

Miami University study links earthquakes and drilling, suggests partnership to detect fault lines



By [Katelyn Ferral](#)

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Increased monitoring of seismic activity could help prevent earthquakes near hydraulic fracturing sites, which can upset unknown fault lines underground, say the authors of a study that finds a link between earthquakes and drilling.

The results of the study, which will be released Tuesday, link fracking along an unknown fault line to a rare 3.0-magnitude earthquake in Poland Township, Ohio, and highlight the pitfalls of unseen faults within such operations.

"I don't think there's a cost-effective strategy or technique to be able to deduce where those faults are in advance," said Michael Brudzinski, professor of seismology at Miami University and co-author of the report.

The industry, regulators and the scientific community could do a better job of monitoring seismic activity if they worked together, he said.

The study, published in the *Bulletin of the Seismological Society of America*, a peer-reviewed geology journal, was conducted by researchers at Miami University in Ohio.

The report is one of several in recent years linking horizontal drilling and fracking, in which gas or oil is extracted from the earth by injecting a high-pressured water-sand mixture into shale underground, with earthquakes.

Geological due diligence is a critical piece of planning when drillers decide where to put a well and how to frack it.

"Operators don't want to frack on a fault plain because if they did that, they'd lose all their frack fluid," said Betsy Suppes, a geologist who consults for companies in the oil and gas industry.

Not all gas drillers employ seismic imaging, and even ones that do can miss fault lines when planning wells.

"I wouldn't be surprised if they just couldn't see it," Brudzinski said. It isn't until they started operation and some earthquakes happened that operators would know something is going on, he said.

Not seeing where there could be a fault line is the problem, said Mark Szybist, a staff attorney with Penn Future, a Pennsylvania-based environmental group that monitors fracking's effects on the environment.

"This looks like yet another example of fracking first and understanding fracking later," he said. "This study underscores the importance not only of knowing where the faults are, but also of understanding how they work."

An information-sharing and monitoring partnership between the industry, regulators and environmental groups is a need Brudzinski hopes the study highlights.

"The point I would want to sort of shout is: 'Hey this is rare, but looks like we could employ some techniques to help regulation to help prevent cases like this,' " he said.

In March, there were five earthquakes ranging from a 2.1 to 3.0 magnitude recorded within one kilometer of a group of oil and gas wells being fracked in Poland Township by Hilcorp Energy. The Ohio Department of Natural Resources later stopped operations at the site.

Researchers examined the correlation between fracking activity and earthquakes in the area by reviewing seismic data and comparing identified earthquakes with well stimulation reports from the state. They found the 3.0 earthquake near Poland Township coincided temporarily and spatially with

fracking.

They identified a total of 77 earthquakes with magnitudes from 1.0 to 3.0 between March 4 and 12 in the area. There are an average 1.3 million earthquakes ranging from 2.0 to 2.9 each year, according to the U.S. Geological Survey. Earthquakes under a 2.5 magnitude are often not felt.

“We are still in the process of reviewing the study and are not in a position to comment on any specific findings at this time,” Hilcorp spokesman Justin Furnace said. “However, Hilcorp is committed to conducting all of its operations in a safe and responsible manner and will continue to participate with various state and federal regulatory bodies and other stakeholders in the ongoing efforts to further study and understand the issues related to induced seismicity.”

The Ohio Oil and Gas Association said it's studying the link between earthquakes and fracking.

“Our industry is working collaboratively with regulators, experts, academics and environmental groups through the Interstate Oil and Gas Compact Commission's state's first initiative to study and address these concerns,” said Shawn Bennett, executive vice president of the group.

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