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Testing the waters: Tucson links water conservation with environmental benefits

Arizona's semi-arid riparian ecosystems have been degraded. There have been efforts to restore and enhance riverine and riparian habitats in the state, although some projects lack long-term water sources or sufficient funding (Megdal et al, 2006). To help recognize the environment as a water-using sector and to secure water for environmental purposes, the University of Arizona Water Resources Research Center (WRRC) proposed an innovative mechanism called Conserve to Enhance (C2E; Schwartz et al, 2008). C2E is a program concept using voluntary municipal water conservation to secure instream flows and support riparian enhancement. The C2E concept aims to increase water conservation activities by water users who are motivated to save water for environmental benefits.

Turning this concept into reality required finding a community interested in developing a pilot program. Three essential elements for a pilot C2E program emerged: support from local stakeholders, a community-approved river or enhancement project, and an accounting mechanism to track participants' water use and savings.

LOCAL STAKEHOLDER SUPPORT

The first of these essential elements was met when the idea of connecting people's water conservation with environmental enhancement received support in a joint City of Tucson & Pima County Water Study (2009), which established a set of shared policy goals. The study recommended using the C2E program as a funding source to acquire water supplies for the environment. In 2009, the Sonoran Institute (SI) and Watershed Management Group (WVG), two environmentally focused nongovernmental organizations located in Tucson, joined WRRC in designing a pilot program (Figure 1). An advisory board was formed to make sure local values were represented in the program

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The Atturbury Wash in Tucson, Ariz., has been selected as the first Conserve to Enhance recipient site.

design. Stakeholders on the board from local conservation organizations, the city, county, and Tucson Water—the primary local water provider—reviewed the program outline. Tucson Water offered its support in a C2E grant proposal, recognizing that “The C2E Pilot Program is an exciting and innovative next step for further reducing our community’s usage of municipal potable water outdoors and thereby decreasing our reliance on groundwater pumping and importation of Colorado River Water.”

The Tucson C2E Program asks participants to

- implement water conservation methods,
- track the money they save on their water bills, and
- donate some or all of those savings to a fund for local riparian enhancement.

To increase the program participants’ ability to achieve water savings and therefore their willingness to donate financial savings to enhancement projects, SI offered pilot participants rainwater-harvesting subsidies. These subsidies, ranging from \$500–\$1,000, were funded

by the US Environmental Protection Agency (USEPA) to help pilot participants install water-harvesting features such as building land-contouring berms and basins and installing cisterns. Rainwater harvesting is gaining popularity in Tucson and is widely accepted as a feasible means of reducing municipal potable water use (Tucson Water, 2011).

After essential partnerships were formed, direction for the other two critical elements—the accounting mechanism and the receiving project—was needed. Although Tucson Water was supportive of C2E program development, its complex, third-party-managed billing system presented a challenge to securing funds from C2E participants through water bills. Identifying a project or projects to benefit from C2E program funding was the other major pilot-development task.

Finding the connection to the environment. The advisory board undertook a process to select the best local enhancement site(s) to receive the first year of C2E funds. Previous research had identified several local riparian enhancement projects in need of water. Written applications

and in-person presentations were solicited from these project managers, who were asked to identify how potential receiving sites would use C2E funds. In September 2010 the board selected Atturbury Wash, a Tucson Audubon Society project on city of Tucson land southeast of the city center (see the photograph on this page). This ephemeral waterway in the project area experiences erosion caused by sediment sequestration upstream and has lost significant amounts of riparian vegetation (Tucson Audubon Society, 2011). Depending on the amount of funds raised during the first year, Tucson Audubon Society plans to use C2E funds either to water previously established native plantings or add to the riparian restoration area. The overall intention is that the first year of funds will result in small but highly visible improvements at the receiving site.

Accounting for savings. The original C2E paper outlined a plan to use local utility billing systems to calculate water use and track donation amounts. However, the Tucson Water billing system does not currently allow a participant’s water bill to integrate a tracking calculator. Because of this limitation, the core development team (WRRC, SI, and WMG) is overseeing the details of implementing the pilot. With consent from participants, Tucson Water releases to the core team household water use data, which are entered into the C2E Water Conservation

Calculator. WMG e-mails the calculator outputs to participants quarterly so they may compare their baseline water use (the past three years of their water use history) with their current use and view a suggested donation based on their water savings. Each quarter, participants are also asked to complete a short survey and are guided to a donation page on the WMG website.

Expanding the program's reach. A water bill donation checkbox, offered by the utility so customers may contribute directly to environmental projects, helped grow the program. After the pilot was launched, Tucson's mayor and council authorized the expansion of the existing Tucson Water checkbox program to accept donations for riparian enhancement. Although the checkbox donation is not connected to a customer's water savings, the expansion created a way for all water customers to contribute to the C2E fund.

