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WATER-CONSERVING ATTITUDES AND LANDSCAPE CHOICES IN NEW MEXICO

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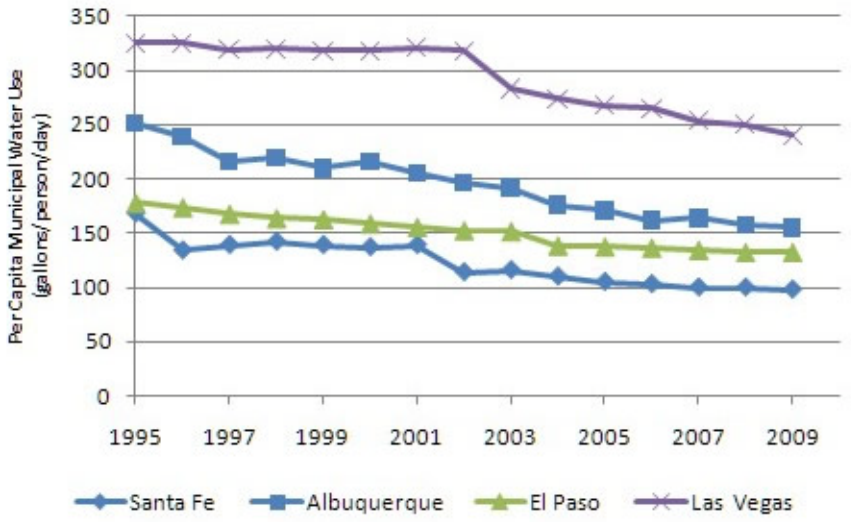
Communities throughout the arid western United States and in growing numbers in the relatively more water-abundant east are challenged by increasingly scarce water supplies, growing populations, and needed economic development. Communities desire secure, reliable water supplies, as well as a varied array of attractive public amenities including parks, open spaces, swimming and recreation facilities, public golf courses, and other water-intensive services. Water managers must balance these desires with the growing costs of system maintenance and expansion, all the while generating sufficient revenues to service these costs.

Municipal Waters and Household Choices

This balance is frequently achieved by community efforts to reduce per capita residential water use. Figure 1 shows successful reductions in several cities—a pattern that is repeated across the region. Economic incentives—such as increasing block rate structures where per unit water prices are higher for higher volumes consumed and rebates for water-saving appliances, fixtures, and landscapes—alone do not appear to explain the relative success that communities have achieved in reducing per capita water use. It appears likely that for many communities, water-use patterns have positively responded to noneconomic factors including heightened awareness and education, increased sense of duty, and responsibility to the community's resources and to neighbors.

