

## **Not My Fault: Earthquakes are not fun – Make sure you are prepared for the next one**

Lori Dengler/For the Times-Standard

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It's ok if you choose to turn the page. I won't be offended. If you were in Humboldt County last Tuesday, I understand the desire to blot earthquake experiences out of your mind.

I was lucky. I was in Sacramento. I knew about the earthquake the same time you did. The MyShake App on my cell phone jerked me awake at 2:34 AM with the announcement "Earthquake, earthquake, drop cover and hold on." As I lay in bed, I heightened every sense to detect a motion. I had no idea where the earthquake was. It could have been near Lake Tahoe, San Francisco, or anywhere in between. And of course, it could also have come from home.

I didn't feel a thing in that third-floor hotel room, but the mystery of the quake's location was soon solved. Katie Whiteside, a neighbor and long-time colleague/friend from the days when KHSU was a community radio station, called minutes later. In the golden KHSU era when it was staffed round the clock, Katie would call me after felt quakes and have me on the air within minutes. Katie is now at KEET, North Coast Public Television, but old habits die hard, and it was still in Katie's DNA to push the "call Lori button" after an earthquake.

Katie experienced what I had just missed – a terrible earthquake she said gasping for breath. I hadn't had the time to pull up any details so just listened. She described those moments in the dark, crashing, lurching, and terrifying. The connection was poor and dropped after a few minutes.

I quickly got the preliminaries – magnitude 6.4 just offshore of False Cape, about 33 miles away from my home. The next call was Lauren Schmidt from KMUD radio. Lauren and I have a similar relationship to what Katie and I used to have. I often record a snippet for her news broadcast after local quakes. This was the first time she reached out in the middle of the night. She had me on air at 3 AM.

Being in Sacramento was fortunate. Not only had I missed a scary quake, I was also able to collect my wits and gather information. At home, I would have been in the dark. We have poor cell coverage in the best of times and, with no WIFI assist, am offline. I learned there was no tsunami – no surprise as the earthquake wasn't large enough - updated our earthquake telephone recording (707) 826-6020 and Facebook pages and talked to reporters.

We've learned much since the earthquake. It's called the Ferndale earthquake, after the closest community to the epicenter. Teams of local and out-of-the-area geologists, seismologists, and engineers have poured over the landscape looking for signs of ground failure, landslides, liquefaction, and structural damage. Those not in the field analyzed seismic and strong motion data. The State set up a clearing house to share technical information. I mainly ferried questions from media and the public.

Here is a short list of the most frequent questions.

- Why was the shaking so strong?

"It was fierce .... it felt like a 7 or more," said colleague and friend Larry Karsteadt. Larry, like many, is mixing magnitude and shaking strength. Magnitude is related to fault rupture length, slip, and how tightly the earth is pushing the rock against each other. Some faults slip slowly, and others snap quickly. How the rupture occurs, and its orientation is not part of the magnitude calculation but will profoundly affect shaking strength.

The December 20th quake produced the third highest shaking ever recorded in a California earthquake. Several instruments in Rio Del recorded over 1 G acceleration, enough to make you momentarily weightless. Acceleration, not magnitude is the real culprit when it comes to damage. If you increase your driving speed from zero to sixty over an hour, you won't feel any force. But slamming the accelerator and getting to sixty in a second will force you into the back of your seat. Slowly changing ground motion creates rolling, gentle motion. Tuesday's earthquake produced high frequency, rapidly changing motion, particularly damaging to single family homes.

Newer structures and those that had secure foundations performed well in the earthquake. No bridges collapsed; hospitals were able to continue operations after switching to backup power. Post and pier foundations, older cripple walls, and unbraced mobile homes were particularly vulnerable.

If you were in Rio Del or Fortuna, you are unlikely to ever experience an earthquake this strong again, even if the next quake has a larger magnitude.

- Why was this earthquake so different than December 2021?

We have many faults, especially in the vicinity of Cape Mendocino and the Mendocino triple junction. Last year's quake was beneath Petrolia, about 11 miles SE of this year's Ferndale earthquake and on a different fault. The orientation of that fault and how the rupture occurred was different as well. The next large earthquake in the area will likely be different than either of these.

- Why did we lose power and communications for so long? Utilities are vulnerable to earthquakes. Powerlines go down, water and gas mains rupture. The PG&E electric grid has motion sensors that trip the power after strong shaking. Every line has to be examined by professionals before power can be restored. It is a time-consuming process.

People living in earthquake country need to realize:

- 1- After a strong earthquake the best way to get information is via radio. KMUD did a good job of getting information out. KHUM personnel couldn't get to their studio in Ferndale. You need to have a portable radio and batteries and just keep spinning the dial until you find a station.
- 2- STAY OFF THE PHONE IF YOU DON'T HAVE A LIFE-THREATENING EMERGENCY. Never call "for information" in the hours immediately after a strong earthquake. Your call only clogs our telephone capacity. Phone systems are designed to handle roughly 10% of users at the same time. If everyone gets on their phone, you make it impossible for anyone to get through.

This earthquake was peanuts compared to what the next one could be. Use it to learn self-reliance. You and your neighbors are likely to be on your own for days or even weeks in more remote areas. Store food/water/medical supplies, learn first aid, harden your home so it will withstand earthquakes and provide a place to shelter in place. If you don't know your neighbors, now is the time to meet them. You will need to work together.

I'm sorry that there is no easy fix. The rate and size of aftershocks appears to be decreasing. But the forces that have created our beautiful region sometimes exact a price and there is always a small but real chance of another major quake just around the corner. Resilience is in our court, take this moment of heightened awareness to reduce home and business place hazards, update your

family emergency plan, and make sure you've got a flashlight and shoes near your bed for next time.

Note:<https://www.thesanfranciscoexperiencepodcast.com/64-earthquake-in-humboldt-county-california-talking-with-dr-lori-dengler-professor-emeritus-cal-poly-humboldt/> San Francisco Experience podcast and KEET's Headline Humboldt half hour news summary <https://video.keet.org/video/headline-humboldt-dsecmber-23rd-2022-vtkmey/> for more of my perspectives on the Ferndale earthquake.

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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/resources> and may be reused for educational purposes. Leave a message at (707) 826-6019 or email [rctwg@humboldt.edu](mailto: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."