

**TECHNICAL ADVISORY COMMITTEE
TO TEXNET AND BUREAU OF ECONOMIC GEOLOGY**

Meeting Minutes

Tuesday, June 10, 2025 – 11:00 a.m. to 3:00 p.m.

OPENING

The meeting of the TexNet Technical Advisory Committee was called to order at ~ 11:00 a.m. on Tuesday, June 10, 2025.

PRESENT

Alexandros Savvaidis, Manager of TexNet
Brian Stump, Committee Chair
Jeff Nunn, Committee Member
Chris Hillman, Committee Member
Aaron Velasco, Committee Member (joined the meeting in person at 12 p.m.)
Larry French, Committee Member
Dave Cannon, Committee Member (via Zoom)
Mark Boyd, Committee Member (via Zoom)
Lorena Moscardelli, Director, Bureau of Economic Geology (left the meeting at 1:45 p.m.)
Elizaveta Rybina, TexNet Administrative Program Coordinator

ABSENT

Scott Mitchell, Committee Member
Ken Wisian, Associate Director, Bureau of Economic Geology

AGENDA FOR JUNE 10th, 2025 MEETING

1. Approval of previous minutes (5 min)
2. Introduction of BEG Director (5 min)
3. Operations (e.g., status/maintenance, resources) (15 min)
4. Pause of seismic station deployments from BEG (20 min)
5. Lunch (from 11:45 to 12:30; 45 min)
6. Budget for FY25-26 (20 min)
7. USGS reporting, collaboration and funding (15 min)
8. Engagement plan and budget for next biennium (15 min)
9. Research update; Eagle Ford new earthquake catalog (30 min)
10. FSP and GIST update (20 min)
11. Outreach updates (10 min)
12. Publications and presentations update (15min)
13. Suggestions for the subsequent meetings (15min)

APPROVAL OF March 24th, 2025 MEETING MINUTES

The Committee reviewed and approved the March 24th, 2025 Meeting Minutes.

INTRODUCTION OF BEG DIRECTOR

Lorena Moscardelli, the new Director of the Bureau of Economic Geology and TAC members introduced themselves sharing their professional backgrounds. Alexandros Savvaidis announced that Aaron Velasco would join the meeting in person later and noted Kris Nygaard's retirement from the Committee.

OPERATIONS UPDATE

Alexandros provided updates on seismic station deployments, challenges with hardware maintenance, and noise issues in the Delaware and Midland basins.

Key points:

- New Deployments: Six stations from operators (SA01, DBL01, DBL02, SM06, EE05, FOR01) and five TexNet stations (MB27, MB28, MB29, DFG08, DFG10).
- Station Loss: Two critical stations (SA07, SA09) in the New Mexico border area were lost due to a deep injection well closure. The Committee discussed plans to deploy new stations in areas with emerging seismicity, particularly in Martin County and Midland, since decommissioning these two stations may have a significant impact on detecting seismic events in the border area.
- Seismicity Patterns: Culberson and Martin Counties remain highly active.
- Increased seismicity in Eagle Ford highlights gaps in coverage, particularly in the western (La Salle) and eastern (Lavaca) parts of the array.
- Challenges:
 - Maintaining 200 seismic stations hardware and access restrictions to densify the network. Boreholes for critical stations were considered, subject to budget constraints.
 - In the Eagle Ford 20 out of 30 stations belong to UTIG with hardware being shared with TexNet.
 - These challenges were also identified in the December 2024 Report and costs assessments were made although no new funding has been provided to address these issues.
- Plans to replace aging equipment and explore sharing USGS equipment in the New Mexico border region were discussed.
- Magnitude Thresholds: TexNet lowered thresholds for published seismic events in order to improve monitoring and support industry risk mitigation efforts. Lower threshold bulletins also aid training for machine learning.

Alexandros outlined the process of visiting sites for potential deployments, the technical details for picking a site and deployment of seismic stations by TexNet, which takes more than one month on average.

The TAC discussed a plan to finalize the budget for funding in September 2025 and the option of relocating hardware in the next biennium to enhance monitoring in areas with increased seismicity and establishing criteria for such decisions. TexNet TAC also agreed to plan equipment replacement over the next few years, with initial funding a goal for the first year of the next biennium.

