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Established by an Act of Congress in 1947, the New England Interstate Water Pollution Control Commission is a not-for-profit interstate agency that meets the water-related needs of our member states: Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. The thirty-five NEIWPCC Commissioners, five from each member state, are appointed by their state governors.

Interstate Waters

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From the Executive Director

Pride and Appreciation

THIRTY-FOUR YEARS AGO I JOINED THE STAFF of a quiet but energetic organization called the New England Interstate Water Pollution Control Commission. As 2017 begins, NEIWPCC approaches its seventh decade of service to the people, programs, and partners of the six New England States and New York—its member states.

As I reflect upon the many years of serving as Executive Director of this great organization, I do so with a sense of pride and a depth of appreciation in what we have accomplished together.

I now prepare myself to, in four months, step down and pursue new challenges after having had the privilege of working together with all of you: my friends, colleagues, and fellow water quality professionals. NEIWPCC has certainly taken seriously its role and bold mission, which simply is to help and assist working with the states and water environmental community to ensure the success of the Clean Water Act. By doing so, we have brought about extensive benefit to the economies, environment, and public health of our region.

This October, shortly after my departure, marks the forty-fifth anniversary of the Clean Water Act. There is no doubt it has been the premier successful environmental statute in American history. Significant progress has been made under this law. Water quality has improved enormously, reductions in pollution from point source discharges abound, and important investments in infrastructure continue to be made (albeit too slowly). The Act has worked well.

But progress has stalled. The Act is showing its age, modern complex challenges exist, and new approaches are required that take into account the issues and needs of those present-day water quality challenges. These challenges are multi-dimensional and they involve the subjects of emerging contaminants, nutrient pollution, climate change, research and development of new treatment technologies, and the continued failings of aging infrastructure.

The time has come to modernize the Act. It has served us well, but is no longer achieving the water quality improvements it once did. A Clean Water Act must build upon its predecessor's success but create the new tools, mechanisms, and resources to eliminate the water quality problems of today and future decades. While it might be too much to hope for now with Washington priorities being what they are, I am confident the clean water community will be positioned to advance this effort when the time is right.

Consequently, as I enter the last phase of my professional career here at the Commission, I am confident that NEIWPCC is well placed and well equipped to address the challenges before all of us. We together have worked very hard and have been a strong force for clean water and I have enjoyed my role. It has been a deep honor to play a part and I thank all of you for the support and contributions you afforded me. I wish you all the best in your continuing efforts!

Sincerely,

Ronald Poltak
NEIWPCC Executive Director



CONGRATULATIONS TO **Kerry Strout**, a former NEIWPCC environmental analyst who is the new sustainability coordinator for the Town of Scarborough, Maine. Strout worked in NEIWPCC's Lowell office from 2006 to 2011. In addition to traditional municipal sustainability responsibilities such as energy efficiency, her portfolio includes watershed management and other environmental programs.

The NEIWPCC staff was saddened to learn of the passing of **Carmine Goneconte**, superintendent of the Narragansett Bay Commission's Field's Point Wastewater Plant in East Providence, Rhode Island. Goneconte was also an adjunct trainer for NEIWPCC's wastewater program in the Ocean State.

NEIWPCC's **Jim Ammerman**, the science coordinator for the **Long Island Sound Study**, led a panel on nitrogen reduction strategies at the 8th National Summit on Coastal and Estuarine Restoration held in New Orleans last December by **Restore America's Estuaries**. Also on the panel: **Joseph Costa** of the **Buzzards Bay National Estuary Program**, **Courtney Schmidt** of the **Narragansett Bay Estuary**

Program, **Alison Branco** of the **Peconic Estuary Program**, **James Vasslides** of the **Barnegat Bay Partnership**, and **Mark Tedesco** of the **EPA**.

Our congratulations to **David Gray**, Nantucket's new Director of Wastewater Projects and Operations. Gray is a graduate of many NEIWPCC-sponsored wastewater training sessions.

NEIWPCC staff member **Paul Spina** has been reelected to the Board of Directors of the Association of Boards of Certification. The ABC promotes and coordinates environmental certification programs. At NEIWPCC, Spina



Cambria Happ

plays an integral role in the certification and renewal of Massachusetts Title 5 system inspectors and soil evaluators and of Massachusetts wastewater-treatment plant operators.

The Commission staff is pleased to welcome **Cambria Happ**, NEIWPCC's new Business Operations manager. She brings to NEIWPCC more than ten years of experience in nonprofit operations and management, event planning, and office administration. Happ will direct the Business Operations Division. She joined the staff in February. 💧

Welcome New Commissioners

SINCE THE LAST issue of NEIWPCC's print publication went to press in August of 2016, there have been a few changes to the roster of our governing Commission.

After serving as Commissioner of New Hampshire's Department of Environmental Services since 2006, **Thomas Burack** resigned in December of 2016. Burack has returned to Sheehan Phinney, where he practiced law for many years earlier in his career. Assistant Commissioner **Clark Freise** is acting in the role of Commissioner.

NEIWPCC welcomes **Dr. Mark Levine**, Vermont's new Commissioner of Health, and also **Emily Boedecker** as Commissioner of the Department of Environmental Conservation. By virtue of those offices, both sit on NEIWPCC's governing Commission. Both were scheduled to take office soon as this issue of *Interstate Waters* was going to press.

Prior to his February appointment by Governor Phil Scott, Levine was a professor of health medicine at the University of Vermont, where he also served as the associate



Clark Freise

dean for graduate medical education at the Larner College of Medicine and at the UVM Medical Center.

At press time, Levine was due to take office in March. **Harry Chen**, the incumbent Health Commissioner who has served since 2011, will stay on until then. Chen was also acting secretary of Vermont's Agency of Human Services from August 2014 to January 2015.

Boedecker is a former member of the staff of the Nature Conservancy of Vermont. She comes directly from the leadership of Local Motion, a Vermont-wide group that advocates for cyclists and pedestrians and promotes inclusive transportation planning.

Boedecker is scheduled to succeed **Alysa Schuren**, who had been DEC Commissioner since 2015. Schuren is now a senior policy advisor in the Office of the Vermont State Treasurer.

In February of this year, **Donald Pryor** of Rhode Island resigned from the Commission. Pryor, who is a physical scientist and senior policy advisor, served as a NEIWPCC Commissioner for ten years.

NEIWPCC is grateful for the service rendered by departing Commissioners, and looks forward to working with new Commission members. 💧



Dr. Mark Levine



Emily Boedecker

Our New Look

THE NEIWPCC STAFF IS PLEASED to introduce a new design for its flagship publication, including a new name. What had been the *Interstate Water Report* is now *Interstate Waters*, a magazine rather than a tabloid.

The new design should do a better job of delivering the feature stories we write and publish. These include in-depth reports on topics like emerging contaminants and algal blooms as well as stories about water-related projects and events in the Northeast.

Various editorial departments will continue to bring you news of the work of the Commission, its workgroups, and its staff.

Like its predecessor, *Interstate Waters* will be published twice a year.

We hope you like the new design. Please tell us what you think at iwr@neiwpcc.org.



Joint Meetings and More

NEIWPCC CONVENES STANDING workgroups where state-agency staff members sit down with their peers from other states in the region and with federal officials, NEIWPCC staff members, and other practitioners to grapple with the ongoing and latest issues and trends in the field. The below meetings took place at NEIWPCC's main office in Lowell, Massachusetts, unless otherwise noted.

Nutrient pollution took center stage at a joint meeting of NEIWPCC's **Nonpoint Source** and **Onsite Wastewater** workgroups. On August 31, the two groups met to discuss efforts being made around the region to mitigate nonpoint source pollution from failing and outdated onsite wastewater treatment systems.

Each group met separately earlier that day. The **Onsite Wastewater Workgroup** reviewed such state-level developments as a new point-of-sale cesspool-elimination rule in Rhode Island, and regulations related to the design of onsite systems for assisted living facilities in Massachusetts.

