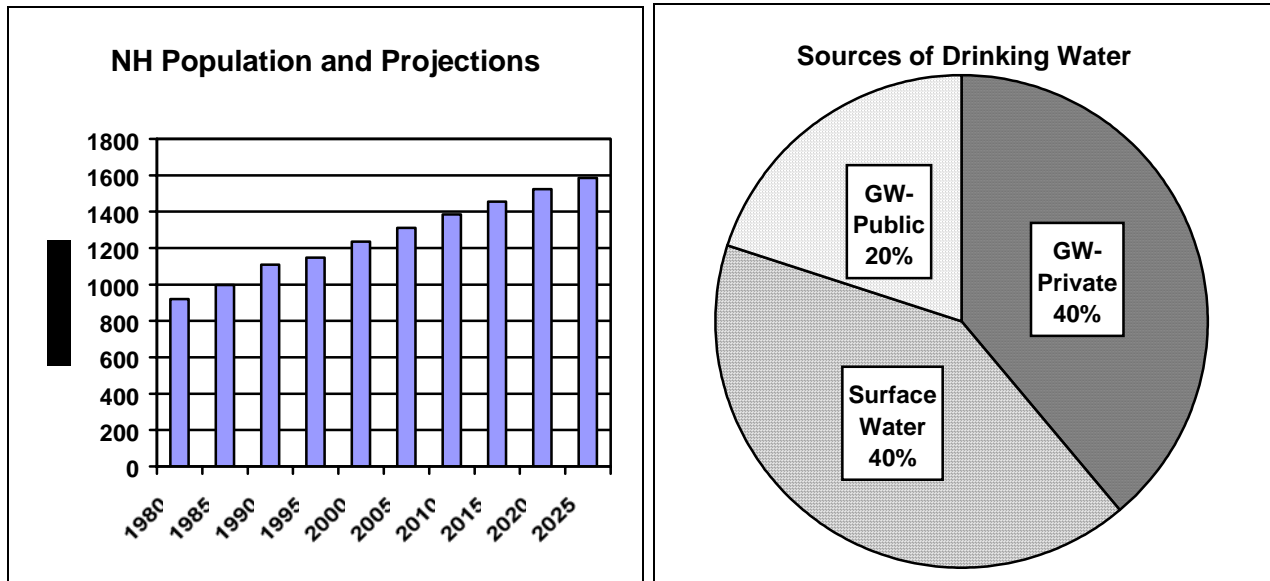


NEW HAMPSHIRE GROUNDWATER CONDITIONS 2003



Groundwater importance: Groundwater is a critical natural and economic resource for New Hampshire. It is our most important source of drinking water and an integral part of the water cycle, vitally important for fish, wildlife, and recreation. Approximately 60% of New Hampshire residents rely on groundwater for their drinking water. Community water systems serve an estimated 60% of the state's households; over a third of this water comes from groundwater. Of the 2,177 public water systems in New Hampshire, 98% rely on groundwater. Groundwater is also the source for the 40% of NH residents who rely on private water systems. The U.S. Geological Survey estimates that of the 82 million gallons per day (MGD) of groundwater withdrawn in New Hampshire in 1995, 31 MGD were used for public supply, another 31 MGD for private domestic use, and the remainder for commercial, industrial, and agricultural activities. Groundwater also provides an estimated 40% of the total flow in New Hampshire's rivers, which in turn feed the state's lakes, reservoirs, and estuaries.

Where is it? Almost anywhere in New Hampshire it is possible to site a well capable of providing enough water for a home. While 85% of private water supply wells tap bedrock aquifers, most high-yielding public water supply wells tap stratified-drift aquifers. Of the state's registered groundwater withdrawals (20,000 gal/day or more) 33 MGD come from stratified-drift wells, compared to 4 MGD from bedrock wells. About 14% of the state is underlain by stratified-drift aquifers with saturated thicknesses ranging up to 500 feet. In general, the highest-yielding aquifers are found in localized areas in central and southern New Hampshire. The largest stratified-drift aquifer is in the Ossipee River Basin and the thickest lies along the Connecticut River in Orford and Haverhill. Of the 82 MGD of groundwater withdrawn in 1995, nearly half were in Hillsborough County (21 MGD) and Rockingham County (19 MGD); each of the state's other eight counties accounted for less than 10 MGD.

