

Suffolk County North Shore Embayments Watershed Management Plan



EEA Inc.

PUBLIC SUMMARY DOCUMENT

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Purpose

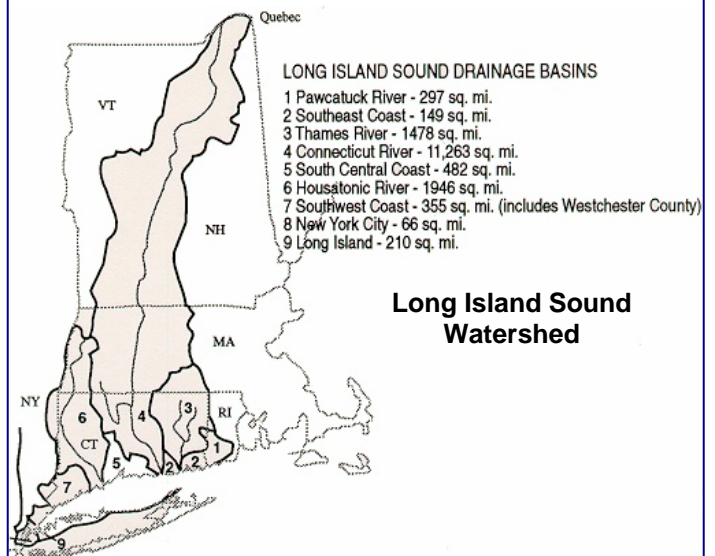
The Suffolk County North Shore Embayments Watershed Management Plan (herein called the “Plan”) for Long Island Sound was prepared for Suffolk County, NY by consultants Nelson, Pope & Voorhis, LLC and EEA, Inc. The Plan was created after the adoption of a Nitrogen Total Maximum Daily Load (TMDL) document developed by the Long Island Sound Study (LISS) and its partners for Nitrogen pollution entering the Sound. The Plan is a comprehensive document that analyzes the current information available to gain an understanding of the watershed and its influence on the Sound with respect to:

- * Water quality of embayments (harbors and bays), streams and groundwater;
- * Land use and Nitrogen pollution loading from point (e.g. sewage treatment plants) and nonpoint sources (e.g. lawn fertilization, pet waste, etc.); and
- * Natural resources.

Reductions in Nitrogen loads are necessary to curtail the hypoxia (low dissolved oxygen) problems which occur in the Sound each summer. The excess Nitrogen fuels algal blooms that deplete oxygen during transpiration and die off and can lead to fish kills. The focus of the Plan is to provide recommendations which will achieve the Nitrogen reductions required by the TMDL. The Plan consists of chapters which characterize existing information and data, map and analyze pollutant inputs, and provide recommendations for improving water quality within the Sound by meeting the goal of reducing Nitrogen pollution from Suffolk County.

Background

Long Island Sound’s watershed is more than 16,000 square miles in size and extends far beyond the boundaries of those states that border the Sound (New York, Connecticut and Rhode Island). In fact, the drainage basin areas extend as far away as Canada. The north shore of Long Island accounts for only **1.3%** of the Sound’s total watershed area.



Long Island Sound Watershed

The Sound’s drainage areas are divided into 12 Management Zones to assist in implementation of the Nitrogen TMDL. The north shore of Suffolk County is **Management Zone 11**.

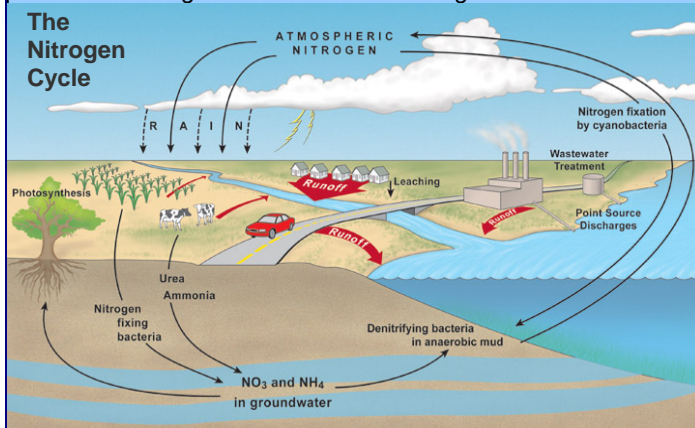


Background (cont.)

