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A thinking man's approach to water

WEFTEC® 2018 explores the idea of smart water

The water sector knows adaptation and innovation are key to survival in these challenging times and "smart water" is one of the fastest growing areas of technology. This new discipline enables utilities to monitor, operate, and optimize their network systems and treatment assets. It leverages everything from 5G wireless networks to help reduce sanitary sewer overflows (SSOs), to cybersecurity to protect the integrity of existing assets, to the Internet of Things (IoT) to collect data from far-flung sensors. Several technical sessions at WEFTEC® 2018 will explore these topics, provide real-life examples of implementation, and share how you can make the most of smart water.

Establishing the basics

Technical Session No. 318, Setting the Course to Become a Smart Utility Through Effective Information Management, on Tuesday, Oct. 2, will discuss what a smart utility is and what it is not. This session will include Kevin Stively, Smart Utility Services leader and vice president, and Michael Karl, National Utility Technology lead at Brown and Caldwell (Walnut Creek, Calif.).

The two presenters think the topic will be particularly relevant to the WEFTEC audience at all levels of organization – from utility managers to operators to officials – because "utilities have been starting to implement portions of smart utility in an ad hoc manner over the last 5 years, more recently realizing that a more strategic and carefully planned out approach provides a better foundation for future success," Stively and Karl said.

Stively and Karl will share the steps to becoming a smart utility. They will start with the basics of awareness and progress through a final vision that uses predictive and prescriptive data analytics. They will make clear the benefits of embracing the smart utility approach as well as the challenges utilities commonly face. They also will touch on the concepts of IoT, cybersecurity, and analytics.

Their presentation also will present case studies based on projects implemented by Brown and Caldwell. The case studies will show the significant benefits that a smart utility can reap, such as sizeable cost savings and cost deferrals.

Making your utility faster, stronger

Technical Session No. 225, Get Smart: IoT and AI in the Water Utility Sector, will take place on Monday, Oct. 1. This session includes a presentation on the Federal Bureau of Investigation New Orleans cybersquad and will examine cybersecurity

Smart water at WEFTEC 2018

Get more smart utility, Internet of Things, and artificial intelligence sessions

Technical Session No. 225, Get Smart: IoT and AI in the Water Utility Sector
Monday, Oct. 1, 3:30 p.m.
Room 357

Technical Session No. 318, Setting the Course to Become a Smart Utility Through Effective Information Management
Tuesday, Oct. 2, 9 a.m.
Room 357

Technical Session No. 328, Intelligent Water Technology Control Strategies for Potable Reuse
Tuesday, Oct. 2, 10:30 a.m.
Room 336

Technical Session No. 417, Digital Watersheds: Big Data Analytics for Watershed Management
Tuesday, Oct. 2, 1:30 p.m.
Room 345

for water and wastewater utilities and municipalities. During the presentation, "Building a Smart City Wireless Network for Improved SSO Reduction," Director Patrick Woodall and flow monitoring specialist Christopher J. Parrish from the City of Atlanta Department of Watershed Management will discuss how they used a software program they designed themselves and smart meters they deployed to help mitigate sewer spills, Woodall said.

They will share how Atlanta built an anomaly detection system that can help reduce repeat SSOs. The city chose to further expand this monitoring network to reduce the number of spills to a certain cost threshold. In their abstract, Woodall and Parrish note that the current system "has done an excellent job of predicting where spills may occur, but as problem sites are identified and corrected, the success rate tends to flatten or decrease," they write. "The best way forward is to increase the number of monitored manholes, but it becomes cost-prohibitive to deploy hundreds of additional monitoring sites."

The city's solution is to explore deploying simple, ultrasonic level meters that transmit data to a server via low power, long-range radio networks. Woodall and Parrish will discuss their proof-of-concept, which is essentially how Atlanta moved data from sensor nodes to a server in real-time, both reliably and cheaply. They will explore in detail how they made this project a success.

Parrish said interested utilities need to attend a session like this to help their bottom lines. Implementing this type of technology "will save you millions," in SSOs costs in the long-term, he said.

