

Texas water supply for the future is uncertain

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First in a series

DALLAS - Texas has a powerful thirst, one that won't be quenched any time soon given projections that the state's population will double to 46 million over the next half-century.

In the past, Texans - particularly those in the most populated areas - found water for all those extra showers, sprinklers and toilets by heading to where the water was and grabbing it. They did this with big reservoirs, deep wells and long pipelines. Whatever it took.

But the days of cheap and abundant water are coming to an end, and where the additional supply will come from is not clear.

The devastating drought of the 1950s, the marker for the worst-case dry spell in Texas history, prompted a massive investment in the state's water infrastructure designed to ensure there would be enough water to meet the demand in decades to come.

Sixty years later, with the state gripped once again by a record-setting drought, lawmakers are balking at the price tag of a plan designed to meet demand for the next 50 years - a staggering \$53 billion for more reservoirs, desalination plants and pipelines, among other projects.

The Texas House failed to take action during its last session on two bills intended to create the first permanent funding source for the state's water plan. Instead, lawmakers placed two propositions on last week's ballot, with mixed results. Voters authorized a revolving \$6 billion bond program to pay for water supply projects, but rejected another that would provide tax breaks for conservation on ranch lands.

The central dilemma - not enough water to meet competing demands - can be seen along the Trinity River, which runs for 715 miles from the Oklahoma line to Galveston Bay. The rain-fed stream carries the heavy burden of supplying water for Texas' two largest metropolitan areas, Dallas-Fort Worth and Houston, and the demands will only grow with an ever booming, increasingly urban population.

But the Trinity, like many other Texas rivers, is tapped, with virtually every drop appropriated by farmers, industries and boundless cities.

Without room for new reservoirs in the Trinity basin, water managers will rely more on conservation and recycled water to close the gap between supply and demand, according to the state plan. They also will protect more aquatic ecosystems that hold storm waters and act as filters. And they will charge those who waste water even more.

All the while, they must leave some water in the river for the benefit of fish and wildlife.

"We're lucky to be on the water-rich side of the state," said Jim Lester, an ecology expert and vice president at the Houston Advanced Research Center in The Woodlands. "We're just not rich enough."

Texas' hydraulic heart

Texas is laced with fabled rivers, but the Trinity isn't one of them. It lacks the fame of the Rio Grande, the classic narrative of the Brazos, the mystery of the Neches, the rivalry of the Red or the good times of the Guadalupe.

Even through Dallas, where the Trinity runs along downtown, many see the river as nothing more than a muddy ditch, too polluted to swim or fish.

But the Trinity is the state's hydraulic heart, a life-giving force for millions of Texans. Water flows into the main stem through four major arteries and is pumped into the homes of Dallas and Fort Worth, flushed or poured down drains, then treated, discharged into the river and purified for reuse by those cities, as well as Huntsville and Houston. What water is left empties into one of the nation's most bountiful estuaries.

But much more is being asked of the river now than before the 1950s drought - after which the vast majority of the state's great dams and reservoirs were built. The Trinity basin alone has 32 reservoirs, with a storage capacity of more than 7 million acre-feet of water. One-acre foot, equal to about 326,000 gallons, is enough to serve two typical Texas families for a year.

Most of the Trinity's reservoirs, including Lavon Lake, Lewisville Lake and Lake Ray Roberts, are found north of Dallas and Fort Worth. In the middle basin, Lake Livingston is the primary water source for Houston.

"The best thing to do is build an upstream lake and let it flow to the users below," said Richard Browning, who served as chief of the Trinity River Authority's planning and environmental management division for 36 years until his retirement last December.

But there's no room left in the Trinity basin for another man-made lake. The completion of the Richland-Chambers Reservoir, about 70 miles south of Dallas, in 1987 started a new chapter for water managers. Since then they have had to look beyond the basin to find new supplies.

To meet the future demands of Dallas and Fort Worth, known as Region C in Texas water planning, they must add at least 1.6 million acre-feet by 2060. The state plan calls for as many as four new reservoirs in East Texas and a pipeline to import Oklahoma water, but there are many barriers in the way.

A federal court recently blocked plans to import Oklahoma water after the state argued that its law prevents nonresidents from purchasing water rights. The Choctaw and Chickasaw nations also have filed suit, saying the water belongs to them, not Oklahoma, because of a treaty with the United States.

And East Texas property owners are fighting plans to dam the Sulphur River for the proposed Marvin Nichols reservoir. If approved, the project, the largest proposed lake in the Region C plan, would flood more than 70,000 acres of mostly private property.

North Texas leaders say their economic viability depends on the ability to find new sources of water and increase the supply through reuse, or recycled water.

An inadequate water supply would harm the economy, reducing employment by 546,000 people and income by more than \$61 billion in Region C during a severe drought, according to the state's draft plan.

"It is not possible to get there through conservation and reuse," said Jim Parks, chairman of the Region C planning group and executive director of the fast-growing North Texas Municipal Water District, which provides water for 13 cities, including Frisco, McKinney and Plano.

