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Brochure

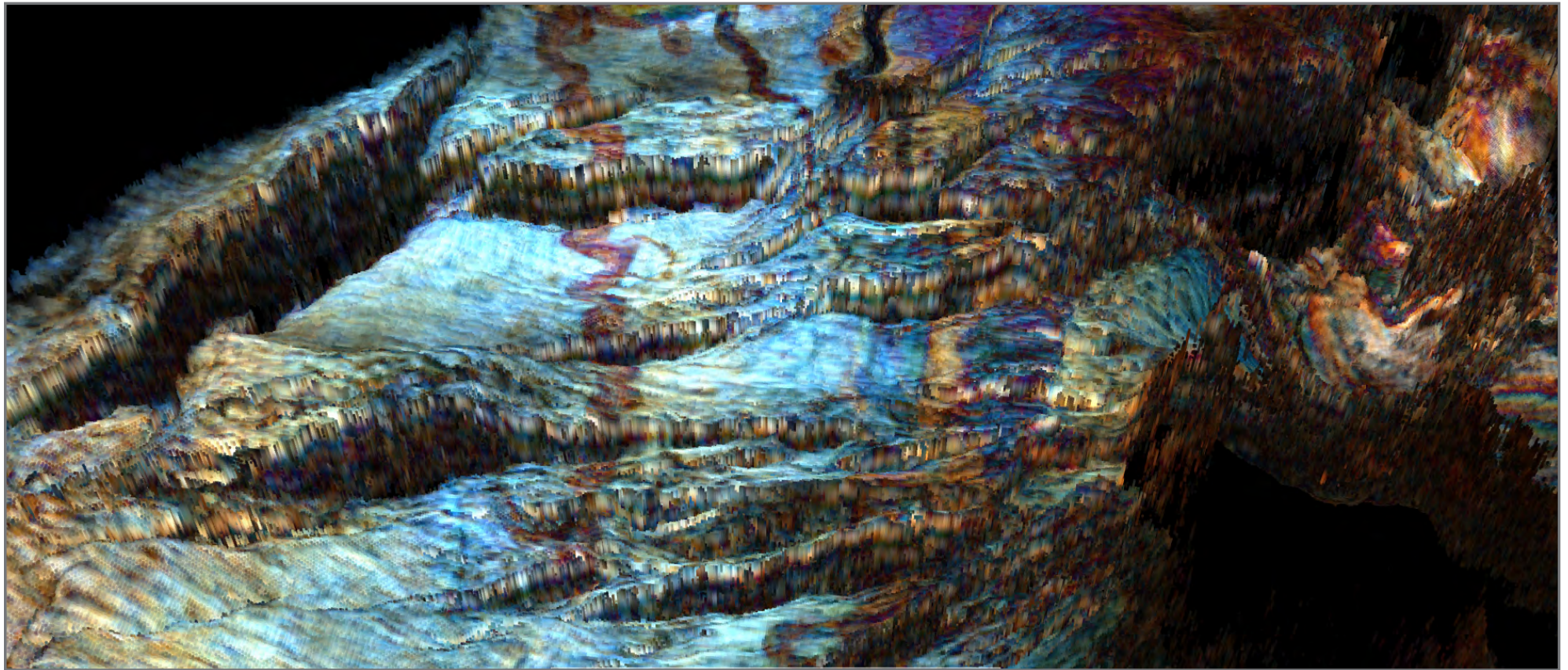
Fast and accurate seismic interpretation, from regional to reservoir

Aspen SeisEarth™

A One-Stop Shop for Every Seismic Interpretation Job

The Aspen SeisEarth multi-survey, regional-to-prospect interpretation and visualization suite is a powerful and flexible interpretation system suitable for subsurface exploration and production in traditional oil & gas projects as well as sustainable energy environments, such as geothermal energy and carbon capture and storage.

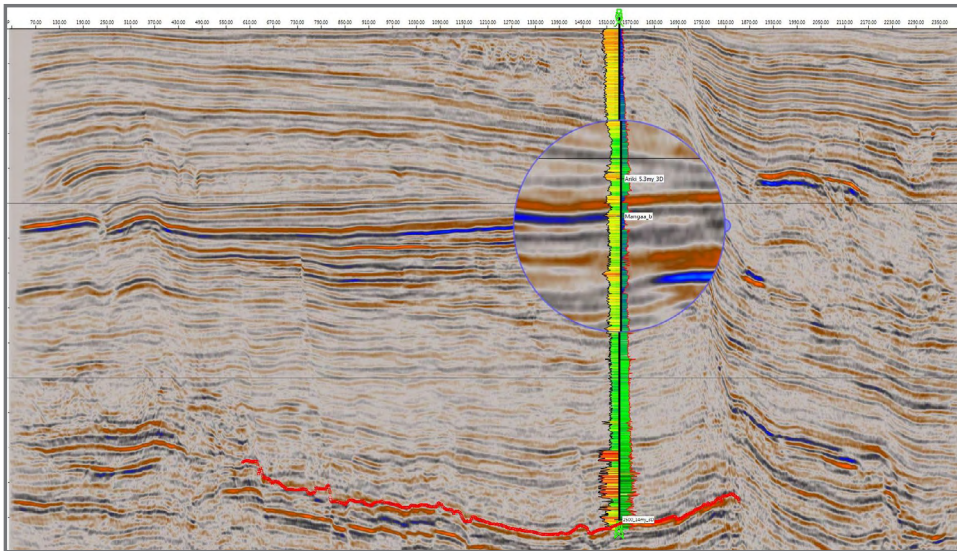
The system enables interpreters to easily handle single or multiple 2D and 3D seismic surveys and multiple well databases. Its complete scalability allows geoscientists to conduct their interpretation activities in a regional framework, scaling from basin to prospect and reservoir, from exploration to development, and from a single user to multi-disciplinary teams of geoscientists and petrophysicists. With fully integrated classification, volume visualization and quantitative interpretation capabilities, Aspen SeisEarth truly offers a one-stop shop for interpreters.



