



# Climate Ready Water Utilities Working Group

## Meeting #2 Summary

### February 3 & 4, 2010

The following is a recap of the second meeting of the Climate Ready Water Utilities (CRWU) Working Group. The meeting took place in Las Vegas, Nevada on February 3 & 4, 2010 and focused on refining the concept of a climate ready utility, as well as actions needed to create an environment which would enable utilities to implement steps towards climate preparedness. The substance of the Working Group's discussion is captured below. All meeting materials and presentations are available on the CRWU public website at: <http://client-ross.com/crwuwg/>.

#### Welcome, Overview, and Introductions

- Lauren Wisnewski, EPA's Designated Federal Official for this process, opened the meeting.
- David Travers, Water Security Division Director, provided opening remarks and a reminder of EPA's role in this process.
- Duane Smith, Working Group Co-Chair, and Rob Greenwood, Lead Facilitator, provided an overview of the meeting objectives. Mr. Smith announced to the group that he has taken another position outside of the country and, therefore, will be stepping down as a National Drinking Water Association (NDWAC) member and Co-Chair of the CRWU Working Group. Working Group and NDWAC member Olga Morales-Sanchez will fill the empty Co-Chair position, and NDWAC member Jeff Cooley will join the Working Group.
- Paul Fleming, Working Group Co-Chair, provided an introduction to Kevin Young, invited presenter from Australia.

#### Background Presentations

Based on feedback from Working Group members at the first meeting, two Federal partners and one outside presenter gave the following background presentations.

- Kevin Young, Managing Director of Hunter Water Corporation, gave a presentation on Australia's water utility sector response to realized climate change impacts. In response to questions relating to the type and extent of the climate adaptation Australia has undertaken, Mr. Young indicated that Australia has recently seen the biggest increase in water bills in its history, with bills nearly double what they were a decade or so ago. In an effort to curb the impact to low income communities, the government has provided support to the water sector for programs in this area. With regard to community outreach and involvement, Mr. Young talked about the importance of detailed monitoring to provide the public with performance data, particularly regarding new technologies and approaches. As an example, he cited a desalination program in Perth where a camera installed at the outfall allows community members to observe marine life activity and receive reassurance that there is limited or no impact. At the same time, he cited an example (indirect potable water use in communities) where strong community opposition existed, but the government used executive powers (rather than a public vote or consensus building) to implement the program believing there was no viable alternative available. Experience with the program and the absence of the feared health consequences has, over time, turned community opposition to support, as the benefits of the program have become apparent.

Answering further questions, Mr. Young described some of the Australian Federal government's dictated water sector restructuring measures, including the following:

- Restructuring the relationship between small and larger systems - the government required small systems (struggling under the pressure created by severe and prolonged drought conditions) to merge with larger systems, while the government paid for the value of the small system assets;
- Requiring an alteration of agricultural water use - approximately 80 percent of water in Australia is used for agricultural purposes generating a focus on the part of government to shift agricultural and irrigation practices including altering the types of crops produced (e.g., moving from monsoon crops such as cotton and rice to those more conducive to growing in arid climates); and
- Establishing a national water trading and marketing program – this effort created “high” and “low” security water (high security water comes with a strong guarantee of availability, while low security water is subject to cyclical availability), with high security water sold at ten times the cost of low.

Overall, the Australian Federal government now exerts substantially more control over water resources reflective of the recognition that water resource challenges do not respect local or state boundaries and the belief that problem solving requires national level direction.

Additional observations by Mr. Young included:

- The core challenge related to climate change is understanding and managing risk, while the understanding in this area remains nascent and evolving – this points to the need for and importance of international cooperative efforts such as the International Benchmarking Network for Water and Sanitation Services; and
  - Even as Australia in response to severe impacts has been a leader in climate change adaptation, the country is continuing to explore and implement additional measures including looking beyond water resource focused actions to build in energy-related considerations, implementing restrictions on building locations (e.g., avoiding low lying areas along coastlines), and more explicitly planning for population patterns relative to (efficient) availability of resources.
- Jim Goodrich, EPA’s Office of Research and Development (ORD) and Joan Brunkard, the Center for Disease Control (CDC), gave a co-presentation on public health impacts of climate change impacts within the water sector. Mr. Goodrich presented on operational, daily impacts, while Ms. Brunkard presented on acute impacts. After the presentation, Mr. Goodrich noted that by the end of this spring, EPA will have a new, robust five-year plan for their research program. Working Group members noted that the presentation emphasized all the important factors the water utility sector needs to pay attention to and set a catalyst for why the sector needs to deal with climate change.

