

Ōhinetahi-Governors Bay



The community at **Ōhinetahi-Governors Bay** is significantly elevated and generally out of reach of coastal hazard impacts. However, the shoreline and low-lying areas such as the Head to Head Walkway will be increasingly impacted by coastal hazards as sea levels rise. The extent of coastal flooding is unlikely to change much over time, but the depth and duration of flooding will increase over time, as will the risk of erosion.

The Ōhinetahi-Governors Bay tidal flats are recognised as a place of ecological and cultural value and the low-lying Head to Head Walkway is recognised as a significant and valued community asset.

Te Hapū o Ngāti Wheke Inc is the Papatipu Rūnanga legal entity that represents Ngāti Wheke, the hapū with manawhenua status over the Whakaraupō basin and surrounding areas as outlined in the Port Cooper Deed. This entire area is culturally significant to Ngāti Wheke and sustains the hapū. Te Hapū o Ngāti Wheke has a strategic plan, a key part of which is the protection and enhancement of the whenua, moana and awa. Ngāti Wheke hopes to be a part of the leadership in climate action for future generations.

Mō tātou, ā, mō kā uri ā muri ake nei.
For us and our children after us.

Christchurch City Council recognises the rangatiratanga of Ngāti Wheke over its whenua and is working in partnership to plan for impacts on public assets and places of value.

| | Short-term | Long-term |
|--------------------|------------|-----------|
| Coastal flooding | Yellow | Orange |
| Coastal erosion | Yellow | Orange |
| Rising groundwater | Yellow | Yellow |

The colours in this table* show how exposed this area is to each of the coastal hazards and are indicative only. Yellow refers to low exposure to the hazard and orange to moderate exposure.

Environmental setting

Ōhinetahi-Governors Bay is nestled at the head of Whakaraupō-Lyttelton Harbour and is comprised of a shallow intertidal environment that backs onto a steep, populated, hillside. These tidal mudflats support mahinga kai - areas of food gathering, valued habitats and diverse ecosystems. It is recognised that these mudflats help to mitigate coastal hazards by reducing wave energy.

The mudflat areas located at the head of Whakaraupō-Lyttelton Harbour are classed as regionally, nationally and internationally significant as a bird habitat and also support a variety of native mollusc, worms and crustacea species.

* The table is intended to provide a sense of what hazards are most relevant to the location and how severe the impacts might be. The colouring has been informed by the Christchurch City Council's 2021 Coastal Hazard Assessment and data held by the Council about risks to assets.

Rising seas

Sea level rise

The long-term record at Lyttelton Port tells us that sea level has risen by around 30cm between 1901 and 2018, at a rate of 2.2mm/year. Over this period the rate of sea level rise increased slightly.

Projections from the Intergovernmental Panel on Climate Change (IPCC) indicate that we should expect between 17-23cm of sea level rise to occur by 2050, and 52cm-1m by 2100 depending on how significantly we are able to reduce greenhouse gas emissions.

The amount of sea level rise that we experience can depend on where we are located, because the land that we stand on can also move.

Vertical land movement

The NZ SeaRise Programme (www.searise.nz) has estimated local rates of land movement to help us understand where land is going up (uplift) and where it

is going down (subsidence). These changes in land level, known as vertical land movement, can slow local rates of sea level rise in areas experiencing uplift and speed up sea level rise where land is subsiding.

When thinking about how we can adapt, it is useful to understand ‘relative sea level rise’ which includes the effects of local vertical land movement.

Historically, Ōhinetahi-Governors Bay has experienced minor uplift which could slow the onset of coastal hazard impacts locally. The rates of uplift for this area are 1-1.5mm/year. If this rate of uplift continues over the next 30 years (to 2050), the rate of sea level rise could be slowed by roughly 15 percent, from around 6.5mm/year to around 5.5mm/year.

All locations in Ōhinetahi-Governors Bay have some degree of historic uplift (Source: NZ SeaRise). There is uncertainty associated with this data, so this information should be considered indicative only.



Coastal hazards in Ōhinetahi-Governors Bay – today

Ōhinetahi-Governors Bay is relatively sheltered due to its location at the head of the harbour and only small areas of land are exposed to coastal hazards due to the steep topography.

This area can be impacted by waves travelling into the harbour, however the relatively shallow water depth surrounding the bay means these waves are small. Winds can generate waves within the harbour that can cause erosion and flooding around the shorefront and Head to Head Walkway. The shorefront can also be impacted by spring and king tides and storm surge; a temporary rising of water levels that occurs during a low pressure weather system.

