

## CLIMATE CHANGE Achievements

Adapting California to changes happening now and in the future



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## *Adapting California to changes happening now and in the future*

Climate change is already affecting California's water resources. Warmer temperatures, different patterns of precipitation and runoff, and rising sea levels increasingly affect the ability to manage water supplies and other natural resources. Adapting California's water management systems in response to climate change presents one of the most significant challenges for the 21st century.

In the course of the past five years, the Department of Water Resources has achieved a leadership role in both the mitigation of greenhouse gas (GHG) emissions and in positioning California to adapt to changes happening now and in the future. In the *California Water Plan Update 2005*, DWR substantively assessed the threats of climate change, at the time a landmark for a major State planning process. The very next year the Department issued *Progress in Incorporating Climate Change into Management of California's Water Resources*, an extensive technical report that described in detail the potential impacts of climate change to the operations of the State and federal water projects, the Delta, and flood management. During the summer of 2007, the Department featured climate change at its widely-attended annual State Fair exhibit, focusing the public's attention on this important issue at the grassroots level.



*Sacramento-San Joaquin Delta*



Since 2007, DWR has measured, verified, and publicly reported its annual “carbon footprint” to the California Climate Action Registry (CCAR). DWR has been named a “Climate Action Leader” each year for reporting verified GHG emissions. In 2010, DWR will begin using The Climate Registry to report its annual GHG emissions.

DWR is aggressively targeting GHG emissions from power purchases to run the State Water Project, and is replacing coal-fired electricity with cleaner natural gas and renewable electricity sources. In addition, DWR has developed a progressive Renewable Energy Procurement Plan to increase the use of renewable electricity, generally. In 2009, the Department entered into a voluntary agreement with the U.S. Environmental Protection Agency (EPA) to reduce sulfur hexafluoride (SF6) emissions. SF6, used in electric power systems, is identified by the Intergovernmental Panel on Climate Change as an extremely potent greenhouse gas. By 2050, DWR plans to reduce its GHG emissions by 80 percent below its 1990 level of emissions.

In October 2008, DWR released *Managing an Uncertain Future*, the first-of-its-kind climate change adaptation white paper that proposed 10 strategies in four categories to adapt to a changing climate. A product of diverse technical and stakeholder input, the white paper was reviewed by the California Water Plan’s Climate Change Technical Advisory Group, composed of many of the nation’s leading climate change experts. In *California Water Plan Update 2009*, the Department further advanced water resource planning by including anticipated climate change impacts to agricultural and outdoor urban water demand for the first time.



# 1

## Regional Strategies

**California lies within multiple climate zones**, and thus each region of the state will experience unique impacts from climate change. Moreover, economic and environmental effects from climate change are dependent upon location, so adaptation strategies must be regionally appropriate. In response, Integrated Regional Water Management (IRWM) provides a critical framework for actions to address the uncertainties presented by climate change, as well as other risks to California’s water future. For every IRWM plan, water use efficiency must be a foundational action and a key part of every water agency’s portfolio. In many instances, water conservation reduces not only water demand but energy demand as well, which in turn can lead to reductions in GHG emissions.



*Tertiary treatment at Desert Water Agency*



## Integrated Regional Water Management

DWR has incorporated climate change into the most recent guidelines and proposal solicitation packages (PSPs) for the IRWM grant program. The guidelines address both adaptation to the effects of climate change and consideration of GHG emissions when selecting project alternatives. Adaptation to climate change and reduction of GHG emissions are also IRWM program preferences, which means that proposals meeting these preferences will earn additional credit in the application scoring process. The Department has also developed an on-line IRWM/Climate Change Clearinghouse of guidance documents to help IRWM applicants meet these new grant requirements. The IRWM Guidelines, PSPs, and Clearinghouse are available on the DWR website at:

[http://www.water.ca.gov/irwm/integregio\\_new10.cfm](http://www.water.ca.gov/irwm/integregio_new10.cfm)

In addition to the IRWM/Climate Change Clearinghouse, DWR has also initiated a project with U.S. EPA Region 9, the U.S. Army Corps of Engineers, and the Resources Legacy Fund to develop an IRWM Climate Change Handbook. The Handbook is scheduled to be complete in mid-2011. It will provide detailed information for IRWM practitioners on completing climate change vulnerability assessments, measuring impacts, evaluating strategies for meeting the challenge of climate change, and planning and implementing under increased future uncertainty.