## Meeting Discussions

The majority of the meeting focused on discussions building off of the work of the Attributes and Enabling Environment Task Teams that occurred between the first and second meeting. On the first day, the Working Group discussed the Task Team outcomes and identified areas of general agreement, as well as areas for modification and improvement. On the second day, Working Group members broke into four small working groups to discuss more in-depth specific topics identified on Day 1 in both the Attributes and Enabling Environment areas, and to develop more specificity around what each topic should cover in the recommendations. The second day ended with an initial brainstorming session on a list of tools, trainings, or other resources needed to successfully implement a climate ready utility program. Following is a summary of key points from these discussions.

## Day 1 Discussion Highlights

### Attributes

#### *Reframing/ Overarching*

- Reframe the attributes in the context of an adaptive management framework focusing on short term outcomes and long term, proactive planning.
- The reframing into the context of an adaptive management framework should include moving away from a “list of attributes” and the use of the term attributes - the activities and actions currently captured in the attributes will combine into an iterative and interactive framework of climate-related actions undertaken by utilities seeking to prepare for climate change impacts.
- Utility success in implementing climate responsive actions will rely greatly on a strong enabling environment.
- Which elements and to what extent they will be implemented will differ depending on utility size, geographical location, and local circumstances. In this sense, the elements need to be sufficiently flexible to meet local conditions and needs.
- Climate responsiveness should be a core responsibility of water utilities today; however, due to competing priorities, resource constraints, and other factors, some utilities are unable to make this a focus without both internal water sector leadership, as well as external, support.
- Consider a recommendation that speaks to the benefit of having a crisis plan in place prior to a crisis so that all options can be considered, rather than being left with only one (or none) when a crisis occurs.

#### *Partnerships, Understanding and Support*

- Highlight the overarching importance of strengthening partnerships between water utilities and interdependent entities, and of creating an overall culture of acceptance in the community.
- Broaden community outreach beyond the traditional utility operating framework and outside of the immediate community, as everyone is downstream from someone else. Underscore the importance of partnerships both within and outside of the basin in which a utility operates.
- Stress the need for partnerships with local and state planning organizations, as well as the agriculture community.
- Consider a recommendation to restructure planning for the water sector around climate regions/ climate zones, with potential regulatory differences between the zones.

#### *Vulnerability Assessments*

- A Climate Ready Water Utility (CRWU) will build triple bottom line analysis into its decision making, and will conduct comprehensive analyses to determine how the whole system (including economic sustainability, environmental protection, and quality of life) is integrated.
- Vulnerability assessments should focus on both immediate and potential climate change impacts as well as adaptive capacity. A CRWU assesses what the impacts are/ could be and what tools they have in place to address those impacts.
- Vulnerability assessments need to include a public health connection.

#### *Long Range Planning*

- A CRWU will develop coping strategies for highly improbable, but not impossible scenarios as part of their planning; they will create strategies for non-predictable crisis events as well as predictable events.
- A CRWU takes a two tier approach to long range planning looking out beyond 50 years for potential climate impacts and then rolling that information back into planning for the next 50 years.

- Long range planning needs to occur within the context of a watershed approach.
- There is a need to consider full water cycle management and coordinate planning between water, wastewater, and stormwater segments.
- Make explicit the need for focused demand and supply side climate impact response strategies.

#### *Increased Flexibility*

- Every utility should take steps to ensure they are operating the most efficient delivery and procurement systems possible.

