

Affects of Water Use Increases and Potential Climate Change on the Ground-Water
Availability of the Seacoast, New Hampshire

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The U.S. Geological Survey, together with the New Hampshire Department of Environmental Services, New Hampshire Coastal Program, and New Hampshire Geological Survey, have investigated the availability of ground-water resources in the Seacoast region of New Hampshire to address current and future water needs. Population growth, increasing water demand, and potential climate change have prompted concern for the sustainability of the region's ground-water resources. Water use associated with population growth in the region is expected to increase by 30 percent over the next 20 years. The region has limited ground-water storage in the surficial-sediment and fractured-crystalline bedrock-aquifer systems. A ground-water-flow model was developed for a 160-square mile coastal area incorporating detailed water-use information, water-level, and streamflow-discharge observations to estimate bedrock-aquifer properties and seasonal recharge. Simulations indicate that water availability varies with hydrogeologic setting in the model area, and that increasing water use, in addition to potential increases in sewerage areas, will result in decreases in total water availability. About half of the total annual ground-water recharge coincides with the spring melt period. Rising temperatures, associated with predicted climate change, will likely shift the spring recharge period 2 to 4 weeks earlier in the year, than present, and may increase the total annual evapotranspiration. The impacts of increasing water use and potential climate change may negatively affect recharge, ground-water levels, and baseflows to streams in the future. The model developed in this investigation can provide water-resource managers and planners tools with which to assess future water resources in the Seacoast region.

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