Other activities:

- Water use efficiency legislation
- “Save Our Water” campaign
- Water-Energy Subgroup of the Governor’s Climate Action Team (“WETCAT”)

*Save Our Water campaign at the California State Fair*



## 2 Statewide Strategies

**California has an unparalleled water infrastructure system** that stores and conveys water, manages flood flows, and interconnects many of the state's regions. However, current water resource infrastructure is already strained to meet existing, competing objectives, for water supply, flood management, ecosystem health, water quality, hydropower, and recreation. In particular, many Californians already face an unacceptable risk of flooding, even without further impacts from climate change. The current system of reservoirs, canals, floodplains, and levees must be modified and managed differently to adapt to climate change.

In a changing climate, the conflicts between competing interests will be even greater as supplies become less reliable. Because prediction of climate change impacts will never be perfect, flexibility must be a fundamental tactic, especially with respect to water system operations. As droughts and floods may be exacerbated by climate change, better management of surface storage reservoirs and groundwater can provide such flexibility. Flood systems throughout the state must also be enhanced—and, in some cases, enlarged—to accommodate the higher variability of flood flow magnitude and frequency. Adapting to climate change will also entail resolution of long-standing issues related to water management, ecosystems, water quality, and public safety in the Sacramento-San Joaquin Delta. Most of all, reliable water supplies and resilient flood protection will require a new emphasis on environmental stewardship.



*Jones Tract levee break, June 2004*



## Central Valley Flood Protection Plan

DWR is preparing a Central Valley Flood Protection Plan (CVFPP) that will explicitly consider climate change impacts to flood management, due by 2012. Even at an early stage of developing the CVFPP, the Department has already convened a special workgroup composed of some of the top climate scientists and planners in the country, to provide input about the scope of climate change considerations to be addressed in the CVFPP. The charge of the workgroup was to: 1) identify key aspects of climate change that may affect flood management; 2) ascertain existing problems and expected future challenges related to climate change; 3) develop a checklist of climate change considerations; 4) inventory related climate change projects and programs; and 5) compile a list of climate change references. The workgroup completed its task in December 2009 and its report is available on the DWR website at: [http://www.water.ca.gov/cvfmp/docs/DRAFT\\_SPFC\\_Descriptive\\_Doc\\_20100115.pdf](http://www.water.ca.gov/cvfmp/docs/DRAFT_SPFC_Descriptive_Doc_20100115.pdf)

### Other activities:

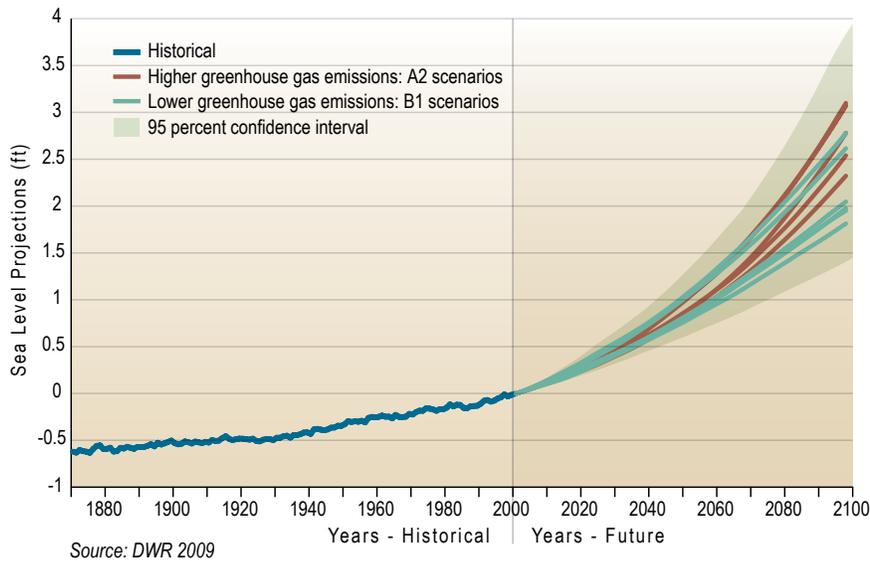
- Integration of Climate Change and Flood Management into *California Water Plan Update 2009*
- Upper meadow restoration project (with the US Forest Service)
- Groundwater monitoring legislation
- Delta legislation



