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Municipal Deliveries of Colorado River Basin Water

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Cover Photo: Aerial view of the Whitsett Pumping Plant, Courtesy © The Metropolitan Water District of Southern California

Note – this 8/21/2011 revision corrects: population data for the City of Westminster, water delivery data for Denver Water, GPCD calculations for Grand Valley, CO (Grand Junction), and 2005 Colorado River deliveries for San Luís Río Colorado, Mexico.

About the Pacific Institute

The Pacific Institute is one of the world's leading independent nonprofits conducting research and education to create a healthier planet and sustainable communities. Based in Oakland, California, with an office in Boulder, Colorado, we conduct interdisciplinary research and partner with stakeholders to produce solutions that advance environmental protection, economic development, and social equity—in California, nationally, and internationally. We work to change policy and find real-world solutions to problems like water shortages, habitat destruction, global warming, and environmental injustice. Since our founding in 1987, the Pacific Institute has become a locus for independent, innovative thinking that cuts across traditional areas of study, helping us make connections and bring opposing groups together. The result is effective, actionable solutions addressing issues in the fields of freshwater resources, climate change, environmental justice, and globalization. More information about the Institute and our staff, directors, funders, and programs can be found at www.pacinst.org.

This report is available online at no charge at http://www.pacinst.org/reports/co_river_municipal_deliveries/. Also posted at this website is the spreadsheet compiling water use and population data and calculating per capita use rates. The spreadsheet also lists the sources for the data used in this report.

About the Author

Michael Cohen is a senior research associate at the Pacific Institute and is based in Boulder, Colorado. He is the lead author of several Institute reports and the co-author of several journal articles on water and the environment in the border region.

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Executive Summary

The iconic Colorado River supplies water to millions of people in fast-growing cities in the Colorado River's watershed, such as Las Vegas, Mexicali, Phoenix, and St. George, Utah (see Figure ES-1 at the end of the Executive Summary). Tens of millions of people outside the watershed, from Denver to Albuquerque and from Salt Lake City to Los Angeles, San Diego, and Tijuana, also receive water exported from the basin to meet at least some of their residential and commercial water needs. More than half of the people receiving water from the basin live in southern California. In fact, about 70 percent of the people that receive water from the basin do not actually live in the basin. This study reports population and water delivery data and trends for 100 cities and water agencies that use Colorado River basin water, compiling such information for the first time in one location.

These municipal deliveries – which include deliveries to the residential, commercial, industrial, and institutional sectors, as well as some landscape irrigation, but do not include deliveries to agriculture, energy producers, or mining – comprise only about 15 percent of total Colorado River use (agriculture uses more than 70 percent). However, municipal deliveries are the fastest-growing sector, driving demands for additional water supplies, placing pressure on a river system that is over-allocated and facing a supply-demand imbalance, as well as the prospect of long-term declines in run-off due to climate change.

The number of people relying at least in part on water from the Colorado River basin increased by roughly 10 million people from 1990 to 2008, to a total of almost 35 million. Much of this increase occurred in areas experiencing extraordinary population growth: several cities in Arizona and Utah more than tripled in population between 1990 and 2008. The Las Vegas metropolitan area added upwards of a million people, more than doubling in size. Tijuana also roughly doubled in size, adding more than 800,000 people reliant on Colorado River water for an estimated 90 percent of their water supply.

Total water deliveries by these 100 agencies increased from about 6.1 million acre-feet in 1990 to about 6.7 million acre-feet in 2008. The volume of Colorado River basin water deliveries by these agencies also increased by about 0.6 million acre-feet over this period, from 2.8 million acre-feet to 3.4 million acre-feet, rising from 46 percent to 51 percent of total deliveries. The agencies delivering water in southern California actually delivered four percent less water in 2008 than they had in 1990, despite delivering water to almost 3.6 million more people. In fact, 29 water agencies in five different states delivered less water in 2008 than they had in 1990, despite population growth in their service areas.

Almost every one of the water agencies included in the study experienced declines in per capita deliveries from 1990 to 2008. People and business are demanding less water than they did in 1990. This report does not attempt to determine the causes of these declines, but it does quantify these changes over time, giving a picture of trends for municipal water providers. The majority of people receiving water from the Colorado River basin live in areas where per capita deliveries dropped an average of at least one percent per year from 1990 to 2008, generating substantial long-term declines. Many of these areas showed substantial reductions in per capita deliveries

from delivery rates that were already much lower than average for the 100 agencies; it was not just the high per-capita-use agencies that demonstrated large reductions in per capita deliveries. Because of these substantial per capita declines, municipal water deliveries were roughly two million acre-feet lower than they would have been had per capita deliveries remained constant from 1990 to 2008.

Nine agencies' per capita deliveries actually increased from 1990 to 2008, though these agencies provide water to only about two percent of the total population receiving water from the basin. If the water agencies in this study had all experienced per capita declines of at least one percent, total deliveries would have increased by about 300,000 acre-feet, only half as much as the actual increase in municipal deliveries by these agencies. While small in comparison with the two million acre-foot reduction already achieved, 300,000 acre-feet is still a sizeable volume of deliveries that could have been avoided if the agencies with less than one percent average annual per capita reductions had been more efficient.

Total municipal water deliveries by agencies delivering water from the Colorado River basin increased by more than 600,000 acre-feet between 1990 and 2008, taking water from a basin that faces a future challenged by diminished supply and continued population growth. Yet the water delivery trends of many of these water agencies offer a route forward, where growth can be accommodated within existing supplies and total demands on the basin actually decline over time. The large number of water agencies from many parts of the Colorado River basin states and Mexico that have already achieved substantial declines in per capita deliveries demonstrate what increased water efficiency and conservation can accomplish and should encourage the less successful agencies to promote conservation and efficiency more aggressively in their own service areas.

Figure ES-1. The Colorado River Basin and Service Areas of Agencies Delivering Colorado River water[1]

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Abbreviations and Acronyms

ADWR	Arizona Department of Water Resources
AF	acre-feet
CO R	Colorado River
CRWUA	Colorado River Water Users Association
GPCD	gallons per capita per day
IID	Imperial Irrigation District
Metropolitan	The Metropolitan Water District of Southern California
MWD	Municipal Water District
Reclamation	Bureau of Reclamation
SDCWA	San Diego County Water Authority
SNWA	Southern Nevada Water Authority