Meanwhile, at the **Nonpoint Source Workgroup** meeting, personnel from New Hampshire described the Granite State's Soak Up the Rain initiative. The program had a busy summer helping to install stormwater best management practices, including a rain garden and infiltration trenches at Phillips Exeter Academy.

Many members of the Nonpoint Source Workgroup attended the National Nonpoint Source Training Workshop that took place in Boston October 31–November 3. Some workgroup members also helped NEIWPCC and EPA to plan the event.

The NPS Workgroup also convened by conference call on January 31, 2017. State personnel provided brief updates of projects funded through the federal Clean Water Act Section 319 Program, under which states use federal grants to support local nonpoint-source-management activities.

NEIWPCC's **Wastewater Certification Workgroup** convened by conference call on August 3 and December 6. One of the main discussion topics in August was certification reciprocity: How can a person who is a certified wastewater operator in one state become certified in others? States have differing systems of certification grades or lev-

els. Some states use exam questions written by the Association of Boards of Certification, an international body, which simplifies operator reciprocity.

During the December 6 conference call, members discussed updates to state regulations, wastewater management school programs, and a grant opportunity for developing wastewater curriculum in New England community colleges.

On September 14, the **Wetlands Workgroup** convened in Lowell to hear Tina Heath of the Vermont Agency of Natural Resources describe an initiative to synchronize the agency's monitoring of Vermont's lakes, rivers, and wetlands. Staff members of the Udall Foundation described a mediation effort and some research by the Foundation about state general permits and joint processing of applications by the Army Corps of Engineers, states, and the EPA.

Members of the **Climate Change Workgroup** gathered on September 26. One highlight from the discussion concerned the need to bridge the gap between state and local government on climate-change issues. At this stage, state resources to help municipalities respond to and plan for climate change are limited, while cities and towns often lack the expertise to respond to climate-change matters.

NEIWPCC's **Underground Storage Tanks Workgroup** met on October 13 and December 9. Some workgroup members are

working with small businesses that need to comply with a new regulation that requires the closure of some single-walled tanks installed prior to mid-1985.

Group member Sofia Kaczor, of the Rhode Island Department of Environmental Management, told how a contaminated former Sunoco gas station was remediated for benzene, toluene, and other contaminants. The site was purchased by the neighboring International Tennis Hall of Fame for a major expansion of its campus.

On December 9, Allison Forrest-Laiuppa, of Connecticut's Department of Energy and Environmental Protection, told how a rapid response to the detection of a pinhole leak at a service station prevented contamination of nearby drinking-water wells.

At an October 27 meeting of NEIWPCC's **Water Quality Standards Workgroup**, personnel from EPA Headquarters described a new tool for determining copper criteria for estuarine waters. The tool is one of three "biotic ligand models" from the EPA. State personnel in the workgroup learned about the model and the monitoring data that states can plug into it to find water-quality criteria for copper.

In addition, workgroup members from each state gave updates about the integrated reports on the quality of each state's waters. The federal Clean Water Act requires states to submit these reports to the EPA every two

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NEIWPCC's New England Biological Assessment of Wetlands Workgroup held a joint meeting with the Mid-Atlantic Wetland Workgroup in November. Above, members of the two groups visit the New Jersey Pinelands National Reserve to view unique plant communities and other features.



NYC Department of Environmental Protection

Soaking It Up

Innovative Park Prototype Tackles Runoff in Brooklyn

BY ANNA MEYER

LEGACY INDUSTRIAL POLLUTION, combined sewer overflows, and stormwater runoff plague the Gowanus Canal in Brooklyn, New York. The canal and its environs, designated a superfund site in 2010, may seem a hopeless case. Yet as land use near the canal shifts from heavy industrial to a mix of light industrial, commercial, and residential, more people—and agencies—are growing interested in cleaning up the canal and minimizing further pollution, such as from combined sewer overflows.

The canal's champions include the Gowanus Canal Conservancy and Brooklyn-based design firm DLANDstudio. Susannah Drake, a landscape architect and founding principal of the firm, says the fledgling Conservancy approached her newly formed firm in 2008 to develop a master vision for adding 5.5 acres of open space to the densely populated Gowanus Canal watershed.

The staff at the Conservancy had liked an earlier proposal from the studio to build a public green space over part of the Brooklyn Queens Expressway as a means of reconnecting neighborhoods. Drake says she helped the Conservancy to procure a grant from the New York State Council on the Arts to create the master plan. Andrea

Parker, the Conservancy's current executive director, says it was the group's "first large grant."

Drake realized that publically owned street ends abutting the 1.8-mile-long canal could be transformed into working landscapes that absorb and filter stormwater runoff. That idea, which she dubbed a "sponge park," appears multiple times in the master plan.

DLANDstudio's vision was to connect twelve street-end sponge parks and other community-recreation areas with an esplanade along the canal. The firm has received multiple awards for the 2008 master plan, including honors from the American Society of Landscape Architects and the American Institute of Architects. The sponge park design, in particular, is lauded for its two simultaneous identities: green infrastructure and public park.

In 2010, NEIWPCC awarded DLANDstudio an EPA grant of \$184,995 to design a pilot sponge park. Over the next six years, the firm not only devised the pilot project but also raised funds for construction and worked with city, state, and federal agencies to see the project through to installation.

To develop the project plan, the firm worked closely with neighborhood residents, community groups, and numerous government agencies whose jurisdictions the small park intersects. These authorities included the New York City Departments of Environmental Protection, Parks and

Recreation, Transportation, City Planning, and Design and Construction, and the New York State Department of Environmental Conservation. Since the canal is a Superfund site, the EPA and the U.S. Army Corps of Engineers had regulatory jurisdiction as well.

"It is important to understand the rules and understand who has jurisdiction," Drake says of the labyrinthine permitting process. "Visualization of territory...stops some of the churning that can happen when it's not clear who is the responsible party."

The pilot project cost a total of \$1.5 million, but Drake credits the grant from NEIWPCC not only as critical to moving the pilot-project forward but also helping establish the firm, since it was "the first big grant" for the project.

