

RECLAMATION

Managing Water in the West

Lower Colorado Region Overview 2011





Message from the Director

In 2010, the Bureau Reclamation's Lower Colorado Region faced many challenges as we continue to provide water and power to our customers in the Southwest and meet our Native American trust responsibilities and honor the 1944 Treaty with Mexico.

Management of the lower Colorado River is likely to become more complex in the future as demand for water increases with growing communities and economies. The river is crucial to the Southwest for agriculture and industry, health, safety, and recreation opportunities such as America's Great Outdoors. We are addressing the ecosystems that rely on riverine health for thriving aquatic and terrestrial populations through our Multi-Species Conservation program with over fifty partners collaborating in habitat management along the lower Colorado River.

In 2010 we continued to suffer from a drought resulting in the driest 10-year period in over 100 years along the lower Colorado River basin. Even with these serious conditions, our partner states and water managers grow even more committed to work together in meeting any future scenarios of less water or different timing of the flows based on the effects of climate change. We were very close in 2010 to implementing the actions in the 2007 Shortage criteria as Lake Mead water levels continued to drop. Fortunately, plentiful snowpacks and moderate levels of runoff in the upper Colorado River basin allowed us to forgo reducing water deliveries in the lower Basin with no shortage conditions forecast now until at least 2012.

This close call in the Lower Colorado Region remains a powerful reminder to continue seeking new water recycling technology, storage opportunities and providing water and power efficiency grants through Reclamation's WaterSMART program. We are proud of our successes and know how important our water partners are to making projects such as the Yuma Desalting Plant, Warren H. Brock Reservoir and extensive groundwater treatment programs in Arizona and California and water conservation programs in Nevada work for the Southwest.

As Reclamation is engaging in climate change research as part of the Secure Water Act, the Lower Colorado Region's Basin Study is underway so we can be more prepared and as flexible as possible to changing conditions. Through lessons learned from climate change research and scientific modeling of future conditions, we hope to actively mitigate any impacts to ensure the water and power supplies we oversee are managed as efficiently and as collaboratively as possible. In 2010 we celebrated the 75th Anniversary of the construction of Hoover Dam reminding us that amazing achievements are accomplished when we all work together.

Our region continues to benefit from the support our Commissioner Mike Connor and the leadership provided by Secretary of the Interior Ken Salazar. Thank you for your interest in the Lower Colorado Region.

Lorri Gray-Lee
Lower Colorado Regional Director





Theodore Roosevelt Dam

Dams along the Colorado River; Theodore Roosevelt Dam and the Salt River Project, the Central Arizona Project (CAP), Imperial Diversion Dam and the Yuma Desalting Plant in Arizona; the All-American Canal System in southern California; and the Robert B. Griffith Project in Nevada.

In a typical year, Reclamation projects in the Region deliver 7.5 million acre-feet (MAF) of water to users in Arizona, California, and Nevada, and 1.5 MAF to Mexico. The water helps irrigate more than 2.5 million acres of land and meet the domestic needs of more than 23 million people.

Hydroelectric powerplants at Hoover, Davis and Parker Dams annually generate five to six billion

kilowatt-hours of clean, non-polluting hydroelectric power that is distributed to contractors in Arizona, Nevada and California.



Davis Dam spillway

Reclamation also owns about 25 percent of the output of the Navajo Generating Station (NGS) located near Page, Arizona. The NGS power is used to pump water through the CAP. Reclamation also built the original hydroelectric powerplant at Roosevelt Dam, as well as the powerplants at Headgate Rock Dam and New Waddell Dam. These facilities serve the Salt River Project, Colorado River Indian Tribes and CAP, respectively.

More than 10 million people recreate on the reservoirs and river stretches behind and below Reclamation dams on the lower Colorado River each year, generating billions of dollars in revenue for local communities. Lake Mead, Hoover Dam's reservoir, led to the creation of the Lake Mead National Recreation Area, America's first national recreation site managed by the National Park Service. The dam itself is a popular tourist destination; more than 800,000 people a year take one of the tours offered at the dam.

About Us

Our People

There are about 852 full-time employees working in more than 114 occupational specialties in the Region. In addition, contract employees provide janitorial services, clerical support, visitor ticketing and parking management services, security, warehouse support, and operations and maintenance services at various Regional offices.

We use a variety of techniques to develop new skills in current employees and to recruit new personnel to meet the existing and projected staffing and skill sets we need to successfully conduct the Nation's work. Apprenticeships, developmental assignments, and a leadership development program help existing employees refresh and develop new skills. A Student Career Experience Program (SCEP) and Student Temporary Employment Program (STEP) offer high school and college students opportunities to gain valuable work experience and potentially a long-term position with Reclamation.

Sustainability

The Regional Office is also responsible for the regional Sustainability Program. An on-site maintenance staff provides maintenance and repair services for twenty buildings in the Boulder City, NV, area. Some of the buildings maintained are historical in nature, dating back to the Hoover Dam construction era and require close coordination with the State Historic Preservation Office before any exterior changes are made.

Our sustainability program in 2010 included the purchase of six electric vehicles to decrease the use of petroleum-based fuels during the short trips between the Boulder City offices located on four campuses. This allowed the Regional Office to return three gasoline-fueled vehicles to the General Services Administration. Energy saving measures also included installing occupancy sensors LED lights in several offices, and replacing 40 old EXIT signs with new energy efficient versions. A successful office recycling program is also in place.

Further savings were attained by increased use of video teleconferencing instead of travel, and using virtualized computer servers enabling the Regional Office to reduce the number of physical servers from twenty to five, saving nearly \$100,000 per year.

Our Budget

The Region's annual budget emphasizes the management of water and power resources through the effective and efficient accomplishment of annual and long-term goals and commitments. Projected work and budget requests are aligned to performance goals outlined in the Department of the Interior's Strategic Plan, as well as to Reclamation and Regional management goals and initiatives. Information regarding the Region's fiscal year budgets and annual performance data is available to the public via the Region's "Budget and Finance" internet site – www.usbr.gov/lc/region/g7000/.



Hoover Dam

Lake Mead, Hoover Dam's reservoir, led to the creation of the Lake Mead National Recreation Area, America's first national recreation site.

Twenty-six percent of the Region’s annual FY 2010 funding was provided through the appropriations process, with the remaining balance provided via permanent appropriations, revenue-funded programs, or other federal and non-federal agencies.

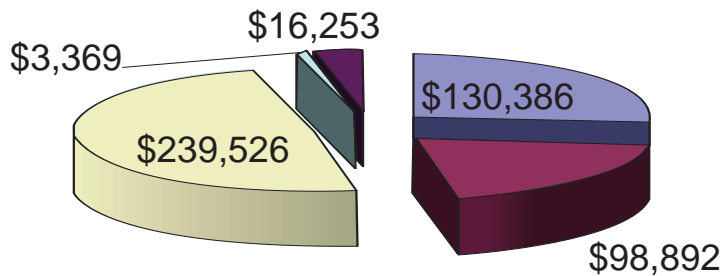
Permanent funding is provided through the Colorado River Dam Fund, which derives its revenues largely from the sale of hydropower from Hoover Dam. In 1984, the Hoover Dam Power Plant Act established that all receipts would be deposited into this fund and made available without further appropriation to pay for operations, maintenance, replacement, interest, and repayment associated with the Boulder Canyon Project. It also provided for the transfer of power revenues to the Lower Colorado River Basin Development Fund (LCRBDF). The Parker-Davis Project is funded by power customers, and is able to successfully operate and maintain project facilities without seeking Federal appropriations while significantly contributing to the Region and Reclamation successfully delivering water and generating hydropower.

The LCRBDF was established by the 1968 Colorado River Basin Project Act to collect revenues from the Central Arizona Project (CAP), certain revenues generated from the Boulder Canyon and Parker-Davis Projects, and revenues from the contemplated-but-never-implemented Northwest-Pacific Southwest Power Intertie. These revenues are available without further appropriation to help defray the costs of CAP operations and maintenance, and repayment. In addition, Title I of the Arizona Water Settlements Act (AWSA) authorizes the revenues that were to be returned to the U.S. Treasury to repay CAP construction costs to be retained in the LCRBDF and invested. The earnings from these investments are also retained in the Fund. Beginning January 2010, the funds were made available without further appropriation for a multitude of specified purposes identified in the AWSA, including the operation and maintenance of Indian water distribution systems for Arizona tribes served by the CAP.

