

Tsunami Awareness

Even if you do not live near the coast, you must know about tsunamis. Today, many people travel to ocean resorts, enjoy cruises, and have increased potential to be exposed to such a threat.

WHAT IS A TSUNAMI?

You may have seen a large wave with white cap ready to smash down on a beach in the movies. That's what Hollywood thinks it is. However, that's not entirely correct!

A tsunami is a series of large ocean waves generated by either large subduction zone earthquakes, which deform the ocean floor, by landslides within or falling into the ocean. When the waves enter shallow depths near a coastline, they may rise to several feet or, in rare cases, tens of feet. If you are on a beach or in low coastal areas, you must be aware that a tsunami could arrive within minutes after a severe earthquake. A tsunami's danger period can even continue for many hours after a significant earthquake and can occur during any season of the year and at any time, day or night.

CAUSES OF TSUNAMIS

Any disturbance in the ocean that causes the displacement of large amounts of water could result in a tsunami. While earthquakes may be the common cause, not all earthquakes generate a tsunami. To generate tsunamis, earthquakes must occur underneath or near the ocean, be of a significant magnitude and create vertical movement of the seafloor. Generally, earthquakes that occur on strike-slip faults, such as the San Andreas, do not by themselves generate tsunamis. However, sizeable strike-slip earthquakes may trigger landslides which could cause a local tsunami.

Most tsunamis are caused by earthquakes generated on a subduction zone, where one tectonic plate is forced under another plate. One plate is pushed down in subduction zones, and an adjacent plate is forced up, causing an earthquake. The plates' movement displaces water on the ocean floor vertically, resulting in a wave that then propagates horizontally through and across the entire ocean.

Eventually, water rushes landward and may flood the shoreline resulting in inundation of dry land. While tsunamis can occur in any oceanic region globally, more large earthquakes take place in the Pacific Ocean basin than anywhere else.

NEAR AND DISTANT SOURCE TSUNAMIS

After an event on the ocean floor (earthquake, landslide) displaces water, a wave is formed, which travels out from where the event occurred. Some of the water travels across the ocean basin. Scientists refer to this event as a "distant source tsunami." Distant source tsunamis usually provide more time than near source tsunamis for warning and preparation.

If your organization is located in or near a tsunami threat zone, Titan HST can be used to facilitate tsunami drills, warnings, or updates during or following the event. The National Weather Service may also issue alerts, watches and warnings. You may also receive official instructions from your local government officials through the media.

Near the source, tsunamis are caused when a subduction zone (such as Cascadia) is immediately offshore from your location. They can be more dangerous as they are closer to shore and reach your shoreline within minutes of the originating earthquake. They may also be larger than a wave coming from across the ocean when they strike, as their energy has not had time nor distance to dissipate.

Near the source, tsunamis provide little to no time for warning, evacuation, first responder preparation, and dangerous circumstances for the response. For near source tsunamis, do not wait for official warnings to evacuate. Strong shaking and other natural warning signs are indicators that a tsunami could be on the way.

Consider establishing a preset broadcast message with local tsunami evacuation protocols!

Information and instructions can be quickly disseminated to your organization members through Titan HST even if you've already evacuated, and, in several redundant methods in the event that local networks are not reliable. Emergency information can be communicated via mobile app including the use of dual-channel mesh networking, text message, email, web, auto-call, or social media.

NATURAL WARNING SIGNS

Natural warnings may occur before a tsunami, however, in such cases, the warning indication may occur only a few minutes before the tsunami impact. Knowing what to watch for, how to react, and where to go in the event of a tsunami is the most effective way to understand how to protect yourself and your family. The bottom line is...

1. When at the coast, know where safe, high ground is located.
2. When you are near the shore and feel a firm ground shaking that lasts a long time, drop, cover and hold on until the shaking stops, then move to higher ground.

3. If you see the water recede out to sea, abnormally far from shore, move to higher ground.
4. If you hear a loud ocean roar, move to higher ground.
5. If you observe any of these natural warning signs, a tsunami may arrive in minutes and last for eight hours or longer.
6. Never return to the shore until you are given the "all clear" from a reliable source.

Knowing this information will allow you to react more quickly and safely when a tsunami is expected. Visit the resources section below for more information!

UNDERSTANDING TSUNAMI SIGNAGE

When you travel along the United States' coastal areas, you will see Tsunami Hazard Zone signs. In that case, you are in an area that a tsunami could potentially inundate.

ENTERING/LEAVING TSUNAMI ZONE

The Entering/Leaving signs are used to delineate defined inundation areas on federal and state highways, local streets, and roads. You are considered safe and out of the tsunami hazard zone if moving inland away from the coast from these signs.



HAZARD

Upon seeing a tsunami hazard sign, identify possible locations to which you will travel if the water starts moving. These signs are generally located near the immediate coastline, parking lots, parks, and beaches. When seeing this sign, be prepared by taking note of the location to which you will go after an earthquake. In most cases, safe, high ground is reachable by foot.



EVACUATION ZONE

Evacuation Route signs are used with arrows to direct individuals toward a safe area. Follow the arrows until reaching an evacuation site. These signs can be found on federal and state highways, as well as local streets and roads.



EVACUATION SITE

Signs designating an Evacuation Site may be used to direct road users, including pedestrians and cyclists, to safe areas. Evac signs such as these are further confirmation that you've reached, or are on your way, to safe, high ground.



DID YOU KNOW?

- Most tsunamis are not one big breaking wave that overruns the shore. They are usually a series of waves behaving similar to a rapidly rising high tide that can repeatedly continue over many hours and even days.
- In most cases, the first in the series of waves is not the biggest. A tsunami may start small, relatively speaking, and develop over time. People have been killed most often by subsequent waves, coming hours after the "start" of a tsunami.
- Tsunamis travel faster over the open ocean than they do toward land. They travel at speeds of up to 600 mph in the open ocean, about the speed of an airline jet.
- Not all tsunamis are recognizable by the fast recession of water from the shore. Only about 40% of tsunamis produce this natural warning sign.

RESOURCES

[TSUNAMI PREPAREDNESS](#)

[SOCIAL MEDIA MESSAGING, NOAA](#)

[TSUNAMI AWARENESS & SAFETY, NTHMP](#)

[BE INFORMED: TSUNAMIS, READY.GOV](#)

[TSUNAMI SAFETY E-BOOKLET, NOAA](#)