



[**CLICK TO KNOW MORE**](#)

SATLANTIS



Microsats

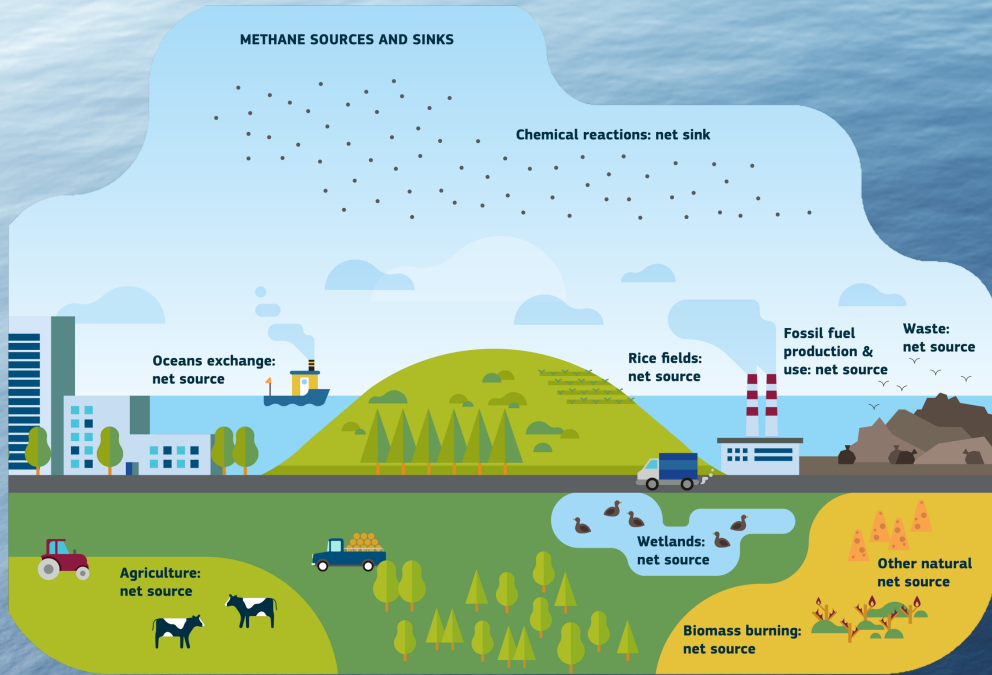
Innovative CH₄ Monitoring from Space



Markel Aramberri
BD Manager
SATLANTIS Microsats

Rotterdam, GWF 24 [ESG & CLIMATE RESILIENCE SUMMIT], May 15th 2024

METHANE IN GHG CONTAMINATION



2nd most abundant GHG, after CO₂

25% of today's global warming

AGRICULTURE & LIVESTOCK		24%	FOSSIL FUEL OPERATIONS		20%	LANDFILLS & WASTE		11%	BIOFUELS & BIOMASS		6%
-------------------------	---	-----	------------------------	---	-----	-------------------	---	-----	--------------------	---	----

Emission sources

- **Vents** from pipework, compressors and gas-driven pneumatic devices.
- **Methane leaks** (e.g., in the US the gas transmission network comprises 485,000 km of pipelines)



REGULATION

Global Methane Pledge

COP27
Global Methane Pledge
30% CH₄ emissions reduction by 2030



The EU **strict rules** to reduce GHG emissions and become **climate-neutral by 2050**

IMEO
Full public transparency
on emissions



gather data from:

- OGMP 2.0 reporting
- Scientific studies
- **Remote sensing data**
- National inventories



OGMP (2.0)
Measurement-based
reporting framework



WHY SATELLITES FOR METHANE

Recurrent measurements

Regular revisits of the same target as the satellite orbits the Earth, increased with the agility-mode

Large scale observations

Surveillance of large areas of the Earth surface in a single snapshot, thanks to high altitudes and suitable detectors

Remote areas

Its global coverage enables observing geographic areas difficult to access or far from urban areas

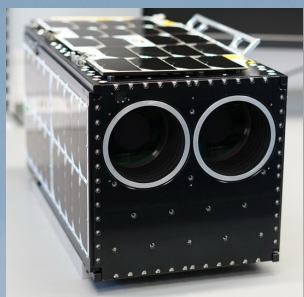


Six missions, three **satellites in orbit**



Urdaneta-Armsat 1 (**EO**)

May 2022



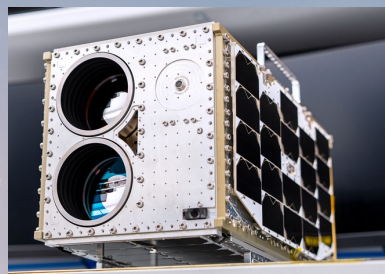
GEISAT- P (**CH₄ + EO**)

June 2023



HORACIO (**CH₄ + EO**)

March 2024



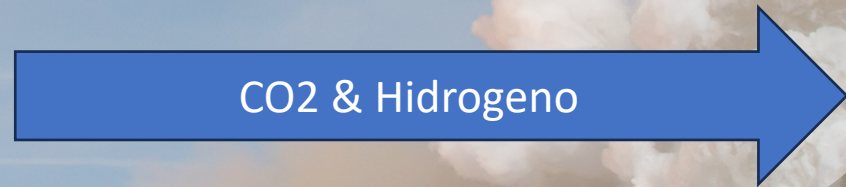
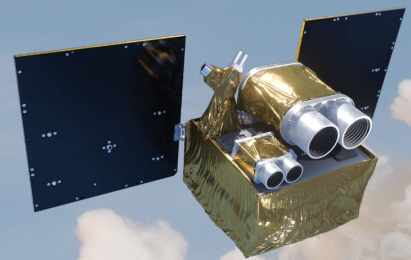
GARAI-1 (**CH₄ + EO**)

