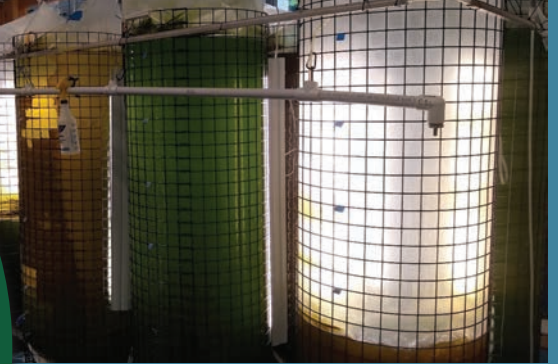


## **QAPP:** Quality Assurance Project Plans Ensure Accurate and Usable Data



**ALSO:**  
**Reducing Long  
Island Sound's  
Hypoxic Waters**







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NEIWPCC is a regional commission that helps the states of the Northeast preserve and advance water quality. We engage and convene water quality professionals and other interested parties from New England and New York to collaborate on water, wastewater, and environmental science challenges across shared regions, ecosystems, and areas of expertise.

## Interstate Waters

Volume 8, Number 2, Fall 2024

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**Contributing Editors:** Cheyenne Ellis, Beth MacBlane

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## FROM THE EXECUTIVE DIRECTOR

Welcome to the fall of 2024 and Volume 8, Number 2, of NEIWPCC's Interstate Waters. I know you will be impressed by this issue.



James Ammerman's piece on "Reducing Long Island Sound's Hypoxic Waters" fits perfectly into the conversation of NEIWPCC and its partners' commitment to clean and safe water. The significant nitrogen load reductions occurring in Long Island Sound over the past decades demonstrate hard-work, perseverance and commitment by all the parties involved. While there are still numerous challenges to be met, the Long Island Sound partners are up to the challenge.

The cover story introduces readers to our Quality Assurance Project Plans - mandated by the EPA - which are required for any study NEIWPCC funds that collects or uses data for the purpose of environmental decision-making.

Another marvelous discussion in this issue is the Wastewater Trainer Spotlight. NEIWPCC has many people helping and training wastewater and water treatment professionals to improve their job performance skills and to maintain their required licenses. The pieces on Nora Lough and Don Kennedy are great reads.

Also, don't shy away from taking out your calendars and marking down the upcoming water events listed on the back cover. You won't want to miss these programs.

Best regards,

Susan J. Sullivan  
NEIWPCC







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# HIGHLIGHTS FROM NEIWPCC AND OUR PARTNERS



## Lake Champlain Ecosystem Status Report

The Lake Champlain Basin Program (LCBP) released an updated “State of the Lake and Ecosystems Indicators Report.” Drawing on the most recent scientific data, the report documents ongoing challenges and successes in the management of the lake’s water quality and ecosystem, which spans Vermont, New York and Quebec. An indicators scorecard provides the status and trend for key water quality and ecosystem parameters across the lake’s five major regions: Missisquoi Bay, Northeast Arm, Malletts Bay, Main Lake and South Lake.

Climate change impacts are among the greatest challenges to Lake Champlain. The publication details more frequent and intense rainfall events that increase erosion and nutrient loading to the lake, as well as increased air and water temperatures that contribute to cyanobacteria blooms. However, positive findings are also outlined, including a downward trend in mercury levels in all monitored sport fish.

In addition, the report shares detailed maps, scientific data visualizations, educational diagrams and infographics to support data accessibility and a wide range of uses. The report is available in English and French on the LCBP website, and also as an interactive StoryMap.

## Annual Nonpoint Source Conference

The 34th Annual Nonpoint Source (NPS) Conference, “Climate Resiliency through NPS Outreach and Implementation,” was held in Connecticut in April. The two-day conference attracted attendees from federal and state governments, watershed organizations, and education and private industry leaders.

Plenary sessions featured Mike Scozzafava, NPS management branch chief with the Environmental Protection

Agency (EPA); Emma Cimino, deputy commissioner at the Connecticut Department of Energy and Environmental Protection (CT DEEP); and Mike Bisi, a NEIWPCC commissioner and former superintendent of sanitation for Glastonbury, Connecticut. The speakers discussed Clean Water Act Section 319 guideline revisions, current and future water quality initiatives in Connecticut, and NEIWPCC’s work to support its member states. Presentations covered a wide range of topics such as dam removal, classroom engagement and cranberry bog restoration. The conference also provided a field trip to a stormwater classroom, where town engineers presented innovative stormwater management practices, such as permeable parking lots, catch basins and other stormwater capture measures.

## Wastewater Management Training Series

NEIWPCC launched an à la carte management training series for wastewater operators. The interactive virtual classes introduce participants to the elements of managing and leading a team, group dynamics and communications. Training Specialist Bill Patenaude also instructs the operators in building response plans for threats such as cybercriminals, climate change and labor shortages.

In April, Patenaude led a live-virtual course, “Increasing Public Support for Wastewater with Proven Positive Outreach.” The speakers included NEIWPCC commissioners Janine Burke-Wells and Stacy Thompson, and Scott Goodinson, superintendent at the Narragansett Wastewater Treatment Facility. Together, they discussed previous outreach efforts such as wastewater treatment plant tours open to the public, youth education, publishing success stories in local papers and developing materials for outreach and education.

## Videos Showcase Staff and Science

NEIWPCC’s website and social media channels feature new videos in which viewers can learn about the work of staff to preserve and advance water quality in the Northeast, including the following:

- Environmental Analyst Sarah Healy explains how nitrogen pollution can result in low-oxygen conditions in New York’s waters, leading to fish kills, habitat degradation and human health impacts. Healy shares how she supports the Long





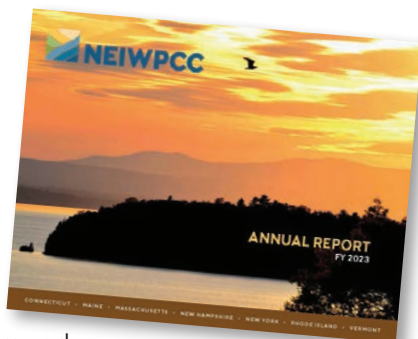
Sarah Healy

Island Nitrogen Action Plan and highlights ways that local homeowners can help reduce nitrogen runoff into surface and ground water.

