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2017-18 Theme - Water Resources & Climate Change: Back to Basics?

Inaugural Panel Discussion on Utilities' Preparedness for Weather Disasters and Climate Change *by K. Jack Kooyoomjian, Ph.D*

Alexandria Renew Enterprises (AlexRenew) hosted the Federal Water Quality Association (FWQA) on October 12, 2017 at their Conference Center in Alexandria, VA for FWQA's first luncheon discussion of the 2017-18 year. The 6th Floor Conference Room overlooks their beautifully-maintained soccer field which is directly on top of their wastewater treatment facility (*one of their treatment systems pictured on left*). FWQA President-Elect, Amanda Waters introduced the three panelist speakers, Ms. Karen Pallansch, Chief Executive Officer and General Manager of AlexRenew who also serves on the Water Sector Coordinating Council (WSCC); Mr. Jonathan Reeves, Chair of the WSCC and Chief of DC Water's Office of Emergency Management, and Mr. David Travers, Director of the U.S. Environmental Protection Agency's (EPA's) Water Security Division (WSD) in Washington DC. Amanda Waters welcomed about 40 participants to this meeting to discuss the FWQA theme for the 2017-18 year, namely "Water Resources & Climate Change: Back to Basics?" This panel discussion focused on disaster preparedness for water and wastewater utilities.

Karen Pallansch welcomed participants to the Alexandria Renew Enterprises facility. She reflected on another session held at the facility entitled "Imagine a Day Without Water," where over 600 organizations came from across the U.S. to discuss this topic. Most Americans take water and the systems that provide them for granted. However, those who work in the industry are deeply committed to public service and providing safe, clean, wholesome water and treated wastewater as stewards of the environment. Without clean water and sound infrastructure, you can't have strong, vital and healthy communities. The recent storm (Continued on Page 8)

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President's Corner

I am honored and very excited to serve as the FWQA President this year. I think we are entering interesting times as Water Resource Professionals. FWQA's theme for this year aims to capture the challenges we are facing. Our theme is "Water Resources & Climate Change: Back to Basics?"

We planned an interesting line-up of speakers, to begin we have Jonathan Reeves, Chair of WSSC and Karen Pallansch CEO of AlexRenew together to speak about Utility Preparedness, along with David Travers, Director of EPA's Water Security Division (see article on Page 1). Putting this program together we were fresh from the events on the Texas Gulf from Hurricane Harvey and watching Hurricane Irma tear across the Caribbean, unsure of Florida's fate.

More and more our Water Resource Professionals are being challenged with floods, major storm events and drought. I am confident that we will manage these events and I know that there are many people working hard to ensure that we have safe and clean water. But it is important that we all stay informed, share our experiences and knowledge so that we all can stay on top of these challenges. I hope that in some way FWQA can contribute to that need.

Future topics for our luncheons this year include learning about what is happening on the Hill and in EPA's Congressional Affairs Office. We also hope to have a luncheon on the topic of recovery once some of the dust has settled in Houston and Florida.

Early next year we intend to host Ben Grumbles, Secretary for the Environment in Maryland. We will ask Ben to provide his perspectives on the role that States will need to play in the coming years as responsibilities may be shifting away from the Federal Government to State Governments.

As always, our goal is to offer perspectives on many different aspects of the water resource and clean water fields. I hope you will make the time to attend one or more of our luncheons this year and invite you to provide your suggestions and input on topics that you would like to hear about.

I look forward to having the opportunity to meet you at one of our events and look forward to serving you this year.

Janet Goodwin
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From wef hq Leading-edge updates from the Water Environment Federation

Utilities Acting on Climate Change

By Beth Conway and Amy Kathman

Beth Conway (left) is an engineer in the Water Science & Engineering Center and Amy Kathman (right) is a Government Affairs specialist at the Water Environment Federation (Alexandria, Va.). Beth can be reached at econway@wef.org and Amy at akathman@wef.org

Earth's land, oceans, and troposphere have been warming for many years. Projections for the U.S. from the 2014 National Climate Assessment include not only an increase in temperatures, but also other climate changes, such as an increased intensity of droughts in the Southwest and of heat waves and precipitation events throughout the U.S. Precipitation events also are projected to become more frequent.

