

**Late Precambrian-Cambrian magmatic evolution of southern New Brunswick
and southeastern Cape Breton Island, Nova Scotia**

S.M. Barr, C.E. White

Department of Geology, Acadia University, Wolfville, Nova Scotia B0P 1X0, Canada

M.L. Bevier

Geological Survey of Canada, 601 Booth Street, Ottawa, Ontario K1A 0E8, Canada

and

E. Hegner

Universitat Tubingen, Tubingen, Germany

New U-Pb (zircon) dates from igneous units combined with geological mapping and petrochemical studies are clarifying the Precambrian and Early Palaeozoic magmatic evolution of the Mira and Bras d'Or terranes of Cape Breton Island and the corresponding Caledonia and Brookville terranes of southern New Brunswick. The Mira and Caledonia terranes are characterized by abundant volcanic rocks formed in a continental volcanic arc setting and range in age from ca. 675 Ma to 600 Ma. They are associated with calc-alkalic dioritic to granitic plutons dated at ca. 615 to 625 Ma. Younger (ca. 550 Ma) dominantly bimodal volcanism and related high-level granitic and dioritic/gabbroic plutons formed in a post-subduction extensional setting. Both volcanic and plutonic units in the Mira Terrane have positive

initial ϵNd values from +0.8 to +5.0 that indicate juvenile sources. This juvenile crust is also present under southern New Brunswick, although zircon inheritance indicates that old (Early Proterozoic and Archaean) continental crust is also present. In contrast, the Bras d'Or and Brookville terranes lack abundant volcanic rocks and are characterized by Late Precambrian gneisses and sedimentary successions, intruded by calc-alkalic dioritic to granitic plutons ranging in age from ca. 565 to 540 Ma and formed in a continental margin subduction zone. Late post-tectonic granitic plutonism occurred at ca. 500 Ma (Early Ordovician). Initial ϵNd values are generally negative and, combined with zircon inheritance, indicate involvement of early to mid-Proterozoic continental crust.