

Coastal inundation mapping

Frequently asked questions (FAQs)

Why are you releasing this sea level rise information now?

We have made this information and maps available to help us continue our conversation with our communities on coastal management and to plan for our region's future.

We have produced maps showing flood extents under 'present-day' sea levels and then including 0.5 metres (m), 1m, 1.5m and 2m increments of sea level rise, so you can see how the risk will change in the future. Based on existing government guidance, we are expecting sea level rise somewhere between 0.5-1.5m over the next 100 years. The 2m sea level rise map is more likely to occur beyond the next 100 years.

How have climate change and sea level rise been factored into the models?

Records indicate that sea levels are rising in many areas across the earth. One of the key influences on future sea level rise and the frequency and magnitude of coastal inundation will be changes to the temperature and volume of the earth's oceans, which are strongly influenced by global greenhouse gas emissions.

Scientists predict that sea level will continue to rise in the future. We can't predict exactly when and how these events will occur, how big they will be and what effect they will have on our community, environment and landscapes, so any future planning has to take this uncertainty into account.

For this reason, the Ministry for the Environment has adopted four different sea level rise projections for New Zealand to guide planning and decision making today. These projections are based on four scenarios of possible future greenhouse gas emissions (referred to as "Representative Concentration Pathways" or RCPs).

Depending on which RCP we follow, the projected sea level rise is between 0.6m to 1.5m by 2130, and between 0.7m and 1.9m by 2150. Which of these projections becomes a reality is linked to how successful humans are in reducing global greenhouse gas emissions and the associated rise in the earth's surface temperatures. The RCP table can be viewed via the *coastal inundation map viewer* or on the [Shape Nelson](#) web page.

Who is affected by this information?

In November 2020 we wrote to landowners whose properties are included in the extent of the coastal inundation mapping. It is important to note that:

- for some properties, the house is not included in the maps, only an area of the land, garden or driveway
- in many cases, affected properties are outside of present-day coastal inundation areas, and will only be affected in the future with sea level rise

We recommend you refer to the [maps](#) to assess whether the risk to your property is an existing or possible future risk and to what extent your property is likely to be affected.

Have the assessments been peer-reviewed?

The methods used by Tonkin + Taylor Ltd to assess and map coastal inundation have been peer-reviewed by coastal expert Jim Dahm of Eco Nomos Ltd to make sure they conform to best practice. The reports associated with the mapping assessment and peer review can be viewed on Council's website <https://shape.nelson.govt.nz/coastal-hazards>.

How accurate are the coastal inundation maps?

The coastal inundation maps have been produced in line with contemporary, best-practice techniques, using the latest information available. They provide a reasonably accurate indication of the areas that are currently vulnerable and the areas that could potentially be exposed to risk over the next 100 years and beyond. However, the accuracy of mapping is dependent on the underlying topographic data, which was last captured using aerial LiDAR in 2015 and due to be refreshed in 2021.

The bathtub model does not show how fences, barriers, or structures may impede, impound or divert water flows. The maps cannot be relied upon for detailed property development purposes.

We will continue to refine the maps as we receive new or improved information.

We are also seeking information from the community that may help refine and improve existing knowledge. So, if you have information on coastal flooding please share it with us, either by email ourcoasts@ncc.govt.nz or by telephoning us on 03 546 0200.

My property is identified on the coastal inundation maps, does that mean my property will be impacted?

If your property is located within an area identified as being vulnerable to the impacts of sea level rise, there is a risk that it might be affected directly by seawater, by stormwater being trapped and not being able to exit during elevated seas or by groundwater as water tables rise with sea levels either now or in the future. To put this in context the future scenarios mapped may occur between the years 2060 to after 2150. If you want to find out more about the impacts of this email ourcoasts@ncc.govt.nz or telephone 03 546 0200 to arrange to talk to one of our planners.

My property is not shown on the maps even though I live near the coast, am I still affected?

There are properties close to the coast that are not included in the extent of the mapping because their land elevation is higher than the coastal flood levels (sea level rise and extreme storm-tide elevations) that we've mapped.

Rising sea levels will have increasing implications for 'everyday life' activities in our coastal communities. For example, road access to individual properties, delivery of services such as telecommunications, and access to coastal recreation reserves could all be affected by inundation.

There may also be other natural hazards that should be taken into consideration, such as coastal erosion, wave run-up, stormwater flows, river and stream flooding or elevated groundwater levels that may become more prevalent as sea levels rise.