FY 2010 Budget Accomplishments:

The FY 2010 budget continued to emphasize the management of water and hydropower resources within the Region.

**Lower Colorado Region FY 2010 Funding
(\$ in thousands)**



- Appropriated
- Permanent
- Revenues
- Other-Federal
- Non-Federal

The total available funding in FY 2010 was \$488.4 million, of which \$130.3 million were appropriated funds; \$98.9 million from permanent appropriations; \$239.5 million from revenue-funded programs; \$3.4 million in “other-federal” funds from the Bureau of Indian Affairs and Southern Arizona Water Rights Settlements Act (SAWSA); and \$16.3 million in funding provided by non-federal entities for the Parker-Davis Project.

Security

Reclamation’s Regional Security Program provides for the protection of Reclamation facilities, critical information, operational plans and procedures, and more importantly, the employees, contractors and visitors at or near its facilities.



Drop2/Warren H. Brock Reservoir

The Regional Security Officer, the Regional Special Agent (RSA), Hoover Dam Police Department (HDPD) Chief, and HDPD Major are active members of the Las Vegas Area Law Enforcement Coordinating Council. Additionally, the RSA is a participating member of the Federal Bureau of Investigation’s Joint Terrorism Task Force in Las Vegas.

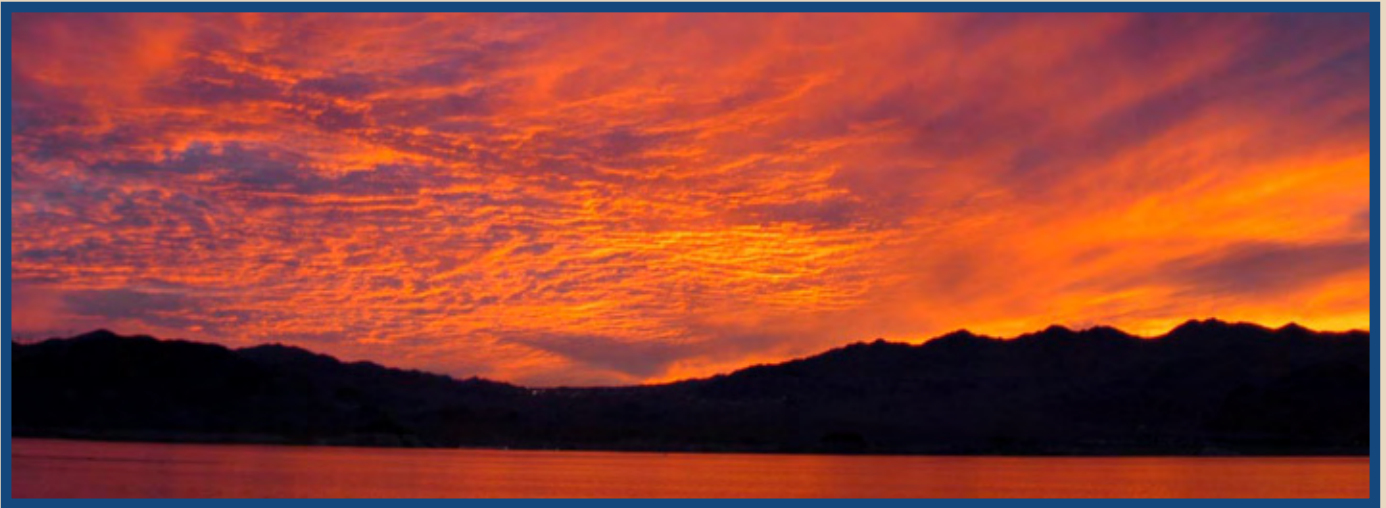
Collaboration continues with local law enforcement agencies in southern Nevada and northwestern Arizona to familiarize them with Hoover Dam, part of the Nation's critical infrastructure, and Reclamation’s Defense Plan. Response teams from most local law enforcement agencies have been provided informational tours through the facility.

Annual physical security reviews as well as formal Security Issue Evaluations, Periodic Security Reviews and regular critical incident exercises continue to safeguard the protection of the critical structures and facilities in the Region. Reclamation's 24-hour Duty Officer responsibilities are centralized at the Hoover Dam Command Center, and all Command Center security personnel have been trained to perform these new duties.

Security-related exercises including the implementation of the Department of Homeland Security’s Federal Air Marshal Visible Intermodal Protection and Response Team, and a Public Safety and Anti-Terrorism collaborative partnership has provided enhanced protective measures to Hoover Dam through advanced planning and implementation of key security assets throughout the project.

Natural and Cultural Resources Management

The Region's Resources Management Office (RMO) provides services for Reclamation’s environmental compliance and planning activities, land-use management, public outdoor recreation management, and long-term water and land resources planning programs. RMO also provides coordination and oversight



Lake Mead

of the Region’s environmental and cultural resources, wildlife habitat, and hazardous material management programs and policies to ensure compliance with associated laws and regulations on Reclamation lands.

Important functions of the RMO also include managing the Regional Laboratory that provides soil and water analyses for Regional projects; providing Geographic Information Systems (GIS) geo-spatial and mapping services for the Region; and administering water conservation, wastewater reclamation and reuse studies, emergency drought assistance and Native American assistance programs within the Region.

RMO staff are also participants in the Las Vegas Wash Coordinating Committee and the Lake Mead Water Quality Forum in southern Nevada. The Wash, which carries treated and other waters from the Las Vegas Valley to Lake Mead, includes wetlands and other vegetation that provide habitat to about 300 fish and wildlife species and more than 200 species of upland, riparian and wetland plants. The partnering organizations are dedicated to the development and implementation of practical, comprehensive approaches for managing the Wash to reduce the likelihood of water quality problems in Lake Mead.



Quagga mussels

Invasive Species:

Quagga mussels are a growing problem in the lower Colorado River. This invasive species is of particular concern in maintaining the efficiency and operations of hydropower facilities in the Region. Environmental research and test programs in the Lower Colorado Dams Office and the region’s RMO are ongoing to find solutions to this expensive and potentially damaging infestation. Near Yuma, we are also working with Palo Verde Irrigation District and Arizona Game and Fish Department to control the invasive giant salvinia weed that can affect facilities on the lower Colorado River.

Native American Activities Program

Regional and Area offices work with Native American Tribes in their respective areas of responsibility. Reclamation assistance to Tribal governments includes assessment, protection, management, and development of Tribal water and related resources, and assistance with drought mitigation efforts when possible. Reclamation participates in and supports the Department of the Interior's efforts to negotiate and implement water rights settlements and uphold Indian Trust responsibilities in the lower Colorado River Basin.



Native American Petroglyph

Reclamation also protects cultural and historic resources at our projects, and participates in activities with other federal and non-federal archaeologists to help monitor and protect other cultural resource sites. The Region manages about one-third of Reclamation's entire collection of museum property, which consists primarily of archaeological collections, historic records and art work, and their associated records. These collections are in repositories in Boulder City, which is shared with the National Park Service, at Hoover Dam, and in a facility in Arizona that houses approximately two million items collected during construction of the CAP. That facility is managed by the Gila River Indian Community through an Annual Funding Agreement.

In addition, several Hoover Dam Police Department officers provided cooperative law enforcement assistance with the Bureau of Indian Affairs in "Operation Alliance" at the Wind River Indian Reservation in Wyoming.

Native American Affairs Program Region-wide Program Accomplishments

In 2010, Reclamation awarded \$684,188 in Native American Affairs Technical Assistance funds for water related activities on tribal lands. Approximately \$264,000 went to the Phoenix Area Office, \$210,000 to the Southern California Area Office, \$116,000 to the Yuma Area Office, and \$95,000 to the Region's RMO.

In 2011, the Region is distributing \$400,000 in Native American Affairs Technical Assistance funds for water related activities on tribal lands. \$100,000 will go to the Phoenix, Yuma and Southern California Area offices as well as the Region's RMO.

The Region also participated on water rights assessment, negotiation and implementation teams in Arizona and California with the Department of the Interior, Native American Tribes, water management entities, and community representatives to facilitate water rights settlements. Under Miscellaneous Public Law 93-638, Contracts, Grants and Cooperative Agreements (638), the region administers fourteen Title I agreements and one Title IV agreement to assist tribes in developing water projects for the benefit of their communities.

