

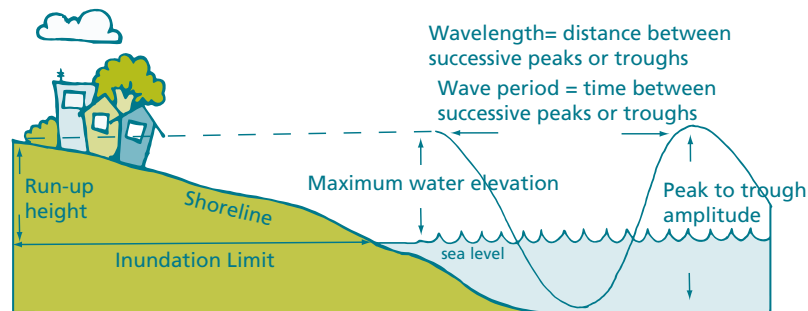


Tsunami Hazard

This fact sheet describes hazards and risks associated with tsunami in the Wellington Region.

What is a tsunami?

Tsunami is a Japanese word meaning 'harbour wave'. A tsunami is a series of waves generated by the sudden disturbance of a water surface by submarine earthquakes, underwater landslides, volcanic eruptions or even meteorite impacts. The disturbance creates energy that is transmitted through the water as a series of low, but extremely fast moving waves. They can have periods of over 1 hr and move at speeds of up to 700 kph in the open ocean. Tsunami are not usually noticed at sea, but when one



approaches the coast it slows down and grows in height. Sometimes this produces a breaking wave, but more commonly it causes an extremely rapid flow of water, similar to a fast moving tide or a river. There is usually more than one wave in a tsunami and often the 3rd wave is the highest.

Features of a tsunami.

What effects do tsunami have?

Tsunami can inflict major damage to buildings and infrastructure, cause widespread coastal erosion, flooding and salt water damage and result in injuries and loss of life. A lot of damage is caused by debris entrained in the flow (e.g. boulders, boats, timber, glass, cars). Up to 75% of fatalities can be caused by impacts from floating debris. An equal amount of damage occurs when the water drains back to sea. Water depths of 2.0 m or more are destructive and life-threatening, but even water 1.0 m deep can cause significant damage and wash people off their feet. Another serious health and safety hazard comes from contaminants like sewerage and hazardous substances that may be spilled into the water. Tsunami can be a major secondary hazard associated with a large earthquake that may already have caused serious damage.

How is the Wellington Region at risk?

The Wellington region is at risk from tsunami generated from both overseas (over 3 hrs) and local sources (under 1 hr). Local tsunami could be generated by submarine faulting or landslides in Cook Strait, or along the Pacific-Australia Plate boundary or from numerous underwater faults all around the coast. The level of risk around the coast varies depending on exposure levels to local and distant sources. The Kapiti Coast is considered to have the lowest risk; Wellington a moderate to high risk and the Wairarapa coast (east and south) the highest risk.



Tsunami Hazard from distant sources.

Have we experienced tsunami in the Wellington Region?

Since 1848 there have been four tsunami over 1.0 m in the Wellington region and numerous smaller events under 0.35 m. The largest of these was caused by the Wairarapa earthquake in 1855. There were 3.5 m breaking waves at the Harbour entrance and waves over 5.0 m at Cape Palliser. Water washed over Lyall and Evans Bay and flooded shops along Lambton Quay. There is one historical account of a wool shed being destroyed in Palliser Bay situated 9.0 m above sea level. Another large event occurred in 1960 that was generated by a large earthquake off the coast of Chile. It produced a wave approximately 1.0 m high around Wellington and there were reports of a 1.5 m high wave at Ngawi.

Will there be any warning?

If a local earthquake or landslide causes a tsunami, there may only be a few minutes warning or none at all. If the wave trough arrives first, you will see a withdrawal of water from the coast, but if the crest arrives first there will be no such warning. An tsunami generated overseas could take up to 14 hrs to reach New Zealand. In this situation the Pacific Tsunami Warning Centre in Hawaii sends a warning to Civil Defence authorities who will warn the local community. Warning will be broadcast over radio and television. Civil Defence authorities are currently working on evacuation plans for at risk communities.

For more information, check the Yellow Pages or contact a civil defence emergency management advisor at your local council.

Did you know?

In 1988 a large rock fall in Deep Cove, Doubtful Sound lifted a 40 tonne boat 4.0 m onto a wharf.

A 1.0 m tsunami occurred in Tauranga Harbour in 1979 after a cliff collapsed into the water.

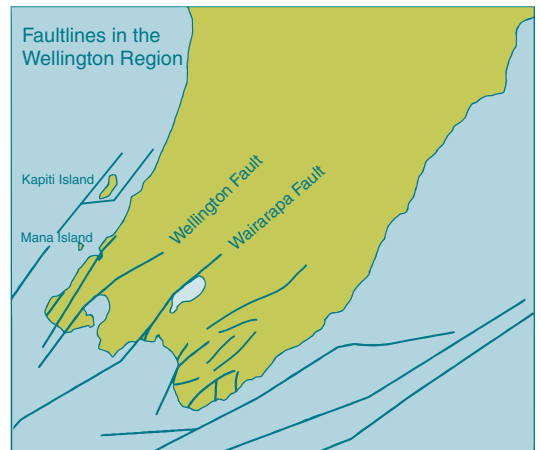
Further reading:

Review of Tsunami Hazard and Risk in New Zealand. Compiled by Kelvin Berryman, Institute of Geological & Nuclear Sciences, 2006, for Ministry of Civil Defence and Emergency Management. Copies available to view at Greater Wellington or online at: www.civildefence.govt.nz

Wellington Regional Tsunami Hazard Scoping Project. GeoEnvironmental Consultants, 2001. Report prepared for Greater Wellington. Copies available to view at Greater Wellington or online at: www.gw.govt.nz

For interesting tsunami facts and information: www.tsunami.noaa.gov

Check out the Pacific Tsunami Warning Centre: www.prh.noaa.gov/ptwc



Tsunami Risk in the Wellington Region



Tsunami warning sign on the Wairarapa Coast.

What should I do?

If you hear a tsunami warning or after a very strong earthquake:

- Move inland or to higher ground
- Listen to the radio for further advice
- Do not go to the coast to see the tsunami

For more information, contact
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