Petrel Geophysics

Solve complex structural and stratigraphic challenges at any scale

APPLICATIONS
- Qualitative and quantitative interpretation

BENEFITS
- Solve complex structural and stratigraphic challenges at any scale using powerful and scalable 2D/3D/4D interpretation capabilities
- Enhance productivity and retain focus on data via an intuitive interface
- Improve collaboration through multiuser database access, subscriptions, and notifications

FEATURES
- Patented coordinate conversion technology
- Extensive attribute libraries with interactive parameter control
- Advance dip-guided horizon waveform-tracker and automatic fault
- Flexible seismic to well tie and depth conversion tools
- Geomechanical seismic reconstruction and modeling-while-interpretation
- Volume interpretation leveraging the latest GPU capabilities
- Seismic compression for significant file size reduction and improved performance
- Interactive prestack seismic processing and interpretation
- Industry leading deterministic and stochastic inversion algorithm
- Litho classification and prediction
- Seamless integration with the Omega* geophysical data processing platform

The Petrel* E&P software platform enables multiple disciplines to collaborate effortlessly using the deepest science brought together in a single and precise model-centric subsurface representation—from exploration to production. In 3D, map, or section views, you can visualize, analyze, interpret, and edit geophysical, geological, reservoir engineering, production, and drilling data.
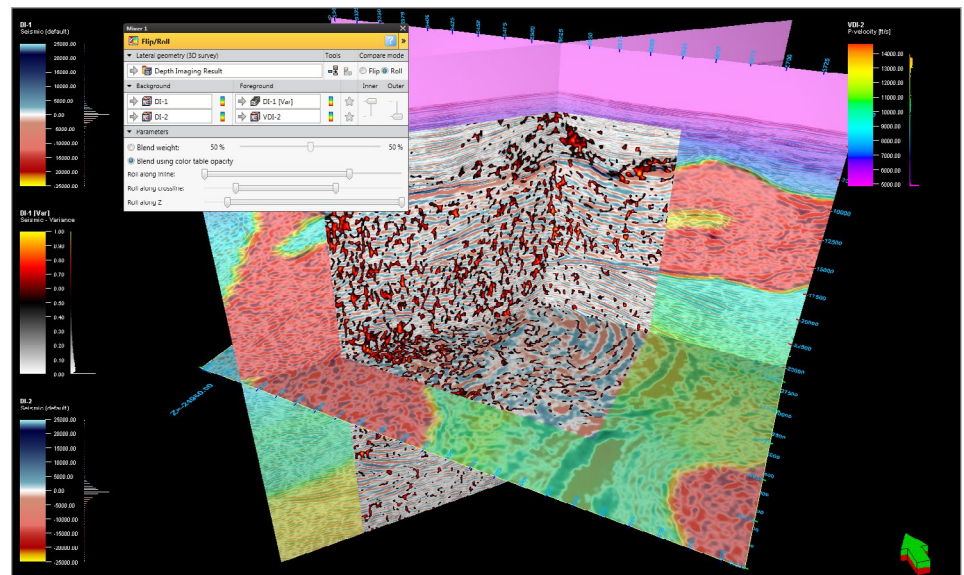
Improved usability and collaboration

Petrel 2015 provides a focused environment in which key tools are presented in context, mouse clicks are significantly reduced, and users are kept focused on interpretation and data.

The multiuser interpretation environment provided by the Studio* E&P knowledge environment ensures efficient collaboration between all geoscientists in the team, providing them with unique capabilities to quickly find and retrieve any relevant data in the context of their work environment. In order to do so efficiently, new metadata capabilities on horizons have been enabled as well as the ability to tie interpretation to the stratigraphic column to tag the interpretation following geological ages.

Scalable platform with enhanced workflows

Working in exploration, scale projects requires daily handling of large 2D and 3D seismic surveys, potentially across multiple coordinate reference systems. The Petrel platform is scalable, which allows users to work with terabytes of 2D and 3D data with no compromise on performance.

The new visualization approach within the Petrel platform significantly enhances its capabilities and drastically reduce the number of steps to covisualize multiple vintages or versions of large 3D seismic data applicable in data screening, structural and stratigraphic interpretation, and 4D and depth imaging workflows. The new Mixer tool provides the ability to interactively covisualize, blend, compare and seamlessly filter and mask large volumes of data across different geometries.
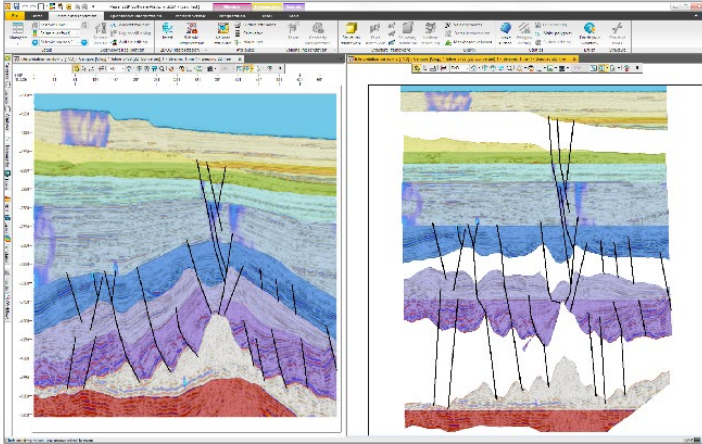

