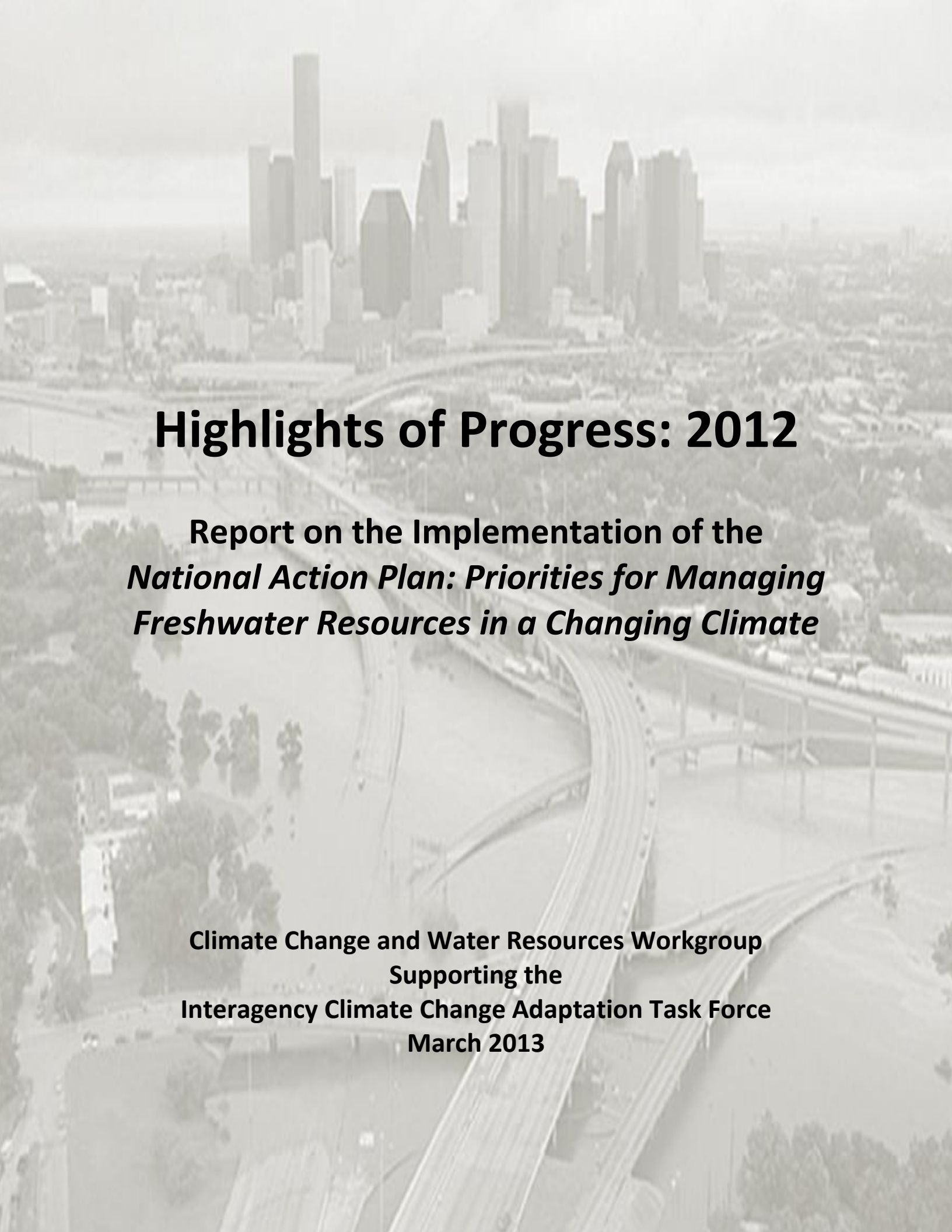

Highlights of Progress: 2012

Report on the Implementation of the *National Action Plan: Priorities for Managing Freshwater Resources in a Changing Climate*

Climate Change and Water Resources Workgroup
Supporting the
Interagency Climate Change Adaptation Task Force
March 2013

Prepared by the
Water Resources Workgroup
Supporting the
Interagency Climate Change Adaptation Task Force
March 2013

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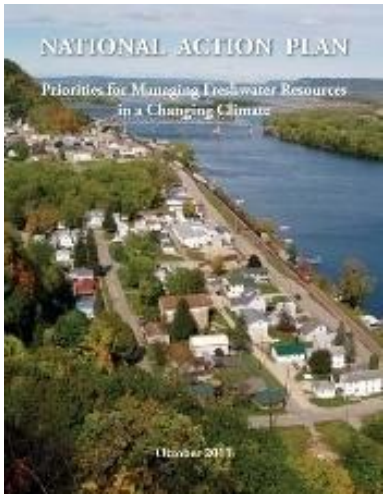
Introduction

In October 2011, the Interagency Climate Change Adaptation Task Force published a *National Action Plan* providing an overview of the challenges that a changing climate presents for the management of the Nation's freshwater resources and recommending actions for Federal agencies to support water resource managers in understanding and reducing the risks of climate change.[1] During 2012, Federal agency members of the Task Force have worked to implement the actions called for in the *National Action Plan*. This *Highlights of Progress: 2012* document summarizes the progress agencies have made in implementing the *National Action Plan* between January 2012 and January 2013.

The *National Action Plan* was developed in response to a recommendation in the October 2010 *Progress Report* of the Interagency Climate Change and Adaptation Task Force. It was developed for the Task Force by an Interagency Climate Change and Water Resources Workgroup made up of representatives from Federal agencies involved in water resources science and management. The Workgroup, which is co-chaired by the Department of Interior (DOI), the Environmental Protection Agency (EPA), and the Council on Environmental Quality (CEQ), prepared this *Highlights of Progress: 2012* document to provide an annual report to the public concerning progress in addressing this important topic (see Supporting Action #1; page 16 of the *National Action Plan*).



Six recommendations to improve water resources management in a changing climate are presented in the *National Action Plan.* For each of these recommendations, Federal agencies are implementing supporting actions, which are summarized in Table 1 below.

Tasks supporting each if the six major recommendations are managed by teams made up of Workgroup members representing agencies most closely associated with the recommendation. For each recommendation and supporting action, this document:

- summarizes key accomplishments over the past year;
- identifies whether the progress on a supporting action is "on track," "delayed," or "complete"; and
- identifies key future actions to help fully implement the six recommendations.

[1] *National Action Plan; Priorities for Managing Freshwater Resource sin a Changing Climate*; Interagency Task Force on Climate Change Adaptation; 2011; available on the web at: http://www.whitehouse.gov/sites/default/files/microsites/ceq/2011_national_action_plan.pdf

Overall, Federal agencies have made significant progress in implementing the 24 supporting actions in the National Action Plan. In 2012, the Workgroup determined that one supporting actions is completed, 19 are on track and 4 are delayed.

Some of the most significant accomplishments in implementing the National Action Plan in 2012 include:

- **Establishing an External Stakeholder Committee:** a new Climate Change and Water Workgroup of the Advisory Committee on Water Information (ACWI) was formed in July 2012. The ACWI is a Federal Advisory Committee that provides guidance on water issues to Federal agencies. The workgroup include 14 Federal agencies and 26 non-Federal stakeholders.

