SHARP REFLECTIONS
DISCOVER MORE

# Deep seismic insight for **better unconventional drilling decisions**

*Subsurface characterization in unconventional plays is challenging. The geology is complex. Seismic datasets tend to be complicated and dense. Operations in unconventional plays are conducted at breakneck speeds. All of this makes it particularly challenging for seismic interpreters to deliver high-quality subsurface characterization and recommendations to inform drilling and development decisions.*

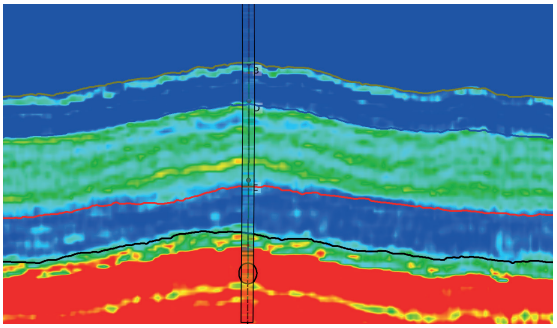
## An unconventional solution for unconventional challenges

The Sharp Reflections platform, powered by high-performance computing (HPC), makes it possible to process huge seismic multidimensional data volumes quickly and painlessly.

The solution begins with rapid data quality assurance, encompasses robust data conditioning processes that can be customized to target specific issues, and includes prestack seismic data inversion for illuminating elastic rock properties. Users can visualize and quantify results interactively and iteratively to reveal deeper insights into the data, apace with the speed of operations.

Seismic volumes in onshore plays display a continuous subsurface image over large regions, and provide high-resolution 3D views of complex geological structures, allowing for higher certainty estimations of resources, and critical insights into field-scale geomechanical properties.

Reliable and efficient seismic analysis represents a mere fraction of the cost of full wellhydraulic completions, and has the potential to impact every stage of development from exploration, appraisal, field development planning, drilling and completions.

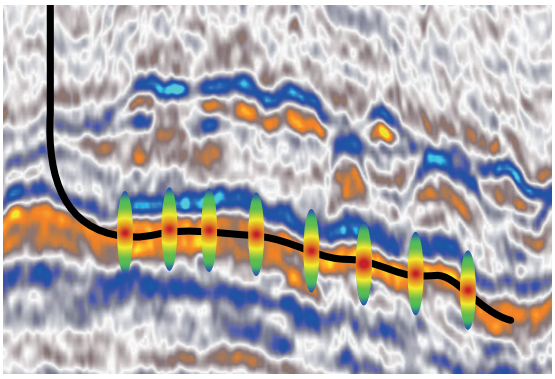


## Target the best rocks

Target the best rocks through trustable reservoir property prediction.

- Calibrate amplitude responses interactively using well data.
- Create customized data enhancement workflows to highlight areas of highest resource potential.
- Develop strategies to maximize reservoir performance based on lithology-informed prestack inversion using the Sharp Reflections inversion toolkit.

*Notoriously noisy seismic land data makes looking for subtle changes in reservoir properties like porosity difficult. Sharp Reflections software lets users interactively calibrate amplitude responses using their well data, and perform focused inversion using custom lithology-fluid classifications to achieve greatly improved reservoir property predictions.*

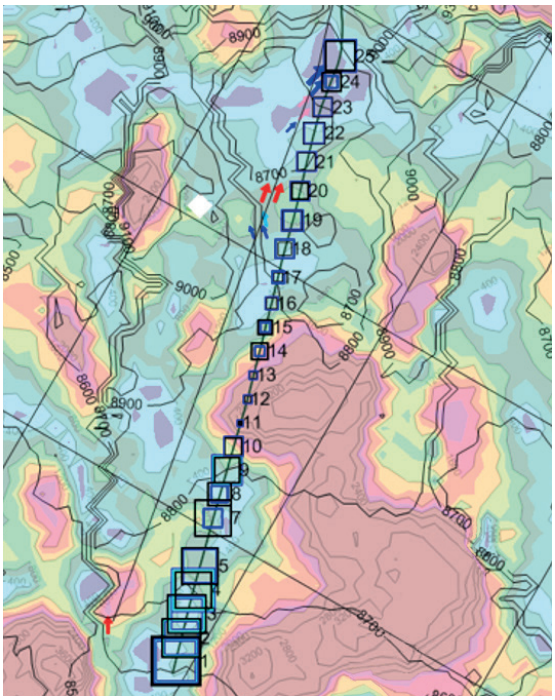


## Stay in zone

Stay in zone by enhancing resolution and minimizing structural uncertainty.

- Generate and visualize full density data quality QCs to inform structural and stratigraphic resolution enhancement strategies.
- Assess results in real time using a fully parallelized computing backbone to stay ahead of the bit and minimize uncertainty in geosteering.
- Quantify uncertainty in the landing zone like never before.

*In a rock formation with a velocity of 10,000 ft/s, an 8 ms of residual move out on your gathers can lead to a significant 80 ft difference in depth. Being able to interactively update seismic interpretation reduces uncertainty and makes it easier to stay in zone while drilling.*



## Optimize completion design

Optimize completion designs by predicting 3D geomechanical property variations.

- Calibrate seismic data to invert for key geomechanical parameters and generate 3D models of subsurface stress (i.e., Young's Modulus and Poisson's Ratio).
- Describe the potential of natural fracture density and orientation with the Sharp Reflections azimuthal amplitude and velocity analysis toolkits.
- Understand how critical variables in fracture propagation change along the wellbore.

*Use maps showing differences in horizontal stress overlaid with stage specific instantaneous shut-in pressures to provide insight into potential fracture propagation changes along the wellbore.*

## Discover more

Sharp Reflections was built on a bold idea—to reinvent seismic data processing and analysis. Sharp Reflections software, powered by high-performance computing, runs on a bespoke engine that allows users to explore enormous volumes of raw processed data. Users are empowered to extract detailed reservoir insight, make trustable drilling decisions and optimize production.

## Sharpreflections.com