2010-2011 Accomplishments

Water: The Boulder Canyon Operations Office (BCOO)

Water Management

The Secretary of the Interior (Secretary), acting through the Bureau of Reclamation, is the “water master” for the lower Colorado River. As water master, the Secretary is authorized to manage and operate the lower basin of the Colorado River. The Secretary’s water master authority extends from Lees Ferry, Arizona, downstream to the southerly international border with Mexico and stems from a combination of federal and state statutes, interstate compacts, court decisions and decrees, contracts, an international treaty with Mexico, operating criteria, and administrative decisions. Collectively, these authorities, known as the “Law of the River” control the allocation and operation of the Colorado River.



The Lower Colorado River Operations Program (LCROP), performs water master responsibilities. LCROP includes river operations, water delivery contracting and repayment, and water accounting. We work closely with the seven Colorado River Basin States of Arizona, California, Colorado, Nevada, New Mexico, Wyoming, and Utah; Native American tribes; water and power agencies; environmental groups; other federal agencies, and interested parties to operate and manage major dams, reservoirs, diversion works, and other facilities on the Colorado River. LCROP also includes accounting for the consumptive use of Colorado River water and managing lower Colorado River water entitlements.

Water and power data is posted on the internet www.usbr.gov/lc/riverops.html to provide the public with information about Reclamation's management of the lower Colorado River.

The Colorado River Annual Operating Plan (AOP), developed in coordination with the Upper Colorado Region and basin stakeholders, describes the Colorado River's hydrologic conditions, the releases from system storage during the prior operating year, and the projected operations for the current or upcoming year. The AOP also specifies the quantity of water considered necessary to be stored in the Upper Basin reservoirs as of September 30, the quantity of water available for delivery to Mexico, and the amount of water that will be available to the lower basin states.

The Inadvertent Overrun and Payback Policy is the mechanism used by contractors to repay the Colorado River system for inadvertent water use in excess of their annual water contracts. Since 2004, the system has recovered nearly 350,000 acre-feet, thereby reducing the potential for a shortage determination.

The Region approves annual water orders from lower Colorado River water entitlement holders and accounts for the consumptive use of this water by each entitlement holder. Water accounting is accomplished through a real-time monitoring system of stream gauges and microwave telemetry transmitting data from the point of measurement in the Colorado River to Reclamation's database in Boulder City and ultimately to the Region's internet site. This website helps water users track actual use on a daily basis and helps them project their end-of-year total water use. The Region annually prepares a report showing the amount of water diverted and consumptively used by each user.

Water Operations

In 2010, Arizona used 2.781 million acre-feet of Colorado River water; California used 4.357 million acre-feet; and Nevada used 242 thousand acre-feet. Mexico's use in satisfaction of the U.S. - Mexican Water Treaty totaled 1.5 million acre-feet.

The Intentionally Created Surplus (ICS) Program

This program, implemented with the 2007 Interim Guidelines, allows eligible contractors to perform conservation measures to store a portion of their entitlement in Lake Mead, thus adding to system storage and reducing the potential for a shortage determination. Since the program's inception, contractors have conserved and stored nearly 200,000 acre-feet through extraordinary measures. In addition 620,000 acre-feet of ICS credits were designated to the parties' funding for system improvements which will yield conservation for future years.

Power – The Power Management Office

The Region's Power Management Office (PMO) provides oversight for the operations, maintenance and management of all Reclamation power facilities in the Region, ensuring the Region's hydroelectric powerplants comply with federal requirements. PMO participates in rate setting power contracting activities in the Region, the process for re-marketing Navajo Generating Station (NGS) surplus power after 2011 and Hoover Dam power after 2017 when the contracts expire, and other related power generation and transmission functions within the Region.

The PMO also completes actions necessary to ensure the hydroelectric powerplants comply with the mandatory reliability standards developed in accordance with Section 1211 of the U.S. Energy Policy Act of 2005. We annually audit Reclamation facilities to assess their current compliance with the standards and, if needed, initiate corrective action to identify what documentation is needed for compliance.

Other activities include participating in a Reclamation-wide study to evaluate potential development of new hydropower projects at federally-owned facilities, and the upgrade or rehabilitation of existing hydropower generation facilities. This is part of Region's efforts toward the Nation's clean energy goals and implementing the Hydropower Modernization Initiative (HMI). The HMI is a joint Reclamation and U. S. Army Corps of Engineers program designed to assess and prioritize the investment needs of federally-owned hydropower facilities.

Navajo Generating Station

During Fiscal Year 2010, the NGS supplied 4,248.77 million kWh of energy. This is enough energy to annually provide approximately 384,852 average households with all the electric energy they need for one full year.¹



Parker Dam

Hoover, Davis and Parker Dams generated a total of 5,129.64 million kilowatt-hours of energy. This is enough energy to provide approximately 464,642 average households with all the energy they would need for one full year.

¹According to the U.S. Energy Information Administration, the average monthly residential electricity consumption in 2008 was 920 kilowatt-hours (kWh).

<http://tonto.eia.doe.gov/tools/faqs/faq.cfm?id=97&t=3>

Lower Colorado River Multi-Species Conservation Program (LCRMSCP)



Yellow Warbler

2010 marks the 5th year of the implementation of the Region's MSCP. The partnership involves 56 state and federal agencies, water and power users, and other interested parties, that provide input and oversight in support of LCR MSCP implementation. Program costs are split evenly between the federal government and the nonfederal partners.

The goals of the 50-year program are to conserve habitat, work toward the recovery of threatened and endangered species, reduce the likelihood of additional species being listed along the lower Colorado River, and accommodate present water diversions and power production while optimizing opportunities for future water and power development. The program also provides federal

and non-federal agencies' and organizations' Endangered Species Act compliance for covered actions, such as the delivery of nine million acre-feet of water, the production of power from six mainstem dams, and the maintenance of the lower Colorado River, through the implementation of a Habitat Conservation Plan.



Cottonwood and willow habitat

Since its inception, the LCR MSCP has established 1,372 acres of land cover habitat including 871 acres of cottonwood-willow, 139 acres of mesquite, and 267 acres of marsh and 95 acres of backwater habitat. In 2011, an additional 220 acres of cottonwood-willow and 89 acres of mesquite were established. The program has also stocked over 133,400

endangered razorback suckers and 40,950 bonytail fish into the lower Colorado River system.

Yuma Desalting Plant (YDP) Pilot Run

The YDP was constructed under the authority of the Colorado River Basin Salinity Control Act of 1974 to recover the majority of Arizona's Wellton-Mohawk Irrigation and Drainage District's agricultural run-off. Due to the high cost of operating the plant and general agency budget constraints, as well as surplus and normal conditions on the lower Colorado River prior to the current drought, the YDP was not operated prior to 2010, but the facility was maintained.

With ten years of drought affecting lower Colorado River water supplies, the YDP began a pilot run May 3, 2010. The plant operated at one-third capacity for nearly one year to gather critical information about its capability to be used in the future to reliably produce water that could be used for a multitude of purposes.



Solid Contact Reactor Clarifier at the Yuma Desalting Plant

The Metropolitan Water District of Southern California (MWD), Central Arizona Water Conservation District (CAWCD), and Southern Nevada Water Authority (SNWA) funded about \$14 million of the pilot runs estimated \$23.2 million cost. In return, each agency received an acre-foot of water credit in Lake Mead through the Intentionally Created Surplus (ICS) conservation program. The amount of storage credits each agency receives is proportionate to its funding contribution.

The YDP operations concluded March 26, 2011 after recycling about 30,000 acre-feet of irrigation return flow water

that was included in Colorado River water deliveries to Mexico. Over the entire pilot run, the plant operated effectively and efficiently with no substantial equipment problems or any accidents, finishing ahead of schedule and under budget. With an acre-foot of water measuring 325,851 gallons of water, the pilot run produced approximately the amount of water used by about 116,000 people in a year.

Warren H. Brock Reservoir



Drop 2/Warren H. Brock Reservoir

Approximately six million acre-feet of Colorado River water is regulated annually at Imperial Diversion Dam north of Yuma for irrigation and other uses in California, Arizona and Mexico. Water releases from Hoover Dam/Lake Mead, 300 miles to the north, take about five days to reach Imperial Dam. During that time, conditions can change so that users no longer need the water. Without a way to store this unneeded water already on its way from Hoover Dam, it could not be put to beneficial use within the United States.

