

The Hidden Cost of Data Centers

A special session at the 20th River Symposium

Saturday, November 8, 2025 - 1 to 2 pm

The Center Room (Rm 272), Elaine Langone Center. Bucknell University

SPEAKERS/MODERATORS

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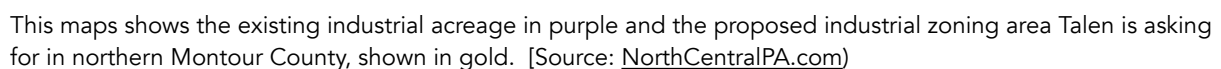
A data center owned by Amazon Web Services under construction next to the Susquehanna nuclear power plant in Berwick, Pa.(AP Photo/Ted Shaffrey).

Data centers are huge facilities - often covering thousands of acres - that house computer systems and related components — such as servers, storage systems, networking equipment, and security devices — that are used to **store, process, and distribute large amounts of data**. Large companies (like Amazon, Microsoft, Google, and Facebook) run **massive global networks of data centers**, each containing thousands or even millions of servers. It is where their websites are hosted, cloud services (like Google Drive or Netflix streaming) are run, emails are stored, and business applications and databases operate.

TOPICS FOR DISCUSSION

1. What resources (power, water, space etc.) does our area offer large companies in need of “data centers” and how might they impact our local communities?
2. Who approves the location(s) of these facilities and what local zoning and water resources protection measures are (aren't) in place?
3. Who determines the health risk and environmental impact of a data center on its local citizen?
4. What state permits and environmental regulations must the owners comply with?
5. What health and environmental concerns to large data centers present? Given the local geology and hydrology, with there be thermal pollution or loss of groundwater for farming or stream health? What about air quality and noise? Other issues?
6. What are the next steps?
7. What might the future look like if one is built near where I live?

Pennsylvania and New York. In June, 2025 Amazon announced that it will spend \$20 billion on two data center complexes in Pennsylvania, including one it is building alongside a nuclear power plant that has drawn federal scrutiny over an arrangement to essentially plug right into the power plant. One data center is being built next to northeastern Pennsylvania's Susquehanna nuclear power plant. The other will be in Fairless Hills at a logistics campus, the Keystone Trade Center, on what was once a U.S. Steel mill. **A similar center is being proposed in the rural farm communities surrounding Talen Energy's Montour power plant in Northumberland and Montour counties.** his maps shows the existing industrial acreage in purple and the proposed industrial zoning area Talen is asking for in northern Montour County, shown in gold. [Source: NorthCentralPA.com]



IMPORTANT FACTS

1. Energy

- Data centers require enormous amounts of energy for cooling systems that prevent overheating of the expensive server electronics.
- Data centers consume about 1–3% of all electricity, and that share is growing as digital services expand (streaming, AI, cloud computing, etc.).
- If the electricity comes from fossil fuels (e.g., natural gas), this leads directly to greenhouse gas (CO₂) emissions.



2. Heating/Cooling

- Servers release large amounts of heat during operation.
- Cooling systems (air conditioning, liquid cooling, etc.) often use additional electricity and sometimes water.
- Inefficient cooling can double the energy demand of a facility. Example: A large hyperscale data center can use enough electricity to power tens of thousands of homes.
- If the center uses a closed-loop cooling system whereby cooling water is pumped from the ground, run through the servers system for cooling and then the warmer water is returned underground via an injection well drilled into the aquifer, then groundwater temperatures will locally increase. This becomes especially important in areas underlain by limestone and dolomite bedrock, prevalent throughout Northumberland and Montour County.

3. Water Consumption

- Many data centers use evaporative cooling, which consumes millions of liters of water per day to dissipate heat.
- In drought-prone areas, this puts pressure on local water supplies.
- For example, studies have found that some large facilities can use as much water as a small town.

4. Carbon Footprint

- The combination of electricity use, backup diesel generators, and cooling processes creates a notable carbon footprint.
- Even with improvements, the ICT (information and communication technology) sector—including data centers—may account for up to 8% of global carbon emissions by 2030 if growth continues unchecked.

5. Electronic Waste (E-waste)

- Servers and storage devices have relatively short life cycles (typically 3–5 years).
- Upgrading or replacing them generates large quantities of electronic waste containing metals, plastics, and toxic components.
- Improper disposal can contaminate soil and water.

6. Land Use and Local Impact

- Data centers are physically large; building them can lead to land clearing and infrastructure expansion.
- They can also strain local power grids or raise energy prices for nearby communities.