MICROSEISMIC IMAGING
TURNKEY SURFACE MICROSEISMIC MONITORING

Understand and Optimize your Well Completions to Maximize your Return on Investment

Our Microseismic Imaging service provides all of the microseismic information required to evaluate the effectiveness of completions programs, without the high-cost and operational risk of deploying downhole sensors. Combining intelligent acquisition with advanced data processing to provide actionable results, earlier in the development cycle.

KEY BENEFITS

- Fast, Accurate, and Complete Data
- Improved Decision-Making
- Optimized Operations
- Low Environmental Impact

ACQUISITION - SCALABLE DESIGN AND DEPLOYMENT

Our super-station design allows for scalable and flexible array configurations that adapt to any environment and reduce the number of sensors required. The lower station count compared to traditional surface acquisitions reduces the environmental footprint, field exposure and acquisition cost of the project. The unique geometry of a super-station and proprietary noise suppression algorithms provide best-in-class enhancement of signal-to-noise ratio, allowing detection of microseismic events below Mw−2.

HIGHLY SCALABLE & ADAPTABLE

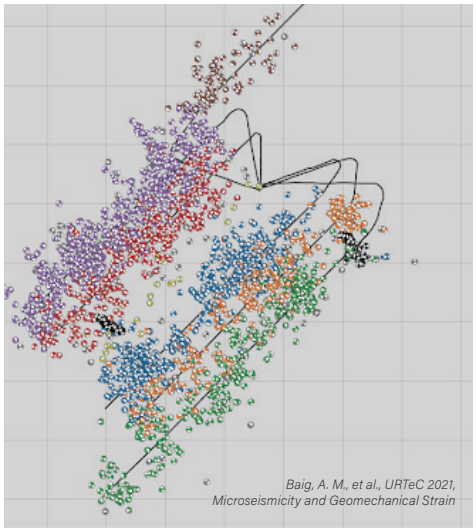
UNIQUE STATION DESIGN & DEPLOYMENT

PROCESSING - FAST, ACCURATE AND COMPLETE RESULTS

Our leading edge workflows and enhanced data processing maximizes data and reduces the turn-around time, getting you actionable results quickly. Imaging algorithms are used to automatically detect and locate events using a velocity model calibrated from perforations or events in a series of refinements. Matched-filter techniques are also applied to ensure a uniform detection threshold is achieved. All potential events also undergo an additional manual verification by our highly specialized team of data analysts.

ADVANCED DATA PROCESSING

QUANTITATIVE INTERPRETATION



PROCESSING INCLUDES:

- Semblance-weighted stacking for noise suppression
- Triggering based on image-space bright spots supplemented with template matching
- Anisotropic velocity model and location refinements throughout the project
- Calibration of events to moment magnitude
- Moment tensors with confidence parameters
- Fracture dimensions and azimuth
- Geomechanical deliverables (stress, strain)
- Flexibility to handle third-party acquisitions

PROJECT MANAGEMENT

Our experienced team will work closely with you to deliver a microseismic solution that is optimized for your specific objectives. The standard deliverables listed below are included in every Microseismic Services project with the option to add advanced deliverables as required.

STANDARD

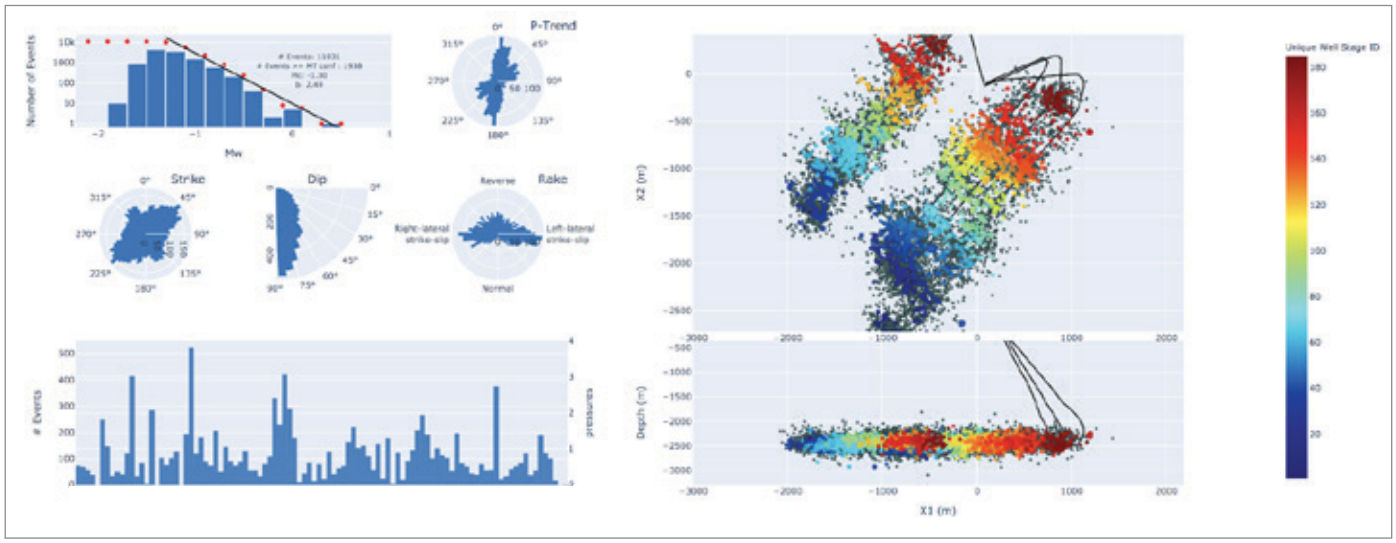
- Locations with errors
- Calibrated velocity model
- Signal to noise ratio (SNR) for each event
- Calibrated moment magnitudes and seismic moment
- Moment tensors with confidence values
- Stage geometries (azimuth, half-lengths, half-widths, half-heights)
- Horizontal and vertical stage diffusivities (RT analysis)

ADVANCED

- Stimulated Reservoir Volume (SRV) based on strain and/or event density
- Scalar and tensorial strain fields
- Stress inversions (temporal and/or spatial volumes)
- Synthesized DAS transects
- Analysis of well overlap, parent-child interaction, and other aspects of the completion
- Interpretation of results

DATA VISUALIZATION - LUMINOS

Deliverables are provided through our interactive data visualizer, Luminos, which provides a dynamic view of the microseismic data for greater operational insight. Luminos allows you to isolate specific features for closer examination, rotate and manipulate the view to examine data from more angles, view source parameters for selected events and review how the seismicity evolves over time.



INDUCED SEISMIC MONITORING

REDUCE RISK WITH REAL-TIME MONITORING

Your Microseismic Imaging project can also be combined with our real-time Seismicity Monitoring service via the Athena platform. These insights can be used to alter operations to mitigate risk and proactively reduce the potential for induced seismicity.