Long Island Nitrogen Action Plan (LINAP) - Newsletter
Summary of Partnerships 2022

This month's newsletter provides an overview of the great progress that was made in advancing the goals set by the Long Island Nitrogen Action Plan during another extraordinary year.

Nassau County

2022 was a historic year for Nassau County as many nitrogen reducing initiatives saw significant advancements including the expansion of the Septic Environmental Program to Improve Cleanliness (SEPTIC) Program. The program provides funding to eligible residents and small businesses to replace a cesspool or septic system with Innovative Alternative Onsite Wastewater Treatment Systems (I/A OWTS). The program is administered by the Nassau County Soil and Water Conservation District and funded by the New York State Septic System Replacement Program and federal sources. Over 225 residents have applied to the program.

Nassau County is also leading a series of resiliency and sustainability projects that will improve the water quality of the Western Bays. The projects include the Bay Park Conveyance Project, which will convey treated wastewater from the improved South Shore Water Reclamation Facility (SSWRF) to the Cedar Creek Water Pollution Control Plant (WPCP) ocean outfall pipe. The County is also working on the consolidation of the Long Beach Water Pollution Control Plant. The project includes converting the plant to a pump station and rerouting Long Beach's sewage to the SSWRF, where the sewage will be treated to a higher standard through new enhanced nitrogen removal processes. These projects combined will remove a total of approximately 55 million gallons per day of treated wastewater effluent from the Western Bays.

Additionally, in December the State accepted and approved a comprehensive 9 Element Subwatershed Plan for Nassau County which identifies the sources of nitrogen pollution, establishes nitrogen reduction goals and identifies programs, key individuals, and organizations needed to help implement these reductions. The plan also provides a timetable and milestones for the 10-year implementation of reductions. Having an approved 9 Element Watershed Plan improves eligibility for federal and state funding programs.

Construction on Bay Park Conveyance Project. Photo Credit: Nassau County

Suffolk County

This past year, the County has made great progress in the expansion of sewer systems through the Suffolk County Coastal Resiliency Initiative and with the help of federal, state, and town funding. The various sewering projects underway will eliminate thousands of cesspools and septic systems improving water quality, boosting economic development, and protecting against storm surges by strengthening wetlands. This represents the largest expansion of sewer infrastructure in Suffolk County in nearly 50 years!

The County is also currently preparing a Sewage Treatment Plant (STP) capacity study--a recommendation from the Suffolk County Subwatersheds Wastewater Plan. The STP Capacity study is looking at the current capacity of private STPs to determine if there is capacity to connect additional parcels to sewers. Private STPs with additional capacity are uniquely positioned to provide both environmental protection through the connection of adjacent unsewered parcels and to help facilitate targeted economic development.

In areas that are outside designated sewer areas, the County has seen an exponential increase in the installations of Innovative Alternative Onsite Wastewater Treatment Systems (I/A OWTS). I/A OWTS through the assistance of several grant and rebate programs. The program is funded by the New York State Septic System Replacement Program and local sources. To date, over 2,000 I/A OWTS have been installed across Suffolk County and that number continues to grow each year. More growth is expected since the IRS recently ruled that the grant funds are not taxable income. In support of the

extraordinary efforts to replace cesspools and septics, municipalities are amending County, Town, and in some cases Village codes to require homeowners to upgrade their septic and cesspool systems to I/A OWTS system.

To read more about Suffolk County's nitrogen mitigation efforts check out the January, October and November newsletters.

Suffolk County officials and construction leaders at the groundbreaking ceremony for the Carlls River Watershed sewer expansion project. Photo credit: Suffolk County

Peconic Estuary Partnership

Nitrogen management is a critical part of the Peconic Estuary Partnership's (PEP) strategy to protect and restore water quality in the Peconic Estuary. PEP made significant progress on many nitrogen focused projects such as the Solute Transport Model, which was developed to better understand legacy nitrogen within the aquifer system. The Model is being used to run scenarios that will help decision makers understand how certain management actions might reduce nitrogen in groundwater that flows into marine waters. These results will help inform decisions about where and how nitrogen reduction efforts might be beneficial. It will also provide realistic expectations on when improvements might be seen, as the travel time of the groundwater in some areas is decades long. The scenarios being run for the Peconic Estuary include those which outline the recommendations from the Suffolk County Subwatersheds Wastewater Management Plan, such as stormwater management and fertilizer reductions.

Another crucial program is PEP's Homeowner Rewards Program (HRP). The program provides Peconic watershed residents the opportunity to be reimbursed for installing practices, such as rain gardens and rain barrels, that can help address excess nitrogen from homes and businesses. At the request of DEC, the Long Island Regional Planning Council passed a resolution to provide funding to expand the HRP

island wide. The expanded program will be modeled after PEP's program and is expected to be rolled out next year.

