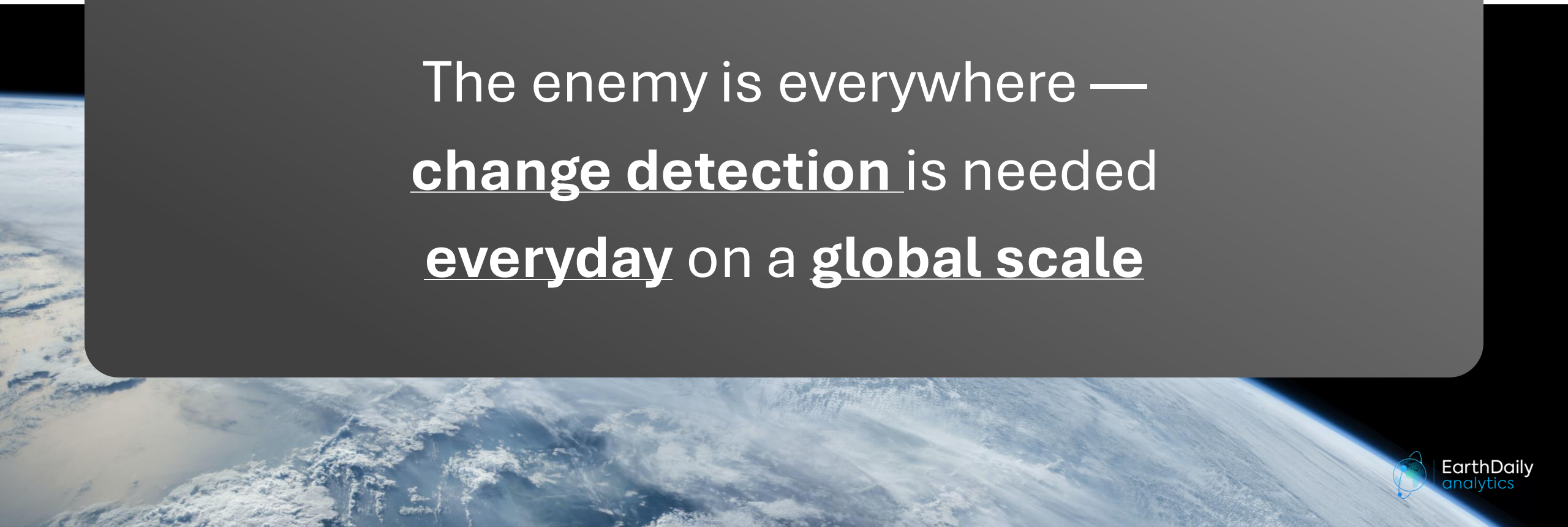
EarthDaily analytics

Everywhere, Everyday

The Case for Commercial Multispectral Global Coverage

Pete Round VP BD Defence and Intelligence

The Challenge



The enemy is everywhere —
change detection is needed
everyday on a **global scale**

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The Challenge

Today’s military and intelligence organizations need a way to monitor and detect change, daily on a global scale.

01

Global change detection requires automated analytics and high-quality consistent imagery data to feed AI and avoid false positives

02

Existing surveillance platforms either cover small areas with high resolution at high quality, or large areas with poor image consistency and quality.

03

High resolution systems are fantastic for detail, but not good at monitoring change across very wide areas

04

Threats can erupt anywhere—
change detection is needed **daily** on a **global scale**

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The Gap in Current Solutions

Earth Observation satellites can support a variety of military activities by providing signals intelligence, enabling battle damage assessments, and assisting military operations

