
Geology; Study Data from Southern Methodist University Update Knowledge of Geology (Stress-drop Estimates for Induced Seismic Events In the Fort Worth Basin, Texas)

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2021 JUL 9 (NewsRx) -- By a News Reporter-Staff News Editor at Science Letter -- Investigators publish new report on Geology. According to news reporting from Dallas, Texas, by NewsRx journalists, research stated, "Earthquakes in the Fort Worth basin (FWB) have been induced by the disposal of recovered wastewater associated with extraction of unconventional gas since 2008. Four of the larger felt earthquakes, each on different faults, prompted deployment of local distance seismic stations and recordings from these four sequences are used to estimate the kinematic source characteristics."

Financial supporters for this research include Roy M. Huffington Department of Earth Sciences at Southern Methodist University, Texas Seismic Network program at the **Bureau of Economic Geology**, University of Texas.

The news correspondents obtained a quote from the research from Southern Methodist University, "Source spectra and the associated source parameters, including corner frequency, seismic moment, and stress drop, are estimated using a modified generalized inversion technique (GIT). As an assessment of the validity of the modified GIT approach, corner frequencies and stress drops from the GIT are compared to estimates using the traditional empirical Green's function (EGF) method for 14 target events. For these events, corner-frequency residuals (GIT-EGF) have a mean of -0.31 Hz, with a standard deviation of 1.30 Hz. We find consistent mean stress drops using the GIT and EGF methods, 9.56 and 11.50 MPa, respectively, for the common set of target events. The GIT mean stress drop for all 79 earthquakes is 5.33 MPa, similar to estimates for global intraplate earthquakes (1-10 MPa) as well as other estimates for induced earthquakes near the study area (1.7-9.5 MPa). Stress drops exhibit no spatial or temporal correlations or depth dependency. In addition, there are no time or space correlations between estimated FWB stress drops and modeled pore-pressure perturbations."

According to the news reporters, the research concluded: "We conclude that induced earthquakes in the FWB occurring on normal faults in the crystalline basement release pre-existing tectonic stresses and that stress drops on the four sequences targeted in this study do not directly reflect perturbations in pore-fluid pressure on the fault."

This research has been peer-reviewed.

For more information on this research see: Stress-drop Estimates for Induced Seismic Events In the Fort Worth Basin, Texas. Bulletin of the Seismological Society of America, 2021;111(3):1405-1421. 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 journalists report that additional information may be obtained by contacting Seong Ju Jeong, Southern Methodist University, Huffington Dept Earth Sci, Dallas, TX 75205, United States. Additional authors for this research include Brian W. Stump, Heather R. DeShon and Louis Quinones.

Keywords for this news article include: Dallas, Texas, United States, North and Central America, Geology, Southern Methodist University.

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