

Regional Geoscience Studies of the Labrador Margin: Providing the Framework for Petroleum Exploration

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Recent studies of the Labrador margin by the Geological Survey of Canada have focused on improving our understanding of the structural and stratigraphic evolution of the offshore shelf and deepwater regions. Activities have included seismic stratigraphic mapping, biostratigraphic studies, geochemical analyses, and numerical modelling. The objective is to better understand the stages of development of the Hopedale and Saglek basins, to identify and characterize potential source rocks, to map and characterize potential reservoir units, and to identify possible petroleum plays, all of which will provide the framework for more detailed resource assessment work.

Early work has focused on stratigraphic mapping, with over 7000 km of legacy seismic data added to the digital database for interpretation. Gravity and magnetic data have been used to interpolate between gaps in seismic coverage and characterize features recognized on seismic interpretations. Well ties have been re-examined and modified where necessary to incorporate new biostratigraphic interpretations and improve correlations with seismic data. Palynological analysis of 7 wells in Saglek Basin and 5 wells in Hopedale Basin has helped to fine-tune the rift-to-drift history of the Labrador Sea, and has improved the correlation between regional hiatus and seismic unconformities. This research has also led to the recognition of the fresh-water fern *Azolla* at the early-mid Eocene boundary in several wells; this fern may be a good indicator of a promising potential source rock for hydrocarbons. Future work will lead to an improved lithostratigraphic framework to support resource assessments and exploration.