In This Issue:

Letter from the Chairman ➤ page 1

Workforce Spotlight: Diversity in Water - The Time is Now ➤ page 2

NEWIN Network in the News ➤ page 4

Upcoming NEWIN Pitch Night - Boston ➤ page 6

Did You Know? Water Information Technology ➤ page 6

NEWIN Companies Making a Splash ➤ page 7

Water Industry Updates and Opportunities ➤ page 8

NEWIN New York Chapter Spotlight ➤ page 9

NEWIN Community Calendar at a Glance ➤ page 9
NEWIN Community,

I speak on behalf of our entire board when I say that we are delighted to publish our Newsletter for the second quarter of 2019. We have been working hard behind the scenes all year, ably supported by Cohesion Marketing Partners, to improve our back office, business and marketing processes, including our new website, here - and our marketing communications systems. Additionally, we would like to extend our gratitude to BW Research Partnership for their contribution to this Quarterly Newsletter – research, writing and content development. We hope you like the outcome and that you will continue to notice improved website user experience and member experience throughout the year.

We are planning to run more events in the second half of 2019. Indeed, we are already, together with New England Water Environment Association (NEWEA), discussing the arrangements for the Water Innovation Pavilion at their conference in January 2020. The feedback from the 2019 Pavilion was universally positive and we aim to do even better next year.

The NorthEast Water Innovation Network is a member-led organization; therefore, we ask you to champion membership to NEWIN as a sustaining-member for your organization and invite you to consider volunteering your time to support our water innovation programs. For information on why and how to become a member, please visit our site here and/or for information on how to volunteer, we request that you please submit an inquiry here.

NEWIN’s only source of income is from membership, sponsorship and/or donation. Therefore, we will shortly be contacting members regarding 2019 membership dues and sponsorship opportunities to allow us to sustain our efforts and, indeed, to do more to support advancing water innovation. We hope you enjoy this Newsletter and encourage you to contact us with your feedback and/or interest in being included in our upcoming communications with the NEWIN community, and beyond, on the Contact Us section of our site, here.

Best Regards,
Philip Ashcroft
Chairman, NEWIN
Diversity in the Water Industry – The Time is Now

The retirement crisis in the water industry has been well documented. More than 1/3 (34.5%) of the 4,568 water and wastewater treatment operators in New England are 55 years old or older, a talent succession problem somewhat more acute than in the nation as a whole. While the aging workforce has been widely discussed, little attention has been paid to the severe lack of diversity in the water and wastewater sectors, a problem much more pronounced in the Northeast than in other regions of the U.S. This is especially problematic, as Generation Z is the most ethnically and racially diverse generation in U.S. history.

Water and wastewater treatment operator positions, which are core occupations in the water and wastewater sector, are nearly exclusively held by men (94.5%, nationally and 95.4% in New England). Engineers are only slightly more diverse by gender, at 87% male nationally as well as in New England. It is not only the field occupations that lack gender diversity. The water and wastewater utility sector is 80.3% male in New England (75.9% in the U.S.) and the engineering services sector is 71.3% male in New England (72.1% in the U.S.). For reference, 49% of all workers in New England are male (50.8% in U.S.).

Racial and ethnic diversity are also severely lacking in the New England water and wastewater sector. While about one in four water and wastewater operators across the U.S. are non-white, in New England, only 11.5% are. Among engineers it is just as stark, with fewer than 12.5% of the jobs in New England held by people of color. The water and wastewater utility sector is 90.3% white in New England (compared to 76.2% nationally). This is despite explicit programs at regional utilities that are focused directly on the issue.

The lack of diversity is especially problematic given the quality of the jobs available. Building successful career pathways is difficult, and building them for underprivileged communities has become a profession of its own. Identifying careers that are simultaneously attainable and sustainable to these communities will determine the dynamics of diversity in the future, and careers in water operations will be a catalyst for this necessary transformation in communities throughout New England.

In addition to high demand due to retirements, water and wastewater operator positions are intriguing because they have relatively low barriers to entry. Most (approximately 75%) do not require a college degree (Figure 1: National Education Attainment, Water and Wastewater Operators), and Level II operator certifications can be completed in less than a year.

