
**New constraints on deciphering the origin of the
Meguma Group in southwestern Nova Scotia**

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Detailed mapping in the Digby to Liverpool area of the Meguma terrane was initiated in 1998 by the Nova Scotia Department of Natural Resources to produce a series of updated geological bedrock maps. The Meguma terrane, includes the Goldenville and Halifax formations (Meguma Group) and the younger White Rock and Torbrook formations, intruded by mainly Devonian plutonic units and overlain by Carboniferous and younger rocks. The new maps, combined with detailed petrography, geochemistry, and geochronology, have better defined the distribution, age, and character of the Meguma Group in southwestern Nova Scotia.

The Goldenville Formation can be subdivided into a lower metasandstone-dominated Green Harbour member, a middle metasandstone/slate Government Point member, and an upper metasilstone Bloomfield/Moshers Island member. The Green Harbour member, north of Yarmouth, contains a distinctive metasilstone unit (High Head) with abundant trace fossils including the early Cambrian deep-water ichnofossil *Oldhamia*, suggesting that the Goldenville Formation below the fossiliferous member likely extends into the Neoproterozoic. In the area north of Liverpool, the Green Harbour member contains the Lake Rossignol unit, composed of regularly bedded metasandstone and metasilstone with a distinct aeromagnetic pattern. The upper part of the Government Point member was shown by earlier workers to contain a Middle Cambrian trilobite faunule of Acado-Baltic affinity. The overlying slate-rich Halifax Formation has been divided into the Cunard and Bear River members. The upper part of the Bear River Member locally contains the graptolite *Rhabdinopora flabelliformis* and acritarch species that are Early Ordovician, suggesting that underlying Cunard, Bloomfield, and Moshers Island members

are of Late Cambrian age, and that a significant unconformity exists between the Halifax Formation and the overlying late Ordovician – Early Silurian White Rock Formation. Both the Goldenville and Halifax formations are locally intruded by swarms of syn-depositional mafic sills of within-plate chemical character. A revised minimum thickness for the Meguma Group is 10 km.

Protoliths of the Goldenville Formation were predominantly immature feldspathic to quartz wackes, whereas protoliths of the Halifax Formation were mainly mudstones. Preliminary whole-rock geochemical data show that most of the clastic material in the Meguma Group was deposited on an active continental margin and (or) oceanic island arc, not on an Atlantic-style passive continental margin. Although a Neoproterozoic Pan-African source is implied for the Meguma Group, the new chemical data combined with recent published work on equivalent units in northern Africa suggest that it was not deposited on the northern margin of Gondwana as previously assumed.