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Deepwater Petroleum System of Jurassic-Tertiary Sediments of the Scotian Basin, Offshore Nova Scotia, Eastern Canada

We have evaluated the hydrocarbon prospects of selected slope and outer shelf areas to the southeast and south of Sable and Shelburne subbasins of the Scotian Basin, offshore Nova Scotia, Eastern Canada. Only five wells have been drilled within the Upper Jurassic to Miocene sediments on the continental slope off Scotian Basin. None of these wells have discovered any hydrocarbons. At least eight source rock facies are identified or projected (from the DSDP/ODP wells) in sediments from the Middle Jurassic (Callovian) to Tertiary Banquereau formations. Organic-rich amorphous organic facies that have anoxic signatures are likely present in intervals within local 'microbasins'. These 'microbasins' have developed, primarily, in association with major growth fault or salt diapirism.

Maturity data indicates a decrease in heat flow from west to east and wide variability within various "microbasins". Numerical modeling documents at least three pulses of hydrocarbon expulsion and migration from the source rock units. Hydrocarbon migration follows the path of major growth faults and fractures caused by salt movement. The presence of pockmarks on the Scotian Slope indicates probable gas seepage, which supports the modeling.