- **Launching the New Waterborne Disease Outbreak Reporting System:** CDC transitioned to electronic reporting of waterborne outbreaks in 2009 by launching the National Outbreak Reporting System (NORS). In 2012, the NORS system was updated to NORS Version 2.0 to improve the speed, accuracy, and ease of reporting by all 50 state health departments.

- **Developing Water Utility Climate Tool: Version 2.0**: The Climate Resilience Evaluation and Awareness Tool (CREAT) assists users in conducting climate change risk assessments and promotes a general understanding of climate change impacts for utility owners and operators. The new version of CREAT was developed in 2012 and features more robust scenario-based planning, extreme event data, and energy management capabilities.

- **Surveying State Hazard Mitigation Officials and Report on Needed Actions**: Senior executives from USACE and FEMA signed a joint letter to the State officials seeking input on a survey to identify best practices related to flood and drought management, successful cooperative efforts with Federal agencies (e.g., Silver Jackets), and innovative or especially useful planning or coordination mechanisms. Most surveys are now complete and a joint USACE-FEMA report is planned for March 2013.

- **Conducting a Workshop and Study of Climate Change and Extreme Weather Impacts including Drought on the U.S. Energy Sector:** The Department of Energy held a workshop in July 2012 with government, industry and non-governmental experts to identify energy sector vulnerabilities, discuss progress on innovation for improving the climate resilience of the energy sector, and identify gaps and potential response strategies. The Department is conducting a study of the impact of climate change, including decreasing water availability and drought, on the energy sector, and developing recommendations to address knowledge, technology, and policy gaps to building a sustainable energy future. A report is expected to be issued in 2013.

Table 1: Summary of Recommendations and Supporting Actions
Recommendation 1: Establish a Planning Process
Action 1: Establish a planning process
Action 2: Establish an organizational framework
Recommendation 2: Improve Water Resources and Climate Data
Action 3: Strengthen data for understanding climate change impacts on water
Action 4: Create a program to align hydroclimatic statistics
Action 5: Implement a surveillance system for tracking waterborne disease threats
Action 6: Provide information to identify areas likely to be inundated by sea level rise
Action 7: Expedite implementation of wetlands mapping standard
Recommendation 3: Strengthen Assessment of Vulnerability
Action 8: Publish guidance on use of modeled projections for water resources applications
Action 9: Develop an internet portal on water resources and climate change
Action 10: Develop a pilot climate change/freshwater vulnerability index
Action 11: Develop tools to build capacity for vulnerability assessments
Action 12: Assess vulnerability of National Forests and Grasslands
Action 13: Promote free and open access to water resources data
Recommendation 4: Improve Water Use Efficiency
Action 14: Develop nationally consistent metrics for water use efficiency
Action 15: Make water use efficiency an explicit consideration in the revision of Principles and Guidelines for water resources projects and in the new NEPA guidance on climate change
Action 16: Enhance agency coordination and create a toolbox of key water efficiency practices
Recommendation 5: Support Integrated Water Resources Management
Action 17: Strengthen the role of interstate bodies in climate change adaptation
Action 18: Revise Federal water project planning standards to address climate change
Action 19: Working with States, review flood risk management and drought management planning and identify “best practices”
Action 20: Develop benchmarks for incorporating adaptive management into water project designs, operational procedures, and planning strategies
Recommendation 6: Educate Water Resource Managers and Build Capacity
Action 21: Establish a core training program on climate change science
Action 22: Focus existing youth outreach programs on climate change and water issues
Action 23: Engage land grant colleges in climate change adaptation research
Action 24: Increase graduate level fellowships in water management and climate change

Recommendation 1:
Establish a Planning Process and Organizational Framework:

Supporting Action Status:

- **Establish Planning Process: *On Track***
- **Establish Organizational Framework: *On Track***

The *National Action Plan* was an initial step to respond to the challenges to freshwater resource management posed by a changing climate. Its recommendations, however, will need to be evaluated and updated over time. In addition, a more formal organizational framework is needed to oversee implementation of the Plan and strengthen links to Federal agencies with State, tribal and local governments and other interested parties.

During 2012, the Water Resources and Climate Change Workgroup co-chairs (i.e., USGS, EPA, and CEQ) managed the implementation of actions and tasks to support this recommendation in conjunction with the agency members of the Workgroup. Two supporting actions were established for this effort:

- Establish the planning process; and
- Establish an organizational framework.

Both of these supporting actions are on track.

Supporting Action 1: Establish a planning process with the capability to identify priority adaptation actions and promote their implementation.

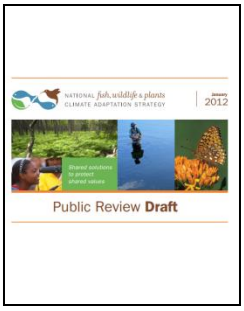
2012 Status: *On Track*

Key accomplishments in 2012 related to this Action included:

1. **Publish a 2012 Progress Report:** The publication of this ***2012 Progress Report*** outlining the actions taken to implement the *National Action Plan* in 2012 was called for in the Plan as a means of recording actions to implement the Plan, advising agency managers of progress in implementation, and identifying areas where additional work is needed.

2. **Coordinate with Related Climate Change and Water Plans and Projects:** Throughout 2012, the Workgroup participated in a range of related programs and projects including:

    - Preparing a Federal Technical Input Document for Water and the Water Chapter of the draft National Climate Assessment;
    - Developing the Climate Change chapter of the Implementation Plan for the National Ocean Policy;
    - Contributing to the *National Fish, Wildlife and Plants Climate Change Adaptation Strategy;*



- Commenting on several documents developed by the Climate Change and Water Working Group (CCAWWG); and
- Reviewing and commenting on draft Agency climate change adaptation strategies to provide input to CEQ agency guidance on development of plans.

The Workgroup co-chairs participated in several meetings convened by CEQ to improve coordination among managers working on the implementation of the *National Action Plan*, development of the Climate Change chapter of the Implementation Plan for the National Ocean Policy, and development of the final National Fish, Wildlife and Plants Climate Change Adaptation Strategy. The continuing coordination among managers of these three crosscutting efforts will improve implementation of each.

Needs Attention: New or improved measures to track progress in improving adaptation of water resources to a changing climate are needed. In 2012, the Workgroup co-chairs identified and discussed several potential evaluation systems and approaches but did not adopt a specific set of evaluation measures.

Supporting Action 2: Establish an organizational framework to promote effective management of water resources in a changing climate

2012 Status: ***On Track***

Key accomplishments in 2012 related to this Action include:

1. **Holding Regular Workgroup Meetings:** The Climate Change and Water Resources Workgroup met monthly in 2012. These meetings provided for exchange of information among participating agencies concerning developments related to climate change adaptation, coordination with related projects, and review of progress implementing the *National Action Plan*.

2. **Publishing a 2012 Workplan for the Workgroup:** In January 2012, the Workgroup published and provided the Interagency Climate Change Adaptation Task Force with a Workplan for implementation of the *National Action Plan* in 2012. This Workplan served as a point of reference for agency efforts to implement the Plan. A key element of the Workplan is maintenance of interagency teams working on the key recommendations of the Plan.

3. **Establishing an External Stakeholder Committee:** A significant accomplishment of 2012 was the formal establishment of a new Climate Change and Water Workgroup of the Advisory Committee on Water Information (ACWI). The ACWI is a Federal Advisory Committee that provides advice and guidance on water issues to Federal agencies. The *National Action Plan* includes a recommendation that ACWI serve as a vehicle for engaging stakeholders on climate change and water issues.

