A Newsletter from the Connecticut Department of Energy & Environmental Protection
Exploring Long Island Sound - Issues and Opportunities

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Welcome to the 50th Issue of *Sound Outlook*

The October 2015 issue of *Sound Outlook* marks the publication's 50th edition. When Sound Outlook was launched back in June of 1999, our intent was to bring readers "the latest on current projects, events, and information, as well as tips on how we can all help protect the health of the Sound." We hope we've succeeded in doing that and more.

To celebrate 50 issues, this edition takes a look back at that very first issue to see how far we've come over the past 16 years in meeting our initial intent to better protect Long Island Sound. We'll review our efforts to reduce nitrogen and plan on a watershed basis, and we'll report on updates to Connecticut's coastal public access guide.

This issue also includes subjects that weren't even anticipated in the first issue, including our ongoing Climate Change Update column and an article about the possible establishment of a National Estuarine Research Reserve for Long Island Sound.

So, thank you to all of our readers for supporting 50 issues of *Sound Outlook*. Get ready to party like it's 1999!

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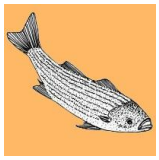
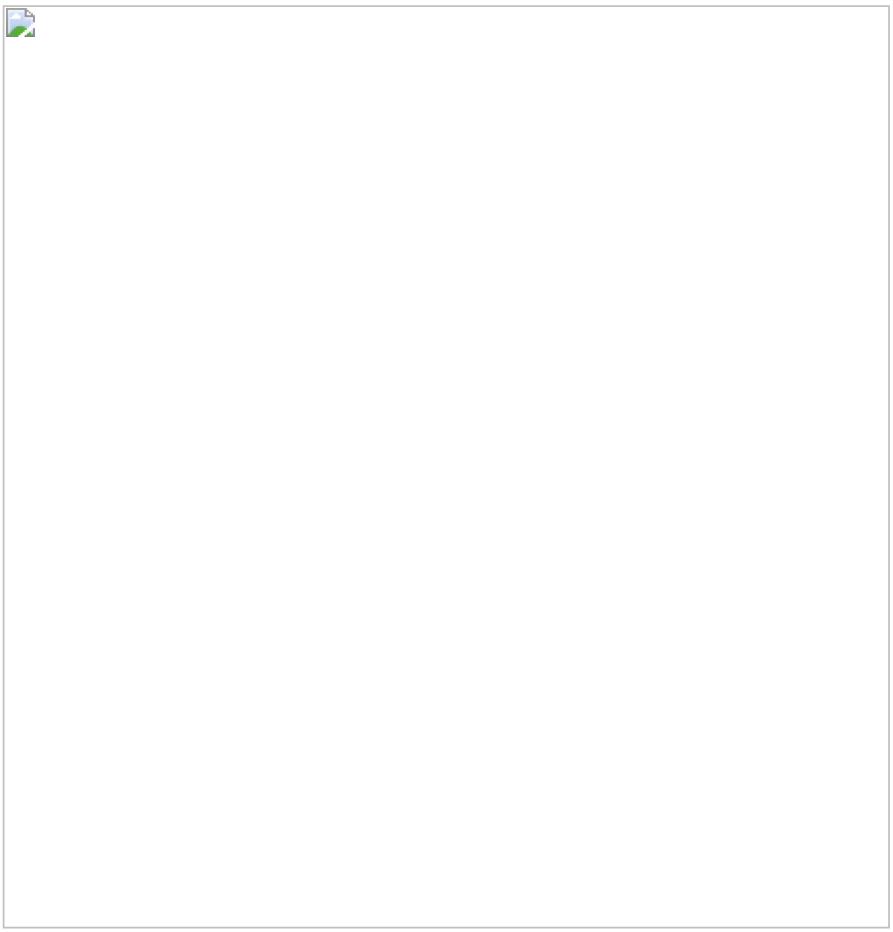


Is the Sound Too Rich? Nitrogen in Long Island Sound: Too Much of a Good Thing is Bad

The first issue of *Sound Outlook* debuted a column that asked, "How's the Water?" to report on water quality conditions and identify information sources about water quality. That's because water quality in Long Island Sound has long been a major concern, especially as it relates to swimming and fishing. DEP had already been asking "How's the Water" long before that June 1999 issue was released.

