AI Data Centre Expansion and Emerging Water Security Risks in Canada

Overview

The rapid expansion of artificial intelligence (AI) infrastructure has intensified pressures on water, energy, and climate systems globally and in Canada. Large-scale data centres, critical to AI model training, cloud computing, and digital services—require substantial quantities of water and energy for cooling and electricity generation. These demands are emerging at a time when climate-driven drought, declining freshwater availability, and increasing ecological stress are pushing regional systems toward or beyond their carrying capacity.

Water Consumption and Environmental Impacts

- A typical **100-megawatt** data centre consumes approximately **two million litres of water** per day, mostly from municipal utilities.
- Data centres use over **560 billion litres** of water annually world wide.
- Canada's **drought conditions**: 77% of the country classified as abnormally dry due to extreme drought.
- Alberta at **Stage 4** water emergency. Atlantic Canada is facing "**once-in-50-year**" drought.

Quick Facts:



100 MW DATA CENTRE
~2 MILLION
LITRES OF WATER PER DAY



560 BILLION LITRES
GLOBAL ANNUAL WATER USE



77% OF CANADA
ABNORMALLY DRY
OR IN DROUGHT

Scale and Drivers of Data Centre Growth

- The **Federal government** has committed over **$1 billion** to AI and quantum computing.
- Bell plans a 6-site "supercluster" in BC: Alberta aims for **100 billion** in investments.
- Microsoft acquiring sites in Quebec and Etobicoke, approved to use up to **Canada's 40 litres of water** per second.
- US data centres drove **92% of GDP growth** in early 2025.

Regional Vulnerabilities: The Great Lakes Basin



The Great Lakes region—home to approximately 847 U.S. and up to 340 Canadian data centres, is experiencing accelerating pressure. More than 100 facilities operate in the Greater Toronto Area alone. Despite this density, comprehensive data on water consumption remain unavailable. Industry stakeholders have resisted legislative efforts to mandate disclosure, hindering public-sector planning and environmental oversight. The Alliance for the Great Lakes has warned that, in the absence of strong regulation, current growth trajectories could significantly deplete regional groundwater resources. The ongoing drop in St. Lawrence River water levels underscores the vulnerability of interconnected watersheds to compounding stressors.

Governance Gaps and Indigenous Rights

- **No national water use reporting** framework in Canada
- **Inconsistent provincial oversight** and lack of transparency
- **Indigenous rights** and treaty obligations not adequately addressed.

– International Perspectives –

- UN calls for a global moratorium on new data centres.

– "Collective suicide mission" –

~ Pedro Arrojo-Agudo, UN Special Rapporteur of the Human Right to Water

Conclusion

Canada's rapid AI data centre expansion risks freshwater availability and ecological stability. Without comprehensive policies and protections, Canada may sacrifice its most vital natural resource.

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