Bucksport Quadrangle, Maine

Surficial geologic mapping by
Alice R. Kelley and Lynn Caron

Geologic editing by
Thomas K. Weddle

Digital cartography by:
Susan S. Tolman

Robert G. Marvinney
State Geologist

Cartographic design and editing by:
Robert D. Tucker

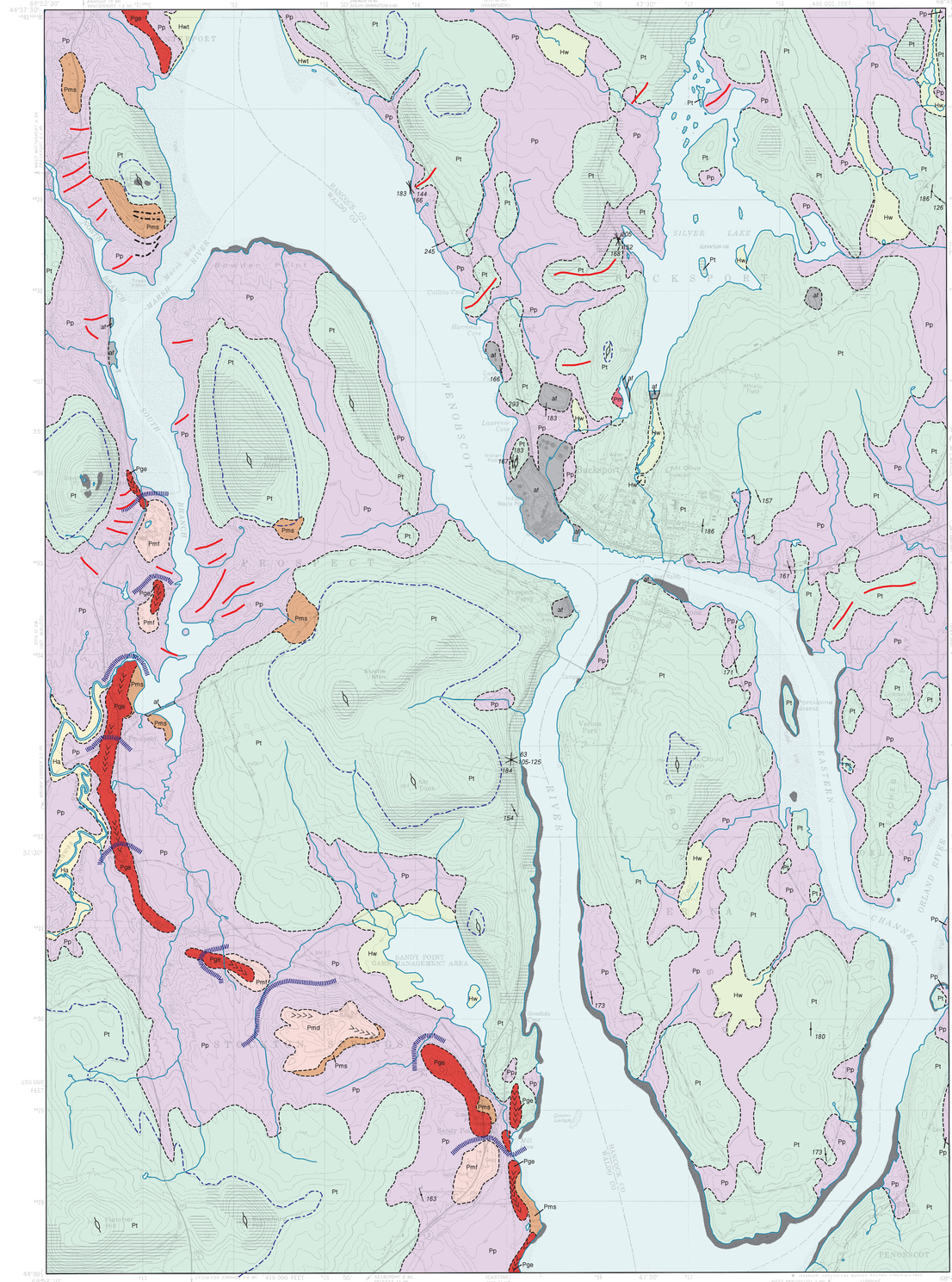
Funding for the preparation of this map was provided in part by the U.S. Geological Survey
STATEMAP Program, Cooperative Agreement No. G09AC00175.

Maine Geological Survey

Address: 22 State House Station, Augusta, Maine 04333
Telephone: 207-287-2801 **E-mail:** mgs@maine.gov
Home page: http://www.maine.gov/doc/nrimc/nrimc.htm

Open-File No. 11-9
2011

Surficial Geology



Quadrangle Location

SOURCES OF INFORMATION

Surficial geologic mapping of the Bucksport quadrangle was conducted by Alice R. Kelley and Lynn Caron in 2009 for the STATEMAP program.

Topographic base from U.S. Geological Survey Bucksport quadrangle, scale 1:24,000 using standard U.S. Geological Survey topographic map symbols.

The use of industry, firm, or local government names on this map is for location purposes only and does not impute responsibility for any present or potential effects on the natural resources.

Ha **Stream alluvium** - Sand, gravel, and silt deposited on flood plains of modern streams.

Hw **Fresh water wetland deposits** - Peat, muck floored by silt and clay. Deposited in poorly drained areas on valley floors. Unit may grade into or include areas of stream alluvium.

Hwt **Brackish/salt water wetland deposits** - Tidally influenced marshes. Present as marshes fringing uplands and tidal creeks.

