Rio Grande Valley Water & Data Centers

Understanding the intersection of water scarcity, energy demand, and infrastructure growth in the Rio Grande Valley.

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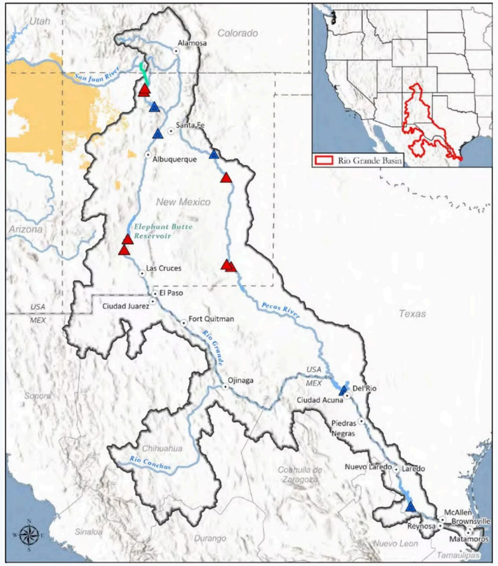
WATER SOURCES

Where the Rio Grande Valley Gets Its Water

The Rio Grande River

Begins in Colorado and travels 1,800+ miles through the U.S. and Mexico. By the time it reaches the Gulf, only 15% of original flow remains. The Valley sits at the end of a heavily depleted system.



The Arroyo Colorado

Runs from Mission to Rio Hondo. Not a natural river—flow maintained largely by wastewater discharges from cities, agriculture, and stormwater runoff.

Both Water Sources Are Impaired

Rio Grande

Overused before reaching the Valley. Already stressed by upstream diversions for cities, agriculture, and industry.

Arroyo Colorado

Exists largely as a managed wastewater channel. Without discharges, large portions would have little to no flow.

Water Quality

Neither meets TCEQ and EPA standards for recreation, fishing, or aquatic habitat. Both systems are interconnected and fragile.

The Rio Grande Valley does not have excess water. It is surviving on what remains.

STATEWIDE CRISIS

Texas Is Running Dry

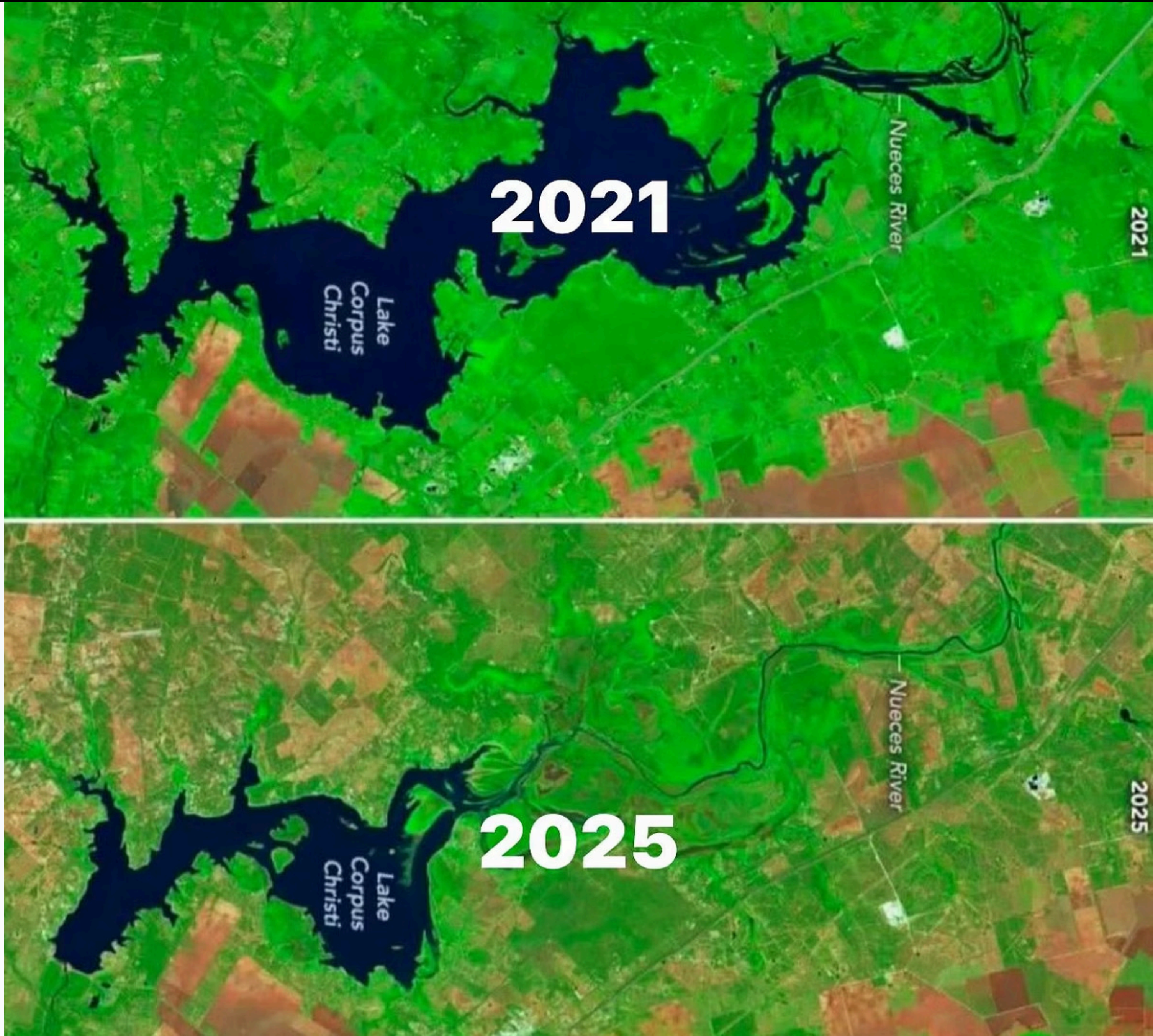
After back-to-back hot, dry summers, multiple regions face notably low water supplies. Projections show municipal supplies may not meet demand by 2030 without significant action.

