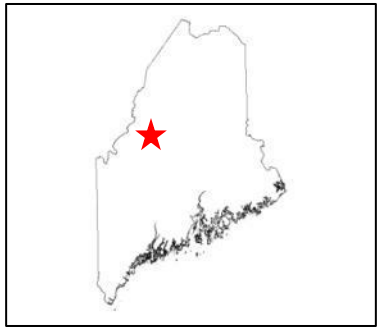
Maine Geologic Facts and Localities

August, 1999

Seboomook Lake, Maine



45° 54‘ 42.03“ N, 69° 52‘ 59.20“ W

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Introduction

The rocks of Maine record a rich history of geological events that formed our landscape. Four hundred million years ago, Maine was a vastly different place, with an ocean covering most of the northern part of the State, massive young mountains along the present-day coast, and volcanos punctuating all. Sand and mud -- materials eroded from the young mountains -- were deposited by ocean currents in layer upon layer. Lava erupted from fissures into the seawater to form oddly shaped deposits within the sand and mud. All of these features are well exposed on Seboomook Lake, a long narrow lake a few miles northwest of Moosehead Lake.

The Seboomook Lake area may be reached from Millinocket via the "Golden Road." Follow this road to mile 65 where the Seboomook Dam access road intersects it. Alternatively, travelers may come from Rockwood on the west side of Moosehead Lake via the Pittston Farm road. Wise travelers will carry U.S. Geological Survey topographic map sheets (Seboomook Lake East and Seboomook Lake West) or a Maine map atlas to guide their wanderings.

Bedrock Geology

Figure 1 is a simplified geologic map of the Seboomook Lake area that shows where the major types of rocks (pillow basalt, thickly bedded sandstone, thinly bedded slate, and thinly bedded sandstone) are found in the area. Fortunately, these rocks have not been subjected to the high levels of heat and pressure that have affected many areas of the state; features can still be readily seen that tell us most of the rocks originally formed as layers of sediment. If they had been metamorphosed (heated and squeezed) to the degree that rocks in other parts of the state have been, those features would have been wiped out.

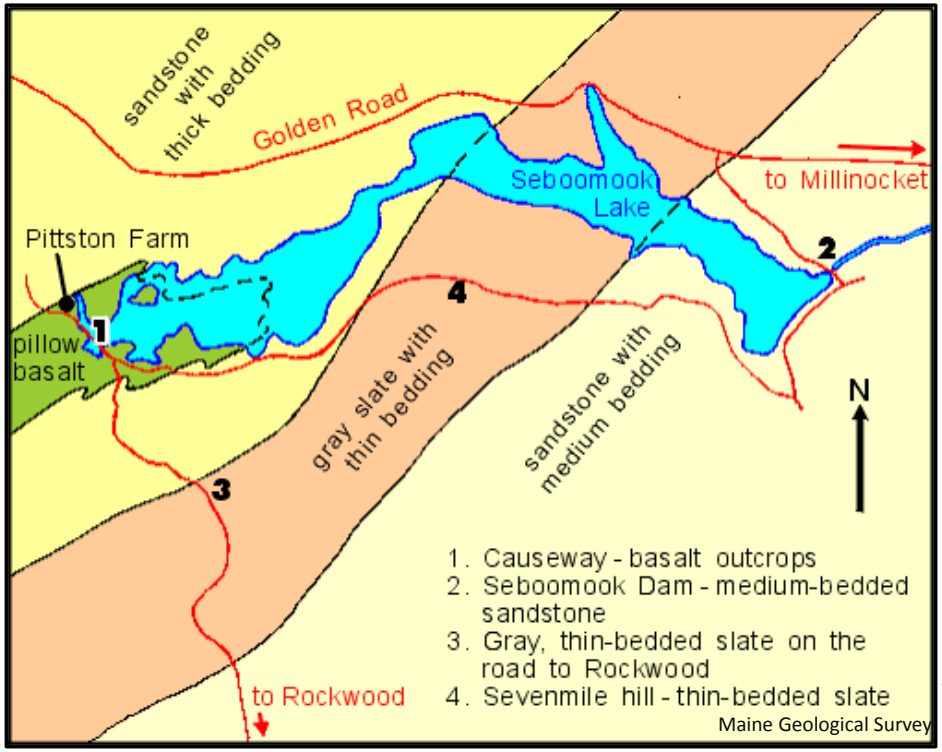

Figure 1. Bedrock geology map of the Seboomook Lake area.

