

Preliminary Assessment of the Petroleum Systems in the Scotian Outer Shelf and Slope, Eastern Canada: Role of Geochemical Interpretations and Modeling

P.K. Mukhopadhyay (Muki)*
Global Geoenergy Res Ltd., 1657 Barrington St, #427, Halifax, NS, B3J 2A1
muki@global-geoenergy.com

J.A. Wade
Geological Survey of Canada, Dartmouth, NS, Canada B2Y 4A2

and

B. Wygrala
IES (GmbH) Inc., BastionStr.11-19, Juelich, Germany

We are evaluating the petroleum systems of selected slope and outer shelf areas in the southeastern and southwestern portions of the Scotian Basin, offshore Nova Scotia, Eastern Canada. None of the five wells drilled in the slope have discovered hydrocarbons.

In the deepwater Scotian Basin, the organic-rich source rocks with anoxic signatures are likely to be present in intervals within local “microbasins”, which have developed, primarily, in association with major growth fault or salt diapirism. Various oil- and gas-prone source rock facies have been identified from Scotian Outer Shelf and Slope wells or projected from the DSDP/ODP wells in sediments from the Middle Jurassic (Callovia) to early Tertiary in age. They have variable maturities related to their basin position or proximity to salt diapirism. With limited geochemical and modeling data, the migration of hydrocarbons from source to trap could be evaluated from various seismic signatures (“hot spots) and presence of pockmarks in various parts of the Scotian Outer Shelf and Slope

The concept suggests that the geological interpretation and seismic ‘hotspots’ in relation to individual prospects should be fully evaluated using an integrated approach of petroleum system analysis. This will include the detailed geological and 2D/3D seismic interpretations in association with source rock hydrocarbon charge histories, framework of possible fluid flow using various geochemical interpretations and by 2D/3D petroleum system modeling.