- The Youth and the Environment Program engages young adults with their local environments, while introducing them to career opportunities in the field of clean water. NEIWPCC staff, interns and students discuss the program and how it has impacted each of them personally.
- The NEIWPCC All Staff Meeting is convened once each year as an opportunity for technical skill development, knowledge sharing, team building and to celebrate everyone's united work for clean water.
- Local communities volunteer in removing invasive water chestnuts (*Trapa natans*) from Southern New England waterways with the guidance of Program Manager Maryann Dugan.

## NEIWPCC's 2023 Annual Report

NEIWPCC's 2023 annual report is now available, both online and in print. The report features accomplishments from throughout the fiscal year and is organized around NEIWPCC's core values: leadership, collaboration, education, service and science. The publication highlights staff initiatives in research, monitoring and outreach. In addition, NEIWPCC hosted four national and regional conferences, and more than 20 workgroups focused on critical topics related to water. A new workgroup is brainstorming a path forward for establishing a regional biosolids technology hub, to test residual destruction technologies.



needs of communities' water infrastructure, combat climate change, meet water quality standards and confront workforce development challenges.

NEIWPCC submitted comments to the EPA in December 2022 requesting an extension to submit data for the Clean Watershed Needs Survey (CWNS), as states were struggling to get timely participation from wastewater treatment plants. The delay was due to monumental challenges over the previous two years, including the pandemic, staffing challenges and ensuring effective spending of the Bipartisan Infrastructure Law funding. In agreement that more time was warranted, the EPA extended the survey deadline to ensure that the data collected was accurate and complete.

The EPA issued the results of the CWNS in May, outlining wastewater, stormwater and other infrastructure needs. All of the states and territories provided voluntary data on investments needed to meet the water quality goals of the Clean Water Act over the next 20 years. The resulting report is being shared with Congress, quantifying the nation's total wastewater infrastructure needs and serving as a reference when allocating funding across the country.

## Northeast Aquatic Biologists (NAB) Conference

The annual Northeast Aquatic Biologists (NAB) Conference, held in April in Vermont, focused on the power of collaboration and community across the region. More than 50 speakers presented on topics such as the impact of climate change on streams, long-term and continuous monitoring, PFAS, macroinvertebrate indices and environmental justice. Plenary speaker Kathryn Cottingham, a professor of biological sciences at Dartmouth College, explained how cyanobacteria may help drive eutrophication by changing the availability of phosphorus and nitrogen within the water column.

This year, the event also included two optional pre-conference meetings. "R Exchange" provided 26 R coding enthusiasts with an opportunity to share innovative methods and experience leveraging various R programs to streamline unique processes and problems. The second option connected state employees throughout the Northeast with staff from the United States Geological Survey about the network of streamgages, and through collaboration, developing a comprehensive regional analysis.



## Northeast Region Comment Letters

In April, NEIWPCC sent a letter to President Joseph Biden regarding the fiscal year 2025 budgets for the clean water and drinking water state revolving funds. On behalf of its member states, NEIWPCC requested that future budgets be fully funded at congressionally authorized levels to address the increasing



## HIGHLIGHTS FROM NEIWPCC AND OUR PARTNERS

### Incorporating Climate Change into Stream Temperature TMDLs

NEIWPCC hosted a webinar focusing on the role of climate change in temperature total maximum daily loads (TMDLs). Part of the National 303(d) Restoring Our Impaired Waters Webinar Series, the session covered the importance of including climate change impacts in stream temperature TMDLs in Washington's South Fork Nooksack River. Presenter James Kardouni illustrated how this approach allows for collaboration, which can lead to broader water management strategies, such as Endangered Species Act recovery actions. Kardouni is the water quality lead for the state of Washington's Department of Ecology's Environmental Assessment Program and serves as the TMDL lead in the Nooksack River basin and San Juan Islands.



South Fork Nooksack River

### Protecting Hudson River Shoreline

The New York State Department of Environmental Conservation (NYSDEC) announced approximately \$384,000 in contract awards to help the city of Hudson and town of Bethlehem increase shoreline resilience and improve recreational access using nature-based solutions. Funding for the two projects is provided by the New York State Environmental Protection Fund and is administered by NEIWPCC in partnership with the NYSDEC's Hudson River Estuary Program.

In Hudson, the project will create a more accessible waterfront that maintains the city's water-based recreational vitality, while prioritizing nature-based solutions that restore the shoreline to a dynamic intertidal marshland and adapt to projected future sea-level rise and flooding.

Bethlehem will launch a shoreline stabilization project at Henry Hudson Park, which is the town's only public access point to the Hudson River and provides a public boat launch, accessible fishing platform, kayak launch, and many other amenities. Commercial ship and barge traffic creates large vessel wakes that contribute to shoreline erosion and damage to docks and bulkheads. The project will replace the bulkhead with a combination of rock riprap layers on the bank and plantings, while balancing opportunities for ecological health, resiliency, and recreation.



Project rendering by  
Assemblage Landscape  
Architecture.

## 12th U.S. Symposium on Harmful Algae

October 27 – November 1, 2024

Holiday Inn Portland by the Bay, Portland, Maine

This year's theme, "ONE BLOOM: Unifying HAB Science in Aquatic Ecosystems," seeks to identify and highlight commonalities across diverse study systems and disciplines within Harmful Algal Bloom (HAB) research. Sessions and discussions will foster a unified understanding that integrates perspectives and approaches in HAB science, and equips researchers, managers, and policymakers with the knowledge needed to address this pressing environmental challenge.

For more information, go to  
<https://neiwpcc.org/events/ushab12/>.  
For general questions, contact  
[HABS@neiwpcc.org](mailto:HABS@neiwpcc.org).



## Clean Water Pod: From New Hampshire's Oyster Aquaculture to New Mexico's Rio Hondo

The second season of the Clean Water Pod podcast drew attention to the coast of New Hampshire in episode four, bringing together water quality improvements, eelgrass restoration, oyster aquaculture and the local food movement. Host Jeff Berckes explored research in the Great Bay estuary and efforts to reduce nutrient pollution, including the growing local oyster aquaculture industry and its impact on seasonal menus. Guests included Ted Diers, assistant director of the Water Division at the

New Hampshire Department of Environmental Services; Kalle Matso, director of the Piscataqua Region Estuaries Partnership; Jay Baker, founder and owner of Fat Dog Shellfish Company; and Evan Mallett, owner and chef of Black Trumpet Restaurant and Bar, located in Portsmouth, New Hampshire.

