



**quakes with a magnitude 2.5 or greater, but there were only 20 in the 18 days following the shutdown, according to the state Geological Survey.”**

How did they get the idea to study the link? Well, in 2010, after fracking started in the state, the number of earthquakes was over 600 — about as many as in Arkansas in the last 100 years! Connection?



Also, it should be noted that the U.S. Army and U.S. Geological Society [conclusively linked fracking to earthquakes](#) long ago.

## **Oklahoma Earthquakes & Fracking**

In Oklahoma, the situation is quite similar (though, of course, the investigation has not been completed yet). The largest earthquake that hit Oklahoma this weekend, a 5.6-magnitude tremor near Sparks, was the largest on record in the state. Dozens of earthquakes hit Oklahoma on the weekend.

Oklahoma has seen the same rise in earthquake activity that Arkansas saw. Going from about 50 earthquakes a year up until 2009, the state got 1,047 last year! I'm sorry, but did no one there or studying the matter notice? Or did they just not make the connection to fracking? Or did they just have no influence over the matter, so no one heard them?

Of course, the trend has continued in 2011, and now almost the whole country knows that Oklahoma all of a sudden gets strong earthquakes. (The 5.6-magnitude quake this week was felt as far away as Illinois and Wisconsin.

## Fracking & Earthquakes

OK, now, how can fracking be related to earthquakes? It's actually the disposal wells that seem to cause the problem. Fracking involves high-pressure injection or pumping of fluids into the ground,.. in order to open up cracks in the rock for natural gas to escape and be capture.

Hmm, open up cracks in the rock....

While it seems fracking doesn't cause earthquakes immediately, it lowers the barriers to earthquakes happening, loosens up the rocks enough that it is more likely to happen. In Arkansas, they noticed that it was especially the wastewater disposal wells that seemed to be setting the stage for earthquakes. As quoted above, when these wastewater disposal wells were shut down — high-pressure injection of wastewater was stopped — the number of earthquakes diminished back down to a more normal level soon after.

Of course, many (especially corporate interests in the fracking industry) still claim there is no conclusive link between fracking and earthquakes, and making a clear, direct link to any specific quake is rather hard (if not impossible). But I think we've come far enough to know by now that fracking causes (or helps to cause earthquakes). And not just small ones (another common claim in the natural gas industry). And, of course, less not forget about the flammable water....

*Sources: [Planetsave](#), [Guardian](#), [Earth & Industry](#), [Arstechnica](#), and numerous articles I've read and written on the matter this year.*

*Oklahoma recent earthquakes by flickr user kelleymcd via [Red, Green, and Blue](#); [Oh Frack](#) image via Shutterstock/Gas2*

***Want to help [stop fracking in Oklahoma](#)? Visit the linked Facebook page on the matter.***

Still here? OK, bonus for you then! Check out this fun [fracking infographic](#):

# CRACKING DOWN ON HYDRAULIC FRACTURING

## HYDRAULIC FRACTURING AND INCREASED EARTHQUAKE RISKS

Several regions worldwide have experienced an increase in seismic activity since hydraulic fracturing operations began. This includes the United States, Canada, China, and the United Kingdom.

Though scientists are still unsure of the exact mechanism, the link between hydraulic fracturing and earthquakes is becoming increasingly clear.

## WHERE FRACKING IS BEING DEVELOPED



## WHO HAS THE SHALE GAS RESERVES



### DALLAS-FORT WORTH, TEXAS

Between 2009 and 2012, there were 180+ minor tremors in the Dallas-Fort Worth area. This is a significant increase from the 10-15 tremors recorded in the same area in 2008.

### BLACKPOOL, UK

2.3 magnitude earthquake in 2011, 1.5 magnitude earthquake in 2012. This is a significant increase from the 1.0-1.2 magnitude earthquakes recorded in the same area in 2010.

### GUY-GREENBRIER, ARKANSAS

Officials have analyzed a series of small earthquakes in the Guy-Greenbrier region. Here, 2,000+ earthquakes were recorded between 2009 and 2012. This includes the 3.9 magnitude earthquake in 2011.

## WHY DOES FRACKING INCREASE EARTHQUAKE RISKS?

The injection of large volumes of water into the ground increases the pore pressure in the rock, which can cause it to fracture and release stored energy.



## NOT ALL FRACKING CONTRIBUTES TO EARTHQUAKES



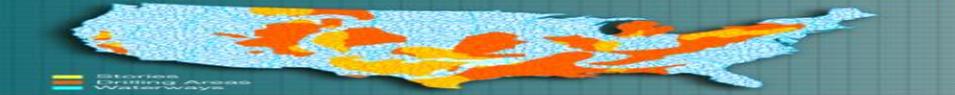
For instance, the wells concentrated around the **Greenbrier** region are likely contributing to the increase in seismicity in the region.

## HYDRAULIC FRACTURING MAY ENDANGER DRINKING WATER AQUIFER HEALTH

Hydraulic fracturing is also suspected in the contamination of shallow aquifers. Drinking water in aquifers is contaminated by the chemicals and wastewater used during the shale fracturing and extraction process.



## FRACKING COULD BE CONTAMINATING THOUSANDS OF DRINKING WATER AQUIFERS THROUGHOUT THE COUNTRY



## FRACKING AND UNEQUAL WEALTH

RESIDENTS LIVING NEAR SHALE GAS EXTRACTION ACTIVITIES OFTEN EXPERIENCE A LOSS OF PROPERTY VALUE.

As water becomes more scarce, the value of property near shale gas extraction areas falls.

Those who remain must have their property value diminished by the water scarcity. As their water supply diminishes, their property value falls.

WATER

Some choose to fight their property value loss by suing the companies.

These families are sometimes forced to sell their property at a bargain basement price.

BARGAIN BASEMENT PRICE

But if they do not accept, the property value continues to fall.

Hydraulic fracturing puts whole communities on the brink of disaster by threatening drinking water and causing a loss of property value. But these are certainly important things to consider.

**SOURCES**

- 1. U.S. Geological Survey, "Seismicity Associated with Hydraulic Fracturing in the Central and Eastern United States," 2011.
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