

WaterSMART



With dwindling water supplies, lengthening droughts, and rising demand for water in many areas of the country, a sustainable water strategy for America's water resources is one of my highest priorities. We must ensure stable, secure water supplies for future generations.

*Ken Salazar, Secretary of the Interior
February 1, 2010*

WATERSMART SUSTAIN AND MANAGE AMERICA'S RESOURCES FOR TOMORROW

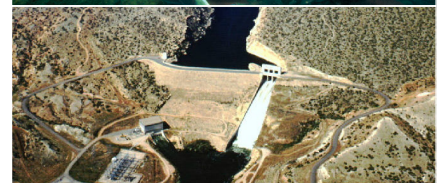
The Nation faces an increasing set of water resource challenges. Aging infrastructure, rapid population growth, depletion of groundwater resources, impaired water quality associated with particular land uses and land covers, water needed for human and environmental uses, and climate variability and change all play a role in determining the amount of fresh water available at any given place

and time. Water shortage and water-use conflicts have become more commonplace in many areas of the United States, even in normal water years. As competition for water resources grows – for irrigation of crops, growing cities and communities, energy production, and the environment – the need for information and tools to aid water resource managers also grows. Water issues and challenges are increasing across the Nation but particularly in the West and Southeast due to prolonged drought. These water issues are exacerbating the challenges facing traditional water management approaches,

WATERSMART (dollars in millions)

<u>Bureau/Program</u>	<u>2010</u>	<u>2011</u>	<u>Change</u>
Bureau of Reclamation			
WaterSMART Grants*	18.0	27.0	+9.0
Basin Studies	3.0	6.0	+3.0
Title XVI Projects	<u>13.6</u>	<u>29.0</u>	<u>+15.4</u>
Subtotal, Reclamation.....	34.6	62.0	+27.4
U.S. Geological Survey			
WaterSMART Availability/Use Assessments			
Geographic Analysis/Monitoring ..	0.0	0.5	+0.5
Nat'l. Coop. Geologic Mapping	0.0	0.5	+0.5
Ground Water Resources.....	1.6	2.7	+1.1
Hydrologic Networks/ Analysis	0.4	6.8	+6.4
Biologic Research/Monitoring	<u>0.0</u>	<u>0.5</u>	<u>+0.5</u>
Subtotal, USGS	1.9	10.9	+9.0
Total	<u>36.5</u>	<u>72.9</u>	<u>+36.4</u>

*Formerly known as Challenge Grants.



which by themselves no longer meet today's needs. The Department's WaterSMART program is working to achieve a sustainable water strategy to meet the Nation's water needs.

The 2011 budget includes \$72.9 million for the WaterSMART program, which is a total increase of \$36.4 million over the 2010 enacted, including \$27.4 million for the Bureau of Reclamation and \$9.0 million for the U.S. Geological Survey.

Bureau of Reclamation – Reclamation is the largest supplier and manager of water in the 17 western States. It maintains 476 dams and 348 reservoirs with the capacity to store 245 million acre-feet of water. These facilities deliver water to one in every five western farmers for about ten million acres of irrigated land and provide water to over 31 million people for municipal, rural, and industrial uses. Reclamation is also the Nation's second largest producer of hydroelectric power, generating 40 billion kilowatt hours of energy each year from 58 power plants. In addition, Reclamation's facilities provide substantial flood control, as well as many recreation and fish and wildlife benefits. The bureau has an important role to play in providing leadership and assistance to States, Tribes, and local communities to address these competing demands for water.

The 2011 Reclamation budget includes \$62.0 million for water sustainability efforts through WaterSMART grants, basin studies, and water reclamation and reuse programs. Within this total is \$27.0 million, an increase of \$9.0 million, for competitive cost-share grants that will fund the following types of on-the-ground water conservation projects:

- Water marketing projects with willing sellers and buyers, including water banks that transfer water to other uses to meet critical needs for water supplies.
- Water efficiency and conservation projects that allow users to decrease diversions and use or transfer the water saved.
- Projects that improve water management by increasing operational flexibility such as constructing aquifer recharge facilities or making system optimization and management improvements.

