The WATER Foundation

# Water & Data Centers

# Executive Summary

Driven by the rise of artificial intelligence (AI) technologies, data centers are being built at an unprecedented scale and rate. Nearly 3,000 of these server warehouses are currently in development in the U.S. Technology companies are projected to spend $6.7 trillion on data center infrastructure through 2030 — $700 billion in 2026 in the U.S. alone. This buildout is already generating significant community resistance: In the first quarter of 2026, local campaigns led to the cancellation of 20 proposed projects representing $41 billion in investments. One often-cited concern in these campaigns is data centers' water use. These concerns are well-founded, as this paper examines in depth.

Data centers use water primarily for cooling their heat-generating servers, and the volume of their water use is largely determined by cooling system design. Evaporative cooling, which is especially common in newer, larger facilities, uses and consumes large amounts of water. Current estimates put U.S. data centers' direct water consumption at 17 billion to 19 billion gallons annually, a figure projected to rise to 60 billion to 110 billion gallons by 2030. Less visible, but potentially larger, is data centers' indirect water footprint through their high energy use. One analysis of the country's regional grid mixes estimated that data centers' electricity use consumed 211 billion gallons of water in 2023.

These numbers, however, only tell part of the story. A data center's actual impacts depend heavily on where it is built, what kinds of water it consumes and discharges, and the condition of the infrastructure on which it relies. Since 2022, two-thirds of new data center construction has been in areas already experiencing high water stress. Municipal water systems, which supply 97% of data centers' water, face costly infrastructure upgrades to meet new demand, and those costs can fall on residential ratepayers rather than developers. High levels of water consumption can also strain watersheds, and water discharged to the environment after use can degrade local waterways through heat pollution and contaminants. Data centers tend to cluster geographically to take advantage of tax incentives, land prices, and cheap and accessible energy, creating cumulative impacts on watersheds and municipal water infrastructure.

This paper puts forward five categories of response to addressing and mitigating these harms. First, communities should be centered in decision making, with national organizations offering technical assistance and capacity building so communities can evaluate the impacts of proposed projects and block them if they choose or negotiate enforceable community benefits if they proceed. Second, siting and design should be required to match local water and energy conditions, prioritizing mild climates, co-location with recycled water facilities, and cooling systems appropriate to the local context; siting choices should also consider the cumulative impacts of nearby data centers and other large-scale water users. Third, there should be more transparency: Data center companies should be required to track and publicly report projected and actual water use, consumption, and peak demand, making cumulative regional impacts and seasonal differences in water need legible to policymakers and communities. Fourth, developers should cover the full costs their facilities impose on water systems, including infrastructure upgrades, new capacity, and broader watershed benefits. Lastly, development should not outpace communities' ability to exercise self-determination; data center moratoriums can give communities time to evaluate potential impacts and institute protections. As of early 2026, moratorium bills had been introduced in at least 11 states and passed in dozens of cities and counties.

These policy and regulatory recommendations are put forward as options that can protect communities and ecosystems from the worst of data centers' water-related harms, but they are not intended as a checklist for how to create a "good data center." For each proposed project, officials and community groups should examine their specific context to understand potential local and cumulative impacts, discern whether the facility should be built at all, and, if they do move forward, what protections and community benefits they should demand in return.

Today's fights over data center water use are significant in their own right, but they are also an opening. Campaigns that began as opposition to a single facility are surfacing broader questions about who bears the cost of industrial water use, what accountability corporations owe to the communities they affect, and what transparency the public is entitled to expect. In some states and cities, moratoriums and reporting requirements are already being extended beyond data centers to include other large industrial water users. For water advocates and funders, this moment is an opportunity not just to protect specific watersheds or support specific local communities, but also to shift the norms and policies that will govern industrial water use for years to come.


"No Data Center" yard sign from Physicians for Social Responsibility Pennsylvania in downtown Delaware Water Gap.
PHOTO: HERE NOW / SHUTTERSTOCK.COM

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On the cover: Google data center campus in Oregon.

PHOTO: HRACH HOVHANNISYAN / SHUTTERSTOCK.COM

# Introduction

Data centers are a hot topic in 2026. As part of the rapid expansion of artificial intelligence (AI), technology companies are investing heavily in building out massive new data centers to meet the projected demands for processing power. Nearly 3,000 new data centers are currently in development in the United States.

This mammoth buildout of large-scale data centers has raised a broad range of concerns, and communities across the U.S. and the world are increasingly opposing the development of local projects.[1] In the first quarter of 2026 alone, local campaigns led to the cancellation of 20 proposed data center projects in the U.S., which collectively accounted for more than $41.7 billion in investments. In the same three months, more than 100 new local campaigns launched to block the permitting of additional data centers.

Much of this pushback stems from concerns about the environmental impact of data centers, including their high power demands, the growth of which is already slowing or canceling the planned retirement of coal plants. Other commonly cited concerns include the misapplication of tax incentives for projects that will not create many permanent jobs; their sheer physical footprint, including light and sound pollution; and objections to AI technologies in general, or to their role in surveillance and data mining in particular. These impacts are racially skewed: Data centers are more likely to be sited near communities of color, exacerbating the already disproportionate racial impacts of air pollution and other environmental harms.

Many communities are also opposing data centers because of concerns related to their water use. It is true that data centers' water use can have deleterious impacts on local communities, water infrastructure, and watersheds. This is especially relevant because developers have so far prioritized cheap land and energy in their siting choices, often without considering water needs or impacts; since 2022, two-thirds of new data center construction has been in areas with high water stress.

