

Highlights: Outcomes of the Office of Water's Security and Resilience Program

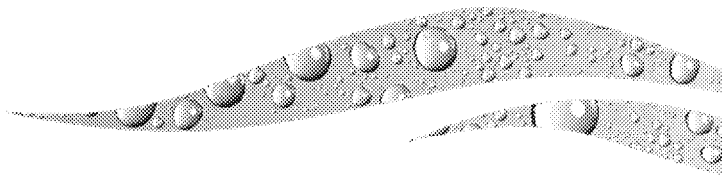
Overall Training Metric: *On an annual basis, the Office of Water trains over 5,000 water utilities, state officials, and federal emergency responders to become more resilient to any natural or manmade incident that could endanger water and wastewater services.*

Florida Functional Exercise. On November 4 – 5, 2015, 110 representatives from Florida drinking water and wastewater utilities, hospitals and emergency response agencies participated in a two-day EPA-sponsored water sector workshop and Functional Exercise (FE) focused on emergency preparedness and response. The event included a half-day workshop discussing water sector-specific response protocols followed by a full-day facilitated FE utilizing a wide-area hurricane scenario. Objectives included testing water sector and response partner emergency response and coordination tools/services and assessing water sector local and interstate mutual aid capabilities. Notably, the exercise included development and processing of an interstate Emergency Management Assistance Compact (EMAC) request for water sector crews that mirrored an actual EMAC request from Florida that was successfully filled by Tennessee, North Carolina and South Carolina utilities following Hurricane Irma in September 2017. Below are exercise participant comments:

- “The event was a highly worthwhile exercise that further highlighted the strengths and weaknesses in the current EOC process.”
- “It was a great experience for a brand new Emergency Manager (such as myself) to see how the whole system works and how it can be used during an event.”
- “The event identified the need for more communications between the local emergency management agencies and the State.”

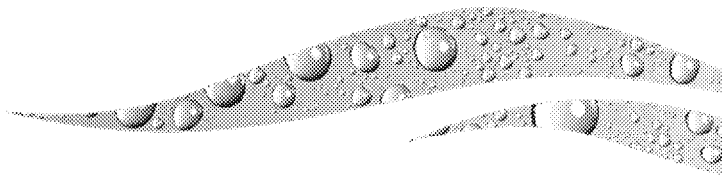
Water/Wastewater Agency Response Networks or WARN. WARNs are a network of utilities organized within a state to facilitate the exchange of resources after an emergency. EPA has long worked with local and state government and water sector associations to support WARNs, including the initial development of WARNs that resulted in WARNs being established in 49 of the 50 states and the National Capital Region. EPA has continued to support WARNs by conducting tabletop and functional exercises, providing webinar training, sponsoring a yearly Chairs coordination meeting and developing tools and resources to keep WARNs response ready. In total, 45 out of the 50 WARNs have been activated in response to a local or state-wide emergency and have benefitted from the training available as shown by three WARN responses to the recent hurricanes:

- TXWARN – In August and September 2017, Hurricane Harvey dumped over 50 inches of rain in parts of southeast Texas. Thanks to the continuous training and exercises TXWARN participates in, TXWARN successfully coordinated all response activities with other TXWARN leaders, the Texas Emergency Operations Center, Texas Commission on Environmental Quality, Public Works Response Team, Texas Rural Water, U.S. EPA, DHS and national WARN through the extended response period. Between August 23 and September 6, 2017, TXWARN responded to, or coordinated response and recovery requests for resources, assessment teams and recovery teams for over 50 utilities affected by Hurricane Harvey.



- FLAWARN – In September 2017, Hurricane Irma affected over 90% of Florida drinking water and wastewater utilities. Even though only 10% of utilities were able to assist, those utilities quickly stepped in and provided valuable assistance to utilities in need.
 - A call center was developed by the Florida Department of Environmental Protection (DEP) to determine the operational status of utilities across the state. This was a coordinated effort between DEP, the U.S. Army Corps of Engineers, U.S. EPA, DHS, Florida Rural Water Association (FRWA), FlaWARN, DEP district offices and local county health departments to determine what local resources were available to meet needs. This successful coordination is a direct result of the training and tabletop exercises that have taken place between these groups.
 - FlaWARN received over 130 requests for assistance and deployed generators, operators, electricians, bypass pumps, pumper trucks and other equipment. FlaWARN is fortunate that the State of Florida Department of Emergency Management (DEM) purchased 16 generators, and a bypass pump for use at utilities. FRWA maintains these generators, as well as another 17 generators and a by-pass pump owned by their Association.
 - The following is a testimonial from impacted FlaWARN member, Beth Johnssen, Director, Collier County Public Utilities, Inground Services Division
“The value of FlaWARN system is incalculable. The teams that were deployed hit the ground running without additional training and education needed and they knew how to operate equipment safely and efficiently. The FlaWARN system has long been recognized by Collier County Public Utilities as a valuable resource who is there to help in a time of need. Our entire community is indebted to FlaWARN, the Agencies that responded and to those individual professionals who came to assist. They played a valuable role in reducing further damage to our environment and community.”
- GAWARN – In September 2017, Hurricane Irma caused widespread power outages and flooding throughout Georgia. GAWARN and Georgia Rural Water were able to successfully respond to all utility impacts within the state, and did not need to request federal assistance for the water sector.

