CARBON MAPPER

Making Emissions Data Actionable and Accessible

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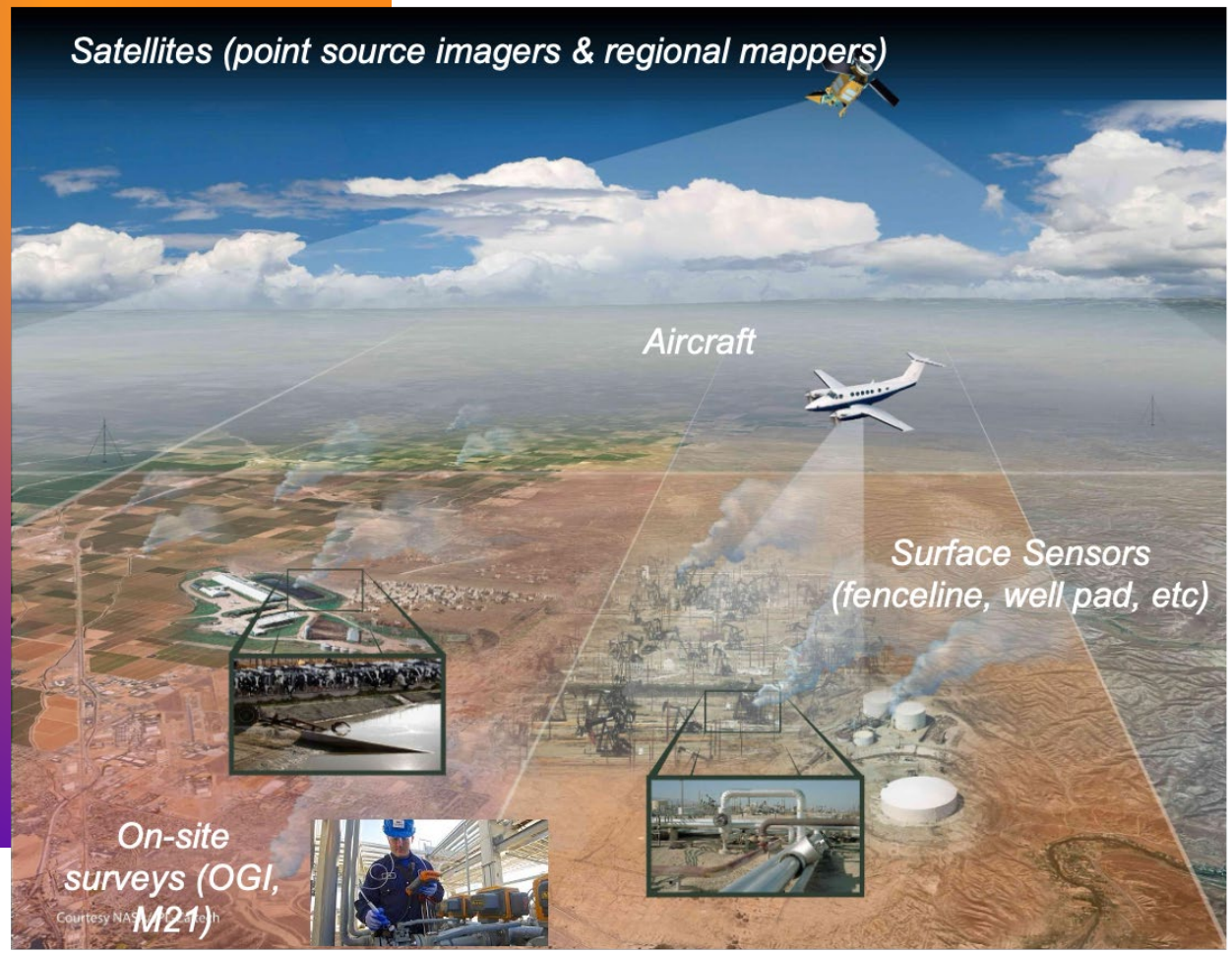
CH4Connections
Oct 8, 2025