#### *Research*

- In order to conduct effective scenario planning, monetization of key system variables is needed – this is a significant research gap.

#### *Carbon and Water Footprints*

- Carbon management should not be thought of in terms of a “footprint” – different nomenclature is needed to convey the intent of managing carbon emissions.

#### *Dedicated Resources*

Working Group members made no specific comments in this area.

#### *Situational Awareness*

Working Group members made no specific comments in this area.

### Enabling Environment

#### *General Observations*

- Balanced attention to all aspects of the water sector (water, wastewater, stormwater) must be provided for in the recommendations.
- Coordination among Federal agencies at the watershed implementation level is needed to ensure consistency of objectives and requirements.
- Federal roles could include financial assistance and expert technical assistance.
- It is critically important for utility climate adaptation strategies to integrate with urban design/land use (e.g., some communities have seen the ability to cut 50 percent of water demand through land use alterations).
- Although water resource management reform has proved difficult, a critical mass of utilities with a focused agenda holds the potential to catalyze water resources management change – as a result, lack of past change should not be seen as a deterrent to making proposals for water resources reform.

#### *Education*

- Identify specifically within recommendations the need to educate decision makers.
- K-12 education should be an important aspect of the education strategy, and utility education efforts should include bringing youth in the community directly into the utility.
- Planning staff within communities need education on water resource issues and challenges.
- Utility manager leadership training is needed, including training on collaboration and financing methods.

### *Agenda*

- A critical area of needed research focus is connecting public health impacts to climate change.
- It is important for the water sector to provide input into emergent federal efforts to provide climate services to climate adaptation implementers (e.g., NOAA Climate Service). The water sector must also engage with the broader federal family on climate policy and regulation.
- Federal implementation support will need to be “nimble” (i.e., for utilities with high capacity, federal efforts can focus on providing information, for lower capacity utilities, federal efforts may need to be more involved (e.g., technical assistance)).
- Research is needed on policy options for adaptive regulatory capacity (e.g., examine opportunities to change the FEMA requirement to rebuild water infrastructure to previously existing conditions).
- The water sector needs help developing monitoring and evaluation techniques and vulnerability assessment tools.

### *Regulatory*

- Utilities need to integrate with state adaptation planning efforts, and there is a need to ensure consistency with other climate-related plans (e.g., any cap-and-trade programs that might emerge), while at the same time more information is needed from utilities to support effective state planning (e.g., water use data).
- State planning can make an important contribution to water resource inventory and current condition information, but will require rule changes to “add value” to climate adaptation implementation. Current practice (at least for many states) is inadequate to support climate change planning needs. In addition, state planning frameworks are disconnected from local land use planning efforts.
- The State role needs to evolve to bring a broader, regional perspective to water resources management, rather than focusing on parochial state needs – such a change in perspective can play a role in supporting the need to engage in cross-jurisdictional, shared resource management and help to avoid states competing on the basis of individual state water resource management plans.
- There is a need to reframe the term “tradeoffs” in the context of treatment requirements and GHG emissions implications – although these potentially represent competing demands, they are not necessarily tradeoffs.
- The recommendations should indicate that, as well as regulatory requirement challenges, there may be improvement opportunities that emerge from, for example, no regrets investment strategies.
- The label “regulatory” is too narrow; consider “government” as a replacement.
- Focused recommendations in this area could include: Identify examples of effective state comprehensive water resource management planning; produce guidance for states based on the examples; and potentially tie financial incentives to states that undertake planning consistent with the guidance.

### *Capacity*

- States will be the primary implementers of any climate-related capacity services delivered to utilities in need, while states themselves are severely resource constrained. This reality must both temper expectations for what states and capacity constrained utilities can do and drive the development of very practical, manageable climate-related actions for those utilities that face capacity constraints.
- It is important to emphasize that utilities gain value in knowledge acquisition and learning about climate change to enable utility management willingness to take on activities that move beyond a narrow focus on providing basic services.

## Day 2 Discussion Highlights

The Working Group broke into four smaller groups to discuss one of four of the nine attributes areas, as well as one of the four enabling environment areas. These highlights are drawn from the small group flip chart notes, report-outs from each group, and full group discussion on the small group findings.

