A View of the Future for Research on Climate Change Impacts on Water: Workshop Focusing on Adaptation Strategies and Information Needs

August 31-September 1, 2010
(National Climate Assessment Component – September 2)
Curtis Doubletree Hotel
1405 Curtis Street
Denver, Colorado 80202

WORKSHOP PROGRAM

DAY 1: Tuesday, August 31

7:30 a.m. **Continental Breakfast**

PLENARY SESSION

8:00 a.m. **Welcome Remarks & Objectives of the Workshop**

Nancy Beller-Simms, Program Manager
Sector Applications Research Program
National Oceanic and Atmospheric Administration

Robert Renner, Executive Director
Water Research Foundation

Claudio Ternieden, Assistant Director of Research
Water Environment Research Foundation

The key objective of this workshop is to establish a link between the efforts being undertaken in research and information generation and the needs, current and future, of the water and wastewater community using the research and information generated. This session will also make the link between the proceedings and the National Assessment Efforts.

8:15 a.m. **Climate Change: Water Sector Information, Data and Tools – What's Out There?**

Moderator: Kenan Ozekin, Senior Project Manager
Water Research Foundation

Chet Koblinsky, Director
Climate Program Office
National Oceanic and Atmospheric Administration

Jim Goodrich, Sr. Environmental Scientist
Global Change Research Program - Water Adaptation Team
Office of Research and Development
Environmental Protection Agency

David Toll, Deputy Program Manager
Water Resources Program & Hydrological Sciences Branch
National Aeronautics and Space Administration/
Goddard Space Flight Center (GSFC)

Radley Horton, Associate Research Scientist
Center for Climate Systems Research Columbia University
(Working with the National Aeronautics and Space Administration)

Katharine L. Jacobs, National Climate Assessment Lead
White House Office of Science and Technology Policy

This session includes high level agency speakers from NOAA, NASA, and EPA providing an update on what these agencies have available in the way of information, data and tools helpful to the water/wastewater sector. This session will provide a common base of knowledge associated with water supply and wastewater management climate change adaptation issues to the audience of professionals which include academics, agencies, information generators, information users, tools developers and tools users. This session will set the tone of the workshop which is centered on the participants learning about the water and wastewater management tools and information being developed, generated and made available by other participants and sharing what they themselves have developed, generated and made available. Finally, this session will also feature an overview of the National Climate Assessment.

10:15 a.m. **BREAK**

10:30 a.m. WORKGROUP BREAKOUTS: Charge and Deliverables of Workgroups

Facilitator: Robert S. Raucher, Stratus Consulting, Inc.

Participants: The following climate change topics will guide the discussion in the facilitated breakout groups. These topics are centered on a specific theme, however, there is considerable overlap between topics to explore different views from infrastructure to the natural environment. Questions to help guide these discussions are also being made available (see accompanying document with detail discussion of the workgroups approach).

- **Flooding and wet weather implications**
  Many water facilities and infrastructure are located near major waterways for obvious reasons. Such proximity gives rise to a concern for increased flooding to these facilities in the presence of a changing climate. The increased risk of flood damage arises from either sea level rise or more intense rainfall events. This group will discuss the latter (intense rainfall events) while sea level rise is part of the coastal zone issues.

- **Water quality implications**
  The implications of climate change on water quality can be expansive, diverse and are probably less understood than other groups of implications. Water quality can be affected directly by warmer temperatures and altered aquatic biology and water chemistry. However, climate change effects in the watershed can also impact water quality as can extreme wet and dry weather events.

- **Coastal zone implications**
  Coastal zone implications can affect the water sector in several ways, from increased risk of direct storm and flood damage, to salt water intrusion in to fresh groundwater, and altered biochemistry of brackish waters. At the root of all of these impacts, however, is the warmer seas and sea level rise. This group will discuss the implications of impacts resulting from sea level rise.

