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OIL AND GAS

Fracking causing earthquakes in Permian Basin — study

Mike Soraghan, E&E News reporter
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New research out of Texas indicates that man-made earthquakes in the Permian Basin area are more likely being caused by hydraulic fracturing than injection of oil-field wastewater.

The west side of the Permian zone in West Texas has seen an uptick in earth-shaking events since a drilling boom there. By taking an in-depth look at several points in the region, scientists at the state's Bureau of Economic Geology found they lined up well with fracturing operations, or "fracking."

"It was that correlation in time and space that showed they were much more likely to be from hydraulic fracturing than saltwater disposal," said Michael Young, the associate director of environmental research at the bureau, which is part of the University of Texas, Austin.

Researchers analyzed a group of 3,103 quakes. They found 1,217 were associated with hydraulic fracturing, about 40%. None of the quakes was larger than magnitude 2.8, which is about the size at which people can feel them at the surface.

It's not clear what that might mean for oil production in the region, a major driver of the Texas economy that fuels a big chunk of the country's gasoline needs. Young said oil producers could use the research to change their fracking techniques to prevent shaking.

"They don't want earthquakes either," Young said. Oklahoma oil and gas officials have developed a set of protocols for scaling back or ceasing frack jobs when low-level shaking is detected.

Young added that the **study** isn't excluding disposal of oil-field wastewater as a cause of earthquakes in the region, just that more are lining up with fracking operations.

But most of the earthquakes appear to be occurring deeper in the ground than the geologic formation where the industry injects wastewater, he said.

The study was made possible by the TexNet Seismic Monitoring Program, which placed a dense array of seismometers around the state. The research was funded by the Texas Legislature several years ago after several earthquake swarms were linked by residents and academics to oil and gas operations. The study was funded through TexNet and its affiliated industry consortium, the Center for Integrated Seismicity Research (CISR).

Many people use the term "fracking" to describe nearly all of the oil and gas production process. But it actually refers to a specific part of well development after the well is drilled and before production begins. Large volumes of chemical-laced water and sand are injected underground at high pressure to break open deep-rock formations and release oil or gas.

Man-made earthquakes in the United States, particularly Oklahoma, have been more commonly associated with disposal of the millions of barrels of salty wastewater that comes up with oil and gas. Though injected at far lower pressure, disposal injects far more fluid over years and decades. The fluid can change pressure along faults, essentially lubricating them and causing them to slip.

Most frack-lined quakes are small. But scientists have already linked quakes to "frack jobs" in Oklahoma, Canada and China. A magnitude 4.6 quake linked to fracking shook a remote area in British Columbia, Canada, in 2015. In 2016, fracking appears to have triggered a magnitude 4.7 quake in the Sichuan Basin of China.

Twitter: **@MikeSoraghan** | Email: **msoraghan@eenews.net**

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