



WATER FACT SHEET

U.S. GEOLOGICAL SURVEY, DEPARTMENT OF THE INTERIOR

U.S. GEOLOGICAL SURVEY GROUND-WATER STUDIES IN MAINE

GROUND-WATER ISSUES

Ground water is a vital natural resource in Maine. Although less than 10 percent of the total freshwater withdrawals are from ground-water sources, 57 percent of the population relies on ground water for drinking-water supplies. The rural population depends almost entirely on ground water. The greatest amount of ground-water pumping occurs in southwestern and coastal Maine, with other ground-water withdrawals located near the large towns in central and northern Maine. The quality of ground water is suitable for most uses; however, local contamination of aquifers has occurred. The major issues related to ground water in Maine are:

- Availability,
- Contamination from landfills, hazardous-waste sites, agriculture, and urbanization, and
- Water-quality management.

U.S. GEOLOGICAL SURVEY PROGRAMS

The U.S. Geological Survey (USGS) is the principal Federal agency providing data on the Nation's water resources. These data are used by other Federal agencies, State governments, and private organizations to plan, manage, and evaluate water resources, and to understand the hydrologic cycle. In Maine, the USGS collects streamflow data at 45 stations; water-quality data at 9 surface-water stations and 31 ground-water stations; and ground-water-level data at 31 stations. The USGS also cooperates with Canadian water-resource agencies through exchange and review of hydrologic data collected on boundary waters. Examples of investigations by the USGS that address ground-water issues in Maine are presented in the following sections.

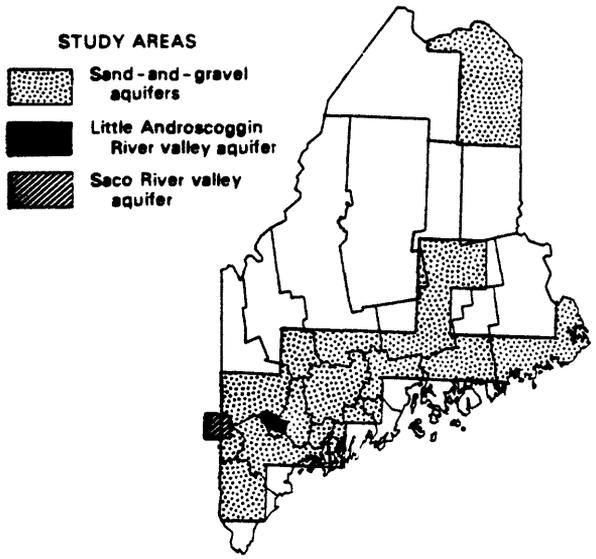
Sand-and-Gravel Aquifers

An important tool in managing Maine's ground-water resources has been the identification of potential sources of water supply. In 1978, the USGS, in cooperation with the Maine Geological Survey (MGS) and the Maine Department of Environmental Protection, began a program to map the sand-and-gravel aquifers in Maine. Delineation of aquifers was based on surficial mapping and inventory of well-log information. This investigation resulted in 59 maps showing approximate aquifer boundaries, estimated well yields, and locations of some potential sources of contamination. In 1981, the USGS began a program

to update this information with test drilling, water-level measurements, seismic-refraction surveys, and collection of water-quality data. Twenty-five maps covering almost 10,400 square miles of the State have been completed. The maps and accompanying interpretive reports identify aquifer boundaries, estimated yield zones, depth to water table, depth to bedrock, and characterize the chemistry of ground-water. Sites having the potential for contamination of ground water have been located on the maps. This series of maps serves as a basis for more detailed studies of aquifers.

Little Androscoggin River Valley Aquifer

Three towns—South Paris, Oxford, and Norway—obtain water for municipal supply from a 15-mile reach of the Little Androscoggin River valley aquifer. In addition, numerous domestic wells tap this aquifer. Land-use activities, including sanitary landfills, a sludge-disposal site, and road-salting operations, may affect water quality in the aquifer. The USGS, in cooperation with the MGS, the Maine Department of Human Services, and the Androscoggin Valley Regional Planning Commission, conducted a study from 1980 through 1982 to determine the quantity and quality of water available, to develop a better understanding of how ground water moves through the



aquifer, and to analyze effects of pumping on the aquifer. A computer model of ground-water flow was used to simulate conditions observed in the aquifer during 1981. The model was then used to estimate aquifer response to proposed future pumpage.

