

## The Danger of Data Centers

By Jacob Wiser

With the rise of AI, and new tech start-ups appearing all the time, it seems like data centers are an unstoppable force of the market. But what is a data center? According to Amazon, a data center is a physical location made to store a company's data; "it contains the computing infrastructure that IT systems require, such as servers, data storage drives, and network equipment." These billion-dollar systems sound quite simple when explained in this way, but they come with many complex caveats. According to the Energy Information Administration, in 2022, US energy consumption was about 4070 TWh, with 35% of this coming from the commercial sector, which is largely made up of five uses of electricity: "computers and office equipment (combined), refrigeration, space cooling, lighting, and ventilation," all of the components of a data center. So, it is no surprise that, according to research done at UC Riverside, global AI data centers "could consume 85–134 TWh of electricity in 2027." The high energy requirement of data centers, while a concern of its own, creates an even more vital problem: water consumption. "On average, depending on the weather conditions and operational settings, data centers can evaporate approximately 1–9 liters per kWh of server energy"; that's a lot of water. Data center cooling systems require fresh water to cool their computing systems without damage. Because data centers require fresh water, they must pull from fresh water sources; somewhere like Cook County, right along Lake Michigan, has many data centers and does not have to spend much time dwelling in concern of losing out on their drinking water source. However, somewhere like McHenry County, which relies heavily on its groundwater sources, may have cause for concern when considering the introduction of data centers to its communities. According to research done at UC Riverside, "water withdrawal of global AI is projected to reach 4.2–6.6 [trillion liters] in 2027," and "one technology company's self-owned data centers alone directly withdrew 29 billion liters and consumed (i.e., evaporated) more than 23 billion liters of freshwater for on-site cooling in 2023." While these staggering numbers do not apply to one single data center location, they provide a better idea of the consumption level they deal with, raising possible concerns when it comes to McHenry County. By visiting the groundwater monitoring well network map found on [mchenryh20.com](https://mchenryh20.com) and clicking on any given well, it is clear to see that this year's drought has caused local groundwater levels to approach a worryingly low level. The introduction of data centers to the county would mean disaster for

local groundwater levels. Seemingly, Illinois' government does not have mitigation for situations such as these, so it is the responsibility of the county's citizens to see the potential danger of data centers; rather, Illinois' government supports data centers, providing an investment program that "provides owners and operators with exemptions from a variety of state and local taxes for qualifying Illinois data centers. The program also provides data center owners and operators with a tax credit of 20% of wages paid for construction workers for projects located in underserved areas." While they support the infrastructure of our digital world, data centers come with steep environmental costs, particularly in terms of energy and water consumption. For communities like McHenry County, where water resources are already strained, the introduction of such facilities could pose serious risks to long-term sustainability. With state incentives encouraging data center expansion and no clear mitigation plans in place, it falls on local citizens and leaders to critically assess the true cost of these developments and advocate for responsible planning.

[1] <https://aws.amazon.com/what-is/data-center/> - "A data center is a physical location that stores computing machines and their related hardware equipment. It contains the computing infrastructure that IT systems require, such as servers, data storage drives, and network equipment. It is the physical facility that stores any company's digital data."

[2] <https://www.eia.gov/energyexplained/electricity/use-of-electricity.php> In 2022, us energy consumption was about 4070 TWh, with 35% of this coming from the commercial sector, which is largely made up of five uses of electricity: "computers and office equipment (combined), refrigeration, space cooling, lighting, and ventilation".

[3] <https://arxiv.org/pdf/2304.03271> water use - "On average, depending on the weather conditions and operational settings, data centers can evaporate approximately 1 – 9 liters per kWh of server energy" "global AI could consume 85 – 134 TWh of electricity in 2027" "water withdrawal of global AI is projected to reach 4.2 – 6.6 [trillion liters] in 2027"

[4] [mchenryh2o.com](https://mchenryh2o.com) - <https://rconnect.usgs.gov/McHenry-groundwater/Index.html> groundwater monitoring

[5].

<https://eta-publications.lbl.gov/sites/default/files/2024-12/lbnl-2024-united-states-data-center-energy-usage-report.pdf?ref=floodlightnews.org> “U.S. data center energy use has continued to grow at an increasing rate, reaching 176 TWh by 2023, representing 4.4% of total U.S. electricity consumption”, projected 6.7-12% by 2028

[6] <https://dceo.illinois.gov/expandrelocate/incentives/datacenters.html> - Data Center Investment Tax Exemptions and Credits - “The data centers investment program provides owners and operators with exemptions from a variety of state and local taxes for qualifying Illinois data centers. The program also provides data center owners and operators with a tax credit of 20% of wages paid for construction workers for projects located in underserved areas.”