

Earthquake monitoring is important to the Permian Basin

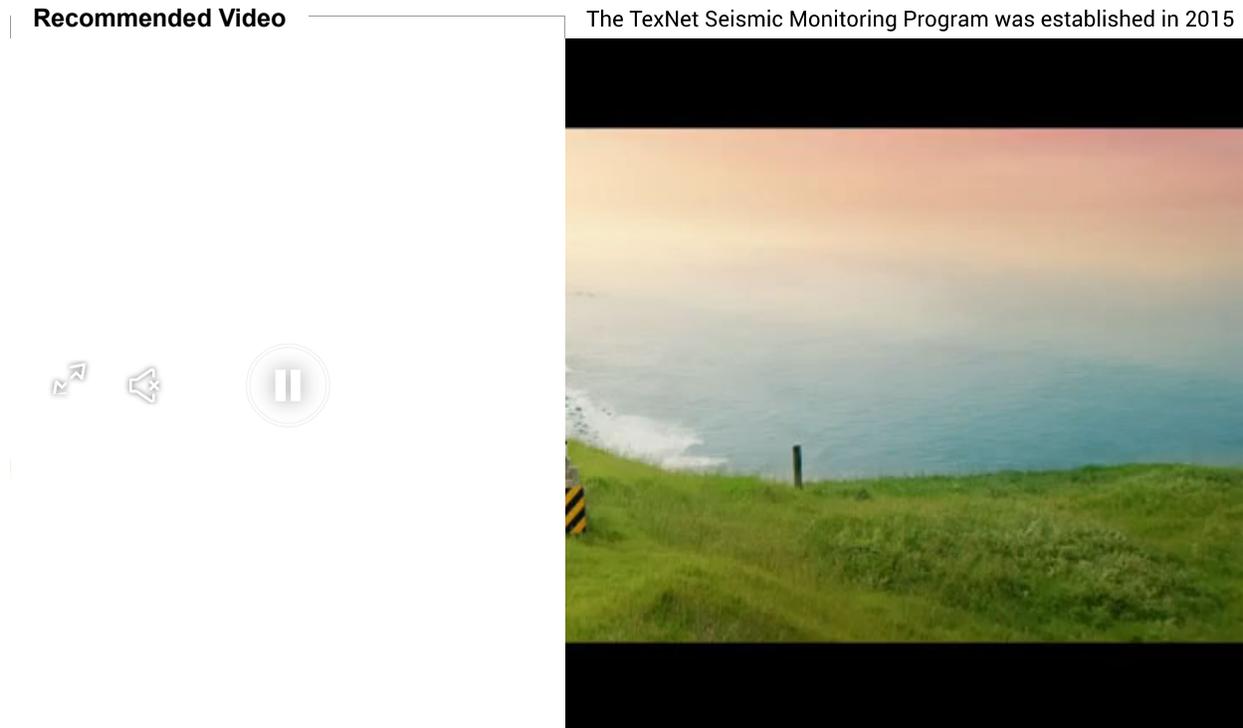
Scott W. Tinker Bureau of Economic Geology Published 10:14 am CST, Monday, February 25, 2019

West Texas has seen its share of earthquakes in the distant past. They occurred naturally, when rock formations deep beneath the Earth's surface slipped along existing faults and caused seismic waves to traverse and to vibrate the overlying layers of rock. However, starting in 2010, the number of small earthquakes recorded in the Permian Basin began to increase dramatically. In 2018, there were an average of more 400 small earthquakes recorded each month. Most are too small to feel. Why has the rate of earthquakes increased in West Texas, the Dallas-Fort Worth area, Oklahoma, and other states?

To answer that question, the state of Texas funded and put in place one of the most sophisticated statewide earthquake monitor networks in the country. This network is called TexNet, and it is operated by the Bureau of Economic Geology (Bureau), the State Geological Survey of Texas, housed at The University of Texas at Austin.

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The TexNet Seismic Monitoring Program was established in 2015



especially in the Delaware Basin, which is now producing more oil than any other U.S. region. Questions remain about the causes of the increase in earthquakes, and the interplay between geologic processes and human influences, such as disposal of oilfield waste water by injection, hydraulic stimulation and other industrial operations. This is where integrated research comes into play, which helps stakeholders make important decisions and assists operators and regulators with potential mitigating actions.

TexNet works very closely with state agencies, such as the Railroad Commission of Texas, to provide the best information available on earthquake events so that they can make decisions on how industry operations should be monitored and potentially regulated. The energy industry has access to and closely watches TexNet data to make decisions that allow them to conduct best practices in their drilling operations. The public and other researchers also rely on this information. Having specific geologic and earthquake data reduces uncertainty so that vital decisions can be made with a much higher degree of confidence.

To help the citizens of Texas, the TexNet earthquake operations team has recently developed the TexNet Earthquake Catalog, a dynamic interactive mapping web page that provides information on the location of seismometers operating in Texas and data on the location and magnitude of recorded earthquakes across the State. The map includes events recorded since Jan. 1, 2017, when data collection began. Keeping Texas citizens informed about earthquake activity helps to mitigate the effects of future earthquakes through improved knowledge and preparation. The TexNet Earthquake Catalog and its data, found on

the Bureau of Economic Geology's website, are accessible to everyone and to other national and international earthquake reporting systems.

TexNet provides the very important connection between raw data being collected and streamed by the statewide seismometer network, and the critical decisions that the State of Texas must make to manage earthquake activity in West Texas. As the 86th State Legislature continues its deliberations this session, it is key to note that TexNet's existence and success are due to the vision that Texas senators, representatives, and Governor Abbot showed in creating and funding it four years ago. TexNet serves as a powerful state, academic, industry, and public partnership to keep citizens informed and safe, while maintaining a vital workforce and producing critical energy for Texans.

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