

## **Not My Fault: California's Tsunami Preparedness Week approaches**

Lori Dengler/For the Times-Standard  
Posted March 12, 2022

<https://www.times-standard.com/2022/03/12/lori-dengler-californias-tsunami-preparedness-week-approaches/>

There's a reason California highlight's tsunami preparedness in March. The two most damaging tsunamis in the State's history occurred in this month. Last Friday marked eleven years since the Great East Japan earthquake and in two weeks we note the 58 years since the 1964 Alaska earthquake and tsunami.

Mother Nature gave us a little tsunami nudge this year with the first tsunami alert issued for California coastlines in more than a decade. The volcanic explosion in the Tonga Islands on January 15 resulted in a Tsunami Advisory that caused strong currents, minor flooding, and required several Coast Guard rescues in the State.

How common are tsunamis along our coast? Fifteen years ago, I did an exercise with Paul Whitmore, the director of the National Tsunami Warning Center (NTWC) in Palmer, Alaska. We looked at all the earthquakes that had occurred in the Pacific Basin since 1900 and, using present-day protocols, estimated what type of tsunami alert would have been issued. For much of this time period, there were no tsunami warning centers; NTWC was only established in 1967 and alert definitions have changed a number of times since then.

We found that tsunami alerts wouldn't be as rare as you might think. NTWC issues three types of alert bulletins: Tsunami Warning (significant on-land flooding possible), Tsunami Advisory (hazard restricted to beaches, bays, and harbors), Tsunami Watch (possible tsunami threat is being evaluated). During the past 122 years, we estimated that twelve Warnings, eleven Advisories, and fifteen Watches would have been issued.

Five of the Warnings were triggered by great earthquakes far away from us and would have resulted in all or nearly all of the California coastline being placed in a warning. The sources of the 1946 (M8.6), 1952 (M 9.0), 1960 (M9.5), 1964 (9.2), 2011 (M9.1) were 4.5 to 16 hours tsunami travel time away. All of these tsunamis caused damage in California and three (1946, 1964, 2011) resulted in fatalities. No one in California would have felt them and

we would need the NTWC alert for our county emergency managers to conduct evacuations.

The other seven Warnings would have been issued for earthquakes in the magnitude 7 to 8 range, located close to the US West Coast. The 1906 "San Francisco" earthquake would have triggered a Warning from Monterey to Humboldt County. The 1927 "Lompoc" earthquake would have caused a warning for Southern California and the rest would have been limited to our North Coast area.

These "near field" earthquakes are much trickier to handle from a warning center perspective. In contrast to great earthquakes far away from us, the travel time between the earthquake and the arrival of the first tsunami waves in these nearby events is a half hour or less. The NTWC wouldn't have the luxury of hours to assess whether a tsunami was actually generated and run forecast models of the likely tsunami wave heights. When time is of the essence, it is important to err on the side of caution.

For nearby earthquakes, people will feel the earthquake minutes before NTWC issues any bulletin. These large earthquakes produce many seconds of shaking that is your heads up a tsunami could be on the way. We always recommend reacting quickly to the shaking alert; you might never get an official alert due to infrastructure damage. If you are on the beach or in a tsunami hazard zone, evacuate to high ground as soon as the shaking lessens enough for you to safely move. The large coastal and offshore earthquakes of the past produced modest tsunamis, but fortunately none caused damage.

Our study projected twelve Advisory bulletins since 1900. Advisories, like the January 15th Tonga alert, are more limited in potential impact than Warnings. There is no need for broad evacuations of the tsunami hazard zone as the threat is limited to beach and harbor areas. Of these, eight were from large earthquakes elsewhere in the Pacific and three were from North Coast earthquakes located further offshore than those warranting a Warning. January 15th was the oddball – the first alert ever issued for a volcanic eruption. Two of these Advisory-level events (1957 and 2006) caused damage in Crescent City.

Thirteen earthquake events from the past century would have reached the Watch level. All were caused by large earthquakes at least four hours travel time away from California and would have been cancelled before any part of the State were placed in an Advisory or Warning. Some, however, would have resulted in Warnings for other parts

of the United States and it can be confusing as to whether your area is in the alert. NOAA's <https://www.tsunami.gov/> website provides quick information about alert areas and county emergency notification systems will let you know if you need to be concerned.

Next week the Humboldt County Board of Supervisors will proclaim March 21 – 25 Tsunami Preparedness Week. The Redwood Coast Tsunami Work Group has a number of events/activities planned. The Manila community on the Samoa Peninsula will hold a tsunami evacuation drill next Saturday, March 19th and a Tsunami Communications Test will be conducted on March 23.

Evacuation drills are one of the best ways to prepare for tsunamis. By walking the route to get to a safe area, you develop muscle memory on what to do to protect yourself and your family in a real earthquake/tsunami event. Beginning around 9:30 AM on March 19th, Humboldt County Sheriff's deputies will patrol Manila neighborhood streets sounding the Hi-Lo Evacuation Siren. This is the signal for residents and visitors alike to head to high ground. Volunteers from Humboldt County CERT teams and the RCTWG will help direct you to the nearest evacuation site. I will be one of them and we will all be happy to answer any questions you have.

Note: Check out the new Tsunami Preparedness page <https://rctwg.humboldt.edu/> on the Redwood Coast Tsunami Work Group website. It includes more information on the Manila drill, the March 23 Tsunami Communications test, and background information on tsunamis and local tsunami hazards.

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