In the Choptank River watershed, located in Delaware

and Maryland, a multi-stakeholder collaborative works to improve water quality by developing locally driven projects that benefit the community and the environment. The fifth episode focuses on the unique approach

and successes of this partnership, named "Envision the Choptank." Berckes talked to Joanna Ogburn, principal and founder of JBO Conservation, LLC; and Leslie Grunden, assistant director of planning with the Caroline County Maryland Department of Planning and Codes.

Water quality issues on Cape Cod, Massachusetts stem from an increasing population as well as an influx of summer tourists that nearly triple the local population. Excess



*Great Bay National Wildlife Refuge*



*Choptank River*



*Cape Cod*

nitrogen enters area waterbodies primarily through septic systems as well as stormwater and nitrogen-rich fertilizers. In episode six, Berckes examined local efforts to reduce nitrogen pollution, such as alternative septic systems and cranberry bog restoration. He spoke with Jennifer Loughran, project manager for innovative solutions at Barnstable Clean Water Coalition; Erin Perry, deputy director of the Cape Cod Commission; and Sara Wigginton, microbiologist at the Massachusetts Alternative Septic System Test Center.

Episode seven took listeners to the Rio Hondo, a 79-mile-long tributary of the Rio Grande located in northern New Mexico. Impaired by wastewater effluent in the 1970s and



*Rio Hondo*

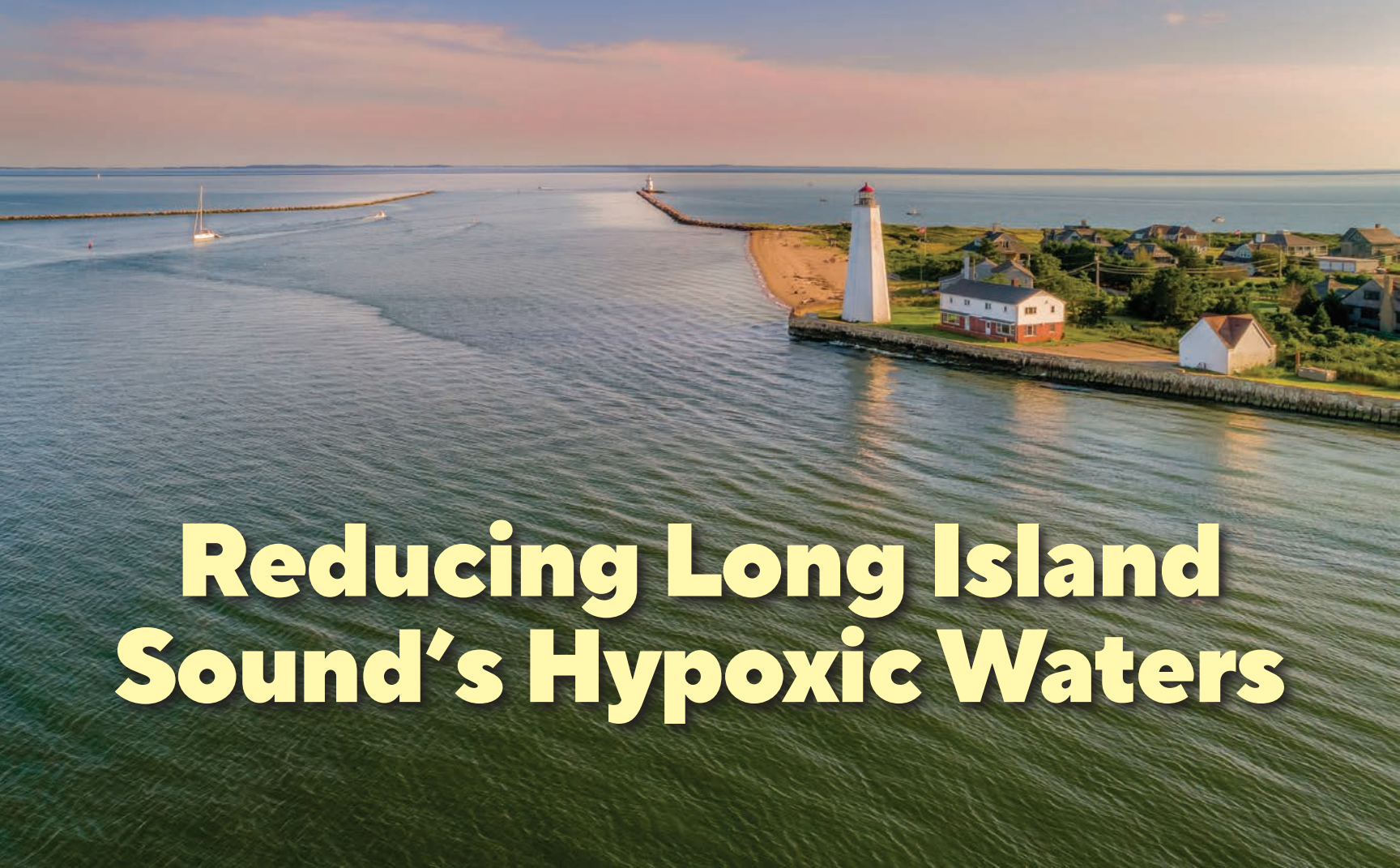
'80s, water quality has since improved and the river was delisted from the impaired waters list. The Rio Hondo now boasts two uncommon measures to ensure its water quality does not deteriorate:

a protective total maximum daily load (TMDL), and the Outstanding National Resource Waters (ONRW) state designation – a special protection for waters of "exceptional recreational or ecological significance" under the Clean Water Act.

Berckes spoke with Shelly Lemon, chief of the Surface Water Quality Bureau in the New Mexico Environment Department; and Rachel Conn, deputy director of Amigos Bravos, a nonprofit water conservation organization in the state. They shared the unique history of the area, the role local communities and volunteers play in protecting their rivers, and discuss the balance needed between protecting water quality and managing the impact of increased attention to these areas. 🌈

For more information about these stories, visit NEIWPCC's website at [www.neiwpcc.org](http://www.neiwpcc.org) to view the "News" page. Sign up for NEIWPCC's monthly e-newsletter, Streamlined, at the bottom of the homepage.