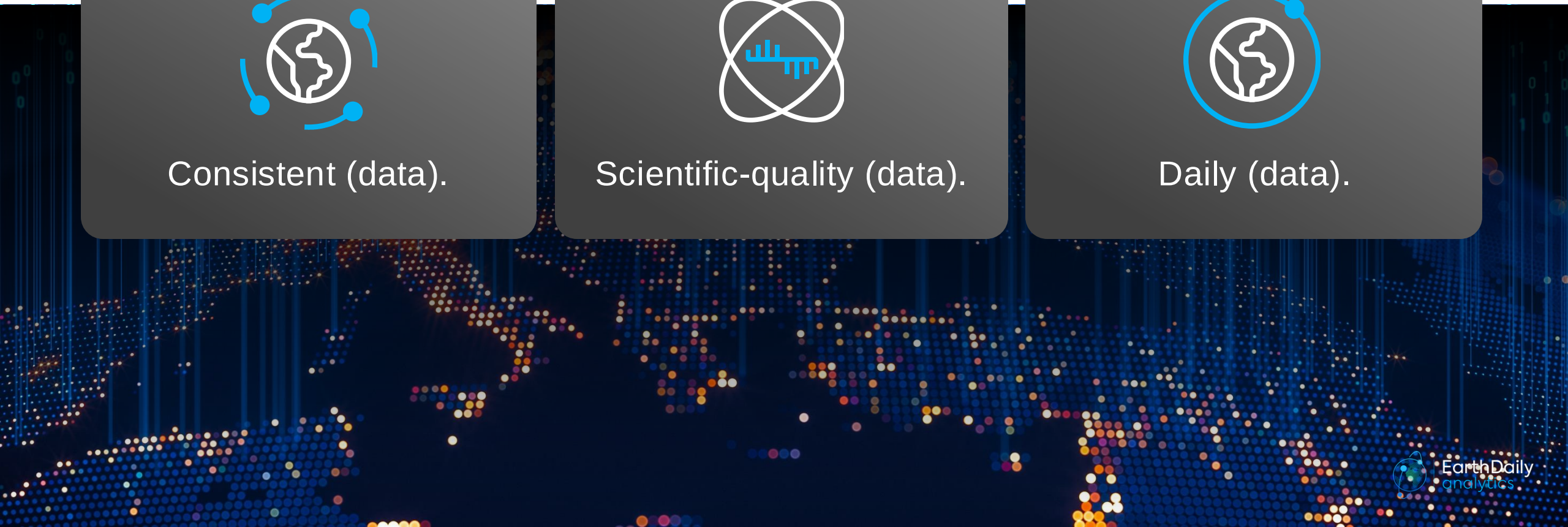
Space systems are no longer just process enablers they are a critical piece of the multi-domain operations puzzle

Connecting Space Intelligence and Operations requires holistic integration of all data with the quality and quantity of data to enable the process

Using Earth Observation data powered by Artificial Intelligence provides a "first indication" a head start

> There remains a critical gap in the market concerning the resolution and revisit frequency required for early change detection and dynamic monitoring.

Reliable change-detection requires:



Consistent (data).

Scientific-quality (data).

Daily (data).

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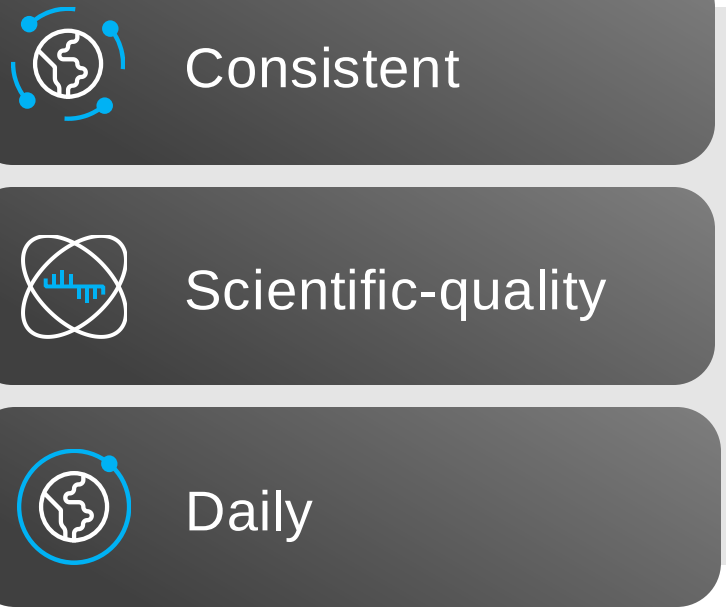
So what:

Consistent, Scientific-Quality,
Daily Global Observations & Measurements.



