Times Standard

Not My Fault: Earthquake – Tsunami Booth returns to the Humboldt County Fair

Lori Dengler for the Times-Standard
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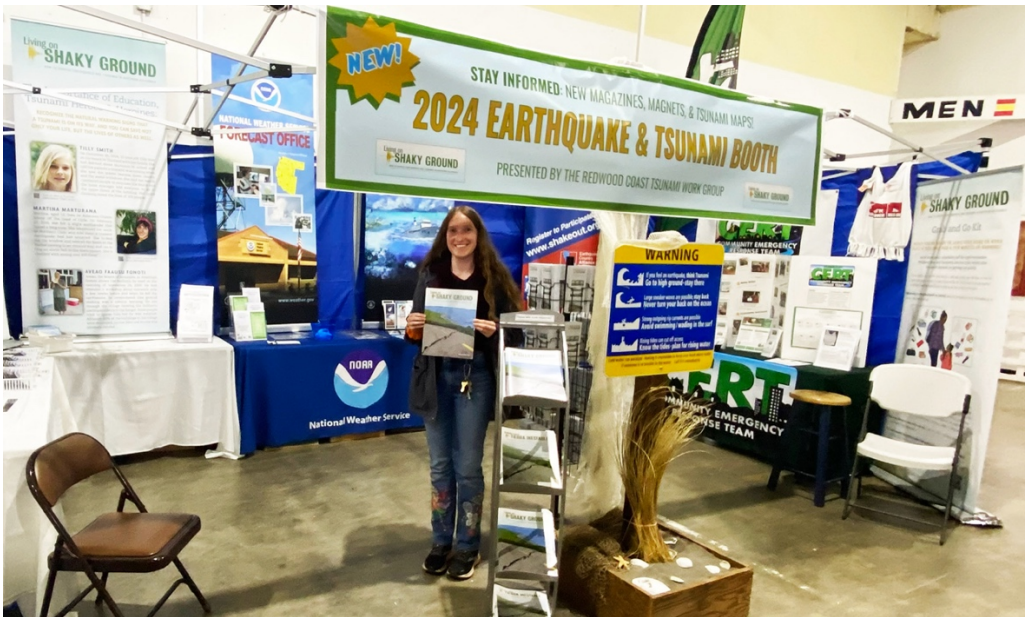

2024 Cal Poly Humboldt alum Cheyenne Bailey greets visitors to the 2024 Earthquake Tsunami Booth at the Humboldt County Fair.

I am not one of the regular staffers at the 2024 Earthquake Tsunami Booth at the County Fair, but I did visit on Friday, and I've gotten feedback from the Redwood Coast Tsunami Work Group volunteers who have been answering your questions. The Fair display is a two-way street. It doesn't only push out information to the public. It is also a great research tool for us. We learn what your concerns are, what materials are working well, and where we need to improve.

I had no idea how invaluable rubbing shoulders with thousands of people over the fair run can be until I started putting my time in in the 1990s. The Ivory Tower of Academia can be isolating. It's easy to think we know what information you need and how to deliver it without ever listening to how it has been received and what we might have missed entirely.

Over the course of past 11-day Fair runs, between 3000 and 7900 people have visited our displays. Peak years were in 2014 and 2015 when we featured a small fishing boat swept away from Japan in the 2011 Japan tsunami that beached in 2014 at Humboldt county's Dry Lagoon. If you missed those fairs, visit the National Weather Service Office on Woodley Island where the boat is on permanent display.

We realized early on in our fair history that visitors made a pretty good sampling group to gather information or to test out ideas. In 1992, we collected felt and damage reports from people who experienced the Cape Mendocino earthquakes. It helped us to compile maps showing the different shaking patterns of the three main earthquakes and became a foundation of what is now the USGS "Did You Feel It?" web site.

When our tsunami signage program began in the 2000s, we used the fairs in Humboldt and Del Norte County to see how well people understood tsunami evacuation site signs. The original version featured a person running up a hill with a shelter on the top. We learned that many people thought they were supposed to keep running, especially non-English speakers who didn't understand what "Evacuation Site" meant. Our current signs only show the shelter.