This year PEP also began working with Stony Brook University's School of Marine and Atmospheric Sciences Gobler Laboratory to study Harmful Algal Blooms (HAB's). The study will analyze three HABs (rust tide, mahogany tide, and toxic blue green algae) that recur annually across the Peconic Estuary. The goals of this study are to assess how the changes in nutrients over time affect HABs within bloom prone regions, the ability of nitrogen and phosphorus to intensify HABs, and the levels of nutrient load reduction needed to lessen the intensity of these HABs.

PEP has also moved forward with designing a 1.2-acre stormwater wetland to treat stormwater runoff at Meetinghouse Creek. This will improve water quality in the downstream wetland and surface water, increase the ecological quality of the habitat and improve plant and wildlife diversity.

Read more information about PEP in LINAP's June newsletter.

Rust tide in the Peconic Bay. Photo Credit: PEP

Long Island Sound Study (LISS)

This past spring the largest budget in LISS history, $54 million dollars, was finalized to fund projects for Long Island Sound restoration efforts. The 2022 Work Plan describes the LISS activities planned with the historic funding.

Also this year, LISS has brought on board Sustainable and Resilient Communities (SRC) professionals to coordinate a regional response to current and future climate change impacts. The SRC team has been hard at work providing support, training, and tools to assist Long Island Sound communities in achieving their goals for sustainability and resilience. One program the SRC team launched just last

month is the Long Island Sound Resilience Grant Writing Assistance Program. This program provides funding for municipalities and community organizations to acquire grant writing support for sustainable and resilience focused projects within the Long Island Sound coastal boundary.

LISS also developed an Environmental Justice program. To launch the program, LISS is creating a new fund called the Long Island Sound Community Impact FUND (LISCIF) which will direct funds and technical assistance to communities experiencing or affected by adverse and disproportionate environmental and human health risks or harms, including affected underserved communities. LISS is working to select an organization to manage the fund. EPA expects to provide up to $5 million to cover three years of this program.

Interested in learning more about projects from LISS? LISS and its partners are undertaking hundreds of projects to help support its restoration efforts. The LISS website recently launched a Program Implementation and Progress page to make it easier to find information about the progress of projects. This page provides information such as, individual project summaries, project challenges, and progress of implementation. The database covers projects from 2020 to today. Take a look on the LISS website for a project near you!

Read more about LISS in LINAP's August newsletter.

Photo Credit: LISS

South Shore Estuary Reserve

Reducing nitrogen pollution in the South Shore Estuary Reserve (SSER) is a significant focus of the Reserve's Comprehensive Management Plan (CMP). In September, the final 2022 Long Island South Shore Estuary Reserve Comprehensive Management Plan (CMP) was released by the New York State Department of State (DOS) and the Long Island South Shore Estuary Reserve Council. The 2022 CMP provides communities and stakeholders with a guide for managing, protecting, and restoring the South Shore's valuable resources and the estuary economy. It also addresses the resiliency of the South Shore Estuary into the future.

Each year the SSER Local Assistance Grant Program provides funding to municipalities for projects helping to implement the SSER CMP. This year the Town of Brookhaven was awarded a grant to restore critical eelgrass habitat in the South Shore Estuary Reserve. Eelgrass is a type of underwater marine plant found throughout the Northeast Atlantic coast and is the most abundant seagrass species found in the SSER. Eelgrass provides shelter for finfish and shellfish to live, reproduce, grow, and hide from predators as well as many other ecosystem services.

Read more about SSER in LINAP's July newsletter.

The Center for Clean Water Technology (CCWT)

Launched in 2015, CCWT seeks to position Long Island as a leader in innovation and development in water treatment technology. CCWT's thrust is to research, develop and commercialize cost effective solutions for removing nitrogen and other contaminants of emerging concern from both drinking water

and onsite wastewater. Since its inception, CCWT continues to develop onsite wastewater treatment systems for residential and commercial use that reduce nitrogen to below 10 mg/L.

Read the January 2023 LINAP newsletter where current CCWT activities will be highlighted.

Long Island Regional Planning Council (LIRPC)

This past year, the LIRPC continued its commitment to advancing the goals of LINAP by developing several new projects.

LIRPC and DEC have been working hard on a new program called Nitrogen Smart Communities (NSC). NSC encourages municipalities in Nassau and Suffolk counties to take meaningful and effective actions to reduce, prevent or eliminate nitrogen pollution in Long Island's waters through community-specific plans of action. The program will involve understanding and analyzing each community's specific sources of nitrogen and then planning strategic projects that will reduce nitrogen at the local level. The pilot program is expected to be rolled out in 2023.

