Water Resilience Summit

Summary & Next Steps

APRIL 9 – 10, 2014
WASHINGTON, DC

NACWA
A Clear Commitment to America's Waters

ASSOCIATION OF
METROPOLITAN
WATER AGENCIES

Thank You

AMWA and NACWA would like to thank those organizations and federal agencies that participated in the *Water Resilience Summit*:

Alameda County Water District, CA
Albuquerque-Bernalillo County Water Utility Authority, NM
Alexandria Renew Enterprises, VA
Boston Water & Sewer Commission, MA
DC Water, DC
Delta Diablo Sanitation District, CA
Denver Water, CO
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Palm Beach County Water Utilities Department, FL
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Federal Emergency Management Agency
U.S. Army Corps of Engineers
U.S. Department of Energy
U.S. Department of Interior
U.S. Environmental Protection Agency
U.S. Geological Survey
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Summit Overview and Next Steps

The National Association of Clean Water Agencies (NACWA) and the Association of Metropolitan Water Agencies (AMWA) hosted a *Water Resilience Summit* on April 9-10, 2014 in Washington, D.C., as part of *Water Week 2014*. The meeting came about as a result of discussions with high-level U.S. Environmental Protection Agency (EPA) officials, including Administrator Gina McCarthy, who made it clear that climate resilience was a top priority of the agency and that it would be critical for the federal government and the municipal sector to work on the issue collaboratively and proactively. At the Summit, key municipal and federal agency leaders convened for a two-day discussion to examine the array of challenges facing utilities in light of climate change and, more importantly, to outline the policy and advocacy steps and collaborative actions that could be taken to improve resilience. In short, the Summit focused on how to get things done to ensure the water sector becomes more resilient, while allocating resources and mitigating some of the enormous costs better than in past storm-related, post-disaster recovery and relief efforts. This paper summarizes the outcomes of the Summit discussions.

Gina McCarthy, who delivered the event's keynote address, noted, "…from historic droughts that threaten water supplies to super storms that overwhelm sewer systems, the impacts of climate change are felt at the local level where we treat and manage our water. That's why EPA supports AMWA's and NACWA's leadership on building and designing resilient water systems that take climate change into account." In short, resilience is a game-changer for the water sector, and failing to act now will only cost our communities and the nation more in the long run.

Three key themes were explored at the Summit:

- Resilience, Risk Tolerance, and Long-Term Planning
- Constraints to and Collaborations for Building Local Utility Resilience
- Financing, Funding and Partnering for Resilience

Water and wastewater utilities from coast to coast participated, as well as federal agencies, including EPA, the Army Corps of Engineers, the Department of the Interior (DOI), the Department of Energy (DOE), the White House Council on Environmental Quality (CEQ), and the Federal Emergency Management Agency (FEMA). Representatives of the insurance industry, utilities and federal agencies were invited to present overviews of their activities and outline the challenges and opportunities regarding resilience from their unique perspectives.

Since the *Summit* important federal actions in the resilience space have come about largely due to municipal advocacy. The recently passed Water Resources Reform and Development Act (WRRDA) makes changes to the Clean Water State Revolving Fund (CWSRF) to include resilience planning and projects, as well as water reuse projects, as eligible activities not only for typical CWSRF loans but also for additional subsidization (i.e., low-interest loans or grant equivalents). The Department of Homeland Security (DHS) recently announced the creation of a Resilience Star program (similar to

Energy Star or WaterSense) that will certify certain products or approaches as best in class to ensure resilience. As this program progresses, DHS is interested in potentially conducting Resilience Star pilots with water and wastewater treatment agencies. And, late last year, the Obama Administration announced the formation of the National Drought Resilience Partnership – a collaboration of several federal agencies, as well local, state and regional governments. The Partnership is focused on federal policy coordination to improve monitoring and drought forecasting. The partnership also developed a web portal (*http://www.drought.gov/drought/content/ndrp*), which serves as a clearinghouse and entry point for federal drought forecasts and planning tools.

These are just a few examples of the types of new and emerging federal agency activities – two of which took place between the *Summit* discussion and the release of this paper – that demonstrate how existing programs can be tailored to incorporate resilience as discussed at the *Summit*.

The goal of AMWA and NACWA is to ensure that the water sector is proactively working with all state, federal and private partners that can help ensure improved water sector resilience. This document outlines next steps NACWA and AMWA will take collaboratively on this topic, based on the *Summit* discussions. *Appendix A* provides a summary of the key challenges and opportunities for water sector resilience, as identified by *Summit* participants. *Appendix B* is a summary of the introductory remarks that were provided by several federal agencies and utilities in attendance.

