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Also Inside: Introducing NYWEA's 93rd President



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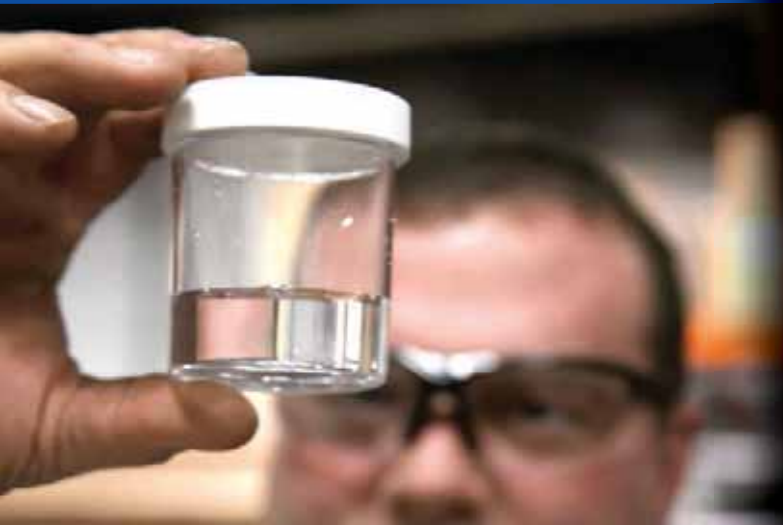
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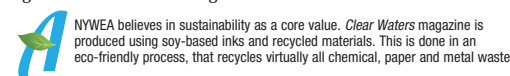
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Clear Waters

New York Water Environment Association, Inc.

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Cover: NYWEA members are a diverse group of individuals representing various races, genders, ages, sexual orientations, disabilities, educational backgrounds, socioeconomic statuses, lifestyles, religions and ethnicities. (Left to right, top to bottom) Row 1: Robert Ortiz, Vijesh Karatt Vellatt, Alex Leu, Vatche Minassian, Katie Ottoboni and Craig Hurteau. Row 2: Rajith Mukundan, Briskella Garas, Kiah Miller, Michelle Hess, Justin Slentz and Jamie Johnson. Row 3: Delores Hewitt, Briana Fitzgerald, Mel Butcher, William J. Nylic III, Donna Grudier and Ethan Sullivan. Row 4: Daniel O'Sullivan, Lauren Livermore, Robert Wither, Victoria Johnson, Khristopher Dodson and Jen Muir. Row 5: Sara Igielski, Clement Chung, Eileen M. Reynolds, Zion Chaney, Michelle Virts and Walter Walker. Row 6: Fiona Dunn, Dahlia Thompson, Stephan Ungar, Lisa Derrigan, Oluwole McFoy and Mary Doran. Row 7: Angel French, Charlie Starke, Flakë Gjonbalaj, Joseph Massaro, Stephen Sanders and David Stahl. Photos courtesy of NYWEA

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As 2020 comes to a close I'd like to take some time to pause and think about the past year. At the forefront of my mind are the sacrifices we've all had to endure to ensure that we can move past the difficult time we're currently in. While we've been unable to operate as we have in the past, the essential NYWEA members have shown their resilience and commitment to the common goal of protecting public health and the environment. NYWEA has

also been committed to staying true to its mission statement by promoting sustainable clean water quality management through science, education and training.

Conferences Go Virtual

We've had to learn new ways of connecting but as a silver lining, these virtual tools NYWEA has implemented have expanded our reach to those members who may have not been able to attend one of our trainings in the past. Now, moving forward, we have the ability to offer premier trainings on a wide variety of topics. These offerings have shown our members that NYWEA will continue to offer the trainings they need for their ongoing educational needs.

Earlier this year, I had been looking forward to attending the *2020 Spring Technical Conference & Exhibition* in June on Long Island. Unfortunately, due to the pandemic NYWEA needed to change gears to offer the conference virtually instead. The conference went very well, and there were many Long Island-specific presentations that I greatly enjoyed. I wanted to take a minute and thank the members of the chapter that put a tremendous amount of time and effort into planning, including George Desmarais, Tom Immerso, Joe Massaro and Greg Levasseur.

With the lessons learned from the spring conference and the fall *2020 NYC Watershed Science & Technical Conference*, we are planning the *93rd Virtual Annual Meeting & Exhibition* in a similar way. The annual meeting will be offered over a two-week period, with sessions starting the first week Tuesday, Feb. 9, and running through Feb. 11. In the second week, sessions begin Tuesday, Feb. 16, and run through Feb. 18. There will be three concurrent sessions on Tuesdays and Thursdays, with mobile sessions on Wednesdays. The awards will be presented Wednesday, Feb. 17. Both the opening session panel discussion on "COVID Tracing via Water Resource Recovery Facilities" and the awards ceremony will be free and open to anyone. I encourage you all to attend and support those deserving members who will be receiving awards.

Diversity, Equity and Inclusion

Over the summer of 2020, the executive committee of NYWEA issued a statement in response to the wave of protests surrounding national issues of racial inequity. This statement, originally published in the summer issue of *Clear Waters*, is reiterated in this winter issue on page 7.

As noted in the statement, NYWEA has been pursuing measures to address inequality, including a task force on Diversity and Inclusion. From the roots of this task force, a new NYWEA committee was formed in September 2020, with the approval of NYWEA's board, that will be focused on diversity, equity and inclusion in the water industry. Walter Walker describes the process of forming this committee in his article on page 10.

NYWEA is involved with two innovative programs that will help to address diversity, equity and inclusion in the water workforce. There is a new grant called the Work in Water Program NYWEA is offering that allows utilities to hire an intern and NYWEA will pay them. Contact the NYWEA administrative office for more details.

Additionally, NYWEA is teaming with the YMCA to promote a fundraiser where essential water and wastewater professionals can send their children to camp. Right now, this is being offered in the downstate area but if effective will be expanded throughout the state.

Reflections

As my time as President of NYWEA comes to an end, the experience was much different from what I expected, to say the least! This year will be very memorable for us all for a multitude of reasons. However, the one thing that will stick with me is the amount of work all the NYWEA staff do to make our great organization what it is. I strongly encourage everyone to join a committee, check out what your chapter is doing, and get involved. It will be one of the most rewarding times in your career and you'll make friends that will last a lifetime. Speaking of friends, it gives me great pleasure to introduce to you NYWEA's next president, Lauren Livermore. See page 5 for further details. I look forward to seeing you all again soon.

A handwritten signature in black ink that reads "William J. Nylic, III, PE". The signature is written in a cursive style with a large, stylized "W" and "N".

William J. Nylic, III, PE, NYWEA President

Executive Director's Message | Winter 2020



Much has been written and discussed about diversity, equity and inclusion recently, but what exactly do those words mean? History is rife with stories of racism and discrimination, these stories and events are both angering and tragic, but what have we learned from them? We need to improve; and we need to change! We can start by not suppressing problems or the important discussions that must be had to begin healing the wounds of the past, and improving the

societal landscape for the future.

This issue of *Clear Waters* is dedicated to the topic of DE&I and you will hear diverse perspectives from several members. Our hope is these varied perspectives will take you a step deeper with insights into inequality and give you some tools on how to communicate and inculcate better practices in our personal and professional lives. Walter Walker, chair of NYWEA's Diversity, Equity, and Inclusion Committee, provides some background on why the committee was created and what the water/wastewater industry can do to give exposure to careers and leadership opportunities to underrepresented populations. Steve Sanders' conversation with Michelle Hess gives us a better understanding of what it is like to be a female water resource recovery operator. Included in these pages I hope you will find insight and inspiration. Hat's off to the members of the Publications Committee who worked hard to make this issue well-rounded and comprehensive.

It is wonderful to see NYSDEC and NYSEFC engaged on this topic with their newly established Environmental Justice Capacity

Building Grant programs. On page 53 you will see real life examples of the Environmental Justice Grants put to use. We are also happy to have excerpts from our friends at the Brookings Institute included in this issue. It is tremendous to collaborate and share this important, timely and relevant research that is taking place on water affordability. This is the tip of the iceberg; there will be more to share on this topic so stay tuned.

As we close out 2020 amid this pandemic, although challenging, there is still much to be grateful for. Through these challenges, turmoil and grief we learn and grow. Here's wishing each one of you a healthy, happy and productive 2021.

In a special issue of the alumni magazine from Case Western Reserve University there was a quote that struck a chord with me from Frederick Douglass, given in his commencement address July 12, 1854, to the graduating students.

"The relation subsisting between the white and black people of this country is the vital question of the age. In the solution of this question, the scholars of America will have to take an important... part."

It's a great quote, but it's not only the scholars, it falls to each and every one of us to make a difference for the future.

Patricia Cerro-Reehil

Patricia Cerro-Reehil, pcr@nywea.org



Introducing NYWEA's 93rd President

On Wednesday February 17, 2021, Lauren M. Livermore will become NYWEA's 93rd president, the third woman to hold the title in the organization's nearly 100-year history.

Lauren is a lifelong resident of Syracuse, New York, whose connection to Onondaga Lake brought her into the water sector. She is a managing engineer in the asset management practice area for Barton & Loguidice in Syracuse, New York. For the past three years,

most of her professional life has been dedicated to the Municipal Sewage System Asset Management Pilot Program, funded and managed by the New York State Environmental Facilities Corporation and New York State Department of Environmental Conservation.

When asked about serving as president, Lauren answered, "I am truly honored to lead such a dedicated group of individuals who share the same passion for improving water quality in New York state and beyond. My NYWEA family has become such an important part of my life over the course of my career. The things we accomplish and connections we make when we get together, whether in person or virtually, speak volumes of the commitment and camaraderie of this organization. It is truly unique and special."

Lauren holds a Bachelor of Science degree in civil engineering with a concentration in environmental engineering from Clarkson University. She is a professional engineer in New York and a board-certified environ-

mental engineer. Lauren's connection to NYWEA started in college where she worked up to the position of president of the Clarkson University Student Chapter her senior year. From there, she has held numerous roles in both the Central Chapter and state organization, including: Central Chapter Young Professionals representative, director on the Central Chapter Board, member of the Young Professionals Committee, Young Professionals representative to the State Board, State Program Committee chair, and Association Activities Committee representative.

Lauren was a recipient of one of the first two Select Society of Sanitary Sludge Shovelers (5-S) bronze shovels, an award presented to young professionals who are very active in the organization. She also received the Young Professionals Award and two Service Awards, one for service on the board of directors as the young professional representative and one as Program Committee chair.

Lauren loves spending time with her husband Seth, and her children Leilani and Daniel. Her family enjoys going up to the Adirondacks whenever possible to get away for the day or the week. In her limited spare time, she likes to craft, sing, run and golf.

Lauren succeeds William J. Nylic, III who steps down as NYWEA's president on February 17, 2021.



Lauren Livermore with her husband Seth, and children Leilani and Daniel.

S. Kelly Photography



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From the Executive Committee of NYWEA

The New York Water Environment Association is an organization that considers all members of the water workforce our fellow colleagues. This role we hold in the water sector gives us the unique opportunity to share our commitment to equality with our membership and, in turn, influence the organizations and companies they are associated with. The leaders of NYWEA recognize that there is a historic issue of inequity in the water sector that continues to persist. We can see it through the attendees at our meetings and the students we meet who are pursuing water-related careers.

Recognizing it is not enough.

At NYWEA, we acknowledge the systemic barriers and discrimination that perpetuates racism and inequality needs to be dismantled in New York and across the country. We know it will be challenging. Its roots are much deeper than what we can see in our industry. Knowing this, we stand in support of those who are peacefully protesting the senseless killings of Eric Garner, Amadou Diallo, Ahmaud Arbery, Breonna Taylor, George Floyd and many others, in addition to protesting the inequities that continue to persist in the communities we serve as clean water professionals.

Acknowledging it is not enough.

Knowing that our membership is not reflective of the communities we serve, last year NYWEA created a Diversity & Inclusion Task Force to foster an environment of belonging in the organization, among other guiding principles. Through that task force and other initiatives, we are working to encourage water careers for students from minority and underserved high schools through the Rise High program. We have also sought to engage college students through the INFLOW program.

Initiatives are not enough.

We will continue to work with our membership to advance our vision and create a diverse, equitable, and inclusive community of water professionals. We challenge and encourage all NYWEA members to pause, examine, and implement actions to remove barriers that divide us. As dedicated members of NYWEA and our communities, we cannot stop trying to make a difference until all of our current and future members of the water workforce feel a sense of belonging in the water sector and NYWEA.

Only then will our actions prove to be enough.

William J. Nylic, III
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Water Views | Winter 2020



Environmental Justice at NYSDEC

This past year's headlines have brought everyone's attention to values like diversity and equity. They are key to the concept of "environmental justice," defined as the fair and meaningful treatment of all people, regardless of race, income, national origin or color, with respect to the development, implementation and enforcement of environmental laws, regulations and policies. NYSDEC has continued and expanded environmental justice programs for disproportionately impacted residents so that they have the tools to address environmental concerns across all NYSDEC's responsibilities.

NYSDEC's environmental justice initiatives include:

- The Environmental Justice Capacity Building Grant Program, managed in partnership with WE ACT for Environmental Justice, an organization with over 30 years of experience advocating for environmental justice and empowering communities. In 2020, \$900,000 was awarded to support the efforts of 18 community-based environmental justice organizations.
- Environmental Justice Community Impact Grants, which in 2020 awarded \$1.9 million for 21 community-based projects that address environmental and public health concerns.
- Operation ECO-Quality, a partnership between NYSDEC and the community with the goals of engaging and educating small to mid-sized businesses about environmental conservation laws, and of improving quality of life in communities with clusters of businesses such as dry cleaners and the auto body sector.
- Commissioner Policy 29, which sets the general policy of

NYSDEC to advance environmental justice by providing guidance for incorporating environmental justice concerns into the agency's environmental review and State Environmental Quality Review Act processes.

New York's ongoing commitment to environmental justice was highlighted by the Climate Leadership and Community Protection Act (CLCPA), which drives clean energy investment in wind, solar, energy efficiency and energy storage, and ensures that at least 40% of these investments benefit disadvantaged and low-to-moderate income communities. This June, NYSDEC Commissioner Seggos announced the appointment of nine members of the Climate Justice Working Group to help guide implementation of the CLCPA.

In August, Governor Cuomo announced proposed changes to New York's financing tools to prioritize Environmental Justice Areas for water infrastructure projects. The Clean Water State Revolving Fund (CWSRF) and Drinking Water State Revolving Fund (DWSRF) programs were revised to include additional considerations for low-income communities and communities of color that have historically been burdened by pollution and other environmental challenges. In addition, zero-interest financial assistance will be made available to more areas that serve environmental justice community residents. The draft 2021 CWSRF and DWSRF Intended Use plans include revisions to incentivize water infrastructure improvements in environmental justice communities.

Sign up to receive regular email updates from our Office of Environmental Justice: www.dec.ny.gov/public/65855.html, or visit NYSDEC's Environmental Justice webpage for more information: <https://www.dec.ny.gov/public/333.html>.

—James Tierney, Deputy Commissioner for Water Resources
NYS Department of Environmental Conservation

Focus on Safety | Winter 2020



Safety is for Everyone

The theme of this month's issue of *Clear Waters* relates to diversity and inclusion. In my career, I have experienced the frustration of noninclusion and lack of diversity due primarily to my gender or age. Well, time certainly took care of one of them while we are still working on the other!

This time, though, and primarily because of my life experiences, diversity in a human resources sense has become a more contextual experience for me. It is no longer only race, gender and age but can include disability, education, socioeconomic status, rural/urban lifestyle, religion and ethnicity. Most all of these are characteristics that make me different from you beyond what you can physically see. All these factors can come into play with safety and the interaction of an individual with the concept of safety. If I don't care for you because of who you are, then how can I advocate safety? How can I expect you to care about safety when you don't feel supported or protected? How can I expect you to care about safety when you don't know what 'safe' is because you have never received any training before? How can I expect you to care about safety when the PPE doesn't fit, or you are refused a different respirator because you cannot shave? How can I expect you to care

about safety because you are a temporary employee and every other employer considered you a 'throwaway'?

When I started my career, we as employees were expected to tough it out, take what you were given, shut up and play ball. We were headcount and disposable. Total baloney. Nowadays, a company is only as good as each employee who believes they are valued and included. So, how can we as employers or managers make all our employees feel valued?

An effective way to show a person that they matter is to listen. I mean to really listen to understand. When one listens to another, one needs to both give attention and pay attention. Surprisingly, this takes practice; it may not be easy for some folks, but it is effective. We are so concerned with getting to the end of the story, trying to devise a solution while the other person is still talking, constructing a rebuttal, or thinking about what to cook for dinner that we devalue the individual, and what they are trying to say. I had the advantage to be a listener all my life; it was natural since everyone else around me was a talker! But this experience provided me with the opportunity to practice in listening, to enter another person's inner space. With this entry comes a responsibility to respect, to appreciate, and to honor other people's experiences. And then to act. With better understanding of each other's experience, we can provide a safer work environment for everyone.

—Eileen M. Reynolds, Certified Safety Professional
Owner, Coracle Safety Management

Introducing NYWEA's Newest Committee

by Walter Walker

The water industry has many issues of diversity, equity, and inclusion within the profession itself, despite the recent frequency of these conversations through special programming, conferences, webinars and collaborations. Our industry's diversity challenge cannot be viewed separately from the systemic racism, sexism and unconscious bias that has existed and continues to exist within the broader society. Approaching this challenge is beyond the reach of traditional engineering problem-solving based on models and computations. We need to engage with people for people-based solutions to achieve an inclusive and equitable future in our water industry. The equity is the power, and who has a role in shaping the industry, regardless of race, ethnicity, background, discipline and industry (*Lingenfeller 2020*).