In July 2012, the ACWI membership voted to establish a new Workgroup on Climate Change and Water and approved terms of reference describing the charge and operations of the Workgroup. A key purpose of the Workgroup is to guide Federal agency efforts to implement the *National Action Plan*. Some 26 organizations representing States, Tribes, and public interest groups are members of the Workgroup along with 14 Federal agencies. EPA is the Federal agency co-chair of the Workgroup and the Water Environment Federation is the non-Federal co-chair.

Three formal meetings of the Workgroup were held in 2012 by conference call and an in-person meeting is planned to be held in Washington, D.C. in March or April, 2013.

4. **Cooperating with the SWAQ and CCAWWG:** Throughout 2012, the Workgroup co-chairs and members participated in monthly meetings of the Committee on the Environment, Natural Resources, and Sustainability's Subcommittee on Water Availability and Quality (SWAQ) and the work of the interagency Climate Change and Water Working Group (CCAWWG).

5. **Regional Development:** The Workgroup members participated in activities organized by the CEQ and the Interagency Climate Change Adaptation Task Force to identify regional hubs for the development of information and plans for multi-state or regional adaptation to climate.

Needs Attention: The *National Action Plan* calls for Agencies to work with the Water Science and Technology Board (WSTB) of the National Research Council to consider changes to the charter of the Subcommittee on Hydrology. The revised charter would utilize the Subcommittee to provide a forum for coordination among climate modelers and data managers. The Workgroup co-chairs initiated discussions of this topic with the WSTB but changes to the Charter of the Subcommittee on Hydrology were not developed. The absence of funds to reform the Subcommittee contributed to this lack of progress. Workgroup co-chairs will continue to explore options for further development of this task in 2013. Other groups are addressing the issue of coordination between modelers and data providers, including the SWAQ and the agencies involved in the Integrated Water Resources Science and Services (IWRSS) activity.

Recommendation 2: Improve Water and Climate Change Information for Decision-Making:

Current decision-making tools and policies for water resources management rely on historical water data to estimate future variations in water availability and quality. In a changing climate, however, water data used in decision-making tools need to be more complete and current. In addition, new insights from predictive models and vulnerability and assessment tools need to be applied to key decisions.

Supporting Action Status:

- **Strengthen data for understanding climate change impacts on water: *On Track***
- **Create a program to align hydroclimatic statistics: *On Track***
- **Implement a surveillance system for tracking waterborne disease threats: *On Track***
- **Provide information to identify areas likely to be inundated by sea level rise: *Delayed***
- **Expedite implementation of wetlands mapping standard: *On Track***

The Data and Information team led by USGS, managed the implementation of actions and tasks to support this recommendation in conjunction with the agency members of the Workgroup. Five supporting actions were established for this effort:

- Strengthen data for understanding climate change impacts on water
- Create a program to align hydroclimatic statistics
- Implement surveillance system for tracking waterborne disease threats
- Provide information to identify areas likely to be inundated by sea level rise
- Expedite implementation of wetlands mapping standard

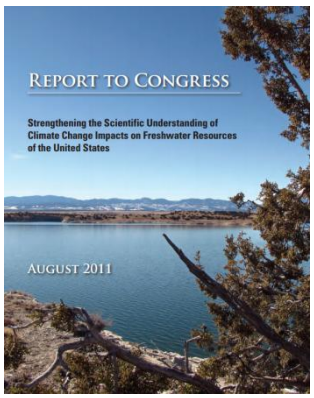
These supporting actions are in various stages of implementation.

Supporting Action 3: Strengthen data for understanding climate change impacts on water

2012 Status:
On Track

Key accomplishments in 2012 related to this Action include:

1. **Implementing SECURE Water Action Section 9506 report recommendations:** With leadership from the Bureau of Reclamation, the SWAQ has initiated agency report-outs on progress toward implementation of the Section 9506 report recommendations. A progress report template was distributed to SWAQ agencies, and Reclamation, National Weather Service, and EPA have reported on accomplishments. SWAQ leadership will emphasize this activity with key agencies in early 2013, and plans to produce a summary report by the end of the year.



2. **Evaluating USGS Monitoring and Science Programs:** At the recommendation of the Secretary of the Interior, ACWI formed a workgroup to provide advice to the Secretary on approaches and options that might be implemented by USGS and Interior leadership in order to sustain and enhance water monitoring and related science for the Nation. The workgroup formed in late summer 2012, met at biweekly intervals, and anticipates a report to ACWI in summer 2013.

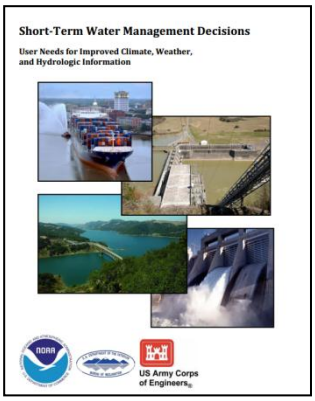
3. **Contributing to the National Climate Assessment (NCA) Water Resources chapter:** USGS and the US Army Corps of Engineers co-led development of a Technical Input report to the NCA's water resources chapter. Representatives from Task Force agencies served as co-authors to the Technical Input report, which summarized current observations of effects of climate change on the water cycle, anticipated effects based on climate modeling, and developed adaptation strategies. The report was completed in 2012, currently is in review, and should be published in 2013 as a USGS Circular. Task Force members also served as co-authors on the NCA Water Resources chapter, which currently is in review.

Supporting Action 4: Create a program to align hydroclimatic statistics

2012 Status: ***On Track***

Key accomplishments in 2012 related to this Action included:

1. **CCAWWG publications and summary for NAP workgroup:** The report, "Short-Term Water Management Decisions: User Needs for Improved Climate, Weather, and Hydrologic Information," was finalized in Jan 2013.



2. **ACWI Sub-committee on Hydrology update to Bulletin 17B:** The last revision of Bulletin 17 on floodplain management occurred over three decades ago in 1982. The outdated statements in the "Climate Trends" section were replaced to reflect the current understanding of climate variability and climate change.

Needs Attention: In many parts of the Nation, precipitation intensity-duration-frequency (IDF) statistics have not been updated in many years. Funding currently is limited for further updates, but current IDF statistics are critical for water resources design. There are no observations to suggest that climate change to this point has broadly affected flooding in this country, but much research is needed to understand and anticipate the effects of a changing climate on flooding

Supporting Action 5: Implement surveillance system for tracking waterborne disease threats

2012 Status: ***On Track***

Key accomplishments in 2012 related to this Action include:

1. **First Waterborne Disease Capacity Grants**: CDC supports all state health departments through its epidemiology and laboratory capacity building grant. In 2012, for the first time, the ELC grant began funding small waterborne disease response capacity building grants in seven states: Arizona, Florida, Ohio, South Carolina, Washington, New Hampshire, and Louisiana. CDC continued to provide funding for these states and added Maine to the program.

