Geology; Studies from University of Texas Austin Add New Findings in the Area of Geology (Characteristics of Seismicity In the Eagle Ford Shale Play, Southern Texas, Constrained By Earthquake Relocation and Centroid Moment Tensor Inversion)

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2021 DEC 3 (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, "Analysis of earthquake locations and centroid moment tensors (CMTs) is critical in assessing seismogenic structures and connecting earthquakes to anthropogenic activities. The objective of this study was to gain insights into the seismotectonics of the Eagle Ford Shale play (EF), southern Texas, through relative relocation of earthquakes, assessment of CMT solutions, and investigation of the background stress field."

Funders for this research include Texas Seismological Network Research, Center for Integrated Seismicity Research, **Bureau of Economic Geology**, Jackson School of Geosciences, The University of Texas at Austin.

Our news editors obtained a quote from the research from the University of Texas Austin, "Using Texas Seismological Network (TexNet) data from 2017 through 2019, we were able to relocate 326 earthquakes and obtain CMT solutions for 37 M-L >= 2.0 earthquakes. These earthquakes are located in the sedimentary basin and uppermost crust, with depths ranging from 2 to 10 km. The earthquake groups in the northeastern EF are linearly distributed along the Karnes fault zone, whereas the southern and western groups are spatially scattered around mapped or unmapped faults. CMTsolutions identified 32 normal fault earthquakes and five strike-slip earthquakes. The orientation of the fault plane of most normal fault earthquakes is southwest-northeast, whereas the possible fault plane of the strike-slip fault is from north-northwest to south-southeast, which is roughly perpendicular to the normal faults. Normal and strike-slip faults in the EF are of high dip angles, with the dip angles of the most faults ranging from 60 degrees to 80 degrees. Stress inversion results show that the major orientation of maximum horizontal stress (S-Hmax) is southwest-northeast, with minor local stress-field rotations. We further estimated earthquake energy release in the EF region using moment magnitude from the CMT solutions, and the cumulative earthquake energy release curve reveals three notable increases in cumulative seismic moment, which occurred in January-July 2018 and January-March 2019, and May-August 2019."

According to the news editors, the research concluded: "Whether these energy releases were caused by anthropogenic activities is a matter for further investigation."

This research has been peer-reviewed.

For more information on this research see: Characteristics of Seismicity In the Eagle Ford Shale Play, Southern Texas, Constrained By Earthquake Relocation and Centroid Moment Tensor Inversion. Seismological Research Letters, 2021;92(6):3504-3515. Seismological Research Letters can be contacted at: Seismological Soc Amer, 400 Evelyn Ave, Suite 201, Albany, CA 94706-1375, USA.

The news editors report that additional information may be obtained by contacting Peng Li, University of Texas Austin, Bur Econ Geol, Jackson School of Geosciences, Austin, TX 78712, United States. Additional authors for this research include Guo-Chin D. Huang, Alexandros Savvaidis, Florentia Kavoura and Robert W. Porritt.

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