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Maine Geological Survey
DEPARTMENT OF CONSERVATION

USGS
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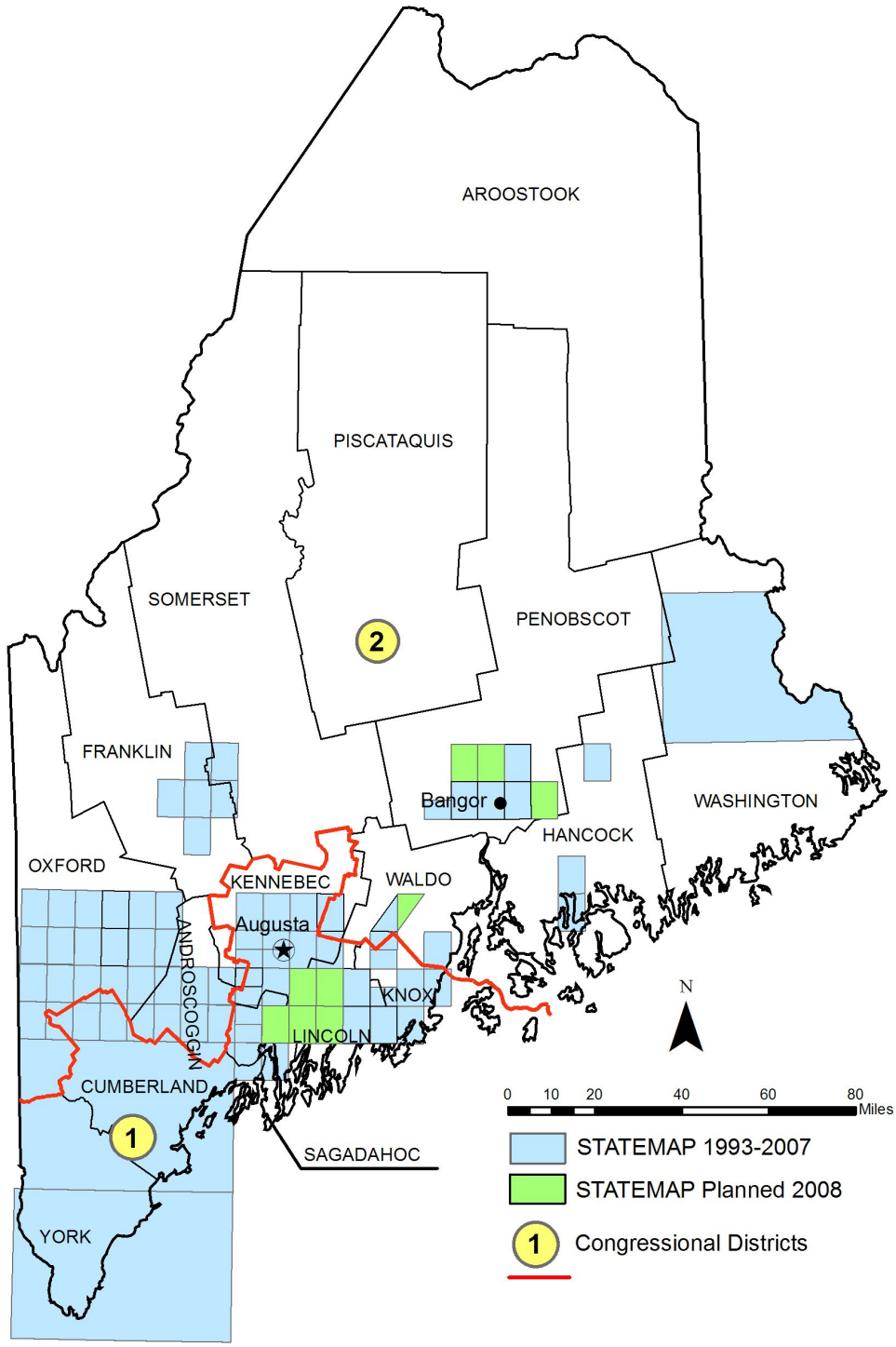
United States
Geological Survey

National Cooperative Geologic Mapping Program

STATEMAP Component: States compete for federal matching funds for geologic mapping.



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Geologic Maps

Geologic maps are important sources of natural resource information. In Maine, two types of geologic maps are useful: bedrock geologic maps show the nature of the solid rock (ledge) at or near the surface; surficial geologic maps show the nature of materials above the bedrock.

Bedrock geologic maps show the distribution, rock type, age, and relationships of rock units at or near the surface. Maine is underlain with a wide variety of rocks including granite, various types of metamorphic rocks, and abundant volcanic rocks. Bedrock maps also show the nature of geologic structures in the rock (faults, fractures, folds). Most of the rock units in Maine are over 400 million years old.

Surficial geologic maps show the nature of the materials above the ledge including sand, gravel, marine clay, and glacial till. These materials are all products of the most recent glacial episode that covered the state with several thousand feet of ice until it melted between 14,000 and 11,000 years ago.

Benefits and Uses

Geologic maps form the foundation of site investigations of many types ranging from aggregate resource assessments to ecological analysis. Some specific uses of geologic maps are the following:

Ice formed on a road cut graphically illustrates the role of fractures in determining groundwater quantity. In this example, most of the water flows through one near-horizontal fracture.

- Groundwater quality and quantity: Maine is heavily dependent on groundwater resources for domestic water needs. More than 50% of the citizens get their water from wells. The quality and quantity of this water is directly dependent on rock type and the nature of the fractures through which water travels. Mapping the distribution of rock types, for example, will help define the sources of arsenic and radon in groundwater, significant problems in Maine. Furthermore, glacial sand and gravel deposits are important groundwater resources for municipalities, more than 70 of which currently use these resources.
- Aggregate resources: Sand and gravel deposits are also important sources of materials for our built environment. They are essential to constructing and maintaining our roads, safe winter driving, site work and foundations for buildings, and for septic systems.
- Geologic hazards: Maine's most significant geologic hazards are from landslides and coastal erosion. The marine mud deposited after the glaciers melted is the most common geological unit involved in landslides. Mapping the distribution of these deposits is the first step in understanding this hazard.

A large landslide in marine mud in Rockland in 1996 destroyed two homes.

- Site-selection studies: Geologic maps are important tools to ensure that public and private facilities (waste disposal sites, treatment facilities, underground storage tanks) are located properly to reduce hazards to themselves and the environment.

Geologic maps are essential to human use of the landscape. Use of these maps during planning of facilities will reduce the potential future costs of poorly sited facilities. Maine is highly dependent on local geological materials to support our standard of living. Use of geologic maps helps protect the quality of our groundwater and ensure that other important resources remain available.

Publications information:

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Geologic maps from this program are posted on our website: www.maine.gov/doc/nrimc/mgs/mgs.htm

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