

Times Standard

Not My Fault: Tsunami Week 2025 features an opportunity to hone your tsunami evacuation skills

Lori Dengler for the Times-Standard

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One of the simplest ways to learn if you are in a tsunami zone is to look for posted ENTERING and LEAVING Tsunami Zone signs. Most public roads and highways in North Coast California have posted signs that correspond to the mapped tsunami zone for the largest tsunami likely to affect our area, a magnitude 9 earthquake on the Cascadia subduction zone.

March 22nd to 30th is Tsunami Preparedness Week in California. Usually, the main event of this Week on the North Coast is our Tsunami Communication Drill when we test the ability to issue a Warning for a tsunami coming from far away.

No need to do that in 2025 because we had a REAL tsunami communications run on December 5th of last year when a magnitude 7 earthquake occurred about 40 miles offshore of Cape Mendocino. It wasn't the usual type of quake in our annual communications test – a very large earthquake in Japan, Alaska or elsewhere in the Pacific – but our M7 wasn't strong enough to damage our communications infrastructure so we got an unexpected test of our ability to issue tsunami warnings just the same.

This week it makes far more sense to test an aspect of our tsunami system that didn't perform very well last December – who should and should not evacuate and how to do so safely and effectively. Please visit https://rctwg.humboldt.edu/sites/default/files/north_coast_tsunami_drill_2025_flyer_2.pdf for details.

I need to backstep a little to explain why this approach and how this three county-wide drill will happen. By now I hope most of you realize there are different types of tsunamis we need to prepare for. At one end of the spectrum is the very big earthquake far away in the Pacific. The

most damaging tsunami in our relatively short written record (175 years) came from far away. In 1964 a M9.2 earthquake occurred in the Prince William Sound area of Alaska sending a series of surges along the Alaskan and British Columbian Coasts in the first minutes to hours after the earthquake. It took a bit longer to hit the lower 48 – reaching Washington in three hours, Crescent City in four hours, and the Port of Long Beach in just under nine hours.

By the time the surges receded many hours later, 124 people had lost their lives including 5 in Oregon and 13 in California. No one in Oregon or California had felt the earthquake and the US tsunami warning system at that time was slow and mainly focused on Hawaii. Visit <https://rctwg.humboldt.edu/1964-great-alaska-earthquake-tsunami> for more about the warning system and what happened in 1964.

At the other end of the spectrum is a great earthquake centered here, beneath our feet. The Cascadia subduction zone extends from Cape Mendocino to Vancouver Island, Canada and wasn't recognized as a hazard until the late 1980s because it lay quietly sleeping producing no major earthquakes during the instrumental earthquake era. But we now have a plethora of data about a mega-quake on January 26th, 1700, from the oral history of the peoples who lived in northern California and the Pacific Northwest, geologic evidence of strong shaking, tsunami deposits, and written records from Japan where that earthquake damaged multiple coastal areas and caused at least one ship to sink.

For the Yurok, Tolowa, Wiyot and many other nations that lived near the coast in 1700, their warning was their oral history, stories passed down for generations that when you feel the ground shake head to higher ground. Oral history is a strong resiliency system. In 2004, it saved almost everyone on Indonesia's Simeulue Island and the indigenous peoples on India's Andaman and Nicobar islands where elders taught everyone to head to safe areas when an earthquake occurs. We have no idea how many people perished in the 1700 tsunami, but certainly some did and became part of the oral history to teach the next generation.

Our tsunami threat is not just these two end members, but many in-between cases as well. Between 2018 and 2021 four major earthquakes occurred in Alaska. They all produced modest tsunamis but no official alerts for our area. However, the M8.2 in July of 2021 caused strong currents in the Humboldt Bay bar crossing that nearly upset several boats. In January 2022, a tsunami alert was triggered by an explosive eruption in the Tonga Islands area of the SW Pacific putting the entire California coast into a Tsunami ADVISORY (strong currents on beaches and harbors, no threat of flooding). A number of people who didn't heed the alert had to be rescued and a number of injuries were reported.

