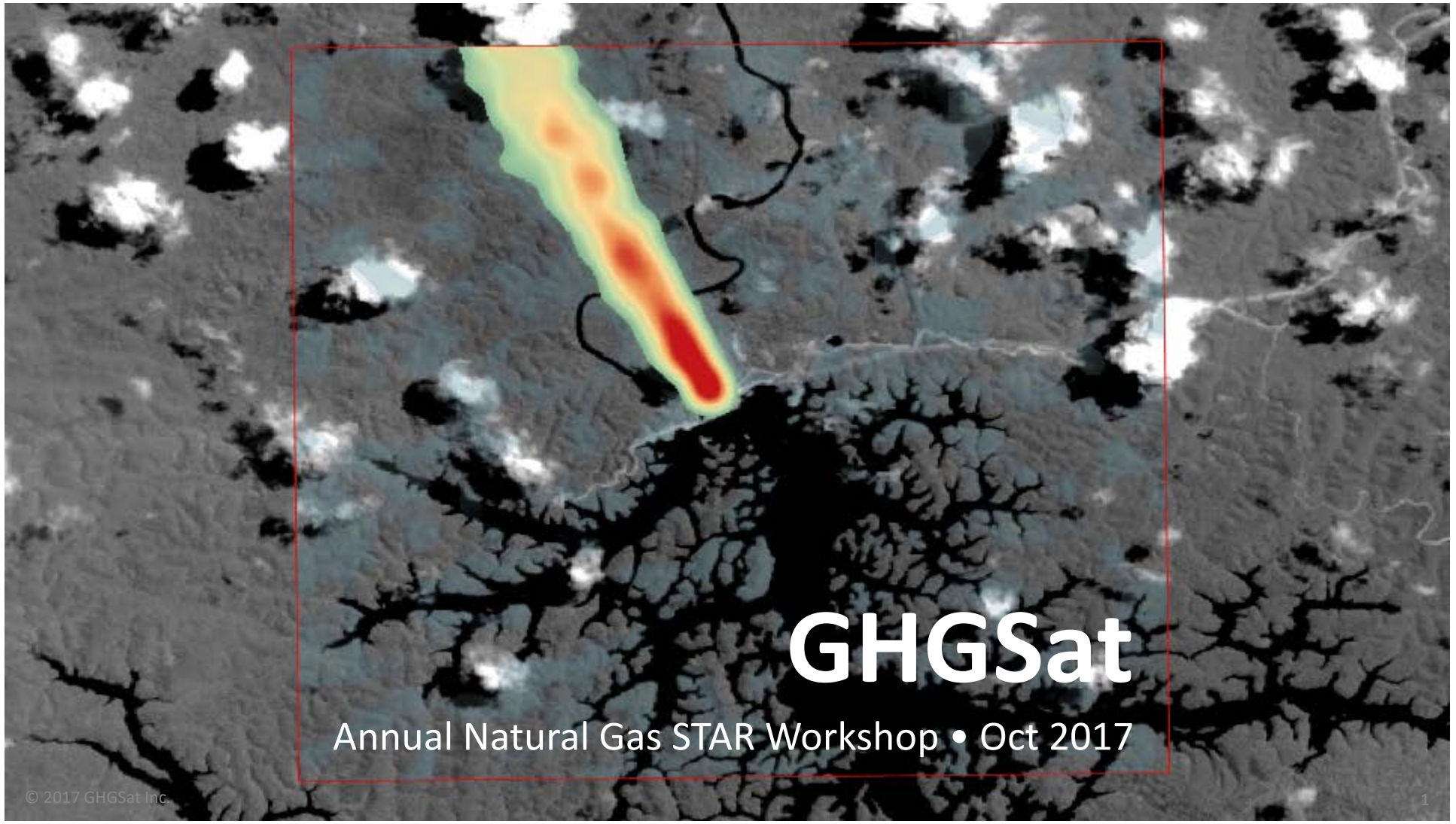


GHGSat

Annual Natural Gas STAR Workshop • Oct 2017

Monitoring Methane from Space

GHGSat owns and operates the world's first satellite capable of measuring greenhouse gas emissions (carbon dioxide and methane) directly from industrial sources

Why a Satellite?