# Reducing Long Island Sound's Hypoxic Waters

BY JAMES AMMERMAN

**F**or decades, the Long Island Sound (LIS), located between New York and Connecticut, has had a chronic problem with bottom water hypoxia, or oxygen depletion, due to nutrient pollution from urban wastewater treatment plants, stormwater, septic systems and fertilizer runoff. These hypoxic waters are unable to sustain life, leading to die-offs of fish and shellfish. However, joint efforts by the U.S. Environmental Protection Agency (EPA) and the surrounding states to tackle the sources of this pollution have resulted in a reduction of the hypoxia area by more than 50% since 2001.

Long Island Sound is an urban estuary with 25 million people living within 50 miles, primarily around New York City, and nine million people living in its watershed. The LIS watershed drains more than 16,000 square miles and stretches all the way to Canada. LIS is unusual in its east-west orientation and being connected to the ocean at both ends. It has a mean depth of about 60 feet and receives 70% of its freshwater from the Connecticut River near the mouth. LIS is part of the Virginian Atlantic Ecoregion, which stretches from Cape Hatteras in North Carolina to Cape Cod in Massachusetts, and includes other estuarine and coastal regions such as Albemarle/Pamlico Sound, Chesapeake Bay, Delaware Bay, New York Bight and Buzzards Bay. This region has been known for oysters, striped bass and other important commercial species, though many have declined from pollution, overfishing or other human impacts.

The EPA, Connecticut and New York established the Long

Island Sound Study (LISS) in 1987 to protect the Sound, an estuary of national significance. LIS has had a chronic problem with bottom water hypoxia, which has been monitored during the summer since the late 1980s, and year-round since the 1990s. This hypoxia occurs in the summer months in the western Sound. In 1994, the worst year to date, almost a third of the nearly 1,300 square mile area of the Sound was hypoxic, meaning that the bottom water dissolved oxygen concentration was 3 mg/liter or less.

As a result of this recurring problem, the EPA, along with Connecticut and New York, agreed to a total maximum daily load (TMDL) for nitrogen in 2000. The primary target of the TMDL was point source in-basin wastewater treatment plants in the western Sound, which were required to reduce nitrogen loading by 60%. Additional nitrogen reductions in the TMDL included 10% of in-basin and upper basin non-point sources, and 25% from point source upper basin wastewater treatment plants. Further nitrogen loading decreases were also expected from decreased atmospheric deposition due to Clean Air Act improvements, and in water removal processes like bioextraction by seaweed and shellfish.

The 60% load reduction from western Sound treatment plants was achieved in 2016 after expensive treatment plant upgrades. With \$2.5 billion invested since the 2000 TMDL, New York and Connecticut are discharging 49 million fewer pounds of nitrogen annually by sewage treatment plants compared to the early 1990s.

As a result of this nitrogen load reduction, the annual hypoxic area has also been reduced by about 60%, and the most recent five-year rolling average (2019-2023) was 102 mi<sup>2</sup>. The area varies annually with weather and hydrographic conditions in the Sound, and the reduction was limited until after the major

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*James Ammerman is a NEIWPCC environmental analyst and Long Island Sound Study science coordinator.*



treatment plant upgrades in 2009.

Nonetheless, a recent paper demonstrated that each decade has seen a decline in the hypoxic area (1994, 2004, 2014) (Whitney & Vlahos, 2021).

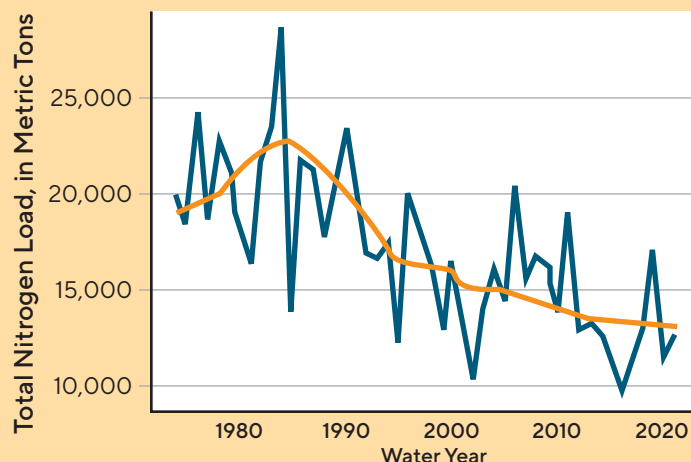
Even though the water quality has improved, LIS still has numerous challenges. Many of the 115 embayments around the Sound exhibit harmful algal growth and nocturnal hypoxia. Areas of seagrass and salt marsh have also declined. Going forward, researchers at LISS will concentrate nitrogen reduction efforts on three groups of watersheds: coastal, which drain directly into embayments or coastal waters; tributary, which drain inland areas; and the western Sound with large treatment plants which drain directly to the Sound.

Tributary nitrogen loading has also declined, as shown by the Connecticut Fall Line nitrogen load from seven major tributaries to LIS. This is due to improved upstream controls as well as reduced atmospheric deposition. Remaining nitrogen reduction targets from the 2000 TMDL include a 10% reduction of in-basin and upper basin nonpoint sources, and a 25% reduction from point source upper basin wastewater treatment plants. New targets may also be developed in the future.

Current efforts that address these issues include the Connecticut Department of Energy and Environmental Protection's Second Generation Nitrogen Strategy, which involves increased water quality monitoring and modeling. Similarly, the New York State Department of Environmental Conservation has the Long Island Nitrogen Action Plan, focused on reducing nitrogen loading to ground and surface waters in Nassau and Suffolk counties. The Unified Water Study of Save the Sound and the U.S. Geological Survey have also increased their monitoring and modeling efforts, especially in embayments and tributaries. Additionally, the EPA, in partnership with the New York City Department of Environmental Protection, are sponsoring development of a new systemwide hydrodynamic and water quality model covering LIS, New York Harbor, New York Bight, and major tributaries. The LISS also sponsors a bioextraction program to encourage increased aquaculture of seaweed and shellfish for both commercial use and nitrogen removal.

