

# Are you prepared for disasters?



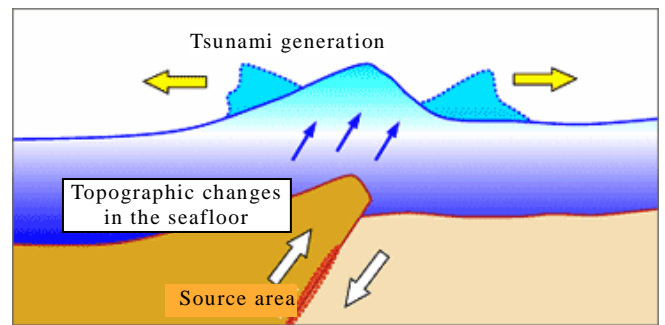
## 2. Tsunami

Tsunami waves may strike after an earthquake. If you feel strong shaking and are in or near the coast, evacuate immediately to high ground or another safe place. Tsunami waves may strike repeatedly with high speed, and the first wave is not necessarily the biggest. Do not go near the sea until the tsunami warning or advisory is lifted.

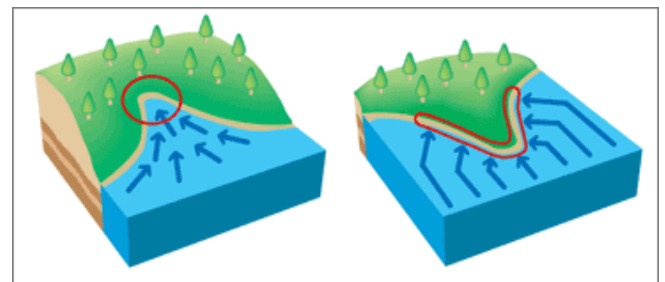
### Why do tsunami occur?

#### - What is a tsunami?

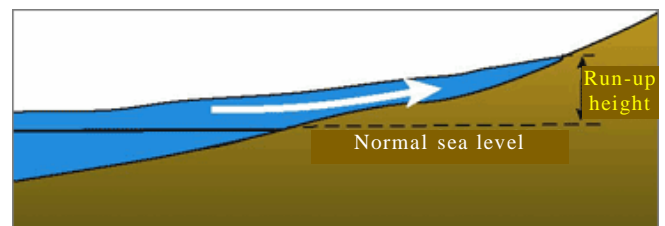
When a large earthquake occurs at a shallow depth below the seafloor, the resulting fault movement causes the seafloor to rise or subside. This in turn causes massive amounts of water to move up and down, and this movement spreads out in all directions in the ocean. This is how a tsunami is generated.



Tsunami have a longer wavelength than normal ocean waves. As they lose little energy in their motion, they travel further.



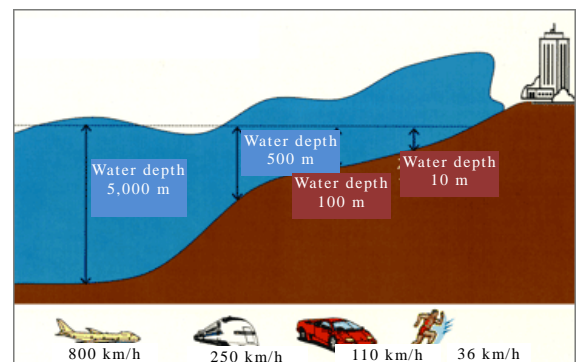
Tsunami waves propagate more slowly as the sea becomes shallower. As a result, trailing waves catch up with those ahead nearer the coast, and the tsunami grows much higher. Coastal landforms and buildings can also cause wave reflection and diffraction, thereby amplifying tsunami heights in some areas.



Tsunami may run up from the waterfront to inland areas depending on coastal landforms. These waves contain massive amounts of water welling up from the seafloor to the surface; they can run ashore with huge power and wash away everything in their path, destroying buildings and carrying inland large ships, rocks and other objects, which themselves can further damage houses and buildings. Tsunami can also run up rivers and cause damage to basin areas.