How good is the water? Groundwater quality is a concern in New Hampshire. Although ambient water quality is generally good, degradation or contamination has resulted from point and non-point sources in localized areas throughout the state. The most common natural contaminants are iron, manganese, arsenic, and radon. An estimated 15 to 20% of bedrock wells are estimated to exceed the new arsenic MCL of 10 ppb. Iron and manganese present aesthetic problems in an estimated 15% of all wells but do not constitute a health threat. A similar number of wells have taste and odor problems. Approximately 95% of bedrock wells and 70% of stratified-drift wells are likely to exceed a radon concentration of 300 pCi/L (the standard

currently being proposed by the EPA for public water systems in states without multimedia mitigation programs). Contaminants caused by human activity, including volatile organic chemicals (VOCs) such as solvents and petroleum constituents, are detected in approximately 5% of groundwater samples. VOCs have been detected in wells at 352 community water systems and 279 non-community public water systems. Approximately 1% of stratified-drift wells have nitrate above the health-based standard of 10 mg/L; fewer than 1% of bedrock wells exceed that level.

Costs of contamination: The estimated cost of cleaning up the 18 Superfund sites in NH is \$350 to \$400 million. Since 1990, DES has provided \$86 million in financial aid to owners of leaking petroleum storage tanks (above ground and underground) to clean up contamination at 2,501 sites. Typical site cleanup costs are in the range of \$20,000 to \$80,000, but may exceed \$1 million for complex sites. DES estimates that the private sector has spent an additional \$5 to \$10 million for the remediation of petroleum contaminated groundwater, while \$20 to \$40 million has been spent by the private sector at 750 sites contaminated by chemical wastes. The NH Department of Transportation has also spent \$3.2 million since 1983 to replace 424 water supply wells contaminated with road salt.

Efforts to protect groundwater: NH DES has many programs in place to protect groundwater through regulatory and non-regulatory means. For instance, DES has an aggressive program to ensure the removal of old underground storage tanks and provide financial assistance in cleaning up leaking UST sites. Other regulatory programs include DES's hazardous waste (RCRA) compliance program and subsurface program (to ensure adequate lot size, design, and installation of septic systems) and the Department of Agriculture's pesticides control program. Non-regulatory programs include grants for local drinking water source protection programs, for water supply land conservation, and for household hazardous waste and waste oil collection. Since 1992, the Drinking Water Source Protection Program (formerly the Wellhead Protection Program) has worked with water suppliers and municipal officials to encourage the identification and protection of key groundwater resources such as wellhead protection areas and important aquifers. As a result of these efforts, approximately 85% of the state's community water systems have implemented source protection measures including dozens of water suppliers and municipalities who inspect facilities that use and store regulated substances to ensure good management practices. Since 1994, the Comprehensive State Groundwater Protection Program has brought together a wide range of government agencies and stakeholders to identify needs and opportunities for improved groundwater protection. This program has brought about improved coordination and responsiveness of DES programs, the development of new tools for local entities to use in identifying and protecting groundwater resources and key water supply lands, and expanded public education and outreach programs. The NH Office of State Planning projects that between 2000 and 2025 the state's population will grow 28% from 1,235,786 to 1,586,000. Accordingly, attention is now focused on protecting the quantity as well as quality of groundwater resources. Since 1998, NH DES has regulated large new groundwater withdrawals to prevent impacts on other water resources and water users, and the Department is currently developing water use efficiency rules that will apply to water users obtaining permits from DES related to new water withdrawals. In 2001, DES issued *Managing Stormwater as a Valuable Resource*, a publication aimed at raising the awareness of local officials and the public regarding the need to preserve hydrologic function through better site design and infiltration of stormwater, and signaling a shift in DES stormwater management policy. As of April 2003, the state legislature seemed poised to mandate a broad study of issues related to groundwater withdrawals

What else is needed? Although great progress has been made in identifying and protecting groundwater that is being used as a source of public drinking water, a great deal of assessment and protection still must be done. Specifically, protection efforts for the private water supplies used by 40% of the state's residents lags behind protection for public water supply sources. Similarly, the quality and quantity of groundwater that is necessary to support healthy ecosystems is not well understood. With 15,000 people moving into New Hampshire each year, the state needs a better understanding of the impacts of development on the quantity and quality of the groundwater within our watersheds. Finally, more funding is needed for local implementation of groundwater protection strategies and to address the threats posed by non-RCRA, non-Superfund sites.