

Revised Stratigraphy and Tectonic Evolution of the Meguma Terrane

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The Meguma terrane is the most outboard tectonic element of the northern Appalachian orogen and includes the Cambrian to Ordovician Goldenville and Halifax groups and the younger Silurian to early Devonian Rockville Notch group, intruded by mainly Devonian plutons and overlain by Carboniferous and younger rocks. The redefined Goldenville Group is divided into several formations and members that in its lower part consist of varying amounts of massive feldspathic wacke to arenite with minor interbeds of siltstone and slate. The group grades upwards into thinly bedded feldspathic wacke, siltstone, and slate and is capped by a Mn-rich siltstone to slate unit. The lower part of the Goldenville Group contains a siltstone unit (High Head member) with abundant trace fossils, including the late Early Cambrian ichnofossil *Oldhamia*. The upper part of the Goldenville Group has yielded early Middle Cambrian Acado-Baltic trilobites and acritarchs. The overlying Halifax Group is divided into several slate-bearing formations and based on trace fossil morphology and graptolite (*Rhabdinopora flabelliformis*) and acritarch species, ranges in age from Late Cambrian at the base to Early Ordovician at the top. Chemical signatures of the Goldenville and Halifax groups combined with the presence of numerous syn-depositional mafic sills of within-plate chemical character suggest that the Goldenville and Halifax groups were deposited in a rift setting, perhaps formed as Avalonia rifted from Gondwana.

Younger Silurian to Devonian units of the Rockville Notch group include bimodal within-plate volcanic and sedimentary rocks of the lower White Rock Formation and overlying siltstone and slate of the Kentville Formation. The uppermost units (New Canaan and Torbrook formations) consist of marine sedimentary and volcanic rocks. The gap in age between the Halifax Group and the overlying Rockville Notch group indicates that a major unconformity spanning approximately 30 Ma exists between the two groups.

Folding, cleavage development, and low-grade regional metamorphism of these units at ca. 395 Ma (Neocadian orogeny) is interpreted to have been related to dextral oblique collision of Meguma with Avalonia. These events were followed by emplacement of voluminous granitoid plutons at ca. 380–357 Ma, probably related to on-going subduction associated with closure of the Rheic Ocean located to the present-day southeast. The unique stratigraphy and orogenic history of Meguma indicates that it was a separate microcontinent in the Rheic Ocean throughout the Early to mid-Paleozoic.

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