Climate change risks are not limited to the U.S. Among the many risks projected globally by the Intergovernmental Panel on Climate Change (IPCC) are "drought, water scarcity, sea level rise and storm surges" for urban communities and "water availability and supply" for rural communities, according to IPCC's Climate Change 2014: Synthesis Report. The full report can be obtained at www.ipcc.ch/report/ar5/syr.

Water is likely to be further affected by climate change as precipitation patterns change, sea levels rise, and water quality degrades. In the U.S., the drinking water and wastewater infrastructure already requires significant investment to maintain current levels of service over the coming decades. The effects of climate change may significantly stress critical infrastructure further.

However, climate adaptation strategies can help mitigate climate change effects. Many municipalities already

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are assessing and implementing measures to build resilience to climate change. Their work provides examples of what adaptation measures can achieve.

Declining water resources due to drought

In the Southwest, Albuquerque, N.M.; Bernalillo County, N.M.; and the Albuquerque Bernalillo County Water Authority (ABCWUA) have demonstrated that relatively low-cost measures can be effective in adapting to drought conditions. Albuquerque and Bernalillo County began a conservation program in 1995to deal with drought issues. In 1997, they developed a Water Resources Management Strategy that they update every 10 years.

The programs and ordinances undertaken at ABCWUA focused on residential areas and public buildings. They encouraged water-conserving landscaping and water-efficient appliances in new development. According to the U.S. Environmental Protection Agency (EPA) report, Smart Growth Fixes for Climate Adaptation and Resilience: Changing Land Use and Building Codes and Policies to Prepare for Climate Change (EPA 231-R-17-001), ABCWUA gives rebates on the purchase of high-efficiency toilets, encourages xeriscaping (a type of landscape design for areas susceptible to drought), and touts compact development as examples of the measures instituted. As a result, residential customers achieved great reductions in water usage

In 2014, ABCWUA programs shifted more of the focus to non-residential customers. The water authority adopted four programs, according to their document, 2024 Water Conservation Plan Goal and Program Update. ABCWUA updated building codes, modified the xeriscape program in several ways to include a larger rebate to some non-residential customers, created a cooling tower rebate program, and offered assistance to new low-income customers with water auditing and water-conserving fixture installation.

Minimizing potential flood effects

Parts of Kansas City, Mo., are at risk of flooding from rivers and streams. As of early 2017, more than two thousand structures sit in Kansas City's 100-year floodplain.

Enter, the Wet Weather Solutions Program, which provides for street and sewer infrastructure upgrades, as well as an increase in green infrastructure use. Two of this program's goals are to reduce flooding and increase in water quality. The shorter-term projects of the program's overflow control plan will be completed between 2010 and 2020. Major changes will be finished by 2035. For example, the Middle Blue River Basin pilot project, which improved streetscapes through the inclusion of green infrastructure solutions was completed in 2012.

By its end, the overflow control program seeks to reduce the estimated sewer overflow by approximately 15 billion L (4 billion gal) per year, thereby reducing cleanup, damage, and grey infrastructure costs, according to Kansas City Water Services.

Looking internationally, in Tokyo, Japan, heavy rains often lead to flooding, and increased urbanization has decreased the amount of permeable ground. In 2015, Tokyo completed an upgrade to the Tokyo Amesh, its rainfall information system. As described in the article, "Reconstructed Tokyo Amesh system crucial to flood prevention" in the Spring 2017 issue of WorldWater: Stormwater Management, rainfall radars were improved by upgrading to X-band

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multiparameter radars. These radar systems offer improved collection of rainfall data due to wave polarization. Information gathered from both radar and rain gauges is used by centrally located operators in determining pumping requirements for individual pumping stations. The Tokyo Bureau of Sewerage plans to continue improving radar capabilities and to increase the capacity of sewer facilities to handle up to 60 mm of rain per hour.

