

## **Future Directions in Deep-water Exploration: Convergence of New Technologies and Geologic First Principals**

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**Timothy R. Garfield<sup>1</sup>**, R.T. Beaubouef<sup>1</sup>, and A.R. Sprague<sup>2</sup>. (1) 233 Benmar, ExxonMobil Exploration Co, Houston, TX 77060, phone: 281-654-5866, tim.r.garfield@exxonmobil.com, (2) ExxonMobil Production Research Co, P.O. Box 2189, Houston, TX 77252

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Our understanding of the three-dimensional architecture of deep-water facies has improved dramatically over the last several years. Numerous giant oil discoveries totaling 10's of billions of barrels have fueled a rapidly increasing pace of exploration and field development drilling targeting deep-water reservoirs around the world. Integration of high-resolution seismic images, well data and principals of process sedimentology enable more accurate predrill characterizations of sedimentary facies to be made and used to optimize exploration and development well locations. Analysis of depositional responses in a wide range of basinal settings, where direct correlations can often be made to coeval shelfal units, coupled with experimental and numerical modeling of process-response relationships, have led to significant new insight into the primary geologic factors controlling sediment transport and depositional patterns in deep-water settings. Collectively these data sets suggest that in most basins, reservoir-grade, deep-water clastic sediment distribution is controlled by channel processes. Lack of understanding of these processes and their recognition criteria can lead to incorrect interpretations of facies patterns and exploration and development drilling surprises. By recognizing and isolating both extrinsic and intrinsic factors controlling deep-water reservoir development, we can better leverage high-resolution seismic imaging technology to more accurately predict sand distribution patterns and production performance behavior in any depositional setting.

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