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Petroleum Systems of Deepwater Scotian Basin, Eastern Canada: Challenges for Finding Oil Versus Gas Provinces

The deepwater Scotian Basin, which covers an area between Louisiana and Texas deepwater in the Gulf of Mexico, has been considered as one of the major petroleum provinces in the North Atlantic margin. This prognosis is based on the geochemical and petroleum system modeling studies on both sides of the Atlantic.

The Petroleum System approach in the deepwater Scotian Basin (west of Laurentian Channel to Georges Bank) has provided a framework to improve predictions of hydrocarbon saturation in the "hot spots", prediction of "oil" versus "gas", and the volume of possible expelled hydrocarbons. The framework of fluid or gas flow in the mini-basin environment within both the inner and outer Scotian Slope will be controlled by basement fractures, salt tectonics, source rock anoxicity, growth faults, timing of trap formation, and overburden thickness.

The expected hydrocarbon families in the Scotian Slope would be different compared to shelf and shelf-break petroleum. However, the concept of a petroleum system using geochemical data and 1D/2-D/3-D numerical modeling suggest that late Triassic-early Jurassic lacustrine source rock and Jurassic-Cretaceous Verrill Canyon Source Rocks could be the key factor for future oil and gas discoveries in the slope.