

**Geochemical discrimination of provenance and tectonic setting of siliciclastic rocks in the Antigonish Highlands, Nova Scotia**

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The Antigonish Highlands, Nova Scotia, is suitable for testing the reliability of geochemical discriminants in sedimentary rocks because the tectonic setting has been evaluated using penecontemporaneous volcanic rocks, and since sediments derived from the same source area are deposited in variable tectonic environments.

Volcanic sequences ranging from Precambrian to Late Paleozoic in age are each interlayered with clastic sedimentary rocks. Geochemistry of these volcanic rocks indicates that the Precambrian turbidites were probably associated with an ensialic volcanic arc, whereas the Paleozoic fluvial arkosic sequences of various ages were deposited in an intra-continental rift environment.

Generally, standard discrimination plots for sedimentary

rocks are consistent with provenance type and tectonic setting determined from analysis of the volcanic rocks. Some discrimination diagrams cannot distinguish immature intra-continental sediments from volcanic arc turbidites.

In general, variation diagrams yield smooth trends showing progressive increases in  $\text{SiO}_2$ , and decreases in  $\text{Al}_2\text{O}_3$ , Ti, Rb,  $\text{MgO} + \text{Fe}_2\text{O}_3$ , Ga, V, and Ni from older to younger sequences. These trends indicated a single provenance area for these sequences, and increasing maturity of the younger sediments. Rb/Sr isotopes show a limited range of  $^{87}\text{Sr}/^{86}\text{Sr}$  initial ratios within individual units, which lie within the range of  $^{87}\text{Sr}/^{86}\text{Sr}$  initial ratios for volcanic rocks of the same age. This implies that the main sediment source for each sedimentary unit was the penecontemporaneous volcanic sequences.