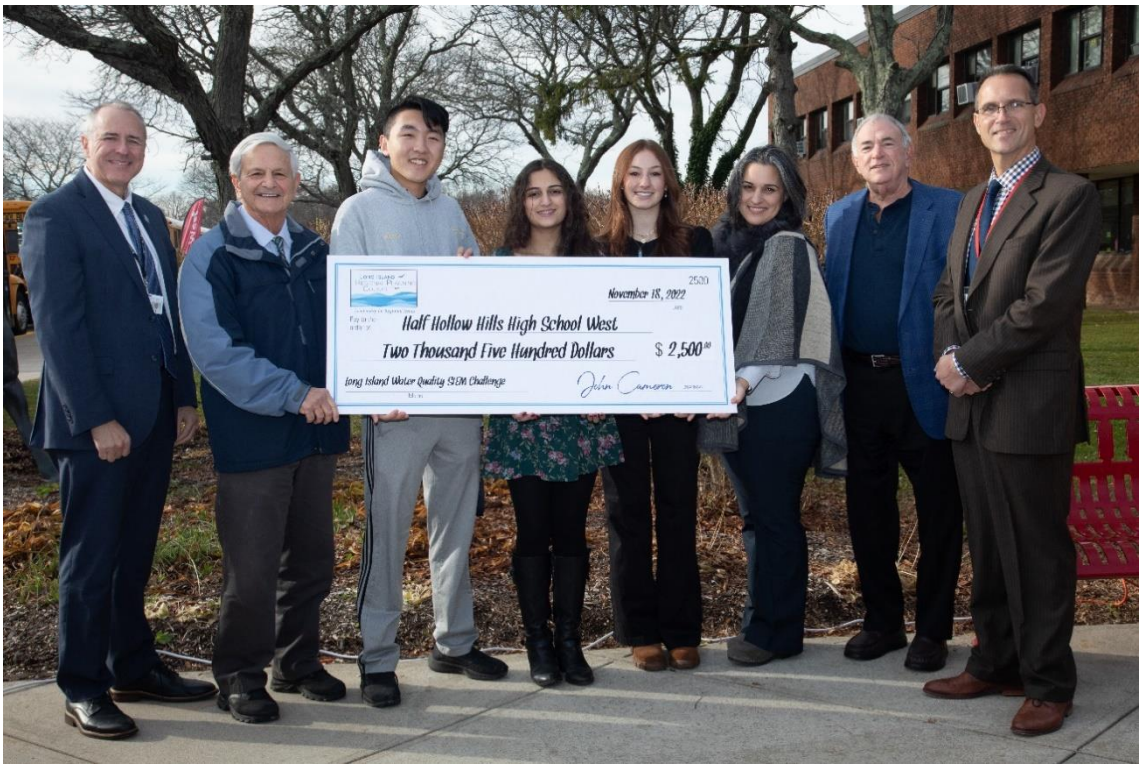
The LIRPC partnered with the Town of Hempstead this year for the preparation of an aquaculture license/lease feasibility study for Hempstead Bay. The feasibility study will provide essential information needed by the Town to consider and adopt a lease/license program. Establishment of a properly planned and implemented aquaculture program will enable the Town to improve water quality and generate economic activity in marine related businesses.

The LIRPC is also collaborating with Save the Sound to train Long Island water quality data generators on how to participate in a new data platform that Save the Sound, Harbor Watch, Maritime Aquarium at Norwalk, The Commons, and University of Connecticut plan to roll out in 2023. The program, called QuickDrops, makes community science data collected throughout the region easily accessible to regulators, advocates, academics, government officials, and agency experts—paving the way for more regional, science-driven decision-making. QuickDrops will offer numerous data storage, download, visualization, and sharing options in addition to responsibly streamlining the upload of data to the EPA Water Quality Exchange database. Nitrogen, in various forms, is one of the initial data sets being entered into QuickDrops. Centralizing nitrogen data for regulators facilitates data-driven decisions to protect and restore coastal waters.

The LIRPC's Long Island Water Quality Challenge promotes project-based learning in Science, Technology, Engineering, and Mathematics (STEM) in Long Island schools. The program, which is in its fourth year, helps students develop a greater understanding of how their classroom curriculum can be applied to protecting Long Island's crucial water resources – with a specific focus on reducing nitrogen pollution. The 2022 Challenge winning proposals came from Half Hollow Hills West, Herricks and Jericho high schools. These innovative proposals included constructing a roof garden, using rain barrels, planting denitrifying flower beds and the developing a compost program. Each of the winning teams received a $2,500 grant to implement their proposals.