Figure 1
National Educational Attainment, Water and Wastewater Operators
This is particularly important given the current unemployment situation. Unemployment rates are significantly higher among people without a college degree and in communities of color, meaning that significant strides can be made to both reduce unemployment in specific communities as well as increase the diversity of the sector overall. Using Boston as an example, select communities such as Roxbury, Mattapan, and Dorchester have unemployment rates ranging from 3.9%-6.4% higher than the rest of Boston. Furthermore, these communities foster the largest African American and Hispanic populations, some of the lowest median household incomes, and have limited access to the city compared to other Boston neighborhoods. The transportation disconnect is apparent in Figure 2. The map reveals how the subway lines skirt around the African American neighborhoods, leaving them unable to access the growing wealth of city jobs and training opportunities. This map also shows operator training and certification opportunities in the Boston area, and they are virtually nonexistent. In order to receive long-term employment as a water/wastewater operator, an interested individual must pass a certification test. Generally, classes are available to help individuals do so, but these classes are not being offered, or at least advertised, at levels that will promote water operator growth in years to come. While individuals may be able to take the test, they are currently unable to acquire the training they need to get into the operator positions. Providing equal access to these positions should be in the interest of the Boston government, and creating new training centers would provide careers to many disadvantaged individuals in these target communities.

Gender diversity requires some of the same strategic planning (access to training and information) but also requires mentorship and networking activities. Developing the water and wastewater workforce with an eye for gender and racial equity can alleviate pressures currently facing the industry’s workforce. With a collaborative effort between workers, employers, workforce development professionals, training providers, and government officials, New England’s water and wastewater industry can work towards a prosperous future. For more information about NEWIN’s current and planned activities, please visit us here.
2019 MIT Water Innovation Prize Pitch Night

MIT Water Club sponsored their annual Water Innovation Prize Final Pitch Night on April 18th, 2019. To set the night in motion, Dr. You Wu, the 2017 MIT Water Innovation Prize winner, spoke about the journey he took in starting his water robotics business, then PipeGuard, now Watchtower Robotics. Dr. Wu invited the audience to follow the trail he blazed, mapping the peaks and valleys he faced over the past two years. Making his first pitch at the September 2017 NEWIN Water Pitch Night, Dr. Wu is an excellent example of leadership in water innovation. After a roaring applause, Tom Ferguson, VP of Programming for Imagine H20, NEWIN’s proud community partner, took the stage to speak on water-focused entrepreneurship and building a sustainable business. His words inspired the audience, and set an exciting tone for the night ahead. NEWIN members are encouraged to look into the MIT global Water Innovation Accelerator program. Eight teams were selected to participate in this final pitch night, competing for up to $35,000 in prizes. Below is a summary of their compelling pitches:

The first pitch came from Alexia Akbay, CEO and Co-founder of Symbrosia. Alexia shared the company’s mission to reduce greenhouse gases and address global food security by cultivating a contained, recirculating, symbiotic aquaculture system with shrimp and red asparagus algae. This seaweed is shown to reduce methane emissions from cattle by 99% while the shrimp cultivation allows for reduction in imports of shrimp, a product that is 90% imported, and helps put a stop to mangrove destruction that is often necessary for shrimp farming.

Next came Essam Elsahwi, CEO of Aquova, introducing their intelligent electrochemical wastewater treatment system used to clean water used in mining activities. Aquova collects data from the unit in order to optimize the electrochemical process. This reduces electricity consumption, prolongs the unit’s life through predictive maintenance, and efficiently treats water to meet discharge requirements, so mining companies can save money.

Third, Charles Nana Kwarteng, CEO of Volta Irrigation, followed with Volta’s pedal-powered irrigation system. The machine requires only 20 minutes of pedaling for six hours pumping, and reduces water usage up to 70%, stretching one months’ worth of water into four. Up to ten farmers can share this loaned irrigation system, that is then paid back using profits earned from the year’s harvest.

Fourth, Dan Zillante, CEO of Zilper Trenchless, showed the audience how Zilper’s trenchless pipeline installation system can save time and money by combining installation processes into one system. A project that would have needed four different machines to complete and cost over $1M can be done using one Zilper machine costing $250K. While this is not the first trenchless installation system, Zilper wants to be the most efficient.
Fifth, Nissim Gore-Datar, Researcher of ULTRON, introduced their portable electrochemical human wastewater purification system. ULTRON can be retrofitted onto any toilet, killing 99.999% of bacteria and making treated wastewater surpass discharge standards.

