

Not My Fault: Remembering the shaking of thirty years ago

Lori Dengler/For the Times-Standard
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April 25th marks thirty years from the most expensive earthquake disaster in North Coast history. The M7.2, 6.5 and 6.6 earthquakes also marked a sea change in the acceptance of the tsunami hazard in the Pacific Northwest. I'll revisit those earthquakes and what we've learned in the last three decades since then in today's and following columns.

I remember exactly where I was and what I was doing when the first earthquake struck at 11:06 AM. It was a Saturday, and we were planning a family picnic at Big Lagoon. I was upstairs when the house shivered. I advise people to count during an earthquake as a way to calm yourself. It worked like a charm – I could feel the adrenalin rush subside as I counted. I could observe what was happening around me as the shaking continued. By the time I could no longer perceive motion, my count was 45.

Over the years, I have developed a qualitative way to estimate size and location of earthquakes just based on how they feel. From the length, I guessed this was at least a mid 6 and from the rolling feel, perhaps 40 to 50 miles away from me. I knew also that my family picnic was out the window. After the shaking was over, I rejoined my family downstairs and took a quick perusal of the house – no damage and only one small item had toppled over. Then I headed out to our front yard and lay down on my back on the grass. I knew there would be aftershocks and lying prone was the best way to feel them. I wasn't disappointed.

All earthquakes occur in a context with other events and the Cape Mendocino earthquakes sequence was no exception. Let me set the stage. Cape Mendocino, about 30 miles south of Eureka, is the most westerly point of California. The rugged landscape is among the most rapidly rising ground in the western United States, driven by the compressional forces of the three interacting plates: Gorda, Pacific, and North America. This triple junction zone is also the most seismically active region of the contiguous 48 states, accounting for nearly half of all the earthquake energy released on the US mainland.

Eight months before the April 92 quakes, a 6.0 earthquake occurred in the small hamlet of Honeydew about five miles south of Petrolia. I was at the Humboldt County Fair in Ferndale at the time, and it was the most memorable ride of the day. Fortunately, only a few things fell over at the fairgrounds, and though the grandstands groaned, they held. Honeydew had been a fascinating earthquake. It produced cracks in the ground and bounced boulders out of the ground, implying accelerations stronger than gravity. On April 25, 1992, it became a foreshock to the much larger earthquake that was located less than 7 miles to the north.

But the Honeydew earthquake was not the only foreshock. A 5.3 occurred only a few miles south of the Honeydew epicenter in March 1992. I noted in my journal, "We got a long roller – about 20 sec duration." Estelle Finnell, then news director at KMUD called to get my take on the earthquake. She reported items off shelves again in Redway, Honeydew and Petrolia." At the time, I thought of it only as a Honeydew aftershock.

On April 25, 1992, information was not as instantaneous as it is today. From radio news, it was clear the earthquake was in the Mendocino triple junction region, but it took several hours to get a preliminary epicenter location and magnitude estimate from Berkeley (6.9). The local network of seismic stations that had been installed to study the PG&E nuclear power plant at King Salmon was dismantled in 1986 and the only nearby seismic station was in the basement of Founders Hall on the Humboldt campus. The old analog instruments recorded on paper and had to be analyzed by hand. Of course, the earthquake was large enough to be recorded on instruments throughout the world, but it still took months before a consensus of scientists determined a final magnitude of 7.2.

The 7.2 was not the beginning of the sequence nor was it the last. While lying on our front lawn, I felt at least three aftershocks that turned out to be in the M4 range. But the next big act began that night. A 12:41 AM, a 6.5 jolted the region followed by a 6.6 at 4:18 AM. By that time, I was glued to the phone with UC Berkeley Seismology folks and was able to get their preliminary locations/sizes much more quickly.

Both of the nighttime quakes were offshore of Cape Mendocino and roughly twenty miles away from the 7.2. They were different from the mainshock in several ways: deeper, different type/orientation of faulting, in a different plate. These late-night temblors were strike slip quakes – where the faulting is horizontal. The 7.2 was a thrust with

the two sides pushing together. They were felt differently too – directing stronger ground shaking to the south. The 6.6 reportedly woke sleepers as far away as Salinas.

Were they aftershocks? Not in the narrow definition of smaller earthquakes on the same fault as the main quake. The 6.5 and 6.6 were on different faults and not directly connected. But there is no question in my mind that these earthquakes were directly triggered by the earlier quake, and I have no objections to call them ‘aftershocks’ in a broader use of the term.

When the dust had settled and the losses tallied up, the bill came to over \$60 million dollars in property losses. The worst loss was the Scotia shopping center destroyed in a blaze triggered by the 12:41 AM quake. At least 60 structures were knocked off foundations and roads suffered cracks and slip outs. About 400 injuries were reported, most abrasions and cuts due to falling objects and broken glass. No one died. We were lucky.

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/resources> and may be reused for educational purposes. Leave a message at (707) 826-6019 or email rctwg@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.”