

Integration—The Key to Understanding Petroleum Systems in the Gulf of Mexico

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Abstract

Working petroleum systems are dependent on the distribution and nature of reservoir, source and sealing units, the timing of traps and the maturation and migration of hydrocarbons. By combining a wide variety of data sets (seismic, potential fields, satellite images, well and field data) with source rock and reservoir information from in-house studies and public domain reports and publications we have analysed, described and mapped the petroleum systems and play fairways for the Gulf of Mexico using a number of novel techniques.

For example, unresolved problems and alternative models for the tectonic evolution of the Gulf of Mexico have been reviewed and refined and a series of palaeodepositional maps for key source and reservoir horizons have been compiled. Integration of these maps with analysis of the onshore uplift and drainage networks across the continental United States and Mexico has enabled us to highlight sediment influx patterns and further contributed to our ability to predict reservoir and source distribution in the nearshore, shelf and in the under explored deep-water arena of the US and Mexico.

Furthermore, using a consistent, geologically constrained method we have estimated the prospective, recoverable (yet-to-find) resources across the Gulf of Mexico. Understanding basin-scale characteristics allows greater insight into the development and extent of individual elements of each proven and potential play. In contrast to other published methods, the focus here is on the hydrocarbon pools i.e., the receiving, not generating end of the system, as the reservoirs are the best documented and most easily understood aspects of the petroleum system.