But in an estuary like Long Island Sound, there is no simple "good" or "bad" answer to the question, "How's the water?" A better response might be, "It's complicated." But we can look at water quality monitoring data to see how the water is in the Sound now, and determine if has been better or worse in the past.

About 30 years ago, the states of Connecticut and New York took a look at the Sound from a biochemical water quality point of view. There were growing observations of fish kills, eel grass die-offs, and tidal marsh destruction occurring in and around the Sound and people wondered if something in the water was causing these problems. So the two states conducted an initial 3-year study [the beginnings of the Long Island Sound Study (LISS)] to look at the physical and chemical properties of water that are essential to healthy plants, animals, and people living in and around Long Island Sound.



Hypoxia Diagram
Source: Long Island Sound Study

One of the primary elements needed for aquatic life is the amount of free oxygen dissolved (or mixed) in the water. Just as people need oxygen in the air to breathe, aquatic organisms need dissolved oxygen (DO) in the water. A healthy level (or water quality standard) for DO in the Sound is at or above 5 parts per million (ppm), or 0.00005%. The study conducted in 1987-1989 found that from mid- to late-summer, DO in the bottom waters of Long Island Sound dropped to

Sound Tips :

Nitrogen Reduction Remains a Top Priority

In the 16 years since the first issue of *Sound Outlook* was published, DEEP has made great strides in reducing the amount of nitrogen that gets discharged to Long Island Sound.

Although we have accomplished a great deal, we must remain vigilant in reducing nitrogen discharges to the Sound every chance we get.

With that in mind, here are a few tips on stopping excess nitrogen in its tracks before it makes its way to Long Island Sound:

- Consider installing a rain garden to treat rainwater before it runs off of your property. The plants in the garden will take-up the nitrogen in the rainwater as fertilizer, reducing the load in whatever excess rain runs off.

- Apply fertilizers no more than twice a year: after plants start to "green-up" in the spring, and no later than mid-October. You're wasting product (and money) if you apply too early or too late in the year--the plants aren't ready to eat yet, or they're shutting down for the winter. If plants can't eat, the fertilizer gets washed away into streams, rivers, and Long Island Sound.

- Consider the use of timed-release fertilizer on lawns and gardens.

- And rather than depending on the fertilizer bag, you should

life-threatening low levels for aquatic plants and animals, a condition known as hypoxia. It was found that hypoxia in large bodies of water occurs when a natural condition called stratification (i.e., layers of fresh water riding over salt water, and warm water riding over cold water) is coupled with the addition of nutrients, such as nitrogen-containing compounds, into the waters.

When the waters of the Sound get too much of a good thing, they become nutrient rich. This nutrient enrichment spurs algae to grow so fast and in such great numbers in the surface waters that aquatic animals can't eat it all. The excess algae floating in the water blocks out the sunlight from reaching the bottom-anchored seaweeds that need sunlight in the near-shore waters to help them live. In addition to the lack of sunlight reaching the bottom waters of the Sound, all the excess algae and fecal matter of the plankton eating the algae settle down through the bottom waters where they decay, using up the dissolved oxygen and leaving little or no DO for fish and shellfish to survive. The "pycnocline" layer that is formed between lower density surface water and higher density water that sinks to the bottom prevents oxygen from being able to flow to bottom waters.

This may be an over-simplified explanation of a complex system that is intricately interconnected (it's complicated, remember?). But since most life forms need certain basic elements such as oxygen and nitrogen, hypoxia is the most likely explanation for the fish kills observed in Long Island Sound in the late 1980's and early 1990's.

As the initial 3-year study evolved into the LISS, research conducted by the LISS partners determined that hypoxia occurs as a result of certain natural biological, chemical, and physical conditions occurring in concert, and has probably always naturally occurred in Long Island Sound. But the LISS also found that hypoxia has worsened over time as a result of increased human activity. Over the last 200 years, human activity has added extra nitrogen to the Sound, and DO levels in some bottom waters in the Sound today fall well below natural conditions.

