

## What can I do ahead of time to protect myself and my family from a tsunami?

(continued)

**3. Take a first aid class.** Learn survival skills, talk with your family, friends, and neighbors. Knowledge is your greatest defense against any potential disaster.

**4. Join a Community Emergency Response Team (CERT).** Contact your local Office of Emergency Services to see if there is a CERT in your area or find out how to start one in your own community.

### Remember:

**Never** go to the coast to watch for a tsunami if you hear that a warning has been issued. Tsunamis move faster than a person can run. Also, incoming traffic hampers safe and timely evacuation of coastal areas.

Tsunamis are **not surfable!** They are not V-shaped or curling waves. Large tsunamis most frequently come onshore as a rapidly rising turbulent surge of water choked with debris.

All Tsunamis – like hurricanes – are potentially dangerous, even though they may not damage every coastline they strike.

Our coastlines are vulnerable but damaging tsunamis are rare along the California coast. Understand the hazard and learn how to protect yourself, but don't let the threat of tsunamis ruin your enjoyment of the beach.

## Who gives Official Tsunami Warnings?

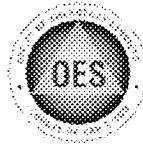
The West Coast & Alaska Tsunami Warning Center is responsible for issuing warnings and information about potential tsunamis along the West Coast of the United States. Bulletins are typically issued within 10 – 15 minutes of a large undersea earthquake in the Pacific basin. The information is transmitted to local emergency response personnel who decide whether or not to order an evacuation. For more information, contact:

**West Coast & Alaska Tsunami Warning Center**  
910 S. Felton, Palmer, AK 99645  
Phone: 907-745-4212 FAX: 907-745-6071  
<http://wcatwc.arh.noaa.gov/>

### For Further Information about Tsunamis:

**Federal Emergency Management Agency**  
FEMA 500 C Street, SW Washington, D.C. 20472  
Phone: (202) 566-1600  
<http://www.fema.gov/hazards/tsunamis/>

### For local Emergency Information:



Office of Emergency Services  
5555 Overland Ave, Suite 1911  
San Diego, CA 92123  
(858) 565-3490  
Email: [oes@sdcounty.ca.gov](mailto:oes@sdcounty.ca.gov)  
Website: [www.sdcounty.ca.gov/oes](http://www.sdcounty.ca.gov/oes)

# Tsunami!

How to survive this Hazard on California's Coast



**IF YOU FEEL A STRONG EARTHQUAKE WHEN YOU ARE ON THE COAST:**



1. **Duck, cover and hold on** and watch for falling objects until the earthquake is over.



2. **Move to higher ground** or inland away from the coast immediately. A tsunami may be coming. Go on foot if at all possible.

**Do Not Wait For Official Warning**



3. **Stay away from the coast**; do not return to shore after the first wave. Waves may continue to arrive for hours



4. **Listen to your radio** for an official "all clear" before returning to the beach.

## What is a tsunami (soo-nah-mee)?

A tsunami is a series of sea waves most commonly caused by an earthquake beneath the sea floor. In the open ocean, tsunami waves travel at speeds of up to 600 miles per hour. As the waves enter shallow water, they may rise to several feet or, in rare cases, tens of feet. The waves can cause great loss of life and property where they come ashore. The first wave is often not the largest; successive waves may be spaced tens of minutes apart and continue arriving for a number of hours.

**You may find out about a potentially damaging tsunami in two ways:**

**1. Strong local ground shaking:** If a large earthquake strikes nearby, the first waves may reach the coast within minutes after the ground shaking stops. There is no time for authorities to issue a warning. People on the beach or in low coastal areas need to be prepared to move to higher ground as soon as the ground shaking stops and stay away from the beach until told by an official source that the danger has passed. As you move to higher ground, be aware of other potential dangers caused by earthquakes such as falling debris and masonry and downed power lines.

**2. Official warning issued by the West Coast & Alaska Tsunami Warning Center:** Very large earthquakes in other areas of the Pacific Rim or regional earthquakes from the Pacific Northwest might also cause tsunamis. The first waves reach our coastline many hours after the earthquake has occurred. Tsunami Warning Centers will contact local officials who may order evacuation. Expect to be notified of an evacuation by TV and radio stations (through the Emergency Alert System), door-to-door contact by law enforcement agencies and on NOAA weather radios. If you do not hear evacuation announcements but notice a sudden drop or rise in the sea level or hear a loud noise coming from the ocean, nature may be warning you of impending danger. Move off the beach and to high ground immediately.

**Where and when do tsunamis occur?** Tsunamis can occur at any time of day or night, under any and all weather conditions and throughout the year. Beaches open to the ocean, bay mouths or tidal flats and the shores of large coastal rivers are in the greatest danger of tsunamis.

## California Tsunami Risk

Since 1812, California has experienced 14 tsunamis with wave heights greater than 3 feet; 6 of these waves were destructive. The worst resulted from the 1964 Alaskan earthquake and caused 12 deaths and at least \$17 million in damages in California.

The tsunami history of the San Diego area specifically is sparse. Dr. William Van Dorn of Scripps Institution of Oceanography stated (in 1979) that the "greatest single excursion of sea level (1.0 m) was recorded at La Jolla for the tsunami of May 22, 1960 which was produced by the largest earthquake ever recorded" (Chilean earthquake, magnitude 9.5). Locally, the 1862 earthquake, a magnitude about 5.8 probably located in the vicinity of central San Diego, caused a 3 to 4 foot run-up at Point Loma. Despite this sparse history, earthquakes from offshore faults and offshore landslides are capable of generating locally damaging tsunamis along the San Diego coastline. The events are rare, but can be catastrophic.

## How can I save myself from a locally generated tsunami?

The information in this brochure could save your life. Read and share with friends and family. **Memorize the instructions on the cover of the brochure.**

## How do I know when to evacuate?

A major tsunami-producing earthquake will likely shake the ground strongly for 30 seconds or longer. Historic California earthquakes have typically produced no more than 10 to 15 seconds of strong ground shaking. Get into the habit of counting how long the earthquake shaking lasts. **If you are on the coast and count 20**

**seconds of very strong ground shaking, evacuate as soon as it is safe to do so.**

## What is a low-lying area and how high is high ground?

- Typical peak wave heights from large tsunamis in the Pacific Ocean over the last 80 years have been between 21 and 45 feet at the shoreline. A few waves, however, have locally been higher - as much as 100 feet in a few isolated locations. The best general advice available today is to:

- **Go to an area 100 feet above sea level**, if possible, or go up to 2 miles inland, away from the coastline. If you can not get to this height or that far, go as far inland or uphill as you can. Every foot inland or upwards may make a difference.
- **Go on foot** if at all possible because of traffic and possible damage to roads, downed power lines and other earthquake debris.

*If evacuation is impossible, the third floor or higher of a reinforced concrete building may offer protection, but such a building should be used only as a last resort.*

## What can I do ahead of time to protect myself and my family from a tsunami?

**1. Make disaster plans beforehand.** Talk to the people you live with about what may happen during a strong earthquake or other disaster. If you live or work in a low-lying coastal area, know where to go to survive a tsunami. Hold earthquake/tsunami drills at home or at work.

**2. Assemble a portable disaster supply kit.** Have a kit available in your car, at home and at work. Your kit should include a portable radio with fresh batteries, water, first aid supplies, flashlight, and extra clothes or a blanket. Put your kit in a backpack and leave it in an easy-to-reach place.