Sixth, Lily Cheng Zedler, Business Development Lead and Dr. Brendan Smith, Co-founder of SiPure, illustrating their wastewater purification system for textile production wastewater. Their patented membrane filters out contaminants, reclaims 98% of wastewater (reducing water use by 500B L/year), and drastically reduces already tight expenses.

Seventh, came Joshua Kao, Founder and CEO of LivingWaters, to pitch their water collection and treatment system intended for disaster relief scenarios. The system is designed to be tossed over relief tents and tied down, collecting and filtering rain water. Each unit costs only $7, which can effectively cut water costs during crises.

To close the night, Haytham Dbouk, CEO of PRO-Shield, introduced their solution to overheating solar water heaters. An app-controlled shield deploys automatically when the solar water heater reaches a set temperature. The PRO-Shield system saves money compared to other high-tech systems, is much more efficient than manual systems, and extends the lifespan of solar water heaters.

Pictured below, the night’s winners, Volta Irrigation, taking home $7,000, and Symbrosia and SiPure, taking home $14,000 each, hold their big checks and smile for photos. So ends another successful Water Innovation Prize Pitch Night, hosted by The MIT Water Club. Applications to enter next year’s Water Innovation Prize contest are being accepted starting in November, 2019.
On Wednesday, June 19th, 2019 NEWIN will be hosting a Water Pitch Night at Wolf Greenfield Boston, located in the Federal Reserve Building. For those who have not previously attended a Water Pitch Night event, it is much more than a water-themed “Shark Tank”. Water Pitch Night attendees include industry professionals, entrepreneurs, university students, investors, and representatives from government, professional services, and nonprofit sectors. These events offer valuable opportunities to learn of the latest ideas and inventions, network with some of the industry’s key players, and gain a better perspective of the water innovation landscape.

The theme of this event is **Digital Transformation: The Role and Impact of IT in the Water Sector**. The event’s speakers and pitches will all focus on the ever-increasing number of applications of Information Technology, Big Data, IoT, and analytics in the water industry. If you work within the water sector, or someday hope to, this is an event you will not want to miss! Come join industry leaders and drivers in water innovation! Detailed information on our guest speakers, our sponsor, tickets and event registration is available [here](#). We look forward to seeing you there!

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**Did You Know?**

**Water Information Technology**

Water Information Technology (Water IT), or the Big Data of water, is playing an increasingly important role in the future of water processing and delivery. The most prominent technologies in Water IT are AMR and smart meters, freshwater distribution monitoring solutions, software as services, the Internet of Things (IoT), and the Industrial Internet of Things (IIoT). The Water IT market is growing at a 10-15% compound annual growth rate (CAGR) and is expected to reach a global market value of $150 billion USD by 2020. According to Global Market Insights, a market research firm, smart metering systems alone are expected to exceed $21 billion USD by 2024.

Water IT solutions also have big economic and environmental impacts for two reasons. First, iterations of product development life-cycle in this field are often rapid and low-cost. This allows for updates and upgrades to be implemented with relatively few barriers. Second, applications in areas such as water conservation and resource management often have immediate economic and environmental impacts. A year after the Miami-Dade County parks system installed IoT smart meters throughout their 263 parks, the department estimated there was a 20% reduction in water usage which amounted to about $860,000 in savings that year.

The following highlights some cutting-edge NEWIN companies that are making a splash in the world of Water IT:
**Sanitaire OSCAR by Xylem**

Sanitaire OSCAR is a process performance optimizer that can monitor the wastewater treatment processes and adjust controls accordingly to maximize the use of resources. One prominent feature advertised is the nutrient control system, which can monitor effluent nutrient concentrations and adjust conditions to meet regulatory standards. According to Xylem, this can lead to energy savings of 20% or more. Given that an estimated 80% of municipal water processing and distribution costs are electricity, it stands that this technology has substantial potential to reduce costs of water treatment.

**Pipeguard**

Pipeguard is a robot that can travel through a distribution system and uses sensors along its rubberized skirt to sense changes in water pressure along water pipes. The robot--created by a team at MIT--was even able to detect a leak of about a gallon a minute. This may sound like a substantial leak, but comparable technologies struggle to find leaks even three times as large. The tests were conducted in Monterrey, Mexico, a city that loses an estimated 40% of its water at a cost of about $80 million per year. Given that the average US city water utility loses 30% of their water through leakage or other losses, it is clear that this technology has substantial potential.

