

CMC Meeting Minutes
7:00 p.m. Thursday, July 10, 2025
Virtual Meeting

CMC Members Present: Reg Rankin, Peter Lund, Channing Davis, John Cascadden, Christa Schnare, Councillor Janet Steele, Nancy Hartling, Teneka Warikubu, Hailey MacKinnon

Others Present: Shannon Betts, Jordan Vallis, Steve Copp, Rick Grant, Jason Timms, Betsy Chambers and Dr. David Risk

1.0 Motion to approve the agenda moved by Nancy Hartling, seconded by Janet Steele. Motion carried.

2.0 Motion to approve the March 22, 2025 minutes, moved by John Cascadden, and seconded by Nancy Hartling. Motion carried.

3.0 The Chair welcomed and introduced Christa Schnare who replaces Nadia Fougere as an HRM-appointed representative to the CMC, and then turned to the CMC Liaison Assistant Rick Grant to introduce the guest speaker.

4.0 Dr. David Risk, an emissions measurement specialist who holds the Brian Mulroney Institute of Government Research Chair in Climate Science and Policy at St. Francis Xavier University, Antigonish, has been overseeing a large-scale measurement program documenting landfill methane emission levels at over 100 sites in Canada (not including the Otter Lake Landfill) to establish mitigation opportunities. The findings could help with the establishment of new federal regulations that were in development by the Trudeau government in 2024. With the change of government in March 2025, the status of that activity remained unclear at the time of the meeting.

Dr. Risk discussed some of the measurements made by his team across Canada and its work at a simulation facility where the team tests different types of measurement most useful for the large operators of North America's waste sector sites.

This activity is taking place against the backdrop of Canada's commitment to reduce its methane output, of which 23 per cent comes from the provincially regulated waste sector. While methane output from oil and gas has been coming down, reductions in agriculture are more difficult to achieve. The methane it generates comes mainly from livestock, leaving the waste sector, which has never been subject to methane regulation,

to make up the difference if reduced emission targets are to be reached.

Methane emissions at landfills can come through cracks at the active work face or surface areas near the collection wells. The average Canadian landfill can emit the methane equivalent of up to 400 oil and gas sites, of which there are 100,000 in Canada.

Dr. Risk's group was asked in 2020 by Environment and Climate Change Canada to survey the waste sector. The group had measured methane in Canada's oil and gas sector, predominantly in western Canada but also in Canada's offshore, on the east coast. Canada had crude estimates of methane emissions in the waste sector, but not the factual data required to support a regulatory regime.

Dr. Risk's presentation (attached) triggered lively discussion and a flood of questions.

5:0 No members of the public were in attendance from whom to invite input, and the Chair turned to the next item on the agenda.

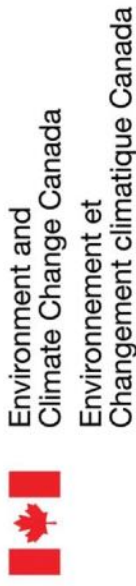
6.0 Commenting on the May 2025 Otter Lake Landfill tour, John Cascadden stated that while he appreciated members were shepherded around the site in Steve Copp's vehicle due to the inclement weather, he hoped a tour could be arranged in better conditions to give members an opportunity to view the facility's operations more closely on foot.

7.0 Following a motion to adjourn, moved by Janet Steele, the CMC meeting adjourned at 8:36 p.m.

Methane Measurements at Canadian Landfills



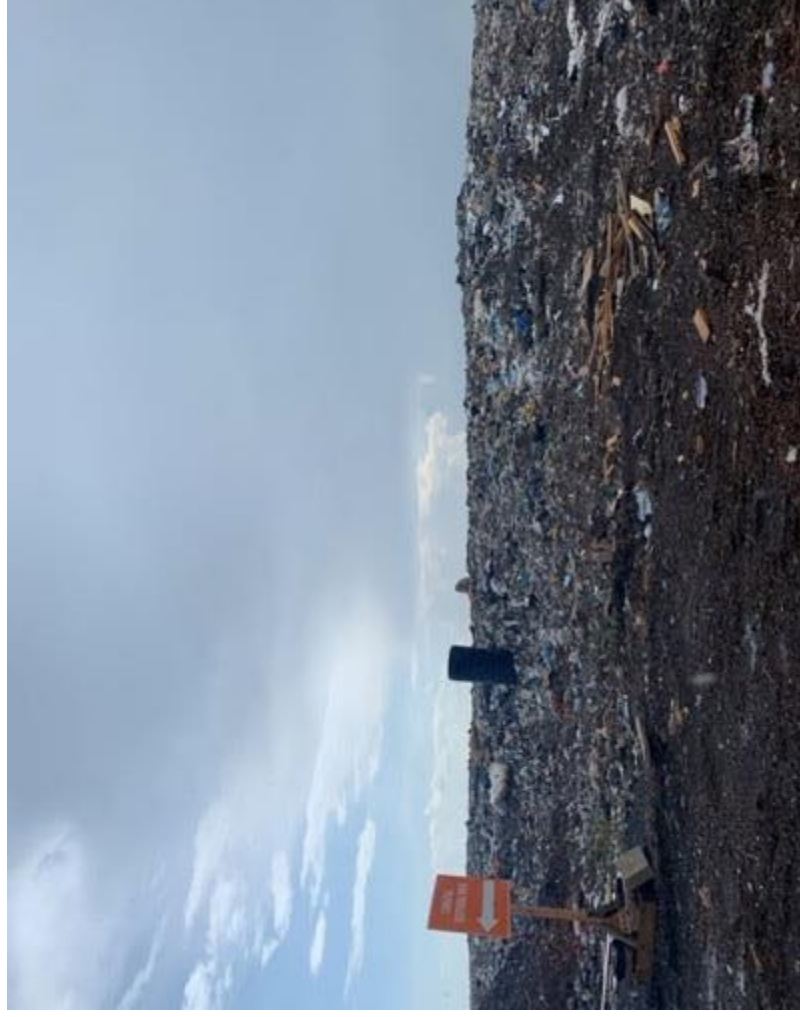
Dave Risk
Earth and Environmental Sciences
St. Francis Xavier University



ST. FRANCIS XAVIER
UNIVERSITY

- [illegible]

Why Are Measurements Important?



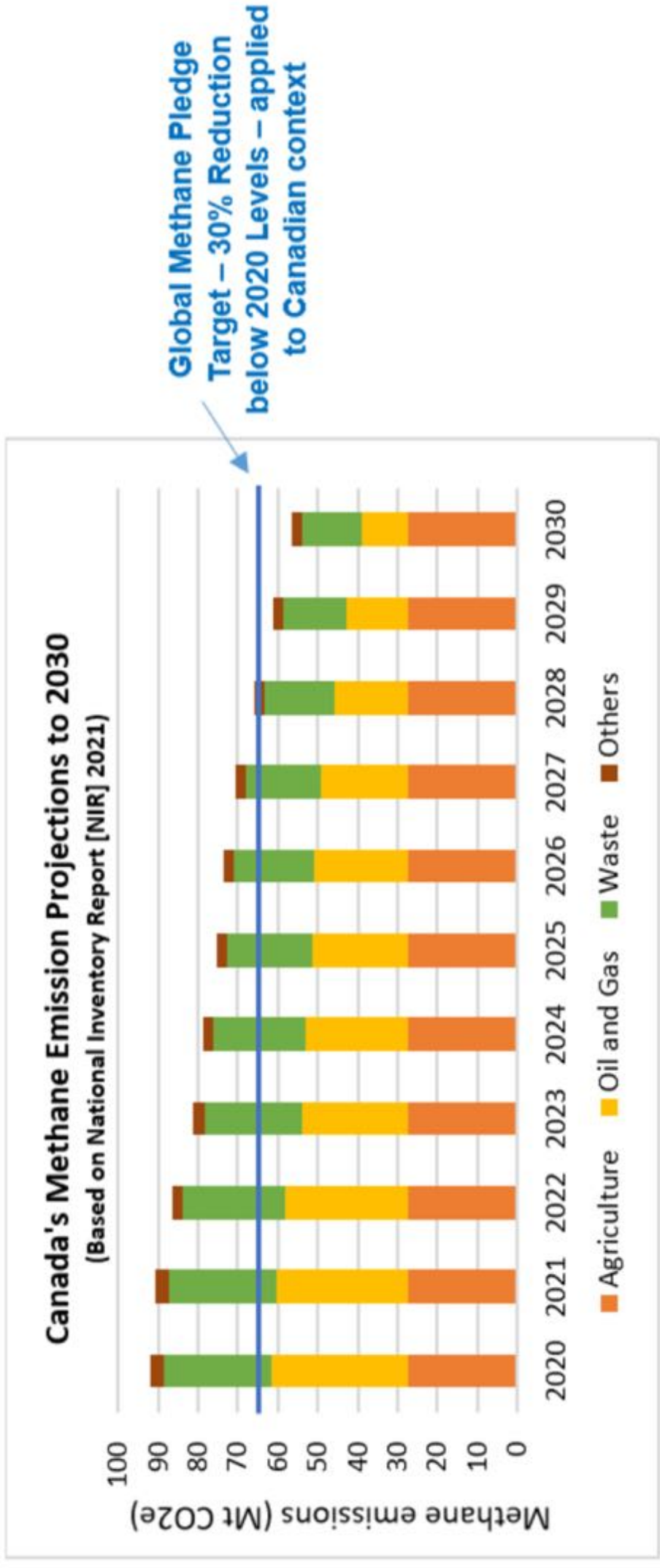
Canada has pledged support to the Global Methane Initiative, to reduce global methane emissions by 30%

Waste sector makes up 23% of Canada's annual methane emissions as of 2022

Federal government aims to put regulations in place by 2025

Waste Sector – The Next Frontier

Global Methane Pledge (GMP) Commitments Aren't Achievable Without the Waste Sector



Canada 50% waste sector reduction planned by ~2030
From now to 2030 – 60:40 O&G vs Waste

