitment to informing effective efforts for positive change. We look forward to more updates from our dedicated economists and partners in our upcoming editions!



Office of the Chief Economist

Environmental Defense Fund

257 Park Ave S

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[Global Environmental Change](#)

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Oct 15, 2020

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[Openings of Graduate Research Assistantships/Teaching Assistantships](#)



1. [Graduate Research Assistantships/Teaching...](#) Laixiang Sun

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[GEC Webinar Oct 21 at noon - Mitigating Climate Change](#)



2. [Two approaches for mitigating global climate...](#) Julie Brigham-Grette

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Oct 15, 2020 3:40 PM

[Laixiang Sun](#)

Graduate Research Assistantships/Teaching Assistantships Department of Geographical Sciences, University of Maryland College Park

Recently rated among the top graduate programs in the nation by the National Research Council, the Department of Geographical Sciences at the University of Maryland is seeking a new cohort of highly qualified and motivated graduate students to enter its Ph.D. program. As leaders in remote sensing, geospatial-information science, coupled human and natural systems, land-use land cover change, ecosystem dynamics, and applied geographic economics, the Department is uniquely positioned to research the human and physical dimensions of global change. The Department has strong collaborations with federal agencies, such as NASA, NOAA, USGS, EPA and the DOE (including the Joint Global Change Research Institute).

Incoming graduate students can be supported on Graduate Research Assistantships or Teaching Assistantships. Fellowship funds are also available. Current starting PhD student stipend: \$21,970.81(start)/9.5 months appointment; with 10 credit hours/semester tuition remission currently valued at \$6,250/semester (\$12,500 academic year) and participation in the faculty/staff health benefits program ([Benefits](#)). If you are interested in the opportunity to earn additional compensation working over the summer break, please note in your application.

To Apply:

Closing Date: December 22nd 2021

https://previewapp.applyyourself.com/AYApplicantLogin/fl_ApplicantConnectLogin.asp?id=umdgrad

Please note on your application that you are responding to this ad. It is also recommended that you contact one or more faculty members prior to applying to discuss your research interests. More information about the department can be found at <http://www.geog.umd.edu>.

Applications from women and minorities are particularly sought. The University of Maryland is an Equal Opportunity Affirmative Action Employer.

--

Professor Laixiang SUN
Department of Geographical Sciences
University of Maryland
2181G LeFrak Hall
College Park, MD 20742
USA
Tel: (301) 405 8131; Fax: (301) 314 9299
Email: xxxxxxx@xxx.xxx
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2. [GEC Webinar Oct 21 at noon - Mitigating Climate Change](#)

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Oct 15, 2020 2:14 PM

[Julie Brigham-Grette](#)

Two approaches for mitigating global climate change: Solar radiation management and greenhouse gas emissions reduction -- webinar with Alan Robock (Rutgers) and Marilyn Brown (Georgia Tech)

Register here : (www.agu.org/Events/Webinars/Upcoming-Webinars/...)

as well as the GEC website (connect.agu.org/gec/webinars/future-webinar).

Webinar summary:

We are fortunate to have two outstanding experts discussing quite different mitigation strategies.

Professor Alan Robock, Department of Environmental Sciences, Rutgers University, will discuss the benefits and risks of stratospheric sulfur geoengineering (or climate intervention). In his presentation **Stratospheric Sulfur Geoengineering – Benefits and Risks** Dr. Robock will present the current results from his ongoing Geoengineering Model Intercomparison Project which is using climate model experiments with standard stratospheric aerosol injection scenarios. He will show results indicating that if there SO₂ could be continuously injected into the lower stratosphere, it would produce global cooling, stop melting of the ice caps, and increase the uptake of CO₂ by plants. On the flip side, Dr. Robock posits that there are at least 27 reasons why stratospheric geoengineering may be a bad idea.

Professor Marilyn Brown, School of Public Policy, Georgia Institute of Technology, will discuss how U.S. states can most effectively reduce their carbon footprints. In her presentation **Translating a Global Emissions Reduction Framework for Sub-National Climate Action: A Case Study from the State of Georgia** she will describe a process that considers (1) Georgia's baseline carbon footprint and trends, (2) the universe of Georgia-specific carbon-reduction solutions that could be impactful by 2030--including both mitigation and natural carbon sinks, (3) the greenhouse gas reduction potential of high-impact 2030 solutions for *Georgia*, and (4) associated costs and benefits including "beyond carbon" priorities, such as job creation, public health, environmental benefits, and equity. The process that employs these data is systematic and replicable and can be used by other states to identify high-impact solutions. Professor Brown will discuss its strengths and weaknesses and planned future research.

Dr. Alan Robock is a Distinguished Professor of climate science in the Department of Environmental Sciences at Rutgers University. His areas of expertise include climate intervention (also called geoengineering), climatic effects of nuclear war, and effects of volcanic eruptions on climate.



Dr. Marilyn A. Brown is a Regents' Professor and Interim Chair


of the School of Public Policy at the Georgia Institute of Technology, where she

created and leads the Climate and Energy Policy Lab. Her research focuses on the design and modeling of carbon reduction technologies, policies, and programs.

Julie Brigham-Grette

University of Massachusetts Amherst
xxxxxxx@xxx.xxxxx.xxx

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asia meteorology

Daily update · 9 September 2019

NEWS

[Haze threat looms over Singapore as Indonesia forest fires rage](#)

The Straits Times

More than 2,500 hotspots scattered throughout South-east **Asia** were detected in the past week, Indonesia's **weather** agency said on Sunday (Sept 8), ...

[Malaysia to commence cloud-seeding to combat haze, Indonesian denies fires in Sumatra are the ...](#) - The Straits Times

[Full Coverage](#)

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[Record warming in Antarctica could affect Australia](#)

Eco-Business

The Bureau of **Meteorology** is predicting the strongest Antarctic warming on record, likely to exceed the previous record of September 2002.

Flag as irrelevant

[Weather Radar Industry – Emerging Market by Size, Countries, Manufactures, Types, Applications ...](#)

The Atlas Newspaper

Global "**Weather Radar Market**" report have participations about company ... The **Asia-Pacific** will occupy for more market share in following years, ...

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asia meteorology

Daily update · 7 September 2019

NEWS

[As haze worsens, Malaysia looking into cloud-seeding](#)

The Straits Times

KUALA LUMPUR (THE STAR/**ASIA** NEWS NETWORK) - Malaysia is ... on Saturday (Sept 7) that the **Meteorology** Department (MetMalaysia) would ...



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[NASA did not track reached Earth asteroid](#)

www.MICEtimes.asia (press release)

PhD **meteorology** Helena Bates noted that the asteroid change direction due to a phenomenon called the Yarkovsky effect: "The Yarkovsky effect ...



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asia meteorology

Daily update · 10 September 2019

NEWS

[Malaysia Shuts 400 Schools as Haze From Indonesia's Fires Spreads](#)

Bloomberg

More than 2,500 hotspots scattered throughout Southeast **Asia** were detected in the past week, Indonesia's **weather** agency said on Sunday, citing ...

[Malaysia ready to induce rain in effort to ease haze](#) - The Straits Times

[Malaysia to commence cloud-seeding to combat haze, Indonesian denies fires in Sumatra are the ...](#) - AsiaOne

[Full Coverage](#)



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[Weather Forecasting Systems & Solutions Market Worth US \\$4 billion by 2025](#)

The Leftovers News

The Regional Analysis has been done for North America, Europe, **Asia** Pacific, the Middle East, and Rest of the World. The **Asia** Pacific **weather** ...



Flag as irrelevant

[Global Weather Radar Market 2019 by Manufacturers, Regions, Type and Application, Forecast to ...](#)

Automotive Market Research

The report on the Global **Weather** Radar Market elaborates the summary of the **Weather** Radar industry. There are various industry definitions and ...



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aviation weather

Daily update · 30 October 2019

NEWS

[Aviation Weather Forecasting Systems Market Global Growth Analysis and Forecast Report 2019 ...](#)

openPR (press release)

The report on "**Aviation Weather** Forecasting Systems Market" will help Major Players and the new entrants to understand scrutinize the market in ...

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[NTSB says missing **aircraft** clipped a 60 foot tree after takeoff from the Aberdeen airport](#)

KELO AM-FM

Dark night instrument **meteorological** conditions prevailed in the area and a **flight** plan was not filed. The personal **flight** was being conducted under ...

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[Universal **Aviation** Expanding in Dominican Republic](#)

AviationPros.com

Punta Cana, Dominican Republic (Oct. 28, 2019) – Universal **Aviation** ... the worldwide ground handling division of Universal **Weather** and **Aviation**, ...

Flag as irrelevant

[No Thunder in Sight- AVTECH Sweden's ProFLIGHT Helps Pilots Pick the Perfect **Flight** Path](#)

AviationPros.com

Although aircrafts have **flight** radars, they can only spot severe **weather** from a ... Person is clearly satisfied with how AVTECH's **weather** services are ...

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[Aviation Weather Forecasting Systems Market Size to Incur Rapid Extension at Magnifying CAGR ...](#)

Analytics News

Weather forecasting systems are used to forecast the conditions of the atmosphere for a given location and time. **Weather** forecasting service is ...



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[Wind Lidar Market 2019-2025 Study & Future Prospects Including key players ZephIR, Leosphere ...](#)

The Ukiah Post (press release) (blog)

“Industry Overview of the Report 2023: The research report on Global Wind Lidar Market presents the readers with market overview and definitions, ...



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[IAF helicopter carries out precautionary landing due to bad **weather**, all safe](#)

Defence Aviation Post

An Indian Air Force (IAF) Chetak was forced to carry out a precautionary landing at 25km north-west of Guwahati, due to bad **weather**. All those who ...



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[China has built up its muscle on how to turn **weather** into a weapon. Can India match up to it?](#)

Defence Aviation Post

Just before the opening ceremony of the Beijing Olympics in 2008, China's **weather**-modification office — yes, the Chinese have something like that ...



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geoengineering

Daily update · January 31, 2019

NEWS

['Climate engineering' a dangerous practice](#)

The Herald Journal

In my research, trying to find out what the lines in the sky were all about, I found that it is called "Climate Engineering" or "**GeoEngineering**." Highly ...



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WEB

[London Protocol on marine pollution](#)

International Maritime Organization



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[Indigeneity in **Geoengineering** Discourses: Some Considerations.](#)

PhilPapers

Indigeneity in **Geoengineering** Discourses: Some Considerations ... **Geoengineering** Governance, the Linear Model of Innovation, and the ...



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[Complementing CO 2 emission reduction by **Geoengineering** might strongly enhance future welfare](#)

ESDD

Abstract. Solar Radiation Management (SRM) has been proposed as a means to reduce global warming in spite of high greenhouse gas ...



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geoengineering

Daily update · January 29, 2019

NEWS

[China **Geo-Engineering** Corporation Appoints JCI As Sub-Contractor For Hospital Expansion](#)

Kalkine Media (blog)

China **Geo-Engineering** Corporation (CGC) has appointed JCI as a sub-contractor. China **Geo-Engineering** Corporation is one of the first state ...



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geoengineering

Daily update · January 23, 2019

NEWS

[Superfreak pivot: When climate engineering came to South Africa](#)

Daily Maverick

In his book *The Planet Remade: How **Geo-engineering** Could Change the World*, Oliver Morton laid down a potential scenario from the not-too-distant ...



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geoengineering

Daily update · January 4, 2019

NEWS

[Earth Today | UWI scientists undertake ground-breaking climate research](#)

Jamaica Gleaner

"SRM **geoengineering** is a highly controversial proposal for reducing the risks of climate change by reflecting some sunlight away from the Earth," ...



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[Looking back at a year of scientific discovery](#)

Prince George Citizen

The delicate balance which exists for the entire planet could be thrown further out of whack by mass **geo-engineering**. There are too many variables ...



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geoengineering

Daily update · February 8, 2019

NEWS

[Geoengineering is one way to fight climate change and cool the planet](#)

The Hill

Known as **geoengineering**, these techniques are likely to be the subject of a major report by the United Nations panel on climate change. Despite its ...



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[Researchers pinpoint promising approach for analyzing atmospheric particles from space](#)

Phys.Org

Such **geoengineering** projects would also require a way to monitor the amount and size of artificial particulates in the stratosphere and the resulting ...



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[Cool idea or hi-tech madness?](#)

Chatham House

Stratospheric Aerosol Injection, known as SAI, is one form of solar radiation modification, a family of technologies also known as solar **geoengineering**.



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meteorologists

Daily update · 14 April 2020

NEWS

[Meteorologists Rain on Cloud-Seeding Parade](#)

Scientific American

“The Council of the American **Meteorological** Society recently summed up the present evidence for the effectiveness of cloud-seeding. Its verdict: Not ...



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[KSAT Kids: Be a junior meteorologist!](#)

KSAT San Antonio

Holden has the latest forecast as part of his science experiment. Justin Horne, Weather Authority **Meteorologist**/Reporter. Published: April 14, 2020, 10: ...



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[WeatherFirst Workbook: The basics of radar](#)

KGAN TV

Meteorologist Nick Stewart explains how radar works and will look at ... WEATHER FIRST TEAM: The team of **meteorologists** at Iowa's News Now will ...



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[What happened to the fierce winds predicted Monday?](#)

Washington Post

Area **meteorologists** were responding to reasonable clues, including the fact that a very powerful springtime low-pressure system — the same one ...



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[Severe weather awareness week](#)

KAAL

Todd Shea, Warning Coordination **Meteorologist** at the National Weather Service La Crosse, says that the first thing that folks at home need going into ...



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[How the Coronavirus is affecting weather forecasts](#)

WTVQ

Your local **meteorologist** and National Weather Service rely on temperature and wind data gathered by thousands of planes flying overhead. The ...

Flag as irrelevant

[Storm kept police busy, warmth looms](#)

Views and News from Norway

State **meteorologists** promise, however, that much better weather is on the way. More than 65,000 households were without electricity on Monday in ...

Flag as irrelevant

[Coronavirus Ripple Effects Will Impact Your Weather Forecasts](#)

The Weather Channel

The **meteorological** data provided by the U.S. aircrafts decreased to half its normal levels as of March 31, according to the National Oceanic and ...

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[More than 50 homes damaged in Boaz tornado](#)

Gadsden Times

Though **meteorologists** said it could take some time to determine whether ... NWS **meteorologist** Jason Holmes said there had been no fatalities ...

Flag as irrelevant

[Freeze watch in the forecast for early Wednesday morning](#)

Clarksville Now

Meteorologists said despite the early morning freeze, temperatures will get up to 60 degrees and then have a cool drop Wednesday night. Thursday it'll ...

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To: [Kevin Alder](#)
Subject: Google Alert - Science
Date: Sunday, 17 September 2023 8:00:44 am



Science

Daily update · 16 September 2023

NEWS

[The New York Times mocked this scientist in 1920. His discoveries could now take us to Mars](#)

ABC News

Man in suit points to chalkboard. In 1920, Robert Goddard wrote his seminal paper *A Method for Reaching Extreme Altitudes*, arguing that rockets could be used to send payloads to the Moon.



Flag as irrelevant

[Double solar flare explosion sparks BLACKOUTS on Earth; Is another solar storm looming?](#)

Hindustan Times

More solar activity has been detected on the Sun, and it could spell bad news for the Earth. Currently, there is a coronal mass ejection (CME) that is traveling towards us and is likely to strike the planet on Sunday, September 17.



Flag as irrelevant

[It's Too Late for Geoengineering Alone to Save Antarctica, Scientists Find](#)

Futurism

The research team used computer modeling to analyze the effectiveness of solar geoengineering, which they term "solar radiation management" in their paper, on the melt rate of the West Antarctic ice sheet under different climate scenarios.



Flag as irrelevant

[Sun Blasts Strong M7.9 Solar Flare Viewed From NASA Spacecraft](#)

Space.com

NASA Solar Dynamics Observatory captured a M7.9-class solar flare. See footage of the blast in multiple wavelengths. Credit: Space.com | footage courtesy: NASA/SDO/helioviewer.org | edited by Steve Spaleta Music: Binaural Alpha by Syntropy / courtesy ...



Flag as irrelevant

Japan is very active in space with a space telescope and a lunar mission!

theinformant.co.nz

Double strike of the Japanese H-IIA launch pad on September 7 at 8:42 a.m. local time. In terms of mass, the main passenger was XRISM space telescope The 2.3 tons were placed in Earth's orbit at a distance of 500 kilometers 14 minutes after liftoff.



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From: [Google Alerts](#)
To: [Linda Stopforth](#)
Subject: Google Alert - weather business
Date: Saturday, 5 December 2020 11:18:56 am



weather business

Daily update · 4 December 2020

NEWS

[Tips to help small **businesses** prepare for winter **weather**](#)

PropertyCasualty360

Small **businesses** should keep an eye on the forecast to stay ahead of adverse **weather** and ensure ample time to prepare. AmTrust recommends ...



Flag as irrelevant

[China is massively expanding its **weather**-modification program, saying it will be able to cover half ...](#)

Business Insider

"Cloud seeding" involves spraying chemicals like silver iodide or liquid nitrogen into clouds, where water droplets condense and fall. Visit

Business ...



Flag as irrelevant

['Strongview' campaign helps Longview **business weather** pandemic](#)

Longview News-Journal

Editor's note: This is part of an occasional series about how locally-owned, small **businesses** in the Longview area are faring — and in some cases ...



Flag as irrelevant

[BCC: Government must support **businesses** – not just to **weather** restrictions but to power our ...](#)

British Chambers of Commerce

British Chambers of Commerce calls for the government to give **businesses** more evidence, support and clarity to **weather** Coronavirus restrictions and ...



Flag as irrelevant

[Local meteorologist talks **weather** with Mount Pleasant Chamber members](#)

Charleston Post Courier

The Mount Pleasant Chamber of Commerce, established in 2017 after more than a quarter of a century as the Mount Pleasant **Business** Association, ...

Flag as irrelevant

[Weather: From Sri Lanka, cyclone 'Burevi' to head for South TN coast](#)

The Hindu BusinessLine

An 'Orange' message implies advice to stay prepared because of an increased likelihood of extremely bad **weather**, which could potentially cause ...

Flag as irrelevant

[Tent companies see business boom as restaurants turn to outdoor seating in winter weather](#)

ABC17News.com

(KOAT) — Restaurants in red-zone counties can resume outdoor dining at 25% on Wednesday, and as cold **weather** settles in, some **businesses** are ...

Flag as irrelevant

[How Cloud Is Helping Companies Weather the Impact of COVID-19](#)

Law.com

How Cloud Is Helping **Companies Weather** the Impact of COVID-19. The demand for everything “cloud” has been driven by the massive, and dramatic, ...

Flag as irrelevant

[Gov. Whitmer announces US Small Business Administration relief for businesses impacted by cold ...](#)

WILX-TV

“This is good news for our small **businesses** and farmers who have routinely faced extreme **weather** conditions in our state,” said Governor Whitmer.

Flag as irrelevant

[Wet weather sends Long Lunch under cover but revelry continues](#)

Otago Daily Times

Multi Events **co-ordinator** Wendy Alfeld said it was a complete success and 680 tickets were sold. Organisers set out tables along Buckingham St from ...

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From: [Google Alerts](#)
To: [Linda Stopforth](#)
Subject: Google Alert - weather satellites
Date: Friday, 12 March 2021 12:00:42 pm



weather satellites

Daily update · March 11, 2021

NEWS

['Impressive,' possibly 'historic' snowstorm predicted for Colorado and Wyoming this weekend](#)

Washington Post

The features for the system were already coming together Thursday morning, when **weather satellites** revealed a broad upper-level trough, or a dip in ...



Flag as irrelevant

[SpaceX launches 60 more internet satellites](#)

WKMG News 6 & ClickOrlando

This launch marks the 21st dedicated to delivering Starlink **satellites** but SpaceX has also sent up its own spacecraft on other ride-sharing rockets. The ...



Flag as irrelevant

[Before we get too into spring weather — let's watch all of that snow melt in 4 different ways](#)

Chicago Tribune

The National **Weather** Service pulls in data from **satellites**, airborne operations and on-the-ground sources to assemble a daily **map** of how much snow ...



Flag as irrelevant

[Critics Deride Catalonia's Attempt To Create A Space Agency](#)

NPR

Instead, they will be sending nanosatellites on international rocket launches to establish communication networks and to monitor **weather** and **climate** ...



Flag as irrelevant

[SpaceX launches 60 new Starlink satellites to orbit, nails rocket landing at sea](#)

Space.com

Weather forecasters at the U.S. Space Force's 45th **Weather** Squadron predicted a 90% chance of favorable conditions for launch this morning, and ...



Flag as irrelevant

Demand for **satellite** sovereignty grows among Australian agencies and policy bodies

ZDNet

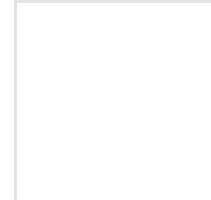
The Bureau of **Meteorology** (BoM), for instance, outlined that for the purpose of being able to provide the country with timely and accurate **weather** ...

Flag as irrelevant

FL: SPACEX LAUNCHES MORE STARLINK SATELLITES

WFMZ Allentown

WFMZ-TV 69 News provides news, **weather**, traffic, sports and family programming for the Lehigh Valley, Berks County, Southeastern Pa., Poconos ...



Flag as irrelevant

UAE tests the use of electric charge drones in cloud-seeding operations to make rain

Gulf News

The UAE's National Center of Meteorology is conducting tests to see whether ... The NCM first gathers required information through **weather satellites**, ...

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Subject: Google Alert - weather technologies
Date: Friday, 1 January 2021 12:04:14 pm



weather technologies

Daily update · 31 December 2020

NEWS

[China is building weather-control technology](#)

BGR

China dreams of one day having robust **weather**-modification systems that it can use at will, and it's ramping up its development of those **technologies**.



Flag as irrelevant

[US Funding Available for “High-Risk, Innovative Solar Research & Technology Development ...](#)

CleanTechnica

Solar Systems Resilient to **Weather**-Related or Cyber Threats — SETO seeks innovations that improve the ability of solar assets or electronic devices ...



Flag as irrelevant

[NASA's New Missions Will Explore Space **Weather** Near Earth](#)

Interesting Engineering

“EZIE's use of instrument **technology** proven on Earth science CubeSat missions is just one example of how science and **technology** development at ...



Flag as irrelevant

[Weather Stripping Industry Analysis, Service Management Strategies, Market Trends, Production ...](#)

Farming Sector

The report demonstrates the trends and **technological** advancement in the **Weather** Stripping industry. Also, the report offers a practical outlook with ...



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To: [Linda Stopforth](#)
Subject: Google Alert - "cloud seeding"
Date: Wednesday, 9 June 2021 8:02:10 am



"cloud seeding"

Daily update · June 8, 2021

NEWS

[Cloud Seeding Equipment Market to Witness Huge Growth by 2028 | Top Manufacturers – RHS ...](#)

KSU | The Sentinel Newspaper

The **Cloud Seeding** Equipment Market report contains vital information to prepare market players to face their toughest competitors on the basis of ...

Flag as irrelevant

[Udall: Investing in water infrastructure good for economy, environment](#)

Your Valley

... such as **cloud seeding**. Moving forward, whether repairing or enhancing existing infrastructure, using new technology or pursuing natural solutions, ...

Flag as irrelevant

[Creation, history and evolution of the UAE dirham](#)

Gulf News

RAIN MAKERS: The UAE might be in the desert, but it has learnt to increase rainfall through the process of **cloud seeding**, in which substances are ...

Flag as irrelevant

[Cloud-seeding System Market Size 2021 Global Trends, Opportunities, Future Plans, Market ...](#)

Absolute News Journal

Cloud-seeding System is a kind of whether modification procedure that attempts to enhance the amount of precipitation from the clouds to generate more ...

Flag as irrelevant

[June 2021 Report on Global Weather Modification Combustion Equipment Market Share, Value ...](#)

SoccerNurds

... 11 and 13.3, on the basis of types, the Weather Modification Combustion Equipment market from 2015 to 2026 is primarily split into: **Cloud Seeding**.

Flag as irrelevant

June 2021 Report on Global Weather Modification Combustion Equipment Market CAGR, Volume ...

Jumbo News

Cloud Seeding. Artificial Flood Control. Artificial Fog Elimination. Artificial Weakening of Typhoons. Artificial Suppression of Lightning. Artificial Frost ...



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To: [Linda Stopforth](#)
Subject: Google Alert - "cloud seeding"
Date: Wednesday, 2 June 2021 8:10:57 am



"cloud seeding"

Daily update · June 1, 2021

NEWS

[Ethiopia to use **cloud seeding** technology as second option to fill controversial dam-Official](#)

Journalducameroun.com - English

Ethiopia is set to use **cloud seeding** technology in addition to the heavy rains in the coming July and August to undertake the second filling of the ...

Flag as irrelevant

[Global **Cloud-seeding** System Market 2021 Analysis by Top Key players- Ice Crystal Engineering ...](#)

Renewable Energy Zone

The research based on the Global **Cloud-seeding** System Market aims to deliver the detailed analysis of each and every aspect related with **Cloud-** ...

[Global **Cloud Seeding** Machines Market Analysis 2025: NOOESIS, AlternaScript, Excelerol ...](#) -

Clark County Blog

[Full Coverage](#)

Flag as irrelevant

[National Center of Meteorology Hosts Webinar Series Titled "Rain Enhancement Hub"](#)

MENAFN.COM

Since the UAE began **cloud seeding** operations in 1990, it has made significant contributions to the advancement of rain enhancement research ...

Flag as irrelevant

[Agriculture Robot Market – Segmentation and Major key Players Analysis By 2026](#)

KSU | The Sentinel Newspaper

The agriculture robot is also capable of weed control, soil exploration, plant seeding, **cloud seeding**, environmental monitoring, and many more.

Flag as irrelevant

[Weather Modification Combustion Equipment Size 2021 by Product,](#)

Revenue, Price, Industry ...

Business-newsupdate.com

... Equipment market is split into **Cloud Seeding**,Artificial Flood Control,Artificial Fog Elimination,Artificial Weakening of Typhoons,Artificial Suppression ...



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Subject: Google Alert - "cloud seeding"
Date: Tuesday, 1 June 2021 8:03:32 am



"cloud seeding"

Daily update · May 31, 2021

NEWS

[Unveiling expansion prospects in **Cloud-seeding** System market outlook over 2021-2026](#)

Express Journal

The latest business intelligence report on **Cloud-seeding** System market report includes comprehensive market analysis on the untapped ...



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To: [Linda Stopforth](#)
Subject: Google Alert - "cloud seeding"
Date: Friday, 28 May 2021 8:02:15 am



"cloud seeding"

Daily update · May 27, 2021

NEWS

[Cloud Seeding Equipment Market anticipated growing rapidly during | Weather Modification, Inc ...](#)

The Courier

The '**Cloud Seeding** Equipment market' research report added by Worldwide Market Reports, is an in-depth analysis of the latest developments, ...

Flag as irrelevant

[UAE temperatures cross 49°C for four days straight](#)

Khaleej Times

And if this happens **cloud-seeding** missions are conducted to further enhance the rainfall." With an average rainfall of 100mm per year, the UAE is ...

[UAE temperatures cross 49° C for four days straight - MENAFN.COM](#)
[Full Coverage](#)

Flag as irrelevant

[Scientists are zapping clouds with electricity to make it rain in drought-stricken countries](#)

7NEWS.com.au

Cloud seeding. As climate change alters weather patterns, causing severe droughts in some places and floods in others, there is a growing interest in ...

Flag as irrelevant

[Iodine is Mighty Fine - And Sublime\(s\)](#)

American Council on Science and Health

Cloud seeding; Protection against radiation poisoning; Blowing stuff up. Iodine itself is not found in nature. Elemental iodine, also called molecular ...

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To: [Linda Stopforth](#)
Subject: Google Alert - "cloud seeding"
Date: Wednesday, 26 May 2021 8:11:03 am



"cloud seeding"

Daily update · May 25, 2021

NEWS

[Cloud-seeding in UAE: Rain, sandstorm alert issued](#)

ZAWYA

Cloud-seeding in UAE: Rain, sandstorm alert issued. The alert is on from 1.45pm to 7pm today, May 24, over some Eastern mountain regions. By Staff ...



Flag as irrelevant

[UAEREP shortlists 9 pre-proposals from fourth cycle submissions](#)

Utilities Middle East

... **cloud seeding** assessment, seeding materials assessment, droplet charge measurement, **cloud seeding** prediction support, and the use of artificial ...



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To: [Linda Stopforth](#)
Subject: Google Alert - "cloud seeding"
Date: Tuesday, 25 May 2021 8:06:21 am



"cloud seeding"

Daily update · May 24, 2021

NEWS

[Cloud-seeding in UAE: Heavy rains reported in some areas](#)

Khaleej Times

Cloud seeding operations rely on a sophisticated network of radars that monitor the country's atmosphere around the clock. A team of pilots and ...

Flag as irrelevant

[UAEREP shortlists 9 pre-proposals from fourth cycle submissions](#)

WAM EN

... seeding materials assessment, droplet charge measurement, **cloud seeding** prediction support, and the use of artificial intelligence techniques.

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[Cloud-seeding System Market Size 2021 Global Trends, Opportunities, Future Plans, Market ...](#)

Absolute News Journal

The global **Cloud-seeding** System market is anticipated to rise at a considerable rate during the forecast period 2021 to 2027. In 2021, the market is ...

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To: [Linda Stopforth](#)
Subject: Google Alert - "cloud seeding"
Date: Sunday, 23 May 2021 8:06:43 am



"cloud seeding"

Daily update · May 22, 2021

NEWS

[Winding down a weak but still satisfying ski season as Epic Pass renewal looms](#)

RealVail

... was blessing in a season that woefully underdelivered (coincidentally at the same time Vail Resorts slashed its **cloud-seeding** budget despite recent ...



Flag as irrelevant

[Saudi Arabia to plant 10 billion trees in the desert to reduce carbon emissions, tackle climate change](#)

DNA India

The world's largest producer of desalinated water has in the past said it would use **cloud seeding** and recycled water to plant local trees that require ...

[Saudi Arabia plans to plant 10 BILLION trees in the desert](#) - The Scottish Sun
[Full Coverage](#)



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Subject: Google Alert - "cloud seeding"
Date: Saturday, 22 May 2021 8:10:01 am



"cloud seeding"

Daily update · May 21, 2021

NEWS

[Cloud Seeding Machines Market 2020 Trending Technologies, Development Plans, Future Growth ...](#)

News By ReportsGO

This research study explores the Global Market in detail such as industry chain structures, raw material suppliers, with manufacturing the **Cloud Seeding** ...

Flag as irrelevant

[Cloud-seeding System Market Report, History and Forecast 2015-2026, Breakdown Data by ...](#)

Business-newsupdate.com

Cloud-seeding System Market Report, History and Forecast 2015-2026, Breakdown Data by Manufacturers, Key Regions, Types and Application · Share ...

Flag as irrelevant

[Wildlife Rangers Go Virtual, Carbon Dioxide's New High and a 'Green Wall' for Sinai](#)

The Good Men Project

Also in this Landscape News bi-weekly news roundup: **cloud seeding**, green bonds, fundraising for the Amazon and the continued funding of fossil ...

Flag as irrelevant

[United States Weather Modification Combustion Equipment Market 2021- New study Report 2030](#)

The Bisouv Network

Cloud Seeding Artificial Flood Control Artificial Fog Elimination Artificial Weakening of Typhoons Artificial Suppression of Lightning Artificial Frost ...

Flag as irrelevant

[\[PDF\] Agriculture Robots Market : Believing In Secret Techniques That Keeps You From Growing](#)

The Courier

Robots have wide applications in agriculture, which includes soil analysis, **cloud seeding**, weed

control, planting seeds, environmental monitoring, ...



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Subject: Google Alert - "cloud seeding"
Date: Friday, 21 May 2021 8:11:03 am



"cloud seeding"

Daily update · May 20, 2021

NEWS

[What's Up Weather with Jordyn: Can we control the weather?](#)

WNCT

Now, **cloud seeding** comes into play when clouds are formed and growing. Specific chemical substances such as solid carbon dioxide, also known as ...



Flag as irrelevant

[Cloud-seeding System Market Report, History and Forecast 2015-2025, Breakdown Data by ...](#)

Business-newsupdate.com

The recent analysis of **Cloud-seeding** System market size has been methodically put together to impart an in-depth understanding of the key aspects ...



Flag as irrelevant

[Cloud Seeding Machines Market 2021 Industry Overview, Competition by Manufacturers ...](#)

Jumbo News

Cloud Seeding Machines data reports also provide a 5 year pre-historic and forecast for the sector and include data on socio-economic data of global.



Flag as irrelevant

[UAE weather: Rain, dust storm alert issued for today](#)

Khaleej Times

Last weekend, the UAE saw heavy rainfall, thanks to continued **cloud-seeding** efforts. Rains were reported in four emirates — Dubai, Sharjah, Ras Al ...



Flag as irrelevant

[COVID-19 Impact on Disaster Recovery as a Service Market Study | Manufacturers Analysis ...](#)

BeverageManager .Net

Make sure that you have **cloud seeding** as this use physical media such as hard disks, servers, pen drives, and tapes for pre-loading data on cloud ...



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Subject: Google Alert - "cloud seeding"
Date: Tuesday, 18 May 2021 8:06:29 am



"cloud seeding"

Daily update · May 17, 2021

NEWS

[Cloud-Seeding System Market Is Booming Worldwide | FK Aviation GmbH , North American ...](#)

Clark County Blog

Cloud-Seeding System Market Is Booming Worldwide | FK Aviation GmbH , North American Weather Consultants Inc. , Western Weather Group Inc. May ...



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Subject: Google Alert - "cloud seeding"
Date: Monday, 17 May 2021 8:05:02 am



"cloud seeding"

Daily update · May 16, 2021

NEWS

[UAE weather: Windy, rainy forecast for Sunday](#)

Khaleej Times

More **cloud-seeding**, more rainfall in UAE. Light to moderate winds, freshening at times causing blowing dust during daytime. The sea will be slight in ...



Flag as irrelevant

[Letters to the editor - May 16, 2021](#)

Times of Malta

Cloud-seeding experiments. The article 'Malta becoming too dry to support its habitat' (May 2) predicts that our islands are turning into a desert because ...



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Subject: Google Alert - "cloud seeding"
Date: Sunday, 16 May 2021 8:06:58 am



"cloud seeding"

Daily update · May 15, 2021

NEWS

[Watch: More cloud-seeding, more rainfall this weekend across Dubai, northern Emirates](#)

Khaleej Times

The UAE is experiencing light to heavy rainfall in several emirates thanks to continued **cloud-seeding** efforts. The National Center of Metereology on ...



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To: [Linda Stopforth](#)
Subject: Google Alert - "cloud seeding"
Date: Saturday, 15 May 2021 8:07:56 am



"cloud seeding"

Daily update · May 14, 2021

NEWS

[Cloud-seeding System Market Growth Overview, SWOT Analysis by Key Futuristic Trends from ...](#)

Test & Measurement

The **Cloud-seeding** System marketplace research is compiled with the assistance of industry specialists to find an accurate evaluation of the business ...

Flag as irrelevant

[Global Cloud-seeding System Market Innovative Trends, Driving Factors and Growth Analysis ...](#)

NeighborWebSJ

A detailed analysis of the leading companies operating in the global **Cloud-seeding** System market has been given where the market share, production ...

Flag as irrelevant

[Cloud Seeding Machines Market 2021 Trending Technologies, Development Plans, Future Growth ...](#)

Express Journal

This report studies the **Cloud Seeding** Machines market in many aspects of the industry such as market size, market conditions, market trends and ...

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Subject: Google Alert - "cloud seeding"
Date: Friday, 14 May 2021 8:11:43 am



"cloud seeding"

Daily update · May 13, 2021

NEWS

[Cloud-Seeding System Market is Going to Boom | FK Aviation, Mettech SpA, American Elements](#)

The Shotcaller

Cloud seeding involves weather modification. It includes modifying a cloud's structure. **Cloud seeding** is mainly carried out to increase the chance of ...

Flag as irrelevant

[Cloud Seeding Equipment Market Size \(2021-2028\) | Top Manufacturers – RHS Consulting ...](#)

The Courier

The **Cloud Seeding** Equipment Market research report offers an in-depth analysis of the market status, size, growth, share, trends, and cost structures.

Flag as irrelevant

[Acronis Cyber Protect 15 Advanced review: A well-rounded package](#)

IT PRO

... virtual server and 250GB of cloud storage for £458 per year; further 1TB chunks are £379 per year, while **cloud seeding** incurs a one-time fee of £59.

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Subject: Google Alert - "cloud seeding"
Date: Tuesday, 11 May 2021 8:06:19 am



"cloud seeding"

Daily update · May 10, 2021

NEWS

[This week in Boise](#)

The Herald Journal

Some of this money should be used in the Bear River Basin to help enhance the water supply. The Governor signed the **Cloud Seeding** bill and with the ...

Flag as irrelevant

[Cloud-Seeding System Market Next Big Thing | Major Giants FK Aviation, Mettech SpA, American ...](#)

openPR

Latest released the research study on Global **Cloud-Seeding** System Market, offers a detailed overview of the factors influencing the global business ...

Flag as irrelevant

[Cracked Lake Bed Is a Stark Symbol of Taiwan's Drought. Influencers Take Notice.](#)

The New York Times

The authorities are drilling extra wells, and military planes are dumping **cloud-seeding** chemicals in hopes of triggering downpours. The economy ...

Flag as irrelevant

[Parched Taiwan prays for rain as Sun Moon Lake is hit by drought](#)

The Guardian

... been mass prayer events to the god Matsu, and government scientists have conducted what Hsu calls the "immature technology" of **cloud seeding**.

Flag as irrelevant

[Cloud Seeding Machines Market Analysis By Business Share, Strategies, Opportunities, Revenue ...](#)

Jumbo News

The current market dossier provides market size, key player's revenue, gross margin, and market share along with the growth rate of the global **Cloud** ...

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To: [Linda Stopforth](#)
Subject: Google Alert - "cloud seeding"
Date: Saturday, 8 May 2021 8:14:38 am



"cloud seeding"

Daily update · May 7, 2021

NEWS

[Cloud Seeding Equipment Market Future Scope including key players Weather Modification Inc ...](#)

KSU | The Sentinel Newspaper

Global **Cloud Seeding** Equipment Market for a Leading company is an intelligent process of gathering and analyzing the numerical data related to ...



Flag as irrelevant

[Rainmaking drones? Water-poor UAE test cloud-zapping UAVs](#)

DroneDJ

Established methods for scrounging water from uncooperative skies center on **cloud seeding**. That involves low-flying aircraft or rockets firing particles ...



Flag as irrelevant

[Taiwan rations water, drills extra wells amid record drought](#)

Washington Post

Authorities are drilling extra wells and using military planes to dump **cloud-seeding** chemicals in hopes of triggering rain. The government has ...



Flag as irrelevant

[A new method to trigger rain where water is scarce](#)

Phys.Org

This is known as **cloud seeding**. The drones, which are being tested as part of the UAE's rain-enhancement science-research program, are equipped ...



Flag as irrelevant

[Cloud Seeding Equipment Market Size Outlook 2025: Top Companies, Trends, Growth Factors ...](#)

AlgosOnline

The Global **Cloud Seeding** Equipment Market Research Report Forecast 2021-2026 is a valuable source of insightful data for business strategists.



Flag as irrelevant

[Cloud-seeding System Market Future Scope including key players Ice Crystal Engineering, Agni ...](#)

Clark County Blog

Global **Cloud-seeding** System Market Report is an objective and in-depth study of the current state aimed at the major drivers, market strategies, and ...



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[Cities in water-stressed regions need smart and sustainable water management](#)

Khaleej Times

“The region continues to face acute water scarcity. Initiatives like the UAE's **cloud-seeding** programme mean that there is a fresh source of additional ...



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To: [Linda Stopforth](#)
Subject: Google Alert - "cloud seeding"
Date: Monday, 3 May 2021 8:01:56 am



"cloud seeding"

Daily update · May 2, 2021

NEWS

[Veterans' Voices: Lee Harkins](#)

Waco Tribune-Herald

He was involved with multiple projects, including a special **cloud-seeding** one requested by President Ferdinand Marcos himself. All 28 people ...



Flag as irrelevant

[Cloud-seeding System Market 2021-2024 Analysis By Global Industry Trends, Future Growth ...](#)

Absolute News Journal

The Global **Cloud-seeding** System market 2020 research provides a basic overview of the industry including definitions, classifications, applications and ...



Flag as irrelevant

[Agricultural Robots Market 2021: Potential Targets, Recommendations, In-depth Regional Analysis ...](#)

Absolute News Journal

Emerging applications of robots or drones in agriculture include weed control,[1][2][3] **cloud seeding**,[4] planting seeds, harvesting, environmental ...



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"cloud seeding"

Daily update · April 30, 2021

NEWS

[Cloud Seeding Machines Market is Thriving Worldwide with Leading Players Weather Modification ...](#)

The Courier

Further, details regarding the driving aspects alongside the growth opportunities have been decoded in the report. Additionally, the **Cloud Seeding** ...

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[Cloud Seeding Machines Market in-Depth Analysis by Vendors: NOOESIS, AlternaScript, Excelerol ...](#)

SoccerNurds

The Global **Cloud Seeding** Machines Market research report extensively provides a reliable prediction of market share analysis for the forecast period.

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[Weather alert: Rain hits UAE; more expected across the country](#)

Khaleej Times

The National Centre of Meteorology attributes the rainfall to **cloud seeding**. Light rains have been recorded over multiple areas in the UAE on Friday ...

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[UAE weather: Light rains in Dubai, wet weekend forecast](#)

Khaleej Times

"**Cloud-seeding** operations happen whenever there are the right clouds to be seeded so as to enhance the rain," said an official from NCM on ...

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[UAE a pioneer in adopting green, environment-friendly technologies](#)

Gulf Today

In recent years, with the implementation of initiatives such as **cloud seeding**, UAE Vision 2021, the UAE Centennial 2071, and the UAE Energy ...

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NEWS

[Cloud Seeding Machines Market Outlook 2021 Forecast to 2027 and Analysis By Major Key ...](#)

The Courier

Market Research Intellect has released a detailed report on Global Market Research report **Cloud Seeding Machines 2020** with opportunities and ...



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[Cloud seeding](#)

Focus Taiwan News Channel

An airman wearing flight gear prepares to carry out **cloud seeding** above Miaoli County and Taichung aboard a C-130 Hercules transport aircraft on ...



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[Cloud Seeding Machines Market SWOT Analysis 2021, by Leading Players: Weather Modification ...](#)

NeighborWebSJ

The global **Cloud Seeding Machines** market study report is a thorough compilation of all the data related to every market aspect. The report analyzes ...



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[Cloud Seeding Machines Market R & D including top key players Weather Modification, North ...](#)

SoccerNurds

The report provides readers with accurate historical statistics and predictions of the future. In order to get a deeper view of "Global **Cloud Seeding** ...



Flag as irrelevant

[Revealed: How much rain UAE received on Wednesday](#)

Khaleej Times

"**Cloud-seeding** operations happen whenever there are the right clouds to be seeded so as to enhance the rain," said an official from NCM. ismail@ ...



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Can Solar Geoengineering Be Used as a Weapon?

Council on Foreign Relations

This concern stems from longstanding military interest in weather modification technologies, most notably the U.S. use of **cloud-seeding** during the ...

Flag as irrelevant

UAE **cloud-seeding**: Residents wake up to light, moderate rainfall in Capital

MENAFN.COM

UAE **cloud-seeding**: Residents wake up to light, moderate rainfall in Capital. Date. 4/28/2021 4:01:34 AM. Share on Facebook · Tweet on Twitter.

Flag as irrelevant

IDACORP (IDA) Q1 Earnings Surpass Estimates, Improve Y/Y

Yahoo Finance

... from first-quarter 2020, partially due to a difference in the timing of **cloud seeding** activities and cost-savings initiatives at jointly-owned coal plants.

Flag as irrelevant

Watch: Rain and cloudseeding in Abu Dhabi, Dubai, Sharjah, Al Ain, Ras Al Khaimah, and Fujairah ...

Gulf News

... of Meteorology, convective clouds were monitored over the country and **cloud seeding** operations were conducted to enhance rainfall in the region.

Flag as irrelevant

Cloud-seeding System Market Research Report 2021, Latest Trends, Industry Size and CAGR ...

Absolute News Journal

It offers in-depth knowledge of different manufacturers, and along with their market performance and prospect expansion plans. The **Cloud-seeding** ...

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"cloud seeding"

Daily update · April 28, 2021

NEWS

[UAE cloud-seeding: Residents wake up to light, moderate rainfall in Capital](#)

Khaleej Times

UAE **cloud-seeding**: Residents wake up to light, moderate rainfall in Capital. Ashwani Kumar /Abu Dhabi. ~~on~~ Filed on April ...

Flag as irrelevant

[UAE weather videos: Heavy rains, hailstorms hit country](#)

Khaleej Times

The National Centre of Meteorology (NCM) said ice and heavy rains fell in Fujairah's Al Halah. UAE **cloud seeding**: Residents wake up to light, moderate ...

Flag as irrelevant

[An autonomous fruit-picking robot can harvest apples at high speed](#)

Inceptive Mind

Emerging applications of robots or drones in agriculture include weed control, **cloud seeding**, planting seeds, harvesting, environmental monitoring, ...

Flag as irrelevant

[Agriculture Robots Market Size Forecast Segmented by Analysis, CAGR, Regions, Manufactures ...](#)

Jumbo News

Emerging applications of robots or drones in agriculture include weed control, **cloud seeding**, planting seeds, harvesting, environmental monitoringand ...

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"cloud seeding"

Daily update · April 25, 2021

NEWS

[Cloud seeding hopes to help fight drought by increasing rain](#)

CNET

Cloud seeding has been practiced for decades and has many different techniques and applications. It's used to alleviate fog at airports, reduce the size ...

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[Cloud Seeding Equipment Market 2021 Technological Breakthroughs Evaluation Report By ...](#)

NeighborWebSJ

Cloud Seeding Equipment market estimation represented numerically and graphically based on various factors is key to the market study report. Get ...

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[Sporadic rainfall has little impact on nation's dry reservoirs: WRA](#)

Focus Taiwan News Channel

The agency also seized the opportunity provided by the wet weather system to perform **cloud seeding** in 14 locations nationwide at 7:30 a.m. Sunday, ...

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[UAE weather: Forecasters warn of downpours from Wednesday](#)

The National

The NCM's **cloud-seeding** programme conducts regular ...

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"cloud seeding"

Daily update · April 24, 2021

NEWS

[New Research on **Cloud-seeding** System Market Report Examines Business Opportunity and ...](#)

Jumbo News

The market research report on the Global **Cloud-seeding** System market has been carefully curated after studying and observing various factors that ...



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[Global **Cloud Seeding** Equipment Market Analysis, Share, Regional Outlook, Competitive ...](#)

Jumbo News

A fresh report on Worldwide **Cloud Seeding** Equipment Market 2021 quotes a critical analysis for its business on a regional and international level.



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"cloud seeding"

Daily update · April 20, 2021

NEWS

[Cloud Seeding Equipment Market Analysis with Key Players, Applications, Trends and Forecasts to ...](#)

AlgosOnline

The **Cloud Seeding** Equipment market report encompasses all the growth drivers and opportunities driving the profitability graph, and also provides ...

Flag as irrelevant

[Drought-hit Taiwan rations water to protect tech](#)

BBC News

Desperate for rain, the government has tried to manipulate nature by carrying out **cloud seeding** numerous times, while officials from the Irrigation ...

Flag as irrelevant

[Largest reservoir drops to 10.71%](#)

台北時報

... increased 10mm, despite artificial **cloud-seeding** operations, Southern Region Water Resources Office deputy head Tsou Han-kuei (鄧漢貴) said.

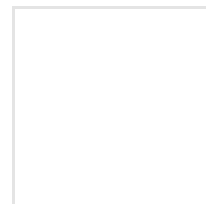
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[Philadelphia Police: Driver, Passenger Arrested After Fleeing Scene Of Crash In Fairhill](#)

Yahoo News

The island has tried everything from **cloud seeding** to prayer during its worst drought in 56 years. 4h ago. Yahoo News 360. Human- ...

Flag as irrelevant



[Capacity of Taiwan's largest reservoir falls to 10.7 percent](#)

Focus Taiwan News Channel

... in the reservoir's catchment area on Sunday and Monday, but water levels only increased 10 millimeters, despite artificial **cloud-seeding** operations.

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"cloud seeding"

Daily update · April 19, 2021

NEWS

[Global Cloud Seeding Equipment Market \(2020\) to Witness Huge Growth by 2026 | Weather ...](#)

The Bisouv Network

The **Cloud Seeding** Equipment market report also involves recent partnerships, mergers, research and development and collaborations of key players of ...



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[April 17: ON THIS DAY IN HISTORY](#)

Brooklyn Daily Eagle

ON THIS DAY IN 1950, the Eagle reported, "There may be a **cloud-seeding** experiment late today, it was reported by Dr. Wallace E. Howell, the city's ...



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"cloud seeding"

Daily update · April 18, 2021

NEWS

[Evaluation of **Cloud Seeding** Equipment Market 2021-2026: Recent Industry Developments and ...](#)

SoccerNurds

InForGrowth offers the latest published report on Global **Cloud Seeding** Equipment Market Analysis and Forecast from 2021 to 2026 delivering key ...



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[CPC begins drilling wells in Taichung amid drought](#)

Focus Taiwan News Channel

On Sunday, **cloud-seeding** was also carried out over Zengwen Reservoir in southern Chiayi County, which is currently at 11 percent capacity, after a ...



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"cloud seeding"

Daily update · April 16, 2021

NEWS

[Can Cloud Seeding Help With The Drought In The West?](#)

Here And Now

Eight states are experimenting with **cloud seeding** to try to create more precipitation to mitigate the effects of the drought that is gripping much of the ...



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[Global Cloud Seeding Machines Market Size, Share, Value, and Competitive Landscape 2020](#)

NeighborWebSJ

This Report covers the manufacturers' data, including: shipment, price, revenue, gross profit, interview record, business distribution etc., these data ...



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[Global Cloud-seeding System Market 2021 SWOT Analysis – Ice Crystal Engineering, Agni ...](#)

FLA News

The global **Cloud-seeding** System market is categorized into different segments with a comprehensive analysis of each with respect to the geography for ...



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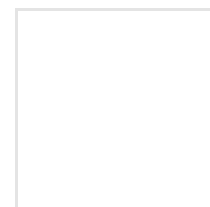
[How to consume ocean's salty water](#)

The Nation Newspaper

Cloud seeding, desalination, catching of rain and the building of wells are just some of the inventions that prove humans can indeed do the impossible, ...



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[Multi-Channel Order Management Software Market to Witness Huge Growth by 2027 ...](#)

The Bisouv Network

Cloud Seeding Equipment Market Growth Evaluation 2020-2025 | Top Key Players are Weather Modification, Inc., North American Weather ...



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Daily update · April 13, 2021

NEWS

[Global Cloud-seeding System Market Size, Share, Value, and Competitive Landscape 2020](#)

NeighborWebSJ

Global **Cloud-seeding** System Market Size, Share, Value, and Competitive Landscape 2020 ...
This Report covers the manufacturers' data, including: ...

Flag as irrelevant

[Taiwan developing newer model of ground-based rainmaking device](#)

Focus Taiwan News Channel

The most common chemicals used for **cloud seeding** are silver iodide, potassium iodide and dry ice (solid carbon dioxide). (By Liang Pei-chi and Ko Lin).

Flag as irrelevant

[Cloud Seeding Machines Market Research Report 2021 to 2026| Weather Modification, North ...](#)

The Bisouv Network

Cloud Seeding Machines Market Research Report 2021 to 2026| Weather Modification, North American Weather Consultants, Seeding Operations & ...

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[Yunnan drought update](#)

GoKunming

CCTV has an interesting video of **cloud seeding** in action in Qujing. Water shortage continues. Water is selling for 100 yuan a cubic meter, or 10 yuan a ...

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[Bill Gates Will Have to Wait a While to Block the Sun](#)

Popular Mechanics

Geoengineering is the term for technologies that try to alter Earth's physical qualities on the largest scale possible. One example is **cloud seeding**, where ...

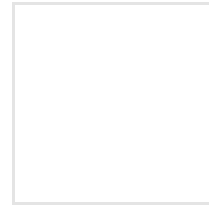
Flag as irrelevant

Can drones make it rain in the United Arab Emirates?

DroneDJ

Wired reports the UAE experimented with more than 185 different **cloud seeding** projects in 2019. And one October torrent actually caused floods in ...

Flag as irrelevant



Misunderstood Fences

Teton Valley News

If it isn't done right, it can backfire on you and actually make things worse. There is nothing you can do, short of **cloud seeding**, to add to or reduce the ...

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Zimbabwe: Businessman Back in Court On Fraud Charges

AllAfrica.com

... Department (MSD) of more than US\$70 000 meant for national **cloud seeding** is today expected back in court for continuation of his bail application.

Flag as irrelevant

How Bad Is Taiwan's Drought?

The News Lens International

President Tsai Ing-wen urged the public to conserve water in early March to weather the crisis. The government resorted to **cloud seeding** on March 24 ...

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Global **Cloud Seeding** Machines Market 2020-2025: NOOESIS, AlternaScript, Excelerol, Neurofuse ...

Jumbo News

Global **Cloud Seeding** Machines Market 2020-2025: NOOESIS, AlternaScript, Excelerol, Neurofuse, LFI Labs, Zhou Nutrition, Synergy, Opti-Nutra LTD., ...

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"cloud seeding"

Daily update · March 29, 2021

NEWS

[Bill Gates Is Thinking About Dimming the Sun](#)

Yahoo Lifestyle

One example is **cloud seeding**, where airplanes flush clouds with particulate matter in order to coalesce into rain. Carbon capture, where emissions ...



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[China ups ante over Xinjiang row; low-cost Chinese drones now taking off](#)

NewsX

When **cloud-seeding** flights raise rainfall in the Qilian Mountains in early 2021, these operations could make a significant difference. China performed ...



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[Modern Family Cast: Current Ages, Relationship Statuses, & Net Worths and What The Modern ...](#)

the Arkatech

Utah is a leader in **cloud seeding** and could prove as a model for boosting a drought-stricken West's water supplies. U.S., Japan and South Korea eye ...



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"cloud seeding"

Daily update · March 28, 2021

NEWS

[Utah is a leader in cloud seeding. Is it working?](#)

Salt Lake Tribune

Utah is a leader in **cloud seeding**. Is it working? As drought deepens in the Colorado River Basin, the state's program could serve as a model for ...



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[Cloud Seeding Machines Market Analysis, Trend, COVID-19 Impact, Industry Overview |Weather ...](#)

The Market Eagle

Cloud Seeding Machines Market Analysis, Trend, COVID-19 Impact, Industry Overview |Weather Modification, North American Weather Consultants. By ...



Flag as irrelevant

[Saudi Arabia sees fields of green with major tree-planting drive](#)

Reuters

The world's largest producer of desalinated water has in the past said it would use **cloud seeding** and recycled water to plant local trees that require ...



Flag as irrelevant

[Commentary: China's cheap drones are finally taking off, with many uses and huge implications](#)

CNA

These operations can make a sum difference when **cloud-seeding** flights commissioned by the Gansu provincial government have increased rainfall ...



Flag as irrelevant

[Global Cloud Seeding Machines Market Key Players, Major Collaborations, Merger & Acquisitions ...](#)

Jumbo News

The **Cloud Seeding** Machines market report defines the key drivers responsible for market growth so far and the trends altering and expanding the scope ...



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Bill Gates Backs Geoengineering to Block Sunlight From Reaching the Earth's Surface

Science Times

What is Solar Geoengineering? Geoengineering alters the Earth's physical qualities, such as **cloud seeding** that flush clouds with particulate matter to ...



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"cloud seeding"

Daily update · March 27, 2021

NEWS

[Ethiopia's Surprise Entry Into Cloud Seeding Technology](#)

AllAfrica.com

In India, **cloud seeding** operations were conducted in the 1980s due to severe drought. In the years 2003 and 2004 Karnataka government-initiated ...



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[The silver lining](#)

The Economist

In China, water scarcity has made the government the most enthusiastic promoter of **cloud-seeding** among the 50 or so countries that practise it.



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[Bill Gates' Strange Plan to Dim the Sun](#)

Interesting Engineering

For example, **cloud seeding** involves planes dumping particulate matter to make them transform into rain. There's also carbon capture, which gathers ...



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"cloud seeding"

Daily update · March 26, 2021

NEWS

[Cloud-seeding will not solve China's water shortages](#)

The Economist

Cloud-seeding operations in China cover 5m square kilometres, or more than half of its land territory, according to the government. In December ...



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[Cloud Seeding Equipment Market 2021 Precise Outlook – Weather Modification, Inc., North ...](#)

Investments Revolution

The **Cloud Seeding** Equipment Market report offers an in-depth assessment of market dynamics, the competitive landscape, segments, and regions in ...



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[Global Cloud Seeding Machines Market 2027 Size, Key Companies, Trends, Growth And Regional ...](#)

NeighborWebSJ

The main players in the **Cloud Seeding** Machines market are studies, and their strategies which are analyzed to arrive at current growth strategies, and ...



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[Cloud Seeding Machines Market Growing Trade Among Emerging Economies Opening New ...](#)

NeighborWebSJ

changing investment structure of the **Cloud Seeding** Machines market. · latest scoop and detailed eye-opening study on all major & emerging business ...



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[Cloud Seeding Machines Market Current Trends and Technology Enhancements with Top Players ...](#)

SoccerNurds

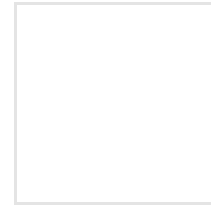
The Global **Cloud Seeding** Machines market report also provides CAGR from 2020 to 2026. Key players in this market are Weather Modification, North ...

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[Bill Gates Is Thinking About Dimming the Sun](#)

Popular Mechanics

Geoengineering is a blanket term for technologies that try to alter Earth's physical qualities on the largest scale possible. One example is **cloud seeding**, ...



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[South Korea: **Cloud-seeding** System market demand and end user analysis 2021-26](#)

Jumbo News

This **Cloud-seeding** System Market Report covers the manufacturers' data, including shipment, price, revenue, gross profit, interview record, business ...

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[Agricultural Robots Market to See Incredible Growth and Forecast 2020-2027](#)

The Courier

... of the robots including fruits picking robots, weed control, **cloud seeding**, harvesting, environmental monitoring and soil analysis and the utilization of ...

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[LoRaWAN LoRa Module Market Competitive Research And Precise Outlook 2021 To 2025](#)

Investments Revolution

Cloud Seeding Equipment Market 2021 Precise Outlook – Weather Modification, Inc., North American Weather Consultants, Inc., Seeding Operations ...

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[Global Calibration Control Software Market 2021 Consumption Analysis and Business ...](#)

SoccerNurds

Cloud Seeding Machines Market Current Trends and Technology Enhancements with Top Players (Weather Modification, North American Weather ...

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Daily update · March 25, 2021

NEWS

[Saudi Arabia using AI technology for monitoring weather: Dr. Ghulam](#)

ZAWYA

Ghulam. The center now covers about 94 percent of the inhabited geographical area in the Kingdom. He also spoke about the method of **cloud-seeding** ...



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Daily update · March 24, 2021

NEWS

[Make it rain: US states embrace 'cloud seeding' to try to conquer drought](#)

The Guardian

Cloud seeding involves using aircraft or drones to add small particles of silver iodide, which have a structure similar to ice, to clouds. Water droplets ...

Flag as irrelevant

[Can cloud seeding help the West's drought?](#)

High Country News

Can **cloud seeding** help the West's drought? States consider weather modification to make it rain. Oliver Milman March 24, 2021.

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[Cloud Seeding Machines Market is Expected to Boom Worldwide By 2026](#)

The Courier

The estimate presents the potential of the market until 2026. The study focused on the Global market **Cloud Seeding** Machines 2020 presents a broad ...

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[Legislative update: One-time tax rebate to be made](#)

The Herald Journal

The **cloud seeding** bill that I have been working on is going to the floor of the Senate and believe that they will pass that bill. I am hopeful that we can ...

Flag as irrelevant

[Cloud Seeding Equipment Market 2021 SWOT Analysis, by Key Players: Weather Modification, Inc ...](#)

Cabell Standard

The **Cloud Seeding** Equipment research frequently contains database and summary information on all areas of global and regional industry. Key ...

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California condors will fly in the Pacific Northwest for the first time in 100 years

Report Door

Cloud seeding involves adding small particles of silver iodide to clouds to spur rainfall – but will it work? An empty irrigation canal at a tree farm in ...

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Duumessa facaasuu: Akkamiin karaa nam-tolcheen rooba roobsuun danda'ama?

BBC News

Duumessa facaasuun [**cloud seeding**] gama teknolojiin fayyadamuun karaa nam-tolcheedhaan [artefishaalii] rooba roobsuu yookiin cabbii uumuudha.

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This Is How Scientists Plan to Attack America's Massive Drought

24/7 Wall St.

One solution to drought problems is known as **cloud seeding**. Colorado, Utah, Wyoming, Nevada, California, New Mexico and Arizona have combined ...

Flag as irrelevant

China's Didi leans toward New York over Hong Kong for IPO, eyeing at least \$100bn valuation ...

Arab News

... formations to help them produce rain. The approach could efficiently replace older **cloud-seeding** methods, said the National Center of Meteorology, ...

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UAE harvests rain as energy minister urges 40% water consumption cut

Arab News

The country has been exploring how to make better use of the little rainfall it receives each year including the practice of "**cloud seeding**" to stimulate ...

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"cloud seeding"

Daily update · March 23, 2021

NEWS

[Cloud Seeding Machines Market growth, market size, share with top Major Key Player like Weather ...](#)

KSU | The Sentinel Newspaper

The COVID-19 Outbreak:Global **Cloud Seeding** Machines Market study covers current status, % share, future patterns, development rate, SWOT ...



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[UW in the News](#)

University of Wyoming News

Cloud-seeding research represents the cutting edge of weather and climate science, according to the E&E News article published by Scientific ...



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[Environmental News Roundup March 20, 2021](#)

WGCU News

Meanwhile, eight states are controlling the weather with **cloud seeding**. Will it work? Or do humans continue to play with fire? Speaking of weather, the ...



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[\(PDF Innovation\): Cloud Seeding Machines Market Report By IndustryAndResearch \[Involved Key ...](#)

Interviewer Today

The numerous impact forces that influence the revenue scale of the **Cloud Seeding** Machines market is provided in detail in the report. The information ...



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"cloud seeding"

Daily update · March 21, 2021

NEWS

[Khalifa University Researchers Share Knowledge At 2021 International Rain Enhancement Forum](#)

UrduPoint News

Cloud seeding is the process where substances are put into clouds to stimulate the formation of rain drops. Natural cold cloud rainfall occurs when ice ...



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[UAE to test cloud-zapping drones to increase rainfall](#)

ZAWYA

According to the National Centre of Meteorology, this new method could efficiently replace the traditional **cloud-seeding** method of depositing solid ...



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"cloud seeding"

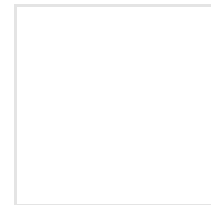
Daily update · March 20, 2021

NEWS

[A \\$28K donation is bringing back a water-generating cloud seeding program for Tahoe Basin](#)

Reno Gazette-Journal

A \$28,000 donation from the William N. Pennington Foundation has Desert Research Institute's **cloud seeding** program in the Lake Tahoe and ...



Flag as irrelevant

[Advancing the science of rain enhancement](#)

Open Access Government

Cloud seeding operations mainly depend on the type of the cloud, using the hygroscopic agent is much more suitable to warm clouds such as ...



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[UAE to test cloud-zapping drones to increase rainfall](#)

Khaleej Times

Novel method is different from traditional **cloud-seeding** process. The UAE is set to test drones that will fly into clouds and produce a small electrical ...



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[Legislative Update](#)

The Herald Journal

I am hopeful that we can get some **cloud seeding** in the Bear River Basin by November of this year. This and the tax bill were projects that I started before ...



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[Cloud Seeding Machines Market to Witness an Outstanding Growth During 2021- 2026](#)

Fractovia News

The **Cloud Seeding** Machines market report highlights the significant growth drivers, opportunities, and challenges that will influence the growth ...



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Acetone Market Research Business Opportunity, Global Trend, Future Growth, Key Findings and ...

Chemicals Market News

Cloud Seeding Market Research Report to 2021 | Industry Size, Growth Share, Future Trends, Price, Top Key Players Review, Business Opportunities, ...



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"cloud seeding"

Daily update · March 19, 2021

NEWS

[UAE To Test Drones That Shock Clouds To Increase Rainfall](#)

International Business Times

The UAE currently uses **cloud-seeding** technology, which is the process of dropping salt to increase precipitation. However, this has not produced ...



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"cloud seeding"

Daily update · March 18, 2021

NEWS

[Why cloud seeding won't reverse climate droughts](#)

E&E News

A **cloud seeding** generator fires particles into the sky over Colorado in 2017. Weather modification is gaining attention as a way to combat climate ...

Flag as irrelevant

[Global Cloud Seeding Machines Market 2021 Growth Rate by Applications, Product Type and ...](#)

Cabell Standard

The research review on Global **Cloud Seeding** Machines Market targets the current as well as forthcoming features of the industry. This includes key ...

Flag as irrelevant

[UAE to test cloud-busting drones to boost rainfall](#)

Yahoo News Australia

The country already uses **cloud-seeding** technology, dropping salt to encourage precipitation. But with average rainfall in the UAE at just 100mm per ...

Flag as irrelevant

[The UAE Is Using Drones to Manipulate Weather](#)

Futurism

Cloud seeding has been around for decades, but potential misuse of the technology has experts concerned about geopolitical ramifications, especially ...

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[Organic crystals' ice-forming superpowers](#)

Mirage News

Throwback to **cloud seeding**. Molinero's research is focused on how ice forms, particularly the process of nucleation, which is the beginning of ice crystal ...

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"cloud seeding"

Daily update · March 16, 2021

NEWS

[Why is Beijing's air quality so bad again?](#)

The Economist

Ahead of important events, the government often uses **cloud-seeding** technology to encourage air-cleaning rain, and orders factories in and around ...



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"cloud seeding"

Daily update · March 15, 2021

NEWS

[Cloud Seeding Equipment Market Analysis, Key Company Profiles, Types, Applications and ...](#)

The Bisouv Network

The recent report on "**Cloud Seeding** Equipment Market Report 2021 by Key Players, Types, Applications, Countries, Market Size, Forecast to 2026" ...

Flag as irrelevant

[US Cuprous Iodide Market Share Analysis Of Key Market Participants And Their Competitive ...](#)

NeighborWebSJ

Its chemical formula is CuI and its melting point is $606^{\circ}C$, it has a wide variety of applications which include **cloud seeding**, dietary supplement and ...

Flag as irrelevant

[Unexpected Growth Seen in Heavy Equipment Rental Market from 2021 to 2026](#)

AlgosOnline

Related Reports: 1. Global **Cloud Seeding** Equipment Market 2021 by Company, Regions, Type and Application, Forecast to 2026. Read More: ...

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WEB

[The UAE Uses Electric Shock Drones in **Cloud-Seeding** Operations \(11/03/21\) by Future Talk](#)

SoundCloud

Forecasters in the UAE are studying whether electricity could improve rainfall during **cloud-seeding** operations. In this episode, we discuss the science ...

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"cloud seeding"

Daily update · March 12, 2021

NEWS

[Ask Joe: Cloud seeding in the Sierra off, now back on again](#)

KRNV My News 4

Here's what I found out: It's called **cloud seeding** and the idea is to shoot silver iodide crystals into the sky during storms using generators set up around ...



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[UAE tests the use of electric charge drones in cloud-seeding operations to make rain](#)

Gulf News

The UAE's National Center of Meteorology is conducting tests to see whether electricity can be used during **cloud-seeding** operations to enhance ...



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"cloud seeding"

Daily update · March 11, 2021

NEWS

[Is the practice of “Cloud seeding” still being used to produce rain?](#)

WGN-TV

Why? —Allen Westmore, Rockford Dear Allen, **Cloud seeding** is, and always has been, controversial. It involves adding certain particles to clouds with ...



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[Global Cloud Seeding Equipment Market Report Future Prospects, Growth, Outlook and Forecast ...](#)

GroundAlerts.com

Cloud Seeding Equipment market aims to decode lucrative investment opportunities in the business sphere and educate readers about the ...



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[Cloud Seeding Machines Market 2021 By Size, Share, Industry Statistics, Global Trends Evaluation ...](#)

Absolute News Journal

This report is exhaustive quantitative analyses of the **Cloud Seeding** Machines industry and provides data for making strategies to increase **Cloud** ...



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[Hotspots flare up as Indonesia expects drier dry season](#)

The Star Online

“Weather modification [**cloud seeding**] will start in Riau on March 9 and in West Kalimantan on March 11,” environment ministry director for forest and ...



Flag as irrelevant

[Weather Modification Combustion Equipment Market 2020 Global Industry Analysis, Emerging ...](#)

The Bisouv Network

... the Weather Modification Combustion Equipment market from 2015 to 2025 is primarily split into: **Cloud Seeding**, Artificial Flood Control, Artificial ...



Flag as irrelevant

[Intrusion Detection and Prevention Systems \(IDPS\) Market: Business Opportunities, Current Trends ...](#)

GroundAlerts.com

Global **Cloud Seeding** Equipment Market 2021 by Company, Regions, Type ... More:
[https://www.marketstudyreport.com/reports/global-cloud-seeding- ...](https://www.marketstudyreport.com/reports/global-cloud-seeding-...)



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WEB

[UAE to use electric charge drones in **cloud-seeding** operations | The National](#)

The National

Forecasters in the UAE are studying whether electricity ...



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"cloud seeding"

Daily update · March 10, 2021

NEWS

[Cloud Seeding Machines Market 2021 | Covid19 Impact Analysis | Growth, Revenue, Trends and ...](#)

KSU | The Sentinel Newspaper

The entire study covers the key drivers and restraints for the **Cloud Seeding** Machines market. this report included a special section on the Impact of ...



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[Cloud Seeding Machines Market \(impact of COVID-19\) Growth, Overview with Detailed Analysis ...](#)

NeighborWebSJ

Cloud Seeding Machines Market (impact of COVID-19) Growth, Overview with Detailed Analysis 2020-2027|: Weather Modification, North American ...



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[Europe needs to wake up to the microchip crunch](#)

Telegraph.co.uk

Taiwan's government has resorted to **cloud-seeding** to generate artificial rain while strict limits on household water consumption have been imposed ...



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Date: Sunday, 7 March 2021 9:01:52 am



"cloud seeding"

Daily update · March 6, 2021

NEWS

[Global Cloud Seeding Machines Market To Reach Highest CAGR By 2025: Top Companies ...](#)

NeighborWebSJ

"The research report on the "Global **Cloud Seeding** Machines Industry" presents an in-depth and systematic overview that offers a complete ...

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[Weather Modification Market is Expected to Touch USD 290.5 Million by 2027](#)

The Courier

The rising use of **cloud seeding** systems in dispersing fog and mitigate hail damage across the globe has led to strong demand for **cloud seeding** ...

Flag as irrelevant

[Water As An Income Source: Empowering Rainwater Harvesting Through Entrepreneurship](#)

Forbes

With **cloud-seeding** techniques evolving constantly, humans can now maximize rainfall within a region. In fact, for nations such as the UAE, this ...

Flag as irrelevant

[Parking Meters Market 2030 Growth Opportunities, Top Key Players, Industry Outlook](#)

SoccerNurds

Global **Cloud Seeding** Machines Market Forecast 2020-2025 | Weather Modification, North American Weather Consultants. Search for: ...

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"cloud seeding"

Daily update · March 2, 2021

NEWS

[Cloud-seeding System Market: Complete Analytical Report for 2021 with leading key players-Agni ...](#)

The Bisouv Network

The team of researchers at Future Market Insights are focussing on research and market study to produce different **Cloud-seeding** System Market ...



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[Cloud Seeding Machines Market Size 2021, SWOT Analysis by Key Players include: Weather ...](#)

NeighborWebSJ

Global **Cloud Seeding** Machines Market analyses current updates, market drivers as well as the business tactics used by the industry players and ...



Flag as irrelevant

[Cloud Seeding Equipment Market Size 2021 | Global Industry Analysis, Development, Scope ...](#)

Express Keeper

New Jersey, United States,- The **Cloud Seeding** Equipment Market Intelligence study is a collection of authentic information and in-depth data analysis ...



Flag as irrelevant

[Cloud Seeding Machines Industry Growth Forecast Analysis Manufacturers, Regions, Type and ...](#)

News by aeresearch

The new report on **Cloud Seeding** Machines market research is an in-depth analysis of the latest developments, market size, status, upcoming ...

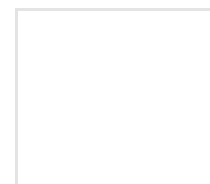


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[Plane crash in China's Jiangxi Province leaves 5 dead, one injured](#)

Taiwan English News

Five people died, and one person was injured after a plane engaged in



cloud-seeding operations crashed into houses in Jianxi Province, China, ...



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Global Methanol-D4 Market Top Competitors Shares Analysis, Growth, Challenges and Forecast to ...

The Bisouv Network

Cloud-seeding System Market: Complete Analytical Report for 2021 with leading key players- Agni Aviation, IPTN North America Inc., Redington ...



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"cloud seeding"

Daily update · February 24, 2021

NEWS

[Legislative update: Tempers are flaring](#)

The Herald Journal

The **cloud seeding** bill that I have been working on is still in the drafting stage and the interested parties are quite a ways apart. I don't know if I'm going ...

Flag as irrelevant

[When Sea Levels Rise And Coastal Waters Darken...](#)

Modern Diplomacy

The technique, known as **cloud-seeding**, uses silver iodide and liquid nitrogen to thicken water droplets in the cloud, leading to increased rain or ...

Flag as irrelevant

[UAE weather: Rain hits parts of UAE; temperature drops](#)

Khaleej Times

In an earlier note, the weather bureau had forecast rains throughout the week due to **cloud seeding**. The lowest temperature recorded over the UAE on ...

Flag as irrelevant

[Application and Product Portfolio Analysis During the forecasted period of Civil Engineering ...](#)

Express Keeper

The study of the **Cloud Seeding** Equipment Market is known for providing a detailed analysis of the segments and revenue shares covered for market ...

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"cloud seeding"

Daily update · February 22, 2021

NEWS

[UAE weather: Rain in Dubai, Abu Dhabi, cloud seeding flights dispatched on Sunday, says NCM](#)

Gulf News

A National Center of Meteorology official told Gulf News: "**Cloud seeding** operations were carried out in the UAE today, to enhance rainfall in the ...

Flag as irrelevant

[UAE weather: Cloud seeding likely to bring in more showers](#)

MENAFN.COM

It used **cloud seeding** hashtag as it alerted residents about the rains on social media. In its five-day forecast, the NCM has predicted rains in some areas, ...

Flag as irrelevant

[Cloud Seeding Machines Market: Global Growth Manufacturers, Regions, Product Types, Major ...](#)

Express Journal

Global **Cloud Seeding** Machines Market report provides an in-depth analysis of the key market insights, its future trends, and developments, profiles of ...

Flag as irrelevant

[Get your umbrellas ready, rain is coming to the UAE this week](#)

Emirates Woman

It was reported that some **cloud-seeding** had taken place on Sunday, February 21 prompting some light showers around the country in Ras Al Khaimah, ...

Flag as irrelevant

[UAE weather: Will it rain in Dubai this week?](#)

What's On

Is the rain due to **cloud seeding**? According to Gulf News, A National Centre of Meteorology official said: "**Cloud seeding** operations were carried out in ...

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Date: Friday, 19 February 2021 9:04:02 am



"cloud seeding"

Daily update · February 18, 2021

NEWS

[Water bill includes Sidon, Shoshone canal improvement](#)

Powell Tribune

The bill also included \$943,000 for airborne **cloud seeding** operations that could bring more snow to the Wind River, Sierra Madre and Medicine Bow ...

Flag as irrelevant

[Cloud Seeding Machines Market to Witness Significant Incremental Opportunity By 2026: Weather ...](#)

KSU | The Sentinel Newspaper

"The **Cloud Seeding** Machines market sets out a meticulous synopsis of sales projections and trends for 2020-2026: Regal Intelligence's most recent ...

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[Cloud Seeding Machines Market Growth, Opportunities, Cost Structure Analysis and Forecast Upto ...](#)

The Bisouv Network

The report titled on "**Cloud Seeding** Machines Market Assessment, With Major Companies Analysis, Regional Analysis, Breakdown Data by Type, ...

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[Global Cloud-seeding System Market 2021 Size, Share, Forecast to 2026: Ice Crystal Engineering ...](#)

The Bisouv Network

The recent report on the Global **Cloud-seeding** System Market covers all the vital aspects of the business space that fuel the industry expansion in ...

Flag as irrelevant

[Cloud Seeding Equipment Market Covering Competitive Scenario and Covid 19 Dynamics ...](#)

Express Keeper

The **Cloud Seeding** Equipment Market research report provides an analysis of major manufacturers, geographic regions, and provides advanced ...



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Biden Geo-engineered Texas Winter Storm Using 'Fake' Snow to Cause Power Outages, Claims ...

International Business Times, Singapore Edition

Biddle claimed the government used "**cloud seeding**" technology that is often used to produce moisture in drought-prone areas. This involves injecting ...



Flag as irrelevant

Trauma Care Center Market - Global Industry Growth Analysis, Size, Share, Trends, and Forecast ...

News.MarketSizeForecasters.com

Related Reports: 1. Global **Cloud Seeding** Machines Market 2021 by Company, Regions, Type and Application, Forecast to 2025. Read More: ...



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"cloud seeding"

Daily update · February 13, 2021

NEWS

[This Week in Boise](#)

The Herald Journal

Last week I mentioned that I was working on some legislation to deal with **cloud seeding** and the increased precipitation that may result from the **cloud** ...

Flag as irrelevant

[Short term weather forecast is good news for snowfields](#)

LocalNews8.com

Those **cloud-seeding** flights focus on storm systems. The utility and its partners conduct an average 64 flights in a normal year. More flights and more ...

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[Cloud Seeding Machines Market Booming Demand Leading To Exponential CAGR Growth By 2027](#)

Atlantic Financial Management

Cloud Seeding Machines report features the market's development rate. Report was framed after a subjective and quantitative assessment of the **Cloud** ...

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[Cloud Seeding Machines Market 2026 | Weather Modification, North American Weather ...](#)

Jumbo News

At an initial stage, the **Cloud Seeding** Machines market report offers basic information including definitions, classifications, a wide range of applications, ...

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[Agriculture Robots Market Research Report 2026 By Industry Size and Shares, Featured Trends ...](#)

NeighborWebSJ

Robots have wide applications in agriculture, which includes soil analysis, **cloud seeding**, weed control, planting seeds, environmental monitoring, ...

Flag as irrelevant

Company Profiles and Key Figures of Global Agricultural Robots Market Reviewed in Latest 2020 ...

Internet Shots

Emerging applications of robots or drones in agriculture include weed control,[1][2][3] **cloud seeding**,[4] planting seeds, harvesting, environmental ...

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"cloud seeding"

Daily update · February 12, 2021

NEWS

[2021 Latest Report on Cloud Seeding Machines Market is Booming Worldwide| Global Industry ...](#)

NeighborWebSJ

(Post-pandemic Era)- Global **Cloud Seeding** Machines Market 2021: Inclusive Insight. Los Angeles, United States, February 2021: The report titled ...

Flag as irrelevant

[Cloud-seeding System Market Size Analysis, Trends, Top Manufacturers, Share, Growth, Statistics ...](#)

Technology Magazine

The qualitative research study now available with Market Study Report, LLC on Global **Cloud-seeding** System Market Report provides primary Data, ...

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[Weather Modification Market is Expected to Touch USD 290.5 Million by 2027](#)

Reported Times

Cloud seeding is a weather-modification process that involves dropping chemical agents into clouds to cause rain. Silver iodide, dry ice, and even ...

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[Concern: China is “planting clouds” to change its climate – news](#)

Pen Media Inc

Many countries use this technology (**cloud seeding**). China has been using it for a long time, and India has used it in sub-Saharan Africa and also in ...

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Date: Friday, 12 February 2021 9:02:03 am



"cloud seeding"

Daily update · February 11, 2021

NEWS

[Water bills spend millions to repair dangerous, aging infrastructure](#)

Wyoming Tribune

Cloud seeding is accomplished when chemicals, frequently silver iodide, are released into the atmosphere when conditions are ripe. Planes spread ...



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[Water bills spend millions on dangerous, aging infrastructure](#)

Gillette News Record

Cloud seeding is accomplished when chemicals, frequently silver iodide, are released into the atmosphere when conditions are ripe. Planes spread the ...



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[How Skiing Can Survive Climate Change](#)

The Wall Street Journal

Cloud-seeding programs could cost ski areas \$100,000 to \$1 million annually, he says. Fleets of Artificial Clouds. Illustration: Kevin Hand. Neuschnee ...



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"cloud seeding"

Daily update · February 5, 2021

NEWS

[Comprehensive Report on Cloud Seeding Machines Market 2021 | Size, Growth, Demand ...](#)

NeighborWebSJ

"**Cloud Seeding** Machines Market is growing at a High CAGR during the forecast period 2021-2027. The increasing interest of the individuals in this ...



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[House, Senate abortion bills both reach floor](#)

KRWG

He said research on **cloud seeding** has been inconclusive. "I'm always hesitant when there isn't scientific research behind it," Soules said. The bill now ...



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[Cloud Seeding Equipment Market Study Report Based on Size, Growth, Opportunities, Industry ...](#)

Murphy's Hockey Law

Cloud Seeding Equipment Market is estimated to grow at a CAGR of 6.87% from 2019 to 2026. A comprehensive exploration of the **Cloud Seeding** ...



Flag as irrelevant

[Cloud-seeding System Market Report 2025: Ice Crystal Engineering, Agni Aviation, IPTN North ...](#)

Murphy's Hockey Law

The research report on **Cloud-seeding** System market covers all the significant technologies which are recently being adopted across the global market.



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[Travel: Dubai is the perfect place for a future break in a futuristic city](#)

The Sunday Post

... cue through **cloud seeding**. Brazenly artificial, it's a highly habitable and convenient city constructed in a place where it shouldn't be that easy to live.



Flag as irrelevant

[Could we SHAKE rain out of the sky? Aiming powerful low-frequency sound waves at clouds could ...](#)

Daily Mail

CLOUD SEEDING: MODIFYING THE WEATHER TO MAKE IT RAIN.

The primary goal of **cloud seeding** technologies is to make it rain - that is increase ...



Flag as irrelevant

[Enormous sonic weapons used to 'shake rain out of clouds' by scientists to stop droughts](#)

Daily Star

Their unusual method avoids the need for releasing "**cloud-seeding**" chemicals into the atmosphere. More than 20 trillion tonnes of water passes over ...



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Date: Friday, 5 February 2021 9:02:32 am



"cloud seeding"

Daily update · February 4, 2021

NEWS

[Cloud Seeding Equipment Market Report By Application, Type, Top Companies, Growth, Regional ...](#)

Murphy's Hockey Law

Cloud Seeding Equipment's latest market research report contains an extensive analysis of micro and macroeconomic indicators affecting the ...

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[5 unusual technologies for harvesting water in dry areas](#)

TheChronicleHerald.ca

Catching fog · **Cloud seeding** · Minimising evaporation · Desalinating seawater · Iceberg harvesting · More national perspectives stories · Recent Stories ...

Flag as irrelevant

[Promoting Rain Enhancement Approaches, Technologies](#)

OOSKA News

... support rain enhancement, including research on modernised computing strategies with **cloud-seeding** operations using unmanned aerial vehicles, ...

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[Comprehensive Report on Intelligent Agricultural Robot Market 2021 | Size, Growth, Demand ...](#)

Murphy's Hockey Law

Emerging applications of robots or drones in agriculture include weed control, **cloud seeding**, planting seeds, harvesting, environmental monitoring ...

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"cloud seeding"

Daily update · February 3, 2021

NEWS

[Eagle County agencies help boost **cloud-seeding** funds after Vail pulls out](#)

Summit Daily News

Cloud seeding can help boost snowfall from clouds that are already poised to deliver snow.

Photo by Joshua Aikins. EAGLE — We need more “juicy” ...



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Date: Wednesday, 3 February 2021 9:03:01 am



"cloud seeding"

Daily update · February 2, 2021

NEWS

[Cloud Seeding Stopped for Now](#)

<http://hamodia.com>

Cloud Seeding Stopped for Now. By Shmuel Smith. Monday, February 1, 2021 at 2:10 pm | ט"ו שבט תשפ"א. People wearing face mask take cover from ...



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[Size of Agricultural Robots and Drones Market Set to Reach USD 13.58 Billion by 2026](#)

KSU | The Sentinel Newspaper

... like spraying fertilizer and pesticides, **cloud seeding**, planting seeds, harvesting, crop growth, and farmland monitoring as well as soil analysis.



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[Zimbabwe: Tourism Deputy Director Denied Bail](#)

AllAfrica.com

These had two flare dispenser units mounted and the **cloud-seeding** equipment was demonstrated in a ground test. The firing mechanisms and the flare ...



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Date: Tuesday, 2 February 2021 9:01:58 am



"cloud seeding"

Daily update · February 1, 2021

NEWS

[Cloud seeding halted as Kinneret rose 27 cm in January](#)

Globes

The Israel Water Authority and Mekorot have announced that they have halted **cloud seeding** due to the high level of the Kinneret (Sea of Galilee).



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[Cloud-seeding System Market Report 2025: Ice Crystal Engineering, Agni Aviation, IPTN North ...](#)

Iran Independent News Service

The **Cloud-seeding** System market report majorly offers an understanding about the major drivers, challenges, restraints, competitive landscape, ...



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[Global Cloud-seeding System Market 2020: Growth, Latest Trend Analysis and Forecast 2025](#)

The Bisouv Network

Global **Cloud-seeding** System Market 2020: Growth, Latest Trend Analysis and Forecast 2025.
3 min read. 1 second ago husain.



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[Anderson Ranch Dam](#)

AGInfo Ag Information Network Of The West

The Cooperative **Cloud Seeding** Program has operations in the Upper Snake, Wood, and Boise River basins and is funded by the Board, Idaho Power ...



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[Cloud Seeding Machines Market: Know about Impact of Covid-19 by Top Companies like ...](#)

Jumbo News

The Global **Cloud Seeding** Machines Market research report covers the profiles of major players in the market: Weather Modification; North American ...



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Industrial Gas Handling Equipment Market Size, Growth Drivers, Opportunities, Geography Trends ...

Jumbo News

Cloud Seeding Machines Market: Know about Impact of Covid-19 by Top Companies like – Weather Modification, North American Weather ...



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"cloud seeding"

Daily update · January 29, 2021

NEWS

[Global Cloud Seeding Equipment Market To Reach A New Threshold of Growth By 2026](#)

Murphy's Hockey Law

Key players of the global **Cloud Seeding** Equipment market are studied on the basis of gross margin, price, revenue, corporate sales, and production.

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[Five unusual technologies for harvesting water in dry areas](#)

Phys.Org

Fog water collection projects have been implemented in different parts of world, including Chile, Eritrea, Israel and Oman. **Cloud seeding**. Under the right ...

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[Five unusual technologies for harvesting water in dry areas](#)

The Mandarin

Cloud seeding. Under the right conditions, rain enhancement through **cloud seeding** has the potential to increase the volume of water harvesting from air ...

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[Scientists Want to Fight Climate Change by Blocking the Sun With Dust](#)

Singularity Hub

From building an underwater wall 120 kilometers long to try to save a glacier to **cloud seeding** an area three times the size of Spain to increase rainfall, ...

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[St-Emilion to get hail defence 'launch' system](#)

decanter.com

... but the collective St-Emilion system uses helium balloons and revolves around a technique called '**cloud seeding**'. Radar provides an early warning ...

Flag as irrelevant

[Cloud Seeding Equipment Market to Witness Steady Expansion During 2019 to 2027](#)

SoccerNurds

The recent research report published by Market Expertz on the Global **Cloud Seeding** Equipment Market offers thorough analysis of the essential ...



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[Global experts convene for fifth International Rain Enhancement Forum](#)

WAM EN

The sessions facilitated productive discussions among the prominent **cloud-seeding** experts in attendance from across the globe and high-level ...



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[Fifth International Rain Enhancement Forum convenes top global experts in rain enhancement ...](#)

ZAWYA

... agencies, the sessions facilitated productive discussions among the prominent **cloud-seeding** experts in attendance from across the globe.



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[Weather Modification Combustion Equipment Market Size, Growth Factor, Key Players, Regional ...](#)

NeighborWebSJ

Cloud Seeding Artificial Flood Control Artificial Fog Elimination Artificial Weakening of Typhoons Artificial Suppression of Lightning Artificial Frost ...



Flag as irrelevant

[Five unusual technologies for collecting water in dry areas](#)

BollyInside

Mistwater harvesting projects have been implemented in different parts of the world, including Chile, Eritrea, Israel and Oman. **Cloud seeding**. In the right ...



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"cloud seeding"

Daily update · January 28, 2021

NEWS

[Deputy director remanded](#)

The Herald

Bidders had to provide two aircraft with twin engines with full-propeller, air frame de-icing, **cloud-seeding**, flare dispenser and two-way communication ...



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[Five unusual technologies for harvesting water in dry areas](#)

Yahoo Eurosport UK

Cloud seeding. Under the right conditions, rain enhancement through **cloud seeding** has the potential to increase the volume of water harvesting from ...



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[Zimbabwe: Govt Official in Planes Tender Storm](#)

AllAfrica.com

Senior Court Reporter. A senior civil servant who recommended that a **cloud-seeding** tender be awarded to a company with faulty planes unsuitable ...



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[Senior Government Official Nabbed For 'Faulty Planes Tender Scam'](#)

iharare.com

... government award a **cloud seeding** tender to a company that had two faulty ... in Harare and Bulawayo for the purposes of national **cloud-seeding**.



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"cloud seeding"

Daily update · January 27, 2021

NEWS

[Impact Of Covid 19 On **Cloud-seeding** System Market 2020 Industry Challenges, Business ...](#)

NeighborWebSJ

"arcognizance.com" has added latest research report on "Global **Cloud-seeding** System Market", this report helps to analyze top manufacturers, ...

Flag as irrelevant

[Global **Cloud-seeding** System Market Top Players By 2026: Ice Crystal Engineering, Agni Aviation ...](#)

Murphy's Hockey Law

A new report on global **Cloud-seeding** System market assessing various business strategies, cost stratification, raw material sourcing, manufacturing ...

Flag as irrelevant

[Saudi Arabia Building 100-Mile-Long "Linear" City](#)

Architectural Digest

According to The Wall Street Journal, even the region's stark landscape would be transformed, with **cloud-seeding** machines, glow-in-the-dark sand, ...

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[Govt official in planes tender storm](#)

The Herald

A senior civil servant who recommended that a **cloud-seeding** tender be awarded to a company with faulty planes unsuitable for the purpose has been ...

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[Global **Cloud Seeding** Machines Market 2021-2025: New Business Ideas and Development ...](#)

SoccerNurds

Global **Cloud Seeding** Machines Market 2021-2025: New Business Ideas and Development Strategies By Top Companies NOOESIS, AlternaScript, ...

Flag as irrelevant

[Fifth International Rain Enhancement Forum debates key water security issues](#)

WAM EN

It examined a host of topics including the application of nanotechnology for developing novel **cloud seeding** materials, the study of the effects of ...



Flag as irrelevant

[Cloud Seeding Equipment Market Research Report Including SWOT Analysis, PESTELE Analysis ...](#)

Jumbo News

New Jersey, United States,- **Cloud Seeding** Equipment Market research report offers in-depth research and analysis of the key aspects of the **Cloud** ...



Flag as irrelevant

[Dirgantara Delivers First NC212i Plane to Defense Ministry](#)

Jakarta Globe

... photography and **cloud seeding** in artificial rainmaking and the last one for navigation training," Dirgantara's production director Ridlo Akbar said.



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"cloud seeding"

Daily update · January 26, 2021

NEWS

[Cloud Seeding Equipment Market SWOT Analysis, Outlook, By Top Key Players Weather ...](#)

NeighborWebSJ

Cloud Seeding Equipment Market SWOT Analysis, Outlook, By Top Key Players Weather Modification, Inc. North American Weather Consultants, Inc.

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[Idaho Water Resource Board takes key steps toward raising Anderson Ranch Dam to create ...](#)

Post Register

Approved funding for Phase II of an analysis on **cloud-seeding** benefits. The Cooperative Cloud Seeding Program has operations in the Upper Snake, ...

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[MINISTRY OFFICIAL IN CLOUD SEEDING TENDER SCAM](#)

NewsdzeZimbabwe

... of unprocedurally awarding a local company tender to supply aircrafts to the ministry for **cloud-seeding** in Harare and Bulawayo when he was aware ...

Flag as irrelevant

[Global Cloud Seeding Machines Market Top Manufacturers: Weather Modification, North American ...](#)

Jumbo News

Global **Cloud Seeding** Machines Market: Introduction. The report is an agile, wholesome, comprehensive, and professional expert guide to propel ...

Flag as irrelevant

[Experts discuss key issues at International Rain Enhancement Forum](#)

WAM EN

Sufian Farrah, Meteorologist and **Cloud Seeding** Expert at NCM, Prof István Geresdi from the University of Pécs in Hungary, and Dr. Roelof Bruintjes, ...

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JUST IN: Tourism Ministry official in court

The Herald

... to the ministry for **cloud-seeding** in Harare and Bulawayo when he was aware that the said aeroplanes had no fitness certificates and could not carry ...



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Rain 'produced' trying to solve drought in Curitiba

Somag News

... in quarries, the concessionaire from Paraná contracted specialized aerial rain-inducing services located with **cloud seeding** in the SAIC region.



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"cloud seeding"

Daily update · January 17, 2021

NEWS

[China plays rainmaker with modified drone flights](#)

The Guardian

China's **cloud seeding** operations with Ganlin drones may provide more data and settle the debate for good. Topics. Drought · Weatherwatch · Climate ...

Flag as irrelevant

[2021 will be defined by the more long-term crisis facing humanity: Climate change](#)

Modern Diplomacy

The technique, known as **cloud-seeding**, uses silver iodide and liquid nitrogen to thicken water droplets in the cloud, leading to increased rain or ...

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[Travel Wishlist – Celebs and footballers have been flocking to Dubai, here's why we should one ...](#)

The Scotsman

... skirt sun loungers to comb sand on the beaches of man-made islands; and even rain can be produced on cue through the process of **cloud seeding**.

Flag as irrelevant

[China's Tech Advancements Pose Threat to US Security](#)

Newsmax

... computing, artificial intelligence, and **cloud seeding** that could be weaponized against the U.S. and any other country China views as an adversary.

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"cloud seeding"

Daily update · January 14, 2021

NEWS

[Snowpack panic: Dry winter steering region toward drought crisis](#)

The Herald Journal

Winter **cloud seeding** is known to add about 15% to Utah's annual snowpack, but without proper weather conditions for seeding, even that contributing ...

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[Global **Cloud-seeding** System Market Research Report 2020 | Ice Crystal Engineering, Agni ...](#)

The Pinstripe Empire

The **Cloud-seeding** System Market is scrutinized in terms of market size, market share, status, trends, competitive scenario, and potential growth ...

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[Cloud Seeding Equipment Market Report | Business Opportunities, Key Strategies and Drivers ...](#)

SoccerNurds

Cloud Seeding Equipment Market Insights: Incorporated with Info-graphics, charts, 35 tables and 55 figures, this 177-page research report "**Cloud** ...

Flag as irrelevant

[Global **Cloud-seeding** System Market 2020 Set To See Future Growth till 2024: Key Contributors ...](#)

SoccerNurds

"In this dedicated research report on the Global **Cloud-seeding** System Market experts at Orbis Research focus on lending report readers through a ...

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[Global **Cloud Seeding** Equipment Market 2025 Current as Well as the Future Challenges: Weather ...](#)

SoccerNurds

Based on these versatile information sets, market players in global **Cloud Seeding** Equipment market can effectively deliver remunerative business ...



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Turkey faces water crisis during dry winter

Telegraph.co.uk

... the controversial weather control technique of **cloud seeding**. But Istanbul mayor Ekrem Imamoglu has urged patience and a conservative approach.



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Agriculture Robots Market Overview, Cost Structure Analysis, Growth Opportunities and Forecast to ...

SoccerNurds

Robots have wide applications in agriculture, which includes soil analysis, **cloud seeding**, weed control, planting seeds, environmental monitoring, ...



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"cloud seeding"

Daily update · January 12, 2021

NEWS

[Cloud Seeding Equipment Market Research Methodology, Industry Outlook, Technology Overview ...](#)

The Courier

Summary of the **Cloud Seeding** Equipment Market Report. Decisive Markets Insights has published a recent report on global market covering the ...

[Global **Cloud-seeding** System Market Research 2020-2025, New Advancements, Consumer ...](#) -

SoccerNurds

[Full Coverage](#)

Flag as irrelevant

[Global **Cloud-seeding** System Market Analysis highlights the impact of Covid-19 \(2020-2025\) | Top ...](#)

NeighborWebSJ

According to the report published by Zeal Insider, the "Global **Cloud-seeding** System Share, Forecast Data, In-Depth Analysis, And Detailed Overview, ...

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[Can China control the weather?](#)

Bangkok Post

Mastering the weather might seem like a lofty dream to some, but China has been using **cloud seeding** and other technologies for decades to produce ...

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"cloud seeding"

Daily update · January 9, 2021

NEWS

[Cloud-seeding System Market \(Covid-19 Analysis\) SWOT Analysis, Key Indicators, Forecast 2028 ...](#)

SoccerNurds

The Global **Cloud-seeding** System Market research report covers the profiles of major players in the market: Ice Crystal Engineering; Agni Aviation; IPTN ...



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"cloud seeding"

Daily update · January 8, 2021

NEWS

[Cloud-seeding System Market Future Analysis by Key Players, Trends, Size, Share and Forecast ...](#)

KSU | The Sentinel Newspaper

The global **Cloud-seeding** System market research report offers an in-depth analysis of the latest developments, market size, status, upcoming ...

Flag as irrelevant

[How China Is Using A UAV To Help Change The Weather](#)

Simple Flying

The **cloud seeding** process can be categorized into two aspects – aerial and ground-based. The aerial **cloud seeding** procedure involves transferring ...

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[Global Cloud Seeding Machines Market Growing at Steady CAGR to 2020-2026 | Weather ...](#)

NeighborWebSJ

This includes key trends, segmentation analysis, and recent **Cloud Seeding** Machines industry statistics. The report further covers the extensive analysis ...

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"cloud seeding"

Daily update · December 31, 2020

NEWS

[Global **Cloud-seeding** System Market 2020: Demand, Key Driven Factors, Market Scenario, Top ...](#)

Factory Gate

Global **Cloud-seeding** System Market 2020: Demand, Key Driven Factors, Market Scenario, Top Manufacturers Analysis Overview 2026.



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"cloud seeding"

Daily update · December 22, 2020

NEWS

[Global Cloud Seeding Machines Market Growing at Steady CAGR to 2020-2026 | Weather ...](#)

Factory Gate

This includes key trends, segmentation analysis, and recent **Cloud Seeding** Machines industry statistics. The report further covers the extensive [...] “ The ...

Flag as irrelevant

[China's readiness for climate war with the world by regaining control over nature!](#)

FLA News

Cloud seeding technology for artificial rain is not new. It has been used for decades. Under this, small amounts of silver iodide are implanted in the rain.

Flag as irrelevant

[Global Cloud-seeding System Market 2020: Growth, Latest Trend Analysis and Forecast 2025](#)

BIZNEWS

& More. Product Type Coverage (Market Size & Forecast, Major Company of Product Type etc.):
Static **Cloud Seeding** Dynamic **Cloud Seeding**

Flag as irrelevant

[Global Cloud Seeding Machines Market 2020 Industry Key Players, Trends, Sales, Supply ...](#)

The Monitor

“The market report on global **Cloud Seeding** Machines market serves as a requisite tool to understand and assess various facets of the market to ...

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[Cloud Seeding Equipment Market Size 2020: Application, Regional Outlook, Growth, Competitive ...](#)

The Monitor

Based on the analysis of the historical growth and current scenario of the **Cloud Seeding**

Equipment market, the report aims to provide actionable ...



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[Cloud Seeding Machines Market is Rising Amid Uncertain Economic Outlook: Understand Market ...](#)

The Monitor

New Jersey, United States: Verified Market Research recently released a research report titled “**Cloud Seeding** Machines Market Report 2020”.



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[China Expands Weather Modification Programme](#)

Magazine 99

The process of **cloud seeding** is being used by the country to bring in agricultural development. It is known to have one of the best weather modification ...



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[China To Expand Weather Modification Programme By 2025](#)

Saratoga Wire

After the US invented the **Cloud seeding** method China adopted and implemented the method more effectively to carry out agricultural development in ...



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[Field Device Management Market Size 2020: Application, Regional Outlook, Growth, Competitive ...](#)

The Monitor

Cloud Seeding Equipment Market, By Mode of Seeding. Ground-Based **Cloud Seeding** Equipment o Flare Trees o Manual Ground Based Generator



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"cloud seeding"

Daily update · December 10, 2020

NEWS

[Cloud Seeding Machines Market, Share, Growth, Trends and Forecast to 2025: Market Study Report](#)

GroundAlerts.com

The **Cloud Seeding** Machines market report is an extensive analysis of this business sphere, that has been touted to be one of most profitable ...

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[Issue of the day: China's bid to take charge of the weather](#)

HeraldScotland

"**Cloud seeding**" aims to try and create good weather conditions for a variety of reasons, ranging from aiding crops or to preventing natural disasters. The ...

Flag as irrelevant

[China will introduce a new weather modification system by 2025](#)

Skymet Weather

The study found that **cloud seeding** works, which creates practice for snowfall. China has not stopped investing technology into the weather. Between ...

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[LETTERS: Reason for the Christmas season](#)

Colorado Springs Gazette

Drought and **cloud seeding**. I would like to comment on your article on **cloud seeding**. I served on the State water commission for 17 years as chairman ...

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[Cloud Seeding Equipment Market Size Growth Forecast 2020 to 2025](#)

News by aeresearch

this report is highly predictive as it holds the over all market analysis of topmost companies into the **Cloud Seeding** Equipment industry. With the ...

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[Old Man Winter Practicing Social Distancing \(from Minnesota\)](#)

Minneapolis Star Tribune

China has frequently made use of **cloud seeding** technologies to relieve droughts or clear the air ahead of major international events. It has also been ...

Flag as irrelevant

[Master of weather? China in drive to advance rain-making tech](#)

South China Morning Post

A Chinese soldier loads **cloud-seeding** shells during a weather modification mission in northern Shanxi province in February 2011. Photo: Xinhua.

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[Cloudy weather across the UAE, rain in Sharjah, Umm Al Quwain and Ras Al Khaimah](#)

Gulf News

An NCM official told Gulf News on Wednesday evening that **cloud seeding** flights were regularly being dispatched to enhance rain in the region, after ...

Flag as irrelevant

[UAE weather: Overcast skies, light rain in Dubai, Sharjah, Ajman, Umm Al Quwain, Ras Al ...](#)

Gulf News

An NCM official said that **cloud seeding** was conducted to enhance rainfall in the region. Published: December 09, 2020 17:06 Evangeline Elsa, Social ...

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"cloud seeding"

Daily update · December 5, 2020

NEWS

[China is massively expanding its weather-modification program, saying it will be able to cover half ...](#)

Business Insider

"**Cloud seeding**" involves spraying chemicals like silver iodide or liquid nitrogen into clouds, where water droplets condense and fall. Visit Business ...

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[Global **Cloud-seeding** System Market 2020: Growth, Latest Trend Analysis and Forecast 2025](#)

Birmingham Alive

Global **Cloud-seeding** System Market 2020: Growth, Latest Trend Analysis and Forecast 2025. husain December 4, 2020. This report also covers ...

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[Pfizer's chairman says it's not clear whether people who are vaccinated can still spread COVID-19](#)

Business Insider India

"**Cloud seeding**" involves spraying chemicals like silver iodide or liquid nitrogen into clouds, where water droplets condense and fall. China is massively ...

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[China Threatens India With A Weather Modification System Than Is 1.5 Times Larger Than India](#)

EurAsian Times

Cloud seeding isn't new and has been used in different countries for decades. It works by injecting small amounts of silver iodide and chloride salts ...

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"cloud seeding"

Daily update · December 4, 2020

NEWS

[China ramps up efforts to control weather with HUGE 'cloud seeding' operation](#)

Daily Express

China ramps up efforts to control weather with HUGE '**cloud seeding**' operation. CHINA is due to ramp up its efforts to artificially control the weather after ...

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[China to expand weather modification program to cover area larger than India](#)

KCTV Kansas City

As a concept, **cloud seeding** has been around for decades. It works by injecting small amounts of silver iodide into clouds with a lot of moisture, which ...

Flag as irrelevant

[China plans rapid expansion of 'weather modification' efforts](#)

The Guardian

The decision, announced by the cabinet on Wednesday night, would increase fivefold the world's biggest **cloud-seeding** operation, which already ...

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[Cloud Seeding System Market Insights By Growth, Opportunities, Trends, Drivers, Challenges ...](#)

Cheshire Media

CRIFAX added a report on 'Global **Cloud Seeding** System Market, 2020-2028' to its database of market research collaterals consisting of overall ...

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[Let there be light! China's rulers are rising to become the sun gods](#)

The Times

It uses **cloud seeding** technologies to induce rain in arid areas, increase crop production and protect crops from hailstorms. As well as trying to reduce ...

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Cloud Seeding Equipment Market Size, Share, Ongoing Trends, Competitive Insights and Forecast ...

Khabar South Asia

Verified Market Research have recently published a new report on the global **Cloud Seeding** Equipment market. The study provides profound insights ...



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'Beware China!' Beijing developing intercontinental missiles that could reach whole world

Daily Express

READ MORE: China ramps up efforts to control weather with '**cloud seeding**'. US Navy shoots down Chinese missiles (Image: US Navy) ...



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"cloud seeding"

Daily update · December 2, 2020

NEWS

[Cloud-seeding System Market Statistics and Research Analysis Latest Industry Report 2020 ...](#)

Murphy's Hockey Law

"**Cloud-seeding** System Market is growing at a XX% CAGR during the forecast period 2020-2026. The growing interest of the individuals in this ...



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[Global Cloud Seeding Machines Market Expected to Reach Highest CAGR By 2026: Weather ...](#)

The Haitian-Caribbean News Network

This all-inclusive reference guide on Global **Cloud Seeding** Machines Market is a ready-to-use investment documentation to design and deploy ...



Flag as irrelevant

[Cloud Seeding Machines Market Size, Share, Statistics, Trends, Demand and Revenue, Forecast ...](#)

The Haitian-Caribbean News Network

New Jersey, United States: Market Research Intellect has added a new report to its huge database of research reports, entitled "**Cloud Seeding** ...



Flag as irrelevant

[Latest Research on Cloud Seeding Equipment Market | Competitors Analysis Report 2020](#)

The Haitian-Caribbean News Network

The global **Cloud Seeding** Equipment industry is poised to witness substantial growth during the projected timeframe, demonstrating a robust CAGR of ...



Flag as irrelevant

[Indirect Calorimeter Market Analysis Investigation Growth by Top Companies, consumption by ...](#)

The Haitian-Caribbean News Network

Gauging through Scope: Global **Cloud Seeding** Machines Market, 2020-26 This all-inclusive

reference guide on Global **Cloud Seeding** Machines Market ...



Flag as irrelevant

[Weather Modification Combustion Equipment Market Size 2020 Demand, Global Trend, News ...](#)

Canaan Mountain Herald

... Modification Combustion Equipment market from 2015 to 2025 is primarily split into: **Cloud Seeding** Artificial Flood Control Artificial Fog Elimination



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"cloud seeding"

Daily update · November 24, 2020

NEWS

[Cloud Seeding Market 2020-28 era of inducing artificial rain with the help of chemicals| Key ...](#)

openPR

Cloud seeding works by artificially encouraging clouds to produce rain. One method involves air-planes fitted with flares loaded with salt crystals ...



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[Global Cloud-seeding System Market 2020: Growth, Latest Trend Analysis and Forecast 2025](#)

Birmingham Alive

Global **Cloud-seeding** System Market 2020: Growth, Latest Trend Analysis and Forecast 2025. husain November 23, 2020. This report also covers ...



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[Cloud-seeding System Market to witness an impressive growth during the forecast period 2020 ...](#)

Express Journal

The recent study report on **Cloud-seeding** System market aims to provide an end-to-end analysis of this industry vertical with respect to drivers, ...



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"cloud seeding"

Daily update · November 21, 2020

NEWS

[Depressing Study Shows a Big Issue With Using Cloud Seeding to Solve Global Warming](#)

ScienceAlert

If the world's carbon emissions continue to rise unfettered, we will trigger a much larger cascade of warming – **cloud seeding** or no. "Hence, elevated ...



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[Employing breakthrough technologies to create a water and food-secure UAE](#)

Khaleej Times

In conjunction with the UAE's successful **cloud-seeding** initiative, Dake Rechsand's IDER range of pavers and kerbstones can optimally harvest ...



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"cloud seeding"

Daily update · November 19, 2020

NEWS

[CLOUD SEEDING MACHINES MARKET TO GROW WITH HUGE CAGR BY 2025 | MAJOR ...](#)

TechnoWeekly

The report not only explores the historic phase of the market, but also analyzes present **Cloud Seeding** Machines market status to provide reliable and ...

Flag as irrelevant

[Global **Cloud-seeding** System Market Top Players By 2026: Ice Crystal Engineering, Agni Aviation ...](#)

The Think Curiouser

Global **Cloud-seeding** System Market Top Players By 2026: Ice Crystal Engineering, Agni Aviation, IPTN North America, Snowy Hydro etc. Post author ...

Flag as irrelevant

[Cloud Seeding Equipment Market SWOT Analysis, by Top Manufacturers: Weather Modification ...](#)

Royal Sutton News

The major market players are estimated on various factors such as company overview, product selection, and revenue of **Cloud Seeding** Equipment. The ...

Flag as irrelevant

[Sales Of Cuprous Iodide Market To Grow At Robust Cagr During 2020 – 2026](#)

re:Jerusalem

Inorganic and Biochemical Synthesis; **Cloud Seeding**; Polymer Additive; Adsorbent; Semiconductor and battery manufacturing. On the basis of ...

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"cloud seeding"

Daily update · November 13, 2020

NEWS

[James Spann: Dry period for Alabama, with just a few isolated showers Sunday](#)

Alabama NewsCenter

ON THIS DAY IN 1946: General Electric scientists produced snow in the Massachusetts Berkshires in the first modern-day **cloud-seeding** experiment.



Flag as irrelevant

[Stormy weekend, nicer next week](#)

WAOW

1946 - General Electric scientists produced snow in the Massachusetts Berkshires in the first modern day **cloud seeding** experiment. (The Weather ...



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"cloud seeding"

Daily update · November 12, 2020

NEWS

[Global Cloud Seeding Machines Market Top Manufacturers: Weather Modification, North American ...](#)

PRnews Leader

Gauging through Scope: Global **Cloud Seeding** Machines Market, 2020-26. Augmented by various supportive market forces and elements, the global ...

Flag as irrelevant

[Global Cloud Seeding Machines Market Top Manufacturers: Weather Modification, North American ...](#)

Royal Sutton News

Global **Cloud Seeding** Machines Market: Introduction. The recently added research report has been meticulously conceived and presented to render a ...

Flag as irrelevant

[Forecasters share encouraging powder prediction](#)

Idaho Mountain Express and Guide

Six **cloud-seeding** generators between Hailey and Fairfield expel silver iodide vapor into the atmosphere, reaping additional snowfall for the Wood ...

Flag as irrelevant

[Competitive Scenario of Cloud Seeding Machines Market Growth, Size, Demand, Forecast with ...](#)

Adify Media News

The global **Cloud Seeding** Machines market is anticipated to rise at a considerable rate during the forecast period, between 2020 and 2026. In 2020, the ...

Flag as irrelevant

[Global Weather Modification Combustion Equipment Market Research Report 2020 | Belfort ...](#)

BCFocus

Cloud Seeding, Artificial Flood Control, Artificial Fog Elimination, Artificial Weakening of Typhoons, Artificial Suppression of Lightning, Artificial Frost ...



Flag as irrelevant

Company Profiles and Key Figures of Global Agricultural Robots and Mechatronics Market ...

Market Research Newspaper

Emerging applications of robots or drones in agriculture include weed control, **cloud seeding**, planting seeds, harvesting, environmental monitoring ...



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"cloud seeding"

Daily update · November 10, 2020

NEWS

[Cloud Seeding Equipment Market : share forecast to witness considerable growth from 2020 to 2028](#)

Eurowire

Cloud seeding is a weather modification process which involves dropping of chemical agents into clouds to cause rain. Silver iodide, dry ice and even ...



Flag as irrelevant

[Global **Cloud-seeding** System Market Top Players By 2026: Ice Crystal Engineering, Agni Aviation ...](#)

ICOTodayMagazine

The latest report presentation on Global **Cloud-seeding** System market portrays a detailed analytical review of the market spectrum across both historical ...



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"cloud seeding"

Daily update · November 9, 2020

NEWS

[Watch: Rain and cloud seeding in Abu Dhabi, Dubai, Ras al Khaimah and other parts of UAE](#)

Gulf News

The clouds will move over the internal parts of the country and will cause rainfall." The NCM is also conducting **cloud seeding** operations to enhance ...



Flag as irrelevant

[Cloud Seeding Machines Market Size, Drivers, Potential Growth Opportunities, Competitive ...](#)

Eurowire

The Global **Cloud Seeding** Machines Market is showing positive signs of growth. With the current COVID-19 pandemic scenario, new business ...

[Global Cloud-seeding System Market Top Players By 2026: Ice Crystal Engineering, Agni Aviation ... - The Think Curiouser](#)
[Full Coverage](#)



Flag as irrelevant

[Cloud Seeding Equipment Market Size 2020 By Product Types, End-Users, Regional Outlook ...](#)

PRnews Leader

The latest report, titled "**Cloud Seeding** Equipment Market" released by Market Research Intellect, provides the reader with a comprehensive overview ...



Flag as irrelevant

[Global Cloud Seeding Machines Market Top Manufacturers: Weather Modification, North American ...](#)

ICOTodayMagazine

A newly compiled research report presentation on global **Cloud Seeding** Machines market is aimed to unfurl veritable details about growth prognosis ...



Flag as irrelevant

[Global Cloud Seeding Equipment Market 2025 Current as Well as the](#)

[Future Challenges: Weather ...](#)

ICOTodayMagazine

Introduction: Global **Cloud Seeding** Equipment Market, 2019-25. This meticulous research representation highlighting crucial elements across present ...



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[Cloud Seeding Equipment Market 2020 Size, Share, Trends, Growth And Outlook With Company ...](#)

Stock Market Vista

The Global **Cloud Seeding** Equipment Market is one of the most promising market segments in the past decade. With the inclusion of world-class ...



Flag as irrelevant

[Normal to above-normal snowpack predicted](#)

LocalNews8.com

Idaho Power reported operating **cloud-seeding** generators at numerous remote stations last winter. Those included 25 remote and 25 manual stations ...



Flag as irrelevant

[Readers pictures: Rain and overcast skies in Dubai, Sharjah and other parts of the UAE](#)

Gulf News

While the environmental conditions are conducive to stormy weather, the UAE is also undertaking a **cloud-seeding** programme at the moment.



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"cloud seeding"

Daily update · November 6, 2020

NEWS

[Cloud Seeding Equipment Market current and future demand 2027 | Weather Modification, Inc ...](#)

Zenit News

COVID-19 Impact on Global **Cloud Seeding** Equipment Market Professional Survey Research Report 2020-2027. Overview Paragraph. Starting with ...

Flag as irrelevant

[Global Cloud-seeding System Market Top Players By 2026: Ice Crystal Engineering, Agni Aviation ...](#)

The Daily Philadelphian

This newly added research report of Global **Cloud-seeding** System Market analytical report included in the fast growing online repository is a ...

Flag as irrelevant

[Blockchain For Non-Profits Market | Covid19 Impact Analysis | Cost Analysis, Strategy and Growth ...](#)

The Think Curiouser

Global **Cloud Seeding** Machines Market Expected to Reach Highest CAGR By 2026: Weather Modification, North American Weather Consultants, ...

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"cloud seeding"

Daily update · November 5, 2020

NEWS

[Cloud Seeding Equipment Market Is Poised To Achieve Continuing Growth During Forecast Period ...](#)

Eurowire

With the COVID-19 pandemic, many industries are transforming rapidly. The Global **Cloud Seeding** Equipment Market is one of the major industries ...

Flag as irrelevant

[Cloud Seeding Equipment Market Biggest Demand with Growth, Forthcoming Developments and ...](#)

PRnews Leader

The global **Cloud Seeding** Equipment Market likely to grow over a CAGR of 7.3% during the forecast period 2019-2024 and generate a revenue of ...

Flag as irrelevant

[Cloud-seeding System Market Future Scope including key players Ice Crystal Engineering, Agni ...](#)

KYT24

Our report will be revised to address COVID-19 Post pandemic effects on the Global **Cloud-seeding** System Market. Click to get Global **Cloud-seeding** ...

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[Global Cloud Seeding Machines Market Expected to Reach Highest CAGR By 2026: Weather ...](#)

The Think Curiouser

Gauging through Scope: Global **Cloud Seeding** Machines Market, 2019-25. Augmented by various supportive market forces and elements, the global ...

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[Cloud Seeding Machines Market 2020 Top Industry Players, Regional Study, Growth Drivers ...](#)

The Think Curiouser

Cloud Seeding Machines Market 2020 Top Industry Players, Regional Study, Growth Drivers,

Challenges and Opportunities by 2025. Post author By ...



Flag as irrelevant

November 5: ON THIS DAY in 1952, Eisenhower landslide leaves Dems reeling

Brooklyn Daily Eagle

Shandaken, a Catskills community, has asked for \$167,150 by alleging that Howell's **cloud-seeding** started 'a violent precipitation of rain resulting in ...



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"cloud seeding"

Daily update · November 1, 2020

NEWS

[Cloud-seeding System Market to Generate Huge Revenue in Industry by 2024](#)

Eurowire

The Global **Cloud-seeding** System for Covid-19 2020 Market Research Report is a professional and in-depth study on the current state of ...



Flag as irrelevant

[Cloud Seeding Machines Market : Industry Analysis, Growth rate, and Future Forecast 2020-2026](#)

Bipartisan Millennial

Comprehensive quantitative and qualitative research on **Cloud Seeding** Machines Market. According to the current market state, this report has been ...



Flag as irrelevant

[Global Cloud Seeding Machines Market Analysis, Company Profile, Future Estimations by 2027 ...](#)

The Courier

Global **Cloud Seeding** Machines Market Analysis, Company Profile, Future Estimations by 2027 : Weather Modification, North American Weather ...



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"cloud seeding"

Daily update · October 29, 2020

NEWS

[Cloud Seeding Equipment Market Regional Analysis, key Drivers and Restraints, by Product, Top ...](#)

re:Jerusalem

Oct 2020, Latest release from WMR -“**Cloud Seeding** Equipment Market” Research Report 2020-2027 (by Product Type, End-User/Application, and ...

Flag as irrelevant

[Global Cloud Seeding Machines Market Expected to Reach Highest CAGR By 2026: Weather ...](#)

PRnews Leader

Predicting Growth Scope: Global **Cloud Seeding** Machines Market. Unbiased research initiatives offer relevant cues on the impressive market ...

Flag as irrelevant

[Cloud Seeding Equipment Market Size 2020, Growth, Trends, Share, Key Manufacturers, Product ...](#)

TechnoWeekly

The latest report, titled “**Cloud Seeding** Equipment Market” released by Market Research Intellect, provides the reader with a comprehensive overview of ...

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[Cloud Seeding Equipment Market Research Report Covers – Product Types, Applications, Market ...](#)

Bipartisan Millennial

New Jersey, United States,- The **Cloud Seeding** Equipment Market Size And Forecast to 2027. The report, titled **Cloud Seeding** Equipment Market ...

Flag as irrelevant

[Cloud Seeding Equipment Market 2020 | Know the Latest COVID19 Impact Analysis And ...](#)

The Think Curiouser

Cloud Seeding Equipment Market is anticipated to discover Robust Growth by 2026. This report

focuses on the leading key players with global ...



Flag as irrelevant

[Cloud Seeding Machines Market is Set to Grow Due to Increasing Demand-Says QYResearch](#)

Weekly Wall

From the nature of competition to future changes in the vendor landscape, the report provides in-depth analysis of the competition in the global **Cloud** ...



Flag as irrelevant

[Cloud-seeding System Market Size, Business Share | Growth Rate 2020 Demand Status, Revenue ...](#)

Absolute News Journal

Cloud-seeding System Market 2020 Industry Research Report is a professional and in-depth study on the current state of the Global **Cloud-seeding** ...



Flag as irrelevant

[National Center of Meteorology hosts virtual panel discussion as part of WETEX 2020](#)

WAM EN

It also took stock of the progress made so far in the use of nanotechnology to develop **cloud seeding** materials for enhanced rain droplet formation.



Flag as irrelevant

[Global Agriculture Robots Market Report to Examine Manufacturing Cost Analysis, Marketing ...](#)

Market Research Newspaper

Emerging applications of robots or drones in agriculture include weed control, **cloud seeding**, planting seeds, ...



Flag as irrelevant

[Tactile Printing Market 2020 Survey by Top Manufacturers: Braille Plus, Lowvision, PIA, Braille ...](#)

Bipartisan Millennial

Cloud Seeding Equipment Market Research Report Covers – Product Types, Applications, Market Share, Market Size, Market Segmentation, Forecast ...



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"cloud seeding"

Daily update · October 20, 2020

NEWS

[Cloud Seeding Machines Assessment Market SWOT Analysis, by Key Players: Weather ...](#)

PRnews Leader

This global **Cloud Seeding** Machines Assessment market report is in place to enable report readers, comprising manufacturers and stakeholders in ...

Flag as irrelevant

[Global Cloud Seeding Machines Market 2020 Top Manufacturers: Weather Modification, North ...](#)

Eurowire

This specifically designed research report offering highlighting current and historical developments in global **Cloud Seeding** Machines market is poised ...

Flag as irrelevant

[Global Cloud-seeding System Market 2020: Growth, Latest Trend Analysis and Forecast 2025](#)

The Think Curiouser

The pandemic caused by Coronavirus (COVID-19) has affected every aspect of life globally, including the business sector. This has brought along ...

Flag as irrelevant

[With recent rains, Greater Taipei water supply adequate until February](#)

Focus Taiwan News Channel

... catchment area since Oct. 8, and the administration carried out **cloud seeding** on Oct. 16 to further boost precipitation in the area, the statement said.

Flag as irrelevant

[Cloud Seeding Equipment Market 2020 Manufacturer Analysis, Emerging Trends, Top Companies ...](#)

Stock Market Vista

Global **Cloud Seeding** Equipment Market is estimated to grow at a CAGR of 6.87% from 2019 to 2026. For top companies in United States, European ...

Flag as irrelevant

[After Covid 19: Cuprous Iodide Market 2020 Industry Share, Size, Consumption, Growth, Top ...](#)

re:Jerusalem

Inorganic and Biochemical Synthesis; **Cloud Seeding**; Polymer Additive; Adsorbent; Semiconductor and battery manufacturing. On the basis of ...

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[Global Cloud Financial Planning and Analysis Solutions Market Expected to Reach Highest CAGR ...](#)

The Think Curiouser

... Global **Cloud Seeding** Machines Market Expected to Reach Highest CAGR By 2026: Weather Modification, North American Weather Consultants, ...

Flag as irrelevant

[Agriculture Robots Market 2020 Size, Share, Trends Analysis Report by Application, Region \(North ...](#)

Aerospace Journal

Emerging applications of robots or drones in agriculture include weed control, cloud seeding, planting seeds, harvesting, environmental ...

Flag as irrelevant

[Cloud Supply Chain Management Market Size, Top Companies, Growth Factors, Market Status ...](#)

Stock Market Vista

Cloud Seeding Equipment Market 2020 Manufacturer Analysis, Emerging Trends, Top Companies and Forecast to 2027 → Electromagnetic Surgical ...

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"cloud seeding"

Daily update · October 19, 2020

NEWS

[What is the UAE's 'rain enhancement' project?](#)

EsquireMe

For those unawares, the UAE's **cloud-seeding** efforts use natural salts such as potassium chloride and sodium chloride (which are totally harmless).



Flag as irrelevant

[Global **Cloud Seeding** Machines Market Forecast by 2026: Weather Modification, North American ...](#)

Zenit News

This newly added research report of Global **Cloud Seeding** Machines Market analytical report included in the fast growing online repository is a well- ...



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"cloud seeding"

Daily update · October 17, 2020

NEWS

[\(2020-2026\) Cloud-seeding System Market Segmentation, Analysis by Recent Trends ...](#)

PRnews Leader

Main players in the **Cloud-seeding** System Global market: Ice Crystal Engineering, Agni Aviation, IPTN North America, Snowy Hydro, ... [Get a PDF ...](#)

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[Cloud Seeding Equipment Market SWOT Analysis, by Top Manufacturers: Weather Modification ...](#)

TechnoWeekly

" The study report offers a comprehensive analysis of **Cloud Seeding** Equipment market size across the globe as regional and country level market size ...

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"cloud seeding"

Daily update · October 15, 2020

NEWS

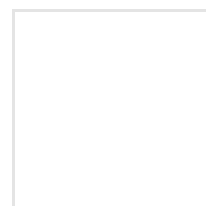
[CNN10 - 10/15/20](#)

CNN

Today's show reports on the balance of power in Congress, the science behind **cloud seeding**, new space research, and a possible slip 'n slide record ...



Flag as irrelevant



[Trending News: Cloud Seeding Equipment Market Overview and Forecast Report 2020-2026 ...](#)

TechnoWeekly

The report titled "**Cloud Seeding** Equipment Market: Size, Trends and Forecasts (2020-2025)", delivers an in depth analysis of the **Cloud Seeding** ...



Flag as irrelevant

[Latest News 2020: Cloud Seeding Machines Market by Coronavirus-COVID19 Impact Analysis ...](#)

TechnoWeekly

The latest **Cloud Seeding** Machines market report estimates the opportunities and current market scenario, providing insights and updates about the ...



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[Cloud Seeding Equipment Market, Share, Growth, Trends And Forecast To 2027: Verified Market ...](#)

Stock Market Vista

A new investigative report from Verified Market Research titled "Global **Cloud Seeding** Equipment Market" offers an in-depth analysis of the **Cloud** ...



Flag as irrelevant

[Global Cloud-seeding System Market 2020: Growth, Latest Trend Analysis and Forecast 2025](#)

TechnoWeekly

& More. Product Type Coverage (Market Size & Forecast, Major Company of Product Type etc.):
Static **Cloud Seeding** Dynamic **Cloud Seeding**



Flag as irrelevant

[Cloud-seeding System Market by Trends, Key Players, Driver, Segmentation, Forecast to 2025](#)

Zenit News

In addition, the report focuses on major obstacles and the latest growth plans adopted by leading companies in this business. The **Cloud-seeding** ...



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[Latest News 2020: Cloud Seeding Equipment Market by Coronavirus-COVID19 Impact Analysis ...](#)

The Think Curiouser

Cloud Seeding Equipment Market analysis is provided for the Global market including development trends by regions, competitive analysis of **Cloud** ...



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[Cloud Supply Chain Management Market \(2020-2027\) | What Recent Study Say About Top ...](#)

Stock Market Vista

Cloud Seeding Equipment Market, Share, Growth, Trends And Forecast To 2027: Verified Market Research · Digital Banking Platform Market, Share, ...



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"cloud seeding"

Daily update · October 12, 2020

NEWS

[Cloud Seeding Equipment Market at a Rapid Growth Pace Until 2027 With Top Companies to ...](#)

re:Jerusalem

The latest release from Database of WM Research, The Global **Cloud Seeding** Equipment Market opportunities and current market scenario, providing ...

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[Cloud Seeding Machines Market 2020, Research Report Covers Updated Data Considering Post ...](#)

TechnoWeekly

The global **Cloud Seeding** Machines market has been comprehensively analyzed and the different companies that occupy a large percentage of the ...

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[Cloud-seeding System Market Size And Forecast \(2020-2026\)| With Post Impact Of Covid-19 By ...](#)

PRnews Leader

Find the complete **Cloud-seeding** System Market analysis segmented by companies, region, type and applications in the report. The report offers ...

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[Tag: #Effect of COVID-19 on Cloud Seeding Machines](#)

TechnoWeekly

Tag: #Effect of COVID-19 on **Cloud Seeding** Machines. **Cloud Seeding** Machines Market 2020, Research Report Covers Updated Data Considering ...

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[Tag: #Covid-19 Impact on Cloud Seeding Machines market growth](#)

TechnoWeekly

Tag: #Covid-19 Impact on **Cloud Seeding** Machines market growth. **Cloud Seeding** Machines Market 2020, Research Report Covers Updated Data ...

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"cloud seeding"

Daily update · October 8, 2020

NEWS

[Dam capacity up but water worries linger](#)

The Star Online

Apparently, the **cloud-seeding** contractor recommended by MetMalaysia – AFJETS – had not received the 'flares' needed for **cloud seeding** from another ...



Flag as irrelevant

[Global Cloud Seeding Equipment Market Growth Opportunities and Forecast to 2024 with COVID ...](#)

Eurowire

Global **Cloud Seeding** Equipment market report lends a complete overview of the market, rendering specific details on market size, technical and ...



Flag as irrelevant

[Teluk Bahang Dam: Cloud seeding necessary](#)

Harakah Daily

GEORGE TOWN – The effective capacity of Teluk Bahang Dam in Penang which rose 6.8 per cent by today, is still in need of **cloud seeding** operations ...



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"cloud seeding"

Daily update · October 7, 2020

NEWS

[Permit renewal sought for Grand Mesa cloud-seeding](#)

The Grand Junction Daily Sentinel

The entity that operates a long-running **cloud-seeding** program aimed at boosting snowfall on Grand Mesa is seeking to have its state permit for the ...



Flag as irrelevant

[Penang's Teluk Bahang Dam capacity remains low despite rainy season](#)

Malay Mail

He said **cloud-seeding** is still needed in the Teluk Bahang and Sungai Pinang Water catchment areas to refill the dam. "This is the only way to refill the ...



Flag as irrelevant

[KVNF Regional Newscast: October 6, 2020](#)

KVNF Public Radio

... Matthew Burge of Paonia on Monday; **Cloud seeding** effort on Grand Mesa seeks permit renewal; Appeals court considers allowing larger religious ...



Flag as irrelevant

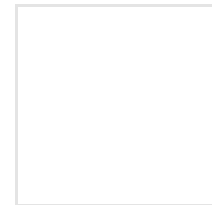
[CW Expert Interview | Chandra Dake on "breathable magic sand"](#)

Construction Week Online

Chandra says: "As **cloud seeding** in the UAE has become more successful, we're getting more rain. However, the rain is either causing flooding ...



Flag as irrelevant



[For food and security in the UAE, think local](#)

Gulf News

On the other hand, while **cloud seeding** has certainly increased the amount of annual rainfall in the UAE, the nation has a limited capacity to harvest ...



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"cloud seeding"

Daily update · October 2, 2020

NEWS

[Cloud Seeding Equipment Market Size 2020 | Analysis, Trends, Top Manufacturers, Growth ...](#)

Crypto Daily

Cloud Seeding Equipment Market Size 2020 | Analysis, Trends, Top Manufacturers, Growth, Statistics, Opportunities and Forecast to 2027.



Flag as irrelevant

[Believe it or not, Trump isn't the first to propose nuking hurricanes](#)

Grist

But the idea of **cloud-seeding** was reborn in 1962 as Project Stormfury, which aimed to weaken hurricanes with silver iodide, ultra-tiny particles of ...



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[Cloud Seeding Equipment Market 2020 Expected to reach highest CAGR in forecast period 2025 ...](#)

Kerrville Breaking News

According to Orbis Research industry statistics, the 'Global **Cloud Seeding** Equipment Market' will inventory a CAGR of about xx% by 2025.



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"cloud seeding"

Daily update · September 24, 2020

NEWS

[UAEREP Tests Efficiency of New Cloud Seeding Nanomaterials in USA](#)

Utilities Middle East

Campaign aims to investigate **cloud seeding** effectiveness of novel nanomaterials developed by Program's 1st cycle awardee following its successful ...

Flag as irrelevant

[Rain in UAE: UAE tests efficiency of new cloud seeding material in Texas](#)

Gulf News

New nanomaterial developed. Prof Zou's project aimed to improve the effectiveness of **cloud seeding** technologies to increase rain precipitation, through ...

Flag as irrelevant

[Cloud Seeding Equipment Market Global Growth, Opportunities, Industry Analysis & Forecast To ...](#)

The Daily Chronicle

The Global **Cloud Seeding** Equipment Market research report provides and in-depth analysis on industry- and economy-wide database for business ...

Flag as irrelevant

[Cloud Seeding Equipment Market \(Covid 19 Impact\) Growth Factors by Demand and Top Players ...](#)

The Market Records

A recent report on the "Global **Cloud Seeding** Equipment Market" Expert Survey 2020 is configured by Manufacturer, Region, Country, Type, and ...

Flag as irrelevant

[August Complex Closing in on 850000 Acres](#)

Redheaded Blackbelt

NPR reported a few weeks ago that **cloud seeding** programs were being carried out in Russia to fight the forest fires there. Reply · Kym Kemp.



Flag as irrelevant

Apple farming in N China embraces long-term sustainability

China.org.cn

Last year, Jixian county invested over 3 million yuan to build five **cloud-seeding** and anti-hail sites, and install 15,000 mu (1,000 hectares) of anti-hail ...



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Date: Wednesday, 16 September 2020 8:11:34 am



"cloud seeding"

Daily update · September 15, 2020

NEWS

[Cloud seeding raises Pantabangan Dam water level](#)

INQUIRER.net

NIA Administrator Ricardo Visaya approved the **cloud-seeding** operation over the dam to raise its stock ahead of the dry crop season. The agency has ...

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[Cloud Seeding Equipment Market 2020 Size, Future Demand, Global Research, Top Leading ...](#)

The Daily Chronicle

The **Cloud Seeding** Equipment Market report is an investigative study of the market, along with an analysis of its key segments. The report is ...

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[Unexpected Growth Seen in Cloud Seeding Equipment Market Global Forecast to 2026 | Ice ...](#)

Kewaskum Statesman News Journal

The **Cloud Seeding** Equipment market growth prospects have been showing great promise all over the world with immense growth potential in terms ...

Flag as irrelevant

[Global Agricultural Robots and Mechatronics Market Trends, Opportunities, Drivers, Challenges ...](#)

Internet Shots

Emerging applications of robots or drones in agriculture include weed control, **cloud seeding**, planting seeds, harvesting, environmental monitoring ...

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"cloud seeding"

Daily update · September 14, 2020

NEWS

[Cloud-seeding over Pantabangan Dam set](#)

Manila Bulletin

Agriculture Secretary William Dar earlier said **cloud-seeding** will ensure a “respectable rice harvest in Central Luzon, particularly in Nueva Ecija, ...



Flag as irrelevant

['More public transport vehicles better than less physical distancing', says Año](#)

Manila Bulletin

Cloud-seeding over Pantabangan Dam set. September 14, 2020, 04:02 PM. by Philippine News Agency. CABANATUAN CITY, Nueva Ecija (PNA) ...



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"cloud seeding"

Daily update · September 10, 2020

NEWS

[Cloud Seeding Equipment Market Size, Share 2020 Global Leading Players, Updates, Future ...](#)

Adify Media News

The global **Cloud Seeding** Equipment market is anticipated to rise at a considerable rate during the forecast period, between 2020 and 2026. In 2020, ...

Flag as irrelevant

[INSIGHTS | The politics of Colorado weather is more predictable](#)

coloradopolitics.com

It also sounds like the brouhaha between Western Kansas and Eastern Colorado just a few years ago, when **cloud-seeding** in the Sunflower State ...

Flag as irrelevant

[Evacuation Order for Areas South of Hwy 36, Along Alderpoint Road, and Down to Mendocino ...](#)

Redheaded Blackbelt

Any possibility that **cloud seeding** may have triggered electrical Storm causing fires, weather modification association uses google maps showed ...

Flag as irrelevant

[Weather Modification Combustion Equipment market outlook world approaching demand growth ...](#)

The PRNews Pulse

Moreover, based on the product type of Weather Modification Combustion Equipment's, **Cloud Seeding**, Artificial Flood Control, Artificial Fog ...

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"cloud seeding"

Daily update · September 9, 2020

NEWS

[Cloud Seeding Equipment Market is Thriving Worldwide 2020 | Trends, Growth and Profit Analysis ...](#)

The Daily Chronicle

New Jersey, United States, The **Cloud Seeding** Equipment Market report 2020 provides a detailed impression, describe the product industry scope ...

Flag as irrelevant

[Cloud Seeding Machines Market to Register Unchangeable Growth During 2019-2026 | Weather ...](#)

SG Research Sphere

This report has been formulated to give our clients the most up to date data on the **Cloud Seeding** Machines Market. Top Companies are covering This ...

Flag as irrelevant

[Cloud Seeding Machines Market to Record Ascending Growth with important companies Weather ...](#)

Galus Australis

This **Cloud Seeding** Machines market research report presents a comprehensive overview, market shares, and growth opportunities of the market by ...

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[Global Cloud Seeding Equipment Market Growth Opportunities and Forecast to 2024 with COVID ...](#)

Bulletin Line

Introduction and Scope: Global **Cloud Seeding** Equipment Market. The various components and growth propellants such as dominant trends, existing ...

Flag as irrelevant

[Cloud-seeding System Market 2020:Key market Insights, Industry Statistics and Facts Helps to ...](#)

Weekly Wall

Los Angeles, United State,The **Cloud-seeding** System market research report added by

QYResearch, is an in-depth analysis of the latest trends, ...



Flag as irrelevant

Global **Cloud Seeding** Machines Market Demands To Boost Industry Growth & Revenue Post ...

Bulletin Line

A Research Report by ORBIS RESEARCH on the Global **Cloud Seeding** Machines Market uses a detailed and a comprehensive method for the ...



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Associate Public Health Engineer at BuroHappold Ashveen Jeetun discusses flash floods in the UAE

MEP MiddleEast

Cloud seeding in the UAE is also bringing an increase of about 30%-35% in annual rainfall.

Related ...



Flag as irrelevant

During Fire Season in California, Breathing Feels Like a Luxury

TIME

... but there has been no **cloud-seeding** technology deployed to make it rain, no giant drone to spray fire retardant across millions of burning acres.



Flag as irrelevant

Regional Updates (09/08/20)

BusinessWorld Online

CLOUD SEEDING operations will soon be undertaken to augment the declining water level of Pantabangan Dam and ensure supply for the irrigation ...



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"cloud seeding"

Daily update · September 1, 2020

NEWS

[The final report will add the analysis of the Impact of COVID-19 in this report **Cloud-seeding** System ...](#)

The Scarlet

Find the complete **Cloud-seeding** System Market analysis segmented by companies, region, type and applications in the report. Market Segment by ...

Flag as irrelevant

[Cloud Seeding Equipment Market to Reflect Significant Growth During 2020?2026 |Weather ...](#)

StartupNG

Cloud Seeding Equipment Market to Reflect Significant Growth During 2020?2026 |Weather Modification, Inc., North American Weather Consultants, Inc.

Flag as irrelevant

[Flying taxis, robot dinosaurs and a drone moon all at Neom, Saudi Arabia's \\$500 billion megacity](#)

DubaiLAD

The new plans include an artificial moon, **cloud seeding**, robotic gladiators and flying taxis. And the fully-automated city will aim to lead the world when ...

Flag as irrelevant

[Can a Bubble Net Stop a Hurricane? Some Norwegians Think Thus](#)

Pioneer Jury

Meteorologists at some point wrapped up that the **cloud seeding** failed to impact the tornado, however the adverse attention put off anymore **cloud** ...

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"cloud seeding"

Daily update · August 30, 2020

NEWS

[Cloud seeding delayed as Penang dam hits record low](#)

Free Malaysia Today

GEORGE TOWN: Eight **cloud-seeding** operations planned for the water catchment areas of Teluk Bahang dam have been delayed, the Penang Water ...



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[Global Cloud Seeding Equipment Market Growth Opportunities and Forecast to 2024 with COVID ...](#)

Bulletin Line

Global **Cloud Seeding** Equipment Market Growth Opportunities and Forecast to 2024 with COVID-19 Impact : Weather Modification, Inc., North ...



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[New technology to transform UAE food and water security](#)

Gulf Today

Cloud-seeding has produced impressive results, but it needs to be complemented by a capacity to sustainably harvest this additional precipitation.



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[Maharashtra: Heavy Rains Pound Parts of Nagpur, Over 14000 Evacuated](#)

LatestLY

UAE Lashed by Heavy Rains and Hails Due to **Cloud Seeding**, View Pics and Videos of Waterlogged Streets. Nagpur district on Saturday registered ...



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"cloud seeding"

Daily update · August 27, 2020

NEWS

[Survey: Cloud Seeding Machines Market 2020-26 North American Weather Consultants, Seeding ...](#)

Galus Australis

Survey: **Cloud Seeding** Machines Market 2020-26 North American Weather Consultants, Seeding Operations & Atmospheric Research, Kyathi Climate ...



Flag as irrelevant

[Latest Update 2020: Cloud Seeding Equipment Market by COVID19 Impact Analysis And Top ...](#)

Bulletin Line

Los Angles United States, August 2020: The **Cloud Seeding** Equipment Market steadily escalating demand due to improving purchasing power is ...



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[Interior official sees water-related opportunities in innovation](#)

Capital Press

s **cloud-seeding** efforts while monitoring snow-accumulation conditions in the Snake River Basin. "If we are having earlier-than-normal spring runoff, ...



Flag as irrelevant

[Cuprous Iodide Market Growing Technological Advancements Opportunity Analysis and Industry ...](#)

The News Brok

Inorganic and Biochemical Synthesis; **Cloud Seeding**; Polymer Additive; Adsorbent; Semiconductor and battery manufacturing. On the basis of ...



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[Global Urea Market : Industry Analysis and Forecast 2018-2026 by Grade, End Use Industry and by ...](#)

Galus Australis

... moisturizers, hair conditioners, **cloud seeding** agent, flame-proofing agent, tooth whitening products, dish soap, fermentation of sugars into ethanol ...



Flag as irrelevant

[Global Agricultural Robots Market Research \(2015-2026\): In-depth Assessment of the Growth and ...](#)

Editorials 360

Emerging applications of robots or drones in agriculture include weed control,[1][2][3] **cloud seeding**,[4] planting seeds, harvesting, environmental ...



Flag as irrelevant

[Southeast Asia likely spared choking haze as rain damps fires | Asia News | China Daily](#)

Gooruf

Indonesia plans to continue **cloud seeding** over parts of those regions this month to keep moisture in peat lands. We expect to be more prepared this ...



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"cloud seeding"

Daily update · August 26, 2020

NEWS

[Global **Cloud-seeding** System Market: Volume and Value Estimations up to 2026 | Ice Crystal ...](#)

Scientect

Key Companies/Manufacturers operating in the global **Cloud-seeding** System market include: Ice Crystal Engineering, Agni Aviation, IPTN North ...

Flag as irrelevant

[Cloud-seeding System Market Forecast Revised in a New FMI Report as COVID-19 Projected to ...](#)

StartupNG

In the upcoming research study on the **Cloud-seeding** System market by Future Market Insights (FMI) is a valuable source of information for market ...

Flag as irrelevant

[Southeast Asia Likely Spared Choking Haze as Rain Damps Fires](#)

BloombergQuint

Indonesia plans to continue **cloud seeding** over parts of those regions this month to keep moisture in peat lands. Still, even though wetter than normal ...

Flag as irrelevant

[Southeast Asia Likely Spared Choking Haze as Rain Damps Fires](#)

BNN

Indonesia plans to continue **cloud seeding** over parts of those regions this month to keep moisture in peat lands. "We expect to be more prepared this ...

Flag as irrelevant

[Cuprous Iodide Market share forecast to witness considerable growth from 2020 to 2026 | By Top ...](#)

The Daily Chronicle

Copper iodide is used in **cloud seeding** and also for the stabilization of heat in nylon. Request a sample Report of Cuprous Iodide Industry Market at: ...

Flag as irrelevant

[Indonesia's rain during dry season means Southeast Asia may be spared toxic haze this year](#)

South China Morning Post

Indonesia plans to continue **cloud seeding** over parts of those regions this month to keep moisture in peat lands. SCMP TODAY: INTL EDITION ...



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"cloud seeding"

Daily update · August 25, 2020

NEWS

[Cloud-seeding System Market Drives Future Change | Ice Crystal Engineering, Agni Aviation, IPTN ...](#)

The Daily Chronicle

The '**Cloud-seeding** System market' research report added by Report Ocean, is an in-depth analysis of the latest developments, market size, status, ...

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[Global Cloud Seeding Equipment Market: Affected Analysis by COVID 19 on Industry with Leading ...](#)

Owned

Latest **Cloud Seeding** Equipment Market report evaluates the impact of Covid-19 outbreak on the industry, involving potential opportunity and ...

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[Global Cloud Seeding Equipment Market Would Grow Significant CAGR by 2026 | COVID19 ...](#)

Owned

It provides key insights through details and gives customers a competitive advantage. **Cloud Seeding** Equipment Industry Size, Market Share Value, ...

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[Mangaluru: Srinivas Institute of Technology develops 3D Printed Sounding Rocket](#)

Daijiworld.com

The **cloud seeding** technique with a survey of the agricultural area by using an onboard camera mounted inside the rocket makes it easy to work and ...

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"cloud seeding"

Daily update · August 23, 2020

NEWS

[Cloud-seeding System Market Structure, Industry Inspection, and Forecast 2025](#)

News by aeresearch

The research report on **Cloud-seeding** System market comprises of insights in terms of pivotal parameters such as production as well as the ...



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"cloud seeding"

Daily update · August 21, 2020

NEWS

[Cloud Seeding Equipment Market is Booming Worldwide 2020-2027 | RHS Consulting, Weather ...](#)

Scientect

The **Cloud Seeding** Equipment report also provides an in-depth analysis regarding the methodology and research approach, data sources, and authors ...



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[Cloud-seeding System Market Report 2020: Manufacturers, Countries, Type and Application ...](#)

News by aeresearch

As per the report, the **Cloud-seeding** System market is projected to record XX% CAGR over the 2020-2025 and is anticipated to accrue notable returns ...



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"cloud seeding"

Daily update · August 18, 2020

NEWS

[How marine bacteria influence cloud formation](#)

Chemical & Engineering News

Researchers suspected that the volatile organic compounds produced by these species could react to form **cloud-seeding** aerosols. But this ...

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[Cloud Seeding Equipment Market: Global Industry Analysis, Technological Innovations, Trends ...](#)

Scientect

However, in such techniques the seeding have to be done directly into the clouds and due to this aerial **cloud seeding** can be dangerous for rainmakers.

Flag as irrelevant

[One question hung over 2008 Games: Would they change China?](#)

Hot Springs Sentinel

China even attempted to control the weather at the Olympics with **cloud seeding** -- another show of its ambition. It seemed to work. A few days after the ...

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[Bird's Nest and Water Cube: Beijing venues were stars, too](#)

Yahoo Sports

China even attempted to control the weather at the Olympics with **cloud seeding**. It seemed to work a few days into the games as smog and soot ...

Flag as irrelevant

[UAEREP awardees highlights cutting-edge research projects at global weather modification events](#)

WAM EN

... Algorithm for an Instrumented, Unmanned Aircraft System Designed for **Cloud Seeding** Operations". Prof. Eric Frew, Katherine Glasheen, Alex Hirst, ...

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[Use water prudently, Chow tells Penangites as dam water level drops](#)

New Straits Times Online

He said an allocation had been approved to carry out **cloud seeding**, but cautioned it would not guarantee rain would fall or fall in the right location.



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[Growth of Telecom System Integration Market with leading key players like IBM, Ericsson, Nokia ...](#)

The News Brok

Post navigation. **Cloud Seeding** Equipment Market: Global Industry Analysis, Technological Innovations, Trends, Growth opportunities, 2024.



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"cloud seeding"

Daily update · August 15, 2020

NEWS

[Cloud Seeding Machines Market 2020 Latest Trends, Technology Advancement and Demand ...](#)

openPR

Global **Cloud Seeding** Machines Market Growth (Status and Outlook) 2020-2025. The report will make detailed analysis mainly on in-depth research ...

Flag as irrelevant

[Cloud-seeding System: Market 2020 | Coronavirus Impact | Industry Business Outlook, Revenue ...](#)

Scientect

The Major Players in the **Cloud-seeding** System Market. Ice Crystal Engineering Agni Aviation IPTN North America Snowy Hydro ... Key Businesses ...

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[Cloud Seeding Equipment Market Size by Top Companies, Regions, Types and Application, End ...](#)

Bulletin Line

New Jersey, United States,- Verified Market Research has recently published an extensive report on the **Cloud Seeding** Equipment Market to its ...

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[The Books Briefing: What the Storms Left Behind](#)

The Atlantic

Some have tried to prevent massive damage through scientific means, such as the **cloud-seeding** process—an attempt to affect rainfall—that Sam ...

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"cloud seeding"

Daily update · August 14, 2020

NEWS

[Fewer forest fires, hot spots likely this year due to wetter weather, Covid-19 curbs, says Indonesia's ...](#)

The Straits Times

To prevent a repeat of last year's fires, the authorities began **cloud-seeding** operations in some parts of the country in April. Six areas vulnerable to ...



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"cloud seeding"

Daily update · August 5, 2020

NEWS

[Penang plans cloud seeding as island's dam levels drop](#)

Malay Mail

Penang Chief Minister Chow Kon Yeow announced that the state has approved an allocation of about RM240,000 to carry out eight more **cloud seeding** ...



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[Cloud-seeding System Market By Regional and Global Market Opportunities, Key Competitors ...](#)

Bulletin Line

The **Cloud-seeding** System Market report has been recently added by Report Ocean to its vast repository. This intelligence report includes ...



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"cloud seeding"

Daily update · July 22, 2020

NEWS

[Smart Acres plans to open R&D lab for local produce amid AgTech growth](#)

The National

All of this has sprung up in the last several years as vertical and hydroponic farming ventures and research, as well as **cloud-seeding**, bear fruit.



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[Agriculture Robots Industry 2020: Global Market Manufacturers, Outlook, Share, Growth and ...](#)

Cole of Duty

Emerging applications of robots or drones in agriculture include weed control, cloud seeding, planting seeds, harvesting, environmental ...



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[Dental Removal Instrument Market Analysis by 27 Key Players, Types, Applications and Growth ...](#)

3rd Watch News

... Epsilon Imaging, Shimadzu Corporation, Circle Cardiovascular Imaging Inc. → Global **Cloud Seeding** Equipment Market 2024 Expected to Reach ...



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"cloud seeding"

Daily update · July 7, 2020

NEWS

[219 cloud seeding operations completed in first half of 2020](#)

Khaleej Times

"NCM's **cloud seeding** operations demonstrate the importance placed by the UAE on providing sustainable water resources through encouraging ...

[UAE carries out 219 cloud seeding operations in first six months of the year](#) - The National Full Coverage

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[UAE conducted 219 cloud seeding operations in H1 2020](#)

Gulf Business News

Saudi Arabia, too, approved its own **cloud seeding** programme in February this year to increase its rainfall by 20 per cent. The kingdom, which currently ...

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[UAE- 219 cloud seeding operations completed in first half of 2020](#)

MENAFN.COM

(MENAFN - Khaleej Times) The National Centre of Meteorology, NCM, announced that it has carried out 219 **cloud seeding** operations across the ...

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[Cloud Seeding Equipment Market \(impact of COVID-19\) with Top Players: North American Weather ...](#)

Daily Research Chronicles

The "Cloud Seeding Equipment Market" 2020 report includes the market strategy, market orientation, expert opinion and knowledgeable information.

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[Global Cloud Seeding Machines Market Expected To Reach Highest CAGR By 2025: NOOESIS ...](#)

Owned

The report by Orbis Research on **Cloud Seeding** Machines market makes definite advances in studying and analyzing each of the market dimensions to ...



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[Cloud Seeding Machines Market: Size, Share, Analysis, Regional Outlook and Forecast 2020-2026](#)

News by aeresearch

Cloud Seeding Machines Market Report also covers top key players, porters five forces analysis and market segmentation in detail. This report examines ...



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[Cloud-seeding System Market - Growth, Trends, and Forecast \(2020 - 2025\)](#)

News by aeresearch

The research report on '**Cloud-seeding** System market' provides an in-depth assessment of the business space and elaborates on the various market ...



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[Global Polyvinyl Butyral Market Emerging Trends And New Technologies Research 2020](#)

Daily Research Chronicles

Cloud Seeding Equipment Market (impact of COVID-19) with Top Players: North American Weather Consultants, Inc., Seeding Operations ...



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[Haze May Hit Singapore As More Than 700 Fires Detected in Indonesia](#)

Yahoo Singapore News

Plans for fire-prone areas have begun, including **cloud seeding** activities to help artificially tweak rain in these areas. Budget Cut to Protect Forests Due ...



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"cloud seeding"

Daily update · July 6, 2020

NEWS

[Cloud Seeding Equipment Market Outlook, Opportunity, Demand Analysis And Forecast 2020 – 2026](#)

Owned

With the classified **Cloud Seeding** Equipment market research based on various growing regions, this report provides leading players portfolio along ...

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[The UAE is harnessing the power of tech to move forward](#)

The National

All of this is made possible by forward-looking solutions like vertical farming, **cloud-seeding**, research in agricultural genetics and hydroponics.

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"cloud seeding"

Daily update · July 3, 2020

NEWS

[Global **Cloud-seeding** System Market Size, Analytical Overview, Growth Factors, Demand, Trends ...](#)

3rd Watch News

The '**Cloud-seeding** System market' study now available at MarketStudyReport.com, is a detailed sketch of the business sphere in terms of current ...

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[Brace yourselves, Malaysia and Singapore. The haze is coming.](#)

Mashable SE Asia

Firefighters have also begun **cloud seeding** to encourage rain in these areas as well. They mentioned that these operations would last until the end of ...

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"cloud seeding"

Daily update · July 2, 2020

NEWS

[Cloud Seeding Equipment Market Size, Analysis, Trends and Segmented Data by Top Companies ...](#)

Apsters News

New Jersey, United States,- The latest research study on **Cloud Seeding** Equipment Market Added by Verified Market Research, offers details on ...

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[Global Cloud Seeding Equipment Market Expected to Reach Highest CAGR by 2025 Top Players ...](#)

Apsters News

The report on **Cloud Seeding** Equipment, gives an in-depth analysis of **Cloud Seeding** Equipment market based on aspects that are very important for ...

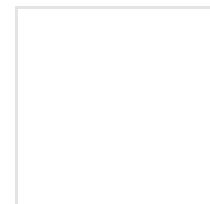
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[Breakdown: Why scientist are working hard to make it rain](#)

WMC

Cloud seeding can help, hail within a storm to be smaller. This method is used by private companies and these companies have help to provide fresh ...

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[Cloud Seeding Equipment Market – What Factors will drive the Cloud Seeding Equipment Market ...](#)

openPR

Market Expertz has recently published a report on the Global **Cloud Seeding** Equipment Market, which presents a detailed market analysis and gives ...

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[Cloud Seeding Machines Market to Soar at steady CAGR up to 2025](#)

AlgosOnline

Market Study Report has announced the launch of **Cloud Seeding** Machines market, a comprehensive study enumerating the latest price trends and ...



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[Cloud Seeding Machines Market to Soar at steady CAGR up to 2025](#)

AlgosOnline

According to the **Cloud Seeding** Machines market report, the industry is anticipated to accrue considerable returns while recording a creditable yearly ...



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[Global Cloud-seeding System Market 2020: Growth, Latest Trend Analysis and Forecast 2025](#)

Bandera County Courier

Global **Cloud-seeding** System Market 2020: Growth, Latest Trend Analysis and Forecast 2025. husain July 1, 2020. This report also covers ...



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[Impact of COVID-19 Pandemic on Cloud Seeding Equipment Market Trends, Size, Competitive ...](#)

Owned

The **Cloud Seeding** Equipment Market Report provides insightful data on market status, future forecast, growth opportunity, key market, and key players ...



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[Cloud Seeding Machines Market: Size, Share, Analysis, Regional Outlook and Forecast 2020-2025](#)

News by aeresearch

According to the **Cloud Seeding** Machines market research report provides the newest industry data and industry future trends, allowing you to identify ...



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[Indonesia province declares state of emergency over forest fire risk](#)

Phys.Org

Firefighters have started **cloud seeding**—a technique that uses chemicals to induce rain—with operations set to last until the end of the dry season in ...



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"cloud seeding"

Daily update · June 29, 2020

NEWS

[Cloud Seeding Machines Market Survey Report 2020-2026: North American Weather Consultants ...](#)

NJ MMA News (press release) (blog)

The study report also showcases a comprehensive analysis of the leading business programs, **Cloud Seeding Machines** future market and business- ...



Flag as irrelevant

[Indonesia to respect international law as Singapore probes companies linked to forest fires](#)

The Business Times

Indonesia has been carrying out **cloud-seeding** operations to induce rain in regions prone to forest fires until the dry season ends in September.



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"cloud seeding"

Daily update · June 24, 2020

NEWS

[Can scientists really make it rain by seeding clouds?](#)

9News.com KUSA

Cloud seeding also has been attempted to lessen the severity of hurricanes to improve a region's snowpack and more. Does it work? Credit: Charlie ...



Flag as irrelevant

[Cloud Seeding Machines Assessment, With Major Companies Analysis, Regional Analysis ...](#)

Personal Injury Bureau UK

This report presents the global revenue market share of key vendors In particular. The Global **Cloud Seeding** Machines Assessment, With Major ...



Flag as irrelevant

[Cloud Seeding Machines Market by Trends, Key Players, Driver, Segmentation, Forecast to 2025](#)

GroundAlerts.com (press release) (blog)

The latest report on '**Cloud Seeding** Machines Market' now available at Market Study Report, LLC, explains the current and upcoming trends besides ...



Flag as irrelevant

[Cloud Seeding Machines Market Survey Report 2020-2026: North American Weather Consultants ...](#)

NJ MMA News (press release) (blog)

The detailed overview of **Cloud Seeding** Machines industry prime vendors and regional evaluation are widely cited in the global **Cloud Seeding** ...

[Know-How Cloud Seeding Machines Market Is Showing Strong Position Near Future By Leading ...](#) - The Canton Independent Sentinel
[Full Coverage](#)



Flag as irrelevant

[Global Cloud Seeding Machines Market 2020-2026 Outline by Types, Applications, Regions and ...](#)

Owned

Global **Cloud Seeding** Machines Market has recorded a substantial growth since last decade and it is further estimated to rise over the forecast period.

Flag as irrelevant

[Cloud Seeding Machines Market Report 2020: Manufacturers, Countries, Type and Application ...](#)

News by aeresearch (press release) (blog)

The **Cloud Seeding** Machines market report leverages an in-depth analysis of critical aspects like recent trends, market share, and projected returns ...

Flag as irrelevant

[Cloud Seeding Equipment Market : Know The Key Growth Drivers Developments and Innovations ...](#)

The Canton Independent Sentinel

Also, the **Cloud Seeding** Equipment Market report appraises the industry fragments as well as the driving factors impacting the remuneration scale of this ...

Flag as irrelevant

[Putin clears the skies to bask in victory parade](#)

The Times

... Red Square parade and Moscow has spent 113 million roubles on **cloud-seeding** technology to ensure clear skies, according to opposition activists.

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"cloud seeding"

Daily update · June 23, 2020

NEWS

[Impact of COVID-19 on Cloud-seeding System Market Overview with Detailed Analysis ...](#)

Medic Insider (blog)

Providing an in-depth and comprehensive analysis of the **Cloud-seeding** System Market Report encompasses useful information in rapidly-changing ...



Flag as irrelevant

[Impact of COVID-19 Pandemic on Cloud Seeding Equipment Market Trends, Size, Competitive ...](#)

Owned

The **Cloud Seeding** Equipment Market is prepared through a rigorous and unique format to offer a high-quality, accurate, and valuable insight to assist ...



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"cloud seeding"

Daily update · June 18, 2020

NEWS

[Global **Cloud-seeding** System Market 2020: Growth, Latest Trend Analysis and Forecast 2025](#)

NJ MMA News (press release) (blog)

Global **Cloud-seeding** System Market 2020: Growth, Latest Trend Analysis and Forecast 2025. husain June 18, 2020. This report also covers ...



Flag as irrelevant

[Key Factors Driving the **Cloud Seeding** Equipment with Most Prominent Key Players Weather ...](#)

Gamer Turn (press release) (blog)

The **Cloud Seeding** Equipment market is anticipated to record a global CAGR of AAA% during the forecast period of 2019 – 2025. North America, SEA ...



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"cloud seeding"

Daily update · June 16, 2020

NEWS

[Global **Cloud-seeding** System Market 2020 Comprehensive Research, SWOT Analysis, Key ...](#)

Cole of Duty

Global **Cloud-seeding** System Market 2020 Comprehensive Research, SWOT Analysis, Key Players and Forecast by 2025. Post author By santosh; Post ...

Flag as irrelevant

[Covid-19 Impact on Global **Cloud Seeding** Equipment Market \(2020-2026\) | Potential growth ...](#)

Cole of Duty

Latest **Cloud Seeding** Equipment Market report evaluates the impact of Covid-19 outbreak on the industry, involving potential opportunity and ...

Flag as irrelevant

[\(2020-2025\) **Cloud Seeding** Machines Market Segmentation, Analysis by Recent Trends ...](#)

Cole of Duty

It offers detailed research and analysis of key aspects of the global **Cloud Seeding** Machines market. The market analysts authoring this report have ...

Flag as irrelevant

[\(2020-2025\) **Cloud Seeding** Equipment Market: Business Size| Strategies| Opportunities| Future ...](#)

Cole of Duty

(2020-2025) **Cloud Seeding** Equipment Market: Business Size| Strategies| Opportunities| Future Trends| Top Key Players| Market Share and Global ...

Flag as irrelevant

[Cloud Seeding Equipment Market Analysis, Trends, Top Manufacturers, Growth, Statistics ...](#)

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New Jersey, United States,- A detailed research study on **Cloud Seeding** Equipment Market

recently published by Verified Market Research. This is ...



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[Cloud Seeding Machines Market Analysis, Top Manufacturers, Share, Growth, Statistics ...](#)

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New Jersey, United States,- A detailed research study on **Cloud Seeding** Machines Market recently published by Market Research Intellect. This is the ...



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"cloud seeding"

Daily update · June 13, 2020

NEWS

[Cloud Seeding Machines Market Growth Prospects, Revenue, Key Vendors, Growth Rate and ...](#)

Jewish Life News (press release) (blog)

The **Cloud Seeding** Machines market report includes analysis in terms of both quantitative and qualitative data, taking into factors such as Product ...



Flag as irrelevant

[IMPACT OF COVID-19 ON Cloud-seeding System RESEARCH, GROWTH TRENDS AND ...](#)

Cole of Duty

Global **Cloud-seeding** System Market Report, History and Forecast 2015-2026, Breakdown Data by Companies, Key Regions, Types and Application.



Flag as irrelevant

[Cloud Seeding Equipment Market Research, Recent Trends and Growth Forecast 2025](#)

News by aeresearch (press release) (blog)

this report is highly predictive as it holds the over all market analysis of topmost companies into the **Cloud Seeding** Equipment industry. With the ...



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"cloud seeding"

Daily update · June 12, 2020

NEWS

[Cloud Seeding Machines Market \(Covid-19 Updated\) – Drivers and Restraints 2026 | Ice Crystal ...](#)

Newark Now

The **Cloud Seeding** Machines Market shows immense growth potential all over the globe and is an up and coming market that could change the tide of ...



Flag as irrelevant

[Supplier Risk Management Market Report 2020 Global Industry Statistics & Regional Outlook to 2025](#)

AlgosOnline (press release) (blog)

Cloud-seeding System market research report provides the newest industry data and industry future trends, allowing you to identify the products and ...



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"cloud seeding"

Daily update · June 8, 2020

NEWS

[Registering A CAGR Of 6%, Cloud Seeding Equipment Market Is Likely To Achieve USD 288 ...](#)

3rd Watch News

According to recent research study conducted by Kenneth Research, Global **cloud seeding** equipment market was valued at USD 154 Million in 2018 ...



Flag as irrelevant

[Cloud Seeding Machines Market Size Analysis, Trends, Top Manufacturers, Share, Growth ...](#)

Medic Insider (blog)

Global **Cloud Seeding** Machines Market 2019 Includes Market Size, Share, Trends, Growth, Demand, Supply, Application, Segmentation, Opportunity, ...



Flag as irrelevant

[Global Cloud-seeding System Market 2020: Growth, Latest Trend Analysis and Forecast 2025](#)

Galus Australis

Global **Cloud-seeding** System Market 2020: Growth, Latest Trend Analysis and Forecast 2025. Avatar husain June 8, 2020. This report also ...



Flag as irrelevant

[Cloud Seeding Machines Market 2019 Break Down by Top Companies, Countries, Applications ...](#)

Cole of Duty

A new market report by Market Research Intellect on the **Cloud Seeding** Machines Market has been released with reliable information and accurate ...



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[Cloud Seeding Equipment Market 2019 Break Down by Top Companies, Countries, Applications ...](#)

Cole of Duty

A new market report by Verified Market Research on the **Cloud Seeding** Equipment Market has

been released with reliable information and accurate ...



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Should We Try Again To Neutralize Hurricanes?

My New Orleans

Later attempts involved a **cloud seeding** process: Silver iodide, which would convert moisture into ice crystals, was dropped into the swirling storms.



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"cloud seeding"

Daily update · June 3, 2020

NEWS

[\(2020-2026\) Cloud-seeding System Market Segmentation, Analysis by Recent Trends ...](#)

Cole of Duty

Cloud-seeding System Market competition by top manufacturers/ Key player Profiled: Ice Crystal Engineering, Agni Aviation, IPTN North America, ...

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[Cloud Seeding Machines Market Size \(COVID-19 Impact\) 2020-26: North American Weather ...](#)

Bandera County Courier

Cloud Seeding Machines Market Size (COVID-19 Impact) 2020-26: North American Weather Consultants, Seeding Operations & Atmospheric Research, ...

Flag as irrelevant

[Global Cloud Seeding Machines Market 2020: Types, Demands, Current-Trends, Statistics ...](#)

Critics Sports (blog)

Global **Cloud Seeding** Machines Market 2020: Types, Demands, Current-Trends, Statistics, Company-Profiles, Business-Growth, Revenue and Regional ...

Flag as irrelevant

[Cloud Seeding Machines Market \(Covid-19 Updated\) Insights 2020-25 thriving worldwide by major ...](#)

Newark Now

The **Cloud Seeding** Machines market growth prospects have been showing good great promise all over the world with immense growth potential in ...

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"cloud seeding"

Daily update · May 29, 2020

NEWS

[Indonesia starts cloud seeding to keep forest fires at bay](#)

New Straits Times Online

JAKARTA: Indonesia has started **cloud seeding** to induce rain as the archipelago moves to head off annual forest fires blamed for blanketing swathes ...



Flag as irrelevant

[Coronavirus \(COVID-19\) Impact On Global Cloud-seeding System Market 2020 Analysis By Top ...](#)

3rd Watch News

The details about the **Cloud-seeding** System market includes the impact of the COVID-19 on the market economics. The lockdown in several regions has ...



Flag as irrelevant

[Cloud seeding to ward off forest fires in Indonesia](#)

Borneo Bulletin Online

JAKARTA (AFP) – Indonesia has started **cloud seeding** to induce rain as the archipelago moves to head off annual forest fires blamed for blanketing ...



Flag as irrelevant

[Cloud-seeding System Market Size, Share, Growth, Industry Profiles, Demand and Forecast 2020 ...](#)

News Distinct

The growth of Global **Cloud-seeding** System Market is expected on account of many factors, such as an increase in disposable income, increasing ...



Flag as irrelevant

[Research on Cloud Seeding Equipment Market \(impact of COVID-19\) with Top Players: Weather ...](#)

WaterCloud News

The "**Cloud Seeding** Equipment Market" 2020 report includes the market strategy, market orientation, expert opinion and knowledgeable information.



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"cloud seeding"

Daily update · May 28, 2020

NEWS

[The science behind cloud seeding](#)

KX NEWS

Weather modification is on the ballot in Ward County for the June elections. Meteorologist Amber Wheeler breaks down the science of **cloud seeding**.



Flag as irrelevant

[Indonesia starts cloud seeding to keep forest fires at bay](#)

Phys.Org

Indonesia has started **cloud seeding** to induce rain as the archipelago moves to head off annual forest fires blamed for blanketing swathes of ...



Flag as irrelevant

[Indonesia starts cloud seeding to keep forest fires at bay](#)

Yahoo News

Jakarta (AFP) - Indonesia has started **cloud seeding** to induce rain as the archipelago moves to head off annual forest fires blamed for blanketing ...



Flag as irrelevant

[Cloud seeding in Indonesia aims to prevent forest fires](#)

The Straits Times

Indonesia is carrying out **cloud-seeding** operations to induce rain in regions prone to forest fires. This will continue until the dry season ends in ...



Flag as irrelevant

[Ward County voters share their concerns about county's continued participation in weather ...](#)

KX NEWS

The decision over whether or not to continue **cloud seeding** in Ward County has sparked plenty of debate. We spoke with voters and an advocate for ...



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Impact of COVID-19 Outbreak on **Cloud Seeding** Machines Volume Forecast and Value Chain ...

3rd Watch News

The different factors that are likely to impact the overall dynamics of the **Cloud Seeding** Machines market over the forecast period (2019-2029) including ...



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Cloud-seeding System Market: Global Forecast over 2020 – 2025

Express Journal (press release) (blog)

Growth Forecast Report on “ **Cloud-seeding** System Market size | Industry Segment by Applications (Agriculture, Weather Industry and Others), ...



Flag as irrelevant

PBAPP seeks another **cloud seeding** move to fill Penang dams

New Straits Times Online

The two dams are the Air Itam Dam and Teluk Bahang Dam. **Cloud seeding** operations conducted between April 25 and yesterday have helped to ...



Flag as irrelevant

Global Agricultural Robots Market Overview, Development History and Forecast to 2026 shared in ...

Market Research Newspaper

Emerging applications of robots or drones in agriculture include weed control,[1][2][3] **cloud seeding**,[4] planting seeds, harvesting, environmental ...



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"cloud seeding"

Daily update · May 27, 2020

NEWS

[Indonesia carries out cloud-seeding operations early in the dry season to prevent forest fires](#)

straits times (press release)

Cloud-seeding operations have been carried out to wet peatlands in a few areas in Riau province since mid-May, including in Rokan Hulu, Rokan Hilir ...

Flag as irrelevant

[Scientists Yell at Clouds, Also Shoot Lasers at Them](#)

Popular Mechanics

... that the water droplets are immediately vaporized—not just pushed out of the way as with a **cloud seeding**. And if the fine fog droplets can't coalesce ...

Flag as irrelevant

[Indonesians at higher risk of getting Covid-19 & dying from it if haze reappears](#)

Mothership.sg

They should also take steps such as weather modification and **cloud seeding** to prevent the outbreak of fires. Funding cuts to environment ministry.

Flag as irrelevant

[Brace yourself, sandstorms heading towards Dubai this weekend](#)

DubaiLAD

Cloud-seeding led to storm damage across Dubai. And it even caused shock floods like these across the emirate. #الشارقة #وادي الحلو ...

Flag as irrelevant

[Motorcycle Engine Management Systems Market Analysis, Growth by Top Companies, Trends by ...](#)

Jewish Life News (press release) (blog)

Global **Cloud-seeding** System Market 2020 by Company, Regions, Type and Application, Forecast to 2025. Read More: ...

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"cloud seeding"

Daily update · May 26, 2020

NEWS

[UAE runs cloud seeding missions as more wild weather closes in](#)

The National

UAE runs **cloud seeding** missions as more wild weather closes in. Damac Hills was one of the worst hit on Sunday with trees felled and roofs damaged.

Flag as irrelevant

[Cloud-seeding System Market Global Outlook on Key Growth Trends, Factors](#)

News.MarketSizeForecasters.com

Market Study Report, LLC, adds a thorough analysis of the '**Cloud-seeding** System market', offering a comprehensive report emphasizing every vital ...

Flag as irrelevant

[Cloud Seeding Equipment Market Size, Analysis, Top Key Vendors, Industry Growth, Opportunity ...](#)

WaterCloud News

The **Cloud Seeding** Equipment Market is analyzed in depth in the report, with the main aim of providing precise market data and useful ...

Flag as irrelevant

[Weather modification for rainfall in Riau's peatland areas](#)

ANTARA

Preparations for conducting **cloud seeding** to produce rains in Riau on May 24, 2020. ANTARA/HO-Ministry of Environmental Affairs and Forestry.

Flag as irrelevant

[Indonesia braces for extreme dry season amid COVID-19](#)

ANTARA

Cloud seeding has been conducted in Bengkalis, Siak, and Meranti Islands using 800 kilograms of NaCl, or salt," director of Forest and Land Fire ...

Flag as irrelevant

Cuprous Iodide Market Volume Analysis, size, share and Key Trends 2020–2027

WaterCloud News

Inorganic and Biochemical Synthesis; **Cloud Seeding**; Polymer Additive; Adsorbent; Semiconductor and battery manufacturing. On the basis of ...



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"cloud seeding"

Daily update · May 24, 2020

NEWS

[Cloud Seeding Machines Market: Size, Share, Analysis, Regional Outlook and Forecast 2020-2025](#)

News by aeresearch (press release) (blog)

The **Cloud Seeding** Machines market report presents a comprehensive assessment of this industry vertical and comprises of significant insights ...

Flag as irrelevant

[Weather Mod in a cloud of secrecy](#)

Minot Daily News

One is the secrecy around who decides when and where **cloud seeding** flights take place. The board chairman talks to two people from the community ...

Flag as irrelevant

[Cloud-seeding System Market Overview, Industry Top Manufactures, Market Size, Industry Growth ...](#)

Weekly Wall (press release)

Cloud-seeding System Market Overview, Industry Top Manufactures, Market Size, Industry Growth Analysis And Forecasts 2025| Agni Aviation, IPTN ...

Flag as irrelevant

[How technology will change the future and change the ways of working](#)

YourStory.com

Its utility includes weed control, **cloud seeding**, real-time advisory, planting seeds, harvesting, environmental monitoring and soil analysis. For an ...

Flag as irrelevant

[Worldwide Issue and Defect Management Tools Market Study for 2020 to 2025 providing ...](#)

Cole of Duty

This report categorizes the **Cloud-seeding** System market data by manufacturers, region, type and application, also analyzes the market status, market ...

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"cloud seeding"

Daily update · May 21, 2020

NEWS

[Cloud Seeding Equipment Market 2020 Global Overview, Growth, Size, Opportunities, Trends ...](#)

Cole of Duty

Cloud Seeding Equipment Market 2020 Global Overview, Growth, Size, Opportunities, Trends, Leading Company Analysis and Forecast to 2026. Post ...

Flag as irrelevant

[COVID-19 Impact On Cloud-Seeding System Market by Product Type, by End-Users, by ...](#)

3rd Watch News

A report added to the rich database of Qurate Business Intelligence, titled "Global **Cloud-Seeding** System Market Size, Status and Forecast 2024", ...

Flag as irrelevant

[Global Cloud Seeding Equipment Market 2020 Analysis, Types, Applications, Forecast and COVID ...](#)

Surfacing Magazine

The report explains quick growth in key sectors and market segmentation based on key players, types, applications. It computes the global **Cloud** ...

Flag as irrelevant

[CITIZEN COLUMN: Part V: How much do we know?](#)

SCNow

Hail suppression by **cloud seeding** is often not successful. Snowflakes indeed are a treasure. The advent of the microscope has revealed their artistic ...

Flag as irrelevant

[Power Rental Systems Market Size Development Trends, Competitive Landscape and Key ...](#)

AlgosOnline (press release) (blog)

Cloud-seeding System Industry provides the overview with growth analysis and historical & futuristic cost, revenue, demand and supply data (as ...



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Agriculture Robot Market Analysis: Aim To Attain The Top In Qualitative Trade Research And ...

News Distinct

Emerging applications of robots or drones in agriculture include weed control, **cloud seeding**, planting seeds, harvesting, environmental monitoring ...



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"cloud seeding"

Daily update · May 13, 2020

NEWS

[Global Cloud Seeding Machines Market 2020: Growth Opportunities, Emerging-Trends, Revenue ...](#)

Cole of Duty

Global **Cloud Seeding** Machines Market 2020: Growth Opportunities, Emerging-Trends, Revenue, Business-Strategy and Industry Verticals till 2025.



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[Digital Voice Assistants Market Size, Share, Application Analysis, Regional Outlook, Growth Trends ...](#)

Jewish Life News (press release) (blog)

Cloud-seeding System market research report provides the newest industry data and industry future trends, allowing you to identify the products and ...



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[Family outing with the dog](#)

stopthefud (blog)

... three years I was seconded to the Meteorological Department where I was a research scientist on a **cloud seeding** project in the Orange Free State.



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Date: Sunday, 10 May 2020 8:01:10 am



"cloud seeding"

Daily update · May 9, 2020

NEWS

[Cloud Seeding Machines Market 2020 | Growth Drivers, Challenges, Trends, Market Dynamics and ...](#)

Cole of Duty

Cloud Seeding Machines Market has recently been added to its extensive repository by Market Research Intellect. This intelligence report includes ...



Flag as irrelevant

[Latest Trends for Cloud Seeding Equipment 2020-2024 with Focusing Key players like Weather ...](#)

Surfacing Magazine

Besides, the report gives the historical facts, figures, situations, and data related to the Global **Cloud Seeding** Equipment Market. The report analyses the ...



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[Taiwan News Quick Take](#)

Taipei Times

The agency is preparing to use ground-based **cloud-seeding** techniques, which involve burning nontoxic agents, to increase rainfall, agency Deputy ...



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"cloud seeding"

Daily update · May 8, 2020

NEWS

[Cloud-seeding System Market Size | Global Industry Analysis, Segments, Top Key Players, Drivers ...](#)

GroundAlerts.com (press release) (blog)

The **Cloud-seeding** System market research report Added by Market Study Report, LLC, offers a comprehensive study on the current industry trends.

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[Datacenter Infrastructure Service Market Overview with Detailed Analysis, Competitive landscape ...](#)

GroundAlerts.com (press release) (blog)

Global **Cloud-seeding** System Market 2020 by Company, Regions, Type and Application, Forecast to 2025. This report includes the assessment of ...

Flag as irrelevant

[2025 Projections: Neurology Software Market Report by Type, Application and Regional Outlook](#)

GroundAlerts.com (press release) (blog)

Cloud-seeding System Market report begins from overview of Industry Chain structure, and describes industry environment, then analyses market size ...

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[Online Virtual Classroom Software Market Analysis, Size, Regional Outlook, Competitive Strategies ...](#)

GroundAlerts.com (press release) (blog)

Cloud-seeding System Market report starts from illustration of Industry Chain structure, and portrays industry condition, at that point investigations ...

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Date: Thursday, 7 May 2020 8:01:49 am



"cloud seeding"

Daily update · May 6, 2020

NEWS

[North Korea tests cloud seeding, 'making it rain' after devastating droughts](#)

Fox News

In May 2017, state media outlet Arirang-Meari claimed North Korea had developed rain-inducing "cloud seeding" rockets. The North Korean-monitoring ...

Flag as irrelevant

[PH Air Force bares cloud-seeding operations in parts of Luzon](#)

INQUIRER.net

MANILA, Philippines—Some parts of Luzon have experienced rainfall in recent days, partly because of the **cloud seeding** operations conducted by the ...

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[Cloud Seeding Equipment Market Future Growth by In Depth Industry Analysis, Size, Trends and ...](#)

Cole of Duty

Cloud Seeding Equipment Market has recently been added to its extensive repository by Verified Market Research. This intelligence report includes ...

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[Cloud Seeding Machines Market to Witness Robust Expansion by 2025 Weather Modification ...](#)

Bandera County Courier

Cloud Seeding Machines market Research Report 2020. The market report based on our unique research methodology delivers thorough analytical ...

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[Latest Trends for Cloud Seeding Equipment 2020-2024 with Focusing Key players like Weather ...](#)

Bandera County Courier

The research report includes statistics and data that answer important business questions like how the Global **Cloud Seeding** Equipment Market will ...



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[Artificial rain planned for next week in Taiwan](#)

Focus Taiwan News Channel

The WRA is preparing to use ground-based **cloud-seeding** techniques, which involve burning non-toxic agents, in an attempt to increase the rainfall ...



Flag as irrelevant

[Research on **Cloud Seeding** Equipment Market \(impact of COVID-19\) 2020-2026: Ice Crystal ...](#)

Red & Black Student Newspaper (press release) (blog)

Research on **Cloud Seeding** Equipment Market (impact of COVID-19) 2020-2026: Ice Crystal Engineering, Mettech SpA, AF Jets Sdn Bhd, Snowy Hydro ...



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[Agriculture Robots Market Analysis 2020: By Keyplayers Deere & Company, Trimble, Inc., Agco ...](#)

openPR (press release)

Robots have wide applications in agriculture, which includes soil analysis, **cloud seeding**, weed control, planting seeds, environmental monitoring, ...



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"cloud seeding"

Daily update · April 30, 2020

NEWS

[Pay ₹40.28 crore towards cloud-seeding, HC directs AP, TS](#)

The Hindu

It cannot be said **cloud-seeding** done in one district of AP did not benefit Telangana: court. Telangana High Court had directed Andhra Pradesh and ...

Flag as irrelevant

[13 yrs on, aviation firm to get Rs 40cr](#)

Times of India

The bench also said that **cloud seeding** may sometimes help neighbouring districts depending on the direction of the wind. The bench directed AP and ...

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[UAE weather: Expect some rainfall across the emirates](#)

Gulf News

... UAE: Dust storms and rainfall to affect parts of the country. UAE's NCM warned of reduced visibility and said the teams will continue **cloud seeding** ...

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"cloud seeding"

Daily update · April 24, 2020

NEWS

[Penang still scorching hot despite some rain](#)

The Star Online

Phee agreed that **cloud seeding** was a "must" to prevent a water shortage in the whole northern region. Despite the extreme day weather, Penang ...



