

BROAD-TERRANE JURASSIC FLOOD BASALTS ACROSS NORTHEASTERN NORTH AMERICA

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Early Jurassic tholeiitic lavas that flowed across Mesozoic basins from Virginia (Culpeper basin) to Nova Scotia (Fundy basin) were co-magmatic, as shown by their similar geochemistry, petrography, paleomagnetism, radiometric ages (c. 201 Ma?) and stratigraphy. The basin basalts are correlated with diabase dikes of the same magmas, which intersect the basins but also extend far outside them. In northeastern North America, several of these dikes are 20 to 60 m wide with lengths more than 250 km. As shown in the Columbia River Basalt province, single basalt flows from such fissures can travel hundreds of km. A model in which the Jurassic dikes acted as feeders to fissure vents implies a vast flood basalt province that extended across the rifted terranes of eastern North America. The initial basalt flood was the most uniform and widespread among the preserved basin basalts, but flows that immediately followed may have extended farther as shown by the source dike distribution. The present-day Mesozoic basins preserve only small remnants of these basalt floods. Younger (middle Jurassic ?) flood basalts remain today along submarine sections of the continental shelf and shelf break, and beneath Cretaceous Coastal Plain sediments in the southeastern U.S. Apart from likely connections with Iberia and northwest Africa, just the initial fissure eruptions produced a temporary basaltic plain perhaps 16(K) km long and 200 to 400 km wide, or roughly 500,000 km², rivaling other great continental flood basalt provinces. The basalts were "broad-terrane" strata that formed an exception to the "closed-basin" stratigraphic model for the rifts.