As part of developing a long-term adaptive approach, we will need to consider the wider implications and a 'whole of community' response. Council would like to know what you have

seen and experienced in relation to coastal inundation or erosion and to draw on community knowledge. The information will help inform how we proceed with our response to rising sea levels.

Why is my property shown as being potentially affected when it's not directly connected to the coast?

The maps simply show land at or below the elevation of the particular scenario being viewed. The actual extent of the land flooded will be dependent on its connectivity and distance to the coast.

Low lying land not directly connected to the coast may appear on the maps due to its low elevation. These areas are not expected to be subject to seawater flooding as a result of overland flow but may be subject to ponding due to inflow of seawater through stormwater pipes, elevated groundwater levels or river flooding that may become more prevalent as sea levels rise.

What can I do?

We will be working through options with the community and encourage you to become actively involved in this conversation on coastal hazards and the development of an adaptation approach for the region. To find out where we are in the process, visit shape.nelson.govt.nz.

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What is a 1% AEP event?

AEP stands for Annual Exceedance Probability. It expresses the likelihood or probability of an event of a given size or larger occurring in any year; usually expressed as a percentage.

Without consideration of climate change, a 1% AEP flood event has a 1% chance of occurring in any year, or over a long period of time, an event of similar size may occur, on average, once every 100 years and may therefore also be termed a 100 year return period event. However, while the likelihood of an event occurring in any one year is low, the risk increases over time.

Sea level rise will increase the frequency and extent of coastal flooding over time – meaning that a rare event that would today be considered to have a 1% chance of occurring in any year, may have a 5% or 10% or higher chance of occurring in any year in the future.

For the Nelson urban area, a sea level rise of 0.4m – 0.6m would mean that a future tidal event that had the same flood level and extent as a present-day 1% AEP event (as shown in Figure 1 below) would be expected to occur on an annual basis.

With 0.8m – 1.0m of sea level rise, a future MHWS-6 spring tide (which occurs approximately 80 times per year-that includes storm surge) would have the same inundation extent as a present day 1% AEP event (see Figure 1 below). This can be observed in the mapping by comparing the present day 1% AEP flood extent (Figure 1) with the MHWS-6 (spring tide) flood extent for the 1.0m sea level rise scenario (Figure 2 below).

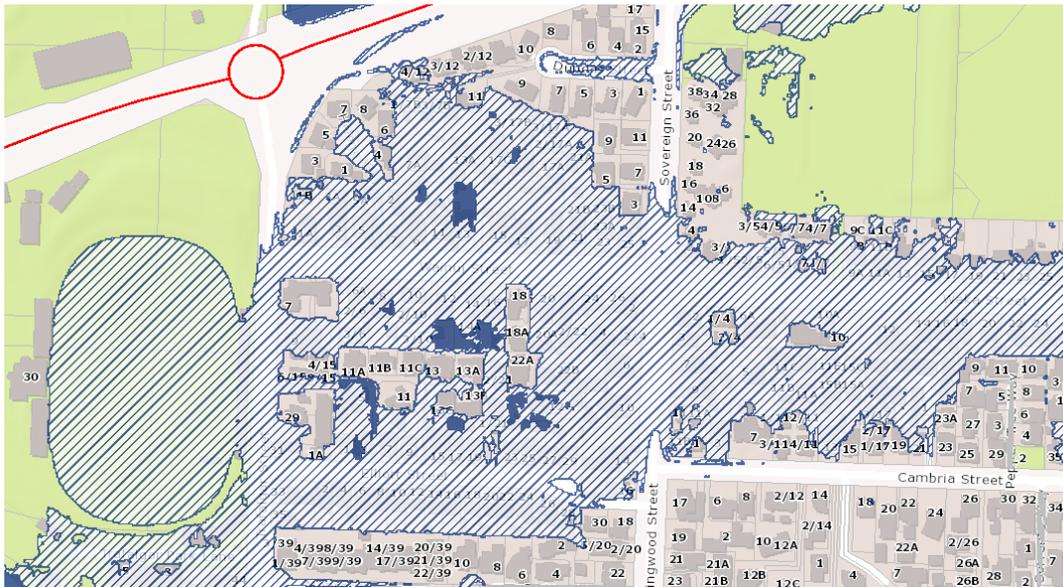


Figure 1 1% AEP flood extent (hatched dark blue), present-day, part of The Wood



Figure 2 MHWS-6 (spring tide) extent (solid dark green) and 1% AEP flood extent (hatched dark green) with 1-metre sea level rise, part of The Wood

Source Nelson City Council coastal inundation mapping

Figure 3 below illustrates the relationship between an increase in sea level rise and the present day 1% AEP event for four coastal cities.