A study by the Bureau of Reclamation and lower Colorado River basin stakeholders in Arizona, California, and Nevada identified additional water storage opportunities below Parker Dam and determined that construction of a small reservoir near the All-American Canal in Imperial County, California, was the best alternative for conserving Colorado River water. Reclamation built this additional reservoir along the All-American Canal.

The Warren H. Brock Reservoir can store 8,000 acre-feet of water, roughly double the current storage capacity available below Parker Dam and can conserve 2.6 billion gallons of Colorado River water.

The Brock Reservoir can save on average 70,000 acre-feet of Colorado River water annually. Water management organizations in Nevada, Arizona, and California funded construction and in return receive a specific amount of additional water as part of the ICS Program. The additional water is conserved in Lake Mead and the river system.

International Relations

As a member of the Binational Core Group formed by the International Boundary and Water Commission (IBWC) to address joint cooperative actions for the use of Colorado River waters in both the United States and Mexico, the Region participates in various United States work groups evaluating programs or projects in the areas of conservation, new water sources, environmental issues and system operations that could potentially be implemented for the benefit of both countries.

In 2010, three Minutes were signed affecting the terms of the 1944 Treaty with Mexico.

Minute No. 316 was enacted in April in conjunction with the “Joint Report of the Principal Engineers Concerning U.S.- Mexico Joint Cooperative Actions Related to the Yuma Desalting Plant (YDP) Pilot Run and the Santa Clara Wetland” which allows water to be moved to the wetland in support of the YDP Pilot Run. Given the interest of both governments in preserving the environmental values of the Santa Clara Wetland during the YDP Pilot Run, Minute No. 316 establishes a commitment by Mexico, the U.S., and non-governmental organizations of both countries to each contribute 10,000 acre-feet of water to the Santa Clara Wetland. This water contributed by the two governments and the non-governmental organizations helps preserve the ecosystem of the Santa Clara Wetland, part of the Colorado River Delta Biosphere Reserve in Mexico.



Santa Clara Wetland

Minute No. 317, “Conceptual Framework for U.S. - Mexico Discussions on Colorado River Cooperative Actions” was enacted in July and documents the cooperative commitments of the U.S. and Mexico for future bi-national initiatives. The Minute notes the interest of IBWC in exploring opportunities for binational projects that conserve water, minimize the impacts of potential Colorado River shortage conditions, and generate additional volumes of water using new water sources by investing in infrastructure such as desalinization facilities. The agreement also notes interest in the possibility of permitting Mexico to use U.S. infrastructure to store water (there are no Colorado River reservoirs in Mexico). To develop these opportunities, the Minute formalizes a process for stakeholder participation through various binational groups to explore potential areas of cooperation and to consider projects or initiatives of interest to both countries such as those related to water conservation, new water sources, system operations, and the environment.

Minute No. 318, “Adjustment of Delivery Schedules for Water Allotted to Mexico for the Years 2010 through 2013 as a Result of Infrastructure Damage in Irrigation District 014, Rio Colorado, Caused by the April 2010 Earthquake in the Mexicali Valley, Baja California,” was approved by the governments of the United States and Mexico on December 20. This agreement allows for a temporary delay in delivery of water allotted to Mexico under the 1944 Water Treaty. The delay affects water that Mexico cannot use until repairs are made to infrastructure damaged during the April 2010 earthquake in the Mexicali Valley. Minute No. 318 allows Mexico to adjust its delivery schedule downward during the period from 2010 through 2013 by a total of up to 260,000 acre-feet when it cannot utilize its full allotment due to damage to its irrigation infrastructure. The water would then be delivered to Mexico in subsequent years after repairs are made to irrigation district canals.

LEED Certified Platinum “Green” Building

Boulder City, Nevada was constructed through the Boulder Canyon Project Act to house workers building Hoover Dam. Since 1943, Boulder City has served as the headquarters for the Lower Colorado Region. The current workforce is dispersed among four separate office locations. This two-story general office use building is approximately 49,000 square-feet and funded primarily by \$14.8 million in American Recovery and Reinvestment Act (ARRA) funds.



LEED Platinum rated building in Boulder City

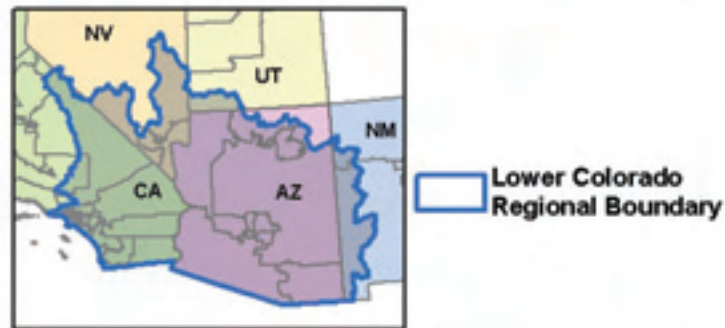
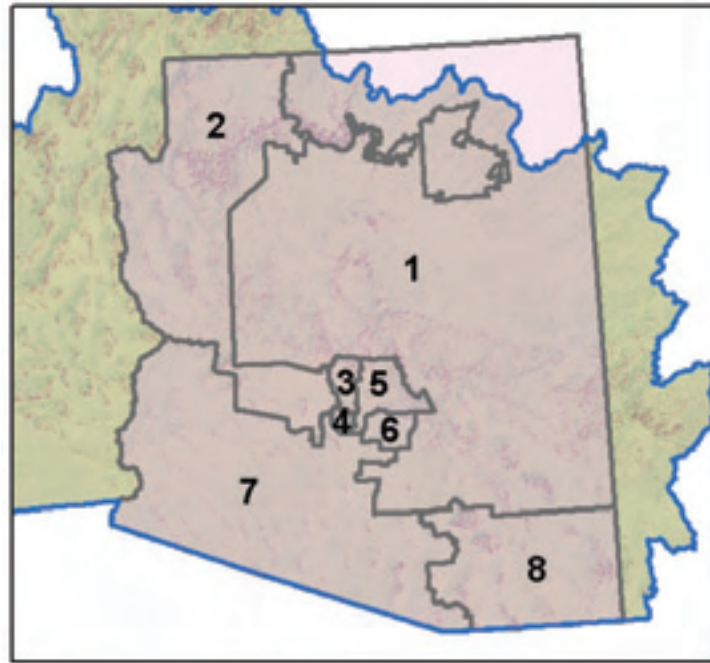
As a “green” building, this structure is being constructed with environmentally sustainable methods, including efficiently using energy, water and materials while reducing building impacts on the environment through improved siting, design, construction, operations, and maintenance techniques. The building and its related systems were designed, constructed, and commissioned in accordance with the 2008 Guiding Principles for Federal Leadership in High Performance and Sustainable Buildings, and to achieve a “Platinum” rating as established by the U.S. Green Building Council’s Leadership in Energy and Environmental Design (LEED) Green Building Rating System. The new building reduces the Regional Office’s overall energy and water consumption, reduces

travel between offices saving on fuel and vehicle mileage, and improves the Regional Office’s operational efficiency by providing appropriate and safe working spaces. The building also complies with Executive Order 13423, Strengthening Federal Environmental, Energy and Transportation Management.

The building is located within the view-shed of the Boulder City Historic District as listed in the National Register of Historic Places. To comply with historic preservation objectives, the building’s exterior appearance is designed to be compatible with other historic buildings within the District. Completion is slated for September 2011. 170 employees will work from this location.

Arizona

Arizona Congressional Districts



Senators

John McCain (R)
Jon Kyl (R)

Representatives

Paul Gosar (R-1)
Trent Franks (R-2)
Ben Quayle (R-3)
Ed Pastor (D-4)
David Schweikert (R-5)
Jeff Flake (R-6)
Raúl Grijalva (D-7)
Gabielle Giffords (D-8)

Phoenix Area Office (PXA0)

Area of Responsibility: Most of Arizona, and the Gila River watershed in New Mexico.

PXA0's approximately 90 employees (85 in Phoenix and 5 in Tucson) work with the state of Arizona, cities, counties, tribes and other partners to help Arizona move forward with its water management goals. PXA0 provides oversight of the operating entities for Reclamation projects to protect the public's safety and investment in the structures Reclamation built and owns. PXA0 strongly encourages water conservation, recharge, reuse, and treatment in order to stretch Arizona's water supplies and cultivates partnerships to bring together a variety of interests to address the continuing competition for limited water resources.

