Geology of the Guysborough - Isle Madame - L'ardoise area, Nova Scotia

C.E. White[1] and S.M. Barr[2]
[1]*Nova Scotia Department of Natural Resources, Mineral and Energy Resources, P.O. Box 698, Halifax, Nova Scotia B3J 2T9, Canada*
[2]*Department of Geology, Acadia University, Wolfville, Nova Scotia B0P 1X0, Canada*

Based on new mapping, Devonian and Carboniferous rocks in the Guysborough-Isle Madame-L'Ardoise area are divided into the Guysborough Group in the south and the Horton Group in the north. Mylonite, amphibolite, and garnet-sillimanite schist occur within the western and southern parts of the Guysborough Group along the Chedabucto and Guysborough County faults and along faults in the Petit-de-Grat area. Granite and associated mylonite and phyllonitic rocks of unknown age occur along the Strait of Canso, in faulted contact with the Carboniferous units.

The early to mid-Devonian Guysborough Group is a fault-bounded sequence of volcanic and sedimentary rocks, intruded by gabbroic plutons and dykes, that extends from mainland Nova Scotia to the Petit-de-Grat area of southernmost Cape Breton Island. It is bounded on the south by the Chedabucto and Guysborough County faults, and on the north by the Roman Valley and Arichat faults. The Guysborough Group is divided into five formations: Minister Brook (feldspathic greywacke and quartz wacke), Sunnyville (mafic volcanic rocks and conglomerate), Glenkeen (conglomerate), Roman Valley (quartz arenite, conglomerate and laminated siltstone), and Hoppenderry (mafic and felsic flows and tuffs).

Units of the Horton Group extend from the northern mainland through the Isle Madame and L'Ardoise areas of southern Cape Breton Island, as far as Loch Lomond. In the latter area, the absolute age of the uppermost Horton Group is constrained by the presence of intrusions of dykes, plutons, and related flows of the ca. 340 Ma St. Peters gabbro. The Horton Group in the map area is divided into three formations (Clam Harbour River, Tracadie Road, and Caledonia Mills), which are broadly equivalent to the Creignish, Strathlorne, and Ainslie formations of the Horton Group in western Cape Breton Island.

In contrast to units of similar age elsewhere in Nova Scotia, rocks of the Guysborough and Horton groups in the map area are typically well cleaved and locally strongly deformed. This deformation may be related to a more complex history of juxtaposition of the Meguma terrane with the Avalon terrane than generally thought.