**The purpose of this white paper is twofold: to provide a primer on the water-related impacts of data centers, and to put forward a vision of how water advocates and funders can engage with the groundswell of organizing to advance their larger goals of protecting watersheds, strengthening water infrastructure, and protecting people's health.** The first section gives an introduction to data centers and the current context for their growth; the second explores what we know about data centers and water, including how much they use and why, where the water goes, and how that usage is projected to change; and the third outlines data centers' water-related impacts on both human communities and the environment. The paper concludes with recommendations for ways various stakeholders can curb the runaway harms of data centers and argues these fights are also opportunities to have broader conversations about cumulative impacts, what is acceptable practice in industrial water use, and what corporate responsibilities should be.

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1 As this is a quickly evolving field, this paper does not attempt to summarize current updates about community organizing around the country, which will be quickly out of date. Instead, it focuses on research and policy developments.

This paper includes recommendations about how to improve data centers' water efficiency and water use. We take this approach knowing many data centers are already underway, and stakeholders should understand how better siting, design and technology choices, and regulation can mitigate their impacts. Despite including these recommendations, the Water Foundation's top priority is community self-determination, including the categorical right to decide whether any data center should be built in the first place.

Google Data Center, Council Bluffs Iowa
PHOTO: CHAD DAVIS, WIKIMEDIA COMMONS

# Data Centers 101

Data centers are facilities that house the information technology (IT) infrastructure that stores and processes digital data. In more concrete terms, they are warehouses filled with the computer servers that make possible everything from hosting websites and streaming videos to running AI large language models (LLMs) like ChatGPT.

There are currently more than 4,000 data centers in the U.S., representing a range of types and purposes.[2] ***Enterprise data centers*** are owned by individual companies to serve their employees and clients; for example, a large bank may operate an enterprise data center to host its customer information and financial records securely. ***Colocation data centers*** are operated by third parties that lease out space to multiple other organizations, allowing smaller companies the flexibility to scale up or down as needed. ***Hyperscale data centers*** are large-scale facilities that support massive computing workloads, typically owned and operated by a small number of cloud service companies like Amazon Web Services, Meta, Google, and Microsoft.

Less than a decade ago, the majority of data center capacity came from enterprise data centers, with under a quarter from hyperscale facilities. That dynamic has shifted, and by 2030, more than 60% of data center capacity is projected to be from hyperscale facilities. This is largely because of the rise of AI technologies, which require huge amounts of computing power. Because of the shift toward large hyperscale facilities — some of which can take up hundreds of acres of land — about 67% of proposed developments are in rural areas, mostly in the South and Midwest. This is in sharp contrast with existing data centers, 87% of which are in urban areas.

Companies are rapidly expanding their data center capacity to meet their projected processing needs, which may more than triple by 2030. Industry estimates expect around 40% of this demand to be from the use of generative AI. These estimates are predicated on a lot of unknown factors, including the evolution of the technology itself. As companies roll out more AI products, their primary computing

2 *America's AI Surge: Powering Investment, Jobs, and Growth in Every State* (American Edge Project, 2025).

needs are shifting from *training* — a preparatory effort to build the code and input vast amounts of data into the AI model — toward *inferencing*, in which the model's training is put to work in response to user requests. The widespread adoption of the advanced AI models tech companies are projecting will require a vast amount of computing. For example, autonomous AI agents can require as much as 100 times more processing power to run than simple chatbots. Computing needs will continue to shift, increasing as models evolve and become more widely used and decreasing somewhat as companies improve computational efficiency.

The attempt to meet projected data center needs are driving capital expenditures at a truly colossal scale. In 2025, Amazon, Google/Alphabet, Oracle, Meta, Microsoft, and CoreWeave spent nearly $400 billion combined on data center infrastructure, a number that is projected to rise to $700 billion in 2026. McKinsey estimates data center infrastructure spending will reach $6.7 trillion through 2030, more than half of that on physical servers and the remainder on costs like labor, electrical and mechanical equipment, and acquiring land.[3]

Some economists are concerned that these projections reflect an "AI bubble" that will eventually burst, with wide-reaching impacts, as tech companies make up a third of the stock market. Others assert that these investments will pay off in massive returns as AI reshapes the way companies work. In any case, AI infrastructure buildout will have far-reaching economic effects.

## Defining Common Terms

**Water use** or **water withdrawal**: The total amount of water a facility takes in for its operations.

**Water discharge**: The amount of a facility's total water usage that is returned to its source, for example, by reentering a municipal water treatment system.

**Water consumption**: The amount of a facility's total water usage that is not returned to its original source or available for reuse, typically because it has evaporated.

**Blowdown**: The process of intentionally removing water from a system (like a cooling tower) and replacing contaminated water with fresh water to avoid the buildup of impurities.

**Water use efficiency** (WUE): The amount of water a data center uses on-site in comparison to energy used for computing, usually measured in liters per kilowatt-hour (L/kWh). The metric is common in industry but has limited meaning: A facility with a low WUE could still cause water stress through poor siting or consuming a high percentage of its water withdrawal, leave high concentrations of contaminants in blowdown or other water discharge, and/or indirectly consume large amounts of water offsite for electricity generation.

**Water stress:** When the demand for freshwater exceeds its availability in a specific place and time because of water scarcity or inadequate infrastructure.

3 Barth et al., *The Data Center Balance*.

# Data Centers & Water Use

It is difficult to know the actual amount of water used by data centers in the U.S. Most large-scale data center operators only report limited, aggregated data on water use; many operators do not even track their water use across facilities. Sometimes data is collected but not available publicly, for example, when projected water and energy use for a proposed development is covered by nondisclosure agreements (NDAs). This section sets forward what we do know about data centers' water use. It covers two distinct categories: direct water usage, or that which is used on-site for data centers' operations; and indirect water usage, the off-site water use that allows data centers to function.

