
Provenance and depositional environment of the Lumsden Dam formation, Wolfville, Nova Scotia

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Recent mapping of the Meguma terrane in the Nova Scotia has led to the identification of several mappable units in the Halifax and Goldenville groups of the Meguma Supergroup. In the Wolfville region the Halifax Group comprises the North Alton, Lumsden Dam, Elderkin Brook, and Hellgate Falls formations. The Lumsden Dam formation is laterally equivalent to the Bluestone and Feltzen formations in the Halifax and Mahone Bay areas. Excellent exposure of the Lumsden Dam formation can be seen in the overflow channel at the type section. The outcrop exhibits low metamorphic grade and is a fossil locality of the graptolite *Rhabdinopora flabelliformis*. This, together with acritarch assemblages, constrains the unit to the early Tremadocian. The Lumsden Dam formation consists mainly of light-grey siltstone and dark-grey mudstone with minor very fine-grained sandstone. Bouma sequence divisions Tb-Te are common in thin to medium graded beds throughout the section. Siltstone and sandstone beds are parallel to cross-laminated, while mudstone layers contain thin parallel silt laminations.

A detrital zircon assemblage from a sandstone bed in the Lumsden Dam formation displays a similar distribution to samples collected in the upper Goldenville Group. It shows a prominent peak in the late Neoproterozoic (common in peri-Gondwanan terranes) and has a significant cluster of grains between 1.9 and 2.1 Ga, consistent with a source in the West African or Amazonian craton. The sample also contains a cluster between 0.9 and 1.1 Ga, possibly derived from Amazonia. Lithological and provenance similarities between the Cambrian successions of the Harlech Dome in North Wales and the Meguma Supergroup have been identified. They both show an increase in detrital zircon age diversity up section; however, the early Tremadocian Dolcyn-afon Formation in North Wales displays an assemblage suggesting derivation from Ganderia, indicating different source regions for the basins by Early Ordovician time.