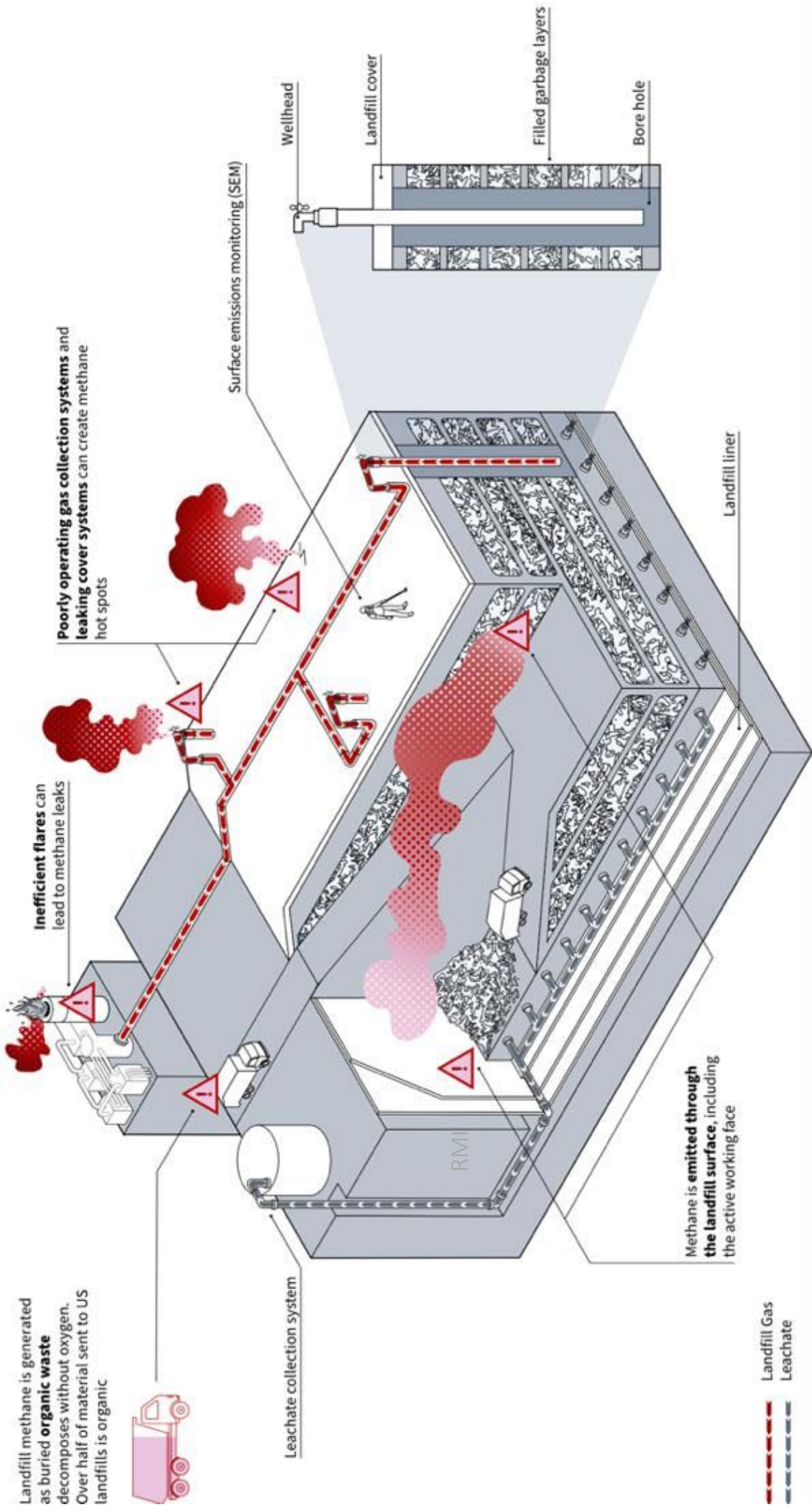
Waste Sector – Playing Catch Up

Substantial time pressure to address key gaps in data and knowledge

**Regulations will have ~5 years to achieve the promised 50% reduction – not much!
Waste sector is the biggest source of methane uncertainty in Canada's Inventory.**

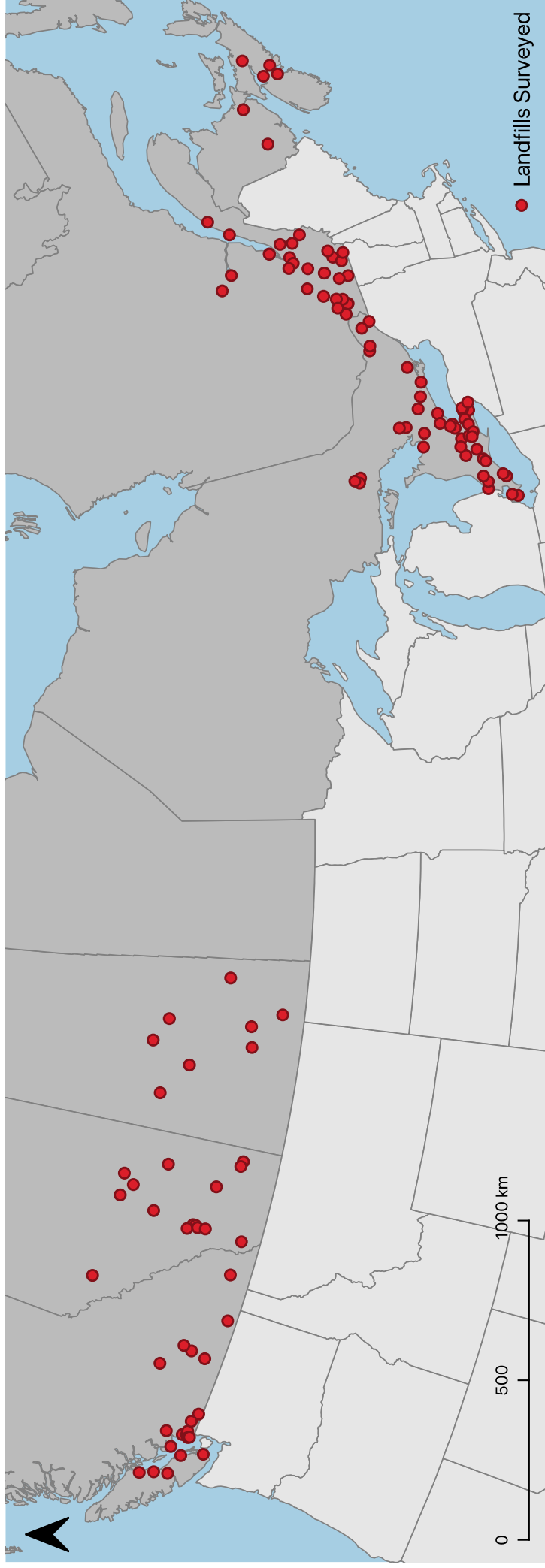
- Starting data: Are reported and modeled values reasonable?
- Do we have an appropriate understanding of sources and variability?
- What types of measurements should the regulator conduct or recommend?
- How can we capture more gas?

Measurement Challenge – Many Sources



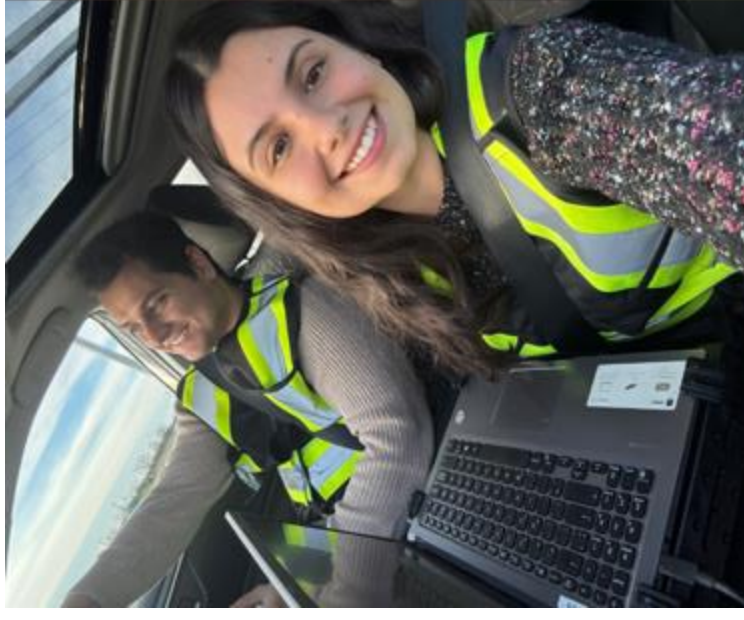
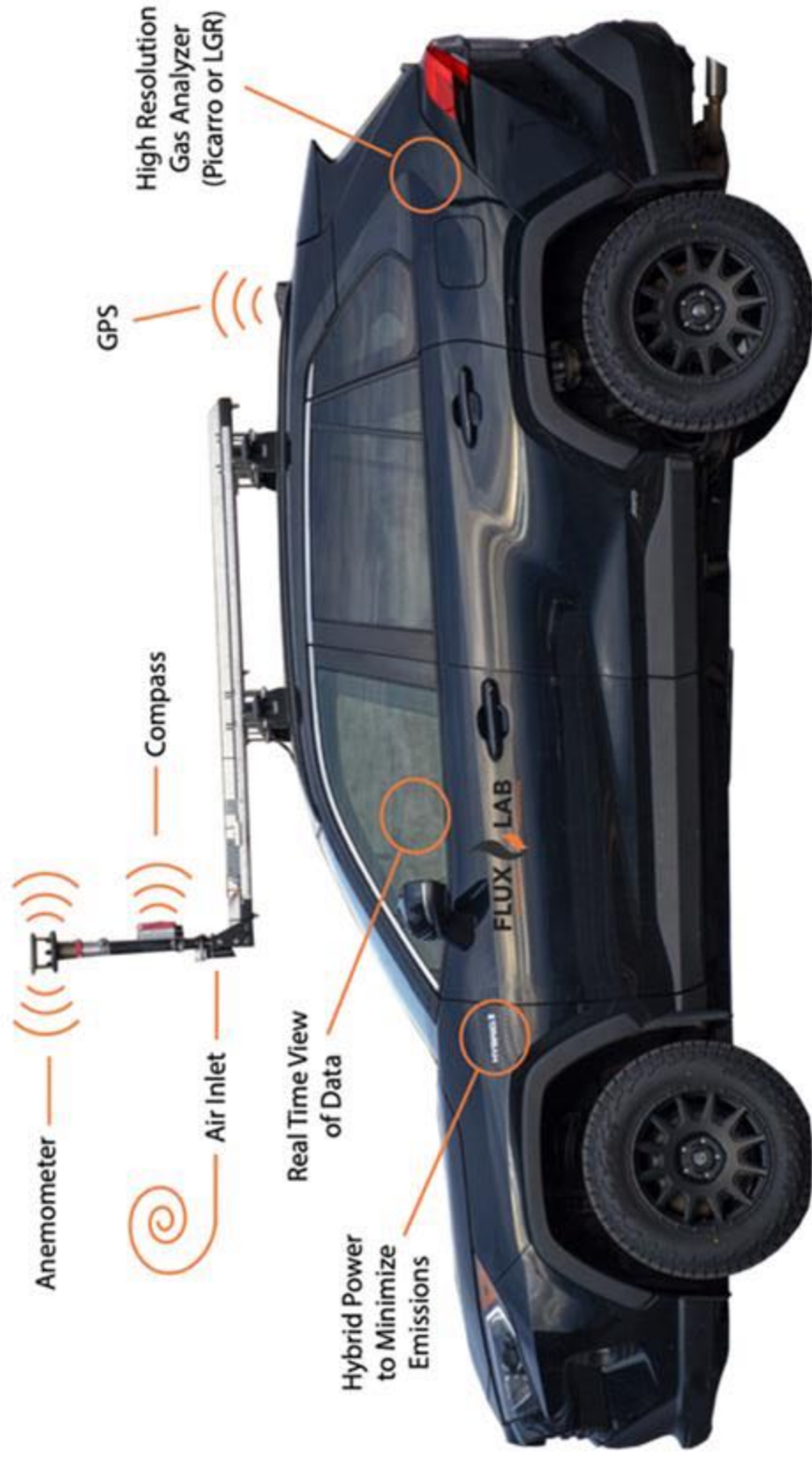
Part 1 – Landfill Survey

- 125 truck snapshot measurements of landfills across Canadian climate zones
 - 10% were visited 2x
- 27 aircraft mass balance snapshot measurements in November 2022
- Not all measurements were successful (78/125 mobile & 13/27 aerial)

