TexNet·CISR — BUREAU OF ECONOMIC GEOLOGY

PROJECT UPDATES — November 2016

Summary — Since Governor Abbott authorized funding for TexNet, project personnel at the Bureau, along with our UT-Austin, SMU, and TAMU research partners, have been working to create the foundation for a successful program. Below we provide updates on network installation and operation, recruiting and staffing, research, and outreach.

Network Installation and Operation:
- New website summarizing seismometer deployments: http://www.beg.utexas.edu/texnet/operations-status
- Data are now streaming to the TexNet Hub from 10 portable stations recently installed in the DFW area.
- TexNet is now supporting SMU's maintenance of their DFW seismic network and data archiving to IRIS.
- Five of the planned 22 permanent seismic stations now have executed landowner site agreements and 13 are in the contracting process.

Recruiting and Staffing:
- University of Texas Institute for Geophysics seismologist Jake Walters has taken the position of Oklahoma State Seismologist but will continue to collaborate with TexNet researchers through August of 2017 as he finalizes earthquake characterization studies for the Texas Panhandle and Permian Basin regions.

Research:
- Eleven TexNet seismic station sites in the DFW area have been chosen for shallow shear velocity measurements in December 2016, using active- and passive-source surface wave testing (the magnitude of earthquake ground shaking is controlled, in part, by the near-surface shear velocity). Nineteen other sites in the DFW area have previously been tested in conjunction with a project funded by TxDOT. TexNet sites elsewhere in Texas are being prioritized for field testing during the summer of 2017.
- SMU completed stress inversions for 2013-2016 SMU catalog and supplied the information to the Bureau for inclusion in the Fort Worth Basin geomodel.
- UTIG completed matched-filter analysis of historical West Texas seismicity from regional stations and began computing earthquake magnitudes for newly-detected events.
- The Bureau completed numerical simulations of the effect of varying injection rate on fault reactivation potential using their generic faulted basement computational model.
- Formation tops and lithology of intervals in Fort Worth Basin from Mississippian to Pre-Cambrian have been identified and work continues to develop a stratigraphic model for application to the injection intervals.
- Fort Worth Basin injection volumes have been updated and distributed for inclusion in the Fort Worth Basin geomodel, including an analysis of variance produced by the RRC annual well injection reporting cycle.
- TAMU continued testing of the workflow for coupled fluid flow and geomechanical modeling of fluid injection/production, including sensitivity studies of rock failure conditions with respect to parameters such as maximum/minimum principal stress, cohesion, internal friction angle, and reservoir and fault properties.
- The Social Science team is finalizing data collection and beginning data analysis for the Phase I earthquake survey.

Outreach:
- The "Report on House Bill 2 (2016–17) Seismic Monitoring and Research in Texas" has been completed and was submitted to Texas Legislature on December 1st. It can be accessed at: http://www.beg.utexas.edu/files/content/texnet/docs/TexNet-Report-2016.pdf.

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