

# Tsunamis



Tsunamis (pronounced soo-ná-mees), also known as seismic sea waves (mistakenly called “tidal waves”), are a series of enormous waves 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.

From the area where the tsunami originates, waves travel outward in all directions. Once the wave approaches the shore, it builds in height. The topography of the coastline and the ocean floor will influence the size of the wave. There may be more than one wave and the succeeding one may be larger than the one before. That is why a small tsunami at one beach can be a giant wave a few miles away.

All tsunamis are potentially dangerous, even though they may not damage every coastline they strike. A tsunami can strike anywhere along most of the U.S. coastline. The most destructive tsunamis have occurred along the coasts of California, Oregon, Washington, Alaska and Hawaii.

Earthquake-induced movement of the ocean floor most often generates tsunamis. If a major earthquake or landslide occurs close to shore, the first wave in a series could reach the beach in a few minutes, even before a warning is issued. Areas are at greater risk if they are less than 25 feet above sea level and within a mile of the shoreline. Drowning is the most common cause of death associated with a tsunami. Tsunami waves and the receding water are very destructive to structures in the run-up zone. Other hazards include [flooding](#), contamination of drinking water, and [fires](#) from gas lines or ruptured tanks.

## Before a Tsunami

The following are things you can do to protect yourself, your family and your property from the effects of a tsunami:

- To begin preparing, you should [build an emergency kit](#) and make a [family communications plan](#).
- Talk to everyone in your household about what to do if a tsunami occurs. Create and practice an evacuation plan for your family. Familiarity may save your life. Be able to follow your escape route at night and during inclement weather. You should be able to reach your safe location on foot within 15 minutes. Practicing your plan makes the appropriate response more of a reaction, requiring less thinking during an actual emergency.

- If the school [evacuation plan](#) requires you to pick your children up from school or from another location. Be aware telephone lines during a tsunami watch or warning may be overloaded and routes to and from schools may be jammed.
- Knowing your community's warning systems and disaster plans, including evacuation routes.
- Know the height of your street above sea level and the distance of your street from the coast or other high-risk waters. Evacuation orders may be based on these numbers.
- If you are a tourist, familiarize yourself with local tsunami evacuation protocols. You may be able to safely evacuate to the third floor and higher in reinforced concrete hotel structures.
- If an earthquake occurs and you are in a coastal area, turn on your radio to learn if there is a tsunami warning.

### **Know the Terms**

Familiarize yourself with these terms to help identify a tsunami hazard:

#### **Warning**

A tsunami warning is issued when a tsunami with the potential to generate widespread inundation is imminent or expected. Warnings alert the public that dangerous coastal flooding accompanied by powerful currents is possible and may continue for several hours after initial arrival. Warnings alert emergency management officials to take action for the entire tsunami hazard zone. Appropriate actions to be taken by local officials may include the evacuation of low-lying coastal areas, and the repositioning of ships to deep waters when there is time to safely do so. Warnings may be updated, adjusted geographically, downgraded, or canceled. To provide the earliest possible alert, initial warnings are normally based only on seismic information.

#### **Advisory**

A tsunami advisory is issued when a tsunami with the potential to generate strong currents or waves dangerous to those in or very near the water is imminent or expected. The threat may continue for several hours after initial arrival, but significant inundation is not expected for areas under an advisory. Appropriate actions to be taken by local officials may include closing beaches, evacuating harbors and marinas, and the repositioning of ships to deep waters when there is time to safely do so. Advisories are normally updated to continue the advisory, expand/contract affected areas, upgrade to a warning, or cancel the advisory.

#### **Watch**

A tsunami watch is issued to alert emergency management officials and the public of an event which may later impact the watch area. The watch area may be upgraded to a warning or advisory - or canceled - based on updated information and analysis. Therefore, emergency management officials and the public should prepare to take action. Watches are normally issued based on seismic information without confirmation that a destructive tsunami is underway.

## Information Statement

A tsunami information statement is issued to inform emergency management officials and the public that an earthquake has occurred, or that a tsunami warning, watch or advisory has been issued for another section of the ocean. In most cases, information statements are issued to indicate there is no threat of a destructive tsunami and to prevent unnecessary evacuations as the earthquake may have been felt in coastal areas. An information statement may, in appropriate situations, caution about the possibility of destructive local tsunamis. Information statements may be re-issued with additional information, though normally these messages are not updated. However, a watch, advisory or warning may be issued for the area, if necessary, after analysis and/or updated information becomes available.

## During a Tsunami

- Follow the evacuation order issued by authorities and evacuate immediately. Take your animals with you.
- Move inland to higher ground immediately. Pick areas 100 feet (30 meters) above sea level or go as far as 2 miles (3 kilometers) inland, away from the coastline. If you cannot get this high or far, go as high or far as you can. Every foot inland or upward may make a difference.
- Stay away from the beach. Never go down to the beach to watch a tsunami come in. If you can see the wave you are too close to escape it. CAUTION - If there is noticeable recession in water away from the shoreline this is nature's tsunami warning and it should be heeded. You should move away immediately.
- Save yourself - not your possessions.
- Remember to help your neighbors who may require special assistance - infants, elderly people, and individuals with access or functional needs.

## After a Tsunami

- Return home only after local officials tell you it is safe. A tsunami is a series of waves that may continue for hours. Do not assume that after one wave the danger is over. The next wave may be larger than the first one.
- Go to a designated public shelter if you have been told to evacuate or you feel it is unsafe to remain in your home. Text **SHELTER** + your ZIP code to **43362** (4FEMA) to find the nearest shelter in your area (example: *shelter 12345*).
- Avoid disaster areas. Your presence might interfere with emergency response operations and put you at further risk from the residual effects of [floods](#).
- Stay away from debris in the water; it may pose a safety hazard to people or pets.
- Check yourself for injuries and get first aid as needed before helping injured or trapped persons.
- If someone needs to be rescued, call professionals with the right equipment to help. Many people have been killed or injured trying to rescue others.
- Help people who require special assistance—infants, elderly people, those without transportation, people with access and functional needs and large families who may need additional help in an emergency situation.
- Continue using a [NOAA Weather Radio](#) or tuning to a Coast Guard station or a local radio or television station for the latest updates.

- Stay out of any building that has water around it. Tsunami water can cause floors to crack or walls to collapse.
- Use caution when re-entering buildings or homes. Tsunami-driven floodwater may have damaged buildings where you least expect it. Carefully watch every step you take.
- To avoid injury, wear protective clothing and be cautious when cleaning up.

This information is taken from: <http://www.ready.gov/tsunamis>

While a tsunami might not seem a threat to us being inland quite a ways, remember that our rivers flow out to the Delta. The Delta flows out to the ocean. A tsunami hitting San Francisco could easily surge back up through the Delta and reverse flow back up through our rivers. This could easily cause breaches and failures in our dikes and levies. Even if the dikes and levies were to hold, the reverse surge could cause the river levels to overflow the dikes and levies and still cause major flooding.

This and other training modules from this website will be helpful to your family and you as an ARES member. It might be advisable to print these modules out and keep them in a binder for your family to be able to refer to in your absence. Being prepared is no accident.

