ResPack HD

Geostatistical inversion for better subsurface insight

INDUSTRY CHALLENGES

Identifying

It is challenging to image and accurately predict fine-bed formation details within the subsurface from seismic alone.

Modeling

Reservoir models require high vertical resolution for reservoir simulations and field development plans, as well as multiple scenarios to represent uncertainties.

Certainty

Seismic data provides unique insight beyond spatial well control – including greater understanding of rock properties and facies distribution.

GEOSCIENCE SOLUTIONS

RESPACK HD ADVANTAGES

- Reveals the most probable geological features using well and geological information plus seismic data to constrain the reservoir model

- Provides reservoir property detail at a scale of 5-25 ft compared with 50-120 ft achieved by deterministic inversions

- Enables probabilistic interpretation of geological features within the subsurface—especially thin-bed reservoirs—with detailed enhanced seismic reservoir property volumes

- Helps identify stratigraphic elements using additional workflows, such as fans, channels and shoals

RESPACK HD DELIVERS SUBSURFACE DATA TO REVEAL PROFITABLE TARGETS

A recent **ResPack HD** project addressed key subsurface evaluation objectives within the Meramec-Woodford Formations in the STACK plays of Oklahoma. This process included the characterization of rock-constrained petrophysical lithofacies in the target formation and their extrapolation throughout the seismic survey.
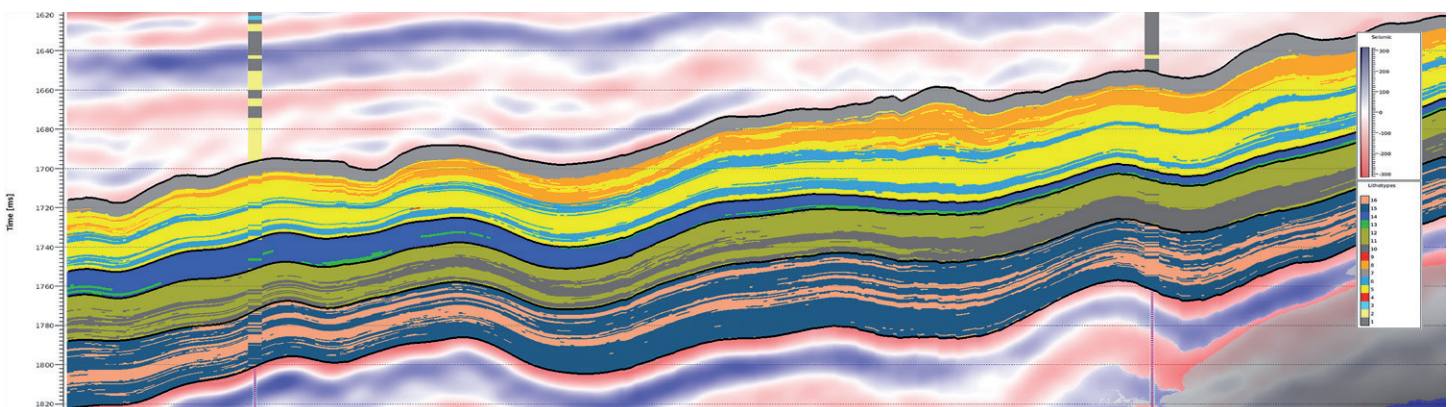
Facies classification from geostatistical seismic inversion highlighting potential targets in the SCOOP & STACK plays of Oklahoma (data courtesy of CGG Multi-Client).

RESPACK HD DELIVERABLES

Reservoir characterization

- Petrophysical models constrained by real rock data
- 1D petroleum systems model
- Sub-seismic resolution geomodel
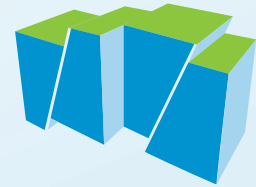- Lithofacies model
- TOC volume
- Porosity volume

Geomechanical properties

- Poisson's ratio, Young's modulus
- Pore pressure
- Fracture initiation pressure/gradient
- Stress

Fractures, faults, and structure

- Fracture density and orientation (from full-azimuthal seismic data)
- Structural analysis

RESPACK HD ADD-ONS

Geochemistry	Evaluation of source rock potential and hydrocarbon occurrence
Sedimentology	Evaluation of core to determine depositional setting and sedimentary architecture. Facies data are utilized in core-to-log-to-seismic constraints and upscaling.
Biostratigraphy	Evaluation and determination of formation age and depositional environment. Key input to regional stratigraphic understanding with sedimentology.
RoqScan™	Automated mineralogy to provide geological ground truth calibration for petrophysical analysis, rock physics and reservoir characterization.
Pore pressure analysis	The study of how pressures within rock pores vary within the subsurface.
Production analysis	Advanced analysis to identify crucial production drivers within your asset.
GeoAnalytics	Advanced data analytics to identify production performance drivers within the subsurface from the integration of seismic, geology and engineering data.