Enabling change detection and ML/AI applications at scale.

Current Systems don’t offer AI ready wide area coverage

Today’s imaging satellite missions fall into three main categories, none of which are fit-for-purpose for large scale change detection and predictive analytics:

Commercial high resolution and high-quality systems

- Useful for analytics, good revisit for small areas
- Do not offer broad-area coverage & do not have the needed spectral bands

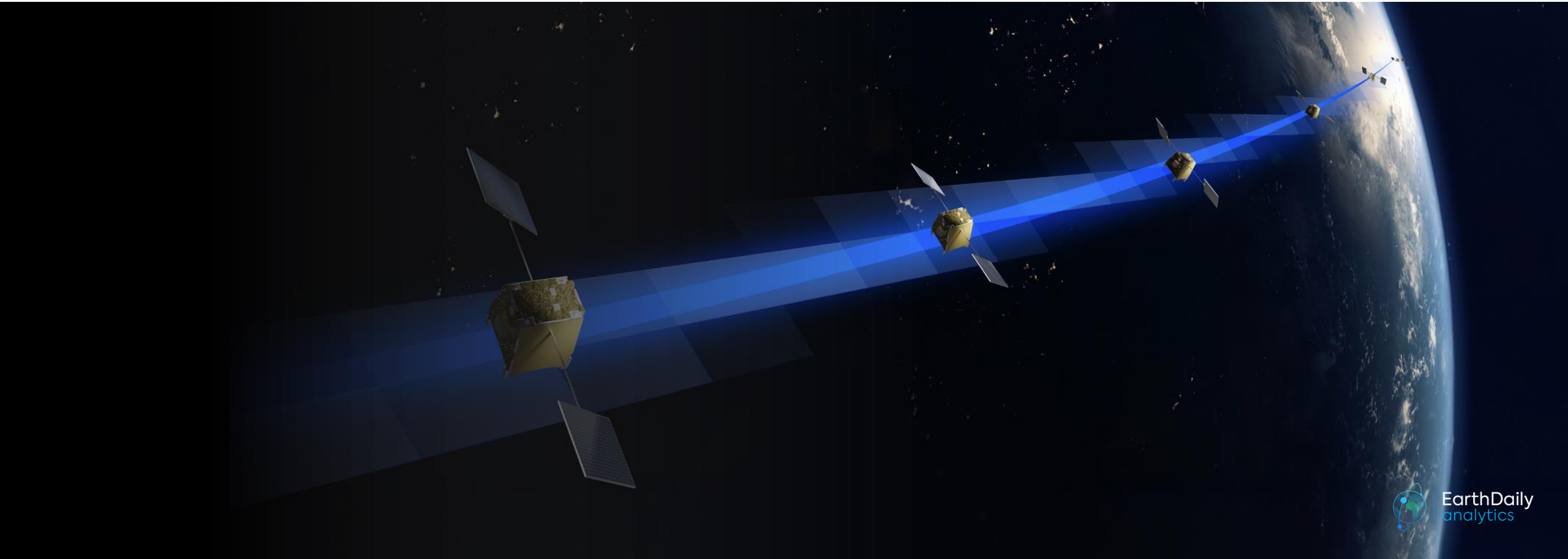
Government scientific satellite missions

- Offer high-quality that support analytics
- Have limited revisit and coverage and competition for priority

Small / cheap “mini sat” and “micro sat” constellations

- Offer good coverage and revisit
- Produce poor-quality data and poor derived analytics and have a limited set of spectral bands

Addressing today’s challenge requires scientific-quality data, with **global daily coverage** at much **lower cost** than currently available and delivered **automatically** and **seamlessly** for machine-to-machine **AI** and **ML-derived analytics**.



