The St. Croix Terrane of coastal Maine and adjacent New Brunswick is characterized by Ordovician carbonaceous pelites that are locally interbedded with mafic volcanic rocks. These mafic rocks are moderately to highly evolved basalts (Mg’
ranging from 54 to 41) that have trace-element abundances similar to intraplate tholeiites. Their La/Nb ratios of 1.3 to 1.9 and absolute REE concentrations of 30 times chondrite in the more evolved basalts are features common to many continental flood basalts. The lack of depletion in high field-strength elements relative to MORB readily distinguishes them from island-arc tholeiites.

Deposition of carbonaceous pelites coincided with the widespread development of back-arc basins along the southeastern margin of an early Paleozoic ocean. The trace-element and REE patterns from basalts interbedded with pelites of the St. Croix Terrane suggest eruption into an aborted marginal ensialic basin remote from the influence of any consuming plate margin.