

# Keeping It Local



By Vaikko Allen

## Storm water & the urban water cycle

**A**s we continue to deal with a multiyear drought in the southwestern U.S., our normal rainy season precipitation has been replaced with a deluge of water scarcity news. From billboards to mailers to public service announcements, we constantly are urged to reevaluate our water use. Conservation is critical because every unused gallon is a gallon that does not have to be imported or extracted locally. The energy savings alone would justify conservation, even if the water supply situation was not so dire. But water supply is not the end of the issue; it is only the start of the local water cycle story.

In most urban areas, water use is a once-through affair. We receive potable water from a municipal supply and return it either to the sewer system as wastewater or to the atmosphere as evapotranspiration from landscape areas and crops. Rethinking the design of our water supply, use and disposal systems is a crucial but complicated undertaking as we brace for what is projected to be a long-term trend toward lower precipitation totals and warmer weather in the Southwest.

On a residential scale, recent building code changes allowing greywater harvesting and new municipal programs promoting rainwater capture and native, drought-tolerant landscaping are making a difference. On the regional scale, municipal systems are shrinking the gap between wastewater discharge and water supply intake. In some cases, treated water is returned to the same reservoir it was taken. Examples include the withdrawal and return of treated water to Lake Meade near Las Vegas and the recharge of the San Fernando Groundwater Basin with effluent from the Donald C. Tillman Water Reclamation Plant in Los Angeles.

There is demand for similar solutions for projects that fall between the single-family residential and municipal scales, like large commercial buildings and neighborhood developments. Typically, these projects can benefit from an economy of scale that is unavailable to individual homeowners, but cannot support an operator-intensive plant. There has been rapid innovation at the sub-regional scale for packaged systems with more than 10,000 gal of rainwater storage capacity or 2,000 to 250,000 gal per day of wastewater treatment capacity. These new systems make it possible to use the same water multiple times before it is lost.

At any scale, reusing greywater and treated wastewater offsets potable water demand and increases the proportion of the total water supply that rainwater harvesting can provide. The loop often is completely closed on water that is cycled through buildings. For example, the recently approved Pure Water San Diego program recycles wastewater and returns it to users as potable water. With this program, rainwater essentially becomes a means of topping off the system to account for evapotranspiration losses. Seen in this context, storm water harvesting, whether through deep infiltration to an active groundwater supply aquifer or direct capture and use, is a vital component of a local water balance and security plan. When combined with conservation and wastewater recycling, we just might have the tools we need to withstand the current drought and the changes to come. **SWS**

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