- Pilot and demonstration projects that showcase the technical and economic viability of treating and using brackish groundwater, seawater, or impaired waters within a specific locale.

With the funding requested in 2011, Reclamation will be able to fund at least 60 new water conservation projects that will be completed within two years from the date of funding to encourage near-term impacts on water savings. Reclamation believes that water conservation, use of water markets, and improved efficiency are crucial elements of any plan to address western water issues. With leveraged water sustainability grants, an important step will be taken towards increasing conservation for a more efficient use of water in the West.

All grant proposals will be evaluated using established criteria giving priority to projects that save the most water, facilitate transfers to new uses, address endangered species and other environmental issues, improve energy efficiency, conserve Reclamation project water, and exceed the minimum 50 percent non-Federal cost-share requirement.

This request also increases the Reclamation Basin Study program by \$3.0 million, for a total \$6.0 million, to partner with State and local entities to initiate comprehensive water supply and demand studies in the West. Such efforts are critical in dealing with the impacts of climate change coupled with record droughts and population increases. Each study will include four key components:



- State-of-the-art projections of future supply and demand by river basin.
- An analysis of how the basin's existing water and power operations and infrastructure will perform in the face of changing water realities.
- Development of options to improve operations and infrastructure to supply adequate water in the future.
- Recommendations on how to optimize operations and infrastructure in a basin to supply adequate water in the future.

The WaterSMART program is directly aligned with Reclamation's High-Priority Performance Goal.

Enable capability to increase available water supply for agricultural, municipal, industrial, and environmental uses in the western United States by 350,000 acre-feet (estimated amount) by 2012 through the bureau's conservation-related programs, such as water reuse and recycling (Title XVI) and WaterSMART Grants.

EXAMPLES OF TITLE XVI PROJECTS IN CALIFORNIA

The City of Long Beach Recycled Water System Expansion project will expand an existing distribution system that allows the use of recycled water throughout the City. The expansion consists of pumps, pipes, storage facilities, and control systems that will increase use of recycled water from 4,585 acre-feet per year to 16,677 acre-feet per year—more than tripling the use of recycled water and avoiding the use of treated water.

The San Diego Water Reclamation project is being implemented by the cities of San Diego and Poway, the Sweetwater Authority, and the Otay Water District. The project provides for the construction of five new wastewater treatment plants, expansion of an existing plant, along with recycled water distribution systems, and two conjunctive use projects. Total system capacity will be approximately 57,116 acre-feet of recycled water per year.

The WaterSMART program also increases the Title XVI, Water Reclamation and Reuse program by \$15.4 million for a total of \$29.0 million. Title XVI projects will identify and investigate opportunities to reclaim and reuse wastewater and naturally impaired ground and surface water in the 17 western States and Hawaii. Title XVI also provides authority for project sponsors to receive Federal funding on a cost-share basis for planning and pre-construction activities such as feasibility studies and financial capability preparation or environmental compliance, as well as construction of specific water recycling projects. Title XVI projects have a huge potential to stretch water supplies using both time-tested methodologies and piloting new concepts.

The Federal government will continue to work collaboratively with the 17 western States and other non-Federal stakeholders to reduce water conflicts and enhance existing water supplies.

U.S. Geological Survey – The USGS provides a broad range of expertise in geography, geology, hydrology, biology, and data integration that is used by States, local communities, and others. Analyses of water quality and quantity at USGS help water and land resource managers develop, regulate, and monitor management practices to ensure the continued availability of water resources for human consumption, agriculture, industry, recreation, and fish and wildlife habitat.

WATERSMART AVAILABILITY AND USE ASSESSMENT GOALS

- Bring existing plans and legislative mandates together in one strategy.
- Integrate existing science efforts across Interior to focus resources on water availability questions.
- Set forth a strategy to answer the questions: 1) Does the Nation have an adequate quantity of water, with sufficient quality and timing-characteristics, to meet both human and ecological needs? 2) Will this water be present to meet both existing and future needs?