Bedrock Geology

Around the western part of Seboomook Lake there are some volcanic rocks (Canada Falls Member of the Frontenac formation). They formed when fissures opened in the ocean floor and molten rock (lava) spewed onto the bottom of the sea. How do we know this? Within the volcanic rocks are distinctive shapes, called pillows by geologists, which form when lava is suddenly cooled by contact with cold water. The water immediately cools and hardens the outer skin of lava into a rind, but the pressure of the eruption pushes more lava out until a partially hardened blobby shape (pillow) forms and breaks off. The process continues as more lava erupts, in this way forming a deposit made up almost entirely of pillows.

Pillow Lava

Figure 2 shows examples of the pillows found along the causeway at the west end of Seboomook Lake (location 1 on Figure 1).

Figure 2. Two examples of pillows found along the causeway at the west end of Seboomook Lake

Pillow Lava

Figure 3 shows newly formed pillows on the bottom of the Pacific Ocean near a modern volcanic fissure along the mid-ocean ridge (photo from NOAA).

Figure 3. Newly formed pillows on the bottom of the Pacific Ocean near a modern volcanic fissure along the mid-ocean ridge.

Sedimentary Rocks

Several types of sedimentary rocks are well exposed along the shores of the lake, in the river below Seboomook Dam (location 2, Figure 1), and along the woods roads surrounding the lake. Below the dam is one of the best places to view the spectacular layering and other sedimentary features in a sandstone unit with beds of medium thickness (Northeast Carry Formation). Figure 4 shows the general character of the outcrop with a very regular succession of continuous beds.

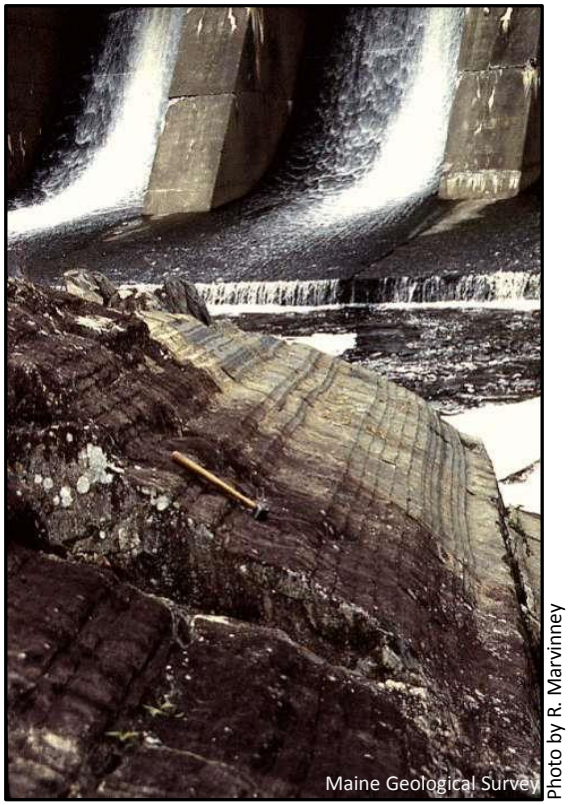

Figure 4. Northeast Carry Formation outcrop below the dam.

Sedimentary Rocks

Individual beds range from a few inches to several feet thick. Most beds are graded. That is, the individual sand grains making up the base of the bed are larger and pass gradually upward through smaller grains to the top of the bed which consisted of silt or mud (Figure 5).

Figure 5. The light and dark layers oriented vertically are "graded beds." As each bed was deposited, the heavier sand and silt particles (light colored) settled first, followed by an increasing amount of lighter clay particles (dark colored).

Sedimentary Rocks

Some beds contain cross-beds which are thin crosswise layers caused by ripples which formed on the surface of the bed as it was deposited (Figure 6). From all of these features, geologists surmise that for each bed the sediment was deposited from a thick slurry of mud and sand that coursed down a submarine slope, dropping the larger sand particles first, then successively finer materials until all the sediment had settled to the bottom.

