

Ongoing U.S. Geological Survey studies that are being conducted to help us better understand water-quality and contamination issues

**Statement for Public Hearing—Water Quality and Contamination  
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*Christopher Schubert, U.S. Geological Survey*

Thank you for the opportunity to participate in a discussion of issues related to water quality and contamination. Today, I would like to take this opportunity to provide an overview of ongoing USGS studies that are being conducted to help us better understand these issues.

During the past year, the USGS has begun several projects focused specifically on addressing key water-quality concerns. Although each is motivated by one or more specific issues, they contribute collectively to improving our system-wide understanding of groundwater quality and its role in sustaining human and environmental needs.

At the Federal level, the USGS has allocated resources to develop a new island-wide groundwater flow model. This model is being developed by a team from our National Water Quality Assessment (or NAWQA) Program as part of its ongoing water-quality assessments of the Nation's principal aquifer systems. One of the main objectives of this study is to assess the vulnerability of the quality of water at aquifer depths relied on for public supply. To help do so, we are in the process of sampling supply wells across Long Island to better understand the ages of water they capture. This will enable us to identify the depths that water affected by human activities has traveled in the aquifer system and, ultimately, better understand the vulnerability of our water supply to contamination introduced at the land surface. You can expect to hear and see more about this multiyear study—one of only a few like it currently being done across the country—in the near future.

The development of this new, island-wide groundwater model by our national program has uniquely positioned the local USGS office to explore opportunities to address other priority concerns not considered as part of this larger study. These concerns include the need for a comprehensive delineation of all of the areas that contribute groundwater recharge to surface waters across Long Island, to aid in nitrogen loading studies under LINAP—the Long Island Nitrogen Action Plan—and other uses. These recharge areas are often referred to as groundwatersheds, and defining them for all of the key streams, ponds, wetlands, and coastal waters across the island is the focus of a project begun in October 2015 in cooperation with the New York State Department of Environmental Conservation. This 2-1/2-year project is delineating the groundwatersheds, and groundwater travel times and outflow rates, to upwards of 1,000 receiving surface waters, including all those in the State's Priority Waterbodies List. Partners providing technical advice to the USGS on the project include Nassau and Suffolk Counties, The Nature Conservancy, and other stakeholders.

Another concern that will be addressed with this new groundwater flow model is the sustainability of public-water supplies derived from the Long Island aquifer system, which is the focus of a project begun in April of this year in cooperation with the DEC. This 5-1/2-year project will involve an ambitious, exploratory drilling program to locate the boundary between fresh and salty groundwater along the coast in the deepest parts of the aquifer system. This information, along with an improved understanding of the subsurface geology derived from this drilling effort, will be used to refine the groundwater model, which then will be used to predict how the aquifer system may respond to a range of future changes in pumping conditions. The study is being coordinated with a number of partners, including the Nassau County Department of Public Works, Suffolk County Water Authority, and other agencies with drilling expertise.

In addition to this modeling effort, we also are addressing concerns regarding widespread contamination from past and present uses of pesticides with a project we began in April of this year in cooperation with the DEC. This project will include up to three years of sampling wells in the shallow groundwater system to better understand the presence and distribution of current and legacy pesticides, pesticide breakdown products, and other constituents associated with agriculture and with residential turf maintenance. Samples are being collected from an existing network of shallow wells in areas of primarily medium-density residential and mixed land use, for which we already have over a decade worth of data. These data will be augmented by additional samples collected from shallow wells in areas of mostly agricultural land use as part of a separate cooperative program between the USGS and Suffolk County Department of Health Services. Together, these results will provide a much more comprehensive understanding of the vulnerability of the aquifer system to pesticide contamination.

Looking ahead, we see additional opportunities for the USGS to provide assistance in addressing the water-quality and contamination issues of the future. One of these would be to leverage the newly developed groundwater flow model to explicitly track nitrogen contamination as it moves through the aquifer system, using modeling techniques developed by the USGS for the similar aquifer system on Cape Cod. This proposed project, designed in consultation with the Peconic Estuary Program, would account for changes in nitrogen loading to the aquifer system through time, and predict when the effects of human actions would reach coastal receiving waters. Another opportunity would be to build on the new pesticide network to sample for a more comprehensive suite of water-quality analyses—including those for pharmaceuticals and other contaminants of emerging concern—to better understand contaminant threats to supply wells on Long Island. This proposed sentinel monitoring project, which has been designed in consultation with the Suffolk County Water Authority and others, would help provide advanced warning of potential contamination before it is drawn downward into the aquifer system and threatens supply wells.

Ultimately, the results of all of these efforts—the data, models, scientific reports, and other products—are tools accessible to all parties to inform wise decision making. If you have any questions or comments about the information I have provided, please do not hesitate to contact us. Thank you!