## Direct Water Usage

Just as your laptop's fan might turn on when it has a high processing load, the servers in data centers run hot when they work hard. To function well, computer chips need to stay within a specific temperature and humidity range, so a key operational goal for a data center is to keep the chips cool. Cooling design is the most consequential factor in a data center's direct water use. The industry uses a variety of cooling systems, the most common of which are outlined below.

***Evaporative cooling*** is a broad category of cooling methods that use evaporation to transfer heat. Evaporative cooling can be used to cool incoming air; in "direct evaporative cooling," hot outside air is blown into absorbent wet pads, causing the water to evaporate. This cools down the air, which is then blown into the facility.[4] Evaporative processes are also used to reject heat that the facility has generated. In many large-scale data centers, water transfers heat from the facility to an open-air "cooling tower," where the heat is released via evaporation. These cooling towers consume high volumes of water and require blowdown to keep the remaining water in a usable state. This is the most water-intensive of the cooling methods. A large data center using evaporative cooling during the summer could use more than 1 million gallons per day.[5] Because these processes rely on evaporation, they consume a high proportion of the water used.

***Air cooling*** uses fans or air conditioning to cool the air inside the facility. It is energy intensive: Data centers using air cooling consume 33% to 54% more electricity than those using evaporative cooling. It uses much less water but may still use some, for example to control facility humidity in a dry climate. Air cooling used to be the primary way that data centers were cooled. With the growth of heavier computing workloads over the past decade, its use has declined.[6]

***Free cooling*** ventilates cool outside air into the data center. This uses no water and is very energy efficient, but requires a temperate climate and is often paired with backup cooling systems for use on hotter days.

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4 Sandalow et al., *Sustainable Data Centers Roadmap*, 86.

5 Han et al., "Small Bottle, Big Pipe," 2, 6.

6 Sandalow et al., *Sustainable Data Centers Roadmap*, 79–81.

***Closed-loop cooling*** focuses on cooling equipment rather than the whole facility. Conventional closed-loop cooling systems work by circulating cold water or water-coolant mixes in sealed pipes or coils that run next to the servers. Because the liquid is not exposed to air, water loss is generally low. Still, many so-called "closed loop" systems still rely on evaporative processes, like cooling towers, to disperse the heat absorbed by the circulating water. Some closed-loop systems do release heat without evaporation, for example through air-cooled chillers. Even these "dry heat rejection" systems are still not completely closed, however, the water in closed-loop systems must be replaced periodically.[7]

***Liquid cooling*** is a growing subcategory of closed-loop cooling that uses water-glycol mixes or other liquids to cool equipment directly, by running fluids through plates that sit directly on the chips (also called "direct-to-chip" cooling) or by submerging servers in chemically engineered, non-conductive liquids ("immersion cooling"). Because fluids have a higher thermal capacity than air, liquid cooling is very effective at heat removal. Liquid cooling loops can also run at hotter temperatures, reducing the need for mechanical or evaporative heat rejection.[8] These systems require higher upfront costs to set up, but they are more energy and water efficient than evaporative or air cooling. Immersion cooling systems can use PFAS-based fluids, causing environmental harm if the system leaks.

The choice of cooling system requires prioritizing among water use, energy use, and setup and maintenance costs. A basic trade-off is that the most common water-efficient systems tend to be more energy-intensive, and vice versa. In general, air cooling has historically been the most common system, but many of the new hyperscale data centers rely on various methods of evaporative cooling to function, because those methods are more effective and require less electricity.[9] Liquid cooling is more water *and* energy efficient, but it is still rare. A 2024 survey shows 22% of data centers were using this type of cooling, but about half of those operators were applying it to just a small portion of their server racks.[10] Many facilities are built with the capacity to cool with more than one system; for example, a data center that mostly relies on air cooling may "pre-cool" the air with evaporative cooling to reduce energy use, or have evaporative cooling as a backup to use on high-heat days.[11]

## Units of Measurement

Research on data centers often uses liters or gallons, while the most common metric for industrial agriculture is acre-feet (1 acre-foot = ~326,000 gallons). This paper converts data into gallons for ease of comparison.

The water use for all these data centers adds up. One report estimates their annual consumption is currently 17.5 billion gallons;[12] another analysis, extrapolating from large data center operators' publicly available sustainability reports, estimates total water consumption for data centers in the U.S. in 2024

7 Volzer and Iturbide-Chang, *A Regional Playbook*, 10.
8 Sandalow et al., *Sustainable Data Centers Roadmap*, 87–88.
9 Ferreira et al., *Economic, Fiscal, and Energy-Related Impacts of Data Centers in the Great Lakes Region*, 44.
10 *Data Centers and the Climate Landscape*, 34.
11 Han et al., "Small Bottle, Big Pipe."
12 James et al., *Drained by Data*, 4.

was 19 billion gallons, with 24 billion gallons of water withdrawn. The same researchers predict by 2030 data centers will withdraw between 80 billion and 150 billion gallons of water and consume 60 billion to 110 billion gallons of that annually, depending on the growth of industry and water efficiency measures.[13]

## Indirect Water Usage

Most discussions of data centers and water focus on direct water use, but the larger water use is often indirect. Data center indirect water use generally comes in two categories: the water required to generate the energy that a data center runs on, and the "embodied water" used to extract and create the materials in the facility itself.