The LISS partnership was created in 1985 and the Sound was designated as an “Estuary of National Significance” in 1987. In 2001, the Nitrogen TMDL was adopted and mandated reductions in Nitrogen pollution from human sources to the Sound by 58.5% by 2014. To accomplish this, the TMDL states that Suffolk County is responsible for reducing its Nitrogen contribution by 205 tons per year; 81% of the total (166 tons/year) from sewage treatment plants and the remainder (19% or about 39 tons/year) from nonpoint sources.

How does Nitrogen reach the Long Island Sound?

Through stormwater runoff and groundwater.



Source: Florida Sea Grant

For more technical information regarding nonpoint source pollution impacts, Nitrogen and human alteration of the natural cycle, visit the Ecological Society of America's (ESA's) website at www.esa.org. The ESA's recently established series, *Issues in Ecology*, is an especially useful resource for citizens, resource managers, policymakers, and others designing and implementing watershed approaches to environmental management. The series is available at: www.esa.org/science_resources/issues.php.

Measuring Pollutant Loads

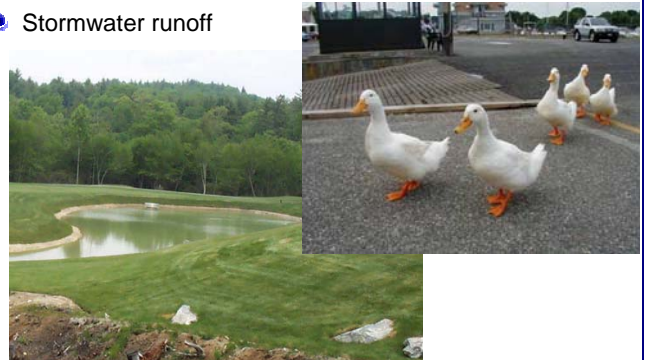
Quantifying the required reductions from point sources is straightforward in comparison to measuring reductions from nonpoint sources (which up until this time had not been quantified for Suffolk County).

Point sources in Suffolk County are limited to the existing STPs with discharge pipes to surface waters: e.g. Port Jefferson (including flow from SUNY Stony Brook), Kings Park, Huntington, Northport and Greenport.



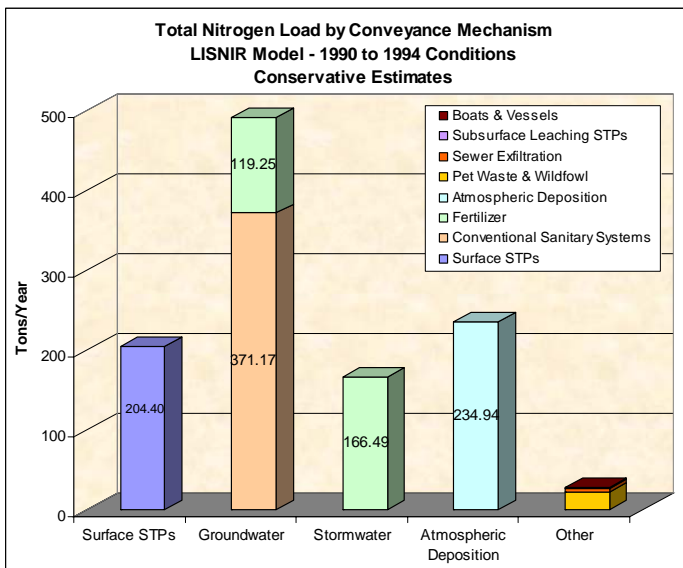
Nonpoint source Nitrogen is discrete and generated by a vast array of sources, including:

- ④ Individual sanitary systems (homes and businesses)
- ④ Fertilizer application (lawns/gardens, golf courses, farms and ballfields)
- ④ Animal waste (pets and waterbirds)
- ④ Atmospheric deposition (smokestacks, trucks & car exhaust)
- ④ Boats
- ④ Stormwater runoff

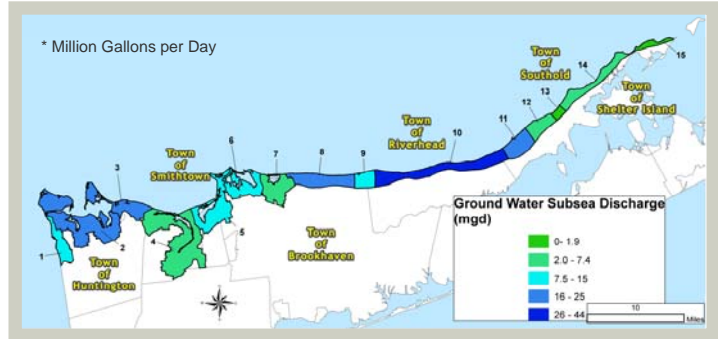


To understand how much Nitrogen was entering the Sound, NP&V first identified all potential sources of Nitrogen and then for each source, quantified the quantity of the expected Nitrogen load based on Geographic Information System (GIS) data, referenced sources and other factors. The Long Island Sound Nitrogen Influx Reduction (LISNIR) Model was the product of this effort. With the development of a mass-balance model quantifying Nitrogen from each source, a management plan could be designed to prioritize implementation measures and concentrate efforts where the most effective pollutant reductions could be made.

Based on the LISNIR model, it was determined that the estimated volume of Nitrogen from nonpoint sources in Suffolk County is much greater than anticipated in the TMDL. In fact, the nonpoint sources account for 72-82% of the total Nitrogen load to the Sound under 1990 conditions. The model allows scientists and planners to identify where the largest sources of Nitrogen come from and will help to determine where efforts should be concentrated to reduce the amount of Nitrogen entering the Sound. Perhaps most importantly, the model will allow the County to track the progress and report measurable benefits as the Plan is implemented. This is an important element which will assist in obtaining and maintaining federal funding for implementation of the Plan.



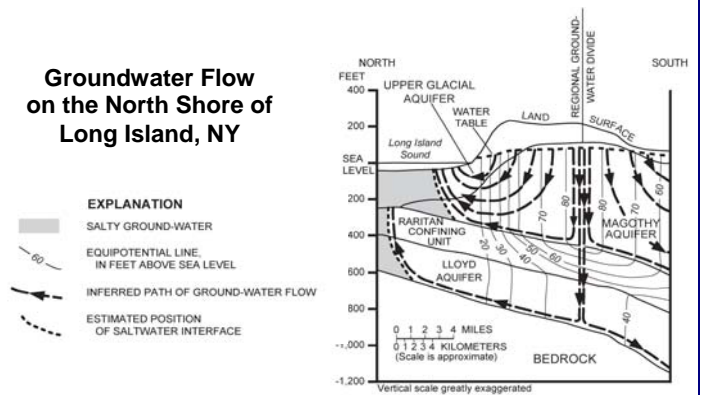
Suffolk County Groundwater Discharge Sub-Areas and Estimated Daily Groundwater Discharge Volume*



Studies published by the USGS and Suffolk County have shown that significant amounts of groundwater enter Long Island Sound via subsurface outflow.

Because nonpoint sources actually account for a greater portion of the total than originally estimated, future efforts in reducing and controlling these sources will need to be dramatically increased. Through the course of the study, NP&V identified all point and nonpoint sources of Nitrogen and estimated Nitrogen load quantities for Management Zone 11. Long Island is unique in that a vast amount of Nitrogen is conveyed through the subsurface discharge of groundwater. Long Island's sandy soils allow much of the rainfall to "recharge" and travel below ground through aquifers until the groundwater outflows into the Sound. The study area for the Plan was based on an inland distance equivalent to the 25 year travel time for groundwater to discharge to the harbors, bays or the Sound.