Figure 6. Some beds contain cross-beds which are thin crosswise layers caused by.

Slate

Another belt of rocks (named the Ironbound Mountain Formation) is mostly gray slate that is thinly bedded (Figure 7). These rocks formed much in the same way that the sandstone formed, except that the slurry of material was mostly mud with little sand. Some good exposures of this rock are along the road to Rockwood and near Sevenmile Hill (locations 3 and 4 on Figure 1).

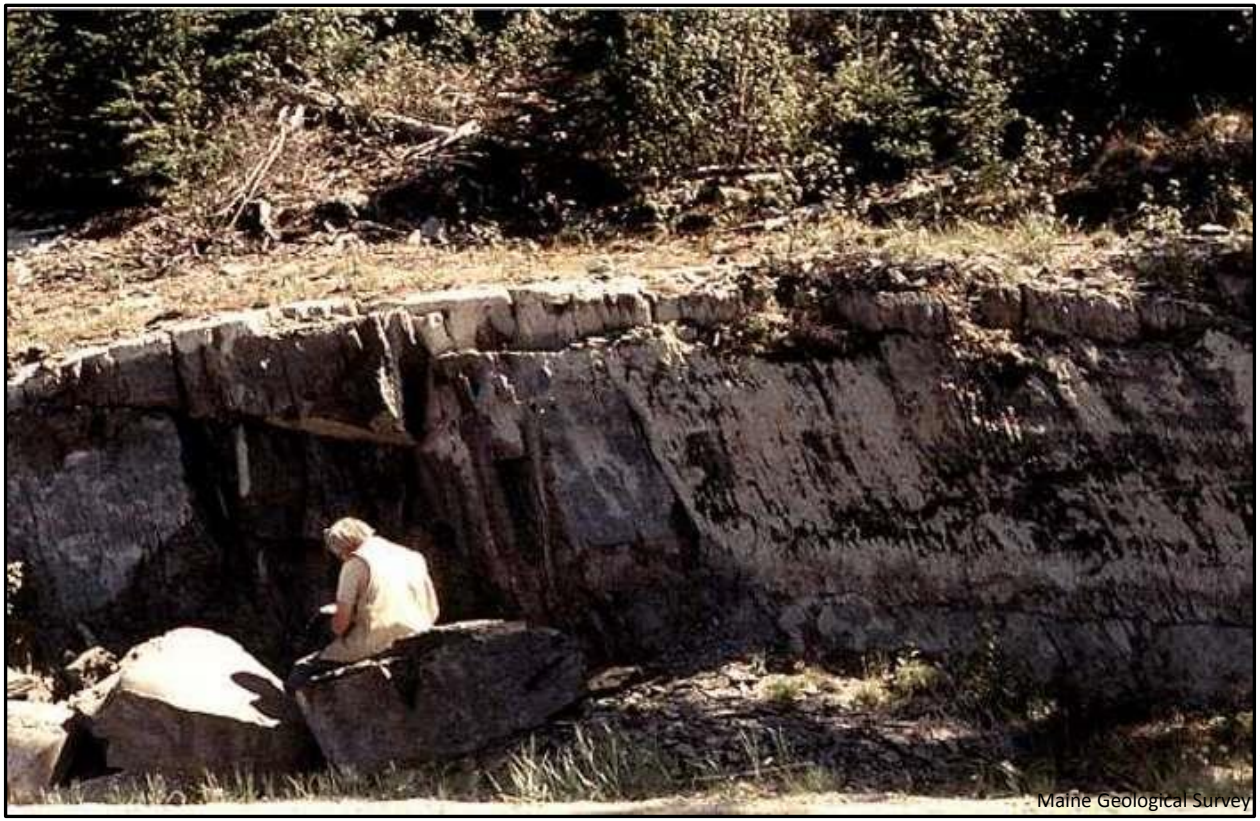

Figure 7. Another belt of rocks (named the Ironbound Mountain Formation) is mostly gray slate that is thinly bedded.

References and Additional Information

Hanson, Lindley S. (editor), Caldwell, Dabney W. (co-organizer), 1995, New England Intercollegiate Geological Conference 85th Annual Meeting: Guidebook to Field Trips in North-Central Maine, September 23-25, 1994, Millinocket, Maine, 268 p.