In 1990, Connecticut and New York adopted a Nitrogen Reduction Strategy (NRS) and began working with the 106 municipal sewage treatment plants in the Long Island Sound watershed to reduce the amount of human-caused nitrogen compounds being discharged into the Sound. The first step (Phase I) called for a freeze on nitrogen discharges ("No Net Increase of Nitrogen") from 33 coastal municipal sewage treatment plants (STPs). In 1994 the LISS partners committed to Phase II of the NRS which implemented low-cost retrofits and other process modifications to reduce the nitrogen levels in the discharges at 18 of the coastal STPs. By 1998, Phase III Actions for Hypoxia Management were adopted that established eleven management zones around the Sound and set specific nitrogen reduction targets for each of the zones. Thus, DEP had made great strides in improving water quality before the June 1999 debut of *Sound Outlook*.

Sewage treatment plant discharges were found to be a major source of nutrients getting into the Sound, but nonpoint source pollution and stormwater runoff also contribute significantly to the nitrogen load. So in 2000, Connecticut and New York developed a Total Maximum Daily Load (TMDL) Analysis which set a goal to reduce nitrogen discharges from not only point sources like STPs (known as waste load allocations) but to also reduce nonpoint source contributions (known as load allocations). Point source loads of nitrogen were to be reduced by 60% of 1990 levels, and nonpoint source contributions of nitrogen within the Long Island Sound watershed would be reduced by 10%.

Today, Connecticut has met its goals for point source nitrogen discharges to the Sound and New York is on track to meet their nitrogen reduction goals by 2017. This was accomplished, in part, through the development of Connecticut's statewide Nitrogen General Permit and implemented a Nitrogen Credit Exchange

check your soil to determine what type of fertilizer and how much your lawn really needs. Contact the UConn Soil Testing Lab to perform a soil test--it might help you use less fertilizer and actually save some money.

- Give yourself a mowing break: reduce the amount of lawn coverage in your yard! Consider replacing unused portions of your lawn with native plant borders and beds that attract wildlife and provide habitat for important insect pollinators.

- Consider planting a buffer of native plants next to any stream, river, or coastal waterbody that abuts your property. The plants will help take-up extra nitrogen from rain runoff before it ends up in the water and, ultimately, Long Island Sound. And you'll have less lawn to mow at the edge of the stream bank.

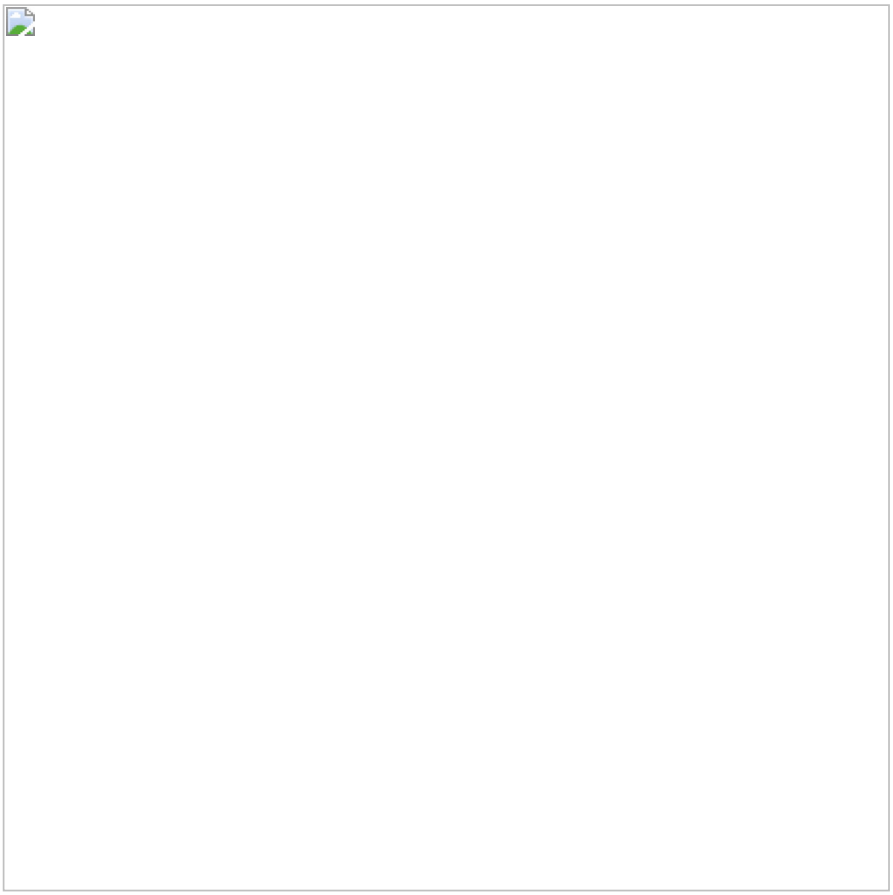
- If you're able to squeeze in some last-minute boating this season (now that you have less lawn to mow!), always use a shoreside or mobile pumpout facility to flush your holding tank.

