Tucson's water ethic: Blueprint for Minnesota?

• Beneath the Surface, a special Ground Level report

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Tucson Water auditor Felix Morales helps Merri Pendergrass measure her water use at her home in Tucson. Pendergrass called the auditors, known as "Zanjeros," for help when her water bill skyrocketed. The auditors were able to determine that Pendergrass could save water, and money, by cutting the amount of water her backyard lawn uses in half. Nick Cote for MPR News

First of four reports from Tucson, Ariz.

Forty years ago, this desert city faced a water crisis. Groundwater levels were plummeting. The river flowing past downtown had dried up.

But now, even after decades of population and economic growth, water consumption has been declining and, under much of the city, groundwater levels have been rising. Those responsible for the shift credit landmark water laws, public education and enforcement but mostly the development of a new water conservation ethic that many think Minnesota needs to adopt.

Odd as it might sound to Minnesotans, they could stand to learn from Tucson, said Ali Elhassan, Water Supply Manager with the Metropolitan Council in the Twin Cities.

“Ever since I moved here I have felt like a criminal for having this back here, but it's so nice,”

"We may not need to go to the same extremes as people in the southwest and California. We are still a water-rich state, but our management strategies are unsustainable. And that's the thing we really need to be careful about."

“We try not making people feel that way. If you had it in your front yard, we would guilt you a little bit.”

Even in Tucson, mired in a decade-long drought, the water conservation ethic gets constant reinforcement.

That was clear earlier this month in the back yard of Merri Pendergrass, who moved to Tucson a year and a half ago to teach at the University of Arizona medical school.

Her front yard befits her new hometown -- no grass, just rocks, cacti and some drought-resistant shrubs. But in back, it's an oasis, with a small patch of grass, flowers, a grapefruit tree full of plump yellow fruit.
"Ever since I moved here I have felt like a criminal for having this back here, but it's so nice," Pendergrass said.

That's where Eddie Lopez comes in.

"We try not making people feel that way," he told Pendergrass. "If you had it in your front yard, we would guilt you a little bit."

Lopez is the head of Tucson Water's "zanjero" program. "Zanjero" is an old Spanish word for a water "boss," someone who helped divide water for irrigation among farmers. He was standing in Pendergrass' back yard to help her figure out ways to lessen her water use.

“Once the drought goes away, people go back to their old customs and habits. And that never happened here.”

"We never tell people to get rid of your lawn," he said. "What we do tell them, is when was the last time you set foot on the lawn in your front yard? It's probably when you paid someone to mow it."

After flipping through the settings on her irrigation timer, Lopez determined Pendergrass is watering her lawn much more than it needs.

He then spent two hours checking toilets, looking for leaks, examining Pendergrass' landscape irrigation and concluded with one main recommendation.

By cutting her grass watering in half - to every other day - she can cut her total water use by about a third, saving 4,500 gallons a month.

"I'm very happy to be advised what to do," she said.

How Tucson conserves water:

--Charges a higher price for water beyond basic needs.

--Discourages lawns, especially in front yards.

--Requires efficient toilets and fixtures.

--Limits water-intensive plants.

Tucson Water auditors Gabriel Martinez, left, and Felix Morales measure how much water an irrigation system uses at a customer's home in Tucson. The auditors, who are known as "Zanjeros," can determine the source of a costly water bill as well as educate customers about water conservation techniques. Nick Cote for MPR News

“Water is way too cheap.”
For nearly 20 years Tucson Water's "zanjeros" have educated customers, cajoled them, even occasionally made them feel guilty, to cut their water use.

And Tucson residents have responded by ripping out grass and installing super efficient toilets. They are capturing rainwater and even waste water from their washers and showers to irrigate their landscaping.

As a result, Tucson's per capita water usage has shrunk by more than a third since the 1970s, from about 200 gallons per day to 130. Put another way, Tucson as a whole uses the same amount of drinking water as it did 25 years ago even though the city has grown by 40 percent.

“It's an important tool. But at the same time, almost everyone recognizes that conservation alone won't close the gap.”

Tucson Water spokesman Fernando Molina said the city faced a water crisis in the mid 1970s. It couldn't meet peak water demand in the summer. So the utility told customers they had to cut their water use or pay for new wells and expensive pipelines.

"That was before anybody could spell 'conservation,' said Tucson resident Val Little. "I mean nobody was talking about conservation anywhere."