### Attributes

#### *Situational Awareness*

- There is a need to enable consistent, sector-wide situational awareness relating to climate change science and impacts, along with proactive planning methods, tools, resources, and approaches for addressing climate change impacts. First steps can include identifying who and what those resources are, and identifying trusted sources (e.g., EPA, associations, universities) from which utilities can gain this knowledge. In this context, there is an opportunity to leverage resources of national, regional, and state associations, as well as the research community, to collaborate and foster information sharing to enhance awareness.
- Situational awareness needs to occur at all levels of utility operations, from upper management through front line operators. To be useful at the operational level, potential climate change scenarios must be translated into tangible threats and impacts. In addition, front line operator observation of changes to key operating variables affected by climate change (e.g., increased source water turbidity), can help to inform the utility planning process, as these observations can be early indicators of important changes to operating conditions and can create a more informed basis for long term decisions.
- In order to enhance situational awareness, coordination and proactive engagement with interdependent partners such as local land use agencies should be made a core water utility business practice. As part of this engagement, water utilities need to participate in local, regional, and state land use and integrated water resource planning, as well as understand and engage in emergency operations and response at local, state, and federal levels.
- In addition to consistent sector-level and comprehensive utility level awareness, awareness (on environmental and water utility operating conditions, trends, and options to address change) has to be fostered beyond utility boundaries with the communities in which utilities operate. Two venues for conducting this level of engagement include focus groups and through existing community organizations.
- In order to develop comprehensive plans, utilities will need to develop a broader understanding of stakeholder groups and their needs within a watershed, and include these perspectives and needs in the early stages of a two-way planning process.

#### *Long Range Planning*

- In order to be a prepared and resilient utility in the case of either a foreseeable and/or potentially catastrophic climate change event, a utility needs to incorporate climate change into existing long-range planning and consider climate change as just an additional factor in the planning process that will increase the options that need to be considered. The four main components of planning for climate change that need to be considered are:
  - Inputs – assumptions, options, and scenarios gathered via situational awareness;
  - Demand planning – changing land use patterns and how they influence demand and population projections/ dynamics;
  - Resource and supply planning – taking into account baseline carrying capacity and potential for droughts, floods, and/or sea-level rise on the water supply (and quality) side, as well as talent, skills, and assets needed on the human capital resources side; and
  - Continuous monitoring and evaluation.

- A robust enabling environment is needed for a utility to successfully conduct the type of long range planning required to address potential climate change impacts. This enabling environment should allow for development of quickly implementable short term crisis plans, developed in advance of a crisis occurring. Ideally, as part of creating this enabling environment, utilities would broaden their criteria for investment decisions to ensure potential climate change impacts are included in both long and short term decision-making.
- Long range planning will need to evolve into a process that can better address the fact that uncertainty is amplified by climate change and there is increased unpredictability around extreme weather events. In order for this to occur, a suite of scenario planning tools that utilities of all sizes can use is needed. In addition, there must be an outreach and education component of planning to both inform the public, as well as help guide the regulatory community in a supportive direction.

#### *Interdependent Partnerships*

- The overarching theme of the discussions is that there is a shared risk, and therefore, responsibility in facing climate change, and that change is driven by appropriate leadership, collaboration, coalition and the sense of urgency. Therefore, the two most important factors for water utilities addressing climate change are identifying all the interrelated entities and getting the right people from those entities to the table to develop solutions. In addition, shared responsibility calls for a change in how water is managed, including creating inter-local agreements and deploying an integrated resource management process. In many cases incentives (specifically financial) will be needed for the necessary partnerships to be made.
- To successfully manage available regional water resources, every entity with a connection to the water sector needs to be involved and every concern related to supply and demand needs to be considered. Those entities and concerns include: economic, public, academia, agriculture industry, public health, political, technical assistance providers, other utilities, associations, regulators, human behavior, environmental/ ecological, land use, water customers, and state and Federal partners.
- The agriculture sector is one of the most important for the water sector to forge a partnership with, and is also one of the most difficult to engage. Shared issues include run-off, pollutants, and water efficiency. An overarching paradigm change combined with specific local approaches will be needed to jointly address these issues.

