

**American Water Resources Association**  
**2015 SUMMER SPECIALTY CONFERENCE**  
**Climate Change Adaptation**  
**June 15 - 17, 2015**  
**New Orleans, LA**

**Monday, June 15**

**1:30 PM – 3:00 PM**

**SESSION 1: Climate Change Adaptation 1**

**National Action Plan for Managing Freshwater Resources in a Changing Climate - Jerad Bales, U.S. Geological Survey, Reston, VA (co-author: K. Metchis)**

Federal agencies have been working together since 2009 to build the nation's resilience to climate change. The Freshwater Resources Workgroup is one of the workgroups established by President Obama several years ago as part of the Interagency Climate Change Adaptation Task Force, and continues to inform the more recently established Interagency Climate and Natural Resources Working Group. In 2011, the Freshwater Resources Workgroup published the National Action Plan for Managing Freshwater Resources in a Changing Climate, and the participating federal agencies have been working together to implement the recommendations in five priority areas: Information for Decision Making, Assessment of Vulnerability, Water Use Efficiency, Integrated Water Resources Management, and Training and Outreach. This presentation will include an overview of the recommended actions in the National Action Plan, and will provide highlights of progress and ongoing efforts. This session will give attendees insight into many of the water resources-related activities going on 'inside the beltway' to improve the nations' readiness for the impacts of climate change.

**Addressing Climate Change Adaptation in EPA's National Water Program - Highlights of Progress - Karen Metchis, USEPA, Washington, DC**

EPA Office of Water has been working to since 2007 to understand the implications of climate change for our water resources and our water programs. During the past 8 years, we have been building information, tools and approaches to mainstream climate into our programs and to help states, tribes and localities find what they need to build their resilience to climate change. In this presentation, participants will get an overview of the progress we have made - including tools and initiatives - in several areas: Water Infrastructure, Water Quality, Coastal and Ocean Waters, and Watersheds and Wetlands. A preview of ongoing work and research will also be described.

**NYC Wastewater Resiliency Plan: Climate Risk Assessment and Adaptation - Pinar Balci, Hazen and Sawyer, New York, NY (co-author: P. Balci)**

The New York City Department of Environmental Protection (DEP) owns and operates one of the largest wastewater collection and treatment systems in the world, with many waterfront facilities that are vulnerable to flooding, as was evident during Hurricane Sandy when a number of facilities suffered extensive damage. This vulnerability is likely to increase over time, as

climate change projections anticipate more extreme storm surge events and continued sea level rise in the next several decades. As such, DEP has taken a proactive stance in assessing its infrastructure vulnerabilities and setting forth a framework to implement protective measures. In October 2013, DEP released the NYC Wastewater Resiliency Plan (NYC DEP, 2013), the nation's most detailed and comprehensive assessment of the risk climate change poses to a wastewater collection and treatment system. Building upon previous studies, the DEP's 2013 citywide risk assessment and adaptation study sets forth a cost-effective strategy for reducing flooding damage to wastewater infrastructure and safeguarding public health and the environment. This comprehensive study examined buildings and infrastructure at DEP's 96 pumping stations and 14 wastewater treatment plants, identifying and prioritizing infrastructure that is most at-risk of flood damage. DEP developed a set of cost-effective protective measures that are tailored to each facility to improve resiliency in the face of future flood events. The study revealed a number of key results: All 14 wastewater treatment plants and 60% of pumping stations (58 out of 96) are at risk of flood damage. The study estimates that equipment valued at more than one billion dollars is at risk and requires additional protection. The recommended protective measures, ranging \$315-\$426 million in improvements, are costly but critical. Increased resiliency not only reduces damage costs during a flood event, but also enables rapid recovery of full service following a flood event, prevents sewage backup into homes, and reduces the likelihood of release of untreated sewage into the environment. DEP is working towards implementing the recommended actions to increase resiliency through new design standards and by leveraging post-Sandy storm funds through the EPA Storm Mitigation Loan Program.

**Overcoming Collaboration Barriers Among Multiple Levels of Government for Climate Change Adaptation - Shirley Laska**, University of New Orleans, New Orleans, LA (co-authors: K. Peterson)

Climate change adaptation is not/will not occur in a vacuum although we often frame it as a unique challenge that stands alone in the actions that comprise it. The need for climate change adaptations 'comes upon the scene' of a historied, regularized, sometimes contentious, sometimes very imbalanced relationship among government units who would be expected to respond at the three geographic levels of American governing: local (municipality and county), state and federal. Climate change comes at a senior point in the history of both creation and implementation of the responsibilities, regulations and ultimate decision authority assigned to these various levels and units of government. Additionally, climate change adaptation comes chronologically at the nadir of decades of environmental challenges experienced by the geographic locations within the communities/counties, states and jurisdictional areas of federal agencies. For some locales, the environmental challenges have been benign; for others they have posed serious challenges, some with regular occurrence and others with intermittent fury. This history will 'color' the nature of the response to climate change. The third component of the backdrop of the current need to adapt to climate change is the financial capacity of these locales to respond to environmental challenges and which level of government holds the purse strings for these government response(s). What is necessary to achieve successful collaborative governance among these levels of government given the complexity of the history of

environmental co- management among the levels? Are there new methods of co-engagement that might improve the collaborations so as to achieve more rapid and successful responses to climate adaptation than have been achieved for previous environmental challenges? Extending the earlier research by Burby, Koontz, Hales, Jessen, our own (Vedlitz, Alston, Laska et al., 2007; Peterson, 2011; Bethel et al. including both abstract authors, 2014) and three of our graduates and post-docs - Jerroleman (2013), Norris-Raynbird (2011), and Seth (2013), we explore the case study of climate adaptation within Coastal Louisiana and consider among other options for improving climate adaptation the implementation of a method of successful collaboration sensitization called "boundary crossing" (Peterson, 2011). Louisiana is already subject to impacts of climate change, one of the most dramatic being sea level rise. It also has had continual weather and environmental challenges, some of catastrophic proportions. And to address these challenges, it has regularly been the recipient of large amounts of federal recovery funds, a fact that has both positive as well as negative implications for future climate change adaptation.