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# What's shaking? New online map shows Texans where earthquakes strike



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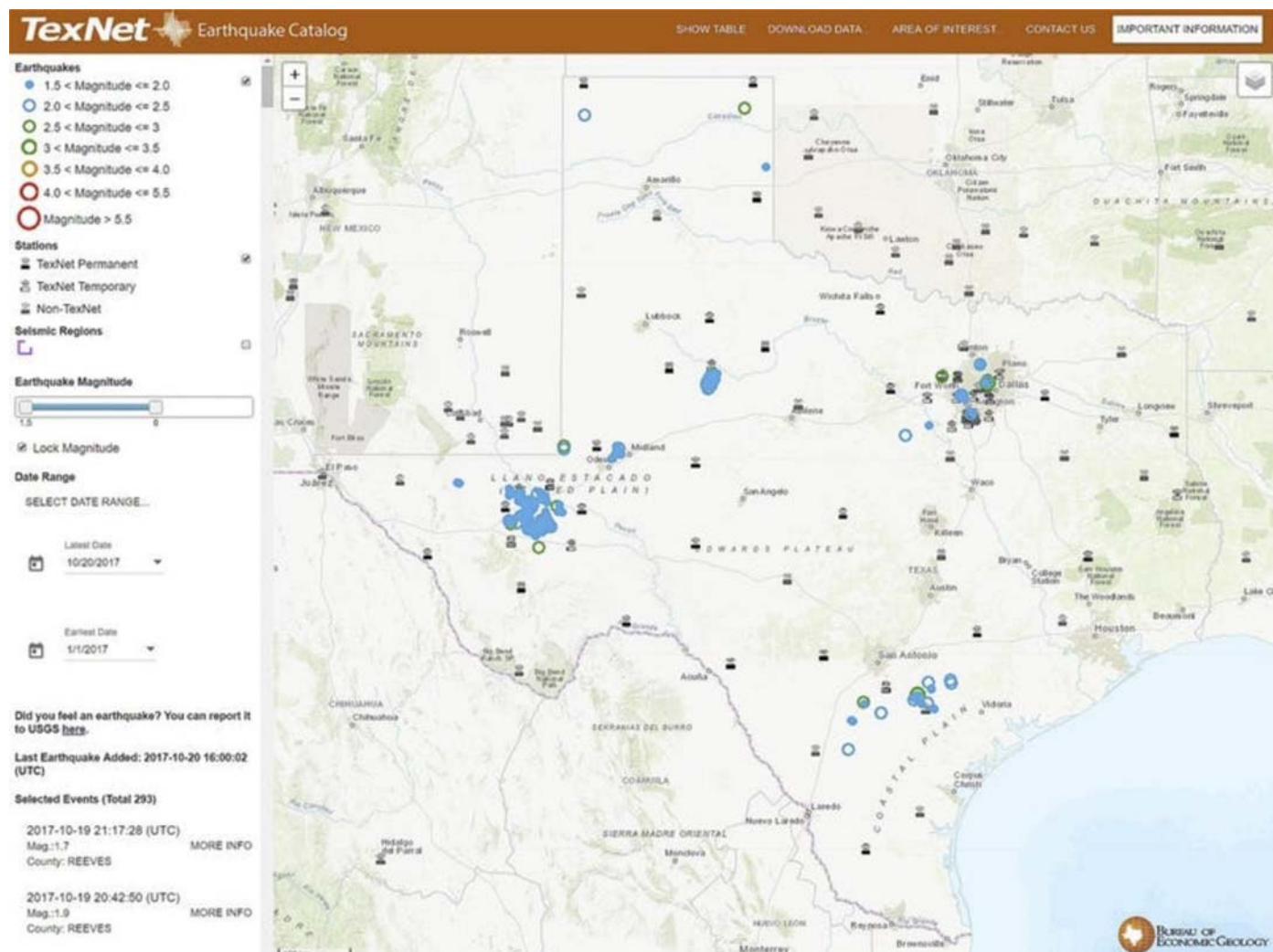
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The next time North Texans feel a jolt, they'll have a new way of finding out whether they experienced an earthquake and where it struck. Was it 5 miles away, or beneath the local park?

A new website run by the University of Texas at Austin's Bureau of Economic Geology provides the most precise near real-time information available about earthquakes across Texas.

It uses data from TexNet, the state-funded seismic network that Gov. Greg Abbott and the Legislature authorized in June 2015 with \$4.47 million in state funding. It also incorporates data from monitors operated by the U.S. Geological Survey and Southern Methodist University. TexNet's broader mission is to track earthquake hazards across the state and to help scientists understand why the state's quake rate has grown sixfold since 2008.