#### *Adaptive Management Reframing*

- A successful adaptive management framework will address climate change challenges identified through vulnerability assessments of a utility's water resources, infrastructure, surrounding environmental conditions and other indirect risks. This framework must be flexible enough to allow for utilities operating under different internal, local, and regional conditions to implement it in the manner that is most conducive to each utility's unique situational and operational circumstances.
- An adaptive framework could be thought of in terms of a continuous improvement model with the following components. Note that the original list of "attributes" identified by the Task Team is organized under these areas.
  - Organize planning resources – This includes dedicating resources; enhancing community and institutional partnerships; increasing education and outreach; and engaging in research.
  - Assess risks (both direct and indirect) – This includes increasing situational awareness; conducting vulnerability assessments; and considering environmental footprints.
  - Develop strategies (short, medium, and long term, as well as opportunistic).
  - Implement strategies and monitor progress by identifying and monitoring for triggers including politics, weather, unhappy/ happy public, money availability, land use, regulatory change, economic, legal, technology, and data.

This adaptive management cycle (organize, assess, develop, implement and monitor) would reoccur on a regular basis (e.g., every five years) or be driven by specific triggers that would necessitate management adaptation, and thus a need to start the cycle over earlier.

## Enabling Environment

### *Capacity*

- Utilities will engage in climate preparations along a spectrum of engagement, and therefore services provided or initiatives taken by EPA should segment the market and target different places along that spectrum. EPA will want to consider how they might expand on the work that comes out of this Working Group process by developing, either independently or in association with other organizations, a set of activities that mirrors the spectrum of engagement within the water sector.
- Capacity building needs to be considered on a variety of levels – national, association, state, regional, local, and utility.
- There are numerous existing national associations and processes (e.g., industry associations and the national climate change assessment process) with which utilities could partner to develop materials, disseminate information, and obtain water sector climate-related knowledge. In the same vein, EPA could partner with other Federal entities such as the National Climate Service, NOAA, and/or the Department of Interior to ensure the right folks are getting the information they need and can use.
- One way to build capacity is with a partnership program that would match a utility that has not been very engaged in climate preparedness with one that has, or match an already engaged utility with international partners to push them further down the leadership path. For a program like this to be successful, some degree of incentives is needed to minimize the time and staff burden to utilities involved. Incentives could include EPA handling the logistics, creating some type of recognition system for those utilities that participate, or creating a forum involving other sectors.
- The biggest underlying capacity issue for implementing climate change options is financial, which will need to be addressed in a variety of ways. One option is to figure out how to get utilities cheaper money. For example, in the same way sustainable communities currently receive higher bond ratings, EPA could establish a rating system for climate responsive utilities that would result in cheaper money for those utilities falling higher on the rating scale. Another approach is for the Federal government to stop rewarding “bad” behavior, and instead use those funds to support utilities undertaking actions to prepare for climate change.

### *Education*

- Education at all levels, from school children to training future utility leaders at the university level, is a key to successful long-term program implementation. Elected officials also need to be educated, and one way to do this is to build strong coalitions which allow politicians to see the importance of advocating actions that lead to climate resiliency in the water utility sector.
- It is important to identify who should be educated and by what mechanisms (e.g., utility leaders – certifications; grade school children – utility sponsorships; political decision makers – town hall meetings). Common education components at all levels include public health impacts, water quality, water quantity, financial impacts, and real life examples.
- Similar to universities recognizing the need for a broader education and changing their approach to teaching, utility managers need to recognize the broader skill sets (e.g., technical, financial, managerial, communications) required to maintain future operations.
- There are a number of areas where EPA could help foster education including: ensuring grants and compliance regulations contain an education component; developing marketing information; and evaluating how existing EPA programs include information about climate change and considering new education materials or tools that could be incorporated.