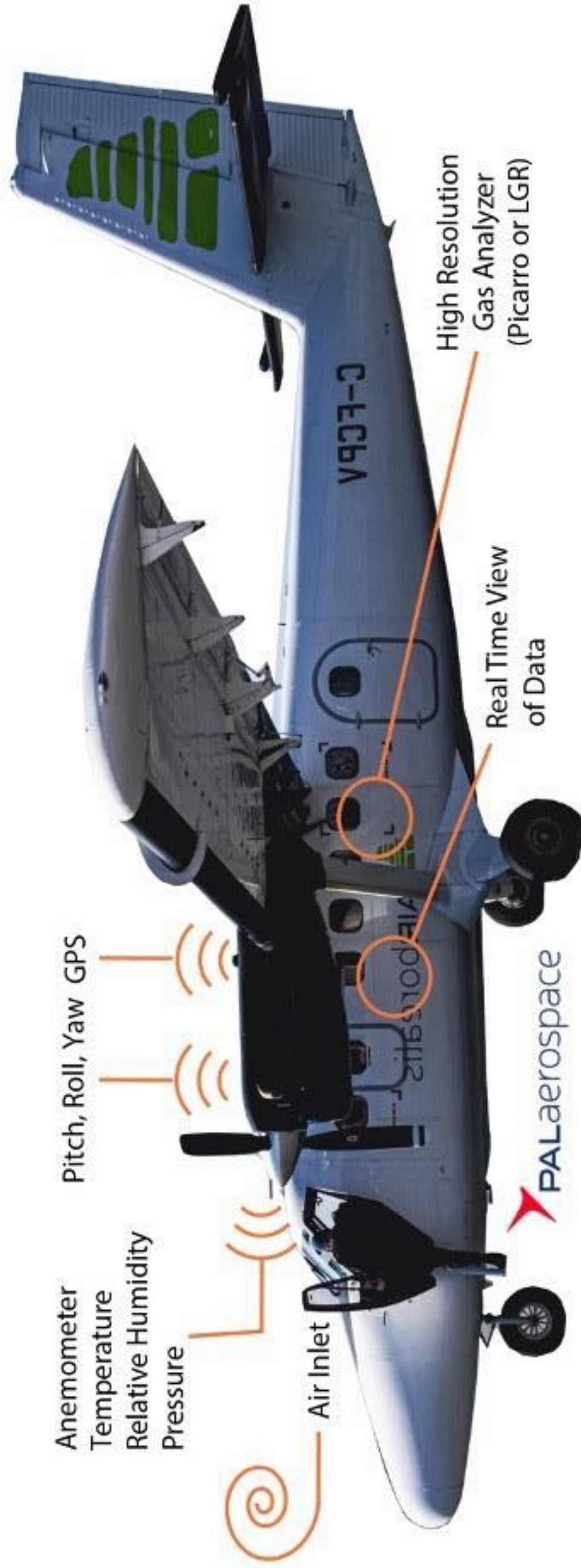


CSRS: Albers Equal Area Conic. Provincial boundaries from Statistics Canada. State boundaries from the US Census Bureau.

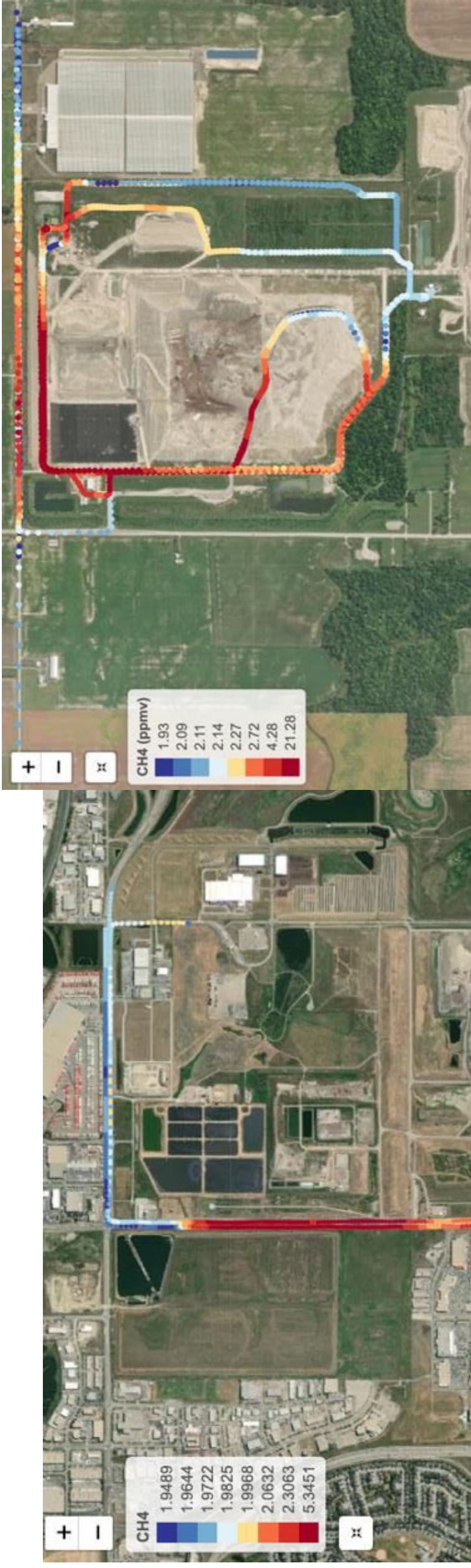
Measuring by Truck



Measuring by Air

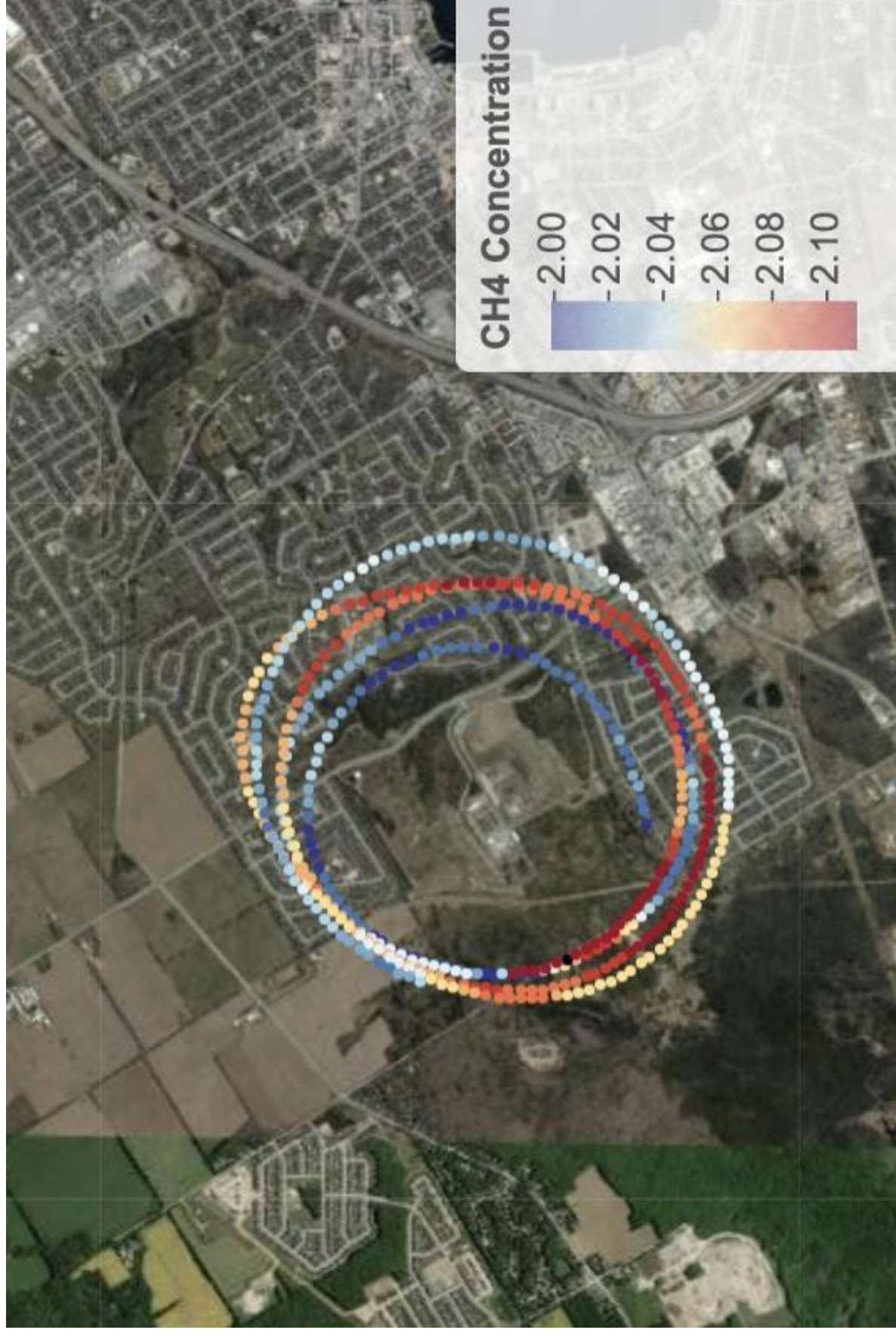


Truck Measurements



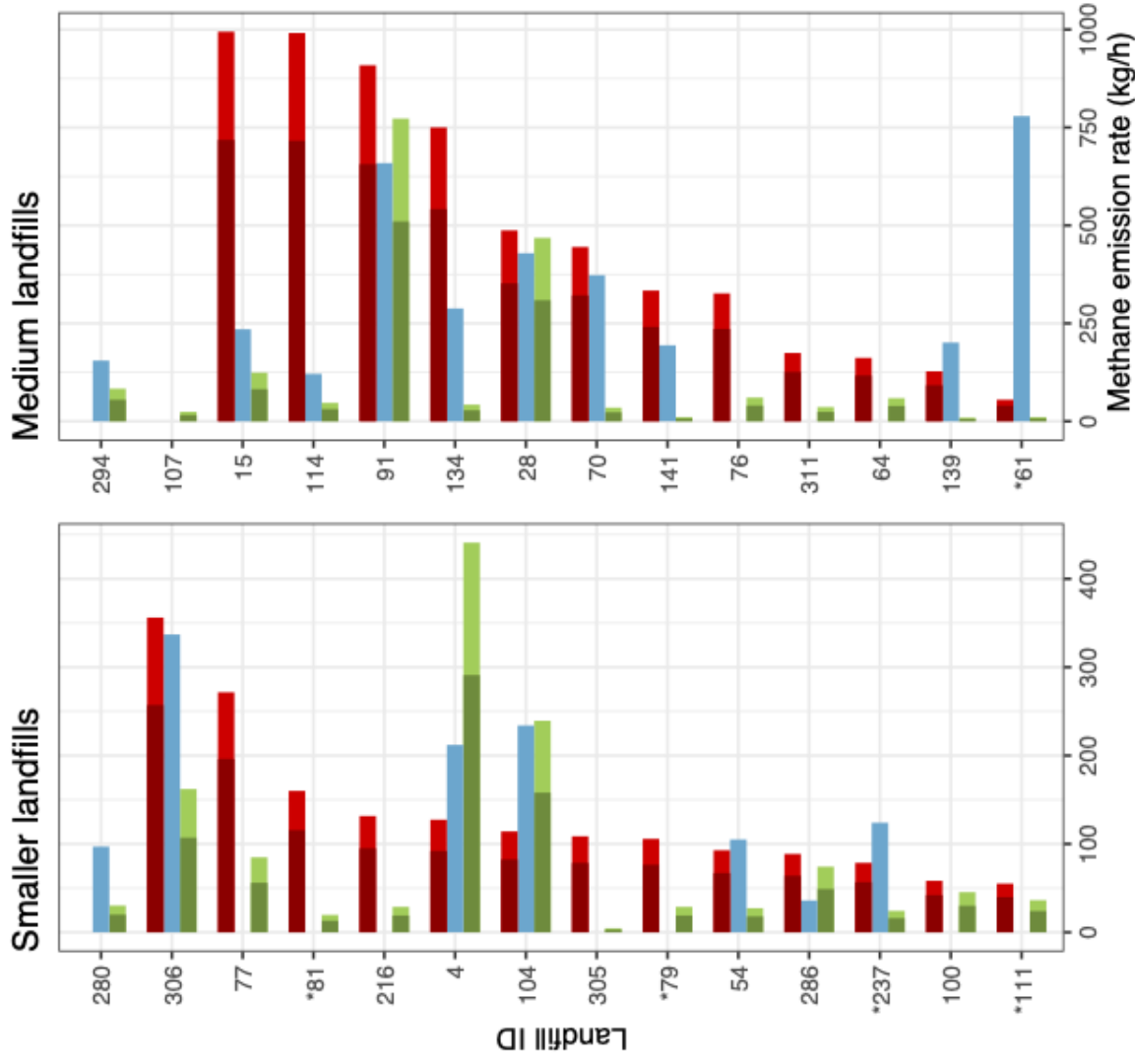
Offsite downwind transects
Onsite access to many

