

Not My Fault: The Cascadia story chapter 5 – A Humboldt County earthquake sheds light on the Cascadia risk

Lori Dengler/For the Times-Standard
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Next month marks 25 years since the last major North Coast earthquake. This earthquake was a really big deal – both in terms of impacts on the North Coast and in how it changed the way we think about regional hazards. It also changed my career, refocusing my research interest and efforts. Today, an introduction and in the next couple of columns, how it influenced intensity and tsunami studies.

For those of you in Humboldt County on April 25, 1992, I bet you can remember exactly what you were doing around 11 am. It was a Saturday morning and my family and I were getting ready to go on a picnic. It was a beautiful spring day. I was in McKinleyville, upstairs in my bedroom, when the house began to vibrate. There was no doubt this was an earthquake.

I began to count. Counting gives your brain something to focus on and keeps the adrenalin rush of fear at bay. Counting can also turn anyone into a seismologist because the length of shaking is a measure of earthquake magnitude. Once I passed 30, my thoughts of a peaceful family day began to recede. When I ended up at 74, it was clear this was a major earthquake and my family picnic plans were long gone. My guess, at least a magnitude 6.5 and maybe into the 7s.

1992 was long before the days of internet and earthquake apps. It took over a half hour to hear a magnitude and location air on the radio – a M 6.9 on shore near Petrolia – and several weeks to determine the final magnitude of 7.2. I wasn't too surprised, this is the Mendocino triple junction area where three great plates of the earth's surface meet and the most seismically active region of California. In August 1990, a magnitude 6 quake had occurred near Honeydew, close to the 92 epicenter, and Bob McPherson and I had just finished a paper on it.

The rest of the day was a blur, off to my office to get an intensity survey going (see the next column), get updated information from the USGS and Berkeley and

help coordinate scientific teams who would soon be converging on Humboldt County to study aftershocks and shaking effects. I made it home in the evening but was still working at 12:41 am when interrupted by more strong shaking. This time I counted to 60. I figured this was our largest aftershock.

All large earthquakes are followed by aftershocks, smaller earthquakes related in time and space to a larger one. Aftershocks are earthquakes in their own right and, as we were to find out that night, quite capable of producing significant damage. Think of them as nature trying to create a new equilibrium's response to the fault rupture and stress changes caused by large earthquakes. In California, a typical rule of thumb is that the largest aftershock is about one magnitude unit less than the main earthquake.

By this time, I was in close contact with Mike Pasyanos at the Berkeley Seismology Lab and was on the phone with him as they worked out the preliminary magnitude. M 6.5, on the large side for a typical aftershock. The location also was a little odd – it was centered offshore and didn't appear to be on the same rupture as the main quake. The third major tremor in the sequence struck at 4:18 am, just as I was finally falling asleep. About 65 seconds this time, probably very similar in size to the midnight quake. I was just about to call Mike again when our phone rang. It was a sheriff's deputy on duty near Fortuna. I'm not sure how he got my number (it's unlisted), but his question was clear enough, "Is this going to be the last one?" Like many in the area, quake number three was one to many and I could hear in the rising tone of his voice that he was beginning to lose it. Unfortunately, all I could say was maybe. Aftershocks are a normal part of the earthquake process and as time passed, the chances of really big ones would recede. People hate probabilities and I could tell this wasn't a very satisfactory answer.

When I talked to Mike at Berkeley, this aftershock was also very large (M6.6), also offshore and not the same type of earthquake as the one on Saturday morning. We were learning that earthquakes in the triple junction are complex, and an event in one plate can trigger different ones in others.

Aftershocks would continue for months, but all were smaller and mainly felt only in the Cape Mendocino area. When the dust finally settled, assessments, analyses and field studies completed, the April 25th and 26th earthquakes would turn out to be the most damaging North Coast sequence since 1906. They caused nearly

\$70 million in property losses, over 380 injuries and triggered a fire that nearly destroyed Scotia. Ten days after the earthquakes, George W. Bush declared a Presidential Disaster.

“How many people died?” I was asked early the following morning on my national TV network debut. “No one.” I think they were a little disappointed when I explained that our wood frame construction, California building codes and relatively sparse population density, and luck were all in our favor. I hope I am always able to give that answer.

Next chapter – the 1992 shaking gives rise to a new way to measure earthquake shaking

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