

Graduate students at UT-Arlington are developing a way to cool data centers without water

By Alejandra Martinez, *The Texas Tribune/AP*, 26 September 2025 (shortened)

Sai Abhideep Pundla has been awake since 3 a.m. After a red-eye flight from Las Vegas, where he briefed data center company executives and local government officials about the future of artificial intelligence, he's back in a lab at UT-Arlington, tinkering with a prototype he thinks could solve one of the industry's biggest challenges: how to keep data centers cool without draining finite water supplies.

Pundla, a doctoral candidate in engineering, is testing a system that cools the computer servers using a recirculating chemical refrigerant instead of water.

It's a timely innovation. Texas is building dozens of massive data centers—some as large as New York's Central Park—and experts say they're expected to guzzle millions of gallons of water a year in a state facing an increasingly urgent water crisis.

Every snap of a photo, message sent, or Google search requires data, which has to go somewhere. That "somewhere" is a data center.

These massive facilities filled with servers that store and process everything we do online keep our digital lives intact. However, keeping all that data takes electricity to power the data centers and cooling systems to keep their equipment from malfunctioning. And both of those require water.

While data centers currently consume a small portion of the state's total water supply, according to the state's water plan, some researchers warn that with droughts and population growth, data centers have the potential to help push water supplies to the brink—especially in Texas' more arid regions.

The Houston Advanced Research Center, an independent nonprofit research organization focusing on sustainability solutions, estimates that existing data centers in Texas will consume approximately 25 billion gallons of water, or 0.4% of the state's total water use in 2025.

By 2030, this demand could increase up to 2.7% of the total annual water use in Texas. That's the equivalent water consumption of 1.3 million average U.S. households.

The state currently has more than 400 data center facilities, with about 70 more on the way.

"(It) may not feel like it's a whole lot at the state level," said Margaret Cook, a researcher studying data center water use at HARC. But if massive data centers locate in small communities, she said, they may not be able to handle big jumps in water demand.

In the Texas Panhandle, for example, Amarillo residents recently held a community event to oppose five planned data centers and inform others of the potential risks to the Ogallala Aquifer, the region's main water source that is being drained faster than it can be replenished.

"Our water sources aren't as reliable as what would be needed for the data center," said Madison Boyle, an event organizer.

This growing concern has highlighted the state's limitations in tracking and forecasting water usage by emerging industries. In Texas, companies are required to report historical water consumption, but aren't required to report how much water they expect to consume in the future or where it would come from, making it difficult for communities to plan or better manage their water supplies.

Other states are starting to act on data centers' water use. California lawmakers recently passed a bill, which is awaiting the governor's signature, that will require new data centers to report their projected water use before they start operations, while in Minnesota, data center developers are required to consult with the state's environmental agency to make sure their proposed location has an adequate water supply.

Some data centers in other states are built near lakes, rivers or in colder climates where there's natural free cooling. In Texas, many data centers are located in areas where water supplies already are under high stress, according to research by Yi Ding, an assistant professor at Purdue University's School of Electrical and Computer Engineering. [...]