



SOUTHERN UTE GROWTH FUND

DEPARTMENT OF ENERGY



Tribal Air Quality Initiatives

Southern Ute Indian Tribe / State of Colorado
Environmental Commission Meeting
November 29, 2023

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Southern Ute Department of Energy
Exploration and Regulatory Manager



Agenda

- **Introduction**
- Tribal Air Quality Initiatives
- Methane Seepage and Vent Well Project
- Methane Detection and Quantification
- Questions



DOE Mission and Goals

MISSION

The mission of the Southern Ute Indian Tribe's Department of Energy is to ensure that the members of the Southern Ute Indian Tribe receive maximum benefit from the energy and mineral resources located on their Reservation while at the same time minimizing the impact of extraction of the resources on the natural and cultural environment



Related Goal

Further support the development of energy transition projects that provide economic synergies for the Tribe's energy companies



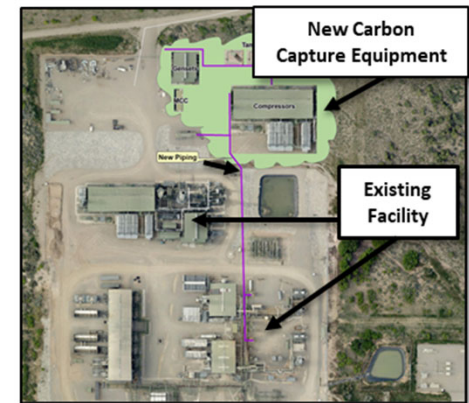
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Voluntary Operational Initiatives

- Reduce carbon intensity of oil and gas production
 - Certification of produced natural gas and midstream operations by 3rd party verifier
 - Voluntary continuous emissions monitoring at new facilities
- Embrace carbon capture
 - Arkansas Loop CO₂ capture and pipeline



Academic Initiatives

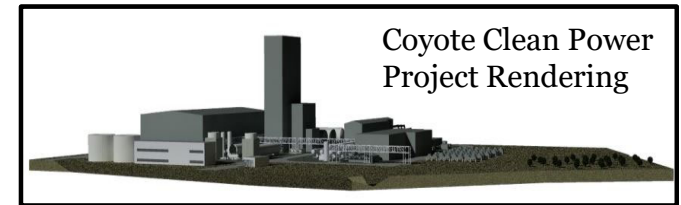
- National Petroleum Council Study on GHG Emissions from the Natural Gas Supply Chain
- Collaborations with The Payne Institute and Energy Emissions Modeling and Data Lab

The Payne Institute for Public Policy



Energy Transition Initiatives

- Embrace new technology to support carbon neutral energy development
 - Coyote Clean Power Project
 - Enhanced Geothermal
 - Hydrogen
- Electrification and grid resiliency work with LPEA



