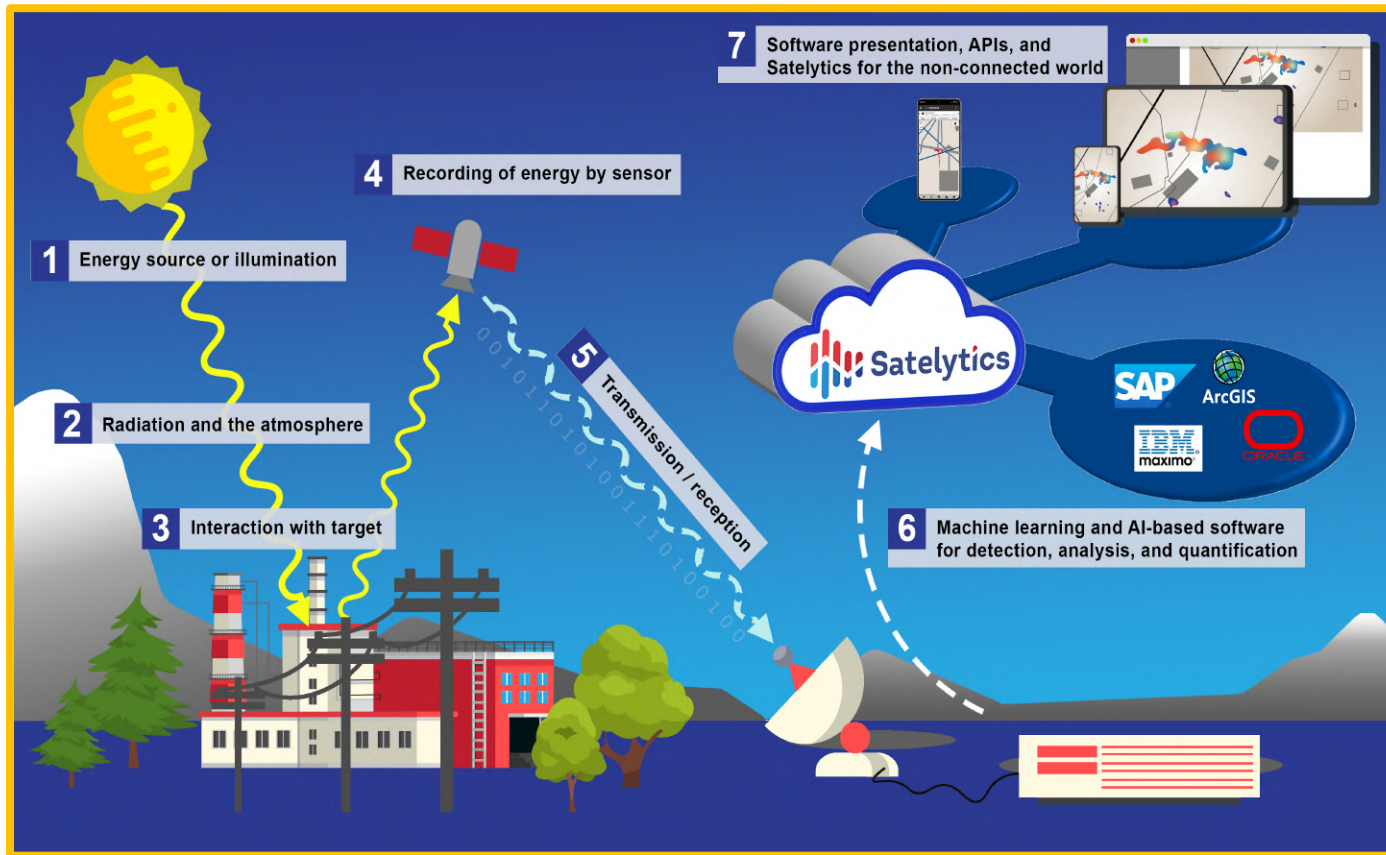




Prepared For:



How Our Solution Works



- 1) **Energy Source or Illumination** - sunlight illuminates the target.
- 2) **Radiation and the Atmosphere** - atmospheric distortion of the reflected energy is accounted for in the analysis.
- 3) **Interaction with the Target** - energy reflects off the target and is distorted in the reflection.
- 4) **Recording of Energy by the Sensor** - a sensor records the reflected electromagnetic radiation.
- 5) **Transmission, Reception, and Processing** - energy recorded by the sensor is transmitted, then received and processed at a ground station.
- 6) **Software Detects, Analyzes, and Quantifies** - the data is analyzed using artificial intelligence-based software – algorithms designed to extract and quantify measurements of the target.
- 7) **Presentation of Analytics** - Data and imagery is presented in a customer-defined form to allow decision-making and immediate action.
- 8) **Device Platform** - Data, analytics, and imagery are accessible

on smartphones, tablets, and browsers. Alerts are also delivered by text message.

