

Sea level rise – what will the effects be?

Sea level in New Zealand has been rising at an average rate of 1.7 mm per year for the last 100 years. The most likely estimate when looking towards the year 2100, is for another rise of between 30 and 50 cm.

In the Wairarapa, this sort of a rise in sea level will not be much of a hazard on its own. However, it will accelerate erosion from wave action and cause more frequent flooding from storm surges. This needs to be a consideration for the future safety of present coastal communities and new developments.

Controlling the problem – what are we doing and what can you do?

Local authorities in the Wairarapa manage coastal hazards by creating hazard zones, undertaking dune care programmes, and through civil defence and signage. Due to the Wairarapa's wild physical environment and poorly understood coastal processes, these methods are not always enough to reduce the risk to an acceptable level.

You can help reduce the risks to yourself by taking note of the following points:

- Always take into consideration possible future shifts in shoreline position due to coastal erosion if you are developing coastal land.
- Before developing always consider the effects of elevated sea water levels on your property as a result of storm surge and large waves which can greatly accelerate erosion and cause flooding.
- Joint public and council initiatives such as dune care programmes can help reduce the risks of coastal hazards.
- Always take note of warning signs on the coast for tsunami as well as beach and wave hazards.
- A hazard assessment undertaken by a professional can help you plan a safe development which avoids unnecessary risks.

For more information on what you can do contact Greater Wellington, or your local council or consult the Wairarapa Coastal Strategy document entitled *Caring for our coast – a guide for coastal visitors, residents and developers*. Included in these guidelines are more detail and advice on reducing the risk from hazards and carrying out hazard assessments

A wave overtops the reef and popular fishing platform at Castlepoint



Further Reading

- Wairarapa Coastal Strategy Group, 2004. *Wairarapa Coastal Strategy, 2004. Caring for our coast – a guide for coastal visitors, residents and developers*.
- Greater Wellington Regional Council Hazard Fact Sheet series.
- Wairarapa Coastal Strategy Group, 2002. *Coastal Hazards in the Wairarapa*, Wairarapa Coastal Strategy Technical Report.
- National Tsunami Hazard Mitigation Program, 2001 *Designing for tsunamis – seven principles for planning and designing for tsunami hazards*.
- Tonkin and Taylor, 2002. *Options for managing risks from tsunami in the Wellington region*. A report prepared for Greater Wellington.

Coastal hazards in the Wairarapa

New Zealanders have a fascination with living and playing on the coast. As a consequence, we are exposed to a variety of coastal hazards that occur on this relatively narrow strip of land.

This fact sheet talks about what coastal hazards affect us, and what you can do about reducing the risks. It has been written for those who want to know more about coastal hazards and those who want to develop near the coast.

Why do coastal hazards affect us in the Wairarapa?

The Wairarapa coast's unique natural setting makes it a rugged and beautiful place to live and visit. As a result, it's becoming an increasingly popular place for development and recreation. By increasing our use of the coastal margin, we are putting pressure on this fragile environment and increasing the risk of being exposed to coastal hazards. The Wairarapa coast experiences many hazards because of its location, geology, and exposure to a high energy wave environment.

Coastal erosion – why do we have it?

Coastal erosion occurs when parts of the coast are washed away by high waves, allowing the sea to move in and take its place. It only becomes a hazard when houses, roads and other infrastructure have been built too close to the sea.

The erosion of coastal land is usually due to wave action but can also be worsened by people's activities such as building on sand dunes, the construction of poorly planned sea walls, and poorly planned storm water runoff. Much of the Wairarapa coast is already undergoing long term erosion due to the soft nature of the rock and exposure to high-energy waves. It is therefore important for development to recognise this threat. Some areas of the Wairarapa are eroding at a rate greater than one metre per year. The diagram on the following page shows an example of just how quickly some coastlines can erode.

The beaches at Castlepoint and Riversdale Beach can suffer from short periods of erosion, which can be severe and threaten property, especially if a series of storms occur close together. Council and community initiatives such as dune care programmes minimise the need to use engineering structures such as sea walls. Reducing unplanned human interference is important in slowing coastal erosion in these areas.

To minimise the risk, don't locate any valuable permanent assets too close to the water, and consult your local council for information related to coastal erosion for your property.



A Palliser Bay house claimed by the sea.