Program Summaries

Oversight and Construction. PXA0 began studies in the 1940's for what is today's Central Arizona Project (CAP). The CAP was authorized in 1968, and Reclamation began construction in 1973. Twenty years later, the project was declared "substantially complete," and operation and maintenance was turned over to the Central Arizona Water Conservation District (CAWCD). However, Reclamation maintains ownership and PXA0 retains oversight responsibility for both the CAP system and the adjoining Indian and Non-Indian distribution systems.

The CAP delivers approximately 1.5 million acre-feet of Colorado River water to central and southern Arizona communities, farms and Indian tribes. The CAP is also the primary beneficiary of Reclamation's share in the Navajo Generating Station in Page which supplies all the project's pumping energy needs. PXA0 continues to work in partnership with several communities and interests in the Tucson area to plan for water delivery reliability.

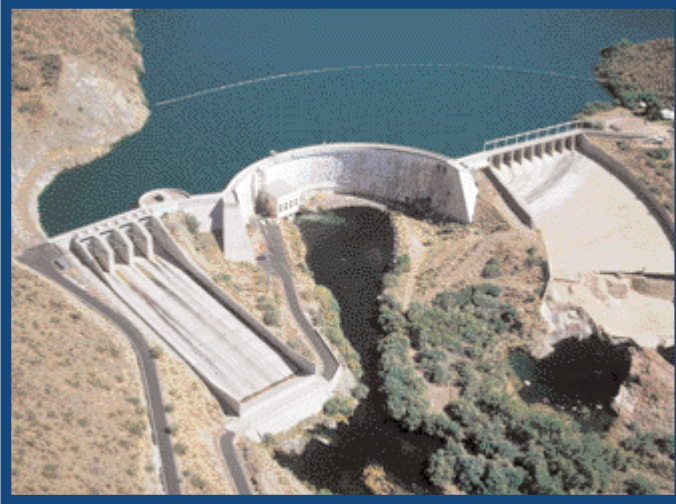
Construction continues on Indian distribution systems to allow the Gila River Indian Community, the Tohono O'odham Nation, and San Carlos Apache Tribe to accept delivery and fully utilize their CAP water allocations. PXA0 also works with the Yavapai Apache Nation, Tonto Apache Tribe, and Pascua Yaqui to ultimately enable them to utilize their CAP water in conjunction with their goals for water management. Construction also continues on a series of fish barriers, which are being constructed on Arizona streams to protect endangered or threatened native fish from invasive non-native species.



Gila River



Aerial view of CAP



Stewart Mountain Dam on the Salt River

PXAO is responsible for oversight of the operation and maintenance of the Salt River Project (SRP), one of the first Reclamation projects authorized in 1903. This project includes the historically significant Theodore Roosevelt Dam on the Salt River which celebrated 100 years of operation in 2010, as well as 1,200 miles of canals, three other dams on the Salt River with electrical generation capabilities, two dams on the Verde River, a diversion dam at the confluence of the two rivers. The C. C. Cragin Dam on East Clear Creek was transferred to federal ownership in 2005 as part of the Arizona Water Settlements Act - P.L. 108.

Indian Settlements. PXAO plays a key role in the continuing implementation of Indian Water Rights Settlements that contain an element of CAP water allocations. Previous settlements involving CAP entitlements include the Ak-Chin Indian Community, Tohono O’odham Nation, Salt River Pima-Maricopa Indian Community, Fort McDowell Yavapai Nation, San Carlos Apache Tribe, Yavapai-Prescott Indian Tribe, and Gila River Indian Community. Implementation activities for the Arizona Water Settlements Act and the 2010 White Mountain Apache Water Rights Settlement require Reclamation prepare construction schedules, environmental compliance, administration and oversight of disbursements from the Lower Colorado River Basin Development Fund.

While several tribes within PXAO’s area of responsibility have reached settlement, PXAO participates in the ongoing water rights negotiations for the combined Navajo-Hopi claims; the Yavapai Apache Tribe; the San Carlos Apache Tribe’s claims on the upper Gila River, and is involved in other Arizona tribal water rights settlement negotiations. PXAO employees also act as team members or chairs of several water rights settlement negotiation or implementation teams.

Program Development. PXAO works with the state, counties, cities, communities, Tribes and organizations to help them develop and manage their limited water resources. Currently, PXAO’s planning and technical assistance activities are focused on the state’s rapidly growing rural areas. PXAO conducts an extensive Water Conservation Field Services Program, involving agricultural, industrial and residential users, and also partners with local water users and universities on research efforts to manage and treat the salts (or Total Dissolved Solids) in SRP and CAP water, and in impaired groundwater, to allow the most efficient use and reuse of available water supplies.

Water Conservation: PXAO encourages and supports efficient water use in the arid Southwest, supporting water conservation efforts through the Water Conservation Field Services Program (WCFSP) and WaterSMART Challenge Grant program. The grants support conservation

planning efforts, implementation of conservation measures, the use of new technology and innovative techniques, and conservation training and education programs. They have helped water districts, communities, Native American Tribes and others throughout the Region accomplish their water conservation objectives.

Increasing Water Availability: While many Regional programs and projects focus on the Colorado River, PXAO also conducts or participates in other projects and programs designed to increase available water supplies in the Southwest. These include wastewater reclamation and reuse projects in all three lower basin states as well as one seawater desalination demonstration project and five brackish groundwater projects. These projects are developing water supplies that were not previously available and help conserve the Colorado River water supply.

Planning Investigations Program: LC Region offices work closely with partners on 50/50 cost-shared, long-range investigation/planning studies designed to meet critical water supply issues. This program is a critical part of PXAO work. The studies address and seek resolutions to issues rising from the competing demands on the lower Colorado River, and they help identify and address concerns about the availability, quality, and allocation of other water supplies. Many of the studies are designed to help state and local entities identify and develop cost-effective and reliable local water supplies, so they can become more self-reliant in addressing their existing and future water supply needs.

Environmental Programs: In Arizona, PXAO is constructing barriers on several streams to protect endangered native fish species. These barriers, required as mitigation for construction of the CAP, will ensure that non-native fish species that might be imported into Arizona by the CAP do not move upstream into areas where the native species live.

While many LC Region programs and projects focus on the Colorado River, PXAO also conducts or participates in other projects and programs designed to increase available water supplies in the Southwest.

Resources Management: The majority of PXAO constructed projects are transferred works whereby day-to-day management is performed by an operating organization, managing partner, or other government unit. We communicate and work closely with these cooperators who manage our project lands to ensure both contractual and regulatory requirements are carried out in the areas of land management, hazardous waste, pests and invasive species, cultural resources, fire management plans, and other related contractual management arrangements. Oversight includes ensuring compliance is occurring with requirements of the Americans with Disabilities Act (ADA) and the Native American Graves Protection and Repatriation Act (NAGPRA).

Recreation: In Arizona, recreational opportunities are provided on reservoirs, through unique canal-side developments, and on CAP flood retention basins providing venues for nationally recognized golf tournaments, horse shows and car auctions. Recreation facilities are operated and maintained through formal agreements with Reclamation partners. Additionally, soccer fields and Little League baseball fields that are accessible to children with disabilities were constructed on Reclamation lands in Phoenix. Planning and construction continues for a Regional trails system that uses CAP and SRP canal corridors and provides inter-connections with Lake Pleasant Regional Park.

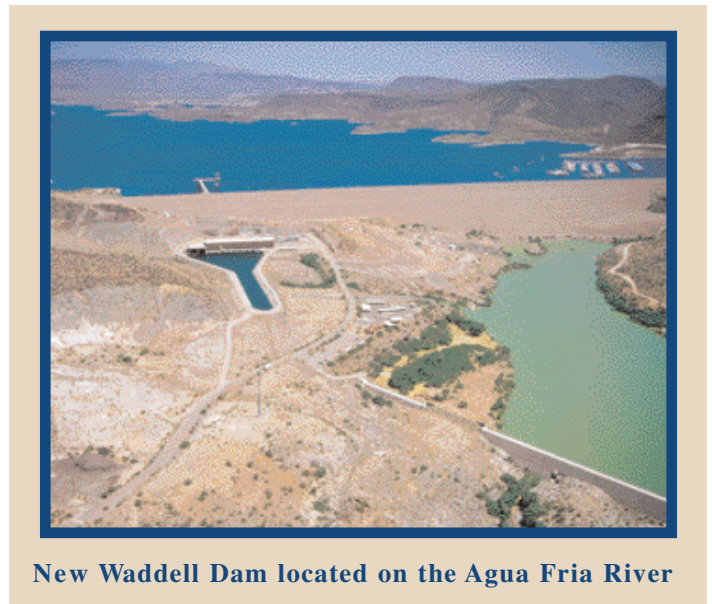
Program Details

Central Arizona Project: PXAO continues work on the construction of water distribution systems for several Native American tribes and on obligations required to mitigate the environmental impacts of construction of the CAP canal. The office oversees the project's long-term operation and maintenance, performed by the CAWCD, an entity created by the State of Arizona. PXAO works closely with the CAWCD to operate and maintain the project and repay the federal construction costs on many activities. PXAO, CAWCD, the City of Tucson and other interests in the effort to develop projects or alternative solutions that would ensure reliable delivery of CAP water to southern Arizona entities. Numerous issues, such as design and environmental compliance of features are being addressed.