- **Economies of scale:** Each satellite can measure any site in the world, every two weeks
- **Ease of deployment:** Can measure any site in the world within a few days of request, as many times as needed, with no deployment cost
- **Consistency, transparency:** Same method used for all sites, everywhere, for anyone
- **Performance:** Can detect and quantify ~50% of methane emissions by volume in the US

Demonstration Satellite Launched in Q2’16

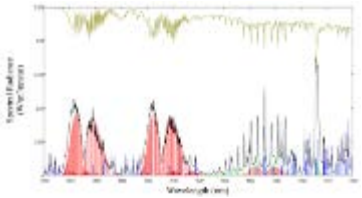
How it Works

Monitoring

Each GHGSat satellite orbits the Earth every 98 minutes

- Each satellite measures any site in the world once every two weeks
- Constellation will increase coverage to 1-2x per day

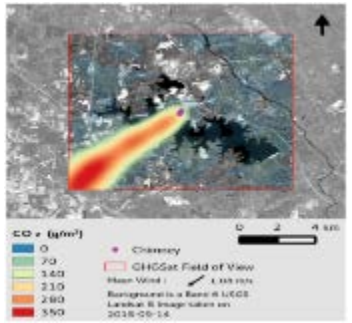
Data Processing



Instrument measures absorption spectrum (upper curve) in targeted spectral bands (in this case, CO_2, CH_4 and water in SWIR)

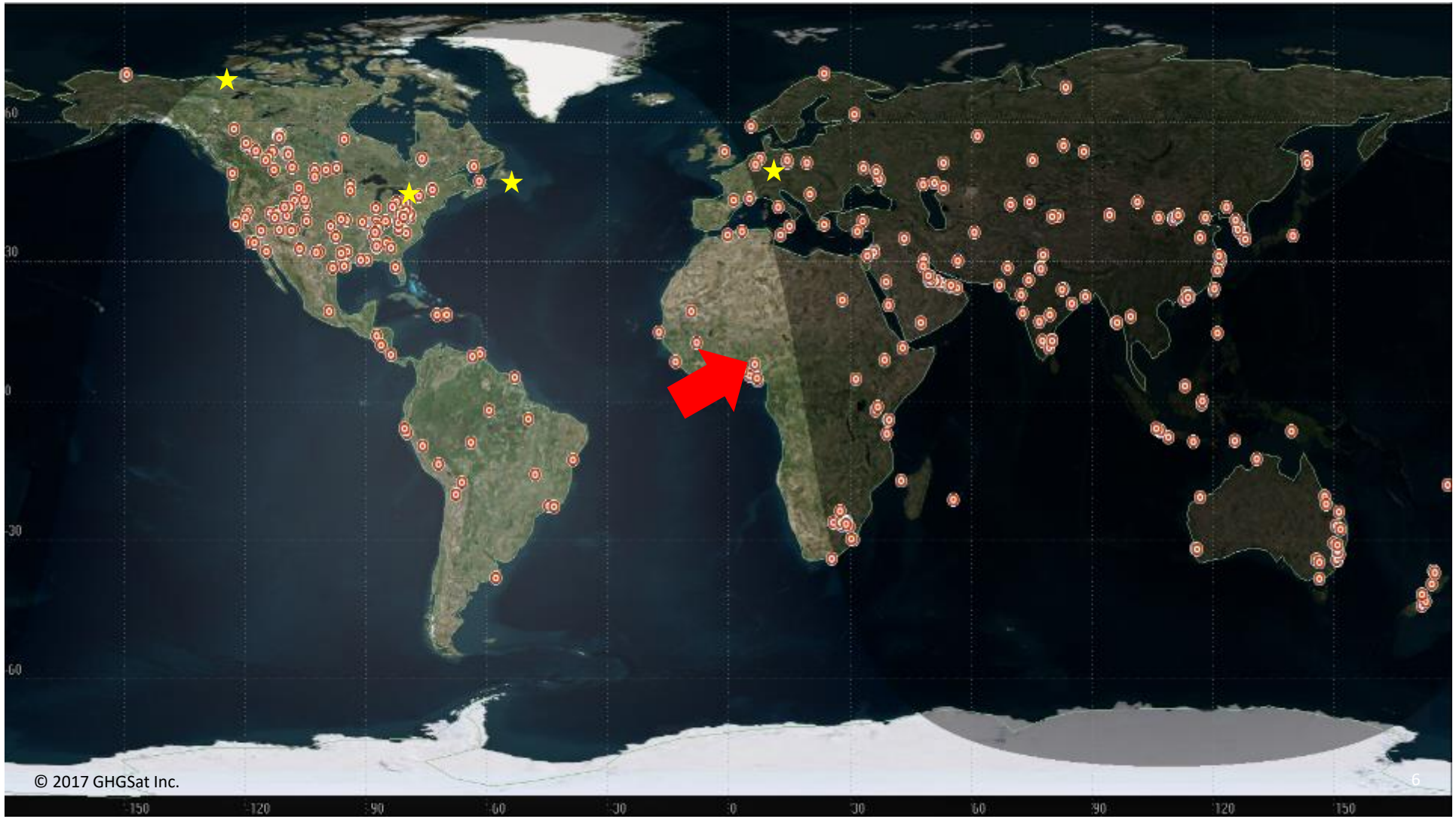
- GHGSat target precision of 1% of background (Approx. 4 ppm CO2, 18 ppb CH4) comparable to current state-of-the-art from satellites