Long Island Sound is one of the few estuaries to successfully reduce hypoxia because most of its nitrogen loading is from regulated point sources. Hypoxic systems dominated by non-point agricultural runoff like Chesapeake Bay, Lake Erie, and the Gulf of Mexico have had less success. For instance, though Chesapeake Bay has met its point source nitrogen reduction goals, its remaining nitrogen reduction target is largely from non-point source agricultural input, which is not regulated and very challenging to reduce. Despite its success, LIS must continue to further reduce nitrogen loading, both to continue water quality improvement, and to keep up with climate change, which could reverse current progress. 🌊

## Nitrogen Loads to Long Island Sound

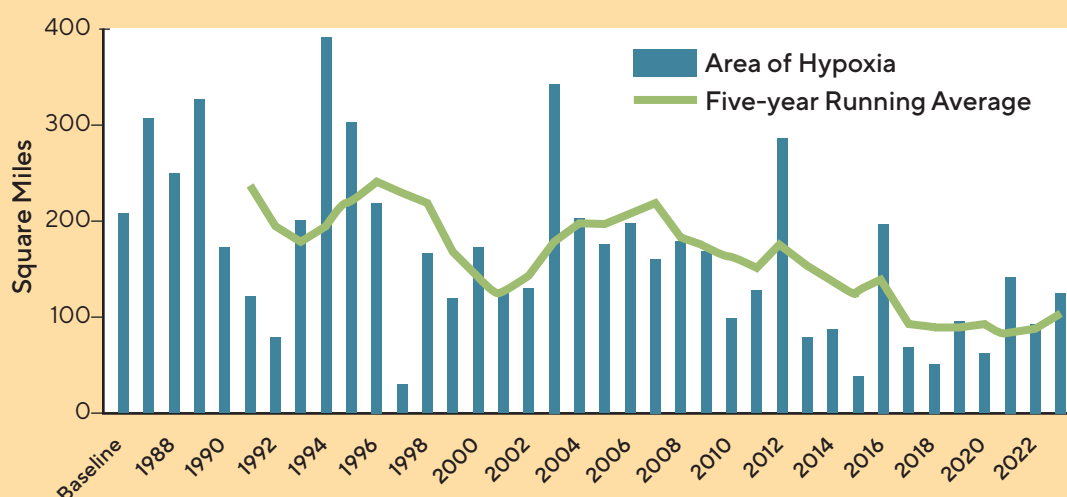


*Acknowledgements: Melissa Duvall, EPA research and modeling lead; and Mark Tedesco, director, EPA Long Island Sound Office.*

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## Hypoxia (Dissolved Oxygen ≤ 3 mg/L) in Long Island Sound







# Quality Assurance Project Plans Ensure Accurate and Usable Data

BY EMILY BIALOWAS  
AND CHEYENNE ELLIS

Every year, NEIWPCC funds numerous projects across its partner programs, including the Long Island Sound Study (LISS), the Hudson River Estuary Program (HREP), and the Lake Champlain Basin Program (LCBP). The U.S. Environmental Protection Agency (EPA) is the source of a significant portion of this funding, which therefore requires NEIWPCC to meet specific quality assurance standards.

NEIWPCC's Quality Program began in 2001, backed by an EPA-approved Quality Management Plan. This plan encompasses all aspects of NEIWPCC's work including hiring, data storage, procurement and quality assurance of projects. Every five years, NEIWPCC staff review and update this plan and submit it to the EPA for approval.

Following the EPA's directive, the funded partners – in conjunction with the NEIWPCC manager – must develop a Quality Assurance Project Plan (QAPP) for any study that collects or uses data for the purpose of environmental decision-making. These individualized plans provide information on the data being collected, the protocols and instruments used, who is involved and their qualifications, and how records are kept throughout the process. Projects are only able to use NEIWPCC funds if they have an approved QAPP.

## Long-Term Monitoring in Lake Champlain

The Lake Champlain Basin Program maintains a long-term data collection of water quality and biological data. This

research dates back to 1992 and has assembled a range of chemical and biological measurements almost every year since then. The QAPP for this project is updated every three years to ensure that the methods allow for accurate data compatible with previous records.

"The strength of this program lies in its longevity and consistency," said NEIWPCC Environmental Analyst Matthew Vaughan, who is the chief scientist at the LCBP. "The core methodologies have remained largely unchanged throughout the project's duration."

From April to October, NEIWPCC staff from the LCBP, including Environmental Analyst Kelsey Colbert, regularly visit the lake's 15 monitoring stations to collect vital data about the water quality. Colbert brings the QAPP for this project with her every time she goes out to ensure the process follows the plan as written. The QAPP also contains information about the equipment to use and the protocols for collection. The measurements taken for this study include temperature, oxygen, conductivity, turbidity and pH. Other tests are performed to gain biological data about the lake, including the presence of zebra mussels and cyanobacteria blooms.

The staff perform yearly field assessments on the process, which entails reviewing whether the QAPP is being followed and if there are any deviations from the plan. The QAPP outlines the high level of scientific rigor for these measurements, allowing the data to be used for significant decision-making,

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*Emily Bialowas is an environmental analyst with NEIWPCC's Division of Water Resource Protection and is the Quality Assurance Program manager.*

*Cheyenne Ellis is an information officer with NEIWPCC's Division of Communications and Outreach.*





*Environmental Analysts Matthew Vaughan and Kelsey Colbert using a multiparameter sonde at the Lamoille River long term monitoring buoy.*

such as the New York and Vermont total maximum daily load regulations for phosphorus, and the determination of trends in nutrient and sediment loads. The data has also documented the impact of aquatic invasive species, road salt and climate change on Lake Champlain.

"The information gathered from this project has been invaluable to managing Lake Champlain and its watershed," said Vaughan.

## Researching Mussel Aquaculture in Long Island Sound

In the summer of 2023, researchers at the Long Island Sound Study (LISS) compared the effectiveness of different practices for raising Atlantic ribbed mussels. They also examined the potential of mussel aquaculture as a tool to improve water quality. The required QAPP determined if a new best management practice could be developed based on the outcomes.

The project took place at the Flax Pond Marine Laboratory in Old Field, New York, where mussels were raised in a hatchery environment. They were spawned using the bin-silo method, a quick and efficient technique that uses a silo with a mesh bottom and hot water to trigger reproductive behavior. The young mussels were then fed using algae feeding equipment, providing them with nutrients.

When large enough to leave the hatchery, the mussels were taken to the docks, where a motorized floating upweller shellfish nursery system (FLUPSY) was located. Underneath the FLUPSY platform, the juvenile mussels were stored within mesh bags contained in a larger metal cage. The motor then caused movement that drew water up through the cage. As filter feeders, the mussels derived energy from small organic particles found in water and the motion of the platform provided access to a continuous food source.

This project was one of many over the past few years to examine the practicality of nutrient bioextraction in the Long Island Sound. In this practice, growing and harvesting shellfish and seaweed is used as a strategy for removing excess nitrogen and nutrients from the water.

