

Not My Fault: Lesson from the shakeup of Nov. 8

Lori Dengler/For the Times-Standard

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November 8 was a day of seismic proportions. It shook our region to its core and exposed long-hidden fault lines. No – not Tuesday’s election. I speak of November 8, 1980, the first earthquake I ever felt in Humboldt County. The magnitude 7.2 earthquake struck just offshore of Patrick’s Point and about 9 miles NW of our home in Westhaven.

My family and I were rudely awakened a little before 3 am. The shaking was intense, but what I remember most was the noise. The house was groaning and screaming, the cacophony punctuated by the crash of our antique clock hitting the floor. My husband and I rode it out in our bed – we couldn’t move and were confused by the fog of sleep. After the shaking subsided, we did have enough wits about us to put on slippers and grab a flashlight to check on our son and survey the damage.

My family was lucky. No injuries and, other than the beautiful clock, we lost nothing of value. Humboldt County was lucky too – about \$2 million in losses but almost all from the collapse of the southbound span of Highway 101 at Thompkins Hill near College of the Redwoods. The Mariani family was not so lucky. They were driving south and hit the overpass just as the strongest seismic waves arrived. At first they thought their Volkswagen beetle had a flat tire, but then realized that the bridge was falling beneath them. They sustained serious injuries but all survived.

The bridge had a serious flaw. There was no structural connection between the deck and the supports – it was held in place by gravity. It would hold together as long as all the forces on the bridge are down like gravity, but earthquakes exert side-to-side forces. The ground and the supports moved out from beneath the deck and the southern end fell to the ground. It was bad luck for the Marianis to be on the bridge at that moment, but they were lucky that it was the south end that failed and the collapsing deck reduced the speed at which they fell. Design codes required at the time required that new bridges meet strict seismic guidelines but older bridges were exempt. It took the spectacular bridge failures of the 1989 Loma Prieta earthquake to finally require that all bridges in the state be retrofitted.

This earthquake occurred at a time when the thinking about the nature of North Coast faults and earthquake sources was changing. The 1906 earthquake established California as an important place for seismology and by the 1920s, seismic stations dotted much of California. By the middle of the century, it was understood that the San Andreas and its close relatives were strike-slip faults - vertical clefts in the earth’s surface trending NW – SE, with the land to the west moving to the NW relative to the land on the eastern side of the fault.

Seismologists analyzing offshore North Coast earthquakes saw similarities to the San Andreas earthquakes. Seismic analysis showed they were also strike-slip and were either oriented similar to San Andreas faults or at a 90° angle to them. It is perhaps not too surprising, that Berkeley scientists (where I received my graduate degrees), were a little biased towards the San Andreas system, choosing the San Andreas orientation and declaring that the San Andreas fault was breaking through the crust offshore of Humboldt and Del Norte Counties.

Other research groups were beginning to have doubts about the Berkeley interpretation. My colleague and former HSU and CR lecturer Bob McPherson and colleagues from the University of Washington ran the Humboldt Bay Seismic Network at the time and made the controversial assertion that our quakes were a different breed entirely. And then the 1980 quake came along. Aftershocks clearly delineated an 80-mile long fault that extended from the epicenter just offshore of Patrick’s Point to the SW all the way to the Mendocino fault. The fault was at a right angle to what the Berkeley experts had proposed and exactly what McPherson’s group had proposed.

The 1980 earthquake wrote and new chapter about the unique setting of our area. And I learned to always secure valuable items to the wall.

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