

Geology of the Lower to Middle Paleozoic Metamorphic Rocks in the Digby-Weymouth Area, Southwestern Nova Scotia¹

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Systematic regional (1:10 000 scale) mapping of lower to middle Paleozoic metamorphic rocks, including the Meguma Group (Goldenville and Halifax formations), White Rock Formation and Torbrook Formation, was conducted in the Digby-Weymouth area. Results indicate significant revisions to previous maps, including subdivision and re-assignment of stratigraphy, re-interpretation of regional fold geometries, recognition of a regional-scale shear zone, and identification of new mineral occurrences.

The Goldenville Formation consists of medium- to thickly-bedded metasediments with variable amounts of laminated metasediments. Coarse metasediments to fine metaconglomerate beds occur locally. Concretions, locally metamorphosed to calc-silicate, are abundant within the metasediments. The Halifax Formation conformably overlies the Goldenville Formation and has been subdivided into four lithologic units (members). The Bloomfield member, the lowest unit, consists of distinct green and maroon, locally variegated, laminated metasediments. The Acacia Brook member, overlying the Bloomfield unit in the northern part of the area, consists of medium- to dark-grey, well laminated, slate-metasediments. The Cunard member consists of dark, finely laminated, locally sulphide-rich, slate and minor metasediments, and overlies the Bloomfield member in the southern part of the area. The Bear River member (Tremadocian), represents the upper Halifax Formation in the Bear River area and consists of silty slate, metasediments and minor metasediments. In the south part of the area the upper Halifax Formation is referred to as the Sissiboo member, and consists of well laminated and distinctly colour-banded slate-metasediments. The White Rock Formation (Silurian), consisting mainly of dark slate with minor metasediments, marly metasediments and local, thickly bedded quartzite, conformably to disconformably overlies the Halifax Formation. The Torbrook Formation (Early Devonian) conformably overlies the White Rock Formation and consists of slate and metasediments, locally with abundant macrofossils.

The lower to middle Paleozoic metamorphic sequence is folded into regional-scale northeast-southwest to north-south, moderately plunging folds. Axial planar cleavage is strongly developed in the Goldenville and Halifax formations, however, only moderately developed in the White Rock and Torbrook formations. The variation in strain may be related to the disconformity between the Halifax and White Rock formations. Concretion shapes and stretched clasts in coarse metasediments and conglomerate of the Goldenville Formation indicate significant extension parallel to fold hinges. Regional metamorphism is greenschist facies (up to biotite). Contact metamorphism is defined by biotite \pm cordierite \pm andalusite hornfels adjacent to granite intrusions and locally in areas away from exposed intrusions, implying buried intrusions in these areas. A regional-scale, dextral shear zone reflecting Carboniferous reworking of the fold belt overlaps the Goldenville-Halifax boundary and several late brittle faults occur.

Several new mineral occurrences were found, including Cu-Mo in quartz veins associated with the Clayton Hill pluton and Cu-Sn-Ag-Zn associated with skarn developed from concretions in the Goldenville Formation in areas of contact metamorphism.

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