– ***LaShell Stratton-Childers,*** *WE&T*

WEFTEC® 2018 provides something for everyone

WEFTEC 2018 will be packed with opportunities for attendees to learn, network, and be inspired, by the innovation, creativity, and dedication of the ReGeneration. The events listed below represent a small cross-section of the number and type of experiences that WEFTEC has to offer.

For the most complete and most up-to-date details on everything happening at WEFTEC, download and use the 2018 WEFTEC Mobile App at www.weftec.org/WEFTECmobile.

Student Design Competition

Sunday, Sept. 30
7:30 a.m. to 5 p.m.
Rooms 272 & 276

The WEF Student Design Competition promotes real-world design experience for students interested in pursuing education and careers in water and wastewater engineering and science. To compete, individuals or teams of students prepare a design to help solve a water quality issue. Teams evaluate alternatives, perform calculations, and recommend the most practical solution based on experience,

economics, and feasibility.

The competition has two categories: Environmental Division and Wastewater Division. Student presentations will take place from 8 a.m. until 2:10 p.m. The Process Design Challenge will happen from 2:10 p.m. until 3 p.m. Join a networking reception from 3 p.m. to 4:30 p.m. Stay for the award presentation beginning at 4:30 p.m.

Opening General Session

Monday, Oct. 1
8:30 a.m. to 10:15 a.m.
Great Hall A
No registration badge needed for entry

Highlighted speaker

- Kevin Brown, motivational speaker and author of *The HERO Effect*

During this keynote address, Brown will share his ideas, strategies, and principles to inspire water professionals to recognize and embrace being everyday heroes who show up and give their best when it matters the most. This session is open to all WEFTEC attendees and guests.

Technical Session No. 100: The Emerging Circular Economy – Can We Make a Relevant Contribution?

Monday, Oct. 1
10:30 a.m. to 12 p.m.
Room 347

Highlighted speaker

- Art K. Umble, Stantec Consulting

This prestigious lecture is given annually by a selected researcher, alternating each year between an academic and a practitioner. Umble was selected this year for his significant contributions to the water sector from the practitioner's viewpoint. He has chosen to speak about the contributions of the water sector to the circular economy.

Umble leads the Global Wastewater Practice for Stantec Consulting (Edmonton, Canada), focusing on municipal and industrial wastewater treatment technologies, with an emphasis on converting waste streams to value streams. He additionally provides technical analysis and support to design teams for new and rehabilitated water resource recovery facilities, specializing in nutrient removal, process and energy optimization, wet weather treatment, and more.

Umble's experience also includes time as a university educator and as manager of a publicly owned water and wastewater utility.

Technical Session No. 101: Exploring the Tensions Within the Water–Energy–Food Nexus

Monday, Oct. 1
10:30 a.m. to 12 p.m.
Room 252

Highlighted speakers

- William Sarni, author and CEO of Water Foundry LLC
- Jonathan Witt, environmental engineering manager, J.R. Simplot Co.
- Alan Prouty, vice president of environmental and regulatory affairs, J.R. Simplot Co.
- Gopi Sandu, director of sustainable operations, Nestlè Purina Pet Care Co.

- David Marrs, director of wastewater technology, Valero Energy Corp.
- Karl J. Rockne, environmental engineering program director, U.S. National Science Foundation

A panel of professionals on the cutting-edge of sustainability in the water, power, and agricultural sectors will meet to discuss growing tensions among three of the world's most essential resources.

Attend the session for forward-looking perspectives on how the interdependence of water, energy, and food may affect businesses and even entire economies as a growing number of regions around the globe grapple with resource scarcity.

Technical Session No. 102: Intelligent Water Systems Data Challenge

Monday, Oct. 1
10:30 a.m. to 12 p.m.
Room 244

Teams present their innovative solutions for the first-ever Intelligent Water Systems Challenge. This challenge demonstrates the value of intelligent water systems for utilities and helps foster the adoption of smart-water technologies. It provides students, professionals, and technology aficionados the opportunity to showcase their talents, with a focus on leveraging data using the best available tools to help utilities better understand the dynamics of complex systems and make better decisions. Winning teams will receive cash awards with the top team winning $25,000.