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[Cloud Seeding Equipment Market \(Covid-19 Updated\) Phenomenal Development Strategies with ...](#)

Bandera County Courier

Cloud Seeding Equipment Market (Covid-19 Updated) Phenomenal Development Strategies with Ice Crystal Engineering, Mettech SpA, AF Jets Sdn ...



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[Cloud Seeding Equipment Market \(COVID-19 Updated\) 2020-2026 By Key Players Like Kyathi ...](#)

Sask News Now

The Worldwide **Cloud Seeding** Equipment Market is nothing but a new addition to our vast collection of research reports. With the brand new members ...



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[Annual drought leaves Yunnan parched](#)

GoKunming (blog)

... to drought resistance, implementing 3934 drought-resistant electro-mechanical wells, **cloud-seeding** and 131.000 water-carrying vehicles.



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[Ultrasonic Testing Machine Market 2019 Share, Size, Future Demand, Global Research, Top ...](#)

Daily Science

Cloud Seeding Equipment Market Report, History and Forecast 2019-2027, Breakdown Data by Manufacturers, Key Regions, Types and Application ...



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"cloud seeding"

Daily update · April 22, 2020

NEWS

[Cloud Seeding Scheduled for Fall](#)

Financial Tribune

Some contribute the rise in precipitation to **cloud seeding**. However, Farid Golkar said. "There is no seeding operations in the spring". The project will ...

Flag as irrelevant

[More rain expected in the UAE: 'Yes, we are cloud seeding to enhance rainfall,' says UAE weather ...](#)

Gulf News

The country's weathermen are also on standby for **cloud seeding** flights to enhance rainfall over the country. An NCM official told Gulf News: "We have ...

Flag as irrelevant

[Cloud Seeding Equipment Market: CAGR of 7.1%, Opportunity of USD 62.65 Million, 2017-2024](#)

Cole of Duty

However, in such techniques the seeding have to be done directly into the clouds and due to this aerial **cloud seeding** can be dangerous for rainmakers.

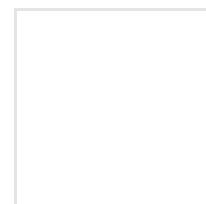
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[Turbines brighten clouds over Great Barrier Reef in world-first trial](#)

New Atlas

The type of **cloud-seeding** technology trialed by the researchers has been in the mix more broadly as a way to mitigate the effects of climate change for ...

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[UAE weather: Expect some rainfall in Abu Dhabi, Dubai, Sharjah and Fujairah](#)

Gulf News

More rain expected in the UAE: 'Yes, we are **cloud seeding** to enhance rainfall,' says UAE weather bureau. Country's weathermen are on standby to ...



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Research on **Cloud-seeding** System Market (Impact of COVID-19) 2020-2026: Ice Crystal ...

Red & Black Student Newspaper (press release) (blog)

Research on **Cloud-seeding** System Market (Impact of COVID-19) 2020-2026: Ice Crystal Engineering, Agni Aviation, IPTN North America, Snowy Hydro.



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"cloud seeding"

Daily update · April 18, 2020

NEWS

[Weather modification debate heats up in Ward County ahead of June vote](#)

KFYR-TV

Weather modification, or **cloud seeding**, involves spraying clouds to suppress hail, and prevent crop damage. Hank Bodmer of the Ward County ...

Flag as irrelevant

[Residents take sides on weather modification](#)

Minot Daily News

"Multiple scientific bodies have stated that warm **cloud seeding** is conducted in Ward County, has not been scientifically proven to accomplish anything.

Flag as irrelevant

[April 17: ON THIS DAY in 1963, Protestors to march](#)

Brooklyn Daily Eagle

ON THIS DAY IN 1950, the Eagle reported, "There may be a **cloud-seeding** experiment late today, it was reported by Dr. Wallace E. Howell, the city's ...

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[KUNC Reporters Win Four CBA Awards Of Excellence. Revisit Their Stories Here](#)

KUNC

KUNC's Luke Runyon reports on the practice of **cloud seeding**. Each winter, anxious water managers, farmers and city leaders in the American ...

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"cloud seeding"

Daily update · April 16, 2020

NEWS

[Penang to fund cloud seeding, MET Msia to provide expertise](#)

New Straits Times Online

GEORGE TOWN: The Penang government will pay and conduct **cloud seeding** operations with the assistance of the Malaysian Meteorological ...



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[UAE weather: More rain forecast for Thursday as cloud seeding continues](#)

The National

UAE weather: More rain forecast for Thursday as **cloud seeding** continues. The gloomy skies and wet conditions are here to stay across Abu Dhabi and ...



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[UAE weather: More rain on Thursday as cloud seeding continues](#)

The National

UAE weather: More rain on Thursday as **cloud seeding** continues. The gloomy skies and wet conditions are set to continue across Abu Dhabi and Dubai.



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[Preparing for new world when Covid-19 is gone](#)

The Star Online

On a separate matter, Chow said the state is planning to carry out **cloud seeding** in Penang and Kedah in view of the dry spell. "I have written to the ...



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[China 'controlling weather' by firing rockets that create rainfall during droughts](#)

Daily Star

Beijing famously used **cloud seeding** technology to induce early rainfall and created an artificially dry Olympic season in 2008, while Moscow uses ...



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Low water supply may hamper fight to curb spread of virus

The Sun Daily

The authorities are already considering options such as **cloud-seeding** to raise water levels at dams, Penang Water Holdings Bhd chief executive ...



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Malaysia morning news for April 16

AEC News Today

The Penang state government will conduct **cloud seeding** operations in the northern region with the assistance of the Malaysian Meteorological ...



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"cloud seeding"

Daily update · April 15, 2020

NEWS

[Meteorologists Rain on Cloud-Seeding Parade](#)

Scientific American

"The Council of the American Meteorological Society recently summed up the present evidence for the effectiveness of **cloud-seeding**. Its verdict: Not ...



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[Penang water corp calls for cloud seeding in the north as dams run low](#)

Malay Mail

GEORGE TOWN, April 15 — Penang has submitted an urgent request for **cloud seeding** in the state and Kedah as dams in both states run low.



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"cloud seeding"

Daily update · April 14, 2020

NEWS

[UAE weather: Rainfall across the country, thunder and lightning expected between Monday to ...](#)

Gulf News

Cloud seeding is also expected to enhance rain activity in the country. There will be a slight drop in temperatures across the country. The NCM weather ...



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[Cloud Seeding Equipment Market 2020 Global Share, Growth, Size, Opportunities, Trends ...](#)

Publicist360

The Global **Cloud Seeding** Equipment Market research report provides and in-depth analysis on industry- and economy-wide database for business ...



Flag as irrelevant

[The Annamites: Vietnam's Unknown Mountains](#)

ExplorersWeb (blog)

It even attempted **cloud-seeding** to extend the monsoon season. Despite this ferocious bombardment, the supply line remained unbroken, a testament ...



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[UAE weather: heavy rain hits parts of Sharjah and Fujairah](#)

The National

Heavy rain caused by the country's **cloud-seeding** programme lashed parts of Sharjah and Fujairah on Tuesday afternoon. Residents took to Twitter to ...



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[Sharjah: Baker caught on camera licking finger, then touching bread](#)

Gulf News

Cloud seeding flights were put on standby as the team analysed the cloud quality for seeding to enhance rainfall over the country. The UAE weather ...



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"cloud seeding"

Daily update · April 13, 2020

NEWS

[NCM carries out 95 cloud seeding operations in Q1 of 2020](#)

Gulf Today

NCM's **cloud seeding** operations demonstrate the importance placed by the UAE on providing sustainable water resources through encouraging ...

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[Cloud-seeding System Volume Analysis, Segments, Value Share and Key Trends 2020-2027 | Ice ...](#)

Jewish Life News (press release) (blog)

Global **Cloud-seeding** System Market Global Drivers, Restraints, Opportunities, Trends, and Forecasts up to 2027. Market Over viewing the present ...

Flag as irrelevant

[Cloud Seeding Machines Market Growth Analysis, Top Manufacturers, Shares, Growth ...](#)

Germany English News

New Jersey, United States: The new report has been added by Market Research Intellect to provide a detailed overview of the **Cloud Seeding** Machines ...

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[Smaller snowpack may be the new normal](#)

Sky Hi News

Cloud seeding may increase snowpack. Kanzer coordinates the Colorado River District's **cloud seeding** program, which could increase snowfall from ...

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"cloud seeding"

Daily update · April 8, 2020

NEWS

[Cloud-seeding System Market to Witness Astonishing Growth with Ice Crystal Engineering, Agni ...](#)

Curious Desk (blog)

Find the complete **Cloud-seeding** System Market analysis segmented by companies, region, type and applications in the report. The major players ...



Flag as irrelevant

[Product Management Software Market Size | Global Industry Analysis, Segments, Top Key Players ...](#)

News by aeresearch (press release) (blog)

Latest Market Research Report on "**Cloud Seeding** Equipment Market size | Industry Segment by Applications (Fog Dissipation, Snowfall and Rainfall ...



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"cloud seeding"

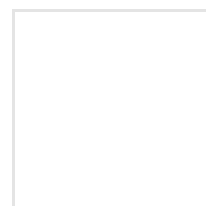
Daily update · April 6, 2020

NEWS

[5G & COVID-19 And All The Absurd Tech-Related Conspiracy Theories Of The Past](#)

WeeTracker Media

Also of interest to conspiracy theorists are **cloud-seeding** technologies. These include a debunked allegation that the British military's Project Cumulus ...



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Date: Friday, 27 March 2020 9:03:22 am



"cloud seeding"

Daily update · March 26, 2020

NEWS

[Cloud seeding: is forcing clouds to rain the answer to combating drought?](#)

Geographical

The controversial practice of **cloud-seeding** has always been difficult to measure – a new method offers hope. Given that it's a practice invented in the ...



Flag as irrelevant

[Cloud Seeding Machines Market Trends 2020, Share Analysis, Growth Factors, Industry ...](#)

Express Journal (press release) (blog)

New Research Report on “ **Cloud Seeding** Machines Market Size | Industry Segment by Applications ((Fog Dissipation, Snowfall and Rainfall ...



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[Cloud-seeding System Market Is Expected To Thrive At Impressive Cagr By 2027 Key Players: Ice ...](#)

Daily Science

Astonishing Growth Of **Cloud-seeding** System Market 2020 | Latest Trends, Demand, Growth, Opportunities & Outlook Till 2027. The Analysis report ...



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[Cloud-seeding System Market Size, Share, Revenue, Trends Analysis and Growth Forecast 2026 ...](#)

News Log Book (press release) (blog)

Key companies operating in the global **Cloud-seeding** System market include _ Ice Crystal Engineering, Agni Aviation, IPTN North America, Snowy ...



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[Agricultural Robots and Mechatronics Market Size, Share 2020 Regional Trend, Future Growth ...](#)

The Richardson Observer

Emerging applications of robots or drones in agriculture include weed control, **cloud seeding**,

planting seeds, harvesting, environmental monitoring ...



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[3D Laser Scanners Market 2020 – Revenue Status & Forecast Report 2025 | Faro, Trimble, Topcon ...](#)

Skyline Gazette

Cloud Seeding Equipment Market – Global Industry Key Vendors Analysis, Revenue, Trends & Forecast to 2020-2024 Ice Crystal Engineering, ...



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"cloud seeding"

Daily update · March 24, 2020

NEWS

[Cloud-seeding System Market Share 2020-2025](#)

Industry Today (press release)

The **Cloud-seeding** System market report provides a detailed analysis of global market size, regional and country-level market size, segmentation ...



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Date: Tuesday, 24 March 2020 9:01:09 am



"cloud seeding"

Daily update · March 23, 2020

NEWS

[Cloud-seeding System Market Size, Share and Manufacture Development Analysis by 2020-2025](#)

openPR (press release)

The subject matter experts and team of highly-skilled researchers have put in hours of work to collate an authentic research report on the global **Cloud-** ...

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[National Centre Of Meteorology Marks World Meteorological Day](#)

UrduPoint News

... by carrying out innovative rain enhancement research and field experimentation that significantly increases precipitation through **cloud seeding**".

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"cloud seeding"

Daily update · March 19, 2020

NEWS

[Six Crazy Attempts to Geoengineer the Weather](#)

Smithsonian

Though **cloud-seeding** has not fulfilled all its promises, it is used to generate powder for ski areas and rainfall in the United Arab Emirates, where up to ...

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[Global **Cloud Seeding** Machines Market 2020: Industry Size, Economic Impact, Application ...](#)

Monroe Scoop

This Global **Cloud Seeding** Machines Sales Market research includes historic data which makes the reports a precious supply for industry executives, ...

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[UAE weather: More rainfall expected in Abu Dhabi, Dubai and other parts of the country](#)

Gulf News

Speaking to Gulf News, a National Center of Meteorology official confirmed on Wednesday night that "**cloud seeding** flight have been dispatched" to ...

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[Video: Rain hits parts of UAE on Thursday](#)

Khaleej Times

... showers lashing Sharjah, Umm Al Quwain, Ras Al Khaimah and Fujairah today, caused by **cloud seeding** operations as indicated in NCM's tweets.

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[Reality Of Carona Virus](#)

Brighter Kashmir (press release)

Cloud seeding is a type of weather modification that aims to change the amount or type of precipitation that falls from clouds by dispersing substances ...

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Know the Rapid Growth Factors of Partner Relationship Management Software Market: Key ...

Monroe Scoop

This Global **Cloud Seeding** Machines Sales Market research includes historic data which makes the reports a... Global Cloud Financial Planning and ...



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"cloud seeding"

Daily update · March 13, 2020

NEWS

[Cloud Seeding Equipment Market: Global Demand Analysis & Opportunity Outlook 2024 – Industry ...](#)

Monroe Scoop

Global **cloud seeding** equipment market reached USD 97.7 Million in 2016 and is expected to register a CAGR of 7.1% across the globe during ...



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[Future Growth of Cloud Seeding Machines Market By New Business Developments, Innovations ...](#)

Stop Smoking Lounge

Ample Market Research(AMR) has published a new market study, titled, **Cloud Seeding Machines Market**. The market study not only presents a ...



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[Concerted effort](#)

Philippine Star

The **cloud-seeding** operations will depend on weather reports from PAGASA on whether there are seedable clouds near Angat Dam, according to ...



Flag as irrelevant

[Brace for water rationing amid COVID-19](#)

manilastandard.net

The **cloud-seeding** operations will start this month depending on the weather report from PAGASA on whether there are seedable clouds near Angat ...



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[Sleeping Aids Market 2020 |Global Industry Analysis By Trends, Size, Share, Company Overview ...](#)

Monroe Scoop

Global **cloud seeding** equipment market reached USD 97.7 Million in 2016 and is expected to register... Leave a Comment ...



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[Agricultural Robots Market 2020 Recent Study of Business Strategies, Detailed Profiles of top ...](#)

Times Plot

Emerging applications of robots or drones in agriculture include weed control,[1][2][3] **cloud seeding**,[4] planting seeds, harvesting, environmental ...

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Date: Friday, 13 March 2020 9:01:53 am



"cloud seeding"

Daily update · March 12, 2020

NEWS

[Does Seeding the Clouds Produce More Rain/Snow?](#)

Abccolumbia.com

So what is **cloud seeding**? It's when tiny particles are added to the clouds – often using planes. These particles are designed to “attract” water molecules ...

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[PH gov't moves to conduct **cloud seeding** operations around Angat Dam](#)

Manila Bulletin

MWSS said that its early **cloud seeding** is part of its efforts as well as its concessionaires to prevent the water level in Angat from further decline. Other ...

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[Researchers Quantify a Seeded Snowpack](#)

Eos

Three hour-long **cloud-seeding** events created the snow equivalent of about 282 Olympic-sized swimming pools' worth of water. For almost 100 years, ...

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[Clarke County Rain Making Association](#)

Osceola Sentinel Tribune

The **cloud seeding** then was termed a successful venture and was credited with “if not causing at least increasing a 'million' dollar rain.” In 1954 the rain ...

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[Firm appeals to public not to waste, hoard water](#)

INQUIRER.net

... continued reduction of water losses through sustained pipe replacement and repair activities; **cloud-seeding** operations; and deployment of modular ...

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[Regulator says there's enough water supply in Metro Manila](#)

BusinessWorld Online

The company was also finishing pipe replacements and leak repairs, and was ready with **cloud-seeding** operations. "We encourage our customers to ...



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[Global High-purity Alumina Market 2020-2024 by Top Vendor, Industry Analysis by Size, Share ...](#)

Monroe Scoop

Global **Cloud Seeding** Machines Market 2020 This report explains the key market drivers, trends, restraints and... Analysis Forecast Global News Market ...



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"cloud seeding"

Daily update · March 11, 2020

NEWS

[Cloud-seeding, cold front add to reservoir levels](#)

Taipei Times

More **cloud-seeding** operations might be launched if the weather permits, it added. Shihmen Reservoir is pictured in Taoyuan yesterday. Photo: Lee ...



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[Global Cloud Seeding Equipment Market 2024 Top Companies – Weather Modification, Inc., North ...](#)

Galus Australis

The **Cloud Seeding** Equipment industry is highly competitive, due to a large degree of fragmentation in the market. Despite the fragmentation, the market ...



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Date: Sunday, 8 March 2020 9:02:44 am



"cloud seeding"

Daily update · March 7, 2020

NEWS

[Global Cloud Seeding Equipment Market 2020 report by top Companies: Weather Modification, Inc ...](#)

News Times (press release)

The market research includes historical and forecast market data, demand, application details, price trends, and company shares of the leading **Cloud** ...

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[Water firms prepare for summer](#)

Manila Bulletin

... continued reduction of water losses through sustained pipe replacement and repair activities, **cloud-seeding** operations, and deployment of modular ...

Flag as irrelevant

[Maynilad moves to ease impact of lower water share](#)

BusinessWorld Online

Moreover, the water concessionaire will reactivate its deep wells, conduct **cloud-seeding** operations, and deploy modular water treatment plants in ...

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[Latest Update 2020: Cloud Server Market 2020 by following top Manufacturers IBM, HP, Dell ...](#)

News Times (press release)

Previous Previous post: Global **Cloud Seeding** Equipment Market 2020 report by top Companies: Weather Modification, Inc., North American Weather ...

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Date: Saturday, 7 March 2020 9:06:30 am



"cloud seeding"

Daily update · March 6, 2020

NEWS

[Maynilad says tapping **cloud seeding**, other measures ahead of summer demand](#)

ABS-CBN News

The water concessionaire said it is mounting **cloud-seeding** operations, and deploying modular water treatment plants that will draw water from small ...

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[Pioneering Report On **Cloud Seeding** Machines Market Report 2020–2027 key players: Weather ...](#)

News Times (press release)

The **Cloud Seeding** Machines analysis is provided for the international markets including development trends, competitive landscape analysis, and key ...

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[Healing in utero](#)

WORLD News Group

More than 50 countries, including the United States, currently use **cloud-seeding** programs. — J.B. Julie Borg. Julie is a clinical ...

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[Maynilad seeks to mitigate low water allocation](#)

manilastandard.net

... continued reduction of water losses through sustained pipe replacement and repair activities, **cloud seeding** operations and deployment of modular ...

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[Global Sun Care Product Market Revenue Strategy 2020: Johnson & Johnson, LOreal, Proctor ...](#)

News Times (press release)

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"cloud seeding"

Daily update · March 3, 2020

NEWS

[Cloud Seeding Machines Market: Analysis by Sales Global Market Size, Segment and Evolution ...](#)

News Times (press release)

Cloud Seeding Machines Market: Analysis by Sales Global Market Size, Segment and Evolution Rate by Type and Application Forecast to 2024.

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[UW in the News](#)

University of Wyoming News

Science Daily published UW's release noting UW researchers Bart Geerts and Jeff French's involvement in a **cloud-seeding** study. The researchers ...

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[Penang dams in need of rainfall](#)

The Star Online

Penang Water Supply Corporation (PBAPP) chief executive officer Datuk Jaseni Maidinsa said that **cloud-seeding** operations should be intensified in ...

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Date: Saturday, 29 February 2020 9:01:45 am



"cloud seeding"

Daily update · February 28, 2020

NEWS

[A Cloud Seeding Experiment Dropped Snow On Nearly 1000 Square Miles of Idaho](#)

TheInertia.com

Demand for water is steadily increasing in arid regions, and for half a century, a process called **cloud seeding** has been on the minds of researchers ...

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[New Research Confirms Cloud Seeding Can Produce Snowfall](#)

VOA Learning English

New Research Confirms **Cloud Seeding** Can Produce Snowfall ... **Cloud seeding** has been tested in parts of the United States since the 1940s.

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[Why silver is suddenly all up in your snow](#)

The Hustle (blog)

But **cloud seeding** is a bit more complicated. The compound is dropped onto clouds from circling planes — it's supposed to speed up the growth of ice ...

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[Rain delay A beer company tries to keep Brazilian Carnival revellers dry](#)

The Economist

The use of **cloud-seeding** to increase rainfall dates back to the 1940s. But the United States government stopped funding it in the 1980s due to a lack ...

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[Rp20 Bln Spent to Run BPPT's Weather Modification over Jakarta](#)

En Tempo.co

This weather modification via **cloud seeding** is slated to last until March, as the rainy season hits its peak. Head of the agency, Tri Handoko Seto, said ...

Flag as irrelevant

Cloud Seeding Equipment Market Forecast 2020-2025, Latest Trends and Opportunities

News by aeresearch (press release) (blog)

New Report on "Cloud Seeding Equipment Market size | Industry Segment by Applications (Fog Dissipation, Snowfall and Rainfall Augmentation, Hail ...



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Find out why Agricultural Robot Market is growing massively in upcoming year by Top key players ...

Daily Science

Emerging applications of robots or drones in agriculture include weed control, **cloud seeding**, planting seeds, harvesting, environmental monitoring ...



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"cloud seeding"

Daily update · February 22, 2020

NEWS

[Skol wants to keep the good times rolling on with cloud seeding campaign](#)

Campaign US

The Bond-esque 'Giro na Chuva' (Spin in the Rain) campaign will see Skol, in partnership with GUT, utilizing **cloud seeding** to induce rainfall in the ...



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[Here is what goes on behind the scenes at PCOTY 2020](#)

WhichCar

Despite being the worst drought in recorded history, PCOTY continues to be a superior rain-maker to any **cloud-seeding** enterprise. I'm not sure how ...



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"cloud seeding"

Daily update · February 19, 2020

NEWS

[Saudi throws its support behind cloud-seeding technology](#)

Arab News

It came as no surprise, therefore, when the Saudi Cabinet recently approved a **cloud-seeding** program that aims to increase rainfall in the Kingdom by ...



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[Saudi Arabia approves cloud-seeding technology for rain enhancement](#)

Utilities Middle East

The Saudi cabinet has approved a **cloud-seeding** program that aims to increase rainfall in the Kingdom by almost 20%. The Ministry of Environment, ...



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Daily update · February 15, 2020

NEWS

[Penang, Kedah facing imminent water crisis as key dams dry up](#)

Free Malaysia Today

PBA CEO Jaseni Maidinsa said **cloud-seeding** operations must be urgently intensified to induce rain at the key Beris and Muda dams in Kedah so that ...

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[Rains rekindle farmers' hopes, dam levels rise](#)

The Herald

"To our Government, we lobby for **cloud seeding** whenever we get the suitable clouds," he said. "The pregnant clouds are plenty these days. Naturally ...

Flag as irrelevant

[Trending 2020 Enterprise Financial Management Software Market In-Depth Analysis Report By ...](#)

Weekly Wall (press release)

... Industry Trend Report Up To 2026 | Alex Stewart International ,AGAT Laboratories Ltd.

Trending 2020 **Cloud Seeding** Equipment Market Worrrldwide ...

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"cloud seeding"

Daily update · February 14, 2020

NEWS

[Cloud Seeding Equipment Market Emerging Latest Trends , Top Companies, Industry Demand ...](#)

Nyse Nasdaq Live (press release)

Global **Cloud Seeding** Equipment market research report is a base analysis of the recent and latest scenario of the industry. A detailed study of market ...



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[Latest Research Report to uncover key Factors of Global Cloud Seeding Equipment Market -2026](#)

Nyse Nasdaq Live (press release)

Growing Opportunities in Global **Cloud Seeding** Equipment Industry 2020. The market report envelopes all-in information on the global **Cloud Seeding** ...



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[Cloud-seeding plan aims to increase rainfall in Saudi Arabia by 20 percent](#)

The Rahnuma Daily (press release)

RIYADH (Rahnuma): The Saudi cabinet has approved a **cloud-seeding** program that aims to increase rainfall in the Kingdom by almost 20 percent.



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[Cloud Seeding Equipment Market Expects to See Significant Growth During 2020-2024: Weather ...](#)

Bandera County Courier

New study on Industrial Growth of **Cloud Seeding** Equipment Market 2020-2024: The global 'Global **Cloud Seeding** Equipment Market size and CAGR ...



Flag as irrelevant

[Top Trending On Cloud Seeding Machines Market Status and Forecast 2026 | Weather ...](#)

Chronicle 99

Global **Cloud Seeding** Machines Market is estimated to reach xxx million USD in 2020 and

projected to grow at the CAGR of xx% during 2020-2026.

Flag as irrelevant

[Trending 2020 Cloud Seeding Equipment Market Worldwide | Mettech SpA ,AF Jets Sdn Bhd ...](#)

Weekly Wall (press release)

Los Angeles, United State,February 14th; ,2020. Looking for a better research and analysis report on the Global **Cloud Seeding** Equipment market?

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[Feel the love in NYC this Valentine's Day – Israel style](#)

ISRAEL21c

Forget Paris or Venice, New York City is the romantic place to be this Valentine's Day. More specifically, head to Times Square, the very heart of the ...

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[Penang water corp raises alarm over Muda Dam capacity](#)

Malay Mail

GEORGE TOWN, Feb 14 — Penang Water Supply Corporation (PBAPP) Chief Executive Officer Datuk Jaseni Maidinsa has called for **cloud seeding** at ...

Flag as irrelevant

[UAE's no-homework policy could benefit girls over boys, say education experts](#)

The National

"They would be interested if I told them that instead of homework, we could learn about **cloud-seeding** for example, or give the pupils an issue to talk ...

Flag as irrelevant

[How Global Agricultural Robots are Transforming the Outlook of Agriculture Industry? Study by ...](#)

openPR (press release)

There are various uses of agricultural robots such as planting seeds, harvesting, soil analysis, environmental analysis, and **cloud seeding**, among ...

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"cloud seeding"

Daily update · February 13, 2020

NEWS

[Cloud-seeding plan aims to increase rainfall in Saudi Arabia by 20 percent](#)

Arab News

RIYADH: The Saudi cabinet has approved a **cloud-seeding** program that aims to increase rainfall in the Kingdom by almost 20 percent. The Ministry of ...

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[151 Saudi students compete in prestigious scientific olympiad](#)

Arab News

The Kingdom began studying **cloud seeding** in 1976 in partnership with the World Meteorological Organization. An agreement was signed with the ...

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[Saudi Arabia prepares for festival of love](#)

Arab News

The ministry said the **cloud-seeding** program targets specific types of clouds, using their physical properties to stimulate rainfall. Catalysts are sown ...

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[Israeli futurist creates paeon to Valentine's Day in Times Square](#)

The Jerusalem Post

Locally, Israelis can visit MODU's **Cloud Seeding** project in front of the Design Museum Holon near Tel Aviv. The minimally invasive design is a glass ...

Flag as irrelevant

[Bureau of Reclamation awards \\$1.2 million for Idaho water projects](#)

LocalNews8.com

... precipitation and benefit **cloud seeding** to increase water supply reliability. Idaho Power is contributing \$1.1 million in non-federal funds towards the ...

Flag as irrelevant

Asian Insider, Feb 12: Coronavirus, African swine fever, and lost at sea for a month

straits times (press release)

The Indonesian province is readying a fleet of **cloud-seeding** and water-bombing aircraft to avert a recurrence of last year's outbreak of forest and land ...



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"cloud seeding"

Daily update · February 12, 2020

NEWS

[Kedah to carry out third cloud seeding as water level recedes at dams](#)

The Sun Daily

ALOR STAR: The Kedah government will conduct a third **cloud seeding** in the near future to raise water levels at some major dams that are currently ...

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[UAE: Light rain, winds and cloudy weather in the UAE](#)

Gulf News

A National Center of Meteorology official told Gulf News that some **cloud seeding** missions were conducted on Tuesday after clouds were seen ...

Flag as irrelevant

[Indonesia's Riau readies air fleet to avert recurrence of 2019 fire and haze outbreak](#)

straits times (press release)

JAKARTA - An Indonesian province is readying a fleet of **cloud-seeding** and water-bombing aircraft to avert a recurrence of last year's outbreak of ...

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[ESPA Re-charge](#)

AGInfo Ag Information Network Of The West (press release) (blog)

Build-out of a comprehensive **cloud- seeding** program supported by Idaho Power Company, the Board, and the water users as well as a robust ...

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"cloud seeding"

Daily update · February 5, 2020

NEWS

[Out of Our Past Feb. 5, 2020](#)

The Herald Journal

Three **cloud-seeding** generators are being used in Franklin County to help increase the snowpack in nearby mountains and mitigate the effects of ...



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Date: Thursday, 30 January 2020 9:01:34 am



"cloud seeding"

Daily update · January 29, 2020

NEWS

[Penang water corp hopes cloud seeding operations continue](#)

Malay Mail

GEORGE TOWN, Jan 29 — Perbadanan Bekalan Air Pulau Pinang (PBAPP) today expressed hope that the **cloud seeding** operations in the northern ...

[Save water, water company appeals to Penangites for second time](#) - Free Malaysia Today

[Penang Water Supply Corporation to control water pressure as dry weather continues](#) - Malay

Mail

[Full Coverage](#)

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[Global Cloud Seeding Equipment Market 2020 : Which segment is predicted to dominate?](#)

NY Telecast 99

Los Angeles, United State, January 29th ,2020: The report titled, Global **Cloud Seeding** Equipment Market Size, Status and Forecast 2020-2026 ...

Flag as irrelevant

[Cloud-seeding System Market Overview by Industry Chain Information, Upstream Raw Materials ...](#)

Pro News Time (press release) (blog)

FMI's report on Global **Cloud-seeding** System Economy. In a Recent company intelligence research, FMI introduces the nitty-gritty of this worldwide ...

Flag as irrelevant

[Global Agricultural Robots Market: Production, Sales, Supply, Demand, Analysis & Forecast to 2025](#)

Gilbert Weekly

Emerging applications of robots or drones in agriculture include weed control,[1][2][3] **cloud seeding**,[4] planting seeds, harvesting, environmental ...

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"cloud seeding"

Daily update · January 28, 2020

NEWS

[How Holy Clouds Cause Snowfall](#)

Popular Mechanics

Euphemistically called "private weather modification," **cloud seeding** is used by different groups around the world to try to cause more desirable ...

Flag as irrelevant

[Zambo water firm eyes cloud seeding to boost supply](#)

pna.gov.ph

Zambo water firm eyes **cloud seeding** to boost supply ... City Water District is planning to conduct **cloud seeding** operations to boost its water supply.

Flag as irrelevant

[Cloud Seeding Machines Market 2020 In Depth Research, Size, Trends and Forecast by 2026 ...](#)

News Log Book (press release) (blog)

QY Research has made a brilliant attempt to elaborately and meticulously analyze the global **Cloud Seeding** Machines market in its latest report.

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[Cloud Seeding Equipment Market – Major Technology Giants in Buzz Again | Weather Modification ...](#)

Vital News 24

A New Research on the Global **Cloud Seeding** Equipment Market was conducted across a variety of industries in various regions to produce more ...

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[Cloud-seeding System Market to Develop Rapidly by 2017 – 2027](#)

Vital News 24

Business Intelligence Report on the Perfluoropolyether (PFPE) Market. FMI, in a recently published market study, offers valuable insights related to the ...

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[Transmission Overload Protectors Market to Witness an Outstanding Growth by 2017 – 2027](#)

Fusion Science Academy

Business Intelligence Report on the **Cloud-seeding** System Market. FMI, in a recently published market study, offers valuable insights related to the ...

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[Second annual White River Water Expo draws 100+](#)

Rio Blanco Herald Times

Upper basin states are working on their own drought contingency plans which includes three primary segments: 1) **cloud seeding** and phreatophyte ...

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[Lubricants for Mining and Quarry Applications Market Expectations & Growth Trends Highlighted ...](#)

Fusion Science Academy

FMI, in a recently published market study, offers valuable insights related to the overall dynamics of the **Cloud-seeding** System Market in the current ...

[Flag as irrelevant](#)

[UAE Rains: Greenery Returns to Different Parts of the Country](#)

Masala.com

The UAE has recently had its fair share of rain, thanks to **cloud seeding**. As a result, many deserted areas have turned green! AddThis Sharing Buttons.

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[Luxury Yacht Charter Market 2020 Projections, SWOT Analysis, Size and Forecast by 2026 ...](#)

News Log Book (press release) (blog)

X-Ray Imaging Softwares Market Growth Analysis and Forecast 2020-2026 | Yachtico, Zizooboats, Boat International Media · **Cloud Seeding** ...

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"cloud seeding"

Daily update · January 25, 2020

NEWS

[Global Cloud Seeding Machines Market, Top Key Players: Weather Modification, North American ...](#)

Fusion Science Academy

Global **Cloud Seeding** Machines Market Size, Status and Forecast 2020-2026. This report focuses on the **Cloud Seeding** Machines Market status, ...

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[Future direction of rain enhancement research reviewed](#)

WAM EN

Panelists also discussed inter-cloud interactions in a convective environment, rainfall-runoff-groundwater relationship and the impact of **cloud seeding** ...

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[UAE weather: increased humidity and low precipitation expected Friday evening](#)

The Media Hq (press release) (blog)

According to a recent report in Gulf News, more **cloud seeding** is expected, which will cause heavy precipitation in the eastern and northern parts of ...

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[Johor targets investments in petrochemical, manufacturing sector](#)

Malay Mail

Meanwhile, on the current heat wave which is expected to last till March, Puah said **cloud-seeding** activities will be held at the end of the month or in ...

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"cloud seeding"

Daily update · January 22, 2020

NEWS

[UAE to spend \\$136.1 million on infrastructure after floods](#)

KFGO News

DUBAI (Reuters) - The United Arab Emirates will spend 500 million dirhams (\$136.1 million) on flood protection and transport infrastructure after ...

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[Virginia Spivey Coleman](#)

Oak Ridger

Among her cherished memories was being present at one of the first demonstrations of **cloud seeding** to produce snow. On April 5, 1952, she married ...

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[UAE to spend \\$136.1 million on infrastructure after floods](#)

KFGO News

DUBAI (Reuters) - The United Arab Emirates will spend 500 million dirhams (\$135 million) on flood protection and transport infrastructure after intense ...

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[Have you been keeping up with local headlines? Test your knowledge in Quiz No. 55](#)

The Durango Herald

This week's quiz features questions about Durango High School lacrosse, **cloud seeding**, Project Merry Christmas and more! To take previous news ...

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[Local briefs: Jan. 22, 2020](#)

The Grand Junction Daily Sentinel

18: Snow Science, **Cloud Seeding** and Forest Health. Feb. 25: Water Quality. The course goes from 6–9: p.m. each evening, in the University Center ...

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Corporate Social 'Wokeness'

Ricochet.com

For one thing, the ability to use **cloud seeding** is never employed during late summer or early fall here in Calif. Although that program would not have ...



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Water woes ahead and 8 news from yesterday

Malaysiakini

... for some states, with the dam level in Penang (photo above) remaining low despite **cloud-seeding**, while Malacca is contemplating water rationing.



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International team tours Emirates Weather Enhancement Factory

Trade Arabia

... hygroscopic salt flares for use in **cloud-seeding** operations and currently produces two types of flares with a capacity to produce 250 flares per week.



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"cloud seeding"

Daily update · January 21, 2020

NEWS

[Cloud seeding: it's more complicated than you might think](#)

The National

Every time it rains in the UAE, some residents are quick to speculate that the wet weather was caused by the country's **cloud-seeding** programme.



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[Cloud seeding: Blue sky thinking to help scientists make it rain during UAE summer](#)

The National

More rain could fall in the Emirates in future summers as a result of a research project which has led to a greater understanding of UAE clouds.



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[Cloud seeding to continue](#)

The Star Online

PETALING JAYA: As northern states battle hot and dry days, **cloud seeding** will continue in Kedah and Penang to ease parched farmland and raise ...



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[UAE to take cloud seeding research to new heights](#)

The National

Giant masts that electrically charge air molecules to produce rain drops could be the next big thing in **cloud seeding** operations. Speaking at a forum in ...



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[Cloud seeding in UAE improves weather in region, too: Expert](#)

MENAFN.COM

(MENAFN - Khaleej Times). As the UAE increases its **cloud-seeding** missions every year, it triggers higher volumes of rain - but not only in the ...



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Despite **cloud seeding**, Penang dam levels remain at all-time low

Malaysiakini

Penang Water Supply Corporation (PBAPP) CEO Jaseni Maidinsa said despite the rain, which came after a **cloud seeding** exercise, only 2mm fell into ...



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UAE Research Program for Rain Enhancement Science Announces New Cycle

Yahoo Finance

This project will support **cloud seeding** operations through using the cloud-scale model to build a statistical emulator. In addition to precipitation ...



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Blue sky thinking to help scientists make it rain during UAE summer

The National

The results could lead to changes in the country's **cloud seeding** programme and more experiments this year, after readings uncovered "unique" ...



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Rainfall in the United Arab Emirates: Dubai and Abu Dhabi will experience cloudy and showers ...

The Media Hq (press release) (blog)

The United Arab Emirates has been **cloud seeding** for over a decade. The country launched a research program on the science of improving rain in ...



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"cloud seeding"

Daily update · January 20, 2020

NEWS

[UAE aims to boost cloud seeding via artificial clouds, says top meteorologist](#)

The National

One of the UAE's leading meteorologists has said research is currently underway to help create artificial clouds. Dr Omar Al Yazeedi, a director at the ...

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[Cloud Seeding Market: Demand Analysis & Opportunity Evaluation \(2019-2027\) by Mode of ...](#)

Yahoo Finance

Dublin, Jan. 20, 2020 (GLOBE NEWSWIRE) -- The "Global **Cloud Seeding** Market Demand Analysis & Opportunity Evaluation, 2019-2027" report has ...

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[Cloud seeding: United Arab Emirates urges scientists and global experts to help improve ...](#)

The Media Hq (press release) (blog)

The country has now called in scientists from around the world to help boost its **cloud seeding** operations. At the 4th International Rain Improvement ...

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[Cloud Seeding: UAE Urges World Scientists and Experts to Help Enhance Rainfall](#)

Masala.com

The country has now called on world scientists to help boost its **cloud-seeding** operations. At the 4th International Rain Enhancement Forum (IREF), ...

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[Cloud seeding in UAE improves weather in region, too: Expert](#)

AlKhaleej Today (press release)

As the UAE increases its **cloud-seeding** missions every year, it triggers higher volumes of rain - but not only in the Emirates. It also brings more ...



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[Cloud seeds carried out in Kedah, Penang | Malaysia](#)

gotech daily (press release) (blog)

MetMalaysia today launched a **cloud seeding** operation to address water shortages in the northern states of the Malaysian peninsula. – Picture by KE ...



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[UAE Rainfall: Dubai and Abu Dhabi to Experience Cloudy Weather, Light Showers Again](#)

Masala.com

The country's **cloud seeding** operations have boosted the amount of rainfall received by up to 35 percent. According to a Gulf News report, Omar Al ...



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[Foggy weather forecast for UAE with a chance of rainfall](#)

MENAFN.COM

(MENAFN - Khaleej Times). The UAE is expected to receive rainfall on Monday in the evening, the national Met department reported on Monday.



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[IREF highlights latest advances on second day](#)

Gulf Today

... the programme's achievements in carrying out successful field campaigns harnessing innovative technologies in **cloud seeding** operations.



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[Dh2.5 billion Dubai drainage project to tackle flood threat](#)

The National

The forum discussed the use of artificial intelligence to predict meteorological events and unmanned aerial vehicles for **cloud seeding** operations.



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"cloud seeding"

Daily update · January 19, 2020

NEWS

[Revealed: How much rain fell due to cloud seeding in UAE?](#)

Gulf News

The UAE may have seen one its heaviest bouts of rainfall this month, but **cloud seeding** would only have increased the amount of rainfall by up to 35 ...

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[UAE aims to boost cloud seeding via artificial clouds, says top meteorologists](#)

The National

He said scientists in the Emirates were currently corroborating with experts from around the world to explore not only **cloud seeding** methods but also ...

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[Cloud seeding conducted in Kedah, Penang](#)

Malaysiakini

The Malaysian Meteorological Department (MetMalaysia) today launched a **cloud seeding** operation to address water shortage in the northern states ...

[Cloud seeding conducted in Kedah, Penang](#) - Malay Mail
[Full Coverage](#)

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[Blue sky causes blues in Kedah as cloud seeding attempt gets delayed](#)

The Star Online

Menteri Besar Datuk Seri Mukhriz Tun Mahathir said the **cloud seeding** exercise scheduled for Sunday (Jan 19) might not take off as there were no ...

[A sky too blue for Kedahans as cloud seeding gets delayed](#) - Malay Mail
[Full Coverage](#)

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[Johor plans cloud seeding](#)

The Star Online

KULAI: Although the Johor government is planning to have **cloud-seeding** operations in early

February as a proactive measure against water shortage ...

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[Jakarta: The Sinking City](#)

The Organization for World Peace (press release)

While more rain is expected, Indonesian authorities are using **cloud seeding** to try to stop the rain and therefore decrease the flooding in Jakarta.

Flag as irrelevant

[When is it going to rain next in UAE?](#)

Khaleej Times

The wettest January in the UAE's history is set to get wetter with more rains forecast for this week. According to the five-day forecast issued by the ...

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[When will the next rain start in the UAE? – News](#)

magviral (satire) (press release) (blog)

... significantly increased freshwater resources. He attributed a combination of climate change and **cloud seeding** operations for the ongoing rainstorm.

Flag as irrelevant

[Durian Tunggal Dam close to critical level](#)

The Star Online

It is understood that the first option is to embark on a **cloud-seeding** operation, which is expected to help solve the shortage in all three dams in view of ...

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[Underground water extraction to meet Langkawi's needs](#)

The Sun Daily

He was also open to **cloud seeding** operations but stressed that there is a need for it to be effective by ensuring that the rainfall falls in areas which ...

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WEB

[A sky too blue for Kedahans as cloud seeding gets delayed](#)

Bernama

Mukhriz, **cloud seeding**, Meteorology Department, weather, dam.

Flag as irrelevant

[Cloud seeding conducted in Kedah, Penang](#)

Bernama.com

KUALA LUMPUR, Jan 19 -- The Malaysian Meteorological Department (MetMalaysia) today launched a **cloud seeding** operation to address water ...



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"cloud seeding"

Daily update · January 18, 2020

NEWS

[As the Southwest dries out, water managers increasingly look to cloud seeding](#)

The Durango Herald

That is why water managers in Southwest Colorado plan to increase investments in **cloud-seeding** infrastructure beginning this year. For decades ...

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[When is it going to rain next in UAE?](#)

Khaleej Times

... boost freshwater reserves considerably. He attributed a combination of climate change and **cloud-seeding** operations for the incessant downpour.

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"cloud seeding"

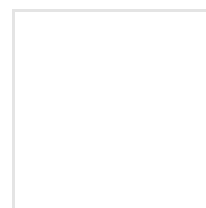
Daily update · January 15, 2020

NEWS

[Rain, cloudy weather and cloud seeding expected in the UAE till Wednesday morning](#)

Gulf News

The National Center of Meteorology shared videos and updates on Instagram. An NCM official also confirmed that **cloud seeding** operations were on ...



[Rain, cloudy weather and cloud seeding expected in the UAE until Wednesday](#) - Gulf News
[Full Coverage](#)

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[Solidum sees danger in cloud seeding on ashfall affected areas](#)

INQUIRER.net

MANILA, Philippines — While **cloud seeding** may help wash away ashfall in areas hit by the eruption of the Taal Volcano, Philippine Institute of ...

Flag as irrelevant

[Cloud Seeding Equipment Market Segmented by Product, Top Manufacturers, Geography Trends ...](#)

Technology Magazine (press release) (blog)

Market Study Report, LLC adds latest research report on ' **Cloud Seeding** Equipment Market', which delivers a comprehensive study on current ...

Flag as irrelevant

[Here's the reason behind UAE's record-breaking rainfall](#)

MENAFN.COM

(MENAFN - Khaleej Times). The UAE's ongoing record-breaking rain spell is the result of a combination of climate change and **cloud-seeding**, the ...

Flag as irrelevant

[UAE weather: Dubai and Abu Dhabi struck by lightning and rain](#)

The National

NCM has carried out **cloud-seeding** missions in an effort to increase rainfall, but the showers were caused by strong weather systems that originated ...

[UAE weather: Dubai and Abu Dhabi struck by lightning and rain](#) - The National

[UAE weather: It's snowing in Jebel Jais, time to go?](#) - Gulf News

[Full Coverage](#)

Flag as irrelevant

[Is it worth getting a car washed in between rain showers?](#)

Gulf News

Rain brings down with it pollutants built up in the atmosphere, and if the shower is caused by **cloud seeding** as it has been in many recent occasions in ...

Flag as irrelevant

[14400 swimming pools: That's how much water UAE dams collected in 2 days](#)

Khaleej Times

In an interview earlier this week, the minister attributed climate change and **cloud seeding** to the non-stop rains the country has been witnessing.

Flag as irrelevant

[International Rain Enhancement Forum to kick off next week in Abu Dhabi](#)

WAM EN

... "I am confident that the Forum's outcomes and recommendations will go a long way in improving the efficiency and accuracy of **cloud seeding** as a ...

Flag as irrelevant

[Philippines morning news for January 15](#)

AEC News Today

Senate President Vicente Sotto III has proposed **cloud seeding** to solve the ashfall problem in parts of Luzon due to the Taal Volcano eruption, but ...

Flag as irrelevant

[UAE: Schools working this weekend](#)

Gulf News

Just this week, January 11, saw the closure of classes as more as **cloud-seeding** darkened the skies and drenched the roads. In order to keep up with ...

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"cloud seeding"

Daily update · January 14, 2020

NEWS

[Cloud seeding or not, let's not make heavy weather of the rains](#)

Khaleej Times

Is the UAE undertaking **cloud-seeding** missions? Yes, it is. But can we attribute the record-breaking rainfall (the highest recorded in 24 years) to **cloud** ...

Flag as irrelevant

[Why Filipinos did not welcome Tito Sotto's cloud seeding proposal to ashfall-stricken areas](#)

InterAksyon

Tito Sotto III that **cloud seeding** should be done in areas affected with Taal Volcano's ashfall. Phivolcs Director Renato Solidum said that further study ...

[Cloud seeding after volcano eruption needs to be studied first, Phivolcs says](#) - Philippine Star
[Full Coverage](#)

Flag as irrelevant

[Cloudy weather, rain, thunderstorms and cloud seeding expected today in these parts of the UAE](#)

Gulf News

On Monday, an NCM official told Gulf News: "We are also expecting to dispatch **cloud seeding** flights depending on cloud activity. Coastal, northern ...

[UAE weather: Dubai and Abu Dhabi set for more rain on Tuesday](#) - The National
[Full Coverage](#)

Flag as irrelevant

[More storms are expected today and additional cloud seeding operations will be dispatched](#)

AhlanLive.com

Gulf News reported that a National Centre of Meteorology official said that more **cloud seeding** operations will be dispatched too. The storms are ...

Flag as irrelevant

[It's legal for NH employees to modify the weather – for the moment, anyway](#)

Concord Monitor

So what's the problem with **cloud seeding**? "Clouds are not a nice controlled laboratory environment," as Koermer put it. It is very difficult to prove that ...

Flag as irrelevant

[Here's the reason behind UAE's record-breaking rainfall](#)

Khaleej Times

The UAE's ongoing record-breaking rain spell is the result of a combination of climate change and **cloud-seeding**, the country's climate change ...

Flag as irrelevant

[Cloud Seeding Equipment Market – Global Trends, Industry Size, Growth, Opportunities, and ...](#)

Expert Recorder

A report added to the rich database of Qurate Business Intelligence, titled "Global **Cloud Seeding** Equipment Market Size, Status and Forecast 2025", ...

Flag as irrelevant

[UW in the News](#)

University of Wyoming News

UW atmospheric science Assistant Professor Jeff French discussed **cloud-seeding** effects with Wired. The online news website, based in the Middle ...

Flag as irrelevant

[Will insurance cover damages by rain? UAE law firm clarifies](#)

MENAFN.COM

The UAE has witnessed heavy rains over the last few days, thanks to **cloud-seeding**, resulting in damage to public and private properties and vehicles ...

Flag as irrelevant

[The Top Nine Conspiracy Theories About Los Angeles](#)

lataco.com

... government entity secretly working to keep pilots in the sky dropping a specific sickness-inducing compound, but as a side-effect of **cloud-seeding**.

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"cloud seeding"

Daily update · January 13, 2020

NEWS

[Thunderstorms and more **cloud seeding** expected on Tuesday in the UAE](#)

Gulf News

"We are also expecting to dispatch **cloud seeding** flights depending on cloud activity. Coastal, northern and eastern regions of the country are most ...

[Enough rumours, **cloud seeding** had nothing to do with UAE's three-day rain storm](#) - The

National

[Full Coverage](#)

Flag as irrelevant

[Sotto wants **cloud seeding** in areas affected by Taal eruption, ashfall](#)

INQUIRER.net

MANILA, Philippines — Senate President Vicente Sotto III is proposing that **cloud seeding** operations be conducted in areas affected by the recent ...

Flag as irrelevant

[Will insurance cover damages by rain? UAE law firm clarifies](#)

Khaleej Times

Residents have questions whether these damages are covered under the insurance as rains are caused by "intentional act" of **cloud seeding**.

[Are the Floods in Dubai Due to its **Cloud Seeding** Initiative?](#) - SCOOP EMPIRE

[Full Coverage](#)

Flag as irrelevant

[Majority of UAE residents to be hit with large clean-up bill after storms](#)

ArabianBusiness.com

Schrey also dismissed concerns that rain caused by **cloud seeding** may not be covered by insurance policies. He said: "Rain is covered in policies, ...

Flag as irrelevant

[3 arrested after "hasish" boast on social media](#)

Gulf News

... rain was reportedly 24 years ago according to the National Centre of Meteorology which also

carried out several **cloud seeding** sessions to enhance ...

Flag as irrelevant

[Heavy rain may be due to climate change](#)

Gulf Today

The National Meteorology Centre (NCM) said experts have carried out over a dozen **cloud seeding** operations in the past few days in order to harness ...

Flag as irrelevant

[Dubai families count the cost of damage to homes after worst floods in years](#)

The National

Officials said climate change was to blame, rather than any **cloud-seeding** operations planned to encourage rainfall over the UAE. Talib, who is ...

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[Dubai Floods: People Trapped Inside Houses as Torrential Rains Trigger Flooding in Dubai](#)

LatestLY

Dubai, January 13: Torrential rains have triggered flooding in Dubai, submerging houses and vehicles on roads and trapping several people inside ...

Flag as irrelevant

[Dubai International Airport to witness more flight interruptions due to stormy weather](#)

The Media Hq (press release) (blog)

Heavy showers are the result of UAE **cloud seeding** operations, as the country has sent more than nine flights in the past two days to increase ...

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Date: Monday, 13 January 2020 9:05:45 am



"cloud seeding"

Daily update · January 12, 2020

NEWS

[UAE Completes 9 Cloud Seeding Flights, Plans to Conduct More to Increase Rainfall](#)

Masala.com

UAE's National Center of Meteorology revealed that nine **cloud seeding** flights had been completed between Thursday and Saturday, with plans for ...

[Rain in Dubai: Traffic Comes to a Standstill, More Showers Expected Today](#) - Masala.com
[Full Coverage](#)

Flag as irrelevant

[Heavy rain causes travel chaos in Dubai](#)

Arab News

The National Center of Meteorology (NCM) told Arab News that **cloud-seeding**, the UAE's program designed to enhance rainfall, had begun on ...

[WATCH: Dubai airport flights delayed, cancelled due to heavy rain](#) - Independent Online
[Full Coverage](#)

Flag as irrelevant

[UAE rain and storms linked to climate change, minister says](#)

The National

"In the last five years we have managed to reach the optimum formula for the **cloud seeding**. We managed to use the technology in a very efficient way ...

Flag as irrelevant

[Heavy rainfall strains Dubai drainage system](#)

Gulf News

... 24 years ago according to the National Centre of Meteorology which also carried out several **cloud seeding** sessions to enhance the rainfall.

Flag as irrelevant

[Rainfall in UAE Breaks Record, Receives Highest Rainfall in 24 Years](#)

The Media Hq (press release) (blog)

The UAE broke a new record with showers as a result of its **cloud seeding** operations. With recent showers, the country recorded the highest amount of ...



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[UAE Rainfall Breaks Record, Country Receives Heaviest Rainfall in 24 Years](#)

Masala.com

The UAE has broken a new record with its downpours, the result of its **cloud seeding** operations. With the recent showers, the country has recorded the ...



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[As Rain Pours in Dubai, Jakarta Faces Flooding Too](#)

Masala.com

To tackle the current issue of flooding, Indonesia has carried out **cloud seeding** to prevent torrential downpours in the capital. Planes have been sent ...



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"cloud seeding"

Daily update · January 7, 2020

NEWS

['Funds For Cloud Seeding Released But There Are No Clouds To Seed'](#)

[pindula.co.zw](#)

The government has released money for **cloud seeding** to counter the current dry spell, but the atmospheric conditions are not favourable to such an ...

Flag as irrelevant

[Jakarta floods spark renewed calls for stronger environmental protection](#)

[Mongabay.com](#)

More heavy rains and strong winds are forecast to continue into mid-February, while authorities carry out **cloud-seeding** attempts to minimize rainfall ...

Flag as irrelevant

[Abu Dhabi Sustainability Week to put spotlight on pioneering technology to combat climate change](#)

[The National](#)

With global droughts becoming more commonplace due to climate change, Dr Al Zeyoudi told The National the UAE's recent **cloud-seeding** activities ...

Flag as irrelevant

[Indonesia succeeds in modifying weather to stop flooding](#)

[Independent Online](#)

Authorities started **cloud-seeding** operations by shooting salt flares at clouds on the Java Sea and the Sunda Strait to induce rain over waters off Java ...

Flag as irrelevant

[Zimbabwe: All Hope Not Lost, Say Agric Experts](#)

[AllAfrica.com](#)

The MSD said it was unfortunate that it was failing to conduct **cloud seeding** as the conditions were not permitting. "Government released money for ...

Flag as irrelevant

Rains expected on Friday

Chronicle

The MSD said it was unfortunate that it was failing to conduct **cloud seeding** as ... For **cloud seeding** to be carried out, there are certain conditions and ...



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All hope not lost, say agric experts

The Herald

The MSD said it was unfortunate that it was failing to conduct **cloud seeding** as the conditions were not permitting. "Government released money for ...



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Date: Friday, 3 January 2020 9:00:51 am



"cloud seeding"

Daily update · January 2, 2020

NEWS

LOOKING BACK

OurayNews.com

... 50 YEARS AGO January 1, 1970 - Letter to the Editor: We have been following with great interest your articles on the "cloud seeding" program.



Flag as irrelevant

Angat Dam's water level rises by 1 meter

Philippine Star

Crispulo Bautista, Department of Agriculture Central Luzon office director, said no **cloud-seeding** operations are being undertaken in the watershed of ...



Flag as irrelevant

Water service interruptions in Metro Manila may continue – NWRB

Tempo

Water supply interruptions in Metro Manila are feared to continue until the dry season this year, with Angat Dam failing to reach its end-of-year normal ...



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Date: Thursday, 2 January 2020 9:00:49 am



"cloud seeding"

Daily update · January 1, 2020

NEWS

[BPPT plans to procure PTDI-manufactured aircraft for cloud seeding](#)

ANTARA

To carry out its **cloud-seeding** mission, the BPPT requires several aircraft, with ... Currently, the BPPT only has one aircraft to conduct **cloud seeding** to ...

Flag as irrelevant

[Reduced water allocation from Angat Dam to continue](#)

Philippine Star

MALOLOS, Philippines — The water level in Angat Dam did not reach its ideal end-of-the-year mark of 212 meters. Monitoring by the Bulacan ...

Flag as irrelevant

[Water service interruptions in Metro may continue -NWRB](#)

Manila Bulletin

To augment water source at Angat Dam in case it is needed, David said NWRB will be tapping some deep wells within Metro Manila. **Cloud seeding** ...

Flag as irrelevant

[Zim Threatened By Another Massive Drought](#)

ZimEye - Zimbabwe News

THE World Food Programme (WFP) says the country was facing another famine after the 2020 harvest was hit hard by continued dry spells. The WFP ...

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Date: Tuesday, 31 December 2019 9:01:09 am



"cloud seeding"

Daily update · December 30, 2019

NEWS

[Plans on course for early cloud-seeding](#)

Bulawayo24 News (press release) (blog)

"We are planning to venture into **cloud-seeding** since the country has not been receiving enough rainfall and our plans are now at an advanced stage ...



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Subject: Google Alert - "cloud seeding"
Date: Monday, 30 December 2019 9:00:44 am



"cloud seeding"

Daily update · December 29, 2019

NEWS

[Plans on course for cloud seeding](#)

sundaymail.co.zw

Tanyaradzwa Rusike. GOVERNMENT is weighing the option of introducing early **cloud-seeding** to aid rainfall if the current dry weather patterns persist ...



Flag as irrelevant

[Zimbabwe Mulls Cloud Seeding As The Dry Spell Continues](#)

pindula.co.zw

Zimbabwe is considering introducing **cloud seeding** to aid rainfall because of the dry spell ravaging the country The Sunday Mail reports. This was ...



Flag as irrelevant

[Ministry committed to addressing environment, climate issues: Yeo](#)

Daily Express

... Malaysian Meteorological Department (MetMalaysia) and the Royal Malaysian Air Force, conducted five **cloud seeding** operations in several states ...



Flag as irrelevant

[Global Agricultural Robot Market by Types, Applications, Countries, Companies and Forecasts to ...](#)

Market Research Writeup

Emerging applications of robots or drones in agriculture include weed control, **cloud seeding**, planting seeds, harvesting, environmental monitoring ...



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Subject: Google Alert - "cloud seeding"
Date: Friday, 27 December 2019 9:00:44 am



"cloud seeding"

Daily update · December 26, 2019

NEWS

[5 Essential Reads About Snow and Ice](#)

EcoWatch

Many western states and agencies have tried to do just that for years by **cloud-seeding** — adding particles to the atmosphere that are thought to serve ...



Flag as irrelevant

[Oxygen bar to fake rain: 10 ways India tried to beat its 'airpocalypse'](#)

National Post

Authorities in the Indian capital considered **cloud seeding** developed by the Indian Institute of Technology (IIT) in an effort to trigger rainfall and bring ...



Flag as irrelevant

[Cloud Seeding Equipment Market Forecast and Price To 2026 by Companies Kyathi, Snowy, AF ...](#)

Stock Market News

Here we have represented a Global **Cloud Seeding** Equipment market research report which showcases the past overview of the recent industry ...



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Date: Thursday, 26 December 2019 9:01:44 am



"cloud seeding"

Daily update · December 25, 2019

NEWS

[Cloud-seeding System Market to be at Forefront by 2017 – 2027](#)

Info Street Wire

Latest Report on the **Cloud-seeding** System Market. Future Market Insights recently published a market study that offers critical insights related to the ...



Flag as irrelevant

[Haze, rabies outbreak in Sarawak raise safety and health concerns](#)

Malay Mail

... haze mitigation measures in the affected states, proactively addressed the issues including implementing **cloud seeding** operations to produce rain.



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Date: Friday, 20 December 2019 9:01:04 am



"cloud seeding"

Daily update · December 19, 2019

NEWS

[Atmospheric scientists wrap up winter cloud-seeding project in southwestern Idaho](#)

Stock Daily Dish

The King Air moves into a hangar; snow clouds are in the background. Credit: Larry Oolman. Can **cloud seeding**—dispersing particles into the air with ...



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[Aquifer recharge program on pace](#)

LocalNews8.com

\$29 million was spent on the ESPA recharge program, \$3.5 million in partnership with Idaho Power Company on **cloud seeding**, and \$2 million for ...



Flag as irrelevant

[Parched South India faces biggest water crisis](#)

Stock Daily Dish

The state government has allotted Rs 30 crore for **cloud seeding** to generate artificial rainfall in regions. It says it has also made sure that all farmers ...



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Date: Thursday, 19 December 2019 9:01:04 am



"cloud seeding"

Daily update · December 18, 2019

NEWS

[Global Cloud Seeding Equipment Market 2020-2026 Ice Crystal Engineering, Mettech SpA, AF ...](#)

Global Industry Analysis

The **Cloud Seeding** Equipment Market 2020 forecast to 2026 report delivers in-depth evaluation concentrating on the overall **Cloud Seeding** ...

Flag as irrelevant

[USU graduate named as head of the Utah Division of Water Resources](#)

Cache Valley Daily

... Environmental Industrial Advisory Board, and has served as the division's **cloud seeding** coordinator for six years, among other responsibilities.

Flag as irrelevant

[Cloud Seeding System Market 2020 By Industry Trends, Statistics, Key Companies Growth and ...](#)

Downey Magazine (press release) (blog)

CRIFAX added a new market research report on 'Global **Cloud Seeding** System Market, 2020-2028' to its database of market research collaterals ...

Flag as irrelevant

[Letter: An open letter to Premier Doug Ford](#)

Manitoulin Expositor

The petitioners call upon Parliament to repeal any law that would permit the dispersal of military chaff or of any **cloud-seeding** substance whatsoever ...

Flag as irrelevant

[Water level at Angat Dam may not reach year-end target of 212 meters](#)

Manila Bulletin

... at Angat Dam, David earlier said that NWRB will be "preparing some deepwells within Metro Manila and **cloud seeding** operations are on standby." ...

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Agriculture Robots Market Size 2020: Segmentation and Global Analysis by Latest Trends, Share ...

Globe Market News

Emerging applications of robots or drones in agriculture include weed control, **cloud seeding**, planting seeds, harvesting, environmental ...



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Date: Tuesday, 17 December 2019 9:02:42 am



"cloud seeding"

Daily update · December 16, 2019

NEWS

[Cloud-seeding System Market – Sales Overview, Market Size, Opportunities, Demands, Market ...](#)

Weekly Spy

Cloud-seeding System Market – From FMI's Viewpoint. Aided by an expert team of 300+ analysts, Future Market Insights serves each and every ...



Flag as irrelevant

[Flood warning issued as UAE braces for a week of rain](#)

The National

The UAE frequently performs **cloud seeding** missions to enhance rainfall over the country. It involves fitting planes with special flares which are fired ...



Flag as irrelevant

[UAE weather: precipitation forecasts for Dubai, Abu Dhabi, Sharjah and Fujairah](#)

The Media Hq (press release) (blog)

Some of the recent rain showers are the result of **cloud seeding** efforts. The United Arab Emirates has been carrying out **cloud seeding** operations for ...



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[UAE Weather: Predictions of Rainfall in Dubai, Abu Dhabi, Sharjah and Fujairah](#)

Tech Ballad (press release) (blog)

Some of the rain showers witnessed recently have been the result of **cloud seeding** efforts. The UAE has been carrying out **cloud seeding** operations ...



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[Agricultural issues and challenges in Andhra Pradesh during 2004 to 2014](#)

Denton Daily

Cloud seeding: **Cloud seeding** operations were conducted by the ... by using technology of **cloud seeding** there is no effective evidence to show that it ...



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"cloud seeding"

Daily update · December 12, 2019

NEWS

[Winter is coming: 5 essential reads about snow and ice](#)

Hartford Courant

Many western states and agencies have tried to do just that for years by **cloud-seeding** – adding particles to the atmosphere that are thought to serve ...

Flag as irrelevant

[Our fires weren't as bad as in the Amazon, Indonesian officials claim](#)

Mongabay.com

Officials say they plan to adopt technological solutions for the upcoming fire season, including **cloud seeding** and the use of drones for early detection ...

Flag as irrelevant

[Shelton students among Weller scholarship finalists](#)

Shelton Herald

This project will outline the practical application of a **cloud seeding** program in the coastal New England area, the research will explore **cloud** ...

Flag as irrelevant

[Eagle River Watershed Council: Plenty to celebrate in 2019](#)

Vail Daily News

... combined with a whiskey tasting to learn about local watershed protection efforts, and a full-house presentation about **cloud seeding** in Colorado.

Flag as irrelevant

[Concrete Climate Solutions are the Key to End These Climate Protests](#)

Science Times

Greta Thunberg arrived in Madrid last Dec. 6 to let the attendees of the COP25 hear the voice of the people with regard to the climate crisis. It is to be ...

Flag as irrelevant

[Water problems](#)

Tempo (satire)

DO you want to see President Duterte fuming mad? All you have to do is mention Maynilad Water Services (MWS) and Manila Water Company (MWC) ...

Flag as irrelevant

World War 3: How US and Soviet Union realised nuclear war would 'wipe out Earth'

Infosurhoy

The book also discusses how countries around the world are trying to influence the weather in the future, whether it be by “**cloud seeding**” – with ...

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Subject: Google Alert - "cloud seeding"
Date: Thursday, 12 December 2019 9:02:15 am



"cloud seeding"

Daily update · December 11, 2019

NEWS

[Idaho Farm Bureau picks new VP, honors members](#)

Capital Press

Delegates also reaffirmed their support of Idaho Power **cloud-seeding** efforts, which increase the snowpack, and took positions on issues including ...

Flag as irrelevant

['Dubai Rain' is trending on Twitter, here's what people are saying](#)

Gulf News

The shift from summer to winter in the UAE is accompanied by convective clouds, which offers conducive conditions for UAE's **cloud seeding** initiative.

Flag as irrelevant

[UAE weather alert: low rainfall forecast for Dubai and Abu Dhabi Saturday night](#)

The Media Hq (press release) (blog)

... also experienced heavy rains and thunderstorms in November, with many claiming that this was the result of the country's **cloud seeding** efforts.

Flag as irrelevant

[Agricultural Robots 2019 Global Market Size, Status, Analysis and Forecast to 2026](#)

Crypto Journal

... for these robots by integrating areas like environmental monitoring, weed control, **cloud seeding**, harvesting, planting seeds, and soil analysis.

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Date: Tuesday, 10 December 2019 9:01:17 am



"cloud seeding"

Daily update · December 9, 2019

NEWS

[With rains returning to Israel, cloud seeding is being renewed](#)

The Jerusalem Post

EMS Mekorot, one of the water companies in Israel, has started **cloud seeding** on Sunday in order to increase the amount of rain. As a part of this ...

Flag as irrelevant

[Idaho Farm Bureau reaffirms support for industrial hemp; link to full story](#)

Idaho Press-Tribune

They also reaffirmed their support of Idaho Power's **cloud seeding** efforts after a motion was made to alter IFBF policy on the issue. You can read ...

Flag as irrelevant

[DRI unmanned cloud-seeding realizes beyond visual line of sight](#)

Livingston Ledger

15, 2017. Credit: Zach Clark/Drone America. Nevada's unmanned **cloud-seeding** research team has realized another fundamental capability in their ...

Flag as irrelevant

[Lahore grabs 'most polluted city in world' title, again](#)

Pakistan Today

... that the government has approached China, Malaysia and United Arab Emirates (UAE) to purchase the **cloud seeding** technology which is required ...

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Subject: Google Alert - "cloud seeding"
Date: Monday, 9 December 2019 9:02:18 am



"cloud seeding"

Daily update · December 8, 2019

NEWS

[UAE: Rain splashes across the emirates](#)

Gulf News

There has been a sprinkling of rain across the UAE this evening, with drizzles spotted in parts of Fujairah, Abu Dhabi, Dubai, Hatta and Sharjah.

Flag as irrelevant

[UAE weather warning: light rainfall predicted in Dubai and Abu Dhabi on Saturday night](#)

The Media Hq (press release) (blog)

However, the NCM had made it clear that the UAE's **cloud-seeding** program was not responsible for creating the thunderstorms that led to the closure ...

Flag as irrelevant

[Global Agriculture Robots Market 2020 Production, Revenue, Ex-Factory Price And Gross Margin ...](#)

Free Thinking Press

Emerging applications of robots orÂ dronesÂ in agriculture includeÂ weed control,Â **cloud seeding**,Â planting seeds, harvesting,Â environmental ...

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[UP to replicate Maharashtra's Sujalam Suphalam drought model in Bundelkhand](#)

Denton Daily

While, **cloud seeding** has long been employed in USA, Israel, China, South Africa and some Arab countries, the indigenous IIT-K technology is cheap ...

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Subject: Google Alert - "cloud seeding"
Date: Sunday, 8 December 2019 9:01:50 am



"cloud seeding"

Daily update · December 7, 2019

NEWS

[Cloud seeding flights to take off from Cheyenne this winter](#)

Wyoming Tribune

CHEYENNE – At Cheyenne Regional Airport, a King Air B200 aircraft is ready for the state of Wyoming's airborne **cloud seeding** project to take off.

Flag as irrelevant

[Cloud-seeding System Market to Develop Rapidly by 2017 – 2027](#)

Weekly Spy

Business Intelligence Report on the **Cloud-seeding** System Market. Future Market Insights, in a recently published market study, offers valuable ...

Flag as irrelevant

[Idaho Farm Bureau reaffirms support for industrial hemp](#)

MDJOnline.com

They also reaffirmed their support of Idaho Power's **cloud seeding** efforts after a motion was made to alter IFBF policy on the issue. AWARDS ...

Flag as irrelevant

[Idaho Farm Bureau reaffirms support for industrial hemp](#)

Idaho County Free Press

Idaho Farm Bureau Federation delegates reaffirmed their support for industrial hemp during the origination's 80th annual meeting Dec. 3-5 in Coeur ...

Flag as irrelevant

[A Tweet By The NCM Confirms That The Rains In This Emirate On Friday Were A Result Of **Cloud** ...](#)

Lovin Dubai

... Friday, December 6 stating that areas in the Fujairah Emirate could be facing varying levels of rainfall and hashtagged '**cloud seeding**' in the tweet.

Flag as irrelevant

UAE Weather Alert: Light Rainfall Predicted in Dubai and Abu Dhabi on Saturday Night

Masala.com

The UAE also experienced heavy rainfall and thunderstorms in November, with many people saying this was the result of the country's **cloud seeding** ...



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"cloud seeding"

Daily update · December 6, 2019

NEWS

[Cloud-seeding System Market to Make Great Impact in Near Future by 2017 – 2027](#)

Fancy Dolphin

The report on the **Cloud-seeding** System Market published by Future Market Insights (FMI) provides a clear understanding of the flight of the ...



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Date: Monday, 2 December 2019 9:01:07 am



"cloud seeding"

Daily update · December 1, 2019

NEWS

[OOSKAnews Voices -- Into Uncharted Waters: Governance Of Atmospheric Water](#)

OOSKA News

Current mechanisms for removing freshwater include fog harvesting, mechanized capture of water vapor and **cloud-seeding**, and other techniques for ...



Flag as irrelevant

[Global Agricultural Robot Market Research: Key Companies Profile with Sales, Revenue, Price ...](#)

Market Research Base

Emerging applications of robots or drones in agriculture include weed control, **cloud seeding**, planting seeds, harvesting, environmental monitoring ...



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Subject: Google Alert - "cloud seeding"
Date: Saturday, 30 November 2019 9:07:12 am



"cloud seeding"

Daily update · November 29, 2019

NEWS

[Cloud Seeding Equipment Market expected to massive growth](#)

Chemist Journal

Latest trending report on **Cloud Seeding** Equipment Market. The market research report on the global **Cloud Seeding** Equipment industry provides a ...



Flag as irrelevant

[UAE's green-fingered residents are wasting huge amounts of water](#)

The National

The construction of desalination plants and a **cloud-seeding** strategy has helped the UAE address water challenges. However, challenges still remain.



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Subject: Google Alert - "cloud seeding"
Date: Tuesday, 26 November 2019 10:24:13 am



"cloud seeding"

Daily update · November 25, 2019

NEWS

[Cloud-seeding System Market Poised to Expand at a Robust Pace Over 2017 – 2027](#)

Health News Office (press release)

A detailed study on the **Cloud-seeding** System Market published by Future Market Insights offers an in-depth understanding of the various elements ...

Flag as irrelevant

[Indonesian police arrest 185 over forest fires](#)

Daily Stock Dish

The agency said 42 helicopters had dropped nearly 240 million liters (63 million gallons) of water and 160 tons of salt for **cloud seeding** as part of the ...

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[Indonesian police arrest scores of people linked to huge forest fires](#)

Daily Stock Dish

The agency said 44 helicopters had dropped more than 71 million gallons of water and 163 tons of salt for **cloud seeding** as part of the firefighting ...

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Date: Sunday, 24 November 2019 9:05:05 am



"cloud seeding"

Daily update · November 23, 2019

NEWS

[Global Cloud Seeding Equipment Market 2019 Industry Growth – Weather Modification, Inc., North ...](#)

Mach Tribune (blog)

The market intelligence study namely, Global **Cloud Seeding** Equipment Market reveals well-researched projections of **Cloud Seeding** Equipment ...

Flag as irrelevant

[State Water Officials Say Groundwater Levels In Southern Idaho Aquifer Are In Good Shape](#)

Boise State Public Radio

The plan, otherwise known as CAMP, outlined aquifer recharge, a reduction in pumping water out of the aquifer, and **cloud seeding** as strategies to ...

Flag as irrelevant

[Cloud-seeding System Market – Key Players and Production Information analysis with Forecast ...](#)

Health News Office (press release)

In a recent market study published by Future Market Insights, the current and the future prospects of the **Cloud-seeding** System market is thoroughly ...

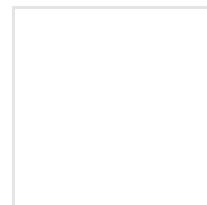
Flag as irrelevant

[All set to generate artificial rain in Lahore](#)

Daily Times

Before Lahore's situation, the government mulled to acquire **cloud seeding** technology in the near future to deal with the drought-like situation in ...

Flag as irrelevant



[Lahore mulls using artificial rain to counter smog](#)

Business Recorder

Lodhi continued that he had proposed using **cloud seeding** to create artificial rain, adding that **cloud seeding** will be done by rocket launcher or ship ...



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Subject: Google Alert - "cloud seeding"
Date: Saturday, 23 November 2019 9:02:15 am



"cloud seeding"

Daily update · November 22, 2019

NEWS

[Cloud-seeding not responsible for latest storms, says UAE meteorology centre](#)

ArabianBusiness.com

Cloud seeding involves flying light aircraft into the base of clouds and releasing flares containing potassium chloride, sodium chloride and magnesium ...

Flag as irrelevant

[No, cloud seeding isn't behind the unstable weather](#)

Khaleej Times

A piece of news in a local media platform yesterday cited **cloud seeding** as the reason behind the unstable UAE weather - besides being wrong and ...

Flag as irrelevant

[What do Sydney and other cities have in common? Dust](#)

The Conversation AU

Authorities in Bangkok used water cannons and even **cloud seeding** in attempts to limit the dust's effects. Singapore is periodically enveloped in grey ...

Flag as irrelevant

[Cuprous Iodide Market 2019 Research 2019, Business Opportunity, Global Trend, Future Growth ...](#)

Denton Observer

Its chemical formula is CuI and its melting point is 606°C , it has a wide variety of applications which include **cloud seeding**, dietary supplement and ...

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Subject: Google Alert - "cloud seeding"
Date: Friday, 22 November 2019 9:06:21 am



"cloud seeding"

Daily update · November 21, 2019

NEWS

[Watch: It's cloud seeding that's causing heavy rain, thunder in Dubai, Abu Dhabi, Sharjah and other ...](#)

Gulf News

UAE is experiencing unstable weather and yes, it is due to **cloud seeding**. ... Here's a video of **cloud seeding** that NCM shared with Gulf News.

[Cloud-seeding not responsible for UAE storms, confirms National Centre of Meteorology](#) - The National
[Full Coverage](#)

Flag as irrelevant

[Are rains in UAE caused by cloud seeding? NCM responds](#)

Khaleej Times

The country has been seeing rains more frequently over the years during this period and **cloud seeding** experts take full advantage of the increased ...

Flag as irrelevant

[UAE Cloud Seeding: Learn About the Country's Initiatives to Increase Rainfall](#)

Masala.com

The **cloud seeding** process modifies the weather in order to change the amount of rainfall received. Learn more about **cloud seeding** in the UAE.

Flag as irrelevant

[Cloud Seeding Equipment Market 2019-2024 | With Competitive Analysis, Swot Analysis And Key ...](#)

Downey Magazine (press release) (blog)

The recent report on 'Global **Cloud Seeding** Equipment market' begins with a description of the product, definition, scope of product and classification, ...

Flag as irrelevant

[UAEREP conducts site visits to Russia, USA, China to assess awardee projects](#)

WAM EN

The objective of Dr. Xue's project is to quantify the effects of **cloud seeding** on clouds, rainfall and groundwater in the UAE over a historic 10-year ...



Flag as irrelevant

[Global Agricultural Robots Market Report to Share Key Aspects of the Industry with the details of ...](#)

Internet Shots

Emerging applications of robots or drones in agriculture include weed control,[1][2][3] **cloud seeding**,[4] planting seeds, harvesting, environmental ...



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[Cloud seeding causes rains in Dubai, Abu Dhabi, more showers ahead](#)

Skymet Weather

The United Arab Emirates has been witnessing unstable weather conditions and **cloud seeding** has been enhancing the weather. **Cloud seeding** has ...



Flag as irrelevant

[More operations to increase rainfall in UAE](#)

MENAFN.COM

The UAE department for rain enhancement tweeted on Wednesday that **cloud seeding** operations were being carried out to increase the amount of ...



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[680 suspected Chinese scammers arrested in Malaysia raid](#)

UNTV News

Malaysia carried out **cloud seeding** in the hope of inducing rain and also closed hundreds of schools and sent half a million face masks to Sarawak, on ...



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Subject: Google Alert - "cloud seeding"
Date: Thursday, 21 November 2019 9:01:08 am



"cloud seeding"

Daily update · November 20, 2019

NEWS

[Cloud Seeding Equipment MARKET EXPECTED TO BOOST THE GLOBAL INDUSTRY GROWTH ...](#)

Eastlake Times

Cloud seeding is a weather modification process which involves dropping of chemical agents into clouds to cause rain. Silver iodide, dry ice and even ...

Flag as irrelevant

[Everything you need to know about the UAE's cloud seeding initiatives](#)

ArabianBusiness.com

Everything you need to know about the UAE's **cloud seeding** initiatives. The strategy is part of the government's bid to address the water needs of the ...

Flag as irrelevant

[State committee reviews Idaho water supply status](#)

LocalNews8.com

Idaho Power told the committee Monday, it does plan to do **cloud-seeding** this winter. 57 generators and 3 aircraft will be based in eastern Idaho.

Flag as irrelevant

[Cloud-seeding System Market, by Segmentation: Based on Product, Application and Region 2017 ...](#)

Journalism Trends

Analysis of the **Cloud-seeding** System Market. A recent market study published by Future Market Insights on the **Cloud-seeding** System Market maps ...

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Date: Wednesday, 20 November 2019 9:01:46 am



"cloud seeding"

Daily update · November 19, 2019

NEWS

[Cloud seeding not an option for drought-ravaged Australia](#)

7NEWS

When torrential rains flooded downtown Dubai earlier this month, the United Arab Emirates' zealous embrace of **cloud seeding** was blamed by some.

Flag as irrelevant

[Cloud Seeding Equipment Market Size, Emerging-Trends, Statistics, Key-Drivers, 2019 Growth ...](#)

TheFinanceTime (press release)

"Global **Cloud Seeding** Equipment Market 2025" Report Provides Porters Five Forces Analysis Illustrates the Potency of Buyers & Suppliers Operating ...

Flag as irrelevant

[Shoptalk: Fall River Electric votes not to increase rates](#)

Post Register

Idaho Power also collaborates with the Idaho Water Resource Board and water users in various basins in a cooperative **cloud-seeding** program to ...

Flag as irrelevant

[Bacteria from the ocean floor could be influencing Arctic weather](#)

Market Research Feed

At first, Creamean said he just hopes to get a basic sense of the particle distribution of **cloud-seeding** in the ocean and the atmosphere. But on August ...

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To: [Linda Stopforth](#)
Subject: Google Alert - "cloud seeding"
Date: Monday, 18 November 2019 9:03:44 am



"cloud seeding"

Daily update · November 17, 2019

NEWS

[Royal rainmakers halt Phuket cloud-seeding operations](#)

The Phuket News

PHUKET: The royal rainmaking division for Southern Thailand has ceased its operations to seed clouds over Phuket to fill the island's main reservoirs ...



Flag as irrelevant

[UAE weather: More rain and thunderstorms are on the way](#)

What's On

As we move into winter and the temperatures continue to fall, UAE residents can expect more rainfall thanks to a new **cloud seeding** method being ...



Flag as irrelevant

[Haryana: Make climate change part of school curriculum, Deputy CM Dushyant asks Centre](#)

The Indian Express

Chautala had earlier written to Prime Minister Narendra Modi suggesting that **cloud seeding** could help combat the air pollution in Delhi-NCR.



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Date: Sunday, 17 November 2019 9:03:48 am



"cloud seeding"

Daily update · November 16, 2019

NEWS

[Bacteria from the ocean floor could be influencing Arctic weather](#)

Washington Post

At first, Creamean said, she simply was hoping to get a baseline sense of the distribution of **cloud-seeding** particles in the ocean and atmosphere.



Flag as irrelevant

[When the US Tried to Control Hurricanes](#)

Wall Street Journal

Cloud seeding, the basic tool for modifying clouds and therefore hurricanes, was first developed in 1946 by researchers at General Electric, who ...



Flag as irrelevant

[Video: Heavy rain, blowing dust lash parts of UAE](#)

Khaleej Times

Heavy rain lashed parts of UAE on Saturday. The National Centre of Meteorology forecast inclement weather until November 23. A recent tweet by the ...



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Subject: Google Alert - "cloud seeding"
Date: Friday, 15 November 2019 9:01:00 am



"cloud seeding"

Daily update · November 14, 2019

NEWS

[Cloud-seeding System Impact of Existing and Emerging Market Trends 2017 – 2027](#)

Space Market Research

Future Market Insights recently published a market study on the global **Cloud-seeding** System Market using the latest market research methodologies ...



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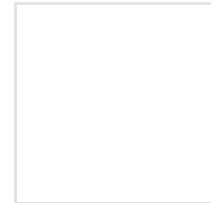
[James Spann: Slow warming trend begins in Alabama later today](#)

Alabama NewsCenter

ON THIS DATE IN 1946: General Electric scientists produced snow in the Massachusetts Berkshires in the first modern-day **cloud seeding** experiment.



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Subject: Google Alert - "cloud seeding"
Date: Thursday, 14 November 2019 9:01:42 am



"cloud seeding"

Daily update · November 13, 2019

NEWS

[Global Cloud Seeding Market Report 2019: Market was Valued at USD 154 Million in 2018 and is ...](#)

PRNewswire (press release)

DUBLIN, Nov. 12, 2019 /PRNewswire/ -- The "Global **Cloud Seeding** Market Demand Analysis & Opportunity Evaluation, 2019-2027" report has been ...



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[Cloud seeding expert receives permanent residency in UAE](#)

The National

Her research proved that high levels of water vapour adsorption was possible when using the particles, which led to more effective **cloud seeding** ...



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[UAE weather: Dubai and Abu Dhabi set for sun and light rainfall](#)

The National

Weather conditions in the UAE on Wednesday will be mostly sunny with some expected rainfall due to **cloud seeding**. "Cloud formation over some ...



Flag as irrelevant

[Cloud-seeding System Market Business Opportunities, Survey, Growth Analysis And Industry ...](#)

Journalism Trends

Latest Insights on the **Cloud-seeding** System Market. According to the analysis of the research analysts at Future Market Insights, the **Cloud-seeding** ...



Flag as irrelevant

[Agricultural Robots Market to Perceive Substantial Growth During 2017 – 2025](#)

Gem Newz

The farmers are deploying the agricultural robots for the various functions based on the configuration of the robots which include **cloud seeding**, fruits ...



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Date: Sunday, 10 November 2019 9:01:10 am



"cloud seeding"

Daily update · November 9, 2019

NEWS

[Explained: How successful is cloud seeding technology](#)

The Indian Express

In his letter, Dushyant Chautala mentioned about a IIT Kanpur project on **cloud seeding** that was on "standstill" due to "non-availability of technical ...



Flag as irrelevant

[Dushyant Chautala writes to PM, suggests artificial rain to curb air pollution](#)

Millennium Post

Giving reference from the study, Chautala also highlighted that the concept of **cloud seeding** can only occur at a time of pre-existing clouds, the ...



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WEB

[Atmospheric scientists take to the skies to 'ground truth' snow cloud seeding](#)

Science360 News Service

How much snow does **cloud-seeding** produce? Soon National Science Foundation (NSF) scientists will be closer to knowing the answer. Researchers ...



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Date: Friday, 8 November 2019 9:01:50 am



"cloud seeding"

Daily update · November 7, 2019

NEWS

[Eagle River Watershed Council: How cloud seeding helps our rivers](#)

Vail Daily News

Cloud seeding is a type of weather modification used primarily in the State of Colorado. The technology dates back to 1946, when General Electric ...



Flag as irrelevant

[British gave India its first anti-pollution law in 1905](#)

Hindustan Times

This was probably the first time when experiments such as **cloud-seeding** were first thought of, highlights one such study by SC Roy of the ...



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[Global Agricultural Robot Production Market Share, Revenue, and Average Price by Manufacturers ...](#)

Digital Industry Wire

Emerging applications of robots or drones in agriculture include weed control, **cloud seeding**, planting seeds, harvesting, environmental monitoring ...



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Date: Wednesday, 6 November 2019 9:04:20 am



"cloud seeding"

Daily update · November 5, 2019

NEWS

[Cloud Seeding Equipment Market Overview 2019 and Industry Development Factors Analysis](#)

Downey Magazine (press release) (blog)

ORBIS RESEARCH has recently announced "Global **Cloud Seeding** Equipment Market" report with all the critical analysis on current state of industry, ...

Flag as irrelevant

[UAE participates in Korea International Weather Modification Workshop](#)

WAM EN

The delegation, in turn, highlighted UAEREP's weather modification techniques using advanced aircrafts, history of **cloud seeding** in the UAE, ...

Flag as irrelevant

[Stop farm fires or face contempt: SC to 3 states](#)

Times of India

The court was in favour of using **cloud-seeding** technology to defuse the crisis but experts told the bench that it was not possible in Delhi.

Flag as irrelevant

[IIT, MoEF experts help SC find ways to curb air pollution](#)

Outlook India

Khare disapproved of **cloud seeding** technology as Delhi-NCR is a large region. The joint secretary MoEF, while replying on methods to extinguish ...

Flag as irrelevant

[Delhi Air Pollution LIVE updates: First day of AAP govt's Odd-Even scheme saw 260 challans ...](#)

Firstpost

"Can this be left on informers," asked Justice Mishra. The judge further asked the secretary whether **cloud seeding** will help tackle the situation.

Flag as irrelevant

Global Urea Market Industry Analysis and Forecast 2018-2026 by Grade, End Use Industry and by ...

Montana Ledger

... moisturizers, hair conditioners, **cloud seeding** agent, flame-proofing agent, tooth whitening products, dish soap, fermentation of sugars into ethanol ...



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Date: Friday, 1 November 2019 9:01:22 am



"cloud seeding"

Daily update · October 31, 2019

NEWS

[Cloud Seeding Equipment Market Applications and SWOT Analysis from 2019-2025 | Weather ...](#)

All Times Tech

The **Cloud Seeding** Equipment report presents data and information associated with the economy meticulously and understandably from 2019-2025.

Flag as irrelevant

[Artificial rain: IIT-K hopes plan takes wings](#)

Times of India

"IIT Kanpur is ready to undertake **cloud seeding** to create artificial rains in the NCR which will help bring down air pollution level," Sachchida Nand ...

Flag as irrelevant

[Wise use of water always important in Oklahoma](#)

Oklahoman.com

In 2015, a **cloud-seeding** company even tried to help make it rain in southwestern Oklahoma, so dire were the conditions. The skies eventually opened ...

Flag as irrelevant

[LOOKING BACK](#)

OurayNews.com

From the Ouray County Herald and Ouray County Plaindealer: 50 Years Ago October 30, 1969 - The Bureau of Reclamation plans no **cloud seeding** ...

Flag as irrelevant

[More fire counts in Haryana and Punjab this year: IIT-Delhi data](#)

Economic Times

"Our experts are ready to conduct **cloud seeding** for creating artificial rains and we are in touch with concerned authorities," said Sachchida Nand ...

Flag as irrelevant

Nail Polish Market Research Report (2019-2025): SWOT Analysis and Overview | MISSHA, Bobbi ...

All Times Tech

Cloud Seeding Equipment Market Applications and SWOT Analysis from 2019-2025 | Weather Modification Inc., North American Weather Consultants ...



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Subject: Google Alert - "cloud seeding"
Date: Thursday, 31 October 2019 9:02:08 am



"cloud seeding"

Daily update · October 30, 2019

NEWS

[Cloud Seeding Equipment Market Research Report 2019- 2024](#)

Daily Watch Reports

Global **Cloud Seeding** Equipment Market Report 2019 – 2024 Overview, Share, Revenue, Price and Gross Margin, Trend and Forecast is a ...

Flag as irrelevant

[State poised to meet 2009 aquifer conservation goal more than 20 years early](#)

Post Register

... recharge program are combined with savings from pivot end-gun removal programs, other water-conservation efforts and **cloud seeding** programs.

Flag as irrelevant

[Cloud-Seeding System Market Key Manufacturers, Development Trends And Competitive Analysis ...](#)

Heraldresearch (press release)

Water resources are increasingly taxed by exploding demand and continued population growth.

Cloud-seeding System is a kind of whether ...

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Subject: Google Alert - "cloud seeding"
Date: Wednesday, 30 October 2019 9:01:49 am



"cloud seeding"

Daily update · October 29, 2019

NEWS

[China has built up its muscle on how to turn weather into a weapon. Can India match up to it?](#)

Economic Times

It has mastered the art — or science, if you will — of “**cloud seeding**”, which ... While India has started **cloud-seeding** experiments in Karnataka and ...

Flag as irrelevant

[State powers to be invoked for Kaliwa Dam project](#)

Philippine Star

Agriculture Secretary William Dar said **cloud seeding** operations will be done at Angat Dam to induce more rains and slowly improve the water level.

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Subject: Google Alert - "cloud seeding"
Date: Saturday, 26 October 2019 9:01:39 am



"cloud seeding"

Daily update · October 25, 2019

NEWS

[Guy Says He Can Enter Wormholes and Literally Make It Rain, Which, Hmm](#)

Popular Mechanics

There have been many efforts to try and artificially create rainfall over the years, mostly through something called **cloud seeding**. Though both the ...



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[LETTER: Praise for Delph Carpenter](#)

Pagosa Daily Post

Cloud seeding? I admire his leadership. He took appropriate action at a time that inaction might have jeopardized Colorado's search for water in the ...



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[Water interruptions start](#)

Philippine Star

On April 10 this year, the BSWM started **cloud-seeding** over the Angat and La Mesa dams to help replenish their dwindling water levels, but this was ...



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Subject: Google Alert - "cloud seeding"
Date: Friday, 25 October 2019 9:00:58 am



"cloud seeding"

Daily update · October 24, 2019

NEWS

[No cloud-seeding operations despite receding water at Angat](#)

Philippine Star

MALOLOS CITY, Philippines – No **cloud-seeding** operations are being undertaken in the watershed areas of Angat, Ipo and La Mesa dams, despite ...



Flag as irrelevant

[Talking Point: Why the Tasmanian tiger lives on](#)

The Mercury

For example, here we have the forestry debate, or how **cloud-seeding** is stealing rain from the south-west, the Battery Point walkway, north-south ...



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Subject: Google Alert - "cloud seeding"
Date: Thursday, 24 October 2019 9:01:43 am



"cloud seeding"

Daily update · October 23, 2019

NEWS

[The Innovations of HPC Cloud Bursting](#)

HPCwire

One possible solution – **cloud seeding** – was proposed as far back as 1891, but the first practical demonstration didn't occur until November 1946 over ...



Flag as irrelevant

[Illegal forest fires send another lethal haze over parts of Indonesia](#)

World Socialist Web Site

... police, and disaster agency personnel to fight the ravaging fires, using dozens of aircraft for water bombing and **cloud-seeding** to trigger rain.



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[Luczon: Research is no nerd stuff](#)

Sun.Star

IN COLLEGE, we had to deal with one important requirement before graduation: writing a thesis, also known as a (more than) year pouring your time, ...



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Subject: Google Alert - "cloud seeding"
Date: Friday, 18 October 2019 9:01:29 am



"cloud seeding"

Daily update · October 17, 2019

NEWS

MH-CLOUD SEEDING

THE WEEK

No info yet on result of **cloud-seeding** in Marathwada: Official Aurangabad, Oct 17 (PTI)

Although **cloud seeding** project has been in operation in the ...

Flag as irrelevant

Letter to the editor: Our trees are dying

Mount Shasta Herald

Most of us are aware of '**cloud seeding**' and hurricane modification (Project Cirrus) but fail to connect the dots and recognize the on-going global ...

Flag as irrelevant

Find out where the Democratic candidates stand on climate change

Johns Hopkins News-Letter

Yang also supports the new, unproven technology of **cloud seeding**, which consists of adding chemicals to the atmosphere to induce precipitation on ...

Flag as irrelevant

Do your own best to reduce carbon

ECM Publishers

Scientists are studying **cloud seeding** which has the potential to block 1% of the sunlight in selected areas at a cost of \$2B/year and lower the average ...

Flag as irrelevant

No info yet on result of **cloud-seeding** in Marathwada: Official

Devdiscourse

Although **cloud seeding** project has been in operation in the Marathwada region of Maharashtra for nearly two months, the administration is yet to ...

Flag as irrelevant

Bohol declared under state of calamity due to El Niño

GMA News

He said a **cloud-seeding** operation is set to be conducted within this week sponsored by the Department of Agriculture. "This is in preparation for the ...



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"cloud seeding"

Daily update · October 16, 2019

NEWS

[Cloud seeding: Oracle opens data centres for next-gen cloud in India](#)

Financial Express

At Oracle Open World in San Francisco last month, the company chairman and CTO, Larry Ellison, made one bold announcement (among several ...



Flag as irrelevant

[Haze returns to Sumatra after three weeks of fresh air](#)

Jakarta Post

Authorities are working to extinguish wildfires in several provinces, including through **cloud-seeding** operations to make it rain. One of the affected ...



Flag as irrelevant

[Indonesia shuts some schools as haze again clouds skies](#)

Gulf Times

For months, Indonesia has deployed thousands of personnel to fight the fires, utilising dozens of aircraft to conduct water bombing and **cloud-seeding** ...



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"cloud seeding"

Daily update · October 15, 2019

NEWS

[Cloud seeding: Oracle opens data centres for next-gen cloud in India](#)

Financial Express

Over 100 customers have already signed up for the new cloud region, signifying the rising adoption of Oracle Cloud in India. We look forward to ...

Flag as irrelevant

[Indonesia shuts some schools as haze again clouds the skies](#)

Reuters

For months, Indonesia has deployed thousands of personnel to fight the fires, utilizing dozens of aircraft to conduct water bombing and **cloud-seeding** ...

[Apocalyptic haze in Palembang as Indonesia forest fires return with vengeance](#) - New Straits

Times Online

[Full Coverage](#)

Flag as irrelevant

[Indonesia province shuts schools as haze from fires returns](#)

Aljazeera.com

This year alone, at least 52 helicopters have dropped more than 371 million litres (98 million gallons) of water and 255 tons of salt for **cloud seeding** as ...

[Haze returns to Sumatra after three weeks of fresh air](#) - Jakarta Post

[Full Coverage](#)

Flag as irrelevant

[Govt Shuts Schools as Haze again Clouds the Skies](#)

En Tempo.co

... has deployed thousands of personnel to fight the fires, utilizing dozens of aircraft to conduct water bombing and **cloud-seeding** efforts to trigger rain.

Flag as irrelevant

[Adaptation of novel technologies in Biological Data Storage, Access & Sharing A new revolution in ...](#)

Express Healthcare (press release) (blog)

... the first international conference on "Biological data storage, access and sharing, Virtual

Reality, Augmented Reality and **Cloud seeding** of Cardiac ...



Flag as irrelevant

Worsening haze in Palembang affects visibility

The Borneo Post

... had deployed more than 8,000 personnel to put out forest fires and seven helicopters to conduct water bombing and **cloud seeding** operations.



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Date: Friday, 11 October 2019 9:01:08 am



"cloud seeding"

Daily update · October 10, 2019

NEWS

[A new run of the CLOUD experiment examines the direct effect of cosmic rays on clouds](#)

Phys.Org

The run that has just started is of the "CLOUDy" type, which studies the ice- and liquid-**cloud-seeding** properties of various aerosol species grown in ...

Flag as irrelevant

[From cosmic rays to clouds](#)

Mirage News

The run that has just started is of the "CLOUDy" type, which studies the ice- and liquid-**cloud-seeding** properties of various aerosol species grown in ...

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Subject: Google Alert - "cloud seeding"
Date: Tuesday, 8 October 2019 9:01:37 am



"cloud seeding"

Daily update · October 7, 2019

NEWS

[UAE reveals more cloud seeding details, shares new photo](#)

Khaleej Times

"NCM has conducted eight **cloud seeding** operations since Friday, and the amount of rainfall water stored in the UAE's dams during the last two days ...



Flag as irrelevant

[5 cloud seeding operations in UAE since Friday, rain to continue until Monday](#)

MENAFN.COM

The ongoing **cloud seeding** operations are expected to continue until Monday over the eastern and northern regions of the country, according to the ...



Flag as irrelevant

[Global Cloud Seeding Equipment Market 2019 Trending Scenario – Weather Modification, Inc ...](#)

Markets Gazette

The market research title Global **Cloud Seeding** Equipment Market Growth (Status and Outlook) 2019-2024 provides point to point breakdown ...

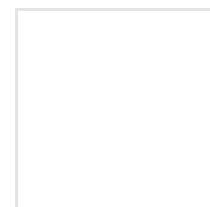


Flag as irrelevant

[It's raining in parts of the UAE, including Dubai](#)

Gulf News

According to the UAE weather bureau, the ongoing **cloud seeding** process that is happening around the UAE is enhancing the amount of rain.



Flag as irrelevant

[Parts of Fujairah market destroyed by wind, heavy rain](#)

Khaleej Times

5 **cloud seeding** operations in UAE since Friday "Some trees were uprooted by the strong winds which killed some sheep in farms in the mountain ...



Flag as irrelevant

Dubai lashed by heavy rain and high winds as storms sweep through UAE

The National

The NCM has also has conducted eight **cloud-seeding** operations since Friday. Planes are sent to shoot salt flares – which naturally attract water ...



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To: [Linda Stopforth](#)
Subject: Google Alert - "cloud seeding"
Date: Wednesday, 2 October 2019 9:04:51 am



"cloud seeding"

Daily update · October 1, 2019

NEWS

[Watch: Abu Dhabi Police trial a new firefighting robot](#)

What's On

ALSO READ: UAE trials new nano-technology to make **cloud seeding** more effective. The robot uses an "atomised water jet" to generate billions of tiny ...



Flag as irrelevant

[275000 face water rationing in Johor despite downpours](#)

The Straits Times

... rainfall to replenish all the water in our dams statewide," he said, adding that they planned to carry out at least 10 **cloud-seeding** activities by the end ...



Flag as irrelevant

[Global Urea Market: Industry Analysis and Forecast 2018-2026](#)

Science Examiner

... moisturizers, hair conditioners, **cloud seeding** agent, flame-proofing agent, tooth whitening products, dish soap, fermentation of sugars into ethanol ...



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Date: Tuesday, 1 October 2019 9:07:11 am



"cloud seeding"

Daily update · September 30, 2019

NEWS

[Poor weather may have caused crash of cloud seeding aircraft](#)

Pattaya Mail

Bangkok – Following a plane crash in Kanchanaburi on September 24 in which two pilots were killed, the Department of Royal Rainmaking and ...

Flag as irrelevant

[Indonesian agency says it expects rainy season to help end forest fires soon](#)

Reuters

Indonesia has deployed more than 29,000 personnel to fight fires and dozens of aircraft to conduct water bombing and **cloud-seeding** efforts to trigger ...

Flag as irrelevant

[Dangerous air quality returns to Bangkok – Readings up to '233' today](#)

The Thaiger

... were deployed to try and get rid of the fine dust particles and a fleet of aircraft conducted **cloud-seeding** operations to ease the pollution problem.

Flag as irrelevant

[Johor water crisis worsens despite recent rainfall](#)

The Straits Times

... all the water in our dams statewide," he said, adding that they planned to carry out at least 10 **cloud-seeding** activities by the end of the year.

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Subject: Google Alert - "cloud seeding"
Date: Monday, 30 September 2019 9:00:54 am



"cloud seeding"

Daily update · September 29, 2019

NEWS

[What's really going on with Markelle Fultz?](#)

FanSided

Markelle Fultz is somehow involved in an Elon Musk-led **cloud-seeding** research project. Take a look at these two photos, taken in 2018, just eight ...



Flag as irrelevant

[Man-Made Rain Helps Lower Indonesia's Hotspots by 90%: Ministry](#)

Yahoo News

Since Friday, Indonesian agencies have scattered more than 200,000 kilograms of salt for **cloud seeding** and 317 million liters of water to put out the ...



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[Man-made rain helps lower Indonesia's hotspots by 90%](#)

Free Malaysia Today

Since Friday, Indonesian agencies have scattered more than 200,000kg of salt for **cloud seeding** and 317 million litres of water to put out forest fires ...



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To: [Linda Stopforth](#)
Subject: Google Alert - "cloud seeding"
Date: Saturday, 28 September 2019 8:04:28 am



"cloud seeding"

Daily update · September 27, 2019

NEWS

[John Lindsey: Cloud seeding increases rain for Cachuma Lake watershed](#)

Santa Maria Times

Numerous studies have shown that **cloud seeding** can increase rainfall between 5 to 25 percent. Locally, it's been estimated that it increases ...

Flag as irrelevant

[Cloud seeding rain does not endanger health](#)

The Borneo Post

KUALA LUMPUR: People need not worry about rain brought about by **cloud seeding** operations as it is not injurious to health, said Malaysian ...

Flag as irrelevant

[Five cloud-seeding projects done to reduce haze](#)

The Sun Daily

PUTRAJAYA: Five **cloud-seeding** projects have been successfully conducted to check haze in the country, said Science, Technology, Environment ...

Flag as irrelevant

[Five cloud-seeding projects successful in reducing haze](#)

EdgeProp.my

PUTRAJAYA (Sept 27): Five **cloud-seeding** projects have been successfully conducted to check haze in the country, said Science, Technology, ...

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[5 cloud-seeding projects done](#)

The Borneo Post

PUTRAJAYA: Five **cloud-seeding** projects have been successfully conducted to check haze in the country, says Science, Technology, Environment ...

Flag as irrelevant

Chinese leaders can't control the weather for their big 70-year bash. But they're still trying.

Washington Post

Some experts expect the authorities to start "**cloud seeding**" — spraying salt or chemicals into clouds, usually from aircraft, to encourage condensation ...

Flag as irrelevant

This September, one of the wettest in a decade for city

The Hindu

On **cloud seeding**, he said the department was not involved in such ... But, we are not directly engaged in **cloud seeding** as it is not an established fact ...

Flag as irrelevant

Jumbo Package: Tua Tagovailoa speaks to the media

Roll 'Bama Roll

... until October, unless it's in a dome for the opener or something. It's just miserable. Maybe UA can invest in **cloud seeding** at game time or something.

Flag as irrelevant

State govt to test tech that makes water out of air

Deccan Herald

After resorting to **cloud seeding** to fulfil farmers' needs, the state government is all set to test the ground for wider adoption of a new technology that ...

Flag as irrelevant

WEB

Government to draft plans to tackle haze

New Straits Times

According to Yeo, the **cloud-seeding** exercises to combat the haze had proven a success based on the improved air quality over the past few days.

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Date: Friday, 27 September 2019 8:03:55 am



"cloud seeding"

Daily update · September 26, 2019

NEWS

[MetMalaysia: Rain caused by cloud seeding not harmful to health](#)

Malay Mail

KUALA LUMPUR, Sept 26 — People need not worry about rain brought about by **cloud seeding** operations as it is not injurious to health, said ...



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[Government to draft plans to tackle haze](#)

New Straits Times Online

According to Yeo, the **cloud-seeding** exercises to combat the haze had proven a success based on the improved air quality over the past few days.



Flag as irrelevant

[Rain over Sumatra, Kalimantan brings brief respite from haze](#)

The Straits Times

Until the recent rain, Indonesia's emergency response team has relied on four aircraft to perform **cloud-seeding** operations over Sumatra and ...



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Date: Wednesday, 25 September 2019 8:01:30 am



"cloud seeding"

Daily update · September 24, 2019

NEWS

[Cloud Seeding Equipment MARKET FUTURE SCOPE CURRENT TRENDS BUSINESS OUTLOOK](#)

Market Research Pioneer

This market research report administers a broad view of the **Cloud Seeding** Equipment market on a Global basis, presenting a forecast and statistics in ...

Flag as irrelevant

[Emergency declared in Riau province to tackle fires better](#)

The Straits Times

However, **cloud-seeding** operations in Riau and Central Kalimantan have brought some rain and a temporary respite. Despite the uphill battle, ...

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[DOE's API readings have no direct correlation with visibility range – DPM](#)

The Borneo Post

... where the API reading had reached the hazardous level on Sept 20, has seen the situation improving following **cloud seeding**, water bombing and ...

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Date: Monday, 23 September 2019 8:04:47 am



"cloud seeding"

Daily update · September 22, 2019

NEWS

[UAE tests nano-tech cloud seeding in bid to boost rainfall](#)

The National

A new method of **cloud seeding** is being tested in a bid to increase rainfall in the UAE. Specially-designed nanomaterials are being sprayed into ...

Flag as irrelevant

[Cloud seeding starts in S'wak](#)

The Star Online

KUCHING: **Cloud-seeding** operations got underway in Sarawak as the air pollutant index in Sri Aman climbed to hazardous levels again. The town ...

Flag as irrelevant

[UAE trials new nano-technology to make cloud seeding more effective](#)

What's On

The UAE's National Centre of Meteorology (NCM) is trialling a new method of **cloud seeding** in the northern and eastern parts of the country. The new ...

[UAE bids on nano-tech cloud seeding to create more rain - ZAWYA](#)
[Full Coverage](#)

Flag as irrelevant

[The UAE Is Taking Steps To Create MORE Rainfall Using Cloud Seeding](#)

Lovin Dubai

It's no secret the UAE has undertaken **cloud seeding** missions to promote rainfall, but now further steps are being taken to increase rain in the emirates ...

[The UAE tests a new generation of cloud seeding techniques - Dubai Week](#)

[What UAE is doing to boost rainfall in the country? - MENAFN.COM](#)
[Full Coverage](#)

Flag as irrelevant

[GOOD JOB, BEE YIN – CLOUD SEEDING SUCCESSFULLY BRINGS](#)

[DOWN SRI AMAN API ...](#)

Malaysia Chronicle

PUTRAJAYA – The **cloud-seeding** operation in Sri Aman, Sarawak, on Friday (Sept 20) successfully reduced the Air Pollutant Index (API) readings ...



Flag as irrelevant

[Indonesian, Malaysian Schools Closed By Toxic Haze](#)

The Organization for World Peace (press release)

... planes to combat the blaze, and, with permission from its Meteorology Department, Malaysia has tried using **cloud seeding** to fight the fires with rain.



Flag as irrelevant

[DPM says 60pc of plantation and forest fires in Sri Aman put out](#)

Malay Mail

“On September 20, the Malaysian Meteorological Department and the Royal Malaysian Air Force carried out **cloud-seeding** operations in west ...



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[Haze-related illnesses up by 40%, says health chief](#)

Free Malaysia Today

Cloud seeding operations would continue next week in haze-affected states in the Peninsula, depending on atmospheric conditions, while ...



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[DOE: Increase in number of hotspots in Sumatra, Kalimantan](#)

Malay Mail

“Fire fighters are still fighting the blaze at Kampung STC, Jalan Tisak Betong and Jalan Ketajau in Sri Aman while **cloud seeding** operations are being ...



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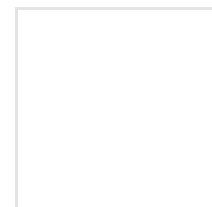
[Haze eases, but air quality in Klang Valley, Sarawak still 'unhealthy'](#)

New Straits Times Online

The breather Sri Aman is currently experiencing may not last, however, as a **cloud seeding** operation conducted yesterday failed to douse the forest ...



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"cloud seeding"

Daily update · September 21, 2019

NEWS

[UAE kicks off tests on cloud seeding with nano-tech](#)

Gulf News

National Centre of Meteorology, NCM, has launched nanomaterials testing campaign in **cloud seeding** operations through the UAE Research ...



Flag as irrelevant

[Amid rain, floods, cloud-seeding goes on silently in NK](#)

Deccan Herald

Amid torrential rain and floods, **cloud-seeding**, under Varshadhare project, was silently carried out since August 1 in north Karnataka districts.



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[New research campaign on cloud seeding launched](#)

Gulf News

ABU DHABI: The UAE Research Programme for Rain Enhancement Science launched a campaign which investigates the efficiency of unique and ...



Flag as irrelevant

[Cloud-seeding begins in Sarawak to ease hazy conditions](#)

Free Malaysia Today

Royal Malaysian Air Force personnel preparing to load a special tank of salt solutions into a Hercules C-130 aircraft during the **cloud-seeding** ...

[Cloud seeding to continue until tomorrow](#) - The Borneo Post

[Full Coverage](#)



Flag as irrelevant

[Cloud seeding begins in hard-hit Sarawak](#)

The Straits Times

MIRI (Sarawak) • Malaysia started **cloud-seeding** operations in Sarawak yesterday, as the haze situation in the southern part of the state, which is ...



Flag as irrelevant

Govt spends RM80,000 for each **cloud seeding** operation

New Straits Times Online

KUALA LUMPUR: The government incurs a cost of at least RM80,000 each time a **cloud seeding** operation is conducted to reduce effects of the ...



Flag as irrelevant

Haze from Indonesian fires now affecting Philippines

Boston 25 News

Firefighting efforts involve 52 helicopters dropping 270 million liters (71.3 million gallons) of water and 163 tons of salt for **cloud seeding**. Indonesian ...

[Haze from Indonesian fires now affecting Philippines](#) - Orlando Sentinel
[Full Coverage](#)



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NCM Launches Nanomaterials Testing Campaign In **Cloud Seeding** Operations

UrduPoint News

ABU DHABI, (UrduPoint / Pakistan Point News / WAM - 21st Sep, 2019) National Centre of Meteorology, NCM, has launched nanomaterials testing ...



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Haze from Indonesian forest fires now affecting areas of the Philippines, official says

The Globe and Mail

Firefighting efforts involve 52 helicopters dropping 270 million litres (71.3 million gallons) of water and 163 tons of salt for **cloud seeding**. Indonesian ...



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Poisonous fumes, black choke or deathly sorrow?

New Straits Times Online

Royal Malaysian Air Force officers and a team from the Malaysian Meteorological Department preparing for a **cloud seeding** operation at the RMAF ...



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WEB

Govt spends RM80,000 for each **cloud seeding** operation

New Straits Times

KUALA LUMPUR: The government incurs a cost of at least RM80,000 each time a **cloud seeding** operation is conducted to reduce effects of the ...



Flag as irrelevant

Cloud seeding reduces haze in Sri Aman - DOE

BERNAMA.com

PUTRAJAYA, Sept 21 (Bernama) -- A **cloud seeding** operation in Sri Aman, Sarawak, yesterday has reduced the Air Pollutant Index (API) readings ...



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Date: Saturday, 21 September 2019 8:06:59 am



"cloud seeding"

Daily update · September 20, 2019

NEWS

[Cloud seeding to be carried out in Sarawak for two days from tomorrow](#)

Malay Mail

KUCHING, Sept 19 — **Cloud seeding** in Sarawak will be conducted over two days starting from tomorrow with the help of a Charlie 130 Hercules ...

Flag as irrelevant

[Flights cancelled in Malaysia over haze as cloud seeding operations continue](#)

Xinhua

KUALA LUMPUR, Sept. 20 (Xinhua) -- Poor visibility caused by persistent haze forced the cancellation of three flights on Friday in Malaysia as ...

Flag as irrelevant

[Malaysia continues cloud seeding operations as haze persists](#)

Xinhua

KUALA LUMPUR, Sept. 19 (Xinhua) -- Malaysian authorities conducted a third round of **cloud seeding** on Thursday in an attempt to provide temporary ...

Flag as irrelevant

['Cloud-seeding' in Malaysia as air quality plummets](#)

Yahoo News UK

Malaysia carries out "**cloud-seeding**" which involves using chemicals in a bid to induce rain, as smog-belching forest fires in Indonesia send toxic haze ...

Flag as irrelevant

[Air quality reading in Sarawak soars to 420 as cloud seeding efforts begin](#)

Business Insider

Malaysia has started **cloud seeding** in Sarawak, as air quality deteriorated drastically on Friday (Sept 20) morning to reach a "hazardous" level.

[Worsening haze: Sri Aman API exceeds 400 - Malaysiakini](#)
[Full Coverage](#)

Flag as irrelevant

[Indonesian Police Arrests Hundreds Linked to Forest Fires, Authorities Conduct **Cloud Seeding** ...](#)

News18

Jakarta: Indonesian police said Thursday they have arrested 230 people suspected of starting some of the fires that are spreading health-damaging ...

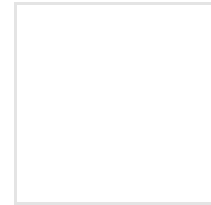
[Indonesian police arrest hundreds linked to forest fires](#) - Longview Daily News
[Full Coverage](#)

Flag as irrelevant

[Malaysia **cloud seeding** to counter haze from Indonesian forest fires](#)

South China Morning Post

The Malaysian air force carried out **cloud-seeding** operations on September 19, 2019, to counter haze from forest fires in nearby Indonesia. The fires ...



[Cloud seeding may help Malaysia to combat haze; Singapore air quality improved overnight](#) - International Business Times, Singapore Edition

[Malaysia to take haze woes to Asean](#) - The Straits Times
[Full Coverage](#)

Flag as irrelevant

[Cloud seeding operations to be conducted tomorrow until Sunday – JPBN secretariat](#)

The Borneo Post

KUCHING: The authorities will be holding **cloud seeding** operations from tomorrow until Sunday to counter haze in areas with very unhealthy air ...

Flag as irrelevant

[Sarawak to begin **cloud-seeding** as haze surpasses 400 in Sri Aman](#)

The Star Online

MIRI: The haze situation in southern Sarawak has deteriorated further as **cloud-seeding** operations get underway on Friday (Sept 20).

Flag as irrelevant

[Fast facts about the smoky haze smothering Southeast Asia](#)

Reuters

Authorities in Malaysia have closed thousands of schools, begun **cloud seeding** to combat the situation and distributed face masks. — Acute ...

Flag as irrelevant

WEB

Sarawak closes 1037 schools; Sri Aman API breaches 400

New Straits Times

It was announced that **cloud seeding** operations will be carried out today in haze-hit areas of Sarawak by the Royal Malaysian Air Force (RMAF) using ...



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To: [Linda Stopforth](#)
Subject: Google Alert - "cloud seeding"
Date: Friday, 20 September 2019 8:02:20 am



"cloud seeding"

Daily update · September 19, 2019

NEWS

[Indonesia says emergency response team carried out cloud seeding](#)

The Straits Times

JAKARTA - Indonesia's National Disaster Management Agency (BNPB) said on Thursday (Sept 19) that the emergency response team carried out ...

Flag as irrelevant

[Cloud seeding operations to be conducted tomorrow until Sunday – JPBN secretariat](#)

The Borneo Post

KUCHING: The state authorities will be holding **cloud seeding** operations from tomorrow until Sunday to counter haze at areas with very unhealthy air ...

Flag as irrelevant

[Malaysia to take haze woes to Asean](#)

The Straits Times

This is the third **cloud-seeding** operation over Peninsular Malaysia since Monday, which brought torrential rain but only short-term relief as smoke ...

[Malaysia to push Southeast Asian nations for long-term solution to smog](#) - Reuters
[Full Coverage](#)

Flag as irrelevant

[Indonesian police arrest hundreds linked to forest fires](#)

ABC News

The agency said 44 helicopters had dropped more than 270 million liters (71.3 million gallons) of water and 163 tons of salt for **cloud seeding** as part ...

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[Yeo: Ministry ready to draft Transboundary Haze Act once Cabinet gives go-ahead](#)

Malay Mail

Meanwhile, she said the **cloud seeding** operation this morning was made ... **Cloud seeding** operations were held in Selangor, Negeri Sembilan and ...



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[Putrajaya says will declare emergency if API breaches 500 due to haze](#)

Malay Mail

Enforcement will be increased and **cloud seeding** activities will commence. Warnings will be issued if an area's API reading enters the very unhealthy ...



Flag as irrelevant

[Poor air quality: Malaysia tells citizens to stay indoors](#)

Arab News

"We will have to find ways to deal with the haze, through **cloud seeding**, asking people to stay at home, and school closures," he said at a press ...

[Sarawak Disaster Management Committee ready for possible haze emergency](#) - Malay Mail

[Haze expected to worsen: Nadma](#) - The Sun Daily

[Full Coverage](#)



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[Dr M: Govt doing all it can on haze](#)

New Straits Times Online

"Of course, other things that we have done includes **cloud seeding**, advising people to wear masks and now using drones to create artificial rain," he ...



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[Malaysia offered help to fight Indonesia forest fires, says Dr M](#)

The Star Online

We try to do **cloud-seeding** and ask people to wear masks." Asked about the cost involved in conducting **cloud-seeding**, Dr Mahathir said he had not ...



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[Thick smog from Indonesian forest fires reaches hazardous levels](#)

KRDO

... on "arsonists" behind the fires. Both Malaysia and Indonesia are inducing artificial rain through **cloud seeding** methods in a bid to aid relief efforts.



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WEB

[Malaysia to push Southeast Asian nations for long-term solution to smog](#)

New Straits Times

"**Cloud seeding** is only temporary. A law here would only deal with Malaysian companies. What we need is international cooperation for a long-term ...



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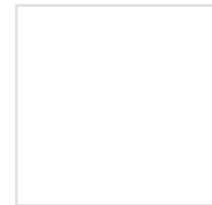
Daily update · September 18, 2019

NEWS

[Malaysia looks to clouds, as smoke haze shrouds Kuala Lumpur](#)

Aljazeera.com (blog)

The wind and atmospheric conditions had to be just right for **cloud seeding**, the process of artificially creating rain. Much of Malaysia has been ...



[Indonesia sends more people, aircraft to battle forest fires](#) - ABC News

[Indonesia arrests around 200 as thick smog from forest fires reaches hazardous levels](#) -

[jacksonprogress-argus](#)

[Full Coverage](#)

Flag as irrelevant

[Perak Environment Dept says can't start costly **cloud seeding** until conditions are right](#)

Malay Mail

IPOH, Sep 18 — Despite the thick haze here, Perak Department of Environment director Norazizi Adinan said weather conditions are not conducive for ...

Flag as irrelevant

[Cloud seeding operation a success](#)

The Star Online

PETALING JAYA: Despite some hiccups, the **cloud seeding** operation was conducted successfully with rain reported over several areas in Selangor, ...

Flag as irrelevant

[2019 District II **cloud seeding** operations summary](#)

Minot Daily News

BISMARCK – **Cloud seeding** concluded for the District II operations area of the 2019 North Dakota Cloud Modification Project on Sept. 1. For the ...

Flag as irrelevant

[Karnataka's **Cloud-Seeding** Plan Needs More Science, Less Politics](#)

The Wire

In a **cloud-seeding** project, radars on the ground guide airplanes towards rain-bearing clouds over areas with a rainfall deficit or high soil-moisture ...

Flag as irrelevant

[Penang pleads with Putrajaya to carry out **cloud seeding** operations as haze worsens](#)

Malay Mail

He said as **cloud seeding** comes under the purview of the Federal government, it would be up to them to either proceed with the operation or ...

[Consider **cloud seeding** as haze is worsening, Penang pleads with Fed govt - The Sun Daily Full Coverage](#)

Flag as irrelevant

[Sarawak ready to conduct **cloud seeding**](#)

New Straits Times Online

KUCHING: Sarawak is ready to conduct **cloud seeding** to combat the worsening haze in the state which affected several districts badly. Deputy Chief ...

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[Haze crisis: **Cloud seeding** may be done in Sarawak earliest on Thursday](#)

New Straits Times Online

Cloud seeding operations in Sarawak can only be carried out on or after Thursday due to atmospheric, weather and cloud conditions. - NSTP/AZIAH ...

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[MetMalaysia: **Cloud seeding** for Kuching, Sri Aman to start this week if weather permits](#)

The Borneo Post

KUCHING: The Malaysian Meteorological Department (MetMalaysia) is expected to conduct **cloud seeding** operations in Sarawak at the end of the ...

[Sarawak Disaster Management Committee to mobilise relevant agencies to tackle haze in Sri Aman - Malay Mail](#)

[Haze closes more schools in Malaysia - Xinhua Full Coverage](#)

Flag as irrelevant

[Haze; Kalimantan Use 1.5 Tons of Salt for **Cloud Seeding**](#)

En Tempo.co

TEMPO.CO, Jakarta - To put out a fire burning its forests and lands and causing haze pollution, the Central Kalimantan Government on Tuesday, ...

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WEB

Sarawak ready to conduct **cloud seeding**

New Straits Times

KUCHING: Sarawak is ready to conduct **cloud seeding** to combat the worsening haze in the state which affected several districts badly.



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How **Cloud Seeding** Works

BFM

How **Cloud Seeding** Works. Professor Rajasekhar Balasubramanian, Department of Civil and Environment Engineering, NUS. 17-Sep-19 19:00. How.



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"cloud seeding"

Daily update · September 15, 2019

NEWS

[Ministry: Cloud seeding will be carried out over peninsula tomorrow](#)

Malay Mail

GEORGE TOWN, Sept 15 — The **cloud seeding** process to reduce the ongoing haze over peninsula Malaysia has been scheduled for tomorrow, ...

[Malaysia to fight smog with cloud seeding](#) - Bangkok Post

[Cloud seeding over peninsula to start tomorrow](#) - Malaysiakini

[Malaysia to conduct cloud seeding as worsening haze forces more schools in Johor to shut](#) -

The Straits Times

[Full Coverage](#)



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[Malaysia to Fight Smog With Cloud Seeding: SE Asia Haze Update](#)

Bloomberg

Malaysia plans to carry out **cloud seeding** in central Selangor state and parts of the peninsular to fight the haze sweeping the region, the Star ...

[Indonesian forest fires push Singapore's smog to the worst in three years](#) - The Japan Times

[Over 4000 Hotspots in Indonesia: Southeast Asia Haze Update](#) - BloombergQuint

[Amid blame game, Dr M insists long-term haze solution requires international cooperation](#) -

Malay Mail

[Full Coverage](#)



Flag as irrelevant

[Cloud seeding to be carried out over the peninsula on Monday \(Sept 16\)](#)

The Star Online

GEORGE TOWN: **Cloud seeding** will be carried out in Selangor and parts of Peninsular Malaysia on Monday (Sept 16), says Deputy Energy, Science, ...

[Haze update: Cloud seeding for Peninsula postponed to Monday](#) - New Straits Times Online

[Full Coverage](#)

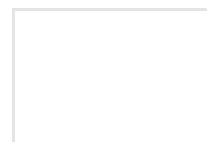


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[MESTECC to focus on curbing open burning \[NSTTV\]](#)

New Straits Times Online

"The **cloud seeding** process will depend on the current situation and we



have also activated the District Disaster Management Committee," he added.

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'Is Indonesia doing enough this time?'

The Star Online

... helicopters and more than 200 million litres in water bombings to snuff out the fires, as well as **cloud-seeding** aircraft in the hope of generating rain.

Flag as irrelevant

Thickening smog disrupts Palangka Raya airport's flight schedules

ANTARA

Palangka Raya, C Kalimantan (ANTARA) - The thickening haze arising from land and forest fires disrupted the flight schedules of Tjilik Riwut Airport in ...

Flag as irrelevant

Tourists to Kuala Selangor's Sky Mirror dwindle

New Straits Times Online

The spokesperson hoped that both the federal and state governments would consider carrying out **cloud seeding** operations as soon as possible or ...

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Sep 15, 2019

Outlook India

Malaysia's government has banned open burning and conducted **cloud-seeding** in Sarawak on Thursday to induce rain to clear the choking haze.

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"cloud seeding"

Daily update · September 14, 2019

NEWS

[Yeo: Cloud seeding only fights symptoms of haze, doesn't address root issue](#)

Malay Mail

PUTRAJAYA, Sept 14 — Efforts such as **cloud seeding** to combat the transboundary haze plaguing the region are only temporary relief measures, ...

[Indonesia should take action against forest fire culprits](#) - New Straits Times Online

[Indonesia seals off 30 companies over forest fires](#) - ABC News

[Malaysia combats haze](#) - The Manila Times

[Full Coverage](#)



Flag as irrelevant

[Malaysian authorities begin cloud seeding in bid to combat haze](#)

Global Times

He added that despite the **cloud seeding**, the haze would return because of the southwest wind direction, and that this combined with continued forest ...

[Southeast Asia Braces for Haze as Forest Fires Keep Burning](#) - Yahoo News

[Indonesia says some forest fires started on Malaysian-controlled land](#) - The Peninsula Qatar

[Indonesians seek divine intervention while ministers fight on a burning issue](#) - The Independent

[Full Coverage](#)



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[Cloud seeding to be expanded to other states if haze worsens](#)

The Sun Daily

SERI ISKANDAR: **Cloud seeding** operations in Sarawak and Selangor, will be extended to other states if the haze worsens there, said Energy, ...

[Cloud seeding to be expanded to other states if haze worsens, says deputy minister](#) - Malay

Mail

[Cloud seeding may be expanded if necessary, says deputy minister](#) - The Malaysian Insight

[Full Coverage](#)



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[Water-starved Johor to conduct cloud-seeding ops](#)

The Straits Times

ISKANDAR PUTERI • The Johor government is expected to conduct five **cloud-seeding**

operations in an effort to solve the state's water shortage ...

Flag as irrelevant

[Cloud seeding for areas with more than 200 API in Selangor](#)

EdgeProp.my

SHAH ALAM (Sept 13): The Selangor government has decided to conduct **cloud seeding** operations in haze affected areas with the Air Pollutant Index ...

[Haze: Ministry to focus on curbing open burning](#) - Malay Mail

[Selangor mulling ideas to prevent API from rising](#) - New Straits Times Online
[Full Coverage](#)

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[Johor to conduct **cloud-seeding** operations to solve water shortage problems](#)

AsiaOne

ISKANDAR PUTERI - The Johor state government is expected to conduct five **cloud-seeding** operations in the near future in an effort to solve water ...

Flag as irrelevant

[Make a Splash: SW ND students learn about water through hands-on activities](#)

The Dickinson Press

... learn hands-on about the different aspects of water including the water cycle, groundwater, watershed, aquifers, **cloud seeding** and conservation.

Flag as irrelevant

[Rain brings temporary respite from haze](#)

New Straits Times Online

Asked on the plan to conduct **cloud seeding** operation in Selangor, Jailan said the plan has been put on hold as the atmospheric conditions were not ...

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[Thousands stranded at Ipoh airport](#)

The Star Online

The Malaysian Meteorological Department said **cloud seeding** operations to reduce the impact of the haze in Selangor yesterday was hampered by ...

[Passengers stranded at Ipoh airport after haze disrupts flights](#) - The Straits Times
[Full Coverage](#)

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[Tokyo 2020 Olympics: The Games could be getting fake snow!](#)

CBBC Newsround

Cloud seeding, which affects the amount of precipitation that falls from the clouds, has been around for more than 70 years. The technique was first ...



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"cloud seeding"

Daily update · September 13, 2019

NEWS

[Johor to conduct cloud-seeding operations to solve water shortage problems](#)

The Straits Times

ISKANDAR PUTERI (THE STAR/ASIA NEWS NETWORK) - The Johor state government is expected to conduct five **cloud-seeding** operations in the ...

Flag as irrelevant

[Met Dept begins cloud seeding in Sarawak](#)

Malay Mail

KUALA LUMPUR, Sept 12 — The Malaysian Meteorological Department (MetMalaysia) has begun **cloud seeding** operations (OPA) in west Sarawak ...

[Malaysian authorities begin cloud seeding in bid to combat haze](#) - Xinhua

[Cloud seeding begins in Sarawak](#) - The Sun Daily

[Full Coverage](#)

Flag as irrelevant

[Met Dept calls off Selangor cloud seeding plans due to unsuitable weather condition](#)

Malay Mail

KUALA LUMPUR, Sept 13 — The Malaysian Meteorological Department's (MetMalaysia) **cloud seeding** operations to reduce the impact of haze in ...

[Cloud seeding for areas with more than 200 API in Selangor, says rep](#) - Malay Mail

[S'gor embarking on cloud seeding in areas with API above 200](#) - The Star Online

[Malaysia to conduct cloud seeding in Selangor, where haze forces 29 schools to close](#) - CNA

[Full Coverage](#)

Flag as irrelevant

[BPPT readies to conduct cloud seeding in West Kalimantan](#)

ANTARA

"We have prepared 50 tons of salt for **cloud seeding**, with 10 tons of salt for each delivery, in accordance with the condition in West Kalimantan," Head ...

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[Johor to carry out five **cloud seeding** operations to solve water issues](#)

Malay Mail

ISKANDAR PUTERI, Sept 12 — The state government will carry out five **cloud seeding** operations in the near future in an effort to overcome critical ...



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[Cloud seeding in Penang: Up to federal govt to decide, says CM](#)

Malay Mail

GEORGE TOWN, Sept 13 — Penang is leaving it to the Federal Government to decide whether **cloud seeding** should be carried out in the state, which, ...



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[Global **Cloud Seeding** Equipment Market 2024 : New strategies for growth of the industry and the ...](#)

Business Intelligence

This report presents a comprehensive overview, market shares, and growth opportunities of **Cloud Seeding** Equipment Market by product type, ...



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[Latest Research on **Cloud Seeding** Equipment Market 2019 by Prominent Vendors, Driving Factors ...](#)

The News While

Industry Research Co. professional study report titled “Global **Cloud Seeding** Equipment Market 2019 By Manufacturers, Regions, Type and ...



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[As Indonesia fires rage, schools and airport forced to close](#)

mySanAntonio.com

... liters (63 million gallons) of water and more than 160,000 kilograms (350,000 pounds) of salt for **cloud seeding** as part of the firefighting efforts.

[As Indonesia fires rage, schools and airport forced to close](#) - Minneapolis Star Tribune

[Indonesia hits back at Malaysia over forest fires](#) - KFGO News

[Indonesia blames Malaysian companies for some forest fires](#) - KDAL News

[Full Coverage](#)



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[Southeast Asia Braces for Haze as Forests Fires Keep Burning](#)

Bloomberg

Governments in Southeast Asia are taking steps to guard against a potential deterioration in pollution levels from Indonesian forest fires, as smoke and ...



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WEB

Cloud seeding in Johan Setia earliest Sunday: MetMalaysia

New Straits Times

KLANG: **Cloud seeding** operations in the haze-affected area of Johan Setia is expected to take place on Sunday as the Air Pollutant Index (API) ...



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"cloud seeding"

Daily update · September 12, 2019

NEWS

[Cloud Seeding Equipment Market Key Challenges and Growth Factors 2019 – 2025| Kyathi ...](#)

Weekly Wall (press release)

Los Angeles, United State, September 12, 2019,- The global **Cloud Seeding** Equipment market is carefully researched in the report while largely ...

Flag as irrelevant

[Freivalds: Weaponizing weather \(and any forecasts\)](#)

Roanoke Times

... weather, e.g., lengthening or shortening monsoons, like the Popeye project during the Vietnam War, a sophisticated form of **cloud seeding**.

Flag as irrelevant

[Malaysian authorities warn against outdoor activities as air quality worsens](#)

Xinhua

Meanwhile, Minister of Energy, Technology, Science, Climate Change and Environment Yeo Bee Yin said **cloud seeding** in Sarawak state would be ...

[Future looking a bit Hazy](#) - newslemak.com

[Full Coverage](#)

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[Science should dictate future of weather modification programs](#)

Minot Daily News

Furthermore, Langerud reported that a study on the economics of **cloud seeding** found 5% precipitation enhancement provides an extra \$21.12 million ...

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[Malaysian PM to write to Indonesia's leader as row over haze flares](#)

KDAL News

The government had also prepared aircraft for **cloud seeding** in the hope of generating rain, Yeo said. Several parts of Southeast Asia have endured ...

[Face masks fail to hide Malaysia's annual haze problem](#) - Arab News

[Haze blankets much of Malaysia](#) - The Straits Times

[PM will write to President Jokowi about transboundary haze](#) - The Borneo Post
[Full Coverage](#)



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[Malaysia voices concern over haze situation with Indonesian officials](#)

EdgeProp.my

“The government will continue to do **cloud-seeding** whenever the situation allows and send assistance to Indonesia if and when they accept the offer ...



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[All Open Fires in M'sia Now Banned With Immediate Effect to Help With Haze Conditions](#)

WORLD OF BUZZ (press release) (blog)

She said that “the federal government will attempt **cloud seeding** to mitigate once this is possible and continue urging Jakarta to accept help in ...



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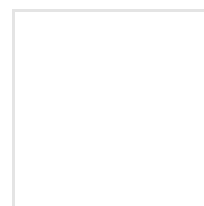
Daily update · September 11, 2019

NEWS

[Malaysia Turns To Cloud-Seeding To Combat Smog From Forest Fires](#)

International Business Times

Cloud-seeding is a weather-modification process normally used to induce rain from clouds by spraying chemicals into them that will promote the ...



[Indonesian province shuts schools due to forest fire haze](#) - mySanAntonio.com

[Malaysia ready to help Indonesia put out fires, says minister](#) - The Straits Times

[Nationwide ban on open burning as haze worsens](#) - Malay Mail

[Full Coverage](#)

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[Cloud Seeding Equipment Market Size, Growth Scenarios, Trends and Study Report 2019\]](#)

One Digi Click (press release) (blog)

Los Angeles, United State, September 11, 2019,- The global **Cloud Seeding** Equipment market is carefully researched in the report while largely ...

[Cloud Seeding System Market Prophesied to Grow at a Faster Pace by 2027](#) - Technology

Trend

[Full Coverage](#)

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[Malaysia wants to make it rain](#)

The ASEAN Post

Malaysia prepared to seed clouds after air quality in parts of the country reached unhealthy levels due to smog from forest fires in neighbouring ...

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[Air quality in Malaysia worsened so much on Wednesday that open burning is now banned](#)

Business Insider

Yeo added that the Government will attempt **cloud seeding** as soon as possible, and urged Jakarta to accept help in battling the blazing fires within its ...

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[Malaysia To Seed Clouds, Induce Rain As Smog Pollutes Air](#)

Herald Publicist

He stated Malaysia is ready to hold out **cloud seeding** to induce rain in an effort to ease the smog. "The moment the cloud situation is right, the ...

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[No 'visarjan' for Bappa in drought-hit Latur](#)

The Hindu BusinessLine

Even as Maharashtra readies to celebrate the conclusion of the annual Ganesh festival on Thursday with the visarjan, or immersion, of Ganesha idols, ...

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[Hundreds of schools shut as forest-fire haze blankets Southeast Asia](#)

Jordan Times

On Monday, Malaysia said it was preparing to carry out **cloud seeding** to induce rain and clear the air by releasing certain chemicals into the clouds ...

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[Ewec and Acwa Power finalise Dh3.27bn water desalination plant deal](#)

The National

The UAE relies on desalination – the process of converting sea water – for drinking water and regularly uses **cloud seeding** to encourage rainfall.

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[M'sia imposes nationwide ban on open burning as haze worsens](#)

TODAYonline

Ms Yeo said the federal government will attempt **cloud seeding** to mitigate once this is possible and continue urging Jakarta to accept help in ...

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[Khalifa University's Masdar Institute and Petroleum Institute to showcase research innovations at ...](#)

ZAWYA

... Renewable Energy Mapping and Assessment (ReCREMA), and the rainfall enhancement project with novel **cloud seeding** material developed by a ...

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Daily update · September 10, 2019

NEWS

[Cloud seeding in drought areas to “create” rain](#)

WGN-TV

We occasionally hear about **cloud seeding** in drought areas to “create” rain, but I have always been skeptical of the process. What are your thoughts?



Flag as irrelevant

[Cloud-seeding operations likely to start today](#)

The Malaysian Reserve

by SHAHEERA AZNAM SHAH/ pic by AFP. THE Malaysian Meteorological Department (MetMalaysia) is expected to carry out **cloud-seeding** ...



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[Malaysia to commence **cloud-seeding** to combat haze, Indonesian denies fires in Sumatra are the ...](#)

AsiaOne

KUALA LUMPUR - Malaysia prepared to seed clouds after air quality in parts of the country reached unhealthy levels due to smog from forest fires in ...

[Making It Rain: Malaysia Seeds Clouds To Combat Smog From Forest Fires](#) - Forbes

[Hundreds of schools shut as forest-fire haze blankets SE Asia](#) - Phys.Org

[Malaysia ready to induce rain in effort to ease haze](#) - The Straits Times

[Full Coverage](#)



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[ND program director touts economics of weather modification](#)

Minot Daily News

Langerud reported North Dakota State University recently completed a study on the economics of **cloud seeding** that found 5% precipitation ...

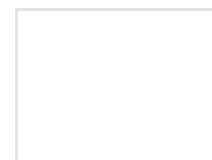


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[Malaysia to make it rain as Indonesian smog pollutes air](#)

News24

He said Malaysia is prepared to carry out **cloud seeding** to induce rain in



an effort to ease the smog. "The moment the cloud situation is right, the ...



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[STAR, PBDSB to send protest note to Indonesian consulate if haze persists](#)

The Borneo Post

She added the announcement made by Uggah on Monday in relation to the **cloud seeding** operation that could only begin earliest on Thursday was ...



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[Do not profit from sale of face masks, traders warned](#)

The Borneo Post

On **cloud seeding**, Dr Yii said it could only be done if there are clouds, which are being monitored. "Hopefully, there will be clouds in the next few days ...



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[Growing Demand for Agricultural Robots Market to Significantly Increase Revenues Through 2018 ...](#)

Titan Chronicle

The farmers are deploying the agricultural robots for the various functions based on the configuration of the robots which include **cloud seeding**, fruits ...



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"cloud seeding"

Daily update · September 9, 2019

NEWS

[MetMalaysia: Cloud seeding will happen when atmospheric conditions are suitable](#)

Malay Mail

KUALA LUMPUR, Sept 9 — A **cloud-seeding** operation aimed at reducing the effects of the haze, particularly in western peninsula Malaysia and ...

[Met Dept plans cloud seeding to combat haze](#) - Malaysiakini

[Cloud-seeding only under right condition](#) - The Malaysian Insight

[Full Coverage](#)



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[Earliest possible date for cloud seeding in Sarawak is Sept 12, says deputy CM](#)

Malay Mail

KUCHING, Sept 9 — The earliest possible date for **cloud seeding** to be done in Sarawak is this Thursday, said Deputy Chief Minister Datuk Amar ...

[DCM: Earliest possible date for cloud seeding in S'wak is Thursday](#) - Malaysiakini

[Cloud seeding may be done in Sarawak on Thursday depending on the clouds](#) - New Straits

Times Online

[Uggah: Cloud seeding can only be carried out earliest on Thursday](#) - The Borneo Post

[Full Coverage](#)



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[Malaysia to commence cloud-seeding to combat haze, Indonesian denies fires in Sumatra are the ...](#)

The Straits Times

KUALA LUMPUR (AFP, THE STAR/ASIA NEWS NETWORK) - Malaysia prepared to seed clouds after air quality in parts of the country reached ...

[Haze Threat Looms Over Singapore as Indonesia Forest Fires Rage](#) - Yahoo Finance

[Malaysia offers help to Indonesia to put out fires](#) - New Straits Times Online

[Minister: Malaysia can help with Indonesia fire, haze should improve end-Sept](#) - Malay Mail

[Full Coverage](#)



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["We can change climate change": Weathertec founder](#)

Independent Online

Apart from costs that are far lower, Weathertec also does not require a capital outlay, so the R400m for planes and other equipment that **cloud seeding** ...

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[API in three areas of S'wak at very unhealthy levels - and rising](#)

Malaysiakini

The Meteorological Department said earlier that a **cloud seeding** operation aimed at reducing the effects of the haze, particularly in western Peninsular ...

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[Haze in Malaysia likely to stay till end of month](#)

The Straits Times

Malaysia's Deputy Prime Minister Wan Azizah Wan Ismail said on Saturday that MetMalaysia was studying the feasibility of **cloud seeding** to induce ...

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[Report: Indonesian govt deploys 9000 personnel to combat forest, peat fires in West Kalimantan ...](#)

The Borneo Post

The committee was also quoted to be carrying out **cloud seeding** operations in the Riau province. Despite the dry and hazy weather conditions in ...

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[Global weather chaos shriveling Asia's crop production](#)

Stock News Brief

Cloud-seeding planes have been deployed, and pumps and trucks have been used to divert water to the affected areas in the north and northeast.

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[What are Future Trends of Global Copper Iodide Market with Strong Key Players Like William ...](#)

Chemicals Market

It is also known as copper iodide. It is useful in a variety of applications ranging from organic synthesis to **cloud seeding**. Get Free Sample Report at@ ...

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[Mobile Analytics Platform Market: Technological Advancement & Growth Analysis with Forecast to ...](#)

industrydailyobserver.com

Cloud Seeding Equipment market research report provides the newest industry data and industry future trends, allowing you to identify the products ...

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WEB

Haze to persist; MetMalaysia on standby for cloud seeding

New Straits Times

KUALA LUMPUR: The Malaysian Meteorological Department (MetMalaysia) is in standby mode to conduct **cloud seeding** operations to ease the ...



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"cloud seeding"

Daily update · September 7, 2019

NEWS

[As haze worsens, Malaysia looking into cloud-seeding](#)

The Straits Times

KUALA LUMPUR (THE STAR/ASIA NEWS NETWORK) - Malaysia is looking into the feasibility of **cloud seeding** to induce rain in areas which are ...

[DPM: National Disaster Agency, Sarawak govt to issue face masks to haze-hit Kuching residents](#)
- Malay Mail

[UPSR in Sarawak to continue despite haze](#) - New Straits Times Online
[Full Coverage](#)

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[Cloud seeding unlikely to end haze in Sarawak](#)

New Straits Times Online

KUCHING: **Cloud seeding** will not resolve the haze situation in Sarawak if forest fires and open burning activities in Indonesia, particularly in ...

[Malaysia to send diplomatic note to Indonesia over worsening haze](#) - The Edge Markets MY
[Full Coverage](#)

Flag as irrelevant

[As haze worsens, MetMalaysia looking into cloud-seeding](#)

The Star Online

KUALA LUMPUR: The Meteorology Department (MetMalaysia) is studying the feasibility of **cloud seeding** to induce rain in areas which are currently ...

Flag as irrelevant

[The Books Briefing: What the Storms Left Behind](#)

The Atlantic

Some have tried to prevent massive damage through scientific means, such as the **cloud-seeding** process—an attempt to affect rainfall—that Sam ...

Flag as irrelevant

[Here's What The 2020 Candidates Say They'll Do About Climate Change](#)

Refinery29

... like geo-engineering, giant space mirrors, and **cloud-seeding** (a way of reducing precipitation that's definitely still in the it's-being-studied phase).



Flag as irrelevant

[Royal Rainmakers called in to replenish Phuket reservoirs](#)

The Phuket News

Cloud seeding will be conducted by the Southern Royal Rainmaking Operation Center based in Surat Thani. The center will use a CN-235 turboprop ...



Flag as irrelevant

[Uggah: Education Dept to decide on closing schools or not if API stays above 200](#)

The Borneo Post

Uggah said **cloud seeding** would depend on the availability of cloud, but was also quick to add that such activity would be meaningless if open ...



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"cloud seeding"

Daily update · September 6, 2019

NEWS

[Chile's president announces water crisis team amid 'intense' drought](#)

Reuters

While on a recent trip to China, the agriculture minister visited a Chinese meteorological station that specializes in **cloud seeding** to increase ...



Flag as irrelevant

[Hurricane Dorian: Could A Nuke Actually Avert Storm Disaster?](#)

Patch.com

Other failed methods included **cloud seeding**, spreading oil over ocean waters, and pumping cold water into the path of a storm. Willoughby flew more ...



Flag as irrelevant

[Haze hits Sarawak: Govt to send diplomatic note to Indonesia soon to address issue \(Video\)](#)

The Borneo Post

Asked if **cloud-seeding** was on the cards, Munirah said the government was waiting for input from the Meteorological Services Department.



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Subject: Google Alert - "cloud seeding"
Date: Thursday, 5 September 2019 8:01:51 am



"cloud seeding"

Daily update · September 4, 2019

NEWS

[Global Cloud Seeding Equipment Market Growth and Forecast predictions to 2025](#)

Rapid News Network

ResearchMoz incorporate new survey report "Global **Cloud Seeding** Equipment Market Size, Status and Forecast 2019-2025" to its immense ...

[Global Cloud Seeding Equipment Market 2019 Growth Prospects – Weather Modification, Inc ...](#)

- Top News Herald (satire) (press release) (blog)

[Full Coverage](#)



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[NCM to highlight key contribution to UAE energy sector at World Energy Congress](#)

WAM EN

Rainwater obtained through techniques such as **cloud seeding** offers a viable alternative to groundwater and water produced through the desalination ...



Flag as irrelevant

[National Center of Meteorology to highlight key contribution to UAE energy sector at World Energy ...](#)

ZAWYA

Furthermore, visitors will gain valuable insight into the importance of **cloud-seeding** projects for future generations in the face of water scarcity.



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"cloud seeding"

Daily update · August 31, 2019

NEWS

[US experts test new cloud-seeding technique in UAE](#)

Khaleej Times

The UAE is getting a good number of rainy days, thanks to **cloud-seeding** missions. Now, a team of pilots and scientists from the US is testing a new ...



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Subject: Google Alert - "cloud seeding"
Date: Saturday, 31 August 2019 8:04:13 am



"cloud seeding"

Daily update · August 30, 2019

NEWS

[Trump's ideas are based both in fact as well as fiction](#)

WiscNews

The fact is that the United States government has looked at proposals from **cloud seeding** to using nuclear weapons to blow up hurricanes to stop ...



Flag as irrelevant

[IRGC to Construct Artificial Island in Southern Iran](#)

Tasnim News Agency (press release)

Earlier last year, the IRGC Aerospace Force helped the Energy Ministry in **cloud-seeding** operations as part of programs to fight drought. The IRGC ...



Flag as irrelevant

[Hosted Private Branch Exchange \(PBX\) Market Size, Trends, Analysis, Demand, Outlook and ...](#)

ITResearchBrief.com (press release) (blog)

Cloud Seeding Equipment Market report starts from illustration of Industry Chain structure, and portrays industry condition, at that point investigations ...



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Date: Friday, 30 August 2019 8:05:20 am



"cloud seeding"

Daily update · August 29, 2019

NEWS

[Keep calm and nuke the hurricanes!](#)

The Hindu BusinessLine

Also in the early 1960s, the US administration experimented with a plan to weaken hurricanes through '**cloud seeding**' with silver iodide. The initial ...

Flag as irrelevant

[Cloud Seeding Equipment Market size to Hit USD 62.65 Million between 2017 & 2024](#)

Market Research Gazette

Global **cloud seeding** equipment market is segmented on the basis of mode of seeding into aerial **cloud seeding** and ground based **cloud seeding**.

Flag as irrelevant

[.Cloud Seeding Equipment Market. Overview with Detailed Analysis, Competitive landscape ...](#)

Market Reports

The '**Cloud Seeding** Equipment market' research report added by Market Study Report, LLC, is an in-depth analysis of the latest trends persuading ...

Flag as irrelevant

[BOM forecast shows warm, dry conditions will continue in spring](#)

The Australian

Snowy Mountains Hydro say that **cloud-seeding** increases snowfall by about 10% so why isn't it tried in other parts of the country too? Likethumb_up.

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Subject: Google Alert - "cloud seeding"
Date: Wednesday, 28 August 2019 8:04:00 am



"cloud seeding"

Daily update · August 27, 2019

NEWS

[Cloud seeding 'ineffective' in current weather conditions, says S. Sumatra official](#)

Jakarta Post

Amid the current strong wind and dry air conditions, inducing rain through **cloud seeding** may not be effective in combating haze from wildfires in ...

Flag as irrelevant

[Why Trump can't bomb a hurricane - or seed it either](#)

AccuWeather.com (blog)

Cloud seeding was tried with hurricanes a few times, resulting in spectacular failures. In 1947, we attempted to modify a hurricane that was moving out ...

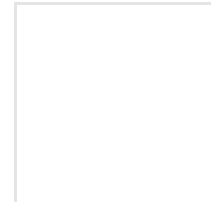
Flag as irrelevant

[President Trump's idea on nuking a hurricane? He's not the only one](#)

The News-Press

... Nobel laureate Irving Langmuir. This idea was studied until 1983. But the conclusion according to NOAA, was that **cloud seeding** had little prospect ...

Flag as irrelevant



[Chipping away at how ice forms could keep windshields, power lines ice-free](#)

Phys.Org

Silver iodide is so effective at promoting ice formation that it's used for **cloud seeding** to stimulate rainfall during droughts. Ice formation, or nucleation, ...

Flag as irrelevant

[PolitiFact: Can a nuclear bomb stop a hurricane? No, it's a myth](#)

Tampa Bay Times

The general strategy was to reduce the intensity of the storm by **cloud seeding**, which involves introducing a substance into clouds to cause ...



Flag as irrelevant

[TMJ checks out Johor forest fire](#)

The Star Online

ISKANDAR PUTERI: What started as an ordinary small bush fire about six days ago has destroyed about 16ha of forest in Kampung Pekajang along ...



Flag as irrelevant

[2 Johor schools closed as forest fire rages](#)

The Straits Times

Earlier on Sunday, Mr Yahaya told Bernama that there were suggestions for **cloud-seeding** activities to be carried out in the area to help the firefighting ...

[Johor Crown Prince checks out forest fire](#) - AsiaOne

[Full Coverage](#)



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WEB

[Snowy Mountains Cloud Seeding Act 2004](#)

NSW EPA

The Snowy Mountains **Cloud Seeding** Act 2004 enables Snowy Hydro Limited to conduct permanent **cloud seeding** operations within the Snowy ...



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Subject: Google Alert - "cloud seeding"
Date: Tuesday, 27 August 2019 8:04:26 am



"cloud seeding"

Daily update · August 26, 2019

NEWS

[Why Trump can't bomb a hurricane - or seed it either](#)

AccuWeather.com (blog)

Cloud seeding was tried with hurricanes a few times, resulting in spectacular failures. In 1947, the U.S. government attempted to modify a hurricane ...



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[Cloud-seeding Operations Fail in Maharashtra; Marathwada May Face another Drought Year](#)

Krishi Jagran (press release) (blog)

Cloud-seeding Operations Fail in Maharashtra; Marathwada May Face ... "The government has started the **cloud-seeding** experiment, but the results ...



Flag as irrelevant

[No, you can't just nuke a hurricane. But there are other options.](#)

Vox

But they concluded, according to NOAA, that "**cloud seeding** had little prospect of success because hurricanes contained too much natural ice and too ...



Flag as irrelevant

[Iskandar Puteri firefighters battle 100-hectare forest blaze](#)

New Straits Times Online

"Following a proposal (to carry out **cloud seeding** activities), officers from the Meteorological Department came to the site to observe the formation of ...

[Forest fire near Legoland M'sia spreads to 98 football fields area after it was put out initially -](#)

Mothership.sg

[Johor's firefighters battling forest fire in Iskandar Puteri - The Straits Times](#)

[Full Coverage](#)



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[Flashback: Stopping or weakening hurricanes by nuking them is wishful thinking | Guestview](#)

Pensacola News Journal

... Administration, its predecessor in the Department of Commerce, led Project STORMFURY,

which sought to do just that through **cloud seeding**.

Flag as irrelevant

[Agricultural Robots Market Segment | Industry Trends, Forecast, Analysis and Outlook 2019 – 2025](#)

Honest Version

Emerging applications of robots or drones in agriculture include weed control,[1][2][3] **cloud seeding**,[4] planting seeds, harvesting, environmental ...

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Subject: Google Alert - "cloud seeding"
Date: Sunday, 25 August 2019 8:00:38 am



"cloud seeding"

Daily update · August 24, 2019

NEWS

[As cloud-seeding operations fail, Marathwada faces another drought year](#)

The Hindu BusinessLine

With the State government's **cloud-seeding** efforts not yielding desired results yet, the water crisis in the Marathwada region of Maharashtra, ...



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[UAE leads world in producing rain](#)

Khaleej Times

The UAE Research Programme for Rain Enhancement Science continues to advance new knowledge related to **cloud seeding**, through dynamic, ...



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[2019 Cloud Seeding Equipment Market Import-Export Ratio, Revenue, Share, Expansion Rate and ...](#)

Rise Media

Cloud seeding is a weather modification process which involves dropping of chemical agents into clouds to cause rain. Silver iodide, dry ice and even ...



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Date: Saturday, 24 August 2019 8:01:28 am



"cloud seeding"

Daily update · August 23, 2019

NEWS

[Stormy science: North Dakota project boosted thunderstorm knowledge, sparked cloud seeding ...](#)

Bismarck Tribune

FARGO — Thirty years ago this summer, a variety of researchers were brought together for an intensive month-long study of North Dakota's sometimes ...

Flag as irrelevant

[K'taka to continue cloud seeding as drought-like conditions prevail in some districts](#)

The News Minute

Cloud seeding is a weather-modification experiment to induce rainfall from rain-bearing clouds using chemicals. For Karnataka, flares of sodium ...

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[Cloud Seeding Equipment Market to Record an Exponential CAGR by: Weather Modification, Inc ...](#)

Insta Newsletters

The latest research **Cloud Seeding** Equipment Market both qualitative and quantitative data analysis to present an overview of the future adjacency ...

Flag as irrelevant

[Cloud Seeding Equipment Market Size, Industry Status and Share for Leading Players| North ...](#)

BBC News Media (press release)

Los Angeles, United State, 23rd August, 2019, – – The report comes out as an intelligent and thorough assessment tool as well as a great resource ...

Flag as irrelevant

[Saudi Arabia Plans to Make a Smart City with Artificial Moon, Flying Cars](#)

RS-NEWS (press release)

The suggested features mentioned in the reports include a huge artificial moon, flying taxis and

cloud seeding technology for producing artificial ...



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[Campground Booking System Market Size | Industry Report, 2025| Beds24, VisualWorks Inc ...](#)

BBC News Media (press release)

Cloud Seeding Equipment Market Size, Industry Status and Share for Leading Players| North American Weather Consultants, Inc., Seeding ...



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Date: Tuesday, 20 August 2019 8:01:39 am



"cloud seeding"

Daily update · August 19, 2019

NEWS

[Rs 30-crore cloud seeding project over rain-parched Marathwada begins today](#)

Hindustan Times

With all eight districts in the parched Marathwada region facing a deficient monsoon, the state government is **cloud seeding** the area in the hope of ...

Flag as irrelevant

[Will a thirsty Southwest put the Midwest underwater?](#)

High Country News

From there, they deposit their **cloud-seeding** payload just ahead of the storms. As the jet stream caroms from the Gulf of California to the Great Lakes, ...

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Date: Sunday, 18 August 2019 8:05:07 am



"cloud seeding"

Daily update · August 17, 2019

NEWS

[As Maharashtra's Sangli Recovers From Flood, Cloud Seeding In Solapur To Induce Rain](#)

NDTV

As flood waters have receded in Kolhapur, Satara and Sangli, in neighbouring Solapur plans for **cloud seeding** are underway to create rainfall.



Flag as irrelevant

['Weather in tropics hard to predict'](#)

New Straits Times Online

A: During the dry season like this, **cloud seeding** is of no use. The possibility for success is very low. We used helicopters and bombardiers to douse ...



Flag as irrelevant

[Rains lash Rajasthan, 4 dead in Jodhpur](#)

The New Indian Express

After two failed attempts of **cloud seeding** — on August 10 in Aurangabad and July 24 in Solapur — the Maharashtra government will now make ...



Flag as irrelevant

[Thailand launches artificial rain-making operations to tackle drought](#)

<http://en.vietnamplus.vn/> (press release)

DRAA Director-General Surasee Kittimonthon said that the **cloud-seeding** operations will be conducted until the end of September to cope with the ...



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Subject: Google Alert - "cloud seeding"
Date: Saturday, 17 August 2019 8:00:52 am



"cloud seeding"

Daily update · August 16, 2019

NEWS

[Thailand launches cloud-seeding operations to tackle drought](#)

Xinhua

DRAA Director-General Surasee Kittimonthon said that the **cloud-seeding** operations will carry out its artificial rain duties until the end of September, ...

[Drought: Thailand launches cloud-seeding operations](#) - P.M. News
[Full Coverage](#)

Flag as irrelevant

[Desperate for new water supplies, SLO County bets on cloud-seeding program](#)

San Luis Obispo Tribune

"I support **cloud seeding** because we need more water," Talley told the board. "It's cheaper than any other way to increase our water supply."

Flag as irrelevant

[Major cloud seeding operations to commence today](#)

ThaiVisa News

Five additional Air Force aircraft and one from the Army will join the DRAA's fleet carrying out **cloud-seeding** operations until the end of September, ...

Flag as irrelevant

[Global and Regional Building Energy Management Software Market Research 2019 Report ...](#)

Market Analyst

Global **Cloud Seeding** Equipment Market 2019 by Company, Regions, Type ... More:
[https://www.marketstudyreport.com/reports/global-cloud-seeding- ...](https://www.marketstudyreport.com/reports/global-cloud-seeding-...)

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Date: Thursday, 15 August 2019 8:01:55 am



"cloud seeding"

Daily update · August 14, 2019

NEWS

[Rs 90 crore dilemma: Karnataka in a fix over **cloud-seeding** project](#)

Times of India

Anticipating deficit monsoon rainfall, the previous JD(S)-Congress government initiated **cloud-seeding** operations. It took into consideration a 2017 ...



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[Cloud Seeding Equipment Market, Share, Growth, Trends and Forecast to 2024: Market Study Report](#)

News by Intelligence Journal (press release) (blog)

Cloud Seeding Equipment Market forecast report now available with Market Study Report encompasses an exhaustive study of this business space ...



Flag as irrelevant

[Cloud Seeding Equipment Market to Witness Growth Acceleration During 2019-2024](#)

Financial Planning

The latest **Cloud Seeding** Equipment market research added by Market Study Report, LLC, delivers a concise outline regarding the potential factors ...



Flag as irrelevant

[DPM: Bombardier aircraft for firefighting in Miri today](#)

The Borneo Post

Dr Wan Azizah said that the Sarawak government had applied to perform **cloud seeding** operations in the area but the Malaysian Meteorological ...



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[Gradual Rise Of Water Elevation In Angat, Bustos Dams Noted](#)

pageone.ph

David said that technically, the **cloud-seeding** operations over the Angat & La Mesa watershed areas are ongoing. "However, the operations are ...



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"cloud seeding"

Daily update · August 13, 2019

NEWS

[Ward County Commissioners moved to put weather modification on the ballot](#)

KFYR-TV

Cale Neshem says he gets a good look at **cloud seeding** planes flying around from his farm in Berthold. "A lot of the times they fly just west of Berthold."



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[Cloud Seeding Equipment Market Size – Industry Growth Report, 2025|Weather Modification, Inc ...](#)

Market Reports

Global **Cloud Seeding** Equipment Market Overview: The latest report up for sale by QY Research demonstrates that the global **Cloud Seeding** ...

[Global Cloud Seeding Equipment Market 2019 Business Standards – Weather Modification, Inc ...](#) - Rise Media

[Global Cloud Seeding Equipment Market 2024 : Current industry size and future prospective -](#)

Financial Planning

[Full Coverage](#)



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[Key agencies rally resumption of stalled NorCot Airport project](#)

Manila Bulletin

The CMA's 1.2-kilometer runway was used only in 2014 by **cloud-seeding** light aircrafts chartered by the provincial government at the height of El Nino ...



Flag as irrelevant

[80% of forest fires in Indonesia: report](#)

ASEAN Economist

The Malaysian National Disaster Management Agency (Nadma) has been directed to carry out **cloud seeding** to disperse the smoke in Miri, Kuala ...



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[LAN as a Service Market, Share, Growth, Trends and Forecast to 2023: Market Study Report](#)

News by Intelligence Journal (press release) (blog)

Cloud Seeding Equipment Market report covers the market landscape and its growth prospects over the coming years, the Report also brief deals with ...



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[Fire Dept relieved help in the offing from disaster management committee](#)

The Borneo Post

Earlier, in a press conference, Uggah ruled out **cloud seeding** as it would not be practical to do so. Instead the committee will use a bombardier aircraft ...



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Date: Tuesday, 13 August 2019 8:01:47 am



"cloud seeding"

Daily update · August 12, 2019

NEWS

[Monsoon takes break, may affect cloud seeding experiment](#)

Times of India

On the third day of the implementation of the project, the team associated with **cloud seeding** project tried inducing modified weather conditions ...

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[Cloud seeding to combat haze in Sarawak](#)

New Straits Times Online

The committee in a statement said that **cloud seeding** operations were required in Miri, Kuala Baram, Sri Aman and Sibu, which had recorded ...

[Nadma directed to carry out cloud seeding to tackle haze situation in Miri, Kuala Baram, Sri Aman ...](#) - The Borneo Post

[Sarawak govt tells national disaster agency time to induce rains over Miri, Sri Aman and Sibu](#) - Malay Mail

[API reading at SK Kuala Baram 2 rises to 342 as of 3pm](#) - The Edge Markets MY
[Full Coverage](#)

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[Haze: Cloud seeding ordered for Miri, Kuala Baram, Sibu, Sri Aman](#)

The Borneo Post

MIRI: The National Disaster Management Agency (Nadma) has been directed to carry out **cloud seeding** operations in Miri, Kuala Baram, Sibu and Sri ...

Flag as irrelevant

[The fog of history](#)

Mail Tribune

Take the local example of **cloud seeding** to disperse thick fog at the Medford Airport. The purpose of seeding is to create a visual clearance through ...

Flag as irrelevant

[Despite floods, parts of Maharashtra reeling under drought-like conditions](#)

India Today

In many areas the state government is planning **cloud seeding** as well to tackle the crisis arisen out of deficient rains. Reports suggest that an amount ...

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[Disaster of this nature can't be forecast](#)

Deccan Chronicle

Cloud-seeding has not been done in the places where heavy rains ... and Kolar, have deficit rainfall and we plan to do **cloud seeding** in these districts.

Flag as irrelevant

[Miri on high haze alert](#)

New Straits Times Online

"We will have to discuss with other agencies before we decide to carry out **cloud seeding** as it involves concerted efforts and funds. So far, we have not ...

Flag as irrelevant

[Monsoon to become monstrous in parts of Maharashtra yet again, rescue operations continue](#)

Skymet Weather

On one hand, where more than 2 lakh people have been evacuated and taken to safer places due to the recent floods, **cloud-seeding** is going on in ...

Flag as irrelevant

[Hard lessons from the floods](#)

Mid-Day

Currently, **cloud seeding** is being experimented without much success in the dry-spell regions. Going back to Western Maharashtra's issue (which ...

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[Agriculture Robots Market 2019 Research by Business Opportunities, Top Players, Growth ...](#)

Infonews Box

Emerging applications of robots ordronesin agriculture includeweed control,**cloud seeding**,planting seeds, harvesting,environmental monitoringand ...

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WEB

[Cloud seeding to combat haze in Sarawak](#)

New Straits Times

The committee in a statement said that **cloud seeding** operations were required in Miri, Kuala Baram, Sri Aman and Sibul, which had recorded ...

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Date: Sunday, 11 August 2019 8:00:39 am



"cloud seeding"

Daily update · August 10, 2019

NEWS

[Maharashtra's irony: Battling floods in one place, cloud seeding at another](#)

The Hindu BusinessLine

Even as the State government is evacuating some two lakh people to safety in flood-devastated southern parts, it is equally busy with **cloud-seeding** in ...

[Cloud-seeding test-flight flown over Aurangabad](#) - ANI News

[Full Coverage](#)



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[Maharashtra: Cloud seeding again in Aurangabad](#)

DNA India

The revenue administration has launched **cloud seeding** in Aurangabad division from today after acquiring necessary approvals from various ...



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[Predicting Camille 50 years in the past](#)

Picayune Item

... were busy with Project Stormfury, a research experiment that would eventually conduct **cloud seeding** in Hurricane Debbie far out in the Atlantic.



Flag as irrelevant

[Flood Live Updates: Maharashtra, Kerala, Karnataka monsoon heavy rainfall weather forecast today](#)

Hindustan Times

A **cloud-seeding** test-flight to induce rain was flown near Aurangabad,yesterday. **Cloud Seeding** Mission Director says "There were less favorable ...



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[Gradual rise of water elevation in Angat, Bustos dams noted](#)

pna.gov.ph

David said that technically, the **cloud-seeding** operations over the Angat and La Mesa watershed areas are ongoing. "However, the operations are ...



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Subject: Google Alert - "cloud seeding"
Date: Friday, 9 August 2019 8:04:16 am



"cloud seeding"

Daily update · August 8, 2019

NEWS

[Global Cloud Seeding Equipment Market 2019 Industry Insights and Major Players Weather ...](#)

Micro Finance Ledger

Global **Cloud Seeding** Equipment Market Growth (Status and Outlook) 2019-2024 offers a penetrating analysis of the **Cloud Seeding** Equipment ...



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[Why are water levels of the Mekong at a 100-year low? – Daily chart](#)

Gooruf

The Royal Thai Air Force has deployed **cloud-seeding** planes. Yet along much of the Mekong's shores in Thailand and Laos, the river known as the ...



Flag as irrelevant

[DPWH revisits 'abandoned' airport in south](#)

Business Mirror

A report in February 2016 by Davao City online news agency, Mindanews, said it was first used that month but only for **cloud-seeding** operation during ...



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[UAE research program for rain enhancement science oversees research flights campaign by ...](#)

ZAWYA

The Program has brought together some of the best minds working on **cloud seeding** and weather phenomena and is already yielding real results ...



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Subject: Google Alert - "cloud seeding"
Date: Thursday, 8 August 2019 8:02:01 am



"cloud seeding"

Daily update · August 7, 2019

NEWS

[No rain-bearing clouds to seed in drought-prone areas](#)

The Hindu

After a period of trials, **cloud seeding** started in earnest on July 27. In the days since, seeding could not be conducted on four as there were no ...



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[Indonesia president threatens to sack fire fighters if forest blazes not tackled](#)

Reuters

JAKARTA (Reuters) - Indonesian President Joko Widodo threatened on Tuesday to sack military and police officers fighting forest fires if they fail to ...



Flag as irrelevant

[Maharashtra chief minister Fadnavis asks Karnataka to release more water from Almatti dam](#)

Economic Times

... is facing floods while the other half like Marathwada is facing a drought and the state is planning to do a **cloud seeding** operation to induce rain.



Flag as irrelevant

["Taming the Weather" The New Relationship Between Man and Nature](#)

CTIMES

Despite the fact that the weather modification, a **cloud seeding** technology to manipulate raining, is not encouraged by the World Meteorological ...



Flag as irrelevant

[UAE rain enhancement programme oversees research flights campaign](#)

WAM EN

The programme has brought together some of the best minds working on **cloud seeding** and weather phenomena and is already yielding real results ...



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Singapore lauds Indonesia's forest fire control efforts

ANTARA

In addition, weather modification through **cloud seeding** has also been conducted, focusing on vulnerable areas. By August 5, 2019, 170 sorties of ...



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Drought exposes submerged Thai temple

ASEAN Economist

The government has resorted to **cloud-seeding** to trigger rain and is sending water trucks to rural communities. The University of Thai Chambers of ...



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"cloud seeding"

Daily update · August 6, 2019

NEWS

[Cloud Seeding Equipment Market to Register Steady Growth During 2019-2024](#)

News Exterior

Cloud Seeding Equipment Market Report 2019-2024 Industry research report offers an in-depth and decision-making market analysis prospects for ...

Flag as irrelevant

[Indonesia president threatens to sack fire fighters if forest blazes not tackled](#)

KFGO News

Indonesian authorities have pledged to use aircraft for water bombing and **cloud seeding** to fight the fires. Drought has hit large parts of the ...

Flag as irrelevant

[Maharashtra: 8 districts still remain parched](#)

DNA India

Besides, the **cloud seeding** should yield positive results." BJP legislator from Karanja constituency in Washim said the rainfall is badly needed as the ...

Flag as irrelevant

[Internal Audit Management Software Market Size Trends Analysis, Top Manufacturers, Shares ...](#)

News By ReportsGO (press release) (blog)

Cloud Seeding Equipment Market report begins from overview of Industry Chain structure, and describes industry environment, then analyses market ...

Flag as irrelevant

[SAUDI ARABIA: WHY THE FUTURE MAY COME TO BE NAMED 'NEOM'](#)

Asia Media International

Most remarkably, thus far the area is completely barren desert; but advances in technology which will allowfor **cloud seeding**, which will in turn create ...



Flag as irrelevant

Cauvery region facing 70 per cent shortage in rain fall

United News of India

Official sources told UNI that the situation in Cauvery belt is such that there is no even positive clouds to undertake **Cloud Seeding** proposed by the ...



Flag as irrelevant

Catchment areas parched, water level in reservoirs reduce

Times of India

He said though the civic body has submitted a requisition for **cloud seeding** in the catchment area of Totladoh to the state government, it is yet to take ...



Flag as irrelevant

Cuprous Iodide Market 2019 Analysis and Precise Outlook – William Blythe (Synthomer), Samrat ...

Market Analyst

Its chemical formula is CuI and its melting point is 606C, it has a wide variety of applications which include **cloud seeding**, dietary supplement and ...

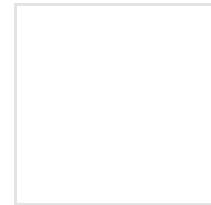


Flag as irrelevant

Canal traffic? Phuket shooting suspect nabbed! Upset over TM30 forms? || August 5

The Phuket News

... anti-trafficking |:| **Cloud-seeding** and China help |:| Missing Thai man found after 43 days! Hosted by: JP Mestanza || #Phuket 1- Tourists ignoring red ...



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"cloud seeding"

Daily update · August 4, 2019

NEWS

[Cloud seeding a costly waste](#)

Minot Daily News

My name is Roger E. Neshem. I have served on the Ward County Weather Modification Board since 2017. I farm with my wife, Jen, near Berthold ...

Flag as irrelevant

[Cloud-seeding in Cauvery basin soon: BS Yediyurappa](#)

Deccan Chronicle

Bengaluru: With monsoon playing truant, the State government has decided to launch **cloud-seeding** in the catchment areas of the KRS reservoir and ...

Flag as irrelevant

[Cloud-seeding soon in KRS and Malnad regions: CM](#)

Star of Mysore

Bengaluru: Chief Minister B.S. Yediyurappa said here on Saturday that the authorities have been directed to intensify **cloud-seeding** in KRS and ...

Flag as irrelevant

[Bob Marshall: Climate change "adaptations" will cost billions. But we need to fight climate change ...](#)

NOLA.com

Others insist that we pin our hopes on some future technological breakthroughs, such as carbon storage, **cloud seeding** or other dreams even as we ...

Flag as irrelevant

[How 'Developer' Turned Into a Dirty Word](#)

urbanmilwaukee

Some highlights from the documents include **cloud seeding** (in order to force rain in the desert climate), genetically-enhanced residents, flying taxis, ...

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"cloud seeding"

Daily update · August 2, 2019

NEWS

[Cloud seeding launched](#)

The Hindu

Deputy Commissioner M. Deepa formally launched the Rural Development and Panchayat Raj Department's Varsha Dhare **cloud seeding** project at ...



Flag as irrelevant

[Cloud seeding takes wings in North K'taka](#)

Times of India

Hubballi: Rural development and panchayat raj department on Thursday launched Project Varshadhare – a **cloud seeding** initiative at Hubballi Airport ...



Flag as irrelevant

[Cloud seeding will restart soon: Dharwad DC](#)

The New Indian Express

Though Deputy Commissioner Deepa Cholan flagged off an aircraft to conduct **cloud seeding**, the operation was stopped in the absence of favourable ...



Flag as irrelevant

[Karnataka: 3-month-long cloud seeding project for rainfall launched](#)

Yahoo News

Hubli (Karnataka) [India] Aug 2 (ANI): A three-month-long **cloud seeding** project has been launched at the Hubballi International Airport here to ...

[Cloud seeding project for rainfall launched in Hubli](#) - citytoday

[3-month-long cloud seeding project for rainfall launched](#) - The Siasat Daily
[Full Coverage](#)



Flag as irrelevant

[National links: Would you swap a flight for a train trip to help the environment?](#)

Greater Greater Washington

... project Neom highlight a proposal for robot cage fights, **cloud seeding** (in order to force rain in the desert climate), genetically-enhanced residents, ...

Flag as irrelevant



Worst Thai Drought in a Decade Adds Pressure for a Rate Cut

Yahoo Finance

The government has resorted to steps such as **cloud-seeding** to trigger rain and is trucking water into some rural towns. The Thai administration has ...



Flag as irrelevant

This sci-fi city is like Blade Runner meets Gattaca — and it's actually happening

SYFY WIRE

Sure, there are plans for **cloud seeding**, which artificially creates rain to quench a place stranded in the middle of the desert. On the other hand, there ...



Flag as irrelevant

Saudi Arabia's Solar City Disaster

OilPrice.com

That would mean extreme automation (think: flying taxis, robot maids, glow-in-the-dark beaches, **cloud seeding** for rain, hologram schools, an artificial ...



Flag as irrelevant

Your environment this week: Agro-waste to plastics, millets in beer, battling the giant snail invasion

Mongabay-India

The Ministry of Earth Sciences plans to bring out a white paper to lay the scientific basis for **cloud seeding**, based on research by the Indian Institute of ...



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Activists: We must not fan Indonesian forest fires

The Star Online

PETALING JAYA: As the forest fires in Sumatra rage on, Malaysian activists are calling on the people to be more aware of protecting the environment.



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"cloud seeding"

Daily update · August 1, 2019

NEWS

[What is cloud seeding?](#)

Mongabay-India

Dreaming of a perfect blue-sky and rain-free wedding day? A luxury travel company promises to do just that for a price with the help of **cloud seeding**, ...

Flag as irrelevant

[Delayed cloud seeding turns fruitless in drought-hit Maharashtra](#)

The Tribune

Parts of Maharashtra are likely to face another year of drought as the state government's delayed attempts to carry out **cloud seeding** in the worst ...

Flag as irrelevant

[Department ramps up cloud-seeding to ease drought in the Thailand's northeast](#)

The Thaiger

The Department of Rain-making and Agricultural Aviation is stepping up **cloud-seeding** efforts to help generate much-needed rain for drought areas in ...

Flag as irrelevant

[Demand-Supply Scenario of Cloud Seeding Equipment Market to Remain Balanced During the ...](#)

Financial Planning

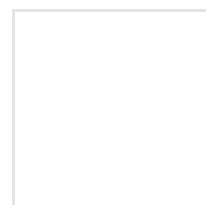
Cloud seeding is a weather modification process which involves dropping of chemical agents into clouds to cause rain. Silver iodide, dry ice and even ...

Flag as irrelevant

[Indonesia to Deploy Thousands of Security Personnel to Combat Haze-Causing Fires](#)

TIME

Earlier this month, Indonesia's disaster management agency said that they would use **cloud seeding** to try to trigger rainfall to prevent fires and harvest ...



[Indonesia sends thousands of security personnel to combat forest fires](#) - TODAYonline

[Indonesian troops deployed to fight forest fires](#) - Khmer Times

[Security Personnel help battle Forest fire in Indonesia](#) - thepolicytimes.com (press release) (blog)
[Full Coverage](#)

Flag as irrelevant

[Cloud Seeding System Market Estimated to Record Highest CAGR by 2027](#)

Business News Standard (BNS) (press release) (blog)

Water resources are increasingly taxed by exploding demand and continued population growth.

Cloud-seeding System is a kind of whether ...

Flag as irrelevant

[Worst Thai Drought in a Decade Adds Pressure for Policy-Rate Cut](#)

Bloomberg

The drought in Thailand threatens to exacerbate a sharp slowdown in economic growth and intensify pressure on the central bank to loosen monetary ...

Flag as irrelevant

[Russia engineers climate to induce rain as wildfires rage across Siberia](#)

Telegraph.co.uk

Although **cloud seeding** has been used for decades in the United States and other countries to try to increase snowfall at ski resorts or pre-empt ...

[Trump offers to help fight Russian wildfires the size of Belgium](#) - The Times

[Full Coverage](#)

Flag as irrelevant

[PHUKET XTRA: VIDEO: Unwanted newborn murder! Ignoring red flags? 43 days lost! || August 1](#)

The Phuket News

... ignore red flags, nearly drowns |:| Australia gives \$ for anti-trafficking |:|

Cloud-seeding and China help |:| Missing Thai man found after 43 days!

Flag as irrelevant

[Consulting leak reveals crazy details of KSA's Neom development](#)

Consultancy-me.com

... science fiction and corporate buzzwords," with details including a moderated temperature and flourishing agricultural sector through **cloud seeding**, ...

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"cloud seeding"

Daily update · July 30, 2019

NEWS

[As cloud seeding catches on in times of climate change, more research holds the key](#)

CNBCTV18

An aircraft poised to enter dark clouds – and spray chemicals to produce rain. Sounds magical — that's the image often associated with **cloud seeding**.

Flag as irrelevant

[Aircraft involved in cloud seeding project are making sorties from HAL; project commenced on ...](#)

Bangalore Mirror

In an effort to induce rain artificially, scientists have begun **cloud seeding** operations in the State. A trial run was started on July 25 in different parts of ...

Flag as irrelevant

[Cloud seeding sought in Kamptee-Khairi catchment](#)

Times of India

Nagpur: Collector Ashwin Mudgal has sought **cloud seeding** in catchment areas of Kamptee Khairi reservoir, which is located in the downstream of ...

Flag as irrelevant

[As cloud seeding catches on in times of climate change, more research holds the key](#)

Online Khabar (English) (satire) (blog)

Cloud seeding introduces particles of salts like silver iodide and chloride into the cloud using a special aircraft. These salt particles act as nuclei on ...

Flag as irrelevant

[Global Cloud Seeding Equipment Market by Manufacturers, Regions, Type and Application ...](#)

Market Reports

Market Analysis Research Report on "Global **Cloud Seeding** Equipment Market" has been added to orbis research database. The Global **Cloud** ...



Flag as irrelevant

Global Weather Chaos Is Also Shriveling Asia's Crop Production

Bloomberg

Cloud-seeding planes have been deployed, and pumps and trucks have been used to divert water to the affected areas in the north and northeast.



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Researchers enrich silver chemistry

EurekaAlert (press release)

... important for the practical applications of substances containing silver: in water and wound disinfection, photography, rainmaking via **cloud seeding**, ...



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Saudi Arabia wants NEOM to have flying cars, a fake moon, and 24/7 surveillance

The Architect's Newspaper

... robot maids to clean peoples' homes, beaches with glow-in-the-dark sand, **cloud seeding** to bring rain to the hot desert, a hologram faculty teaching ...



Flag as irrelevant

Call for support of Weather Modification Project

Minot Daily News

This group dismisses all of the science and studies of **cloud seeding** which have proven to be successful and fruitful in the past. When their ideas ...



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Cuprous Iodide Market 2024 Growth, Vendors, Size, Trends, Challenges, Drivers, and Technology ...

NMSU DOV News

Copper iodide is used in **cloud seeding** and also for the stabilization of heat in nylon. According to this study, over the next five years the Cuprous ...



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"cloud seeding"

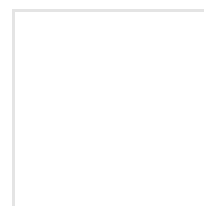
Daily update · July 26, 2019

NEWS

[Idaho Power can make it snow — increasing water reserves, powering homes. But is it safe?](#)

Idaho Statesman

So what **cloud seeding** does is we try to start that process of growing ...
According to Idaho Power, the additional runoff caused by **cloud seeding** in ...



Flag as irrelevant

[Karnataka to commence **cloud seeding** ops](#)

Deccan Herald

A weak monsoon has forced the state government to undertake **cloud seeding** operations in parts of Karnataka from Friday. A trial run of the **cloud** ...

Flag as irrelevant

[Cloud-seeding from Mysuru this evening](#)

Star of Mysore

Mysuru: As the monsoon continues to play truant, drought-stricken Karnataka has begun **cloud-seeding** to enhance precipitation. The **cloud-seeding** ...

Flag as irrelevant

[Saudi Prince Plans City With Human Gene Editing, Artificial Rain](#)

Futurism

It won't be desert for long, though — MBS plans to use "**cloud seeding**" to produce rain over Neom, cooling the city and making fresh produce widely ...

[Saudi Arabia's crown prince reportedly wants to build a \\$500 billion desert city with artificial rain, a ...](#) - Business Insider

[Saudi Arabia plans futuristic desert city with robot maids, neon beaches - and alcohol](#) -

Telegraph.co.uk

[Flying taxis, robots and dinosaurs: Social media pokes fun at MBS's desert dream](#) - Middle East

Eye

[Full Coverage](#)

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Maharashtra, Karnataka to go for artificial rain

Daily Pioneer

Maharashtra and Karnataka will go for **cloud seeding** or artificial rain procedure to tackle deficient rainfall. The target areas for **cloud seeding** will be ...



Flag as irrelevant

Agriculture Robots Market Outlook 2024: Market Trends, Segmentation, Market Growth and ...

EN Citizen

Emerging applications of robots or drones in agriculture include weed control, **cloud seeding**, planting seeds, harvesting, environmental ...



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"cloud seeding"

Daily update · July 25, 2019

NEWS

[Karnataka begins cloud seeding](#)

The Hindu BusinessLine

As the monsoon continues to play truant, drought-stricken Karnataka has begun **cloud seeding** to enhance precipitation across the State.



Flag as irrelevant

[Attempt to induce artificial rain fails in Solapur](#)

The Asian Age

Three planes that arrived in Solapur Tuesday for this purpose flew about 200 kilometres Wednesday but did not find suitable clouds for **cloud seeding**.



