



Story by Kathy Wythe

Researcher explores economics of U.S. urban water demand



Photo by: Danielle Supercinski

With projected demands for future water supplies becoming more critical, understanding urban water needs more thoroughly is essential for accurate planning.

Ron Griffin, professor in Texas A&M University's Department of Agricultural Economics, and his graduate student, David Bell, recently completed a study of the economic factors contributing to urban water demand in the United States. They analyzed how water use is affected by water prices in nearly 200 U.S. cities.

"It's interesting that many people still buy into the myth that water demand is not price-sensitive, even though that would make water unique among all commodities and is well disputed by hundreds of statistical studies emphasizing residential water," Griffin said.

The study, funded by the U.S. Geological Survey, looked at not only residential use but also commercial and industrial use. The researchers assembled water use, water rates, census, business activity, and weather data spanning 11 years—from 1995 to 2005. They collected the information on a monthly scale, which allowed them to examine the seasonality of rate responses, Griffin said.

"Traditional visions of water supply problem-solving have reduced relevance as cities confront the challenges ahead," Griffin said. "As a consequence, continued economic growth and the preservation of economic welfare for American cities likely depend on the cultivation of demand management strategies, such as water use regulations, conservation incentives, and advanced forms of water pricing, to augment supply development, which in turn is aided by a more comprehensive understanding of water demand."

Without this information, Griffin said local planners will be ill-prepared when making important supply choices and crafting appropriate demand-influencing strategies, and policy makers will be deprived of clear projections of water use based on economic growth,

rate modifications, population growth, and climatic conditions.

The data collected from the study showed that for all three sectors, water and sewer rates increased more rapidly than the Consumer Price Index—a measure of the average change over time in the prices of consumer goods and services. The data also showed that cities are revising rates more often in recent years.

"Knowing how water consumption responds to rates enables not only better informed rate-making by water utilities," Griffin said, "but it also embeds the information needed to do other analyses, such as computing the user benefits associated with proposed water development projects."

Their statistical analyses provide quantitative findings regarding both short- and long-term elasticities, by sector and by U.S. region, Griffin said. Price elasticity is a measure of how demand for a commodity, in this case water, reacts to a change in price.

The researchers' statistical analyses found lower long-term price elasticities than are typically reported, Griffin said, which means that users are less reactive to price.

"Short-term price elasticities are even lower," he said, "due to the adjustment time as consumers make progress in adopting new behaviors and establishing conservation measures."

Griffin said the short-term results, once they are verified, imply that pricing appears to be less effective as a short-term conservation policy, and that policies that address short-term shortages by acquiring water—for example, leasing water—are more valuable than previously thought.

More information on the research can be found at <http://twri.tamu.edu/reports/2008/tr331.pdf>. 