"All these entities have looked at that question," he said. "But if you look at the population projections, you can't get there without a balanced approach" that includes new reservoirs and pipelines.

But Ken Kramer, director of the Sierra Club's Lone Star chapter, said the state plan is flawed because it's predicated on the idea that Texans will continue normal water use even in drought. It ignores the fact that cities are required to have drought contingency plans, he said.

"We're over-projecting supply and over-projecting demands without considering cutbacks in dry times," Kramer said. "So it's an effort to maximize infrastructure. The people who are responsible for our water supply don't want to be caught short. But we need to make a distinction between demands and needs."

Need to conserve

It's not new to hear folks grumble about plugging East Texas rivers for green lawns and swimming pools in Dallas and Fort Worth.

The cities and their suburbs have long-worn reputations as water hogs. Dallas residents use 213 gallons per person per day in their homes, compared with 134 for Houstonians. San Antonio, which relies on the Edwards Aquifer, an underground reservoir, uses 149 gallons per person per day, according to Texas Water Development Board's most recent data.

But Parks said the numbers are misleading because water use in Texas and throughout the United States varies widely, influenced by climate, the number of businesses and the age of infrastructure in a community, among other things.

The Trinity's northern basin, for example, receives 27 inches of rain each year, while the southern basin gets 51 inches a year, according to the Trinity River Authority. That's a lot

of water that Houstonians, unlike Dallas residents, can use for lawns without tapping into the municipal supply.

The North Texas district has spent about \$9 million over the past five years on programs to educate residents on conservation. Parks said he is seeing progress, but it will take time to take hold, like the "Don't Mess with Texas" anti-litter campaign launched a quarter-century ago.

Then again, getting by with less water is not only a goal now. It's required. The North Texas district has adopted Stage 3 restrictions in response to the ongoing drought - a move that will limit landscape watering to once every two weeks starting Nov. 1.

"This looks every bit as bad as the drought of record," said Parks, whose district also can't pump from Lake Texoma along the Oklahoma border because of an invasive mollusk.

Environmentalists said they want aggressive conservation to be the norm instead of something communities do during dry spells. They fault Dallas, Fort Worth and Houston, among other cities, for "weak" goals in reducing daily consumption over the next decade.

Kramer noted that San Antonio's water system does not pump more water today than 20 years ago, despite a population boom, because of its conservation efforts. The city has offered rebates for low-flow toilets and drought-resistant landscaping, among other programs.

The Environmental Defense Fund has concluded that Texas would save an additional 1 million acre-feet a year if every city reduced daily consumption to 140 gallons per person by 2060. (Houston is already there, but the city's 10-year goal is actually higher than its current daily usage.)

"Does Dallas really need as much water as they project?" said Mary Kelly, who runs the Austin environmental consulting firm Parula and contributed to the Environmental Defense Fund report. "They built all those reservoirs in the past, and it worked, so they'll do it again. They don't want water to be seen as a constraint on growth."

Push to reuse

Unfortunately for water managers, they never know when a drought will end. The current one - already the worst one-year dry spell in Texas since records started being kept in the 19th century - will last another year, and possibly for a decade, the state's climatologist says.

The drought's effects can be seen throughout the Trinity basin. Every major tributary went dry north of Dallas and Fort Worth this year, while reservoir levels dropped. Lavon Lake, for one, is at about half its capacity.

Still, the decades-long scramble by North Texas cities for water has put more in Trinity than it had. The U.S. Geological Service gauge near Oakwood, about 120 miles south of

Dallas, shows the river's minimum flow this year remains higher than it was before 1988. A similar trend can be seen at Romayor, the last gauge before the river reaches Galveston Bay.

That's because the base flow in dry times comes from drains, kitchen sinks and toilets in and around Dallas and Fort Worth. The more water those cities store, then use, the more water is available for those downstream.

"Every drop of water in Houston this year has already gone through the wastewater treatment plants in Dallas and Fort Worth," said Andrew Sansom, executive director of the River Systems Institute at Texas State University.

The North Texas sewage is pumped to treatment plants throughout the region. The Trinity River Authority's central facility in Dallas, for one, handles an average of 162 million gallons a day, removing 99 percent of the pollutants before returning clear-looking, but undrinkable, water into the river.

At the same time, some of the recycled water is pumped directly to irrigate nearby golf courses and fill decorative lakes and canals in Las Colinas, a planned community in Irving. It's a practice that is growing in popularity among water managers across the state because recycled water is cheaper than potable, or drinking, water.

The Region C plan calls for a three-fold increase in reuse by 2060, accounting for 16 percent of its total water supply. That's possible in part because state law does not require water rights holders to return their share to the river.

The North Texas water suppliers, however, have agreed to leave at least 30 percent of their treated wastewater in the river for Houston's use. About 40 percent of what's reused will return to the river, and that should be enough to maintain Houston's supply in Lake Livingston, water managers said.

Still, it's a situation worth watching closely, the Sierra Club's Kramer said.

"It makes sense in many ways, but we have to be careful," he said. "There needs to be a balance because if it doesn't get discharged, it's not there for users downstream."

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