THE EMERGING METHANE MONITORING SYSTEM OF SYSTEMS

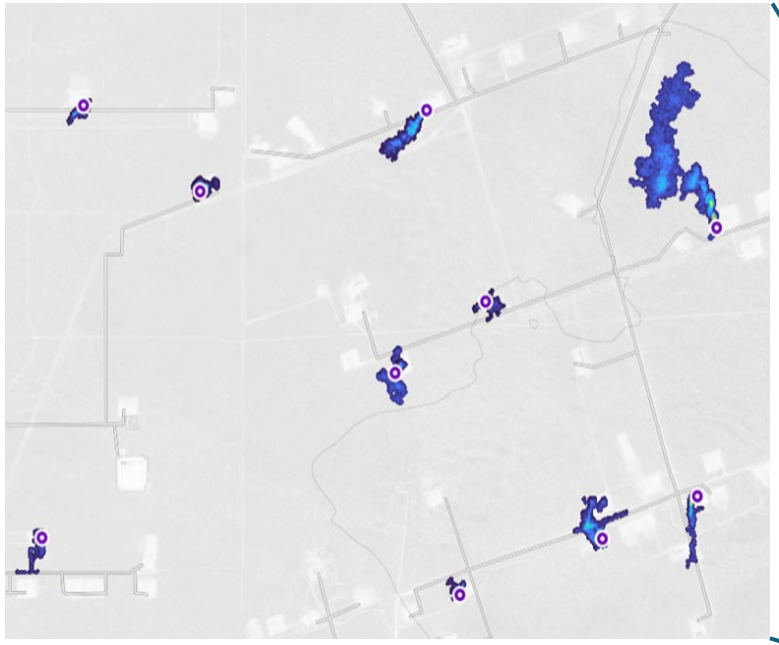
Two Main Types of Monitoring

1. Direct Mitigation Guidance - use tools that can pinpoint and attribute to the source
2. Aggregate Accounting - use tools that can detect total emissions over large areas/regions

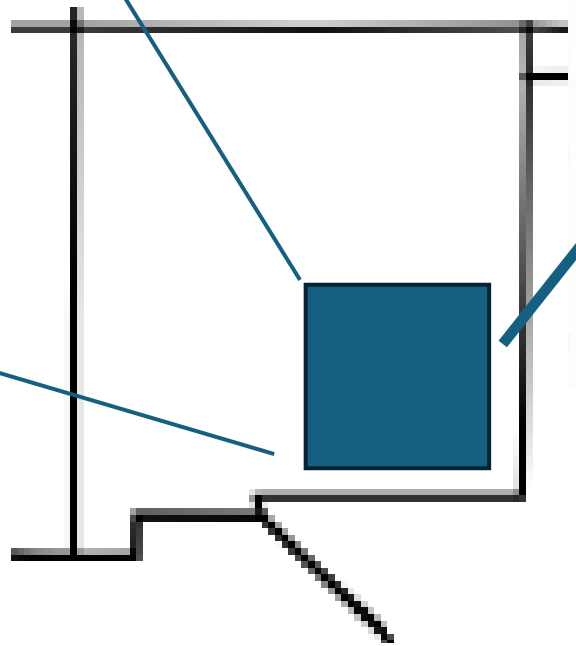
KEY MESSAGE: No single system can measure all methane emissions; need a **portfolio** of methods

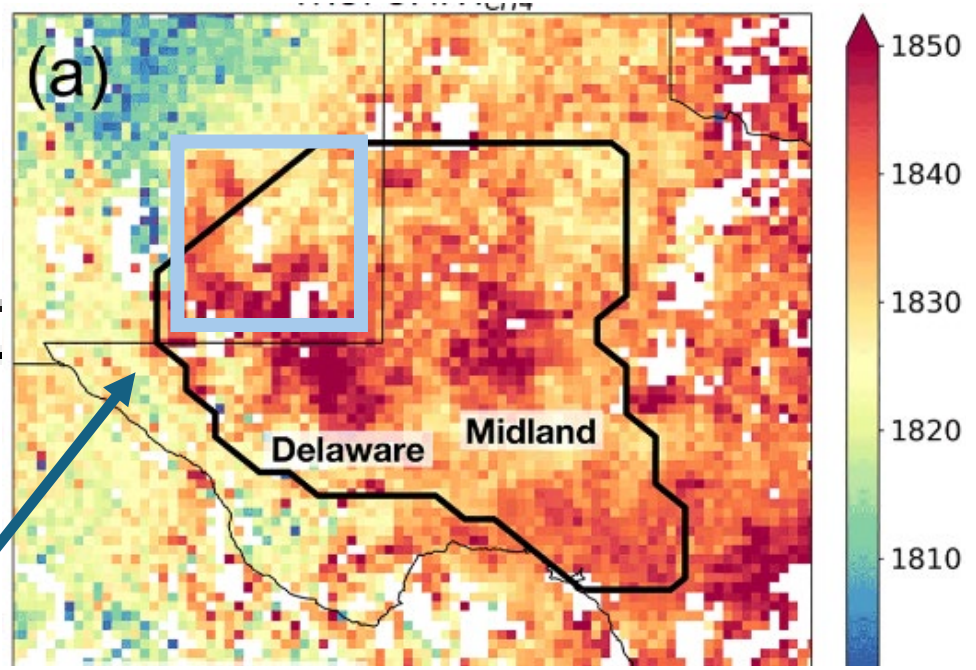
Understanding emissions at basin scales: total flux, super-emitters, attributed datasets

