AI Isn't Invisible, It's Draining the Planet: Why We Need to Know the Cost Before We Click

Description

We like to imagine artificial intelligence as something clean and weightless, floating somewhere in "the cloud." But it isn't in the sky. AI lives in tangible buildings—windowless, humming, heavily cooled warehouses filled with machines that run on electricity, water, copper, lithium, land, and air. They never turn off. And as AI is built into emails, classrooms, customer service systems, search engines, and art-making tools, its physical footprint keeps growing.

It stopped being abstract for me last week.

At a screening of *Diverted*, a documentary created through *Wake the Great Salt Lake*, a public art initiative supported by Bloomberg Philanthropies, images of wind, salt, and silence moved across the screen like a living eulogy. During the Q&A, an audience member asked the question hanging in the air: "We aren't the only state that grows alfalfa—so if others manage their water better, why is the Great Salt Lake disappearing so fast?"

The filmmakers said they learned the answer too late to include in the film. Agriculture matters. So do drought and climate change. But the part almost no one is talking about is technology.

Across Utah, especially along the Wasatch Front and into central and southern parts of the state, dozens of data centers already exist or are being built, many to power AI. At the screening, they mentioned around 50 either operating or planned (personal communication, 2025). These centers use enormous amounts of electricity and water. Not symbolic water—real water from aquifers, municipal systems, and rivers (Barringer, 2025; Bosco et al., 2024). **Water that might otherwise have flowed to the lake.**

As reported in a 2025 KSL.com op-ed by V. Hudson, some Utah cities and data centers even receive guaranteed water contracts, sometimes protected by confidentiality agreements, making it difficult to compare their use to that of agriculture or households.

AI doesnâ??t just draw water and electricity; it also affects the air we breathe. Recent studies link U.S. data centers to significant public-health harms from pollution tied to fossil-fuel power and diesel backup systems. These impacts extend far beyond where the facilities are built. A 2024 study by Han et al. found that training a single large AI model comparable to Metaâ??s LLaMA 3.1 can generate as much fine particulate pollution (PM2.5) as more than 10,000 car trips from Los Angeles to New York. And a 2025 Business Insider investigation, drawing on modeling by economists Nicholas Muller and Koichiro Ito, reported that air pollution from U.S. data centers, driven by fossil-fuel power plants and diesel backup generators, causes an estimated $5.7 to $9.2 billion in public health damages every year, including asthma attacks, hospitalizations, heart disease, and premature deaths. These pollutants do not remain where they are generated; they drift across state lines and accumulate in human lungs.

Aerial view of the Great Salt Lake showing surrounding land, water bodies, and snow-capped mount
Great Salt Lake

What AI Takes From the Earth

As discussed earlier, most of AIâ??s water footprint is embedded in electricity generation rather than on-site cooling. The International Energy Agency reports that global electricity demand from data centers could more than double between 2022 and 2026â??a surge driven largely by AI expansion (International Energy Agency, 2023). Researchers at MIT also emphasize that AIâ??s environmental footprint includes not only electricity but also significant water consumption (Tao et al., 2023).

Data centers use water directly to cool servers that generate intense heat, and indirectly through the electricity they depend on. Most electricity in the United States still comes from thermoelectric power plantsâ??coal, gas, nuclearâ??that require large volumes of water to generate and cool steam. IEEE Spectrum reports that up to 80 percent of a data centerâ??s total water footprint can come from electricity generation, not on-site cooling (IEEE Spectrum, 2023). The Environmental and Energy Study Institute adds that a single large data center may use up to five million gallons of water per day, roughly equivalent to a small cityâ??s consumption (Barringer, 2025).

Cooling water, however, is only part of the story. Long before data reaches a server, massive amounts of water have already been consumed upstream. As researchers at the University of Oxford explain, â??the largest source of water usage is actually electricity generation,â?• because fossil-fuel and nuclear power plants all depend on boiling water into steam to drive turbines (University of Oxford, n.d.). In the United States, generating one kilowatt-hour of electricity requires around two gallons of water, and the average data center uses nearly half a gallon more to cool each kilowatt-hour it consumes (Water Calculator, 2022). In other words, AIâ??s water footprint is embedded in the power supply long before a single prompt is sent.

