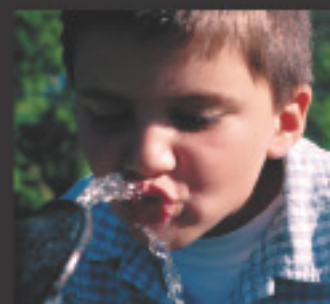


The Colorado River Basin Salinity Control Program



*A cooperative effort between
Colorado River Basin water users
Colorado River Basin Salinity Control Forum
United States Department of Agriculture
Natural Resources Conservation Service
United States Department of Interior
Bureau of Reclamation
Bureau of Land Management*

The Colorado River Basin

The Colorado River is the primary source of *domestic water supply* for some 27 million people in the seven Colorado River Basin states. It also provides irrigation water for more than 3.5 million acres of farmland within the basin and hundreds of thousands more acres outside the basin. In addition, the United States is *required by the Mexican Water Treaty of 1944* to annually deliver 1.5 million acre-feet of water. Near its headwaters in the Rocky Mountains, the salinity concentration of the Colorado River is typically 50 parts per million or less.

About one half of the salinity in the river comes from natural sources and the other half comes from human uses of the water and activities near the river. At Hoover Dam, the river delivers about 9 million tons of dissolved salts per year. At Lake Havasu, from which water is diverted to the southern California coastal plain and to central Arizona, the concentration of salt results in impacts to residential, commercial, industrial, and agricultural water users. It also impacts groundwater and recycled water resources; and utility distribution systems. Upon reaching the last diversion point in the U.S. at Imperial Dam, the concentration of salt decreases crop yields and increases water treatment costs.

Current economic damages in the lower basin states are about \$330 million per year. The quality of water in the Colorado River is therefore critical to the economics of small communities and large cities in both the U.S and Mexico.



The Colorado River Basin Salinity Control Program

The Program reduces salinity by preventing salts from dissolving and mixing with the River's flow. Irrigation improvements and vegetation management reduce water available to transport salts vertically, laterally and on the soil surface. Point sources, such as saline springs are also controlled. A long term, interstate and interagency public/private partnership effort is being carried out to reduce the amount of salts in the River and its associated impacts in the Basin.

The Environmental Protection Agency (EPA) required development of water quality standards for salinity in the Colorado River in 1972.

The Basin states formed the Colorado River Basin Salinity Control Forum (Forum) in 1973 to develop these standards including numeric salinity criteria and a basin-wide plan of implementation for salinity control which EPA subsequently approved.

In 1974, Congress enacted the Colorado River Basin Salinity Control Act with subsequent amendments. This authorized the construction, operation, and maintenance of salinity control works in the Colorado River Basin. Title I of the Act addresses the U.S.' commitments to Mexico established by agreement of the International Boundary and Water Commission, United States and Mexico. This agreement addressed the quality of water deliveries to Mexico pursuant to the Mexican Water Treaty of 1944. Title II of the Act created the Colorado River Basin Salinity Control Program and directed the U.S. Department of the Interior (USDI) and the U.S. Department of Agriculture (USDA) manage the River's salinity, including salinity contributed from public lands. The law directed that preference be given to those projects which are the most cost-effective – that is, obtaining the greatest reduction in salinity concentration per dollar spent.

A partnering effort

The Colorado River Basin Salinity Control Program is a partnership effort between agriculture producers, federal agencies and the seven Colorado River Basin states, Colorado River water users in each of the States and the Forum. Collectively, the programs are reducing the amount of salt in the River while water uses continue to increase.

The Forum

The Colorado River Basin Salinity Control Forum provides important interstate and interagency coordination and guidance for the Program and the combined efforts of the federal agencies and states. The Governor of each of the seven Colorado River Basin states appoints up to three Forum members.

Basin States

Funds are collected and used to provide the 30 percent up-front cost share contributed by the Basin states for the Bureau of Reclamation and USDA programs.