Two Benefits, One Park

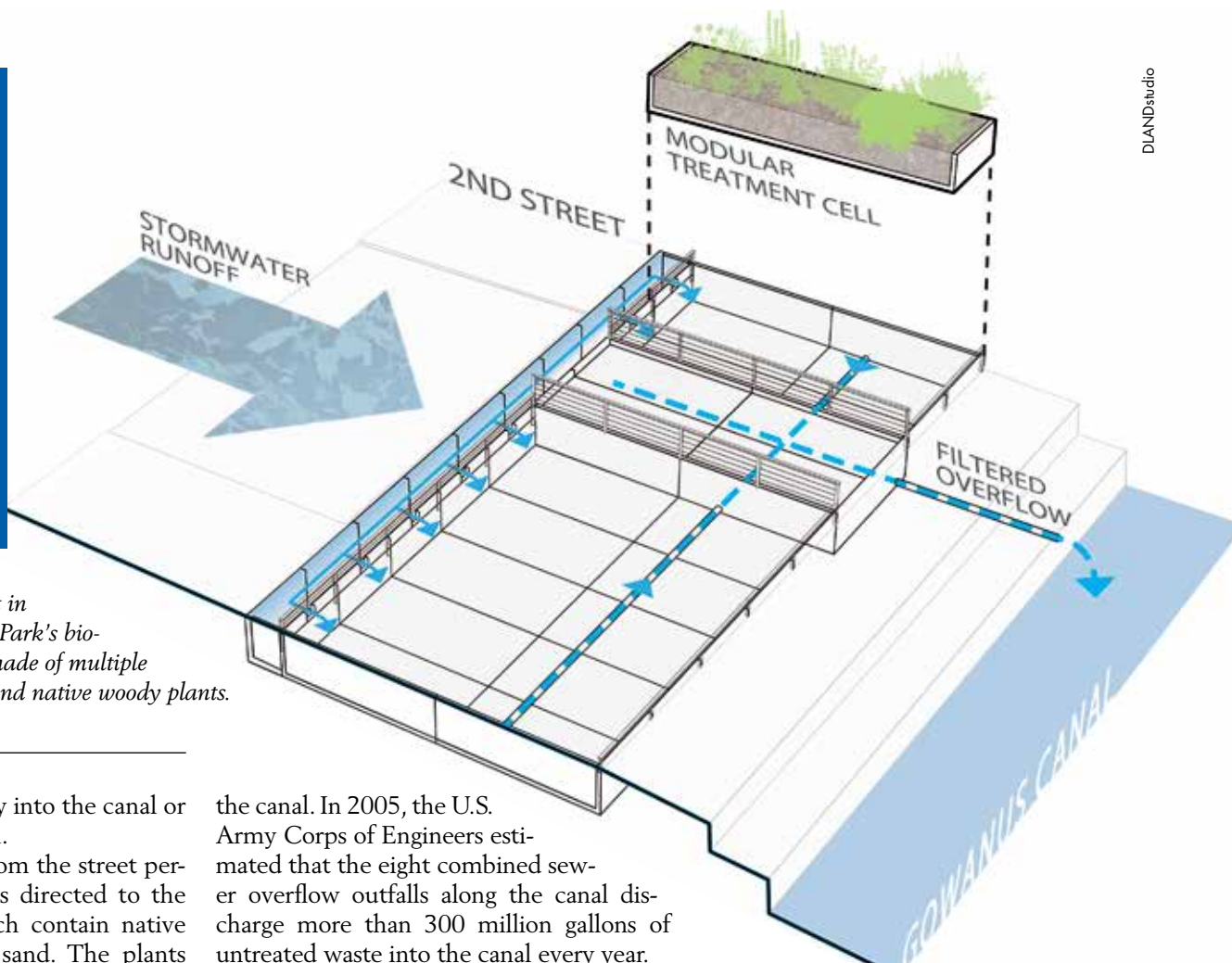
The Gowanus Canal Sponge Park officially opened in October of 2016. On the surface, the park is geometrically simple. Twin bioremediation basins flank a central walkway that connects the street to the water's edge. The basins include a mix of green vegetation.

The park is designed to work against two major sources of pollution to the Gowanus Canal: street runoff and combined sewer overflows. According to the design firm, the park will capture some one million gallons of stormwater annually that would have

Anna Meyer is an environmental analyst in the Communications Division at NEIWPCC. Above: A view of the Gowanus Canal Sponge Park.

The park is designed to work against two major sources of pollution to the Gowanus Canal: street runoff and combined sewer overflows.

Stormwater from 2nd Street in Brooklyn flows into Sponge Park's bio-retention system, which is made of multiple cells containing soil, sand, and native woody plants.



otherwise drained directly into the canal or entered the sewer system.

Instead, stormwater from the street perpendicular to the park is directed to the bioretention basins, which contain native woody plants, soil, and sand. The plants chosen absorb, accumulate, or metabolize pollutants that stormwater picks up on roadways, including oil and heavy metals. They include beach rose, bay laurel, iris, summer-sweet, and a grass-like plant in the sedge family. The plants are native to the region, salt tolerant, and able to withstand various levels of inundation.

Sponge Park uses mostly woody plants instead of the herbaceous plants typically found in bioremediation basins. Drake said she wanted Sponge Park to be easy to maintain and to feel like a park, even in the New York winter. "Woody plants are used more in park landscapes," she said. "In the winter, it looks like there's something there."

Some of the water infiltrates into groundwater. The remainder flows into the canal, but only after being filtered by the basins.

The system also diverts some of the rainwater from entering the sewer during small and large storms. In this way, the park helps prevent the Red Hook wastewater treatment plant in Brooklyn—which receives both domestic wastewater and stormwater—from reaching its maximum capacity and discharging untreated wastewater into

the canal. In 2005, the U.S. Army Corps of Engineers estimated that the eight combined sewer overflow outfalls along the canal discharge more than 300 million gallons of untreated waste into the canal every year.

The Bigger Picture

Residents and officials have different reasons for supporting Sponge Park, but a compelling one is how the park complements the cleanup that will happen as a result of the EPA's 2010 designation of the canal as a Superfund site. Like so many waterways in

the Northeast and beyond, Gowanus Canal served as a place to dump waste for more than a century.

The canal was a major industrial shipping route, and received waste from paper mills, tanneries, and chemical plants. Factories that manufactured gas from coal for

The plants, soil, and sand in Sponge Park filter pollutants out of stormwater. Near the Gowanus Canal, a walkway and boat ramp echo the park's intended use as a recreational space.



lighting, cooking, and heating added their effluents to the mix. High concentrations of more than a dozen contaminants, including polycyclic aromatic hydrocarbons, polychlorinated biphenyls and heavy metals, including mercury, lead, and copper, have been found in canal sediment.

The EPA also recognizes combined sewer overflows as part of the problem. Consequently, the remedy plan for the site includes not only removal of contaminated material but also the construction of two large storage tanks that will hold wastewater from the combine sewer until treatment plants can handle it.

Modular Cells

Another notable aspect of Sponge Park is its modular construction. The bioretention basins are made up of prefabricated perforated concrete cells. The whole park is about 2,500 square feet (about the size of a singles tennis court).

Offsite construction offered multiple benefits, according to Drake. Fabricating the cells in a controlled environment, and not onsite, meant the concrete curing process was not disrupted by tidal changes in the water table. (The Gowanus Canal was built in the nineteenth century in a wetland connected to the New York Harbor.) Offsite construction also gave the firm more control over construction quality.

The fact that the cells are identical to one another is economical. Perhaps most significantly, the pattern is now on hand, ready to cast any number of modules.

Drake's firm is currently working with New York City's Departments of Transportation and Environmental Protection on a few projects that use the technology developed for Sponge Park. However, she has set her sights even higher, hoping that the modular basins will become "the Jersey barriers of stormwater management": inexpensive, simple, and easy to deploy widely.

Accent on Access

In a relatively recent change to City zoning, every time a parcel changes use (from industrial to residential, for example), the property owner is required to provide a forty-foot setback from any waterfronts. Subsequent regulation applied this standard to the canal. In a few places on the canal, including a parcel adjacent to Sponge Park, the setback has made room for a section of an esplanade—a public walkway dotted with benches. Lightstone Group, the developer of a high-rise near Sponge Park, installed a small boat ramp on the esplanade so that boaters, such as members of the local canoeing group, can easily leave



Maps and satellite imagery show how Brooklyn grew near Gowanus Bay from 1766 to the present era. The canal was built in the nineteenth century in a wetland connected to New York Harbor. It runs through Brooklyn and was a major industrial shipping route. Today, land use near the canal has shifted from heavy industry to a mix of light industrial, commercial, and residential uses.

the water if a barge comes along.

Susannah Drake said public access to the canal was one of the main concerns raised when DLANDstudio solicited public comments about the master plan for the watershed in 2008. In 2016, when Sponge Park officially opened, New York City Council Member Stephen Levin said, "This project proves that taking care of our environment and providing amenities to the public are not mutually exclusive—in fact, quite the opposite is true. The more green infrastructure and open space we create, the greater the public's stewardship."

Looking Ahead

The plan includes provisions for Manhattan College to monitor the park's effectiveness at removing pollutants. NEIWPCC's 2010 grant to DLANDstudio covered the development of a quality assurance project plan for the monitoring work, which

will include measurements of the volume of runoff entering Sponge Park and the amounts of pollutants removed. It is likely that the results of the monitoring will give confidence to those considering installing a sponge park or similar green infrastructure system.

Meanwhile, the Gowanus Canal Conservancy, which was one of many partners in the design process of the pilot project, is looking at the big picture. Andrea Parker, executive director of the Gowanus Canal Conservancy, says the group is seeking "a community vision plan for Gowanus Greenscape, the network of parks and public spaces centered on the Canal." The Conservancy plans to post a request for proposals this spring.