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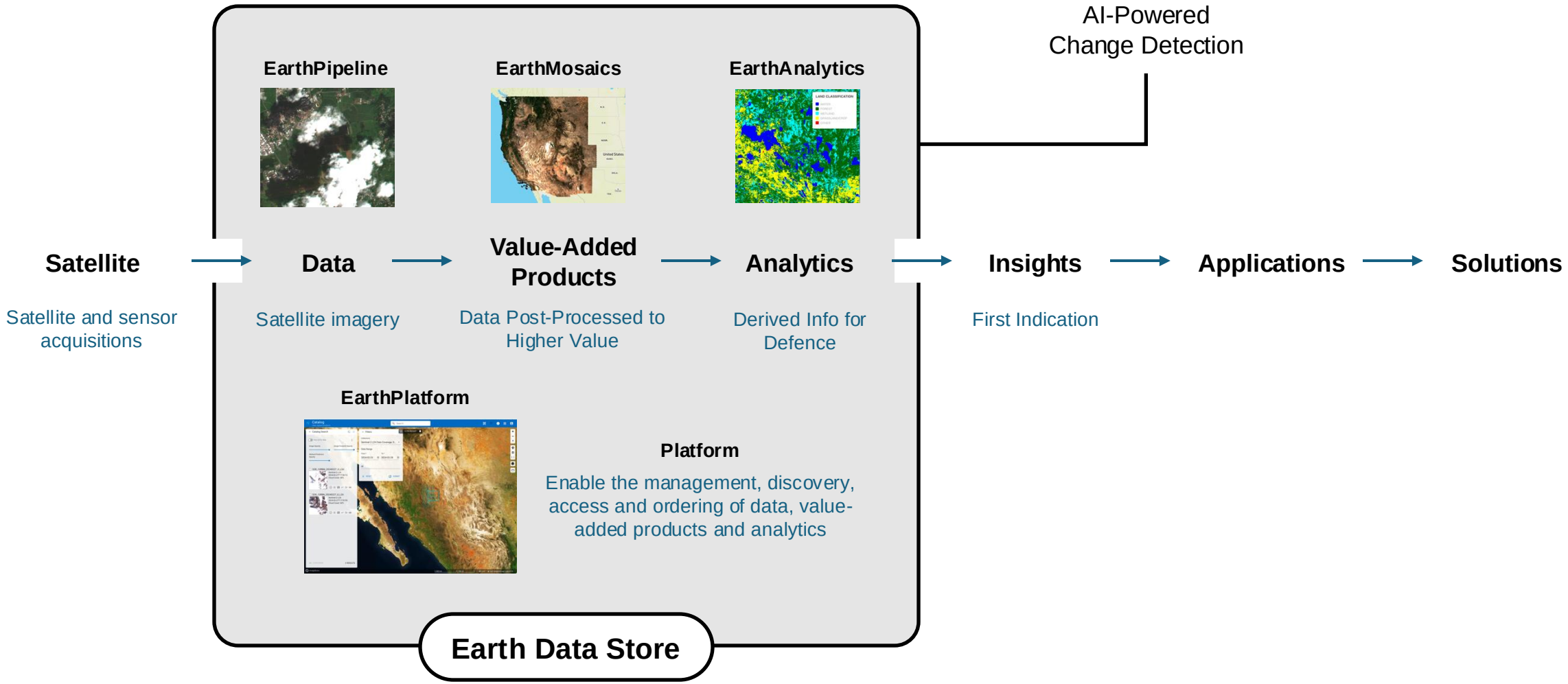
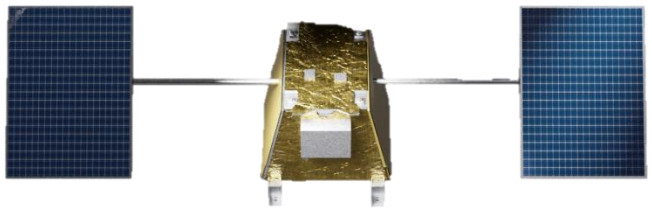