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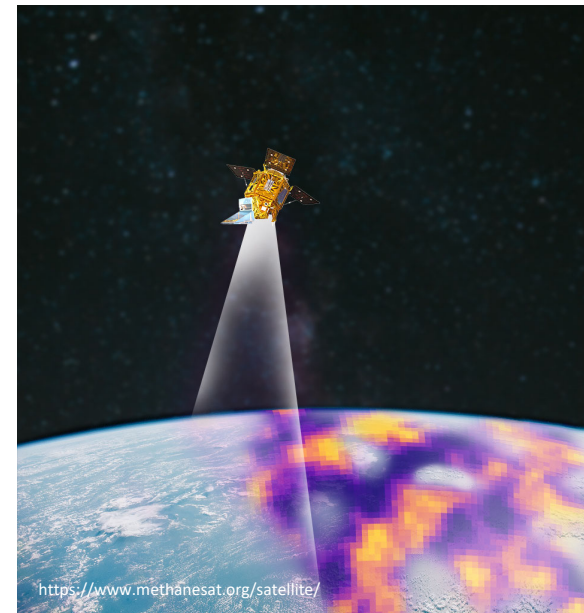
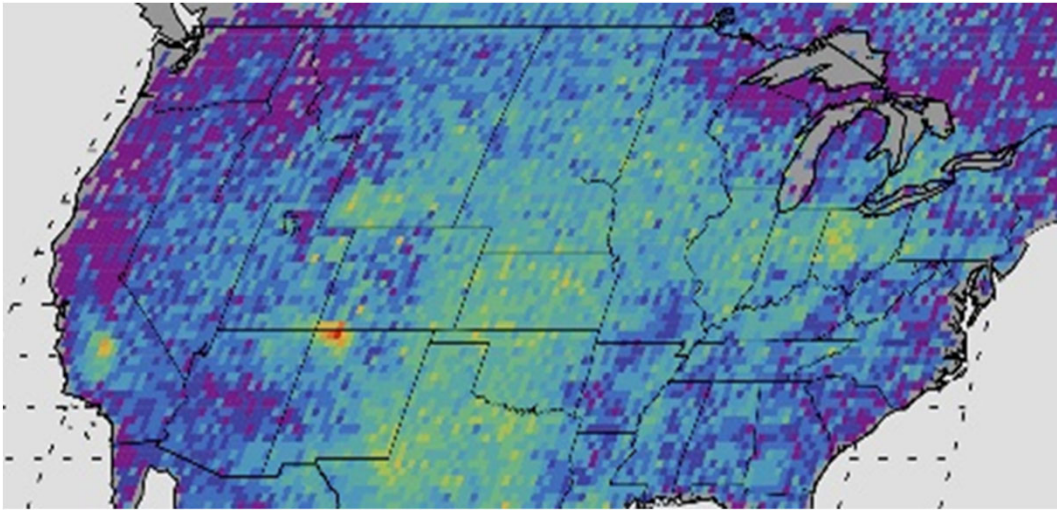
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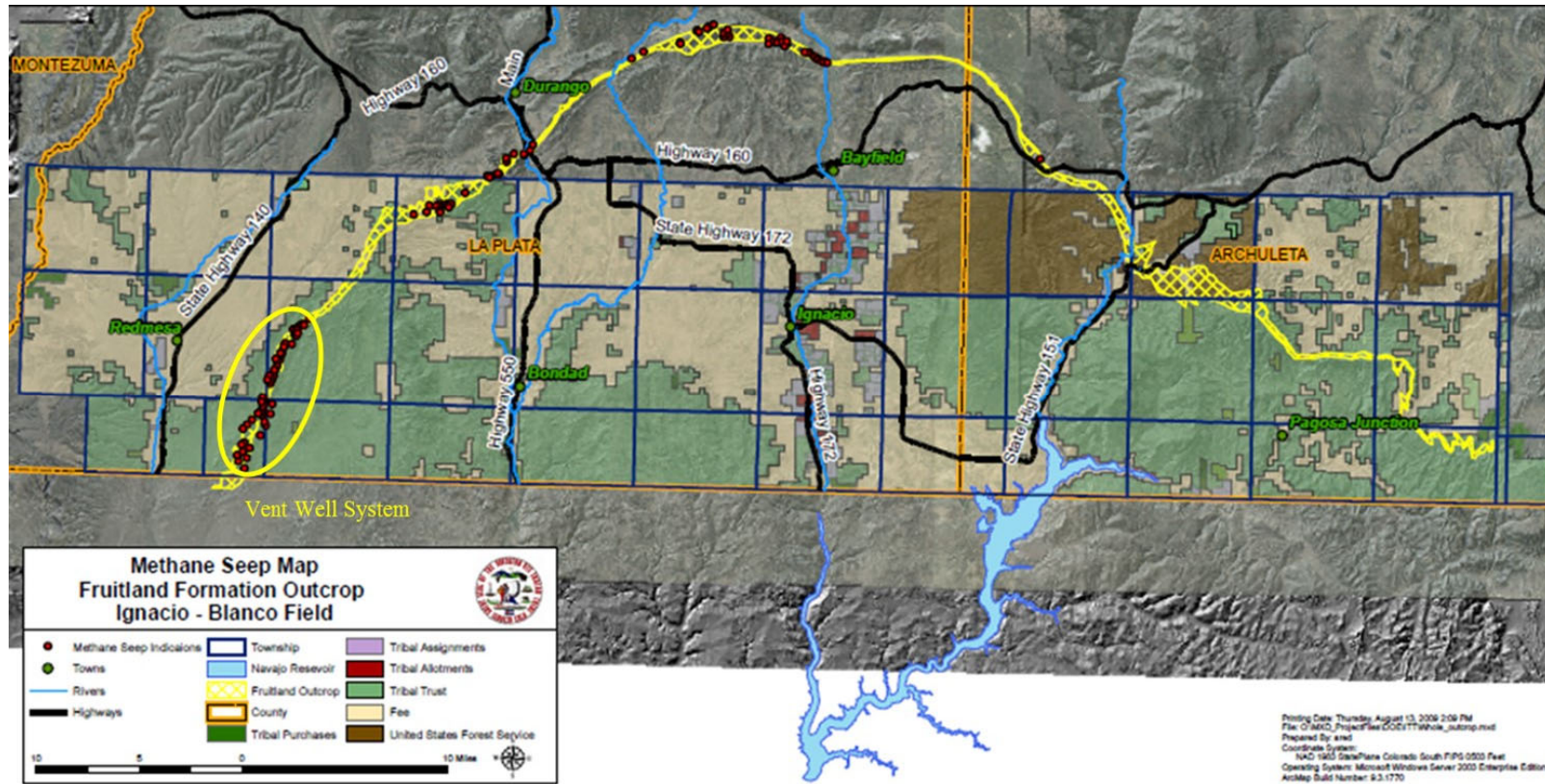
Fruitland Outcrop, Methane Hotspot and the Reservation

