

PROJECT UPDATES — July 2016

The TexNet and CISR project teams are at the Bureau of Economic Geology and other groups at The University of Texas at Austin, Southern Methodist University, and Texas A&M University. This monthly update covers seismic network installation and operation, synopsis of recent seismicity in Texas, recruitment, partnerships, research, and outreach.

Seismic Network Installation and Operation:

- Nanometrics has delivered approximately 90% of the necessary equipment for 36 portable stations, with the remainder expected by the end of August 2016.
- Scouting and initial site evaluation of proposed permanent station sites is in progress, with 20 of the 22 sites identified, including back-up sites.
- Nanometrics and BEG staff have initiated the 24-hour noise surveys with 11 stations out of 22 completed. We will proceed on no-fee lease contracts with landowners, after the evaluation of the noise surveys.
- Support for the existing SMU network in the Ft. Worth Basin transitioned from USGS to TexNet.
- Scouting of TexNet portable station sites in the Ft. Worth Basin has identified 10 of the required of 12 sites. Universities in the DFW area are participating by hosting a TexNet station (UTD, UTA, TCU, Univ. Dallas). Stations are also being placed on city properties (Farmers Branch, Dallas, Irving). Local ISDs are also possible sites.

Synopsis of Recent Seismicity in Texas:

- In July, the USGS did not report earthquakes of $M > 2.5$ in Texas. Reporting of data from TexNet stations will commence later in 2016.
- SMU cataloged 10 earthquakes of $M < 2.0$ during July, all tentatively associated with the 2015 Venus sequence.

Recruitment:

- Screening is complete for applicants for the position of Structural Interpretation Specialist at the BEG and site interviews are being scheduled. This position will contribute to the *Faults and Geomodels* project.

Partnerships:

- Discussions are continuing between representatives from CISR and the Stanford Center for Induced and Triggered Seismicity and six energy companies operating in the Ft. Worth Basin to collaborate on the use of proprietary subsurface data for characterizing faults, stress, and reservoir properties and conditions.

Research:

- The SMU local magnitude calculator for the Ft. Worth Basin is complete. Stress drop studies continue.
- TAMU has constructed preliminary Petrel models for the Azle area to develop and test workflows for coupled simulation of fluid flow and the geomechanics of fluid injection/production, potential fault activation and history matching of seismic events. Upon validation of the workflow, the next step will be application to more detailed models incorporating additional wells and 3D property variations to be developed in collaboration with BEG.
- UT-BEG is developing solutions to analytical and numerical approaches for predicting fault reactivation in basement rocks underlying porous injection reservoirs. A report is being prepared.
- UT-Austin has developed a three-dimensional coupled fluid flow and geomechanics simulator. The rate and state friction law is being implemented into the model. The simulator will be used to investigate the effect of fluid injection on induced earthquakes, providing a suite of recommended practices for wastewater injection.

Outreach:

- A talk was given by the BEG at the Industrial Council for the Environment on July 21 entitled: TexNet and CISR: Seismicity Monitoring and Research in Texas.
- More information can be accessed at the [TexNet](#) and [CISR](#) websites.