2024



GARAI-2 (**CH₄ + EO**)

Q1 2025



Enabling CH₄ Detection and Mitigation from Space



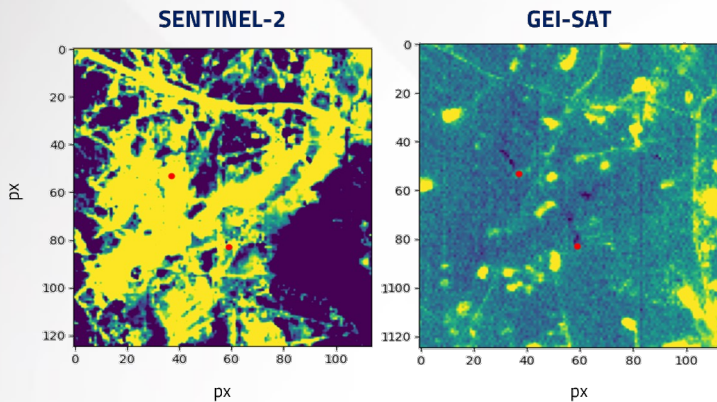
VHR Sensor Technology

Binocular sensors, VHR, custom filter configuration



1 Better Plume Detection

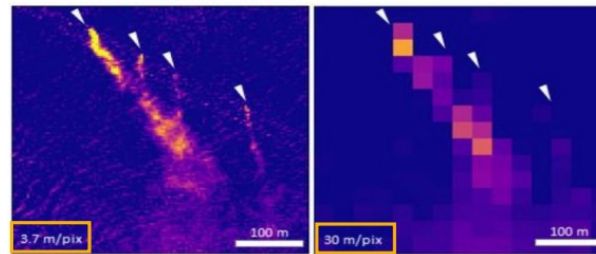
Our **optimized filter configuration** enables a more reliable detection of CH₄ anomalies, with a greater number of plumes detected and fewer false positives



GEISAT is the name of SATLANTIS' methane detection satellite

2 Enhanced Resolution

The **spatial resolution** of our sensor is in the order of **13m** i.e., setting a new benchmark in the industry for methane measurement from space

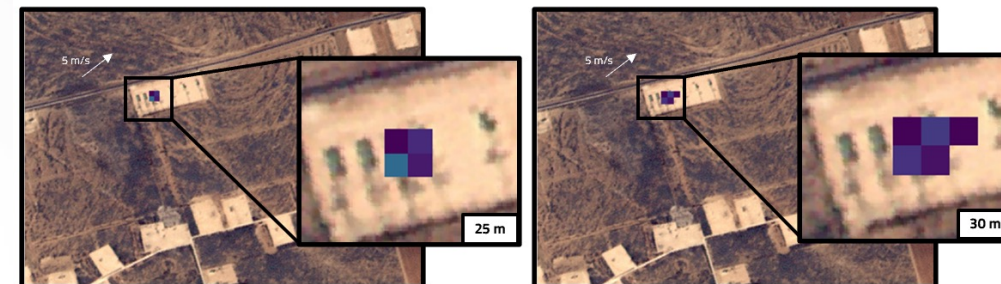


Sánchez-García, et. al.: Mapping methane plumes at very high spatial resolution with the WV-3 satellite

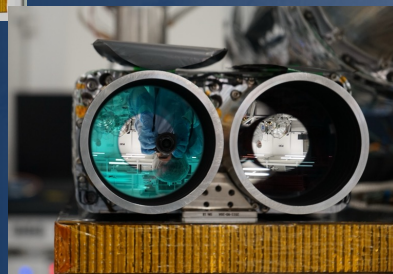
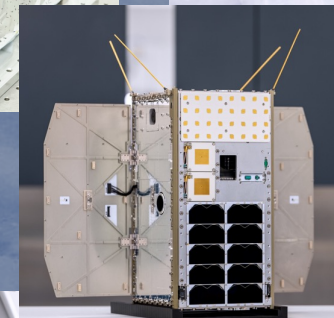
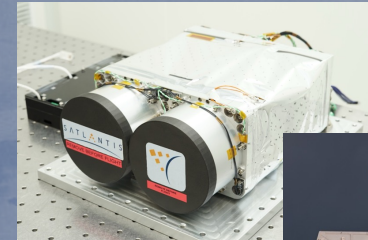
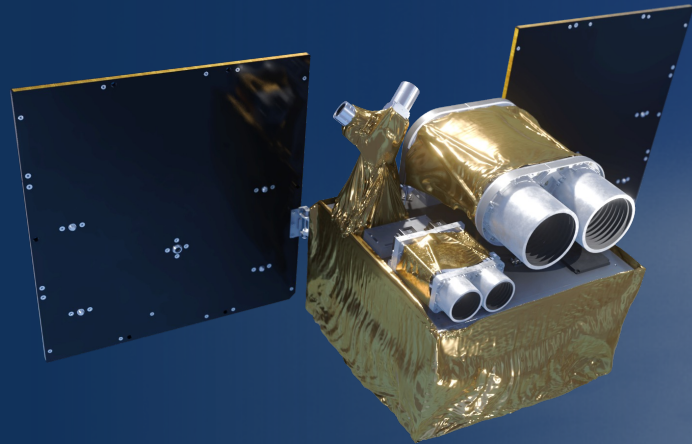
High-resolution: GEISAT