In September 2020, NYWEA's board approved formation of a new Diversity, Equity and Inclusion Committee to further NYWEA's efforts to address these challenges faced by the water/wastewater industry.

Diversity, Equity and Inclusion

First, how can diversity, equity and inclusion be defined? Within the context of NYWEA and the water industry I most align it with the following (*D5 Coalition 2014*):

- Diversity – Encompassing a demographic mix of a specific collection of people taking into account elements of human difference, but focusing particularly on race, ethnicity, sexual orientation, disability and gender.
- Inclusion – The degree to which diverse individuals are able to participate fully in the decision-making processes within an organization or group. While a truly “inclusive” group is necessarily diverse, a “diverse” group may or may not be “inclusive.”
- Equity – Promoting justice, impartiality and fairness within procedures, organizational processes, design processes and distribution of resources. Tackling equity issues requires an understanding of the underlying or root causes of outcome disparities within a community or group.

Diversity asks, “Who’s in the room?” Inclusion asks, “Have everyone’s ideas been heard?” Equity responds, “Who’s trying to get in the room but can’t? Whose presence in the room is under constant threat of erasure?” Justice responds, “Whose ideas won’t be taken as seriously because they aren’t in the majority?” (*Stewart 2017*)

A range of characteristics may pose a risk of exclusion, preferential treatment or discrimination. Among these are (but not limited to): race, ethnicity and religion; age and generation; gender and gender expression; sexual orientation; language and nationality; location (such as rural and urban); income, education and socio-economic status; appearance; professional discipline/background (representation of consultant, utility, operator, specialization, etc.).

Exploring Policies and Practices

Policies and practices that create diverse and inclusive environments make all members feel welcomed, valued and respected. Members of inclusive organizations experience a deep sense of belonging, empowerment and feel that they can grow within the organization. Inclusive organizations take a responsibility in a sense not just for the impact they (and the water industry overall) have on their members’ lives, but also on the broader communities in which they operate, working toward social justice and equity for all. But again, from an equity perspective, who gets to make those decisions and impact within the industry and for their communities. Why isn’t it more reflective of the industry/community we serve?

We do not want equity to be an afterthought, but really integrate it into how the organizations make their decisions and interact with their members. So, how do we build equity within the water sector, and in our own backyard, through NYWEA?

NYWEA's D&I Task Force

In September 2019, the NYWEA Diversity & Inclusion (D&I) Task Force was formed with the goal of not only exploring the current state of representation within NYWEA but mapping out what actions the NYWEA needs to take to provide opportunities

DIVERSITY

Who’s in the room?



Demographic mix of specific collection of people with focus on race, ethnicity, sexual orientation, disability and gender.

INCLUSION

Have everyone’s ideas been heard?



Degree to which diverse individuals are able to participate fully in decision-making processes in group or organization.

EQUITY

Who’s trying to get in the room but can’t?



Promoting justice, impartiality and fairness within procedures, processes and resource distribution.



and welcome a more diverse and inclusive representation of water professionals, to also strengthen the workforce and array of contributions. To quote WEF’s own D&I Task Force, it is “representation of progress toward an equitable future in our communities through the water industry, incorporating and appreciating the unique experiences and challenges we all face.”

Thus, the guiding principles of the D&I Task Force were:

- To promote diversity, equity, and inclusion among NYWEA’s membership and the water quality profession.
- To communicate the professional value of diversity, equity and inclusion.
- To integrating water/wastewater professionals and interested students of underrepresented backgrounds and disciplines, facilitating inclusive spaces and conversations.
- A collaborative approach mindset, moving beyond short-term transactional relationships to promoting interactive, collaborative and long-lasting relationships.
- Support growth, development and inspiration of youth for an inclusive future workforce.
- Generally, grow interest in the workforce and industry.

The NYWEA D&I Task Force met regularly over the past year and began brainstorming, ideating and mapping the ways and methods that NYWEA could undertake to best enhance and recruit those underrepresented and underserved groups. The task force identified more than 25 different groups represented within the water industry and determined that NYWEA could best impact the following:

- Underrepresented/underserved in management and leadership.
- Underrepresented/underserved in operations.
- Expertise diversity.

In September 2020, the recommendation was made and the NYWEA board unanimously approved the D&I Task Force be elevated to a standing committee status. This new committee would be titled the Diversity, Equity, and Inclusion Committee. The Task Force also agreed that it is imperative to include “equity” in the name and mission of the committee moving forward, as equity is an essential goal of diversity and inclusion and speaks to the justice and meaningful outcomes. All three elements of diversity, equity and inclusion must be fully, permanently, and visibly integrated into NYWEA’s culture, as these elements are fundamental and relate to the retention and recruitment of quality staff, members, professionals and volunteers in the water sector.

NYWEA Diversity, Equity and Inclusion Committee

The guiding vision of the DE&I Committee is representation to progress toward an equitable future in our communities through the water/wastewater industry, incorporating and appreciating the unique experiences and challenges we face.

The mission of the NYWEA DE&I Committee is to further opportunities for diverse and multidisciplinary representations in the water/wastewater industry by growing the level of engagement through NYWEA events and programs, support student and young professional participation, and collaborate with cultural and professional organizations/societies through networking, professional development, education, mentorship and leadership opportunities. The DE&I Committee would also give exposure to water quality careers and leadership opportunities to underrepresented populations.

The initial responsibilities of the DE&I Committee would include

the following:

- Foster a sense of belonging among all members of the water sector. This involves working with the NYWEA program committee to ensure there is content for all, as well as reviewing NYWEA events to ensure that they are truly inclusive and belonging for all.
- Assume responsibility to make the NYWEA INFLOW program a success. The committee will establish contacts at schools, create background materials, form criteria for participants, and develop schedules and evaluations for participants at NYWEA events. Our current and future workforce needs to mirror the communities we serve.
- Encourage and enhance operator engagement. The committee will explore the challenges and seek answers to the engagement of operators within NYWEA beyond the Ops Challenge. We have much to learn from our facility operators.
- Encourage engagement and look for partnerships with other professional organizations that represent underrepresented populations.
- Seek partnerships with community organizations in underrepresented neighborhoods and among underrepresented populations, such as community boards, youth groups, churches, etc.
- Promote equity with Civil Service through addressing barriers to entry, visibility of announcements, and availability of exam preparation materials.

I want to thank the NYWEA D&I Task Force for their efforts and contributions over the year, for crafting this vision and mission, the sharing of personal experiences, the approach to uncomfortable conversations, and the respect and active listening for others in the safe space of our meeting times.

I know there is still a significant amount of work to be done to fully comprehend the opportunities in achieving equity within the water sector, but I hope the vision and mission presented to you herein encourages all members to participate, inquire and learn from the conversations and activities to come within the NYWEA space. I invite you to constantly question, “Are we including all the right voices?” and “How can we better engineer for people, with people?” We look forward to your support and engagement and collaboration and partnerships.

Walter Walker, PE, ENV SP is the chair of the NYWEA Diversity, Equity, and Inclusion Committee and may be reached at wwalker@greeley-hansen.com.

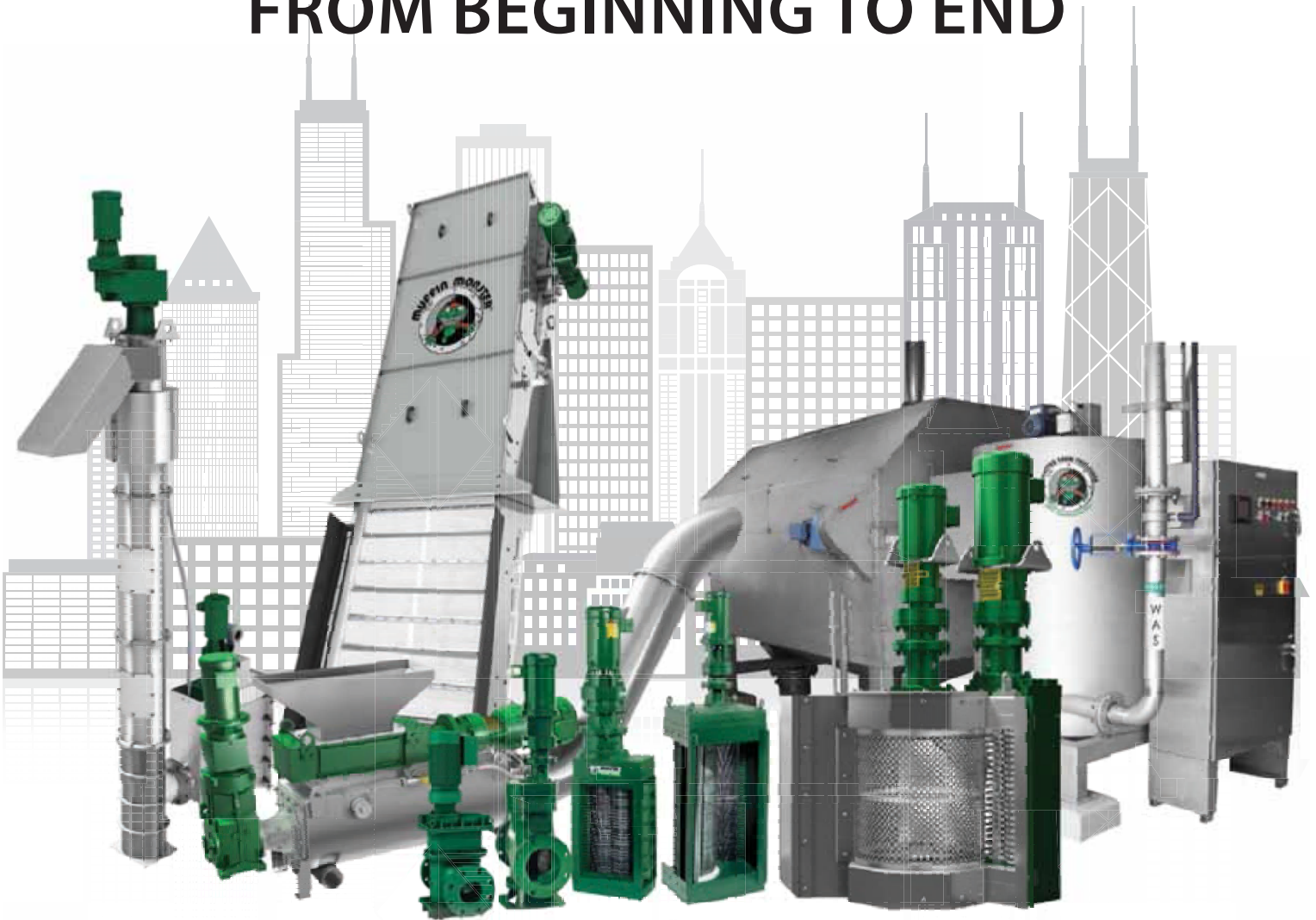
References

D5 Coalition. 2014. “What is DEI?” *D5 Advancing Diversity, Equity, and Inclusion in Philanthropy*. <http://www.d5coalition.org/tools/dei/>.

Lingenfelter, N. 2020. “Diversity, Equity, and Inclusion – Not a Quick Fix at WEF and in Water.” WEF Water Blog. Water Environmental Federation. Aug 5. <https://www.wef.org/wef-waterblog/wef-waterblog/diversity-equity-and-inclusion-not-a-quick-fix-at-wef-and-in-water/>.

Stewart, D.L. 2017. “Language of Appeasement.” *Inside Higher Ed*. March 30 <https://www.insidehighered.com/views/2017/03/30/colleges-need-language-shift-not-one-you-think-essay>.

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Highlights in Diversity, Inclusion & Equity Programs and Conversations at WEFTEC Connect

by Madison Quinn

WEF InFLOW Virtual Program 2020

The Water Environment Federation (WEF) began the **Introducing Future Leaders to Opportunities in Water (InFLOW)** program in 2018 to enhance diversity and inclusion in the water workforce and engage a diverse group of students in the experience that is WEFTEC. This scholarship opportunity engages participants in WEF programs and events in order to solidify their interest in working in the water sector and increase probabilities for employment and long-term success working in water. WEF InFLOW consists of two career tracks: STEM Path identifies scholars enrolled in undergraduate/graduate degree programs from historically underrepresented ethnic and racial groups. CareerTech connects with underserved scholars who may face barriers to employment (*WEF 2020a*).

Due to the COVID-19 pandemic, WEFTEC went virtual with the launch of WEFTEC Connect. The organizers at WEF thus redesigned the program to implement the InFLOW program in a virtual format, including both the STEM Path and CareerTech tracks, over the course of five weeks. Before the start of the program, scholars in both tracks received an orientation packet and a welcome video. Week 1 focused on introducing the InFLOW Program and allowing the participants to get to know their fellow InFLOW colleagues. Weeks 2 and 3 introduced the participants to the water industry. Hot topics in water were discussed, the participants met industry experts, and case studies of water utility infrastructure were reviewed. In Week 4, water industry leaders shared their journey in water and advised the scholars on how to succeed in the water sector. The program culminated with a variety of WEFTEC events in the fifth week.

WEF's 2020 Virtual InFLOW Program will serve as a model for a NYWEA InFLOW Program for young scholars from colleges.

WEFTEC Connect Daily Flow Briefing

Jacqueline Jarrell, then president of WEF, kicked off the "Workforce on Wednesday" programming, exploring the workforce challenges and successes across the water industry with her daily briefing titled "Fostering Diversity and Excellence," presented Wednesday, Oct. 7.

"We will share and discuss with each other our collective efforts of cultivating a more diverse, equitable, and inclusive WEF and overall workforce," said President Jarrell. "Over the past few years, stabilizing and growing the unified water workforce that is more representative of the communities that we serve has been a major focus for WEF. One of our greatest challenges is that people don't know about the amazing career opportunities, because we haven't done a good job in promoting it as a sector."

President Jarrell emphasized the need to attract new talent to the industry, saying that we cannot rely on workers just falling into the water sector, as many have in the past. Instead, she called on industry leaders to be more strategic in recruitment and retention of diverse talent.

"We cannot keep hoping that people will keep entering the water workforce and there will be enough talent to respond to the needs of our communities and the water sector," said Jarrell. "We have to be intentional. We need to mentor, encourage and share. We need to make people aware of the opportunities at every level and at all skills. I love being able to share how broad in scope our sector truly is. We have everything from engineering and sciences to communication and finances."

The video is available for attendees to view on the WEFTEC Connect platform (*WEF 2020b*).

continued on page 14



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Ask the Experts Technical Session – A Path Forward: Exploring Diversity, Equity and Inclusion in the Water Industry

A panel discussion Wednesday, Oct. 7, 2020, from 3:30 to 4:30 p.m. EDT, focused on the intersection of race and equity in the water system, exploring environmental justice and how we serve our communities. Panelists defined the issues through case studies and explored solutions and ideas to address these key issues as an industry. Equity is not “someone else’s problem”; it is our problem. This session aimed to help attendees understand the issues of water equity and how we all might take meaningful action toward improvement. The panel included water industry leaders from both public utilities and private companies, including NYWEA’s own Diversity, Equity & Inclusion Committee chair, Walter Walker (*WEF 2020c*).



Keynote – Meet Me in the Middle: Making Workforce Connections

A 30-minute keynote presentation from Anna Maria Chávez was broadcast Wednesday, Oct. 7, 2020, at 3 p.m. EDT. She was the first woman of color to lead the iconic Girl Scouts of the USA and as CEO of the National Council on Aging, Chávez is an expert on leadership and a passionate advocate for helping others find opportunity and success across all stages of life. Her presentation explored issues of diversity, equity and inclusion; personal growth and achievement; courage and leadership. She shared her insights, experiences and personal journey to both inform and inspire the audience of water professionals to embrace their role as agents of change within their communities.

“Every day our communities are relying on your knowledge and your expertise to protect public health, the environment and our economy,” said Chávez in her closing remarks. “You are on the front lines during these uncertain times. ... So, I encourage you to embrace your leadership journey. Understand the catalyst moments that have created you as the worker, the leader you are today. Don’t forget what you’re passionate about, and make sure people are connecting the dots around the needs of diverse populations, because together, we’ll make this a better place.”

The video is available for attendees to view on the WEFTEC Connect platform (*WEF 2020d*).

Live Discussion – Public Communication and Outreach, Utility Management and Leadership: Diversity, Equity and Inclusion

Another live discussion Thursday, Oct. 8, 2020, explored diversity, equity, and inclusion issues in the context of utility management, communications and leadership, moderated by WEF trustee, Ifetayo Venner.

The conversation included methods for effectively communicating the collective benefit of diversity, equity and inclusion. One analogy likened diversifying the workforce to remodeling a home. When a home is remodeled, it of course benefits the homeowner with increased property value, but it also benefits the homeowner’s neighbors, who also see their property value increase when a home in the neighborhood is improved. Similarly, affording greater inclusivity and equitable representation to underrepresented individuals benefits the new individuals joining the water workforce, but also benefits the “neighborhood,” i.e., the water sector, with input from groups that have not historically been equitably represented in our water workforce. The greater inclusion of more diverse perspectives can lead to creative solutions and innovation that benefits the industry as a whole (*WEF 2020e*).

Madison Quinn is the Communications Manager and Scholarship Program Administrator for NYWEA and may be reached at madison@nywea.org.