Parker says the plan "will build on" the 2008 master plan "and take into account the canal's 2010 designation as a Superfund site as well as expected zoning changes." 💧

A Life of Public Service

Ron Poltak's career is the story of water quality efforts in the Northeast and nationally

BY ADAM AUSTER

RONALD POLTAK, WHO JOINED NEIWPCC's governing Commission in 1979 and went on to become the organization's first executive director four years later, will depart from that role in July. A search for his successor is in the planning phase.

When hired in 1983, Poltak was one of the new breed of environmental policy makers who rose to professional maturity implementing the Clean Water Act, which Congress adopted in 1972.

Poltak steered what had been a small, technically oriented group through decades of sweeping changes in the environmental field. Under his direction, the Commission added training programs and forged partnerships with the EPA and with regional and national organizations. His unwavering goal was always to support state and local efforts to resolve difficult water issues, including appropriate standards, planning, and funding decisions.

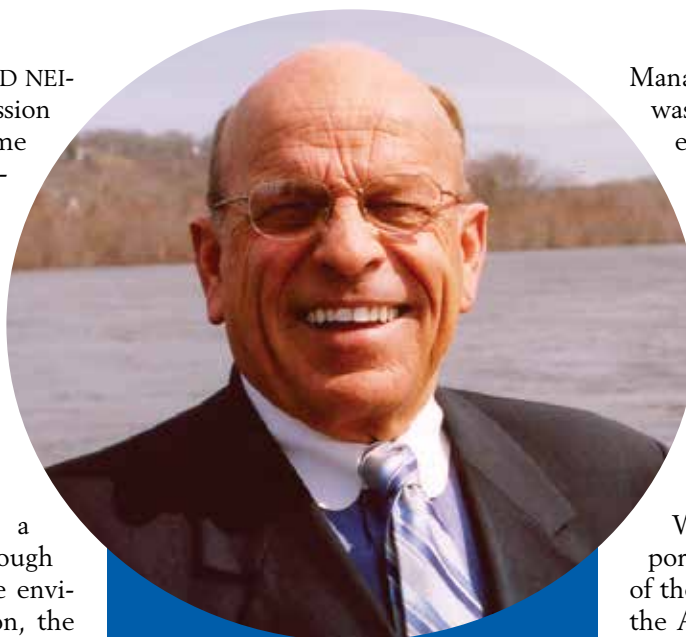
Decades of Service

Poltak entered public service in New Hampshire as an intern in the state planning department in 1968 while still an undergraduate at the University of New Hampshire. He returned to that department following active duty in the Air Force, eventually becoming the director of the state's Office of Comprehensive Planning and advisor to New Hampshire governors on environmental issues.

In that capacity, it was inevitable that Poltak would work with NEIWPCC. Then-Governor Hugh Gallen appointed Poltak to the Commission in 1979. The decision to hire Poltak as NEIWPCC's first executive director in 1983 marked a new direction for the organization.

Starting in 1948, NEIWPCC's staff had been led by a succession of engineers who

Adam Auster is the Director of NEIWPCC's Communications Division.



Poltak steered what had been a small, technically oriented group through decades of sweeping changes in the environmental field.

served under the title of executive secretary. When Al Peloquin retired from that position in 1983 after sixteen years, following a fruitful decade of implementing the priorities of the Clean Water Act, the Commission made a deliberate break with the past, hiring a policy professional rather than an engineer.

"It was unheard of that you would have some kind of generalist environmentalist in this role," Poltak said. "Today our advocacy is so diverse that a big-picture focus is required," he said. In 1983, it was a break with the past.

New Directions

Under Poltak's leadership, NEIWPCC turned outwards, reaching out to younger sister organizations such as the Northeast States for Coordinated Air Use Management (air quality) and the Northeast Waste

Management Officials' Association (solid waste). It was a time, he recalls, when environmental issues left their discrete cubbyholes and demanded a comprehensive approach. During this period, he remembers, the states consolidated their individual environmental bureaus into "comprehensive resource-management agencies," each a single coordinated organization dealing with environmental issues statewide.

Poltak became the face of the Commission in statehouses and in Washington, and helped to craft important legislation. He served as president of the national organization now known as the Association of Clean Water Administrators. Poltak came on board as executive director at a time when the EPA's budget had been slashed by 30 percent. Within a few years, Congress replaced the federal wastewater grants program with the State Revolving Fund, a loan program.

The EPA eventually recovered, Poltak said, but the switch to loans has "slowed the pace of progress" in controlling water pollution. The change has contributed to "a funding gap between need and appropriation." With less funding, state and local governments are no longer able to replace and improve wastewater facilities in a timely way. Another consequence has been steady increases in water and sewer bills to users over time.

Poltak also led the organization in an expansion of its training program for wastewater and drinking water plant operators. Training "was implicit" in the push to build new wastewater facilities per the Clean Water Act, backed up by federal funding in the 1970s. "It was clear from inception," Poltak said, "that we would have to train people to operate these facilities."

Training for wastewater professionals was under way before the Clean Water Act. By the late 60s, NEIWPCC had created the New England Regional Wastewater Institute (NERWI), a training school for waste-

water-treatment-plant operators, located on the campus of what is now the Southern Maine Community College in South Portland, Maine.

When the relationship with the school ended in 1998, Poltak moved the training effort to NEIWPCC's headquarters, where the program took the general form that it has kept to this day. NEIWPCC still staffs a South Portland office that houses Maine's Joint Environmental Training Coordinating Committee and other Maine-based NEIWPCC initiatives.

By the 1990s, the Commission's work ranged far beyond the end of the wastewater pipe. It had calculated the cost per household of new water infrastructure. The Commission had published a comprehensive design guide for wastewater facilities, which would be revised several times, and NEIWPCC had become a source of information about a broad range of water issues to policy makers and the public.

Also under Poltak's leadership, the Commission developed deep relationships with place-based programs such as the Hudson River Estuary Program, the Lake Champlain Basin Program, and the Long Island Sound Study. These partnerships endure to the present day.



Hannah Mellman/NACWA

Ron Poltak testifies at a hearing of the U.S. House Transportation and Infrastructure Committee's Water Resources and Environment Subcommittee on July 24, 2014.

The success of the original Clean Water Act in regulating discharges from pipes has left nonpoint source pollution, such as runoff from farms and roads, as the most stubborn challenge for water-quality professionals and policy makers.

Modern Challenges

A provision of the 1980s-era reauthorization of the Act requiring states to establish science-based management plans for water bodies is the lynchpin of state efforts to

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The Long View

A VISIT WITH RON POLTAK, NEIWPCC'S EXECUTIVE DIRECTOR SINCE 1983, IS A TOUR OF THE NATION'S RESPONSE TO ENVIRONMENTAL ISSUES FOR THE LAST FOUR DECADES.

Starting with the creation of the EPA and the passage of the Clean Water Act in the early 1970s, government has sought to identify and deploy the smartest, most cost-effective ways to fix acute environmental problems and protect water quality.

Poltak advised several New Hampshire governors on environmental issues in the 1970s and 80s and served as a member of NEIWPCC's Commission before signing on as executive director in 1983. He says the story of clean water in the northeast and the nation has been a progression from clear-cut technical issues focusing on "the end of the wastewater pipe" to a more policy-oriented focus on nonpoint source pollution.

In the first decade following the adoption of the Clean Water Act, he said, the commission developed standards "based on the best technology available" to reduce discharge "at the pipe." It was a technically challenging problem, but one that seems simple compared to today's. "Our challenges are nonpoint source-related, not through pipes," he said, citing "climate change, superstorms and runoff, and



Fresh out of the Air Force in 1970, Ron Poltak sits at his desk in New Hampshire's Office of Comprehensive Planning.

emerging contaminants."