4-Corners Methane Hotspot

2014 Geophysical Research Letters and subsequent November 2020 Elementa Publication

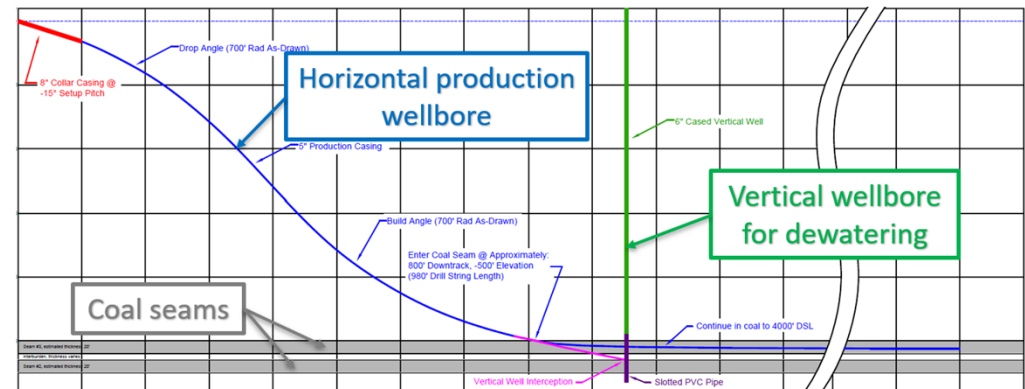
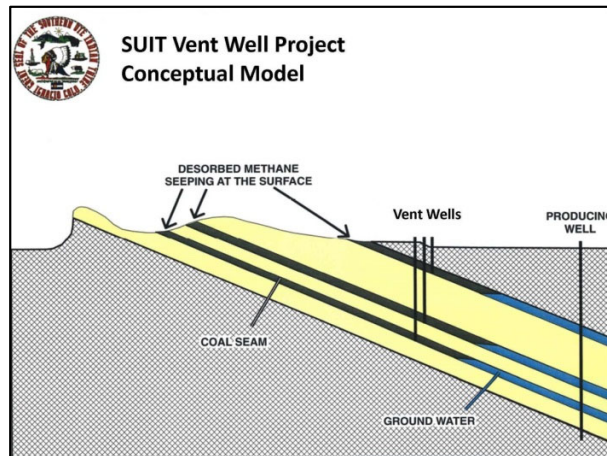


