

# A New Perspective on Stratigraphy, Deformation, and Metamorphism in the Southwestern Meguma Terrane, Nova Scotia<sup>1</sup>

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Detailed mapping in the Meguma terrane from Digby to Shelburne was initiated in 1998 by the Nova Scotia Department of Natural Resources to produce updated 1:50 000 scale geological maps of the area. The new maps better define the distribution of, and show internal stratigraphic subdivisions in, the Goldenville and Halifax formations of the Meguma Group. Newly discovered occurrences of Early Tremadocian graptolite fossils near the top of the Halifax Formation confirm that the Meguma Group is mainly Cambrian in age, with the Halifax Formation extending into the Early Ordovician.

The White Rock Formation overlies the Meguma Group but original contact relations are controversial. Late Silurian fossil occurrences near the top of the formation and U-Pb ages of ca. 440 Ma for volcanic rocks near the base indicate that the White Rock Formation is dominantly Silurian. The ca. 50 million-year difference in age between the upper part of the Halifax Formation and the lower part of the White Rock Formation suggests an originally unconformable relationship.

Mid-Devonian regional metamorphism was at greenschist facies for most of the area, but reached amphibolite facies in the White Rock Formation in the Yarmouth area and in the Meguma Group in the Shelburne area. Muscovite and whole-rock <sup>40</sup>Ar/<sup>39</sup>Ar data from the Digby area indicate that metamorphism occurred at ca. 400 Ma, similar to results reported from the eastern part of the Meguma terrane. However, based on structural studies and published age data, high-grade regional metamorphism in the Shelburne area was younger (ca. 373 Ma). The age of high-grade metamorphism in the White Rock Formation is not yet well constrained.

Major shear zones have been mapped throughout the area. The most significant occur along the margins of the White Rock Formation in the Yarmouth area and continue to the Digby area. These shear zones locally juxtapose staurolite schist in the White Rock Formation against chlorite and biotite-bearing slate of the Halifax Formation. The most southeasterly shear zone juxtaposed the Meguma Group and White Rock Formation with abundant mafic sills on the north against the Meguma Group with contrasting internal stratigraphy and no White Rock Formation or mafic sills to the south. <sup>40</sup>Ar/<sup>39</sup>Ar muscovite ages of 335-320 Ma suggest that these shear zones are Alleghanian.

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