



A Sound Review

I hope everyone had a great summer and was able to experience all of the great natural features New York State has to offer. There are lakes, rivers, streams, mountains, trails as well as man-made attractions. This edition is dedicated to one of our "natural" attractions – Long Island Sound.

Long Island Sound History

The first European to record the existence of Long Island Sound was the Dutch navigator Adriaen Block, who entered the Sound from the East River in 1614. The Sound was known as the Devil's Belt in colonial times and the reefs that run across the Sound were known as Devil's Stepping Stones. Nine drainage basins make up the Sound, the largest by far being the Connecticut River Basin.

Ferries have long provided transportation across the Sound between Port Jefferson, NY and Bridgeport, CT, and Orient Point, NY and New London, CT. The Sound has always been rich in both commercial and recreational fishing. In the western part of the Sound during the late 1980s, there was a dramatic series of fish kills that were later attributed to low dissolved oxygen levels in the bottom waters of the Sound. This condition, known as hypoxia, is most severe in the summer when the waters of Long Island Sound heat up and form a pycnocline – a separation of water into layers that acts like a barrier preventing oxygen in the surface waters from mixing with the bottom waters. At the same time, nutrients, most notably nitrogen, fuel the growth of algae and bacteria feeding on algae that sinks to the bottom, which also uses up any available oxygen.

As development over the years increased in the drainage basins of the Sound, the nitrogen load increased accordingly until problems became severe. In 1990, the Long Island Sound Study proposed a phased plan to improve oxygen levels by reducing nitrogen loads. Nitrogen loads from Wastewater Treatment Plants (WWTPs) were frozen at 1994 levels and, in 1998, the states of New York and Connecticut along with the USEPA adopted a target of reducing nitrogen levels from WWTPs by 58.5 percent by the year 2014. Since that time, 36 of the region's 105 WWTPs have been upgraded to provide biological removal of nitrogen.

What's Being Done

In this issue, you will read about some of the projects completed, those just started, others in the pilot phase and other plans. To date, the WWTP upgrades have reduced nitrogen discharges by 47,000 pounds per day or about 20 percent of the target. While this has reduced the area and duration of hypoxia in recent years, there have been spikes as in 2003. Even with all of the upgrades completed, some feel the major factor in determining the area and duration of hypoxia is due to weather and geographical features such as inlets and embayments.

In addition, although WWTPs account for 40 percent of the nitrogen, nonpoint sources, atmospheric, sediment, etc., also provide significant sources of nitrogen. Other sources of pollution such as toxic

contaminants and pathogens affect the Sound. These sources cause impacts to aquatic life and contribute to beach closings. Although fin fish numbers and variety have increased, the oyster and lobster population, once a more than \$40-million-a-year industry, has almost disappeared due to shell parasite and diseases, respectively.

The investment for the upgrade of the WWTPs once thought to be a few hundred million, will now cost several billion dollars with \$617 million already spent by 2007. However, upgrades of WWTPs are not the only answer. There are articles in this issue concerning phase II stormwater management and nonpoint source reduction. In addition, there have been habitat restoration projects that have restored almost 600 acres or almost 30 percent of the LISS goal. However, after the WWTP upgrades, there is still much work to be done in the area of nonpoint pollution and atmospheric deposition. One of the most effective ways to counter nonpoint pollution from runoff is to provide more permeable surfaces.

What's Ahead

The Clean Water Bond Act has provided some of the funding for nitrogen reduction projects, but additional funds are needed. The recent addition of money to the Environmental Protection Fund (EPF) will help, but more is required. It is hoped that the state legislature will address the Bigger Better Bottle Bill and set aside these funds in the EPF.

Recently, a study was conducted of residents who live within 15 miles of LIS. The study showed that while people care about the environment, they are not fully informed about the primary causes of pollution and how they can affect change in water quality in their everyday behavior. Only 17 percent knew that an excess amount of nitrogen can harm water quality in LIS. In addition, only 20 percent knew that a watershed means a land area that drains into a specific body of water.

It seems clear that although a lot has been accomplished to treat nitrogen in WWTPs, there is a way to go. In addition, it is incumbent upon all of us, even though there has been consistent press on the matter, to continue to educate the public and our officials about all the factors, and to address the different areas affecting Long Island Sound.

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