From that perspective, the Clean Water Act of 1972 is, in Poltak's view, "the most successful environmental legislation of our time." It led directly to the cleanup and control of significant point-source pollution that was fouling the waters of the United States. Forty-five years later, the Cuyahoga River in Ohio no longer catches fire, and the question "Who killed Lake Erie?"—the title of a Peabody-award-winning documentary in 1969—seems to belong to a dystopian parallel universe.

Yet today, he said, the provisions of the Clean Water Act are proving to be poor instruments to answer current "trends and problems that were never contemplated by the authors" of the Act, such as nutrients and climate change. The next step, he says, must be to "create new tools to address today's water-quality issues and those of the future."

Looking ahead and beyond the current turmoil in Washington, Poltak sees water quantity as the next big issue for the Northeast. Already, he says, "providing and maintaining adequate water supply for public use is as essential as maintaining water quality" as a matter of concern, and it is an issue that will demand "substantial energies from policy makers" in the water-rich region. 💧

Microfibers in the Freshwater Environment

Plastic Fibers Emerge as a Contaminant of Concern

BY JACLYN HARRISON

IT SEEMS ALMOST UNFAIR. LIGHT-weight, warm, and economical polyester fleece, often made in America from recycled plastics, is the source of a stealth contaminant that is polluting our waterways and food chain on a massive scale, especially in areas near dense human populations. The consequences to aquatic organisms and to humans are not known.

Among the various types of microplastics that have been found in the aquatic environment, plastic microbeads are better known. Congress banned microbeads in 2016 in the U.S. However, recent studies have found microfibers to be even more pervasive.

Polyester fleece is nearly ubiquitous today but was unknown before the late 1970s. An early commercial fleece product, Polartec, originated in the old mill city of Lawrence on the Merrimack River in Massachusetts. There the Malden Mills company created Polartec in 1979, and would grow to 3,000 employees.

Microfibers are small plastic particles, less than 5 millimeters long and fibrous in shape. Polyester, acrylic, nylon, and rayon are the most common types of microfibers now being found in water bodies and in the food chain. Researchers are finding the fibers incorporated into fish tissue. Over the past five years, the production of polyester, the most common



On average, synthetic fleece jackets release 1.7 grams of microfibers each wash, which equates to an average of 80,000 microfibers.

synthetic fiber, was two to three times that of all other fibers combined. Its production will likely reach 84 million metric tons per year by 2025. As demand for polyester grows, its life-cycle impacts should be of increasing concern.

These plastic microfibers (magnified) were found in the esophagus of a double-crested cormorant. Rachel Ricotta took this photo through a microscope while assisting with a study of microplastics in the Great Lakes.

Pervasiveness

Ecologist Mark Browne was one of the first researchers to study microfibers in marine environments. In 2011, Browne published a study in which he sampled eighteen shorelines around the world and found that 85 percent of the synthetic materials at those sites were microfibers, especially at sites near wastewater treatment plants.

Microfibers are also found in the freshwater environment. On the surface of Lake Michigan, researchers found 19,000 strands of microfibers per square kilometer, 16 percent of the total plastic recovered. It is important to note that in this study the samples were collected by skimming a fine-mesh net along the surface of the lake. That sampling method did not account for any fibers that may be present throughout the water column or that may have settled at the lake bottom. To date, researchers have sampled twenty-nine tributaries of the Great Lakes using same surface-only

Jaclyn Harrison is an Environmental Analyst for NEIWPCC's Water Resource Protection Division. She coordinates the Commission's Contaminants of Emerging Concern Workgroup.

technique. Microfibers account for 71 percent of microplastics found in these smaller bodies of water, measured in particles per cubic centimeter.

Patagonia Study

Apparel seems to be the obvious and logical source of the microfibers being found in our waterways. A study released by researchers at the University of California at Santa Barbara, and funded by the outdoor clothing manufacturer Patagonia, found that, on average, synthetic fleece jackets release 1.7 grams of microfibers each wash, which equates to an average of 80,000 microfibers.

Clothing age, washing machine type, and clothing construction significantly alter shedding characteristics. Older jackets shed almost twice as many fibers as new ones. Greater shedding in older jackets is most likely due to the weakening of fibers as a result of wear. Top-load washing machine trials had over five times the average microfiber shedding of the front-load machine trials because of the agitator used in top-loading machines to wash clothes. Finally, shedding from a budget jacket was consistently higher than its Patagonia counterpart, which could indicate the importance of textile composition and garment construction.

Wastewater Plants

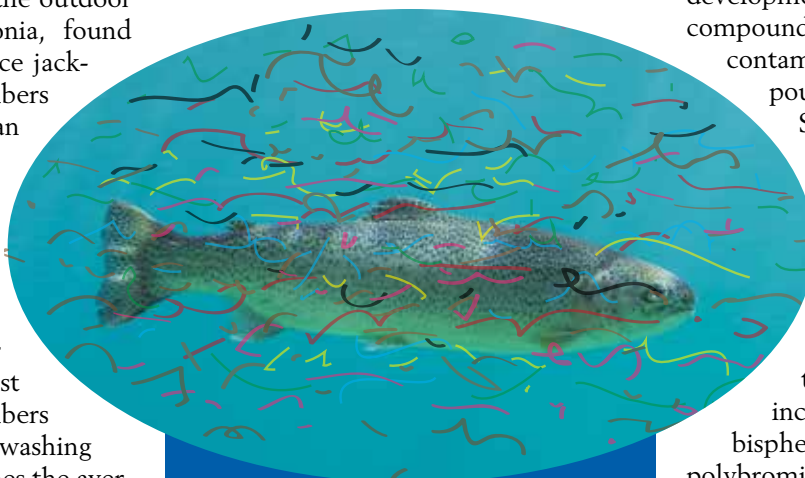
Wastewater treatment plants (WWTPs) play a critical role in the fate and transport of microfibers in the environment. WWTPs receive large amounts of microfibers daily and while most microfibers are removed, a significant amount are still released into the local environment. The Patagonia researchers calculated that a city of 100,000 people could send anywhere from 20 to 240 pounds of microfibers into local waterbodies daily, which averages out to around 15,000 plastic bags.

Researchers at SUNY Fredonia found microfibers accounted for 85 percent of the plastic in effluent at treatment plants they examined. There is a greater proportion of smaller microfibers in plant effluent, which indicates that smaller fibers are more likely to make it through the WWTP process.

The influent and effluent of numerous WWTPs has been sampled and analyzed for microfiber and microplastic particles. Sampling methods vary between studies, but removal efficiency ranges from 65 to 99.9 percent based on influent versus effluent concentrations. Most of the fibers appear to be removed during the grease-

removal stage.

Due to high capital costs, however, upgrading WWTPs is not a feasible solution to microfiber pollution in the short term. Even if the removal efficiency were to improve, the fibers would be retained in the sewage sludge. Microfibers can still enter the environment from sewage sludge, which is increasingly being applied to farmland as fertilizer.



Fibers can also harm fish by leaching toxic chemicals into their bodies.

Impact

The size of microplastics and microfibers allow them to be easily consumed by fish and other wildlife. These particles have been found to cause physical and chemical impacts on aquatic organisms.

Microfibers in particular are not as easily excreted as other plastic fragments due to their shape. Ingestion of microplastics may cause internal bleeding, abrasion, and ulcers, as well as blockage of the digestive tract. In a 2014 study from the University of Exeter, crabs were given food contaminated with microfibers. The crabs subsequently ate less food overall due to the feeling of being full. This could stunt growth over time or lead to starvation.

Fibers can also harm fish by leaching toxic chemicals into their bodies. These chemicals include fabric finishes, plasticizers, and adhered organic pollutants. While the data are still limited at this point, it is safe to assume that the longer these fibers stay inside a fish, the more likely they are to leach chemicals into its body.