2024 airborne + satellite study in New Mexico Permian



Wall-to-wall aerial mapping of all infrastructure in NM Permian – over 200,000 site visits in 3 weeks

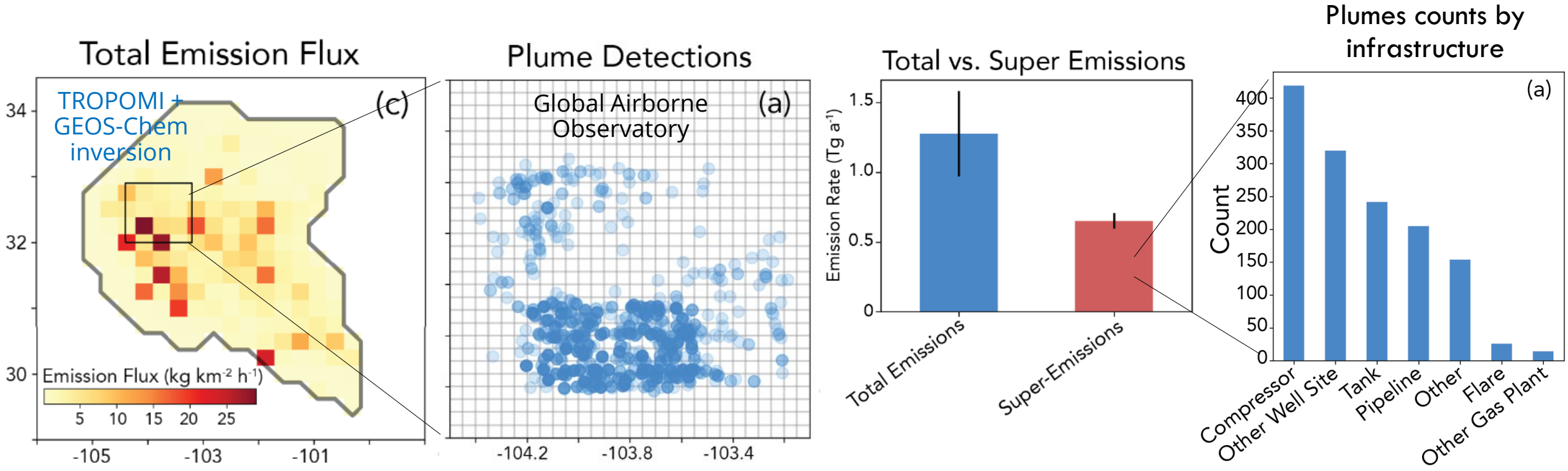




Basin flux estimation using TROPOMI satellite observations

Understanding emissions at basin scales: total flux, super-emitters, attributed datasets

