

United States Geological Survey

Programs in Delaware

Fact Sheet



The USGS provides maps, reports, and information to help others meet their needs to manage, develop, and protect America's water, energy, mineral, and land resources. We help find natural resources needed to build tomorrow, and supply scientific understanding needed to help minimize or mitigate the effects of natural hazards and environmental damage caused by human activities. The results of our efforts touch the daily lives of almost every American.

National Water-Quality Assessment Program

The effect of human activity on water quality is a very important and visible environmental issue in the Nation. In response to this concern, the U.S. Geological Survey (USGS) is conducting comprehensive assessments of water-quality in 60 large regions across the Nation. The purpose of this program, the National Water-Quality Assessment Program, is to assess current water-quality conditions and to determine the causes of water-quality changes. The Delmarva Peninsula is 1 of the 60 study areas in this program and was 1 of 7 areas chosen for pilot studies. The study is federally funded, but the USGS is working in partnership with a large group of State and Federal agencies that regulate water quality and resource management.

The Delmarva study has provided policymakers and resource managers with important information on the extent of water-quality contamination caused by agricultural and residential land use. The study has shown that high concentrations of nitrate (greater than 10 milligrams per liter), a known hazard to human health, are found in most of the surficial aquifer, including deep parts of the aquifer used for water supply (fig. 1). Pesticides generally are not found in deep parts of the surficial aquifer, but they could migrate to these zones during the next few decades. The Delmarva study also showed that ground water containing high concentrations of nitrate will continue to discharge to streams draining into Chesapeake Bay for at least the next few decades. Accordingly, ground-water quality, as well as surface-water quality, is an important consideration in land-use

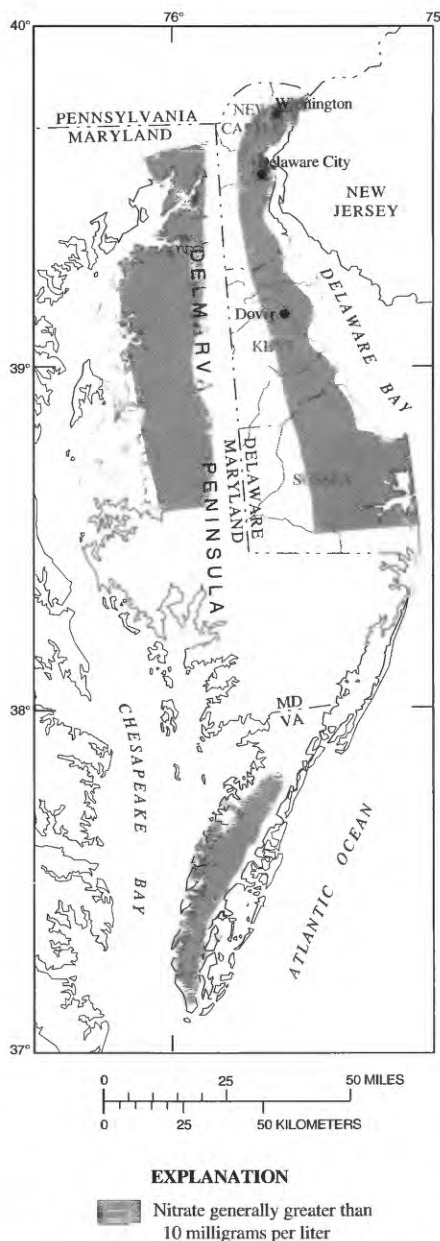


Figure 1. Areas of high concentrations of nitrate in the Delmarva Peninsula.

practices designed to improve water quality in the Chesapeake Bay watershed. The issue is of vital importance to local resource managers and concerned citizens because the States in the Chesa-

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apeake Bay watershed have made a commitment to reduce contamination of the Bay significantly by 2000.

Contributions to the Resource Conservation and Recovery Act Program

Understanding how ground water becomes contaminated is basic to making informed decisions on ways to protect our drinking-water supplies. Contamination of these supplies from leaking hazardous-waste sites can seriously affect human health.

The USGS provides technical assistance to the U.S. Environmental Protection Agency (EPA), Region III, Resource Conservation and Recovery Act Division. This assistance can take the form of computerized simulations of ground-water flow in the Delaware City area (fig. 1). Specific activities include data collection, developing models of ground-water flow by means of a geographic information system, and modeling possible ways to reduce ground-water contamination caused by leaks from hazardous-waste sites in the Delaware City area. These efforts will help managers at the EPA to develop effective and economical plans for reducing contamination in this area and to address the concerns of local citizens.

Hydrologic Hazards

Changes in climatic conditions in Delaware can produce large variations in surface-water supplies. Severe variations (floods and droughts) can adversely affect the agricultural sector of the State's economy, as well as public safety. The USGS actively works to improve the accuracy of predictions of floods and droughts. State, county, and local planning officials use the predictions to develop improved strategies for water management and the design of infrastructure.