References

- WEF. 2020a. *WEF InFLOW: Water Environment Federation Introducing Future Leaders to Opportunities in Water*. (<https://www.wef.org/globalassets/assets-wef/3---resources/inflow/inflow-brochure-2020-final.pdf>)
- WEF. 2020b. *WEFTEC Connect Daily Flow Briefing: WEF President Jackie Jarrell*. Oct. 7, 2020. (<https://www.weftecconnect.org/live-stream/19752209/Daily-Briefing--Wednesday>)
- WEF. 2020c. “A Path Forward: Exploring Diversity, Equity, and Inclusion in the Water Industry.” *WEFTEC Connect Ask the Experts Panel*. (<https://www.weftec.org/attend/scheduled-events/a-path-forward-exploring-diversity-equity-and-inclusion-in-the-water-industry/>)
- WEF. 2020d. “Meet Me in the Middle: Making Workforce Connections.” *WEFTEC Connect Keynote*. Oct. 7, 2020. (<https://www.weftecconnect.org/live-stream/15350624/Keynote-Meet-Me-in-the-Middle-Making-Workforce-Connections--Anna-Maria-Chvez>).
- WEF. 2020e. “Public Communication and Outreach, Utility Management and Leadership: Diversity, Equity and Inclusion.” *WEFTEC Connect Live Discussion*. Oct. 8, 2020. (<https://www.weftecconnect.org/sessions/15350635/Live-Discussion-Diversity-Equity-and-Inclusion>)



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WEF Words on Water: Conversations on Equity and the Water Sector

Words on Water is a podcast featuring conversations with influential and interesting people from the water sector and news from the Water Environment Federation.

Among other topics, the podcast features a new series of conversations on equity and diversity in the water sector co-hosted by Travis Loop, senior director of communications and public outreach for WEF and his colleague at WEF, Rahkia Nance.

According to Travis and Rahkia, initially these episodes will focus on social justice and equity issues for Black Americans as they pertain to the water sector. Other issues in diversity, equity and inclusion will be explored in future episodes. Guests of the podcasts will include a variety of people from across water: different occupations, different points in their careers, different ages, different locations and different races.

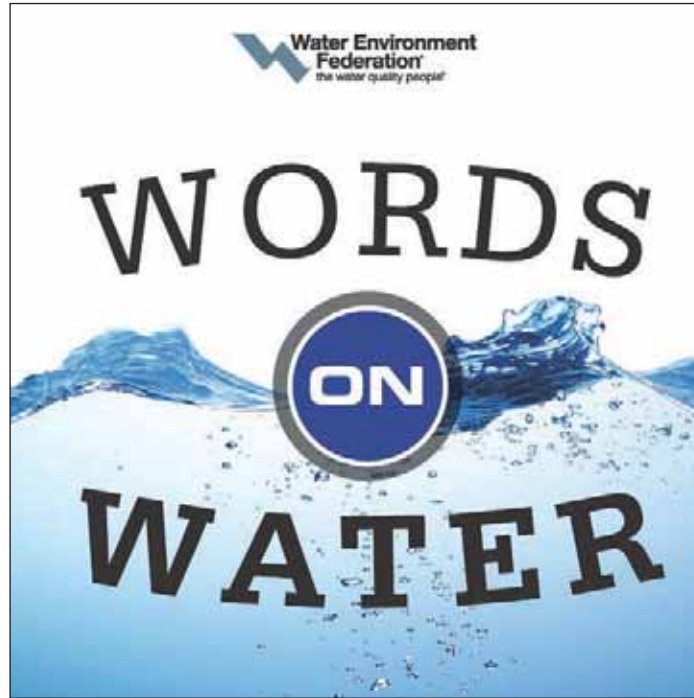
The goal is to have open, candid conversations, with the hope that the dialog can raise awareness about problems, provide solutions, and enable us to move forward together and build equity throughout the water and wastewater sectors. Two episodes of this new series have already aired as of this writing, one Aug. 5, 2020, and the other Sept. 21, 2020.

Guests for the Aug. 5 episode included Jackie Jarrell, Nikita Lingenfelter and NYWEA's own Stephen Sanders. Jackie Jarrell is president of the Water Environment Federation and interim deputy director at Charlotte Water. Nikita Lingenfelter is speaker-elect of the WEF House of Delegates and an engineer with the State of Nevada Department of Environmental Protection. Stephen Sanders is director and head

trainer at The Environmental Training Center at Morrisville State College.

In the episode, they discuss how WEF has responded to the calls for equity for Black Americans and the work of WEF's Workforce Diversity and Inclusion Task Force. Nikita and Stephen talk about their experiences as Black Americans working in the water sector and how WEF can improve diversity and equity for its members and volunteers. They also share personal perspectives on racism in America. The episode is available online at (<https://wordsonwaterwef.com/2020/08/05/wow-conversations-on-equity-with-jackie-jarrell-nikita-lingenfelter-and-stephen-sanders/>).

Guests for the Sept. 21 episode included Cathy Bailey, Randy Hayman and Tony Parrott. Cathy Bailey is the Executive Director of Greater Cincinnati Water Works. Randy Hayman is the Commissioner and CEO of the Philadelphia Water Department. Tony Parrott is CEO of Louisville and Jefferson County Metropolitan Sewer District. In the episode, they talk candidly about their experiences as Black Americans working in the water sector and reaching the level of utility executive. The episode is available online at (<https://wordsonwaterwef.com/2020/09/21/wow-conversations-on-equity-with-cathy-bailey-randy-hayman-and-tony-parrott/>).



Words on Water logo.

WEF

Edited by Kerry A. Thurston. Kerry A. Thurston is the editor for Clear Waters magazine and may be reached at clearwaters@nywea.org.

Water Workforce: Recruiting for Diversity and Inclusion

by Sapna Mulki and Steven Stone-Sabali

The U.S. water workforce includes about 1.7 million people, according to a Brookings Institution report (*Kane and Tomer 2018*). Almost one-third of those workers will be eligible for retirement in the next 10 years. As the water industry addresses its expected loss of expertise and institutional knowledge, it must seek out and support diversity in recruiting and hiring so future water professionals fully represent the diversity found in the communities they serve.

Hire for Diversity

Hiring for diversity gives a competitive advantage, as it increases productivity and engagement, increases the quality of customer service, and improves workplace retention. With the right intentions and patience, the right people can be hired for the job while fulfilling the need for diversity in the workforce. Fortunately, there are some simple steps – from crafting inclusive job descriptions to conducting thoughtful interviews – to ensure equal opportunity and meaningful improvement in recruitment processes.

When hiring for diversity, keep in mind that everyone deserves a fair chance regardless of their race and ethnicity, age, gender, religion, sexual orientation, disability, socioeconomic status, education level and life experiences. The main goal is to make every step of the recruiting process inclusive, whereby those who are qualified for the position feel excited, encouraged, and safe to apply for the job posting and bring their true selves forward, including their diverse identities.

Ultimately, diversity and inclusion go hand in hand, and crafting a holistic, inclusive job description is the first step for attracting diverse applicants. Following this, a thoughtful interview procedure will make the process more welcoming for less represented candidates. For example, working parents may be put off if an “agile/flexible working environment” statement isn’t included in the job description or discussed during the interview process.

Ensuring the recruiting process is inclusive requires a concerted effort to find out who people are as well as what skills and experiences they could bring to a team. When discussing with applicants

what the organization is looking for, it is helpful to describe how new employees are brought onboard and how the team builds cohesion once new employees become settled in their positions.

Based on available research and best practices, the following provides several recommendations that can be used to create a more intentional and thoughtful recruiting process. These recommendations are separated into building effective job descriptions and developing inclusive interview guidelines.

Job Descriptions

Use Gender-Neutral Titles

Research has shown that a determining factor in defining a candidate pool is the choice of words used in the job description. For example, according to one study, many of the water industry’s technical professions, such as engineering and systems operations, have been dominated by men (*Gaucher, Friesen and Kay 2011*). To make these technical positions more attractive to women, job descriptions should reflect their values and needs. Thus, be conscientious about word choice. Avoid using words that were historically associated with masculinity, such as “rock star,” “go-getter,” and “versatile,” and instead use gender-neutral words such as “ambitious,” “curious,” and “motivated”.

Another helpful resource is a *Harvard Business Review* article that identifies a list of stereotypes/words that often are associated with men and women in the workplace (*Smith, Rosenstein and Nikolov 2018*).

Be Mindful of Pronouns

Job descriptions, especially those written for technical positions, tend to use male descriptors. This isn’t helpful for candidates who don’t identify as male. Instead, when describing tasks use “S/he,” “they,” or “you”. For further guidance in this area, refer to “Using Inclusive Language in the Workplace” (*Mulki and Stone-Sabali 2020*).



Consider Haves versus Must Haves

Stating the most necessary requirements for a job is helpful to an employer because it increases the pool of qualified candidates. This approach also helps women identify whether they are the best candidates for the job. However, a *Harvard Business Review* article found that women do not apply for jobs unless they meet 100% of the necessary requirements, “believing that the job qualifications are real requirements, and seeing the hiring process as more by-the-book and true to the on-paper guidelines than it really is” (Mohr 2014).

Although nobody wants unqualified candidates to apply, the goal should not be to discourage potentially strong candidates from applying. A simple solution is to categorize the job requirements as “required” and “desired” skills and experience. However, avoid having an unreasonable list of required expertise, as it deters potential applicants.

Another reason it is important to pay attention to identifying required and desired skills is to make reasonable space and accommodations for people with visible and invisible disabilities, so they will also consider applying. When including physical requirements, consider noting how often an employee would be expected to perform such functions by using words like “occasionally,” “frequently” and “constantly”. Also, describe the work environment if it is even partially out of the office; this includes irregular work hours and working in hazardous conditions (such as outside, in inclement weather or in confined spaces).

Recognizing that some positions in the water industry tend to be labor-intensive and sometimes hazardous, it is worth considering positions that would be safer and fulfilling for people with disabilities. Additionally, establishing a hiring goal is an effective way to attract diversity.

Clearly State the Organization’s Values

Most of us look for a place to belong in our workplace. Applicants of all backgrounds and experiences would like an employer who will have their best interests at heart and one that provides safety and support. Including statements in job descriptions that affirm commitment to diversity and inclusion is one such way to create that sense of belonging.

In addition, including statements on health and financial benefits will let applicants know that the organization cares about the welfare of employees no matter their stage of life. Such statements also attract a spectrum of people with different life circumstances while helping build loyalty for the organization.

Clearly stating the organization’s values is just the start though. It is also important to “walk the walk”. One author wrote that “employers claiming to be pro-diversity discriminated against resumes with racial references just as much as employers who didn’t mention diversity at all in their job ads” (Gerdeman 2017). With this in mind, ensure that specific examples of how the organization promotes camaraderie and practices diversity are provided during the interview process.

Disseminating Job Ads

Simply posting the ad on an organization’s website will not attract a diverse range of candidates. To recruit as widely as possible, post job ads on various social media platforms such as LinkedIn, Twitter and Facebook. Additionally, share the job ad with local community organizations that focus on improving the well-being of specific groups. Examples include local chambers of commerce as well as Hispanic, Asian, and African American community online newspapers, newsletters and Facebook groups.

The water sector affects public health, commerce and the environment, so water professionals must be embedded in and engaged with the communities they serve. Water professionals can help their communities learn about careers in the water industry by having operators, utility managers, engineers, customer service and communications professionals, and other experts give “a day in the life of” presentations at community and organization events. As those in a community get to know the water sector better and appreciate the important but fun work water professionals do, local positions will become better understood and more attractive to a wider range of potential water professionals.

Using Artificial Intelligence (AI)

Unconscious and implicit bias are “automatic, mental shortcuts used to process information and make decisions quickly” to which

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continued from page 19

“everyone is susceptible” (Gomez 2020). In fact, software is not exempt from unconscious bias, as it is developed by humans with their own biases. For example, Palantir, a software startup that unknowingly used unconscious/implicitly biased AI software, had to pay \$1.7 million to settle a racial discrimination lawsuit with the Department of Labor’s Office of Federal Contract Compliance Programs when it disproportionately rejected qualified Asian applicants for certain engineering positions by routinely eliminating resumes and telephone interview phases. This case highlights the need for compliant AI software in creating a fair recruiting process.

If an organization is using AI to sift through resumes, make sure the software is programmed to ignore demographic information about candidates. Exclude information about names of schools and years attended along with ZIP codes to ensure the software selects candidates based solely on their expertise.

Resumes Reviewed by Humans

Because we all have unconscious/implicit biases, it is important to try to recognize and act on them positively. A study cited an example of our unconscious/implicit biases at work; the researchers found that when African American and Asian job applicants hid their race by “whitening” their resumes, they were twice as likely to get a call for an interview (Kang, et al. 2016). Keeping bias in mind, recognize and correct the process if resumes are disregarded because of age, gender, religion, sexual orientation, disability, socioeconomic status, educational path or life experiences.

To avoid decisions based on unconscious/implicit biases, it is helpful to create a diversity team within your organization to

ensure that colleagues of all backgrounds are sufficiently represented in the decision-making process within the organization. Certain members of the diversity team can also play a role in the recruiting process by reviewing finalist resumes and sitting in on interviews to ensure there is a representative pool of candidates. At the end of the day, the main goal is to broaden the hiring decision beyond one or two people who look and think alike.

The Interview Process

When interviewing someone, we often gravitate toward those who look and think like us. But hiring on this basis creates a homogeneous culture that leaves organizations susceptible to risks; and worse, it limits its employees’ growth, creativity and innovation.

Hiring managers often ask if a potential new hire is a good cultural fit. This question is problematic because it may really be asking if this is someone who “I” can relate to, someone who will laugh at “my” jokes or understand “my” cultural references – in other words, is this essentially someone who looks and thinks like the hiring manager.

As an alternative, ask what can be learned from this person. What does he or she bring to the team and organization? It is helpful to have a standard list of questions for each candidate and to create a rubric to rate their responses based on expertise, experience and personality. This approach helps assess all candidates on the same standards so they each have a fair chance.

Such questions reflect an organization’s commitment to creating a diverse and inclusive environment. For candidates, questions such as these can help them get a sense of how the organization

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will make them feel like valued members of the team and to understand where there are opportunities for long-term growth.

Although a standardized recruiting process that integrates diversity and inclusion is essential, it is equally important to offer flexibility to candidates who need it. For example, candidates who are on the autism spectrum often faced shame and bullying within their communities. Accommodating a remote nonvisual interview in the first round may help a candidate on the spectrum to fully express themselves without judgment (*Ciampi 2018*).

Every interview should be conducted thoughtfully and with empathy to bring out the best in each candidate. Traditional methods of trying to create an atmosphere of intimidation and a question-and-answer format are fast becoming relics of the past. In its place, employers are steadily moving toward a hybrid format of standard questions and conversation, where the intention is to accurately assess a person's skills and disposition in a short time.

Commit to Diversity and Inclusion

If an organization is committed to hiring for diversity and inclusion, it needs to be reflected in job descriptions and recruiting processes. Demonstrate to candidates how diversity and inclusion are integrated into your organization's operations, daily decision-making and team-building efforts. It is important to integrate the principles of diversity and inclusion into the DNA of the teams and processes. There are many ways to create an inclusive culture and help employees feel a sense of belonging, and that will be the focus of a future article. In the meantime, keep an open mind, be empathetic and try following the tried-and-true recommendations provided here to promote diversity, inclusion, and belonging in the recruiting process and the workplaces it creates.

Sapna Mulki is the founder and principal of Water Savvy Solutions (www.watersavvysolutions.com), Columbus, Ohio, and may be reached at sapna@watersavvysolutions.com. Steven Stone-Sabali is a visiting assistant professor in the Educational Studies Department at The Ohio State University (www.osu.edu), Columbus, Ohio.

References

Ciampi, M. 2018. "8 Proven Strategies to Attract and Retain Job Candidates on the Autism Spectrum." *ERE Recruiting Intelligence*. Aug. 8. <https://bit.ly/3cRWYsy>.

Gaucher, D., J. Friesen, and A.C. Kay. 2011. "Evidence That Gendered Wording in Job Advertisements Exists and Sustains Gender Inequality." *Journal of Personality and Social Psychology* 101 (1): 109-128. doi:10.1037/a0022530.

Gerdeman, D. 2017. "Minorities Who 'Whiten' Job Resumes Get More Interviews." *Harvard Business School – Working Knowledge: Business Research for Business Leaders*. May 17. <https://hbs.me/2GpKrK5>.

Gomez, D. 2020. "How AI Can Stop Unconscious Bias in Recruiting." *Ideal Blog – AI for Recruiting: News, Tips and Trends*. June 18. <https://ideal.com/unconscious-bias>.

Kane, J.W., and A. Tomer. 2018. "Renewing the Water Workforce: Improving Water Infrastructure and Creating a Pipeline to Opportunity." *Brookings*. June. <https://brook.gs/2KSCBlN>.

Kang, S.K., K.A. DeCelles, A. Tilcsik, and S. June 2016. "Whitened Resumes: Race and Self-Presentation in the Labor Market." *Administrative Science Quarterly* 61 (3): 469-502. doi:10.1177/0001839216639577.

Mohr, T.S. 2014. "Why Women Don't Apply for Jobs Unless

They're 100% Qualified." *Harvard Business Review*, Aug. 25. <https://bit.ly/2HKs4a8>.

Mulki, S., and S. Stone-Sabali. 2020. "Using Inclusive Language in the Workplace." *JournalAWWA*. doi:10.1002/awwa.1615.

Smith, D.G., J.E. Rosenstein, and M.C. Nikolov. 2018. "The Different Words We Use to Describe Male and Female Leaders." *Harvard Business Review*. May 25. <https://bit.ly/3nMoVXC>.



Word Choice Guidance for Job Descriptions

- Gender Decoder for Job Ads (free): <http://gender-decoder.katmatfield.com>
- Textio (paid service): www.textio.com

Bias Testing Tool

Harvard University's Implicit Association Test can help explore for unconscious/implicit bias; this tool helps an individual identify implicit/unconscious biases toward a certain group of people. The test is available online at <https://implicit.harvard.edu/implicit/takeatest.html> – results may be surprising.