Last December's magnitude 7 earthquake really opened my eyes to the importance of these in-between tsunamis and the need to bring them out of the closet and do a better job of communicating what they are and how to respond. The initial magnitude (7.3) was just large enough for the National Tsunami Warning Center to issue a Tsunami WARNING. But the earthquake wasn't strong enough to damage infrastructure and was never though likely to produce the level of inundation of a Cascadia tsunami.

There were multiple reasons for the confusion and over-evacuation on December 5th. Some of it was the result of the text 'You are in danger' in the Wireless Emergency Alert System that was sent to many people outside of the mapped tsunami hazard zone. But I'll take some of the

blame for not doing a better job of explaining the tsunami zone – what areas are at risk and what areas are safe.

In California, all tsunami maps and tsunami road signs are based on our worst-case tsunami threat – the Cascadia subduction zone monster. The maps don't show where the water will be. Every Cascadia earthquake is different in its slip distribution and tsunami generating potential. A clear example is Lagoon Creek in Del Norte County where the deposits from seven Cascadia tsunamis have been preserved. Some barely make it over the beach berm and others extend nearly as far inland to the toes of Babe the Blue Ox at Trees of Mystery.

Our tsunami maps were compiled by the California Geological Survey and take the maximum modeled Cascadia tsunami, add on high tide, and put in another meter of elevation “factor of safety.” Learn more about the process at <https://www.conservation.ca.gov/cgs/tsunami/maps>. You can also use this site to figure out where your home, work, schools or other locations are compared to the tsunami zone. Printable maps are available for most North Coast communities at <https://rctwg.humboldt.edu/tsunami-hazard-maps>.

Not a map person? Look for the posted ENTERING, LEAVING, and HAZARD ZONE signs on nearly all public roads and highways. Make it a game with your kids to see who can spot a sign first. The signs like the maps are overly conservative, almost always defining a slightly larger hazard zone due to considerations of sign placement.

This Wednesday at 11 AM most of you should receive a text alert from your county. Del Norte, Humboldt, and Mendocino counties will all use their emergency notification systems to send out the notice. Not enrolled? Search for the name of your county and ‘emergency notification’ to sign up. The message will be brief telling you that it is only a test, and the three-county evacuation drill has begun. Respond with a brief yes to note you have gotten the message.

No sirens, no civil air patrol, no one knocking on your door – what happens next is up to you. I hope you will take a moment to register whether you are in our outside of a tsunami zone. If you are in the zone, the county notification is your pretend earthquake and your warning to head immediately to a safe area. DON'T DRIVE. We saw what driving could do on December 5th – enormous traffic jams even without shaking damage to roads. WALK to an area in the green area of the map or beyond the “Leaving Tsunami Zone” sign.

What will I be doing on March 26th at 11? I'll pretend a great quake has happened, lean over in my chair, and protect my neck with my arm – my knees won't let me get under a desk anymore. After a minute or so, I'll be “sheltering in place.” I'm over a mile away from any tsunami zones so even in a worst-case Cascadia tsunami, I don't need to leave the safety of my home.

Note: Other Tsunami Week activities: OLLI talk Monday March 24 from 12 – 1:30 via zoom <https://www.humboldt.edu/olli/events/december-5-2024-earthquake>. If you prefer an in-person event, I'll be reprising some of this talk at the Natural History Museum from 5:30 – 7PM 12:42 G St, Arcata. More at <https://rctwg.humboldt.edu/tsunami-preparedness-week>.

Lori Dengler is an emeritus professor of geology at Cal Poly Humboldt, and an expert in tsunami and earthquake hazards. The opinions expressed are hers and not the Times--Standard's. All Not My Fault columns are archived online at <https://kamome.humboldt.edu/taxonomy/term/5> and may be reused for educational purposes. Leave a message at (707) 826-6019 or email Kamome@humboldt.edu for questions and comments about this column or to request copies of the preparedness magazine “Living on Shaky Ground.”