TECHNICAL ADVISORY COMMITTEE
TO TEXNET AND BUREAU OF ECONOMIC GEOLOGY

Meeting Minutes
Monday, March 24, 2025 – 11:30 a.m. to 3:30 p.m.

OPENING

The meeting of the TexNet Technical Advisory Committee was called to order at ~ 11:30 a.m. on Monday, March 24, 2025.

PRESENT

Alexandros Savvaidis, Manager of TexNet
Brian Stump, Committee Chair
Jeff Nunn, Committee Member
Chris Hillman, Committee Member
Aaron Velasco, Committee Member
Larry French, Committee Member
Dave Cannon, Committee Member (via Zoom)
Scott Mitchell, Committee Member (via Zoom)
Mark Shuster, Interim Director, Bureau of Economic Geology
Elizaveta Rybina, TexNet Admin Program Coordinator

ABSENT

Mark Boyd, Committee Member
Ken Wisian, Associate Director, Bureau of Economic Geology

AGENDA FOR MARCH 24th, 2025 MEETING

1. Approval of Minutes from December 3rd, 2024, meeting.
2. Update on the Hiring Plan (15 min)
3. Update on releasing M1.5+ auto-picked events (15 min)
4. Lunch (30 min)
5. TexNet operations update, including NMT collaboration (30 min)
6. Education outreach (15 min)
7. Research update (45 min)
    1. Depth estimation in Midland Basin
    2. Eagle Ford relocation
8. Earthquake Hazard assessment plan (30 min)
9. Recent and upcoming publications and meetings (5 min)
10. Update on work towards ANSS (5 min)
11. Current legislative session - TexNet Budget (10 min)
12. Suggestions for the subsequent meetings (10 min)

APPROVAL OF DECEMBER 3rd, 2024 MEETING MINUTES

Brian Stump informed the Committee of Kris Nygaard's resignation.

The Committee reviewed and approved the December 3rd, 2024 Meeting Minutes.

HIRING UPDATE

Alexandros Savvaidis reported that the field operations team's final hire was completed with Andres Gomez joining as an instrumentation engineer. With two instrumentation engineers, Vincent O'Sullivan and Andres Gomez, TexNet can perform minimal repairs and calibration in-house. Training with instrumentation vendors is being considered to improve capabilities.

Additionally, TexNet UTemps may potentially transition to permanent positions. A Research Associate Professor position has been opened to the public with plans to hire by summer or September.

To address poor cell signal and improve communication in Culberson County, a Starlink system was deployed at a station.

UPDATE ON RELEASING M1.5+ AUTO-PICKED EVENTS

TexNet currently provides auto-picked seismic events to its web portal and USGS using machine learning algorithms for the Delaware Basin, Midland Basin, and Eagle Ford. TexNet also provides automatic events for M1.5 and above for the Delaware Basin and Eagle Ford with manual review on the next business day. TexNet provides auto picked M1 and above events for the Midland Basin with manual review on the next business day.

Backlog with manually reviewed M1 and above events from Jan 2024 onwards (excluding Scurry-Fisher) for the Midland Basin and Snyder is expected to be available to the public by the end of March, 2025.

Backlog analysis for Eagle Ford from January 2024 and onwards is ongoing.

M2 and above events backlog from 2017 to 2021 (excluding a short period in 2020) for the Delaware Basin is publicly available, with the remaining backlog expected to be completed by September 2025.

USGS reports the TexNet automatic picked events. Once TexNet releases the manually reviewed analysis, USGS updates that location to indicate that it is a manually reviewed event.

TexNet maintains statistics for false positive events, reporting high accuracy for the Delaware Basin and Eagle Ford. In the Midland Basin there are no false positive M1.5 events, and there are a few false positive M1 and above events due to a less dense network.

Additionally, the TAC and Alexandros Savvaidis discussed USGS stations in Texas and New Mexico.

TEXNET OPERATIONS UPDATE, INCLUDING COLLABORATION WITH NMT

Alexandros Savvaidis provided updates on seismic stations deployments in Q1:

Two new stations, SM05 and PRS01, were deployed by operators with the data provided to TexNet, and one station, MB26, was funded by the industry and deployed by TexNet.

