



CLIMATE CHANGE & WATER • FACT SHEET

EPA Regional and Large Aquatic Ecosystem Programs Highlights of Progress 2007-2009 Implementing the NWP Strategy: Response to Climate Change

EPA Region 1

Region 1 is supporting the EPA National Water Program Climate Change Strategy through programs that address both climate change mitigation and adaptation needs and resources. Region 1 is internally addressing climate change through establishing a Climate Change Network, holding “Climate 101” seminars, and hosting a regional conference on climate change impacts. Region 1 has also conducted extensive education and outreach, holding a series of workshops, conferences, and meetings.



Photo: Casco Bay Estuary Partnership

Four Climate Ready Estuary (CRE) pilot projects are underway with the Casco Bay Estuary Partnership, the Massachusetts Bays Program, the Piscataqua Region Estuaries Partnership, and the Long Island Sound Study, a Region 1 & 2 National Estuary Program (NEP). In addition,

the New England Environmental Finance Center is piloting the COAST sea level rise action evaluation tool. Region 1 is also working with the Gulf of Maine Council’s Climate Change Network and Ecosystem Indicators Partnership to develop climate change indicators based on sea level rise, air temperature, and precipitation data.

The Region released “A Guide to Residential Green Building” in New England in March 2008 and has a popular Green Building website: <http://www.epa.gov/region1/topics/envpractice/gbuildings.html>. The new Region 1 office and regional laboratory also incorporate green building design.

For additional information regarding Region 1’s water and climate programs, visit: <http://www.epa.gov/region1/climatechange/index.html>, or contact Mel Cote, e-mail: cote.mel@epa.gov; phone: (617) 918-1553.

EPA Region 2

Region 2 is focusing their climate change and water programs on the protection of coral reefs in the Caribbean

through promoting the Coral Reef Team and providing grants for outreach and education that support the 2008 International Year of the Reef. Region 2 and EPA’s Office of Research and Development (ORD) have played an important role in efforts to characterize impacts to coral degradation from both local and global stressors, including land-based sources of pollution and climate change.

Three CRE projects are underway: the Barnegat Bay Estuary Program; the Long Island Sound Study, a Region 1 & 2 NEP; and the Partnership for the Delaware Estuary (PDE), a Region 2 & 3 NEP. PDE created a team to estimate the value of losses/changes in natural capital from climate change effects and to demonstrate how ecosystem services valuation can be utilized to facilitate adaptation planning.

A Green Team was established to coordinate green initiatives, including green buildings, and to implement the WaterSense Program. Region 2 also established a Climate Change/Energy Workgroup to coordinate and track energy and climate change activities.

Additional information on Region 2’s climate change activities can be found at: <http://www.epa.gov/region2/climate/> or contact Patricia Pechko, e-mail: pechko.patricia@epa.gov; phone: (212) 637-3796.

EPA Region 3

Region 3 is focusing their water and climate change programs on outreach to wastewater and water treatment plants by conducting multiple workshops on energy and water use for water/wastewater infrastructure. In cooperation with the U.S Department of Energy, Region 3’s Underground Injection Control (UIC) Program is working with energy companies on permit requirements for the construction and operation of coal bed sequestration sites.

The PDE was chosen as one of six NEP pilot projects, receiving targeted support from the CRE Program, lead by the EPA Office of Water (OW) and the Office of Air and Radiation (OAR). Region 3 is collaborating with Region 2, the PDE, OAR, and contractors to incorporate ecosystem services impacts and implement a methodology for identifying and valuing the ecological impacts of sea level rise on the New Jersey portion of the Delaware Estuary.

The Region has begun to integrate its programs through a monthly Energy Team meeting. Region 3 is also collaborating with Regions 2, 9 and EPA ORD to develop a Climate Change Adaptation Workshop, planned for June 2010.

For additional information regarding Region 3's water and climate programs, visit: <http://www.epa.gov/region03/index.htm> or contact Joe Piotrowski, e-mail: piotrowski.joe@epa.gov; phone: (215) 814-5715.

EPA Region 4

Region 4 is focusing climate change and water work in three key areas: preparing the southeast for adaptation, supporting energy efficiency at southeastern utilities, and demonstrating the potential for geologic sequestration of carbon dioxide.