Electricity generation is one of the most water-intensive sectors in the U.S., although the water intensity varies significantly by fuel source. A relatively large data center using 600 million kWh of electricity annually would have an indirect water use of 30 million to 420 million gallons per year if it were running on natural gas, depending on the setup of the plant; 180 million to 420 million if it were running on coal; 330 million to 390 million running on nuclear power; and close to zero if it were running on wind or solar (not counting embodied water use).[14] Based on an analysis of regional grid mixes across U.S. data center locations, researchers estimate in 2023, indirect water consumption (not withdrawal) for data centers from electricity use was approximately 211 billion gallons — more than 10 times the estimates of direct water consumption. This sizable water usage complicates the water/energy trade-off described above. As one analysis puts it, when a data center shifts from evaporative to air cooling, "overall water demand could still be very high; the water use has simply shifted from the data center to the power plant."[15]

It is worth noting these types of water use are not necessarily directly comparable. While most data centers' onsite water is potable and comes from municipal water systems, most water used by the grid comes from rivers, lakes, or reservoirs, thus raising different issues and potential impacts.[16] To complicate this picture, new data center developments are increasingly bypassing the grid altogether. According to one recent analysis, around 30% of currently planned U.S. data center capacity will generate its own "behind-the-meter" power, with roughly 75% of that relying on natural gas plants. It is unclear how these onsite power plants will source their water.

An understudied facet of indirect water usage is data centers' "embodied water," or the water required to make the physical materials that constitute the facility. Water is required to mine minerals and to manufacture semiconductors, concrete, and steel, which are all key components of data center facilities.[17] Information is limited on how much embodied water goes into a new data center, but the industry's rapid expansion will increase that water use as well.

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13 Han et al., "Small Bottle, Big Pipe," 4.
14 *Data Centers and Water Use: What You Need to Know*, 5.
15 Volzer and Iturbide-Chang, *A Regional Playbook*, 10.
16 Han et al., "Small Bottle, Big Pipe," 4.
17 Sandalow et al., *Sustainable Data Centers Roadmap*, 223–25; Han et al., "Small Bottle, Big Pipe," 6–7.

# Consequences of Data Center Water Use

Data centers' direct and indirect water use is dwarfed by that of other water-guzzling industries. For comparison, from 2010-2020, the freshwater withdrawal for thermoelectric power plants in the continental U.S. was an average of 82.7 billion gallons per day. For crop irrigation, it was even higher, at 108.7 billion gallons per day.[18]

Despite the relatively small amount of data centers' direct water usage, to understand the nature and scale of data centers' water-related impacts, their water usage needs to be understood in its full context. This includes the degree of local water stress, the type of water the data center is using, how much of the water used is being consumed, and the condition of the infrastructure on which it relies.

Data centers' local impacts should also be understood in aggregate rather than on a facility-by-facility basis. This is especially true because data centers are often built in clusters, as multiple developers take advantage of a location's tax incentives, infrastructure access, and/or network connectivity; in fact, nine in ten data centers are within five miles of another data center.[19] For that reason, it is especially important to not just evaluate each facility's impacts, but also local and regional cumulative impacts. This section explores what data centers' water usage can materially mean for the people and ecosystems where they are located.

## Community Impacts

A primary threat to communities posed by unrestrained growth of data centers is overloading local water infrastructure on which residents also rely, reducing the resilience and reliability of those water systems and increasing costs for the local communities.

Data centers source 97% of their water from municipal water systems.[20] Even data centers that primarily run on low-water cooling systems often use water-based cooling as a backup on particularly hot days, when their primary cooling methods are insufficient. Those surges in water withdrawals, however brief, increase stress on water infrastructure and can lead to systemwide issues like main breaks, lower system pressure, and increased wastewater treatment costs.[21]

Upgrading the infrastructure of a municipal water system to meet the increased water needs of data centers requires significant investments: the total valuation of new water capacity needed for data centers in the U.S. through 2030 may be up to $58 billion, depending on the industry's rate of growth and facility water efficiency.[22] These public water system upgrades are not only expensive, they are also time consuming, complex to build, and subject to local hydrology, water rights, and regulatory oversight. If a municipal water system needs to develop a new water source to meet the increased

18 Laura Medalie et al., *Water Use Across the Conterminous United States, Water Years 2010–20*, U.S. Geological Survey Integrated Water Availability Assessment—2010–20 (U.S. Geological Survey, 2025), 26, 31.
19 Seets and Radde, "Most New Data Centers in the U.S. Are Coming to Rural Areas."
20 *Data Centers and the Climate Landscape*, 9.
21 Volzer and Iturbide-Chang, *A Regional Playbook*, 20.
22 Han et al., "Small Bottle, Big Pipe," 4.

need, the process can take up to two decades until it is available for use, assuming there is even a viable new source nearby.[23] In the meantime, existing water systems can be overloaded: For example, one report estimated data centers will drive a 22% increase in water stress in Phoenix during summer months.[24]

Although water utilities generally charge industrial customers fees to cover the cost of connecting to the system, those fees do not necessarily cover the full costs of expanding or strengthening water infrastructure to adapt to the higher stress of high-volume demands. "Pro rata" policies requiring large-scale industrial users to pay for system-wide infrastructure improvements are not universal, which means the burden of expanding infrastructure costs has the potential to fall on residential customers.

An additional concern is the risk of stranded assets if the projected water needs do not materialize. For example, if the AI boom falls short of its projections, the company pulls out or goes bankrupt, and no binding provisions have been made for that eventuality, the local utility could be left with a massive infrastructure buildout but no company paying the water bill that could fund system upkeep, and the remaining community would have to cover the costs.