In DFW area TexNet is planning to take over 10 SMU stations, with 7 currently deployed: DFG01, DFG03, DFG04, DFG05, DFG06, DFG07, DFG09. Those sites have 2Hz geophones, complementary to the broadband network that TexNet already has in the area.

One station in East Texas, TX.SNAG (borehole), was decommissioned due the reconstructions of the site and redeployed at a different location on the same property as TX.ET03 (portable) station.

TexNet deployed one station in South Texas, 2T. EF80 (UTIG equipment).

TexNet works on a plan to deploy one new station south from the City of Midland, due to concerns of seismicity in the area.

Seismicity patterns were discussed, including several M4 and above events in Culberson County, Martin County, and in the Midland Basin. There are active clusters south and northwest from the city of Midland. Some seismicity is observed in Mitchell County.

TexNet is exploring additional stations deployments in Martin County.

In the Eagle Ford area, there are active clusters at Gonzales, Lavaca, Karnes, Atascosa, Wilson, Frio, and La Salle Counties. Alexandros Savvaidis reported that some of the observed seismicity in Eagle Ford might be related to shallow saltwater disposal.

TexNet observes an increase of overall seismicity in Q1 in comparison to the previous year. Earthquake statistics are published on the TexNet website.

NEW MEXICO TECH COLLABORATION

Alexandros Savvaidis provided an updated on TexNet's meeting with NMT seismologists highlighting collaboration on collocated seismic stations, USGS stations, software, servers, web interfaces, and machine learning applications.

EDUCATIONAL OUTREACH

Elizaveta Rybina outlined two upcoming outreach initiatives aimed at promoting STEM education, earthquake awareness, as well as academic and career opportunities in geosciences and seismology.

1. Earth Fest (April 11, Fort Cavazos): Demonstrations of seismic equipment, real-time data streaming, and interactive activities for elementary and middle school students, focusing on earthquake monitoring and awareness, and safety practices.
2. Legacy High School (Midland, TX): Lecture on Texas seismicity and geoscience careers, followed by hands-on seismic station setup and real-time data streaming activities.

These initiatives are aimed at enhancing students' critical thinking, teamwork, and environmental responsibility while inspiring interest in geosciences careers.

Alexandros Savvaidis discussed with the TAC the opportunity of deploying seismic stations at schools and emphasized the importance of outreach initiatives for public and state engagement.

RESEARCH UPDATE

1. Depth estimation in Midland Basin

Alexandros Savvaidis presented findings on seismic station density in the area of interest, and described areas with maximum stations coverages, subsurface structure, and depth estimation statistics.

Alexandros Savvaidis presented check shots data, tomography, and sonic log, along with the research group's approaches, tests, and analysis for the Midland Basin with optimal 12 km distance density between the stations for the Midland Basin. Seismicity was found not directly related to shallow injection or fracking but currently linked to deep injection. The TAC also discussed azimuthal gap testing and coverage.

2. Eagle Ford relocation

Alexandros Savvaidis presented the new analysis on Eagle Ford relocation and depth statistics. Seven velocity models were tested, with findings using different velocity models, and hypocenter shifting.

EARTHQUAKE HAZARD ASSESSMENT PLAN

Alexandros Savvaidis outlined plans for earthquake hazard assessment in collaboration with USGS and discussed USGS hazard maps with the TAC. He also explained the difference between the hazard (ground shaking and probability) and risk (impacts on infrastructure, inhabitants, and economic consequences).

Key parameters for hazard assessment include magnitude, paths through different formations, site term or how the ground motion is amplified based on soil conditions, and an event term that quantifies the earthquake.

Additionally, Alexandros summarized the program's research contributions and papers related to seismic hazard assessment and seismic risk, as well as TexNet statistics for the Midland Basin and Delaware Basin.

The TAC discussed the fragility parameter for different types of infrastructure and how it is measured for the State of Texas. Alexandros presented a risk model based on recorded ground motion, as well as economic impacts. Using region specific data, TexNet's model projected significantly lower repair costs for a hypothetical earthquake with M5.8 in Irving, Texas, compared to FEMA's general model. He stressed the importance of creating a local ground motion model and use of local data.

