Paradigm 15 strengthens high-definition G&G Platform with new processing, imaging, interpretation and modeling technologies, supporting cross-domain workflows and expanded third-party data interoperability.

Truly Electrifying
In the last several years, seismic service companies and oil field services companies have invested heavily in improved equipment and methods for acquiring high-resolution data from the subsurface. These methods include broadband seismic acquisition and processing, wide and rich azimuth seismic acquisitions, and new downhole tools that capture key reservoir parameters with high levels of precision. This information allows geoscientists to resolve geologic features not resolvable by conventional technologies and acquisition methods.

Unfortunately, by the time this information is processed, interpreted and modeled, much of the rich information that was acquired has been downgraded or even lost due to limitations in software technology.

The Paradigm “high-definition” platform is based on a broad technology chain designed to capture and preserve high-resolution subsurface information, from field recording to reservoir simulation. This chain of technologies allows geoscientists to image, visualize and model subsurface detail and features so that the full investment and value of the original field data is maintained.

Paradigm 15 extends this high-definition method to more accurate parameterization of anisotropic velocity models with the incorporation of VSP arrivals in the GeoDepth grid tomography solution.

Strengthening a high-definition G&G Platform with Paradigm 15

Duane Dopkin
Executive Vice President-Geoscience, Paradigm

High-resolution seismic and borehole data can result in improvements in vertical resolution, spatial resolution and azimuthal (directional) resolution.

To properly image, interpret and model this high-resolution data, Paradigm has developed a platform of high-definition technologies, including a new broadband deg hosting solution, in situ, full-azimuth seismic imaging and characterization, high fidelity voxel-visualization, and true 3D chronostratigraphic modeling solutions that implement high-resolution geologic grids without distortions or approximations.

Collectively, these technologies form a contiguous system enabling oil field operators and service companies to optimize their return on investment from high-resolution recorded surface and subsurface data. This platform encourages the development of supporting technologies that return high-resolution outcomes and preserve oil companies’ ROI on high-resolution data, with the aim of identifying the most productive targets first, drilling fewer but better...
With its latest release, Paradigm 15, Paradigm has strengthened this high-definition platform with new processing, imaging, interpretation and modeling technologies, supporting cross-domain workflows and expanded third-party data interoperability.

In support of high-resolution processing and imaging objectives, the Paradigm 15 release introduces variable density support in its Echos® Reverse Time Migration, to capture and more accurately represent subsurface wave propagation. The release also expands its multi-component offering with shear wave splitting processing and analysis for application to shale resource plays and other fractured reservoirs. Significant improvements in run time performance in its broadband deghosting solution and its patented in-situ full azimuth imaging solution (EarthStudy 360®) create additional opportunities for geophysicists to pursue high-definition processing and imaging objectives, from field data through seismic inversion. The Paradigm 15 release extends this high-definition method to more accurate parameterization of anisotropic velocity models with the incorporation of VSP arrivals in the GeoDepth grid tomography solution. When combined with full azimuth tomography, high-resolution velocity models can be secured with reduced mathematical uncertainty. The release also strengthens synchronization between the geophysical (velocity) model and geological (earth) model, with the first integration efforts of its industry-leading GeoDepth® and SKUA-GOCAD™ product lines. This integration enables geophysicists to utilize advanced structural and stratigraphic model building capabilities in the depth imaging workflow, incorporating geologic complexity and constraints in the depth imaging process. The Paradigm 15 release extends this high-definition method to more accurate parameterization of anisotropic velocity models with the incorporation of VSP arrivals in the GeoDepth grid tomography solution.

The integration of early

Filtering rays through a salt body using a structural volume from SKUA
Paradigm has enriched its existing QSI solutions by offering two dedicated packages: QSI-RFP for rock and fluid properties, specifically designed for interpreters and reservoir geophysicists; and QSI-AzFP for azimuthal analysis of fracture properties. Among many fully integrated features, QSI-RFP offers multi-disciplinary cross plot, AVO analysis, and a new colored inversion tool to generate impedances as part of the interpretation process. Through the azimuthal analysis of fracture properties, QSI-AzFP provides interpreters with accurate information about the orientation, intensity and density of fracture/tectonic-stress systems, which is essential for the efficient production of oil and gas.

As part of the high-definition theme, the SKUA-GOCAD modeling system now offers a new, easy-to-use variogram analysis tool to capture crucial multi-scale spatial variability that is fundamental to building accurate velocity and reservoir models. Additionally, the release includes enhancements that allow the construction of flow simulation grids that honor geological deformations in highly compressive structures.

Expanded integration with third-party databases and applications offers further productivity improvements for
Duane Dopkin is the Paradigm Executive Vice President of Geoscience. In this role, he helps set the technical direction for the company’s product portfolio and helps educate the market, from global operators to universities, on the value of advanced geoscience techniques across the full range of G&G disciplines. In his 30 year career at Paradigm, Mr. Dopkin worked as a Geophysicist for Digicon Geophysical Corporation and served as Manager of Special Products and Vice President of Research for CogniSeis Development, a geosciences software company acquired by Paradigm in 1997.

Dopkin holds a BS in Geosciences from the Pennsylvania State University and an MS in Geosciences from the University of Houston at Clear Lake. He has published numerous articles on the integration of the geoscience disciplines to improve hydrocarbon detection and recovery, and is a member of the Society of Exploration Geophysicists.

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