

## U-Pb detrital zircon age constraints on evolution of the late Palaeozoic St. Marys Basin, central mainland Nova Scotia

J. B. Murphy<sup>1</sup> and M.A. Hamilton<sup>2</sup>

<sup>1</sup>*Department of Geology, St. Francis Xavier University, Antigonish, Nova Scotia B2G 2W5, Canada <bmurphy@stfx.ca>*

<sup>2</sup>*Geological Survey of Canada, Ottawa, Ontario K1A 0E8, Canada*

The St. Marys Basin, central mainland Nova Scotia, lies along the southern flank of the composite Late Devonian-Permian Magdalen Basin in the Canadian Appalachians and along the Avalon-Meguma terrane boundary, which is defined by the E-W Minas Fault Zone. The basin fill consists of Late Devonian-Early Carboniferous continental clastic rocks of the Horton Group that were deposited in fluvial and lacustrine environments after the peak of the Acadian orogeny.

SHRIMP II GSC data for approximately 100 detrital zircons from three samples in the Horton Group show that most of the zircons have been involved in a multi-stage history. Although there is a minor contribution from Early Silurian and Late Devonian suites, most detrital zircons are recycled from clastic rocks in the adjacent Meguma and Avalonian rocks. Neoproterozoic (ca. 680-550 Ma) and Palaeoproterozoic (ca. 2.0 to 2.2 Ga) zircon populations predominate although there is an important, but minor contribution from ca. 1.0 Ga, 1.2 Ga and 1.8 Ga zircons.

U-Pb analyses of single zircon grains from clastic sedimentary rocks of the Meguma and Avalon terranes show that these terranes have different populations of detrital zircons, suggesting they are sourced from different portions of the ancient Gondwanan margin. Both terranes contain Neoproterozoic and Late Archean populations. However, Avalon terrane rocks also contain important Mesoproterozoic zircons between 1.0 Ga and 1.8 Ga.

In general, the SHRIMP data, when combined with geochemical and Sm-Nd isotopic data, indicate that the Horton Group basin fill sediments are largely attributed to uplift and erosion of Meguma terrane metasedimentary and granitoid rocks immediately to the south of the St. Marys Basin in the waning stages of the Acadian orogeny. Regional syntheses indicate that this uplift occurred before and during deposition and was coeval with dextral ramping of the Meguma terrane over the Avalon terrane along the southern flank of the Magdalen Basin.