Aircraft Measurements



Not shown: Gravel

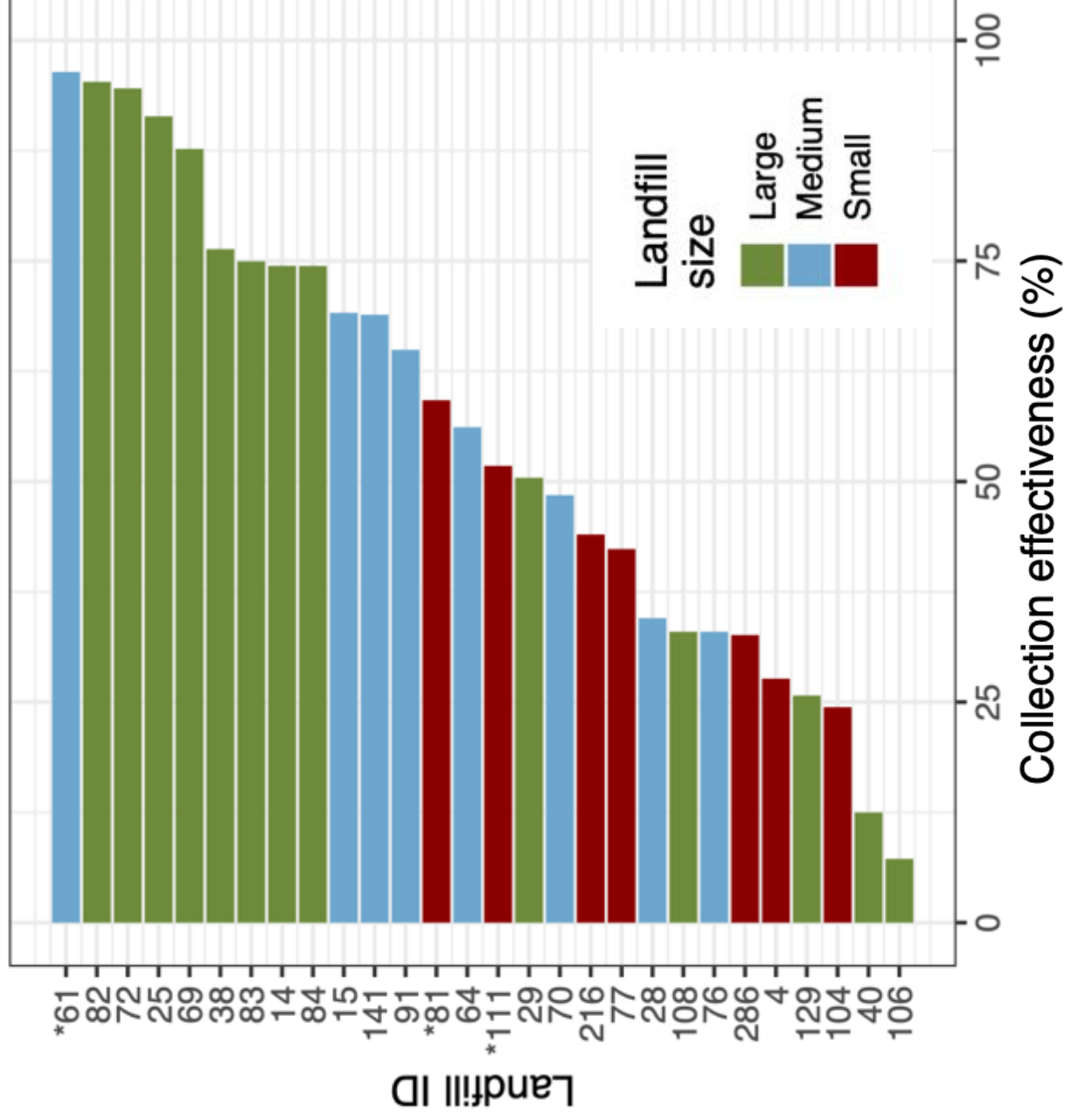
Comparing Emissions from Landfills



- Most of the time, measurements were lower than inventory model

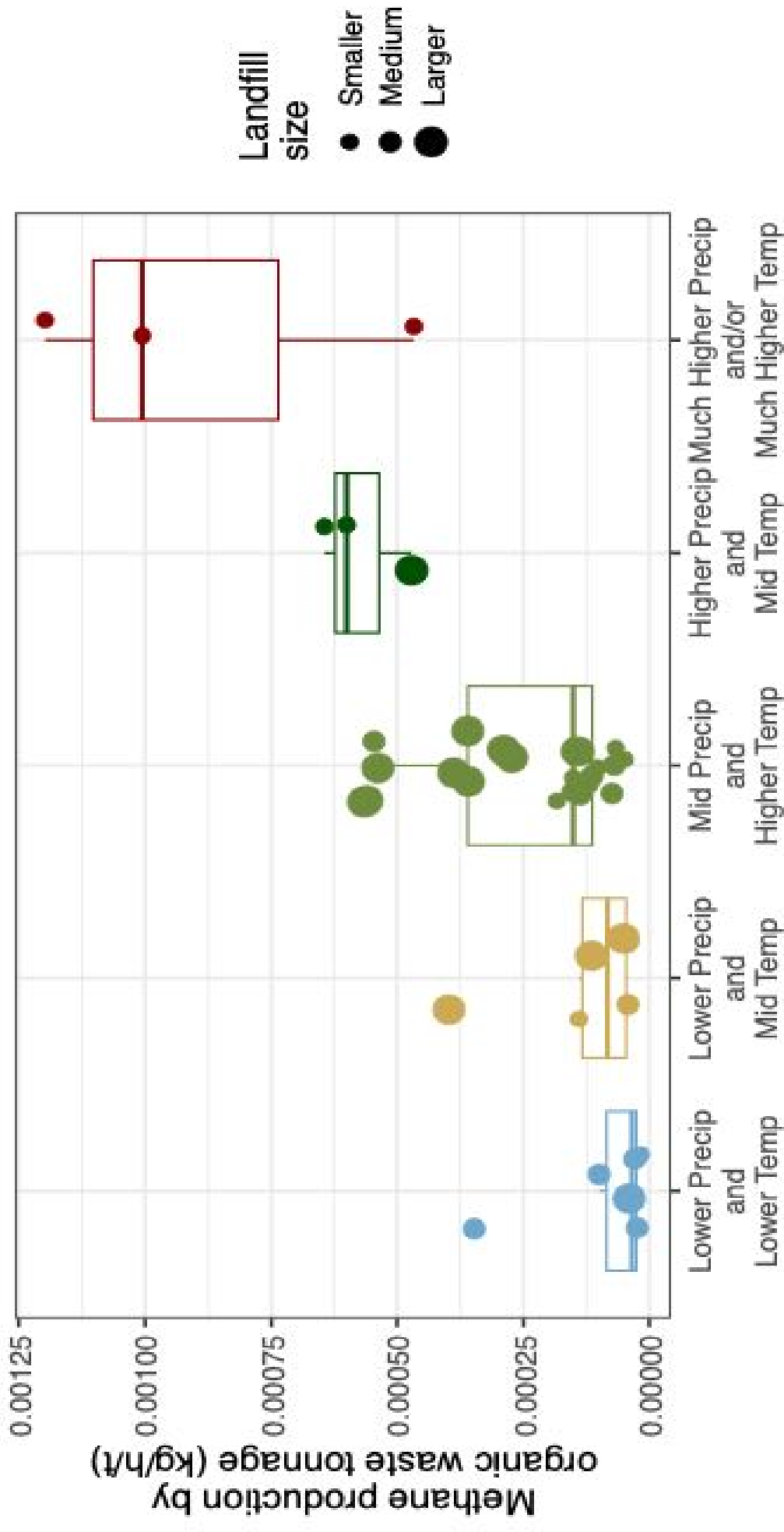
- Measurements were similar to reported values

How Efficient Are Collection Systems?



- Collection systems can be very effective within the covered area in which they are installed
- If the landfill is very large and mature, it will have a higher proportion of covered area relative to filling area, further increasing effectiveness