*Meadow Restoration Project*

# 3 Improving Management and Decision-Making Capacity

**Determining the impacts of climate change** on the varying regions of the state requires that data about our environment be collected and analyzed in a consistent and comprehensive way. Improved data collection and a robust monitoring network will help identify trends, provide for better real-time system management, and evaluate and, if necessary, correct adaptation strategies. In addition, sea level rise presents a particular dilemma for water planners because of the great uncertainty around ice sheet dynamics, as well as the potentially large impacts. Developing more focused research on sea level rise and other topics can help narrow the range of uncertainty in climate changes.



*Sea Level Rise projection*

## NRC Sea Level Rise Study

In response to Executive Order S-13-08, the Department has led the implementation of the Governor's directive to convene a panel of the National Research Council (NRC) to evaluate sea level rise issues and their impacts to California's coast. Along with its State agency partners (the Ocean Protection Council, State Water Resources Control Board, California Energy Commission, and CalTrans), DWR has asked the NRC to address planning for future sea level rise, including estimation of a range of likely amounts of sea level rise in 2030, 2050, and 2100. Subsequent to the issuance of the Executive Order, three federal agencies—the US Army Corps of Engineers, the National Oceanic and Atmospheric Administration, and the US Geological Survey—have joined the study, as have the states of Oregon and Washington, making the study both an interstate and federal partnership on climate change. The study is expected to conclude by June 2012.

Other activities:

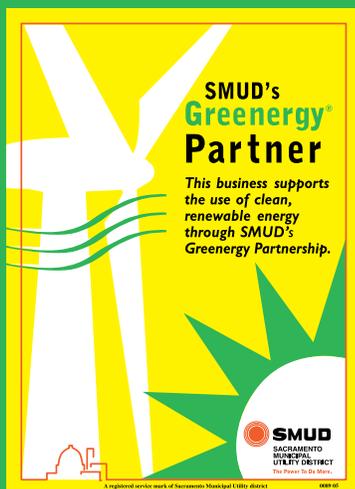
- Water use measurement legislation
- Public Interest Energy Research (PIER) Program Vulnerability Study
- Paleohydrology studies of the San Joaquin, Sacramento, and Klamath River basins
- 2009 Climate Action Team Report

## DWR Sustainability Policy

On Earth Day in 2009, DWR adopted its first Sustainability Policy, which forms the foundation of the Department's many "greening" activities. The policy articulates the goals and directions the Department will take to be a sustainability leader within State government and the California water community. The changes implemented through this policy will not only make DWR a better steward of the environment, but also should yield cost savings to the State taxpayers through reduced operating costs, and provide healthier work environments for staff and visitors. DWR's Sustainability Policy is available at:

[http://www.water.ca.gov/climatechange/docs/Sustainability\\_Policy.pdf](http://www.water.ca.gov/climatechange/docs/Sustainability_Policy.pdf)

