

Structural evolution and tectonic history of the Glenelg area, Nova Scotia, and relationship to correlative rocks of the South Portuguese Zone, Spain

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The peri-Gondwanan Meguma terrane is the most outboard terrane of the Canadian Appalachian orogen and encompasses an area of 200 000 km² extending from the Gulf of Maine to the Grand Banks of Newfoundland. The terrane consists of mainly greenschist to amphibolite facies turbiditic metapelitic sequences that were intruded by Devonian plutonic rocks during the Neoacadian orogeny, a tectonic event that stitched the Meguma terrane to the Avalon Terrane (ca. 380–370 Ma). Surface exposure of the Meguma terrane is believed to be restricted to Nova Scotia. However, U-Pb detrital zircon and isotopic data indicate that the South Portuguese Zone (Iberian Peninsula) may be underlain by Meguma basement. This interpretation is consistent with paleogeographic reconstructions that place Maritime Canada adjacent to autochthonous Iberia in the Late Paleozoic. In Iberia, the oldest exposed rocks are relatively weakly deformed Late Devonian phyllite and quartzite; however, the recent discovery of exposed polydeformed alternating beds of phyllite and quartzite could represent an older sequence. These rocks were intruded by felsic-intermediate plutonic rocks and are disconformably overlain by Carboniferous (ca. 343 Ma) volcanic rocks of the Iberian pyrite belt. To test potential linkages between Iberia and Meguma, a sequence of folded and metamorphosed quartz-rich metasandstone and siltstones, in the northeastern Meguma terrane near Glenelg, Nova Scotia, was studied. The region is of economic interest as it hosts an anomalous galena deposit, and outcrops along strike of the Cochrane Hill gold occurrence. Preliminary field and petrographic studies in the Meguma terrane indicate a NE-SW trending fold system and amphibolite facies metamorphism. Results show that metamorphic grade increases towards the center of the fold and has resulted in large staurolite and garnet porphyroblasts. U-Pb detrital zircon geochronology from both localities will test possible genetic linkages between the Meguma terrane and South Portuguese Zone. Sample assays were also taken to target and assess economic mineralization potential.