

### Sm-Nd and U-Pb isotopic compositions of felsic volcanic rocks in the Antigonish Highlands: tectonic implications

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The age and nature of the continental basement to various parts of the Avalon Composite Terrane is of critical importance to Appalachian tectonic syntheses. In the Antigonish Highlands, geochemical data indicate that the Late Proterozoic volcanic rocks (ca. 618 Ma, U-Pb concordant monazite) were extruded in a rifted volcanic arc, whereas the Palaeozoic volcanic rocks (dated palaeontologically) were developed in within-plate rift environments. The felsic volcanic rocks are mainly the product of anatexis of continental crust melted by the heat generated by rising mafic magmas. Therefore neodymium isotopic compositions of felsic rocks

yield information on their basement sources.  $\epsilon_{\text{Nd}}$  values, corrected for the extrusive age of each unit, are generally positive (0 to +5), reflecting moderately to strongly depleted sources. The recurrence of  $T_{\text{DM}}$  ages between 955 and 1000 Ma in each volcanic suite and in 9 of the 12 samples is remarkable. The simplest explanation for this data is that the Avalonian continental basement was the main source of the felsic magma and melted during successive anatectic events. The data could reflect either a ca. 1.0 Ga tectonothermal event affecting Avalonian basement or a source with a mean crustal-residence age of 1.0 Ga.