



CLIMATE CHANGE & WATER • FACT SHEET

EPA Office of Water

Highlights of Progress 2007-2009

Implementing the NWP Strategy: Response to Climate Change

The National Water Program Strategy: Response to Climate Change (<http://www.epa.gov/water/climatechange/strategy.html>), published in September 2008, was an initial effort to describe climate change impacts on water programs, to define goals and objectives for responding to climate change, and to identify a set of key actions that could be undertaken in Fiscal Years 2008 and 2009 under level resources in the areas of mitigation, adaptation, research, education, and management.

This document summarizes some of the accomplishments of the National Water Program (NWP) within EPA's Office of Water (OW). More details of these and other actions are described in the 2009 Progress Report, available at <http://www.epa.gov/ow/climatechange/implementation.html>.

Goal 1: Water Program Mitigation of Greenhouse Gases

To contribute to the reduction of greenhouse gas emissions, the NWP's primary efforts included:

- Improving energy efficiency at water and wastewater utilities;
- Implementing the WaterSense Program;
- Implementing the Green Infrastructure Initiative;
- Developing technical guidance for water reuse;
- Promoting technologies to address water leakage from pipes and other conveyances; and
- Developing carbon sequestration regulations under the Safe Drinking Water Act's (SDWA) Underground Injection Control (UIC) Program.



OW and Region 1 developed the Energy Management Guidebook for Wastewater and Water Utilities to provide utility managers with a step-by-step method to identify, implement, measure, and improve energy efficiency and renewable opportunities, available at: http://www.epa.gov/waterinfrastructure/pdfs/guidebook_si_energymangement.pdf. In partnership with the Public Entity EMS Resource (PEER) Center, OW developed the Effective Utility Management Primer and Resource Toolbox (http://www.peercenter.net/Featured_Tools/index.cfm?FrontID=5832), which includes ten attributes that incorporate consideration of climate change.

OW continues to implement the WaterSense Program (<http://www.epa.gov/watersense/>), a partnership program promoting water efficiency and enhancing the market for water-efficient products, programs, and practices. Achievements in 2008 include saving 9.3 billion gallons of water and 1 billion kWh through use of WaterSense labeled products, helping consumers realize more than \$55 million in water and sewer bill savings, and doubling the number of program partners.

Many of the actions to mitigate greenhouse gases are also important adaptation measures. EPA's Green Buildings and Green Infrastructure programs are cross-office efforts that address both nonpoint source runoff and stormwater management. The "green buildings" and "smart growth" programs focus efforts on reducing nonpoint source pollution while reducing energy and water consumption. Efforts continue to promote low impact development and green infrastructure, consistent with EPA's January 2008 Green Infrastructure Action Strategy entitled Managing Wet Weather with Green Infrastructure (http://cfpub.epa.gov/npdes/home.cfm?program_id=298).

OW is funding a study by the Water Science and Technology Board (<http://dels.nas.edu/wstb/>), of the National Academy of Sciences National Research Council (NAS/NRC), on "Assessment of Water Reuse as an Approach for Meeting Future Water Supply Needs" (<http://www8.nationalacademies.org/cp/projectview.aspx?key=48995>). The study began in 2009 and the report is expected by the end of 2010, at which time the results will be incorporated into case studies, fact sheets, and technical guidance.

To reduce water loss, OW is promoting technologies to identify and address water leakage from pipes and other conveyances. A decision tree and matrix are being developed to allow utilities to identify and implement effective water loss mitigation tools. A guidance document entitled Control & Mitigation of Drinking Water Losses in Distribution Systems is expected to be released in 2010.

OW is developing carbon sequestration regulations under the SDWA UIC Program (<http://www.epa.gov/ogwdw000/uic/index.html>). In August 2009, OW published a Notice of Data Availability (NODA) soliciting comments on new sequestration research and an alternative to the injection depth requirement of the 2008 Notice of Proposed Rulemaking (NPRM). OW is moving forward with the rule-making process in anticipation of finalizing the UIC geologic sequestration rule in early 2011. Additionally, OW is working with stakeholders to develop regulations for siting and managing carbon sequestration projects to prevent endangerment of underground sources of drinking water.

OW also continues to work with other interested agencies and the international community to develop guidance on sub-seabed carbon sequestration and ocean “fertilization”.

Goal 2: Water Program Adaptation to Climate Change

Climate change will have far-reaching implications for water resources and water programs, requiring EPA to evaluate and adapt its programs and develop new tools. Over the past two years, some of the NWP highlights have included:

- Water Quality and Technology-Based Standards
 - Examining the policy and technical implications of velocity or flow standards; and
 - Improving biological indicators for climate change.
- Watershed Approach
 - Integrating the Climate Assessment Tool (CAT) into the Surface Water Assessment Tool (SWAT) BASINS 4.0 system;
 - Implementing the Climate Ready Estuaries Program (CRE); and
 - Participating in the U.S. Coral Reef Task Force (CRTF).
- National Pollutant Discharge Elimination System (NPDES) Program
 - Evaluating the potential for NPDES program to consider climate change impacts.
- Water Infrastructure
 - Establishing a Climate Ready Water Utilities advisory working group;
 - Developing tools for water and wastewater utilities including a Climate Readiness and Awareness Assessment Tool;
 - Implementing the Green Infrastructure Initiative; and
 - Promoting the use of the Clean Water State Revolving Fund (CWSRF) and the Drinking Water State

- Revolving Fund (DWSRF) for green projects.
- Wetlands Protection
 - Developing the National Wetlands Mapping Standard; and
 - Developing a new Coastal Wetlands Initiative.