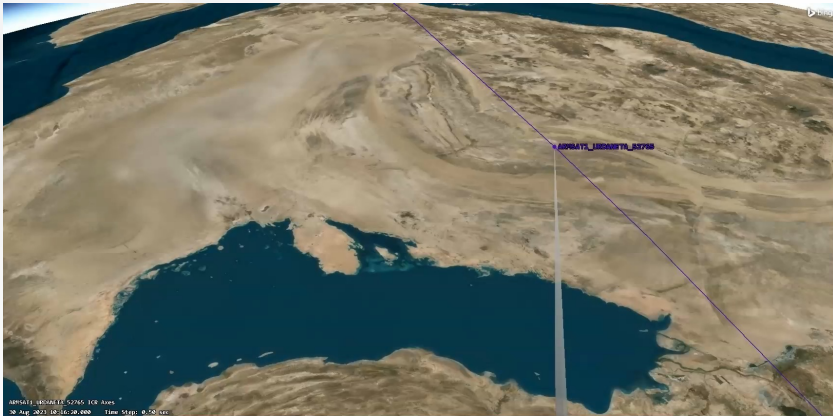
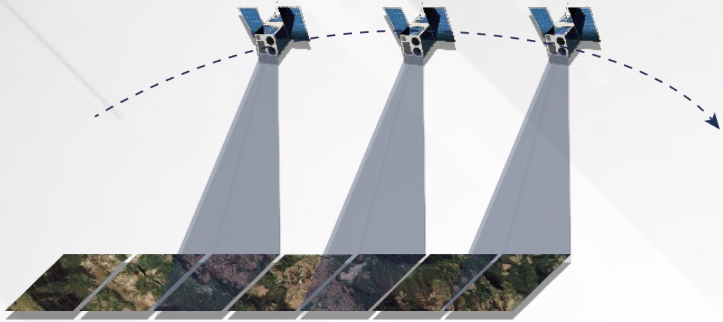
Mid-resolution



