

IGNEOUS AND TECTONIC STRUCTURES IN NORTH MOUNTAIN BASALT, GRAND MANAN ISLAND, NB

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Members of the Early Jurassic North Mountain basalt in the Early Mesozoic Fundy rift basin between New Brunswick and Nova Scotia are co-magmatic expressions of a single gigantic ponded flow, as shown in spectacular outcrops on Grand Manan. After the massive lower flow unit (here called Dark Harbour member, 120 m thick) filled the large basin, it produced middle member layers (Seven Days Work member, total thickness about 50 m) as a series of 2 to 5 m thick gas-rich crusts, sills, and amygdaloidal flows formed by extrusive surges out of the upper levels of the lower member. Intrusions from the lower member also crosscut the middle flows, including a large dike that connects to one of the middle member flows. The third or upper member (Ashburton Head member, about 70 thick) was apparently formed as the final massive extrusion of magma from the lower member.

Spectacular outcrops show features of this sequence. At Whale Cove, the contact between the Dark Harbour and Seven Days Work members is conformable but with layers that interfinger, showing co-liquid relationships. At Eel Brook Beach, the Ashburton Head member forms the hanging wall of a normal fault against Seven Days Work member in the foot wall. At Whistle Beach this same fault is also exposed, but in addition it shows an intrusion of basalt into the fault plane. At Indian Beach an even larger cliff exposes a fault between the Seven Days Work and overlying Ashburton Head member on the northeastern side, and the Dark Harbour member to the southwest. A large dike parallels the fault, containing basalt that crosscuts lower flows of Seven Days Work member but in the cliff overhead, turns to become a flow about 5 m thick. Red siltstone intrudes this zone, apparently derived from sediment of the underlying Blomidon-type formation.

These exposures of igneous and tectonic contact features are unique in the region, and it illustrates very well the genetic sequence of this gigantic basalt formation, possibly the largest known single lava flow on earth.