But Little, who was a spokeswoman for Tucson Water at the time, says residents changed their behavior.

"People began doing dishes at night, they did laundry when they went to bed. People just curtailed their water use to a great degree."

The "Beat the Peak" conservation program staved off the need for new infrastructure. And Molina said that water-saving ethic stuck.

David Stevenson shows the cisterns where he stores 5,000 gallons of rainwater he has harvested at his home in Tucson. Nick Cote for MPR News

"That's really what's unique about Tucson," he said. "You see a lot of communities react to shortages, and you might see some changes happen, but once the drought goes away, people go back to their old customs and habits. And that never happened here."

Driving around Tucson, you hardly see any grass in neighborhoods. It's mostly desert style landscaping, even some artificial turf.

Tucson has also done something a lot of communities are unwilling to do. It's jacked up the price of water, adopting what is called an increasing-block rate structure. The more water a resident uses, the more he or she is charged per gallon.

"Imagine going to a gas station, and filling up your car with gas," Molina explained. "The first five gallons will be charged at maybe a little less than the price posted, but then you get to the
next five gallons, and they're going to tack on an extra fifty cents a gallon, then the next five, gets an extra dollar a gallon, so that creates an incentive for you to drive a little more carefully."

The water utility charges below the cost of service for a customer's first block of water, enough to cover basic needs like cooking and washing. Then, as customers use more discretionary water, to fill up swimming pools or water lawns, the price jumps up as much as nine times higher than the lowest rate. The highest rate is about $11 for 750 gallons, more than three times what Minneapolis residents pay for water, for example.

This has cut consumption but also generated a complication. The water utility generates less revenue to pay for its operations, so that causes the rates to rise a little more.

Still, there are many water policy experts around Tucson who think it should be priced even higher.

"Water is way too cheap," said Linda Stitzer, a water advisor with the group Western Resource Advocates.

"People in Tucson think nothing of a $300 electric bill in the summer to stay cool, but if their water bill goes up $20, they're upset."

Tucson's water use is back down to 1990 levels even though the population has grown by 40 percent. William Lager / MPR News

That's not the case with David Stevenson, a technology developer who lives with his son in what's almost a living laboratory for water conservation. Together they use about 750 gallons of water a month, about a seventh of the Tucson average.

"As you notice there's no lawns here at my house, there's no citrus gardens," Stevenson said.

But he does have vegetable gardens, shrubs and fruit trees, watered primarily by two huge silver cisterns that store 5,000 gallons of rainwater and by greywater left over from his shower, sink and washing machine.

While Tucson can't expect many residents to be as die-hard as Stevenson, the city has adopted several ordinances designed to push people in that direction. Plumbing codes require water efficient toilets and fixtures. Commercial landscaping laws limit plants that require a lot of water. Homeowners who install rainwater harvesting systems are eligible for a two thousand dollar rebate. New homes must be plumbed for greywater. The list goes on.

Minnesota should look to Tucson and other western cities for conservation strategies, Elhassan, at the Metropolitan Council, said.

The place to start is lawns, which he called the biggest irrigated crop in the United States. Four times as much land is devoted to irrigated lawns as to irrigated corn, he said.
"It's the biggest user of our water. So you have two or three months that people are pumping all of this clean water, cities are treating it, cleaning it, sending it to houses, and the houses are taking this water and putting it out into the lawn."

He said he often sees sprinklers spraying water when it's raining.

"We need to value our water more and more, before we lose the ability to irrigate anything."

Minnesota has the advantage of just starting down this road toward smarter water use.

The challenge facing Tucson now, said Sharon Megdal, who directs the Water Resources Research Center at the University of Arizona, is that when it comes to conserving water, the city has already plucked much of the low hanging fruit. Tucson is looking ahead 40 or 50 years, where population growth is expected to cause a gap between water supplies and demand, she said.

"Clearly conservation is an important option," Megdal said. "It's an important tool. But at the same time, almost everyone recognizes that conservation alone won't close the gap."

One way to close that impending gap is to reuse water - even after it's flushed down the toilet.

**Part 2: Using water more than once.**

Gallery
Tucson Water auditors Gabriel Martinez, right, and Felix Morales measure how much water an irrigation system uses at a customer's home in Tucson. The auditors, who are known as "Zanjeros," can determine the source of a costly water bill as well as educate customers about water conservation techniques. Nick Cote for MPR News