

## **CanCH<sub>4</sub> Symposium Recap: Carleton Advances Climate Leadership Through Methane Research**

Carleton University hosted the 2025 CanCH<sub>4</sub> Symposium on May 7–8, convening top researchers, policymakers, and industry leaders to accelerate Canada's efforts in methane mitigation. Spearheaded by Professor and Scientific Director Matthew Johnson and the Energy & Emissions Research Laboratory (EERL), the event highlighted the critical role of science-based policy, satellite innovation, and collaborative data systems in tackling methane emissions.

“Carleton is proud to be a convener of research and ideas that directly address our climate future,” said President Wisdom Tettey. “The work presented at CanCH<sub>4</sub> shows not only scientific excellence but a deep commitment to meaningful change.”

### **Why Methane Matters—Now More Than Ever**

Methane is over 25 times more potent than carbon dioxide over a 100-year period. Global concentrations continue to climb rapidly, with trends now aligned with high-emissions scenarios incompatible with the Paris Agreement’s 2°C limit.

“We’ve reached a point where Canada must not only monitor methane more precisely—but act on it faster,” said Professor and Scientific Director Matthew Johnson.

### **Canada’s Challenge: Complex Terrain, Limited Data**

Due to its high latitude and boreal forests, Canada faces unique challenges with methane detection. Satellite signals are often weakened or biased—delaying national readiness to apply space-based data for real-time flux measurements.

“This is a real data gap,” Johnson noted. “We were behind for years, unable to fully utilize LEO (low-Earth orbit) satellite observations until retrieval algorithms finally improved.”

“This is one of the more valuable regulatory monitoring tools we've got,” said Professor Johnson. “We can absolutely see the positive impact of current regulations [and] of industry action — things we can be proud of. And I want to be positive about this. We’ve got measured reductions in all three provinces.”

Canada’s national campaigns from 2021 to 2024 are changing that. EERL has led a shift toward measurement-based inventories, combining aerial surveys, satellite data, ground-level facility scans, and advanced modeling like MAZE and IMI (Integrated Methane Inversion).

“What we're doing now is unprecedented. We're flying over thousands of sites, pairing that with targeted bottom-up work. The goal is to produce a measurement-based inventory that

has some validity, some meaningful uncertainty attached to it, and this is an evolving process.”

### **Data That Drives Action**

One of the most compelling findings came from Johnson’s work in Saskatchewan, the second-largest oil-producing province in Canada, where over 12,000 facilities were sampled.

“Each source is getting visited an average of about three times. Then there's a statistical based approach to factoring in the probability of detection.”

In British Columbia, methane emissions have dropped nearly 40%—a success story Johnson credits to ongoing collaboration and targeted regulation. In contrast, Alberta and Saskatchewan show progress, but it's leveling off.

“It looks like we had an impulse of regulations followed by an exponential decay. We’re stabilizing, but not dropping fast enough to meet 2030 targets,” he warned.

Meanwhile, Alberta offered what Johnson described as a “perfect case study” for evaluating the effectiveness of prescriptive regulation:

“This is hard evidence that prescriptive regulations really do work. I mean, if you want a clearer case with a perfect case study, it's the same region, and you carved out a scientific sample of Directive 84 sites and did one thing, and then the very adjacent sites you did something else — the results are on the screen.”

### **Is the Low-Hanging Fruit Gone?**

“Let's be honest. I don't know how many talks I hear other people say the low-hanging fruit's gone, but it isn't. I see unlit flares in every one of those pies. That's the definition of low-hanging fruit.”

He emphasized that over 50% of methane emissions now occur below 10 kg/hr, often below current aerial detection thresholds. These smaller sources account for nearly 90% of total methane emissions—making them harder, but not impossible, to mitigate.

### **Leading the World—and Looking Forward**

With upstream methane intensities at 0.2% or lower, British Columbia now sits among the global leaders. Carleton researchers hope to replicate these “Made in Canada” successes abroad—with early collaborations already underway in Colombia.

“If we're seeing this level of success, then the sources that are out there are different now than they were three, four years ago. And we want our mitigation action on the ground and our policies to reflect that.”