Key regional activities include:

- The Region hosted a training workshop for over 100 local officials that presented the energy-water relationships for water/wastewater infrastructure and discussed grant eligibility of energy management project elements and actions;
- The Region issued two UIC Class V permits for CO₂ test wells in Kentucky to the Kentucky Geologic Survey and Duke Energy.
- Five CRE projects are underway in the Region. The Charlotte Harbor National Estuary Program prepared the first CRE regional product, a Climate Change Adaptation Plan for the City of Punta Gorda, Florida.
- The Region also delivered 17 Sustainable Infrastructure/Energy Management presentations and provided outreach material at workshops and conferences in six states; and
- The Region partnered with OAR and OW to organize a Southeast Regional Adaptation Workshop (http://epa.gov/region4/clean_energy/conferences.html), convening local, state and federal stakeholders to explore regional collaboration to address climate change.

Additional information can be found at: http://www.epa.gov/region4/clean_energy/climatechange.html. Region 4's contact for energy and climate change is Ken Mitchell; e-mail: mitchell.ken@epa.gov; phone: (404) 562-9065.

EPA Region 5

Region 5 is addressing climate change through a variety of outreach and educational efforts, as well as through pilot projects that assist public utilities in their efforts to improve water efficiency and reduce the amount of energy used to transport and treat drinking water and wastewater.

The Region's Water Division has focused on several mitigation related activities including energy management at water and wastewater facilities, water conservation through

the promotion of WaterSense, Green Infrastructure initiatives, and involvement in developing geologic sequestration regulations. In addition, the Region focused on several activities related to adaptation including evaluating opportunities to address climate change impacts at municipalities, sustainable water infrastructure, and emergency response planning.

Region 5 will continue outreach and technical assistance efforts with state and local partners in 2010, as well as work to incorporate climate change activities into daily program work. For additional information, visit: <http://www.epa.gov/r5water/> or contact: Kate Balasa, e-mail: balasa.kate@epa.gov; phone: (312) 886-6027.

EPA Region 6

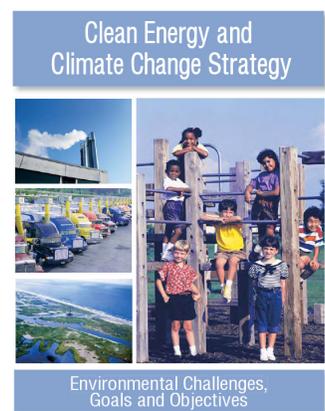
Recently, Region 6 completed the development of a multi-media Clean Energy and Climate Change Strategy, available at: <http://www.epa.gov/region6/climatechange/strategy.htm>. The cross-program strategy prioritizes activities to conserve energy and resources, reduce greenhouse gases, adapt to climate change impacts, and promote clean/renewable energy sources.

Region 6 hosted the first Climate Change Summit (<http://www.epa.gov/region6/climatechange/summit.htm>) with state partners for senior managers from state environmental, agricultural, energy, conservation, and water resource development to discuss clean energy and climate change.

An inventory of climate change adaptation and mitigation projects in Texas and Louisiana is also under development and review by members of the Region 6 Climate Change Workgroup. The pilot-scale initiative will enhance Region 6 and its partners' ability to identify the types of climate change projects to target.

Region 6 has also focused on improving energy efficiency at water and waste water utilities, developing geological CO₂ sequestration regulations, and developing responses to sea level rise and coastal land loss.

For additional information regarding Region 6's water and climate programs, visit: <http://www.epa.gov/region6/climatechange/water.htm> or contact Jim Brown, e-mail: brown.jamesr@epa.gov; phone: (214) 665-3175.



EPA Region 7

Region 7's 2009 water and climate change work emphasized both mitigation and adaptation. Mitigation activities included improving energy management and water conservation by promoting the WaterSense program, promoting green infrastructure, and supporting carbon sequestration research and development. Adaptation activities focused on source water protection, sustainable water infrastructure, and wetlands protection.

Some highlights of activities that will continue into 2010 include:

- Region 7 is working with 12 communities as a pilot project to evaluate and improve energy management in order to reduce costs, improve treatment, and reduce environmental impacts;
- Along with EPA ORD, Region 7 is participating on the project team for Kansas City, Missouri's Green Solutions Project to determine the effects of implementing various elements of green infrastructure in a 100-acre urban study area; and
- Region 7, Iowa Department of Agriculture and Land Stewardship, and other state and federal organizations are partnering to develop a pilot program for an integrated drainage and wetland landscape system.

For additional information regarding Region 7's water programs, visit: <http://www.epa.gov/region7/water/index.htm> or contact Karen Flournoy, e-mail: flournoy.karen@epa.gov; phone: (913) 551-7782.

EPA Region 8

Region 8 has been very active over the past year in facilitating mitigation activities throughout the Region.