**CDM Smith**

CDM Smith is creating a cloud-based solution that harnesses the firm’s engineering expertise with the power of a digital twin to quantify insights and empower decision-making for its utility clients. The first product in its portfolio of products to be released is aimed at helping sewer system utilities analyze their overflow events, simulate performance by integrating real-time hydraulic and IOT data sources, and identify smart O&M activities through data analysis and trending.

If you would like to learn more about the current and future state of Water IT, visit the NEWIN website [here](#), watch this video of “Big Data” water industry experts [here](#), and attend the upcoming NEWIN Water Pitch Night “Digital Transformation: The Role and Impact of IT in the Water Sector” on June 19, 2019 in Boston.

*This article is an adaptation of an article originally written by Marcus Oliver Gay, titled “Water IT - a $150 Billion Market!”*
New Funding to Improve Water Infrastructure

On May 8th, 2019 the EPA announced the availability of $2.6 billion for the State Revolving Funds in an effort to improve water infrastructure across the country. New England states will see substantial increases in funding. Funding per state is as follows:

Connecticut: $30,469,000
Maine: $23,304,000
Massachusetts: $79,479,000
New Hampshire: $26,883,000
Rhode Island: $21,673,000
Vermont: $18,783,000

PFAS Gets Attention in Congress

Five separate bills focused on Per- and polyfluoroalkyl substances (PFAS) use, transparency, disposal, and aiding communities already effected were recently introduced at various stages throughout Congress. These bills are:

The PFAS Federal Facility Accountability Act (H.R.2626): This bill would require federal departments to follow state guidelines on PFAS removal and disposal.

The PFAS User Fee Act (H.R. 2570): This bill would require PFAS manufacturers to contribute to a trust fund which would then be accessible to affected communities for the treatment and removal of PFAS from local water sources.

The PFAS Drinking Water Act: This proposed bill would, among other things, provide up to an additional $500 million per year over a five-year period for the EPA to disburse to communities for the treatment of PFAS-contaminated drinking water.

The PFAS Right-to-Know Act (H.R. 2577): This bill proposes to add PFAS chemicals to the EPA’s Toxics Release Inventory, which would require companies to disclose the amount of PFAS compounds they release annually.

The PFAS Waste Incineration Ban Act: This proposed bill would mandate that the EPA prohibit burning of PFAS-laden firefighting foam as a method of disposal.
Urban Water Challenge 2019

The Urban Water Challenge 2019 is the second annual global innovation competition that deploys and invests in scalable water solutions for tomorrow’s megacities. Register your solution today by submitting a pre-application here. Once a pre-application is approved, you will receive access to the Full Application due on June 22, 2019.

34th Annual WateReuse Symposium

This year, the WateReuse Association Annual Symposium will be held in San Diego, California. The symposium will take place between September 8-11, 2019. Topics for the symposium include innovations in monitoring water quality, bioanalytical screening, and expanding applications for reuse in industry. The keynote speaker is Peter Annin, author of The Great Lakes Water Wars and director of the Mary Griggs Burke Center for Freshwater Innovation. More information on this event, including the events schedule, can be found here.

NEWIN New York Chapter Spotlight

New Method of Desalination

A team led by Ngai Yin Yip of Columbia University’s School of Engineering and Applied Science published a study in Environmental Science and Technology Letters that discussed a new desalination process known as “temperature swing solvent extraction” or TSSE. This new method of desalination proved effective at desalinating brines of very high salinity—up to seven times the concentration of seawater. Dr. Yip is a member of NEWIN’s New York chapter.

2019 NEWIN Calendar at a Glance

We encourage you to mark your calendars for these upcoming events in our community!

June 19th – NEWIN Water Pitch Night – Boston, MA
Sept 5th – NEWIN Women in Water Diversity Event – Boston, MA
Sept 18th – NEWIN Water Pitch Night – Boston, MA
Sept 8-11th – WateReuse Association Annual Symposium – San Diego, CA
Oct 4th – NEWIN to Host CEO Dinner
Nov 6th – NEWIN Water Pitch Night – Boston, MA
Dec 5th – NEWIN Gala

Please note that all NEWIN Water Pitch Night events are being held at Wolf Greenfield – Federal Reserve Building – 600 Atlantic Avenue – Boston, MA 02210. Tickets must be secured 48 hours in advance of each WPN event, in order to be registered for entry. Federal ID will be required for entry into the building for all registered attendees.