

Revised stratigraphy and paleogeography of Siluro-Devonian rocks adjacent to the Ordovician Elmtree Inlier, northern New Brunswick

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Siluro-Devonian rocks surround the Elmtree Inlier (EI) and the northern end of the Miramichi Highlands (MH) in northern New Brunswick and comprise the Chaleurs and Dalhousie groups. These rocks occur in four structurally and stratigraphically distinct zones namely: (1) The east-west trending Nigadoo River Synclinorium (NRS) that separates the southern edge of the EI from the MH. (2) The north-south trending Jacquet River Syncline (JRS) that borders the western margin of the EI. (3) The Hendry Brook Syncline (HBS) that lies on the northern margin of the EI. (4) The Black point Anticline (BPA) that borders the JRS to the northwest and is separated from the JRS by the north-south trending, Black Point-Jacquet River Fault.

The Silurian to Lower Devonian Chaleurs Group rests unconformably on Ordovician basement in all four zones. Ten formations constitute this group; these are: Clemville, Armstrong Brook, Upsalquitch, La Vieille, Simpsons Field, Bryant Point, South Charlo, LaPlante, Free Grant and Benjamin (423 ± 3 Ma). The Armstrong Brook and La Vieille formations outcrop in all four zones. The volcanic members of this group (South Charlo, Bryant Point and Benjamin formations) are restricted to JRS and HBS. The Clemville, Simpsons Field, LaPlante and Free Grant formations are restricted to the NRS whereas the Upsalquitch Formation is restricted to the BPA.

The Lower Devonian Dalhousie Group conformably to disconformably overlies the Chaleurs Group and is restricted

to the JRS. Five formations constitute this revised group as follows in ascending order: Mitchell Settlement (newly defined and comprises siltstone, mafic volcanic rocks and minor red beds), Jacquet River (sandstone, siltstone and minor mafic volcanic rocks), Archibald Settlement (felsic volcanic rocks), Sunnyside (mafic volcanic rocks) and Big Hole Brook (new name, sandstone and siltstone.)

In Early Llandovery the EI and MH did not exist as uplands, i.e., were not above sea level. By Middle Llandovery these uplands, which were separated by the incipient NRS, were the source area for conglomerates of the Armstrong Brook Formation. In the west, shallow marine clastic rocks of the Upsalquitch Formation were being deposited at the same time. In the Late Llandovery the La Vieille limestone was deposited around both uplands and to the west. By Wenlock time the Elmtree Upland began to subside whereas the Tetagouche Upland began to rise, as shown by the Simpsons Field conglomerate that coarsens upward on the southern margin of the NRS and fines upward on the northern margin of the NRS. At the same time in the west, subaerial mafic and felsic volcanic rocks of the Bryant Point and Benjamin formations were erupted. Laterally equivalent volcanoclastic conglomerates of the South Charlo Formation were deposited on the western edge of the Elmtree Upland. In Pridolian time the Elmtree and Tetagouche uplands were decoupled along the dextral Rocky Brook-Millstream Fault. Tectonic instability (uplift and strike-slip movement) caused large

blocks of LaPlante limestone to slide down slope into the NRS. By Early Devonian time, tectonic transport of the Elmtree block created a frontal trough in which the shallow

marine Dalhousie Group was deposited. Continued westward transport deformed these rocks and caused their present day spatial distribution.