2024 airborne + satellite study in New Mexico Permian

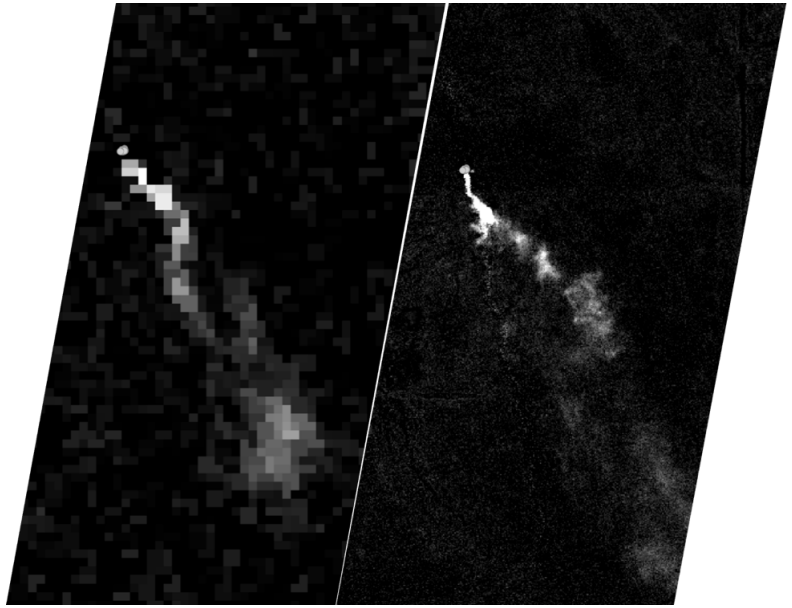


Cusworth et al. (in review)

Intensity + infrastructure + operator attribution provides a pathway for mitigation

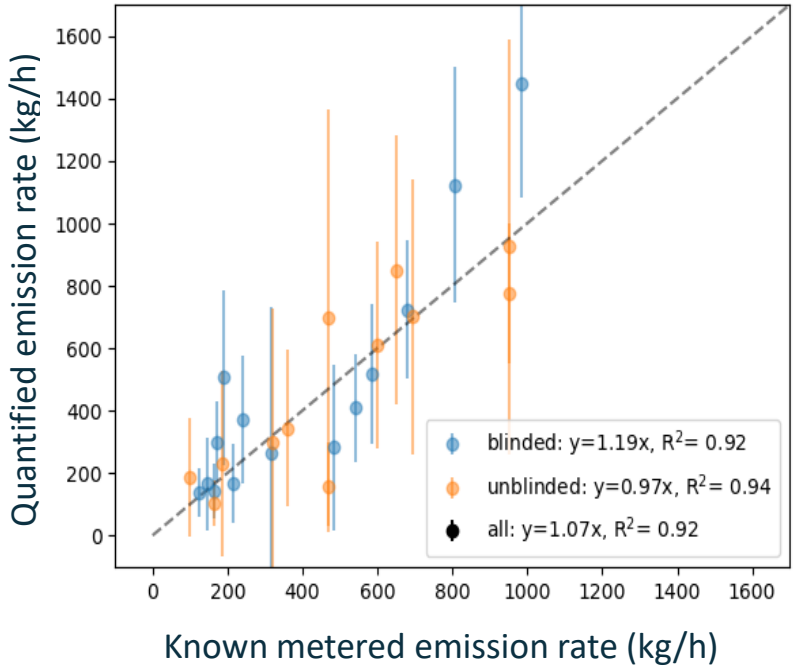
Validation programs are reducing uncertainty in datasets