NACWA/AMWA Collaborative Actions

There are many recommendations suggested by *Summit* attendees. In the short term, NACWA and AMWA plan to focus the associations' efforts specifically on the following:

1) Document federal agencies with responsibilities for resilience, as well as existing partnerships involving federal agencies and local utilities and communities. Analyze the federal landscape for potential redundancies in resilience efforts and identify potential areas for collaboration.

2) Advocate leveraging existing federal funds from agencies with programs that benefit drinking water and clean water utilities for projects that advance resilience goals (e.g., SRFs, WIFIA, Farm Bill, Dept. of Energy grants and HUD Community Block Grants.

3) Make the case for streamlined permitting requirements and flexibility in addressing regulatory requirements with federal agencies, including lengthened permit terms, to allow for longer term resilience planning.

Concluding Observations

Understanding the baseline now of what is and is not resilient is a challenge, as is determining what to measure to know that resilience has improved. Meaningful progress likely requires the need for longer time horizons to examine, analyze, and address climate impacts. These timeframes could need to be 50 to 100 years – an issue that needs further dialogue and collaboration. Overall, more cross-sector and cross-agency solutions are needed that can consider environmental protection, health, energy, transport and communications in a holistic implementation package. This requires coordination across agencies at all levels of government and with the private sector.

AMWA and NACWA will continue discussions with federal agencies and with its memberships to work collaboratively to address these challenges.

APPENDIX A: Summary of Comments by Summit Participants

Appendix A summarizes what the *Summit* facilitator, NACWA and AMWA identified as the key points from the *Summit*. The *Appendix* is organized to include a section on *Key Challenges* as identified by utilities and the insurance industry participants during the *Summit* and *Opportunities/Recommendations* suggested by participants, including federal agencies, to potentially address these challenges.

Participants recognized the *Summit* is just one step in what is an ongoing dialogue to find solutions to the complexities of building and maintaining resilient water systems.

KEY CHALLENGES

During presentations and interactive discussions at the *Summit*, utility participants identified a number of critical challenges affecting their ability to build infrastructure and make improvements that will meet the challenges of managing water resources under a changing climate. Key challenges were identified from the discussion notes and are described below in this section. These challenges generally fit into one of four categories: planning, funding and financing; permitting and regulatory flexibility; public education and community outreach; and partnerships and coordination.

An underlying complexity of all these challenges is how to develop a baseline for what constitutes sufficient resilience. Specifically how much operational preparation, and what type and amount of infrastructure will provide basic resilience to respond to the future demands of a changing climate, and at what cost? Utilities, federal agencies, local governments, the insurance industry and the public need to consider this uncertainty in combination with limited resources as they consider the key challenges.

Planning, Funding and Financing

a. *Appropriations for utility projects take many years and require multiple applications.*

- Utilities interested in beneficial reuse of wastewater have in some cases waited years to get federal partnership funds. In some cases, this federal funding may be authorized but not ultimately appropriated by Congress.

b. *Long-range resilience planning is difficult to fund and incentivize.*

- Many people often cannot visualize the problem and is seldom willing to plan for something that may occur beyond their lifetime.
- Many people tend to believe that either the government or the insurance industry will "bail them out" when systems fail.

- Federal agencies often do not demonstrate climate change planning behavior on federal lands.
- Some communities face high levels of poverty struggle to provide basic services and cannot raise rates to fund resilience planning. Utilities need federal incentives.
- While federal funding is available post disaster, historically little is designated for long-term resilience funding, and what is spent post-disaster is not often contributing to increased future resilience.

c. *Time horizons vary for federal and utility planning and funding cycles, creating challenges for resilience funding.*

- The Clean Water and Clean Air Acts require renewal of permits every five years, making long-term planning for resilience difficult.