2. **Launch of New Waterborne Disease Outbreak Reporting System:** CDC transitioned to electronic reporting of waterborne outbreaks in 2009 by launching the National Outbreak Reporting System (NORS), which enabled 50 state and 9 U.S. jurisdiction health departments to more quickly report detailed information about waterborne disease outbreaks. NORS 2.0 and a user training website were launched in January 2012 to improve the speed, accuracy, and ease of reporting of information about outbreak etiologies, contributing factors, and antecedent causes.

3. **Grants to Great Lakes States:** CDC obtained funding to start building state capacity for detection, investigation, and reporting of waterborne disease and outbreaks related to ambient water exposure in all eight Great Lakes states (Minnesota, Wisconsin, Illinois, Indiana, Michigan, Ohio, Pennsylvania, and New York) by partnering with the Council of State and Territorial Epidemiologists (CSTE) to place CSTE fellows in each state to work on ambient water-related health projects.

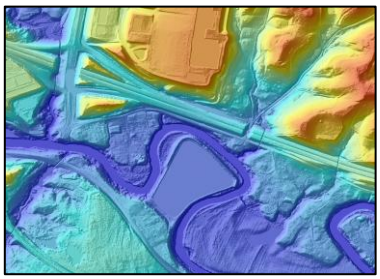
4. **Tracking Harmful Algal Blooms**: Funding for CDC's harmful algal bloom surveillance system ended recently. CDC has obtained funding to integrate the system into the National Outbreak Reporting System (NORS) so that these events can be reported electronically through CDC's largest outbreak reporting system.

Supporting Action 6: Provide information to identify areas likely to be inundated by sea level rise

2012 Status: ***Delayed***

Key accomplishments in 2012 related to this Action included:

1. **Interagency LiDAR Briefing:** In October 2012, CEQ and the Office of Science and Technology Policy sponsored an interagency briefing to share information about Federal agency investments in LiDAR mapping. The presentations from the briefing are being reviewed and additional steps planned.



Source: USGS

2. **Map inundation and shoreline change:** Prior to Hurricane Sandy, USGS and NOAA conducted LiDAR shoreline mapping from North Carolina to New York. Immediately

following the landfall, the mapping was repeated in order to document the impact of major storms on shoreline change. In addition, USGS mapped high-water levels resulting from Sandy at more than 1,000 points in the impact zone. These data, along with data from more than 200 recoding water level gages, are being used to document the magnitude and extent of inundation and to improve NOAA and FEMA surge forecast models. Reports are anticipated on each of these activities.

3. **Demonstrate Climate Change Impacts on Inundation:** USGS completed a pilot project in the San Francisco Bay-Delta region to demonstrate the potential effects of climate change on sea level in the Bay-Delta. The study accounted for changes in rainfall, snowmelt, storms, and sea level in the region. This is one of the first studies of this kind to anticipate the full range of climate change impacts on coastal waters.

Needs Attention: This action is similar to an action proposed in the climate change chapter of the Draft Implementation Plan for the National Ocean Policy. Full implementation actions will be developed jointly by the National Ocean Policy staff and the Water Resources Workgroup. This action is pending the upcoming release of the final Implementation Plan for the National Ocean Policy.

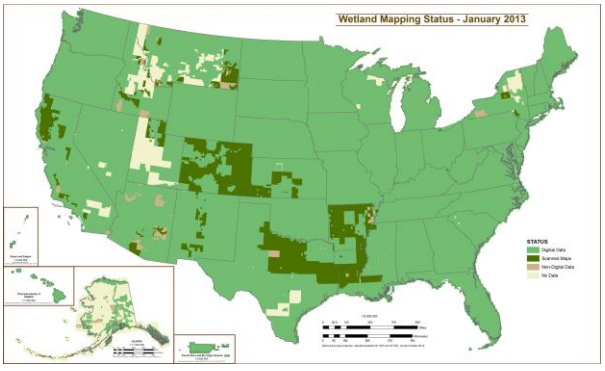
Supporting Action 7: Expedite implementation of wetlands mapping standard

2012 Status: ***On Track***

Key accomplishments in 2012 related to this Action include:

1. **Continuing Progress in Digitizing Maps Showing Location of Wetlands**: As of February 2013, the National Wetlands Inventory had produced wetland digital data for about 81 percent of the country. This includes 89% of the continental United States, 34% of Alaska, 100% of the Hawaiian Islands, 76% of Puerto Rico and the U.S. Virgin Islands and 100% of Guam and Saipan in the Pacific Trust Territories.

   Additional resources are needed to provide wetland coverage data for the continental United States and Puerto Rico and convert existing hard copy maps in Alaska to digital data that can be used in GIS analysis. The cost of this remaining work is about $12 million dollars and does not include any new mapping in Alaska.



Source: US FWS, 2013

Recommendation 3: Strengthen Assessment of Vulnerability of Water Resources to Climate Change:

Climate change impacts—including extreme weather events, sea level rise, shifting precipitation and runoff patterns, among others—are expected to significantly affect the water environment, water infrastructure, and the operations of water resources facilities. To effectively reduce risks from climate change, water resource managers need improved tools to assess the climate change vulnerabilities in their systems that are tailored to the specific type of facility and most critical management decision.

Supporting Action Status:

- **Publish guidance on use of modeled projections for water resources applications: *On Track***
- **Develop an internet portal on water resources and climate change: *On Track***
- **Develop a pilot climate change/freshwater vulnerability index: *On Track***
- **Develop tools to build capacity for vulnerability assessments: *On Track***
- **Assess vulnerability of National Forests and Grasslands: *On Track***
- **Promote free and open access to water resources data: *On Track and Complete***

Throughout 2012, the Vulnerability Assessment team led by NOAA managed the implementation of actions and tasks to support this recommendation in conjunction with the agency members of the Workgroup. Six supporting actions were established for this effort:

- Publish guidance on use of modeled projections for water resources applications
- Develop an internet portal on water resources and climate change
- Develop a pilot climate change/freshwater vulnerability index
- Develop tools to build capacity for vulnerability assessments
- Assess vulnerability of National Forests and Grasslands
- Promote free and open access to water resources data

Progress on the specific actions has been steady and most of the items have been completed at this point. Others should be finished in the very near future.

Outlined below is a summary of 2012 efforts from the Vulnerability team and an overview of activities being carried out under each supporting action. These tasks directly address the actions in the implementation plan. As can be seen by reviewing the activities that follow, each agency has significant work underway. Some of the projects, the results of which would be critical in advancing activity on metrics, have timeframes that, by necessity, extend beyond the shorter time frame contemplated by the action plan. Given other priorities and resource constraints, deadlines for tasks fluctuate based on agency support. Committing to ongoing coordination and collaboration to keep other agencies aware of these and other efforts will provide significant benefits to stakeholders.

Supporting Action 8: Publish guidance on use of modeled projections for water resources applications

2012 Status: ***On Track***

Key accomplishments in 2012 related to this Action include:

1. **Developing a Compendium of Uses of Downscaled Climate Data:** NOAA continues to lead the effort to complete the 2013 National Climate Assessment for the U.S. As part of the Assessment, lead scientists at the Cooperative Institute for Climate and Satellites are developing a compendium of uses of downscaled climate information applicable to all climate applications including water that have been used in the Assessment and have passed peer review. The anticipated date for the release of this peer-reviewed document is early Q3, 2013.