Increasing Water Availability: PXAO participates in cooperative planning and investigative studies with Arizona communities and Native American tribes to help identify water resource needs and constraints, and develop water supply and management options and strategies. The Northern Arizona Investigations Program will identify and develop potential water supply and management strategies to address resource issues in the Little Colorado River Watershed and Colorado Plateau area in northern Arizona. Feasibility studies for the North Central Arizona Water Supply Study and the Mogollon Rim Water Supply Study under the Rural Water Program were initiated in FY 2011, and an appraisal level study for the Navajo Nation under the Rural Water Program was also begun.

Planning Investigations Program: PXAO produced an Environmental Impact Study and Feasibility Study for a recharge project in the Agua Fria River and completed the preliminary design of a pipeline and pump stations as part of the ongoing Phoenix Metropolitan Water Reclamation and Reuse Project Study. The study will help determine whether recharging reclaimed water into the aquifer underlying the metro area via a recharge project in the Agua Fria River would slow the decline in the groundwater table, reduce the demand for imported water, and provide a continuous and dependable supplemental source of water for this area.

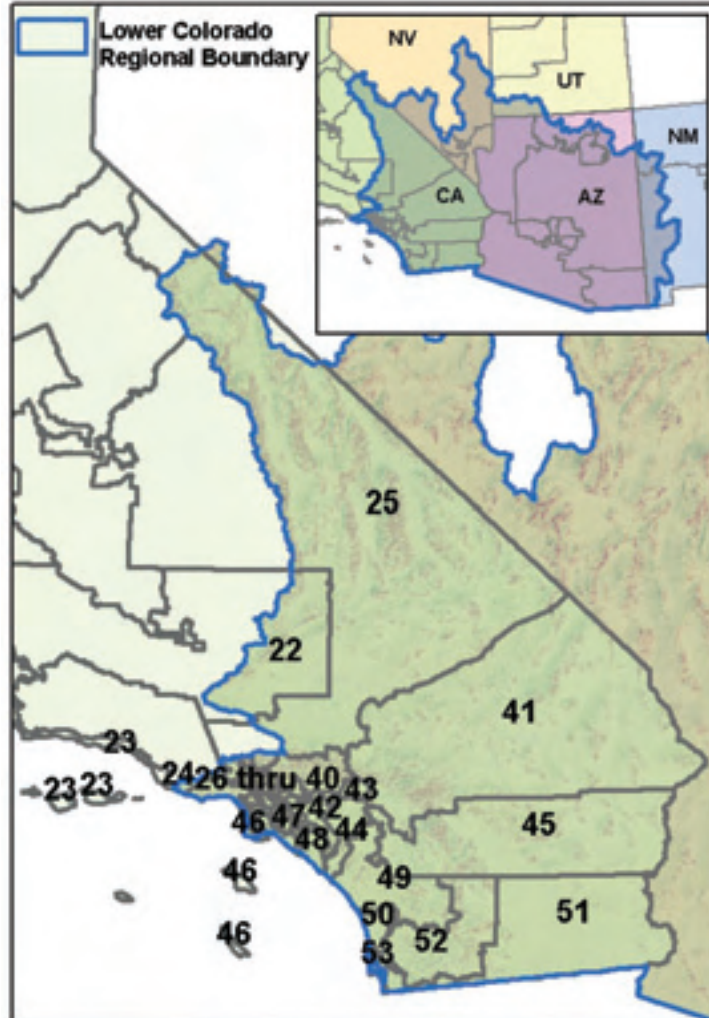
Multi-agency studies will help address concerns about future water availability and quality in central and southern Arizona. This program includes the Central Arizona Salinity Study, the East Valley Water Forum, the El Rio River Restoration Study, the Floodplain/Watershed Management Study, the Globe-Miami Water Study, the Mogollon Rim Water Resource Management Study, the Nogales Area Water Storage Study, the Pinal County Water Resources Study and the Verde River Water Resources Study.



New Waddell Dam located on the Agua Fria River

California

California Congressional Districts



Senators

Dianne Feinstein (D)
Barbara Boxer (D)

Representatives

Kevin McCarthy (R-22)
Lois Capps (D-23)
Elton Gallegly (R-24)
Howard McKeon (R-25)
David Dreier (R-26)
Brad Sherman (D-27)
Howard Berman (D-28)
Adam Schiff (D-29)
Henry Waxman (D-30)
Xavier Becerra (D-31)
Judy Chu (D-32)
Karen Bass (D-33)
Lucille Roybal-Allard (D-34)

Maxine Waters (D-35)
Jane Harman (D-36)
Laura Richardson (D-37)
Grace Napolitano (D-38)
Linda Sanchez (D-39)
Ed Royce (R-40)
Jerry Lewis (R-41)
Gary Miller (R-42)
Joe Baca (D-43)
Ken Calvert (R-44)
Mary Bono Mack (R-45)
Dana Rohrabacher (R-46)
Loretta Sanchez (D-47)

John Campbell (R-48)
Darrell Issa (R-49)
Brain Bilbray (R-50)
Bob Filner (D-51)
Duncan Hunter (R-52)
Susan Davis (D-53)

Southern California Area Office (SCAO)

Area of Responsibility: Located in Temecula, California, SCAO encompasses more than 56,000 square miles in nine southern California counties within the LC Region.

SCAO has 10 full-time employees that administer programs to develop or enhance water management throughout southern California in support of Reclamation's mission. There are five distinct programs: Title XVI Water Reclamation and Reuse including desalination research; Water Conservation Field Services; Technical Assistance to Native American Tribes; Water Resources Planning activities; and Drought Assistance.



Temecula, California

Program Summaries

Title XVI Water Reclamation and Reuse. Through Reclamation's Water Reclamation and Reuse Program, authorized by the Reclamation Wastewater and Groundwater Study and Facilities Act of 1992 (Title XVI of Public Law 102-575) as amended, SCAO participates with southern California entities to: investigate and identify opportunities for water reclamation and reuse of municipal, industrial, domestic, and agricultural wastewater, and naturally impaired ground and surface waters; design and construct demonstration and permanent facilities to reclaim and reuse wastewater; and conduct research, including desalting, for the reclamation of wastewater and naturally impaired ground and surface waters. Twenty-three of the 51 specific projects authorized by the amended Act are located in SCAO's area of responsibility. When all these projects are completed, they will produce over 500,000 acre-feet of reclaimed water annually.

Water Conservation Field Services Program (WCFSP). Southern California is an area with scarce water resources and a population that is increasing by nearly 280,000 people each year. Water conservation is essential to maintaining the quality of life and economy of this area. Through the WCFSP, SCAO provides technical and financial assistance to agricultural, municipal and industrial water users, local governments, universities, non-profit organizations, and Native American Tribes to promote and sustain the efficient use and conservation of water supplies. SCAO also administers financial assistance through WaterSMART, Challenge Grants, and CALFED/Bay Delta programs to qualifying agencies within its area of responsibility.

Native American Affairs. This program provides financial and technical assistance to some of the 31 Federally recognized Native American Tribes within SCAO's area of responsibility. Projects include wetlands restoration, irrigation facilities rehabilitation, exploration and treatment of deep ground water supplies, surveys and work associated with endangered species, general project planning, installation of ground water monitoring wells, development of water management plans, water assessment investigations, general water supply/quality investigations and technical assistance as needed.