Finished apparel products contain large quantities of chemical substances. These chemicals may include formaldehyde, flame retardants, and perfluorinated chemicals. Some anti-wrinkle finishes in new clothing release formaldehyde, which is a

human carcinogen. Flame retardants have been linked to thyroid disruption, memory and learning problems, delayed mental and physical development, lower IQ, early puberty, and reduced fertility. Some perfluorinated chemicals, such as Teflon (which is sometimes added to clothing to make it waterproof) disrupt normal endocrine activity, reduce immune function, cause adverse effects on multiple organs, and cause developmental problems. (Perfluorinated compounds are another class of emerging contaminants; see "Perfluorinated Compounds: Emerging Challenge for States, Communities" in the September 2016 issue of the *Interstate Water Report*, this publication's predecessor.)

Plasticizers are additives that enhance the plasticity or fluidity of a material. As plastics degrade, they may release these additives. These substances include phthalates, alkyl phenols, bisphenol A (BPA), heavy metals, and polybrominated biphenyl ethers (PBDEs). These chemicals are known to disrupt endocrine functions and cause harmful reproductive and developmental effects in aquatic animals. The chemicals have the potential to bioaccumulate, becoming more concentrated as they move up the food chain.

Of even greater concern is the ability of the microfibers to act as a vector for contaminants because they can absorb persistent organic pollutants and bioaccumulate in animal tissues. These pollutants include dichlorodiphenyltrichloroethane (DDT), polychlorinated biphenyls (PCBs), and polychlorinated dibenzo-p-dioxins.

Reproductive effects from microplastics have been found in filter feeders, such as mussels and oysters, which filter large volumes of water and thereby ingest suspended plastics. Studies of oysters that consumed microplastics found that the oysters produce fewer and smaller egg cells and slower sperm, which results in fewer larvae.

Health Risks

Microplastics and microfibers have been found in marine species consumed by humans. A 2014 study estimated that regular consumers of European shellfish may ingest up to 11,000 microplastic particles per year. A 2015 study found microplastics in the stomachs of swordfish, bluefin tuna, and albacore tuna. A recent study on fish purchased at markets in California found that 25 percent of fish and 33 percent of shellfish contained plastic and natural mi-

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Estuary Knowledge

Research Seminar Boosts Estuary Work

BY ADAM AUSTER

Save The Bay

THE FISH WERE DYING, AND IT TOOK continuous monitoring to explain exactly why.

Alison Branco, the program director of the Peconic Estuary Program, described the problem at a gathering of estuary researchers last fall. There had been two major fish kills in the tidal portion of the Peconic River in late spring of 2015. Thousands of fish had died and the cleanup was “massive.”

The usual suspects were present at the sites of the die-offs: nutrient pollution, rising water temperature, and algal blooms. However, the levels of dissolved oxygen, though low, exceeded the 3-milligrams-per-liter state standard for acute concentrations of oxygen. Suffolk County measured the dissolved oxygen level regularly.

Continuous monitoring by the U.S. Geological Survey told the real story, a daily cycle in which levels of dissolved oxygen dipped well below the acute standard and then rose again. The die-offs coincided with especially lengthy nighttime periods of low dissolved oxygen. The periodic sampling had missed those events. Fortunately, researchers could draw on both sets of monitoring data.

Branco was one of thirty-five researchers, administrators, and advocates who shared stories and ideas at NEIWPCC's first research workshop, held in Staatsburg, New York, last September. Last year NEIWPCC funded thirty-three projects involving the collection or use of environmental data, fourteen of them estuary related.

Estuary scientists and administrators across the Northeast engage in similar work, yet had never before come together at a single regional estuary-specific forum. A second research seminar planned for September 13 will focus on phosphorus in estuaries. NEIWPCC also sponsors an ongoing series of webinars on current research topics, some estuary related.

In Staatsburg, the workshop began with six presentations, including Branco's, but then resolved into breakout sessions on topics generated by participants. Personnel from many different organizations sat down together to compare notes and perspectives on such topics as behavior-change campaigns, data quality, and the impact of science on public policy.

They discussed equipment, calibration and maintenance protocols, open spaces as pollution vectors (think golf courses, crop lands), and parameters to monitor and track nutrient progress.

Except for Branco's, the morning presentations were all from NEIWPCC staff members working at regional organizations, as follows.

- Daniel Miller, the habitat restoration coordinator for the Hudson River Estuary Program, described four sustainable-shorelines demonstration projects along the Hudson River. Miller told the group “the most common methods of shoreline preservation” such as riprap (stone or concrete fortification) “are not good for the river.”

“People don't always want what's good



At the September 24 Estuary Research Workshop in Staatsburg, New York, Sean O'Neill of Peconic Baykeeper pitches a topic for the afternoon session.

Adam Auster is the Director of NEIWPCC's Communications Division. Alison Branco, the Director of the Peconic Estuary Program, created and refined the graphic display (opposite) of dissolved oxygen levels in the Peconic River in late spring of 2015.

for the river,” he cautioned. “They like ‘clean’ shorelines devoid of important vegetation.” Outreach is critical, he said.

- Sarah Fernald, the research coordinator for the Hudson River National Estuarine Research Reserve, said she and her colleagues at the Reserve are contributing to national long-term monitoring efforts coordinated by the National Estuarine Research Reserve System. This work monitors water quality, vegetation, surface elevation, water level, and other parameters in the Hudson River Estuary.

- Tom Borden, program director of the Narragansett Bay Estuary Program, described a multi-year effort to compile data on the condition of Narragansett Bay and its watershed. A forthcoming report will include research about a wide range of topics including sea grass, salt marsh, benthic habitat, dissolved oxygen, nutrients, chlorophyll, water clarity, and toxins.

- The Long Island Sound gets 70% of its fresh water from the Connecticut River, according to Jim Ammerman, the science coordinator for the Long Island Sound Study. Ammerman described a biennial research grant competition that focuses on research to inform policy related to improving the management of Long Island Sound.

One recently funded project is quantifying changes in organic matter as it falls

through the water to sediment. It is also examining how the movement of nutrients into and out of the sediment may change in response to changes in the magnitude of nutrient inputs.

- In Lake Champlain, the University of Vermont has set up twenty-seven fixed-position acoustical receivers to monitor fish movements. According to Eric Howe, the director of the Lake Champlain Basin Program, “All the state has to do,” is to put transmitters in fish or other organisms, “and the monitoring stations will track them.”

Researchers are scrambling to keep up with the volume of data generated by new technology and citizen-science programs. One of the afternoon sessions was titled “Keep collecting data! Now what to do with it?” Data quality, and ways to characterize data from different sources to render them useful, were recurring themes throughout the day. So was the importance and difficulty of interpreting the results of monitoring to policy makers and the public.

The graphical representation of the dissolved-oxygen data from the Peconic River fish kills paints a vivid picture of cause and effect. It was, Branco said, “especially useful to help the public understand what was going on.”

She added that the data are downloadable, free to use, and “available in real time”:

the monitoring system generates a text message whenever the oxygen level drops below 3 milligrams per liter.

Experience and Humility

Comments at the breakout sessions reflected decades of experience, leavened with frustration and a good measure of humility:

“It’s a shame” that data sources and programs come and go, because consistency and persistence are valuable. Data grow more valuable “when collected over time.”

“It’s great if you have the data on a spreadsheet, but” you also need “the meta-data about how it was collected and the quality.”

There’s a creek that goes “completely anoxic...every single year” due to lack of funding to fix the problem (which involves a wastewater treatment plant).

“The kind of change we can get from” adaptive management techniques “is very small.” It can take “decades” to make a meaningful change “and by that time everything’s changed.”

“You can’t move a seawall when there’s a whole community on the other side of it who pays a lot more in taxes.”

“Laws and policies only happen when there is a demand by the public.”


“Wastewater plant operators say, ‘If you want me to do something, tell me what it is now so that we can plan for it.’”

“We tend to be weaker when it comes to integrating economic and social information. We do a great job in struggling to understand natural systems, but we have a harder time putting that in a social context that drives decisions.”