- The delivery mechanisms for certain types of climate change-related messages should be carefully considered - e.g., people may think there are political implications around certain messages coming directly from EPA; therefore those message may be best coming from a different entity.

### *Research Agenda*

- There are signs that the country is at a national pivot point with respect to the research agenda, providing new opportunities for the water sector to engage in agenda setting. One of the key actions for informing and influencing the national research agenda is to have the water sector associations compile the questions and needs of individual utilities with regard to what utilities need the science to help address.
  - Potential research questions could include: What are the potential increases and severity of forest fires and how will vegetation be changed and affect runoff? What water quality changes do we expect to occur? What pathogens and water borne diseases can we expect and what is the magnitude of those implications? What is the potential magnitude of changes in sea level and how would that affect salt water intrusion into groundwater supplies? How are changes in precipitation going to affect inflows and drought frequency and severity?
  - Other research areas could include anticipated changes in customer demand, air and water temperature, and storm intensity; methods for downscaling and analyzing historical baselines and trends; watershed carrying capacity; basic stream data robustness; economic impacts, value of ecological benefits, and triple-bottom-line modeling; and decision support tools and options such as sensitivity analysis.
- Information output (data) at the watershed level should be fed into a sector-wide, watershed based framework leading to a more integrated approach for evaluating alternative future options. At the same time, there should be a handoff of data and methods from the researchers to utilities who would best determine their system-specific impacts. Land use patterns and energy use would be integral components of this comprehensive framework; however care must be taken to ensure they are included in a useful and realistic manner that may or may not conform to a watershed based approach.
- One starting point is to conduct an inventory of all available information, in which EPA or another entity searches all the adaptive management and watershed-based frameworks currently in place, and identifies best practices which they then analyze for gaps/ areas for improvement, as well as how to customize for local needs.
  - *EPA noted at the meeting that the Army Corps of Engineers is conducting a similar process, looking at integrated resource management plans. EPA could approach the Corps and ensure they are appropriately considering water utility perspectives when they conduct this inventory.*

### *Regulatory Framework*

- The overarching goal is to encourage collaborative decision making on a watershed basis, based on best available science and conducted within a flexible framework.
- At the highest level, the ideal would be to align all the existing water regulations into a new bill that also incorporates climate change. As a first step, EPA should evaluate the current regulatory framework and identify opportunities and constraints to dealing with climate change.
- Although the breakout group did not reach consensus in the time allotted, they discussed the following as potential recommendation areas for this topic:
  - Articulate and advocate for alternative water resources management institutional and regulatory framework. Consider a regulatory framework focused on watersheds and provide the incentives to make that happen, such as permitting on a watershed basis.

- Promote and better enable integrated water resources management within the current regulatory framework by encouraging watershed management by providing funding to support planning processes, and requiring minimum capability and management that if a utility could not meet, would trigger the need for some type of regionalization.
- Develop a national policy and guidance on reuse, based on scientific data.
- Rewrite the State Revolving Fund (SRF) rules to accommodate climate change and apply to utilities of all sizes.
- Establish an adaptive regulatory capacity to address alterations in underlying environmental and ecological conditions.

### **Tools, Training, and Resources**

Working Group members spent fifteen minutes brainstorming an initial list (see below) of existing and needed climate change-related tools, training, and resources that will support an enabling environment and/or help to achieve the attributes of a climate ready utility. This list will be expanded and further vetted between the second and third meetings, with broader discussion to occur at the third meeting.

#### Needed Tools

- Hydrology models for watersheds - in support of downscaling
- Vulnerability assessment tools
- A process model for engaging interdependent sectors
- Communication guidance – how to communicate with stakeholders and customers on climate impacts
- A primer on how to access all the materials currently available
- A basic guidance or primer on the basic low/ no cost actions that can be done now/ preemptive measures

#### Existing Tools

- EPA BASINS with climate assessment tool
- New Jersey Water Supply Authority water allocation/ forecasting tool

### **Expert Reflections**

Based on Working Group member feedback at the first meeting, along with an Australian expert, representatives from the local agriculture and land use planning communities were invited to attend the meeting and provide their perspectives on the Working Group discussions to-date. Following are highlights from the insights provided by these representatives.