Water affordability is already an issue across the U.S. Between 9.2% and 14.6% of households lack affordable access to water. This crisis falls disproportionately along racial lines: Communities where a higher share of residents are people of color are already more likely to face unaffordable water bills and service shutoffs. If and when the costs of upgrading water infrastructure are shifted onto residential ratepayers rather than the companies that necessitated them, those costs will compound existing inequities, falling hardest on communities already struggling to pay for water.

## Environmental Impacts

A data center's water-related environmental impacts begin before it opens. The construction of extensive server facilities typically replaces permeable land with buildings and paved surfaces, reducing the area where rainfall can soak into the ground and naturally recharge local aquifers.[25] Impermeable surfaces can increase runoff and reduce the rate at which groundwater can recharge, compounding the operational water impacts that follow.[26]

Once a data center is online, if it uses evaporative cooling, it will have a high consumptive ratio: 70% to 90% of data centers' water withdrawals are consumed rather than returned to their source for downstream use. For comparison, typical consumptive ratios are 20% for manufacturing and 5% to 15% for residential homes.[27] This high level of consumption can pose problems for public water systems, especially in water-stressed areas with limited water supply. Although most data center operators source their water from municipal suppliers, some do access water directly from

23 Han et al., "Small Bottle, Big Pipe," 3, 8.
24 James et al., *Drained by Data*, 10.
25 Volzer and Iturbide-Chang, *A Regional Playbook*, 17.
26 *Data Centers and Water Use: What You Need to Know*, 7.
27 Han et al., "Small Bottle, Big Pipe," 10–11.

groundwater or surface water. One large colocation provider, Equinix, reported 6% of its global water use in 2024 was pulled directly from groundwater.[28] In places that rely on groundwater for drinking water, consumptive use beyond natural replenishment rates can threaten long-term sustainability of those water sources.[29]

Water discharge — water that is returned to its source rather than consumed — is also a potential problem. Data center discharge tends to be warm; this "thermal pollution" reduces the dissolved oxygen levels in water and can change the reproductive cycles, metabolic rates, and migration behavior of cool-water species.[30] In addition, evaporative cooling creates a wastewater byproduct known as ***blowdown***, or water that is periodically drained to prevent excessive concentration of impurities that would otherwise damage the equipment. Blowdown can contain elevated concentrations of minerals, treatment chemicals like biocides and corrosion inhibitors, and other pollutants. This blowdown may be discharged to municipal wastewater systems or directly to surface waters under discharge permits, depending on the facility's design and local regulations. Local wastewater systems are not always equipped to handle the contaminants, requiring expensive wastewater system infrastructure upgrades or risking the contamination of groundwater and surface water.[31]

These impacts are magnified when the discharge is not diluted significantly, either because it is entering smaller bodies of water or because there is cumulative impact from other industrial facilities nearby. Climate change also intensifies the harms of water discharge: Thermal pollution gets worse because baseline temperatures are higher, and dilution problems increase because there are more periods of low water flow in rivers and streams.[32]

28 Grimm et al., *Regulating Data Center Water Use in California*, 19.
29 Volzer and Iturbide-Chang, *A Regional Playbook*, 12.
30 *An Investor Guide to Addressing Water Risk in the High-Tech Sector Value Chain* (Ceres, n.d.), 4.
31 *An Investor Guide to Addressing Water Risk in the High-Tech Sector Value Chain*, 4.
32 Volzer and Iturbide-Chang, *A Regional Playbook*, 12–13.

# Harm Mitigation Strategies

As noted in the previous section, a data center's water impacts depend heavily on factors beyond gallons used per day, including what kind of water it is using and how much it is consuming, the condition of the connected infrastructure, how much water scarcity is already felt or likely to be felt in that region, and how many other facilities are nearby. For this reason, it is important to evaluate proposed projects based on their specific contexts.

Given that, these recommendations are not intended as a checklist for how to create a "good data center." Instead, this is a survey of policy or regulatory options that can be used to prevent, mitigate, or offset water-related harms. In each case, officials and community groups should evaluate proposed projects based on their specific context to discern whether to allow the facility to be built — and if so, what protections and community benefits they should demand in return.

It is worth noting that many companies scaling up data centers are already trying to reduce their water impacts. Microsoft and Amazon have both committed to being "net water positive" by 2030, meaning they will generate or return more water to their local watersheds or water systems than their data centers directly consume. Google has committed to returning 20% more water than its data centers consume directly by 2030.[33] Microsoft has invested in developing "cold plates" that cool chips, in an attempt to cut back on the needs for both water and energy in their cooling.[34] Other corporate responsibility efforts include wetland restoration and detecting leaks to "offset" industrial water use. Ultimately, however, the need for transparency and real accountability mechanisms means we should not rely on voluntary, corporate-led initiatives.

The following recommendations are relevant to, and can be adapted by, many different levels of government. State policy can mandate higher transparency and change tax incentives; regional water and energy utilities can coordinate to manage collective impacts across shared geography; and local city councils and zoning boards can make stipulations during the process of zoning or permitting new projects. Many of these recommendations could be applied on several levels: For example, in the absence of state policy requiring reporting on water use, a municipality or county could require the same through a local ordinance.

Below is an overview of some of the most important approaches to mitigate water-related harm by data centers, according to current research and practice.

