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"An independent, scientific voice for the future of the Colorado River"

THE CASE FOR CONSERVATION

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As we approach the summer of 2015, unprecedented water shortages in California and record low storage volumes in Lake Mead are grabbing the headlines, as the combined impact of drought and high water demands focus national attention on the topic of water scarcity. More and more, the people of the Southwest are asking tough questions about how best to manage and save increasingly valued supplies, and how to ward off a looming Colorado River crisis.

These questions are central to the work of the Colorado River Research Group, who recently concluded that overall water consumption in the basin needed to be reduced, a conclusion running counter to every growth scenario considered in the Colorado River Basin Water Supply and Demand Study and to the usual rhetoric of western water managers.[1] Our conclusion was backed by a sobering comparison of supplies and demands, and the observation that, even without the current drought, annual depletions now exceed reliable annual supplies—something only made possible in the short-term by drawing down reservoirs and groundwater reserves.

But that was only part of our reasoning. The other, ultimately more compelling, argument for reduced consumption is that leaving more water in rivers, reservoirs, and aquifers offers a broad suite of benefits, including drought protection, increased hydropower generation, enhanced environmental flows, recreation opportunities, and reduced legal and political tensions. In previous eras, promoting water development and consumption was generally accepted as the route to regional prosperity, but today, reducing consumption promises a more reliable and cost-effective way to accommodate growth, expand our economy, protect our quality of life, satisfy environmental needs, and meet our national obligations to Mexico and the tribes.

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By embracing this modern era of demand management with the same passion, ingenuity, and brashness once applied to water development, management of the Colorado River can again be the envy of the world. So what, exactly, do we need to be doing? Two pathways immediately come to mind:

1. Aggressively pursue municipal conservation to minimize or completely offset additional consumptive uses associated with new population growth.

2. Utilize incentive-based mechanisms to conserve and shift modest amounts of water out of irrigated agriculture without compromising the economic and social viability of rural communities.

Compared to the alternatives, these approaches are practical, low-risk, and high-reward, and should form the foundation of future management efforts.

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[1] "*The First Step in Repairing the Colorado River's Broken Water Budget,*" www.coloradoriverresearchgroup.org. Basin Study demand estimates are at www.usbr.gov/lc/region/programs/crbstudy/finalreport/techrptC.html.

The Unfolding Success Story of Municipal and Industrial Conservation

For all the bad news about water and water management in the West, there is one shining success story: municipal and industrial (M&I) water conservation. Given that each municipal water agency is its own independent organization, there's a tremendous variety of experiences and track records out there, and the way that each provider calculates use (and savings) varies and is difficult to verify; so our generalizations carry those caveats. But on balance, the story unfolding in many of the major cities served by the Colorado is that water consumption has not appreciably increased during the last several decades, despite the region leading the nation in population growth. The media has taken note:

- The *New York Times* notes that Los Angeles consumes less water today than in 1970, despite adding roughly 1.1 million new residents.[2]
- In a special report for the *Arizona Republic*, reduced water use in Los Angeles, Phoenix, Las Vegas and other southwestern cities is highlighted. Perhaps most notable: Las Vegas residents reduced consumption by nearly a third in a 12-year period that saw its population grow by 25 percent.[3]
- The *Denver Post* reports that city residents this winter (2014-2015) are demanding less water than in 1973-1974, despite a population increase of 350,000 people.[4]
- The *Albuquerque Journal* notes that total water deliveries in the city have been dropping since 1989, and are now the lowest since 1983 despite a 70 percent increase in population.[5]

Further evidence comes from the M&I Water Conservation and Reuse workgroup, one of the "next steps" (now known as "Moving Forward") efforts coming out of the Basin Study process.[6] To date, that workgroup has focused on documenting the effectiveness of past and planned conservation efforts in the major metropolitan areas serving over 29 million residents—more than 85 percent of all municipal water users served by the Colorado. Preliminary findings suggest conservation and re-use programs active since 1990 have reduced 2010 M&I demand levels by nearly 2.4 million acre-feet/year.

On the downside, this level of water demand savings was sufficient only in "partially attenuating the effect of population growth on M&I water use." And in the next two decades (2010 to 2030), the workgroup suggests a much more tempered estimate of potential savings: roughly 700,000 acre-feet/year. While it's true that conservation can become increasingly difficult as the most egregious wastes of water are eliminated first, we suspect that this modest savings projection—just like previous M&I demand estimates in the basin—is heavily influenced by the risk-aversive nature of water providers who understand it's much safer for them to over-estimate (than under-estimate) demand. It also, in part, reflects a sentiment that the M&I sector is already pulling its weight, and that further savings should also come from agriculture. Regardless, there's no shortage of options for maintaining and building upon past progress, and a goal of meeting all future M&I demands through conservation, while impractical in some areas, seems like a reasonable regional objective.

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[2] Jacques Leslie, "Los Angeles, City of Water," New York Times, 12/7/2014, SR1.
[3] Brandon Loomis and Mark Henle, "As the River Runs Dry: The Southwest water crisis," Arizona Republic, 2/27/2015.
[4] Bruce Finley, "Denver water use dips to 40-year low," Denver Post, 2/10/2015.
[5] John Fleck, "Total ABQ water use lowest in 30 years," Albuquerque Journal, 1/11/2014.
[6] "*Chapter 3: Municipal and Industrial Water Conservation and Reuse*." May, 2015. Specific statistics and quotes attributed to this chapter are taken from pages 3-5, 3-24, 3-32 and 3-51. The Moving Forward Phase 1 report is at: http://www.usbr.gov/lc/region/programs/crbstudy/MovingForward/Phase1Report/fullreport.pdf

Agricultural Water Conservation and Transfers

Parallel to the workgroup focused on M&I Conservation and Reuse, an agricultural team has been examining similar concerns under a name that reflects the diversity of issues and perspectives implicated: the Agricultural Conservation, Productivity, and Water Transfers workgroup. The deliberations of that group have reminded us that saving water in agricultural settings is a much more complicated subject than M&I conservation, but given that agriculture is the largest water using sector, it is a subject in need of much more thoughtful and informed discussions. In fact, of all the Colorado River issues that deserve greater attention, the future of agriculture is perhaps the most salient. For now, we'll merely focus on some larger issues and trends that can frame a larger discussion.

