JOURNAL

OF THE NEW ENGLAND WATER ENVIRONMENT ASSOCIATION

VOLUME 55 NUMBER 4 / ISSN 1077-3002 WINTER 2021

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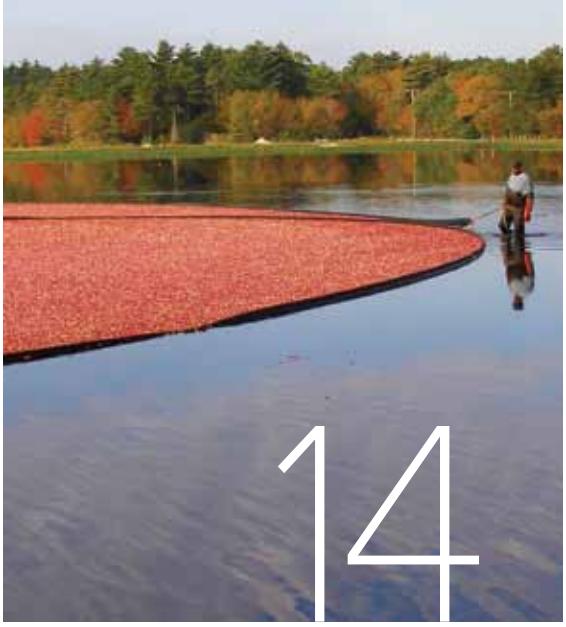

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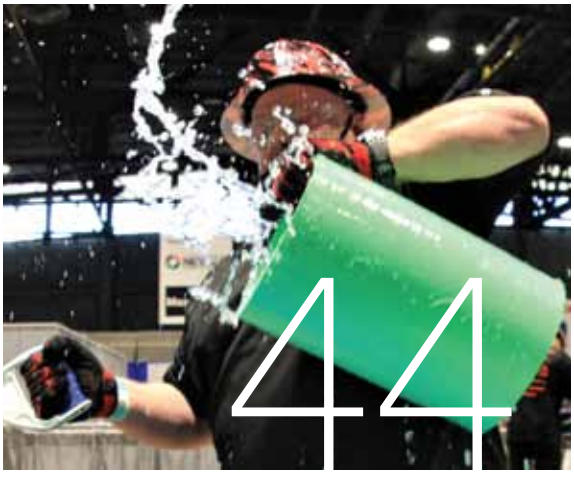
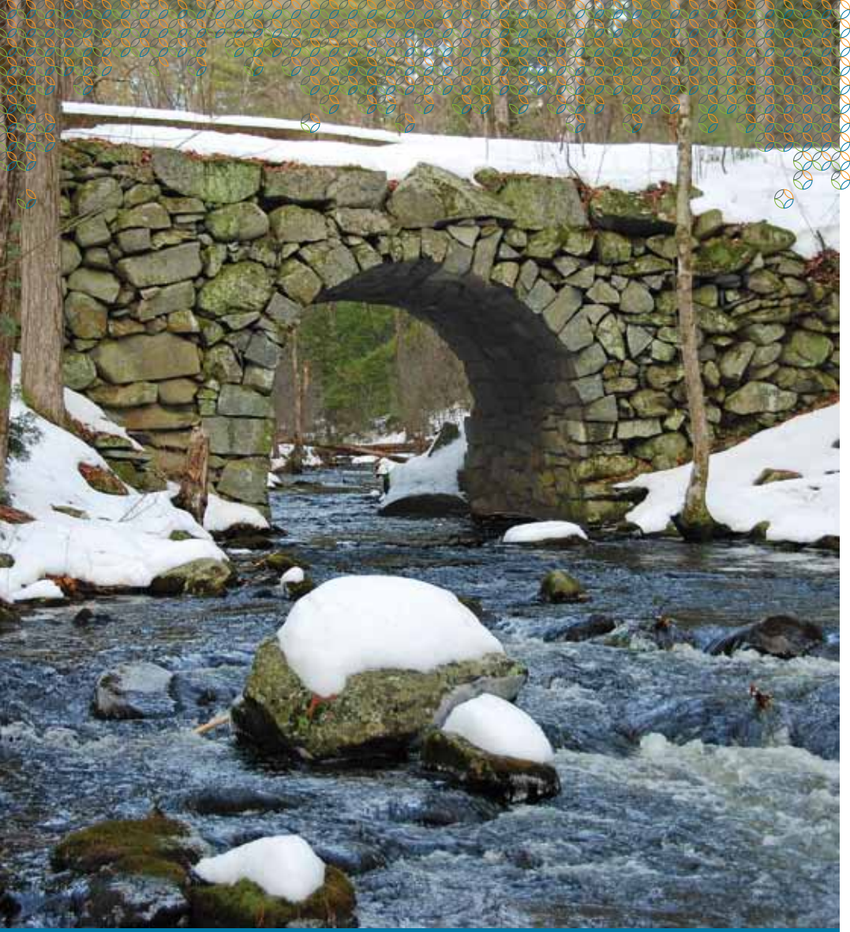


On the cover: Courtesy of Lynn Water and Sewer Commission Regional Water Pollution Control Plant, Lynn, MA

Page 56: Measurement unit conversions and abbreviations



The concepts, ideas, procedures and opinions contained in the articles in this publication are those expressed by the various authors who submit the material for publication. The New England Water Environment Association, its executive committee, the editors, the executive director, and administrative staff hereby assume no responsibility for any errors or omissions in the articles as presented in this publication, nor are the concepts, ideas, procedures and opinions in these articles necessarily recommended or endorsed as valid by NEWEA, its executive committee, the editors, the executive director or staff. References to specific products or services do not constitute endorsement of those offerings by NEWEA. The Journal's committee reserves the right to make any editorial changes deemed necessary for publication of submitted papers.

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OUR ASSOCIATION WAS ORGANIZED NINETY-TWO YEARS AGO in Hartford, Connecticut, on April 23, 1929, with the objectives of advancing the knowledge of design, construction, operation and management of waste treatment works and other water pollution control activities, and encouraging a friendly exchange of information and experience. From 40 charter members, the membership has steadily grown to more than 2,000 today. Membership is divided into the following classes:

Professional Member—shall be any individual involved or interested in water quality including any manager or other officer of a private waste treatment works; any person engaged in the design, construction, financing, operation or supervision of pollution control facilities, or in the sale or manufacture of waste treatment equipment.

Executive Member—shall be an upper level manager interested in water quality and who is interested in receiving an expanded suite of WEF products and services.

Corporate Member—shall be a sewerage board, department or commission; sanitary district; or other body, corporation or organization engaged in the design, consultation, operation or management of water quality systems.

Regulatory Member—this membership category is a NEWEA only membership reserved for New England Environmental Regulatory Agencies, including: USEPA Region 1, Connecticut Department of Energy and Environmental Protection, Maine Department of Environmental Protection, Massachusetts Department of Environmental Protection, New Hampshire Department of Environmental Services, Vermont Department of Environmental Conservation, and Rhode Island Department of Environmental Management.

Academic Member—shall be an instructor or professor interested in subjects related to water quality.

Young Professional Member—shall be any individual with five or fewer years of experience in the water quality industry and who is less than 35 years of age.

Professional Wastewater Operations Member (PWO)—shall be any individual who is actively involved on a day-to-day basis with the operation of a wastewater collection, treatment or laboratory facility, or for facilities with a daily flow of <1 million gallons per day. Membership is limited to those actually employed in treatment and collection facilities.

Student Member—shall be a student enrolled for a minimum of six credit hours in an accredited college or university.

WEF Utility Partnership Program (UPP)—NEWEA participates in the WEF Utility Partnership Program (UPP) that supports utilities to join WEF and NEWEA while creating a comprehensive membership package for designated employees. As a UPP a utility can consolidate all members within its organization onto one account and have the flexibility to tailor the appropriate value packages based on the designated employees' needs. Contact WEF for questions & enrollment (703-684-2400 x7213).

BECOME A NEWEA MEMBER

- Complete and mail the membership application form on pages 59–60
- Download a membership application from **newea.org** by selecting—*Join Us/Become a NEWEA Member*
- Join online at **wef.org** by selecting—*Become a Member*

2021 RATES ($)

Professional	185
Executive	355
Corporate	420
Regulatory	50
Academic	185
Young Professional	70
PWO	110
Dual	45
Student	15

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Total number of copies		2,500	2,500
Legitimate paid and/or requested distribution	Outside country paid/requested mail subscriptions	0	0
	In-country paid/ requested mail subscriptions	2,200	2,200
	Sales through dealers & carriers	8	8
	Requested copies distributed by other mail classes	0	0
Total paid and/or requested circulation		2,208	2,208
Total nonrequested distribution		0	0
Total distribution		2,208	2,008
Copies not distributed		292	492
Total		2,500	2,500
Percent paid and/or requested circulation		100	100

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President's Message

Where does the time go? This is my final President's Message before I pass the gavel at the Annual Conference. Much is changing in our industry as well as in the world around us. This year's theme for NEWEA is about working together to navigate our organization through these waves and tides of change, to set a course where we continue to foster diversity and be leaders of this change. An exciting step in this direction will occur in early January, when NEWEA's officers and the chairs of our 40-plus standing and ad-hoc committees will generously donate their time for two sessions of discussion and training in diversity, equity, and inclusion. Our goal with this investment of our time and resources is to continue to improve the culture and environment of our organization, and to enhance the experience of all our members. We envision this training will carry forward and become a part of our established onboarding process for new chairs and officers.

We are now some 21 months into the pandemic, and while Covid-19 stubbornly remains a significant health concern and dominant in our lives, we see that our many months of sacrifice and "doing the right thing" are bearing fruit. We are witnessing society slowly returning to pre-pandemic ways (but with new precautions and new health habits). For NEWEA this means, in recent months, a careful and responsible return to in-person events. More on this topic below.

ANNUAL CONFERENCE UPDATE. To that end, I am thrilled that the upcoming Annual Conference will be in person (along with a virtual option for major portions). I hear repeatedly that the ability to interact and network has been sorely missed, and I am sure many of you are as eager as I am to resume this vital aspect of our conference. After deliberation, the meeting management team adopted a vaccine requirement for all in-person attendees, as well as the required use of masks and social distancing. This decision resulted from many conversations over several weeks and was made with full awareness of our role in the water industry as leaders and protectors of public health, as well as our responsibility to our members. With the emergence of the Omicron variant as the latest danger from Covid-19, I hope this decision will reassure all of you that your health is our first priority. For those who may still be reluctant to gather under these conditions, we will have strategic portions of the conference available online.

CODE OF CONDUCT. This summer the WEF Board of Trustees adopted a Member Code of Conduct (CoC), which was endorsed at NEWEA's November Executive Committee meeting for presentation to the membership at the Annual Conference. The CoC is being proposed to formally ensure that WEF and NEWEA provide a uniformly professional, safe, and welcoming environment for all members and others who interact at our events and functions. The CoC outlines expectations around maintaining an appropriate professional, ethical manner, being courteous and civil, and supporting diversity, equity, and inclusion throughout WEF/NEWEA.

The CoC was spearheaded by WEF, with input from a broad and diverse group of stakeholders. The goal was to consider and incorporate different perspectives gathered through engagement and discussion. The CoC reflects this broad stakeholder representation. It can be accessed, alongside other important WEF policies, at wef.org/about/about-wef/wef-policies.

CHARITABLE GIVING TASK FORCE UPDATE. In January 2019, NEWEA established the Charitable Giving task force. Over the past three years under the guidance of former NEWEA president Linda Carroll, this task force has quietly and thoroughly explored raising revenue through soliciting donations and other fundraising. One important recommendation points to developing a more far-reaching fundraising/giving campaign, to be aligned with NEWEA's long-range goals for membership, programs, and partnerships. While the task force has completed its charge, these efforts will continue with further development and implementation of their recommendations. If you are interested in participating in future discussions on this important topic, please contact anyone on the Finance Committee or me.

COMMITTEE TRANSITIONS. Earlier this year the Executive Committee voted to sunset the Humanitarian Assistance and Grants Committee and the Water for People Committee, based on the recommendation of the current chairs of those committees as well as on a workshop with stakeholders. The workshop identified the potential to combine and refine the mission and goals of the original two committees into a potential new committee with a renewed focus and energy. This new committee would focus on service and stewardship and collaborate with other interested committees (such as Young Professionals). The work group is drafting a committee charge as a necessary step before a new ad-hoc committee is created, something that may happen at the Executive Committee meeting in January. Thank you, Devon Jones, for leading the group in its work and commitment to this effort.

EVENTS. The fall has been busy with a full calendar of events and webinars, including the resumption of in-person events. Congratulations to the CSO/Wet Weather Issues (WWI) Committee for conducting the first in-person specialty conference since the beginning of the pandemic! It was a two-day hybrid event in Portsmouth, New Hampshire, with multiple sessions and a tour of the Portsmouth Wet Weather Treatment Facility. The importance of being together in person again at long last was evidenced by the energy and excitement among the attendees. Hats off to the CSO/WWI Committee and Chair Steve Perdios for arranging an excellent program and selecting a terrific venue.

The very next week, the Residuals Management Committee teamed with the North East Biosolids & Residuals Association (NEBRA) and conducted the regional biosolids conference, which also was an in-person event with a hybrid option. This conference was held at the University of Massachusetts Lowell Conference Center and featured regional updates on PFAS as well as a panel discussion and technical presentations. Kudos to NEBRA and Residuals Management Committee Chair Eric Spargimino for this successful event.

The Collection Systems Committee joined its counterpart from the Pacific Northwest Clean Water Association to create the webinar "Infiltration & Inflow Coast to Coast: Tools & Technology." The webinar presented lessons learned and information sharing between the northwest and northeast regions of the country. This unique collaboration compared and contrasted how infiltration and inflow (I/I) affects communities in both regions. Thank you to Collection Systems Committee Chair Scott Lander and member Jim Barsanti for representing NEWEA in creating this innovative and informative webinar.

The NEWEA Golf Tournament was conducted in early October at Derryfield Country Club in Manchester, New Hampshire, after a one-year hiatus due to Covid-19. We had great weather and again it was wonderful to be together with so many friends in an informal setting after the long pandemic interruption. Thanks to NEWEA President-elect Fred McNeill for coordinating the event to make it such a good time and successful occasion.

NEWEA OPS CHALLENGE TEAMS ROCK WEFTEC. Last but assuredly not least, WEFTEC returned in October as an in-person event. New England had around 100 members attend, including three teams who participated in the Operations Challenge competition. Our teams—Force Maine, Mass Chaos, and RI-Conn United (the latter a combined team from Rhode Island and Connecticut)—all performed with distinction. The well-seasoned members of the RI-Conn United team earned first place in Laboratory, first place in Process, and a third place in Collections, culminating in second place overall in Division II (the largest division), missing first place by a few seconds. Congratulations to all our teams.

From the Editor

Welcome to 2022, NEWEA! While it seems trite to comment on the swiftness of time passing, the past three years as editor of the NEWEA *Journal* truly feel like they have been the fastest of all moments. Over that time, I've had the great privilege to meet (most virtually, of course… #pandemic) many diverse and impressive professionals across our industry. Despite the turbulent times, one consistent and dependable metric we, the NEWEA membership, can use to measure the passing of time is tracking the quarterly NEWEA *Journal*.

Alexandra Greenfield (Bowen), PE
Environmental Engineer
CDM Smith
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Although it's vitally important to look forward and continue moving ahead, at times it's necessary and imperative to take a moment of pause to reflect upon where we've been.

Over the past three years, 12 *Journal* issues have been published containing nearly 50 feature articles that have highlighted projects in every New England state. The *Journal* has also showcased 12 Young Professionals representing a small sampling of the region's up-and-coming industry leaders. Each issue has highlighted a different NEWEA committee in an effort to increase organizational knowledge, encourage cross-pollination, and foster membership participation and connectivity.

Journal themes have spanned a wide cross section of our industry's most pressing topics and environmental concerns, from more classic themes (e.g., collection systems, stormwater management, and wastewater treatment) to those only recently receiving the attention they need, namely climate change and resiliency, and environmental justice.

CORRECTION—on page 56 of the Summer NEWEA *Journal*, Session 1 of the Young Professional Summit was moderated by Sam Downes and Caitlin DeWolfe, both from Tighe & Bond, not by Colin O'Brien and Renee Lanza.

Through (the proverbial) "rain or shine," members can always count on the publication of the *Journal*, made possible by the hard work of an incredibly dedicated and diligent committee of bootstrappers. The committee has taken great pride in distributing a high-quality, technically vetted product worthy of routine reading and knowledge sharing. I consider it an honor to have served as editor, carrying this tradition of publication excellence, and I am proud to pass the torch to our incoming editor and chair, Jen Lawrence.

Ms. Lawrence has served the committee as co-chair, guest editor, content generator, and author. She brings fresh ideas and perspectives to the *Journal*, and I so look forward to her taking on this leadership role through the next 12 *Journal* issues. The stature of the *Journal* is directly attributable to the strength of our small but mighty committee.

I couldn't get through my final "From the Editor" without expressing my sincere and deepest gratitude for our *Journal* team, including three who prove the *omne trium perfectum* theory (the best things come in threes); Tom Heinlein, Charlie Tyler, and Bob Randazzo. Messrs. Heinlein and Tyler are seriously talented copy editors, and I've had the privilege of taking a front row seat to witness the two volley through some of the most intellectually rich ping pong matches of grammar and syntax that most engineers will NEVER get the chance to witness. Mr. Randazzo is a miracle worker who manages to pull everything together with artistic precision despite the occasional (but often-too-frequent) scope-creep mishap or schedule blunder. Thanks to those three, but also many thanks to all the amazingly participatory, responsive, and essential members of the *Journal* committee, for helping me have such a great, rewarding past three years in this role.

A Happy New Year to all. I so look forward to connecting with you all in other roles through the wonderful network of NEWEA's diverse and rewarding avenues!

National Water Week–DC Fly-In

April 26–27, 2022
Washington, D.C.

The NEWEA Congressional Briefing is the annual hallmark for the Association and its government affairs program. Mark your calendar to join us on April 26–27, 2022. This is a great opportunity for our membership and elected officials to join together to discuss water, wastewater and stormwater infrastructure issues facing communities of the Northeast.

We look forward to meeting with you and providing you with the latest information affecting our industry. Your involvement is critical—come to D.C. and be heard.

Attending the Briefing will allow:

- Opportunities to meet with senators, representatives, and legislative staff
- Substantive discussion of federal clean water legislative initiatives and opportunity to provide feedback related to the impact that these initiatives have on our communities and the water quality industry
- A forum for presentation and discussion of the NEWEA Position statements
- Opportunities to learn about key federal regulatory initiatives
- A forum to provide comments directly to regulatory leaders from EPA's Washington, D.C. Headquarters.

In addition to the Briefing Lunch, an important part of this day is holding individual meetings with senators and representatives on the Hill. If you plan to attend the briefing, the government affairs committee will work with you to schedule these individual appointments.

BECOME A WATER ADVOCATE

Make your voice heard even before you get to DC by **becoming a Water Advocate**. WEF's Water Advocates program empowers you to share your knowledge and expertise to inform government decision-makers about the importance of water.

Visit www.wef.org/advocacy/water-advocates/ to enroll.

Industry News

EPA is awarding $150,000 to apply an innovative nature-based solution to reduce nitrogen impacts from a retired cranberry bog in Marstons Mills, Massachusetts

Nearly $600,000 in EPA Funding for Four Pilot Watershed Projects Will Demonstrate Holistic Solutions to Common Coastal Challenges

EPA will provide $599,993 through its Southeastern New England Program (SNEP) to support four projects that will benefit Cape Cod, Martha's Vineyard, Charlestown, Rhode Island, and the Buzzards Bay watershed.

The funding, part of a new SNEP pilot watershed initiative, is the first of an expected $3 million across the four projects over the next five years. The project partners are also expected to leverage an additional $1,127,380 in matching funds. These projects are intended to demonstrate how concentrated, collaborative efforts and holistic planning can more effectively address common environmental challenges in coastal southeastern New England. Demonstrating watershed-scale solutions is central to SNEP's Strategic Plan and ultimately important in promoting safe and clean water, healthy habitats, and thriving communities.

"While every community in the southeastern New England region is unique, each of the projects announced today will address common environmental challenges that cities, towns, and tribes face, such as nitrogen pollution, habitat loss, and excess stormwater," said Acting Regional Administrator Deborah Szaro. "Developing solutions that can be demonstrated in one area and adapted to others is vital to tackling these challenges in an efficient, forward-thinking way. I'm excited to see what these four strong groups of partners can accomplish in their watersheds in the coming years. And equally excited to see how their lessons learned will be transferred to and used by other communities across the entire SNEP region."

