

NUTRIENT REDUCTION



Through the efforts of the Long Island Sound Study (LISS), measurable results are being achieved in reducing nitrogen discharges to the Long Island Sound—a water body where sewage treatment plants discharge more than a billion gallons of nutrient-rich effluent. Large inputs of nutrients such as nitrogen have over-fertilized significant areas of the Sound, fueling the excessive growth of marine plants that deplete the water's oxygen. These low dissolved oxygen levels—a condition called hypoxia—degrade the habitat for fish and shellfish.

THE NATIONAL ESTUARY PROGRAM IN ACTION

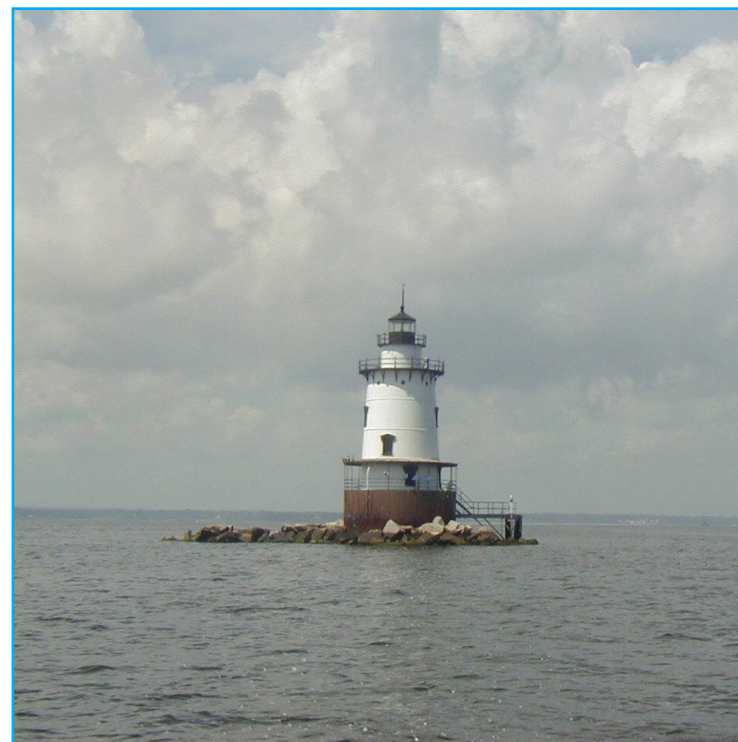
Long Island Sound Study

To address the problem, LISS provides progressive leadership that has resulted in investments to upgrade wastewater treatment plants to treat nitrogen, implement watershed protection measures aimed at reducing polluted runoff, and protect and restore wetlands and other natural habitats.

To gain a better understanding of the relationship between nitrogen discharges to the Sound and dissolved oxygen levels, LISS supported research, monitoring, and the development of mathematical water circulation and water quality models that helped provided a scientific ba-

sis for establishing a nitrogen reduction target of 58.5 percent for sources that include sewage treatment plants, storm-water runoff, and atmospheric deposition. Connecticut and New York incorporated the target into a Total Maximum Daily Load (TMDL) for nitrogen to help meet water quality standards. The states have also revised their water quality standards for dissolved oxygen in marine waters to reflect EPA criteria for protection of living resources in marine waters and created new provisions for pollutant trading for cost-effective attainment of water quality standards. Implementation of the TMDL is mov-

ing forward, with upgrades at wastewater treatment plants decreasing the amount of nitrogen discharged into Long Island Sound by Connecticut and New York's 106 sewage treatment plants. By 2008, daily discharges had decreased by 50,000 pounds compared to year 1994 baseline levels. These reductions are partly due to innovative strategies. Connecticut's Nitrogen Credit Exchange program, which won a 2007 EPA Blue Ribbon Water Quality Trading Award, sold \$10.5 million worth of credits in five years. In 2007, 34 percent of the 79 participating sewage treatment plants had reduced nitrogen output below



assigned permit limits, making them eligible to sell a total of \$2.07 million in nitrogen credits. This innovative program is expected to save the state between \$200 million and \$400 million in wastewater treatment construction costs over the next decade. In New York, “bubble permits” now provide flexibility to dischargers on how to attain per-

mit limits. This concept allows sewage treatment plants within each management zone to meet their “bubble” limit by upgrading some, but not all, of the plants. This approach is expected to save New York City up to \$660 million in sewage treatment plant upgrade costs and is now being applied in Westchester County.

Watershed management is another valuable approach to reducing nitrogen discharge. For example, a stewardship action plan, developed for the Nissequogue River watershed in the Town of Smithtown on Long Island, New York, contains objectives such as reducing the impacts of stormwater pollution, investigating groundwater

quality and tracking of potential impacts of contaminants, and reducing the impacts of nitrogen overloading on water quality.

Local watershed associations and municipalities throughout the Sound are developing programs to reduce polluted runoff, from educating homeowners about ways to reduce the leaching of nutrients into streams from lawn fertilizer applications to installing filters in coastal storm drains to keep sediment, debris, harmful bacteria, oil, and toxic metals from entering the Sound.

The states of Massachusetts, Vermont, and New Hampshire are also working with the Connecticut River Nitrogen Work Group to discuss reducing nitrogen loading from the Connecticut River watershed to the Long Island Sound. These states

are participating in the process to revise the Long Island Sound TMDL by evaluating options for additional nitrogen reduction scenarios.

Visit **www.longislandsound-study.net** to learn more about this and other LISS efforts.

EPA's National Estuary Program (NEP) is a unique and successful coastal watershed-based program established in 1987 under the Clean Water Act Amendments. The NEP involves the public and collaborates with partners to protect, restore, and maintain the water quality and ecological integrity of 28 estuaries of national significance located in 18 coastal states and Puerto Rico.

For more information about the NEP go to www.epa.gov/owow/estuaries.