- **Water supply and drought implications**
  Warmer weather and drier summers can affect the water sector through extreme heat waves, dry spells and drought. Extreme heat presents operational challenges. Drought presents water supply issues as well as maintenance issues from damage to pipes from accelerated corrosion by concentrated wastewater to addition root damage. Low stream flows have water quality implications, watershed risks from fire, risk from changing agriculture practices and altered biology and chemistry of the waterbodies. This group will discuss all implications from heat wave and drought conditions.

- **Water-Energy Nexus**
  Water and energy are critical, mutually dependent resources- the production of energy requires large volumes of water and water is required to generate energy. Additionally, a large amount of energy is needed to extract, convey, treat, and deliver potable water. As water and energy demand and supply shift, two resources will need to be managed together to maintain reliable and sustainable supplies of both energy and water. This workgroup will discuss the water-energy nexus.

12:00 p.m. **Buffet Lunch**

1:00 p.m. **Topic Workgroup Breakout – Reconvene**

4:00 p.m. **Report Out on Afternoon Workgroup Breakouts Work**

5:00 p.m. **Reception with Tools Demonstrations/Posters from NASA, NOAA and EPA**

DAY 2: Wednesday, September 1

7:30 a.m. **Continental Breakfast**

8:00 a.m. **Welcome Speakers:**

Moderator: **Karen Metchis, Climate Advisor**
Office of Water
Environmental Protection Agency

Speakers: **Jim Martin, Regional Administrator**
Environmental Protection Agency, Region 8

Catherine R. Gerali, District Manager
The Metro Wastewater Reclamation District
Denver, Colorado

WORKGROUP BREAKOUT

8:30 a.m. **Overview of DAY 1 Activities and DAY 2 Charge to the Workgroups**

Facilitator: **Robert S. Raucher, Stratus Consulting, Inc.**

8:45 a.m. **Groups Continue Breakout**

12:00 p.m. **Break/Working Lunch**

PLENARY SESSION

1:00 p.m. **Topic Workgroup Reports and Discussions**

- Flooding and wet weather implications
- Water quality implications
- Coastal zone implications
- Water supply and drought implications
- Water-energy nexus

Discussions: Clarifying questions (ALL)

3:00 p.m. **BREAK**

3:15 p.m. **Continued Discussions of Water Sector Information Needs**

4:15 p.m. **Follow-up to Workshop and Wrap Up**

4:30 p.m. **Adjourn**

DAY 3: Thursday September 2, 2010

NATIONAL CLIMATE ASSESSMENT DISCUSSIONS

7:30 a.m. Continental Breakfast

NATIONAL CLIMATE ASSESSMENT DAY

8:00 a.m. Welcome

Nancy Beller-Simms, Program Manager
Sector Applications Research Program
National Oceanic and Atmospheric Administration

Overview of National Climate Assessment
Katharine L. Jacobs, National Climate Assessment Lead
White House Office of Science and Technology Policy

Overview of Days 1 & 2 – Getting on the Same Page
Anne Waple, Program Lead
NOAA Assessment Services

9:00 a.m. Session 1: Listening Session on the National Climate Assessment related to Process:

1. What are the ways that the utilities would like to be engaged in the Assessment that are of least burden and greatest benefit?

2. What kinds of partnerships/networks would be effective to generate and submit information to/from the Assessment, e.g. coordinated through professional organizations, states, federal agencies or regional entities?

3. How can we measure the value of climate information in decision processes (as opposed to other factors like politics, economics, social welfare, etc?)

10:15 a.m. Break

10:30 a.m. Session 2: Listening Session on the National Climate Assessment related to Substance:

1. What do we need to know to do a better job of understanding the impacts of climate change on the industry (including gaps)?

2. What kinds of information would the water industry like to bring to the table for consideration?

3. What are the kinds of water-related adaptation and mitigation decisions that need climate-change related input? Are there specific types of climate information not currently available to support these decisions?

4. What are the climate change impacts and vulnerabilities of greatest concern and what are the indicators for those issues? What are the outcomes/thresholds/triggers you most want to avoid?

5. What are the information needs related to projected changes in water quality? How can this information be generated?

11:45 a.m. Report out and a discussion of next steps for the utilities (if we have more than one group discussing each topic – otherwise we will have slightly longer sessions)

12:30 a.m. Adjourn