Technical Session No. 103: Tracking Down the Roots of Our Sanitary Sewers

Monday, Oct. 1
10:30 a.m. to 12 p.m.
Room 243

Highlighted speaker

- Jon Schladweiler, historian for the Arizona Water Association

This presentation will trace the development of sewers from 3500 BC through the early 1900s. It will describe what drove the earliest sewerage systems as well as discuss what happened when wastewater infrastructure declined. The presentations will include photos, sketches, and anecdotes. Participants should come away with a better appreciation for the "roots" of the modern sewer as well as some insights into the ups and downs sewerage has traversed through the ages.

Technical Session No. 104: The Value of Water and the U.N. Sustainable Development Goals

Monday, Oct. 1
10:30 a.m. to 12 p.m.
Room 256

Highlighted speakers

- John Doyle, Little Big Horn College
- Margaret Eggers, Montana State University
- Bruce Robinson, Inter Tribal Council of Arizona
- James Temte, National Tribal Water Center
- Steve Terry, United Southern and Eastern Tribes

Data collected between 2003 and 2015 show that 12% to 16% of homes in Indian Country lacked access to safe drinking water, compared to 0.6% for non-Alaska Native and non-American Indian homes. Factors behind the disparity are thought to range from lack of resources to the disconnect between science and technology and cultural values and traditions.

This panel discussion is designed to provide a broad overview of the working relationship between federally recognized Tribes and the federal government and describe the treaty obligations associated with that relationship. The panel also will evaluate how to improve safe drinking water and sanitation conditions.

The panelists are technical experts with a long history of working with and representing American Indian and Alaska Native nongovernmental organizations and members, community activists, and academics in these communities.

Public Officials Forum Luncheon

Monday, Oct. 1
11 a.m. to 1 p.m.
Rivergate Room
Ticketed event: $40

Highlighted speaker

- James A. "Tony" Parrott, executive director of the Louisville/Jefferson County Metropolitan Sewer District

Designed specifically for elected and appointed public officials, this event will focus on three of the most trending topics in the water sector: regionalization, fragmentation, and consolidation. In addition to receiving lunch and hearing the keynote address, participants can engage in facilitated roundtable discussions focused on these topics.

Scientists' Luncheon

Monday, Oct. 1
12 p.m. to 1:30 p.m.
Room 260
Ticketed event: $40

Highlighted speakers

- Mark van Loosdrecht, 2018 Stockholm Water Prize co-winner
- Angeliki Diane Rigos, executive director of Massachusetts Institute of Technology Tata Center
- William J. Mitsch, director of Everglades Wetland Research Park

Over lunch with colleagues, enjoy a panel discussion focused on the role of the scientist in environmental protection, how that role has changed, and how it may continue to change in the future.

This year's newly formatted Scientists' Luncheon combines the American Academy of Environmental Engineers and Scientists' (AAEES; Annapolis, Md.) annual breakfast event with the popular luncheon event held each WEFTEC by the Association of Environmental Engineering and Science Professors (AEESP; Washington, D.C.).

Global Engagement in Water, Sanitation, Hygiene: How You Can Contribute to Those in Need

Monday, Oct. 1
3:30 p.m. to 5 p.m.
WEF Global Center, Hall G

Highlighted speakers

- Gary De Kock, Paddle with Purpose
- Dave Kinnear, Jammin' 4 Water
- Melissa Montgomery, Engineers Without Borders

Meet and learn from organizations active in water, sanitation, and hygiene (WASH) programs, and Water Environment Federation (WEF; Alexandria, Va.) members working to raise funds for WASH projects around the world. Enjoy a sampling of the wide range of opportunities available to support WASH in developing countries. Panelists will describe steps audience-

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members can take to engage with the organizations working on these projects.

Women in Water: Informing, Inspiring, Connecting

Monday, Oct 1
5:00 p.m. to 6:15 p.m.
Room 276
Ticketed event: $40

During this reception and session, current and future female water sector leaders representing a variety of disciplines – engineering, operations, research, management, and communications – are informed and inspired by guest speaker Fidan Karimova This exciting event also includes ample time for facilitated peer-to-peer exchange of knowledge and support.

