Preliminary Bedrock Geology of the Kejimkujik Lake Map Area (NTS 21A/06), Southern Nova Scotia

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The third year of the South Shore Bedrock Mapping Project focused on completion of the Kejimkujik map area (NTS 21A/06) in southern Nova Scotia. As in the previous year, the main objectives of the 2006 field season were to (1) produce a 1:50 000-scale geological bedrock map, (2) assess the validity, in 21A/06 map area, of the stratigraphic subdivisions of the Meguma Group made in the previous two field seasons in maps to the south and southwest, and (3) comment on the economic potential of the area.

The oldest units in the map area are the Late Neoproterozoic to Early Ordovician Goldenville and Halifax formations. Mapping in 2006 demonstrated that the Goldenville Formation in this study can be subdivided into two members, similar to those in the previous map areas to the south and southwest. The lower unit is thickly bedded, massive, grey metasandstone interbedded with laminated metasandstone and minor metasiltstone. The upper unit consists of cleaved, featureless to well laminated grey to green-grey metasiltstone and slate with thin metasandstone beds. The metasandstone beds typically display cross-stratification. The upper 50-100 m of this unit locally contains thin dark grey to black manganese-rich beds and nodules. Joint surfaces in this zone are locally covered with thick manganese coatings. Close to the contacts with the South Mountain Batholith the manganese nodules and beds are garnet- (spessartine-) rich. Calcsilicate nodules and beds are common throughout the Goldenville Formation. Grazing and burrowing trace fossils were observed in the upper unit, but have not yet been assigned an age. A pelmatozoan echinoderm fragment in a calcsilicate nodule discovered near the base of the upper unit is tentatively assigned a Middle Cambrian age, based on its similarity to the only other 'dated' fossil locality in the Meguma Group on Big Tancook Island.

The overlying Halifax Formation consists of black slate to silty slate that is commonly stained orange in outcrop by the weathering of pyrite. The slate is interbedded with pyrite-rich, cross-stratified metasandstone. This unit is typical of the Cunard member described elsewhere in the Meguma Group. The contact with the underlying Goldenville Formation is sharp and conformable. Conformably overlying the Cunard member is black silty slate with rare fine-grained metasandstone laminae, similar to the Feltzen member.

The Meguma Group was intruded by the ca. 380 Ma South Mountain Batholith. In the map area it consists of coarse-grained, megacrystic biotite-bearing monzogranite. Locally it contains abundant xenoliths of metasedimentary rocks, porphyritic granite and diorite. The South Mountain Batholith produced a well-developed contact metamorphic aureole in the adjacent Meguma Group with sillimanite- and andalusite-bearing hornfels in the more pelitic units.

The Meguma Group in the map area is deformed into regional, northeastward-trending F_1 folds with a well-developed axial planar cleavage, produced during the Devonian Neoacadian Orogeny. Intersection lineations (L_1) and the long axes of nodules typically plunge gently to the northeast. Deformation was accompanied by greenschist-facies (biotite-grade) metamorphism.

Several past-producing gold districts occur in the Kejimkujik map area, where bedding-parallel quartz veins in the Goldenville Formation are gold-bearing. In addition, minor copper, tin and wolframite occurrences have been documented in the metasedimentary units. The Halifax Formation hosts several small-scale rock quarries, and numerous gravel and sand pits are currently being used. The area has potential for additional base metal prospects, as well as aggregate and sand/gravel deposits.

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