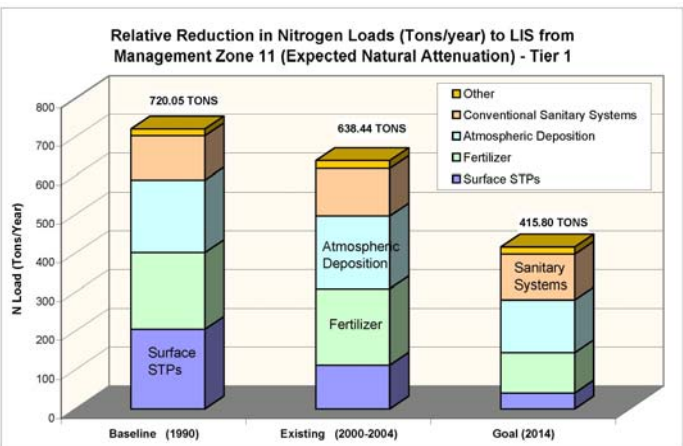
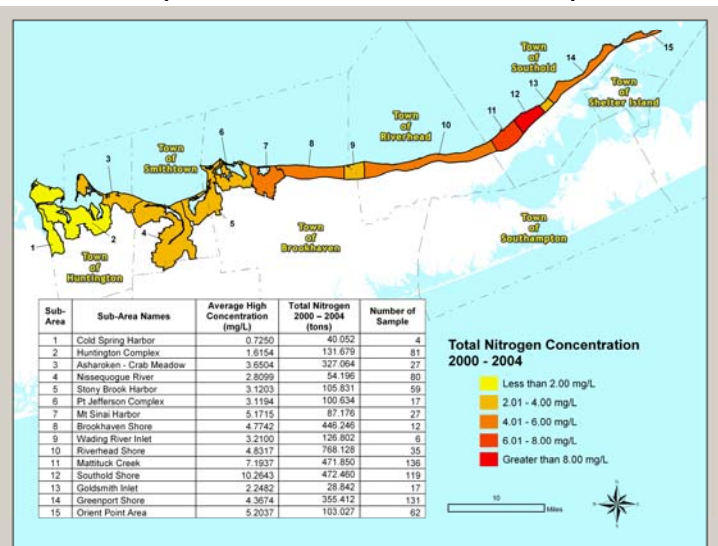
Groundwater Flow on the North Shore of Long Island, NY



Source: Scorca & Monti, 2001

The private well dataset maintained by Suffolk County Department of Health Services (SCDHS) indicates that water quality samples taken from private wells in the eastern portion of the County have the highest average concentrations of Total Nitrogen.

Average Groundwater Nitrogen Concentrations (Based on SCDHS Private Well Data)



Since colonial times, Nitrogen from human sources has been introduced into the groundwater, where it can take decades for pollutants to travel from the land's surface to the Sound. The amount of Nitrogen in groundwater is largely a function of land use and population (sewered vs. non-sewered areas and trends in fertilizer use). Lawns and farms, for example, result in a relatively high volume of Nitrogen loading due to the use of Nitrogen-based fertilizers. Groundwater models illustrate that Nitrogen levels are highest in the eastern portion of the County, where agriculture has traditionally dominated the landscape. In order to meet the goals of the TMDL, public education and outreach are necessary to help the citizens of Suffolk County understand the consequences of Nitrogen pollution and provide them with tools to reduce their individual contributions.

Additionally, the reduction of stormwater has been a focus throughout NY for the past decade. The Suffolk County Comprehensive Stormwater Management Program has been instrumental in conducting public outreach as well as implementing measures to reduce and remove sources of stormwater pollution from County roads and facilities. Stormwater reduction initiatives and programs will continue to assist in meeting the goals for Nitrogen reduction by both reducing and filtering runoff before it reaches the Sound.

