

The Hydrocarbon Exploration Risk of Ultra Deep-Water Petroleum Systems in the Great Campos Basin and Gulf of Mexico

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Hydrocarbon exploration in ultradeep-water frontier areas entails both high costs and increased inherent risk of dry holes. The main uncertainty is the presence of active commercial petroleum systems. Therefore the prediction and characterization of generative hydrocarbon source rocks to charge potential traps is imperative. This paper shows some examples of the application of several predictive high resolution geochemical and 3D compositional basin modeling tools as fully integrated models in the frontiers ultra-deep water areas of Gulf of Mexico and the Great Campos Basin. The integration of new technology, ranging from age-related molecular geochemistry to diamondoids, compound specific isotope analyses of biomarkers (CSIA-B) and of diamondoids (CSIA-D) are of fundamental importance to evaluate the hydrocarbon potential in a sedimentary basin in frontier areas. When the HRGT data are integrated with 3D Petroleum Systems Modeling in a petroleum systems context, these techniques are powerful tools for regional as well as prospect-scale evaluations of hydrocarbon charge and accumulation risk.