The funding announced today will support the following four projects:

1. $149,998 to the Buzzards Bay Coalition to identify and prioritize sources of watershed impairments and develop solutions to address stream alteration and nutrient loading in an urbanized area of the Buttonwood Brook–Apponagansett Bay area of Massachusetts. Project partners include the City of New Bedford, the Town of Dartmouth, Buttonwood Zoo, the Friends of Buttonwood Park, and the Dartmouth Natural Resources Trust.
2. $149,995 to the University of New Hampshire Stormwater Center to demonstrate the effectiveness of using distributed, small-scale stormwater control measures to restore hydrologic balance and address water quality and flooding issues in Tisbury, Massachusetts. Project partners include the Town of Tisbury, the Martha's Vineyard Commission, and the Massachusetts Department of Transportation.
3. $150,000 to the Barnstable Clean Water Coalition to apply an innovative nature-based solution to reduce nitrogen impacts from a retired cranberry bog in Marstons Mills, Massachusetts, while also restoring habitat. Project partners include the Town of Barnstable, The Nature Conservancy, and the Native Land Conservancy.
4. $150,000 to the Town of Charlestown, Rhode Island, to address the impacts of excess nutrients from septic systems and stormwater on Greater Allen's Cove and Ninigret Pond through installation of nitrogen-reducing septic systems and nature-based stormwater solutions. Project partners include the University of Rhode Island, the Salt Pond Coalition, and Save the Bay.

In 2012, Congress charged EPA with conserving and restoring southeastern New England's coastal environment, and in 2014 began providing funding to develop SNEP. The SNEP Watershed Grants Program provides needed funding to local organizations that are restoring clean water and healthy coastal ecosystems while strengthening local communities.

Septic Nitrogen Sensor Successfully Completes Performance Testing

An innovative sensor technology to provide real-time information on the amount of nitrogen in wastewater has been developed as part of an EPA research challenge. The sensor has completed rigorous field testing on Cape Cod. The new technology shows strong potential for use in coastal areas where excess nutrients from septic systems adversely affect water quality in nearby surface and groundwater.

The nitrogen sensor designed for use in advanced treatment septic systems was developed by Dr. Qingzhi Zhu at the School of Marine and Atmospheric Sciences, New York State Center for Clean Water Technology at Stony Brook University in Stony Brook, New York. This project won EPA's Advanced Septic System Nitrogen Sensor Challenge in 2020 stemming from an international competition around development of low-cost sensors to measure nitrogen levels discharged from advanced septic systems.

Prototype nitrogen sensors will be tested and deployed in 200 residential advanced septic systems

The sensor has now completed independent third-party testing at the Massachusetts Alternative Septic System Test Center in Sandwich. The prototype sensor was exposed to wastewater effluent from standard, as well as advanced, nitrogen-reducing septic systems for six months. The sensor was tested with effluent receiving various levels of treatment, a simulated septic system failure, and a septic system during a simulated power outage. The testing verified the long-term performance of the new technology in the field and promises to help address significant estuarine water quality and ecological problems caused by excess nitrogen.

"The ability to measure nitrogen concentrations in the effluent exiting advanced septic systems will provide real-time data on the performance of these systems," said EPA New England's Ms. Szaro. "I applaud the determination and creativity shown by Dr. Zhu and his team, and by EPA scientists in pursuing the goal over many years to develop technology for these measurements. EPA is hopeful that this new technology will increase the viability and use of innovative/alternative septic systems, which are integral to our region's future wastewater treatment infrastructure as we move to address the ecological issues caused by high levels of nitrogen."

The sensor will be used in innovative/alternative nitrogen-reducing septic systems (I/A systems). The Stony Brook University team and the New York State Center for Clean Water Technology believe that the commercial adoption of the sensor can help increase consumer and regulator confidence in the performance of I/A systems, leading to more widespread use by homeowners, municipalities, and other organizations to reduce nitrogen pollution and restore coastal water quality.

Conventional septic systems are not designed to remove nitrogen from wastewater. Nitrogen from conventional residential septic systems, excessive lawn fertilizer, and other sources enters groundwater and eventually surface water where it can cause harmful algal blooms, low dissolved oxygen, and fish and shellfish kills. In contrast, I/A systems turn the nitrogen in wastewater into harmless nitrogen gas. Nitrogen removal performance of these systems has traditionally been determined by sampling and lab analysis, both costly and labor-intensive. With the new sensor technology, nitrogen concentrations in the effluent leaving an I/A system are measured directly and transmitted electronically to remote locations in near real time. Stony Brook University has begun to deploy prototype sensor units in I/A systems on Cape Cod and Long Island, with plans to deploy more in the future.

Regional Environmental Merit Awards

EPA New England each year recognizes individuals and groups in the region who are distinguished by their work to protect or improve the environment. The Environmental Merit awards, given for work or actions in the prior year, include the following categories: individual; business (including professional organizations); local, state, or federal government; and environmental, community, academia, or nonprofit organization. EPA also presents lifetime achievement awards for individuals. For 2021, the following individuals and organizations have been recognized.

LIFETIME ACHIEVEMENT AWARDS

Yvonne Bolton, Marlborough, Connecticut, was honored with a Lifetime Achievement award from EPA for her work at the Connecticut Department of Energy and Environmental Protection (CTDEEP). Ms. Bolton joined CTDEEP four decades ago as an environmental attorney. She helped to develop regulations and shepherd them through the legislature in her early days at the department, and her understanding of science, policies, and the various constituencies was key to the department's success. Ms. Bolton modernized and streamlined the state's environmental regulatory programs, from coastal management to water and waste, enforcement, pesticides, and recycling. She also established the department's first data and geographic information system, improving access to information, leading to better-informed decisions.

In addition, as chief of the Water, and then Materials Management, Bureau, she helped to maintain funding for and improve management of wastewater treatment plants; establish appropriate water quality standards; improve emergency response to spills; update the state's solid waste management plan; and adopt and revise the state's first FEMA-approved disaster debris management plan. To improve public outreach, she also launched the Solid and Hazardous Waste Advisory committees. Ms. Bolton has also been a member of NEIWPCC's Executive Committee since 2003, helping develop its water resources priorities. And, as a member of the Northeast Waste Management Officials' Association Board of Directors since 2006, she was instrumental in developing the organization's strategic plans and advancing its priorities.

David Burns, Augusta, Maine, who retired this spring after 38 years with the Maine Department of Environmental Protection (Maine DEP), was honored with a Lifetime Achievement award from EPA. After graduating from the University of Maine–Orono in 1983, Mr. Burns worked in the Bureau of Water Quality Control reviewing wastewater treatment facilities. Soon after, he shifted to engineering of solid waste projects and landfill operations. He advanced to senior environmental engineer, supervising others in the solid waste engineering unit, and in 2015 became director of the Division

Note: All EPA industry news provided by EPA Press Office

of Technical Services. In 2016, he was named director of the Bureau of Remediation and Waste Management, the agency's largest bureau.

Among his many accomplishments at Maine DEP, Mr. Burns played a key role in drafting Maine's secure landfill regulations. These rules changed the landscape in Maine from open dumps to highly engineered and designed landfills. He also helped with challenging remediation projects, including the major landslide of a landfill that moved 1,000,000 yd^3 (764,555 m^3) of waste and clay soils underneath. He worked to understand the causes of the landslide and the damage, then developed a plan that included construction of a lined landfill to hold the waste.

In the early days of managing PFAS, Mr. Burns became an expert and encouraged Maine DEP and other state agencies to solve the problem. He has worked with agencies and stakeholders, nonprofit organizations and citizens, the legislature, Maine's congressional delegation, and Maine DEP staff to address PFAS contamination. After joining the board of directors of the Northeast Waste Management Officials' Association (NEWMOA) in 2016, he provided leadership on PFAS and solid waste issues. He was NEWMOA's treasurer in 2018 and vice chair in 2021.

Richard Skarinka, PE, Wolfeboro, New Hampshire, retired in June 2021 from managing the engineering and survey section of the Drinking Water and Groundwater Bureau in the New Hampshire Department of Environmental Services (NHDES), where he worked for 31 years. In this job, he managed drinking water engineers, sanitary surveyors, and the operator certification program, and oversaw 2,500 public water systems in New Hampshire. He also was instrumental in developing and administering the Drinking Water State Revolving Fund throughout his career. He often led responses to natural disasters affecting water systems, from droughts and floods to widespread power outages caused by ice storms.

Mr. Skarinka understood that communication is key to ensuring safe and reliable drinking water. An analogy he shared is that regulation is a moving train and community leaders can choose any of three options—wave as it goes by, hop on board, or stand in front of it. He approached difficult conversations with respect and a desire to understand where people are coming from, believing that working hand in hand with communities leads to better outcomes.

A hallmark of Mr. Skarinka's efforts at NHDES and with water systems was to always encourage long-term thinking so that decisions would improve the long-term sustainability and reliability of public water systems. He always put in the effort to mentor new staff and collaborate with other agencies and programs. He consistently worked with managers of water systems to educate local and state officials on the challenges and needs of these systems in order to identify options and facilitate solutions. Mr. Skarinka's lifetime achievements at NHDES have and will continue to improve and protect the health of New Hampshire citizens by ensuring an adequate quantity and quality of drinking water.

Angelo Liberti III, PE, Providence, Rhode Island, motivated by a lifelong affinity for being on the water, is retiring after 30 years as administrator of the surface water protection programs in the Rhode Island Department of Environmental Management (RIDEM).

Mr. Liberti's degrees in marine biology and civil and environmental engineering laid the foundation for a successful career. He led the surface water programs when wastewater and stormwater management were evolving. He advanced water quality-based permitting for discharges, and under his guidance permits were modified to require advanced treatment. This led to greatly improving water quality in Rhode Island's rivers and in Narragansett Bay.

A boater, scuba diver, and recreational shellfisherman, Mr. Liberti deeply understands Narragansett Bay; he applied this understanding in 2003 while on panels established by the governor to make recommendations on the Greenwich Bay fish kill, an event in which 1 million fish died from lack of oxygen. He helped shape the bistate strategy to reduce nutrient pollutant loadings from 11 wastewater treatment facilities in Massachusetts and Rhode Island tied to problems in the upper Narragansett Bay.

Mr. Liberti leads RIDEM in eliminating combined sewer overflows, work that has reduced discharges and opened areas for shellfishing that had been closed for over 75 years. His expertise and composure under pressure were invaluable in 2016 when an outbreak of algae bloom closed much of the bay to shellfishing.

Mr. Liberti ensures that decisions are scientifically sound and protect the public interest. His depth of knowledge, attention to detail, and analytical skills have directly benefited the state's environment. Rhode Island's waters are healthier because of his service.

Annette DeSilva, Narragansett, Rhode Island, is being recognized for 30 years of outstanding and sustained stewardship of the Pettaquamscutt estuary, known locally as the Narrow River.

In 1992, Ms. DeSilva, with Dr. Veronica Berounsky and others, founded Narrow River Preservation Association's River Watch Program in concert with the University of Rhode Island's Watershed Watch Program. Monitoring water in the estuary allows the association and local officials to identify problems and find remedies.

Since the start of the River Watch Program, Ms. DeSilva has coordinated the all-volunteer program, supporting over 200 volunteers who spent 8,800 hours at the Narrow River taking 47,400 field measurements and obtaining 13,700 water samples.

Under Ms. DeSilva's leadership, the program has expanded to 13 sites, which include streams and stormwater outfall pipes. Having found high bacteria counts that could not be explained by processes within the river, she advocated adding new sites so inputs could be examined. Shortly after the program started and one test site showed high bacteria counts, an outhouse along Gilbert Stuart stream was removed, resulting in clean water samples within weeks. Since then, many projects informed by River Watch data have been

installed. When the U.S. Fish and Wildlife Service required water monitoring in 2015, the agency came to the association because of its reputation for reliable river monitoring.

Ms. DeSilva and colleague Dr. Berounsky have presented detailed findings, trends, and summaries of decades of River Watch data. These show improvements in water quality and identify problematic areas that require more research and mitigation. Having served on the association's board of directors from 1990 to 2018, Ms. DeSilva is now an advisory board member.

Ms. DeSilva's 30 years of commitment to the River Watch Program has improved water quality in the estuary. This well-established program is expected to continue improving the estuary's water quality for decades to come.

Dr. Veronica Berounsky, Narragansett, Rhode Island, was recognized for 30 years of outstanding and sustained stewardship of the Pettaquamscutt estuary, or Narrow River. Dr. Berounsky, a board member and vice president of the Narrow River Preservation Association, has been integral through her advocacy to the environmentally responsible development and protection of the watershed.

A powerhouse of energy and dedication, Dr. Berounsky was instrumental in creating the association's River Watch Program in 1992, which has directly led to better water quality in Narrow River. In 2018, after high bacteria was found in two spots on the river, she secured funds, and then organized and oversaw an innovative program that uses trained dogs to detect human bacteria. The failing septic systems that the dogs identified now are being repaired.

Dr. Berounsky works to involve the public in protecting the health of the watershed. She has led educational tours for students and visiting academics, teaching them about the estuary's ecology. She also led a program that educated teachers on informing students about watershed ecology. She founded Art on the River, inspiring artists and families to create art along the river's edge. She also began What Lives in the River, an event inviting families to discover the creatures in the Pettaquamscutt estuary area, with volunteer experts on hand. In 2005, Dr. Berounsky led the creation of the Narrow River Turnaround Swim, a fundraiser highlighting the river's excellent water quality. In 2020, she initiated an event in which participants swam the 6 mi (9.7 km) from a tributary to the mouth of Narrow River.

Dr. Berounsky has shared her talents with other organizations, serving as chair of Rhode Island Rivers Council since 2013, contributing to the Coastal & Estuarine Research Foundation and New England Estuarine Research Society, and working with the University of Rhode Island Graduate School of Oceanography.

Her sustained, consistent, and outstanding efforts have directly led to better water quality in the Pettaquamscutt estuary.

Chuck Schwer, Montpelier, Vermont, was honored with a Lifetime Achievement award from EPA for his accomplishments over three decades of service at the Vermont Department of Environmental Conservation (VTDEC). He started with VTDEC in the mid-1980s in the new Leaking Underground Storage Tanks Program. Over the years, the program has prevented numerous releases of hazardous materials. One of the earliest members of the Vermont hazardous materials response team, founded in 1996, Mr. Schwer remained on the team as deputy crew chief.

Mr. Schwer then took on a supervisory role, managing staff as well as contaminated sites and the Vermont Petroleum Cleanup Fund. As fund manager, he developed important relationships and showed that industry and government can be partners for success. In addition, he helped to procure state funding for brownfields. He participated in the Northeast Waste Management Officials' Association for many years and served on its board for seven years, including one year as chair. He was also involved in the Association of State and Territorial Solid Waste Management Officials since the 1990s, serving as subcommittee chair and regional representative.

Mr. Schwer's most important contributions may be around per- and polyfluoroalkyl substances (PFAS) contamination. He managed staff on sites in Bennington and Pownal, and at the Rutland airport, responding to public concerns and providing safe drinking water supplies. In Bennington, he helped make sure almost 700 homes sampled for PFAS had clean drinking water. Throughout his career, Mr. Schwer demonstrated a commitment to resolving waste issues and empowering staff, leaving a legacy of competent leaders to continue to guide the department.

Chuckie Green, Mashpee, Massachusetts, was honored with a Lifetime Achievement award from EPA. Mr. Green retired in January 2021 as natural resources director of the Mashpee Wampanoag Tribe, having benefited his tribe and community since his teenage years. He served on the Mashpee Board of Selectmen from 2000 through 2009. In 2008, he became chair of the board, a position not filled by a Mashpee Wampanoag tribal member in 30 years. He also led the Mashpee Wampanoag Tribe as vice chairman from 1993 to 1996, and as tribal historic authority director and preservation officer from 2006 to 2012. Mr. Green was on the Mashpee Conservation Commission and was district supervisor for the Barnstable County Conservation District, both from 1992 to 2000. He became district supervisor again in 2010. Protecting the tribe's

natural resources was a priority, but Mr. Green's greatest gift to the environment was forming the tribe's Natural Resources department in March 2008 using an EPA grant. He then served as director and assistant director of the department.

In 1995, Mr. Green helped establish the Mashpee National Wildlife Refuge partnership involving eight conservation landowners. From 2000 to 2012, he was on a board overseeing the Superfund cleanup of the former Otis Air Force Base. In 2008, he established the Mashpee Water Collaboration in partnership with the tribe, the town, and the University of Massachusetts Dartmouth to monitor water quality of nearby waterways. In 2012, Mr. Green established a project addressing nitrogen-loading and fish kill in the Mashpee River and Popponesset Bay system. And in 2012, he started an environmental science camp for tribal youth.

Since 2010, Mr. Green has partnered with the U.S. Army Corp of Engineers to mitigate algal growth and restore habitat in Santuit Pond. His lifetime investment in environmental leadership and cultural preservation will have a lasting impact on Mashpee Wampanoag tribal members.

ENVIRONMENTAL MERIT AWARDS – GOVERNMENT

Massachusetts Department of Environmental Protection (MassDEP) PFAS Team, Boston, Massachusetts, has worked above and beyond to address PFAS. The department's PFAS team has made much progress in addressing PFAS issues by helping communities affected by contamination, establishing protective regulations, gathering data to determine the extent of contamination, and assessing PFAS in other media. MassDEP has designated the equivalent of 13 full-time staff to address PFAS over a one-year period. This team has worked extensively with communities where PFAS were detected, reviewing treatment options, helping with permits, and providing the public with information on the health effects of PFAS. MassDEP also promulgated a stringent drinking water standard, monitored water supplies in search of contaminated sites, provided free lab analyses for water systems, and developed sampling programs. It also created a new grant program to support PFAS treatment design, awarding $5 million among 27 communities. With $2 million in state funding, the department created a program to help provide safe drinking water to public water supply systems affected.

Covid-19 Ensuring Safe Drinking Water Team is a conglomerate of New England's state drinking water programs, state water and wastewater agency response networks, and other water sector associations that ensured the safe operations of water utilities during the pandemic. This conglomerate consisted of the following:

- Connecticut Department of Public Health
- Connecticut Water and Wastewater Response Network
- Maine Drinking Water Program – Centers for Disease Control
- Maine Rural Water Association; Maine Water and Wastewater Response Network
- MassDEP
- Massachusetts Rural Water Association
- Massachusetts Water and Wastewater Response Network
- Massachusetts Water Works Association
- New England Water Works Association
- NHDES
- Rhode Island Department of Health
- Rhode Island Water and Wastewater Response Network
- Rhode Island Water Works Association
- Rural Community Assistance Program
- VTDEC
- Vermont Water and Wastewater Response Network
- Vermont Rural Water Association

During the pandemic, water system managers and operators faced staff and chemical shortages, restricted access to assets, and health and safety challenges. In the midst of this, drinking water programs created new guidance around flushing, hydrant sampling, tap sampling, and Legionella control, as well as designed new protocols that enabled state staff to perform remote sanitary surveys of water utilities. The programs also issued email newsletters, helped with virtual meetings with the state drinking water staff, developed virtual training opportunities, and offered professional training for certified operators. While the New England state drinking water programs worked to address the regulatory, policy, and technical assistance challenges of the pandemic, the state water and wastewater agency response networks worked to protect the health and safety of water system managers and operators. Because of their efforts, drinking water in New England has remained safe and plentiful, even during the pandemic.

ENVIRONMENTAL MERIT AWARDS – ENVIRONMENTAL, COMMUNITY, ACADEMIA, & NONPROFIT ORGANIZATIONS

Chelsea GreenRoots: Roseann Bongiovanni, Maria Belen-Power, and John Walkey, Chelsea, Massachusetts

GreenRoots, a community organization that improves the environment and public health in Chelsea, Massachusetts, empowers a region long underserved and disproportionately polluted. Working with community members, youth, other organizations, and government, GreenRoots has protected and improved the environment of Chelsea, one of the most polluted cities in New England with high rates of asthma, heart disease, lung disease, and cancer. Just as important, GreenRoots brought in residents who in the past lacked a voice. In the last year, historic inequities have been exacerbated by the pandemic as Chelsea experienced the highest rate of Covid-19 infections in the state. In 2020, GreenRoots helped obtain funding for the Mystic River watershed, air monitors for the city, and Covid-19 protections for residents. Over the years, GreenRoots has helped restore urban salt marshes, create new parks, increase public access to the waterfront, and improve water quality in Chelsea Creek. Recently, GreenRoots engaged the community in the NPDES permitting process for petroleum storage facilities at Chelsea Creek and Logan Airport. As government agencies seek to increase engagement with communities disproportionately affected by pollution, they can look to GreenRoots for examples of successful community collaboration and environmental protection.

Racial and Environmental Justice Committee Members: Monica Huertes and Vatic Kuumba, Providence, Rhode Island

The Racial and Environmental Justice Committee in Providence aims to ensure that communities disproportionately affected by pollution and historically excluded from decision-making take the lead in events affecting them. The committee, made up of 11 community members and residents, has become the voice and ears of many Providence communities with environmental justice concerns, and has helped bring a racial equity lens to the city's Office of Sustainability. The committee, through training and advocacy, has helped citizens and government officials better understand the disproportionate environmental harm historically faced by communities of color and other populations. The committee is a model for communities building support starting from the ground up, showing that training is central to raising awareness and gaining political will and public support needed for change. The committee developed recommendations that were adopted in the city's Just Providence Framework in 2017. And the committee drove the creation of three Green Justice Zones, which give residents a say in development and use decisions, and which are incorporated in the city's 2020 Climate Justice Plan. The committee, through its work with frontline communities, has emerged as a voice for residents historically not heard in decision-making.