Fruitland Formation Outcrop Seeps



Vent Well Project

- Over a 10-year period (2008-2018) Tribe intercepted 2.5 bcf of methane through vent wells prior to the methane venting along the Fruitland Outcrop
- Successfully sold carbon credits equating to over 420,000 metric tons of CO₂
- The Enhanced Outcrop Methane Capture project aims to increase methane capture by drilling two shallow horizontal pilot wells into the Fruitland Formation
- Utilize advanced methane sensing for quantification of impacts



Enhanced Outcrop Methane Capture



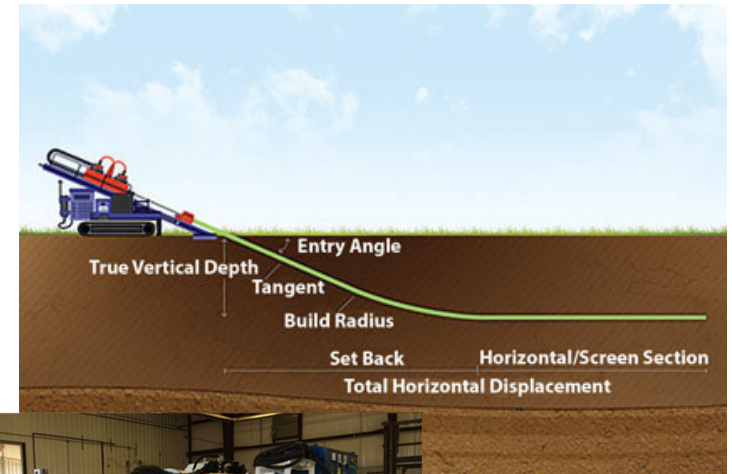
Utilize modern horizontal drilling technology and subsurface modeling to enhance interception of methane/CO₂ downdip of outcrop reducing greenhouse gas emissions



Link methane capture to potential power projects to increase value of electricity sold



Expand footprint to encompass additional portions of the Outcrop located on the Reservation



Enhanced Outcrop Methane Capture Project Team and Funding



Partners



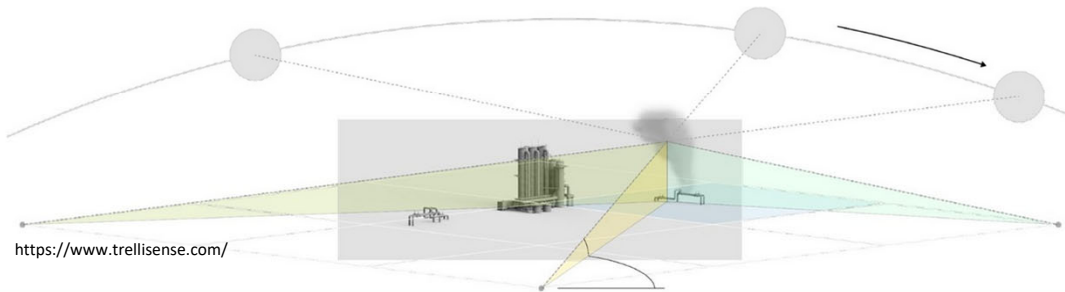
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Methane Detection and Quantification

- Ground-based Detection
- Flyover/Aerial Detection
- Satellite Detection



Ground-based Methane Detection

- Pedestrian Surveys
 - Completed on an annual basis since 2008
 - Working with Colorado School of Mines to analyze historic and new survey data
- Laser-based Sensors
- Metal Oxide Sensors
- Optical Gas Imaging