- If you have a septic system, be sure to have it pumped-out regularly, every 3-5 years. Learn more about your septic system through the CT Department of Public Health's Environmental Engineering Program.

- Always clean up after your pet and properly dispose of pet waste.

program to reduce the equalized load of nitrogen to Long Island Sound. New York chose to issue individual permits to reduce nitrogen discharges from their STPs that discharge to the Sound.

Now the TMDL has moved into Phase IV in which Connecticut, New York, and the upper Long Island Sound watershed states (Massachusetts, New Hampshire, and Vermont) are being engaged to reduce nitrogen loads from nonpoint sources. Reducing the nonpoint source load will be a bit more . . . complicated, because every one of us contributes a little bit to the problem.



So, "How's the Water?" All things considered, the water is better! Long Island Sound has responded positively to our collective actions, and the area and duration of hypoxia in Long Island Sound seems to be declining. The Sound is less rich (nutrient rich, that is) and water quality is improving. If we all do our part to control nitrogen (see the Sound Tips column for ways you can help), there will be fewer occurrences of hypoxia and a healthier Long Island Sound.

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Watershed Planning
We've Come a Long Way in 50 Issues

The first issue of *Sound Outlook* asked readers if they were "watershed minded" and introduced them to the innovative concept of watershed planning. To review, a watershed is an area of land that drains, or sheds, all of its water (e.g., rain runoff, melted snow, water used to hose-down a sidewalk, etc.) to the same receiving waterbody. As that waters runs down through the watershed, it can pick-up sediment, oil, animal scat, and other polluted materials from the ground and deposit them into the receiving waterbody.

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Look Out For These Other Upcoming Events!

Long Island Sound Study (LISS)
Committee Meetings

Living Shorelines Meeting and Regional Workshop
December 1-2, 2015
Hartford Hilton
Hartford, CT
Early Bird Registration Rate until November 16, 2015
Learn More Here