"The purpose of this research was to identify the best methods for hatchery-based shellfish aquaculture," said Alex DuMont, an environmental analyst at NEIWPCC, who serves as

*Mussel cage holding juvenile mussels.*



the project manager for LISS. "Documenting effective and replicable aquaculture techniques is critical in supporting our goal of establishing a bioextraction industry within the Long Island Sound."

If successfully implemented, nutrient bioextraction could help prevent problems created by excess nutrients, including harmful algal blooms and hypoxia (a deficiency in the amount of oxygen in the water), which are harmful to aquatic life and ecosystems.

## Developing Watershed Characterizations in the Hudson River Estuary

In New York, the Hudson River Estuary Program is collaborating with the Hudson River Watershed Alliance (HWRA) to support two local group's watershed characterization reports.

This is the first step to watershed planning in the state; by gathering, organizing and summarizing existing information in a written report, including maps, water quality data, physical conditions and land use data.

Due to the nature of this project, it requires a different category of QAPP, designed for

previously collected data which will be used in a new way. The QAPP outlines the data involved, the new analyses to be done, existing data on the subject and the intended end-product.

The small watersheds working on characterization reports, Sparkill Creek and the Punch Brook-Roeliff Jansen Kill, have different priorities as one is urban and the other is rural. However, the approach is the same, with data sources to be reviewed and the sections of the report to be completed, including physical characteristics, trends, land use, water quality and demographic information.

Even though all the data being used has already been collected, the groups will make future decisions for these watersheds based on the report. The QAPP is key in backing for how the data was sourced and analyzed, providing credibility for the project.

## Quality Assurance Training

As NEIWPCC funds more projects, the number of QAPPs needed annually has increased significantly. Because of this, some staff members now act as quality assurance designees, which allows them to review and approve QAPPs in conjunction with the EPA. Designees are also permitted to complete field assessments.

To become a designee, staff must meet certain requirements: experience managing projects with quality assurance components, training on how to review QAPPs and at least two years of employment at NEIWPCC. Having designated staff review these plans allows additional projects to be taken on each year and enables the program to continue growing.

Additional non-designee staff attend annual training sessions on quality assurance, learning how it works and why it is of such importance to NEIWPCC's mission of advancing clean water in the Northeast. 🌈



*Members of the Watershed Advisory Committee.*



# Meet the Wastewater Trainers

BY BETH MACBLANE

## A Passion for Microbiology: Trainer Nora Lough

**O**n any given day, one can find Nora Lough peering into a microscope studying bacteria and other microorganisms that underpin the wastewater treatment process.

“Working in wastewater is the best profession in the entire world,” said Nora Lough, biologist II at the Narragansett Bay Commission (NBC) and a training consultant with NEIWPCC’s Wastewater and Onsite Programs Division. “It is challenging and dynamic work, and at the forefront of water quality and environmental protection.”

Lough has worked with NEIWPCC for more than 15 years, developing and leading wastewater trainings on laboratory procedures and microbiology for operators across the Northeast. While life under the microscope may be tiny, microorganisms play a crucial role in the wastewater treatment process, breaking down pollutants and purifying the water. Teaching both virtual and in-person courses, Lough’s classes help wastewater treatment facilities better manage microbial populations in the bioreactor.

She began her career with NEIWPCC teaching a basic laboratory series alongside long-time instructor Charles “Chuck” Conway. Upon his retirement in 2012, she took over the role of leading trainings and onsite workshops across the region – all the while using vacation time from her full-time job at the NBC to pursue this passion.

“I enjoy visiting facilities in-person to see their unique processes and laboratory set-up,” she said. “When I can reinforce the training in the lab, it becomes a great hands-on experience for the students.”

Her trainings include introduction to water and wastewater laboratory, advanced laboratory procedures, and an exam preparation course for the New England Water Environment Association (NEWEA) lab analyst exam. Lough recently launched an advanced laboratory procedures series with courses on quality assurance, analytical and organic chemistry, and alkalinity, cyanide and turbidity.

“Nora is incredibly passionate for educating wastewater professionals on any laboratory procedure that might be needed to keep treatment plants in compliance with their National Pollutant Discharge Elimination System (NPDES)

permits,” said NEIWPCC Environmental Analyst Ryan Buckley. “Wastewater labs can be intimidating and complicated, but Nora makes the material easy to understand for professionals of all positions and experience levels.”

Lough develops her own courses with the goal of creating standardized trainings that can be used by other trainers to deliver consistent content. A self-proclaimed perfectionist by nature, Lough goes the extra mile by requesting the class list ahead of time to pull real-world examples from the students’ facilities and permits to make the training more relatable. “I

see a lot of the same operators in my classes and have gotten to know them over time,” she said. “I modify the course content to make it as useful and applicable to them and their labs as possible.”

One of Lough’s students, Emily Spring with the Montville Water Pollution Control Authority in Uncasville, Connecticut, said, “The class was so engaging, and it was clear Nora loved the course topic. I enjoy having enthusiastic teachers – the class was in-depth while still being challenging at times.”

Lough found her passion for environmental microbiology while a student at the University of Massachusetts Amherst. She credits the mentorship of Professor Steve Goodwin at the university’s microbiology program that steered her towards this line of study. “I discovered I

enjoyed working in the lab,” Lough said. “Not only did I like the hands-on nature of the work, but I also enjoyed seeing a project from beginning to end – from doing the research and benchtop work to reporting and presenting my findings.”

After college, Lough worked at a commercial analytical lab as director of microbiology and quality assurance manager before joining NBC in 2005. In her current role, she ensures that the department and lab run smoothly and satisfy the requirements for the EPA’s NPDES permitting.

Lough believes wastewater laboratory protocols are a growing training component. “As technology changes and improves, we also see more stringent limitations on our permits across EPA Region 1 that really push us to perfect our laboratory procedure limits,” she said. “It is an exciting time for wastewater with all the new procedures and technology.”

Another change Lough has experienced is the expanding role of communication and collaboration between the laboratory and the treatment facility staff. “Throughout my career, I have become more focused on microscopic examinations of treatment facilities,” she said. “This work connects what I am seeing under the microscope directly to what is happening in the wastewater treatment tanks, and has afforded me the opportunity to build relationships with plant operators and superintendents. Being able to give them real-time, usable data so that they can improve their process really drives and excites me.”



