



Changing climate and rising seas: **Understanding the science**

Frequently Asked Questions

What is this report about?

This report explains the science of sea level rise, one of the major consequences of climate change. It aims to make this science both accessible and relevant to New Zealanders.

Why has the Commissioner decided to investigate sea level rise?

Sea level rise is a significant and certain effect of climate change. Flooding will occur more frequently in some low-lying coastal areas, when storm surges coincide with high tides. Coastal erosion will become an increasing problem in some areas.

Next year the Commissioner expects to release a follow-up report looking at which areas of New Zealand's coast are most vulnerable and assessing the risk to infrastructure in those areas.

What is causing the sea to rise?

Burning coal, oil, and gas releases carbon dioxide and this, along with other greenhouse gases, is warming the climate. As a consequence seawater is expanding, glaciers are retreating and ice sheets are melting.

How will sea level rise affect New Zealanders?

New Zealand is a coastal nation so the impact of even a small rise in sea level will be significant and very costly for some landowners. Storms occurring on top of a higher sea level will affect public infrastructure such as roads, railways and stormwater systems, as well as private homes and other buildings. Although not covered in this report, climate change is expected to result in more large storms compounding the effects of sea level rise.

Auckland experienced major coastal floods in 1936 and 2011. In 30 years' time, NIWA projects that floods of this size will occur about once every decade.

Can we stop sea level rise?

Around the world the average sea level has risen by about 20 centimetres in the last century. A rise of a further 30 centimetres by 2050 is now inevitable. But how high and how fast the sea rises in the longer term will be influenced by the speed at which the world – including New Zealand – reduces greenhouse gas emissions.

Is New Zealand doing enough to prepare for sea level rise?

Some in local government and the insurance industry have called for central government to do more to assist councils to prepare for sea level rise. This report sets out the science behind climate change and sea level rise to inform this debate.

Is New Zealand doing enough to reduce greenhouse gas emissions?

The Commissioner has previously argued for stronger policies to move New Zealand towards a low-carbon economy.

New Zealand has two opportunities in 2015. First, the Government will need to decide on New Zealand's commitment as part of negotiations for a new international agreement to reduce global greenhouse gas emissions. Second, the Emissions Trading Scheme is scheduled to be reviewed next year.

What kind of climate change research should be done in New Zealand?

Climate change science is very complex and incorporates many different disciplines and areas of work. This report is focused on one aspect – the rise in sea level that is already evident. It does not make recommendations about what kinds of climate change research should be undertaken in New Zealand.

How has the Commissioner developed this report?

The report has drawn on over two hundred years of science, the latest peer-reviewed research on sea level rise, and wide consultation with leading climate change scientists. As with all of the Commissioner's reports, this report has undergone a rigorous peer-review process. This report is focused on the science of sea level rise and uses the latest projections of future rise from the Intergovernmental Panel on Climate Change (IPCC). The IPCC reports cover the full range of climate change science and reflect the consensus of hundreds of experts from many different countries. The latest IPCC reports can be found [here](#).