Comparing Across Climate Types



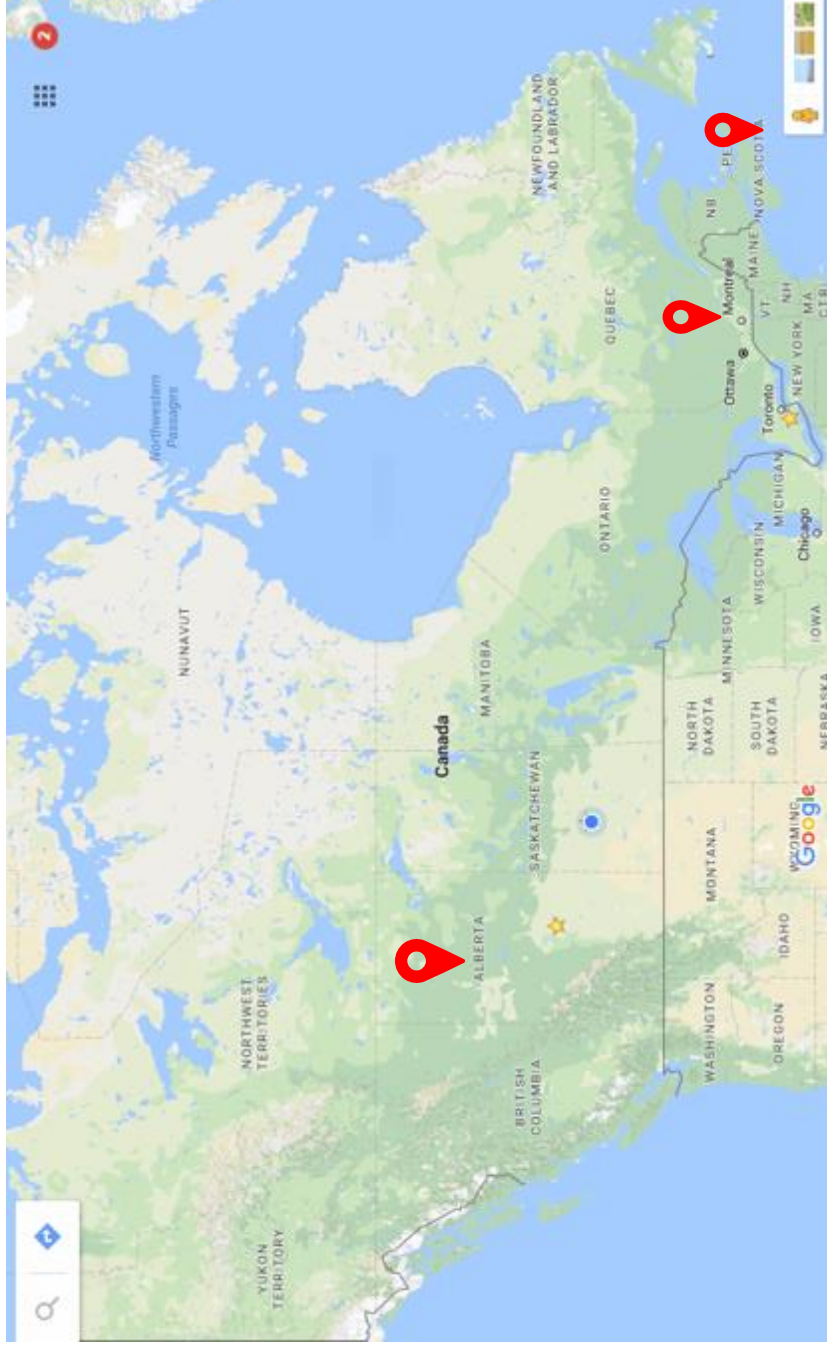
- In our moist and warm climate, methane generation potential is significantly higher

Part 2: The Sources – Critical for Regulation

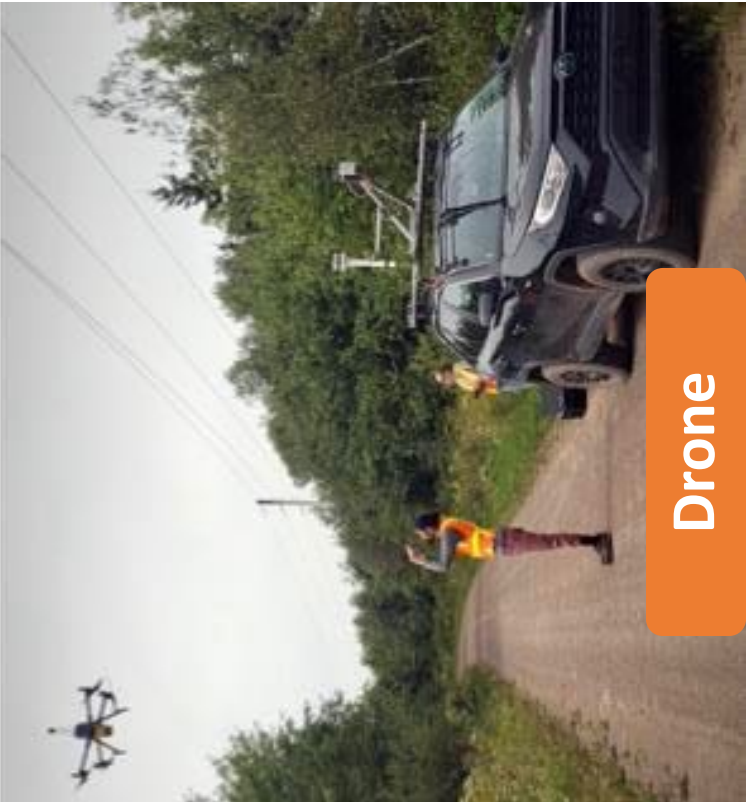
Field work: June 2023 – February 2024
Data analysis: Finished (March 2024)

12 Landfills in 3 different provinces

- ❖ Maritime/ coastal climatic zone
- ❖ Humid/continental climate zone
- ❖ Dry prairie steppe climate



Measurements



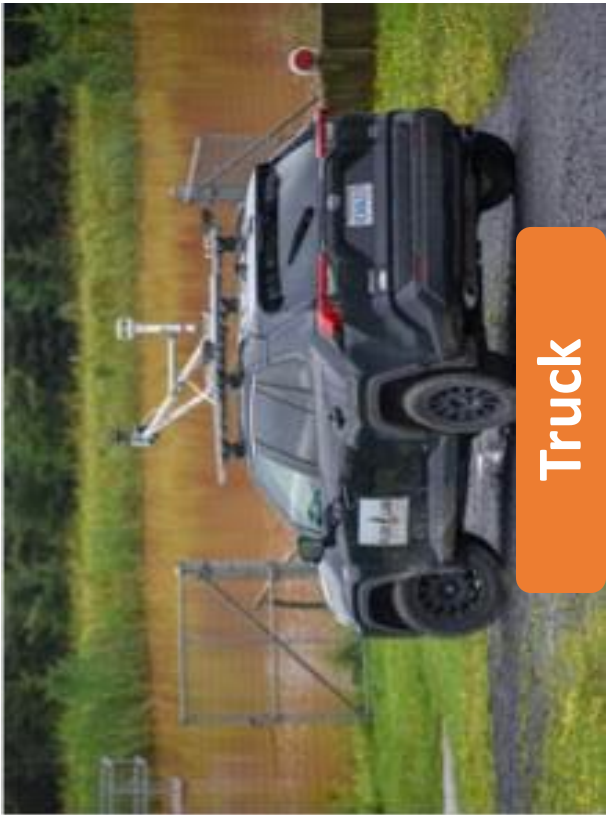
Drone



Tripod



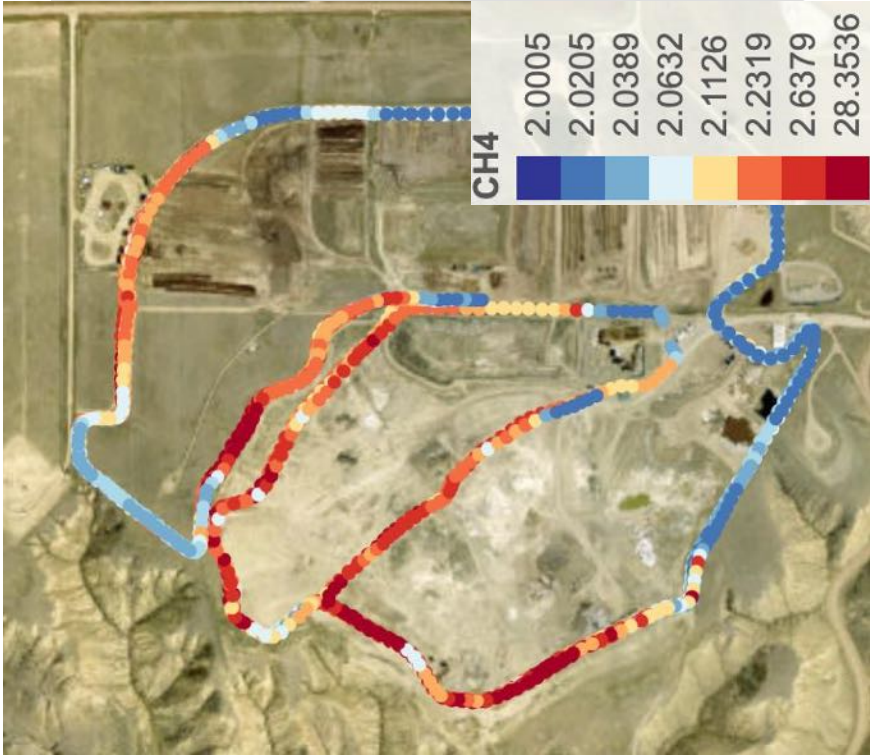
Surface Emission Measurements (SEM)



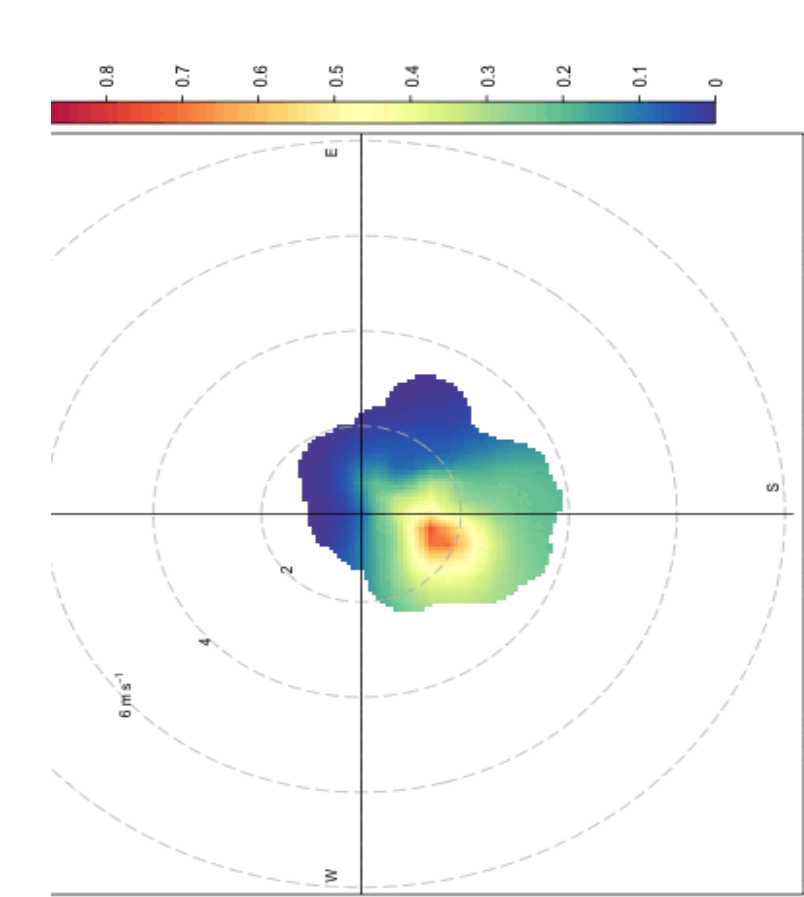
Truck

Measurement Outcomes

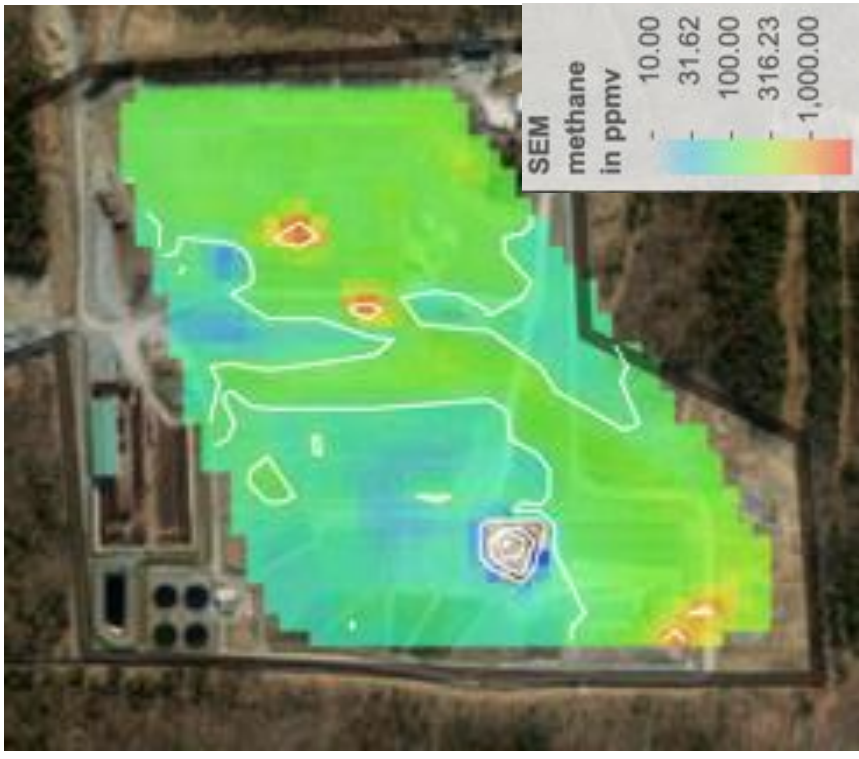
Source localization using different methods



