

New 1:50 000 geological maps of the Cobequid Highlands, Nova Scotia

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The Cobequid Highlands are a block of Avalonian Neoproterozoic and Silurian rocks with widespread latest Devonian to earliest Carboniferous plutons and volcanic rocks. The Highlands lie within a major late Paleozoic strike-slip fault zone between the Avalon and Meguma terranes. The Cobequid Fault, which marks the southern margin of the Highlands, was reactivated as a basin-margin fault in the Triassic. The Rockland Brook Fault separates two contrasting blocks of Neoproterozoic rocks, the Bass River block to the south and the Jeffers Block to

the north. The northern margin of the Cobequid Highlands is largely fault-bound, with minor overstep of upper Carboniferous rocks of the Cumberland Basin. A series of E-W striking faults have been mapped between the Rockland Brook and the northern margin of the Cobequid Highlands, resulting in E-W trending outcrop belts of Neoproterozoic, Silurian and Devonian-Carboniferous rocks.

Principal results of the new mapping have been largely reported in the literature. In the Bass River block between

Londonderry and Mount Thom, late Paleozoic plutonic rocks are of very limited extent and most plutonic rocks are Neoproterozoic in age. Neoproterozoic granite outcrops northeast of Earltown and slivers of granodiorite outcrop north of Dalhousie Mountain. A complex thrust sheet is recognized in the area south of New Annan, deforming rocks as young as earliest Carboniferous. In the area west of the Cobequid Pass highway, the geology is dominated by E-W striking belts of Neoproterozoic Jeffers Group, late Paleozoic Fountain Lake Group, and late Paleozoic plutonic rocks. North of Five Islands, late Paleozoic plutonic rocks intrude Nuttby Formation (Horton Group). North of Parrsboro, Silurian rocks are much less widespread than previously mapped. The relationship between the Fountain Lake Group in the western and eastern Cobequid Highlands has been clarified.

Three phases of late Paleozoic pluton emplacement are

recognised. (1) The granite plutons of the western Cobequid Highlands and their associated gabbro, the mafic Wyvern pluton, and the granites in the northern part of the Wentworth pluton have yielded ages of 362 to 358 Ma by U-Pb on zircon and $^{40}\text{Ar}/^{39}\text{Ar}$ on amphiboles and thus span the Devonian-Carboniferous boundary. (2) A complex intrusion of fine-grained granite and diabase along the northeastern margin of the Wentworth pluton corresponds to the top of the Byers Brook Formation and is of earliest Carboniferous age. (3) Gabbro/diorite and associated granites of the southwestern Wentworth Pluton (the Folly Lake gabbro) consistently yield $^{40}\text{Ar}/^{39}\text{Ar}$ ages on amphibole and biotite of 350-354 Ma, synchronous with the extrusion of the voluminous basalt of the Diamond Brook Formation, and are thus of earliest Carboniferous age.