Technical Session No. 309: Carbon for Energy or Carbon for BNR: You be the Judge (...Well ok, the Jury)

Tuesday, Oct. 2
8:30 a.m. to 10 a.m.
Room 352

This is an interactive session where attendees will be asked to be jurors in the landmark case: *Carbon for Energy v. Carbon for Biological Nutrient Removal.* Expert litigators will make their best case and our honorable judge will hope to maintain order, but the verdict will be up to you.

Technical Session No. 404: FUNdamentals: Secondary School on Nutrient Removal

Tuesday, Oct. 2
1:30 p.m. to 5 p.m.
Room 347

Highlighted speakers

- Pusker Regmi, process engineer, Brown and Caldwell
- Bruce Mansell, Los Angeles County Sanitation District
- Sidharta Arora, contract compliance assistant manager, Milwaukee Metropolitan Sewerage District
- David Parry, senior fellow technologist and vice president, CH2M

Are you intimidated by super nerdy nutrient removal sessions? Come and join us for a review of biological and chemical nutrient removal treatment fundamentals. An interactive session that provides an overview, a nutrient roadmap, and approaches for process optimization.

Technical Session No. 535: Operator Excellence: Operations Ingenuity Contest Winners

Wednesday, Oct. 3
10 a.m. to 11 a.m.
Booth No. 3129, Hall E

Find out who won the seventh-annual WEFTEC Operator Ingenuity Contest. This year's class of entries resulted in three winners.

Not all innovations come from a research lab. Sometimes, you need to tackle a persistent problem using just what's at hand and a big shot of ingenuity. Hear about the winning entries and how they measured up in terms of resourcefulness, safety, and transferability.

Technical Session No. 624: WEFTEC Session: State and Future of Stormwater

Wednesday, Oct. 3
1:30 p.m. to 3:30 p.m.
Room 352

Hear about the current trends in the stormwater sector and take a look at the future. This interactive session will include panel presentations and small group discussions and input. Hear the basic findings from the WEF's Stormwater Institute MS4 Needs Survey as well as panelists' perspectives on the state of stormwater, as well as anticipated changes in the years ahead.

Participants will then be asked to work in small groups and provide feedback based upon panel discussions and WEF's Stormwater Institute objectives.

Technical Session No. 622: U.S. EPA's Water Infrastructure Finance and Innovation Act

Wednesday, Oct. 3
1:30 p.m. to 5 p.m.
Room 349

Highlighted speakers

- Kevin McDonald, underwriter, U.S. Environmental Protection Agency (EPA)
- Danusha Chandy, senior engineer, U.S. EPA
- Karen Fligger, senior project manager, U.S. EPA

The U.S. EPA's Water Infrastructure Finance and Innovation Act of 2014 (WIFIA) program will hold a panel discussion with conference attendees.

The session will include a background and a general update on the program as well as a case study on a successful WIFIA loan application process, including both borrower and U.S. EPA perspectives. Following this presentation, the WIFIA program staff will open the floor to allow for questions from the audience.

International Operations Challenge events unite water sector professionals

The Operations Challenge competition tests the skills of wastewater professionals and draws attention to their important work. It also helps competitors build skills and expand professional networks.

The U.S. national Operations Challenge competition is held during WEFTEC, but similar events are held worldwide throughout the year. The international expansion of these competitions in South America and Germany unites water sector professionals on a global scale.

Recognition and pride for Argentinean competitors

The 2018 Sanitary Olympics was held June 27 in Buenos Aires, Argentina. The competition is held every 2 years and was modeled after Operations Challenge.

"One of the main [benefits] is the recognition that our operators receive for their hard and dedicated work," said Daniel Nolasco, president of NOLASCO y Asociados S.A. (Buenos Aires). Nolasco started this competition in Argentina. He is an active member of the Water Environment

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Two teams represented the U.S. in the World Water Skills competition at IFAT 2018 in Munich, Germany. At left, Lacy Burnette and Troy Newton formed Team KSB East and, at right, Nicholas Janicke and Carlos Vasquez formed Team KSB West. Water Environment Federation (Alexandria, Va.) Senior Manager of Operations Programs Steve Harrison (center) also attended; Harrison runs the Operations Challenge competition at WEFTEC. Lacy Burnette

Federation (WEF; Alexandria, Va.) and past participant in Canada's Operations Challenge competition.