The Fair display is also an education experience for the people who staff the room. Listening to people's concerns and questions gives them exposure to a much wider range of the earthquake story. We've always had Humboldt students help out at the display. Some have told me it was the most valuable part of their college years. A shout out to 2024 alum Cheyenne Bailey and student Megan Bryant who are carrying on the tradition.

It's also a good way to open the eyes of decision makers. Over the years, we've had a number of people in governance positions do stints at the display including the head of the State Earthquake – Tsunami Program and the outreach director for the Earthquake Alliance. A favorite moment was in 2013 when then Humboldt President Rollin Richmond joined me under the big Red Table to illustrate Drop, Cover, and Hold On.

What have we learned in 2024 so far? There are many repeat attendees from all over the State who make the Humboldt County Fair an annual trek to get away from the heat. Many comment that they wish something similar was available where they live. When we ask people how they learned about the display, roughly 25% say they have visited it before and always keep their eyes out for it.

The most common questions are about the tsunami hazard zone and tsunami mapping: what type of tsunami does the map show, what does the line mean, and why so much difference in inundation extent.

The California Geological Survey is the agency responsible for mapping the State's geologic hazards. The State tsunami maps are updated at least every ten years, most recently in 2020/2021. The process involves compiling a variety of information including historic tsunamis, paleotsunamis, and numerical modeling of likely inundation from major tsunami sources around the Pacific.

All of the California's maps are based on the largest credible tsunami for a particular section of coast. For the southern and central part of the State, that source is a tsunami generated by a great earthquake on the eastern part of Alaska's Aleutian Islands. For the North Coast, our worst case is a magnitude 9 earthquake on the Cascadia subduction zone along and beneath our coast.

The maps show two colors: green and yellow. The maps are conservative, based on high tide and include several additional feet of safety. The boundary between the green and yellow parts of the map do not show where the water will likely extend. If everyone has done their job correctly, even the largest tsunami will be blocks away from the line of demarcation. I think of green being safe and yellow as all bets are off. I visit or drive through yellow areas almost every day and I always keep a map in my mind of where the nearest green is and how I would get there.

Looking at tsunami maps can be confusing if you don't understand the role of topography and the shape of the sea floor. It's not a bathtub ring with a single height. In Humboldt Bay, the tsunami zones very greatly in width. Near Eureka the zone is very thin, especially in the Old Town area and along the north shore of the Bay. It becomes much broader in the Freshwater Valley area and Arcata Bottom. When it comes to tsunamis, the difference in a few feet of elevation and how a tsunami flows over land and in the Bay is important.

We have little direct evidence of past great tsunamis in the Humboldt Bay region. In historic times, no tsunami including 1964 has breached either the North or South Spits. There have been many paleotsunami studies, looking for the sand deposits that a major tsunami would leave, and the only places where they have been found is near the southern end of the Bay. The lack of deposits in the Mad River Slough and around the perimeter of Arcata Bay strongly suggests that high dunes on the Samoa Peninsula has effectively blocked tsunamis for at least the past 3000 years.

A caveat: We've been doing paleotsunami investigations for less than 30 years in Northern California and a renewed interest in re-examining coastal sites could still turn up something new. It is important to emphasize we are still on the steep part of the tsunami learning curve. That is one reason why the State's tsunami maps need regular updating.

We've always had teachers visiting our fair displays, but this year there were many more. Some wanted a better understanding of our hazards, and many were looking for materials to include in class curriculum materials. We are happy to provide classroom copies of the Living on Shaky Ground magazine and direct teachers to our Kamome curriculum (https://kamome.humboldt.edu/activities). It's entirely on-line and includes activities for all grade levels K-12. Let me know if you find any expired links so we can update them.

The beginning of the school year is a great time to incorporate earthquakes into your classrooms. Something as simple as having students check our daily earthquake report (audible link at https://rctwg.humboldt.edu/home) and plotting epicenters on a map is an easy way to teach geography.

Lori Dengler is an emeritus professor of geology at Humboldt State University, 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." Digital copies are at https://rctwg.humboldt.edu/prepare/shaky-ground.