www.satelytics.com

What are the Sources of Data

Data Acquisition, From Where, How Often, and What the Future Holds

Satellytics takes in multi and hyperspectral data from a variety of third-party sources including enterprise satellite data providers using conventional and nano-satellite arrays, plane or drone aerial imagery, and fixed or persistent camera platforms.

Perspective on Scale and Capture

3,000 sq km over the Bakken, ND

Satellite 11 minutes

Plane 2 days

UAV 25 hectares 6 hours



Satellites



Nano-satellites



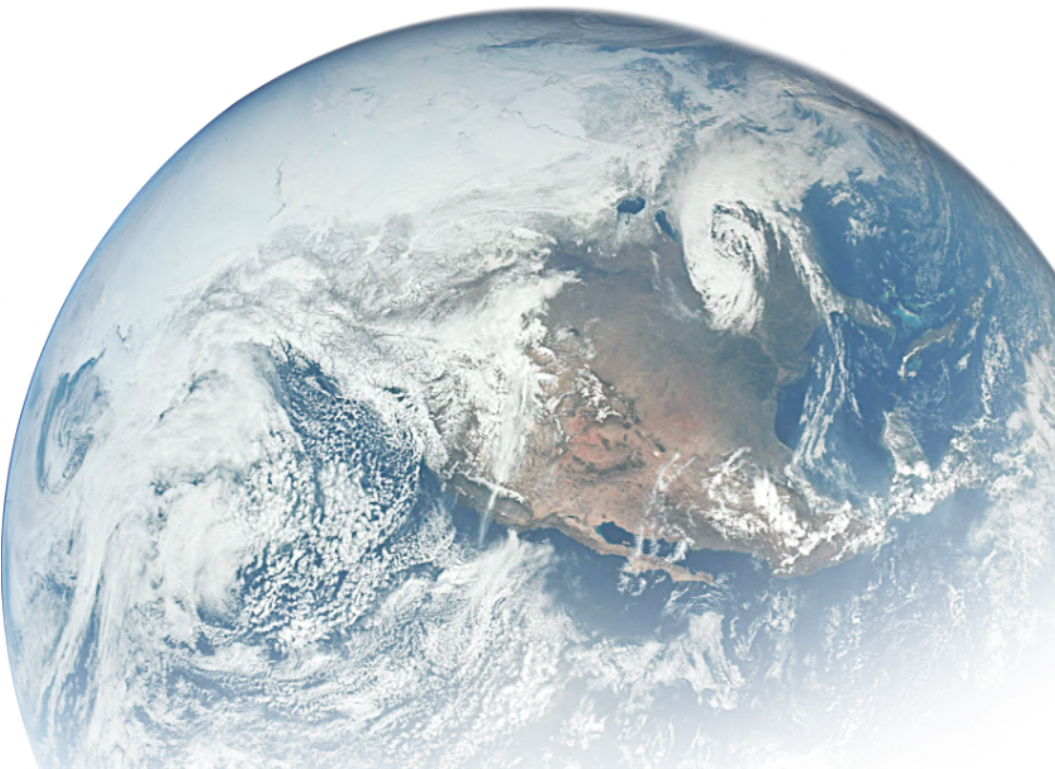
Aircraft



Drone/UAV



Fixed/Persistent Platform



Increasing Pressures via Activist Press



The Importance of High-Resolution Imagery

Spatial resolution is critical when identifying source and quantifying methane emissions

NGO Result
(Simulated)