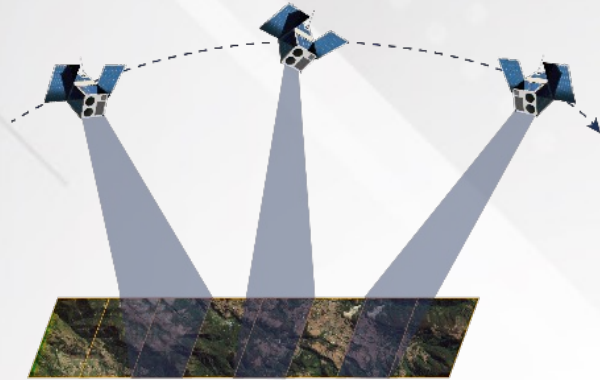
Agile Satellite Platforms



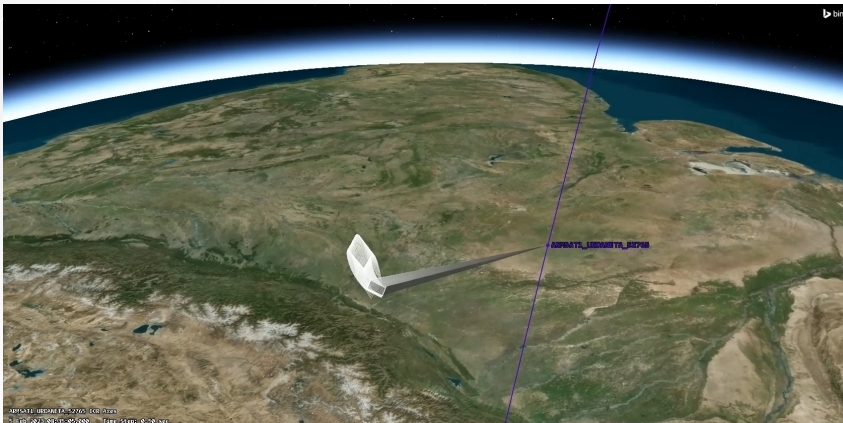
PUSH FRAME SCANNING



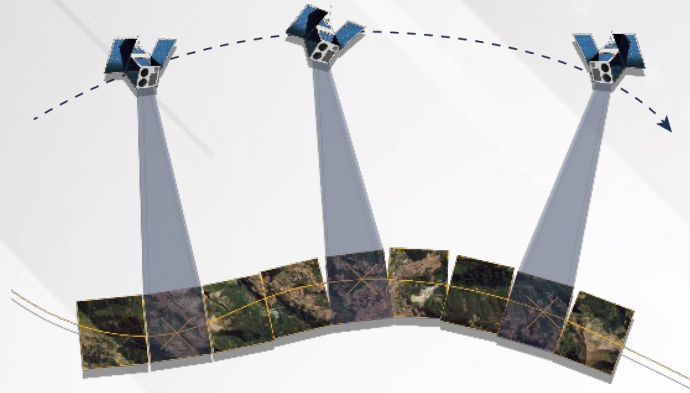
BACK-SCANNING



- Enhanced signal
- Videos
- Stereo imaging



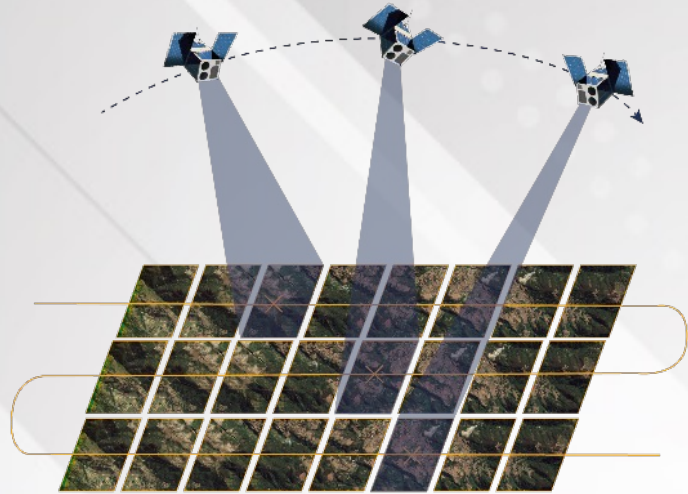
NON LINEAR TRACKING



- Coastlines
- Irregular structures
- Borders

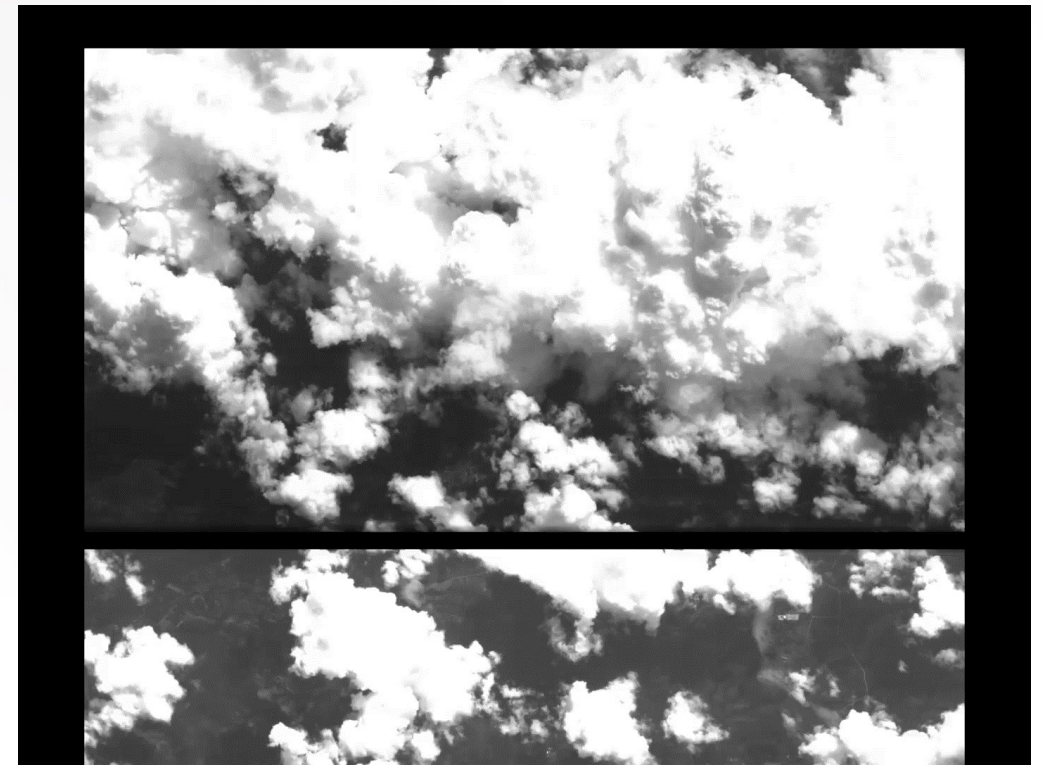
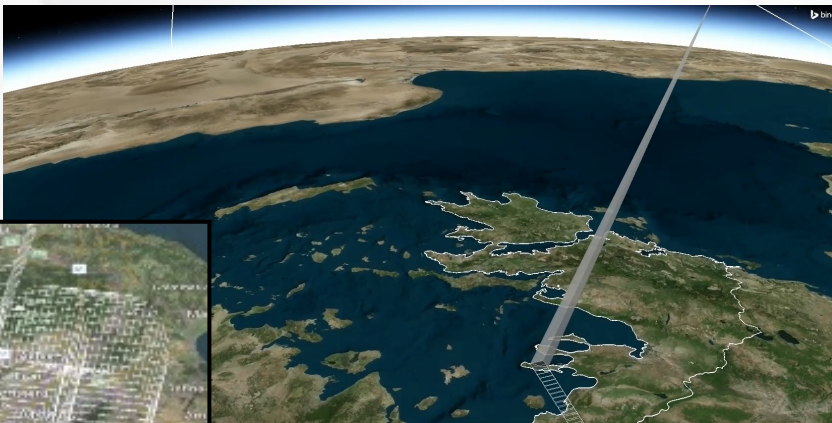