Water Quality and Technology-Based Standards

In anticipation of increased flow, velocity, and sediment loadings in some streams, rivers, and estuaries, OW has examined the policy and technical implications of velocity and flow standards, and provided technical and policy support to regions and states interested in developing flow criteria, including Region 1.

OW is working closely with EPA’s Office of Research and Development (ORD) to improve biological indicators for climate change. After holding a joint workshop, Climate Change Effects on Biological Indicators: Rivers, Streams and Lakes in February 2008, ORD initiated four pilot studies with bioassessment programs in Ohio, North Carolina, Utah, and Maine. For additional information on these efforts, visit: <http://cfpub.epa.gov/ncea/global/recordisplay.cfm?deid=190304>.

Watershed Approach

OW integrated CAT into the SWAT BASINS 4.0 system (<http://cfpub.epa.gov/ncea/global/recordisplay.cfm?deid=203460>). BASINS is a decision support system that integrates a geographical information system (GIS) with geophysical, meteorologic, hydrologic and water quality data, and watershed and water quality models in one package. The integration of CAT into the BASINS system extends the existing capabilities of BASINS to incorporate climate change and variability into modeling scenarios. OW is developing a training module to assist BASINS users in employing CAT to simulate impacts of modified climate with BASINS watershed models. Training materials are expected to be complete in April 2010.



Photo credit: Carole McCauley

OW and EPA Office of Air and Radiation's (OAR) Climate Change Division are jointly working with interested National Estuary Programs (NEPs) to develop and implement the CRE program (<http://www.epa.gov/cre/>). The program is designed for NEPs and other coastal managers to assess climate change vulnerabilities, develop and implement adaptation strategies, engage and educate stakeholders, and share lessons learned with other coastal managers. Since its inception in 2008, CRE has supported 11 partners by providing funding and direct technical assistance. In December 2009, EPA published the 2009 CRE Progress Report (<http://www.epa.gov/cre/downloads/2009-CRE-Progress-Report.pdf>).

OW continues to participate in the CRTF (<http://coralreef.gov/>). EPA is one of three federal agencies invited to participate on the NOAA Coral Reef Conservation Program's (CRCP) Land Based Sources of Pollution Working Group, which is tasked with recommending goals and objectives for the CRCP to better address this major threat to coral reef ecosystems.

National Pollutant Discharge Elimination System (NPDES) Program

OW's Water Permits Division evaluated the NPDES program to examine the flexibilities of the program to consider climate change when developing NPDES permits and to identify the areas in which new methods, improved data, or training will be needed. The report will be available in Spring 2010.

Water Infrastructure

The Climate Ready Water Utilities (CRWU) Working Group (<http://client-ross.com/crwuwg/>) was established under the National Drinking Water Advisory Council (NDWAC) (<http://www.epa.gov/safewater/ndwac/>) to help inform the development of an effective program for drinking water and wastewater utilities to integrate climate change adaptation and mitigation strategies into utility management.



Work on a climate change vulnerability assessment tool has been underway since May 2008. It is designed to help utility managers approach vulnerability and risk assessments and is expected to be available in 2010.

EPA supports municipal, state, and regional efforts within the stormwater NPDES permitting program to reduce overflows from storm sewers and combined sewers, and to garner a variety of additional co-benefits including reducing energy used for wastewater treatment. EPA provided support for the Center for Neighborhood Technology to enhance a web-based stormwater calculator tool for quickly comparing the performance, costs, and benefits of green infrastructure to conventional stormwater practices (<http://greenvalues.cnt.org/national/calculator.php>). EPA also provided support to the Water Environment Research Foundation (WERF) to develop the Green Infrastructure Cost Tool. This tool addresses the costs associated with vegetative roofs, rainwater catchment systems, and bioretention facilities by providing a framework for estimating capital costs, operation and maintenance costs, and life-cycle net present value (<http://www.werf.org/AM/Template.cfm?Section=Stormwater3&TEMPLATE=/CM/ContentDisplay.cfm&CONTENTID=10836>).

OW worked with partners to determine projects eligible for CWSRF and DWSRF financial assistance. Eligibility was analyzed from both the perspective of adapting to conditions caused by climate change and reducing the emission of greenhouse gases (GHG). The American Recovery and Reinvestment Act (ARRA) provided a 20 percent Green Project Reserve (<http://www.epa.gov/water/eparecovery/>) that directs funds to capital projects, such as water and energy efficiency projects, green stormwater infrastructure, and other innovative environmental projects. A range of potential utility and state responses to climate change may be supported through the funds themselves or through state set-asides.