Alexandros Savvaidis explained that both nuisance and fragility functions enable the estimation of the likelihood of felt and damaging seismicity, respectively.

Nuisance can be quantified through Community Decimal Intensity (CDI) and damage through Damage State (DS).

The TAC discussed the importance of addressing the seismicity concerns from a community perspective.

Alexandros suggested creating a questionnaire to collect CDI data from the Midland and DFW residents to quantify the degree of earthquake shaking felt by a person. This information could be used for the TexNet outreach program and legislative initiatives.

TexNet's next steps for earthquake hazard assessment for each area of interest include:

- Collaboration with USGS
- Seismicity distribution: Incorporating earthquake source information and known rupture zones.
- Time dependent hazard: Using crustal deformation studies, seismicity trends, and industry operations data.
- Wave path characteristics: Estimating attenuation and geometrical spreading using ground motion data and other geophysical data).
- Site amplification: Improving soil condition data through direct measurements and data analysis.
- Ground Motion Models: Providing models for near and far fields and different shaking.

The TAC recommended initiating community outreach in densely populated areas, such as DFW and Midland areas, with recommendations on how to prepare for seismic risks. It was also suggested to allocate resources for the hazard and risk assessment team to address safety concerns, infrastructure impacts, and engineering standards.

As the next step, the TAC proposed seeking funding in the next legislative session to support hazard and risk assessment efforts, including hiring a dedicated postdoc or research assistant professor with an engineering background to address community concerns and infrastructure fragility analyzing the data gathered by TexNet.

Collaboration with Caltech group was also discussed, suggesting their potential participation in the TexNet Annual Review.

CURRENT LEGISLATIVE SESSION - TEXNET BUDGET

Mark Shuster provided an update on TexNet's funding request included in the December report for the UT Government. An additional $1million funding was requested for improving the network in the Delaware Basin, IT

infrastructure, and replacement of aging equipment. However, the request was submitted too late and was deferred to the next legislative session.

The TAC discussed documentation preparation to develop detailed budget proposal and supporting materials for submission to the UT Government by April 2026 for the 2027 legislature session.

The TAC discussed current budget cuts for instrumentation and IT but stressed the importance of sustaining human resources. They discussed the possibility of collaborating with other agencies to secure additional funding and resources and voicing the importance of TexNet's work in the legislature, highlighting its contributions to seismic monitoring, hazard assessment, and public safety. They discussed engagement with legislators to advocate for funding and reaching out to the UT Government Affairs Office for the next biennium regarding budget allocation for the risk and hazard assessment team to strengthen TexNet's capabilities.

RECENT AND UPCOMING PUBLICATIONS AND MEETINGS

Alexandros Savvaidis provided an update on the recent manuscripts, which included seven manuscripts under review, as well as an overview of recent presentations.

UPDATE ON WORK TOWARDS USGS/ANSS

Alexandros Savvaidis reported that TexNet continues to provide data to USGS and is interested in collaborating with and contributing to USGS, but lacks funding and acknowledgment for its contributions.

A suggestion to include different data for the TexNet catalog was discussed, but it was decided not to currently proceed with this approach but rather discuss this issue at one of the upcoming TAC meetings.

The TAC emphasized the importance of proper acknowledgment, representation and funding support.

SUGGESTIONS FOR THE SUBSEQUENT MEETING Q2-2025

1. Operations update (e.g., status, maintenance, resources) (15min)
2. Budget for FY25-26
3. USGS reporting, collaboration and funding
4. Engagement plan and budget for next biennium
5. Research update (Eagle Ford and Midland Basin depth estimation)
6. Outreach updates
7. Publications and presentations update (15min)
8. Suggestions for the subsequent meetings (15min)

ADJOURNMENT

Meeting was adjourned at ~ 3:30 p.m. by Brian Stump, Committee Chair

Minutes submitted by: Elizaveta Rybina, TexNet

Minutes reviewed by: Alexandros Savvaidis, TexNet

Minutes approved on June 10, 2025, 2025, by:

Brian Stump, Committee Chair

Chris Hillman, Committee Member

Jeff Nunn, Committee Member

Larry French, Committee Member

Mark Boyd, Committee Member (via Zoom)

Dave Cannon, Committee Member (via Zoom)