*Beth MacBlane is an information officer with NEIWPCC’s Division of Communications and Outreach.*



Lough is further invested in the wastewater industry by serving on various committees at the state, regional and national level. Through her roles with the Rhode Island Clean Water Association, NEWEA and Water Environment Federation (WEF), Lough applies insights into laboratory topics and trends to help curate training content.

For her work training wastewater operators across New England, the EPA Region 1 honored Lough with the 2018 Regional Wastewater Trainer of the Year Excellence Award. She also received NEWEA's Clair N. Sawyer Award in 2020 in recognition of her outstanding service to the water industry.

As technology in the wastewater industry continues to progress and develop, Lough intends to keep sharing her expertise on – and enthusiasm for – the powerful microorganisms at the heart of the process with the next generation of operators. “As a life-long learner, I find teaching for NEIWPCC a rewarding aspect of my career. I enjoy seeing my students grow and advance in their careers, and I learn a lot from them, too.”

## A 25-year Career Teaching Wastewater Operators: Don Kennedy

Over the course of Don Kennedy's multi-decade career, he enthusiastically taught thousands of operators about industrial wastewater treatment and collection systems throughout the Northeast. Kennedy began working as a wastewater training specialist at NEIWPCC in 1999, leading single and multi-day courses on all aspects of operations and maintenance of treatment facilities.

“Despite my long career, I actually fell into the wastewater industry,” he admits. “I studied to be a teacher but could not find a teaching job after graduating from college, so I took a position working at a treatment facility and ended up loving it.” Kennedy worked at the Raytheon industrial wastewater treatment plant in Lowell, Massachusetts and the Greater Lawrence Sanitary District in North Andover, gaining first-hand knowledge of the treatment process before joining NEIWPCC.

“Don is well-versed in all things wastewater and a valuable asset to our training team,” said Christina Stringer, director of Wastewater and Onsite Programs. “He brings so much personal experience into his teaching that he is instantly relatable and respected. He is also great at getting folks to participate and be engaged throughout his courses.”

Kennedy's teaching repertoire currently includes in-person and live virtual courses covering basic and advanced industrial wastewater. Some of these trainings are topic-based, such as pH neutralization and solids handling, while others are more extensive exam preparation classes, equipping students with the knowledge needed to pass wastewater operator exams.

He also teaches courses on specialized topics including

electricity, motors and horsepower; pumps and hydraulic principles; and wastewater safety – such as wastewater risks and hazard communication.

“Don's vast industry and teaching experience blend seamlessly,” said student Evan Redden, an environmental scientist at the engineering consulting firm, Kleinfelder. “Don is very good at making his trainings interactive and holding the listeners attention.”

Kennedy, having combined his passion for wastewater and teaching, enjoys seeing his students learn to solve problems through his courses. “The operators are a good group to work with – they are dedicated and down to earth. It is also very fulfilling to do something that benefits the environment and helps to clean water, a precious resource.”

As a trainer, Kennedy travels throughout New England and New York to teach, exposing him to a variety of treatment plants and training and treatment systems. Along the way, he has amassed first-hand knowledge about the systems and challenges at particular facilities and collected “war stories”

from operators to infuse in his courses. He says this variety keeps his job interesting and engaging.

“I always tell my students that there is something for everybody in wastewater treatment,” said Kennedy. “There are many different avenues that you can go in with mechanical, electrical, biological and chemistry components of treatment.”

Over the course of his career, Kennedy notes the obvious technological advances he has witnessed as well as a few less apparent changes. “When I began teaching it was difficult to find a comfortable place to hold trainings, and you had to haul all your equipment from location to location,” recalls Kennedy. Now, many wastewater treatment plants are designed to include conference and meeting spaces well-suited for classes like his.

Kennedy also describes how communities have become more aware of the clean water cycle. “Early on in my career – really the infancy of wastewater treatment – the general public often had no idea what a wastewater treatment plant was,” he said. “I remember telling people where I worked, and they had no idea what wastewater even was. Now, a lot has changed for the better.”

Kennedy has been a key figure in this transformation, raising the expertise and professionalism of the industry through his trainings and encouraging the next generation of operators.

“If I had to do it over again, I would not think twice about going into wastewater,” he adds.

His enthusiasm and talent for teaching has not gone unnoticed. For his many years of service and dedication to the wastewater industry, Don Kennedy received the U.S. Environmental Protection Agency (EPA) New England Lifetime Achievement Award in 2020. That same year he was honored with the New England Water Environment Association's James J. Courchaine Collection Systems Award, which recognizes the members “outstanding efforts in the operation, maintenance, management or design of a wastewater collections system.”





## MAKING WAVES

**James Ammerman** served on a plenary panel at the National Sea Grant American Lobster Initiative Regional Research and Outreach Summit. Additionally, during a webinar hosted by the Connecticut River Joint Commissions, he and **Richard Friesner**, director of Water Quality Programs, presented about nitrogen pollution in the river.

**Ryan Buckley**, environmental analyst, served on a panel during a young professionals technical session at the New England Water Environment Association (NEWEA) Annual Conference.

NEIWPCC commissioners **Janine Burke-Wells**, executive director of the North East Biosolids and Residuals Association (NEBRA) and **Brian Tarbuck**, general manager of the Greater Augusta, Maine Utility District, served as panelists during a plenary session exploring the future of the Clean Water Act and the water industry at the NEWEA Annual Conference.

**Richard Friesner**, director of Water Quality Programs, and **Livia Graham**, environmental analyst, gave a presentation on the Regional Mercury TMDL to the ACWA Monitoring, Standards, and Assessment committee.

**Sue Hagar**, Lake Champlain Basin Program education and outreach



NEIWPCC Executive Director **Susan Sullivan** awarding **Colleen Hickey**, information officer and LCBP education and outreach coordinator, with a 30 years of service award, at the All Staff Meeting in March.



NEIWPCC staff attended the biennial Long Island Sound Research Conference in Jefferson, New York. Topics included nitrogen loading, microfibers, bioextraction, oyster restoration, coastal resilience and hypoxia. Shown here, from left to right: **Robert Burg**, **Chris Eagler**, **James Ammerman**, **Alex DuMont** and **Richard Friesner**. Ammerman, an environmental analyst and Long Island Sound Study science coordinator, served on the planning committee, presented about hypoxia and moderated a session.

steward, gave a presentation on equity in angling at the 2024 National Outdoor Recreation Conference.

**Jen Lichtensteiger**, environmental engineer, facilitated a BioHub stakeholders meeting at the NEWEA Annual Conference to share newly developed information and resources.



