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Drought-Plagued Regions Struggle to Conserve Water and Make Money.

The more water people save, the more money utilities lose. They're looking far afield for a solution.

Midland, Texas, has prospered and suffered along with the fortunes of oil and gas drilling since the rich Permian Basin was discovered in 1921. Recently, hydraulic fracturing technology has reopened once-inaccessible formations beneath the dry brown West Texas plains. This spring, Midland's unemployment rate was down to 2.7 percent, the lowest in the country. But good times are fragile in Midland, often hostage to a different hard-to-find resource. Two years ago, the city came perilously close to running out of water for its 120,000 residents to drink.

Over three straight hot summers, unforgiving drought has sucked two Midland reservoirs virtually dry. Lake O.H. Ivie, the last surface supply, has been falling rapidly toward 15 percent of previous capacity. Things looked so dire in 2012 that Midland rushed into a crash project that city hall insiders regarded as the city's "last card to play." Midland reached out 67 miles for a new source that within a year was pumping in 4 million gallons a day.

Eventually that \$197 million project will bring Midland 20 million gallons a day of fresh groundwater from beneath the historic T-Bar Ranch, which city fathers bought 50 years ago. Now Midland is backing a 15-mile extension to transport another 4 million gallons daily from a second ranch, and the city has no intention of stopping there. Those new resources "give us 50 years of water," Midland Mayor Jerry Morales says. Morales has allied with the Abilene and San Angelo mayors to hunt for even more below-surface reserves to provide plenty of future water. "We're looking for a 100-year supply," Morales says. "We're looking everywhere in Texas."

Long-distance water searching has gotten much more expensive than it once was. Midland bought the 20,000-acre T-Bar spread for \$750,000 in 1965. Last year, the city paid \$3.5 million for the 6,800-acre Clear Water Ranch just for the right to pump its water. "Water is the new blue gold," Sara Higgins, the Midland city spokeswoman, says. "It's never going to be cheap again."

As a result of its recent moves, Midland's water problems don't seem as severe as they did in 2012. But they are causing the city some unexpected financial headaches. While the new pipeline was being built, the Midland City Council slapped homeowners and businesses with fivefold increases in top water rates. The levies were designed to penalize wasting water flagrantly to sprinkle lawns, wash cars and refill swimming pools.

Almost immediately, sticker shock from higher bills slashed the city's water consumption 35 percent. Midland had tried strictly regulating outdoor watering, but "it wasn't until we hit people in their pocketbooks that we saw the numbers go down," says Higgins. "I don't think consumption will ever come back."

As a means of conserving water, these punitive rates succeeded. But they created a serious new problem. They left the local water utility short of the revenue it needed to operate.

Midland's water struggles offer a cautionary tale for other cities where customer water rates are rising at the same time a shifting climate may be starting to dry lakes and rivers up.

Around the country, as water gets scarce and its value goes up, municipal water revenues are going into free fall. Sixty percent of U.S. utilities in one survey sold less water in 2012 than six years earlier. Bond rating services in recent years have given negative ratings to utilities in California, Minnesota, North Carolina and Oregon, citing disappointing revenues.

Utilities in Sun Belt states have had their bonds downgraded because they had relied too much on fees for connecting newly built homes when housing markets were inflated. Elsewhere, Altoona, Pa., and Bowling Green, Ky., were hit with downgrades because they'd put off expensive maintenance, leading to massive losses of water through leaky pipes. Utility costs will only keep climbing as governments work through what may be a \$1 trillion backlog to replace deteriorating pipes, improve treatment plants and extend mains into sprawling neighborhoods.

Raising rates to catch up, however, just gives customers more reason to use less water. That reduces water sales even more, and water supply agencies "end up in a downward cycle of lower revenues and increasing rates, and customers feel like they're being punished for doing the right thing," says Mary Tiger, chief operating officer at the University of North Carolina Environmental Finance Center.

Drought complicates the fiscal outlook. In Texas, the Wichita Falls utility lost \$4.5 million in revenue last year after drought forced it into drastic water-saving steps. Fitch Ratings downgraded Fort Worth's water and sewer debt after revenues fell \$11 million short.

Midland lifted its 2012 emergency rates once its new T-Bar pipeline began operating. But total consumption has leveled off at half its previous level, opening a \$4 million annual budget gap. This January, the city council voted to raise rates by 9.5 percent over three years in an attempt to clear the water fund deficit and assure state approval for extending the new pipeline.

Utilities typically bring in 20 percent of their revenues through fixed fees for delivering water to homes and businesses. The other 80 percent comes from fluctuating charges based on meter readings that tally how much water customers used the previous month. Water agencies build and maintain enough infrastructure to supply everybody with water when demand peaks during hot weather. To reward conservation, many cities have installed block rates that go up significantly the more water a home or business uses, sending a pricing signal to encourage customers to conserve. But the more water users conserve, the more fiscal problems the utilities find themselves scrambling to solve.

At the same time utilities are coping with declining revenues, many consumers are dealing with sharply higher prices. The North Carolina Environmental Finance Center found that some low-income families are paying up to 9 percent of their monthly earnings for water. Baltimore is raising rates 41.7 percent over three years, and community activists object that bills totaling \$1,000 or so a year will be beyond the means of senior citizens and impoverished families. "Municipal utilities exist to provide something we consider a basic necessity of living, but in a lot of places water is becoming very unaffordable," says Sharlene Leurig, the water program director for Ceres, a Boston organization that advocates sustainable business practices.