Advanced visualization: An RGB-rendered, horizon-sculpted interval through four seismic volumes, highlighting the juxtaposition of stratigraphic and structural features.

A Modern and Flexible Design

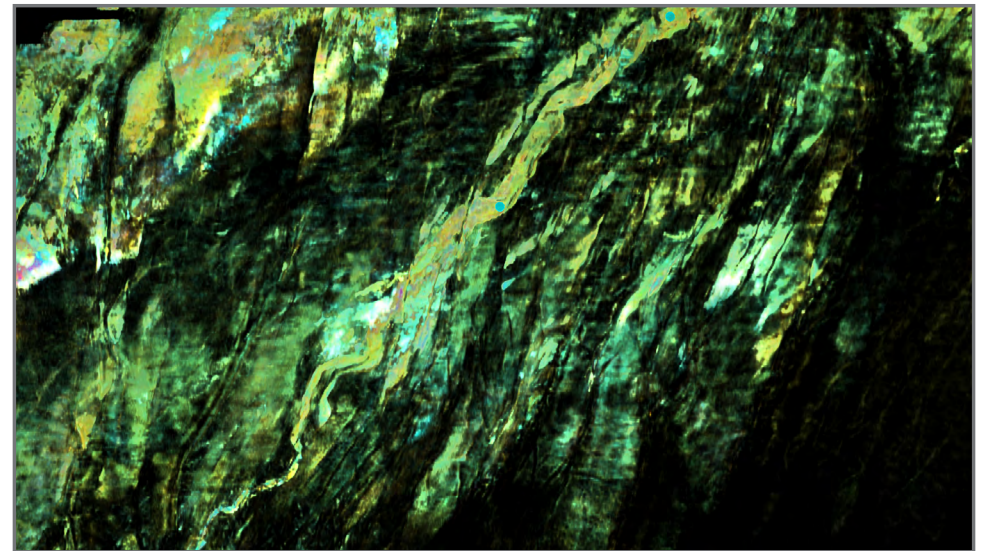
Aspen SeisEarth has been designed to work with modern workstations, on premise and on the cloud, in which high-speed 3D graphics, very large memory, and multiple CPUs and GPUs are the norm. Multiple 2D sections and 3D surveys, wells and logs, horizons, faults, T-surfaces and many other data objects all display interactively. Section, map and 3D views enable the user to choose the best views for the task at hand. Interpretation tools such as horizon flattening and correlation polygons are available in both 2D and 3D environments.



Aspen SeisEarth Section provides a comprehensive suite of features for traditional interpretation and visualization, including innovative tools such as the interactive magnifying glass.

Easy Usability, Low Learning Curve

A simple, intuitive user interface and a highly ergonomic design make Aspen SeisEarth easy to learn and even easier to use. The interactivity and consistency of use between the main viewers accelerate the interpretation process and enable interpreters to easily perform comprehensive analyses involving many datasets. Contextual menus, object identification and pie menus minimize button clicks and hand movements, reducing user fatigue and stress.



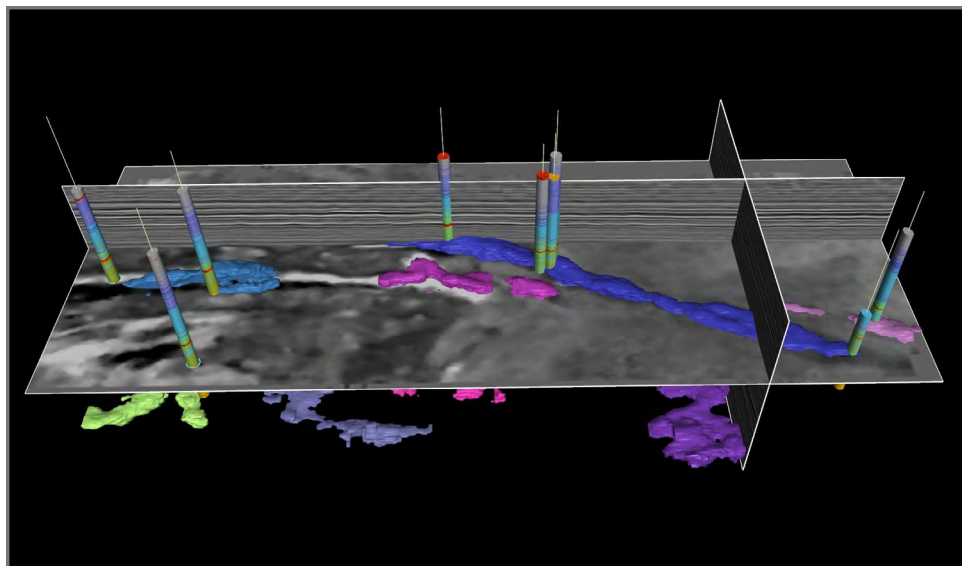
Advanced visualization: RGB-rendered volumes with opacity applied highlight a hydrocarbon-bearing channel deposit.

