Geology; Findings from University of Houston Broaden Understanding of Geology (Complex Shear-wave Anisotropy From Induced Earthquakes In West Texas)

521 words
30 October 2020
Science Letter
SCLT
531
English

2020 NOV 6 (NewsRx) -- By a News Reporter-Staff News Editor at Science Letter -- Researchers detail new data in Geology. According to news reporting originating in Houston, Texas, by NewsRx journalists, research stated, "We have analyzed shear-wave splitting (SWS) data from local earthquakes in the Permian basin in west Texas to understand crustal stress change and induced seismicity. Two SWS parameters, the fast polarization direction and the delay time, are computed using a semiautomatic algorithm."

Funders for this research include state of Texas through the University of Texas **Bureau of Economic Geology** Texas Seismological Network (TexNet) Seismic Monitoring and Research Project, industrial affiliates of the Center for Integrated Seismicity Research (CISR).

The news reporters obtained a quote from the research from the University of Houston, "Most measurements are determined in the Delaware basin and the Snyder area. In both regions, SWS fast directions are mostly consistent with local S-H max at stations that are relatively far from the earthquake clusters. Varying fast directions at one station are related to different ray paths and are probably caused by heterogeneity. In the Snyder area, most northeast southwest fast directions are from the events in the northern part of the cluster, whereas the northwest southeast fast directions are mostly from the southern part. The northeast southwest and northwest southeast fast directions could be attributed to the northeast-trending normal faults and the northwest-trending strike-slip faults, respectively. SWS results in the Delaware basin have two unique features. First, most shallow earthquakes less than 4 km deep produce relatively large delay times. This observation implies that the upper crust of the Delaware basin is highly fractured, as indicated by the increasing number of induced earthquakes. Second, diverse fast directions are observed at the stations in the high-seismicity region, likely caused by the presence of multiple sets of cracks with different orientations. This situation is possible in the crust with high pore pressure, which is expected in the Delaware basin due to extensive wastewater injection and hydraulic fracturing."

According to the news reporters, the research concluded: "We propose that the diversity of SWS fast directions could be a typical phenomenon in regions with a high rate of induced seismicity."

This research has been peer-reviewed.

For more information on this research see: Complex Shear-wave Anisotropy From Induced Earthquakes In West Texas. Bulletin of the Seismological Society of America, 2020;110(5):2242-2251. Bulletin of the Seismological Society of America can be contacted at: Seismological Soc Amer, 400 Evelyn Ave, Suite 201, Albany, CA 94706-1375, USA.

Our news correspondents report that additional information may be obtained by contacting Aibing Li, University of Houston, Dept. of Earth and Atmospheric Sciences, Houston, TX 77004, United States. Additional authors for this research include Regan Robinson, Hongru Hu and Alexandros Savvaidis.

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

Document SCLT000020201030egau000bh

