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# The next generation high-definition G&G software platform

## New developments announced in Paradigm 16

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Contributed by Paradigm

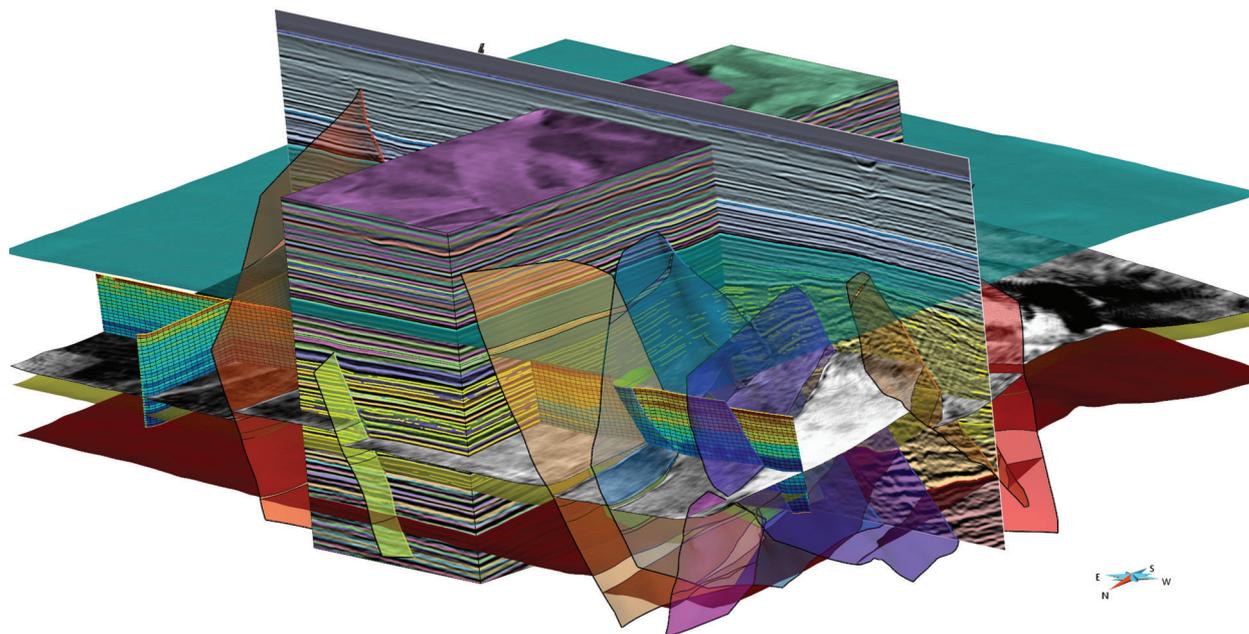
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The E&P industry is undergoing a transformation similar to what the television industry went through a few years back in its switch to high definition. During that transition, there was a period during which television broadcasters were transmitting signals in high definition, but most homes still had standard-definition televisions, so the extra resolution was being lost.

That's where the E&P industry stands today. High-definition seismic acquisition and well-log data are ubiquitous. But organizations, having spent money to acquire the data, still lack the tools to extract the deeper levels of information now available. The challenge isn't limited to data processing and imaging; it extends into tying to logs, performing interpretations, honoring complex geology in the model, and outputting this into simulation. Paradigm's vision is to create the first high-definition software platform to ensure that operators' investments in data acquisition can be leveraged for their drilling, completion, and production decisions. To deliver on this software platform, the company is adding more innovation, integration, and interconnectivity in Paradigm 16.

Paradigm has a long history of innovation, from pioneering modern depth-imaging and volume-based modeling to the commercial introduction of neural network technology in oil and gas, and advanced 3D visualization. Paradigm 16 introduces additional advancements. A new high-fidelity process in SKUA-GOCAD helps build challenging geologic models based on a patented technology called geologic time refinement (GTR). GTR aims to enable organizations to generate structural models at or near the resolution of the seismic interpretations, unlocking unique workflows such as model-driven tomography updates and 3D paleospace seismic imaging. These workflows allow organizations to honor their high-definition data for a better understanding of the subsurface.

Another innovation is in the new Geolog Monte Carlo uncertainty functionality for optimizing multimineral and fluid-log analysis. This enables organizations to more accurately characterize formations at the well bore and extends the existing capability to conduct uncertainty analysis deterministically. A new 3D petrophysics feature allows accurate analysis of logs in high-angle or horizontal wells. Other advancements in Geolog include slowness frequency analysis of full-waveform sonic logs, improved image-log processing, and numerous new production log-analysis tools. These tech-



Volumetric interpretation combined with UVT modeling and GTR in SKUA-GOCAD produces accurate paleospace imaging for chronostratigraphic interpretation and generates high-definition 3D models matching intraformation seismic details.

niques take on increasing importance as organizations continue to produce from ever-thinner beds, needing higher-resolution analysis.

Improved diffraction and specular imaging in the EarthStudy360 full-azimuth depth-imaging platform help minimize guesswork for interpreters. Innovations in GeoDepth include the introduction of structural model-based tomography, which fully honors faults and multi-Z surfaces, allowing complete synchronization between velocity-model updates and the geologic model. In addition, an innovative implementation of new 2D multiline tomography and imaging workflows maximizes productivity and minimizes manual intervention. The Echos platform introduces a range of functionalities, including a new method for production-oriented estimation of  $Q$  from seismic data, and new capabilities in refraction statics and trace interpolation.

Of course, for innovations to enhance productivity gains, the disparate tools must work together. This is why Paradigm has made a strong commitment to integration around its Epos data-management platform. In Paradigm 16, the interpretation platform becomes a single application, further improving the level of cross-product integration. Together with industry-leading interpretation tools, the system has been enriched through the first stage of Stratimagic integra-

tion, enabling classification for all interpreters. Similarly, Paradigm's advanced visualization solution VoxelGeo continues to be unified with SeisEarth. This means that customers can work within a truly integrated ecosystem, for everything from well-log analysis to seismic imaging, interpretation, and modeling.

Finally, Paradigm recognizes that despite its platform-level integration, organizations will continue to use specialized tools in different parts of their workflows. Therefore, Paradigm 16 continues to increase interconnection into third-party solutions. Paradigm believes it now offer the deepest integration in the industry to Halliburton OpenWorks and Schlumberger Petrel\*, as well as to many other third-party data stores. Paradigm 16 also allows Geolog users to work with code written using Matlab, allowing them to easily integrate their custom algorithms into Geolog. Paradigm has added to its level of RESQML support for cross-vendor data exchange, retaining the comprehensive implementation of this open-standards approach.

To learn more, visit Paradigm Booth 3107 anytime at the SEG Annual Meeting, or attend a special presentation today, Oct. 18, at 12:15 p.m. ■

\*Mark of Schlumberger