Supporting Action 9: Develop an internet portal on water resources and climate change statistics

2012 Status: ***On Track***

Key accomplishments in 2012 related to this Action include:

1. **USACE leadership on the development of their Federal Toolbox to support water managers.** This effort is aiming for a Q2, FY2013 roll out of the website improvements that will include climate change information and data and web content from partnering federal agencies that will help serve water management decision makers.

Supporting Action 10: Develop a pilot climate change vulnerability index for a major category of water facilities

2012 Status: ***On Track***

Key accomplishments in 2012 related to this Action include:

1. **Examine Low Flow and Drought Impacts on Colorado River:** The interagency National Integrated Drought Information System (NIDIS) and NOAA are supporting the examination of low flow and drought in the Colorado River Basin on junior water rights holders. New findings will be incorporated into the Colorado River Basin Drought Early Warning System, part of NIDIS, to give advance warning to junior water rights holders when a drought is developing. This work is supported by a grant, and planned work completion and operational incorporation are likely in 2014.

Supporting Action 11: Continue development of tools and approaches that build capacity for water institutions to conduct vulnerability assessments and implement responses

2012 Status: ***On Track***

Key accomplishments in 2012 related to this Action include:

1. **Issuing Water Utility Climate Tool Version 2.0** : The Climate Resilience Evaluation and Awareness Tool (CREAT) assists users in conducting climate change risk assessments and promotes a general understanding of climate change impacts for utility owners and operators. A new version of CREAT was released in January 2013. CREAT 2.0 features more robust scenario-based planning, extreme events data, and energy management capabilities. The new version also includes embedded basic and advanced video training modules and allows utilities to conduct analysis comparison scenarios for multiple time periods. During 2012, pilots were conducted in Oakland, California and Wilmington, Delaware for the updated software. The EPA has made the final version of the CREAT available for download at http://water.epa.gov/infrastructure/watersecurity/climate/creat.cfm.

2. **Publishing a *Adaptation Strategies Guide:*** In January 2012, EPA published an *Adaptation Strategies Guide* that serves as an introduction to climate change adaptation planning for drinking water, wastewater, and stormwater utilities. A series of briefs organized by region and climate-related impacts provide a better understanding of what challenges utilities can expect to face along with adaptation strategies that can be used to prepare their systems for those impacts. An updated version of the Guide will be released in the spring of 2013. The new Guide will include two new sections on Green Infrastructure and Energy Management, which contribute to a more comprehensive adaptation planning process.

3. **Publishing Planning for Extreme Weather Events: Workshop Planner for the Water Sector:** The Extreme Events Workshop Planner includes everything a utility needs to plan, customize, and conduct a workshop focused on planning for more frequent and more intense extreme events. Five extreme event scenarios are included in the Workshop Planner:

   - flooding;
   - drought;
   - sea level rise;
   - wildfire; and
   - reduced snowpack.

   Each scenario walks users through a long-term planning exercise in which workshop participants gain a better understanding of how projected changes in the frequency and intensity of extreme events can impact their utility and community, and how they can begin to adapt to prepare for these changes. By the end of a workshop, each participant

will have identified actionable next steps the can take today to increase the resilience of their utility and community to extreme events. Three communities have piloted the Workshop Planner: Manchester, New Hampshire; Erie, Pennsylvania; and Bisbee, Arizona.

Supporting Action 12: Assess vulnerability of watersheds and aquatic systems on National Forests and Grasslands

2012 Status:
On Track

Key accomplishments in 2012 related to this Action include:

1. **Watershed Vulnerability Assessment Webinars:** The National Forest Service has conducted a series of three watershed vulnerability assessment webinars featuring representatives from 12 Pilot National Forests in 9 Forest Service regions. These webinars included information on assessing the relative vulnerability of water resources to climate-based hydrologic change. The assessments demonstrate how available information can be used to provide managers with a relative rating of water resource vulnerability to climate change and how the results of the assessments can be used to develop recommendations on the responses each forest might take to best respond to predicted climate-based hydrologic change. See http://www.fs.fed.us/ccrc/livelearn/wva/ for more information.

Supporting Action 13: Promote free and open access to authoritative climate change-science and water resources data

2012 Status:
On Track and Complete

Key accomplishments in 2012 related to this Action include:

1. **Removing Charges for Climate Data:** The NOAA National Climatic Data Center has changed its policy on charging for climate data. Effective in FY2012, all climate data obtained via the internet is provided without charge. By Q2, 2013, all former account holders will have been moved to this new model. There is still a charge for "Official" and "Certified" data, as those data require significant manpower. However, this volume is small and limited almost completely to climate records used in legal proceedings.

Recommendation 4: Expand and Improve Water Use Efficiency

Climate change will further challenge water resources that are already under stress because of growing populations, contamination, and demands to meet diverse human and ecosystem needs. Making more efficient use of water can extend the availability of current supplies, reduce competition among sectors, save energy, and reduce the cost of water system operations.

Supporting Action Status:

- **Develop nationally consistent metrics for water use efficiency : *On Track***
- **Make water use efficiency an explicit consideration in the revision of Principles and Guidelines for water resources projects and in the new NEPA guidance on climate change: *Delayed***
- **Enhance agency coordination and create a toolbox of key water efficiency practices: *On Track***

Throughout 2012, Water Use Efficiency team led by EPA managed the implementation of actions and tasks to support this recommendation in conjunction with the agency members of the Workgroup. Three supporting actions were established for this effort:

- Develop nationally consistent metrics for water use efficiency
- Make water use efficiency an explicit consideration in the revision of Principles and Guidelines for water resources projects and in the new NEPA guidance on climate change (led by CEQ rather than EPA)
- Enhance agency coordination and create a toolbox of key water efficiency practices

These supporting actions are in various stages of implementation. Progress on the specific actions has been slow, largely due to other priority activities on which the different agencies are focused. However, those other activities are linked to this effort in that they are either directly furthering water use efficiency or laying a foundation for future efforts.

Outlined below is a summary of 2012 efforts from the WUE team and an overview of activities being carried out by each that support improvements in water efficiency. While not always directly tied to the tasks in the implementation plan, the activities undertaken by the agencies will flow into other efforts that will address the tasks in the implementation plan. Given other priorities and resource constraints, the group has not assigned specific deadlines to tasks. As can be seen by reviewing the activities that follow, each agency has significant work underway. Some of the projects, the results of which would be critical in advancing activity on metrics, have timeframes that, by necessity, extend beyond the shorter time frame contemplated by the action plan. However, committing to ongoing coordination and collaboration to keep other agencies aware of these and other efforts will provide significant benefits towards advancing water use efficiency efforts to support our respective stakeholders.

Supporting Action 14: Develop nationally consistent metrics for water use efficiency in key sectors and report water efficiency information in nationally consistent formats

Key accomplishments in 2012 related to this Action include:

2012 Status: ***On Track***

1. **Improving Water Use Assessment in the Water Census Program:** The USGS is conducting the Water Census under the umbrella of the DOI WaterSMART initiative. The project is wide-ranging and has subprojects that will build a foundation for development of metrics and better assessments of water use in different sectors.

    - **Public Supplies.** WaterSMART is working on a five year effort to develop a site specific water use database for 55,000 public water systems that will be able to link with monthly withdrawal amounts by type of delivery (e.g., domestic, industrial, or cooling uses). After database completion, a consumption profile of each facility will be developed. This project is in coordination with EPA.