Guided, Repeatable Workflows Enhance Interpretation Productivity

Taking advantage of the Aspen SeisEarth integrated platform, guided workflows take the user step-by-step through data selection, process parameterization and result display. Saved workflows enable auditability and repeatability.

Examples of embedded workflows include:

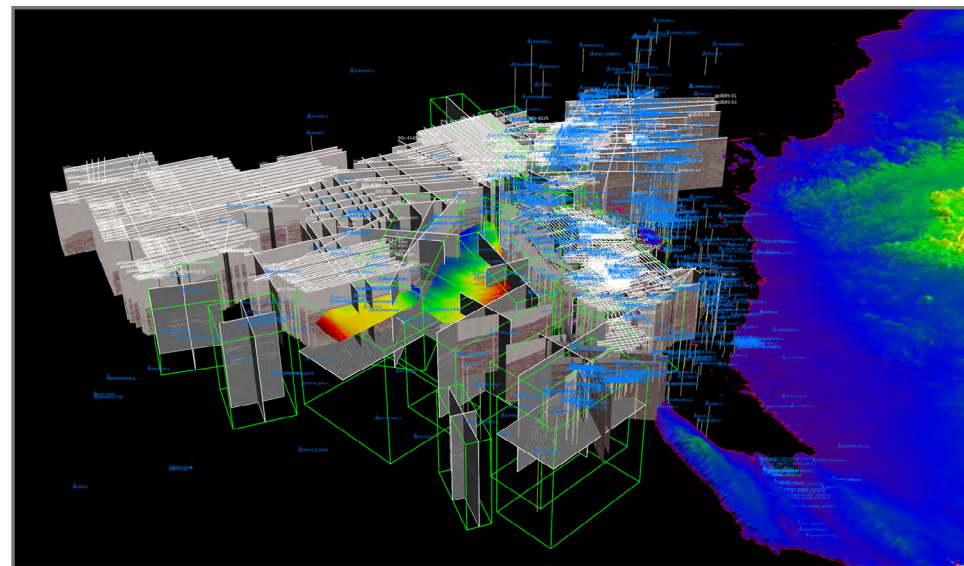
- Subvolume detection, including geobody detection and data sculpting, for advanced stratigraphic interpretation.
- Automated attribute workflows for Dip Steered Enhancement (dip controlled lateral smoothing filter) and Spectral Decomposition, with previews in 3D Canvas for parameter validation.



Advanced subvolume detection capabilities can be used to extract key features from classification and QSI volumes.

Efficient Data Management

Every interpretation project starts with collecting all the relevant seismic, well positioning and cultural data. The Aspen Epos™ data management and interoperability framework enables data loading and export in industry-standard data formats, and also offers connectivity to different open platforms, and proprietary and third-party databases, such as OSDU™, Petrel, OpenWorks® and RESQML™, so that projects can be started quickly with only minimal preparation. Time that used to be wasted searching and copying data can now be dedicated to the interpretation process.



Many thousands of 2D lines, and large numbers of 3D surveys co-visualized and interpreted in a common visualization canvas.

Keeping Up with the Massive Growth in Data

A modern dataset comprises up to hundreds of thousands of 2D sections, numerous large 3D surveys with many vintages, attributes, inversion results and prestack data, and tens of thousands of wells – all of which must be pulled together to produce a reliable set of maps or a detailed subsurface model, calibrated to existing well data.

Aspen SeisEarth has continuously adapted to the evolution in data size and diversity, offering a unique and comprehensive solution to data handling, display, interpretation and mapping. Through the use of efficient volume roaming, automatic picking and high levels of interactivity, SeisEarth is equipped to deal with massive seismic surveys.

A Framework for Secure and Effective Collaboration

Aspen SeisEarth offers full support for simultaneous multi-user interpretation and data sharing. Regional projects can be created using seismic data and interpretations from many smaller surveys, directly, with no need to create copies.

Alternatively, independent interpretation teams throughout the organization can choose to share seismic and well data while maintaining separate interpretation databases. Users are able to work in a secure environment with different levels and granularities of data access control.