## DWR-SMUD Partnership



**On Earth Day in 2010**, DWR and Sacramento Municipal Utility District (SMUD) jointly announced a new partnership in which SMUD will provide 33% renewable energy and 33% carbon offsets for DWR's retail electrical and natural gas use, respectively, based on its 2008 retail consumption data. Specifically, DWR will participate in SMUD's Commercial "Greenergy" Program whereby SMUD matches 33% of DWR's estimated retail electricity needs with Greenergy purchases from renewable resources such as landfill gas, wind, solar, and small hydroelectric plants. In addition, SMUD will match an *additional* 40 percent to the amount DWR pays under the agreement to build new,

cleaner energy resources, reducing the need to build future polluting power plants. Through SMUD's Carbon Offset program, DWR will also reduce the effects of its GHG emissions related to its natural gas use. SMUD uses revenues from participating customers to build carbon reduction projects locally, promoting "green" jobs in Sacramento. DWR is the first State agency to participate in SMUD's Carbon Offsets program.

# 4 Investment Strategies

**As we stated in October 2008**, “climate change presents an ongoing risk that requires a long-term commitment of funding that is properly matched to anticipated expenditures, beneficiaries, and responsible parties.” Although bonds provide enormous financial benefits, this type of unpredictable funding provides a poor foundation for supporting long-term water planning and management in light of a changing climate. And while bonds can fund structural improvements for water systems, they generally cannot support other important activities such as regional water planning, inspection and maintenance of flood management facilities, observational networks, and water-related climate change adaptation research. These ongoing efforts require more than short-term support; they require continuous, stable revenue. Climate change is by definition a long-term challenge, and therefore needs to be assessed and funded accordingly.

## Climate Change and CEQA (California Environmental Quality Act)



All climate change analyses in DWR environmental documents are now reviewed by DWR’s CEQA Climate Change Committee, which was formalized in June 2009. Through these reviews the committee has developed environmental analysis methodologies and reference materials for use by Department staff and consultants. These guidance documents provide a consistent approach to conducting project specific environmental analyses for CEQA compliance documents, biological assessments, permit applications, and other environmental needs. Because of the evolutionary nature of climate change analysis, these documents will be updated periodically to include the most current legal rulings and state-of-the-science on the subject.

During 2010, the CEQA Climate Change Committee began developing a programmatic approach—in the form of a Climate Action Plan and GHG Emissions Reduction Plan—to address climate change across all DWR programs and projects, to comply with the new CEQA Guideline Amendments recently adopted by the Natural Resources Agency. The Climate Action Plan will also help document Departmental compliance with AB32; set greenhouse gas reduction targets and reduction strategies; streamline environmental review; and demonstrate DWR’s commitment to environmental stewardship, sustainability, and climate change mitigation and adaptation.

## “A Climate of Change”

On Earth Day in 2009, DWR also released “A Climate of Change,” a mini-documentary that brings to life numerous climate change reports and makes them relevant for Californians. The video drives home the point that climate change isn’t something that’s going to hit in the future; it’s already here and changing the weather patterns and water supply in California through a dwindling snowpack, bigger flood flows, rising sea levels, and longer and harsher droughts. Produced in partnership with the Water Education Foundation, “A Climate of Change” also previews adaptation strategies the Department of Water Resources proposes to address this problem. The documentary can be viewed at: [http://www.water.ca.gov/climatechange/docs/Climate\\_of\\_Change.wmv](http://www.water.ca.gov/climatechange/docs/Climate_of_Change.wmv)



*Southern Coast*

## Conclusion

Since the October 2008 release of *Managing an Uncertain Future*, DWR has continued its leadership role on climate change. This climate change adaptation white paper served as a model for the multi-sector California Climate Adaptation Strategy released by the Governor in December 2009, and served as the core of the recently released *California Water Plan Update 2009*. In all, nearly every part of the Department is involved in some way in climate change, and DWR is truly moving towards a comprehensive incorporation of variable climatic and ecosystems conditions into the way we manage water and ourselves.