The U.S. Geological Survey does not yet track data centers or AI infrastructure as a separate water-use category (USGS, 2023). Instead, these withdrawals are folded into broader categories such as public supply, industrial use, and thermoelectric power. The most recent comprehensive national estimates of all water-use sectorsâ??*Estimated Use of Water in the United States in 2015*â??found total withdrawals of approximately 322 billion gallons per day, with thermoelectric power and irrigation dominating national water use (USGS, 2018).

Within that already strained system, environmental reports from Google, Microsoft, and other major tech companies show steep increases in data-center water consumption over the past decade (Google, 2023; Microsoft, 2023). Much of this growth is occurring in water-stressed regions such as Utah, Arizona, Texas, and Nevada (Barringer, 2025; EESI, 2025). These are the same regions experiencing long-term drought, shrinking snowpack, and ecosystem crises, including the collapse of the Great Salt Lake (USGS, 2023; Bosco et al., 2024).

And most people have no idea.

One Prompt Seems Small â?? Until It Isnâ??t

To understand the math, hereâ??s the simplest way to think about it:

Googleâ??s **0.3 mL** estimate only covers on-site cooling water.
But as previously stated, most of the water used by AI actually comes from the electricity supply, where thermoelectric power plants boil and cool enormous volumes of water to generate steam.

When assessments include both on-site cooling water and water used indirectly through electricity generation, the total water footprint of AI systems increases substantially.

Researchers at the University of California, Riverside estimate that producing a single 100-word prompt with a large language model requires approximately 519 milliliters of water, roughly equivalent to one standard bottle.

Billions of prompts are processed daily by large language models, each requiring extensive computational power. These calculations generate significant heat, making liquid-based cooling systems necessary for maintaining data center operations (YaÃ±ez-Barnuevo, 2025).

To evaluate water efficiency in data center infrastructure, researchers affiliated with The Green Grid, a nonprofit industry consortium, developed the Water Usage Effectiveness (WUE) metric. Modeled after the Power Usage Effectiveness (PUE) metric used to assess energy efficiency, WUE measures the relationship between a facilityâ??s water consumption and its energy use. Specifically, WUE is calculated by dividing total water usage (in liters) by total energy consumption (in kilowatt-hours) over the same time period.

Although a WUE value of zero represents an ideal benchmark, such efficiency is achievable only in fully air-cooled data centers. Due to regional climate conditions and technological constraints, most facilities rely on water-intensive cooling methods. As a result, the average WUE across data centers is approximately 1.9 liters per kilowatt-hour, a figure that now serves as a sustainability benchmark for the industry (YaÃ±ez-Barnuevo, 2025).

A Personal Wake-Up Call

The week before I visited *Diverted*, I was at home workingâ??using AI. My teenager walked up to me and said quietly:

â??Please donâ??t use it so much. I want the world I live in one day to still be livable.â?•

They weren't accusing me of over-relying on technology. They were asking if there would still be water, breathable air, a Great Salt Lake. They were asking if convenience was worth their future. That was my wake-up call. I hope something in this is one for you.

If artificial intelligence is going to reshape daily life, then the public deserves to know what it costs to run—not just in dollars, but in water, energy, and land. AI companies should be required to disclose how much water and electricity their systems use per query, per model, and in total each year, much like nutrition labels on food or emissions ratings on cars. Without transparency, meaningful accountability is impossible.

Yet even when companies do release environmental numbers, those figures often understate the true impact. They frequently exclude indirect water use embedded in electricity generation, mineral extraction, and supply chains. And history shows that efficiency alone is not a solution: as systems become more efficient, total use often increases—a phenomenon known as the Jevons Paradox. What looks sustainable at the scale of a single prompt becomes destructive at the scale of millions of users.

This is where art enters the conversation. Wake the Great Salt Lake exists because data and policy reports, on their own, have not been enough. Art does what spreadsheets cannot: it makes loss visible and felt. Mayor Erin Mendenhall has spoken about public art's ability to activate both urgency and hope. Arts Council director Felicia Baca has noted that *wake* can mean mourning, awakening, or the trail left behind when something moves through water. The project asks people not just to understand the lake's decline, but to feel their relationship to it.

