Preliminary Interpretation of Syn-rift and Early Post-rift Stratigraphy on the St. Lawrence Promontory, John S. Allen and William A. Thomas, University of Kentucky, Department of Earth and Environmental Sciences, Lexington, KY 40506, geowat@uky.edu, john-allen@uky.edu

The St. Lawrence promontory broadly defines the Laurentian rifted margin in western Newfoundland. There, Neoproterozoic through Early Ordovician clastic, volcanic, and carbonate successions indicate protracted continental rifting and passive-margin thermal subsidence followed by destruction of the passive margin during the Middle Ordovician in a westward progressing foreland basin and thrust belt. These rocks are host to an unknown quantity of oil and bitumen beneath the western coast of Newfoundland. Understanding the geologic framework of the Laurentian rifted margin is important to constraining the development of these potential hydrocarbon plays.

Rift facies rocks on the St. Lawrence promontory include conglomerate and red sandstones of the Bateau Formation (~0–242m), which lie directly on basement and are cross-cut by and interlayered with ca. 605 Ma tholeiitic basalts of the Lighthouse Cove Formation (~3–310m). A rift-to-drift transition is preserved in shelf sandstones of the Bradore Formation (~65–170m), which blankets most of the St. Lawrence promontory. These rocks contain an Early Cambrian fauna indicating a significant depositional hiatus between active rift and transition to passive margin. Anomalously thick foreland basin deposits near Port au Port bay suggest reactivated rift graben on the promontory.

The thickness and distribution of rift and transitional rocks indicate an upper plate configuration with local syn-rift graben on the St. Lawrence promontory. A hiatus between rift and rift-to-drift transitional rocks may reflect thermal uplift and passive margin mountains along the upper-plate boundary. Further geophysical investigation and palinspastic restoration of rift and early drift stratigraphy can confirm this new hypothesis.