Hays County Stage 4 Restrictions

Aggressive pumping reductions, curtailed outdoor water use, and suspended permitting for new industrial extractions.

Historic Low Groundwater

Satellite reports show groundwater levels nearing record lows, triggering reduced well production and increased competition for limited supplies.



What Is a Data Center?

Servers

Thousands to millions running 24/7

Cooling Infrastructure

Constant heat removal and airflow

Electrical Systems

Industrial-scale power delivery

Backup Systems

Redundancy to prevent downtime

Large industrial facilities housing thousands to millions of servers that power cloud computing, AI, social media, streaming, financial systems, and government operations.

Unlike other buildings, data centers run every minute of every day, consuming power at industrial scale and generating intense heat. Power, cooling, and backup systems are fundamental—not optional.

PROPOSED PROJECT

Cameron County: A 2 GW Data Center Proposal

Scale

2 GW capacity, 1,785 acres (2.8 square miles), 16 data halls. Bigger than La Villa and Palm Valley combined.

Power Demand

Total Capacity: The 2 GW capacity is equivalent to **2,000 megawatts (MW)**. This facility could theoretically power approximately **1.4 million homes**

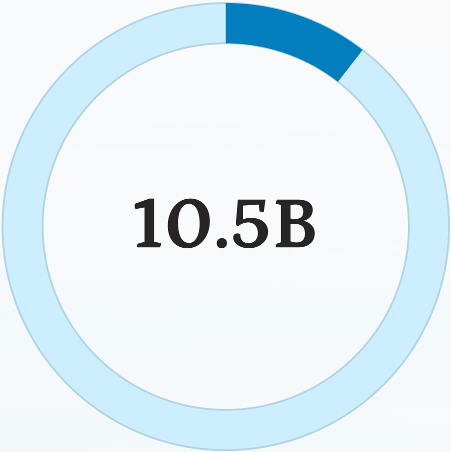
Projections

Projected $14 billion+ in capital investment and estimated 360 permanent jobs.Up to 1 GW interconnection capacity reportedly secured.

Based on the current agreement with the Harlingen Waterworks System, the proposed data center is authorized to use up to **4.6 million gallons** of effluent (reclaimed) water per day. **Per Month:** Approximately **140 million gallons.** **Per Year:** Approximately **1.68 billion gallons**. An annual usage of **1.68 billion gallons** is equivalent to the water needs of approximately **15,500 typical American households** per year.

How Much Water Could a 2 GW Data Center Use?

No cooling design has been disclosed for the proposed Cameron County project. In the absence of public information, the responsible approach evaluates worst-case demand using industry data for hot climates.