Sea level rise

A report by The Union of Concerned Scientists, When Rising Seas Hit Home Hard Choices Ahead for Hundreds of US Coastal Communities, estimates approximately 85 coastal communities in the U.S. are at risk from chronic inundation, and the number of at-risk communities is expected to roughly double by 2035. Miami, New Orleans, and San Francisco are among municipalities implementing adaptation plans for sea level rise (SLR).

The City of Miami has monitored the risks of flood and saltwater intrusion for years. SLR affects flooding and saltwater intrusion risks. Among many projects underway to aid in adapting to climate change is the construction of a chlorine facility at the Central District Wastewater Treatment Plant. This facility will be elevated 4.9 m (16 ft) above ground-level to accommodate SLR and storm surges, according to the April 2017 BBC article, “Miami’s fight against rising seas.” The City of Miami Beach is installing pumps, improving drainage systems, and raising roads as part of their approach to address rising sea levels.

San Francisco, under immediate and long- term threat from SLR, has developed the Sea Level Rise Action Plan, which will have an SLR adaptation plan by 2018. Combined sewer discharge (CSD) outfall structures with low-elevation weirs present immediate threats from SLR to the wastewater treatment process. In 2014, a device to prevent the inflow of seawater into the sewer system was installed in a CSD outfall structure. Data gathered from this installation will provide information useful for the installation of future devices.

New Orleans faces risks from SLR from loss of coastal land. As noted in the report, Resilient New Orleans: Strategic actions to shape our future city,” Greater New Orleans has invested $14.5 billion in such infrastructure as pump stations, levees, and floodwalls. The City of New Orleans also will leverage financial resources available through several sources to support the Coastal Protection and Restoration Authority. Adaptation approaches may, in many cases, require additional resources.

Resources available to utilities

Localities can access many resources to help develop climate change adaptation strategies. WEF offers the book, Emergency Planning, Response, and Recovery as well as the upcoming manual, Sustainability and Energy Management for Water Resource Recovery Facilities.
EPA’s Creating Resilient Water Utilities (CRWU) initiative also can be a resource. Through CRWU utilities can access tools, training, and assistance. The Climate Resilience Evaluation and Awareness Tool (CREAT) provides climate change threat identification, consequence assessment, and adaptation evaluation options for water and wastewater utilities. The table on p. xx shows threats listed in CREAT for use in preparing assessments in the tool. These resources can be found at www.epa.gov/crwu.

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CRWU also offers a basic guide to the effect of climate change on water and wastewater utilities. This guide is titled Adaptation Strategies Guide for Water Utilities.

For European cities, the European Union's Climate-Adapt program can be found at http://climate-adapt.eea.europa.eu. It provides information on several areas, including projected climate change, adaptation case studies, options, and planning tools. It also enables users to share data.

For resources spanning both U.S. and international interests, resources from 100 Resilient Cities can be found at www.100resilientcities.org.Formed and funded by the Rockefeller Foundation, 100 Resilient Cities provides "resources necessary to develop a roadmap to resilience."

Action today pays off in the long run

The work needed to adapt to climate change and handle extreme weather events can be expensive; however, the do-nothing option can be even costlier.

For example, New York City has an estimated $1.1 billion of vital infrastructure at risk. To mitigate the risk, New York is investing in protective measures for facilities and structures and is developing the city's green infrastructure. Construction investments between $315 million and $426 million in the city can save potentially more than $2 billion in cumulative emergency response costs by 2065 according to Workshop W13: Vulnerability & Risk Response to Climate Change from WEFTEC® 2015.

Two principal goals for water and wastewater utilities regarding climate change effects are

- to assess risk and uncertainty due to climate change and
- to develop and take actions to improve resilience and sustainability in utility facilities and overall utility management.

Federal, state, and local funding is needed to adapt infrastructure and water supplies to climate change. As part of an ongoing effort to encourage funding for critical water infrastructure, WEF's government affairs team developed talking points on climate change related infrastructure investment. Access these talking points at http://bit.ly/climate-talking-points.

