

Cyclic, bimodal volcanism in a Siluro-Devonian continental volcanic zone: the Eastport Formation, southwestern New Brunswick

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The Siluro-Devonian Eastport Formation in southwestern New Brunswick comprises a continental, bimodal volcanic sequence with intercalated littoral to subaerial sedimentary rocks. Mafic-felsic volcanism occurs in three to four cycles through the represented stratigraphy of the complex. The complex is intruded by the Saint George Batholith as well as smaller rhyolitic, andesitic and gabbroic bodies and is overlain unconformably by the Late Devonian Perry Formation.

Mafic volcanic rocks are less abundant than the felsic units in each cycle. In the final cycle, however, the mafic to felsic ratio increases with mafic flows and littoral to subaerial sedimentary rocks being intruded by small felsic bodies. This cycle may represent the waning stages of volcanism.

The extrusive volcanic rocks are bimodal with a SiO_2 gap between 58% and 69% SiO_2 . The mafic rocks are tholeiitic and have a within-plate tectonic affinity. The three lower mafic units

plot as distinct groups for most immobile trace elements but as a whole lie along a single trend. The lowermost mafic unit contains the most-evolved composition with high abundances of Y, Nb, Zr and SiO_2 and low Cr and Ni. Y, Nb, Zr and SiO_2 decrease upward through the succession while Ni and Cr abundances increase.

Major element plots of the felsic rocks suggest they are calc-alkalic; however, the abundances of the immobile trace elements Y, Nb and Zr are comparable with those of alkalic to peralkalic rhyolites. The tectonic affinity of the felsic rocks is ambiguous.