Science - Geology; Reports Outline Geology Study Results from University of Texas Austin (Hydraulic Fracturing, Fault System Architecture, and the Details of Anthropogenic Earthquakes in the Post-Pennsylvanian Delaware Basin of West Texas)

465 words
11 October 2024
Science Letter
SCLT
602
English

2024 OCT 11 (NewsRx) -- By a News Reporter-Staff News Editor at Science Letter -- Investigators publish new report on geology. According to news reporting originating from Austin, Texas, by NewsRx correspondents, research stated, "Since about 2009, oil and gas production activities in the Delaware Basin of West Texas and southeast New Mexico have caused a rapid increase in rates of seismicity."

Our news journalists obtained a quote from the research from University of Texas Austin: "This seismicity has been driven primarily by pore fluid pressure increases caused by subsurface injection of both waste saltwater and hydraulic fracturing fluids. High-quality teleseismic monitoring shows that earthquakes have been concentrated in previously dormant fault systems. The analysis of the timing of earthquake occurrence and magnitudes in two southern Delaware Basin fault systems indicates that continuous versus sporadic seismic energy release corresponds with continuous versus sporadic hydraulic fracturing and saltwater disposal activities proximal to the faults, respectively. Treating earthquake magnitudes as a proxy for fault displacement reveals that fault reactivation occurs in patterns that resemble segmented faults both hard and soft linked and that this distribution is likely a faithful representation of the fundamental architecture of the reactivated fault and not simply a function of pore pressure perturbation. The spatial distribution of earthquake magnitudes in the two fault systems illuminates the strong control that preexisting fault system architecture exerts on fault reactivation."

According to the news reporters, the research concluded: "Larger earthquakes tend to occur in larger, likely hard linked, fault segments. This suggests that a priori knowledge of a fault system's architecture can provide some degree of predictability for induced seismicity."

For more information on this research see: Hydraulic Fracturing, Fault System Architecture, and the Details of Anthropogenic Earthquakes in the Post-Pennsylvanian Delaware Basin of West Texas. Lithosphere, 2024,2024(Special 15). (Lithosphere - https://pubs.geoscienceworld.org/lithosphere). The publisher for Lithosphere is GeoScienceWorld.

A free version of this journal article is available at https://doi.org/10.2113/2024/lithosphere_2024_116.

Our news editors report that additional information may be obtained by contacting Alan Morris, **Bureau of Economic Geology**, University of Texas Austin 1, Austin, TX, United States. Additional authors for this research include Katie Smye, Peter Hennings.

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Keywords for this news article include: University of Texas Austin, Austin, Texas, United States, North and Central America, Geology, Science.

Document SCLT000020241011ekab000ek