

Project: Measuring Wintertime Methane in Upstream Oil and Gas using Top-Down Aerial Methods

- **Knowledge Gap: Wintertime Methane Emissions Remain Uncertain**
 - Measurement surveys (e.g., Bridger, satellite) are almost exclusively conducted in summer
 - However, winter oil and gas practices differ (injection pumps, catalytic heaters, etc.) [1,2]
 - ***Are summer-only measurements sufficient to characterize annual emissions?***
- **This project will measure ~300+ sites during the winter months, and compare with available summer aerial measurements**
 - Do emissions vary seasonally? By how much?
 - Are winter surveys necessary to determine year-around methane emissions?



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**Environmental
Defense
Fund**

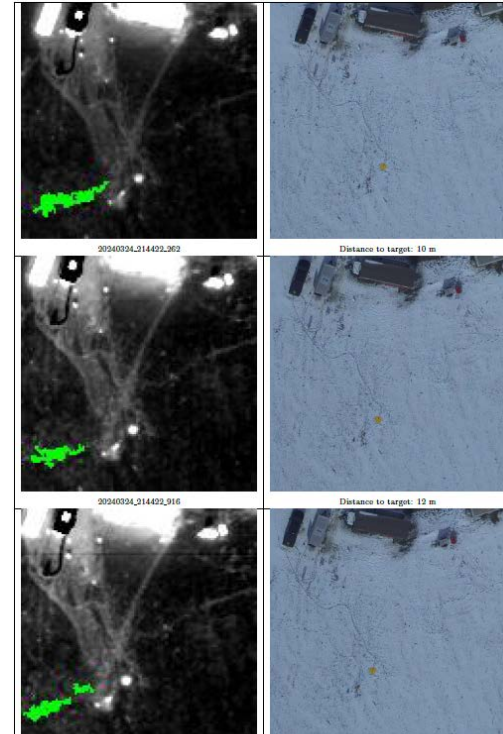


A Novel Approach, Wintertime Methane Measurements

- Wintertime aerial measurements made possible with Quebec-based Telops Inc.
 - [Hyper-Cam Airborne Mini](#) is a Thermal Infrared Hyperspectral Imager capable of sensitive methane measurements
 - **90% probability of detection (POD) for methane at 4.3 kg/h** with thermal contrast of +3°C (which is common even over snow)
 - Wintertime controlled releases conducted in 2024 in Edson, Alberta
 - EDF pilot winter measurement – in progress



Methane leak detected from an oil and gas facility in Alberta (2023)



Methane leak detected during tests in Edson, Alberta (2024)

Methodology, Wintertime Methane Measurements in Oil & Gas

1. Identify key region(s) and sources for survey

- Leverage our Petrinex inventory models [3, 4]
- Consider MethaneSAT, MethaneAIR coverage

2. Wintertime survey of selected region(s), ~300 sites

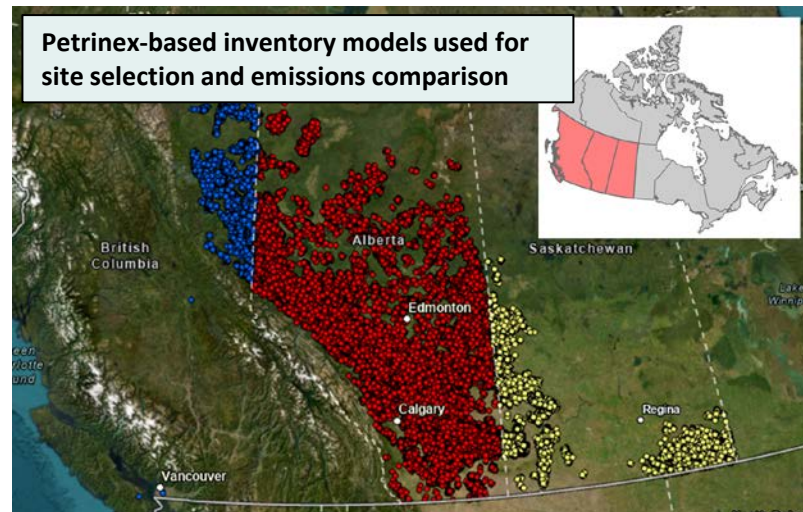
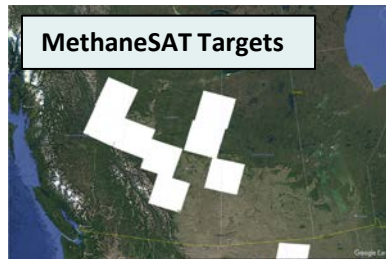
- Telops to provide detected emission data (emission rates, plume imagery, etc.)
- Compare with plot plans, contact operators

3. Analysis:

- Compare emissions data with Petrinex reporting and summertime Bridger data [e.g., 5, 6, 7]
- MethaneSAT seasonal data comparison
- Evaluate seasonal emission patterns

4. (Leverage AUPRF for NSERC Alliance funding)

- Expand survey size, survey multiple regions
- Add ground-based measurement to supplement aerial observations



Partners & Budget, Wintertime Methane Measurements in Oil & Gas

- **Our Team**



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- **McGill University** – provides site selection, seasonal emissions comparison analysis
 - Personnel: Scott Seymour, Prof. Mary Kang, TBD Master's student
- **Telops Inc.** – provides Hyper-Cam Mini, processes measurements, coordinates aircraft
- **EDF** – 2025 winter pilot study, in progress

- **Budget – requested \$200,000 from AUPRF for a ~300-site Telops survey**

- Will leverage for NSERC Alliance (+\$400,000)

Item, AUPRF Budget	Cost (CAD)
Aerial Surveying (Telops Inc.), ~300 sites	150,000
McGill Student HQP	25,000
Publication Fees, Conferences	8,000
McGill Overhead (10%)	18,300

Approx. \$ 200,000

- **Broader Project Scope** – greater funding would:

- Significantly expand survey size, cover multiple production regions
- Include contracting of OGI (or similar) services to detect any emitters too small for aerial system

Project Benefits, Wintertime Methane Measurements in Oil & Gas

- **Knowing to what extent winter-related emissions contribute to annual totals is important for:**
 - **Operators** – to know what sources are key to methane mitigation, regulatory compliance
 - **Regulators** – to know where spot-checks are most important
 - **Government** – to inventory annual methane emissions accurately (summer-only measurements are currently the norm)
- **Giving a platform for Canadian technology provider, Telops:**
 - There are few providers of aerial *methane imaging* measurements at industry's disposal
 - Telops has detection limits in the range of the key emission sources (1-10 kg/h)

Thank you for your consideration

Questions?

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