

**ESP FOCUS****Tsunamis****You can't surf these waves!**

You may not live near the coast, but you may visit beaches and coastal cities. Wherever you live, work, or play, use the information on the reverse side of this Focus Sheet to learn more about the tsunami threat and what to do if a tsunami occurs or if a tsunami watch or warning is issued.

Contrary to popular belief, a tsunami isn't one giant wave. It is a series of waves most commonly generated by great earthquakes below the ocean floor. Underwater landslides also can cause tsunamis.

Tsunamis can travel at speeds up to 500 miles per hour in the open sea and reach heights of up to 100 feet in shallow coastal waters. Usually, however, tsunamis that reach California average 10 feet in height and peak in the 20-40 foot range.

The first tsunami wave may not be the highest or the last. Waves may continue to arrive for several hours, spaced minutes to hours apart. In fact, hundreds and perhaps thousands of people in the affected south Asian nations died in the catastrophic 2004 tsunami when they went to the ocean to see the impacts of the first waves and were swept to their deaths when subsequent waves struck.

The time it takes for tsunami waves to reach the coast depends on where the earthquake or underwater landslide occurs. A tsunami caused by an earthquake a few miles off the coast is called a "locally generated" tsunami. It will arrive within minutes of the quake. Residents of coastal communities probably will feel such an earthquake. The earthquake may be the only warning of an approaching tsunami so it is important to respond quickly.



## The Threat in California

Tsunamis caused by large earthquakes centered near Alaska and other distant parts of the Pacific Ocean are called "distant source" tsunamis. The first waves from these events take several hours to reach the California coastline. The West Coast and Alaska Tsunami Warning Center in Alaska will issue a Tsunami Warning or Tsunami Watch if an Alaskan or Pacific tsunami threatens California.

More than a dozen tsunamis with waves three feet high or more have struck California since 1812. Six caused damage. The tsunami generated by the 1964 Alaska earthquake killed a dozen Crescent City residents and caused more than \$34 million in damage. Three tsunamis flooded Santa Barbara during the 1800's; a tsunami resulting from a Chilean earthquake damaged a pier in San Diego Harbor in 1960; and one-foot waves resulting from the 1992 Cape Mendocino earthquake were detected near Santa Barbara.

Historically, while tsunamis have caused greater casualties and damage in northern California, and while the threat of local and distant tsunamis is greater on the north coast, southern California also has significant risk because of its large coastal population.

## Before the Next Tsunami or Tsunami Watch

- Determine the elevation of your home and how far it is from the coast. Know whether you live in a tsunami danger zone.
- If you live within a couple of miles of the coast, identify a location to go if a tsunami watch or warning is issued or if you feel an earthquake lasting for 15-20 seconds. The location should be at least two miles inland or 100 feet above sea level.
- Learn the signs of an approaching tsunami. If the tide rises or recedes rapidly, move immediately inland to higher ground.
- Ask local emergency officials or your planning department what areas are susceptible to the flooding from a tsunami.
- Locate refuge areas and learn evacuation routes that are safe.
- Develop or update your family's emergency plan.
- Assemble an emergency supply kit, if you haven't done so. Include a portable radio. (Consider the purchase of a NOAA weather radio.)
- Identify a friend or relative living in another state as your family point of contact.
- Learn first aid.
- Teach family members how and when to turn off the utilities.
- Start or join a Community Emergency Response Team.

## During and After the Tsunami or Tsunami Warning

- If you feel an earthquake, **Drop, Cover, and Hold on** until the shaking stops. Estimate how long the shaking lasted. If severe shaking lasted 20 seconds or more, immediately evacuate to high ground as a tsunami might have been generated by the earthquake.
- Move inland two miles or to land that is at least 100 feet above sea level immediately. Don't wait for officials to issue a warning. Walk quickly, rather than drive, to avoid traffic, debris and other hazards.
- Stay away from coastal or low-lying areas until an "all clear" notice has been issued by local emergency officials. Waves might continue to arrive for several hours.
- Use common sense. Do not go to the coast to see a tsunami. Tsunamis are not like regular waves. They are much faster, higher, and are filled with debris.
- Obey evacuation notices. Listen to the radio or watch television for emergency information and instructions from local officials about re-entry.
- Contact your local office of emergency services for more information about preparing for tsunamis.

*Extracted and adapted from "Tsunami! How to Survive This Hazard on California's North Coast," Humboldt Earthquake Education Center, Humboldt State University, Arcata, CA; Other sources included the FEMA publication "Are You Ready? Your guide to disaster preparedness," and from information provided by the Governor's Office of Emergency Services, Earthquake and Tsunami Program.*

**HEALTH TIP:** After tsunamis, the primary public health concerns are clean drinking water, food, shelter, and medical care for injuries. Floodwaters can pose health risks such as contaminated water and food supplies. Listen to your radio or television for news and instructions.



This Focus Sheet is produced as part of the Emergency Survival Program (ESP). ESP is an awareness campaign designed to increase home, neighborhood, business and school emergency preparedness. ESP was developed by the County of Los Angeles. The California Governor's Office of Emergency Services (OES) and representatives from Contra Costa, Imperial, Inyo, Kern, Los Angeles, Marin, Mono, Orange, Riverside, San Bernardino, San Diego, San Luis Obispo, Santa Barbara, Santa Cruz, and Ventura counties; Southern California Edison; the Southern California Earthquake Center and the American Red Cross assist in the development of campaign materials and coordination of the campaign.