    - **Irrigation.** WaterSMART is working on a large project looking at amount of evapotranspiration associated with irrigated crop land in order to develop a better sense of the consumptive use associated with irrigation (i.e., how much of a crop can we produce per a given amount of water consumed). The project is being piloted in the Colorado River basin, with results expected next year. This project is being coordinated with USDA NRCS and the Bureau of Reclamation, which is a large user of this information. They also have a project underway with Utah State University to look at methodologies for evapotranspiration measurements. Many states have their own evapotranspiration methods, and want to incorporate this into the Water Census. However, if states carry out these measurements and want them included in the Census, some type of standardization will be needed to ensure consistent data.

    - **Thermoelectric Power.** As part of follow-up to recommendations from a GAO report in 2010, the USGS is working with the Energy Information Administration (part of DOE) to improve the collection of water use data from thermoelectric power plants and to better estimate the consumptive water use associated with plants, rather than just withdrawals.

3. **Developing State Water Data Exchange:** The Department of Energy (DOE) and Sandia National Laboratory, in cooperation with the Western Governors' Association, the Western States Water Council (WSWC), and the Federal Agency Support Team to the WSWC (WestFAST), is engaged in a major project to create a water data exchange that will enable states to share data to support studies that cross state borders (http://www.westernstateswater.org/wade/). State water

allocation, supply and demand data, along with other relevant Federal data, are being collected to support an analysis by DOE of water availability and demand for energy production in the West. In addition, WestFAST is surveying the states to determine what data they collect and how they collect it, and will develop a summary report with recommendations on establishing a common data exchange framework. WestFAST hopes to pilot a data exchange network with 3-5 states over the next year and is building the system such that it could be expanded beyond the western states. The work will support both the Water Census and DOE studies looking at the availability of water for energy in the West and across the Nation.

4. **Conducting Workshop and Study of Climate Change and Extreme Weather Impacts including Drought on the U.S. Energy Sector:** The Department of Energy Office of Policy and International Affairs, in collaboration with the National Renewable Energy Laboratory, is conducting a study of the impact of climate change and extreme weather, including drought, on the US energy sector, and developing recommendations to address knowledge, technology and policy gaps to building a secure and sustainable energy future. A workshop was held in July 2012 with government, industry and non-governmental experts from the energy sector to identify vulnerabilities, to discuss progress on energy technology innovation to improve climate resiliency, including opportunities to reduce water intensity of the energy sector, and to identify gaps and potential response strategies. A report is expected to be issued in 2013.

5. **Adding Water Data to Energy Surveys:** EPA's WaterSense program is working with the EPA ENERGY STAR program to promote addition of questions asking about water use into the DOE Energy Information Agency Commercial Building Energy Consumption Survey (CBECS) and other surveys that investigate energy use in buildings.

   The ENERGY STAR program is also enhancing the collection of water information in its Portfolio Manager tool which is used to track energy use with a goal of developing metrics to support performance benchmarking. The two programs will be working to determine if there is sufficient data to support similar benchmarking of facilities for water use.

   ENERGY STAR has also added a component to recognize water savings as part of its 2012 National Building Competition.

6. **Revising Water Grants to Include Water Savings Data**: The Bureau of Reclamation continues to review the process used to select grants they make for water conservation to assess the different measurements of success for water savings that grantees report. In 2012, significant revisions were made to the funding opportunity announcement for WaterSMART Grants to request more detailed support for applicants water savings estimates so that those estimates can be evaluated as effectively as possible. The Bureau is also conducting before and after visits to project sites for a sample of funded

projects to compare project sponsors' estimates of water savings with post-project results. The information they gather during this process may be of benefit to the work on metrics.

7. **Developing Army Water Efficiency Metrics:** The Army Corps of Engineers is developing new water efficiency metrics to be proposed for the Army Campaign Plan Major Objective 8-3: Enhance Water Security. These objectives include assessing the percent of potable water distribution system linear feet assessed for leaks and gallons per person per day of consumptive use.

Supporting Action 15: Make water use efficiency an explicit consideration in the revision of Principles and Guidelines for water resources projects and in the new NEPA guidance on climate change

2012 Status: Delayed

The *National Action Plan* provides for consideration of climate change in the revision of the Principals and Guidelines for the management of federal water projects and for consideration of water related issues in the development of guidance concerning climate change in the National Environmental Policy Act project review process. These documents are still under development.

Supporting Action 16: Enhance coordination among Federal water efficiency programs and improve program effectiveness, including creating a "toolbox" of key practices

Key accomplishments in 2012 related to this Action included:

2012 Status: On Track

1. **Maintaining Water Efficiency Web Clearinghouse:** The Bureau of Reclamation is maintaining DOI's WaterSMART Clearinghouse, a portal of water resource management resources that was "soft-launched" in 2011 (http://www.doi.gov/watersmart). Through the Clearinghouse, information on best practices, case studies, education and outreach, sources of grants and other financial resources, research, and water data are available to the public. The initial phase of the Clearinghouse has been limited to gathering information from governmental agencies and land grant universities. The program plans to look at expanding the types of entities that can submit information to the Clearinghouse in the future.

2. **Developing a Toolbox on Water Management:** The Army Corps of Engineers is developing a Federal Support Toolbox to provide a single source for stakeholders looking for technical resources to support water management. The project is an outcome of the *Building Strong Collaborative Relationships for a Sustainable Water Resources Future* effort which interviewed State, Federal,

Source:watertoolbox.us

and other water stakeholders across the country to identify resource needs, challenges, and priorities (see http://www.building-collaboration-for-water.org/).

The Corps released the first version of the Toolbox in early 2013 (www.watertoolbox.us). A future goal of the Toolbox will be to add resources from States. There are likely opportunities to see how this toolbox can be integrated with and/or complement the DOI WaterSmart Clearinghouse.

3. **Maintaining WaterSMART Grants for Water Efficiency:** The Bureau of Reclamation's WaterSMART Grants program offers cost-shared grants for water and energy efficiency (http://www.usbr.gov/WaterSMART/weeg/). The grants cover water management improvements, including piping of channels to reduce seepage, installation of more advanced water management and irrigation devices, and municipal rebate programs for activities including metering and turf replacement. Approximately 127 projects have been funded since FY 2010 and the program has set a goal that projects funded under WaterSMART Grants and other water conservation programs FY 2010 through FY 2013 enable the capability to conserve 730,000 acre-feet of water. Through FY 2012, about 615,000 acre-feet have been reported toward that goal. An accomplishments report, *WaterSMART: A Three-Year Progress Report*, was published in October 2012: http://www.usbr.gov/WaterSMART/docs/WaterSMART-thee-year-progress-report.pdf.

4. **Expanding WaterSense into New Areas** : Efficient use of water is a key strategy for managing water resources as supplies become more unpredictable as a result of climate change.

   - In August 2012, EPA released a revised specification for WaterSense labeled new homes which expanded the label to include multi-family housing.

   - In late 2011, EPA released a WaterSense specification to label weather-based irrigation controllers. Use of labeled controllers can help to reduce water waste associated with outdoor landscape watering.

   - The program also released a guide, *WaterSense at Work: Best Management Practices for Commercial and Institutional Facilities*, to help businesses and institutions understand how they can better manage their water footprint through the use of water efficient products and practices. The guide is available at http://www.epa.gov/watersense.