Instrument intercomparison

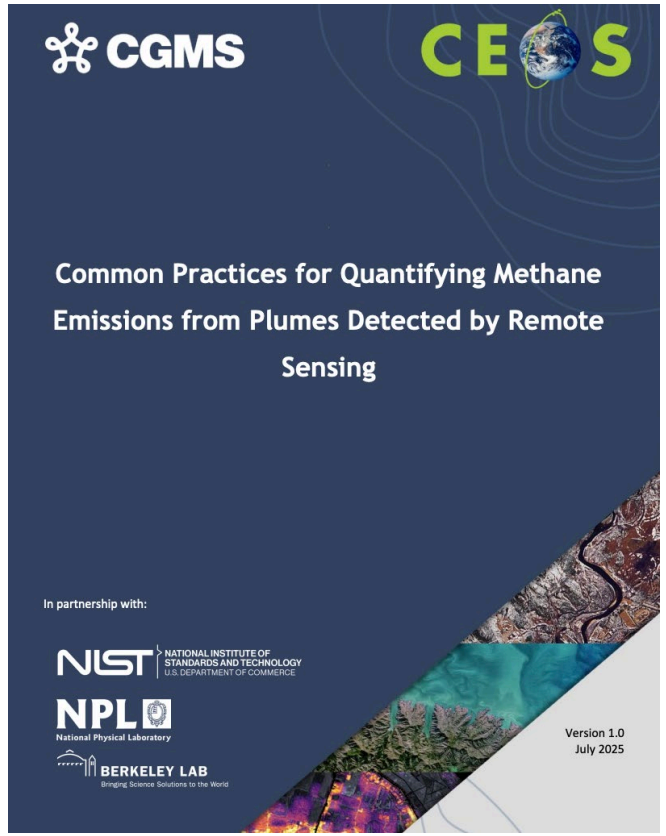


Simultaneous observation of controlled release by Tanager and aircraft

Tanager-1 controlled release results



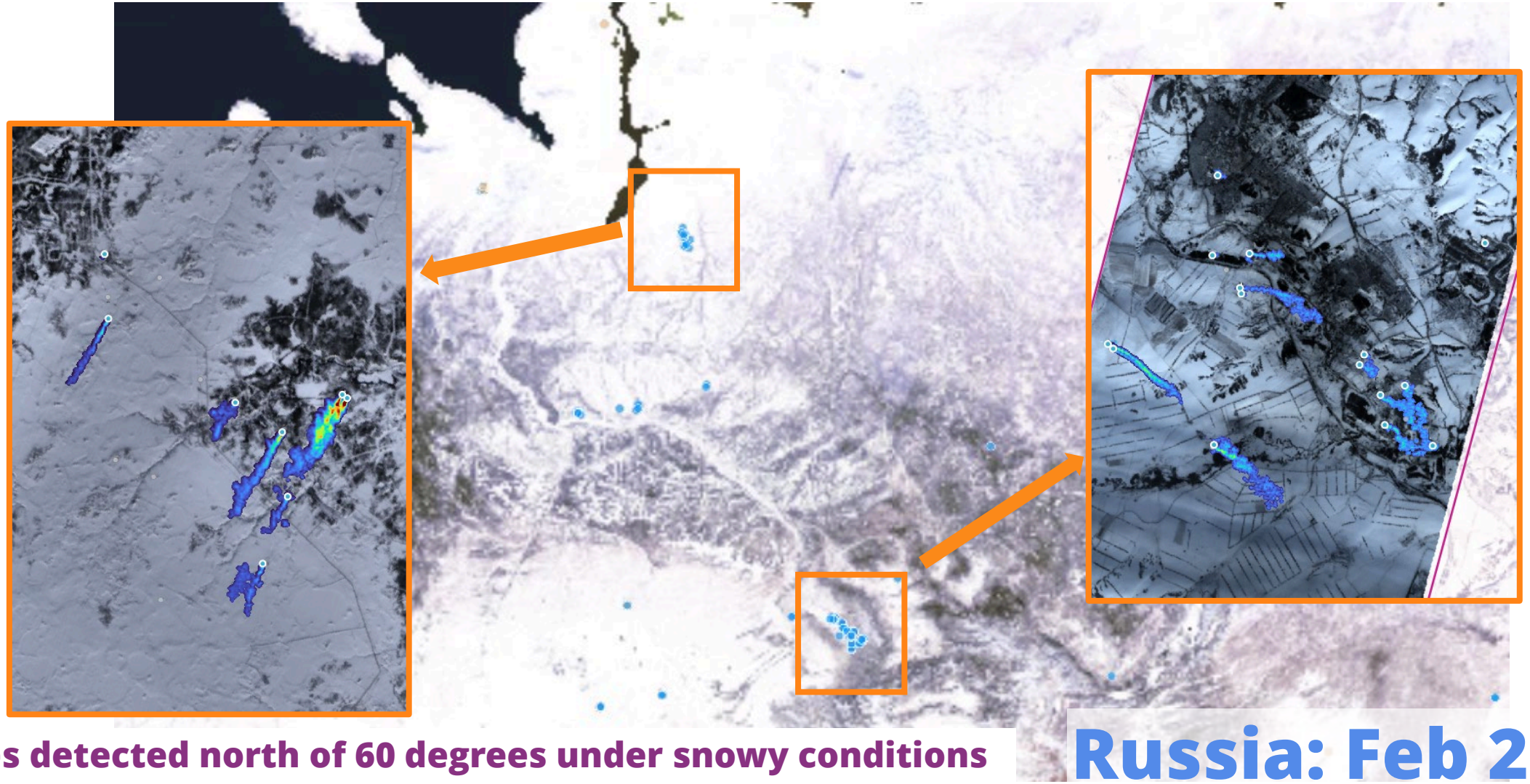
Community Standards Development



10.5281/zenodo.17047788.