Pge **Eskers** - Sand and gravel deposited in tunnels in ice sheet. Esker deposits in this region are draped with fine-grained glaciomarine deposits.

Pms **Marine shoreline deposit** - Wave-worked fine to very fine sand.

Pmd **Glaciomarine delta** - Sand and gravel deposited into the sea and built up to the ocean surface. Commonly displays larger foreset beds and features such as faults and soft-sediment folding. Formed at the glacier margin during recession of the late Wisconsinan ice sheet.

Pmf **Glaciomarine fans** - Sand and gravel deposited as submarine fans. Frequently associated with eskers.

Pm **Marine deposits, undifferentiated** - Sand and gravel of uncertain origin, but thought to have been deposited in the sea.

Pp **Presumpscot Formation** - Fine-grained marine silt and clay. Locally fossiliferous. Has characteristic gullied appearance.

Pt **Till** - Loose to compact and poorly sorted, matrix supported to weakly stratified clay, silt, sand, and gravel. Boulders may be present on surface. Upper portions of till deposits are brown and weakly stratified as a result of regressive marine phase. Matrix in areas dominated by metasedimentary rocks have a clay-rich matrix, while till associated with areas of granitic outcrop have a sand-rich matrix.

af **Artificial fill** - Earth, rock, and/or man-made fill.

Bedrock outcrops

Thin drift areas - Ruled pattern indicates area where outcrops are common and/or surficial sediments are generally less than 10 ft thick. Thin drift is more extensive than shown, particularly on topographic highs.

Contact - Boundary between map units. Dashed where approximately located.

Ice-margin position - Shows an approximate position of the glacier margin during ice retreat, based on meltwater deposits, moraines, and/or positions of meltwater channels.

Glacial marine limit - Approximate elevation of late-glacial sea (here approximately 300 feet above modern sea level).

Crest of esker - Shows trend of esker ridge. Chevrons point in direction of glacial meltwater flow.

Moraine ridge - Line shows inferred crest of moraine ridge deposited along the retreating margin of the most recent glacial ice sheet. These moraines are composed mostly of till but may also include sand and gravel.

Higher than present marine shoreline position.

135 **Glacial striation locality** - Dot marks point of observation. Number is azimuth (in degrees) of flow direction. Symbol with no arrow indicates unknown flow direction. Three striation locations in the central part of the map show what appear to be anomalous ice-flow directions: 293° on the east side of the Penobscot River near Lawrence Cove, 63° on the west side of the river opposite Verona Park, and 245° on the east side of the river north of Collins Cove. The trends do not have a unique flow direction, but ice flow indicators with unique flow directions toward the river are found in the Hampden quadrangle to the north. The two trends mentioned from the Bucksport quadrangle are interpreted to represent ice-flow convergence toward the Penobscot River, similar to that found in the adjacent Hampden quadrangle.

Glacially streamlined hill - Symbol shows long axis of hill or ridge shaped by flow of glacial ice, and which is parallel to former ice-flow direction.

USES OF SURFICIAL GEOLOGY MAPS

A surficial geology map shows all the loose materials such as till (commonly called hardpan), sand and gravel, or clay, which overlie solid ledge (bedrock). Bedrock outcrops and areas of abundant bedrock outcrops are shown on the map, but varieties of the bedrock are not distinguished (refer to bedrock geology map). Most of the surficial materials are deposits formed by glacial and deglacial processes during the last stage of continental glaciation, which began about 25,000 years ago. The remainder of the surficial deposits are the products of postglacial geologic processes, such as river floodplains, or are attributed to human activity, such as fill or other land-modifying features.

The map shows the areal distribution of the different types of glacial features, deposits, and landforms as described in the map explanation. Features such as striations and moraines can be used to reconstruct the movement and position of the glacier and its margin, especially as the ice sheet melted. Other ancient features include shorelines and deposits of glacial lakes or the glacial sea, now long gone from the state. This glacial geologic history of the quadrangle is useful to the larger understanding of past earth climate, and how our region of the world underwent recent geologically significant climatic and environmental changes. We may then be able to use this knowledge in anticipation of future similar changes for long-term planning efforts, such as coastal development or waste disposal.

Surficial geology maps are often best used in conjunction with related maps such as surficial materials maps or significant sand and gravel aquifer maps for anyone wanting to know what lies beneath the land surface. For example, these maps may aid in the search for water supplies, or economically important deposits such as sand and gravel for aggregate or clay for bricks or pottery. Environmental issues such as the location of a suitable landfill site or the possible spread of contaminants are directly related to surficial geology. Construction projects such as locating new roads, excavating foundations, or siting new homes may be better planned with a good knowledge of the surficial geology of the site. Refer to the list of related publications below.

OTHER SOURCES OF INFORMATION

1. Kelley, A. R., Caron, L., and Doughty, D. F., 2011, Surficial materials of the Bucksport quadrangle, Maine: Maine Geological Survey, Open-File Map 11-10.

2. Foster, L. E. and Smith, T. T. (compilers); Doughty, D. F. (mapper), 2011, Significant sand and gravel aquifers of the Bucksport quadrangle, Maine: Maine Geological Survey, Open-File Map 11-59.

3. Thompson, W. B., 1979, Surficial geology handbook for coastal Maine: Maine Geological Survey, 68 p. (out of print).

4. Thompson, W. B., and Borns, H. W., Jr., 1985, Surficial geologic map of Maine: Maine Geological Survey, scale 1:500,000.