Saco River Valley Aquifer Study

Southwestern Maine uses the Saco River for water supply. Increasing water demands in the area have caused water shortages. Interest has been focused on developing the Saco River valley aquifer as an additional source for water supply. Information on the quantity and quality of water, the effects of sub-surface disposal of wastes on water quality, and the effects of additional development on water levels were needed by State and local officials in order to manage this ground-water resource. In 1984, the USGS, in cooperation with the MGS, the New Hampshire Water Supply and Pollution Control Commission, the New Hampshire Water Resources Board, and the town of Conway, began a study of the Saco River valley aquifer. During 2 years of data collection, 69 exploration holes were drilled, 130 samples of glacial sediments were analyzed for grain size, and monthly water levels were measured in 100 wells. Ground-water quality was analyzed at 92 sites. A computer model of ground-water flow was developed to predict the effects of increased pumping and variable recharge on ground-water levels in the aquifer. The model also was used to determine directions of ground-water flow and recharge areas that contribute ground water to municipal wells.

GROUND-WATER MANAGEMENT

The principal State agencies responsible for ground-water management in Maine are the Maine Geological Survey, the Maine Department of Environmental Protection, and the Maine Department of Human Services. The Maine Department of Conservation, through the Maine Geological Survey and the Land Use Regulation Commission, coordinates ground-water research and regulates activities that affect ground water in areas of sparse population. The department also coordinates a statewide ground-water-quality sampling network and studies the effects of pesticides on ground water. The Maine Department of Environmental Protection is responsible for reviewing and licensing activities that affect ground water. This department studies the effects of gasoline leaks and pesticides on ground water, assesses ground-water quality, and oversees emergency response and cleanup efforts. The Maine Department of Human Services is responsible for reviewing and approving new public water-supply sources, monitoring the quality of existing sources, studying ground-water-transmitted diseases, and analyzing the quality of private water supplies.

During 1987-88, the following Federal and State agencies entered into interagency or cooperative cost-sharing agreements with the USGS to conduct ground-water investigations in Maine:

Maine Department of Environmental Protection
Maine Geological Survey
U.S. Environmental Protection Agency

SELECTED REFERENCES

- Adamik, J.T., Tolman, A.L., Williams, J.S., and Weddle, T.K., 1987, Hydrogeology and water quality of significant sand and gravel aquifers in parts of Franklin, Kennebec, Knox, Lincoln, Penobscot, Somerset, and Waldo Counties, Maine: Maine Geological Survey Open-File Report 87-24a, Sand and Gravel Aquifer Maps 18, 30, and 31.
- Johnson, C.J., Tepper, D.H., and Morrissey, D.J., 1987, Geohydrologic and surface-water data for the Saco River valley glacial aquifer from Bartlett, New Hampshire, to Fryeburg, Maine, October 1983 through January 1986: U.S. Geological Survey Open-File Report 87-44, 80 p.
- Morrissey, D.J., 1983, Hydrology of the Little Androscoggin River valley aquifer, Oxford County, Maine: U.S. Geological Survey Water-Resources Investigations Report 83-4018, 79 p.
- Prescott, G.C., Jr., 1980, Records of selected wells, springs, and test borings in the upper Androscoggin River basin in Maine: U.S. Geological Survey Open-File Report 80-412, 84 p.
- Tepper, D.H., Williams, J.S., Tolman, A.L., and Prescott, G.C., Jr., 1985, Hydrogeology and water quality of significant sand and gravel aquifers in parts of Androscoggin, Cumberland, Franklin, Kennebec, Lincoln, Oxford, Sagadahoc, and Somerset Counties, Maine: Maine Geological Survey Open-File Report 85-82a-f, Sand and Gravel Aquifer Maps 10, 11, 16, 17, and 32.
- U.S. Geological Survey, 1984, National water summary 1983—Hydrologic events and issues: U.S. Geological Survey Water-Supply Paper 2250, 243 p.
- , 1985, National water summary 1984—Hydrologic events, selected water-quality trends, and ground-water resources: U.S. Geological Survey Water-Supply Paper 2275, 467 p.
- Williams, J.S., Tepper, D.H., Tolman, A.L., and Thompson, W.B., 1987, Hydrogeology and water quality of significant sand and gravel aquifers in parts of Androscoggin, Cumberland, Oxford, and York Counties, Maine: Maine Geological Survey Open-File Report 87-1a, Sand and Gravel Aquifer Maps 12, 13, 14, and 15.

Information on technical reports and data related to ground water in Maine can be obtained from:

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U.S. Geological Survey
Water Resources Division
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