Florida Flood Resiliency Project. In 2015, EPA sponsored a project to help water utilities in the Florida Panhandle assess their flood risks, identify vulnerable utility assets and identify and fund mitigation opportunities. The project also focused on integrating these mitigation projects into local hazard mitigation plans. Examples of recommended mitigation projects included elevating instrument panels, creating a wall around influent headworks, reinforcing an embankment, and relocating a lift station. Three Florida utilities developed projects for flood mitigation and incorporated those projects into local mitigation plans and utility capital plans for funding.

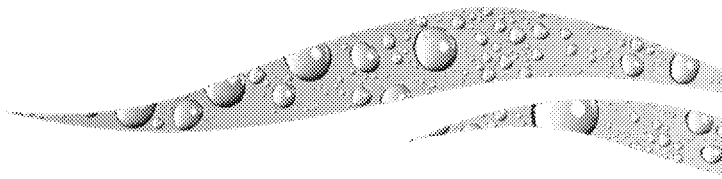


Preparing Florida for Hurricane Response. For the last few years, EPA has been preparing water and wastewater utilities in Florida and in nearby states for hurricanes and flooding. The effectiveness of these efforts in Florida is summarized by two key partners in reference to the September 2017 Hurricane Irma response:

- Gary Williams, Executive Director of Florida Rural Water Association: "Currently, my staff are helping the water sector in Florida to respond and recover from Hurricane Irma. I just wanted to express my support to EPA's Water Security Division (WSD) who over the years have undertaken valuable efforts in Florida to prepare the water and wastewater sector for hurricanes and flooding. Our staff in the Florida Rural Water Association are better able to respond to Hurricane Irma because of past EPA efforts that have included a water emergency response functional exercise in 2015/2016, a regional flood resilience project in 2015, two trainings on EPA's Flood Resilience Guide in 2014, and multiple workshops on EPA's Fed FUNDS federal funding tool in 2013. Particularly useful was the functional exercise which practiced the response capability now being used during Hurricane Irma. We improved our coordination with the Emergency Operations Center, resource tracking, situational awareness, and mutual aid requests through Water/Wastewater Alert Notification System (WARN) and through Emergency Management Assistance Compact (EMAC). In fact, an EPA Region 4 workshop specifically on EMAC ultimately helped us activate EMAC during Hurricane Irma to bring utility teams from Tennessee, North Carolina, and South Carolina to repair water and wastewater systems in the Florida Keys."
- Carol Hinton, FlaWARN Administrator: "FlaWARN was greatly aided in its response to Irma by the various training and presentations that the EPA funded including:
 - Interstate Mutual Aid and Assistance Training in Atlanta Georgia in 2015
 - Functional Exercise in Ft Lauderdale in 2015
 - Session at the Governor's Health Conference in Orlando in 2016

I would like to see more of this support offered around the country. As much as we train, we still see new needs arise and plenty of lessons learned."

EPA Regional Interstate Mutual Aid and Assistance Workshop Series. Starting in 2013, EPA has conducted a series of Interstate Mutual Aid and Assistance (MAA) workshops for EPA Regions 1 (June 2013); 2 and 3 (September 2014); 4 (September 2015); 10 (November 2016) and 5 (August 2017). The goal of the workshops was to bring together representatives from water utilities, Water/Wastewater Agency Response Networks (WARNs), state regulatory agencies and emergency management agencies in order to strengthen relationships and improve interstate MAA capabilities through state-level Emergency Management Assistance Compacts (EMACs). Lessons learned from the EPA Region 4 workshop were instrumental in exercising water sector EMAC requests between Florida and the states of Tennessee, North Carolina and South Carolina in the wake of Hurricane Irma in September 2017. This EMAC deployment included about 8-10 out-of-state water utility teams sent to storm-ravaged Florida Keys utilities to help restore water and wastewater services.