ENVIRONMENTAL MERIT AWARD – INDIVIDUAL

Thomas Maguire, Boston, Massachusetts, has served for over 20 years as the chief resource for stormwater in the Wetlands Program of the MassDEP. His expertise in hydraulics and hydrology was recognized in 2019 with a promotion to a new position, senior analyst for climate resiliency and hydraulic and hydrologic support. With increased precipitation and revisions to federal stormwater permits, MassDEP's *Stormwater Handbook* and regulations needed updating. Precipitation estimates used to design stormwater control measures did not reflect reality. Also, MassDEP had to align its regulations with the federal permit. Mr. Maguire initiated a study to determine how standards for stormwater should be updated, using his regulatory experience and expertise in statistical modeling and analysis. Based on that study, MassDEP is revising critical regulations. Rather than using the median rainfall amount, MassDEP proposes to rely on the upper range reflecting the higher end of extreme storms now seen. This approach is intended to prepare Massachusetts for the future. Mr. Maguire also is contributing to the Massachusetts *Stormwater Handbook* update, which supports the wetlands stormwater regulations. These changes to stormwater management improve water quality long-term. The standards will be used by municipalities and developers statewide and will be available to other states.

IRA LEIGHTON IN SERVICE TO STATES ANNUAL AWARD

Janet Coit, Rhode Island, former director of RIDEM, has been a leader in getting New England states to work as a team, evidenced by her nomination for the Ira Leighton Award by commissioners of the region's state environmental agencies. Ms. Coit set an outstanding example that motivated RIDEM's employees and her colleagues across New England.

As other leaders joined and left the Northeast Committee on the Environment, Ms. Coit provided consistency throughout her decade-long tenure at RIDEM. Her commitment to such regional efforts has made a difference. She engaged in regional environmental challenges, including PFAS, climate change, water quality, and equity and justice issues.

The longest-serving chief executive in RIDEM's history, Ms. Coit greatly improved its culture and operation. From her appointment by Governor Lincoln Chafee in 2011, she insisted RIDEM focus on customer service. Her accomplishments led to her reappointment by both Governors Raimondo and McKee. In 2021, she was appointed assistant administrator for Fisheries at the National Oceanic and Atmospheric Administration (NOAA) and is NOAA's acting assistant secretary of commerce for Oceans and Atmosphere and deputy administrator.

In Rhode Island, Ms. Coit focused on improving natural resource conservation, promoting locally grown food, and addressing the climate crisis. Doing so she led not only the state's environmental protection efforts but also the natural resources and agriculture programs, including fisheries and fishing ports. Before joining RIDEM, Ms. Coit was state director for The Nature Conservancy in Rhode Island for 10 years. She previously had also been counsel and environmental coordinator for the late Senator John Chafee and, subsequently, then-Senator Lincoln Chafee. She also was counsel to the U.S. Senate Committee on the Environment and Public Works.

An operator's story

JAMES BARSANTI, PE, Massachusetts Department of Environmental Protection, Wilmington, Massachusetts

ABSTRACT | Our water industry offers each of us rich and fulfilling personal and professional opportunities, whether as a consulting or municipal engineer, scientist, product sales representative, service provider, utility manager, regulator, academic, or operator. Career paths vary, and each of us has a unique story to tell. This article highlights the career paths of 10 talented NEWEA colleagues and describes how they arrived in their current roles as operators in our water industry.

KEYWORDS | Career, operator, professional association, mentor, training, licensing, outreach

PROLOGUE

The torrential early evening thunderstorm had mercifully passed, providing little relief from the heat as the latent steam slowly rose from the grimy, sweltering streets while a few dark clouds still hovered menacingly over the Prudential Center. It was early September 1985, and a late summer heat wave refused to release its grip on the city of Boston, keeping its inhabitants hotter and crankier than normal. "Ain't No Sunshine," Bill Withers' lonesome lament about a man questioning if his lover has left him for good, crackled from the cab driver's radio speakers. The cabbie knew this song by heart, and he quietly sang as he expertly maneuvered his faded yellow 1975 Checker taxicab through the traffic snaking along Beacon Street through Back Bay. He swerved to avoid the minefield of puddles clinging to the curbs as his trained eyes darted like laser beams while stalking his next fare. "Tuesday is always a slow night," he mused, further noting that his bookings had been off lately. "My dispatcher is going to light me up like a Christmas tree," he sighed to himself wearily. He was driving a hack at night to support himself and his soon-to-be wife, and he wondered if this was all his life would ever be. As he crossed Massachusetts Avenue, he glanced toward the Charles River. "Love that dirty water," he chuckled.

His keen eye always noticed the river's dark and cloudy sheen and floating debris after a rainstorm, and he wondered why nothing had ever been done to solve what was to him such an obvious problem. The Charles River and Boston Harbor fascinated him; their waters were rich in history and uniquely defined this quintessential American port city and his home. He pulled up to a stop light, and his thoughts trailed away as Bill Withers' forlorn refrain faded off into the ether. A top-of-the-hour news brief abruptly interrupted his daydream, announcing that a new state agency was developing a program to modernize Boston's antiquated and dysfunctional sewer system and address the decades of pollution. The newscaster reported that it was anticipated that this agency would boost the economy with new employment opportunities to address what was being termed a massive undertaking. As the evening darkness draped the streets, he listened intently; he found this news strangely intriguing. Suddenly, with a jolt, his momentary respite from reality was rudely shattered by the loud and sustained blare of an impatient car horn behind him. The light had turned green, and he had not instinctively jackrabbited through the intersection as was customary of all Boston cab drivers. Twenty-one-year-old cabbie Lenny Young momentarily considered letting the driver behind him know he was number one, but his common sense prevailed and reminded him of the futility of such a gesture. Mr. Young took a deep breath, slowly depressed his cab's worn gas pedal, and drove into the falling darkness—with an inkling of a new path into a world of environmental improvement involving his native community's water resources.

Two roads diverged in a wood, and I—
I took the one less traveled by,
and that has made all the difference.
Robert Frost

When you come to a fork in the road, take it.
Yogi Berra

His is one of many stories depicting how individuals from various backgrounds have been drawn into this field of improving and enhancing the water environment that is so abundantly important to us all as inhabitants of this sensitive planet. And as you will see from the following stories, this field offers us rich and fulfilling personal and professional opportunities. It may be as a consulting or municipal engineer, scientist, product sales representative, service provider, utility manager, regulator, academic, or operator. Career paths vary, and each of us has a unique story to tell regarding how we came into our place and role. The stories of our operators, and their career paths, tend to be interesting, sometimes humorous, and often evocative. In some cases, the circumstances of their lives led them from their occupation at that time into our water industry in a roundabout way, often merely by a random event, the proverbial "fork in the road," where fate interceded and redirected the course of their life. The following are the stories of "how they got here" by a group of 10 talented NEWEA colleagues who are starring on the water industry's stage. Each story is distinctive, yet what binds these individuals together is their common sense of purpose, passion, and commitment to operations, water quality, and the essential role operators play in improving our world. I hope you enjoy this wonderful collection of NEWEA operators' stories.

DUSTIN PRICE

Chief Operator for Wastewater Treatment, Portland Water District

Dustin Price was born in Los Angeles, California, and began his career in the U.S. Navy as a nuclear machinist's mate, specializing in propulsion systems. After serving in various ports of call in the United States and abroad, his last port was in Kittery, Maine, in the shipyard. After his discharge from the service, he remained in Kittery where he met his wife and began a career repairing small engines at a local marina. Then one summer night, fate intervened and altered his life. "I heard a 'profusion of profanity' through an open window of my apartment," Mr. Price recalls. His landlord was outside struggling with repairing his tractor. Mr. Price came outside to help and mentioned to his landlord he had experience with engines and mechanical systems. His landlord told him that the York Sewer District was looking for mechanics. At that time, Mr. Price had little familiarity with a wastewater treatment plant. He toured York's plant, and as he walked around observing the pipes, valves, and pumps he found them similar to the systems he had worked on in the Navy. He decided to throw his hat in the ring and applied for a job. He was hired as a collections foreperson, and the door to our water industry swung open. After 12 years in York, and then three years as the chief operator in Seabrook, New Hampshire, he became chief operator at the Portland Water District. Mr. Price relishes the challenges of an operator and first responder serving his community. He enjoys the problem-solving that goes with the complex process control systems and helping other operators in their careers. He has been active in the New Hampshire and Maine state associations and NEWEA. He served on the New Hampshire Water Pollution Control Association (NHWPCA) Board of Directors and has helped drive NEWEA's Water Warriors campaign to bring water industry career awareness to veterans. He credits the importance of the relationships he has built with his colleagues and their willingness to mentor him when he was a young operator. He named Aubrey Strause and Paul Rodriguez as two of his most important influences early in his career. Mr. Price values his professional association activities and their importance in his career growth, and now strives to "pay it forward," repaying the kindness to others. "When you are at an association event," he says, "make someone you don't know feel welcome."

CHERI COUSENS

Executive Director, Greater Lawrence Sanitary District

Cheri Cousens grew up in Medway, Massachusetts, and as a student always enjoyed math and science. After graduating from high school, she pursued a major in biology at the University of Massachusetts Lowell. During her college years, she became interested in environmental engineering, and transferred to Wentworth Institute of Technology to pursue an engineering degree. While at Wentworth, she heard her mother mention that the nearby Charles River Pollution Control District had openings for summer interns. Ms. Cousens applied for the position and, with her strong background in math, science, and engineering, was readily hired. In this role, she worked in every aspect of the plant, including process control, laboratory, engineering, and administration. At that time, Bob McRae was the District's executive director, and he took Ms. Cousens under his wing and served as her first mentor. She returned to Wentworth and had a subsequent summer internship with CDM Smith that led to an entry-level position after she graduated. Interestingly, and perhaps serendipitously, her first assignment was working for the District on a phosphorus study. As she was working on this project, it really hit home with her how much she enjoyed working at the plant. She found the combination of chemical, biological, and physical treatment, and the decision-making necessary to optimize these processes, fascinating. Mr. McRae mentioned to her he was looking for an engineer to run the plant's pretreatment program, and so Ms. Cousens applied for the position and was hired. She worked at the plant for the next eight years, eventually rising through the ranks to become executive director when Mr. McRae retired. Several years later, she was considering upgrades to the plant's bar screens and decided to visit the Greater Lawrence Sanitary District (GLSD) to observe its system in operation. At that time, GLSD's executive director was retiring, and Ms. Cousens applied for the position and was hired. GLSD's collection system was combined, and wet weather impacts on a plant interested her. She also wanted to build a team that could meet the regulatory challenges of combined sewer overflow abatement and coping with aging infrastructure. As an operator, Ms. Cousens enjoys the collaborative spirit among her peers and the importance of every employee and his/her contribution to the successful operation of its facilities. Since taking the helm, Ms. Cousens has championed the development and operation of several innovative upgrades at the plant including its high-flow treatment system, food waste-to-energy process, and the use of biogas and heat extracted from the combined heat and power engines as alternative energy sources for the plant. Mr. McRae had encouraged Ms. Cousens to be involved with NEWEA, and she has never regretted following that advice. She is also active with the North East

Biosolids and Residuals Association and the Massachusetts Coalition for Water Resources Stewardship. Ms. Cousens is an operator at heart, and lives by an adage that Mr. McRae once mentioned to her: "When you work at the plant, you are in the game."

SCOTT GOODINSON

Superintendent, Scarborough Wastewater Treatment Plant, Town of Narragansett

Scott Goodinson grew up in the Federal Hill neighborhood of Providence, Rhode Island, and later moved to Warwick when he was in high school. As a young man, he had dreams of being a chef and opening his own restaurant. Seeking attainable opportunities to follow his aspiration, he decided to enlist in the U.S. Navy, as it could provide him a start in food service as a mess specialist. After serving several years on nuclear submarines and feeding hungry and appreciative sailors, Mr. Goodinson returned to Rhode Island as a Navy reservist stationed in Newport. He bounced from job to job, at one point delivering furniture for a local merchant, eventually settling in with a job as a septage hauler pumping out portable toilets. He found the job quite humbling and noted its reputation as a "dirty job." A seminal moment occurred one day when he was pumping out a portable toilet at a baseball field. He noticed a father and son watching him intently, and after shutting down the vactor hose, Mr. Goodinson overheard the father admonishing his son that he'd better go to college, or he may end up doing a job like this. At that moment of self-realization, Mr. Goodinson decided to make a change. He knew several operators at the Cranston wastewater treatment plant (WWTP), and one day while emptying his truck, he decided to apply for a vacant operator-in-training position. Mr. Goodinson was soon hired and underway in our water industry. He quickly developed a passion for it, honed his skills, and became a licensed operator. After working in Cranston, he moved on to West Warwick and then Warwick, ultimately finding a home at the Scarborough WWTP for the town of Narragansett. Mr. Goodinson notes the vital roles we play as clean water operators with respect to fishing, recreational swimming, and boating. He lauds the progress Rhode Island has made with its receiving waters, specifically the Pawtuxet River near where he grew up. For decades, the river was a Class D receiving water; owing to the progress in our clean water efforts, it is now classified as a B+. He also notes the positive work he and his Rhode Island colleagues have done with keeping beaches, that were frequently closed during his youth, open now during the summer. Mr. Goodinson remains active in our water industry. He has served on the Pawtucket River Authority & Watershed Council for 10 years and is a past president (and frequent "chowder cookoff" champion) of Rhode Island Clean Water Association (RICWA), and former NEWEA state director. Mr. Goodinson strongly supports Operations Challenge and after some years as a team contestant he chaired the Operations Challenge Committee. Just this year, Mr. Goodinson was nominated to be NEWEA's vice president in 2022. Quite a journey for a proud yet humble Navy submariner.

STACY THOMPSON

Deputy Director, City of Saco Water Resource Recovery Department

Stacy Thompson grew up in the Berkshires in western Massachusetts. After graduating from high school, she attended St. Joseph's College in Maine to pursue a degree in biology with a chemistry minor, with a potential goal of enrolling in premedical studies. After graduation, her first job was as an analyst with Katahdin Analytical Services in its environmental laboratory. Her responsibilities included testing, reporting, and database development for samples from Superfund sites. She found data management interesting and pursued a second degree in information technology, with expertise in Oracle server networks. At that time, she decided to seek another job, and heard the City of Saco was looking for a laboratory technician, so she applied. She was offered the position; Ms. Thompson noted that she knew nothing about wastewater, but still jumped right in. She was fortunate to have NEWEA members John Hart, Howard Carter, and Travis Peaslee as mentors early in her water quality career, and each helped her with the transition understanding the basics of wastewater biology and chemistry. As her experience grew, she took advantage of training opportunities and secured her wastewater operator's licenses. Ms. Thompson's mentors soon encouraged her to become active with Maine Water Environment Association (MeWEA) and NEWEA. One of her first activities with NEWEA was as a member of the Force Maine Operations Challenge team from 2011 to 2014, and Ms. Thompson proudly notes her team took first place at WEFTEC for three years in a row for the Division II Process Control event. She became active with MeWEA, serving on various committees, and eventually on the executive board, where she was president in 2019. Meanwhile, Ms. Thompson continued to progress with her career in Saco. After serving as a laboratory technician for four years, she was promoted to lead operator, a position she then held for five years. Her hard work and dedication to the water industry paid off with her promotion to her current position as Saco's deputy director. Ms. Thompson enjoys the daily challenges that operators face keeping a plant operating at optimal conditions and finds it keeps her engaged and motivated. She especially notes the comradery among operators and their willingness to share knowledge, equipment, and resources. Her experience with association activities has helped her grow personally and professionally as an operator and provided her with what she feels is a fulfilling career path in the water industry.

PAULA DROUIN

Assistant General Manager, Lewiston-Auburn Water Pollution Control Authority

Paula Drouin grew up in Lewiston, Maine, on the banks of the Androscoggin River. After high school, she went off to college to pursue a bachelor's degree in natural and applied sciences from the University of Southern Maine. After her graduation, she began her job search, and a friend mentioned she had seen a laboratory technician position at Lewiston-Auburn Water Pollution Control Authority (LAWPCA) advertised in the newspaper. She had no real understanding of the wastewater treatment process, but felt she had the laboratory skills and was thrilled that the plant was in her hometown. She applied and was hired. A "job" quickly became a career, and she is proud to still be at LAWPCA 13 years later, now as the assistant general manager. Ms. Drouin enjoys being a reliable resource for her operations and maintenance crew; she notes that they are the true operators and that she is a piece of an amazing team. She enjoys describing to the public the job that operators (and all staff) perform daily and how the treatment process functions. "Our water infrastructure is out of sight, out of mind," she says, "but people tend to have a great amount of appreciation upon learning about the process." Ms. Drouin stresses connecting with our communities so that they understand the environmental and public health services we provide, and she finds that aspect of her work personally and professionally important and rewarding. She most enjoys the environmental protection aspect, but also watching the industry change over time as newer technologies for both monitoring and treatment become available. Ms. Drouin emphasizes the notion of "One Water" and feels wastewater, drinking water, stormwater, and groundwater must be thought of holistically rather than as separate water systems, and that practitioners of each system must work together toward the same water quality goals. Ms. Drouin has been active with both MeWEA and NEWEA. In 2011, she started and was the first chair of MeWEA's Young Professionals Committee. In 2014, she developed and was the first chair of the New Media Committee, which brought MeWEA into the social media world on Facebook and Twitter. Though this committee has since merged with the Communications Committee, she still oversees the website and social media accounts. She was MeWEA president in 2018, and recently she chaired MeWEA's Awards Committee and Public Relations Committee. She will be NEWEA's state director starting in 2022. Ms. Drouin notes that professional associations are tremendously valuable because "we get back so much more than we give." She notes that the community network that water professionals have built, some of which truly feels like family, is dense and vast. The exchange of information, ideas, and support is seen most through networking events and training, but so much happens individually as well. As highlighted by several of her operator colleagues in this article, she knows that anytime she has a question, a problem, or just needs a sounding board, help is just a phone call away.

ROBERT FISCHER

Water Quality Superintendent, City of South Burlington

Bob Fischer grew up in Buffalo, New York, and after finishing high school, sought degrees in biology and history (dual major) from State University of New York College at Buffalo. As Mr. Fischer notes, he chose this path because he did not like math and English when he was in high school, but more on that later. After graduating, his first job was as a federal fisheries biologist in Truckee, California, and later in more northern California. An interesting aspect of his job involved working with Native American tribes who resided along the banks of the Klamath River. After changing jobs seven times in seven years, the challenges of the work and general isolation living in the remote areas of California began to wear on Mr. Fischer's family, so he decided to switch gears and seek a position as an operator with the Tahoe-Truckee Sanitation Agency (TTSA). Mr. Fischer notes that, up to that time in his life, he thought of a wastewater treatment plant as an industrial entity and a river polluter. However, once he became more immersed in his new job, he realized he could use his biology background to have more of an impact on water quality as a plant operator than as a fishery biologist. After several years at TTSA, Mr. Fischer, an avid skier and ski racing coach, moved back east, to Vermont, and accepted jobs as an operator in Stratton and later in Middlebury. These jobs helped galvanize his career; Mr. Fischer liked that he could "do everything" at the plant, including driving a plow, maintaining equipment, and keeping intellectually engaged in every aspect of the problem-solving that goes with a wastewater treatment plant's daily operation. His career path then took him to Montpelier and ultimately South Burlington. Mr. Fischer has been engaged in the Green Mountain Water Environment Association (GMWEA) and NEWEA, having served several roles in both associations. He is a past president of GMWEA and past NEWEA state director, and currently is NEWEA's vice president. Mr. Fischer's advocacy on the state and federal government levels are second to none; he has served on and chaired both associations' Government Affairs committees, and he is a frequent visitor to representatives and senators in Montpelier and Washington. Mr. Fischer fully understands the importance of our wastewater operators and the vital work they do, and that the public and government officials who make policy and provide public financing must be reminded that we in the water industry are the environmentalists and leading protectors of public health. Mr. Fischer feels his career has come full circle from his high school years and notes

ironically that with the technical and public outreach aspects of his job, "All I do now is math and English!"