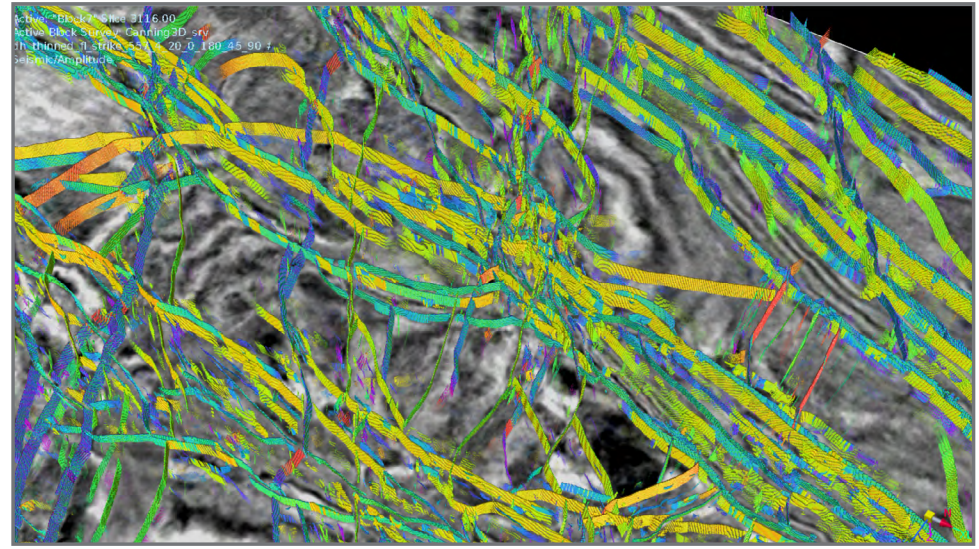
Work in a secure environment with different levels and granularities of data access control.

Automated Picking Tools Deliver Superior Results with Minimal Effort

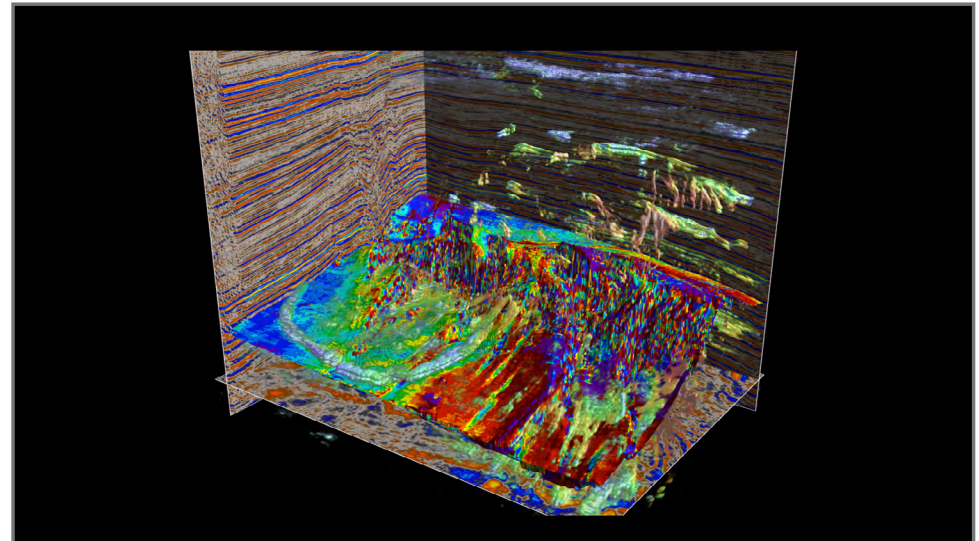
The Aspen Seismic Propagator, the best event tracker in the industry, operates on both 3D volumes and 2D sections. Its accurate waveform tracking algorithm produces reliable results quickly, avoiding the need for extensive user editing. The combination of user control and automation offers the optimal mix to the interpreter. Other advanced automation tools facilitate the interpretation of surveys containing complex faulting with minimal manual effort.

Embedded Voxel Rendering in a Common Interpretation Canvas

Leading-edge, multi-volume voxel rendering technology is directly embedded in the Aspen SeisEarth 3D Canvas. Through the use of graphics processing units (GPU's) where hundreds of cores are deployed to carry out seismic volume rendering, this enhanced visualization process removes artifacts, revealing subtle details of the actual geology while dramatically accelerating refresh speed. By deploying this technology in the 3D Canvas, interpreters are able to conveniently carry out regional-to-prospect scale interpretation activities without the need to move from one application to another.



