Times-Standard
Times-Standard / Humboldt Beacon

Not My Fault: 2019 earthquakes at the halfway point

Lori Dengler/For the Times-Standard
Posted July 3, 2019

It's time for the midterm earthquake report for 2019. The good news is that the number of earthquake casualties is the second lowest since 2000.

There have been 77 earthquakes of magnitude 6 or larger in the first half of the year and seven that reached the magnitude 7 or greater level and only two of M7.5 or larger. That puts us in the lower third of earthquake energy release for the past two decades and very similar to the last three years.

The largest magnitude earthquake of the year was the M8.0 on May 26th in Peru. This was a moderately deep earthquake, 76 miles beneath the surface. The greater depth had two effects. It reduced the strength of the shaking in the epicentral area and caused it to be felt over a large area – as far as a 1000 miles away including parts of Brazil, Colombia and Bolivia. The earthquake damaged at least 1000 structures in Peru and Ecuador and caused one death in each country.

53 deaths have been attributed to earthquakes so far this year, well below the six-month median number of about 800 for the past two decades and the third lowest number since 2000. Only two earthquakes in 2019 produced casualty numbers in double digits. The deadliest to date was the April 22 M6.1 earthquake on the Philippines' most populated island of Luzon, only 40 miles away from Manila. The USGS estimates that over 5 million people experienced strong to very strong shaking. 18 deaths were reported, five in the collapse of a single supermarket.

The second deadliest quake of the year occurred on June 17th in Sichuan, China. It only had a magnitude of 5.8 but caused 13 deaths, injured more than 200 and caused significant damage to at 1000 structures. The Philippine and Sichuan quakes illustrate it's not the magnitude of an earthquake that is the primary factor in impacts, but the exposed population and how well built the structures are. The seven earthquakes of M7 or larger this year only caused 4 deaths.

The April 2nd M 6.4 in the Rat Island area of the Aleutians was the largest magnitude US quake of the year, followed by a M6 earthquake in May in the neighboring Andreanof Islands. Both earthquakes were in remote, sparsely populated areas and caused no impacts. Closer to home, our M5.6 on June 23 was the largest quake in the lower 48 states. It knocked some items off shelves in the Cape Mendocino area but otherwise caused little damage. This earthquake was similar in size to the Sichuan quake that killed 13. Fewer than 500 North Coast residents were in the area of strong shaking for the June 23rd earthquake compared to 770,000 exposed in the China quake. Exposure and construction standards make a big difference in impacts.

A few other comments on the first year seismicity: First the oddities. The largest earthquake east of the Rocky Mountains was a 4.6 on January 15 centered off the Atlantic coast 135 miles east of the Maryland coast line. This earthquake was near the base of the continental shelf and a very long way from any active plate boundaries. A M4 earthquake occurred near the south shore of Lake Erie on June 10th. Not quite as unusual as the Atlantic quake (a M5 occurred in nearly the same spot in 1986), but a surprise to the nearly 10,000 people who reported feeling it. These earthquakes are reminders that earthquakes can and do occur anywhere, just not as frequently as in places like Alaska and California near active faults.

An earthquake swarm made headlines in Southern California last month. Over 1000 small quakes have been recorded since May 25th centered near Rancho Cucamonga and Fontana. Called the Glen-Avon earthquake swarm, the epicenters have been tightly clustered along a five-mile long zone trending N-NE at depths of between two and seven miles beneath the surface. Most of the quakes are tiny, measuring less than magnitude 2, but five have made it into the magnitude 3 range and at least 50 were large enough to be felt. The swarm is ongoing but the rate of activity appears to be slowing. Swarms are not unusual in this area and past sequences suggest that swarm activity is not likely to produce earthquakes larger than magnitude 4. That doesn't mean there is no reason for concern. There are plenty of fault systems in the region quite capable of producing significant earthquakes quite independent of swarm activity.

The first half of 2019 has been notable for where earthquakes haven't been occurring. Earthquake activity in Oklahoma is sharply down this year compared to the past five years. Only 20 earthquakes of magnitude 3 or larger were recorded in the first six months of the year compared to 472 back in 2015. Oklahoma was not a

seismically active region until oil companies began injecting drilling waste fluids into deep wells around 2010. In the later half of 2015, regulations were put in place controlling the rate and volume of injected fluids. The change in policy has had an effect. Seismicity is still elevated compared to the one or two quakes of this size per year before the injection era, but significantly reduced from four years ago.

The relatively low number of large earthquakes means few tsunamis have been recorded in 2019. NOAA's National Center for Environmental Information (https://www.ngdc.noaa.gov/) reports only four tsunami events recorded to date, and none produced waves higher than a half a foot or caused any impacts.

Just because it's been a relatively seismically quiet year so far, don't assume it will stay that way. The next six months could continue the quiet trend, be much more active or somewhere in between. My prediction – there will be surprises and the best way to counteract any unpleasant ones is to take action to prepare now.

Lori Dengler is an emeritus professor of geology at Humboldt State University, an expert in tsunami and earthquake hazards. Questions or comments about this column, or want a free copy of the preparedness magazine "Living on Shaky Ground"? Leave a message at (707) 826-6019 or email Kamome@humboldt.edu

https://www.times-standard.com/2019/07/03/lori-dengler-2019-earthquakes-at-the-halfway-point/