Alexandros stated that as of June 1, 2025, TexNet publishes manually reviewed seismic events on its website as follows: $M \geq 1.5$ for the Delaware Basin (high seismicity) ; and $M \geq 1.0$ for Central Basin Platform–East Delaware (emerging clusters and CO2 storage plans). TexNet publishes $M \geq 0.5$ for the Midland Basin (low earthquake count, better seismicity understanding); $M \geq 1.0$ for Eagle Ford (emerging clusters); and $M \geq 2.0$ for the rest of Texas (Panhandle, DFW, East Texas).

The TAC discussed auto picker statistics, metadata availability for download, and the need for consistent magnitude thresholds across regions. The TAC will revisit the Midland Basin magnitude thresholds in the next October meeting with provided auto-picking accuracy statistics for magnitudes 1–1.5.

PAUSE OF SEISMIC STATION DEPLOYMENTS

Alexandros Savvaidis informed the TAC that administrative delays related to the recent organizational leadership changes at UT delayed 12 landowner-signed license agreements since February 2025, prompting BEG to halt seismic station deployments until agreements were signed.

This delay risks losing \$60,000 per station in operator funding and incurs daily costs of \$550 for idled staff. Alexandros emphasized that the delays are impeding project goals and seismic data collection and will update operators on the status of UT agreement delays. The TAC and Bureau agreed to follow up with UT administration to expedite these agreements.

Additionally, Brian Stump stressed the importance of promptly initiating communication with UT representatives regarding the new budget for hardware replacement. Alexandros Savvaidis will develop a plan for station hardware replacement and upgrades for the next biennium.

BUDGET FOR FY25-26

Alexandros presented the FY25-27 budget, highlighting shifts in funding priorities:

- In 2025-2027 the amount will further decrease for both categories – operations and seismicity analysis in order to maintain human resources.
- The total budget remains \$3,032,000 per year.
- There are very limited funds for equipment maintenance, IT infrastructure, and outreach activities.
- TexNet will no longer support collaborating universities including SMU and University of Houston in the next biennium.

The noted significant decrease in projected IT hardware budget means there are no funds for a collocated backup system or new equipment and require reliance on IRIS data storage to decrease the risk of catastrophic data loss.

While equipment maintenance funding will also decrease, it remains a priority.

The TAC discussed the possibility of adopting a 4O network station and its associated maintenance costs for TexNet.

USGS

Alexandros Savvaidis reminded the TAC that TexNet has provided data to USGS for each earthquake since 2017 and addressed the need to update the USGS catalog for the Eagle Ford and Midland Basin, highlighting the extensive effort required to process and thousands of data files provided by TexNet for each earthquake when the bulletins are revised because of velocity model changes or inclusion of additional smaller magnitude events.

TexNet TAC discussed the following topics:

- Collaboration on Earthquake Hazard
- Request funding through a collaborative agreement
- Equipment (new and maintenance)
- Software development
- In person meeting with USGS scheduled for June 24th, 2025

The TexNet TAC and Bureau explored USGS funding opportunities and the possibility of aligning next fiscal year's research with USGS executive directives, highlighting that TexNet's work, connected to seismicity in oil and gas regions in the state, plays a crucial role in supporting the industry.

The TAC and the Bureau also discussed the eligibility of programs or research proposals related to the energy sector for funding in the next fiscal year, as well as the possibility of inviting USGS representatives to one of the future TexNet TAC meetings. TAC emphasized that TexNet's collaboration with the industry since 2016 could provide valuable insights and benefits to USGS.

Alexandros Savvaidis emphasized TexNet's strong interest in participating in ANSS and USGS collaborative projects focused on induced seismicity. The TAC also discussed opportunities to communicate with Texas Senators and Representatives, either directly or through UT Governmental Affairs highlighting TexNet contributions as well as resource needs to maintain the current level of services.

ENGAGEMENT PLAN AND BUDGET FOR NEXT BIENNIUM

The group discussed plans for the next biennium, including budget requests and engagement strategies. They agreed to prepare a presentation highlighting the impact of TexNet on the state for a meeting in October 2025.