Permitting and Regulatory Flexibility

a. *Federal permitting processes can often be cumbersome and redundant. Obtaining permits sometimes involves more than one federal agency, each with its own set of policies and procedures. There is a need for streamlined permitting processes.*

- Utilities expressed concerns about the time it takes to gain approval to build resilient infrastructure projects. One utility gave an example of a water storage project permit process that is still ongoing and has lasted nearly 12 years. Delays mean that data originally submitted are outdated and often no longer accurate. However, the information must continue to be used in the public process, making interactions challenging and planning difficult. For example, in the case of permitting for concentrate management for the establishment of a desalinization plant, several federal and state agencies are involved. Each federal agency handles the National Environmental Policy Act (NEPA) process differently, which burdens utilities in their efforts to be responsive.
- Western drinking water utilities face significant issues in water availability as they function in an interconnected system of water sources (e.g., Colorado River, San Francisco Bay-Delta). The biggest challenges they face are the lack of coordination among federal agencies in permitting requirements, which increases wait-times to secure permits.

b. *The lack of flexibility in addressing regulatory requirements is an impediment to building resilience.*

- Standards and risks assessed decades ago can become outdated in light of significant changes in environmental conditions (e.g., temperatures and chemistry), impeding the ability to develop resilient utilities.
- Permitting agencies are not coordinating on ways to holistically support multiple outcomes or cross-sector solutions. For example, individual agency permitting requirements, standards and regulations impede innovations such as the ability to consider how biosolids might become energy, how stormwater could be reused, or how wastewater could be recycled.

Public Education and Community Outreach

a. *The public does not understand the potential risks of climate change to water and wastewater systems.*

- The population reliant on public water systems takes for granted that water will be delivered and wastewater whisked away. In general, they have limited knowledge or understanding

about threats to supplies, flooding and risks of service disruptions. In most cases, they have not experienced loss of services that can extend to weeks or months and cause significant economic disruption. It is difficult to communicate the very real risks of climate change, including disruption to drinking water and wastewater services.

Partnerships and Coordination

a. *Until now, the challenge of responding to climate change has not fostered a cross-sector/cross-agency dialogue.*

- It is not clear who will lead or how to optimally structure such a dialogue.
- Utilities want to know how they can work across boundaries and consider all infrastructure – water, energy, communications and transportation – in addressing future needs.
- More cross-sector solutions that consider environmental protection, health, energy, transport and communications in a holistic implementation package are needed. This requires coordination across agencies at all levels of government and with the private sector.

b. *More than 20 federal agencies have a role in managing or regulating water.*

While many agencies coordinate on different partnerships and initiatives related to water, there is no structure or body in place that promotes the ability of federal agencies to coordinate an industry-wide resilience effort. No one agency is in charge.

OPPORTUNITIES/RECOMMENDATIONS

Based on the *Summit* discussion, participants identified various opportunities for federal agencies, states and utilities to influence progress on resilience. Several recommendations rise to the top, either because they were mentioned several times or because they are the most actionable. They are organized by the four categories previously identified.

Planning, Funding and Financing

a. *Federal agencies and local utilities should work together to identify means to fund resilience planning and implementation.*

- Advocate leveraging existing federal funds from agencies with programs that benefit drinking water and clean water utilities for projects that advance resilience goals.
    - This should include incentivizing resilient-smart projects in federally funded grants/loans and "rewarding" utilities that engage in resilience planning.
    - The State Revolving Fund Programs (SRFs) may be leveraged for resilience investments.
- Federal agencies should fund innovation and research with a focus on new technologies that contribute to resilience.
- Build a federal framework for funding infrastructure that incorporates resilience before it is needed rather than only rebuilding post-disaster. For example, FEMA spends billions for rebuilding, but the perception of *Summit* utility attendees is that the rebuilding is frequently not required to be any more resilient than pre-disaster construction.

b. *Utilities should plan for and fund resilience as a component of all system services, not as a stand-alone activity.*

c. *Examine options to ensure that all federal investments in water resource management are to some degree considering how the project being funded contributes to overall system resilience.*

d. *Explore options to have utilities play a role in the Community Rating System of the National Flood Insurance Program, whereby homeowners would get a reduction on insurance rates based on steps taken in their communities.*

e. *Leverage partnerships with the private investment sector to broaden the incorporation of technologies that create more resilient water and wastewater systems.*

Permitting and Regulatory Flexibility

a. *Federal and state agencies and utilities must look more holistically at regulations to ensure flexibility for resilience and to leverage opportunities that capitalize on multiple benefits for innovation (e.g., biosolids for energy).*

b. *Given the high priority of water needs, permitting agencies should speed up project review and expedite permit approvals.*

Public Education and Community Outreach

a. *Federal agencies and utilities should work together to better inform the public and communities about the need for resilience in water systems.*