The event gives operators, equipment suppliers, union leaders, professional organization representatives, utility management, and the public the opportunity to interact with each other and admire the skills of competitors, he said.

In 2001, Nolasco moved from the U.S. to Buenos Aires, and proposed an Operations Challenge event to the local WEF Member Association (MA), Interamerican Sanitary and Environmental Engineering Association (AIDIS) Argentina. The AIDIS president supported the idea and

Newton competes in the World Water Skills Laboratory Event. Lacy Burnette

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Energizing the KSB Maintenance Event

Big changes to event reflect real-world problems and solutions

When entering the exhibition at WEFTEC® 2018, Operations Challenge spectators will see some big changes in the KSB Maintenance Event. Not only will a new pump make its debut, but also for the first time in the competition, the system will be pumping water.

"Spectators will find this new event very exciting and it will imitate actions that operators perform on a daily basis," said Stephen Motley, KSB Maintenance Event coordinator.

The submersible pump, provided by KSB Inc. (Frankenthal, Germany), is equipped with an impeller that has been designed to help with ragging issues caused by wipes.

"Recently there has been a changing composition of the sanitary sewer flows that has caused complex problems worldwide. The composition of today's sanitary sewer flows is different than that of previous years due to an ongoing trend," Motley said. The trend has been an increased use and disposal of wipes down toilets that have led to "countless numbers of sanitary sewer overflows and additional maintenance and overtime by wastewater workers to keep our wastewater systems up-and-running," he said.

The KSB F-Max pump consists of an asymmetrical blade arrangement that allows solids to pass through the pump and creates a swirling effect to shift wipes away from the impeller's shaft. As the wipes move to the outside of the impeller, they can be pumped out, Motley said.

In the new event, teams will need to respond to a trouble alarm sent to the Operations Control Center by the pump. The team will need to

- troubleshoot the electrical control panel,
- perform routine maintenance on the submersible pump and wet well, and
- restore the pump station back to normal operating condition.

When the team finishes the event, if the steps have all been done correctly, the pump will begin moving water again. The event introduces the danger of an arc flash – a rapid release of electrical energy – within the electrical equipment.

"Pump ragging and arc flash have been recent hot topics within the industry and things that operators are routinely having to deal with," Motley said. "This new event exposes them to those issues and how to deal with them."

Operations Challenge teams have had the opportunity to try out the new event at local and regional competitions. "I have been extremely pleased with how the new event has gone," Motley said.