Products & Services



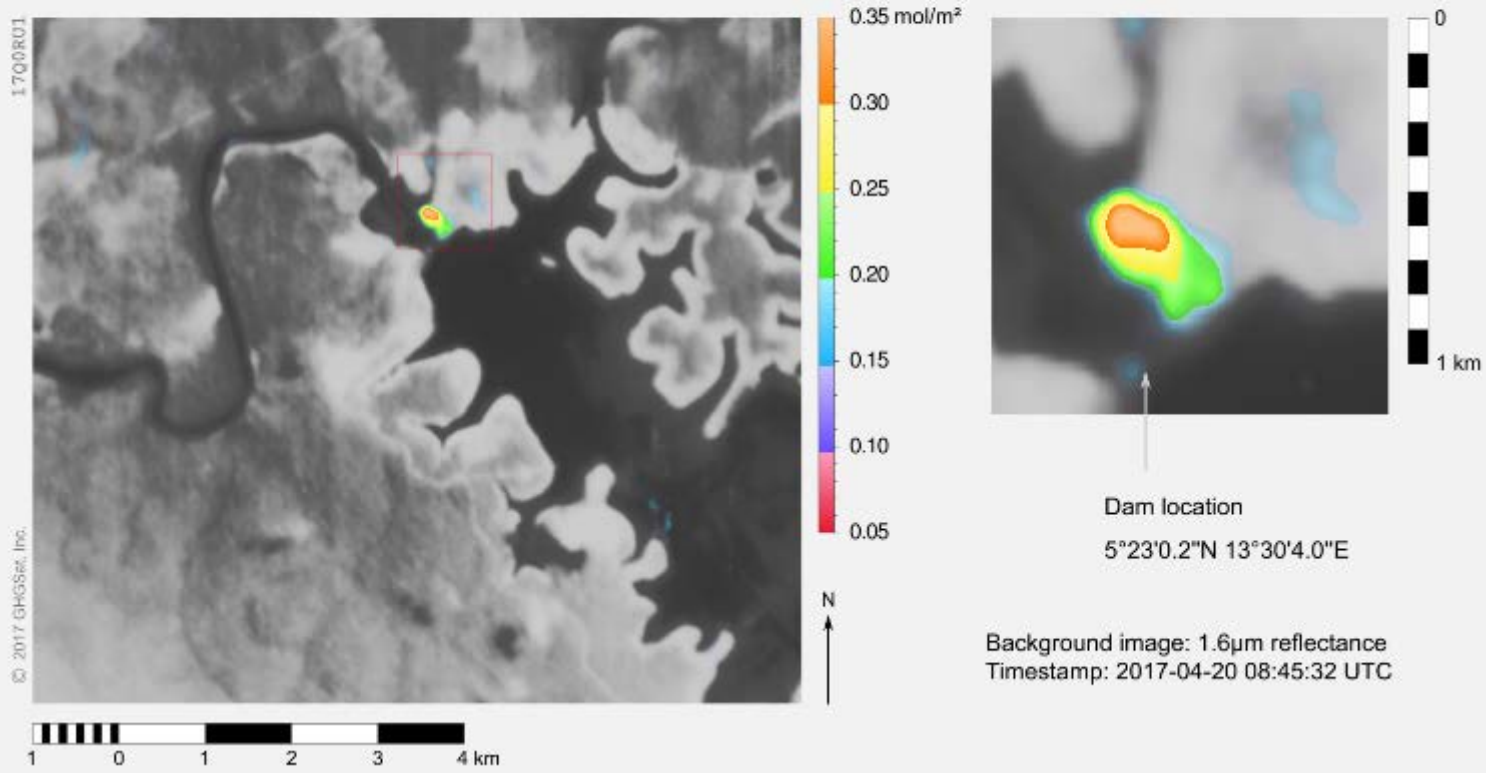
GHGSat delivers data products and value-added analytics

- Spatial resolution < 50m is ~2 orders of magnitude better than current state of the art from satellites



GHGSat
GLOBAL EMISSIONS MONITORING

Lom Pangar Dam, Cameroon — April 20th, 2017
GHGSat-D excess CH_4 column measurement



