EMERSON™

VoxelGeo

Voxel Volume
Interpretation

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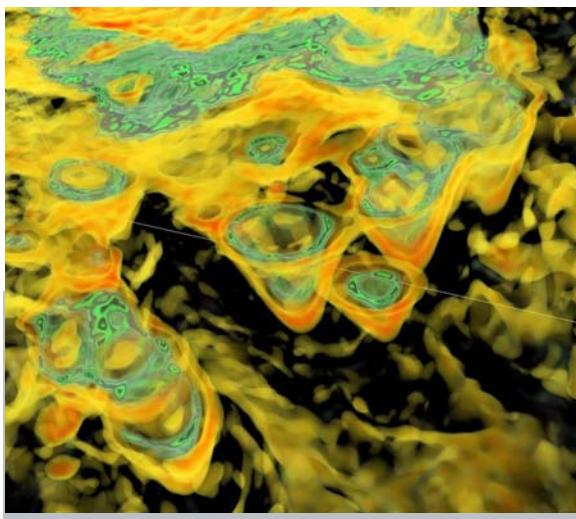
Voxel Volume Interpretation

> *We recently started using VoxelGeo in our new visualization room. The 3D stereo viewing is far superior to other solutions we've seen... It has become our preferred platform for external visitors, including our partners.*
> *OMV Petrom*

The Interpreter's Tool of Choice

Paradigm™ VoxelGeo™ was the first volume-based structural and stratigraphic interpretation solution offered to the oil and gas E&P industry, in the early 1990s. Today, VoxelGeo remains the tool of choice for interpreters, due to its powerful interpretation and visualization capabilities, simple usage, and complete integration with advanced multi-survey interpretation applications. From seismic processing to well planning and engineering, from depth imaging to advanced reservoir characterization, VoxelGeo provides a common interpretation and visualization workspace, for a complete understanding of the subsurface geology.

The Best Just Got Better

A new approach to 3D rendering has dramatically accelerated the refresh speed of VoxelGeo displays and improved the visual integrity of 3D features. Based on VoxelGeo's unique opacity technology, the enhanced rendering process is able to remove artifacts, revealing subtle details of the actual geology.

Full Integration into the Paradigm Interpretation Suite

VoxelGeo is an integral part of the Paradigm SeisEarth™ multi-survey, multi-attribute product suite, sharing seismic, culture and interpretation data through the Integrated 3D Canvas. Users can perform detailed visualization and interpretation in VoxelGeo, while concurrently sharing and reviewing the data on a regional scale with both 2D and 3D seismic. VoxelGeo's subvolume detection functionality is also available to interpreters in the Integrated Canvas in two new workflows:

- Sculpting: to create a new postack volume with data limited between formations or constant values (sculpted)

- Geobody detection: identification of anomalies in the data based on connectivity and shared value range.

Integration with the Paradigm Stratimagic™ seismic facies classification application improves the delineation of subtle stratigraphic features. VoxelGeo works seamlessly with the DirectorGeo™ 3D directional well planning system to provide volume-based target picking and 3D visualization of the wellbore, including the identification of potential geohazards.

With these combined capabilities, asset and exploration teams can use geophysical, geologic and engineering data to plan wells in a single 3D view. The well plan is immediately available for analysis in other drilling applications, allowing quicker design of a fully engineered well trajectory, while steering clear of geohazards.

▲ Shale interval with new rendering
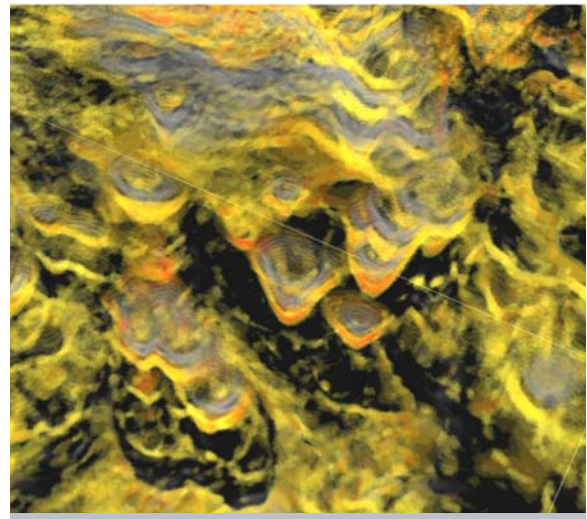
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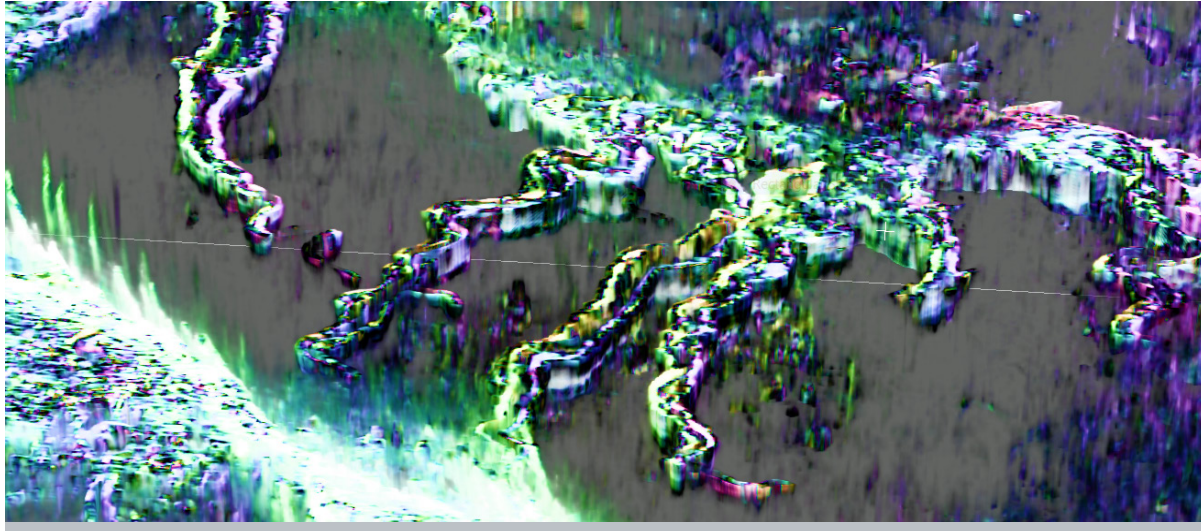
▲ Channel complex visualization using Volume Fusion HSV blending of dip, azimuth and semblance data

