

As climate gets drier, will LCRA be prepared?

River authority says its models are divorced from policy pressures

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The news from around the nation has been grim: Lake Mead, the reservoir that sustains Phoenix and Las Vegas, could dry up in the next 13 years. Lake Lanier, Atlanta's main source of drinking water, is perilously low, and there is no end in sight for the drought that has seized the Southeast.

Could Central Texas find itself in a similar situation? The Lower Colorado River Authority says no. But some of the factors that have caused water crises in Arizona and Georgia - rampant growth, exceptional drought, increasing reliance on water from lakes and rivers - are at play here.

It is impossible to say, to the drop, just how much water flows through the Colorado River every day. What matters to the people who manage that water is how much they can count on during the driest of times - the worst drought.

In the water business, this is called firm water. Although Austin has its own long-established rights to the Colorado River, it also purchases firm water from the LCRA.

Calculating firm water is tricky: The U.S. Army Corps of Engineers, for example, relied for years on drought records from the Dust Bowl years of the 1930s to calculate baseline water supplies in a couple of North Carolina lakes. But in 2007, the drought in the Southeast exceeded that worst "drought of record."

The LCRA, like all river authorities, uses complicated modeling algorithms to predict river flow during drought. Those water availability models, or WAMs as they are known in hydrological parlance, determine how much water the river authority can commit to one of the fastest-growing regions of Texas.

The forecasts are not foolproof. For one, they're based on a benchmark barely a half-century old: the seven-year drought Texas experienced in the 1950s. For another, they typically don't take into account long-term predictions of climate change. Finally, the calculations might be skewed by a policy of selling as much water as possible.

Though the LCRA insists that its water models are independent of such policy pressures, others disagree.

"The general manager is balancing lawyers and hydrologists and an economic development officer, and he has to be as optimistic as possible," said Kent Butler, who teaches water resource planning at the University of Texas and was LCRA water resources director in the late 1980s.

Crunching the numbers

State forecasts suggest that the 14-county Lower Colorado River basin will grow by 2.5 million people over the next 45 years. Cities' demand for water will double, with the river satisfying most of that demand. The latest population estimates in the 2007 water plan are already running behind actual population growth - a defect the LCRA says it will try to correct by crunching its own population numbers.

The LCRA says it would never be as unprepared for drought as states in the Southeast were.

Last April, the agency convened a meeting of water planners from California and Arizona, as well as from El Paso, to talk about drought preparedness.

"Those eastern states are used to a wetter climate," said Mark Jordan, the LCRA's river operations manager. During hard times in the West, river managers secure more water for firm customers by systematically cutting off "interruptible" users, who pay less because their water supply is not guaranteed. On the Lower Colorado, these are chiefly rice farmers near the Gulf Coast.

Although the farmers use more water in a given year than Austin, their usage has declined as agricultural acreage shrinks. The LCRA says that within decades - it doesn't specify how many - downriver farmers will be phased out as customers, to be replaced by municipal and industrial users.

Early last year, before the drought broke, the river authority told the farmers that their water would probably be curtailed for the first time ever. Should Central Texas exceed the 1950s drought of record, the LCRA plans to take a page from Alabama and Georgia's book. It will ask cities to voluntarily cut back their water use - and if that doesn't work, force them to.

Says Butler: "If you get to an extreme, record-breaking drought, the assumption is draconian measures. And no one wants to talk about draconian measures in peacetime."

The new normal

Computer simulations of various rainfall scenarios show that the LCRA could supply its water customers even in a drought as bad as the one that plagued Texas in the 1950s, says James Kowis, the agency's manager of water supply planning.

The problem is, Central Texas might be in for far worse droughts.

In a University of Arkansas tree ring analysis published in 2006 by the Guadalupe-Blanco River Authority, author Malcolm Cleaveland found that since 1648, "there may have been periods when drought was more protracted and the impact might have been considerably worse. ... It would appear unwise for civil authorities to assume that the 1950s drought represents the worst-case scenario."

A drought that hit Texas from 1856 to 1865 was more severe, said Richard Seager, a senior research scientist at Columbia University's Lamont-Doherty Earth Observatory.

Last year, Seager co-wrote an article for Science magazine predicting that the levels of aridity seen in the Dust Bowl and 1950s droughts "will become the new climatology of the American Southwest." The wet spells that allow river systems to recover from drought will grow shorter, he said, thus giving the lie to all water models based on 20th century data.

"There's going to be a new mean climate," Seager said.

An article in last month's Science, authored by U.S. Geological Survey climatologists and other scientists from around the world, says a basic principle of water management - the idea that natural systems fluctuate within certain known limits - is rapidly becoming useless because of climate change.

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