
Modern Imaging of Pre-Salt Strata and Structures in the Mississippi Canyon Area of the Gulf of Mexico Provide New Insight into the Evolution of the Basin

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ABSTRACT

The pre-salt domain in the Gulf of Mexico has historically been very difficult to image. This is primarily due to the issues brought on by the abundance of salt. During the past few years the seismic industry has developed acquisition and processing procedures that have mitigated the salt effects. Imaging of the pre-salt strata and structures in the Mississippi Canyon protraction area in the Gulf of Mexico has drastically improved with the new TGS Declaration multi wide azimuth (M-WAZ) 3D seismic. This survey provides detailed images that are used to reliably interpret Mesozoic sequences and associated structures that lie below the Louann Salt.

An interpretation of the lower Mesozoic sequences, below the Louann Salt, has revealed variations in sediment packages that can be related to pre-rift and syn-rift depositional patterns. These patterns are compared to current paleogeographic interpretations providing insight to the structure of the basin in the early Mesozoic. Interpretation and analysis of local structures below the Louann Salt including faults, basement features, and crustal anomalies have been correlated east to the Florida Escarpment and south to the Gulf of Mexico spreading center using additional TGS seismic data. The analysis of these structural features are integrated with current Gulf of Mexico opening models to help validate the mechanics, kinematics and timing of the various models. The improved pre-salt imaging provides a more robust understanding of the Gulf of Mexico Mesozoic structures and depositional environment that will lead to refined models and insight into new and existing oil and gas plays.

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