

Scientists see fracking as cause of earthquakes in heartland

4 November 2014, by Sean Cockerham, McClatchy Washington Bureau

Evidence is growing that fracking for oil and gas is causing earthquakes that shake the heartland.

States such as Oklahoma, Texas, Kansas and Ohio are being hit by earthquakes that appear linked to oil and [gas](#) activity. While the quakes are far more often tied to disposal of drilling waste, scientists also increasingly have started pointing to the fracking process itself.

"Certainly I think there may be more of this that has gone on than we previously recognized," Oklahoma Geological Survey seismologist Austin Holland told colleagues last week.

In addition to what Holland has seen in Oklahoma, a new study in the journal *Seismological Research Letters* concludes that fracking caused a series of earthquakes in Ohio a year ago. That follows reports of fracking leading to earthquakes in Canada and across the Atlantic in the United Kingdom.

Hydraulic fracturing, known as fracking, is when massive amounts of high-pressure water with chemicals is pumped underground to break shale rock and release the oil and natural gas inside.

The process is responsible for the nation's energy boom since 2008, as it has allowed access to oil and gas trapped in the shale. But at the same time, earthquakes have spiked in the central and eastern United States.

Before 2008 Oklahoma averaged just one [earthquake](#) greater than magnitude 3.0 a year. So far this year there have been 430 of them, Holland said.

Scientists have linked earthquakes in Oklahoma to drilling waste injection. Shale drilling produces large amounts of wastewater, which then is often pumped deep underground as a way to dispose of it without contaminating fresh water. Injection

raises the underground pressure and can effectively lubricate fault lines, weakening them and causing earthquakes, according to the U.S Geological Survey.

USGS senior science adviser Bill Leith, speaking at an earthquake forum last week held by the U.S. Energy Association, said communities need to be worried about earthquakes from drilling waste injection. But quakes from fracking itself are rare, Leith said.

Following a presentation at the earthquake forum, however, Oklahoma seismologist Holland suggested fracking is indeed playing a role in his state.

"The time period in which I looked at could explain about 10 percent of the earthquakes," said Holland.

A study published in the November edition of *Seismological Research Letters* concluded that fracking operations triggered a series of earthquakes up to magnitude 2.2 last year in Harrison County, Ohio.

"Hydraulic fracturing has the potential to trigger earthquakes, and in this case, small ones that could not be felt, however the earthquakes were three orders of magnitude larger than normally expected," Paul Friberg, a seismologist with Instrumental Software Technologies Inc. and co-author of the study, said in an email.

The authors concluded that the fracking likely triggered a slip in a previously unmapped fault. They suggested that "as [hydraulic fracturing](#) operations explore new regions, more seismic monitoring will be needed since many faults remain unmapped."

Ohio imposed seismic regulations on fracking after regulators found it probably triggered minor earthquakes in March. But such restrictions are

rare.

There is a more of a move toward regulations for waste disposal wells. Oil and gas regulators in Texas, who have long expressed skepticism about the link between drilling and earthquakes, passed a rule last week that requires oil and gas companies to consult seismic records before drilling a waste disposal well. The action followed a swarm of earthquakes in North Texas near Fort Worth.

Kansas has seen an increase in earthquakes as well, with more than 60 of them reported so far this year.

Gov. Sam Brownback, a Republican, convened a task force that declared last month there wasn't enough information to determine the cause of the small Kansas earthquakes, despite the fact that the earthquake surge corresponds to increased oil and gas activity in the same area.

USGS scientist Jason Rubinstein said in an interview that wastewater, injection and [fracking](#) are possible culprits for the Kansas quakes.

Kansas officials are hesitant to point the finger at oil and gas. The official announcement of the task force findings declared that "[oil](#) and gas is a cornerstone industry in Kansas generating nearly \$4.3 billion each year, and employing 118,000 Kansans each day."

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