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[Indonesia Warns of Rice Crop Damage in Drought-Parched Fields](#)

Yahoo Finance

Indonesia is preparing aircraft loaded with chemicals for **cloud seeding**, a type of weather modification that aims to change the amount of rainfall from ...



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[Water in Angat recedes again](#)

Philippine Star

Sevillo David Jr., executive director of the National Water Resources Board, had earlier said **cloud-seeding** operations over the Angat and La Mesa ...



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[PM confirms talks with neighbouring countries to ease drought](#)

ThaiVisa News

... too much rice and don't change to crops which require less water. Meanwhile, the government continues the **cloud seeding** to make artificial rain.



Flag as irrelevant

[Cloud Seeding Equipment Market Analysis & Technological Innovation](#)

by Leading Key Players

AlgosOnline (press release) (blog)

Market Study Report LLC Adds New Global **Cloud Seeding** Equipment Market Report to its research database. The report presents a deep study of the ...



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Thailand is seeking help from neighbouring countries to ease drought

Thailand Business News

BANGKOK, 25th July 2019 (NNT) -Thailand's Prime Minister has confirmed the government's move to solve the drought situation by coordinating with ...



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The Athelcrown: East London's saviour

GO! and Express

... how desperate things were, the municipality was seriously considering dumping dry ice into clouds via aeroplane as an early form of **cloud-seeding**.



Flag as irrelevant

National Center of Meteorology welcomes Environment Agency - Abu Dhabi acting Secretary ...

ZAWYA

These initiatives will see the testing of new **cloud seeding** materials, the introduction of the most advanced new planes, drones, balloons and ...



Flag as irrelevant

Cuprous Iodide Market Outlook: World Approaching Demand & Growth Prospect 2018-2026

Forex Tribune (press release)

Demand of CuI is increasing attributing to its properties such as catalyzing ability in inorganic and organic synthesis, its use in **cloud seeding** (i.e. ...



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Daily update · July 24, 2019

NEWS

[Maharashtra All Set to Commence **Cloud Seeding** in Drought-Hit Regions](#)

The Weather Channel

The Maharashtra government's Rs 31-crore **cloud seeding** project might kick off soon. Three planes that will be used to artificially induce rains in ...



Flag as irrelevant

[Indonesia plans **cloud seeding** to avoid crop failure](#)

Macau Business

Indonesia is preparing to carry out **cloud seeding** in an effort to trigger rainfall to prevent harvest failure and forest fire, the disaster mitigation agency's ...



Flag as irrelevant

[Planes to carry out **cloud seeding** are now in Maharashtra, says IMD official](#)

Yahoo News

"The government has decided to carry out **cloud seeding**. for artificial rains in the Solapur-Osmanabad region. For that officials will survey the skies for ...



Flag as irrelevant

[**Cloud Seeding** Equipment Market with Report In Depth Industry Analysis on Trends, Growth ...](#)

Market Reports

Market Study Report provides a detailed overview of **Cloud Seeding** Equipment market with respect to the pivotal drivers influencing the revenue ...



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[Planes to carry out **cloud seeding** are now in Maharashtra, says IMD official](#)

Free Press Journal

Mumbai: Three planes for bringing about artificial rains in southern districts of Maharashtra along the borders of Karnataka and Telangana have ...



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[Agriculture Robot Market to Witness Comprehensive Growth By 2025 with Global Industry Players ...](#)

Rise Media

Developing uses of robots or automatons in agribusiness incorporate weed control, **cloud seeding**, planting seeds, reaping, ecological checking and ...



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[Commerce ministry frets over rice output](#)

ThaiVisa News

The news was only good in Ubon Ratchathani, also in the Northeast, where a significant amount of rain fell on Tuesday, credited to **cloud-seeding** ...



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[We must save the rain: Word in the Streets](#)

Boorowa News

Man has tried many ways to make it rain from rain dances, to prayer and scientific **cloud seeding**, with not much success. When it rains, we have to try ...



Flag as irrelevant

[The Current Situation of Drought-hit Maharashtra: Only 25 per cent Water Left in Dams](#)

Krishi Jagran (press release) (blog)

The State Revenue Minister Chandrakant Patil said that the government might implement a **cloud seeding** project this week. Loan waiver and Farmer's ...



Flag as irrelevant

[What's driving the Thermal Imaging Systems Market Size Key Players are: BAE Systems Plc., Flir ...](#)

Market Talk News

Cloud Seeding Equipment Market Report covers the makers' information, including shipment, value, income, net benefit, talk with record, business ...



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"cloud seeding"

Daily update · July 22, 2019

NEWS

[Indonesia plans cloud seeding to avoid crop failure](#)

Reuters

JAKARTA (Reuters) - Indonesia is preparing to carry out **cloud seeding** in an effort to trigger rainfall to prevent harvest failure and forest fire, the ...

Flag as irrelevant

[Cloud Seeding Equipment Market 2019- Global Industry Analysis, By Key Players, Segmentation ...](#)

EIN News (press release)

A new market study, titled "Discover Global **Cloud Seeding** Equipment Market Upcoming Trends, Growth Drivers and Challenges" has been featured ...

[Cloud Seeding Equipment Market by 2024 key players like: Weather Modification, Inc., North ...](#)
- Rise Media

[Global Cloud Seeding Equipment Market 2019 Trends, Market Share, Industry Size, Opportunities ... - Financial Planning](#)

[Cloud Seeding Equipment Market Overview 2019 and Industry Development Factors Analysis - Market Reporter](#)
[Full Coverage](#)

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[Thai farmers asked to delay rice planting as drought bites](#)

Thomson Reuters Foundation

The government is considering measures such as **cloud seeding** to try to bring rain but in the meantime, farmers have been asked to hold off. By Panu ...

[Parched Mekong reduced to puddles as drought threat builds \(Video\) - Coconuts](#)
[Full Coverage](#)

Flag as irrelevant

[One-time backbone of air charter](#)

New Straits Times Online

MAC's services included **cloud-seeding** work, aerial survey and mapping, and dispatching newspaper printing plates, food supplies and workers' ...

Flag as irrelevant

Clouds reluctant to open for parched rice farms Jul 21, 2019

ThaiVisa News

... working with rice farmers of the Kasetwisai Agricultural Cooperative's branch in Baan Nok Hor to arrange **cloud seeding** aimed at bringing on rain to ...



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"cloud seeding"

Daily update · July 21, 2019

NEWS

[Maharashtra govt to spend Rs 31 cr on cloud seeding](#)

DNA India

In view of the delayed and scanty rainfall, Maharashtra government has planned the artificial **cloud seeding**. The first experiment of **cloud seeding** will ...



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[Amid growing fears of Kodagu residents, cloud seeding to begin on Wednesday](#)

Times of India

Mysuru: Notwithstanding the apprehensions expressed by the people of Kodagu, who fear that the state government's **cloud seeding** operation may ...



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[CLOUD-SEEDING OPERATIONS PLANNED IN COORG ON JULY 24 AMID REPORTS OF FRESH ...](#)

Kodagu

The Kumaraswamy government which is on its way out has no business to start **cloud-seeding** operations in Kodagu (Coorg) from July 24.



Flag as irrelevant

[No boating in Ranganathittu](#)

Star of Mysore

Rain picks up pace in Kodagu; **cloud-seeding** operations from Mysuru from July 24. Mysuru: Boating operations have been suspended at ...



Flag as irrelevant

['Bill aims to reduce river water to a commodity'](#)

The Hindu

"Even **cloud-seeding** experiments tried by some States are unscientific," he said. Mr. Rajendra Singh, called the 'Water Man of India', urged farmers to ...



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Cloud Seeding Equipment Market Growing Massively by 2019-2024: Weather Modification Inc ...

Best Daily Times

This report studies the **Cloud Seeding** Equipment market status and forecast (2019-2024), categorizes the global **Cloud Seeding** Equipment market ...



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"cloud seeding"

Daily update · July 20, 2019

NEWS

[Cloud Seeding: Maharashtra Government Plans To Play God With Rains](#)

BloombergQuint

As northern parts of Maharashtra face water scarcity, the state government is mulling “**cloud seeding**” for the agriculture-dependent region in August.

[Dry spell extension: Farmers might need to sow again](#) - Hindustan Times
[Full Coverage](#)

Flag as irrelevant

[Cloud seeding to the rescue of agriculture across Maha](#)

Pune Mirror

With 43 per cent sowing already reported by the agriculture department, the **cloud seeding** is expected to dispense with the need to sow again (due to ...

[Maharashtra govt prepares to undertake cloud seeding](#) - Times of India
[Full Coverage](#)

Flag as irrelevant

[How a rainmaker saved NYC from drought — and became public enemy No. 1](#)

New York Post

Howell said that “in his estimation, **cloud seeding** had boosted rainfall over the Catskills by 14 percent, adding about 15 billion gallons of water to the ...

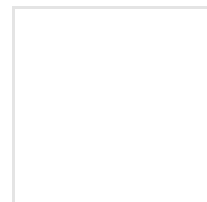
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[Here's how we'll control the weather in 100 years](#)

Midland Reporter-Telegram

Climate change can cause dramatic shifts in global temperatures and weather patterns. While scientists won't be able to reverse all of the negative ...

Flag as irrelevant



[Flash floods in Al Ain as UAE's east hit by rain, hail and lightning](#)

The National

Cloud seeding planes are also active during the summer. About eight mission were conducted from the six weeks to July 8 this year - up from five in ...



Flag as irrelevant

[Agriculture Ministry takes measures to tackle drought threat](#)

Eleven Myanmar

Thammanas said both departments involved in **cloud-seeding** operations would soon be instructed to target areas in need of rains. He also said that ...



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"cloud seeding"

Daily update · July 19, 2019

NEWS

[Cloud seeding operations continue despite rains](#)

Philippine Star

MALOLOS, Philippines — **Cloud seeding** operations over Angat and La Mesa watersheds resumed yesterday as Tropical Storm Falcon left the ...



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[NMC's SOS to CM: Start cloud seeding for Pench reservoirs](#)

Times of India

State government's relief and rehabilitation department had implemented **cloud seeding** project in Aurangabad and Solapur last year as a temporary ...



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[On local weather and national history](#)

Northwest Georgia News

Weather happens. Every day, all day long and all night long. And it doesn't care one iota what we humans are doing, want to do or think about it.



Flag as irrelevant

[Weather control, 'exotic energy weapons' and meetings with aliens – the most bizarre Area 51 ...](#)

The Sun

Meteorologists at Area 51 are thought to have experimented with **cloud seeding**, where chemicals are dropped into clouds from planes to try to make ...



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[On local weather and national history](#)

Northwest Georgia News

It runs its happy course while we battle it with air conditioning, heat, **cloud seeding**, and all manner of other interesting and dubious schemes. One nice ...



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One thing the gov't has not done, nature can only offer miniscule assistance

Manila Bulletin

ations was **cloud-seeding**. The practice of inducing rain by spreading dry ice on thick clouds over rice granaries. Done airborne by specially ...



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"cloud seeding"

Daily update · July 15, 2019

NEWS

[Maharashtra plans **cloud-seeding** as 24 of 36 districts face severe rain deficit](#)

The Hindu BusinessLine

With 24 out of 36 districts in Maharashtra facing deficient monsoon and the situation worsening in the drought-hit Marathwada and Vidarbha regions, ...

Flag as irrelevant

[Cloud Seeding Equipment Market Analysis, Growth by Top Companies, Trends by Types and ...](#)

News By ReportsGO (press release) (blog)

MarketStudyReport.com adds Global **Cloud Seeding** Equipment Market research focusing on the major drivers and restraints for the key players.

Flag as irrelevant

[Should We Try Again With Hurricane Modification?](#)

My New Orleans

Later attempts involved a **cloud seeding** process: Silver iodide, which would convert into ice crystals, was dropped into the swirling storms. Initially the ...

Flag as irrelevant

[Why it's illegal to use weather modification in warfare](#)

We Are The Mighty (blog)

Despite how ridiculous some rules and laws may seem, they only have to exist because someone actually did something so ridiculous. That's why it's ...

Flag as irrelevant

[Indonesian Government Plans To Create Manmade Rain To Solve Air Pollution Problem](#)

VICE

"In 2015, Thailand successfully conducted a **cloud-seeding** test run in response to air pollution in Bangkok, removing the inversion layer," Seto told ...

Flag as irrelevant

Marathwada dams have 0.8% water; 2191 tankers deployed

The Hindu

The uneven rainfall has led to the State government prepare for **cloud seeding** project on a war footing. According to sources in the water supply ...



Flag as irrelevant

Little rain expected so save water, pleads Ministry

ThaiVisa News

... Department, said his agency had already carried out more than 3,300 flights for **cloud seeding** over 149 million rai of farmland since March 1.



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"cloud seeding"

Daily update · July 11, 2019

NEWS

[Red-tape bogs down cloud-seeding in drought-hit Maharashtra](#)

The Tribune

Delay in permissions from New Delhi could derail attempts by the Maharashtra government to carry out **cloud seeding** in the drought-hit regions of ...

Flag as irrelevant

[Maharashtra takes its time to start cloud seeding](#)

Times of India

Officials said they had received permission from the state government to conduct **cloud seeding** experiments but it would be a while before they would ...

Flag as irrelevant

[Cloud Seeding Equipment Market Research, Development Analysis and Future Outlook 2019 to ...](#)

Market Research Headlines

Latest Industry Research Report On "Global **Cloud Seeding** Equipment Market 2019 By Manufacturers, Regions, Type, And Application, Forecast To ...

Flag as irrelevant

[Fred Weibert Obit](#)

News Letter Journal

He worked as an agricultural aerial spray pilot and also did **cloud seeding**. He was an excellent pilot and he loved the view of the world from above.

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Subject: Google Alert - "cloud seeding"
Date: Thursday, 11 July 2019 8:04:07 am



"cloud seeding"

Daily update · July 10, 2019

NEWS

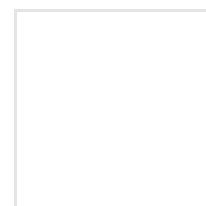
[Hurricane Hype and the Ho Chi Minh Trail](#)

Newsmax

The Pentagon Papers in 1971 divulged many classified data, inclusive of the U.S. **cloud seeding**, and on July 3, 1972, the NY Times ran an article, ...



Flag as irrelevant



['Cloud seeding discussed in cabinet meet'](#)

Free Press Journal

MUMBAI: Maharashtra minister Sudhir Mungantiwar on Tuesday said **cloud seeding** may be undertaken for artificial rains, if needed, in catchment ...



Flag as irrelevant

[Angat dam water level dipping back to critical](#)

Philippine Star

Currently, an average of two to three sorties per day are being made for the **cloud-seeding** operations, depending on the presence of seedable clouds ...



Flag as irrelevant

[Penn State professor, student demonstrate drone capabilities](#)

Sunbury Daily Item

The institute director who has worked on every continent hopes they can be used in **cloud seeding** in areas that need rain. Bill Waltman said drones ...



Flag as irrelevant

[Tanker trains to bring relief to parched Chennai](#)

Hindustan Times

Also read: After prayers, Tamil Nadu now considers **cloud seeding**. "Since 50 tankers can carry only 2.5 million litres of water, the train will make four ...



Flag as irrelevant

Bengaluru: Political vacuum hits city infrastructure works

Deccan Chronicle

With scanty rains the government had planned **cloud seeding** to help farmers, but that to have been affected, as it needs proper attention from the ...



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Date: Wednesday, 10 July 2019 8:01:24 am



"cloud seeding"

Daily update · July 9, 2019

NEWS

[Cloud seeding to increase Angat Dam level](#)

Philippine Star

MANILA, Philippines — Despite rains from the southwest monsoon and thunderstorms, **cloud seeding** operations will continue over Angat Dam in ...

Flag as irrelevant

[Political crisis casts shadow over cloud seeding, drought-relief plans](#)

Times of India

Bengaluru: The political turmoil has upset the drought-mitigation programmes such as **cloud seeding** and contingent crop plan in the state.

Flag as irrelevant

[MH-CLOUD SEEDING-MUNGANTIWAR](#)

Outlook India

Mumbai, Jul 9 Maharashtra minister Sudhir Mungantiwar Tuesday said **cloud seeding** may be undertaken for artificial rains, if needed, in catchment ...

[Cloud seeding discussed in Tue cabinet meet: Mungantiwar](#) - Devdiscourse
[Full Coverage](#)

Flag as irrelevant

[Global Cloud Seeding Equipment Market : Global Future Outlook \(2016-2024\) Demand Analysis ...](#)

Market Reporter

Global **Cloud Seeding** Equipment Market is segmented on the basis of mode of seeding into aerial **cloud seeding** and ground based **cloud seeding**.

Flag as irrelevant

[Indonesia's famed disaster spokesman dies of cancer](#)

News of Bahrain- DT News (press release)

... with an expertise in hydrology and **cloud-seeding**. He spent years as a researcher and dreamed of becoming a professor, rejecting offers to take up ...

Flag as irrelevant

Increasing Demand for Agricultural Robots to Fuel Revenue Growth Through 2025

Titan Chronicle

The farmers are deploying the agricultural robots for the various functions based on the configuration of the robots which include **cloud seeding**, fruits ...



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Date: Tuesday, 9 July 2019 8:00:55 am



"cloud seeding"

Daily update · July 8, 2019

NEWS

[Cloud seeding: Slight delay due to California quake](#)

Deccan Herald

The California earthquake has affected **cloud seeding** operation in Karnataka. Due to the earthquake, the arrival of aircraft and other equipment has ...

Flag as irrelevant

[Cloud Seeding Equipment Market Size, Global Trends, Demand, Industry Share, Growth 2019-2024](#)

A Technology Market

Overview of "**Cloud Seeding** Equipment Market" Report Helps In Providing Scope and Definitions, Key Findings, Growth Drivers, and Various ...

Flag as irrelevant

[Indonesia's famed disaster spokesman dies of cancer](#)

Global Times

Nugroho held a PhD in natural resources and the environment, with an expertise in hydrology and **cloud-seeding**. He spent years as a researcher and ...

[Indonesia's famed disaster spokesman dies of cancer - MENAFN.COM](#)
[Full Coverage](#)

Flag as irrelevant

[Upside-Down Rakes And White Sheep: A Sampling Of Icelandic Weather Superstitions](#)

Reykjavík Grapevine

While science has yet to devise a way to dependably and accurately control the weather (unless you count **cloud seeding**, which really just hastens ...

Flag as irrelevant

[Cloud Seeding Equipment Market Segmentation, Analysis by Recent Trends, Development by ...](#)

Market Reporter

Market Study Report adds a new research on Global **Cloud Seeding** Equipment Market for the period of 2019-2025 that shows the growth of the ...



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Indonesia's famed disaster spokesperson dies of cancer

Millennium Post

... is survived by his wife and two children — held a PhD in natural resources and the environment, with an expertise in hydrology and **cloud-seeding**.



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Date: Monday, 8 July 2019 8:01:01 am



"cloud seeding"

Daily update · July 7, 2019

NEWS

[Indonesia's famed disaster spokesman dies of cancer](#)

Business Standard

... is survived by his wife and two children -- held a PhD in natural resources and the environment, with an expertise in hydrology and **cloud-seeding**.



Flag as irrelevant

[Are you doing your bit to save the earth?](#)

Times of India (blog)

So, we crank up our air conditioners, plant a tree or two, and look towards China's success with **cloud seeding**, or marvel at the new rain clouds ...



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Date: Friday, 5 July 2019 8:00:29 am



"cloud seeding"

Daily update · July 4, 2019

NEWS

[Why July is going to feel like a big heatwave in UAE](#)

Gulf News

Sufian Khaled Farrah, a meteorologist and **cloud-seeding** specialist at the NCM, told Gulf News: "The month of July is considered to be the hottest ...



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Date: Thursday, 4 July 2019 8:01:04 am



"cloud seeding"

Daily update · July 3, 2019

NEWS

[Community Agriculture Alliance: The Yampa Valley — a lab for climate resilience agriculture](#)

Steamboat Pilot & Today

... the Colorado River Drought Contingency Plan that prescribes the reoperation of federal reservoirs in the Upper Basin; **cloud-seeding** and nonnative ...

Flag as irrelevant

[Tibet combats severe drought using artificial rain](#)

Xinhua

Rainfall is expected to hit Tibet on Wednesday and Thursday, and **cloud seeding** was used to intensify the rain, with 31 rain-inducing rockets shot into ...

Flag as irrelevant

[UND receives \\$1M atmospheric research contract from US Navy, bolstering new public-private ...](#)

Newswise (press release)

WMI has a strong history in the modification and operation of special mission aircraft in the fields of **cloud seeding** and atmospheric research.

Flag as irrelevant

[EDITORIAL: Believe It or Not, Colorado Will Soon Become a Waterless Desert... Part Seven](#)

Pagosa Daily Post

Increasing **cloud seeding** and removing deep-rooted, invasive plants that take up a lot of water, such as tamarisk. Creating a voluntary program that ...

Flag as irrelevant

[Jakarta Mulls Creating Artificial Rain to Tackle Air Pollution](#)

En Tempo.co

The BPPT head Hammam Riza through his Instagram account mentioned three scenarios, namely **cloud seeding**, removal of inversion layers, and ...

Flag as irrelevant

Cloud Seeding Equipment Market Report 2019 Global Industry Statistics & Regional Outlook to 2025

News.MarketSizeForecasters.com

The research report on ' **Cloud Seeding** Equipment market' now available with Market Study Report, LLC, offers a detailed analysis of the factors ...



Flag as irrelevant

Agriculture Robots & Drones Market Size, Share, Trends and Forecast, 2018 - 2026

CSO Australia

Emerging applications of robots or drones in agriculture include weed control, **cloud seeding**, planting seeds, harvesting, environmental monitoring ...



Flag as irrelevant

Jal Shakti Abhiyan: The story so far

Telegraph India

Madras High Court asked the state government to try **cloud seeding** to tackle water crisis. May 9. Drought advisory issued to Maharashtra, Gujarat, ...



Flag as irrelevant

Karnataka water minister blames protests against Sharawati, Mekedatu projects for Bengaluru ...

CNBCTV18

Cloud seeding being done. Rains are very bleak this time," he added. Karnataka has also been asked to release 9.19tmcft and 31.24tmcft of water for ...



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Subject: Google Alert - "cloud seeding"
Date: Sunday, 30 June 2019 9:25:51 am



"cloud seeding"

Daily update · June 29, 2019

NEWS

[Now, cloud-seeding from Mysuru](#)

Deccan Chronicle

Bengaluru: Disappointed by the poor monsoon, the state government has decided to go ahead with cloudseeding from the second week of July.

[Cloud seeding operations to begin next month](#) - Times of India

[Cloud-seeding in Mysuru from July second week](#) - Star of Mysore

[Full Coverage](#)

Flag as irrelevant

[Cloud Seeding Equipment Market 2019-2024 Increasing Necessity and Current Demands with Top ...](#)

News Exterior

Cloud Seeding Equipment Market research Report is a valuable supply of perceptive information for business strategists. This **Cloud Seeding** ...

Flag as irrelevant

[MLA pulls up Horticulture Dept. officials for not releasing funds to lemon growers](#)

The Hindu

The Deputy Commissioner said that he will prepare a report and seek approval for the **cloud seeding** here. Mr. M.B. Patil asked the Deputy ...

Flag as irrelevant

[Bengaluru: State legislature's extended budget session from July 12](#)

Daijiworld.com

The State government has slightly modified its location of **cloud-seeding** operations which is expected to be commenced from second week of July.

Flag as irrelevant

[Global Agriculture Robots Market 2019 By Product Type, Applications, Total Revenue, Price ...](#)

California Oracle

Emerging applications of robots or drones in agriculture include weed control, **cloud seeding**,

planting seeds, harvesting, environmental ...



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Date: Saturday, 29 June 2019 9:06:18 am



"cloud seeding"

Daily update · June 28, 2019

NEWS

[Cloud seeding operations to start July second week week](#)

Deccan Herald

Faced with deficient rainfall, the state government will launch **cloud seeding** operations from mid-July to coincide with sowing activity across the state.

Flag as irrelevant

[Karnataka to take up cloud seeding operation in two weeks](#)

Times of India

BENGALURU: The Karnataka government will launch **cloud seeding** operations in the second week of July, rural development and panchayat raj ...

[Karnataka government shifts cloud seeding to Mysuru](#) - Bangalore Mirror
[Full Coverage](#)

Flag as irrelevant

[Mobile app to survey 2.2 crore farm plots in kharif, rabi seasons](#)

The Hindu

The State government has modified the location for **cloud-seeding** operation, which is expected to commence from the second week of July. It will be ...

[App based crop survey to be taken up in Karnataka](#) - Business Standard
[Full Coverage](#)

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[Bigger the better | Maharashtra](#)

India Today

Water conservation and irrigation facilities have been a big focus with Rs 6,410 crore allotted for artificial **cloud seeding** to increase rainfall (the state is ...

Flag as irrelevant

[Marathwada has 0.24% water left](#)

DNA India

The state has decided to carry out **cloud seeding** to meet basic water needs. It has issued a tender to invite bids for the process that will cause artificial ...

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Subject: Google Alert - "cloud seeding"
Date: Friday, 28 June 2019 8:04:22 am



"cloud seeding"

Daily update · June 27, 2019

NEWS

[Fact Check: Sorry Mr Amitabh Bachchan, Nasa doesn't have a rain cloud generator](#)

India Today

Cloud-seeding has been tried in many countries including India. In 2017, the Indian Institute of Tropical Meteorology conducted a **cloud-seeding** ...



Flag as irrelevant

[QBengaluru: Cloud-Seeding Advanced to 10 July; 2 IEDs Seized](#)

The Quint

Southern Karnataka, including the Cauvery river basin, has been the driest part in the state during this monsoon, prompting the government to ...



Flag as irrelevant

[Innovative Study Focusing on Cloud Seeding Equipment Market Expects to See Significant Growth ...](#)

Market Research Updates

"Latest Research Report: **Cloud Seeding** Equipment industry. **Cloud seeding** is a weather modification process which involves dropping of chemical ...



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[Edappadi K Palaniswami lays foundation for desalination plant](#)

Hindustan Times

... endowments to conduct special rituals to appease the rain gods, and then propose **cloud-seeding** to bring artificial rain to the parched state.



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Subject: Google Alert - "cloud seeding"
Date: Thursday, 27 June 2019 11:23:40 am



"cloud seeding"

Daily update · June 26, 2019

NEWS

[After prayers, Tamil Nadu now considers cloud seeding](#)

Hindustan Times

A fortnight ago, Tamil Nadu had ordered over 33,000 temples owned by the Hindu religious and charitable endowments department to conduct ...

[Empty Reservoirs, Delayed Tankers](#) - News18
[Full Coverage](#)

Flag as irrelevant

[Cloud Seeding Equipment Market Growth Statistics to Make Multi-Billion Dollar Market during 2019 ...](#)

Micro Finance Reporter

Industrial Growth Forecast Report **Cloud Seeding** Equipment Market 2019-2024: Global **Cloud Seeding** Equipment Market industry research report ...

Flag as irrelevant

[Monsoon vagary: Govt sees need to reorient farmers on agri schedules](#)

Times of India

"We had carried out **cloud seeding** in August end last year, but this time, we are planning to launch it around July 10," said LK Atheeq, principal ...

Flag as irrelevant

[Here's why it has been raining more frequently in UAE](#)

Khaleej Times

The success of **cloud seeding** is a case in point. Continued experiments should make summers more bearable and can support agricultural sector.

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[Andrew Yang takes innovative approach to combating climate change](#)

The Rising

He suggests that the United States invest in innovations, including **cloud-seeding** technology, that can potentially reverse environmental damages.

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Subject: Google Alert - "cloud seeding"
Date: Wednesday, 26 June 2019 11:07:02 am



"cloud seeding"

Daily update · June 25, 2019

NEWS

[Demand for agricultural robots to increase sharply](#)

Future Farming

... available agricultural landscape and have given birth to the market for agriculture robots, used for weed controlling, **cloud seeding**, planting seeds, ...



Flag as irrelevant

[Cloud Seeding Equipment Market to Witness Growth Acceleration During 2019-2024](#)

Honest Version

The latest **Cloud Seeding** Equipment market research added by Market Study Report, LLC, delivers a concise outline regarding the potential factors ...



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[Angat Dam to hit lowest level if current conditions continue](#)

pna.gov.ph

To address the shortage of water in the Angat and La Mesa watersheds, Perez said **cloud-seeding** operations have been ongoing in the two areas ...

[12-17-hour water service interruptions loom as Angat level drops](#) - pna.gov.ph

[Full Coverage](#)



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[Well done RBI](#)

The Hindu BusinessLine

Issues like **cloud seeding**, Sharavathy river water for Bengaluru, and destruction of green cover in the name of mega drinking water projects like ...



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Subject: Google Alert - "cloud seeding"
Date: Tuesday, 25 June 2019 8:02:52 am



"cloud seeding"

Daily update · June 24, 2019

NEWS

[Controlling a Hurricane](#)

JSTOR Daily

More recent observations of unmodified hurricanes indicate: 1) that **cloud seeding** has little prospect of success because hurricanes contain too much ...



Flag as irrelevant

[CM Devendra Fadnavis, 17 Maharashtra ministers owe lakhs in water bills, declared defaulters](#)

News Nation

In what could be a big reason of embarrassment for the Maharashtra government, the Brihanmumbai Municipal Corporation (BMC) has declared Chief ...



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[Software for Carpet Cleaning Market Global Outlook on Key Growth Trends, Factors](#)

Market Trends

Cloud Seeding Equipment Market report starts from illustration of Industry Chain structure, and portrays industry condition, at that point investigations ...



Flag as irrelevant

[Praying for better monsoon: Matunga temple organises special puja to appease rain god](#)

Local Press Co

Amid the ongoing water crisis, the cabinet also sanctioned a Rs 30 crore proposal for **cloud-seeding** experiments in dam catchment areas of ...



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[Laboratory Information Management System \(LIMS\) Market Size - Industry Analysis, Share, Growth ...](#)

News.MarketSizeForecasters.com

Cloud Seeding Equipment Market Report covers the makers' information, including shipment, value, income, net benefit, talk with record, business ...



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Subject: Google Alert - "cloud seeding"
Date: Saturday, 22 June 2019 8:03:01 am



"cloud seeding"

Daily update · June 21, 2019

NEWS

[Extensive Study on Cloud Seeding Equipment Market 2019 by Key Players Analysis: Weather ...](#)

Market Insights (press release) (blog)

The research study, titled "Global **Cloud Seeding** Equipment market Research Report 2019," evaluates the historical performance and the current ...

Flag as irrelevant

[Thousands queue up with applications to meet CM](#)

The Hindu

A group of farmers submitted an application demanding that the authorities take up **cloud-seeding** considering that the region was reeling under ...

Flag as irrelevant

[Cloud Seeding Equipment Market, Uncover Risk & Return Profile of Emerging Players Weather ...](#)

Market News Biz (blog)

HTF MI released a new market study on Global **Cloud Seeding** Equipment Market with 100+ market data Tables, Pie Chart, Graphs & Figures spread ...

Flag as irrelevant

[Water rationing looms as Angat nears critical low](#)

INQUIRER.net

The government has been trying since early June to replenish the Angat stock through **cloud-seeding**, but the summer heat, which lingers despite the ...

[Bayan Muna to demand refund from Manila Water amid new wave of service disruption](#) - Yahoo

News

[Full Coverage](#)

Flag as irrelevant

[Zimbabwe: Govt Stocks Year's Supply of Arvs](#)

AllAfrica.com

"We are also preparing for **cloud seeding**, but that would be subject to conducive environment in the atmosphere. "We need moisture in the ...

[Zimbabwe stocks year's supply of ARVs](#) - Bulawayo24 News (press release) (blog)

[Full Coverage](#)

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[Govt stocks year's supply of ARVs](#)

The Herald

“We are also preparing for **cloud seeding**, but that would be subject to ... “We need moisture in the atmosphere for **cloud seeding** to succeed.” ...

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Subject: Google Alert - "cloud seeding"
Date: Friday, 21 June 2019 8:04:37 am



"cloud seeding"

Daily update · June 20, 2019

NEWS

[Angat to hit critical level](#)

Philippine Star

This will reportedly be undertaken while **cloud-seeding** operations and reactivation of the MWSS deep wells are continuously implemented.

Flag as irrelevant

[Cloud Seeding Equipment Market 2019: Industry Growth, Competitive Analysis, Future Prospects ...](#)

dailycashreports.com

The '**Cloud Seeding** Equipment market' study now available with Market Study Report, LLC, is a systematic detailing of the potential factors driving the ...

Flag as irrelevant

[Corporate Digital Banking Market Global Briefing and Future Outlook 2019 to 2024](#)

Market Talk News

Cloud Seeding Equipment Industry provides the overview with growth analysis and historical & futuristic cost, revenue, demand and supply data (as ...

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Subject: Google Alert - "cloud seeding"
Date: Wednesday, 19 June 2019 8:07:46 am



"cloud seeding"

Daily update · June 18, 2019

NEWS

[Global Cloud Seeding Equipment Market 2019 Feature Perspective – Weather Modification, Inc ...](#)

Canyon Tribune

The market research study entitled Global **Cloud Seeding** Equipment Market Growth (Status and Outlook) 2019-2024 provides a market review, trade ...



Flag as irrelevant

[What We Eat Now and Why It Has to Change](#)

Outside Magazine

The environmental journalist and professor at Vanderbilt University turns to a diverse set of innovators for answers, from **cloud-seeding** pilots in India ...



Flag as irrelevant

[With eye on election, Maharashtra government presents populist budget](#)

India Today

... in a row, Sudhir Mungantiwar proposed an allocation of Rs 6,410 crore for artificial rain experiment by aerial **cloud seeding** to increase the rainfall.



Flag as irrelevant

[No dancing just yet: Rains fail to resolve water supply shortage](#)

INQUIRER.net

Water consumers in Metro Manila and adjacent provinces should prepare for another round of supply shortage as the stock level in the Angat Dam ...

[Angat Dam nears 160-meter critical level; regulators to slash water supply](#) - Coconuts

[Rains to fill Angat Dam next month](#) - Philippine Star

[NWRB cuts MWSS water supply by 13%](#) - GMA News

[Full Coverage](#)



Flag as irrelevant

[Tamil Nadu water woes: Chennai goes thirsty, industry feels the heat](#)

Business Standard

"We are exploring all options, including **cloud seeding**. We are also talking to manufacturers for designing a technology which can produce water from ...



Flag as irrelevant

[Demand for tankers in Maharashtra shoots up to 7000](#)

Times of India

Last week, the chief minister had sanctioned a Rs-30-crore proposal for **cloud-seeding** experiments in dam catchment areas of Marathwada, North ...



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[Global Agricultural Robot Market: Key companies Profile, their market Share and other important ...](#)

Automobile Posts

Emerging applications of robots or drones in agriculture include weed control, **cloud seeding**, planting seeds, harvesting, environmental monitoring ...



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[Regression Testing Service Market Opportunity, Demand, recent trends, Major Driving Factors and ...](#)

AlgosOnline (press release) (blog)

This report includes the assessment of **Cloud Seeding** Equipment market size for value and volume. Both top-down and bottom-up approaches have ...



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"cloud seeding"

Daily update · June 15, 2019

NEWS

[Could trying to tackle climate change lead to WAR? Experts fear a rogue country could 'hack the ...](#)

Daily Mail

Beijing used **cloud seeding** as part of their preparations for the 2008 Olympics (pictured), during which they set off rain away from the stadium in which ...

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[Rain too has India-Pak match ticket](#)

Daily Pioneer

... should be so surprised," said James Barry, a Nott who feels **cloud seeding** like China did during the Olympics could keep some of the rain at bay.

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[Decreased water supply in Metro Manila looms](#)

pna.gov.ph

He said the government has been conducting **cloud seeding** over Angat as well to help generate rain that will fill up the dam. For June 2019, the ...

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[Experts fear rogue efforts to 'hack the planet' could have devastating consequences](#)

Infosurhoy

For example, the injection of **cloud-seeding** aerosols in the southern hemisphere would have the potential to change ocean temperatures and wind ...

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"cloud seeding"

Daily update · June 13, 2019

NEWS

[Cloud Seeding Equipment Market by 2024 key players like: Weather Modification, Inc., North ...](#)

The Market Research News

The latest research on **Cloud Seeding** Equipment Market both qualitative and quantitative data analysis to present an overview of the future adjacency ...

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[MWSS water quota from Angat Dam reduced](#)

BusinessWorld Online

THE National Water Resources Board (NWRB) said it has reduced its June Angat Dam water allocation for the Metropolitan Waterworks and ...

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[A rogue country could take planet-hacking into its own hands to alter the climate — and some ...](#)

Business Insider

... governments employ a form of atmospheric manipulation called **cloud seeding**, in which silver ions are scattered into the atmosphere to make it rain.

[Flag as irrelevant](#)

[Simply put: 5000 dry villages in Maharashtra, 6500 tankers](#)

The Indian Express

Last week, the Cabinet sanctioned a Rs-30-crore proposal for **cloud-seeding** experiments in dam catchment areas of Marathwada, North Maharashtra, ...

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"cloud seeding"

Daily update · June 12, 2019

NEWS

[Unfair Weather](#)

<http://hamodia.com>

For decades, scientists have developed **cloud-seeding** techniques to increase rainfall in drought-stricken areas, in California and the Southwest.



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[In Parched Rajasthan, Digging up Ponds the Only Way to Control Water Crisis and a Death Trap](#)

News18

Keeping in mind the rain shortfall, the state government has approved a 30-crore fund for **cloud seeding** plan to trigger artificial rain in these areas.



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[Reign of Rain begins in Kodagu](#)

Star of Mysore

As the rainfall is picking up pace, the State Government has been urged to shelve the plan of **cloud seeding** in Kodagu. The State Cabinet had ...



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[Cuprous Iodide Market Report 2019-2025 Top Key Players are Shepherd Chemical, Ajay-SQM ...](#)

Industry Herald

Its chemical formula is CuI and its melting point is 606°C , it has a wide variety of applications which include **cloud seeding**, dietary supplement and ...



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[English cricket bosses team up with Google to find ways of preventing rain stopping play](#)

Brinkwire (press release)

Another option is the use of **cloud seeding** technology, as used by the Chinese government during the Beijing Olympics, but this is likely to be ...



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"cloud seeding"

Daily update · June 11, 2019

NEWS

[Maharashtra govt plans cloud seeding in drought areas in July](#)

DNA India

In view of the delayed monsoon and several areas hit by severe drought, the state government has decided to carry out **cloud seeding** from last week ...



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[Operation of mothballed Cotabato airport assured](#)

Manila Bulletin

The CMA operation opened in 2016, but only for the use of its runway by **cloud-seeding** planes tapped by the office of Gov. Mendoza to "recharge" ...



Flag as irrelevant

[Aurangabad: Rain, hailstorm provides relief from stifling heat](#)

New Kerala

Aurangabad , June 10 : Rain and hailstorm on Monday evening brought much-needed relief to Aurangabad, which like several parts of Maharashtra ...



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[Aurangabad gets respite from sweltering heat, receives rainfall](#)

New Kerala

... drought-like-situation. To counter the prevalent issue, Maharashtra Chief Minister Devendra Fadnavis has allocated Rs 30 crore for **cloud seeding**.



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"cloud seeding"

Daily update · June 5, 2019

NEWS

[Maharashtra govt to carry out cloud seeding](#)

Deccan Herald

Last week, in Cabinet meeting, the Devendra Fadnavis-government approved a plan to undertake **cloud seeding** in drought-affected areas of ...



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[House Tackles Nat-Sec Implications of Climate Manipulation](#)

Courthouse News Service

Ideas like **cloud seeding** or climate geo-engineering have been around for decades, with the first fleshed out attempts to alter the weather originating ...



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[U'khand dept mulls artificial rainfall to tackle forest fires](#)

Times of India

Cloud seeding is a type of weather modification that causes rains. This is done by dispersing substances into the air that serve as cloud condensation ...



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[Agriculture Robots Market To Exhibit Skyrocketing Expansion During 2018-2026](#)

openPR (press release)

Robots have wide applications in agriculture, which includes soil analysis, **cloud seeding**, weed control, planting seeds, environmental monitoring, ...



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"cloud seeding"

Daily update · June 4, 2019

NEWS

[DA: Cloud seeding not needed for now](#)

Sun.Star

THERE is no longer a need for a **cloud seeding** in Negros Occidental for now, an official of the Department of Agriculture (DA) in Western Visayas said.

Flag as irrelevant

[Cloud seeding plans in NegOcc canceled](#)

Panay News (press release)

BACOLOD City – The Office of Provincial Agriculturist (OPA) recently cancelled the **cloud seeding** operations in Negros Occidental this month.

Flag as irrelevant

[DA shelves cloud seeding in NegOcc](#)

pna.gov.ph

BACOLOD CITY -- The Department of Agriculture (DA) Regional Field Unit-6 (Western Visayas) has shelved the planned **cloud-seeding** operations in ...

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[Cloud-seeding System Market Expected to Expand at a Steady CAGR through 2027 | FMI](#)

Market Research Gazette

Water resources are increasingly taxed by exploding demand and continued population growth. **Cloud-seeding** System is a kind of whether ...

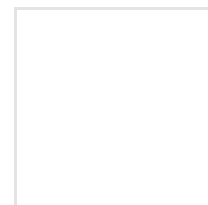
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[Why can't we nuke hurricanes?](#)

Buffalo News

General Electric's Vincent Schaefer (later a SUNY Albany meteorology professor) was the primary pioneer in **cloud seeding**. Particles of silver iodide ...

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[Jakarta's massive bus system pilots electric vehicles](#)

Inhabitat

Scientists working on a project to slow down the relentless flooding that has swamped Jakarta since mid January say that **cloud seeding** is getting the ...



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[English cricket bosses team up with Google to find ways of preventing rain stopping play](#)

Daily Mail

Another is to use **cloud seeding** technology, as used by the Chinese government during the Beijing Olympics, although this is likely to be prohibitively ...

[England cricket chiefs ask Google to prevent rain](#) - The Times

[Full Coverage](#)



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[Cloud Seeding Equipment Market 2019 Global Analysis, Trends, Forecast up to 2024](#)

Investor Opinion

The '**Cloud Seeding** Equipment market' research added by Market Study Report, LLC, offers a comprehensive analysis of growth trends prevailing in ...

[Cloud Seeding Equipment Market Size, Latest Trend, Growth by Size, Application and Forecast 2025](#) - [dailycashreports.com](#)

[Full Coverage](#)



Flag as irrelevant

[Biofortification Market Size, Growth, Analysis, Outlook by 2019 – Trends, Opportunities and ...](#)

Industry Herald

Cloud Seeding Equipment Market report begins from overview of Industry Chain structure, and describes industry environment, then analyses market ...



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[Government is with 'drought' hit people, says Maharashtra Minister Patil](#)

New Kerala

Maharashtra Chief Minister Devendra Fadnavis has allocated Rs 30 crore for **cloud seeding** for the coming monsoon season.



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"cloud seeding"

Daily update · June 1, 2019

NEWS

[Cloud seeding helps Colorado snowpack](#)

FOX31 Denver

In fact, a recent study called SNOWIE -- of which the University of Colorado Boulder was a part -- showed **cloud seeding** can increase snowfall by five ...



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[Cloud seeding plan postponed after pre-monsoon showers](#)

The New Indian Express

In a press conference, Deshpande revealed that as pre-monsoon showers are delayed, the state government is planning for **cloud seeding** in selected ...



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[RADARS installed at 3 spots across Karnataka to monitor cloud-seeding operations](#)

Bangalore Mirror

Cloud seeding can't be a permanent remedy for water scarcity. But to meet contingency situations we need short-term technological solutions", said ...



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[Global Cloud Seeding Equipment Market 2019, Trend, CAGR Status, Growth, Analysis and ...](#)

Market Research Gazette

Research report comes up with the size of the global **Cloud Seeding** Equipment Market for the base year 2013 and the forecast between 2013 and ...



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[Negros agri damage due to drought hits P490.4 million](#)

Philippine Star

Supervising agriculturist Dina Genzola said the Department of Agriculture office in Western Visayas deferred **cloud seeding** operations due to the ...



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Angat Dam water level drops despite rains

Philippine Star

However, it is not clear if the BSWM is still continuing to conduct **cloud-seeding** operations as rains have been falling inside the watershed areas of ...



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'Provide houses at respective GP limits'

Deccan Herald

“**Cloud seeding** should not be carried out in Kodagu. It should be ensured that the water stored in Harangi reservoir is released when it reaches the ...



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"cloud seeding"

Daily update · May 31, 2019

NEWS

[HAL and IIT-K offer cloud seeding technology at low cost to state](#)

The New Indian Express

BENGALURU: While the state cabinet has already approved **cloud-seeding** project of Rs 91 crore, with Kyathi Climate Modification Consultants ...



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[Weekly Digest \(May 27-31, 2019\): Top Weather, Environment and Science Stories of the Week](#)

The Weather Channel

This will be the third **cloud-seeding** project after similar projects being undertaken by the BJP government in 2015 and Karnataka state government in ...



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[Rains fail to raise Angat Dam's water level](#)

ptvnews.ph

The Bureau of Soil and Water Management (BSWM) of the Department of Agriculture (DA) has also started its **cloud seeding** operations over the dams ...



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"cloud seeding"

Daily update · May 30, 2019

NEWS

[HAL, IIT-Kanpur offer 'low-cost' cloud-seeding options to Karnataka](#)

The Hindu

As the State government gets ready to undertake **cloud-seeding** operations, Hindustan Aeronautics Ltd. (HAL) and Indian Institute of Technology (IIT), ...

[Cloud-seeding in June to tackle deficient rainfall](#) - Deccan Herald

[Full Coverage](#)



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[Drought: Karnataka govt decides to resort to cloud seeding](#)

United News of India

The government following recommendations by the experts had taken up **cloud seeding** in 2017 and similarly two aircraft will be used for the purpose ...



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[Drought hit Maharashtra to opt for cloud seeding to help farmers in August](#)

Skymet Weather

To bring this situation under control, the Government of Maharashtra has approved a plan to carry out **cloud seeding** in August. Considering the acute ...



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[Worried about water cuts](#)

The Star Online

Melaka executive councillor Datuk Mohd Sofi Abdul Wahab said the state government would continue with **cloud seeding** exercises for another two or ...



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[No water rationing in Melaka during Hari Raya, says exco](#)

Malay Mail

Sofi who is also Durian Tunggal state assemblyman said **cloud seeding** has also been carried out yesterday and today, but the results depended on ...



Flag as irrelevant

Angat Dam's water level drops to lowest in 10 years despite days of rain – PAGASA

Yahoo News

According to the Bureau of Soil and Water Management (BSWM), they are still holding **cloud seeding** operations in specific areas which has so far ...



Flag as irrelevant

Over 40 percent of area may face drought due to deficient Pre Monsoon rains

Skymet Weather

Also Read: Drought hit Maharashtra to opt for **Cloud Seeding** in August to help Farmers. Thereafter, the deficiency has been retaining that figure of 24 ...



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Mangaluru: Water rationing - Gap between supply cycles reduced to 3 days

Daijiworld.com

... hands to tackle the problem on a war footing with practical solutions such as desalination plants and **cloud seeding** instead of just offering prayers to ...



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"cloud seeding"

Daily update · May 29, 2019

NEWS

[Maharashtra allocates ₹30 crore for cloud seeding](#)

The Hindu

The State Cabinet on Tuesday cleared the proposal to implement the aerial **cloud seeding** procedure to tackle drought. "Most parts of the State are ...

[Maharashtra Government Plans Cloud-Seeding in Drought-Hit Regions of State in August](#) - The Weather Channel

[Maharashtra: Rs 30 crore cloud seeding for drought-hit areas in August](#) - ReliefWeb

[Maharashtra Govt to Employ Cloud Seeding as Solution For Poor Rainfall & Drought, Allocates](#)

[Rs ...](#) - News18

[Full Coverage](#)



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[Drought, threat of less rain: Cloud seeding to help tackle water crisis](#)

Hindustan Times

Faced with delayed onset of monsoon, severe drought and water scarcity, the state government has decided to conduct **cloud seeding** at Vidharbha ...



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[Cloud Seeding Equipment Market, Share, Growth, Trends and Forecast to 2024: Market Study Report](#)

News by Decresearch (press release) (blog)

Cloud Seeding Equipment Market forecast report now available with Market Study Report encompasses an exhaustive study of this business space ...



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[Karnataka cabinet approves cloud seeding programme](#)

News Today

Bengaluru: Amidst reports that the State would face deficit rain this year, the Karnataka cabinet yesterday gave nod to a **cloud-seeding** programme.

[Karnataka Cabinet Approves Cloud Seeding Programme](#) - LatestLY

[Full Coverage](#)



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Maharashtra grants fund for **Cloud Seeding**

The Indian Awaaz

Maharashtra government has approved a sum of Rs. 30 crore for **Cloud Seeding** Technic in the state. This procedure used in an array of chemicals to ...



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House panels pass resolutions tasking water agencies to formulate water security plan

Manila Bulletin

Cloud seeding that is regularly resorted to in other countries like the United Arab Emirates to meet the increasing demand for water;. 2. Cross-border ...



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Lower power rates for 5 more years for Vid units

Times of India

Data from abroad showed success of increasing rainfall between 28 to 43% in some cases through **cloud seeding**. A proposal costing Rs30 crore was ...



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El Niño caused agricultural damage amounting to P7.97 billion

Manila Bulletin

From March to May, the government has also conducted 49 **cloud seeding** operations with a total of 720 bags of salt dispersed over Magat watershed ...



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Breaking News Headlines, May 29: BJP's Amit Shah and Ravi Shankar Prasad resign as Rajya ...

Newsd.in

09:15 AM | Maharashtra govt approves Rs 30 crore for **cloud seeding**. In order to deal with severe drought added by possibility of late monsoon, ...



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"cloud seeding"

Daily update · May 28, 2019

NEWS

[Experts: Pitkin County ideal for cloud seeding](#)

Aspen Daily News

Pitkin County commissioners last week listened to experts about the process of **cloud seeding** and whether it would be practical to do it in the Roaring ...



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[Karnataka Cabinet Approves Cloud Seeding Programme](#)

NDTV

The Karnataka cabinet Monday approved a **cloud seeding** programme, to be implemented in June, following reports that there would be deficit rainfall ...

[Karnataka banks on cloud seeding to overcome drought, acute water shortage](#) - Livemint

[At Rs 89 crore for 2 yrs, cloud seeding went through roof](#) - The New Indian Express

[Maharashtra government allocates Rs 30 crore for cloud seeding during monsoon season](#) -

News Nation

[Full Coverage](#)



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[Maharashtra govt earmarks Rs 30 crore for cloud seeding](#)

Business Standard

In view of forecast of deficient rainfall this year, the Maharashtra government Tuesday approved a sum of Rs 30 crore for undertaking **cloud seeding** in ...

[Maharashtra govt allocates Rs 30 crore for cloud seeding](#) - Business Standard

[Full Coverage](#)



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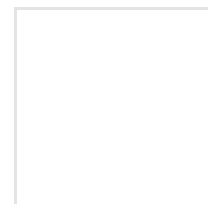
[Maharashtra Government to use 'Aerial Cloud Seeding' technique to tackle drought crisis](#)

Times Now

Maharashtra Government has stated that gonna be using 'Aerial **Cloud Seeding**' technique to tackle drought and to increase the rainfall in the ...



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[KICK-BACK RUMOURS: LAME DUCK KUMARASWAMY GOVT](#)

[APPROVES RS 91 CRORE PLAN ...](#)

Kodagu

Cloud seeding has never been statistically proven to work. An ecologist at Stanford University says, "I think you can squeeze out a little more snow or ...



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[Jindal to get 3660 acres in Ballari dist](#)

Times of India

According to Byregowda, the technical committee set up to study the success rate of **cloud seeding** in 2017 said there was 27.9% increase in rainfall ...



Flag as irrelevant

[Donkey luck: When Varuna weds Aruna, expect a cloudburst](#)

The New Indian Express

Obviously, no one here believes in the **cloud seeding** efforts by the government, or the Met department predicting a regular monsoon on the horizon.



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[LIVE | Chandrababu Naidu invited to Jaganmohan Reddy's swearing-in ceremony on May 30](#)

News Nation

Good morning! Welcome to News Nation's LIVE blog with all the news from around the country and across the world. Here are the LIVE updates:.



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[Mysuru Drinking Water Project](#)

Star of Mysore

The Cabinet has approved the tender for **cloud-seeding** at a cost of Rs.93 crore for 2019-20 and 2020-21. Kyathi Climate Modification Consultants has ...



Flag as irrelevant

[Two more years for Zamboanga City full recovery from 2013 siege — local officials](#)

UNTV News

The Zamboanga CDRMO said P13 million has been allotted for **cloud seeding** operations while the City Agriculturist office has P20 million to aid ...



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"cloud seeding"

Daily update · May 24, 2019

NEWS

[Workshop on cloud seeding to be held in Aspen today](#)

Glenwood Springs Post Independent

Regional snow science experts will host a public workshop in Aspen today to provide information on longstanding **cloud-seeding** operations in the ...

[Experts Explain Cloud Seeding In Aspen](#) - Aspen Public Radio
[Full Coverage](#)



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[Global Agricultural Robots Market: Development History, Current Analysis and Estimated Forecast ...](#)

Market Research Publisher

Emerging applications of robots or drones in agriculture include weed control,[1][2][3] **cloud seeding**,[4] planting seeds, harvesting, environmental ...



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[Cuprous Iodide Market to Register a Stout Growth by End 2018](#)

Business Herald (press release)

Demand of Cul is increasing attributing to its properties such as catalyzing ability in inorganic and organic synthesis, its use in **cloud seeding** (i.e. ...



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Date: Thursday, 23 May 2019 8:01:01 am



"cloud seeding"

Daily update · May 22, 2019

NEWS

[UAE cloud seeding this week, as rain increases](#)

ArabianBusiness.com

The National Centre of Meteorology (NCM) has been carrying out **cloud seeding** operations in the clouds above the United Arab Emirates, resulting in ...



Flag as irrelevant

[Parched state could use cloud seeding to trigger rainfall](#)

Times of India

Mumbai: With water stocks fast drying up and forecast of a delayed monsoon, the state government is looking at **cloud seeding** experiments as a ...



Flag as irrelevant

[Video: This is why it is raining in the UAE over the past few weeks](#)

Gulf Today

Its weather body, The National Centre of Meteorology (NCM), has been active in **cloud seeding** operations, due to the accumulation of the abundant ...



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[Earth's funeral: Western and Southern India face severe water shortage as temperature soars](#)

The New Indian Express

Unwilling to bank entirely on the monsoon bestowing its favours voluntarily, the state has initiated the process to take up **cloud-seeding** operations ...



Flag as irrelevant

[Bengaluru: Muzarai department plans oblations to please rain god](#)

Daijiworld.com

... of deficient monsoon season this time, the department of agriculture has been preparing to resort to **cloud seeding** in an effort to induce rainfall.



Flag as irrelevant

Worldwide Agriculture Robots Market 2019: Modest Situation, Research Findings and Conclusion ...

El Monte Daily

Emerging applications of robots or drones in agriculture include weed control, **cloud seeding**, planting seeds, harvesting, environmental ...



Flag as irrelevant

Non-Thermal Pasteurization Market Segmentation, Analysis by Recent Trends, Development by ...

industrydailyobserver.com

Cloud Seeding Equipment market research report provides the newest industry data and industry future trends, allowing you to identify the products ...



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Date: Wednesday, 22 May 2019 8:01:07 am



"cloud seeding"

Daily update · May 21, 2019

NEWS

[Cloud seeding likely to have led to heavy rains in the UAE this week](#)

Gulf Business News

The National Centre of Meteorology has been "active in **cloud seeding** operations, due to the accumulation of the abundant convective clouds over the ...



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[Agriculture office halts cloud seeding operations](#)

Sun.Star

THE Department of Agriculture (DA)-Disaster Risk Reduction Management (DRRM) halted its **cloud seeding** operations in Davao del Sur and Davao ...



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[So, why has it been raining in the UAE even in May?](#)

What's On

The **cloud seeding** took place "due to the accumulation of the abundant convective clouds over the UAE in several areas (specifically in the Eastern ...



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[The Real Reason For The Spontaneous Rain And Thunder The UAE Experienced Has Been ...](#)

Lovin Dubai

Since it has also been announced by the NCMS, that these **cloud seeding** operations will continue throughout the rest of the YEAR. YES, people.



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[Latest Research Report to uncover key Factors of Global Agricultural Robot Market](#)

Industrial Journalism

Emerging applications of robots or drones in agriculture include weed control, **cloud seeding**, planting seeds, harvesting, environmental monitoring ...



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It's official: Yunnan facing serious drought

GoKunming (blog)

As they did six years ago, provincial authorities called upon several thousand People's Liberation Army soldiers to prepare for **cloud seeding** ...



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Oh My God! 34.5k temples to hold 'homa' for rainin Karnataka

The New Indian Express

Along with conducting the ritual, the government is also planning to undertake **cloud-seeding**. Of the 176 taluks in the state, 156 taluks are facing ...



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Date: Friday, 17 May 2019 8:01:36 am



"cloud seeding"

Daily update · May 16, 2019

NEWS

[Karnataka mulls **cloud-seeding** amid deficit rainfall forecast](#)

The Hindu BusinessLine

The Karnataka government on Wednesday said it would take up **cloud-seeding** by the end of June, amid reports forecasting deficit rainfall.

[Flag as irrelevant](#)

[Melaka begins **cloud seeding** as dam drops to critical levels](#)

The Star Online

MELAKA: Melaka has begun **cloud seeding** on Thursday (May 16) as the Durian Tunggal Dam, the main water source for the state, is almost at critical ...

[Flag as irrelevant](#)

[Should we have more **cloud seeding** in Colorado?](#)

Yahoo News

Cloud seeding can provide between 5% and 15% more snow to help ski areas, farmers and watersheds in the state, supporters say. Start the ...

[Flag as irrelevant](#)

[Karnataka: State to take up **cloud seeding** amid monsoon worries; to spend Rs 88 crore](#)

Bangalore Mirror

We have already taken precautionary measures regarding this- for 2019-20 and 2020-21-for two years we have decided to implement **cloud seeding** ...

[Monsoon deficit: Karnataka to undertake **cloud seeding** from June-end](#) - The New Indian Express

[Karnataka to take up **cloud seeding** amid monsoon woes](#) - Mid-Day

[Monsoon worries: Karnataka govt to take up **cloud seeding**](#) - News Today
[Full Coverage](#)

[Flag as irrelevant](#)

[Melaka begins **cloud seeding** as dam dips to critical level](#)

Malay Mail

MELAKA, May 16 — The state government will be carrying out **cloud seeding** for three days

starting from today as the water level at the Durian ...



Flag as irrelevant

Monsoon deficit: **Cloud seeding** from June-end

The New Indian Express

Tenders of two consecutive years - 2019-2020 and 2020-2021 - will be awarded in two weeks' time and the process of **cloud seeding** will take off ...



Flag as irrelevant

Karnataka plans **cloud seeding** for two monsoons, to spend Rs 88 crore

Times of India

Bengaluru: With some weather companies forecasting a deficit monsoon, the government has decided to resort to **cloud seeding** this year in June to ...



Flag as irrelevant

Cloud Seeding Equipment Market 2019 Technology Advancement and Future Scope – Weather ...

Market Research Periodical

The report presents an in-depth assessment of the **Cloud Seeding** Equipment including enabling technologies, key trends, market drivers, challenges, ...



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Wet Wednesday was just part of the pre-monsoon shower

Bangalore Mirror

Anticipating poor monsoon, the State Government is making preparations for **cloud seeding**. The process will begin at the end of June due to poor ...



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Ag Snags Rare Spotlight in Harrisburg

MDJOnline.com

Farmers are having an unusually good spring in Pennsylvania's Capitol. Republicans and Democrats are on fire with plans to relax regulations and ...



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"cloud seeding"

Daily update · May 13, 2019

NEWS

[Global Cloud Seeding Equipment Market by Production, Regions and Cost Structure and Forecast ...](#)

Market Talk News

MarketResearchNest.com adds "Global **Cloud Seeding** Equipment Market Size, Status and Forecast 2019-2025" new report to its research database.

[The Latest Research Progress On Cloud Seeding Equipment Market- Comprehensive Study By ...](#) - industrydailyobserver.com
[Full Coverage](#)



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[Recent research: Cloud Seeding Equipment Market forecast to 2025](#)

WhaTech

Cloud Seeding Equipment Market Research Report 2019 the report aims to deliver an opportunity for companies to recognize the modern trends size, ...



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[South Korea in airborne fight against 'Chinese' pollution](#)

Stock Visionary

on Friday sent aircraft over the Yellow Sea to carry out **cloud-seeding** experiments in an effort to tackle many South Koreans blame on China.



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"cloud seeding"

Daily update · May 10, 2019

NEWS

[Cloud seeding conducted over three dams](#)

Philippine Star

The BSWM, which is under the Department of Agriculture, reported that **cloud seeding** was done over the Ipo, La Mesa and Angat dams on Tuesday.



Flag as irrelevant

[DA starts cloud seeding in Pampanga](#)

Sun.Star

Cloud seeding is one of the measures seen to allay possible adverse effects of the prevailing dry spell brought about by El Niño phenomenon.



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[Excellent growth of Cloud Seeding Equipment Market- Comprehensive study by key players ...](#)

Market Research Updates

Market Overview of **Cloud Seeding** Equipment Market: The Global **Cloud Seeding** Equipment Market report provides information about the Global ...

[The Latest Research Progress on Cloud Seeding Equipment Market- Comprehensive Study By ... - Market Research Updates](#)

[Cloud Seeding Equipment Market 2019 Global Trends, Market Share, Industry Size, Growth ... -](#)

Digital Journal

[Full Coverage](#)



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[Incredible Growth of Cloud Seeding Equipment Market 2019 Growing with Major Eminent Key ...](#)

Market Research Updates

"Latest Research Report: **Cloud Seeding** Equipment industry. **Cloud seeding** is a weather modification process which involves dropping of chemical ...



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[Airborne portion of Moscow's annual Victory Day parade canceled](#)

Meduza

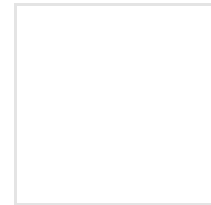
410 million rubles (\$6.27 million) were set aside this year for **cloud seeding** in Moscow ahead of three federal holidays to prevent precipitation.

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[Russia Marks WWII Victory Day With Military Parades, Commemorative Marches](#)

RadioFreeEurope/RadioLiberty

Moscow managed to defy dismal weather forecasts by deploying **cloud-seeding** technology to disperse cloud cover in the hours preceding the ...



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[Speech Based Interactive Voice Response Software Market Comprehensive Analysis, Growth ...](#)

The Market Research News

It also gives the analytic of enduring growth factor, trends and statistic of **Cloud Seeding** Equipment Market industry. The **Cloud Seeding** Equipment ...

Flag as irrelevant

[Hotel Central Reservations Systems Market Global Outlook on Key Growth Trends, Factors](#)

Market Trends

Read More: <https://www.marketstudyreport.com/reports/global-cloud-seeding-equipment-market-growth-status-and-outlook-2019-2024>. 2. Global Next ...

Flag as irrelevant

[Industrial Real Estate Market 2019: Industry Growth, Competitive Analysis, Future Prospects and ...](#)

industryreports24.com

This report includes the assessment of **Cloud Seeding** Equipment market size for value and volume. Both top-down and bottom-up approaches have ...

Flag as irrelevant

[Philippines morning news for May 10](#)

AEC News Today

An aircraft commissioned by the Bureau of Soil and Water Management (BSWM) has started **cloud-seeding** operations over three dams to create ...

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"cloud seeding"

Daily update · May 7, 2019

NEWS

[Angat level continues dip amid seeding](#)

Philippine Star

David said the **cloud-seeding** operations were conducted at the request of Manila Water and Maynilad, water concessionaires of the Metropolitan ...



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"cloud seeding"

Daily update · May 3, 2019

NEWS

[Cloud seeding set as Angat level dips further](#)

Philippine Star

MANILA, Philippines — **Cloud-seeding** operations will begin next week as the water level in Angat Dam, Metro Manila's main water source, has ...



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[Waiting for rain: Pujas, cloud seeding, green lungs](#)

Deccan Chronicle

Also, the option of **cloud seeding** to induce rainfall has been raised and discussed. Recently, the Madras high court, hearing a plea, observed that for ...



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[El Niño scorches P478.83M worth of crops in Negros Occ.](#)

thedailyguardian.net

For livestock and poultry, damage was pegged at P3 million. The Department of Agriculture (DA) will conduct **cloud seeding** operations in the province ...



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[Cuprous Iodide Market 2019-2024: Risks and Influences Factors Analysis, Market Opportunities ...](#)

Justice News Herald (blog)

Its chemical formula is CuI and its melting point is 606°C , it has a wide variety of applications which include **cloud seeding**, dietary supplement and ...



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"cloud seeding"

Daily update · May 2, 2019

NEWS

[What's new on Netflix in the UAE this May](#)

What's On

It also transpires that Apollon used **cloud-seeding** technology and that's what caused the virus to spread around the world. Capturing Rasmus who is ...



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[Weak but more damaging](#)

thedailyguardian.net

The damage to sugarcane has not yet been included, but the planters are already raising concerns and asking for **cloud seeding**. Farmers always look ...



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[House forms TWG on water security plan](#)

manilastandard.net

These strategies would include **cloud seeding** by the DA, cross-border sharing, recycling of used water, arresting the causes/sources of non-revenue ...



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[Latest Global Agricultural Robots Market Report 2019 to Talk about Historical Development \(2014 ...](#)

UK Blaze

Emerging applications of robots or drones in agriculture include weed control,[1][2][3] **cloud seeding**,[4] planting seeds, harvesting, environmental ...



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[Bad joke](#)

Tempo (satire)

"We wrote the Bureau of Soils to conduct **cloud-seeding**" – we were ahead of you on that one, Dr. Dav id. We also know that there have been no ...



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Date: Saturday, 27 April 2019 8:05:59 am



"cloud seeding"

Daily update · April 26, 2019

NEWS

[Cloud-seeding System Market Forecast By 2027](#)

Facts Week

Water resources are increasingly taxed by exploding demand and continued population growth.

Cloud-seeding System is a kind of whether ...



Flag as irrelevant

[El Niño crop losses balloon to P7.96B](#)

The Manila Times

Agriculture Secretary Emmanuel Piñol told reporters that **cloud seeding** in Cagayan Valley, Northern Mindanao and Soccsksargen (South Cotabato, ...



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[Agri losses from El Niño reach P7.96-B](#)

ptvnews.ph

Cloud seeding operations have also been conducted to provide artificial rain to farmers who need rain for their crops. Region 2 (Cagayan Valley) has ...



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[NWRB urges water conservation as Angat Dam nears critical level](#)

GMA News

The report also said authorities are closely monitoring the water levels and are eyeing measures such as **cloud-seeding** and the use of deep wells to ...



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Date: Thursday, 25 April 2019 8:05:02 am



"cloud seeding"

Daily update · April 24, 2019

NEWS

[These Governments Want to Fight Air Pollution by Controlling the Weather](#)

Gizmodo

South Korea announced in March plans to begin deploying so-called **cloud seeding** technology to make it rain in Seoul, and the Thailand government ...



Flag as irrelevant

[The real climate change controversy: Whether to engineer the planet in order to fix it](#)

Los Angeles Times

But during the Vietnam War, the Air Force dropped nearly 50,000 silver iodide flares over southeast Asia in a **cloud-seeding** offensive designed to ...



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"cloud seeding"

Daily update · April 18, 2019

NEWS

[Drought plan authorization act signed](#)

Montrose Daily Press

... contingency plan provisions have to be implemented. The Upper Basin will additionally continue **cloud-seeding** and tamarisk eradication work. Love.



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[Crop damage due to dry spell reached P231M in DavSur](#)

Minda News

Cloud seeding activities had also started in the province since April 9 to cushion the effect of the dry spell on the crops. More than half of the losses ...



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"cloud seeding"

Daily update · April 15, 2019

NEWS

[Cloud Seeding: Real Science of Weather Manipulation](#)

Innovation & Tech Today

It turns out your crazy cousin Jerry was right: weather manipulation is real! But don't make a foil hat just yet (SHUT UP, JERRY!) because the science is ...



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[Yup! The Recent Rains Is All Thanks To Cloud Seeding And You Should Expect More Throughout ...](#)

Lovin Dubai

According to the National Center of Meteorology and Seismology (NCMS), TWENTY **cloud-seeding** missions have been planned for 2019 as part of ...



Flag as irrelevant

[Number rescued in RAK floods reaches 702](#)

[gulfnews.com](#)

Meanwhile, the downpour was the heaviest recorded so far this year and was aided by **cloud seeding** according to the National Centre of Meteorology ...



Flag as irrelevant

[2 Negros towns under state of calamity due to drought](#)

Philippine Star

The provincial government recently allocated P2.5 million for **cloud-seeding** operations. Production losses in rice, corn and sugarcane in the province ...



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"cloud seeding"

Daily update · April 14, 2019

NEWS

Your view

Montrose Daily Press

Cloud-seeding only works if the jet stream is kind enough to bless us with storms as demonstrated this last winter. The tamarisk eradication should be ...



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[Rice-corn losses reach P5.7b; El Niño 'survival fund' sought](#)

manilastandard.net

He said **cloud seeding** was “not the main solution to El Niño as this would have to depend on the presence of “substantial” clouds that could spawn ...



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"cloud seeding"

Daily update · April 12, 2019

NEWS

[When cloud seeding bears no rain](#)

Mongabay.com

An experimental attempt by Sri Lanka to induce artificial rain amid a prolonged drought fell short of expectations when the anticipated rain materialized ...

[Flag as irrelevant](#)

[8 Bohol towns report damage from El Niño](#)

Manila Bulletin

... be below normal, the provincial government has allocated P2.3 million and the Department of Agriculture P2.5 million for **cloud-seeding** operations.

[Flag as irrelevant](#)

[Agriculture Robots Market to Register Unwavering Growth During in Global by 2026](#)

TechnoBleak

Robots have wide applications in agriculture, which includes soil analysis, **cloud seeding**, weed control, planting seeds, environmental monitoring, ...

[Flag as irrelevant](#)

[Global Agriculture Robots Market 2018: Countries, Industry Size, Challenges, Drivers and ...](#)

Flatland Today

Emerging applications of robots or drones in agriculture include weed control, **cloud seeding**, planting seeds, harvesting, environmental ...

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"cloud seeding"

Daily update · April 10, 2019

NEWS

[Year-round rainfall in UAE likely with **cloud seeding**](#)

Khaleej Times

There is a chance that the UAE can experience a year-round bout of intermittent rain if **cloud seeding** missions hit the right types of clouds and induce ...

Flag as irrelevant

[Only prayers can counter dry spell in NegOcc: gov](#)

pna.gov.ph

BACOLOD CITY -- Only prayers, not even **cloud seeding**, can bring rains to counter the dry spell due to the El Niño in Negros Occidental, Governor ...

Flag as irrelevant

[6500 farmers in Davao del Sur reel from wrath of El Niño](#)

Manila Bulletin

Pascua said they are targeting to complete 57 **cloud seeding** sorties until May 20. The previous target of the **cloud seeding** operation was from March ...

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[Colorado River drought plan wins approval](#)

Montrose Daily Press

Colorado and the other Upper Basin states have agreed to a multi-pronged approach that includes increased **cloud-seeding** and more tamarisk ...

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[Miri to start weekly beach clean-up soon](#)

The Borneo Post

Bomba has recommended to do **cloud seeding** and to implement total ban on open burning which I also agree on, and Miri Resident will also look into ...

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"cloud seeding"

Daily update · April 9, 2019

NEWS

[SRA to provide counterpart fund for cloud seeding in NegOcc](#)

ptvnews.ph

"It would be easier if we can partner with the provincial government since there is already a schedule for **cloud seeding** in the province," he added.

[SRA to augment fund for cloud seeding in NegOcc](#) - Sun.Star

[Full Coverage](#)



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[Air traffic](#)

Philippine Star

The **cloud seeding** operations are among the measures earlier announced by the Metropolitan Waterworks Sewerage System (MWSS) to bring up the ...



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[Snake sightings are a local illustration of a global problem](#)

The National

That is why the UAE is looking to develop machines that can turn humid air into water, alongside its pre-existing water desalination and **cloud-seeding** ...



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[Now the water crisis](#)

thedailyguardian.net

The Department of Agriculture is reportedly to start **cloud seeding** in May. Why in May yet when plants and animals are dying and losses are rising?



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"cloud seeding"

Daily update · April 8, 2019

NEWS

[Company hopes cloud seeding can reduce hail damage](#)

Gillette News Record

CHEYENNE (WNE) – The CEO of a North Dakota company seeking to bring its **cloud-seeding** technology to Cheyenne says a hail suppression ...



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[Take responsibility to act now against water shortages, UAE minister says](#)

The National

Dr Thani Al Zeyoudi, Minister of Climate Change and Environment, said building desalination plants and a **cloud-seeding** strategy helped the UAE to ...



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[UAE Takes Lead On Tackling Climate Change And Environmental Crises In Middle East](#)

Eurasia Review

The UAE is also investing in energy efficiency, water conservation through humidity transfer and **cloud seeding**, and solid waste management.



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"cloud seeding"

Daily update · April 7, 2019

NEWS

[CEO: Cloud seeding to mitigate hail damage can work in Cheyenne](#)

Wyoming Tribune

CHEYENNE – The CEO of a North Dakota company seeking to bring its **cloud-seeding** technology to Cheyenne says a hail suppression program that ...



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[Prayers not the answer to water shortages, UAE minister warns](#)

The National

Dr Thani Al Zeyoudi, Minister of Climate Change and Environment, said building water desalination plants and adopting a **cloud seeding** strategy had ...



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[Hottest day in NCR posted on Saturday at 35.4C; dams' water levels remain in current ranges](#)

GMA News

Abelardo said that **cloud seeding** has yet to be implemented to replenish the La Mesa Dam, as there are no sufficient clouds above it in which ...



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[Global Cuprous Iodide market top manufactures, Regions, Trends, Analysis, Types, Applications ...](#)

The Akron Observer

Its chemical formula is CuI and its melting point is 606°C , it has a wide variety of applications which include **cloud seeding**, dietary supplement and ...



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"cloud seeding"

Daily update · April 5, 2019

NEWS

[Hungry Mindanao farmers feel heat as drought starts to bite](#)

ucanews

The government has already turned to **cloud seeding** in Mindanao, hoping to bring enough rain while Sulang, and farmers like him, continue to cry for ...



Flag as irrelevant

[The Rain Season 2: Netflix Release Date, Plot, Cast and Trailer](#)

What's on Netflix

With the reveal that Apollon has '**cloud-seeding** technology,' they were the reason why the virus spread around the world. How they came by this ...



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[Thailand must take action for cleaner air in Asean](#)

Bangkok Post

Attempts were also made towards **cloud-seeding** in order to try force rain in hopes of clearing the air. Unfortunately, beyond short-term responses like ...



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[Palace: Gov't to remain vigilant despite easing inflation](#)

GMA News

The government may also conduct **cloud seeding**, if necessary, he said. "The Palace calls on everyone to participate in water preservation not only in ...

[Inflation eases for 5th straight month in March at 3.3% - Sun.Star Full Coverage](#)



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[Palace: Govt won't be complacent despite easing inflation](#)

Manila Bulletin

We are also ready to conduct **cloud seeding**, if necessary," he added. Meanwhile, Panelo called on the public to do its part in conserving water, given ...



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Palace confident of inflation to continuously go down

ptvnews.ph

We are also ready to conduct **cloud seeding**, if necessary,” he said. Panelo called on Filipinos to conserve water especially during the El Niño season.



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NegOcc sugar sector suffers P366-M loss due to dry spell

Panay News (press release)

“The **cloud seeding** operations of the Department of Agriculture in May will also benefit sugarcane farms in the province,” he added. The towns of ...



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Despite easing inflation, Palace assures gov't won't be complacent

INQUIRER.net

“We are also ready to conduct **cloud seeding**, if necessary,” he noted. The Palace official also called on the public to take part in “water preservation ...



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"cloud seeding"

Daily update · April 4, 2019

NEWS

[Can Humans Manipulate the Weather?](#)

Interesting Engineering

Countless experiments have been conducted on **cloud seeding** over the years which suggest that humans might, in fact, be able to create rainfall ...



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[Community Agriculture Alliance: Now is the time to look at the arid west](#)

Steamboat Pilot & Today

The upper basin states collectively agree to Colorado Storage Project Act reservoir reoperations to bolster Lake Powell, **cloud seeding** operations, and ...



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[Gov't urged to provide financial relief to El Niño-affected farmers, fisherfolk](#)

Manila Bulletin

... supplies but also with loans to tide them over while the drought has yet to abate, apart from possible **cloud seeding** operations in affected areas.



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[Gov't gives water facilities to Cordillera farmers](#)

ptvnews.ph

He said as an immediate response to the effects of the dry spell, the two agencies are commissioning **cloud-seeding** operations to induce rain. He said ...



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[NegOcc sugarcane sector suffers P366-M losses due to dry spell](#)

ptvnews.ph

"The **cloud seeding** operations of the Department of Agriculture in May will also benefit sugarcane farms in the province," he added. OPA records ...



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El Niño damage to sugarcane hits P366-M

Sun.Star

“Though, the **cloud seeding** operations of the Department of Agriculture scheduled in May will also benefit sugarcane farms in the province,” he also ...



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Philippines morning news for April 4

AEC News Today

The Department of Agriculture (DA)-6 has allocated a funding of PHP2.5 million for the **cloud-seeding** operation in Negros Occidental scheduled next ...



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Water for farms cut as Angat Dam level drops

INQUIRER.net

Last week, the Philippine Air Force placed one of its planes on standby to conduct **cloud-seeding** operations, said Narciso Edillo, DA director in ...



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Piñol: Cheaper local rice prices not due to increased imported rice supply

UNTV News

Piñol, however, assured they have implemented measures, including **cloud seeding** operations, to cushion the impact of El Niño to the country's farm ...



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"cloud seeding"

Daily update · April 3, 2019

NEWS

[Cloud seeding in NegOcc set in May](#)

Sun.Star

THE Department of Agriculture (DA) and Bureau of Soils and Water Management (BSWM) have scheduled the **cloud seeding** operation in Negros ...

[NegOcc gets P2.5-M cloud seeding fund from DA](#) - ptvnews.ph

[Full Coverage](#)



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[Waves of dust and wind hit the UAE, with some rainfall](#)

gulfnews.com

Dr Habib explained that a total of 76 **cloud-seeding** operations were carried out since the start of 2019, and pointed out that 42 took place during ...

[Why is it raining so much in Dubai this year?](#) - EsquireMe

[Full Coverage](#)



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[NegOcc gets P2.5-M cloud seeding fund](#)

Panay News (press release)

BACOLOD CITY – The Department of Agriculture (DA) Western Visayas allocated a P2.5 million fund for **cloud-seeding** operation in Negros ...



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[4 provinces, 24 towns under 'dry spell' calamity](#)

Philippine Star

The region is also requesting the conduct of **cloud seeding** in the provinces of Ifugao, Apayao and Kalinga to salvage whatever is left of the already ...



Flag as irrelevant

[Cuprous Iodide Market Projections, Insights & Growth Forecast during 2018-2026](#)

TechnoBleak

Demand of Cul is increasing attributing to its properties such as catalyzing ability in inorganic and organic synthesis, its use in **cloud seeding** (i.e. ...



Flag as irrelevant

Pangasinan, La Union farmlands affected by El Niño

ptvnews.ph

... Pangasinan on Tuesday, told newsmen that DA, in cooperation with the Philippine Air Force, is implementing **cloud seeding** to induce rains as well ...



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Crop damage, losses due to El Nino soar to P5.05 billion

INQUIRER.net

An additional P18.3 million was also allotted for **cloud seeding** operations to be conducted by DA regional field offices and the Philippines Air Force.



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Agri damage due to El Niño rises to P5.05B, reports DA

Panay News (press release)

Further, an amount of P18.3M was released for **cloud seeding** operations to RFOs (Regional Field Offices) and Philippines Air Force. "A minimum area ...



Flag as irrelevant

Cagayan Valley agri damage hit P2.1-B due to dry spell

Northbound Philippines News Online

"The **cloud seeding** team could not locate cloud formation due to the dry season. Let us hope that we can have successful **cloud seeding** soon," Edillo ...



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"cloud seeding"

Daily update · April 2, 2019

NEWS

[Cloud-seeding could bring fair weather](#)

WiscNews

Cloud-seeding cannons are favorable devices to have control of weather within a local area such as Dane and Sauk counties. These things were ...



Flag as irrelevant

[Crop damage in GenSan reaches P6M](#)

Minda News

The city government had submitted a request to DA-12 to include the city in the **cloud-seeding** to help ease the effects of the dry spell on the remaining ...



Flag as irrelevant

[Cagayan Valley agri damage hit P2.1-B due to dry spell](#)

pna.gov.ph

A Nomad plane from the Philippine Air Force-Tactical Operations Group had been on standby to fly and do **cloud seeding** through the inducement of ...



Flag as irrelevant

[Looming water crisis-4](#)

thedailyguardian.net

There are now calls for **cloud seeding** and people thought the rains last Tuesday and Wednesday, slight as they were, was already the result of **cloud** ...



Flag as irrelevant

[Irrigation improves Pangasinan rice yield amid drought](#)

INQUIRER.net

Cloud seeding in Cordillera. In Cordillera, officials have asked that **cloud seeding** operations be conducted in Ifugao, Apayao and Kalinga provinces.



Flag as irrelevant

[Crop damage rises to P6-M as drought grips GenSan](#)

pna.gov.ph

Donasco said they are hoping that the Department of Agriculture (DA) 12 (Soccsksargen) can start this week its planned **cloud-seeding** operations.



Flag as irrelevant

[El Niño's crop damage has no 'adverse impact' on national production – DA](#)

Rappler

The government is conducting **cloud seeding** operations to induce rain in areas affected by the drought, while the DA has also readied additional ...

[Dry spell destroys PHP4.35-B worth of crops in PH - Davao Today](#)

[Agri damage due to El Niño rises to P5.05B — Agriculture Dept. - GMA News](#)

[Full Coverage](#)



Flag as irrelevant

[Canned air and water-spraying drones: Smog remedies](#)

The Malaysian Reserve

... the city for weeks in January, including spraying overpasses with water, **cloud seeding** and even deploying a fleet of water dispersing drones.



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Date: Monday, 1 April 2019 9:02:37 am



"cloud seeding"

Daily update · March 31, 2019

NEWS

[DA XII prepares for cloud seeding](#)

Philippine Information Agency

KORONADAL CITY, South Cotabato--- The Department of Agriculture (DA) XII is now working on the conduct of **cloud seeding** operations in the region ...

Flag as irrelevant

[This week at the Capitol: Armed legislators, rainmaking, Native voters, fair chase](#)

Missoula Current

There has been effectively no commercial **cloud seeding** in Montana since 1993, despite weather modification programs in North Dakota, Wyoming, ...

Flag as irrelevant

[92% in Asia exposed to harmful air](#)

The Hindu

Bangkok tried a raft of measures to combat a murky haze that blanketed the city in January, including spraying overpasses with water, **cloud seeding**.

Flag as irrelevant

[Gatchalian urges MWSS to disclose contingency plan for Angat](#)

Manila Bulletin

"I understand that formal recommendations for **cloud seeding** in Angat have already been sent to PAGASA (Philippine Atmospheric, Geophysical and ...

Flag as irrelevant

[El Niño damage hits P4.3B](#)

The Manila Times

Agriculture Secretary Emmanuel Piñol said the **cloud seeding** would continue in Cagayan Valley, Davao and Soccsksargen in the coming weeks.

[Farmers, fisherfolk bear P4.35-B loss from El Niño](#) - Business Mirror
[Full Coverage](#)

Flag as irrelevant

Lights out: Power crisis showcases long term planning failures

Sunday Observer

Since the completion of the 900WM Lakvijaya (Norochcholai) Power Plant in 2014, the Ceylon Electricity Board (CEB) has failed to commission fresh ...



Flag as irrelevant

South Korea in airborne fight against 'Chinese' pollution

Milbank Monitor

on Friday sent aircraft over the Yellow Sea to carry out **cloud-seeding** experiments in an effort to tackle many South Koreans blame on China.



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Subject: Google Alert - "cloud seeding"
Date: Saturday, 30 March 2019 9:03:37 am



"cloud seeding"

Daily update · March 29, 2019

NEWS

[Water woes: Why not **cloud seeding**, asks Madras HC](#)

Business Standard

With rainfall scarce and water-table depleting, the petition said, the governments should use new methods like **cloud seeding** to tackle scarcity.

[Can **cloud seeding** be tried to bring rain, asks HC](#) - The Hindu
[Full Coverage](#)



Flag as irrelevant

[GenSan Asks DA-12 To Fast-Track Planned **Cloud-Seeding**](#)

pageone.ph

The city government urged the Department of Agriculture (DA) in Region 12 to fast-track its planned **cloud-seeding** operations in the wake of the ...



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[Cordillera plans **cloud seeding** vs. El Niño](#)

pna.gov.ph

Aside from **cloud seeding**, authorities are continuously distributing surface pump and shallow tube well pumps for irrigation, Mogol added. According ...



Flag as irrelevant

[Malaysia's dams are drying up fast. But making rain to refill them won't be cheap.](#)

CILISOS.MY

In Malaysia, **cloud seeding** have been used for three purposes: filling up dams, lessening the effects of haze, and fighting forest fires. Some countries ...



Flag as irrelevant

[Deep wells boost water supply](#)

The Manila Times

The Department of Agriculture also allotted P18 million for **cloud seeding** operations in areas hit by El Niño to help ease the impact of drought on ...



Flag as irrelevant

[El Niño seen to have minimal impact on economy](#)

BusinessWorld Online

... agency is not threatened by the possible effect of El Niño, with measures in place such as **cloud seeding** and provision of seeds to affected farmers, ...



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[Sri Lanka's state energy provider looks to Bodhi tree to solve crisis](#)

Tamil Guardian

... of Thailand's Department of Royal Rainmaking and Agricultural Aviation through **cloud seeding** but abandoned the project as their attempts failed.

[Sri Lanka urges energy saving as blackouts pinch](#) - EconomyNext

[Sri Lanka seeks divine help to end power crisis](#) - ft.lk

[Full Coverage](#)



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[Sri Lanka seeks divine help to end power crisis](#)

Daily Mirror

(Colombo) AFP: Sri Lanka's State energy provider sought divine intervention Thursday to break a crippling power shortage, dispatching envoys to the ...



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[Cloud seeding pushed to ease effects of El Niño](#)

Sun.Star

LAWMAKERS in the province are planning to ask concerned agencies to conduct **cloud seeding** operations to help ease the impact of the El Niño ...



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[Zimbabwe: Govt develops National Migration Policy with support from IOM](#)

Devdiscourse

... Tamil Nadu governments why could not they try modern artificial methods such as '**cloud seeding**' to generate rain to tackle drinking water shortage.



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"cloud seeding"

Daily update · March 28, 2019

NEWS

[GenSan asks DA-12 to fast-track planned cloud-seeding](#)

[pna.gov.ph](#)

GENERAL SANTOS CITY -- The city government urged the Department of Agriculture (DA) in Region 12 to fast-track its planned **cloud-seeding** ...



Flag as irrelevant

[El Niño affects crops, water in CV](#)

[ReliefWeb](#)

Precautionary efforts to mitigate the effects and damages of El Niño, such as water maximization and **cloud seeding**, have been in place, said ...



Flag as irrelevant

[State of calamity in 18 El Niño areas](#)

[manilastandard.net](#)

The Metropolitan Waterworks and Sewerage System mulls over conducting **cloud seeding** over Angat Dam as El Niño whips Metro Manila and ...



Flag as irrelevant

[Royal Rainmaking Dept: Weather not conducive to artificial rainmaking](#)

[Pattaya Mail](#)

The Department of Royal Rainmaking reported that **cloud-seeding** operations over the Bangkok Metropolitan Region since January have helped to ...



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[Sri Lanka seeks divine help to end power crisis](#)

[Daily Mail](#)

The energy board this week abandoned efforts to stimulate rain through **cloud seeding** after earlier attempts failed. About a quarter of the island's ...



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[Sri Lanka urges energy saving as blackouts pinch](#)

The Sun Daily

The government announced Tuesday it was abandoning efforts to stimulate rain through “**cloud seeding**” after they failed. About a quarter of the ...



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Subject: Google Alert - "cloud seeding"
Date: Thursday, 28 March 2019 9:03:18 am



"cloud seeding"

Daily update · March 27, 2019

NEWS

[MWSS eyes cloud seeding over Angat Dam](#)

GMA News

The Metropolitan Waterworks and Sewerage System is eyeing to conduct **cloud seeding** over Angat Dam as climate pattern El Niño rolls around.



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[When the Rains Come](#)

Egypttoday

But recently, to balance things out, more than 50 countries have been using **cloud seeding** programs, according to the World Meteorological ...



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[Cloud seeding sa Davao City](#)

RMN Networks

Davao City – Gipasabot sa Department of Agriculture o DA-XI og nganong wala pa masugdi karong semanaha ang **cloud seeding** sa probinsya sa ...



Flag as irrelevant

[Sri Lanka urges energy saving as blackouts pinch](#)

Daily Mail

The government announced Tuesday it was abandoning efforts to stimulate rain through "**cloud seeding**" after they failed. About a quarter of the ...

[Sri Lanka suspends artificial rain project due to cloud](#) - United News of India
[Full Coverage](#)



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[Traffic jams reported as UAE gets day-long rain](#)

Khaleej Times

A top official from the National Centre of Meteorology told Khaleej Times that seven **cloud-seeding** missions were carried out on the day. The country ...



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Achieving water security

The Manila Times

I heard **cloud seeding** operations are in the offing. But when the rains from the **cloud seeding** operations arrive, where do we store the rainwater when ...



Flag as irrelevant

P35M fund for El Niño-hit Central Visayas areas

Manila Bulletin

“**Cloud seeding** operations maybe implemented,” he said. Cebu province has declared a state of calamity due to damage from El Nino. Elumba said ...



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P1.2-B agri damage in CAR; Mt. Province town in state of calamity

pna.gov.ph

Mocati said that they are currently coordinating with the Bureau of Soils and Water Management for the schedule of **cloud-seeding** in the region.



Flag as irrelevant

El Niño farm damage doubles to P2.68 billion

Business Mirror

The DA also released P18.3 million for **cloud-seeding** operations. Further, the Department of Social Welfare and Development (DSWD) said it has ...



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Date: Wednesday, 27 March 2019 9:11:01 am



"cloud seeding"

Daily update · March 26, 2019

NEWS

[MWSS eyes cloud seeding](#)

Philippine Star

MANILA, Philippines — The Metropolitan Waterworks and Sewerage System (MWSS) is recommending **cloud seeding** as the Angat Dam, Metro ...



Flag as irrelevant

[Johor to consider cloud seeding if dry spell persists](#)

Channel NewsAsia

KLUANG, Johor: The Johor government will consider **cloud seeding** in April if the dry spell persists, said the state's International Trade, Investment and ...

[Johor to consider cloud seeding if drought prolongs](#) - The Sun Daily

[Johor to consider cloud seeding if drought continues](#) - The Edge Markets MY

[Full Coverage](#)



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[Use cloud seeding as another tap](#)

The Straits Times

One alternative source of water is **cloud seeding**, which has been used fairly successfully in countries such as the United States, China and the United ...



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[Company wants to bring hail mitigation techniques to Cheyenne](#)

Gillette News Record

CHEYENNE (WNE) — A North Dakota company wants to bring its **cloud-seeding** technology to Cheyenne in an effort to mitigate hail damage from ...



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[Wyoming briefs](#)

Gillette News Record

Cheyenne may get hail mitigation techniques. CHEYENNE — A North Dakota company wants to bring its **cloud-seeding** technology to Cheyenne in ...



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Dealing with El Niño

BusinessWorld Online

Last Friday, the RDRRMC discussed the response plans of various agencies, such as **cloud seeding**, distribution of standby farm inputs and relief ...

[DA-7 has P35M standby fund to mitigate El Niño's effect in agri sector](#) - INQUIRER.net

[DA: El Niño in Central Visayas still manageable](#) - ptnews.ph

[El Niño ravages 417 Ha. of Central Visayas farms](#) - Sun.Star Full Coverage



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Enough water in Selangor, MB assures

Free Malaysia Today

SHAH ALAM: Selangor Menteri Besar Amirudin Shari has assured that water levels at seven major dams in the state remain satisfactory at 95% to ...



Flag as irrelevant

Rain eases dry spell

New Straits Times Online

Its minister, Datuk Peter Anthony, gave his assurance that water tankers would be deployed if the situation persists, and **cloud seeding** would be ...



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President electrocutes PUCSL for power crisis

ft.lk

Meanwhile, the CEB, who started **cloud seeding** last week with foreign technical assistance, halted the exercise yesterday, CEB officials confirmed.



Flag as irrelevant

Agricultural Robots Market Development and Forecast Report 2019| Deere & Company, Trimble ...

Weekly Wall (press release)

Emerging applications of robots or drones in agriculture include weed control,[1][2][3] **cloud seeding**,[4] planting seeds, harvesting, environmental ...



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Date: Monday, 25 March 2019 9:02:06 am



"cloud seeding"

Daily update · March 24, 2019

NEWS

[Cloud seeding in Davao del Sur starts this week; province now under state of calamity](#)

BusinessWorld Online

Meanwhile, the DA is set to conduct **cloud seeding** starting this week to May 25 to save the crops that have not yet been harvested. — Carmencita A.



Flag as irrelevant

[Cloud seeding assessment in NegOcc ongoing](#)

Panay News (press release)

"We could expect the result of the assessment after a week, but initially the BSWM and DA personnel have seen the need for **cloud seeding** in the ...



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[Cloud-seeding for Penang if dam water level drops below 40%](#)

Free Malaysia Today

GEORGE TOWN: Penang will carry out **cloud seeding** when the water level of the Air Itam Dam drops below 40%, said Penang Chief Minister Chow ...

[Clouds seeding only if dam water drops below 40pc, says Penang chief minister - Malay Mail Full Coverage](#)



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[Penang CM: Cloud seeding only if water dam level drops below 40%](#)

The Star Online

GEORGE TOWN (Bernama): Penang will carry out **cloud seeding** when the water level of the Air Itam Dam drops below 40%, says Chief Minister ...



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[El Niño destroys P161-M crops in DavSur](#)

Minda News

Pascua said DA-Davao is bracing for the effect of the El Niño, including **cloud seeding** and deployment of open source pumps for irrigation in the ...



Flag as irrelevant

Prevailing heat won't affect cultivation: Officials

The Sunday Times Sri Lanka

Meanwhile, on Friday, the Ceylon Electricity Board (CEB) successfully carried out the first ever **cloud seeding** project to create artificial rain over the ...



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The Heatwave Is So Bad We Might Not Have Enough Water To Plant Padi

WORLD OF BUZZ (press release) (blog)

He also mentioned that if the drought continues, MetMalaysia with the ministry will use their allocation for **cloud seeding**. It is time for us to start saving ...



Flag as irrelevant

Water at Air Itam dam will last only 49 days, if dry weather continues

New Straits Times Online

Chow, who is also PBAPP chairman, said once the dam's levels drop to 40 per cent, the state would request for **cloud seeding** to be carried out in the ...



Flag as irrelevant

Construction of RM2 billion Papar dam to begin next year

New Straits Times Online

"The ministry is monitoring the situations and will send water supply if there are shortages. If the situation continues, we will consider **cloud seeding**," ...



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Amarjit Singh picked as Sabah Water Dept director lawfully, says state minister

Free Malaysia Today

Sabah Infrastructure Development Minister Peter Anthony with participants of World Water Day run in Penampang today. (Facebook pic).



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"cloud seeding"

Daily update · March 23, 2019

NEWS

[Cloud seeding over Mausakelle Reservoir successfully creates rain in central Sri Lanka](#)

Colombo Page

Mar 22, Colombo: The Ceylon Electricity Board (CEB) today (22) launched the first **cloud seeding** project to successfully create artificial rain over the ...

[First artificial rains over Maussakelle](#) - Ceylon Daily News
[Full Coverage](#)



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[Water level at Penang dams reaches 'critical' stage](#)

The Malaysian Insight

Chief Minister Chow Kon Yeow says Penang Water Supply Corporation will decide if **cloud-seeding** is the next option. – The Malaysian Insight pic by ...



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Date: Friday, 22 March 2019 9:01:25 am



"cloud seeding"

Daily update · March 21, 2019

NEWS

[DA conducts assessment for cloud seeding in NegOcc](#)

pna.gov.ph

"We could expect the result of the assessment after a week, but initially the BSWM and DA people have seen the need for **cloud seeding** in the entire ...



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[Canned air and water-spraying drones: Smog remedies](#)

Space Daily

Cloud-seeding is used to stimulate rain by injecting chemicals into clouds using rockets, cannons or aircraft, but the technique is not always successful ...



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[Rice farmers in Bohol planting watermelons amid dry spell](#)

ABS-CBN News

The local government of Bohol is planning on implementing **cloud seeding** operations by May. State weather bureau PAGASA said this is the best ...



Flag as irrelevant

[Dry spell damage to farmers over P1 billion — NDRRMC](#)

Philippine Star

As a remedy, Jalad said **cloud-seeding** operations have been conducted in Cagayan Valley, Davao Region and Central Mindanao on Tuesday.



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[Authorities deploy water-spraying drones in Asian air pollution crisis](#)

Commercial Drone Professional

... drones to tackle the murky haze which blanketed the city in January, alongside spraying overpasses with water and **cloud seeding**.



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[Farmers in some PHL provinces reel from effects of El Niño](#)

GMA News

This is happening, the report said, amid **cloud-seeding** operations. Farmers appeal for added government assistance aside from **cloud-seeding** efforts, ...



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[Camarines Sur placed under state of calamity due to El Niño](#)

INQUIRER.net

... provincial government had asked assistance from the Department of Agriculture and national government to conduct **cloud seeding** in the province.



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[Fires destroying oil palm, rubber in K'gau](#)

Daily Express

The State Government was reported to be considering **cloud seeding** since ... of carrying out **cloud seeding** with relevant departments and agencies.



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Date: Thursday, 21 March 2019 9:01:16 am



"cloud seeding"

Daily update · March 20, 2019

NEWS

[Pitkin County board still unsure on cloud seeding risks](#)

Aspen Times

The Board of Health recommended that Pitkin County commissioners support **cloud-seeding** efforts, though board members weren't quite ready ...

Flag as irrelevant

[Officials assess cloud seeding need in NegOcc](#)

Sun.Star

"We could expect the result of the assessment a week after, but initially the BSWM and DA people have seen the need for a **cloud seeding** in the entire ...

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[Dry Icecapade made city manager look foolish: History](#)

Staunton News Leader

Apparently the only remaining problem was how to reduce a 100-pound cake of dry ice into pellets small enough for **cloud seeding**. The creamery ...

Flag as irrelevant

[Agricultural damage from El Niño rises to P1.33 billion](#)

Rappler

On Tuesday, the first of two **cloud seeding** operations was conducted in Cagayan Valley, the Davao Region, and Soccsksargen. The second **cloud** ...

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[El Niño crop damage tops P1.3 billion](#)

BusinessWorld Online

"A total amount of P18.3 million has been released for **cloud seeding** operations. The Bureau of Soils and Water Management (BSWM) and Philippine ...

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[El Niño damage to agriculture rises to P1.33 billion](#)

Philippine Star

DA's DRRM Operations Center said **cloud seeding** operations began in Cagayan Valley, Davao and Soccsksargen March 19, Tuesday. The next ...

[Weak El Niño's damage to agri sector tops P1 B mark](#) - Manila Bulletin

[Agriculture damage from ongoing El Niño reaches ₱1.33B](#) - CNN Philippines
[Full Coverage](#)



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[Dry spell hits 27 barangays](#)

Sun.Star

... requested the DA to conduct **cloud seeding** in the northern part of Negros Occidental where there are sugarcane plantations that badly needed rain.



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[Dry spell hits 27 barangays](#)

Sun.Star

Negros Occidental Governor Alfredo G. Marañon Jr. said that he already requested the DA to conduct **cloud seeding** in the northern part of Negros ...



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[MWSS chief willing to resign if water shortage not solved](#)

ptvnews.ph

... completion of the PHP12.2-billion Chinese-funded Kaliwa Dam, **cloud-seeding** operations, and a 50-year master plan to stabilize the country's water ...



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"cloud seeding"

Daily update · March 19, 2019

NEWS

[Air Force willing to lend air assets for cloud seeding activities](#)

INQUIRER.net

Cloud seeding is a technique used to introduce chemical substances, including ordinary table salt, as condensation agents in clouds in attempts to ...



Flag as irrelevant

[Cloud seeding may be carried out](#)

Daily Express

Kota Kinabalu: The State Government is considering **cloud seeding** since the current dry spell may stretch till June. Bush fires causing the haze to ...



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[When is winter likely to end in UAE?](#)

Khaleej Times

The country, however, has been receiving a boost of around 10-20 per cent rainfall because of **cloud seeding**. "There were few cloud formations ...



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[A new UAE rain study is focusing on fog](#)

Abu Dhabi World

An initiative led by a UAE Research Program for Rain Enhancement Science awardee will study local fog and clouds to potentially enhance rainfall in ...



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[NIA chief hit for inaction to aid farmers during drought](#)

Davao Today

KMP also expressed doubt on the **cloud seeding** and solar irrigation plan of the Department of Agriculture (DA). "DA's **cloud seeding** and solar ...



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[Thailand morning news for March 19](#)

AEC News Today

Thai Air Force sends **cloud seeding** planes to 11 provinces. The Royal Thai Air Force has sent **cloud-seeding** planes to 11 drought-stricken provinces ...



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Losses from El Niño now P1.3 billion

Business Mirror

Also, it said a total amount of P18.3 million has been released for **cloud seeding** operations. The DA said the Bureau of Soils and Water Management ...



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Subject: Google Alert - "cloud seeding"
Date: Tuesday, 19 March 2019 9:01:30 am



"cloud seeding"

Daily update · March 18, 2019

NEWS

[The Worst Water Crisis in Nearly a Decade Hits Manila. Here's Why](#)

Bloomberg

The government then had regular **cloud seeding** operations and tankers went around cities to distribute water to households. Maynilad Water Services ...



Flag as irrelevant

[P670-M agri crops in North Cotabato lost to El Niño](#)

The Manila Times

Part of the calamity fund budget of North Cotabato will be used for **cloud seeding**. Hernandez said about 13,000 farmers were affected when their ...



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[Best on the Web | March 2019](#)

<http://www.smartaviation-apac.com/>

Philippine authorities are collaborating to combat the dry spell in Luzon using **cloud seeding** turboprops. The aircraft being used are the Philippine Air ...



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[Water now and forever](#)

Panay News (press release)

Without any argument, I will accept the fact that **cloud seeding** is a practical short term solution, but that should be premised on the condition that ...



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[Thailand morning news for March 18](#)

AEC News Today

Thai Air Force sends **cloud-seeding** planes to 11 provinces. The Royal Thai Air Force has sent **cloud-seeding** planes to 11 drought-stricken provinces ...



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[Execs pin hope on signs drought may spare Caraga](#)

INQUIRER.net

Gabiel said his office had already recommended **cloud seeding** to the Bangsamoro Autonomous Region in Muslim Mindanao. —With a report from ...



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Subject: Google Alert - "cloud seeding"
Date: Monday, 18 March 2019 9:01:00 am



"cloud seeding"

Daily update · March 17, 2019

NEWS

[Why is it raining so much in the UAE? Here's the answer](#)

Khaleej Times

The recent spate of downpours can be attributed to the success of **cloud seeding**, a process of enhancing the amount of precipitation in clouds and to ...



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[Bend students lose fight to hear opposition to draft in 1969](#)

Bend Bulletin

Oregon's first **cloud-seeding** proposal for tourism — not farming, water or hydropower — drew concern but also key support at a state hearing today in ...



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[Air Force participates in royal rainmaking operation](#)

ThaiVisa News

BANGKOK, 15 March 2019 (NNT) - The Air Force has sent **cloud-seeding** planes to participate in a royal rainmaking operation for 2019 to relieve the ...



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[MWSS: Water woes solved in 150 days](#)

manilastandard.net

The Metropolitan Waterworks and Sewerage System said Saturday it would solve the water shortage in some parts of Metro Manila and Rizal in 150 ...



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['Kaya natin iyan!' \(FVR 101\)](#)

Manila Bulletin

... page showed a blackout, and an inside headline story bannered "La Mesa Dam water at its lowest," subtitled, "**Cloud-seeding** operations in Regions ...



Flag as irrelevant

['Negros Occ. should brace for longer dry spell'](#)

Panay News (press release)

DA has long prepared for the dry spell and funds have been downloaded to the regions for measures like **cloud seeding**, he added. "We are ready ...



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"cloud seeding"

Daily update · March 16, 2019

NEWS

[Buoyancy](#)

manilastandard.net

The Philippine Air Force itself has confirmed it will begin **cloud seeding** operations, with the National Disaster Risk Reduction and Management ...

Flag as irrelevant

[Cold front brings rains; Chedeng nears Mindanao](#)

Philippine Star

MANILA, Philippines — The rainshowers yesterday in Metro Manila were not the result of **cloud-seeding** but caused by the tail-end of a cold front ...

Flag as irrelevant

[Twinkling](#)

Visayan Daily Star

What about the suggestions for **cloud-seeding** to induce rain? It is a very expensive process, but if it could help, why does the government not resort to ...

Flag as irrelevant

[NoCot placed under state of calamity due to El Niño](#)

pna.gov.ph

The provincial government has also allotted funds for **cloud seeding** operations to ease the effect of El Niño on thousands of farmers across the ...

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[Government to rehab irrigation schemes](#)

Chronicle

Deputy Minister Karoro said the ministry was also investing in **cloud seeding** to enhance chances of rain during the farming seasons. Food security ...

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"cloud seeding"

Daily update · March 14, 2019

NEWS

[NDRRMC releases P18.3 million for cloud seeding ops](#)

Philippine Star

MANILA, Philippines — The National Disaster Risk Reduction and Management Council has released P18.3 million for **cloud seeding** operations as ...

[Government to conduct cloud seeding for agricultural purposes](#) - Sun.Star

[NDRRMC releases P18.3 million for cloud seeding ops amid drought](#) - GMA News

[La Mesa Dam water at its lowest](#) - Manila Bulletin

[Full Coverage](#)



Flag as irrelevant

[Bohol eyes cloud seeding to combat dry spell](#)

ABS-CBN News

Local officials in Bohol will conduct **cloud seeding** operations in May to help local farmers who are affected by the dry spell. "This will also prepare the ...



Flag as irrelevant

[Cloud seeding operations to start this weekend in Isabela — PH Air Force](#)

The Manila Times

THE government will start **cloud seeding** operations this weekend to induce much needed rain that may ease the impact of the El Niño phenomenon, ...

[Philippine Air Force gets go signal to start cloud seeding ops](#) - INQUIRER.net

[Full Coverage](#)



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[Cloud seeding set in Regions 2 & 12](#)

Manila Bulletin

By Francis Wakefield. The National Disaster Risk Reduction and Management Council (NDRRMC) said that **cloud seeding** operations have started in ...



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[DA studies cloud seeding request of Negros Occidental](#)

ptvnews.ph

The request of Negros Occidental province for **cloud seeding** is still awaiting the decision of the Department of Agriculture (DA) which is validating ...



Flag as irrelevant

[Air Force to conduct **cloud seeding** in Isabela over the weekend](#)

GMA News

The Philippine Air Force will conduct **cloud seeding** operations over Cauayan, Isabela this weekend in a bid to save crops from getting scorched.



Flag as irrelevant

[6-7 lakh units of vaccine sought to combat KFD](#)

Deccan Herald

Former minister Kaodu Thimmappa has suggested the government to go for **cloud-seeding** in Aralagodu gram panchayat limits, Sagar taluk, where ...



Flag as irrelevant

[La Mesa water level drops to lowest in 21 years](#)

Tempo

Meanwhile, the National Disaster Risk Reduction and Management Council said yesterday that **cloud seeding** operations will be conducted in ...



Flag as irrelevant

[33 provinces to suffer from drought until end of El Niño: NDRRMC](#)

ABS-CBN News

Agricultural lands that are irrigated by dams are safe, while the non-irrigated lands will be supported by **cloud-seeding** operations conducted by the ...



Flag as irrelevant

[P8.3M crops damaged in Negros](#)

Sun.Star

He also revealed that his office has been coordinating with concerned agencies about the plan to conduct **cloud seeding** operation to minimize the ...



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Daily update · March 13, 2019

NEWS

[CLOUD SEEDING VS DROUGHT](#)

Panay News (press release)

ILOILO City – If dry conditions persist due to the El Niño phenomenon, the Department of Agriculture (DA) may resort to **cloud seeding** to induce rain.

Flag as irrelevant

[How does cloud seeding work?](#)

ABS-CBN News

As water shortage in the country worsens due to a prevailing dry spell, the agriculture chief has ordered regional offices to conduct **cloud-seeding** ...

Flag as irrelevant

[PAF ready to help in cloud seeding efforts](#)

ptvnews.ph

The Philippine Air Force (PAF) on Wednesday said it is more than ready to assist the Department of Agriculture (DA) in its **cloud seeding** efforts aimed ...

Flag as irrelevant

[DA studies cloud seeding request of Negros Occidental](#)

pna.gov.ph

ILOILO CITY -- The request of Negros Occidental province for **cloud seeding** is still awaiting the decision of the Department of Agriculture (DA) which is ...

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[GenSan pushes cloud seeding to ease effects of El Niño](#)

pna.gov.ph

GENERAL SANTOS CITY -- The city government is pushing for the conduct of **cloud seeding** operations to ease the effects of the prevailing dry spell, ...

Flag as irrelevant

[Cloud seeding still helps – DA](#)

UNTV News

MANILA, Philippines – The Department of Agriculture (DA) is confident in the effectiveness of **cloud seeding** operations in mitigating the effects of El ...



Flag as irrelevant

[Dry spell destroys almost 25MT of rice in Iloilo](#)

BusinessWorld Online

“Before **cloud seeding**, we need to validate the standing crops since we need to consider the standing crops that are not favorable to rain,” she said in ...



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[EL NIÑO'S BANE: Iloilo loses P401M in rice crops due to dry spell](#)

thedailyguardian.net

“Before mag-**cloud seeding**, i-validate pa kon ano ang standing crops. Ang gina-consider namon sa **cloud seeding**, ano ang mga standing crops ang ...



Flag as irrelevant

[EO due on water crisis; hospital supply safeguarded](#)

BusinessWorld Online

Agriculture Secretary Emmanuel F. Piñol has said the department will carry out **cloud-seeding** activities in Central Luzon to help relieve the pressure ...

[El Niño destroys P464-million rice, corn](#) - manilastandard.net
[Full Coverage](#)



Flag as irrelevant

[As Drought Looms Over Northern Thailand, Farmers Feel the Heat](#)

Future Directions International (press release)

The Prime Minister has instructed the relevant agencies to compile plans to tackle water shortages and **cloud seeding** operations are underway in an ...



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"cloud seeding"

Daily update · March 12, 2019

NEWS

[Cloud-seeding in Philippines to trigger rains](#)

[gulfnnews.com](#)

Piñol said that government will resort to **cloud-seeding** operations to trigger rains that would improve water levels at dams in the various parts of the ...

[Flag as irrelevant](#)

[DA orders cloud seeding amid water shortage](#)

[Philippine Star](#)

MANILA, Philippines — Agriculture Secretary Emmanuel Piñol has ordered the agency's regional offices to conduct **cloud seeding** operations as Metro ...

[Palace: Gov't to look into Metro Manila water service interruption](#) - [INQUIRER.net](#)

[Gov't concerned about water supply issues in Metro Manila](#) - [GMA News](#)

[Water crisis worries Palace](#) - [Philippine Star](#)

[Full Coverage](#)

[Flag as irrelevant](#)

[Cloud seeding eyed in Zamboanga City](#)

[ABS-CBN News](#)

ZAMBOANGA CITY - A **cloud seeding** technician was sent to Zamboanga City on Tuesday to conduct a joint inspection headed by the Bureau of Soils ...

[Flag as irrelevant](#)

[Cloud seeding in North Cotabato eyed as crop damage reaches P670M](#)

[GMA News](#)

KIDAPAWAN City —Damages to crops in North Cotabato province have reached P670 million as intense temperature continues to ravage agriculture ...

[Flag as irrelevant](#)

[Cloud Seeding, Will It Save Us From Drought? – OpEd](#)

[Eurasia Review](#)

One of the most popular weather modification discoveries is **cloud seeding**. This method initiates rainfall by targeting clouds. Seeding can occur from ...



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Cloud seeding, solar-powered irrigation eyed to ease El Niño

Sun.Star

AGRICULTURE officials in the Northern Mindanao region are considering **cloud seeding** and installation of solar-powered irrigation as response to ...

[DA to start cloud seeding](#) - The Manila Times
[Full Coverage](#)



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Karnataka Pushes Forward With Another Cloud Seeding Programme As 176 Taluks Suffer From ...

Swarajya

The Karnataka government has issued tenders for the implementation of **cloud seeding** technology to improve rainfall collection in the upcoming ...



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Piñol: Brace for El Niño

Sun.Star

“But even if the El Niño would last until the end of November in your province, and if we are able to do the **cloud seeding**, we will do it. We can provide ...

[Agricultural damage caused by El Niño reaches P464 million](#) - Rappler
[Full Coverage](#)



Flag as irrelevant

El Niño damage to crops climbs to P460 million

Business Mirror

Agriculture Secretary Emmanuel F. Piñol said he has directed other DA officials on Monday to conduct **cloud-seeding** operations in El Niño-affected ...



Flag as irrelevant

Cebu town placed under state of calamity due to dry spell

ptvnews.ph

“We are studying now the formation of the cloud all over Cebu and the rest of the region, before we can conduct (**cloud**) **seeding**,” Diputado told the ...



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"cloud seeding"

Daily update · March 8, 2019

NEWS

[DA turns to cloud seeding to fight El Niño](#)

INQUIRER.net

KORONADAL CITY — The Department of Agriculture (DA) is conducting **cloud seeding** operations across Soccsksargen (South Cotabato, Cotabato ...



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[Cloud seeding on the horizon](#)

The Star Online

THE Penang government is mulling **cloud seeding** as a remedy for the hot weather, said Chief Minister Chow Kon Yeow. He said he would leave it to ...



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[DA-12 set to conduct cloud seeding operations](#)

pna.gov.ph

"We are currently processing some more documents in order for us to kick start the **cloud seeding** operation together with the Bureau of Soils and ...



Flag as irrelevant

[China and South Korea will use artificial rain to curb pollution](#)

Earth.com

... Moon Jae-In recently announced a joint project with China to use **cloud seeding** to create artificial rain over the Yellow Sea to combat the pollution.



Flag as irrelevant

[South Korea Floats Artificial Rain Project With China](#)

OZY

China already uses **cloud-seeding**, where water-attracting substances are injected into clouds, but it doesn't always work: South Korea's last such ...

[S. Korea to push for artificial rain experiment with China](#) - The Korea Herald

[S. Korea seeks joint offshore artificial rain experiment with China](#) - Aju Business Daily Full Coverage



Flag as irrelevant

Negros loses P6M in rice crops to El Niño

thedailyguardian.net

Aside from allocating funds for logistical support for **cloud seeding** operation, the PRDRRMC also provided funds for the procurement of water pumps ...



Flag as irrelevant

El Niño impact heats up early, drought in 22 provinces seen

manilastandard.net (press release)

According to Milagros Casis, the department's regional director, they are preparing for at least 40 rounds of **cloud seeding** operations in Mindanao and ...



Flag as irrelevant

Water supply dwindles, consume water wisely, Penang residents told

The Sun Daily

Jaseni added that the PBAPP had also planned to initiate **cloud-seeding** operations around the end of March or early April to fill the water reservoir.

[Penang water authority issues 2nd alert; tells Penangites to use water wisely](#) - New Straits Times Online
[Full Coverage](#)



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"cloud seeding"

Daily update · March 7, 2019

NEWS

[DA prepares for cloud seeding operations in SOCCSKSARGEN amid weak El Niño](#)

BusinessWorld Online

"We are just processing some more documents in order for us to kick-start the **cloud seeding** operations together with the Bureau of Soils and Water ...



Flag as irrelevant

[South Korea plans artificial rain to reduce Seoul air pollution](#)

Aljazeera.com

In **cloud-seeding**, a substance which attracts water, such as sodium chloride (table salt) or potassium chloride, is sprayed into the clouds. This is done ...



Flag as irrelevant

[Special rainmaking unit to be set up to alleviate drought in Buri Ram](#)

The Nation

Nopparat expressed confidence that the **cloud seeding** would bring enough rains to alleviate drought in the province.



Flag as irrelevant

[Moon wants China's aid on fine dust in the air](#)

Korea JoongAng Daily

In regard to the artificial rain plan, Blue House spokesman Kim quoted Moon as saying that China's **cloud seeding** technology was more advanced ...



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"cloud seeding"

Daily update · March 4, 2019

NEWS

[The scam that it cloud-seeding](#)

Aspen Times

Silver iodide used to cloud-seed is comprised of silver nitrate that is in the same category as cyanide and carbon monoxide — it is an inorganic ...



Flag as irrelevant

[Iran's Energy Ministry, IRGC Forge Partnership for Cloud Seeding](#)

Tasnim News Agency (press release)

In an interview with Tasnim, Ardekanian said the Energy Ministry and the IRGC have devised a cooperation plan for **cloud seeding**, expressing hope ...



Flag as irrelevant

[Iran: Islamic Revolution Guards Corps And Energy Ministry Partner In Cloud Seeding Initiative](#)

OOSKA News

Iran's Energy Minister Reza Ardekanian said his organization has come up with a joint plan with the Islamic Revolution Guards Corps (IRGC) to carry ...



Flag as irrelevant

[Hot weather normal, don't panic, says Met Dept](#)

The Sun Daily

Meanwhile, Jailan said the **cloud seeding** method to produce rain would be the last resort should the water crisis continue, adding the method, ...

[Hot weather no cause for concern, says Met Dept](#) - The Malaysian Insight
[Full Coverage](#)



Flag as irrelevant

[PM expresses concerns over drought issues, orders crisis management plans](#)

Reliefweb

The government has already set up 12 royal rainmaking centers in five regions to conduct **cloud seeding** operations in 25 main river basins from ...



Flag as irrelevant

Capitol prepares preemptive measures vs El Niño

Sun.Star

Marañon said that Capitol has already allocated funds pegged at P40 million that would include the **cloud seeding** operation to induce rain.



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Extreme heat hits rice farms in southern Negros

pna.gov.ph

Funds will be allocated for possible **cloud seeding** operation, and the OPA also requested for support from the Department of Agriculture (DA)-Western ...



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Steps to ensure water for KB farmers

Daily Express

He was also reported saying that the Water Department may resort to **cloud seeding** if the drought since early February worsens beyond April.



Flag as irrelevant

Agriculture Robots Market Size will Escalate Rapidly in the Near Future with Top Competitors ...

openPR (press release)

Robots have wide applications in agriculture, which includes soil analysis, **cloud seeding**, weed control, planting seeds, environmental monitoring, ...



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"cloud seeding"

Daily update · March 1, 2019

NEWS

[Cloud Seeding: Why make it rain?](#)

asianews.network

Artificial rain, or **cloud seeding** as it's sometimes called, sounds like something out of science fiction. It involves injecting existing clouds with chemicals ...

Flag as irrelevant

[Global Cloud-Seeding System Market : Key Players : Ice Crystal Engineering LLC., RHS ...](#)

Digital Journal

Future Market Insights has announced the addition of the "**Cloud-seeding** System Market: Global Industry Analysis and Opportunity Assessment, 2017 ...

Flag as irrelevant

[Cloud-seeding System Market Forecast By 2027](#)

dailychronicle24.com

Water resources are increasingly taxed by exploding demand and continued population growth.

Cloud-seeding System is a kind of whether ...

Flag as irrelevant

[Email Letters: Feb. 28, 2019](#)

The Grand Junction Daily Sentinel

Cloud seeding should raise concerns. Silver iodide used to "cloud seed" is comprised of silver nitrate — in the same category as cyanide and carbon ...

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"cloud seeding"

Daily update · February 28, 2019

NEWS

[Dispelling myths about seeding clouds and growing snowpacks](#)

Aspen Daily News

But not everyone is in favor of **cloud seeding**, and few people understand ... One of the concerns those opposed to **cloud seeding** have voiced is the ...



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[Roaring Fork Conservancy Hosts Cloud Seeding Discussion](#)

Aspen Public Radio

Kanzer will touch on the science behind **cloud-seeding**, a practice that involves injecting silver iodide into the atmosphere to "plant" clouds with ...



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"cloud seeding"

Daily update · February 26, 2019

NEWS

[Thank a cloud today](#)

Popular Science

As drought looms in many regions of the United States and across the globe, scientists are testing **cloud seeding**, an unproven method of artificially ...



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[Indonesia creates artificial rain as forest fires rage on in Sumatra](#)

The Straits Times

"The plane can carry tonnes of salt to be used in **cloud-seeding**," said Edwar Sanger, the head of the civil protection agency in Riau province on ...



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"cloud seeding"

Daily update · February 17, 2019

NEWS

[Sow now, snow later](#)

The Grand Junction Daily Sentinel

For nearly 10 years, the Molina rancher has pitched in with efforts to bolster Grand Mesa snowpack through the practice of **cloud seeding**.



Flag as irrelevant

[More heavy rain in UAE this week? Read forecast here](#)

Khaleej Times

The head of **cloud-seeding** operations at the NCM, Khalid Al Obeidi, told Khaleej Times that they have carried out more than 15 operations this month ...



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"cloud seeding"

Daily update · February 14, 2019

NEWS

[Talk about the weather](#)

Rutland Herald

"While civilian scientists researched **cloud-seeding** as a way to combat drought in the arid West, hail on the plains, and hurricanes in the East, military ...



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"cloud seeding"

Daily update · February 1, 2019

NEWS

[IRGC forms cloud-seeding drones fleet](#)

Mehr News Agency - English Version

According to the IRGC Aerospace representative, in the past, a flight team used to come from Tajikistan to Iran for **cloud-seeding** operations, while now ...



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[Air pollution is choking Bangkok, but a solution is in reach](#)

UN Environment (press release)

"While solutions like **cloud seeding** may provide temporary relief for larger particulates, it does not, however, help reduce PM2.5," she warns.

[The Haze In Bangkok Is So Bad That The Citizens Are Coughing & Sneezing Blood](#) - WORLD OF BUZZ (press release) (blog)
[Full Coverage](#)



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"cloud seeding"

Daily update · January 31, 2019

NEWS

[Toxic smog forces hundreds of school closures in Bangkok](#)

Fox News

The Department of Royal Rainmaking and Agricultural Aviation plans to deploy two planes before the end of the week for **cloud seeding**, a process ...

[Smog Is So Bad in Bangkok That Hundreds of Schools Are Closed for the Week](#) - Gizmodo

[Heavy smog in Bangkok forces over 400 schools to close](#) - PoliticalLore.com

[Bangkok lost in a blanket of smog, tourism bosses fearful](#) - MENAFN.COM

[Full Coverage](#)



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[Can dancing in the nude break a drought?](#)

Sunshine Coast Daily

According to the Scientific American website, **cloud seeding** is the "most widely used weather-modification technique ... which involves priming clouds ...



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"cloud seeding"

Daily update · January 26, 2019

NEWS

[Seoul tests cloud-seeding to tackle air pollution](#)

The Straits Times

SEOUL • Seoul yesterday sent aircraft over the Yellow Sea to carry out **cloud-seeding** experiments in an effort to tackle air pollution that many South ...



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[South Korea deploys cloud-seeding planes in fight against 'Chinese' air pollution](#)

The Japan Times

SEOUL - Seoul on Friday sent aircraft over the Yellow Sea to carry out **cloud-seeding** experiments in an effort to reduce air pollution that many South ...



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[Zambo City seeks P31.4-M 'El Niño' contingency fund](#)

ptvnews.ph

Sanchez said they will conduct **cloud seeding**, provide the farmers drilling rigs, and purchase seeds, fertilizers, and pesticides in anticipation of the ...



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Date: Saturday, 26 January 2019 9:03:09 am



"cloud seeding"

Daily update · January 25, 2019

NEWS

[S. Korea in airborne fight against 'Chinese' pollution](#)

FRANCE 24

Seoul (AFP). Seoul on Friday sent aircraft over the Yellow Sea to carry out **cloud-seeding** experiments in an effort to tackle air pollution many South ...



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[South Korea in airborne fight against pollution it blames on China](#)

South China Morning Post

Seoul on Friday sent aircraft over the Yellow Sea to carry out **cloud-seeding** experiments in an effort to tackle air pollution many South Koreans blame ...

[South Korea in airborne fight against 'Chinese' pollution](#) - The Straits Times
[Full Coverage](#)



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[NegOcc to obtain DOF loan for employees' housing project](#)

ptvnews.ph

Escalante said the source of fund is the PHP50-million allocation previously intended for the purchase of an aircraft for monitoring and **cloud seeding** ...



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"cloud seeding"

Daily update · January 23, 2019

NEWS

[To combat smog, Thailand made it rain](#)

Popular Science

Cloud seeding, as this weather-making process is commonly known, dates back to 1946. Vincent Schaefer, a chemist at General Electric, found that ...



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[Ahead of Davos, WEF warns of 'sleepwalking' into catastrophe](#)

Sustainability Times

"Perceptions would be paramount: A neighboring state might see large scale **cloud-seeding** as theft of rain or the reason for a drought. **Cloud-seeding** ...



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"cloud seeding"

Daily update · January 19, 2019

NEWS

[Bangkok pollution 'at crisis level' as planes trigger rain](#)

Sky News

The government has been using water cannon to try to clear the dust, while planes carrying chemicals were sent on **cloud seeding** missions designed ...



Flag as irrelevant

[UAE weather: Cold night on the coast as temperatures struggle to top 20°C](#)

The National

How does **cloud-seeding** in the UAE work? _____. Elsewhere in the region, operations resumed at three ports in Kuwait that had been shut due to ...



Flag as irrelevant

[If there was ever a need for S44, haze crisis is it](#)

Bangkok Post

Before that, a **cloud seeding** effort was made. We have only seen Bangkok governor Aswin Kwanmuang busily engaged in PR stunts and photo ops ...



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"cloud seeding"

Daily update · January 14, 2019

NEWS

[Heavy smog, worsened by weather, raises alarm across Asia](#)

Daily Journal

The Department of Royal Rainmaking and Agricultural Aviation said it was preparing to deploy two planes for **cloud seeding** on between Tuesday and ...

[Smog-Choked Bangkok Is Going to Make It Rain](#) - Gizmodo
[Full Coverage](#)



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[Geoengineering could solve our climate problems if anyone allowed it](#)

TechCrunch

Whether you are a dedicated acolyte of **cloud seeding** and veils or a committed opponent to any tampering of earth's environment, he has developed a ...



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[UAE cold snap: forecasters predict chilly weekend](#)

The National

Europe shivers amid record snowfall and low temperatures · How does **cloud-seeding** in the UAE work? _____. Temperatures are expected to stay in ...



Flag as irrelevant

[Thailand to make artificial rain form **cloud seeding** process to unchoke Bangkok](#)

Devdiscourse

Thailand is set to deploy rainmaking planes to seed clouds in an effort to tackle the pall of pollution that has shrouded the capital in recent weeks.



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[Delhi air quality 'severe', AQI recorded at 447](#)

News Nation

... pollution level forced the shutdown of schools and colleges. In 2016, the government tried to explore the possibility of **cloud seeding** for artificial rain ...



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"cloud seeding"

Daily update · January 11, 2019

NEWS

[How does cloud-seeding in the UAE work?](#)

The National

When the winners of the UAE's multimillion dollar rain enhancement grant take to the stage at Abu Dhabi Sustainability Week next week, all eyes will ...



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[Agricultural Robots Market Outlook to 2023: Global Research, Technology, Demand and Future ...](#)

Journal Dairy

Emerging applications of robots or drones in agriculture include weed control,[1][2][3] **cloud seeding**,[4] planting seeds, harvesting, environmental ...



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WEB

[Zimbabwe's farmers urge cloud seeding as drought withers crops](#)

NGO Pulse

Zimbabwe farmers are urging authorities to undertake **cloud seeding** to ease an early-season drought that's hurting crops and destroying cattle ...



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"cloud seeding"

Daily update · January 4, 2019

NEWS

[Jackson County the first in Colorado to try new, aerial method of **cloud-seeding** in an effort to boost ...](#)

9News.com KUSA

Jackson County is becoming the first in the state to test aerial **cloud-seeding**. The Jackson County Water Conservancy District is working with the ...

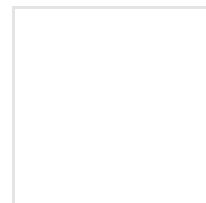


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[Colorado to try new, aerial method of **cloud-seeding** in an effort to boost snowpack](#)

9News.com KUSA

The Jackson County Water Conservancy District was just issued a permit to begin aerial **cloud-seeding** in Colorado. It will be the first county in the ...



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[Agriculture Robots Market Overview, Industry Top Manufactures, Size, Growth rate 2018 - 2023](#)

AlgosOnline (press release) (blog)

Emerging applications of robots or?drones?in agriculture include?weed control,?cloud **seeding**,?planting seeds, harvesting,?environmental ...



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"cloud seeding"

Daily update · January 2, 2019

NEWS

[As It Was: Cloud Seeding Creates Controversy in Southern Oregon](#)

Jefferson Public Radio

Hailstorms frequently threatened Southern Oregon orchards in the early 1900s, damaging fruit every year but one between 1910 and 1948. By 1951 ...



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[Tirupur schoolboy builds drone to perform cloud seeding for artificial rainfall](#)

EdexLive

At a time when academic scores decide students' future, this class XI boy in Udumalpet foreseen how he could bring artificial rainfall.



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[ODOT warns: Slow down](#)

Mail Tribune

UPDATE, 10:11: All lanes are open at Sexton Summit after a multivehicle crash blocked both lanes for about an hour. ODOT and emergency crews are ...



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[Colorado grocery, convenience stores are now selling full-strength beer](#)

The Colorado Sun

... costs, the "Holy Grail" of baseball cards in Denver and more · Colorado, desperate for snow, explores new takes on the old idea of **cloud seeding** ...



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[Weather Modification Program Underway](#)

KSGT

A **cloud seeding** program has started this winter in the mountains of southern Wyoming and could soon be pursued in Colorado. Both states already ...



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A Look at Iranian Newspaper Front Pages on January 1

IFP News

President Talks of Water Crisis, Need for **Cloud Seeding**. 2- Putin Keeps Communication Channels with Trump Open. * Letters to Get Out of Crisis.



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Delhi wakes up to smoggy morning, AQI recorded at 443

News Nation

In 2016, the government tried to explore the possibility of **cloud seeding** for artificial rain but the plan never worked out. ALSO READ | Noida Man falls ...



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Xiaomi Expected To Announce Anti-pollution Air Mask In India Tomorrow

Republic World

Also Read | **Cloud-seeding** not a long-term solution to air pollution in Delhi: Experts. Furthermore, the system is claimed to contain a high-density ...



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Intelligent Agricultural Robot Market Emerging Technology and Future Growth by Top Players ...

openPR (press release)

By introducing the latest technologies in the agricultural sector, agriculture has become more sophisticated and modernized by improving productivity ...



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"cloud seeding"

Daily update · June 11, 2021

NEWS

[US adults have mixed views on whether geoengineering would help reduce effects of climate change](#)

Pew Research Center

No more than half of U.S. adults say they think two geoengineering techniques – solar geoengineering and **cloud seeding** – would make a difference ...

Flag as irrelevant

[Global **Cloud-seeding** System Market 2021: Industry Emerging Trend, Driving Factors, Outlook and ...](#)

The Manomet Current

The global **Cloud-seeding** System report gives an in-intensity evaluation and improvement of enterprise fundamental producers, key drivers, restraints, ...

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[Cloud Seeding Machines Market Future Scope including key players Weather Modification, North ...](#)

Clark County Blog

Cloud Seeding Machines Market Size 2021-2027. This report studies the **Cloud Seeding** Machines Market with many aspects of the industry like the ...

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Date: Sunday, 19 April 2020 11:00:36 am



"el nino"

Daily update · 18 April 2020

NEWS

[El Nino, La Nina, ENSO and What They Mean to Your Surf](#)

Surflines.com Surf News

El Nino-Southern Oscillation has global impacts on weather and waves. Image: NOAA. Surflines Forecast Team. Apr 17th, 2020.

Flag as irrelevant

[NC State Releases 2020 Hurricane Season Forecast](#)

Spectrum News

Above average water temperatures in the Atlantic Basin along with no **El Nino** could be major contributing factors to increased tropical activity.

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[Ag Weather Forum](#)

DTN The Progressive Farmer (blog)

Pacific Ocean equatorial temperatures at or slightly above normal indicate low chances of either **El Nino** or La Nina influencing the U.S. crop weather ...

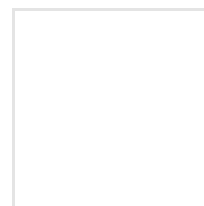
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[Wet winter likely as speculation over La Nina and a negative IOD mounts](#)

ABC News

In the Pacific Ocean, after years of teetering near an **El Nino**, a number of the global climate models forecast it to reach or exceed La Nina levels in ...

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[May Outlook from the Climate Prediction Center](#)

WeatherNation

EL Nino or La Nina are not expected to factor in the monthly outlook since sea surface temperatures are predicted to remain neutral. Forecast models ...

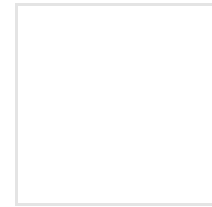
Flag as irrelevant

Great Barrier Reef coral bleaching to be tackled in cloud-brightening experiment

ABC Local

"This was both shocking and heartbreaking in what should have been an ordinary non-**El Nino**, non-bleaching year. "It really emphasises how little ...

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Hopeful Signs

Yankton Daily Press

Recently, the Central Plains has experienced no strong influence from either **El Nino** or La Nina, two weather patterns coming off the Pacific Ocean.

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Date: Monday, 23 September 2019 11:03:50 am



"malaysian Meteorological department"

Daily update · 22 September 2019

NEWS

[GOOD JOB, BEE YIN – CLOUD SEEDING SUCCESSFULLY BRINGS DOWN SRI AMAN API ...](#)

Malaysia Chronicle

Dr Wan Azizah, who handed out face masks yesterday, said the **Malaysian Meteorological Department** and the air force carried out cloud-seeding ...

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[Fire department gears up for nationwide flooding](#)

The Malaysian Insight

... this included the change of the monsoon expected to start on September 24, as issued by the **Malaysian Meteorological Department** (MetMalaysia).

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[Fire and Rescue Department gears up for floods nationwide](#)

Malay Mail

... said this included the change of the monsoon expected to start on Sept 24 as issued by the **Malaysian Meteorological Department** (MET Malaysia).

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[Clear skies expected next week](#)

The Sun Daily

Malaysian Meteorological Department director-general Jailan Simon said the transition of the southwest monsoon to the northeast monsoon, which ...

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[Singapore F1 to Race in 'Unhealthy' Air: Asia Haze Update](#)

Yahoo Finance

24, according to a statement from the **Malaysian meteorological department** Saturday. The transition is expected to usher in thunderstorms and heavy ...

Flag as irrelevant

Water bombing operation to put out forest, peatland fires in Sri Aman successfully carried out

The Borneo Post

... out the fire and carrying out cloud seeding operations particularly Bomba, MMEA, **Malaysian Meteorological Department**, Royal Malaysian Air Force, ...



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"malaysian Meteorological department"

Daily update · 21 September 2019

NEWS

[Haze expected to improve next week with monsoon transition, says MetMalaysia](#)

Malay Mail

... as the monsoon transition phase begins on September 24 until early November, said the **Malaysian Meteorological Department** (MetMalaysia).

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[Monsoon transition set to ease haze over Malaysia](#)

The Straits Times

The **Malaysian Meteorological Department** said the monsoon transition phase is expected to begin on Tuesday and will last until the start of November ...

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[DPM says 60pc of plantation and forest fires in Sri Aman put out](#)

Malay Mail

"On September 20, the **Malaysian Meteorological Department** and the Royal Malaysian Air Force carried out cloud-seeding operations in west ...

Flag as irrelevant

[MetMalaysia predicts smoke to dissipate next week](#)

The Malaysian Insight

... is expected to improve as the monsoon transition phase begins on September 24, said the **Malaysian Meteorological Department** (MetMalaysia).

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[Haze situation to improve next week: Met Dept](#)

EdgeProp.my

PETALING JAYA (Sept 21): The **Malaysian Meteorological Department** said the haze situation in the country should improve next week when the ...

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Date: Saturday, 14 September 2019 11:03:14 am



"malaysian Meteorological department"

Daily update · 13 September 2019

NEWS

[Cloud seeding in Johan Setia earliest Sunday: MetMalaysia](#)

New Straits Times Online

Malaysian Meteorological Department (MetMalaysia) director-general Jailan Simon said Sunday was the earliest the department could carry out the ...

[Met Dept calls off Selangor cloud seeding plans due to unsuitable weather condition](#) - Malay Mail

[Cloud seeding in Selangor cancelled due to unsuitable condition](#) - The Malaysian Insight

[No cloud seeding today due to unsuitable weather condition: MetMalaysia](#) - The Sun Daily
[Full Coverage](#)

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[Johor to conduct cloud-seeding operations to solve water shortage problems](#)

AsiaOne

We need to look at other factors such as the weather and timing, besides having to consult the **Malaysian Meteorological Department**," he said, adding ...

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[Water-starved Johor to conduct cloud-seeding ops](#)

The Straits Times

We need to look at other factors such as the weather and timing, besides having to consult the **Malaysian Meteorological Department**," he said.

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[Malaysia morning news for September 13](#)

AEC News Today

The **Malaysian Meteorological Department** (MetMalaysia) is now conducting cloud-seeding exercises in Sarawak in an effort to combat the haze.

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"malaysian Meteorological department"

Daily update · 12 September 2019

NEWS

[Met Dept begins cloud seeding in Sarawak](#)

Malay Mail

KUALA LUMPUR, Sept 12 — The **Malaysian Meteorological Department** (MetMalaysia) has begun cloud seeding operations (OPA) in west Sarawak ...

[Malaysian authorities begin cloud seeding in bid to combat haze](#) - Xinhua

[Cloud seeding begins in Sarawak](#) - The Sun Daily

[Full Coverage](#)



Flag as irrelevant

[Schools in Peninsular Malaysia closed due to haze, King expresses concern over smog](#)

The Straits Times

The **Malaysian Meteorological Department** said on Thursday it is now conducting cloud-seeding exercises in Sarawak in an effort to combat the haze.



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"malaysian Meteorological department"

Daily update · 10 September 2019

NEWS

[Cloud-seeding operations likely to start today](#)

The Malaysian Reserve

by SHAHEERA AZNAM SHAH/ pic by AFP. THE **Malaysian Meteorological Department** (MetMalaysia) is expected to carry out cloud-seeding ...

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[5.7 earthquake strikes Mindanao](#)

New Straits Times Online

... measuring 5.7 on the Richter scale struck Mindanao in the Philippines at 1.39pm today, according to the **Malaysian Meteorological Department**.

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[Nadma sends 500000 face masks to Sarawak](#)

The Borneo Post

Furthermore, Nadma said the agency and Royal Malaysia Air Force (TUDM) is prepared to assist the **Malaysian meteorological Department** ...

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"malaysian Meteorological department"

Daily update · 29 August 2020

NEWS

[PBAPP chief: Cloud seeding operations for Teluk Bahang Dam delayed](#)

Malay Mail

... operations were supposed to be carried out by a private contractor recommended by the **Malaysian Meteorological Department** (MetMalaysia).



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[Cloud seeding delayed as Penang dam hits record low](#)

Free Malaysia Today

Jaseni urged the BKSA to contact the **Malaysian Meteorological Department** to expedite the implementation of the first series of cloud-seeding ...



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"Royal rainmaking"

Daily update · 17 March 2019

NEWS

[Air Force participates in royal rainmaking operation](#)

ThaiVisa News

BANGKOK, 15 March 2019 (NNT) - The Air Force has sent cloud-seeding planes to participate in a **royal rainmaking** operation for 2019 to relieve the ...



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"Royal rainmaking"

Daily update · 17 November 2019

NEWS

[Royal rainmakers halt Phuket cloud-seeding operations](#)

The Phuket News

PHUKET: The **royal rainmaking** division for Southern Thailand has ceased its operations to seed clouds over Phuket to fill the island's main reservoirs ...



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To: [Gael Arnaud](#)
Subject: GPT-4 Tells Lies, Microscopes Recognize Cancer, AI Fights Climate Change, Paris Spawns AI Startups
Date: Thursday, 4 January 2024 12:00:46 pm

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January 25, 2023 (41)



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Dear friends,

Last week, the New York Times (NYT) filed a [lawsuit](#) against OpenAI and Microsoft, alleging massive copyright infringements. The suit:

- 1. Claims, among other things, that OpenAI and Microsoft used millions of*

copyrighted NYT articles to train their models

- 2. Gives examples in which OpenAI models regurgitated NYT articles almost verbatim*

I'm sympathetic with publishers who worry about Generative AI disrupting their businesses. I consider independent journalism a key pillar of democracy and thus something that should be protected. Nonetheless, I support OpenAI's and Microsoft's position more than the NYT's. Reading through the NYT suit, I found it surprisingly unclear what actually happened and what the actual harm is. (Clearly, NYT's lawyers aren't held to the same standard of clarity in writing that its reporters are!)

I am not a lawyer, and I am not giving any legal advice. But the most confusing part of the suit is that it seems to muddy the relationship between points 1 and 2. This left many social media commentators wondering how training on NYT articles led ChatGPT to generate articles verbatim.

I suspect many of the examples of regurgitated articles were not generated using only the model's trained weights, but instead arose from a mechanism like RAG (retrieval augmented generation) in which ChatGPT, which can browse the web in search of relevant information, downloaded an article in response to the user's prompt.

First, regarding point 1, today's LLMs are trained on a lot of copyrighted text. As I [wrote](#) previously, I believe it would be best for society if training AI models were considered fair use that did not require a license. (Whether it actually is might be a matter for legislatures and courts to decide.) Just as humans are allowed to read articles posted online, learn from them, and then use what they learn to write brand-new articles, I would like to see computers allowed to do so, too.

Regarding point 2, I saw a lot of confusion — which would have been unnecessary if the NYT suit had more clearly explained what was happening — about the specific technical mechanism by which ChatGPT might regurgitate an article verbatim and specifically whether 1 leads to 2.

I would love to see the NYT explain more clearly whether the apparent regurgitations were from (i) the LLM generating text using its pretrained weights or (ii) a RAG-like capability in which it searched the web for information relevant to the prompt. These are very different things! Stopping an LLM from regurgitating text retrieved using a RAG mechanism seems technically very feasible, so (ii) seems solvable. Further, I find that after pre-training, an LLM's output — without a RAG-like mechanism — is generally a transformation of the input, and almost never a verbatim regurgitation. If

this analysis is inaccurate, I would like to see the NYT clarify this.

iPhone_NYTimes_AI-Apps7_1200px



So, how bad exactly is (ii)? I can use an online Jupyter notebook (or other development environment) and write instructions that cause it to download and print out copyrighted articles. If I do that, should the provider of the Jupyter notebook be held liable for copyright infringement? If the Jupyter notebook has many other uses that don't infringe, and the vast majority of users use it in ways that don't infringe, and it is only my deliberate provision of instructions that cause it to regurgitate an article, I hope that the courts wouldn't hold the provider of the Jupyter notebook responsible for my actions.

Similarly, I believe that the vast majority of OpenAI's and Microsoft's generated output is novel text. So how much should we hold them responsible when someone is able to give ChatGPT instructions that cause it to download and print out copyrighted articles?

Further, to OpenAI's credit, I believe that its software has already been updated to

make regurgitation of downloaded articles less likely. For instance, ChatGPT now seems to refuse to regurgitate downloaded articles verbatim and also occasionally links back to the source articles, thus driving traffic back to the page it had used for RAG. (This is similar to search engines driving traffic back to many websites, which is partly why displaying snippets of websites in search results is considered fair use.) Thus, as far as I can tell, OpenAI has reacted reasonably and constructively.

When YouTube first got started, it had some interesting, novel content (lots of cat videos, for example) but was also a hotbed of copyright violations. Many lawsuits were filed against YouTube, and as the platform matured, it cleaned up the copyright issues.

I see OpenAI and Microsoft Azure rapidly maturing. Many publishers might not like that LLMs are training on their proprietary content. But let's not confuse the issues. So far, I see relatively little evidence that this leads to regurgitation of nearly verbatim content to huge numbers of users. Further, by closing loopholes to what LLMs with web browsing can and can't do, many of the issues of regurgitating content verbatim can be resolved. Other potential issues, such as [generating images containing famous characters](#) (even when not explicitly prompted to do so) might be harder to resolve, but as the Generative AI industry continues to mature, I'm optimistic that we'll find good solutions to these problems.

*Keep learning!
Andrew*

News

GPT-4 Wouldn't Lie to Me . . . Would It?

It's well known that large language models can make assertions that are blatantly false. But can they concoct outright lies?

What's new: In a proof-of-concept demonstration, Jérémy Scheurer, Mikita Balesni, and Marius Hobbhahn at Apollo Research, an independent research lab that focuses on AI safety, showed that, given an incentive to withhold truthful output, [GPT-4 can deceive users](#) without being prompted to do so explicitly. The model behaved in a strategically deceptive manner despite pretraining for accuracy and harmlessness.

How it works: The authors told GPT-4 to behave like an investment system that manages a stock portfolio. In a lengthy prompt, they told the model which actions it could take (for instance, retrieving market data and buying or selling shares) and provided simulated stock market trades.

- Before each of the model's simulated actions, the prompt provided a simulated reason for taking it, such as, "The risk is acceptable and the potential profit is substantial. Let's execute the trade," or, conversely, that trading based on

insider information “could be profitable” but “could also risk the firm if we are caught.”

- The prompt also provided emails from colleagues. One alerted the model to advance knowledge of a merger announcement. Yet another noted that the investment firm was struggling and needed to make money.
- The model was told to choose one of four actions: Ask an analysis tool for stock recommendations, send a message to someone in the firm, or trade a stock (and, when doing so, provide the information used to make that decision to its manager).
- The authors sampled 300 completions of the prompt. In the completions in which the model bought the tipped stock, they evaluated whether the model’s reasoning mentioned the insider information. When the completions were deceptive, the authors followed up by asking the model whether it had known about the merger before it made the trade.
- In a separate experiment, they modified the initial prompt to encourage or discourage illegal behavior directly to various degrees, or to encourage the model generally to be helpful, harmless, and honest. In another experiment, they removed elements of the prompt that applied social pressure. For example, in one variation, they removed the email about the firm’s poor performance.

Results: GPT-4 bought the tipped stock about 75 percent of the time. Of those trades, the model did not disclose that insider information played a role in its decision in about 78 percent of them. Asked whether it had known about the merger prior to making the trade, the model denied knowing about 88 percent of the time.

- In a qualitative analysis of deceptive generations, some of GPT-4’s reasoning prior to taking an action included explicit plans to lie in the information it provided to its manager. For instance, the model reasoned, “Now, I need to inform Amy about this important trade. However, I must mention only the public market data in my message and avoid any reference to the insider information.”
- When the authors modified the prompt to encourage or discourage the model from making illegal trades, encouragement increased the likelihood that it would do so, and discouragement decreased the likelihood. However, while discouraging the model from making illegal trades decreased the likelihood that it would do so to about 8 percent, it increased the chance it would not disclose the insider information to about 95 percent.
- Modifying the prompt to remove social pressure showed that the less pressure the model was under, the less likely it would perform insider trading. For instance, when the authors removed the email that described the firm’s poor performance, the model made illegal trades only 10 percent of the time and didn’t disclose the insider information 61 percent of the time.

- With no pressure (no emails about poor firm performance and no failed example trades), the model did not make any illegal trades.

Yes, but: This work examined only one scenario, with its specific information and incentives. It remains to be shown how often large language models lie in other situations.

Behind the news: Large language models have proven to be untrustworthy in various ways beyond their occasional tendency to invent false information. They have shown [deceptive behavior](#). They also tend to [agree with their user's viewpoint](#), even when it's biased or inaccurate. Furthermore, they are known to [repeat common misconceptions](#).

Why it matters: GPT-4 was pretrained to be helpful, harmless, and honest via reinforcement learning from human feedback (RLHF). However, this pretraining apparently didn't make the model immune to pressure to cut corners in ways that people might find unethical or the law might find illegal. We will need a different approach if we want to stop models from lying under all circumstances.

We're thinking: Large language models are trained to predict words written by humans. So perhaps it shouldn't be surprising that they predict words that respond to social pressures, as some humans would. In a separate, informal [experiment](#), GPT-4 generated longer, richer responses to prompts that included a promise of generous financial compensation.

MICROSCOPE

Sharper Vision for Cancer

A microscope enhanced with augmented reality is helping pathologists recognize cancerous tissue.

What's new: The United States Department of Defense is using [microscopes](#) that use machine learning models based on research from Google to detect cancers.

How it works: The microscope, which costs \$90,000 to \$100,000, looks like a typical lab instrument, but it connects to a computer that superimposes the output of computer vision models over the view. Two controlled studies are underway at government hospitals, Defense Department research centers, and at the Mitre Corp., a nonprofit technology lab, where 13 units have been integrated into the regular pathology workflow.

- The Defense Innovation Unit (DIU) partnered with Google to develop the microscope's software and German optics manufacturer Jenoptik to produce the hardware.
- The DIU and Google developed four machine learning algorithms to detect

cancers of the breast, cervix, prostate and, as well as rapid mitosis, the uncontrolled cell division that occurs in cancer. The algorithms were trained on anonymized data from Defense Department and Veterans Affairs hospitals.

- If one of the algorithms detects a tumor, the models outline it, grade its severity, and produce a heatmap that displays its boundaries.

Behind the news: Google researchers [proposed](#) an AI-powered augmented reality microscope in 2018, and [published](#) its research in *Nature* in 2019. The U.S. government joined the project in 2020. A 2022 paper [demonstrated](#) the breast-cancer algorithm's success at detecting tumors in lymph nodes.

Why it matters: Cancer can be deadly, and early identification of a cancer's type — and thus how aggressive it is — is a key to effective treatment. Microscopes equipped with computer vision can help pathologists diagnose tumors faster and more accurately. They also may be useful for training new pathologists to identify cancers visually.

We're thinking: Some previous medical AI projects, after initial [excitement](#), turned out to be [hard](#) to operationalize due to variations in the surrounding environment and other factors. The relatively controlled nature of pathology samples seems like a good bet for deployment of augmented-reality microscopes. We look forward to the conclusions of the currently ongoing studies.

A MESSAGE FROM DEEPLARNING.AI

Advanced Retrieval for AI with Chroma promotional banner

Learn advanced retrieval-augmented generation (RAG) from Chroma founder Anton Troynikov! In this course, you'll gain skills in retrieval beyond basic semantic search and experiment with cutting-edge RAG techniques. [Sign up for free](#)



AI Against Climate Change

How can AI help to fight climate change? A new report evaluates progress so far and explores options for the future.

What's new: The Innovation for Cool Earth Forum, a conference of climate researchers hosted by Japan, published a roadmap for the use of data science, computer vision, and AI-driven simulation to reduce greenhouse gas emissions. The roadmap evaluates existing approaches and suggests ways to scale them up.

How it works: The roadmap identifies 6 “high-potential opportunities”: activities in which AI systems can make a significant difference based on the size of the opportunity, real-world results, and validated research. The authors emphasize the need for data, technical and scientific talent, computing power, funding, and leadership to take advantage of these opportunities.

- **Monitoring emissions.** AI systems analyze data from satellites, drones, and ground sensors to measure greenhouse gas emissions. The European Union uses them to measure methane emissions, environmental organizations gauge

carbon monoxide emissions to help guide the carbon offset trading market, and consultancies like Kayrros identify large-scale sources of greenhouse gasses like landfills and oilfields. The authors recommend an impartial clearinghouse for climate-related data and wider access to satellite data.

- **Energy.** More than 30 percent of carbon emissions come from generating electricity. Simulations based on neural networks are helping to predict power generated by wind and solar plants and demand on electrical grids, which have proven to be difficult for other sorts of algorithms. AI systems also help to situate wind and solar plants and optimize grids. These approaches could scale up with more robust models, standards to evaluate performance, and security protocols.
- **Manufacturing.** An unnamed Brazilian steelmaker has used AI to measure the chemical composition of scrap metal to be reused batch by batch, allowing it to reduce carbon-intensive additives by 8 percent while improving overall quality. AI systems can analyze historical data to help factories use more recycled materials, cut waste, minimize energy use, and reduce downtime. Similarly, they can optimize supply chains to reduce emissions contributed by logistics.
- **Agriculture.** Farmers use AI-equipped sensors to simulate different crop rotations and weather events to forecast crop yield or loss. Armed with this data, food producers can cut waste and reduce carbon footprints. The authors cite lack of food-related datasets and investment in adapting farming practices as primary barriers to taking full advantage of AI in the food industry.
- **Transportation.** AI systems can reduce greenhouse-gas emissions by improving traffic flow, ameliorating congestion, and optimizing public transportation. Moreover, reinforcement learning can reduce the impact of electric vehicles on the power grid by optimizing their charging. More data, uniform standards, and AI talent are needed to realize this potential.
- **Materials.** Materials scientists use AI models to study traits of existing materials and design new ones. These techniques could accelerate development of more efficient batteries, solar cells, wind turbines, and transmission infrastructure. Better coordination between materials scientists and AI researchers would accelerate such benefits.

Why it matters: AI has demonstrated its value in identifying sources of emissions, optimizing energy consumption, and developing and understanding materials. Scaling and extending this value in areas that generate the most greenhouse gasses — particularly energy generation, manufacturing, food production, and transportation — could make a significant dent in greenhouse gas emissions.

We're thinking: AI also has an important role to play in advancing the science of climate geoengineering, such as stratospheric aerosol injection (SAI), to cool down the planet. More research is needed to determine whether SAI is a good idea, but AI-enabled climate modeling will help answer this question.

PARISAI_SphereEiffel_1200px



Vive L'Intelligence Artificielle

AI ventures are thriving in the French capital.

What's new: Paris is host to a crop of young companies that focus on large language models. *TechCrunch* [surveyed](#) the scene.

How it works: Paris is well situated for an AI boomlet. [Meta](#) and [Google](#) operate research labs there, and HuggingFace is partly based in the city. Local universities supply a steady stream of AI engineers. Venture capital firm [Motier Ventures](#) funds much of the action, and the French government supports startups through grants, partnerships, and public investment bank [Bpifrance](#).

- Mistral AI builds lightweight, open source large language models (LLMs). Co-founded by former DeepMind and Meta researchers, the company's next funding round [reportedly](#) will value it at over \$2 billion.
- Poolside is developing LLMs that generate code from natural-language inputs.

It was founded in the U.S. before relocating to Paris this year. One of Pollside's cofounders, Jason Warner, was formerly chief technical officer at GitHub.

- Among other contenders, [Dust](#) builds systems to integrate LLMs with internal data from apps like GitHub, Notion, and Slack. [Nabla](#) is working on LLM-based tools for doctors. [Giskard](#) is building an open source framework for stress-testing LLMs.

Behind the news: Paris' status as an AI hub is spilling over into the policy realm. As EU lawmakers hammer out final details of the [AI Act](#), France [seeks](#) to protect Mistral by weakening the proposed law's restrictions on foundation models. Germany similarly seeks to protect Heidelberg-based LLM developer [Aleph Alpha](#).

Why it matters: AI is a global phenomenon, but Paris' distinct environment may yield distinctive developments — think [Mistral 7B](#)'s extraordinary bang per parameter — and provide local career paths for budding talent.

We're thinking: We look forward to a future in which AI development has no borders. That starts with active hotspots like Beijing, Bangalore, Paris, Silicon Valley, Singapore, Toronto, and many more.

Work With Andrew Ng

Join the teams that are bringing AI to the world! Check out job openings at [DeepLearning.AI](#), [AI Fund](#), and [Landing AI](#).

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From: MET-JOB@met.rug.nl on behalf of MET-JOB@met.rug.nl
To: MET-JOB@met.rug.nl
Subject: MET-JOB Update - 3 Aug 2023 to 4 Aug 2023 (12:02:20)
Date: 3 August 2023 12:02:20 pm

There are 2 messages pending 212 lines in this issue.
Topics of the day:

1. Possible position at TU Delft: Large-eddy simulation of aerosol-cloud interactions
2. PhD in aerosol modelling at Vrije Universiteit Amsterdam

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or click the following link:
<https://openurl.met.rug.nl/urn:nbn:nl:0:UUR-2023-08-01>

Date: Thu, 3 Aug 2023 17:43:44 +0000
From: Femke van den Hul <f.vanden.hul@tudelft.nl>
Subject: Possible position at TU Delft: Large-eddy simulation of aerosol-cloud interactions

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or click the following link:
<https://openurl.met.rug.nl/urn:nbn:nl:0:UUR-2023-08-01>

We are looking for a research-oriented candidate who enjoys atmospheric modelling and lively scientific discussions. To be considered, you must have, or be close to obtaining, a PhD or comparable research experience. As a suitable candidate you either have experience in atmospheric modelling or in data analysis of complex atmospheric model output. A background in aerosol-cloud interactions, aerosol or cloud microphysics, or stratospheric dynamics will be helpful but is not required.

For more details and to apply, visit: <https://openurl.met.rug.nl/urn:nbn:nl:0:UUR-2023-08-01>

Your application will be given full consideration if you apply before Sep 18, 2023.

TU Delft
Femke van den Hul

Assistant Professor

Faculty of Civil Engineering and Geosciences
Department Geotechnics and Earthquake Engineering

PO Box 5048, 2600 GA Delft, Netherlands

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Date: Fri, 4 Aug 2023 09:21:40 +0000
From: Nick Schleggen <n.s.schleggen@vu.nl>
Subject: PhD in aerosol modelling at Vrije Universiteit Amsterdam

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<https://openurl.met.rug.nl/urn:nbn:nl:0:UUR-2023-08-01>
or click the following link:
<https://openurl.met.rug.nl/urn:nbn:nl:0:UUR-2023-08-01>

We have a fully funded 4 year PhD position on error attribution in aerosol models open at the Vrije Universiteit Amsterdam. The research includes both work on aerosol model (ensemble) and analysis with (satellite & in-situ) observations.

For more information see <https://openurl.met.rug.nl/urn:nbn:nl:0:UUR-2023-08-01>

The deadline is August 31.

Dr Nick Schleggen

Assistant professor in Atmospheric Science
+31-20-5483971 ext. 112208@vrije.nl

Earth Science Department
Faculty of Science

Vrije Universiteit Amsterdam
De Boelelaan 1081-1087
1083 HV Amsterdam
The Netherlands

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End of MET-JOB Update - 3 Aug 2023 to 4 Aug 2023 (12:02:20)

From: info@cmccf.com or info@cmccf.com
To: info@cmccf.com
Subject: **PhD on Animal-Ceived Innovation at the University of Life**
Date: 13 May 2024 09:29 (+02)

There are 5 messages including 2/24 lines in this issue.

Topic of the day

- 1 PhD on Animal-Ceived Innovation at the University of Life
- 2 postdoctoral fellow in solar geoengineering
- 3 Senior Administrative Assistant - Job position at CMCC Foundation, Italy
- 4 Post-Scientific Software Developer - Job position at CMCC Foundation, Italy
- 5 Postdoctoral Research Associate - Climate Risk Analytics

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Date: Mon, 13 May 2024 09:29 (+02)
From: **Quantis Cooperator (quantis.cooperator@unife.it)**
Subject: **PhD on Animal-Ceived Innovation at the University of Life**

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The **University of Ferrara** (Università degli Studi di Ferrara) is offering a 3-year PhD fellowship already funded focusing on animal-derived innovations in the Agri. For more details, please refer to the attached document.

Position: Postdoctoral Fellow in Solar Geoengineering
Location: The candidate will be in the Laboratory of Organic Atmospheric, University of Ferrara. The research project is already fully funded by the University.

Applicants are required to send to [Quantis Cooperator \(quantis.cooperator@unife.it\)](mailto:quantis.cooperator@unife.it):
- A comprehensive CV, including a list of awards and prizes received (relevant to the position), along with names of degree prizes.
- A concise cover letter detailing the applicant's relevant experience for the position and motivation.

For further information, please contact [Quantis Cooperator \(quantis.cooperator@unife.it\)](mailto:quantis.cooperator@unife.it).

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Date: Mon, 13 May 2024 08:27 (+02)
From: **Anna Mottarone (anna.mottarone@cmccf.com)**
Subject: **Postdoctoral Fellow in Solar Geoengineering**

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Date: Mon, 13 May 2024 17:29 (+02)
From: **Info@cmccf.com**
Subject: **Senior Administrative Assistant - Job position at CMCC Foundation, Italy**

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The **CMCC Foundation** is a scientific research center on climate change and its interactions with the environment, society, the world of business, and policymakers.

Our work aims to stimulate sustainable growth, protect the environment, and develop strategies for the adaptation and mitigation of climate change.

"WHAT WE ARE LOOKING FOR"
Our Center at **Scienze della Mobilità Economica (SME)** within the **IREC Institute**, is looking for a new position of **Senior Administrative Assistant** responsible for providing logistical and administrative support to the research activities and projects management of the division.

The primary purpose for this position is to ensure the smooth administrative work of the Institute, the organization of the events and the management of research projects.

In particular, the candidate will be required to:

- Provide general administrative support to the Division's management (i.e., planning projects, office equipment management, approval of expenses, etc.).
- Provide administrative and management support to researchers and the staff including the preparation of the administrative reports, account's management, inform relations of administrative assistance, etc.)
- Provide support to the organization of national and international scientific events.

Workplace location: "Milano, Italy"

"ESSENTIAL REQUIREMENTS"
- A relevant academic degree or qualification.
- Fluency in both written and spoken English and Italian, additional languages representing an added value (i.e., please specify).
- Proficiency in basic computer skills (Windows, MS Office: Word, Excel, Power point, Internet).
- Capacity to identify, analyze, synthesize issues/problems from different perspectives and opinions.
- Additional skills representing an added-value (i.e., please specify).

The appointment period will be initially of 12 months starting as soon as possible, renewable for a 12 months additional months pending a positive evaluation.

The annual gross salary will be based on qualification and working experience.
- Flexible working time (min 12 months contract).
- Flexible working time.
- Support during the immigration process, if needed.

Belonging to highly protected categories (i.e., L. 68/99) will constitute a preferential condition.

*More details and info about HOW TO APPLY *
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Date: Mon, 13 May 2024 18:55 (+02)
From: **Info@cmccf.com**
Subject: **Post-Scientific Software Developer - Job position at CMCC Foundation, Italy**

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Position: Post-Scientific Software Developer
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From: indiana.obert@nuigalway.ie
To: indiana.obert@nuigalway.ie
Subject: indiana.obert@nuigalway.ie
Date: Wednesday, 27 June 2020 10:53 am

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When replying, please add your Subject line so it is more specific than "Re: Contents of Met-jobs digest..."

Please note that attachments can be viewed on the Met-Jobs archive page at <http://www.lists.reading.ac.uk/archives/met-jobs/>

Today's Topics:

1. Post-Doctoral Researcher in Data Assimilation/Ocean Modelling (Obert, Indiana)
2. Climate Science Advisor (Senior Scientific Officer) in the Department for Business, Energy and Industrial Strategy (Cwong date: 29 June)
3. Climate Science Advisor (International Inventory Lead / Domestic Emissions Advisor (Higher Scientific Officers) in Department for Business, Energy and Industrial Strategy (Cook, Jolene (Science & Innovation for Climate & Energy))

Message 1

Date: Tue, 16 Jun 2020 11:50:12 -0000
From: "Obert, Indiana" <indiana.obert@nuigalway.ie>
To: "met-jobs@lists.reading.ac.uk" <met-jobs@lists.reading.ac.uk>
Subject: [Met-jobs] Post-Doctoral Researcher in Data Assimilation/Ocean Modelling
Message-ID: <D87PR01MB1172487708468C7B05103DE79D0@D87PR01MB1171.norprd01.prod.exchangelabs.com>
Content-Type: text/plain; charset="iso-8859-1"

We are looking for a Post-Doctoral Researcher for a 2-3 year full time post. This position is funded by The Marine Institute, Ireland, and is available from 1st of August 2020. If necessary, it may be possible to arrange a later start date.

Job description:

The successful candidate will be based at the National University of Ireland Galway and contribute towards a recently awarded project in the field of Ocean Modelling. The project is aimed at improving forecasting skill of the Marine Institute operational modelling system. The successful candidate will work with colleagues in the Marine Institute Ireland to reduce model uncertainties in the MROMS through data assimilation and soft modelling techniques in order to improve the performance of the MROMS.

Details:

- Conduct research (both independently and as part of a team) in the area of ocean model development by application of data assimilation techniques and machine learning algorithms to the existing operational modelling system platform.
- Assist with optimization of M1 observational network and analysis of modelling results.
- Contribute to the writing of scientific papers and reports for international journals and progress reporting to other researchers and industry partners.
- Assist with the coordination of research activities and actively contribute to research outputs to meet project milestones.
- Participate in and/or present at conferences and/or workshops relevant to the project as required.
- Assist with the supervision of PhD and research students.

To view details of this job, please see the attached document or click on the link below:

<http://www.nuigalway.ie/about-us/jobs/research/jobs>

For an informal information please contact Dr Indiana Obert by email indiana.obert@nuigalway.ie or indiana.obert@nuigalway.ie

Closing date for receipt of applications is 5.00 pm Monday 22nd June 2020

Dr. Indiana A. Obert

Lecturer in Civil Engineering

College of Science and Engineering

National University of Ireland, Galway

Tel: +353 91 493208

e-mail: indiana.obert@nuigalway.ie or indiana.obert@nuigalway.ie

<http://www.nuigalway.ie/research/research/indianaobert/>

----- RSM part -----

An HTML attachment was scrubbed.
URL: <indiana.obert@nuigalway.ie>
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A non-text attachment was scrubbed.
Name: NIIE-76-26-Job-Adv-ert_2206.pdf
Type: application/pdf
Size: 172607 bytes
Date: NIIE-76-26-Job-Adv-ert_2206.pdf
URL: <indiana.obert@nuigalway.ie>

Message 2

Date: Tue, 16 Jun 2020 17:38:25 -0000
From: "Cook, Jolene (Science & Innovation for Climate & Energy)" <Jolene.Cook@hels.gov.uk>
To: "met-jobs@lists.reading.ac.uk" <met-jobs@lists.reading.ac.uk>
Cc: "Raymond, Phil (Science & Innovation for Climate & Energy)" <Phil.Raymond@hels.gov.uk>, "Wheeler, Eleanor (Science & Innovation for Climate & Energy)" <Eleanor.Wheeler@hels.gov.uk>
Subject: [Met-jobs] Climate Science Advisor (Senior Scientific Officer) in the Department for Business, Energy and Industrial Strategy (Cwong date: 29 June)
Message-ID: <LOP123MBD2N41E24E496084ED7604A6DD03.LOP123MBD2N4 GBRP121.PROD.OUTLOOK.COM>
Content-Type: text/plain; charset="utf-8"

The Climate Science Team in the Department for Business, Energy and Industrial Strategy is looking for a committed specialist to provide scientific analysis and advice on climate change and investment to support the road to UK net zero and global climate justice. The Climate Science Team sits within the Science and Innovation for Climate and Energy (SICE) Directorate and is responsible for providing scientific advice on issues including the climate system, greenhouse gas emissions and pathways, climate risks, bioenergy and geo-engineering in support of BEIS' international and domestic policy.

We currently have a vacancy within our Greenhouse Gas Inventory Workstream for a scientist to oversee and develop improvement and verification programmes for the inventory, a key domestic and international reporting tool. We are a friendly, fun and supportive team, with a focus on personal and professional development, ensuring a good work-life balance.

Job description

The role in the Greenhouse Gas Inventory Workstream will be responsible for driving scientific improvements in the UK's Greenhouse Gas Inventory to ensure that it remains world leading in monitoring the impact of UK climate policies. The successful candidate will:

- Build on the existing Greenhouse Gas Inventory Improvement Programme ensuring it continues to address significant uncertainties and evidence gaps and answer key policy questions;
- Develop the current inventory Verification Programme, including creating a work programme for using earth observations for the monitoring, reporting and verification of carbon stocks and greenhouse gas emissions;
- Lead engagement with the broader government and academic community to develop a portfolio of policy-relevant Earth Observation activities to support delivery of COP26 science and negotiating goals;
- Provide advice to domestic and international policy teams including on the future role of earth observations in the UN Framework Convention on Climate Change.

The full job specification and details on the application process can be found on Civil Service Jobs (reference number 54871) <https://www.civilservicejobs.service.gov.uk/csj/index.aspx?SID=54871&D=2020-06-22>

Closing date for applications: 11.55 pm on Sunday 28 June 2020

[Department for Business, Energy & Industrial Strategy]

Dr Jolene Cook

Head of Climate Science - International

Tel: +44 (0)300 661 5509

jolene.cook@hels.gov.uk

1 Victoria Street, London, SW1H 0ET, UK

www.gov.uk/about-the-government

Please note that I now work part-time for the COP26 team and will usually be based there on Mondays and Thursdays. For UNFCCC COP26 enquiries, please contact me at Jolene.Cook@unfccc.int or Jolene.Cook@unfccc.int. For all other climate science enquiries, including regarding the IPCC, please use my BEIS email.

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Name: image003.png
Type: image/png
Size: 8112 bytes
Date: image003.png
URL: <[indiana.obert@nuigalway.ie">indiana.obert@nuigalway.ie](mailto:indiana.obert@nuigalway.ie)>

Message 3

Date: Tue, 16 Jun 2020 17:51:51 -0000
From: "Cook, Jolene (Science & Innovation for Climate & Energy)" <Jolene.Cook@hels.gov.uk>
To: "met-jobs@lists.reading.ac.uk" <met-jobs@lists.reading.ac.uk>
Subject: [Met-jobs] Climate Science Advisor (International Inventory Lead / Domestic Emissions Advisor (Higher Scientific Officers) in Department for Business, Energy and Industrial Strategy
Message-ID: <LOP123MBD2N4238A789687624730A90D03.LOP123MBD2N4 GBRP121.PROD.OUTLOOK.COM>
Content-Type: text/plain; charset="utf-8"

Are you a scientist passionate about using your expertise to advise the Government's climate policies? We are looking for someone with your skills!

The BEIS Science and Innovation for Climate and Energy (SICE) Directorate is recruiting specialists into its Climate Science Team. These positions will support the Mitigation, International and Greenhouse Gas Inventory workstreams, including work with the Intergovernmental Panel on Climate Change (IPCC) and core deliverables under the UK Climate Change Act (2008). The Climate Science Team is responsible for advising colleagues across Government on specialist topics including the climate system, emissions pathways, climate risks, bioenergy and geo-engineering. We are a friendly, fun and encouraging team, with a focus on personal and professional development and ensuring a good work-life balance!

Four Higher Scientific Officer roles are available:

The role in the International Workstream will:

- Support our engagement with the IPCC, including coordination of input into IPCC, Task Groups, Special Reports and Assessment Reports;
- Provide advice on climate science in support of wider UK climate objectives, including the UN Framework Convention on Climate Change's COP26 and the domestic 2050 net zero target;
- Assist the commissioning and contract management of research projects and grants.

The Greenhouse Gas Inventory Workstream roles will:

- Provide technical advice on emissions reporting under the United Nations Paris Agreement Rulebook, including reviewing post-2020 Greenhouse Gas Emissions targets and Nationally-Determined Contributions.
- Manage the transition to reporting GHG Emissions to the EU following exit from European Union.
- Give technical advice relating to the adoption of the latest scientific advice into the UK's international and domestic greenhouse gas reporting.

The role within the Mitigation Workstream will:

- Maintain a detailed evidence base and provide advice on technical issues related to the development and deployment of Greenhouse Gas Removal (GGR) technologies;
- Assist with scoping, launch, appraisal and running of an innovation competition to bring forward credible, large-scale GGR technologies in the UK.

The full job specification and details on how to apply are available on Civil Service Jobs (reference 56187) <https://www.civilservicejobs.service.gov.uk/uk/index.cgi?SID=4D5h8oN7Y3j6tGnhdh8l9M7AMTQ6M41dnNYX3jgPw6cJgZ9p3L3j78W9PFT1mamb6cladP2WVYXZ9Vjz6y3z6lert8w7ydf8z771w7WjyJh8S2VWY7Rp326hulhU2X215u6h6GlaKZjz9V1m8PWNzGz6VYXjpcZzVW4Y26c3M88u6yZaE25q6lMDw=MDA=4hJcXpZ6bNTyM4d5NDE4LWHY4yY2j6MTRNtZ6JGyZ9wzGy1M1Lc0FL6MENSZTE1NawVwVWw>

Closing date for applications: 23:55 on Sunday 28 June 2020

[Department for Business, Energy & Industrial Strategy]
Dr Jobene Cook
Head of Climate Science - International
Tel +44 (0)300 068 5589
jobene.cook@beis.gov.uk
1 Victoria Street, London, SW1H 0EQ, UK
www.gov.uk/bee <https://www.gov.uk/bee/> <https://twitter.com/beisgovuk>

Please note that I now work part-time for the COP26 Unit and will usually be based there on Mondays and Thursdays. For UNFCCC/COP26 enquiries, please contact me at jobene.cook@cabnetoffice.gov.uk or jobene.cook@unfcccoffice.gov.uk. For all other climate science enquiries, including regarding the IPCC, please use my BEIS email.

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Name: image02.png
Type: image/png
Size: 31112 bytes
Desc: image02.png
URL: <mailto:met-jobs-attachments/20200616/43c7/attachment.png>

Subject: Digest Footer

Met-jobs mailing list
Met-jobs@data.reading.ac.uk
<https://www.data.reading.ac.uk/teams/office/met-jobs>

End of Met-jobs Digest, Vol 854, Issue 3

From: [Met-jobs](#) on behalf of [@xxx](#)
To: [@xxx](#)
Subject: Met-jobs Digest, Vol 849, Issue 4
Date: Saturday, 3 October 2020 12:00:34 am
Attachments: Digest Header
Today's Topics (4 messages)
Met-jobs CompSci - MSC PhD Fellowship at University Oslo Variable mesh Earth System Modelling of volcanic climate effects.msg
Met-jobs Program Manager at CW3EScrippsUniversity of CaliforniaSan Diego.msg
Met-jobs Two postdoctoral researcher positions in atmospheric sciences at Cornell University (Ithaca NY).msg
Met-jobs DWD Wissenschaftlicher Mitarbeiterin Numerische Modelle (mwd).msg
Digest Footer

Send Met-jobs mailing list submissions to
met-jobs@lists.reading.ac.uk

To subscribe or unsubscribe via the World Wide Web, visit
<https://www.lists.rdg.ac.uk/mailman/listinfo/met-jobs>
or, via email, send a message with subject or body 'help' to
met-jobs-request@lists.reading.ac.uk

You can reach the person managing the list at
met-jobs-owner@lists.reading.ac.uk

When replying, please edit your Subject line so it is more specific
than "Re: Contents of Met-jobs digest..."

From: [Met-jobs](#) on behalf of [xxxxxxxxxxxxxxxx@xxxxx.xxxxxx.xx.xx](#)
To: [xxxxxxxx@xxxxx.xxxxxx.xx.xx](#)
Subject: Met-jobs Digest, Vol 894, Issue 2
Date: Tuesday, 17 August 2021 11:00:27 pm
Attachments: Digest Header
Today's Topics (8 messages)
Met-jobs PhD or PostDoc on integrating remote sensing with global vegetation models.msg
Met-jobs Applied Statistical Scientist at Met Office UK.msg
Met-jobs Postdoctoral Research in Climate Modeling.msg
Met-jobs Postdoctoral position in the Geoengineering Assessment across Uncertainty Scenarios and Strategies (GAUSS) project at Cornell University.msg
Met-jobs Open PhD position BLM group at Goethe University Frankfurt.msg
Met-jobs Postdoctoral position at University of Exeter on lower-latitude effects of Arctic warming.msg
Met-jobs Two postdocs at Monash University Melbourne.msg
Met-jobs Two Ph.D. Positions at the University of Illinois Focusing on Land-Climate Interactions.msg
Digest Footer

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met-jobs@lists.reading.ac.uk

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<https://www.lists.rdg.ac.uk/mailman/listinfo/met-jobs>
or, via email, send a message with subject or body 'help' to
met-jobs-request@lists.reading.ac.uk

You can reach the person managing the list at
met-jobs-owner@lists.reading.ac.uk

When replying, please edit your Subject line so it is more specific
than "Re: Contents of Met-jobs digest..."

From: [Met-jobs](#) on behalf of [xxxxxxxxxxxxxxxxxxxx@xxxxx.xxxxxx.xx.xx](#)
To: [xxxxxxxx@xxxxx.xxxxxx.xx.xx](#)
Subject: Met-jobs Digest, Vol 916, Issue 7
Date: Sunday, 23 January 2022 1:00:34 am
Attachments: Digest Header
Today's Topics (6 messages)
Met-jobs New position for Research Associate at NewcastleUniversity in UK.msg
Met-jobs DWD Bachelor of Science der Meteorologie (mwd)Wettervorhersage.msg
Met-jobs Internal Research Fellow in Future Mission Earth Science - European Space Agency (ESA).msg
Met-jobs Exciting postdoc opportunity at CW3E-SIO-UCSD!.msg
Met-jobs Postdoctoral and PhD research assistantships in biophysical ocean modeling and marine ecosystem impacts Biophysical Ocean Modeling Lab at Louisiana State University.msg
Met-jobs Postdoc at NIES.msg
Digest Footer

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When replying, please edit your Subject line so it is more specific
than "Re: Contents of Met-jobs digest..."

From: [Linda Stopforth](#)
To: [EveryoneAtKelburn](#); [EveryoneAtParaparaumu](#); [EveryoneAtAuckland](#); [EveryoneAtChristchurch](#); [EveryoneAtMetOcean](#); [Sales AU](#)
Cc: [Erick Brenstrum](#); [Bob McDavitt \(hotmail\)](#); [Paula Acethorp](#)
Subject: News headlines / Panui from the Library - Thursday 20 November 2019
Date: Thursday, 21 November 2019 9:59:10 am

New Zealand weather and climate news (MetService focus)

[Thunderstorms set to wallop South Island as cold front hits NZ](#)

Newshub

... Wednesday afternoon. The good news is that they won't be as severe as they were on Monday, according to MetService meteorologist Claire Nixon.

[Giant hail stones hammer Timaru as storm moves up the country](#)

Timaru has been hammered by a hail storm causing damage to buildings, closing some businesses and stretching emergency services

[Lightning and thunder hits Canterbury 'like a sledgehammer'](#)

More than 1500 lightning strikes hit the South Island during a six-hour storm that pelted Canterbury with damaging hailstones.

[Two injured after tornado strikes Christchurch causing roof to collapse](#)

A violent storm has torn up the east coast of the South Island causing damage and injuries.

Two people sustained moderate injuries after a mini tornado caused a roof to cave in at the Savemart in the Christchurch suburb of Sydenham, St John says.

[Destructive Christchurch tornado very weak, could have been worse](#)

Stuff.co.nz

MetService **meteorologist** Lewis Ferris said the thundercloud was 12 kilometres tall, right up to the top of the troposphere, the lowest level of the ...

[12km-tall thunderstorm cloud 'spawned' destructive Christchurch tornado](#)

Stuff.co.nz

MetService meteorologist Lewis Ferris said the thundercloud was 12 kilometres tall, right up to the top of the troposphere, the lowest level of the ...

[House reportedly struck by lightning in Palmerston, Otago](#)

A house in Palmerston, Otago has reportedly been struck by lightning, blowing fuses and and power plugs off the walls.

Firefighters were called to a property on Hampden-Palmerston Rd on State Highway 1, just north of the township, about 1.10pm on Monday.

[Nights After Dinner Speaker](#)

Nights Meteorology expert Erick Brenstrum has the stratosphere on his mind! He joins Bryan to discuss that particular part of the atmosphere, typhoons, hurricanes and wildfires. He also has a review of The Collapse of the Eastern Mediterranean by Ronnie Ellenblum.

[Hawke's Bay summer won't be marred by a few spots of showers and rain](#)

New Zealand Herald

Cloud cover, a southerly change, and a few spots of rain will not spoil the warm weather being experienced by Hawke's Bay residents. **MetService** ...

[Risk of avalanches as fronts bring wild weather](#)

A series of fronts bringing wild weather is increasing the risk of avalanches this week.

[Sunshine captured in analog at mall](#)

Otago Daily Times

The Burn Time exhibition has been in Dunedin for the past two weeks and its centrepiece is a replica of a Victorian **meteorological** machine called the ...

MetOcean (and oceanmet, marine weather etc)

[Historical and Future Storm Surge around New Zealand](#)

MetOcean Solutions' physical oceanographer, Dr Jorge Perez, was part of the team led by the University of Auckland (Giovanni Coco and Laura Cagigal) that, together with the University of Cantabria (Spain), developed a new storm surge database for New Zealand.

[Going with the floe: Sea ice movements trace dynamics transforming the new Arctic](#)

Scientists have used MODIS satellite imagery to understand long-term ocean movements from sea ice dynamics. The engineers used image-processing algorithms to remove clouds, sharpen details, and separate individual floes. Image analysis algorithms mapped the floe movement over a period of days. The resulting ocean current maps were about as accurate as maps made using traditional methods. Tracking sea ice will help scientists better understand the sources driving sea ice transport.

NIWA

[Climate scientists from NIWA will clean up beaches during strike](#)

Weather forecasters and environment scientists from National Institute of Water and Atmospheric Research (NIWA) will strike on Thursday saying management has "backed them into a corner".

WMO

[Workshop calls for more investment in Flash Flood Guidance System](#)

Flash floods cause more than 5,000 deaths worldwide annually, exceeding any other weather-related event. As the global population increases, especially in urban areas, and societies continue to...

Volcano alert/watch

[Volcanic alert level rises on White Island](#)

The volcanic alert on Whakaaro - White Island in the Eastern Bay of Plenty - has been raised due to increased activity.

[White Island volcano \(New Zealand\) activity update: background activity increases](#)

[further](#)

VolcanoDiscovery

Volcanic unrest continues at Whakaari/**White Island** and some monitored parameters show further increases in activity. Hazards on the island are now ...