- ➔ One of the land use planners made the following three points: 1) Water utilities should stress working with their local and state planning organizations, as a planner’s job is to look out 50 years and predict what land use patterns might exist in a community across multiple basins – exactly what this Working Group has discussed needs to occur in order for water utility climate change planning to be successful. 2) States vary a lot with regard to how well they plan and the scope and ability of their planning (i.e., at the state level some states do not do any planning, while others such as Maryland, have extremely strong state planning). 3) The best planning in the world comes from the people that care the most about it; therefore, planning should be built from the bottom up and incentivized from the top down.
- ➔ The agricultural community representative provided the following observations: The term “water resources” needs to be defined and should include agriculture groundwater recharge; the Native American community should be included in this process; there needs to be a method to determine the

probability of a major climate event happening; land use and integrated resource planning needs to occur at the regional and state levels; there is currently a disconnect between water and land planners; the concept of global warming needs to be unbundled from the concept of climate change; affordability is a key factor for consideration; everything the Working Group has said about education is supported; and utilities need to get information on water quality and public health directly from the best sources.

- Mr. Young provided the following thoughts: If utilities are looking for Federal support to implement climate change strategies, they need to ensure their own strategic plans address climate change issues. Generally, support will come in behind, not ahead of, climate change planning. In addition, rather than talking about water quantity or quality in and of itself, a complete sustainability agenda should be presented to the community. Furthermore, what is meant by vulnerability assessment and at what level it occurs (e.g., watershed) needs to be defined. In addition, proactive planning is essential. In a crisis, all the things you could have done are boiled down to a small subset, costing a lot more money than if all the available options had been analyzed beforehand. Lastly, multi-basin planning and broader engagement should, by necessity, be a component of operational flexibility. For ensured success, partnerships should be mandatory.

## Next Steps

- Prepare the meeting summary and develop the meeting discussions into a draft product for discussion on Task Team calls.
- Schedule and conduct at a minimum one call of each of the two Task Teams (Attributes and Enabling Environment) to discuss and further refine the draft product and complete additional work prior to the third meeting.
- Gather input via email from Working Group members to further refine the initial list of tools, training, and products.
- Collect suggestions from Working Group members for expert presenters at the third meeting and secure appropriate representatives.
- Refine the list of relevant on-going Federal activities.
- Check-in with working group members who were unable to attend the meeting or had to leave early to ensure they are fully informed.

## Public Comments and Closing

- One member of the public provided the following comment: It is a little challenging, as an observer, to try and understand the context of the discussions without knowing what the common baseline knowledge is that the Working Group is operating under. It is also difficult to see how the fairly specific recommendations of the Working Group will help to improve something that is such a broad issue.
- Written comments are welcome throughout the process and should be sent to Ms. Wisnewski. In addition, all face-to-face meetings will include time for public comment. The following public website includes all meeting logistics and agendas, final Working Group documents, and background information: <http://client-ross.com/crwuwg/>.
- Ms. Wisnewski, adjourned the meeting at 3:00pm Pacific Time.

## Attendees

### Working Group Members

### Federal Partners

Matt Appelbaum	Tony Quintanilla	Veronica Blette, EPA
Katherine Baer*	Sri Rangarajan	Joan Brunkard, CDC
Jeff Cooley	Steve Schmitt	Hiba Ernst, EPA
George Crombie	Duane Smith*	James Goodrich, EPA
Pat Davis	Lisa Sparrow	Juliette Hayes, FEMA
Paul Fleming	Marcia St. Martin	Marty Savoie, Army Corps
Cindy Forbes	Michael Wallis	Frederick Sharrocks, FEMA
Gregory McKnight	Rebecca Weidman	David Travers, EPA
Olga Morales-Sanchez	Rebecca West	Paul Wagner, Army Corps
Pat Mulroy*	Paul Whittemore	

\*Present on the first day only