

ESP FOCUS

Tsunamis



You don't want to surf these waves!

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

Tsunamis can travel at speeds up to 600 miles per hour in the open sea and reach heights of up to 100 feet in shallow coastal waters. Usually, however, tsunamis that cause damage average nine to 10 feet in height and peak in the 21-45 foot range. The first wave almost never is the highest.

Waves might continue to arrive for several hours, with several passing between them. In fact, the dozen residents of Crescent City who died as a result of the 1964 tsunami were killed when they went to the ocean to see the impacts of the earlier waves and a subsequent wave struck.

The time it takes for the waves to reach their destinations depends on where the earthquake occurs. A tsunami caused by an earthquake a few miles off the coast is called a "near field" or "locally generated" tsunami. Residents of coastal communities probably will feel such an earthquake. The first wave might reach shore in only a few minutes.

Wherever you live, work or play, use the information on the reverse side of this *Focus Sheet* to learn more about the tsunami threat in Southern California and what to do if a tsunami occurs or if a tsunami watch or warning is issued.

Each month during 1999, ESP examines a different hazard that could affect Californians and offers suggestions to reduce their impacts where you live, work and play. These hazards are not limited to the month featured in the ESP Focus Sheet and can occur at any time.



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The Threat in California

Tsunamis caused by large earthquakes centered near Alaska and other distant parts of the Pacific Ocean are called "far field" or "distant source" tsunamis. The first waves from these events take several hours to reach the California coastline.

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 Alaskan earthquake killed a dozen Crescent City residents and caused more than \$34 million in damages.

The tsunami risk is greater along the north coast than in Southern California because more faults capable of generating tsunamis lie off the coast of Northern California. The threat in Northern California also is higher because of its proximity to Alaska, where most tsunamis that are damaging to California originate.

Southern California is not immune from the threat, however. Three tsunamis flooded Santa Barbara during the 1800s; a tsunami resulting from a Chilean earthquake damaged the pier in San Diego Harbor in 1960; and one-foot waves resulting from the 1992 Cape Mendocino earthquake were detected near Santa Barbara.

Before the Next Tsunami or Warning

- Learn what tsunami warning signs mean.
- Determine whether you live in a danger zone, the elevation of your home and how far it is from the coast.
- Ask local emergency officials or your planning department what areas are susceptible to the impacts of a tsunami. Learn evacuation routes that are safe.
- Develop or update your family's emergency plan. If you live within a couple miles of the coast, identify a location to go to if a tsunami strikes. The location should be at least two miles inland or 100 feet above sea level.
- Assemble an emergency supply kit if you haven't done so. Include a portable radio.
- Identify a friend or relative living in another state as your "family contact."
- Learn first aid.
- Teach family members how and when to turn off the utilities.
- Start or join a neighborhood emergency response team.

During and After the Tsunami or Tsunami Watch

- If you feel an earthquake, duck, cover and hold until the shaking stops. Count how long the shaking lasts. If severe shaking lasts 20 seconds or more, a tsunami might follow.
- 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. Waves might continue for several hours and travel several times faster than you can walk, run or drive.
- Use common sense. Do not endanger yourself by trying to surf a tsunami. Because they are not like regular waves, they are impossible to surf. They are much faster, higher and can come onshore filled with debris.
- Follow any evacuation notices.
- Listen to the radio or watch television for emergency information and instructions about re-entry from local officials.

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."

BE AWARE! PREPARE FOR ALL HAZARDS!



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