Key regional activities include:

- Region 8 is leading-by-example with their state-of-the-art green building, which has received LEED (Leadership in Energy and Environmental Design) Gold certification by the U.S. Green Building Council (USGBC) for new construction, and is being used as a laboratory for green building design and operating techniques;
- The Region is achieving results through EPA's voluntary partnership programs and initiatives, including ENERGY STAR®, WasteWise, the Coal Combustion Products Partnership, SmartWay, and the Federal Electronics Challenge;
- Region 8 is also achieving results through other means, such as revitalization of contaminated lands, enforcement actions, climate change education, and other ongoing program activities; and
- Region 8 is conducting multiple trainings for municipalities to implement conservation measures at water treatment facilities.

Adaptation activities will be the focus of efforts in the coming year. Region 8 is developing a decision tree for addressing climate change considerations for National Environmental Policy Act (NEPA) reviews focusing on water-related projects. Region 8 is also evaluating methods for using environmental indicators to inform adaptation decision-making.

For additional information about Region 8's climate change programs, visit: <http://www.epa.gov/region8/climatechange/> or contact Carol Russell, e-mail: russell.carol@epa.gov; phone: (303) 312-6310.

EPA Region 9



The Irvine Ranch Water District provides recycled water for toilet flushing in high rise buildings in Irvine, California. For new buildings over seven stories, the additional cost of providing a dual system added only 9% to the cost of plumbing.

Region 9's primary focus is on promoting sustainable infrastructure, especially through water and energy efficiency at water and wastewater facilities. This is accomplished through developing tools and conducting workshops and benchmarking classes. Over 200 facilities have attended workshops and 35 are using ENERGY STAR Portfolio Manager.

The Region has the only EPA website dedicated to water recycling focusing on recycled water from centralized wastewater treatment facilities. The website (www.epa.gov/region9/water/recycling/) will be expanded to cover grey water reuse from residential homes.

Region 9 also developed "EPA Recommended Green Practices for Federally Funded Projects" in the areas of diesel emission reduction strategies, smart energy practices, green remediation, green building and construction practices, water management, and environmentally preferable purchasing. This list of environmental best practices was distributed to states and is intended to be used in regional grant awards in the future. It is available at: <http://www.epa.gov/recovery/recommendations.html>.

Other activities underway include: promoting renewable energy production at wastewater treatment facilities; supporting the CRE program for San Francisco Bay; promoting green infrastructure practices through Municipal Separate Storm Sewer System (MS4) permits and American Recovery and Reinvestment Act (ARRA) funding; supporting the Region's climate change speaker series; and participating on California's Water/Energy Team to implement the state's climate change legislation.

For additional information regarding Region 9's climate change programs, visit: <http://www.epa.gov/region09/climatechange/> or contact Cheryl McGovern, e-mail: mcgovern.cheryl@epa.gov; phone: (415) 972-3415.

EPA Region 10

Region 10 is supporting the Climate Change Strategy by focusing on improvements in energy efficiency at water and wastewater utilities, implementing the WaterSense program, and promoting energy savings through green buildings.

Key activities include:

- Region 10 is promoting the WaterSense program internally and at public events. In FY 2009, the Region's WaterSense program recruited 11 new irrigation partners and 21 new promotional partners;
- Region 10 is collaborating with ORD's Regional Applied Research Effort in research on the relationship of leachate, groundwater, and thawing permafrost in up to five Tribal communities in rural Alaska;
- The Region is partnering with the U.S. Geologic Survey (USGS) and the U.S. Fish and Wildlife Service (USFWS) to lead the creation of a climate change-oriented association of federal agencies working in the Pacific Northwest. The Climate Change Collaboration meets regularly to share information regarding climate change work and research;
- Region 10 has also been working with partners to understand potential carbon offset measures and market mechanisms for biological sequestration through forest practices;
- The 40-year old Region 10 Headquarters building is in the process of upgrading to LEED Platinum, with the installation of a green roof and an onsite rainwater collection and reuse system; and
- Region 10 focused 2008 Puget Sound appropriations on watershed protection and land use impacts on water quality. These grants encourage local governments with land use authority to develop appropriate information and tools so they can make better decisions.

To learn more about Region 10's water and climate programs, visit: <http://yosemite.epa.gov/r10/water.nsf/homepage/water> or contact Paula VanHaagen, e-mail: vanhaagen.paula@epa.gov; phone: (206) 553-6977.