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Express Yourself: A Conversation with Michelle Hess

by Stephen D. Sanders

Our society encourages freedom of expression. But whether we really embrace other people's expression is an entirely different story. There are many barriers to expressing ourselves and many barriers to listening to others. But why? After all, didn't we gain the majority of our knowledge from listening to others? Parents, school, college, books, and mentors all required us to listen to others. Unfortunately, at some point we all get selective with who we will listen to.

One of my favorite quotes from the legendary UCLA coach John Wooden is "It's what you learn after you know it all that counts." It's been hanging in my office for years as a constant reminder that I should never stop listening, never stop learning.

I had the privilege to ask for the perspective of one of my favorite operators, Michelle Hess. I learn from listening to her. Michelle has a Bachelor of Arts in political science; an Associate of Arts, in liberal arts; Associate in Science in environmental studies; and Associates in Applied Science in natural resource conservation and in fisheries technology. She is also a Grade 4A water resource recovery operator and a Grade 4 collection systems operator. Enjoy the conversation!

How did you find your way into water/operations?

I have a lifelong connection with water. My folks used to take us on vacation to the Thousand Islands every year. Over the decades, I've seen the health of the St. Lawrence River decline and then improve. Although I've always felt a connection to doing my part to help protect aquatic environments, I experienced a renewed sense of urgency when I worked for the American Red Cross' disaster relief efforts in Louisiana after hurricanes Katrina and Rita. It was there on the Gulf Coast that I experienced firsthand what a dead zone looked like and the cascading effect it had, not just on the aquatic ecology but the economic and social impacts on the community as well.

Those experiences in Louisiana lead me to seek further education in the natural sciences. I enrolled in the conservation program at Finger Lakes Community College where I earned associate degrees in environmental studies, natural resource conservation and fisheries technology. We toured a local water resource recovery facility (WRRF) for one of my classes, but it never occurred to me to work for one. I worked on an aqua culture farm and pond service company for a while, encouraging customers to work with Mother

Nature to take care of their ponds instead of using harsh, slow to degrade chemicals.

I loved working with fish and aquatic plants, but I needed something that would take care of "Old Michelle." Having exhausted the traditional online searches as well as the state's unemployment resources, my dad suggested looking on the county's website. I applied for the Pure Waters Technician position, which is a catch-all for our whole department including administration, lab, storm-water, pump stations, etc. I had no idea the position I applied for was at the WRRF until I showed up for an interview. After making it through the screenings building and the thickener complex without losing my lunch, I got the job.



We're working to change minds on what a certified operator looks like. Michelle Hess is a 4A water resource recovery operator with Monroe County Department of Environmental Services.

Kimmy Blanks Photography

What was your initial reaction to the lack of diversity in the water workforce?

Being the only female on the job is not a new experience for me. Really, it felt like any other blue-collar job I've had in the past. Coming from a small farming community, it wasn't unusual for me to be working with all white people, maybe some Hispanics. I think the industry as a whole is not recognized. The attitude for a long time was "if they don't know we exist then we're doing our jobs right." Unless there's a problem with the water coming

into or leaving the home, folks will pay little attention to us and that was preferred. With so few knowing that water has a workforce it's no wonder that it lacks diversity.

How do you feel we arrived at this point?

Oh boy, where to start? It's not a feeling, it's documented history. There were conscious decisions made decades ago that have turned systemic. If I had to put my finger on one thing, I think it all starts with the rules set up for where you're able to live. Richard Rothstein, a Distinguished Fellow of the Economic Policy Institute, makes the argument that even if we prohibit the effects of residential segregation it's not as though people can just up and move the next day the same way people could just pick any seat on the bus.

Federal, state and local policies were created allowing for the segregation of whites and Blacks. Without going too far into a history lesson I want to mention the Housing Act of 1949. After a lively debate and a fist fight on the Senate floor, the Housing Act of 1949 was only passed because it did not specifically prohibit racial discrimination, leaving administration of the program up to the

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local authorities. Black families were not permitted to buy the mass-produced homes built in the suburbs that were subsidized by the federal government. The Federal Housing Authority often added the condition requiring that deeds for a home in those subdivisions prohibit resale to Blacks. The results were the segregation of public housing in urban areas and the subsidization of white families to leave urban areas for the suburbs.

Add on top of that, our system of funding education largely through property taxes. This perpetuates schools in these historically segregated neighborhoods to be overcrowded and underfunded. Underfunded schools mean there is little money left over for field trips and without field trips to local utilities, there are fewer opportunities to expose Black and Hispanic kids to the industry. Without repeated exposure to our industry kids won't become interested in water as a career in the same way they become interested in careers as teachers, doctors or firefighters.

Have you witnessed unconscious bias in our industry?

Sure. My first year on the Operations Challenge team I was repeatedly asked how long I had worked in the lab. There were two other teams that year with female operators that said they were asked that same question all the time. There's no malicious intent behind it, just awkward small talk. There's an unconscious bias as to what a wastewater operator should look like. At the plant while I was training there were some guys that would step in front of me to crank on valves for me. It was nice, but I would tell them that if I can't do the same job as them I have no business being there.

Despite having worked in other blue-collar jobs, I will say that this was my first experience with conscious bias. Early on I was getting a lot of push back from my peers. I thought it was because I'm an enthusiastic hard worker, and I speak up (loudly) when I want something. I was very clear that I was gunning for promotions because at the time that was the only way to make a decent living wage within my department. But that wasn't it. I was told that it was because I am a woman. There are so few women holding operator titles that it's just assumed that you can't perform on the same level as the guys and when you do, there's a lot of grumbling about it.

Last year I read an article in one of our industry publications highlighting Pamela Rose as she retired from operations in a water treatment plant. She said she was required to lift and carry a 50-pound bag of copper sulfate across the floor and was then called back to move a 150-pound cylinder before she got the job even though most supervisors wouldn't ask a man to prove he could perform the same tasks. Although her story was from 25 years ago, I felt angst. I know there are women operators (and engineers for that matter) out there who have the same kind of experiences she did 25 years ago and that I did less than four years ago. I've also met women who were only given a shot because they shared the same military experience as the guy in charge of hiring. I've met women who have been pulled aside at work or at a conference and told they fill out their shirt or pants nicely. Growing up during the girl power movement of the 1990s I learned to expect this behavior and to strive to be the best at whatever I do just to be considered an equal to the men. As much as we hate to see decades of knowledge going out the door, I think a benefit of the wave of retirees is the conscious biases that leave with it.

What challenges does the lack of diversity in the water workforce present today?

The lack of diversity in the water workforce has contributed

to the gray tsunami most utilities are experiencing. The wave of guys retiring faster than young people coming in is causing a lot of stress on our utilities. The lack of diversity means we're missing out on a previously untapped labor market for our industry. Aside from an untapped labor market we're missing out on the different experiences that help to grow industries. We're also missing out on growing our local communities in a meaningful way.

Do you feel we need more training on diversity, equity and inclusion (DE&I) issues and how could that benefit us?

We do but each organization needs to look at why they need more training. It can't just be because an exec from the top says we need to. We've seen some of the success and failures of the affirmative action plans from the 1990s. We're not looking to check off boxes here. We're looking to incorporate different backgrounds, experiences and cultures into our workplaces and keep them here! There are many well-meaning folks who consciously select nonwhite males to try and increase their diversity, but there is little support or training that makes those people comfortable enough to stick around.

I think the DE&I training needs to be more than the virtual, click-through slide training many organizations have begun to use. We need the dialogue. We need to be face-to-face where we can interject comments, ask questions and be fully engaged. This is stuff we've been trying to address since the 1980s and 1990s and yet we still haven't figured it out. I also think that the training needs to be tailored to specific audiences. The training you give your human resources team should not be the same training you give to your operations team. Human resources departments should be focused on where to look for candidates while operations should be focused on how to make those candidates comfortable enough to stay.

When we talk about benefits the first thing decision makers want to know is, "how much?" How much time is this going to take away from my business and operations? How much money are we going to have to dump into this training? And for what? The answer is better profitability. It's expensive to have high employee turn-over rates. Employees who feel included and enjoy, or at least respect who they are working with, tend to stay with the same organization much longer than those who don't. There are now a number of published reports showing that diversity and inclusion translates to improved employee morale which creates more productivity and thus higher profitability.

The benefits don't end at company or utility profitability. They extend to the communities we all work and live in. Opening employment opportunities to underserved communities has cascading benefits for all of us. Regular, *well paying* employment translates to more stable home lives, healthier lifestyles, higher graduation rates, lower crime, and increased property values just to name a few. All of these things are interconnected and we are all missing out.

Do you think that the current climate of social unrest can assist or harm us in the water workforce?

I am hopeful that the current unrest can assist us. It has primed people to start having difficult and uncomfortable conversations. There are some community and political leaders who have taken this opportunity to address the conscious and unconscious biases within their own organizations. But I worry the continued unrest will harm us by turning into background noise. It takes decades to make real change happen and if folks see the movement as destructive people will stop listening.

What are the next steps? Where do we need to focus?

The number of areas to address is overwhelming but I think if we start with kids, the rest will start to fall into place. Our industry needs to do a better job engaging minority communities in STEM (Science, Technology, Engineering and Math) programs. We need to be knocking on doors instead of waiting for the off chance of them knocking on ours. As utility workers we need to focus on how we present ourselves to kids and to their teachers. The guys that have given a number of tours to school age children have at least one story of a teacher giving the “stay in school or you’ll end up here” speech. There is a historic undervaluing of utility workers. More and more of our operators are college educated. We are required to have a number of years of experience and specialized training before we’re allowed to sit for any certification exam. Once we’ve invited folks in, we need to give our utilities the tools they need to educate kids about how important our field is and the endless career paths available in our industry.

We should also focus on giving organizations the tools they need to guide their workplace cultures. It’s great to get kids involved but if they have an uncle that used to work at a plant or engineering firm but left because he didn’t feel welcomed there, our efforts to get kids involved are pointless.

How optimistic are you that we can make progress increasing equity within the water workforce?

As long as we can keep the narrative of increasing equity tied to economic benefit, I am very optimistic that we can make progress. There’s a lot going on in the world right now and people are tired of fighting. The issue of diversity, equity and inclusion is not going to go away until those fighting no longer feel the need to keep fighting for inclusion. Our industry had started working on addressing these issues before the U.S. seemed to be turned upside down. As former U.S. Secretary of State George Shultz once said, “You’ve got to have leaders who can come to a conclusion and lead.” I think NYWEA has those leaders.

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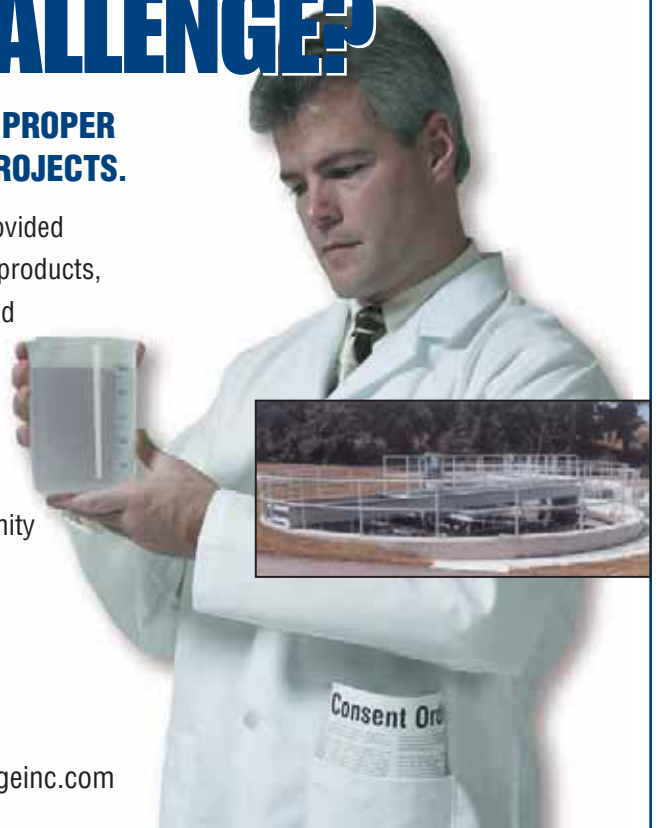
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The Community Choice

by *Mel Butcher*

What do you and I have in common?

If we were standing side by side, would an outsider see anything more than, “they’re both human”? After all, my upbringing was different from yours. Your hair is different from mine. My family dynamics are different from yours. Your spirituality is different from mine. I like different food. You like different sports. ...

And yet, we come together to work toward some common goals.

If you are reading this, then I know in some way, you work to contribute to clean water and water environment protection.

I feel confident that you and I agree on other things, too, like all children deserve access to clean water. And we want to be confident that when we turn on the tap, the water coming out is safe to drink. And we want to be confident that our wastewater is treated responsibly, so that our waterways and future water resources are protected.

Even with all our differences, I suspect many of our core values and aims align.

Listening

Recently, it has been difficult to focus on these similarities and our uniting qualities. If social media had a mind, we might imagine that mind is out to divide us as deeply as possible.

Celeste Headlee, of the popular TED talk *Ten Ways to Have a Better Conversation*, once wrote:

“Any time you enter a conversation, and especially when you are about to talk with someone who holds different beliefs from your own, ask yourself: What do you hope to get out of this exchange? What would you like to have happen at the end and how would you like to walk away from the other person? Angry, frustrated, and no smarter than when you started? You probably cannot change their mind, so perhaps your goal should be your own enlightenment. You can’t control what they take away from the conversations, but you can control what you get out of it.”

Our ability to raise our own consciousness and make choices accordingly might be the thing that makes humans unique.

Watching people, people like you, choose to step above division gives me hope.

We unite, despite the many differences we perceive, toward the aim of clean water and protected water resources. For what else might we choose to unite?

Sonder

“Sonder” is a new word to me. Sonder is the idea that you can come to an awareness that every person has an internal life and dialogue as rich and conflicted as yours.

Take a moment to stop.

Take a deep breath.

Visualize someone whom you believe is quite different from you. Once this person is in your mind’s eye, consider – what is in their mind?

Can you imagine their different thoughts?

Their beliefs?

Their motivations?

Can you imagine how they want their family members to have clean water? To live in a safe community? For their children to get a good education so they can make a living and contribute to society?

That person you imagined – did you realize that they, too, have suffered affronts, and experienced let-downs and shame?

How might a new, deeper understanding of the people around us – those we serve through our work, friends, neighbors, co-workers – change us? How might it change the way we choose to show up for others?

Over this past exceptional year, we as a society have been asked over and over to consider others. Public health officials have asked us to wear masks to protect one another, particularly those vulnerable to complications of COVID-19. Some people, people who may have skin color different from yours, have asked us to see and consider their lived experiences of bias, racism and ostracization and then, hopefully, take action.

With such new understanding and empathy, we open up our choices.

Can we choose to do more listening than telling?

Can we choose to acknowledge the pain others feel, even if it’s not the same pain we have experienced, and then choose to be part of the solution, rather than a bystander?

Can we choose to cultivate equity and inclusion, not because of a so-called “business case,” but because it’s the *right* thing to do?

Can we choose to find new ways to cultivate unity in our communities?

We have tremendous power and influence through **choice**.

I know the answers to these questions.

Every day, you get to decide for yourself. What will you choose?

Melissa (Mel) Butcher is a Regional Lead at Carollo Engineers, a U.S. consultancy focused solely on water with a new office in the state of New York. She earned a B.S. and M.S. in civil engineering with a water focus from the University of South Florida. Mel’s current work focus includes industrial water treatment, water risk and resilience. In her free time, Mel serves as a partner to A Career That Soars, a leadership and career development community for ambitious women. Get in touch at MelButcher.com.



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STEM-Based Higher Education Resources and Initiatives to Promote Inclusion and Diversity

by Douglas Daley and Madison Quinn

Our motive in compiling this article is to summarize the opportunities available to our current (and future) NYWEA members in supporting inclusion and diversity within their respective organizations. As this is not intended as an exhaustive investigation into how to “be inclusive,” we focused on examples of how New York state institutions of higher education are working to change the landscape of inclusivity and diversity within the science, technology, engineering and mathematics (STEM) professions. It’s no coincidence that we focused on our alma mater institutions that have STEM-focused educational missions and active NYWEA student chapters.

We recognize that universities and our NYWEA student chapters are at the forefront of advocating for and adopting institutional and academic initiatives that will improve the awareness, attitude, knowledge and skills of future professionals in fostering inclusive and diverse working environments. Additionally, many water workers are approaching retirement within the next decade. Across the industry, we need to not only fill those vacancies in the water workforce but recruit a diverse group of young people that brings fresh perspectives and innovative solutions to meet water quality challenges and reflect the diversity of the communities they serve. Recruiting students from underrepresented populations to pursue degrees in STEM disciplines will help the water sector build a more robust water workforce in the future.

This article is organized to summarize educational resources for underrepresented groups in STEM education and to highlight extracurricular and institutional actions that promote inclusivity.

Resources for Underrepresented Groups in STEM Education

Funding Resources to Engage Underrepresented Groups in STEM Higher Education

- Collegiate Science and Technology Entry Program
- Ronald E. McNair Post-Baccalaureate Achievement Program
- Louis Stokes Alliances for Minority Participation Program
- New York State Arthur O. Eve Higher Education Opportunity Program
- New York State American Indian Aid Program
- Academic Success Program to Improve Retention and Education

Academic and Professional Efforts to Promote Inclusion and Diversity

- The State University of New York (SUNY)
- Accreditation Board for Engineering and Technology
- American Society of Civil Engineers Code of Ethics
- Center for Native Peoples and the Environment
- SUNY-ESF Women’s Caucus

Organizations Engaging Underrepresented Students

- National Society of Black Engineers
- Society of Hispanic Professional Engineers
- Out in STEM



Recruiting students from underrepresented populations to pursue degrees in STEM disciplines will lead to a more robust workforce in the future.

istockphoto.com, gorodenkoff

Funding Resources to Engage Underrepresented Groups in STEM Higher Education

Collegiate Science and Technology Entry Program (CSTEP)

The goal of CSTEP is to increase the number of historically underrepresented and economically disadvantaged students that are pursuing careers in STEM or licensed professions. Students must be New York state residents.