CALIFORNIA WATER ISSUES

While there have been more severe droughts, never before has drought fallen upon a State with so large a population, and so many competing uses for its water.

*Michael L. Conner
Bureau of Reclamation Commissioner
January 25, 2010*

California Bay-Delta – On December 22, 2009 the Administration announced a new Interim Federal Action Plan for the California Bay-Delta. A discussion of the Interim Plan and Interior’s activities in the California Bay-Delta are contained in the Treasured Landscapes chapter.

Other California – In addition to the Bay-Delta, other portions of California are suffering from unmet water needs. More than \$400 million, roughly 40 percent of Reclamation’s American Recovery and Reinvestment Act funding, has gone to California projects, significantly more than any other Reclamation State. This funding is going to a mix of projects to promote not just traditional water supplies, but also to healthy fisheries and habitat projects to sustain and protect species’ ability to reproduce and thrive.

Since 2004, Reclamation has awarded over \$40 million in cost-shared financial assistance for 67 projects in California under the competitive challenge grant program. The improvements resulting from these grants are projected to create or conserve 177,000 acre-feet of water annually for agricultural and urban uses.

Interior helped California move record amounts of water, more than 600,000 acre-feet of water to communities most in need, and continues taking steps to prepare for a potential fourth year of drought.

In October 2009, Reclamation initiated implementation of the San Joaquin River Restoration Settlement. Implementation began with the release of “interim flows” from Friant Dam, which is designed to provide valuable information necessary in designing the improvements needed in the river to support salmon reintroduction as called for in the settlement.

In 2010, Interior is facilitating final permitting and construction of the Delta-Mendota and California Aqueduct Intertie, a project which will connect the Federal Delta-Mendota Canal and California Aqueduct. It will allow greater flexibility in operating pumping systems which each have its own export constraints, and allow for recovery of water between the State and Federal systems. Interior expects to initiate construction in June of this year and complete construction in 2011.

Groundwater continues to be an essential water supply for many of California’s coastal and inland communities. With the combined impact of the drought and environmental needs, existing groundwater sources are being significantly stressed. The USGS is actively engaged in expanding the range of information available to water users and policymakers regarding groundwater. The USGS developed the Central Valley groundwater model to assess water resources in the Central Valley and provide an important tool to evaluate the impacts of drought on groundwater conditions. This new hydrologic model can also be used by water managers to address water issues related to conjunctive water use, recognizing the interdependence of surface water supplies and groundwater.

The need to quantify, forecast, and secure freshwater sources to meet human, environmental, and wildlife demands now and into the future has been well established. The National Research Council's 2004 Report, *Confronting the Nation's Water Problems: The Role of Research* noted, "The strategic challenge for the future is to ensure adequate quantity and quality of water to meet human and ecological needs in the face of growing competition among domestic, industrial-commercial, agricultural, and environmental uses." The USGS Science Strategy, *Facing Tomorrow's Challenges – U.S. Geological Survey Science in the Decade 2007-2017*, identifies the need to address this gap in understanding.

Most information about human water use is obtained through programs operated by State water resource agencies. Through the WaterSMART program, USGS will provide grants to State water agencies that are developing water use availability datasets that can be integrated with appropriate national water use data to advance understanding.

The Congress recognized the need to quantify, forecast, and secure fresh water and thus directed the Secretary of the Interior to establish a National Water Availability and Use Assessment Program in the Omnibus Public Land Management Act of 2009. An assessment of the availability and use of water resources in the U.S. was last completed in 1978 – more than 30 years ago. Much has changed since then and the time has come to establish a program that will address the need for a new and continuing assessment of the Nation's water resources.

The 2011 budget request includes \$10.9 million, an increase of \$9.0 million to fund the USGS WaterSMART Availability and Use Assessment program. An interdisciplinary science approach will be used to implement this assessment, which will include:

- Estimates of the distribution and abundance of freshwater resources over time.
- Evaluation of factors affecting water availability including energy development, changes in agricultural practices, increasing population pressures, and competing priorities for limited water resources.