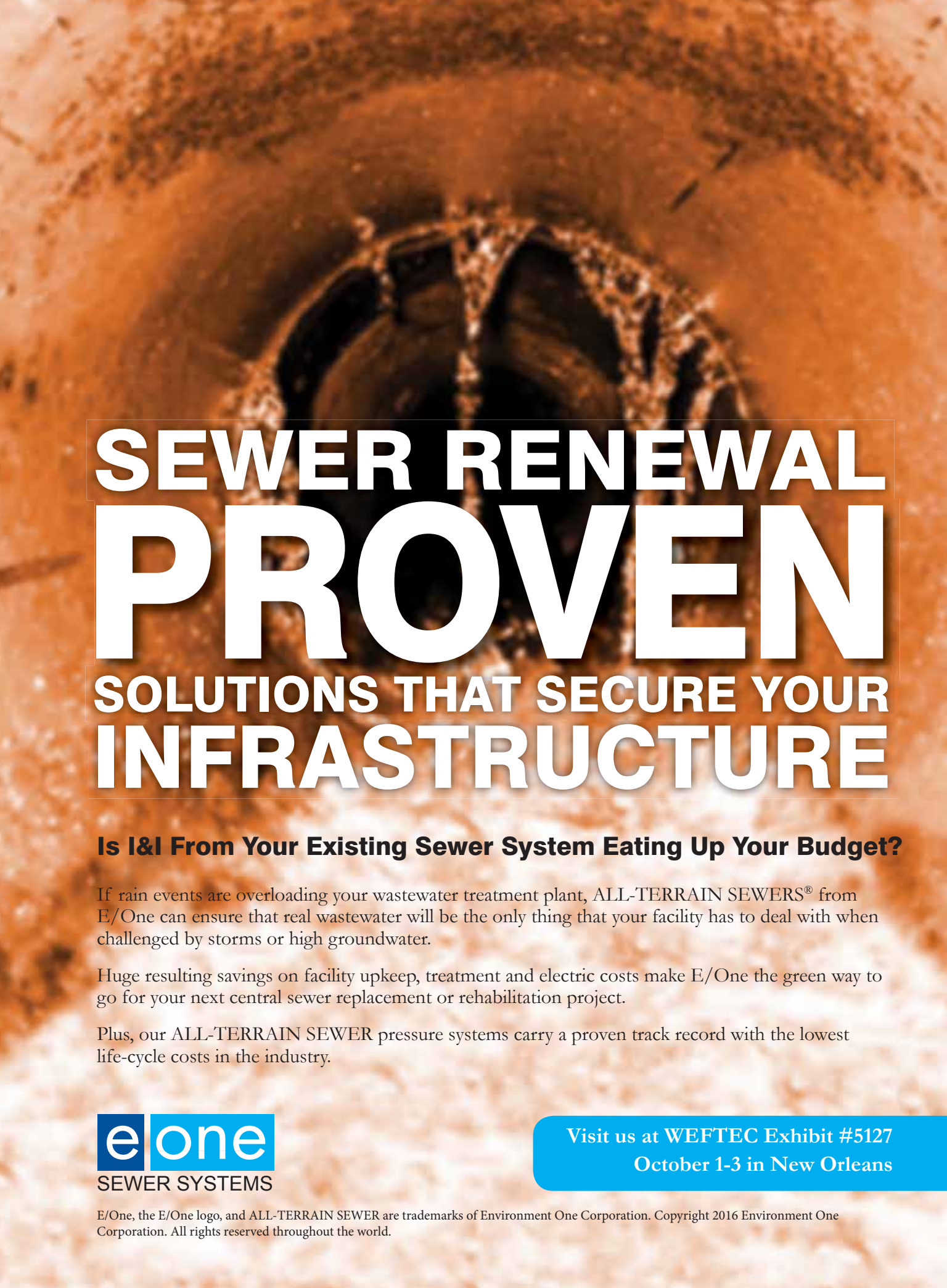
"We felt it was important to simulate a real wastewater challenge," said Sherry Heinly, KSB Inc. marketing manager for North America. The event was designed to represent a current problem for those in the water sector and follows the steps of a real-world solution from shutting down an operating pump to locking out the system to performing typical maintenance to putting the pump back into service, she said.

"The teams seem very excited about this new event," Heinly said.

The Franken Foggers team from the New England Water Environment Association competes in the new KSB Maintenance Event at the Battle of the Boardwalk in Atlantic City, N.J. The New Jersey Water Environment Association hosts this regional Operations Challenge competition. Stephen Motley

For the first time, the updated Operations Challenge KSB Maintenance Event will feature running water. Stephen Motley

Teams that competed in the Operations Challenge event hosted by the Water Environment Association of Texas at Texas Water 2018 had the opportunity to try out the new KSB Maintenance Event. Empowering Pumps



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Team 4KVA of Agua y Saneamientos Argentinos S.A. (AySA; Buenos Aires, Argentina) – Nicolás Couso, coach and captain Pablo Quiroga, Nahuel Sánchez, Sebastián Lomazzi, and Ariel Acosta – won the 2018 Sanitary Olympics in Argentina. AySA

the first competition took place during the AIDIS annual conference and exhibition in 2003, Nolasco said.

Since then, the team that wins the Sanitary Olympics travels to compete at WEFTEC. The runners-up travel to Colombia to compete at the Sanitary Olympics organized by the Colombian Association of Sanitary and Environmental Engineering (ACODAL; Cartagena, Colombia).

