

## RHODE ISLAND GROUND WATER CONDITIONS

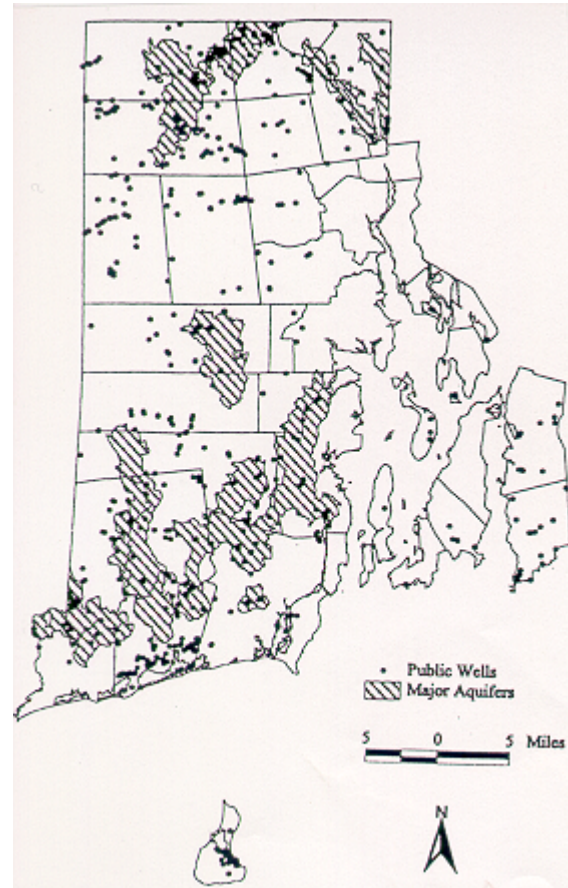
**Ground Water Importance:** Ground water plays a critical role in the maintenance of a high quality of life in the state of Rhode Island. The United States Geological Survey estimates an average of 27 million gallons of ground water are used per day in the state for drinking water and other beneficial uses. Ground water supplies approximately 26% of the state's population with drinking water from both public and private wells.

The dependence on ground water for drinking water varies across the state with southern and western Rhode Island 100% dependent on ground water. Overall, approximately two-thirds of the state's municipalities rely on ground water to a significant degree as a source of drinking water. As of December 2002 there were 620 active public wells in the state with 152 of these wells community wells serving residential populations of 25 persons or greater. Three aquifers in southern Rhode Island have received the federal recognition as sole source aquifers (Pawcatuck, Hunt-Annaquatucket-Pettaquam-scutt, and Block Island), which means that more than 50% of the drinking water is ground water and there are no feasible water supply alternatives. Ground water is expected to meet a substantial part of the state's future water supply needs as the population continues to grow in the rural parts of the state.

In addition to water supply for drinking water, industrial, commercial and agricultural use in Rhode Island, ground water quality is an important contributor to surface water quality. During periods without precipitation, water in streams and rivers is derived almost entirely from ground water discharging to these water bodies.

**Where Is It?** The state's most significant and productive aquifers for water supply development are located in the glacial deposits of stratified drift. Stratified drift consists of well-sorted layers of silt, sand and gravel deposited by melting water from the glaciers. The thicker, high yielding deposits, which are commonly 75 to 100 feet thick, are located west of Narragansett Bay with a high concentration in southern Rhode Island. The fractured bedrock

underlying the state is also an important aquifer providing drinking water to most private wells and small public water systems.



**Ground Water Quality:** Over 90% of Rhode Island's ground water has been classified as suitable for human consumption and other beneficial uses without treatment. However, the growing number of contamination incidents that have been discovered reflects the resource's vulnerability to contamination because of the generally shallow depth to ground water, aquifer permeability, and the absence of any subsurface confining layers. The leading cause of new ground water contamination incidents reported is the release of petroleum products from underground storage tanks.

The most frequently detected contaminants in Rhode Island's ground water are the widely used chemical solvents, compounds found in

gasoline and other petroleum products and nitrates. Data from the "State of the State's Ground Water" report showed that although none of the public wells last tested for volatile organic compounds exceeded the drinking water standards, approximately one out of every three public wells tested for volatile organic compounds had a detection. Of the public wells tested for nitrates, 89% contained nitrate concentrations less than three parts per million, and two wells exceeded the drinking water standard of 10 parts per million. Metals and pesticides were not detected in public wells in any frequency or concentration that was a concern.

**Efforts to Protect Ground Water:** Beginning in 1985 with the passage of the state Ground Water Protection Act, the Rhode Island Department of Environmental Management has continued to develop and implement a comprehensive approach to protecting the state's ground water resources. This approach involves a number of pollution source control regulatory programs (underground storage tanks, ground water discharges, etc.) and ground water remediation efforts. These programs operate within the framework of the ground water classification system that has classified all of the state's ground water resources into one of four classes and specified ground water quality standards for each class.

Protection of ground water quality is a shared responsibility with the state and federal governments playing a major role, but with the municipalities and the water suppliers having equally important responsibilities. Rhode Island's fully established Wellhead Protection Program for protection of ground water contributing to public wells is based on this principle. Publication of source water assessments by the Rhode Island Department of Health will also play an important role in furthering local and state protection efforts.

Long-term protection of the state's ground water resources will require continued efforts by all involved with success measured by our ability to sustain vital ground water resources free of contamination. In order to improve our protection efforts more can be done in the following areas, most of which will require increased funding:

- ◆ Assistance to municipalities and small water systems to develop and implement local ground water protection programs.
- ◆ Improved delineations of wellhead protection areas, particularly for bedrock wells, and other valuable aquifer areas.
- ◆ Ground water monitoring in areas of suspected non-point pollution.
- ◆ Increased efforts to educate business owners and the general public on the value of the state's ground water resources and the steps necessary to prevent contamination; increased assistance for pollution prevention activities.
- ◆ Expanded efforts in eliminating certain discharges to groundwater and permitting others.