EPA Water and Emergency Services Coordination Workshop Series. Between April 2016 and September 2017, EPA has conducted nine workshops throughout the country to increase coordination and communication between drinking water and wastewater utilities and local and state emergency management agencies before, during, and after disasters. Workshop locations include: Lincoln, RI (April 2016), Orlando, FL (May 2016), Bordentown, NJ (June 2016), Richmond, VA (August 2016), Denver, CO (January 2017), Portland, OR (February 2016), Robertsdale, AL (July 2017), Wichita, KS (August 2017), and Raleigh, NC (September 2017).

- Michael Sprayberry, the Director/Deputy Homeland Security Advisor for North Carolina Emergency Management wrote the following about EPA's Water and Emergency Services Coordination Workshop that occurred in the state Emergency Operations Center (EOC) the day it was activated to prepare for potential impacts from Hurricane Irma:

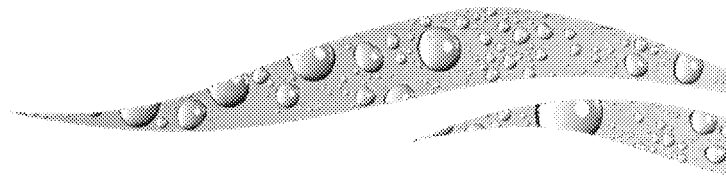
The timing of the workshop, so near to Hurricane Irma landfall, gave the topics a real time sense of urgency for most of the attendees. Again, we appreciate you and the EPA team for all of the work you put in to bringing this valuable training and networking opportunity to North Carolina.”

EPA Water and Healthcare/Public Health (PH) Interdependencies Workshop Series. Since August 2016, EPA has held five Water and Healthcare/Public Health workshops throughout the country to enhance coordination, communication and collaboration between water utilities and the healthcare and public health sectors prior to, and during an event which can impact water supply. The workshop locations include: Atlanta, GA (August 2016), Hartford, Connecticut (September 2016), Cincinnati, OH (April 2017), Morgantown, WV (August 2017), Boston, MA (September 2017); with upcoming workshops in: Norristown, PA (September 2017) and Albany, NY (October 2017). Lessons learned from the Atlanta, Georgia workshop assisted with the response efforts of Hurricane Irma. The Norristown, Pennsylvania workshop was rescheduled from early September to late September to allow speakers and attendees of the workshop to deploy to Texas for Hurricane Harvey relief efforts.

EPA Water and Power Resilience Guide and Workshops: Since August 2013, EPA held nine Water and Power Resilience Workshops throughout the country to increase coordination between water utilities and their electric providers and to increase water utilities' resilience to power outages. These workshops were held in: Lorton, VA (August 2013), Sayreville, NJ (November 2013), Bethpage, NY (November 2013), Lore City, OH (April 2014), Oklahoma City, OK (May 2014), Hadley, MA (November 2014), Anaheim, CA (July 2015), Arlington, TX (September 2017), and Tempe, AZ (September 2017). In March 2016, EPA published the Power Resilience Guide to share key workshop findings and best practices with a larger audience. Feedback on the guide and workshop series include:

- Power Resilience Workshop Series: Julie Hunt, Assistant Regional Manager, Trinity Water Authority provided the following feedback regarding a workshop held in Texas less than three weeks after Hurricane Harvey made landfall:

“Thank you very much for EPA’s leadership in developing the Water and Energy Coordination workshop. Your leadership in developing this workshop, the topics and a table top exercise was



valuable. You were able to plan and execute an informative workshop for the region. The workshop provided the utilities that attended with relevant knowledge pertaining to the electrical grid in Texas, EPA air regulations related to generators and ideas for microgrids and other backup electrical supplies. The workshop promoted awareness in preparing for outage events.

By having both water utilities and energy providers in the room together for the tabletop exercise, we were able to have a great dialogue about how each utility responds during an outage. The dialogue definitely strengthened the local relationships between energy and water utilities as well.

There is real value to utilities to have opportunities to take time to attend workshops like this one- it will help us be more resilient when the next power outage occurs. Thank you."

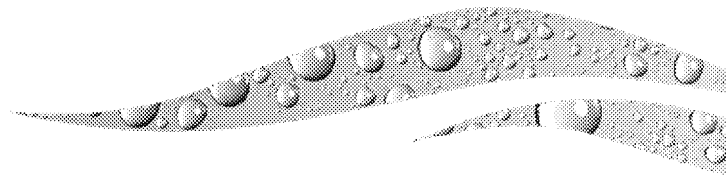
- Diane VanDe Hei, Executive Director, Association of Metropolitan Water Agencies provided the following feedback on coordinating with EPA on the September 2017 workshops in Texas and Arizona:

"It was a pleasure working with you on the energy resilience workshops last week in Texas and Arizona. AMWA, WaterISAC and our local member utilities appreciate having had the opportunity to participate.