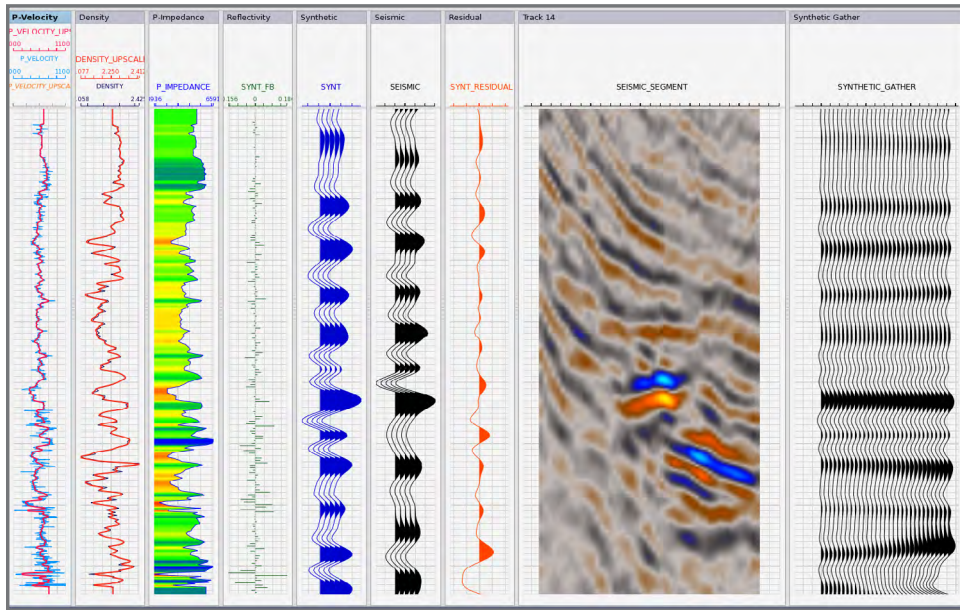
Advanced visualization: Fault likelihood colored by dip azimuth draped over seismic data.



Multi-volume rendering, seismic classification and interpretation in a single integrated window, enhances usability and performance.

Seismic-to-Well Calibration

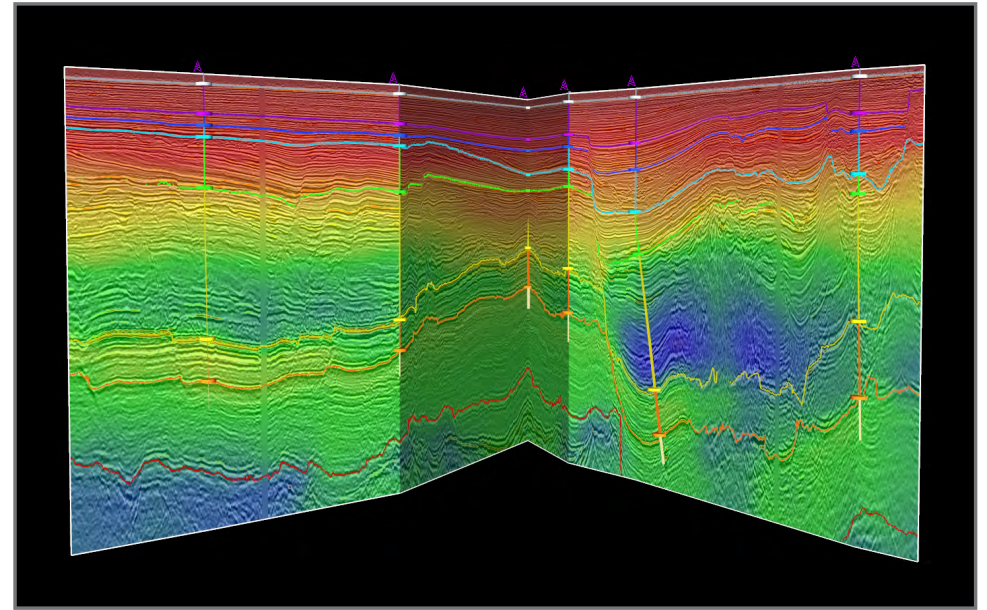
Dedicated workflows are available in the main visualization window for synthetic modeling in time or depth. Multi-attribute seismic and synthetics are automatically matched with one mouse click. Comprehensive calibration capabilities include zero and non-zero offset elastic modeling for generating synthetic seismograms and synthetic gathers, with multi-well processing capabilities and easy-to-use QC calibration tools.



Seismic-to-well calibration performed directly in the visualization windows ensures an efficient work process.