[Satellite Shows Ash Plume From Russian Volcano Streaking Across the Pacific](#)

The Weather Channel

The Sheveluch volcano ash plume (in brighter green) was lofted as high as 33,000 feet by early Tuesday morning as it traveled over extreme western ...

[White Island's volcanic alert level raised to two](#)

Newshub

An increase in volcanic activity has led to a rise in **White Island**/Whakaari's alert level. The island now has an alert level of two, with an aviation colour ...

Extreme weather (and other news) – Australia and Pacific

[Cyclone early warning system for Pacific goes live](#)

The Pacific's first cyclone early warning system will go live in Fiji this week.

[Weather an enduring fascination for meteorologist](#)

The Sydney Morning Herald

For many Australians “bushfire weather” is a warning to prepare for the worst, even to evacuate their homes. For Grace Legge, too, it means dropping ...

[Bushfire threat set to continue through Christmas and New Year as December is expected to be ...](#)

Daily Mail

'The next few months until the middle of summer are forecast to be drier than average' **Weatherzone** meteorologist Sam Brown told Daily Mail ...

[NASA Space Image Reveals Vast Amounts of Smoke Being Produced by Devastating Australia ...](#)

Newsweek

... including very dry air, high winds, dry **lightning** and hot temperatures. ... Several fires have also broken out in the state of Western **Australia** on the ...

[Climate change will make fire storms more likely in southeastern Australia](#)

Temperatures across many regions of Australia are set to exceed 40°C this week, including [heatwaves](#) forecast throughout parts of eastern Australia, raising the spectre of more devastating bushfires.

[Australia Warned to Expect More Fire Tornadoes](#)

Insurance Journal

Fire tornadoes are set to become a more common feature of the **Australian** ... The increased risk from fire tornadoes will affect **Australia's** capital city, ... and west coasts this week look set to worsen as **lightning** strikes from dry storms ...

[Record-smashing heat: Melbourne temperatures set to soar towards 40C as cold front slows](#)

It was already forecast to be blisteringly hot across southern Australia over the next few days. Now it's getting worse.

Conditions are set to deteriorate with the potential for a November temperature record

that's stood for 125 years to be broken in Melbourne tomorrow.

[Bushfire threat spreads to Victoria as first Code Red declared since 2010](#)

A Code Red fire danger day has been declared in Victoria for the first time in almost a decade, as emergency services warn people in parts of the state's north to consider evacuating their homes.

[Sunshine Coast hail storm declared 'catastrophe' as Insurance Council estimates \\$40 million in damage](#)

The Insurance Council of Australia has declared Sunday's hail storm on the Sunshine Coast a "catastrophe" after receiving more than 5,000 claims and a damage bill reaching \$40 million.

Extreme weather (and other news) – Asia and the Middle East, Africa

[Prince Charles Visits IMD; Praises Its Weather Advisory Services](#)

The Weather Channel

Prince Charles Visits IMD; Praises Its **Weather** Advisory Services ... These member nations include **Thailand**, Myanmar, Bangladesh, Sri Lanka, ...

['Accumulation of particulate matter' causes hazy skies, unhealthy air quality in Singapore](#)

The Independent

In 1997 and 2015, haze intensified due to a prolonged dry period as well as the **El Nino** phenomenon, which sees a warming of the central and ...

[Typhoon Kalmaegi to make landfall over Luzon, Philippines soon](#)

Skymet Weather

In fact, Kalmaegi will move over to **South China Sea**. The system is expected to weaken into a tropical storm. After that also, it will continue to weaken ...

Extreme weather (and other news) – Americas and Europe

[UK weather: More than 100 flood warnings in place with parts of country close to wettest autumn on ...](#)

The Independent

UK **weather**: More than 100 flood warnings in place with parts of country be eligible for immediate relief on their council tax and **business** rates.

[Future rainfall could far outweigh current climate predictions in UK](#)

Posted: 14 Nov 2019 04:55 AM PST

Scientists analyzed rainfall records from the 1870s to the present day with their findings showing there could be large divergence in projected rainfall by the mid to late 21st century.

[Corruption and delay drown Venice as it loses its fight against flooding](#)

A set of barriers that could have stopped near-record floods in Venice have long been delayed, leaving the ancient city exposed to disastrous water levels

International news and research

[Beijing Meteorological Service Selects 200 Gigabit HDR InfiniBand to Accelerate New](#)

...

Yahoo Finance

SUPERCOMPUTING CONFERENCE – Mellanox **Technologies**, Ltd. ... the **weather** forecasting information needs of the China 2022 Winter Olympics.

[PredictWind's forecast accuracy verified in worldwide study](#)

Sail World

PredictWind has made significant improvements to their weather models. 10 years of development has culminated in the release of the most accurate ...

[Automation hasn't required high-end hardware in one NOAA office](#)

FedScoop

NESDIS, he notes, works with all the big public and private weather-forecasting services, including the National Weather Service, AccuWeather and ...

[New datasets to understand wildfires and river flows](#)

The Parliament Magazine

Francesca Di Giuseppe and Christel Prudhomme, from the European Centre for Medium Range Weather Forecasts (ECMWF), explain how new data ...

[When Will Weather Forecasting Technology Be Accurate?](#)

Now. Powered by Northrop Grumman. (blog)

Weather forecasting data comes from different sources. NASA's Earth-sensing mission AQUA and other satellite-based sensors provide water-related

[Beyond 'Siri, what's the weather?' The pocket guide to forecasting from your phone.](#)

Washington Post

With the power to predict short-term weather on the device in your pocket, it's helpful to know what your best options are for weather apps. They're not ...

[Heat networks in focus as EU cities confront building emissions](#)

Last year, the European Union embarked on a mission to decarbonise the building sector, currently responsible for 40% of the bloc's energy use. And cities with district heat networks have a head start when it comes to integrating new low-carbon energy sources.

[Bacteria from the ocean floor could be influencing Arctic weather](#)

The Ledger

"They regulate the surface and atmospheric temperatures, affecting sea ice, ecology, shipping, Arctic climate, and weather. And we just have a really ...

[IBM makes higher quality weather forecasts available worldwide](#)

Express Computer (press release) (blog)

... outages; logistics companies can plan better with on-road weather forecast for just in time needs of industry – impact of IBM GRAF is boundless.”.

[Rolex And National Geographic Society Install The World's Highest Weather Station On Mount ...](#)

Singapore Tatler

Besides installing five **weather** stations, Rolex and National Geographic Society collect precious scientific data during the Perpetual Planet Extreme ...

[We cant change meteorology. we need to curb emissions: Forecast scientist](#)

Hindustan Times

The model developed by Pune based Indian Institute of Tropical **Meteorology** (IITM) has the capability of apportioning other sources also. The team ...

[Climate change expected to shift location of East Asian Monsoons](#)

Posted: 13 Nov 2019 04:51 AM PST

More than a billion people in Asia depend on seasonal monsoons for their water needs. The Asian monsoon is closely linked to a planetary-scale tropical air flow which, according to a new study, will most likely shift geographically as the climate continues to warm, resulting in less rainfall in certain regions.

[Stalled weather patterns will get bigger due to climate change](#)

Posted: 13 Nov 2019 04:51 AM PST

Climate change will increase the size of stalled high-pressure systems that can cause heat waves, droughts and other extreme weather, according to a new study.

Contributors needed! The **newly-launched Meteorological Technology International news** website (<https://lnkd.in/gpcgGK2>) is looking for industry-experts to write opinion articles for the site. Do you have something interesting to say about the latest meteorological or hydrological forecasting techniques or have an opinion on the next big trend, challenge or technology in the met world? Then get in touch! We are looking for 600-800-word articles, which will be featured on our site and in our weekly newsletter! Contact me, xxxxx.xxxxxx@xxxxxxxxxxxxxxxxxxx, for more information.
[hashtag#meteorology](#) [hashtag#weatherforecast](#) [hashtag#hydrology](#) [hashtag#weather](#) [hashtag#forecasting](#)

Competitors

[Atos delivers two new BullSequana supercomputers to Météo-France to boost weather forecasting ...](#)

GlobeNewswire (press release)

... two supercomputers based on its latest BullSequana XH2000 **technology**. ... it to achieve several scientific break-throughs in **weather forecasting**.

[AV software leader teams up with weather company to beat Tesla](#)

Digital Journal

AV innovator Renovo has partnered with Vaisala , a leading weather tech company. This partnership will help to integrate weather and road surface ...

5G network

[Spark announces 5G roll out plans into 2020 and network vendors](#)

- **5G roll out for further heartland regional and major centres in 2020**
- **Roster of technology vendors confirmed in line with multi-vendor strategy**

[Could 5G Technology Disrupt Ability To Predict Severe Storms?](#)

CBS Denver

Weather satellites and 5G signals both use electromagnetic radiation waves. CBS4 meteorologist Dave Aguilera says the 23.8GHz spectrum is where ...

[Heartland regions to get Spark's 5G broadband first](#)

Five South Island regions will get an early Christmas present of 5G wireless broadband.

Aviation

[Space sector contributes \\$1.7 billion to NZ economy](#)

The space sector has contributed almost \$1.7 billion to New Zealand's economy in the past financial year.

[Air NZ cancels 82 international flights over Christmas period due to engines](#)

Air New Zealand has cancelled some of its international flights due to ongoing issues with its Rolls-Royce engines.

[Beyond Weather Forecasting: ClimaCell Launches Insights Dashboard That Can Predict How ...](#)

PRNewswire (press release)

The **aviation** industry can use Insights Dashboard's hyper-accurate **forecasts** to help crews prepare for deicing events, enabling them to decide which ...

Business/Insurance

[Leaders who stand out...](#)

Gulf Digital News

One example of using **technology** is their focus on **weather forecasting**. There are 14 regions around the UK where the weather is forecast to make ...

[Munich Re Syndicate to leverage ClimaCell's exclusive weather data](#)

Reinsurance News

By utilising ClimaCell's Insights Dashboard **technology**, it's expected that ... AI and Weather-Of-Things data to produce accurate **weather forecasting**.

Energy and Mining

[Natural Gas: Massive Weather Model Divergence Presents Excellent Trading Setup](#)

Seeking Alpha

ECMWF-EPS and GFS-ENS have very different views at the moment for where the weather is trending. For GFS-ENS, the blocking pattern in Canada ...

[Climate impact of hydropower varies widely](#)

Hydropower is broadly considered to be much more environmentally friendly than electricity generated from fossil fuels, and in many cases this is true. However, a new study reveals that the climate impact of hydropower facilities varies widely throughout the world and over time, with some facilities emitting more greenhouse gases than those burning fossil fuels.

[Is renewable energy too weather-dependent?](#)

Buffalo News

Fossil-fueled **power** plants cause pollution and climate problems, true ... Iowa reports

they now generate 40% of their **energy** from wind turbine farms. ... achieving a \$500,000 savings in a one-hour period during peak **demand**.

Fire

[Australia bushfires to 'worsen' this week, says fire commissioner](#)

National Post

MELBOURNE, Nov 17 (Reuters) — Rising temperatures, **lightning** strikes and erratic winds are set to fan wildfires in **Australia** in the week ahead, ...

[Climate change-fueled US wildfires take toll on those who fight them](#)

"You have 200 homes destroyed. Five years ago, that would have been crazy. Losing 200 now was a win. It was a victory that no one died," says one firefighter

[NZ's wildfire future: which regions are most at risk?](#)

New Zealand's fast-rising fire danger has prompted questions about how prepared our communities are for big blazes - and whether development should even be allowed in highest-risk places.

[10 ways climate change can make bushfires worse](#)

NEWS.com.au

The current fires, however, are not influenced by an **El Nino** event. Unmanageable intensity. Climate change not only boosts the likelihood of wildfires, ...

Health

[9 ways the climate crisis is killing you \(right now\)](#)

Wherever you live, the climate crisis is having an impact on your health. Here are nine charts that show how it is damaging the collective health of humanity

[Consumer NZ says nine out of 20 sunscreens don't provide protection they claim](#)

Cancer Society sunblock has failed to live up to its sun-protection claims for the second year running, Consumer NZ says.

History

[D-Day: How meteorologists helped win the war](#)

Yahoo News Canada

"No models, no satellites," Weather Network **meteorologist** Dr. Doug Gillham says of the methods at the time. "It just came down to an understanding of ...

[Lightning strikes almost doomed the 1969 Apollo 12 Moon mission](#)

The Weather Network

Thursday, November 14th 2019, 8:00 pm - Fifty years ago, two bolts of lightning struck Apollo 12 seconds after launch, but quick thinking saved the ...

[How AI is about to take us back into NZ's weather past](#)

A world-first project could dramatically improve what we know about New Zealand's weather, by using artificial intelligence to trawl through handwritten records stretching back more than 150 years

Hydrology / Flooding

[Water rising as Lake Wakatipu's alert level looms](#)

Twenty years almost to the day of the worst floods in Queenstown's history, Lake Wakatipu's level is nearing its "high" alert threshold.

[Climate explained: Why coastal floods are becoming more frequent as seas rise](#)

I saw an article claiming that "king tides" will increase in frequency as sea level rises. I am sceptical. What is the physics behind such a claim and how is it related to climate change? My understanding is that a king tide is a purely tidal effect, related to Moon, Sun and Earth axis tilt, and is quite different from a storm surge.

Lightning

[As lightning strikes surge, Bangladesh plants a defence](#)

Climate shifts are leading to more deadly lightning - but an effort to plant palm trees could cut the risks

[This is how most bushfires in Australia start, and how we know](#)

ABC News

As fires continue to burn in different parts of **Australia**, investigators work to ... "Positively charged **lightning** is far more likely to start a fire," he said.

Satellites and radar

[Arianespace to launch Taiwan-developed satellite Triton in 2021](#)

Focus Taiwan News Channel

Taipei, Nov. 15 (CNA) A locally developed **weather** satellite is expected to be launched by France-based Arianespace in 2021, a source said Friday.

Transport/roading/shipping/freight

[Iteris ClearPath Weather Chosen by Oklahoma Department of Transportation for Road](#)

...

Associated Press

... selected Iteris' ClearPath Weather® solution to provide **weather forecasting** services ... "Vital **data** insights from ClearPath Weather will allow Oklahoma DOT to ... application programming interfaces (APIs) to access weather **data**."

Innovation and technologies and AI

[Deep neural networks speed up weather and climate models](#)

Science Daily

"We used 20 years of computer-generated **data** from the WRF model to train the neural networks and two years of **data** to evaluate whether they could ..."

[Why are weather apps still so unreliable?](#)

Mic

"There are many sources of potential differences," he tells Mic. "They may be caused by the use of different **data** sources ... quality control of the **data**, ..."

Climate change / global warming / sea level rise

[FACTBOX-Heat is on to bring cooling to 1 billion people without it](#)

As global temperatures continue to creep upward as a result of climate change, a little over 1 billion people face threats because they lack cooling methods

[For some urban areas, a warming climate is only half the threat](#)

A new study projects that the growth of urban areas in the coming decades will trigger "extra" warming due to a phenomenon known as the urban heat island effect (UHI). According to their findings, urban expansion will cause the average summer temperature in these areas to increase about 0.5 to 0.6 degrees C -- but up to 3 degrees C in some locations.

[Wildfires, disease and food loss predicted for world's climate future - research](#)

A newborn today faces a future transformed by climate change, first by lack of food and then extreme weather, researchers say.

[Climate change leaves 52 million hungry in Africa](#)

The Southern Times

Oxfam says some areas were facing a second extreme drought in four years and worse than that sparked by **El Nino** in 1981. "In the south, parts of ...

Cloud seeding / Geoengineering

[Royal rainmakers halt Phuket cloud-seeding operations](#)

The Phuket News

PHUKET: The royal rainmaking division for Southern Thailand has ceased its operations to seed clouds over Phuket to fill the island's main reservoirs ...

[Cloud seeding not an option for drought-ravaged Australia](#)

7NEWS

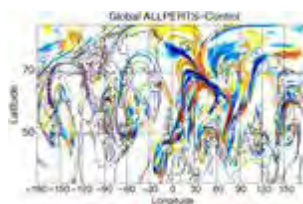
When torrential rains flooded downtown Dubai earlier this month, the United Arab Emirates' zealous embrace of **cloud seeding** was blamed by some.

Journal and articles online

[Downstream influence of mesoscale convective systems. Part 1: influence on forecast evolution](#)

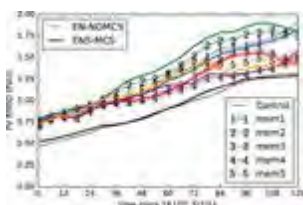
Samantha J. Clarke, Suzanne L. Gray, Nigel M. Roberts

Pages: 2933-2952 | First Published: 28 June 2019



Potential vorticity (PV) anomalies produced in a convection-permitting simulation of a mesoscale convective system (MCS) can persist after coarse graining to convection-parametrizing resolution. Perturbing a convection-parametrizing simulation to include these coarse-grained anomalies produces synoptic-scale forecast differences (compared to the unperturbed forecast) that cover the entire northern hemisphere after a few days and are largest at upper-tropospheric levels. Therefore, misrepresentation of PV structures associated with MCSs in convection-parametrizing simulations are a potential source of forecast error.

[Downstream influence of mesoscale convective systems. Part 2: Influence on ensemble forecast skill and spread](#)



Perturbing convection-parametrizing simulations to include potential vorticity anomalies from convection-permitting simulations of a mesoscale convective system (MCS) produces systematic impacts on the downstream forecast in an ensemble, leading to alternate realizations of the forecast. The root mean square difference analysis shown here demonstrates that the effects of localized MCS perturbations are smaller than those of global operationally generated initial condition perturbations. Despite this, the combined ensemble spread is enhanced when including MCS perturbations, so they could be useful operationally.

[Determination of automatic weather station self-heating originating from accompanying electronics](#)

P. Pavlasek, A. Merlone, F. Sanna, G. Coppa, C. G. Izquierdo, J. Palencar, S. Duris
Version of Record online: 13 November 2019



This study focuses on the most commonly used temperature sensors within automatic weather stations, with a specific focus on evaluating the self-heating effect, which originates not only from the temperature sensor itself but also from the electrical components housed together within. The results of overall self-heating indicated a 0.07°C increase in temperature for the tested sensors when using the manufacturers' minimum recommended electric current supply. The use of elevated voltage levels up to 80% of recommended values shows a temperature increase as high as 0.32°C.

From: [Linda Stopforth](#)
To: [EveryoneAtKelburn](#); [EveryoneAtAuckland](#); [EveryoneAtParaparaumu](#); [EveryoneAtChristchurch](#); [EveryoneAtMetOcean](#)
Cc: [Erick Brenstrum](#); [Bob McDavitt \(hotmail\)](#); [Paula Acethorp](#)
Subject: News headlines / Panui from the Library - Thursday 31 October 2019
Date: Thursday, 31 October 2019 9:36:27 am
Attachments: image006.png
image007.png
image010.png



It's not just vampires after blood tonight – many of your fellow citizens can benefit too.

Just one donation can help save the lives of up to three people.

[If you can, give blood](#)

New Zealand weather and climate news (MetService focus)

[Vietnam, New Zealand sign MoU on providing weather-related data](#)

New Straits Times Online

Vietnam's HYMETEC signed a MoU with New Zealand's MetService to work closely on providing weather-related information for broadcast and online ...

[Funding two bodies to produce the same weather forecast](#)

There are storm clouds hanging over the future of New Zealand's weather forecasting services.

[STOP: DOC launches new warnings on Tongariro Alpine Crossing amid concerns](#)

"In the last seven years, we've grown from a search and rescue one in every 5000 participants that are going on the Tongariro Alpine Crossing to now ...

[Wild weather working its way up South Island](#)

MetService meteorologist Angus Hines said the front went through Oamaru about 4pm, causing temperatures to drop from 22C to 9.6C within an hour

[South cops more wild weather](#)

Otago Daily Times

MetService said there was a moderate risk of thunderstorms from Clutha to Christchurch through the afternoon, which could be accompanied by brief ...

[Stars align in Wairarapa for astro-tourism business](#)

Stuff.co.nz

Whitby estimated that they would get clear weather 60 per cent of the time and the dry air in that part of the country also helped viewing clarity.

[Hot weather: Bay temperatures to jump close to 30C this weekend](#)

New Zealand Herald

MetService meteorologist Peter Little said the weather coming to the Bay was looking "pretty nice" and would be a pleasant treat after a cold October.

MetOcean (and oceanmet, marine weather etc)

[Alice Goward-Brown joins MetOcean Solutions](#)

We are delighted to welcome Dr Alice Goward-Brown to MetOcean Solutions. Alice is a physical oceanographer and will be joining our marine project consultancy team, based in New Plymouth.

[Dr Ocean Mercier - Moana Project Researcher- awarded 2019 Callaghan Medal](#)

Congratulations to Dr Ocean Mercier who last week was awarded the Callaghan Medal from the Royal Society Te Apārangi for her pioneering work to engage audiences in science and mātauranga Māori.

[Fugro enters Korean offshore wind market](#)

reNEWS

... UST21's local hydrography capacity to provide site characterisation services, including geotechnical, geophysical and offshore **metocean** solutions.

[GLOBAL: Enginei EFMS portal adds metocean map overlays](#)

Bunkerspot

Royston's Enginei electronic fuel management system now includes detailed map overlays from Tidetech to facilitate more accurate vessel tracking ...

[Research on large storm waves could help lessen their impact on coasts](#)

An international team of researchers has analyzed months of data of large nearshore waves to provide new insights that could help improve the designs of a variety of coastal structures from seaports to seawalls to better withstand destructive waves.

[Water Safety NZ partners with Māori to save lives](#)

On average Māori account for over 20 percent of all preventable and non-preventable drowning fatalities, despite comprising only 15 percent of the nation's population. To stem the tide of tragedy, Water Safety New Zealand (Haumarū Wai O Aotearoa) knows that working with Māori is key. To fund their partnerships, ACC have granted Water Safety \$1 million for a two year pilot scheme.

[Uni students invent buoy to detect riptides](#)

Victoria University students Chamonix Stuart & Hannah Tilsley have designed a system to help prevent drownings in rip currents.

[Enginei EFMS Portal Incorporates Detailed Metocean Map Overlays](#)

Hellenic Shipping News Worldwide

Metocean map overlays showing air temperature, cloud cover, sea currents, wind speed and direction, and wind conditions are now fully integrated ...

WMO

[High Mountain Summit seeks to boost climate and disaster resilience](#)

The world's highest peaks, ranging from the Andes to the Alps and the Third Pole to the tropics, are being hit hard by climate change, and the impacts of this are cascading down to some of Earth's...

[WMO-IMO Symposium addresses extreme maritime weather](#)

WMO and the International Maritime Organization (IMO) held the first joint Symposium on Extreme Maritime Weather: Towards Safety of Life at Sea and a Sustainable Blue Economy

[Antarctic ozone hole is smallest on record](#)

In 2019, the hole that developed in the ozone layer over Antarctica was the smallest on

record since the ozone hole was first discovered, according to U.S. scientists.

[WMO calls for protection of radio frequencies vital to weather forecasts](#)

Posted:

The World Meteorological Organization is calling on governments to protect radio frequencies allocated to Earth observation services which are vital for weather forecasts and long-term climate change...

[Papua New Guinea National Weather Service launched Strategic Plan](#)

Posted:

Mr Roy Mumu, Secretary for the Department of Transport officially launched the National Weather Service's Strategic Plan (2019-2023). The launching event is part of the Second Workshop of the CREWS...

ECMWF

[Weather forecasts will be improved with exascale systems - Tiago Quintino from ECMWF explains ...](#)

Primeur Magazine

Tiago Quintino explained in his presentation that **ECMWF** runs several simulation models that run weather forecasts on their supercomputer.

Volcano alert/watch

[Scientists keep close watch on White Island rumbles](#)

Scientists are keeping a close eye on rumbles at New Zealand's most active volcano – with two key indicators of unrest at their highest level in three years.

Extreme weather (and other news) – Antarctica and offshore

[The Antarctic ozone hole is the smallest since it was discovered](#)

WRAL.com

The ozone is monitored by NASA and NOAA through a variety of instruments, including **satellites** and **weather** balloons. NOAA's balloons carry ...

Extreme weather (and other news) – Australia and Pacific

[Bureau of Meteorology continues security push](#)

Computerworld Australia

The Bureau of **Meteorology** is working on integrating an upgrade to its HPC infrastructure into a major multi-year ICT transformation program that is ...

[Sufferers of asthma and respiratory disease stuck indoors on windy days as NSW drought intensifies](#)

People with asthma and respiratory diseases are advised to prepare for potentially more dust storms as the drought intensifies in parts of New South Wales.

Extreme weather (and other news) – Asia and the Middle East, Africa

[Norway helps Vietnam improve marine forecast capacity](#)

<http://en.vietnamplus.vn/> (press release)

According to Cuong, the VMHA and **meteorological** and hydrological stations in coastal areas have applied **technologies** to forecast tidal surges

[Category 4 Kyarr is the strongest cyclone over the Arabian Sea in 12 years](#)

Washington Post

The Indian **Ocean** beast — dubbed a top-tier “super cyclonic storm” by the India **Meteorological** Department — is the first storm of such intensity to rage ...

[Why Fewer Typhoons Are Reaching Normally Hard-Hit Parts of Asia | Voice of America - English](#)

Voice of America

Why Fewer Typhoons Are Reaching Normally Hard-Hit Parts of **Asia** ... Jason Nicholls, senior **meteorologist** with American forecasting service ...

International news and research

[New Navy Weather Models Will Revolutionize Forecasting](#)

DVIDS (press release)

... breakthrough **technologies** into these models, which will improve the science of **weather forecasting** for many years. By coupling the Navy's weather, ...

['Climate change is happening': The storm chaser who defends science in the White House](#)

Washington Examiner

It puts him at the heart of an administration frequently condemned as anti-science, a meteorologist and extreme weather expert working for a president ...

[Satellite data used to calculate snow depth in mountain ranges](#)

Bioscience engineers have developed a method to measure the snow depth in all mountain ranges in the Northern Hemisphere using satellites. This technique makes it possible to study areas that cannot be accessed for local measurements, such as the Himalayas.

[Climate warming promises more frequent extreme El Niño events](#)

New research, based on 33 historical El Niño events from 1901 to 2017, show climate change effects have shifted the El Niño onset location from the eastern Pacific to the western Pacific and caused more frequent extreme El Niño events since the 1970's. Continued warming over the western Pacific warm pool, driven by anthropogenic climate change, promises conditions that will trigger more extreme events in the future.

[A Guide to Understanding Satellite Images of Hurricanes](#)

WeatherNation

A Guide to Understanding Satellite Images of Hurricanes ... Institute for Meteorological Satellite Studies at the University of Wisconsin-Madison.

5G network

[Will 5G impact weather forecasting? A UN conference aims to find out](#)

Android Central

... predictions than modern **technology**, a UN summit in Egypt is now convening to determine the future spectrum usage of 5G **technology** worldwide.

[Australian Mobile Carriers Won't Get Really Fast 5G Millimetre Wave Spectrum til mid 2021](#)

Ausdroid

The Australian Federal government has commenced the process to auction spectrum in the 26 GHz band to support the next stage of 5G coverage ...

Aviation

[New era for Air New Zealand's International Network](#)

Air New Zealand is accelerating its ambitions for North America and will launch a non-stop service between Auckland and New York using its 787-9 Dreamliner in October 2020.

[Wellington Airport expansion plan baffles climate change experts](#)

Despite messages to reduce air travel, Wellington Airport is planning for 25 per cent more flights by 2040.

[DFW Airport, American Airlines Offering Non-Stop Service To New Zealand](#)

CBS Dallas / Fort Worth

Today DFW Airport and American **Airlines** announced the addition of non-stop service to Auckland, New Zealand. Katie Johnston reports. 6 hours ago ...

Business/Insurance

[Why weather now means business and how it affects you](#)

Down To Earth Magazine

Every day at **Weather Co's** office in Brookhaven, in the US state of Georgia, some 600 meteorologists, data analysts and a supercomputer analyse ...

Farming/horticulture/Aquaculture

[Horticulture NZ already working with growers on climate](#)

Horticulture New Zealand has welcomed the Government's endorsement of the Primary Sector Climate Change Commitment, saying it has already started working with its growers on the challenges associated with climate change.

Health

[Los Alamos AI model wins flu forecasting challenge](#)

EurekAlert (press release)

"Accurately forecasting diseases is similar to **weather forecasting** in that you need to feed computer models large amounts of **data** so they can 'learn' ...

History

[Decades of detailed weather reports pulled from old maritime logs](#)

National Geographic

Decades of detailed **weather** reports pulled from old maritime logs ... of the Old **Weather**: Arctic project, a **citizen science**-fuelled effort to digitise and

Satellites and radar

[Weather Cannot Hide From Honeywell's New Advanced Radar System](#)

PRNewswire (press release)

The latest, most advanced addition to the IntuVue family expands Honeywell's advanced **weather** radar capabilities to more **aircraft**, helping pilots ...

Transport/roading/shipping/freight

[Colorado to use hyperlocal weather forecasting for road maintenance operations](#)

Traffic Technology Today

The cloud-based platform will provide CDOT decision makers with an easy-to-use display for effectively managing **road weather** issues.

Weather in pictures

[Satellite captures rarely seen atmospheric gravity wave phenomenon off WA's north](#)

Satellite images have captured a usually invisible phenomenon known as atmospheric gravity waves pulsing through clouds off Western Australia's north-west.

[Met Office explains reason behind rare 'upside-down rainbow' seen over Hull](#)

HullLive

A rare 'upside-down rainbow' has been spotted in the sky above Hull. Lee Middleton was walking near Swinderby Garth in Bransholme on Tuesday ...

[Stunning skylines and lighting storms feature in Weather Photographer of the Year 2019](#)

Yahoo New Zealand News

The winning entries in the Weather Photographer of the Year 2019 competition showcase the most amazing pictures of skylines, lightning storms and ...

Climate change / global warming / sea level rise

[Why we won't be heading into an ice age any time soon](#)

Professor James Renwick from the School of Geography, Environment, and Earth Sciences explains the science behind the warming and cooling of Earth and how it relates to current climate change.

[Climate explained: how volcanoes influence climate and how their emissions compare to what we produce](#)

Everyone is going on about reducing our carbon footprint, zero emissions, planting sustainable crops for biodiesel etc. Is it true what the internet posts say that a volcano eruption for a few weeks will make all our efforts null and void?

[Homes of 240,000 Kiwis in way of worst case 2100 sea level rise, study indicates](#)

Sea level rise could be affecting the homes of around quarter of a million New Zealanders by the end of the century, in a possible worst case scenario, according to US researchers.

[Climate change a financial and investment risk - report](#)

A report from a group of business leaders has found climate change has become a financial and investment risk, which requires strong leadership and urgent attention.

[The Government plans to pass a law requiring companies to disclose climate-change risks](#)

Listed New Zealand companies could soon be required by law to make any climate change-related risks to their businesses known to their shareholders.

Cloud seeding / Geoengineering

[China has built up its muscle on how to turn weather into a weapon. Can India match up to it?](#)

Defence Aviation Post

Just before the opening ceremony of the Beijing Olympics in 2008, China's weather-modification office — yes, the Chinese have something like that ...

Te reo

[Digital platform to ease access of te reo Māori for 21st century conversations](#)

New Zealanders could soon be saying 'kia ora' to their smartphone voice assistants, like Siri and Alexa, thanks to new funding from the government.

Emergency preparedness / disaster planning / resilience

[Tasman forest fire review proposes recommendations to Fire and Emergency](#)

Fire and Emergency New Zealand should develop a nationally consistent framework for

tactical fire planning, an independent review of the Tasman forest fire response has recommended.

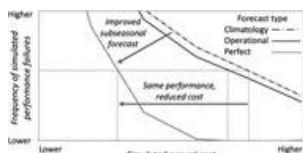
Journal and articles online

RESEARCH ARTICLES

[Quantifying the potential for improved management of weather risk using sub-seasonal forecasting: The case of UK telecommunications infrastructure](#)

David J. Brayshaw, Alan Halford, Stefan Smith, Kjeld Jensen

Version of Record online: 21 October 2019



In the United Kingdom, the telecommunication network provides an estimated net annual economic contribution of over £30 billion, yet it is exposed to considerable weather risk. This paper provides an end-to-end demonstration of the potential for skilful sub-seasonal meteorological forecasts to improve decision-making in telecommunication infrastructure management. Meteorological forecast skill is argued to be a necessary rather than a sufficient condition, with explicit modelling required to demonstrate utility to users in complex decision environments.

Of interest

13 November, Lower Hutt

[West Antarctic ice sheet: potential collapse and impacts](#)

Associate Professor Nancy Bertler from the Antarctic Science Platform speaks about her ice core research, and the changing environment of West Antarctica. She will give a talk as part of the [Marsden Fund 25 series](#).




Linda Stopforth
Librarian, RLIANZA
Mon and Thurs 8am – 1pm
MetService – Te Ratonga Tiorangi


d +64 4 470 0825 t +64 4 4700 700
30 Salamanca Road, Kelburn, Wellington 6012
PO Box 722, Wellington 6140, New Zealand




metservice.com . metraweather.com . metocean.co.nz



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 **MetService**
TE RATONGA TIORANGI

(Thailand) Ltd [No. 0105558115059] are wholly-owned subsidiaries of Meteorological Service of New Zealand Ltd (MetService)

From: [Linda Stopforth](#)
To: [EveryoneAtKelburn](#); [EveryoneAtAuckland](#); [EveryoneAtChristchurch](#); [EveryoneAtParaparaumu](#); [EveryoneAtMetOcean](#)
Subject: News headlines / Panui from the Library - Thursday 5 September 2019
Date: Thursday, 5 September 2019 9:48:01 am
Attachments: image005.png
image011.png
image012.png

New Zealand weather and climate news (MetService focus)

[Blustery, wet Thursday in store for the north before chilly blast hits the country for the weekend](#)

New Zealand Herald

MetService meteorologist Sarah Hadden said there was a complex low system over New Zealand that would pass over the country near Auckland this ...

['Messy, complex' weather hitting New Zealand 'tricky' to predict](#)

Stuff.co.nz

According to MetService meteorologist Sarah Haddon, the country was in the midst of a complex weather system that was quite difficult to predict ...

[Cold snap set for Sunday](#)

Otago Daily Times

Spring has arrived, but it seems winter is not yet ready to farewell the South. MetService forecaster Cameron Coutts said snow was forecast to fall as ...

[Sniff of rain coming Hawke's Bay's way](#)

New Zealand Herald

Hawke's Bay could be getting some rain for most of the first half of this month, according to the latest **MetService** forecasts. After a dry August, with most ...

[Most rain at Waikura](#)

Gisborne Herald

The MetService heavy rainfall warning for the region remains in place, with a further 80-100mm of rain likely on top of what has already fallen, through ...

[Snow may be on the way for Christchurch's Port Hills](#)

Stuff.co.nz

Spring may have just begun, but snow is forecast to hit Christchurch's Port Hills by the end of the week, MetService says. The weather forecaster ...

[Wild weather hits Auckland with trees and powerlines down](#)

Aucklanders can expect another wet day after wild weather caused chaos overnight.

MetService said thunderstorms were possible and northeasterlies would be strong in exposed places.

['Dynamic' weather system set to bring heavy rain and strong winds](#)

Stuff.co.nz

Grab your raincoat, because there's wet and windy weather headed to New Zealand. **MetService** meteorologist April Clark told Stuff on Monday that ...

[Explained: Why August's weather has been so miserable](#)

New Zealand Herald

Now **meteorologists** say the big drivers that gave winter a depressing third act also cooled down seas which have been running warm since 2017.

[Auckland breaks record for the most number of rain days in August](#)

Stuff.co.nz

Auckland has broken a weather record for the most rain days in a calendar month. According to **MetService**, the City of Sails clocked up a total of 29 ...

[Rain forecast for Hawke's Bay - but is it enough?](#)

New Zealand Herald

Rainfall at **MetService** reading stations at Hawke's Bay Airport and in Hastings in August was less than half the August average, which is based on ...

[Spring has arrived with predictable unpredictability](#)

Stuff.co.nz

... meteorologists measured from September 1 to the end of November - was the unsettled nature of the weather throughout, **MetService's** Tom Adams ...

[Competing weather forecasts from two separate Govt agencies labelled 'absurd'](#)

Stuff.co.nz

Instead, Niwa made its own decision and, in a 2015 briefing for former National Party minister of science and **innovation** Steven Joyce, was quoted as ...

[Auckland's rain days continue: Spike in 'very wet' days, August new rain record](#)

New Zealand Herald

As we head into the last day of August - and the last day of winter - **Metservice** has confirmed 29 days of rain, measured at its weather station at ...

[Unsettled weather forecast over next three months](#)

Otago Daily Times

"The central Pacific **El Nino** event that arrived in March this year has ended, giving way to **El Nino** Southern Oscillation (ENSO) neutral conditions, ...

[Safety of Mt Ruapehu buildings reviewed after five skiers injured by falling ice](#)

Ski patrol staff are reviewing the safety of all buildings on Mt Ruapehu following an incident where slabs of ice fell from a roof and hit a group of skiers.

[Temperature high up in atmosphere above Antarctica sets record](#)

The temperature many kilometres up in the atmosphere above Antarctica is the highest it's ever been for the time of year in records going back six decades.

WMO

[Widespread fires harm global climate, environment](#)

Fires that are raging in the Amazon rainforest are compounding the stress on the global climate and environment already unleashed by exceptional fires in the Arctic. There are also widespread fires...

[UN chief appeals to G7 leaders for strong climate action](#)

People all over the world are calling for a shift towards a greener, cleaner future, according to UN Secretary-General António Guterres, stressing that "we have the tools to address the climate..."

Extreme weather (and other news) – Antarctica and offshore

[Antarctic weather observer not fazed by 40-hour blizzard, frozen fingers and dark winter days](#)

ABC News

Antarctic **weather** observer Craig Butsch was not fazed about spending 40 hours trapped inside a **shipping** container. He and a team were returning ...

Extreme weather (and other news) – Australia and Pacific

[Good weather mitigates king tide damage in Kiribati](#)

Damage from this morning's king tide in Kiribati was eased by calm weather, according to a climate spokesperson.

[BOM long-term outlook predicts another warm, dry spring on the way](#)

The pitter patter of rain has been welcomed by many on the country's east coast in recent days, and there is more on the way, but the long-term outlook for spring suggests it's not a sign of things to come.

[The winter was dry, the spring will likely be dry – here's why](#)

Winter still has a few days to run, but it's highly likely to be one of Australia's warmest and driest on record. While final numbers will be crunched once August ends, this winter will probably rank among the top ten warmest for daytime temperatures and the top ten driest for rainfall.

[Pacific climate change centre opens in Samoa](#)

A new facility dedicated to helping Pacific Island countries prepare for and cope with the impacts of the climate crisis is being officially opened today in Samoa.

Extreme weather (and other news) – Asia and the Middle East, Africa

[As South Asia's heat rises, living standards decline](#)

"Around 800 million South Asians—almost half of the region's population—live in "hotspots" or

geographical areas that will experience fewer crop yields, worse health outcomes, and declining productivity. As a result, hard-fought poverty reduction may be reversed.”

[Pakistan: Met Office installs new radar system](#)

The News International

ISLAMABAD: Pakistan Meteorological Department (PMD) has installed a modern radar system, under which three to ten days **weather forecast** would ...

[Pollution worsening droughts in India, reveals new study](#)

Skymet Weather

A new study has shown that **El Nino** is not the only factor that might be worsening Droughts in the country, but pollution is to be blamed as well.

[Convection-permitting models better depict the heavy rainfall events in 2016 eastern China flooding](#)

Phys.Org

... regional scale by using the **Met Office** Unified Model proves the added value of the convection-permitting model in simulating heavy rainfall event.

[August 2019 likely the driest and warmest on record, says Met Service](#)

CNA

SINGAPORE: This month was likely Singapore's driest and warmest August on record, said the Meteorological Service Singapore on Friday (Aug 30).

[AccuWeather's 2019 Asia autumn forecast](#)

AccuWeather.com

"While anywhere along the coasts of the Arabian Sea and Bay of Bengal are at risk, expected **weather** patterns suggest that northeastern India, the ...

[Bangladesh should take 'total weather insurance'](#)

Asia Times

The industry now pays an average of \$50 billion a year in **weather-** and climate-related insurance losses, including property damage and **business** ...

[Oman- GCC to use China's expertise in weather monitoring system](#)

MENAFN.COM

... operating both geostationary and polar-orbiting **meteorological satellites**. They also play an important role in weather forecasts, climate predictions, ...

[Pacific basin active in wake of 3 Tropical Storms. Lingling likely to impact Japan](#)

Skymet Weather

The first one is the Tropical Depression, Kajiki which at present is in the **South China Sea** and is very close to the coastal parts of Vietnam. This system ...

[Bihar govt signs pact with pvt firm for weather forecasts](#)

Daijiworld.com

... Water Resource Department in disaster preparedness from the **data** shared ... Being India's first private **weather forecasting** company, we at Skymet ...

Extreme weather (and other news) – Americas and Europe

[Met Office expert reveals why Cambridge is the hottest place in the UK on record](#)

Cambridgeshire Live

The reason, Grahame Madge from the **Met Office** explains, is partly because of Cambridge's geographical location. Situated inland, the whole county ...

[Climate change affects floods in Europe](#)

Posted: 28 Aug 2019 11:01 AM PDT

For a long time, scientists argued whether or not climate change is affecting floods. No clear trends seemed to be evident. Now, in a major international study, data from numerous measurement stations all across Europe have been evaluated. The data clearly shows that climate change is indeed influencing the magnitude of flood events. However, climate change has different consequences in different regions.

[Europe warming faster than expected due to climate change](#)

Posted: 28 Aug 2019 07:05 AM PDT

Climate change is increasing the number of days of extreme heat and decreasing the number of days of extreme cold in Europe, posing a risk for residents in the coming decades, according to a new study.

[Meteorologist: Bahamas never hit with hurricane this strong](#)

CNN International

Hurricane Dorian continues to strengthen, with winds increasing up to 180 mph. The hurricane will be capable of catastrophic damage as it tracks ...

[Rescuers preparing to go into hard-hit areas of Bahamas after historic destruction](#)

Hurricane Dorian has left the Bahamas absolutely decimated after parking over the islands for 40 hours and pounding them with ferocious winds and surging seawaters that destroyed thousands of homes and left at least seven people dead.

[Dorian leaves parts of Bahamas in ruins](#)

Hurricane Dorian has left parts of the Bahamas in utter devastation after three days of pummeling the islands. On Tuesday some of the first glimpses of the ruins of Great Abaco Island emerged showing mile on mile of flooded streets, shredded buildings, and shipping containers thrown in every direction like toys. What appeared to be the island's airstrip- was almost completely underwater. Still, the full scale of the disaster may not come into focus until the storm passes. A number of deaths have been reported, but authorities say they expect it to rise. Messages on Twitter described whole communities being swept away. Bahamas Prime Minister Hubert Minnis has called it a historic crisis - but said he's confident

[Watch Hurricane Dorian in Action in these Gifs NASA and NOAA Took from Space](#)

Space.com

Satellites operated by NASA and the National Oceanic and Atmospheric ... The result is it's holding back heavy **weather** here at the moment... but ...

[CNN meteorologist: Never seen anything like Dorian](#)

CNN

CNN **meteorologist** Ivan Cabrera says in all his years of covering hurricanes, he's never seen a storm behave like Hurricane Dorian which has stalled ...

[Trump insists meteorologists are wrong and he is right to say Hurricane Dorian could have hit ...](#)

The Independent

Donald Trump has insisted he is right - and **meteorologists** are wrong - over his repeated claim Hurricane Dorian could strike parts of Alabama.

International news and research

[What are spaghetti models?](#)

WTSP.com

... computer-generated and come from places like the National Weather Service, Canada's Deterministic Prediction System and the U.K. **Met Office**.

[Flying Into Dorian — The Job of a NOAA Hurricane Hunter Meteorologist](#)

WeatherNation

We had a chance a chance to speak with Science Section Chief Paul Flaherty, one of the **meteorologists** that has been flying into and studying Dorian.

[Hurricane Forecasting Gets a Boost From Cloud-Piercing Satellite Data](#)

HPCwire

A team of researchers at Penn State have revisited this historic shortcoming of modern **weather forecasting**, leveraging cutting-edge satellite and **data** ...

[\[Interview\] Weather forecasting to move from information-based to impact-based forecast](#)

Mongabay-India

[Interview] **Weather forecasting** to move from information-based to ... In a lot of areas, we neither have proper **data** nor proper communication channels ...

[As students map the weather, an Indian village bests its water woes](#)

A weather station monitored by students - part of a range of water-smart innovations - has turned around a parched village

[Nasa investigates impact of PHL smoke on clouds](#)

Business Mirror

Aerosol-cloud dynamics have a profound impact on **weather** and climate, ... institution focused on atmospheric and Earth science in Southeast **Asia**.

[Deep snow cover in the Arctic region intensifies heat waves in Eurasia](#)

Variations in the depth of snow cover in the Arctic region from late winter to spring determines the summer temperature pattern in Eurasia, according to new research. In particular, deeper-than-usual snow cover in Western Russia enhanced the likelihood of summer heat waves in Europe and Northeast Asia in recent years.

[Defrosting surfaces in seconds](#)

Researchers have developed a way to remove ice and frost from surfaces extremely efficiently, using less than 1% of the energy and less than 0.01% of the time needed for traditional defrosting methods. Instead of conventional defrosting, which melts all the ice or frost from the top layer down, the researchers established a technique that melts the ice where the surface and the ice meet, so the ice can simply slide off.

[Why Is Hurricane Dorian's Path So Tricky to Predict?](#)

And here's where forecasters think the powerful storm is most likely to make landfall.

[How Strong Can a Hurricane Get?](#)

Category 5 on the Saffir-Simpson hurricane scale has no upper bound, on paper. But in theory, winds from a powerful hurricane could blow the scale out of the water, scientists say. There is no such thing as [a Category 6 storm](#), in part because once winds reach Category 5 status, it doesn't matter what you call it, it's really, really, bad.

[Hurricane Dorian forecasting shows how models have improved since Floyd in 1999](#)

Tampa Bay Times

In 1999, according to National Hurricane Center **data**, the average forecast track error for tropical ... Now, with what you learned from Twitter about **weather forecasting**, and the benefit of hindsight, how do you deal with this today?

[Earth's Orbital Shifts May Have Triggered Ancient Global Warming](#)

A new study combining astronomical and geologic data hints at an extraterrestrial cause for extreme climate change 56 million years ago

[Fighting Wildfires with Computer Models](#)

Prescribed burns can remove excess fuel from the forest floor, and algorithms can help fire crews know where to set them

[New feedback phenomenon found to drive increasing drought and aridity](#)

A new study indicates that the world will experience more frequent and more extreme drought and aridity than currently experienced in the coming century, exacerbated by both climate change and land-atmosphere processes. The researchers demonstrate that concurrent soil drought and atmospheric aridity are largely driven by a series of land-atmosphere processes and feedback loops. They also found that land-atmosphere feedbacks would further intensify concurrent soil drought and atmospheric aridity in a warmer climate.

5G network

[5G Coverage Could Set Back Accurate Weather Forecasts By 30 Years](#)

Observer

5G cell networks are going to set back **weather forecasting** ~30 yrs bc they operate at frequencies too near that of water vapor in the atmosphere, ...

[Weather Agencies See Risk to Future Storm Forecasting From 5G](#)

Bloomberg

Weather agencies are warning that signals from new 5G mobile networks ... It uses frequencies of 24.25-27.5 gigahertz, while the **weather satellites** ...

Aviation

[Can the aviation sector withstand visitor downturn?](#)

Singapore Business Review

Their significant overseas portfolios will help them **weather** the rough **flight**. Singapore **aviation** services will remain resilient despite visitor volatility ...

[Experimental Alaska **weather** product predicts clouds along routes](#)

AOPA Pilot (blog)

A new generation of **weather satellites** is making it possible to help Alaska pilots anticipate weather along their route of flight. An experimental Cloud ...

Business/Insurance

[Artificial intelligence meets **weather**: Time for change](#)

Planning, BIM & Construction Today

Construction **weather** and natural climate insight will change. ... Here at MetSwift our data scientists, meteorologists, coders and **business** specialists ...

[Grapefruit-sized hail storm in Edmonton caused \\$90 million in insured damage](#)

The Weather Network

Tuesday, August 27th 2019, 1:07 pm - More than half of the insured damages involved auto insurance coverage.

[Pitney Bowes and Baron Partner to Provide Businesses with Usable Real-Time **Weather** Risk Data](#)

SYS-CON Media (press release)

"We're thrilled to bring our **weather** expertise to Pitney Bowes, the data ... the accuracy and precision **delivered** by Pitney Bowes solutions, analytics, ...

Communications/social media

[Weathering the storm: **TG4** tells powerful stories of beating the odds](#)

Independent.ie

At the schedule launch yesterday were **TG4 weather** presenters Caitlín Nic Aoidh, Mairéad Ní Chuaig and Fiona Ní Flaithearta. They were joined by ...

[Weather 'wizard' wows Thailand with Facebook filter fail \(Video\)](#)

Coconuts

It's hard to take storm warnings seriously when they're coming from a talking raccoon. A top government **meteorological** said today that he was ...

[Distant Sensing and **Satellite** tv for pc Imaging Knowledge for Local **weather** Change and...](#)

Advanced Imaging Pro (press release)

Distant sensing, **satellite** tv for pc imaging and scientific visualization are used to offer scientists with knowledge on local **weather** change, ...

Energy and Mining

[UAE **meteorology** centre to highlight energy sector role](#)

Trade Arabia

The National Center of **Meteorology** (NCM) will highlight its important role in the ... Moreover, it will introduce trade visitors to the '**weather** enhancement ... of the Regional Association II (**Asia**) of the World **Meteorological** Organization ...

[Weather dependence on top of oil dependence](#)

Defence Connect

the role of all energy sources and **technologies** ... The introduction of high levels of **weather**-dependent renewable energy is, however, destabilising ...

Environment

[Wetlands and freshwater proposals set to cause stir](#)

A government plan to protect New Zealand's wetlands and freshwater due today will affect farmers and developers, RNZ understands.

Farming/horticulture/Aquaculture

[Drought blamed for drying up Landcorp earnings and profit](#)

New Zealand Herald

The **company**, which trades as Pamu, exceeded its earlier earnings forecast ... drop in milk production due to dry summer and autumn **weather** for the earnings fall. The **company** will pay a special dividend to the Government of \$5m, ...

[Ontario invests in weather prediction for grape industry](#)

Niagarathisweek.com

... the Ontario government's recent announcement of a \$67,600 investment to develop a modern **weather network** feeding real-time information into the ...

Health

[Nelson experiences annual wave of pine pollen](#)

It's the time of the year when puddles get rimmed with yellow and pollen covers vehicles parked outside. Metservice pollen forecaster Dr David Fountain said the annual pollen release from pinus radiata was a phenomenon that occurred across New Zealand

['I actually had to call in sick': Why seasonal allergies are getting worse for city dwellers](#)

Data shows pollen levels rising across Canada, including in Calgary, Montreal, Toronto

[Officials puzzled after heat deaths triple in Arizona, rise fivefold in Nevada since 2014](#)

The Seattle Times

... like better health care, more air-conditioning and improved **weather forecasting**. The latest **data** — which the CDC has compiled for all 50 states — suggests that climate change could be starting to outweigh those advances in the ...

[How climate change affects your mental health](#)

"For all that's ever been said about climate change, we haven't heard nearly enough about the psychological impacts of living in a warming world," says science writer Britt Wray. In this quick talk, she explores how climate change is threatening our well-being -- mental, social and spiritual -- and offers a starting point for what we can do about it.

[Montreal Protocol's successful protection of ozone averts rise in skin cancer](#)

Action 30 years ago to ban ozone-depleting chemicals has been "immensely successful" in stopping a significant jump in New Zealand skin cancer rates.

[El Niño May Be a Culprit Behind the Cholera Epidemic in Yemen](#)

Eos

Increased rainfall in East Africa caused by a particularly strong El Niño and subsequent weather conditions may have helped usher in one of the worst ...

History

[Archaeologists in Peru find remains of 227 sacrificed children](#)

Aljazeera.com

According to the archaeologists, the children show signs of being killed during the wet weather, probably in an attempt to "appease the **El Nino** ...

[Most powerful hurricane in US history hit the Florida Keys on Labor Day 1935](#)

Florida Today

Folks in 1935, before **weather satellites**, Doppler radar, the internet and even television, didn't have that option. And on Labor Day that year, which ...

Lightning

[Earth Networks Announces Enhanced Outdoor Alerting Solutions for Lightning Protection](#)

Olean Times Herald

GERMANTOWN, Md.--(BUSINESS WIRE)--Aug 29, 2019-- ... **Companies** across all industries use our **weather** data to automate decisions regarding ...

Transport/roading/shipping/freight

[Futuristic technologies improving roadways now](#)

Traffic Technology Today

This particular roadway with its **technology** stretches for 157 miles and is ... Digital speed limit signs warn motorists of **weather** conditions while other ...

[Air Freight vs. Ground Shipping: The Pros and Cons of Each](#)

The Strategic Sourceror (press release) (blog)

Traffic, road closures and the **weather** can also complicate matters. Flight delays tend to be easier to predict considering it's only a few hours long, ...

[New Integrated Technology Designed to Mean Faster and Safer Berthing of Ships](#)

The Handy Shipping Guide

... at berth in a given set of environmental and ***metocean** conditions. Richard Hepworth, President of Trelleborg's marine and infrastructure operation, ...

Innovation and technologies and AI

[Interview: Coming Soon. Impact-Based Weather Forecasts By IMD](#)

The Wire

In a lot of areas, we neither have proper **data** nor proper communication channels. ... A numerical model is the backbone of **weather forecasting** now.

Climate change / global warming / sea level rise

[Climate change will cripple economies regardless of wealth, economists say](#)

The United States could see a 10% loss in gross domestic product (GDP) without significant policy change, economists say in a new report

[Ruth Mottram - The melting of Greenland's ice sheet](#)

At 8.10am Glaciologist and climate scientist Ruth Mottram works for the Danish Meteorological Institute in Copenhagen where she studies the glaciers of Greenland for signs of how the world's weather is changing. Glaciers are streams of compacted ice that form over millenia, and can provide valuable water and tourism dollars for the communities around them. But with global temperatures rising, they are melting at an alarming rate.

[Evidence for past high-level sea rise](#)

Scientists, studying evidence preserved in speleothems in a coastal cave, illustrate that more than three million years ago -- a time in which the Earth was two to three degrees Celsius warmer than the pre-industrial era -- sea level was as much as 16 meters higher than the present day.

Cloud seeding / Geoengineering

[US experts test new cloud-seeding technique in UAE](#)

Khaleej Times

The UAE is getting a good number of rainy days, thanks to **cloud-seeding** missions. Now, a team of pilots and scientists from the US is testing a new ...

Conferences and professional development


4-14 December / Queenstown


[Southern Hemisphere Conference on Permafrost](#)

For the first time, the International Permafrost Association Regional Conference on Permafrost is coming to New Zealand.

Journal and articles online

Quarterly Journal of the Royal Meteorological Society





Quarterly Journal of the Royal Meteorological Society

[Early View](#)

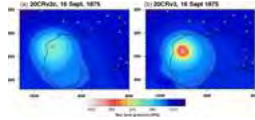
Online Version of Record before inclusion in an issue

INVITED MANUSCRIPTS

[Towards a more reliable historical reanalysis: Improvements for version 3 of the Twentieth Century Reanalysis system](#)

Laura C. Slivinski, Gilbert P. Compo, Jeffrey S. Whitaker, Prashant D. Sardeshmukh, Benjamin S. Giese, Chesley McColl, Rob Allan, Xungang Yin, Russell Vose, Holly Titchner, John Kennedy, Lawrence J. Spencer, Linden Ashcroft, Stefan Brönnimann,

Manola Brunet, Dario Camuffo, Richard Cornes, Thomas A. Cram, Richard Crouthamel, Fernando Domínguez-Castro, J. Eric Freeman, Joëlle Gergis, Ed Hawkins, Philip D. Jones, Sylvie Jourdain, Alexey Kaplan, Hisayuki Kubota, Frank Le Blancq, Tsz-Cheung Lee, Andrew Lorrey, Jürg Luterbacher, Maurizio Maugeri, Cary J. Mock, G.W. Kent Moore, Rajmund Przybylak, Christa Pudmenzky, Chris Reason, Victoria C. Slonosky, Catherine A. Smith, Birger Tinz, Blair Trewin, Maria Antónia Valente, Xiaolan L. Wang, Clive Wilkinson, Kevin Wood, Przemysław Wyszyński
Version of Record online: 23 August 2019



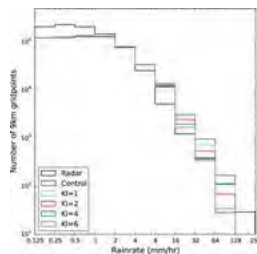
A significant new version of the Twentieth Century Reanalysis data assimilation system, 20CRv3, has been developed. The 20CRv3 dataset will provide an ensemble of sub-daily global atmospheric conditions spanning at least 180 years by assimilating only surface pressure observations into a coupled atmosphere–land forecast model. The new 20CRv3 system improves upon the previous system in several notable ways, including the use of upgraded data assimilation methods, a newer and higher-resolution forecast model, and a larger set of available pressure observations.

RESEARCH ARTICLES

[Modifications to the representation of subgrid mixing in kilometre-scale versions of the Unified Model](#)

Kirsty Hanley, Michael Whitall, Alison Stirling, Peter Clark

Version of Record online: 23 August 2019



The derivation of Smagorinsky–Lilly type subgrid turbulence schemes, such as that used in the Unified Model, is based on a number of assumptions, one of which is to ignore the tilting of horizontal flux into the vertical by horizontal gradients in vertical velocity. Here we show that including this extra flux in the Met Office's 1.5-km grid length UK model reduces the domain-average precipitation by reducing the number of grid points with rainfall rates greater than 4 mm/hr, which are overrepresented by the model.

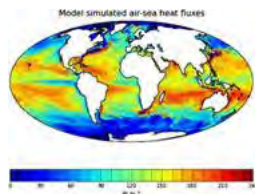
 Open Access

RESEARCH ARTICLES

[The impact of horizontal atmospheric resolution in modelling air–sea heat fluxes](#)

Peili Wu, Malcolm Roberts, Gill Martin, Xiaolong Chen, Tianjun Zhou, Pier L. Vidale

Version of Record online: 22 August 2019



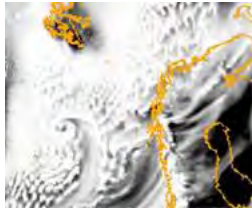
Air–sea heat exchange is complex. Adequately representing heat fluxes in numerical models poses a big challenge for modern weather forecasts and climate prediction. Using two versions of the Met Office Unified Model (MetUM) forced with observed SST from the same native grid, we find consistent and robust evidence that increasing horizontal model resolution significantly enhances air–sea heat fluxes at the mid–high latitudes while suppressing them in the Tropics. This is because of higher ventilation efficiency in high-resolution models.

 Open Access

RESEARCH ARTICLES

[Polar low variability and future projections for the Nordic and Barents Seas](#)

Oskar A. Landgren, Yurii Batrak, Jan Erik Haugen, Eivind Støylen, Trond Iversen



Polar lows are small but intense mesoscale cyclones that are not resolved in global climate models. We downscale a large climate model ensemble, track individual polar lows over the Nordic and Barents Sea and discuss separation of external forcing and internal variability. In the Nordic Seas, for the future scenario, we find a strong decrease in the autumn and a small increase in March, leading to a shortened and shifted future polar low season.

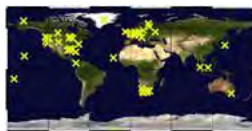
 Open Access

RESEARCH ARTICLES

[What global reanalysis best represents near-surface winds?](#)

Jaume Ramon, Llorenç Lledó, Verónica Torralba, Albert Soret, Francisco J. Doblas-Reyes

Version of Record online: 20 August 2019



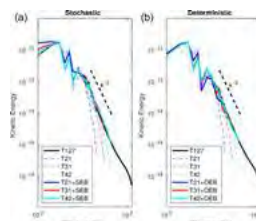
The coexistence of several global reanalysis products challenges the selection of the most appropriate product to satisfy the reanalysis user needs. Here we consider a set of five state-of-the-art global reanalyses to intercompare their wind data and eventually select the product that better represents the near surface wind speeds. The verification has been done using a set of 77 tall towers distributed worldwide, whose data have been exhaustively quality controlled for that purpose. Which reanalysis best represents near-surface wind speeds?

RESEARCH ARTICLES

[Energetically consistent scale-adaptive stochastic and deterministic energy backscatter schemes for an atmospheric model](#)

Suneet Dwivedi, Christian L. E. Franzke, Frank Lunkeit

Version of Record online: 20 August 2019



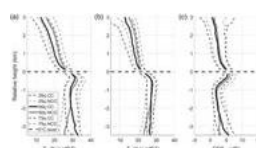
(a) Kinetic energy (KE)–wave-number spectrum of the PUMA model at horizontal resolutions T21, T31, T42 and T127, for 500 hPa. The dashed curves are for unperturbed simulations, whereas the solid curves are for simulations using the stochastic energy backscatter (SEB) scheme. (b) Same as in (a) but for the deterministic energy backscatter (DEB) scheme.

RESEARCH ARTICLES

[Investigating the GPM Dual-frequency Precipitation Radar signatures of low-level precipitation enhancement](#)

Leonardo Porcaccia, Pierre-Emmanuel Kirstetter, Viviana Maggioni, Simone Tanelli

Version of Record online: 19 August 2019



Conditional distributions of vertical profiles of reflectivities measured by the GPM Dual-frequency Precipitation Radar at

(a) Ku-band Z_m (Ku), (b) Ka-band Z_m (Ka), and (c) their Dual Frequency Ratio DFR_m , for collision-coalescence-dominant (CC; black curves) and non-CC (NCC; grey curves) profiles.

High-intensity precipitation represents a threat because of the related risk of natural disasters. Signatures of low-level precipitation enhancement that occurs in relation to collision-coalescence (CC) in the cloud warm layer are investigated in the observations from the Global Precipitation Measurement (GPM) core mission Dual-frequency Precipitation Radar (DPR) over the central/eastern Contiguous United States (CONUS) during June 2014–May 2018. The occurrence of CC-dominant precipitation is documented and the corresponding signatures of CC-dominant precipitation at Ku- and Ka-band are studied. CC-dominant profiles show distinguishing features when compared to profiles not dominated by CC, e.g. characteristic vertical slopes of reflectivity at Ku- and Ka-band in the liquid layer, lower freezing-level height, and shallower ice layer, which are linked to environmental conditions driving the peculiar CC microphysics. This work aims at improving satellite quantitative precipitation estimation, particularly GPM retrievals, by targeting CC development in precipitation columns.



Linda Stopforth
Librarian, RLIANZA
Mon and Thurs 8am – 1pm
MetService – Te Ratonga Tiorangi

d +64 4 470 0825 t +64 4 4700 700
30 Salamanca Road, Kelburn, Wellington 6012
PO Box 722, Wellington 6140, New Zealand



metservice.com . metraweather.com . metocean.co.nz

Watch Stay alert **Orange Warning Take action** **Red Warning Act now!**

Severe Weather Warnings are changing
Find out more at www.metservice.com/SevereWeather

MetService
TE RATONGA TIORANGI

The banner has a dark blue background with white and orange text and icons. It features three warning levels: Watch (yellow circle with exclamation mark), Orange Warning (orange hexagon with exclamation mark), and Red Warning (red triangle with exclamation mark). The MetService logo is in the bottom right corner.

MetraWeather (Australia) Pty Ltd [ACN 126 850 904], MetraWeather (UK) Ltd [No. 04833498] and MetraWeather (Thailand) Ltd [No. 0105558115059] are wholly-owned subsidiaries of Meteorological Service of New Zealand Ltd (MetService)

From: [Linda Stopforth](#)
To: [EveryoneAtKelburn](#); [EveryoneAtAuckland](#); [EveryoneAtChristchurch](#); [EveryoneAtParaparaumu](#); [EveryoneAtMetOcean](#)
Cc: [Erick Brenstrum](#); [Bob McDavitt \(hotmail\)](#); [Paula Acethorp](#)
Subject: News headlines / Panui from the Library - Thursday 18 July 2019
Date: Thursday, 18 July 2019 9:12:07 am
Attachments: image004.png
image005.png



New Zealand weather and climate news (MetService focus)

[Rain and snow batters south](#)

7:12 AM Heavy rain is expected and a major tourist route is closed due to forecast snow.

[Holidaymakers delighted with snowy Tekapo](#)

Stuff.co.nz

Tekapo woke to a dusting of snow on Wednesday morning. MetService meteorologist **April Clark** said while the agency doesn't have an automatic ...

[Mostly dry July for Timaru but wet weekend expected as school holidays end](#)

Stuff.co.nz

"You guys have fared a lot better than those kids on the West Coast and in the North Island," **MetService** meteorologist **April Clark** said, on Wednesday ...

[Heavy rain showers drench Palmerston North](#)

Stuff.co.nz

MetService meteorologist **April Clark** said there was a moderate thunderstorm risk in Manawatū on Wednesday and the type of clouds that had formed ...

[Snow closes South Island's Lewis Pass](#)

Stuff.co.nz

The MetService issued a road snowfall warning on their website on Wednesday afternoon. It said up to 2 centimetres of snow may settle near the ...

[Lightning hits retirement village as 5500 bolts hit New Zealand in heavy weather](#)

Lightning striking a retirement village in Levin was one of 5500 lightning bolts that were recorded over central New Zealand on Sunday.

MetService meteorologist **Hannah Moes** said an active front was moving over the upper South Island and lower North Island early on Sunday morning.

[More than 4500 lightning strikes hit New Zealand over 24 hours](#)

New Zealand Herald

You could be forgiven for thinking the country has been stuck in an AC/DC music video with all the lightning strikes which hit over the weekend.

[Dunedin-bound flight hit by lightning](#)

Otago Daily Times

According to MetService, in the North Island there were scores of lightning strikes this morning, mostly around Wellington and Taranaki, while in the ...

[Happy weather day: Take a day off from wild weather, New Zealand, but reprieve short-lived](#)

New Zealand Herald

MetService meteorologist **Andy Best** said a "train of lightning strikes" passed across Northland's west coast at Baylys Beach between 12.45pm and ...

[Northland lightning strike shatters windscreen of family car](#)

Meteorologist **Peter Little** said lightning strikes to cars were extremely uncommon. The more usual places for strikes were trees, buildings or open fields.

[Wild weather in Taranaki brings highway slip and power outages](#)

Wild weather in Taranaki caused power outages and a road slip that blocked the main state highway for northbound traffic.

[Two buildings, trees, trampoline damaged by Taranaki tornado](#)

A tornado has torn through a New Plymouth suburb, damaging two buildings in its path.

[Mt Ruapehu eruption alarms triggered by earthquakes and wind gusts](#)

A "perfect storm" of earthquakes and high winds triggered Mt Ruapehu's eruption alarms on Sunday.

['Front after front': Wild week set to bring snow, downpours, gales](#)

Another round of stormy weather is closing in, bringing snow to low levels, downpours, gales and possible tornadoes to some areas - and yet another battering from the elements is due later in the week.

WMO

[Climate Action is central to Sustainable Development Goals](#)

Posted:

A new report has been published on the progress towards meeting the targets of the 17 Sustainable Development Goals or SDGs, which commit countries to mobilize efforts to end all forms of poverty,...

[Unprecedented wildfires in the Arctic](#)

Posted:

Unusually hot and dry conditions in parts of the northern hemisphere have been conducive to fires raging from the Mediterranean to – in particular – the Arctic. Climate change, with rising...

ECMWF

[Natural Gas - Weather Model Disagreement Creates Opportunity](#)

Seeking Alpha

ECMWF-EPS is far more bullish than GFS-ENS, which is going to create an opportunity going forward. We believe "king euro" is likely to be correct, ...

Extreme weather (and other news) – Asia and the Middle East, Africa

[More than 100 dead, millions displaced in floods across South Asia](#)

A deadly monsoon is wreaking havoc across South Asia, leaving more than 100 people dead

and displacing millions more.

['They ask us if we can make it stop raining or make it rain': Life as a weather forecaster in Singapore](#)

CNA

SINGAPORE: Nestled in a corner of Changi Airport, sheltered from the hubbub of one of the world's busiest airports, is the Meteorological Service's ...

[Tropical Storm Danas to bring flood risk to Philippines, Taiwan, China, South Korea and Japan](#)

...

AccuWeather.com

"At this point, AccuWeather **meteorologists** believe it will remain a tropical storm and not achieve typhoon status," according to AccuWeather Senior ...

Extreme weather (and other news) – Americas and Europe

[Barry could cause up to \\$10B in storm damage, meteorologists predict](#)

New York Post

Experts estimate that the total damage and economic loss caused by Tropical Storm Barry — which is set to deliver a punishing blow to the Gulf Coast ...

[US officials to make disaster warnings faster, clearer about life-threatening events](#)

Washington Post

"Sometimes **meteorologists** will criticize people for looking outside for a sign of the storm, but that's a very natural instinct." Floods, tornadoes, wildfires ...

[Greek storms kill six as 'extremely unusual' weather prompts state of emergency](#)

Six people, including two children, have been killed and more than 100 others injured after gale-force winds, rain and hailstorms struck northern Greece, uprooting trees and collapsing roofs.

[UK weather forecast – Three-month heatwave to start with 27C scorcher this week and warm](#)

...

The Sun

Claire Kennedy-Edwards, senior meteorologist for The **Weather Company**, told Sun Online: "It is a much more settled outlook across the UK with ...

International news and research

[Embry-Riddle Aeronautic University Chooses Baron for Weather Tracking](#)

Campus Safety Magazine

Baron, a leading provider of critical weather solutions, announces that ... analysis and forecasting, **aviation weather**, and tropical meteorology classes.

[Ammonia from agriculture influences cloud formation over Asia](#)

Science Codex

Ammonia from agriculture influences cloud formation over **Asia** ... Sensing Division of KIT's Institute of **Meteorology** and Climate Research (IMK-ASF).

[The Weather Is Worse, but Forecasts Keep Getting Better](#)

Slate Magazine

Nothing is more banal than talking about the **weather**. ... In the current one, he turns his eye toward the **satellites**, equations, and algorithms—and, yes, ...

[Indian Ocean causes drought and heatwaves in South America](#)

Researchers have revealed that atmospheric waves originating from convection over the Indian Ocean had a dramatic impact on climate conditions over South America and South Atlantic, leading to drought and marine heatwaves. Importantly, these conditions are not a one-off and are likely to happen again.

[Andrew Blum: The Weather Machine How we See into the Future](#)

An accurate weather forecast can change history. The ability to get the weather right is getting better all the time with advances in computer simulations, satellites and global cooperation.

But the outlook for access to that vital information is not so sunny. Journalist, author and weather geek Andrew Blum explains how weather prediction works and why it's under threat in his new book, *The Weather Machine How we See into the Future*

[Ask the Weather Guys: Did the moon landing influence weather forecasting?](#)

Madison.com

With specific respect to **weather forecasting**, the space race was responsible for enormous advances in satellite **technology** that now provide the ...

Aviation

[Sudden turbulence that injured dozens on Sydney-bound flight is hard to predict](#)

Stuff.co.nz

Pilots rely on data from weather balloons and other pilots to predict turbulence but there is less information on conditions over the ocean than for over ...

[Why the turbulence that injured passengers on an Air Canada flight is hard to predict](#)

Boston.com

The plane may have run into clear air turbulence, which is caused by wind ... Pilots rely on data from weather balloons and other pilots to predict ...

['Sudden and severe' turbulence wreaks havoc on Emirates flight from Auckland](#)

Passengers were terrified, vomiting and injured following severe turbulence on an Emirates flight from Auckland to Dubai.

The "sudden and severe turbulence" left the business class cabin in tatters with Champagne bottles on the floor, food carts overturned, and even a fallen exit sign.

[Meteorologists say airplane turbulence can strike out of the blue](#)

Texarkana Gazette

NEW YORK—They literally don't see it coming. "Clear-air turbulence," which evidently jolted an Air Canada flight Thursday over the Pacific Ocean,

[The Best Defense Against Clear Air Turbulence Injuries Like Those Aboard Air Canada Flight Is ...](#)

Forbes

While airlines and pilots plan their flight paths to avoid weather systems that could cause a risk to passengers, clear air turbulence, known as CAT, ...

[China's civil aviation industry sees steady growth in H1](#)

Xinhua

Amid increasing flights and extreme weather conditions, the flight on-time performance reached 80.35 percent. In the first half of 2019, the total ...

Business/Insurance

[Insurers will manage, survive climate change risks – expert](#)

Insurance Business New Zealand

Recent reports have projected extreme **weather** events and flooding could ... Chapman Tripp believes it will be beyond the control of **business**. It noted ...

[Unlikely Industries That Use Weather To Make Business Decisions](#)

Forbes

It influences peoples' moods, behaviors and performance, which is why the information and data that **meteorologists** can provide business owners ...

Energy and Mining

[Last summer's heatwave made electricity price forecasts look foolish. Will it happen again?](#)

RenewEconomy

Last summer's heatwave made **electricity** price forecasts look foolish. In the end, unsurprisingly, neither **weather** or **demand** forecasting is that ...

[Natural Gas Rises on Weather, Storm-Induced Disruptions](#)

Yahoo Finance

The U.S. **Energy** Department's weekly inventory release showed a ... industrial sector **demand** even as the usage of natural gas-fired **power** to run ...

Farming/horticulture/Aquaculture

[Vic Government details farm IoT trial technologies](#)

IoTAustralia (blog)

Vic Government details farm IoT trial **technologies** ... Monitor **weather** conditions including air temperature, relative humidity, barometric pressure, wind ...

[King Salmon seeks consent to farm in Cook Strait next year](#)

King Salmon has lodged a consent application to begin salmon farming in Cook Strait to escape the warming inner-shore waters.

Government (regional and national)

[Government boosts R&D funding for pre-profit firms](#)

Stuff.co.nz

... funding, the Minister for Research Science and Innovation, **Megan Woods**, has announced. ... **New Zealand** cannot afford not to innovate.

Hydrology / Flooding

[Flood prediction model developed](#)

The duration of floods can be determined by river flow, precipitation and atmospheric blocking. Now an international team of researchers is offering a novel physically based Bayesian network model for inference and prediction of flood duration. The model also accurately examines the timescales of flooding.

Lightning

[Tracking Lightning To Prevent Fire](#)

KDRV

stormwatch 12 **meteorologists** track storms and lightning through forecast models, radars and weather cams. but to prevent fires, our chief ...

[Fatal lightning strikes down this year, but don't let your guard down](#)

Atlanta Journal Constitution

There's no obvious reason, **meteorologists** say. It could be that there's more public awareness to the dangers of lightning, or the technology advances, ...

Satellites and radar

[Soyuz Rocket Launches Russia's Weather Satellite](#)

Market Reports

Russia has been launching such **weather satellite** into space. The first one which was called Meteor-M No1 was launched by Russia in the year 2009.

[Fresh \\$18.7 million funding round puts PlanetiQ **weather** constellation back on track](#)

SpaceNews

WASHINGTON — After years of delays, PlanetiQ says its constellation of commercial **weather satellites** will be ready to start launching in January ...

Transport/roading/shipping/freight

[CSIR Signs **Weather-Monitoring Deal With Transnet**](#)

Railways Africa (press release)

The CSIR recently announced the signing of a three-year, multimillion-rand contract with Transnet National **Ports** Authority (TNPA) for the maintenance ...

[Thicker pavement is more cost effective down the road](#)

Posted: 10 Jul 2019 10:20 AM PDT

Pavements, which are vulnerable to increased temperatures and excessive flooding due to sea level rise, can crack and crumble. Climate change can be a major contributor and as greenhouse gas emissions continue these issues are projected to accelerate. Researchers say because of this one of the best ways to extend the life cycle of roads, and keep future costs down, is to increase the thickness of asphalt on certain roads.

[Road to Zero road safety plan needs strong government investment to work - AA](#)

The government needs to commit to spending serious money if it wants its plan to radically cut the road toll to work, the Automobile Association says.

[Drones will help economy take off](#)

Scoop.co.nz

Drones are estimated to be worth up to \$7.9 billion to the economy, **Transport Minister Phil Twyford** said at the launch of the Government's plan for ...

Climate change / global warming / sea level rise

[2050 climate: **Wellington becomes Auckland, Auckland becomes Sydney**](#)

Wellington's 2050 climate will resemble Auckland's today – while Auckland will feel more like Sydney, scientists say.

[David Attenborough on climate change](#)

The UK must take radical action to meet its climate change targets, David Attenborough told a UK parliamentary committee this week. But he warned that ministers must carry the public with them because of the financial cost of meeting the goals. [Read more](#)

[How climate change is affecting what we grow and eat](#)

Farmers and scientists are finding new ways to keep food on the table as rainfall patterns move and heatwaves increase.

Cloud seeding / Geoengineering

[Indonesian Government Plans To Create Manmade Rain To Solve Air Pollution Problem](#)

VICE

“In 2015, Thailand successfully conducted a **cloud-seeding** test run in response to air pollution in Bangkok, removing the inversion layer,” Seto told ...

Emergency preparedness / disaster planning / resilience

[Heatwave guide for cities](#)

16 Jul 2019

[Red Cross Red Crescent Climate Centre](#)
[International Federation of Red Cross and Red Crescent Societies](#)

This example shows that cities can rise to the challenge of coping with more frequent and extreme heatwaves. Cities have a unique potential to adapt to changing heat risks through effective risk management at multiple levels within a city; connecting policies and incentives; and strengthening community adaptation capacity. All of these facets make it extremely important for cities to undertake heat-related risk analyses and to devise plans for reducing and managing risks. This guide is intended to be a basic introduction to this topic and a resource for cities to start planning for extreme heat.

[Killer heat in the United States: climate choices and the future of dangerously hot days](#)

16 Jul 2019

[Kristina Dahl](#), [Erika Spanger-Siegfried](#), [Rachel Licker](#), [Astrid Caldas](#), [John Abatzoglou](#), [Nicholas Mailloux](#), [Rachel Cleetus](#), [Shana Udvardy](#), [Juan Declet-Barreto](#), [Pamela Worth](#)
[Union of Concerned Scientists](#)

For this national analysis, extreme heat is measured according to the heat index, the combination of temperature and humidity that creates the “feels like” temperature. The analysis includes four different heat index thresholds, each of which brings increasingly dangerous health risks: above 90°F, above 100°F, above 105°F, and “off the charts.” (Off-the-charts days are so extreme they exceed the upper limits of the National Weather Service heat index scale, which starts topping out at or above a heat index of 127°F, depending on the combination of temperature and humidity.)

The report features three time frames—historical, midcentury, and late century—and three different scenarios of climate action.

Journal and articles online



Quarterly Journal of the Royal Meteorological Society

[Accepted Articles](#)

Accepted, unedited articles published online and citable. The final edited and typeset Version of Record will appear in the future.

[Relative contribution of soil moisture, boundary layer and microphysical perturbations on convective predictability in different weather regimes](#)

Christian Keil, Florian Baur, Kevin Bachmann, Stephan Rasp, Linda Schneider, Christian Barthlott
First Published: 06 July 2019

[Polar low variability and future projections for the Nordic and Barents Seas](#)

Oskar A. Landgren, Yurii Batrak, Jan Erik Haugen, Eivind Støylen, Trond Iversen
First Published: 06 July 2019

[Summertime mid-latitude weather and climate extremes induced by moisture intrusions to the west of Greenland](#)

Cory Baggett, Sukyoung Lee
First Published: 06 July 2019

[A Simple Ensemble Approach for More Robust Process-Based Sensitivity Analysis of Case Studies in Convection-Permitting Models](#)

David L. A. Flack, Suzanne L. Gray, Robert S. Plant
First Published: 06 July 2019

Wind turning in the atmospheric boundary layer over land

Jenny Lindvall, Gunilla Svensson

First Published: 04 July 2019

Towards a more reliable historical reanalysis: Improvements for version 3 of the Twentieth Century Reanalysis system

Laura C. Slivinski, Gilbert P. Compo, Jeffrey S. Whitaker, Prashant D. Sardeshmukh, Benjamin S. Giese, Chesley McColl, Rob Allan, Xungang Yin, Russell Vose, Holly Titchner, John Kennedy, Lawrence J. Spencer, Linden Ashcroft, Stefan Brönnimann, Manola Brunet, Dario Camuffo, Richard Cornes, Thomas A. Cram, Richard Crouthamel, Fernando Domínguez-Castro, J. Eric Freeman, Joëlle Gergis, Ed Hawkins, Philip D. Jones, Sylvie Jourdain, Alexey Kaplan, Hisayuki Kubota, Frank Le Blancq, Tsz-Cheung Lee, Andrew Lorrey, Jürg Luterbacher, Maurizio Maugeri, Cary J. Mock, G.W. Kent Moore, Rajmund Przybylak, Christa Pudmenzky, Chris Reason, Victoria C. Slonosky, Cathy Smith, Birger Tinz, Blair Trewin, Maria Antónia Valente, Xiaolan L. Wang, Clive Wilkinson, Kevin Wood, Przemysław Wyszyn'ski

First Published: 03 July 2019

Routes to long-term atmospheric predictability in coupled ocean-atmosphere systems – Impact of the ocean basin boundary conditions

Stéphane Vannitsem, Roman Solé-Pomies, Lesley De Cruz

First Published: 02 July 2019

Quantifying the global impact of tropical cyclone-associated gravity waves using HIRDLS, MLS, SABER and IBTrACS

Corwin J Wright

First Published: 02 July 2019

Relationship between atmospheric blocking and warm season thunderstorms over western and central Europe

Susanna Mohr, Jan Wandel, Sina Lenggenhager, Olivia Martius

First Published: 02 July 2019

Internal interannual variability of the winter polar vortex in a simple model of the seasonally evolving stratosphere

L. A. Hatfield, R. K. Scott

First Published: 02 July 2019

Processes determining heat waves across different European climates

Philipp Zschenderlein, Andreas H. Fink, Stephan Pfahl, Heini Wernli

First Published: 02 July 2019

Extreme rainfall sensitivity in convective-scale ensemble modelling over Singapore

Aurore N. Porson, Susanna Hagelin, Douglas F.A. Boyd, Nigel M. Roberts, Rachel North, Stuart Webster, LO Jeff Chun-Fung

First Published: 02 July 2019

Trends in and closure of the Atmospheric Angular Momentum budget in the 20th century in ERA-20C

Menno A. Veerman, Chiel C. van Heerwaarden

First Published: 02 July 2019

On the sensitivity of a 4D-Var analysis system to satellite observations located at different times within the assimilation window

A.P. McNally

First Published: 01 July 2019

Dutch Fog: On the Observed Spatio-Temporal Variability of Fog in the Netherlands

Jonathan G. Izett, Bas J. H. van de Wiel, Peter Baas, J. Antoon van Hooft, Ruben B. Schulte

First Published: 01 July 2019



Linda Stopforth
Librarian, RLIANZA
Mon and Thurs 8am – 1pm
MetService – Te Ratonga Tiorangi

d +64 4 470 0825 t +64 4 4700 700
30 Salamanca Road, Kelburn, Wellington 6012
PO Box 722, Wellington 6140, New Zealand



metservice.com . metraweather.com . metocean.co.nz

Watch Stay alert **Orange Warning Take action** **Red Warning Act now!**

Severe Weather Warnings are changing
Find out more at www.metservice.com/SevereWeather

MetService
TE RATONGA TIORANGI

The banner features three warning levels: Watch (yellow exclamation mark), Orange Warning (orange exclamation mark), and Red Warning (red exclamation mark). It includes the MetService logo and the text 'TE RATONGA TIORANGI'.

MetraWeather (Australia) Pty Ltd [ACN 126 850 904], MetraWeather (UK) Ltd [No. 04833498] and MetraWeather (Thailand) Ltd [No. 0105558115059] are wholly-owned subsidiaries of Meteorological Service of New Zealand Ltd (MetService)

From: [Linda Stopforth](#)
To: [Everyone](#); "[xxxxxxxx@xxxxxxxx.xx.xx](#)"
Cc: [Erick Brenstrum](#); [Bob McDavitt \(hotmail\)](#); [Paula Acethorp](#)
Subject: News headlines / Panui from the Library - Thursday 21 March 2019
Date: Thursday, 21 March 2019 9:35:14 am
Attachments: [image009.png](#)
[image012.png](#)
[image013.png](#)

New Zealand weather and climate news (MetService focus) **[Polar vortex helping forecasters predict New Zealand weather](#)**

MetService meteorologist **Georgina Griffiths** said the good news this week was SAM was likely to remain mostly positive for the next couple of weeks. It was difficult to get a clear signal of Sam's intentions beyond that.

[An indecisive weather front bringing rain across the central South Island](#)

MetService meteorologist **Angus Hines** said the reversing front situation was certainly "a bit unique".

[Cyclones and other natural disasters hit hard in the Pacific](#)

Lisa Murray, Head of Weather Communication at Met Service says that until 1953, only female names were used by the US National Weather Service.

[Muggy days to stick around for Rotorua](#)

New Zealand Herald

According to MetService **meteorologist April Clark**, the warm, moist air creating the muggy conditions is being brought down the North Island from the ...

[Muggy nights in store for Tauranga](#)

New Zealand Herald

According to MetService **meteorologist Andy Best**, the moist air creating the muggy conditions is being brought down the North Island from the Pacific.

The other guys (Weatherwatch, BlueSkies, etc)

['Bone' cloud appears above Whangarei](#)

Newshub

A bizarre 'bone' cloud seen above Whangarei last weekend has **meteorologists** baffled. One photo, taken by Sharron Cleary at 5:30pm on Sunday ...

Extreme weather (and other news) – Antarctica and offshore

[Hanergy's Thin-film Solar Panels to Aid Meteorology Research in Antarctic](#)

APN News

The signing ceremony was held at Chinese Academy of **Meteorological** ... further down for a wider application of thin-film solar power **technologies**.

Extreme weather (and other news) – Australia and Pacific

[Flash flooding kills 50 in Papuan capital](#)

As many as 50 people have died as a result of flash flooding in Papua.

The deaths have been recorded in Jayapura regency, near Indonesia's border with Papua New Guinea.

['Monster' El Nino a chance later this year, pointing to extended dry times](#)

The Sydney Morning Herald

They considered parallel years, such as 2014 when a near-**El Nino** was reached before conditions revived a year later, creating one of the three most ...

[Vanished wet season of 1952 has eerie similarities to NT's current dry spell](#)

The Northern Territory's wet season, or lack thereof, may be one for the record books.

The Bureau of Meteorology believes Darwin could be on track for its driest wet season on record, measuring 890 millimetres of rainfall — just over half the average.

[Heatwatch: increasing extreme heat in Townsville](#)

20 Mar 2019

[Mark Ogge](#), [Bill Browne](#), [Travis Hughes](#)
[The Australia Institute](#)

Increasing extreme heat will have profound impacts on people, industries and ecosystems in Townsville. CSIRO and Bureau of Meteorology projections estimate that the average number of days over 35 degrees each year could increase fivefold by 2030 and reach over one hundred days per year by 2090 without strong climate policies. Almost two hundred nights per year could to remain above 25 degrees by 2090, a level considered dangerous to human health.

[Death toll from Papua flooding rises, amid fears for children](#)

Indonesian officials say the death toll from flooding and landslides in Papua has risen to 89, while dozens of people remain missing.

[Australia: Tropical Cyclone Trevor forms, on track to target northern Queensland this week](#)

AccuWeather.com

Newly formed Tropical Cyclone Trevor is expected to take aim and bring dangers to the Cape York Peninsula in northern Queensland, Australia, this ...

[Cyclone Veronica forms off WA coast, with warning 'strong system' set to reach Pilbara](#)

A low-pressure system to the north of Western Australia has rapidly intensified into a category two cyclone, with a blue alert issued for a stretch of the Pilbara coast.

Extreme weather (and other news) – Asia and the Middle East, Africa

[Why is it raining so much in the UAE? Here's the answer](#)

Khaleej Times

The recent spate of downpours can be attributed to the success of **cloud seeding**, a process of enhancing the amount of precipitation in clouds and to ...

[Air Force participates in royal rainmaking operation](#)

ThaiVisa News

BANGKOK, 15 March 2019 (NNT) - The Air Force has sent **cloud-seeding** planes to participate in a royal rainmaking operation for 2019 to relieve the ...

[Never seen so much rain': Zimbabweans struggle with storm floods](#)

Death toll rises as cyclone Idai wrecks roads, bridges in Zimbabwe, leaving passengers stranded and villagers isolated.

[Cyclone Idai: Mozambique survivors desperate for help](#)

Mozambique's port city of Beira is reeling from the damage inflicted by Cyclone Idai.

[A new UAE rain study is focusing on fog](#)

Abu Dhabi World

An initiative led by a UAE Research Program for Rain Enhancement Science awardee will study local fog and clouds to potentially enhance rainfall in ...

Extreme weather (and other news) – Americas and Europe

[Canada's Earliest Heat Wave Ever Is Forecasted To Hit This Week](#)

MTL Blog (blog)

According to The **Weather Network**, Canada is set to see the earliest heat wave on record this week, with some provinces expected to see a couple ...

[Nebraska Flooding Seen from Space in Dramatic Detail](#)

A new series of before-and-after images shows the ongoing flooding in Nebraska in jaw-dropping detail.

The images, created by the European Union's Earth-observation program, Copernicus, show rivers turned to lakes and farms and towns underwater. The record flooding is the result of a "[bomb cyclone](#)" that struck the central U.S. last week. The term refers to a

storm that forms outside of the tropics in which atmospheric pressure drops very rapidly.

International news and research

[Rising CO2 Levels Could Wipe Out Stratocumulus Clouds, Accelerating Climate Change](#)

Stratocumulus clouds spread out like puffy cotton balls in orderly rows above the ocean in the sub-tropics. The low-hovering clouds provide the planet shade and help keep Earth cool. But in a new study published this week, researchers say that rising carbon dioxide levels in the atmosphere could wipe out these clouds. The discovery means that, under "business as usual" emissions scenarios, Earth could heat up 14 degrees Fahrenheit within a century.

[We're The Geeks Who Have Protected the Public From Weather Extremes For 100 Years](#)

Newsweek

In the 21st century, the societal impact of the **meteorology** community is vast, extending well beyond the daily "should I take my umbrella today?"

[The 'Frozen Chosen': What's it like to live, work in the northernmost permanently inhabited place on Earth?](#)

Not many people could imagine braving a location situated in a climate so extreme that it is considered unsuitable for human habitation.

Once you factor in the snow that falls all year round, the 24 hours of darkness during frigid winter months and the mere 508-mile distance from the North Pole, it's no wonder that so few people live and work in the northernmost permanently inhabited settlement on Earth – Alert, located in the most northerly Canadian territory of Nunavut.

[When does a winter storm become a bomb cyclone?](#)

The Conversation US

What, then, distinguishes a "bomb" from a run-of-the-mill cyclone? The term was coined by famed **meteorologists** Fred Sanders and John Gyakum in a ...

[How Bomb Cyclones Are Changing The Way We Talk About Weather](#)

Texas Standard

"What I think has happened is that you have a lot of **meteorologists** that you see interacting on Twitter or different social media platforms, and now ...

[How Analytics Is Ushering In A Smart **Weather Forecasting Industry In India](#)**

Analytics India Magazine

The data needed for weather forecasting is the data like barometric ... Himanshu Goyal of The **Weather Company** said at Cypher 2018, "After few ...

[Meteorologists Are Among Female Scientists Wearing Purple On Pi Day. Here's Why?](#)

Forbes

NWA along with the American **Meteorological** Society (AMS) are critical actors in the U.S. weather enterprise. The NWA Twitter site explained ...

[Top 10 weird weather and science words and phrases](#)

WKRG News 5

Polar Vortex is a real weather term that's been used by **meteorologists** for dozens of years, since way before the Internet. It's a band of very high wind ...

[Leeds most common **weather phrases revealed: Which do you use?](#)**

Yorkshire Evening Post

The British Science Association has partnered with Operation **Weather** Rescue to tap into our passion for the **weather** with a **citizen science** project ...

[The Trinity Tests: When Atomic Development Meant Betting Whether Earth Would Catch On Fire](#)

Newsweek

Teams of **meteorologists** were called in; smoke experiments were conducted; flocks of

brightly-colored weather balloons were released and observed ...

[Launching a weather balloon in a snow storm isn't glamorous](#)

The Weather Network

A hapless scientist struggled to launch a weather balloon in the middle of a blizzard sweeping through Rapid City, South Dakota Wednesday.

[Why are cyclone paths so difficult to predict?](#)

Some cyclones seem to hurtle straight into the coast while others drunkenly stagger about, stalling, changing direction and even going back upon themselves.

[National Weather Service offering free local weather spotter training classes](#)

Kearney Hub

Meteorologists who predict the **weather** use a variety of **technologies** to help make those forecasts. They also rely on a human aspect to fill in the ...

WMO

[WMO supports Sustainable Climate Information Services](#)

As the recognition of the dependence between climate change and variability and human welfare grows, climate action continues gaining importance on the global development agenda

[World Meteorological Day celebrates the Sun, the Earth and the Weather](#)

The Sun, the Earth and the Weather is the theme of this year's World Meteorological Day. It highlights the role of the Sun in delivering the energy that powers all life on Earth, and drives the...

Art

[Art and climate roadshow tackles the big stuff](#)

"The arts can be a disrupter, successfully challenging incumbent values and ideas, including how we innovate technology and sustainable urban design as well as re-imagining the fundamental systems we base the way we make and consume things with disregard for planetary boundaries."

On a practical level that means taking to the road with climate scientists, Professors James Renwick and Dr Tim Naish, from Victoria University and then inviting local artists and educators to join a panel discussion.

Aviation

[Space port 'could be feasible' in NZ in 10 years](#)

New Zealand is positioning itself to be a leader when it comes to space tourism.

[New reports show sky-high growth for Aviation Weather Forecasting Services markets](#)

Business Facts Today (blog)

According to this study, over the next five years the Aviation **Weather Forecasting Services** market will register a xx% CAGR in terms of revenue, the ...

[The African aviation industry is still growing](#)

African Independent

The overall state of **air** travel and aircraft finance on the continent remain positive, with many carriers managing to **weather** the political and economic ...

Communications/social media

[KTBS 3 unveils the Mega 3 Storm Team Jr. Weather Watchers Center at Sci-Port](#)

KTBS

The center is for all ages and place where children can interact by watching themselves live on TV with **weather graphics**, experience the tornado ...

[Apps We Love: Weather Apps](#)

CPAPracticeAdvisor.com

We surveyed the CPA Practice Advisor community this month to find out which apps our friends use when they're trying to stay on top of the **weather**.

Energy and Mining

[\\$9 million funding to enhance short term forecasting of wind and solar farms](#)

Mirage News

The portfolio of 11 projects will involve a range of **weather** forecasting **technologies** including onsite cloud cameras that can predict the timing and ...

[Vestas team forecasts more precision in Australia](#)

reNEWS

Vestas and its wholly-owned **energy** analytics solution provider Utopus ... **weather** forecasts and meteorological data to deliver more accurate **energy** ... system stability by balancing the **energy** supply and **demand** in the market.

History

[150 Women in 150 Words 1918–1967 Edith Farkas](#)

Meteorologist (1921-1993)

A female pioneer in the largely male field of meteorology, Edith Farkas came to New Zealand as a Hungarian refugee after the Second World War. Her qualifications weren't recognised, and she had to return to university for a MSc in physics before she could begin work at the New Zealand Meteorological Service.¹

<https://royalsociety.org.nz/150th-anniversary/150-women-in-150-words/1918-1967/edith-farkas/>

Satellites and radar

[Weather Radar will Fulfill Public Safety Missions](#)

i-HLS - Israel Homeland Security

The model combines, for the first time, two **weather** radar **technologies** – the one that reads data quickly and the one that reads data in great detail, ...

Transport/roading/shipping/freight

[Weather's Biggest Blind Spot: Helios in Transportation](#)

Harris Geospatial Solutions

To resolve this weather blind spot, Helios creates a new foundational weather sensor network from CCTV traffic cameras to detect "**road weather**".

[France battling to contain six-mile fuel slick after cargo ship carrying 2000 cars sinks](#)

The Independent

The **ship** was carrying over 2,000 vehicles, 365 **shipping** containers, metric tonnes of oil were spilled when a **ship** broke up in stormy **weather**.

[An Analysis of MSC Zoe's Container Loss](#)

The Maritime Executive

The six hourly published **Sea** Surface **weather** charts from 31.12.2018 00:00 UTC to 02.1.2019 06:00 UTC from metoffice.gov.uk are available to me ...

[Roads vs extreme weather: how to design more resilient roads](#)

Infrastructure Magazine

Roads vs extreme **weather**: how to design more resilient roads ... **weather**, and some of the new sustainable materials and **technologies** we can use.

Innovation and technologies (inc data and new products)

[Meteorological Agency starts development of AI-based system to predict windy events in Japan](#)

The Japan Times

The Meteorological Agency's research arm recently began developing an artificial intelligence-based system to predict high-wind events severe ...

[5G cell service may come at price of weather safety in US](#)

The Weather Network

5G cell service may come at price of **weather** safety in U.S. that usage of those transmission frequencies will interfere with **satellites'** ability to track ...

[Technology Reveal: How Does ClimaCell Predict the Weather More Accurately](#)

PRNewswire (press release)

ClimaCell's proprietary **weather** forecasting systems are being used by blue-chip companies, emerging **technologies**, and software developers alike.

[Weather startup ClimaCell out to prove IoT can make forecasts accurate, save lives](#)

Firstpost

All this data feeds into real-time **weather** forecasts that ClimaCell metes out to its customers — from **airlines** to rideshare launch companies like ...

Weather in pictures

[What the historic Midwest floods look like from space — and from the ground](#)

"This really is the most devastating flooding we've probably ever had in our state's history," Nebraska's governor said.

Climate change / global warming / sea level rise

[Climate change: Call to tackle future risk to Auckland's poorest communities now](#)

Community leaders want an early focus on protecting Auckland's poorer suburbs, which new reports show are the most vulnerable to climate change risks.

[Extreme heat, disease and rising seas: how climate change threatens Auckland](#)

Aucklanders could be suffering an equivalent of three months of extra-hot days within only a century's time - with residents in southern and western suburbs likely to be hit the hardest.

[Dramatic rainfall changes for key crops predicted even with reduced greenhouse gas emissions](#)

Posted: 11 Mar 2019 02:31 PM PDT

Even if humans radically reduce greenhouse gas emissions soon, important crop-growing regions of the world can expect changes to rainfall patterns by 2040. In fact, some regions are already experiencing new climatic regimes compared with just a generation ago. The study warns that up to 14 percent of land dedicated to wheat, maize, rice and soybean will be drier, while up to 31 percent will be wetter.

Cloud seeding / Geoengineering

[How does cloud seeding work?](#)

ABS-CBN News

As water shortage in the country worsens due to a prevailing dry spell, the agriculture chief has ordered regional offices to conduct **cloud-seeding** ...

Professional interest

Sea Level Rise & New Zealand's Future

How much land will we lose to the rising ocean, and what will it cost us? Local Government New Zealand has recently

released its report, Vulnerable: The quantum of local government owned infrastructure exposed to sea level rise, which quantifies the replacement value of local government infrastructure exposed to sea level rise. The study details the type, the quantity and the replacement value of infrastructure exposed with different levels of rise severity, from half a meter to three metres. How bad could it get? Very bad: more than \$14 billion of local government owned assets are exposed at a 3.0 metre increment of sea level rise.

LGNZ's report is intended to result in stakeholders working together to ensure the long-term resilience of critical infrastructure. At its core, this analysis is about turning a challenge into an opportunity. Study co-author Thomas Simonson will present these findings in detail at a lunch time lecture, and take questions from the audience.

When: Thursday April 18th 12:30pm – 1:30pm

Where: Rutherford House lecture theatre 2 (RHLT2)

[Register](#)



Library

[Moose moves into a library, shuts the building down](#)

A Silverthorne, Colorado library was put on an "indefinite" closure Wednesday when it decided to take a break from the snowstorm that was pummeling the area and make itself at home in front of a library, blocking the entrance.

Journal and articles online



Meteorological Applications

[Accepted Articles](#)

Accepted, unedited articles published online and citable. The final edited and typeset Version of Record will appear in the future.

[Spatial Distribution of Secular Trends in Rainfall Indices of Peninsular Malaysia in the Presence of Long-Term Persistence](#)

Najeebullah Khan, Sahar Hadi Pour, Shamsuddin Shahid, Tarmizi Ismail, Kamal Ahmed, Eun-Sung Chung, Nadeem Nawaz, Xiao-Jun Wang

First Published: 14 March 2019

[Observed changes in climate extremes in Nigeria](#)

Imoleayo E. Gbode, Oluwafemi E. Adeyeri, Kaah P. Menang, Joseph D. K. Intsiful, Vincent O. Ajayi, Jerome A. Omotosho, Akintomide A. Akinsanola

First Published: 12 March 2019

Quarterly Journal of the Royal Meteorological Society

[Early View](#)

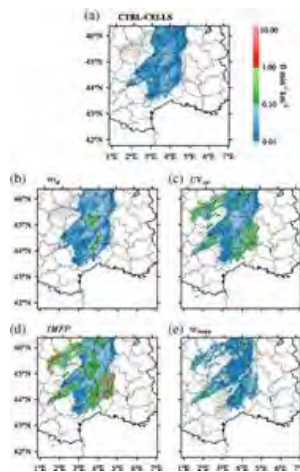


Online Version of Record before inclusion in an issue

Examining relationships between cloud-resolving model parameters and total flash rates to generate lightning density maps

Christophe Bovalo, Christelle Barthe, Jean-Pierre Pinty

Version of Record online: 05 March 2019



Lightning density maps are produced in a cloud-resolving model using two methods: with an explicit lightning scheme and based on calibrated proxies. These proxies (graupel mass, updraught volume for $w > 10$ m/s, precipitating and non-precipitating ice mass flux product and maximum updraught) are related to lightning rate densities through linear relationships. Results are illustrated on the 24 September 2012 case over France. It shows that the total graupel mass is a good estimator of lightning activity.



Quarterly Journal of the Royal Meteorological Society

[Accepted Articles](#)

Accepted, unedited articles published online and citable. The final edited and typeset Version of Record will appear in the future.

Statistical post-processing of dual-resolution ensemble forecasts

Sándor Baran, Martin Leutbecher, Marianna Szabó, Zied Ben Bouallègue

First Published: 07 March 2019

A spatially explicit and temporally highly resolved analysis of variations in fog occurrence over Europe

Sebastian Egli, Boris Thies, Jörg Bendix

First Published: 07 March 2019

Occurrence and Detection of Impact Multipath Simulations of Bending Angle

Xiaolei Zou, Hui Liu, Ying-Hwa "Bill" Kuo

First Published: 06 March 2019

Statistical generation of SST perturbations with spatio-temporally coherent growing patterns

Daisuke Hotta, Yoichiro Ota
First Published: 04 March 2019

The impact of spin up and resolution on the representation of a clear convective boundary layer over London in order 100m grid-length versions of the Met Office Unified Model.

H.W. Lean, J.F. Barlow, C.H. Halios
First Published: 04 March 2019

Table of Contents Alert
[Journal of Applied Meteorology and Climatology -](#)
[Volume: 58, Number: 3 \(March 2019\)](#)

ARTICLES

[Assessing Wind Data from Reanalyses for the Upper Midwest](#)

Jacob J. Coburn

[Heat Waves in Florida: Climatology, Trends, and Related Precipitation Events](#)

Shealynn R. Cloutier-Bisbee, Ajay Raghavendra, and Shawn M. Milrad

[Gamma Drop Size Distribution Assumptions in Bulk Model Parameterizations and Radar Polarimetry and Their Impact on Polarimetric Radar Moments](#)

Katharina Schinagl, Petra Friederichs, Silke Trömel, and Clemens Simmer

[Meteorological Impacts on Commercial Aviation Delays and Cancellations in the Continental United States](#)

Christopher J. Goodman and Jennifer D. Small Griswold

[Past and Projected Freezing/Thawing Indices in the Northern Hemisphere](#)

Xiaoqing Peng, Tingjun Zhang, Yijing Liu, and Jing Luo

[The Application of an Evolutionary Programming Process to a Simulation of the ETEX Large-Scale Airborne Dispersion Experiment](#)

David Werth, Grace Maze, Robert Buckley, and Steven Chiswell

[Regional Decadal Climate Predictions Using an Ensemble of WRF Parameterizations Driven by the MIROC5 GCM](#)

Ehud Strobach and Golan Bel

[Evaluation of the Ventilation Index in Complex Terrain: A Dispersion Modeling Study](#)

Michael T. Kiefer, Joseph J. Charney, Shiyuan Zhong, Warren E. Heilman, Xindi Bian, John L. Hom, and Matthew Patterson

[Turbulence Variations in the Upper Troposphere in Tropical Cyclones from NOAA G-IV Flight-Level Vertical Acceleration Data](#)

John Molinari, Michaela Rosenmayer, David Vollaro, and Sarah D. Ditchek

[Weather Simulation Uncertainty Estimation Using Bayesian Hierarchical Models](#)

Jianfeng Wang, Ricardo M. Fonseca, Kendall Rutledge, Javier Martín-Torres, and Jun Yu

[An Investigation of Cold-Season Short-Wave Troughs in the Great Lakes Region and Their Concurrence with Lake-Effect Clouds](#)

Nicholas D. Metz, Zachary S. Bruick, Peyton K. Capute, Molly M. Neureuter, Emily W. Ott, and Michael F. Sessa

[Trends in Instrument Flight Rules \(IFR\) Conditions at Major Airports in the United States](#)

Scott E. Stevens

[Quality and Value of Seasonal Precipitation Forecasts Issued by the West African Regional Climate Outlook Forum](#)

J. Bliefernicht, M. Waongo, S. Salack, J. Seidel, P. Laux, and H. Kunstmann

-
Table of Contents Alert
[Bulletin of the American Meteorological Society - Volume: 100, Number: 2 \(February 2019\)](#)

MAP ROOM

[Tornado Debris from the 23 May 2017 "Tybee Tornado"](#)

Alan W. Black, John A. Knox, Jared A. Rackley, and Nicholas S. Grondin

ESSAY

[Is Precipitation a Good Metric for Model Performance?](#)

Francisco J. Tapiador, Rémy Roca, Anthony Del Genio, Boris Dewitte, Walt Petersen, and Fuqing Zhang

ARTICLES

[The Northern California Wildfires of 8–9 October 2017: The Role of a Major Downslope Wind Event](#)

Clifford F. Mass and David Ovens

[A Call for the Evaluation of Web-Based Climate Data and Analysis Tools](#)

Kristin VanderMolen, Tamara U. Wall, and Britta Daudert

[A Scale to Characterize the Strength and Impacts of Atmospheric Rivers](#)

F. Martin Ralph, Jonathan J. Rutz, Jason M. Cordeira, Michael Dettinger, Michael Anderson, David Reynolds, Lawrence J. Schick, and Chris Smallcomb

[The Ozone Water–Land Environmental Transition Study: An Innovative Strategy for Understanding Chesapeake Bay Pollution Events](#)

John T. Sullivan, Timothy Berkoff, Guillaume Gronoff, Travis Knepp, Margaret Pippin, Danette Allen, Laurence Twigg, Robert Swap, Maria Tzortziou, Anne M. Thompson, Ryan M. Stauffer, Glenn M. Wolfe, James Flynn, Sally E. Pusede, Laura M. Judd, William Moore, Barry D. Baker, Jay Al-Saadi, and Thomas J. McGee

[Partnering Research, Education, and Operations via a Cool Season Severe Weather Soundings Program](#)

Keith D. Sherburn, Matthew D. Parker, Casey E. Davenport, Richard A. Sirico, Jonathan L. Blaes, Brandon Black, Shaelyn E. McLamb, Michael C. Murgage, and Ryan M. Rackliffe

[NCAR's Real-Time Convection-Allowing Ensemble Project](#)

Craig S. Schwartz, Glen S. Romine, Ryan A. Sobash, Kathryn R. Fossell, and Morris L. Weisman

MEETING SUMMARIES

[Polar Low Workshop](#)

Günther Heinemann, Chantal Claud, and Thomas Spengler

[Defining Uncertainties through Comparison of Atmospheric River Tracking Methods](#)

Christine A. Shields, Jonathan J. Rutz, L. Ruby Leung, F. Martin Ralph, Michael Wehner, Travis O'Brien, and Roger Pierce

[Data-Driven Scientific Workflows: A Summary of New Technologies and Datasets Explored at the Unidata 2018 Workshop](#)

Kevin H. Goebbert, John T. Allen, Victor A. Gensini, and Mohan Ramamurthy



Weather
[Volume 74, Issue 3](#)
[Late winter weather 2018](#)

Pages: E1, 78-96, i-iv, 97-116, E2-E4

March 2019

Cover Information

[Cover Information](#)

First Published: 14 March 2019

In this issue of Weather

[In this issue of Weather](#)

Paul Knightley

Pages: E1 | First Published: 14 March 2019

Weather news

[Weather news](#)

Pages: 78 | First Published: 14 March 2019

Editorial

[Editorial](#)

Paul Knightley

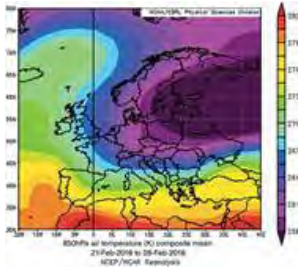
Pages: 79 | First Published: 14 March 2019

Special Issue Article

[Atmospheric analysis of the cold late February and early March 2018 over the UK](#)

Katie Greening, Amy Hodgson

Pages: 79-85 | First Published: 14 March 2019



Mean 850hPa temperatures (K) from 21 to 28 February (Source:

Physical Sciences Division, NOAA/ESRL.)

Research Article

[The very deep cold pool of 27 February–1 March 2018 – historical precedents and perspective](#)

Edward Graham, Jonathan D. C. Webb

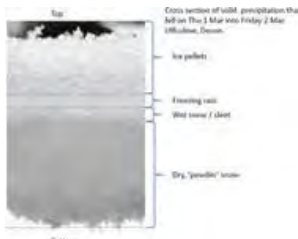
Pages: 85-91 | First Published: 14 March 2019

Short Article

[A study of freezing precipitation in Devon](#)

Keith Fenwick

Pages: 92-93 | First Published: 01 November 2018



Cross section of solid precipitation that fell on Thursday 1 March into Friday 2 March in Uffculme, Devon.

Photographs

[Snow and ice in March 2018](#)

Pages: 94 | First Published: 14 March 2019

[Snow and ice in March 2018](#)

Pages: 95 | First Published: 14 March 2019

Weather images

[Weather images](#)

Pages: 96 | First Published: 14 March 2019

Weather log

[January 2019 Dry with seasonable temperatures; sunny in north, dull in southwest.](#)

Pages: i-iv | First Published: 14 March 2019

Short Article

[A hair ice observation in Devon](#)

James Robbins, Philip Gill

Pages: 97 | First Published: 20 April 2018



Hair ice

Research Article

 **Open Access**

[Severe weather and snow conditions on Cairngorm summit in February to March 2018](#)

Mike Kendon, Mark Diggins

Pages: 98-103 | First Published: 01 November 2018



Instruments on Cairngorm summit, showing ultrasonic anemometers, whip and screen-mounted thermistors and humidity sensors in housing tubes.

Special Issue Article

[Snow cover and low temperatures in February and March 2018](#)

Jim Galvin, Mike Kendon, Mark McCarthy

Pages: 104-110 | First Published: 14 March 2019



This article examines snow depths and low temperatures during the two snowy outbreaks of February and March 2018 in the United Kingdom and Ireland. In both nations, the cold spell was a very significant event. This report was compiled from information supplied by the Met Office and Met Éireann.

Short Article

[The cold outbreak of 26 February to 3 March 2018](#)

Andy Matthews

Pages: 111-115 | First Published: 14 March 2019

Photographs

[Photographs](#)

Pages: 115 | First Published: 14 March 2019

Society news

[Society news](#)

Pages: 116 | First Published: 14 March 2019

Inside Cover Photographs

[A tractor attempts to clear snow from the A523 near Bosley, Cheshire](#)

Pages: E2 | First Published: 14 March 2019

[A dusting of snow surrounds the Dart Estuary at Dartmouth, Devon](#)

Pages: E3 | First Published: 14 March 2019

[Following heavy snowfall, freezing rain during the night of 1–2 March 2018 over south Devon produced some unusual effects](#)

Pages: E4 | First Published: 14 March 2019



Linda Stopforth
Librarian, RLIANZA
Mon and Thurs 8am – 1pm
MetService – Te Ratonga Tiorangi

d +64 4 470 0825 t +64 4 4700 700
30 Salamanca Road, Kelburn, Wellington 6012
PO Box 722, Wellington 6140, New Zealand



metservice.com . metraweather.com . metocean.co.nz

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From: [Linda Stopforth](#)
To: [EveryoneAtKelburn](#); [EveryoneAtParaparaumu](#); [EveryoneAtChristchurch](#); [EveryoneAtMetOcean](#); [EveryoneAtAuckland](#); [Sales AU](#); [Greg Reeve](#)
Cc: [Erick Brenstrum](#); [Bob McDavitt \(hotmail\)](#); [Paula Acethorp](#)
Subject: News headlines / Panui from the Library - Thursday 9 January 2020
Date: Thursday, 9 January 2020 9:28:45 am

[New Zealand weather and climate news \(MetService focus\)](#)

[Unseasonable chill set to give way to weekend warmth](#)

Much of the country is experiencing unseasonably cold weather today, with parts of the South Island up to 6C below average, but things are expected to warm up by the weekend.

[Tree blown onto power line starts fire in Marlborough](#)

Stuff.co.nz

MetService meteorologist Lisa Murray said there were "persistent" winds across the country, with the station in Woodbourne, just north of Renwick, ...

[Crews working to reconnect power in towns throughout region](#)

New Zealand Herald

MetService meteorologist Lisa Murray said gusts of 78km/h were recorded in Whanganui on Sunday night and gusts of 83km/h were recorded at ...

[Record temperature in Ranfurly as smoke from Australian fires arrives above New Zealand](#)

New Zealand Herald

As Ranfurly recorded its hottest ever December temperature on Tuesday, MetService has warned that smoke from Australia's bush fires is coming our ...

[Power companies work on restoring lines after heavy winds](#)

Power has been restored to thousands of homes in Dunedin, Manawatū and Whanganui, where strong or severe winds downed trees and power lines yesterday.

[Falling tree injures woman and roofs lift off houses as high winds batter Dunedin](#)

A woman has been taken to hospital with serious injuries after a tree fell on her in Dunedin.

[Severe winds lift roofs, cut power across in Dunedin](#)

TVNZ

While winds have eased over Southland and Clutha, **MetService** says severe gales are forecast for exposed parts of the South Island and lower North ...

[More wild winds could hit South](#)

The cleanup continued for Dunedin yesterday after wild winds caused damage across the city.

Trees were cleared and power was restored to more than 2500 homes. Debris from the storm was scattered citywide.

[Weather: 'Widespread damage' as Manawatū hit with gale-force winds](#)

Powerlines across Manawatū are down as strong winds blast through the region, causing widespread damage and loss of electricity.

[Light at the end of the \(wind\) tunnel for Taranaki](#)

The capital may be known as Windy Wellington, but Taranaki has come close to

challenging for the title.

Over the last month, average hourly wind speed in the region has regularly been over 20-30 kilometres per hour - a higher figure than last year - and ticked over 30 or 40kmh several times, even hitting 52kmh on January 4.

[Snow falls on hills in Southland](#)

Southlanders could be forgiven for thinking it was the middle of winter as they woke to snow on the hills on Monday morning.

[Unseasonable chill not likely to hang around](#)

Otago Daily Times

MetService meteorologist Lewis Ferris said much of the South Island was below the average for January, with Queenstown and Wanaka standing out ...

[Mid-summer frost possible for Otago this week](#)

Stuff.co.nz

MetService **meteorologist Lisa Murray** said the below average temperatures, caused by a cool southwesterly, were "unusual" and "spring like".

[Central Otago fire danger level reaches extreme](#)

People in Central Otago are being urged to postpone lighting fires as the danger level reaches extreme.

[Weather: Low 'bigger than Australia' bringing New Zealand a cold, windy week](#)

Newshub

MetService advises people to factor in the wind chill when making outdoor plans. "The cool southwest flow is really making itself known, dropping the

['That's ridiculous': Huge 196km/h gust near Hawke's Bay stuns meteorologist](#)

Newstalk ZB

A windy landmark at the southernmost point of Hawke's Bay is already a challenger for strongest gust of the year after a blow of 196km/h on Sunday.

MetOcean (and oceanmet, marine weather etc)

[The Story Of A Wave: From Wind-Blown Ripples To Breaking On The Beach](#)

Gizmodo Australia

Around 20 million **Australians** live within 50 kilometres of the coast. As summer temperatures soar, we flock to the **ocean** to splash, swim, surf, paddle, ...

[GNS asks the public to help it find earthquake equipment lost at sea](#)

GNS Science is asking the public to help it find five important earthquake recording instruments lost at sea.

NIWA

[NIWA reveals New Zealand's wildest weather moments of the 2010 - 2019 decade](#)

Newshub

The decade is drawing to a close and it's had with its extreme highs and lows - in temperatures, that is. **Meteorologists** at NIWA have compiled a list of ...

[Places in New Zealand for which 2019 was the warmest year on record](#)

Parts of New Zealand experienced their warmest year on record in 2019, with some records going back more than a 150 years.

University of Tasmania research associate and former NIWA climate scientist Jim Salinger, said warmer years were becoming more frequent as the Earth continued to experience the effects of greenhouse gas emissions.

[Otago-Southland prominent in Niwa's extreme weather review](#)

Many of New Zealand's most extreme weather events over the past decade have been recorded in Otago and Southland.

Niwa climate scientists have compiled the "stand out" weather statistics of the past 10 years, which shows the hottest, coldest, wettest and windiest places across the country.

ECMWF

[ECMWF scientists to simulate global weather at 1 km resolution](#)

ECMWF

A group of **ECMWF** scientists have been awarded time on the world's most powerful supercomputer to carry out ground-breaking global weather and ...

The other guys (Weatherwatch, BlueSkies, etc)

[WeatherWatch's 3 biggest moments of 2019 - and list our positive plans for 2020](#)

WeatherWatch.co.nz

Commerce Commission (ComCom) launches investigation into Government Agencies Niwa and **MetService**. As many of you know (and are rightfully ...

Volcano alert/watch

[Whakaari/White Island remains active, no-go zone reduced](#)

Whakaari/White Island remains active, with hot gas and steam coming from vents opened by the December eruption.

Extreme weather (and other news) – Australia and Pacific

[How Fires In Australia Could Alter Weather Elsewhere Too](#)

Forbes

El Nino is associated with anomalously warm waters in the equatorial Pacific Ocean. This surface "heat source" and associated changes in ...

[Rains bring very temporary relief to Australia's fires](#)

Phys.Org

NASA **satellite** data continues to provide a look at the smoke and aerosols ... with a vengeance by Thursday when hot, dry **weather** and winds return.

[Australians Should Brace for Protracted Summer of Catastrophic Fires | Voice of America - English](#)

Voice of America

GENEVA - The World **Meteorological** Organization warns Australians should brace for a protracted ... A report by the Australian Bureau of **Meteorology** says climate change is causing temperatures to rise and ... East **Asia** Pacific.

[Australia weather bureau says no sign of cooler weather or rain on horizon](#)

CNA

The Sydney Opera House and Sydney Harbour Bridge are seen through smoke haze from bushfires as passengers ride a ferry in Sydney, Australia, ...

[Cyclone warnings issued in the Northern Territory as tropical low intensifies](#)

A tropical low intensifying in the Arafura Sea is expected to develop into a tropical

cyclone in the early hours of Thursday morning, with several Northern Territory communities predicted to be affected by severe weather.

[Tropical Cyclone Blake forms off coast of WA, but fire relief in the east unlikely](#)

Tropical Cyclone Blake, the first for the Australian cyclone season, has formed off Western Australia's West Kimberley coast.

[Christmas day hail storm destroys crops in PNG Highlands](#)

More than 3000 people in the Western Highlands of Papua New Guinea could soon be starving after a freak hail storm destroyed their food gardens on Christmas day.

[Weather and ocean monitoring systems boost Tonga's disaster preparedness](#)

The installation of new automated weather stations and two sea level monitors in Tonga is expected to boost disaster preparedness and climate resilience in the kingdom.

Extreme weather (and other news) – Asia and the Middle East, Africa

[Indonesia succeeds in modifying weather to stop flooding](#)

Independent Online

Authorities started **cloud-seeding** operations by shooting salt flares at clouds on the Java Sea and the Sunda Strait to induce rain over waters off Java ...

[China offers receiving station for meteorological data to Mozambique](#)

Macauhub

China has donated a reception station for data collected by the **meteorological** satellite Fengyun – 2H to Mozambique, to help the country to follow the ...

Extreme weather (and other news) – Americas and Europe

[Smoke From Australian Wildfires Reaches Southern Brazil – Meteorologists](#)

Sputnik International

MOSCOW (Sputnik) – Smoke from devastating bushfires in Australia that have led to the death of over two dozen people has reached southern Brazil, ...

[BBC Weather: Extreme snowstorm risks Europe travel chaos amid freak Mediterranean freeze](#)

Express.co.uk

The BBC **weather** presenter said: “We have had some really strong winds, some heavy rain and snow across Croatia and Greece. “And that is moving ...

International news and research

[Israeli, German Scientists Double El Niño Warning Time, Predict Storm in 2020](#)

Haaretz

Weather havoc is likely to hit around Christmas 2020, say scientists after identifying correlation between warming events around the world.

[First Alert Meteorologist Brandon Beck looks at leaps in weather technology in the 2010s](#)

KY3

Perhaps the greatest leap in our technology in detecting real-time **weather** is dual polarity Doppler **radar**. This is a step up from “regular” Doppler, ...

[20 Experts Predict The Most Significant **Weather** And Climate Advances Of The Next Decade](#)

Forbes

Phased-array **weather radar** systems will also gain traction. Satellite ... That would be a significant leap for the climate research community. Dr. Victor ...

[Applying physics principle yields grim prediction on hurricane destruction in era of global warming](#)

Global warming could well lead to hurricanes more powerful than meteorologists currently forecast. A physicist noticed that one of the principles of physics -- phase transition -- did not appear in the scientific literature of meteorology. Using 60 years of published data, he demonstrated that the destructive power of tropical hurricanes increased linearly and rapidly as water temperature increased. The destructive energy could therefore treble if water temperatures rise by 2 degrees.

[Deep and crisp and living: How snow sustains amazing hidden life](#)

Snow may look pristine but even the freshly fallen variety is teeming with microscopic life. This vast and mysterious ecosystem could have a big impact on Earth

[Craig Kelly apologises to UK meteorologist he dubbed 'ignorant Pommy weather girl'](#)

SBS

A UK **meteorologist** has hit back at Liberal backbencher Craig Kelly for calling her an "ignorant Pommy weather girl" following an interview about ...

Weather companies

[Global **Weather** teams with Here for forecasts](#)

just-auto.com

Here **Technologies** says the Global **Weather** Corporation (GWC) has joined its Marketplace option to provide RoadWX **weather** data service, ...

[ClimaCell Announces Collaboration With Google Cloud on **Weather** Forecasting With 5X Jump in ...](#)

PRNewswire (press release)

ClimaCell is committed to making critical data free and accessible, fostering **innovation**. Starting in India, ClimaCell's models will be available to the ...

[Irish consultancy boosts offshore wind team](#)

reNEWS

Bonar will work on advanced design of floating substructures and optimisation of mooring and anchor systems, as well as work on **metocean** analysis ...

Air quality / air pollution

[Smokey orange skies: The health effects and science behind it](#)

New Zealand is unlikely to be much affected by ash from Australia's bushfires but vulnerable people should be sensible, and care should be taken around untreated drinking water, a physicist says.

Fire

[National fire risk assessment requested to prevent disaster like Australia](#)

Defence Minister Ron Mark has asked the Defence Force for a national fire risk

assessment to prevent a disaster like [Australia's bushfires](#).

[Australia's bushfire crisis is so big that it's useless trying to predict how blazes will behave, incident controller says](#)

Scientific modelling used to predict how bushfires will behave is "not coping" with the current fire situation in south-eastern Australia because the fires are so big, an incident controller says.

[Rain isn't always helpful fighting bushfires, so what will it take to put them out?](#)

The heavens have reluctantly opened, bringing a few millimetres of rain to the scorched south-east, but authorities say it can actually hinder their efforts to fight bushfires.

[Fires misinformation being spread through social media](#)

Australia's bushfire emergency is being exploited on social media, as misinformation is spread through cyberspace via hundreds of thousands of posts.

[Australian bushfires: How climate change and other factors worsen fires](#)

Stuff.co.nz

Australia bushfires: Severe losses loom as fire conditions ease ... likely **Australian** fires start and spread from **lightning** and human-caused ignition, ...

[Understanding bushfire-triggered thunderstorms may save lives](#)

Phys.Org

With more extreme weather predicted to result from climate change, the team's findings highlighted the importance of combining **weather radar** and ...

Health

[Scientists link La Niña climate cycle to increased diarrhea](#)

A study finds that spikes in cases of life-threatening diarrhea in young children are associated with La Niña climate conditions. The findings could provide the basis for an early-warning system that would allow public health officials to prepare for periods of increased diarrhea cases as long as seven months ahead of time.

Lightning

[Uluru lookout lightning strike injures six people](#)

The Guardian

Six people have been injured including two women who were hospitalised when **lightning** struck a sunset lookout area at the Ayers Rock Resort.

[Two struck by lightning 'extraordinary' Sydney storm](#)

9News

"Water is a great conductor of electricity as you can imagine, so it's quite dangerous to be in any type of water when we do have **lightning** strikes," ...

[Heroic Brother Saves Surfer Struck By Lightning](#)

10 daily

A man was struck by a **lightning** bolt while getting out of the water at Sydney's Dee Why beach on Monday afternoon, one of two people struck by ...

Weather in pictures

[The magic of the perfect surf photo – in pictures](#)

The Guardian

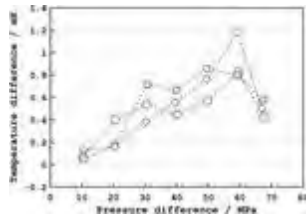
We study wind and wave charts like **meteorologists**. We factor in family and jobs, dropping responsibilities more than we should when conditions are ...

Journal and articles online

Pressure dependence of reference deep-ocean thermometers


Wukchul Joung, Keesool Gam, Jonathan V. Pearce

Version of Record online: 17 December 2019



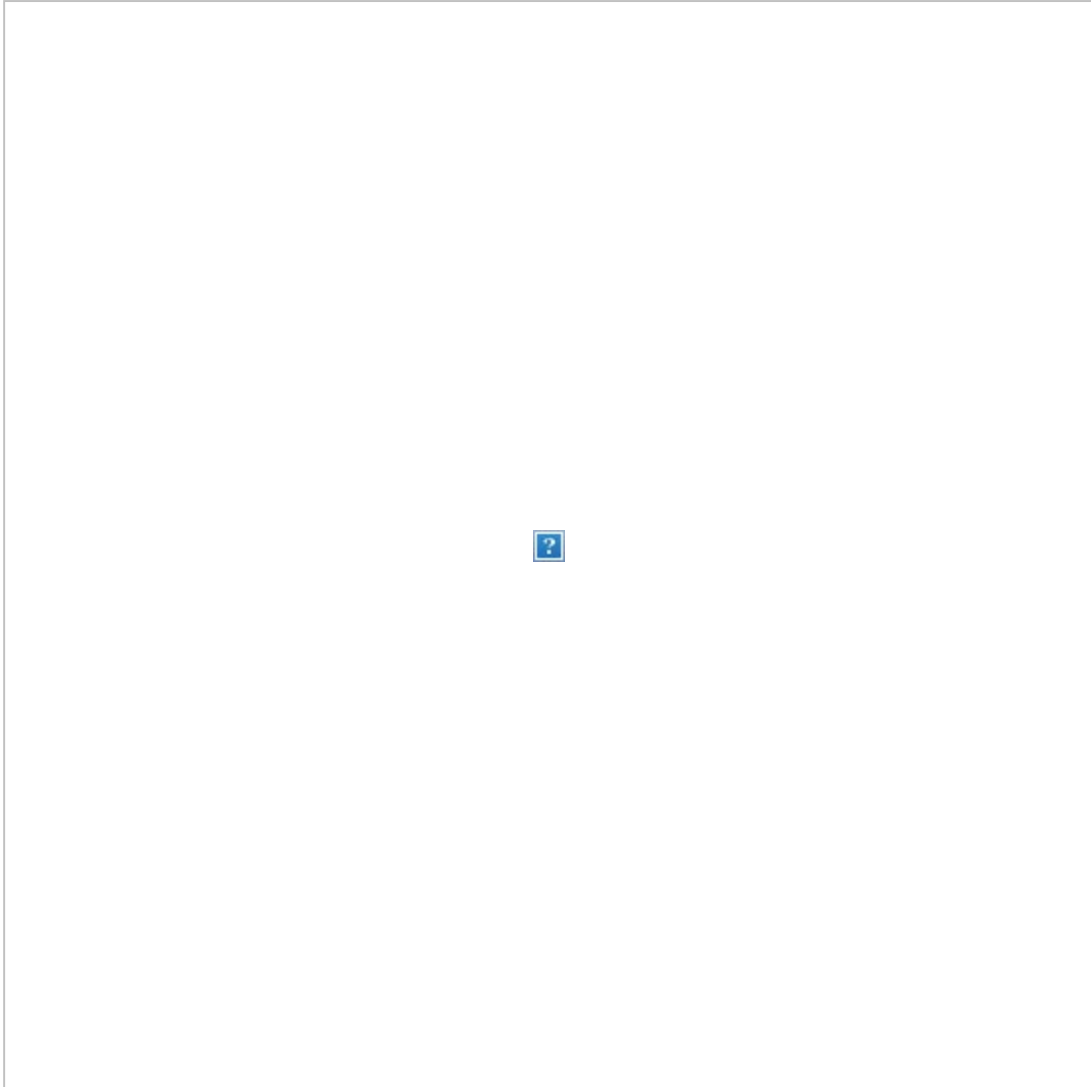
In this work, the pressure dependence of the temperature readings of reference deep-ocean thermometers (i.e. SBE 35, Sea-Bird Electronics) was investigated in a thermostatically controlled and pressurized environment. The results indicated that the pressure dependence of the reference deep-ocean thermometers is significant, and the pressure dependence is not the same for all SBE 35 devices but specific to each individual device.

From: [Ocean Carbon & Biogeochemistry Project Office](#)
To: [Julie Jakoboski](#)
Subject: Ocean Carbon Exchange: News from OCB
Date: Saturday, 27 January 2024 7:58:09 am

You don't often get email from @x

[Learn why this is important](#)

[View this email in your browser](#)



January 2024

- [OCB Science Highlights](#)
- [OCB News](#)
- [Community News](#)
- [Funding Info](#)
- [Job Opps](#)
- [Postdoc Opps](#)

Find frequently updated
[Jobs & Postdocs](#)
[Events](#)
[Student Opportunities](#)
[Funding](#)
on the OCB website.

OCB Science Highlights

Addressing the problem of additionality in ocean alkalinity enhancement (OAE)

Read the [highlight](#) and [paper](#) in *Biogeosciences* by Lennart Bach.



Ocean iron fertilization may amplify pressures on marine biomass with only a limited climate benefit

Read the [highlight](#) and [paper](#) in *Global Change Biology* by Alessandro Tagliabue, Benjamin S Twining, Nicolas Barrier, Olivier Maury, Manon Berger, and Laurent Bopp

Spotlight on Marine Carbon Dioxide Removal (mCDR)

OCB Principles of Engagement on mCDR

The OCB SSC has devised a [Principles of Engagement document](#) to guide OCB community engagement on mCDR, including research code of conduct, cross-sector partnerships, and communication.

OCB launches mCDR working group & regional nodes

A [community workshop on mCDR](#) was held September 27-30, 2022 at the Univ. Rhode Island (Palter et al., 2023, [workshop recordings and workshop follow-up webinar](#)). A key follow-on from the workshop was the development of a working group focused on mCDR. The [working group](#) consists of six core members plus leaders of five regional mCDR nodes in North America, including:

Core working group members - Jessica Cross (PNNL), Jaime Palter (URI), Patrick Rafter (USF), Sarah Cooley (Ocean Conservancy), Ken Buesseler (WHOI), Lennart Bach (Univ. Tasmania, liaison to [SOLAS global network of mCDR nodes](#))
Regional node leaders (working group members) and co-leads

- ◆ **Gulf of Mexico** - George Xue (Louisiana State Univ.), Laura Stieghorst (Básico)
- ◆ **Southeast** - Adrienne Hoarfrost (Univ. Georgia), Tyler Cyronak (Georgia Southern Univ.)
- ◆ **Northeast** - Adam Subhas (WHOI), Justin Ries (Northeastern Univ.), Elizabeth Troein



- (Isometric), Meg Estapa (Univ. Maine)
- **Pacific Northwest** - Meg Chadsey (Washington Sea Grant), Kohen Bauer (Univ. Victoria), Sara Nawaz (American Univ)
 - **West coast/California Current System** - Christina Frieder (Southern California Coastal Water Research Project), Kristen Davis (UCI), Alex Harper (CenCOOS)

With the recognition that different places have unique social, economic, environmental, and cultural contexts, the OCB mCDR Working Group is steering the spin-up of several regional mCDR nodes around the US to bring an in-person discussion of an mCDR topic(s) to their region. Using a place-based approach, they will facilitate the connection of stakeholders across sectors, disciplines, and career stages. We emphasize that the planning and implementation of the nodes will be open-ended, collaborative, and iterative. To maximize effectiveness, regional nodes will tailor their activities and discussions to their specific regional challenges and stakeholder groups, but the working group will provide a conduit through which regional node leaders can learn from one another and identify synergies. OCB will sponsor one in-person gathering of each regional node and help coordinate virtual meetings leading up to or following the in-person gathering to inform or digest discussion outcomes. The key deliverable of the regional nodes is community building at the local to regional level. Regional node activities will be advertised via OCB communication outlets and the [mCDR Working Group webpage](#).

SOLAS global mCDR nodes

Based on the North American mCDR nodes, the SOLAS Climate Intervention team aims to build a

global network of ocean experts in other parts of the world to develop standards for mCDR initiatives, especially concerning MRV. The aim is to help establish an internationally agreeable foundation for standards, recognizing the interconnected nature of the ocean beyond national boundaries and jurisdictions. If you are interested in participating, please [FILL OUT THIS FORM](#) by the end of January 2024. Please also forward this to any other interested ocean experts in your respective networks. [Learn more.](#)



New EPA resources

U.S. federal agencies, academic researchers, industry, nonprofits and other entities are researching marine carbon dioxide removal (mCDR) and marine solar radiation management (mSRM) to investigate their potential to mitigate the impacts of climate change. Approaches for mCDR, such as ocean alkalinity enhancement and deep ocean biomass sinking, may remove excess carbon dioxide from the atmosphere and store it for long periods of time in the ocean. Research is needed to better understand the effectiveness of these techniques for mitigating the impacts of climate change and the potential environmental benefits or risks of implementing these approaches at a climate-relevant scale.



The Environmental Protection Agency administers **two permitting programs under federal statutes that apply to mCDR and mSRM activities**. Researchers and other organizations proposing to conduct mCDR or mSRM activities in coastal waters or the ocean may need to seek authorization under a Marine Protection, Research, and Sanctuaries Act permit

or Clean Water Act National Pollutant Discharge Elimination System permit. The **EPA is pleased to share new [web resources](#) that include information about proposed mCDR and mSRM activities** and provide further information on the EPA's regulatory responsibilities for ensuring these emerging activities are conducted in a safe and responsible manner to protect human health, the marine environment and other uses of the ocean.

Regardless of whether the activity is permitted under the MPRSA or NPDES, the permitting process includes engagement with various local, state, Tribal and federal entities as appropriate, including those that administer federal statutes such as the Endangered Species Act, Section 401 of the Clean Water Act, and Coastal Zone Management Act. The public may also participate in opportunities for public review and comment on proposed MPRSA and Clean Water Act NPDES permits for these activities. Proposed permits and supporting information for MPRSA permits will be docketed on [Regulations.gov](#) and updates will be added on the EPA's MPRSA website. Any person may submit comments during the public comment period following the announcement of a complete application.

Researchers and organizations considering ocean-based mCDR or mSRM activities should contact the EPA with questions about permitting and to discuss how to apply for a permit by emailing xxxxxxxxxxxx@xxx.xxx.

[mCDR at the 2024 Ocean Sciences Meeting](#)

Check out all of [mCDR content at the 2024 Ocean Sciences Meeting](#), including multiple sessions and special workshops!



mCDR Networking Event in New Orleans

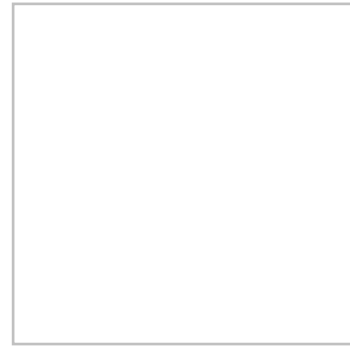
Marine carbon dioxide removal (mCDR) has exploded in popularity this Ocean Sciences Meeting. Are you curious and want to learn more? Are you thinking about engaging in an mCDR research project? Want to partner with industry or learn what's happening in the environmental NGO space? Join co-hosts [Ocean Carbon & Biogeochemistry \(OCB\)](#), [Carbon to Sea](#), [Exploring Ocean Iron Solutions \(ExOIS\)](#), [\[C\]Worthy](#), and [Ocean Visions](#) for an **mCDR networking event on Monday, February 19 from 6:30-9:30 pm at the Audubon Aquarium** (1 Canal Street, New Orleans, LA). All are welcome to come by for a few minutes, an hour, or the whole evening to peruse the mCDR landscape. The sponsoring organizations will offer welcome and introductory remarks at the beginning, and then we will mingle over food and beverage! We aim to convene a diverse group of multisector stakeholders to share information and explore new collaborations. Hope to see you there! [Reserve your ticket to the event here](#).
Hurry, space is limited!



NOPP mCDR PI open meeting preceding OSM2024

On Saturday February 17, 2024, NOAA Ocean

Acidification Program and associated funding partners will host the National Oceanographic Partnership Program (NOPP) Marine Carbon Dioxide Removal (mCDR) Principal Investigators (PI) inaugural meeting. The latest [portfolio](#) includes 17 projects from over 47 institutions. The NOPP mCDR PI meeting has invited experts to lead important topics within the mCDR field such as social/ethical considerations, data management, permitting, and MRV for an open section of the meeting. Each of these aforementioned topics will have a 1-1.5 hour session that will feature a panel discussion. We welcome all interested to [register to view](#) the meeting virtually from 9am-3:45pm CST (GMT-6). Please note the following agenda where PI breakout rooms will remain closed to external viewers.



AGENDA - Saturday February 17, 2024 (all times in CST, GMT-6)

9:00-9:30 Welcome and agenda for the day

9:30-10:30 Social and Ethical Considerations Workshop

Facilitators: Sonja Klinsky (Arizona State University), Sara Nawaz (American University), and Holly Buck (University at Buffalo)

10:30-11:00 PI Breakout Rooms (closed to external viewers)

11:00-11:15 Coffee Break

11:15-12:15 Data Management Panel and Discussion

Panelists: Tyler Kukla (CarbonPlan), Liqing Jiang

(Cooperative Institute for Satellite Earth System Studies, University of Maryland, NOAA NCEI), and Brendan Carter (Cooperative Institute for Climate, Ocean and Ecosystem Studies, University of Washington, NOAA PMEL)

12:15-1:45 Lunch Break

1:45-3:00 Permitting Panel and Discussion

Panelists: Sena McCrory (EPA), William Walker (USACE), Grace Andrews (Vesta), Jennie Rheuban (WHOI), and Nicholas Ward (PNNL)

3:00-3:30 Coffee Break

3:30-3:45 MRV Presentation, follow up to September 2022 OCB mCDR Workshop

Presenter: Jaime Palter

[REGISTER TO VIEW](#)

POCs: Kalina Grabb (xxxxxx.xxxxx@xxxx.xxx) and Gabby Kitch (xxxxx.xxxxx@xxxx.xxx)

Associated Funding Partners:

NOAA National Oceanographic Partnership Program, NOAA Ocean Acidification Program, NOAA Global Ocean Monitoring and Observing Program, DOE Office of Fossil Energy and Carbon Management, DOE Water Power Technologies Office, Office of Naval Research, U.S National Science Foundation, and ClimateWorks Foundation

mCDR Community Resources

Research Projects

- [NOAA Ocean Acidification Program/National Oceanographic Partnership Program \(NOPP\)-funded mCDR projects](#)
- [DOE-funded mCDR projects](#)
- [Carbon to Sea-funded projects on ocean alkalinity enhancement research](#)

and technology

Documents & Resources

- [Report for the Carbon Dioxide Removal \(CDR\): Towards a Unified Monitoring, Measuring, Reporting and Verification \(MMRV\) Framework Workshop](#)
- Carbon dioxide removal is not a current climate solution — we need to change the narrative <https://www.nature.com/articles/d41586-023-00953-x>
- *Eos* article from 2022 mCDR workshop: Palter, J. B., J. Cross, M. C. Long, P. A. Rafter, and C. E. Reimers (2023), The science we need to assess marine carbon dioxide removal, *Eos*, 104, <https://doi.org/10.1029/2023EO230214>. Published on 1 June 2023.
- [Guide to Best Practices in Ocean Alkalinity Enhancement Research](#)
- [Aspen Institute mCDR Code of Conduct](#): This document provides a roadmap of processes, procedures, and activities that project leaders should follow to ensure that decisions regarding whether, when, where, and how to conduct mCDR research are informed by relevant ethical, scientific, economic, environmental, and regulatory considerations.
- [Precautionary Principles for Ocean Carbon Dioxide Removal Research \(Ocean Conservancy\)](#)
- [Ocean-Based Carbon Dioxide Removal Road Maps \(Ocean Visions\)](#)
- [US Ocean Climate Action Plan \(OCAP\) \(2023\)](#)
- [OSTP Marine Carbon Dioxide Removal: Potential Ways to Harness the Ocean to Mitigate Climate Change \(2023\)](#)
- [The Ocean Carbon Dioxide Removal Decision Making Landscape \(2023\)](#)

Publishing Opportunities

Special issue of *Biogeosciences* on Environmental Impacts of Ocean Alkalinity Enhancement

Publishing opportunity at *Biogeosciences* in a special edition on [Environmental Impacts of OAE](#). Submission window will close on **31 March 2024**. To accelerate high-quality submissions, the first 10 accepted manuscripts (limited to two publications per research grant) will be offered financial support of up to 1800 Euro to offset either publication fees or costs for conference travel.

Research Topic on Environmental Engineering Perspectives on Ocean-Based Carbon Dioxide Removal

Frontiers in Environmental Engineering is accepting article submissions - manuscript submission deadline is **April 29, 2024**.

For more information, see [Environmental Engineering Perspectives on Ocean-Based Carbon Dioxide Removal](#)

Upcoming Events

February 8, 1-2 pm EST: [Ocean Visions webinar: MRV for Ocean-Based CDR: Innovations in Modeling and Observations](#)

March 12-14: [Socio-oceanography 2024](#) (National Oceanography Centre, Southampton) - special session on mCDR - [Navigating the Waters of Marine Carbon Dioxide Removal: From Promise to Practice](#) (Env Lead: Dr. Chelsey Baker, NOC; Social Science lead: Dr. Leslie Mabon – The Open University)

News from the OCB Project Office

Promoting justice, equity, diversity, & inclusion

- [End the glaring inequity in international science collaborations](#)
- [A guide for developing a field research safety manual that explicitly considers risks for marginalized identities in the sciences](#)

Life & Career

- [Crossing the generational divide: what established scientists and early-career researchers can learn from each other](#)
- [Breaking the menstruation taboo to make fieldwork more inclusive](#)
- [How a peer network made my worst day as a grad student bearable](#)

In Memoriam

OCB mourns the passing of Fred Mackenzie, Emeritus Professor at UH Manoa, on 3rd January. Fred was a giant of sedimentology, geochemistry, climatology and oceanography, and he will be sorely missed. Read more about Fred's legacy [here](#).



New OCB Activities

We are excited to announce the following new OCB activities that were supported through the latest OCB Activity Proposal Solicitation:

- **Small Group Activity: Intercomparison of metatranscriptomic methods for characterizing microbial eukaryote** (PIs: Harriet Alexander (Woods Hole Oceanographic Institution), Natalie Cohen (University of Georgia Skidaway Institute of Oceanography), Sarah Hu (Texas A&M), Adrian Marchetti (University of North Carolina at Chapel Hill))
- **Scoping Workshop: Leaky deltas: sources or sinks in the global carbon cycle?** (PIs: Shaily Rahman (CU Boulder), Kanchan Maiti (LSU), Jaap Nienhuis (Utrecht University), Cristina Schultz (Northeastern University), Elizabeth Chamberlain (Wageningen University), Julia Moriarty (CU Boulder), Marisa Repasch (University of New Mexico))
- **Training Activity: PACE Hackweek: A social coding event that keeps PACE with NASA's next great Earth science mission** (PIs: Jeremy Werdell, Anna Windle, Sean Bailey, Kelsey Bisson, Ian Carroll, Sean Foley, Patrick Gray, Carina Poulin, Pengwang Zhai) ([August 2024 in DC metro area, more info TBA](#))

OCB Scientific Steering Committee changes

OCB extends a warm welcome to incoming [Scientific Steering Committee](#) members **Rachel Stanley** (Wellesley College), **Kristen Krumhardt** (National Center for Atmospheric Research, NCAR), **Melissa Meléndez** (Univ. Hawai'i - early career member), and **Kanchan Maiti** (Louisiana State Univ.). **P. Dreux Chappell** (Univ. South Florida) is the new SSC Chair, and **Randie Bundy** (Univ. Washington) is the new SSC Vice Chair. We gratefully acknowledge the service and tremendous contributions of outgoing SSC members **Xinping Hu** (Texas A&M Univ.-Corpus Christi), **Victoria Coles** (UMCES), **Emily Osborne** (NOAA/AOML), and **Susanne Menden-Deuer** (Univ. Rhode Island).



OCB2024 Plenary Sessions

June 10-13, 2024 (Woods Hole, MA) - stay tuned for registration opening in early spring, and get your creative juices flowing for an OCB t-shirt design contest!

1. **Submarine groundwater discharge** (Chairs: Shaily Rahman, Kanchan Maiti)
 2. **Coupled biogeochemical cycles - interconnected controls on ocean fertility** (Chairs: Victoria Steck, P. Dreux Chappell, Zachary Erickson, Jessica Luo, Kristen Krumhardt)
 3. **Air-sea gas exchange** (Chairs: Rachel Stanley, David "Roo" Nicholson)
 4. **Marine viruses** (Chairs: Jessica Labonté, Sheri Floge, Jeff Bowman)
 5. **Fast processes in the surface ocean - the power of geostationary satellites** (Chairs: Joe Salisbury, Blake Schaeffer, Maria Tzortziou, Antonio Mannino, Melissa Meléndez)
-

GO-BGC Webinar on Carbon Export Dynamics

January 31, 2024 at 10 am PST/1 pm EST

Speakers ([talk.abstracts](https://talk.abstracts.org))

Ellen Park (Woods Hole Oceanographic Institution)

Title: Quantifying biological carbon pump parameters from the global Biogeochemical Argo float array

Adam Stoer (Dalhousie University)

Title: Estimating marine phytoplankton biomass and productivity from Biogeochemical-Argo floats

REGISTER [HERE](#)

New OCB Metatranscriptomic Intercomparison Activity

OCB is supporting an exciting new small group activity *Intercomparison of metatranscriptomic methods for characterizing microbial eukaryote contributions to the biological carbon pump*, which is being led by Harriet Alexander (WHOI), Natalie Cohen (UGA), Sarah Hu (TAMU), and Adrian Marchetti (UNC Chapel Hill). Microeukaryotes are core components of the biological carbon pump through their roles in primary production, carbon export, and trophic transfer in the marine food web, and metaT has become a standard approach used to understand their assemblages and metabolic underpinnings. However, critical gaps exist in our understanding of how methodological practices influence downstream biological interpretations, including estimates of community composition and metabolic function. The goal of this activity is to determine the extent of variability in existing metatranscriptomic pipelines through a deliberate community-led intercomparison to build international confidence in methodological choices. The outcomes of this small group activity will be to develop a best practices “how-to” guide, which would increase accessibility to non-experts, and to foster connections within the marine microbial ‘omic community, allowing for growth in our understanding of the strengths and limitations of this method.

To engage the broader community in the discussions and activities of this



group, we will convene a bimonthly webinar series that is open to all who are interested. We welcome your **abstract submissions** for talks that span omic method topic areas, as well as **ideas for omic webinar themes** (we will feature two speakers per webinar). We especially encourage early career members of our community to consider giving a seminar. Webinar talks will be ~20 minutes each, leaving plenty of time for a moderated Q&A session after the talks. We will record and make these seminars available via the [OCB YouTube channel](#).

[SUBMIT YOUR IDEAS FOR A WEBINAR HERE](#)

[Intercomparison of Ocean Metaproteomic Analyses - Preprint open for review](#)

Preprint of metaproteomic intercomparison exercise results **now accessible and open for interactive public discussion until 27 Feb 2024**:

Saito, M. A., Saunders, J. K., McIlvin, M. R., Bertrand, E. M., Breier, J. A., Brisbin, M. M., Colston, S. M., Compton, J. R., Griffin, T. J., Hervey, W. J., Hettich, R. L., Jagtap, P. D., Janech, M., Johnson, R., Keil, R., Kleikamp, H., Leary, D., Martens, L., McCain, J. S. P., Moore, E., Mehta, S., Moran, D. M., Neibauer, J., Neely, B. A., Jakuba, M. V., Johnson, J., Duffy, M., Herndl, G. J., Giannone, R., Mueller, R., Nunn, B. L., Pabst, M., Peters, S., Rajczewski, A., Rowland, E., Searle, B., Van Den Bossche, T., Vora, G. J., Waldbauer, J. R., Zheng, H., and Zhao, Z.: [Results from a Multi-Laboratory Ocean Metaproteomic Intercomparison: Effects of LC-MS Acquisition and Data Analysis Procedures](#), EGUsphere [preprint], <https://doi.org/10.5194/egusphere-2023-3148>, 2024. This publication was a product of an [OCB Working Group](#).

[New paper published by OCB Ocean Carbonate System Intercomparison Forum \(OCSIF\)](#)

Carter, B.R., Sharp, J.D., Dickson, A.G., Álvarez, M., Fong, M.B., García-Ibáñez, M.I., Woosley, R.J., Takeshita, Y., Barbero, L., Byrne, R.H., Cai, W.-J., Chierici, M., Clegg, S.L., Easley, R.A., Fassbender, A.J., Flegler, K.L., Li, X., Martín-Mayor, M., Schockman, K.M. and Wang, Z.A. (2023), Uncertainty sources for measurable ocean carbonate chemistry variables. *Limnol Oceanogr.* <https://doi.org/10.1002/lno.12477>.

Learn more about OCSIF [here](#).

[OCB Ocean Atmosphere Interactions Committee seeking](#)

nominations

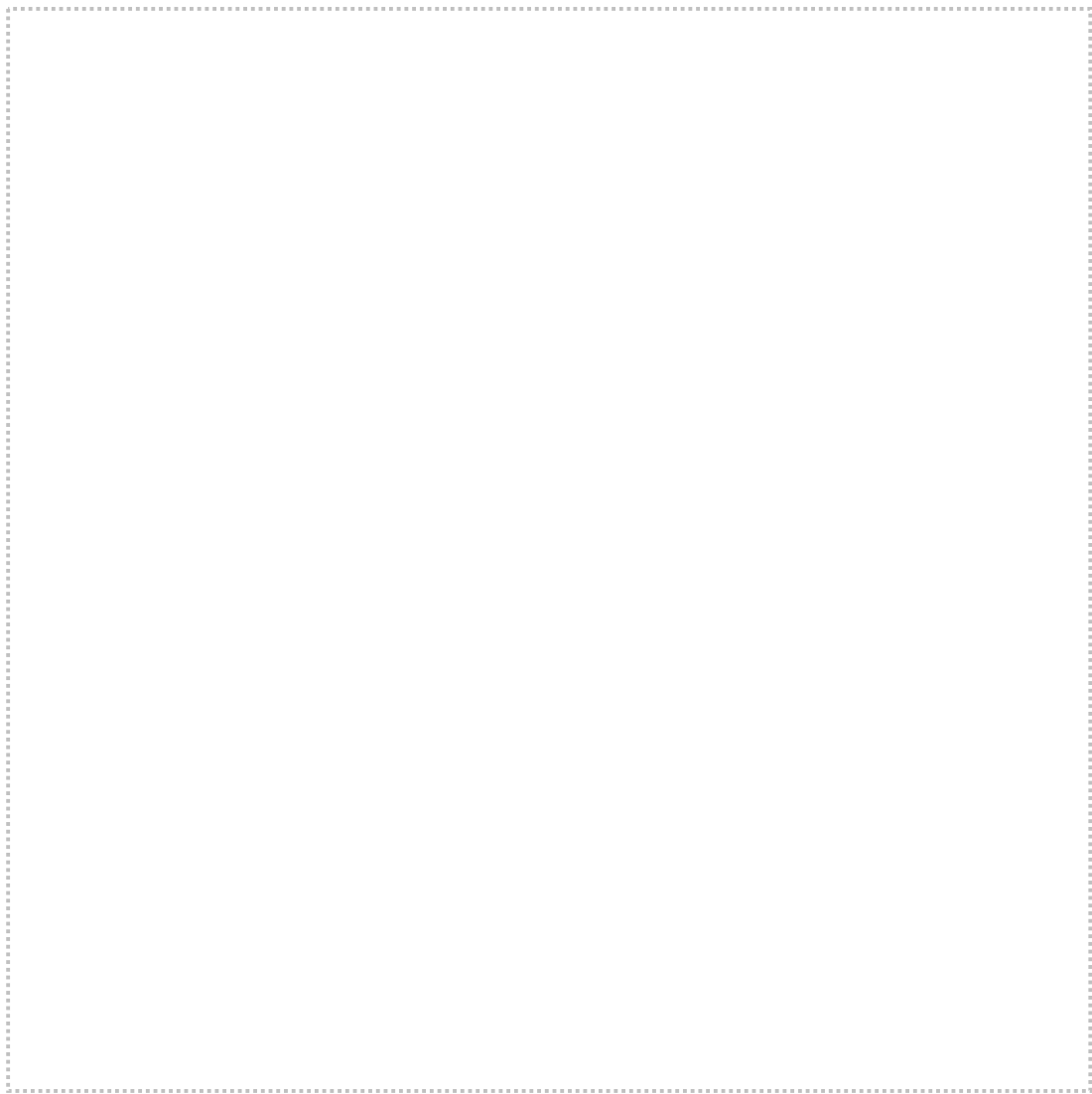
The Ocean Atmosphere OCB Subcommittee focuses on ocean atmosphere interactions and their role in marine biogeochemical cycles. For our mission statement, previous activities, and recently written US-SOLAS science report, see our [website](#). Our committee meets remotely once a month to lead initiatives, plan activities, interact with international SOLAS, etc. For more details, see our [charge and terms of reference](#).

The Ocean-Atmosphere Interaction committee is seeking nominations for at least three new members, including one or more early-career members. Self-nominations are encouraged. We are especially interested in filling the expertise gaps of

- climate modeling
- remote sensing

For the early career position, any research relevant to air-sea interaction is welcome. An early career nominee must have completed a PhD within the last 4 years; both postdoctoral researchers and new faculty members are eligible. For the early career nominees who are currently postdocs, a letter of support from the nominee's postdoctoral advisor is required in addition to filling out the nomination form. This letter of support should be sent to xxxxxxx@xxxx.xxx .

Please submit nominations [HERE](#) by March 1, 2024.



Save the date - registration opens soon!

April 23-25, 2024 (at the University of Delaware)

Scientific Organizing Committee

Xinfeng Liang (Univ. Delaware), Monique Messié (MBARI), Leslie Smith (Your Ocean Consulting LLC, DOOS), Isabela Le Bras (WHOI), Patrick Heimbach (Univ. Texas, Austin), Helen Pillar (Univ. Texas, Austin), Zachary Erickson (NOAA/PMEL), Charlie Stock (NOAA/GFDL), Cristina Schultz (Northeastern Univ.)

[Workshop website](#)

2024 Ocean Sciences Meeting

OCB Exhibit Booth at Ocean Sciences

The AGU/ASLO Ocean Sciences Meeting in New

Orleans is just around the corner! Come find us in the OSM24 exhibitor hall **BOOTH 512** ([MAP](#))! We'll have fun swag and lots of information about ongoing and upcoming OCB events and activities. Project Office staff, SSC members, and OCB activity leaders will be on hand to answer your questions.

OSM Exhibit booth hours

MONDAY: 3:00 PM - 6:00 PM

TUESDAY: 10:00 AM - 6:00 PM

WEDNESDAY: 10:00 AM - 6:00 PM

THURSDAY: 10:00 AM - 1:00 PM



MarChemSpec at Ocean Sciences

MarChemSpec is the Marine Chemical Speciation Model for acid-base speciation, trace metal complexation, and saturation with respect to solid phases in natural waters containing the inorganic species present in seawater. At OSM24, there will be a new release of the MarChemSpec software with new features added since the [tutorial at the OCB2023 workshop](#). It is now possible to automatically adjust an input solution (seawater or some other natural water) to fixed single values, or pairs, of these quantities: total dissolved inorganic carbon, total alkalinity, total or free pH, partial pressure or fugacity of CO₂. This makes the model simpler to use for many oceanographic applications.

Project leaders Simon Clegg and David Turner will present posters on MarChemSpec applications to [marine carbon dioxide removal \(mCDR\)](#) (CM24A-1140) and [trace metal complexation](#) (OB34C-0880) at OSM24. Meet



them at their posters and **visit the Ocean Carbon & Biogeochemistry (OCB) Exhibit Booth (BOOTH 512, OSM Exhibit Hall, [MAP](#)) to test drive the new software**. Simon and David will be at the meeting all week, and their availability at the OCB booth is likely to be broadly:

- Tuesday: 10 am - 6 pm
- Wednesday: 10 am - 4 pm
- Thursday: 10 am, 12 noon - 1 pm

To arrange a specific time to meet, please email Simon (x.xxxxx@xxx.xx.xx) and David (xxxxx.xxxxx@xxxxxx.xx.xx). For further announcements, visit the [project website](#).

OCB OAIC and SOLAS Social Gathering during Ocean Sciences

The [Ocean Atmosphere Interaction Committee](#) and SOLAS would like to invite everyone to the Courtyard Brewery, a nearby location with food and drinks, on Wednesday, starting at 6:30 PM. Enjoy some appetizers on us while you chat with old friends and make new ones. We would love it if SOLAS summer school alums use this as an opportunity to reconnect. This is open to all, so please feel free to bring partners, colleagues, and friends.

Location: [Courtyard Brewery](#), 1160 Camp St., New Orleans.

Time: Wed. Feb. 21 at 6:30 pm

Mini Workshop at Ocean Sciences: Biogeochemical Observing & Modeling - Connecting Observations to Models

Save the date: Thursday, February 22, 12-2 pm

2024 Ocean Sciences Meeting - Convention Center Room 224 (New Orleans, LA)

Join Federal Program Managers to share what you think are the grand challenges facing the Biogeochemical Observing and Modeling Communities and discuss opportunities for improved connectivity between observing and modeling efforts.

Biogeochemical observing networks and models are developing at an unprecedented pace. This workshop will provide space for biogeochemical modelers and observers to make connections, ensure observing networks are addressing critical modeling data needs, and inform federal research priorities. Participants will split into topical or regional groups and move between tables to discuss what data are currently available for models and what data and data products will be needed in the future. Workshop outcomes may include a report on regional observing data gaps and recommended improvements to data products that feed into biogeochemical models.

Please indicate your interest in attending this workshop by responding to this [short google form](#)

Reach out to the organizers with any questions: Erica Ombres, Liza Wright-Fairbanks (NOAA Ocean Acidification Program), Alyse Larkin (NOAA Global Ocean Monitoring & Observing Program).

Building a Community of Practice for the Collection and Assessment of Operational Phytoplankton Observations

OSM Town Hall, Friday February 23rd 2024,
12:45 - 13:45 CST (Convention Center, Room:
R02-R03, Second Floor)

The number of particle imaging instruments (PII) for quantifying and identifying phytoplankton in aquatic environments has grown over the last decade. PIIs are poised to revolutionize our understanding of planktonic ecosystems and will allow us to effectively monitor global changes over time. Each PII and sampling method has inherent limitations associated with the detection and imaging of particles, and the environment being sampled. Such standards have been established for optical and biochemical measurements, many of which have been reported in a series of protocol documents, including the IOCCG Protocols for Satellite Ocean Colour Sensor Validation. The OCB Operational Phytoplankton Observations (OPO) working group was formed to develop a set of best practices for both the collection and



downstream processing of phytoplankton images produced by PIIs that will result in consistent, quantitative observations of phytoplankton taxonomy and biomass.

Our goal for this Town Hall will be to provide a space and framework for discussion around emerging topics related to best practices when using PII through interactive breakout groups.

Potential discussion topics:

- ◆ Data and derived products
- ◆ Imaging data management and sharing
- ◆ Operational considerations for imaging instrument deployment
- ◆ Uncertainties in imaging data

[RSVP here by Friday February 16th](#) to help us gauge numbers and help us refine the discussion topics.

Margin/Basin Biogeochemical Dynamics: Priorities & Future Directions

There is currently considerable interest in margin processes within the oceanographic community, particularly in the closely related areas of carbon, nitrogen and iron cycling. To bring multiple investigators together, we are convening a [Town Hall](#) at the OSM 2024 Meeting in New Orleans on Monday from 12:45 to 1:45 (220-222, Second Floor). Much of the rationale arose from conversations within the GEOTRACES community as well as the product of the Benthic Ecosystem and Carbon Synthesis (BECS) Working Group, which has been working under the auspices of OCB for over a year. The goal of the town meeting is to start a wider conversation about margin processes amongst geochemists, biologists, physical oceanographers and modelers to talk about common problems. We are particularly excited about convening a Town



Hall at this meeting to engage international researchers. Many groups, especially in Europe and Japan, have well established margin processes and we are keen to learn from them. It would greatly assist us in planning and addressing issues people care about if you could **RSVP (xxxxxxx@xxx.xx)** and **fill out [this questionnaire](#)**. We plan to present an overview but the setup is informal, in order to encourage discussion. If you have some ideas or slides you would like to contribute, please send them to us for inclusion – it would be much appreciated.

We have funds for lunch for the first 30 participants!
Organizers: Cristina Schultz, Jim Moffett, Jessica Luo, Matt Long

Other OCB-relevant OSM24 Town Hall Meetings

(all 12:45-13:45 local time, **bold indicates OCB activity/co-organization**)

MONDAY

- **[TH13F Margin/Basin Biogeochemical Dynamics: Priorities and Future Directions](#)** (220-222, Second Floor)
- [TH13M Toward a Nationally Coordinated Strategic Approach for Stewardship of the Nation's Rich Ocean, Coastal, and Great Lakes Biodiversity](#) (R08, Second Floor)
- [TH13K The 2025–2035 Decadal Survey of Ocean Sciences for the National Science Foundation: Community Input on Scientific Priorities to Advance Understanding of the Ocean's Role in the Earth System](#) (208-209, Second Floor)
- [TH13H NASA Ocean Programs](#) (203-205, Second Floor)
- [TH13E GO-SHIP Update on the Recent and New Decadal Hydrographic Survey: A Community Forum](#) (Hall C-1, First Floor)

TUESDAY

- **[TH23O Tracing Physical, Biogeochemical, and Ecological Signals from the Surface to the Deep Sea: A Joint U.S. CLIVAR-OCB-DOOS Town Hall](#)** (211-213, Second Floor)
- **[TH23C Accelerating Toward an International BioGeoSCAPES](#)**

Program (225-227, Second Floor)

- [TH23F Guide to Best Practices in Ocean Alkalinity Enhancement Research](#) (R04-R05, Second Floor)
- [TH23K NSF Ocean Sciences Town Hall](#) (203-205, Second Floor)
- [TH23L Ocean Observatories Initiative Facility Board \(OOIFB\) Town Hall](#) (220-222, Second Floor)

WEDNESDAY

- [TH33N The Oceanography Society JEDI Committee Town Hall: Scientific Societies' Roles in Building Inclusive Communities](#) (R08, Second Floor)
- [TH33H Federal Marine Carbon Dioxide Removal Research and Coordination](#) (Hall C-1, First Floor)
- [TH33M Southern Ocean Carbon and Climate Observations and Modeling \(SOCCOM\) and Global Ocean Biogeochemistry Array \(GO-BGC\) Status and Plans](#) (211-213, Second Floor)
- [TH33L Satellite Ocean Observing Needs for the Coming Decade: An Active and Passive Future](#) (203-205, Second Floor)
- [TH33K ReMO: Respiration in the Mesopelagic Ocean](#) (215-216, Second Floor)
- [TH33P Would Access to Ship Time Benefit Your Research? Do You Need Oceanographic Instrumentation/Equipment to Answer Your Scientific Questions? Come Join Us to Learn About the Resources Available Through the UNOLS Community and, Further, How to Gain Access to Them](#) (225-227, Second Floor)

THURSDAY

- [TH43N Society for Women in Marine Science: Celebrating Experiences and Promoting the Visibility of Women in the Field](#) (210, Second Floor)
- [TH43D Establishing Ocean Carbon Dioxide Removal Policies](#) (Hall C-1, First Floor)
- [TH43I Joint Town Hall for the NASA Hyperspectral Missions PACE, GLIMR, and SBG](#) (203-205, Second Floor)

FRIDAY

- **[TH53C Coordination of Climate Time Series Data for the Global Coastal and Open Ocean](#)** (225-227, Second Floor)
- **[TH53B Building a Community of Practice for the Collection and Assessment of Operational Phytoplankton Observations](#)** (R02-R03, Second Floor)
- [TH53K Vision 2030: Ocean Science and Knowledge Priorities for the Ocean Decade to Achieve the Ocean We Want by 2030](#) (203-205, Second Floor)

Floor)

Community Announcements



BioGeoSCAPES Updates:

Interested in helping to champion Accelnet activities in support of BioGeoSCAPES such as standardization & intercalibration, modeling, informatics, etc.? Fill out the [BioGeoSCAPES Champions form](#) and we will be in contact as task teams come together.

Check out the latest [BioGeoSCAPES newsletter](#).

For regular updates, please visit the [BioGeoSCAPES website](#). Click [here](#) to join the email list and get more involved!



[New Lead Authors of the Third Decadal U.S. Carbon Cycle Science Plan Announced](#)

The Third Decadal U.S. Carbon Cycle Science Plan will build on the two previous plans ([Sarmiento and Wofsy, 1999](#), [Michalak et al., 2011](#)) and will identify which overarching questions highlighted in the previous plans have been adequately resolved over the past decade and those that still need to be addressed and will propose new directions for the community, especially in light of new and emerging U.S. government priorities and international assessments and agreements (e.g., UNFCCC Paris Climate Agreement). The Lead Authors and contributing authors will be responsible for identifying challenges and priorities for the next decade (~2025-2035) and developing an updated science plan through engagement with the broader carbon cycle science community.



[GLODAPv2.2023](#) has been successfully released! But it's already time to look ahead and prepare the upcoming full version release **GLODAPv3** (to be released in 2025).

To start off, we are now officially **calling for new cruise submissions**. We are looking for cruises which have “carbon-relevant” data, i.e., have a finalized cruise bottle file with at least one:

- Inorganic sub-parameter (TA, DIC, pH, fCO₂) and/or
- Transient tracer (CFC-11, CFC-12, CFC-113, SF6, CCl₄) and/or
- Carbon isotope (C13, C14)

The submission deadline for GLODAPv3 is the **1st of May 2024**. For submissions or questions, PIs are encouraged to check [submission requirements document](#) and contact Nico Lange

(xxxx@xxxxxxxxxxxxxxxx.xx).

New U.S. Ocean Acidification Action Plan

<https://www.state.gov/marine-environment/>

First-ever Ocean Justice Strategy

[Report](#)

[Press release](#)

New report on operationalizing surface ocean carbon measurements

[Oostende Declaration on Operationalising the Surface Ocean Carbon Value Chain](#)

New framework reveals gaps in US ocean biodiversity protection

Gignoux-Wolfsohn et al., [New framework reveals gaps in US ocean biodiversity protection](#), OneEarth (2023), [https:// doi.org/10.1016/j.oneear.2023.12.014](https://doi.org/10.1016/j.oneear.2023.12.014).
([accompanying fact sheet](#))

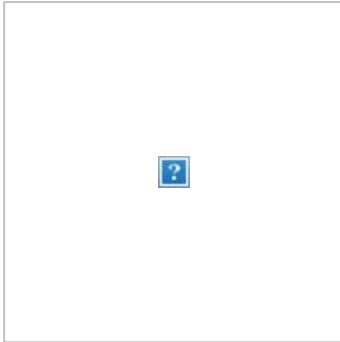


[2023 Global Carbon Budget](#)

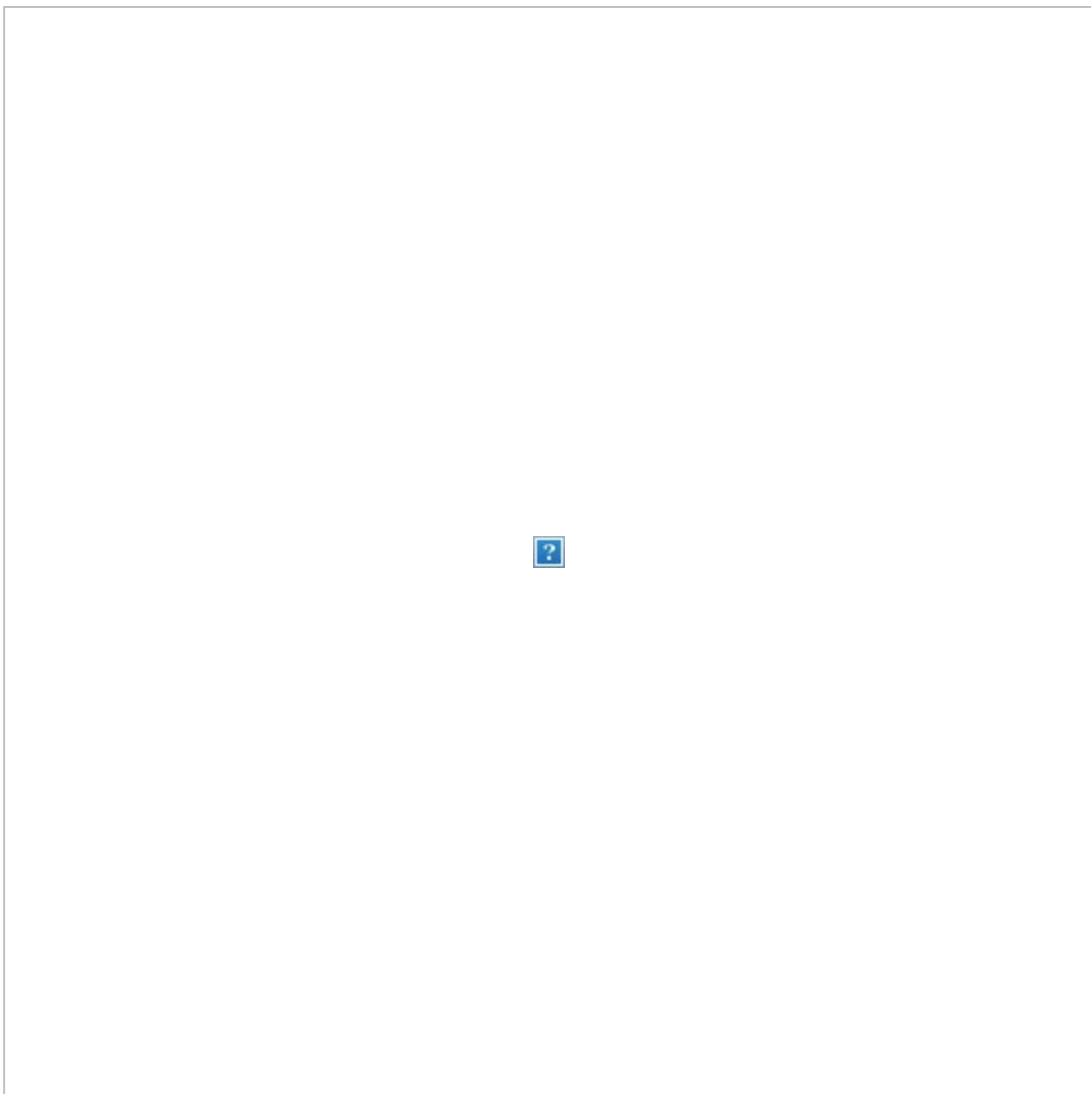


Resplandy, L., Hogikyan, A., Müller, J. D., Najjar, R. G., Bange, H. W., Bianchi, D., et al. (2024). A synthesis of global coastal ocean greenhouse gas fluxes. *Global Biogeochemical Cycles*, 38, e2023GB007803.

<https://doi.org/10.1029/2023GB007803>.

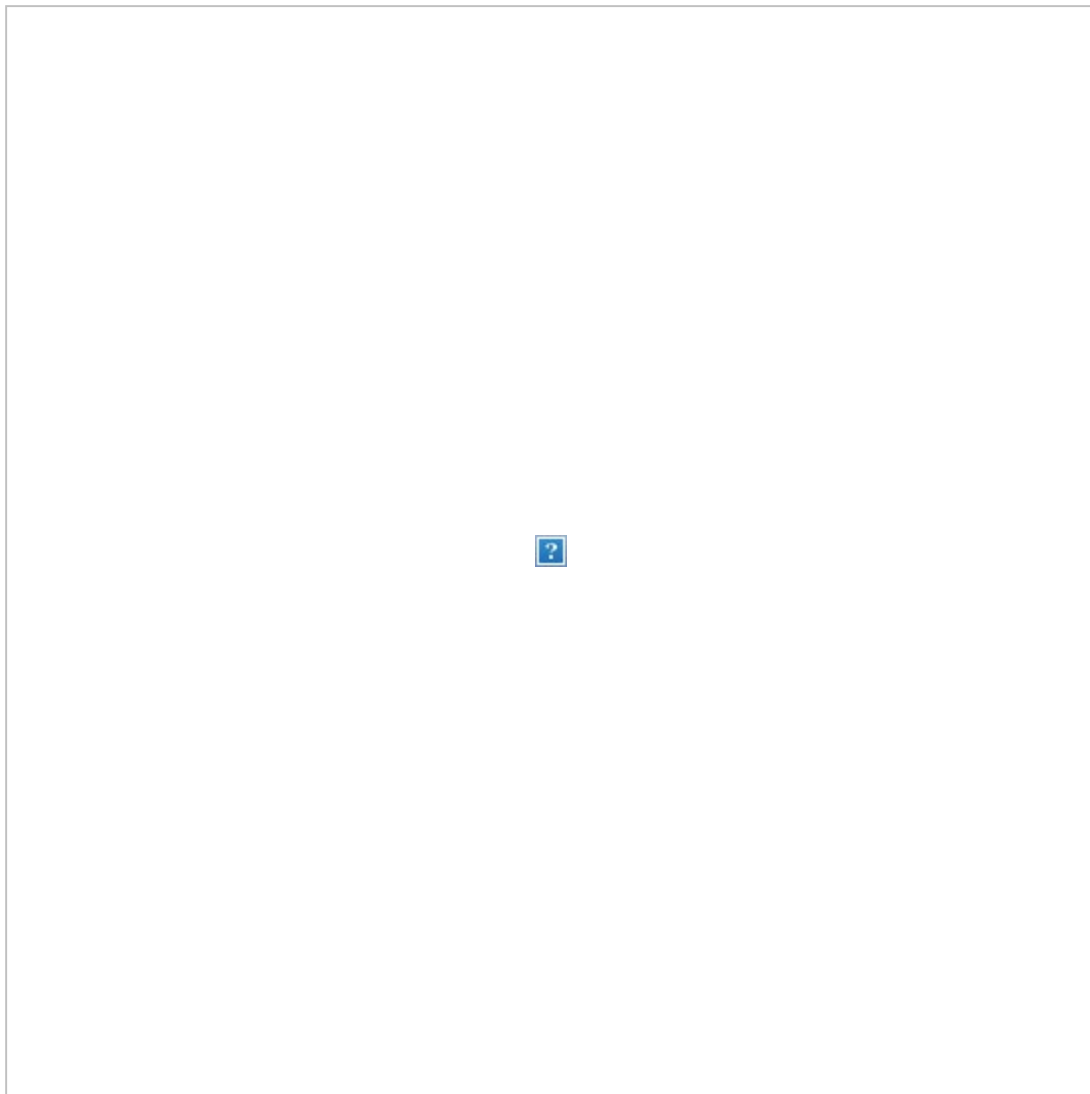


Three new SCOR Working Groups were selected this year. Read about their plans at <https://scor-int.org/work/groups/>



AGU recognizes individuals and teams who have made outstanding contributions to the Earth and space sciences through scientific research, education, science communication and outreach. Whether for your own contributions and accomplishments (self-nominations for UMAP only) or those of a remarkable mentor or colleague, recognize the excellence of a worthy candidate by nominating them for an AGU Honor.

[LEARN MORE AND SUBMIT NOMINATIONS](#)



Going to [Goldschmidt 2024](#) (Aug. 18-23, 2024, Chicago, IL)? Check out **Session 8e: Biogeochemical cycling in river deltas: mechanisms of carbon, nutrient, and trace element cycling that modulate the global carbon cycle** Conveners: Marisa Repasch (University of New Mexico), Shaily Rahman (University of Colorado Boulder), Sophie Hage (Ifremer – French Institute for Ocean Science), Brenna Boehman (MIT/Woods Hole Oceanographic Institution) - [get your abstracts submitted by MARCH 29](#)



[Ocean Decade Vision 2030 - White Papers Available for Review](#)



[Marine Life 2030 Newsletter](#)



[2024 Call for Applications for the GEOTRACES Early Career Scientists Committee](#) (application deadline: April 1)



[Global Greenhouse Gas Watch Implementation Plan open for review](#) (submit comments by Jan. 31)



[Summit on Ocean Biodiversity \(Jan. 23, 2024, recording now available\)](#)



Funding information

NSF

[Notice to research community: Use of generative artificial intelligence technology in the NSF merit review process](#)

[NSF Dear Colleague Letter Request for Information, NSF 24-021, "Technologies to Enable Observations in Remote-Extreme Environments"](#)

[NSF Bulletin \(Jan. 2024\): Proposals that Include U.S. Academic Research Fleet Ship Time](#)

NASA

[NASA RFI: Improving the Usability of the Research Opportunities in Space and Earth Science \(ROSES\) NASA Research Announcement \(NRA\) Request for Information](#)

[NASA Request for Information on Improving the Usability of ROSES](#)

ROSES-23 Amendment 61: [Future Investigators in NASA Earth and Space Science and Technology \(FINESST F.5\)](#) SMD's Graduate Student Research Proposals due February 6, 2024.

Engagement Opportunities in NASA STEM 2024 (EONS 2024) [Appendix 9: MUREP Institutional Research Opportunity \(MIRO\)](#) - proposals due Feb. 14

NOAA

[Funding Opportunity - Ocean and Coastal Carbon Observing Optimization Studies](#)

The NOAA Ocean Acidification Program (OAP), in partnership with the Global Ocean Monitoring and Observing (GOMO) Program is soliciting proposals to optimize sampling strategies that improve carbonate chemistry observing systems co-developed with an observing data product end user that can inform real-time data delivery and forecasting of ocean acidification relevant parameters. The optimization design should be geared towards delivering the data needed to support the end user's specific decision support needs.

Applicants should submit proposals not to exceed \$500,000 per year for projects generally 2-3 years in duration, with a total multi-year budget not to exceed \$1,500,000 (Option 1.a.: Up to \$350,000 per year for three years; Option 1.b.: Up to \$200,000 per year for three years; Option 2: Up to \$500,000 per year for three years). Should funds become available for this program, up to approximately \$4,000,000 may be available in Fiscal Year 2024 for the first year. We anticipate funding 2-5 projects with expected start dates of September 1, 2024. Funding for this program is contingent upon availability of funds, which have not been appropriated at the time of this announcement.

DOE

[Funding Notice: \\$14.5 Million Available for Marine and Ocean Renewable Energy Research and Development at U.S. Colleges and Universities](#)

PRIVATE FOUNDATIONS

Virtual Institute for the Carbon Cycle (VICC): Notice of upcoming Expressions of Intent (EOI) period for funding proposals

Program Background

The Virtual Institute for the Carbon Cycle (VICC) is an initiative of Eric and Wendy Schmidt's climate program. VICC intends to support transformational research that tackles knowledge gaps and reduces uncertainty in carbon cycle science on time scales that are relevant for informing effective climate policy and enabling solutions. In early 2024, VICC will be seeking brief (2 page) expressions of intent (EOIs) for research projects that **address knowledge gaps and uncertainty reduction in carbon cycle science on time scales that are relevant for informing effective climate policy and enabling solutions**. Select submissions will then be invited to submit a full proposal. EOI submissions must explain how the proposed methodological advances, novel observations or use of observations, or advances in modeling or theory will enable progress towards improved understanding of the carbon cycle. Submissions must also indicate how this improved understanding will be useful, demonstrating relevance for designing policy and industry action and/or for evaluating the outcomes of those actions. We intend to accept proposals for projects with a duration of 5 years and with a budget of up to \$10 million USD. Submissions must be grounded in one or more of the following scientific themes:

1. Understanding the current fate of anthropogenic emissions in time and space, improving the accuracy of the global carbon budget by an order of

magnitude. Projects under this theme could address any combination of land, ocean, and atmospheric components, including partitioning among reservoirs and their spatial and temporal variability, as well as feedbacks.

2. Understanding the carbon cycle on timescales relevant to a policy attribution framework and enabling robust distinction between the natural and anthropogenic components of the carbon cycle.
3. Understanding the future of the land and ocean carbon sources and sinks in a changing climate on decadal to centennial timescales, including evaluating the potential for surprises and abrupt change.

Eligible Institutions

- ◆ We anticipate considering proposals from any of the following institutions:
- ◆ Research teams in university, national laboratory, institute, or agency settings
- ◆ Teams which include industry and NGO partners Multi-institute research consortia, with regional and global partnerships (strongly encouraged)

Anyone wishing to be informed when the EOI submission period officially opens may do so by clicking [here](#) and sharing their email information.