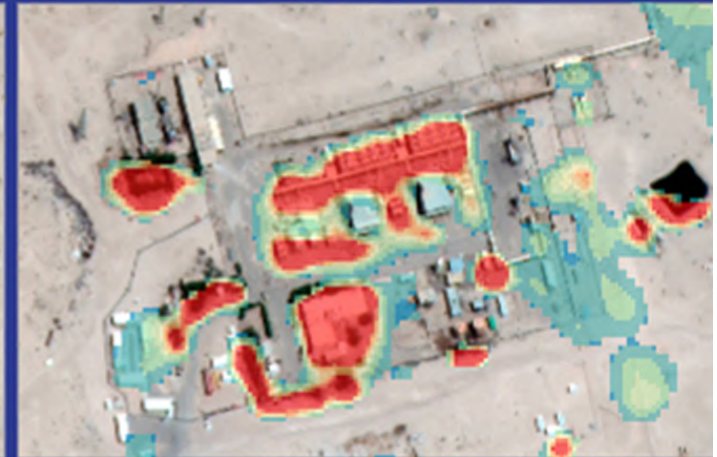
100m x 400m pixels

GHG SAT, Landsat, Sentinel Results
(Simulated)



30m x 30m pixels or
25m x 25m pixels
(small variation between the two)

Maxar World View- 3

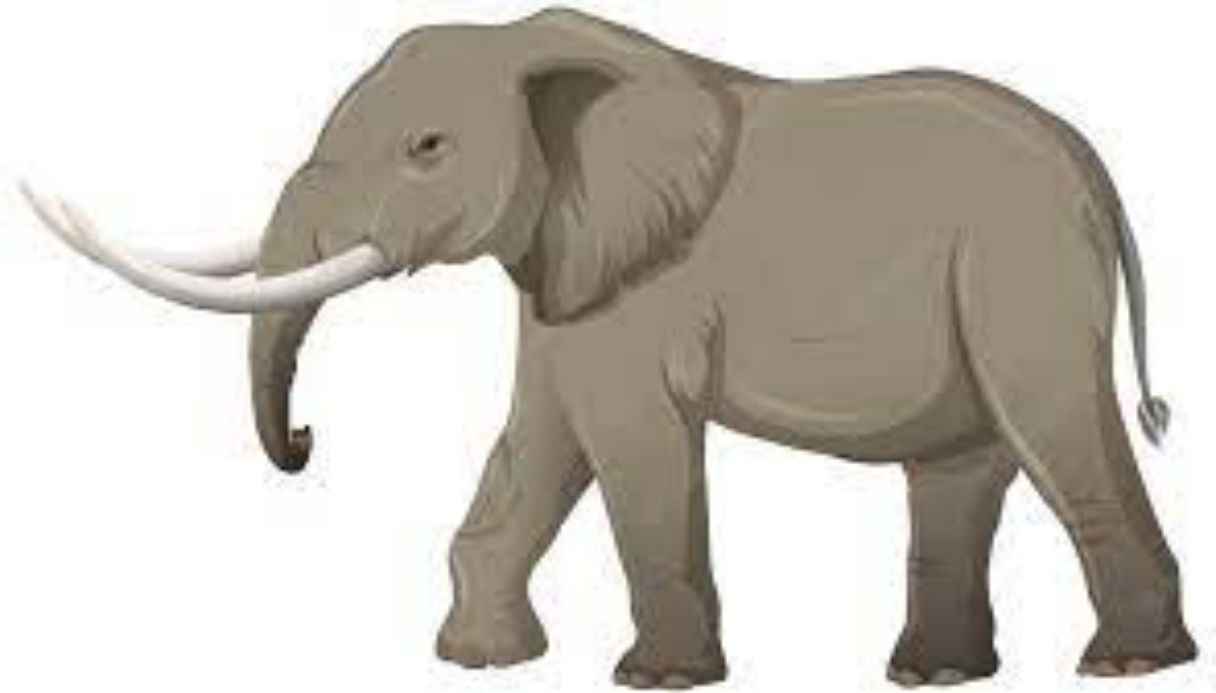


3.7m x 3.7m pixels

Satelytics pinpoints source location and measures plume and flowrate

- **For all other measurements, 30-cm to 46-cm resolution yields specificity to help you get the earliest possible notification of trouble.**

English expression....



- **Its like cathing the mice and missing the elephants**

Alerts with Specificity, Location, and Measurement, Not Directionless Data

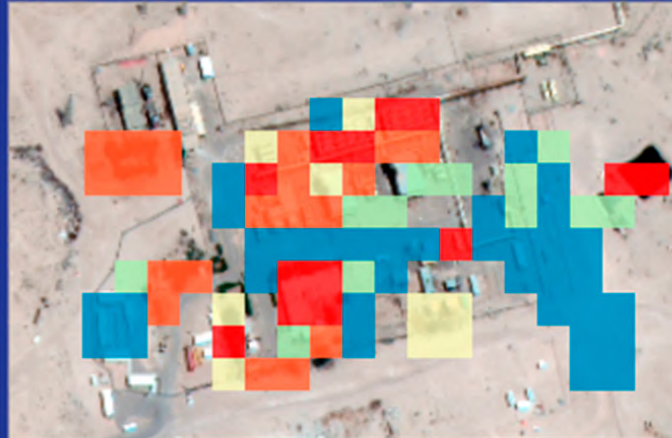
Spatial resolution is critical when identifying source and quantifying methane emissions