Universities with NYWEA student chapters that have CSTEP programs include:

- Brooklyn College
- City College of New York
- Clarkson University
- Cornell University
- Hofstra University
- New York University
- Stony Brook University
- University at Buffalo

For more information, visit the website (<http://www.nysed.gov/post-secondary-services/collegiate-science-and-technology-entry-program-cstep/>).

Ronald E. McNair Post-Baccalaureate Achievement Program

Ronald E. McNair was among the USS Challenger space shuttle’s seven-member crew that met with tragedy and death in January 1986. As a tribute to his lifelong achievements, Congress and the McNair family formed the Ronald E. McNair Post-Baccalaureate Achievement Program to assist young people in not only following

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McNair's path, but in taking the initiative to blaze trails of their own. First-generation college students from low-income backgrounds or students from underrepresented groups interested in performing research in science or engineering can become a McNair Scholar. Colleges and universities that have an outstanding record of research are considered for the Federal TRIO Grant, which provides operating monies.

Universities with NYWEA student chapters that have McNair Programs include:

- Clarkson University
- Cornell University
- University at Buffalo

For more information visit the website (<https://mcnairscholars.com/resources/>).

Louis Stokes Alliances for Minority Participation Program (LSAMP)

The Louis Stokes Alliances for Minority Participation (LSAMP) program is an alliance-based program funded by the National Science Foundation (NSF) and the universities participating in each alliance. The goal of the program is to assist universities and colleges in diversifying the nation's workforce by increasing the number of STEM baccalaureate and graduate degrees awarded to populations historically underrepresented in these disciplines: African Americans, Hispanic Americans, American Indians, Alaska Natives, Native Hawaiians and Native Pacific Islanders.

The Upstate Louis Stokes Alliance for Minority Participation (ULSAMP) is a partnership of:

- Clarkson University
- Cornell University
- Monroe Community College
- SUNY Onondaga Community College
- Rensselaer Polytechnic Institute
- Rochester Institute of Technology
- Syracuse University (lead institution)

The New York City Louis Stokes Alliance for Minority Participation (NYC-LSAMP) is an alliance of City University of New York (CUNY) colleges:

- Borough of Manhattan Community College
- Bronx Community College
- Brooklyn College
- City College
- College of Staten Island
- Hostos Community College
- Hunter College
- Kingsborough Community College
- LaGuardia Community College
- Lehman College
- Medgar Evers College
- New York City College of Technology
- Queens College
- Queensborough Community College
- York College
- CUNY Graduate Center

For more information, visit the website (https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13646).

New York State Arthur O. Eve Higher Education Opportunity Program (HEOP)

The Arthur O. Eve Higher Education Opportunity Program (HEOP) provides a broad range of services to New York state res-

idents who, because of educational and economic circumstances, would otherwise be unable to attend a postsecondary educational institution. HEOP students are provided with academic support services, tuition assistance, supplemental financial assistance, and full need packaging to enable them to successfully complete the institutional components required for graduation.

Universities with NYWEA student chapters that have HEOP include:

- Clarkson University
- Cornell University
- Manhattan College
- New York Institute of Technology
- New York University

For more information visit the website (<https://bit.ly/3oBTYWe>).

New York State American Indian Aid Program

In 1953, the New York State Legislature authorized Education Law Section 4118, which provides funding for American Indian students from tribes located within the state. Eligible American Indian students can receive grant awards of up to \$2,000 per year for attending any approved, accredited postsecondary institution in New York state. Students also may receive student aid for less than four years of study and for part-time study.

For more information, visit the website (<http://www.p12.nysed.gov/natamer/studentaidinfo.html>).

Academic Success Program to Improve Retention and Education (ASPIRE)

Clarkson University's "ASPIRE: Academic Success Program to Improve Retention and Education," is funded by both the NSF and Clarkson University. The program seeks to:

1. Increase the number of women and minority students completing degrees in STEM majors.
2. Prepare these students for professional careers.
3. Place these students in STEM-related positions upon graduation.

This is accomplished through an integrated program of financial aid, academic success programming, professional development activities and individual faculty mentoring.

The program serves women and minority students who are chronically underrepresented in STEM fields, thus serving to increase the breadth and depth of talent in STEM disciplines and addressing a recognized national need to substantially increase the number of American scientists and engineers. Additionally, increasing the number of women and minority students on Clarkson's small, rural campus exposes all students to diverse cultures and perspectives to better prepare all students to compete in the global workplace.

For more information visit the website (https://www.nsf.gov/awardsearch/showAward?AWD_ID=1060382).

Academic and Professional Efforts to Promote Inclusion and Diversity

The State University of New York (SUNY)

In 2015, SUNY launched an intentional strategic focus on diversity with the work of the SUNY Diversity Task Force and the subsequent adoption of its recommendations by the SUNY Board of Trustees as part of the SUNY Diversity, Equity and Inclusion Policy (the "Policy"). Through implementation of the Policy, SUNY will lead the national dialogue and achieve its goal of becoming the

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most inclusive institution of public higher education in the country. SUNY hopes to provide a dynamic model for campus inclusion programs with a goal of continuous improvement throughout every aspect of campus life.

A campus strategic diversity plan that relies on the guiding principles of the Policy will help focus campus efforts to meet the challenges associated with building a more inclusive campus environment. Highlights from the Policy:

- Diversity and inclusion are integral components of the highest quality academic programs and the strongest campus climate.
- SUNY's statutory mission makes clear its responsibility to provide the broadest possible access, fully representative of all segments of the population of New York state.
- A multi-pronged approach to strengthening diversity and inclusion is essential for a system of SUNY's stature.
- The appointment of a chief diversity officer on each campus to implement best practices related to diversity, equity and inclusion in recruitment and retention.
- The campus chief diversity officer will work collaboratively with units across each campus, including but not limited to the offices of academic affairs, human resources, enrollment management and admission, as well as with the network of SUNY's chief diversity officers, to implement best practices.

For more information visit the website (<https://bit.ly/35rLwl3>).

Accreditation Board for Engineering and Technology (ABET)

ABET is a nonprofit, nongovernmental organization with ISO 9001:2015 certification. ABET recognizes that, to succeed, graduates must have the ability to thrive in diverse and inclusive environments. ABET states that professions require creativity and innovation, which are best achieved when people with varied perspectives, experiences and talents work toward a common goal.

ABET is committed to the principles of diversity, equity and inclusion through global leadership in STEM education. According to ABET, "Inclusion is the intentional, proactive, and continuing efforts and practices in which all members respect, support and value others. An inclusive environment provides equitable access to opportunities and resources, empowers everyone to participate equally, and offers respect in words and actions for all."

Engineering programs seeking ABET accreditation must prepare students for the global workforce by demonstrating that they have achieved certain outcomes that describe what students are expected to know and be able to do by the time of graduation. Effective in 2019-2020, ABET's Criteria for Accrediting Engineering Programs were updated to specifically address "inclusion" in Outcome 3.5, which expects that all graduates of an accredited engineering program have "an ability to function effectively on a team whose members together provide leadership, create a collaborative and **inclusive** [emphasis added] environment, establish goals, plan tasks and meet objectives." This expectation will ensure that the next generation of engineers will understand the fundamentals of how to create an inclusive workplace and team environment.

For more information visit the website (<https://bit.ly/37Nm3Ts>).

American Society of Civil Engineers (ASCE) Code of Ethics

The ASCE Code of Ethics was recently updated and modified (Oct. 26, 2020) to incorporate inclusivity, diversity and equity into the ethical fabric of engineering practice. The Preamble explicitly addresses these principles by declaring that engineers "... treat all persons with respect, dignity, and fairness in a manner that fosters

equitable participation without regard to personal identity."

The Code of Ethics further elaborates that an engineer's responsibilities to society includes recognition of "... the diverse historical, social, and cultural needs of the community, and incorporate these considerations in their work." Further, an engineer's ethical responsibility to their engineering peers must "... promote and exhibit inclusive, equitable, and ethical behavior in all engagements with colleagues."

To view the Code of Ethics in full, visit the website (<https://www.asce.org/code-of-ethics/>).



Solutions to complex problems require not only scientific expertise, but understanding of the cultural context in which they occur.

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Center for Native Peoples and the Environment at the SUNY College of Environmental Science and Forestry, Syracuse, New York (SUNY-ESF)

The mission of the SUNY-ESF Center for Native Peoples and the Environment is to create programs that draw on the wisdom of both Indigenous and scientific knowledge in support of our shared goals of environmental sustainability. The Center incorporates Indigenous perspectives and knowledge for the benefit of Native students and work to educate mainstream students in a cross-cultural context. The Center includes a significant outreach element focused on increasing educational opportunities for Native American students in environmental sciences, research collaborations, and partnerships with Native American communities to address local environmental problems.

Native Americans are the most underrepresented group in the American scientific community. If the valuable contributions of Indigenous thinking are to be incorporated into the realm of environmental problem-solving, we must envision ways to increase the participation of native people in the environmental dialogue.

Solutions to complex ecological problems require not only scientific expertise, but also understanding of the cultural context in which they occur. Cross-cultural competence thus becomes an important component of functioning effectively in the global scientific community. This is particularly true in the environmental disciplines, where science and culture intersect.

Due to the efforts of the Center, SUNY-ESF organizations now start meetings with an acknowledgement of "Where We Stand." In 2015, SUNY-ESF instituted a protocol recognizing "that we have the privilege of meeting today in the ancestral lands of the Onondaga Nation, the center of the Six Nations of Haudenosaunee (Iroquois)

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Confederacy, who we honor for their many contributions, including the original philosophy and practice of environmental stewardship.”

For more information visit the website (<https://www.esf.edu/native-peoples/>).

SUNY-ESF Women’s Caucus

The SUNY-ESF Women’s Caucus was formed in 1994 by students, staff, and faculty who wanted the opportunity to collaborate and socialize, and to mentor one another. This nonpartisan Caucus still works to improve the climate for women at SUNY-ESF, to plug leaks in the STEM pipeline, to foster community, to improve services for all SUNY-ESF families, and for respectful forums for diverse ideas. Any woman student (undergraduate or graduate), staff or faculty member can join the Women’s Caucus; contingent faculty, alumnae and emeritae are also welcome.

The SUNY-ESF Women’s Caucus shares news and notes through a blog, *WiSE Professions & Programs*. A recent post reads as follows:

On Women’s Equality Day (Aug. 26, 2020), the National Academies reminds academia to “continue to drive bias, discrimination, and harassment out of our institutions and society. Despite decades of research, funding, and programs dedicated to increasing the representation of women in science, engineering, technology, mathematics and medicine [STEMM], the numbers, particularly in leadership roles, have remained low or stagnant in many fields, especially among women of color. Our [free, downloadable] reports explore the wide range of structural, cultural and institutional patterns of bias, discrimination and inequity that affect women, and the steps that can be taken to increase representation in STEMM.”

Historically, these materials are promoted most heavily to marginalized groups. However, those impacted most negatively by marginalization cannot fix the bias, or the culture that penalizes them for asking, by themselves. We all have a role in creating, and maintaining an inclusive, equitable work and learning environment. Students learn not only from course content, but by the examples set by faculty, staff and administration in their classroom and team management, policies and mentorship models.

National Academies Press reports that address inclusion, diversity, and equity are available at the website (<https://bit.ly/2VQCYN>).

For more information about the Women’s Caucus, visit the website (<https://www.esf.edu/womenscaucus/>).

News and notes from the Women’s Caucus are available on the blog *WiSE Professions & Programs*; visit the website (<https://esfwomen.blogspot.com/>).

Organizations Engaging Underrepresented Students

National Society of Black Engineers (NSBE)

The National Society of Black Engineers (NSBE) is one of the largest student-governed organizations based in the United States. NSBE supports and promotes the aspirations of collegiate and pre-collegiate students and technical professionals in engineering and technology. NSBE’s mission is “to increase the number of culturally responsible Black engineers who excel academically, succeed professionally and positively impact the community.” NSBE offers its members leadership training, professional development activities, mentoring, career placement services and community service



Preparing students to become leading innovators, scientists, mathematicians and engineers is the goal of professional organizations.

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opportunities. (<https://www.nsbe.org/About-Us.aspx>)

Universities with NYWEA student chapters and NSBE collegiate chapters include:

- City College of New York
- Clarkson University
- Columbia University
- Cornell University
- Hofstra University
- Manhattan College
- New York Institute of Technology
- New York University
- Rensselaer Polytechnic Institute
- Stony Brook University
- University at Buffalo

For more information, visit the website (<https://www.nsbe.org/Membership/Find-a-Chapter.aspx>).

Society of Hispanic Professional Engineers (SHPE)

The Society of Hispanic Professional Engineers (SHPE) is the nation’s largest association dedicated to fostering Hispanic leadership in the STEM field. The organization raises awareness, provides access, and prepares Hispanic students and professionals to become leaders in the STEM field. SHPE’s vision is a world where Hispanics are highly valued and influential as the leading innovators, scientists, mathematicians and engineers.

Universities with NYWEA student chapters and SHPE chapters include:

- Clarkson University
- Cornell University
- Hofstra University
- Manhattan College
- New York University
- University at Buffalo

For more information, visit the website (<https://www.shpe.org/>).



To succeed, students must learn to thrive in diverse and inclusive environments. *istockphoto.com, Morsa Images*

City College of New York's Latin American Engineering Student Association is also a chapter of the Society of Hispanic Professional Engineers (LAESA-SHPE); more information is available on the website (<https://groups.cuny.cuny.edu/laesashpe/home/>).

Out in STEM (oSTEM)

Out in Science, Technology, Engineering and Mathematics (oSTEM), Inc. is a 501(c)(3) nonprofit professional association for lesbian, gay, bisexual, transgender and queer and/or questioning (LGBTQ+) people in the STEM community. The oSTEM mission is to empower LGBTQ+ people in STEM to succeed personally, academically, and professionally by cultivating environments and communities that nurture innovation, leadership and advocacy.

Universities with NYWEA student chapters and oSTEM chapters include:

- Cooper Union
- New York University
- Stony Brook University
- University at Buffalo

For more information, visit the website (<https://www.ostem.org/page/about-ostem>).

Douglas Daley is an associate professor at the SUNY College of Environmental Science and Forestry and may be reached at djdaley@esf.edu. Madison Quinn is the Communications Manager and Scholarship Program Administrator for NYWEA and may be reached at madison@nywea.org.



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The Hidden Role of Water Infrastructure in Driving a COVID-19 Recovery

by Newsha Ajami and Joseph W. Kane

The COVID-19 pandemic has not only disrupted the social and economic realities of our communities, but also undermined some of the basic infrastructure we depend on. Our water infrastructure has been at the heart of this realization; its importance to health, hygiene, and safety has never been more obvious, yet millions of disadvantaged and vulnerable households still lack reliable and affordable access to water. Meanwhile, climate change has fueled extreme droughts, fires, and floods that have disrupted or destroyed this essential infrastructure. COVID-19 has exposed the continued neglect of our water infrastructure, magnifying long-standing social and environmental stressors as well as economic inequities.

State and local leaders manage most of our water needs, and many recognize the gravity of the challenges, despite facing massive fiscal constraints due to COVID-19. But federal leaders have not shown the same urgency. As Congress debates recovery strategies and stimulus efforts, water should be a bigger part of the conversation. Water can serve as a lever to achieve greater economic equity and access, environmental resilience and technological innovation, among other benefits. Now is the time for Washington to elevate water as a core issue to drive a lasting recovery.

In a recent webinar hosted by the Stanford Woods Institute for the Environment ([video link at the end of this article](#)), we discussed a set of practical solutions to address the gaps in water infrastructure and advance new innovations. Below are five key areas of intervention that federal leaders should be focusing on.

Boosting Water Equity and Affordability

Our massive physical infrastructure needs (leaking pipes, overwhelmed sewers and outdated treatment plants) often overshadow the needs of individual households. Water is ultimately an enabler for health and opportunity, but too many people cannot access or afford it. Lower-income communities of color frequently face some of the greatest water inequities – increased lead exposure and other harmful contaminants threaten drinking water quality in many of these communities, while storm and wastewater overflows inundate their streets and backyards. COVID-19's economic impacts have also highlighted persistent struggles to pay bills and avoid water shutoffs.

Federal policymakers need to focus more on people, not just projects. That means defining and measuring our water needs in light of our most vulnerable households. Fortunately, the Environmental Protection Agency (EPA) has started to revise its inadequate definition of water affordability to serve as guidance for utilities. But this should be just the beginning – the nation requires increased technical and financial support for customer assistance programs, including a comprehensive utility bill assistance program.

Amplifying Water in Climate Discussions

Climate change is inextricably linked to changes in the water cycle, such as too much or too little water, shifts in precipitation patterns, and untimely melts. Yet much of our national climate discussion focuses on mitigation (reducing greenhouse gases, improving energy efficiency) rather than adaptation (coping with sea level rise, handling extreme storms, etc.). While both are important,

federal policymakers need to clearly acknowledge and invest in water-related adaptation efforts, especially since climate disasters tend to affect lower-income, disadvantaged communities the most.

When addressing wildfires, floods or droughts, local governments are largely on their own. The Federal Emergency Management Agency (FEMA) and other federal agencies provide disaster relief, but utilities and other local leaders often struggle to accelerate proactive infrastructure investments that would improve their long-term resilience.