**Meg Modley**, environmental analyst and Lake Champlain Basin Program aquatic invasive species management coordinator, delivered a presentation on aquatic invasive species spread prevention in the Champlain Canal, as well as efforts to prevent round goby introduction to Lake Champlain, at the International Conference on Aquatic Invasive Species in Halifax, Nova Scotia.

**Emma Shipley**, environmental analyst with the Rhode Island Department of Health Center for Drinking Water Quality, presented about the department's voluntary sampling



program for lead in drinking water in schools and childcare facilities at the Rhode Island School Superintendents Association meeting.

**Matthew Vaughan**, environmental analyst and chief scientist at the Lake Champlain Basin Program, presented "Exploring Water Quality Impacts of the July 2023 Storm in the Lake Champlain Basin," as part of the Love the Lake speaker series. He was also interviewed by North Country Public Radio about this same topic.

**Peter Zaykoski**, program manager of NEIWPCC's South Portland, Maine office, received NEIWPCC's Annual Achievement Award at the 2024 All Staff Meeting. Zaykoski received nominations for his proactive management and leadership of Maine's Joint Environmental Training Coordinating Committee.





## PARTING SHOT



From left to right: Riley Moulton, Rebecca Navarrette, Daphne Short and Graham Stedfast.

**T**his past summer, NEIWPCC hired 30 interns and seasonal staff across four states, in positions ranging from invasive species management and environmental monitoring to public outreach and communications. These paid positions provided relevant training and career experience. The interns included:

- **Emma Dannenberg** and **Vivienne Shields**, education and outreach coordinators for the resource room within ECHO, Leahy Center, Lake Champlain Basin Program, engaged the public on a variety of watershed topics and stewardship actions.
- **Avril Lynch**, invasive species intern supporting the Rhode Island Department of Environmental Management Office of Water Resources, implemented water chestnut removal and management in the Blackstone and Ten Mile watersheds.
- **Riley Moulton**, contracts/legal intern, assisted with processing and compliance of new and existing contracts.
- **Rebecca Navarrette** and **Daphne Short**, Youth and the Environment Program (YEP) coordinators, supervised and mentored participants, developed environmental education curriculum, coordinated field trips, and organized work activities at two local wastewater treatment facilities. This was Short's second summer as a YEP coordinator, and she joins NEIWPCC in the fall in a full-time capacity.
- **Amy Oblitas Rojas**, research and monitoring intern with the Hudson River National Estuarine Research Reserve, studied estuary habitats, including freshwater tidal emergent marshes and beds of submerged aquatic vegetation.
- **Maya Ray**, communications intern at the Long Island Sound Study, wrote about science and management sustaining and protecting an urban waterway from emerging threats such as sea level rise and climate change.
- **Graham Stedfast**, water quality and business operations intern, supported the Long Island Garden Rewards Program, which reduces stormwater runoff.

Twenty-one of the interns served as aquatic invasive species boat launch stewards with the Lake Champlain Basin Program. They educated lake visitors, collected data, and inspected and decontaminated watercraft for aquatic organisms. 🌊





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## EVENTS

### 2024

Sept. 12, **New England Water Environment Association Laboratory Practices Specialty Conference**, Hartford, Conn., [www.newea.org](http://www.newea.org)

Sept. 15-18, **New England Water Works Association Annual Conference**, North Falmouth, Mass., [www.newwa.org](http://www.newwa.org)

Sept. 17-19, **21st Annual EPA Drinking Water Workshop**, Cincinnati, Ohio, [www.epa.gov/water-research/](http://www.epa.gov/water-research/)

Sept. 18-20, **Maine Water Environment Association 2024 Annual Fall Convention**, Newry, Maine, [www.mewea.org](http://www.mewea.org)

Sept. 24-26, **American Water Works Association Sustainable Water Management Conference**, Las Vegas, Nev., [www.awwa.org](http://www.awwa.org)

Sept. 30-Oct. 2, **Association of State Drinking Water Administrators Annual Conference**, St. Louis, Miss., [www.asdwa.org](http://www.asdwa.org)

Oct. 5-9, **WEFTEC Annual Technical Exhibition and Conference**, New Orleans, La., [www.weftec.org](http://www.weftec.org)

Oct. 6-10, **Restore America's Estuaries Coastal and Estuarine Summit**, Washington, D.C., [www.estuaries.org](http://www.estuaries.org)

Oct. 20-23, **National Onsite Wastewater Recycling Association Onsite Wastewater Mega-Conference**, Spokane, Wash., [www.nowra.org](http://www.nowra.org)

Oct. 27-Nov. 1, **12th U.S. Symposium on Harmful Algae**, Portland, Maine, [www.neiwpcc.org](http://www.neiwpcc.org)

Nov. 5-8, **North American Lake Management Society Conference**, South Lake Tahoe, Calif./Nev., [www.nalms.org](http://www.nalms.org)

Nov. 7, **Green Mountain Water Environment Association Fall Tradeshow**, South Burlington, Vt., [www.gmwea.org](http://www.gmwea.org)

Nov. 13-14, **NorthEast Residuals and Biosolids Conference**, Providence, R.I., [www.nebiosolids.org](http://www.nebiosolids.org)

Nov. 13-15, **NACWA Clean Water Law and Enforcement Seminar**, Tucson, Ariz., [www.nacwa.org](http://www.nacwa.org)

Nov. 17-24, **American Water Works Association Water Quality Technology Conference and Exposition**, Schaumburg, Ill., [www.awwa.org](http://www.awwa.org)

### 2025

Jan. 26-29, **New England Water Environment Association Annual Conference**, Boston, Mass., [www.newea.org](http://www.newea.org)

Feb. 3-5, **New York Water Environment Association Annual Technical Meeting and Exhibition**, New York, N.Y., [www.nywea.org](http://www.nywea.org)

Feb. 4-6, **Maine Water Utilities Annual Tradeshow and Conference**, August, ME [www.mwua.org](http://www.mwua.org)

Feb. 5-7, **Northeast Aquatic Biologists Conference**, Bartlett, N.H. [www.neiwpcc.org](http://www.neiwpcc.org)

Feb. 11-14, **WEF/AWWA Utility Management Conference**, Dallas, Texas, [www.wef.org](http://www.wef.org)

March 16-19, **Annual WaterReuse Symposium**, Tampa, Fla., [www.watereuse.org](http://www.watereuse.org)

