
Understanding the Complex Petroleum Systems of the Greater Gulf of Mexico Using Post Well Analysis in Both U.S. and Mexican Territories

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EXTENDED ABSTRACT

A multidisciplinary study of wells from the U.S. offshore Gulf of Mexico, seen in **Figure 1**, has been carried out in order to assess, for each formation in each well, the four key risk factors for exploration: reservoir, trap, seal, and charge, forming the basis of the post well analysis (PWA).

This multidisciplinary approach, that includes the integration of well data (including geological reports, well logs, mud logs, biostratigraphic reports, etc.), 2D and 3D seismic and petrophysical data (including computer based petrophysical interpretations [CPIs]), thermal modelling, and public data provides a unique systematic assessment of the petroleum systems of U.S. offshore Gulf of Mexico (**Fig. 2**).

By understanding the complex petroleum systems in the U.S. offshore Gulf of Mexico we can compare these analogues with the Mexican Gulf of Mexico to increase our understanding of a frontier region (**Fig. 3**). In turn, this may help to highlight potential key risk factors, identify areas of interest, and reduce exploration risk.

Using PWA examples of both discoveries and dry holes, from an area such as the Alaminos Canyon protraction area in the U.S., increases the understanding of salt body formation, development, and movement within analogous regions in the Mexican Gulf of Mexico. Accurate mapping of salt bodies on seismic in the U.S. offshore Gulf of Mexico and utilising well controls to determine salt thicknesses and their interaction with the surrounding stratigraphy is shown to increase the confidence in the style of salt tectonics that may be found in the Mexican Gulf of Mexico.

Though there are similarities in the structural and stratigraphic regimes across the U.S. and Mexican Gulf regions, one key element that must be considered when assessing petroleum systems in the Mexican Gulf of Mexico is the differing amounts of sediment input and their respective source regions. Understanding these sediment influxes into the basin is key to understanding the development of potential reservoirs in the Mexican Gulf of Mexico and will further contribute to the knowledge of salt behavior in the area.

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