Figure 1: Recent Trends in Per Capita Water Use for Selected Major Desert Cities

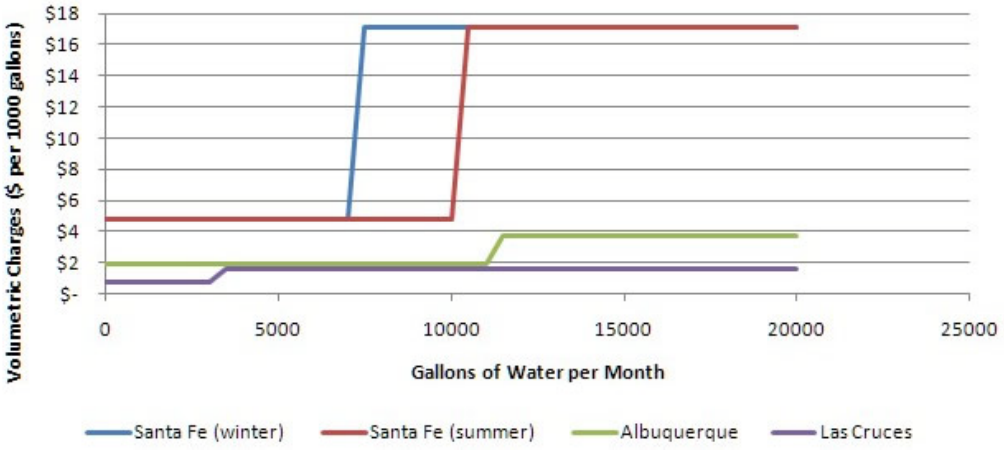


Municipal water conservation programs have found growing acceptance in communities throughout regions grappling with water scarcity and drought. Program elements often include economic incentives, such as rebate programs that reduce or replace turfgrass with water-wise landscapes and drought–tolerant vegetation and in some places provide credits for installing water-conserving fixtures and appliances. Communities are also encouraging conservation by replacing declining or flat rate pricing structures with increasing-block rates. However, in addition to public acceptability of rate changes, the utility must also meet its revenue requirements and avoid the 'conservation trap' in which reduced water use results in diminished revenues and hence the need to raise rates even further and risk the perception that water conservation success is being punished. This is a particular problem for systems where system-wide growth is leveling off and there are not sufficient numbers of new customers to offset revenue losses from conservation. That is an important and recognized problem that confronts successful water conservation and drought management programs. In fact, the city of Las Cruces' water conservation ordinance explicitly addresses this problem and implements program monitoring and economic evaluation to ensure that the program will "remain revenue neutral on utility operations" (City of Las Cruces Water Conservation Program, page 15).

Resistance to higher water rates and limited program resources for financial incentives means greater reliance on noneconomic approaches and public appeals for wise–use and 'correct' behavior. As public resources are directed into such programs, concerns are raised about their effectiveness and performance. Assessments of public attitudes and the barriers to changing behavior can provide both quantitative and qualitative measures of conservation program impacts and effectiveness and are the subject of recent research in New Mexico (Spinti, St-Hilaire, and Van Leeuwen, 2004; Hurd and Smith, 2005; Hurd, 2006; Hurd, St-Hillaire, and White, 2006).

In New Mexico water conservation programs have been very actively developed in all of the urban areas, including the major cities of Santa Fe, Albuquerque, and Las Cruces. Each of these cities, for example, have revised their water rates structures, and all have an increasing-block structure to volumetric pricing in addition to fixed monthly charges. Figure 2 compares the current volumetric pricing for each of these cities, and shows that Santa Fe has the most aggressive volumetric pricing policy as well as the highest fixed charge of $14.54 per month—compared to $11.41 and $6.82 in Albuquerque and Las Cruces, respectively. This disparity is explained in part by Santa Fe's recent acute shortages and heightened need for conservation as well as raising revenues for infrastructure expansion.

Figure 2: Volumetric Water Use Rates as of September 2010 for Selected New Mexico Cities



In addition to conservation pricing, additional incentive and rebate programs have been offered. For example, Albuquerque currently offers single-family residences a water bill credit of $0.75 for every square foot of lawn converted to Xeriscape up to 2,000 square feet, and has rebate programs for high-efficiency showerheads, toilets, washing machines, and hot water recirculation systems. Until July 2010, Santa Fe had a rebate program for washing machines, high efficiency toilets, and rain barrels; though successful it was discontinued due to limited funds. And Las Cruces, while not providing direct incentives or rebates, offers education and occasional workshops in residential landscape planning and implementation (Santa Fe Sangre de Cristo Water Division, 2010; Albuquerque Bernalillo County Water Use Authority, 2010; City of Las Cruces Utilities

Dept., 2010).

Household Perceptions of Water Importance and Personal Responsibility

Irrigating the urban residential landscape usually accounts for 40-70% of household water use. Additionally, residential landscapes receive 30 to 40% more water than typically required by the common types of plants and grass. Estimates of potential water savings range from 35% to 75% of current per capita water use based on a typical home with a traditional bluegrass type landscape (Sovocool, 2005). Improvements in the efficiency of landscape irrigation could yield significant water savings and is properly the focus of municipal water conservation programs.

In 2004, a mail survey was conducted of 1,216 households in Santa Fe, Albuquerque, and Las Cruces, New Mexico to gather data on household water conservation, preferences and attitudes toward landscapes using accepted protocols (e.g., Dillman, 2000). Survey findings from 423 completed responses were compared to 2000 Census data and, although the sample was higher than the general population in levels of both education and income, that is not too surprising given that the sample is based on home ownership, which is likely to correlate with higher levels of both income and education. The primary focus of the survey was to collect data on landscape preferences in order to model landscape choices and the important factors that affect a homeowner's landscape decisions. Summary findings from selected survey questions are given below, however the technical details and results from the choice modeling are more completely provided in Hurd (2006).

Two key factors that determine how receptive a household might be to both economic and noneconomic efforts to change their water-use and landscape choices is the degree of perceived importance of water-stress within their community and the perception of personal responsibility toward water conservation in general. It is expected that residents who tend to consider water-stress within their community as important and that those who are more considerate of their own personal responsibility will more likely be influenced by water conservation programs. And this could indicate if there would be an increased likelihood of making actual changes in their landscape and water-use choices and behaviors. Key findings suggest that homeowner attitudes and perspectives regarding importance of water issues and personal responsibility for water conservation are generally strong.