While great strides have been made toward improving water quality in the Sound, there is more to be done.

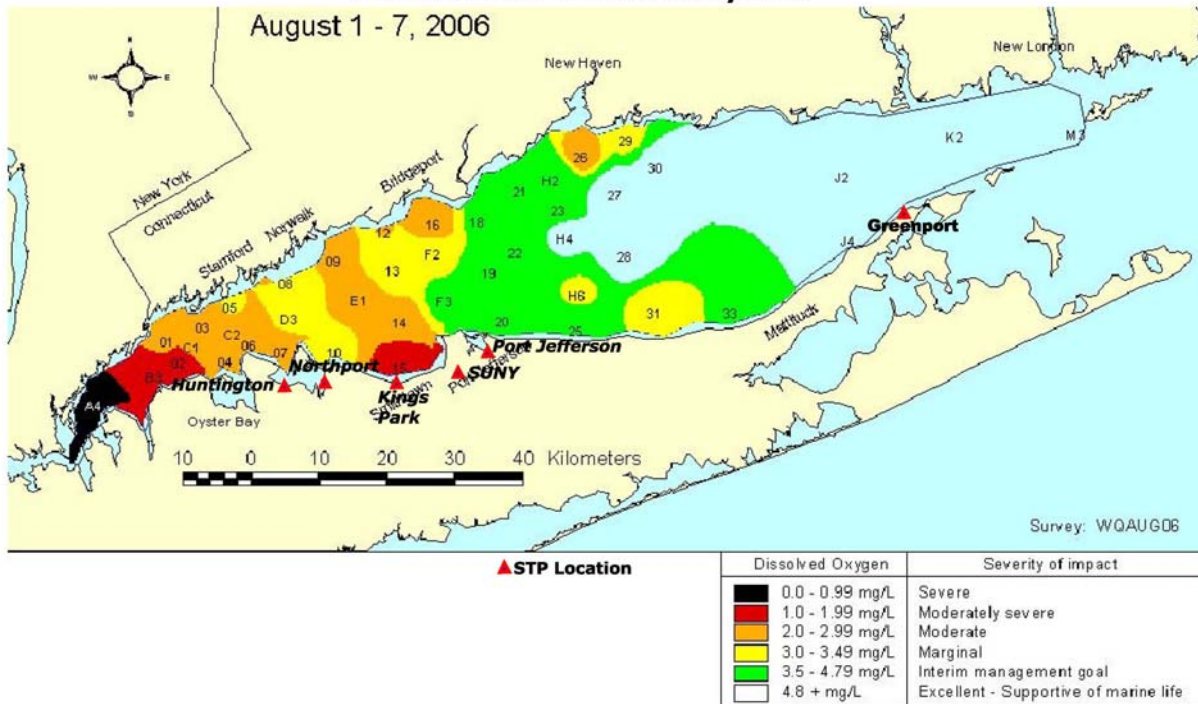
Accomplishments

In Suffolk County, major reductions in Nitrogen loading from Sewage Treatment Plants (STPs) have already been accomplished. The illustration below depicts the locations of all six STPs on the north shore of Suffolk County with pipes that discharge Nitrogen in the form of treated effluent into surface waters. Table 1 characterizes the reductions, in tons of Nitrogen, that have already taken place from STPs in the County, as well as the future goals for each plant.

Table 1
STP Waste Load Allocation Summary
(Tons/Year)

Sewage Treatment Plant	1990 - 1993 (Baseline)	2000 - 2004 (Existing)	2014 (Goal)
SUNY	37.96	14.24	7.30
Port Jefferson	36.87	19.16	7.12
Huntington	81.76	51.10	15.88
Kings Park	24.46	8.40	4.75
Northport	9.49	9.49	1.83
Greenport (Village)	13.87	9.43	2.01
Total	204.40	111.81	38.87

Dissolved Oxygen in Long Island Sound Bottom Waters and Location of Suffolk County STPs