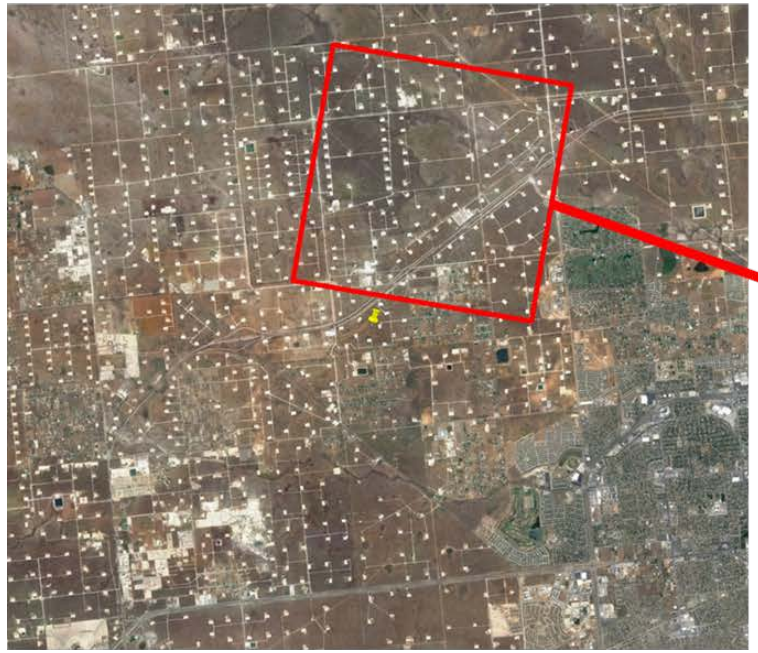
Oil & Gas Solutions

- Oil and gas sector is GHGSat's largest market for methane leak detection and quantification
- Technology is applicable to all types of facilities: wells, compressor stations, receiving terminals, processing plants, gas-to-liquid facilities, refineries, etc

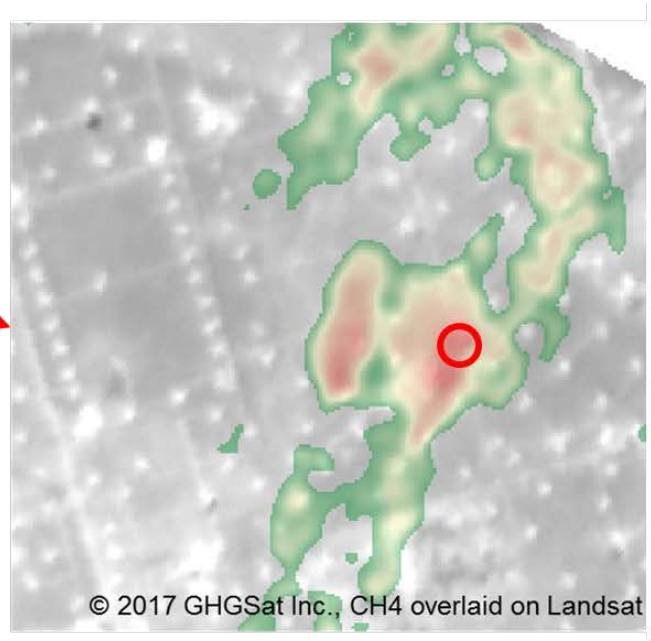
.

- GHGSat offers both one-time measurements, and annual subscriptions for ongoing monitoring of facilities
- GHGSat performs both (i) measurements of point sources for single customers, and (ii) wide-area surveys for multiple customers

Oil & Gas Superemitter



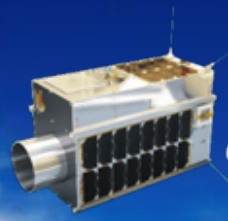
Google Earth image for context; area outlined in red is shown with GHGSat methane measurements in right image. Pin in Google Earth image is arbitrary target used for center of measurement.



Pseucolor map combining (a) GHGSat column density for CH4, and (b) Landsat imagery taken in similar spectral band, each take at a different times.

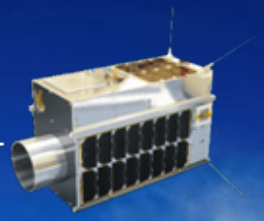
What's Next?

Q2'16 Launch GHGSat-D



Q4'18 Launch GHGSat-C1

Q2'19 Launch GHGSat-C2



Q4'16 Ordered Two More Satellites

Q1'17 Added Second Ground Station

Q4'17 Two More Ground Stations

Q1'19 Fly Aircraft Variant

2020 Onwards

Deploy satellites and aircraft to match demand

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