Comprehensive Velocity Modeling and Time-to-Depth Conversion

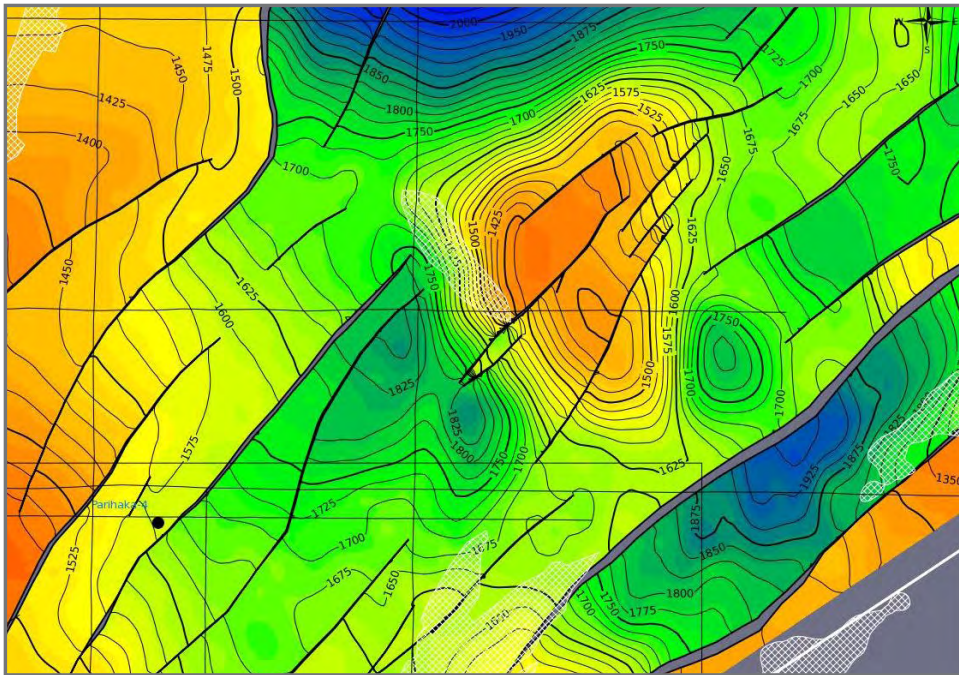
Aspen SeisEarth offers a comprehensive set of velocity modeling and domain conversion workflows for any velocity data source and any geological environment. 2D/3D seismic, interpretation and well data can be scaled from different seismic surveys and well databases. Aspen SeisEarth enables the creation of multiple velocity models utilizing different parameters or data types. The user may then choose a preferred model for the scaling. SeisEarth includes time-preserving and well tie tomography to calibrate depth-domain seismic data to well markers while maintaining seismic travel times.



Well-tie tomography calibrates seismic volumes in depth to well markers, generating geophysically valid and geologically plausible velocity models.

Advanced Mapping

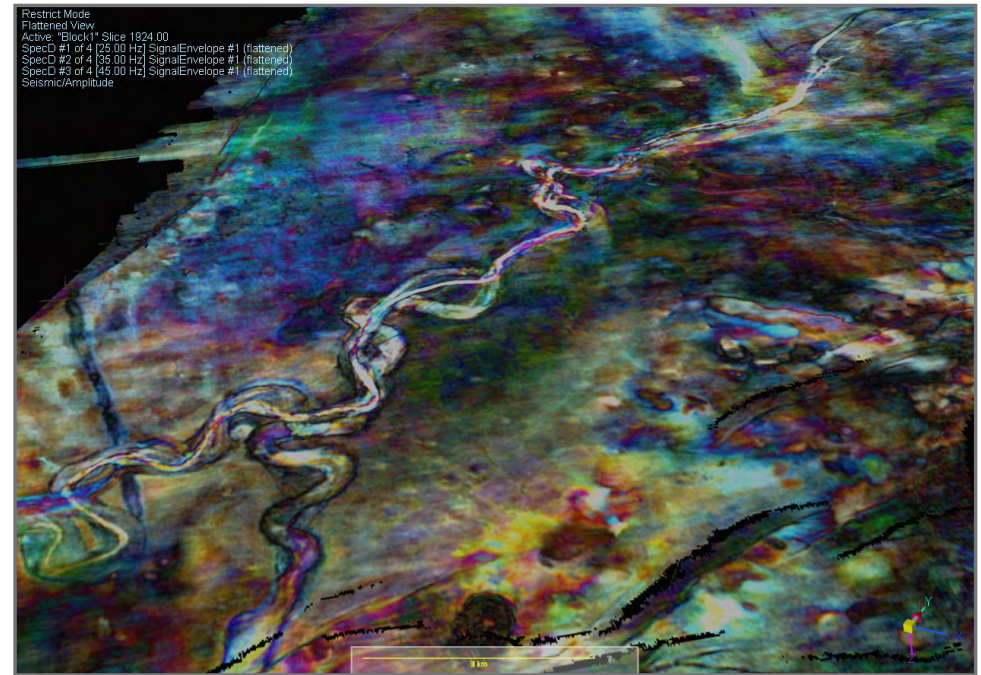
In Aspen SeisEarth, the outcome of every interpretation project is a quality map, with rich capabilities for gridding, contouring and analyzing anomalies. The BaseMap visualization window is central to any interpretation session. It may be configured with multiple panels in one window, and supports posting of line and well locations with associated interpretations for multiple seismic surveys and well databases. A dynamic, interactive plotting preview utility makes it easy to create high-quality hard copies.



Aspen SeisEarth BaseMap window provides comprehensive capabilities for the generation, cleaning and plotting of prospect- and regional-scale maps.