## Prioritize Local Self-Determination & Community Benefit

Local populations will bear the brunt of these new facilities, but most do not have the capacity, expertise, or time to conduct their own analysis of the factors that might determine whether they want a data center in their backyard. National organizations and funders can invest in building out technical assistance and strategy support for local elected officials and community groups. This

33 Sandalow et al., *Sustainable Data Centers Roadmap*, 226.

34 James et al., *Drained by Data*, 10.

hands-on support can help nearby communities evaluate proposed data centers in the context of their local needs, organize to block the proposal if they think it is not worth the cost, and implement comprehensive community protections and benefits if they decide to move it forward. The need for this kind of capacity building is especially urgent for rural communities, which face unique governance challenges and likely have more limited supply options to meet data centers' water demands.[35]

If communities do want data centers, there should be robust efforts to ensure public benefit. Community benefit agreements (CBAs), negotiated directly between the developer and the city or community groups, and community benefit ordinances, which carry the force of law, are the primary tools. Ordinances can set minimum standards for CBA negotiations, or they can mandate that the city deploy a portion of a data center's tax revenue to benefit the population closest to the facility. Community benefits can include protective measures around site design, reporting, and infrastructure development, as outlined below; they can also include broader requirements that data center operators invest in regional watershed restoration and conservation, like wetland and riparian buffer restoration and groundwater recharge projects.[36] Any agreements should also include stipulations for when the data center is eventually decommissioned, including plans for the site and building infrastructure, any tax exemptions it has received, and exit fees to cover the costs of any water infrastructure upgrades it has prompted.

Ideally, these community benefits would not be negotiated just by elected officials, but would include meaningful input from residents and community groups. Any community benefit agreement should be legally binding and enforceable rather than voluntary.

## Site Well & Design for Context

Data centers are sited based on a range of factors, including the availability and cost of land, proximity to network connectivity and customers, access to (renewable) energy and water, climate conditions, and risk of natural disasters. Strategic siting can minimize water usage by building in mild climates that require less cooling; co-locating with recycled water facilities; using reclaimed water; and/or building near renewable energy infrastructure, so low-water, high-energy cooling methods do not increase indirect water use or carbon emissions.[37] Once a location is chosen, thoughtful design can ensure that the data center uses cooling systems most fitting for that location's particular water and energy context.

There are several points of leverage that can ensure new data centers are sited and designed well. State-level regulations or local zoning rules can require or incentivize new data centers to co-locate with recycled water facilities, for example, or can put limits on the total volume of new industry that can come into places with water stress. Siting requirements and incentives can also minimize the development of previously undeveloped land, prioritizing brownfields as sites for new facilities.[38]

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35 Grimm et al., *Regulating Data Center Water Use in California*, 12–13.
36 Volzer and Iturbide-Chang, *A Regional Playbook*, 29.
37 Grimm et al., *Regulating Data Center Water Use in California*, 7; *Data Centers and Water Use: What You Need to Know*, 7.
38 *Data Centers and Water Use: What You Need to Know*, 9.

Like data centers, brownfields tend to cluster and are disproportionately located in communities of color; any zoning rules or incentives should protect against further environmental injustice by evaluating proposed developments in the context of the cumulative impacts of all extractive and polluting industries nearby.

Siting and design choices largely constrain resource needs. Still, once a data center is built, there are operational measures that can be taken to reduce water use. For example, operators can plan heavy processing loads for cooler times of the day, or prioritize computational efficiency to produce less heat.[39] Coordinated water and energy planning can, for example, use surplus solar energy for air cooling during midday heat, avoiding overloading the grid and also avoiding water cooling when water evaporation rates would be especially high.[40]

Data centers can also be required to build in more sustainable ways to mitigate buildings' impacts on stormwater runoff, including using permeable pavement, restoring wetlands and riparian buffers, and building rain gardens.[41]

## Mandate Tracking & Reporting of Water Usage

Some data center companies do not track water use across their facilities, because they are not required to and water is relatively low cost in their operations.[42] Even when it is tracked, data centers' projected or actual energy or water usage is often not publicly accessible, because the information is considered trade secrets and covered by NDAs.[43] This confidentiality makes it difficult for the public to understand the impact of current or proposed data centers, and impedes the ability of researchers and water policy advocates to get a full picture of a region's cumulative water impacts.

During the planning and review process, states or cities should require companies to disclose data on projected water usage, water consumption, and peak water demand, and to make that data publicly available so it can inform community decision making. Data centers already in operation should be mandated to track and report the same data, making it possible to analyze how projections compare to actual use and to better understand strains on water infrastructure.[44] Water use reporting requirements could be applied to other water-intense commercial and industrial facilities, so policymakers and community members can more fully understand cumulative industrial water demands and compare facility usage.[45]

Mandating transparency is good public policy beyond data centers, too. At the time of writing, for example, Minnesota is considering a bill that would ban elected officials from being able to sign NDAs

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39 Grimm et al., *Regulating Data Center Water Use in California*, 7.
40 Han et al., "Small Bottle, Big Pipe," 22.
41 *Data Centers and Water Use: What You Need to Know*, 7; Volzer and Iturbide-Chang, *A Regional Playbook*, 25.
42 Grimm et al., *Regulating Data Center Water Use in California*, 34.
43 Finn et al., *The Costs of Data Centers to Our Communities—and How to Fight Back*, 15.
44 Han et al., "Small Bottle, Big Pipe."
45 Volzer and Iturbide-Chang, *A Regional Playbook*; Grimm et al., *Regulating Data Center Water Use in California*, 41. Texas Living Waters defines large water users as those consuming more than five million gallons per year; see *Balancing the Water Needs of Data Centers and Large Water Users in Texas with the State's Vision for Long-Term Water Security* (Texas Living Waters and Houston Advanced Research Center, 2026). Other proposed legislation has defined large water users at 50 million to 100 million gallons per year.

related to any project involving taxpayer funds, ensuring more transparency for planning processes and for future developments. Microsoft has also recently publicly stated they will no longer be using NDAs for new data center projects.