Flyover/Aerial Detection

- Completed flyover of Outcrop in September 2023 with Bridger Photonics
- Data currently undergoing analysis and quantification
 - Challenging due to local topography and meteorology







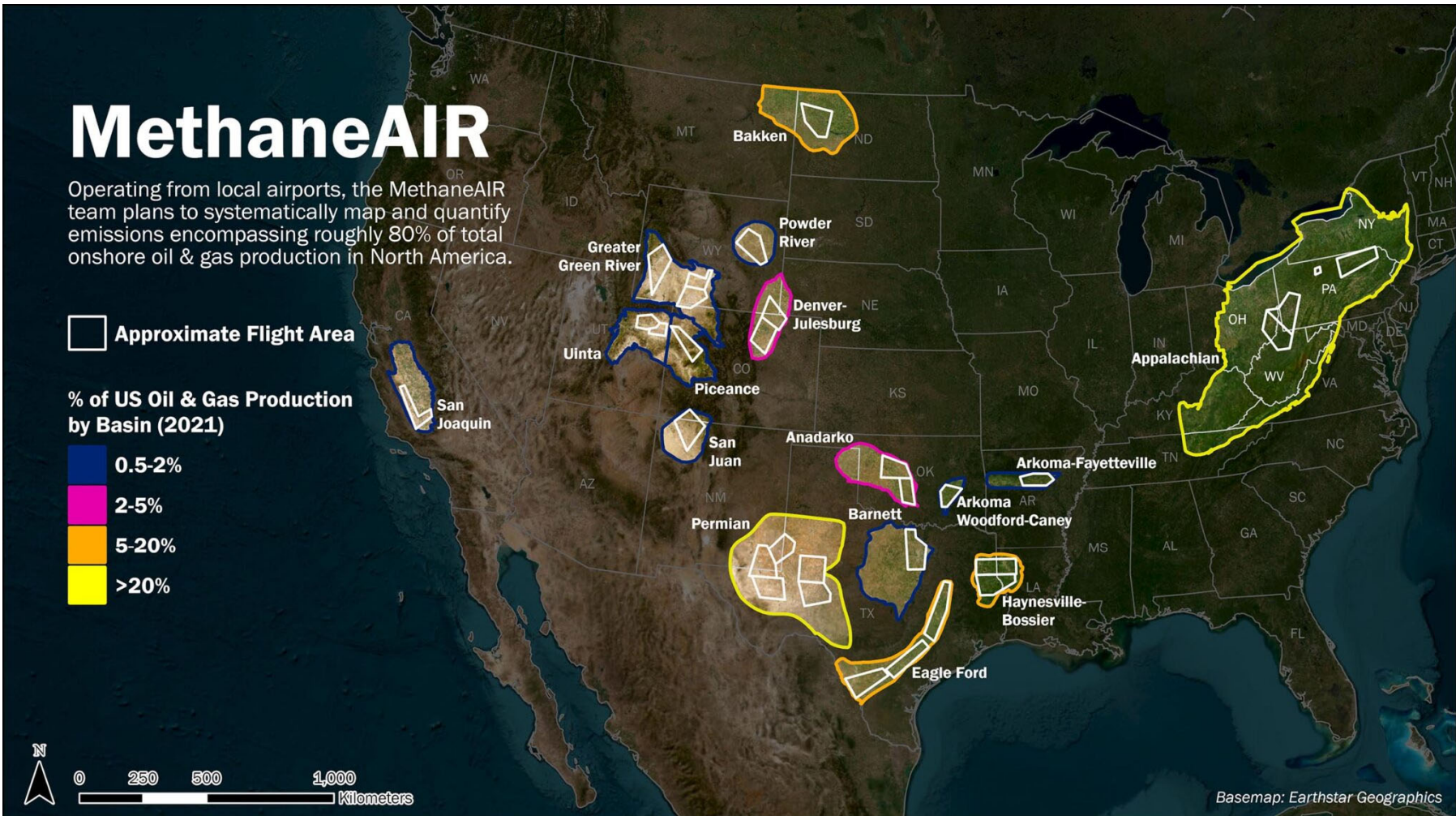
MethaneAIR

Operating from local airports, the MethaneAIR team plans to systematically map and quantify emissions encompassing roughly 80% of total onshore oil & gas production in North America.