- Assessments of water use and distribution for human, environmental, and wildlife needs.
- Estimates of undeveloped potential water resources such as saline and brackish water and wastewater.
- Data and information needed to forecast likely outcomes of water availability, quality, and aquatic ecosystem health due to changes in land use and cover, natural and engineered infrastructure, water use, and climate.
- A grant program to assist State water resource agencies in integrating State water use and availability datasets with Federal databases for a more comprehensive assessment of water availability.

Water Use Evaluations – In order to address water-use conditions and integrate that information to provide a comprehensive picture of water availability, water-use evaluations will be conducted that will address not only human uses, but also environmental needs for water. This will assess the use of groundwater and surface water by a variety of sectors including agriculture, municipalities, industry, and electric power generation. The USGS, in collaboration with other bureaus, will provide information that can be used by land managers in developing adaptive management strategies.

Water Availability – To focus its efforts, USGS will conduct water availability studies to define the need for freshwater in comparison with resource availability. Water availability will be



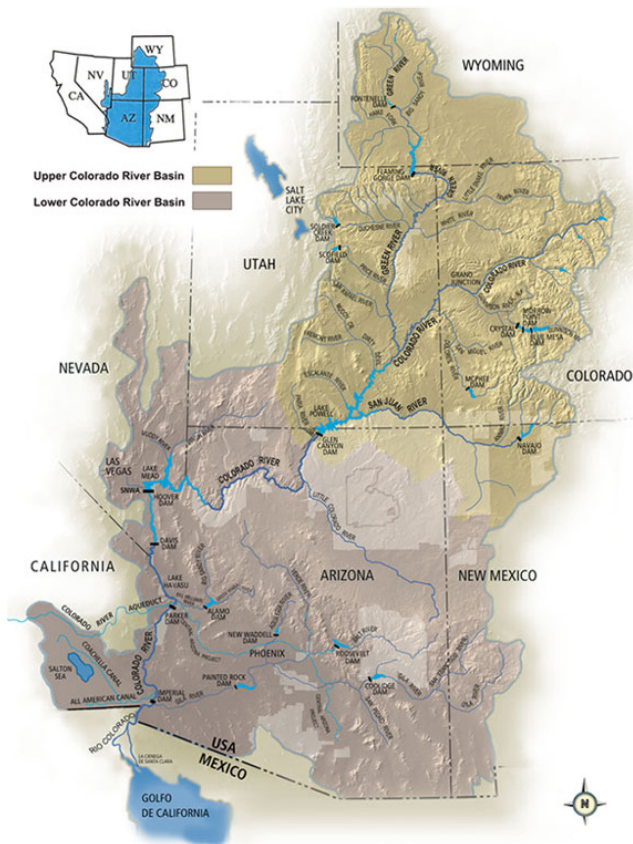
studied comprehensively, including quantity and quality aspects of both surface and groundwater resources. Water uses will be examined for human, environmental, and wildlife needs with special emphasis on impacts to biodiversity and threatened and endangered species.

Surface Water Availability Studies – In 2011, USGS will initiate studies and examine the challenges in high priority river basins such as:

- *Colorado River Basin* – This region has one of the fastest-growing populations in the Nation combined with the potential for expanded development of renewable energy and fossil fuels. The river supports fragile ecosystems and provides the backbone for hydroelectric power, irrigation, industry, and recreation throughout the region. River flows have been progressively decreasing since the 1920s, and future projections of consumptive use along the river pit the water supply needs of the upper basin States against those in the lower basin and Mexico.

- *Delaware River Basin* – The basin is the subject of the largest inter-basin withdrawal of water east of the Mississippi River and provides water to over 15 million people, more than five percent of the Nation’s population. Two Supreme Court decrees and coordination by an interstate river basin commission including the States of Delaware, New Jersey, New York, and Pennsylvania, are just part of the history of allocating scarce resources in the basin. In the upper portions of the basin, concerns over the effects of new natural gas development and the freshwater requirements for a recently-discovered endangered mussel species have added new complexities to managing water resources in the basin.

