

Developing strategies in a desert watershed that sustain regional water supplies

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U.S. Department of Agriculture (USDA) scientists are helping meet the water demands of a riparian desert region that is home to a national conservation area and a thriving military base.

Agricultural Research Service (ARS) hydraulic engineer Dave Goodrich and hydrologist Russ Scott have been part of Arizona's Upper San Pedro Partnership (USPP)-a mix of 21 federal, state, and local groups managing the region's water-supply needs-since the association started in 1998. ARS is USDA's chief intramural scientific research agency, and this work supports the USDA priority of responding to climate change.

Fort Huachuca, which is the primary economic engine in the upper San Pedro River valley, draws its water from the aquifer that sustains the desert river, but this groundwater is being depleted more rapidly than it is replenished. In 2004, Congress directed the Department of the Interior to work with the Department of Defense, USDA and the USPP to develop water use management and conservation measures that would restore and maintain water supplies in the upper San Pedro watershed.

Goodrich and Scott both work at the ARS Southwest Watershed Research Center in Tucson, Ariz. The scientists are studying how much water is used by riparian vegetation and evaluating how storm water runoff from urban development affects groundwater reserves.

As part of this work, Goodrich and others measured storm water runoff from undeveloped land at the edge of Fort Huachuca and from a newly

developed area just outside the military installation. They found that a third of the runoff from the developed site resulted just from the compaction from the surface soils during construction-and not from the installation of impervious barriers, as they had expected.

Meanwhile, Scott and his colleagues found that mesquite woodlands use much more water than cottonwood and [willow trees](#) that grow along the riverbanks. He used this finding to develop a GIS-based riparian evaporation and transpiration tool that regional land managers can use to estimate water savings by replacing mesquite with native desert grasses.

Results from this work have been published in *Global Change Biology*, the *Journal of Contemporary [Water](#) Research and Education*, *Southwest Hydrology*, and elsewhere.

More information: Read more about this research in the March 2011 issue of *Agricultural Research* magazine.

www.ars.usda.gov/is/AR/2011/mar11/river0311.htm

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