As more data is available, states, regions, and research institutions can explore ways to centrally collect and analyze that data to better track cumulative local and regional impacts.[46] This would enable more robust statewide and regional analysis and planning, so policymakers and communities can make more proactive decisions about the growth, siting, and development of data centers and other large-scale industrial water consumers.

## Make Data Center Companies Cover Their Full Costs

Given the strain data centers can put on local water systems, states or local jurisdictions should require data center developers entirely cover upgrades to the local water infrastructure that can alleviate the burden constant or short-term use increases might put on the infrastructure. Developers should also pay to add new water capacity across the whole system, so their needs are met without maxing out the host community's capacity for future growth.[47] In addition, companies can be required to pay for broader benefits to the water system, like watershed restoration, irrigation optimization, and utility-scale efficiency measures.[48]

The need to make companies pay their fair share goes beyond water infrastructure. As of 2025, 36 states had economic development subsidies for data center projects, including sales tax or property tax credits. These subsidies are not transparent: Only five of those states publicly disclose how much those subsidies are costing the states and which companies received them. The subsidies are intended to stimulate economic development and job creation, but while data centers may create short-term construction jobs, they add few permanent jobs to the economy.[49] Repealing these subsidies can make sure that the public tax base has more resources to meet public needs. Cities can also consider having companies commit to a certain threshold of tax revenue, so projected revenues are not lost if the project is decommissioned early.

There are also mechanisms to ensure tax revenue from data centers benefits the communities most impacted by their presence. For example, the Memphis City Council adopted an ordinance in 2025 requiring that 25% of property tax revenue from the AI hyperscale data center in South Memphis be reinvested within a five-mile radius of the facility. This ensures direct economic benefit to the predominantly Black community bearing the brunt of the cumulative environmental harms from that data center and other industrial facilities in the area.

46 Grimm et al., *Regulating Data Center Water Use in California*, 8.
47 Han et al., "Small Bottle, Big Pipe," 21.
48 *Balancing the Water Needs*, 3–4.
49 *Data Centers and the Climate Landscape*, 33.

## Buy Time With Moratoriums

Data center development is moving fast — often far too fast for communities, states, and regions to understand the potential impacts of new data centers and consider their path forward. Moratoriums pause data center development altogether for a set period, allowing community groups, utilities, and policymakers to evaluate whether proposed projects align with their needs, to institute protective policies, and to negotiate for real community benefits. This is a popular strategy: As of March 2026, moratorium bills had been introduced in at least 11 states and have been successfully passed in dozens of cities and counties.

# Conclusion: Looking Beyond Data Centers

The furor over data centers has generated important conversations about community self-determination and the need to protect communities and the environment from water-hungry industrial expansion. Amid the very real harms of this industrial expansion, this moment is also a profound opportunity to broaden the coalition of actors working for water protection and environmental justice and to change paradigms about what to demand from industrial water users and polluters. This fight can be a way to move forward a larger set of policies and regulations that will be protective in other ways as well.

We are already seeing how this is playing out in practice. For example, Aurora, Colorado banned new development of any industries with projected consumptive water demands above a certain threshold. In Las Vegas Valley, Nevada, the water authority instituted a moratorium on new evaporative cooling systems in any commercial or industrial buildings, not just data centers.[50] In places where data centers are being built, regulations about how they must operate can be more widely applied too. This can be as simple as ensuring any new mandates around tracking, reporting, cost sharing, and community benefits do not just apply to data centers, but to all industrial water users over a certain scale threshold.

There are many ways for water funders to engage to help make that happen. Particularly compelling opportunities include:

- Investing in capacity building and technical assistance so local communities have support to evaluate the risks of proposed data centers in their area, block the developments if they so choose, or negotiate comprehensive protections and benefits if they prefer;
- Directly funding local communities to resource those efforts;
- Supporting information flows among policymakers and advocates, to share data, strategy, lessons learned, and best practices;

50 Kapiloff et al., *Data Center Impacts in the West*, 49.

- Partnering with groups whose advocacy focuses on other impacts of data centers — like energy, land use, or tax reform — to encourage that they include water impacts in shared platforms; and
- Making connections between data center campaigners and water advocates working on other issues, like water quality and affordability, to ensure coordinated efforts.

The rapid expansion of data centers is a crucial challenge for the water movement. It is also an opportunity to create a new answer to the question of who bears the cost of industrial water use, and who gets a say in that decision. How advocates and practitioners respond now will shape not only local water outcomes but broader norms around corporate accountability and environmental justice for years to come.

# Appendix A: Policy & Legislation Resources

These resources aim to help policymakers and advocates to understand the evolving policy landscape around data centers and AI more broadly and learn from other communities' efforts to regulate them. The resources span the federal, state, and local levels of government.

## Policy & Legislation Trackers

**Brennan Center for Justice** has an Artificial Intelligence Legislation Tracker that lists all bills introduced into the U.S. Congress related to AI.

*Artificial Intelligence Legislation Tracker.* Brennan Center for Justice, 2025. https://www.brennancenter.org/our-work/research-reports/artificial-intelligence-legislation-tracker

**Brown University** updates a "CNTR AISLE Portal" that tracks federal and state-level legislation related to AI within the U.S., including their intended areas of impact.