Extensive Multi-Attribute Capabilities

Seismic attributes can be calculated using CPU and/or GPU computation, in batch or on-the-fly, in order to perform rapid investigation of geological features. The unique multi-attribute environment in Aspen SeisEarth includes many advanced capabilities for performing attribute visualization and interpretation, including blending, merging, comparing and crossplotting. Together, they enable the interpreter to extract more value from data. Advanced spectral analysis tools further enrich the data analysis process.



Create impactful, compelling and informative images of subsurface analyses using advanced visualization in Integrated Canvas.

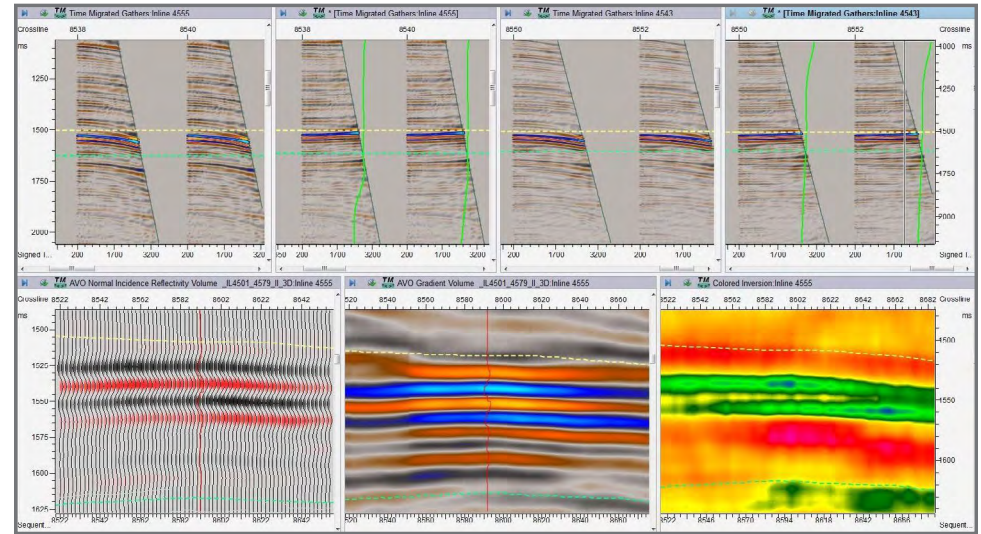
Quantitative Seismic Interpretation

The integration of Quantitative Seismic Interpretation (QSI) into the seismic interpretation process is one of the most effective methods for reducing uncertainty in the subsurface description. Comprising rock physics analysis, prestack seismic analysis and preconditioning, and numerous traditional and innovative amplitude inversion techniques, Aspen SeisEarth QSI offers a broad range of robust quantitative seismic interpretation capabilities directly integrated into the interpretation platform. They include a high-quality viewer and direct access to data stored in Aspen Epos-based repositories. These allow both interpreters and QI experts to perform different types of analyses, including:

- AVO and inversion-type projects for rock property, lithofacies and fluid descriptions
- Seismic azimuthal anisotropy analysis for fracture direction and density determination
- Pore pressure prediction from well logs and seismic velocities to assist in well design and evaluation of prospect trap integrity.

Advanced Multi-data Crossplotting

Aspen SeisEarth contains an easy-to-use crossplot utility with advanced features for integrating data from different data types (e.g. well, seismic, velocities, maps), and rock physics analysis and modeling. The seamless interaction between the crossplot, the rock physics calculator and the data viewers is enhanced by a variety of crossplot coloring options especially designed for analyzing multi-attribute data, highlighting geobodies and generating rock property volumes efficiently.



Prestack and poststack integration in a single system for interactive Quantitative Seismic Interpretation.



An easy-to-use crossplot utility includes advanced features for integrating data from different data types, together with rock physics analysis and modeling.

