



# Hazard Factsheet: Tsunami



Auckland  
Emergency  
Management

Tsunami are series of ocean waves that can cause significant destruction along coastlines. They are usually caused by underwater disturbances such as earthquakes, landslides or volcanic eruptions that create waves which travel out in all directions. These waves can appear small and travel at high speeds across the deep ocean, but slow and grow in height and destructive power as they approach the coast.

All New Zealand's coastline, including Auckland, is at risk from tsunami due to our position in the Pacific Ring of Fire. This is a geologically active area surrounding the Pacific Ocean marked by frequent earthquakes and volcanic eruptions because of the collision and subduction of the earth's tectonic plates.

The National Emergency Management Agency separates tsunami into three types, depending on where they form, with each type creating unique challenges:

- Distant source tsunami: generated across the Pacific Ocean like in Chile, Alaska, or Japan, which could take 14 hours or more to arrive.
- Regional source tsunami: generated from the southwest Pacific like Tonga, Samoa and Vanuatu, which could take between one and three hours to arrive.
- Local source tsunami: generated very close to New Zealand, which could arrive in minutes.

**If you are near the coast, you need to act immediately if you experience any of the following:**

**FEEL** a strong earthquake that makes it hard to stand up, or a weak rolling earthquake that lasts a minute or more.

**SEE** a sudden rise or fall in water level.

**HEAR** loud and unusual noises from the water.



## HOW A TSUNAMI WORKS

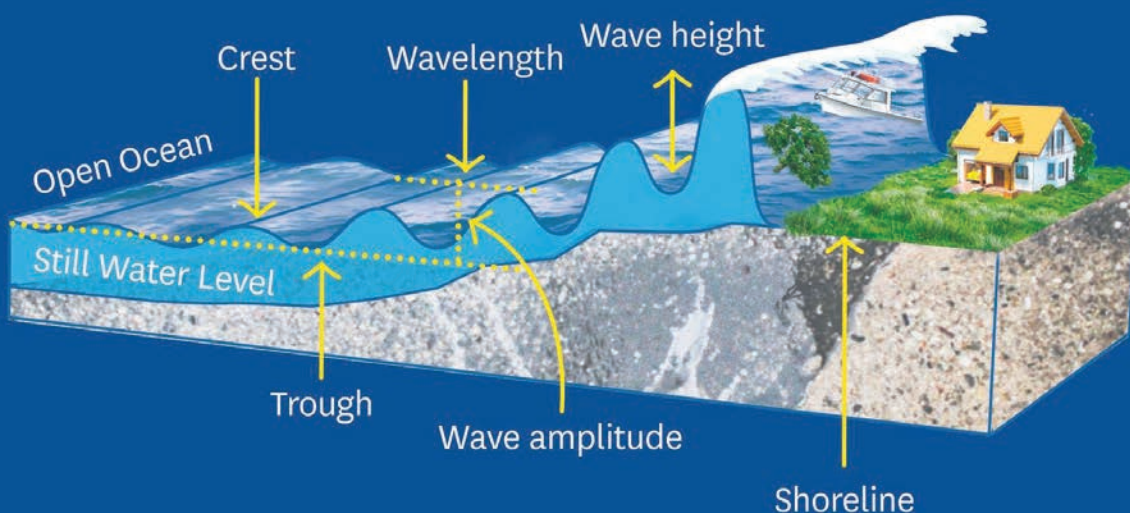


Figure 10: How a tsunami wave changes as it moves from the open ocean on to land. Source: NEMA

**Move immediately to the nearest high ground or as far inland as you can, out of tsunami evacuation zones. Do not wait for official warnings.**

Immediately follow the advice of any emergency warning. Do not wait for more messages before you act.

- Walk, run or cycle if you can and remember your grab bag. This reduces the chances of getting stuck due to damaged roads or traffic congestion.
- While evacuating, be aware of other hazards. For example, a large local earthquake may damage electricity lines and bridges and create liquefaction and landslides.
- Do not return until an official all-clear message is given. Tsunami activity can continue for several hours, and the first wave may not be the largest. If there was an earthquake, expect aftershocks that may generate another tsunami.

If you live near the coast but are not located in a tsunami evacuation zone, you do not need to evacuate. Your whare/home could be a safe location for friends and whānau/family who need to evacuate.

Tsunami can be very dangerous for boats and their crews.

#### **Tsunami dangers for boats include:**

- Strong and unpredictable currents and surges that can affect ports and marinas even during small tsunami.
- Grounding of vessels, as water levels can suddenly drop.
- Capsizing due to incoming surges, complex coastal waves, and surges hitting grounded boats.
- Collision with other boats, docks, debris and changes to the seafloor such as movement of sand bars, wrecks, reefs and boulders.



**A tsunami could be generated at any time** – Earthquakes, volcanic eruptions, landslides and meteor impacts are all unpredictable events that may generate tsunami.

**There may be very little warning time for a tsunami** – Depending on the source location, there may be very little warning time.

**There may be more than one wave** – Tsunami waves, unlike normal beach waves, have very long wavelengths (distance between successive waves) which can range from several kilometres to over 400km long.

**The first wave may not be the largest** – A tsunami is a series of waves and the first wave to reach the shore may not be the largest.

**Tsunami waves may continue for some time** – Tsunami waves may continue to arrive for up to 24 hours and these may arrive at intervals of five minutes to an hour.

**Tsunami waves may run many kilometres inland** – Particularly in low-lying areas, tsunami waves may flood inland and up rivers for many kilometres.

## **Know your tsunami evacuation zones**

A tsunami evacuation zone is an area that you may need to leave if you feel a long or strong earthquake, or if there is an official tsunami warning.

Make sure you know where to go, whether you are at whare/home, at work or out and about.

Search for your whare/home, work or school address on the Auckland Emergency Management Hazard Viewer to find out if they are in a tsunami evacuation zone.

In Auckland we have two types of tsunami zones – red, and yellow – based on the areas that can be affected in different sized tsunami.

**Red** is a shore and marine threat zone: This includes the shore and adjacent low-lying areas most likely to be affected by a tsunami. You should avoid this area following any tsunami alert for the Auckland rohe/region until you are told it is safe to return.

**Yellow** is a land threat zone and is the area that would need to be evacuated. You should evacuate this area if directed, or if you notice any natural warnings, until you are told it is safe to return.