Truck



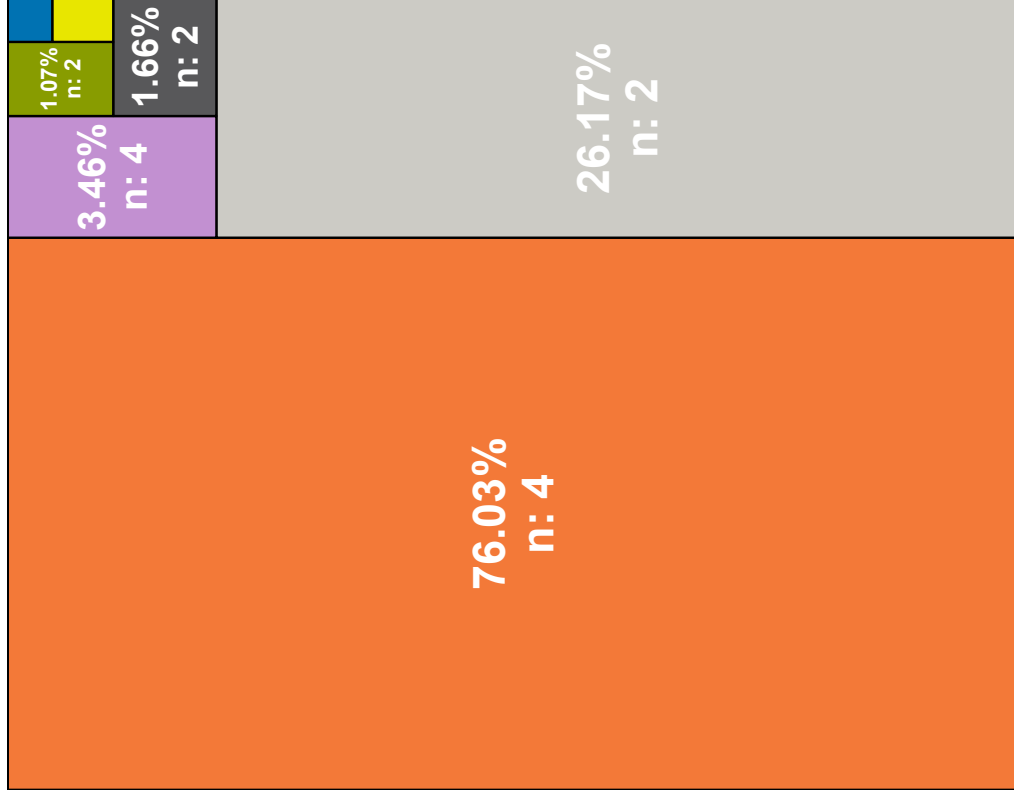
Tripod



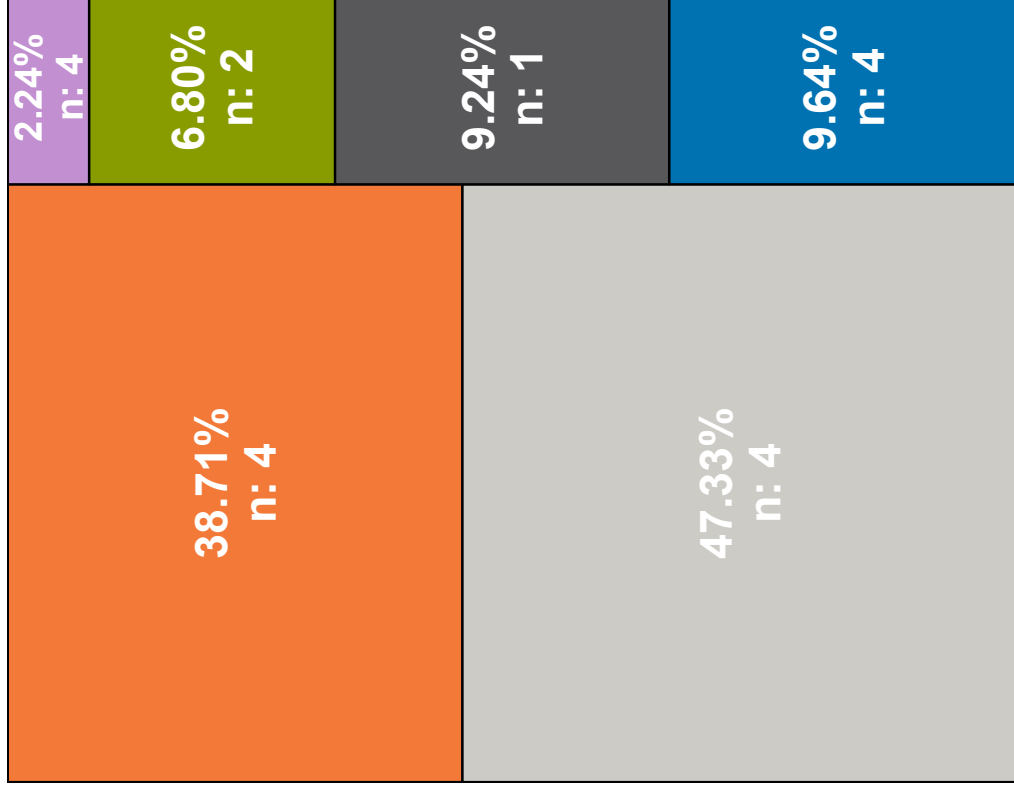
SEM

Outsized Contribution of Work Face

With GCCS



Without GCCS



Active work face = where fresh waste is being deposited

GCCS = Gas Collection and Control System

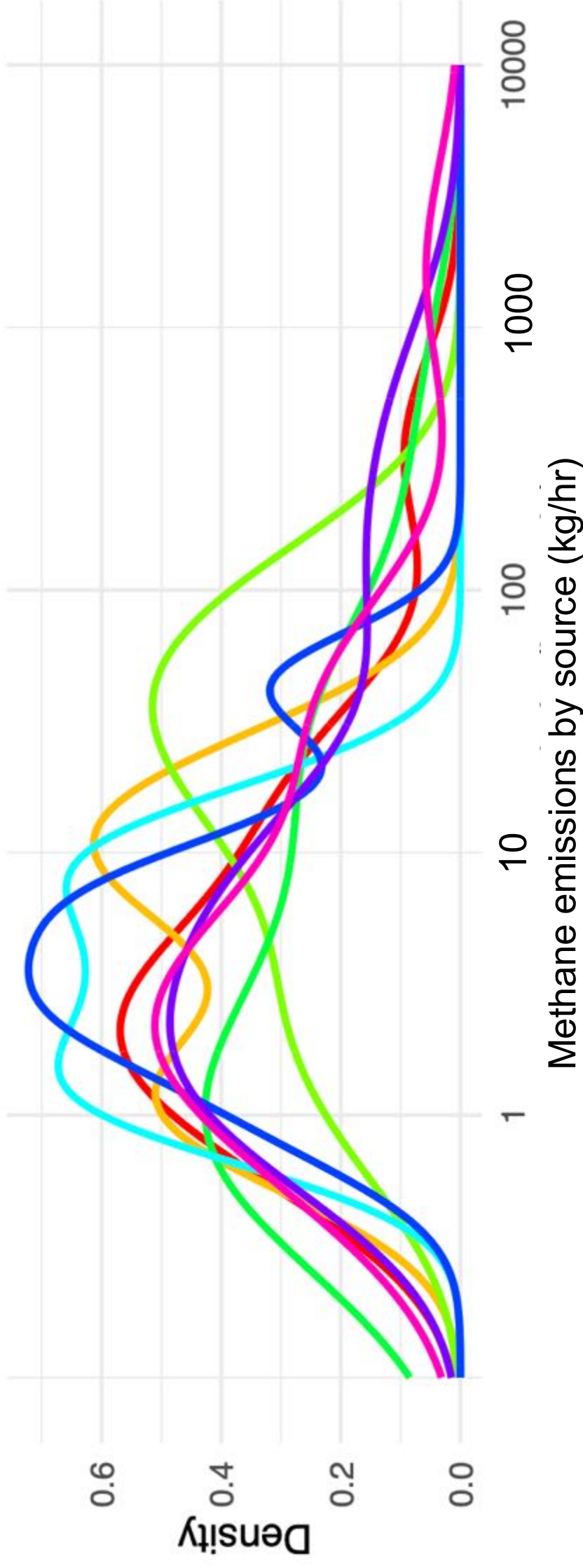
Across all sites, active work face (orange) a prolific source

- Normally relatively few hotspots but emissions are intense

Final cover areas (light grey) next most prolific source



Right-Sizing Detection Tech to Sources



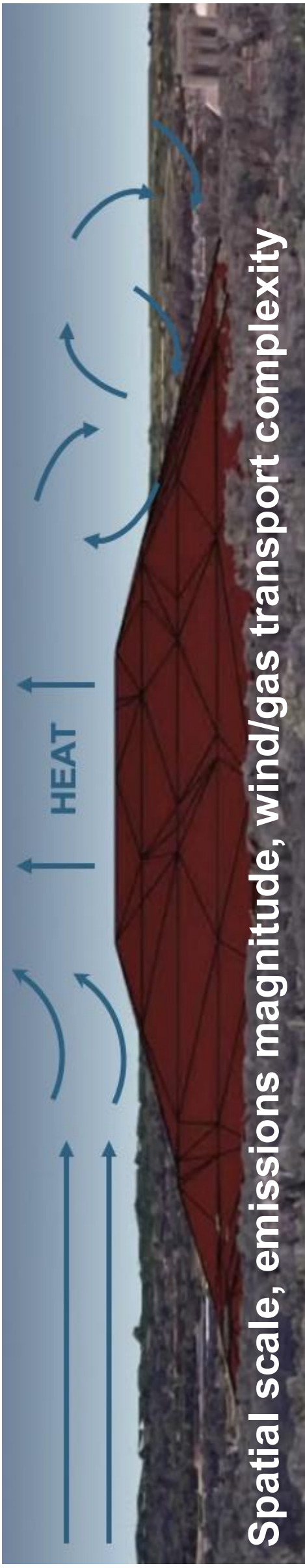
- Across all landfills, “leaks” were numerous but small, between 1 and 50 kg/hr
- Work face was normally made up of 1-4 source hotspots, each 50 kg/hr or more
- Must size monitoring to catch hotspots below 50 kg/hr
- Should we be incentivizing work face collection, as in Britain?
 - A few Canadian sites do it.