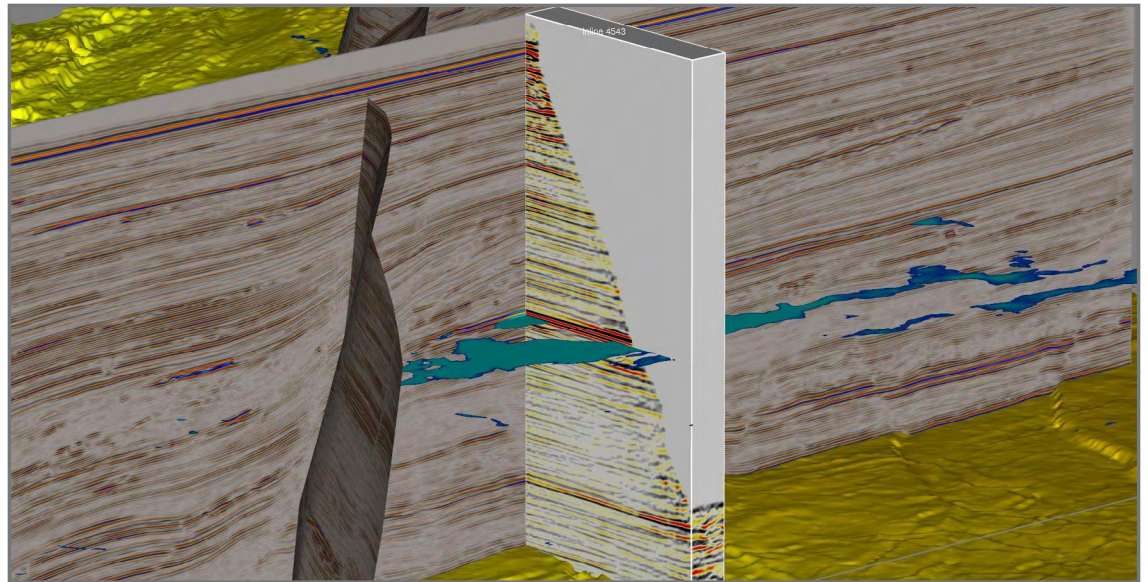


Interpreting Prestack Data

Aspen SeisEarth offers easy-to-use capabilities for fast access and visualization of prestack data, in the standard poststack interpretation environment. The interpreter can view multiple gathers and lines in a 3D perspective, adding new information into the interpretation workflow and optimizing the QC process.

A broad portfolio of prestack data QC, interpretation and analysis tools is embedded in SeisEarth. These include interactive mute picking, 3D propagation on gathers, visualization of residual moveouts, interactive AVO plots, trace header displays, and other functionalities that, when embedded in the 3D environment, become convenient tools for the user.

Prestack visualization is supported by flexible data loading capabilities, with no need to re-format or replicate data, so that even very large datasets can be efficiently accessed, viewed and interpreted.



Prestack seismic data can be co-visualized with poststack seismic data in a shared 3D view.

Formation Evaluation/Petrophysical Analysis

The Aspen Epos interoperability integration framework enables our applications to access well data from a single source, creating new synergies between them. Through its common data repositories, Epos allows close collaboration between petrophysicists performing reservoir characterization and well data analysis in Aspen Geolog™, and geologists working in interpretation and earth modeling in Aspen SeisEarth and Aspen SKUA™. The same well data that petrophysicists are working with and generating using the best-in-class capabilities in Aspen Geolog, can be viewed and used to constrain seismic interpretation, inversion, classification and velocity modeling in the Aspen SeisEarth suite.

Integrated Modeling

The tight integration between Aspen SeisEarth and Aspen SKUA modeling technology closes the traditional gap between interpretation and modeling. Through its ability to create a 3D model, no matter how complex the geology and how many faults control the structure, the SeisEarth-SKUA application suite enables concurrent interpretation and modeling, with no loss of information. It simplifies many workflows, such as mapping, fault analysis, structural restoration and the use of seismic attributes to constrain reservoir property modeling. This solution enhances teamwork, significantly improves interpretation quality, reduces cycle time, and delivers structurally consistent prospect maps, as well as stratigraphic and reservoir models.



Features

- Ergonomic design, including a simple, intuitive user interface
- Multi-user interpretation, including permission management
- A single entry point for managing, viewing, creating and editing all seismic, interpretation and well data in a project
- Visualization of large 3D and 2D seismic datasets, multiple seismic surveys, and multiple well databases
- Support for both poststack and prestack seismic data
- Full integration:
 - Multi-survey mis-tie correction for time, phase and amplitude
 - Seismic-to-well tie and synthetic well modeling
 - Optimized multi-resolution disk-roaming for seismic data
 - Industry-leading horizon auto-picker
 - Interactive seismic attribute generation, including user-defined attributes
 - Machine learning driven, and deterministic facies classification of maps and seismic volumes
 - Geobody extraction
 - Prestack seismic preconditioning
 - Rock physics analysis
 - AVO/AVAZ analysis
 - Colored, neural network, post/prestack determinist and stochastic inversions
 - Pore pressure prediction
 - Simple-to-advanced velocity modeling and domain conversions

The Aspen SeisEarth Advantage

- Regional-scale interpretation allows insights that are not possible from multiple separate surveys.
- Complete visual integration enables informed, collaborative decision-making.
- Operates on a highly agile data management system designed specifically for oil and gas data.
- Designed to exploit the high-speed graphics, large memory and fast connectivity of modern computers.
- Prestack data, geological correlation and advanced modeling tools are accessible with a mouse click.

Interoperability

- Microsoft® Windows® 10, 11
- 64-bit Red Hat® Enterprise Linux® 7.6+, 8.4+

System Specifications

All Epos-based applications enable interoperability with third-party data stores, including:

- RESQML 2.0.1
- OpenWorks R5000.10
- Petrel* 2021, 2020, 2019

(* a mark of Schlumberger)



About AspenTech

Aspen Technology, Inc. (NASDAQ: AZPN) is a global software leader helping industries at the forefront of the world's dual challenge meet the increasing demand for resources from a rapidly growing population in a profitable and sustainable manner. AspenTech solutions address complex environments where it is critical to optimize the asset design, operation and maintenance lifecycle. Through our unique combination of deep domain expertise and innovation, customers in capital-intensive industries can run their assets safer, greener, longer and faster to improve their operational excellence.

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