“Our predictive capacity is pretty slim since we do not always know the direction of change or the pace of change”

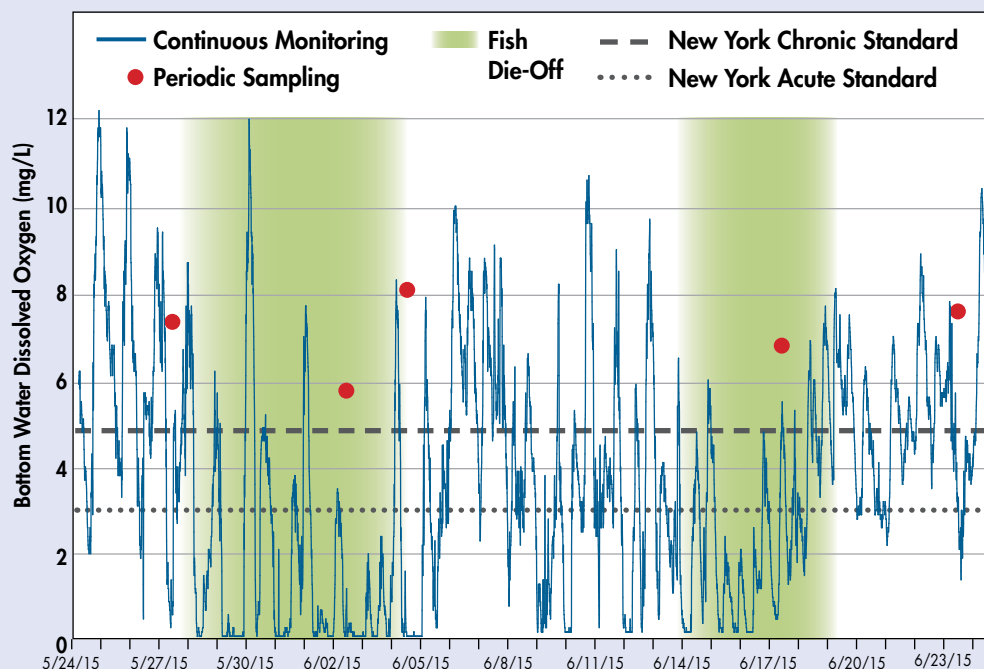
The daylong workshop is part of a broader effort by NEIWPCC to share the research that it conducts or funds in the Northeast. This work is not all about estuaries, but estuaries are important ecological resources and their health has broad implications that extend beyond their physical boundaries.

Estuaries are sensitive to climate change and nutrient pollution, issues that can similarly affect large water bodies. Accordingly, at the workshop last September, discussion of monitoring and research on Lake Champlain was a natural complement to conversations about monitoring and research on the Northeast’s estuaries.

This workshop brought research personnel from Lake Champlain, Long Island, New Hampshire’s Great Bay, and Narragansett Bay areas to join Hudson Valley estuary scientists and administrators. 

Oxygen Levels and Fish Die-Offs

Continuous Monitoring Shows What Periodic Sampling Misses



Periodic sampling (red dots) fails to capture critically low levels of dissolved oxygen revealed by continuous monitoring (blue). Low oxygen coincided with major fish die-offs in late spring of 2015. Shading shows the approximate durations of two of the die-offs. (Sampling and monitoring stations may have differed slightly in their depth and location in the channel.)

Data: Suffolk County and USGS. Chart: Alison Branco/Peconic Estuary Program

Microfibers

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crofibers. Microplastics have even been found in sea salt.

The EPA is currently studying the human health impacts of microfiber consumption. Although the effects of microfibers on humans are unknown, studies of chemical compounds often found on microfibers are associated with alterations in normal function of the human endocrine system, impaired brain development, learning disabilities, and increased incidents of cancers.

Next Steps

On December 28, 2015, President Obama signed into law the Microbead Free Waters Act, which bans the manufacture of microbead products by July 2017 and the sale of microbead products by July 2018. However, solving the microfibers issue will be more challenging than the banning of microbeads. Despite the sheer volume of



microfibers reaching our waterbodies, regulatory action will be difficult because it is hard to assign responsibility to a specific group and it is very expensive to upgrade WWTPs.

The cosmetic industry was able to replace microbeads with natural alternatives, such as sand and nut shells, that provide the same function as their plastic counterparts. The apparel industry, however, faces a more difficult situation. Alternatives to synthetic textiles are limited and fall short of the performance capabilities of materials like polyester.

The simplest solution might lie in the way we do laundry. Consumers can buy a lint filter for their washing machine, switch to front-loading washing machines, use a nanoball in the machine to attract and capture fibers, wash their clothes less frequently, and/or buy clothing made out of natural fibers like cotton. As of this writing, a German firm is developing a wash bag designed to keep most of the fibers from entering the wastewater system.

Further studies are needed on the effects of water temperature, cycle length, and other washing characteristics. 💧

Ron Poltak

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control nonpoint pollution. To Poltak, the shift from pipes to water bodies describes the central theme of the Commission's work over the past three decades. "Now," he says, "we gauge the health of our water in terms of water quality in a more holistic way."

Ironically, he says, the effort that established the nonpoint-source-management process was originally a pilot program. Since then NEIWPCC has helped its member states to use this process to the fullest, designing detailed pollution budgets based on science and geography. It is a comprehensive approach to pollution control in which "you have to take all those players in the watershed and divide up the pie," he said.

Under the 1987 revisions to the Clean Water Act, federal grants support the implementation of nonpoint-source-management plans. Poltak and other Commission members helped to design the formula for the grants program, which grew from \$38 million nationally in 1990 to \$238 million in 2003. Today after cutbacks the grants are still funded at \$161 million.

One far-reaching management project in the Northeast concerns nitrogen levels in Long Island Sound. The nitrogen causes hypoxia, low levels of dissolved oxygen in water. Consequently, parts of the Sound sometimes fail to meet water-quality standards. The source of the nitrogen is runoff, wastewater-plant discharge, and other sources in the sprawling Long Island Sound watershed.

The watershed, the largest in the Northeast, intersects six states. Consequently, a farmer in Vermont whose property falls within the watershed may be one of the "players" with a stake in the process.

The decades inform Poltak's perspective and activism beyond his long NEIWPCC career. Poltak chairs the elected planning board in his town of Auburn, New Hampshire, and serves on state boards and commissions. He will tell you that he is not leaving public life and that there is plenty of work to do in the meantime.

Poltak reflects on the rewards of a career of public service with pride and optimism. His advice to young people considering an environmental career is characteristically upbeat: "Go for it!" 💧

Workgroup Roundup

continued from page 4

years. States list waters not meeting water-quality standards and prioritize those waters for management by a total maximum daily load or other means.

On November 1–3, members of NEIWPCC's **New England Biological Assessment of Wetlands Workgroup** (state and federal personnel who coordinate wetlands protection programs) convened in Galloway, New Jersey, with their colleagues in the **Mid-Atlantic Wetlands Workgroup**. Over three days, the fifty-five participants delivered and listened to presentations on topics of shared

concern, such as methods for measuring climate-related changes in wetland health.

The meeting included a tour of the New Jersey Pinelands National Reserve and a visit to a wetland outside of the reserve.

NEIWPCC's **Stormwater Workgroup** met on November 2 and discussed new or forthcoming statewide municipal separate storm sewer system permits. The group also discussed revising NEIWPCC's "Illicit Discharge Detection and Elimination Manual," which helps municipalities identify sources of pollution that are entering the stormwater system.

Perfluorinated compounds (PFCs) and microfibers, two developing threats to wa-

ter quality, received the attention of the **Contaminants of Emerging Concern Workgroup** at its November 9 meeting. Members discussed state responses to recent research and EPA guidance about the presence of PFCs in drinking-water supplies. By contrast, there is currently no public response to problems posed by microfibers, which are discharged into water bodies when households launder synthetic fabrics such as polyester fleece. The workgroup reviewed what is known about this contaminant.