Image from Satellite A



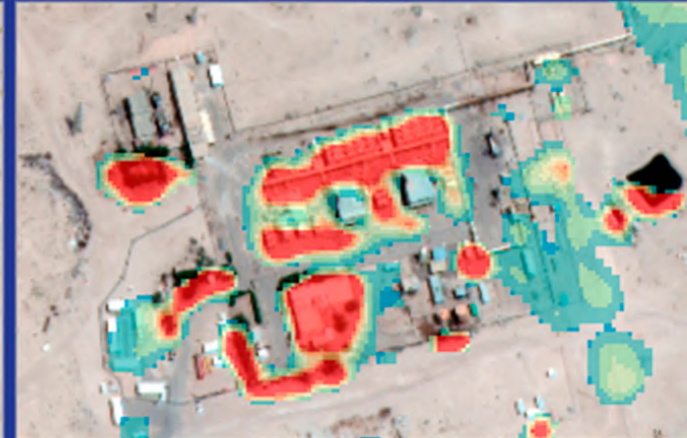
100m x 100m pixels

Image from Satellite B



30m x 30m pixels or
25m x 25m pixels
(small variation between the two)

Satelytics using SWiR



3.7m x 3.7m pixels

Satelytics pinpoints source location and measures plume and flowrate

- For methane: 3.7-m by 3.7-m pixels enable source identification at the component level
- For all other measurements, 30-cm to 46-cm resolution yields specificity to help you get the earliest possible notification of trouble.

Algorithm Focus	ANNUAL	TWICE YEARLY	QUARTERLY	MONTHLY	TWICE MONTHLY	WEEKLY	ACCURACY	NOTES
Methane Detection Measurements	YES	YES	YES	IDEAL	YES	NO	±10%	Quantified algorithm, source data capacity issues
Liquid Leak Detection	YES	YES	YES	YES	YES	IDEAL	95%	Best run twice monthly or more frequently.
Change Detection	NO	NO	NO	YES	IDEAL	YES	98%	Requires two collections, results are best at twice monthly
Encroachment Detection	YES	YES	YES	YES	YES	IDEAL	98.3%	Can be run at any collection frequency
Land Movement Detection	NO	NO	NO	NO	YES	IDEAL	93%	Frequency can be increased during wet seasons.
Water Detection	YES	YES	YES	IDEAL	YES	YES	98.5%	Ideal for monitoring water crossings & flood locations.
Vegetation Management	YES	YES	YES	IDEAL	NO	NO	98.6%	Ideal for vegetation control & reduction projects.
Land Use Classification	YES	YES	IDEAL	YES	NO	NO	93.2%	Ideal for HCA analysis
Theft Detection	NO	NO	NO	NO	YES	IDEAL	96.2%	Currently defining detection criteria.
Water Quality Analysis	YES	YES	YES	YES	IDEAL	YES	±7.5%	Quantified algorithm; spatial resolutions & constituents vary

Algorithm Focus	ACCURACY
Methane Detection	>96%
Methane Measurement	+/- 10%
Liquid Leak Detection	95%
Change Detection	98%
Encroachment Detection	98%
Land Movement Detection	93%
Water Detection	98.5%
Vegetation Management	98.6%
Land Use Classification	92%
Theft Detection	97%
Water Quality Analysis	Varies but above 98.5%

Integration With Other Software Applications on a Number of Platforms



Methane Leak Detection

Gas leak detection during the Aliso Canyon gas leak near Porter Ranch, Los Angeles using satellite data.