What Accountability Requires

We should push for laws that require AI platforms to:

- Show estimated water and energy use per interaction or task
- Publish annual reports on total water consumption, electricity use, and emissions
- Allow users to download their personal AI environmental footprint
- Undergo environmental impact assessments before building new data centers—especially in drought-prone regions
- Use recycled or non-potable water where possible

  A map of Utah highlighting the locations of data centers with numbered markers indicating their distr
  [Data Centers in Utah](#)

For places like Utah, where every drop is contested and evaporation outpaces replenishment, these hidden withdrawals matter. Data centers draw from the same aquifers and municipal systems that communities, farmers, and ecosystems rely on. When the Great Salt Lake is already at risk of ecological collapse, we cannot pretend that any additional industrial water use is benign.

AI does not need to be the enemy—**but it must be transparent.**
It must be accountable to the land and communities it affects.

Environmental Accountability Requirements for AI Systems

1. Environmental Impact Labels

AI platforms must display per-query water use (mL), energy use (Wh), and carbon equivalentâ??similar to nutrition labels or vehicle emissions stickers.

2. Disclosure Requirements

Companies must publicly disclose model-level energy and water intensity, data-center water sources, cooling methods, and water-withdrawal locations. Disclosures must indicate whether potable, reclaimed, or non-potable water is used.

3. Annual Environmental Reporting

Publish total water consumption, electricity use, and greenhouse-gas emissions for each model (training + inference), including regional breakdowns.

4. Independent Audits

Third-party auditors verify disclosures, environmental reports, and siting claims, similar to financial or emissions testing.

5. User â??Right to Knowâ?•

Users can download a report of their personal AI environmental footprint (water, energy, emissions), modeled on GDPR data-access rights.

6. Penalties & Incentives

Fines for underreporting, non-compliance, or misuse of potable water; incentives for verified renewable power, on-site batteries, recycled-water systems, and water-neutral operations.

7. Pre-Deployment Impact Review

Large AI models must undergo an environmental impact assessment before release, similar to ethical or biomedical review, including cumulative watershed impacts.

8. Data-Center Siting Restrictions

New or expanding data centers in drought-prone, arid, or ecologically sensitive basins (including the Great Salt Lake watershed) must undergo hydrological review. States, cities, or tribes may deny siting if withdrawals threaten ecological stability, dust mitigation, or treaty rights.

9. Water-Source Standards (Potable Water Limits)

Data centers must prioritize recycled, reclaimed, brackish, agricultural runoff, or industrial-process water. Use of municipal drinking water is prohibited unless no alternative exists and is publicly justified in filings.

10. Community Oversight & Tribal Consultation

Facilities affecting Indigenous lands, shared waters, or treaty-rights areas must undergo consultation and obtain consent from relevant tribal nations and nearby communities before construction or expansion.

11. Water Rights & Withdrawal Transparency

Companies must disclose all water rights, permits, leases, transfers, and purchase agreements. Renewal requires proof of sustainable withdrawal and non-impairment of downstream or terminal ecosystems.

12. Grid Impact & Renewable-Energy Verification

Companies must verify that renewable energy powering operations is direct (â??additionalâ?• supply), not offsets or unbundled RECs. Grid-impact reports must show peak-load strain and mitigation plans.

13. Drought-Emergency Curtailment Protocols

During declared drought emergencies, data centers must reduce water use proportionally with industrial sectors or switch exclusively to non-potable sources. Priority must be given to ecological health and public supply.

14. Decommissioning & Remediation Plans

Before approval, companies must submit plans for end-of-life decommissioning, infrastructure removal, land restoration, and mitigation of long-term water and soil impacts.

Why This Matters

AI has real planetary costsâ??electricity, water, mineralsâ??but those impacts are hidden behind the â??cloud.â?• Without transparency and regulation, AI growth risks accelerating climate change, drought, and resource depletion. Clear reporting gives the public the information needed to demand cleaner, more responsible infrastructure.

This Is About the World We Leave Behind

Great Salt Lake is one of the most important ecosystems in North America. Its decline threatens birds, brine shrimp, air quality, public health, regional economies, and cultural identity. And at the same time we are creating art to mourn and awaken public responsibility, we are expanding AI infrastructure that draws from the same stressed watershed.

We still have a choice. Technology does not have to mean extraction, and progress does not have to mean depletion. But choice requires knowledge.

AI is not weightless. It runs on land and water, copper and lithium, air and energy. It is built from the spaces we dedicateâ??and the resources we give upâ??to make it work. Before we use it casually or constantly, we deserve to know what it takes.

What comes next is not a mandate. It is a question. And it is one we now have the responsibility to sit withâ??because the world we leave behind should not be decided by convenience alone.

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