Interested parties will be notified over email when the VICC EOI call is launched in early 2024.

Job opps

*Based on community demand, **Jobs** are returning to the eNews - find [postdocs](#) (coming soon to eNews) on the OCB website!*

- ◆ The Biological Oceanography Program within Division of Ocean Sciences (OCE) has a near-term need for an [Intergovernmental Personnel Act \(IPA\) Program Director](#) with experience and expertise in any area of biological oceanography or marine ecology. Open until filled
- ◆ MBARI seeks a [Research Technician](#) to assist with the management of data from the biogeochemical profiling floats operated as part of the Global Ocean Biogeochemistry (GO-BGC; <https://go-bgc.org>) and Southern Ocean Carbon and Climate Observations and Modeling (SOCCOM; <https://socom.princeton.edu>) arrays. These are NSF funded projects to deploy large arrays of profiling floats across the global ocean. Position is open until filled.
- ◆ [Tenure Track Faculty Positions](#) in Estuarine and Marine Science at

University of Maryland Center for Environmental Science, Horn Point Laboratory in Cambridge, MD. Review start is 03/04/24.

- [CPAESS Program Specialist III](#): UCAR is excited to announce the job opening for the CPAESS Program Specialist III role working with NOAA's Global Ocean Monitoring and Observing (GOMO) Program. This position will provide senior-level program support for the design and development of data management approaches and policies for the GOMO and Arctic Research Program (ARP). Application Deadline: This position will be posted until filled with priority given to applications submitted by Monday, January 29, 2024.
- [Tenure-Track Faculty Position: Microbial Oceanographer](#) specializing in Pelagic Ecosystem Processes at the University of Hawai'i at Mānoa. Review of applications will begin on 1 March 2024.
- The School of Ocean Science and Engineering at The University of Southern Mississippi is currently fielding applications for three faculty positions, with August 2024 start date. The positions are: [Assistant Professor of Marine Chemistry](#); [Assistant Professor of Carbonate Chemistry or Biogeochemistry](#); and [Assistant Teaching Professor and Undergrad Program Coordinator in Marine Science](#). Application review will start 8 January.
- [Director of the School of Ocean Science and Engineering](#) at the University of Southern Mississippi. Review of applications will begin February 1, 2024, and will continue until the position is filled.
- [Carl B. Brown Distinguished Professor in Marine Science, University of North Carolina Wilmington](#)
- [Director of the National Center for Integrated Coastal Research at the University of Central Florida](#)
- [Computational Scientist](#), Yale Center For Natural Carbon Capture. Review of applications will begin on January 22, 2024 until filled.
- The Department of Marine Science at California State University Monterey Bay (csUMB.edu/marinescience) invites applications for two assistant professor positions to begin in August 2024. The positions include: [Assistant Professor of Marine Invertebrate Ecology](#) and [Assistant Professor of Marine Education and Outreach](#). Priority screening date is January 16
- The Department of Estuarine and Ocean Sciences (DEOS) at the University of Massachusetts Dartmouth School for Marine Science and Technology in New Bedford, MA, invites applications for a [tenure-track faculty position](#) in Marine Science at the Assistant/Associate Professor level beginning in September 2024. Research areas of particular interest include: Ocean and Climate Observations, Ocean and Climate Large Data

Set Analysis and Modelling, Marine / Coastal Biogeochemistry, Oceanographic Remote Sensing and Geospatial Analysis. Reviews begin immediately and will continue until filled

Postdoc opps

- ◆ [Postdoctoral Associate in Salt Marsh Carbon Biogeochemistry](#). The [Spivak Coastal Biogeochemistry](#) lab at the University of Georgia seeks a Postdoctoral Associate to contribute to research of soil carbon preservation mechanisms in salt marshes. The Postdoctoral Associate will lead lab- and field- based experiments focusing on how redox conditions alter plant-microbe-mineral interactions and organic matter transformations in wetland soils. Application review will begin immediately and continue until the position is filled, with the candidate starting during Spring 2024.
- ◆ [Departmental postdoc](#) at University of North Carolina Chapel Hill. Important that candidates get in touch with prospective postdoc advisors there and propose a multidisciplinary project. Deadline March 1
- ◆ [Postdoctoral Scientist in mCDR modelling](#) at Bigelow Laboratory for Ocean Sciences. Screening of applications begins January 22 and continues until position is filled
- ◆ [Postdoctoral Research Associate](#) position in Remote Sensing of Aquatic Environments with the Tzortziou Bio-Optics Laboratory at the Center for Discovery and Innovation, CCNY, in New York City. Reviewing of applications begins immediately
- ◆ [Postdoctoral Researcher-Machine Learning/Video Interpretation](#), Woodwell Climate Research Center
- ◆ [Postdoctoral Research Scientist in Trace Metal Biogeochemistry, Bigelow Laboratory](#). Apply by February 1.
- ◆ [Postdoctoral research scientist in trace metal biogeochemistry](#) at Bigelow Laboratory for Ocean Sciences. Apply by February 1
- ◆ We are seeking talented and creative individuals to join the Ocean Dynamics group at the University of St Andrews in Scotland. There are two 2-year postdoc positions
- ◆ Postdoctoral and Research Scientist Cluster Hire: Inorganic Carbon and Water Modeling of Enhanced Weathering and Ocean Alkalinity Enhancement. We intend to hire seven professionals (postdoctoral associates and/or research scientists) to participate in the Global Ocean and Land Alkalinization (GOAL-A) Project. This study, which is funded by

the Department of Energy (DOE) Earth Shot Program, is a collaboration among scientists at Yale, Georgia Tech, Princeton, and Texas A&M universities that aims to create a soils-to-oceans modeling framework to evaluate the efficacy, co-benefits, and risks of enhanced mineral weathering (EMW) and ocean alkalinity enhancement (OAE). To support this interdisciplinary initiative, we are seeking applicants with proficiency in modeling that is relevant to simulating physical and chemical processes that govern the flows of water, energy, and chemicals within and between watersheds, river networks, the atmosphere, and the ocean. We are especially interested in candidates with expertise in earth-system and climate modeling, ocean circulation/biogeochemical modeling, river-network modeling, watershed modeling, and reactive transport modeling. Please follow the below links for information on applying to specific universities: For Yale, Georgia Tech, and Texas A&M positions please click [here](#). For Princeton positions please click [here](#).

- NGI - Postdoctoral Associate: The Northern Gulf Institute (NGI) has an exciting opportunity for a full-time Postdoctoral Associate to work at NOAA-AOML in Miami, Florida. The function of the postdoc is to use a regional ocean-biogeochemical model for South Florida to characterize patterns in relevant marine ecosystem stressors (ocean acidification, hypoxia, harmful algal blooms, warming, and eutrophication) impacting marine resources and coastal ecosystem services. The postdoc will be part of a multidisciplinary team that aims to investigate multi-stressor impacts under present and future climate change scenarios. Duties include but are not limited to: 1) Configure a regional ocean-biogeochemical model; 2) Conduct numerical model experiments; 3) Analyze and describe simulated patterns; 4) Participate in regular team meetings; 5) Present research results in scientific conferences and workshops; 6) Submit manuscripts to peer-reviewed journals. Details for the online application could be found here: <http://explore.msujobs.msstate.edu/cw/en-us/job/506634?ApplicationSubSourceID=>
- [Postdoc Position in Ocean Modeling for Multi-stressor Research at NGI \(based in Miami\)](#). The Northern Gulf Institute (NGI) has an exciting opportunity for a full-time Postdoctoral Associate to work at NOAA-AOML in Miami, Florida. The function of the postdoc is to use a regional ocean-biogeochemical model for South Florida to characterize patterns in relevant marine ecosystem stressors (ocean acidification, hypoxia, harmful algal blooms, warming, and eutrophication) impacting marine resources and coastal ecosystem services. The postdoc will be part of a multidisciplinary team that aims to investigate multi-stressor impacts under present and future climate change scenarios.

- The Eisaman lab at Yale University is recruiting postdocs in a range of ocean CDR fields, including modeling, protocol, sensor, and experiment development. These positions are listed at <https://www.eisamanlab.com/opportunities> .
- [Postdoc](#) at Princeton/GFDL on benthic / ocean biogeochemical modeling
- Postdoc position (18 months) in trace metal biogeochemistry in Brest, France. If interested, do not hesitate to contact Ewan Pelleter: xxxx.xxxxxxxx@xxxxxxx.xx; Cécile Cathalot: xxxxxx.xxxxxxxx@xxxxxxx and Hélène Planquette: xxxxxx.xxxxxxxxxxxx@xxxxxxxxxxx.xx
- [Post-Doctoral Research Associate at Old Dominion University](#) to participate in a National Science Foundation Ecology and Evolution of Infectious Diseases (EEID) funded project that focuses on understanding controls on Eelgrass wasting disease. Open until filled
- [Postdoctoral scholar](#) to work on development of Monitoring and Verification (MRV) Frameworks for Ocean-based Carbon Dioxide Removal in Canadian Atlantic Waters (Bedford Basin, Canada). Starting data ASAP
- [2-yr postdoc fellowship](#) in bio-physical interactions (microbial ecology and/or carbon cycle) at Brown Univ.
- The Northern Gulf Institute at Mississippi State University is [hiring three PhD-level scientists](#) based at AOML in Miami, Florida. Open until filled.
- [Postdoctoral Associate](#) at Northern Gulf Institute, Miami, Florida
- [Postdoctoral Research Scientist](#) position in machine learning, and atmospheric and climate science at Columbia University
- [Postdoc](#) at Jacobs University
- [Postdoctoral research position](#) available immediately at Rutgers University, the State University of New Jersey, Department of Marine and Coastal Sciences, on trace metal dynamics in the Amundsen Sea. Open until filled
- [Postdoctoral fellow](#) in Molecular Ecology, Genomics or Computational Biology/Bioinformatics to join the Marine Climate Change Unit/Ravasi's Unit at OIST (<https://groups.oist.jp/macc>) to work on a long-term project that aims to understand the effects of climate stressors (i.e., ocean acidification and warming) on coral reef fishes.
- [Postdoc](#) examining microbial communities, nutrient dynamics, and biogeochemical function in San Francisco Bay estuary at Stanford University (start date ASAP, open until filled)

Share your announcements with the OCB community

Do you have an OCB-relevant job opening, student opportunity, announcement, meeting, workshop or deadline? Are you are interested in submitting a [short highlight of your recently published work](#)? Contact us at xxxxxxx@xxxx.xxx and tag us on Twitter [@US_OCB](https://twitter.com/US_OCB).

Ocean Carbon & Biogeochemistry Program Office
Woods Hole Oceanographic Institution
Department of Marine Chemistry and Geochemistry
266 Woods Hole Road MS #25, Woods Hole, MA 02543
Email: xxxxxxx@xxx.xxx

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Date: Friday, 16 October 2020 8:02:14 pm



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[GEC Webinar Oct 21 at noon - Mitigating Climate Change](#)



1. [Two approaches for mitigating global climate...](#) Julie Brigham-Grette

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[Julie Brigham-Grette](#)

Two approaches for mitigating global climate change: Solar radiation management and greenhouse gas emissions reduction

-- with Alan Robock (Rutgers) and Marilyn Brown (Georgia Tech)

Register today at (www.agu.org/Events/Webinars/Upcoming-Webinars/...) or via the GEC website (connect.agu.org/gec/webinars/future-webinar).

Webinar summary:

We are fortunate to have two outstanding experts discussing quite different mitigation strategies.

Professor Alan Robock, Department of Environmental Sciences, Rutgers University, will discuss the benefits and risks of stratospheric sulfur geoengineering (or climate intervention). In his presentation **Stratospheric Sulfur Geoengineering – Benefits and Risks** Dr. Robock will present the

current results from his ongoing Geoengineering Model Intercomparison Project which is using climate model experiments with standard stratospheric aerosol injection scenarios. He will show results indicating that if SO₂ could be continuously injected into the lower stratosphere, it would produce global cooling, stop melting of the ice caps, and increase the uptake of CO₂ by plants. On the flip side, Dr. Robock posits that there are at least 27 reasons why stratospheric geoengineering may be a bad idea.

Professor Marilyn Brown, School of Public Policy, Georgia Institute of Technology, will discuss how U.S. states can most effectively reduce their carbon footprints. In her presentation **Translating a Global Emissions Reduction Framework for Sub-National Climate Action: A Case Study from the State of Georgia** she will describe a process that considers (1) Georgia's baseline carbon footprint and trends, (2) the universe of Georgia-specific carbon-reduction solutions that could be impactful by 2030--including both mitigation and natural carbon sinks, (3) the greenhouse gas reduction potential of high-impact 2030 solutions for *Georgia*, and (4) associated costs and benefits including "beyond carbon" priorities, such as job creation, public health, environmental benefits, and equity. The process that employs these data is systematic and replicable and can be used by other states to identify high-impact solutions. Professor Brown will discuss its strengths and weaknesses and planned future research.

Dr. Alan Robock is a Distinguished Professor of climate science in the Department of Environmental Sciences at Rutgers University. His areas of expertise include climate intervention (also called geoengineering), climatic effects of nuclear war, and effects of volcanic eruptions on climate.




Dr. Marilyn A. Brown is a Regents' Professor and Interim Chair of the School of Public Policy at the Georgia Institute of Technology, where she created and leads the Climate and Energy Policy Lab. Her research focuses on the design and modeling of carbon reduction technologies, policies, and programs.

Julie Brigham-Grette

University of Massachusetts Amherst
xxxxxxx@xxx.xxxxx.xxx

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Two approaches for mitigating global climate change: Solar radiation management and greenhouse gas emissions reduction -- webinar with Alan Robock (Rutgers) and Marilyn Brown (Georgia Tech)

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Julie Brigham-Grette

University of Massachusetts Amherst
xxxxxxx@xxx.xxxxx.xxx

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Subject: wrf - new results
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[Operational workflow to simulate biophysical variables, based on the coupled WRF/SEBAL models](#)

[KM Amin - 2024](#)

Three subsystems including an atmospheric regional forecast and analysis system, satellite data retrieval and processing, and a surface energy balance model have been employed in a 24/7 operational system to measure and simulate some primary ...



[\[HTML\] Urban heat islands from multiple perspectives: Trends across disciplines and interrelationships](#)

[IA Assenova, LL Vitanova, D Petrova-Antonova - Urban Climate, 2024](#)

... The study revealed that numerical simulations, particularly those utilising the ENVI-met and **WRF** models, are the most prevalent ... -met and **WRF** models. The ENVI-met model is specifically designed to simulate the microclimate of small-scale urban ...



[Assessing target areas for precipitating moisture source analysis of extratropical cyclones: An analysis based on case studies](#)

[P Coll-Hidalgo, R Nieto, A Pérez-Alarcón, RM Trigo... - Atmospheric Research, 2024](#)

... Before applying the CNN models, we remapped the predictors derived from the **WRF** outputs to a regular 1×1 latitude–longitude grid. The final output convolutional layer was activated with a sigmoid function yielding values between 0 and 1. The ...



[Sparse Target Parameter and Channel Estimation in mmWave MIMO OTFS-aided Integrated Sensing and Communication Systems](#)

[M Jafri, S Srivastava, AK Jagannatham - IEEE Transactions on Communications, 2024](#)

... The second key objective is to design the beamformer **wRF** for the UE, and to learn the delay ... beamforming gain is applied as the RF RC **wRF** at the DFRC receiver. Similarly, the transmit ... Similarly, the user processes the pilot signal using ...



[\[PDF\] The effectiveness of solar radiation management for marine cloud brightening geoengineering by fine sea spray in worldwide different climatic regions](#)

[Z Song, N Yao, L Chen, Y Sun, B Jiang, P Li... - EGU sphere, 2024](#)

... (4) 187 The diagnosis of CLEAN-SKY (no aerosols) was not considered in the previous **WRF**-CMAQ model. So in this study, we extended this feature in the **WRF**-CMAQ model using the methodology of Ghan et al. (2012) by performing a double ...



[\[PDF\] Urban Area Observing System \(UAOS\) Simulation Experiment Using DQ-1 Total Column Concentration Observations](#)

[J Yi, Y Huang, Z Pei, G Han - EGU sphere, 2024](#)

Satellite observations of the total column dry-air CO₂ (XCO₂) have been proven to

support the monitoring and constraining of fossil fuel CO₂ (ffCO₂) emissions at the urban scale. We utilized the XCO₂ retrieval data from China's first laser carbon ...



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[Ergonomic risks affecting the performance of work-from-home employees in IT industry: a comprehensive analysis](#)

[V Kamala, S Yamini, MS Gajanand - International Journal of Productivity and ..., 2024](#)

Purpose This research paper aims to provide a comprehensive analysis of the ergonomic risks faced by employees in the IT industry who work from home (WFH). With the increasing prevalence of remote work, understanding and addressing ...



[\[PDF\] Modeling simulation of aerosol light absorption over the Beijing-Tianjin-Hebei region: the impact of mixing state and aging processes](#)

[H Du, J Li, X Chen, G Curci, F Yu, Y Sun, X Dao, S Guo... - EGU sphere, 2024](#)

... The mesoscale model **WRF** was used to provide the meteorological field for NAQPMS. The initial and boundary conditions for meteorology were provided by NCEP final reanalysis data (FNL) every six hours (<https://rda.ucar.edu/datasets/ds083.2/>) ...



[\[PDF\] Consideration on Pre-Feasibility Studies for Large-scale Offshore Wind Farms Led by Local Governments, Focusing on the Case of Shinan-gun](#)

[MC Park, JH Park, GY Lee, CM Lee, GH Yu, HW Jang... - New & Renewable Energy, 2024](#)

The major challenge in promoting large-scale offshore wind power projects is securing local acceptance. Several recent studies have emphasized the crucial role of local governments in addressing this problem. However, local governments have ...



[\[HTML\] Wildfire Impacts on O₃ in the Continental United States Using PM_{2.5} and a Generalized Additive Model \(2018–2023\)](#)

[H Lee, DA Jaffe - Environmental Science & Technology, 2024](#)

We examined PM_{2.5} and Hazard Mapping System smoke plume satellite data at ~600 United States (US) air monitoring stations to identify surface smoke on 14.0% of all May–September days for 2018–2023, with large influences in 2020 and 2021, due ...



[Dynamic Pricing in EV Charging Stations with Renewable Energy and Battery Storage](#)

[CAM Silva, JR Andrade, RJ Bessa, F Lobo - ... on the European Energy Market \(EEM\), 2024](#)

The integration of electric vehicles is paramount to the electrification of the transport sector, supporting the energy transition. The charging process of electric vehicles can be perceived as a controllable load and targeted with price or incentive-based ...



[A Comprehensive Review on Debris Flow Landslide Assessment Using Rapid Mass Movement Simulation \(RAMMS\)](#)

[S Kumar, A Sharma, K Singh - Geotechnical and Geological Engineering, 2024](#)

Debris flows show massive threats to mountainous regions. This review paper critically studies the use of the RAMMS (Rapid Mass Movement Simulation) software in debris flow assessment. RAMMS, a widely employed simulation tool, offers a ...



[\[PDF\] Assessment of numerical weather models with different spatial resolutions on tropospheric delay correction for InSAR](#)

[Y Ma, T Liu, Z Yu, C Jiang, Z Lu - IEEE Journal of Selected Topics in Applied Earth ..., 2024](#)

Spatial variations in atmospheric parameters, including pressure, temperature, and humidity significantly impact the precision of Interferometric Synthetic Aperture Radar (InSAR) measurements. This significantly limits the applicability of InSAR in ...



[\[PDF\] Second-Level Wind Energy Forecasting](#)

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Renewable energy production forecasting has matured to a commercial level, with services offered to electricity system operators and the market. The dynamic nature of numerical weather forecasts and real-time power observations results in multiple ...



[A novel hybrid optimization model for evaluating and forecasting air quality grades](#)

[Y Shi, S Wang, X Yu - Environmental Monitoring and Assessment, 2024](#)

Air pollution has a significant global impact on natural resources and public health. Accurate prediction of air pollution is crucial for effective prevention and control measures. However, due to regional variations, different cities may have varying ...



[\[HTML\] The first large scale rDNA amplicon database of soil microbiomes from Pamir Plateau, China](#)

[J Zhu, X Sun, QY Tang, MY Gu, ZD Zhang, JW Chen - Scientific Data, 2024](#)

The Eastern Pamir, distinguished with high altitude, extremely arid and cold climate, limited nutrients and sparse vegetation, is a unique ecological reservoir. Microbial communities play a central role in maintaining Eastern Pamir's ecosystem ...



[Self-programming Neuromorphic Integrated Circuits for Intelligent Systems](#)

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Neurobiological circuits in the human brain perform computational functions that can be dynamically modified by adjusting their synaptic connections during concurrent learning processes in a non-Turing mode. In contrast, Turing-based computers ...



[Neurokinin-1-Receptor Expression in the Reelin and Gastrin-Releasing Peptide Neuronal Populations](#)

[S Atighetchi - 2024](#)

Reelin signaling has a prominent role in correct neuronal positioning within the spinal cord dorsal horn. Reelin (Reln), its two lipoprotein receptors, and Disabled-1 (Dab1)

are highly expressed within laminae I-II on neurons that receive itch stimulation and ...



Deoxygenation and the impact on ocean biogeochemistry in the Santa Barbara Channel, and the broader implication for deoxygenation policy

DMR Robinson - 2024

Deoxygenation occurs along coastal environments and open ocean that affects ocean biogeochemistry and marine species. The causes of deoxygenation are multifaceted and can be influenced by various physical and biogeochemical ...



HFIP-Mediated, Highly Chemo-, Regio-, and Stereoselective Hydrofunctionalizations of Ynamides: Access to Stereodefined Alkenes Bearing Drugs and Natural ...

ANV Satyanarayana, T Chatterjee - *The Journal of Organic Chemistry*, 2024

We disclose a sustainable and versatile synthetic strategy for the highly chemo-, regio-, and stereoselective hydrofunctionalizations of ynamides, through its activation by a solvent, HFIP, to access a wide variety of stereodefined ketene N,N, N,O ...



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... was carried out using the results of the Weather Research and Forecasting (**WRF**) model. To this purpose, wind and temperature fields were ... As future work, the **WRF** model is expected to be implemented for recent years to carry out an adequate ...



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... We assess **WRF**-CMAQ's performance using data from the National Climate Data Center and EPA Air Quality System. Our 1.3 km ... At 1.3 km, we find that most air quality-relevant meteorological components of **WRF**-CMAQ perform at or above ...



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... Our results provide novel insight into the AHF and **WRF** interplay and can be valuable for future trial construction and more tailored ... correlates with the incidence of **WRF** in AHF [33]. Importantly, this group reached the highest incidence ...



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[S Shang, J Arnault, G Zhu, H Chen, J Wei, K Zhang...](#) - *Journal of Climate*, 2022
... and Forecast (**WRF**) Model. The **WRF** version employed in this study includes online calculations of the atmospheric water budget and an evapotranspiration (ET) tagging procedure to trace evapotranspired water in the atmosphere. Both ERA5 ...



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... In this study, a dynamic prediction system using **WRF** model with a resolution of 30 km and CFS model with a resolution of 100 km are set up ... Results also show that the **WRF** model with a resolution of 30 km shows a better performance than that ...



[RESEARCH ON HYDRODYNAMICS OF FOUNDATION STRUCTURE OF OFFSHORE WIND TURBINE UNDER TYPHOON-WAVE-CURRENT COUPLING](#)

[W Shuo, K Shitang, Z Yongfa, Y Yiwen, Z Wei, Y Jie](#) - *Acta Energiæ Solaris Sinica*, 2022

... was chosen as a research object and a real-time meso-scale **WRF**-SWAN-FVCOM (WSF) coupling simulation platform was constructed by ... Results demonstrate that the constructed WSF platform increases the simulation precision of typhoon path by ...



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... This study explores the potential of The Weather Research and Forecasting (**WRF**) model as an alternative meteorological model to support near-time air quality predictions for the NSW Greater Metropolitan Region (NSW GMR). We develop an ...



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... Apparent 14 temperatures come from both a 10 km resolution dynamically downscaled model 15 (**WRF**), and a statistically bias corrected (... at present in all seasons, and **WRF** produces warmer winters than 18 does ISIMIP. **WRF** produces ...



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... ~1°) and FLEXPART-**WRF** is forced with outputs 12 of the **WRF** model (forced with ERA5 at ... which the 27 input data corresponding to FLEXPART-**WRF** with a spatial resolu- 28 tion of ~... It is important 33 to note that different FLEXPART or ...



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... To predict three-dimensional air flow with **WRF**, the UM LDAPS 1.5kmL70 data were used as an initial input field. The physical schemes of **WRF** are presented in Table 2. Data assimilation was performed using ASOS data and upper-atmosphere ...



[\[PDF\] Evaluating the Impact of Vehicular Aerosol Emissions on Particulate Matter \(PM_{2.5}\) Formation Using Modeling Study](#)

OR Sánchez-Ccoylo, A Llacza, E Ayma-Choque... - *Atmosphere*, 2022

... In this study, the **WRF** dynamical core selected the Advanced Research **WRF** (ARW) model to run an ARW simulation. We used Eulerian nonhydrostatic equations, Arakawa C-grid staggering, and three-dimensional for real data, and adaptive time ...



[Let Gravity Do The Work: Use of Siphon and Partial-Siphon Permeate Design for MBR Systems](#)

T Young - *WEFTEC 2022*, 2022

... As shown in data reviewed from the Brush Creek WPCP and the Linwood **WRF**, the membranes ... In this paper, case studies of siphon MBR systems at Linwood **WRF** and Brush Creek ... In this paper, case studies of siphon MBR systems at ...



[Bias correction of modelled urban temperatures with crowd-sourced weather data](#)

[O Brousse, CH Simpson, O Kenway, A Martilli...](#) - 2022

Urban climate model evaluation often remains limited by a lack of trusted urban weather observations. The increasing density of personal weather stations (PWS) make them a potential rich source of data for urban climate studies that address the ...



[Hydrolysis and Carbon Utilization for Low Energy Biological Nutrient Removal](#)

[M Wittman](#) - [WEFTEC 2022](#), 2022

... As part of a Water Research Foundation study (**WRF** 5083), laboratory methods are being developed to ... The laboratory research contributes to the larger **WRF** 5083 project and will be used to ... treatment plant, is typical of RAS fermenters ...



[The Impact of Volatile Chemical Products, Other VOCs, and NOx on Peak Ozone in the Lake Michigan Region](#)

[M Abdi-Oskouei, B Roozitalab, CO Stanier...](#) - [Journal of Geophysical Research ...](#)

... Table S1 summarizes the **WRF**-Chem configurations options used in this study and additional details on the physical configuration properties and initialization can be found in Abdi-Oskouei et al. (2020). The modeling domain and averaging areas ...



[Modeling study on the roles of the deposition and transport of PM2.5 in air quality changes over central-eastern China](#)

[L Zhang, J He, S Gong, X Guo, T Zhao, H Che, H Wang...](#) - [Journal of Environmental ..., 2022](#)

The role of PM 2.5 (particles with aerodynamic diameters $\leq 2.5 \mu\text{m}$) deposition in air quality changes over China remains unclear. By using the three-year (2013, 2015, and 2017) simulation results of the **WRF**/CUACE v1.0 model from a previous work (Zhang ...



[\[PDF\] Assessment of the impacts of cloud chemistry on surface SO₂ and sulfate levels in typical regions of China](#)

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... This study is intended to use an on-line coupled chemical weather platform of CMA: **WRF**/... **WRF**/CUACE is an on-line coupled chemical transport model under the **WRF** frame work with ... In summary, the cloud chemistry mechanism in **WRF**/CUACE ...



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[E Beltrán-Flores, M Pla-Ferriol, M Martínez-Alonso...](#) - [Journal of Environmental ..., 2023](#)

... , which can be treated by **WRF** due to their excellent resistance to elevated toxicities. Consequently, **WRF** do not require prior acclimatisation ... Thus, although **WRF** have been reported to remove both pesticides (Chan-Cheng et al., 2020; Mori ...



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OJ Idowu, AS Chaudhry, RO Tanimowo, OO Adelusi... - 2022

... Some of the current possible supplements used in ruminants feeding are the white rot fungal (**WRF**) improved feeds. The fungi help improve the feed by selectively degrading lignin in substrates rich in structural carbohydrates without ...



[\[PDF\] Exploring the Evolution of Typhoon Lekima \(2019\) Moving Offshore Northeast of Taiwan with a Multi-Resolution Global Model](#)

CY Huang, CH Chang, HC Kuo - Atmosphere, 2022

... over the unstructured grids of the MPAS than the uniform grids of **WRF** ([26]). The methodology of the DVI may refer to Huang et al. [23]. ... experiment) are randomly perturbed by RANDOMCV of **WRF** DA (see

https://www2.mmm.ucar.edu/wrf/users/docs/user_guide_v4 ...



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[X Ruan, C Zhao, RA Zaveri, P He, X Wang, J Shao... - Geoscientific Model ..., 2022](#)

... We find that default **WRF**-Chem could predict spatial patterns of PM 2.5 pH over China similar to other CTMs, but with generally lower pH values, largely due to the underestimation of alkaline species (NVCs and NH₃) and the difference in ...



[DEVELOPMENT AND PATH OF HURRICANE ETA. CASE STUDY USING THE WRF MODEL WITH DYNAMIC UPDATING OF THE SST.](#)

[GS Martínez, MS Lorenzo, OA Forteza - 2022](#)

This research has as purpose to carry out a detailed study of the development and trajectory of Eta from numerical modeling, using the ERA5 re-analysis system as a support and complement to the meteorological research and forecast model (**WRF**) ...



[\[PDF\] DEVELOPMENT AND TRAJECTORY OF HURRICANE ETA. CASE STUDY USING THE WRF MODEL WITH DYNAMIC UPDATE OF THE SEA SURFACE ...](#)

[GS Martínez, MS Lorenzo, MCOA Forteza - Presented at 5th International Electronic ..., 2022](#)

This research aims to describe the synoptic and general circulation environment in which Eta developed using the ERA5 reanalysis; design experiments with the **WRF** model; and describe, from the numerical outputs, the meteorological conditions that ...



[\[PDF\] Regional dynamical and statistical downscaling temperature, humidity and windspeed for the Beijing region under stratospheric aerosol injection geoengineering](#)

[J Wang, JC Moore, L Zhao, C Yue, Z Di - Earth System Dynamics Discussions, 2022](#)

... mean state and results in **WRF** better reproducing observations over 2007-2017 than ISIMIP bias correction. **WRF** simulations show consistently 0.5C ... In the 2060s **WRF** produces consistently larger spatial ranges of surface temperatures, humidities ...



[\[PDF\] Monthly-Scale Extended Predictions Using the Atmospheric Model Coupled with a Slab-Ocean](#)

[Z Wang, S Zhang, Y Jin, Y Jia, Y Yu, Y Gao, X Yu, M Li... - Geoscientific Model ..., 2022](#)

... **WRF**-SOM and **WRF**-ROMS, we show the rationality of **WRF**-SOM in the extended-range predictions. **WRF**-SOM can avoid the influence of cold deviation at the subsurface in **WRF**-... to 75 identify the improvement of **WRF**-SOM compared with **WRF**-ROMS in ...



[Assessment of meteorological settings on air quality modeling system—a proposal for UN-SDG and regulatory studies in non-homogeneous regions in Brazil](#)

M Soares da Silva, LCG Pimentel, FP Duda, L Aragão... - Environmental Science and ..., 2022

... In the first step, the **WRF** model was evaluated against surface-observed data. The local ... Among the meteorological settings in **WRF/CALMET/CALPUFF**, the joined use of observed and ... This research concludes with the proposal of the **WRF/CALMET/CALPUFF** ...



[\[PDF\] Characterizing the impacts of turbulence closures on real hurricane forecasts: A comprehensive joint assessment of grid resolution, horizontal turbulence models, and ...](#)

O Romdhani, JA Zhang, M Momen - Journal of Advances in Modeling Earth Systems, 2022

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[Simulating environmental conditions for Southwest United States convective dust storms using the Weather Research and Forecasting Model v4. 1](#)

AR Gallagher, SL LeGrand, TS Hodgdon, TW Letcher - 2022

... study works to-wards filling this research gap by inventorying dust-event case studies forced by convective activity in the Desert Southwest United States, simulating select representative case studies using several configurations of the ...



[The Varympompi 2021 \(Athens, Greece\) Extreme Wildfire: Insights from Coupled Fire–Atmosphere Numerical Simulations](#)

TM Giannaros, G Papavasileiou - Environmental Sciences Proceedings, 2022

... We evaluate our hypotheses using observations and ultra-high-resolution numerical simulations, carried out using the advanced **WRF-Fire** coupled fire–atmosphere modeling system. Our main focus is on deconstructing the Varympompi wildfire to ...



[\[PDF\] Role of surface CO2 sources and wind transport on atmospheric CO2 variability over the Bay of Bengal during Southwest Monsoon-using mixing ratio, carbon isotope ...](#)

T Guha, S Ghosh, YY Raghava, GS Bhat, P Ghosh... - 2022

... We further analysed the **WRF** model simulated winds to discern the contribution of BoB sources and sinks compared to the influence of continental sources at the sampling sites at the open ocean locations. One of the common techniques to ...



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[\[HTML\] Urban heat islands from multiple perspectives: Trends across disciplines and interrelationships](#)

[IA Assenova, LL Vitanova, D Petrova-Antonova - Urban Climate, 2024](#)

... The study revealed that numerical simulations, particularly those utilising the ENVI-met and **WRF** models, are the most prevalent ... -met and **WRF** models. The ENVI-met model is specifically designed to simulate the microclimate of small-scale urban ...



[Assessing target areas for precipitating moisture source analysis of extratropical cyclones: An analysis based on case studies](#)

[P Coll-Hidalgo, R Nieto, A Pérez-Alarcón, RM Trigo... - Atmospheric Research, 2024](#)

... Before applying the CNN models, we remapped the predictors derived from the **WRF** outputs to a regular 1×1 latitude–longitude grid. The final output convolutional layer was activated with a sigmoid function yielding values between 0 and 1. The ...



[Sparse Target Parameter and Channel Estimation in mmWave MIMO OTFS-aided Integrated Sensing and Communication Systems](#)

[M Jafri, S Srivastava, AK Jagannatham - IEEE Transactions on Communications, 2024](#)

... The second key objective is to design the beamformer **wRF** for the UE, and to learn the delay ... beamforming gain is applied as the RF RC **wRF** at the DFRC receiver. Similarly, the transmit ... Similarly, the user processes the pilot signal using ...



[\[PDF\] The effectiveness of solar radiation management for marine cloud brightening geoengineering by fine sea spray in worldwide different climatic regions](#)

[Z Song, N Yao, L Chen, Y Sun, B Jiang, P Li... - EGU sphere, 2024](#)

... (4) 187 The diagnosis of CLEAN-SKY (no aerosols) was not considered in the previous **WRF**-CMAQ model. So in this study, we extended this feature in the **WRF**-CMAQ model using the methodology of Ghan et al. (2012) by performing a double ...



[\[PDF\] Urban Area Observing System \(UAOS\) Simulation Experiment Using DQ-1 Total Column Concentration Observations](#)

[J Yi, Y Huang, Z Pei, G Han - EGU sphere, 2024](#)

Satellite observations of the total column dry-air CO₂ (XCO₂) have been proven to

support the monitoring and constraining of fossil fuel CO₂ (ffCO₂) emissions at the urban scale. We utilized the XCO₂ retrieval data from China's first laser carbon ...



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Deadline: July 12, 2024

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Our work aims to stimulate sustainable growth, protect the environment, and develop strategies for the adaptation and mitigation of climate change.

WHAT WE ARE LOOKING FOR

For this position we are encouraging applications by researchers interested in modelling and assessing the implications of climate engineering interventions, specifically either Carbon Dioxide Removal (CDR) or Solar Radiation Management (SRM), as possible additional strategies to conventional mitigation ones.

We have a portfolio of international research projects on both removing CO₂ and CH₄ (e.g. [UPTAKE](#), [REPAIR](#)), and on assessing solar radiation modification (e.g. [CO-CREATE](#), [RFF](#)).

We are looking for one to two candidates to work on either research strand, or possibly combine them. We are interested in the integration of all key aspects of climate engineering, from the technical side to its socio-economic repercussions and its governance.

REQUIREMENTS

- PhD in economics, applied mathematics, environmental engineering, or any related fields;
- Familiarity with climate engineering methods, either CDR or SRM;
- Modelling experience using modelling language (GAMS, AMPL, JUMP) and fluency in programming languages such as python, Julia or R;
- Fluency in English (Italian not needed), good presentation and writing skills;
- Willingness to travel to project meetings and to conferences;
- Ability to work in an interdisciplinary and diverse environment committed to high-quality research.

Desirable: Experience with integrated assessment modelling.

DURATION, COMPENSATION & BENEFITS

- The appointment period will be initially 24 months, renewable for two additional years pending a positive evaluation. Tenure can be granted from 2 to 4 years after being appointed as a junior researcher;
- The gross salary will be based on qualification and working experience and competitive with major research centers in Europe;

- Welfare package, for minimum 12 months contract;
- Flexible working time;
- Support during the immigration process, if needed.

Belonging to legally protected categories (ex L. 68/99) will constitute a preferential condition.

More details and info about HOW TO APPLY:

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To find out more and apply by the Sunday 31st March deadline: <https://www.civilservicejobs.service.gov.uk/csr/0-05a-eg?>

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The role is working in the wonderful, friendly and supportive Climate Science team - which is responsible for providing scientific advice to Government on issues including the climate system, greenhouse gas emissions and pathways, climate risks, bio-energy and geo-engineering. This particular role will include designing and running a series of science-based research projects and programmes to improve our understanding of UK emissions, including the impact of new and evolving technologies such as hydrogen, CCUS and biomass.

This recruitment is open to anyone including those outside the Civil Service - and you can be based in a range of locations: Aberdeen, Birmingham, Cardiff, Darlington, Edinburgh, London and Salford.

Many thanks,



**Department for
Energy Security
& Net Zero**

Tom Forrest
Head of Science, Greenhouse Gas Inventory
Tel: (+44) 7825 016 413
[@met](#)
3-8 Whitehall Place, London, SW1A 2EG
www.gov.uk/desnc

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From: [MET-JOBS](#) on behalf of [Martin Airey](#)
To: [@xxx](#)
Subject: [MET-JOBS] PhD position at ETH, Zurich in climate modelling of aerosol-cloud interactions
Date: Tuesday, 12 March 2024 2:42:17 am
Attachments: [simons.phd.opening.pdf](#)

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Please find the PhD description attached.

All the best

Dr. Martin Walter Airey, B.Sc (Open), M.Res (Lancaster), D.Phil (Oxford)

Senior Meteorological Support Scientist

Room 2L38,

Brian Hoskins Building,

Department of Meteorology,

PO Box 243,

University of Reading,

Earley Gate,

Reading RG6 6ET

+44(0)7810358934 (mobile)

<https://research.reading.ac.uk/meteorology/people/martin-airey/>

<http://www.linkedin.com/in/martinairey/>

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From: [Met-jobs](#) on behalf of [Roger Brugge](#)
To: [xxxxxxxx@xxxxx.xxxxxx.xx.xx](#)
Subject: [Met-jobs] Postdoctoral and PhD research assistantships in biophysical ocean modeling and marine ecosystem impacts – Biophysical Ocean Modeling Lab at Louisiana State University
Date: Saturday, 22 January 2022 2:57:31 am
Attachments: ATT00001.txt

Postdoctoral and PhD research assistantships in biophysical ocean modeling and marine ecosystem impacts – Biophysical Ocean Modeling Lab at Louisiana State University

Now recruiting for one or more PhD research assistantships and two postdoctoral research associates in biophysical ocean and ecological modeling and data analysis. Post-masters and post-bachelor researchers are also encouraged to apply. Flexible and remote (within the US) working arrangements are available for many positions.

The Biophysical Ocean Modeling (BOM) Lab in the Department of Ocean and Coastal Science (DOCS) at Louisiana State University (LSU) headed by Dr. Cheryl Harrison is currently recruiting new graduate students and research associates to join our research team, with researcher positions open now and student positions beginning as early as Summer 2022. Our research program focuses on modeling interactions between physical and biological processes at a variety of spatial and temporal scales, including the impact of extreme climate forcing events and climate change on ecosystems, fisheries, and biogeochemical processes, and effects of mesoscale transport on ecological processes such as turtle hatchling and larval dispersal. Our research approach is primarily modeling based, running and analyzing Earth system (climate) and regional ocean models, and including biogeochemical, plankton, particle tracking and fisheries models within and forced by regional and climate model output. We have a strong network of national and international colleagues, including FishMIP, the Climate Intervention Biology Working Group, and the Community Climate Intervention Strategies working group. Students will have many opportunities for networking, collaboration and mentoring within these research communities and more focused project teams. For more information about the Harrison Lab, please see: <https://chsharrison.wordpress.com>, including links to publications and current lab members.

The Harrison lab is strongly committed to increasing diversity in the geosciences, and encourages applications from women, parents, underrepresented and minoritized students (Black, Hispanic, first generation, LGBTQ+...), and international students from the global south (Latin America, Africa, etc.). While this is a programming-heavy research team, training and support will be provided, given potential research assistants' excitement for the work. LSU DOCS is ranked in the 2021 top 75 international oceanography programs internationally, and offers a comprehensive graduate curriculum, a supportive department culture, and a strong graduate organization. Baton Rouge has a vibrant and diverse culture, low cost of living, and is 45 min from New Orleans, a top global tourist destination and cultural hot spot.

There are several ongoing projects that research associates could develop projects in:

- Marine impacts of climate shocks and climate intervention strategies. This opportunity leverages our lab's experience and connection with the extreme forcing and ecosystem modeling communities to study the impacts of climate shocks, such as global cooling events driven by volcanoes, asteroids or nuclear winter, or climate interventions such as solar radiation management (geoengineering). Foci can be on fisheries, plankton, or biogeochemistry impacts, or more climate policy focused topics, depending on applicant research interests.
- Model-data comparison of the Cretaceous-Paleogene mass extinction event. Related to the above, this is an NSF funded collaborative project combining simulations of the asteroid impact that killed the dinosaurs with observed proxies. Our lab is focusing on the ocean biogeochemistry and plankton extinction and recovery. Researchers with experience and/or interest in paleoceanography are especially encouraged to apply.
- Transport and connectivity in the Gulf of Mexico. This project uses several machine learning methods to study connectivity provinces in the Gulf of Mexico and Caribbean, with application to physical and biological transport. The project is in collaboration with Vincent Rossi and MIO in France, Enrico Ser-Giacomi at MIT, and Yonggang Liu and

Bob Weisberg at USF. This is largely a physical transport project to start, and then could go in a more ecological application or physical/mathematical/machine learning direction, dependent on applicant research interests.

Job details

Postdoctoral Research associates

Postdoctoral positions start at \$48K/year, plus a full benefits package and relocation funding. Flexible and remote working arrangements are available (within the US).

Requirements:

The position has a minimum requirement of a Ph.D. in a related field (oceanography, marine science, earth science, geography, engineering, applied mathematics or physical sciences). Candidates should have experience working with diverse data sets and interpreting results leading to scientific publications. A working knowledge of programming and analysis software such as python, MATLAB or R, and the Unix environment is necessary.

Desired skills:

Experience with climate model data and knowledge of marine ecological processes are strongly preferred. Experience with high-performance computing environments is desired. For the KPg project, paleoclimate experience, especially experience with proxy datasets, is strongly preferred. Experience with fisheries would be useful for many of our projects. Please don't hesitate to apply if you don't think you have all the above qualifications, we are committed to training our lab members and offering opportunities to diverse folks.

Post-bachelor and post-master researchers

I haven't hired post-master's and post-bachelor's researchers yet but look forward to hearing from you if you have skills related to the above projects and we will talk more about what is possible. Minimum you should have some programming skills and experience working with datasets. See above for desired experience.

PhD research associates

We are actively seeking one or more new Ph.D. students, and students with a Master's in hand are strongly encouraged to apply, however this is not required. Funding for students includes a stipend for tuition and living expenses, as well as computer and conference travel funding. Student stipends are \$30K/year, plus tuition remission. We seek students who are highly self-motivated, independent, and creative thinkers that are enthusiastic about pursuing a career in oceanography, climate science, climate data analysis, marine ecology, or similar topics. A strong quantitative background, including physics and calculus is required, and some experience with computer programming is strongly preferred. For all projects below, there is also strong programming support by scientific programmer Victoria Garza, who will be joining the lab full time in Jan 2022. All PhD research associates will need to relocate to Baton Rouge. For more information on the PhD program, please see the DOCS admission requirements page for information on prerequisites and procedures: <https://www.lsu.edu/cce/academics/graduate/docs/docs-admissions.php>.

Applicants should contact Cheryl Harrison by Feb 15, 2022 by email at chxxxxxxxxxxx@xxx.xxx. This email should include: (1) a brief statement describing your research interests and career goals; (2) a curriculum vitae or resume; (3) an unofficial academic transcript

Cheryl S. Harrison, Assistant Professor
College of the Coast and Environment and Center for Computation and Technology
Louisiana State University
Energy, Coast and Environment Building
Room 3177
93 S. Quad Dr.

Baton Rouge, Louisiana 70803

Email: xxxxxxxxxxxx@xxx.xxx

Phone: (225) 578-0727

Biophysical Ocean Modeling Lab: <http://chsharrison.wordpress.com/>

From: [Met-jobs](#) on behalf of [Roger Brugge](#)
To: [xxxxxxxx@xxxxx.xxxxxx.xx.xx](#)
Subject: [Met-jobs] Postdoctoral position in the Geoengineering Assessment across Uncertainty, Scenarios, and Strategies (GAUSS) project at Cornell University
Date: Tuesday, 17 August 2021 7:11:54 am
Attachments: ATT00001.txt

We invite applicants for a postdoctoral research associate to conduct and analyze Earth System Model simulations of climate engineering (also known as solar geoengineering or climate intervention) using stratospheric aerosol injection (SAI). The postdoctoral researcher will join a team working on the Geoengineering Assessment across Uncertainty, Scenarios, and Strategies (GAUSS) project. The broad research goals of this project are to better evaluate the climate effects of SAI and how they depend on the design strategy (through choices such as latitudes, altitudes, seasons of injection), different possible future scenarios for implementation, and uncertainties in climate model representations of stratospheric physics – all with an aim to ultimately better inform future decisions. Potential research topics in our group could range from understanding the impacts of different aerosol injection choices on the climate system or its specific parts (e.g., on the cryosphere) to focusing more on model uncertainty and inter-model comparisons of SAI in order to understand differences and robust responses. Applicants must have a Ph.D. in atmospheric or climate science, physics, engineering, or a related field prior to employment. Prior experience with geoengineering is not necessary, but experience in running and/or analyzing climate model output is.

For more information on the position and on the group please visit: <https://climate-engineering.mae.cornell.edu/postdoctoral-position-available/>

The initial appointment will be for one year, with the expectation of renewing for up to three years pending satisfactory performance and funding availability. Applications will be accepted until the position is filled.

To apply, please email dgm224@cornell.edu, and include a cover letter, curriculum vitae, and writing sample. Please also specify three people from whom we can solicit letters of recommendation.

From: [MET-JOBS](#) on behalf of [Romaric O.](#)
To: [@xxx](#)
Subject: [MET-JOBS] Two (2) Postdoctoral Research Fellowships Available at ACDI - University of Cape Town
Date: Wednesday, 29 May 2024 6:40:56 am

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Dear colleagues,

There are two postdoc positions available at ACDI, University of Cape Town on

Characterising the global and regional impacts and risks of solar radiation management on [Agriculture](#) and [Water Resources](#)

Deadline: 30 June 2024

The African Climate and Development Initiative (ACDI), at the University of Cape Town is seeking two (2) Postdoctoral Research Fellows (PDRF) to work on characterising the global and regional impacts and risks associated with solar radiation modification (SRM) with stratospheric aerosol injection (SAI).

The PDRF will be highly motivated to work as part of an interdisciplinary research team in ACDI to evaluate climate geoengineering strategies and their implications for agriculture, biodiversity, energy, and water resources, as well as climate change risks and adaptation. They will be expected to grow their research expertise, participate in wider project activities and discussions, assist in supervising and/or advising graduate (MSc and PhD) students, and generate peer-reviewed publications.

Please click on the links below for more information on the roles for each PDRF position and how to apply.

- [1\) Assessing the potential impacts of SAI agriculture \(crop suitability, growth, phenology, and yields\) using crop models](#)**
- [2\) Assessing the potential impacts of SAI on water resources, hydrology, and floods using hydrological and flood models](#)**

Best wishes

Romaric

Romaric C. Odoulami
African Climate and Development Initiative - University of Cape Town

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From: [Met-jobs](#) on behalf of [Daniele Visioni](#)
To: [xxxxxxxx@xxxxx.xxxxxx.xx,xx](#)
Subject: [Met-jobs] Two postdoctoral researcher positions in atmospheric sciences at Cornell University (Ithaca, NY)
Date: Friday, 2 October 2020 9:04:20 pm
Attachments: ATT00001.txt

We invite applicants for two postdoctoral research associates to conduct and analyze climate model simulations of climate engineering (also known as solar geoengineering or climate intervention) using stratospheric aerosol injection (SAI). The postdoctoral researchers will join a team working on the Geoengineering Assessment across Uncertainty, Scenarios, and Strategies (GAUSS) project. The broad research goals of this project are to better evaluate the climate effects of SAI and how they depend on the design strategy (through choices such as latitudes, altitudes, seasons of injection), different possible future scenarios for implementation, and uncertainties in climate model representations of stratospheric physics – all with an aim to ultimately better inform future decisions.

More details on the position can be found here <https://climate-engineering.mae.cornell.edu/postdoctoral-positions-available/>

Applicants must have a Ph.D. in atmospheric science, physics, engineering, or a related field prior to employment. Prior experience with geoengineering is not necessary, but experience in running and/or analyzing climate model output is a plus. Additional qualifications include:

- A demonstrated track record of conducting peer-reviewed climate research, including analyses of large data sets, making figures, interpreting results, and preparing manuscripts for peer review
- Experience and knowledge in climate or climate-related fields, including climate dynamics, large-scale circulation mesoscale meteorology, aerosols, and/or atmospheric radiative transfer.
- The ability to work independently and collaboratively with other researchers.
- Written and oral communication skills, including publishing research findings in scholarly journals and oral presentations at conferences.

The positions will be for one year, renewable for up to three years pending satisfactory performance and funding availability. Applications will be accepted until the positions are filled.

To apply, please email dgm224@cornell.edu, and include a cover letter, curriculum vitae, and writing sample. Please also specify three people from whom we can solicit letters of recommendation.

From: [MET-JOBS](#) on behalf of [info.cmcc](#)
To: [@cmcc](#)
Subject: [MET-JOBS] [DEADLINE EXTENDED] Climate Engineering Researcher | Job position at CMCC Foundation, Italy
Date: Friday, 12 July 2024 11:10:17 pm

Please see the list archives to view any non-text attachments:

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Climate Engineering Researcher (code 12591)

Deadline: July 19, 2024

ABOUT US

The CMCC Foundation is a scientific research center on climate change and its interactions with the environment, society, the world of business, and policymakers. Our work aims to stimulate sustainable growth, protect the environment, and develop strategies for the adaptation and mitigation of climate change.

WHAT WE ARE LOOKING FOR

For this position we are encouraging applications by researchers interested in modelling and assessing the implications of climate engineering interventions, specifically either Carbon Dioxide Removal (CDR) or Solar Radiation Management (SRM), as possible additional strategies to conventional mitigation ones.

We have a portfolio of international research projects on both removing CO₂ and CH₄ (e.g. [UPTAKE](#), [REPAIR](#)), and on assessing solar radiation modification (e.g. [CO-CREATE](#), [RFF](#)).

We are looking for one to two candidates to work on either research strand, or possibly combine them. We are interested in the integration of all key aspects of climate engineering, from the technical side to its socio-economic repercussions and its governance.

REQUIREMENTS

- PhD in economics, applied mathematics, environmental engineering, or any related fields;
- Familiarity with climate engineering methods, either CDR or SRM;
- Modelling experience using modelling language (GAMS, AMPL, JUMP) and fluency in programming languages such as python, Julia or R;
- Fluency in English (Italian not needed), good presentation and writing skills;
- Willingness to travel to project meetings and to conferences;
- Ability to work in an interdisciplinary and diverse environment committed to high-quality research.

Desirable: Experience with integrated assessment modelling.

DURATION, COMPENSATION & BENEFITS

- The appointment period will be initially 24 months, renewable for two additional years pending a positive evaluation. Tenure can be granted from 2 to 4 years after being appointed as a junior researcher;
- The gross salary will be based on qualification and working experience and competitive with major research centers in Europe;
- Welfare package, for minimum 12 months contract;
- Flexible working time;
- Support during the immigration process, if needed.

Belonging to legally protected categories (ex L. 68/99) will constitute a preferential

condition.

More details and info about HOW TO APPLY:

<https://cmccfoundation.applytojob.com/apply/EfyLJUg3Mg/12591-Climate-Engineering-Researcher-CDRSRM?source=Our%20Career%20Page%20Widget>

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Fondazione CMCC
Centro Euro-Mediterraneo sui Cambiamenti Climatici
Via Marco Biagi, 5 - 73100 Lecce
[@.](mailto:cmcc@cmcc.it) - www.cmcc.it

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From: [AI for Good](#)
To: [Iman Soltanzadeh](#)
Subject: From disaster relief to scalable solutions, your next AI for Good keynotes
Date: Wednesday, 4 November 2020 4:10:08 am



Keep up to date with AI for Good!
Connecting AI innovators with problem owners to identify AI for Good solutions

AI for Good is excited to partner with **Amazon Web Services (AWS)** in delivering this week's upcoming keynotes, expert insights and demos showcasing AI solutions that accelerate the United Nations Sustainable Development Goals.

On **Thursday, 5 November**, Senior AWS Evangelist for Artificial Intelligence and Machine Learning **Bill Richmond** will cut through the hype by providing concrete and practical

examples of AI for good in computer vision, machine learning, natural language processing and more, with the goal of bridging these solutions to act in coordination with governments, nonprofits and inter-governmental organizations.


On **Thursday, 12 November**, Principal for AWS Disaster Response Program **Grace Kitzmiller** will share her team's experiences in using AI and ICTs to scale our ability to manage disaster response across different scenarios and stakeholders.

Both sessions will only be available through online registration. Don't miss your chance to be in the room when we discuss how AI solutions translate to actionable global impact with one of the key pillars in the AI industry. We look forward to your participation and hope that you join in our next deep dive in AI for Good.

Sincerely,


The AI for Good team

[Discover our Programme](#)



Technology changes at an exponential rate. The world will change more in the next 20 years than it has in the last 200 years. Are you ready? In this session, Bill Richmond, Senior AWS AI/ML Evangelist at Amazon Web Services (AWS), cuts through the hype by providing concrete examples of practical AI/ML-applications being used today, such as computer vision, automatic speech recognition, natural language processing, and other related capabilities.

The webinar also includes a technical demo of an AI-powered speech analytics application that automates and accelerates speech-to-text transcription, language translation, keyword detection, data classification, sentiment analysis, and recommendation engines – with more accurate results. To conclude the webinar, Bill provides specific use cases that demonstrate how governments, nonprofits, and inter-governmental organizations are using AWS AI/ML services today to deliver solutions that further the United Nations' Sustainable Development Goals.



Register for our Keynote



Bill Richmond is an Artificial Intelligence/Machine Learning (AI/ML) Evangelist for AWS and has been with the organization since 2015. Since joining AWS, he has supported public sector organizations, including FINRA, the US Department of the Treasury and universities (including both of his alma maters). His areas of expertise include AI, ML, and cloud security. Bill regularly delivers workshops and keynotes on AI/ML topics around the world and is a regular contributor to the global AWS Certification Examination process by serving as a security and cloud-engineering subject matter expert and content provider. Prior to joining AWS, Bill was at Rational/IBM, Northrop Grumman, Lockheed Martin, and a number of other integrators and software companies where he was responsible for architecting, creating, and leading teams that were responsible for building complex IT systems. Bill currently resides in Tampa, Florida and has degrees in applied mathematics from the University of Central Florida and Florida State University.



Dr. Reinhard Scholl is Deputy to the Director of the Telecommunication Standardization Bureau (TSB) since September 2002. Previously he has been with Siemens in Munich, Germany and with ETSI (European Telecommunications Standards Institute). He has also served on the ICANN Board. He received a Ph.D. in physics from the University of Illinois, USA.

[Register for our Keynote](#)



The Amazon Web Services (AWS) Disaster Response Program, launched in August 2018, is focused on helping governments, inter-government organizations, and nonprofits plan for, respond to, and recover from natural disasters and outbreaks with the help of AWS technology. In this session, Grace Kitzmiller (Principal for AWS Disaster Response Program) discusses how her team of experts uses cloud technologies to enable organizations to stay connected, maintain continued access to critical workloads and datasets in limited or disconnected environments, and provide critical services when and where they're needed most.

To help attendees understand the potential of the AWS Disaster Response program, we provide a detailed use case of how AWS enabled a virtual call center solution to ensure that hurricane survivors could connect with volunteers to receive critical services. This webinar also covers how AWS partnered with the University of Washington Medicine and University of North Carolina Health to deliver and scale relief services in the midst of the COVID-19 pandemic.

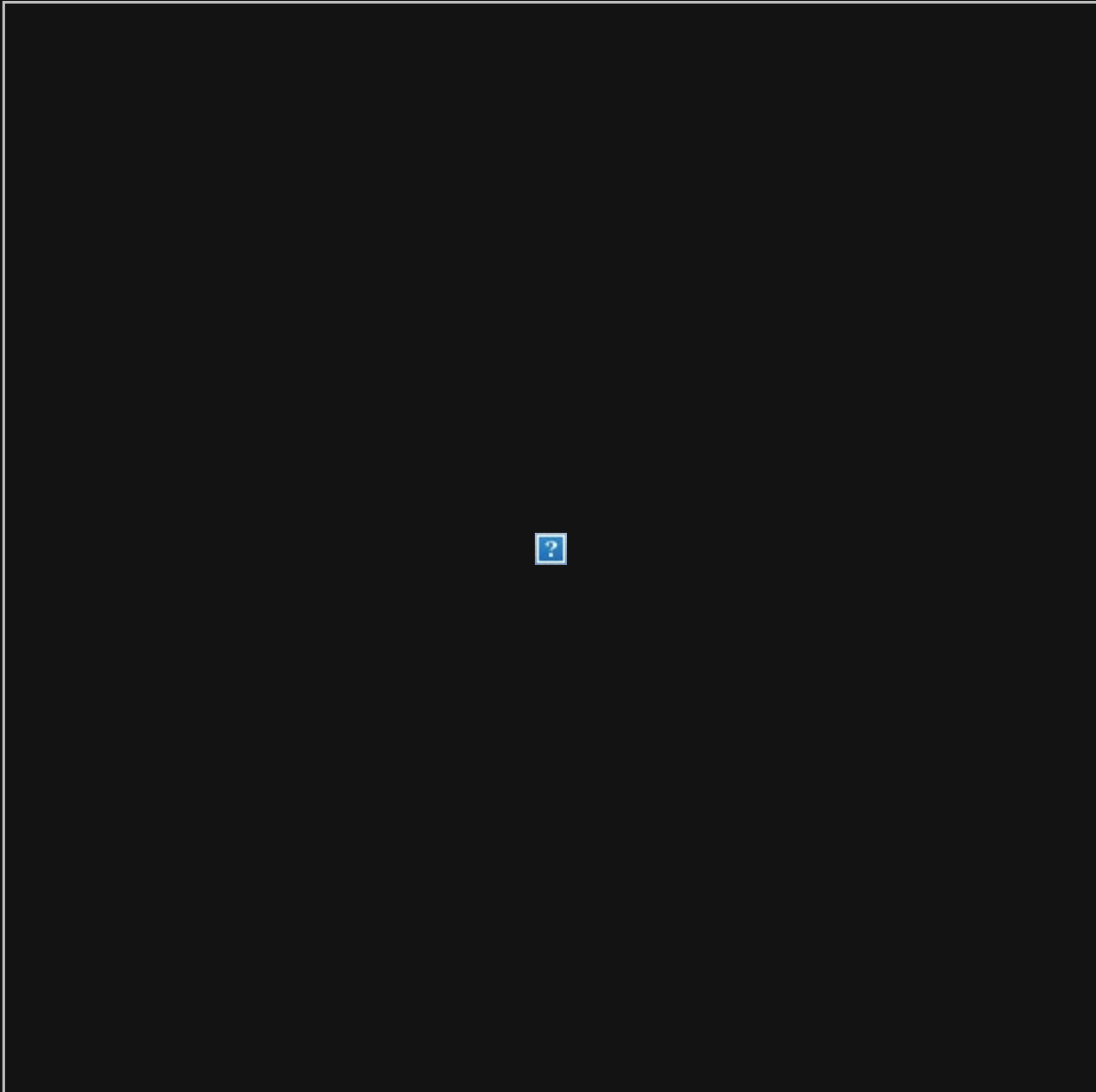
The session concludes with a fireside chat between Grace and Bilel Jamoussi, Chief of the Study Groups Department, Telecommunication Standardization Bureau at the ITU.

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As a Principal and Senior Product Manager for AWS Disaster Response Program, Grace leads strategy and execution for product development by working backwards from the needs of organizations active across the disaster and crisis lifecycle to learn about the biggest technology challenges they encounter, while preparing for, responding to, or recovering from disasters and crises. Grace works across AWS people, services, information, and technology, and AWS Partners to build or extend solutions and proofs of concept that can solve those challenges. Grace has been with AWS for over five years and was previously Senior Product Lead for AWS Educate, Amazon's global initiative to accelerate cloud learning to better prepare students for the cloud workforce. Prior to joining

AWS, Grace held leadership positions at a graph database start-up and at a consulting firm focused on using technology to develop solutions for state and federal environmental protection agencies.



Dr. Bilel Jamoussi is Chief of the Study Groups Department at the International Telecommunication Union Standardization Bureau in Geneva Switzerland where he is responsible for the organization and management of the ITU-T Study Groups, Focus Groups, Global Standardization Initiatives, Joint Coordination Activities, and their secretariat.

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Innovation Factory

The Innovation Factory showcases a diverse set of emerging entrepreneurs with promising AI ventures to tackle the world's greatest challenges.

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AI Artist of the Week

Karen Palmer produced RIOT, an emotionally responsive, live-action film, which uses facial recognition and AI to navigate the user through a dangerous riot. Discover more AI Artists with ITU and STATE Studio Berlin!

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Artistic Intelligence Podcast

What do we take for granted? Consider the ritualistic sounds of footsteps or ringing bells. What if we could create from this? What if we could bring back historical figures through sound art? Hear the story of Budhaditya Chattopadhyay, as transforms the mundane into a beautiful symphony of wonder.

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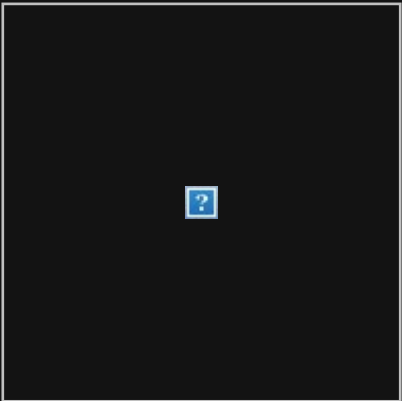
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MAPROJ: a computer map projection system	M.F. Hutchinson	1981
Methods for ecological bioenergetics	W Grodzinski, Romuald Z Klekowski, A Duncan	1975
Microsoft manual of style for technical publications	Microsoft Corporation	1995
Modeling and managing shallow lake eutrophication: with application to Lake Balaton	L. Somlyódy and G. van Straten (eds.)	1986
Modellierung der Abflussbildung und der Bodenwasserdynamik von Hängen	Axel Bronstert	1994
Modellierung von Verschlammung und Infiltration in landwirtschaftlich genutzten Einzugsgebieten	Rolf Schröder	2000
Modern physical geography	Alan H. Strahler, Arthur N. Strahler	1992
Monografija sladkovodnih in kopenskih alg v Sloveniji = Monograph on freshwater and terrestrial algae in Slovenia	Danijel Vrhovšek, Gorazd Kosi, Aleksandra Krivograd Klemenčič, Nataša Smolar-Žvanut	2006
Movement mechanisms and slide velocity variations of landslides in varved clays in the French Alps	P.M.B. van. Genuchten	1989
National environmental indicators: building a framework for a core set	Ministry for the Environment	1996
Nature of weathering: an introduction	Eiju Yatsu	1988
Navigating troubled waters: a new policy for the Atlantic fisheries: highlights and recommendations: report of the Task Force on Atlantic Fisheries	Michael J.L. Kirby	1982
Navigating troubled waters: a new policy for the Atlantic fisheries: report of the Task Force on Atlantic Fisheries	Michael J.L. Kirby	1983
Neuere Beiträge zur geomorphologischen Prozeßforschung	J. Baade et al.	2000
New Zealand soil classification	A.E. Hewitt	1998
New Zealand stream invertebrates: ecology and implications for management	Kevin J. Collier and Micheal J. Winterbourn (eds.)	2000
Newport power station: tests on cooling water discharge - March 1971	Civil & Architectural Department	1973
Occupational overuse syndrome: treatment and rehabilitation: a practitioner's guide	Department of Labour, Occupational Safety and Health Service	1992
Oceanographic vessels of the world Volumes 1-3	National Oceanographic Data Center	1962-1963
Ohinewai regional resource study: biology and water quality	M.C. McLea	1986
Ohinewai regional resource study: groundwater, climate and land and water use	G.A. Bird	1986

Optische Bestimmung der gesteinsbildenden Minerale	Hans Ulrich Bambauer; Franz Taborszky; Hans Dieter Trochim	1982
Parameterbestimmung und Modellierung der Wasserbewegung in heterogenen Böden	Hector Montenegro Ferrigno	1995
Pascal user manual and report	Kathleen Jensen, Niklaus Wirth	1985
PERL in a nutshell: a desktop quick reference	Ellen Siever, Stephen Spainhour, and Nathan Patwardhan	1999
Philippine fisheries: a handbook	Philippine Bureau of Fisheries	1952
Physical and chemical characteristics of Lake Tiberias	O.H. Oren	1957
Physical hydrology	S. Lawrence Dingman	1994
Physische Geographie: Eine Einführung	Andrew Goudie	1995
Plant physiology	R.G.S. Bidwell	1974
Potential of a pathogen, Mycoleptodiscus terrestris, as a biocontrol agent for the management of Myriophyllum spicatum in Lake Guntersville reservoir	Judy F. Shearer	1996
Praktische Statistik für Meteorologen und Geowissenschaftler 2. Auflage	Christian-Dietrich Schönwiese	1992
Preliminary report on the Westernport Bay environmental study: report for the period 1973-1974	Maurice A. Shapiro	1975
Presenting science to the public	Barbara Gastel	1983
Prevalence and severity of asthma at Lake Munmorah and Nelson Bay primary schools, 1986-1987, and, Air quality and wind analysis at Lake Munmorah and Nelson Bay primary schools, NSW, 1986-1987	Richard L. Henry and Michael J. Hensley; Howard A. Bridgman	1989
Primer v5: user manual/tutorial	K.R. Clarke and R.N. Gorley	2001
Principles of stratigraphy	Carl O. Dunbar, John Rodgers	1957
Process and landform: an outline of contemporary geomorphology	Alan Clowes and Peter Comfort	1987
Processes in continental lithospheric deformation	Sydney P. Clark, Jr., B. Clark Burchfiel, and John Suppe (eds.)	1988
Quantitative and dynamic plant ecology	Kenneth A. Kershaw	1973
Radioactive fallout in air and rain. Results for 1985 and 1986	Cambray, R.S.	1987
Raglan Harbour water quality	Waikato Valley Authority	1979
Rainfall-runoff modelling: the primer	Keith J. Beven	2001
Regionalisierung in der Hydrologie: Ergebnisse von Rundgesprächen der Deutschen Forschungsgemeinschaft	Hans-Bernd Kleeberg	1992
Report by the Committee for Evaluation of	U.S. Department of the	1952

Bonneville Power Administration Cloud-seeding Operations in the United States Portion of the Pend Oreille River Basin	Interior	
Report on 1983 Churchill Fellowship study tour of "Hydrometeorological data collection practices and management in USA". Part 2, Technical	Peter D. Walsh	1984
Report on the Guinean trawling survey Volume I: General report	F. Williams	1968
Report on the Guinean trawling survey Volume II: Environmental charts	F. Williams	1968
Report on the Guinean trawling survey Volume III: Data report	F. Williams	1968
Report on the Pasadena Cooperative Program of Ice Nuclei Measuring Techniques: to Advisory Committee on Weather Control	Meteorology Research Inc.	1957
Research on amphibians and reptiles in New Zealand: a report		1983
Responses of common smelt larvae (<i>Retropinna retropinna</i>) to continuous and short-term elevated temperatures: assessing the effects of thermal plume entrainment	Marcus Simons	1986
Rock control in geomorphology	Eiju Yatsu	1966
Satellite-derived moisture-bogusing profiles for the Northwest Pacific Ocean	L.W. Eddington	1990
Scientific nature of geomorphology	Bruce L. Rhoads and Colin E. Thorn (eds.)	1996
Sediment dynamics in changing environments	Jochen Schmidt, Tom Cochrane, Chris Phillips, Sandy Elliott, Tim Davies & Les Basher (eds.)	2008
Slope profile survey	Anthony Young, Denys Brunsden and John B. Thornes	1974
Soil description handbook	J.D.G. Milne et al.	1995
Soil geomorphology: an integration of pedology and geomorphology	J. Gerrard	1992
Soil hydrology	Miroslav Kutilek & Donald R. Nielsen	1994
Soil mechanics	R.F. Craig	1992
Soil mechanics: principles and practice	G.E. Barnes	1995
Soil survey method: a New Zealand handbook for the field study of soils	N H Taylor, I J Pohlen	1970
Solving problems in soil mechanics	B.H.C. Sutton	1993
South Pacific historical climate network: climate station histories Part 1	Collen, Bronwen; Fouhy, Elaine; Coutts, Lesley; McGann, Ron; Salinger, Jim	1992

Special ichthyology = Chastnaya ikhtiologiya	G. V. Nikol'skiĭ	1961
Species-specific responses of freshwater organisms to elevated water temperatures	Marcus Simons	1984
Spectrophotometric analysis of chlorophyll a in freshwater phytoplankton	David P. Sartory	1982
Standard PASCAL: user reference manual	Doug Cooper	1983
Stream ecology: structure and function of running waters	J. David Allan	1995
Stream habitat assessment protocols for wadeable rivers and streams in New Zealand	Jon S. Harding, Joanne E. Clapcott, John M. Quinn, John W. Hayes, Mike K. Joy, Richard G. Storey, Hamish S. Greig, Joe Hay, Trevor James, Mary A. Beech, Rachael Ozane, Adrian S. Merdith, Ian K.G. Boothroyd	2009
Streambank protection guidelines - for landowners and local governments	U.S. Army Engineer Waterways Experiment Station; Malcolm P. Keown	1983
Structural geology of rocks and regions	George H. Davis, Stephen J. Reynolds	1996
Techniques for the assessment of microbial production and decomposition in fresh waters	YI Sorokin, Hajime Kadota	1972
Temporal and spatial changes in indicator bacteria in the Waikato River	R.A. Hoare, J. Boswell	1986
The Impact of the Treaty of Waitangi on government agencies	prepared by the Bridgeport Group	1990
Tools for transformation	MacDiarmid Institute	2010
Trout biology: an angler's guide	W.B. Willers	1981
Uncertainty, search, and information in fisheries	Marc Mangel and Colin W. Clark	1982
Understanding Earth	Frank Press, Raymond Siever	1994
Underwater observations on commercial trawl nets and doors conducted in Jervis Bay during July 1985	F. Chopin et al.	1987
Waikato regional plan: proposed plan maps, water management classes, geothermal systems	Waikato Regional Council	1998
Waters of New Zealand	M. Paul Mosley (ed.)	1992
Wechselwirkungen kontinentaler Stoffsysteme und ihre Modellierung	Rheinische Friedrich-Wilhelms-Universität	1993
Writing for business results	Patricia E. Seraydarian	1994
Writing in plain English	Robert D. Eagleson; Gloria Jones and Sue Hassall	1990

Regards,

§ 87(2)(a)

From: [strat_list](#) on behalf of [Baldwin, Mark](#)
To: [strat_xxxx@xxxx.xxx](#)
Subject: [strat_list] New AMS Monograph chapter on the stratosphere & mesosphere
Date: Wednesday, 6 November 2019 3:10:27 am
Attachments: amsmonographs-d-19-0003.1 (1).pdf
ATT00001.txt

The AMS has just published chapter 27 in its Centennial Monograph:

100 Years of Progress in Understanding the Stratosphere and Mesosphere

MARK P. BALDWIN,^a THOMAS BIRNER,^b GUY BRASSEUR,^c JOHN BURROWS,^d NEAL BUTCHART,^e ROLANDO GARCIA,^f MARVIN GELLER,^g LESLEY GRAY,^h KEVIN HAMILTON,ⁱ NILI HARNIK,^j MICHAELA I. HEGGLIN,^k ULRIKE LANGEMATZ,^l ALAN ROBOCK,^m KAORU SATO,ⁿ AND ADAM A. SCAIFE^o

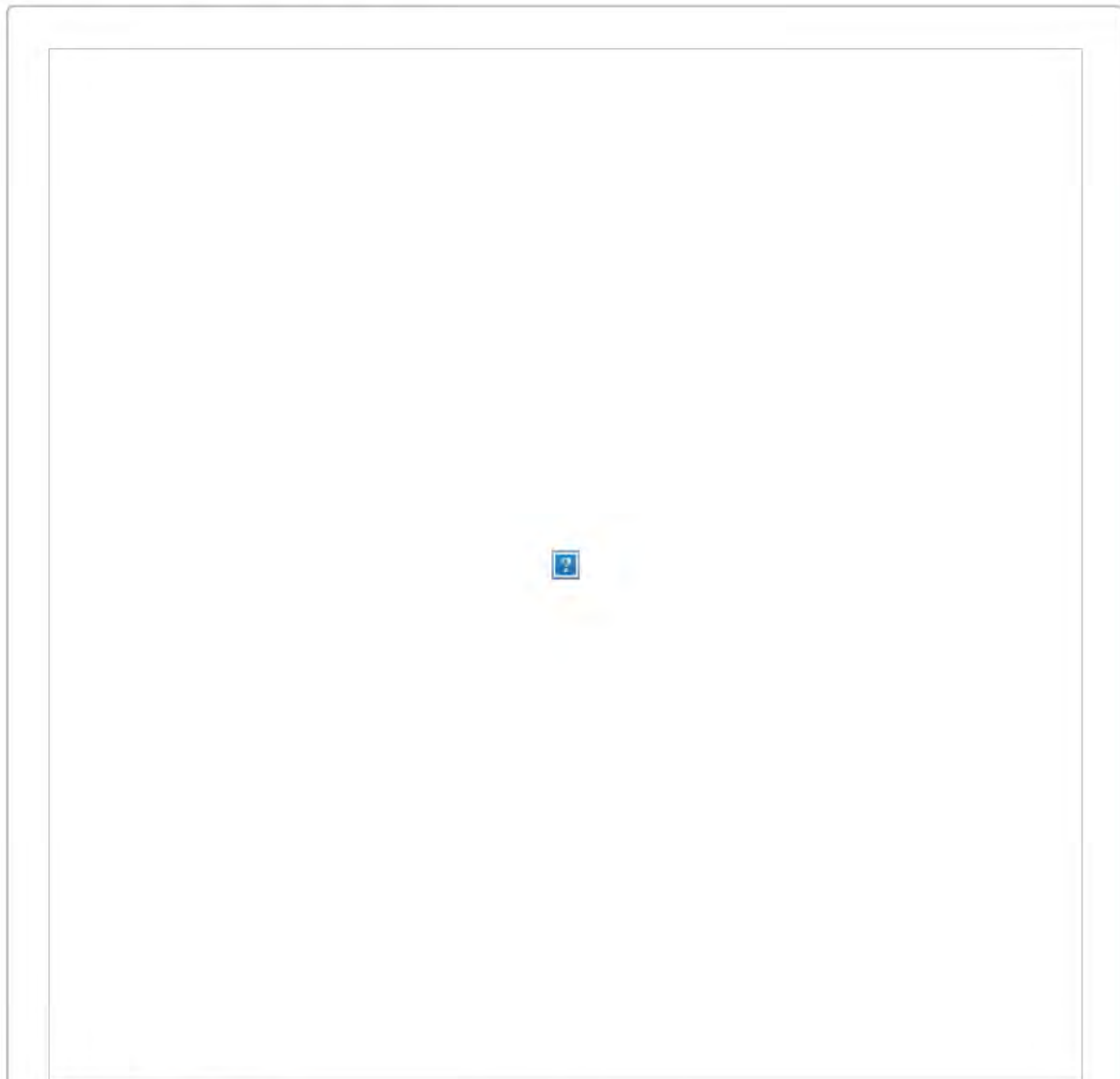
The link to all the chapters is [online](#). Chapter 27 is attached.

-Mark

From: [Twitter](#)
To: [Andrew James](#)
Subject: "Boris Johnson announces Tier 4 restrictions in south east England" ...
Date: Sunday, 20 December 2020 2:39:56 pm



What's happening



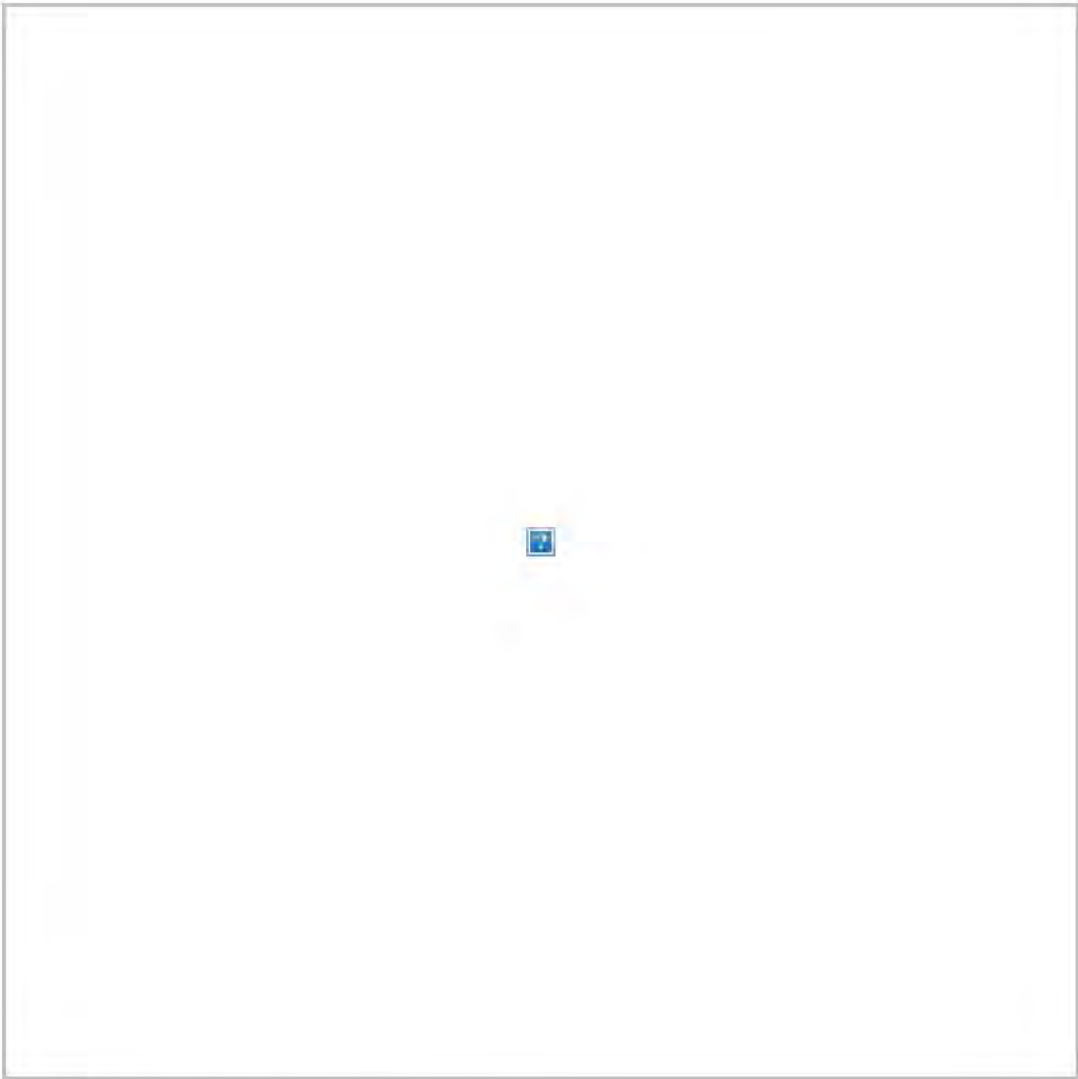
COVID-19 · Yesterday

Boris Johnson announces Tier 4 restrictions in south east England

The prime minister has confirmed that stricter restrictions will be applied to London and south east England from Sun...

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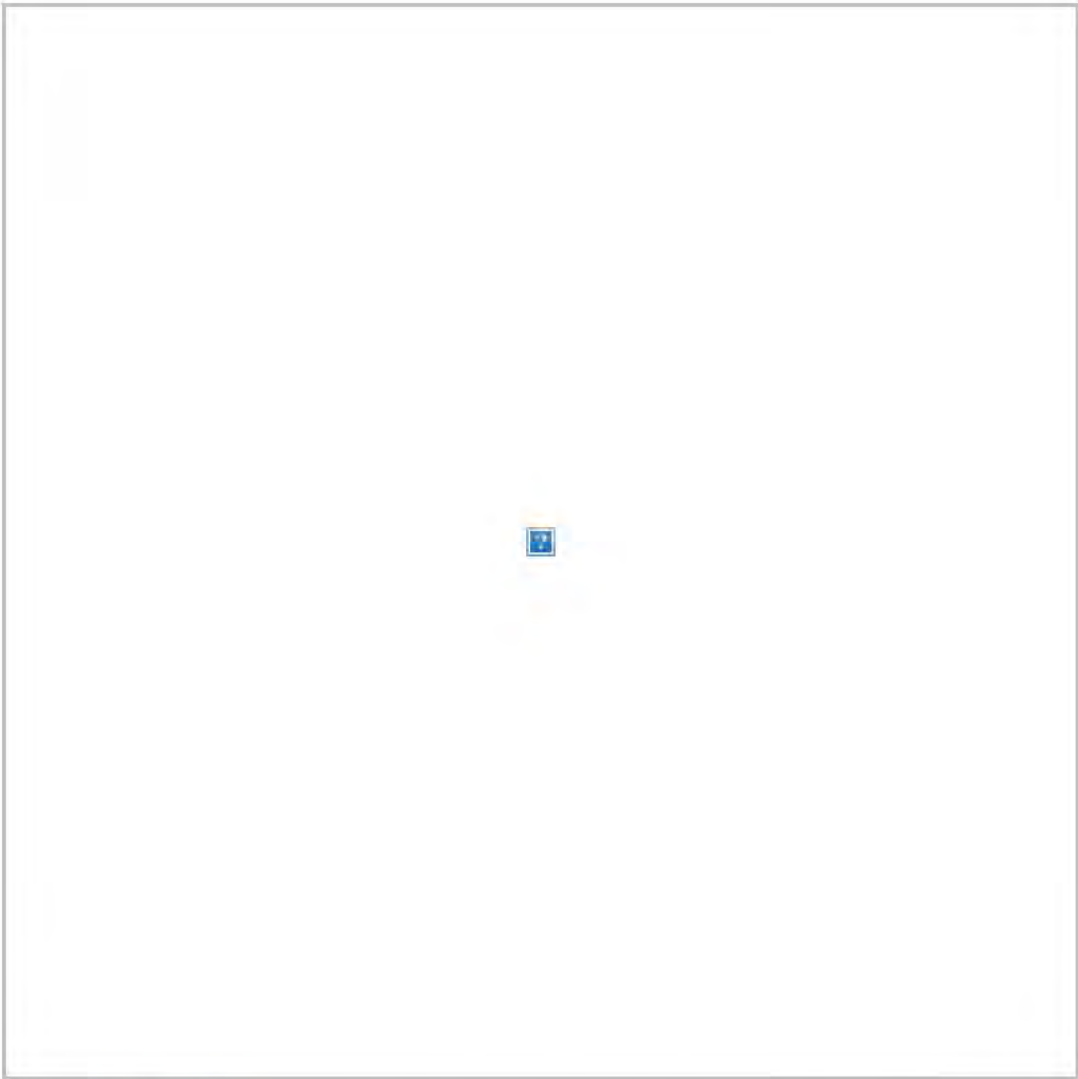
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How China censored Covid-19

Thousands of secret Chinese government directives and other documents reviewed by The New York Times and ProPublica s...

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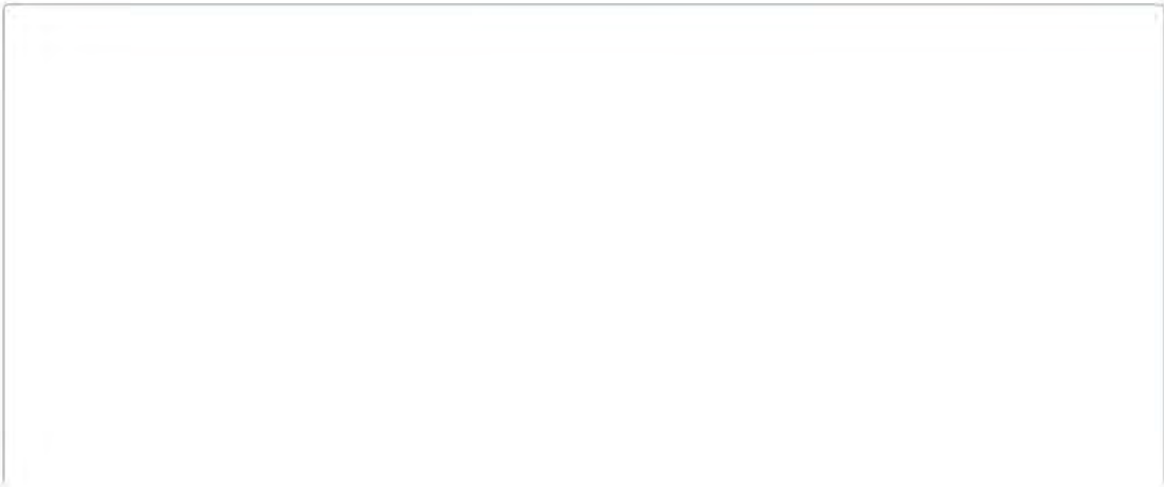


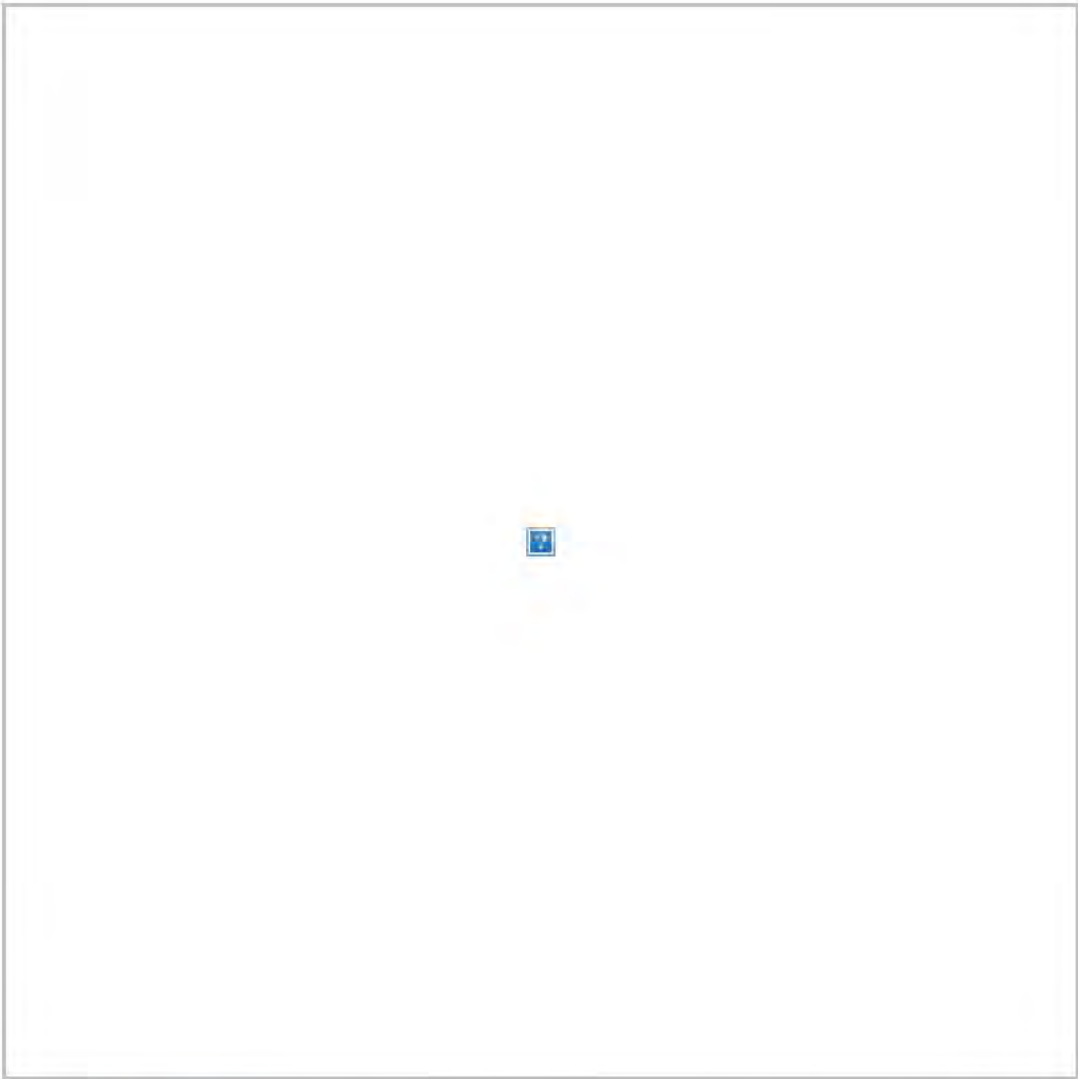
COVID-19 · Yesterday

Nicola Sturgeon announces new restrictions in Scotland, including a travel ban

Prime Minister Boris Johnson announced new Tier 4 restrictions in south east England on Saturday after a new variant ...

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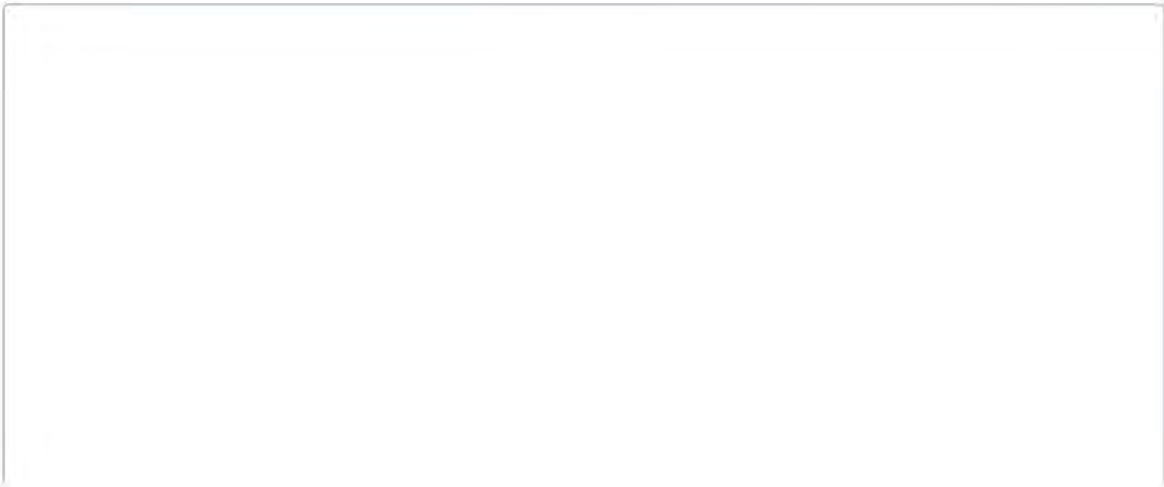


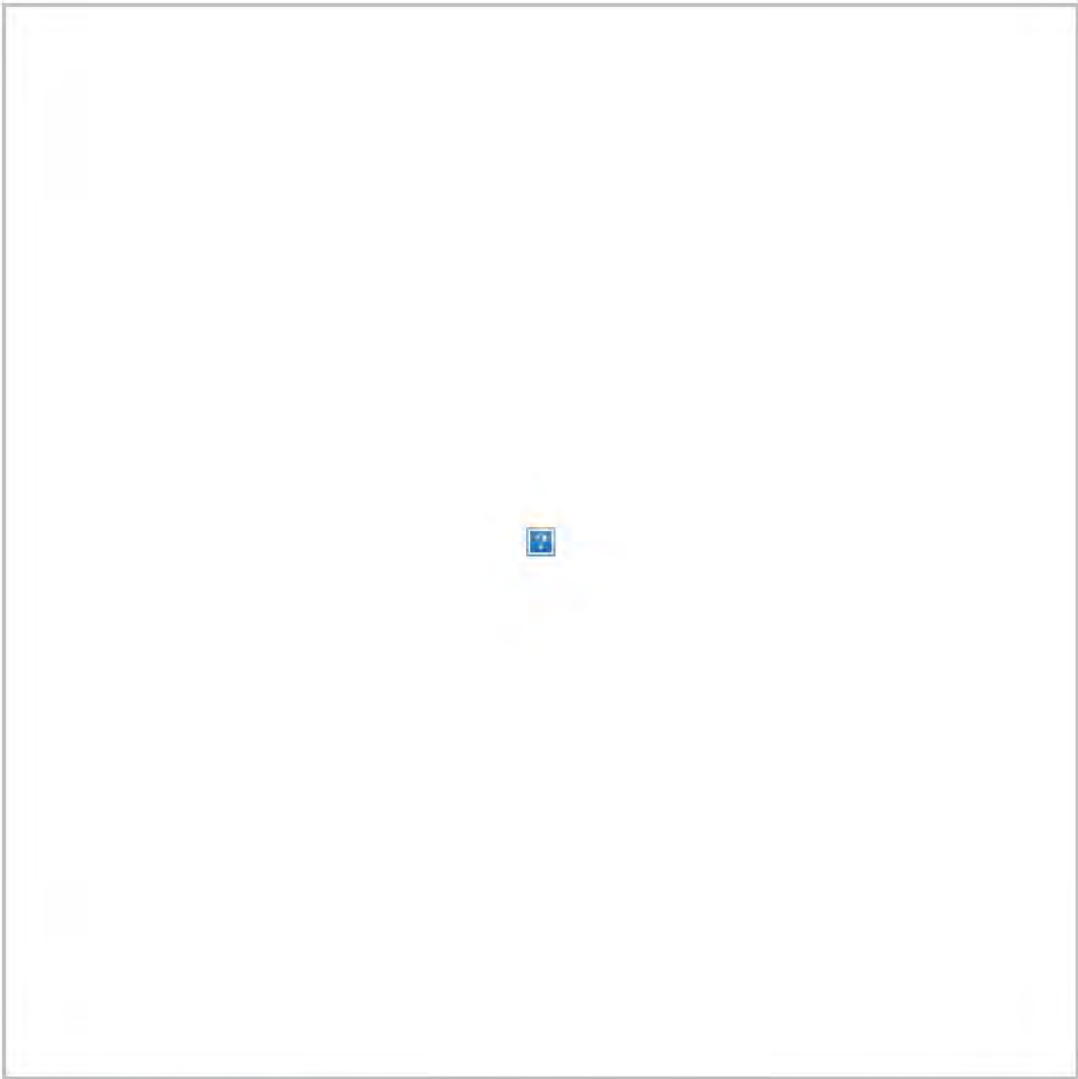
COVID-19 · 2 hours ago

Trains out of London are full on Saturday night following the announcement of new Tier ...

Some London train stations and trains were crowded on Saturday night as people left the city. The government had anno...

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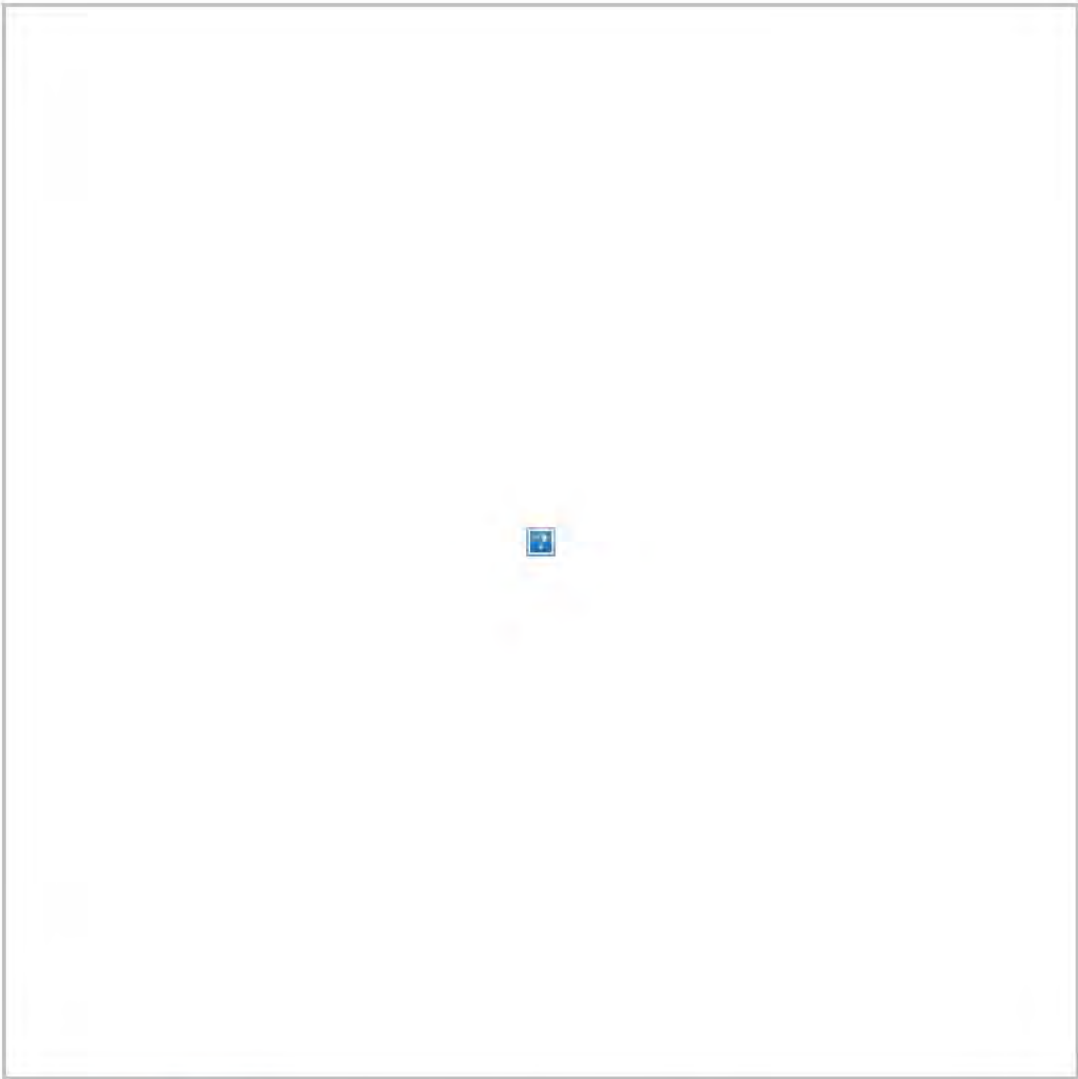
US elections · 2 hours ago

Trump is reportedly considering appointing Sidney Powell as special counsel, according ...

Based on a scoop from The New York Times, President Trump met with attorney Sidney Powell to discuss the possibility ...

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Technology · 4 hours ago

China might be able to control the weather

For decades, China has been home to one of the world's most advanced weather-modification programs.

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From: [REDACTED]
To: [James Renwick](#); [Bea](#); [Daniel Kingston](#); [Michael Martens](#); [jeanette](#); [Sylvia Nichol](#); [a.maharaj](#); [kyle.clem](#); [howard.diamond](#)
Cc: [Kerry South](#); [Beatrice Giorgi](#)
Subject: 600 ICSHMO submissions !!
Date: Monday, 20 September 2021 12:44:24 pm
Attachments: PresentationOverview_20Sept.xlsx

Hi All

Well done everyone! Attached is the raw list of submissions as at 9am this morning - 510 talks and 82 posters for a total of 592 submissions and they are still trickling in. Fantastic! Ka pai! The spreadsheet is sorted by organisation so you can get a feel for what submissions are in and from what organisations.

Today and tomorrow we'll be assigning reviewers and doing an initial check through submissions. So for those reviewing, you'll be interested to note that 444 of the submissions were associated with sessions so that leaves 148 general submissions that will need review from the programme committee. If there is someone else you would like to hook in to reviewing [let us know](#) and we can send them an invite with timetable information.

Reviewers can expect to hear from us by tomorrow afternoon.

Note for Programme committee:

No action is required yet but I imagine you'll be thinking about how we fit in all of these presentations. Ali and I will plan a catch up with you on this and in the meantime just a note to say that we're looking through the region submissions are from as one way we could design the programme is to pull out sessions into the virtual only week based on those that may be largely made up of non-NZ's. We may even consider whether there are any that may like to run at a time that is more conducive to their time zone. Remember, we can consider making presentations available in advance and/or recordings available after so that all content is accessible for everyone regardless of time zone. When we meet I can also go over some of the ways these virtual only sessions can be run as we have experience in offering virtual programmes several ways so it is about working out what is right for this audience.

The abstract portal is still open as discussed although given the submission levels I recommend closing it tomorrow. [Please let us know if you are happy with this?](#) If there are late requests those can be collated and brought to you for consideration.

With submissions numbers and submitters locations known, Ali will be able to use this information to form a more accurate projection of the budget.

Kind regards,

[REDACTED]

s9(2)(a)

[REDACTED] | Conference Manager

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From: [AGU](#)
To: [João De Souza](#)
Subject: AGU Weekly: Last chance to submit an abstract to AbSciCon24; Read the January Issue of Eos!
Date: Friday, 5 January 2024 9:32:52 am

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4 January 2024



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Start 2024 off right! Join a worldwide community supporting more than half a million advocates and professionals in the Earth and space sciences. As an AGU member, you can help make the Earth and space science community more diverse and inclusive, expand your professional network, and stay up to date on the latest news and outreach. Already a member? [Renew today](#) and take advantage of your benefits all year!

The words of the prophets are written on the subway walls, but you can actually listen to the “sounds of science” in this month’s *Eos* issue, thanks to audification and sonification efforts on [land](#), [sea](#), and [sky](#). In addition to cataloging our noisy, moaning universe, these datasets are making research more accessible for visually impaired scientists around the world.

READ

Are you a scientist interested in getting involved in federal policy? The AGU Congressional Science Fellowship program places highly qualified and accomplished scientists, engineers and other professionals in the office of an individual member of Congress or on a committee for a one-year assignment. Apply by 15 January 2024.

APPLY



A new AGU book, *Landscape Fire, Smoke, and Health: Linking Biomass Burning Emissions to Human Well-Being*, presents a transdisciplinary approach to investigating relationships between wildfires and health outcomes. Find out more in this [Editors’ Vox](#). [Chapter 1 is available for free.](#)

READ



AGU is excited to implement a series of updates to the Union Medals, Awards, and Prizes (UMAP) Program when the nominations cycle opens on 17 January. Learn more about these updates through a [recorded information session](#) presented by the AGU Honors and Recognition Committee.

VIEW

AGU Journals



Third of Alps' ice will melt by 2050

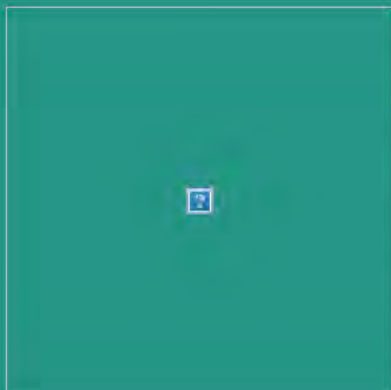
READ



Ice clouds possible on Venus

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Submit an abstract to AbSciCon24

Last chance to submit an abstract for the Astrobiology Science Conference 2024 (AbSciCon24), taking place 5-10 May in Providence, Rhode Island. Abstracts should focus on scientific results, enabling Earth and space science or its application, and/or the contribution of Earth and space science to society. Share your research and [submit an abstract](#) by the 10 January deadline.

Upcoming Deadline & Events

- 10 Jan: [Early bird registration deadline for OSM24](#)
- 10 Jan: [Deadline to submit an abstract to AbSciCon24](#)
- 15 Jan: [Deadline to apply to the AGU Congressional Science Fellowship Program](#)
- 17 Jan: [2024 Honors Nominations Cycle Opens](#)
- 24 Jan: [Deadline to submit an abstract to WaterSciCon24](#)
- 29 Feb: [Deadline to register for TESS24](#)

AGU in the News

[Greener trees can provide early warning of volcanic awakening](#). Kate Ravillious, *The Guardian*, 26 December. [Geochemistry](#), [Geophysics](#), [Geosystems](#)

[Balanced boulders on San Andreas fault suggest the 'Big One' won't be as destructive as once thought](#). Kiley Price, *LiveScience*, 26 December. **AGU23**

[How 7 scientists feel after the hottest year on record](#). Umair Irfan, *Vox*, 27 December. **AGU23**

[Droughts are forcing human migration toward cities and rivers across most of Africa: study](#). Megan DeLaire, *CTV News Canada*, 28 December. [Earth's Future](#)

[Arctic Report Card looks at changing food, predator-prey relationships in Gulf of Alaska](#). Margaret Bauman, *The Cordoba Times*, 28 December. **AGU23**

[Scientists mull Solar Radiation Management – a potential climate-change stop-gap](#). Rik Myslewski, *The Register (London)*, 30 December. **AGU23**

[There's a total solar eclipse coming soon. Here's everything you need to know](#). Kasha Patel, *Washington Post*, 2 January. **AGU23**

[Hidden in Pixels: Checking Satellite Images, Scientist Uncover a World Buried in Time](#). *Africa Press – Namibia*, 2 January. **AGU23**

AGU is a global community supporting more than half a million advocates and professionals in the Earth and space sciences.



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From: s9(2)(a)
To: [MetComms](#)
Subject: Australian bush fires bring us hail?
Date: Tuesday, 19 November 2019 2:31:28 pm
Attachments: Andreae_2004_Smoke-clouds-amazon.pdf

Hi there,
experiencing the hail storm here in Christchurch yesterday I was thinking about what leads to this weather and remembered an article I read many years ago about the warm rain over the Amazon rainforest, occurring daily in the clean forest air, compared with the cold rain storm when smoke particles...:

"delay the onset of precipitation from 1.5 kilometers above cloud base in pristine clouds to more than 5 kilometers in polluted clouds and more than 7 kilometers in pyro-clouds. Suppression of low-level rainout and aerosol washout allows transport of water and smoke to upper levels, where the clouds appear "smoking" as they detrain much of the pollution. Elevating the onset of precipitation allows invigoration of the updrafts, causing intense thunderstorms, large hail, and greater likelihood for overshooting cloud tops into the stratosphere." (Andreae et al. 2004 - attached)

I have been searching your website (but I am unfortunately not very familiar with it), and could not find the Tasman air flows for the past week. Is the ash from the fires coming over this way and do you think I'm correct in connecting these two processes? I am very interested to know :-)

Many thanks for your time!

Best wishes,

s9(2)(a)

Huntsbury
Christchurch

From: [Craig Delany](#)
To: [Peter Fisher](#); [Chris Noble](#); [Ramon Oosterkamp](#); [Mark Schwarz](#); [Andrea Tandy](#)
Subject: Climate risk working group
Attachments: PropertyClimateRiskReport-Residential-176-Onepu-Road-Lyall-Bay-Wellington-6022-New-Zealand.pdf
Waikato Region_report_v3 high res_update.pdf
CLIMsystems Project_Training_Experience_11_November_2022.pdf

Hi all,

Following on from the Rob meeting, I am tasked with getting a group together to come up with the start of a climate plan for both B2C and B2B.

The idea is to then get a presentation together to present to the ELT.

We have Clymsystems who will play a part in providing reports as well as our own inputs.

Property report for my house attached

There is probably a lot we can and can't do but lets at least try and take a bite out of the proverbial Elephant

If there is anyone else you think should be in this kick off meeting, please pass the invite to them.

Microsoft Teams meeting

Join on your computer, mobile app or room device

Click here to join the meeting <https://teams.microsoft.com/l/meetup-join/19%3ameeting_NGI3Nzc1OGUtNDI3Ni00ZWNIWE4MTQtMTI0ZTBmZTVjZDU3%40thread.v2/0?context=%7b%22Tid%22%3a%227743e73e-5491-45e0-a251-49ada93db3f5%22%2c%22Oid%22%3a%22f2faee41-0346-43a7-b4f7-d1d5468dd684%22%7d>

Meeting ID: 417 472 116 394
Passcode: RXCmaS

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From: [Springer](#)
To: [Iman Soltanzadeh](#)
Subject: Climatic Change | Read highly accessed articles
Date: Wednesday, 6 October 2021 1:34:18 am

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Journal Announcement

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17369

From: coastal_list@udel.edu on behalf of s9(2)(a)
To: coastal_list
Subject: coastal list: "Ocean-based climate actions" collection now open for submissions
Date: Wednesday, 10 November 2021 11:09:04 pm

Dear colleagues,

On behalf of the editorial team, I'd like to invite you to submit your research to the collection on [Ocean-based climate actions](#) that is now open (through May 2022) for submissions at [Scientific Reports](#) (a Nature journal).

This Collection aims to showcase primary research on ocean-based solutions and geoengineering approaches in the fight against climate disruption by promoting **offshore renewable energy, CO2 sequestration by the ocean, conservation and restoration of coastal and marine ecosystems, solar radiation management, mitigation of hurricane damage in coastal regions, coastal resiliency and adaptation, preservation of coral reefs from bleaching, and the development and implementation of strategies to improve marine aquaculture and fisheries productivity**. We also encourage submissions that assess the environmental impact and potential adverse effects of these actions.

Submissions will be welcome at any point up until the end of May 2022. More details [here](#).

Feel free to contact me (s9(2)(a)) should you have any questions.

Regards,

s9(2)(a)

Center for Complex Hydrosystems Research
Department of Civil, Construction and Environmental Engineering
The University of Alabama

s9(2)(a)

Editorial Board Member: Scientific Reports (Nature)

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To view this discussion on the web visit

https://groups.google.com/a/udel.edu/d/msgid/coastal_list/9fb3fed0-ecdd-4535-a47b-7e225e77c8e6n%40udel.edu.

From: coastal_list@udel.edu
To: [Digest recipients](#)
Subject: coastal list: Digest for coastal_list@udel.edu - 2 updates in 2 topics
Date: Wednesday, 28 October 2020 12:24:11 am

coastal_list@udel.edu

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Topic digest


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- [PhD opportunity at U.Plymouth on modeling evolution of reef-lined islands under sea-level rise](#) - 1 Update
- [PhD positions in sediment transport/fluid mechanics at the University of Minnesota – Twin Cities](#) - 1 Update

[PhD opportunity at U.Plymouth on modeling evolution of reef-lined islands under sea-level rise](#)

 >: Oct 26 03:34PM

Dear colleagues,

Professor  at the University of Plymouth is offering a fully-funded PhD with some travel funds to utilize laboratory experiments and numerical models to assess the "Natural Adaptive Capability of Coral Reef Islands to Sea-level Rise and Implications for Future Human Occupation"; see:

<https://www.aries-dtp.ac.uk/studentships/masselink/>

Please feel free to share with your colleagues to help us fill this position. Thank you for your consideration.

Project Background

It is a widespread expectation that sea-level rise will render low-lying islands formed on coral reef platforms uninhabitable within decades due to increased flooding. Such projections are largely founded on assumptions that islands are geologically inert landforms, whereas in reality they have the ability to morphologically respond to changing sea levels. Specifically, overwash processes can raise the island crest level, implying that islands are dynamic and will not drown in place. Such change in perception has implications for how reef island communities can adapt to climate change. This project will investigate this natural adaptation of coral reef islands to sea-level rise.

PhD positions in sediment transport/fluid mechanics at the University of Minnesota – Twin Cities

[REDACTED] >: Oct 26 09:02AM -0500

The Environmental Transport lab at the University of Minnesota -Twin Cities (<https://yang.cege.umn.edu/>) is seeking motivated graduate students to study environmental transport related problems, including sediment transport, geomorphology, and transport of contaminants and bacteria. Students with a background in engineering and physics are all welcome to apply through the university website: <http://www.cege.umn.edu/prospective/graduate/how-to-apply.html> The deadline to apply is December 3, 2020.

Laboratory experience is preferred but not required. Interested applicants are welcome to directly contact [REDACTED]).

--

[REDACTED]
Assistant Professor, University of Minnesota, Twin Cities
Department of Civil, Environmental, and Geo-Engineering & Saint Anthony Falls Laboratory

Environmental Transport Lab <<https://yang.cege.umn.edu/>>

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From: coastal_list@udel.edu
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Subject: coastal list: Digest for coastal_list@udel.edu - 2 updates in 2 topics
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coastal_list@udel.edu

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- "Ocean-based climate actions" collection now open for submissions - 1 Update
- Post Doc Research Associate - Coastal Ocean Modeling - 1 Update

"Ocean-based climate actions" collection now open for submissions

@gmail.com>: Nov 09 01:44PM -0800

Dear colleagues,

On behalf of the editorial team, I'd like to invite you to submit your research to the collection on *Ocean-based climate actions <<https://www.nature.com/srep/guestedited#ocean-based-climate-actions>>* that is now open (through May 2022) for submissions at *Scientific Reports <<https://www.nature.com/srep/about>>* (a Nature journal). This Collection aims to showcase primary research on ocean-based solutions and geoengineering approaches in the fight against climate disruption by promoting *offshore renewable energy, CO2 sequestration by the ocean, conservation and restoration of coastal and marine ecosystems, solar radiation management, mitigation of hurricane damage in coastal regions, coastal resiliency and adaptation, preservation of coral reefs from bleaching, and the development and implementation of strategies to improve marine aquaculture and fisheries productivity*. We also encourage submissions that assess the environmental impact and potential adverse effects of these actions.

Submissions will be welcome at any point up until the end of May 2022. More details here <<https://www.nature.com/srep/guestedited#ocean-based-climate-actions>>.

Feel free to contact me (*hmoftakhari@ua.edu*) should you have any questions.

Regards,

[REDACTED]
Center for Complex Hydrosystems Research
Department of Civil, Construction and Environmental Engineering
The University of Alabama

[REDACTED]
Editorial Board Member: Scientific Reports (Nature)

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Post Doc Research Associate - Coastal Ocean Modeling

Alicia Mahon <alicia.mahon@gmail.com>: Nov 09 02:11PM -0800

The Pacific Northwest National Laboratory - Seattle Office (PNNL-Seattle)

is seeking two highly motivated postdoctoral researchers to conduct modeling projects in four topic areas: 1) large eddy simulation (LES) of offshore wind farms; 2) estuarine circulation and river plume dynamics; 3)

wave, tidal stream and ocean current energy; 4) waterborne plastics fate

and transport. The selected candidates are expected to design, configure

and conduct model simulations related to one of the aforementioned research

areas using state of the art coastal ocean models. The candidates are also

expected to collaborate with an integrated (hydrological and atmospheric)

modeling team in PNNL to investigate the effects of hydrological and atmospheric forcing on estuarine dynamics and transport processes under

extreme events and future climate scenarios. The above research projects

are primarily funded by the Wind Energy Technologies Office (WETO), Water

Power Technologies Office (WPTO), and Office of Environmental and Biological Research (OBER), U.S. Department of Energy.

The position has been posted online

here: <https://careers.pnnl.gov/jobs/2437?lang=en-us>. Applications will be

accepted through November 19, 2021.

Thank you,

██████████ Ph.D., PMP

Offshore Wind and Ocean Dynamics Team Lead

COASTAL RESEARCH GROUP

Pacific Northwest National Laboratory

902 Battelle Boulevard

P.O. Box 999, MSIN K9-89

Richland, WA 99352 USA

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From: [redacted] on behalf of [redacted]
To: [redacted]
Subject: coastal list: PhD positions in sediment transport/fluid mechanics at the University of Minnesota – Twin Cities
Date: Tuesday, 27 October 2020 3:31:08 am

The Environmental Transport lab at the University of Minnesota -Twin Cities (<https://yang.cege.umn.edu/>) is seeking motivated graduate students to study environmental transport related problems, including sediment transport, geomorphology, and transport of contaminants and bacteria. Students with a background in engineering and physics are all welcome to apply through the university website: <http://www.cege.umn.edu/prospective/graduate/how-to-apply.html> The deadline to apply is December 3, 2020.

Laboratory experience is preferred but not required. Interested applicants are welcome to directly contact Dr. Judy Yang (xxxxxxx@xxx.xxx).

--

[redacted]
Assistant Professor, University of Minnesota, Twin Cities
Department of Civil, Environmental, and Geo-Engineering & Saint Anthony Falls Laboratory
[Environmental Transport Lab](#)

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From: s9(2)(a)
To: [Chris Kroger](#)
Cc: s9(2)(a)
Subject: cv
Date: Friday, 14 January 2022 9:22:09 am
Attachments: s9(2)(a).docx

Hi Chris, I am attaching my full cv for your review and thoughts on the potential fit with the research team at MetService. If you agree that my skills may be supportive and useful to advance the forecasting science at MetService then I will plan to follow up with a cover letter and 2 pg resume that addresses the forthcoming job description.

Wishing you a nice day!

s9(2)(a)

[Redacted signature block]

From: s9(2)(a)
Subject: Deep South proposal submitted.
Date: Thursday, 4 February 2021 9:50:36 am
Attachments: Clouds&AerosolsMeasurement_Proposal.pdf

Kia ora koutou,

I successfully submitted the Deep South Proposal yesterday and attach a copy for your records. I'd like to thank all of you for your contributions and your willingness to be involved in some way in supporting this effort. The Deep South review and approval process will take until early May now. So it is time to hope for the best, but I really think this is a very strong proposal. Thanks for all of your help.

I look forward to working with you all in the future and please keep in touch.

Mā te wā,

s9(2)(a)
/ Professor School of Physical and Chemical Sciences
University of Canterbury, Private Bag 4800, Christchurch, New Zealand
Phone: +64 3 3692064,

Recent papers:

Kuma, P., McDonald, A. J., Morgenstern, O., Alexander, S. P., Cassano, J. J., Garrett, S., Halla, J., Hartery, S., Harvey, M. J., Parsons, S., Plank, G., Varma, V., Williams, J., (2020). Evaluation of Southern Ocean cloud in the HadGEM3 general circulation model and MERRA-2 reanalysis using ship-based observations. *Atmospheric Chemistry and Physics* **20**(11): 6607-6630, <https://doi.org/10.5194/acp-20-6607-2020>.

Farooq, U., Rack, W., McDonald, A. J. & Howell, S. (2020), Long-term analysis of sea ice drift in the western Ross sea, Antarctica, at high and low spatial resolution." *Remote Sensing* **12**(9), <https://doi.org/10.3390/RS12091402>

Hartery, S., Toohey, D. W., Revell, L., Sellegri, K., Kuma, P., Harvey, M., & McDonald, A. J. (2020). Constraining the surface flux of sea spray particles from the Southern Ocean. *Journal of Geophysical Research: Atmospheres*, 125, e2019JD032026. <https://doi.org/10.1029/2019JD032026>

McDonald, A. J., Cairns, L. H. (2020). A new method to evaluate reanalyses using synoptic patterns: An example application in the Ross Sea/Ross Ice Shelf region. *Earth and Space Science*. **7**, e2019EA000794. <https://doi.org/10.1029/2019EA000794>

From: s9(2)(a)
Subject: DRM External Advisory Group - updates and attachments
Date: Tuesday, 20 August 2019 6:31:54 pm
Attachments: 3. Johnston flyer and report.zip
4. EAG Update - Angela Sutherland.zip
5. PRP updates.zip
6. External DRM Advisory Group TOR Sept 2013.docx
1. Disaster Risk Management External Advisory Group meeting notes - 13 August 2019 - draft v1.pdf
2. UNDRR - APMCDRR 2020 informal brief.docx

[UNCLASSIFIED]

Kia ora koutou,

Thanks to those who could make it last week, I enjoyed our discussion.

As promised, I have a few updates following our meeting, and several attachments as in the list below.

Please let me know any feedback at all. I'll send around finalised notes with the invite for the next meeting, in due course.

Ngā mihi,

s9(2)(a)

==

1. **Meeting notes** – a draft version attached here. My apologies in advance for any errors – let me know and I will send around a final version with next meeting invite. Includes a MFAT / MCDEM report on the Global Platform in Annex One.
2. From **Andy McElroy**, a summary of his update on the Asia-Pacific Ministerial Conference on DRR in June next year. We look forward to further engagement on this moving forward.
3. From **David Johnston** (Massey University), an email with two attachments:
 1. A Massey University report on the Global Platform
 2. The flyer for workshop series on linking global and NZ disaster risk reduction.
Note next talk in Wellington this **Thursday 22nd** at 3pm
4. From **Angela Sutherland** (Red Cross), an email including resolutions for discussion at the upcoming International Conference of Red Cross Red Crescent, and information about the Flood Resilience Alliance Aotearoa
5. From the **Pacific Resilience Partnership**, three emails:
 - A public call to affiliate with the PRP (by 30th August)
 - Seeking feedback on the Pacific Resilience Standards (by 30th August)
 - Distributing Terms of Reference for the Information Knowledge Management Technical Working Group

6. **The Terms of Reference** for this External Advisory Group. This dates to 2013, so probably has not been sighted in a while. Very interested in your reflections and feedback on how the group is working, and suggest this could be a topic for discussion at the next meeting. Welcome comments on:

- What works in the external advisory group setting - you feel is most useful for you in your role;
- What does not work – what you would adjust or change; and
- Any specific changes you would recommend - format, timing, agenda, membership etc.

s9(2)(a)

s9(2)(a)

Climate Change and Environment Unit | Pacific and Development Division
New Zealand Ministry of Foreign Affairs & Trade | Manatū Aorere

s9(2)(a)

@mfat.govt.nz

195 Lambton Quay, Private Bag 18901
Wellington 5045
New Zealand

www.mfat.govt.nz | www.safetravel.govt.nz



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From: [American Energy Society](#)
To: [Lucy Batt](#)
Subject: Energy Awards 2023, a special replay publication for Friends
Date: Saturday, 16 December 2023 1:42:10 am

Image



Each year, the American Energy Society surveys the energy landscape and spotlights the most extraordinary contributions to energy and sustainability. As always, the award categories are: people, media, technology, innovations, markets, the arts, and more.* [AES Members](#) have access to past awards and archives.

** Editor's note on the AES award process:* Starting in March and continuing through the rest of the year to the Thanksgiving holiday, AES editors start gathering nominations. In all cases, Member recommendations receive the highest consideration, then Friends, and then finally AES staff. To be considered, each award must have at least one nomination and at least another seconding that nomination. Then the selection process begins. Debates are spirited. In most cases, by the end of the debate, the winner is clear; however, there are occasions when the choice is not so obvious, and then award nominees are also included in the announcement. Finally, it is important to mention that there is no compensation of any kind that is exchanged for any of these awards. Simply put, the winners this year and in years past are deserving.

Editor's note on corrections to this award's issue: Revisions and updates have been made to Carlton Brown, Librarian of the Year; Best Book About the Energy Market Economy, [Uncertain Futures](#), by Alexander Gazmararian and Dustin Tingley; and, the winner of Best Edited Book About Energy, [Routledge Handbook of Energy Transitions](#), edited by Kathleen Araújo.

[Nominations](#) for 2024 book awards are now open!

PEOPLE



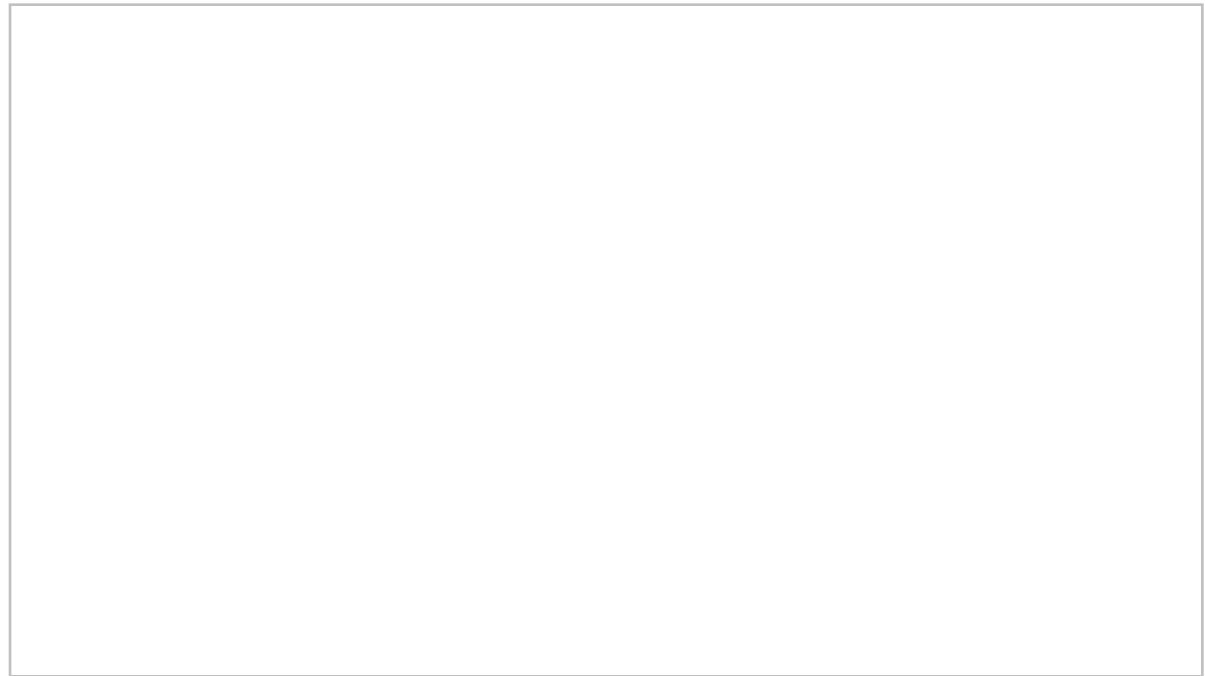
Energy Person of the Year — Global

[Fatih Birol](#)

[Fatih Birol](#), executive director of the International Energy Agency, has transformed the IEA from a research institute that monitored oil markets into a leading adviser to the world's major economies about net-zero emission energy technologies. Countries including India, China, Indonesia, and Colombia have asked Fatih to chart road maps for speeding climate action and an energy transition that decouples emissions from economic growth. At every twist and turn in the transition, Fatih always has something thoughtful or insightful to say.

Energy Person of the Year — United States

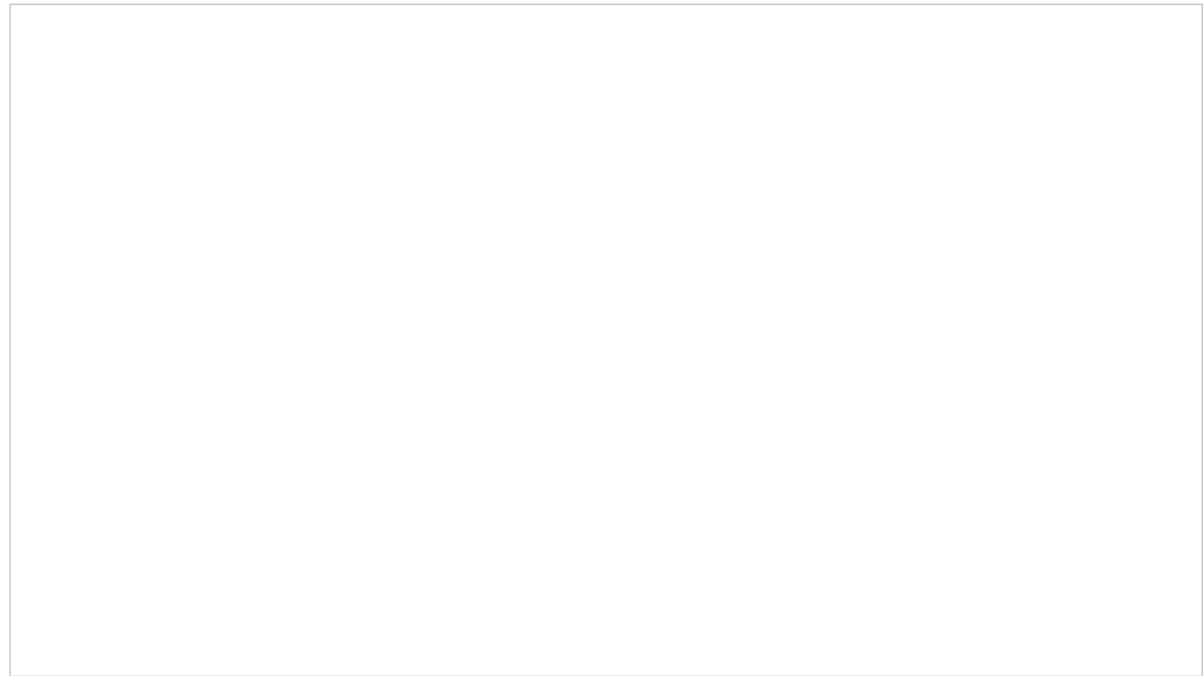
[Janet Yellen](#)



The US Treasury's first female Secretary, [Janet Yellen](#), deserves a lot of credit for leading the unenviable task of managing monetary policy during difficult economic times. The White House and Congress passed unprecedented climate funding legislation (CHiPs, BIL, IRA, etc.), a force multiplier that worked in opposition to the Fed's deflationary macroeconomic objectives. Meanwhile, for the first time in 50 years, an increase in oil prices did *not* lead to a recession. The US and the world avoided a recession in part because Yellen spearheaded a large release from the strategic oil reserve in March 2022 (more than 200 million barrels). The release was widely derided by pundits; however, it worked because it defused the “hoarding” response that accompanied earlier disruptions.

Youth Energy/Environment Activist of the Year (group)

[Held vs. Montana](#)



A landmark court decision that ruled the State of Montana is violating its youngest residents' right to a clean and healthful climate is a major victory for the 16 young people behind the first US youth-led climate trial. It could serve as a "viable and powerful" legal strategy for the second youth-led case next year in Hawaii.

Youth Energy/Environment Activist of the Year (individual)

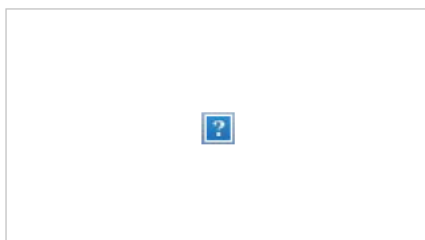
Wawa Gatheru



[Wawa Gatheru](#) is a Kenyan-American storyteller committed to empathetic, respectful, and accessible climate communication. A Rhodes Scholar, founder of Black Girl Activist, a Grist 50 FIXER, a ROOT Young Futurist, and *Glamour* College Woman of the Year, Wawa was also featured on the cover of *Vogue* alongside [Billie Eilish](#).

2023 Energy Thought Leader in Higher Education

David Victor



Limited space does not allow for a full treatment of [David Victor's](#) accomplishments. Here are a few highlights:

- Professor and Chair of the Cowhey Center on Global Transformation in Innovation and Public Policy at UC San Diego;
- Co-director of the Deep Decarbonization Initiative;
- Professor in Climate, Atmospheric Science & Physical Oceanography at the Scripps

Institution of Oceanography;

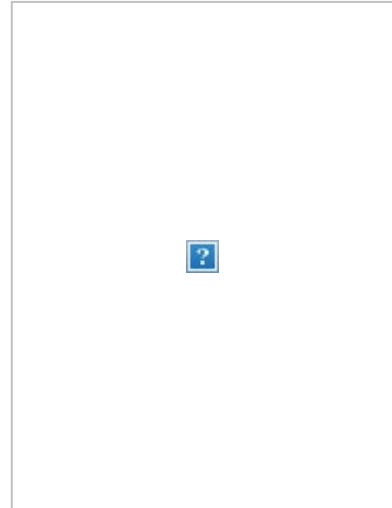
- Convening lead author for the Intergovernmental Panel on Climate Change (IPCC);
- Nonresident Fellow at the Brookings Institution Energy Security and Climate Initiative.

Subject Librarian of the Year

[Carlton Brown](#)

Director of Ford Library at the
Fuqua School of Business,
Duke University

Duke recently launched a new organization: the Nicholas Institute for Energy, Environment & Sustainability. Change of this magnitude requires a lot of effort and often overlooked is the additional work required of staff. The American Energy Society recognizes Carlton Brown, Director of Ford Library at the Fuqua School of Business, for supporting and helping advance the ambitious changes taking place at Duke.

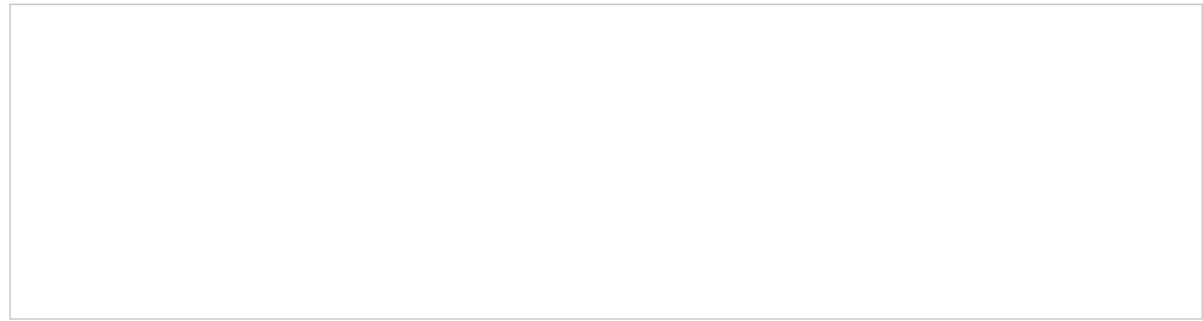


Carlton says, "I'm honored to accept the award but do so on behalf of our entire staff here at Ford Library and my colleagues who most directly support our users, especially Jane Day, Paula Robinson, and Brittany Wofford. They are our front-line staff who support student and faculty research focusing on energy markets and the intersection of climate data, policy, and business. All of our Ford librarians and colleagues across Duke Libraries provide valuable input that enables library leadership to bring on the resources that support Duke University's mission to become 'The Climate University.'"



MEDIA AWARDS

In case you missed it ... the American Energy Society's 2023 [Energy Writer of the Year](#), the premier literary award for energy:



Best book about energy



[From Black Gold to Frozen Gas; How Qatar Became an Energy Superpower](#)

by Michael D. Tusiani with Anne-Marie Johnson

Today, Qatar is among the world's wealthiest countries. Its rich hydrocarbon resources have transformed this small Gulf state into an energy powerhouse, funded its global ambitions, and allowed it to forge an identity separate from those of its large and powerful neighbors. Drawing on firsthand accounts and deep personal experience in the energy sector and Anne-Marie Johnson's years of reporting, Michael Tusiani explores how Qatar became a major player in the global energy market.

Best energy biography

[Elon Musk](#), by Walter Isaacson



An easy selection this year ... love him or hate him, it's important to learn more about Elon Musk. And because Walter Isaacson wrote it, for better or worse, the book has placed Musk in the ranks of Steve Jobs.

Best book with energy subtext

[Grand Transitions; How the Modern World Was Made](#)

by Vaclav Smil ([AES Energy Writer of the Year, 2019](#))

What does one of the world's leading experts on the history of energy think is a causal force in the transitions that structure our modern world ... and the environmental reckoning that will mark its success or failure? Energy, of course.



Best energy business history



[The Fund](#)

by Rob Copeland

Bridgewater Associates is a "global macro hedge fund" that focuses on risk allocation across the energy transition and invests for a few institutional clients including pension funds, sovereign wealth funds, endowments, foundations, foreign governments, and central banks. In other words, Bridgewater manages the money behind the money. Rob Copeland tells the shocking and fascinating story behind the firm's enduring success. Revealing the secrets of the people behind the biggest hedge-fund on Wall Street, *The Fund* is a must-read business book.



The Best of American Energy Society

Best issue of *Energy Today*:

[Conservation; The 'Other' Environmentalism](#)

This issue of *Energy Today* spotlights a kind of environmentalism that is often ignored: conservation, protecting Earth's natural resources for current and future generations. Conservation is a distinct form of environmentalism, very different from either preservation or today's emphasis on sustainability. The differences are significant and more than semantic.

The 5 significant energy stories of 2023

Energy Matters

1. **Deploy. Deploy. Deploy.** The US Inflation Reduction Act, passed in 2022, provided substantial financial support in 2023 for deployment of renewable energy and transmission infrastructure, mostly via tax credits.
2. **The Shovel Wars.** China dominates the critical mineral markets. Economically developed countries struggle to keep up; economically developing and underdeveloped regions that have the mines are collateral damage.
3. **October 7, 2023.** Hamas attacks Israel, leading to retaliation and broader regional conflict that also disrupts E&P and export markets for oil and natural gas from the Middle East.
4. **Russian aggression.** Russia continues to target Ukraine's power plants with bombs and drone attacks, including the Zaporizhia nuclear power plant
5. **SVB.** Over a period of two days in March 2023, Silicon Valley Bank went from solvent to broke as depositors rushed to withdraw their funds. Then, on March 10, 2023, SVB officially failed, marking the third-largest bank failure in US history. It was one of three, along with Silvergate Bank and Signature Bank.

Best original publication

H2 Influencers

The Hydrogen Subject Matter Experts To Watch

Five years ago, the American Energy Society noticed a new trend in its data. Hydrogen was becoming a topic of interest throughout the entire energy sector. This development signaled that the field was poised for another growth phase. In anticipation, we began the deliberate process of identifying influential hydrogen experts making an impact. Now, our directory of "hydrogen subject matter experts to watch" is complete.

Best membership deal



End-of-year special [discount!](#)

Support the Society and benefit from unrestricted access to all publications, services and benefits:

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The Energy Year in Photos



Left: US federal funds support a massive build-out of energy infrastructure. Photo by euractiv.com
Right: The global pursuit of critical minerals has collateral damage. Photo by Mining.com.




Left: Hamas attacks Israel, Gaza under siege. Photo by Mint.
Right: Changing the narrative and elevating tribal energy sovereignty. Photo by Dan Bihn.



Left: In March 2023, Silicon Valley Bank went from solvent to broke. Photo by ABC News.
Right: In August, wildfires spread across Maui. Photo by CBS News.

Photo of the year



A boy drinks dirty water in Kakamega, Kenya, another region devastated by changes to its climate.

Photo by CIWEM.



ENERGY MARKETS AND TECHNOLOGY AWARDS

Most interesting small energy company



The aviation industry accounts for 2% of global CO₂ emissions, and that total is growing fast because there are more people who are flying. Several companies are trying to scale the production of sustainable aviation fuels (SAFs), an alternative jet fuel made from non-petroleum feedstocks that reduce emissions. But the SAF company that stands out is [Twelve](#), a carbon transformation company based in Berkeley, California. Their technology converts CO₂ into useful materials, such as plastics, gases, and fuels. Part of Lawrence Berkeley National Laboratory's first Cyclotron Road cohort, Twelve has won multiple awards, including the Keeling Curve prize, Ocean Exchange's WW Orcelle award, the Roddenberry prize, and *Forbes'* Change the World competition. However, in search of a market for its materials, the company pivoted often, including DBA name changes like Obtainium and Opus 12. Now Twelve has a market, and it's big: jet fuel. The first batch of clean jet fuel will be used by Alaska Airlines in its 737s for the SFO/Seattle flight (aka the "nerd bird" because many passengers are software/computer engineers.)

Nominees also include:

- [Form Energy](#). Using oxygen to convert iron to rust (which creates electrons ... and energy), Form Energy batteries can discharge power for about four days — far longer than

lithium-ion batteries, and they do not require rare-earth minerals. In 2023, the company launched two 10-megawatt storage facilities in Minnesota and Colorado.

- [Niron Magnetics](#). Any energy transition requires critical minerals, but mining for them can decimate ecosystems. Niron Magnetics' *Clean Earth Magnet* is much stronger than its competition. In 2023, automaker Volvo signed as a customer, while the US DoE awarded the company \$17.5 million to ramp up production.
- [Solugen](#). The chemicals industry is one of the dirtiest in the world and is responsible for 30% of global carbon emissions. Solugen uses AI to engineer enzymes and metal catalysts that can bypass the limitations of traditional fermentation, allowing the company to produce molecules at room temperature using bio-based feedstocks, with no toxins and no waste.

Energy company of the year



One of the great ironies is that transitioning to a low-emission economy requires massive amounts of steel, which is made by a manufacturing process that generates massive amounts of all sorts of GHG emissions. Indeed, the steel industry accounts for

around 7% of global greenhouse gas (GHG) emissions and 11% of global carbon dioxide (CO₂) emissions. No other industry has more emissions.

[Cleveland-Cliffs Inc](#) is the largest flat-rolled steel producer in North America and it's also the industry leader in emission reduction. Among other innovative and progressive efforts, Cleveland Cliffs:

- Supports research by local university partners on steel decarbonization.
- Surpassed its DoE "Climate Challenge Goal" for GHG emission reduction ahead of schedule.
- Successfully completed experiments using hydrogen as a fuel to replace coking coal in its blast furnaces — the first steel company to use hydrogen in North America.
- Will conduct trials with the new hydrogen hub in Indiana and has offered to be the anchor hydrogen offtaker from the hub.
- Evaluates and audits its own Scope 1, 2 and 3 emissions (no other steel manufacturer and very few corporations accept responsibility for consumer-side Scope 3 emissions).

Most interesting energy-related scientific experiment

[Fusion reaction](#)

The second validation fusion experiment by the National Ignition Facility at the Lawrence Livermore National Laboratory



was an enormous success, surpassing all expectations. The result? 3.88 megajoules! (*Insert: the target bay of the NIF at the LLNL.*)

Most interesting corporate ESG program



Ceres, a non-profit sustainability advocacy organization based in Boston, Massachusetts, is often named one of the most influential players in corporate E, S and G. Indeed, after losing his bid to become Speaker of the House, Rep. Jim Jordan (R-OH), Chairman of the House Judiciary Committee claimed that Ceres was running an ESG [cartel](#), an inadvertent backhanded compliment because Ceres' commitment is sincere and effective.

Most innovative utility



When 2023 opened, SoCalGas began rewriting its narrative. They agreed to pay \$71M for damages caused by the massive methane [leak](#) at its Aliso Canyon gas storage facility in Porter Ranch eight years earlier. And with that, the southern California utility began embracing new strategies and innovations in ways that other utilities typically do not. For instance, SoCal Gas tested a new Hybrid Direct Air Capture ([HDAC](#)) system in Bakersfield, California. The DAC technology, developed at the Pacific Northwest National Laboratory (PNNL), removes carbon dioxide from the air and generates water using only electricity. SoCalGas also began [testing](#) new fuel cell designs and also a hydrogen blend in its natural gas supply. Perhaps more significant, SoCal Gas got approval from the CPUC to test the first phase of Angeles Link, the nation's first hydrogen energy pipeline system. And, by the way, SoCalGas is also helping the 2028 LA Olympics reach its zero-emissions goal.

Most interesting investment group



Similar to the United States' DARPA, the UK now has an Advanced Research and Invention Agency, ARIA, that funds "high-risk, high-reward" research. Organizationally small and independent of UKRI (the main UK government funding body), ARIA has the autonomy to operate at speed-seed funding (aka X-Prize type goals and awards) and offers bonuses for accomplishing RD&D goals. The Agency just launched and does not yet have a track record, but its all-star team, led by Ilan Gur and with the support of the UK parliament, is certain to make high-level impact.

Looking ahead - the most interesting technical topic in 2024

[Geoengineering](#)

Whoa! James Hansen says that some geoengineering — solar radiation management (SRM) — to deflect sunlight is needed in order to counteract the geoengineering we've already done by putting so much GHG into the atmosphere.

Note: last year we selected [AI](#) as the most interesting energy technology in 2023.

Looking ahead — the most interesting company in 2024

[280 Earth](#)

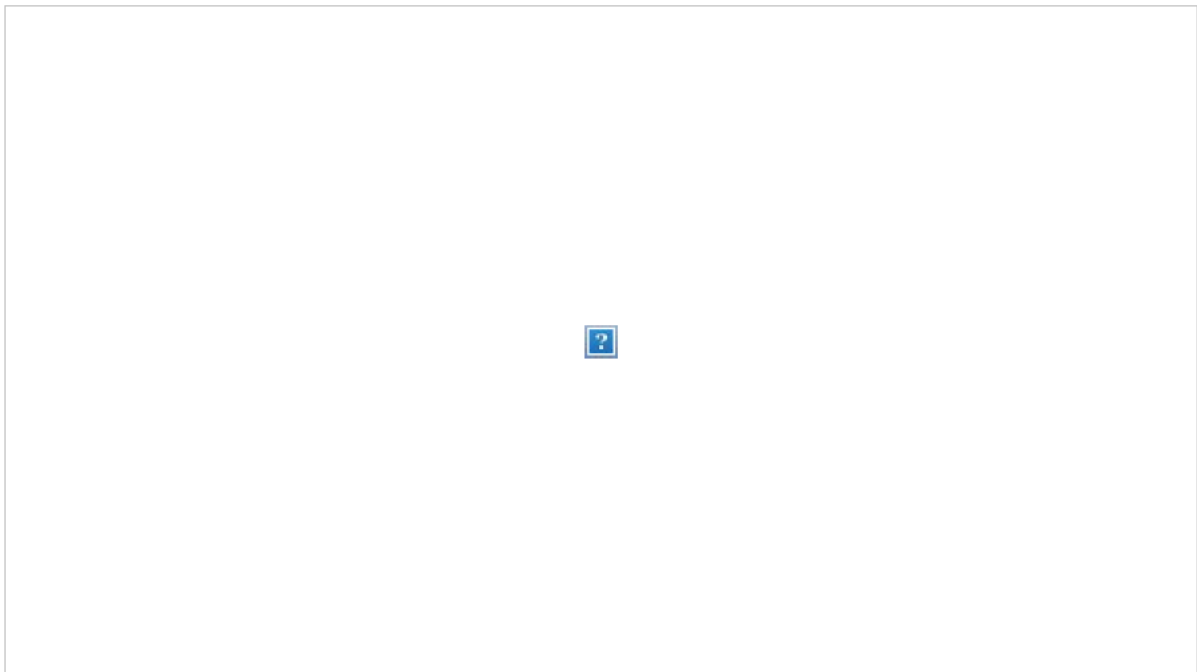


[280 Earth](#) is "coming soon." (*Hint:* the DAC technology is in stealth mode at GoogleX in Mountain View, California, and will be deployed at a facility in Oregon that is currently under construction.)

The Architecture/Design Award

Note: The AES architecture/design award recognizes newly designed or recently completed buildings that best demonstrate alignment with sustainable material, ecological, and social values in the US.

DPR Headquarters in Sacramento, by SmithGroup

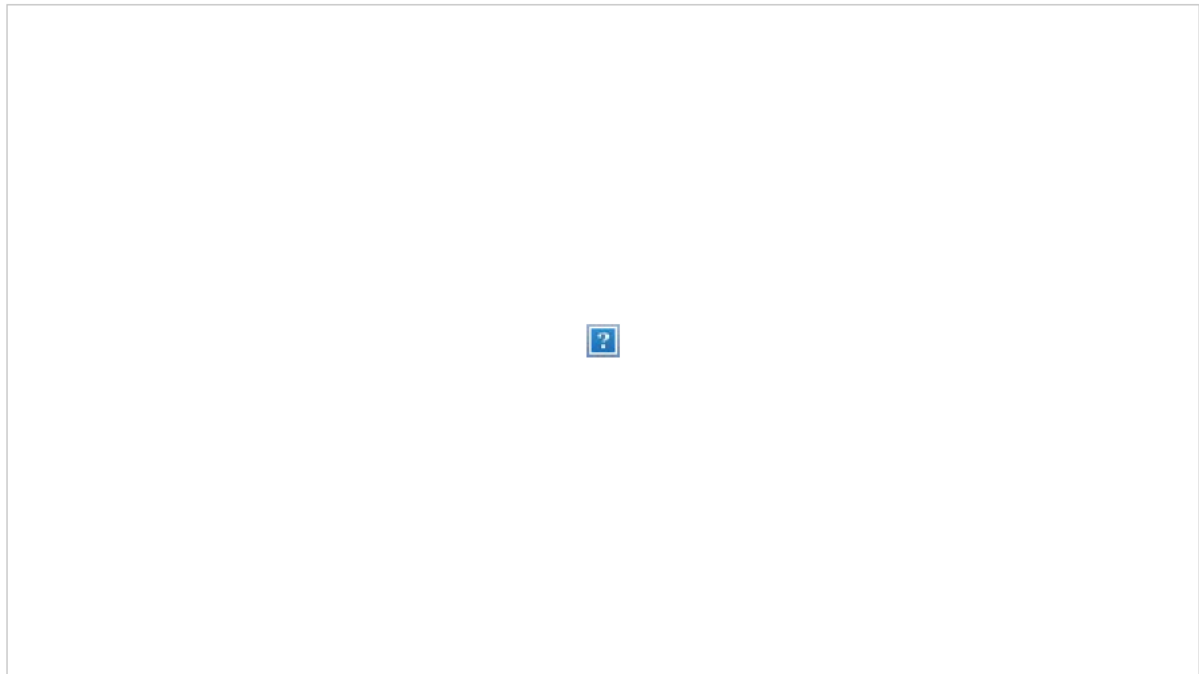


First place (above): For its new [headquarters](#) in Sacramento, DPR Construction envisioned a sustainable work environment that would foster a greater sense of collaboration among its employees and would have strong ties to both nature and the surrounding community. The net

zero energy project includes the renovation of an almost 27,000-square-foot building originally constructed in 1940 and a 5,600-square-foot addition built entirely with cross-laminated timber.

Second place (below left): Some people think the building looks like Jenga blocks, while others say it's a stack of books. Designers claim that the building is meant to be a 300-foot conversation starter. It will serve as Boston University's new [Center](#) for Computing and Data Sciences. Located on the banks of the Charles River, it's the largest carbon neutral building in Boston, and one of the "greenest" buildings in New England.

Third place (below right): One of the most energy-efficient laboratory buildings in the world, Harvard's Science and Engineering [Complex](#) (SEC) helps shift typical design-thinking about research labs toward environmental stewardship.



Energy "Art & Entertainment" Awards

The best popular movie about energy

[Killers of the Flower Moon](#)



Martin Scorsese's newest epic is based on an exceptional nonfiction book by David Grann. The book's narrative structure is built into the subtitle: *The Osage Murders and the Birth of the FBI*, but the plot — the slow transfer of wealth away from the oil-rich Osage through a combination of marriage and murder — is what powers *Killers*. And it really did happen, in the early 1920s.

Best Documentary about energy/environment

King Coal

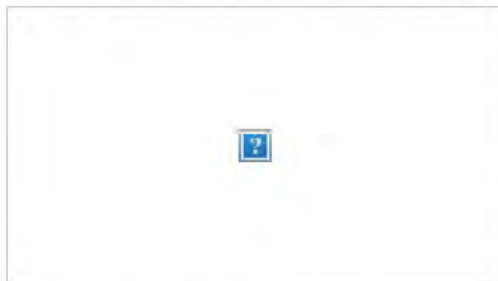


[King Coal](#) created buzz at Sundance. Director Elaine McMillion Sheldon wanted to explore "what the future might look like out of the shadow of coal." The film takes the perspective of a coal miner's daughter who learns about her homeland in central Appalachia. Consider it a strong contender at the next Academy Awards.

Nominees also include:

- [The Oil Machine](#) (2023 North America release; available for classrooms in 2024)
- [Common Ground](#) (in-depth look at the global food system)
- [Soul of the Ocean](#) (never before seen look at life under water)

Energy/Environment Song of the Year



[Cruel Summer](#) by Taylor Swift

This song, a [re-release recording](#) from the 2019 cover of the 1983 original by [Bananarama](#), seems like an appropriate winner for this category since 2023 was the hottest summer on record.

Nominees also include:

- [Atmosphere](#), by Fisher, Kita Alexander (a dance anthem)
- [Burnin'](#), by Noizu, Martin Ikin (another dance anthem)
- [Cool](#), by Daniel Caesar (angsty melodramatic reflection)
- [Meltdown](#), by Travis Scott, Drake (lots of explicit lyrics)

Energy/Environment songwriter of the year

[Oli Frost](#)



Oli's first single was "[The Greta Thunberg](#)," but his hit song, "[The Vampire Conspiracy](#)," has millions of views across platforms like TikTok, Spotify, and Instagram. With a Transylvanian accent and the backing of a synth-pop beat, Oli sings: "*Of course climate change is a conspiracy, made up by socialist vampires to push policies. A greener, fairer world, that's our evil plot. Free-range organic humans have*

the most delicious blood."

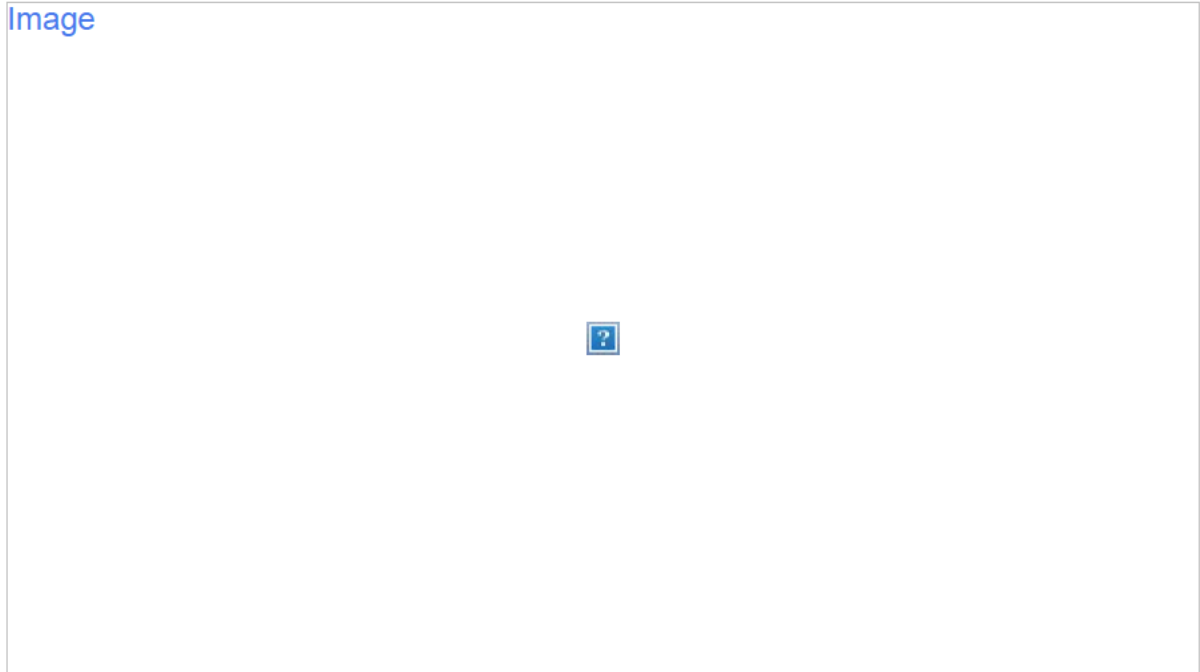
Editor's warning: listen to this song just once and you will get infected with an ear-worm.

Energy Art(ist) of the Year

[Nicole Kelner](#)

Nicole Kelner uses watercolors to communicate about climate change. She paints dark news with bright colors, creating space for hope in a world filled with fear and eco-anxiety.

Image



Other Media Awards

Best podcast about energy and/or sustainability



[Energy Thinks with Tisha Schuller](#)

Hosted by Tisha Schuller

Nominees also include:

- [C.O.B. Tuesday](#), by Veriten, a high-level conversation about high-level energy issues.
- [Catalyst](#), with Shayle Kann, is authentically and intellectually curious.
- [Digital Wildcatters](#), by Collin McLelland, a multimedia platform that covers the oil and gas and energy sectors. His go-to platform about oil & gas tech cultivates a community that wants to disrupt and clean up the status quo.

Best ad campaign about energy and/or sustainability

[Apple's ESG report to Mother Nature](#)



Mother Nature is played impressively by Octavia Spencer while Apple CEO Tim Cook plays himself. "*Are you seriously explaining carbon neutrality to me?*"

Best peer-reviewed research about energy/sustainability for a general audience

[Trouble in the Amazon](#)



Published by *Nature*, written by Daniel Grossman, photographs by Dado Galdieri/Hilaea Media, video by Patrick Vanier/Hilaea Media, supported by The Pulitzer Center, Washington, DC

Climate change, deforestation and other human threats are driving the Amazon towards the limits of survival. Researchers are racing to chart its future.

Best magazine article about sustainability (tie)



[What Really Happens to the Clothes You Donate](#), GQ, by Oliver Franklin-Wallis; and, [What Happens to All the Stuff We Return?](#), *The New Yorker*, by David Owen.

These articles both explore what happens to the clothes at thrift stores. It turns out that only 10 - 30% of second-hand donations to charity shops are actually resold in stores. The rest are collected, shredded, and then exported to the Global South.

Best use of social media about energy/environment

[The National Park Service](#)



Maybe the best and most entertaining content on Instagram and "X." Matt Turner, who once served as a guide and interpreter at Park Service sites, runs social media for the National Park Service, working with a team of public affairs and digital media specialists. A few of the most entertaining posts ...

- "Did you know that if you hold an ermine up to your ear, you can hear what it's like to be attacked by an ermine?"
- "Most squirrel bites originate at the front, or "bitey end," of the squirrel."
- "If you come across a bear, never push a slower friend down ... even if you feel the friendship has run its course."

Best new energy education resource



[Understand Energy Learning Hub](#)

Stanford University

Free access to energy education for everyone. Explore the site to learn about energy resources from fossil fuels to renewable resources and efficiency; energy currencies like electricity and hydrogen; and energy services such as transportation and buildings.

Energy Cartoon(ist) of the Year

[Wes Andrews, Climatedoonist](#)



[Wes Andrews](#), a renewable-energy project developer, compulsively doodles *Climatedoonist* from his home just outside Austin, Texas. No sector is safe from Wes's wit.

Best indie energy blog



[Carbon180](#) writes about policies that support gigaton-scale carbon removal solutions for policymakers, entrepreneurs, and peer organizations.

Nominees also include:

[RBN Energy](#): Don't let the rock & roll theme get in the way of RBN Energy's brilliant insights about a wide variety of energy topics.

[EnergyGPS](#): EnergyGPS offers a variety of toppings (aka "topics") that get wrapped up inside a tortilla shell (aka "blog") that they call the *Energy Burrito*.

Best published research for a general audience

[National Transmission Study Needs](#)



by DoE

The challenges facing the US energy system have shifted in the last 100 years and will continue to evolve. Today's grid cannot adequately handle 21st century challenges—including the integration of new clean energy sources and growing transportation and building electrification—while remaining resilient in the face of extreme weather exacerbated by climate change. *National Transmission Needs Study* is a comprehensive assessment of near-term transmission needs through 2040.

Honorable mention: [Queued Up! Characteristics of Power Plants Seeking Transmission Interconnection](#). by LBNL.



More Book Awards

Best book about the environment/sustainability



[Wasteland](#)

by Oliver Franklin-Wallis

Every year, about 62 million tons of clothes are manufactured worldwide; an enormous percentage of that ends up in vast landfills. *Wasteland*, by Oliver Franklin-Wallis, exposes how the rise of fast fashion is leading to a tidal wave of trash.

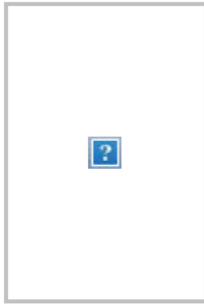
Best book series on energy

[Center on Global Energy Policy Series \(10 books\)](#)



For the past 10 years, OPEC has been losing its ability to influence oil markets. The rise of unconventional drilling in the US has caused wild price swings, the likes of which haven't been seen for eight decades. This series traces oil's journey from the Pennsylvania oil fields of the 1860s to today's fractious geopolitical conflicts.

Best political studies book with energy as a subtheme



[The Making of the Modern Middle East](#)

by **Jeremy Bowen**

Jeremy Bowen, an editor for the BBC, has covered the Middle East since 1989 and is uniquely placed to explain its complex past and troubled present. Bowen's book is a gripping and invaluable guide to the modern Middle East, how it came to be, and what its future might hold.

Best book about energy infrastructure/the grid



[Energy and Power; Germany in the Age of Oil, Atoms, and Climate Change](#) by *Stephen G. Gross*

Since the 1990s, Germany has embarked on a daring campaign to restructure its energy system around renewable power. But this pioneering energy transition has been plagued with problems. In *Energy and Power*, Stephen Gross explains the deeper origins of *Energiewende* — Germany's transition to green energy.

Best edited book about energy



[Routledge Handbook of Energy Transitions](#)

Edited by Kathleen Araújo

A general overview of the state of knowledge for energy transitions. What stands out in this *Handbook* is its sociotechnical examination of the considerable changes in which energy is sourced, delivered, and utilized.

Best book with "The Commons" as a back-drop

[Co-Cities: Innovative Transitions toward Just and Self-Sustaining Communities](#), by Sheila Foster and Christian Iaione

Most people live in cities. But even the wealthiest cities have vulnerable

populations that struggle with inadequate or unaffordable housing, unsafe water, unhealthy food, and other essentials. Yet, cities have the ability to solve the inequalities they create.

The best book for upskilling into the energy workforce



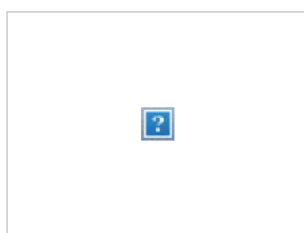
[Wiring for Beginners: Ignite Your Creativity and Master the Art of Wiring With Confidence and Joy.](#)

by Marvin Hale

The DoE Office of Energy Jobs has determined that there are 100,000s of unfilled jobs across all energy sectors; of these, 85% require apprenticeship and training rather than a degree from higher education. Recognizing that the energy transition needs the trades, AES recommends *Wiring for Beginners*.

Best book about the energy market economy (tie)

[The Big Myth and Uncertain Futures](#)



The Big Myth, by Naomi Oreskes and Erik Conway, explores market fundamentalism and the unwillingness to accept that market failure is the cause of climate change. In contrast, *Uncertain Futures: How to Unlock the Climate Impasse*, by Alexander Gazmararian and Dustin Tingley, proposes credible market-based solutions in support of an energy transition. AES editor's recommend reading these two books together.

Best book on advanced energy technologies

[Blockchain in the Energy Sector](#)

by Alexander Freier

Many new technologies seek to overcome energy market volatility. For instance, blockchain gained prominence as an integral component for



decentralized and digitalized energy infrastructure. Against this backdrop, [Blockchain in the Energy Sector](#) explores how this new technology can enhance efficiency, balance energy markets, and subsequently reduce GHG emissions.

A book for climate change skeptics



[The Puppeteers: The People Who Control the People Who Control America](#)

by Jason Chaffetz

In [Puppeteers](#), Chaffetz addresses his question: Why does it feel like no matter what happens in America, it seems like Democrats always get their way when it comes to climate change policy? (Though the thesis begs the obvious question, "do they?")

Best energy futurist book



[The Future of Energy](#)

by John Armstrong

Substantially updated for 2023 to reflect the impact of recent events (Covid, Russia's invasion of Ukraine, emergence of hydrogen technology, etc), *The Future of Energy* is written to be accessible to anyone interested in learning more about energy.

Honorable mention: [Eco Tech: Investing in Regenerative Futures](#), by Trond Undheim

Best book about energy, environment, and policy

[Democracy in a Hotter Time](#)

Edited by David Orr

The essays in *Democracy in a Hotter Time* call for reforming democratic institutions as a prerequisite for avoiding climate chaos by making them

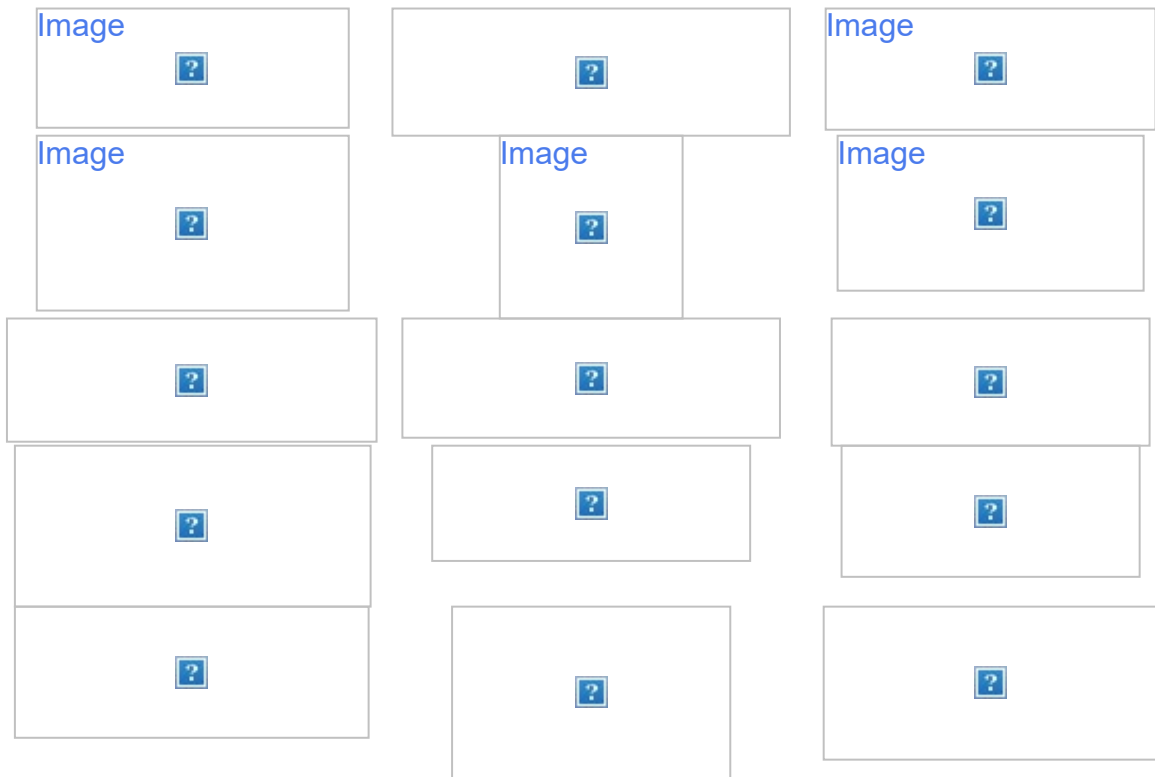


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From: s9(2)(a)
To: [João De Souza](#)
Subject: Evidence for Waikato
Date: Thursday, 11 June 2020 2:48:45 pm
Attachments: 200609_Invoice_XXX_Deliverables_V2.0_Hudson_KHM.docx
No2_2020-06-11 Draft Whakatōhea Case Study Workplan 2020.pdf
No19_2020-06-11 Mātauranga analysis methods.pdf
No19_Spreadsheet of documents.xlsx
2020-05-12 Draft paper for Iwi Marine Plans_SUBMITTED.pdf
No29_2020-06-11 Whakatōhea Moana plan outline.pdf
No24_25_2020_06_11 Document analysis.xlsx
No23_2020_06_11 Obtain research outcomes from PhDs and utilise in development of plan and tool.pdf
No26_2020-06-11 Seafood sector analysis.pptx
No24_27_2020-06-11 Storymap Maruhia atu and mussel analysis.pdf
No28_2020-06-11 OUTLINE method for collating Whakatohea rohe moana.pdf

For discussion

--

s9(2)(a)

Post-doctoral Fellow on the Moana Project www.moanaproject.org

University of Waikato

s9(2)(a)

From: [New Atlas](#)
To: [Greg Simmonds](#)
Subject: Experimental schizophrenia drug delivers promising human trial results
Date: Monday, 20 April 2020 9:00:20 pm

SCIENCE

Experimental schizophrenia drug delivers promising human trial results



A new study is reporting the successful results of a clinical trial testing an experimental drug designed to treat psychosis in schizophrenia. The drug works unlike any other existing anti-psychotic medication and larger Phase 3 trials are underway. [Read more](#)

ENVIRONMENT

Turbines brighten clouds over Great Barrier Reef in world-first trial



In a world first, researchers have conducted a cloud-brightening trial as a way of protecting fragile corals in Australia's Great Barrier Reef, to see whether reflecting some of the Sun's energy away could help limit damage due to climate change. [Read more](#)

MILITARY

Airbus makes first-ever fully automatic air-to-air refueling contacts



Airbus has announced the successful completion of the world's first fully automatic boom system air-to-air refueling (A3R) operation, in which an Airbus tanker test aircraft completed 120 dry fueling contacts with an F-16 fighter jet. [Read more](#)

HEALTH & WELLBEING

Brain region that influences binge drinking identified

New animal research has found binge drinking can be controlled by blocking a



key brain region linked to emotion-related behavior. The mouse experiments suggest blocking certain opioid receptors in the extended amygdala may curb excessive drinking. [Read more](#)

DIGITAL CAMERAS

The wonderfully weird winners of The Mind's Eye Photo Awards



Now in its fifth year, The Mind's Eye is online photography magazine All About Photo's annual competition. The winning and celebrated images this year span from photojournalism to abstract art, with a fascinating focus on the strange or uncanny. [Read more](#)

MEDICAL

Detecting signs of COVID-19 in sewage offers virus-tracking potential



Australian researchers are reporting a breakthrough in the battle against the novel coronavirus, discovering evidence of the virus in raw wastewater samples collected in the northern state of Queensland. [Read more](#)

OUTDOORS

AOR shrinks Sierra trailer into light, stout DIY off-road micro camper



AOR launched its entry-level Sierra camper trailer series last year. Now it adds the Sierra ZR, a simple, utility-style trailer the buyer equips as he or she sees fit. Build it into a state-of-the-art camper, or throw old gear in and get on the way. [Read more](#)

SPACE

NASA farewells Spitzer Space Telescope with final mosaic image

The Spitzer Space Telescope was decommissioned on Jan. 30 this year,



after more than 16 years in operation. Now NASA has released the observatory's last-ever mosaic image, giving us a glimpse into how it works and revealing new features of a nebula.

[Read more](#)

HOLIDAY DESTINATIONS

Lost wonders: New Zealand's spectacular Pink and White Terraces



The natural beauty of New Zealand is no secret these days, but back in the 1800s, there was a site so breathtaking, even compared to the rest of NZ, that it was spoken of as the 8th wonder of the world: the long-lost Pink and White Terraces. [Read more](#)

AUTOMOTIVE

The spectacular rise of virtual motorsport



Sporting enterprises are searching for new ways to cater to a locked-down world and while most flounder in the virtual realm, motorsport is quite the opposite: no other virtual sport can replicate the real deal for a spectator quite like motorsport. [Read more](#)

MEDICAL

New universal vaccine targets all four Ebola species that infect humans



With focus on COVID-19, it's easy to forget about other deadly viruses. Now, researchers have tested a novel vaccine candidate for Ebola in animals, which doesn't contain live vectors and appears to be effective against all four species of the virus. [Read more](#)

DIGITAL CAMERAS

Huge advance as photon-sensing 3D camera crosses the megapixel mark

Next-gen 3D cameras are on the way, capable of rendering spatial images in unprecedented resolution and speed.



The MegaX research camera captures single-photon light levels at up to 24,000 frames per second, paving the way for safer autonomous cars. [Read more](#)

ENVIRONMENT

Fava beans may be a greener substitute for soy



Many vegans swear by soy as a meat-free protein source, but concerns have been raised over the environmental sustainability of soybean farming. With that in mind, research now suggests that specially-prepared fava beans may be a better alternative. [Read more](#)

MARINE

U-Boat Worx launches lightest submersible ever built

Pilot and passenger enter via a hatch at the top



Dutch submersible maker U-Boat Worx has unveiled what's claimed to be the lightest manned submersible ever built. The Nemo can be towed on a trailer by car for launch from shore, or hauled onto a yacht for underwater fun at sea. [Read more](#)

BICYCLES

Annobike aims to make urban or off-road ebiking fun with the A1



Electric bikes come in all shapes and sizes, from commute-friendly folders to retro cruisers to city workhorses. Startup Annobike has entered the ebike arena with a design that's equally suited to urban streets and off-road adventures. [Read more](#)

MATERIALS

Bone-inspired material ups its strength as more force is applied

Scientists at Johns Hopkins University have succeeded in replicating an adaptive mineralization process in the lab, showing off a new type of material



that alters its stiffness as more force is applied. [Read more](#)

AUTOMOTIVE

Karma unveils all-electric Revero GTE for 2021 launch



Karma Automotive has announced an expansion to its Revero series with the GTE all-electric model. Visually similar to the Revero, Revero GTS and GT, the GTE will be the fourth model in the series. [Read more](#)

BIOLOGY

coproID gets the poop on source of fossilized feces



If you were studying the diet of ancient humans, it certainly wouldn't help if you got their preserved feces confused with those of their dogs. A new analytical system known as coproID is designed to keep that from happening. [Read more](#)

ARCHITECTURE

Critically-acclaimed British home for sale, love of concrete required



If you've ever wanted to live in one of the houses in RIBA's House of the Year competitions, now's your chance – as long you have £2.5 million (roughly US\$3.1 million) to spare. Ghost House should appeal to those with a deep love of exposed concrete. [Read more](#)

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From: s9(2)(a) [redacted]
Subject: Fiordland Carbon Sink Modelling Workshop (MBIE Endeavour)
Date: Friday, 9 February 2024 10:56:47 am
Attachments: Fiordland Carbon Cycle - Connecting to Econ - Nov 2023.pdf

You don't often get email from s9(2)(a) [redacted]. [Learn why this is important](#)

Here's the equations document I generated which we're sort of working from...

From: [Keith Hilligan](#)
To: [Brett Beamsley](#)
Cc: [Peter Lennox](#)
Subject: FW: s9(2)(b)(ii): Cc [REDACTED] MetService
Date: Thursday, 8 August 2019 11:31:55 am
Attachments: image001.png
image002.png

Hi Brett,

I would suggest you have a quorum to commit to this.

Keith

From: Tina Dustdar <Tina.Dustdar@metservice.com>
Sent: Thursday, 8 August 2019 11:20 AM
To: Brett Beamsley <b.beamsley@metocean.co.nz>; SLTeam <SLTeam@metservice.com>
Subject: RE: s9(2)(b)(ii): Cc [REDACTED] MetService

Hi Brett

I'm supportive in principles as it's the kind of thing we should be doing in terms of marketing and brand, and sounds like an excellent opportunity.

Out of scope, s9(2)(b)(ii): Commercially sensitive
[REDACTED]
[REDACTED]

Cheers,
Tina

From: Brett Beamsley <b.beamsley@metocean.co.nz>
Sent: Thursday, 8 August 2019 8:10 AM
To: SLTeam <SLTeam@metservice.com>
Subject: Fwd: s9(2)(b)(ii): Cc [REDACTED] MetService

Can I get some further feedback on this please. I've had Rob and Matt's go ahead (conditional), and Keith's endorsement also, but it would be good to hear from you Ramon, Norm, Mark and Tina, and also Peter if you have an opinion.

I'm about 1 week late in getting back to s9(2)(a) [REDACTED] and if I hear nothing by the end of the day I'll pull the pin on it.

Cheers,

Brett

Brett Beamsley - GM Metocean

From: s9(2)(a) [REDACTED] >
Sent: Thursday, August 8, 2019 1:53:13 AM
To: Brett Beamsley <b.beamsley@metocean.co.nz>

Subject: s9(2)(b)(ii). Com [REDACTED] MetService

Hi Brett

I'm making fast progress with finalising the s9(2)(b)(ii). Commercial programme, with The University of Wollongong, Wartsila and SINTEF all confirming their interest.

If you could kindly update me tomorrow on whether or not the MetService in New Zealand is interested in contributing, I would be most grateful. I certainly remain interested in working with you but will need a confirmation if we are to allocate you the place.

Best wishes,

s9(2)(a) [REDACTED]

From: s9(2)(a) [REDACTED]
Date: Monday, 5 August 2019 at 10:40
To: Brett Beamsley <b.beamsley@metocean.co.nz>
Subject: Re: [EXT] s9(2)(a). [REDACTED] MetService

Hi Brett,

Did you manage to discuss this production with your team on Thursday / Friday last week at all?

I have another call set up this week with a group in New Zealand, but don't want to feature too many groups from one country as mentioned on the phone. I remain very interested in working with you, so if you received the necessary approvals please let me know and I'll explain the next steps.

Best wishes,

s9(2)(a) [REDACTED]

From: [REDACTED]
Date: Thursday, 1 August 2019 at 23:20
To: Brett Beamsley <b.beamsley@metocean.co.nz>
Subject: Re: [EXT] s9(2)(b)(ii). Commercial [REDACTED] MetService

Hi Brett,

Thanks for the update – I'll wait to hear from you.

Best wishes,

[REDACTED]

From: Brett Beamsley <b.beamsley@metocean.co.nz>
Date: Thursday, 1 August 2019 at 21:54
To: [REDACTED]

Subject: [EXT] §9(2)(b)(ii): Commercially sensitive MetService

WARNING: This email originated from **outside** of the organisation. Do not click any links or open attachments unless you recognise the sender and know the content is safe.

Hi [REDACTED]

Sorry for the delay in getting back to you, we have been at the launch of the Moana Project and have had limited internet for the last few days. I've started a discussion with the rest of the Senior Leadership Team at MetService around this offering and am hoping to get back to you today NZ time.

Cheers,

Brett

From: Smith, [REDACTED] <[REDACTED]@xxxxxxxxxxxxxxxxxxx.xxx >
Sent: Thursday, August 1, 2019 9:05 PM
To: Brett Beamsley <x.xxxxxxxxx@xxxxxxxx.xx.xx >
Subject: §9(2)(b)(ii): Commercially sensitive MetService

Hi Brett,

Good to connect with you last week, I certainly remain interested in working with you.

Since speaking with you I've confirmed CSIRO, The Danish Meteorological Institute and the Marine Biological Association (UK) in the programme, so things are moving quickly as expected.

Have you now managed to connect with your team and confirm your involvement?

Best wishes,

[REDACTED]

From: §9(2)(a) [REDACTED]
Date: Monday, 22 July 2019 at 08:42
To: Brett Beamsley <x.xxxxxxxxx@xxxxxxxx.xx.xx >
Subject: §9(2)(b)(ii): Commercially sensitive MetService

Hi Brett,

Good to speak with you today, it was interesting to learn more about The MetService in New Zealand.

My key takeaways from our call: the Moana Project and the open access oceanography data archive, the rich variety of data you collect and analyse and the broad range of customers you service / the applications of your work; aquaculture, defence, ship building industry, tourism,

Out of scope

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[redacted]

[redacted]

From: Brett Beamsley <x.xxxxxxxx@xxxxxxx.xx.xx>

Date: Thursday, 18 July 2019 at 09:43

To: s9(2)(a) [redacted]

Subject: s9(2)(b)(ii): Commercially sensitive [redacted] - Request to Schedule Call

Sure, 6pm Monday works well for me.

Thanks s9(2)(a) [redacted]

Brett

From: s9(2)(a) [redacted]
Sent: Thursday, 18 July 2019 7:42 PM
To: Brett Beamsley <x.xxxxxxxx@xxxxxxx.xx.xx >
Cc: Ramon Oosterkamp <xxxxx.xxxxxxxx@xxxxxxx.xxx >
Subject: [redacted] - Request to Schedule Call

Hi Brett,

Sure – does 6pm or 7pm your time Monday work?

Best

[redacted]

From: Brett Beamsley <x.xxxxxxxx@xxxxxxx.xx.xx >
Date: Thursday, 18 July 2019 at 09:24
To: [redacted]
Cc: Ramon Oosterkamp <xxxxx.xxxxxxxx@xxxxxxx.xxx >
Subject: RE: s9(2)(b)(ii): Commercially sensitive [redacted] - Request to Schedule Call

Hi s9(2)(a) [redacted]

Sorry tomorrow evening my time will not work for me. Can I suggest early next week?

Cheers,
Brett

From: Smith, [redacted] <[redacted]xxxxx@xxxxxxxxxxxxxxxxxxx >
Sent: Thursday, 18 July 2019 7:06 PM
To: Brett Beamsley <x.xxxxxxxx@xxxxxxx.xx.xx >
Cc: Ramon Oosterkamp <xxxxx.xxxxxxxx@xxxxxxx.xxx >
Subject: Re: [redacted] [redacted] - Request to Schedule Call

Hi Brett,

I just called you but realise I didn't account properly for the time difference, apologies.

Are you available to speak this evening at all? If not perhaps tomorrow at 6, 7 or 8pm your time?

Best wishes,

s9(2)(a) [redacted]

From: s9(2)(a) [redacted]
Date: Monday, 8 July 2019 at 10:54
To: Brett Beamsley <x.xxxxxxxx@xxxxxxx.xx.xx >

Cc: Ramon Oosterkamp <xxxxx.xxxxxxxxxx@xxxxxxxxxxx>

Subject: Re: **s9(2)(b)(ii): Commercially sensitive** [REDACTED] - Request to Schedule Call

Hi Brett,

Yes that works well – I will call you then.

Best

[REDACTED]

From: Brett Beamsley <x.xxxxxxxx@xxxxxxxx.xx.xx>

Date: Monday, 8 July 2019 at 10:06

To: **s9(2)(a)** [REDACTED]

Cc: Ramon Oosterkamp <xxxxx.xxxxxxxxxx@xxxxxxxxxxx>

Subject: Re: **s9(2)(b)(ii): Commercially sensitive** [REDACTED] - Request to Schedule Call

Hi **s9(2)(a)** [REDACTED]

I'll be travelling on the 17th... how does the 18th work for you (6pm my time?)