Urban domain methane measured in parts per million and flow rates in kg/hour



Measuring both plume and flow rates using Satelytics' algorithms – source of leak marked with alert symbols chosen by customer



The meter has a small leak 200 ppmXm seen in image to the right below the insulated union

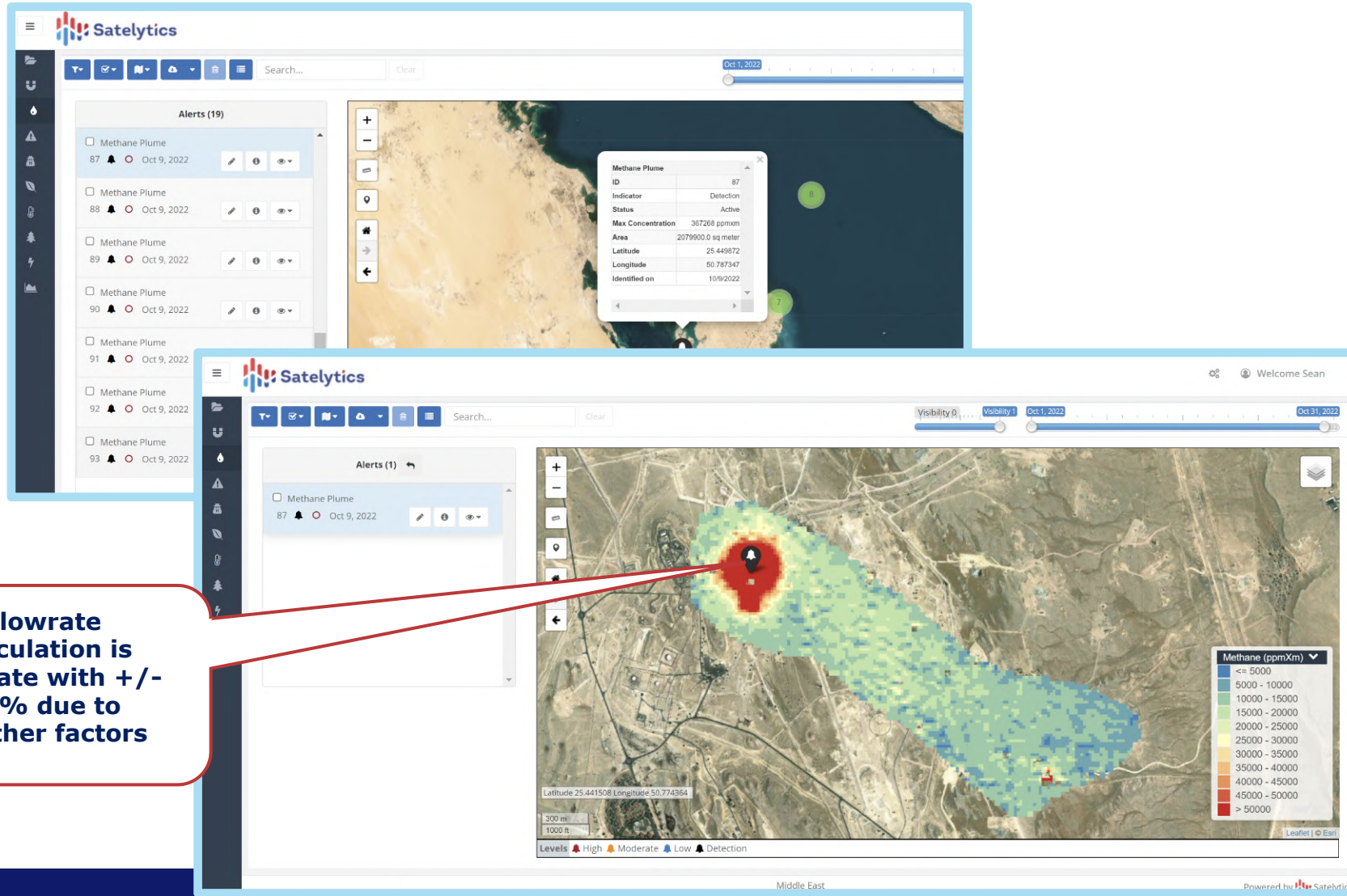
Satelytics Calculated Flowrates of CH₄ in Qatar with a Variation Factor of +/- 10%.

Flowrates are calculated using Satelytics Convolutional Neural Network based algorithm.

Weather conditions namely wind direction, wind velocity and relative humidity are streamed in at the precise time and location

Satelytics measurements are highly accurate there is a +/- 10% variation factor.

Flowrate Calculation is accurate with +/- 10% due to weather factors



Current Results – Algorithm Accuracies

Location (Date)	wind speed (m/s)	Flow Rate (kg/hr)	Actual (kg/hr)	ERROR (%)
METEC (3/4/2020)	1.84	12.39	13.12	5.56
VIVER (12/7/2017)	2.07	59.02	56	-5.39



Questions, comments, and suggestions please share with...

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