Federal leaders must prioritize our water challenges in climate discussions, measure the fiscal impacts to states and localities, and build more financial and technical capacity at the state and local level for water-related adaptation. For example, establishing clearer federal regulations to govern private sector environmental, social and governance (ESG) investment – including ways to collaborate with public sector entities such as local water utilities – could get more projects done and help more communities.

Breaking Down Governance Silos

There are more than 50,000 water utilities scattered across the country, making it hard to consistently and comprehensively govern (let alone define) our most pressing water infrastructure needs. Many utilities use antiquated business models that assume resource abundance and steady water sales. Meanwhile, federal agencies such as the EPA operate in the same bureaucratic silos and oversee the same regulations that they did decades ago.

These outdated business practices, rigid laws, and fragmented governance structures impair the maintenance of our existing infrastructure and investment in new and innovative solutions.

Federal policymakers need to break down these silos in order to better manage our national water needs and support a forward-looking governance model centered around the “One Water” concept. This concept involves looking at our drinking water, wastewater and stormwater needs collectively, particularly when developing plans and launching investments.

To promote more collaborative governance across and within utilities, federal leaders should provide more guidance on the process for setting water rates so as to guarantee access for all households. Second, they should introduce new financial tools (such as a Public Benefits Charge) to enable more integrated resource management. Finally, leaders should implement new regulatory measures (such as water diversification portfolio standards) to better assess and support the financial standing of all utilities.

Investing in the Water Solutions of Today and Tomorrow

Our 21st century water infrastructure must address our 21st century environmental, economic and health challenges. Federal leaders can embrace this shift in two ways.

First, there needs to be a transition to a hybrid infrastructure model that promotes a combination of gray/green and centralized/decentralized infrastructure improvements. Rather than supporting large, centralized treatment facilities and other traditional “gray” infrastructure (which can be costly to maintain and susceptible to climate risks), federal leaders need to look toward nature,

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floodplains and other “green” infrastructure for more flexibility and environmental resilience. Doing so can help us recover and reuse every drop of water in our system, create operational redundancies through more distributed systems, and lead to many other environmental and community benefits. Federal leaders can promote these new designs through new financial incentives and pathways – including loans, grants and tax credits – that encourage local experimentation.

Second, federal leaders need to embrace the digital transition in our water systems. The COVID-19 pandemic has disrupted our standard operating procedures and highlighted the importance of digital solutions, including “advanced metering infrastructure” and leak-detection analytics that help utilities prevent resource loss and maintain affordable, dependable service. Federal leaders should revisit regulations that govern federally owned infrastructure systems and federally funded projects to find room for data-driven solutions. For instance, Forecast Informed Reservoir Operations can help avoid dam failures, and revisions to the U.S. Army Corps of Engineers’ benefit-cost analysis can better evaluate water resources projects.

Expanding Green Careers

Improving the nation’s physical infrastructure depends on a skilled workforce to construct, operate and maintain our facilities, but federal policymakers have overlooked these needs for decades. Many of the operators, engineers and technicians who keep our water clean and essential services online are reaching the ends of their careers and frequently lack visibility, resulting in a diminished pipeline of talent. Meanwhile, millions of workers have lost their jobs during the pandemic, and there are mounting struggles to connect the unemployed to stable, well-paying careers. This gap in hiring, training, and retention comes even as water jobs – many of which are in the skilled trades – offer competitive pay and the opportunity to develop valuable, transferable work experience.

The COVID-19 recovery gives us a chance to not only rebuild and renew our infrastructure, but to connect more and different types of workers to water careers. Establishing a new, 21st century federal infrastructure workforce program aimed at providing flexible learning and career opportunities in the skilled trades – including water – can help disadvantaged and disconnected workers earn higher pay, learn more skills and seize enduring opportunities. Expanded apprenticeships and work-based learning programs can prepare a new generation of talent while retraining and assisting other workers in water careers.

Together, these five areas of intervention reveal a national need to focus on future water priorities, not just prevailing trends. Water remains an essential service to all households and industries, but we can’t keep taking it for granted; federal leaders need to intentionally elevate it as an economic and environmental priority. Proactive federal investment in new types of projects and people-centered strategies can support climate resilience, affordable access and equitable growth. The COVID-19 pandemic has highlighted water’s foundational role and the cracks in our existing system – now it’s time to strengthen our commitment to water solutions that can support us for years to come.

Newsha Ajami is the director of Urban Water Policy with Stanford University’s Water in the West program, and a senior research associate at the Stanford Woods Institute for the Environment. She may be reached at newsha@stanford.edu. Joseph W. Kane is a senior research associate and Associate Fellow at the Brookings Metropolitan Policy Program. He may be reached at jkane@brookings.edu.

Video link to a recent webinar hosted by the Stanford Woods Institute for the Environment: <https://youtu.be/tsFxY5CjeFk>

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Challenge Coins

by Tanya May Jennings

Issuing challenge coins started as a military tradition; today the distribution of challenge coins has been adopted by municipal organizations, clubs and universities throughout the world.

A challenge coin is a small medallion bearing an organization's insignia or emblem and carried by the organization's members. Traditionally, they might be given to prove membership when challenged and to enhance military morale. Modern challenge coins are made in a variety of sizes and are often made using popular culture references to include superheroes and other well-known characters in a way to create parody. Historically challenge coins were presented by unit commanders in recognition of special achievement by a member of a unit.

The origins of the coins can be traced back to the Roman Empire; soldiers were presented the coins to recognize their achievements. Soldiers who acted bravely in battle would be rewarded by their superiors, who would buy that soldier a drink. They would give that soldier a coin to buy the drink, but more commonly, they would make a spectacle by slapping it down loudly on the bar or presenting them a coin in an informal setting. Receiving a coin from an officer was generally a considerably more valuable coin and rarely presented.

As a way to honor our Operations Challenge teams, I reached out to William Grandner to run the idea by him to issue these coins to our 2020 Operations Challenge teams. This year seemed the perfect opportunity to provide such a

memento for our teams competing in the national WEFTEC competition. This has been a difficult year for everyone, and in this time of uncertainty a token like this could be very meaningful.

The WEFTEC Operations Challenge Committee developed an idea to create a virtual 2020 WEFTEC Operations Challenge event. We were so pleased that the WEFTEC Operations Challenge leaders decided to carry on despite the pandemic and hold the challenge virtually. Usually, this competition takes place in either New Orleans or Chicago but due to COVID-19, this year's competition took place virtually across member organizations. A total of 29 teams participated in the national event and NYWEA had five teams who represented New York. Teams included: NYCDEP Rockaway Sludge Hustlers and NYCDEP Bowery Bay Coyotes; Long Island Brown Tide; Genesee Valley Water Recyclers; and Watertown Water Bears. All teams performed exceptionally given the challenges of competing remotely.

These challenge coins are a token of thanks to each competitor as well as recognition of a job well done from NYWEA. We hope these coins will become a tradition at future events and will hold a special memory for years to come.

Tanya May Jennings is the Operator Certification Program Administrator for NYWEA and may be reached at tmj@nywea.org.

The design of the NYWEA challenge coin. Top: front of the coin. Bottom: back of the coin. Actual coins are 1.75 inches in diameter.



2020 VIRTUAL OPS CHALLENGE TEAMS



Five teams competed in the Operations Challenge during WEFTEC Connect. Top row, left to right, **NYCDEP Bowery Bay Coyotes** (Chris Reyes, Yue Yue Guo, Anthony Quadrino, Mike Prats and Dragan Pilovic); **Watertown Water Bears** (Seth Foster, Angel French, Jay Slate, Mark Crandall) and **Genesee Valley Water Recyclers** (Anthony Filer, Michelle Hess, Angelo Dinottia, Lucas Kasperowicz and Will Monier). Bottom row, left to right, **NYCDEP Rockaway Sludge Hustlers** (Yu Tung Chan, Ettore Antenucci, Robert Ferland and Robert Ortiz) and **Long Island Brown Tide** (Jake Miller, Rob Jentz, Nick Barresi and Hector Soto). NYWEA was well represented during the virtual Operations Challenge. Thank you to all the coordinators and team members who put so much effort into the competition!



The Case for a Comprehensive Workplace Wellness Initiative for NYC Municipal Employees

by Leslie F. Boden and Andrew Goodman

Editor's Note: This is an excerpt from the Executive Summary of a policy brief on the benefits of wellness initiatives for municipal employees of New York City. During the coronavirus pandemic, municipalities and businesses throughout New York state have been faced with new challenges in supporting employees' physical and mental health, while continuing to function in a reduced economy. Workplace wellness initiatives are one means to meet these challenges. The full policy brief is available online at: <https://www1.nyc.gov/assets/olr/downloads/pdf/wellness/wellnessmatters/workwell-policy-brief.pdf>.

New York City's workers need to be healthy to be productive and effective at work and in their communities. A worksite wellness program enables city workers to live healthy, productive lives and deliver the best public services in the nation.

Why NYC Should Invest in its Municipal Employee Workplace Wellness Initiative

New York City's roughly 380,000 municipal employees power our vibrant, safe and thriving city. Yet, as in the city's general population, many employees suffer from or are at risk for preventable diseases or mental health challenges – high blood pressure, obesity, diabetes and depression, among others – that diminish their work performance and impact their quality of life (Figure 1). New York City's workers need to be healthy to be productive and effective at work, at home and in their communities. Investing in a comprehensive workplace wellness initiative will reduce health care costs and enhance efforts to attract well-qualified candidates to civil service employment. Most importantly, it will enable city workers to live healthy, productive lives and deliver the best public services in the nation.

WorkWell NYC is an innovative workplace wellness program of the New York City Office of Labor Relations in collaboration with the New York City Department of Health and Mental Hygiene (DOHMH), ThriveNYC, and the leadership of the city's unions. The program has taken initial, successful steps to improve the health of New York City's municipal workforce with a spec-

trum of evidence-based health promotion programs that have been enthusiastically embraced. WorkWell NYC can have the urgently needed deep and broad impact on the health of the city's employee population if this initiative can be sustained, expanded and disseminated further. WorkWell NYC is well positioned to make an important contribution to reaching the [New York City mayor] de Blasio administration's goals of health, equity, and resiliency for all New York City residents.

Benefits of Workplace Wellness Initiatives

Worksite wellness programs that are well designed, well implemented, and have strong leadership support can result in numerous benefits for employees, employers, and the public that depends on myriad government services. These include:

- Improved employee physical and mental health, including reduced stress and mental health issues.
- Reduced health care costs. Return-on-Investment (ROI) analyses of comprehensive workplace wellness programs show medical care cost savings of \$3.27 per dollar spent, after initial start-up costs, which increase over time. A recent ROI analysis conducted for New York City (Figure 2), with conservative assumptions, projected a positive ROI on direct medical expenditures within five years (\$1.07 ROI per dollar spent) and growing over time (\$1.88 at 10

years (Goetzel 2018)).

- Improved productivity due to reduced absenteeism, presenteeism (coming to work but not fully functioning due to illness or injury), and short-term disability and improved employee retention, recruitment and job satisfaction. While these improvements have enormous nonmonetary value in the workplace, their benefits are also generally shown to result in a ROI of \$2.73. The recent ROI analysis for New York City projects a savings of \$1.27 within three years and \$3.15 at 10 years, in addition to savings of direct medical expenditures.

What's Needed to Realize the Known Benefits

The workplace is a natural and powerful place in which to promote health among workers, who typically spend about half of their waking hours there.

No element is more pivotal than senior executive leadership in promoting a culture of health and well-being in the workplace. Agency and union leaders can model behaviors by engaging in workplace health programs, steering organizational plans, priorities and policies, and committing resources to implement approaches that work. In organizations with leadership support, employees are more likely to engage in health promotion programs, recommend their employer to others, be moti-



Figure 1. An unhealthy workplace can contribute to decreased productivity and increased medical costs.

WorkWell NYC

vated to do their best, and are less likely to leave their jobs.

For worksite efforts to be effective, employers must go well beyond health education sessions or on-site physical activity classes and establish an organizational culture of health, defined as “a workplace that places value on and is conducive to employee health and well-being” (Kent, et al. 2016), a critical underpinning to successfully improve the physical and mental health of employees. Cultivating a workplace culture of health is essential for a worksite health promotion initiative to achieve its potential fiscal, health, well-being, engagement and productivity outcomes.

Programs with all the following ingredients have been shown to succeed in realizing the value of investing in employee health and well-being:

1. Organizational leadership.
2. Dedicated team of managers, union representatives and workers.
3. Data-driven strategy built on workplace health assessment.
4. Operating plan that includes program and implementation planning and management.
5. Comprehensive, varied, integrated programs and activities.
6. Policies and practices that support workplace wellness goals.
7. Strategic communications.
8. Evaluation that determines impact and allows for program refinement.

Preventable health problems diminish the quality of city workers’ lives, their productivity at work, their engagement as productive community members, and

the quality of the services they deliver. WorkWell NYC provides a ready foundation of expertise and resources for a robust workplace wellness initiative for all city employees. Seizing on emerging opportunities to implement comprehensive workplace wellness efforts within agencies will increase workforce health literacy and education and enable city employees to make more strategic use of their medical benefits, have better health, and provide better service while lowering costs for the city, agencies and employees alike.

Prepared for the New York City Office of Labor Relations by Leslie F. Boden, MSUP, of Leslie Boden Consulting and Andrew Goodman, M.D., MPH, of New York University College of Global Public Health.

References

Goetzel, R. 2018. *A Return-on-Investment (ROI) Analysis Resulting from a Comprehensive Risk Reduction and Health Promotion and Well-Being Program for City of New York Employees*. Institute for Health and Productivity Studies, Johns Hopkins Bloomberg School of Public Health: Sept.

Kent, K., R.Z. Goetzel, E.C. Roemer, A. Prasad, and N. Freundlich. 2016. “Promoting Healthy Workplaces by Building Cultures of Health and Applying Strategic Communications.” *J. Occupational and Environmental Medicine* 58 (2): 114-122.

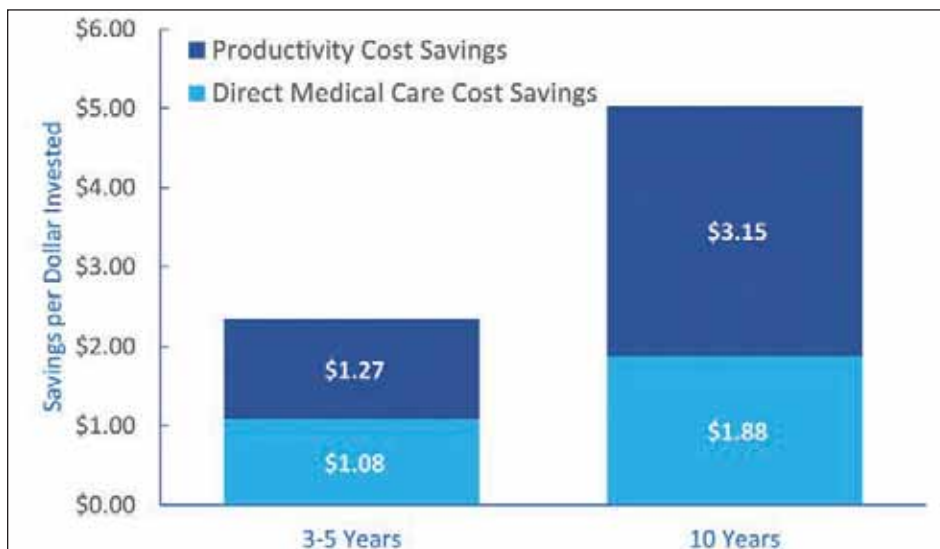


Figure 2. Workplace wellness projected return-on-investment for New York City (Goetzel 2018).
WorkWell NYC

WorkWell NYC’s values embody who we are and underscore everything we do to empower City of New York employees to live their healthiest lives:

Inclusion: We believe that every person should have access to live their healthiest life, regardless of their age, race, ethnicity, gender identity, sexuality or ability. We strive to build a team that reflects the City we serve and advance causes that contribute to a more equitable one.

Diversity: There is unlimited value in bringing people together with different ideas, strengths, interests, and cultural backgrounds to work toward a common goal. We believe difference is at the heart of progress.

Innovation: We actively seek unique opportunities to deliver customized health and wellness programs to City employees. We are inventive, adaptable, persistent, and always open to new ideas.

Quality: With an intentional focus on high-quality service, we use data, evidence, and continuous process improvement to develop customized programming to City employees.

Teamwork: We actively work to create a supportive, team-based work environment that allows each employee to share their specific gifts and strengths.

Passion: What we do matters. We are highly dedicated to whole-person health both in and out of the work environment. Our passion leads to high-quality programs that empower City employees to actively participate in their own wellness journeys.

Integrity: We are committed to being open, honest and genuine. We take pride in the work that we do and the services we provide.

Fun: We enjoy what we do. We want those who join us to do so as well. We seek to create a workplace culture where wellness is as good to you as it is good for you.

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Wards Island WRRF mixers with wipes wrapped around the shaft.
Jean Schwarzwald/DEP

“Flushable” Wipes at New York City Water Resource Recovery Facilities: Overcoming Challenges

by Pamela Elardo and Irina Dopson

Nationwide, water resource recovery facilities (WRRFs) continue to battle against so-called “flushable” wipes. Despite the wipes being marketed as “flushable,” they do not break down or dissolve after being flushed and contribute to generating “fatbergs,” resulting in clogged sewers and damage to equipment at WRRFs.

Concerns associated with “flushable” wipes have arisen over the last two decades. Originally designed by American inventor Arthur Julius in 1957, they were first commercialized in 1963, when the Wet-Nap was introduced to the market. The first Wet-Nap was given to customers of Kentucky Fried Chicken. Since then the market has evolved and now includes a variety of “flushable” wipes. Wipes are popular among consumers but pose significant challenges to wastewater management.