Part 3: Assessing the Tech

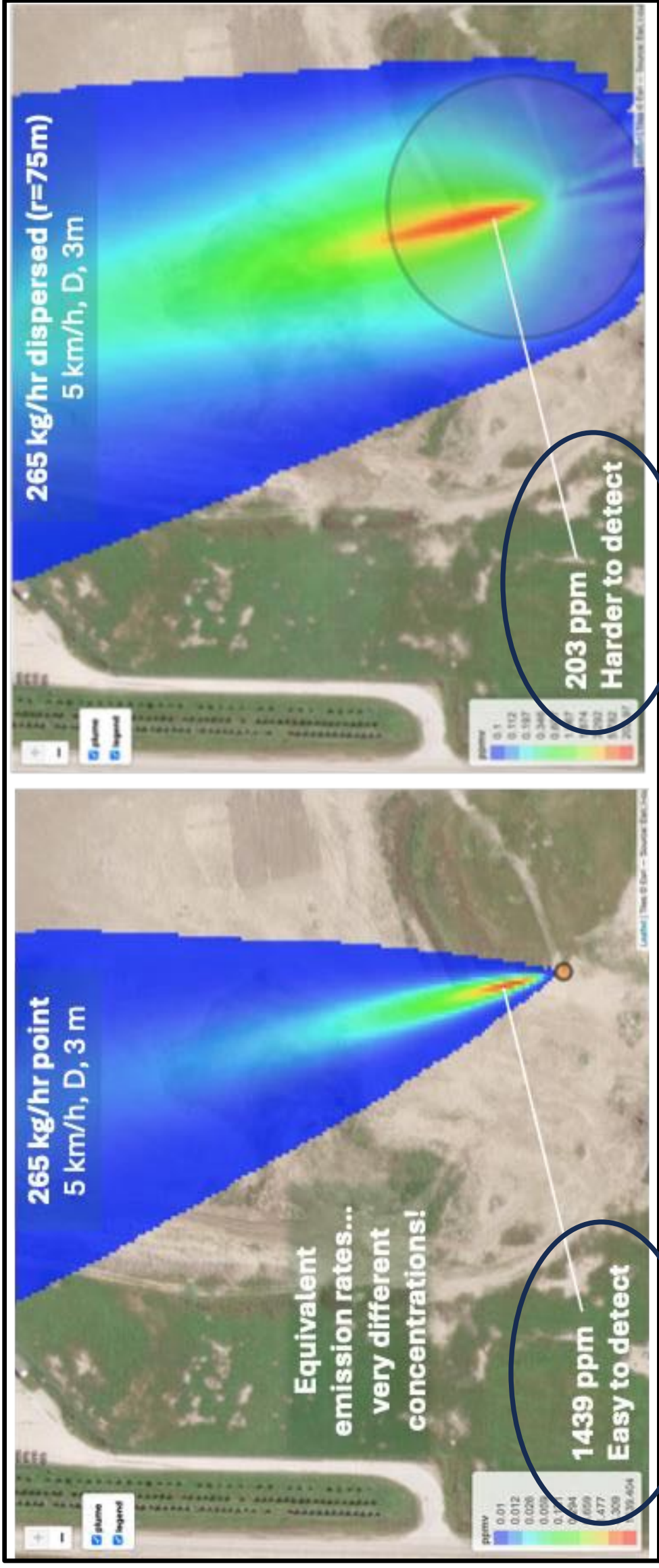
- Environmental Research and Education Foundation (EREF)
- Assessing various methodologies' performance in controlled conditions at a closed landfill
- Methodologies are grouped based on localization, quantification, or both
- Only dispersed release site globally



Landfill measurement challenges



What is a Dispersed Source, Really?



Dispersed sources (or *diffuse* or *area*) have lower “density” .
Work face is an example of a dispersed source.



Pylp Buntc

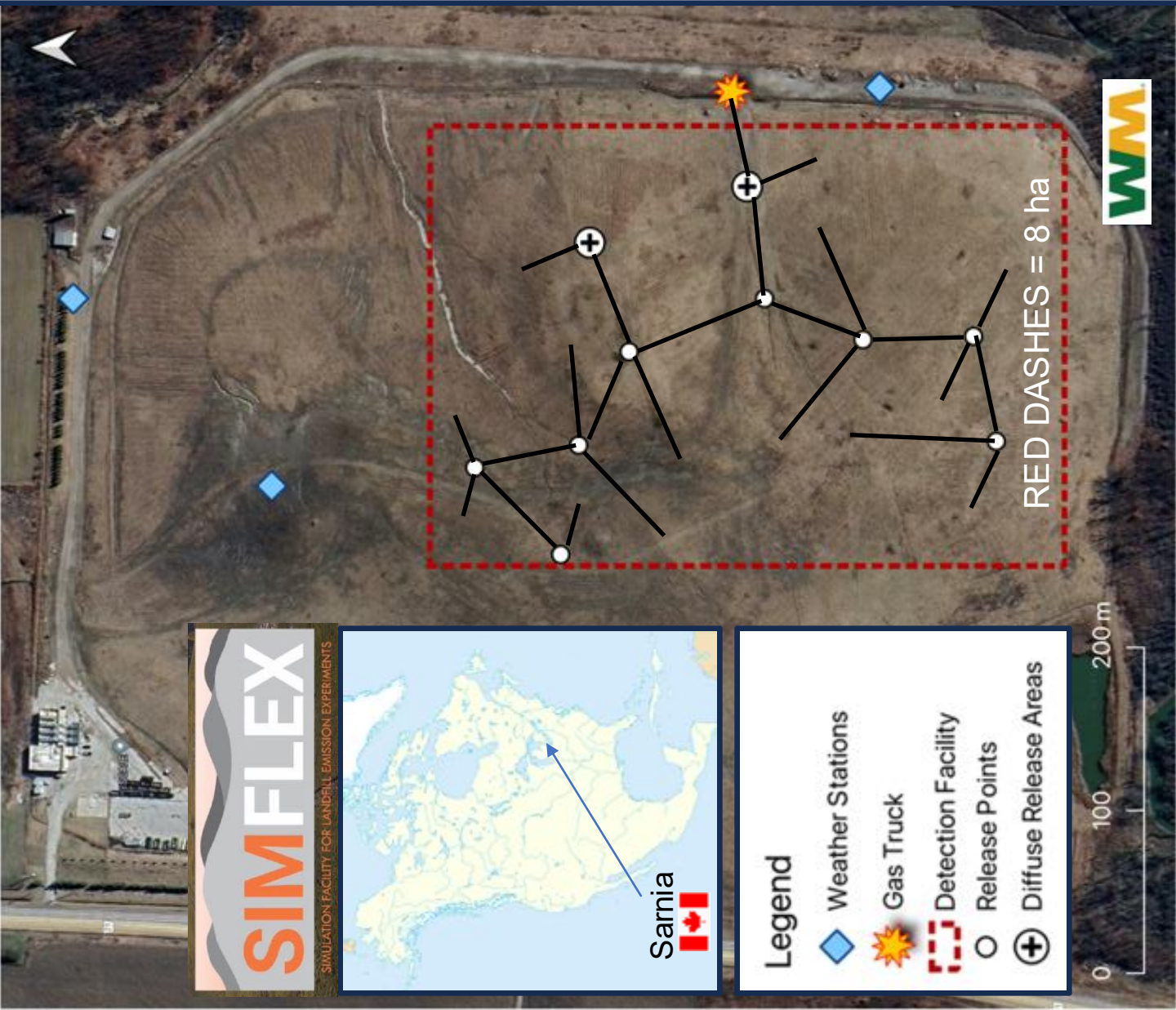
Field Engineer

<https://www.youtube.com/watch?v=dvEbOqOTagc>

Dispersed releases

Simulation Facility for Landfill Emission Experiments (SIMFLEX)

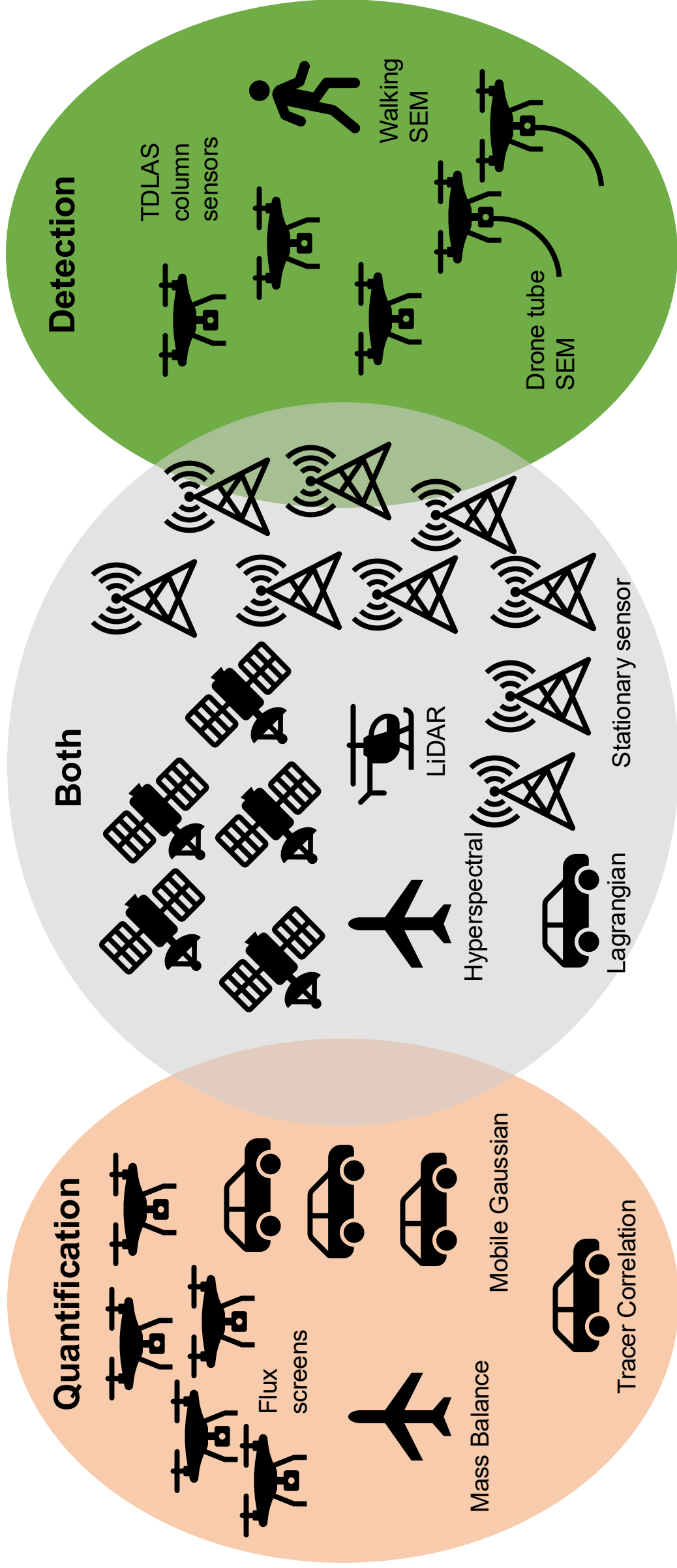
- Operated for **EREF**, representing US/CAN landfill industry, and hosted by **WM**.
- Actual closed landfill with gas collection
- For testing ALL measurement methods
- Satellites of huge interest to industry
- >12 release points over ~8 hectares
 - point, small area, large area sources
- More gas pipe than CN tower (Toronto)
- Gas delivered by tanker
- >1000 kg/hr total capacity
- 3 experiments -> November 2023, November 2024, May/June 2025