Mixer covisualization capabilities, including flip and roll, RGB/CMYK blending, and masking.
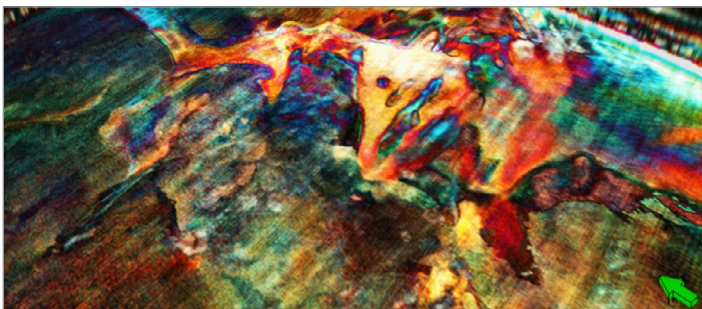
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Structural and stratigraphic seismic interpretation

The Petrel platform provides the geoscientist with a single environment for powerful 3D, classical 2D, and pre-tack seismic interpretation (horizons, faults, and geobodies), as well as quantitative interpretation and 4D seismic workflows.
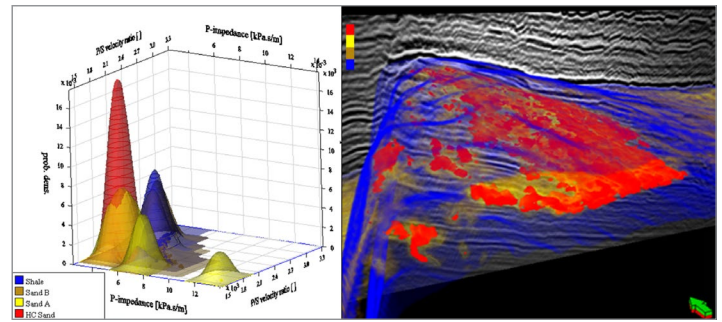

Seismic reconstruction of complex geology using a geomechanical engine, leading to pseudo-Wheeler diagrams for more confident decisions.

Advanced edge detection, such as the new consistent curvature and consistent dip seismic attributes in the Petrel platform, provides a clear delineation of complex structures, such as complex faulting or in sub- and presalt areas. Through interactive geomechanical seismic reconstruction, tectonic and depositional relationships can be investigated. The modeling-while-interpreting capabilities help deliver a confident validated structural framework of the subsurface that can be used directly in fracture modeling, as well as volumetric workflows.

Generalized Spectral Decomposition result, RGB blended using the Mixer tool.

Multitrace attribute analysis and volume-based interpretation is the fastest way to interrogate and analyze your data when delineating subtle stratigraphic features. The Petrel platform improves productivity and visualization using the latest GPU technology. Advanced volume attributes, such as Generalized Spectral Decomposition, are generated on the fly and blended using the Mixer tool in true 32-bit color. Parameters are fine-tuned using interactive and dynamic controls for instant updates. Geological bodies are isolated and extracted from the seismic, and can be directly sampled into the model and used instantly in property distribution

Litho classification and prediction from seismic inversion results.
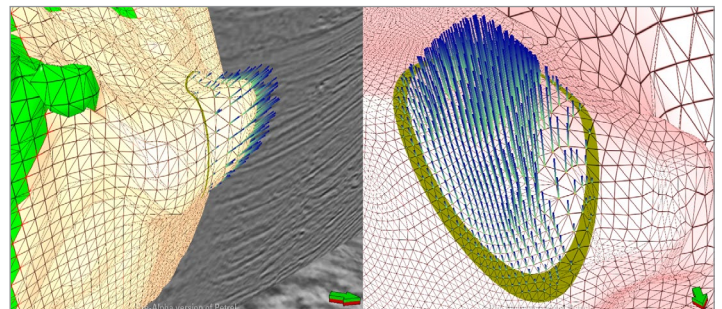
Quantitative interpretation

The Petrel Quantitative Interpretation module provides a comprehensive range of advanced, intuitive, and interactive tools to estimate reservoir properties, all in the same interpretation canvas.

Geoscientists can seamlessly visualize, process, and interpret prestack data; perform seismic data conditioning; achieve accurate seismic-well calibration; perform detailed rock physics, AVO, or AVA analysis with 3D cross-plotting capabilities; and perform prestack and poststack deterministic and stochastic inversion. In Petrel 2015, lithology classification cubes (as well as associated probability cubes) can be generated directly from the inversion results.

Complex reservoir imaging

The Petrel platform allows access to prestack data and multi-Z interpretation that streamlines the depth imaging workflow between the Omega and Petrel platforms.

In Petrel 2015, the new interactive mesh editing tools provide the ability to interactively modify the triangulated mesh surface, representing the salt body, generated from the multi-Z interpretation or from a previous model.

Interactive Mesh Editing tool allowing to push/pull or smooth/refine salt mesh bodies to greatly enhance productivity in depth-imaging workflows.

Any geophysical work—from classic map based interpretation to advanced quantitative interpretation or 4D workflows—performed using the Petrel platform can be automatically used by other disciplines, such as petroleum systems modeling, geological modeling, and reservoir simulation.

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