Water Resources Planning. SCAO offers a wide range of water management resources and related technical services and helps address water issues in southern California by developing integrated and sustainable solutions to water problems from a regional perspective, and by providing local program advocacy. SCAO promotes the efficient use of water through different types of water and related resources planning investigations. They include: water conservation; reclamation reuse and recycling; water banking/water transfers; salinity management; seawater/brackish water desalination; brine concentrate disposal and management; drought planning; ground and surface water conjunctive use; river restoration; storm water augmentation and management; watershed modeling addressing both water quantity and quality; watershed/integrated resources plans and better basin management; groundwater recharge; and the development of new water sources.

Drought Assistance. Droughts differ from typical emergency events such as floods or forest fires, in that they occur slowly over a multiyear period. Drought impacts increase with the length of a drought, as carry-over supplies in reservoirs are depleted and water levels in groundwater basins decline. California continues to face drought conditions and numerous California communities are being forced to mandate water conservation or rationing. The lack of water has created other problems, such as extreme fire danger due to dry conditions, economic harm to urban and rural communities, loss of crops and the potential to degrade water quality in some regions. SCAO continues to work with the State, local government entities, and Tribes to address the development of drought plans and emergency drought assistance through technical and financial assistance.

Program Details

Water Conservation. SCAO has long encouraged and supported efficient water use in the arid Southwest, supporting water conservation efforts through the Water Conservation Field Services Program (WCFSP) and financial assistance through the WaterSMART, Challenge Grant, and CALFED programs. These programs award grants that support water conservation planning efforts, implementation of water conservation measures, the use of new or emerging technologies and innovative techniques, and conservation training and education programs. These programs help water districts, communities, Native American Tribes and others throughout the LC Region accomplish their water conservation objectives.

Increasing Water Availability. Many LC Region programs and projects are focused around the Colorado River, but SCAO also conducts or participates in other projects and programs designed to increase available water supplies in the Southwest. Title XVI Water Reclamation and Reuse is a viable authority to help with increasing water availability. Reclamation is involved in wastewater reclamation and reuse projects in all three lower basin states. SCAO has one seawater desalination demonstration project and five brackish groundwater projects on-going. These projects are developing new water supplies that have not previously been available for use, and helps stretch the Colorado River water supply.

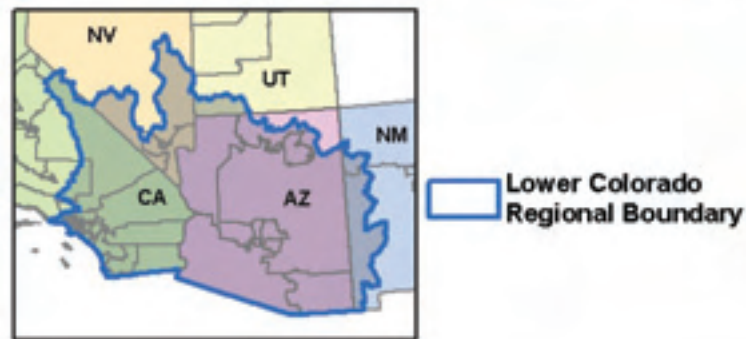
Water Resources Planning and Investigations Program. The LC Region and its three Area Offices work closely with study partners on a 50/50 cost-share basis. Water and related resources planning opportunities are specifically designed to meet critical water supply and demand, and address emerging issues like brine concentrate management. These studies address and seek solutions to water

problems that have arisen or may arise from competing and often conflicting uses of Colorado River water; and they identify and address concerns about the availability, quality, and allocation of other regional water supplies. These studies help state and local water agencies identify and develop cost-effective and reliable water supplies so they can become more self-reliant in addressing current and future water supply needs.

Water issues in the Southwest are growing, changing, and becoming more complex. These studies are a critical component to help the LC Region meet its mission. Over the next 25 years, each river basin within the Region will face critical water supply challenges. SCAO is working closely with water agencies to reduce the likelihood of more demand being made on the already over-appropriated Colorado River system; and to address other water supplies that are the basis of existing Reclamation projects. Water resources planning efforts continue to address impacts on local and regional water supply and demand and quality in Southern California now and in the future.

Nevada

Nevada Congressional Districts



Senators

Harry Reid (D)
Dean Heller (R)

Representatives

Shelley Berkley (D-1)
Vacant (R-2)
Joe Heck (R-3)

Lower Colorado Dams Office (LCDO)

Area of Responsibility: The LCDO consists of Hoover, Davis, and Parker Dams and their associated powerplants and appurtenant facilities on the lower Colorado River. Hoover Dam, about seven miles east of Boulder City, is the administrative headquarters for the LCDO.

With a total of about 253 full-time employees, the LCDO manages, operates, and maintains these facilities to reliably and efficiently deliver Colorado River water and hydroelectric power to its customers. LCDO also provides Hoover Dam visitors, who come from all over the world, an educational and entertaining tour experience.



Program Summaries

Water and Power: Completed in 1935, 1953, and 1938, respectively, Hoover, Davis and Parker dams were essential to the initial economic growth of the Southwest, and help sustain that growth today. Through coordinated operations, they annually deliver an average of 7.5 million acre-feet of Colorado River water to urban and agricultural water users including Indian Tribes in Arizona, Nevada, and



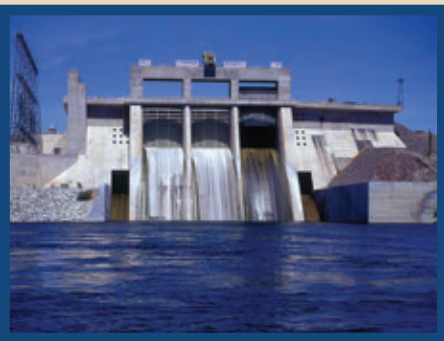
Aerial view of Hoover Dam and Lake Mead

California, and 1.5 million acre-feet of water to Mexico insatisfaction of a 1944 Treaty. The dams also protect downstream communities from floods and cumulatively generate about 5.5 million kilowatt-hours of electricity that is distributed to the three states.

Recreation and Resource Management:

Hoover Dam's reservoir, Lake Mead, and Davis Dam's reservoir, Lake Mohave, are the centerpieces of the Lake Mead National Recreation Area, the nation's first national recreation area. These and other reservoirs and controlled stretches of water on the lower Colorado River provide year-round recreational opportunities enjoyed by millions of people as well as important habitat for several

species of fish, wildlife, and birds. The LCDO also operates the Hoover Dam Visitor Center providing a variety of educational, historical and entertaining displays and tours for visitors from all over the world.



Davis Dam

Security and Law Enforcement

At Hoover Dam, Reclamation's only police force provides security and law enforcement services for the dam and an approximately 22 square-mile security zone. Hoover Dam police enforce federal and state laws and regulations in the security zone; help local and federal law enforcement agencies with various

assignments; protect employees and visitors from physical harm; and perform the many other tasks required to protect one of America's National Critical Infrastructure sites.

Davis and Parker dams are monitored by contract security forces on a 24/7 basis. Law enforcement at these facilities is provided by local and federal law enforcement agencies. Hoover, Davis, and Parker dams are all monitored 24/7 with an electronic access control and surveillance system (EACSS), the Hoover Dam Command Center. The EACSS incorporates CCTV with electronic access control to monitor and assess activities throughout the facilities. The Hoover Dam Command Center also serves as the 24/7 Duty Officer for reporting of suspicious activity, serious injuries, deaths, and other unusual events that may happen at any of Reclamation's offices, lands, or facilities.

Program Details

Environmental Programs: Quagga mussels, discovered in Lake Mead in January 2007, can colonize water pipes, gates, valves, and other types of physical infrastructure to the point of completely disrupting and potentially even stopping water delivery, power generation or other operations. Infestations also disrupt ecosystems and negatively impact recreation. The LC Region consults and

collaborates with other Reclamation offices, state agencies, other federal agencies, private industry, and other natural resource management agencies to identify and implement measures to prevent or control mussel infestations that would adversely affect our facilities or other facilities in the LC Region and across the West.

During Water Year 2010 (October 1, 2009 – September 30, 2010), Hoover, Davis, and Parker Dams generated a total of 5,381.7 million kilowatt-hours of hydroelectric power.

Hydroelectric Power: The electricity generated at Hoover, Davis, and Parker Dams is an important resource for the Arizona, California, and Nevada entities that have contracts for this power, and they are fully engaged in the management of these facilities. During Water Year 2010 (October 1, 2009 – September 30, 2010), Hoover, Davis, and Parker Dams generated a total of 5,381.7 million kilowatt-hours of energy.