Participants

Over 30 participants from 8 countries thus far

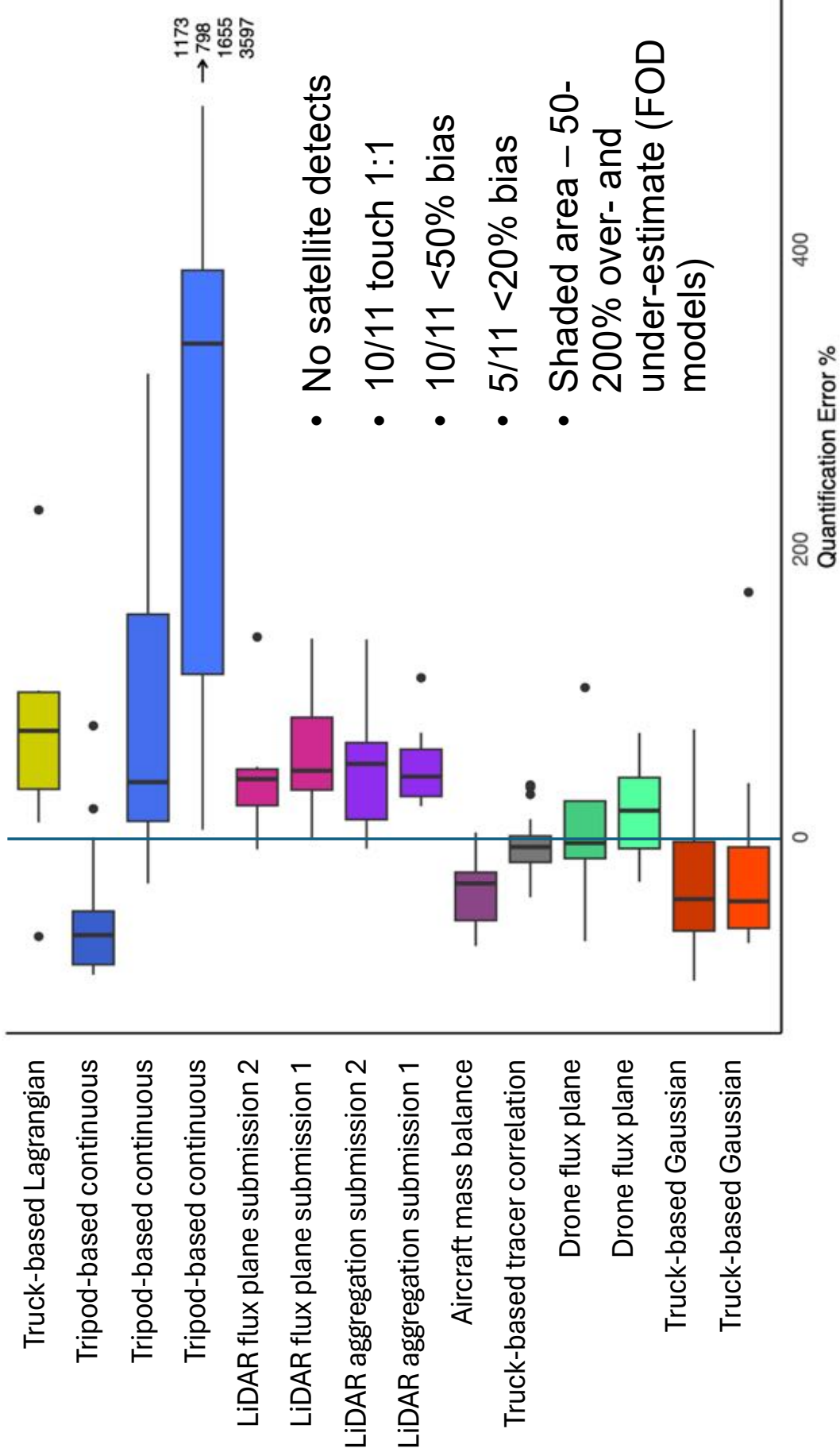
Over 200 blind experiments Nov 2023, Nov 2025, May/June 2025



November 2023 - Example

Quantification

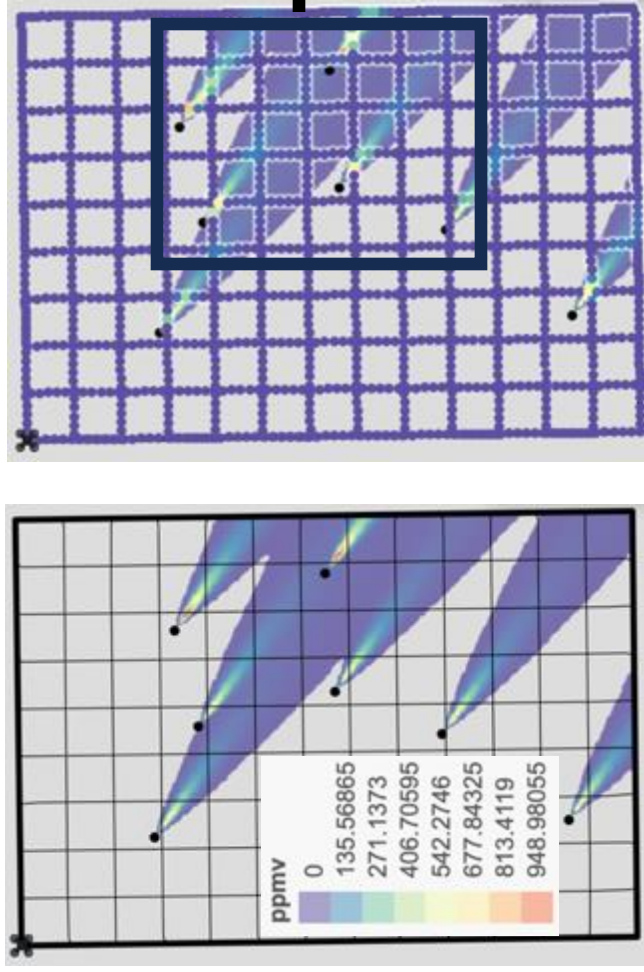
Report:



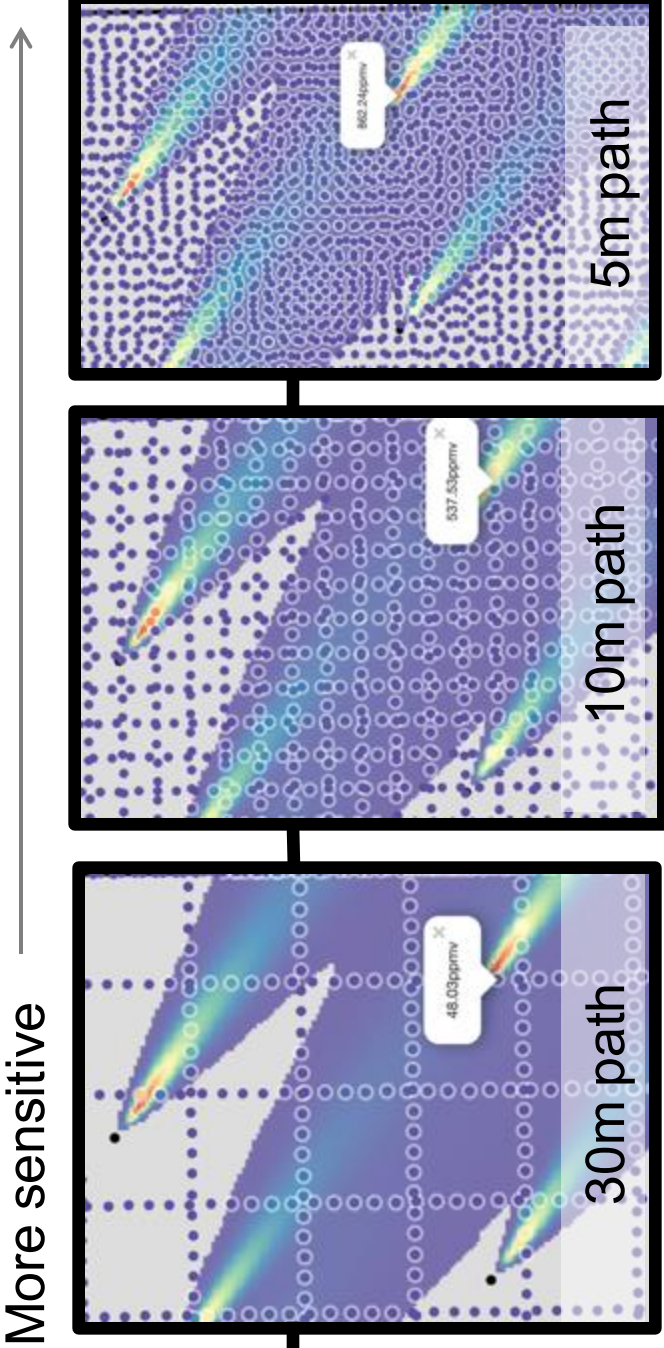
Main learning – Many can perform well compared to models. (Site level inventories are a different challenge!)

Accelerating Techs

- We work with companies to advance **their technologies**
 - Examples below from walking and UAV scanning solutions could improve sensitivity if they used more closely spaced lines – the 30 m standard typically delivers VERY poor results
 - Computer model simulations to show changes in sensitivity
 - Tech companies adopt, and together we aim to build “standard” methods for regulatory use



More sensitive



20 acre 2023 CR area, actual rates, ppm <1 m (exp 41)

Tighter = higher likelihood to find high concentrations

FluxLab's Future Directions

Enhance Gas Collection

- **Objective:** Expand knowledge of work face, collection design, and operational practices, esp work face gas resource. Build local opportunities in Nova Scotia municipalities for advanced collection and revenue.
- **Advantage:** Enables practical, economic strategies for operators to meet regulatory standards and reduce costs, increase revenue streams, mitigate methane for Canada



Work with Global Community

- **Focus:** Improve access to technologies and expertise, refine measurement tech
- **Advantage:** Ensure reliable and precise emission data, supporting operators in scaling up, obtaining carbon credits, and improving performance.

Nova Scotia



Traditional Leader = New Leader

- **Objective:** Build local opportunities in Nova Scotia municipalities for advanced collection and revenue
- **Gas Collection:** Upcoming federal regulations could result in methane reductions of 240,000 tonnes CO₂e per year in Nova Scotia. If active work face systems are also implemented concurrently at municipal sites, a further 100,000 tonnes could be mitigated. Significant energy potential. Would also significantly reduce emissions of VOCs, hydrogen sulfide, particulates, nitrogen oxides, and odorous compounds like ammonia and mercaptans.
- **Barriers:** Many landfills are operated by municipalities or small operators. Build collective action, deploy best tech locally in affordable ways.



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LINKEDIN:



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