System

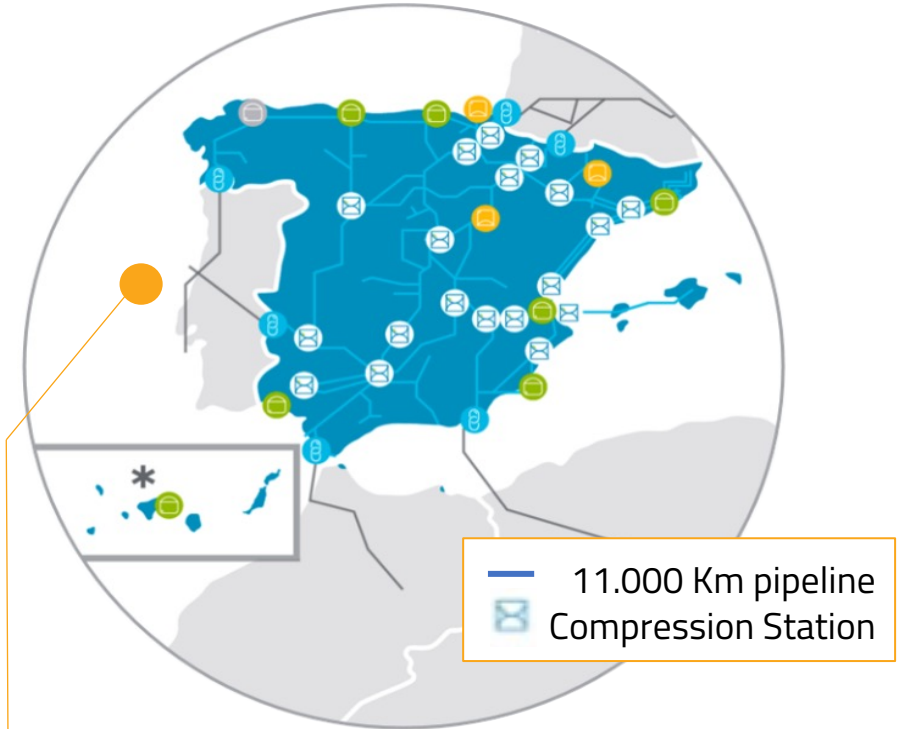


ENHANCED SWATH

- ❖ "Bi-Swath"
- ❖ "Tri-Swath"