You might have photos or stories about previous storms in this area. If you would like to share these with us then please get in touch at coastalcommunities@ccc.govt.nz

Coastal hazards in Ōhinetahi-Governors Bay – the future

Coastal flooding & rising groundwater

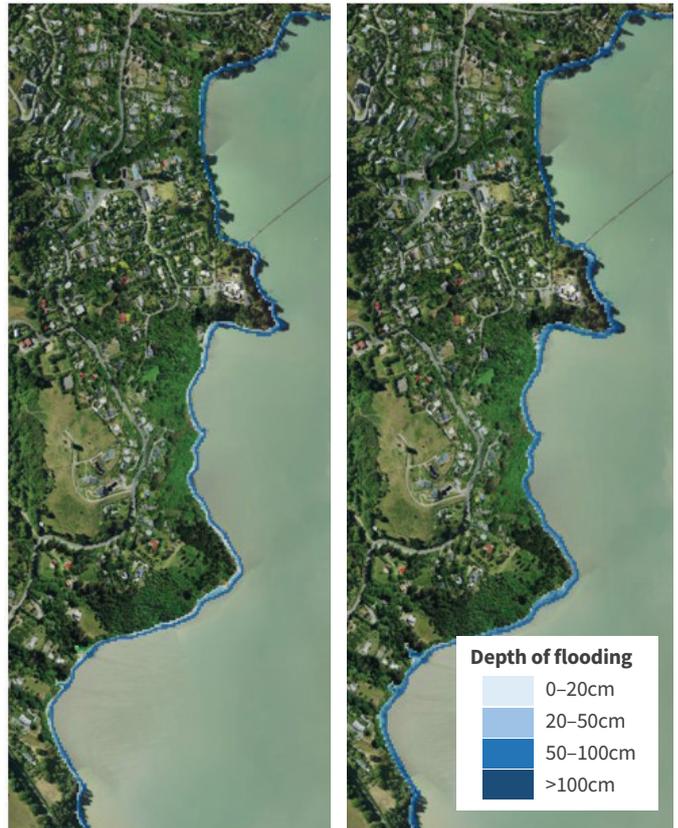
Rising sea levels are unlikely to increase the extent of coastal flooding or rising groundwater in this area because of the height of the land. Rising sea levels will however increase the frequency and severity of flood events that occur along the shorefront and Head to Head Walkway, particularly when storm surge and spring/king tides occur at the same time.

The images to the right show the projected flooding extent and depths with 40cm of sea level rise (left) and 1m of sea level rise (right).

Coastal erosion

As sea levels rise, slightly larger waves will reach the Ōhinetahi-Governors Bay shorefront, increasing rates of erosion. The lower slopes of Ōhinetahi-Governors Bay are partially protected by the rock wall which extends along the Head to Head Walkway. The condition of this rock wall will influence the rate at which these lower slopes erode in the future.

We don't have a detailed assessment of erosion risk for this area, because the historic development of the Head to Head Walkway and associated rock wall means that we lack an understanding of the past rates of natural erosion. As a result, it is difficult to predict how the coast might respond in the future. A high-level assessment of erosion risk shows us the area which may be at risk of slope instability because of coastal processes. This area of instability is shown to be 30m wide (dashed line) and is a generic setback distance, rather than a site-specific projection of erosion.



Coastal flooding extents and depths with 40cm (left) and 1m (right) of sea level rise – sourced from Coastal Hazard Assessment 2021 (Tonkin & Taylor). The maps show the projected flooding during a rare (1 in 100 year) storm event.



Coastal erosion distances sourced from Coastal Hazard Assessment 2021 (Tonkin & Taylor). The orange dashed line shows the area prone to instability resulting from coastal processes.



What is at risk?

The primary public asset at risk of coastal hazards in this area is the Head to Head Walkway, which will be at greater risk of erosion and flooding as sea levels rise. Other assets at risk include the jetty and wastewater infrastructure located along the base of the hillside.

While Ōhinetahi-Governors Bay does include a significant amount of residential property, it is generally so elevated that it is out of reach of coastal hazards. Erosion of the lower slopes and the resulting slope instability could impact assets and residential properties located at higher elevation. It is unlikely that these impacts would occur in the next 50 years.

The mudflat areas within the bay are places of significant ecological and cultural significance. With rising seas, we expect these environments to be placed under increased pressure as they become squeezed between the sea and the land. The ability of these environments to adapt to rising seas will depend, in part, on how the shorefront is managed.

Where to find out more:

- Christchurch City Council webpage on coastal hazards and adaptation planning ccc.govt.nz/adapting-to-coastal-hazards/
- Christchurch City Council coastal hazards portal gis.ccc.govt.nz/hazard-viewer/
- NZ SeaRise webpage, for information on sea level rise and vertical land movement www.searise.nz/