

Petroleum Exploration in the Carboniferous Magdalen Basin, Gulf of St. Lawrence, Eastern Canada: Past Results - Future Prospects

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The Carboniferous Magdalen Basin underlies the Gulf of St Lawrence and Prince Edward Island, encompassing a total area of 160,000 km². The basin contains up to 12 kilometers of continental and shallow marine strata (predominantly clastics and evaporites). The Magdalen Basin is part of the broader Maritimes Basin that incorporates a number of late Paleozoic basins and sub-basins in Atlantic Canada.

Petroleum exploration in the Magdalen Basin (principally in the 1970s and early 1980s) included acquisition of about 40,000 line-kilometers of seismic reflection data and drilling of 9 offshore and 8 onshore (PEI) wells. One gas field was discovered offshore (East Point) and several gas shows were encountered. Most of the wells tested large anticlinal structures associated with salt diapirs and pillows. The Magdalen Basin is still under-explored and numerous structures and prospects remain untested. Although significant exploration risks are present, the basin may have considerable petroleum resource potential, particularly for natural gas.

The geological setting and petroleum system elements of the Magdalen Basin have been outlined in previous studies. Recent work completed at the Geological Survey of Canada included establishment of a new stratigraphic framework from well data and compilation of sandstone reservoir data. A study currently in progress (the focus of this presentation) involves re-evaluation of seismic reflection data across the basin, with the aim of providing new insights into basin stratigraphy, structure, and exploration prospects.