

Title	Annual mean sea level (relative to land) (1900–2013)
Type	Dataset
Subject	climate change
Source	University of Otago
Description	Sea-level rise is a consequence of climate change. Increases in global temperature cause ocean waters to expand, and glaciers and ice sheets to melt into oceans. Sea-level rise affects estuaries, coastal wetlands, and intertidal and sub-tidal habitats and species. The increased likelihood of coastal erosion from sea-level rise presents a risk for seaside communities and their infrastructure, and for the marine environment itself, from increased suspended sediments.
Rights	Creative Commons Attribution 3.0 New Zealand
Publisher	New Zealand's Environment Reporting Series: The Ministry for the Environment and Statistics New Zealand
Coverage	1900–2013; Auckland, New Plymouth, Wellington, Lyttelton, Dunedin
Identifier	<a href="https://data.mfe.govt.nz/x/jndYLK">https://data.mfe.govt.nz/x/jndYLK</a>
Language	eng-nz
Issued	21/10/2015
Environmental reporting topic	Sea level, temperature, and circulation
Environmental reporting category	National indicator
Methodology (collection & analyses)	<p>The indicator presents data on the rise in annual mean coastal sea levels relative to land for five locations across New Zealand (Auckland, New Plymouth, Wellington, Lyttelton, and Dunedin) and the trends over time. The data were corrected for land movements: tectonic events such as the Christchurch earthquakes between September 2010 and December 2011 resulted in an uplift of about 108mm at the Lyttelton site and 4mm at the McQueens Valley site at the base of Banks Peninsula. These results are consistent with previously published information using the same tide gauges (Hannah, 1990; 2004).</p> <p>Melting sea ice has little direct effect on sea-level rise, compared with the main factors of ocean expansion, and glacial and ice-cap melt.</p> <p>The 2014 Intergovernmental Panel on Climate Change (IPCC) report had a high confidence that coastal squeeze (when natural habitats are eroded by the sea and cannot retreat due to arable, built, or unsuitable land on their landward edge) will accelerate with rising sea levels (Wong et al, 2014). This can lead to habitat loss for resident or migrant species.</p>

	<p>References:</p> <p>Hannah, J (1990). Analysis of mean sea level data from New Zealand for the period 1899–1988, <i>Journal of Geophysical Research</i>, 95(B8): 12399–12405.</p> <p>Hannah, J (2004). An updated analysis of long-term sea level change in New Zealand. <i>Geophysical Research Letters</i>, 31(3): L03307, doi:10.1029/2003GL019166.</p> <p>Wong, PP, Losada, IJ, Gattuso, JP, Hinkel, J, Khattabi, A, McInnes, KL, Saito, Y, &amp; Sallenger, A (2014). <a href="#">Coastal systems and low-lying areas</a>. In Field et al (Eds.). <i>Climate change 2014: Impacts, adaptation, and vulnerability. Part A: Global and sectoral aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change</i>. Available from <a href="http://ipcc-wg2.gov/">http://ipcc-wg2.gov/</a>.</p>
Limitations to data & analysis	<p>The accuracy of the data source is of high quality.</p> <p>There is no information available for New Plymouth before 1955 (apart from some data for 1918–1921). The relative sea-level trend for New Plymouth is strongly influenced by the mean value for relative sea level for the 1918–1921 period. This single value, which was found in old correspondence files, is known to have been derived from the original tide charts.</p>
Changes to time series	