Threats listed by the Climate Resilience Evaluation and Awareness Tool

Threat Group	Threat
Altered service demand and competing use	Changes in agricultural practices & outdoor use Changes in energy sector water needs Changes in influent flow & temperature Changes in residential use
Altered or loss of ecosystem services	Altered vegetation / wildfire risk Loss of coastal landforms Loss of wetlands
Degraded water quality	Altered surface water quality Saline intrusion into aquifers
Increased flood frequency & extent	Coastal storm surges High flow events
Increased incidence of droughts	Lower lake and reservoir levels Reduced groundwater recharge Reduced snowpack

Dr. Thomas J. Grizzard, Jr. August 23, 1946 – June 24, 2017

Dr. Thomas Jefferson Grizzard, Jr. passed away June 24, 2017 at the age of 70 in Manassas, VA. in a biking accident. Tom is fondly remembered by our FWQA Select Society of Sanitary Sludge Shovelers colleagues (known as the FWQA 5S Society) for being the Influent Integrator of the Virginia WPCA (Water Pollution Control Association, now known as the Virginia Water Environment Association, VAWEA), as a member and Director of the Occoquan Monitoring Laboratory, a VA Tech Graduate and Adjunct Professor of VA Tech on the Northern VA Campus, and famously as the installer of the Charter 5S Chapter of the FWQA on the Chartering Ceremony of November 15, 1986 at the Sheraton Hotel in Tyson's Corner. He conveyed the title of Charter 5S pH7 Influent Integrator on Dr. Ed Bryan of NSF of the newly-installed FWQA Chapter of the 5S Society that fateful and fun-filled evening.

Tom became Professor Emeritus of VA tech in 2014. In the course of his very active career, he established a Northern VA graduate program in Civil Engineering and taught over 1,000 students in Environmental Engineering and Science, and he advised more than 200 Master's Degree and Ph.D. students. Tom was an expert in the urban water cycle and a dedicated member of the VA WEA and Director of the Occoquan Watershed Monitoring Laboratory. Tom was known throughout the Northern VA Capitol Region as "the protector of the Occoquan," and anyone who enjoys tap water in the region should raise a glass of it to Tom Grizzard.

Tom entered VA Tech in 1964 and received his B.S. in 1968 in Civil Engineering. He accepted a position with the U.S. Army Corps. of Engineers District in Norfolk, VA and while with the Corps of Engineers, he developed an intense interest in watershed planning and management. In 1969 he married his college sweetheart, Marilyn "Lynn" White, and they returned to Blacksburg, VA in 1971 so he could pursue graduate studies in Sanitary Engineering. In 1974, while still a Ph.D. student, Tom joined the VA Tech Civil Engineering Department as Director of the Occoquan Watershed Monitoring Laboratory in Manassas, VA. For nearly 40 years, he ran the lab and used his academic credentials, depth of knowledge and personal credibility to bring all the regional water and wastewater partners together for the greater public interest for clean, safe water and wastewater treatment in the Occoquan watershed area and the Northern VA region. All those involved recognize his dedication and caring manner to protect water quality for the benefit of all.

Tom is survived by his wife of 48 years, Marilyn "Lynn" Grizzard of Manassas, VA and daughter, Jennifer Leigh Grizzard Ekzarkhev (Dimitry) of Maryland, Joshua Thomas Grizzard (Carey) of Manassas, and 4 grandchildren. For those who wish to make a donation in Tom's memory, there is the Potter's for Peace where they provide education, training and support for bringing people access to clean drinking water via ceramic creations to filter water. You can donate through the Tom Grizzard Memorial Fund page (www.pottersforpeace.org) or via check sent directly to the following:

Potters for Peace
c/o Tom Grizzard Water Filter Memorial Fund
P.O. Box 113
Dodgeville, WI 53533

Contributions can also be made to Engineers Without Boarders to benefit student projects in Guatemala, Uganda and the Dominican Republic and can be donated on line at: https://support.ewb-usa.org/TomGrizzard or via check made out to "Engineers Without Borders" with Virginia Polytechnic Institute Chapter written in the memo line. Checks can be mailed directly to the following address:

Engineers Without Borders at VT
Suite 225, Squires Student Center
290 College Avenue
Blacksburg, VA 24060

NOTE: *This obituary was prepared by K. Jack Kooyoomjian, Ph.D. who is the current pH7 Influent Integrator for the FWQA Chapter of the 5S Society, and a Charter member of the FWQA 5S Society conferred at the Chartering Installation Ceremony on November 15, 1986 by Dr. Thomas J. Grizzard, Jr.*

Inaugural Panel Discussion (contd. from Page 1)
events, such as Harvey, Irma, Maria and others demonstrated vividly storm intensity, destruction, and extremely intense rainfall rates causing severe flooding. These types of events are going to continue into the future. Sea levels in the New York City area have increased one foot in the past century. How do we prepare for these events? What resources do we have and need? With respect to natural and man-made hazards impacting upon water security, planning, response and recovery, Ms. Pallansch introduced Mr. David Travers and Mr. Jonathan Reeves to provide their perspectives.

David Travers (*on right in picture below*) discussed EPA'a WSD's mission to enhance emergency preparedness and resiliency of the water sector at all levels. The thrust of the EPA's program is to provide practical and innovative tools, as well as preparedness and resiliency training to the water sector utilities. In 2017, the Agency had provided such training to 5,000 water sector utilities. The primary risks for the drinking water sector are from natural disasters, contamination from hazardous pollutants, degraded infrastructure, and threats from cybersecurity (represents a substantial concern for utilities).

Mr. Travers mentioned the substantial adverse effects on water infrastructure from the recent hurricanes Harvey, Irma, Maria, Matthew and Nate. Also discussed were the effects from the recent fires in the Northwestern U.S. (California, Oregon and elsewhere), and drought and flooding. The FY 2017 Program Priorities for EPA's WSD have focused on providing emergency response tools and training, risk assessment, contamination warning and response and cybersecurity nationwide. This has been offered in the form of 1-day training sessions, and the release of a simplified web-based version of a software planning tool. There is a subset of resilience training that has been conducted across the US on drought and water loss workshops and flood resilience training.

In this 2017 hurricane season, there is a focused concern for loss of life and the loss of basic essential services, the loss of infrastructure, and the adverse impacts on the public health of citizens, as well as for adverse impacts on businesses, local and state revenues and recovery of infrastructure. There were issuances of boil water notices following many of these events. Before any event, EPA focuses on preparing the states and utilities. During the event EPA supports the water sector response, and also conducts the damage assessments with sampling and analysis. EPA has contacted hundreds of affected utilities to identify operational status of the affected treatment plants and to provide technical assistance.

Jonathan Reeves (*on left in picture below*), continued the discussion and touched on DC Water's preparedness and resilience planning. He advised that in emergency preparedness and planning in order to maintain and recover essential services such as power, transportation and all those things that impact operational logistics need to be focused upon. If you turn the water off in your home, you cannot go for too long without needing it. Hospitals, dialysis patients and others with critical needs are particularly vulnerable and have especially critical needs for safe, clean water. He remarked that the average citizen tends to overlook "what it takes" to get the utilities that are knocked out in a disaster "up and running." In fact, it is an enormous effort requiring coordination at all levels of government. When disaster strikes, the utility workers need to be treated as first-responders in disaster-preparedness and response.

The utility workers need to train, prepare and have access to effective resources to respond properly to disasters and emergencies. DC Water is one of the few utilities in the U.S. that actually has a team of five professionals devoted to planning and response for emergencies and disasters. He remarked that "luck and hope" are not planning tools. Mr. Reeves stressed the need for a model on how we are going to deal with disasters and what is the appropriate level of response to deal with these challenges. He remarked that what we are doing today is a large step from where we were a decade ago.