- **Facility Capacity Enhancement:** Currently, Reclamation is implementing a capacity improvement program that was initiated in 2005. This program's focus is to increase water flow thru turbines to the extent possible when Lake Mead drops 55 feet or more below its full operating elevation of 1219.6 feet above mean sea level. To accomplish this, original turbine wicket gates on some generating units are being replaced with new stainless steel gates that allow more water to reach the turbine even under the reduced water pressures experienced at lower lake levels. On other units, mechanical changes to the wicket gate system allow the existing gates to open wider.
- When this program began, Hoover Dam's maximum rated generating capacity of 2,074 megawatts (MW) for the 17 commercial generating units had fallen to approximately 1,700 MW because of the reduced water pressure resulting from the lower water level in Lake Mead. By the end of FY10, these improvements had recovered 93 MWs of that lost capacity. After the program is completed in 2012, it is anticipated that more than 100 MW of capacity will have been recovered for use when Lake Mead is at these lower elevations. This program does not change Hoover Dam's maximum rated capacity.
- **Facility Efficiency:** The LCDO is implementing an efficiency improvement program by completely refurbishing the turbine components at each individual generating unit. This refurbishment improves a unit's efficiency by three to four percent and reduces the amount of water leaking through the unit when the turbine is shut down.
- **Facility Modernization:** A \$17 million project initiated in FY07 to replace the original analog controls on the 26 generating units at Hoover, Davis, and Parker Dams with new digital control equipment is scheduled for completion in 2012. Among other benefits, this program allows the units to go from a non-generating mode to full generation in about one-third the amount of time previously required. Ultimately, it also will reduce the number of hours the units are operated at low, inefficient loads.
- **Collaboration:** LCDO meets regularly with its power contractors and with the power marketing agency Western Area Power Administration to discuss maintenance plans and needs, projected operation and maintenance costs funded by the contractors, and other activities.

This collaborative partnership benefits Reclamation and the customers by providing transparency to our operations and strong communication about both Reclamation and customer goals and objectives.

- **Regulatory Compliance:** The hydroelectric power plants operated by LCDO comply with the mandatory reliability standards developed by the North American Electric Reliability Corporation (NERC) in accordance with section 1211 of the U.S. Energy Policy Act of 2005. The facilities are assessed annually to ensure they are in compliance or identify what corrective action is needed to bring them into compliance. The LCDO also helped create a Reclamation-wide compliance working group, and form a Reclamation-wide permanent management compliance team. This team provides the structure, accountability, communication, and oversight necessary to show Reclamation is meeting or exceeding these standards.



Monitoring of mussels

Invasive Species: As a high priority component of Reclamation's Science & Technology (S&T) Program since 2008, Reclamation has focused invasive mussel research activities on improving early detection methods; identifying, developing, demonstrating, and implementing facilities protection technologies and strategies; and assessing ecological impacts. Through efforts between Reclamation's Research & Development Office, Lower Colorado Regional personnel, and Technical Service Center (TSC), researchers are engaged in a number of mussel-related research activities including:

- **Improvements in quagga monitoring and detection:** In collaboration with MWD, Reclamation researchers are investigating the potential of isolating and producing primary antibodies to improve detection of mussel larvae and explore the potential for other uses in controlling mussels. Under a Cooperative Research and Development Agreement (CRADA) with Fluid Imaging Technologies, Reclamation has also been actively involved in identifying improvements for automated mussel detection in water samples using FlowCAM® technology. Reclamation also recently provided MWD with Golden Mussel samples for DNA sequencing to assist in the development of future screening capability for this species.
- **Facilities Coatings testing:** Since 2007, Reclamation researchers have conducted ongoing field testing of various commercially available coatings at Reclamation's Parker Dam. Results to date have identified certain coatings systems that inhibit mussel fouling. However, durability in those cases remains low. Reclamation researchers are working to further identify and develop durable coatings solutions with the desired anti-fouling or foul release performance features.
- **Development of Zequanox:** Under a CRADA with Marrone Bio Innovations (MBI), a promising environmentally friendly treatment product derived from dead *Pseudomonas fluorescens* bacteria has been further developed through extensive testing at Reclamation's Davis Dam. Results to date have shown efficacy in closed-system trials. Reclamation has received approval from the Environmental Protection Agency (EPA) for a permit to use

Zequanox at impacted Reclamation facilities along the lower reaches of the Colorado River. The NEPA process is completed for the treatment of a cooling water subsystem at Reclamation's Davis Dam. The testing began in July 2011.

- **Facility Vulnerability Assessments:** To further assist Reclamation's Regional, Area, and Project Offices as well as managing partners including the U.S. Army Corps of Engineers, staff from Reclamation's TSC and Lower Colorado Region will conduct more than 75 facility vulnerability assessments throughout the western United States by the end of 2011. This effort, in conjunction with early detection, is geared toward providing site-specific information on potential mussel-related impacts to key facility features and will assist project management and staff in anticipating and planning for those impacts if a future infestation occurs.
- **Collaboration and Outreach:** Reclamation is continuing to explore collaboration opportunities with federal and state agencies, private industry, and academia to identify, evaluate, develop, and implement new mussel management and control technologies and strategies. In addition to recently hosting the 17th International Conference on Aquatic Invasive Species in San Diego, CA and the 2009 Western Invasive Mussel Management Workshop in Las Vegas, NV, Reclamation plans to pursue future technical exchange forums with our managing partners and the scientific community.



Hoover Dam Visitor Center

Recreation: The LCDO manages the Hoover Dam visitor program. This program is largely self-supporting, using visitor fees, parking fees and other revenue it generates to pay program operation, maintenance and repair/replacement costs, as well as a portion of the repayment obligation for construction of the visitor facilities. Hoover hosts approximately 850,000 visitors annually.

FY10 and FY11 Accomplishments at Parker Dam

FY 2010 Projects

- A variety of quagga mussel activities.
- Powerplant rehabilitation of Unit 4.
- Unit 4: Install new protective relay panels.



Parker Dam

Unit 4: Rebuild eight generator stator coolers.

Unit 4: Replace thrust bearing oil cooler.

Unit 4: Rebuild 16" penstock drain valve.

Unit 4: Install new governor, and rebuild governor oil pumps and motors.

- Rehabilitate the DC Distribution system within the powerplant.
- Replace the station battery.
- Replace the station UPS System.
- Install upstream security boom.

FY 2011 Projects

- Continue a variety of quagga mussel activities.
- Rehabilitate the 240-VAC system.
- Begin to rehabilitate the 480-VAC system.
- Design and install an emergency generator to support the powerplant
- Install Unit Control Modernization on the generating units
- Design and begin installation of a trash rack cleaning system.
- Begin the design and installation of the 6.9-KV Station Service Switch Gear.

FY10 and FY11 Accomplishments at Davis Dam

- Unit 5 Governor Pump and PMG refurbishment completed a 5-year project to refurbish all 5 generator governor units
- Started 4-year project refurbishment of generator air coolers. Unit 5 air cooler water boxes and covers were repaired, tube sheets repaired or replaced, and tubes replaced.
- Installed new DC Breakers system for Unit 5 Generator Control.
- Installed new Unit Control Cabinets for all generating units in preparation of FY11 UCM.
- Multi-year project started to rehabilitate radial arm gates.
- Project consists of sand blasting, recoating and seal replacement.
- Replaced a bucket truck with a better suited aerial reach platform. This equipment assists in the continued maintenance of the Dam.
- Arc Flash analysis was completed and plan implemented.
- Research and development continued in quagga mussel testing. Testing of a compound produced by a common bacterium was conducted to help determine if it is lethal to quagga mussels. Testing has taken place throughout the year.
- Filters were installed on Units 1 and 5 turbine pit cooling water lines to mitigate the quagga infestation problem.

FY11 to Date Accomplishments at Davis Dam

- Final installation and commissioning of Unit Control Modernization project for all 5 Davis Generating Units.
- Installed new DC Breakers system for Units 1-4 Generator Control.
- Filters installed on Units 2, 3 and 4 turbine pit cooling water lines to mitigate the quagga infestation problem.

- Continued 4-year project refurbishment of generator air coolers. Unit 4 air cooler water boxes and covers were repaired, tube sheets repaired or replaced and tubes replaced.
- Continued multi-year project rehabilitating arm gates. Project consists of sand blasting, recoating and seal replacement.
- Installation of testing equipment on Unit 3 generator in preparation of July 2011 Zequanox treatment of generator cooling water.
- Replacement of old forebay buoy line for increased security of critical assets.