



16th July 2015

Dear Warwick,

Thank you for your enquiry.

The Commissioner's statements on the rate of sea level rise are based on projections from the Intergovernmental Panel on Climate Change (IPCC) and published research papers.

In its most recent report (2013), the IPCC projects changes in global mean sea level across four different scenarios of future greenhouse gas emissions. These scenarios range from taking actions that quickly and significantly reduce greenhouse gas emissions, through to no additional efforts to curb emissions. Across the four scenarios, the sea is projected to rise 17 to 38 cm by the middle of the century (2046-2065). The IPCC uses the average sea level between 1986 and 2005 as a baseline for these projections. These projections are therefore for a 60 year period.

Therefore the Commissioner is not saying "*we are guaranteed to get 300mm of sea level rise in 35 years, that is an average of 8.5mm a year*". Rather, she is saying that the IPCC projections mean that 20 to 40 cm (or about 30 cm) of sea level rise off the 1986-2005 baseline is 'locked in' by mid-century *regardless* of action to reduce greenhouse gas emissions. This is explained on pages 41 and 42 of her report.

In contrast, the IPCC projections for the end of the century (off the 1986-2005 baseline) diverge dramatically, ranging from 28 to 98 cm. This wide range is because the projections for rise later in the century are much more dependent on greenhouse gas emission scenarios.

The Commissioner's report is available [here](#); and the IPCC report chapter detailing the projections is available [here](#).

Regarding your first and second questions, the rate of sea level rise is usually assessed over multiple years rather than based on a single year.

For the long term trend in **global** mean sea level, please see Figure 3.5 on page 31 of the Commissioner's report which presents global mean sea level rise over the past 130 years. The IPCC has estimated that the average rate of sea level rise between 1901 and 2010 is between 1.5 and 1.9 mm per year ([IPCC, 2013](#)). For the more recent rate of rise, note 59 in the Commissioner's report describes an average rise in global sea level of 3.2 mm per year since 1992. Sources are referenced in the report.

Around the **New Zealand** coastline, mean sea level rise has risen roughly in line with the global average; although there is some variation around the country depending, for example, on whether the land is rising or falling. The long-term rate of sea level rise over the last century around New Zealand's coast has been recorded as between 1.3 and 2.2 mm per year ([Table 2; Hannah and Bell, 2012](#)). For the more recent period of 1993 to 2011, the rate of rise has been calculated as between 4 and 5 mm per year ([Ackerley et al., 2015](#)).

Regarding your third question, the IPCC report projects future increases in sea level based on four different scenarios of greenhouse gas emissions. Their report explains the relative contribution from expanding seawater, retreating glaciers, and shrinking ice sheets. This is summarised on pages 41-42 of the PCE's report.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'G Blackwell', with a large, stylized initial 'G'.

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Dr Grant Blackwell
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