In 2018 the New York City Department of Environmental Protection (DEP) ordered an independent evaluation of 28 different wipe products, which were tested for their flushability using the Disintegration Sloss Box Method. Many of these samples were labelled as “flushable” by the manufacturer and included baby wipes, biodegradable flushable wipes, medicated wipes, cleaning makeup-remover towelettes, disinfecting wipes, hand sanitizing wipes, feminine wipes, full sheet paper towels, and of course, toilet paper. The only samples that successfully passed the test were two brands of toilet paper, while the remaining 26 samples failed.

Throughout the U.S., wipes are among the leading causes of sewer system backups, impacting collection systems as well as treatment facilities and equipment. When wipes pass through bar screens, their effects can lead to increased maintenance and capital costs. Typical operational problems caused by wipes include:

- Accumulation in primary and final settling tanks, causing

jamming and damage of the flight mechanisms and cross-collectors, which in turn affects treatment performance and permit compliance.

- Premature failures of the mechanical mixers in the anoxic zones due to roping; affecting total nitrogen permit compliance.
- Clogging of the surface wasting system (SWAS) and return activated sludge (RAS) line and pumps, increasing maintenance and froth accumulation (odors).
- Clogging of the overflow weirs of sludge thickeners, increasing odors and degrading thickener performance.
- Jamming and wear of the facility’s grinders.
- Accumulation in digesters and reduction of digester volume.
- Decreased centrifuge performance in sludge dewatering processes.
- Poor quality biosolids that are not amenable to beneficial use.

The first operating cost evaluation of impacts done by DEP’s Bureau of Wastewater Treatment (BWT) in 2014 showed that, at the Wards Island WRRF alone, the city spent approximately \$600,000 annually on additional downstream equipment corrective maintenance and outside contracting due to ragging. In 2018 at the same facility, the new \$7 million Primary Influent Channel Invent Mixer system failed because of wipes.

COVID-19’s Intensifying Effect

During the COVID-19 pandemic, which included a shutdown of most economic activities in New York City for almost four months, the demand for toilet paper and disinfection wipes escalated immensely. As a result, the majority of WRRFs experienced an increase in screenings accumulations and negative impacts to treat-



Wards Island WRRF impeller from E Battery RAS pump, damaged beyond repair, caused by wipes. *Jean Schwarzwald/DEP*



Wipes bound around impeller hub, E Battery RAS pump. *Jean Schwarzwald/DEP*

ment processes, hitting the preliminary and primary treatment systems in particular. DEP had to increase staffing and labor hours in response. Assessment of labor costs during the COVID-19 shutdown between March and August shows the escalation in labor costs by 50% in comparison to the same timeline in 2019. For example, at Wards Island WRRF, the city spent \$192,408 on corrective maintenance during this pandemic, which is a significant increase from 2019, where labor costs utilized on maintenance due to “flushable” wipes were estimated to be \$127,868.

DEP’s Response

DEP BWT is taking steps toward optimization of the headworks screens by implementing a cost-effective solution that would minimize negative impacts on the downstream equipment in the WRRF,

while saving a significant amount of rate-payer dollars on systematic maintenance. To achieve this goal, DEP is moving forward with a retrofit to a multi-rake fine screening technology.

The current generation of multi-rake fine screens, with 3/8-inch or narrower openings, have significantly higher capture rates than the coarser 3/4-inch to 1-inch screens typically encountered in U.S. WRRFs. The finer screens are capable of removing “flushable” wipes and smaller materials, while allowing for high flow rates and providing low head loss through the screens. Multi-rake fine screens have been on the market for over 20 years and have received positive feedback from WRRFs worldwide. The increased capture provided by fine screen is critical to downstream processes and is shown to materially decrease the operating and maintenance costs related to pump ragging, plugged lines, cleaning and reduced aeration efficiency.

As a first optimization approach, DEP is implementing a fine screen retrofit project for one of four Headworks multi-rake bar screens at the Manhattan Grit Chamber (MGC). The MGC sends screened and de-gritted sewage to Wards Island WRRF. Currently, there are four Headworks multi-rake bar screens with 3/4-inch bar spacing. The goal of the retrofit project is to reduce screen openings to 3/8-inch and capture “flushable” wipes more effectively, while allowing wet weather flows to pass through a combination of fine (3/8-inch) and coarser (3/4-inch) screens.

During the first three months of operation, the screenings volume captures and screenings makeup will be established by conducting side by side comparison of dry weather and wet weather capture between fine and coarse screens. Additionally, it will be important to validate the Kirschmer equation for fine screen head losses and assess the applicability of the fine screen retrofit to 3/8-inch on existing multi-rake

screens for the remaining New York City WRRFs.

The retrofit project described above will target the following strategic initiatives set forth by the DEP Strategic Plan:

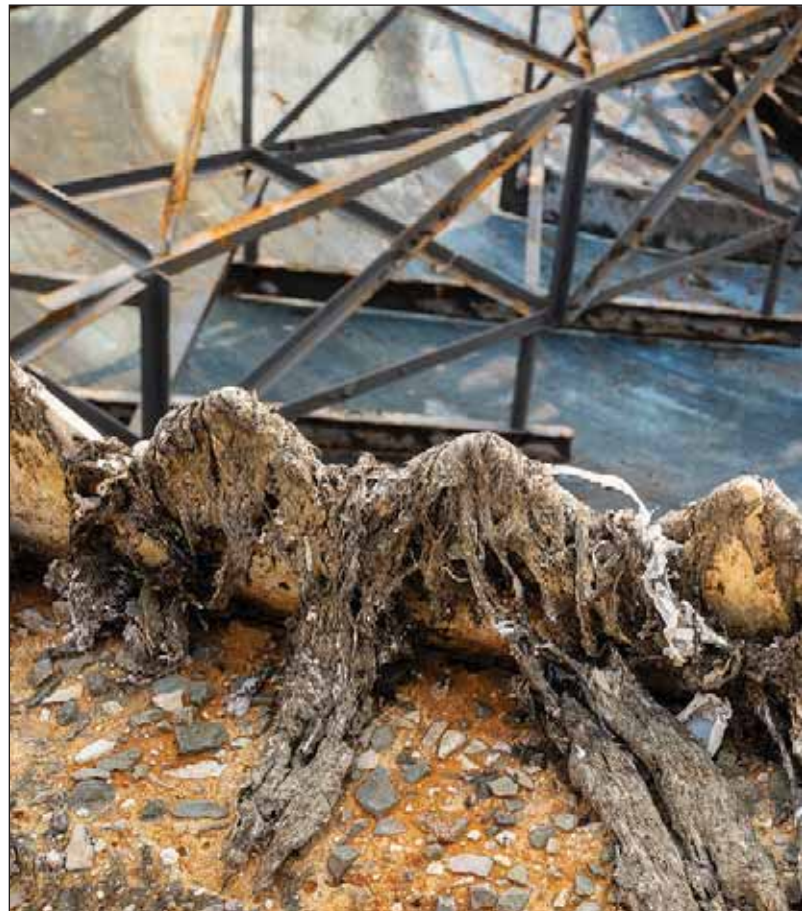
- Initiative 2 – Manage assets to ensure the long-term sustainability and optimal efficiency of our water and wastewater services.
- Initiative 12 – Transition wastewater treatment plants to wastewater resource recovery facilities.
- Initiative 34 – Insource in strategic areas to improve capital program delivery and operations.
- Initiative 36 – Use predictive analytics to drive operational efficiency.
- Initiative 43 – Expand the use of technology to improve performance.

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Empty thickener clarifier tank being repaired and cleaned due to wipes damage.

Jean Schwarzwalder/DEP



Left: Wipes clogging overflow weirs on thickener clarifiers at Wards Island WRRF.

Jean Schwarzwalder/DEP



Use of “flushable” disinfection wipes escalated during the COVID-19 pandemic, resulting in increased negative impacts to preliminary and primary treatment systems and a 50% increase in maintenance labor costs from March to August 2020 as compared to the same period in 2019.



Wipes creating clogs in the thickener clarifiers at Wards Island WRRF.
Jean Schwarzwald/DEP



Weir of empty thickener showing rag accumulation.
Jean Schwarzwald/DEP



Distribution box of thickener clarifier clogged with rags.
Jean Schwarzwald/DEP

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The fine screen retrofit project at the MGC and future upgrades to influent screens at other facilities are aligned with the Triple Bottom Line (TBL) goal of making New York City “more sustainable, equitable and productive” (*OneNYC, 2015*). Improvements will reduce the potential for odors due to ragging and froth accumulations, which are of major concern to local residents. Changes will enhance permit compliance by minimizing downstream equipment disruptions and may reduce greenhouse gas emissions by eliminating negative impacts on the pumping capacity and aeration efficiency. This and future retrofits will save ratepayer dollars, reducing expenditures on downstream equipment failures and maintenance and help reduce overall operating and maintenance costs.

These improvements do include certain risks, including underestimating head loss, screen blinding especially during the fall leaf season, wear on chains and bearings due to higher rake circulation rates, and stress on motors.

Public Education is Key

In parallel with enhancement to preliminary treatment, DEP is now building on a significant public education campaign, “Trash It, Don’t Flush It,” to minimize flushing of wipes and grease into sewer systems. The goal of “Trash It, Don’t Flush It” is to spread the message that improperly disposing of grease, wipes and other trash that clogs pipes could lead to nasty fatbergs and sewer backups, negatively impacting public health and causing costly damage to WRRFs and private property. The ultimate goal is to change public

behavior and increase awareness by featuring ads around the city at subway and bus stations and on buses, trains, television, social media, as well as in press publications and additionally by streaming ads on radio stations.

Through continuously improved technology and sustained public education, DEP expects to advance in the battle against the “flushable” wipes problem in years to come, yielding significant cost savings and reduced equipment failures at New York City’s 14 wastewater resource recovery facilities.

Pamela Elardo, P.E., is the Deputy Commissioner for the Bureau of Wastewater Treatment, New York City Department of Environmental Protection. Irina Dopson, CDT, ENV SP, is an Optimization Specialist with the Division of Regulatory Compliance, Strategy, and Technology Innovation in the Bureau of Wastewater Treatment, New York City Department of Environmental Protection. Follow up for this article may be directed to Andrew Olesh, Outreach and Communications Coordinator for the DEP Bureau of Wastewater Treatment, at aolesh@dep.nyc.gov.

Reference

City of New York, Mayor’s Office of Sustainability. 2015. *One New York: The Plan for a Strong and Just City*, page 47. Available from: <http://www.nyc.gov/html/onenyc/downloads/pdf/publications/OneNYC.pdf>, accessed 12/4/2020.



A dumpster full of screenings, overwhelmingly wipes.

Jean Schwarzwald/DEP



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Red lobelia, hibiscus and blue flag irises thrive in the stormwater wetland at the North Tonawanda Botanical Garden. *Laura Pecoraro*

The North Tonawanda Sustainable Community Program – A Visionary Partnership

by Robbyn Drake, David Conti and Laura Pecoraro

The city of North Tonawanda, New York, is a community embraced by fresh water. The sweeping arc of the Erie Canal, here a stretch of native Tonawanda Creek, borders the city to the east and south. The sun sets in the west over the majestic Niagara River, the connecting channel for lakes Erie and Ontario and a stunning stretch of fast, clean Great Lakes water. This community is defined by life on the water: fishing, swimming, boating and paddling form the foundations of good living for residents and visitors alike. This love of water has given rise to a unique partnership to preserve water quality and engage young people in creating a cleaner future for their city.

The North Tonawanda Botanical Garden

Our story begins at an 11-acre botanical garden in disrepair along the Erie Canal. The garden was a local fixture in the 1960s and 1970s but fell victim to budget cuts as maintenance requirements outstripped the city's budget for staffing and repairs. In 2016, a small group of residents took charge of the garden and began to reimagine what it could be to their community. Envisioning a low-maintenance, ecologically sustainable facility featuring native plants, pollinator gardens, cutting-edge green infrastructure and environmental education opportunities, group leaders founded the 501(c)(3) nonprofit North Tonawanda Botanical Garden Organization, Inc. NTBGO leaders recognized the enormous potential to grow the botanical garden into an educational hub for exploring the ecological links between native plants, pollinators and birds; for piloting green infrastructure practices such as rain gardens, rain barrels and stormwater wetlands to keep our water clean; and for modeling sustainable gardening to inspire a lifetime of environmental stewardship. NTBGO strives to exhibit sustainability in practice, programs and future plans for infrastructure.

It was no accident that water quality became a central theme of the NTBGO. The organization's all-volunteer board is led by Chair David Conti, chief operator of the City of North Tonawanda Water Treatment Plant. With 14 years of experience operating both wastewater and water treatment plants, David recognizes the importance of preserving our clean source water as well as educating the public about water quality and recruiting young people to careers in water infrastructure. Local teachers were already bringing their students to visit the water treatment plant and learn from David. An idea was born for an innovative partnership that could

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Volunteers donate their time to work on restoring a reclaimed garden bed at the botanical garden. *Laura Pecoraro*

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link educational visits to the water treatment plant, hands-on experiences establishing green infrastructure at the botanical garden, and field trips to explore water quality and green infrastructure in other areas of the city.

Sustainable Community Program

Collaborating with a local grant writer, NTBGO leaders developed the details and budget for the new North Tonawanda Sustainable Community Program. Economic need, documented by city and U.S. Census Bureau data, qualifies parts of North Tonawanda as a New York State Department of Environmental Conservation (NYSDEC) Environmental Justice Area. As a community-based organization in an Environmental Justice Area, NTBGO is uniquely situated to collaborate with local educational, municipal and private sector partners to engage young people and adults in environmental stewardship projects and to invest city residents in local environmental health. In addition, because North Tonawanda's history includes heavy industrialization of the Niagara River shoreline, land and water contamination are real health and safety concerns. These factors made the new North Tonawanda Sustainable Community Program a top candidate for



Students from the North Tonawanda Middle School plant native *Monarda* and *Liatris* in the stormwater wetland in October 2020.

Laura Pecoraro

the NYSDEC's Environmental Justice Community Grant. NTBGO was awarded the three-year grant in 2019 and is currently carrying out the project.

North Tonawanda middle and high school students participating in the Sustainable Community Program learn how to plant and sustain native habitats and engage in best practices for water quality stewardship in their community. They conduct water testing and collect data for water monitoring research. They study native habitats created by NTBGO within the botanical garden and have planted hundreds of native plants to attract native pollinators for habitat and hosting, to mitigate stormwater and to beautify the landscape. Students engage in creating and maintaining green infrastructure to protect water quality, both at the botanical garden and at other sites within the city. These real-life experiences make environmental stewardship come alive for students in a way that is difficult to achieve in the classroom.

The Water Treatment Plant is located within the state-



Students from North Tonawanda High School tour the North Tonawanda Water Treatment Plant in February 2020.

Laura Pecoraro



North Tonawanda High School students help with potting plants at the botanical garden's greenhouse in February 2020 for planting in the spring.

Laura Pecoraro

designated Environmental Justice Area of North Tonawanda. Chief Operator David Conti maintains contact with local educators and partners in the Sustainable Community Program and schedules tours of the plant. When students tour the water treatment plant, they experience the process of cleaning and disinfecting the water delivered to the community. They see firsthand how our city treats and uses water and addresses water quality issues such as stormwater runoff. Water plant operators provide these guided tours and engage students in conversations about choosing a career in the water industry.

The 2020 pandemic has brought changes in the way the Water Treatment Plant, NTBGO and our other partners can access and interact with teachers and students, but it has not stopped our programs. Visits to the water treatment plant were limited to very small groups, with masking and social distance requirements in place. Instead of collecting 120 middle school students for one annual field day event, we began holding small group events to



Blue lobelia in the stormwater wetland frame a picturesque gazebo in the North Tonawanda Botanical Garden.

Laura Pecoraro



Perennials wait in a holding area before planting in their final location in the botanical garden.

Laura Pecoraro



Plants for the botanical garden projects are germinated and propagated in the greenhouses on the property.

Laura Pecoraro

make sure students still enjoyed a live educational experience. Water sampling kits were provided to middle school students attending a weekend event at NTBGO. Each individual experienced sampling and recorded data. College and middle school students stayed outdoors in small groups and engaged in exciting initiatives such as planting native species in stormwater wetlands or collecting seeds for propagation at a native tree nursery at the wastewater treatment plant. The City of North Tonawanda Youth Center has been an invaluable partner in reaching out to parents and students that may be interested in participating in the Sustainable Community Program.

A Bright Future Ahead

The North Tonawanda Botanical Garden has thrived under its new use as a community teaching tool. NTBGO plans sustainable gardens for locations topographically suited to plants' moisture requirements, carefully selecting plants that will flourish without

supplemental irrigation. The 5,000-square-foot stormwater wetland on the site is in constant bloom from May through October. Favorite pollinators flock to the chosen plants and have increased biodiversity within the gardens. Many new species of butterflies, bees and birds are identified each year. As natives plant species grow, stormwater ponding has decreased.

Each spring, NTBGO volunteers select and grow all the plants used in the garden projects on-site. Plants are selected for criteria such as deer resistance, pest and disease resistance, moisture and exposure requirements and attraction of pollinators.

Another partnership underway at the botanical garden is a Living Shoreline Restoration Project sponsored by Buffalo Niagara Waterkeeper. Part of the Tonawanda Creek shoreline and an acre of the park itself will be restored to a riparian buffer zone, which will feature native plant habitat for shoreline and wetland creatures. Paths and educational signage throughout this area will educate visitors about the importance of riparian buffers along with native plant and animal species. This project is already being incorporated into Sustainable Community Program educational sessions at the botanical garden with students of all ages.