Figure 3: Homeowner Perceptions of Relative Importance of Water—Stress in Their Community

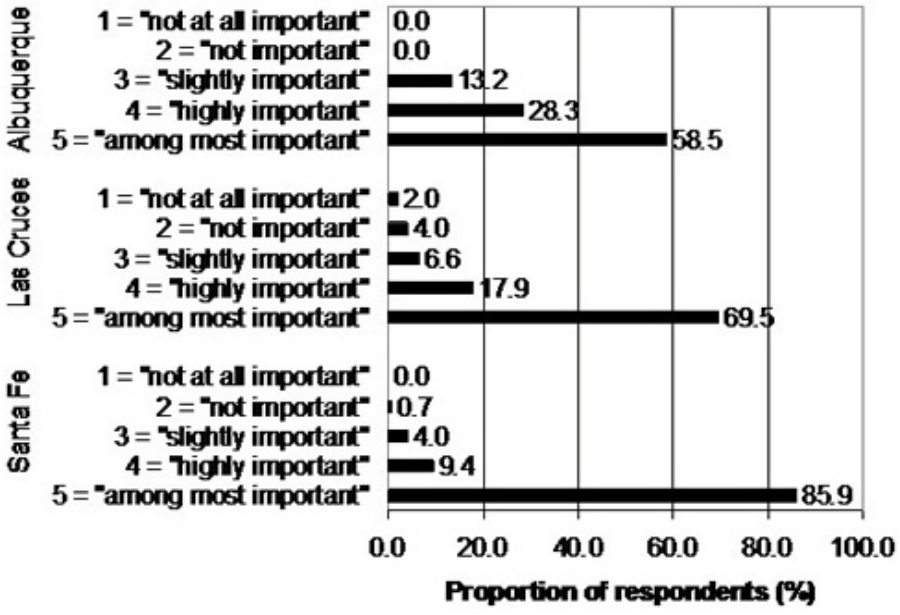
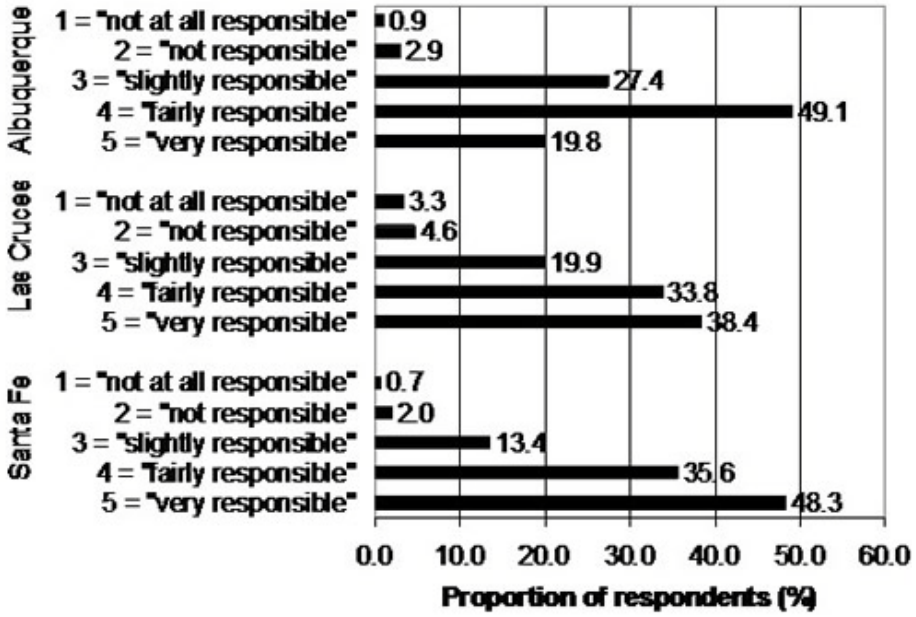


