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The Long Island-New Jersey Coastal Drainages National Water-Quality Assessment (NAWQA) Study Unit

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In 1991, the U.S. Geological Survey (USGS), U.S. Department of the Interior, began its National Water-Quality Assessment (NAWQA) program to (1) document the quality of a large, representative part of the Nation's surface- and ground-water resources, (2) define current trends in the quality of these waters, and (3) identify the major natural and human factors that affect the quality of these waters. In addressing these goals, the program will produce a wealth of information that will be useful to policy makers and managers at Federal, State, and local levels.

The NAWQA program emphasis is on regional-scale water-quality conditions. This program will not diminish the need for smaller scale studies and monitoring programs now being conducted by State, Federal, and local agencies but will provide a framework for many of these activities and a data base of regional and national water-quality conditions that cannot be acquired from small-scale studies.

Studies of 60 hydrologic systems that include parts of most major river basins and aquifer systems in the United States form the building blocks of the NAWQA program. Study units range in size from less than 1,000 mi^2 (square miles) to about 60,000 mi^2 and represent 60 to 70 percent of the Nation's water use and population served by public water supply. The first set of 20 study-unit investigations was begun in 1991; the second set of 20 is starting in 1994, and the third set of 20 is scheduled to begin in 1997. The Long Island-New Jersey (LINJ) study unit was selected as one of 20 study units to begin assessment activities in 1994. This study will be conducted from the West Trenton, N.J., office of the USGS.

The LINJ study unit covers about 6,000 mi^2 of New York and New Jersey. It includes all of Long Island (1,400 mi^2), much of the New Jersey Coastal Plain (2,400 mi^2), and the Passaic (950 mi^2), Raritan (1,105 mi^2), and Hackensack (202 mi^2) River Basins in northern New Jersey and southern New York.

In 1990, the population of the LINJ study was more than 12.5 million, with the highest density on western Long Island and in northeastern New Jersey. In 1973, about 28 percent of the study unit was developed for residential and urban use, about 7 percent was devoted to industrial and commercial use, and 14 percent was agricultural; 34 percent was forested, 9 percent was wetland, and 8 percent was surface-water bodies and miscellaneous land use.

Major water uses in the study unit include public supply, industrial processes and cooling, mining, power production, and crop irrigation. In 1985, 469 million gallons per day (Mgal/d) was withdrawn from Long Island's aquifer systems to serve nearly 3 million people in Nassau and Suffolk Counties. In 1985, about 73 percent of freshwater used in New Jersey was surface water, and about 27 percent was ground water. About 600 Mgal/d of freshwater was withdrawn north of the Fall Line in 1985 for public supply; of that amount, about 77 percent was from surface water and about 23 percent was ground water. South of the Fall Line, about 354 Mgal/d of freshwater was withdrawn for public supply in 1985; of that amount, about 71percent was ground water and about 29 percent was surface water.

At least two regional water-quality issues remain high priority State and local interests: the effects of point-source discharges and nonpoint-source runoff to streams and, ultimately, the New York Bight and Barnegat Bay; and the vulnerability of public and domestic ground-water supplies to contamination from urban, industrial, and agricultural sources. Nutrients and toxic substances are of great concern in relation to both these issues, primarily because our understanding of the many processes governing the presence, distribution, fate and biological effects of these contaminants is limited.

The large population, extensive urban and industrial development, and, in some areas, agricultural activities, are the main cause of many water-quality problems in the study area. The NAWQA program can provide both data and insight that can be used to formulate potential solutions to these problems. Efforts will focus on gaps in available data and development of a comprehensive water-quality data base. The following issues are perceived to be the highest priorities among State and local organizations in the LINJ study unit:

- o Effects of urban runoff and, to a lesser degree, agricultural runoff on water quality (nutrients, sediment, metals, and pesticides and other synthetic organic compounds), aquatic habitat, and biodiversity of receiving streams, lakes, reservoirs, and estuaries.
- o Effects of urban and agricultural land-use practices on shallow-ground-water quality, especially pesticides, nutrients, and volatile organic compounds.
- o Surface- and ground-water contamination by toxic synthetic organic compounds and metals resulting from decades of industrial activity, waste disposal, and spills.
- o Effects of wastewater-treatment discharges on concentrations of nutrients and dissolved oxygen in streams and on stream biota.
- o Effects of acidic atmospheric deposition on poorly buffered streams and aquifers.
- o Effects of naturally occurring radioactivity in ground water.
- o Saltwater intrusion into coastal aquifers, induced largely by ground-water pumpage.

Communication and coordination between the USGS and water-management agencies and other related scientific organizations are essential to the NAWQA program. Study-unit liaison committees consisting of representatives from Federal, State, and local agencies, universities, and the private sector who have water-resources responsibilities have proven effective in this process. The liaison committee for the LINJ study unit will hold its first meeting in May 1994. Specific activities of the liaison committee include–

- o Exchange of information on and prioritization of water-quality issues.
- o Identification of sources of water-quality data and other information--for example, land use, demographics, soils, land-management practices, and pesticide use.
- o Assistance in design and scope of the study-unit investigation.
- o Review of planning activities, findings, and interpretations, including reports.

Information on technical reports and hydrologic data related to the NAWQA program can be obtained from the LINJ NAWQA Project Chief, Suite 206, 810 Bear Tavern Road, West Trenton, New Jersey 08628.