



## SCIENCE SNAPSHOT

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### Data Centers and Conservation Considerations

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#### Background

Data centers (DC) are the physical backbone of the digital world. They enable the operation of online services, business systems, communications platforms, video streaming, cloud storage, and emerging technologies like artificial intelligence (AI) and autonomous vehicles. These facilities house computer systems, servers, network equipment, and supporting infrastructure. They range from small server rooms to massive warehouse-scale complexes. To operate reliably for 24 hours a day, seven days a week, they require continuous electricity, extensive cooling systems, strict security for servers and network hardware, and space.

There are three traditional types of data centers and the cloud:<sup>1</sup>

- *Enterprise* DCs are owned and operated by a single organization for its internal operations.
- *Managed Services* DCs is when one company manages a data center on behalf of another company.
- *Colocation* DCs rent space, power, and connectivity to multiple businesses.
- *Cloud* DCs are operated by large providers (e.g., Amazon, Microsoft, Google) to serve global customers.

#### Growth and Scale

As of 2025, there are an estimated 3,000 to 5,400 data centers in the U.S., with all 50 states hosting at least one facility.<sup>2,3</sup> The United States contains roughly 30-37% of the world's data centers, more than any other nation.<sup>4,5</sup> Rapid expansion is being driven by the explosion of digital content, cloud computing, smart infrastructure, and AI adoption. From 2010 to 2018, workloads grew 550%, with AI workloads accelerating growth further in the 2020s.<sup>4,6</sup> The technology sector is under growing pressure to advance both digital transformation and climate action. As major tech companies embrace AI, the infrastructure that supports their vast data needs is evolving as well. AI demands more electricity, more water, and more raw materials. While certain AI tools can improve data center efficiency (by optimizing energy use, predicting equipment failures, and automating maintenance), these gains risk masking deeper, urgent issues. In many cases the very growth of AI intensifies the environmental and resource pressures that such efficiencies claim to address.<sup>1</sup> Meeting these challenges will require innovations that go beyond simply cutting emissions or using water more efficiently.

#### Energy & Water Demands

It is estimated that in 2022, data centers consumed approximately 17 gigawatts of power in the US. For comparison, a large nuclear power plant generates approximately 1 GW. U.S. data center electricity consumption is projected to increase to as much as 130 GW by 2030, potentially consuming up to 12% of total U.S. electricity demand. Additionally, roughly 56% of electricity used by data centers currently comes

from fossil fuels. In 2023, data centers represented 4.4% of total electricity consumption, emitting approximately 105 million metric tons of carbon emissions (2.18% of US emissions).<sup>7</sup>

Water is used both directly (liquid cooling systems) and indirectly (thermoelectric power generation), placing additional stress on watersheds, especially in arid regions. Data centers operated by companies like Amazon, Microsoft, Alphabet/Google, and Apple, as well as colocation providers such as Equinix, Digital Realty, and China Telecom, choose locations strategically. While factors like infrastructure and climate matter, political will from local and state governments, often expressed through financial incentives, is a consistent driver of growth. Facebook's decision to build a series of data centers in Los Lunas, New Mexico, illustrates how water resources factor into these choices. The company launched a bidding contest between Utah and New Mexico. New Mexico won by offering a more attractive package, including a 30-year property tax break, annual gross receipts reimbursements, and most significantly, a long-term guarantee of 4.5 million gallons of water per day.<sup>8</sup> These agreements were not without controversy. Utah had faced public criticism over the environmental toll facilities like the water-intensive NSA Data Center in Bluffdale had taken on the state's water resources.<sup>9</sup> Salt Lake County Mayor Ben McAdams openly criticized Facebook's proposal, noting that the promised water allocation, equivalent to that used by a midsize city, would create hidden costs for the community.<sup>10</sup> In New Mexico, however, the deal was met with little resistance. Local news outlets and elected officials from both parties framed Facebook's arrival as a win for the state's economy. Leaders emphasized the state's readiness to host most data infrastructure in the future, signaling an ongoing political commitment to attract similar projects.<sup>1</sup> The contrast between these two arid states highlights a core reality that securing large scale data centers requires years of political groundwork and the willingness to commit substantial local resources, including water, to a single company. In regions where water scarcity is already a pressing concern, these deals raise urgent questions about long-term sustainability.<sup>11</sup>

### **Wildlife Habitat Considerations**

The concentration and rapid proliferation of data centers present several environmental concerns relevant to TRCP's mission to conserve fish and wildlife habitats and ensure access for hunters and anglers (Bird's eye view):

- Increased greenhouse gas emissions from fossil fuel-based electricity generation.
- Increased burden on water resources in areas already facing scarcity, affecting aquatic ecosystems and competing human needs.
- Land use changes for facility construction, transmission lines, and cooling infrastructure that may fragment habitats or displace wildlife.
- Pressure on local energy grids, prompting new fossil-fuel power plant development if renewable integration lags.
- Biodiversity risks if siting decisions do not account for sensitive habitats or migration corridors.

Although data centers don't directly intersect with wildlife, several indirect pathways pose risks:

- Construction can fragment or eliminate natural habitats, notably when sited in undeveloped areas.
- The substantial energy consumption of data centers contributes to greenhouse gas emissions, driving habitat shifts, changing species distributions, and weakening ecosystem resilience.
- The highest concentration of data centers in the U.S. is in Virginia which attracts major technology companies and is known as "Data Center Alley." In Northern Virginia, data center expansion has disrupted historical landscapes, harmed water and air quality, and pressured habitats near sites like Manassas National Battlefield Park.

## Takeaways

The rapid expansion of data centers driven by AI, streaming, and global digitalization, poses significant risks to wildlife, water resources, and climate goals. TRCP and its partners can play a critical and proactive role in shaping siting, design, and operational policies so that data centers support rather than undermine conservation priorities. By coupling science with policy advocacy, TRCP can ensure that digital growth and habitat stewardship advance together.

## Citations

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*The Science Snapshot is intended to provide an overview of science-based topics and convenings that are relevant to the mission of the TRCP. If you have additional questions, please contact Jamelle Ellis at [jellis@trcp.org](mailto:jellis@trcp.org).*