RAY VERMETTE

Facility Superintendent, City of Dover WWTF

Ray Vermette grew up in Rollinsford, New Hampshire. In 1986, in the summer of his junior year in high school, he signed up for employment with a state vocational program. He was slated to clean cars at an auto dealership that summer. When school ended, he visited family in Connecticut for a week before he started work. When he returned, the job at the auto dealership had been filled, and he was told that the only program slot left was at the Somersworth Wastewater Treatment Facility (WWTF). After graduating from high school, Mr. Vermette attended two years of plumbing school, but the economic downturn of the late 1980s led him to leave plumbing and seek another field. He applied for a position as a laborer with the Dover WWTF. After Mr. Vermette's first year as a maintenance technician, the City of Dover decided to privatize its operations and hired OMI to operate the facility. Mr. Vermette was retained under the OMI contract and worked for seven-and-a-half years for the company, eventually becoming chief operator. In 1999, when the City returned operation of the WWTF to the public sector, Mr. Vermette continued his career there, eventually rising to his current role as facility supervisor. Mr. Vermette feels his experience operating a plant in both the public and private realms has given him the best of both worlds. During the contract operations role, Mr. Vermette learned much about streamlining, structure, and policy. That experience enabled him to think and act from an owner's perspective and to do more with less.

Mr. Vermette takes pride in making the environment a better place every day. He notes that facility operators are the first line in protecting the waters of the world and cites the commitment and dedication that operators have in keeping complex systems running every day, largely out of sight of the public. Mr. Vermette says our industry is continually changing with regard to technology. He has advocated for integrating innovative technologies into the systems at Dover. The ability of much new equipment to operate virtually unattended allows him and his operators to improve process performance and to manage personnel resources more efficiently. Mr. Vermette has been an active member of NHWPCA, NEWEA, and WEF. He sees networking as one of the biggest benefits in becoming a member of one or more of these associations. It gives individuals a valuable opportunity to talk to other professionals about the issues we all face. The sense of shared purpose among all the professionals that make up our associations is inspiring, as are the training and trade shows that keep us informed about the latest innovative technologies. Mr. Vermette is a NHWPCA past president and a NEWEA past president. He previously served as New Hampshire state director and is currently a NEWEA WEF delegate. Mr. Vermette prizes his professional association activities and his relationships with his colleagues. As Mr. Vermette notes, "We have a great story to tell. The challenges keep coming; working together we can meet those challenges."

LENNY YOUNG

Facilities Manager, Massachusetts Water Resources Authority

Lenny Young was born and raised in Malden, Massachusetts. In the mid-1980s, he was working nights driving a cab. After several years of battling Boston's notorious traffic, he heard that the Massachusetts Water Resources Authority (MWRA) was hiring laborers and so applied for an entry-level position. He was hired, and after a few years, was promoted to sewer and drain pipeline inspector. He was heavily involved in the infiltration/inflow program in Quincy inspecting pipelines along Wollaston Beach. Mr. Young found this work interesting and important, as the leaks they identified as needing repair were typically discharging sewage directly into Quincy Bay. His work on the program expanded from Quincy to locations along the Charles River, and subsequently he began overseeing daily planning and inspection schedules and later a five-year system-wide plan to perform comprehensive condition assessments of 274 miles (441 km) of MWRA pipelines. Mr. Young became a supervisor of the inspection crews, eventually rising to his current position of facilities manager at the Deer Island Treatment Plant. Mr. Young oversees all aspects of building and vehicle maintenance and has been with MWRA for 34 years. He enjoys the problem-solving aspects of operations and providing his experience and guidance to other operators regarding training and licensing. He is especially proud that 30 people who have worked for him have been promoted to higher positions in MWRA. Mr. Young became involved with NEWEA through MWRA's confined space entry program. He was encouraged to join the NEWEA Safety Committee by MWRA colleagues Joe Del Greco and Charlie Tyler. He also has been an active member, current chair, and driving force of NEWEA's Youth Education Committee. He is especially proud of NEWEA's mentoring program and Water for People. He believes his involvement with NEWEA has made a difference in the lives of students through its various programs such as the Stockholm Junior Water Prize and Mr. and Mrs. Fish. He has seen how students begin to understand the importance of water in our daily lives and its vital place in the natural environment. Mr. Young noted that his involvement with NEWEA has helped him see the bigger picture of our water industry and that everybody involved has a role to play in protecting our water environment.

CHARLIE TYLER

Process Control, Massachusetts Water Resources Authority (Retired)

Charlie Tyler grew up on a farm in western New York, where he witnessed small community sanitation issues and questionable farm runoff management firsthand. Hoping to escape from pitching manure for a living, he attained a degree in speech communications, but graduated in the midst of a major recession and employment squeeze. While scraping for a job in the wake of the 1972 Clean Water Act, Mr. Tyler passed a Civil Service examination and found he had an aptitude for wastewater treatment that blossomed while he worked at the City of Batavia, New York wastewater treatment facility. (He never did escape that manure after all.) After several years at Batavia's plant, he moved east and worked briefly at a 50,000 gpd (190,000 L/d) sand filter and lagoon facility at a small college but then moved to the Town of Marshfield's start-up secondary wastewater treatment plant where he worked until the late 1980s. Mr. Tyler then took on a new assignment with the construction management team on the Boston Harbor Project where he worked on operational planning and input to the design, construction, and startup of the Deer Island Treatment Plant and related facilities. Once the first phase of that plant was ready for start-up, he accepted a process position at the treatment plant where he worked for 23 years. Mr. Tyler has participated in Massachusetts Water Environment Association (MAWEA) and NEWEA activities throughout his career in New England. He is a NEWEA and MAWEA past president, past Massachusetts state director, and past WEF delegate. Mr. Tyler emphasizes the importance for NEWEA to be a friendly and welcoming organization and the need to encourage young professionals and women members to be active and to serve in leadership roles. Although he is now retired from the MWRA, he continues to be active on NEWEA and WEF work groups and committees. To some, he is best known for prowling conference halls with his camera, capturing photos for professional association publications and websites. What Mr. Tyler finds important in our industry is the connection we have to each other, our care and commitment to the work we do, and its vital importance to society. He feels our industry is filled with people with high character and spirit second to none. He finds it rewarding that NEWEA provides all of us with a forum to meet and interact with a broad spectrum of colleagues from the consulting, regulatory, manufacturer's representative, utility management, and operations sides of our industry.

MIKE BISI

Superintendent of Sanitation, Glastonbury Wastewater Treatment Plant

Mike Bisi was born and raised in Glastonbury, Connecticut. Mr. Bisi has always loved everything about cars, and as a young man, he worked in a car dealership as a budding mechanic. He was interested in a career as a police officer and decided to attend Manchester Community College to study law enforcement. However, while still working at the car dealership, he heard about an interesting opportunity at the new wastewater treatment plant being constructed adjacent to the middle school he had once attended. It was the 1970s, and the EPA's Clean Water Act was funding communities for the construction of wastewater collection and treatment facilities; the demand to join the water industry was strong. This piqued Mr. Bisi's interest, and with his strong mechanical background, he thought this industry could provide a career path and a chance to do something different. He applied for a job as an operator and was hired. Early in his career, he enjoyed his job's variety of tasks and its opportunities for learning new things, and he acknowledges the expertise shared from the experienced operators and supervisors he worked with. He embraced all aspects of life as a wastewater operator, including working in the plant's laboratory. As a young operator, Mr. Bisi soon became involved with the Connecticut Water Pollution Abatement Association (CWPAA), and he credits Brian Armet of The Mattabassett District for this engagement. He found CWPAA's members welcoming and open to helping him personally and professionally. Mr. Bisi now notes the importance of this community of operators, its comradery, and the willingness to share their knowledge and help each other troubleshoot issues with operation and maintenance activities. Mr. Bisi came to realize in those early days that his involvement in CWPAA and NEWEA made his job a career. He has remained active in CWPAA serving on the board of directors and Government Affairs Committee and is a past president. He has served as NEWEA Connecticut state director and is a NEIWPCC commissioner. Today, as the plant's superintendent with 48 years of experience in the water industry, Mr. Bisi coordinates school tours of the plant and says he has come full circle from his formative years growing up in Glastonbury.

ABOUT THE AUTHOR

James Barsanti is an environmental engineer with the Massachusetts Department of Environmental Protection's Wastewater Section. He has 37 years of experience in the water industry as a consulting engineer, municipal engineer, director of water and wastewater operations, and regulator. He is a registered professional engineer in Massachusetts and Vermont, a NEWEA Grade IV wastewater collection systems operator, and a Massachusetts Grade 4D drinking water operator-in-training. He has been an active member of NEWEA and WEF for 30 years, and is a NEWEA past president (2017), currently serving as a WEF delegate and incoming chair of NEWEA's Bylaws Committee.

FEATURE

Operator exchange—NEWEA's least known excellent opportunity

CLAYTON "MAC" RICHARDSON, PE, Lewiston-Auburn Water Pollution Control Authority (retired)
Windham, Maine

ABSTRACT | Are you familiar with, or even aware of, the NEWEA Operator Exchange Program? This remarkable opportunity inexplicably often goes begging for participants. The NEWEA Operator Exchange Program is largely managed by the NEWEA state director from each of the six New England states, in conjunction with the state operator associations. Each year, the six states are paired, and each sends an operator to the respectively paired state where the operator normally tours a few treatment plants for a day or day and a half before attending the host state's conference or trade show. By working with the host state director, the exchange operator can tailor the trip to include facilities facing similar issues as at his or her home plant or look at new processes or equipment that his or her plant may be considering. At the end of trip, the exchange operator is asked to write an article describing the experience.

KEYWORDS | Operator Exchange Program, NEWEA, wastewater operations, operator training, MEWEA, GMWEA

Courtesy of Lynn Water and Sewer Commission Regional Water Pollution Control Plant, Lynn, MA

The Operator Exchange Program provides opportunities for operators in one state to exchange positions with operators in another state to enhance skills and see how different treatment plants work. The visiting operator's expenses are paid in full; the only requirements for the operator are written confirmation of approval for the exchange dates by their facility, photo documentation of the trip, and a small presentation or written summary to promote the program.

The host state provides an agenda for the exchange, sets up room reservations for the incoming operator, and pays for lodging, meals during exchange activities (lunches and dinners), and other necessary fees (meeting reservations, etc.) for the visiting operator. The visiting state ensures that the visiting operator has his or her agenda and funds the operator's travel and other incidental expenses. NEWEA does not require strict accountability for the funds; however, the host and visiting states should request receipts for travel and other incidental expenses for reimbursement, to check that advanced monies were properly spent.

So, what is in it for the operator and the operator's employer? First, is there a better opportunity to learn than to interact with people who experience similar problems? Perhaps your facility wants to upgrade the dewatering system. As you work with the state director, it is generally possible to schedule the trip so that you see three or four technologies, understand how they work, and ask questions of those who know how the equipment operates. Does the screw press really deliver 25 percent solids on waste-activated sludge without primary? How loud is a centrifuge when operating? Why and how did they pick the equipment they are using? What problems did they experience with start-up? Are they happy with the final dewatering system, or are there things they would do differently? Of course, the same information could be gathered for nearly any equipment or process that you may be interested in. Talk about getting the straight skinny.

My first operator exchange experience (about a hundred years ago) was when Maine exchanged with Vermont. At the time the Maine Waste Water Control Association—now Maine Water Environment Association (MEWEA)—had no volunteers for the exchange, so I volunteered. In my 30 years at the Lewiston-Auburn treatment plant (LAWPCA) I never spent a better, more productive, and fun two-and-a-half days. I toured Middlebury, where I saw my first sequencing batch reactor and a new UV disinfection system (also a first for me) and discussed the plant's issues with slug loading from a dairy/creamery discharge and the issues with biosolids treatment and disposal. At Essex Junction I saw my first anaerobic digester and learned that anaerobic digestion could work at a "smaller" treatment plant. Without that experience, I would not have had the conviction to push forward with anaerobic digestion at LAWPCA when most of the experts were saying that it did not make sense for a plant of less than 25 mgd (95 ML/d). Talking to the operators at Essex Junction gave me confidence to advocate for the project. At Waterbury, I saw positive displacement blowers installed and started up at a time when the Lewiston facility was considering replacing its blowers with a new aeration system. When I ended my exchange trip at the annual convention and trade show, I felt I had been treated as an honored guest.

Later, as Maine state director I hosted operators from other states as they came to Maine in the Operator Exchange Program. Our "routine" was to meet the "operator from away"—a Maine way of putting it, I have to note—around 8:00 AM on Tuesday before the MEWEA annual convention on Thursday and Friday of the exchange week. We would visit three or four treatment plants that day, typically sharing lunch and or/dinner with one of the operators or superintendents who had given us tours. The time spent during these meals was often surprisingly rewarding. It often enabled younger people to ask older people what they learned from their experience, asking, for example, Why did they get into wastewater treatment? The following day, we would visit one or two additional treatment plants before heading to the annual golf tournament (except for one exchange operator one year, who, not being a golfer, opted to tag along with a vendor's gun sighting-in event). On the last day (or occasionally last two days) of the exchange we would attend the MEWEA annual conference. The Maine association would pay for the exchange operator to attend the conference and for meals and lodging.

I have never heard from an exchange operator who did not find the experience fun, informative, and rewarding. Generally, each exchange operator is asked to write up his or her experience for publication in the newsletter or journal of the exchange operator's home state association. Whether you are a first-year operator or have 25 years of experience as a maintenance mechanic, I urge you to find out about the NEWEA Operator Exchange Program from your NEWEA state director. It is a rare opportunity to have an economical, valuable learning experience while meeting important contacts in our industry.

OPERATOR EXCHANGE ROTATION

Year Last Digit	States Exchanging
1, 6	Connecticut ◄ ► Maine Massachusetts ◄ ► Vermont New Hampshire ◄ ► Rhode Island
2, 7	Connecticut ◄ ► Massachusetts Maine ◄ ► New Hampshire Rhode Island ◄ ► Vermont
3, 8	Connecticut ◄ ► Rhode Island Maine ◄ ► Massachusetts New Hampshire ◄ ► Vermont
4, 9	Connecticut ◄ ► New Hampshire Maine ◄ ► Vermont Massachusetts ◄ ► Rhode Island
5, 0	Connecticut ◄ ► Vermont Maine ◄ ► Rhode Island Massachusetts ◄ ► New Hampshire

ABOUT THE AUTHOR

Clayton (Mac) Richardson, PE, has spent over 35 years in environmental engineering, much of it at the Lewiston-Auburn Water Pollution Control Authority (Lewiston, Maine), from which he retired in June 2020. He is a certified professional engineer in Maine and holds a Grade 5 Maine wastewater treatment plant operator's license. Long active in both Maine and New England professional associations, he currently is treasurer of NEWEA.

The challenges in operating a small wastewater treatment facility

ROBERT D. LILLEY, Small Water System Services, Littleton, Massachusetts

ABSTRACT | Over the past 30 years, small, decentralized wastewater treatment plants have proliferated in remote areas without municipal collection systems. That growth has been accompanied by the emergence of an uncommon set of challenges that need attention. This article discusses some of the challenges in this service sector that threaten the proper operation of those systems. Included is a case study on typical operational failures encountered: improper equipment replacement or use, failed/failing equipment, neglected operational components that could extend service life, out of range process settings, and occasionally a general disregard to examine or to operate the facilities based upon designer and manufacturer intent. New contractual start-up assessment methods are discussed, along with troubleshooting methodology, with a brief emphasis of the benefits of strong communication between operators and relevant engineers to resolve issues and provide innovative solutions to system and industry shortfalls.

KEYWORDS | Small wastewater treatment facilities, operation and maintenance, process assessment, operations management

Before discussing the inherent challenges of operating a small wastewater treatment plant, it is necessary first to identify why this topic is both important and necessary. As the populations of both the United States and Massachusetts grow, it can reasonably be expected that the number of small, decentralized, wastewater treatment plants will continue to increase, as it has over the past 30 years. As we start up these facilities around the state, understanding the recurring challenges in the industry and the means to solve them will help to prevent future facility malfunction, deterioration, and diminished performance. Through a better understanding of the problems, we can focus on innovations needed and which industry aspects require more attention.

One challenge all treatment facilities face is the passage of time—the biggest enemy of a small wastewater treatment plant. Unlike a municipal facility that is overseen, in many cases, by one governing body and operation group for its entire lifetime, operational contracts for small wastewater treatment plants often rotate annually, biannually, or every five years. Exacerbating this issue, often these facilities are overseen by a secondary owner-management group that provides limited oversight of the facility and its finances year over year. Even when the same operations firm does oversee a facility for a long time, typically various operators are rotated through the facility semi-regularly. Rare is a situation in which the same operator manages a facility for an extended duration. What is created by this cycle of revolving and intermittent oversight is a discontinuity in operation. With such a discontinuity in operation, each new contracted operator must sort through old data and logbooks to understand a site's history, challenges, and reactions to seasonal conditions. Too often, maintenance is delayed until maintenance contracts rotate, at which point the new operator has to repeat the legwork required to understand the site's intricacies and remedy ongoing issues. Long-standing issues are often remedied only after catastrophic failure, and it is not uncommon for excessive time to be spent on resuscitating treatment facilities when the process failure could have been averted by simple, more timely solutions. When beginning work on any new project, identification of the site history, to the best of one's ability, is paramount. Many days of anguish can be saved by drawing on the work of others, regardless of their reported successes or failures.

Finances also pose a major challenge for treatment facilities, regardless of the operator or operations company. All financial decisions ultimately are handed down by the facility owners, whether a home ownership association, a management entity, or an individual owner. Often the owner's concern is not for the long-term condition of a facility but more with the annual financial burden. One key factor in stabilizing operations is a strong financial commitment by the owners to maintain their facility to design standards. A common thread through most facilities with poor operational history has often been the direct or indirect neglect by the owner and operator for mainly financial reasons. This neglect is often manifested in the form of delayed pumping of primary treatment tanks, ignoring of preventative maintenance and needed equipment repair or replacement, neglect of heating equipment within the treatment building, a poor stockpile of spare equipment and essential parts, and/or simply inadequate time spent on operational assessment to analyze facility issues because of budgetary restrictions or the assignment of too many facilities per operational staffer. Especially in the post-Covid-19 world where supply chains are a challenge in all areas of the economy, better financial management by owners can have long-term positive effects on the facilities. A sound financial approach also saves money, as it can preclude major facility breakdowns that often result in expensive temporary solutions (such as pumping and hauling wastewater and expending extensive operator overtime). If all facilities were stocked with at least one spare of each critical piece of equipment, potential downtime could be greatly decreased, repairs could be made quickly, and processes would less often see major changes to operational performance. A change in financial management approach to these facilities clearly could prevent many issues from emerging.

Regarding the breakdown of equipment within a treatment facility, most often the question is not if, but when. With the inevitable equipment breakdown comes repair and replacement, two instances where the treatment plant risks diverging from its initial design intent. Small wastewater treatment plants are not the easiest facilities to maintain and repair. Often unit process and component redundancies are significantly reduced, and the demand for continuous operation of critical components leaves little opportunity for downtime without significant cost to the facility owner. To this end, it is not uncommon for "patches" to be applied to major portions of the process as interim solutions. When replacement equipment or parts are not readily available, these temporary fixes may become long-term solutions, and over time the urgency to reinstate the full functional use begins to dwindle. In most situations when a system experiences long-term effluent compliance issues, the root cause can be traced to a mechanical failure and the attendant repair method. To prevent repair issues from becoming causes of breakdown, operators, engineers, and technicians must work together to identify the best solution and how it can be accomplished with as little deviation as possible from the intended system design.

1. Repaired aeration line 2. Overdosing sodium bicarbonate resulted in blockages and precipitation in feed lines 3. Improper materials used on heated line 4. Temporary spliced wiring job that becomes long-term

In most situations when a system experiences long-term effluent compliance issues, the root cause can be traced to a mechanical failure and the attendant repair method

The challenge of staffing wastewater treatment plants shows no signs of easing, especially if growth continues in constructing and commissioning small treatment facilities. Following the Clean Water Act of the 1970s, a concerted effort was made to recruit, educate, and employ operators for newly constructed facilities. This trend has waned over the years, leaving the industry short of qualified workers. Since the benefits of working for a municipality generally outweigh those of employment with a smaller

company, hiring staff for small remote treatment facilities becomes increasingly difficult. One solution has been the hiring of retirement-age municipal operators wanting to work three to five more years before final retirement. Another solution has been to recruit individuals from outside the profession who have helpful experience or attributes for the operator role, such as a military background, experience in the automotive or HVAC industry (and thus comfort with power and control systems), some post-secondary education, an affinity for manual labor,

A successful operator is one who can consistently generate quality results, an outcome which requires disciplined adherence to standardized operating procedures, attentiveness to all aspects of the facility, and a proactive approach to preventing breakdowns

and a disciplined and self-starting work attitude. A successful operator is one who can consistently generate quality results, an outcome which requires disciplined adherence to standardized operating procedures, attentiveness to all aspects of the facility, and a proactive approach to preventing breakdowns. Potential candidates should be determined and able to solve problems and to increase their subject matter knowledge. Without these characteristics, new operators may be out of place within a treatment facility, especially after they obtain their certification and are assigned one-person treatment facilities to operate.