Dallas-Fort Worth, which felt no earthquakes before 2008, has experienced more than 200 small- to moderate-sized ones since then, though its earthquake rate fell after 2015.



A new interactive earthquake map of Texas from the University of Texas Bureau of Economic Geology uses data from the state-sponsored seismic monitoring network TexNet to allow users to track tremors across the state. (UT Bureau of Economic Geology)

Scientific studies have tied the quakes to the disposal of wastewater from oil and gas production. The most recent quake in Dallas occurred Sept. 14 and measured 2.6-magnitude.

[3.1-magnitude earthquake in northwest Dallas surprises residents, scientists](#)

The map, at [www.beg.utexas.edu/texnet](http://www.beg.utexas.edu/texnet), shows the location of every earthquake of 1.5-magnitude and greater since January 2017, when staffers installed the seismic network. Smaller quakes that don't make the map are listed in TexNet's full catalog, which users can download from the site.

The TexNet map complements information available from the [U.S. Geological Survey](#), the main source of data on earthquakes around the world.

While the USGS has a mandate to track quakes of 2.5-magnitude and greater, TexNet will catalog every verifiable earthquake its monitors can detect. So far this year, the TexNet map shows 285 small quakes measuring 1.5-magnitude and above across the state, while the USGS reports 35.



The UT Bureau of Economic Geology's interactive earthquake map shows 20 quakes in North Texas so far this year, most too small to be felt. (UT Bureau of Economic Geology)

TexNet will also improve the accuracy with which Texas earthquake locations are reported to the public. Its precision comes from its state-of-the-art equipment, its large number of stations and its staffers' ability to manually analyze events within the context of local geology.

"Our analysts will be reviewing data 24/7, 365," said Peter Hennings, principal investigator of the Bureau of Economic Geology's Center for Integrated Seismicity Research.

In the case of larger events or those that strike in a densely populated area, TexNet analysts will review the information right away. Smaller earthquakes will be reviewed

and posted as quickly as possible, typically within a couple of days to ensure accuracy, Hennings said.



Alexandros Savvaidis, program manager for TexNet, checks his laptop as he and research scientist associate Bissette Young install a portable seismometer behind a fire station on Sept. 29, 2016, in Farmers Branch. TexNet is an earthquake monitoring program run by the Bureau of Economic Geology at the University of Texas at Austin to help locate and determine the origins of earthquakes in Texas. (Smiley N. Pool/Staff Photographer)

TexNet consists of 22 permanent monitoring stations and 40 portable stations, which staffers deploy to more quake-prone areas of the state. Dallas-Fort Worth has two permanent TexNet stations and 12 temporary ones. In addition, Southern Methodist University, which has led investigations of North Texas earthquakes, operates 20 temporary stations, and the USGS operates two permanent ones in the area.

All the monitors send data to the scientific organization Incorporated Research Institutions for Seismology, or IRIS, where it is made public for all researchers to use.



“Seismology has had a culture of sharing data for a lot longer than many science subdisciplines,” said SMU’s Heather DeShon, who leads the university’s North Texas earthquake research. “Everybody gets to use everybody else’s real-time data feeds. It’s kind of cool.”

Seismologists and technicians at TexNet, the USGS, SMU and other institutions access and analyze data using the IRIS archive. Differences in quake locations and magnitudes among institutions come from the different ways in which each group crunches the information.



Heather DeShon, SMU associate professor of geophysics, during an April 2015 news conference on oil and gas drilling's effect on North Texas earthquakes. (Smiley N. Pool/Staff Photographer)

A pattern that quickly emerges upon viewing the TexNet map is a cluster of small quakes near the West Texas town of Pecos. The area is home to the country’s hottest oil and gas plays. According to TexNet, the area has experienced 181 earthquakes of 1.5- to 3-magnitude since Jan. 1.

“TexNet will be using its advanced networks to investigate the seismicity so we can start to build an understanding of what the potential causes might be,” said Hennings.

The network will also help scientists map faults across the state, predict earthquake hazards and figure out ways to lower the risk of damaging events. SMU’s DeShon, who receives TexNet funding for some of her research, said a key benefit of TexNet is that the stations will allow her team to track earthquake sequences from the moment they start. That will help her understand the exact mechanism that kicks them off. Until now, she and her colleagues have rushed to deploy equipment in the wake of initial tremors, like EMTs responding to an emergency.

For quakes thought to be linked to wastewater wells, tracking them from the start may also allow operators to adjust injection volumes before the tremors grow large enough

for people to feel.

“The hope is that with a network like TexNet, you catch the beginning of those sequences,” DeShon said. “And maybe you catch the beginning of the sequences early enough to actually do something.”

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