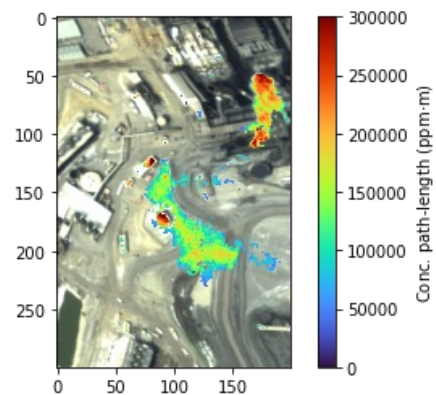


Use Case: Methane Detection

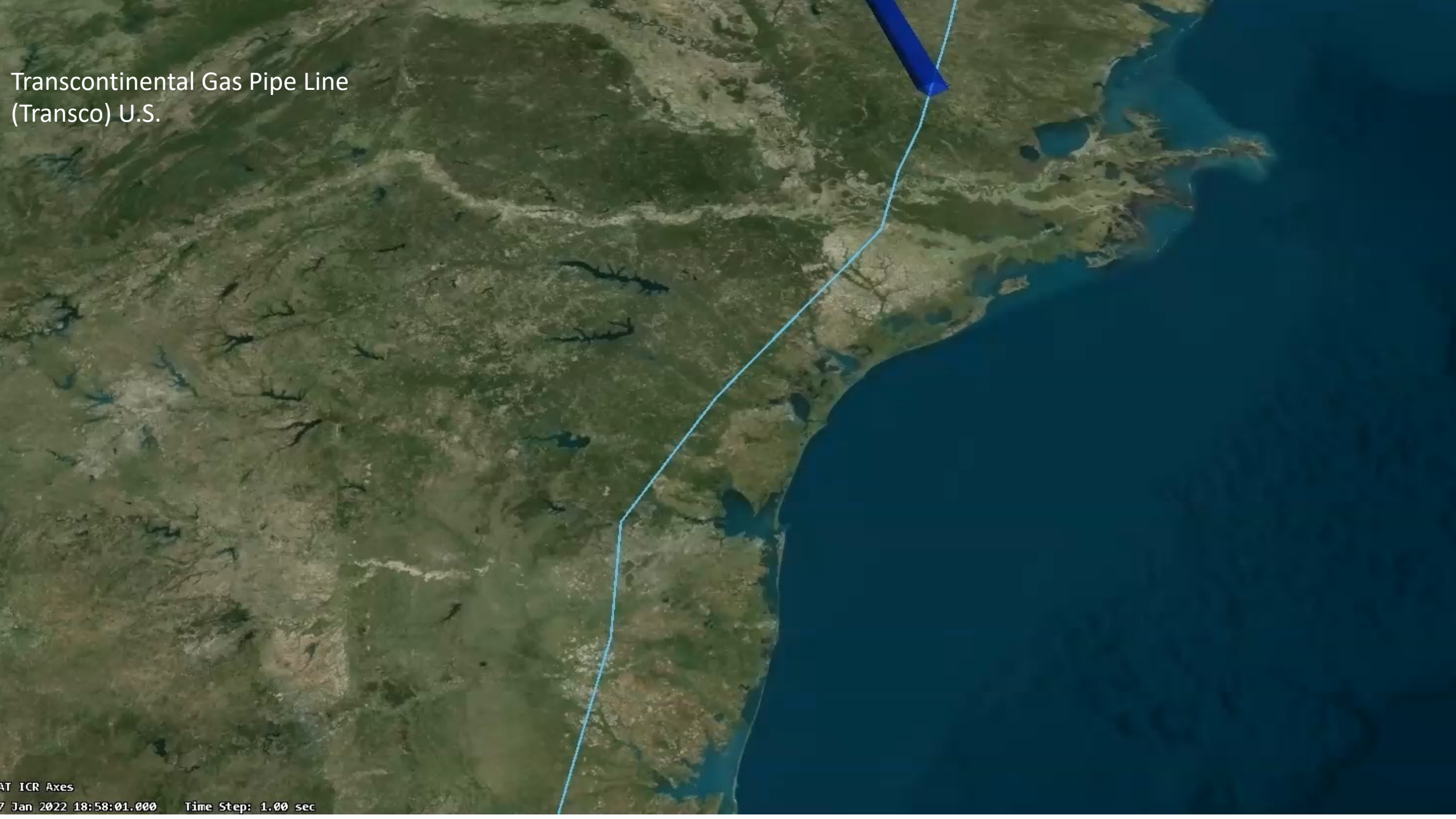


Objective: to be able to image all the **ENAGAS infrastructure every 2 weeks**

iSIM Agility: Unique capability in the market for **pipeline monitoring**



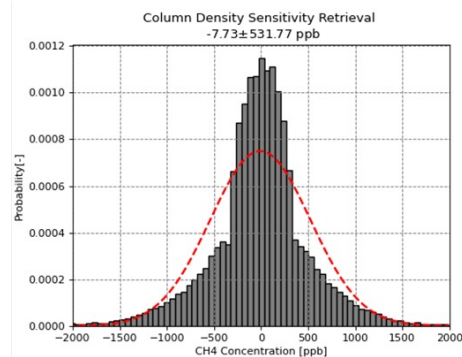
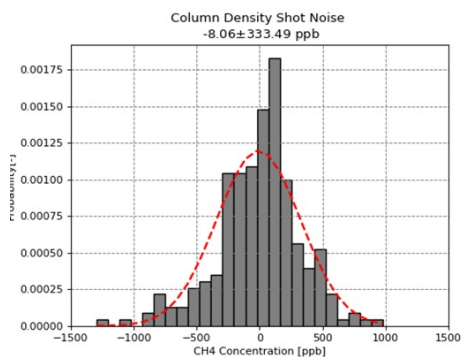
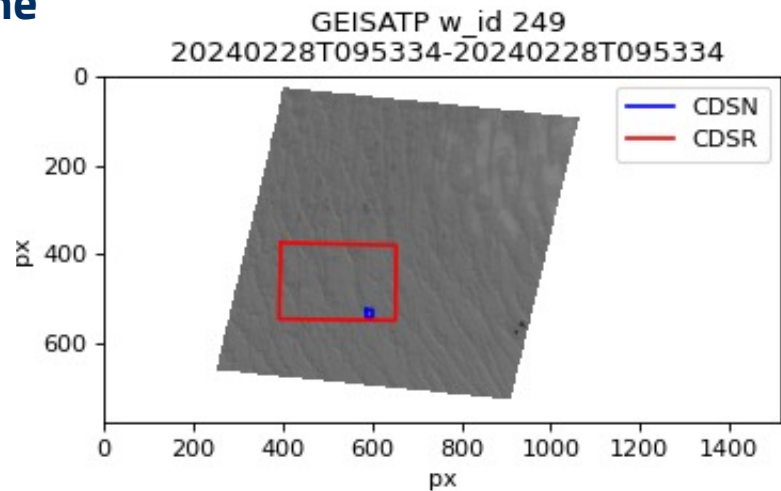
Transcontinental Gas Pipe Line
(Transco) U.S.



CH4 Cross-Validation



Methane Noise



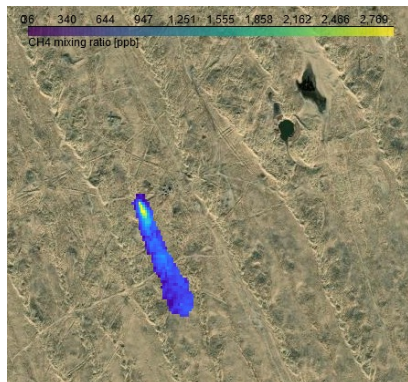
Metric	Window 200	Window 249	Window 289	Average	Criteria
CDSN	0.03	0.02	0.03	0.027±0.005	0.5
CDSP	0.15	0.19	0.15	0.163±0.019	1.5
PD	0.08	0.04	0.07	0.063±0.017	-

Cross-validation

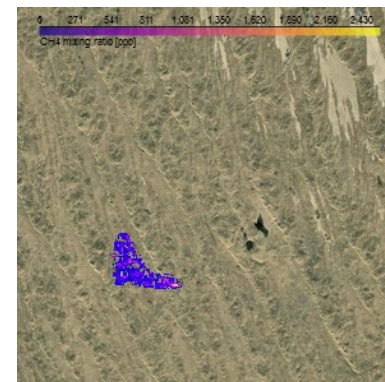
Building a time series in Turkmenistan:

D.2

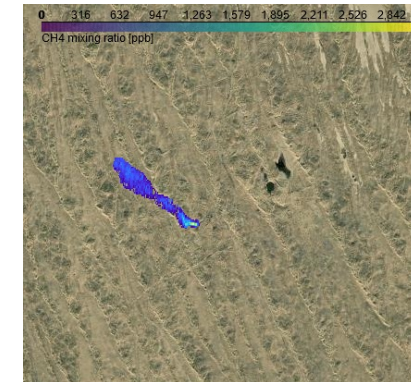
Sentinel-2B 2024-02-28



GEISAT-P 2024-03-06

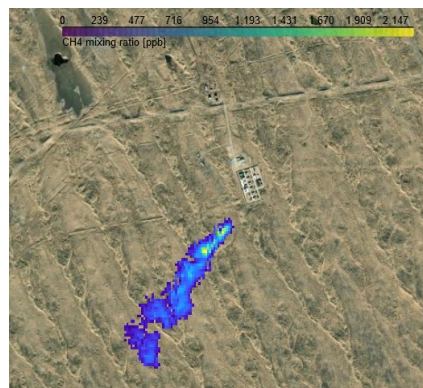


Sentinel-2B 2024-03-29

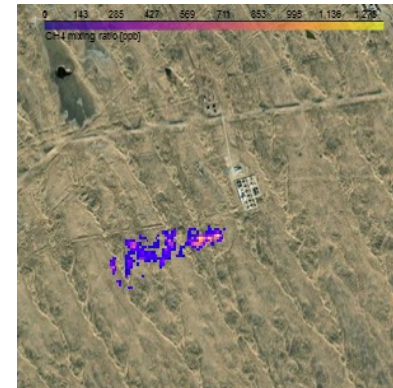


D.7

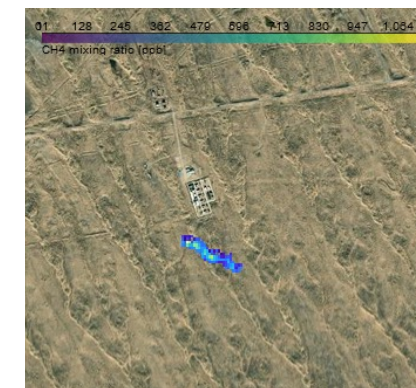
Sentinel-2A 2024-02-23



GEISAT-P 2024-03-06



Sentinel-2A 2024-03-24




Background: ESRI World Map



Methane Emissions Reporting

Our global data directly plugged into the customer's infrastructure

Emission location and quantification (Basemap: GEISAT-P RGB product)



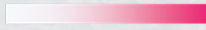
Emission location

Methane emission detection report

Product ID:
Window ID:

Legend

Emission location ◆
Emission concentration:



Cartographic information

Scale main map
Scale general map
Reference system:
WGS 1984

Data source

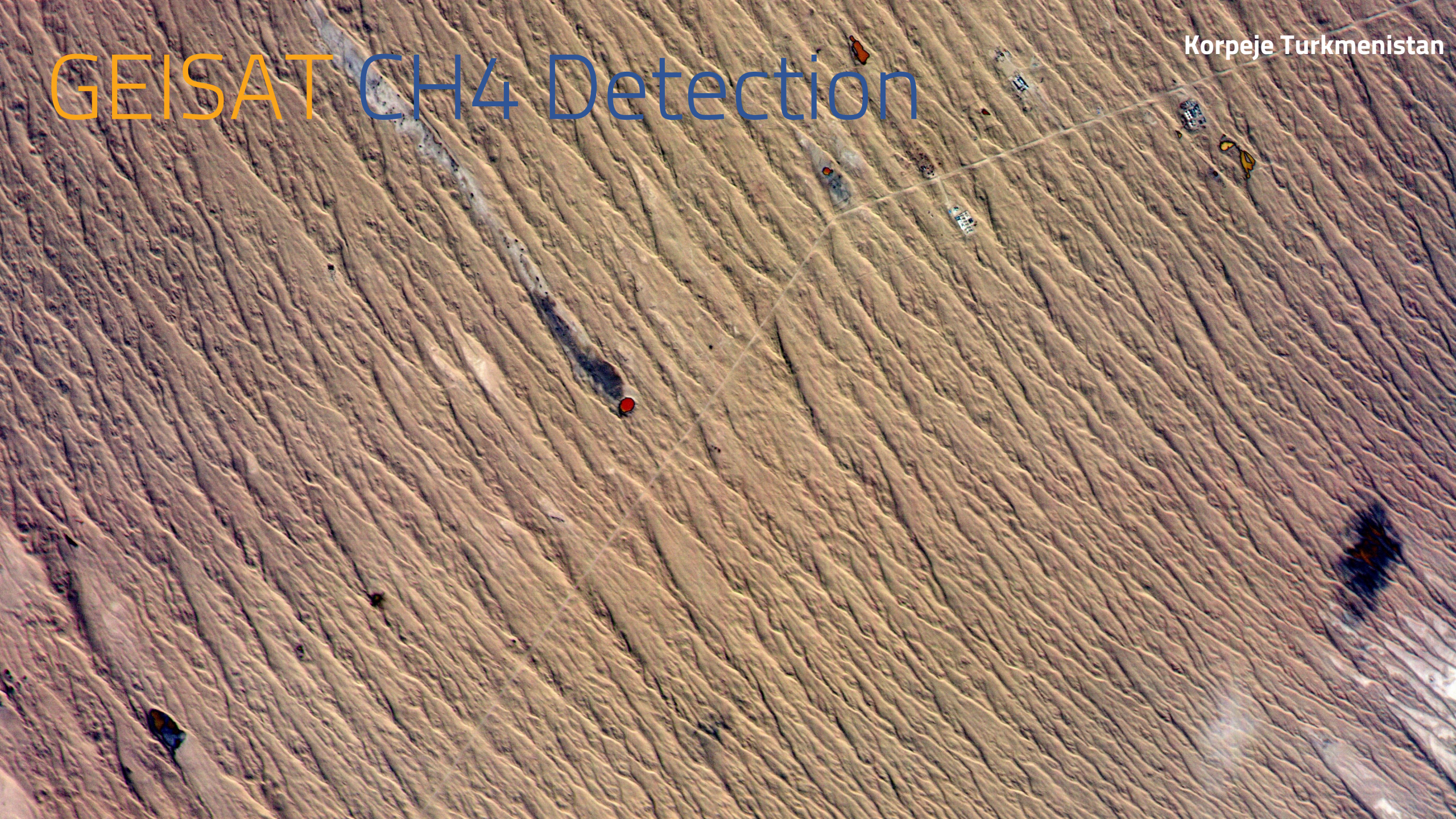
Emission: GEISAT-P
Visible image: GEISAT-P
Base map:
Vectorial layers:
Data url: _ _ _ _