Alexandros Savvaidis outlined a plan to address TexNet's needs by Q1 2026, finalize the budget request by Q2 2026, and discuss the possibility of providing a TAC letter highlighting TexNet's importance to Texas to support a budget increase for the next biennium. This documentation and request would need to be a priority for the UT System since the TexNet budget goes through UT System. The group discussed the timeline for BEG to finalize this request for UT Government Affairs. Lorena stressed the importance of defining a proper timeline before UT establishes its plan. Lorena will follow up with Mark Blount to coordinate with UT Governmental Affairs. Brian Stump suggested inviting UT representatives to the next TAC meeting.

The group discussed scheduling the Q2 2026 meeting at the Capitol, noting that previous TexNet TAC meetings held there allowed public engagement and facilitated more productive conversations, which could support strategic planning.

Lorena proposed inviting UT Government Affairs representatives to a segment of the TexNet TAC meeting to discuss the existing plan and ensure alignment with UT, with the TAC, appointed by the Governor, serving as the messenger. The TAC supported this idea, expressing interest in introducing themselves to the new UT Governmental Affairs representative, presenting the role and impact of the TexNet TAC, highlighting past successes collaboration with oil and gas, and providing an opportunity for firsthand insight into TexNet's work.

The TAC and BEG Director supported the proposal to invite UT representatives, RRC representatives, State Government partners, and potentially Commissioner Wright, who has been aware of earthquake issues, to the Q2 2026 meeting. The TAC expressed interest in delivering a one-hour seminar to brief this group on seismicity, TexNet's impact on the state, and its benefits to the industry.

The TAC and Bureau discussed creating a one-page proposal highlighting TexNet's successes, current priorities, and future impact projections. The TexNet team will draft a one-page summary of impact and success stories, and TexNet with the TAC will prepare a presentation for the meeting at the Capitol.

Brian and Alexandros emphasized the broader significance of risk assessment in such a meeting, particularly its role in evaluating industry investment risks.

RESEARCH UPDATE AND EAGLE FORD NEW EARTHQUAKE CATALOG

Alexandros presented updates on the Eagle Ford earthquake catalog, including a new velocity model (EF1D-CS-170S) and manual review of events from 2017–2025. The updated catalog will be published next week for industry feedback before any changes to the USGS catalog.

Alexandros discussed with the TAC the need for a 3D velocity model for each basin agreeing with the suggestion that each basin deserves its own model due to their differences.

Alexandros presented EF1D-CS-170S model. This model was selected as the preferred velocity model for improving event location accuracy and reducing residuals. Compared to previous models, it provided more consistent and reliable earthquake depth estimates. Overall, it led to better clustering and alignment of seismic events.

Alexandros shared that the velocity model is available on the TexNet's publication list / TexNet operation's manual, on website in FAQ, and the catalog is updated on the USGS's site.

Lorena Moscardelli left the TAC meeting at 1:45pm due to a scheduling conflict.

Alexandros Savvaidis and the TAC discussed the importance of aligning TexNet data with USGS for the Railroad Commission to ensure the TexNet catalog complies with RRC rules, which mandate the use of the USGS catalog, noting challenges in securing USGS funding or recognition of TexNet efforts. Alexandros also shared that relocating all Permian Basin earthquakes and updating the USGS website will require significant effort from TexNet. Alexandros shared that he will address catalog changes with USGS at the June 24, 2025 meeting.

FSP AND GIST UPDATE

Alexandros presented updates on two web tools, GIST and FSP. These tools are hosted on a common TexNet web platform.

Geomechanics Induced Seismicity Toolkit (GIST) Web Tool analyzes water injection data to understand the plausibility of different inducement scenarios for an earthquake and aids development of response plans after seismicity, i.e. what could have happened, what should be done about it, and why. Subsequent versions will have additional inducement mechanisms, model calibration, and user feedback. Core code co-developed with ExxonMobil is available open-source at <https://github.com/ut-beg-texnet/GIST>. Initial publication was at IMAGE 2022 and additional future publications are in preparation.

Fault Slip Potential Web Tool is a tool for probabilistically screening faults near injection wells, originally developed by the Stanford Center for Induced and Triggered Seismicity and ExxonMobil, last updated in 2018.

Quantitative risk assessment combines probabilistic estimates of pore pressure to slip potential of faults. Core code is available open-source at: <https://github.com/ut-beg-texnet/FSP>. TexNet is developing an updated version of FSP and creating a web tool by collaborating with the original developers Decision Geomechanics and ExxonMobil and incorporating additional functionality requested in the 2022 FSP User Survey.