- Identify, publicize and streamline access to water-related climate resilience tools and data that can help communities understand and address the issues.
- Demonstrate and publicize the economic value (including, but not limited to, jobs created) of investments in climate resilient water/wastewater infrastructure.
- Identify best practices and model environments that are demonstrating resilience and share this knowledge through workshops, webinars and field visits.
- Conduct visioning sessions at the local level about what infrastructure is needed to ensure the community's water future.
- More effectively share stories about what is successful – among utilities and federal agencies.
- Make ideas and recommendations laid out in other reports and plans (e.g., Utilities of the Future, Climate Ready Utilities) more visible and encourage local water agencies to carry them out.
- Develop a better story on the cost of *not* thinking about resilience. Develop clear messaging on what has been done (and by whom) and what remains to be done.

b. *The public sees utility leaders (not federal agencies) as the "face" of water. Utility leaders should make use of this unique relationship to more effectively communicate the importance of investment in resilience.*

Partnerships and Coordination at All Levels of Government

a. *Document federal agencies with responsibilities for resilience, as well as existing partnerships involving federal agencies and local utilities and communities (e.g., Urban Waters, Partnerships for Sustainable Communities).*

- Once the documentation is complete, outline ways to build on these existing partnerships.
- Develop a menu of how federal agencies can support utilities. For example, it would be useful to know how the Department of Energy can support the use of biofuels at wastewater treatment plants.

b. *Federal agencies should more effectively coordinate among themselves and with the private sector to ensure the ability to optimally manage water resources.*

- When water scarcity or flooding and inundation reach crisis levels, it will be essential that federal agencies work together to help local agencies respond and recover. Preparing for such situations in advance should be a high priority. This coordination should minimize bureaucracy and be a cross-sector effort that considers requirements of Clean Water Act, Safe Drinking Water Act, Endangered Species Act and other health, energy, transport and communication needs.
- Federal agency climate resilience planning under the President's "E*xecutive Order on Preparing the United States for the Impacts of Climate Change*" (E.O. 13653) should include integrated thinking across agencies on how to address impacts and strategies for protecting water resources.
- The U.S. Department of Transportation should be actively engaged in thinking about stormwater management.
- Coordination of shared data and models, and consolidation of climate data, is important to water utilities.
- The recently formed State, Local, Tribal Leaders Task Force may provide a means for utilities to provide input to the Administration on ways to enhance and coordinate water resilience efforts.

c. *Utilities should build more partnerships with NGOs, federal landowners and the public to move beyond confrontation and toward collaboration for holistic water resource management.*

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APPENDIX B: Summary of Opening Remarks by Summit Participants

This appendix provides a high-level summary of the opening remarks provided by representatives from the insurance industry, water and wastewater utilities and the federal agencies that participated in the *Summit*.

Insurance Perspective

The insurance industry is paying close attention to climate change impacts. It is aware risk management policies were designed when the population of the U.S. was significantly smaller, less urban and less concentrated in coastal areas than is true today. The changes over the last several decades have increased risks and have the potential to compromise U.S. competitiveness. Infrastructure that is not resilient or cannot recover quickly in the case of extreme weather events can cause significant business and community distress. Policies must be redesigned based on what is currently known about risks. These externalities need to be brought into the discussion of vulnerabilities to understand potential future risks and costs.

Insurance penetration in municipal assets has decreased over the last several decades. Studies show that the unfunded federal government costs potentially resulting from extreme weather events could match unfunded Social Security liabilities, ranging from $1.1 to $5 trillion. The public currently seems to expect that government funding will play the role that insurance has traditionally played. Meanwhile, the insurance industry sees a need for a three-pronged approach that includes: educating policymakers, advocating for different approaches to risk management and funding, and collaboratively packaging messages around these issues. The data exist to show costs for insured losses, but not for uninsured (e.g., interruptions to people's lives). There are, however, efforts underway to do this. The challenge is similar to convincing the public and policy makers to invest in safety. They are being asked to pay for something that has not happened. This is very difficult messaging.

Utility Perspectives

Utilities vary in services provided (drinking water, wastewater, stormwater, energy) and in the challenges they face (too much water, too little water, sea level rise, falling water tables, etc.). Some utilities have built resilience into their day-to-day operations with ratepayer support. Other utilities are facing significant budget shortfalls or drawn-out federal permitting processes that are impeding their ability to respond to a changing climate.

Some utilities have developed comprehensive scenarios about the future, considering a diverse range of conditions and how they would respond. In some cases, these include considering a "clean sheet future" exercise, envisioning what might be done to rebuild anew should significant impacts occur to their utilities. They are focused on building resilient and robust utilities that can respond to uncertainty in finances, affordability, declining use of water, declining availability, employee turnover, tax changes, security issues and population growth, among other factors.

