

Fifty years of geological study of the Meguma terrane as recorded in the journal “Atlantic Geology”

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Paul Schenk in 1967 wrote in the third issue of “Maritime Sediments” that little research had been conducted up to that time on the Meguma Series or Group of southern Nova Scotia. All that was known was that the group consists of the basal sandstone-dominated Goldenville Formation and the upper slate-rich Halifax Formation. The presence of Bouma Sequence sedimentary structures led Schenk to interpret these units as likely deep-water deposits. He and later his students described the rocks as a “monotonous package” of lower Paleozoic eugeosynclinal sandstone and shale deformed into NE-trending folds and intruded by Devonian to Mississippian plutons.

By 1975 Rb-Sr and K-Ar ages had enhanced understanding of southern Nova Scotia. They confirmed that plutonism ranged from Devonian to Mississippian and suggested that the upper part of the Goldenville and lower part of the Halifax formations may in part be laterally equivalent, Early Ordovician, and conformably overlain by the Ordovician to Early Devonian White Rock, Kentville, and Torbrook formations. With the acceptance of plate tectonics, all of these units and associated plutons in southern Nova Scotia were termed the Meguma Zone, later terrane, and interpreted to have originated in western Africa.

By the 1980s and early 1990s improvements in radiometric dating (⁴⁰Ar/³⁹Ar and U-Pb methods) and lithogeochemistry corroborated many earlier assumptions. Although somewhat ambiguous, the strongly peraluminous South Mountain Batholith appears to exhibit both ‘S- and A-type’ affinities but southward the satellite plutons display volcanic-arc signatures. In 2010, as a result of detailed mapping over the western half of the terrane, combined with U-Pb and ⁴⁰Ar/³⁹Ar dating, acritarch ages, and lithogeochemical studies, regional formations were established and the Goldenville and Halifax justifiably became groups. Their ages are now well defined—Early to Middle Cambrian for the Goldenville Group and Late Cambrian–Early Ordovician for the Halifax Group, with a 35 Ma time gap before deposition of the overlying Early Silurian to Early Devonian White Rock, Kentville, and Torbrook formations. As a result of the Neocadian orogeny (ca. 415–365 Ma), these rocks were folded, variably metamorphosed (greenschist to amphibolite facies), and intruded by the late syntectonic to post-tectonic Late Devonian to Early Carboniferous plutonic units. Similarities in the Cambrian to Tremadocian successions of the Meguma terrane to those of the Harlech Dome of North Wales and the Brabant Massif in Belgium suggest these areas may have been part of a ‘Megumia domain’ that occupied a rift on the margin of Gondwana.