Following the presentations, there was a very lively and active question and answer session. One participant observed that the various slides focused prepared

Inaugural Panel Discussion **(contd. from page 9)**

on a variety of natural disasters, but are you for man-made disasters as well? The short answer was "Yes we are!" Since 911 (Sept 11, 2001), there has been a focus on terrorism preparedness, but the fact is that natural disasters are by far the more frequent events to plan for. At EPA they focus on "all hazards events" and terrorism is one of the scenarios. There, of course is the challenge of being prepared for and responding effectively to droughts, floods, hurricanes, and other natural and possible man-made disaster scenarios. At EPA, they focus on the training to the states and local governments, and reach out to the utilities in particular and encourage them to participate (see www.epa.gov/waterresilience).

There was a discussion of the Water Sector Coordinating Council (WSCC) as a policy, strategy and coordination mechanism for the U.S. water and wastewater system sector in interactions with the government and other sectors on critical infrastructure security and resilience. The WSCC coordinates collaboratively with the EPA, Department of Homeland Security (DHS) and state primary administrators and other government agencies, primarily through the Government Coordinating Council (GCC). The WSCC is one of the 16 sector councils which are self-organized and self-governed bodies that enable owners and operators, their trade associations and subject-matter experts to interact on sector-specific strategies, policies and activities. The easy part is putting staff in a truck and sending them in the right direction. None of us have Urban Search and Rescue as a water and wastewater industry. Some responders and utilities look at the Texas model for response, where they self-deploy from Texas to help other jurisdictions.

One question centered on how is the support function funded and how are you certain that you are employing resources correctly to high priority areas? The answer was that offering webinar training nation-wide and meeting proactively with state response personnel makes a positive difference. Whenever there is activation, there are always bucket trucks being deployed by the electrical utilities, but generally you do not see the same thing with the water sector utilities.

For a question on response issues, the advice offered from the speakers was to work with the WSCC and try to coordinate with others to have robust projects, and also to have training that is practical, and applicable to a wide variety of threats (i.e., the "all hazards" approach is best). It was remarked that this is an imperfect and subjective process. The "all hazards process" seems to be best, because it provides a common approach to hazard assessment, hazard response and hazard recovery. Jonathan Reeves noted that, for instance, they have one person designated as the food services leader, and their job is to get food. It doesn't matter if the event is an active shooter response incident or a natural disaster event. The basic idea is to have one person to be assigned a specialty area during a response, so that item is not overlooked, but in fact is well planned for and well executed in a timely fashion during an emergency situation.

There were questions directed to EPA's "skinny budget" for FY 2018 and what it means for the water security program at EPA. It was observed that the House Budget reduces Homeland Security at EPA, but that it doesn't eliminate the EPA Water Security Program. We were advised to "stay tuned" and see how it all transpires in the budget process.

A final question was asked about how do you respond to the natural disasters when they come at you one after another? How do you handle that? The response from David Travers is that each EPA Region responds to drinking water and wastewater challenges, and they also have "back up" regions that can step in to help, such as was the case in Puerto Rico. EPA currently has a staff of 24 people and works with the EPA Regions on disaster response. Jonathan Reeves remarked that with multiple events, we can send wastewater people to the water side and vice-versa.

The Federal Water Quality Association (FWQA) is a member association of the Water Environment Federation (WEF). WEF is a world leader in water quality and environmental stewardship. The WEF established the National Capitol Environmental Scholarship Fund in 1991 The scholarship fund provides funding to graduating seniors in the Washington, DC metropolitan area that will be attending colleges or universities with an environmental, water resources, or other related curriculum.

The merit scholarships are awarded based on the applicant's academic achievements and essay demonstration the applicant's commitment to environmental stewardship at school, at home, and in the community. Since the inception of the scholarship program, the fund has awarded over 80 scholarships, totaling more than $75,000. The goal of the scholarship program is to support and encourage students to pursue careers in the water industry, and to become young professionals with the knowledge to tackle the future global challenges of protecting public health and the environment.

We need your help to make this happen. The scholarship fund runs solely on donations from corporations, members, and individuals. The FWQA is a technical/educational professional organization and is designated by the IRS as a 501 (c)(3) charitable organization. All donations are tax deductible and you will receive an invoice and an IRS W9 form for your records. If you need more information about the FWQA scholarship fund: please contact Jim Wheeler, FWQA Treasurer, at virginiawheels@aol.com.