

PROJECT UPDATES — January 2017

Summary — Project personnel at the Bureau, along with our UT-Austin, SMU, and TAMU research partners, continue to make progress on this successful program as highlighted below.

Network Installation and Operations

- Two permanent TexNet stations were installed in January bringing the total number to seven of 22. TexNet is now averaging three to four permanent and approximately three portable station installations per month.
- A total of 31 stations are operating in the DFW area, including 13 portable TexNet stations and 18 stations maintained by SMU. Note that all but two SMU stations are owned by IRIS and that the USGS recently removed 10 (NetQuake) stations.
- One portable station was installed in the town of Pecos.

Synopsis of January Seismicity in Texas

- Sixteen earthquakes (magnitude < 1.5) were recorded in the ongoing Ft. Worth Basin sequence. Two events were associated with the Irving-Dallas sequence, and 14 with the Venus sequence in Johnson County.
- A total of 28 earthquakes were recorded in Texas by TexNet. The largest ($M_L=2.7$) occurred in Pecos on Jan. 25.

Recruitment

- Chastity Aiken moved from UTIG to BEG as a Post-Doc as a TexNet seismologist.
- Graduate student Jennifer Kurkowski was hired by UT-CAEE for the Texas building vulnerability project.

Partnerships

- On Jan. 23, the CISR Science Advisory Committee met in Austin to discuss collaboration and research initiatives.

Research

- SMU continued research efforts on seismic velocity imaging of the Azle earthquake sequence.
- BEG continued geologic characterization of the Fort Worth Basin, including stratigraphic interpretation and preliminary petrophysical analysis. The fault framework is 90% complete, the 3D geomodel is under construction.
- BEG continued development of the fluid flow model of Fort Worth Basin, including the operational workflow and model data import and conditioning. The computational tool CMG-STARs will be used.
- UT Petroleum Engineering is improving stability of their numerical algorithm for fast fault rupture propagation and began implementation of a discrete fracture model technique.
- TAMU Petroleum Engineering constructed a fine-scale Azle model with 70 producers and two injectors, calibrated the model using well BHP data, and performed sensitivity analysis of the principal parameters.
- UT Social Science group analyzed data from the earthquake survey and is collecting new data on how best to implement training about induced earthquakes in oil and gas regulatory agencies.
- BEG continued geomechanics-related research, using numerical simulations to assess the effect of varying injection rate, fault dip, and permeability structure on potential for basement fault reactivation.

Outreach:

- An event response communication plan was shared with the Texas Division of Emergency Management.
- TexNet-CISR PIs Hennings and Savvaidis attended a Pecos City Town Council meeting and presented information on seismicity in Texas and the TexNet-CISR program.

Funding:

- Scott Tinker has been spending time in the Capitol. Some indications that legislature thought TexNet was one-time funding event. TAC needs to get involved with key legislators and Governor's office.