- *Apalachicola, Chattahoochee, and Flint River Basin* – Competition for scarce water resources is occurring in the southern region of the country. In the ACF Basin, comprising portions of Alabama, Florida, and Georgia, severe drought has exacerbated an ongoing issue driven by increased public water supply demands associated with growth in the Atlanta region and increased agricultural withdrawals in the southern portion of the basin. This basin is a prime example of where competing demands for water have resulted in litigation between States to determine who gets how much water and when.



Groundwater Availability Studies – The WaterSMART availability and use assessment will require that regional groundwater availability studies be conducted in each of the 30 principal water-use aquifers of the U.S. These studies will be linked with surface water studies to improve our understanding of these as a single resource. The focus in the first year will be on two high priority aquifers and will also include a preliminary national assessment of brackish and saline groundwater resources.

As competition for water resources grows, for irrigation of crops, for growing cities and communities, for energy production, and for the environment – the need for information and tools to aid water resource and land managers grows. WaterSMART, through the combined efforts of Reclamation in the West and USGS throughout the entire Nation, provides the foundation for a sustainable water strategy.

U.S. GEOLOGICAL SURVEY SCIENCE STRATEGY

The last decade has witnessed the emergence of a new model for managing Federal lands – ecosystem-based management. The USGS has developed a science strategy that embraces this new model of management and recognizes the global trends of climate change and rapidly-evolving societal needs that pose important natural science challenges. The changing natural environment poses risks to society in the form of volcanoes, earthquakes, wildland fires, floods, droughts, invasive species, variable and changing climate, natural and anthropogenic toxins, as well as animal-borne diseases that affect humans. The use of, and competition for, natural resources on a global scale and natural threats to those resources, requires greater understanding and innovation to sustain the Nation’s economy, national security, quality of life, and natural environment.

Responding to these national priorities and global trends requires a science strategy that builds on existing USGS strengths and partnerships and integrates the full breadth and depth of these interdisciplinary capabilities into an ecosystem-based approach. The USGS science strategy, outlined in Circular 1309, *Facing Tomorrow’s Challenges – U.S. Geological Survey Science in the Decade 2007 – 2017*, addresses societal issues in six science directions, which represent major challenges for the Nation’s future and for the stewards of Federal lands, both onshore and offshore.

- Understanding ecosystems and predicting ecosystem change ensuring the Nation’s economic and environmental future.
- Climate variability and change clarifying the record and assessing consequences.
- Energy and minerals for America’s future providing a scientific foundation for resource security, environmental health, economic vitality, and land management.
- A national hazards, risk, and resilience assessment program ensuring the long-term health and wealth of the Nation.
- The role of environment and wildlife in human health, identifying environmental risk to public health in America.
- A water availability and use assessment of the United States, quantifying, forecasting, and securing freshwater for America’s future.

The science strategy identifies opportunities for USGS to better use its scientific capabilities to serve Interior and the Nation. The strategy takes an ecosystem-based approach to inform planning, technology investment, partnership development, and workforce and human capital strategies.

The six science directions of the strategy serve as an outline for USGS research and development efforts that promote the economic growth and innovation necessary to enhance the economic competitiveness of the U.S. in a global market. The USGS programs contribute to the economy by providing all sectors of society with the information necessary to avoid or mitigate natural hazard risks, manage natural resources, and enhance quality of life and national security.

The science strategy also calls for research and development practices that foster innovation and competitiveness through implementation of its programs. For example, USGS engages youth to achieve organizational goals today and to train the next generation of scientists critical to a competitive workforce in the future. The USGS programs invest in new technologies that range from satellites to streamgages and wireless biological monitoring to advanced geographic information systems and advanced computing technology. These technologies are widely deployed across the country, both in urban and rural settings. Finally, USGS employs partnerships to leverage funding and enhance open innovation of science and technology.

Contributing to an integrated science approach, USGS participates in the coordinated, government-wide strategy for Science, Technology, Engineering, and Math education by identifying and validating effective approaches to increasing STEM program completion at the undergraduate level and by increasing the number of graduate fellows with the goal of expanding the number who enter employment in STEM fields. This strategy is relevant to both STEM-focused and many broader purpose programs, such as job training and new higher education programs.