A long-term project of the LIRPC is the Hempstead Bay Water Quality Monitoring Program. This program provides a framework for monitoring, analysis, and reporting of water quality within the surface waters of Hempstead Bay and its major tributaries. This program also looks at atmospheric nitrogen deposition which is associated with emissions from fossil fuel-related energy production,

fertilizer usage, and transportation emissions. The long-term nature of this monitoring work will advance our understanding of the impacts of severe storms, residential and commercial development, and climate change on our water resources. Overall, this water quality monitoring program will increase our knowledge of nitrogen pollution sources in the region and the associated impacts on environmental quality. A report, *Water Quality Trends in Hempstead Bay, NY from 1968-2022: An Updated Report for Long Island's South Shore Estuary Reserve Western Bays* was recently published and compares past water quality with the new data collected under this program. The LIRPC has approved funds for the program for a fourth year.



Regent Roger Tilles joins LIRPC Executive Director Richard Guardino in awarding Half Hollow Hills West High School a grant for their winning project in the 2022 Long Island Water Quality Challenge. Photo credit LIRPC

Nutrient Bioextraction Initiative

The Nutrient Bioextraction Initiative works to improve the quality of marine waters in New York and Connecticut by removing excess nitrogen through the cultivation and harvest of seaweed and shellfish. The Initiative made great strides this year with the completion of a sugar kelp pilot project, a ribbed mussel pilot project, the kickoff of a Bioextraction Economic Feasibility Study, a guide to marine shellfish aquaculture permitting, and a Bioextraction Seaweed Symposium.

The sugar kelp pilot project had two main components: an assessment of how much nitrogen sugar kelp could remove from the water and a study of using sugar kelp as a fertilizer amendment on locally grown, commercial crop species. Project results showed high nitrogen content in the kelp from the East River, and that locally grown sugar kelp fertilizer amendments perform similarly to other seaweed-based fertilizer amendments on the market. Work on sugar kelp fertilizer amendments will be

expanded next year, with Cornell Cooperative Extension of Suffolk County testing the use of these amendments with local commercial farmers. The final report for this year's project can be viewed here.

Another pilot project is currently underway aimed at understanding the nitrogen removal capacity and potential uses of ribbed mussels. In the summer and fall of this year, Cornell Cooperative Extension of Suffolk County staff monitored ribbed mussel growth and water quality at docks in Northport and Huntington Harbors. The staff collected samples to determine nitrogen content and contaminant uptake of the mussels. Mussels were also analyzed for their nutritive value for use as an animal feed. The second field season for this project will begin in May of 2023. This project also includes a component to explore hatchery culturing methods for this currently non-commercial species.

To better understand the capacity of bioextraction as an industry, a Bioextraction Economic Feasibility/Market study will be conducted to determine the feasibility of commercial operations using seaweed and/or shellfish in the Long Island Sound for the purpose of bioextraction. The results of the study will make preliminary recommendations about the most economically viable species and markets for bioextraction. This study will be followed up by a more detailed study to narrow down species and markets and help inform the development of a local industry.

Navigating the permitting process for a shellfish aquaculture business can be complicated. That is why the DEC, in conjunction with NEIWPCC developed, *A Guide to Marine Shellfish Aquaculture Permitting in New York*. The Guide provides current and prospective shellfish farmers with information regarding federal, state, and local roles in the permitting process, best management practices, relevant application forms, a roadmap describing the process, and more.

In May, the Initiative held a Long Island Sound Seaweed Bioextraction Symposium, bringing together experts in the field to present and discuss work related to the technical, regulatory, and economic aspects of seaweed bioextraction. The discussion at the Symposium is being used to guide the next steps of the Initiative.

The Initiative is a collaboration between DEC and LISS.

Department of Environmental Conservation (DEC)

This year, DEC continued to work closely with its partners on their initiatives while also advancing several projects that support LINAP's goals including a: Funding Finder, water exchange study, and an islandwide solute transport model.

DEC recognizes that there are barriers to accessing grant opportunities. As a way to address this, the Funding Finder was recently launched. The Funding Finder is designed to simplify the process for municipalities and other grant seekers finding grant opportunities. The tool enables grant seekers to filter grant opportunities based on criteria that meets their specific needs. The Funding Finder was developed by DEC in conjunction with LISS.

DEC initiated a water exchange study to investigate if increasing flushing in an embayment could improve water quality. DEC, working with a consultant, conducted a feasibility study for water exchange practices or hydrodynamic modifications. This study looked at three different types of embayments and a variety of water exchange practices such as dredging and pipes with and without

pumps. The overall goal of this project is to provide general information to Long Island communities considering using such modification techniques as a way to improve water quality. An outreach plan is being developed to distribute the study results to municipalities in 2023.

DEC is expanding the Solute Transport Model Islandwide. In collaboration with USGS and LISS, the model is a continuation of the one that is being developed for the western portion of the island (see PEP entry above) and will include the entire Island, including parts of New York City. The model is expected to be complete by 2024. Once the model is developed it will be used to run scenarios such as, the change in nitrogen load if LINAP fertilizer recommendations are implemented, amongst others.

Ribbed mussel sampling, September 2022, in Huntington Harbor. Photo Credit: Kristin Kraseski