#### - Tsunami speed

Tsunami waves travel faster through deep water and more slowly as they reach shallower coastal areas. As a result, trailing waves catch up with those ahead nearer the coast, and the tsunami grows much higher.



## Tsunami damage

The greatest damage caused by the 1993 Hokkaido Nansei-oki Earthquake resulted from a tsunami that struck shortly after the tremor. Waves higher than 3 meters hit all coastal areas of Okushiri Island near the epicenter off the coast of Hokkaido immediately after the quake, and waves measuring over 10 meters were also observed in many areas. The event caused extensive damage and many casualties.

More recently, the 2003 Tokachi-oki Earthquake triggered tsunami waves as high as 2.55 meters at Tokachi Port and over 4 meters in coastal areas in the towns of Taiki and Akkeshi. The tsunami also ran 11 kilometers up the Tokachi River.

Japanese people are all too familiar with tsunami-related disasters.

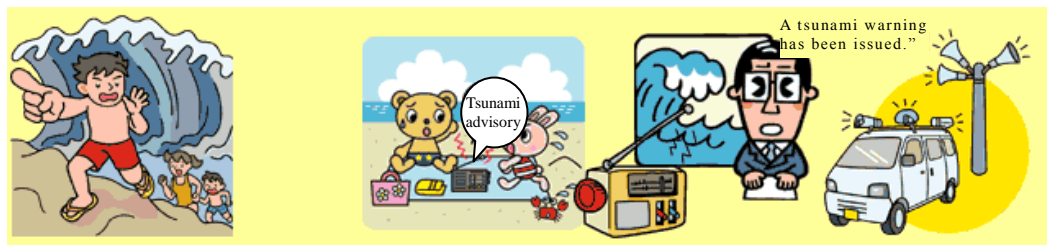
## Tsunami countermeasures

### If you are in or near the coast

Leave the area immediately and evacuate to high ground or another safe place if strong shaking or weak but long-lasting slow shaking is felt.

### Get reliable information

Get information from TV, radio and/or other official channels; do not act on hearsay or rumors. Stay away from the sea until the tsunami warning or advisory is lifted.



## Tips to protect yourself from a tsunami

<b>General public</b>	<ol style="list-style-type: none"><li>1. Leave coastal areas immediately and evacuate to a safe place if strong shaking (seismic intensity of 4 or greater) or weak but long-lasting slow shaking is felt.</li><li>2. Even if you do not feel shaking, leave coastal areas immediately and evacuate to a safe place if a tsunami warning is issued.</li><li>3. Get reliable information from TV, radio, municipal information cars and/or other official channels.</li><li>4. Do not approach the seashore to engage in bathing or fishing activities when a tsunami advisory or tsunami warning is in effect.</li><li>5. Remain on alert until the warning or advisory is lifted, as tsunami waves may strike repeatedly.</li></ol>
<b>Ships</b>	<ol style="list-style-type: none"><li>1. Evacuate from the port (*Notes 1 and 2) immediately if strong shaking (seismic intensity of 4 or greater) or weak but long-lasting slow shaking is felt.</li><li>2. Even if you do not feel shaking, evacuate from the port (*Notes 1 and 2) immediately if a tsunami warning or advisory is issued.</li><li>3. Get reliable information from TV, radio and/or other official channels.</li><li>4. Small ships that cannot evacuate from the port (*Note 2) should be pulled up to high ground and lashed; if this is not practical, the best possible action under the circumstances should be taken.</li><li>5. Remain on alert until the warning or advisory is lifted, as tsunami waves may strike repeatedly.</li></ol> <p>*Note 1: from the port: to deeper, broader waters</p> <p>*Note 2: Evacuation from the port, pulling up of small ships and other measures should be taken only when there is time to do so before a tsunami strikes.</p>

