
**Under-appreciated hydrocarbon potential
of the Devonian to early Permian Maritimes Basin
of eastern Canada**

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Proven hydrocarbon reserves in the eastern Canadian offshore regions overshadow the potential for both oil and gas in the Late Devonian to Early Permian Maritimes Basin. The ~100 Ma history of basin development includes the superposition of at least four basin-wide subsidence episodes, separated by regional unconformities. Historic and recent discoveries, as well as current natural gas production, argue that this under-explored basin has real and significant opportunities for successful hydrocarbon exploration and development. All essential elements of the hydrocarbon system exist. Source-rock intervals range from mid Tournaisian to latest Westphalian in age. The older regionally distributed source rocks comprise organic-rich lacustrine shales of the Horton and Anguille Groups. Transgressive-regressive glacio-eustatic cycles in the Late Viséan Windsor and Codroy Groups deposited thin but laterally extensive organic-rich marine carbonate rocks which have locally sourced liquid hydrocarbons. Coal measures ranging in age from Namurian to late Westphalian provide thick gas-prone source rocks over wide portions of the basin. Seals for Tournaisian-sourced material are provided by regionally extensive Viséan evaporates, including thick halite deposits. Seals for natural gas generated from younger coal measures are provided by mudrocks which are interbedded with and overly source-rock intervals. With main hydrocarbon generation placed in the early Permian, proven natural gas in Tournaisian and late

Westphalian reservoirs attests to the effectiveness of these seals. Reservoirs include sandstones of fluvial origin throughout the succession, but also include lacustrine shoreface sands in the Tournaisian succession. Reservoir quality is problematic, but is comparable to Carboniferous reservoir sands in the North Sea basins of western Europe where significant quantities of oil and gas have been recovered from the Carboniferous succession. A variety of structural and stratigraphic traps can be identified.

Stratigraphic investigations of this large sedimentary basin span more than one hundred and fifty years. Refinements to the stratigraphic framework in both onshore and offshore portions of the basin add new insights for regional understanding of basin evolution. Recent revisions to the Codroy and Barachois groups of western Newfoundland, enabled by newly acquired palynological data, provide an example of changing regional perspective. With an existing seismic database exceeding 40 000 line kilometers, the Maritimes Basin cries out for new and expanded exploration effort in order to reach its true potential.