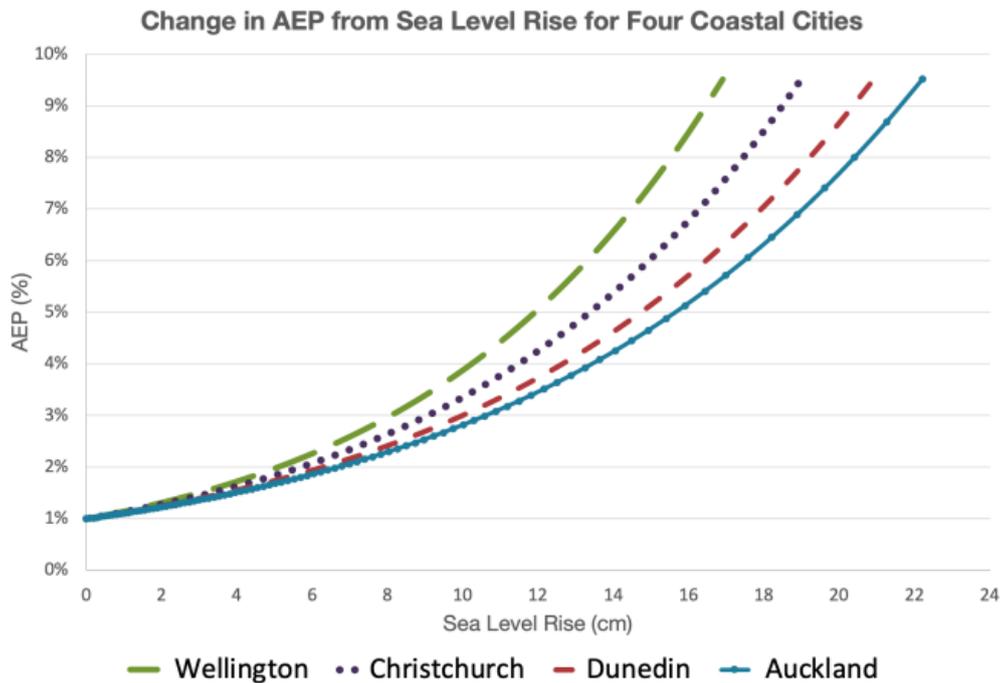


Figure 3 Estimated change in the present day 1% AEP from sea level rise for four coastal cities

Source <https://www.deepsouthchallenge.co.nz/sites/default/files/2020-12/Insurance%20Retreat%20December%202020%20FINAL.pdf>, p8

Additionally, the report prepared by the Parliamentary Commissioner for the Environment, *Preparing New Zealand for rising seas: Certainty and Uncertainty*, 2015 pp 29-31 describes the situation for the major coastal cities of New Zealand.

What relevance does this has for me? my property hasn't flooded or had erosion, so I am not affected

Coastal hazards not only affect individual coastal properties but will become increasingly relevant to areas that are important to the whole community, like beaches, coastal infrastructure, low-lying coastal settlements, coastal ecology, etc. Additionally, although a coastal property may not have flooded in the past, sea level rise may make it more likely to happen in the future. We need to have conversations about where and how we want to grow and about what we can and want to do along our coasts in the future – and everyone needs to have a chance to be involved in that. If you enjoy and value the coast, sea level rise is relevant to you.

What will you do with the information you collect?

The information collected will help the community and Council develop a good understanding of coastal inundation and its potential impacts. This will help us analyse the risk and develop management options for further discussion.

What if I want to sell my property?

Under the Local Government Official Information and Meetings Act 1987, councils have an obligation to make natural hazards information available.

When you're selling a property, you and your agent are legally obliged to share all relevant information about it to buyers. It's also important that potential buyers do their own due diligence on any property they wish to buy.

District and unitary councils also have specific obligations under the Building Act 2004. This allows people to access information held by council about their property or any property they are interested in.

The data used to prepare the maps will be applied on Land Information Memorandum (LIMs) and Project Information Memorandum (PIMs). Please see further information below on the legal requirements for LIMs.

How will this information be used by Council?

Council already uses information about hazards. The further coastal inundation information informs Council processes and our statutory obligations, including LIM notations, processing of resource consents and consideration in building consents.

