Times Standard

Not My Fault: Déjà vu all over again

Lori Dengler for the Times-Standard
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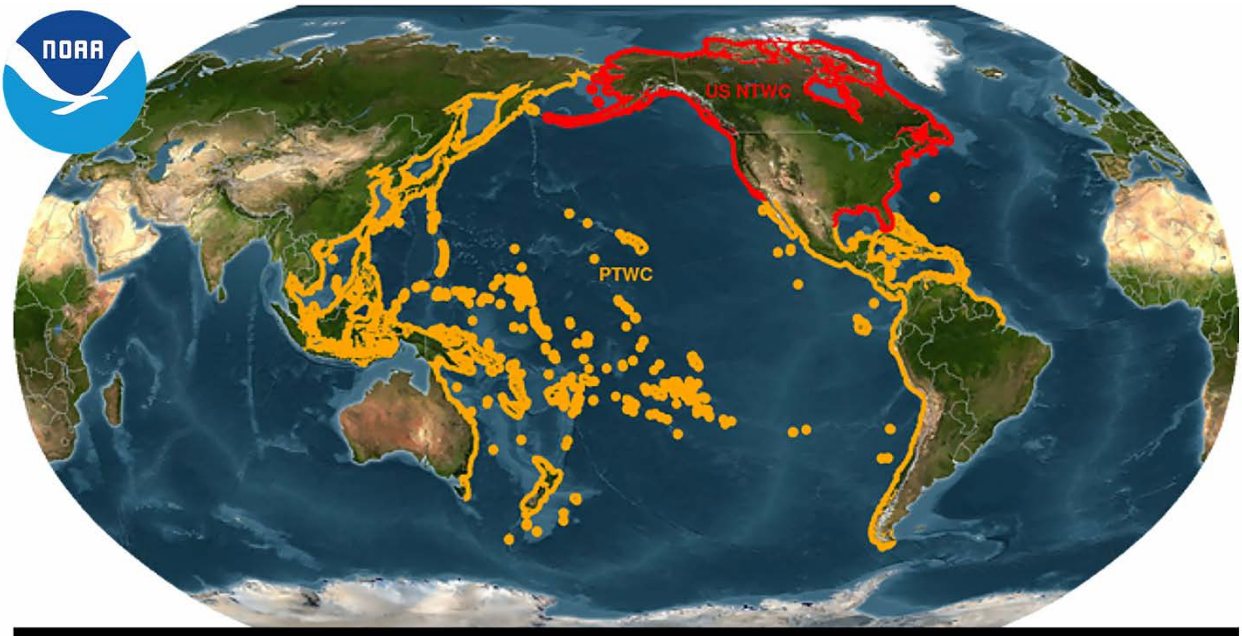

The United States is served by two tsunami warning centers. The National Tsunami Warning Center serves the areas in red, and the Pacific Tsunami Warning Center, the areas in yellow.

My introduction to tsunamis was the 1992 Cape Mendocino earthquake. Before the M7.2 earthquake, I was only vaguely aware. I devoted one lecture in my Earthquake Country class and when the ground began to shake around 11 AM on April 25, the thought that there may have been a tsunami never crossed my mind.

Many people were enjoying North Coast beaches on that unusually warm Saturday, and few of them thought tsunami either. No tsunami warning was issued as the preliminary magnitude came in a 6.9, just a notch below the protocol in place at the time that would have required a warning. But there was a tsunami, and it took nearly a week before I was aware of it.

The tsunami world was much different thirty-one years ago. Like today, we had two tsunami warning centers, one in Hawaii and one in Alaska. But they were staffed during normal working hours five days a week. Duty officers were required to live within five minutes of the center, and someone was always on call for nighttime and weekend alerts, but it did dial in a five-to-ten-minute delay in issuing warnings.

There was a different set of definitions for tsunami alerts in 1992. Like today, both centers issued warnings, watches, and advisories. But they meant different things then. A warning meant a tsunami might reach your coast within three hours, a watch was three to six, and an advisory meant more than six. There were no subtleties to the alert and no information about how big a tsunami. If a warning was issued, there was no way to put particularly vulnerable areas like Crescent City into an alert and leave the much less vulnerable adjacent areas like Humboldt coastlines out of it.