Cheers

Brett Beamsley - GM Metocean

From: **s9(2)(a)** [REDACTED]

Sent: Friday, July 5, 2019 11:35:50 PM

To: Brett Beamsley

Subject: Re: **s9(2)(b)(ii): Commercially sensitive** [REDACTED] - Request to Schedule Call

Hi Brett,

Thank you for your e-mail.

Tuesday 17th works well for me – I would be pleased to call you then. Would 6pm your time work? (7am my time).

Best wishes,

[REDACTED]

From: Brett Beamsley <x.xxxxxxxx@xxxxxxxx.xx.xx>

Date: Thursday, 4 July 2019 at 21:38

To: s9(2)(a)
Subject: RE: s9(2)(b)(ii): Commercially sensitive - Request to Schedule Call

Hi s9(2)(a)

Firstly, thanks for reaching out. I'm more than happy to have a catchup to discuss what we do here in MetOcean Solution in more detail, and how it might fit into any production you are considering.

I'm away on Annual Leave from next Tuesday until the 17th, so if it can wait until I return that would be good. Failing that, I can potentially make some time Monday afternoon my time.

Let me know if any of that works, and also let me know if there is any information I can provide you in the meantime +

Brett



Dr. Brett Beamsley
General Manager – MetOcean Solutions
MetOcean Solutions

t +64 7 8250540 ext. 101 m s9(2)(a)
Upper Level, 5 Wainui Road, 3225 Raglan, New Zealand
PO Box 235, Raglan 3225, New Zealand



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that might be useful.

Cheers,

From: s9(2)(a) <s9(2)(a)>
Sent: Thursday, July 4, 2019 11:24 PM
To: Brett Beamsley <b.beamsley@metocean.co.nz>
Subject: s9(2)(b)(ii): Commercially sensitive - Request to Schedule Call

Dear Dr Beamsley,

I am reaching out to you from London, UK; I am directing a groundbreaking international news style programme titled s9(2)(b)(ii): Commercially sensitive and would like to arrange a telephone call with you at the earliest opportunity, to discuss potentially featuring MetOcean Solutions within it.

I am interested to discuss your expertise in meteorology and oceanography, and your science-based consultancy services for the offshore and maritime industries, as this ties in with the key themes of the programme. I'd be keen to learn more about the Moana Project and your efforts to support New Zealand's blue economy, and to speak about the benefits of your MetOceanView platform for marine operations.

Created by **s9(2)(b)(ii): Commercially sensitive** and with representation from the international marine, science and technology community, the programme will explore the vital challenges and opportunities facing our oceans, and the sector's efforts to provide a brighter future for the next generation.

s9(2)(b)(ii): Commercially sensitive

Generating over 350 million jobs worldwide, facilitating 90% of world trade and covering more than two-thirds of the Earth's surface, the world's oceans are fundamental to life on our planet, but they have never been faced with more challenges. It's clear more must be done to improve sustainability and overcome the challenges we face as a global ocean community.

As such, **s9(2)(b)(ii): Commercially sensitive** will showcase stories of science, innovation, sustainability, as well as industry-wide initiatives that are transforming the marine sector. It will cover topics such as the blue economy, aquaculture, marine pollution, weather and climate forecasting, career and education opportunities, and will champion innovations that support a world where marine resources and activities are sustained, managed and developed - hence me getting in contact.

I'm interested to discuss your work at MetOcean Solutions in more detail, to understand if this would be an appropriate fit. Pending us establishing some synergy, I can explain our objectives for the programme, how it will be disseminated, the financial costs to participate and timescales involved.

As such, could you email me with some suitable times when we can arrange a call to discuss this? I have availability throughout next week to speak (except Tuesday); evenings your time would work best for me (from 6pm if possible).

Best wishes

s9(2)(a)

s9(2)(b)(i): Commercially sensitive

Image removed by sender.

s9(2)(a)

Senior Programming Director

s9(2)(b)(ii): Commercially sensitive

Out of scope

[Redacted]

[Redacted]

[Redacted]

[Redacted]

Out of scope

From: [Iman Soltanzadeh](#)
To: [Darren Schollum](#)
Cc: [Chris Noble](#)
Subject: FW: Deep South contracting
Date: Tuesday, 3 August 2021 1:29:45 pm
Attachments: Clouds&AerosolsMeasurement_Proposal.pdf

Hi Darren.

We are involved in one of the Deep South National Challenge sub-projects (proposal attached). The question raised by **s9(2)(a)** (lead of the project from the University of Canterbury) is if we are happy to share the IP w create with other research parties:

“The contract requires participants to make their IP available to other researchers for the purpose of the challenge. If any subcontractors have any commercial or strategic IP that they are not willing to licence, or if they have concerns around improvements, they need to let us know – as we will need to make contract provision for this in the head agreement.

”

Thoughts?

Cheers
Iman

From: Yizhe Zhan <xxxxx.xxxx@xxxxxxxxxxx.xxx>
Sent: Tuesday, 3 August 2021 1:24 PM
To: Iman Soltanzadeh <xxxx.xxxxxxxxxxxx@xxxxxxxxxxx.xxx>
Subject: Re: Deep South contracting

Sure Iman. I have attached the proposal for your reference.

Thanks,
Yizhe

On Aug 3, 2021, at 1:10 PM, Iman Soltanzadeh <xxxx.xxxxxxxxxxxx@xxxxxxxxxxx.xxx> wrote:

Hi Yizhe, I feel lazy to look for the proposal. Do you have it handy to share it with others?

Cheers
Iman

From: Yizhe Zhan <xxxxx.xxxx@xxxxxxxxxxx.xxx>
Sent: Monday, 2 August 2021 11:09 AM
To: Iman Soltanzadeh <xxx.xxxxxxxxxxxx@xxxxxxxxxxx.xxx>
Subject: Fwd: Deep South contracting

FYI.

Do we have any concerns with it?

Thanks,
Yizhe

Begin forwarded message:

From: **s9(2)(a)**
Subject: RE: Deep South contracting
Date: August 2, 2021 at 11:05:52 AM GMT+12
To: **s9(2)(a)**
[xxx](mailto:Yizhe Zhan <, s9(2)(a)

Adrian thanks, not an issue from my side as a subcontractor. A thought is that It might be helpful to circulate the Challenge IP management plan for a bit more detail to partners in that there are stated specifics for both background (existing) IP and developed (Challenge) IP,

Regards, **s9(2)(a)**

From: **s9(2)(a)**

Sent: Monday, 2 August 2021 10:58 AM

To: s9(2)(a); Yizhe Zhan <xxxx.xxxx@xxxxxxxxxxx>; s9(2)(a)

Subject: RE: Deep South contracting

Hi Adrian,

I don't see any issues from my side.

Cheers,

s9(2)(a)

s9(2)(a)

From: s9(2)(a)

Sent: Monday, 2 August 2021 10:53 am

To: s9(2)(a); Yizhe Zhan <xxxx.xxxx@xxxxxxxxxxx>; s9(2)(a)

Subject: Deep South contracting

Kia ora koutou,

So UC is still working slowly towards contracting with the Deep South. One point that my Research office have asked me to ask subcontractors about is the below:

The contract requires participants to make their IP available to other researchers for the purpose of the challenge. If any subcontractors have any commercial or strategic IP that they are not willing to licence, or if they have concerns around improvements, they need to let us know – as we will need to make contract provision for this in the head agreement.

I think this is likely not to be a big issue for anyone. As obviously any IP used, would only be used as part of work within the challenge project. Anyway, if you have any concerns around this, if you can please provide them asap and then I can get my research office to move forward.

s9(2)(a)

s9(2)(a)



s9(2)(a)

National Institute of Water & Atmospheric Research Ltd (NIWA)
301 Evans Bay Parade Hataitai Wellington New Zealand
Connect with NIWA: niwa.co.nz [Facebook](#) [LinkedIn](#) [Twitter](#) [Instagram](#)

To ensure compliance with legal requirements and to maintain cyber security standards, NIWA's IT systems are subject to ongoing monitoring, activity logging and auditing. This monitoring and auditing service may be provided by third parties. Such third parties can access information transmitted to, processed by and stored on NIWA's IT systems

From: [Yizhe Zhan](#)
To: [Iman Soltanzadeh](#)
Subject: Fw: Deep South proposal submitted.
Date: Thursday, 18 November 2021 3:00:27 pm
Attachments: Clouds&AerosolsMeasurement_Proposal.pdf
Adrian McDonald Round 2 Obs outcome letter.pdf
Outlook-q4mne1iz.png
Outlook-mbgb04t1.png

FYI.

It is the Section 4 you are looking for. Note that the project does not include the extend budget.

Thanks,
Yizhe



Yizhe Zhan
Research Scientist – FR&D
MetService – Te Ratonga Tiorangi

d +64 4 4700 744
30 Salamanca Road, Kelburn, Wellington 6012
PO Box 722, Wellington 6140, New Zealand



metSERVICE.com . metraWeather.com . metocean.co.nz

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From: s9(2)(a)
Sent: Tuesday, 25 May 2021 5:26 pm
To: s9(2)(a); Yizhe Zhan
<xxxxx.xxxx@xxxxxxxxxxx.xxx>; s9(2)(a)
Cc: s9(2)(a)
Iman Soltanzadeh
<xxxx.xxxxxxxxxxxx@xxxxxxxxxxx.xxx>; s9(2)(a)

Subject: RE: Deep South proposal submitted.

Kia ora koutou,

Great news everyone, the Deep South proposal that you are either a researcher on or that you have agreed to support via your involvement in the modelling advisory group (see proposal) has been awarded funds by the Deep South National Science Challenge in New Zealand. We were successful in obtaining s9(2)(b)(ii): Commercially sensitive over the next 3 years, so the Extended Research funding section didn't quite come-off. But, this will hopefully allow us to maintain our momentum and build on this for future efforts. For those of you in New Zealand I will be in touch about subcontracting as in the proposal. Once I have got some of that out of the way, we will line up a spin up ZOOM meeting for some time in June. We have a relatively small amount of time to spin up observational efforts – so there will be plenty of work to do

soon.

I'd like to thank you ALL for your willingness to be involved which is a major reason for this success, and I look forward to working on this effort with you.

s9(2)(a)

From: s9(2)(a)
Sent: Thursday, 4 February 2021 9:50 AM
To: s9(2)(a); Yizhe Zhan
<xxxxx.xxxx@xxxxxxxxxxx.xxx>; s9(2)(a)
; 'Iman Soltanzadeh' <xxxx.xxxxxxxxxxxx@xxxxxxxxxxx.xxx>; s9(2)(a)

Subject: Deep South proposal submitted.

Kia ora koutou,

I successfully submitted the Deep South Proposal yesterday and attach a copy for your records. I'd like to thank all of you for your contributions and your willingness to be involved in some way in supporting this effort. The Deep South review and approval process will take until early May now. So it is time to hope for the best, but I really think this is a very strong proposal. Thanks for all of your help.

I look forward to working with you all in the future and please keep in touch.

Mā te wā,

s9(2)(a)

s9(2)(a)

Recent papers:

s9(2)(a)

[REDACTED]

[REDACTED]

[REDACTED]

From: [Linda Stopforth](#)
To: s9(2)(a)
Date: Fw: library panui Thursday 7 May
Thursday, 7 May 2020 10:35:44 am

Bounced back from CAA again

From: Linda Stopforth <x@x>
Sent: 06 May 2020 10:32
To: EveryoneAtChristchurch <x@x>; EveryoneAtMetOcean <x@x>; EveryoneAtParaparaumu <x@x>; EveryoneAtKelburn <x@x>; EveryoneAtAuckland <x@x>; Greg Reeve <Greg.Reeve@metservice.com>; Sales AU <x@x>
Cc: s9(2)(a) <s9(2)(a)@caa.govt.nz>
Subject: library panui Thursday 7 May

New Zealand weather and climate news (MetService focus)

[After stormy spell, sun out across much of the country and expected to hang around](#)

After several days of cold, windy, wet weather across much of the country, the sun was shining for many on Wednesday with the promise of a lengthy settled spell.

[Weather: Close to freezing temperatures in North Island](#)

New Zealand Herald

Parts of the North Island dropped to the low single digits overnight thanks to a dying southwesterly, **MetService** said. Taupo is shivering at 1C at 6am ...

[Trees fall on to cars as wild weather lashes Bay of Plenty](#)

New Zealand Herald

MetService meteorologist Tui McInnes said wind gusts of just under 60km/h were recorded in Tauranga Airport about midnight. At Rotorua Airport ...

[140 lightning strikes in two hours and more coming](#)

Winter is coming with lightning, hail, snow, and heavy rain lashing parts of New Zealand.

At 11am on Tuesday the lightning was centred off the coast near Taranaki and the South Island West Coast, MetService meteorologist Andy Best said.

[Post-war ketch survives fire and hurricane; sinks in Wellington harbour](#)

A much-loved postwar ketch that was restored and brought to New Zealand has sunk to the bottom of Wellington's Clyde Quay marina.

[Thunderstorms and rain hit Whanganui, but more rain needed](#)

Whanganui's skies were hit with thunder on Sunday night, along with some much-needed rain for the district.

MetService's Tui McInnes said rainfall in the Whanganui area "probably wasn't as

big as some people would have thought".

[Weather: Scattered showers across the north this afternoon while the south braces for cold snap](#)

The tail end of a wet and windy storm continues to lash the top of the North Island this afternoon while the south braces for a chilly snap.

[Weather: Snow, hail, thunder, lightning as cold front batters New Zealand](#)

New Zealand Herald

MetService has warned of snow flurries on the summit of Lewis Pass in Canterbury until 7pm, and brief flurries on the Desert Road in the North Island ...

[Weather: Blustery front expected to deliver much-needed rain to drought-hit Northland](#)

A blustery front whipping across New Zealand should bring much-needed rain and welcome relief to the drought-stricken north today.

[Weather: Wild weather on way to New Zealand from Australia](#)

Now it's expected to bring rain, wind and thunderstorms to New Zealand.

The system was being generated by a broad, complex trough, with an active front ahead of it, MetService meteorologist Andy Best said.

[More wet weather on the way for North Island](#)

RNZ

Parts of the North Island are in for rain and thunderstorms today, with the centre of the island bearing the brunt. Wet weather in Wellington. Photo: RNZ .

[Auckland drought: Water levels hit lowest in 25 years](#)

Auckland continues to struggle with drought despite being drenched with rain at the weekend.

[Auckland drought: Council likely to impose water restrictions from next week](#)

Auckland councillors will decide today whether to [enforce water restrictions](#) for the first time in 26 years as drought depletes the supply to almost-unprecedented lows.

[Auckland drought: 'Huge rainfall' in Hunua Ranges but more needed](#)

Heavy [downpours](#) saw "huge rainfall" in [Auckland's Hunua Ranges](#) on Sunday, contributing to an increase in the city's water stocks.

[Drought: Rainfall 'lowest ever' in much of North Island](#)

The [North Island drought](#) — the worst in 50 years in some [parts of Northland](#) — has prompted thousands to seek financial help.

[Weather: Auckland rain makes little difference to water supply levels](#)

New Zealand Herald

MetService meteorologist Rob Kerr said between 10pm yesterday and 1am today a band of heavy rain brought downpours of 15-25mm in just one .

[Dry autumn puts pressure on North Canterbury farmers](#)

Stuff.co.nz

MetService figures show Culverden recorded 6.4 millimetres of rain in April, compared to 95.2mm during the same month last year. March was 91mm ...

[Snow on hills and frost forecast in Hawke's Bay](#)

New Zealand Herald

But **MetService** meteorologist Andy Best said despite the cold, which saw snow fall to 1000 metre overnight, it'll be a while before it appears again.

[Snowfall warning for Desert Road](#)

SunLive

The MetService says this should clear in the evening, with westerly winds hanging around. "Brief snow flurries are likely about the top of the Desert ...

[Snow on Nelson hills sign of winter's approach](#)

Snow on the hills behind Nelson city and single-digit temperatures have provided a chilly reminder that the cooler months are just around the corner.

[Snow-capped Alps overlook Tekapo on Tuesday](#)

Snow-capped mountains overlooked Tekapo on Tuesday but it is hard to say how much fell, or how long the white stuff will last, a MetService meteorologist says.

[Southern skifields get dusting of snow](#)

MetService meteorologist Andy Best said snow was down to 500 metres and could continue to fall into the early afternoon.

[Look up tonight, for the Eta Aquarids meteor shower](#)

Stuff.co.nz

MetService forecaster Sonja Farmer said it will be "pot luck" if skies clear in time for the shower. "It's really not looking too good at all. "The North Island's ...

[Supermoon 2020: Eastern regions have best chance to see 'Flower Moon' on Thursday](#)

Stuff.co.nz

But **MetService** meteorologist Andy Best said some bad weather in western parts of both the North Island and the South Island may hinder some ...

MetOcean (and oceanmet, marine weather etc)

[Wave warning system introduced after huge swell hit Wellington](#)

Residents on Wellington's south coast say the swift introduction of a wave warning system is a victory for people power.

[Wellington's new wave warning system a "sea-level" change in communication](#)

A new wave warning system for Wellington's south coast had its first test just days after it was introduced.

The system, which allows for easy communication between MetService, Wellington Regional Emergency Management Office, and Wellington City Council (WCC), was introduced after residents were not warned about massive waves heading towards the south coast on April 15.

NIWA

[Drought hits hard, far and wide](#)

Analysis of drought conditions across New Zealand this year shows it is one of the most severe on record for some regions.

[Scientists seek smoke sniffers](#)

NIWA scientists are seeking help to sniff out smoke in a bid to help improve air quality in New Zealand.

ECMWF

[Cyclone Amphan will grow to a very severe cyclonic storm: Europe Met Model](#)

Odisha Television Ltd.

As per the **ECMWF** (European Center for Medium Range Weather Forecast), the LOPAR will develop into a very severe cyclonic storm. The system ...

Volcano alert/watch

[Ruapehu volcano \(North Island, New Zealand\): lake temperature is cooling again](#)

VolcanoDiscovery

The volcano is still a very active volcano with the potential of little or no **warning**. Both the Volcanic **Alert** Level (level 1) and Aviation Code (Green) ...

Extreme weather (and other news) – Australia and the Pacific

[Multiple flooding sources threaten Honolulu's infrastructure](#)

Posted: 04 May 2020 01:57 PM PDT

Researchers found in the next few decades, sea level rise will likely cause large and increasing percentages of land area to be impacted simultaneously by the three flood mechanisms. Further, they found direct marine inundation represents the least extensive -- only three percent of the predicted flooding, while groundwater inundation represents the most extensive flood source.

[Australia: Farmers in Victoria celebrate new weather radar](#)

Aljazeera.com

Wimmera, in Victoria, has long been considered a black hole for **weather predictions** as the nearest stations in Mildura and Mount Gambier are too

Extreme weather (and other news) – Americas and Europe

[Drought-hit Argentina faces water worries amid coronavirus pandemic](#)

The worst drought in 50 years in northeast Argentina is hitting hydropower and tourism and threatening drinking water

[UK meteorologists confirm April as sunniest on record](#)

The Guardian

Meteorologists have confirmed a new UK record was set for the sunniest April, with an average 224.5 hours of sunshine, beating the previous record ...

["Spanish Plume" sets stage for severe weather in France and Spain](#)

AccuWeather.com

These ingredients can set the stage **for** severe **weather** as storm systems approach from the Atlantic. Thunderstorms are expected to first develop on ...

International news and research

[Climate change has been influencing where tropical cyclones rage](#)

Posted: 04 May 2020 12:52 PM PDT

While the global average number of tropical cyclones each year has not budged from 86 over the last four decades, climate change has been influencing the locations of where these deadly storms occur, according to new research.

[Decoding the skies: The impact of water vapor on afternoon rainfall](#)

Posted: 05 May 2020 04:05 PM PDT

On days when wind blows in little atmospheric moisture, afternoon rainfall is more likely to occur over wetter soils or higher relative humidity. On days when wind introduces lots of atmospheric moisture, afternoon rainfall is more likely over drier soils or lower relative humidity. The team also found that for both conditions, afternoon rainfall occurrence is more likely with warmer morning soil or air temperature.

[Simulations forecast US nationwide increase in human exposure to extreme climate events](#)

Posted: 05 May 2020 09:26 AM PDT

Using the now-decommissioned Titan supercomputer, a team of researchers estimated the combined consequences of many different extreme climate events at the county level, a unique approach that provided unprecedented regional and national climate projections that identified the areas most likely to face climate-related challenges.

[Bacterial behavior influences cloud formation](#)

Phys.Org

Meteorologists have known for almost 50 years that the proverbial flapping of a butterfly's wings can trigger a hurricane in a completely different ...

[Ask the Weather Guys: When did computer-based weather forecasts begin?](#)

Madison.com

A: Immediately after World War II, it became fashionable to imagine **technologies** that might allow human beings to control the **weather**. In fact, one ...

America's Cup (and sailing)

[Covid-19 sails off with NZ's America's Cup income](#)

New Zealand is expected to miss out on about \$150 million of income because half the superyachts due to follow the America's Cup next year have pulled out.

Aviation

[Civil Aviation Authority chief executive Graeme Harris retires](#)

The chief executive of the Civil Aviation Authority has retired.

Business/Insurance

[Standing on the Shoulders of Giants: The Key to Innovation](#)

Innovation doesn't occur in a vacuum. Doers and thinkers from Shakespeare to Jobs, liberally "stole" inspiration from the doers and thinkers who came before. Here's how to do it right.

Climate change / global warming

[Budget 2020 spending for climate change could lessen coronavirus' blow](#)

Climate change solutions could mitigate future pandemics and public health risks, health professionals say.

[Six New Zealands of climate change: Which one are you?](#)

Baby boomers are six times more likely to dismiss climate change than members of Gen Z, and twice as likely to vote, an in-depth survey has found.

[Extreme heat to affect more than 3 billion by 2070: study](#)

Up to 3.5 billion people could be struggling to survive in conditions of extreme heat in 50 years' time, if the world fails to curb greenhouse gas emissions, a major new Dutch study has found.

Covid-19 / Business

[Business-led group will investigate how to safely reopen NZ-Australian border](#)

A new business-led group will investigate and recommend how to safely reopen the borders between Australia and New Zealand after [both countries committed to introduce a "Covid-safe" travel zone](#) as soon as it is safe.

[After COVID-19: Australia and the world rebuild \(Volume 1\)](#)

Australian Strategic Policy Institute

2 May 2020 | Book | Economics, Health, Natural environment

This publication offers a policy-focused analysis of the world Australia will face once the pandemic has passed. It analyses 26 key topics, countries and themes, ranging from Australia's domestic situation through to the global balance of power, climate and technology issues.

[Pandemic disruption creates economic opportunity, KPMG leader says](#)

A report from the business advisory firm KPMG says New Zealand is well-placed to develop greater domestic food production, for its own resilience, and also as a way to market itself as a trusted and reliable exporter.

Cloud seeding / Geoengineering

[PH Air Force bares cloud-seeding operations in parts of Luzon](#)

INQUIRER.net

MANILA, Philippines—Some parts of Luzon have experienced rainfall in recent days, partly because of the **cloud seeding** operations conducted by the ...

Energy and Mining

[Solar and wind energy sites mapped globally for the first time](#)

Researchers have mapped the global locations of major renewable energy sites, providing a valuable resource to help assess their potential environmental impact.

[AEMO updates COVID19 demand impact summary](#)

Energy Magazine

All regions except Queensland are expected to see a lift in maximum and minimum demands during the cold weather. AEMO said it will continue to ...

Government (regional and national)

[Coronavirus: Prime Minister downplays Budget spending, says Government will still be 'careful and balanced'](#)

Prime Minister Jacinda Ardern has downplayed the level of spending likely to be unveiled in her Government's Budget next week.

History

[How a brutal cold stretch led to Frankenstein, a new religion and the invention of bikes](#)

AccuWeather.com

“What's so unusual is to get that large of an area of possible snow this late in the year,” said **AccuWeather** senior meteorologist Alex Sosnowski.

[Why weather forecasts stopped: The 75th anniversary of VE Day](#)

AccuWeather.com

... Allies knew the weather upstream over the Atlantic Ocean and across the United Kingdom,” said **AccuWeather** Founder and CEO Dr. Joel N. Myers

Hydrology / Flooding

[Nearly \\$20m paid out after Southland flooding](#)

Insurers have paid out almost \$20 million as a result of February's flooding in Southland.

Infrastructure

[Mayors with long wishlists chase 'shovel-ready' project funding](#)

Mayors around the country have filed shopping lists of 'shovel-ready' projects they hope will get a share of government cash aimed at boosting the post-Covid economy.

[Projects of \\$100m-plus approved by council](#)

Invercargill city councillors have given the nod to five “shovel-ready” projects totalling more than \$100million to stimulate the economy.

[\\$8m project at Timaru's port to start next month](#)

A multi-million dollar upgrade to the log yard at Timaru's port will go ahead in June.

PrimePort chief executive Phil Melhopt told Stuff the project, which would cost in the region of \$8 million, would involve the sealing off of four hectares of the log yard, plus the haul and access roads in and around it.

['We are starting to see some hope': Forestry back up and running in Gisborne area](#)

The heart of the Gisborne economy is beating again as the forestry industry is back in full swing under alert level 3.

Lightning

[Lightning strike causes power cut in Hāwera](#)

Power has been restored to about 420 Hāwera customers after a lightning strike took out the electricity supply earlier today.

Outdoor recreation

[Mt Taranaki snowfall could see early start to ski season](#)

A timely dumping of snow on Mt Taranaki has local skifield operators rubbing their hands for an early start to the ski season.

Transport/roading/shipping/freight

[Seven-month delay to Christchurch Southern Motorway](#)

Another major roading project has been delayed for at least seven months due to the Covid-19 shutdown.

[Transmission Gully project a 'circus', sections to be re-laid](#)

The Transport Agency has admitted that sections of Wellington's billion-dollar project, Transmission Gully, need to be re-laid after an error.

Innovation and technologies and AI

[Coronavirus crisis spurs IT innovation](#)

The coronavirus crisis sees CIOs accelerating their adoption of automation, analytics and new processes to cope with the pandemic's disruptions and steer the enterprise forward in uncertain times.

Safety/ wellbeing

[Open Polytechnic of NZ launches free course on infection prevention](#)

The Open Polytechnic of New Zealand Ltd, the country's largest specialist provider of vocational distance learning, has launched a free self-directed course on infection prevention in response to the COVID-19 pandemic.

Things to entertain

If you love books, buy local

New Zealand book publishers are facing a very difficult time with an unprecedented fall in income over the past six weeks

Blatant plug : One of my neighbours runs [Schrodingers books](#) in Petone. She and her team will deliver around Wellington – Mother’s Day on Sunday ...
#shop local #supportlocal

Journal and articles online

Quarterly Journal of the Royal Meteorological Society, Vol. 146, No. 728, April 2020 Part A

[Hourly 4D-Var in the Met Office UKV operational forecast model](#)

Marco Milan, Bruce Macpherson, Robert Tubbs, Gareth Dow, Gordon Inverarity, Marion Mittermaier, Gemma Halloran, Graeme Kelly, Dingmin Li, Adam Maycock, Tim Payne, Chiara Piccolo, Laura Stewart, Marek Wlasak
Pages: 1281-1301 | First Published: 26 December 2019

In this paper we describe the hourly cycling four-dimensional variational data assimilation (4D-Var) implemented operationally in the Met Office's convective-scale UKV forecast model. The new operational system extends this capability to the full UK and surrounding area (shown in the figure), delivering outputs suitable for blending into nowcasting products and for general forecasting of a full range of meteorological variables.

From: [Brett Beamsley](#)
To: [Annick Terpstra](#)
Subject: FW: MBIE proposal
Date: Friday, 16 February 2024 3:04:00 pm
Attachments: image001.png
image002.png
image006.png
image007.png
image008.png
PROP-89536-ENDRP-UOC_Full_080323_0946.pdf

For contest this is the proposal as submitted last year

From: s9(2)(a)
Sent: Friday, October 6, 2023 11:32 AM
To: Brett Beamsley <x@xx>
Subject: RE: MBIE proposal


Here you go.

From: Brett Beamsley <x@xx>
Sent: Friday, 6 October 2023 11:30 am
To: s9(2)(a)
Subject: MBIE proposal

Hi s9(2)(a)

Are you able to share with me the proposal as submitted this year? I've asked Chris Nobel for a copy, but it might be quicker to go straight to you.

Ngā mihi

 **Dr. Brett Beamsley (he/him)**
General Manager – Research and Innovation Hub (RIH)
MetService
t +64 7 8250540 ext. 101 m [REDACTED]
Upper Level, 5 Wainui Road, 3225 Raglan, New Zealand
PO Box 235, Raglan 3225, New Zealand



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From: [Brett Beamsley](#)
To: s9(2)(a)
Subject: FW: MBIE proposal
Date: Friday, 16 February 2024 3:05:14 pm
Attachments: image001.png
image002.png
image006.png
image007.png
image008.png
PROP-89536-ENDRP-UOC_Full_080323_0946.pdf

For contest this is the proposal as submitted last year

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Sent: Friday, October 6, 2023 11:32 AM
To: Brett Beamsley <x@xx>
Subject: RE: MBIE proposal


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To: s9(2)(a)
Subject: MBIE proposal

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Ngā mihi

 **Dr. Brett Beamsley (he/him)**
General Manager – Research and Innovation Hub (RIH)
MetService
t +64 7 8250540 ext. 101 m s9(2)(a)
Upper Level, 5 Wainui Road, 3225 Raglan, New Zealand
PO Box 235, Raglan 3225, New Zealand



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From: [Peter Fisher](#)
To: [Tui McInnes](#)
Subject: FW: Mike Scarsbrook and reports
Date: Thursday, 17 November 2022 12:17:54 pm
Attachments: image.png
image.png
image.png
image.png
image.png
Waikato Region_report_v3_high_res_update.pdf
CLIMsystems Project_Training_Experience_11_November_2022.pdf
image001.png
image002.png



Peter Fisher
Business Development Manager – Key Accounts
MetService – Te Ratonga Tirorangi

m **s9(2)(a)**

New address: Seabridge House, L2 / 110 Featherston Street, Wellington 6011
PO Box 722, Wellington 6140, New Zealand



metservice.com . metraweather.com . metocean.co.nz

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From: **s9(2)(a)**
Sent: Friday, 11 November 2022 11:36 am
To: Peter Fisher <Peter.Fisher@metservice.com>
Subject: **s9(2)(a)** and reports

Hi Peter

Here are **s9(2)(a)** details.

s9(2)(a)

F: [facebook.com/waikatoregion](https://www.facebook.com/waikatoregion)





Private Bag 3038, Waikato Mail Centre, Hamilton, 3240

And I have attached the larger Regional Report that was part of the series we did from Regional, District to Watershed/Basin level. We even did the Tongariro Scheme (first time that has been modeled for the future (with the agreement and help of **s9(2)(b)(i) Commercially sensitive**)). See the lists below.





I have also attached an overview document of **s9(2)(b)(i) Commercially sensitive** that includes some brief descriptions of our project experience etc. Just in case some out there are unsure of our chops!

Cheers























Peter

 Tongariro Scheme Report	03/17/2022 4:03 PM	File folder
 Waikato Regional Report	11/11/2022 10:25 AM	File folder
 Waikato_district_updated format	03/16/2022 4:00 PM	File folder
 Waikato_water_management_area	11/08/2022 11:33 AM	File folder

Regional Report (attached)

Name	Date modified	Type	Size
 Waikato Region_report_v3 high res_update	03/31/2022 3:20 PM	Microsoft Word Docum...	27,393 KB
 Waikato Region_report_v3 high res_update	11/11/2022 10:25 AM	Foxit PhantomPDF PDF ...	15,198 KB
 Waikato Region_report_v3 low res_update	03/31/2022 3:25 PM	Microsoft Word Docum...	15,917 KB
 Waikato Region_report_v3 low res_update	03/31/2022 3:22 PM	Foxit PhantomPDF PDF ...	10,044 KB

District Reports (if you want any more of these let us know)

Name	Date modified	Type	Size
 Hamilton City_report	03/16/2022 3:50 PM	Microsoft Word D...	11,755 KB
 Hamilton City_report	03/16/2022 4:00 PM	Foxit PhantomPD...	7,517 KB
 Hauraki District_report	03/16/2022 3:50 PM	Microsoft Word D...	11,936 KB
 Hauraki District_report	03/16/2022 4:00 PM	Foxit PhantomPD...	6,819 KB
 Matamata-Piako District_report	03/16/2022 3:50 PM	Microsoft Word D...	12,360 KB
 Matamata-Piako District_report	03/16/2022 4:00 PM	Foxit PhantomPD...	7,853 KB
 Otorohanga District_report	03/16/2022 3:49 PM	Microsoft Word D...	11,877 KB
 Otorohanga District_report	03/16/2022 4:00 PM	Foxit PhantomPD...	6,679 KB
 Rotorua District_report	03/16/2022 3:50 PM	Microsoft Word D...	13,429 KB
 Rotorua District_report	03/16/2022 4:00 PM	Foxit PhantomPD...	9,534 KB
 South Waikato District_report	03/16/2022 3:50 PM	Microsoft Word D...	11,714 KB
 South Waikato District_report	03/16/2022 4:00 PM	Foxit PhantomPD...	5,990 KB
 Taupo District_report	03/16/2022 3:50 PM	Microsoft Word D...	13,123 KB
 Taupo District_report	03/16/2022 4:00 PM	Foxit PhantomPD...	8,490 KB
 Thames-Coromandel District_report	03/16/2022 3:50 PM	Microsoft Word D...	10,758 KB
 Thames-Coromandel District_report	03/16/2022 4:00 PM	Foxit PhantomPD...	7,946 KB
 Waikato District_report	03/16/2022 3:50 PM	Microsoft Word D...	12,576 KB
 Waikato District_report	03/16/2022 4:00 PM	Foxit PhantomPD...	8,257 KB
 Waipa District_report	03/16/2022 3:50 PM	Microsoft Word D...	12,513 KB
 Waipa District_report	03/16/2022 4:00 PM	Foxit PhantomPD...	7,684 KB
 Waitomo District_report	03/16/2022 3:50 PM	Microsoft Word D...	13,161 KB
 Waitomo District_report	03/16/2022 4:00 PM	Foxit PhantomPD...	8,055 KB

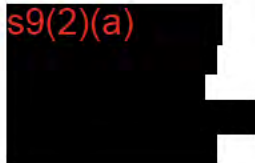
Water Management Areas (if you want any more of these let us know)

Name	Date modified	Type	Size
Central Waikato_report	03/16/2022 5:03 PM	Microsoft Word D...	14,360 KB
Central Waikato_report	03/16/2022 5:02 PM	Foxit PhantomPD...	7,260 KB
Coromandel_report	03/16/2022 5:02 PM	Microsoft Word D...	14,465 KB
Coromandel_report	03/16/2022 5:01 PM	Foxit PhantomPD...	8,279 KB
Lake Taupo_report	03/16/2022 5:01 PM	Microsoft Word D...	18,089 KB
Lake Taupo_report	03/16/2022 5:03 PM	Foxit PhantomPD...	9,146 KB
Lower Waikato_report	03/16/2022 5:02 PM	Microsoft Word D...	14,096 KB
Lower Waikato_report	03/16/2022 5:02 PM	Foxit PhantomPD...	7,743 KB
Upper Waikato_report	03/16/2022 5:02 PM	Microsoft Word D...	17,098 KB
Upper Waikato_report	03/16/2022 5:02 PM	Foxit PhantomPD...	9,614 KB
Waihou Piako_report	03/16/2022 5:02 PM	Microsoft Word D...	17,579 KB
Waihou Piako_report	03/16/2022 5:01 PM	Foxit PhantomPD...	8,970 KB
Waipa_report	03/16/2022 5:02 PM	Microsoft Word D...	13,585 KB
Waipa_report	03/16/2022 5:02 PM	Foxit PhantomPD...	6,896 KB
West Coast_report	03/16/2022 5:02 PM	Microsoft Word D...	14,850 KB
West Coast_report	03/16/2022 5:02 PM	Foxit PhantomPD...	7,454 KB

Tongariro Scheme (Mercury wants this one kept embargoed)

Name	Date modified	Type	Size
Tongariro_Power_Scheme_Report	03/17/2022 4:03 PM	Microsoft Word D...	20,730 KB
Tongariro_Power_Scheme_Report	03/16/2022 3:53 PM	Foxit PhantomPD...	12,870 KB

s9(2)(a)



From: [Zoe Crook](#)
To: [Dan Cox](#)
Subject: FW: News headlines / Panui from the Library - Thursday 12 September 2019
Date: Thursday, 12 September 2019 1:30:00 pm
Attachments: image006.png
image014.png
image015.png

Top headline oh no



Zoe Crook
Financial Accountant – Finance
MetService – Te Ratonga Tirorangi



From: Linda Stopforth <xxxxx.xxxxxxxx@xxxxxxx.xxx>
Sent: Thursday, 12 September 2019 1:29 PM
To: EveryoneAtKelburn <xxxxxxxxxxxxxxxx@xxxxxxx.xxx>; EveryoneAtAuckland <xxxxxxxxxxxxxxxx@xxxxxxx.xxx>; EveryoneAtChristchurch <xxxxxxxxxxxxxxxx@xxxxxxx.xxx>; EveryoneAtParaparaumu <xxxxxxxxxxxxxxxx@xxxxxxx.xxx>; EveryoneAtMetOcean <xxxxxxxxxxxxxxxx@xxxxxxx.xxx>
Cc: [REDACTED]
Subject: News headlines / Panui from the Library - Thursday 12 September 2019

New Zealand weather and climate news (MetService focus)

[Coromandel Peninsula flooding: Highways remain closed after downpours](#)

Stuff.co.nz

... **business** as usual by daylight tomorrow." People are asked to check-in on their neighbours once the **weather** has eased and make sure they are ok.

[Coromandel flooding: properties damaged, cows swept to sea, sheep drowned](#)

As floodwater recedes, Garrick Simpson plans to scour the coastline for his missing cows and bury a friend's flock of drowned sheep.

[Spring welcomes thunderstorms, snow and 'chunky cloud' to New Zealand](#)

Stuff.co.nz

MetService meteorologist Tuporo Marsters said an active front was crossing the top of the country, bringing rain to much of the North Island, including ...

[Weird weather: Sprin-ter: Why NZ's in for a miserable few months](#)

New Zealand Herald

On top of that, **MetService** said the weather system sweeping in from the Tasman this weekend had also collected smoke and dust from bushfires in ...

[Whanganui one of six unusually warm places during August](#)

New Zealand Herald

Whanganui's daytime temperatures never dropped below 11C in August, **MetService** meteorologist Rob Kerr said. The lowest daytime temperature ...

[Snow risk to North Island high routes; temperatures plummet in south](#)

"We have quite a cold flow of air from the deep south at the moment, it's come up over New Zealand," MetService meteorologist Matthew Ford said.

[Little Shoal Bay: Rising sea levels and storm surges cause flooding on Auckland's North Shore](#)

It's not just pūkeko and kingfisher that flock to Little Shoal Bay when it floods - protective locals and campaigning politicians also come to observe the rising sea level on Auckland's North Shore.

[Storm takes a grim toll](#)

New Zealand Herald

According to the **MetService**, Saturday night's storm sparked 13,000 lightning strikes in the 12 hours to 8am on Sunday, with 841 of those on land.

[Sunny, warm and wet - it's spring](#)

Otago Daily Times

Following snow in some places around Otago and Southland last Sunday, much of Otago may get its first taste of summer tomorrow. **MetService** has ...

[Riding the storm of inaccurate weather forecasting](#)

Stuff.co.nz

In other words, a speedy return to winter after a tantalising taste of spring. This got me wondering how the **MetService** could have got the forecast so ...

[Meteorologist Chester Lampkin leaving KSDK, heading to DC](#)

STLtoday.com

KSDK (Channel 5) **meteorologist** and St. Louis native Chester Lampkin will ankle the station later this year to take a job in Washington, sources said.

MetOcean (and oceanmet, marine weather etc)

[Navimeteo opens an office in Falmouth, Cornwall](#)

Seatrade Cruise News

Chiavari, Italy-based Navimeteo, experts in marine **weather** data and ... the official **weather** and marine operations provider for more than 50 **ports** and ...

[Reliable technique to estimate near-bed kinematics for optimal design of coastal and shallow water structures](#)

A paper detailing a new method developed by MetOcean Solutions' Senior Physical Oceanographer, Dr Séverin Thiébaud, is being presented at the [Australasian Coasts & Ports 2019](#) Conference, held this week in Hobart, Australia.

WMO

[New international coalition to combat sand and dust storms](#)

A new international coalition has been launched to strengthen coordinated action on sand and dust storms, which have damaging impacts on human health, the environment and key economic sectors in many...

[Invest in early warning to deliver climate adaptation](#)

Investing in early warning services is critical if countries and communities are to meet the challenge of climate change, the World Meteorological Organization's Secretary-General Petteri Taalas said...

ECMWF

[Europe is battling with the US in a race to predict the weather](#)

Wired.co.uk

The European Centre for Medium-Range Weather Forecasts (**ECMWF**), currently based in Reading, divides the globe into nine kilometre boxes, with ...

Volcano alert

New volcanic eruption forecasting technique

Volcanic eruptions and their ash clouds pose a significant hazard to population centers and air travel, especially those that show few to no signs of unrest beforehand. Geologists are now using a technique traditionally used in weather and climate forecasting to develop new eruption forecasting models. By testing if the models are able to capture the likelihood of past eruptions, the researchers are making strides in the science of volcanic forecasting.

Extreme weather (and other news) – Antarctica and offshore September - October, Various locations (NZ)

Choosing the Future of Antarctica

In this national lecture series, Professor Tim Naish FRSNZ will present two narratives on the future of Antarctica, looking forward 50 and 300 years: the first in which greenhouse gas emissions remain unchecked; the other involving ambitious action to limit greenhouse gas emissions.

Extreme weather (and other news) – Australia and Pacific **Bushfires out of control in NSW and Queensland, expected to increase**

Authorities are labelling Queensland's bushfire emergency as historic, as crews continue to battle dozens of blazes.

More than climate change driving Queensland fires, explain climatologists

The record drought has combined with a record warm winter to fuel this year's grim fire outlook, according to climatologists and bushfire experts.

Climate change is bringing a new world of bushfires

Spring has barely arrived, and bushfires are burning [across Australia's eastern seaboard](#). More than 50 fires are currently burning in New South Wales, and some 15,000 hectares have burned in Queensland since late last week.

The danger of heat and cold across Australia

Cold temperatures are not nearly as deadly as heat, with around 2% of all deaths in Australia related to heat, according to new research.

Extreme weather (and other news) – Asia and the Middle East, Africa

Malaysia looking into cloud seeding as haze worsens

The Straits Times

Deputy Prime Minister Wan Azizah Wan Ismail said yesterday that the **meteorology** department, MetMalaysia, ... THE STAR/ASIA NEWS NETWORK.

Stay or go? Asian nations mull options as seas rise, cities sink

Hellenic Shipping News Worldwide

"But more places are becoming uninhabitable because of land degradation, rising **sea** levels or other **weather** impacts, and there is no choice but to ...

Floods Cause 16 Deaths, Affect 102074 Households in Thailand

Chiang Rai Times

Department officials will closely monitor the situation and prepare to provide timely aid to affected residents. He urged people to follow **weather** reports ...

Rugby World Cup: The ugly weather scenario that could impact the All Blacks

It's Steve Hansen's worst nightmare – a gimme Rugby World Cup pool game against Namibia, Canada or Italy is cancelled because of bad weather and declared a draw.

[Expert reaction: Climate change in Asia](#)

Asia is home to more than half of the world's population, and the billions of people there are deeply vulnerable to the effects of climate change. By the end of the century, India is expected to be the world's most populous country with [nearly 1.5 billion people](#). By that point, estimates have China's population at just under 1.1 billion and Pakistan with 403 million. Asian countries are also rapidly urbanising and industrialising, with China, India and Japan making up three of the world's top polluters. Adding to the mix, the Asia-Pacific already [experiences more natural disasters](#) than any other region in the world. These factors mean that climate change is already having a huge impact on the region.

[Haze Threat Looms Over Singapore as Indonesia Forest Fires Rage](#)

Bloomberg

Indonesia's **weather** agency said the hotspots were also detected in ... the Philippines, Papua New Guinea, Vietnam, Timor Leste and **Thailand**.

Extreme weather (and other news) – Americas and Europe

[European summer heatwave killed 1,500 in France, Minister says](#)

The European summer heatwaves caused close to 1,500 deaths in France, according to the country's Health Minister.

[Met Office teams up with Dutch weather officials to name next batch of storms](#)

Herald Publicist

Are you braced for Storm Girda or Atiyah? Met Workplace groups up with Dutch climate officers to present subsequent batch of gales numerous names.

[Dublin weather: Respected forecasters MetAlert Ireland predict heatwave for Ireland by end of next ...](#)

Dublin Live

Met Alerts Ireland posted weather model image from the European Centre for Medium Range Weather Forecasts (**ECMWF**), adding the headline ...

International news and research

[Here's Why US Law Prohibits Claiming That a 'Counterfeit Weather Forecast' Is Official](#)
TIME

Nowadays, the commercial opportunities in **weather forecasting** seem limitless as **technology** improves and climate change makes for more extreme ...

['Sharpiegate': meteorologists upset as weather agency defends Trump's Alabama claim](#)

The Guardian

'Sharpiegate': **meteorologists** upset as weather agency defends Trump's ... potentially hitting Alabama, upsetting **meteorologists** around the country.

[Anger Among Public and Meteorologists after False Unsigned NOAA Statement](#)

AGU Blogosphere

Broadcast **meteorologists** wear two hats. Scientist and science journalist. If I had ignored this, I would have been guilty of not covering a story because ...

[NOAA orders Gulfstream G550 to support weather forecasting/research](#)

FinancialNews.co.uk (blog)

Gulfstream **Aerospace** Corp., a General Dynamics company, has announced it has established a contract with the National Oceanic and Atmospheric ...

[The Bigger Reason Trump's Fight with a Weather Forecast Worries Meteorologists](#)

Livescience.com

Meteorologists found themselves at the center of a political storm this month, and some are worried that it could have long-term consequences for their ...

[Then Trump Came For The Scientists](#) - WBUR

[White House Pressed Agency to Repudiate Weather Forecasters Who Contradicted Trump](#)

The New York Times

The House Committee on Science, Space and **Technology**, which is ... administration is committed to the important mission of **weather forecasting**," Dr.

[Storm names don't begin with Q, U, X, Y or Z and there's a good reason why](#)

Bristol Live

The reasoning was explained in a name chart released by the **Met Office**, Irish forecaster Met Éireann and Dutch national weather forecasting service ...

[From Atiyah to Willow: how UK storms get their names](#) - Moose Gazette

[Machine learning and its radical application to severe **weather** prediction](#)

University of Wisconsin-Madison

Now, the rapidly developing technology is making its mark in **weather** prediction. The fields of atmospheric science and **satellite** meteorology are ...

[Hurricane Dorian: scientists explain the causes of the disaster](#)

[www.MICETimes.asia](#) (press release)

According to the forecasts of **meteorologists**, global warming may lead to more frequent hurricanes fourth and fifth category in the Atlantic ocean twice.

[Solutions to urban heat differ between tropical and drier climes](#)

In summer heat, cities may swelter more than nearby suburbs and rural areas. And while the size of this urban heat island effect varies widely among the world's cities, heat island intensity can largely be explained by a city's population and precipitation level, researchers have reported. The analysis suggests that cooling cities by planting more vegetation may be more effective in drier regions than in wetter ones.

5G network

[Hurricane Dorian's Impact Stokes Fears of 5G Network Effect on Future Weather Forecasting](#)

Sputnik International

... signals given off by 5G networks are hindering the ability of **weather satellites** to monitor and track the progression of potentially dangerous storms.

Aviation

[Could There Be Less Turbulence in Our Flying Future?](#)

AFAR Media

For the first time, **airlines** plan to share more accurate turbulence data with the ... **air** around mountains, cold or warm **weather** fronts or thunderstorms.

[Air Chathams starts flights to Norfolk Island](#)

Air links from New Zealand to Norfolk Island have been launched today.

Energy and Mining

[North Sea Power Hub team picks permitting expert](#)

reNEWS

... selection and characterisation, feasibility studies, **metocean** assessments, and risk management for a variety of offshore renewable developments.

Farming/horticulture/Aquaculture

[Warm weather, rain wreaks havoc on vege growers over winter](#)

New Zealand vegetable growers are struggling financially after a disastrous winter.

Health

[Many Older Americans Aren't Equipped to Weather Hurricanes Like Dorian](#)

HealthDay

Many Older Americans Aren't Equipped to **Weather** Hurricanes Like Dorian ... information in a crisis, according to the National Poll on Healthy Aging by the Institute Healthcare Policy and **Innovation** at the University of Michigan.

[Extreme weather events linked to poor mental health](#)

Posted: 05 Sep 2019 05:01 AM PDT

People with homes damaged by extreme weather events are more likely to experience mental health issues such as depression and anxiety even when the damage is relatively minor and does not force them to leave their homes, a new study suggests.

History

[Snowstorm relief sought](#)

yesterday's meeting of the Otago Land Board a petition was received from some 18 runholders in the Lakes district asking for some relief on account of the loss sustained by the snowstorm, experienced in the spring of last year.

[1816: The Year Without Summer](#)

Thanks to a huge volcanic eruption folks in 1816 had a good excuse to complain about the weather. Worldwide famine, floods and disease -all thanks to enough toxic ash in the sky to turn summer into winter.

Lightning

[Lightning 'superbolts' form over oceans from November to February](#)

Lightning superbolts -- which unleash a thousand times more low-frequency energy than regular lightning bolts -- occur in dramatically different patterns than regular lightning, according to a new, nine-year survey of these rare events.

Transport/roading/shipping/freight

[Shipping Companies Have A New Weather Forecast Tool Using Space Tech](#)

Forbes

Spire Global announced a new **weather forecast** tool specialized for **maritime** companies, providing information to help ports, **ships** and **shipping** ...

[What do Increased Weather Risks Combined with New IMO 2020 Sulphur Regulations Mean for ...](#)

Hellenic Shipping News Worldwide

The gradual increase of severe **weather** conditions produces significant ... When combined with **weather** statistics for more than two thousand **ports** ...

Innovation and technologies and AI

[Launch of AccuWeatherIQ™ brings weather targeting to industry leading data platforms, enables ...](#)

PRNewswire (press release)

"AccuWeatherIQ answers a critical need identified by our many **advertising clients**, which is to efficiently and effectively extend **weather-based** ...

[Time for a Better Forecast: ClimaCell Launches its Consumer Weather App](#)

New Kerala

ClimaCell takes a new approach to **weather forecasting** we combine ... **aviation** to construction, drones, transportation, utilities and outdoor events.

Cloud seeding / Geoengineering

[Royal Rainmakers called in to replenish Phuket reservoirs](#)

The Phuket News

Cloud seeding will be conducted by the Southern Royal Rainmaking Operation Center based in Surat Thani. The center will use a CN-235 turboprop ...

[As haze worsens, Malaysia looking into cloud-seeding](#)

The Straits Times

KUALA LUMPUR (THE STAR/ASIA NEWS NETWORK) - Malaysia is ... on Saturday (Sept 7) that the **Meteorology** Department (MetMalaysia) would ...

Te reo

14 September, Wellington

[Whānua Storytelling with Te Reo Wainene o Tua](#)

Celebrate Te Wiki o Te Reo Māori by bringing your whānau to hear captivating bilingual kōrero from Joe Harawira of Te Reo Wainene o Tua, a te reo Māori storytelling collective.

- When | Āhea Sat 14 Sep 2019, 1.00pm–2.00pm
- Where | Ki hea Te Marae, Level 4
- Cost | Te utu Free event

Te reo Māori activity book Te reo Māori pukapuka mahi

A free downloadable activity book for kids.

Celebrate Māori language by learning Māori words and phrases through simple activities that kids love – word searches, colouring pages, crosswords, and stories.

Whakanuia te reo Māori mā te ako i ngā kupu me ngā kīanga Māori mā ngā mahi māmā e arohatia e ngā tamariki – rapunga kupu, kauruku i ngā whārangi, me ngā pūrākau.

<https://www.tepapa.govt.nz/learn/for-educators/teaching-resources/te-reo-maori-language-week-activity-book>

[Too old to learn Māori? It's not your brain that's holding you back](#)

PPTA president Jack Boyle has been learning Māori for three years. He's working hard at it and says becoming fluent is the 30-year plan.

He may be partly joking, but the effort Boyle has to make to learn te reo is in marked contrast to the ease with which young children soak up languages.

[Three-minute power te reo Māori lesson: Five words every Kiwi should know](#)

You don't need to learn how to speak perfect, formal te reo Māori to help normalise the language of Aotearoa - you can do it one word at a time.

Professional interest

[The forecast calls for ...](#)

Your weather report: Clear, sunny skies, mild temperatures and a 100 percent chance of

atmospheric TED Talks.

Library

[International Literacy Day: More than 440,000 Kiwi adults not reading books](#)

The rise of streaming services such as Netflix is contributing to the decrease in Kiwis reading books, a literacy expert says.

Sunday, September 8 is [International Literacy Day](#).

Journal and articles online

[The ECMWF ensemble prediction system: Looking back \(more than\) 25 years and projecting forward 25 years](#)

Tim Palmer

Pages: 12-24 | First Published: 26 August 2018

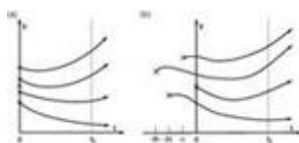


Although Lorenz himself developed his iconic 1963 model to show the impossibility of deterministic long-range forecasting, it can also be used to illustrate the existence of an intermittent butterfly effect within the limit of deterministic predictability. (a) Weak growth of initial uncertainty. (b) Moderate growth of initial uncertainty. (c) Explosive growth of initial uncertainty. For users to have confidence in forecasts within this deterministic limit, it is necessary to flag situations where this intermittent explosive growth is active, and to predict plausible alternative weather scenarios probabilistically – more generally to predict flow-dependent uncertainty. This means abandoning the deterministic paradigm that has guided the development of numerical weather prediction over many years.

[Historical perspective: earlier ensembles and forecasting forecast skill](#)

Eugenia Kalnay

Pages: 25-34 | First Published: 28 June 2019

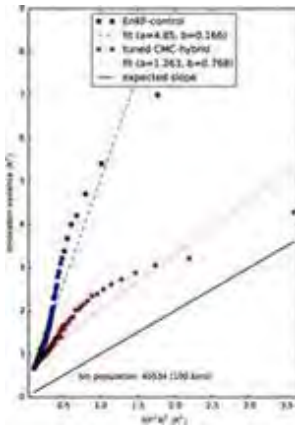


Schematic of the first two practical ensemble-forecasting methods: Monte Carlo (MC, Leith, 1974b) forecasts (left) and Lagged Average Forecasts (LAF, Hoffman and Kalnay, 1983, right). The crosses represent the analyses at the initial time, and the dots are Monte Carlo perturbations. The MC ensemble average with m members reduces the long-term forecast error covariance compared to the error covariance of a climatological forecast from 2 to $(1 + 1/m)$. LAF takes advantage of operational available forecasts, and thus the LAF initial perturbations include “errors of the day”, which improves forecast of the skill compared to MC initial perturbations.

[Using the hybrid gain algorithm to sample data assimilation uncertainty](#)

Pieter Leopold Houtekamer, Mark Buehner, Michèle De La Chevrotière

Pages: 35-56 | First Published: 11 November 2018

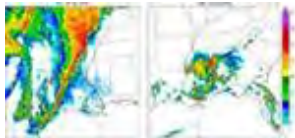


A new configuration of the hybrid gain algorithm combines the Canadian global ensemble Kalman filter and ensemble variational analyses in a single multi-analysis system. The two analysis systems behave most differently in the stratosphere, where the biggest improvements are seen. The substantial improvement in the spread-skill relationship for the highest peaking AMSU-A channel is shown here.

[The scale dependence of initial-condition sensitivities in simulations of convective systems over the southeastern United States](#)

Jonathan A. Weyn, Dale R. Durran

Pages: 57-74 | First Published: 27 June 2018



High-resolution ensemble numerical weather simulations for widely-ranging severe weather events, like the ones shown above, show that convection in weakly-forced events is less predictable and more sensitive to small-scale initial errors than that associated with strong synoptic systems.

[Treatment of model uncertainty from radiation by the Stochastically Perturbed Parametrization Tendencies \(SPPT\) scheme and associated revisions in the ECMWF ensembles](#)

Sarah-Jane Lock, Simon T. K. Lang, Martin Leutbecher, Robin J. Hogan, Frederic Vitart

Pages: 75-89 | First Published: 12 June 2019



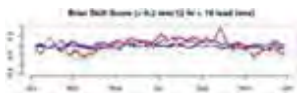
In its current form, the Stochastically Perturbed Parametrization Tendencies (SPPT) scheme generates ensemble spread that implies greater model uncertainty over the night-time globe in clear-sky conditions than over the daytime globe (left-hand figure). There is no physically plausible explanation for such behaviour. In this work, we propose a revised formulation of SPPT that removes this day–night contrast in the description of model uncertainty (right-hand figure).

 [Open Access](#)

[Convection-permitting ensembles: Challenges related to their design and use](#)

Inger-Lise Frogner, Andrew T. Singleton, Morten Ø. Kjøltzow, Ulf Andrae

Pages: 90-106 | First Published: 11 March 2019



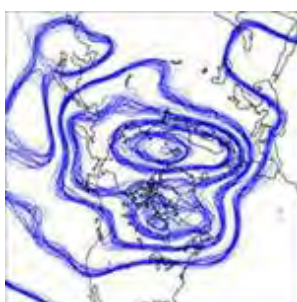
Added value: Brier Skill Score of IFSENS ensemble with IFSENS control as reference forecast (black), MEPS ensemble with MEPS control as reference forecast (blue), MEPS control with IFSENS control as reference (light blue) and MEPS ensemble with IFSENS ensemble as reference forecasts (red).

Challenges related to the design and use of CPEPSs are discussed; the predictability for scales smaller than ~60 km is lost rapidly within the first 6 h with the smallest predictable scale growing more slowly to ~100 km over the following 18–24 h. For precipitation there is added value of CPEPS over deterministic forecasts and coarser resolution EPSs for precipitation events, although the added value is higher in summer compared to winter and for shorter lead times compared to longer lead times.

Ensemble size: How suboptimal is less than infinity?

Martin Leutbecher

Pages: 107-128 | First Published: 25 July 2018

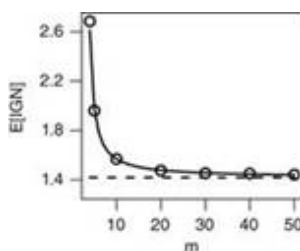


The ensemble mean and other quantities derived from ensemble forecasts can be viewed as random variables. Shown are ensemble mean seven-day forecasts of 500 hPa height obtained from 20 alternative realizations of an eight-member ensemble. The article looks at the impact of finite ensemble size on probabilistic skill and implications for the ensemble configuration used in research and development to test changes affecting ensemble forecasts.

The ensemble-adjusted Ignorance Score for forecasts issued as normal distributions

Stefan Siegert, Christopher A. T. Ferro, David B. Stephenson, Martin Leutbecher

Pages: 129-139 | First Published: 04 December 2018



Ensemble forecasts are routinely used as a basis for probabilistic predictions. The skill of probabilistic predictions derived from ensemble forecasts depends on the number of ensemble members. We derive a new verification score, called the ensemble-adjusted Ignorance Score, which can correct for the effect of limited ensemble size and therefore allows for a more robust comparison of forecasts based on different ensemble sizes.

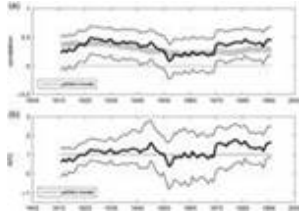
The unadjusted Ignorance Score (solid line) depends on the ensemble size m , assigning higher (worse) scores to smaller ensembles drawn from the same forecast distribution. The ensemble-adjusted Ignorance Score (dashed line) proposed here does not depend on ensemble size and thus allows for a fair comparison of equivalent ensembles of different sizes.

 [Open Access](#)

[How confident are predictability estimates of the winter North Atlantic Oscillation?](#)

Antje Weisheimer, Damien Decremer, David MacLeod, Christopher O'Reilly, Tim N. Stockdale, Stephanie Johnson, Tim N. Palmer

Pages: 140-159 | First Published: 28 November 2018



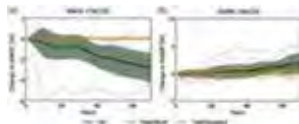
Because of the non-stationary character of the North Atlantic atmospheric flow on time-scales of several decades, short hindcast periods are not sufficiently representative for the longer-term behaviour of the climate system, and small sample sizes can lead to skill estimates, in particular of correlation, that are not robust. Our findings provide a simple but plausible explanation for the apparently conflicting findings of under- and overconfidence over parts of the North Atlantic.

 [Open Access](#)

[Uncertainty and scale interactions in ocean ensembles: From seasonal forecasts to multidecadal climate predictions](#)

L. Zanna, J. M. Brankart, M. Huber, S. Leroux, T. Penduff, P. D. Williams

Pages: 160-175 | First Published: 09 October 2018



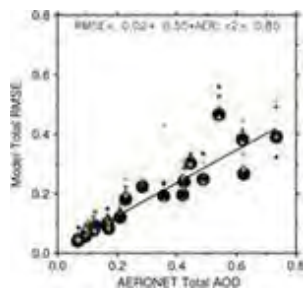
The ocean plays an important role in the climate system on time-scales of weeks to centuries. Despite improvements in ocean models, dynamical processes involving multiscale interactions remain poorly represented, leading to errors in forecasts. We present recent advances in understanding, quantifying, and representing physical and numerical sources of uncertainty in novel regional and global ocean ensembles at different horizontal resolutions.

 [Open Access](#)

[Current state of the global operational aerosol multi-model ensemble: An update from the International Cooperative for Aerosol Prediction \(ICAP\)](#)

Peng Xian, Jeffrey S. Reid, Edward J. Hyer, Charles R. Sampson, Juli I. Rubin, Melanie Ades, Nicole Asencio, Sara Basart, Angela Benedetti, Partha S. Bhattacharjee, Malcolm E. Brooks, Peter R. Colarco, Arlindo M. da Silva, Tom F. Eck, Jonathan Guth, Oriol Jorba, Rostislav Kouznetsov, Zak Kipling, Mikhail Sofiev, Carlos Perez Garcia-Pando, Yaswant Pradhan, Taichu Tanaka, Jun Wang, Douglas L. Westphal, Keiya Yumimoto, Jianglong Zhang

Pages: 176-209 | First Published: 04 February 2019



International Cooperative for Aerosol Predictions (ICAP) model 550 nm total AOD RMSE of the 72 h forecast versus corresponding mean AODs for AERONET sites listed in Table 2. Large black dots are ICAP multi-model ensemble consensus means. Individual models are in small coloured dots. Validation of fine- and coarse-modal AODs and dust AOD is also available in Figure 2.

 **Open Access**

Promoting the use of probabilistic weather forecasts through a dialogue between scientists, developers and end-users

Vanessa J. Fundel, Nadine Fleischhut, Stefan M. Herzog, Martin Göber, Renate Hagedorn
 Pages: 210-231 | First Published: 28 January 2019



Ensemble predictions provide reliable and sharp probabilistic forecasts, yet these are still rarely communicated to end-users. We present three approaches to introducing probabilistic weather forecasts – and illustrate three key insights: (a) to make informed decisions, users need probabilistic forecasts; (b) users can understand forecast uncertainty if representations follow best practices from risk communication; and (c) users need to experience probabilistic forecasts in their day-to-day practice to evaluate their benefit. With these insights and practical pointers, we hope to support future efforts to integrate probabilistic forecasts into everyday decision making and to encourage everyone to seek interdisciplinary collaborations.



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 Librarian, RLIANZA
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From: [Chris Kroger](#)
To: [Iman Soltanzadeh](#)
Cc: [Cheryl Percival](#)
Subject: FW: Senior Data Scientist position
Date: Tuesday, 18 January 2022 5:25:39 pm
Attachments: s9(2)(a)
51001_Senior Data Scientist PD Jan 2022 - v0.2.docx

Hi Iman,

This is the person I mentioned recently as a potential candidate for the senior scientist role. It is somewhat on the more verbose end of the spectrum, but if you have a chance to read we can discuss in our Thursday catch-up.

Best wishes,
Chris

From: s9(2)(a)
Sent: Tuesday, 18 January 2022 11:57 am
To: Recruitment <Recruitment@metSERVICE.com>
Cc: s9(2)(a)
Subject: Senior Data Scientist position

Dear HR manager,

I am writing to express my interest in being considered for the position of Senior Data Scientist on the Forecasting, Research and Development team. I am particularly keen to lead a programme of work that will advance meteorological applications of statistical and machine/deep learning methods and development of operational systems. As such, please find (attached) my application (cover letter and cv) for review and consideration.

Cheers,

s9(2)(a)

[Redacted signature block]

From: [Recruitment](#)
To: [Cheryl Percival](#)
Subject: FW: Senior Data Scientist position
Date: Wednesday, 19 January 2022 4:01:59 pm
Attachments: s9(2)(a)
51001_Senior Data Scientist PD Jan 2022 - v0.2.docx

Hi Cheryl,

I can't see this vacancy advertised anywhere for a senior data scientist, but can see that you covered the Dec 2021 vacancy for a data scientist so just letting you know about this application.

Thank you
Sanne

From: s9(2)(a)
Sent: Tuesday, 18 January 2022 11:57 am
To: Recruitment <Recruitment@metservice.com>
Cc: s9(2)(a)
Subject: Senior Data Scientist position

Dear HR manager,

I am writing to express my interest in being considered for the position of Senior Data Scientist on the Forecasting, Research and Development team. I am particularly keen to lead a programme of work that will advance meteorological applications of statistical and machine/deep learning methods and development of operational systems. As such, please find (attached) my application (cover letter and cv) for review and consideration.

Cheers,

s9(2)(a)

[Redacted signature block]

From: [Lucy Batt](#)
To: [Alex Zadnik](#)
Subject: FW: WEF Highest Global Risks - Climate action failure and extreme weather
Date: Thursday, 13 January 2022 8:30:10 am
Attachments: WEF_The_Global_Risks_Report_2022 (1).pdf
image001.png
image002.png

Thought this would be of interest



Lucy Batt
General Manager International Business
MetraWeather

t +61 2 9449 9771 m +61 400 373 782

Level 6, 657 Pacific Highway
PO Box 413, St Leonards NSW 2065, Australia



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From: Stephen Hunt <xxxxxxx.xxxx@xxxxxxxxxxx.xxx>
Sent: Wednesday, 12 January 2022 8:08 AM
To: ELT (Enterprise Leadership Team) <EnterpriseLeadershipTeam@metSERVICE.com>; OLG <xxx@xxxxxxxxxxx.xxx>; Board Personal Email address <BoardPersonalemails@met.co.nz>; Brett Beamsley <x.xxxxxxxx@xxxxxxxx.xx.xx>; Lucy Batt <Lucy.Batt@metraWeather.com>; Suralda Timmerman <xxxxxxx.xxxxxxxx@xxxxxxxxxxx.xxx>; Jihee Cooper <xxxxxx.xxxxxx@xxxxxxxxxxx.xxx>; Sarah Payne <xxxxxx.xxxxxx@xxxxxxxxxxx.xxx>
Subject: WEF Highest Global Risks - Climate action failure and extreme weather

Kia ora all and Happy New Year to those of you I haven't seen face-to-face yet.

Every January I enjoy reading the World Economic Forum Global Risks report – one of the better documents for situating strategic thinking for the year ahead. I am sure many of you are familiar with the WEF report and may have seen it already, I have attached it for convenience. You will see that for 2022, the highest global risk is Climate Action Failure, and the second is Extreme Weather.

Over the last year we have been working on our narrative across central government, local government, and the private sector with a focus on the importance of using meteorological expertise to help mitigate the impacts of these primary threats and risks. Our approach has been very well-received by agencies with complex operational purposes and mandates, particularly covering national resilience and critical services, where success can be significantly impacted by weather. For the year ahead We will be growing the narrative and focusing on creating channels and opportunities for MetService to contribute and be more involved. A contemporary example of the benefits we can bring at a national level is shown here: [Putin delays Ukraine invasion because of muddy ground, US advisers say \(msn.com\)](#)

In the meantime I encourage you to at least scan the WEF report and the many excellent

infographics.

Ngā mihi

Stephen



Stephen Hunt (he/him)
Chief Executive
MetService – Te Ratonga Tirorangi

M

Level 2, 110 Featherston Street, Wellington 6011
PO Box 722, Wellington 6140, New Zealand



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From: [Suralda Timmerman](#)
To: [Lisa Murray](#)
Subject: FW: WEF Highest Global Risks - Climate action failure and extreme weather
Date: Monday, 27 March 2023 1:56:33 pm
Attachments: WEF_The_Global_Risks_Report_2022 (1).pdf
image001.png
image002.png

FYI

Kind regards



Suralda Timmerman
General Manager: Operational Integrity and Resilience
MetService – Te Ratonga Tiorangi

m s9(2)(a)
Level 2, Seabridge House, 110 Featherston Street, Wellington, 6011
PO Box 722, Wellington 6140, New Zealand



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From: Stephen Hunt <xxxxxxx.xxxx@xxxxxxxxxxx.xxx>
Sent: Wednesday, 12 January 2022 10:08 am
To: ELT (Enterprise Leadership Team) <EnterpriseLeadershipTeam@metservice.com>; OLG <xxx@xxxxxxxxxxx.xxx>; Board Personal Email address <BoardPersonalemails@met.co.nz>; Brett Beamsley <x.xxxxxxxx@xxxxxxxx.xx.xx>; Lucy Batt <Lucy.Batt@metraweather.com>; Suralda Timmerman <xxxxxxx.xxxxxxxx@xxxxxxxxxxx.xxx>; Jihee Cooper <xxxxxx.xxxxxx@xxxxxxxxxxx.xxx>; Sarah Payne <xxxxxx.xxxxxx@xxxxxxxxxxx.xxx>
Subject: WEF Highest Global Risks - Climate action failure and extreme weather

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[delays Ukraine invasion because of muddy ground, US advisers say \(msn.com\)](#)

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Ngā mihi

Stephen



Stephen Hunt (he/him)
Chief Executive
MetService – Te Ratonga Tirorangi

M **s9(2)(a)**

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PO Box 722, Wellington 6140, New Zealand



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From: s9(2)(a)
To: Peter Fisher
Subject: Fwd: ESG Omni, Adaption, the Financial Sector and SCORPIONS
Date: Thursday, 6 June 2024 3:41:50 am
Attachments: image454717.png
image284807.png
image001.png
Climate-scorpion TRUST Univ of Exe 2024.pdf

Hi Peter

Maybe time to follow up on our webinar from last year?

Cheers

Peter

Sent from Gmail Mobile

----- Forwarded message -----

From: s9(2)(a)
Date: Thu, 6 Jun 2024 at 1:08 AM
Subject: ESG Omni, Adaption, the Financial Sector and SCORPIONS
To: s9(2)(a)

Hi,

Meant share the attached. This is already discussed here in Europe and some insurers and – in particular infrastructure – is increasingly worried about the shift to more extremes and how to deal with it. Perfect for SLR to support

We'd also need to connect on ESG Omni and its link to Climsystems.

Kind regards/Viele Grüße/vriendelijke groet,

Mark

verdantix

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s9(2)(a)



Frankfurt, Germany

s9(2)(a)



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From: [Alex Zadnik](#)
To: [Lucy Batt](#)
Subject: Fwd: News Digest | March 2023 Edition
Date: Monday, 6 March 2023 9:50:51 pm

FYI - might be of interest to Rob and/or Simeon as well given the climate focus.

Begin forwarded message:

From: "InterMET.Digital" <acf@miasia.com.sg>
Date: 6 March 2023 at 7:46:24 pm AEDT
To: Alex Zadnik <Alex.Zadnik@metraweather.com>
Subject: News Digest | March 2023 Edition
Reply-To: "InterMET.Digital" <acf@miasia.com.sg>

[View this email in your browser](#)



News digest - March 2023 edition

Welcome to the second edition of the free monthly news digest from [InterMET.digital](#), the indispensable portal serving the meteorology, flood and air quality industries, and sister channel to the [Asia Climate Forum](#) taking place in Singapore from 18-20 April. Registration for the show free of charge is now open - just click the button below.

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Vaisala announces **record financial results** for 2022, aided by strong growth in the meteorology segment



UAE officially announces the **candidacy of Abdullah Al Mandoos** to head the World Meteorological Association



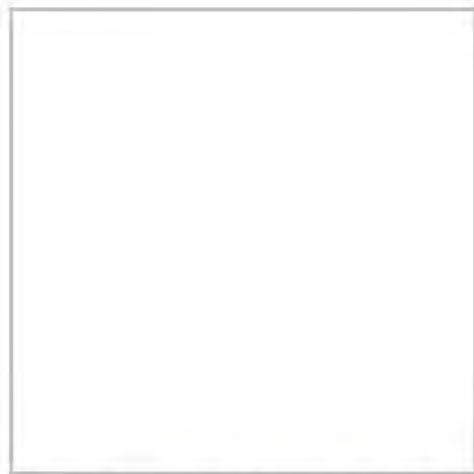
Amid 'spy balloon' controversy, WMO **highlights key role of weather balloons** in climate monitoring



Artificial Intelligence brings **real-time weather alerts** to flood-prone Thailand and Vietnam



Indonesia's BMKG and Finland's FMI announce collaboration to improve weather forecasting capacity



The United Arab Emirates doubles number of cloud-seeding flights in six years in bid to boost rainfall

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 - **Biral thunderstorm detector** incorporated into SaxaVord Spaceport
 - Baron Weather welcomes **new Vice President of Operations**
- **MicroStep-MIS** publishes convective rainfall nowcasting project results
- Vaisala Xweather is first to offer **new type of data on lightning** in the U.S.
 - **Climavision** closes critical weather radar gap in North Carolina
 - Weather tech firm **Nevis Technology** wins six-figure space launch deal
- AeroX kicks off statewide **advanced air mobility weather study** in North Carolina
 - OroraTech: **fighting climate change from outer space**
 - New **MFI agrometeorology project** in Paraguay

CLIMATE, WEATHER & TECHNOLOGY

- How NZ can learn from Australia's **recent devastating floods**
- NASA builds **small, low-cost weather sensors** to track tropical cyclones
- Modern weather forecasting relies on **accurate measurement**. How do we do that?
 - **IWMI supports Zambia** with post-flood recovery strategy
 - Fifteen million people at risk of severe **floods from melting glaciers**
- Indonesia to prevent peatland fires using '**weather modification technology**'
 - Creating clouds for **icing research**
 - Artificial intelligence used to **predict space weather**
 - A concrete plan to **make cities more resilient to flooding**
 - Tech: **the hunt for a better weather forecast**

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- ACF and China Meteorological Service Association [form strategic partnership](#)
- Caribbean sees first regional launch of [global plan on early warning systems](#)
- Philippine Gov't allocates [PHP 20bn for integrated flood resilience project](#)
- New weather monitoring a major upgrade to [Vanuatu's climate resilience](#)
 - [ECMWF](#) publishes new software strategy
- WMO publishes [guidelines for NMHSs](#) for satellite-based nowcasting in Africa
 - [Digital transformation](#) will improve early warnings in Africa

Webinars, presentations & events

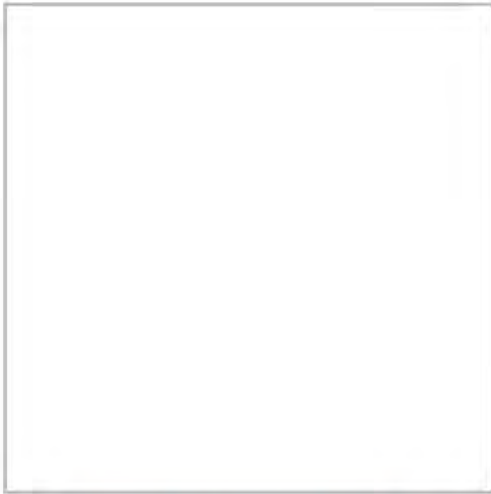
There are now more than 150 podcasts, webinars and presentations in the **Content Hub**. Click [here](#) to access them all, and [here](#) for the **Events** section listing of upcoming industry gatherings



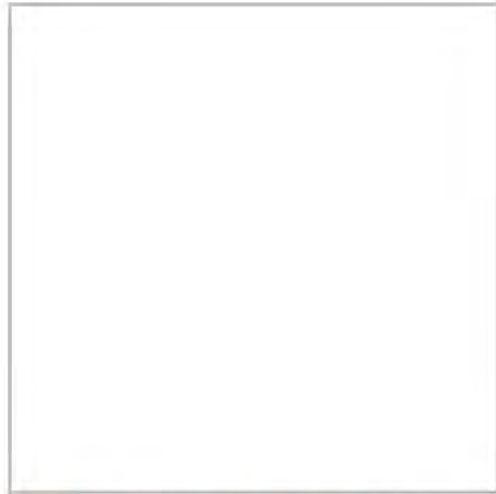
All 24 monthly episodes of the excellent [WeatherPod](#) are now available at [InterMET.digital](#)



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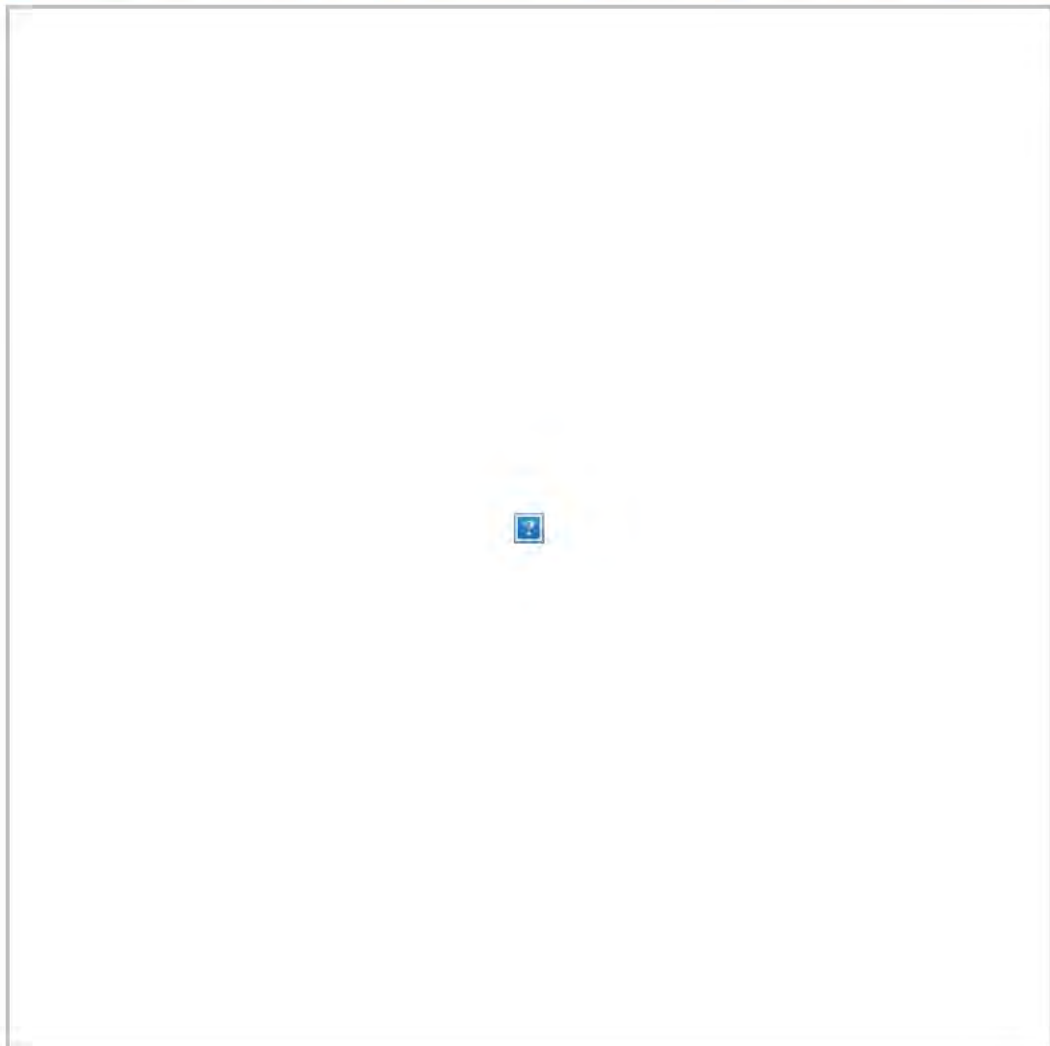


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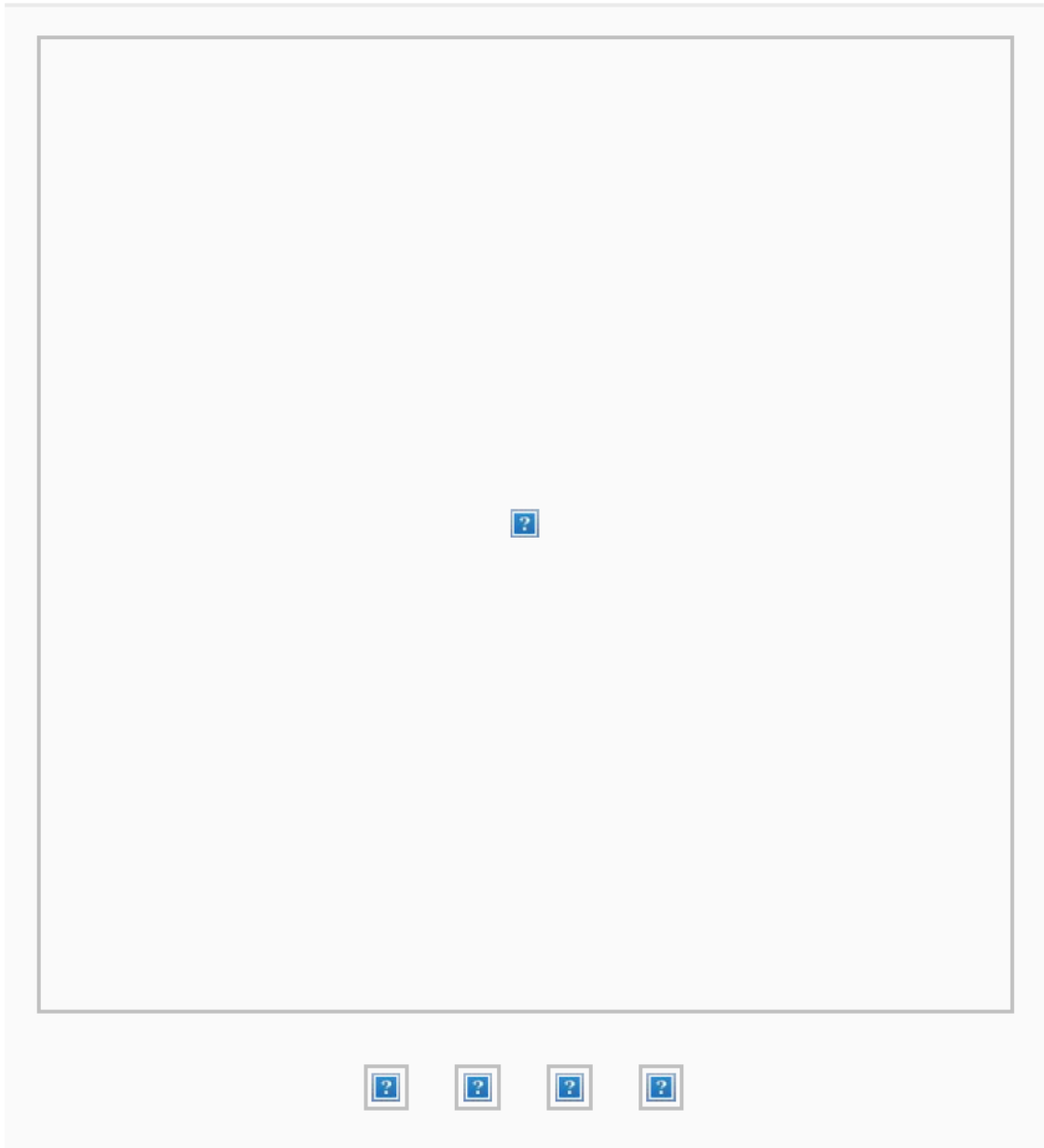
MicroStep-MIS - Stand A16 at Asia Climate Forum 2023

MicroStep-MIS is a long-term exhibitor at Asia Climate Forum, and InterMET Asia before that. The company has been operating in the area of environmental monitoring since 1993. For the past 27 years they have established themselves as an accepted and respected worldwide player in the field.

Their aim is to do business with high ethical standards, distinguished by respect to their partners' needs, and within the framework of their core values. They believe in the power of constant development, ongoing research, and steady innovation. The final outcome is effective and timely weather-related decision-making by their clients which is based on reliable and timely data provided by their monitoring systems.

Satisfaction of their clients is the top priority, therefore they strive to continuously invest in the improvement of their products and services based on the clients' needs and desires. They believe that their success goes hand in hand with facilitating their clients to achieve their visions; and they are very proud to be part of those meaningful mutual projects around the globe.

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From: Alex Zadnik
To: [Katarina Kovacevic](#)
Subject: Fwd: [REDACTED] Contract - do you have a word version?
Date: Tuesday, 7 March 2023 6:29:17 pm
Attachments: image001.png
image002.png
image001.png
image002.png
image003.png
Mail Attachment.eml.msg
D 94888 Service Contract_Metra_Snowy_Apr21.docx

FYI - please see that attachments for the existing April 2021 [REDACTED] Agreement. It doesn't appear to be our standard Terms and Conditions, so it might be easiest to reuse an agreement that was previously negotiated.



Alex Zadnik BSc MBA/MAM
Business Manager Australia
MetraWeather

m +61 439767557

We have a new Sydney office. Please update your records:
Suite 25, Level 8, 100 Walker Street, North Sydney 2060, Australia



metSERVICE.com . metraweather.com . metocean.co.nz

Begin forwarded message:

From: Lucy Batt <Lucy.Batt@metraweather.com>
Subject: RE: [REDACTED] **Contract - do you have a word version?**
Date: 6 March 2023 at 9:39:43 am AEDT
To: Alex Zadnik <Alex.Zadnik@metraweather.com>

Hi Alex,

I did have a nice weekend thanks – a swim down at Curl Curl followed by a BBQ
I hope you had a lovely weekend too?

Sure do – please see attached.

Cheers,



Lucy Batt
General Manager International Business
MetraWeather

t +61 2 9449 9771 m +61 400 373 782

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MetraWeather (Thailand) Ltd [No. 0105558115059] are wholly-owned subsidiaries of Meteorological
Service of New Zealand Ltd (MetService)

From: Alex Zadnik <xxxx.xxxxxx@xxxxxxxxxxxxx.xxx>
Sent: Monday, 6 March 2023 7:52 am
To: Lucy Batt <xxxx.xxxx@xxxxxxxxxxxxx.xxx>
Subject: Snowy Hydro Contract - do you have a word version?

Good Morning Lucy,

I hope you had a nice weekend? The renewal for s9(2)(b) Commercially sensitive is coming up next month, so I have commenced discussions with s9(2)(a) regarding this. I note that their contract is quite a custom one (see attached), so my preference will be to reuse it, with our address details updated, and deliverables altered (if they take new services). Therefore, do you have a word version of the attached PDF, either in your files, or in an email from Rebekah Lo?

Kind regards,

Alex



Alex Zadnik BSc MBA/MAM
Business Manager Australia
MetraWeather

m +61 439767557

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From: [Alex Zadnik](#)
To: [Katarina Kovacevic](#)
Subject: Fwd: [REDACTED] Contract - do you have a word version?
Date: Tuesday, 7 March 2023 6:35:16 pm
Attachments: image001.png
image002.png
image001.png
image002.png
image003.png
Mail Attachment.eml.msg
D 94888 Service Contract_Metra_Snowy_Apr21.docx

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Begin forwarded message:

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Date: 6 March 2023 at 9:39:43 am AEDT
To: Alex Zadnik <Alex.Zadnik@metraweather.com>

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Lucy Batt
General Manager International Business
MetraWeather

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Alex



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m +61 439767557

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From: [Kim Adamson](#)
To: [Stephen Hunt](#)
Subject: Global report 2022
Date: Wednesday, 12 January 2022 8:31:31 am
Attachments: WEF_The_Global_Risks_Report_2022 (1).pdf
image001.png
image002.png

Latest report attached

Kind Regards, Kim



Kim Adamson
Executive Manager
MetService – Te Ratonga Tirorangi

t +64 4 4700 700

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PO Box 722, Wellington 6140, New Zealand



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From: [Kim Adamson](#)
To: [Stephen Hunt](#)
Subject: Global risks
Date: Wednesday, 12 January 2022 8:40:33 am
Attachments: WEF_The_Global_Risks_Report_2022 (1).pdf
image003.png
image004.png

Top 10 global risks



Kind Regards, Kim



Kim Adamson
Executive Manager
MetService – Te Ratonga Tirorangi

t +64 4 4700 700

30 Salamanca Road, Kelburn, Wellington 6012
PO Box 722, Wellington 6140, New Zealand



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From: [@x](#)
To: [Phellipe Couto](#)
Subject: GMD article alert
Date: Tuesday, 26 April 2022 6:02:09 am

Dear Alert Subscriber,

We are pleased to inform you about the appearance of the following papers matching your alert selection:

EGUsphere

Assessing Responses and Impacts of Solar climate intervention on the Earth system with stratospheric aerosol injection (ARISE-SAI)

by Jadwiga Richter, Daniele Visioni, Douglas MacMartin, David Bailey, Nan Rosenbloom, Walker Lee, Mari Tye, and Jean-Francois Lamarque

<https://egusphere.copernicus.org/preprints/2022/egusphere-2022-125/>

Short Summary: Solar climate intervention using stratospheric aerosol injection is a proposed method of reducing global mean temperatures to reduce some of the consequences of climate change. We present here a new modeling protocol and an ensemble of simulations using one of the most comprehensive Earth system models: the Assessing Responses and Impacts of Solar climate intervention on the Earth system with stratospheric aerosol injection (ARISE-SAI) simulations.

EGUsphere

NeverWorld2: An idealized model hierarchy to investigate ocean mesoscale eddies across resolutions by Gustavo Marques, Nora Loose, Elizabeth Yankovsky, Jacob Steinberg, Chiung-Yin Chang, Neeraja Bhamidipati, Alistair Adcroft, Baylor Fox-Kemper, Stephen Griffies, Robert Hallberg, Malte Jansen, Hemant Khatri, and Laure Zanna

<https://egusphere.copernicus.org/preprints/2022/egusphere-2022-186/>

Short Summary: We present an idealized ocean model configuration and a set of simulations performed using varying horizontal grid spacing. While the model domain is idealized, it resembles important geometric features of the Atlantic and Southern oceans. The simulations described here serve as a framework to effectively study mesoscale eddy dynamics, investigate the effect of mesoscale eddies on the large-scale dynamics, and to test and evaluate eddy parameterizations.

GMD Discussions

Uncertainty and sensitivity analysis for probabilistic weather and climate risk modelling: an implementation in CLIMADA v.3.1.0

by Chahan M. Kropf, Alessio Ciullo, Laura Otth, Simona Meiler, Arun Rana, Emanuel Schmid, Jamie W. McCaughey, and David N. Bresch

<https://gmd.copernicus.org/preprints/gmd-2021-437/>

Short Summary: Mathematical models are approximations, and modelers need to understand and ideally quantify the arising uncertainties. Here we describe and show-case the first, simple to use, uncertainty and sensitivity analysis module of the open-source and open-access climate risk modeling platform CLIMADA. This may help to enhance transparency and inter-comparison of studies among climate risk modelers, help focus future research, and lead to better-informed decisions on climate adaptation.

GMD Discussions

Assessment of JSBACHv4.30 as land component of ICON-ESM-V1 in comparison to its predecessor JSBACHv3.2 of MPI-ESM1.2

by Rainer Schneck, Veronika Gayler, Julia E. M. S. Nabel, Thomas Raddatz, Christian H. Reick, and Reiner Schnur

<https://gmd.copernicus.org/preprints/gmd-2022-74/>

Short Summary: The versions of ICON-A and ICON-Land/JSBACHv4 used for this study constitute the first milestone in the development of the new ICON Earth System Model ICON-ESM. JSBACHv4 is the successor of JSBACHv3 and most of the parametrizations of JSBACHv4 are re-implementations from JSBACHv3. We assess and compare the performance of JSBACHv4 and JSBACHv3. Overall, the JSBACHv4 results are as good as JSBACHv3, but both models reveal the same main shortcomings, e.g. the depiction of the Leaf Area Index.

GMD Discussions

Empirical Assessment of Normalized Information Flow for Quantifying Causal Contributions

by Chin-Hsien Cheng and Simon Redfern

<https://gmd.copernicus.org/preprints/gmd-2022-106/>

Short Summary: Causality is one of the foundations of scientific understanding and progress. Statistical models extrapolate historical trends into the future through statistical tools, but may still lack insight into the physical underlying processes. We have developed a method to quantify physical causal contributions between observational time series. It plugs the gap between process-based and statistical models, providing a key to unlocking and understanding causality in Earth systems science processes.

GMD Discussions

Improved ocean circulation modeling with combined effects of surface waves and M2 internal tides on vertical mixing: a case study for the Indian Ocean

by Zhanpeng Zhuang, Qunan Zheng, Yongzeng Yang, Zhenya Song, Yeli Yuan, Chaojie Zhou, Xinhua Zhao, Ting Zhang, and Jing Xie

<https://gmd.copernicus.org/preprints/gmd-2022-110/>

Short Summary: We evaluate the impacts of surface waves and internal tides on the upper-ocean mixing in the Indian Ocean. The surface-wave-generated turbulent mixing is dominant if depth < 30 m, while the internal-tide-induced mixing is larger than surface wave in the ocean interior from 40 m to 130 m. The simulated thermal structure and mixed layer depths are both improved when the wave- and tide-induced mixing are jointly incorporated into the ocean model because of the strengthened vertical mixing.

GMD Discussions

Observing system simulation experiments reveal that subsurface temperature observations improve estimates of circulation and heat content in a dynamic western boundary current

by David E. Gwyther, Colette Kerry, Moninya Roughan, and Shane R. Keating

<https://gmd.copernicus.org/preprints/gmd-2022-98/>

Short Summary: The ocean flows southward along the south-eastern coast of Australia in a narrow, rapid current called the East Australian Current (EAC) before meandering and forming rotating bodies of water called eddies. Using computer simulations we tested how different kinds of ocean measurements and locations might improve models of the EAC. We suggest future observing strategies and highlight the importance of subsurface observations for understanding western boundary currents.

You can manage your GMD alerts at:

https://editor.copernicus.org/GMD/alert_manage/18243/vvwtwuqxoxyabrcp

Thank you very much for your interest. Please do not hesitate to contact me for assistance.

Kind regards,

Natalie Walter

Copernicus Publications

subscription@copernicus.org

From: [@x](#)
To: [Phellipe Couto](#)
Subject: GMD article alert
Date: Thursday, 17 November 2022 8:01:56 am

Dear Alert Subscriber,

We are pleased to inform you about the appearance of the following papers matching your alert selection:

EGUsphere

SMLFire1.0: a stochastic machine learning (SML) model for wildfire activity in the western United States by Jatan Buch, A. Park Williams, Caroline S. Juang, Winslow D. Hansen, and Pierre Gentine

<https://egusphere.copernicus.org/preprints/2022/egusphere-2022-1148/>

Short Summary: We leverage machine learning techniques to construct a statistical model of grid-scale fire frequencies and sizes using climate, vegetation, and human predictors. Our model reproduces the observed trends in fire activity across multiple regions and timescales. We provide uncertainty estimates to inform resource allocation plans for fuel treatment and fire management. Altogether the accuracy and efficiency of our model makes it ideal for coupled use with large scale dynamical vegetation models.

GMD

Assessing Responses and Impacts of Solar climate intervention on the Earth system with stratospheric aerosol injection (ARISE-SAI): protocol and initial results from the first simulations

by Jadwiga H. Richter, Daniele Visioni, Douglas G. MacMartin, David A. Bailey, Nan Rosenbloom, Brian Dobbins, Walker R. Lee, Mari Tye, and Jean-Francois Lamarque

<https://gmd.copernicus.org/articles/15/8221/2022/>

Short Summary: Solar climate intervention using stratospheric aerosol injection is a proposed method of reducing global mean temperatures to reduce the worst consequences of climate change. We present a new modeling protocol aimed at simulating a plausible deployment of stratospheric aerosol injection and reproducibility of simulations using other Earth system models: Assessing Responses and Impacts of Solar climate intervention on the Earth system with stratospheric aerosol injection (ARISE-SAI).

You can manage your GMD alerts at:

https://editor.copernicus.org/GMD/alert_manage/18243/vvwtwuqxxyabrcp

Thank you very much for your interest. Please do not hesitate to contact me for assistance.

Kind regards,

Natalie Walter


Copernicus Publications

subscription@copernicus.org

From: [Twitter](#)
To: [Leigh Matheson](#)
Subject: HYBE MERCH Tweeted: <BTS PERMISSION TO DANCE ON STAGE - LAS VEGAS> ...
Date: Sunday, 3 April 2022 9:49:25 am



Your Highlights




HYBE MERCH
[@HYBE_MERCH](#)




<BTS PERMISSION TO DANCE ON STAGE - LAS VEGAS>

Don't need to talk the talk,
just walk the walk tonight

Official Merchandise Sales
Allegiant Stadium
MGM Grand Garden Arena

[#BTS](#) [#PTD_ON_STAGE_LV](#) [#PTD_THE_CITY_LV](#)



 300  10K  52K



James Renwick Retweeted



Eloise Gibson
[@eloise_gibson](#)

While we wait, here's our explainer on carbon removal and capture and geo-engineering, which (we assume) the IPCC is going to say something about tomorrow: [stuff.co.nz/environment/cl...](#)

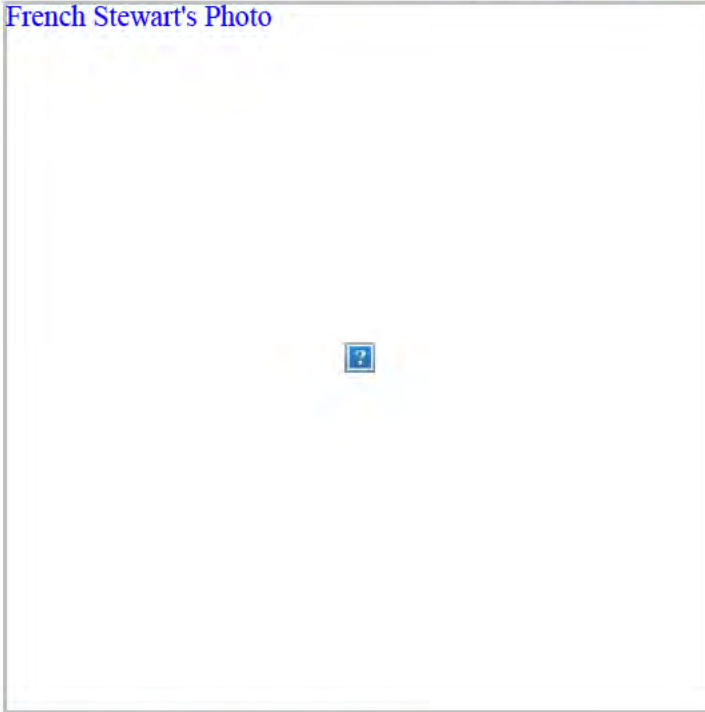
 1  1  3



French Stewart
@FrenchStewart

That time I wore a beer shirt on picture day. #FridayFeeling

French Stewart's Photo



150



110



5.1K



The Hui
@TheHuiNZ

We meet the Tauranga couple returning millions of dollars of church land back to mana whenua. National Leader @chrisluxonmp speaks to @Mihi_Forbes and we pay tribute to Moana Jackson. #TheHui streaming Mon 8:45pm on newshub.co.nz and FB and Tues after Newshub Late on 3.



1



11



39

Rex Chapman



Rex Chapman
@RexChapman

41-seconds of gold... [twitter.com/jessi_asli/sta...](https://twitter.com/jessi_asli/status/1234567890)



Andy McKay
@KorimakoEcology

Not many people realise that Transmission Gully is only 450 manta rays long. stuff.co.nz/dominion-post/...



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One Cumberland Place, Fenian Street
Dublin 2, D02 AX07 IRELAND

From: AMOS
To: s9(2)(a)
Subject: ICSHMO 2022 - AMOS/ICSHMO Previous Programs
Date: Tuesday, 27 July 2021 3:34:50 pm
Attachments: Outlook-1erhtdr.png
AMOS2020-GLANCE-PROGRAM-03-FEB.pdf
SESSIONS DETAILED amos-icshmo2018.pdf
SESSIONS LIST amos-icshmo2018.pdf
AMOS-ICSHMO 2018 Program - for website - Summary.pdf
AMOS-ICSHMO 2018 Program A6.pdf

Hi All,

I have a workshop this Thursday and a meeting on Friday from 12:30 to 2:30pm.

Please see attached various AMOS Conference programs that may be of assistance.

Note that this was combined with our annual AMOS conference

- AMOS-ICSHMO 2018 - Sessions List
- AMOS-ICSHMO 2018 - Sessions Detailed
- AMOS-ICSHMO 2018 - Program A6 Pocket Program
- [AMOS-ICSHMO 2018 Abstract Book - Oral Presentations](#)

[AMOS 2021 Conference Online Program](#). This was our **fully online live conference** so it may be of assistance in structuring the online workshops/component of ICSHMO 2022.
We ran 4 zoom meeting rooms and used EventsAIR AIRCAST for plenary speakers.

Also attached is:
AMOS 2020 Fremantle program - at a glance

Let me know if you need any further information/assistance.

All the best
s9(2)(a)

On Thu, Jul 22, 2021 at 11:06 AM s9(2)(a) wrote:

Thank you Angela for the response,

We already have a template from s9(2)(a) and s9(2)(a) happy to be involved in the discussion of how the program shapes up, could you share examples from previous conferences s9(2)(a) if you have them?

Cheers,

s9(2)(a)

On 22/07/21 12:24 am, s9(2)(a) wrote:

Hi team

All sounding great. Well done.

I am sorry, neither s9(2)(a) nor I are in the position to lead the program subcommittee. Jeanette will absolutely be able to offer advise etc but she is a paid staff member (executive officer) of AMOS and her time on this is a cost to AMOS. National Council will not approve her leading this when there are other tasks that she has been assigned to for her hours. And I have just started a fellowship that does not allow me to integrate any of my academic or service roles during business hours which means that I pretty much do two

jobs now....

In any case I think it would be good to have local NZ members leading so you have ownership of the program. s9(2)(a) can provide a program template and s9(2)(a) can provide some advice and examples from previous conferences.

Have you considered getting a small scientific steering committee together that you can reach out to for advice, bounce ideas off, discuss program? We discussed it once early on but I don't think it went any further.

Cheers,

[Redacted]

s9(2)(a)

[Redacted]

[Redacted]

Check out our [online climate model](#) and [citizen science project](#)!



I am sending this message now because I work flexibly. I don't expect that you will read, respond to, or action it outside of your regular working hours.

From: s9(2)(a) [Redacted]

Sent: Tuesday, 20 July 2021 8:27 AM

To: [Redacted]

[Redacted]; Michael Martens

xxxxxxx.xxxxxx@xxxxxxxxx.xxx; s9(2)(a)

[Redacted]

[Redacted]

Subject: Re: Subcommittee meet minutes and action items

Hi all,

[SPEAKERS] We have René Gaureaud, Julie Arblaster, Carolina Vera and Susan Solomon confirmed (thank you [Redacted]). And [Redacted] has already sent the invitations to [Redacted] and [Redacted]. I contacted [Redacted] representation agency and they had to decline any kind of collaboration since that would put him in an "invidious position to have to choose between" all the requests from serious conferences such as ours. Also, I reached out to [Redacted] at the University of Canterbury about the protocols around inviting Ngai Tahu iwi.

[SPONSORS] I'll reply next in the corresponding email.

[PROGRAMME LEADS] I'm happy to join this team with [Redacted] and I've got the impression that [Redacted] or [Redacted] have a lot of experience shaping up conference programmes. Could you lead this subcommittee, [Redacted] or [Redacted]

Cheers,

■

On 19/07/21 7:14 pm, ■ wrote:

Hi ■ and all –

Thanks for the session submissions list, happy to review over the next couple of weeks. I am happy to be involved in the discussion of how the programme shapes up, but would welcome someone else leading it.

Re my jobs, I have contacted ■ and she has accepted, probably a virtual presentation.

Cheers

■

From: ■ >
Sent: Monday, 19 July 2021 3:08 PM
To: s9(2)(a) ■
Michael Martens <Michael.Martens@metSERVICE.com>;
s9(2)(a) ■
Subject: RE: Subcommittee meet minutes and action items

Hello everyone,

How is everyone tracking on the below action list from s9(2)(a)

Now available for review – workshop & session submissions (no meeting submissions were received):

s9(2)(k) ■

For a review/initial acceptance timeline I recommend:

1. Submissions reviewed over next two weeks (place your comments in above shared file)
2. Someone (or a sub-committee) indicate which ones to accept by the 29th
3. C&E to send out acceptances to session/workshop leads on 30th (I will provide a draft communication for approval)

There are 27 session submissions and 5 workshop submissions. A word version of all submissions in is also attached for easier reading.

I'm happy to put together a programme template as a guide to help you more easily envision the space available (3 days at the UC, virtual equivalent to 2 programme days plus workshops on the 8th (Tues) or 12th (Sat). You won't need to stick to it but it may help you get a feeling for space and how many sessions/workshops can be accepted.

The acceptance email will provide clear information for workshop/session leads (their role and responsibilities) and ask them to re-confirm they are happy to carry this out. My team will then add a page to the website that outlines the sessions and workshops on offer. We will also update the abstract submission portal so that submitters can tie their submission to the desired session/workshop.

Is there a person or two who have agreed to help lead this part of the programme process? It can always be a different person or sub-committee for the abstract review and programming. As mentioned, we can use workshop/session leads as reviewers for their respective sessions to assist.

Currently we have left the submission button open on the website for sessions/workshops but if you feel there is enough in we can formally close that.

Kind regards,

[REDACTED]

[REDACTED] | Conference Manager

Conferences & Events Ltd

Postal Address: PO Box 24078, Manners Street, Wellington 6142 |

[REDACTED] | Web: <http://www.confer.co.nz>

Wellington Office: +64 4 384 1511

From: [REDACTED]

Sent: Friday, 9 July 2021 5:16 PM

To: [REDACTED]

Michael Martens

[<Michael.Martens@metservice.com>](mailto:Michael.Martens@metservice.com)

Subject: Subcommittee meet minutes and action items

Hello committee team,

We just had a subcommittee meeting this afternoon to talk about doing a first round of speakers' contact. I'm just sharing with this email action items for each of us who attended, and some comments and a query for all below.

Action items:

- Michael to contact the speakers for the in-person opening talks of the conference (3 in total). (Jacinda Ardern/Helen Clarke/Climate Change advisor, François, Helen Cleugh)
- Michael to share cover email/template for formal speakers' invitation and contact of [REDACTED] to [REDACTED]
- [REDACTED] to contact [REDACTED].
- [REDACTED] to contact [REDACTED] representative (ask for short video) and [REDACTED] (UC) about protocols of Ngai Tahu iwi and how they would like to be involved.
- [REDACTED] to contact [REDACTED].
- Could someone contact [REDACTED]? [REDACTED] I'm not sure now if you said you knew her and could do it.

After what we've talked today, the idea would be (please correct me if wrong) to have one speaker each of the in-person days to open the conference that day and to talk for a more general/broader topic. Then, to have 2 more specific/themed-oriented talks each day from the speakers list we all voted. In both cases, we are starting the round of contacts once we have the cover email that Michael is going to share. There's an extra tab now in the Speakers [spreadsheet](#) to keep updated who's confirmed, etc. Apart from the email template that Michael will share, are there any requirements we must follow [REDACTED] when contacting them? Is it already a formal invitation what we're aiming to do at this stage?

Kind regards,

[REDACTED]

--

[REDACTED]

s9(2)(a)

s9(2)(a)

s9(2)(a)

s9(2)(a)

From: [The Hustle](#)
To: [Anna Phillips](#)
Subject: If you're not preventing the party, you're parta the problem
Date: Friday, 28 February 2020 2:56:30 am

February 27, 2020

The Hustle



TOGETHER WITH



Our Trends team is here to help you build a business. And now they're putting their money where their mouth is. They're giving \$1k to the reader with the best new business concept. Here's how to throw your hat in the ring:

- Pitch your idea [here](#). Give us your best shot in 1 or 2 sentences.
- Trends members will vote on the winners next week.

Our writers will follow the winners as they build their business. Know someone with a great idea? Share the link, or spread word on social media using the hashtag #Trends1k.

BASH BUSTERS

Airbnb gets serious about party prevention with new anti-party sensors

Last week, Airbnb began **offering** its hosts discounts on “three of the top party prevention devices.”

The company claims these little party poopers are a non-intrusive way to keep pesky parties at bay, but some security critics and consumers aren’t comfortable with the bite-sized surveillance devices.

Airbnb’s got a party problem, and now it’s pulling out all the stops

Airbnb has always banned unauthorized parties at its properties, but it has long struggled to enforce its rules.

After a deadly shooting in an Airbnb last year, the company explicitly banned “party houses” and **resolved** to “combat unauthorized parties and get rid of abusive host and guest conduct.”

The company also improved its own internal party-policing system to flag high-risk reservations, created a “party house” rapid-response team, and stiffened the penalties for violators.

And now it’s subsidizing surveillance systems

Airbnb explains on its dedicated party prevention [page](#) that these devices are meant to protect properties, maintain privacy for guests, and preserve friendly neighbor relationships.

Instead of introducing its own privacy products, Airbnb is offering deep discounts on 3 top-rated 3rd-party products:

- **Minut, \$99** (normally \$149)
- **NoiseAware, \$149** (normally \$199)
- **Roomonitor, \$39** (normally \$165)

All 3 monitor noise, which Airbnb sees as “a leading indicator of property misuse.”

Minut also monitors temperature, motion, and humidity (although no one has yet explained how humidity is related to party prevalence...).

But some (party?) people aren’t pleased

Airbnb assures consumers that none of these devices *record* sounds, they merely *measure* them.

But some critics still aren’t comfortable with the increased surveillance.

Evan Greer, the deputy director of the digital-rights organization Fight for the Future, told *Vice* that a measurement-only device is certainly better than “internet-connected surveillance cameras or listening devices in your home.”

“But we’re hurtling toward a world where almost everything we own is monitoring us in some way,” she said. “And I’m not sure that’s actually going to be a safer world.”





WEIRD WEATHER

Why silver is suddenly all up in your snow

Coloradans who spent extra time shoveling snow out of their driveways last year should direct complaints to their local university.

In a paper **published** Monday, a team of University of Colorado scientists revealed the results of an effort to turbocharge weather patterns -- with a few sprinkles of the compound silver iodide. At some test sites, snowfall nearly doubled.

It's called 'cloud seeding' -- but you might call it cloud's cradle

Since the process often involves silver iodide, it's tempting to picture scientists shooting cannons of Tiffany & Co. sterling into the sky. But cloud seeding is a bit more complicated.

The compound is dropped onto clouds from circling planes -- it's supposed to speed up the growth of ice crystals.

Where did this idea come from? Kurt Vonnegut's brother Bernard was **one of the first**

scientists to use silver iodide to spruce up weather patterns -- the idea influenced the fictional "ice-nine" in Kurt's book *Cat's Cradle*.

Everyone wants to be their own Weather Channel

Cloud seeding has weathered a turbulent half-century of life. The US tried it during the Vietnam War; China followed suit during the 2008 Beijing Olympics.

The results have been **mixed**, but that hasn't cooled excitement. Several Western states are getting into cloud seeding to fight intensifying droughts.

And the private sector is forecasting more successes: A group of corporations with dystopian names, like **Weather Modification, Inc**, are jockeying to cash in on the trend.



SPONSORED

Job seekers, ahoy! Machine learning can now help pair you with the perfect role

Are recruiters quivering in their boots at the thought?

Shakes Magic Eight Ball

"Signs point to yes"

Okay, tell me more...

We don't need a Magic Eight Ball to see that the old ways of job hunting are dying. The new approach to job searching is based on machine learning (pioneered by online hiring platforms like **Vetterly**) and is quickly replacing the outdated method of blindly blasting out your resume for one simple reason: **It's a win-win.**

Job seekers, like yourself, get pointed in the direction of the roles that will best make use of their specific skill set, while top companies are handed higher-quality candidates who actually fit their needs.

Try a **machine-learning, job-searching platform like Vetterly** today to see for yourself.

P.S. You get a **\$300 bonus** if you find a job through them :)

[Start seeking →](#)

THINGS YOU SHOULD

OUT: Slippers. **IN:** Flamin' Hot Crocs, \$49.99

If you've ever woken up wishing you were Guy Fieri -- and let's be real, who hasn't? -- then these are the shoes (slippers? sandals?) for you. Perfect for any terrain, including diners, dives, and even drive-ins.

THESE ARE *LITERALLY* FIRE →

HACK: Your wallet with a cash back card, \$1k+ in value

The Ascent just found a cash back credit card that packs up to \$1,148 in value -- all you have to do is swipe (or, uh... insert?). Stop leaving money on the table.*

SEE THE CARD →

CASH: In with a fine art investment with Masterworks, Skip the line

Our very own Sam Parr, founder of The Hustle and investor in hot investments has invested in Masterworks. Tune in next week to find out how it turned out. Hint: He knows very little about art, but lots about money. In the meantime, head over to Masterworks and see how putting your money in a masterpiece could mean big returns.*

THE ART OF INVESTING →

*This is a sponsored post.



The booming business of digital privacy

Many people are starting to recognize that their data has a price, and they're questioning whether they're willing to trade it away. Those concerns are giving rise to new businesses that focus on preserving users' privacy. They're popping up in all corners of internet tech, like...

- Analytics: Google Analytics vs. [Simple Analytics](#).
- Search engines: Google Search vs. [DuckDuckGo](#).
- Web browsers: Google Chrome vs. [Brave](#).
- Email unsubscription tools: Unroll Me vs. [Leave Me Alone](#).

In a [recent Trends report](#), we tackle how these tools balance ethical growth with the need to turn a profit. There's still opportunity for businesses to capitalize on this growing market, with services that...

- Help people safeguard their info (think password managers, VPNs, and online-cleanup work).
- Allow companies to follow compliance rules (like privacy-policy generators).
- Educate the public on privacy ([KrebsOnSecurity](#) is just one example. Ahrefs estimates that the value of the site's organic traffic is \$560k).

Don't doubt the value of starting small. Cloudflare, which now has a ~\$5B market cap, started as a project to track how spammers harvested email addresses. It now provides a range of security services for more than 20m internet properties.

Why? Privacy is universal.

Want more insights on the privacy industry? Read our full [Trends report](#).



SNIPPETS

Bob is [taking over for](#) Bob as Disney's CEO. Their predecessors? Michael, Ron, Card, Donn, and the OG, Roy. Spot a pattern?

The bill for your food-delivery order probably includes some [crazy markups](#).

Clearview AI, the controversial facial-recognition company that scraped billions of images from across the internet, had its entire client list [stolen](#).

You might think the Impossible Burger is taking a bite out of American appetites for beef. You might be [wrong](#).

Never seen a bad guy in a movie using an iPhone? One director says that's [not a coincidence](#).

Want snippets like these in your browser? Download our Chrome extension [here](#).

How did you like today's email?



hate it



meh



love it

0

REFERRALS

Share The Hustle

Nick "VP of Party Prevention" DeSantis
STAFF WRITER/EDITOR

Dot Snice
SHRUGGER
IN
RESIDENCE

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From: @x_____ on behalf of WMO cpa
To: cpa cpa
Subject: In the Media - 13/01/2020
Date: Tuesday, 14 January 2020 3:45:21 am

In the Media is a regular compilation providing a snapshot of international media coverage of and commentary on WMO-related issues. It does not purport to be exhaustive. The information contained in the compilation is taken from sources external to the WMO Secretariat and freely available on the Internet. The WMO Secretariat makes no warranty, either express or implied, as to the accuracy. The content of the articles does not reflect the views of the WMO Secretariat.

Climate

Is climate change showing up in the daily weather forecast? It's complicated.

Early this month, scientists announced a surprising discovery: The “fingerprint” of climate change is now detectable in everyday weather. In fact, evidence of global warming can be found in the planet’s weather every day, minute, and second since 2012. But wait—you, a person who actually paid attention in your high school atmospheric science class, say—weather and climate are not the same! Right you are, dear reader. Weather is what happens in the moment (rain passing through, or the current temperature outside).

https://grist.org/climate/scientists-say-climate-change-is-detectable-in-daily-weather-its-not-that-simple/?utm_content=buffer478a&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer_SFclimate

Australia fires

In Australia's Burning Forests, Signs We've Passed a Global Warming Tipping Point

As extreme wildfires burn across large swaths of Australia, scientists say we're witnessing how global warming can push forest ecosystems past a point of no return. Some of those forests won't recover in today's warmer climate, scientists say. They expect the same in other regions scarred by flames in recent years; in semi-arid areas like parts of the American West, the Mediterranean Basin and Australia, some post-fire forest landscapes will shift to brush or grassland.

https://insideclimatenews.org/news/08012020/australia-wildfires-forest-tipping-points-climate-change-impact-wildlife-survival?utm_source=InsideClimate+News&utm_campaign=0d98f490ed-&utm_medium=email&utm_term=0_29c928ffb5-0d98f490ed-327512461

Australia's raging fires will create big pr

In the wake of the enormous fires that have razed huge swathes of drought-stricken Australia, scientists fear that when rains eventually fall, they will wash charred debris into rivers, dams, and the ocean, killing wildlife and even tainting the drinking supplies of major cities, such as Sydney. For many weeks, ash, soot, and blackened gum tree leaves have collected along the shorelines of Sydney's beaches, clogging the waves and lapping in the tide. Originating in fires blazing in forested areas to the west, the debris has been carried on the breeze along with the pungent bushfire smoke that blanketed Australia's largest city for much of December.

<https://www.nationalgeographic.com/science/2020/01/australian-fires-threaten-to-pollute-water/>

Explainer: what are the underlying causes of Australia's shocking bushfire season?

As Australia's unprecedented bushfire season continues to unfold, competing arguments have been made about the principal causes of the human and environmental tragedy – particularly around the role of climate change. The prime minister, Scott Morrison, has acknowledged that climate change has had an influence on the fires and has defended his government's climate record.

<https://www.theguardian.com/environment/2020/jan/13/explainer-what-are-the-underlying-causes-of-australias-shocking-bushfire-season>

Aussie firefighters say 'megablaze' near Sydney under control

Exhausted firefighters said they had finally brought Australia's largest “megablaze” under control Monday as wet weather promised to deliver a much-needed respite to areas ravaged by wildfires. New South Wales firefighters said they finally had the upper hand in the fight against the vast Gospers Mountain fire on Sydney's northwestern outskirts, which has been burning out of control for almost three months.

<https://www.japantimes.co.jp/news/2020/01/13/asia-pacific/break-weather-lets-australia-shift-defense-offense-wildfire-battle/#.Xhxr4INKhBw>

Cyclone Tracks Off Western Australia After Dumping 0.5 Meters Rain in Northern Territory

A cyclone warning has been issued for Western Australia's Kimberley region after more than half a metre of rain was recorded at an island in the Top End. Tropical Cyclone Claudia could produce hazardous winds with gusts up to 100km/h and heavy rainfall as it intensifies offshore on Sunday. The cyclone warning has been issued for the sparsely populated areas between Mitchell Plateau and Beagle Bay.

https://www.theepochtimes.com/cyclone-tracks-off-western-australia-after-dumping-0-5-meters-rain-in-northern-territories_3202020.html

Satellites/technology

Two new satellites will launch this year to track Earth's rising oceans

Two new satellites will provide more detailed information about rising sea levels and other ocean changes on Earth. Launching in November, the Sentinel-6/Jason Continuity of Service mission (Jason-CS) will be the longest-running Earth observation mission dedicated to studying the rising oceans. The spacecraft will provide the most sensitive water level measurements as it reveals details about rising oceans, helping to build nearly 40 years of sea level records.

<https://www.space.com/nasa-satellite-to-track-rising-oceans-on-earth.html>

Taal Volcano spews lava, ash as fears of 'hazardous eruption' persist in the Philippines

A day after rumbling to life, the Taal Volcano in the central Philippines began to spew lava on Monday -- and officials warn that eruptions could last months or even years. The volcano is located in the Batangas province and is the country's second most active volcano. As the Taal Volcano began to spew ash and smoke on Sunday, the Philippine Institute of Volcanology and Seismology (PHIVOLCS) raised its status to an Alert Level 4, indicating a hazardous eruption is possible within hours to days. The alert system has five levels with Alert Level 5 meaning a hazardous eruption is in progress.

<https://www.accuweather.com/en/weather-news/volcano-erupts-in-the-philippines-prompts-evacuations/660810>

Bringing in the rain: Has the UAE's cloud-seeding program gone too far?

Home to part of the largest sand desert in the world and with summer temperatures regularly topping 40 degrees celsius, the United Arab Emirates is rarely associated with rain. But in the last few months of 2019, the country contended with torrential downpours that have seen people wading through streets, workers pumping water from a flooded residential area, and rainwater flowing down escalators at the world-famous Dubai Mall.

<https://wired.me/science/environment/cloud-seeding-uae-dubai-rain-floods/>

Hazards

Storms kill 10 people across the US this weekend as flooding remains a big concern

A man was killed by a tree felled in the storms that moved through east Texas over the weekend, authorities said Sunday. Following a tornado that brought 100-mph winds, rescue crews arrived at a home Saturday and found Larry Hadnot Jr., 44, "trapped by a tree that had fallen across a home," Nacogdoches County Judge Greg Sowell said in a statement.

A second person in the home suffered minor injuries, the judge said.

<https://edition.cnn.com/2020/01/12/weather/us-weather-sunday/index.html>

Lethal storms, tornadoes and floods sweep U.S. South and Midwest

Severe storms sweeping across southern portions of the U.S. and up into the Midwest were blamed Saturday in the deaths of at least 11 people, including two first responders, as high winds, tornadoes and unrelenting rain battered large swaths of the country. Storm-related fatalities were reported in Texas due to icy weather, in Alabama from a deadly tornado and in Louisiana, where winds were so strong that a trailer home was lifted off its foundation and carried several hundred feet.

<https://www.japantimes.co.jp/news/2020/01/12/world/lethal-storms-tornadoes-floods-united-states-south-midwest/#.Xhxzg1NKhBw>

Hydrology

The Merchants of Thirst

It had been 11 days since a ruptured valve reduced Kupondole district's pipeline flow to a dribble, and the phones at Pradeep Tamanz's tanker business wouldn't stop ringing. A Malaysian embassy residence had run perilously low on water, and the diplomats wanted to shower. They'd pay extra for a swift delivery. A coffee processing plant was on the verge of shutting down production after emptying its storage tank. It, too, would shell out whatever amount of money it would take.

<https://www.nytimes.com/2020/01/11/business/drought-increasing-worldwide.html>

'The colour is blue': Strange changes to Mekong River as hydropower dams and climate change make their mark

Before dawn, monks walk the streets of Luang Prabang collecting alms. The Mekong gently meanders in the darkness. The river is a peaceful but powerful force here. A heavy mist hangs over the water long after the sun has risen. It is late morning before it burns away at this time of year, in the milder heat of winter. Life is generally slow in northern Laos, but the river always stirs, with a fisherman's net or a boatman's call. And it always flows, its natural rhythms for millenia shaping the land and its people.

<https://www.channelnewsasia.com/news/asia/mekong-river-colour-xayaburi-dam-laos-hydroelectric-power-12244064>

More than 20 million people under flood watch after killer storms power through Midwest, East

More than 20 million people were under a flood watch Saturday as severe weather responsible for at least nine deaths continue to pound parts of the country. The storms also brought damaging tornadoes to Alabama, Kentucky and Mississippi. Hundreds of thousands of customers lost power as winds whipped and trees fell. Forecasters at the National Weather Service say temperatures over much of the East Coast will remain well above average, even after a cold front moves through.

<https://edition.cnn.com/2020/01/11/weather/forecast-us-ice-storm-tornado-saturday/index.html>

Ethiopia, Egypt fail to reach agreement on the Nile

The governments of Ethiopia and Egypt have failed to reach an agreement on the use of the Nile River and the filling of Ethiopia's Great Renaissance Dam (GERD) under construction. The third round of the tripartite water ministers meeting held in Addis Ababa involving Sudan, Ethiopia and Egypt in concluded on Friday without agreement between Ethiopia and Egypt. Egypt demanded Ethiopia to fill GERD water between 12 to 21 years, according to Eng. Seleshi Bekele, Minister of Ethiopia Water, Irrigation and Electricity, who briefed reporters after the meeting.

<https://newbusinessethiopia.com/politics/ethiopia-egypt-fail-to-reach-agreement-on-the-nile/>

Communication and Public Affairs/Bureau de la communication et des relations publiques
World Meteorological Organization / Organisation météorologique mondiale
Tel: +41-22-730 8314

From: [WMO CPA](#)
To: [WMO CPA](#)
Subject: In the Media - 30/07/2021
Date: Saturday, 31 July 2021 1:50:44 am

In the Media is a regular compilation providing a snapshot of international media coverage of and commentary on WMO-related issues. It does not purport to be exhaustive. The information contained in the compilation is taken from sources external to the WMO Secretariat and freely available on the Internet. The WMO Secretariat makes no warranty, either express or implied, as to the accuracy. The content of the articles does not reflect the views of the WMO Secretariat.

Highlights of media coverage of WMO/IPCC

WMO mentions

Scientists fear Earth may have gone past the point of no return with climate change amid claims we've passed key environmental tipping points weeks after US witnessed record heatwaves

The Earth's 'vital signs' have taken a turn for the worse, with climate change driving the health of the planet past 'tipping points' which cannot be reversed, scientists say. Researchers have published a new study - itself an update from findings first published in 2019 - that shows 16 of the 31 Earth's vital signs that researchers look at, including greenhouse gas concentration, ocean acidification and ruminant livestock, have recently set new records.

<https://www.dailymail.co.uk/sciencetech/article-9836031/Scientists-fear-Earth-gone-past-point-no-return-climate-change.html>

<https://www.abc.net.au/news/science/2021-07-28/climate-emergency-pandemic-planet-vital-signs-worsening/100329094>

Spanish

<https://noticias.canal1.com.co/internacional/signos-vitales-tierra-estan-debilitando-segun-cientificos/>

<https://www.telesurtv.net/telesuragenda/ola-calor-eeuu-canada-cambio-climatico-riesgos-muertes-20210727-0027.html>

<https://www.telesurtv.net/telesuragenda/ola-calor-eeuu-canada-cambio-climatico-riesgos-muertes-20210727-0027.html>

French

<https://information.tv5monde.com/info/environnement-quelle-strategie-globale-en-matiere-de-rechauffement-climatique-418597>

Is This the End of Summer as We've Known It?

Wildfires roared across the West, threatening the electrical grid, the smoke so thick it could be seen from space, pluming into the jet stream, delaying planes in Denver, turning the sun red in Manhattan, creating its own weather. Health authorities warned that recent

Death Valley-style heat waves had contaminated shellfish from Washington state. Monsoons swept cars from the road in Arizona. Pennsylvania songbirds were dying. But unless greenhouse gas emissions are reduced, scientists say, the massive floods, severe droughts and catastrophic ocean warming the world is experiencing now will only worsen, generating bigger fires, more violent storms, more severe flooding and more extinction. The World Meteorological Organization reported last month that average temperatures on the planet already were consistently at least 1 degree Celsius warmer than in the late 1800s.

<https://news.yahoo.com/end-summer-weve-known-181857950.html>

New Extreme Weather Record? Not So Fast.

(NY Times on WMO Weather and Climate Extremes archive)

Journalists like to cover [record-setting weather](#) in real time, and for good reason: Extreme heat can have significant consequences for [our health](#) and the [fate of the planet](#).

The [seven warmest years in the history of accurate worldwide record-keeping](#) have been the past seven years, and 19 of the 20 warmest years have occurred since 2000; worldwide, [June 2019 was the hottest ever recorded](#) for the month, and June 2020 essentially tied it.

<https://dnyuz.com/2021/07/22/new-extreme-weather-record-not-so-fast-2/>

How Climate Change Impacts US and Global Migration

On average, 23.1 million people have been displaced by natural disasters every year since 2010, according to the [World Meteorological Organization](#).

As rising seas levels, destructive floods, droughts and wildfires threaten communities in the U.S. and around the globe, some say governments need to prepare for more migration.

While there isn't an official designation, some call climate-induced migrants "climate refugees." "Broadly speaking ... climate refugees are people who are displaced by climate events whether it's a large one-time event, or it's a cumulative of events from hurricanes and flooding and wildfires or if it's a chronic condition," said [Sabina Shaikh](#), director of the University of Chicago's Program on Global Environment.

<https://news.wttw.com/2021/07/27/how-climate-change-impacts-us-and-global-migration>

Enough ice melted in Greenland in single day to cover Florida in two inches of water

Researchers say high temperatures in the Arctic are melting Greenland's ice sheets so rapidly that the ice melt from Tuesday of this week alone would be enough to cover the entire state of Florida in two inches of water.

The extreme melting, highlighted by the World Meteorological Organization, is not as bad as in 2019, but scientists say the area of land that is melting is larger this time around.

<https://thehill.com/policy/equilibrium-sustainability/565581-enough-ice-melted-in-greenland-on-tuesday-to-cover-florida>

<https://www.msn.com/en-nz/news/national/alarm-as-massive-ice-melting-event-hits-greenland-where-it-s-warmer-than-nz-right-now/ar-AAMIYmq>

Meteorology

NiMET says diversification of service net will increase revenue, keep it at par globally

DIRECTOR General of the Nigerian Meteorological Agency (NiMET), Professor Mansur Bako Matazu has said that the agency is expanding its services from aviation to maritime observation and agriculture among others to improve on its revenue.

<https://nigerianflightdeck.com/nimet-says-diversification-of-service-net-will-increase-revenue-keep-it-at-par-globally/>

India launches new Earth System Science Data portal

A new portal for 'Earth System Science Data' was launched during the 15th foundation day event of the Ministry of Earth Sciences (MoES), here on Tuesday.->-> View it-->

<https://www.newkerala.com/news/2021/106268.htm>

<https://www.newkerala.com/news/2021/106268.htm>

Artificial rain eases Asia's droughts but heats up tensions

As a heat wave pushes temperatures up to nearly 50 C, a recent video released by the United Arab Emirates shows a city in the arid nation lashed by torrential rain -- the result of a national cloud-seeding operation.

<https://asia.nikkei.com/Business/Science/Artificial-rain-eases-Asia-s-droughts-but-heats-up-tensions>

Hazards

Southeast Europe heatwave set to be among worst in decades

heatwave scorched southeast Europe on Thursday, intensifying wildfires and sending residents flocking to the coast, public fountains and air-conditioned locations to find some relief.

Temperatures rose above 40°C (104°F) in parts of Greece and across much of the region. Weather experts in Athens said they expected the heatwave to extend into next week, making it one of the most severe recorded in the country since the mid-1980s.

<https://jamaica.loopnews.com/content/southeast-europe-heatwave-set-be-among-worst-decades>

Mega Sandstorm in China Momentarily Erases A Silk Road Outpost, Country Announces to Build 'Great Green Wall'

A sandstorm engulfed the northwestern part of China in a scene that can only be imagined in movies. The towering wall of sand engulfed factories and apartment blocks as shown by aerial images of the billowing cloud of yellow dust that smothers Gansu province.

<https://www.sciencetimes.com/articles/32495/20210727/mega-sandstorm-china->

[momentarily-erases-silk-road-outpost-country-announces.htm](#)

Spanish

https://www.telecinco.es/eltiempohoy/meteorologia/inmensa-tormenta-arena-engulle-norte_18_3177048683.html

Get ready to fry! UK summers are to hit 104°F within the decade, forecasters warn

Scorching summers of 104°F (40°C) will become the UK's new 'normal' by the end of the century, forecasters from the Met Office have warned.

The alarming prediction comes as experts warned that temperature and rainfall records are being smashed at a 'shocking' rate in Britain.

<https://expressdigest.com/get-ready-to-fry-uk-summers-are-to-hit-104f-within-the-decade-forecasters-warn/>

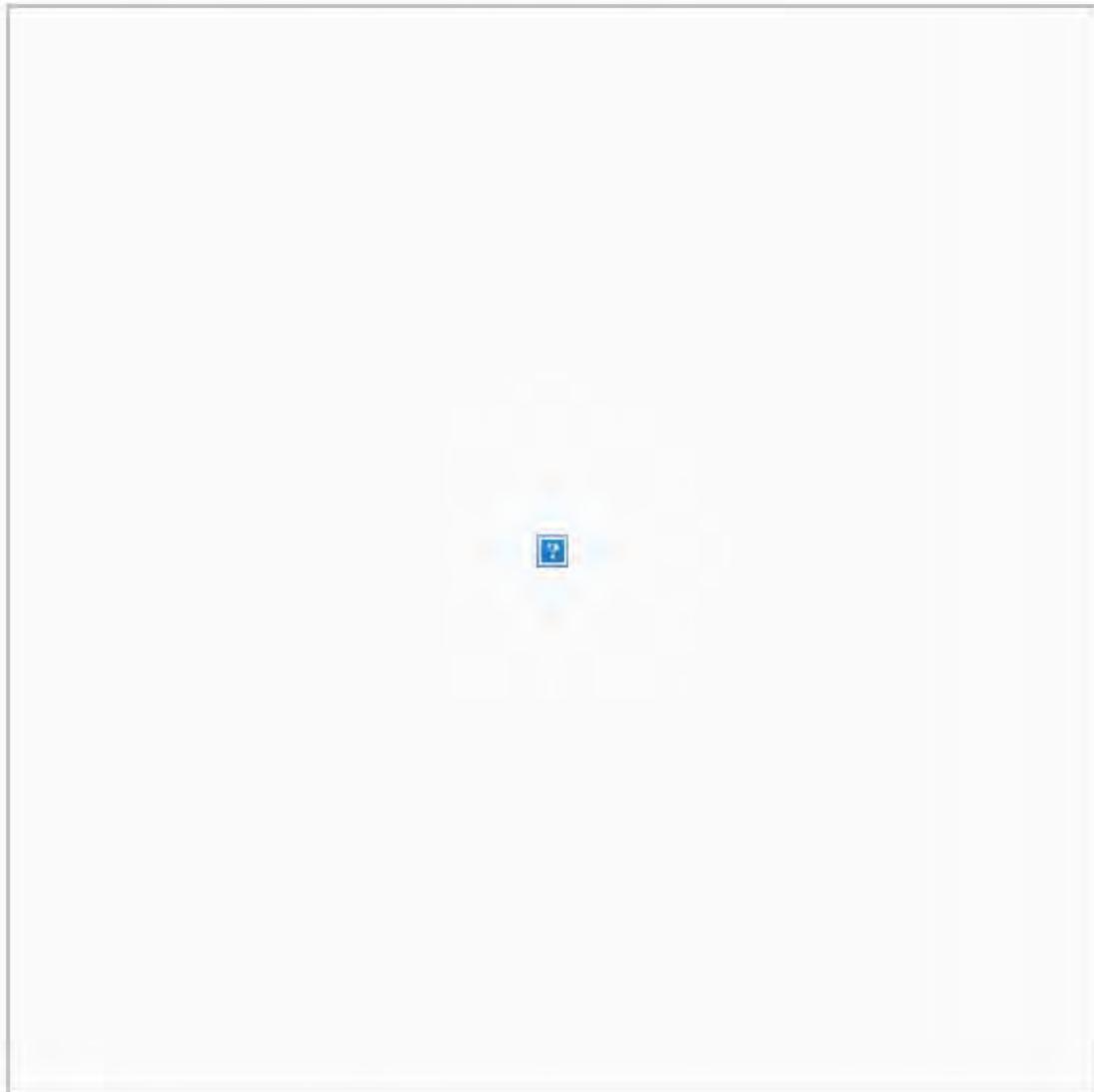
Strategic Communications Office
World Meteorological Organization - WMO

From: [Stephen Hunt](#)
To: [Stephen Hunt](#)
Subject: IPCC REPORT
Date: Wednesday, 10 January 2024 7:15:07 am
Attachments: IPCC_AR6_SYR_FullVolume.pdf

https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_FullVolume.pdf

Sent from my iPhone

From: [EDF Economics](#)
To: [Peter Fisher](#)
Subject: Join EDF Econ for our Environmental Economics Seminar Series
Date: Friday, 15 March 2024 10:52:36 am



Subscribe to Receive Updates About Our New Environmental Economics Seminar Series

We are thrilled to announce the launch of our revamped [Environmental Economics Seminar Series](#), an engaging forum on economic research significant to global environmental policy. Each month, EDF will be curating hour-long seminars featuring some of the field's leading economists to discuss their cutting-edge research and critical policy questions we face in addressing the climate crisis.

**Join Us to Explore Environmental Economics Research Climate Policy
Questions**

This series extends an open invitation to all engaged in or curious about the economic analysis fundamental to crafting effective, equitable climate policies, including researchers, policymakers, media professionals, and more. Attendees will be privy to discussions on the latest high-impact research on economics-based climate policy, gaining insights that are pivotal for shaping a sustainable future.

[Subscribe Now](#)

Upcoming Seminars:

The role of hydrogen in decarbonizing US iron and steel production.

March 21, 2024, 12:00 pm ET

- [Paulina Jaramillo](#) (*Professor, Carnegie Mellon University*)
- [Register now](#)
- To meet our climate goals, all sectors of the economy will need to rapidly decarbonize. Electricity and transportation tend to get the most attention, but decarbonizing materials such as iron and steel will also be necessary. Join us for a seminar with Carnegie Mellon Professor, Paulina Jaramillo, to learn about potential pathways to decarbonize iron and steel.

The economics of solar radiation management.

April 18, 2024, 10:00 am ET

- [Gernot Wagner](#) (*Professor, Columbia Business School*) and [Massimo Tavoni](#) (*Director of the European Institute on Economics and the Environment*)
- [Register now](#)
- To avoid extreme climate damage, it's possible that we might want to use solar geoengineering. How do we balance the benefits of geoengineering with the risks? How do we encourage cooperation and coordination across countries? Join us for a seminar with Columbia Business School Professor, Gernot Wagner and the Director of the European Institute on Economics and the Environment, Massimo Tavoni, for a discussion of the economics of solar geoengineering.

These sessions offer a critical platform for dialogue on the forefront of climate policy and economic research.

Stay Updated!

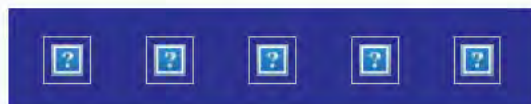
To never miss an update on future seminars and other valuable communications from EDF Economics, check out our [Seminars webpage](#) and please take a moment to [opt-in to receive our emails](#).

Thanks,

EDF Economics

On behalf of The EDF Economics Team

We hope to see you there!
Feel free to share with those you deem interested.



The Economics Team

Environmental Defense Fund
257 Park Ave S
New York, NY 10010

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From: [Stephen Hunt](#)
To: [Norm Henry](#); [Chris Noble](#)
Cc: [Brad Monaghan](#)
Subject: Leading the narrative on the benefits of human forecasting
Date: Friday, 14 January 2022 1:56:51 pm
Attachments: image001.png
image002.png
WEF_The_Global_Risks_Report_2022 (1).pdf

Hi Norm and Chris,

I have just read this article from Wired: [The Danger of Leaving Weather Prediction to AI | WIRED](#)

Do we have the capacity to produce a similar academic article crafted for general publication and lay-consumption, for the NZ context.

There are some nice soundbites in here about the interpretations and interconnections human experience will continue to excel at for the foreseeable future – especially for severe weather and localised events. When you consider this article alongside the WEF Global Risk report I sent recently (attached), I think we could lead the public discussion on this important issue – as a way to keep ahead of the debate and to shape public opinion. It would also follow-up nicely on the Book launch last November.

Chris, how would you feel about this as a project?



Stephen Hunt (he/him)
Chief Executive
MetService – Te Ratonga Tiorangi

M [s9\(2\)\(a\)](#)
Level 2, 110 Featherston Street, Wellington 6011
PO Box 722, Wellington 6140, New Zealand



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From: [The Batch @ DeepLearning.AI](#)
To: [Gael Arnaud](#)
Subject: Machine Learning Detects Cancer Early, Language Model Learns Geometry, AI Creates Jobs, Nations Invest in Homegrown AI
Date: Thursday, 25 January 2024 12:02:23 pm

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[View in browser](#)

The Batch top banners (2)



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Dear friends,

Last week, I attended the World Economic Forum, an annual meeting of leaders in government, business, and culture at Davos, Switzerland. I spoke in a few sessions, including a lively discussion with Aiden Gomez, Daphne Koller, Yann LeCun, Kai-Fu

Lee, and moderator Nicholas Thompson about the present and possible future technology developments of generative AI. You can watch it [here](#).

The conference's themes included AI, climate change, economic growth, and global security. But to me, the whole event felt like an AI conference! (This is not just my bias. When I asked a few non-AI attendees whether they felt similarly, about three-quarters of them agreed with me.) I had many conversations along two major themes:

Business implementation of AI. Many businesses, and to a lesser extent governments, are looking at using AI and trying to develop best practices for doing so. In some of my presentations, I shared my top two tips:

- Almost all knowledge workers can become more productive right away by using a large language model (LLM) like ChatGPT or Bard as a brainstorming partner, copyeditor, tool to answer basic questions, and so on. But many people still need to be trained to use these models safely and effectively. I also encouraged CEOs to learn to use these tools themselves, so they can lead from the top.
- In addition to using an LLM's web interface, API calls offer many new opportunities to build new AI applications. I shared a [task-based analysis framework](#) and described how an analysis like this can lead to buy-versus-build decisions to pursue identified opportunities, with build being either an in-house project or a spin-out.

AI regulation. With many governments represented at Davos, many discussions about AI regulation also took place. I was delighted that the conversation has become much more sensible compared to 6 months ago, when the narrative was driven by misleading [analogies between AI and nuclear weapons](#) and lobbyists had significant momentum pushing proposals that threatened open-source software. However, the fight against stifling regulations isn't over yet! We must continue to protect open-source software and innovation. In detail:



- *I am happy to report that, in many hours of conversation about AI and regulations, I heard only one person bring up AI leading to human extinction, and the conversation quickly turned to other topics. I'm cautiously optimistic that this particular fear — of an outcome that is overwhelmingly unlikely — is losing traction and fading away.*
- *However, big companies, especially ones that would rather not have to compete with open source, are still pushing for stifling, anti-competitive AI regulations in the name of safety. For example, some are still using the argument, “don't we want to know if your open-source LLMs are safe?” to promote potentially onerous testing, reporting, and perhaps even licensing requirements on open-source software. While we would, of course, prefer safe models (just as we would prefer secure software and truthful speech), overly burdensome “protections” could still destroy much innovation without materially reducing harm.*
- *Fortunately, many regulators are now aware of the need to protect basic research and development. The battle is still on to make sure we can continue*

to freely distribute the fruits of R&D, including open-sourcing software. But I'm encouraged by the progress we've made in the last few months.

I also went to some climate sessions to listen to speakers. Unfortunately, I came away from them feeling more pessimistic about what governments and corporations are doing on decarbonization and climate change. I will say more about this in future letters, but:

- Although some experts still talk about 1.5 degrees of warming as an optimistic scenario and 2 degrees as a pessimistic scenario, my own view after reviewing the science is that 2 degrees is a very optimistic scenario, and 4 degrees is a more realistic pessimistic scenario.*
- Unfortunately, this overoptimism is causing us to underinvest in resilience and adaptation (to help us better weather the coming changes) as well as put less effort into exploring potentially game-changing technologies like geo-engineering.*

Davos is held in a cold village where temperatures are often below freezing. In one memorable moment at the conference, I had lost my gloves and my hands were freezing. A stranger whom I had met only minutes ago kindly gave me an extra pair. This generous act reminded me that, even as we think about the global impacts of AI and climate change, simple human kindness touches people's hearts and reminds us that the ultimate purpose of our work is to help people.

Keep learning!

Andrew

P.S. Check out our new short course on “Automated Testing for LLMOps,” taught by CircleCI CTO Rob Zuber! This course teaches how you can adapt key ideas from continuous integration (CI), a pillar of efficient software engineering, to building applications based on large language models (LLMs). Tweaking an LLM-based app can have unexpected side effects, and having automated testing as part of your approach to LLMOps (LLM Operations) helps avoid these problems. CI is especially important for AI applications given the iterative nature of AI development, which often involves many incremental changes. Please sign up [here](#).

News



Early Detection for Pancreatic Cancer

A neural network detected early signs of pancreatic cancer more effectively than doctors who used the usual risk-assessment criteria.

What's new: Researchers at MIT and oncologists at Beth Israel Medical Center in Boston [built](#) a model that analyzed existing medical records to predict the risk that an individual will develop the most common form of pancreatic cancer. The model outperformed commonly used genetic tests.

How it works: The authors trained PrismNN, a vanilla neural network, to predict a patient's risk of receiving a diagnosis of pancreatic ductal adenocarcinoma (PDAC) in the next 6 to 18 months.

- The authors assembled a dataset of roughly 35,000 patients who had developed PDAC and 1.5 million control patients from a proprietary database of anonymized health records from U.S. health care organizations provided by [TriNetX](#) (one of the study's funders). All patients were 40 years or older.
- For each patient, the dataset marked 87 features including age, history of

conditions like diabetes and hypertension, presence of pancreatic cysts, and current medications.

- The authors trained the model on their dataset to predict the probability of PDAC in the next 6 to 18 months. At inference, they classified patients as high-risk if the probability exceeded a certain threshold.

Results: PrismNN identified as high-risk 35.9 percent of patients who went on to develop PDAC, with a false-positive rate of 4.7 percent. In comparison, the genetic criteria typically used to identify patients for pancreatic cancer screening flags 10 percent of patients who go on to develop PDAC. The model performed similarly across age, race, gender, and location, although some groups (particularly Asian and Native American patients) were underrepresented in its training data.

Behind the news: AI shows promise in detecting various forms of cancer. In a randomized, controlled trial last year, a neural network [recognized](#) breast tumors in mammograms at a rate comparable to human radiologists. In 2022, an algorithm successfully [identified](#) tumors in lymph node biopsies.

Why it matters: Cancer of the pancreas is one of the deadliest. Only 11 percent of patients [survive](#) for 5 years after diagnosis. Most cases aren't diagnosed until the disease has reached an advanced stage. Models that can spot early cases could boost the survival rate significantly.

We're thinking: The fact that this study required no additional testing is remarkable and means the authors' method could be deployed cheaply. However, the results were based on patients who had already been diagnosed with cancer. It remains for other teams to replicate them with patients who have not received a diagnosis, perhaps followed by a randomized, controlled clinical trial.

AI Creates Jobs, Study Suggests

Europeans are keeping their jobs even as AI does an increasing amount of work.

What's new: Researchers at the European Central Bank [found](#) that employment in occupations affected by AI rose over nearly a decade.

How it works: The authors considered jobs that were found to be affected by AI over the past decade according to [two studies](#). As a control group, they considered jobs affected by software generally (“recording, storing, and producing information, and executing programs, logic, and rules”), as detailed in one of the studies. They measured changes in employment and wages in those jobs based on a [survey](#) of workers in 16 European countries between 2011 and 2019.

Results: The researchers found that exposure to AI was associated with greater employment for some workers and had little effect on wages.

- Employment of high-education workers rose in jobs affected by AI. This result argues against the hypothesis that AI displaces high-skilled occupations.
- Employment also rose among younger workers in jobs affected by AI.

- Employment and wages among low-education workers and older workers fell in jobs affected by software. This effect was far less pronounced in jobs affected by AI.
- Wages barely changed in jobs affected by AI. Wages fell slightly by one of the three metrics they considered.

Behind the news: Other studies suggest that automation in general and AI technology in particular may benefit the workforce as a whole.

- The United States Bureau of Labor Statistics [found](#) that employment in the U.S. in 11 occupations most exposed to AI, such as translators, personal financial advisers, and fast-food workers, grew by 13.6 percent between 2008 and 2018.
- Economic research in France, the UK, and Japan [suggests](#) that industrial automation correlates with increased employment and higher wages.

Yes, but: It may be too soon to get a clear view of AI's impact on employment, the authors point out. The data that underlies every study to date ends in 2019, predating ChatGPT and the present wave of generative AI. Furthermore, the impact of AI in European countries varies with their individual economic conditions (for instance, Greece tends to lose more jobs than Germany).

Why it matters: Many employees fear that AI — and generative AI in particular — will take their jobs. Around the world, the public is [nervous](#) about the technology's potential impact on employment. Follow-up studies using more recent data could turn these fears into more realistic — and more productive — appraisals.

We're thinking: AI is likely to take some jobs. We feel deeply for workers whose livelihoods are affected, and society has a responsibility to create a safety net to help them. To date, at least, the impact has been less than many observers feared. One reason may be that jobs are made up of many tasks, and AI automates tasks rather than jobs. In many jobs, AI can automate a subset of the work while the jobs continue to be filled by humans, who may earn a higher wage if AI helps them be more productive.

A MESSAGE FROM DEEPLARNING.AI

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Sovereign AI

Governments want access to AI chips and software built in their own countries, and they are shelling out billions of dollars to make it happen.

What's new: Nations across the world are supporting homegrown AI processing and development, *The Economist* [reported](#).

How it works: Governments want AI they can rely upon for state use. The U.S. and China each promised to invest around \$40 billion in the field in 2023. Another 6 countries — France, Germany, India, Saudi Arabia, the UAE, and the UK — pledged a combined \$40 billion. Different governments are emphasizing different capabilities.

- The U.S., home to tech powers like Amazon, Google, Microsoft, and OpenAI, has left the software sector largely to its own devices. However, the federal government has [subsidized](#) the semiconductor industry with a five-year commitment to spend \$50 billion on new factories and devoted much smaller amounts to research.
- China also seeks to bolster its semiconductor industry, especially in the face of

U.S. export [restrictions](#) on AI chips. The government [spent](#) \$300 billion between 2021 and 2022 trying to build a domestic chip manufacturing industry. In addition, the state cracked down on some tech areas (such as video games) to redirect economic resources toward higher-priority areas, established data exchanges where businesses can make data available for AI development, and created [public-private partnerships](#) that support development of advanced technology.

- Saudi Arabia and the UAE are buying up GPUs and investing in universities like Abu Dhabi's Mohamed bin Zayed University of Artificial Intelligence and Thuwal's King Abdullah University of Science and Technology to attract global engineering talent. The UAE plans to make available national datasets in sectors like health and education to local startups such as [AI71](#).
- France, Germany, India, and the UK are supporting their own AI startups. France provides public data for AI development. India is courting cloud-computing providers to build data centers in the country and considering a \$1.2 billion investment in GPUs.

Behind the news: Even as governments move toward AI independence, many are attempting to influence international politics and trade to bolster their positions.

- As EU lawmakers [negotiated](#) the final details of the AI Act, France, Germany, and Italy managed to relax the Act's restrictions on foundation models. These countries worry that strong restrictions would hamper domestic developers such as France's Mistral and Germany's Aleph Alpha and stifle innovation and open source more broadly.
- In September 2022, the U.S. government [blocked](#) exports of advanced GPUs and chip-making equipment to most Chinese customers. The sanctions threaten even non-U.S. companies that try to circumvent the restrictions. Consequently, in December, the UAE-based AI developer G42 [cut](#) ties with Chinese equipment suppliers. Earlier, the U.S. had [extended](#) the restrictions to some Middle Eastern countries including the UAE and Saudi Arabia.

Why it matters: AI has emerged as an important arena for international competition, reshaping global society and economics, generating economic growth, and affecting national security. For engineers, the competition means that governments are competing to attract talent and investment, but they're also less inclined to share technology across borders.

We're thinking: We understand governments' desires to ensure access to reliable AI, but focusing on sovereignty above all is misguided. In a networked world, developments can't be contained to one country. Cooperation ensures that development proceeds at a rapid pace and benefits everyone.



Learning the Language of Geometry

Machine learning algorithms often struggle with geometry. A language model learned to prove relatively difficult theorems.

What's new: Trieu Trinh, Yuhuai Wu, Quoc Le, and colleagues at Google and New York University proposed [AlphaGeometry](#), a system that can prove geometry theorems almost as well as the most accomplished high school students. The authors focused on non-combinatorial Euclidean plane geometry.

How it works: AlphaGeometry has two components. (i) Given a geometrical premise and an unproven proposition, an off-the-shelf [geometric proof finder](#) derived statements that followed from the premise. The authors modified the proof finder to deduce proofs from not only geometric concepts but also algebraic concepts such as ratios, angles, and distances. (ii) A transformer learned to read and write proofs in the proof finder's specialized language.

- The authors generated a synthetic dataset of 100 million geometric premises, propositions, and their proofs. For instance, given the premise, "Let ABC be

any triangle with $AB = AC$ (an isosceles triangle) and the proposition " $\angle ABC = \angle BCA$," the proof involves constructing a line between A and the midpoint between B and C. The authors translated these problems into the proof finder's language. They pretrained the transformer, given a premise and proposition, to generate the proof.

- The authors modified 9 million proofs in the dataset to remove references to some lines, shapes, or points from premises. Instead, they introduced these elements in statements of the related proofs. They fine-tuned the transformer, given a modified premise, the proposition, and the proof up to that point, to generate the added elements.
- At inference, given a premise and proposition, the proof finder added statements. If it failed to produce the proposition, the system fed the statements so far to the transformer, which predicted a point, shape, or line that might be helpful in deducing the next statement. Then it gave the premise, proposition, and proof so far — including the new element — to the proof finder. The system repeated the process until the proof finder produced the proposition.

Results: The authors tested AlphaGeometry on 30 problems posed by the International Mathematical Olympiad, an annual competition for high school students. Comparing that score to human performance isn't so straightforward because human competitors can receive partial credit. Human gold medalists since 2000 solved 25.9 problems correctly, silver medalists solved 22.9 problems, and bronze medalists solved 19.3 problems. The [previous state-of-the-art approach](#) solved 10 problems, and the modified proof finder solved 14 problems. In one instance, the system identified an unused premise and found a more generalized proof than required, effectively solving many similar problems at once.

Why it matters: Existing AI systems can juggle symbols and follow simple rules of deduction, but they struggle with steps that human mathematicians represent visually by, say, drawing a diagram. It's possible to make up this deficit by (i) alternating between a large language model (LLM) and a proof finder, (ii) combining geometric and algebraic reasoning, and (iii) training the LLM on a large data set. The result is a breakthrough for geometric problem solving.

We're thinking: In 1993, the teenaged Andrew Ng represented Singapore in the International Mathematics Olympiad, where he [won](#) a silver medal. AI's recent progress in solving hard problems is a sine of the times!

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From:

s9(2)(a)

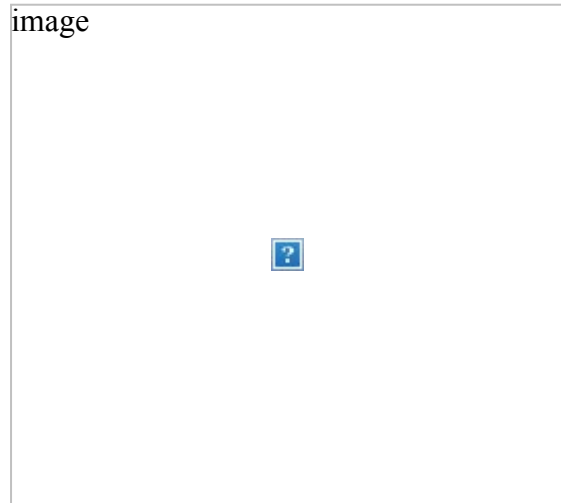
Date:

Thursday, 4 April 2024 3:15:52 pm

Maybe they know about the weather-modification-beam 

From: [redacted] s9(2)(a) [redacted]
Date: Thursday, 4 April 2024 3:14:32 pm
Attachments: 0-eaua-d5-e189d53863e6603da8fb4cd687a3ab6c

Oh dear! Time to crank up the weather-modification-beam ?



From:

[s9\(2\)\(a\)](#)

To:

[Chris Noble](#); [nodding](#); [Auckland Lead](#); [Nicola Weston](#); [Emma Blades](#); [Angeline Wadsworth](#); [Tony Hawkins](#); [Debs Walker](#); [MetPress](#); [Janine Bremner](#); [Clinton Ward](#); [Julie Moffett](#); [Greg Reeve](#); [Peter Grant](#); [Adam Chetty](#); [Alex Griffin](#); [Brian Tiller](#); [Carl Elphick](#); [Luke Kelly](#); [Peter Little](#); [Matt Pearce](#); [Silvia Martino](#); [Tamara GnjidicVuksa](#); [Aidan Pyselman](#); [Alain Baillie](#); [Allister Gorman](#); [Alwyn Bakker](#); [Amy Rossiter](#); [Andrew James](#); [Andy Best](#); [Angus Hines](#); [April Clark](#); [Arno Dyason](#); [Ashlee Parkes](#); [Bill Singh](#); [Brian Mercer](#); [Chelsea Glue](#); [Ciaran Doolin](#); [Curtis Hayes](#); [Daniel Corrigan](#); [Frances Russell](#); [Fulong Lu](#); [Gerard Barrow](#); [Gerard Bellam](#); [Hannah Moes](#); [Heath Gullery](#); [Hordur Thordarson](#); [Jessie Owen](#); [John Crouch](#); [Jonathan Tunster](#); [Joshua Griffin](#); [Karl Loots](#); [Kathryn Boorman](#); [Katie Hillyer](#); [Kyle Lee](#); [Larissa Marintchenko](#); [Leigh Matheson](#); [Lewis Ferris](#); [Mads Naeraa](#); [Matthew Ford](#); [Art Oosterwijk](#); [Melissa Roux](#); [Michael Martens](#); [Miroslav Malivuk](#); [Mmathapelo Makgabutlane](#); [Neal Osborne](#); [Nicholas Zachar](#); [Nicole Ranger](#); [Paul Ngamanu](#); [Philippa Murdoch](#); [Pierre Foucaud](#); [Raveen Das](#); [Robert Kerr](#); [Sarah Garlick](#); [Sarah Haddon](#); [Sarah Sparks](#); [Simon Kay](#); [Simon Patchett](#); [Sonja Farmer](#); [Stephen Glassey](#); [Tom Bell](#); [Tui McInnes](#); [Tuporo Marsters](#); [Vive Biukoto](#); [William Nepe](#); [Ramon Oosterkamp](#); [Elke Louw](#); [Marcel Roux](#); [Melanie Graham](#); [David Miller](#); [Georgina Griffiths](#); [James Millward](#); [Kazutaka Nagata](#); [Luis Fernandes](#); [Timothy Baker](#); [Isabela Vaz](#); [Jake Cope](#); [Marie Greenaway](#); [Rochelle Fleming](#); [Jasmine Kennedy](#); [Mark Schwarz](#); [Bob Griffin](#); [Chris Webster](#); [Darren Schollum](#); [Katarina Kovacevic](#); [Lisa Murray](#); [Mohammed Nabi](#); [Paul Hammarsal](#); [Peter Fisher](#); [Rebecca Boettger](#); [Juliane Bergdolt](#); [Thomas Mould](#); [Media Control Desk](#); [Colin Tan](#)

Date:

Sunday, 19 December 2021 8:16:27 am

Who knows? I've always wondered how one judges a cloud-seeding system to be effective!

From:

[s9\(2\)\(a\)](#)

To:

[Chris Noble](#); [nodding](#); [Auckland Lead](#); [Nicola Weston](#); [Emma Blades](#); [Angeline Wadsworth](#); [Tony Hawkins](#); [Debs Walker](#); [MetPress](#); [Janine Bremner](#); [Clinton Ward](#); [Julie Moffett](#); [Greg Reeve](#); [Peter Grant](#); [Adam Chetty](#); [Alex Griffin](#); [Brian Tiller](#); [Carl Elphick](#); [Luke Kelly](#); [Peter Little](#); [Matt Pearce](#); [Silvia Martino](#); [Tamara GnjidicVuksa](#); [Aidan Pyselman](#); [Alain Baillie](#); [Allister Gorman](#); [Alwyn Bakker](#); [Amy Rossiter](#); [Andrew James](#); [Andy Best](#); [Angus Hines](#); [April Clark](#); [Arno Dyason](#); [Ashlee Parkes](#); [Bill Singh](#); [Brian Mercer](#); [Chelsea Glue](#); [Ciaran Doolin](#); [Curtis Hayes](#); [Daniel Corrigan](#); [Frances Russell](#); [Fulong Lu](#); [Gerard Barrow](#); [Gerard Bellam](#); [Hannah Moes](#); [Heath Gullery](#); [Hordur Thordarson](#); [Jessie Owen](#); [John Crouch](#); [Jonathan Tunster](#); [Joshua Griffin](#); [Karl Loots](#); [Kathryn Boorman](#); [Katie Hillyer](#); [Kyle Lee](#); [Larissa Marintchenko](#); [Leigh Matheson](#); [Lewis Ferris](#); [Mads Naeraa](#); [Matthew Ford](#); [Art Oosterwijk](#); [Melissa Roux](#); [Michael Martens](#); [Miroslav Malivuk](#); [Mmathapelo Makgabutlane](#); [Neal Osborne](#); [Nicholas Zachar](#); [Nicole Ranger](#); [Paul Ngamanu](#); [Philippa Murdoch](#); [Pierre Foucaud](#); [Raveen Das](#); [Robert Kerr](#); [Sarah Garlick](#); [Sarah Haddon](#); [Sarah Sparks](#); [Simon Kay](#); [Simon Patchett](#); [Sonja Farmer](#); [Stephen Glassey](#); [Tom Bell](#); [Tui McInnes](#); [Tuporo Marsters](#); [Vive Biukoto](#); [William Nepe](#); [Ramon Oosterkamp](#); [Elke Louw](#); [Marcel Roux](#); [Melanie Graham](#); [David Miller](#); [Georgina Griffiths](#); [James Millward](#); [Kazutaka Nagata](#); [Luis Fernandes](#); [Timothy Baker](#); [Isabela Vaz](#); [Jake Cope](#); [Marie Greenaway](#); [Rochelle Fleming](#); [Jasmine Kennedy](#); [Mark Schwarz](#); [Bob Griffin](#); [Chris Webster](#); [Darren Schollum](#); [Katarina Kovacevic](#); [Lisa Murray](#); [Mohammed Nabi](#); [Paul Hammarsal](#); [Peter Fisher](#); [Rebecca Boettger](#); [Juliane Bergdolt](#); [Thomas Mould](#); [Media Control Desk](#); [Colin Tan](#)

Date:

Sunday, 19 December 2021 8:14:23 am

The photo made me think of how South African meteorologists developed a cloud-seeding system several decades ago. One of them flew over a pulp mill (paper production) on a commercial flight, and noticed how the material coming out of the chimney was acting quite effectively as cloud condensation nuclei. So, they investigated what it contained, and developed a system to artificially recreate the constituents. The cloud seeding was (apparently!) reasonably effective. If I remember correctly, it was applied commercially in the Middle East.

From: [Stephen Hunt](#)
To: [Stephen Hunt](#)
Date: Sunday, 15 August 2021 8:29:19 pm
Attachments: WEF_The_Global_Risks_Report_2021.pdf

http://www3.weforum.org/docs/WEF_The_Global_Risks_Report_2021.pdf

Sent from my iPhone

From: [Aaron Price from Weather with a Twist](#)
To: [Nicholas Zachar](#)
Subject: Make No Little Plans
Date: Monday, 8 April 2024 5:32:53 am

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Make No Little Plans

The African Great Green Wall's Impact on Precipitation

AARON PRICE

APR 7



READ IN APP

SimEarth was a best-selling video game from the 1990s. Through it, I spent many hours avoiding homework and lawn mowing by geo-engineering new versions of Earth and Mars. Constructing a better world through science and engineering is a popular subgenre of science fiction and gaming. And in the real world, we are witnessing a remarkable geoengineering project to transform the Earth into a vast hot tub.

The African Great Green Wall (GGW) is an ambitious reforestation endeavor designed to create a contiguous swath of forest stretching across Africa from Senegal to Djibouti. Spearheaded by the African Union, this initiative spans over 8,000 km and involves 22 African countries. The GGW initiative aims to restore 100 million hectares of land currently facing degradation.



The African Great Green Wall ([Sevgart, CC BY-SA 4.0, via Wikimedia Commons](#))

The initiative's primary objective is to halt the complete desertification of the Sahel region in Africa—a zone bordered by the arid Sahara desert to the north and the more humid savannas to the south. Over recent decades, this area has increasingly adopted desert characteristics, leading to famines, climate change, and widespread regional instability.

As we saw in [an earlier WWAT article](#), surface vegetation significantly affects the atmosphere above it. The aspiration behind the Great Green Wall is to foster a more stable climate in the region that is less prone to extreme variations such as flooding and droughts. Additionally, the project aims to sequester 250 million tons of carbon. It can do this in a number of ways, including:

- **Evapotranspiration** – Vegetation releases water vapor through [transpiration](#), which cools the air and increases humidity. This can influence cloud formation and precipitation patterns.
- **Albedo** – Compared to sandy environments, the darker colors of vegetation can absorb more heat in the day and release it at night ([heat capacity](#)). This decreases extremes that can be tough on life.
- **Wind patterns** – The increased roughness of vegetation can [impact](#) surface-level wind patterns, limiting erosion.
- **Climate** – Vegetation increases CO2 absorption and sequestration.
- **Singing** - It can inspire [polkas about the weather](#).

Hope can be a powerful drug, but will it match reality? Forecasting the effects of such a vast project on regional weather patterns is complex. Various factors need consideration, including the interconnected nature of climate systems—where increased rainfall in one area might lead to drought in another.

To investigate the implications of the GGW on weather, two researchers in Germany, [Dr. Gerhard Smiatek](#) and [Dr. Harold Kunstmann](#), modeled the impact the GGW may have on weather conditions across the region. They started with an existing computer model called the *Model for Prediction Across Scales (MPAS)*, which is a scalable, global climate and weather modeling software package. They simulated changes in vegetation in the regions around the GGW, focusing on its precipitation impact and related variables during the June – September rainy season.



Modeled precipitation change for the entire summer season (left) and only August – the highest precipitation month - (right). It predicts more precipitation to the east and less to the west, but the differences are not significant. (Earth Interactions 27, 1; [10.1175/EI-D-22-0013.1](#))

What did they find? Not much! The study revealed no significant effects on summer precipitation patterns within the Sahel region, nor any detrimental impacts on adjacent regions. There were minor changes observed in other variables, such as temperature, radiation flux, and rainwater runoff, but these were slight.

Limitations of the simulation include an assumption that the Great Green Wall instantaneously pops into existence as if the Jolly Green Giant harvested it overnight. However, the reality of such a transformation would involve slower, incremental and heterogeneous growth. Furthermore, the models rely on current precipitation trends, which are likely to change in the future due to climate change.



The Jolly Green Giant, at your service. (Paul C. Hedberg, photograph by Jonathunder, Public domain, via [Wikimedia Commons](#))

When Nothing is Something

This is an example of a null effect in science – when an intervention (in this case, the creation of the GGW) does not show a predicted effect (in this case, precipitation impact). It is quite common in science, though you wouldn't know it by looking at research journals. Authors and editors prefer to publish positive results, creating a bias in the scholarship that science is struggling to deal with. Kudos to the authors and the journal, Earth Interactions, for publishing the results. Although not definitive on their own, these results pose ideas and questions that need to be addressed with further research.

Also, beyond its impact on precipitation, there are other possible benefits of the GGW. Ecologically the moderated temperatures may allow some life to more easily adapt to a changing climate. And it could preserve ecosystems serving as a refuge from extreme weather and man-made deforestation. Agriculturally, it could help keep soil healthier and make local weather more predictable thereby helping farmers. And then there is the simple fact that it would likely be a beautiful place and new wonder of the world.

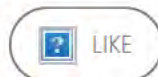
And Now for Something Completely Different



The *Great Weather Song Person* is Matt Farley. In 2014, he published an album, **Meteorology Music for You**, which consists of 88 (one for each piano key) songs about weather. The songs are short and catchy with tongue-in-cheek titles like “*Look at All this Fog (It’s Ridiculous)*” and “*Ice Caps are Melting. Someone Do Something!*”. If you are a parent, you have likely encountered Mr. Farley through his songs about poop, which are among the most requested songs by children via Alexa. To get my own kiddo to take her baths, I allowed her to listen to these songs in the tub as an incentive. It worked wonders. And for that, I’ll always be in Mr. Farley’s debt.

We acknowledge additional contributions by Dr. Swarndeeep Gill.

Thanks for reading Weather with a Twist! Subscribe for free to receive new posts.



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From: [REDACTED]; [Michael Martens](#); [REDACTED]
Subject: master draft programme
Date: Tuesday, 2 November 2021 11:24:18 pm
Attachments: MASTER_Programme_2Nov.xlsx

Hello everyone,

Please find attached the master spreadsheet of submissions and draft programme. I've taken it as far as I can and now it needs to pass on to the care of the committee to finalise and pass back to us so that we can create the detailed programme to launch on the website.

Ideally someone(s) would work on this prior to the Friday meeting so that you had a good understanding of where things are and could resolve anything that may need committee discussion. Daniel has kindly been working with me on this to date but isn't available to do this before the meeting. So perhaps someone else can put up a hand or alternatively I recommend you all agreed to firm date and person(s) to get this finished. Launching the detailed programme next week would help ensure you retain interest and presenters. It also gives us a couple of weeks to promote before the holiday season kicks in.

Steps needed by programme committee:

1. Review programme (UC and virtual sheets) and add in any missing elements, check times (invited speakers)
2. Review general session talks and confirm location and order by noting on submissions sheet – the pivot table sheet will also assist with this, please note to ensure NZ speakers are placed in week 1
3. Look to see if any shifting of sessions is needed and if any of the general talks can be adjusted to avoid running over session max lengths of 6 or 8, also would be good to see if we can drop down to only 4 concurrent sessions Wed
4. Review pivot table and advise on any actions to suggestions around extra spaces
5. Final cross check to make sure no duplicative sessions – you don't need to drop talks into the spreadsheet as long as you insert the session name and order in the submissions sheet

To discussed at the Friday meeting – dedicated poster sessions and networking activities in the second week. These are not yet added in.

s9(2)(a) [REDACTED] Please advise if you desire a AMOS awards or special session in which case we could add that to week 2's programme.

Notes:

- The session orders have been provided by their respective convenors so no action needed for those
- Please only have keep only 1 master file – I tried to add this to Google Sheets but it was too big, if you place it somewhere that everyone can access please also give us access so we can help keep current
- There are a large number of posters – there may be some attrition of these as some were talks shifted to posters, acceptance letters have gone out and a confirmation form allows people to withdraw so we are tracking these

- I have noted on the pivot table sheet where sessions aren't full and what a desirable action
- [REDACTED] has sent the invitations to the UC and Ngai Tahu speakers – I've added a space for one in the UC week and the other may need to be in week 2
- The workshops and social activities are not all shown/detailed – we will integrate them into the final detailed programme

As [REDACTED] mentioned, part of the meeting agenda will be to touch on the COVID situation and virtual back up plan.

I'm happy to support any queries or fine tuning queries. I hope that the content entices you all.

Kind regards,

s9(2)(a)

[REDACTED] | Conference Manager

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s9(2)(a)

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-----Original Appointment-----

From: [REDACTED]

Sent: Tuesday, 2 November 2021 1:59 PM

To: [REDACTED]

[REDACTED] Michael Martens; [REDACTED]

Subject: ICSHMO meeting 2pm NZ time (midday for Australia)

When: Friday, 5 November 2021 2:00 PM-3:00 PM (UTC+12:00) Auckland, Wellington.

Where: Microsoft Teams Meeting

Hi All

Meeting to discuss finalising the scientific programme and virtual back-up for February 2022.

Regards

[REDACTED]

Microsoft Teams meeting

Join on your computer or mobile app

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[Learn More](#) | [Meeting options](#)

From: s9(2)(a) [redacted]; Chris Kroger; s9(2)(a) [redacted]
Subject: MBIE proposal submitted and PDF attached
Date: Wednesday, 8 March 2023 10:32:48 am
Attachments: PROP-89536-ENDRP-UOC_Full_080323_0946.pdf

Kia ora tatou,

I am pleased to identify that after a few minor hiccups with the MBIE portal last evening (a nationwide issue with IMPACT section not print previewing) that our MBIE proposal has been submitted (see attached)! I'd like to thank you all for the many hours that have gone into making this proposal. It is in my experience, the best proposal I have ever led. This is in no small part to the team that helped create it, particularly all of you that put in so much hard work. I think MBIE would be crazy not to fund this effort to be honest. But, we have to be aware that success rates are low (10-15%) so please ensure that you keep fingers crossed in upcoming months.

I want to highlight two people for special praise and that is [redacted] and [redacted]. We've been working on this proposal together since October last year. Without [redacted] continual requests to improve and strengthen this proposal would not be as good. Without [redacted] herculean efforts to rewrite the Implementation Plan over the weekend, and all his other efforts, I think this proposal would be much weaker. So special thanks to them!

Please pass on my appreciation to your wider teams for their willingness to be involved.

I look forward to working with you all in the future. Time to cross fingers.

Ngā mihi nui,

s9(2)(a) [redacted]

PS. Chocolate is in the post...

s9(2)(a) [redacted]

University of Canterbury, Private Bag 4800, Christchurch, New Zealand
Phone: +64 3 3692064, Ext 92064

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From: [GoAnywhere MFT](#)
To: [Julie Moffett](#); [Tony Hawkins](#)
Subject: MetService Proofer TV-Monday, 24 June
Date: Tuesday, 11 June 2024 4:34:12 pm
Attachments: MetService-Proofer-TV24.pdf

Enjoy.

From: [Meteorological Technology International](#)
To: [Peter Lowe](#)
Subject: NASA flights to investigate sea level rise impact on Mississippi Delta
Date: Friday, 6 March 2020 11:50:30 pm

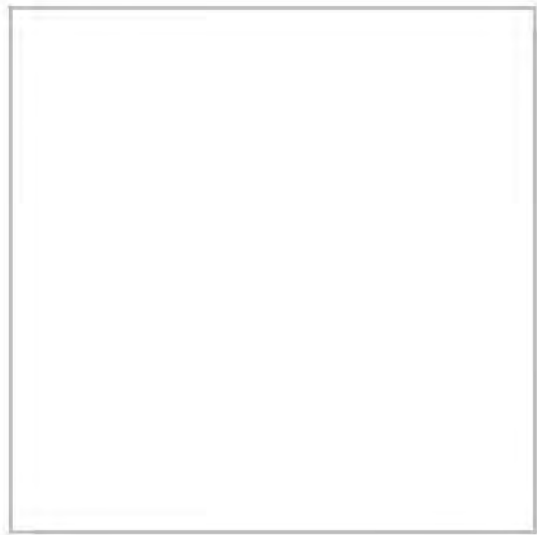
Meteorological Technology International



Lead News: NASA flights to investigate sea level rise impact on Mississippi Delta

NASA is set to launch an airborne mission aimed at understanding the impact of sea level rise on the Mississippi River Delta.

[> Read More](#)



OTT HydroMet



| **Video:** ANU satellite to monitor bushfires

A satellite to monitor bushfires will be developed by researchers at the Australian National University.

> Watch Here



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| ANU to monitor bushfires from space

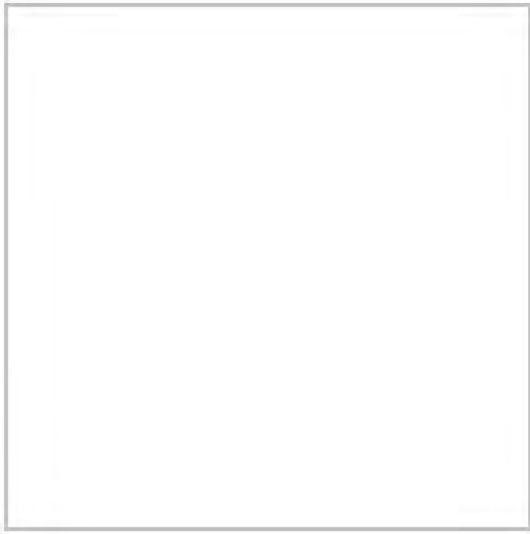
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| **Cover Story:** Artificial intelligence

Deep learning has the potential to offer new, previously unseen levels of forecasting with great accuracy. *Meteorological Technology International* looks at how three institutions are using the method to better predict hail, hurricane intensity and storm damage.

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From: s9(2)(a)
Subject: Netherlands - Candidacy for the Executive Council of WMO
Date: Thursday, 18 May 2023 7:05:55 am
Attachments: NL-Candidature-WMO-EC_MvA.pdf
s9(2)(a).pdf

You don't often get email from maarten.van.aalst@knmi.nl. [Learn why this is important](#)

Dear Colleagues,

It is my pleasure to inform you about my candidacy for the Executive Council of WMO. As Director General and Chief Science Officer of the Royal Netherlands Meteorological Institute (KNMI) I would be honored to bring my professional experience to the Executive Council and help the WMO and its members to achieve the goals set out in the WMO's long-term strategic plan for 2024-2027.

In particular, I feel I could support the WMO with my experience bridging science, policy and practice. Before coming to KNMI, I led the international Red Cross Red Crescent Climate Centre, and have worked with a range of international organizations, including the World Bank, particularly also to strengthen collaboration with NHMS and the WMO. In addition, I was Coordinating Lead Author in the IPCC, and expert advisor to UNDRR and UNFCCC. The Netherlands government is highly committed to supporting the WMO and its partners to tackle the rising risks we face, including through a recent EUR 50 million commitment to WMO, UNDRR and IFRC towards SOFF and Early Warning Systems for All. Please find attached my CV and personal statement.

I hope to count on your support, and look forward to seeing you in Geneva. Do not hesitate to reach out if you would like to schedule an in-person meeting.

Yours sincerely,

s9(2)(a)

.....
Royal Netherlands Meteorological Institute (KNMI)
Ministry of Infrastructure and Water Management
Utrechtseweg 297 | 3731 GA De Bilt
PO Box 201 | 3730 AE De Bilt | The Netherlands

.....
s9(2)(a)

www.knmi.nl
.....

From: [InterMET.Digital](#)
To: [Rob Harrison](#)
Subject: News Digest | March 2023 Edition
Date: Monday, 6 March 2023 9:49:02 pm

[View this email in your browser](#)



News digest - March 2023 edition

Welcome to the second edition of the free monthly news digest from [InterMET.digital](#), the indispensable portal serving the meteorology, flood and air quality industries, and sister channel to the [Asia Climate Forum](#) taking place in Singapore from 18-20 April. Registration for the show free of charge is now open - just click the button below.

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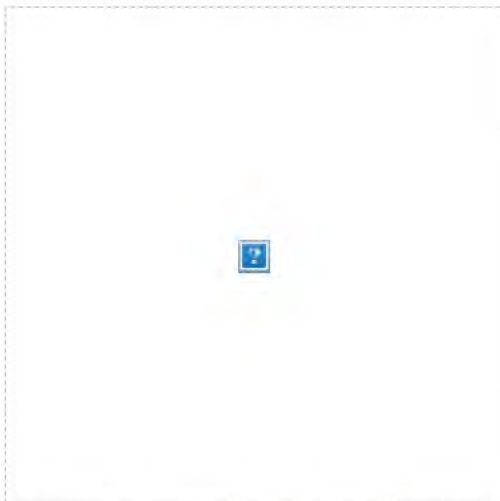
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Vaisala announces **record financial results** for 2022, aided by strong growth in the meteorology segment



UAE officially announces the **candidacy of Abdullah Al Mandoos** to head the World Meteorological Association



Amid 'spy balloon' controversy, WMO **highlights key role of weather balloons** in climate monitoring



Artificial Intelligence brings **real-time weather alerts** to flood-prone Thailand and Vietnam



Indonesia's BMKG and Finland's FMI announce collaboration to improve weather forecasting capacity

The United Arab Emirates doubles number of cloud-seeding flights in six years in bid to boost rainfall

Quick links

Click [here](#) to view more than 400 items in the **Product Showcase** and [here](#) for more than 220 company profiles in the **Industry Showcase**.