Peter Sarkis, BEG Web Developer, demonstrated the web interfaces for both tools to the TAC, highlighting features and designs. The group discussed the importance of providing these tools to industry and ensuring that the correct version is being used.

Alexandros mentioned that these tools have received a lot of feedback and interest from industry. He and the TAC discussed a potential use of the FSP web tool by RRC for deep injections that require permitting.

The TAC discussed the possibility of shutting down the original FSP standalone application at Stanford once TexNet fully adopts and tests the software and proposed designating TexNet's version as the official application that could be used by the Railroad Commission (RRC).

The TAC considered inviting Chairman Drew Darby and other relevant committee representatives to one of the following TAC meeting, as Alexandros had previously testified before Chairman Darby's Energy Resources Committee.

OUTREACH UPDATES

Elizaveta Rybina reviewed TexNet's recent educational outreach initiatives.

TexNet participated in the Month of the Military Child Earth STEM Festival on April 11, 2025, at Fort Cavazos, Killeen, Texas, engaging over 3,000 attendees, including military families of all ages. Activities included interactive seismic demonstrations, children's coloring pages, and TexNet branded giveaways, with key messages focused on earthquake monitoring, safety practices, and career opportunities in geosciences and seismology. The event received positive feedback and enhanced engagement with Killeen public schools.

On May 8, 2025, TexNet conducted an educational outreach at Legacy High School in Midland, Texas, reaching approximately 200 high school students. The session featured an interactive lecture on Texas seismicity, hands-on learning with a mock seismic station, and discussions on earthquake safety and careers in seismology. The event was well-received by students and teachers, opening doors for future collaboration in Midland, one of the most seismically active areas in Texas.

Looking ahead, TexNet will participate in the CAST Conference, November 13–15, 2025, in Dallas, Texas, engaging an estimated 6,000 educators statewide. Workshops will focus on using TexNet's Earthquake Catalog, exploring seismicity in Texas, and teaching basic wave theory aligned with science (Texas Essential Knowledge and Skills - TEKS). Educational materials, including a TexNet brochure and lesson plan, will be provided to enhance teacher readiness and promote TexNet's role in public safety and scientific research. This event aims to increase awareness of seismic activity and strengthen community ties in Texas high-seismicity areas.

The TAC also discussed the possibility of promoting earthquake safety drills in schools connecting with schools' safety officers, lectures for school districts, and potential participation in miniCAST conference in El Paso for raising awareness throughout the state.

RECENT AND UPCOMING PUBLICATIONS AND MEETINGS

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

SUGGESTIONS FOR THE SUBSEQUENT MEETING Q3-2025

1. Engagement plan and budget for next biennium
2. Operations (e.g, status/maintenance, resources) (15min)
3. Final Budget for FY25-26
4. Update on USGS reporting, collaboration and funding
5. Pause of seismic station deployments
6. Planning of Annual Review
7. Research update (Permian Basin Velocity Model)
8. Outreach updates
9. Publications and presentations update (15min)
10. Suggestions for the subsequent meetings (15min)

Alexandros Savvaidis appreciated TAC's feedback, emphasizing the importance of continuing seismic instrument deployment and prioritizing earthquake location and detection for TexNet. Alexandros highlighted TexNet's expansion needs, focusing on additional seismic stations for CO2 storage projects, and noted he had previously advised RRC on optimal coverage for earthquake detection, offering to share his presentation with the TAC.

The group discussed the potential interest for a peer review by an external group.

Alexandros Savvaidis noted that the TexNet Annual review meeting is the main venue for external review and there is additional feedback from the industry and Texas RRC through regular one-to-one meetings.

ADJOURNMENT

Meeting was adjourned at ~ 3:10 p.m. by Brian Stump, Committee Chair

Minutes submitted by: Elizaveta Rybina, TexNet

Minutes reviewed by: Alexandros Savvaidis, TexNet

Minutes approved on October 9th, 2025, by:

Brian Stump, Committee Chair (via Zoom)

Mark Boyd, Committee Member

Chris Hillman, Committee Member

Jeff Nunn, Committee Member

Aaron Velasco, Committee Member

Dave Cannon, Committee Member

Larry French, Committee Member

Stefan Hussenoeder, Committee Member