

## **Not My Fault: Monday's 6.2 reminds us to brush up on preparedness**

Lori Dengler/For the Times-Standard  
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I had just started a holiday baking project when I noticed a tone from my phone. It took a second or two to make it out – a voice saying, “Earthquake Drop Cover and Hold On”. It was the MyShake App on my phone. A second later an alert went off on my husband’s phone. And then we heard the windows rattle and the house begin to sway.

This was a first for me, the first time the Earthquake Early Warning App gave me a notice and shaking soon followed. California’s MyShake earthquake notification system was released statewide in October 2019. It was first triggered on the north Coast on March 18th, 2020. That earthquake was a 5.2 on Cape Mendocino and I felt it lightly. But I didn’t get an alert because I was outside of the automated felt zone generated by the algorithm. Four days later, my phone announced a 6.2 quake and told me to expect shaking. I got down under my desk and waited and waited. But no shaking followed – that quake was only a 4.8 and I really was outside of the felt zone.

Last Monday, the system worked, and several thousand people actually got a notification a few seconds before we felt it. At my house, the shaking was mild, and it was over quickly. The first magnitude estimate was 5.2 with a location near Cape Mendocino. Five minutes later, I received a statement from the National Tsunami Warning Center in Alaska with a magnitude of 6.2 and that a tsunami was not expected.

It is not at all unusual for the first magnitude and location estimates to be off, especially here on the North Coast. Location is a triangulation process and ideally seismologists use data from instruments that surround the source. We don’t have ocean bottom instruments and that means no good constraints for offshore quakes. Accessing additional records and improved data processing reduces that uncertainty but it means adjustments in location, depth, and magnitude can continue for several days afterwards.

As I write, the USGS locates the earthquake offshore of Cape Mendocino, 23 miles west of Petrolia, 45 miles SW of Eureka, and 54 miles away from my home in McKinleyville.

The depth is listed at nine miles beneath the surface and fault motion was primarily horizontal. At first glance, it looks like this earthquake is on the Mendocino fault, the plate boundary between the Pacific plate and the Gorda plate that I wrote about two weeks ago.

But a closer look reveals a more complicated story. This earthquake was within the Mendocino triple junction region, the complex zone of deformation that marks the meeting of the Pacific, North American, and Gorda plates. It is also where three major fault systems connect: the San Andreas, the Mendocino fault, and the Cascadia subduction zone.

There is a lot of stress concentrated in the triple junction region. The result is numerous faults and folds, high uplift rates and some of the most deformed rock units I’ve ever seen. This region and the adjacent offshore area comprise the most seismically active area of the contiguous 48 states. Current discussion among seismologists suggest it wasn’t on the Mendocino fault and is more likely on a fault within the Gorda plate. And we can’t rule out involvement of the northern end of the San Andreas fault yet either.

The best news about the earthquake is that no injuries have been reported even though it was very widely felt. More than 4300 people responded to the USGS Did You Feel It web site from as far south as Monterey, north to Coos Bay and inland to the Lake Tahoe area. We’ve also got a pretty good tally on the impacts. There were numerous reports of items knocked from shelves in the Cape Mendocino and Eel River Valley area. Ceiling tiles fell at the Bear River Casino and broken bottles littered grocery store aisles. A number of small landslides were triggered, and some roads temporarily blocked.

The most significant damage was the partial wall collapse of the Loleta Creamery. The Creamery is an old brick building and has sat derelict since bankruptcy proceedings on the Loleta Cheese Factory began over five years ago. It is identified by the County as a hazardous structure due to its lack of reinforcement and general disrepair. Fortunately, no one was in the building at the time of the earthquake.

Here’s a quick run through of the questions people are asking me.

- How did they know so quickly there was no tsunami threat? The earthquake was too small to pose a tsunami threat and it was the wrong type of fault motion. We need vertical deformation of the sea floor to generate a tsunami and it typically take a magnitude 7 or larger. But if you had

been in a tsunami zone, feeling the quake should have prompted you to begin heading away from the beach and to higher ground. Most of our local radio stations did a good job of getting the “no tsunami threat” message out once it had been posted.

- Why did people have such different experiences of the earthquake in locations that seemed to be nearby? There are many factors that contribute to individual experience and distance from the epicenter is only one of them. Local geology plays a role – people living near the bay on softer sediments tended to feel it more strongly than those on bedrock. Home construction contributes as well – upper floors of wood frame houses tend to sway more. Even two people in the same building can have different experiences – if you are sitting or lying down, it will feel stronger than when walking or active.

- Did this earthquake relieve stress and make a bigger quake more likely? The earthquake did release stress – that’s what an earthquake is. But it is unlikely to play any role in the regional seismic threat. While a 6.2 may sound big, it’s small compared to the regional stress accumulation. There is a network of GPS instruments onshore that can detect small changes in the stress and have been able to sense small changes resulting from past earthquakes. The December 20th earthquake appears to have had no effect. Bottom line – we are still poised to have another strong earthquake and the next one could be larger or closer to populated areas.

The most important take-home message is we live in earthquake country and use this reminder to review how prepared you are. When the ground starts shaking, PLEASE DROP – COVER – HOLD ON.

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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](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.”