Large Aquatic Ecosystem (LAE) Programs

Chesapeake Bay

The Chesapeake Bay Protection and Restoration Executive Order signed in May 2009 established a Federal Leadership Committee that will oversee the development and coordination of reporting, data management, and other activities by agencies involved in Bay restoration. Part of the work includes a concerted effort to coordinate climate change science and adaptation throughout the watershed. The National Oceanic and Atmospheric Administration (NOAA) and USGS will work closely with EPA and other federal and state partners to coordinate existing climate programs to provide the science and assistance to adapt to potential impacts of climate change on the Bay and its watershed. The coordinated effort will allow for collaboration among all levels of government, universities, and nonprofit and private organizations, and would be undertaken with consideration of an emerging national network of regional climate services.

Each federal agency with restoration and protection responsibilities in the Bay region will consider climate change as they implement responsibilities to protect communities, critical habitats, and species. The combination of federal and state efforts is important for developing and communicating information vital to address the impacts of climate on water quality and increase resiliency of communities and valuable habitats to the impacts of a changing climate. These efforts will result in the development of the predictive tools for addressing adaptation action in the near-term and provide projections needed for planning management for the long-term.

The draft strategy is available at: <http://executiveorder.chesapeakebay.net/category/Reports-Documents.aspx>.

Columbia River Basin

The Columbia River Basin LAE is focused on toxics reduction for human health and ecosystem protection and restoration. Toxics reduction efforts through tributary restoration may indirectly help mitigate future climate change impacts. The Columbia River Federal Caucus, of which EPA serves as a member, is currently exploring identifying climate change as a focus issue for FY 2010 Columbia River federal agency integration and coordination efforts.



View from Dog Mountain Trail in Skamania County, WA.

For additional information, visit: <http://yosemite.epa.gov/r10/ecocomm.nsf/Columbia/Columbia>.

Great Lakes Program

The Great Lakes Program's primary focus has been on a multi-agency effort to coordinate federal work under the Great Lakes Restoration Initiative (GLRI) on impacts and adaptation information. The Understanding Climate Change Impacts (UCCI) to the Great Lakes initiative will focus on projects that have identified that 1) there is a clear need articulated by the Great Lakes community; 2) there is a gap in knowledge, decision support tools, or work being undertaken by partners; and 3) there is a federal comparative advantage in performing the work instead of other partners. These projects focus on baseline monitoring, data, and research; downscaling models; education, outreach and communication; building capacity of end-users in the Great Lakes community; and engaging partners in steering this program.

For additional information on GLRI, please visit: <http://www.epa.gov/glnpo/glri/>.

Gulf of Mexico Program

Building on successes of the first Action Plan (2006-2009), the Gulf of Mexico Alliance and their partners developed the Governors' Action Plan II, a farther reaching five-year regional plan developed to address four major challenges to healthy and resilient communities in the Gulf of Mexico region: sustaining the Gulf economy; improving ecosystem health; mitigating the impacts of and adapting to climate changes; and mitigating harmful effects to coastal water quality. Being aware of the relative vulnerability of these coastal areas to climate change related effects will help communities consider the longer-term costs associated with protecting natural resources, including the costs of elevating or relocating their infrastructure and people. Strategic mitigation and planning can increase a community's resilience to climate change impacts. The specific actions provided in the Governors' Action Plan II present a framework for ascertaining the ecological changes and enhancing both the natural and built resources, thus creating more sustainable coastal communities. For additional information on the specific actions planned by the Gulf of Mexico Alliance's Coastal Community Resilience Team, visit: <http://gulfofmexicoalliance.org/issues/resilience.html>.

The Gulf of Mexico Program is a key federal partner supporting the Gulf of Mexico Alliance that works directly with the regional Sea-Grant Programs on their regional research initiatives. These initiatives focus on climate change impacts and review of federal and state coastal laws. Additional information on the Gulf of Mexico program can be found at: <http://www.epa.gov/gmpo/>.

Lake Champlain

The Lake Champlain LAE works closely with the Lake Champlain Basin Program (LCBP), a partnership of government agencies from New York, Vermont, and Quebec, private organizations, local communities, and individuals, working together to coordinate and fund efforts which benefit the Lake Champlain Basin's water quality, fisheries, wetlands, wildlife, recreation, and cultural resources. LCBP developed a Request for Proposals (RFP) for addressing climate change adaptation in the Lake Champlain basin, specifically regarding changes in precipitation patterns and implications for the management of the lake.



Spring flooding in the Lake Champlain watershed

Additional information regarding LCBP can be found at: <http://www.lcbp.org>. For more information on EPA's Lake Champlain LAE program, contact: Erik Beck, e-mail: beck.erik@epa.gov; phone: (617) 918-1606.