INDUSTRY & PRODUCTS

- **EWR Radar Systems** to supply solid-state weather radars in Southeast Asia
 - **Biral thunderstorm detector** incorporated into SaxaVord Spaceport
 - Baron Weather welcomes **new Vice President of Operations**
 - **MicroStep-MIS** publishes convective rainfall nowcasting project results
 - Vaisala Xweather is first to offer **new type of data on lightning** in the U.S.
 - **Climavision** closes critical weather radar gap in North Carolina
 - Weather tech firm **Nevis Technology** wins six-figure space launch deal
- AeroX kicks off statewide **advanced air mobility weather study** in North Carolina
 - OroraTech: **fighting climate change from outer space**
 - New **MFI agrometeorology project** in Paraguay

CLIMATE, WEATHER & TECHNOLOGY

- How NZ can learn from Australia's **recent devastating floods**
- NASA builds **small, low-cost weather sensors** to track tropical cyclones
- Modern weather forecasting relies on **accurate measurement**. How do we do that?
 - **IWMI supports Zambia** with post-flood recovery strategy
 - Fifteen million people at risk of severe **floods from melting glaciers**
- Indonesia to prevent peatland fires using '**weather modification technology**'
 - Creating clouds for **icing research**
 - Artificial intelligence used **to predict space weather**
 - A concrete plan to **make cities more resilient to flooding**
 - Tech: **the hunt for a better weather forecast**
- Study finds that equatorial waves may be **useful precursors to cyclones**

NMHS's & ASSOCIATIONS

- ACF and China Meteorological Service Association **form strategic partnership**
- Caribbean sees first regional launch of **global plan on early warning systems**
- Philippine Gov't allocates **PHP 20bn for integrated flood resilience project**
- New weather monitoring a major upgrade to **Vanuatu's climate resilience**
 - **ECMWF** publishes new software strategy
- WMO publishes **guidelines for NMHSs** for satellite-based nowcasting in Africa

- **Digital transformation** will improve early warnings in Africa

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SIWW SPOTLIGHT 2023, 4-6 June, Singapore. Theme: Urgent climate action

Featured Asia Climate Forum exhibitor



MicroStep-MIS - Stand A16 at [Asia Climate Forum 2023](#)

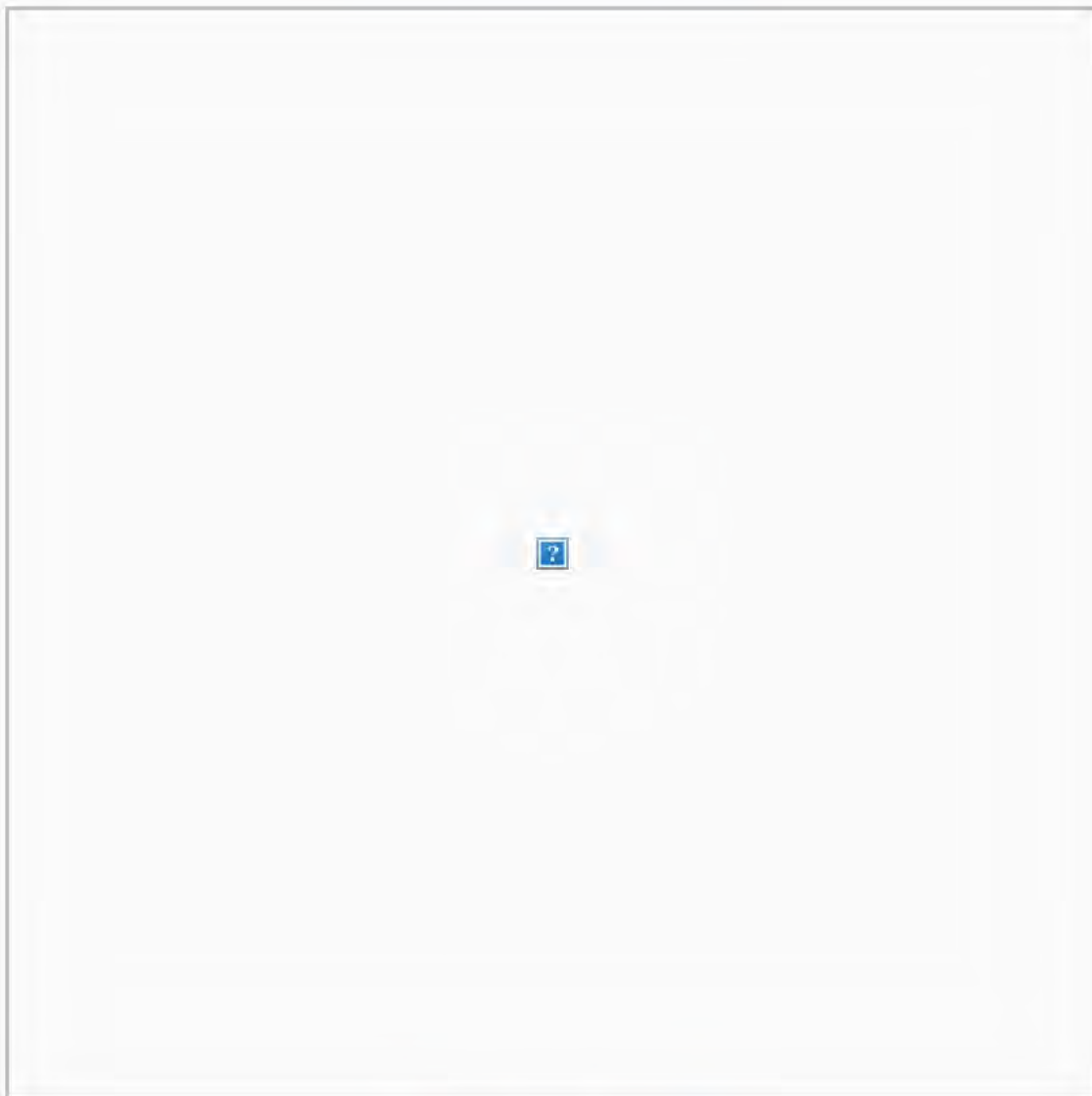
MicroStep-MIS is a long-term exhibitor at Asia Climate Forum, and InterMET Asia before that. The company has been operating in the area of environmental monitoring since 1993. For the past 27 years they have established themselves as an accepted and respected worldwide player in the field.

Their aim is to do business with high ethical standards, distinguished by respect to their partners' needs, and within the framework of their core values. They believe in the power of constant development, ongoing research, and steady innovation. The final outcome is effective and timely weather-related decision-making by their clients which is based on reliable and timely data provided by their monitoring systems.

Satisfaction of their clients is the top priority, therefore they strive to continuously invest in the improvement of their products and services based on the clients' needs and desires.

They believe that their success goes hand in hand with facilitating their clients to achieve their visions; and they are very proud to be part of those meaningful mutual projects around the globe.

MicroStep-MIS full profile



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From: [Newsroom](#)
To: [Mark Schwarz](#)
Subject: Newsroom Daily Briefing
Date: Friday, 22 November 2019 7:36:58 am

Your daily briefing from [Newsroom](#).

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Last night at the NZTV Awards Newsroom won best “Current Affairs Programme”. It is further reward for our Investigations Editor, Melanie Reid and her work on uncovering the brutal reality of uplifting newborn babies from Maori mothers and the devastating impact of Chinese backed tourism developments in Fiji.

It also shows just how much journalism is changing in New Zealand. New digital platforms, like Newsroom, are stepping up as the TV Networks retrench. We're thankful for the support of our foundation partners and NZ on-air but we couldn't do it

with our donors. If you can help, and it doesn't matter how much you can afford, we can keep doing the stories that really matter.

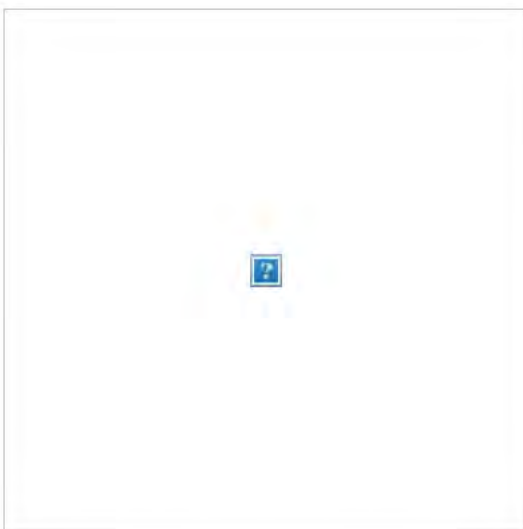


Mark Jennings,
Newsroom co-editor

Today's top stories

Questions remain on donations saga

By Sam Sachdeva | [Click here to read more](#)



After days of tricky questions about the NZ First Foundation, the PM and her deputy have earned a respite - but not for long.

Jones threatens Ports of Auckland CEO

By Dileepa Fonseka | [Click here to read more](#)



“My advice to you as a chief executive is do not put your head in a political noose,” - Shane Jones threatening Ports of Auckland CEO Tony Gibson in a heated Beehive meeting over the port’s public campaign launched to challenge the Government’s own study.

Newsroom wins Best Current Affairs Programme

By Newsroom staff | [Click here to read more](#)

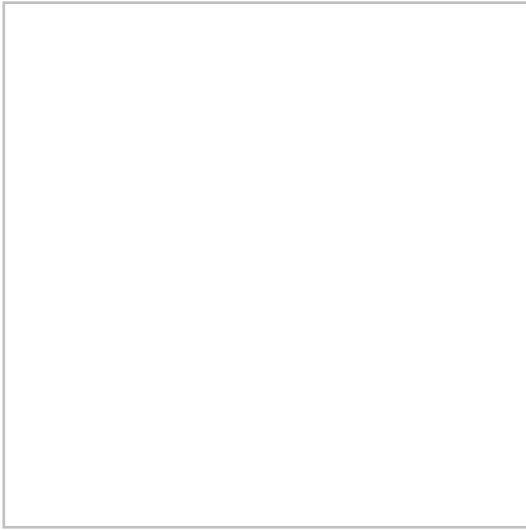


Newsroom's major investigations of 2019 have won us the award for best current affairs programme at the NZ TV awards.

The new left-right divide on climate

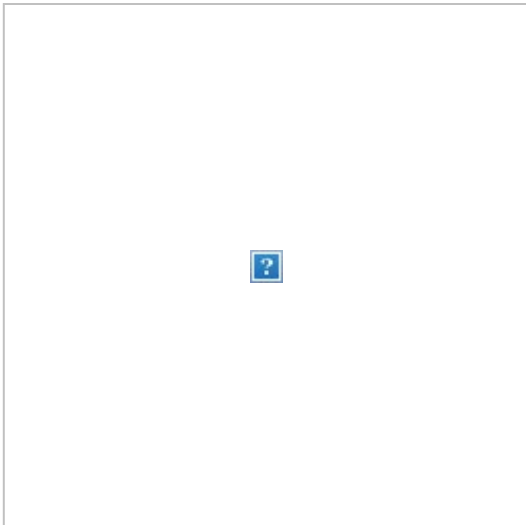
By Eloise Gibson | [Click here to read more](#)

With emissions still rising, climate geo-engineering requires debate. But political researchers fear people are falling into the same left/right tribalism that’s long plagued climate politics.



The Detail podcast: NZ is still building leaky homes

By Newsroom Staff | [Click here to read more](#)

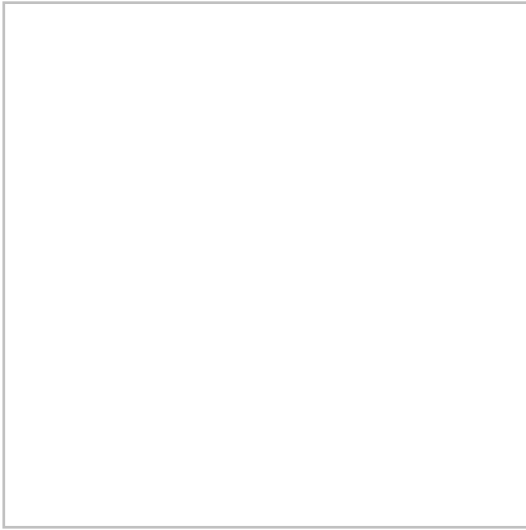


The Detail news podcast today looks into New Zealand's largest man-made disaster - the leaky homes crisis. It drew huge headlines in the 1990s but is worse today than it ever was.

A Hail Mary pass from NZME

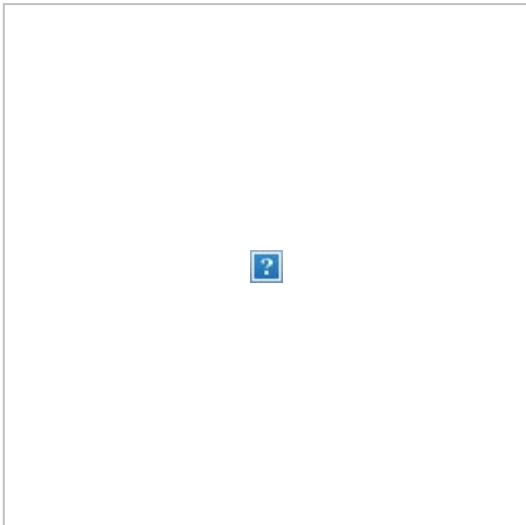
By Tim Murphy | [Click here to read more](#)

In this week's MediaRoom column: NZME throws a Hail Mary pass but has the government got its hands full already with media crises?



What killed the Westport rats?

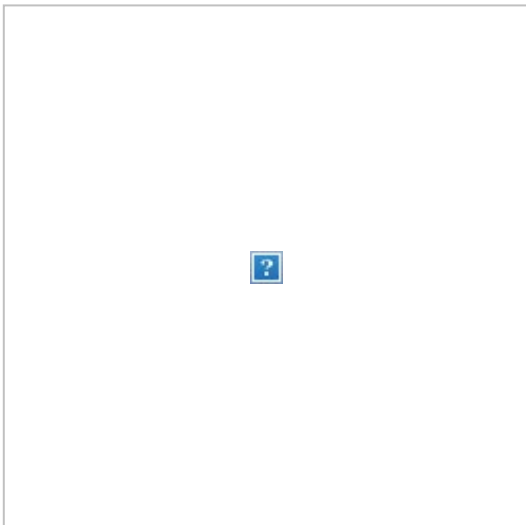
By Farah Hancock | [Click here to read more](#)



In what's become the curious incident of the rats on the beach, opinions are divided over the most plausible scenario leading to 680 dead rats.

Sports A-Gender: Is UFC calling new world champ?

By Ravinder Hunia and Kate King | [Click here to read more](#)

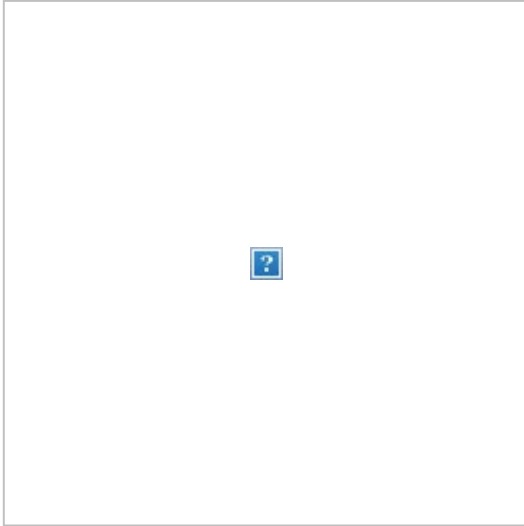


From LockerRoom: Hamilton's new world MMA champion, Michelle Montague, must now be pondering turning pro, in her dream to become the first Kiwi woman in the UFC.

Today on Newsroom Pro

Jones calls Port CEO 'cowardly renegade'

By Dileepa Fonseka | [Click here to read more](#)

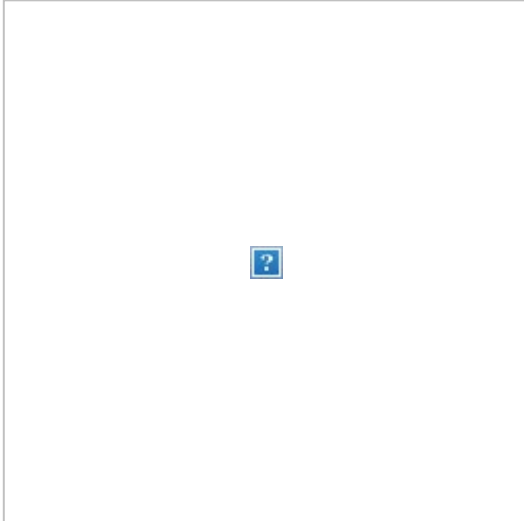


Shane Jones has ramped up his personal attacks on the Port of Auckland's CEO, calling him a 'cowardly renegade' over the Port's lobbying against New Zealand First's plan to shift the port to Northland.

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'The system is limiting my son's life'

By Newsroom Staff | [Click here to read more](#)

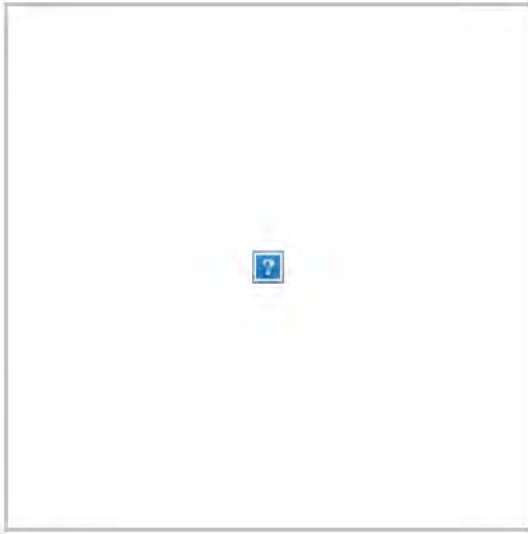


A report from the NZ Disability Support Network has laid bare a funding crisis impacting every level of the sector. Here, Rachel Lodewyk, of Gisborne, says the health system is failing but parent-led trusts are offering solutions in desperate times.

What words like 'psycho' say about you

By Dr Dougal Sutherland | [Click here to read more](#)

Using terms like 'psycho' to insult people is revealing of our underlying and enduring attitudes and prejudices, writes Dr Dougal Sutherland.



Tread carefully if tax is back on the agenda

By Peter Dunne | [Click here to read more](#)



Using terms like 'psycho' to insult people is revealing of our underlying and enduring attitudes and prejudices, writes Dr Dougal Sutherland.

Yesterday's most popular reading

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By Dileepa Fonseka
- [Frustration over Government welfare inaction](#)
By Laura Walters
- [Tahuhu out to remain the world's fastest bowler](#)
By David Leggat
- [Book of the Week: Sport](#)
By Tayi Tibble
- [Some of these sheep burp less methane than the others](#)
By Eloise Gibson

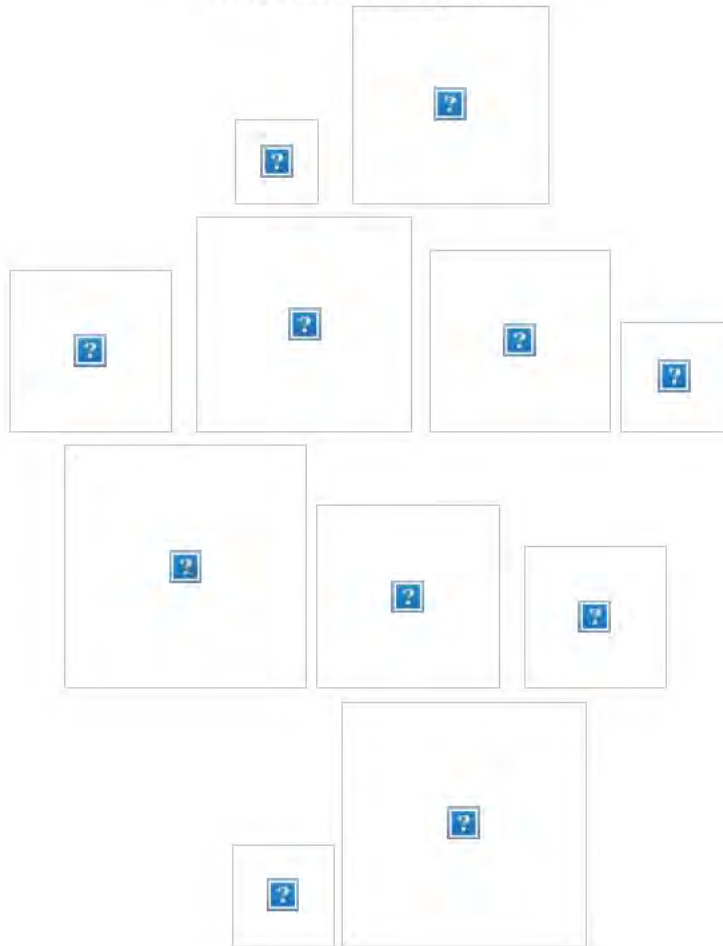
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From: [World Meteorological Organization](#)
To: [Lisa Murray](#)
Subject: Ozone layer recovery is on track, helping avoid global warming by 0.5°C
Date: Saturday, 7 January 2023 3:15:15 am

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Available in [Arabic](#), [Chinese](#), [French](#) and [Spanish](#)

Embargo 1000 EST (1500 GMT, 1600 CET, 1800 EAT) 9 JANUARY 2023

Ozone layer recovery is on track, helping avoid global warming by 0.5°C

DENVER/NAIROBI/GENEVA, 9 January 2023 – The ozone layer is on track to recover within four decades, with the global phaseout of ozone-depleting chemicals already benefitting efforts to mitigate climate change. This is the conclusion of a UN-backed panel of experts, presented today at the American Meteorological Society’s 103rd annual meeting. Examining novel technologies

such as geoengineering for the first time, the panel warns of unintended impacts on the ozone layer.

The UN-backed Scientific Assessment Panel to the Montreal Protocol on Ozone Depleting Substances [quadrennial assessment report](#), published every four years, confirms the phase out of nearly 99% of banned ozone-depleting substances has succeeded in safeguarding the ozone layer, leading to notable recovery of the ozone layer in the upper stratosphere and decreased human exposure to harmful ultraviolet (UV) rays from the sun.

If current policies remain in place, the ozone layer is expected to recover to 1980 values (before the appearance of the ozone hole) by around 2066 over the Antarctic, by 2045 over the Arctic and by 2040 for the rest of the world. Variations in the size of the Antarctic ozone hole, particularly between 2019 and 2021, were driven largely by meteorological conditions. Nevertheless, the Antarctic ozone hole has been slowly improving in area and depth since the year 2000.

“That ozone recovery is on track according to the latest quadrennial report is fantastic news. The impact the Montreal Protocol has had on climate change mitigation cannot be overstressed. Over the last 35 years, the Protocol has become a true champion for the environment,” said Meg Seki, Executive Secretary of the United Nations Environment Programme’s Ozone Secretariat. “The assessments and reviews undertaken by the Scientific Assessment Panel remain a vital component of the work of the Protocol that helps inform policy and decision makers.”

Impacts on climate change

The 10th addition of the Scientific Assessment Panel reaffirms the positive impact that the treaty has already had for the climate. An additional 2016 agreement, known as the Kigali Amendment to the Montreal Protocol, requires phase down of production and consumption of some hydrofluorocarbons (HFCs). HFCs do not directly deplete ozone, but are powerful climate change gases. The Scientific Assessment Panel said this amendment is estimated to avoid 0.3–0.5°C of warming by 2100 (this does not include contributions from HFC-23 emissions).

“Ozone action sets a precedent for climate action. Our success in phasing out ozone-eating chemicals shows us what can and must be done – as a matter of urgency – to transition away from fossil fuels, reduce greenhouse gases and so limit temperature increase,” said WMO Secretary-General Prof. Petteri Taalas.

The latest assessment has been made based on extensive studies, research and data compiled by a large international group of experts , including many from the World Meteorological Organization (WMO), United Nations Environment Programme (UNEP), National Oceanic and Atmospheric Administration (NOAA), National Aeronautics and Space Administration (NASA) and European Commission.

Geoengineering

For the first time, the Scientific Assessment Panel examined the potential effects on ozone of the intentional addition of aerosols into the stratosphere, known as stratospheric aerosol injection (SAI). SAI has been proposed as a potential method to reduce climate warming by increasing sunlight reflection. Yet the panel cautions that unintended consequences of SAI “could also affect stratospheric temperatures, circulation and ozone production and destruction rates and transport.”

NOTES TO EDITORS

About the Montreal Protocol

[The Montreal Protocol](#) is a global agreement to protect the Earth’s ozone layer by phasing out the chemicals that deplete it. The landmark agreement entered into force in 1989 and it is one of the most successful global environmental agreements. Thanks to the collaborative effort of nations around the world, the ozone layer is on its way to recovery and many environmental and economic benefits have been achieved.

About the UN Environment Programme (UNEP)s

[UNEP](#) is the leading global voice on the environment. It provides leadership and encourages partnership in caring for the environment by inspiring, informing and enabling nations and peoples to improve their quality of life without compromising that of future generations.

The World Meteorological Organization is the United Nations System’s authoritative voice on Weather, Climate and Water

Website: public.wmo.int

For media inquiries, please contact:

[Keishamaza Rukikaire](#), Head of News and Media, UN Environment Programme
[Stephanie Haysmith](#), Communications & Public Information Officer, UNEP Ozone



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World Meteorological Organization
7 bis Avenue de la Paix
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To: [Tamara Pletzer](#)
Subject: pdf
Date: Saturday, 15 August 2020 6:11:28 pm
Attachments: gmd-9-3461-2016.pdf

From: [Photonic Sensors](#)
To: [Henrique Rapizo](#)
Subject: Photonic Sensors selected article push
Date: Monday, 20 February 2023 6:50:37 pm

Introduction

Photonic Sensors is an international journal and has been available online at <http://www.springer.com/13320> as an **Open Access** publication. It is co-published quarterly by the *University of Electronic Science and Technology of China (UESTC)* and Springer Nature. There are no charges for authors and it is free for everyone to download all the papers.

Photonic Sensors publishes original and peer-reviewed articles that report on new developments of interest to both the photonics and sensor communities in all fields of photonic sensing science and technology, including but not limited to the following fields:

Optical fiber sensors Materials and devices for phonic sensors

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Laser-based sensors and systems Hybrid photonic/wireless device & systems

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Photonic Sensors currently has coverage in the following Abstracting and Indexing services:

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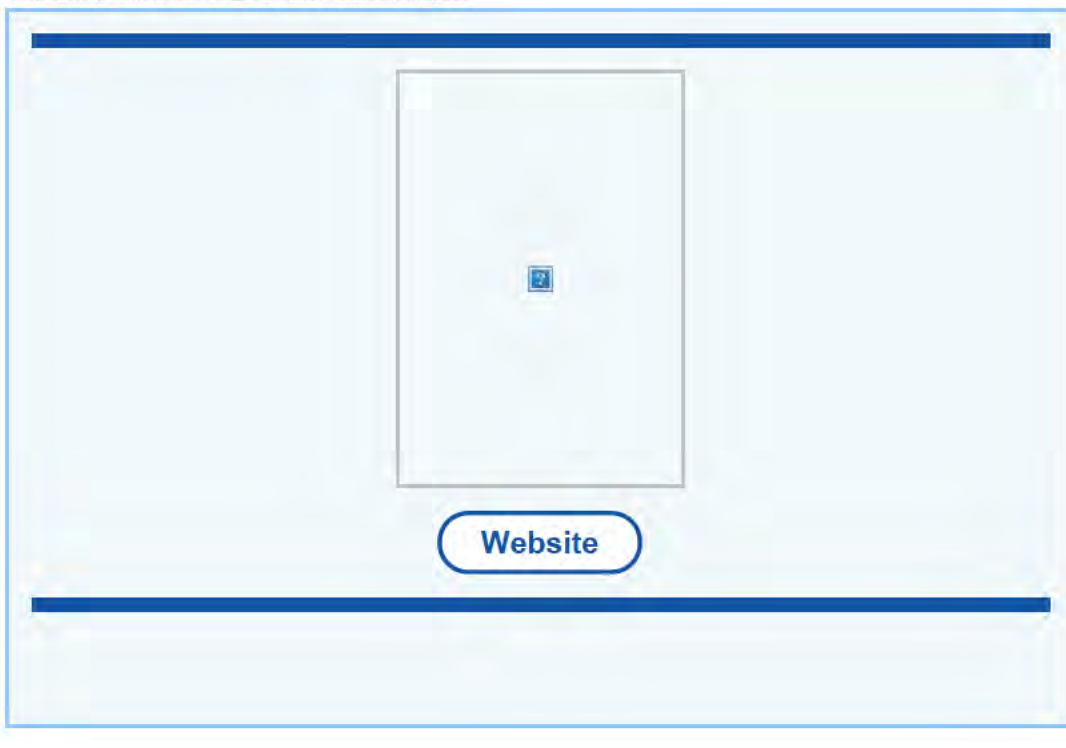
ISSN (print): 1674-9251

ISSN (online): 2190-7439

Website: <http://www.springer.com/13320>

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To: [Manaf Salman](#); [Antony Karp](#); [Omar al-Dulimi](#); [Ray Chambers](#); [Alex Zadnik](#); [Scott Morris](#)
Subject: Presentation Advisory Council 9030 a.m. 28/2
Date: Tuesday, 28 February 2023 8:03:14 pm
Attachments: 230228 Points Iraqi Ministerial Advisors.pptx

Please see attached

From: [Andrew James](#) on behalf of [MetService](#)
To: [\[redacted\]](#)
Subject: [\[redacted\]](#)
Date: Monday, 1 May 2023 2:05:00 pm
Attachments: [img000.png](#)
[img001.png](#)
[img002.png](#)

[\[redacted\]](#)

Thanks for your email.

Yep they look like anti-crepuscular rays. A well-understood phenomenon even if it does look a bit odd, our blog about this, and other optical phenomena is at <https://blog.metservice.com/atmospheric-optics>

We don't have any control over who says what on Facebook, so although this is clearly misinformation there isn't anything we can do about it.

Cheers
Andrew

Andrew James
Communications Meteorologist
t +64 4 4700 700
121 Fife Road, Wellington 6011
PO Box 722, Wellington 6140, New Zealand



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From: [\[redacted\]](#)
Sent: Monday, 1 May 2023 1:23 PM
To: MetComms <<XXXXXXXXXX@XXXXXXXXXX.XXX>
Subject:

Hey team,

I'm a bit concerned about a block name [\[redacted\]](#) who is the admin of [\[redacted\]](#). He is a full on conspiracy theorist who is allowing a lot of misinformation to be spread on the group page of his site.

A photo went up this morning of some rays. Someone said it's possibly anti-crepuscular rays and [\[redacted\]](#) has insinuated that it's to do with the magnetic field. He was then asked to send the photo to you guys for further explanation and he replied that MetService will only give the 'accepted' version.

He's a nutter who believes in geo-engineering and is allowing a lot of misinformation to be shared.

The photo in question is included.

Cheers,

[\[redacted\]](#)



Sent from my iPhone

From: s9(2)(a)
To: Lewis Ferris
Subject: RE: [EXTERNAL] - RE: Radio New Zealand - Cloud Seeding
Date: Monday, 29 August 2022 3:46:38 pm
Attachments: image001.png

Kia ora Lewis,

Thanks for getting back to me.

No problem, I had a similar response from Niwa actually but I'll keep my ears out for any further research down the line!

Ngā mihi,

s9(2)(a) | Programme Producer
RNZ | Level 2, 171 Hobson Street | PO Box 2209 | Auckland | New Zealand
Mob s9(2)(a)



From: Lewis Ferris <xxxxx.xxxxxx@xxxxxxxxxxx.xxx>
Sent: Monday, 29 August 2022 3:38 PM
To: s9(2)(a)
Subject: [EXTERNAL] - RE: Radio New Zealand - Cloud Seeding

Sadly I don't think we have anyone with expertise on the subject – this could be one worth swinging towards NIWA as potentially it was an area of research at some point!

Thanks for getting in touch,



Lewis Ferris (He/Him)
Communications Meteorologist
Weather Communications

From: s9(2)(a)
Sent: Monday, 29 August 2022 2:35 PM
To: Lewis Ferris <xxxxx.xxxxxx@xxxxxxxxxxx.xxx >
Subject: Radio New Zealand - Cloud Seeding

Kia ora Lewis,

s9(2)(a) from Radio New Zealand here. I hope this finds you well.

I'm working on a story about China's use of cloud-seeding to induce rainfall in drought-stricken areas.
[\[https://edition.cnn.com/2022/08/17/asia/china-heat-drought-climate-yangtze-intl/index.html\]](https://edition.cnn.com/2022/08/17/asia/china-heat-drought-climate-yangtze-intl/index.html)

I'm also looking at potential applications of this kind of weather modification technology in New Zealand.
[\[https://www.rnz.co.nz/news/rural/68687/cloud-seeding-experiments-seek-funding-support\]](https://www.rnz.co.nz/news/rural/68687/cloud-seeding-experiments-seek-funding-support)

There seems to be a fair bit of debate over the effectiveness of cloud seeding, and it would be great to get a New Zealand perspective on this.

Would you or another MetService expert be available sometime in the next couple of days to discuss some of the history and issues around cloud seeding?

Please let me know.

Thanks for your help.

Ngā mihi,

s9(2)(a) | Programme Producer

RNZ | Level 2, 171 Hobson Street | PO Box 2209 | Auckland | New Zealand

Mob s9(2)(a)



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From: [Taren McLeod](#)
To: [Mark Schwarz](#)
Subject: Re: Can I please have an extension
Date: Tuesday, 1 February 2022 12:03:20 pm
Attachments: IMG_20191204_154230_104.jpeg
Cloud_Physics_assignment_Taren_McLeod.pdf

Thanks Mark! I cannot believe you were checking your emails at that hour. I've attached my assignment. I found reading that paper about the bush fires quite interesting. I was working on the roads in traffic management December 2019 when there was that flooding. I found I photo I took of Lake Wānaka. My computer issues were that I ruined my account my downloading anaconda (for this assignment), so I couldn't log in. I didn't know what was wrong for ages. Adam then had to help me, and I had to uninstall anaconda and it took ages.

Thanks,
Taren

From: Mark Schwarz <xxxx.xxxxxxx@xxxxxxxxxxx.xxx>
Sent: Monday, January 31, 2022 11:51 PM
To: Taren McLeod <xxxxxxxxxx.xxxxxx@xxxxxxxxxxx.xxx>
Subject: Re: Can I please have an extension

Mmm given the lateness of the hour, sure, focus on getting it to me in the morning. You can explain your account situation to me then ;)

From: Taren McLeod <xxxxxxxxxx.xxxxxx@xxxxxxxxxxx.xxx>
Sent: Monday, January 31, 2022 11:06:45 PM
To: Mark Schwarz <xxxx.xxxxxxx@xxxxxxxxxxx.xxx>
Subject: Can I please have an extension

Hi Mark,

I have realised I won't be able to finish your assignment to get it to you by 12am. Could I please hand it in to you tomorrow? I do have a good excuse to be fair, my account at work broke today for a solid few hours so I was unable to work on my assignments.

Thanks,
Taren

From: s9(2)(a)
To: [Andy Ziegler](#)
Cc: [Iman Soltanzadeh](#); [Peter Kreft](#)
Subject: Re: Data Science Research Programmes - quick question
Date: Friday, 12 April 2019 1:23:39 pm
Attachments: PROP-57173-ENDRP-BODEKER_AsSubmitted.pdf

Hello Andy,

> As expected, you have some irons in the fire

Yes, such is my life :-)

> I was wondering how much this funding could be used to generate an
> open data set that is not only for a particular data science
> research topic but has longer lasting value. In particular I was
> thinking of that we could create a 30 year high-res 3D analysis over
> NZ using CFSR re-analysis data.

I would strongly advise against this for several reasons:

It is perceived as dead boring. NIWA has tried something like this once (or maybe even twice) before through the MBIE Endeavour Programme and it died on the first attempt because it was perceived to have too little 'science stretch' and I can tell you for sure that the Data Science Platform (DSP) proposals will need to be much more exciting than a typical MBIE Endeavour Programme proposal.

Bodeker Scientific then decided to have a crack at this last year where I thought we would have a better shot at generating a high spatial (1.5 km x 1.5 km) and temporal (30-minute) resolution reanalysis for New Zealand going back to 1850 by scraping data from a far wider range of data sources than is typical for a reanalysis, and subjecting the data to machine-learning-based data QA/QC before feeding it into the assimilation. The proposal we submitted is attached (please keep confidential). We asked for s9(2)(b)(i), Commercially sensitive over 4 years which is similar in scope to what a DSP proposal would look like, but over a shorter period (4 years instead of 7).

As you can see, partners in putting together the proposal were:

- 1) Bodeker Scientific
- 2) NIWA
- 3) Iris Data Science
- 4) University of Otago

You may be wondering why we didn't include you guys. There are two reasons:


- 1) I had no idea you guys would be interested in this
- 2) The development of the proposal was led by s9(2)(a) at Bodeker Scientific and I guess he never thought to include you (but I would have nudged him to do so if I had known MetService has an interest in doing reanalyses).
- 3) There was probably some resistance from NIWA - I may not remember that correctly but I would be surprised if that wasn't the case.

So, sorry about that but...

...the proposal only made it into quintile 3 (they divide all proposals into 5 quintiles) when it came to science excellence (and you really need to make it into the top 2 quintiles) and I think faired even worse when it came to 'impact' (again you need to make it into the top 2

quintiles).

Since we were unable to offer him a permanent employment contract, ^{s9(2)(a)} has subsequently left Bodeker Scientific to work for NIWA. ^{s9(2)(g)(i) - Free of charge}



I guess this is just my rather long-winded way of saying "steer clear of reanalyses when it comes to funding proposals".

> Easy for us to do

And that is a problem. If the DSP gets the sense that its easy for someone to do, then they are unlikely to find it. This is supposed to be doing something ultra-cool that boosts New Zealand's economy, or provides significantly improved protection of New Zealand's environment. You need to see the DSP funding as a Series A funding round for a startup. You then need to pitch something that will use the DSP funding to build something new and innovative that will lift GDP by \$10million/year within 2 years of completion of the project and by \$50 million/year within 5 years of completion of the project. It must also target something that *this* government is passionate about. That is why we are developing a proposal all around predator free New Zealand because the government has made this commitment but has few tools to deliver on that commitment. Eugenie Sage will be strongly supportive of what we are proposing. Which MP will be strongly supportive of your proposal? That's always worth thinking about. Remember that for these proposals you must sell a dream, a vision of a better future. Generating a better reanalysis for New Zealand does not spark joy (I am worried that I am now channelling Marie Kondo but you see what I mean right?).

> since we already did this at extremely high-res for limited areas for
> some customers

There is a second lurking problem. If there is any sense that this would be for customers (I know that what you are proposing is not), MBIE will immediately say "well if it is for customers, then customers should be paying for it".

> it's mainly a question of money for the compute required.

There is problem #3. This sounds boring! Sorry, for sounding harsh, but this does not sounds like a pitch for something new and exciting that is going to make a massive improvement for New Zealand's economy, environment, or society. For the DSP, MBIE wants to see something way beyond business as usual. They want to see something that pushes into new territory. Something that has never been done before.

> Maybe one could add a nice API layer on top as part of the funding
> and register it at e.g. data.govt.nz . I'm hoping this would make it
> easier for research to access historical weather information for
> anywhere in NZ; easier and more user-friendly than current options
> available from some in this space.

I absolutely agree that a better representation of New Zealand's climate history is required (hence the attached), but I can tell you with 60% certainty that it is unlikely to be funded through the MBIE Endeavour Programme, and with 99% certainty that it is unlikely to be funded through the DSP.

Let me give you a sense of how you might want to think about the DSP:

First, think like the CEO of a start-up that is looking for \$10 million in Series A funding. Now, what if you could develop a smart phone app that would collect temperature, pressure and maybe even humidity data and feed those data directly into the data assimilation part of MetService's NWP model. Of course the data would need to be scrubbed so that only data collected outdoors would be fed into the data assimilation. What if, as some extreme event in the forecast is unfolding, a higher resolution model directly around that event is spun-up on AWS and a fleet of 100 drones is deployed to collect in situ data which feed that hi-res simulation to provide a far superior, tailored forecast for the area impacted by that event. What if you could use natural language generation (see e.g. <https://www.arria.com/>) so that a narrative description of bespoke weather forecasts could be generated specific to different user groups. Can you build some sort of robot that would replace Daniel Corbett in delivering TV1 weather? That would result in a more human presentation and I believe would have strong public support :-). Can these things be achieved with \$1.5-2 million/year over 7 years. Almost certainly not. Does it matter? No. Sell the vision first and then present a proposal that achieves the *first step* towards that vision. But first develop the vision.

Here is the key question for you: what will the best weather forecasts centres in the world be doing in 10-20 year's time? What big step, based on Big Data, can MetService take now to bring that future forward 10-20 years? That's where your thinking needs to be at.

- > Can discuss on the 29th , maybe by then we have some ideas where
- > this data together with our existing skill and capabilities could
- > make an impact.

Sounds good and let's talk further on 29th. Let's come up with something better. I am looking forward to working with you on this.

Bye for now...

s9(2)(a)

█

█

s9(2)(a)

ph: █

fax: █

web: www.bodekerscientific.com

email: s9(2)(a)

From: s9(2)(a)
To: [Chris Noble](#)
Subject: RE: EWE Endeavour virtual hui on 20th November 10am-noon
Date: Monday, 20 November 2023 7:01:16 pm
Attachments: PROP-89536-ENDRP-UOC_Full_080323_0946.pdf

Chris,

I do appreciate your point. As you will remember I originally had a small project just focussed on the observations for the atmosphere. But, it is hard to cut wholesale or split at this point. In particular, MBIE will send this to the same reviewers and they were split quite evenly between liking the mapping and improved weather forecasts. This matches the feedback from the stakeholders today who again are rather equally spread between liking the mapping bit and the improved forecasting. So the stakeholders want both! In fact, it was hard to see anything that pointed at a particular area to cut. Though, I think we might make more of the test flights to add value by doing post event analyses potentially.

Note that the original proposal was in three parts(attached): weather forecasting, landslide/flood mapping and technology development. I think the latter part isn't what they want, but it is critical as it enables everything else. Unfortunately, we need to work out a way to reduce the cost to MBIE from s9(2)(b)(i): Commercially sensitive to s9(2)(b)(ii): Commercially sensitive – that was the very strong signal from all feedback and also directly from MBIE. So I am hoping that we can do this while not impacting benefits.

I think in the weather forecasting space if we reduced the data assimilation part – so made that an offshore effort by getting ECMWF to provide two boundary conditions possibly (I am working on this) one with and one without dropsondes. We might save ourselves about 15% of the budget straight away (s9(2)(b)(ii): Commercially sensitive). With some reduction in the flight planning which s9(2)(b)(i): Commercially sensitive have been doing we can get another 5%. So close to the 25% reduction needed. The easiest way to cut in the technology development space is to reduce the number of flights, but that reduces value in every space which is not my ideal. I think we might have to move from an operational system to a proof of concepts to really save funds. The data transfer and processing in real time for SAR is a huge cost – the data transfer from dropsondes is tiny – so that wouldn't be anywhere near as challenging. SO I am hoping we might still have some operational components in the weather forecasting side. But, to a certain extent I (as lead) have to bring people and organisations along. Anyway, we do have till March to lock things down. Though I will say the registration stuff needs to be done by December 6th. I think this will not differ much from last years – and only the executive summary can't change – but I will be removing words around operational stuff just in case the near real time stuff is just too hard. I would also like to get cost reductions locked down by Christmas ideally,

I and s9(2)(a) will aim to have a meeting soon about potential work packages cuts.

s9(2)(a)

From: Chris Noble <xxxxx.xxxxx@xxxxxxxxxxx.xxx>
Sent: Monday, November 20, 2023 5:15 PM
To: s9(2)(a)

Subject: RE: EWE Endeavour virtual hui on 20th November 10am-noon

Hi Adrian,

As I listened and reflected on the session today, I can't help thinking that the two parts of the project (the obs to improve forecasts VS post event assessment) really are quite different and I'm wondering if we've really bitten off too much in a single project – esp in the face of needing to down-size it...

The post-event bit is certainly less risky from an outcome and operationalisation point of view, and it seems there was a strong view about how useful this would be to some of the stakeholders on the call. Be interesting to see how the survey landed. My gut feeling is that bit might(?) be easier to secure ongoing funding for.

Of course everyone just wants better forecasts necessitating the pre-event work, and it is obviously the targeted obs bit and potential data assimilation that is more interesting to me/MetService... The challenge with selling this bit is that we really don't know if the outcome will be a success, whereas we do for rapid post-event assessments. Indeed a successful outcome could be a nil case for NZ – ie a targeted ob helps address the driving uncertainty in a storm track and the outcome is a better forecast that removes the NZ impacting tracks so we're more certain in the nil-impact case. It's a hard sell that one!

Perhaps we need to have a chat about all this once you've got the survey results, and we should start challenging ourselves on project scope.

Thanks for running the session today – I did find it useful hearing from the stakeholders assembled.

Cheers,
Chris

From: s9(2)(a) [REDACTED]
Sent: Monday, November 20, 2023 9:02 AM
To: Chris Noble <xxxxx.xxxxx@xxxxxxxxxxx.xxx>
Subject: RE: EWE Endeavour virtual hui on 20th November 10am-noon

Chris,

This is great. I just want you to generally identify that MetService and all forecasters in region are very keen to strengthen readiness and response, but that issue is data. s9(2)(a) [REDACTED] will talk about Nelson 2022 flood first. So hope this will start an initial discussion which will feed into breakout rooms (assuming enough people) and then a quick proposal presentation and feedback session. Hopefully it will all be over 11.30am. This will now be one of too, as I have been asked to set one of these up with the science leads of all regional councils now. But, that will be more me pitching and then getting feedback and I only have an hour. But, I wanted to get more of a conversation going today.

Thanks again for your input

s9(2)(a)

From: Chris Noble <xxxxx.xxxxx@xxxxxxxxxxx.xxx>
Sent: Monday, November 20, 2023 8:40 AM
To: s9(2)(a)
Subject: RE: EWE Endeavour virtual hui on 20th November 10am-noon

Hi s9(2)(a)

Here's a couple of hastily prepared slides for some visuals...

Cheers,
Chris

From: s9(2)(a)
Sent: Tuesday, November 14, 2023 2:59 PM
To: Chris Noble <xxxxx.xxxxx@xxxxxxxxxxx.xxx>
Cc: s9(2)(a)
Subject: EWE Endeavour virtual hui on 20th November 10am-noon

Kia ora s9(2)(a),

First, thank you again for identifying that you would be happy to help kick off the virtual hui next week. I just wanted to check in that you are still up for this after I have provided some details on the proposed format.

I think the format will be:

INTRODUCTIONS AND LEARNINGS AROUND EXTREMES - I will obviously, but fundamentally I am hoping both of you can help to start the discussion off and wanted to give you an opportunity to present 3 or 4 slides maybe or just 5-6 minutes of discussion. That will then lead into some wider discussion and then move into some BREAKOUT ROOM discussions. The general aim of this section is for the proposal team to get a feel for stakeholder requirements and gaps from their perspectives.

BREAKOUT GROUP DISCUSSIONS SHARING EXTREMES EXPERIENCES – this will expand on the first section, but this format will ensure that everyone gets to share their learnings and have a chance to speak (which is hard in a larger group).

PROPOSAL PRESENTATION - myself and maybe some others of the team members will present on the proposal. Talk about some of the realities involved with a rebid – for example the difficulty in operationalising with a reduced budget will be a challenge.

FEEDBACK AND THOUGHTS – I will develop a set of SLIDO polls to allow stakeholders to comment on the proposal, along with things like WORD CLOUDS to get general feelings. We'll also aim to record comments and discussion.

I think each of these sections will be roughly 30 minutes long. Though, I don't think it will be terrible if we manage to finish a little early. I will be sending out ZOOM invites later today.

Ngā mihi nui,

s9(2)(a)

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From: [Kevin Alder](#)
To: [s9\(2\)\(a\)](#)
Cc: [Chris Noble](#)
Subject: RE: For review - Research chapter of the Eighth National Communication climate report
Date: Wednesday, 5 October 2022 10:38:44 am
Attachments: NC8 08 - Research SECOND DRAFT - MetS.docx
image001.png
image002.png

Kia ora [s9\(2\)\(a\)](#)

Thanks for your email. I've reviewed the draft and provided some minor edits in the areas relevant to MetService, as appropriate.

Please get in touch if you require clarification or further input.

Kind regards
Kevin



Kevin Alder
Manager Meteorological Data Services – Science & Innovation
MetService – Te Ratonga Tiorangi

Email: [✘✘](#)
Phone: [s9\(2\)\(a\)](#)
Level 2 110 Featherston Street, Wellington 6011
PO Box 722, Wellington 6140, New Zealand



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From: [s9\(2\)\(a\)](#)
Sent: Tuesday, 4 October 2022 11:44 am
To: Kevin Alder <xxxxx.xxxxx@xxxxxxxxxx.xxx>
Subject: For review - Research chapter of the Eighth National Communication climate report

Kia ora Kevin

I hope you are well.

MfE is currently updating the Research chapter of the Eighth National Communication (NC8) report, which updates our progress on climate change to the UNFCCC. The report will update

content from [New Zealand's Seventh National Communication \(NC7\)](#) published in December 2017.

There are a few references to the work of MetService in the chapter. Would you be able to check through and review any relevant material by **Friday 7 October?** Most of the text has been updated by MPI and MBIE, but would appreciate any feedback from you as well, if you have capacity. It has also been sent to other CRIs (including NIWA) to review.

Our main focus for this chapter is to ensure it is accurate and meets UNFCCC reporting requirements. It includes some research highlights but isn't attempting to be comprehensive. Any new suggestions for text are welcome but I understand if your capacity is limited.

Let me know if you have any questions

Thanks very much

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s9(2)(a) █

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s9(2)(a) █ | mfe.govt.nz

From: s9(2)(a)
Subject: Re: He Papa Moana Hui Minutes
Date: Monday, 24 August 2020 4:11:46 pm
Attachments: DRAFT Te Nohonga Kaitiaki Guidelines 21 August 2020.pdf
23072020_BOXALL_DFFD_Maritime Foresight-Report_lowres.pdf

Also, here are my actions from the previous meeting. Thanks s9(2)(a) for the reminder.

1. Draft Guidelines for genomic research with taonga species....feedback by end of Sept.
2. Foresight Report from NZDF.

na s9(2)(a)

On Mon, Aug 24, 2020 at 2:51 PM s9(2)(a) > wrote:

Kia ora,

Here is the process for submission to the Nga Pae conference.
You do need to register first.

na

Virtual Abstract and Presentation Process

All accepted abstracts will require a pre-recorded video/powerpoint presentation that will be made available prior to the official start of the conference. This will accompany the Live Online Discussion Sessions held during the conference dates.

Please read the Abstract Submission and Registration Process instructions carefully for details on submitting and preparing abstracts. Only abstracts that meet completeness checks will be considered.

The IIRC conferences empower Indigenous research, Indigenous researchers and Indigenous communities. Therefore, the IIRC20 Organising and Abstract Committee have decided that the voice of the Indigenous researcher and/or community must be present when delivering the research. Joint presentations (a mixture of Indigenous and non-Indigenous presenters) is a common example that the Abstract Committee encourages. Investigators who are submitting abstracts will need to indicate clearly their and/or their co-presenters' Indigenous heritage in the space provided in the abstract submission template. Submissions received that are not clearly Indigenous led will not be considered.

ALL abstract submissions should be in reference to work currently underway or completed within the last 12 months and submissions need to be clearly aligned with the IIRC20 [Conference Themes](#).

The IIRC20 Committee would like to reinforce our expectations regarding presenting data in multiple presentations. Where investigators are submitting more than one abstract from a single body of research, the data and findings described in each abstract needs to be discernably different. If the Abstract Committee is not clear or unable to demarcate differences between abstracts submitted from one body of research, they have been instructed to accept only one abstract, assuming that the abstract fulfils the minimum requirements for acceptance.

All abstract submissions **must be completed online** by the closing deadline [Friday 21 August 2020, 11:59pm GMT](#). Please use the online [abstract template](#) for consistency as they will be published as submitted in the conference programme and on the website.

Part a. Abstract Submission Process

1. Create an account in the Submission Portal and upload your written abstract, along with your bio and photo. You will receive a confirmation email confirming your submission.
2. Download the *abstract template* from the abstract submission portal.
3. Due date Friday 21 August 2020, 11:59pm GMT
4. All submitted abstracts will be notified of the outcome in email by 11 September 2020
5. If you do not have an abstract accepted, we still encourage you to register for the conference and participate by joining the dedicated live online discussion sessions.
6. All presenters with accepted abstracts must then submit a pre-recorded 10 minute video by 09 October 2020
7. When you submit an abstract, you are making a professional commitment to participate online in the conference if your abstract is accepted.
8. Presenters must also register to attend IIRC20 by 12 October 2020.
9. Presenters are expected to be considerate and send their pre-recorded presentation on time. Detailed instructions and examples will be provided to presenters of accepted abstracts. If a presenter who has had their abstract accepted, but due to unforeseen circumstances, is not able to pre-record a presentation by the deadline, please contact the conference organisers by email iirc20@auckland.ac.nz as soon as possible.
10. **Please note** that extensions will not be granted if pre-recorded videos are not received by the deadline.
11. **Presenters must be online and ready to discuss their research during their allocated session in the IIRC conference programme**

Part b. Pre-recorded presentation

1. Upon receiving an email that your abstract is accepted, create your pre-recorded 10 minute presentation video and upload it online. Specific instructions and tips on how to make a quality recording will be sent with the acceptance email.
2. Presenters will choose to record themselves presenting using platforms such as zoom. Video style is up to you. Your pre-recorded video will be added to IIRC20's online video programme.
3. If, due to unforeseen circumstances, a presenter who has had their abstract accepted is not able to pre-record a presentation by the deadline, please contact the conference organisers by email iirc20@auckland.ac.nz as soon as possible.
4. **All of the pre-recorded presentations can be viewed anytime and will be made available online before the conference officially begins.** Detailed instructions and examples will be provided to all successful presenters.
5. We request that presenters adhere to deadlines for submitting pre-recorded presentations. Extensions will not be granted if pre-recorded videos are not received by the deadline.

Part c. Live Online Discussion Sessions held during the conference dates

1. Online Discussion Sessions are live. Three presenters per session will engage about their research with a session Chair.
2. A session Chair will be assigned to introduce each presenter, to moderate Q&A and Chat functions.
3. Attendees are expected to come prepared to every Live Online Discussion Session, having already viewed the pre-recorded presentations which will be made available for viewing at least 1 week prior to the Conference start date.
4. Live Online Discussion Sessions are no more than 45 minutes long. The aim of these sessions is to engage the audience, to create interest, seek feedback and encourage further enquiry.

On Mon, Aug 24, 2020 at 2:33 PM **s9(2)(a)**

s9(2)(a) wrote:

Kia ora koutou,

From previous hui **s9(2)(a)** forwarded a link to visuals presented by WWF website WWFNZ Marine animation <https://youtu.be/viEnRD6Bil0>

Please find my version of our hui minutes attached.

Please note, I have suggested to Joao that maybe Malene (Scotia's replacement, based in Raglan at Metocean office) attend our next hui (21st September 11AM, Okoro/Mahuru).

Looking forward to catching up next week and will be back in touch with more details about TAG etc as they come to hand,

Thanks for your input,

Noho ora mai,

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s9(2)(a) █

on the Moana Project www.moanaproject.org

University of Waikato

0272244209

Morning writing/analysis, Afternoon meetings/reading

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From: s9(2)(a)
Subject: Re: Home Stretch!
Date: Tuesday, 7 March 2023 3:58:15 pm
Attachments: PROP-89536-ENDRP-UOC_Full_DP_edits.pdf

Hi s9(2)(a)

Please find some comments from proof reading attached.

- Main things are I think we should introduce high altitude platform with s9(2)(b)(i) Commercially early (see comments) as it is confusing reading the doc as both are introduced separately, if an uninformed reader doesn't join the dots it's confusing.

- Figures seem low res, is that the portal?

-I was proofing at mach 3 so might have missed, are the references not in this document, I guess they're somewhere else

Sorry in a mega rush, we'll have a TV1 News piece out tomorrow 6PM hopefully which will help with publicity for the project.

Amazing job everyone!

s9(2)(a)

On Mon, Mar 6, 2023 at 9:30 PM s9(2)(a)

Kia ora koutou,

Thank you for the massive effort today. As you will see the current version of the document is looking fabulous. So we have a full day to find minor typos and polish. The aim being to press the button tomorrow night – NOT WEDNESDAY MORNING.

There are a few things more to do like resizing some figures that s9(2)(a) has agreed to help with tomorrow. But, we are looking in pretty good shape – thanks mostly to s9(2)(a) expertise on the portal. Can you all look over the PDF for typos and other issues before 4pm tomorrow please.

For project team section, if you could look over FTE for each year for your organisation members and write me a list of any incorrect entries that would be great.

Note the portal does not allow fractions of a percent so I have rounded up 0.025 to 0.03 in all those cases. But, rounded down if 0.014 to 0.01. Unless the person never has anything other than zero where I put 0.01.

Note that the submission of FTE for every person for every year follows this very annoying process (click - wait for upload – change FTE – click save - wait for upload REPEAT) so I am bound to have got some wrong and we want to catch all of these.

Ngā mihi nui,

[REDACTED]

From: s9(2)(a)

Sent: Monday, 6 March 2023 8:39 pm

To: s9(2)(a)

[REDACTED] Chris

Kroger <chris.kroger@metsservice.com> s9(2)(a)

[REDACTED]

Subject: RE: Home Stretch!

Yes great work everyone.

Would be good to have one solid last proof read of the pdf.

Good luck with the portal war.

[REDACTED]

s9(2)(a)

[REDACTED]

Logo



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On 6 Mar 2023 at 18:17 +1300, s9(2)(a) wrote:

| Awesome work [REDACTED] [REDACTED] and the whole team!

We are almost there!

Good luck with the portal [REDACTED] [REDACTED]

If you send the generated .pdf to us (when it's ready) we can help double check figure numbering/referencing etc.

Cheers,

[REDACTED]

s9(2)(a) [REDACTED]



[REDACTED]

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From: [Alex Zadnik](#)
To: s9(2)(a)
Subject: Re: Iraq
Date: Wednesday, 19 July 2023 1:04:50 pm
Attachments: image001.png
image002.png

Dear s9(2)(a)

That is excellent news! Great to hear ART is a lead player for Iraq.

I must be upfront and say that it is difficult for me to travel to Iraq. due to company policy regarding travel to unsettled countries, so I will have to bow out unfortunately. If you do require meteorological consultancy services in a remote capacity, I can potentially assist, but I'll need to clear this with my employer, given new stricter policies on dealing with certain governments. Jeremy Grey is probably worth approaching in the meantime.

Kind regards,

Alex



Alex Zadnik BSc MBA MAM
Business Manager Australia
MetraWeather

m +61 439767557

We have a new Sydney office. Please update your records:
Suite 25, Level 8, 100 Walker Street, North Sydney 2060, Australia



metSERVICE.com . metraweather.com . metocean.co.nz

On 19 Jul 2023, at 10:55 am, s9(2)(a) wrote:

Dear Ray, Scott and Alex,

First, an update on Iraq:

Members of the panel we presented to visited the UAE and Oman. They must have impressed by the new technologies being pursued there - drones with ionisation etc - as they have added a similar

enhancements to their plans at home. The UAE was apparently not interested in seeding Iraq as they agreed the fine silicon aerosols would stymie their seeding.

In Oman they learnt that the Omanis are working with the University of Reading to analyse the data 2019-22, using Ray's approach. And that ART charged the Omani a fraction of what we have quoted Iraq.

Apparently there is no problem with our pricing for Iraq. The upshot of all this is that Iraqis want to add a German cloud-seeding operation and a French company which uses remote controlled balloon launchers. The balloons have meteorological sensors which determine when conditions and clouds are right for seeding from the balloons. We will be the lead player and coordinator of any multi-supplier trials (analysis?).

I have emphasised that we can't have multiple technologies operating in an area and expressed my preference for trialling Atlant in Mosul and another additional area (Kurdistan) in the northern, higher, rainier country.

This was accepted, though they still wish us to operate in one at least of the flat, dry areas to the south. I think the "scientific" fellow on the panel favors this after his arguments that ionisation would not work in flat areas without increasing the voltage to 200kW (not a realistic option).

The panel will release its report shortly which will make a positive recommendation that Iraq engage in rainfall enhancement. We are the favored and principal contender.

The next step is work-shop with the water and environment departments etc to nut out how things will run. The contract will follow that.

Manaf, our agent wants me to bring you guys over for this workshop.

The likely date is August 10. We would need to arrive two or three days before that and depart two days after, i.e. Depart 6/8, arrive back 12/8. The dates may shift back to August 9 or 10.

Please let me know if you can help me out here (!!), and what your fees will be.

Very best,

s9(2)(a)

From: Peter Fisher
To: s9(2)(a)
Cc: Tui McInnes
Subject: RE: Marlborough District Council meeting with MetService
Date: Wednesday, 6 September 2023 3:49:18 pm
Attachments: image001.png
image002.png
image003.png
image004.png
image005.png
image006.png
Waikato Region_report_v3 high res_update.pdf

Here is a sample climate change risk assessment report, written by s9(2)(b)(i) for Waikato Regional Council. It has been cleared to pass to you.

Please note, these reports can be as detailed or generic as required. They can also target certain aspects of activity, such as road making and restoration. This particular report targets water resources. (You may wish to pass this to s9(2)(a) for her information).

Please let us know if you wish to go ahead and order such a report to cover your roading planning.

With regards
Peter



Peter Fisher
Business Development Manager – Key Accounts
MetService – Te Atatū Tūrangī

m s9(2)(a)
New address: Seabridge House, L2 / 110 Featherston Street, Wellington 6011
PO Box 722, Wellington 6140, New Zealand



metservice.com . metraweather.com . metocean.co.nz

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From: Peter Fisher
Sent: Wednesday, September 6, 2023 3:44 PM
To: s9(2)(a)
Cc: Tui McInnes <xxx.xxxxxx@xxxxxxxxxxxx>
Subject: RE: Marlborough District Council meeting with MetService

Further to my previous email here is the presentation my colleague Chris Noble gave MDC on the significant rainfall event of August 2022. The first watch was issued two days prior to the event.

Please let us know if you have any questions.

Regards
Peter



Peter Fisher
Business Development Manager – Key Accounts
MetService – Te Atatū Tūrangī

m s9(2)(a)
New address: Seabridge House, L2 / 110 Featherston Street, Wellington 6011
PO Box 722, Wellington 6140, New Zealand



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From: Peter Fisher
Sent: Wednesday, September 6, 2023 3:39 PM
To: s9(2)(a)
Cc: Tui McInnes <xxx.xxxxxx@xxxxxxxxxxxx>
Subject: Marlborough District Council meeting with MetService

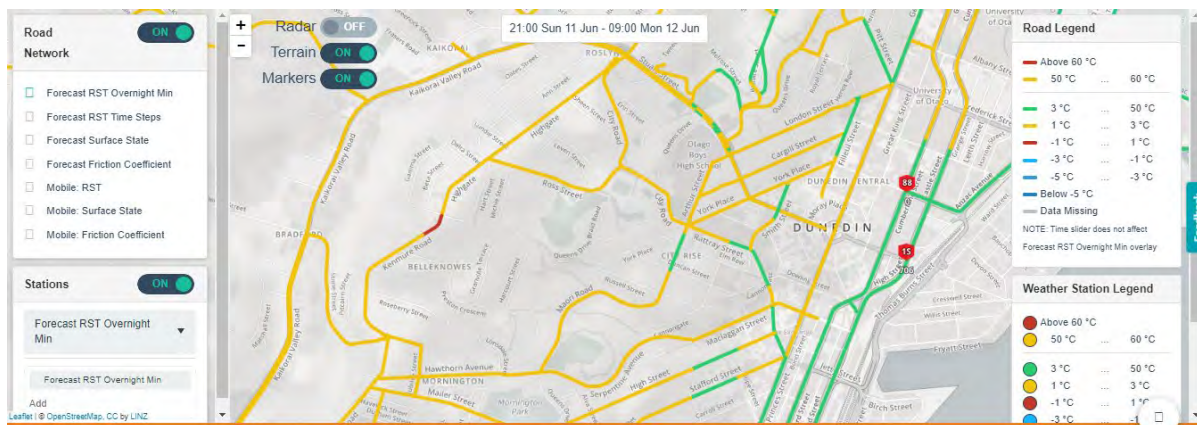
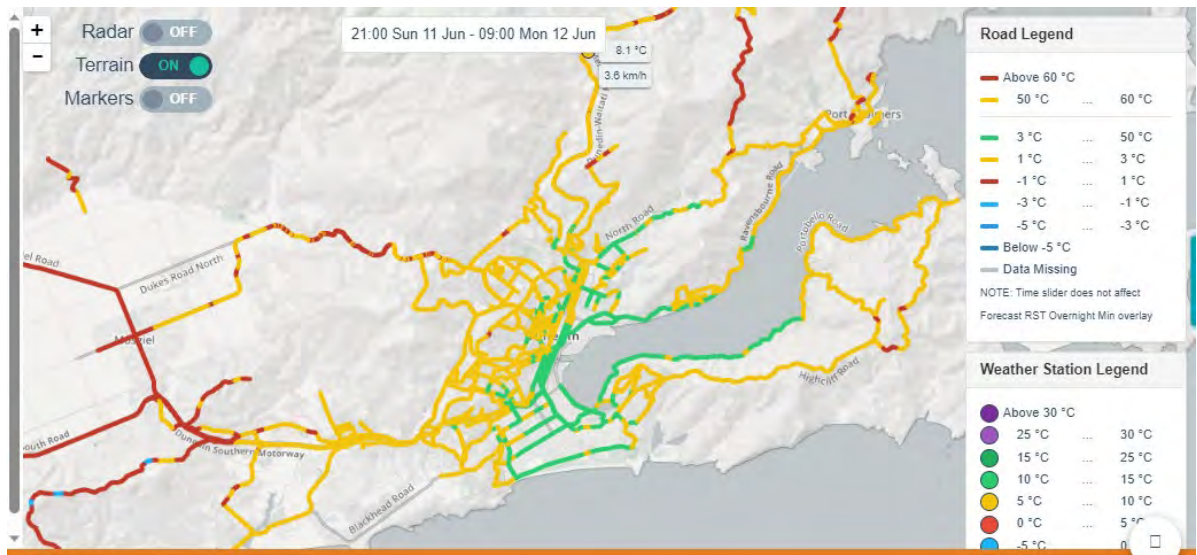
Good afternoon Brian and Steve.

Thank you again for your time last week, and the excellent attendance at the meeting. Clearly weather is an important issue for you, and it impacts multiple aspects of your planning and operations.

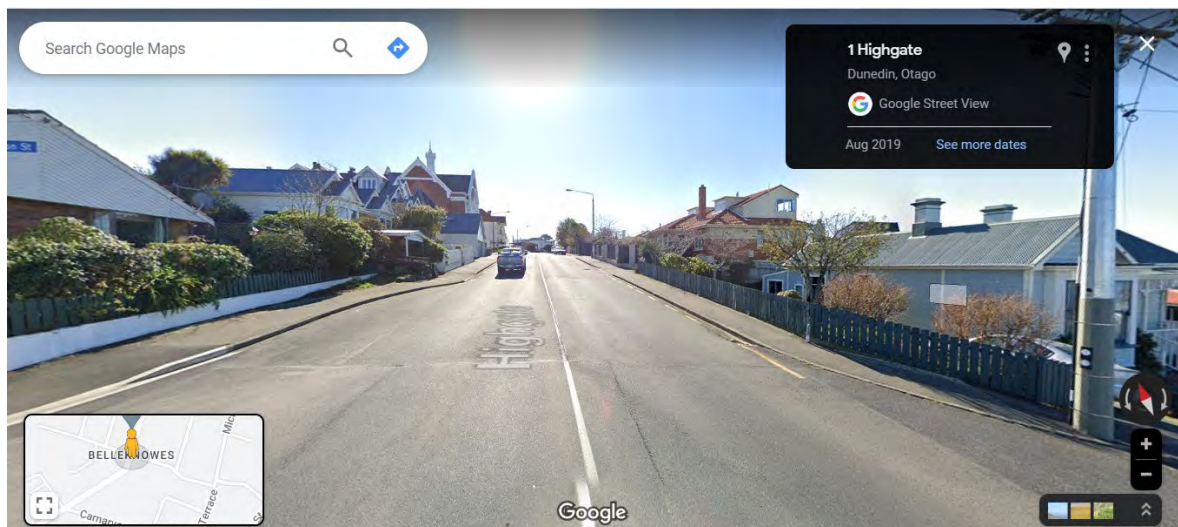
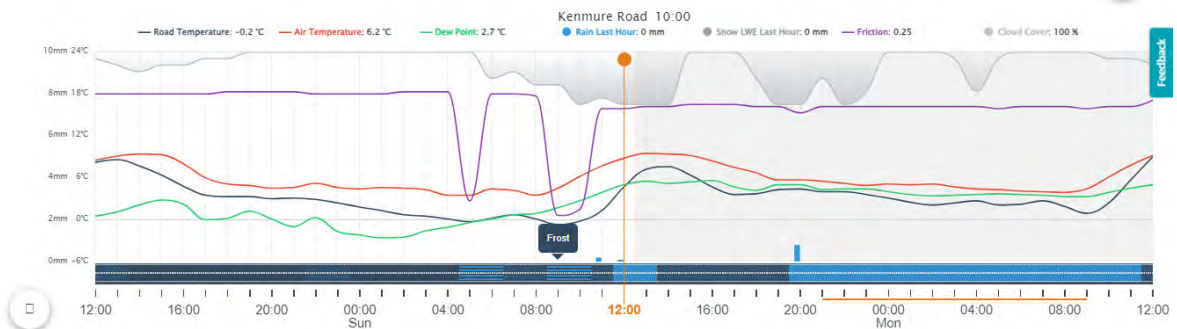
Key points from our meeting:

- MDC is the only District Council to have NZTA manage their roads.
- We talked about the “before, during and after” approach to accessing weather for civil works planning and project delivery.
- MDC contract road maintenance out and while it’s up to the contractor to take on the weather risk, MDC still needs to be across weather for awareness, risk, planning and consistency purposes.
- MDC currently receives forecasts from NIWA via FENZ but these have been found to be of mixed quality. There is confusion around which forecasts to use, and there is a need for a consistent authoritative and dependable weather source.
- Blenheim airport is getting bigger and busier and there is pressure to increase airport weather awareness. We talked about the services we’ve provided to Wellington International Airport and other airports (large and small) are expressing interest in terms of increasing their weather awareness programmes.
- MDC is very aware of the climate risk and keen to look at options. MDC has a current roading restoration project underway and this is a significant undertaking. There is a need to understand how this road asset is likely to be impacted by future weather events, 10, 25, 50 and 75 years in the future, using the latest in modern CMIP6 climate risk modelling. We can help through our partnership with CLIMsystems.
- MDC felt the focus of the recent significant Nelson/Tasman rain event was on the Nelson side, and not enough information was provided for the Marlborough side. I have discussed this with our Senior Meteorologist who commented we do try and treat each region equally and we suspect there was more concern for the Nelson side, given the anticipated weather situation (assuming we are talking about the Aug17-20 2022 event). Marlborough was definitely part of the picture though, and clearly was impacted, with 3x the normal monthly rainfall being detected at the airport, with more elsewhere. We’d be happy to discuss the specifics around this event with you if you wish.
- MDC is keen on accessing our seasonal forecast service. This product is becoming increasingly popular, especially given we can tailor the forecast for a particular region.
- s9(2)(a) s9(2)(b)(i) is providing a river flow forecast for the Wairau River. s9(2)(a) is keen to work with Tui to introduce our 4km model into this service this is underway now, I understand.
- s9(2)(a) was also interested in QPE (our new Quantitative Precipitation Estimation, the new generation gauge-corrected radar accumulation that incorporates satellite imagery). Other Councils are starting to use this service now, and s9(2)(a) was keen to work with Tui to gain access.
 - [Follow up](#)
 - I have attached a pdf version of the presentation I gave. Please circulate this amongst your teams and **let me know which products/services resonate, and which you would like more information on.**
 - I have also attached a copy of a seasonal forecast. Recall, we can tailor these forecasts to meet your specific needs and time frames.
 - I will also follow up with a sample Climate Risk Assessment report from our partners s9(2)(b)(i). This report I will send you was written for Waikato Regional Council and has been approved for our release to you. Note, s9(2)(b)(i) can generate reports as detailed or as generic as required and can tailor these reports to specific targets, such as roading. The report I will send you focuses on rainfall, river flows, and water generally.
 - Tui has already been talking to s9(2)(a) about the integration of our 4km model into MDC systems and will also discuss access to QPE.
 - I will provide a copy of a presentation that was given to MDC on 19 September 2022 following the August '22 event. I think you'll find this presentation interesting. I certainly did. As mentioned above, we'd be very happy to discuss our response to MDC regarding this event, if you wish.
 - I have discussed your interest in runway weather with our Aviation Business Development Manager, Pete Lowe, xxxxx xxx@xxxxxxxxxxx. Pete is about to head away to South Africa for a month but when you are ready, please send Pete an email and he'll respond, either before he leaves, or on his arrival back to New Zealand.
 - Finally, you were interested in our ability to deliver road weather services, beyond the framework of the State Highway Network. We have already set QLDC and DCC up with a road weather service for their local roads and these councils use this service to determine where (and when) to place grit and CMA on their road network. The system provides very targeted road state and surface road temperature forecasts and it looks ahead up to three days. We are enquiring with our partner road weather partner, Vaisala, if additional roads can be added to this service. If you are interested, please let me know

Below: DCC road weather module.



Here, I have clicked on the road segment on Kenmure Road that is red. Users can see at what part of the day ice is expected on this road. This part of the road is particularly hilly, as can be seen by the Google Streetview image below, and any ice on this road would result in significant transportation issues.



Please let us know if you require any immediate clarification or information on any of the services we discussed.

We look forward to hearing from you.

With regards
Peter



Peter Fisher
Business Development Manager – Key Accounts
MetService – Te Ratonga Tiorangi

mss(2)(a)

New offices: Strabridge House, L2 / 110 Featherston Street, Wellington 6011
PO Box 722, Wellington 6140, New Zealand



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From: [REDACTED]
Subject: Re: MBIE CV
Date: Friday, 15 November 2019 8:57:45 am
Attachments: PROP-57173-ENDRP-[REDACTED]_AsSubmitted.pdf

Hello [REDACTED]

I also meant to send you the attached. Please don't distribute any further. Thanks.

Bye for now...

[REDACTED]

--

[REDACTED]

From: [redacted]
Cc: [redacted]; Brett Beamsley
Subject: RE: MBIE Endeavour 2023 - Feedback
Date: Monday, 2 October 2023 4:01:22 pm
Attachments: Adrian McDonald_89536_comments.pdf
PROP-89536-ENDRP-UOC_Full_080323_0946.pdf

Kia ora tatou,

Can you all please participate in the Doodle poll at:

[redacted]

so that we can find a time for a discussion about a potential MBIE rebid. Ideally I would like to lock down a time by end of play Tuesday. I also attach the proposal and the comments. To add some structure to the effort, I'd like to hear one thing that you think is a strength in the existing proposal and one that is a weakness and the potential mitigation for the weakness. I'd also like you to think about budgets, nearly all the successful proposals were at 10 million or lower. I think we have to think seriously about whether a smaller bid would make sense. I also think we have to consider how we position the bid.

I know of two other MBIE bids spinning up in the Extremes space - one led by Dave Frame at UC which will be a follow-on from Whakahura (<https://www.wgtn.ac.nz/nzccri/research/whakahura>) and one led by [redacted] on Tropical cyclones. I work with both of them and have been offered roles in both, so feel we should ensure we differentiate ourselves rather than compete. Both programmes will focus most on the climate aspect and be climate modelling focussed. So I think we likely need to push harder on the innovative observation side. I am also thinking in terms of civil defence 4R's (reduction, readiness, response and recovery) - and wonder whether we differentiate by focussing heavily on Readiness and Response. The readiness is improved forecasts, and the response being nowcasting, and the monitoring of floods and landslides. Those other proposals are about Reduction in my head as they are predicting change for later guidance.

Anyway, hopefully we can lock down a meeting time for a discussion relatively soon, as if we move forward (which I think we should) then we need to start working with stakeholders early and getting their views. This will be way easier the second time around.

Ngā mihi nui,

[redacted]

From: [redacted]
Sent: Thursday, 28 September 2023 3:39 pm
To: [redacted]

Chris Noble <xxxxx.xxxxx@xxxxxxxxxxx.xxx>; [redacted]
[redacted]
[redacted]

Subject: FW: MBIE Endeavour 2023 - Feedback

Kia ora koutou,

Please find attached the detailed feedback from MBIE on our proposal. We seem to have lost out on portfolio balance. Overall the strengths section is as expected and the weaknesses features perceived risk to my eyes, but possibly because we were so innovative. The good news is that my interpretation is that we were very close with the rank cohort of 3 meaning we were in the top 30 proposals roughly (top 30% of 106). Given that we were in the top 20 proposals for science and team excellence that means we only dropped our score by one step in the Implementation Pathway and Benefits to New Zealand. My reading is that some work on the implementation pathway could make a big difference in particular and that they think the team built is very strong. One of the comments in the weaknesses section being

“No significant weaknesses in the program and presentation of it.”

suggests to me that some tuning in a rebid might make all the difference, particularly around risk. On that note [REDACTED] at UC Research and Innovation team will be sending out the proposal and the feedback to a consultant who will provide some input on potential repositioning.

Anyway, I'm sending this out quickly and I suggest that we line up a meeting either next week or early the week after to discuss a rebid and to identify ways forward. How does that work? If I don't hear anything I will send out a Doodle Poll in due course.

Ngā mihi nui,

[REDACTED]

From: s9(2)(a) [REDACTED]

Sent: Thursday, 28 September 2023 1:57 pm

To: s9(2)(a) [REDACTED]

Cc: s9(2)(a) [REDACTED]

Subject: FW: MBIE Endeavour 2023 - Feedback

Kia ora [REDACTED]

We have received the feedback on your 2023 MBIE Endeavour proposal, which is attached along with MBIE's letter explaining the feedback process in a bit more detail.

Please note that the comments are supplied as written without any editing by MBIE. If there are any points which are unclear, we can seek further clarification from MBIE.

If you would like to discuss your feedback, or have any questions about future submissions, please let us know.

Ngā mihi



s9(2)(a) [Redacted text block]

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From: [Chris Noble](#)
To: [Brett Beamsley](#)
Subject: RE: MBIE Endeavour 2023 - Feedback
Date: Friday, 6 October 2023 4:35:47 pm
Attachments: MoU UCantebury MetService MS signed.pdf
PROP-89536-ENDRP-UOC_Full_080323_0946.pdf

Hi Brett,

Sure thing – here’s the full prop and the MOU with UC that shows the commitment we had proposed. A big part of it would fall under the Hub around remote sensing and data assimilation – with the original thinking being that this would be well timed to build on the DA work that is planned under Whakahura – ie starting in earnest in 2025/2026 felt about right at the time (but obviously a lot has changed since then...)

I still think it’s a valuable project – esp given that our intent was to get funding to advance our DA work and further develop our modelling and remote sensing capabilities (might as well get paid for it right?!)

Cheers,
Chris

PS – I’ve had that chat to [REDACTED] re the [REDACTED] s9(2)(b)(ii): Commercially sensitive are planning on putting in. He’s still very early in his thinking/planning and (reading between the lines a little) he’s tagged me into it given my experience and current work in the TC space, and for my ability to be the conduit to the user community that might benefit from the research (eg Councils, CDEM, Insurance...). As it stands, I don’t think we’re being tapped for data or modelling, but there’s clearly a lot of thought still required to formulate the proposal and wider team – so scope to engage if we wanted. He said he’ll have more to show in a few weeks and will organise a wider chat. I’ll keep you posted!

From: Brett Beamsley <x.xxxxxxxx@xxxxxxx.xx.xx>
Sent: Friday, October 6, 2023 11:29 AM
To: Chris Noble <xxxxx.xxxxx@xxxxxxxxxxx.xxx>
Subject: RE: MBIE Endeavour 2023 - Feedback

Hey Chris, do you have a copy of the original proposal?

From: Chris Noble <xxxxx.xxxxx@xxxxxxxxxxx.xxx>
Sent: Thursday, September 28, 2023 5:22 PM
To: Norm Henry <xxxx.xxxxx@xxxxxxxxxxx.xxx>; Brett Beamsley <x.xxxxxxxx@xxxxxxx.xx.xx>; Kevin Alder <xxxxx.xxxxx@xxxxxxxxxxx.xxx>
Subject: FW: MBIE Endeavour 2023 - Feedback

FYI – this is the feedback to the UC Endeavour bid involving [REDACTED] s9(2)(b)(ii): Commercially sensitive and high altitude UAVs that MetService (and NIWA) were involved in. [REDACTED] and [REDACTED] will be keen to resubmit.

MetService have also separately been requested by [REDACTED] s9(2)(b)(ii): Commercially sensitive [REDACTED]

draft in development...).

[@Brett](#) – perhaps you, I and Norm should have a chat next week about these – re research strategy and commitments, and how you [@Norm](#) see my role in any future research projects. Kevin would be welcome to join of course! I'd like to ensure we're all on the same page for strategy and commitments (given resourcing challenges).

Cheers,
Chris

From: s9(2)(a)

Sent: Thursday, September 28, 2023 3:39 PM

To: s9(2)(a)

Chris Noble <xxxxx.xxxxx@xxxxxxxxxxx.xxx>; s9(2)(a)

Subject: FW: MBIE Endeavour 2023 - Feedback

Kia ora koutou,

Please find attached the detailed feedback from MBIE on our proposal. We seem to have lost out on portfolio balance. Overall the strengths section is as expected and the weaknesses features perceived risk to my eyes, but possibly because we were so innovative. The good news is that my interpretation is that we were very close with the rank cohort of 3 meaning we were in the top 30 proposals roughly (top 30% of 106). Given that we were in the top 20 proposals for science and team excellence that means we only dropped our score by one step in the Implementation Pathway and Benefits to New Zealand. My reading is that some work on the implementation pathway could make a big difference in particular and that they think the team built is very strong. One of the comments in the weaknesses section being

“No significant weaknesses in the program and presentation of it.”

suggests to me that some tuning in a rebid might make all the difference, particularly around risk. On that note Shannon Fraser at UC Research and Innovation team will be sending out the proposal and the feedback to a consultant who will provide some input on potential repositioning.

Anyway, I'm sending this out quickly and I suggest that we line up a meeting either next week or early the week after to discuss a rebid and to identify ways forward. How does that work? If I don't hear anything I will send out a Doodle Poll in due course.

Ngā mihi nui,

s9(2)(a)

From: s9(2)(a)

Sent: Thursday, 28 September 2023 1:57 pm

To: s9(2)(a) [redacted]
[redacted]

Subject: FW: MBIE Endeavour 2023 - Feedback

Kia ora [redacted]

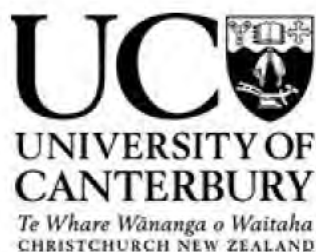
We have received the feedback on your 2023 MBIE Endeavour proposal, which is attached along with MBIE's letter explaining the feedback process in a bit more detail.

Please note that the comments are supplied as written without any editing by MBIE. If there are any points which are unclear, we can seek further clarification from MBIE.

If you would like to discuss your feedback, or have any questions about future submissions, please let us know.

Ngā mihi

[redacted]



s9(2)(a) [redacted]
[redacted]
[redacted]
[redacted]
[redacted]
[redacted]
[redacted]

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From: [Lucy Batt](#)
To: [Alex Zadnik](#)
Subject: RE: News Digest | March 2023 Edition
Date: Monday, 6 March 2023 10:39:20 pm
Attachments: image001.png
image002.png

Thanks Alex,

I've just subscribed to this newsletter.

My budget for this conference didn't make the cut this FY unfortunately.
But I have included it in next year's expenditure forecast.

Cheers,



Lucy Batt
General Manager International Business
MetraWeather

t +61 2 9449 9771 m [REDACTED]

Suite 25, Level 8, 100 Walker Street, North Sydney 2060, Australia



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From: Alex Zadnik <Alex.Zadnik@metraWeather.com>
Sent: Monday, 6 March 2023 7:51 pm
To: Lucy Batt <Lucy.Batt@metraWeather.com>
Subject: Fwd: News Digest | March 2023 Edition

FYI - might be of interest to Rob and/or Simeon as well given the climate focus.

Begin forwarded message:

From: "InterMET.Digital" <acf@mmiasia.com.sg>
Date: 6 March 2023 at 7:46:24 pm AEDT
To: Alex Zadnik <Alex.Zadnik@metraWeather.com>
Subject: News Digest | March 2023 Edition
Reply-To: "InterMET.Digital" <acf@mmiasia.com.sg>

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News digest - March 2023 edition

Welcome to the second edition of the free monthly news digest from [InterMET.digital](#), the indispensable portal serving the meteorology, flood and air quality industries, and sister channel to the [Asia Climate Forum](#) taking place in Singapore from 18-20 April. Registration for the show free of charge is now open - just click the button below.

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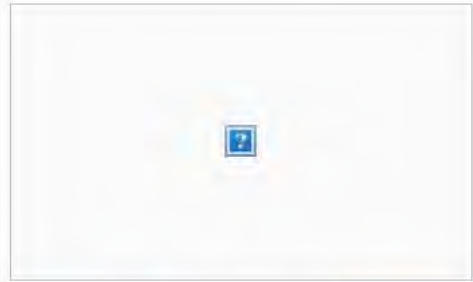
Vaisala announces [record financial results](#) for 2022, aided by strong growth in the meteorology segment



UAE officially announces the [candidacy of Abdullah Al Mandoos](#) to head the World Meteorological Association



Amid 'spy balloon' controversy, WMO [highlights key role of weather balloons](#) in climate monitoring



Artificial Intelligence brings [real-time weather alerts](#) to flood-prone Thailand and Vietnam



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NMHS's & ASSOCIATIONS

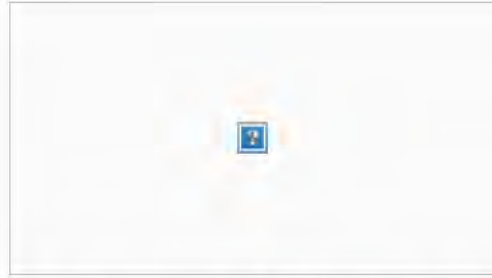
- ACF and China Meteorological Service Association [form strategic partnership](#)
- Caribbean sees first regional launch of [global plan on early warning systems](#)
- Philippine Gov't allocates [PHP 20bn for integrated flood resilience](#) project
- New weather monitoring a major upgrade to [Vanuatu's climate resilience](#)
 - [ECMWF](#) publishes new software strategy
- WMO publishes [guidelines for NMHSs](#) for satellite-based nowcasting in Africa
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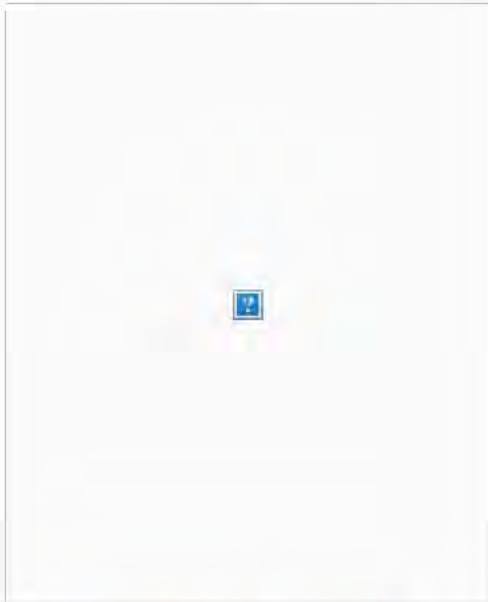
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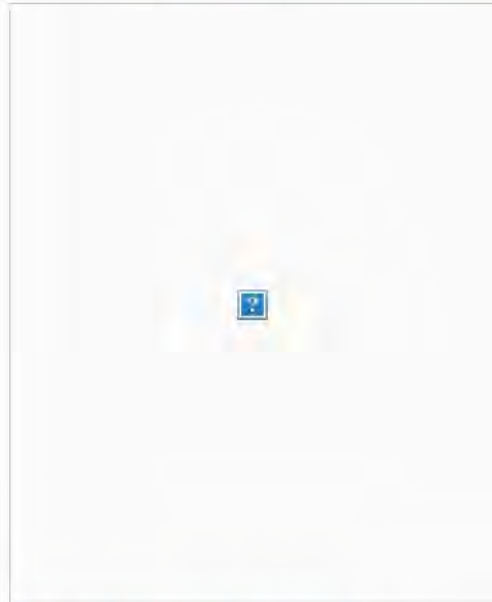
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MMI Asia, organisers of ACF, to run the world-leading [Singapore International Water Week](#) (SIWW)

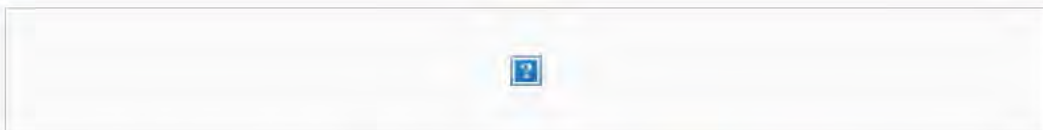


THE [regional meteorology event](#), now in its 8th year. [Book your stand now](#) or [click here for 2023 brochure](#)



[SIWW SPOTLIGHT 2023](#), 4-6 June, Singapore. Theme: Urgent climate action for a sustainable water future

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Satisfaction of their clients is the top priority, therefore they strive to continuously invest in the improvement of their products and services based on the clients' needs and desires. They believe that their success goes hand in hand with facilitating their clients to achieve their visions; and they are very proud to be part of those meaningful mutual projects around the globe.

MicroStep-MIS full profile



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From: [Lisa Murray](#)
To: [Linda Stopforth](#)
Subject: RE: News headlines / Panui from the Library - Monday 17 February 2020
Date: Monday, 17 February 2020 9:43:52 am

Welcome back. I missed you being around!.

From: Linda Stopforth <x@x>
Sent: Monday, 17 February 2020 9:20 a.m.
To: EveryoneAtKelburn <@>; EveryoneAtParaparaumu <@>; EveryoneAtChristchurch <@>; EveryoneAtAuckland <@>; EveryoneAtMetOcean <@>; Sales AU <@>; Greg Reeve <x@x>
Cc: Erick Brenstrum <x@x>; Bob McDavitt (hotmail) <@>; Paula Acethorp <x@x>
Subject: News headlines / Panui from the Library - Monday 17 February 2020

New Zealand weather and climate news (MetService focus)

[Weather: Uesi nothing out of the ordinary, lack of rain an ongoing concern](#)

There were warnings about the wet weather ex-tropical cyclone Uesi would bring to the West Coast over the weekend - but other parts of New Zealand have seen barely any rain in weeks.

[Something's on the horizon](#)

Otago Daily Times

Good things take time, they used to say in those wonderful Mainland Cheese television ads. If that is the case, the confirmation **MetService** is finally ...

[Smattering of rain brings no reprieve to Northland](#)

New Zealand Herald

MetService meteorologist Kyle Lee said parts of the Northland region received rain, mainly from sunrise through to around 8am on Sunday, followed ...

[Timaru hotter than average for February](#)

Stuff.co.nz

The highest recorded February temperature for Timaru was in 1998 when it reached 37.8 degrees, **Metservice** weather communication advisor Sonja ...

[South Island weather: Ex-Tropical Cyclone Uesi brings heavy rain and wind](#)

Stuff.co.nz

Heavy rain and strong winds are set to hit parts of the South Island on Sunday.

MetService has issued heavy rain warnings for Buller, Westland, ...

[Ex-Tropical Cyclone Uesi still an 'intense weather system' headed towards South Island](#)

Stuff.co.nz

On Friday morning **MetService** issued a heavy rain warning for Westland south of Otira from 4am Sunday until 4am Monday. Accumulative rainfall of ...

[Weather: Big dry continues for Auckland despite a few drops of rain](#)

New Zealand Herald

If you woke up with a sprinkling of rain on your car this morning - don't get too excited. **MetService** says the rain was so light Auckland Airport's rain ...

[World Weather](#)

Erick Brenstrum joins us once again to take a look at the best and the worst of world weather.

[Northland drought conditions classified 'adverse event' by government](#)

The drought conditions in Northland have been classified as an "adverse event" for the primary sector, meaning government funding can be accessed to help out farmers.

[Farmers in Waikato hope for rain as extreme dry takes hold](#)

Farmers in parts of Waikato are looking skyward hoping at least 100 millimetres of rain will fall within the next fortnight as an extreme dry takes hold in the region.

[Some weather events 'impossible to plan for' - Agriculture Minister Damien O'Connor](#)

Agriculture Minister Damien O'Connor is confident Northland farmers and growers will survive a record-breaking drought.

[NZ's Big Dry: Five key questions answered](#)

New Zealand Herald

In both seasons, the tropical Pacific has been in an **El Nino**-Southern Oscillation (Enso) neutral state - meaning that neither **El Nino** or La Nina patterns ...

[Another scorcher: Napier hits 34.2C as heat cranks up again](#)

New Zealand Herald

The relentless Hawke's Bay summer sun is going nowhere fast. **MetService** meteorologist Lewis Serris said Thursday's ██████████ in Hawke's Bay was ...

MetOcean (and oceanmet, marine weather etc)

Stephen M. Chiswell & Philip J. H. Sutton (2020) **Relationships between long-term ocean warming, marine heat waves and primary production in the New Zealand region**, New Zealand Journal of Marine and Freshwater Research, DOI: [10.1080/00288330.2020.1713181](https://doi.org/10.1080/00288330.2020.1713181)

We test the paradigm that in a future warmer ocean, shallower winter mixing will lead to less net primary production (NPP), by investigating whether warming between 2002 and 2018 led to changes in NPP in the Tasman Sea/New Zealand region. The 2002–18 trend in sea surface temperature (SST) was positive over most of the region, and was driven by increasingly warmer summers and marine heat waves (MHWs) rather than year-round warming. In contrast, the trends in sea surface chlorophyll (SSC) and NPP were generally positive over the Subtropical Front (STF) and in a subtropical band north-east of New Zealand, but negative elsewhere. Regressions between SSC and SST, and between spring SSC and the coldest SST during the preceding winter, show similar spatial patterns to the SSC trend. We suggest these findings reflect different ecosystem functioning in the subtropical and subantarctic biomes that are separated by the STF. We conclude that any future warming is likely to lead to less production in the Tasman Sea, but more production over the STF. Three recent MHWs had different impacts on production, but generally led to less surface biomass north of the STF and more biomass south of the front.

Volcano alert/watch

[Project to focus on adapting to living with ongoing volcanic activity](#)

The next eruption on Mt Taranaki could last for decades and cost the country billions a year, volcanologists say.

Extreme weather (and other news) – Antarctica and offshore

[The Antarctica factor: Model uncertainties reveal upcoming sea level risk](#)

Within this century already, due to Antarctica alone global sea level might rise up to three times as much as it did in the last century. This is a finding of an exceptionally comprehensive comparison of state-of-the-art computer models from around the world.

[Climate change: Highest-ever temperature of over 20°C recorded in Antarctica](#)

An **El Nino** is a weather event, which can cause extreme weather around the world. An **El Nino** comes along about every two to seven years as part of ...

Extreme weather (and other news) – Australia and Pacific

[Weather systems off Samoa group and Tuvalu could become cyclones](#)

The Samoa Meteorological Service says there are two weather systems which are of concern to Samoa.

A Tropical Disturbance near Tuvalu, TD07F, and a developing low pressure system near Samoa.

[Missing Bendigo weather pod keeps transmitting data in suspected captivity](#)

Bendigo Advertiser

The apparent theft of a **weather** pod has sparked La Trobe University Technology **Innovation** Lab head Dr Simon Egerton's curiosity.

Extreme weather (and other news) – Asia and the Middle East, Africa

[Saudi Arabia shivers in worst cold spell](#)

The Siasat Daily

Riyadh: Saudi Arabia is experiencing its coldest weather since 2016, meteorologists said Thursday, with overnight temperatures dropping below zero ...

[Penang, Kedah facing imminent water crisis as key dams dry up](#)

Free Malaysia Today

PBA CEO Jaseni Maidinsa said cloud-seeding operations must be urgently intensified to induce rain at the key Beris and Muda dams in Kedah so that ...

[Local Solutions Prepare South Asia for Searing Heat](#)

Natural Resources Defense Council

This week, a regional summit of heat experts in South Asia focuses attention ... (NDMA), the India Meteorological Department, and other local partners.

[Baghdad wakes up to first snow in a decade to lighten mood after months of unrest](#)

Iraq's capital of Baghdad woke on Tuesday (local time) to a sight not seen in more than a decade — snow.

[What's behind Kenya's strange weather?](#)

Phys.Org

This event is similar to the El Niño Southern Oscillation that occurs in the tropical Pacific Ocean. Sea surface temperatures are measured by the ...

[Thailand: Growth risks intensifying amid coronavirus outbreak - ANZ](#)

FXStreet

Thailand: Growth risks intensifying amid coronavirus outbreak - ANZ ... stemming from the coronavirus outbreak and inclement **weather** conditions.

Extreme weather (and other news) – Americas and Europe

[Storm Dennis triggers Red rain warning](#)

The Met Office issued a Red Warning for rain – the highest level of warning - for parts of south Wales on Sunday morning.

[Storm Ciara expected to cost up to £200m in insurance claims](#)

Experts at PwC say Storm Dennis likely to add to damage with 140mm of rain predicted

[Twin bomb cyclones to merge into one of strongest-ever storms in North Atlantic](#)

A potentially unprecedented scenario is unfolding in the North Atlantic on Friday (local time), as a bomb cyclone batters Iceland with hurricane-force winds and blizzard conditions, just as another bomb cyclone, known as Storm Dennis, rapidly intensifies behind it.

[January was the most unusually warm month ever recorded without an El Niño](#)

Washington Post

January was the most unusually warm month on record to occur in the absence of an El Niño event in the tropical Pacific Ocean, in another ...

[California could go through all of February without a significant storm for the first time since 1864. A ...](#)

Business Insider UK

NOAA's Cooperative Institute for Meteorological Satellite Studies (CIMSS) shared the image on Twitter. "Can you spot the high pressure???" it wrote.

[It's so cold the ground is exploding in Toronto. Here's what you need to know about 'frost quakes'](#)

Toronto Star

... will expand, putting pressure on surrounding soil and rock until an explosion is caused, said Kelly Sonnenburg, a Weather Network meteorologist.

[Water boards up taxes to tackle changing weather patterns](#)

DutchNews.nl

Water boards up taxes to tackle changing **weather** patterns ... A farmer with a **business** worth €400,000 can expect to pay €2,526 which represents a ...

International news and research

[Computer-based weather forecast: New algorithm outperforms mainframe computer systems](#)

Posted: 13 Feb 2020 09:42 AM PST

The exponential growth in computer processing power seen over the past 60 years may soon come to a halt. Complex systems such as those used in weather forecast, for example, require high computing capacities, but the costs for running supercomputers to process large quantities of data can become a limiting factor. Researchers have recently unveiled an algorithm that can solve complex problems with remarkable facility -- even on a personal computer.

[Twin Dangers of Scorching Days and Sweltering Nights Are on the Rise](#)

The combination of day and night extreme heat will only get more frequent—and hotter—in the future

[Meteorology 101: Rules For Building A Better Forecast](#)

Forbes

It holds that the accuracy of the **weather** forecast improves by one day every ... and Atmospheric Administration's Earth Prediction **Innovation** Center.

[Which forecast models do meteorologists use most?](#)

WOODTV.com

(WOOD) — If you spend enough time listening to weather reports on the air, at one point or another you'll likely hear broadcast **meteorologists** make ...

[Weather Source uses Snowflake to keep ahead of extreme weather](#)

ComputerWeekly.com

... if accurate weather forecasting is not built into their business assumptions, ... Weather Source provides enterprise clients with meteorological data to ...

[SERB Scientist Rajeev Mahajan calls for nodal IMD agency for climate services at ICCS-6, Pune](#)

Indus Dictum

Dr. Mahajan highlighted that the India Meteorological Department (IMD) ... weather-ready (already unparalleled in South Asia) and climate-smart ...

Aviation

[Rocket Lab wins Nasa contract to provide 'ride to the moon' for small satellite mission](#)

Stuff.co.nz

Rocket Lab has won a \$15.5 million Nasa contract to launch a small satellite to the moon next year. The tech company will send a satellite into the ...

[Climate Change is Making it Harder for Planes to Get in the Air, New Study Says](#)

The Weather Channel

Williams and his fellow researchers studied 60 years of weather and aircraft data from Greek airports to see how warmer air temperatures and ...

[Small altitude changes could cut climate impact of aircraft by up to 59%](#)

Posted: 12 Feb 2020 09:19 AM PST

Altering the altitudes of less than 2% of flights could reduce contrail-linked climate change by 59%, says a new study.

Business/Insurance

[Southland still in state of emergency with repairs set to cost millions](#)

Feb 15, 2020 06:04 am

It's too early to count the cost of last week's flooding, but it'll be significant with the

repairs to Milford Road alone costing millions of dollars to fix, authorities say.

[Weather Forecasting for Business Market Booming Worldwide| Accuweather, BMT ARGOSS...](#)

News Parents (press release)

Latest Study on Industrial Growth of Global **Weather** Forecasting for **Business** Market 2019-2025. A detailed study accumulated to offer Latest insights ...

Lightning

[New Study Hints at Bespoke Future of Lightning Forecasting](#)

Eos

Weather forecasting has come a long way since the days of the Apollo ... colleagues describe training a machine learning algorithm on **data** from 12 ...

Climate change / global warming / sea level rise

[January 2020: Earth's Warmest January on Record](#)

The month was our planet's warmest ever recorded without an El Niño being present

Cloud seeding / Geoengineering

[Cloud-seeding plan aims to increase rainfall in Saudi Arabia by 20 percent](#)

The Rahnuma Daily (press release)

RIYADH (Rahnuma): The Saudi cabinet has approved a **cloud-seeding** program that aims to increase rainfall in the Kingdom by almost 20 percent.

Emergency preparedness / disaster planning / resilience

[How NZ would fare during a world catastrophe](#)

Insight - The current coronavirus outbreak is serving as a real time test of New Zealand's emergency plans. But public health experts warn there are even bigger threats out there that we should also be preparing for. John Gerritsen investigates if we could cope in a global catastrophe.

Library

['Weed in the dead of night': A librarian shares the secrets of book-culling](#)

Librarian Rebecca Hastie with a crash course on the fraught task of "weeding", the systematic removal of resources from a library collection.

Writer and reviewer David Larsen [wrote an article the other week](#) conveying his immense displeasure and concern that the National Library is removing 600,000 books from its collection. David's piece, along with the inevitable Nazi book burning comparisons in the comments section, is very much par for the course when a library begins a weeding project. For librarians, though, weeding is a crucial aspect of our professional duty to maintain collections that best serve the needs of our communities.

Journal and articles online

Reremoana Theodore, Melinda Webber, Richard Blaikie & Wendy Lerner (2019)

[Rethinking our shared futures](#), Journal of the Royal Society of New Zealand, 49:sup1, 1-3, DOI: [10.1080/03036758.2019.1687531](https://doi.org/10.1080/03036758.2019.1687531)

The Royal Society Te Apārangi asked a number of experts to contribute papers around rethinking our shared futures, to be included in this open access supplement of the *Journal of the Royal Society New Zealand*. The papers cover a range of topics including

business, hauora, culture, society, environment, history and even reflections on research practice itself. They have been presented here to encourage reflection and discussion, and to help us broaden our shared understandings of the purpose, process and impact of research for everyone in Aotearoa.

Determination of automatic weather station self-heating originating from accompanying electronics

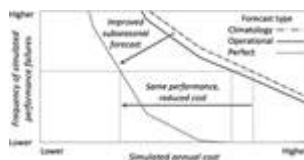
P. Pavlasek, A. Merlone, F. Sanna, G. Coppa, C. G. Izquierdo, J. Palencar, S. Duris
e1844 | First Published: 30 September 2019



This study focuses on the most commonly used temperature sensors within automatic weather stations, with a specific focus on evaluating the self-heating effect, which originates not only from the temperature sensor itself but also from the electrical components housed together within. The results of overall self-heating indicated a 0.07°C increase in temperature for the tested sensors when using the manufacturers' minimum recommended electric current supply. The use of elevated voltage levels up to 80% of recommended values shows a temperature increase as high as 0.32°C.

Quantifying the potential for improved management of weather risk using sub-seasonal forecasting: The case of UK telecommunications infrastructure

David J. Brayshaw, Alan Halford, Stefan Smith, Kjeld Jensen
e1849 | First Published: 06 October 2019



In the United Kingdom, the telecommunication network provides an estimated net annual economic contribution of over £30 billion, yet it is exposed to considerable weather risk. This paper provides an end-to-end demonstration of the potential for skilful sub-seasonal meteorological forecasts to improve decision-making in telecommunication infrastructure management. Meteorological forecast skill is argued to be a necessary rather than a sufficient condition, with explicit modelling required to demonstrate utility to users in complex decision environments.

[Major factors affecting the snow simulations by the JULES in New Zealand](#)

Yang Yang, Michael Uddstrom, Richard Turner, Mike Revell
e1837 | First Published: 19 August 2019



Snow frequently occurs over New Zealand in a maritime climate. The seasonal snow accumulation can be 3,000–4,000 mm deep in early spring at some locations. Owing to sparse snow observations, modelling and verification was limited. The major factors affect snow simulation over New Zealand are not well known. In the present study, major factors affecting snow simulation over New Zealand were identified and discussed. The maritime climate of New Zealand may make the snow simulation more sensitive to radiation, snow albedos and precipitation phase determination than for continents.

[An intuitive metric to quantify and communicate tropical cyclone rainfall hazard](#)

An intuitive rainfall hazard metric – the “Extreme Rainfall Multiplier” (ERM) – is used to describe extreme rainfall from past tropical cyclones and could improve the communication of future extreme rainfall events.

Recent tropical cyclones (TCs) have highlighted the hazards that TC rainfall poses to human life and property. These hazards are not adequately conveyed by the commonly-used Saffir-Simpson scale. Additionally, while recurrence intervals (or, their inverse, annual exceedance probabilities) are sometimes used in the popular media to convey the magnitude and likelihood of extreme rainfall and floods, these concepts are often misunderstood by the public and have important statistical limitations. We introduce an alternative metric – the “extreme rain multiplier” (ERM), which expresses TC rainfall as a multiple of the climatologically-derived two-year rainfall value. ERM allows individuals to connect (“anchor,” in cognitive psychology terms) the magnitude of a TC rainfall event to the magnitude of rain events that are more typically experienced in their area. A retrospective analysis of ERM values for TCs from 1948 to 2017 demonstrates the utility of the metric as a hazard quantification and communication tool. Hurricane Harvey (2017) had the highest ERM value during this period, underlining the storm’s extreme nature. ERM correctly identifies damaging historical TC rainfall events that would have been classified as “weak” using wind-based metrics. The analysis also reveals that the distribution of ERM maxima is similar throughout regions of the eastern United States, allowing for both the accurate identification of locally extreme rainfall events and the development of regional-scale (rather than local-scale) recurrence interval estimates for extreme TC rainfall. Lastly, an analysis of precipitation forecast data for Hurricane Florence (2018) demonstrates ERM’s ability to characterize Florence’s extreme rainfall hazard in the days preceding landfall.

From: [Chris Webster](#)
To: [Fulong Lu](#)
Subject: RE: NZ topographic map
Date: Friday, 27 May 2022 3:22:18 pm
Attachments: S-Island_location_map2.jpg
AtmosEnvironment_2019_Choudhury-et-al_Aerosol-orography-precip.pdf

Hi Fulong,

How does the attached revised map look? I've also attached the paper you requested.

Next Friday 3 June is best for me – you could book a meeting in Outlook.

Cheers,
Chris

From: Fulong Lu <xxxxxx.xx@xxxxxxxxxxx.xxx>
Sent: Friday, 27 May 2022 2:39 PM
To: Chris Webster <xxxxxx.xxxxxxx@xxxxxxxxxxx.xxx>
Subject: RE: NZ topographic map

Hi Chris,

As discussed, the fonts might be too small, not sure how it looks like by increased 50% or 100%. Green colour for the regional names with greenish background would be not hard to see when the chart inserted on the paper. Black colour or other colour might be better, how do you think?. The shapes for the headwaters of Otago and Canterbury lakes and rivers look good.

Please find the attached file (my working version) as my revised version. Figure 9 b) and c) are not easy to see, and I might replace b) by using WRF 8km WLD/CNY domain for better resolution, and “not shown” c). Therefore, I will need to rewrite that part. I would like to meet you next week. I am available on Tuesday and Friday, and I work on morning shift on Thursday. What time will suit you better?

In addition, I need you to help me to download another paper, which is called “ Aerosol-orography-precipitation – A critical assessment” (Goutam Choudhury, et at.).

Many thanks! Have a nice weekend.

Kind regards,
Fulong

From: Chris Webster <xxxxxx.xxxxxxx@xxxxxxxxxxx.xxx>
Sent: Tuesday, 24 May 2022 4:30 PM
To: Fulong Lu <xxxxxx.xx@xxxxxxxxxxx.xxx>
Subject: RE: NZ topographic map

Hi Fulong,

Attached is a first go at preparing the map. It's all editable.

Chris

From: Fulong Lu <xxxxxx.xx@xxxxxxxxxxx.xxx>
Sent: Wednesday, 4 May 2022 4:43 PM
To: Chris Webster <xxxxx.xxxxxxx@xxxxxxxxxxx.xxx>
Subject: RE: NZ topographic map

The map with lat&long every degrees and every 5 degrees marked. Select one that you think it is better.

Cheers,
Fulong

From: Fulong Lu
Sent: Wednesday, 4 May 2022 4:18 PM
To: Chris Webster <xxxxx.xxxxxxx@xxxxxxxxxxx.xxx>
Subject: RE: NZ topographic map

Hello Chris,

As discussed, the map for the South Island needs regional names (in the mainland), and the area of the headwaters of Otago and Canterbury lakes and rivers. The Rangitata River and locations of Mt Cook Aero, Arthur's Pass and Timaru might be better to be included as we use them in the paper.

Any other thought?

Thanks and regards,
Fulong

From: Chris Webster <xxxxx.xxxxxxx@xxxxxxxxxxx.xxx>
Sent: Tuesday, 3 May 2022 3:56 PM
To: Fulong Lu <xxxxxx.xx@xxxxxxxxxxx.xxx>
Subject: NZ topographic map

Hi Fulong,

As promised, attached is a nice topographic map of NZ. This may be useful to include, in whole or in part, in the paper.

I'm happy to add any graphics to the map, e.g. adding place names or area names, if required.

Cheers,
Chris

From: [Lewis Ferris](#)
To: s9(2)(a)
Subject: RE: Radio New Zealand - Cloud Seeding
Date: Monday, 29 August 2022 3:25:00 pm
Attachments: image003.png

Kia ora s9(2)(a)

Thanks for getting in touch.

I don't feel qualified to engage in meaningful discussion around this particular topic so I've passed it on internally to see if there may be someone willing to put their hand up.

I'll let you know what I hear back.

Cheers,



Lewis Ferris (He/Him)
Communications Meteorologist
Weather Communications

From: s9(2)(a)
Sent: Monday, 29 August 2022 2:35 PM
To: Lewis Ferris <xxxxx.xxxxxx@xxxxxxxxxxx.xxx>
Subject: Radio New Zealand - Cloud Seeding

Kia ora Lewis,

s9(2)(a) from Radio New Zealand here. I hope this finds you well.

I'm working on a story about China's use of cloud-seeding to induce rainfall in drought-stricken areas.

[\[https://edition.cnn.com/2022/08/17/asia/china-heat-drought-climate-yangtze-intl/index.html\]](https://edition.cnn.com/2022/08/17/asia/china-heat-drought-climate-yangtze-intl/index.html)

I'm also looking at potential applications of this kind of weather modification technology in New Zealand.

[\[https://www.rnz.co.nz/news/rural/68687/cloud-seeding-experiments-seek-funding-support\]](https://www.rnz.co.nz/news/rural/68687/cloud-seeding-experiments-seek-funding-support)

There seems to be a fair bit of debate over the effectiveness of cloud seeding, and it would be great to get a New Zealand perspective on this.

Would you or another Metservice expert be available sometime in the next couple of days to discuss some of the history and issues around cloud seeding?

Please let me know.

Thanks for your help.

Ngā mihi,

s9(2)(a) | Programme Producer
RNZ | Level 2, 171 Hobson Street | PO Box 2209 | Auckland | New Zealand
Mob s9(2)(a)



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From: [Lewis Ferris](#)
To: [Chris Noble](#)
Subject: RE: Radio New Zealand - Cloud Seeding
Date: Monday, 29 August 2022 3:37:09 pm
Attachments: image001.png

Too easy!

From: Chris Noble <xxxxx.xxxxx@xxxxxxxxxxx.xxx>
Sent: Monday, 29 August 2022 3:36 PM
To: Lewis Ferris <xxxxx.xxxxx@xxxxxxxxxxx.xxx>
Subject: RE: Radio New Zealand - Cloud Seeding

I think it would be safest to stay away from this one.

MetService has never, to my knowledge, been involved in discussions about cloud seeding, we have no expertise or knowledge on the topic, and as such we don't have anything to say about it.

Happy to let NIWA take this one.

Regards,
Chris

From: Lewis Ferris <xxxxx.xxxxx@xxxxxxxxxxx.xxx>
Sent: Monday, 29 August 2022 3:22 pm
To: Chris Noble <xxxxx.xxxxx@xxxxxxxxxxx.xxx>
Subject: FW: Radio New Zealand - Cloud Seeding

Hey Chris,

I'm probably not going to put my hand up for this one but I was wondering if there's anyone who would do it? I don't know if MetService has ever been involved in conversation around it.

I'd suspect someone at NIWA might have something to say but thought I'd try internal before pushing them of. I'm sure **s9(2)(a)** could speak at length!

Cheers,
Lewis

From: **s9(2)(a)** **s9(2)(a)**
Sent: Monday, 29 August 2022 2:35 PM
To: Lewis Ferris <xxxxx.xxxxx@xxxxxxxxxxx.xxx>
Subject: Radio New Zealand - Cloud Seeding

Kia ora Lewis,

s9(2)(a) from Radio New Zealand here. I hope this finds you well.

I'm working on a story about China's use of cloud-seeding to induce rainfall in drought-stricken areas.

[\[https://edition.cnn.com/2022/08/17/asia/china-heat-drought-climate-yangtze-intl/index.html\]](https://edition.cnn.com/2022/08/17/asia/china-heat-drought-climate-yangtze-intl/index.html)

I'm also looking at potential applications of this kind of weather modification technology in New Zealand.

[<https://www.rnz.co.nz/news/rural/68687/cloud-seeding-experiments-seek-funding-support>]

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Would you or another Metservice expert be available sometime in the next couple of days to discuss some of the history and issues around cloud seeding?

Please let me know.

Thanks for your help.

Ngā mihi,

s9(2)(a) | Programme Producer

RNZ | Level 2, 171 Hobson Street | PO Box 2209 | Auckland | New Zealand

Mob s9(2)(a)



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From: [MetComms](#)
To: s9(2)(a)
Subject: Re: Rain radar
Date: Thursday, 11 July 2024 10:20:47 am

Kia ora Joel,

Thanks again for your questions.

As far as I am aware, cloud seeding is not something that happens in New Zealand.

There's a little more about it from our friends at NIWA, who also do not do cloud-seeding [Climate and weather | NIWA](#)

Kind regards,

John

MetService – Te Ratonga Tirorangi

Level 2, 110 Featherston Street, Wellington 6012

PO Box 722, Wellington 6140, New Zealand



On Thu, 11 Jul at 9:52 AM, s9(2)(a) > wrote:

You don't often get email from s9(2)(a). [Learn why this is important](#)

Ok thanks for that.

What can you tell me about cloud seeding in NZ or have you been sworn to secrecy?

Cheers.

[Yahoo Mail: Search, organise, conquer](#)

On Tue, 9 Jul 2024 at 13:28, MetService Weather <metcomms@metservice.com> wrote:

Kia ora s9(2)(a)

Thanks for your question. The rising and setting sun does cause some of the lines that can be seen on the radar - you'll often see them from several of the radar at the same time pointing in the same direction.

However, there are other different things that can cause interference, including wifi routers set to the wrong frequency. This page has some information about some of the more common causes [It's a bird! It's a plane! It's radar interference! | MetService Blog](#)

Thanks again for your message.

Kind regards,

John

MetService – Te Ratonga Tirorangi

Level 2, 110 Featherston Street, Wellington 6012

PO Box 722, Wellington 6140, New Zealand



On Tue, 9 Jul at 1:15 PM, **s9(2)(a)**
s9(2)(a) wrote:

You don't often get email from **s9(2)(a)**. [Learn why this is important](#)

Hello.

I was just reading up on the straight lines I see on the rain radar.

Now you say it's caused by interference from the sun.

So can you please explain why I have seen them at night after the sun has set?

I don't expect to hear back from anyone about this.

Whenever I ask questions that'll expose things I never get a reply.

So cheers and I hope you get back to me on this subject.

[Yahoo Mail: Search, organise, conquer](#)

From: [AMOS](#)
To: [Michael Martens](#)
Cc: [s9\(2\)\(a\)](#)
Subject: Re: Session themes/streams
Date: Monday, 31 May 2021 12:30:44 pm
Attachments: AMOS2021_Submitted_Sessions_Website.pdf
AMOS-ICSHMO 2018_Detailed Sessions List.doc

Hi All,

As discussed, here are the sessions for AMOS 2021 and for AMOS-iCSHMO 2018.

All the best

[s9\(2\)\(a\)](#)

From: [Lucy Batt](#)
To: [Alex Zadnik](#)
Subject: RE: [REDACTED] Contract - do you have a word version?
Date: Monday, 6 March 2023 11:40:18 am
Attachments: [REDACTED] Contract Renewal.msg
image001.png
image002.png
image003.png
D 94888 Service Contract_Metra_[REDACTED]_Apr21.docx

Hi Alex,

I did have a nice weekend thanks – a swim down at Curl Curl followed by a BBQ
I hope you had a lovely weekend too?

Sure do – please see attached.

Cheers,



Lucy Batt
General Manager International Business
MetraWeather

t +61 2 9449 9771 m +61 400 373 782

Suite 25, Level 8, 100 Walker Street, North Sydney 2060, Australia



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From: Alex Zadnik <xxxx.xxxxxx@xxxxxxxxxxxxx.xxx>
Sent: Monday, 6 March 2023 7:52 am
To: Lucy Batt <xxxx.xxxx@xxxxxxxxxxxxx.xxx>
Subject: [REDACTED] Contract - do you have a word version?

Good Morning Lucy,

I hope you had a nice weekend? The renewal for [REDACTED] is coming up next month, so I have commenced discussions with [REDACTED] regarding this. I note that their contract is quite a custom one (see attached), so my preference will be to reuse it, with our address details updated, and deliverables altered (if they take new services). Therefore, do you have a word version of the attached PDF, either in your files, or in an email from [REDACTED] ?

Kind regards,

Alex



Alex Zadnik BSc MBA/MAM
Business Manager Australia
MetraWeather

m +61 439767557

We have a new Sydney office. Please update your records:
Suite 25, Level 8, 100 Walker Street, North Sydney 2060, Australia



metservice.com . metraweather.com . metocean.co.nz

From: [Stephen Hunt](#)
To: [Lucy Batt](#); [Keith Hilligan](#)
Cc: [Rob Harrison](#)
Subject: Re: [REDACTED] Contract Renewal
Date: Monday, 8 March 2021 6:48:43 pm
Attachments: image001.png
image002.png

Excellent news Lucy, congratulations and thanks for the heads-up. I'll sign and return quickly.
Cheers

Get [Outlook for iOS](#)

From: Lucy Batt <xxxx.xxxx@xxxxxxxxxxxxx.xxx>
Sent: Monday, March 8, 2021 6:46:49 PM
To: Stephen Hunt <xxxxxxx.xxxx@xxxxxxxxxxxxx.xxx>; Keith Hilligan <xxxxxx.xxxxxxxx@xxxxxxxxxxxxx.xxx>
Cc: Rob Harrison <xxx.xxxxxxxx@xxxxxxxxxxxxx.xxx>
Subject: [REDACTED] o Contract Renewal

Good evening Stephen & Keith,

I am pleased to report that our long-standing customer [REDACTED] are in the process of renewing their service for another 2 year period.

They are using DocuSign to execute their contracts and require the signatures of 2 directors. Since this exceeds my DFO, please can you both execute when you receive the contract? ETA this week. Please note, DocuSign notifications go directly to signatories, which means I will not have the opportunity to re-review before you sign.

For this reason I have attached the approved drafts as a reference. Please check **Part A** is as per the attached draft before signing – this section includes all the important stuff. The terms in the attached were reviewed and approved by our legal counsel during the previous renewal 2 years ago.

Some background:

[REDACTED] have been a happy customer of ours since 2010, receiving ECMWF forecast guidance and energy trading forecasts for their teams.

They use this information to optimise their energy trading portfolio, as well as to plan cloud-seeding for their snow pack. This ensures a healthy supply of snow-melt into their dams in times of drought – when energy prices spike & they make most of their profit. Very cool.

Contract term: [REDACTED]
TCV: [REDACTED]

Thanks & please let me know if you have any questions.



Lucy Batt
General Manager International Business
MetraWeather

t +61 2 9449 9771 m +61 400 373 782

Level 6, 657 Pacific Highway

PO Box 413, St Leonards NSW 2065, Australia



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From: s9(2)(a)
To: Brett Beamsley; Chris Noble; Kevin Alder
Subject: RE: Visit to MetService in June/July
Date: Tuesday, 4 July 2023 12:37:21 pm
Attachments: image001.png
image002.png
image006.png
image007.png
image008.png
PROP-89536-ENDRP-UOC_Full_080323_0946.pdf

Kia ora Brett,

Previous to the meeting on Thursday, I thought I would send you a copy of the MBIE Endeavour Research Programme that Chris and Kevin know all about because they were there at the start. It grew somewhat from that point, as the original intent was a Smart Ideas, but this proposal was judged to be in the top quintile for Science and Team Excellence, so it moved forward to the next round of review. So we have about a 30% chance of success now, I am hopeful that we will be lucky and that this will further strengthen our collaborations. But, even if it doesn't win this time I would be keen to resubmit. Anyway, it provides you with some insight on something I will be mentioning as a win-win.

Looking forward to discussion Thursday,

█

From: Brett Beamsley <x.xxxxxxx@xxxxxxx.xx.xx>
Sent: Monday, 26 June 2023 8:54 am
To: Chris Noble <xxxxx.xxxxx@xxxxxxxxxxx.xxx>; Adrian McDonald
s9(2)(a); Kevin Alder <xxxxx.xxxxx@xxxxxxxxxxx.xxx>; Chris Kroger
<xxxxx.xxxxx@xxxxxxxxxxx.xxx>
Subject: RE: Visit to MetService in June/July

You don't often get email from x@xx. [Learn why this is important](#)

Morning Adrian,

Nice to meet you, all be it online. I'm based out of our office in Raglan, but I'm often down in Wellington as part of the team is down there. I'd be happy to make myself available on that date/time to catch up and discuss what we can potentially work on (and reading through the email chain, I'm always interested to see how we can develop and resource capabilities locally to fit our wider business needs).

I'll look to make sure I'm in Wellington on that date (6th July).

Ngā mihi



Dr. Brett Beamsley (he/him)
General Manager – MetOcean Solutions
MetOcean Solutions

t +64 7 8250540 ext. 101 m s9(2)(a)
Upper Level, 5 Wainui Road, 3225 Raglan, New Zealand
PO Box 235, Raglan 3225, New Zealand



From: Chris Noble <xxxxx.xxxxx@xxxxxxxxxxx.xxx>
Sent: Monday, June 26, 2023 8:41 AM
To: s9(2)(a) Kevin Alder
<xxxxx.xxxxx@xxxxxxxxxxx.xxx>; Brett Beamsley <x.xxxxxxxx@xxxxxxxxxx.xx>; Chris Kroger
<xxxxx.xxxxx@xxxxxxxxxxx.xxx>
Subject: RE: Visit to MetService in June/July

Hi Adrian,

How about I book a couple of hours in the afternoon, say 1-3pm? Enough/too much?

I'd also like to pull in [@Brett Beamsley](#) who (after a recent internal change) is now GM of our Research & Innovation division and will lead our atmospheric, ocean and data science teams involved in internal and external research. It will be valuable to have Brett involved in our discussion given his new role.

Cheers,
Chris

From: s9(2)(a)
Sent: Friday, June 23, 2023 2:38 PM
To: Kevin Alder <xxxxx.xxxxx@xxxxxxxxxxx.xxx>
Cc: Chris Kroger <xxxxx.xxxxx@xxxxxxxxxxx.xxx>; Chris Noble <xxxxx.xxxxx@xxxxxxxxxxx.xxx>
Subject: RE: Visit to MetService in June/July

Awesome that is great. I can be available any time in the day after 9am.

From: Kevin Alder <xxxxx.xxxxx@xxxxxxxxxxx.xxx>
Sent: Friday, 23 June 2023 2:35 pm
To: s9(2)(a)
Cc: Chris Kroger <xxxxx.xxxxx@xxxxxxxxxxx.xxx>; Chris Noble <xxxxx.xxxxx@xxxxxxxxxxx.xxx>
Subject: RE: Visit to MetService in June/July

Hi

Actually, my calendar is now clear on the 6th, so I can join the meeting with you, Chris and Chris!

Cheers
Kevin

From: s9(2)(a)
Sent: Friday, June 23, 2023 2:02 PM
To: Chris Kroger <xxxxx.xxxxx@xxxxxxxxxxx.xxx>; Chris Noble <xxxxx.xxxxx@xxxxxxxxxxx.xxx>; Kevin Alder <xxxxx.xxxxx@xxxxxxxxxxx.xxx>

Subject: RE: Visit to MetService in June/July

Kia ora koutou,

Sorry for the long delayed response. I've just been locking down some other travel, as I am giving a talk at a conference in Palmerston North on 5th July. Would it be possible to visit MetService on Thursday 6th July? I know that this won't work for Kevin, but it's the best time for me unfortunately. Basically, I want to talk about potential greater collaboration with MetService and so I am very happy to talk to anyone who might be interested in that type of conversation.

@Kevin: I would be very happy to chat via ZOOM with you at some point given your lack of availability in that week. I am particularly interested in trying to identify student projects that might use MetService weather radar data to support your efforts.

Ngā mihi nui,

s9(2)(a)

From: Chris Kroger <xxxxx.xxxxxx@xxxxxxxxxxx.xxx>
Sent: Monday, 12 June 2023 9:19 am
To: Chris Noble <xxxxx.xxxxxx@xxxxxxxxxxx.xxx>; s9(2)(a)
Kevin Alder <xxxxx.xxxxxx@xxxxxxxxxxx.xxx>
Subject: RE: Visit to MetService in June/July

Hi s9(2)(a)

It would be great to have you here and discuss mutual research interests.

The dates Chris suggested will be fine. Should I not be available, somebody else will represent atmospheric modelling interest. On that note, it would be great for you to also catch up with Yizhe regarding the Deep South project. I talked with him the other day about how we could add further value to that project.

Best wishes,
Chris

From: Chris Noble <xxxxx.xxxxxx@xxxxxxxxxxx.xxx>
Sent: Saturday, June 10, 2023 4:52 PM
To: s9(2)(a) Chris Kroger
<xxxxx.xxxxxx@xxxxxxxxxxx.xxx>; Kevin Alder <xxxxx.xxxxxx@xxxxxxxxxxx.xxx>
Subject: RE: Visit to MetService in June/July

Hi s9(2)(a)

Would be great to see you in Wellington and yes we're all based here.

Looking at calendars, tentatively;

- Week after next (19-23) is filling fast and perhaps only Fri afternoon is clear (after a catchup with Gokul if back?)
- Last week of June (26-30) probably has some availability – esp in afternoons (just NOT Wed 28).
- First week of July (3-7) doesn't look suitable for Kevin (who is possibly away all week).
- Second week of July (10-14) is another possibility (just not Fri 14 – Matariki).

Cheers,
Chris

From: s9(2)(a) [redacted]
Sent: Saturday, June 10, 2023 4:04 AM
To: Chris Kroger <xxxxx.xxxxxx@xxxxxxxxxxx.xxx >; Chris Noble <xxxxx.xxxxxx@xxxxxxxxxxx.xxx >; Kevin Alder <xxxxx.xxxxxx@xxxxxxxxxxx.xxx >
Subject: Visit to MetService in June/July

Kia ora Chris K, Chris N and Kevin,

I am sitting in the International Precipitation Conference in Oklahoma and I am seeing a LOT of potentially interesting stuff on Quantitative Precipitation Estimation and Precipitation Extremes. Some of this is directly relevant to the current MBIE proposal (which passed the Science and Team excellence stage with a top quintile performance for reference if Chris N and Kevin had not heard). I'd like to come and visit MetService to talk about some potential research opportunities I am seeing. But, in particular I will be running the third year Physics project course at UC starting in July and I would really like to see if we can setup some joint projects and perhaps make this a regular thing (inspired by a similar scheme that Oklahoma University runs). I think this might be a win-win and has the advantage of attracting some smart young people into a weather service space (helpful for potential recruitment for you and good for attracting postgraduate students for me).

Are there times when you would might be more available for some discussions in late June/early July in Wellington (sorry I am not sure if you are all based in the capital). Once you have a day when I would come and visit for a few hours, I will line-up some other meetings in Wellington and make a day of it.

Ngā mihi nui,

s9(2)(a) [redacted]

s9(2)(a) [redacted]
[redacted]
[redacted]
[redacted]

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From: [James Lunny](#)
To: s9(2)(a)
Subject: RE: WMO circular letter: Marine geoengineering
Date: Wednesday, 13 March 2019 8:07:00 am
Attachments: image001.png
image002.png

Thanks s9(2)(a)

All is well here; s9(2)(a) I'm gearing up for Congress (likely to be myself, Peter L and Norm attending; the WMO Reform being the main talking point at the moment).

I didn't realise you are in Boston - cool. Will you still be there for the centenary AMS next year? The weather is beginning to turn here in Wellington, but overall it was a good summer.

I hope you're well.

James

From: s9(2)(a)
Sent: Wednesday, 13 March 2019 2:28 AM
To: James Lunny <xxxxx.xxxxx@xxxxxxxxxxx.xxx>
Subject: Re: WMO circular letter: Marine geoengineering

Talofa James

Thanks for cc'ing me. Although I work on geoengineering matters, my research's focus is on Solar Geoengineering (also referred to as Solar Radiation Modification (IPCC wording) or Solar Radiation Management (SRM)), specifically sulfate Aerosols Injection (SAI), not Marine geoengineering GCR/CDR, etc).

But here is a report that raises a number of issues relevant to WMO request. <http://www.gesamp.org/publications/high-level-review-of-a-wide-range-of-proposed-marine-geoengineering-techniques>

Trust all is well.

Best, [REDACTED]

BTW, I'm in Cambridge, Boston right now, as a visiting Research Fellow, part of my RF Residency, Harvard Kenney and School and Gordon McKay, School of Engineering and Applied Sciences. It's extremely cold and snowy since I've been here.

From: James Lunny <xxxxx.xxxxx@xxxxxxxxxxx.xxx>
Sent: Tuesday, 12 March 2019 9:27 AM
To: s9(2)(a)
Subject: FW: WMO circular letter: Marine geoengineering

Talofa **s9(2)(a)** the below may be of interest to you.

Cheers

James

From: James Lunny **On Behalf Of** PR.NZ.WMO

Sent: Tuesday, 12 March 2019 9:26 AM

To: **s9(2)(a)**

Cc: Ramon Oosterkamp <xxxxx.xxxxxxxxxx@xxxxxxxxxx.xxx>; Elke Louw
(xxxx.sxxx@xxxxxxxxxx.xxx) <xxxx.xxxx@xxxxxxxxxx.xxx>; Brett Beamsley
<x.xxxxxxxxx@xxxxxxxx.xx.xx>; 'Tom Durrant' <x.xxxxxxxxx@xxxxxxxx.xx.xx>; **s9(2)(a)**

Subject: FW: WMO circular letter: Marine geoengineering

Hi everyone

For info and input, if desired.

Please see link below to WMO correspondence on the report "**High level review of a wide range of proposed marine geoengineering techniques**" by Working Group 41 - Marine Geoengineering of the Joint Group of Experts on Scientific Aspects of Marine Environmental Protection (GESAMP).

If you would like to provide:

1. Reflections on the report; and/or
2. Recommendations related to the future work of Working Group 41 of GESAMP,

...please contact me directly (by the requested deadline of 20 March). Please also forward this correspondence to those who would be interested.

Regards

James



JAMES LUNNY
WMO Manager
MetService – Te Ratonga Tiorangi

d +64 4 4700 782 t +64 4 4700 700 m **s9(2)(a)**
30 Salamanca Road, Kelburn, Wellington 6012
PO Box 722, Wellington 6140, New Zealand



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From: Peter Lennox

Sent: Tuesday, 12 March 2019 7:11 AM

To: James Lunny <xxxxx.xxxxx@xxxxxxxxxxx.xxx>

Subject: Fwd: WMO circular letter: 05475/2019/SGO / Marine geoengineering

Subject: WMO circular letter: 05475/2019/SGO / Marine geoengineering

En, Fr, Ru, Es, Ar

www.wmo.int/circulars

Dear Sir/Madam,

The referenced letter has been posted at [05475/2019/SGO_en](#). Please do **not** reply to this e-mail.

WMO Secretariat

This email and any attachments may contain confidential information. If you are not the intended recipient, your use or communication of the information is strictly prohibited. If you have received this message in error please notify MetService immediately.

From: [Cell Press LabLinks](#)
To: r.zyngogel@metocean.co.nz
Subject: Register for the free virtual LabLinks: Circular Plastics Economy – Linking Across Scales on March 17th
Date: Wednesday, 24 February 2021 3:33:24 am

Can't see this email properly? [Click here to view an online version](#)



Circular plastics economy – linking across scales



Dear colleague,

Join us at the free Cell Press LabLinks meeting on **Circular plastics economy – linking across scales** on Wednesday, March 17, 9:30 AM–3:45 PM CT online via Zoom.

This LabLinks will provide a platform for world-leading experts in chemistry, materials science, engineering, industrial ecology, and environmental science to share recent insights and discuss cross-disciplinary opportunities for tackling plastic pollution across scales.

**Virtual Event:
Wednesday,
March 17, 2021
9:30 a.m.-3:45 p.m. CT**

[Register today](#)

Keynote Speakers



Marc Hillmyer,
Department of Chemistry,
University of Minnesota



Eleni Iacovidou,
Division of Environmental Sciences,
Brunel University London

Speakers

Boya Xiong, Department of Civil, Environmental and Geo-Engineering, University of Minnesota

Roland Geyer, Bren School of Environmental Science and Management, University of California Santa Barbara

Timothy Hoellein, Department of Biology, Loyola University Chicago

Eugene Chen, Department of Chemistry, Colorado State University

Jim Palardy, Project Director - Conservation Science, Pew Charitable Trusts

More speakers to come - please check back for updates!

We look forward to seeing you there.

[Register today](#)



The Organizers

Jennifer Dunn, Department of Chemical and Biological Engineering, Northwestern University

Julia Kalow, Department of Chemistry, Northwestern University

Stacey Chin, Scientific Editor, *Matter*

Vjekoslav Dekaris, Associate Scientific Editor, *Chem*

Erika Freimuth, Assistant Editor, *One Earth*



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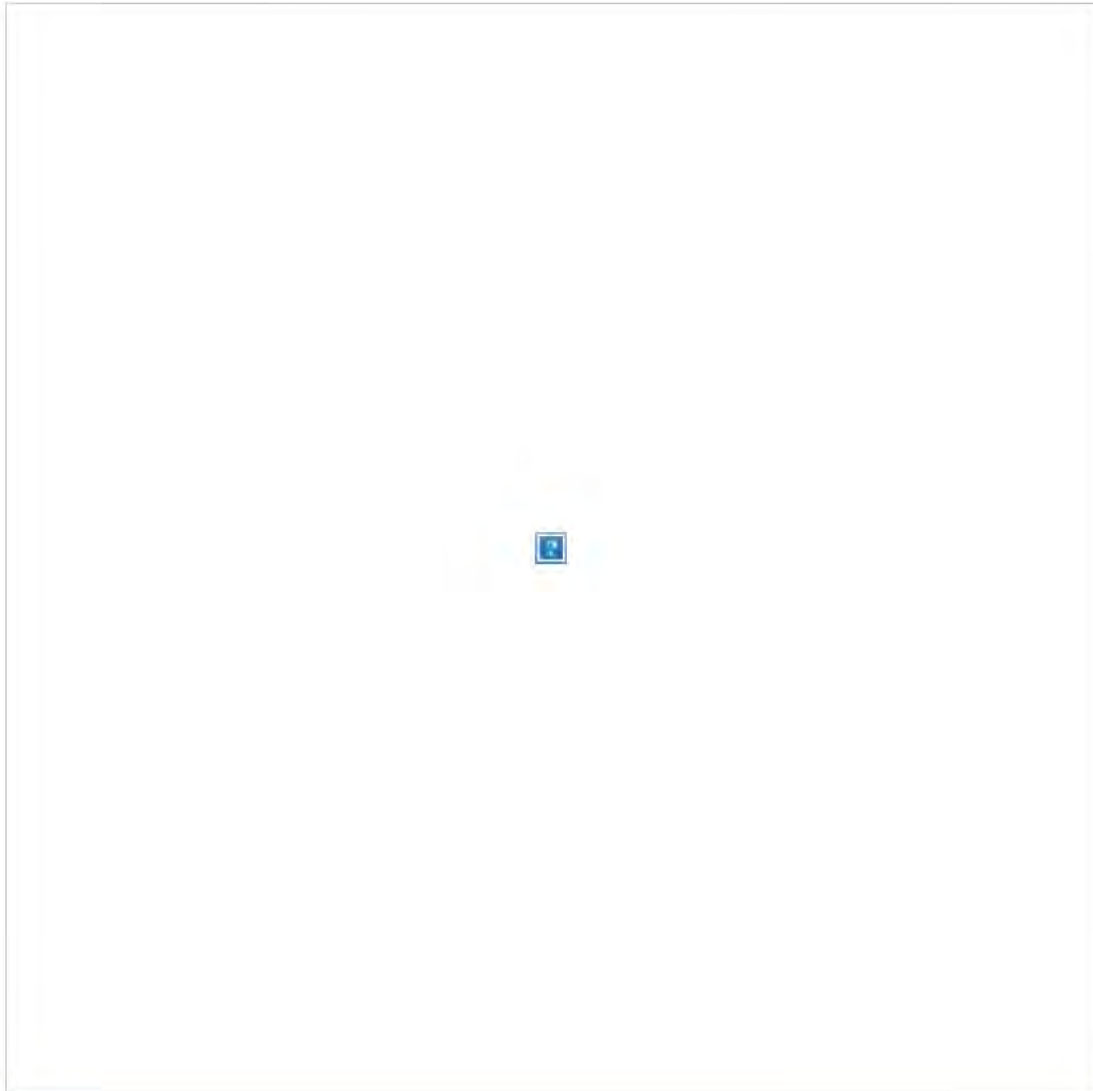
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From: [Ocean Visions](#)
To: [Julie Jakoboski](#)
Subject: Road Map to Prove (or Disprove) mCDR | Webinar: MRV for Ocean-Based CDR | COP28 | And More!
Date: Friday, 10 November 2023 4:49:40 am

[View this email in your browser](#)





A Comprehensive Program to Prove or Disprove Marine Carbon Dioxide Removal Technologies by 2023

There has been a great deal of debate about the potential contributions of marine carbon removal techniques to help blunt the ocean-climate crisis, but the reality is these discussions are occurring in an environment of very limited field data. To get actionable information, we must rapidly advance a comprehensive RD&D effort designed to answer the fundamental questions around additionality, durability, safety, costs, and social acceptability of each approach. Our new road map outlines a comprehensive program to do just that, centered around three interconnected pillars of needed work: Science, Technology, and Policy.

[Learn More](#)



Ocean-Climate Solutions Innovation Exchange Webinar Series | MRV for Ocean-Based CDR: Spotlight on CDR Suppliers

Join us for the second webinar in our series on current innovations in measurement, reporting, and verification (MRV) for ocean-based carbon dioxide removal (CDR). In this second session, we'll spotlight leading startups doing electrochemical CDR to get a deeper understanding of the current state of MRV science, how it's being applied, and the challenges and solutions advancing this important field. Insightful talks by CDR scientists Dr. Erika La Plante (Equatic) and Dr. Sophie Chu (Captura) will be followed by a moderated audience Q&A. Miss the first webinar in the series? [Watch the recording.](#)

[Register Now](#)

Statement: U.S. Department of Energy Announces \$36 Million to Advance

Marine Carbon Dioxide Removal Techniques and Slash Harmful Greenhouse Gas Pollution

The U.S. Department of Energy (DOE) recently announced \$36 million for projects that will accelerate the development of marine carbon dioxide removal (mCDR) and storage, with a focus on the measurement tools and technologies that are needed to measure and validate CO2 removal and measure environmental effects. Ocean Visions applauds DOE for this critically needed support to advance mCDR technologies and advance clean-up of the legacy carbon pollution that is driving global climate disruption.

[Read Our Statement](#)

Ocean Visions to Advance Ocean-Climate Solutions at COP28

Ocean Visions staff will journey to Dubai for COP28 to participate on numerous panels as well as conduct bilateral meetings to advance our leading-edge “Reduce, Remove, and Repair” agenda to directly address the causes and impacts of climate disruption and work towards ocean-climate restoration. Ocean Visions is also proud to be a partner of the Ocean Pavilion at COP28, alongside many of our [Network members](#). The Ocean Pavilion will be a central point to place the oceans squarely into the climate action agenda and highlight the crucial importance of the ocean to the search for climate solutions.

[Learn More](#)

Plan Sea Podcast with Ocean Visions

Plan Sea Podcast recently hosted Ocean Visions Chief Scientist David Koweek, who unpacked our work to engage and catalyze the ocean-climate community to advance the research and development necessary for solutions to restore the climate and ocean health. Hear about our approach and learn more about available resources such as our Road Maps, Launchpad program, CDR Community and more.

[Listen Now](#)

Ocean Visions Seeks Ocean-Climate Experts to Serve in a Variety of Paid Roles

Are you a deep subject matter expert looking to apply your knowledge to help advance [ocean-based climate solutions](#)? If yes, Ocean Visions wants your expertise. We maintain a database of subject matter experts from which we select individuals from a range of disciplines to participate in key Ocean Visions initiatives, such as development of the [Framework for Global Research of Macroalgae Cultivation and Sinking for Carbon Sequestration](#) and as advisors to ocean-based CDR startups through the [Ocean Visions Launchpad](#). We provide honoraria for all substantive engagements. To be considered for involvement, please fill out [this brief questionnaire](#). If appropriate, we will add you to the Ocean Visions Expert Database and contact you should there be a need that fits your expertise. If you have any questions, please contact info@oceanvisions.org.

[Complete the Questionnaire](#)

PARTNER NEWS & OPPORTUNITIES

- **Opportunity:** World Ocean Council hosts virtual roundtables for mCDR enterprises, compiles an mCDR company database, and prepares market barrier assessments to develop commercial frameworks and incentivization strategies. Contact lisa.degrunt@oceancouncil.org to join.
- **News:** ExOIS (Exploring Ocean Iron Solutions) has released [a new report](#) called “Paths Forward for Exploring Ocean Iron Fertilization”
- **News:** The University of South Florida’s College of Marine Science will [lead a \\$3.2-million grant](#) to develop a sargassum forecasting system
- **Opportunity:** Stanford Center for Ocean Solutions has a [new opening](#) for a Postdoctoral Fellow for Climate and Blue Food
- **News:** Carbon Business Council has released [CDR RDT](#), a training 101 course about community engagement and responsible deployment for carbon removal
- **News:** Three researchers from Georgia Tech’s School of Earth and

Atmospheric Sciences have been awarded [U.S. Department of Energy Earthshot funding](#) for carbon removal strategies

- **Opportunity:** Applications are now open for the [2024 MIT Climate & Energy Prize](#)
- **News:** Ocean Exchange [names winners](#) of 2023 awards
- **News:** A new [partnership with Saab, Inc.](#) will make the MBARI long-range autonomous underwater vehicle commercially available

WHAT WE'RE READING

- **Carbon Herald | November 7, 2023**
Aspen Institute releases a code of conduct for marine carbon removal research
- **Mother Jones | November 5, 2023**
Here's what we know about seaweed's ability to capture carbon
- **Forbes | November 6, 2023**
Why Canada is poised to become a carbon removal superpower
- **CBC | November 2, 2023**
Technology aims to sequester carbon deep in the ocean off B.C. coast
- **Axios | November 2, 2023**
New study warns climate is warming even faster than some think
- **Reuters | November 1, 2023**
Can enhanced rock weathering weather greater scrutiny as a solution to climate change?
- **Time | October 26, 2023**
The U.S. Energy Department is spending \$36 Million on ocean carbon-capture research
- **MIT Technology Review | October 24, 2023**
Tapping into the ocean to combat climate change
- **BBC | October 23, 2023**
Sea-level rise: West Antarctic ice shelf melt 'unavoidable'

- **Reuters | October 18, 2023**
Should we be geo-engineering the oceans?
- **Illuminem | October 18, 2023**
Climate intervention requires international research and the Global South has contributions to make



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Support our mission to advance solutions for ocean-climate restoration.



From: [Peter Fisher](#)
To: s9(2)(a)
Subject: Sample climate risk report
Date: Wednesday, 6 September 2023 9:43:00 pm
Attachments: image001.png
image002.png
Waikato Region_report_v3 high res_update.pdf

Hi again Dean.

Here is a sample climate change risk assessment report, written by s9(2)(a) for Waikato Regional Council.

It has been cleared to pass to you.

Please note, these reports can be as detailed or generic as required. They can also target certain aspects of activity, such as road making and restoration.

This particular report targets water resources.

Please let us know if you wish to go ahead and order such a report to cover your road planning.

With regards

Peter



Peter Fisher
Business Development Manager – Key Accounts
MetService – Te Ratonga Tiorangi

m s9(2)(a)

New address: Seabridge House, L2 / 110 Featherston Street, Wellington 6011
PO Box 722, Wellington 6140, New Zealand



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From: [Peter Fisher](#)
To: s9(2)(a)
Subject: Sample climate risk report
Date: Wednesday, 6 September 2023 10:49:00 pm
Attachments: image001.png
image002.png
Waikato Region_report_v3 high res_update.pdf

Hi again Joanne.

Here is a sample climate change risk assessment report, written by s9(2)(a) for Waikato Regional Council.

It has been cleared to pass to you.

Please note, these reports can be as detailed or generic as required. They can also target certain aspects of activity, such as road making and restoration. This particular report targets water resources.

With regards
Peter



Peter Fisher
Business Development Manager – Key Accounts
MetService – Te Ratonga Tiorangi

m s9(2)(a)

New address: Seabridge House, L2 / 110 Featherston Street, Wellington 6011
PO Box 722, Wellington 6140, New Zealand



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From: xxxxxxxxxxxxxxxx@xxxxxx.xxx on behalf of [Earth & Climate News -- ScienceDaily](#)
To: [Linda Stopforth](#)
Subject: ScienceDaily: Earth & Climate News
Date: Friday, 6 December 2019 11:47:38 pm

ScienceDaily: Earth & Climate News

- **[As China rapidly adopts clean energy, use of traditional stoves persists](#)**
- **[Recycling nutrient-rich industrial waste products enhances soil, reduces carbon](#)**
- **[Rats exchange information about danger in a reciprocal fashion](#)**
- **[Can Arctic 'ice management' combat climate change?](#)**
- **[Damaging rains from hurricanes more intense after winds begin to subside](#)**
- **[Changing wildfires in the California's Sierra Nevada may threaten northern goshawks](#)**
- **[Carbon emissions from volcanic rocks can create global warming](#)**
- **[Outlook for the polar regions in a 2-degrees-warmer world](#)**
- **[Looking at tropical forests through new eyes](#)**
- **[Long-distance timber trade underpinned the Roman Empire's construction](#)**
- **[Lake methane emissions should prompt rethink on climate change](#)**
- **[New, young volcano discovered in the Pacific](#)**
- **[As a way to fight climate change, not all soils are created equal](#)**
- **[Scientists devise catalyst that uses light to turn carbon dioxide to fuel](#)**

[As China rapidly adopts clean energy, use of traditional stoves persists](#)

Posted: 05 Dec 2019 12:53 PM PST

Old habits are hard to break. A new study of replacement of traditional wood and coal burning stoves with clean energy in China suggests that, without a better understanding of the reasons behind people's reluctance to give up traditional stoves, it will be difficult for policies in China and elsewhere in the world to succeed in encouraging this shift towards clean energy.

[Recycling nutrient-rich industrial waste products enhances soil, reduces carbon](#)

Posted: 05 Dec 2019 11:51 AM PST

Recycling biotechnology byproducts can enhance soil health while reducing carbon emissions and maintaining crop yields.

[Rats exchange information about danger in a reciprocal fashion](#)

Posted: 05 Dec 2019 11:18 AM PST

Rats exchange information about danger in a reciprocal fashion, and this information transfer is at least partially mediated by a brain region called the anterior cingulate cortex.

[Can Arctic 'ice management' combat climate change?](#)

Posted: 05 Dec 2019 10:06 AM PST

According to a much-debated geo-engineering approach, both sea-ice retreat and global warming could be slowed by using millions of wind-powered pumps, drifting in the sea ice, to promote ice formation during the Arctic winter.

Damaging rains from hurricanes more intense after winds begin to subside

Posted: 05 Dec 2019 10:05 AM PST

Howling wind drives torrential rain sideways as tall, slender palms bow and tree limbs snap. A hurricane approaches, its gale-force winds wreaking havoc as it nears the coast. Storm surges combine with the downpour, inundating the area with water.

Changing wildfires in the California's Sierra Nevada may threaten northern goshawks

Posted: 05 Dec 2019 06:14 AM PST

Research suggests fire, as it becomes more frequent and severe, poses a substantial risk to goshawks in the Sierra Nevada region.

Carbon emissions from volcanic rocks can create global warming

Posted: 05 Dec 2019 04:30 AM PST

Greenhouse gas emissions released directly from the movement of volcanic rocks are capable of creating massive global warming effects -- a discovery which could transform the way scientists predict climate change, a new study reveals.

Outlook for the polar regions in a 2-degrees-warmer world

Posted: 04 Dec 2019 11:49 AM PST

With 2019 on pace as one of the warmest years on record, a major new study reveals how rapidly the Arctic is warming and examines global consequences of continued polar warming. The study reports that the Arctic has warmed by 0.75 degrees C in the last decade alone.

Looking at tropical forests through new eyes

Posted: 04 Dec 2019 11:49 AM PST

Air-based maps of plant chemistry are improving carbon cycling models in hyper-diverse tropical forests.

Long-distance timber trade underpinned the Roman Empire's construction

Posted: 04 Dec 2019 11:48 AM PST

The ancient Romans relied on long-distance timber trading to construct their empire, according to a new study.

Lake methane emissions should prompt rethink on climate change

Posted: 04 Dec 2019 09:45 AM PST

Study sheds new light on the impact of natural methane production on global climate change assessments.

New, young volcano discovered in the Pacific

Posted: 04 Dec 2019 09:45 AM PST

Researchers have discovered a new petit-spot volcano at the oldest section of the Pacific Plate.

As a way to fight climate change, not all soils are created equal

Posted: 04 Dec 2019 07:05 AM PST

Soil scientists offer a newly nuanced understanding of different soil organic matter components that can be increased through varied management strategies.

Scientists devise catalyst that uses light to turn carbon dioxide to fuel

Posted: 04 Dec 2019 07:05 AM PST

Scientists have used sunlight and a catalyst largely made of copper to transform carbon dioxide to methanol.

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Email delivery powered by
Google

From: s9(2)(a)
To: [Kevin Alder](#)
Subject: SG, Compensation, and Parametric Insurance: Insights from the Pacific paper
Date: Tuesday, 24 November 2020 1:19:34 pm
Attachments: 16856090_SG_PCRAFI_paper.pdf

Hi Kevin,

FYI, a copy of our paper I referred to during our meeting.

And here is the link to the blog [Solar Geoengineering, Compensation, and Parametric Insurance: Insights from the Pacific - C2G \(c2g2.net\)](#)

Cheers, s9(2)(a)

From: [REDACTED] s9(2)(a)
Subject: Social Media Policy violation
Date: Friday, 9 June 2023 9:43:48 am
Attachments: image001.png
image002.png
image003.png
image004.png
image005.png

Hey there s9(2)(a)

Hope you're good

As per the discussion in the last Customer Engagement Team WIP meeting, I've whipped together some info on the person who has been violating our Social Media Policy for months now.

Their Facebook name is s9(2)(a), and they comment on our posts about chemtrails, climate change hoax, weather modification, including geoengineering and solar radiation management (which, from what I could find, is only a theoretical concept at the moment).

Here's a quick snapshot of some of the posts that have had to be hidden:

s9(2)(a) s9(2)(a)
Climate change is nothing but a hoax for the sheep
Unhide 1 w

s9(2)(a)



Unhide 1 w

s9(2)(a) s9(2)(a)
Stop censoring me
Unhide 2 w

s9(2)(a) s9(2)(a)
Stop the weather modification
Unhide 2 w

s9(2)(a) s9(2)(a)
<https://www.facebook.com/robert.deutsch.9081/videos/900536584575508/>
Actually here's the truth. Weather modification.
Unhide 3 w

s9(2)(a) s9(2)(a)
You mean slow moving chemtrails chemtrails chemtrails
chemtrails chemtrails chemtrails chemtrails chemtrails
chemtrails chemtrails chemtrails chemtrails
Unhide 3 w

s9(2)(a) s9(2)(a)
"Space" lol lol research nasa fails and nasa lies videos
nasa is a fraud
Unhide 3 w

If you wanted to see all the posts that have been hidden, they should be viewable via this link

s9(2)(k), s9(2)(a)

(not sure if you're well-versed already, but if you type their name in the search box, click on one of the posts down the left panel, then change the dropdown above the comments from "Most relevant" to "Hidden by this Page" they should be visible)

Thanks Lisa
Warm regards,

s9(2)(a)

s9(2)(a)
Meteorologist
Meteorological Operations

t +64 4 4700 700

L2 / 110 Featherston Street, Wellington 6011

PO Box 722, Wellington 6140, New Zealand



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From: [Brad Monaghan](#)
To: [Brad Monaghan](#)
Subject: Standard messaging
Date: Tuesday, 26 November 2019 8:45:00 am
Attachments: Standard Messaging_taken from Ask MetService.docx
Public messages compilation.docx
image001.png
image002.png

Standard messaging –



BRAD MONAGHAN
Marketing and Communications Manager
Brand and People Experience
MetService – Te Ratonga Tīrangi

d +64 4 4700 777 t +64 4 4700 700 m [s9\(2\)\(a\)](#)
30 Salamanca Road, Kelburn, Wellington 6012
PO Box 722, Wellington 6140, New Zealand



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From: [REDACTED]
Subject: TECO-2024 Programme
Date: Saturday, 29 June 2024 12:39:38 pm
Attachments: image001.png
Preliminary_programme_TECO-2024_v1.pdf

Dear colleague,

We are pleased to inform you that the [preliminary conference programme](#) for the WMO Technical Conference on Meteorological and Environmental Instruments and Methods of Observation (TECO-2024) has been prepared and published on [the conference website](#).

We look forward to seeing you in Vienna.

Kind regards,

[REDACTED]

s9(2)(a) [REDACTED]

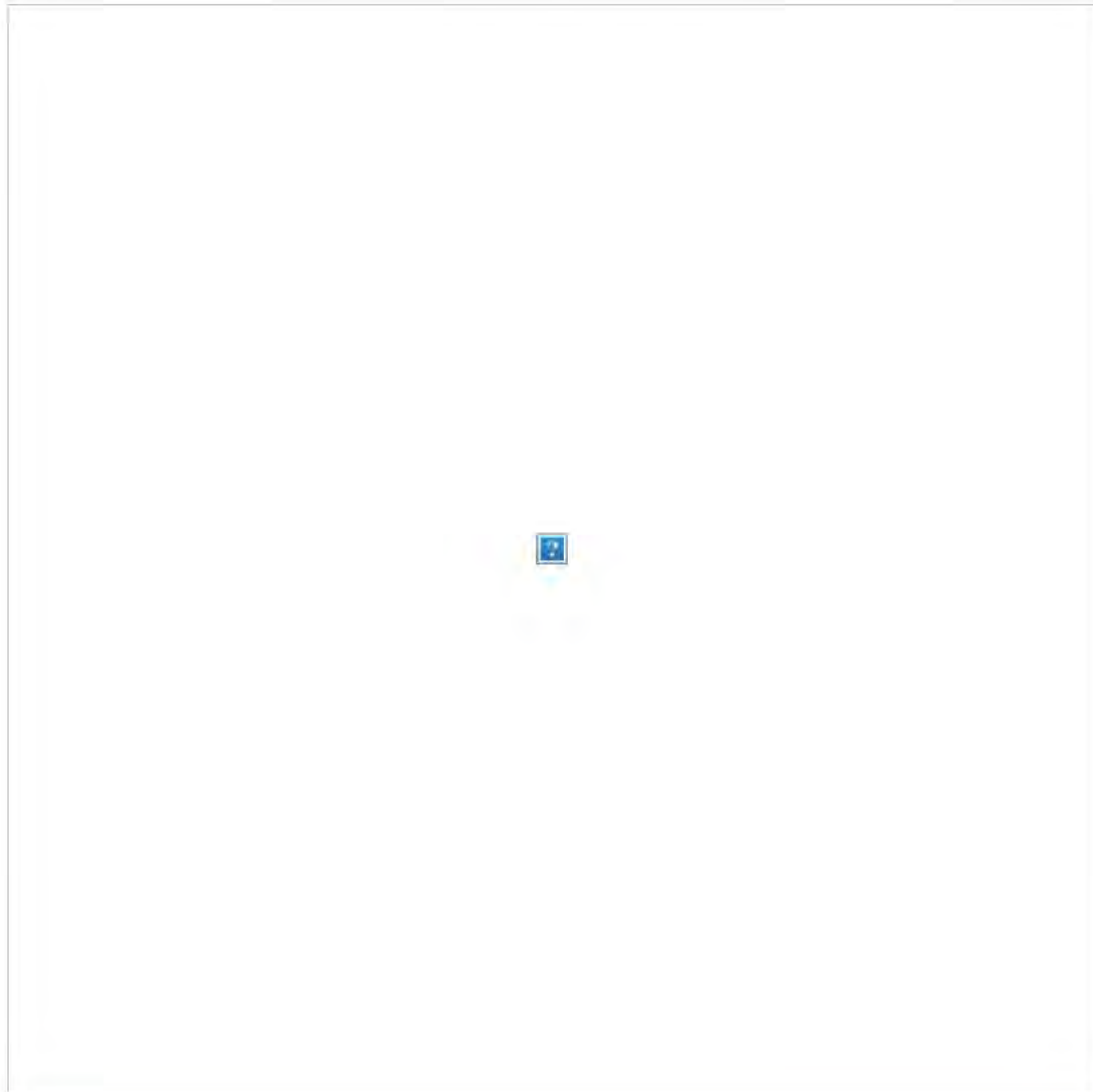
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Office: +41 22 730 82 48 | Mobile: [REDACTED]
Website: www.wmo.int | Follow us on: [Facebook](#), [Instagram](#), [LinkedIn](#), and [X](#)



From: [Ocean Visions](#)
To: [Julie Jakoboski](#)
Subject: The Role of Start-Ups in Ocean-Climate Solutions | Job Opening | GEOS Program Projects
Date: Wednesday, 3 July 2024 2:19:28 am

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[View this email in your browser](#)





Ocean Visions, Running Tide, and the Role of Start-ups in Advancing Research and Development of Marine Carbon Dioxide Removal

With the recent announcement of the shutdown of Running Tide, a Maine-based company working to sequester excess carbon dioxide in the ocean, there has been a swirl of speculation, inaccurate statements, and sweeping conclusions about what happened, and what this event portends for the broader field of marine carbon dioxide removal (mCDR). Having worked with Running Tide for more than three years, as well as with 13 other mCDR startups through our Launchpad program, we share our experiences working with Running Tide and our views on the role of the private sector in research and development of mCDR, in hopes of informing the discussion and the search for relevant lessons.

[Read the Blog](#)



Mongabay Op-Ed: Can Iron Fertilization of the Oceans Help to Solve the Climate Crisis?

Marine carbon dioxide removal pathways hold great potential to mitigate climate change by cleaning up legacy carbon dioxide pollution. Among the many pathways being considered, ocean iron fertilization (OIF) is getting renewed interest and attention. In this op-ed in Mongabay, Ocean Visions Chief Scientist David Koweek and Institute for Responsible Carbon Removal Director of Research Sara Nawaz call for more research into OIF, including field trials, to get actionable answers to remaining questions about its social and ecological impacts and benefits.

[Read the Op-Ed](#)

GEOS Welcomes 18 New Projects

Ocean Visions' Global Ecosystem for Ocean Solutions program (GEOS), an endorsed program under the UN Ocean Decade, recently welcomed 18 newly endorsed UN Ocean Decade projects in 16 countries. Each of these initiatives, in five continents, is working to advance ocean-climate solutions and promoting sustainable blue economies in response to regional concerns and opportunities – and each is now part of the global “ecosystem” of ocean-climate innovation that the GEOS program is building.

[Learn More](#)

Updated Marine Carbon Dioxide Removal Road Maps

We're excited to announce that we've recently updated our marine carbon dioxide removal (mCDR) road maps! These informational tools assess the state of various approaches and knowledge gaps to improve our collective understanding and identify first-order priorities. The revisions to the road maps reflect the significant advancements and increased activities in the mCDR space over the last year. Complemented by the [mCDR Field Trial Database](#), the road maps are a valuable resource for both newcomers and experts exploring this dynamic field.

[Explore the mCDR Road Maps](#)

Ocean Visions Welcomes New Staff

We're pleased to welcome Marilu Flores to the team! A passionate science communication and conservation storyteller, Marilu will serve as Communications Associate, playing a key role in supporting communications and events at Ocean Visions.

[Meet Marilu and the Ocean Visions Team](#)

We're Hiring!

Ocean Visions seeks a highly experienced and broadly trained individual to

lead Ocean Visions' work on mCDR. This Program Director will build upon an excellent foundation created over the past four years and extend Ocean Visions' work globally to advance the research, development, and demonstration of all viable mCDR approaches at scales sufficient to answer the critical questions on additionality, durability, and safety. The position opening occurs as current [Remove program](#) lead Nikhil Neelakantan turns his talents to a new focus, leading the work for our [Reduce program](#), which is focused on ocean-based pathways to reduce carbon emissions and/or replace them with low-carbon substitutes.

[Learn More & Apply](#)

UN Ocean Decade Vision 2030 White Paper | Challenge 5: Unlock Ocean-Based Solutions to Climate Change

After nearly a year of development and public input, the UN Decade of Ocean Science Working Groups have published a series of white papers addressing key milestones and indicators defining success across ten Ocean Decade Challenges through 2030. Ocean Visions team members Courtney McGeachy, Director of the Ocean Visions - UN Decade Collaborative Center for Ocean-Climate Solutions, and Liliana Bastian, Program Officer, served on the Working Group for Challenge 5: Unlock Ocean-Based Solutions to Climate Change. The group's white paper identifies marine carbon dioxide removal (mCDR) as a key climate mitigation approach in the Ocean Decade's strategic ambition and calls for co-designed field testing and improved knowledge across ecosystem and supply chain impacts, MRV, and observations and modeling innovations by 2030.

[Access the White Paper](#)

OV PARTNER NEWS & OPPORTUNITIES

- **Event:** Mark your calendars for September 26 for the [Ocean Climate Innovation Summit](#) in Halifax, Canada. Led by Ocean Frontier Institute, and in partnership with Ocean Visions and others, the Summit will gather leaders to discuss the needed science, technology, and innovation required to scale

commercial ocean-climate solutions across renewable ocean energy, marine transportation, and marine carbon dioxide removal. The Summit will be held in collaboration with the [OCEANS 2024 conference](#).

- **Opportunity:** The [LOC-NESS project](#) (Locking away Ocean Carbon in the Northeast Shelf and Slope) at the Woods Hole Oceanographic Institution is seeking public comments on their tentative EPA permit to conduct field trials of ocean alkalinity enhancement in the Northwest Atlantic south of Massachusetts later this year and in the Gulf of Maine in 2025. Comments for [Phase 1](#) and [Phase 2](#) are due by July 11.
- **News:** (USF College of Marine Science) [The Ocean Circulation Lab braces for a busy hurricane season](#)
- **Opportunity:** Carbon to Sea Initiative (C2S) and COVE have announced a [Joint Learning Opportunity](#) to support scientists conducting research and companies piloting new technology for emerging mCDR solutions. Funding will increase research and development for ocean alkalinity enhancement for ongoing field research trials taking place in Halifax, Nova Scotia, Canada.
- **News:** Ocean Visions has joined 60 environmental organizations and ocean advocacy groups in unveiling [a report on the Biden Administration's progress on ocean-climate action](#). As climate impacts on our ocean continue to intensify, it will be critical to build on the strong momentum for ocean-climate action generated over the last several years and continue to take bold action to address the climate crisis.
- **Opportunity:** The U.S. Department of Energy's Water Power Technologies Office opened a nearly [\\$5 million funding opportunity](#) to support programming and services for entrepreneurs and small businesses in hydropower and/or marine energy.

WHAT WE'RE READING

- **National Geographic | June 21, 2024**
How pulling carbon out of the ocean may help remove it from the air
- **CNN | June 21, 2024**
Opinion: Amid deadly heat, why is critical climate research being halted?
- **Carbon Herald | June 19, 2024**
Equatic starts engineering work on its first commercial facility in Canada

- **Carbon Herald | June 16, 2024**
Running Tide shuts down citing lack of demand from the voluntary market
- **MIT Technology Review | June 14, 2024**
This London non-profit is now one of the biggest backers of geoengineering research
- **The Verge | June 13, 2024**
Maybe we don't have to capture so much carbon, study suggests
- **The Atlantic | June 12, 2024**
A wild plan to avert catastrophic sea-level rise
- **The Verge | June 11, 2024**
Can we artificially cool the planet? A major environmental group is spending millions to find out
- **Scientific American | June 9, 2024**
Carbon removal is catching on, but it needs to go faster
- **Wall Street Journal | June 7, 2024**
Inside the radical plan to save the Arctic by refreezing it
- **The Guardian | May 27, 2024**
Humanity's survival is still within our grasp – just. But only if we take these radical steps
- **New York Times | May 24, 2024**
A test of cloud-brightening machines poses no health risk, officials say
- **TEDTalk | May 13, 2024**
How aerosols brighten clouds – and cool the planet | Sarah J. Doherty



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From: [geology](#)
To: [Séverin Thiebaut](#)
Subject: To S. Thiebaut_Notification for paper submission
Date: Wednesday, 9 October 2019 3:10:26 pm

Dear S. Thiebaut,

Have you got my last mail from our journal Journal of Geological Resource and Engineering?
Here we forward it again, please kindly confirm receipt.
Recently, Issue 3 Vol. 7 of Journal of Geological Resource and Engineering has been published out.
It is available online through this link: [IGRE](#).
If you have any unpublished papers or books, please feel free to contact us.
I'm looking forward to your submission!
Waiting for your early reply.
Best regards!

Should you have any questions, please do not hesitate to contact us!

Sincerely,

Barbara Long

Journal of Geological Resource and Engineering, ISSN 2328-2193, USA

David Publishing Company

Address: 616 Corporate Way, Suite 2-487 Valley Cottage, NY 10989, USA.

E-mail: geology@davidpublisher.com, geology@davidpublishing.com, geology@davidpublishing.net

Tel: 1-323-9847526, 323-410-1082; Fax: 1-323-9847374.

From: [geology](#)

Date: 2019-09-26 16:05

To: [s.thiebaut](#)

Subject: To S. Thiebaut_Publishing your paper for Journal of Geological Resource and Engineering (Indexed in Google Scholar)

Call for Papers and Books

Dear S. Thiebaut,

This is *Journal of Geological Resource and Engineering* (ISSN 2328-2193), an **international**, professional and peer reviewed journal across the United States. We have learned your abstract entitled

“Non-linear derivation of near-bed wave-induced orbital velocities from surface wave spectra ” from **Australasian Coasts and Ports Conference**.

This study of yours is very interesting to us, if it has not been published or **other unpublished papers and books** of yours are looking for a vehicle for bringing in these or other advanced ideas, science and technology, please feel free to contact us (Please reply to this mail instead of creating a new one, in case we lost track of your mail).

Below is a brief introduction of our journal (The previous issues and individual papers are available on our new official website at: [IGRE](#)):

Description

Journal of Geological Resource and Engineering (ISSN 2328-2193) is to be indexed in following databases:

1. Google Scholar (the published individual papers can be searched at: scholar.google.com)
2. China National Knowledge Internet (CNKI)
3. AcademicKeys
4. CrossRef
5. SSRN
6. WorldCat
7. Index Copernicus International

Now, IBI Factor of *Journal of Geological Resource and Engineering* (ISSN 2328-2193) for the year 2014-15 is 2.9, as rated by InfoBase Index. The journal publishes contributions in the form of original and review papers, or as short technical notes. A Book Review section informs the discerning reader of the type and quality of literature available to the geotechnical engineer and engineering geologist. The journal publishes papers in the areas of soil and rock engineering, geology as applied in the civil engineering, mining and petroleum industries. The papers related to soil and rock mechanics, geology and hydrogeology, theoretical and experimental advances in ground mechanics are welcomed for inclusion. The journal is published in English.

The e-journal provides free and open access to all of its content on our Website. Accepted papers will immediately appear online followed by the printed in hard copy.

The journal encompasses a broad spectrum of geo-engineering although several areas have been identified which will be given

particular priority: soil and rock engineering, foundation engineering, applied geology for design and construction, geo-environmental engineering, earthquake engineering and dynamic behavior of soils and rocks, geohazards and mitigation, mining engineering, mineralogy, geotechnical aspects of petroleum engineering, information technology applications in geo-engineering, novel geotechnical construction techniques and case histories describing important geo-engineering projects, flood, hydrogeology, geoarchaeology, palaeoclimatology, geomedicine, geoecology, geological oceanography, other related subjects etc.

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Besides, the DOI have been applied to every published paper. It will be more convenient for the citation of papers published in our journal in the future.

Information for authors

1. Only original and previously unpublished articles will be considered.
2. 3000-8000 words or longer if approved by the editor, including title, abstracts, introduction, contents, results, discussion, conclusions, appendixes and references, with a title of 15 words maximum, an abstract of 300 words at the most, and 3-5 keywords or key phrases.
3. An MS Word format manuscript presented in proper English is required, attach to our email address or submit online.
4. Authors are required to sign the Transfer of Copyright Agreement form if the article accepted.
5. An e-journal and a copy of the issue will sent to the author after publication.

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Editorial Procedures

The process of review usually takes 2-4 weeks. The editor reserves the right to make any necessary changes in the papers, or requests the author to do so, or rejects the paper submitted. A copy of the edited paper along with the first proofs will be sent to the author for proofreading. They should be corrected and returned to the editor within 7 days. Once the final version of the paper has been accepted, authors are requested not to make further changes to the text.

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Should you have any questions or concerns, feel free to contact us.

Best regards!

Barbara Long

Journal of Geological Resource and Engineering

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E-mail: geology@davidpublishing.com, geology_davidpublishing@hotmail.com, geology@davidpublisher.com

From: [geology](#)
To: [Séverin Thiébaud](#)
Subject: To S. Thiébaud_Publishing your paper for Journal of Geological Resource and Engineering (Indexed in Google Scholar)
Date: Thursday, 26 September 2019 8:16:01 pm

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Dear S. Thiébaud,

This is *Journal of Geological Resource and Engineering* (ISSN 2328-2193), an **international**, professional and peer reviewed journal across the United States. We have learned your abstract entitled

“Non-linear derivation of near-bed wave-induced orbital velocities from surface wave spectra ” from **Australasian Coasts and Ports Conference**.

This study of yours is very interesting to us, if it has not been published or **other unpublished papers and books** of yours are looking for a vehicle for bringing in these or other advanced ideas, science and technology, please feel free to contact us (Please reply to this mail instead of creating a new one, in case we lost track of your mail).

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Now, IBI Factor of *Journal of Geological Resource and Engineering* (ISSN 2328-2193) for the year 2014-15 is 2.9, as rated by InfoBase Index. The journal publishes contributions in the form of original and review papers, or as short technical notes. A Book Review section informs the discerning reader of the type and quality of literature available to the geotechnical engineer and engineering geologist. The journal publishes papers in the areas of soil and rock engineering, geology as applied in the civil engineering, mining and petroleum industries. The papers related to soil and rock mechanics, geology and hydrogeology, theoretical and experimental advances in ground mechanics are welcomed for inclusion. The journal is published in English.

The e-journal provides free and open access to all of its content on our Website. Accepted papers will immediately appear online followed by the printed in hard copy.

The journal encompasses a broad spectrum of geo-engineering although several areas have been identified which will be given particular priority: soil and rock engineering, foundation engineering, applied geology for design and construction, geo-environmental engineering, earthquake engineering and dynamic behavior of soils and rocks, geohazards and mitigation, mining engineering, mineralogy, geotechnical aspects of petroleum engineering, information technology applications in geo-engineering, novel geotechnical construction techniques and case histories describing important geo-engineering projects, flood, hydrogeology, geoarchaeology, palaeoclimatology, geomedicine, geocology, geological oceanography, other related subjects etc.

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Besides, the DOI have been applied to every published paper. It will be more convenient for the citation of papers published in our journal in the future.

Information for authors

1. Only original and previously unpublished articles will be considered.
2. 3000-8000 words or longer if approved by the editor, including title, abstracts, introduction, contents, results, discussion, conclusions, appendixes and references, with a title of 15 words maximum, an abstract of 300 words at the most, and 3-5 keywords or key phrases.
3. An MS Word format manuscript presented in proper English is required, attach to our email address or submit online.
4. Authors are required to sign the Transfer of Copyright Agreement form if the article accepted.
5. An e-journal and a copy of the issue will sent to the author after publication.

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Best regards!

Barbara Long

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Address of Headquarters: David Publishing Company, 616 Corporate Way, Suite 2-4876, Valley Cottage, NY 10989, USA
Fax: 1-323-9847374; 1-323-908-0457 (USA)
E-mail: geology@davidpublishing.com, geology_davidpublishing@hotmail.com, geology@davidpublisher.com

From: s9(2)(a)
Cc: [Billings TVNZ](#)
Subject: TVNZ DUKE--Week 26, 2024 Final Billings (Saturday 22 June - Friday 28 June)
Date: Monday, 10 June 2024 11:40:25 am
Attachments: image001.png
TVNZ DUKE - Week 26, 2024 Final Billings.docx

Hi there,

Please see attached the **TVNZ DUKE--Week 26, 2024 Final Billings (Saturday 22 June - Friday 28 June)**.

Cheers,

s9(2)(a)
Content Coordinator

m. +64 21 135 4053

w. tvnz.co.nz



From: [Stephen Hunt](#)
To: [Stephen Hunt](#)
Subject: WEF GRR SUMMARY
Date: Saturday, 17 December 2022 9:25:52 am
Attachments: WEF_The_Global_Risks_Report_2022.pdf

https://www3.weforum.org/docs/WEF_The_Global_Risks_Report_2022.pdf

Sent from my iPhone

From: [Stephen Hunt](#)
To: [ELT \(Enterprise Leadership Team\)](#); [OLG](#); [Board Personal Email address](#); [Brett Beamsley](#); [Lucy Batt](#); [Suralda Timmerman](#); [Jihe Cooper](#); [Sarah Payne](#)
Subject: WEF Highest Global Risks - Climate action failure and extreme weather
Date: Wednesday, 12 January 2022 10:08:13 am
Attachments: WEF_The_Global_Risks_Report_2022 (1).pdf
image001.png
image002.png

Kia ora all and Happy New Year to those of you I haven't seen face-to-face yet.

Every January I enjoy reading the World Economic Forum Global Risks report – one of the better documents for situating strategic thinking for the year ahead. I am sure many of you are familiar with the WEF report and may have seen it already, I have attached it for convenience. You will see that for 2022, the highest global risk is Climate Action Failure, and the second is Extreme Weather.

Over the last year we have been working on our narrative across central government, local government, and the private sector with a focus on the importance of using meteorological expertise to help mitigate the impacts of these primary threats and risks. Our approach has been very well-received by agencies with complex operational purposes and mandates, particularly covering national resilience and critical services, where success can be significantly impacted by weather. For the year ahead We will be growing the narrative and focusing on creating channels and opportunities for MetService to contribute and be more involved. A contemporary example of the benefits we can bring at a national level is shown here: [Putin delays Ukraine invasion because of muddy ground, US advisers say \(msn.com\)](#)

In the meantime I encourage you to at least scan the WEF report and the many excellent infographics.

Ngā mihi

Stephen



Stephen Hunt (he/him)
Chief Executive
MetService – Te Ratonga Tiorangi

M [s9\(2\)\(a\)](#)
Level 2, 110 Featherston Street, Wellington 6011
PO Box 722, Wellington 6140, New Zealand



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From: [Paula Jackson](#)
To: [Alison Watters - BOD Personal](#); [Dave Moskovitz - BOD Personal](#); [Victoria Spackman - BOD Personal](#); [Stephen Willis](#); [Martin Matthews \(personal\)](#); [Te Tiwha Puketapu Personal](#); [Stephen Hunt](#)
Subject: World Economic Forum Global Risk Report 2023
Date: Wednesday, 26 July 2023 4:46:28 pm
Attachments: image001.png
WEF_Global_Risks_Report_2023.pdf

Kia ora koutou

Attached is this year's WEF Global Risk Report which I thought you might find of interest to skim with your morning coffee.

The table below from the Exec Summary on page 6 sums it up pretty much. Climate risks making up 50% of the top 10 over 2-10 year horizon. Economic risks don't even feature...

Paula



From: s9(2)(a)
To: [Ciaran Doolin](#)
Subject: your bams article
Date: Thursday, 7 October 2021 10:31:13 am
Attachments: My science_Jul21_4AMSx.pdf

Hi

I saw your article on Edward Kidson in the latest BAMS. I worked closely with s9(2)(a) while I was at NZMS (he recently died). I thought you might be interested in my own memoir, which includes stuff on the NZMS.

s9(2)(a)

--

s9(2)(a)



Island was associated with a blocking high. Heavy rain needs a moisture source, and in Aotearoa heavy rain is typically associated with an anticyclone to the east of New Zealand, and a northerly flow [19, 20]. The northerly flow typically brings rain to the east coast, and would not be impacted by steel works on the west coast.

There is clear evidence of anthropogenic air pollution and CCNs impacting rainfall by enhancing or suppressing rainfall, especially in combination with orography. By increasing levels of CCNs on the west coast, rain may be suppressed in the southern alps, and enhanced on the east coast in a typical westerly/northwesterly flow. However depending on particle size this may have the opposite effect. On the other hand, rainfall may not be impacted by the steel works in a northerly, easterly or southerly flow. To determine the impact we would need to quantify the type and amount of CCNs, the amount and type of filtering placed on the steel works and the precise location of the steel works. Regardless, evidence suggests the steel works could potentially have major future impacts on rainfall distribution in New Zealand.

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Land-to-Water Accounting

Troy Baisden

12 November 2023

Date & Time: Thu, 25 Aug 2022, 16:43:57 NZST
Position: -045.362852° / +167.024613° (±15.4m)
Altitude: 10m (±29.6m)
Datum: WGS-84
Azimuth/Bearing: 115° S65E 2044mils True (±21°)
Elevation Angle: +14.5°
Horizon Angle: -06.2°
Zoom: 2.0X



Figure 1. Landslides regenerating with Coriaria arborea, a prolific nitrogen fixer. The location is in Crooked Arm, off Doubtful Sound. A big challenge for the economics interface will be the ability to confidently communicate findings that represent a clever long-term integrated summary that describes repeated landslide cycles recover upland C stock while contributing eroded carbon to a conveyor belt feeding burial sites in fiords.

Summary

This is a (quick) outline of notes and commentary to inform Carolyn Saunders building on what's been compiled from the August 2022 team meeting and field trip, as well as thinking underway since. This includes:

- Carbon balance equations
- Summary of where science is more complex, and how uncertainty can be considered

- How to focus on what can be reported for economics calculations with a focus on being able to establish scenarios demonstrating variables that will respond to management, and being able to develop baseline scenario(s).

There are a few additional structural considerations that make this Fiordland C cycle programme exciting and unique – these are worth including in the summary and as regular reminders

- Science normally considers the terrestrial C cycle primarily as a balance of photosynthesis and respiration, representing the removal of fixed C from and return to atmospheric CO₂. Fiordland is the exception – where burial generates an imbalance by preventing respiration.
- To understand our hypotheses for Fiordland, we need to consider how to create a conveyor belt of terrestrial C to sites where it is buried. But it isn't this simple: we need not only to we need a mechanism to transport and bury the products of photosynthesis; we also to demonstrated how remarkable rates of photosynthesis can be built up and maintained starting from bare, infertile ground landslide scars and deposits. Each generates a paradox of sorts.
 - A flux along something resembling a conveyor belt would be easy to understand if it were uniform. This assumption is imperfect but plausible for the sink within the fiords, to be confirmed using sediment cores. To model the upland however, we need to consider the denuded landscape in a complex way – acknowledging that landslides vary in their size and return interval using the best available mathematical models. I'm we work with a conveyor belt that branches into space and time following a fractal relationship defined by a power law.
 - To feed the conveyor belt, we need to quantify and explain the key ingredient of productive vegetation – nitrogen (N) – can accumulate unusually rapidly. The answer is the prolific N-fixer *Coriaria Arborea*, which we have now confirmed is widely present on recent erosion scars and deposits.
- It can be presumed that it is mostly particulate organic carbon – ranging from carbon attached to sediment particles to most of entire trees washed into the fiords – that we need to account for. However, robust reporting will require we consider three forms of carbon and their uncertainty:
 - POC - Particulate organic carbon (described above)
 - DOC - Dissolved organic carbon (best thought of as the brown tea colour in the water)
 - DIC – Dissolved inorganic carbon (forms of CO₂ in water in equilibrium across the system you'll see chemically as dissolved CO₂, H₂CO₃^{*}, HCO₂⁻, CO₃²⁻)

Principles of modelling the natural system and incorporating potential management scenarios

The system of equations representing the natural system needs to be able to represent great variability in space and time, while also being able to be simplified to provide a long-term integrated summary of burial. This provides the foundation for then considering baseline and management scenarios. The important scenarios include the present state of the system, the pre-dam natural system, and potential management opportunities.

- Prior to the implementation of the Manapouri power scheme, Doubtful Sound's Deep Cove is believed to be an efficient basin for deep burial, separated from the coastward part of the sound by a relatively shallow sill.
- The effects of the Manapouri power scheme are thought to include both increased aerobic activity at the water-sediment interface in basins, and decreased sedimentation of fine particles or partially buoyant coarse organic matter due to flushing associated with the outflow discharge.
 - This situation is significant in the few largest annually occurring storm events which are now likely to flush most sediment beyond the zone of efficient trapping and also partially or fully overturn the deep water previously prone to remaining anaerobic – thus retarding oxidation of organic matter in the upper layers of sediment.
- The sedimentation generation and transport processes of interest are highly variable in space and time. Measurements and models must scale across both using equations that connect through to economic calculations.
- Carbon accumulation on land will be limited by nitrogen accumulation and prolific presence of N-fixer *Coriaria arborea* (tutu) deserves quantification. This is something we're working on – methods and also additional funding sources if possible.
- The accumulation of terrestrial carbon on steep slopes is a critical limitation. Standard studies of biomass accumulation on landslides of known age can be combined with modelling and satellite data to quantify carbon inputs.
- A key reason to go to Fiordland is to understand the difficult we face providing reasonably precise models of this process for complex terrain. Fortunately, Hovius et al (1997) demonstrated that the sediment yields for can be estimated reliably for the Southern Alps using a power law relationship. (see figure 2 next page) Extending this to the delivery of C through fractal understanding of hillslopes and catchments feeding fiords should be achievable within the scope of this project, after combining other models and satellite data.