Please be sure to check the Calendar of Events on DEEP's website

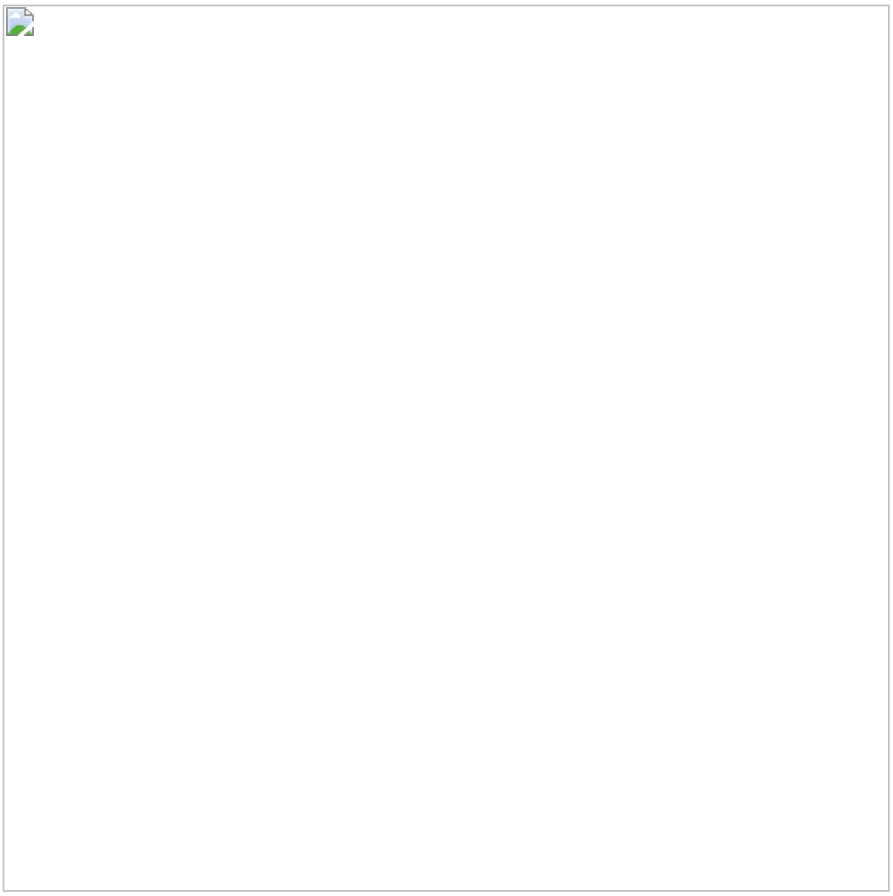
November: Harbor seals arrive in LIS from northern New England; winter flounder move into shallower water

December: Bald eagles return to Connecticut for the winter. For eagle viewing at Shepaug Dam Bald Eagle Observation Area, Southbury, CT, call 1-800-368-8954 after Dec. 19 to register.

Dredged Material Management Plan Update

The Long Island Sound Dredged Material Management Plan (LIS DMMP) is an Army Corps of Engineers (ACOE)-led, comprehensive planning process to address the management of dredged material in Long Island Sound (please see our article in the June 2011 issue of *Sound Outlook*).

The overall goal of the LIS DMMP is to develop a comprehensive document recommending practicable options to manage dredged material in an environmentally acceptable and economically



The idea of controlling "nonpoint source pollution" across municipal--and state--boundary lines was just taking hold in 1999, and DEP embraced the concept by launching the agency's watershed management program. Initially, the program consolidated DEP water permitting, enforcement, resource management, and public outreach efforts on a watershed scale. But in the 16 years since its inception, DEEP's watershed management program has evolved, working successfully within and outside of the agency to help establish and implement over 30 watershed-based plans throughout the state. Some of these watersheds drain directly to Long Island Sound, including the Niantic River, the Quinnipiac River, and the Norwalk River, so the plans developed for those watersheds have a direct positive impact on the quality of the Sound.

However, since all of the land in Connecticut is located within the L ong Island Sound watershed, plans developed for watersheds that are not directly connected to Long Island Sound (e.g., Broad Brook in East Windsor, Ellington, Somers, and Tolland) will also protect the Sound by recommending practices that will protect and improve the quality of local waterbodies and other natural resources. Ultimately, protection of local watersheds is protection of Long Island Sound.

Please visit the DEEP's Watershed Management website to become even more "watershed minded" and see how far we've come in our watershed planning efforts. You may also contact Chuck Lee, supervisor of the watershed management program at 860.424.3716 for all things watershed-related.

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feasible manner in Long Island Sound for the next 30 years.

The ACOE recently released a draft of the LIS DMMP and an accompanying Programatic Environmental Impact Statement (PEIS) and accepted public comment through mid-October 2015. The draft DMMP document has identified an array of options that non-federal dredging proponents can utilize to manage their dredged sediments. It also identifies both potential baseline, or least cost environmentally acceptable plans, and recommended management plans fo