As a case study, a 10,000 gpd (37,850 L/d) facility had historical chronic issues with fecal coliform exceedances. All other effluent characteristics had met compliance, aside from two minor violations which were due to chemical dosing issues. Such exceedances can typically be characterized as either a "point" failure or a "nonpoint" failure. Prior attempts to resolve the issue had approached it as a "point" failure, theorizing that the UV unit at the tail end of the system was not properly disinfecting the effluent and was thus causing the issue. Instead, the problem was ultimately resolved when an effluent grab sample taken showed a murky tint; this led to the examination of the effluent analysis results of the past year along with a physical inspection of the UV unit to confirm proper operation. The data showed that various process-related issues were likely affecting the UV process performance. This characterized it as a "nonpoint" failure. The further investigation, described below, illustrates some of the challenges of operating a small wastewater treatment facility.

The first and most compromising aspect of the previous operation was that the facility operators did not fully use the flow equalization tank volume. Rather than allowing the water to be held back for a steady flow of treatment through the entire 24-hour day, the tank-level settings caused the flow to be sent through the system only during the limited hours of daytime operation; no flow was being pumped through the plant during the night. The second problem was caused by faulty replacement of a float at the feed station to a tertiary treatment unit. Instead of having a relatively small liquid-level variation between the ON and OFF floats, the pump cycle depth between the floats was over 36 in. (91 cm), raising the chamber liquid level above the sanitary influent tee from the previous tank. The improper float levels allowed process water to back up over 1 ft (30.5 cm) into two aerobic tanks. When the ON float was finally activated, the large volume of water that was being pushed forward surged through the final clarifying tank, causing almost all of the solids to accumulate at the end of the system, beyond the point where they could be reasonably and easily removed. The buildup of solids at the tail end of the facility, coupled with an already tinted effluent stream due to extended solids contact time, caused limited fecal coliform treatment through the overwhelmed UV system.

At this facility, a safety net for occasional solids excursions had been installed, in the form of a self-cleaning sand filter. This unit had been manufactured by a company that had since been purchased by another firm that finally dissolved the filter company; therefore, manufacturer information about the filter was unavailable. With instructions about how to troubleshoot the filter scarce, as time passed the operators lost control of the unit. Reactivating this unit was a key to maintaining a high-quality effluent discharge; however, even ideal filter operation would likely not have prevented the problems caused by the up-front solids imbalance and hydraulic issues. Safe to say, several common, interrelated challenges played a role in the failure of the facility's disinfection system.

The following remedial process was used on the case study above and can be applied to the start-up of any new contract or troubleshooting operation. Initially, and before any adjustments are made to a system, the facility must be observed for a period and all possible information gathered. This means reaching out to anyone with knowledge of specific repairs, previous issues, and above all else, the engineering documents presented at start-up. Often overlooked, these manuals can answer the very questions that a new operator may have. However, in cases where many process changes have been made since construction, a deeper history is needed. Understanding the theory behind the operation has little meaning if the equipment is not functioning. At this stage, all equipment should be tested, and if possible, any automatic cycling should be monitored. After observing the facility and making any essential repairs, the operator must create a hypothesis of effective system performance and draft a course of action. It is then vital to gain control of the facility, specifically in the areas you would like to adjust. But instead of starting with abstract actions, first slowly adjust the factors that can be most simply charted and noticed as deviations from conventional wisdom. For instance, if a process is having trouble removing nitrate, the operator could first gradually adjust the carbon feed source to observe the effect of that before focusing on anoxic detention times. Once control has been established, continue methodically moving the facility in the direction needed with caution. Moving slowly while understanding the effect of every change that is occurring is preferable to making rapid, drastic adjustments that could veil a viable solution.

Once the operation is under control, the system can be fine-tuned. This process includes verifying that all equipment is installed according to facility design, all floats function fully and are set at proper levels, all filters and settling zones work, and all process settings optimize treatment rather than hinder it. During this phase it is important to recognize any area where money is being wasted. One of the operator's main objectives is to run the facility properly and as efficiently as possible. This can be done by reducing chemical and electricity use to the minimum point necessary. For example, if an aeration blower can be run for 8 hours instead of 10 hours a day without any ill effect on the system, it should be done. During this stage, correspondence with the design or contracted engineer is recommended. Informing the appropriate parties on the state of facilities and inspection results will help to determine anything overlooked and future steps to improve the facility. If there are looming dates, such as the expected end of a piece of equipment's useful life, it is best to discuss this well in advance with owners and management. Conversations with engineers will also help to determine additional equipment required to perfect the treatment process or reduce any negative impact on the facility's surroundings.

The final stage of any start-up or remedial process is to standardize a procedure of operation that includes all preventative maintenance, recording of process settings and levels, and dates

As an industry, our objective is, and should be, the reduction of the human impact on our surrounding water resources

for equipment updating. Weekly, monthly, and yearly checklists for essential functions should be produced and adherence to these standards maintained. When this stage is taken seriously, the opportunity for breakdown or failure is significantly reduced.

As an industry, our objective is, and should be, the reduction of the human impact on our surrounding water resources. To accomplish this, we must ensure that all facilities receive the attention needed to remain in or return to compliance. The previously stated challenges should identify some of the major roadblocks to this objective, along with the countless smaller challenges that affect all facilities. Overcoming these challenges is no easy matter, but through improved approaches to operating and maintaining facilities, better owner/user knowledge of the system and processes, and a strong financial commitment by owners, we can set a higher baseline of success throughout the small, decentralized treatment industry.

ABOUT THE AUTHOR

Robert D. Lilley is a regional supervising wastewater operations manager for Small Water System Services (SWSS) in Littleton, Massachusetts. His firm provides water and wastewater O&M services to municipal and private clients primarily for facilities of 100,000 gpd (378,540 L/d) or less. Mr. Lilley also manages new contract facility assessments for SWSS and oversees operator troubleshooting and equipment repairs and upgrades. Prior to SWSS, Mr. Lilley worked in the environmental remediation field, with turnkey construction experience building and commissioning systems throughout the Northeast.

Spotlight: **EPA's WWTP Excellence Awards**

Earlier this year, EPA's New England office gave its 2020 Regional Wastewater Treatment Plant (WWTP) Excellence Awards to three area wastewater facilities. These awards acknowledge the facilities for their outstanding commitment to protecting both public health and water quality in the region. The awards are part of the EPA's Regional Wastewater Awards Program, which recognizes facilities, and the individual operators, who manage and operate exceptional wastewater treatment facilities in New England.

The 2020 awards were given to the following New England facilities: the Jackman Utility District Wastewater Treatment Facility, in Jackman, Maine, led by Superintendent Sara Giroux; the Woodstock Wastewater Treatment Facility, in Woodstock, New Hampshire, led by Chief Operator Kathy Welch; and the South Kingstown Wastewater Treatment Facility, in Narragansett, Rhode Island, led by Superintendent Kathy Perez. The award credited these operators, and their staffs, for their exceptional work in operating and maintaining their wastewater treatment facilities during the year. The Maine Department of Environmental Protection (Maine DEP), the New Hampshire Department of Environmental Services (NHDES), and the Rhode Island Department of Environmental Management (RIDEM) were instrumental in the facilities nominations.

Sara Giroux

According to EPA, "The EPA Regional Wastewater Treatment Plant Excellence Award was established to recognize and honor the employees of publicly owned wastewater treatment plants for their commitment to improving water quality with outstanding plant operations and maintenance. More often than not, and particularly with the smaller facilities, conscientious operators and staff continue to perform exceptionally with limited resources."

NEWEA caught up with Kathy Welch and Sara Giroux and asked each what makes their respective facility such a successful treatment operation. The following are excerpts from the interviews.

Spotlight interview and write-up by the Women's Environmental Network and CDM Smith

Journal *What is a day at your facility like? How does your staff help you run a smooth operation?*

Kathy: "We work hard daily to operate our facility like a well-run ship. We have an excellent operations and maintenance (O&M) manual that covers every portion of the facility. Everything is documented. We keep the facility very well maintained from a process perspective, but also from a visual perspective (e.g., landscaping, painting). We strive to get in front of things before they break, so we take preventative maintenance on the equipment very seriously. I perform the majority of the operations tasks myself (e.g., ordering chemicals, greasing the pumps, oiling the equipment, public works communications, the lab work), and my staff helps me with heavy lifting tasks (e.g., replacing the chlorine cylinders). The Town Department of Public Works is also great resource for the tasks we can't do ourselves, such as electrical work, and they also perform operational weekend duty."

Sara: "Our staff consists of two operators and one superintendent who are fully licensed and cross-trained to perform all jobs. We also have a full-time office manager whose role is essential to our operations. We all show up when we say we will, and we have each other's backs. We have created standard operating procedures for not only critical tasks, but also for daily tasks in the field and in the office. Each day we inspect each duplex pump station and record the daily information. This is a proactive approach to making sure all the water is flowing the way it is supposed to. We have also developed a monthly to-do list that lists things that need to be completed each month to keep the place operating smoothly. Each item on the list has a written standard operating procedure that clearly tells the person the task to do and how to do it. We have a great staff, whereby each is capable of stepping up to take the lead on a project when needed. We communicate effectively so we can help each other complete projects safely and smoothly. I feel communication is our staff's best quality to making things run smoothly."

We communicate effectively so we can help each other complete projects safely and smoothly. I feel communication is our staff's best quality...

SARA GIROUX

We work hard daily to operate our facility like a well-run ship. We have an excellent operations and maintenance (O&M) manual that covers every portion of the facility. Everything is documented.

KATHY WELCH

■ *Is there anything unique about your facility operations?*

Kathy: "The facility is still predominantly the original construction and uses traditional equipment and processes. I guess what I'd say about what might be unique about our facility operations is that I like to use a lot of 'gut instinct' in running the facility. I like to walk the facility grounds and use sight and smell to determine if the processes are operating efficiently. I like to check the bubbles and swirls in the channels and then adjust the chemical dosings accordingly. I also like maintaining close and positive relationships with our customers and with the public works staff. This means we can always act quickly as a team when problems need to be solved."

Sara: "We are a facultative lagoon system. We discharge seasonally, from November 1 to March 31. Chlorination is not required due to low biological activity during the allowed discharge period. There is no mechanical treatment; all treatment is biological. We do add alum in September to lagoons 2, 3, and 4 to reduce the amount of phosphorus, and inject alum as wastewater travels from 3 to 4 throughout the discharge season. Safety is very important to us. If you cut corners or don't follow procedure, your life, or the health of the community, could be in danger."

■ *What challenges have you encountered (e.g., smaller facility, limited resources)?*

Kathy: "Because our area is a vacation destination, we get a wide range of loadings to the facility based on visitor fluctuations. The weekend loadings to the facility go up a lot, plus we have a local brewery that provides variable solids loads to the facility that have unique characteristics. This makes it hard to schedule peak loading. We recently installed a SCADA interface, which has been very helpful with managing and treating the increased loads."

Sara: "I feel my most challenging part of this job has been developing written procedures such as the employee handbook, our safety policy, the daily standard operating procedures, emergency response books, and asset management policies. You can't just write them and then throw them on a shelf. The procedures have a purpose, to guide the board and the employees to make good judgements when situations arise, with reasons behind the decision. So you need to continually review them and tweak them to fit your community. We do a constant review of all of our policies, so the board has a clear roadmap to help them make decisions that are designed for our community and employees, not just for a generic utility in a generic town."

■ *How did you rise to role of superintendent? What is your leadership style?*

Kathy Welch

Kathy: "I was originally an engineering consultant at this facility doing lab management and compliance paperwork. We had won awards for our compliance work at that time. Approximately 20 years ago, the Town's facility superintendent retired and I took over as facility superintendent in a contract operations capacity. I believe in having a can-do attitude and in always being prepared. Bringing an attention to detail and continuously striving for perfection is my management style. My attitude is to always have a smile on your face, and go over and above what needs to be done every day."

Sara: "I was hired in 2005, part-time. At the time, I was teaching middle school science. I had a B.S. in Environmental Science from University of Maine–Orono. My father had worked at the facility, and he suggested that I apply, as they were looking for a part-time on-call person. I applied, and the administrator at the time said I should cross train to be in the office too. Sixteen years later I am still here and am now in the role of superintendent. I have dedicated a lot of time and energy to developing my leadership skills. I think my leadership style is collaborative, and I encourage my employees to be a team player and to work beside me. I like to think I am approachable and open to ideas, yet stern enough to call people out when they are not holding up their end of the wagon. We have a great set of policies to guide us. On a daily basis I can pretty much guarantee I will be sitting at my desk, but I do still enjoy getting out of the office to address an operational issue. It is exciting when each day is not predictable, that's fun to me."

NEWEA *Journal* congratulates Sara Giroux of the Jackman Utility District Wastewater Treatment Facility, Kathy Welch of the Woodstock Wastewater Treatment Facility, and Kathy Perez of the South Kingstown Wastewater Treatment Facility for winning this prestigious EPA award. Your commitment to protecting the public health and water quality of our communities in New England is unrivaled.

NEBRA Highlights

NEBRA/NEWEA Host Successful "Hybrid" Residuals Conference

The North East Residuals & Biosolids conference was held on October 7 at the University of Massachusetts Lowell Conference Center. For attendees, it was a long day in masks, although there was also a virtual option this year. It was nice to see and to network with everyone from the biosolids profession in the Northeast. Over 70 people registered to attend in person for the all-day event. Resource Management, Inc., and DN Tanks were the two exhibitors, with booths on either side of the main room where the presentations took place. Many thanks go out to everyone involved in making this year's conference a success, especially NEWEA and its Residuals Management Committee.

In the morning session, NEBRA member Marc Hebert "Zoomed" in from Quebec to talk about Montreal's program to recover ash from sewage sludge incineration as phosphate fertilizer and a liming product, helping reduce greenhouse gas (GHG) emissions. Mr. Hebert's report on the potential for agricultural use in Quebec was recently featured in the newsletter of the *European Sustainable Phosphorus Platform – ESPP eNews no. 58 - September 2021.*

Presentations by other NEBRA members included the following topics: potential for carbon credits from biosolids land application, Bill Brower, Brown and Caldwell (B&C); drying and thermal treatment technologies for biosolids management, Deborah Mahoney and John Ross, B&C; Southington, Connecticut's solids handling upgrades, Amy Sowitcky, Tighe & Bond; process to recover hydrogen from wastewater solids, Robin Parker, Chemergy; adaptive master planning to manage per- and polyfluoroalkyl substances (PFAS) in biosolids, Todd Williams, Jacobs Engineering; and biochar products, Valentino Villa, BioForce Tech.

Update on the National Biosolids Data Project

In the final presentation of the day, NEBRA Executive Director Janine Burke-Wells was joined by NEIWPCC's Jennifer Lichtensteiger to share the status and findings of the National Biosolids Data Project (NDBP). NEIWPCC is coordinating the survey and data collection for the six New England states and New York. In addition to the seven NEIWPCC states, about 20 other state reports have been completed. The reports can be accessed at biosolidsdata.org.

Residuals Conference (left to right): NEWEA Residuals Management Committee Chair Eric Spargimino, Incoming NEBRA President Deborah Mahoney, Outgoing NEBRA President Tom Schwartz

Findings from the data collected (versus 2004 data) include the following:

- Significant increase in Class A biosolids being produced nationwide
- Moderate decrease in biosolids being incinerated
- More pressures and incentives to divert wastewater solids from landfills
- Significant decrease in state regulatory full-time equivalents (FTEs) dedicated to biosolids regulatory programs in many states

Other facts from the data so far:

- Average per capita biosolids used and/or disposed in the United States in 2018 was approximately 42 lb (19 kg) per year
- Less than 1 percent of U.S. cropland is needed for land application of all biosolids
- The top two uses of biosolids soil amendments are for growing hay/grass for pasture/range animals and corn for animal feed (see graph)

The NBDP presentation and other presentations as they become available can be found on NEBRA's website.

Thanks to all the sponsors of the conference, and to Charlie Tyler for the photos.

In her closing remarks, Ms. Burke-Wells acknowledged the difficulty of managing biosolids but stressed its importance. She encouraged practitioners to prepare for the next challenge—whether that be microplastics or something else—and to let NEBRA know how we can help with these critical efforts toward more sustainable biosolids and residuals management systems.

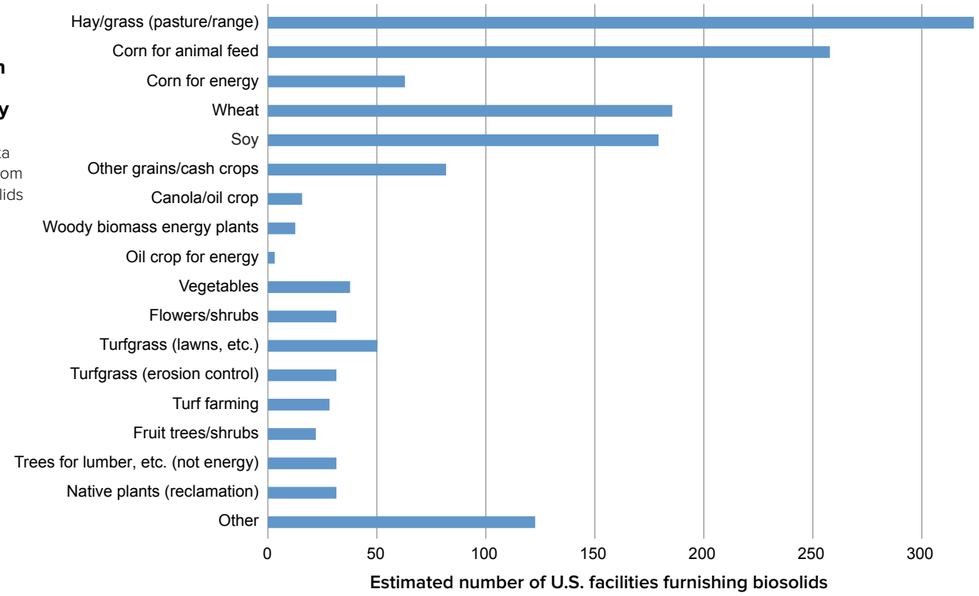
NEBRA Holds Annual Membership Meeting, Election of Board and Officers

NEBRA held its annual membership meeting and board elections on October 7. It was an opportunity for board leadership to update the members on activities over the past year and future plans, and for the general membership to hear from committee leaders on important issues such as the financial health of the organization, membership and industry outreach, regulatory and legislative tracking, and research. Featured were the two newest committees, which are digging into residuals (non-biosolids) and nutrient/carbon trading programs.

Elections were held to fill four open positions on NEBRA's Board of Directors. Incumbents Charlie Alix (Stantec), Isaiah Larry (Lewiston-Auburn Water Pollution Control Authority), and Art Simonian (The Mattabassett District) were each re-elected for another three-year term, while newcomer Aaron Fox from the Lowell Regional Wastewater Treatment Utility was elected to fill the remaining seat, also for a three-year term. In addition, the membership elected the following officers to lead NEBRA in 2022: Deborah Mahoney (B&C), president; Lise LeBlanc (LP Consulting LLC), vice president; Art Simonian, The Mattabassett District, treasurer; and Isaiah Larry (LAWPCA), re-elected as secretary. Thanks to outgoing board member Josh Tyler from Chittenden Solid Waste District in Vermont for his service to NEBRA.

Estimated 2018 Distribution of WRRF Biosolids by Crop Type

Preliminary data extrapolated from National Biosolids Data Project WRRF survey



NEBRA's Natalie Sierra is Incoming WEF Vice Chair

The WEF Residuals & Biosolids Committee (RBC) has appointed Natalie

Sierra, solids and energy practice leader of Brown and Caldwell, as committee vice chair. In addition to 12 years as a member of WEF's RBC and a stint as chair of the Biosolids Products Use and Communication subcommittee, Ms. Sierra is on various NEBRA committees, including the Regulation-Legislation and Membership committees, and she is a past chair of the NEWEA Residuals Management Committee. Ms. Sierra has helped advance sustainable biosolids management practices in the Northeast and across the country.

WEF Seeking Authors for *Manual of Practice*

WEF is updating its *Manual of Practice No. 8 (MOP 8) for Design of Water Resource Recovery Facilities* and is seeking authors to assist with reviewing and updating the solids-related chapters. The new edition will be upgraded with features such as reference text appropriate for undergraduate instruction and a separate handbook on critical design standards for practitioners. WEF needs volunteers to work on the following topics: solids management, storage and transport, chemical conditioning, solids thickening, dewatering, stabilization, and thermal processing. If interested, please contact Lorna Ernst, WEF senior director of publishing.

EPA Awards Research Grants Related to PFAS in Biosolids

EPA announced in September it had selected four projects for grant funding under its national priorities program to evaluate pollutants in biosolids. It is providing nearly $6 million for this research with each project getting around $1.5 million. Researchers from across the country are eager to get going on this important work.