5. **Implementing Net Zero Installation Program:** The Army is carrying out the NetZero Installation Program, which is working to promote net zero approaches for energy, water and waste in a number of installations across the country (http://army-energy.hqda.pentagon.mil/netzero/). Six of the pilots are focused on water. Several activities are supporting the net zero effort.

   As part of this work, the Army is developing planning-scale tools to integrate Army installation actions that support net zero energy, water, and waste. The Net Zero Installation (NZI) tool includes multi-scale modeling and analyses of water conservation measures to document potential water and energy savings. In FY 2012 this research project demonstrated and evaluated existing installation and technology-specific water models to support the NZI tool. Ongoing efforts during FY 2013 include capturing useful capabilities of existing models to populate the water module of the NZI tool and demonstrate the water module at Fort Leonard Wood, MO.

6. **Developing Mobile Table Water Equipment Tracker:** The Army Corps of Engineers is developing a mobile tablet Water Equipment Tracking (WET) application to be used to inventory and track alternative water resource options. In FY12 the Beta WET application was developed. The WET helps eliminate transfer error in auditing and provides an immediate estimate of building water consumption based on occupancy, usage, and existing equipment. The WET application was Beta tested at Fort Hood, Texas in January 2013.

Recommendation 5: Support Integrated Water Resources Management (IWRM)

Management of the risks from a changing climate should not occur in isolation and should be integrated with efforts to address other freshwater resources management challenges. As models and methods for integrated water resources management are developed across the country, challenges posed by a changing climate should be incorporated.

Supporting Action Status:

- **Strengthen the role of interstate bodies in climate change adaptation: *On-Track***
- **Revise Federal water project planning standards to address climate change: *Delayed***
- **Work with States to review flood risk management and drought management planning and identify best practices: *On-Track***
- **Develop benchmarks for incorporating adaptive management into water project designs, operational procedures, and planning strategies: *On-Track***

The Integrated Water Resources Management (IWRM) team led by US Army Corps of Engineers (USACE) managed the implementation of actions and tasks to support this recommendation in conjunction with the agency members of the Workgroup. Four supporting actions were established for this effort:

- Strengthen integrated water resources management practices to advance climate change adaptation
- Revise Federal water project planning standards to address climate change
- Work with States to review flood risk management and drought management planning and identify best practices
- Develop benchmarks for incorporating adaptive management into water project designs, operational procedures, and planning strategies

These supporting actions are in various stages of implementation. Progress on the specific actions has been steady and many interim milestones have been completed. Others should be finished in the very near future.

Outlined below is a summary of 2012 efforts from the IWRM team and an overview of activities being carried out under each supporting action. A number of agencies have significant work underway, some of which have extended schedules and several of which will advance development of metrics for documenting progress.

Supporting Action 17: Work with States and interstate bodies (e.g., River Basin Commissions) to incorporate IWRM into planning and programs, paying particular attention to climate change adaptation issues

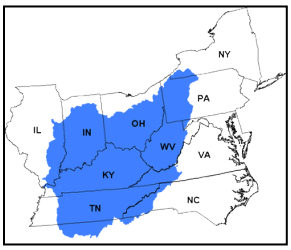
2012 Status: ***On Track***

Key accomplishments in 2012 related to this Action include:

1. **Adaptation Pilot Studies**: The Army Corps of Engineers is funding several climate change adaptation pilot studies that address certain aspects of IWRM.

   - The goal of one pilot study in Hawaii was to collaboratively develop a climate change adaptation strategy for the **West Maui Watershed**. The objective of the West Maui Watershed Plan is to improve the overall quality of the West Maui Watershed, from the summit of Pu`u Kukui to the outer coral reef. Partners in the plan include USACE-Honolulu District, the State of Hawaii Department of Land and Natural Resources (DLNR) and the Department of Health (DOH) with support from NOAA and EPA.

   - Another pilot study involves regional collaboration with the **Ohio River Basin** (ORB) Alliance. The alliance includes representatives from Federal agencies, States, non-governmental organizations (NGOs) and universities. The aim of the pilot study is to collaboratively develop mitigation and adaptation strategies with the ORB Alliance to counteract the anticipated water resources, ecological, and infrastructure impacts of climate change. One intended product is the formation of a permanent climate change working group within the ORB Alliance.



Source: USEPA

Defining Integrated Water Resources Management:

The Workgroup is using the definition of IWRM from the report *Building Strong Collaborative Relationships for a Sustainable Water Resources Future National Report Responding to National Water Resources Challenges* (U.S. Army Corps of Engineers, 2010). The report defines IWRM as:

- Sustainable outcomes—the practice of making decisions and taking coordinated actions for outcomes and benefits that use or affect current economic, environmental and quality of life resources conditions in ways that preserve these resources for future generations.
- Collaborative planning—a process that avails collaboration to secure the input of all stakeholders about their interests and needs.
- A systems perspective—a systems approach that arrays interests and needs as input variables, modeling a system of interdependent variables with multiple outputs.
- A geographic context—a geographic perspective that examines who is doing what where at a broad geographic scale, e.g., a river basin, watershed or coastal zone.
- Balanced aims—a process that seeks to balance multiple objectives as diverse desired outputs producing multiple benefits.

   - USACE has agreed to do an IWRM pilot study with the **Delaware River Basin** Commission (DRBC). Climate change adaptation would be one component of this study. This pilot study has not yet been started.

2. **Identification of Water Resources Science and Services by Interstate Basin Commissions:** In 2012, the National Weather Service, as part of the IWRSS activity, began planning for stakeholder meetings in 2013. These meetings will allow interstate River Basin Commissions and their partners to help define directions for pilot IWRSS activities. Meetings are planned for the Delaware, Susquehanna, Potomac, and Hudson River basins.

3. **Report on IWRM and Climate Change:** The Army Corps of Engineers is developing a report on IWRM practices and climate change adaptation. As a first step, a contractor is preparing a report on governance issues by examining Federal and State laws and authorities that affect water resources management. A draft report should be available by March 31, 2013.

Supporting Action 18: Revise Federal water project planning standards to address climate change

2012 Status: ***Delayed***

The *National Action Plan* provides for consideration of climate change in the revision of the Principals and Guidelines for the management of federal water projects. Work on this project has been delayed as a result of limited Congressional funding.

Supporting Action 19: Work with States to review flood risk management and drought management planning to identify best practices to prepare for hydrologic extremes

2012 Status: ***On Track***

Action 19 in the *National Action Plan* provides for strengthening coordination among Federal, State, Tribal, and local agencies on drought and flood issues. A goal of this effort is to identify best practices that can be shared with others, including: (1) the degree of coordination between flood and drought management; (2) cooperative efforts with Federal agencies (e.g., Silver Jackets); (3) the extent to which new information concerning hydrologic variations is reflected in state hazard mitigation plans; and (4) identification of innovative or especially useful planning or coordination mechanisms.

Key accomplishments in 2012 related to this Action included:

1. **Report on Climate Elements of State Hazard Mitigation Plans:** To support this action, a contractor reviewed State Hazard Mitigation Plans and submitted a report on the plans. This review has been completed and a report has been prepared and is available to the public.