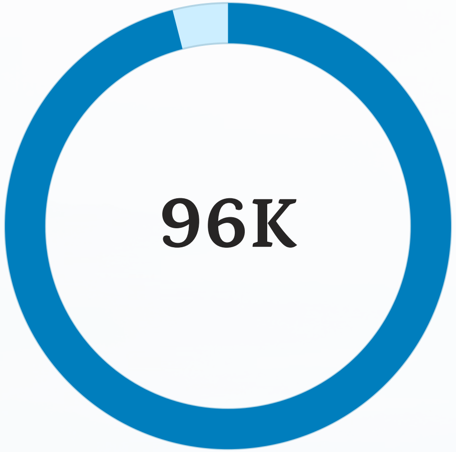


Gallons Per Year

Estimated annual water use at full 2 GW capacity

Gallons Per Day

Daily equivalent water demand



Households

Equal to daily water use of this many homes

This water would come from a region where 90% of supply comes from the Rio Grande. Even if effluent water is used, this volume still comes from a shared regional system already under stress.

GROWTH EXPLOSION

Texas: Second-Largest Data Center Market

570+

Data Centers in Texas

Started in **2017**

7x

Demand Increase Since 2023

Driven by AI model training and hyperscale infrastructure

5,000+

U.S. Facilities

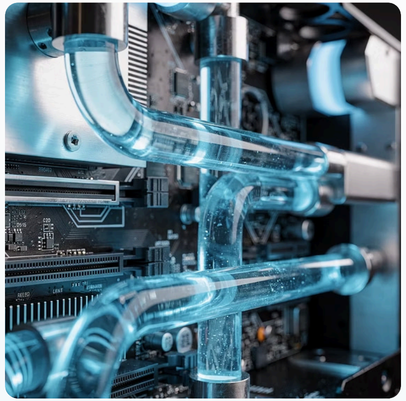
America hosts the world's largest concentration

The modern hyperscale era began in 2006 with Google's first facility in The Dalles in Oregon. Growth accelerated dramatically from 2019 onward, with Texas becoming a major hub. Once a state becomes favorable, infrastructure attracts more infrastructure—growth compounds quickly.

Cooling the Cloud: Three Main Systems

Air-Based Cooling

Common in older facilities. Often paired with evaporative towers. High water use in hot climates. Best for low-density racks (5–25 kW).



Liquid-Based Cooling

Required for AI workloads. Supports high-density racks (50–150+ kW). Water use depends on external heat rejection method.

Hybrid Cooling

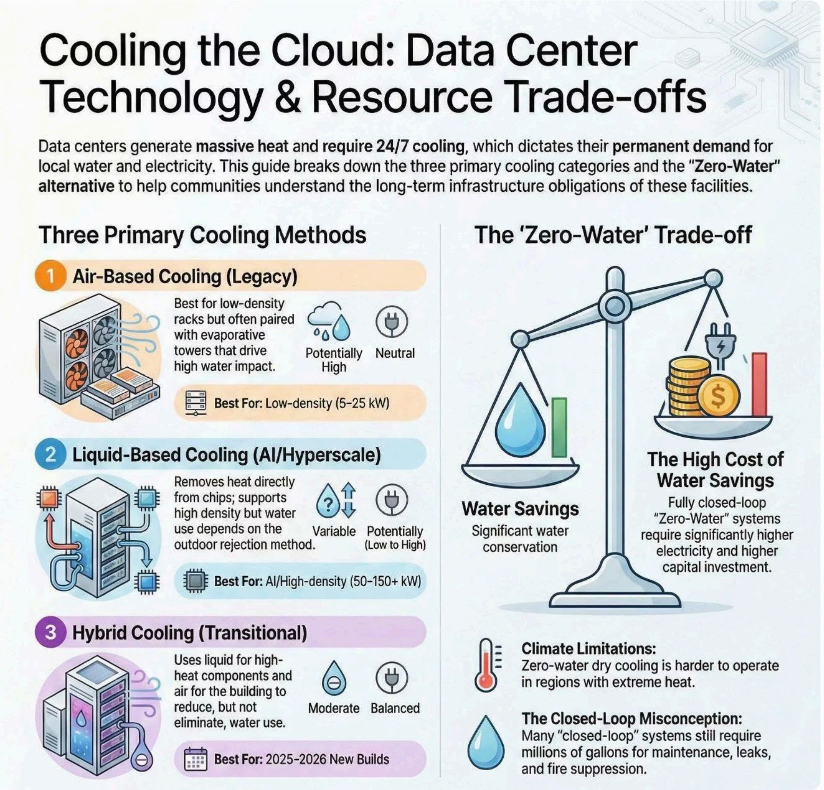
Most common for 2025–2026 projects. Liquid for high-heat components, air for the rest. Reduces but doesn't eliminate water use.

The "Zero-Water" Trade-Off

Claims of "closed-loop," "water-neutral," or "zero-water cooling" require scrutiny. True zero-water systems exist but demand much higher electricity use, higher capital costs, and struggle in extreme heat.