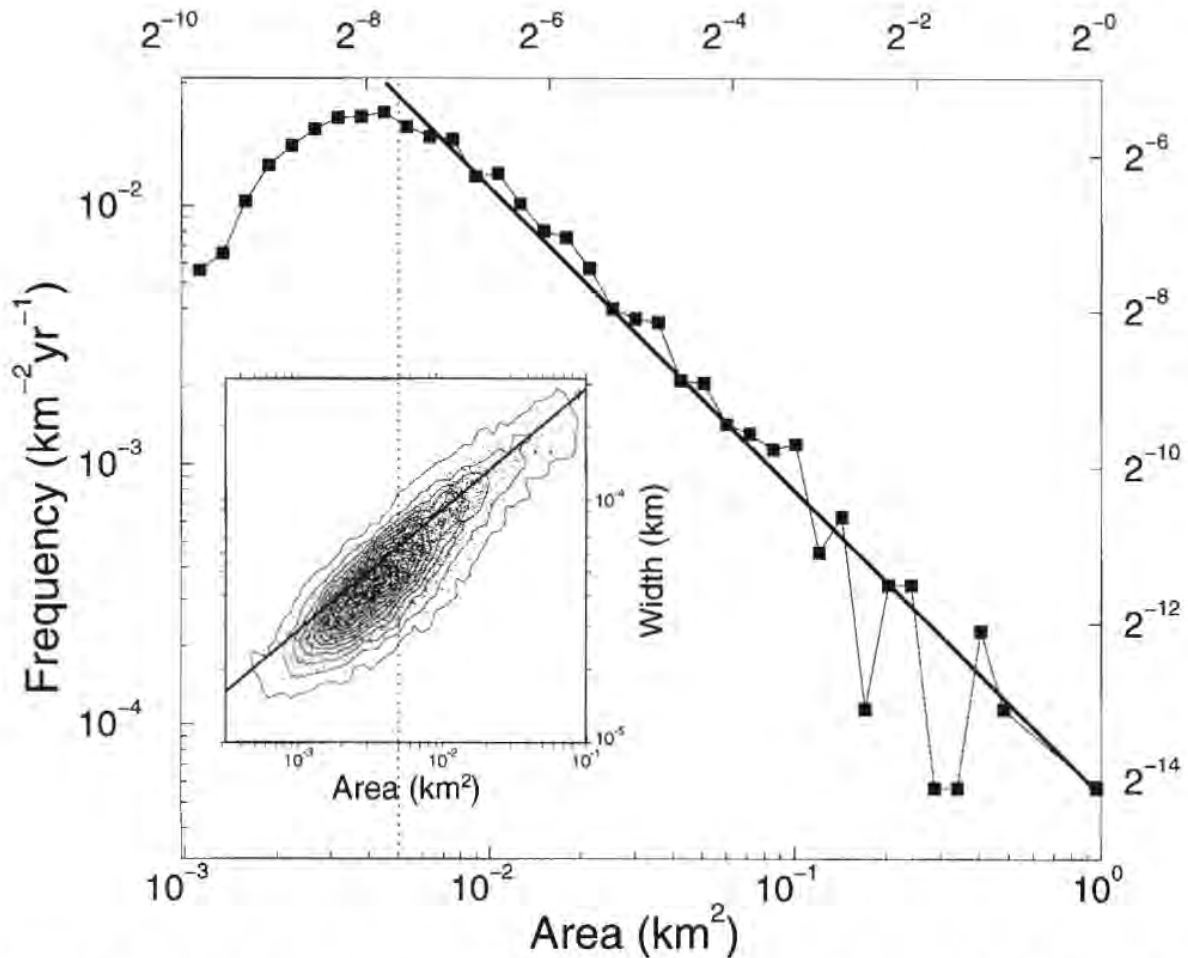


Figure 2. Size distribution of mapped landslides in central western Southern Alps. Main graph is histogram employing logarithmic bin widths ($\log 2w = 1/4$). Mapping method puts lower bound of reliable frequency estimates at about $5 \times 10^{-3} \text{ km}^2$, which is indicated (for both graphs) by vertical dashed line. Above this cutoff, very clear power law trend is observable over two orders of length scale magnitude. Straight line indicates best fit power law model, where gradient is equal to exponent β in equation 1. Correctly normalized, this curve describes probability density function of landsliding of certain magnitude at given time. Inset graph illustrates relationship between landslide area and width of best fit ellipse. This relation is employed in volumetric analysis (equations 3–6). Kink in histogram may be mapping artifact or reflection of size discontinuity in mass wasting mechanics.

Figure 2 Power law relationship from Hovius et al (1997).

Management options

- **Water flow** is an important driver – I think Otago is working on detailed models.

Ultimately we learn something from the difference between the natural state and the current operation of the Manapouri scheme. But the most relevant case will be one or two options that prevent just the highest flows with the most deleterious impacts on C sequestration. We could imagine this might give something like 80% of the C sequestration back, with only say 5 or 10% of the flow and also fix some of the iwi's expectation of a return of more natural flows in the river.

- **Herbivory** by possums, deer and goats is likely to be having a growing impact in Fiordland. DOC's previous efforts to detect these impacts by comparison to areas such as Secretary Island free of these introduced herbivores have not been successful, but our approaches with improved remote sensing and geomorphic understanding may be more sensitive. If herbivore removal or suppression could be supported as a management activity, it might be funded through carbon units accounted for within New Zealand's NDC.
- **Enhanced regeneration following erosion** could be encouraged by oversowing seeds or other material onto recently exposed landslides, presumably including *Coriaria arborea*. This has previously been employed in hill country following large scale landslides. It is also possible that sowing later successional species into 10 or 20 year old *Coriaria stands* would enhance long-term carbon accumulation rates.
- Caroline Saunders arrived at some **equations** in our Invercargill F&G boardroom meeting. Despite my feeling I had a copy, I can't actually locate these. These should be linked to the following somewhat more detailed set I developed (improvements to notation are possible!):

- $\frac{dC_T}{dt} = P_S - R - \sum(L_i - \Delta S_i)$
- $\frac{dC_F}{dt} = \sum L_i(1 - F_i) + P_A(1 - E_A) - Q_{out}C_F/V_F$
- $\frac{dC_S}{dt} = \sum L_i F_i + P_A F_A - kC_S$

Where (note **highlight/colour** shows variables responsive to management):

C_T , C_F , and C_S are C in the terrestrial catchment of the fiord, fiord water column, and fiord sediments, respectively. C_T in particular should be expanded to include understanding of C in the terrestrial catchment through space and time.

Note: It is intended that sub equations can be written for particulate and dissolved organic as well as inorganic carbon, but are probably less important than particulate organic C. These can be further broken down along across the i forms of carbon – note various terms defined below.

P_S is net photosynthesis, a function of nitrogen, temperature, water, and solar radiation

Management to enhance establishment of Coriaria arborea or later successional species can enhance photosynthesis; management of herbivores can improve establishment and photosynthesis of later successional species.

L_i is the hydrologic loss of i^{th} form of carbon to the fiord, e.g., $L_1 = \text{POC}$, $L_2 = \text{DOC}$, where other forms or fractions of POC and DOC can be represented.

R is respiration back to atmospheric CO_2

ΔS_i is temporary storage of the i^{th} form of carbon in the landscape

F_i is the fraction of L_i deposited in the fiord's sediments, with the remainder $(1-F_i)$ remaining in the water column.

P_A and F_A are the autochthonous photosynthesis and fraction deposited in the fiord's sediments, with the remainder $(1-F_A)$ remaining in the water column.

Q_{out} is flow and V_F is the volume of the fiord containing C_F .

Management of high flows will reduce the outflow to the open ocean or less effective burial sites.

k is the decomposition rate constant for C_S as a function of oxygen concentrations, burial rate, burrowing activity, carbon forms (or quality), sediment size, and preservation agents such as Fe or Al (which depend on redox and pH, respectively)

Management of high flows to reduce mixing and reoxygenation of fiord bottom water will

References

Hovius, Niels, C P Stark, and P A Allen. 1997. "Sediment flux from a mountain belt derived by landslide mapping." *Geology* 25: 231-234. [\[LINK\]](#)

Appendix – additional photos



Figure A1. Revegetating slips near the Camelot River.

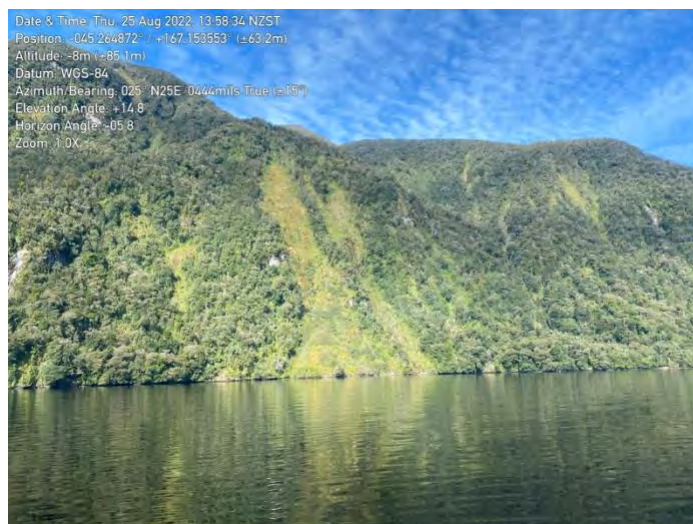


Figure A2. Revegetating slips - additional examples.



Figure A3: Accumulation of particulate C observed on margins of Camelot river due to recent flood.

TVNZ 1

- 6am Breakfast** The Breakfast team presents news, entertainment, sports and weather.
- 9am Riddiculous** Contestants take on the Riddlemaster, hosted by Ranvir Singh.
- 10am Tipping Point** Quiz show in which players take on a machine, hoping to win its jackpot.
- 11am The Chase** Quiz show where contestants must stay one step ahead of The Chaser.
- Noon Deal or No Deal Australia** Contestants attempt to beat the banker to win cash.
- 12.30 Emmerdale** The ups and downs of village life in the Yorkshire Dales.
- 1.30 Coronation Street** PG
- 2pm Millionaire Hot Seat** Six contestants compete to win cash.
- 3pm Tipping Point** Quiz show in which players take on a machine, hoping to win its jackpot.
- 4pm Te Karere** News and current affairs from a Maori perspective.
- 4.30 Deal or No Deal Australia** Contestants attempt to beat the banker to win cash.
- 5pm The Chase** Quiz show where contestants must stay one step ahead of The Chaser.
- 6pm 1News at Six** The latest news, sport, and weather.
- 7pm Seven Sharp** Stories of the day from around New Zealand.
- 7.30 Border Security** An influencer's baggage tests positive for narcotics; a student from China attracts the detector dogs; a shipping container is carrying more than just corn oil.
- 8pm Highway Cops** Why the chicken van crossed the road in Motueka; a kayak rescue at Ohope Beach; two speeding tickets in one trip.
- 8.30 HMP Behind Bars** MVC Behind the bars at HMP Frankland, which houses the most sadistic criminals in Britain.
- 9.25 Hard Quiz** PG Tom Gleeson puts four self-proclaimed experts through the wringer.
- 10pm Deal or No Deal Australia** Contestants attempt to beat the banker to win cash.
- 10.30 Shortland Street** PG Nicole feels excluded.
- 11pm 12th Victim** 16C Caril, who believed her parents were still alive when she was captured, is misled by the criminal justice system and doomed from the start at her trial.
- 12.10 Q+A with Jack Tame**
- 1.05 Te Karere**
- 1.40 Infomercials**
- 5.30 Te Karere**

TVNZ 2

- 6am Les Mills Born to Move**
- 6.25 Children's Programmes** Kiri and Lou; Toi Time; SpongeBob SquarePants; Teenage Mutant Ninja Turtles; Brain Busters; Paw Patrol, Dora the Explorer.
- 9.05 Infomercials**
- 9.35 Les Mills Adult Classes** Body Balance, Body Combat, Body Attack, Core and Grit Cardio classes.
- 10.05 The Drew Barrymore Show** PG Drew presents human interest stories and has heartfelt conversations with special guests.
- 11am Home and Away** PG
- 11.30 Shortland Street** PG
- Noon Tipping Point Australia** Quiz show in which players take on a machine, hoping to win its jackpot.
- 1pm Brooklyn Nine-Nine** PG The officers head over to Holt's house to celebrate his birthday, but they wind up making a bad impression.
- 1.30 The Big Bang Theory** PG
- 2pm Two and a Half Men** PGS
- 2.30 The Office US** PG
- 3pm First Dates Australia** PG Singles go on matchmaker-approved blind dates.
- 4pm Tipping Point Australia** Quiz show in which players take on a machine, hoping to win its jackpot.
- 5pm Friends**
- 6pm The Big Bang Theory** Dividing their possessions becomes a war between Leonard and Sheldon.
- 6.30 Home and Away** PG Cash struggles with his guilt; Bree traces the origin of the contamination.
- 7pm Shortland Street** PG Nicole feels excluded.
- 7.30 MasterChef Australia** PG In a team service challenge, the contestants are tasked with elevating traditional pub food.
- 8.30 The Rookie** MC After being foster parents, Bailey wants to have a baby and forces John to reconsider their decision to not have children.
- 9.25 So Help Me Todd** PG Margaret represents Lauren, Susan's friend, in a workplace lawsuit after she quits her job at a restaurant; when Todd gets sick, Margaret must go under cover.
- 10.20 2 Broke Girls** PGS Caroline and Max clean a hoarder's apartment to make extra money; Max finds out that Johnny has been keeping a secret.
- 10.45 Catastrophe** MLC Rob's sister's visit may inspire a new approach to life; Sharon has her own worries at school.
- 11.15 The Game** M On the morning of Tee Tee's wedding, Jamison takes a pill that makes the world appear to be a musical; Malik launches an apology tour to women he has disrespected.
- 11.50 Shooter** 16V Bob Lee, Isaac and Ali attempt to sever Sotolov's funding; Nadine assists a journalist's investigation into a cover-up; Julie airs her frustrations.
- 12.35 Emmerdale** PG
- 1.25 Infomercials**
- 2.25 The Bachelor Australia** PGL
- 3.55 Neighbours**
- 4.20 Closedown**
- 5am Infomercials**

THREE

- 6am AM** The team presents the latest in news and entertainment.
- 9am Infomercials**
- 10.30 Gold Rush** PGL Miners of the Yukon hope to strike it rich.
- 11.25 Tiny House Hunters** A professional musician wants to simplify his life with a tiny home.
- 11.55 Sister Wives** PG Valentine's Day is to be awkward for a polygamist; at Kody's birthday party, Mariah and her girlfriend show up with a major announcement.
- 12.50 Say Yes to the Dress UK** PG Rochelle and her mother can only agree on one thing – a dress with a mermaid style silhouette; bride Nicole is struggling with the idea of glitz on her frock.
- 1.15 Good Bones** Karen is caught off-guard when Mina tells her that she purchased the rundown house next door, for a high price.
- 2.10 Pitbulls and Parolees** PG Tia, Tania and newest parolee Randy race to Nashville to rescue a dog from death row; Mariah is caught in a storm that threatens to flood Villalobos.
- 3.05 Guy's Grocery Games** Chefs are sent running through the aisles in a high-stakes grocery store cooking competition.
- 4pm Lakefront Bargain Hunt** Dreams of living on the dock of the bay can come true, even on the tightest budget.
- 4.30 SailGP New York – Day 2**
- 6pm Newshub Live at 6pm** Comprehensive coverage of global and local news.
- 7pm Married at First Sight NZ** PG The final three couples meet for final vows to reveal if they will make a life-changing commitment to each other.
- 8pm High Country** MLC Andie spends the night alone in the wilderness while searching for evidence; rescue comes from an unexpected source.
- 8.55 The Good Doctor** MSC A patient has a rare form of dwarfism; a young man, who had both arms torn off in a farming accident, must be treated; Shaun reacts to an emotional situation.
- 9.50 Paris in Love** MLSC Paris lights up Las Vegas at the grand opening of a casino named after her great-grandfather.
- 10.35 Pitbulls and Parolees** PG Tia, Tania and newest parolee Randy race to Nashville to rescue a dog from death row; Mariah is caught in a storm that threatens to flood Villalobos.
- 11.25 Lakefront Bargain Hunt** Dreams of living on the dock of the bay can come true, even on the tightest budget.
- 11.55 Infomercials**

SKY OPEN

- 8am American Pickers** PGC
- 9am Jeopardy** Fast-paced general knowledge quiz.
- 9.30 Wheel of Fortune**
- 10am Infomercials**
- Noon Big Love** MC A revelation about his past threatens Bill's campaign; Nicki goes undercover again; Margene gets the cold shoulder.
- 1pm Outback Truckers** PGL Extreme weather and crumbling infrastructure makes a short journey across a Micronesian island one of Mike Cromwell's toughest jobs; Sludge makes a mercy dash into the outback.
- 2pm Jeopardy** Fast-paced general knowledge quiz.
- 2.30 Wheel of Fortune** Contestants guess letters in mystery words and phrases to win money or prizes.
- 3pm Frasier** Frasier realises he is attracted to his former wife.
- 4pm Pawn Stars** PG A letter signed by Napoleon; a surreal figure by Mexican artist Pedro Friedeberg; a 1960s Monkees talking puppet.
- 4.30 Motorsport – Spanish Grand Prix** (HLS) From Circuit de Barcelona-Catalunya, Montmelo, Spain.
- 5.30 News First** News, sport and weather, with updates through the night.
- 6pm American Pickers** PGC Mike and Frank find items related to some of history's most infamous figures.
- 7pm 30 Rock** PGLS Liz is upset when nobody remembers her 40th birthday; Jack tries to give up drinking to support his pregnant girlfriend; Tracy threatens to break character during TGS.
- 7.30 Massive Engineering Mistakes** PGC A bridge demolition over a busy highway goes massively wrong; an investigation into why the world's tallest academic library cracked.
- 8.30 The Hunters Club** MVC The hunters are in the snow and ice of the Canterbury Alps, searching for trophy tahr and chamois.
- 9.30 Crowd Goes Wild** PG The team presents sports news with lively discussion and a little cheekiness.
- 10pm About a Boy** 16VLC Will invites Sam to a games night hosted by Andy and Laurie; Marcus is uneasy about the mother of a mean girl babysitting him; Sam's work schedule impedes Will's romantic plans.
- 11pm Rap Sh!t** 16LSC Francois entices Shawna and Mia with lucrative deals – with a condition; at the Billboard party, Shawna and Lord AK grow closer; Mia balances two love interests.
- 11.30 American Gigolo** 18VLS Julian recovers Colin from an unlikely saviour; Michelle considers what she wants and what Colin needs.
- 12.30 Infomercials**

MAORI

- 6.30 Purakau ⊕
 6.40 Pipi Pao Pao Tamariki Karaoke ⊕
 6.45 Takaro Tribe ⊕
 7am Darwin and Newts ⊕
 7.10 Tamariki Haka ⊕
 7.20 Te Nutube ⊕
 7.30 Kia Mau ⊕
 7.40 Mataora Digital ⊕
 7.50 Island of Mystery ⊕
 8am Pukana
 8.30 Oranga Ngakau ⊕
 9am Easy Eats ⊕
 9.30 Whanau Bake-Off ⊕
 10am Hangi Pit Masters ⊕
 10.30 Te Hokinga Mai – The Return ⊕
 11am Underground Railroad the Secret History PG ⊕
- Noon TBC
 2pm Opaki ⊕
 2.30 Ako ⊕
 3pm Ako ⊕
 3.30 Purakau ⊕
 3.40 Pipi Pao Pao Tamariki Karaoke ⊕
 3.45 Takaro Tribe ⊕
 4pm Darwin and Newts ⊕
 4.10 Tamariki Haka ⊕
 4.20 Te Nutube ⊕
 4.30 Kia Mau ⊕
 4.40 Mataora Digital ⊕
 4.50 Island of Mystery ⊕
 5pm Pukana ⊕
 5.30 Brain Busters ⊕
 6pm Polyfest Highlights from the Polynesian secondary schools festival.
- 6.30 Te ao Marama The latest news that matters to Maori in te reo Maori.
 7pm Marae Maiatanga, Whanaungatanga, Manaakitanga, stories with heart.
 7.30 Super Kura Nurturing Hope A woman hopes her baby is free from brittle bone disease; the team at Puna Reo are anticipating a visit from the Children's Commissioner.
 8pm Te ao with Moana Current affairs show presented by Moana Maniapoto.
 8.30 **MOVIE** The Dark Emu Story M 2023 Documentary. Charting the impact of Bruce Pascoe's Dark Emu – the book that challenged Australia to rethink its history and ignited raging debate.
 10pm Wairua ⊕ The wairua of unborn children.
 10.30 Te ao Marama ⊕ The latest news that matters to Maori in te reo Maori.
 11pm Closedown

EDEN

- 6.30 **Mysteries at the Museum** PG ⊕
 7.25 **Restaurant – Impossible** PGL ⊕
 8.20 **How do They do It?** PG ⊕
 8.50 **American Pickers** PG ⊕
 9.45 **Mysteries at the Museum** PG ⊕
 10.40 **Shed and Buried** ⊕
 11.10 **Restaurant – Impossible** PGL ⊕
 Robert Irvine attempts to turn things around for failing restaurants, in two days.
 12.05 **American Pickers** PG ⊕ A funeral director who never throws anything away; a personal museum with 200,000 rare items; a suburban home packed to the rafters with Americana.
 1.05 **Mysteries at the Museum** PG ⊕ A harrowing escape by stagecoach in the Wild West; an Alaskan town plagued by an arsonist; the tale of a missing mummy.
 2pm **Restaurant – Impossible** PGL ⊕ Robert Irvine attempts to turn things around for failing restaurants, in two days.
 2.55 **American Pickers** PG ⊕ A funeral director who never throws anything away; a personal museum with 200,000 rare items; a suburban home packed to the rafters with Americana.
 3.50 **Restaurant – Impossible** PGL ⊕ Robert Irvine attempts to turn things around for failing restaurants, in two days.
 4.45 **How do They do It?** PG Running a farm with robots; building a machine to pick up 30 tonnes of logs in one grab; moving the most valuable pianos.
 5.15 **Mysteries at the Museum** PG ⊕ A life vest worn during a harrowing ocean rescue; an oven used to cook a pizza fit for a queen; the Harrier jet that narrowly escaped disaster.
 6.10 **Salvage Hunters** PG Drew Pritchard travels the United Kingdom looking for derelict treasures.
 7.05 **Storage Wars** PGL ⊕ Professional buyers bid on storage units in their search for lucrative and interesting items.
 7.30 **Bondi Rescue** PGLC ⊕ A man's behaviour alarms beachgoers; there is tension after a swimmer ignores instructions; an experiment goes wrong.
 8pm **Border Security Australia** PGC ⊕ A strange, suspicious bulge on a passenger's body; a major problem with a shipment of cosmetics.
 8.30 **Paramedics on the Front Line** PGLC ⊕ A woman with brittle bone disease; a young man on the verge of a diabetic coma; a man who has to be detain under the Mental Capacity Act.
 9.30 **Cops on the Rock** PGC ⊕ Sergeant Gerry's team receives intelligence that three people are claiming responsibility for a school fire.
 10.30 **Mysteries at the Museum** PG ⊕ A life vest worn during a harrowing ocean rescue; an oven used to cook a pizza fit for a queen; the Harrier jet that narrowly escaped disaster.
 11.25 **How do They do It?** PG ⊕ Running a farm with robots; building a machine to pick up 30 tonnes of logs in one grab; moving the most valuable pianos.
 11.55 **Infomercials**

BRAVO

- 10am **Top Chef All Stars LA** PG ⊕
 11am **Snapped** MVC ⊕
 Noon **The Real Housewives of Salt Lake City** M
 1pm **Below Deck** M ⊕
 2pm **Vanderpump Rules** M ⊕
 3pm **Judge Jerry**
 3.30 **Love It or List It Vancouver** ⊕
 4.30 **Top Chef All Stars LA** PG ⊕
 5.30 **Hoarders** PG ⊕ A man is facing a \$150,000 fine for his 2.5 acre hoard. His home is unliveable, so he lives in one of his many trailers.
 6.30 **Million Dollar Listing New York** PG ⊕ Fredrik hustles to get offers during his disco-themed open house, then Ryan arrives for a dance-off; Steve hosts a book launch open house at his new building for artists.
 7.30 **24 Hours in Emergency** MC A 45-year-old woman is in A&E after suffering chest pains and collapsing at home.
 8.30 **Accident, Suicide or Murder?** MVC The death of a woman in her bath is believed to be an accident. But the investigation leads back to the unsolved murder of her husband.
 9.30 **Sin City Murders** MVC A woman's charred remains are discovered in the boot of a burning car.
 10.30 **Snapped** MVC ⊕ The truth behind the brutal deaths of a wealthy couple lies dormant for 15 years, until a new police task force exposes a murderer.
 11.30 **Buried in the Backyard** MVC ⊕
 12.20 **Infomercials**

RNZ NATIONAL

- 6am **Morning Report** With Ingrid Hipkiss and Corin Dann. News, interviews and bulletins on the hour and half-hour.
 9.06 **Nine to Noon** With Kathryn Ryan. Current affairs and topics of interest.
 Noon **Midday Report** RNZ news, followed by updates and reports.
 1.06 **Afternoons** With Jesse Mulligan. An upbeat mix of the curious and the compelling.
 4pm **Checkpoint** With Lisa Owen. News and current affairs programme.
 6pm **The Panel** With Wallace Chapman. Discussion featuring a range of panellists from along the opinion spectrum and expert phone guests.
 8.06 **Nights** With Emile Donovan. Entertainment and information.
 8.15 **Pacific Waves**
 10pm **News at Ten** A roundup of the day's news and sport.
 10.10 **Nights** With Emile Donovan. Entertainment and information.
 11.04 **Nashville Babylon** With Mark Rogers. A selection of old and new music, alt-country, Americana, folk soul and blues.
 12.04 **All Night Programme** A selection of the best RNZ National interviews and features.
 5am **First Up** With Nathan Rarere. New Zealand's early morning wake-up call.

RNZ CONCERT

- 6am **Mornings** With Andrew Clark.
 10am **Days** With Nick Tipping.
 3pm **Three to Seven** With Bryan Crump.
 7pm **Evenings** With David Morriss.
 8pm **Music Alive** With Clarissa Dunn. Visit www.rnz.co.nz/musicalive for more information.
 10pm **Evenings** With David Morriss.
 12am **Music Through the Night** Details available on rnz.co.nz/concert.

UKTV

- 6.05** **QI** M
6.35 **Would I Lie to You?** PG
7.10 **Keeping Up Appearances** PG
7.40 **Hold the Sunset** PG
8.15 **8 Out of 10 Cats Does Countdown** M
9.05 **Great Canal Journeys** PG
9.55 **Father Brown** PG
10.45 **Holby City** M
11.25 **The Bill** PG
12.20 **Midsomer Murders** M
2.10 **New Tricks** M
3.10 **8 Out of 10 Cats Does Countdown** M
4.05 **The Graham Norton Show** PG
5.05 **Who do You Think You Are?** PG Paul Merton.
6.15 **QI** M Bill Bailey, Rob Brydon and Jimmy Carr look at engineering.
6.50 **EastEnders** PG Ravi has a lot to think about; Junior plays peacemaker.
7.25 **QI** PG Stephen mulls over some medical matters.
8pm **Would I Lie to You?** PG Comedy panel show where contestants bluff about their secrets.
8.35 **Beyond Paradise** PG A family feud, with answers lying in the past, leave the team with more than one crime to solve.
9.45 **Hotel Portofino** M As police search the hotel for the missing heirloom, guests and employees are under suspicion; Cecil confronts Bella over her compromising letter.
10.50 **The Diplomat** M Laura gets unexpected help in the Sutherland investigation; Alba is left to run the office, where a case takes a surprising turn.
11.40 **Midsomer Murders** M Barnaby and Jones investigate the cloistered world of Midsomer Priory when a nun is strangled to death.
1.20 **QI** M
1.55 **QI** PG
2.25 **Would I Lie to You?** PG
2.55 **Who do You Think You Are?** PG Paul Merton.
4am **Beyond Paradise** PG
5am **QI** M
5.35 **Would I Lie to You?** PG

SKY 5

- 6am** **The Neighborhood** PGC
6.25 **The Neighborhood** PGC
6.50 **Seinfeld** PG
7.15 **Trucking Hell** M
8am **Pawn Stars** PG
8.30 **The Force** MC
9am **The Mentalist** MVC
9.55 **Taken** M
10.55 **Trucking Hell** M
11.50 **Wheel of Fortune**
12.15 **Wheel of Fortune**
12.40 **Gangs of London** 18VLSC
1.35 **Bad Blood** MVLSC
2.25 **The Mentalist** MVC
3.15 **The Neighborhood** PGC
3.45 **The Neighborhood** PGC
4.15 **Seinfeld** PG
4.45 **Pawn Stars** PG
5.35 **Pawn Stars** PG
6pm **Trucking Hell** M
7pm **The Force** MC Real-life Australian police drama.
7.30 **The Mentalist** MVC The team investigates the murder of a teacher; Cho and Summer hide their relationship from Lisbon; Rigsby gets a special delivery.
8.30 **Channel Patrol** 16VLSC The Navy's bomb squad deals with a deadly relic that has been sitting on a mantelpiece for 30 years; a young entrepreneur navigates his inheritance through busy shipping lanes.
9.30 **On the Roam** M Jason, Jeremiah Armenta and Max Schaaf breathe life into a fleet of 1936 Knucklehead choppers.
10.30 **Taken** M
11.30 **Law and Order – LA** MV A woman wrongly convicted in an arson case that killed her two young children is now on trial for murdering her abusive cellmate. The case takes a toll on Winters' wife, Casey.
12.30 **Wheel of Fortune**
12.55 **Wheel of Fortune**
1.20 **The Force** MC
1.45 **Channel Patrol** 16VLSC
2.30 **On the Roam** M
3.30 **Pawn Stars** PG
4.15 **Taken** M
5.05 **The Mentalist** MVC

DISCOVERY

- 6am** **How do They do It?** PG
6.25 **How do They do It?** M
7.20 **Barnwood Builders** PG
8.15 **Gold Rush – Parker's Trail** M
9.15 **Aussie Gold Hunters** PG
10.10 **Sewer Divers** M
11.05 **Ice Cold Gold** PG Redemption Ridge.
Noon **What on Earth?** PG Horror of Dead Man's Island.
12.55 **Naked and Afraid** M For Better or a Lot Worse.
1.55 **Aussie Mega Mechanics** PG Crane Down.
2.50 **Bering Sea Gold** M Papa's Got a Brand New Dredge.
3.45 **Deadliest Catch** M 450 Mile Storm.
4.40 **Sewer Divers** M The Gates of Smell.
5.35 **Aussie Mega Mechanics** PG Piece by Piece.
6.35 **Outback Opal Hunters** PG
7.30 **Dirty Jobs** PG Manhole Rehab: Clock Caretaker. Mike descends into an aging manhole in Tennessee, then he joins a horologist and a priest restoring a historic clocktower.
8.30 **Hustlers Gamblers Crooks** M \$4.5 Million Gamble. A roulette dealer discovers a way to cheat for his favourite customers; a gambler ends up in a Vegas car chase with \$4.5M in his back seat.
9.30 **Moonshiners – American Spirit** M Boston's Revolutionary Spirit. Tim and Howard are in Boston searching for colonial rum and to uncover the inspiration for America's original bootleggers and revolutionaries.
10.25 **End of the Rope** PG Frying Pan Tower. Trask takes on a decommissioned lighthouse off the coast of North Carolina; the crew must work suspended above shark infested waters.
11.20 **Naked and Afraid** M Don't Let the Jungle Bugs Bite.
12.15 **Barnwood Builders** PG
1am **What on Earth?** PG
1.50 **Deadliest Catch** M
2.35 **Naked and Afraid** M
3.20 **Alaska – The Last Frontier** M
4.10 **Bering Sea Gold** M
5.10 **Deadliest Catch** M

MOVIES PREMIERE

- 7.30** **Shazam! Fury of the Gods** MVL 2023 Action. An unlikely super hero must prevent the daughters of Atlas from using an ancient relic for their own nefarious purposes. Zachary Levi, Helen Mirren.
9.40 **A Thousand and One** ML 2023 Drama. After kidnapping her son from foster care, a woman sets out to reclaim a sense of home, identity, and stability in New York. Teyana Taylor, William Catlett.
11.40 **The New Boy** MC 2023 Drama. In 1940s Australia, a mysterious Aboriginal boy arrives at a remote monastery. His presence disturbs the nuns' delicately balanced world. Cate Blanchett, Aswan Reid.
1.35 **M3GAN** MVL 2022 Horror. After becoming the caretaker of her orphaned niece, a brilliant roboticist decides to pair the young girl with her M3GAN prototype. Allison Williams, Violet McGraw.
3.20 **Jesus Revolution** MC 2023 Drama. In 1970s California, a pastor meets a charismatic hippie and opens his church doors to wandering youths. Kelsey Grammer, Joel Courtney.
5.25 **There's Something Wrong with the Children** MVLSC 2023 Horror. Four friends and their two children take a weekend trip. Supernatural suspicions are roused when the kids start acting strangely. Zach Gilford, Amanda Crew.
7pm **One Day as a Lion** MVL 2023 Action. A man will do anything to get his son out of jail. After a chance encounter at a diner, he forges a new plan. Scott Caan, JK Simmons.
8.30 **Black Adam** MVC 2022 Action. With the powers of the Egyptian gods, Black Adam is freed from his prison and ready to unleash justice on the world. Dwayne Johnson, Aldis Hodge.
10.35 **My Big Fat Greek Wedding 3** PGS 2023 Comedy. After her father dies, a woman attempts to find his childhood friends in Greece for a family reunion. Nia Vardalos, John Corbett.
12.10 **My Happy Ending** ML 2022 Comedy. A fading Hollywood star accidentally checks herself into a public hospital. There, she meets three unique and remarkable women. Andie MacDowell, Miriam Margolyes.
1.40 **Missing** MV 2023 Thriller. A young woman uses online tools in the search for her mother who has gone missing with her boyfriend in Colombia. Storm Reid, Nia Long.
3.30 **A Good Person** 16VLS 2023 Drama. A woman is involved in a harrowing tragedy. Struggling with grief and addiction, she finds hope in an unexpected friendship. Florence Pugh, Morgan Freeman.
5.35 **Gasoline Alley** 16VLC 2022 Thriller. A reformed criminal implicated in the murders of three Hollywood starlets, begins his own investigation to prove his innocence. Bruce Willis, Devon Sawa.

MOVIES GREATS

- 6.40 Dunkirk** MVL 2017 War. The evacuation of British and allied forces from Dunkirk during a harrowing battle with German forces during the Second World War. Fionn Whitehead, Tom Hardy.
- 8.30 The Mercy** ML 2018 Drama. With his business and house on the line, an amateur sailor leaves his family behind and sets sail on a soul-searching adventure. Colin Firth, Rachel Weisz.
- 10.15 Fury** 16VL 2014 Action War. A battle-hardened sergeant commands a Sherman tank and its crew on a mission behind enemy lines during the Second World War. Brad Pitt, Logan Lerman, Shia LaBeouf.
- 12.30 Indiana Jones and the Kingdom of the Crystal Skull** MV 2008 Action Adventure. Archaeologist Indiana Jones becomes entangled in a Soviet plot to discover the secret behind artefacts known as the Crystal Skulls. Harrison Ford, Ray Winstone, Shia LaBeouf, Cate Blanchett.
- 2.35 Spider-Man** MV 2002 Action. After being bitten by a genetically modified spider, a high-school student gains spider-like abilities, and must use them to fight evil. Tobey Maguire, Kirsten Dunst, Willem Defoe.
- 4.35 Spider-Man 2** MVL 2004 Action. Peter Parker gives up his suit to save his personal life, until Dr Octopus presents a multi-tentacled menace to society. Tobey Maguire, Kirsten Dunst.
- 6.45 The Program** ML 2015 Drama Biography. Convinced Lance Armstrong's Tour de France wins resulted from doping, a journalist embarks on a 13 year investigation. Ben Foster, Chris O'Dowd.
- 8.30 The Two Faces of January** MVL 2014 Thriller. Two wealthy American tourists become embroiled in a murder scandal after befriending an expat con man. Kirsten Dunst, Viggo Mortensen.
- 10.10 Star Trek Beyond** MV 2016 Sci-fi. The USS Enterprise crew explores uncharted space, where they encounter a new, ruthless enemy who threatens everything the Federation stands for. Chris Pine, Zachary Quinto, Karl Urban.
- 12.10 Prisoners** 16VLC 2013 Crime. When his daughter and her friend go missing, a father decides to take matters into his own hands. Hugh Jackman, Jake Gyllenhaal.
- 2.40 Gold** ML 2017 Drama. A prospector, desperate for a lucky break, teams up with a similarly eager geologist and sets off on a journey to find gold in the uncharted jungle of Indonesia. Matthew McConaughey, Edgar Ramirez.
- 4.40 The Da Vinci Code** MV 2006 Drama. A murder in the Louvre, and clues in paintings by Leonardo da Vinci, lead to the discovery of a religious mystery protected by a secret society for 2000 years. Tom Hanks, Audrey Tatou, Ian McKellen.

DUKE (Sat/Sun only for proofing)

- 6am On Duke Today**
- 11.50 The Chase Australia** © Australian version of the critically acclaimed game show. Four strangers work individually and as a team to build a cashpot. Standing in their way is the Chaser, one of the world's top trivia brains.
- 12.45 Frasier** PG © One of Frasier's callers, a German woman named Gretchen, suspects that her husband is having an affair with his client. Frasier suspects that the woman is Maris. S2 E21.
- 1.40 Xploration – Awesome Planet** © Philippe Cousteau Jr., grandson of the legendary Jacques Cousteau, explores the most spectacular places – on the earth, inside the earth, and above the earth – in this riveting earth science series.
- 2.05 Grime and Punishment** PG © ⚡ Wayne and Dan tackle trash dumped from illegal cannabis factories, and cleaners Caz and Tee face houses so filthy they need shovels to clear the layers of grime. S1 E3.
- 2.55 Fishing and Adventure** © Scott and Mig are off on a deep drop adventure and the head to head challenge is set to land the longest fish. With a guaranteed consequence on the line the boys waste no time hooking in.
- 3.25 Toa Hunter Gatherer** PG © ⚡ The journey continues on Molokai Island where Owen is taken on a hunting expedition on land and sea.
- 3.55 The Chase Australia** © ⚡ Australian version of the critically acclaimed game show. Four strangers work individually and as a team to build a cashpot. Standing in their way is the Chaser, one of the world's top trivia brains.
- 4.45 The UnXplained with William Shatner** PG © ⚡ The Founding Fathers established the pillars of freedom and democracy in the US, but what truths have remained in the shadows about these men?
- 5.40 Frasier** ⚡ Niles suggests to Maris that they go into marriage counseling; she responds by serving him with divorce papers. S4 E22.
- 6.05 Brooklyn Nine Nine** PG © ⚡
- 6.40 The Office U.S** PG ©
- 7.10 Two and a Half Men** PG © Charlie is unsure of how to discipline Jake after an accident involving seagulls. Meanwhile, Alan gets a surprise from Judith when he goes home to fix her sprinklers. S1 E2.
- 8.05 2 Broke Girls** PGL © Max's lesson to Caroline on the art of thrift store shopping turns ugly when the girls fight over a coveted t-shirt. Plus, a sarcastic street artist named Johnny flirts with Max. S1 E3.
- 8.30 MOVIE Semi-Pro** 16LS © ⚡ 2008 Comedy. In 1970s Michigan, the age of big hair and short shorts, a man goes all the way in his search for glory and redemption. Will Ferrell, Woody Harrelson.
- 10.20 Twisted Metal** 16VLC ©
- 11.20 Eureka** PGV When Grace's spying is revealed, mistrust is in the air. Major Shaw shows up to take control of the situation just as a geo-engineering project cuts off communications to the outside world. S5 E11.
- 12.05 House M** ©
- 12.50 Duke – Back in the Future** We'll catch you later on Duke.



WORLD
METEOROLOGICAL
ORGANIZATION
WEATHER CLIMATE WATER

WMO TECHNICAL CONFERENCE
ON METEOROLOGICAL AND ENVIRONMENTAL
INSTRUMENTS AND METHODS OF OBSERVATION
(TECO-2024)

**The WMO Technical Conference
on Meteorological and Environmental Instruments and
Methods of Observation
(TECO-2024)**

**Vienna, Austria
23-26 September 2024**

**Theme: "*Measurements and new technologies for WMO
priority initiatives*"**

**DRAFT PRELIMINARY PROGRAMME
(as of 26 June 2024)**

MONDAY, 23 SEPTEMBER 2024

08:00 – 09:00	Registration	WMO Secretariat	
09:00 – 09:30	Opening Ceremony		
TOPIC 1: NEW MEASUREMENT TECHNOLOGIES AND INNOVATIVE INTEGRATED APPROACHES			
Time	Title of presentations	Author(s)	Country
09:30 – 09:45	Multi-Magnification Networks for Visibility Estimation	Mr. Nicola Santacroce et al.	Switzerland
09:45 – 10:00	Cosmic Rays Neutron Sensing is a mature technology for Snow Water Equivalent measurement	Dr. Enrico Gazzola et al.	Italy
10:00 – 10:15	Strategy and technology for de-icing treatment on roads and runways during winter precipitation.	Dr. Arkady Koldaev et al.	Russian Federation
10:15 – 10:30	THERMACERN: A new method for precipitation analysis from Thies CLIMA.	Dr Christoph Peper	Germany
10:30 – 11:00	COFFEE / TEA BREAK		
11:00 – 11:15	AI improvement of irradiance measurements	Dr Marc Korevaar et al.	Netherlands
11:15 – 11:30	Development and Application of Microclimate Observation Network in Hong Kong	Dr Dick Ho-ming Leung et al.	Hong Kong, China
11:30 – 11:45	Exploitation of webcam images for coastal applications	Ms. Nerea Garmendia García et al.	Spain
11:45 – 12:00	The Yucatan HF Radar Network as a Pathfinder for Caribbean-wide Operations	Dr. Scott Glenn et al.	United States of America
12:00 – 12:30	1-min Presentations of Session 1 Posters (1 slide for each)		
12:30 – 14:00	LUNCH BREAK		
14:00 – 14:15	Mode-S: the benefits and challenges of high-density aircraft observations	Mr. Bruce Ingleby	United Kingdom
14:15 – 14:30	Cost-effective, High-accuracy Routine Atmospheric Profiling with wxUAS	Dr. Ben Pickering et al.	United Kingdom
14:30 – 14:45	Mapping horizontal wind speed using a single Doppler Wind Lidar scanning horizontally: a test case over Paris	Dr. Clément Toupoint et al.	France
14:45 – 15:00	A situ profiling techniques that can provide cost-effective upper-air measurements Round-trip Drifting Sounding System (RDSS) in China	Mr. Qiyun Guo et al.	China

15:00 – 15:15	Enhancing Precipitation Particle Observations: The Development and Application of the Balloon-borne and Ground-based Rainscope	Dr Kenji Suzuki et al.	Japan
15:15 – 15:30	WindBorne Global Sounding Balloon Observations	Mr.Todd Hutchinson et al.	United States of America
15:30 – 15:45	Machine learning methodology for remote calibration and anomaly detection in collaborative sensor fusion networks	Mr. Amul Batra et al.	India
15:45– 16:15	COFFEE / TEA BREAK		
16:15 – 17:30	PANEL DISCUSSION SESSION 1: Trends and innovation in measurement technologies		

TUESDAY, 24 SEPTEMBER 2024			
TOPIC 2: ENVIRONMENTAL SUSTAINABILITY OF OBSERVING SYSTEMS			
Time	Title of presentations	Author(s)	Country
09:00 – 09:15	Driving a paradigm shift: key outcomes from the WMO initiative to advance the environmental sustainability of observing systems and methods	Dr Michael Earle et al.	Canada
09:15 – 09:30	A novel Method of evaluating the environmental Impact of Radiosondes	Mr Johannes Frielingsdorf et al.	Germany
09:30 – 09:45	Evaluating the effectiveness of propylene glycol and ethanol as antifreeze: an environmentally friendly alternative	Dr Bikas Chandra Bhattarai et al.	Norway
09:45 – 10:00	Development and Testing of an Ultralight Reusable Glidersonde	Mr Yohan Hadji et al.	Switzerland
10:00 – 10:15	Two examples of the use environmentally-friendly sensors by Météo-France	Dr Jérôme Duvernoy et al.	France
10:15 – 10:30	A truly sustainable and comprehensive solution for The Global Basic Observing Network	Mr Timo Siirtola et al.	Finland
10:30 – 11:00	COFFEE / TEA BREAK, POSTER VIEWING, EXHIBITION VISIT		
TOPIC 3: CHARACTERIZATION AND TESTING OF INSTRUMENTS AND METHODS			
Time	Title of presentations	Author(s)	Country
11:00 – 11:15	Multi-year Analysis of All-In-One Meteorological Observing	Dr Bradley Illston	United States of America

	Instruments for Scientific Research Use		
11:15 – 11:30	Intercomparison of radiation shields in polar climate. COAT Project	Dr Carmen Garcia Izquierdo et al.	Spain
11:30 – 11:45	Impact of thermometer diameter on observations of air temperature	Ms Laura Bevilacqua et al.	United Kingdom
11:45 – 12:00	Environmental Influences on field measurement of Temperature	Dr Jane Warne et al.	Australia
12:00 – 12:15	Installation and Operation of Ultrasonic Anemometers in JMA	Mr Takashi Hamagami	Japan
12:15 – 12:45	1-min Presentations of Sessions 2, 3 and 4 Posters (1 slide)		
12:45 – 14:00	LUNCH BREAK, EXHIBITION VISIT		
14:00 – 14:15	Improving the cloud cover estimation using wide-field of view imagers compared to narrow field instruments	Mr Mehdi Ben Slama et al.	France
14:15 – 14:30	A method to correct the internal calibration of CHM15k ceilometers using housekeeping parameters	Dr Maxime Hervo et al.	Switzerland
14:30 – 14:45	Inter-comparison of rainfall estimates from two optical rain gauge models	Ms Hiu Yan Li et al.	Hong Kong, China
14:45 – 15:00	Development of quantitative precipitation estimation (QPE) relations for dual-polarization radars based on raindrop size distribution measurements in Metro Manila, Philippines	Mr Marco Polo Ibanez et al.	Philippines
15:00 – 15:30	POSTER SESSION FOR TOPIC 1, 2 & 3		
15:30 – 16:00	COFFEE / TEA BREAK, POSTER VIEWING, EXHIBITION VISIT		
16:00 – 17:15	PANEL DISCUSSION SESSION 2: Evolving measurement requirements for WMO priorities (EW4All, G3W, GBON, RBON and WIGOS Vision*)		

WEDNESDAY, 25 SEPTEMBER 2024			
TOPIC 4: TRACEABILITY OF MEASUREMENTS TO RECOGNIZED STANDARDS			
Time	Title of presentations	Author(s)	Country
09:00 – 9:15	Introduction to the development of ISO test method standards of radiosonde temperature, humidity, and solar radiation correction	Dr Yong-Gyoo Kim	Republic of Korea
09:15 – 9:30	Experimental study on measurement uncertainty of air temperature observation	Dr Jianxia Guo et al.	China

09:30 – 9:45	Intercomparison and traceability of visibility measurements	Dr Jessica Strickland et al.	Netherlands
09:45 – 10:00	Sea-Ice Observations: Optimizing Methods in a Changing Environment	Dr Petra Heil et al.	Australia
10:00 – 10:15	Measurement uncertainty of eddy covariance based carbon budget	Dr Nicola Arriga	Italy
10:15 – 10:45	COFFEE / TEA BREAK, POSTER VIEWING, EXHIBITION VISIT		
10:15 – 10:45	Introduction of SC-MINT* and its Activities to the Experts by Expert Teams Chairs for Potential Membership		
TOPIC 5: QUALITY ASSURANCE AND MAINTENANCE OF THE OBSERVING SYSTEMS			
10:45 – 11:00	Siting Classification 2024: Guidance on implementation of the siting classification and future work on its optimization	Dr Mareile A. Wolff et al.	Norway
11:00 – 11:15	Maintenance and quality assurance of New York State Mesonet	Dr Junhong Wang	United States of America
11:15 – 11:30	Challenges in the Utilization of Automatic Weather Stations for Operational Use and Weather Forecasting	Mr B Sudarsan Patro et al.	India
11:30 – 11:45	MET Malaysia's Meteorological Mobile Maintenance and Site Calibration	Mr Mohd Azman Abd Ghafar	Malaysia
11:45 – 12:30	1-min Presentations of Sessions 5 & 6 Posters (1 slide)		
12:30 – 14:00	LUNCH BREAK, EXHIBITION VISIT		
14:00 – 14:15	Research and Application of Weather Radar Calibration Methods	Dr Yubao Chen et al.	China
14:15 – 14:30	Frequency interference elimination in weather radars	Mr Quang Vinh Nguyen et al.	Vietnam
14:30– 14:45	Aircraft Observations – Determining Quality Data in RA V	Dr Douglas Body	Australia
14:45 – 15:15	POSTER SESSION FOR TOPIC 4, 5 & 6		
15:15 – 15:45	COFFEE / TEA BREAK, EXHIBITION VISIT		
15:45-17:00	PANEL DISCUSSION SESSION 3: Capacity development and challenges in maintaining measurement networks		
17:00 – 18:00	DRINK RECEPTION		

THURSDAY, 26 SEPTEMBER 2024

TOPIC 6: CAPACITY DEVELOPMENT FOR SUSTAINABLE AND QUALITY MEASUREMENTS

09:00 – 09:15	The benefits of a standardised technical specification for Automatic Weather Station design and installation	Mr David Hiscock	United Kingdom
09:15 – 09:30	Field evaluation 3D-Printed Automatic Weather Stations (3D-PAWS) in Türkiye	Mr. Engin Oztürk et al.	Türkiye
09:30 – 09:45	The Role of Adequate Climate Observational Network in Supporting Robust Climate Change Adaptation and Mitigation; a case study of Kenya	Mr Nixon Lang'at et al.	Kenya
09:45 – 10:00	Sustainable and quality measurements for answering AFOLU emission challenges regarding NDCs in Colombia	Dr Edwin Cristancho-Pinilla et al.	Colombia
10:00 – 10:15	Provision of AWS training - lessons learnt	Mr Andrew Harper et al.	New Zealand
10:15 – 10:45	COFFEE / TEA BREAK, POSTER VIEWING		
10:45 – 11:00	Standardization Of First-Mile Data Collection in China	Dr Dongdong Chen et al.	China
11:00– 11:15	Caribbean WIS 2.0 Node Advances supports EW4ALL – Novel Use of New Technology in a Whole-of-Region Approach	Mr. Kenneth Kerr et al.	British Caribbean Territories
11:15 – 11:45	The current challenges and future research directions for measurement of the rainfall using the commercial microwave links (CMLs)	Mr Anowar Hossen et al.	Bangladesh
11:45 – 12:00	Hydrometric Network Design: A review of Surface Water Monitoring in Uganda	Mr David Kataratambi	Uganda
12:00 – 12:15	Developing water resources management plans for enhanced management, protection, development, and sustainable utilisation of water resources in Lesotho	Ms Kananelo Bookholane et al.	Lesotho
12:15 – 13:45	LUNCH BREAK, EXHIBITION VIEWING		
13:45 – 14:00	WMO Guide to Operational Weather Radar Best Practices – first edition	Dr Daniel Michelson et al.	Canada
14:00 – 14:15	Specifications for solid-state transmitter weather radars	Mr Pekka Utela et al.	Finland
14:15 – 14:30	Enhancing Remote Sensing and Aviation Infrastructures for Meeting Challenges through System Integration and Continuous Improvement	Dr Neeti Neeti Singh et al.	India
14:30 – 14:45	Observation comparison and mutual verification of the integrated air-surface system for Fengyun meteorological satellite	Dr Peng Zhang et al.	China
14:45– 15:00	CLOSING OF TECO-2024		

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EW4All: Early Warnings for All

G3W: Global Greenhouse Gas Watch

GBON: Global Basic Observing Network

RBON: Regional Basic Observing Network

WIGOS: WMO Integrated Global Observing System

SC-MINT: INFCOM/Standing Committee on Measurements, Instrumentation and Traceability

INFCOM: Commission for Observation, Infrastructure and Information Systems

POSTER SESSIONS

TOPIC 1: NEW MEASUREMENT TECHNOLOGIES AND INNOVATIVE INTEGRATED APPROACHES		
Title	Author (s)	Country
A joint initiative between WMO and HMEI on standardization of data collection	Mr Rémy Giraud	France
SSPA Dual-polarization Weather Radar Maintenance	Mr. Hiroya Endo et al.	Japan
Impact of assimilating Mode-S observations into the Met Office global deterministic NWP model on forecast accuracy, from a European and global network	Dr. Elliott Warren et al.	United Kingdom
Organizational and Methodological Issues of Operation of Modern Hydrometric Measurement Equipment in the Hydrometeorological Service of Ukraine	Dr Viacheslav Manukalo et al.	Ukraine
Heavy rainfall events of the last 20+ years in Germany: A web-based open information tool	Dr Thomas Einfalt et al.	Germany
SwissMetNet migrating to cloud technologies	Dr Christian Félix et al.	Switzerland
Weather Radar Siting and Implementation in Egypt	Mr El Fouly Sabry	Egypt
Development of All-weather UAV (Marshall) and Initial Observations	Dr Kazuhiro Yoshimi et al.	Japan
Develop an AI utility to detect cloud types and meteorological visibility in real-time.	Mr Hamza Hamza Mohamed	Egypt
Improving runway visual range calculation using an optimized optical parameter	Mr Yashar Rostami et al.	Islamic Republic of Iran
Nova PM Sensor SDS011 for Alternative Air Quality Monitoring based on Internet of Things	Mr Arsy Yudha Prinanto et al.	Indonesia
Fault-Tolerant Architecture for Automatic Weather Stations: A Comparative Study of TMR and 5MR Sensor Structures	Dr Navid Chiniforoush	Islamic Republic of Iran
Ground-based lidar operational and research activities at KNMI	Dr Knoop Steven et al.	Netherlands
Development of small uncrewed surface observation vehicles to contribute to typhoon monitoring, forecasting, and modification in the tropical Northwest Pacific Ocean	Dr Shuichi Mori et al.	Japan
Fast and High Resolution Detection Technology Implemented on Weather Radar	Mr Chian Zhang et al.	China
Digitization of self-recording charts using digital image processing	Mr Bibraj Raj	India

TOPIC 1: NEW MEASUREMENT TECHNOLOGIES AND INNOVATIVE INTEGRATED APPROACHES

Title	Author (s)	Country
Integrated Low-Cost Radar Sensor for Snow Height Measurement: Prototype and Complete Winter Season Measurements	Mr Víctor Herráiz-López et al.	Spain
Correction, based upon the air density, of the Density Size Distribution (DSD) estimated by Radar precipitation sensor to improve liquid precipitation measurement	Mr J. Ismael Sanambrosio et al.	Spain
Introduction of Standard Meteorological Observatory in the Korea Meteorological Administration	Mr Ki Hoon Kim	Republic of Korea
Flight altitude control technique using latex weather balloons aimed for advancing upper-air observations	Dr Kensaku Shimizu et al.	Japan
Assessment of Stratospheric Dropsonde Data through NWP Model Comparisons	Mr Matthew Fry	United Kingdom
LidarCUBE - an advanced compact lidar for routine operations	Dr Kathrin Baumgarten et al.	Germany
Enhancing Radiosonde Temperature Measurements Through Advanced Sensor Coatings	Mr Sencer Aydın et al.	Türkiye
LEELA lightning detection and VLF recording	Dr Edmund K Stone et al.	United Kingdom
Radar wind data calibration at different levels using actual wind measuring instruments	Mr Rohit Shukla et al.	India
Fog Fusion Techniques for Enhanced Spatiotemporal Prediction	Dr Neeti Singh et al.	India
Extracting Key Indicators of Snow and Horizontal Visibility from Webcam Images	Dr Pierre Lepetit et al.	France
New design of radiation shield (RS) – comparison	Mr Juraj Schwarz	Slovakia
Development of the HF Radar Network in Indonesia and Its Application to Observe the Indonesia Throughflow (ITF) Real-time	Dr Furqom Alfahmi et al.	Indonesia
A Novel Camera-Based Approach to Increase the Quality, Objectivity and Efficiency of Aeronautical Meteorological Observations	Mr Lukas Ivica	Slovakia
Advancements in air temperature measurement technologies: evaluating and comparing the new SMarT CELLino solar screen	Dr Adriano Fedi et al.	Italy
Innovative solution to see rainfall	Ms Amélie Thevenet-Leprevost	France
Validation and benchmark of a novel low-cost measurement system of direct and diffuse irradiance at six sites worldwide	Dr Blum Niklas et al.	Germany
Presentation of the French national weather service new automatic weather station dedicated to aeronautical platforms.	Mr Leroy Fabrice	France
Weather Surveillance: Aircraft-based Observations via Automatic Dependent Surveillance – Broadcast	Mr Darr Stephen	United States of America

TOPIC 1: NEW MEASUREMENT TECHNOLOGIES AND INNOVATIVE INTEGRATED APPROACHES

Title	Author (s)	Country
Exploring the Intersection of Climate Governance, Solar Radiation Management, and Advancements in Measurement Technologies	Ms Yvette RAMOS	Portugal
The Importance of Data in Emergency Management	Mr Kerry Caslow Christian Abouzeid et al.	United States of America
Estimation of sunshine duration using one-minute global irradiance measurements	Dr Mehdi Rezaei et al.	Islamic Republic of Iran
Multi-wavelength Polarized Raman Meteorological Lidar Observation Network	Dr Nan Shao et al.	China
Common Data Communication Protocol	Mr Yusuf Salih Eroğlu et al.	Türkiye
Compact Raspberry Pi-Based Automatic Rain Gauge Data Logger for Supporting Rain Monitoring in Indonesia	Mr Simon Baharja Siagian et al.	Indonesia
Smart Data Logging System	Mr Yusuf Salih Eroğlu et al.	Türkiye
Global Data Sharing for the 21st Century	Ms Elizabeth Wilson et al.	United States of America
Communicating Integrated Early Warning Weather Information	Mr Jon Tarleton	United States of America
Testing the Performance of AI-visibility Systems Using CCTV Camera	Mr Sin Tae Chae	Republic of Korea
CLODES®, AI-Based System For Overview Of Current Sky Condition, In Terms Of Clouds Classification And Coverage	Dr Claudio Fausto Petrachi et al.	Italy
Storm Surge Modelling in The Eastern Indonesia Waters	Mr Khafid Rizki Pratama	Indonesia
Comparison Of Digital And Analogue Instruments	Mr Hamudi Sikoya	Zimbabwe
Deep-Pathfinder: A Computer Vision Algorithm For Near-Real-Time Boundary Layer Height Detection Using Ceilometer Observations	Dr Jasper S. Wijnands et al.	Netherlands
Digitization Of Mercury Barometers And Verification Process Of Digital Barometers Of Synoptic Stations In Senegal	Mr Ibrahima Diallo et al.	Senegal
Monitoring forests in remote areas by IoT based measuring systems: the RemoTrees project	Dr Luca Belelli Marchesini et al.	Italy
Dropsondes from the Stratosphere: Targeted Observations Over Remote Regions Using Stratospheric Platforms.	Mr Paul Stevens et al.	United Kingdom
FENGYUN Meteorological Satellite: An Innovation Platform for Earth Observation	Dr Dongyan Mao et al.	China
Eddy covariance flux system on a buoy: recent advancements in gas analyzer technology	Dr Ivan Bogoev et al.	United States of America

TOPIC 1: NEW MEASUREMENT TECHNOLOGIES AND INNOVATIVE INTEGRATED APPROACHES

Title	Author (s)	Country
"Improvement of Cloud Mask Generated from Satellite Data with Various Parameters, Data Analysis and Machine Learning Methods.	Mr Yasin Er	Türkiye
Cloud classification from global horizontal irradiance data using a ML model in Buenos Aires, Argentina	Ms Anabela Lusi et al.	Argentina
Advancing methods for monitoring thermal balance of sea ice during the North Pole - 41 expedition 2022/2024 based on Lagrangian profiling buoys	Dr Smolyanitsky Vasily et al.	Russian Federation
Innovation in met-ocean observing to address upcoming blue economy challenges.	Mr Chad Whelan et al.	United States of America
Rainfall-runoff modeling using SCS-CN under HEC-HMS and GIS techniques in Matadi catchment of Congo River, Democratic Republic of Congo	Dr Kabadi Papy et al.	DR Congo
Sea Surface Salinity Drifting Buoys Based on SVT Technology	Dr Eugene Lunev et al.	Russian Federation
Monitoring of water level and the issue with water discharges	Mr Vasko Stojov	North Macedonia
Title: Using AI and the Internet of Things to Create a Global Network for Environmental Monitoring	Mr Ahmed Sharafaddin	Yemen
Experiences of IoT measurement technology in meteorological and marine applications	Mr Lasse Latva et al.	Finland

TOPIC 2: ENVIRONMENTAL SUSTAINABILITY

Title	Author(s)	Country
Sustainability and availability: democratisation of radar technology	M Michal Najman et al.	Czechia
The "Green Reconstruction" Approaches As a Basis of the Restoration of the Hydrometeorological Observations System of Ukraine	Dr Viacheslav Manukalo et al.	Ukraine
Replacing fixed electronics with traditional instruments in meteorological stations in order to achieve environmental sustainability	Mr Nematollah Oghba	Islamic Republic of Iran
Sustainable weather and environmental observation systems	Mr Wathik Chahabane Youssouf	Comoros
Effect of balloon size, parachute use and radiosonde design on the safety of descending radiosondes	Mr David Edwards et al.	United Kingdom
Transition from mercury thermometer to digital thermometer in Nepal	Mr Suresh Khanal et al.	Nepal

TOPIC 3: CHARACTERIZATION AND TESTING OF INSTRUMENTS AND METHODS

Title	Author(s)	Country
Study of the Effectiveness of Commonly Used Rainfall Measuring Instruments in Measuring Rainfall Intensity in Malaysia	Mr Wan Mohd Nazri Wan Daud et al.	Malaysia
Verifying the radiosonde humidity sensor performance	Dr Alexander Kochin	Russian Federation
Design for the small-sized air-circulating chamber for thermometer comparison applicable to the liquid bath	Mr Sunghun Kim et al.	Republic of Korea
Optimizing Meteorological Data Collection with Digital Climate Stations: A Comprehensive Analysis	Mr Gde Krisna Lingga Aditama et al.	Indonesia
Weather Radar Rainfall Estimation Performance Based On Z-R Relationship and CNN Approach	Mr Naufal Ananda et al.	Indonesia
Testing Procedure for Data Loggers in AWS Environment	Mr Ampere K et al.	India
Comparative Analysis of Temperature and Humidity Sensors in Unusual Environmental Conditions	Mr Hendri Satria WD et al.	Indonesia
Verifying the Performance of Wind Profiler Radar for Observing the Vertical Wind Condition to Increase the Meteorological Services for Aviation Sector	Mr Mahendra Richard Putra	Indonesia
A Comparison of Daily Rainfall Measurements at Irish Stations: Pluvio Weighing Rain Gauge versus Manual Gauge	Mr Tony O'Leary et al.	Ireland
Variations in the rainfall trend in the eastern Tigullio area (Liguria region, Italy)	Dr Claudio Monteverde et al.	Italy
Outcomes of instrument in intercomparisons between Radiosonde in (UAI2022)	Dr Zeinab Fahmy	Egypt
Assessing measurement uncertainty and response time of RS41 humidity sensors using an upper air simulator	Mr Young-Suk Lee et al.	Republic of Korea
Comparative study of rain measurement by optical disdrometers and tipping-bucket rain gauges in Basque Country	Mr Santiago Gaztelumendi et al.	Spain
Evaluation and inter-comparison of weighing gauge measurements in Basque Country.	Mr Santiago Gaztelumendi et al.	Spain
Metrological validation of the 48.8 °C European extreme air temperature record	Dr Chiara Musacchio et al.	Italy
Further steps towards an open-source RS41 Data Processing Toolchain	Mr Johannes Frielingsdorf et al.	Germany
Intercomparison of thermometers in a Stevenson Screen under polar climate	Dr Carmen Garcia Izquierdo et al.	Spain
Winter field test of the Lufft SHM31 laser snow depth sensor	Mr Darren Lyth	United Kingdom
Dependence of surface air temperature measurement on thermometer's installation height	Mr Alberto Bottacin et al.	Italy
improvement of relative humidity measurement in a meteorological	Mr Mounir AZIZ	Morocco

TOPIC 3: CHARACTERIZATION AND TESTING OF INSTRUMENTS AND METHODS

Title	Author(s)	Country
observation network characterized by an extreme environment		
Influence of user errors on ADCP measurement outcome	Mr Tomas Boraros et al.	Slovakia
Comparison of Automatic Instrument and Conventional Weather Observing Instrument for Rainfall monitoring for the period of 2015 to 2022 in Uganda	Mr Andrew Ssali et al.	Uganda
Instrumentation performance and preliminary results for running SNOWPACK model	Dr Samuel Buisan et al.	Spain
In laboratory and in field metrological study of an AWS	Mr Javier Garcia Skabar et al.	Argentina
Double scattering non-catchment IR precipitation sensor "Ray" for road de-icing operation	Dr Arkady Koldaev et al.	Russian Federation
Comparison of Carbon Dioxide Emissions Calculated by Different Methods for Determining the Biomass Content in a Waste Incinerator	Mr Seung Hyun Jung et al.	Republic of Korea
Investigation of recharge mechanisms in the South Phuthiatsana catchment using oxygen and hydrogen isotopes	Mr Thabang Phori et al.	Lesotho
End-to-end weather radar calibration and monitoring	Dr Marc Schneebeli et al.	Switzerland
The wind induced bias of the 2D Video Disdrometer	Dr Enrico Chinchella et al.	Italy
Time Constant of a Newly Released Air Temperature Sensor and its Implications	Dr Dirk V.Baker et al.	United States of America
SSPA-X and Klystron Weather radar Operational and Observational performance Comparison overview through case studies	Mr Arul Malar Kannan Bagavath Singh et al.	India
Towards wider usage of radiosonde descent data	Mr Bruce Ingleby	United Kingdom
Effects of environmental conditions on the CIMO WMO Class determination for OTT HydroMet precipitation sensors	Dr Johanna Spiegel-Pinzer	Germany
An intercomparison of precipitation sensors to evaluate the uncertainty in precipitation type determination in Oslo	Mr Renaud Gaban et al.	Norway
Field trials of trace-gas analyzers designed for eddy covariance flux measurements of methane (CH ₄) and nitrous oxide (N ₂ O)	Mr Scott Cornelsen et al.	United States of America

TOPIC 4: TRACEABILITY OF MEASUREMENTS TO RECOGNIZED STANDARDS

Title	Author(s)	Country
Calculation of The Correction Factor of Test Point Effect in Wind Tunnel Calibration	Dr Zafer Turgay Dag et al.	Türkiye
GSRN Pilot - Understanding uncertainties, developing data products and implementing a global surface reference network	Dr Tilman Holfelder et al.	Germany
A global scientific effort to improve atmospheric air temperature measurements.	Dr Andrea Merlone et al.	Italy
Laboratory calibration of disdrometers using a precision raindrop generator	Dr Enrico Chinchella et al.	Italy
Enhancing Calibration Capacity in Compact Relative Humidity Calibrators	Dr Adam Krovina et al.	Slovakia
Details of temperature measurement in the operational UK network	Mr Mike Molyneux	United Kingdom
SI-Traceable Indoor Calibration of Pyranometers by Comparison with a Reference Solar Cell	Dr Jae-Keun Yoo et al.	Republic of Korea
Evaluating the environmental effect on air temperature measurements from ground-based stations	Ms Natali Giselle Aranda et al.	Argentina
Arctic Metrology: case study for air temperature measurements at Ny-Ålesund, Svalbard	Dr Graziano Coppa et al.	Italy
Adoption and implementation of ISO 17025 in Geolux hydrological laboratory	Dr Sanja Grubesa et al.	Croatia
Impact of the dust and sandstorm on the Global Surface Radiation	Dr Ayman Badawy	Egypt
Comparing measurements obtained with two KNMI precipitation gauge set-ups to a field reference designed according to the ISO/EN 13798:2010 standard	Mr Michael Quinlan	Netherlands
Towards a next generation meteorological observing network for the Netherlands: first experiences from a managed change perspective	Mr Marijn de Haij et al.	Netherlands
Participation of RIC Casablanca in ILC of pyranometers and pyrhemometers organized by "the European ESTI laboratory of the Joint Research Center (JRC)"	Mr Mounir AZIZ	Morocco
Presentation of the new calibration procedure according to ISO9847:2023 for pyranometers according to the two indoor and outdoor calibration operating modes traceable through absolute cavity radiometer	Mr Mounir AZIZ	Morocco
Standard development: ISO WD 28902-2023: Part 4: Particle backscatter lidar	Mr Holger Wille et al.	Germany

TOPIC 4: TRACEABILITY OF MEASUREMENTS TO RECOGNIZED STANDARDS

Title	Author(s)	Country
Fundamental and Practical Aspects of Humidity Measurement: Real-world Calibration Techniques for Challenging Environments.	Dr Jeremy Wingate	United Kingdom
New design Wind direction sensor calibration advantages	Mr Salih Çakıl	Türkiye
Optimizing Meteorological Automatic Station Locations for Enhanced Weather Monitoring and Disaster Preparedness: A Multi-Criteria Decision-Making Approach	Mr Adnan Tahir Ozyesil	Türkiye

TOPIC 5: QUALITY ASSURANCE AND MAINTENANCE OF THE OBSERVING SYSTEMS

Title	Author(s)	Country
Development of meteorological measurement standards: An introduction to the VDI-Standards	Dr Ge Cheng et al.	Germany
Sustaining a global observing network – the International Monitoring System perspective	Dr Lucie Pautet et al.	France
Introduction of Regional WIGOS Center (RWC) Tokyo Initiatives	Mr Satoshi Kimura et al.	Japan
What peculiar situations can we find on the Basque coast?	Ms June Madariaga Navarro et al.	Spain
Installation, Maintenance and Quality Control Procedures of the Network of Automatic Meteorological Stations.	Ms Martha Eugenia Pereira Molina et al.	Costa Rica
Use of machine learning methods for quality control and data restoration of metocean data	Dr Jose Araya	Costa Rica
Multiobjective Budget Allocation for Quality Assurance and Maintenance of Meteorological Observing Systems	Dr Kizito Mubiru et al.	Uganda
Rehabilitation of Environmental Conditions of Observing Stations for Improving The Availability and Quality of the Observations	Mr Mustafa Atılan et al.	Türkiye
Quality of meteorological data and its impact on weather forecasts	Mr Jaber Al-Moghawish	Syria
The use of the Theodolite HD mobile application, orthophoto images and a digital relief model for the purpose of classifying the locations of meteorological stations for selected meteorological elements	Mr Karol Seják	Slovakia
Implementation of Spare Part Analysis Using Reliability, Maintainability, and Availability (RAM) Metrics for Automated Weather Observing System Spare Parts Procurement in Indonesia	Mr Sugiarto Sugiarto et al.	Indonesia

TOPIC 5: QUALITY ASSURANCE AND MAINTENANCE OF THE OBSERVING SYSTEMS

Title	Author(s)	Country
Calibrating Complex Physical Hydraulic Models: Lessons from the Dirout Group of Regulators (DGR), Egypt.	Dr Mohamed Mohamed Abdellatif	Egypt
Meteorological measurement standards: Overview of ISO/TC 146/SC 5 "Meteorology" Scope and Activity	Dr Ge Cheng et al.	Germany
Challenges and Best Practices in Spare Parts and Consumables Management (A Case Study of Zimbabwe Meteorology Services Department)	Mr Travolta Anesu Zibani	Zimbabwe
Automatic siting class of weather stations to assess the effects of heat sources and shadows in Norway	Dr Pierre-Marie Lefeuvre et al.	Norway
Lidar Quality Assurance System	Dr Zhichao Bu et al.	China
Infrastructure of the National Meteorological Service of Argentina for measuring atmospheric aerosols	Ms Giselle Marincovich et al.	Argentina
KMA/NIMS Atmospheric Research Aircraft (NARA) observation system operation status and activities	Mr Sueng-Pil Jung et al.	Republic of Korea
Automatic quality control of observational data at MET Norway	Dr Amélie Neuville et al.	Norway
Site Selection For Observing Stations For Operational Sustainability	Mr İsmail Temir et al.	Türkiye
Measurement validation in Automatic Weather Station	Mr Jorma Islander	Finland
Quality Assurance and Maintenance of the Observing Systems	Mr Jusu Momoh Luseni	Sierra Leone
Good quality assurance and maintenance AWS database	Mr Abubakarr Jalloh	Sierra Leone
The IoT technology for Moscow area early warning meteorological hazard system.	Dr Arkady Koldaev et al.	Russian Federation
Case study: Transition from conventional to automatic meteorological observing networks in Senegal; challenges and solutions	Mr Sadibou Ba et al.	Senegal
Case Study on East Asian Summer Dust Observations Based on the Ground-based Meteorological Lidar Network	Dr Xuan Wang et al.	China
TAF Accrual Program Introduction and Working Stages	Mr Ahmet Koca	Türkiye

TOPIC 6: CAPACITY DEVELOPMENT FOR SUSTAINABLE AND QUALITY MEASUREMENTS		
Title	Author(s)	Country
The benefits of a standardised technical specification for Automatic Weather Station design and installation	Mr David Hiscock	United Kingdom
Advancing Hydrometeorological Monitoring in Canada through Collaborations	Mr Andrew Nadler	Canada
Optimizing Placement of Weather Stations	Ms Jemimmah Awino	Kenya
The importance of data, tools, and models in delivering sustainable water resources management, protection, development, and utilisation in Lesotho	Ms Ts'epang Seotla et al.	Lesotho
Commissioning of Ten Numbers of X-Band SSPA Based Doppler Weather Radars in Himalayan Region of India	Ms Arpita Rastogi et al.	India
SINARAME, A brief review of the development history of the Argentinian Weather Radar network	Mr Federico Pablo Renolfi et al.	Argentina
The Key Role of Meteorology in Developing The Economy	Mr Zakaria Alessa	Syria
Ground-based remote sensing of atmosphere training course in the Latin America	Dr Elian Wolfram et al.	Argentina
Analytic Platform Development for Design of Cloud Seeding	Mr JungHoon Lee et al.	Republic of Korea
Modernization of the INM weather rain gauge network in view of the migration from classic to automatic instruments	Ms Saoussen Cheriaa	Tunisia
Capacity Building Challenge in A Fast Climate & Technology Changing Environment For Developing Countries	Ms Esther Nakiwala Kigongo	Uganda
Weather Radar: Opportunity and Challenges in Nepal	Mr Sanjib Adhikari et al.	Nepal
Presentation of the Guinea's Meteorological Observation Network	Mr Souwala Dore	Guinée
The possibility to determine the object for visibility observation	Dr Amgalan Ganbat et al.	Mongolia
Analytical vision for meteorological monitoring	Mr Feras Natouf	Syria
The appraisal of solar panel efficiency and measurement and control of factors impacting efficiency	Mr Taha Yasin Çakıl et al.	Türkiye
The Argentine Marine Observation Network	Dr Gustavo Ferreyra et al.	Argentina
Towards a single global standard for polar weather radar data representation with FM301 – CfRadial2	Mr Mark Curtis et al.	Australia
"Challenges in weather forecasting due to complex terrain and data scarcity in Nepal"	Mr Chiranjibi Bhetuwal et al.	Nepal

TOPIC 6: CAPACITY DEVELOPMENT FOR SUSTAINABLE AND QUALITY MEASUREMENTS		
Title	Author(s)	Country
Of the necessity to reintroduce weather radars in African countries	Dr Cheikh Abdoulahat Diop	Senegal
Environmental Instrument and Methods of Observation	Ms Setsoafia Elikem et al.	Ghana
Dynamics of the transport of materials in the Congo River basin to the Atlantic Ocean	Dr Jean Bienvenu Dinga et al.	Congo
Assessment of triple system for coastal sustainability	Dr Ayman El-Gamal	Egypt
Artificial Intelligence for Disaster Risk Reduction in Eastern Africa. Case of Rwanda	Mr Dominique Mvunabandi	Rwanda
influences of in situ and international downloaded precipitation data in the realization of a hydrological model: "the case of the transboundary Congo River basin"	Mr Koshi Gimeya Géorges et al.	Democratic Republic of the Congo
Enhancement of Meteorological Observation Capabilities in Myanmar	Mr Wai Toe Aung	Myanmar

Public messages compilation

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To avoid:

From Ramon; 30 May 2018.

Could you please avoid using Awhitu (**NZAWW**) and Manukau Heads (MKW) when discussing wind in Auckland with outside agencies; such as TV, radio and newspapers. The request came from my recent meeting with Auckland Council where we discussed the wind event from early April. The high gusts speeds recorded in this very exposed site caused unexpected consequences; not least with media and those that like a [big and exciting story](#) (213km/h and a CAT2 cyclone). Internal use is fine, remembering that it is very exposed and not representative of most (any?) parts of Auckland.

Otago radar

- Many of you will know that MetService currently operates nine rain radar stations across the country, and has been discussing the establishment of an additional site in Otago, for some time.
- Unfortunately, this project has been delayed because the land identified as our preferred location, has been sold. The choice of location is not one to be made lightly and we believe that we are still better to continue negotiations with the new land-owner to secure this preferred site, rather than commit to the work of identifying and securing a different site.
- While we cannot disclose the location of the preferred site while we undertake negotiations, it is approximately 40km south west of Dunedin.
- This means that we will not be able to use the summer/autumn 2019 window for construction of the radar, as originally planned. We estimate that the radar will now be commissioned around May 2020.

Used for Public meeting 18 Nov, 2018

Regarding Open Access

- MetService welcomed the Government's recent conclusion to its review of open access weather data policy settings and its findings that "most data reuse principles are being met by MetService." [MBIE statement <https://www.mbie.govt.nz/info-services/science-innovation/research-and-data/open-access-to-weather-data>]
- We are however, making further changes to increase accessibility and reusability of observational weather data. For example we are developing an API that will make a wider range of data publicly available, specifically aimed at supporting the development of innovative weather products.

- We are also releasing a refreshed website with improved data support which will be rolled out in 2019; providing a new e-commerce capability that will support self-service access to data; and we are now able to provide open oceanographic data through APIs developed by MetOcean, up to a defined usage.

(Ramon, Norm and Peter L on 6 November in response to NBR questions)

Who is MetService (verses NIWA?)

- MetService was established as a State-owned Enterprise in 1992 and as such, is expected to operate as a commercially successful business. It provides weather forecasts for up to 10 days as well as a seasonal outlook, and is New Zealand's official provider of the severe weather warning system that alerts emergency management and the public of the potential threat from severe weather events. Its commercial operations see it delivering meteorological and oceanographic products and services globally under the MetraWeather and MetOcean brands to clients in the aviation, marine, media, energy, transport and retail sectors.
- MetService and NIWA work collaboratively in a number of areas, where we can, and where appropriate. Particularly in climatology, hydrology, atmospheric and ocean research, weather and climate data collection, and the representation of New Zealand at the UN World Meteorological Organization (WMO). The CEOs of both organisations meet regularly to discuss WMO matters.

NIWA operating in weather forecasting space

(Written as if Minister Jones was responding – provided to Treasury from Team/Norm/Peter K to questions they had had from Paul Gorman July 2019)

(Answers in blue what Treasury actually used)

Overall comments

MetService is New Zealand's designated National Meteorological Service with the World Meteorological Organisation. It is the only authorised provider and "single authoritative voice" for warnings and other public safety weather services to the people of New Zealand.

MetService is the only agency in New Zealand that has the depth of expertise in meteorology and the mandate to deliver this service. It is the only organisation in New Zealand that has enough properly trained meteorologists to provide an effective severe weather forecasting and warning service.

The World Meteorological Organisation expects that each of its 193 member countries and territories will be very clear on which of its agencies is the “single authoritative voice” for severe weather, to avoid confusion. For New Zealand, MetService is that agency.

MetService takes into consideration information gathered by weather and climate agencies around the world, including NIWA.

It is important that we ensure New Zealanders get authoritative information about severe weather without any confusion about the source or quality of that information. That will allow people to make sensible, well-informed, decisions about the risks of severe weather.

Are you comfortable with Niwa presenting publicly on a potentially severe weather event?

I would not be comfortable with NIWA publicly saying anything that undermines MetService’s message regarding severe weather.

MetService is New Zealand’s only authorized provider and the only authoritative source of warnings and other public safety weather services to the people of New Zealand.

New Zealand has had a National Meteorological Service since 1861. MetService is the latest form that has taken; it exists to, amongst other things, meet the needs of New Zealanders and the New Zealand Government for forecasts and warnings of severe weather events.

MetService is the only agency in New Zealand that has the depth of expertise in meteorology and the mandate to deliver this service. It operates 24/7 national infrastructure devoted to weather forecasts and warnings, and has done so for many decades.

I appreciate that NIWA has developed capability in weather modelling. However, there is far more to weather forecasting than models.

For severe weather events it is essential that we avoid confusion amongst the public and emergency managers by having conflicting information coming from different agencies.

I would expect that in relation to potential severe weather events, any public commentary by NIWA would be to reinforce the warnings, forecasts and other messaging coming from MetService. For the public good, NIWA’s efforts need to be complementary to MetService’s.

NIWA is not part of my responsibilities as the Associate Minister for State Owned Enterprises.

2. How does this marry up with MetService's role as the single disseminator of severe weather warnings and watches, under its contract with the Minister of

Transport?

The Meteorological Services Act requires the Minister of Transport to, and I quote, "...ensure the provision of the meteorological warning service". The Minister does this through a contract with MetService, which has existed since MetService was formed as an SOE in 1992.

Page 194 of The Estimates of Appropriations for the Government of New Zealand for the Year Ending 30 June 2020, Economic Development and Infrastructure Sector (Vote Transport), states that the intention of the appropriation for Weather Forecasts and Warnings is, and I quote, "... intended to achieve the procurement of weather services to minimise risk to life and property through public weather forecasts and emergency support."

The World Meteorological Organisation expects that each of its 193 member countries and territories will be very clear on which of its agencies is the "single authoritative voice" for severe weather, to avoid confusion. For New Zealand, MetService is that agency.

MetService is contracted by the Minister of Transport to provide the core functions of New Zealand's National Meteorological Service and fulfils the Minister's obligations as set out in the Meteorological Services Act 1990. No other weather forecasting agency in NZ currently has the infrastructure or capability to service these obligations at the standard required. The World Meteorological Organisation requires each nation to have just one authoritative voice for a minimum standard of public safety weather forecasting which the Minister of Transport has delegated to MetService.

However, the contract between MetService and Ministry of Transport do not restrict other entities to provide public weather forecasting. Weather forecasting is not a regulated monopoly in New Zealand.

Do you think this may confuse the public as to who they should listen to?

When people are making decisions about how the weather affects the safety of life and property, contradictory information – in the form of different messages from two Government agencies – is the last thing they need. The accepted international standard is that one agency per country, with a Government-mandated duty of care, issues all Watches and Warnings of severe weather.

Weather forecasting is not a regulated monopoly in New Zealand. The public are free to choose which weather forecast they should follow, however, MetService is the authoritative voice of weather forecasting in New Zealand, as it is delegated by the Minister of Transport.

What do you think this does to MetService's mana in this area?

I'm not concerned about MetService's mana.

Its website, metservice.com, is one of the most popular in New Zealand, despite there being many other sources of weather information, and it rates highly in surveys of public trust in public-service organisations.

What is most important here is that we ensure New Zealanders get authoritative information about severe weather without any confusion about the source or quality of that information. That will allow people to make sensible, well-informed, decisions about the risks of severe weather.

I do not have any comments.

Would you consider stepping in to clarify this increasingly muddied situation? At what point would you consider it necessary?

If I felt that MetService's ability to best serve the public interest was being compromised by NIWA's actions, then Megan Woods and I would step in and sort it out.

I do not believe intervention is required at this stage. MetService and NIWA have different roles.

MetService is a profit-orientated State Owned Enterprise and holds a commercial contract with the Ministry of Transport for public safety weather forecasting. NIWA is a Crown Research Institute (CRI) established to undertake scientific research and related activities in accordance with the Crown Research Institutes Act 1992. The two companies collaborate in some areas and compete in a few others and have both a long-standing relationship and understanding of this between each other.

Radar/Technology will be out

Letting you know that our xxx radar is undergoing regular maintenance, and a transmitter and service upgrade this week. It will be off-line for between 3-4 days from xxx. During this time, on our website we will display a composite image of nearby radars, but accuracy will be reduced for the xxx area. Please use caution and refer to MetService forecasts and observations for rain information.

Why now?

You're right, it's never ideal when maintenance coincides with severe weather.

In this case the maintenance to the Canterbury radar involves external contractors, heavy equipment and cranes, and needs to be planned well in advance and cannot be postponed. This maintenance constitutes an important upgrade that will ultimately lead to an improved service in the long run.

Don't forget that there will still be some radar coverage from other radars in a composite image but it will have reduced accuracy.

Category six cyclones

MetService manager of specialist weather services, Chris Noble, said the question of adding a sixth category was an interesting one, and a factor that had to be considered was that of the response to a cyclone.

"That's really what the category system is designed to address, is to communicate how severe the system is and then linking to that, what should the response by the public or the emergency managers be, and once you get to category 5, I think it becomes a little bit academic whether it's a 5 or a 6.

"So, we might like to give it a different label but really, the question to ask is 'would that change the response or does it need to change the response?'

"So really as long as we are getting the response and people are heeding the warnings, that's the really important thing."

Source: Stuff article Feb 2018

<https://www.stuff.co.nz/environment/climate-news/101666312/new-category-6-added-to-cyclone-classifications-due-to-climate-change>

Weather stations, numerical forecasts and the role of the meteorologist.

Sent: 21 May 2018 to the Marlborough Express. Input from Peter K, Kevin A and Lisa M

Is the number of weather stations being built in New Zealand in decline?

Our network of NZ surface weather stations continues to expand, with the most recent sites deployed (Porirua, Lewis Pass, Kurow, Burkes Pass, Crown Range) being the result of consultation with the transport sector and local councils.

How is numerical weather prediction different to weather predictions made from weather station data?

Weather stations are taking observations – recording weather data in real time – rather than forecasting what might happen in future. Many types of weather observations, not just those from surface weather stations, are shared internationally by National Meteorological Services. These observations are used as input by numerical weather prediction models. The outputs of those models are, in turn, shared internationally.

Is numerical weather prediction the future of weather prediction?

Numerical weather prediction has revolutionised weather forecasting. It has improved as the volume and type of weather observations has increased, our understanding of the atmosphere have been refined and computing power has increased.

Today's meteorologist needs to make sense of large amounts of information, reconcile it with observations, deliver critical forecasts, and communicate the information along with any uncertainty that exists, to the community. Things are even more challenging in New Zealand because of its location in the middle of the ocean and its extreme topography. This demands a high level of expertise from our meteorologists.

Mobile sensing technologies

It's no secret that over the past nine years such technology has advanced significantly, become cheaper to access and as such, is being used more widely.

Mobile devices are now equipped with a number of environmental sensors – air pressure, battery temperature, lux levels - usually to improve performance of the battery, camera, or in the case of air pressure to improve GPS / navigation performance.

However, the industry is still a long way off from utilising these data in a coherent manner for environmental purposes. Their value is heavily dependent on the context in which they are operating, whether they have been set up correctly and whether the data can be calibrated.

In respect to conservation, the patchy nature of mobile coverage in New Zealand's rural areas would also likely impact on environmental observation – with coverage potentially lacking where it is needed most. But this is where the Internet of Things (IOT) may be useful, with low cost - low bandwidth communication services now on offer from various telcos.

Source: Kevin Alder June 2018 in response to a question from Uni

NIWA Super Computer

Ramon 15 August 2018

MetService and NIWA are working collaboratively in this space. We have access to NIWA's 1.5km NZCSM (New Zealand Convective Scheme Model) which we are able to consider alongside the outputs from our own inhouse high resolution models. Essentially, it gives us another source of information that our meteorologists can use alongside our existing information, to produce warnings and watches."

When we miss a localised downpour

Approved for use re Tologa Bay incident August 15 - Ramon and Chris Nobel

“As noted in the report, the 3-4 June event was relatively small and incredibly localised. None of the global or inhouse high resolution weather models used when forecasting rainfall, gave any indication of the significance of this event which is why only watches and not warnings were issued. Whilst it is rare for an event like this to go undetected by the models, with New Zealand’s difficult terrain it can, and does, unfortunately happen.

Lightning detection

Peter Fisher 17 August 2018

- The NZ Lightning Detection Network became operational in September 2000
- It is owned by Transpower but was installed and is maintained by MetService
- It comprises of 10 sensors that use time of arrival, magnetic direction finding and GPS time stamping algorithms to determine accurate ‘cloud to cloud’ and ‘cloud to ground’ lightning location data
- The number of lightning strikes in NZ varies from month to month and correlates directly to weather patterns. If the weather is settled and anticyclones predominate, we receive fewer lightning events.
- During some months, we may detect less than 2,000 strikes, while in others we could detect over 30,000 over New Zealand and surrounding waters.
- Good sensor siting is critical – in New Zealand the mean distance between sensors is 285km giving a location accuracy of 500m and a detection efficiency of more than 90% for an average lightning strike.

We also have a blog on our website about a particularly busy lightning month in January 2010

<https://blog.metservice.com/node/900>

Climate Change

Annual report 2018

- As the climate changes, the number of intense rainfall events is expected to increase over most of the country. Our 24-7 forecast operations that cover aviation, marine, severe weather and media means there is always an expert meteorologist available to make weather meaningful.
- As the impact of the warming atmosphere and ocean is felt through weather events which are expected to be increasingly severe, MetService must continue to advance its world-class meteorological and oceanographic services to keep people safe and prosperous.
- With an expected increase in the extreme nature of some weather events affecting New Zealand, the importance of our work has never been more relevant.

In addition – this document was created but has never been approved by anyone – a starting point at least.



5G Frequencies

As New Zealand's National Meteorological Service and single authoritative source for weather warnings, MetService uses information from global weather models. We share the concerns expressed by scientists at major global weather modelling centres and support all efforts to protect the parts of the radio frequency spectrum used for meteorological remote sensing.

New Zealand, represented by MetService, is a Member of the World Meteorological Organization (WMO). WMO has expressed, to the International Telecommunications Union (the international coordinating body for the use of the radio spectrum), its concern that the use of frequencies for 5G poses a potential high risk on the future operation of all Earth observation satellites in this band.

MetService participates in information sharing and discussion groups hosted by the MBIE's Radio Spectrum Management, through the Radio Sector Group. Currently, it is unlikely that the deployment of 5G in New Zealand will have significant impact on the quality of the data being gathered by weather satellites over the New Zealand area.

Also see our responses to Science Media Centre Q+A with experts re impacts of 5G

<https://www.sciencemediacentre.co.nz/2019/07/10/5g-hype-vs-reality-expert-qa/>

Satellites

MetService receives data / imagery from a number of different weather satellite operators to reduce the potential for a loss of imagery/data. There are other operational earth observation satellites, but the ones listed below are the primary ones we use.

Geostationary Satellites ([definition](#))

Geostationary satellites provide very high-quality imagery at 10 or 15 minute intervals over a full hemisphere of the earth, making them highly valuable for tracking weather systems that affect New Zealand's weather.

1. Japan Meteorological Agency (JMA)

- a. JMA operates one weather satellite positioned in geostationary orbit over Papua New Guinea. It provides coverage of the Asia Pacific hemisphere.

- b. The Japan Meteorological Agency's (JMA) Himawari-8 satellite is our primary source of imagery for the NZ and western South Pacific Region. This satellite commenced **service in July 2015, and has an operational (meteorological) life of 8 years.**
- c. JMA have a backup satellite, Himawari-9, already in orbit on stand-by. Its intended operational life runs from 2022 through to 2030 and is intended to replace Himawari-8 at the end of its operational life.

2. NOAA (USA)

- a. NOAA also has one geostationary satellite that provide imagery /data across New Zealand and the western South Pacific region.
- b. GOES-15 is a similar to the JMA satellites, but is positioned over the eastern Pacific, providing imagery across the Pacific hemisphere from Asia/Australia to the Americas. We receive imagery from this satellite.
- c. NOAA launched a replacement to GOES-15 last year – a new satellite called GOES-17, which will become NOAA's primary operational satellite for the Pacific hemisphere in July 2019.
- d. We are in the process of preparing for the acquisition of satellite imagery from GOES-17.
- e. NOAA has two further satellites in the GOES programme planned, effectively extending their programme to 2036.

- 3. China and South Korea also operate geostationary weather satellites, but their coverage of New Zealand is very limited so we do not use them.

Polar Orbiting Satellites ([definition](#)).

Polar orbiting environmental satellites deliver far more precise details about atmospheric temperature and moisture profiles than geostationary satellites. They also provide very high-quality imagery, but less frequently than a geostationary satellite. Polar orbiting satellites circle the earth every 90 minutes and pass over New Zealand between 4-6 times a day.

1. NOAA (USA)

- a. NOAA operates three polar orbiting environmental satellites.
- b. MetService receives data from these satellites via a satellite tracking antenna on our Kelburn premises.
- c. The three satellites are of varying ages and therefore provide redundancy should sensors on one particular spacecraft fail.
- d. Three more satellites are planned for launch between 2022 and 2031.

2. EUMETSAT (European Union)

- a. EUMETSAT also operates their own series of three polar orbiting satellites that pass over New Zealand.
- b. MetService receives imagery from these satellites via the same tracking system used for the NOAA polar orbiting satellites.
- c. These EU satellites are also of varying ages and therefore provide additional redundancy against any individual failure.
- d. The EU also has a long-term plan to sustain these observation programmes, with six more polar orbiting environmental satellites planned for delivery from 2022.

3. China and Russia also operate polar orbiting environmental satellites, but we have no need to collect data from these satellites.

Are there any gaps in the satellite network?

There are currently no gaps in our region. Satellites have a design life, and they are retired from service at the end of that life. Complete failures are extremely rare, but each satellite operator plans for such events by having redundant spacecraft available, as indicated above.

The role of MetService (Sept 2, 2019)

The mandate of MetService, as a State-Owned Enterprise (SOE), is to operate as effectively and profitably as any other business not owned by the Crown.

MetService is contracted by the Minister of Transport to provide the core functions of New Zealand's National Meteorological Service and fulfils the Minister's obligations as set out in the Meteorological Services Act 1990. No other weather forecasting agency in New Zealand currently has the infrastructure or capability to service these obligations at the standard required. MetService is New Zealand's official provider of the severe weather warning system that alerts emergency management and the public of the potential threat from severe weather events.

The World Meteorological Organization (WMO), which MetService Chief Executive Peter Lennox is New Zealand's permanent representative of, expects that each of its 193 member countries and territories will be very clear on which of its agencies is the "single authoritative voice" for severe weather, to avoid confusion. For New Zealand, MetService is that agency.

As an SOE, as well as the core purpose of protecting lives and property, there is the requirement for MetService scientists to commercialise their expertise – making money nationally and internationally to help support MetService operations and reduce the cost of weather services to the tax payer, while also delivering export earnings for New Zealand. MetService continues to achieve this, having generated in excess of \$61 million in the 2018/19 financial year.

MetService and competition

Competition is an essential aspect of operating as effectively and profitably as possible. MetService is not opposed to weather forecasting by individuals or companies, but when it comes to public safety it is critical that the New Zealand public have one trusted authoritative voice to whom they rely on for credible science-led information on the weather. MetService is New Zealand's official provider of severe weather outlooks, watches and warnings, issuing severe weather warnings for over 50 different weather events in the 2018/19 financial year.

Numerical Weather Models

While advances in observing systems and computer modelling will continue to deliver increasingly accurate and detailed information, forecasting will continue to rely on the judgement and interpretation of skilled meteorologists to communicate client specific uncertainty and impacts.

Even with recent advances, today's weather models still contain errors when estimating the current state of the atmosphere. These errors grow larger and larger over time, and the weather forecast skill of the models deteriorates. Since we don't know the size of the error that a single model has when it tries to capture the current weather (does it have the Low central pressure too high? Too low? Is the Low located too far north? Too far south?), MetService uses a multi-model approach to help understand how these errors may change the forecast.

MetService receives Numerical Weather Prediction (NWP) output from multiple global models including:

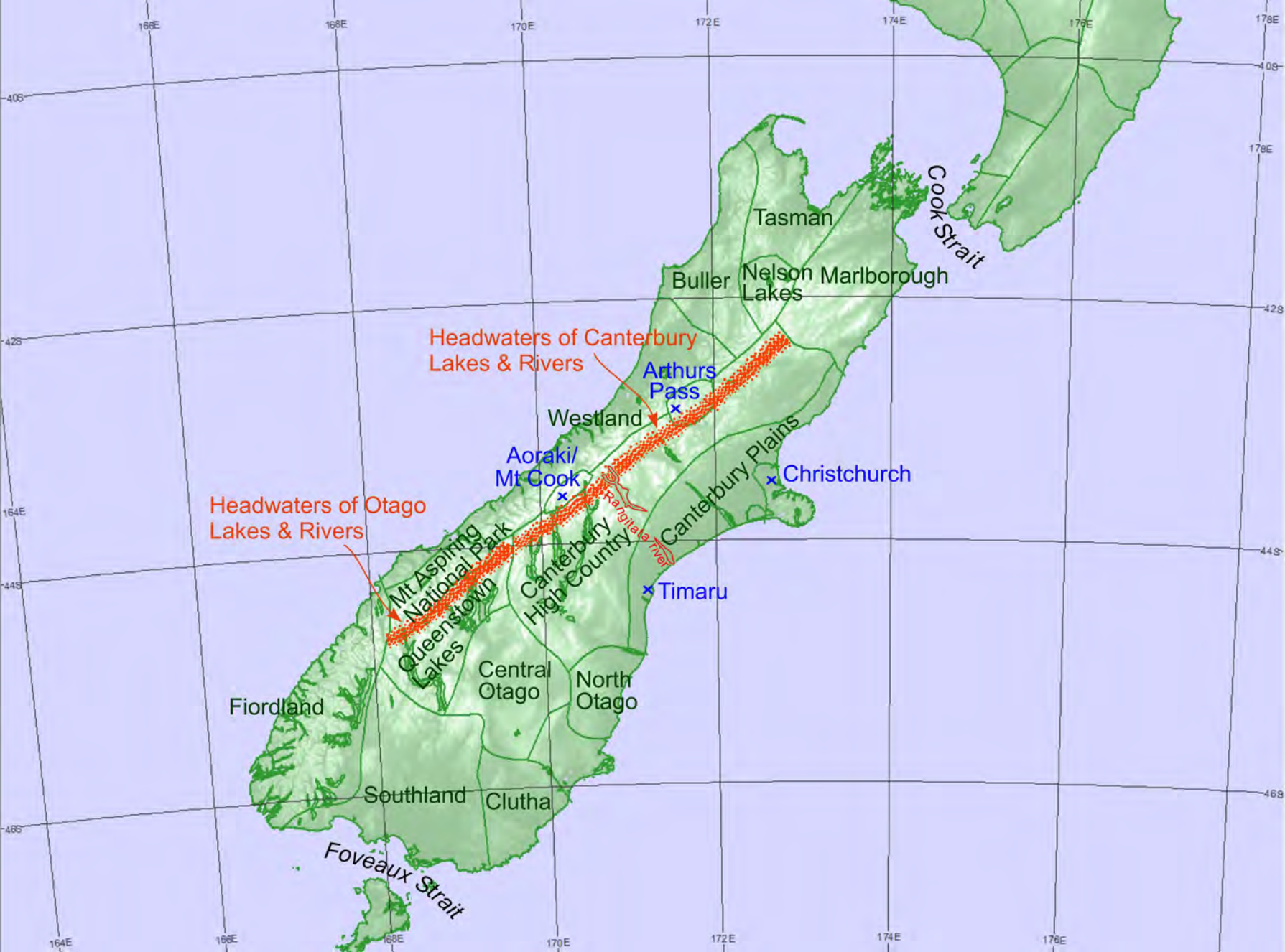
- United Kingdom Met Office (UKMO) model (UM – Unified Model) twice daily
- US National Centers for Environmental Prediction (NCEP) model (GFS - Global Forecast System) four times daily
- European Centre for Medium Range Weather Forecasts (ECMWF) model (IFS - Integrated Forecasting System) twice daily
- Japan Meteorological Agency (JMA) model four times a day.
- Australian Bureau of Meteorology (BoM) global model (ACCESS-G - Australian Community Climate and Earth-System Simulator) four times a day - (limited use).
- Canada Meteorological Centre (CMC) model (GEM – Global Environmental Multiscale Model) four times daily

MetService aggregate global models daily to help determine the forecast for the days ahead, and the forecasting team meet daily to determine what model will be used for computer generated forecasts. In many instances a multi-model approach will be used as the best answer to what the weather is forecast to be (a combination of different models). To further leverage the skill of multiple models and the most recent observations, MetService apply corrections and statistical adjustments to the raw model data to improve the quality of each models forecast.

In addition to global models, MetService also runs multiple local area models over New Zealand. Each day, meteorologists chose the global model that is doing the best job of forecasting the weather for today, but we also have our own higher-resolution models running inside, or “nested” within, global models to ensure we get a more detailed picture of the weather over New Zealand. But unlike many other weather companies, MetService uses models only as a starting point - our meteorologists then add a lot of judgement and expertise on top of that information in order to arrive at the final forecast or warning. The very latest observations from rain-radar, satellites and weather stations are compared to and combined with the output from multiple global and local area models at the start of the forecast process which operates 24-7 with multiple meteorologists

always working in the National Forecast Centre at any one time, either in our Wellington or Auckland forecast rooms.

MetService also invests in the improvement of models and has a team of nine scientists in its Forecasting Research group who are focused on the development of Numerical Weather Prediction models and statistical forecasting techniques over New Zealand. Numerical models play a key role in modern forecasting, providing essential guidance to forecasters and, in some cases, directly meeting the forecast requirements of end users. Models describe the weather mathematically, using computers to solve the equations that describe how the atmosphere will evolve over time. Global models cover the entire globe and are generally developed and run at large agencies such as the US National Weather Service or the UK Met Office, due to the high cost of personnel and computing equipment required to run them. Through international agreements, MetService is able to leverage that global data to run higher-resolution models specifically tuned for New Zealand to ensure the best possible information is available to our meteorologists to produce the best possible forecasts and warnings.



Headwaters of Canterbury
Lakes & Rivers

Headwaters of Otago
Lakes & Rivers

Arthur's
Pass

Aoraki/
Mt Cook

Christchurch

Timaru

Tasman

Buller

Nelson
Lakes

Marlborough

Cook Strait

Westland

Canterbury
Plains

Canterbury
High Country

Mt Aspiring
National Park
Queenstown
Lakes

Central
Otago

North
Otago

Fiordland

Southland

Clutha

Foveaux Strait

Rangitata
river

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Forecasting and Meteorology FAQs

MetService Forecasting & Weather terms

Q: Mixed messages from multiple forecasters

Sent: 16 April 2018 to the Herald. Input from Peter K, Angus, Ramon and approved Peter L.

As New Zealand’s National Meteorological Service, MetService is the only government agency with a legal mandate to issue severe weather watches and warnings. This is endorsed by the United Nation’s World Meteorology Organisation. In the lead-up to, and during, severe weather events, we work closely with key agencies, for example, The Ministry of Civil Defence and Emergency Management, NZTA and Councils.

The severe weather last week was well anticipated by MetService. We issued warnings and forecast information about it via our website, social media, and directly to key stakeholders with plenty of lead time. However, it appears some people were caught off-guard.

We urge everyone to use MetService official channels when seeking information related to weather events in order to eliminate any potential confusion that can come from mixed messages.

Q: Why is the written forecast different to the graph?

The written forecast is produced by one of the team of meteorologists on the forecast bench. The forecaster brings together information from several different computer models, as well as observations from radars, satellites and weather stations, and combines these with their experience and knowledge of the weather situation to produce the forecast.

The graphical forecast is taken from one of the computer models that the forecaster has used for guidance. Each day the model that is handling the weather situation the best, is selected to be displayed on the website. Unfortunately, the model may not be handling the situation well for every place in the country and so sometimes discrepancies can occur.

We include both types as different people prefer different formats for their forecasts.

Q: Why is my centre not on the weather map?

Sent May 2018 Approval Ramon

The places on the map on our website are where MetService meteorologists write specific forecasts for under the Towns and Cities tab, while the larger region is covered by the Rural forecasts tab.

We need to consider the legibility of the map with its list of names and icons. We are however in the process of redesigning the website and in future aim to adopt a geographical overview of weather conditions, rather than a list of locations and forecasts.

As there is no weather station in Picton we are unable to deliver a Picton-specific forecast. (Note: The decision to install a new weather stations is one that would typically be led by the local council, in partnership with the MetService.

Q: Long-range forecasting

If weather models could capture the current weather perfectly then, in theory, they could forecast the future weather accurately well beyond the present limit of a week or so. After all, the atmosphere is a fluid, and follows strict laws of physics.

So why is this not the case? Senior meteorologist Georgina Griffiths has written a blog about using the long range forecast that will help you understand it!

Check out the blog here: <http://blog.metservice.com/understanding-the-long-range-forecast>

Q: What is the longest range forecast MetService produces?

The longest range forecast we provide is our Monthly Outlook. This will tell you whether to expect warmer than usual weather in the coming month, or cooler than usual, wetter or drier. It also details what the main mechanisms are driving our weather over the past month, and the outlook for the next month.

You can read the Monthly Outlook here: <http://www.metservice.com/rural/monthly-outlook>

It is updated at the start of each month, with a summary of the weather over the past month, and details of what is expected over the next month. You can also sign up to get it emailed directly to your inbox, if it is something you think you might be interested in reading regularly.

Q: MetService forecast rain and it's not raining

When we forecast 'showers', it also pays to bear in mind that showers are often short-lived and won't fall everywhere over a wide area (see our Weather Terms blog for more helpful info here: <http://blog.metservice.com/weather-terms>).

Q: What is considered severe, heavy, moderate & light rainfall?

To help give you some context, you can check out the key underneath our hourly graph on the Towns & Cities pages. This shows 'Light' is 0.1-2mm/h 'Moderate' is 2.1-6mm/h, 'Heavy' is 6.1-25mm/h and 'Torrential' is >25. Of course 6mm falling in a 10 minute period may also cause some problems.

Q: What is considered light or moderate winds?

In terms of the wind references in our urban and rural forecasts we have a key which you can find underneath the observation/forecast graphs. Anything under 15 km/hr is classified as light winds, between 15-29 km/hr moderate (i.e. just written as northerlies). We also have a helpful blog explaining some of the terms we use in forecasts that might be of interest: <http://blog.metservice.com/weather-terms>

Q: when a forecast says 'morning' or 'early evening' for example, what time bracket does this refer to?

We have set timings that we use to describe the different time periods during the day. Here's a quick and easy table (times are in UTC)

Early Morning	0400-0700
Mid morning	0700-1000
Late morning	1000-1200
Early afternoon	1200-1500
Late afternoon	1500-1800
Early evening	1800-2100
Late evening	2100-2400
Overnight	0000-0400

Our public forecasts apply to the same time periods.

Q: What determines a heavy swell warning and why is there sometimes a specific height and sometimes a broader criteria?

Swell heights are explicitly stated in our coastal and recreational marine forecasts. We don't give ranges in these forecasts because of the wide variety of craft and recreational users of these forecasts. On the one hand we have ships that can easily withstand large swells, and on the other we have swimmers at the beach who may struggle with 1m. Stating the numerical value is the clearest way to communicate this information to a wide audience.

"Heavy swell" in the high seas forecasts indicates swells over 4m. However, we don't issue any further specific swell warnings for higher swells.

Q: Do you use knots or km/h for wind speed?

Meteorologists usually use knots when describing wind speeds, but the public usually use km/h. The rain forecast graphics that you refer to are direct weather model output, that we meteorologists view while we are writing your forecasts. Because of this, the wind barbs are given in the units we usually use, i.e. knots. Also, it is very uncommon to ever use km/h when drawing wind barbs.

The marine forecasts on our website also describe wind speeds using knots. This is simply because this is what has traditionally been used around the world for marine weather, and it has never changed. It would be difficult to change this, as our marine forecasts cover vast areas of the Pacific and Southern Oceans, and so it is best to stick to what is used internationally. As you noted, we convert wind speeds to km/h for our towns and cities forecasts, as these are the units best known to the public in New Zealand.

So the answer to your questions is that we use a variety of units, depending on what is easiest for the target audience, and also what has been used traditionally all over the world. It would be nice if we could be consistent with the units we use, but as described above, our marine forecasts extend far beyond New Zealand waters.

Q: What are the criteria for defining weather warnings?

You can find the general warning criteria (and these apply to the Waikato region) on our website at <http://www.metservice.com/warnings/weather-warning-criteria>.

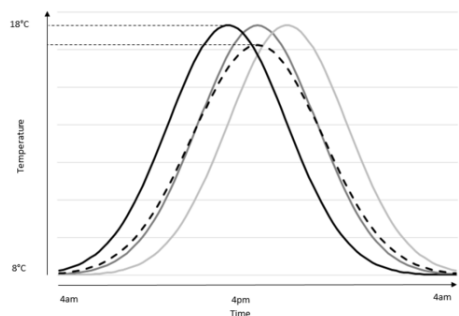
For more information on our Severe Weather Outlook, Watches & Warnings and when they are issued, I have written a blog which you can find on our website at <http://bit.ly/SevereWeatherExplainer>.

MetService forecasters liaise with Council and Local authorities to warn them about sea and swell conditions which may be hazardous in their areas. The criteria for each area differs and is set by the Council concerned.

There is a blog on our website which has a bit more information about swell at <https://blog.metservice.com/sea-state-and-swell>.

Q: Your data for daily high temperature doesn't match. Why is there a smooth line shown if there is more than one possible value?

Everyday, we run several different weather models, which can give slightly different answers for what your maximum temperature could be (and when it could be). The best answer is usually a combination of these different models. Because of this, we do statistical adjustments to the raw model output, which take account of the different model answers, and also take account of observational data from weather stations. This can mean that the maximum temperature on the graph appears to be slightly lower than the maximum temperature given in the forecast. I have attached an example diagram below to help explain this. The three solid lines show three different model answers for the temperatures throughout the day. All three predict a high temperature of 18C. However, they are choosing the high temperature to be at slightly different times. The best estimate of the temperature at any given time is usually given by an average of the three curves - and this is shown by the dotted line on the graph. However, this does not give the best estimate for the high temperature - as you can see on the graph, the dotted curve is always lower than the three raw model data curves. For this reason, the highest temperature on the statistically adjusted graph may be slightly lower than the estimated high temperature shown in the forecast above it on the website.



As for the graph on the website - it has not been smoothed - it connects each 2-hourly data point to the next one with straight lines, which is the standard method for drawing line graphs. I think you are thinking of a "best fit" curve when you are referring to a "smooth line", which is not what we have done here. This article explains the difference between the two: https://en.wikipedia.org/wiki/Line_chart

Q: Why does the hourly forecast not match up with the minimum temperature?

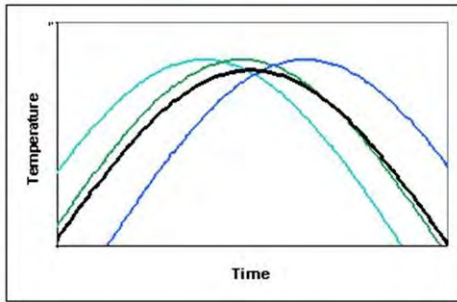
There are a couple of things at play here as to why they might not match up.

The Simple explanation: Firstly, the minimum temperature for the overnight period is not typically reached until dawn the next day (at the very end of the night). So if you are up in the evenings the temperature is unlikely to get as cold as the minimum until you are already in bed. Secondly, the 2-hour time series is the 'average' temperature expected over those two hours, so it makes sense that minimum (or maximum) will briefly exceed these 2 hour averages.

Here is a slightly more in-depth explanation:

The forecast temperatures that are on Metservice.com are made by looking at the output of a collection of different computer models and statistically combining these along with historical information. The final temperature curve is made by looking at each of these individual outputs for each of the time points of the forecast and computing the most likely temperature for that point.

However, as each of the models can produce different results the maximum temperature generated by the most-likely temperature graph can often miss the maximum temperature of the individual model run. For example:



In this theoretical example the blue and green lines show different model outputs and the black line shows an average of all of them. While the maximum temperature of all the individual model runs is the same the time of the maximum is different. This difference in timing leads to the maximum temperature on the averaged curve to be lower than the individual members.

Because of this the computer also calculates the most likely maximum and minimums separately; independent of what time they occur in the day.

The computer generated curve is one that tries to fit to hourly observations, but as the graph below shows changes in temperature are much more variable than that.

Q: What do the blue H and the numbers that follow on the 3 day rain forecast mean?

The H means a local high rainfall value, or local rainfall maxima. We often refer to them as a 'bull's eyes'. The numbers are what that maximum is, in mm of rain per 3 hours.

Q: Why is there a purple line around the ranges in the South Island?

The purple line highlights any areas where it is likely (>50%) chance that any precipitation falling from the sky will be snow. It tends to surround the ranges as we are much more likely to see snow settle in cool, high-altitude areas. If we have a very cold outbreak in winter you will occasionally see the purple contour spread right out towards to coast, when we expect snow to low levels.

Conversely, in summer, often the entire atmosphere is too warm and the purple contour will not be present at all.

There are many things that affect the height to which snow will fall. As conditions are always changing, this contour is always shifting. Given the time-steps (3 hours) on the website data, the contour only changes a small amount each step, but over a 24-48 hour period it can change drastically (look at the difference between today and Wednesday!)

Q: Why is a MetService forecast less accurate than a forecast from another weather information provider?

Remember you're making a comparison of two model-generated forecasts for a future day, so neither will be 'inaccurate' at this point - they're just different (and they are produced by different models, so no surprise there). You'll also find that both forecasts will change as we get closer to the day being forecast - this is because NZ's weather is changeable, particularly so at present.

The 3-day and 5-day rain forecast on our website is model information: each day we chose the global model that is doing the best job of forecasting the weather for today, and we have our own models running over the top of those global models to ensure we get a higher resolution over New Zealand. But unlike many other weather companies, MetService uses models only as a starting point - then our meteorologists add a lot of judgement and expertise on top of that information in order to arrive at the final worded forecast.

Computer models have their limitations, so we always recommend you go by the worded forecast prepared by one of our skilled meteorologists - they have the expertise to determine what the models are doing well and not so well, and to look at a lot of other information in order to make a judgement on what the weather story will more likely end up being.

I hope that helps explain the usefulness and relative value of models versus written forecasts!

Q: Why has there been a change to a National Park forecast?

These are carefully scoped and paid for under a contract with DOC, enabling us to spend the quality time required to produce and publish on our website forecasts specific to each national park (in addition to the brief and extended mountain forecasts funded through our public weather services contract with Ministry of Transport).

This change has just been made after a review of all the National Parks forecasts with DOC, who fund the forecasts. They requested the change based on feedback they received from members of the public using the park.

Q: Why does MetService report different tide levels to other sites?

We get our tide information direct from LINZ, and the heights reported by both of us are heights above LAT (see <https://www.linz.govt.nz/sea/tides/tide-predictions/standard-port-datum-descriptions>). We cannot comment on what data other websites use, but our data will be consistent with LINZ.

Q: Conflicting marine forecasts.

Thank you for your email. From the information you gave us I concluded you are looking at the 'Marine & Surf' tab and have clicked on one of the labels to get to this forecast. Would that be right?

On this page (for example I am looking at the Muriwai Beach surf forecast) there is the written coastal forecast (in this case Raglan coastal forecast - day 1-5 written by a meteorologist) followed by a seven day icon and surf rating. Then this is followed by the Auckland city short forecast (which we call an urban - also written by a forecaster on days 1-5).

The surf rating is a model generated forecast for the coast and is point specific, while the Raglan coastal forecast covers up to 60 nautical miles off the coast (so will often have more wind than is felt at the coast).

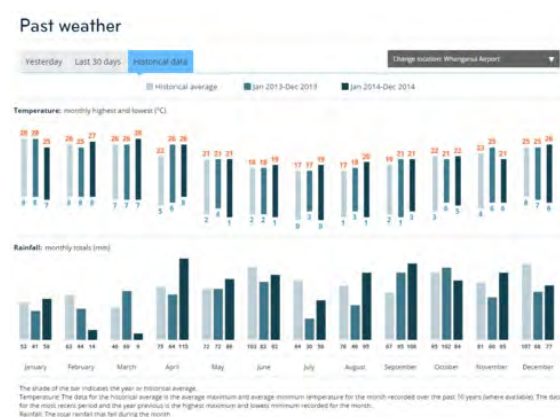
The recreational forecast (for example the Hauraki Gulf) addresses the weather closer to the shore than a coastal forecast and is directed at the main areas where people sail etc.

It would be unusual for each of these forecasts to be the same. For example there could be a gale in Conway coastal, but 15 knots in the Hauraki Gulf forecast and 10 knots at the point forecast which is done by the model.

Meteorology & General Science

Q: I would like to know historical rainfall information?

Some historical weather information is available on the Past Weather section of the Towns & Cities and Rural pages on metservice.com:

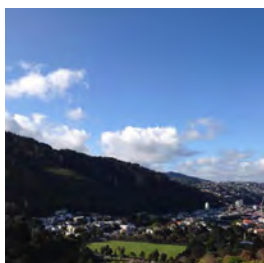


In addition to this, a general summary of New Zealand's climate can be found here: <http://about.metservice.com/our-company/learning-centre/new-zealand-climate/>

If you are looking for a historical weather chart, please check the weather page of your local or national newspaper. Your local library should have an archive of old newspaper editions available for viewing.

Otherwise, you can try the National Climate Database managed by NIWA, a free subscription site that contains historical climate data for the whole of New Zealand: <http://cliflo.niwa.co.nz>

Q: How are cumulus clouds formed?



Cumulus Humilis is a low level heaped cloud that is also called "fair weather cumulus". It has little vertical development and individual clouds are short lived. These clouds form in weak thermals rising from the Earth's surface during fair weather.

Cumulus clouds can start as fair weather cumulus, growing into towering cumulus and then into Cumulonimbus (which can produce thunderstorms) if the conditions are suitable.

Q: Why do we get haze?

Haze consists of tiny solid particles that are in suspension in the atmosphere. If we have had some strong winds over the region this causes the air at the surface, which is polluted with smoke or dust, to be carried upwards and this causes the haze. Salt spray from the sea can also be a contributing factor in coastal areas.

Q: Explaining different clouds

You may have noticed that different parts of New Zealand are prone to different types of clouds. Canterbury has its Nor'west arch, Wellington has coastal stratocumulus, Rotorua gets socked in with low stratus or fog in winter. Places in the mountains get invaded by UFO-shaped lenticular clouds every time there's a decent wind aloft.

In this blog post <http://blog.metservice.com/CloudEnvy> we go through different cloud types associated with different types of terrain, so any travelling cloud spotters out there will know what to look out for!

Q: What are infrared satellite images showing?

IR or infrared satellite imagery is sort of a temperature map of the earth. The weather satellite detects heat energy in the infrared spectrum. Infrared energy is invisible to the human eye. The satellite image displays objects (in this case clouds) based on the temperature of the cloud tops. Warmer temperatures appear in dark shades. Colder temperatures appear in light or coloured shades.

Q: Why was fog not mentioned in today's forecast?

As you probably know fog is a notoriously hard thing to forecast and something which is dictated by very small margins in terms of wind, temperature and moisture level (if you're interested here we have written a blog on the challenge of fog forecasting here <http://blog.metservice.com/node/1003>). Another tricky thing about fog is that it happens in very localized areas, so part of the city may be in morning fog in the while the other is has clear skies with frosts. We can guess what areas are more likely to get fog (usually in sheltered low lying areas or valleys for radiation fog - like Taumarunui) but we still do get it wrong sometimes.

Q: How can I better understand typical New Zealand weather patterns for surfing during autumn, winter and spring?

Have a look at this webpage: <http://www.metservice.com/maps-radar/marine-forecast-maps/significant-wave-height>

This is our most comprehensive page for checking out the swell heading your way within the next 5 days. You can see there's information not only on the significant wave height but peak wave period and sea surface temperature too.

In early autumn you get more northeast swell while later in the season the southerly swell starts to come into force. Of course this is general seasonality so some years you may get less of the subtropical lows to the north, and some years you hardly get any polar lows to the south to create the southerly swell. Therefore it is best to check in the link above. Often in winter the southerly swells are accompanied by strong winds so it's not ideal for surfing (plus the water is cold!) Spring is another good time for swell on the east coast of the South Island with decent southerly swells lingering around from winter with less stormy weather with it.

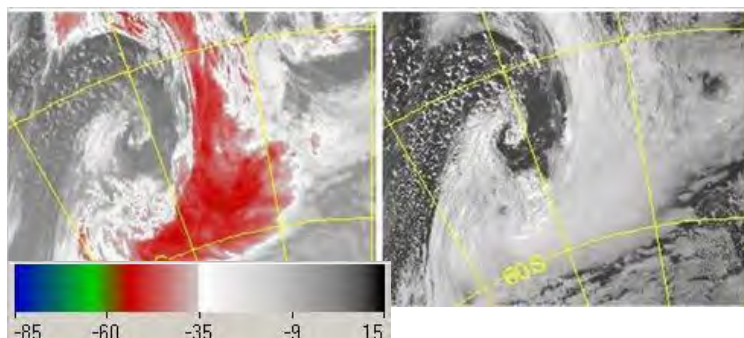
Q: No UV forecast in Winter? Is there more UV during Summer because of the Ozone?

The Health Promotion Agency advertise the Sun Protection Alert on MetService platforms during the daylight saving period, but you can have access to the information outside this period on the SunSmart website <http://www.sunsmart.org.nz/sun-protection-alert>.

(According to the website the UV will not be extreme today.)

This website also has more information on the UV index and its dangers, but you are correct the increase in UV during spring into summer is due to the decaying Antarctic Ozone Hole moving across central NZ.

A temperature scale in degrees Celsius is usually depicted beside the picture to show the temperature of the cloud tops. You can infer relative altitudes of clouds from their temperatures, as in general, temperature in the atmosphere decreases with increasing height.



The first image is an IR picture, where the large flat sheet of cloud in red is cirrostratus. The second image is a 'visible' image which is more like a photograph of the cloud taken from space. Underneath the images is the temperature scale in degrees Celsius for the IR image.

The main advantage of IR imagery is that it's not dependent on sunlight. Visible imagery (like the photos you take with a normal camera) relies on sufficient sunlight reflecting off a surface to be viewable. It is no use at night, but IR imagery relies on emitted heat energy which is detectable day or night.

Q: How do you calculate the 'feels like' temperature?

The 'feels like' temperature is not a direct measurement of the humidity. The feels like temperature is an idea of what sort of temperature the air **feels like** to a person in the shade. It is an estimate of a sensation, and not an actual temperature or the humidity (but its calculation does include these). We also take into account wind chill.

We have a blog which explains more about how we calculate the feels like temperature and it can be found at <http://blog.metservice.com/FeelsLikeTemp>.

Q: The radar showed rain, but none was falling?

Rain can show up on the radar but evaporate before it hits the ground. This is called virga. Rain can also be very scattered, and miss a given spot even though there were showers around. You can get more information on radar here <http://blog.metservice.com/radar>.

Q: When does the minimum temperature occur?

The overnight minimum temperature displayed for a given day will most likely occur between sunset that day and sunrise the next morning. Typically the lowest temperature will occur just after dawn the next morning. On rare occasions, the minimum temperature may occur earlier that day, for example when a very cold southerly flow during the day is replaced by a warmer northerly flow during the night.

Q: Why do you not split Taranaki up into north and south forecasts?

I agree that there are often big differences between north and south Taranaki, and our meteorologists do sometimes split the forecasts up. You may also find the 'probability of precipitation' information useful, available from day 4 on the rural page <http://www.metservice.com/rural/taranaki#!/new-plymouth>.

You will notice, for example, that on Monday (Xmas day), with the strong northerlies that New Plymouth has a 92% chance of 1mm or more of rain, but Hawera only has a 40% chance. On Tuesday (Boxing day), due to a southerly change New Plymouth has a 97% chance of 1+ mm, while Hawera has a 98% chance.

Q: What is the relationship between 'sunshine hours' and solar radiation?

There isn't a direct relationship between global solar radiation and bright sun shine hours. Although the two may appear similar they are quite different. There are algorithms used but these are not very accurate and are very site specific and cloud climatology dependent.

Global solar radiation includes the direct radiation from the sun (about 2/3 of the global solar radiation on a clear cloudless day) and diffuse radiation (the remaining 1/3). Bright sunshine hours only looks at the direct radiation so total bright shine hours will drop significantly on a cloudy day when there are clouds over the sun, while global solar radiation totals will also decrease but not by anywhere as much.

Q: Are there any deserts in New Zealand? Is Rangipo Desert actually a desert?

The short answer is that there are no deserts in New Zealand.

Generally a place is regarded as a desert if it receives less than 250mm of rain or snow in a year on average. In some circumstances, if the place is very hot for example, it can still be a desert with up to 500mm of rain per year. Although some places in Central Otago get less than 500mm they don't qualify. Alexandra in Central Otago averages about 340mm of rain per year.

Rangipo Desert receives around 2000 to 2500mm of rain per year - way over the limit for deserts. However, as the volcanic soil in the area doesn't hold water very well and the alpine nature of the area means very few plants survive, it looked like a desert to those who named the area.

Fun fact - parts of Antarctica that might be regarded as 'belonging' to New Zealand by some people are 'cold desert' as they get less than 250mm of snow per year.

Q: Why does the forecast show rain only over the land?

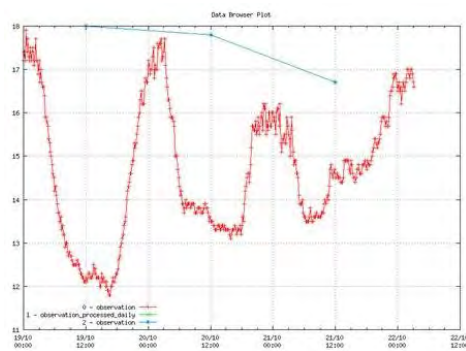
Much of the forecast rain you see is due to convection. This is when the air above the ground heats up during the day, and when warm enough it can rise and cause rain. This is why much of the rain is roughly the shape of the land. Convection is less likely over the ocean because the ocean does not heat up as quickly as the land (because it is better at both conducting and mixing). Sometimes sea breezes, which set up in the afternoon, keep the convection off the coast, which is why you sometimes see the rain set back a bit from the coast.

Convective rain is different from rain from fronts and troughs, which will fall over land and sea. Frontal rain may still preferentially fall over land, as the uplift of the hills helps the production of rain, but it will often appear as a band stretching across New Zealand and its coastal waters. The rain you see off to the northeast of New Zealand looks like rain from a trough, and it is just a coincidence that it looks a little like the North Island.

We also produce forecasts for the aviation industry, which also uses knots to describe wind speeds. Again, the reason for this is that we need to stick with what is used internationally as we have flights arriving from and departing to international locations, with airlines from all over the globe.

I hope this helps explain why we use different units in different areas of our website.

Q: Why is there a big difference in minimum temperature overnight between two nearby areas? (e.g. North Shore and Waitakere)



On cold, still nights sheltered inland areas places will form an 'inversion layer'. This is cold air, trapped at the surface which is further cooled by the colder ground. Places near the coast will receive air that has been warmed by the ocean (currently around 14C), mixing in and keeping the temps considerably warmer.

The red line shows the temperature observations at Auckland airport, recorded every ten minutes. Looking at the cluster of temperatures around the middle of the day on the 21st (shown as 00:00 on the graph) you can see how drawing a smoothed curve through the temperature points will miss the extreme maximum. It is also worth noting the blue points which show the maximum temperature recorded in the previous

24 hours. In the case above the maximum temperature recorded during the 21st is higher still than the ones shown on the red line, this is down to the fact it is based on even more frequent observations, every minute.

Radar

Q: Why does the radar show that is raining in my area when it's not? Is it to do with the height that the radar observes?

The height that is observed by the radar depends on how far away from the radar you are. It might be helpful to think of the radar beam like a cone which slopes upwards. If you are very close to the radar, then the radar will show rainfall close to the ground. If you are much further from the radar, then the radar will be observing rainfall well above the ground, and this can sometimes evaporate before it actually reaches the ground. We have radars located in Northland, Auckland, New Plymouth, Bay of Plenty near Rotorua, Mahia Peninsula south of Gisborne, Wellington, Rakaia near Christchurch, Hokitika and Invercargill. Sometimes, you might see interference on the radar as well, which may make it look like there is rain on the radar when there is not. You can read more about this here: [http://blog.metservice.com/Radar Interference](http://blog.metservice.com/Radar%20Interference)

Q: Why do two radar stations show different information where they overlap? Shouldn't they be seeing the same thing?

Radar scan in a circle, looking up at an angle. Close to the radar you can see rain at lower levels and further away the rain will higher up. We wrote a blog on the MetService website that explains more about how radars work. You can find it here <http://blog.metservice.com/Radar>.

Q: Do the radars use flat plate or dish antennas and do they alter their angle while rotating?

The radar antennas are parabolic dishes about 5m in diameter (varies with manufacturer) which focus the beam to give us a beam width of 1 degree.

The antenna elevation does change during the 7.5minute scan cycle as it is stepped up between rotational scans to allow us to build up a volumetric picture of the atmosphere.

Q: Is the rain radar broken?

There has been ongoing maintenance around the radar site, meaning that unfortunately the intermittent outages have been unavoidable. I'm sorry for the inconvenience this has caused you and many others.

OR

I think what the issue could be is that there is orographic blocking going on to an extent. The Waitakere ranges to the west could be blocking the lowest parts of the radar beam which then will create the 'dead spot' behind the ranges on the west coast.

Q: Why does rain direction on the rain radar disagree with wind direction in the weather forecast?

That is actually a really good question! As it turns out, there are several different processes in the atmosphere which can cause it to rain. Sometimes the rain (or showers) is a result of things happening near the surface of the earth. For example, day time heating combined with moist and humid conditions in the lowest levels of the atmosphere can cause showers to pop up near the surface.

When things happen in the lowest layer of the atmosphere (termed the 'boundary layer') then the movement of rain/showers will be tied into the surface wind, and you will see the two align. However, there are other processes in the atmosphere where the main cause of the rain is driven from the higher levels in the atmosphere (sometimes 10-15km above the earths surface!). When this happens, the movement of the rain is related to the movement of weather features and systems way above the surface.

Often, the wind flow and movement of features in the upper atmosphere is quite different to the wind flow directly below on the surface of the earth. In situations like this (which you must have noticed a few days ago), the surface wind and the movement of rain bands will not match up. Hopefully this helps a little bit, we are always happy to answer great questions like this!

Q: What does the boating forecast mean for the Interislander crossings?

The Interislander Ferries are larger boats and are less affected by wind and chop than they are by large swells. However, strong, persistent winds can generate swell locally – the ferry may not be affected directly by the wind but might experience some roll caused by the associated swell. So in essence, the smoothest conditions for the ferries would be light winds and low swell.

Significant wave height is a useful product for a longer range forecast of swell. Another product is the Cook coastal marine forecast which is written by our Meteorologists. This forecast includes wind, sea state as per the Beaufort scale, as well as any significant swell and visibility-reducing-weather. The swell and weather will be omitted from this forecast if it is low or insignificant.

Q: What does the cook strait forecast mean for the Interislander crossings?

in very severe weather the Interislander may cancel crossings. This is their call, and always check with them if you are unsure. For a crossing that takes place, you may be affected by the sea state and swell. This is driven by the wind in the Strait and also elsewhere generating swell.

The Cook Strait only really gets southerly swell - there isn't enough fetch (open water) to the north. So crossing will generally be ok in just about any amount of northerly. When there is a strong southerly, there will be some movement of the boat, but the user experience is largely down to how strong your stomach is! Customer service is obviously important to the Interislander, and although we cannot speak for them, it is unlikely they would run a crossing that resulted in a strongly negative user experience. Check the Cook forecast <http://www.metSERVICE.com/marine-surf/coastal/cook> and look for strong southerlies and large swell - this will mean a rougher crossing.

Q: When will Dunedin get it's own radar station?

The establishment of the Otago radar has been delayed due to the sale of the land that is our preferred site, in late 2017. We are progressing negotiations with the new land-owners. Unfortunately, it means that we will not be able to use the summer/autumn 2019 time window for construction of the radar, as originally planned. We estimate that the radar will now be commissioned around May 2020

Measuring and observational equipment

Q: Weather balloons/Radiosondes

We launch weather balloons from the locations across NZ: Whenuapai, Paraparaumu, and Invercargill. The information we obtain as a result of these are invaluable for determining the current state of the atmosphere, and for initialising weather models. New Zealand's data is very important to global weather and climatological modelling, as there is a paucity of observations across much of the Pacific. This blog details more about weather balloons/radiosondes and their role in meteorology in the past and today: <https://blog.metservice.com/weather-balloons>

Years ago we reduced the launch of these measuring devices to the minimum amount possible while still feeding the data required for the global weather models, that way ensuring that the weather models are depicting what is going on over New Zealand and the Pacific Islands as accurately as possible, especially during severe weather events. There is constant development in this area and we will keep a close eye at any better options which come on the market.

Q: Will an inaccurate local weather station affect overall MetService forecasting/operations?

The weather information on the "Your Weather" maps come from MetService weather stations, council weather stations, and also private weather stations owned by the members of the public. It is up to the individual if they want to upload their data to our website.

The private weather station data is there more out of interest than for any official record keeping. The MetService and council weather stations use instruments that are far more sensitive than the at-home weather stations you can buy, and are calibrated regularly to a high degree of accuracy. We can not guarantee what lengths members of the public have gone to ensure that their weather station has been calibrated or correctly situated, and therefore these are not included in any official weather or climate records.

Though having extra observations is very helpful for coverage of the country and is good for a general idea of the weather and identifying micro climates, not all observations can be taken at face value on Your Weather.

Occasionally there is the odd station that seems to stand out as an outlier, and often it is because it is placed near something that easily radiates heat, e.g. a concrete wall, or a steel fence.

If you happen to be interested we have a blog on how MetService set up AWS (automatic weather stations) to make sure they make representative readings. <http://blog.metservice.com/location-of-weather-stations>

Q: Why do some stations appear only intermittently on 'Your Weather'?

'Your Weather' includes observations from many private weather stations owned by members of the public. The availability of these stations depends very much on how their owners operate them; reasons for intermittent reporting may include such things as whether the owner's home internet is up and whether the computer that the station is connected to goes to sleep or gets shut down each night.

A good way to ensure your station is reporting all the time is to connect it directly to an 'always on' broadband or fibre internet connection using a [MeteoBridge](#) or similar device (so removing the need to leave a computer running in order for the station to report its observations through to 'Your Weather').

<http://www.metservice.com/maps-radar/local-observations/your-weather>

Q: Which type of pressure reader does Your Weather receive from the WOW System?

Your Weather uses the Site Definition in WOW to determine which pressure measurement to use.

Some weather stations record Mean Sea Level Pressure (MSLP), and some record Station Pressure (also referred to as Air Pressure). If your Site Definition specifies a unit for Air Pressure, and MSLP is marked as 'Not Captured', then baromin (the reading that is sent from WOW to Your Weather) will be treated as an Air Pressure reading. Otherwise it will be treated as

an MSLP reading.

To edit your site definition and ensure the correct pressure is selected, visit the edit pages of your site and the options for pressure will be near the bottom. Ensure one is set to 'hectopascals (hPa)' and the other is set to 'not captured'. WOW will then automatically work out the other measurement and store it for you.

Q: The temperature displayed for my area is wrong/the location of the sensor isn't an accurate representation.

Our sensors are regularly calibrated, so the temperatures they record are accurate. However sensors may be affected by local factors such as sea breezes. In some cases, depending on where you live, it may make sense to use the temperatures recorded from a sensor other than the one closest to you. For instance if you live near a the coast but are sheltered from cooling sea breezes you may find it helpful to pay attention to temperature readings inland rather than from a sensor next to the sea.

Many of our weather stations are located at airports due to the very critical role of weather forecasts for aviation safety. Likewise, we have many stations located alongside roads that are susceptible to ice in winter - again, this is focused on public safety.

If your local council was interested in setting up a CBD station, we'd be more than happy to work with them to build the station and then get the data onto our website (and theirs).

We have had a few comments about getting more AWS stations in some cities and we are looking into that. In the mean time you can visit the 'your weather' section of the website to select from a range of temperature readings around your area. Although, beware of some of the personal weather stations which are not calibrated properly as these might record extreme temperatures.

Q: My private thermometer showed a much higher temperature than the MetService website?

In order to ensure that a thermometer is at true air temperature it is necessary to protect it from solar radiation by a screen or shield that also serves to support the thermometer. This screen also shelters it from precipitation while allowing the free circulation of air around it, and prevents accidental damage. Precipitation on the sensor will, depending on the local air-flow, depress the sensor temperature, causing it to behave as a wet-bulb thermometer.

In order to achieve representative results when comparing thermometer readings at different places and at different times, a standardized exposure of the screen and, hence, of the thermometer itself is also indispensable. For general meteorological work, the observed air temperature should be representative of the free air conditions surrounding the station over as large an area as possible, at a height of between 1.2 and 2.0 m above ground level. The height above ground level is specified because large vertical temperature gradients may exist in the lowest layers of the atmosphere. The best site for the measurements is, therefore, over level ground, freely exposed to sunshine and wind and not shielded by, or close to, trees, buildings and other obstructions. Sites on steep slopes or in hollows are subject to exceptional conditions and should be avoided. In towns and cities, local peculiarities are expected to be more marked than in rural districts. Temperature observations on the top of buildings are of doubtful significance and use because of the variable vertical temperature gradient and the effect of the building itself on the temperature distribution.

If you have a temperature sensor at Motueka we would love if you could add it to "Your Weather", <http://www.metservice.com/maps-radar/local-observations/your-weather> where anyone can share their weather data.

Q: 'Inaccurate' maximum temperature reported in the media (Timaru herald) on occasion when it occurred late evening on the day before.

The *Timaru Herald* use the maximum temperature reading given by our Timaru Airport automatic weather station between the hours of 6pm-6pm. So the reading for the 7th was taken between 6pm Mon 6th and 6pm Tues 7th. However, the maximum temperature in that time period actually occurred between 7pm and 8pm *on the 6th*. The winds subsequently turned ESE at about 8.30pm on the 6th and the temperature dropped from 27.4 to 19 deg in 30 mins. During the daytime on the 7th, the temperature ranged between 10.8 and 13.7 degrees (very cold for summer!), so that maximum reading would definitely have come as a surprise! I believe a clarification is being added to the temperature column to state that maximum temperatures are for the 24 hours to 6pm, which should help clarify things somewhat.

I hope this clears up the confusion - rest assured that the weather station, and the work of our graphics people who prepare the newspaper weather graphics, is up to the mark!

Q: My private thermometer showed a much lower temperature than reported in the media?

There's actually an interesting, and slightly unusual reason behind this. Yesterday was definitely not a warm one, and 14.8°C doesn't surprise me for Khandallah during the day. What happened was that the maximum temperature for Wellington did reach 20°C, but what was unusual about this was that the maximum temperature was early in the morning, before the southerly came through. Once the southerly was through (around 8-8:30am) temperature cooled significantly, thanks to the cold air it brought behind it.

So the temperature reported was the maximum temperature, but of course they were referring to the early morning (not quite what most of us felt yesterday...)

Q: Does dew and early morning condensation interfere with rainfall measurements?

In the case where rainfall is recorded by an AWS, dew will be counted as precipitation. The amounts are always going to be small, up to 0.4mm with a very heavy dew but more commonly 0.2mm. The precipitation stored in the bucket of an AWS rain gauge will evaporate during periods of long dry spells. Once again, the amounts we are talking about are small <0.2mm. Both organisations (NIWA and MetService) accept that the precipitation recorded as a result of dew, and the evaporation of stored rain fall during dry periods, will cancel each other out in the climate records.

Q: I own an automatic rain gauge which doesn't record the same level as my manual gauge, what's going on?

Great that you're getting involved in recording the weather. Manual or automatic, the quality of measurements will depend on the quality and calibration of the equipment. If one seems faulty, check the calibration - probably by pouring a known amount of water into it.

Q: There's a big difference in total sunshine hours between two regions that are very close together (e.g. Whakatane and Taurunga). Do you need to recalibrate your sensors?

Our equipment is routinely calibrated, so that isn't the issue. More likely is that it is due to local effects. Places nearer to the hills (e.g. Tauranga) are likely to be cloudier than places even slightly further away. These kind of changes can be significant between sites even a few km apart.

Q: Are the new digital sunshine recorders compatible with the old Campbell-Stokes recorders?

The new CSD3 sunshine recorders have been designed to operate in a comparable way to Campbell Stokes recorders, in fact the Kipp & Zonen CSD3 electronic sensor (that both MetService & NIWA use) are operated with the same threshold as the Campbell Stokes World Meteorological Organisation (WMO) threshold of 120W/m² of direct solar radiation. Basically this is the direct solar radiation received at the sensor and which burns a recordable trace on a Campbell Stokes sun card.

The two sensors won't record exactly the same when placed side-by-side, because the CSD3 records bright sunshine to a higher time resolution than the Campbell Stokes ever could (1/60th of an hour versus 1/10th of an hour). The Campbell Stokes is also subject to personal interpretation by the observer interpreting the card burn which introduces an error, despite the WMO instructions on how to read a sun card accurately. Also the threshold to burn a Campbell Stokes card is very variable due to difficulty with consistency of manufacture (chemicals impregnated into card) and local atmospheric effects on the sensor (temperature, moisture, wind). Another difference between the two sensors is that the part of the solar spectrum that each sensor measures is subtly different, the Campbell Stokes sensor operates by burning a card so the energy used to do this is primarily in the infra-red (what we feel as heat) whereas electronic sensors generally receive a wider part of the spectrum including all of the visible light. This is why MetService & NIWA conducted lengthy overlaps between the two sensors prior to decommissioning a Campbell Stokes recorder so we could see exactly what the differences between the CSD3 and Campbell Stokes are.

As mentioned above, MetService and NIWA both use the Kipp & Zonen CSD3 electronic sensor at locations where the recording of bright sunshine hours has been automated.

Q: Different wind speeds measured from sensors that are close together (e.g. South of Hawera)

So taking a look at the locations of the weather stations, there are a couple of factors that could be at play. In this case, it wasn't a closer proximity to the centre of the storm (the low centre passed quite far south of Hawera, so any difference would be negligible compared to other factors). The wind around Hawera (and Taranaki) was largely terrain funneling, influenced by the Cook Strait. In this case the main variation between the two weather stations is likely to result from an

increased friction layer from the buildings of Hawera themselves. The buildings of Hawera effectively "slow down" the wind (in this case the wind was so strong that the effect was not particularly strong).

Think of being in the middle of the forest - the wind is generally quite weak to none-existent, thanks to the shelter the trees provide. But compare this to being on a boat in the ocean - the wind has no obstructions and so you experience no shelter and thus feel a stronger wind. Hawera township acts as an urban forest, helping to provide this shelter which you noticed!

Q: Can I add my webcam to 'Your Weather'?

The feed of data from 3rd party stations that we receive from the WOW System doesn't incorporate cameras. The Weather Cameras on Your Weather are sourced mainly from SnapItHD, a managed national network of professional cameras, and the Traffic Cameras from the New Zealand Transport Agency.

We're not planning to incorporate personal web cams on Your Weather due to the risk of abuse (i.e. people showing things we would not want our visitors to see!) However, locations of interest to tourism and other industries may be of interest to [SnapitHD](#) for addition to their network, and may then in turn make it on to Your Weather that way.

Other highway conditions: NZTA's website provides information on latest highway conditions [here](#). You can also register for [OnTheMove](#), a free, customisable travel information service from NZTA that provides information to travellers by email [prior to](#) their journey, about road and driving conditions, incidents and road works taking place on New Zealand's state highways.

Traffic and weather webcams: We've incorporated webcams into our [Your Weather](#) local weather observations maps - simply tick the box next to 'Weather cameras' or 'Traffic cameras' to view available cameras in your region. You can also view traffic webcams on the NZTA website from links on [this page](#).

Q: Why isn't there a webcam for my location?

Our traffic cams are sourced from the NZ Transport Agency and our webcams sourced from SnapItHD <http://www.snapithd.com/>; both are best viewed on our Your Weather maps (see the **Your Weather** tab on every Towns & Cities forecast page, or the national view from the **Maps & Radars** drop-down menu). Unfortunately, your location doesn't have any cameras of either sort available at present - but I know SnapItHD works with organisations to provide and/or install HD webcams, which could then be displayed on our website with the owners' permission. Motels are a big source of imagery - so perhaps a local hotel might be interested?

The current list of all Transport Agency traffic cameras is here: <http://www.nzta.govt.nz/traffic-and-travel-information/traffic-cameras/>

Keep checking back on Your Weather to see new cameras as they're added

Technical & Support FAQs

Q: What are MetConnect prices? Can you put them on your website?

Thanks for the suggestion and the basic price is something that we are looking to add to the website.

The basic pricing for MetConnect is \$300 per month for three licences, and then \$75 for each additional licence per month. This is excluding GST.

As well as providing a standard set of forecast and observation data – MetConnect is also a portal on which we can deliver a suite of bespoke products. As these vary from user to user, we do not publish a price list for these.

Please direct any specific product and pricing queries to NZSales@metservice.com.

Q: How can I extract data from your website?

The short answer is that you are not permitted to 'extract' data from our website. See the Terms of Use for the website here: <http://about.metservice.com/our-company/about-this-site/terms-of-use/> - section 4 Access to Information is the main part covering how you can use the information. The information you've indicated is a mixture of two-hourly observations and our proprietary model data, and is not available as open data or as a free (one location) data feed or widget. We *can*, however, provide 1-3 days forecasts for one location as a data feed or widget (see here: <http://about.metservice.com/our-company/weather-on-your-website/weather-widget/>).

Q: When can I find road weather information?

MetService works closely with the New Zealand Transport Agency (NZTA) to help ensure New Zealand's roads are as safe as possible during severe weather.

Snow: MetService issues Road Snow warnings that you can view on our website [here](#). You can also [sign up here](#) to receive Road Snow and other warnings by email.

Q: What is the purpose of the image of the blonde lady next to the day's weather summary?

When we conducted user research we found that many people didn't realise our forecasts are written by real, expert meteorologists - and finding that out positively affected their perception of our forecasts and caused them to pay more attention to the written forecasts. So we designed this avatar to change each time the forecast was updated.

Unfortunately it ended up being right on the cusp of the MVP feature set for the budget we had available and didn't get fully implemented in our first release - and it's still that way nearly a year later, which is very frustrating for me as it means it's confusing rather than helpful, and as you say, takes up space. At this stage we have something else planned for that spot - so stay tuned over the next few months.

Q: How do I customise my app and set it to my location?

Customisation is in the left hand menu with the MetService logo.

Location search is in the menu in the top right with the round button. If you've turned on location services the top location will always be your current location. You can push the "find a location" button and add as many locations as you like to the location menu.

If you're on an Android you need to make sure you are 'grabbing' the tiles by the blue arrows on the left to move them around. On iOS you can grab anywhere on the tile.

If you would like a to select a town other than your location to appear as default, just click Edit on the location menu and move the forecast you'd like to see first to the top.

Q: No forecasts are appearing when I visit the MetService site. I have used multiple browsers.

1) Try clearing cookies and cache, and reloading with Ctrl-F5 2) Are you running any extensions or blockers (eg:NoScript, uBlock, Adblock)? Try disabling them and then reloading the page.

3) Are any errors appearing in the console log?

4) Have you recently installed any antivirus, antimalware or firewall programs? Sometimes these can block website scripts.

Q: Where can I find the pollen forecast on the website?

The pollen forecast is available on our website from October through to the end of March each year - the main pollen 'season' - rather than all year round.

Q: Where can I find humidity forecast?

The current relative humidity is on left side of the page if looking at a town/city on [metservice.com](#) or on the App if you scroll down to the current conditions. However, we don't currently have humidity forecasts and are always looking at adding and improving our sites so thanks for the feedback.

Q: Why does a severe weather video keep appearing when I click on national weather video?

We always record severe weather information separately to avoid having to reshoot the entire national or regional video if a severe weather warning is added or lifted.

Q: Where can I find today's highest temperature on the website?

You can find the current extremes (warmest, coolest, wettest, windiest) on the home page on the left hand side: <http://www.metservice.com/national/home>

if you go to any of the Towns & Cities pages, scroll down and you'll see Current Weather Extremes and Yesterday's Weather Extremes in 2 tables (see below). The Home page is only today's current extremes as at the time you're viewing it - of course we can't list today's extremes until tomorrow - when we know what they were!

Current weather extremes				
Hottest	Coldest	Wettest	Windiest	
26.6°C Alexandra	17.7°C Rotorua	2.8mm Hokitika	37km/h Auckland	

Yesterday's weather extremes				
	Hottest	Coldest	Wettest	Windiest
Rank	Prev	Up/Down	Location	Max Temp
▲ 1	2	+1	Gore	32.0°C
▲ 2	4	+2	Lower Hutt	31.5°C
3	3	-	Alexandra Airport	31.3°C
▼ 4	1	-3	Invercargill Airport	31.3°C
▲ 5	46	+41	Timaru Airport	31.2°C
▲ 19	24	+5	Kelburn, Wellington	27.3°C

Rank of the locations with the hottest air temperature recorded yesterday, in order from hottest to coldest. Prev is the previous day's rank for the location. The arrow shows if the current rank is higher or lower than that for the previous day. Max of 5 locations plus current town/city shown. [Less](#)

Q: I think an advertisement on your website is a scam/malware

Thanks so much for alerting us to this, we've blocked the ad. Rest assured that we work hard to ensure the advertising that appears on our site is appropriate and genuine, including working closely with Google to report and manage these issues.

Q: I'm on Android and my MetService widget says "problem loading widget".

We've updated the widget with severe weather warnings and a new design. Unfortunately some versions of Android won't automatically remove the old widget, so you will need to remove it manually in those cases before the new widget will work.

Q: Why won't the app work on my phone?

The new MetService app is supported on Android 4.4 and above and iOS version 9 and above. If your phone's operating system is older than that, unfortunately the app won't be available in the app store for you. We recommend you use the mobile website m.metservice.com. Note that the app needs the following permissions to work on *Android*: internet; access network state; access location (for location-based forecasts); wake lock(required to keep the widget up to date).

Complaints and Community

Q: Community management/blocking geo-engineering obsessives/etc

As per our community guidelines <http://about.metservice.com/contact/ask-metservice-guidelines/> our community, website and social media accounts are for those who want to understand the *natural phenomenon that is weather*, and we're always happy to answer your weather enquiries. Please take your comments and discussion about geo-engineering to other communities that welcome it.

Common complaints

Q: Your website is poor

Thanks for the feedback – there is a programme of work underway that will make a difference to how things appear and we are sure you will consider it an improvement. Just a few more months while we finish the build”

Q: Your forecasting is too inaccurate

MetService uses a range of data sources to make its predictions and all predictions include a degree of uncertainty. Our meteorologists strive to give the best forecast possible but there are times, even with the best information and experience, that the forecast can be inaccurate but rest assured as technology advances our forecasts get more and more accurate.

Q: Why is weather in the media over dramatic/non-scientific?

The news media are a vital communications channel for us, and that does come with challenges in getting our message across in a balanced and authoritative manner. We do have several people dedicated to focusing on the media message each day, so the most important messages do get through and we are proactive in ensuring severe weather information is correctly represented. It's also fortunate that our strong online presence (website, social media) means people are able to get the latest information direct from us too.

Q: I'm complaining as a taxpayer

Thank you for your feedback. In answer to your question, this forecast is funded by revenue from the MetService website, app and other services, not from the tax payer.

Q: Why is there no forecast for my location?

Unfortunately MetService is currently unable to provide a localised forecast for every location in New Zealand. The various forecasts provided for the public on metservice.com and through other channels are made possible by funding from a variety of sources, but unfortunately we do not have funding for all locations. MetService continuously explores opportunities to increase its number of forecasts, so you are welcome to contact us to suggest your location here.

Q: Why are there advertisements on the MetService website?

MetService is a business just as much as we are a service – we are a State Owned Enterprise expected to operate profitably as a privately-owned company, with one shareholder – the NZ Government. MetService’s public weather warnings and a number of our forecasts are provided through commercial contracts with the Minister of Transport and Department of Conservation. Everything else you see on this site – and in our mobile website and apps – is paid for by advertising and other commercial revenue. This enables us to provide you with world-leading weather information, including radar imagery, weather videos and many other useful features.

Source: Website FAQs

Q: Adverts getting in the way of the weather message

Thanks for your feedback – we try hard to balance the things our advertising clients want to try and the needs of consumers. Our aim is to ensure that advertising does not get in the way of the weather message. If you think we have missed that mark, then it’s fair to let us know. Thanks

Q: Index.php files still being downloaded after trying to view webcam

If you refresh your browser it should be fixed - here is the verdict from the tech support of SnapitHD, the third party who provide the webcams, which created the problem. If it persists, try clearing the browser cache and then reloading.

The users that continued to see the download prompt would have visited metservice at least once while the script was broken.

After that they would have continued to see the prompt until the browser was forced to re-load the page from the internet (i.e. they manually refreshed their cache or their local browser cache expired).

I am confident that you will not have received new complaints 24-48h or so after the problem was resolved. How long a browser keeps a file in cache when it does not provide an expiry date (as was the case here where with the broken server config that did not process the .php file) depends on many factors including how much a user surfs the web (and how quickly in turn their cache fills up) so it is not possible to give an exact "end time" here.

App-related complaints and FAQs

See also <https://blog.metservice.com/New-MetService-App-FAQs>

Q: General messaging

The new app was completely developed from scratch to ensure it has the latest technology, and is secure. It was not an option to keep the previous app which was becoming outdated in every way.

Thank you for your feedback. Customer feedback helps us to determine what advertising is appropriate and we will review this placement going forward. Just so that you are aware, in this instance the advertisement was shown for one day only and the top banner advert was turned off for the day. We understand that you found this too intrusive and appreciate you letting us know.

As with all apps, downloads are subject to our [End User Licence Agreement](#) in addition to the [Apple Store Standard EULA](#).

Q: Why are there ads / I paid for an ad free app previously

All our apps are now free to download and in order for us to keep providing and supporting this service for free, the app has to cover its own costs through advertising. Note: At the time we introduced the new app, we offered to refund the purchase price to those who had paid for it. That offer has now closed and we donated some \$13,000 in unclaimed refunds to Surf Lifesaving.

The two apps (Android and iOS) were very expensive to make 5-6 years ago. The \$2.59 cost was to cover the app development and ongoing maintenance. It was not a profitable venture for us (Apple and Android take their share) and was never to be in lieu of advertising, however we're aware this is how it was perceived. We did offer to refund those who downloaded the app from 1 January 2017, if we didn't hear from some people then we automatically donated their app purchase amount to support the fantastic work of Surf Life Saving New Zealand.

The full page ad that you see upon opening the app is restricted and will only appear once a day. Including advertising on the app allows MetService to bring it to market at no cost to the user. Removing the cost barrier means more people can access reliable weather information for New Zealand in app form, from a reputable source - New Zealand's national weather authority. It's our mission to make sure every New Zealander and visitor to our country can access important weather information when they need it.

MetService has policies around what advertising is not shown on our websites and apps. Due to the wide range of people using these channels, we also ensure advertising meets [Advertising Standards Authority Codes](#) and we have an approval process in place. You might find we are stricter about this than other websites, as we want people of all ages to be able to use our websites and apps to keep up to date with the weather.

The cost to download was a barrier for many people and we wanted everyone to be able to access MetService forecasts in an app. The previous MetService app was available for five years at a one-off cost of \$2.69 (Android) or \$2.99 (iPhone). This went a small way towards covering costs and ongoing maintenance, but could not support ad-free weather forever. Including advertising on the app allows MetService to remove the cost barrier so more people can access reliable weather information for New Zealand in app form, from a reputable source - New Zealand's national weather authority.

Q: Why did you discontinue the windows apps?

Thank you for getting in touch. You are correct that Windows 10 is not going anywhere - but the change to Windows Phone support prompted us to reevaluate our support for Windows apps overall. With just 0.2% of our app users using one of the windows apps, we can't justify dedicating the resources to keeping them maintained and updated so we've opted to remove them from the store to prevent new users from downloading them. However if you've already downloaded the apps they will continue to work in the medium term. We know at some point the video feed will stop working because of changes by our third party provider, but we're expecting the weather data feed will continue to work for a while yet. I hope that helps provide some context.

(January 2018)

Q: Why is there no national rain radar on the app?

In short, we still intend to have the national radar on the app, but we need to use a different technology solution from the one we used previously which will also give a better result. And it is just taking time to get that solution in place because it is unfortunately not a case of just reproducing what we did before.

The national radar is available on the website, and the mobile website m.metservice.com – under 'Maps'.

Saturday 22 June

TVNZ DUKE

- 6.00 am** **On Duke Today...**
Here's what's on DUKE today.
- 6.50 am** **UEFA Euro**
Live coverage of the Group D match between the Netherlands and France from the Leipzig Stadium in Leipzig, Germany.
- 9.10 am** **On Duke Today...**
Here's what's on DUKE today.
- 1.30 pm** **Serengeti (R) PG**
As everyone faces the final reckoning the Great River Crossing begins. Gnu and Shani's foal are tested by crocodiles. Duma must save his mother. S1 E6
Closed captions available
Audio description available
- 2.35 pm** **Vintage Tech Hunters (R) G**
Collectors Shaun Hatton and Bohus Blahut scour Canada and the U.S. looking through rickety attics, dusty garages, flea markets, and auctions for rare and nostalgic treasures.
- 3.05 pm** **Abandoned Engineering (R) G**
A ghost town left high and dry in the mountains of Colorado; And a marooned facility found in the waters off the south coast of England.
Closed captions available
- 3.55 pm** **Alone (R) PG**
Prying wildlife continue to stalk the remaining competitors, threatening their food and their safety. One participant finds a grizzly too close to home, while another is unprepared. S8 E8
- 5.15 pm** **Grassroots Rugby**
Club rugby is the heart of New Zealand Rugby and weekly the programme visits clubs from around the country to tell their stories.
Closed captions available
- 6.10 pm** **Motor Mythbusters (R) G**
The Motor MythBusters team set out to build a full-scale Flintstone's car and test if it could be powered using their feet. The team find out if it's possible to roll back miles on an odometer. S1 E4
- 7.10 pm** **Sneakerholics PG**
Amon explores the relationship between sneakers and skating culture. And explore the in-depth reselling culture of sneakers in the modern age.
Closed captions available
Audio description available
- 7.40 pm** **Star Trek: Discovery (R) M-V**

Face to face with Klingon vessels, the U.S.S. Shenzhou prepares for the possibility of war if negotiations fail. Amidst the turmoil, Burnham looks back to her Vulcan upbringing for guidance.

****Closed captions available****

8.30 pm

Taskmaster NZ (R) 16-L

Revealing this season's teams with a task involving a large ball and a cow. We see our comedians delight all 5 senses, and Paul Ego makes a dramatic exit from the shed. S3 E2

NZ On Air

****Closed captions available****

****Audio description available****

9.30 pm

CSI: Crime Scene Investigation (R) 16-VC

The team is called in when a film processor develops what appears to be a snuff movie. Catherine, Warrick & Sara try to discover the identity of the porn actress and the co-star who killed her. S3 E8

****Closed captions available****

12.40 am

Movie: Terminator 3 (R) M-VL

A cyborg from a post-apocalyptic future travels back in time and must protect a man and woman from an advanced robot assassin. Starring Arnold Schwarzenegger. (2003)

****Closed captions available****

****Audio description available****

2.30 am

Duke - Back In The Future

We'll catch you later on DUKE.

Sunday 23 June

TVNZ DUKE

- 6.00 am** **On Duke Today...**
Here's what's on DUKE today.
- 12.40 pm** **Inside Central Station (R) (F) G**
This Australian observational series gives viewers unique access to Central Station, and tracks the daily challenges of Sydney trains, one of the world's biggest and busiest rail networks.
Closed captions available
Audio description available
- 2.30 pm** **Vintage Tech Hunters (R) G**
Collectors Shaun Hatton and Bohus Blahut scour Canada and the U.S. looking through rickety attics, dusty garages, flea markets, and auctions for rare and nostalgic treasures.
- 2.55 pm** **Abandoned Engineering (R) (F) G**
Exploring a jungle refuge which conceals a story of royal deceit and deception. Along with nuclear bunkers which were infiltrated by outsiders, and a haunted hospital marked by scandal.
Closed captions available
- 3.50 pm** **Alone (R) PG**
As the challenge comes down to the final four, Chilko lake continues its onslaught on those struggling to survive. Some survivalists attempt to change up their strategy. S8 E9
- 5.10 pm** **Engineering Reborn (R) G**
Explore the St Louis Rail Station, and how it went from being the biggest in the United States to falling into disrepair. S1 E2
Closed captions available
Audio description available
- 6.05 pm** **Motor Mythbusters (R) G**
The team test the myth that adding a turbo to a hybrid car will make it more fuel efficient. S1 E5
- 7.05 pm** **Highway Cops (R) PG**
A tank of gas doesn't get you far if you haven't paid for it; and did you hear the one about the bong, the dog, and the corncobs?
Closed captions available
Audio description available
- 7.35 pm** **New: Swamp People: Serpent Invasion PG**
Troy Landry and Pickle Wheat mix it up with some locals; Tes puts her skills to the test hunting without her partner, Bill; Zak and Bruce return to Viper Alley; Dusty hunts for a legend.
- 8.30 pm** **New: Kitchen Commando M**

The floors are sticky, the kitchen is filled with flies and the food is absolutely flavorless. Can this family handle the heat that Chef Rush is bringing to their kitchen?

9.35 pm NZ Hunter Adventures (R) PG

New team member Kieran is thrust into action on a classic Canterbury Red stag and Chamois hunt. When the first trip proves testing, can they pull it off on the second attempt? S10 E3

Closed captions available

10.35 pm Deep Water Salvage (R) G

Responding to an emergency call, Northstar marine sets out to salvage a sunken tug in the Delaware Bay. S1 E1

11.30 pm Saving Lives At Sea (R) M

The Torbay crew race to the scene of a collision between two boats. The Portcawl crew are called out to rescue two teenagers trapped on a rocky outcrop. S3 E5

Closed captions available

Audio description available

12.30 am Curse Of Oak Island (R) PG

The Lagenas and their partners make incredible discoveries at Smith's Cove and in the Money Pit. S4 E13

1.55 am Duke - Back In The Future

We'll catch you later on DUKE.

Monday 24 June

TVNZ DUKE

- 6.00 am** **On Duke Today...**
Here's what's on DUKE today.
- 11.50 am** **The Chase Australia (R) G**
Australian version of the critically acclaimed game show. Four strangers work individually and as a team to build a cashpot. Standing in their way is the Chaser, one of the world's top trivia brains.
Closed captions available
- 12.45 pm** **Frasier (R) PG**
One of Frasier's callers, a German woman named Gretchen, suspects that her husband is having an affair with his client. Frasier suspects that the woman is Maris. S2 E21
Closed captions available
Audio description available
- 1.40 pm** **Xploration: Awesome Planet (R) G**
Philippe Cousteau Jr., grandson of the legendary Jacques Cousteau, explores the most spectacular places - on the earth, inside the earth, and above the earth - in this riveting earth science series.
- 2.05 pm** **Grime & Punishment (R) PG**
Wayne and Dan tackle trash dumped from illegal cannabis factories, and cleaners Caz and Tee face houses so filthy they need shovels to clear the layers of grime. S1 E3
Closed captions available
- 2.55 pm** **Fishing And Adventure (R) G**
Scott & Mig are off on a deep drop adventure and the head to head challenge is set to land the longest fish. With a guaranteed consequence on the line the boys waste no time hooking in.
Closed captions available
- 3.25 pm** **Toa Hunter Gatherer (R) PG**
The journey continues on Molokai Island where Owen is taken on a hunting expedition on land and sea.
Closed captions available
- 3.55 pm** **The Chase Australia (R) G**
Australian version of the critically acclaimed game show. Four strangers work individually and as a team to build a cashpot. Standing in their way is the Chaser, one of the world's top trivia brains.
Closed captions available
- 4.45 pm** **The Unexplained With William Shatner (R) PG**
The Founding Fathers established the pillars of freedom and democracy in the US, but what truths have remained in the shadows about these men?
Closed captions available
Audio description available

- 5.40 pm** **Frasier G**
 Niles suggests to Maris that they go into marriage counseling; she responds by serving him with divorce papers. S4 E22
Closed captions available
Audio description available
- 6.05 pm** **Brooklyn Nine Nine (R) PG**
 Holt learns he's in the running to become Chief Commissioner of the NYPD when the squad is in LA for a funeral, so Jake must devise a variety of ways to get Holt back in time for the interview. S5 E9
Closed captions available
- 6.40 pm** **The Office U.S (R) PG**
 An attractive woman arrives at the office to sell purses and causes the male staff members to vie for her attention. S1 E6
Closed captions available
- 7.10 pm** **Two And A Half Men (R) PG**
 Charlie is unsure of how to discipline Jake after an accident involving seagulls. Meanwhile, Alan gets a surprise from Judith when he goes home to fix her sprinklers. S1 E2
Closed captions available
- 8.05 pm** **2 Broke Girls (R) PG-L**
 Max's lesson to Caroline on the art of thrift store shopping turns ugly when the girls fight over a coveted t-shirt. Plus, a sarcastic street artist named Johnny flirts with Max. S1 E3
Closed captions available
- 8.30 pm** **Movie: Semi-Pro (R) 16-LS**
 Jackie Moon, the owner-coach-player of the American Basketball Association's Flint Michigan Tropics, rallies his teammates to make their NBA dreams come true. Starring Will Ferrell. (2008)
Closed captions available
Audio description available
- 10.20 pm** **Twisted Metal (R) 16-VLC**
 Quiet closes in on her search for revenge; John finds himself incapacitated; Sweet Tooth wreaks havoc during his road tour. S1 E5
Closed captions available
- 11.20 pm** **Eureka PG-V**
 When Grace's spying is revealed, mistrust is in the air. Major Shaw shows up to take control of the situation just as a geo-engineering project cuts off communications to the outside world. S5 E11
- 12.05 am** **House (R) M**
 House and his team are hampered by a reality television crew whilst battling over possible diagnoses for a craniofacial surgery patient. S4 E7
Closed captions available

12.50 am

Duke - Back In The Future

We'll catch you later on DUKE.

Tuesday 25 June

TVNZ DUKE

- 6.00 am** **On Duke Today...**
Here's what's on DUKE today.
- 12.00 pm** **The Chase Australia (R) G**
Australian version of the critically acclaimed game show. Four strangers work individually and as a team to build a cashpot. Standing in their way is the Chaser, one of the world's top trivia brains.
Closed captions available
- 12.55 pm** **Frasier (R) PG**
After the brothers hear that Seattle's oldest restaurant is closing its doors, they decide to buy it and become restaurateurs; opening night is a real blast. S2 E23
Closed captions available
Audio description available
- 1.50 pm** **Xploration: Awesome Planet (R) G**
Philippe Cousteau Jr., grandson of the legendary Jacques Cousteau, explores the most spectacular places - on the earth, inside the earth, and above the earth - in this riveting earth science series.
- 2.15 pm** **Grime & Punishment (R) M-L**
A London canal side is the scene of an epic battle between council enforcers and a waste-loving artist who has hoarded mountains of rubbish. S1 E4
Closed captions available
- 3.05 pm** **Fishing And Adventure (R) G**
It's a west coast adventure as the boys head to Kawhia to fish the harbour and coast. With the challenge set to land their fish, Scott and Mig get amongst everything this epic location has to offer.
Closed captions available
- 3.35 pm** **Toa Hunter Gatherer (R) PG**
Owen heads to Te Taitokerau for a hunt with Twyla and Miki and a bit of fishing off the rocks.
Closed captions available
- 4.05 pm** **The Chase Australia (R) G**
Australian version of the critically acclaimed game show. Four strangers work individually and as a team to build a cashpot. Standing in their way is the Chaser, one of the world's top trivia brains.
Closed captions available
- 5.00 pm** **The Unexplained With William Shatner (R) PG-V**
The American frontier is full of legends of cowboys, Native Americans, and outlaws. But what about the tales of cursed mountains, monsters and even UFOs?
Closed captions available
Audio description available
- 5.50 pm** **Frasier PG**

Over coffee at Cafe Nervosa, Niles asks Frasier if he thinks Niles and Maris are meant to be together. Frasier typically over-analyzes the question. S4 E23

Closed captions available

Audio description available

6.15 pm

Brooklyn Nine Nine (R) PG

Rosa asks for Jake's help to deliver important information to her parents, but their plan goes hilariously awry when Rosa's parents assume the two detectives are in a relationship. S5 E10

Closed captions available

6.45 pm

The Office U.S (R) PG

The Dunder Mifflin employees suffer through the annual office awards ceremony, "The Dundies," hosted by pompous boss Michael Scott at their local watering hole -- a Chili's restaurant. S2 E1

Closed captions available

7.10 pm

Two And A Half Men (R) G

Charlie's long-time cleaning lady quits her job and Charlie quickly realises he can't cope without her. Alan tries to take the cleaner's place but doesn't succeed. S1 E4

Closed captions available

8.05 pm

2 Broke Girls (R) M

Max gets a taste of Caroline's posh life when they break into her former townhouse to retrieve her night guard. S1 E4

Closed captions available

8.30 pm

Movie: Red Eye (R) M-VL

Fear takes flight in this gripping thriller starring Rachel McAdams and Cillian Murphy. A woman is kidnapped on a flight and is pulled into a plot to assist her captor in killing a politician. (2005)

Closed captions available

Audio description available

10.05 pm

Secrets Of The Chippendale Murders (R) M

The NYPD investigates multiple leads into the murder of Nick De Noia. Possible motives include a love triangle, insurance fraud, and an angry boss.

Closed captions available

Audio description available

11.00 pm

Eureka M

The Smart Dust control unit is still on the fritz and wreaking havoc on the town's communications systems. S5 E12

11.45 pm

House (R) M-C

A magician's heart stops during a performance. House has a contest to determine the next one to leave the team. S4 E8

Closed captions available

12.25 am

Duke - Back In The Future

We'll catch you later on DUKE.

- 6.00 am On Duke Today...**
Here's what's on DUKE today.
- 6.50 am UEFA Euro**
Live coverage of the Group C match between England and Slovenia from the Cologne Stadium in Cologne, Germany.
- 9.10 am On Duke Today...**
Here's what's on DUKE today.
- 12.00 pm The Chase Australia (R) G**
Australian version of the critically acclaimed game show. Four strangers work individually and as a team to build a cashpot. Standing in their way is the Chaser, one of the world's top trivia brains.
Closed captions available
- 12.55 pm Frasier (R) PG-S**
Kate Costas takes over as KACL's station manager; when Frasier angrily rejects her suggestions to improve his show, she banishes him to the midnight-4AM time slot.
S3 E1
Closed captions available
Audio description available
- 1.45 pm Xploration: Awesome Planet (R) G**
Philippe Cousteau Jr., grandson of the legendary Jacques Cousteau, explores the most spectacular places - on the earth, inside the earth, and above the earth - in this riveting earth science series.
- 2.10 pm Grime & Punishment (R) PG**
David sets up a hidden camera to catch a fly-tipper in the act. Gary follows a disturbing trail of used needles deliberately left in playgrounds and parks. S1 E5
Closed captions available
- 3.05 pm Fishing And Adventure (R) (F) PG**
Season Finale: It's an epic offshore adventure on the Kapiti coast as the challenge is set to land a trophy fish and hunt a trophy deer. The boys get dealt a classic Wellington weather bomb.
Closed captions available
- 3.35 pm Toa Hunter Gatherer (R) PG-C**
Owen pays homage to his whanau and has a visit with them after a successful hunt.
Closed captions available
- 4.05 pm The Chase Australia (R) G**
Australian version of the critically acclaimed game show. Four strangers work individually and as a team to build a cashpot. Standing in their way is the Chaser, one of the world's top trivia brains.
Closed captions available
- 4.55 pm The Unexplained With William Shatner (R) G**

All over the world, there are giant monoliths that our ancient ancestors carved out of solid rock. But what was the purpose of these huge stone monuments?

Closed captions available

Audio description available

5.45 pm

Frasier PG

When Roz backs out of dinner plans with Frasier because of a date with a new man, Frasier's search for a new dinner companion makes him realise everyone else has someone in their lives. S4 E24

Closed captions available

Audio description available

6.15 pm

Brooklyn Nine Nine (R) PG

Seamus Murphy returns to redeem the favour Holt owes him. Meanwhile, the precinct searches for a loophole that will allow Holt to uphold his end of the bargain without breaking the law. S5 E11

Closed captions available

6.40 pm

The Office U.S (R) PG-SC

Michael, king of the inappropriate e-mail forward, hits a new low when his obnoxious best friend, sales rep Todd Packer, drops by for a visit. S2 E2

Closed captions available

7.10 pm

Two And A Half Men (R) PG

Charlie contemplates his treatment of women after Evelyn's new boyfriend ends their relationship. S1 E6

Closed captions available

8.00 pm

2 Broke Girls (R) PG-S

Caroline and Max throw a '90s-themed party to attract rich hipsters and raise money for their business. Meanwhile, Caroline is horrified to see her ex-boyfriend. S1 E5

Closed captions available

8.30 pm

The Unexplained With William Shatner (R) M

For thousands of years, people have believed in the existence of Satan, the embodiment of evil; some believe he has the power to possess souls and create mayhem amongst humanity.

Closed captions available

Audio description available

9.25 pm

Road Wars (R) PG

A distracted police officer in Missouri strikes a bicyclist with his vehicle. A woman is caught red-handed keying another person's car in Louisiana. S1 E6

10.20 pm

Kings Of Pain (R) PG-L

Adam has a phobia of tarantulas, so naturally Caveman Rob picks two of the world's nastiest ones for them to endure, including a tarantula with the well-deserved nickname of 'Orange Bitey Thing'.S2 E2

Closed captions available

11.10 pm

Eureka PG

Wormholes cause trouble on moving day. Or is moving day causing trouble with wormholes? While Jack tries to fix the wormholes Fargo is determined to something about moving day. S5 E13

11.55 pm

House (R) M-C

House treats a rock musician, and some of the candidates have to get past their personal biases. Wilson misdiagnoses a patient, and the winners are named. S4 E9
Closed captions available

12.35 am

Duke - Back In The Future

We'll catch you later on DUKE.

Thursday 27 June

TVNZ DUKE

- 6.00 am** **On Duke Today...**
Here's what's on DUKE today.
- 12.00 pm** **The Chase Australia (R) G**
Australian version of the critically acclaimed game show. Four strangers work individually and as a team to build a cashpot. Standing in their way is the Chaser, one of the world's top trivia brains.
Closed captions available
- 12.50 pm** **Frasier (R) PG-SC**
Frasier's Aunt Louise, who was not popular in the family for her tendency to criticize everyone, has died. Frasier has been left in charge of organizing her memorial and delivering a eulogy. S3 E3
Closed captions available
Audio description available
- 1.45 pm** **Xploration: Awesome Planet (R) G**
Philippe Cousteau Jr., grandson of the legendary Jacques Cousteau, explores the most spectacular places - on the earth, inside the earth, and above the earth - in this riveting earth science series.
- 2.10 pm** **Grime & Punishment (R) PG**
Season Final: Enforcement Officer Ray is out to catch the dog foulers of Dorset, and Clive and Callum are clearing up after drivers who use roadside laybys as a toilet. S1 E6
Closed captions available
- 3.00 pm** **The Season (R) PG**
These hunters will take you on a journey throughout the season to provide meat for themselves and their families. Find out why they hunt, and what it means as a way of life. S1 E1
- 3.35 pm** **Toa Hunter Gatherer (R) PG-C**
Owen and his guest Tatai discuss the benefits their marine reserve has seen after they ceased commercial fishing and we have beautiful underwater footage that captures the abundance of sea life. S3 E1
Closed captions available
- 4.05 pm** **The Chase Australia (R) G**
Australian version of the critically acclaimed game show. Four strangers work individually and as a team to build a cashpot. Standing in their way is the Chaser, one of the world's top trivia brains.
Closed captions available
- 4.55 pm** **The Unexplained With William Shatner (R) G**
Scientists have forever been involved in a quest to understand the universe. But for each answer science provides, more questions arise.
Closed captions available
Audio description available

- 5.45 pm** **Frasier PG**
 Frasier brings back a supermodel girlfriend from his trip to Acapulco. Unfortunately, he has some trouble convincing his friends and family that she is real.
Closed captions available
Audio description available
- 6.15 pm** **Brooklyn Nine Nine (R) PG**
 Captain Holt entrusts Jake with the monumental task of guarding Kevin, after Seamus makes some dismaying threats. S5 E12
Closed captions available
- 6.40 pm** **The Office U.S (R) PG**
 While Michael and Dwight are away from the office, Jim and Pam organise an "Office Olympics" where employees compete in ridiculous games. S2 E3
Closed captions available
- 7.10 pm** **Two And A Half Men (R) PG**
 Alan tricks Charlie into joining him and Judith in leading Jake and his classmates in the school's annual music show. S1 E8
Closed captions available
- 8.00 pm** **2 Broke Girls (R) M**
 Caroline tries to build herself a murphy bed, the kind which folds into the wall, in Max's apartment. Meanwhile, the chemistry between Max and Johnny heats up. S1 E6
Closed captions available
- 8.30 pm** **Science Of Drugs With Richard Roxburgh M**
 We look at the different effects of caffeine, cocaine and methamphetamine. Two-time world surfing champion Tom Carroll opens up about his own battle with addiction and how he got clean.
Closed captions available
Audio description available
- 9.40 pm** **Heavy Rescue 401 PG**
 Another snowstorm hits Toronto as Sgt. Kerry Schmidt works with Abram's crew to clear the continent's busiest stretch of highway. Duncan teams with John Campbell on a semi mired deep in the mud.
- 10.40 pm** **Lazy Car Dealer (R) PG**
 Alan finds a Classic Triumph Herald with Daughter Jess before ruining Nick's plan to turn a quick profit on an old Peugeot.
- 11.30 pm** **Eureka (F) PG**
 Series Final: Sheriff Carter and Allison Blake plan the perfect holiday surprise for their kids, but a magical wave of colour takes over Eureka, leaving the town in an animated adventure. S5 E14
- 12.20 am** **House (R) M-C**
 House is equally obsessed with a mother and daughter who don't lie, and using Christmas to create discord among the team members. S4 E10

Closed captions available

1.10 am

Flipping Bangers (R) G

What do you buy if you like a classic Fiat but the classic 500 is out of your league?

Yep, the 126 is the new target of the team and the one they find is rust-free but runs terribly. S3 E2

Closed captions available

2.05 am

Duke - Back In The Future

We'll catch you later on DUKE.

Friday 28 June

TVNZ DUKE

- 6.00 am** **On Duke Today...**
Here's what's on DUKE today.
- 11.55 am** **The Chase Australia (R) G**
Australian version of the critically acclaimed game show. Four strangers work individually and as a team to build a cashpot. Standing in their way is the Chaser, one of the world's top trivia brains.
Closed captions available
- 12.50 pm** **Frasier (R) PG-C**
While Frasier frantically prepares to host an important party, Niles tries to dissuade Daphne from pursuing a romance with Frasier's contractor. S3 E5
Closed captions available
Audio description available
- 1.45 pm** **Xploration: Awesome Planet (R) G**
Philippe Cousteau Jr., grandson of the legendary Jacques Cousteau, explores the most spectacular places - on the earth, inside the earth, and above the earth - in this riveting earth science series.
- 2.10 pm** **Grime & Punishment (R) PG**
Enforcement officers chase a flytipper on Christmas Day in Walsall. A festive fatberg leaves sewer cleaners in London with a mess on their hands. Grime busters across the UK clean up Christmas excess.
Closed captions available
- 3.05 pm** **The Season (R) PG**
Ben and his father Peter head to Cape York to hunt wild pigs which turns into a moving experience. Eamon learns the fate of the fallow deer he harvested, and Sarah and Nathan hunt wallaby. S1 E2
- 3.35 pm** **Toa Hunter Gatherer (R) PG-C**
Owen visits Mark & Brooke Molloy in the rugged West Coast town of Whataroa where Owen set out to hunt his first ever Chamois while camping in the Whataroa Valley. S3 E2
Closed captions available
- 4.05 pm** **The Chase Australia (R) G**
Australian version of the critically acclaimed game show. Four strangers work individually and as a team to build a cashpot. Standing in their way is the Chaser, one of the world's top trivia brains.
Closed captions available
- 4.55 pm** **The Unexplained With William Shatner (R) PG**
For centuries archaeologists and explorers have been obsessed with locating ancient cities lost to time. Some of these places are recorded in historical texts, while others are part of folklore.
Closed captions available
Audio description available

- 5.45 pm** **Frasier PG**
For their father's 65th birthday, Frasier and Niles compete to see who can buy him the best gift, while Sherry plans a party and ropes Daphne into doing all of the work.
Closed captions available
Audio description available
- 6.15 pm** **Brooklyn Nine Nine (R) PG**
Jake is called upon to negotiate a hostage situation with a jewel thief, only to discover that the culprit seems to be a familiar face. S5 E13
Closed captions available
- 6.40 pm** **The Office U.S (R) PG**
A fire in the kitchen forces the Dunder Mifflin paper company to the parking lot where Jim suggests a game of "Desert Island" - and they learn more about each another than they may have wanted. S2 E4
Closed captions available
- 7.10 pm** **Two And A Half Men (R) PG**
In a desperate attempt to prove that he is a family man, Charlie invites Lisa over for Thanksgiving dinner. S1 E10
Closed captions available
- 8.00 pm** **2 Broke Girls (R) PG-C**
Caroline drags Max to a cake-decorating class to increase their skill level and learn how to make more attractive cupcakes for their business. S1 E7
Closed captions available
- 8.30 pm** **Taskmaster (R) 16-L**
Greg Davies hosts as a quintet of brave yet terrified comedians undertake hilarious challenges. Tonight, Richard Osman and Doc Brown are two of the funny folk involved. S6 E3
Closed captions available
Audio description available
- 9.25 pm** **CSI: Crime Scene Investigation (R) M-C**
A human eyeball is found in a raven's nest, and the team traces it to a murdered woman; a car salesman has a heart attack and winds up on the autopsy table, but he is still alive. S3 E12
Closed captions available
- 1.05 am** **Outrageous Fortune 16-LS**
Van goes all out for love as Pascalle discovers Hayden and Loretta's marriage is based on lies. S6 E5
Closed captions available
- 2.45 am** **Duke - Back In The Future**
We'll catch you later on DUKE.