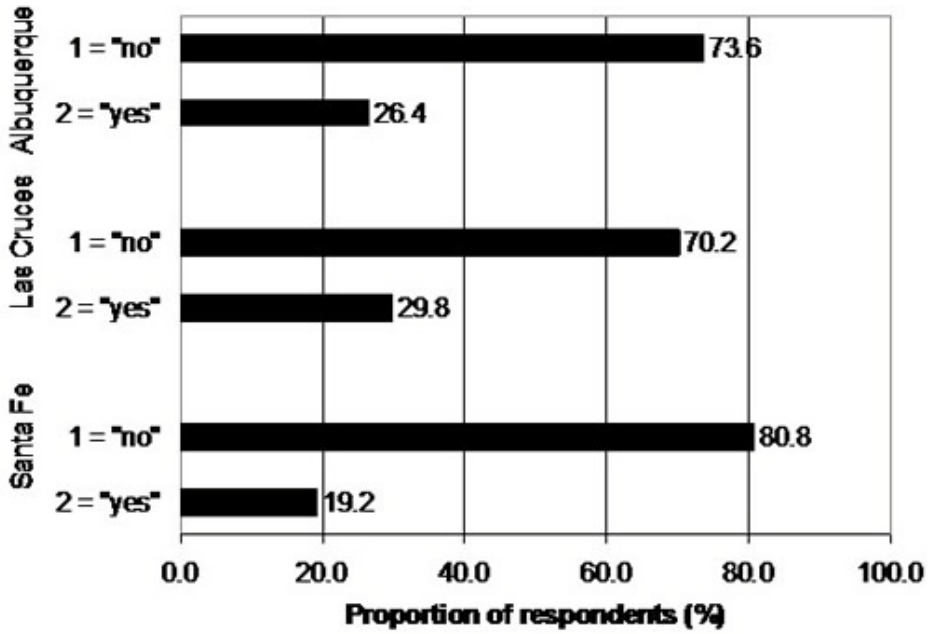
Figure 4: Perceived Degree of Household Responsibility for Water Conservation



Is Cost a Barrier in Landscape Choice?

Water-intensive lawn landscapes are increasingly giving way to more water efficient and climate appropriate landscapes. Acceptance of water-conserving, Xeriscape landscapes appears to be growing, though the rate of adoption seems to be lagging and suggests that significant barriers may well exist (Spinti, St-Hilaire, and Van Leeuwen, 2004). Effective municipal water conservation programs will better achieve significant per capita water savings by identifying and addressing key barriers and triggers that otherwise impede change.

Figure 5: Is Cost Perceived as a Barrier to Xeriscape Adoption?



Transitions toward water-conserving landscapes can be induced or hindered by desires of consistency with

neighboring landscapes, cultural constraints—such as preconceptions of residential landscape or familiarity and comfort with traditional turfgrass lawns, and ultimately by access to and availability of sufficient time and money. Figure 5 shows how homeowners responded when asked if cost was a prohibitive factor in considering whether or not to adopt Xeriscape.

Additional findings suggest that:

1. The use of water-saving devices is quite widespread, with more than 90% of these households reporting at least one device such as a low-flow toilet, faucet or showerhead.
2. Santa Fe residents tend to identify strongly with relatively more natural and native landscapes. With less than 10% of landscape in lawn, 61% of Santa Fe residents report being content with their existing landscape, more than either Albuquerque (55%) or Las Cruces (56%). This suggests that there is a significant share of households, particularly in Albuquerque and Las Cruces that might consider landscape changes with improved outdoor water-use efficiency.
3. There is considerable interest by 15% of these homeowners in learning more about and seeking advice on landscaping. Perhaps this is a potential area for increased Extension and public education programs by local communities.
4. More than 80% of these homeowners indicated that water price is an important consideration in landscape decisions, even more than the 55% indicating the importance of community water-conservation programs.
5. There is broad support by nearly 95% of these households to use water-efficient landscapes around public buildings.

Moving Forward

Communities are realizing measurable success in reducing per capita water use, as residents alter their behavior and patterns of water use, adopt new high-efficiency systems, and adapt to more climate-appropriate landscapes in residential and public settings. Though changes in water rate schedules and limited availability of rebate programs have contributed to this success, something more profound appears to be motivating behavior than mere economics. The survey findings tend to confirm that water-use behavior can be affected by changing attitudes, awareness, and know-how. New Mexico's residents are, for the most part, mindful of water-conservation challenges and prepared to shoulder responsibility for stewarding the state's water resources. The findings further suggest that New Mexico residents are increasingly aware of the role of water in their communities and state. How households manage and use water to create desired landscapes and outdoor living spaces can be significant. For example, if residential outdoor water use could be cut by one-fourth in just the three communities profiled in this study, annual water savings could approach 6 billion gallons of treated, potable water—approximately 17,000 acre-feet. Conservatively valuing this saved water at a rate of $1 per thousand gallons yields, nearly $6 million savings would accrue to the residents of these communities.

Other water-stressed communities may find noneconomic factors attractive program elements in addition to changing water rates and rebate programs. However, it is probably short-sighted to consider these factors as replacements for incentive-based programs that are particularly helpful for achieving the lower levels of per capita water use.

For More Information

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