> **Important:** "Closed-loop" does not mean water-free. Many still require makeup water, maintenance water, leak replacement, and fire suppression systems—millions of gallons over time.

Once built, cooling choice locks in permanent demand for water and electricity. When resources are limited, transparency matters.



What Communities Deserve

Clear answers upfront about water and energy trade-offs—not marketing language. Understanding impacts before approvals happen.

Cumulative Burdens: Air, Flooding, Health

Air Pollution

300,000+ pounds of carcinogens released 2013–2024 in Cameron County. Diesel backup generators add NOx, PM2.5, SO_2, and VOCs during testing and outages.

Flooding Risk

Five "1-in-100-year" storms since 2018. Parts of Harlingen now face 1-in-5 annual flood chance every single year. More impervious surfaces = faster runoff.

Health Context

RGV faces high cardiovascular disease, respiratory illness, obesity, dementia and diabetes rates. Adding infrastructure strain increases cumulative exposure.

Communities already pay for system upgrades through higher utility bills, public bonds, and long-term debt—even if facilities leave, the debt remains.

Data Centers Never Turn Off

They run 24/7/365. Always consuming power. Always generating heat. When the grid fails, diesel or gas generators start automatically—emissions increase during the exact moments communities are already stressed.

Constant demand on the grid. No flexibility during peak events. No pause during emergencies. Water and energy use continue even when households are asked to conserve.

Once one campus is approved, more follow. Demand stacks. Backup generation events increase. Strain becomes normal instead of exceptional.

The question that matters: Can a region at the end of a river, with a strained grid, growing heat risk, and limited reserve margins support infrastructure that never shuts off?

Because once it's built, there is no off switch.

Elon Musk warns that the **trajectory of AI-scale data centers is pushing electricity demand toward a level that could rival the power used by every household in the country if growth continues unchecked**, This is why he is exploring Data Centers in Space.

NATIONAL PRIORITY

So why Data Centers? The USA is trying to achieve AGI (Artificial General Intelligence)

What Is AGI?

> AGI is an intelligence that can learn, think, and connect everything at the same time, faster and deeper than any human or group of humans ever could. It will be smarter than all humans combined.

Why AGI Matters

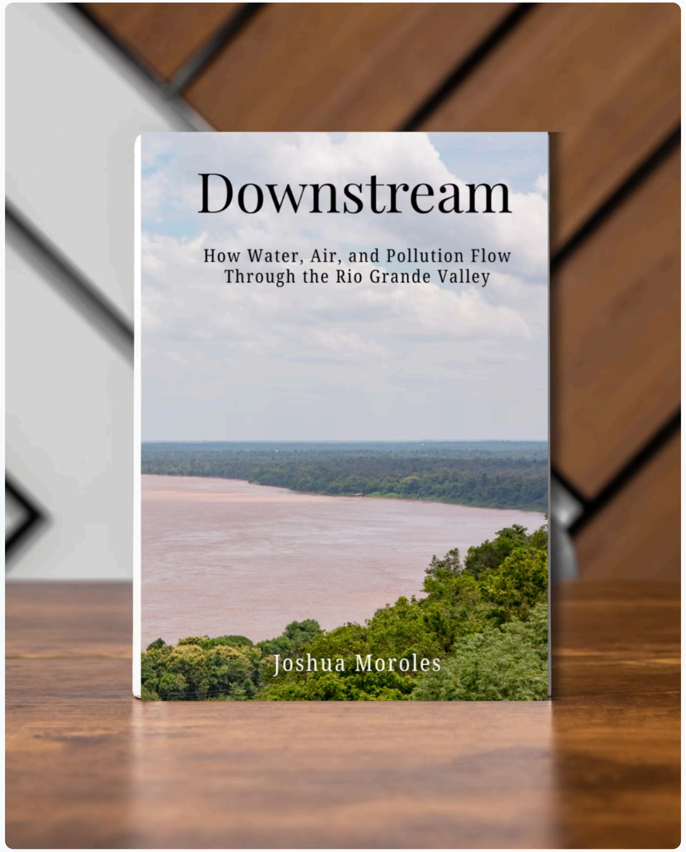
AGI is a strategic capability. Whoever reaches it first gains massive advantages in economic productivity, scientific discovery, military and national security, cyber defense, infrastructure optimization, and supply chains. It would accelerate innovation at unprecedented scale.

Why the U.S. Is Racing

Other nations are investing heavily in AI research, compute infrastructure, energy capacity, and chip supply chains. If another country reaches AGI first, they could set global standards, control key technologies, and gain long-term geopolitical and economic leverage. For the U.S., AGI is a national security priority.

This is a race for strategic dominance in the 21st century.

Help support my on going projects



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