Satellites are expanding the map of global detection

Plume detections from Planet's Tanager satellite

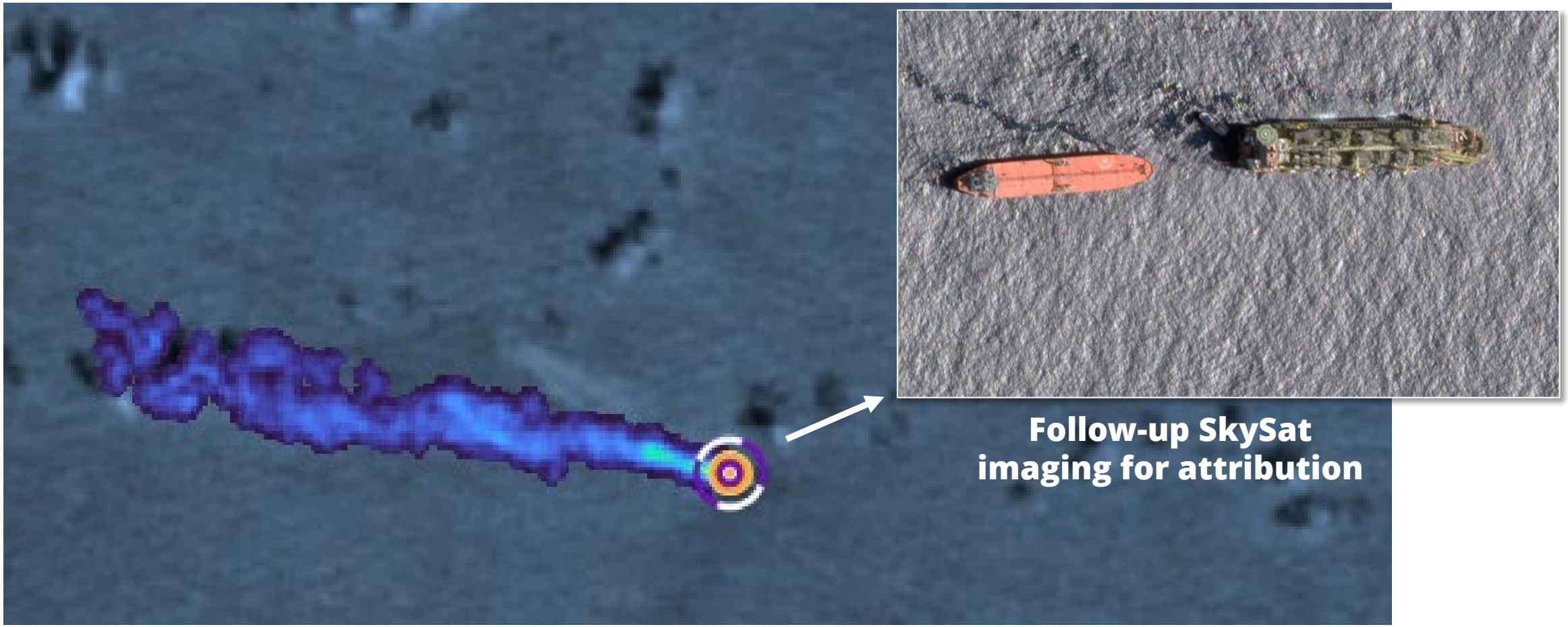


Plumes detected north of 60 degrees under snowy conditions

Russia: Feb 2025

Satellites are expanding the map of global detection

Offshore detection from Planet's Tanager satellite



Execution of glint-tasking: wide area illumination

Maturity, Limitations, Lessons

- As technology evolves, uncertainties get smaller but will never hit zero.

- Uncertainty requirements are specific to the use-case application.

    - A single technology could have uncertainties that both acceptable for one use-case and unacceptable for another.

- Error in analysis is different than error in measurement:

    - E.g., An unbiased measurement incorporated into a biased study does not make the measurement biased.

- Airborne and satellite plume-mapping technology has been demonstrated repeatedly to lead to mitigation. Is ready for action now.

CONTACT INFO

We love hearing from you! If you have questions or comments, please reach out.

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