

Regional Cambrian – Ordovician Stratigraphic Framework Along the Eastern Margin of Laurentia: Relationships with Known Hydrocarbon Reservoirs

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In eastern Canada, the Lower Paleozoic continental margin of Laurentia consists of the St. Lawrence platform and the Appalachian Humber Zone (slope facies).

The Early Cambrian rift-early drift succession in Newfoundland is found in the Labrador (platform) and Curling (slope) groups whereas in Quebec, the Oak Hill (platform) and St-Roch / Sillery (slope) groups recorded it. The end of the rift-early drift episode is marked by a sea level lowstand at the end of the Early Cambrian. No hydrocarbon reservoirs are known in these successions.

The Middle Cambrian to latest Early Ordovician passive margin recorded major cyclic sea level fluctuations. Three of these cycles are found in the Middle to Late Cambrian Port au Port (platform) and Cow Head / Northern Head (slope) groups in Newfoundland. Three major sea level lowstands are recognized in the Middle (?) to Late Cambrian Philipsburg / Potsdam (platform) and Ile d'Orléans / Trois Pistoles (slope) groups in Quebec. No hydrocarbon reservoirs are known in these successions.

The Ordovician passive margin consists of two depositional cycles separated by a sea level lowstand. In Newfoundland, these are found in the St. George (platform) and Cow Head / Northern Head (slope) groups, whereas in Quebec, the Philipsburg / Beekmantown (platform) groups and Rivière-Ouelle / Lévis (slope) formations record these. The St. George and Beekmantown dolostones are hosting hydrocarbon reservoirs.

Major tectonostratigraphic discrepancies started at the inception of Taconian foreland basin in mid-Ordovician. The foreland basin platform has been potentially affected by hydrothermal dolomitisation.