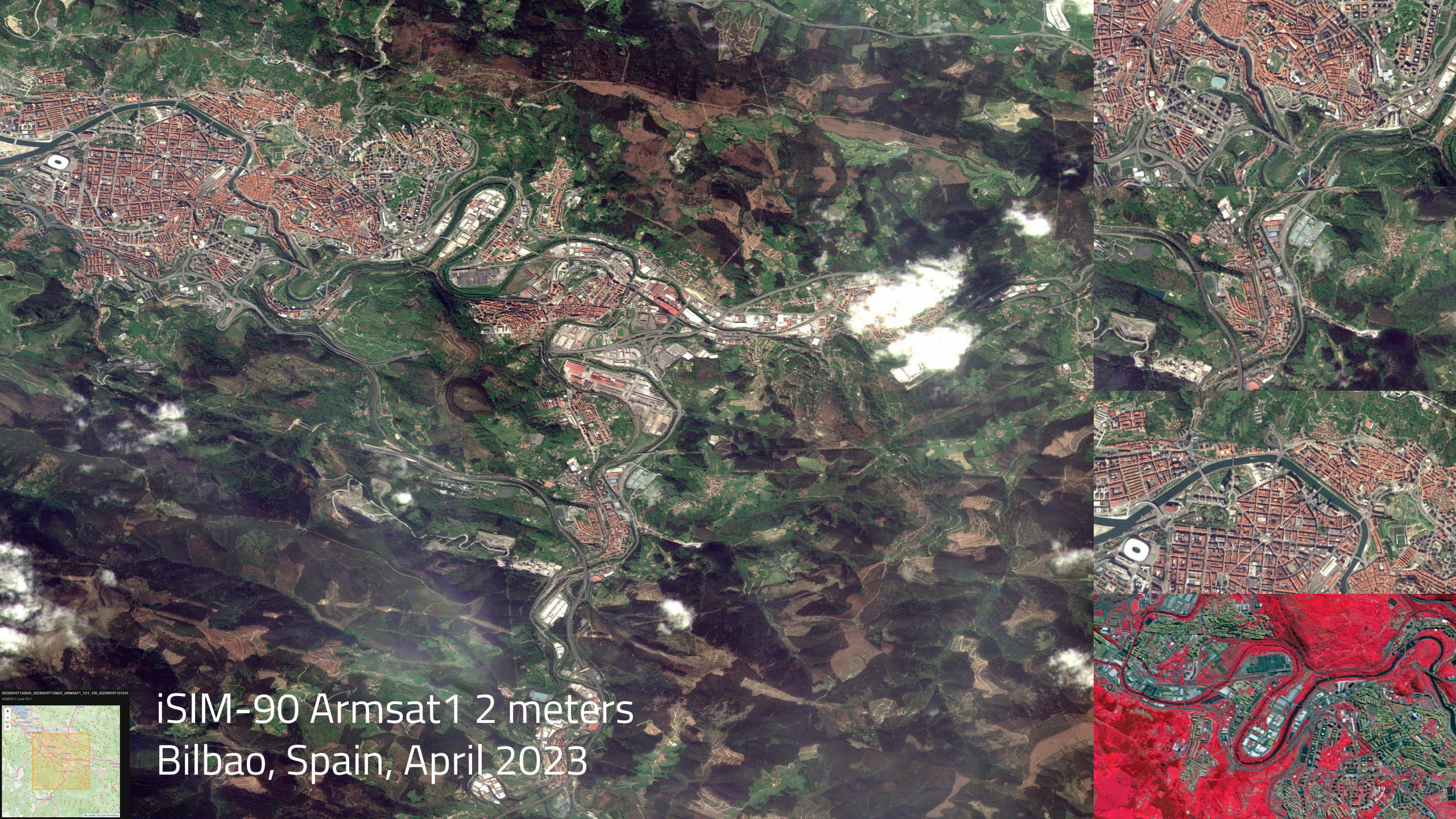
Site ID	Lat	Long	Acq time	Satellite	Flowrate	Min con.	Max con.	Uncertainty



- ◆◆◆ Plume location on RGB background
- ◆◆◆ Flowrate
- ◆◆◆ Uncertainty
- ◆◆◆ Windspeed
- ◆◆◆ Site ID
- ◆◆◆ Window ID

GEISAT CH₄ Detection





iSIM-90 Armsat1 2 meters
Bilbao, Spain, April 2023



An aerial photograph of Atlanta, Georgia, featuring a prominent white swoosh graphic that curves across the center. The city's urban areas are overlaid with a semi-transparent red color, while the surrounding green fields and forests remain in their natural colors. The text 'SATLANTIS' is superimposed in white, with a decorative graphic of five yellow diamonds between the 'L' and 'N'.

SATLANTIS

Thank you

Markel Aramberri