Long Island Sound Study (LISS)

The LISS received a Partner Startup Grant and a Direct Technical Assistance Grant through EPA's CRE program. The Partner Startup Grant was used to develop a coastal climate adaptation plan to define the roles of the various levels of government in climate adaptation. Key partners including the International Council for Local Environmental Initiatives (ICLEI) and the Town of Groton, CT worked with LISS to lead workshops and establish four work groups on infrastructure, natural resources and ecological habitats, agriculture, and health. The Direct Technical Assistance Grant will be used for a project titled "Climate Change Vulnerability Assessment for Long Island Sound via Sentinel Monitoring." The objective of this project is to develop a strategy to quantify, via sentinel monitoring, the impacts of climate change on Long Island Sound, as well as to assess the Sound's vulnerability to those impacts. Identified

indicators will be used to direct priorities for adaptation planning by the states of Connecticut and New York, local municipalities, and other partner organizations.

For additional information, please visit: <http://www.longislandsoundstudy.net/index.htm>.

Pacific Islands



Manu'a Islands, American Samoa

The Pacific Islands Office in Region 9 has been working to address climate change and water issues by focusing on three main areas in the Pacific Islands: water quality protection and improvement; outreach, education and collaboration on climate change issues; and sustainable military buildup on Guam.

Projects include:

- Promoting water conservation and efficiency at public utilities through innovative State Revolving Fund (SRF) projects;
- Co-sponsoring the June 2009 Pacific Islands Environment Conference on Climate Change: Energizing a Sustainable Future for Pacific Islands. The conference, which took place on Saipan, Northern Mariana Islands, hosted sessions on various climate change and water issues including coral reef protection, adaptation strategies for Pacific Islands, and efficiency for water and wastewater services; and
- Working with the Department of Defense (DoD) and other federal resource agencies to ensure efficient, renewable and sustainable practices are included in the military buildup on Guam. This includes improving drinking water and wastewater compliance with environmental standards, utilizing low impact development and green infrastructure for new construction, and minimizing marine habitat disturbance.

For additional information on EPA's work in the Pacific Islands, please visit: <http://www.epa.gov/region09/islands/>.

Puget Sound - Georgia Basin

The Puget Sound Partnership's Action Agenda calls for actions to adapt to and mitigate climate change. The Action Agenda recognizes that climate change will exacerbate the existing threats to Puget Sound. It expects climate change impacts to be considered when evaluating potential actions. In addition, many of the strategies and actions to protect and restore Puget Sound will also serve as mitigation and adaptation measures.

Region 10 included climate change as a factor in its November 2009 RFP for Puget Sound "Watershed Management Assistance" grants, which will provide approximately \$10 million in funding. It cites the following: "In all proposed projects, EPA encourages applicants to factor in the impacts of climate change. EPA recognizes that addressing climate change is broad and multifaceted. In the context of this RFP, climate change information would be an additional overlay in evaluating proposed activities and result in actions that mitigate climate change impacts. The actions would lead to more robust protection and restoration, and more resilient watersheds and underlying hydrologic functions."

For additional information, please visit: <http://www.epa.gov/region10/psgb/>.

San Francisco

Within the San Francisco Bay LAE, the San Francisco Estuary Partnership, the Bay Conservation and Development Commission and EPA ORD's Global Change Research Program are working on a pilot project under the CRE Program to identify key vulnerabilities of the San Francisco Estuary to climate change. The assessment will take advantage of significant work that is already underway in the region, particularly on sea level rise, to support further analysis of climate drivers and ecosystem effects.

For additional information, please visit: <http://www.sfestuary.org/projects/detail2.php?projectID=4>.

South Florida

To address the issues surrounding the South Florida ecosystem EPA is working in partnership with several local, regional, state and federal agencies. The goal is to assure the long-term sustainability of the region's varied natural resources while providing for the coexistence of extensive agricultural operations and a continually expanding human population. The EPA South Florida Geographic Initiative targets efforts to protect and restore various communities and ecosystems impacted by environmental problems. Under this initiative, Region 4 works with stakeholders to develop and implement community-based approaches to mitigate diffuse sources of pollution and cumulative risk.

For additional information, please visit: <http://www.epa.gov/region4/water/southflorida/>.

For more information about climate change and EPA's Large Aquatic Ecosystem Programs, please contact Abby Nickels, e-mail: nickels.abby@epa.gov; phone: (202) 566-6977.

Location of EPA Regions and Large Aquatic Ecosystem Programs