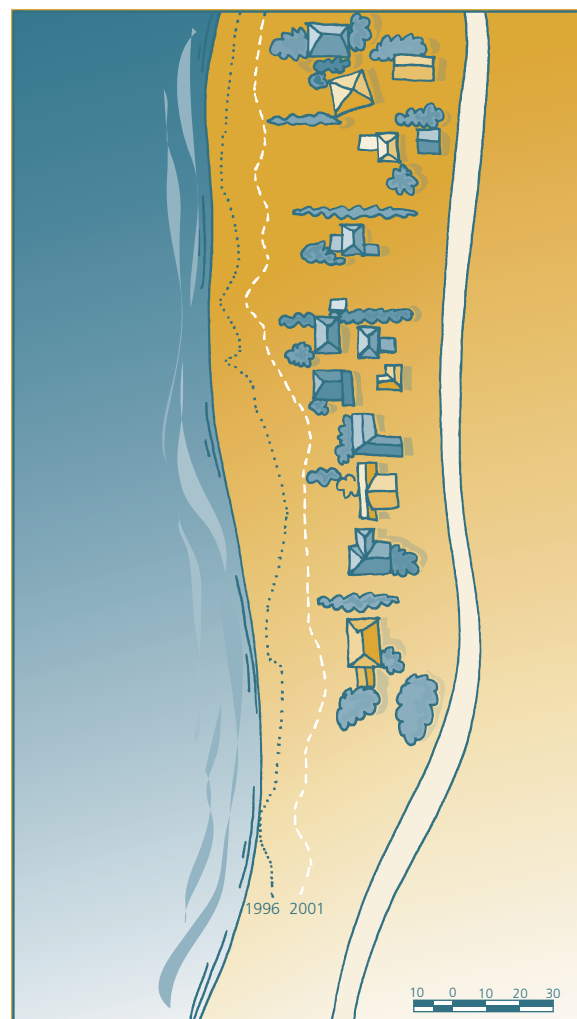


Cape Palliser Road and several houses have been lost to the sea due to erosion in eastern Palliser Bay.

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Comparing the shoreline positions in 1996 and 2001 using aerial photos at Whatarangī shows over 15 metres of erosion in some places over this period.

Storm surge – why is it a hazard?

A storm surge is a temporary rise in sea level that occurs during large storms with very low air pressure.

In New Zealand, the low air pressure and strong winds that come with storms can raise sea level half to one metre above its usual level. Large waves can then wash further inland than normal, causing accelerated erosion and flooding of houses and land. If they coincide with a high tide, the problem is worsened.

Several storm surges have affected the Wairarapa in the past, particularly Riversdale Beach. It's possible storm surges may become more frequent and/or more severe with climate change and the rise in sea level (see fact sheets *Climate Change* and *Meteorological Hazards*).

Along with erosion hazards, storm surges need to be taken into account when designing development. The most vulnerable sites are Riversdale Beach, Castlepoint and any new developments on eroding coast, especially those on low lying, flat land.

Tsunami – are we at risk?

The Wairarapa is at very high risk (higher than on the west coast) of receiving large tsunami because it is exposed to several tsunami generating sources. The Wairarapa coast can receive tsunami from **distant** sources such as South America, or from **local** sources such as offshore faulting or trenches. Some part of the Wairarapa can expect a large tsunami approximately once every 150 years (including both local or distant sources). By world standards, this is a high risk.

The last big **local** Wairarapa tsunami occurred in the 1855 Wairarapa earthquake when a series of waves, the biggest about 10 metres, ran up into Palliser Bay. A similar wave today would cause devastation for any Wairarapa coastal community in its path.

Warning signs along the coast remind visitors and residents of the dangers and what you should do in case of a tsunami.

If you hear a tsunami warning over the radio, TV, or from emergency services, you should continue to listen to the radio for advice and follow instructions. If you feel a large earthquake, a local tsunami may have been generated close to shore and there will be no time for an official warning. In this case **move inland or to higher ground immediately**. Never go down to the beach to see a tsunami arrive, and stay away from estuaries and rivers.

Areas most at risk include Riversdale Beach, Castlepoint, Flat Point, eastern Palliser Bay and the lower Wairarapa Valley below Lake Wairarapa. This is due to the number of houses, people and roads in the area and their close proximity to sea level and rivers, which channel tsunami waves.

Read our fact sheet *tsunami hazard* for further information.



Signs like this have been placed around the Wairarapa coast warning people of the tsunami dangers and advising what to do when you feel an earthquake.



Ngawi and Castlepoint are two of the Wairarapa communities vulnerable to tsunami due to their relatively low elevation and exposure to tsunami generating sources.

What other natural hazards can affect the Wairarapa coast?

Much of the Wairarapa coast consists of a narrow strip of land bordered by steep hill slopes or cliffs which give rise to wind and slope stability hazards in some areas.

Damage to coastal structures has occurred in the past from strong northwest winds in localised areas as a result of winds accelerating over and down the eastern hills. This effect is similar to the one experienced in the lee of bigger mountain ranges such as the Tararua and Southern Alps. Gusts of over 200 km/hour have been observed at Cape Palliser and over 180 km/hour at Castlepoint. Wind speeds this great are classified as hurricane force and have the potential to cause structural damage to buildings that haven't been designed for large wind loadings.

The steep nature of much of the Wairarapa coast can also lead to slope hazards such as rock falls and rainfall related problems such as river scour, unwanted deposition of debris and flooding. Developments close to or on steep slopes or depositional fans (see photograph below) should have the risks assessed early by a professional as part of the development programme.



During high rainfall events, streams on fans such as this can leave their course and flow randomly, causing damage from flooding, scouring and deposition. This has happened in the past at Ngawi.

Did you know recreational hazards on the coast are the biggest killers?

In New Zealand, more people die each year on the coast from recreational related hazards than from all the other coastal hazards. This is also true in the Wairarapa. For example, several people have been killed while walking on or fishing from the reef at Castlepoint due to a lack of awareness and general understanding of wave hazards. The reef can be overtopped even in slight sea conditions and there are warning signs reminding people of the dangers.



Watch out for signs like these warning people of the hazards associated with recreation on the coast.