Projects being funded by EPA's Office of Research and Development are summarized below:

- Michigan State University, in collaboration with Colorado State University, Great Lakes Water Authority, and the University of Georgia's Research Foundation plan to research the effects of biosolids treatment processes on the environmental fate of certain contaminants of emerging concern (CECs), for instance PFAS and pharmaceuticals, and plant uptake following land application.
- The Virginia Institute of Marine Science is collaborating with the Hampton Roads Sanitation District and also plans to study the occurrence of CECs in wastewater biosolids and the influence of treatment and management processes on their fate, mobility, and bioavailability in the environment.
- Johns Hopkins University will work on developing a "flexible framework for the prioritization of biosolids-associated organic contaminants" and will also examine the occurrence, fate, and transport of contaminants after land application of biosolids to model exposures/risks and identify priority pollutants to address with future rulemaking.
- Finally, the Water Research Foundation (WRF) will work with Purdue University, the University of California Riverside, and the University of Cincinnati on a project, "Unregulated Organic Chemicals in Biosolids: Prioritization, Fate, and Risk Evaluation for Land Applications," which WRF hopes will lead to recommended best practices to reduce potential risks from unregulated CECs. NEBRA provided a letter of support to WRF for this grant submission and plans to assist with the project.

More information about these projects is available by searching "National Priorities: Evaluation of Pollutants in Biosolids (2021) | Research Project Database | Grantee Research Project | ORD | US EPA."

In other research news, Dr. Ian Pepper, Regents Professor and director of The WEST Center at the University of Arizona, is spearheading a collaborative national study on the fate and transport of PFAS following long-term land application of biosolids. The project scales up Dr. Pepper's local research on behalf of Pima County following a land application ban there in (see NEBRA News website article, "Pima County Arizona Reinstates Biosolids Land Application Program, Adds to PFAS Knowledge Base"). The study will focus on sites across the country with good records on land application of biosolids to evaluate whether or not land application of biosolids is a significant public health route of exposure to PFAS.

Summer Intern Completes Project for NEBRA Research Committee

Jessica Nekowitsch, who is entering her senior year in the environmental engineering program at the University of New Hampshire, worked for NEBRA this summer on a project developed by the Research Committee to study the effects of biosolids applications on phosphorus availability and transport in agricultural soils. The study focused on two New England farms, one in New Hampshire and one in Vermont, where Class B biosolids have been land applied for more than 10 years. Ms. Nekowitsch conducted an extensive literature review and dug into the soil data and records maintained by the farms and the treatment facilities supplying the biosolids. She also sampled the soil at the farms in the study, learning a lot about biosolids in the process.

Ms. Nekowitsch's final report is on NEBRA's Research Committee webpage and is accompanied by a short presentation she recorded for the October 7 Northeast Residuals and Biosolids Conference. Her major finding was that the iron and aluminum from common coagulants used by water resource recovery facilities (WRRFs)—and which end up in the biosolids—can significantly reduce phosphorus run-off compared to other commercial fertilizers and manure.

Data from the two long-term land-application sites indicated that plant-available and water-soluble phosphorus did not increase as much as the calculated

Research Committee Chair Tracy Chouinard is looking forward to continuing the program and improving connections between NEBRA and local university researchers and their students

excess in total phosphorus applied to the fields would have suggested. In other words, there is less over-application of available phosphorus than accounted for using the current methods to determine land-application rates. Ms. Nekowitsch's report points to research confirming that biosolids applications with added iron and aluminum salts caused lower than expected increases in labile phosphorus, suggesting that some of the phosphorus was bound to these metals. Labile phosphorus is that portion of the total phosphorus considered to be mobile and water soluble, and thus most likely to be transported off-site to adjacent surface waters via stormwater runoff.

Research Committee Chair Tracy Chouinard expressed pleasure with the success of the student intern program in yielding much of benefit both to NEBRA and to Ms. Nekowitsch. Dr. Chouinard is looking forward to continuing the program and improving connections between NEBRA and local university researchers and their students. "We have a long list of ideas for research projects that would answer important questions we still have—especially around biosolids and residuals as soil amendments, which is the most sustainable end use for these 'waste' products," she told *NEBRAMail*.

Thanks to all the Research Committee members and the organizations who funded and supported the project, including the Essex Junction, Vermont water resource recovery facility, LP Consulting, and Northern Tilth. Special thanks to Andrew Carpenter from Northern Tilth who was Ms. Nekowitsch's mentor and guided her research. A future research topic suggested by one of the farmers involved in this project is to look more closely at setbacks and better determine how wide a buffer is needed to protect surface and ground water.

Summer Intern Jessica Nekowitsch completed a project for the NEBRA Research Committee studying the effects of biosolids applications on phosphorus availability and transport in agricultural soils

Committee Meeting Schedule

- Carbon & Nutrient Trading: fourth Tuesday of the month at 1 PM
- Reg-Leg: third Tuesday of the month at 2 PM
- Research: fourth Wednesday of the month at noon
- Residuals: third Tuesday of the month at 10 AM

Upcoming Events

- Monthly Lunch & Learn Series to resume in January 2022—fourth Friday of the month. Check the NEBRA online event calendar for the latest.

Janine Burke-Wells, Executive Director
603-323-7654 / info@nebiosolids.org

For additional news or to subscribe to NEBRAMail, NEBRA's email newsletter, visit nebiosolids.org

nebra
North East Biosolids & Residuals Association

WEF Delegate Report

NEWEA's WEF delegates have had a busy and productive year participating in various activities of WEF standing committees and work groups. Their work year concluded with the convening of the House of Delegates (HOD) in-person meeting at WEFTEC in Chicago.

Despite the challenges and restrictions of the ongoing pandemic, WEFTEC was well attended this year with 10,000 attendees and 500 exhibitors. Our NEWEA delegation participated in a full day of Saturday HOD activities that included interactive tabletop exercises, the formal business meeting, and final reports by HOD committees and work groups. The theme of the day's meeting was diversity, equity, and inclusion (DE&I), and incoming HOD Speaker-elect Donnell Duncan led the delegates in various full-group and table breakout discussions. On Sunday, the delegates and NEWEA Executive Director Mary Barry and NEWEA President Virgil Lloyd participated in WEF's Leadership Day that focused on public communication and DE&I.

WEFTEC's Opening General Session kicked off the conference on Monday with WEF President Lynn Broaddus and WEF Executive Director Walt Marlowe welcoming the attendees to the first major in-person water sector event in two years. President Broaddus's opening remarks emphasized valuing different perspectives, seeking out new experiences, and learning from diverse backgrounds to create a richer and more worthwhile WEFTEC for all its members. Best-selling author Laura Schwartz provided the keynote address. Ms. Schwartz began her professional career in 1993 as the White House director of events for the Clinton Administration. She is the author of *Eat, Drink, and Succeed: Climb Your Way to the Top Using the Networking Power of Social Events.*

One of the centerpieces of WEFTEC is Operations Challenge, this year in its 34th edition, and NEWEA was well represented with three shining teams including Force Maine, Mass Chaos, and RI-CONN United. Each team competed enthusiastically in the five events—process control; laboratory; safety; collections systems; and pump system maintenance. At Tuesday's Ops Challenge awards ceremony, RI-CONN United was awarded second place overall in Division 2. NEWEA was further represented in the WEF awards ceremony in which Past President Erin Mosley was named a 2021 WEF Fellow, one of WEF's most prestigious recognitions of personal achievements and contributions to the water environment.

For this *Journal* issue, each NEWEA and at-large delegate has prepared an individual report.

Sue Guswa, Retiring NEWEA delegate

WEFTEC 2021 marked the end of my term as a WEF delegate. Over the past three years, I witnessed a transformation in the WEF HOD driven by the necessity of remote meetings and the accelerating changes in our world. The response by the delegates was not detachment but increased engagement and focus on critical issues facing our industry. During the past year I served on the HOD Steering Committee, the HOD DE&I work group along with fellow NEWEA delegate-at-large Matt Formica, and the HOD Federal Advocacy work group, which was chaired by our own Susan Sullivan, delegate-at-large.

The HOD DE&I work group surveyed member associations (MAs), particularly regarding DE&I gaps and progress. The work group then developed a series of tools to guide MAs as they address DE&I. The new toolkit for MAs was released at WEFTEC this year and will be available on WEF's website: wef.org/dei. Additionally, the HOD DE&I work group's recommendation to establish a permanent HOD Committee was approved, ensuring that DE&I will remain an important focus in the HOD.

I also chaired one of the subgroups in the HOD Federal Advocacy work group that focused on increasing membership in WEF's Water Advocates program, a tool for advocacy on Capitol Hill. It empowers each participant to share knowledge and expertise to inform government decision-makers about the importance of water. It is easy to be a water advocate using WEFs pre-written, editable letters that you can send directly to your senators and representatives through WEF's Call-to-Action tool. Once you electronically send a letter, you are registered in WEF's Water Advocates program. The calls to action change throughout the year, so check back regularly and keep up the advocacy. We want as many NEWEA members as possible to become water advocates, so please take these easy steps and reach out to Ms. Sullivan or me if you have any questions.

Thank you, all, for the support these past three years; I look forward to seeing everyone at the NEWEA Annual Conference.

Susan J. Sullivan, WEF delegate-at-large

WEFTEC 2021 marked the end of my term as a WEF delegate-at-large, an honor of which I enjoyed every minute. As Sue Guswa has mentioned in her report, I had the privilege of chairing the HOD Federal Advocacy work group. The work group prospered owing to the participation of a wonderful group of delegates from 25 MAs, and it is being continued into 2022 because the work undertaken is so important.

Goals of the 2021 FAW included the following:

- Increase engagement, through the Water Advocates program, with members of Congress (Are you a Water Advocate yet? If not, see Ms. Guswa's note on how to join.)
- Coordinate with the WEF Government Affairs Committee and associated MAs on messages, priorities, and actions
- Identify key members of Congress and develop a plan for increasing engagement and education regarding water infrastructure
- Help develop a tool kit for federal advocacy—keep an eye out for this useful feature
- Help increase participation of MAs in the annual Washington, D.C. Fly-In, scheduled for April 25–27, 2022, in Washington, D.C.

In 2021, the Federal Advocacy work group was successful in many ways, and I cannot wait to see what 2022 brings. As NEWEA delegate Peter Garvey has joined the work group, there will be more news to come on this issue.

Another important task in the past year was my participation in the WEF Membership Engagement Transformation Committee (MET). WEF has been working for the past few years on improving the membership experience, to maximize the impact of members' time and efforts as well as to adjust to when and how they are volunteering. For this to succeed, WEF established the MET to capitalize on the breadth, energy, and enthusiasm of WEF members and heighten the sense of community for members while leveraging and promoting the contributions of all WEF committees' contributions.

Did you know that WEF has over 35,000 members globally? Of these members, fewer than 9 percent serve on a committee; and fewer than 2 percent are active committee members. The MET wants to change this; it has a goal of maintaining WEF's mission, collaboration, and foundational committees, while improving the overall volunteer experience and engagement of new and existing members by increasing the leadership and networking opportunities in both large and small ways. Interested?

Can you imagine the future of water if we could mobilize most of the many WEF members? Are you looking to make a difference and influence the industry, to continue your success in developing long-term relationships and contributing to our technical field? If so, WEF is aiming to be fun and for you to be where it is happening. Why not reach out to join a WEF committee? Contribute in a big or even a small way? Every bit helps, and you can make a difference.

Jim Barsanti, Third-year NEWEA delegate

My second year as a WEF delegate has been fulfilling and culminated with my first time traveling by air since WEFTEC 2019. This was truly a special event for me personally and professionally. It was wonderful to be back in Chicago reconnecting in a live setting with my fellow NEWEA delegates and with WEF colleagues from around the country whom I have met through my work in the HOD and in my WEF committees and work groups.

This past year, I served as vice chair for the Conference Resources work group. We completed an infographic to describe best practices and lessons learned from virtual conferences. The infographic includes tips that MAs can use regarding virtual platforms, live versus pre-recorded formats, preparation, follow-up, sponsorships, etiquette, and successes. Much of the information used to develop the infographic came from interviews of 35 MAs, including their lessons learned while adapting to virtual events, various platforms used, methods to track attendance and training contact hours, methods to maintain engagement, and ways to promote and advertise virtual conferences and events. In addition, we found that virtual or hybrid conferences could allow for more engagement, especially for operators and young professionals, by breaking down geographic and time constraints. Virtual conferences can provide opportunities for collaboration among MAs and provide a platform to integrate national and international

experts into conference programming. We also found that recording virtual sessions makes them more widely available to those unable to attend in-person events and potentially provides opportunities to obtain training contact hours after the conference.

My service on the WEFTEC Advisory Committee has included finalizing a vision statement for WEFTEC. The vison statement is intended to emphasize that WEFTEC is a unique experience that reflects the diversity of the water community and provides an opportunity to connect and share professional passions and interests. The committee has submitted the vision statement to WEF leadership for review, and I anticipate continuing on this committee in the upcoming year.

I will be on the HOD Nominating Committee that receives and reviews applications for HOD committee positions and makes recommendations on each vacancy. I will also participate, with delegate-at-large Matt Formica, in the Emerging Professionals to Leadership work group, which aims to enhance opportunities for emerging professionals to work their way into WEF leadership positions. This group will work closely with WEF's Students and Young Professionals Committee (SYPC) and Committee Leadership Council (CLC) to help attract and encourage emerging professionals to advance in the organization, as further described below by Mr. Formica.

Peter Garvey, Second-year NEWEA delegate

October's WEFTEC conference in Chicago was the highlight of the past several months from a delegate perspective.

Several days before the main conference began, I arrived in Chicago to participate in the HOD meetings with the other NEWEA delegates and those from across the nation. We welcomed a new Speaker of the HOD, Steven Drangsholt. His theme for his term of office is "humanity"— looking after each other and ourselves. There were many activities and reports. Even though this is my second year as a NEWEA delegate, it was my first in-person WEFTEC in this role, so there were many people for me to meet and many things to learn. It was gratifying finally to meet in person for the first time many of the other delegates with whom I had worked virtually in work groups and committees over the past 18 months and to renew in-person friendships with my NEWEA colleagues and friends. For the upcoming year I have enrolled to represent NEWEA on the Federal Advocacy work group and the Budget Committee. I look forward to advancing the water agenda through these initiatives on behalf of NEWEA.

On a separate note, there is renewed focus on how we communicate to those outside our industry. Sometimes just care in the choice of words can affect the success of communication. I am increasingly hearing the terms "water resource recovery facility" for a wastewater treatment plant, "used water" for wastewater, and many others similar to those. One of the goals is to take the "ick" factor out of our industry; we will see if these terms continue to gain traction.

I look forward to continuing to represent NEWEA at the national level going into 2022 and to meeting all of you in person at January's Annual Conference.

Ray Vermette, First-year NEWEA delegate

The past year and a half of pandemic life has been challenging for all of us, and I thank everyone for being creative and working extremely hard to keep moving forward. I could not be prouder to represent NEWEA as a first-year WEF delegate. In August I attended my first HOD quarterly virtual meeting. We divided into breakout groups to discuss how people thought the past year managed without in-person meetings. Most had gained experience with the virtual format and thought it worked well. However, people agreed it is much easier to be distracted in a virtual environment and there is no adequate substitute for in-person events concerning networking and connection. The consensus was that virtual meetings have their place and should continue, but not fully replace the in-person events such as WEFMAX and the WEFTEC Meeting. Personally, it took me a while to get used to virtual meetings, as I am sure my primary coach, Ms. Barry, would agree. I am looking forward to serving on WEF's Nominating Committee and the Water Communications work group for the upcoming year. At WEFTEC I attended my first in-person HOD meeting. This all-day event started with breakfast and a DE&I activity followed by WEF leadership updates and work group reports. At the MA Leaders Forum, we had a presentation on water communications, an update on the national wastewater surveillance system with MAs who have hosted training events, and an "Ask Me Anything" session with incoming WEF President Jamie Eichenberger and Executive Director Walt Marlowe.

This year's WEFTEC Opening Session was full of energy with keynote speaker Laura Schwartz speaking on the power of conversation and connections. The vendor floor was smaller than in pre-Covid-19 days, but it was great to see the latest equipment and greet the manufacturers face to face. And a big congratulations to all of our Operations Challenge teams that participated in this year's event. Whether you took home a trophy or not, I was proud to see our New England teams compete.

In closing, I thank outgoing NEWEA delegate Sue Guswa and delegate-at-large Susan Sullivan for their hard work and commitment as water leaders. I am greatly looking forward to working over the next year with current NEWEA delegates Jim Barsanti and Peter Garvey, and delegate-at-large Matt Formica.

Matt Formica, Third-year WEF delegate-at-large

I am entering my final year as a WEF delegate-at-large. In the previous year, I served on the HOD Outreach Committee, which communicates HOD activities, progress, and work products to the HOD and to MA leadership. We successfully completed our goals for the year. These included collaborating with the Committee Leadership Council (CLC) and the WEF Residuals and Biosolids Committee (RBC) to facilitate alignment of the RBC with the corresponding MA Committee(s), conducting a committee and work group dashboard template presentation to the HOD, and finalizing several HOD member graphic and informational items to clarify the delegate life cycle as well as highlighting other opportunities for WEF members to participate in WEF committees and other roles. With the completion of these goals, we felt this committee had run its course and as such the Outreach Committee participated in a sunsetting evaluation that ultimately resulted in its discontinuation.

In the coming year I will be on the HOD Budget Committee, which reviews WEF's annual budget with the WEF treasurer and finance staff to confirm its consistency with WEF's strategic plan, direction, or other initiatives. The Budget Committee also advises and guides the Speaker of the HOD and the HOD. I will also serve with Mr. Barsanti in the Emerging Professionals to Leadership work group, formed with the idea in mind that for WEF to continue to grow, we need the engagement and advancement of new leaders from within the organization. The goal of the Emerging Professionals to Leadership work group is to support WEF by identifying barriers to entering leadership positions, creating welcoming pathways into leadership roles, and developing resources that better enhance emerging professional transitions into influential positions within WEF and its MAs. The hope is to encourage, enhance, and elongate the experience of more recently involved professionals in WEF and its affiliated organizations.

WEFTEC 2021 Operations Challenge

October 19 • Chicago

Photographs by Mike Spring

Participating New England teams and their coaches

Mass Chaos: Jason Swain, Mike Williams, Scott Urban, Brian Peltier, (John Arneth, Coach)
Force Maine: Riley Cobb (Captain), Andrew Whitaker, Dan Munsey, Jeff Warden, (Rob Pontau, Coach)
RI-CONN United: (photo bottom right with Process Control trophy) Ryan Harrold (CT), Eddie Davies (RI), Jason Nenninger (CT), Riley Greene (RI), and (not pictured) coach Bradford Vasseur (CT);
Division II winners, First Place Laboratory, First Place Process Control, Third Place Collections, and Second Place overall

Navigating the Tides: FOSTERING DIVERSITY AND LEADING CHANGE

Annual Conference & Exhibit Preview

January 23–26, 2022 • Boston Marriott Copley Place, Boston, MA

We are overjoyed to be hosting this year's conference in person! We also have great appreciation for our attendees, exhibitors, and sponsors for navigating the changing times by complying with the conference requirements.

It's the Year of Navigating the Tides: Fostering Diversity and Leading Change! This year's theme focused on how all of us, as members of NEWEA, can be the catalyst to change, leading by example and performing deliberate acts that cultivate diversity and inclusion. The 2022 program highlights these efforts through our keynote speaker and technical sessions. This premier water quality event and exhibit features 30 technical sessions, a student poster session that showcases the work of water quality undergraduates and graduates, an Innovation Pavilion and two floors of exhibitors featuring the industry's latest products.

The conference kicks off on Monday with a variety of technical sessions both morning and afternoon. The Opening Session at 11:00 AM will convene attendees to hear from NEWEA and WEF leadership and our 2022 Keynote, Tamika N. Jacques, Ed.D The afternoon winds down with the first of two Exhibit Hall receptions.

Tuesday offers much to be enjoyed. We celebrate and recognize operators by offering morning and afternoon Plant Operation technical sessions, as well as the Operator's Reception. This year marks 50 years of the Clean Water Act. To acknowledge this monumental day for those in the water environmental field, a keynote session will be held from 11:00 AM to Noon. Even more to celebrate—the fourth annual Innovation Pavilion will be held on Tuesday. Attendees can meet with emerging water industry innovators and learn about their technologies. The day concludes with an Exhibit Hall Reception in the afternoon.

The final day of the conference features a full day of technical sessions and exhibits, our lunch-time awards ceremony recognizing outstanding efforts in our industry, and the passing of the gavel to the 2022 NEWEA President, Frederick McNeill of City of Manchester, NH.

