

The Gulf of St. Lawrence, a Large Basin Virtually Unexplored for Oil and Gas in Quebec

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Quebec's offshore portion of the Gulf of St. Lawrence is a vastly under-explored basin. The Magdalen basin contains mostly rocks from the Middle Devonian to Permian age. Only the marine invasion of Windsor formation (limestone and salt) is present throughout the entire thick continental clastic sequence.

The Magdalen basin covers approximately an area of 30 000 km² of the Quebec portion. More than 15 500 km of seismic lines have been shot between 1967 & 1974. Only two wells (1970 & 1973) were drilled and some gas shows were recorded from Westphalian sandstone.

The 3G integration data (Geophysical, Geological, and Geochemical) mostly depicts halokinesis structure shaped targets at shallow to medium depths. Salt dome features show stratigraphic and structural traps on and around the Magdalen Islands. Salt pillows produce huge anticline plays at the northern edge area of the Magdalen basin. These targets are the largest undrilled structures in eastern Canada. From previous seismic, new targets could be considered between Gaspé and Magdalen Island: (1) biostromal carbonate traps in Windsor Gp.; (2) Pre-salt(?) or Pre-Windsor targets as block-faulted structures in the Horton Gp., and (3) Pre-Windsor-Horton structures as fault-bounded/thrust faults structures probably deformed by Acadian orogeny (Devonian rocks or older).

The East Point E-49 gas discovery well offshore P.E.I. (62 BCF) confirms the occurrence of a valuable source rock for the basin. The Magdalen basin shows geological similarity with some world-class producers such as the Gulf of Mexico and Late Palaeozoic European basins. The Gulf of St. Lawrence basin, in Quebec offshore portion, has a promising hydrocarbon potential.