2. **Survey of State Hazard Mitigation Officials and Report of Needed Actions**: Senior executives from USACE and FEMA signed a joint letter to the State officials describing

and initiating a survey of State Hazard Mitigation Officials (SHMO) and State Floodplain Management Officials. In addition, USACE and FEMA coordinated with the Association of State Floodplain Managers (ASFPM) and the SHMO network to publicize the survey. The intention was to interview two officials from every State and the District of Columbia (102 persons). As of mid-December, 92 surveys have been completed. Missing states include New Jersey and New York, which were badly affected by Sandy and had increased emergency work for State flood officials. The survey and report should be completed by April 2013.

Subsequently, a team from FEMA and USACE will summarize the report on the SHMPs and the survey of State officials and present the report to the Water Resources and Climate Change Adaptation Work Group. The current intent is to publish this report as a joint USACE-FEMA report.

Supporting Action 20: Develop benchmarks for incorporating adaptive management into water project designs, operational procedures, and planning strategies

2012 Status:
On Track

An Interagency Technical Team was formed to write the reports for Action 20. Agencies that participate on this team include USACE, DOI (USGS representing DOI), USDA (NRCS and Forest Service), EPA, and NOAA.

Key accomplishments in 2012 related to this Action included:

1. **Preparing an Inventory Report:** The IWRM Team prepared a report titled "Federal Agency Inventory of Adaptive Management Practices and Policies," which has completed a first round of agency review.

2. **Preparing a Recommendations Report:** "Recommendations for Federal Agency Implementation of Adaptive Management for Climate Change Adaptation." This Report has been sent to the Water Resources and Climate Change Adaptation Work Group and IWRM team members for agency review. The due date for review comments was January 31, 2013.

The Interagency Adaptive Management Team recommends that the reports be published as an interagency document with logos from each team members' agency on the document and completing each agency's review process (USACE, DOI or USGS, USDA or NRCS and Forest Service, EPA, and NOAA).

Recommendation 6: Support Training and Outreach to Educate Water Resource Managers and Build Response Capacity

Today, the workforce that manages water resources programs at all levels of government and in the private sector needs information and tools to recognize the implications of a changing climate or to make complex climate change adaptation decisions related to freshwater resources.

Implementation of actions and tasks in support of this recommendation were taken on by the full NAP Water Resources and Climate Change Workgroup rather than an individual team.

Supporting Action Status:

- **Establish a core training program on climate change science: *On Track***
- **Focus existing youth outreach programs on climate change and water issues: *Delayed***
- **Engage land grant colleges in climate change adaptation research: *On track***
- **Increase graduate level fellowships in water management and climate change: *On Track***

Throughout 2012, the management team in conjunction with the agency members of the Workgroup all managed the implementation of actions and tasks to support this recommendation. Four supporting actions were established for this effort:

- Establish a core training program on climate change science
- Focus existing youth outreach programs on climate change and water issues
- Engage land grant colleges in climate change adaptation research
- Increase graduate level fellowships in water management and climate change

These supporting actions are in various stages of implementation.

Supporting Action 21: Establish a training program that will increase the ability of technical practitioners to incorporate climate change information in the studies they conduct that inform water and water related resource management decisions

2012 Status: On Track

Key accomplishments in 2012 related to this Action include:

1. **Developing Climate Change Training Capacity:** The Bureau of Reclamation worked with other Federal agencies, including U.S. Army Corps of Engineers and EPA, and with the Western Water Assessment and the University Consortium of Atmospheric Research to develop a technical training curriculum that instructs water

resources professionals how to incorporate climate science and its associated uncertainties into hydrologic assessment studies. In 2012, training curricula for assessing climate change impacts on surface water hydrology and on crop irrigation requirements were developed for pilot offerings. Both curricula involve a blend of online distance-learning and residence courses. A common online course was developed to serve both curricula and was released on the UCAR COMET MetEd website in October 2012 ("Repairing Hydro-climate Inputs for Climate Change in Water Resource Planning"). The subsequent pilot residence courses were scheduled for early 2013. See www.ccawwg.us for more information.

Supporting Action 22: Focus existing youth outreach programs on climate change and water issues

2012 Status: Delayed

Key accomplishments in 2012 related to this Action included:

1. **Mapping the Future Project:** This initiative provided a summary and analysis of past and current youth-water programming, including an evaluation of strengths and weaknesses and articulation of the dominant approach and goals. The findings from this analysis were coupled with existing and emerging knowledge related to new directions for education, to create a vision and roadmap for a new paradigm in youth-water programming with recommendations for future funding in this area.

2. **ThinkWater Movement:** This program focuses on understanding, awareness, motivations, and connection around water issues. Campaign components will include a website, a full feature film, and PSAs to spark interest in the ThinkWater movement. The education components will include a teacher/leader tutorial to illustrate how the ThinkWater curriculum can add value to an existing Science Technology Engineering Mathematics (STEM), social studies, language arts, or visual arts lesson plan. Youth become water thinkers by looking at distinctions, systems, relationships and perspectives related to water in their natural and built environments. By applying these learning tools to build knowledge about water, youth will look at and care about water differently.

Needs Attention: These and other existing youth outreach programs such as USDA 4H and Project WET (Water Education for Teachers) should be expanded to include climate impacts on water resources.

Supporting Action 23: Engage Water Resources Research Institutes and land grant colleges in climate change adaptation research

2012 Status: On Track

Key accomplishments in 2012 related to this Action included:

1. **CEQ/USGS Meetings:** The Council on Environmental Quality and the U.S. Geological Survey held a series of meetings with directors and staff of State water resources institutes during 2012. These meetings included discussion of the status of USGS grants to the Institutes and the potential role that the Institutes could play in improving understanding of climate change issues. Options for clarifying grant guidance to more clearly address climate change were discussed. As a result of this process, the representatives of the Institutes proposed to develop a summary of climate change related research work by the Institutes. This product is under development.

Needs Attention: Uncertainty concerning funding for grants for the Institutes makes further discussion of options difficult.

Supporting Action 24: Increase graduate fellowships in water management and climate change

2012 Status: On Track

Key accomplishments in 2012 related to this Action included:

1. **Fellowship Program Development:** The Global Change Research Program is considering a proposal from the Woodrow Wilson Center to support a program of fellowships in climate change adaptation issues over the coming years. Some of these fellowships are expected to address climate change and water adaptation issues.

Appendix:
2012 Membership of the
Water Resources Workgroup of the
Interagency Climate Change Adaptation Task Force

Co-chairs:

Council on Environmental Quality
- Nancy Jane Andrews (co-chair October- December)
- Jeff Peterson (co-chair January –September)

Environmental Protection Agency
- Michael Shapiro

U.S. Geological Survey
- Matthew Larsen

Members:

Army Corps of Engineers
- Janet Cushing
- Rolf Olsen

Bureau of Reclamation
- Curt Brown
- Levi Brekke
- Chuck Hennig

Centers for Disease Control and Prevention
- Joan Brunkard

Council on Environmental Quality
- Susan Ruffo
- Ann Marie Pippin

Department of Agriculture
- Noel Gollehon

Department of Energy
- Craig Zamuda

Department of State
- Matt Robinson

Environmental Protection Agency
- Veronica Blette
- Regina Lyons
- Karen Metchis

U.S. Forest Service
- Christopher Carlson

U.S. Geological Survey
- Jerad Bales

National Aeronautics and Space Administration
- Bradley Doorn

National Oceanic and Atmospheric Administration
- Michael Brewer
- Nancy Beller-Simms