Wetlands Protection

The wetlands mapping standard was finalized and subsequently approved by the Federal Geospatial Data Committee (FGDC) on July 7, 2009, available at: www.fws.gov/wetlands/_documents/gNSDI/DCWetlandsMappingStandard.pdf. EPA's Office of Wetlands, Oceans, and Watersheds (OWOW) chaired the FGDC workgroup which developed and finalized the National Wetlands Mapping Standard. The workgroup continues to work with partners, including federal agencies, states, local governments and non-governmental organizations (NGOs)



to complete an implementation strategy which will pursue ways to fund/encourage statewide wetland mapping efforts. Development of this implementation strategy is ongoing and will continue over the next two years.

The Coastal Wetlands Initiative was launched in response to the results of a recent government report about wetland loss trends in coastal watersheds. The devastation caused by Hurricanes Katrina and Rita in 2005, and Ike in 2008, called attention to the severe threats to coastal areas posed by climate change. The Initiative has the goals of:

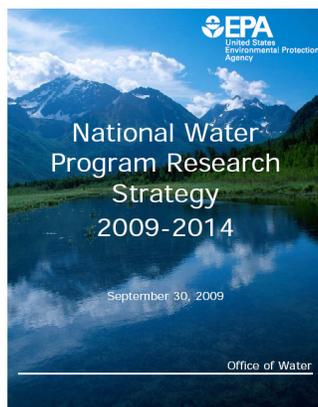
- Confirming wetland loss and gaining a better understanding of contributing stressors;
- Identifying and disseminating tools, strategies, policies and information to protect and restore coastal wetland resources; and
- Raising awareness of coastal wetlands to include their function and value, potential threats, and opportunities for protection and restoration.

The Coastal Wetlands Team will conduct regional reviews of selected coastal watersheds in order to understand climate change stressors, restoration strategies, and conservation strategies to reduce or reverse coastal wetland loss. By taking a holistic approach to understanding the threats to coastal wetlands, the Initiative will identify tools and strategies to help stem the loss of coastal wetland resources.

Goal 3: Climate Change Research Related to Water

The NWP has been working to improve the link between EPA water programs and climate change research. OW developed a comprehensive research needs compendium (<http://www.epa.gov/waterscience/strategy/>), which includes research needed to address the impacts of climate change, and has been working with ORD to integrate climate change concerns into water-related research plans, as well as to integrate water issues into climate change research plans. In addition, OW has been collaborating with ORD on a number of projects, including the First National Expert and Stakeholder Workshop

on Water Infrastructure Sustainability and Adaptation to Climate Change, held in January 2009 (<http://www.epa.gov/nrmrl/wswrd/wqm/wrap/pdf/workshop/600r09010.pdf>).



Goal 4: Water Program Education on Climate Change

Sharing of information is an important part of the NWP's climate change strategy. To date, highlights include:

- Establishing a State-Tribal Climate Change Council;
- Establishing a climate change and water website;
- Publishing a bi-weekly Climate Change and Water News e-newsletter; and
- Developing climate change related training materials.

As the NWP moves forward to develop a new Climate Strategy, OW has established a State-Tribal Climate Change Council to share information to inform future activities. Other avenues for sharing and disseminating information include the Office of Water Climate Change and Water website (<http://www.epa.gov/water/climatechange/>), and the Climate Change and Water News e-newsletter that distribute news to approximately 1,400 subscribers, available at: <http://www.epa.gov/water/climatechange/>. OW also developed a training module, The Effects of Climate Change on Water Resources and Programs (http://www.epa.gov/watertrain/climate_water/), for the Watershed Academy Program. OW is currently working to upgrade its climate change website.

Goal 5: Water Program Management of Climate Change

To ensure that climate change efforts are sustained as part of the NWP, the Office of Water has been:

- Continuing to convene the NWP Climate Change Workgroup; and
- Participating in federal interagency coordination.

The NWP Climate Change Workgroup is chaired by the Deputy Assistant Administrator of the Office of Water and managers and senior staff from throughout OW, the ten EPA Regions and several of the Large Aquatic Ecosystem program offices. The Workgroup ensures communication, coordination and ongoing program development to integrate climate change into EPA's water programs. In addition to monitoring implementation of the 2008 Strategy, the Workgroup is working to update Key Actions for 2010 and 2011, as well as to revise the NWP's long term Strategy for release in 2012.

OW has also been working with other federal agencies to ensure government-wide coordination, and develop tools and methods to address climate change. For example, OW is co-chairing the Council on Environmental Quality (CEQ) Climate Change Task Force workgroup on water, working with the inter-agency Climate Change and Water Working Group (CCAWWG), and coordinating with the Western Federal Agency Support Team (WestFAST). OW continues to seek opportunities to collaborate across the federal government.