How much water do data centers use, and how does it compare?

Cooling is the main water use at a data center. Older designs lost most of their cooling water to evaporation. Closed-loop systems lose only a small share. The applicant's preliminary engineering assumes closed-loop cooling, but the final design is not set. This sheet compares national annual water use to put data-center figures in context.

75–85%
of cooling water evaporated in older open-loop systems

0–5%
of cooling water lost to evaporation in closed-loop systems, with the rest recycled

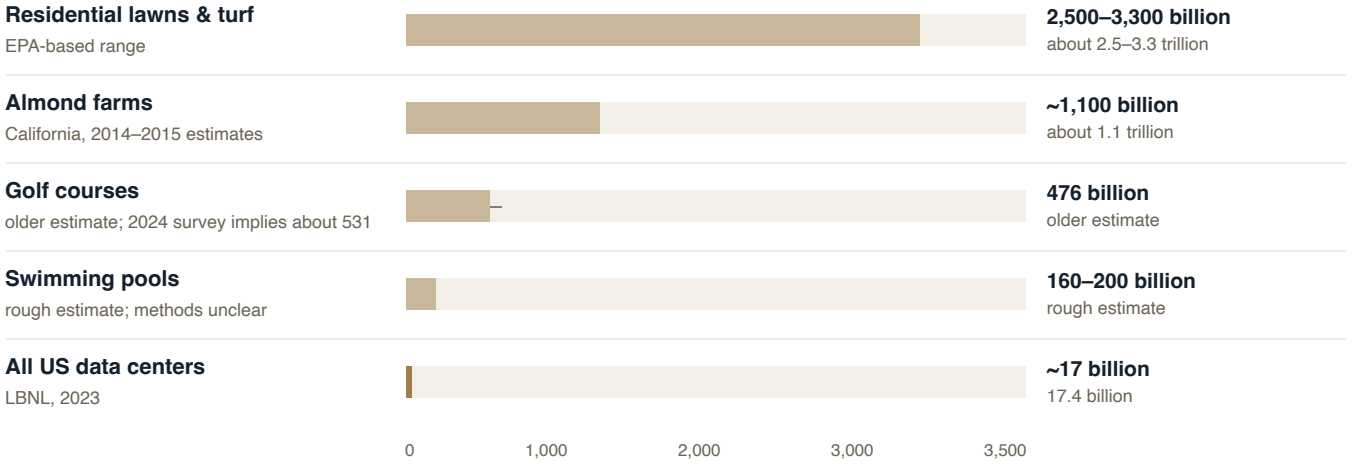
~17 billion
gallons used by all US data centers in 2023 (LBNL, 17.4 billion)

~476 billion
gallons used by US golf courses, an older estimate (2024 survey implies about 531 billion applied)

US ANNUAL WATER USE, BILLIONS OF GALLONS

Comparison of US annual water use

BILLIONS OF GALLONS PER YEAR · NATIONAL ESTIMATES FROM DIFFERENT YEARS AND METHODS



Bars are drawn to the same scale. Ranges show the spread among sources. Estimates are not directly comparable: they cover different years, use different methods, and some describe applied irrigation rather than net consumption.

WHAT THE COMPARISON DOES AND DOES NOT SHOW

Cooling is the main use

Computing equipment is about half of a data center's energy use, and cooling is most of the rest. Water use depends on the cooling design. Closed-loop systems cut evaporation sharply, which is why the design matters more than the building's size.

Willow Lakes: what is known

The applicant's preliminary engineering assumes closed-loop cooling supplied from the on-site reservoir, with domestic and sanitary demand of about 65,500 gallons a day. The cooling water volume is not yet set. Florida law (§373.262) requires disclosure of sources, amounts and losses for uses of 100,000 gallons a day or more, a conservation plan, a public hearing, and reclaimed water where feasible.

Scenarios: municipal water at 450 MW

These are illustrative scenarios for scale, not forecasts. The applicant has not yet stated its cooling water use, and that depends on the final cooling design and the water-district permit.

A. HOUSEHOLD SCALE: 1,000 SINGLE-FAMILY HOMES (MODEL, FOR SCALE ONLY)

USE	ASSUMPTION	GALLONS PER DAY	MILLION GAL / YR
Indoor household use	125 gal per home per day (2.5 residents)	125,000	45.6
Private lawns and landscaping	About 60,000 gal per home per year, averaged	165,000	60.2
Pools and common-area landscaping	300 pools; about 10 irrigated acres of common areas	25,000	9.1
Other amenities	Car washing, outdoor cleaning, clubhouse	5,000	1.8
Total, municipal supply	Cross-check: 300,000 gal/day for 1,000 homes	**320,000**	**116.8**

Cross-check: UF/IFAS reports average metered use of 299 gal per home per day for single-family homes in Orange County, Florida (data 2012–2019). Irrigation from reclaimed water or private wells would lower the municipal figure. This household case is not a proposal for the site.