Implementation of General Recommendations

The general recommendations of the Plan are designed to reduce Nitrogen and benefit the overall area of Management Zone 11. A summary of these general recommendations is provided below:

1. Reduce stormwater runoff to the embayments and Long Island Sound through surface detention/treatment and subsurface containment.
2. Reduce groundwater Nitrogen concentrations by:
 - Ⓧ Evaluating requiring larger lot sizes for single family development;
 - Ⓧ Expanding STP districts in densely populated and low-lying areas;
 - Ⓧ Implementing strict Nitrogen limits for new STPs;
 - Ⓧ Evaluating reducing the lot density criteria in the groundwater contributing areas;
 - Ⓧ Reducing the quantity of fertilizer applied to lawns and agricultural lands; and
 - Ⓧ Increasing public education regarding impact of fertilization.
3. Improve surface water quality through such measures as:
 - Ⓧ Increasing the shellfish population in harbors, such as by implementing an aquaculture program;
 - Ⓧ Establishing and enforcing “No Discharge Zones” for boats within harbors and bays;
 - Ⓧ Providing more pump-out facilities for boaters; and
 - Ⓧ Discouraging dumping of yard debris and the use of leaf blowers that push yard clippings into the street, wetlands or directly into waterways.
4. Preserve priority open space areas.
5. Establish a public education program regarding pet waste; establish pet waste stations.



Shore Road, Mt. Sinai Harbor



Port Jefferson Harbor, LIPA Plant and STP



Photo of “SPAT Shack” in Town of Southold

6. Discourage duck feeding at ponds and stream tributaries to the Sound (through public education).
7. Provide funding to continue water quality monitoring and track progress of Plan implementation.



To meet the goals of the LISS, the Plan also presents an additional 31 recommendations which are tailored to each smaller contributing watershed (sub-area) within Zone 11, allowing municipalities and jurisdictions responsible for implementation to determine appropriate actions.

What Can You Do?

The health of Suffolk County's north shore harbors, bays and the Long Island Sound are vital to all of us. You can be a part of implementing the Plan to reduce Nitrogen pollution to the Sound. Implementation of the recommendations will require extensive coordination and cooperation between the public and many governmental bodies including the state, county, townships, and local villages.

Here are a few simple things you can do to help restore and protect Long Island Sound.

- ④ Learn how to practice environmentally-sound gardening and lawn care. Reduce your use of fertilizers and consider using reduced nitrogen and organic nitrogen varieties of fertilizer – Cornell Cooperative recommends limiting application to one pound of Nitrogen per 1,000 square feet of lawn, twice a year. Never apply fertilizer to bare ground or before a rain event.
- ④ Maintain your septic system by having it pumped out regularly. The LISS recommends pumping every three to five years (or more frequently if your home is located near a wetland or in a high groundwater area).
- ④ Scoop up pet waste and dispose of it in the trash or toilet.
- ④ Do not dump yard debris into or near wetlands or waterways and do not use leaf blowers to direct leaves into stormwater drains or toward surface waters.
- ④ Install a rain garden in your yard to capture and utilize runoff from your roof, driveway and other paved areas on your property.
- ④ Boaters – Utilize your holding tank and take advantage of pump-out boats or other marina facilities. Visit www.soundkeeper.org or contact your local marina for pump-out locations.
- ④ Use public transportation to reduce vehicle emissions (which add nitrogen oxides to the air and ultimately end up in our water).



View the full Suffolk County North Shore Embayments Watershed Management Plan at:
www.co.suffolk.ny.us/

For more information, contact the Suffolk County Office of Ecology at (631) 852-5750 or visit these websites:

Long Island Sound Study -
www.longislandsoundstudy.net

Suffolk County Stormwater Management Program -
www.co.suffolk.ny.us/stormwater

Cornell Cooperative Extension of Suffolk County -
<http://counties.cce.cornell.edu/suffolk>



Long Island Sound Study

A Partnership to Restore and Protect the Sound