Future plans include buildout of a site master plan and development of an education center, featuring Leadership in Energy and Environmental Design (LEED) certification and green infrastructure. The master plan design was created as a semester project by the University of Buffalo's Sustainable Futures Studio, and the education center plans were received through a design contest this year. A green infrastructure training program for professionals is also in development. Partners are seeking grant funding to begin these projects. Students engaging in successive years of the Sustainable Community Program will be able to see these changes as they unfold in real time.

The municipality and NTBGO are working hand in hand to engage residents in hands-on projects that help solve tough environmental problems in their own community. The momentum and excitement generated through the high school and middle school programs has already inspired a small student volunteer base for NTBGO. The synergy between the Water Treatment Plant, NTBGO and city leadership has built a strong base of

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community collaboration and engagement. We look forward to a bright future for our city as we grow opportunities for residents to learn and practice environmental stewardship and sustainability.

Robbyn Drake, the lead author of this article, is an independent consultant to local environmental organizations, offering organizational capacity building, project management, grant writing, community outreach and educational program development services. Robbyn is the project manager for the North Tonawanda Botanical Garden Organization's Sustainable Community Program and can be reached at robyndrake@gmail.com. David Conti is the chair of the North Tonawanda Botanical Garden Organization, Inc., as well as the chief operator of the Water Treatment Plant and a licensed wastewater treatment plant operator. His knowledge of water quality issues and solutions provides guidance for the programming provided by NTBGO to students, citizens and visitors to North Tonawanda. David can be reached at dconti@northtonawanda.org. Laura Pecoraro is a founding member of the North Tonawanda Botanical Garden Organization, Inc. and serves as secretary for the organization. Her interest in returning native plants to any landscape that she can inspired her to create the pollinator garden for the North Tonawanda Botanical Garden. Please contact her with any questions at ntbggo@hotmail.com.



The plants in the pollinator garden are selected and arranged to attract pollinating insects with the promise of nectar and shelter. *Laura Pecoraro*



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May 13, 2021	Biosolids Drying Lunch & Learn Webinar / Part 2 of 2 Virtual via Zoom
May 25, 2021	NYSDEC: Net DMR/DMR Submission Webinar Virtual via Zoom
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News on Tap: New York City Drinking Water

by JoAnne Castagna

Drinking water safety has been in the news. A few years ago, the community of Flint, Michigan, struggled with lead contamination in its fresh water supply and more recently, residents of Newark, New Jersey, experienced the same.

What doesn't always make the headlines are the good things that are occurring concerning the public's drinking water.

Recently, employees from the U.S. Army Corps of Engineers, New York District, completed four streambank management projects in Delaware County, New York, that are helping to protect the quality of New York City's drinking water.

Ensuring that stream banks are fortified is important. If a streambank is eroding, soil and stormwater runoff, which may contain contaminants from nearby streets and land, can easily flow into the stream and adversely affect the water quality. These streams may eventually flow into reservoirs that supply fresh drinking water to the public.

In New York state, the Cannonsville and Pepacton reservoirs are two of several reservoirs that provide billions of gallons of water to New York City.

Several streams that flow into these reservoirs were eroding until the Army Corps restored them under its New York City Watershed Environmental Assistance Program.

"This program funds projects that are protecting the water quality of New York state's watersheds that provide drinking water to mil-

lions of New York City residents and businesses," said Rifat Salim, project manager, U.S. Army Corps of Engineers, New York District.

To perform this work, several agencies collaborated with the Army Corps including the Delaware County Soil and Watershed Conservation District, New York State Department of Environmental Conservation, New York City Department of Environmental Protection, Town of Andes, Town of Roxbury, Town of Walton and the Village of Walton.

Floodplain Reclamation Project, Town of Walton

In the Town of Walton, the West Branch Delaware River flows near the village streets.

Bordering this river are 13 acres of floodplain that are actually part of the river. The purpose of a floodplain is to help keep a river clean and to give it space to spread out and slow down, during big storm events.

Over the years, the floodplain was filled with 10 feet of fill. This raised and hardened the land, killed natural vegetation and caused invasive plant species to flourish, and eroded the river's edge causing soil and trees to fall into the water.

As a result, when the river floods the water that would naturally be absorbed, filtered, and transported by the floodplain is unable to, so floodwaters back up and stay trapped on the village streets, flooding homes and businesses.

New York City Watershed System

The New York City watershed region encompasses approximately 2,000 square miles of land north of New York City.

The land includes three watershed systems – the Catskill, Delaware, and Croton systems – spanning the counties of Greene, Schoharie, Ulster, Sullivan, Westchester, Putnam, Dutchess and Delaware.

A watershed is an area of land that catches rain and snow that drains or seeps into a marsh, stream, river, lake or groundwater.

This water eventually gets stored in reservoirs, a place where water is collected and kept for use when wanted, such as to supply a city.

The New York City Watershed System provides more than 90% of New York City's water supply. This comes to approximately 9.5 million people.

New York City makes sure that this water is safe by treating it at the source rather than building a costly filtration plant. The source is the land that surrounds the streams, rivers, lakes and reservoirs.

"In 1996, all of the municipalities in the New York City watershed region came to an agreement. They wanted to avoid the creation of a huge filtration plant. Instead of a plant they agreed to have small projects throughout the region to provide the public with clean water with minimal filtration.

"This is how our New York City Watershed Environmental Assistance Program came about," said Rifat Salim, project manager, U.S. Army Corps of Engineers, New York District.



Photograph 1 (before). Graydon Dutcher walking Army Corps personnel through the tall invasive plants on the Walton floodplain in the Town of Walton in 2016.

JoAnne Castagna



Photograph 2 (after). The completed Walton floodplain project in late 2019.

JoAnne Castagna

When this high volume of stormwater runoff floods the streets, it can sweep up contaminants and carry them to the West Branch Delaware River that flows into the Cannonsville Reservoir.

“Today, the floodplain is on its way to becoming healthy,” said Graydon Dutcher, stream program coordinator with the Delaware County Soil and Water Conservation District. “The fill was removed and recycled.”

Dutcher, who is also a Walton resident, added, “The residents of Walton were so happy about this work that they took it further. They used their own time and resources to remove the overgrown invasive plants, such as [Japanese] knotweed.”

The village and town also mowed and graded the land to the correct elevation and slope to allow water to spread out onto the floodplain, instead of overtopping the banks and flooding nearby businesses.

Afterward, grass was planted on the floodplain and native vegetation and shrubs were planted along the river including a mix of maple and ash trees.

Dutcher said, “Now floodwaters will drain from the town’s streets, building rooftops and parking lots and filter through the vegetation before entering the river.”

The vegetation traps and absorbs sediment and pollutants, like nutrients phosphorus and nitrogen, from entering the river. The plant’s roots also stabilize the soil and prevent it from running into the river.

An added benefit of this project is that it will lessen the damages of flooding.

It will provide flood reductions for a 100-year storm event. This is a flood whose strength and water height are predicted to occur, on average, about once in 100 years. The project will also be useful for storms that happen more frequently.

Dutcher said, “The village is ecstatic. We have a clean slate here.”

He said that the village’s plans for the land are to create a small pocket park for the community that will include trails, walkways, athletic fields and a boat launch.

South Street Bank Restoration Project, Town of Walton

If you’re standing on the restored Walton floodplain that was just discussed and look across to the other side of the West Branch Delaware River, you’ll see South Street. The street sits high up on a bank that overlooks the river. This is where the South Street Bank Restoration Project is located.

Over the years, South Street, which is lined with a few houses, has been slowly shifting down into the river. The river’s edge adjacent to South Street has been eroding, causing trees and soil to fall into the water and creating tension cracks in the street’s asphalt.

“Under South Street there are water, sewer and gas lines,” said Dutcher. “Under a flood condition, if the street continues to crack and shift down into the river, it could break the sewer line and the sewer would discharge into the river underground, contaminating the water and we wouldn’t even know it.”

To stabilize the river’s banks and prevent the street from continuing to shift down, 40-foot steel sheet pile was installed along the

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Photograph 3 (before). Stone wall sliding down into the West Branch Delaware River at South Street.

JoAnne Castagna



Photograph 5 (after). The West Branch Delaware River and completed South Street Bank Restoration Project in the Town of Walton, as seen from the Walton floodplain.

JoAnne Castagna



Photograph 4. Graydon Dutcher showing the Army Corps’ Rifat Salim (foreground) and other agency representatives the tension cracks in South Street.

JoAnne Castagna



Photograph 6 (before). Hardscrabble’s steep eroding embankment.

JoAnne Castagna



Photograph 7 (after). Completed Close Hollow Streambed and Bank Restoration Project in the Town of Andes in late 2019. *JoAnne Castagna*

bank that extends 30 feet below ground.

Dutcher said, “If we didn’t perform the sheet pile work, this whole area would have cleaved off. We really had to stabilize this bank using hard armoring, which is something we don’t typically do, but in this case, it was really needed.”

To further stabilize the bank and control streambank erosion, loose stone was placed at the edge of the river. The stones slow down the stream along the sheet pile and reduce potential damages downstream.

Native vegetation was also planted near these stones and at the bottom area of the sheet pile. “We also plan on growing creeping vines along the top of the sheet pile, so it looks more natural when grown out,” said Dutcher.

Recently, employees from the Army Corps were visiting South Street with Dutcher when a resident and former president of the Chamber of Commerce conveyed her thanks and appreciation.

Close Hollow Streambed and Bank Restoration Project, Town of Andes and Hardscrabble Streambank Stabilization Project, Town of Roxbury

These two streambank management projects involve streams that provide water to the Pepacton Reservoir, which contributes to the New York City water supply.

These streams were eroding, causing trees and soil to fall into the water.

To stabilize the streambanks, the slopes along the sides of the streams were cleared of the falling trees and debris and the bottom of the slopes and bed of the stream were reinforced with rock. The bare slopes were then hydroseeded and planted with willow stakes and native trees.

While the plants are taking root, a thick coconut geo mesh fabric was laid along the banks to protect the growing plants and to prevent soil from running into the streams.

Dutcher said, “The trees will eventually grow full size through the rock reinforcements and will enhance the bank’s stability.” The plant’s roots will stabilize the soil and prevent the soil from running into the river.

Stormwater runoff will filter through the vegetation before it enters the river. The vegetation will trap and absorb sediment and pollutants before they enter the stream.

While visiting the Hardscrabble project with the Army Corps, Dutcher said, “The stream’s water is bubbling as it moves along the streambed’s rocks. It looks great. Before mud was running down the stream.”



Photograph 8 (after). The completed Hardscrabble Streambank Stabilization Project in the Town of Roxbury in late 2019. *JoAnne Castagna*

These four streambank management projects may be completed, but the Army Corps’ New York City Watershed Environmental Assistance Program continues to support efforts that will protect the quality of New York City’s drinking water supply. More news to come!

JoAnne Castagna, Ed.D., is a Public Affairs Specialist and writer for the U.S. Army Corps of Engineers, New York District. She can be reached at joanne.castagna@usace.army.mil.



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Operator Quiz Winter 2020 – Secondary Treatment

The following questions are designed for individuals/trainees pursuing certification as they prepare to take the ABC wastewater operator test. It is also designed for existing operators to test their knowledge. Each issue of *Clear Waters* will have more questions from a different process of wastewater treatment. Good luck!

1. A dark brown foam on over 30% of the aeration basin surface is most likely to be ...
 - a. Low F:M.
 - b. High F:M.
 - c. System start up.
 - d. Normal.
2. White large sudsy foam on top of your aeration basins is most likely ...
 - a. Shock load from a local laundromat.
 - b. Low MLSS.
 - c. High MLSS.
 - d. Nitrification.
3. What is the formula for Mean Cell Residence Time (MCRT)?
 - a. Mass of total suspended solids in the system divided by mass of total suspended solids lost or removed by the system.
 - b. Measurement of BOD entering the system divided by pounds in the system.
 - c. Size of the clarifier divided by the flow.
 - d. Solids in the system multiplied by pounds lost.
4. What is one advantage of using MCRT rather than SRT?
 - a. All the sludge in the system is accounted for.
 - b. The formula is shorter.
 - c. It includes BOD removed in primary treatment.
 - d. Less sampling is required.
5. What is the growth on an RBC or trickling filter?
 - a. Filter flies.
 - b. Zoogleal mass.
 - c. Sloughing.
 - d. RAS.
6. How many pounds of oxygen are required to treat 1 pound of BOD?
 - a. 2.1-3.0
 - b. 1.1-2.0
 - c. 5.1-6.0
 - d. 0.01-1.0
7. How many pounds of oxygen are needed to convert 1 pound of ammonia into nitrate?
 - a. 4.6
 - b. 6.2
 - c. 2.0
 - d. 3.5
8. What conditions allow for bacteria to denitrify?
 - a. Aerobic.
 - b. Anaerobic.
 - c. Anoxic.
 - d. Acidic.
9. When a WRRF is operated for nitrogen removal, where does the nitrogen go?
 - a. RAS.
 - b. Atmosphere.
 - c. Effluent.
 - d. WAS.
10. Which microorganisms are least wanted in an aeration system?
 - a. Amoebas.
 - b. Stalked ciliates.
 - c. Nocardia.
 - d. Rotifers.

Answers on page 62.

For those who have questions concerning operator certification requirements and scheduling, please contact Tanya May Jennings at 315-422-7811 ext. 4, tmj@nywea.org, or visit www.nywea.org.



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Operator Quiz Winter 2020

Answers from page 61:

- (a) Low F:M.
Small amounts of dark brown foam are normal for extended aeration basins up to 25% of the tank's surface.
- (b) Low MLSS.
- (a) Mass of total suspended solids in the system divided by mass of total suspended solids lost or removed by the system.
- (a) All the sludge in the system is accounted for.
- (b) Zooglear mass.
- (b) 1.1-2.0
The 10-state standard for aeration systems besides (extended 1.5) is 1.1.
- (a) 4.6
- (c) Anoxic.
- (b) Atmosphere.
- (c) Nocardia.



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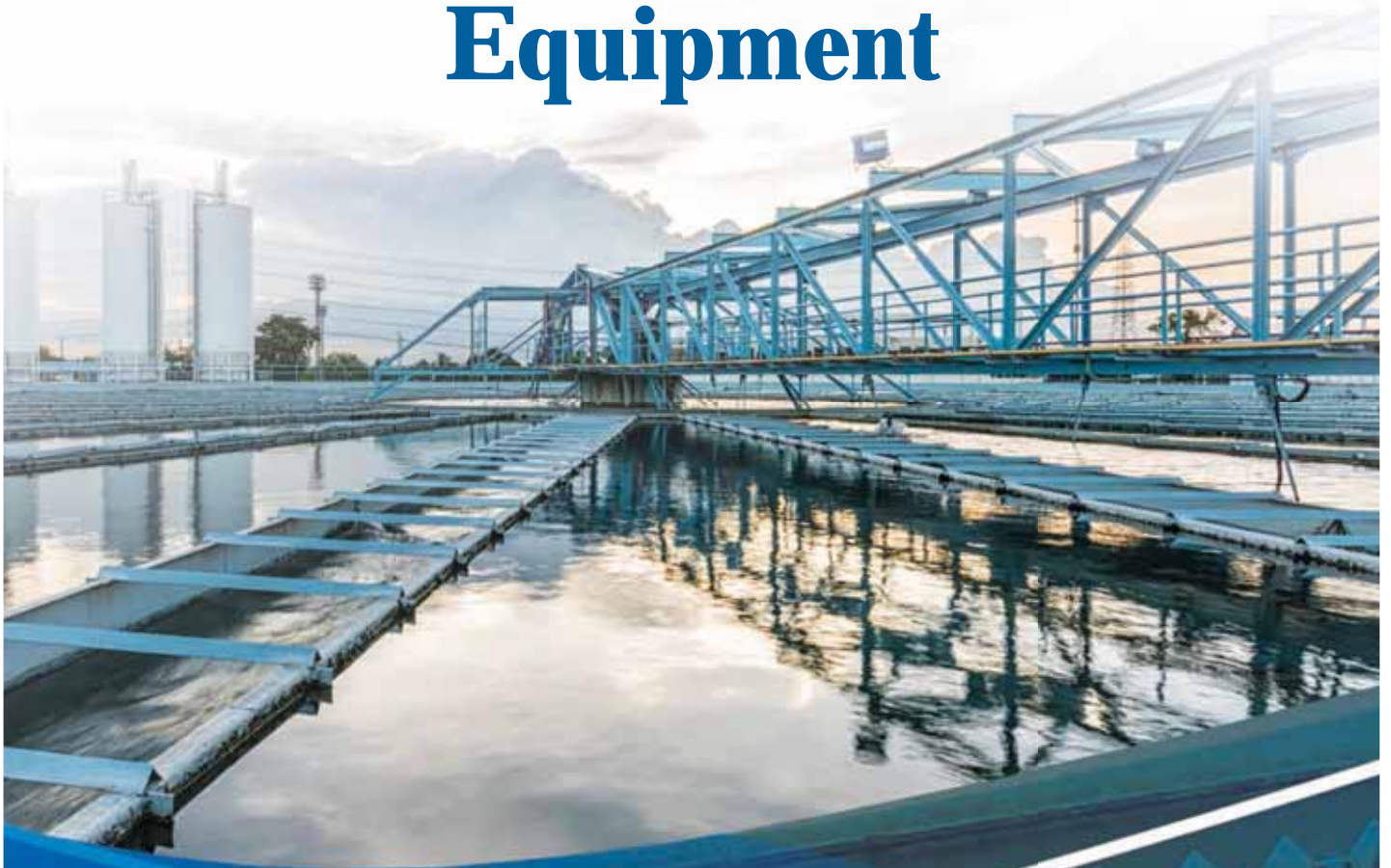
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