Improved irrigation systems reduce the amount of leaching in the soil. This reduces the amount of salt that moves through the soil, into the water table. Less salt moving through the soil, means less salt will end up in the Colorado River system.

USDA Natural Resources Conservation Service

USDA provides financial cost-sharing assistance to agriculture producers who voluntarily implement land management and irrigation practices that reduce salt loading. Agriculture producers participating in these efforts are provided incentive payments but are required to contribute at least 25 percent of the cost of the measures installed to reduce salt loading. The USDA Natural Resources Conservation Service (NRCS) also provides technical assistance to producers to plan, design and install more efficient irrigation systems and to implement other land management practices. Improved irrigation systems result in more efficient water use and reduce the movement of salt from saline shale deposits that underlie the soil throughout the Colorado River Plateau. Therefore, less salt ends up in the Colorado River system.

USDI Bureau of Reclamation

The Bureau of Reclamation constructed several types of salinity control projects under authorities provided in the 1974 Act and its 1984 amendments. Reclamation and the Forum in 1994 concluded that the existing approaches were limiting salinity control opportunities. In 1995, the Act was amended to authorize an entirely new way of implementing salinity control, known as Reclamation's Basinwide Salinity Control Program. This new program initiated competition for funding through a public proposal solicitation process and has greatly reduced the cost of salinity control measures accomplished by Reclamation-funded projects. The 1995 Program was authorized to spend \$75 million. In recognition of the merits of the Basinwide program approach, in 2000 the Congress authorized an additional \$100 million of appropriations. Many of the Basinwide program measures have reduced canal seepage, all of which allows less salt to find its way to the River.

USDI Bureau of Land Management

The Bureau of Land Management (BLM) was directed by Congress in the 1984 amendments to the Salinity Control Act to implement a comprehensive program to reduce salt loading to the Colorado River System. Nearly 40 percent of the Basin area is public lands administered by BLM. Salt retention is achieved through efforts to: minimize the impacts of grazing, protect riparian areas, reduce off-road vehicle impacts, conduct prescribed burns, plug orphaned wells, and generally manage vegetative cover and reduce erosion on public lands. In Utah and Colorado for example, salt controls have been created by establishing riparian pasture and off-channel livestock watering practices.

Through better use of land and water resources, there are many additional opportunities for the BLM to reduce salt delivery to the River.

What has been done so far

The Forum estimates that the combined efforts of the salinity control program have resulted in the control of 772,627 tons of salt per year, or 65 mg/L. That salt reduction results in reduced damages of about \$88 million/year.

About 50 percent of targeted salinity control had been accomplished by the year 2000. The plan of implementation calls for the control of the remaining amounts of targeted salt over the next two decades.

Agency	Reduction in salt tons/year as of 2000
Bureau of Reclamation	431,750
Natural Resources Conservation Service	290,677
Bureau of Land Management	50,200
Total	772,627

Who benefits

Urban and agriculture water users in the Basin states gain direct benefits from the program. This includes home and business owners in the Los Angeles, San Diego, Las Vegas, Phoenix, and Tucson metropolitan areas who have a great impact on the local and national economy.

Reduced salinity in Colorado River water helps:

- reduce corrosion of plumbing fixtures and water-using appliances.
- improve the quality of wastewater discharge and meet permit requirements.
- reduce the costs of providing a very high quality of water for commercial and industrial processes.
- improve agricultural productivity and water efficiency.
- allow water to be used multiple times.
- the U.S. government meet its obligations to Mexico.
- lengthen the life of utility treatment facilities and pipelines.

What is needed

While much progress has been made through the combined efforts of the Basin States and the involved federal agencies, much more remains to be accomplished in reducing the salt loading in the River. Areas to address include:

- **Funding** to construct, operate and maintain salinity control projects that will continue to reduce the salt load.
- Increased efforts to **educate** water users and other beneficiaries about the salinity control program and the resulting benefits.
- A long term **commitment** by all the Program partners to control salinity for sustained use of the River.

For more information online, go to:

www.uc.usbr.gov/progact/salinity/index.html