I became aware that the Cape Mendocino earthquake had produced a tsunami a few days later when California State Geologist Jim Davis asked about any tsunami observations. Davis was more aware of tsunami potential at that time than I was. He had queried the tsunami centers soon after the earthquake to see if a tsunami had been generated.

Then as now the National Oceanographic and Atmospheric Administration (NOAA) maintained coastal tide gauges. They weren't online back in 1992 and it took a while bring up the paper recordings. But once found, there was no doubt. A tsunami arrived at the North Spit gauge at the Coast Guard Station within Humboldt Bay 26 minutes after the earthquake with a height of almost eight inches. It took 47 minutes to travel to Crescent City where it the tsunami was nearly two feet high.

The tsunami was also observed on gauges from Monterey to Port Orford and in Hawaii. Eyewitness accounts put its height at nearly three feet in College Cove just north of Trinidad. Its arrival coincided with low tide and no damages were reported. But that event changed the tsunami world and my involvement in it.

Two years later I found myself part of a group of representatives from the five Pacific States, NOAA, USGS, and FEMA sitting in the seminar room at NOAA's Pacific Marine Environmental Laboratory in Seattle. The U.S. Senate had charged NOAA with developing a proposal to improve U.S. tsunami preparedness. This was nine years before events in the Indian Ocean would make tsunami a household word. Each state had an emergency manager and a scientist participant. My position as the California science representative was an indication of how little California tsunami interest there was at the time.

That seminar room at PMEL became very familiar as we hammered out the framework of what would become the National Tsunami Hazard Mitigation Program (NTHMP). It was the brainchild of Eddie Bernard who was PMEL's director. He deftly corralled the differing state priorities into a package that gained funding through the earmark process and five years later became part of NOAA's operating budget.

The NTHMP was built on a three-sided triangle: warning capability, hazard assessment, and mitigation/preparedness. One of the first issues to arise at those 1995 meetings was coordination issues between the two U.S. tsunami centers. They had developed as separate entities over decades. Hawaii had developed a Linux-based operating system; the Alaska center was based on Microsoft. The two centers had different bosses. Hawaii was under the jurisdiction of the National Weather Service Pacific Region and Alaska was in the Alaska Region. It was clear that the system would function more efficiently if both were under the same management structure and had similar tools and operating systems.

We defined a number of needs back in 1995 and many of those priorities have been accomplished. The NTHMP was able to greatly improve both tsunami centers' access to seismic and water level data. A network of deep ocean water level pressure gauges was installed giving both centers access to real-time data. Tsunami modeling and forecasting methods were improved allowing accurate estimates of peak tsunami heights around the Pacific.

Tsunami hazard maps are now available for most vulnerable coastlines. After the 2004 Indian Ocean tsunami, the program was expanded to include the East Coast states and U.S. territories. And after the 2006 earthquake north of Japan, the definition of advisory was changed to cover localized tsunami events that did not require a warning for entire coastlines.

I continued to be part of the NTHMP until 2001 and kept close ties with the program afterwards. I was part of a review team in 2007 and the Redwood Coast Tsunami Work Group has been a beneficiary of NTHMP funding for outreach activities since 2008. Last year I was asked to join NOAA's Tsunami Science and Technology Advisory Panel and two weeks ago I found myself in PMEL's seminar room again discussing U.S. tsunami preparedness.

The Advisory Panel had compiled a list of recommendations to improve U.S. tsunami resilience. On the top of the list? Improve coordination between the two U.S. tsunami Centers and put them in the same administrative structure. I was the only one at the meeting who had been there at the beginning of the NTHMP, and I kept finding myself quoting Yogi Berra, déjà vu all over again.

I've now been involved with tsunami hazards and resilience for over thirty years. Putting these two centers in a structure akin to the National Hurricane Center makes the most sense to me but any unified structure would be a huge improvement. It seemed like a no-brainer back in the 90s to have coordinated centers using similar tools and capable of fully backing each other up. It's still a good idea today.

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 a free copy of the North Coast preparedness magazine "Living on Shaky Ground."