The Industry's Best Event Trackers

Embedding Seismic Propagator and FaultTrak capabilities into VoxelGeo combines the fastest and most efficient tools for computer-assisted horizon and fault tracking with the best volume interpretation/ visualization solution. An ergonomic user interface assures ease of use while providing highly accurate interpretation results.

Multi-volume, Multi-view Visualization

VoxelGeo's multi-view capability enables simultaneous visualization and interaction between maps, 2D sections and 3D volumes. VoxelGeo supports multiple linked viewers that can be used to investigate seismic volumes from different 3D aspects, showing the full extent of features within the volume.

VoxelGeo has direct, instant access to attribute calculation, enabling the interpreter to quickly select the most suitable attribute for the task at hand. Multiple attribute volumes may be co-rendered in CPU or GPU using a variety of blending techniques in the Volume Fusion tool.

Subvolume Detection and Crossplot

VoxelGeo's unique embedded volume-based crossplot add-on module enables the interpreter to interactively rotate a three-dimensional, multi-attribute crossplot, in order to better distinguish anomalous areas from background trends. These areas can be quickly isolated as geobodies for automated mapping and body size analysis in VoxelGeo.

Areas and subvolumes of the 3D volume crossplot may be identified and flagged as detections. These can be further analyzed by subvolume detection, including geobody mapping and analysis, for rapid interpretation of AVO anomalies and acoustic impedance volumes. Subvolume detection and 3D crossplot enable interpreters to view and use the relationships between volumes. Together, they enable an open set of workflows for analysis.

Stratigraphic Interpretation Workflows

VoxelGeo's sophisticated flattening, formation and fault block sculpting capabilities, together with its variable color and opacity tools, allow interpreters to rapidly scan vast quantities of 3D seismic data looking for anomalies. The ability to recognize and then map anomalous features, such as channels, deltas, fans, dunes, barriers and point bars, both enhances interpretation productivity and provides gratification to the interpreter.
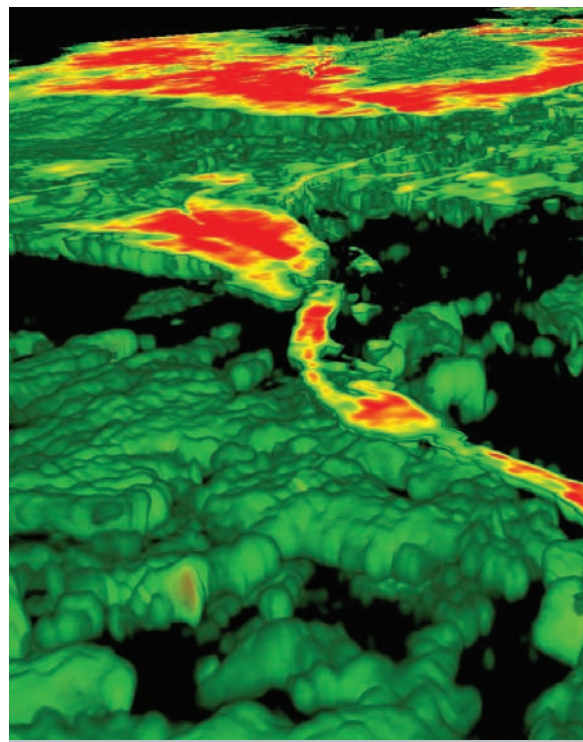
▲ Channel offshore New Zealand (seismic data courtesy of AWE)

Features

- Display of seismic, well, interpretation, culture, GeoTiffs, micro-seismic, 3D glyphs, stratigraphic markers and notes
- Seismic display of sections, volumes, chair-cut volumes, traverses, slabs, and arbitrary planes
- Support for >8-bit shared memory volumes
- Display of non-seismic data from Tiff slices
- Attribute generation and classification
- Custom applications using VgTools
- Volume math
- High-quality movies

Interoperability

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

- RESQML 2.0.1
- OpenWorks® R5000.10
- GeoFrame® 2012
- Petrel * 2017 & 2016
- Recall™ 5.4.2

(*is a mark of Schlumberger)

System specifications

- Microsoft® Windows® 7, 8.1, 10
- 64-bit Red Hat® Enterprise Linux® 6.8 and subsequent minor releases, and 7.1 and subsequent minor releases

The Paradigm Advantage

- Improvements to industry-leading opacity technology remove artifacts, for extremely high-quality rendered displays.
- Direct visualization of fluid contacts and amplitude anomalies enables easy identification of hydrocarbon accumulations.
- Seismic Propagator and FaultTrak provide the best automatic horizon and fault tracking in the industry.
- 3D crossplotting reveals details of AVO volumes that assist in prospect identification.

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Original data courtesy of Devon Energy Corporation.