Small actions add up to big savings. The Tucson C2E program selected 60 participants in January 2011

from the more than 100 applicants who wanted to participate in the pilot; 45 of these 60 participants received water-harvesting subsidies. In the first three quarters, January to September 2011, participants saved an estimated 806,843 gallons of water and were asked to contribute \$1,892 to the fund based on their water savings. Actual donations for this period totaled \$989.70, which is lower than the estimated contribution amount. This result likely occurred because participants are not required to begin making donations until they use their subsidies. All donations have ranged from \$3–\$6 per month per household, averaging \$3.62 per month per household—a figure that is in line with the prepilot estimated monthly donation of \$1–\$6 per household (Megdal et al, 2009).

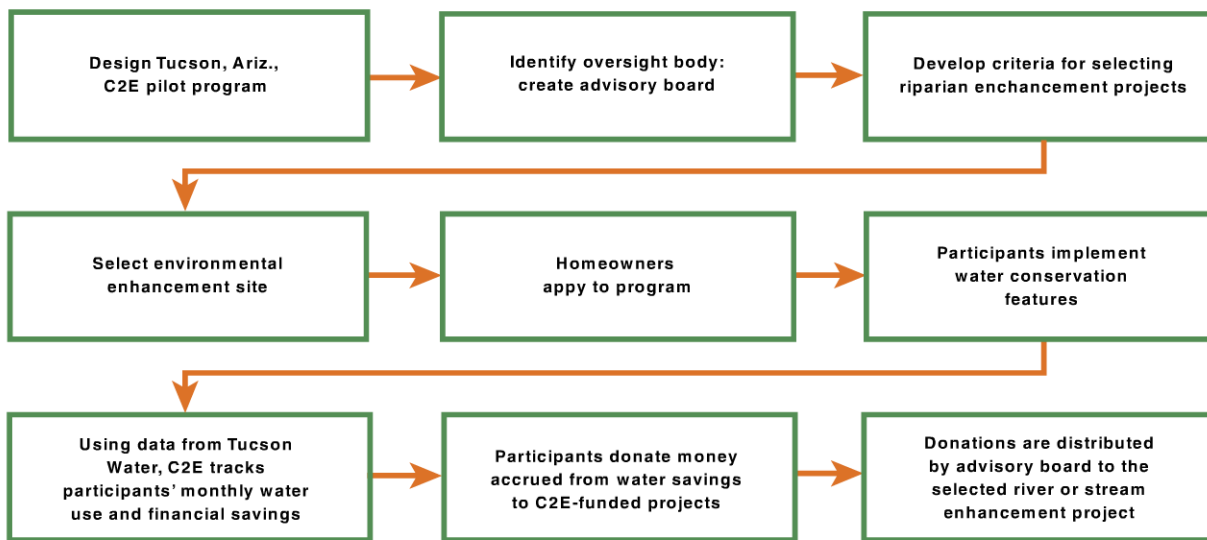
Initial pilot outcomes indicate that scaling up the C2E program to the entire Tucson Water service area could create a sustainable private funding pool for local enhancement projects. Comparable programs

have demonstrated 5% participation rates from utility customers (Schwarz et al, 2007), which would translate to 12,500 participant households producing an estimated \$450,000 annually.

In Tucson, the C2E pilot has taken a major step toward securing water to benefit the local environment. Implementing a pilot program that connects municipal water savings to local enhancement projects required overcoming several locally specific obstacles and securing the help of key partners. Once a recipient project was selected and an accounting mechanism was in place, conditions were right to gain the mayor's and the council's support for expanding the program's reach through the checkbox. Through the efforts of the core team and advisory board, Tucson is now home to the first C2E program in the United States.

By sharing the story of the Tucson C2E pilot, the authors hope to inspire other efforts to support environmental enhancement through voluntary water conservation. A

FIGURE 1 Path of Tucson, Ariz., Conserve to Enhance pilot-program development*



C2E—Conserve to Enhance

**Pilot programs may be developed in a different sequence and with different emphasis, depending on local factors.*

series of implementation tools are now available to simplify the introduction of C2E programs in other communities. A set of key elements for pilot success has been developed (see the sidebar on this page; Megdal et al, 2009). These key elements can help communities determine whether the C2E mechanism is appropriate given local conditions and inform local stakeholders about the program development process.

Although every community has different water conservation goals and constraints, C2E is a foundational effort on which communities can build more sustainable water management. In addition, the program has flexibility. Instead of riparian enhancement, C2E could be used to secure instream flows or for other environmental purposes. Other utilities may not face the same obstacles to adapting billing systems for a C2E accounting mechanism but may face other obstacles. Multiple pilots, each tailored to local community characteristics, will be needed to determine whether a scaled-up version of C2E is widely applicable and realistic.

Results from the Tucson pilot, the C2E-linked checkbox, and the evolution of the C2E mechanism in other communities will continue to inform program development. This initial example demonstrates that C2E is already a practical and appealing mechanism for communities to increase water conservation activities and support local environments. Utilities or others interested in exploring opportunities to implement C2E or a checkbox program are invited to contact the authors.

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Key Elements for Conserve to Enhance Pilot-program Success

- Gain utility support
- Identify general program goals
- Select a donation and accounting mechanism
- Select an oversight body
- Identify a fiscal agent
- Determine environmental enhancement project selection criteria
- Develop marketing materials
- Connect to a conservation incentives program
- Develop reporting mechanisms

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