Solid Earth Research; Study Results from University of Texas Austin Provide New Insights into Solid Earth Research (Onset and Cause of Increased Seismic Activity Near Pecos, West Texas, United States, From Observations At the Lajitas Txar Seismic Array)

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2020 JUN 5 (NewsRx) -- By a News Reporter-Staff News Editor at Science Letter -- A new study on Solid Earth Research is now available. According to news reporting originating from Austin, Texas, by NewsRx correspondents, research stated, "In recent years, numerous small earthquakes have occurred near the town of Pecos in West Texas; however, when this activity began and whether it was caused by increased petroleum industry activity has been uncertain because prior to 2017 there were few permanent seismograph stations in the region. We identify and locate earthquakes using data recorded since 2000 at TXAR, a sensitive 10-station seismic array situated about 240 km south of Pecos."

Financial support for this research came from TexNet program through the University of Texas **Bureau of Economic Geology**.

Our news editors obtained a quote from the research from the University of Texas Austin, "We thus show that in 2007, one earthquake occurred near Pecos, in 2009 several more occurred, and subsequently, activity has increased considerably, with more than 2000 events identified in 2017. A time-of-day and year-by-year analysis identifies geographic areas in West Texas where events are likely to be natural earthquakes and quarry blasts. However, for the Pecos events, annual seismicity rates increase along with annual volumes of petroleum production and fluid waste disposal, suggesting a causal link. Analysis of seismograms collected by the EarthScope Transportable Array indicates that the 2009 earthquakes had focal depths of 4.0-5.2 km below sea level, within or just below strata where petroleum is produced and/or wastewater is injected. The largest earthquake to date had magnitude M(L)3.7, but the recent high activity rates suggest that greater magnitudes may be possible. For the years 2000-2017, we provide a catalog of 10,753 epicenters of seismic events recorded at TXAR. Plain Language Summary Petroleum production in the Permian Basin of West Texas has been accelerating since 2007, and by 2023 it is anticipated that Permian Basin production will exceed the production of every nation in the world other than Saudi Arabia. Developing this domestic source of energy has profound economic and political implications, especially since protecting vital foreign sources of energy has been a major factor affecting U.S. foreign policy. In recent years, numerous small earthquakes have occurred in the Delaware Basin (a subregion of the Permian Basin), but when this seismicity began has been uncertain because there were few seismographs in this region before 2017. We show that these anomalous earthquakes first occurred in 2009 and that many of them are probably induced by petroleum production in the Delaware Basin."

According to the news editors, the research concluded: "Understanding the relationship between production and earthquake activity is a critical first step toward mitigating seismic hazards that could affect local populations and compromise the development of these vital petroleum resources."

For more information on this research see: Onset and Cause of Increased Seismic Activity Near Pecos, West Texas, United States, From Observations At the Lajitas Txar Seismic Array. Journal of Geophysical Research Solid Earth, 2020;125(1):. Journal of Geophysical Research Solid Earth can be contacted at: Amer Geophysical Union, 2000 Florida Ave NW, Washington, DC 20009, USA.

The news editors report that additional information may be obtained by contacting C. Frohlich, University of Texas Austin, Institute of Geophysics, Jackson School of Geosciences, Austin, TX 78712, United States. Additional authors for this research include C. Hayward, H.R. DeShon, J. Rosenblit, C. Aiken, P. Hennings, A. Savvaidis, C. Lemons, E. Horne and J.I. Walter.

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