B. 450 MW CAMPUS: MUNICIPAL WATER DEPENDS ON THE COOLING DESIGN

Cooling water is the swing factor. Staff, kitchens, restrooms, landscaping and cleaning add an assumed 25,000 gal/day. Annual energy is 450 MW × 8,760 hours, about 3.9 billion kWh.

COOLING WATER INTENSITY	DESIGN TYPE (ILLUSTRATIVE)	COOLING WATER, GAL/DAY	TOTAL MUNICIPAL, GAL/DAY	VS 1,000 HOMES (320,000)
0 L/kWh	Fully dry cooling	0	25,000	92% less
0.02 L/kWh	Mostly dry, some evaporative assist	57,000	82,000	74% less
0.05 L/kWh	Partly evaporative	143,000	168,000	48% less
0.10 L/kWh	Largely evaporative	285,000	310,000	3% less

Assumes all cooling water is municipal and the load is continuous at 450 MW of IT equipment. If 450 MW is total campus demand, the IT load and these figures are lower. Dry cooling uses more electricity, which is a tradeoff to weigh against water.

C. WHAT THIS DOES AND DOES NOT SHOW

The 92% result needs a dry design

The large reduction applies only if the campus uses fully dry cooling, with no evaporation. The applicant's preliminary engineering assumes closed-loop cooling supplied from the reservoir, which does not by itself rule out evaporation. Whether the campus achieves the low end depends on the cooling architecture, which is not yet specified.

Industry practice varies

Microsoft reports that its newest designs use closed-loop liquid cooling and air-cooled chillers, with zero water for cooling during normal operation. Its June 2026 update also says cooling towers at its fleet used 750 to 1,150 million liters a year. Water-free designs can need more electricity. A closed loop does not guarantee low water use, because the loop can still reject heat through an evaporative tower.

Sources and notes

Each figure is listed with its source and how much confidence it deserves. Estimates for different places and years are not directly comparable.

SOURCES

FIGURE	SOURCE	CONFIDENCE
Evaporation, open-loop vs closed-loop	Loudoun County, Virginia, water page: loudoun.gov/6402/Water-Considerations	OFFICIAL
US data centers, ~17 billion gal (2023)	Lawrence Berkeley National Laboratory, 2024 US Data Center Energy Usage Report: LBNL report	RESEARCH
Golf courses, 476 billion gal	Golf Course Industry, citing a study by Dave Zoldoske: golfcourseindustry.com. 2024 applied-water estimate (about 531 billion): lenz.io	OLDER ESTIMATE
Residential lawns & turf, 2.5–3.3 trillion gal	EPA outdoor water use fact sheet (2008; archived): EPA WaterSense. Range is our arithmetic from its daily estimates.	FEDERAL, DATED
Almond farms, ~1.1 trillion gal	Slate, 2014: slate.com; AP report, 2015: NBC Los Angeles	PRESS, 2014–15
Swimming pools, 160–200 billion gal	Pool Research statistics page: poolresearch.com/statistics. Source and method not stated.	ROUGH
Household water use, Florida	UF/IFAS, Florida single-family homes, metered data 2012–2019, average 299 gal/day in Orange County (figure from secondary coverage; not checked against the fact sheet): AE561	CHECK BEFORE USE
Pool evaporation	EPA WaterSense pool guide: an uncovered 500 sq ft pool can lose 12,000–31,000 gal/yr: EPA pool guide	FEDERAL
Fort Pierce sewer planning rate	Draft 2026 Infrastructure Element, City of Fort Pierce: 240 gal/day per single-family unit for sewer planning. No FPUA water design figure of 300 gal/day was found: draft plan	CITY DRAFT
Data-center cooling designs	Microsoft, June 24, 2026 water-intensity update: Microsoft blog; 2024 design announcement: Microsoft Cloud blog	COMPANY, SELF-REPORTED
Fort Pierce and Willow Lakes	Fla. Stat. §373.262: leg.state.fl.us. Applicant preliminary engineering: City staff report, Sept. 17, 2026 packet.	APPLICANT / CITY

Prepared by Devcon Enterprises for the Willow Lakes public information website, October 2026. Figures are national or applicant estimates, not City measurements. Willow Lakes water use will be set by engineering and the South Florida Water Management District permit. Updated as sources change.