Virgil Lloyd, NEWEA President
Lauren Hertel, NEWEA Program Committee Chair

HEALTH AND SAFETY INFORMATION

To provide the safest possible event experience, **NEWEA is requiring all event participants to be fully vaccinated, wear a mask covering the nose and mouth in all conference-designated areas, and practice frequent hand hygiene.**

More information on our COVID Safety Protocols is available in our detailed guidelines: www.newea.org/wp-content/uploads/2021/11/AC22-COVID-Protocols.pdf

Conference Events

SUNDAY, JANUARY 23

YP Summit—4th Floor ..... 9:00 AM – 5:00 PM
Registration—4th Floor ..... Noon – 4:00 PM

MONDAY, JANUARY 24

Registration—4th Floor ..... 7:00 AM – 6:00 PM
Technical Sessions 1 – 6 ..... 8:30 – 10:30 AM
Exhibits ..... 10:30 AM – 6:30 PM
Opening Session ..... 11:00 AM – Noon
Technical Sessions 7 – 11 ..... 2:00 – 4:30 PM
Exhibit Hall Reception ..... 4:30 – 6:30 PM

TUESDAY, JANUARY 25

Registration—4th Floor ..... 7:00 AM – 6:00 PM
Exhibits ..... 8:00 AM – 6:30 PM
Innovation Pavilion ..... 8:00 AM – 4:00 PM
Technical Sessions 12 – 16 ..... 8:30 – 11:00 AM
Tuesday Keynote Presentation ..... 11:00 AM – Noon
Technical Sessions 17 – 21 ..... 2:00 – 4:30 PM
Exhibit Hall Reception ..... 4:30 – 6:30 PM

WEDNESDAY, JANUARY 26

Registration—4th Floor ..... 7:30 AM – 2:00 PM
Exhibits ..... 8:00 AM – 1:00 PM
Technical Sessions 22 – 26 ..... 8:30 – 11:00 AM
Awards Luncheon Ceremony ..... 11:00 AM – 1:00 PM
Technical Sessions 27 – 30 ..... 1:00 – 3:00 PM

Conference Exhibitors as of 12/9/2021

Aclarity LLC
ADS LLC
Advanced Drainage Systems, Inc.
Aegion - Insituform Technologies LLC and Underground Solutions, Inc.
Andritz Separation & Aqualitec
AQUA SOLUTIONS, INC.
Asahi/America, Inc.
Atlantic Fluid Technology, Inc.
BAU/Hopkins & Griffco
BDP Industries
Blake Equipment
BMC CORP
Boyson and Associates, Inc.
Brenntag North America
C.N. Wood Co., Inc.
Carl Lueders & Company
Carlsen Systems LLC
Carus LLC
Casella Organics
Champlin Associates, Inc.
Coyne Chemical Environmental Services
Cretex Specialty Products
CSI Controls
CST Industries
CUES, Inc.
Delta Electro Power, Inc.
Denali Water Solutions, LLC
Denora & Saf-T-Flo
DLVEWS, Inc.
DN Tanks, Inc.
Duke's Root Control, Inc.
Duperon Corporation
Englobe
Environmental Operating Solutions, Inc. (EOSI)
Evoqua Water Technologies
F.R. Mahony & Associates
Flottweg Separation Technology
Flow Assessment Services
Flow Tech, Inc.
FlowWorks
Fontaine-Aquanox
Ford Hall Company
GA Fleet - Fleet Pump & Service
Gallagher Fluid Seals
Geotree Solutions
Green Mountain Pipeline Services
Hach
Hach Flow Group & RACO Manufacturing and Engineering & Pribusin
Hayes Pump, Inc.
Hazen and Sawyer
Hobas Pipe USA
Holland Company
Industrial Flow Solutions
Infiltrator Water Technologies
Inframark
Ixom Watercare
J.F. McDermott Corporation
J&R Sales and Service, Inc.
JWB Company
Kemira Water Solution
Kleinfelder
LandTech Consultants, Inc.
M.A. SELMON COMPANY
Madewell Products
Maltz Sales Company
Mass Tank Inspection & Services
Mechanical Solutions, Inc.
Motor Protection Electronics/MPE & Optiflox/Cox Research & Electroscan
MWH
National Filter Media
National Water Main Cleaning Co.
New England Environmental Equipment, Inc.
Nivelco, USA & Autrol America & Toshiba Magnetic Flowmeters
NORESCO
Oakson
Orenco Systems, Inc.
PipeLogix
Primex Controls
Pump Systems, Inc.
Raedlinger Primus Line, Inc.
Rain for Rent
Righter Group, Inc.
Russell Resources, Inc.
Savy & Sons
Scavin Equipment Company LLC
Sealing Systems, Inc.
Shea Concrete Products
SNF Polydyne
SPRAYROQ, INC.
Stacey DePasquale Engineering, Inc.
StormTrap
SULLIVAN ASSOCIATES/RITEC ENVIRONMENTAL
Sulzer Pumps
Synagro Northeast LLC
Technology Sales
The MAHER Corporation
Thermal Process Systems
Truax Corporation
Trumbull Manufacturing
UGSI
United Concrete - Building Group
United Rentals Fluid Solutions
US Ecology
USABLUEBOOK
Victaulic
Vortex Companies
Walker Wellington LLC
Water Analytics
Wescor Associates, Inc.
WesTech Engineering
Williamson Electrical Co., Inc.
World Water Works
Xylem Dewatering Solutions, Inc.
Xylem Water Solutions, Inc. - Flygt Products

CONFERENCE REGISTRATION

View the Preliminary Program and more information about the conference at annualconference.newea.org
Register online: https://sforce.co/3xVCb26
Early registration rate before January 7

EVENT HOTEL

Boston Marriott Copley Place Hotel
110 Huntington Ave., Boston, MA 02116
617-236-5800 • SINGLE—$209 • DOUBLE—$229

2022 Award Recipients

NEWEA Awards

Alfred E. Peloquin, CT ..... Sally Keating
Alfred E. Peloquin, ME ..... Paula Drouin
Alfred E. Peloquin, MA ..... Jennifer Lichtensteiger
Alfred E. Peloquin, NH ..... Michael Trainque
Alfred E. Peloquin, RI ..... Kathy Perez
Alfred E. Peloquin, VT ..... Richard Kenney
Asset Management ..... City of Dover
Biosolids Management ..... James Jutras
Clair N. Sawyer ..... Laurie Perkins
Committee Service ..... Dede Vittori
Diversity, Equity, & Inclusion Leadership ..... Oluwole "OJ" McFoy
E. Sherman Chase ..... Michael Williams
Elizabeth A. Cutone Executive Leadership ..... Susan Sullivan
Energy Management Achievement ..... Jen Muir
Energy Management Achievement ..... Jason Turgeon
Founders ..... Meg Tabacsko
James J. Courchaine Collection Systems ..... Louis Mammolette
Operator, CT ..... Gregory Quink
Operator, ME ..... Theresa Tucker
Operator, MA ..... Ashley Demarey
Operator, NH ..... Dan Driscoll
Operator, RI ..... Scott Goodinson
Operator, VT ..... Robert Protivansky
Past President's Plaque and Pin ..... Jennifer Kelly Lachmayr
Paul Keough ..... Alex Kuffner
Young Professional ..... Colin O'Brien
Youth Educator Award ..... Adriana Cillo

NEWEA Recognition (Stockholm Junior Water Prize)

CT ..... Elizabeth Wallace
ME ..... Ginny Hunt
MA ..... Maxim Attiogbe
NH ..... Abhinav Avvaru
VT ..... Hiba Ali

WEF (presented at WEFTEC)

Operations Challenge Division II: First Place Laboratory, First Place Process Control, Third Place Collections, Second Place Overall ..... RI-CONN United

Student Design Competition Wastewater Division Second Place ..... Aidan Travers, Emily Eastman, Jeffrey Ling, Taylor Labbe (Northeastern University)

Operator Scholarship ..... Riley Cobb

Outstanding Young Water Environment Professional ..... Vanessa Borkowski

Quarter Century Operator ..... Tim Haskell

WEF—MA Awards

George W. Burke, Jr. ..... Woodard & Curran, North Haven Facility
Arthur Sidney Bedell ..... Amy Anderson George
Laboratory Analyst Excellence ..... Michelle Gaudette
WEF Fellow ..... Kristin Morico
WEF Fellow ..... Erin Mosley
William D. Hatfield ..... Cheri Cousens

2022 NEWEA Executive Committee*

*Proposed 2022 NEWEA Executive Committee—pending the election vote at the annual business meeting of the membership on January 24, 2022

PRESIDENT
Frederick J. McNeill
Manchester, NH

PRESIDENT-ELECT
Robert K. Fischer
South Burlington, VT

VICE PRESIDENT
Scott C. Goodinson
Narragansett, RI

TREASURER
Clayton "Mac" Richardson
Windham, ME

DEPUTY TREASURER
David VanHoven
Boston, MA

PAST PRESIDENT
Virgil J. Lloyd
Manchester, CT

EXECUTIVE DIRECTOR
Mary M. Barry

DIRECTORS—COUNCIL
Collection Systems and Water Resources
Vonnie M. Reis
Melrose, MA

Communications
Deborah S. Mahoney
Andover, MA

Innovation
Dr. Marianne Langridge
West Hartford, CT

Meeting Management
Amy Anderson George
Wakefield, MA

Management Review
Virgil J. Lloyd
Manchester, CT

Public Outreach
Colin P. O'Brien
Andover, MA

Treatment, Systems Operation and Management
Marina Fernandes
Milton, MA

DIRECTORS—STATE
Vanessa McPherson
Middletown, CT

Paula L. Drouin
Lewiston, ME

F. Adam Yanulis
Westwood, MA

Michael A. Trainque
Chester, NH

Edward J. Davies
North Kingstown, RI

Michael A. Smith
Waterbury, VT

WEF DELEGATES
James R. Barsanti
Wilmington, MA

Peter B. Garvey
Boston, MA

Raymond A. Vermette, Jr.
Dover, NH

Janine Burke-Wells
West Warwick, RI

New Members September–November 2021

Harold Walker
Worcester Polytechnic Institute
Pomfret Center, CT (ACAD)

Bill Woodworth
Monticello, MS (EXEC)

Ryan Matheson
Weston & Sampson
Engineers Inc.
Foxboro, MA (PRO)

Michele S. Gillen
Massachusetts Water
Resources Authority
Boston, MA (PRO)

Michael McClurg
Load Controls
Sturbridge, MA (PRO)

Ian Baynes
Watts Water Technologies
North Andover, MA (PRO)

Nadeem Mirza
Watts Water Technologies
North Andover, MA (PRO)

Atul Sharma
Watts Water Technologies
North Andover, MA (PRO)

Joshua Coroa
StormTrap
Bristol, RI (PRO)

Jim Healy
Hanover, MA (PRO)

Marianna Novellino
Watts Water Technologies
North Andover, MA (PRO)

Jason Doughty
Watts Water Technologies
North Andover, MA (PRO)

James Koepsell
Watts Water Technologies
North Andover, MA (PRO)

Kathy Nanowski
Fuss & O'Neill Inc
Manchester, CT (PRO)

Dustin Allcorn
Watts Water Technologies
North Andover, MA (PRO)

Joe Burke
Watts Water Technologies
North Andover, MA (PRO)

Kenneth Nolan
Watts Water Technologies
North Andover, MA (PRO)

Amanda Waters
Aqualaw
Richmond, VA (PRO)

Philip Pedros
Mott MacDonald
Wakefield, MA (PRO)

Paola Molloy
Jacobs Engineering
Waterbury, CT (PRO)

Lauren Usilton
J&R Sales and Service, Inc.
Raynham, MA (PRO)

John Tillotson
Downers Grove, IL (PRO)

Paul Brinkman
Town of Pepperell
Pepperell, ME (PRO)

John Tetrault
FR Mahony & Associates
Plainville, MA (PRO)

Brian Kiely
Town of Hull
Marshfield, ME (PRO)

Bryan Levitt
City of Bath WPCF
Bath, ME (PRO)

Linda Allen
Rensselaer, NY (PRO)

John Downey
Dedham, MA (PRO)

Peter Maher
Cumberland, ME (PRO)

Luke Giroux
Chester, CT (PRO)

Stephanie Douglass
Agawam, MA (PRO)

Vincent Masterson
Pomfret, CT (PWO)

Nathan Rzegocki
Wallingford, CT (PWO)

Robert Protivansky
Rutland, VT (PWO)

Craig Goulet
North Haven, CT (PWO)

Paul Goulet
Guilford, CT (PWO)

Timothy Brinkman
Lowell, MA (PWO)

Alex Combes
Winsted, CT (PWO)

Laura Donovan
Portland, ME (PWO)

Miranda Leclair
Lagrange, ME (STU)

Samantha Novak
Stamford, CT (STU)

Ginny Hunt
Bangor, ME (STU)

Jessica Wu
Wilton, CT (STU)

Elizabeth Wallace
Greenwich, CT (STU)

Quinn D'alessio
Bangor, ME (STU)

MaximAttiogbe
Worcester, MA (STU)

Mason Zhang
Woodbridge, CT (STU)

Abhinav Avvaru
Nashua, NH (STU)

Jacinta Swope
Derry, NH (STU)

Hannah DePuydt
Salem, NH (STU)

Hiba Ali
South Burlington, VT (STU)

Julia Worland
Middletown Springs, VT (STU)

Willow Hughes-Muse
Pawlet, VT (STU)

Rob Rioux
New Haven, CT (STU)

Xena Itzkowitz
Northeastern University
Boston, MA (STU)

Lohita Rajesh
Amherst, ME (STU)

Caran Kate Manalo
Watertown, CT (STU)

David Coppes
Massachusetts Water
Resources Authority
Boston, MA (COMP)

Fiona Worsfold
Somerville, MA (YP)

Hillary Waite
Braintree, MA (YP)

Ema Mehuljic
GHD
Malden, ME (YP)

Madelyn Wright
CDM Smith Inc.
Boston, MA (YP)

Kristen Chan
Worcester, MA (YP)

Henry Clarke
Danvers, MA (YP)

Vincent Pileggi
Burlington, MA (YP)

Cassandra Albrecht
Danvers, MA (YP)

Jonathan Tracy
Dupont Water Solutions
Townsend, MA (YP)

Academic (ACAD)
Affiliate (AFF)
Complimentary (COMP)
Corporate (COR)
Dual (DUAL)
Executive (EXEC)
Honorary (HON)
Life (LIFE)
Public Official (POFF)
Professional (PRO)
Professional WW/OPS (PWO)
Student (STU)
Young Professional (YP)

Webinars, Conferences, and Events

INFILTRATION AND INFLOW CONTROL PLANS WEBINAR

NEWEA hosted a one-hour webinar on May 25, 2021, focusing on infiltration and inflow control plans as part of its Clean Water Case Study Series. This event was co-sponsored by Weston & Sampson, a NEWEA Gold Sponsor.

The webinar reviewed the origin and current status of the infiltration and inflow control plans required under Massachusetts 314 CMR 12.04 and included several examples of successful programs in both small and large communities. Sixty-five attendees participated virtually.

Speakers: Kevin Brander, MassDEP; David Elmer, Donald Gallucci, Hillary Lacirignola, and John Potts, Weston & Sampson.

LABORATORY PRACTICES SPECIALTY WEBINAR

Sample Collecting Best Practices

NEWEA's Laboratory Practices Committee hosted a virtual Specialty Webinar on Thursday, June 24, 2021, focusing on sample collecting best practices.

The three-hour webinar commenced on June 24, 2021, with NEWEA President Virgil Lloyd and NEWEA Laboratory Practices Committee Chair Walter Palm providing the Welcome and Opening Remarks to 50 virtual meeting attendees.

TECHNICAL PRESENTATIONS

Chain of Custody, Sample Integrity, Sample Holding Time
- Walter Palm, Narragansett Bay Commission
- Nora Lough, Narragansett Bay Commission
- Danielle Morrison, Town of Fairfield WPCF

Automatic Sample Collection Machines
- Richard Skradski, Teledyne-ISCO

Online Analyzers and Automatic Sample Collection Machines
- Greg Bieszinski, HACH

Regulator Perspective of WWTF Sample Collection Machines
- Matt Puglia, Rhode Island DEM
- Craig Motasky, Connecticut DEEP

Sponsors: Dewberry, Duke's Root Control, Inc., EST Associates, Inc., Flow Assessment Services, LLC, Fuss & O'Neill, Inc., Stantec, Synagro Northeast, LLC

POO & BREW NETWORKING EVENTS

NEWEA's Young Professionals Committee hosts a popular multi-discipline networking event aptly named Poo & Brew. This event features a tour of a local wastewater treatment facility followed by networking at a brewery. These events are open to organization members and non-members who are professionals in the early stages of their water industry careers.

Two Poo & Brew events were recently held. One event was held on July 29, 2021, at the York Sewer District in York Beach, Maine, while the other was held on November 4, 2021, at the Massachusetts Alternative Septic System Test Center in Buzzards Bay, Massachusetts.

Sponsors: ADS Environmental Services, AECOM, Aqua Solutions, ARCADIS, Black & Veatch, Brown and Caldwell, Carlsen Systems, Casella Organics, CDM Smith, DN Tanks, Duke's Root Control, Englobe, Environmental Partners Group, EST Associates, F.R. Mahony & Associates, Fuss & O'Neill, Green Mountain Pipeline Services, Hazen and Sawyer, HDR, Hobas Pipe USA, Hoyle, Tanner & Associates, Inc., Jacobs, Kimley-Horn and Associates, Inc., Kleinfelder, LandTech Consultants, Mott MacDonald, NEFCO, Stacey DePasquale Engineering, Stantec, Technology Sales Associates, Inc., The MAHER Corporation, Tighe & Bond, Weston & Sampson, Williamson Pump & Motor, Woodard & Curran, Wright-Pierce

OPS CHALLENGE TRAINING DAY

NEWEA's Operations Challenge Committee held a Training Day on August 6, 2021, at the Greater New Haven Water Pollution Control Authority in New Haven, Connecticut. Twenty-four attendees participated. Attendees learned about the Operations Challenge and its five competition events (Collection Systems, Process Control, Laboratory, Safety, and Maintenance).

Sponsors Aqua Solutions, Inc., Arcadis, Brown and Caldwell, CDM Smith, Duke's Root Control, Environmental Partners, Flow Assessment Services, GHD, Hoyle, Tanner & Associates, Jacobs, SUEZ, Synagro Northeast, The MAHER Corporation, Weston & Sampson, Woodard & Curran, Wright-Pierce

INNOVATION WEBINAR

Update on a New Generation of Enhanced I/A Septic Systems

NEWEA's Innovation Committee hosted a one-hour webinar on September 15, 2021, to discuss an update on a new generation of enhanced I/A septic systems to over 200 virtual attendees.

This webinar highlighted past progress and recent developments in distributed, enhanced I/A septic systems that produce effluent nitrogen levels at or below 10 mg/L along with key findings (including an update on the sensor challenge) and issues needing attention to accelerate adoption.

Speakers Included:
- Ian Dombroski, USEPA Region 1
- Brian Baumgaertel, Mass. Alternative Septic Systems Test Center
- Scott Horsley, Water Resources Consultant

CSO/WWI SPECIALTY CONFERENCE & EXHIBIT & TOUR

Coping with Change: Regulations, COVID, and Climate Change

NEWEA's CSO/Wet Weather Issues Committee held a two-day Specialty Conference, Exhibit and Tour on September 29–30, 2021, at the Sheraton Portsmouth Harborside Hotel in Portsmouth, New Hampshire. Meeting registrants included 89 in-person attendees and 34 virtual attendees, or 123 registrants total.

The conference commenced on Wednesday, September 29, 2021 with NEWEA President Virgil Lloyd and NEWEA CSO/Wet Weather Issues Committee Chair Steve Perdios providing the Welcome and Opening Remarks to both in-person and virtual meeting attendees.

In addition to the conference, an optional facility tour was offered to Portsmouth, New Hampshire Wet Weather Treatment Facility and a networking reception was held in the exhibit area.

TECHNICAL PRESENTATIONS

September 29, 2021
Two concurrent sessions were held in the afternoon.

Keynote: Chris Kloss, National Green Infrastructure Coordinator, US EPA

Panel Discussion: CSO Programs Facing Change: From Integrated Planning to Long-Term Control Plans and Everything In-between

Panelists: Josh Schimmel, Springfield Water and Sewer Commission (moderator); Nancy Gallinaro, Portland, Maine; Shawn Syde, New Bedford, Massachusetts; and David Bowen, Narragansett Bay Commission, Providence, Rhode Island.

CONCURRENT SESSION: REVIEW OF CSO PROGRAMS AND ELEMENTS

Moderator: Lin Liang, Stantec

The City of Lowell's Integrated Plan—Balancing Environmental and Community Needs with CSO Control
- Ben Agrawal, Hazen and Sawyer
- Evan Walsh, Lowell Wastewater

The City of Manchester, New Hampshire's Ongoing CSO Mitigation Program
- Frederick McNeill, City of Manchester, NH
- Jeremy Bouvier, City of Manchester, NH

Lessons Learned from the First Use Attainability Analysis Approved for Combined Sewer Overflows
- Chris Ranck, Black & Veatch

Assessing the Performance of the North Dorchester Bay Tunnel System
- Gregory Heath, AECOM
- Jeremy Hall, MWRA

CONCURRENT SESSION: MODELING PROGRAMS

Moderator: Larry Murphy, Jacobs

Receiving Water Quality Model Calibration for MWRA CSO Program
- Dominique Brocard, AECOM

Innovative Root Cause Analysis to identify Chronic Surface Flooding Countermeasures
- Yovanni Catano, Dewberry
- Michael Hanley, Dewberry
- Miles Bateman, Dewberry

Having Attained 93% Volumetric Reduction Following Three Decades of Effort, Augusta Had to Get Creative to Further Advance its CSO Program
- Steven Freedman, Consulting Engineer

Brian Tarbuck, Greater Augusta Utility District Emergency Response Under Extreme Storm Events—The Narragansett Bay Commission's Pawtucket Tunnel Project
- Lila Gillespie, Stantec
- Grace Huson, Stantec

TECHNICAL PRESENTATIONS

September 30, 2021
Two concurrent sessions were held in the morning.