Utility analysts suggest stabilizing rates and revenue by repaying dividends to thrifty customers. Another possibility would be letting a ratepayer select an annual budget, subject to hefty penalties for going beyond the target. Davis, Calif., drafted a "consumption-based fixed rate" plan for collecting the \$106 million cost of supplementing overused groundwater with Sacramento River

water.

Starting in 2015, the city wants to cut variable rates but tack on a new fixed monthly charge based on each customer's consumption the previous summer. That way, two-thirds of Davis residents will pay less per month, but "people who use peak capacity [in summer] are going to pay for that year-round," says Frank Loge of the Center for Water-Energy Efficiency at the University of California, Davis. Some residents, most of them elderly, object that the revamped rates would penalize single-family homeowners who keep Davis lawns and trees green. Uneasy about higher bills, Davis voters in June sent the city back to the drawing board by repealing the new rate structure.

Local officials expect second-guessing when they raise water charges. Americans have learned that gasoline pump prices climb if crude oil rises from \$100 to \$120 a barrel. There's no such understanding when it comes to water. In fact, there's no easily understood benchmark for calculating water's value. Still, in some arid regions, water can be bought and sold among municipal governments and private parties as a simple commodity. As the Western states were settled, state water laws awarded prior appropriation rights to whomever was first to put water to use; and miners, ranchers, farmers and commercial ventures have traded those rights since Gold Rush days. "While water in most of the U.S. is not yet priced like a commodity, it likely could be within our lifetime" as more markets develop for scarce resources, a 2011 Standard & Poor's analysis said.

In Texas, a pricey water market already is emerging. Under a 1993 court order, the state capped withdrawals from the Edwards Aquifer, then San Antonio's sole drinking water source, to safeguard water for endangered wildlife. Since then, the city has pursued relentless conservation campaigns, including rate incentives for curbing use. The San Antonio Water System has also bought groundwater rights that farmers now can sell after investing in water-saving irrigation.

In a January report, the San Antonio Chamber of Commerce warned that a truly disastrous drought could still throw 135,000 residents out of work. The study argued that locking up even more supplies would give San Antonio "an advantage at a time when many other communities are struggling to provide water infrastructure."

All along the Interstate 35 corridor from San Antonio to Austin and Dallas, "there's a lot of money and companies coming in here to market groundwater," says Leurig, an Austin resident who's chairing a citizens panel to look at the state capital's water options.

State officials reported this spring that 34 small communities in Texas could run out of water in three months. Meanwhile, the state's megacities are competing to lock up future groundwater rights. Utility rates could spike a lot more as profit-seeking speculators start bidding on water markets.

Like oil and gas, groundwater is a depletable resource. As groundwater tables fall, it's no surprise that Texas businessmen with petroleum and gas fortunes are stepping into the water marketing business.

Oilman T. Boone Pickens assembled groundwater rights to 211,000 acres in the Texas Panhandle and pitched a 350-mile pipeline to sell it to Dallas-Fort Worth. The deal never came together, and three years ago Pickens sold the water for \$103 million to the water authority that supplies 500,000 people in Amarillo, Lubbock and nine other West Texas cities.

The Panhandle sits atop the Ogallala Aquifer, a formation that stretches north from the Midland area to the Dakotas. The water table has been dropping for decades, overdrawn by irrigated farms, municipal wells and expanded energy production. As the water level falls, Midland and other Texas

cities grow more desperate to take water from largely untapped reserves from more distant aquifers beneath surrounding rural counties.

Farm towns and ranching counties are bracing to fend off wealthier big-city designs on their water. Tensions are reminiscent of the Los Angeles water grab a century ago that dried up agriculture in the undeveloped Owens Valley in California's Sierra Nevada.

West of the Pecos River, Texas ranchers already are in a legal showdown with a prominent Midland oilman. Clayton W. Williams Jr. wants to sell Midland 41 million gallons a day from his family's ranch near Fort Stockton, population 8,283 and falling. The Middle Pecos Groundwater Conservation District, based in Fort Stockton, voted unanimously to deny Williams a pumping permit. Williams, who runs his own oil and gas company from Midland, has taken his Fort Stockton neighbors to court. Engineers, geologists and lawyers for private ventures keep showing up to scout Pecos County for available water. "There are water marketers, there are water interests and there are water pirates," Paul Weatherby, the Middle Pecos district manager, says. "We're in the Chihuahuan Desert, and we don't have anywhere to go should we run out of water ourselves."

With drought settling in, the allure of more water led Midland to cut some corners. To finance a Fort Stockton pipeline, project backers rigged an election to create a new state-sanctioned utility — the Midland County Freshwater Supply District No. 1. In Texas, residents normally can vote to set up freshwater districts to supply a rural county, subdivision or other sparsely populated region. Midland's proposal drew the boundaries to encompass just one 20-acre tract close to the Midland airport. The son of a Williams executive moved onto the property to live in a modular home, qualifying as the district's sole eligible voter. Casting the only vote, he singlehandedly adopted 2010 ballot measures that established a new water district and gave it \$375 million in revenue bond authority.

Williams' water deal is tied up in court. Desperate to add more supply, Midland officials partnered with the new district to speed up the T-Bar pipeline. "We could have built it ourselves, but they could do it faster," City Manager Courtney Sharp says. Now Midland pays the district \$1.5 million or so a year to deliver the city's own water. Midland ratepayers will start paying the price when water rates jump 5 percent in October.

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