This year, nine teams competed in Buenos Aires, but the Argentinian event has had as many as 16 teams competing (2012). This makes the competition one of the largest hosted by an MA, Nolasco said.

This year's winning team, 4KVA of Agua y Saneamientos Argentinos S.A. (AySA; Buenos Aires, Argentina), will travel to compete at WEFTEC 2018. The team – Sebastián Lomazzi, Nicolás Couso, Nahuel Sánchez, Ariel Acosta, and coach and captain Pablo Quiroga – looks forward to working to develop new knowledge and teamwork techniques, said Héctor Vaccaro, director of maintenance and workshops at AySA. Vaccaro helps organize the Sanitary Olympics for AySA and has competed on several teams, some of which have won that competition and gone on to compete in Argentina, Colombia, and the U.S.

"Competing in both countries gives us an extra learning [experience]," Vaccaro said. "[It] gives us greater belonging and commitment in the task of public service." In addition to educating about new methods, tools, and equipment in the water sector, competitors learn how to work as a team, make connections, and gain a sense of pride for the work they do, he said.

Members of two AySA teams, Team 4KVA and Team TWT, gathered for a photo during the 2018 Sanitary Olympics in Argentina. AySA

Members of Team 4KVA work together during the Collection Systems Event at the 2018 Sanitary Olympics in Argentina under the close eye of coach and captain Pablo Quiroga. AySA

German competition offers immersive experience

In May, two U.S. teams competed in the World Water Skills competition during IFAT 2018 in Munich, Germany. KSB Inc. (Frankenthal, Germany) sponsored the 2-member U.S. teams at this competition. For these teams, Water Environment Federation (WEF; Alexandria, Va.) chose veteran Operations Challenge competitors:

- Lacy Burnette from the West Virginia Water Environment Association (WEA) Blue Ridge Brawlers,
- Troy Newton from the South Carolina WEA Controlled Chaos,
- Nicholas Janicke from the California WEA LA Wrecking Crew, and
- Carlos Vasquez from the California WEA LA Wrecking Crew.

"The best thing about participating at IFAT was being able to immerse myself in a completely different culture and discuss wastewater treatment with people from all around the world," Burnette said.

Burnette and Newton formed Team KSB East; and Janicke and Vasquez formed Team KSB West. The competition was split into two divisions, each incorporating two events. The Sewer Professionals division covered maintenance and safety. The Wastewater Treatment Plant Professionals division covered process and laboratory events. Both U.S. teams tackled all the events.

Team KSB West earned second place in the maintenance and laboratory events as well as second-place overall in the wastewater professionals category. In addition to their trophies, the U.S. competitors also gained an international network of colleagues and new skills.

Not only are these events different than the Operations Challenge events the U.S. competitors are used to, the teams also had only 1.5 days to prepare. Those days also were the first time Burnette and Newton had competed together; they come from different Operations Challenge teams.

But this experience was educational for Burnette, he said. "My ability to become an efficient problem solver has improved since returning from IFAT," he said. "I also feel that my team-building skills were improved."