The **Groundwater and Source Water Protection Workgroup** has been working on a Source Water Protection Toolkit aimed at

A Towering Loss for the Clean Water Community

THE TIGHT-KNIT COMMUNITY OF Rhode Island wastewater operators was devastated to learn that we lost Carmine Goneconte on October 28. His death at age sixty is difficult to come to terms with and we may never know the reason why he was taken from us so young.

In our public profession, we don't talk about our faith but I'm guessing it's a big reason why many of us do what we do. After reading his obituary, I now know that faith was something that defined Carmine. In addition to his faith in God, Carmine demonstrated a more secular faith that we are probably more comfortable talking about: faith in his vocation, faith in his professional actions and decisions, and faith in his team at the Narragansett Bay Commission (NBC).

Over the course of his career at NBC, Carmine changed the culture from one where mediocrity was the measure to one where excellence is the norm. His faith surely made him strong and resilient in the face of defeats; patient and persistent when faced with roadblocks. He was a champion for clean water and a teacher, mentor, and coach to those of us who work for it.

Interestingly, I met Carmine many years before I joined the wastewater profession. I started my career as an air pollution inspector-enforcer for EPA during the time when Carmine had the difficult duty of keeping the old sewage sludge incinerator at Field's

Point in compliance with the regulations. And, unfortunately for him, I drove by it every day on my way to work.

Being a regulator, I could have easily adopted a cynical view of the regulated community and their compliance intentions. I did find a few who warranted my skepticism. But Carmine bolstered my faith that people would do the right thing if they knew what they were supposed to do and were supported in their efforts. Maybe it was his wastewater training but sometimes I would get to work in Boston and there would be a message waiting for me from Carmine letting me know he was having a bad incinerator day and what he was doing to turn it around. Carmine always did what he said he was going to do; he was a man of integrity.

Carmine's contributions of late to the Narragansett Water Pollution Control Association and previously to the New England Water Environment Association warrant mention. He was inducted into the Select Society of Sanitary Sludge Shovelers



Carmine Goneconte

(5S) back in 1989! Along the way, he held many leadership positions, including Rhode Island State Director. As an operator, he won numerous awards such as Operator of the Year, the Peloquin Award, and the William D. Hatfield Award. In 2006, Carmine joined the Quarter Century Operators Club. However, I suspect he was most proud of all the awards bestowed on NBC and his staff, to which he was devoted and dedicated.

I never asked Carmine how he came to be in the "business," but I'll bet chance played a big part

in it, like it did for a lot of us. I really don't believe in coincidence; I have faith that things happen for a reason even if that reason is not obvious at the time. However it came about for Carmine, his decision to become a wastewater operator nearly forty years ago had a profound impact on the water environment in Rhode Island and water professionals throughout New England. He towered over all of us—literally and figuratively—and was someone we deeply admired.

Rest in peace, Rhode Island Wastewater Operator #131. I hope you knew the tremendous contributions you have made to our profession. We cannot make sense of your death but we find great purpose in the life you lived. Please watch over us and continue to guide us as we attempt to follow in your giant footsteps. 💧

—Janine Burke-Wells
Rhode Island Wastewater Operator #988

Janine Burke-Wells is the Executive Director of the City of Warwick (Rhode Island) Sewer Authority. She has served as a member of NEIWPCC's governing Commission since 2014.

—Anna Meyer

supporting the work of local officials. The group met on November 10 and discussed ongoing work on the project, providing editorial direction to NEIWPCC staff members. Group members also shared that states are moving cautiously on requests to site green-energy projects on lands controlled by public water systems for the benefit of water supplies.

The **Massachusetts Training Advisory Committee** met in Lowell on December 14. The committee discussed the state's management training program and results from the most recent operator certification exams. Members also brainstormed ideas for new classes.

NEIWPCC's **Residuals Workgroup**, generally concerned with treating and managing the sludge that is left over from processes at wastewater plants and from septic systems, had a teleconference meeting on December 15. Topics of discussion included beneficial reuse of residuals, issues related to the EPA's new electronic system for filing annual biosolids reports, and exploring the project of creating a regional database of septage chemical quality. This database, if realized, would provide states with information about the chemical content of septage residuals that are often used as fertilizer. 💧

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Events

March 27, Webinar—*Submerged Aquatic Vegetation*. How satellite-based assessment of submerged aquatic vegetation could be applied to the waters of New England and New York. To participate, browse to neiwpccmeetings.webex.com, register, and enter meeting number 644 466 593. (2–3:00 p.m.)

April 5–6, Worcester, Mass.—*New England Water Works Association Spring Conference and Exhibition*. New England's largest water event with over 3000 water works professionals attending technical sessions, water treatment plant tours, exhibits, posters sessions, career fair and networking opportunities. www.newwa.org.

April 7, Webinar—*Interoperable Sensor Networks: Sharing Data through Open Standards*. Guest presenter Dwane Young, EPA. To participate, browse to neiwpccmeetings.webex.com, register, and enter meeting number 647 998 953 (1–3:00 p.m.)

April 12–13, Northampton, Mass.—*28th Annual Nonpoint Source Pollution Conference*. Two-day conference centered on lessons learned and future planning from nonpoint-source professionals. Technical, general, and concurrent sessions, plus an optional field trip. neiwpcc.org/npsconference

April 13, New Britain, Conn.—*State Water Plan Phase II Public Meeting*. Hosted by the Connecticut Water Planning Council. 1–3 p.m., Public Utilities Regulatory Authority. ct.gov/water/iCal

April 20, New Britain, Conn.—*Development of a Connecticut State Water Plan*. Final public workshop.

1–5 p.m., Public Utilities Regulatory Authority. ct.gov/water/iCal

April 26–27, Presque Isle, Maine—*North Country Convention*. Two-day educational and trade event that draws wastewater and drinking water professionals from around the state. jetcc.org/nconvention.php

April 27, Hyde Park, N.Y.—*Hudson River on the Rise: Waterfront Planning for Communities and Nature Conference*. Join Hudson Estuary riverfront stakeholders for this daylong conference to advance resiliency planning in an age of sea-level rise due to climate change. cdrpc.org/news-events/news/

May 2, Portsmouth, N.H.—*Extreme Weather in the Forecast: Is Your Facility Prepared?* This course explores extreme weather planning and preparedness, post-storm assessments, repairs, and funding resources. Also offered June 8 in Providence, Rhode Island. portal.neiwpcc.org

May 3, New Paltz, N.Y.—*Changing Energy Landscapes in the Hudson Valley and Watershed Symposium*. This one-day symposium will explore the energy policies, demand, and change affecting the Hudson River and watershed. www.hres.org

May 11–12, Portsmouth, N.H.— Spring meeting of NEIWPCC's governing Commission

June 4–7, North Falmouth, Mass.—*New England Water and Environment Association Spring Meeting and Exhibit*. Three-day technical meeting for wastewater and water quality professionals. Technical sessions, new technology exhibits, facility tours, and the event's annual Operations Challenge. Participants may earn training contact hours. springmeeting.newea.org

June 8, Providence, R.I.—*Extreme Weather in the Forecast: Is Your Facility Prepared?* See May 2 calendar listing for more information.

June 11–14, Philadelphia, Penn.—*American Water Works Association Annual Conference: Uniting the World of Water*. Four-day conference, training, and networking opportunity. Exposition hall will host more than 500 exhibitors, poster sessions, roundtables, competitions and more. www.awwa.org/conferences-education/conferences/annual-conference.aspx

September 13, Narragansett, R.I.—*Estuary Research Workshop*. NEIWPCC's 2017 Estuary Research Workshop, a full-day meeting about nutrients other than nitrogen that are potentially limiting in, and detrimental to, the Northeast's estuaries. neiwpcc.org/research/erw.asp

Ongoing, Various Locations— Courses and workshops around the region for wastewater and drinking water professionals. For the full course catalog and online registration information visit neiwpcc.org/training/calendar.asp.



Larry White Photography