Water Quantity

Utilities interested in reuse of wastewater face several challenges. It can take years to get federal partnership funds and requires two acts of Congress, one for individual project authorization and a second for individual project appropriation. A recent survey indicates there are many projects across the nation focused on use of recycled water, totaling in excess of $6.4 billion. Some utilities suggest that rather than individual project authorization, a federal program similar to funding for transportation infrastructure should be formed. This could significantly streamline access to funding.

Western drinking water utilities face significant issues in water availability as they function in an interconnected system of water sources (e.g., Colorado River, San Francisco Bay-Delta). The biggest challenge they have faced is the lack of coordination among federal agencies in permitting requirements, which increases the time required to secure permits. Twelve to twenty year timeframes for permitting are not acceptable in developing new water supplies. Similarly, the lack of regulatory flexibility (based on standards and risks assessed decades ago) in light of significant changes in background conditions (temperatures and chemistry) impedes the ability to develop resilient utilities. Some western drinking water utilities are beginning to work closely with federal land managers (e.g., the U.S. Forest Service) to fund watershed improvements, recognizing watersheds as a critical infrastructure component of their drinking water systems. More productive communications with non-government organizations, rather than ongoing battles, could help tremendously in educating the public about challenges and opportunities in developing resilient utilities. Utilities observed that the role of the Bureau of Reclamation among western states has evolved from facilitator to partner in many discussions about water. This is perhaps a role that other federal agencies might model.

Energy

Some utilities are exploring ways that wastewater might be used to generate energy. Estimates suggest wastewater systems could generate a significant amount of the nation's energy with the support of cross-cutting federal cooperation on research and development.

Innovative Response to Extreme Weather

New York City, has invested more than $10 billion in infrastructure to maintain water quality and harden assets. Rates have increased 164% over the last ten years. Despite these investments, there are not enough resources to make the city's wastewater system flood proof. However, the city can minimize the potential for billion-dollar losses by investing upwards of $315 million in green infrastructure and redundancy in water supplies. Green infrastructure, in particular, offers an adaptable and comparatively low-tech approach with multiple benefits, such as improved neighborhood aesthetics and decreasing heat-island effects. But ongoing operations and maintenance costs need to be assessed to know its true value.

Similarly, Philadelphia faces increasing precipitation and tide surges leading to more frequent flooding. Flood insurance premiums are increasing; for some residents these exceed mortgage payments. The utility is experimenting with green infrastructure, seeing a 10% benefit for combined sewer overflows (CSOs) and additional benefits in absorbing some peak flows. The city reduced energy use and greenhouse gases through diversification of their energy portfolio and is looking to do more through public-private partnerships, tax credits for co-generation, sewer-geothermal power and growing algae. The rate structure is constrained due to high levels of poverty in the city, leading to hope for federal flexibility and incentives.

In the Southeast, extreme events have become increasingly common. Rather than having one hurricane every five years, having three hurricanes per year is not surprising. Among the efforts utilities are undertaking is research into

a more distributed approach to treatment, with treatment taking place at multiple locations — a decentralized system — rather than moving water for several miles to one or two central treatment plants. However, decentralization presents its own concerns. For instance, developers may want to own their supply, for ease of building new developments. The assets are then deeded to the local homeowners associations to operate. This creates many small systems, which makes regional resilience planning for future extreme events very difficult.

Utilities are actively working to avoid possible disincentives to installation of green infrastructure on private property, such as taxation of green infrastructure grant funding, given that half the impervious cover in the nation is on private property. More coordination is needed among utilities and state and federal agencies to ensure that needs, incentives and opportunities for green infrastructure/resilience integration are fully explored. Utilities recognize that resilience cannot be marketed as a stand-alone project and has to be integrated into many aspects of doing business. This can only be done through coordination with partners.

FEDERAL PERSPECTIVES

Federal agencies play a significant role in climate change monitoring and data analysis to understand trends and impacts from climate change. They recognize that their processes are not always nimble and, in some cases, are based on outdated data and assumptions. At least 20 federal agencies have authority for addressing water and many impose different requirements on utilities. In November 2013, President Obama announced the interagency National Drought Resilience Partnership (among seven federal agencies and led by the Department of Agriculture and the National Oceanic and Atmospheric Administration) as part of the President's Climate Action Plan. This partnership is intended to help communities prepare for droughts and reduce the impact of drought events through improved access to federal drought data and a national soil moisture-monitoring network. This effort and the overall Climate Action Plan are intended to help promote resilience and may contribute to better collaboration among some federal agencies.