Resource Management

Under the RMA 1991, councils are required to recognise and provide for the management of significant risks from natural hazards as a matter of national importance (s6(h)) and to have particular regard to the effects of climate change (s7(i)).

National instruments prepared under the RMA 1991 also place requirements on councils. The New Zealand Coastal Policy Statement 2010 (NZCPS) details existing national objectives and policies for coastal natural hazards. Policy 24 requires councils to identify coastal areas that will be potentially affected by coastal hazards over at least 100 years. Policy 25 sets the policy framework for planning decisions for land use and development in areas potentially affected by coastal hazards, with an emphasis on avoidance and reduction of risks.

Councils must give effect to the NZCPS and other national direction through their regional policy statement, regional plans and district plans. The operative suites of resource management plans for the two districts set out the [current] management regimes for dealing with risks from natural hazards and include controls on the use of land for the purpose of the avoidance or mitigation of natural hazards (Inundation Practice Note: Calculating minimum ground and/or floor levels for subdivision, new buildings and major alterations' NCC and TDC, 2019).

For Nelson City Council, there is a review of the planning documents currently underway. The broad approach to coastal inundation will be developed through that process, and involve engagement and consultation with the community as recommended via the Ministry for the Environment's Coastal Hazard and Climate Change, Guidance for Local Government, 2017 document.

Resource consents

Both Nelson City Council and Tasman District Council already account for sea level rise and inundation when issuing resource consents. The approach taken for managing risks from inundation is explained in the 'Inundation Practice Note: Calculating minimum ground and/or floor levels for subdivision, new buildings and major alterations' (NCC and TDC, 2019).

When considering an application for resource consent, Council must have regard to any actual and potential effects on the environment of allowing the activity, including the effects arising from natural hazards (s104).

Council may refuse or grant a subdivision consent subject to conditions if there is a significant risk from natural hazards (s106). Any assessment of the risk from natural hazards requires a combined assessment of:

(a) the likelihood of natural hazards occurring (whether individually or in combination); and

(b) the material damage to land in respect of which the consent is sought, other land, or structures that would result from natural hazards; and

(c) any likely subsequent use of the land in respect of which the consent is sought that would accelerate, worsen, or result in material damage of the kind referred to in (b) above.

Conditions attached to subdivision consents granted may include the protection of the land and any adjacent land against natural hazards including inundation (s220).

For any new subdivision and development, an applicant will need to demonstrate that newly formed allotments contain adequate space for buildings which are not subject to material damage from inundation in response to a 1% AEP design event (refer to Section 2.3). Furthermore, it will need to be demonstrated that in achieving this there are no adverse effects (raised flood levels, diversion of flood flows and/or secondary flood routes) that occur on adjacent or surrounding property in response to this design flood event. Other resource management plan considerations such as amenity and servicing also need to be incorporated into design and decision making processes.

For other development (on existing titles) subject to the RMA 1991, the practice note process will be the same as for subdivision and development as described above.

However, the full application of this process may be modified on a case by case basis where the development is of a limited duration and consequently will not be subject to long term projected climate change effects (Inundation Practice Note, TDC and NCC, 2019, pg7-8).

Building Consents

As for the Resource Consent process above, both Nelson City Council and Tasman District Council already account for sea level rise and inundation when issuing building consents. In March 2019, both Council's adopted the 'Inundation Practice Note: Calculating minimum ground and/or floor levels for subdivision, new buildings and major alterations'. The Inundation Practice Note will continue to apply, and be subject to regular reviews.

The Inundation Practice note sets out a standard approach for industrial professionals (e.g. surveyors and engineers) and Council to calculate acceptable floor and ground levels, given the Ministry for the Environment's predicted increases in sea levels. The document also explains Councils approach under the Building Act 2004 in more detail.

The Building Act 2004 manages natural hazards in relation to the construction and modification of buildings. Council is required to take into account certain natural hazards, including inundation, when determining whether to grant building consents on land subject to specified natural hazards, with certain exceptions (under s.71-74). The

emphasis in the management of natural hazards is to encourage people to avoid situations in which they or their property could be at risk.....

E1 of the Building Code requires buildings and site work to be constructed to protect people and other property from the adverse effects of surface water. Performance E1.3.2 requires that surface water, resulting from an event having a 2% AEP [i.e. 1 in 50-year event], shall not enter housing, communal residential and communal non-residential buildings (Inundation Practice Note, TDC and NCC, 2019, p8).

The Inundation Practice Note also sets out Council's approach to Hazard Notices under the Building Act 2004 (refer pages 31-32).