

Maine Geological Survey
DEPARTMENT OF CONSERVATION
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Title: Preliminary Report on the Surficial Geology of the Stacyville Quadrangle, Northern Half of the Millinocket Quadrangle, Eastern Half of the Katahdin Quadrangle, and the Northeastern Quarter of the Norcross Quadrangle, Maine.

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Topography. The study area with an available relief of approximately 3000 feet constitutes a portion of a dissected upland plateau that extends through northern Maine and adjacent New Brunswick. To the southeast the land slopes gently to the Maine coast. The eastern portion of the map area is underlain by steeply dipping northeastward trending Paleozoic formations of metamorphosed siltstone, shale, sandstone, graywacke, and some volcanic rocks. The western portion of the map area is underlain by Devonian granite and quartz monzonite. The trend of the ridges reflects the nature of the underlying bedrock. In the south and east portions of the map area structurally controlled northeastward trending ridges dominate the topography. To the northwest the trend of the bedrock ridges is more irregular being underlain by the Mount Katahdin granite and quartz monzonite.

Glacial Till. A veneer of coarse, stony, glacial till blankets most of the area and fills or partly fills the river valleys. Most of the major rivers have downcut through this till and flow in large part over bedrock; however, the valley sides are still covered by glacial till and many of the minor tributaries flow entirely on till.

The glacial till contains abundant locally derived clasts. Toward Mount Katahdin and Turner Mountain, increasing amounts of Mount Katahdin granite and quartz monzonite are found in the till. Along major river valleys, highway I-95, and roadcuts in Stacyville the till mantle is very thin, often less than four feet thick. Towards Mount Katahdin and Turner Mountain, till thicknesses increase to 50 feet or more in the stream valleys. Numerous excavations below an elevation of 500 feet along the valleys of the East and West Branch of the Penobscot River and Millinocket Stream reveal sandy and crudely sorted tills.

The region below 600 feet in elevation extending southeastward from Rum Brook Campsite to Schoodic Ridge and including the lowland east of Millinocket Ridge and north of Ambajejus Lake and North Twin Lakes is mantled by an extensive Rogen moraine complex that continues southeastward beyond the study area. Moraines in this region trend approximately N50°E and range in elevation from 20 to 80 feet above the surrounding terrain.

Stratified Drift. Well sorted, loosely packed, cobbly to bouldery gravel and crudely stratified, coarse sand and cobbly gravel is found in some amount in every valley of the investigated area. Eskers, kame terraces, and outwash deposits comprise a large part of the East Branch of the Penobscot and Seboeis River Valleys. Other major esker-kame terrace systems extend down the Wassataquoik, Trout Brook, and Millinocket Stream Valleys. These ice-contact deposits often rise 30- to 100 feet above the level of the adjacent flowing stream. Large delta complexes occur to the north of Dolby Pond and along Millinocket Stream just to the north of the city of Millinocket.

A broad terrace of well- to crudely-sorted sand and pebbly grus extends along Sandy Stream and the northern shore of Millinocket Lake at the 500-foot elevation. This terrace, sharply abutting unsorted Rogen moraines, suggests a glaciolacustrine or a marine origin.

Interpretation. Striae, rock drumlins, and crag-and-tail structures indicate late Wisconsinan ice-flow was south-southeastward. Deglaciation was accomplished by stagnation and downwasting. Meltwater generally flowed along southeastward trending topographic valleys beneath the receding ice sheet and formed extensive esker systems. Local fluctuation along the ice margin southeast of Mount Katahdin produced an extensive Rogen moraine complex.

The raised beach along the northern shore of Millinocket Lake indicates a former lake or sea level position. If a proglacial lake is interpreted to have occupied the present Millinocket Lake, Ambajejus Lake, and North Twin Lake basins then it is difficult to visualize how lake level was maintained. Spillways to the south of these present lake basins have elevations of 450 feet or less. Perhaps these shorelines represent the late Wisconsinan upper marine limit in northern Maine.

Future Investigation. The Sandy Stream Rogen moraine complex suggests some fluctuation along the receding ice margin while associated esker and kame terrace systems imply stagnation and downwasting of the late Wisconsinan ice sheet. These interpretations appear to be incompatible. The origin of the "beaches" located on the northern shore of Millinocket Lake suggest the existence of a large proglacial lake during late stage of Wisconsinan deglaciation yet it is difficult to visualize how such a large lake could be contained. These structures should be reexamined in detail.