

Summary

NIWA (and predecessor organisations) has a long history of undertaking technical work related to understanding the ecological status and water quality of the Manukau Harbour, as well as hydrodynamics of the harbour. Much of the latter work has been associated with specific activities:

- assessment of environmental effects associated with the discharge of treated wastewater.
- prediction of the fate and potential environmental or human health effects of various contaminants.
- understanding potential effects arising from infrastructure projects (e.g., the construction of bridges), or the effects of storm surges on infrastructure.
- potential effects related to discharges of stormwater (particularly the fate and potential effects of various contaminants).

The discharge of well-treated wastewater from Mangere wastewater treatment plant is the single largest freshwater inflow to the Manukau Harbour. It is also a point source of nitrogen and phosphorus. Much of the historical hydrodynamic modelling of the Manukau Harbour has been undertaken to better understand the fate and potential effects of well-treated wastewater.

Work currently being undertaken by NIWA for Watercare Services Limited is aimed at extending our knowledge of the fate and effects of contaminant inputs from all inflows to the harbour.

The following reports have some connection to hydrodynamic modelling in Manukau Harbour. A few of these represent summaries of essential field studies (data collection) that may subsequently be used for model development purposes. Recent examples include Pinkerton (2017), and MacDonald and Broekhuizen (2018).

Hydrodynamic modelling reports

Carter, L., Mitchell, J.S. (1991) Auckland Area Sewerage Study. Bathymetric investigations Manukau Harbour. Report on first stage investigations. NZOI, DMF, Wellington: 9 p., 1 app (in 3 sections).

Green, M. (2008a) Southeastern Manukau Harbour/Pahurehure Inlet contaminant study: implementation and calibration of the USC-3 Model. NIWA Client Report. Report no. HAM2008-140, 122 pp.

<http://www.aucklandcity.govt.nz/council/documents/technicalpublications/TR2008057.pdf>

Green, M. (2008b) Southeastern Manukau Harbour/Pahurehure Inlet contaminant study: predictions of sediment, zinc and copper accumulation under Future Development Scenario 1. NIWA Client Report. Report no. HAM2008-141, 117 pp.

<https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/unitary-plan/history-unitary-plan/documentssection32reportproposedaup/appendix-3-2-13.pdf>

Green, M. (2008c) Southeastern Manukau Harbour/Pahurehure Inlet contaminant study: predictions of sediment, zinc and copper under Future Development Scenarios 2, 3 and 4 NIWA Client Report. Report no. HAM2008-142, 121 pp.

<https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/unitary-plan/history-unitary-plan/documentssection32reportproposedaup/appendix-3-2-9.pdf>

Greig, M.J. (1991) Auckland Area Sewerage Study. Hydrological investigations, Manukau Harbour. Monthly progress report no. 2, June 1991. NZOI, DMF, Wellington: 2 p. [+ 26 p.].

Greig, M.J., Chiswell, S.M. (1991) Auckland Area Sewerage Study. Hydrological investigations, Manukau Harbour. Report on first stage investigations Papakura Channel. NZOI, DMF, Wellington: 19 p., 14 app.

Greig, M.J., Mitchell, J.S. (1991) Auckland Area Sewerage Study. Hydrological and bathymetric investigations. Manukau Harbour. Monthly progress report no. 1. May 1991. NZOI, DMF, Wellington: 5 p.

Greig, M.J., Stanton, B.R. (1992) Auckland Area Sewerage Study. Hydrological investigations Manukau Harbour. Reports on currents in Purakau Channel, Manukau Harbour. NZOI, NIWA, Wellington: 5 p., 8 figs.

MacDonald, I., Broekhuizen, N. (2018) Moored instrument measurements of hydrodynamic and water-quality properties in the northern Manukau harbour: September and October 2017. NIWA Client Report. Report no. 2018300HN, 66 pp.

Oldman, J.W., Bryan, K., Black, K.P. (1999) Manukau STP Ponds 1 and 2 Breach modelling. NIWA, Hamilton: 124 p.

Pinkerton, M. (2017) Satellite remote sensing of water quality and temperature in Manukau Harbour. NIWA Client Report. Report no. 2017092WN, 76 pp.

Pritchard, M., Gorman, R., Lewis, M. (2008a) SE Manukau harbour and Pahurehure inlet contaminant study: hydrodynamic, wave and sediment-transport model implementation and calibration. NIWA Client Report. Report no. HAM2008-138, 65 pp.

<http://www.aucklandcity.govt.nz/council/documents/technicalpublications/TR2008056.pdf>

Pritchard, M., Hancock, N., Lewis, M. (2008b) Manukau and Pahurehure Inlet contaminant study: harbour hydrodynamics and sediment transport fieldwork. NIWA Client Report. Report no. HAM2008-133, 29 pp.

<http://www.aucklandcity.govt.nz/council/documents/technicalpublications/TR2008055.pdf>

Reeve, G., Broekhuizen, N. (2019) Manukau Harbour hydrodynamic model - calibration and validation. NIWA Client Report. Report no. 2019124HN, 52 pp.

Senior, A.K., Oldman, J.W. (1999) Manukau STP Ponds 3 and 4 breach modelling. Manukau Wastewater Services Limited, Hamilton: 121.

Stephens, S., Wadhwa, S., Bell, R. (2016) Coastal hazard and sea-level rise inundation exposure for Onehunga, Mangere and Manukau. NIWA Client Report. Report no. HAM2016-066, 29 pp.