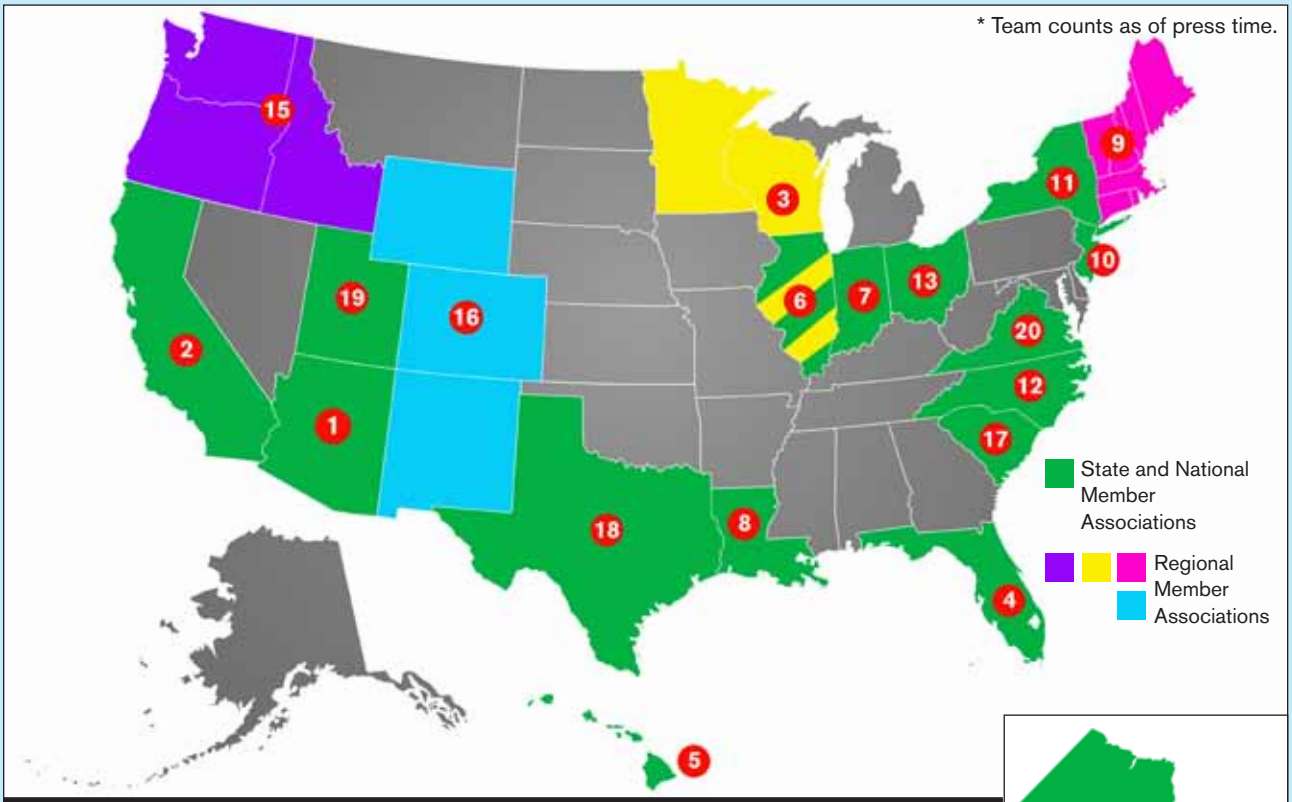
"These competitions unite water sector professionals by giving them a platform to showcase their skills on a national- and international-level," Burnette said. "The conversations I was able to have while at IFAT clearly showed me that we are all on the same team when it comes to protecting the environment and providing clean water to people everywhere."

"I am looking forward to sharing my IFAT experience with other teams that will be participating at WEFTEC," Burnette said.

– Jennifer Fulcher, *WE&T*

Operations Challenge 2018 by Member Association*

* Team counts as of press time.



Member Association	Number of Teams
1 AZ Water Association	1
2 California Water Environment Association	1
3 Central States Water Environment Association	2
4 Florida Water Environment Association	2
5 Hawaii Water Environment Association	1
6 Illinois Water Environment Association	1
7 Indiana Water Environment Association	1
8 Louisiana Water Environment Association	1
9 New England Water Environment Association	3
10 New Jersey Water Environment Association	1
11 New York Water Environment Association	4
12 North Carolina American Water Works Association & North Carolina Water Environment Association	1
13 Ohio Water Environment Association	3
14 Water Environment Association of Ontario	3
15 Pacific Northwest Clean Water Association	1
16 Rocky Mountain Water Environment Association	2
17 Water Environment Association of South Carolina	3
18 Water Environment Association of Texas	6
19 Water Environment Association of Utah	2
20 Virginia Water Environment Association	2
21 British Columbia Water and Waste Association	1

Member Association	Number of Teams
22 Asociación Colombiana de Ingeniería Sanitaria y Ambiental (ACODAL)	1
23 Interamerican Sanitary and Environmental Engineering Association (AIDIS)	1