

## **Tsunami Fast Facts**

### What is a tsunami ?

A tsunami, from the Japanese word for "harbour wave" is a series of giant, long ocean waves (10 or more) created by an underwater disturbance such as an earthquake, landslide, volcanic eruption, or meteorite. A tsunami can move hundreds of miles per hour in the open ocean and smash into land with waves as high as 100 feet or more.

### What are the elements most at risk during a tsunami:

- All structures within 200 m of low lying coastal area are most vulnerable to direct impacts of tsunami waves, and the debris brought by these waves. Settlements in adjacent areas will be vulnerable to floods and scour.
- Structures constructed of wood, mud, thatch, sheets, and structures without proper anchorage to foundations are at risk from tsunami waves and flooding.
- Other elements at risk are infrastructure facilities like ports and harbors, telephone and electricity poles, and cables. Ships and fishing boats near the coast may also be damaged/destroyed.
- Earthquakes and tsunami waves may damage both structural and non-structural elements within the built environment. Essential infrastructure (roads, harbors, power plants, banking, etc.) can be damaged which will shut down a community (for further information see <http://www.nerc-bas.ac.uk/tsunami-risks/html/C1Infra.htm> ).

### How can communities be more protected against tsunamis?

Here are some things that can be done to protect homes and communities from the damage caused by tsunamis:

#### Before the tsunami

##### Reinforce building structures

- Remove homes and buildings to higher land that is away from the coastline. All structures within 200 meters of low lying coastal areas are most vulnerable to the impact of tsunami waves.
- Important buildings, such as schools and hospitals, should be built at higher locations.
- Designate tsunami hazard areas. A hazard map should be prepared, showing areas that could be damaged by flooding caused by tsunami waves. Development in these areas should be avoided, or kept to a minimum.

##### Take some shore line protections:

- Build structures to help protect the shoreline from tsunami damage:

- Seawalls and revetments are structures that can be built along the shoreline to help protect the shore from storm waves. Seawalls are vertical walls made of strong material, such as concrete, that can withstand the power of storm surges. .
- Breakwaters may also protect the shoreline from waves. They are constructed some distance away from the coast in shallow water, to protect gently sloping beaches.
- Build and/or protect natural wave barriers. Natural barriers may help to protect the shore, and they also provide important habitat for fish and wildlife. However, because tsunami waves are so powerful, these measures cannot be relied on alone to protect from the biggest waves.
- Sand dunes may be built to act as a buffer from waves. Existing dunes may be stabilized by planting grasses, shrubs and trees.
- Maintain and/or construct mangroves (tree formations found along tropical and sub-tropical coastlines). These act as natural shock absorbers, soaking up destructive waves.
- Protect coral reefs. They act as natural wave-breakers.
- Shrubs, grasslands, and marshes will not provide adequate protection against tsunami waves, but will help to absorb flood water.
- Sea cliffs act as a natural wall against approaching waves, helping to break their power.

Raise community awareness about tsunami risk:

- Make sure there is a hazard map prepared with designated areas expected to be damaged by flooding caused by tsunami waves.
- Make sure the community has an evacuation plan, and practice it!
- Make sure the public knows that when sea waters recede noticeably, everyone must head for high land. This is nature's warning of an approaching tsunami.
- Place tsunami evacuation signs along roadways clearly indicating the direction inland or to higher ground. These signs will assist coastal residents and visitors in finding safer locations if a tsunami strikes.

Make sure there is a working early warning system in place

- Tsunami early warning systems exist for many countries around the Pacific Ocean, and in certain other tsunami-prone areas. These systems give the public advance warning of tsunami waves, enabling communities to take the appropriate precautions. Make sure that that early warning systems warn all communities of coastal areas when there is the threat of a tsunami. Tsunami warnings should be disseminated at all levels (local, regional, national, international). For more information on early warning systems see:

<http://www.unisdr.org/ppew/> and  
<http://www.unisdr.org/ppew/tsunami/ppew-tsunami.htm>

For more measures to be taken before and during the tsunami see also:

[http://ioc3.unesco.org/itic/categories.php?category\\_no=146](http://ioc3.unesco.org/itic/categories.php?category_no=146)  
<http://www.geophys.washington.edu/tsunami/general/mitigation/mitigation.html#facts>

After a tsunami:

- Draw lessons
- Build back better
- Invest even more in mitigation measures

[http://www.fema.gov/hazard/tsunami/ts\\_after.shtm](http://www.fema.gov/hazard/tsunami/ts_after.shtm)

Good case studies

The Pacific Tsunami Warning System

<http://ioc3.unesco.org/indotsunami/>  
<http://www.geophys.washington.edu/tsunami/general/historic/chilean60.htm>

For more general information about tsunami

<http://www.fema.gov/hazard/tsunami/index.shtm>  
[http://ioc3.unesco.org/itic/categories.php?category\\_no=4](http://ioc3.unesco.org/itic/categories.php?category_no=4)  
<http://www.tsunami.noaa.gov/>