The subject of agricultural water demand management features two threads that differ greatly in salient technical, legal, and cultural dimensions. The first describes efforts to make agricultural water use more efficient—i.e., using existing water supplies to achieve higher yields and profits. The second pertains to strategies for reducing net consumption in agriculture, with the acknowledgement that such waters would then be made available through market mechanisms for urban or environmental uses. Progress of this first kind is impressive: the workgroup estimates that agricultural productivity basin-wide has climbed roughly 25 percent since 1980, while consumption has been stable at roughly 8 million acre-feet/year. Collectively, efforts are thought to have "saved" nearly 1 million acre-feet/year in avoided consumption.[7] This is not new water added back to the system, but much like the hypothetical (but seemingly pretty typical) southwestern city that accommodates a 25 percent increase in residents without a change in consumption, it is significant.

But moving forward, the challenge will be to achieve net reductions in agricultural consumption, with at least some of that water made available for transfer to M&I users and to the natural environment.[8] This is a very different challenge, in that it raises some difficult legal and administrative issues about ownership and control of "saved" water, as well as troubling political, economic and social concerns about potential impacts to agriculture and rural communities. The hesitancy of the agricultural sector to talk about water transfers is appreciated, but like it or not, the vastly higher economic values of water in M&I uses versus agricultural uses, combined with the increasingly fragile regional water budget, ensure that—absent any deliberate intervention—some water will almost certainly move from farms to cities; to suggest otherwise is unrealistic and counter-productive. It is much better to proactively manage this process, ensuring that financial incentives and technical assistance exist to facilitate agricultural water savings, and that administrative mechanisms are put in place to adequately compensate and protect rural areas that export the conserved water.

Many states are already working on so-called "alternative transfer mechanisms" to incentivize agricultural water conservation and to link such efforts to regulated markets that balance efficiency and equity concerns. On-farm tools such as rotational fallowing and limited irrigation, combined with new administrative arrangements (such as water banks), are among the approaches that promise to protect farmers and rural communities in ways that traditional buy-and-dry water transfer approaches have not

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[7] "*Chapter 4: Agricultural Water Conservation, Productivity, and Water Transfers*." May, 2015. Specific statistics attributed to this chapter are taken from pages 4-14 and 4-29. The Moving Forward Phase 1 report is at: http://www.usbr.gov/lc/region/programs/crbstudy/MovingForward/Phase1Report/fullreport.pdf

[8] The working assumption in the Basin Study is that an additional 1 million acre-feet/year of reduced agricultural water consumption was possible by 2060. The workgroup neither embraces nor rejects this goal, but coyly notes it would be a "considerable task" that has "been a point of considerable debate" (page 4-42).

and will not should such reforms not be embraced. This is challenging and politically sensitive work, but it is fundamental to addressing the long-term challenges facing the basin.

Conclusion

The challenges facing the Colorado River Basin are varied and significant. In particular, population growth, drought, and climate change all are likely to further strain the regional water budget unless our management of *water uses* evolves to match our expertise in managing *water resources*. Fortunately, there's also no shortage of viable, cost-effective solutions, and the many reforms enacted during the past decade have opened a short window of opportunity for basin residents to consider what a lasting solution might look like. It's clear that any real solution must take advantage of the many inefficient water uses that persist throughout the basin, which are every bit as much of an opportunity to embrace as a problem to lament.

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In providing "the case" for conservation in the Colorado River Basin, we are explicitly rejecting a few of the common myths that surround and burden the concept. We find that the popular characterization of water conservation as implying a sacrifice, an added cost, and a loss of productivity or opportunity is, at best, misleading and is arguably the direct opposite of the reality we face in the basin. Additionally, the notion that an increase in population must equate to an increase in consumption is not only inconsistent with the water use statistics, but when treated as fact, can become a dangerous self-fulfilling prophecy that pushes the region toward ill-advised supply-side options. While it's true that some of the low-hanging fruit of water conservation has already been captured, there's nothing to suggest that we are close to exhausting the urban conservation potential, and the potential for significant agricultural conservation is exciting as long as it's married to a commitment to protect the economic and social viability of rural communities.

We also appreciate that urban users fear losing their green spaces, while rural areas fear a loss of productive acreage. But that is not always the cost of conservation, and when it is, such reductions in irrigated land can be selected in a strategic and limited manner if rules and programs are created for that purpose. And what is the alternative? Further draining streams, reservoirs and aquifers to a point of collapse? Spending billions to import or desalinate new supplies (if available, and only after decades of work)? Without creative solutions, market forces and crisis scenarios will inevitably dry-up irrigated agriculture in unplanned ways that create undesirable third-party impacts.

As people that live, work, and recreate in the Southwest, we think the path forward is obvious: we should pursue the options that offer the greatest bundle of benefits for the lowest bundle of costs, that are easily scalable and can be done relatively quickly, that offer the lowest risks, and that leave the door open in the future to other approaches should they prove necessary. That is the case for conservation.