# Geology of the Governors Lake Area ('Liscomb Complex'), Meguma Terrane, Nova Scotia, Canada[1]

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In 2008, a detailed (1:10 000 scale) bedrock mapping and sampling project was initiated in the Governor Lake area ('Liscomb Complex') in the central Meguma terrane to better constrain the metamorphic and structural history of the area. The oldest units exposed are the lower Paleozoic Goldenville and Halifax groups. The Goldenville Group is composed of the lower metasandstone-dominated Governor Lake and Taylors Head formations and overlying Beaverbank Formation, a coticule-bearing metasiltstone. Units in the overlying Halifax Group include the slate-rich Cunard Formation and Glen Brook Formation. These metasedimentary units are similar to those established elsewhere in the Meguma terrane. They are deformed into regional, east- to northeast-trending folds with well-developed axial planar cleavages and northeast- and southwest-plunging intersection lineations, produced during the Middle Devonian to Early Carboniferous Neoacadian Orogeny. Deformation was accompanied by greenschist facies (chlorite grade) regional metamorphism. A suite of ca. 385 to 370 Ma igneous units, the Trafalgar Plutonic Suite, intruded the Goldenville and Halifax groups in the Governor Lake area. Based on field evidence combined with geochronology the order of intrusion is: (1) tonalite to quartz diorite with magma-mingling textures, and minor gabbroic enclaves; large garnet crystals are locally abundant; (2) granodiorite with magma-mingling textures and tonalitic enclaves; (3) coarse- grained to megacrystic biotite-muscovite monzogranite; (4) medium- to coarse-grained muscovite-biotite monzogranite; and (5) fine- to medium-grained muscovite monzogranite to syenogranite. The granodioritic units are locally protomylonitic and cut by undeformed monzogranite, suggesting some deformation was synchronous with intrusion. These plutons produced a narrow contact metamorphic zone (less than 500 m in width), consisting of spotted hornfels to granofels containing sillimanite, andalusite, cordierite, +/- garnet and +/- staurolite superimposed on chlorite-zone regional metamorphic assemblages. The results of this project do not support previous interpretations of the presence in the Governors Lake area of basement gneissic units with upper amphibolite- to granulite-facies metamorphic assemblages. Units previously identified as mafic and quartzofeldspathic gneiss appear to be igneous units with magma-mingling textures or superimposed protomylonitic fabrics. The often-cited but unpublished granulite-facies P-T conditions inferred for the complex seem inconsistent with the field evidence. No extensional structures were observed to support the previously proposed core-complex scenario. Therefore, we suggest that the 'Liscomb Complex' is not as complex as previously interpreted, and that the term should be abandoned.

[1]EOS, Transactions of the American Geophysical Union, v. 90, Joint Assembly Supplement, Abstract U21A-04.
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