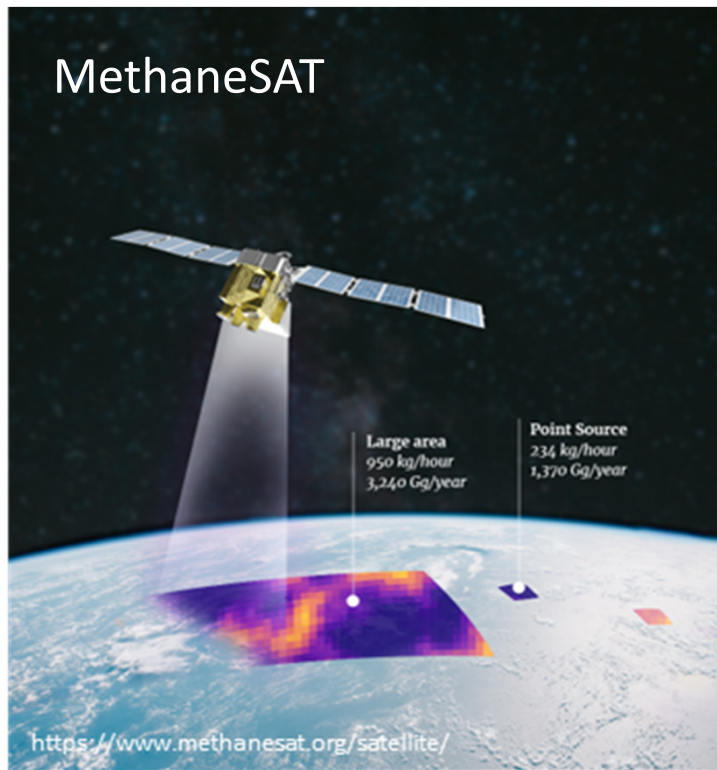
 Approximate Flight Area

% of US Oil & Gas Production by Basin (2021)

-  0.5-2%
-  2-5%
-  5-20%
-  >20%



Satellite Detection



THE METHANE SATELLITE ECOSYSTEM

A complementary ecosystem of methane satellites for addressing methane emissions globally

MethaneSAT
100 m x 400 m pixels across 200 km swath
MethaneSAT will revolutionize measurement of methane emissions by detecting concentrated point sources and dispersed area sources. It quantifies total emissions - not possible with today's satellites - thus advancing the state-of-the-art and filling major data gaps globally.

GHGSat
30 m x 30 m pixels across 10 km swath
An industry-oriented constellation of commercial point-source satellites.

PRISMA
30 m x 30 m pixels across 30 km swath
Launched by the Italian Space Agency in 2019 it combines a hyper-spectral sensor with a high-resolution camera.

TROPOMI
7,000 m x 5,500 m pixels across 2,600 km swath
European Space Agency's global mapper launched in 2017 on the Sentinel-5P satellite.

Carbon Mapper
30 m x 30 m pixels across 18 km swath
A point-source instrument announced in 2021 by coalition of organizations together with commercial satellite provider Planet, planned for launch in 2023.

GLOBAL MAPPING	AREA MAPPING	LOCAL MAPPING
Global & large-scale regions Large point sources	Area sources Point sources Sector-wide quantification	Point sources Facility level attribution
Tropomi, SCIAMACHY, GOSAT, GOSAT-2, CO2M	MethaneSAT	GHGSat, PRISMA, EnMAP, GF-5, ZY-1, Carbon Mapper



Thank You!