The Delaware Department of Transportation (DelDOT), which provided cooperative funds for studies of stream-bed scour at highway bridges and of flood magnitude and frequency, and the Delaware Department of Natural Resources and Environmental Control (DNREC), which cooperated with the USGS in a study of drought frequency, are two of the agencies that rely on the results of USGS studies. Results of these studies are used by the DelDOT to reduce maintenance, repair, and replacement costs for highway bridges and to improve the safety of travelers during floods. The DNREC can use the results of the drought study to improve analyses of water appropriation and use during droughts, thereby allowing appropriate water-supply decisions to be made to ensure that the water needs of the greatest number of people are met to the greatest possible extent. Such contributions to public safety and well-being make USGS reports valuable to the citizens of Delaware.

Data Networks and Water Use

The amount and quality of surface and ground water are of vital importance to the citizens of Delaware. The USGS operates a network of 17 streamflow-gaging stations and 35 water-level-gaging stations at wells to collect the data necessary to evaluate the amount and quality of water in Delaware. The locations of water-quality data-collection sites are shown in figure 2.

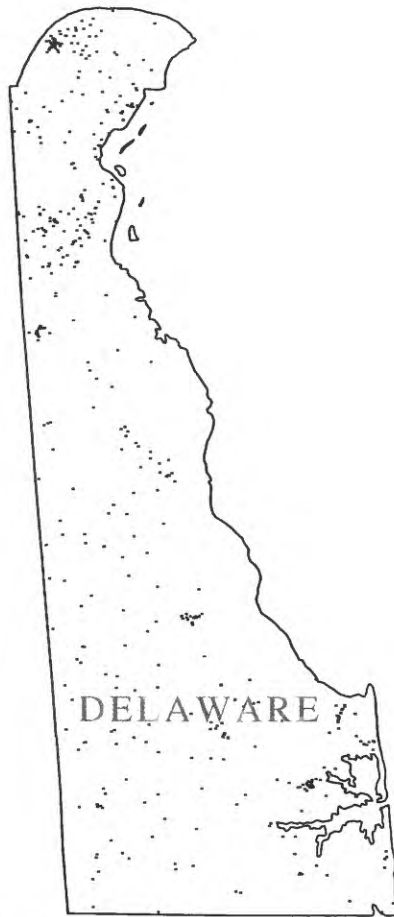


Figure 2. Water-quality data-collection sites in Delaware.

The detection of contamination and the prediction of contaminant movement in ground water are of critical importance in the part of Delaware south of the C & D Canal, where ground water supplies most freshwater needs. Similarly, maintaining adequate supplies of surface water for fisheries and other industries, the support of wildlife, and recreation are important issues. The role of the USGS in collecting these data to address these issues is essential. The USGS systematic data-collection program in Delaware receives cooperative support from the Delaware Geological Survey, the Delaware Department of Natural Resources and Environmental Control, the Delaware Department of Transportation, the U.S. Environmental Protection Agency, the U.S. Army Corps of Engineers, and other organizations. The availability of up-to-date data on water levels and water quality, as well as its use by water-resource managers, to help maintain the quantity and quality of water needed for future use, make the USGS systematic

data-collection program an integral part of water-resources management in Delaware.

National Mapping Program

Among the most popular and versatile products of the USGS are its 1:24,000-scale topographic maps (1 inch on the map represents 2,000 feet on the ground). These maps depict basic natural and cultural features of the landscape, such as lakes and streams, highways and railroads, boundaries, and geographic names. Topographic-contour lines are used to depict the elevation and shape of the terrain. Delaware is covered by 51 maps at this scale, which are useful for civil engineering, land-use planning, natural-resource monitoring, and other technical applications. These maps have long been favorites with the general public for outdoor uses, including hiking, camping, exploring, and back-country fishing expeditions.

The USGS and the State of Delaware have maintained a strong cooperative relation over the past few years. The Delaware Geological Survey, in conjunction with the USGS, funded a 4-year statewide revision of the 1:24,000-scale maps covering Delaware. With that task finished, the USGS will soon complete production of the last of four categories of digital line graph data for the entire State; these maps will be available for use by anyone who has needs for digital spatial data of Delaware.

The USGS has entered into a partnership with the Delaware Department of Transportation to produce color infrared digital aerial photographs that offer an excellent backdrop when used with other computerized data layers to visualize large geographic areas. This will assist transportation planners to predict possible affects of new traffic patterns as a result of road realignment, for example, and to estimate construction costs.

Earth Observation Data

Through its Earth Resources Observation Systems Data Center near Sioux Falls, South Dakota, the USGS distributes a variety of aerial photographs and satellite-image-data products that cover the entire State. Mapping photographs of some sites go back about 40 years. Satellite images dating from 1972 can be used to study changes in regional landscapes.

Cooperative Programs

The USGS cooperates with many local, State, and Federal agencies in Delaware. Cooperators include county and municipal public-works departments, public-health agencies, water and sanitation districts, and Federal agencies, among others. Cooperative activities include water-resources-data collection, interpretive studies of water availability

and water quality, mineral-resource assessments, and mapping. When local and State agencies are involved, activities typically are funded on a matching-funds basis. In addition to the agencies already mentioned, the USGS cooperates with the University of Delaware, the National Oceanic and Atmospheric Administration, and the National Transportation Safety Board.

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Additional earth science information

can be found by accessing the USGS "Home Page" on the World Wide Web at "<http://www.usgs.gov>".

For more information on all USGS reports and products (including maps, images, and computerized data), call 1-800-USA-MAPS.