Environmental Protection Agency

EPA acknowledges that climate change is already having a dramatic effect on people and the environment. EPA has played a role in helping the public better understand water issues by more effectively pulling together the story about costs and successful approaches using the facts and statistics federal agencies collect. Agencies, utilities and the public can be better informed to "grasp the nettle" – that is, to take action immediately to deal with unpleasant situations (climate change) to land in a better place in the future. EPA supports a variety of grant programs including State Revolving Funds and programs for green infrastructure. Efforts such as NACWA's Utility of the Future can provide useful guidelines for utilities. For the last few years, EPA has also promoted an Integrated Municipal Stormwater and Wastewater Planning Approach Framework that provides guidance in integrated implementation of the Clean Water Act.

Department of Interior

The Bureau of Reclamation in the Department of the Interior provides water and hydropower services to 17 western states. It has traditionally focused on agricultural water users, but is increasingly recognizing the need to partner with municipalities. Its resilience efforts have been in risk assessment and long-term planning, looking at water supplies in the west through large basin studies. These are at the watershed level, looking at water demand and how to use science to address water needs in light of climate change. The Bureau's water reclamation and reuse program, known as Title XVI, has authorized 43 projects (17 in Southern California) to investigate and identify opportunities for water reclamation and reuse of municipal, industrial, domestic and agricultural wastewater, and naturally impaired ground and surface waters. Title XVI also considers design and construction of

demonstration and permanent facilities to reclaim and reuse wastewater. Also, in the Department of the Interior, the U.S. Geological Survey conducts extensive monitoring, offers grants to states to help understand water use patterns and produced many resources for decision makers.

Federal Emergency Management Agency

The Federal Emergency Management Agency (FEMA) offers post-disaster and mitigation program grants to communities. It also plays a role in working with other science agencies to understand risk and provide guidance (e.g., floodplain mapping). Some cities are looking to FEMA for buyback funding for housing that is now shown to be on floodplains based on new mapping. There is also interest in buyback for structures that are continually damaged, but may be out of flood zones.

U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers (USACE) helps manage the nation's waterways and educates policy makers and the public. Among its climate change-related services, the Corps hosts a website with extensive climate modeling data and adaptation strategies at www.corpsclimate.us. The Corps also works to understand changes that are occurring on land and in the water through the eyes of field operators and bring the data from those observations into decision-making in USACE and other agencies. Most data are not site-specific, but are at the basin level. Sea-level changes are not uniform across the United States. For example, glacial rebounding in Alaska means the land is actually rising – from a decrease in load from glaciers as they melt – more quickly than sea level is rising. Sea-level change is, however, an easier situation to predict than inland hydrology. Regardless, engineers and planners need to work together to build resilient systems. Both utilities and the ACOE also have an interest in streamlining the 404 permitting process to reduce the time it takes and potentially provide more opportunities for the public to learn how things are changing.

Department of Energy

The Department of Energy (DOE) has looked at resilience in U.S. energy systems in a report: *U.S. Energy Sector Vulnerabilities to Climate Change and Extreme Weather (http:/energy.gov/sites/prod/files/2013/07/f2/20130716-Energy%20Sector%20Vulnerabilities%20Report.pdf)*. A report was produced by the Congressional Research Service on the water-energy nexus in January 2014 (*http://www.fas.org/sgp/crs/misc/R43200.pdf*). DOE is about to release another report on this topic as it is a priority of Secretary of Energy Moniz. [Note: DOE released the report on June 18, 2014, "The Water Energy-Nexus, Challenges and Opportunities" (*http://www.energy.gov/articles/department-energy-releases-water-energy-nexus-report*) DOE recognizes that more needs to be done to identify where there are gaps in the nation's ability to respond to extreme events. Research and development, especially of technical solutions is a focus of DOE.

DOE is a co-lead, along with the Department of Homeland Security of the newly formed State, Local, and Tribal Leaders Task Force under the President's Executive Order 13653 (*http://www.whitehouse.gov/administration/eop/ceq/initiatives/resilience/taskforce*). It expects to produce a report in the fall of 2014. EO 13653 states, "The Task Force will provide recommendations to the President on removing barriers to resilient investments, modernizing Federal grant and loan programs to better support local efforts, and developing the information and tools they need to prepare."