

Maritimes Basin evolution: key geologic and seismic evidence from the Moncton Subbasin of New Brunswick

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The Maritimes Basin is a composite large (148 000 km²) post-Acadian internal successor basin. It comprises several early NE- to E-trending relatively deep isolated subbasins which are covered by mainly regionally derived and widely distributed fluvial sequences. The early basin fill in the Moncton Subbasin of southeastern New Brunswick is seen from stratigraphic and seismic reflection evidence to comprise two depositional sequences (tectonic cyclothem) which are separated by a basin-wide unconformity. The basal cyclothem, the Horton Group, is a 3 to 5 km thick coarse-fine-coarse (alluvial-lacustrine-alluvial) cycle. The medial lacustrine interval implies a period of rapid subsidence. The unconformably overlying cyclothem, recorded by the Windsor and Hopewell groups, is a coarse-fine-coarse (alluvial-marine-alluvial) cycle. The marine Windsor Group indicates a medial period of tectonic(?) subsidence.

The depositional history of the Moncton Subbasin *sensu stricto* ended following Hopewell time when the subbasin was inverted via late Namurian deformation. The Hopewell and older basin fill is unconformably overlain by Westphalian mature fluvial sandstones with associated

inter-channel mudstones and paludal deposits of the regionally distributed Cumberland Group. Cumberland rocks are succeeded by late Westphalian/Permian high sinuosity fluvial strata of the Pictou Group. A locally documented angular discordance between Cumberland and Pictou strata implies a period of uplift or regional tilting.

The tectonism that initiated and terminated the early cyclothem and which is recorded by unconformities following Horton and Hopewell deposition is seen from structural data and seismic reflection profiles to have resulted from dextral transpression. Evidence includes a network of basin-parallel NE-trending anastomosing faults (many with shallowly pitching slickensides), associated en échelon folds, and geologically and seismically identified positive flower structures. An interpretation of early Maritimes Basin evolution in a wrench setting is consistent with the many NE-trending terrane boundary faults in the underlying basement and with most recently published evidence throughout the Appalachians suggesting dextral oblique Acadian and Hercynian (Alleghenian) collisions.