CONCURRENT SESSION: AFFORDABILITY ISSUES

Moderator: Steve Perdios, Dewberry

Using Integrated Planning to Address CSO Affordability Challenges
- Fred Andes, Barnes & Thornburg

This is Not a Drill: Financial Resiliency Lessons Learned From Surviving a Pandemic
- David Hyder, Stantec

Annual North East Residuals & Biosolids Conference

CSO Program Update: Final Phase of the Largest Public Works Project in Rhode Island History
- Melissa Carter, Stantec
- Kathryn Kelly, Narragansett Bay Commission

Affordability—A Driver for Consent Order Driven CSO Abatement for Onondaga County
- Zachary Monge, Jacobs

Enhance CIP Processes at Cincinnati MSD to Achieve Asset Reliability and CSO Compliance
- Laith Alfaqih, Stantec
- Ian Laseke, Metropolitan Sewer District of Greater

CONCURRENT SESSION: THREE PRESENTATIONS ON TREATMENT TECHNOLOGY AND TWO ON PUBLIC NOTIFICATIONS

Moderator: Josh Schimmel, Springfield Water and Sewer Commission

Charleroi, PA Satellite Treatment for CSO Control—From Concept to Reality
- Sarah Willett, WesTech Engineering, LLC

New Primary Bio-Filter Achieves High-Rate Treatment for Wet-Weather Inflows
- Jonathan Liberzon, Tomorrow Water

Large Scale Pilot Test of Satellite CSO Technologies
John Dening, Mott MacDonald

MWRA's CSO Public Notification Program
- David Wu, MWRA

Application of Level Meters at CSO Locations to Provide Real-time Data on System Performance
- Karilyn Heisen, CDM Smith
- Shawn Syde, City of New Bedford, MA

GENERAL SESSION: REAL TIME SYSTEM MANAGEMENT

Moderator: Erika Casarano, AECOM

Application of Real Time Decision Support Systems (RT-DSS) to Reduce CSO Volumes and Compliance Costs
- Richard Loeffler, Xylem

Combating Climate Change with Smart Watershed Network Management
- Vikto Hlas, OptiRTC, Inc.

Data Analytics for Wet Weather Solutions, A Sharing Experience in Getting the Most out of your Data to Achieve the Best Possible Outcome
- Nicholas Anderson, Stantec

Leveraging Machine Learning for Predictive Operational Support
- Chris Ranck, Black & Veatch

Exhibitors: Carlson Systems, DN Tanks, Flow Assessment Services LLC, Green Mountain Pipeline Services, Orenco Systems, Inc., Precision Trenchless, Righter Group Inc.

Sponsors: ADS Environmental Services, AECOM, Arcadis, BMC Corp., Carlsen Systems, LLC, CDM Smith, Dewberry, Englobe, Environmental Partners Group, Inc., EST Associates, Inc., F.R. Mahony & Associates, Flow Assessment Services, LLC, Fuss & O'Neill, Inc., Green Mountain Pipeline Services, Hazen and Sawyer, HDR, Hoyle, Tanner & Associates, Inc., Jacobs, JDV Equipment Corp, Kimley-Horn and Associates, Inc., Kleinfelder, Stantec, Surpass Chemical Company, Inc., Synagro Northeast, LLC, Wright-Pierce

ANNUAL NORTH EAST RESIDUALS & BIOSOLIDS CONFERENCE PROCEEDINGS

NEWEA's Residuals Management Committee held a one-day specialty conference and exhibit on October 7, 2021 at the University of Massachusetts Lowell Inn and Conference Center in Lowell. Meeting registrants included 71 attendees in-person and 36 virtual attendees, or 107 registrants total. The conference was held jointly with the North East Biosolids & Residuals Association (NEBRA).

The technical presentations commenced on Thursday, October 7, 2021, with NEWEA President Virgil Lloyd and NEWEA Residuals & Biosolids

Management Committee Chair Eric Spargimino providing the Welcome and Opening Remarks to both in-person and virtual meeting attendees. The closing remarks were provided by Janine Burke Wells, NEBRA executive director.

In addition to the conference, a meet and greet reception was also held.

TECHNICAL PRESENTATIONS

Digestion, Odor Control & Shipping Cake Isn't What It Used to Be
- Amy Sowitcky, Tighe & Bond

Montreal Sludge Incineration—Recovery of Ash as Phosphate Fertilizer, Liming Product and for the Reduction of GHG Emissions
- Marc Hebert, Expert Consultant & Trainer

Recovering Green Hydrogen and Heat from Wet Sewage Sludge
- Robin Parker, Chemergy

Potential for Carbon Credits From Biosolids Land Application
- Bill Brower, Brown & Caldwell

Drying and Thermal Treatment Technologies for Biosolids Management
- Deb Mahoney, Brown & Caldwell
- John Ross, Brown & Caldwell

Investigating Phosphorus Availability in Biosolids Amended Agricultural Soils
- Jessica Nekowitsch, NEBRA Intern

Sustainable PFAS Reduction/Elimination through the Bioforcetech System
- Valentino Villa, Bioforcetech Corporation

The 2nd National Biosolids Survey: Preliminary Results, Trends and Interesting Developments
- Janine Burke Wells, NEBRA
- Jennifer Lichtensteiger, NEIWPCC

Exhibitors: DN Tanks and Resource Management, Inc. (RMI)

Sponsors: ADS Environmental Services, AECOM, Aqua Solutions, Inc., Black & Veatch, Brown and Caldwell, Casella Resource Solutions, CDM Smith, Dewberry, DN Tanks, Englobe, Environmental Partners Group, Inc., F.R. Mahony & Associates, Flow Assessment Services, LLC, Fuss & O'Neill, Inc., GHD, Green Mountain Pipeline Services, Hazen and Sawyer, HDR, Hoyle, Tanner & Associates, Inc., Jacobs, JDV Equipment Corp, LandTech Consultants, Mott MacDonald, Multiple Hearth Services, IFCO, NEFCO, Stantec, Surpass Chemical Company, Inc., Synagro Northeast, LLC, Technology Sales Assoc., Inc., The MAHER Corporation, Tighe & Bond, Inc., Woodard & Curran

NEWEA/NEWWA INFORMATION TECHNOLOGY & ASSET MANAGEMENT FAIR

Technology in the Water Works Profession

NEWEA's Asset Management Committee in conjunction with New England Water Works Association's Information Technology Committee hosted an in-person workshop on November 2, 2021 in Holliston, Massachusetts. The workshop had 55 participants.

In addition to the morning technical presentations, attendees participated in several interactive learning stations in the afternoon.

TECHNICAL PRESENTATIONS

Interactive and Dynamic Asset Management Plans for Utilities
- Santhosh Krishna Sekar, Arcadis

Good Data Management: Principles, Risk Mitigation, & Paperless
- Pam Moss, Hach

LEARNING STATIONS

The True Cost of Paper—Digital Transformation at the Town of Southbridge
- Steve Gregoire, Southbridge Water Dept., MA
- Keith Hodsden, Sr., Utility Cloud

Integration of GIS and Asset Management into Digital Twins
- Christopher Lorrain, LandTech
- Zachary Jaffe, LandTech

GIS for Asset Management & Planning
- Joe Mcguire, BETA
- Tito Sanchez, BETA

Machine Learning and Data Asset Management
Michael App, Electro Scan

Reduce Your Risk for Preventable Cyber Attacks
- Charles Egli, WaterISAC
- Andrew Hildick-Smith, WaterISAC

Leveraging Asset and Data Management in Mature Plants
- Bill Hollman, NEFCO

COLLECTION SYSTEMS CONFERENCE

NEWEA and the Pacific Northwest Clean Water Association's (PNCWA) Collection Systems committees held a virtual specialty conference on November 9, 2021. Eighty-one meeting registrants participated online.

The three-hour event focused on infiltration and inflow impacts, comparing and contrasting how this problem affects communities in both regions and sharing lessons learned. The technical presentations commenced with NEWEA President Virgil Lloyd and PNCWA President Rob Lee providing the Welcome and Opening Remarks to virtual meeting attendees.

I/I PRESENTATIONS

Moderators:
- Scott Lander, Chair, Collection Systems Committee, NEWEA; Retain-It—Stormwater Management Systems
- Jeff Schmidt, Collection Systems Committee, PNCWA; Jacobs

Presenters:
- Anthony Maressa, City of Fitchburg, MA
- Joseph Laliberte, CDM Smith
- James Barsanti, MA DEP
- Bob Swarner, King County, WA Wastewater Treatment Division (WTD)
- Greg Springman, City of Sweet Home, OR Public Works

I/I Roundtable Discussion and Open Q&A
Facilitator: Vonnie Reis, City of Melrose, MA

Sponsors: ADS Environmental Services, AECOM, Aqua Solution, Inc., Arcadis, Carlsen Systems, CDM Smith, Dewberry, Duke's Root Control, Environmental Partners Group, EST Associates, Flow Assessment Services, LLC, GHD, Green Mountain Pipeline Services, Hayes Pump, Hazen and Sawyer, Hoyle, Tanner & Associates, Jacobs, Kleinfelder, Mott MacDonald, Stacey DePasquale Engineering, Stantec, Synagro Northeast, The MAHER Corporation, Tighe & Bond, Weston & Sampson, Woodard & Curran, Wright-Pierce

Annual Fall Golf Tournament Sponsors

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NEWEA's 2021 Annual Fall Golf Tournament

Photogaphs by Charles Tyler

On October 8, 2021, NEWEA, with the support and coordination of President-elect Fred McNeill and the Sponsor Committee, hosted the annual Fall Golf Tournament at the Derryfield Country Club in Manchester, New Hampshire. Attendees were treated to beautiful weather as they enjoyed a day of golf and connecting with their water industry colleagues. Following the tournament, golfers gathered for a steak lunch. During lunch, prizes were awarded to the top three teams and for Closest to the Pin, Longest Drive, and Straightest Drive. Thank you to all of our sponsors and golfers for another successful tournament!


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1. Tim Vadney and Dustin Price set out for the first hole 2. Mario Leclerc and Meg Tabacsko directed the putting contest 3. Mike Sullivan and Rob Biase head for the tee 4. Ron Kelton, Jennifer Lachmayr, Rene J. Pelletier, and John Adie 5. Deb Mahoney, Howard Carter, Colin O'Brien, and Ray Vermette 6. Second Place team: Jesse Middleton, Bob Mack, Adam Higgins, and not pictured, David Gaipo 7. Third Place team: David Burnett, Marc Shaffer, Jared O'Donnell, and not pictured, Neal Campbell 8. First place team: John DiModica, Ian Gervais, Judy True, and Kevin Desjardins, with trophies—tournament host Fred McNeill, center

Upcoming Meetings & Events

NEWEA INNOVATION COMMITTEE WEBINAR
Virtual
January 11, 2022

NEWEA ANNUAL CONFERENCE & EXHIBIT
Boston Marriott Copley Place Hotel, Boston, MA
January 23 – 26, 2022

NEWEA JOINT ENERGY & PLANT OPERATIONS SPECIALTY CONFERENCE
North Essex Community College, Haverhill, MA
April 14 – 15, 2022

NATIONAL WATER WEEK & DC FLY-IN
Washington, DC
April 26 – 27, 2022

NEWEA SPRING MEETING & EXHIBIT
Mt. Washington Resort, Bretton Woods, NH
May 21 – 26, 2022

AFFILIATED STATE ASSOCIATIONS AND OTHER EVENTS

CTWEA SPRING WORKSHOP AND AWARDS
Aqua Turf, Plantsville, CT
May 2, 2022

NEWWA SPRING JOINT REGIONAL CONFERENCE & EXHIBITION
Worcester DCU Center, Worcester, MA
April 6 – 7, 2022

Measurement unit conversions and (abbreviations) used in the *Journal*

U.S.	International System of Units (SI)	U.S.	International System of Units (SI)
Liquid volume		**Length**	
gallon (gal)	liter (L)	inches (in.)	centimeters (cm)
cubic feet (ft^3)	cubic meters (m^3)	feet (ft)	meters (m)
cubic yards (yd^3)	cubic meters (m^3)	miles (mi)	kilometers (km)
acre-feet (ac ft)	cubic meters (m^3)	**Area**	
Flow		square feet (ft^2) or yards (yd^2)	square meters (m^2)
million gallons per day (mgd)	million liters per day (ML/d)	acre (ac)	hectare (ha)
for larger flows (over 264 mgd)	cubic meters per day (m^3/d)	square miles (mi^2)	square kilometers (km^2)
gallons per minute (gpm)	liters per minute (L/min)	**Weight**	
Power		pounds (lb)	kilograms (kg)
horsepower (hp)	kilowatts (kW)	pounds per day (lb/d)	kilograms per day (kg/d)
British Thermal Units (BTUs)	kilojoules (kJ) / watt-hours (Wh)	ton – aka short ton (tn)	metric ton or tonne (MT)
Velocity		**Pressure**	
feet per second (fps)	meters per second (m/s)	pounds/square inch (psi)	kiloPascals (kPa)
miles per hour (mph)	kilometers per hour (km/h)	Inches water column (in wc)	kiloPascals (kPa)
Gas		**Head**	
cubic feet per minute (ft^3/min)	cubic meters per minute (m^3/min)	feet of head (ft of head)	meters of head (m of head)

THANK YOU
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Build relationships with water industry leaders *and* make a positive impact on the water environment

Join NEWEA's 2022 Annual Sponsor Program

NEWEA offers companies the opportunity to promote their products and services throughout the year by participating in multiple sponsorship activities. Annual Sponsorships include:

- NEWEA Annual Conference
- NEWEA Spring Meeting & Golf Tournament
- NEWEA Golf Classic
- A web presence on NEWEA.org's sponsorship program page
- The option to customize sponsorship levels by selecting to participate in up to eight additional unique NEWEA events plus additional activities

Sponsorship Benefits:

- Increased corporate visibility and marketing opportunities before a wide audience of water industry professionals
- Relationship-building access to key influencers involved in advancing water industry services, technology, and policy
- Recognition as an environmental leader among peers and customers

For more information
contact Jordan Gosselin
Email: jgosselin@newea.org
Phone: 781-939-0908

NEWEA
WORKING FOR WATER QUALITY

Advertiser Index

Upcoming 2022 *Journal* Themes

Spring—**Resiliency & Climate Change**

Summer—**Clean Water Act's 50th Anniversary**

Fall—**Instrumentation & Controls**

Winter—**Funding the Work**

NEWEA/WEF* Membership Application

Water Environment Federation® the water quality people®

NEWEA WORKING FOR WATER QUALITY

Personal Information (please print clearly)

First Name | M.I. | Last Name | (jr. sr. etc)

Business Name (if applicable)

Street or P.O. Box (☐ Business Address ☐ Home Address)

City, State, Zip, Country

Home Phone | Cell Phone | Business Phone

Email Address

☐ Check here if renewing, please provide current member I.D.

***NEWEA is a member association of WEF (Water Environment Federation). By joining NEWEA, you also become a member of WEF.**

ACQ. Code for WEF use only | WEF 21

Membership Categories (select one only)

		Member Benefit Subscription	Dues
☐ **Professional**	Individuals involved in or interested in water quality	■ *Water Environment & Technology* ■ *Water Environment Research* (Online)	$185
☐ **Young Professional**	Water quality professionals, with fewer than five years working experience and under the age of 35, are eligible to join WEF as an Active Member, while participating in the NEWEA/WEF Young Professionals Program. This program allows up to 50% off of the Active Member dues, valid for the first three years of membership. This program is available for new member applicants and Student Members.	■ *Water Environment & Technology* ■ *Water Environment Research* (Online)	$70
☐ **Professional Operator**	Individuals in the day-to-day operation of wastewater collection, treatment or laboratory facility, or for facilities with a daily flow of < 1 mgd or 40 L/sec. License # _____	■ *Water Environment & Technology* ■ *Water Environment Research* (Online)	$110
☐ **Academic**	Instructors/Professors interested in subjects related to water quality.	■ *Water Environment & Technology* ■ *Water Environment Research* (Online)	$185
☐ **Student**	Students enrolled for a minimum of six credit hours in an accredited college or university. Must provide written documentation on school letterhead verifying status, signed by an advisor or faculty member.	■ *Water Environment & Technology* ■ *Water Environment Research* (Online)	$15
☐ **Executive**	Upper level managers interested in an expanded suite of WEF products/services.	■ *Water Environment & Technology* ■ *Water Environment Research* (Online) ■ *WEF SmartBrief* ■ Complimentary WEF Webcasts and more	$355
☐ **Corporate** (member benefits for one person)	Companies engaged in the design, construction, operation or management of water quality systems. Designate one membership contact.	■ *Water Environment & Technology* ■ *Water Environment Research* (Online) ■ *WEF SmartBrief* ■ Complimentary WEF Webcasts and more	$420
☐ **Dual**	If you are already a member of WEF and wish to join NEWEA		$45
☐ **Associate Membership**	This membership category is a NEWEA only membership reserved for the general public who have an interest in water and the environment but are NOT currently employed in the industry (e.g., attorney or supplier). Examples of Associate Members include: teachers; journalists who cover water quality issues; citizen samplers/members of various watershed/ sportsman/conservation organizations, etc.		$45
☐ **New England Regulator**	This membership category is a NEWEA only membership reserved for New England Environmental Regulatory Agencies, including: USEPA Region 1, CT Department of Energy and Environmental Protection, ME Department of Environmental Protection, MA Department of Environmental Protection, NH Department of Environmental Services, VT Department of Environmental Conservation, and RI Department of Environmental Management		$50

WEF Utility Partnership Program (UPP): NEWEA participates in the WEF Utility Partnership Program (UPP) that supports utilities to join WEF and NEWEA while creating a comprehensive membership package for designated employees. As a UPP Utilities can consolidate all members within their organization onto one account and have the flexibility to tailor the appropriate value packages based on the designated employees' needs. Contact WEF for questions & enrollment (703-684-2400 x7750).

Payment

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Depending upon your membership level, $10 of your dues is allocated towards a subscription to the NEWEA Journal.

NEWEA/WEF Membership Application

MEMBERSHIP PROFILE

Please take a few moments to tell us about your background and professional interests.

What is the nature of your ORGANIZATION? (select only one–required) (ORG)

1 Consulting, Contracting, Planning Services

2 Educational Institution

3 Industrial Systems/ Plants)

4 Manufacturer or Distributor of Equipment & Supplies (including representatives)

5 Non-profits/NGOs

6 Finance, Investment, and Banking

7 Laboratories

8 State or Federal Government

9 Utility: Wastewater

10 Utility: Drinking Water

11 Utility: Stormwater

12 Utility: Wastewater, Drinking Water, and Stormwater

13 Utility: Wastewater and Drinking Water

14 Utility: Wastewater and Stormwater

15 Other

_____

(please define)

What is your Primary JOB FUNCTION? (select only one) (JOB)

1 Executive Level

2 ManagementLevel

3 Elected or Appointed Official

4 Educator

5 Student

6 Consultant/Contractor

7 Engineering/Design

8 Operator

9 Scientist/Researcher

10 Legislator/Regulator

11 Analyst

12 Sales/Marketing

13 Manufacturer's Representative

14 Communications/ Public Relations

15 IT/OT

16 Other

_____

(please define)

What are your KEY FOCUS AREAS? (circle all that apply) (FOC)

1 Air Quality and Odor Control

2 Biosolids and Residuals

3 Climate

4 Collection Systems

5 Disinfection and Public Health

6 Drinking Water

7 Energy

8 Finance and Investment

9 Industrial

10 Intelligent Water Technology

11 Laboratory Analysis and Practices

12 Nutrients

13 Plant Operations and Maintenance

14 Public Communications and Outreach

15 Regulation, Policy, Legislation

16 Research and Innovation

17 Resource Recovery

18 Safety, Security, Resilience

19 Small Communities

20 Stormwater

21 Utility Management and Leadership

22 Watershed Management

23 Wastewater Treatment, Design, and Modeling

24 Water Reuse and Reclamation

25 Workforce

Demographic Information (Check box) The following is requested for informational purposes only.

Gender: ☐ Female ☐ Male

Education: ☐ Doctorate ☐ MA/MBA/MS ☐ BA/BS ☐ AA/AAS ☐ Technical School ☐ High School

Race/Ethnic Origin (Check box) The following is requested for informational purposes only.

☐ African-American (Not of Hispanic Origin) ☐ American Indian or Alaskan Native ☐ Asian ☐ Caucasian ☐ Hispanic/Latino ☐ Pacific Islander or Native Hawaiian ☐ Other

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