Several water and wastewater system attendees told us they most appreciated learning about the resilience investments and planning by other utilities - both during presentations and through networking. In our experience, peer-to-peer learning is invaluable, so it's not surprising that the utility staff found the workshops extremely useful.

Being prepared for short-term and long-term power outages is a big challenge for the water sector, so we hope to see more workshops like these, and we would be happy to collaborate with you again."

Colorado Water Emergency Services Workshop. EPA conducted a workshop in January 2017 in Denver to increase coordination between the water and emergency services sectors. Approximately 100 individuals from utilities and state and local government water and emergency management agencies participated. As a direct result of the workshop, Colorado's Division of Homeland Security and Emergency Management decided to form a statewide Water Distribution Task Force to develop a plan for emergency water. Colorado currently does not have a plan or procedures in place addressing this important topic. Per Jeremy Utter, Logistics Section Chief for the Division, the workshop highlighted this important need and brought together all of the key players. He invited workshop participants to contact him to be a part of the task force.



Georgia Tabletop Exercise and Hurricane Matthew. In July 2016, EPA conducted a State Emergency Response Tabletop Exercise (TTX) in Atlanta, Georgia. Participants included federal, state and local agencies and drinking water and wastewater utilities. Three months later, the participants implemented the lessons learned from the exercise during the response to Hurricane Matthew. Following the response, Amy Rammo Kuhs, of Georgia Environmental Protection Division said “I do believe that having our TTX in July did have a big impact on the positive response that was able to be made to help those communities that were impacted by Hurricane Matthew. One of the key points of success in any type of emergency is the effectiveness of communication and coordination with all partners and stakeholders at the local and state level. Keeping one of our exercise action items in mind, I tried to reach and start my pre-landfall communications 4 days out and continued to do so until the day of...Without a doubt in my mind, I believe that our ESF3 Water Sector Exercise that you helped facilitate was definitely a positive learning tool that greatly benefited all that attended.”

Mitigation Funding for North Carolina Following Hurricane Matthew. In the aftermath of severe floods in North Carolina from Hurricane Matthew in October 2016, EPA worked with the North Carolina Department of Environment (NCDEP) to develop cost estimates for implementing mitigation measures to reduce future flooding impacts at water and wastewater utilities. As a result of this coordinated effort, NCDEP received \$4 million from the state for mitigation projects at six water utilities.

Emporia, Kansas Water Main Break and Incident Command System Training. At approximately 4 a.m. Thursday, July 20, 2017, a 20-inch water main break in Emporia, Kansas left 25,000 people without water while in the midst of an intense heat wave gripping the Midwest that saw temperatures soaring to 107°F. That same day, the Kansas Department of Health and Environment (KDHE) issued a boil water advisory for the public water supply of the city of Emporia; the advisory was lifted the morning of Sunday, July 23, 2017. A week prior to the main break, EPA held a 4-day Incident Command System (ICS) training for 20 KDHE staff. These EPA-sponsored trainings are specifically designed to enable more effective response within the ICS structure to water-related incidents, and proved both timely and highly beneficial for KDHE staff during the response. Commenting on the training, Cathy Tucker-Vogel, Section Chief of the KDHE Public Water Supply Section said: “The EPA-sponsored ICS training was invaluable for our recent response to the Emporia water main break. During the activation of the KDHE departmental operations center, our staff trained in ICS were much better prepared to coordinate emergency response operations, including the monitoring of repairs and flushing and disinfection actions. The ICS training was some of the best training that my staff have taken and proved its worth during this event.”

Village of Cobleskill, New York Water Supply Protection Project. In the fall of 2012, just prior to Superstorm Sandy, EPA staff conducted training in the Village of Cobleskill for small water and wastewater utilities on flood resilience and obtaining mitigation funding. This included providing an overview of flood mitigation measures in EPA’s Flood Resilience Guide, and outlining FEMA mitigation programs and procedures described in EPA’s Fed FUNDS online tool. In 2016, FEMA announced a federal mitigation grant for \$2,769,000 (100% Federal cost share) to the State of New York for a Cobleskill Water Supply Protection Project. This project, which is associated with the flooding impacts from Superstorm Sandy, includes reconstruction of existing spillway structures on the Dow and Smith reservoirs and construction of additional spillways to eliminate the risk of loss of water service.