

DATA CENTERS

Five questions on water

Artificial intelligence (AI) data centers are quite thirsty. Just how thirsty are they and why?

1 Why do data centers need water?

Data centers operate 24/7 and their computers, servers and chips require cooling to avoid overheating. Data centers use different cooling approaches that can require significant amounts of water.

Power plants also use water to help convert heat energy into electricity that fuel data centers.

2 What are the different cooling systems used at data centers?

Data centers can use open-loop/evaporative cooling systems (akin to swamp coolers) that are more energy efficient than air conditioning but require water flow.

There are also closed-loop systems that reuse water circulated through sealed pipes and coils to cool servers. This approach uses less water but has a more expensive upfront cost and requires more complex designs.

3 How much water do data centers currently use?

Existing data centers can consume between 300,000 gallons to 5 million gallons of water per day.

4 How does that compare to other uses, such as agriculture?

AI data centers are thirsty. But they are still a drop in the bucket. Agriculture accounts for 70% of global water use and 86% of freshwater use in the U.S. Still, power plants that will help energize machine learning also utilize substantial amounts of water.

5 How much more water could AI data centers use?

AI data centers have significantly greater cooling and power needs than existing digital infrastructure.

By 2030, data centers could consume 9.3 trillion litres of water, according to the United Nations. They currently consume 4.5 trillion litres.

Big hyperscalers and AI chip makers say wider options of closed-loop cooling and innovations could lower data center water use.