*CNTR AISLE.* Center for Technological Responsibility, Reimagination and Redesign, Brown University, 2026. https://www.cntr-aisle.org

**ClimateXChange** tracks proposed state-level bills on data centers relating specifically to water.

*2026 Data Center Bills: Water.* ClimateXChange, 2026. https://www.quorum.us/spreadsheet/external/wLrukbCklRPVdCzpBTen/

**MultiState** tracks and analyzes state data center policy trends across the country, including state bills and ballot measures. They also have an AI legislation map tracking bills related to AI by state.

*State Data Center Policy 101.* MultiState, June 2026. https://www.multistate.us/resources/state-data-center-policy-101

*Artificial Intelligence (AI) Legislation Tracker 2026: All 50 States.* MultiState, 2026. https://www.multistate.ai/artificial-intelligence-ai-legislation

**National Conference of State Legislatures** keeps a database of state-level legislation related to AI policy, with filters by state and by subtopics.

*Artificial Intelligence Legislation Database.* National Conference of State Legislatures, 2026. https://www.ncsl.org/financial-services/artificial-intelligence-legislation-database

**We Build Progress** maintains a database of proposed laws and regulations related to data centers, including state-, county-, and city-level proposals.

*Data Center Laws and Regulations.* We Build Progress, 2026. https://docs.google.com/spreadsheets/d/17Ol66fOIMktqwVyQuA4uLfZ4LKZsQQnwv54kjDi4C6w

## Sample Policies & Regulations

**AI Now**'s North Star Data Center Policy Toolkit outlines sample local, state and regional, and federal policy solutions to problems posed by data centers, including regulating water use.

*North Star Data Center Policy Toolkit: Water*. AI Now, 2026. https://datacenters.ainowinstitute.org/issue-area/water/

**Climate Mayors** has a guide for local elected officials on how to use city policy levers to regulate data centers, including recommendations on ensuring sustainable water use and examples from across the country (pp. 21-25).

*Data Centers and the Climate Landscape: An Actionable Resource for US Mayors*. Climate Mayors, 2026. https://www.climatemayors.org/data-centers

**ClimateXChange** has data center policy toolkit that outlines sample state-level policy mechanisms to regulate data center water use.

Soares, Kristen. *State Policy Toolkits for Data Center Regulations: Water Impacts*. Climate XChange, April 2026. https://climate-xchange.org/resources-for-regulating-data-centers/water-impacts/

# Appendix B: Region-Specific Research & Resources


### Arizona

James, Kirsten, Shama Perveen, and Benjamin Jacobson. *Drained by Data: The Cumulative Impact of Data Centers on Regional Water Stress*. Ceres, 2025. https://www.ceres.org/resources/reports/drained-by-data-the-cumulative-impact-of-data-centers-on-regional-water-stress

### California

Grimm, Marie, Nell Green Nylen, and Michael Kiparsky. *Regulating Data Center Water Use in California*. UC Berkeley Center for Law, Energy and the Environment, 2026. https://www.law.berkeley.edu/research/clee/research/wheeler/water-innovation/data-center-water-use/

### Great Lakes

Ferreira, João-Pedro, William Shobe, Terance Rephann, and Matthew Scheffel. *Economic, Fiscal, and Energy-Related Impacts of Data Centers in the Great Lakes Region*. Weldon Cooper Center, Center for Economic & Policy Studies, 2026. https://www.coopercenter.org/research/GLDC

Volzer, Helena, and Maria Iturbide-Chang. *A Regional Playbook for Managing Data Center Impacts in the Great Lakes*. Alliance for the Great Lakes, 2026. https://greatlakes.org/2026/03/data-center-playbook/

### Southwest

Kapiloff, Deborah, Lindsay Rogers, and Stacy Tellinghuisen. *Data Center Impacts in the West: Policy Solutions for Water and Energy Use*. Western Resource Advocates, 2025. https://westernresourceadvocates.org/data-center-impacts/

### Texas

*Balancing the Water Needs of Data Centers and Large Water Users in Texas with the State's Vision for Long-Term Water Security*. Texas Living Waters and Houston Advanced Research Center, 2026. https://texaslivingwaters.org/wp-content/uploads/TLW_HARC_Data-Center-Policy-Recommendations_Final_2026.pdf

Cook, Margaret. *Thirsty Data and the Lone Star State: The Impact of Data Center Growth on Texas' Water Supply.* Houston Advanced Research Center, 2026. https://harcresearch.org/news/texas-data-center-boom-could-consume-up-to-161-billion-gallons-of-water-annually-by-2030/

*Data Centers and Water Use: What You Need to Know*. Hill Country Alliance, 2025. https://hillcountryalliance.org/wp-content/uploads/2025/12/Data-Centers-and-Water-Usage_Updated-12.4.2025.pdf

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*America's AI Surge: Powering Investment, Jobs, and Growth in Every State*. American Edge Project, 2025.

*An Investor Guide to Addressing Water Risk in the High-Tech Sector Value Chain*. Ceres, n.d.

*Balancing the Water Needs of Data Centers and Large Water Users in Texas with the State's Vision for Long-Term Water Security*. Texas Living Waters and Houston Advanced Research Center, 2026. https://texaslivingwaters.org/wp-content/uploads/TLW_HARC_Data-Center-Policy-Recommendations_Final_2026.pdf

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*Data Centers and the Climate Landscape: An Actionable Resource for US Mayors*. Climate Mayors, 2026. https://www.climatemayors.org/data-centers

*Data Centers and Water Use: What You Need to Know*. Hill Country Alliance, 2025. https://hillcountryalliance.org/wp-content/uploads/2025/12/Data-Centers-and-Water-Usage_Updated-12.4.2025.pdf

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