The EarthDaily Constellation



Number of Satellites	10
Launch Period	2025
Spacecraft	Arrow bus from Airbus
Design Life	10-years
Orbit	Sun-synchronous; 10:30 AM local time passover
Orbit Control	Precisely maintained for consistent viewing over mission life
Revisit	1 Day; daily coverage of ~100% of Earth's landmass
Resolution	VNIR: GSD 5.0m SWIR: GSD: 95m Thermal: GSD: 120m
Altitude	630km
Viewing Angle	Nadir (always)
Delivery Method	Cloud distribution, API-first approach

analytics

EarthDaily Constellation Bands

Land Use / Water Quality

Plant Health

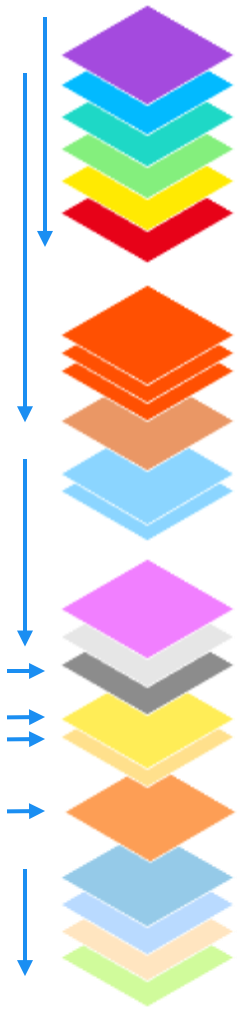
Data Quality

Soil Health

Methane

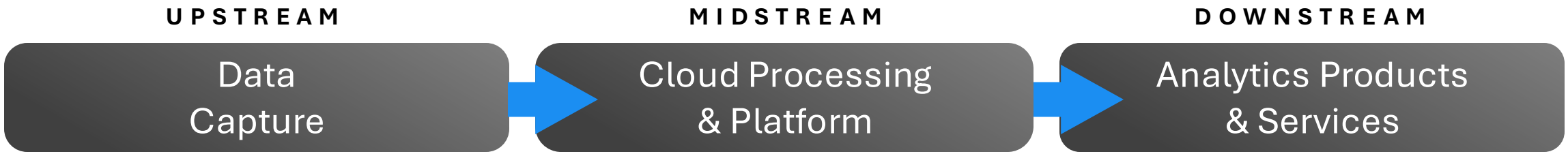
Forest Fires

Land Temperature



Visible	1 Coastal	→	Dust & Smoke, Ocean Colour: Water Quality and Organic Content
	2 Blue		
	3 Aqua		
	4 Green		
	5 Yellow		
	6 Red		
Near Infrared	7 Red Edge 1	→	Fluorescence, Type
	8 Red Edge 2		
	9 Red Edge 3		
	10 Near Infrared	→	Organic Matter, Ocean Colour: Water Quality and Organic Content
	11 Water Vapour 1	→	Atmospheric Water Absorption
	12 Water Vapour 2	→	Atmospheric Water Vapour
Shortwave Infrared	13 SWIR 1	→	Atmospheric Properties
	14 Cirrus	→	Cloud Properties
	15 SWIR 2	→	Snow and Ice Discrimination, Soil Moisture
	16 Methane 1	→	Methane characterization
	17 Methane 2	→	Methane characterization
Thermal Infrared	18 Wildfire	→	Radiative fire power, Fire detection and Characterization
	19 TIR 1	→	Urban Heat
	20 TIR 2		Volcanos, Mineral composition,
	21 TIR 3		Surface temperature,
	22 TIR 4		Snow characterization,

The EarthDaily System is Fully Vertically-Integrated



Satellite Constellation:

10 satellites (includes 1 in-orbit spare) with 22 scientific spectral bands

the Earth's and mass plus large maritime areas every day

Ultra-high pointing stability that enables high geometric accuracy

Precise orbit control enabling accurate cross-calibration to Sentinel-2 & other government science satellites

Ultra-high scientific quality daily imagery that is optimized for change detection, alerting and predictive analytics

10-year design life

EarthPipeline:

Fully automated EO data processing, calibration and quality system to extract highest quality at scale.

Creates first ever automated "Analytics-Ready Data" that is ready to use directly in algorithms

EarthPlatform:

Provides data discovery and distributes data to customers via on-demand API's

Offers "Bring Your Algorithm to the Data" service for customers

Brings together other complementary data

Value-Added Products:

Automated generation of info products:

→ Cloud Free Analysis Ready

→ Mosaics Dynamic Land Cover Maps Land

→ Heath (e.g., Crop Health Status)

Big Data Analytics Services:

Creation of new large scale change detection and predictive analytics, e.g,:

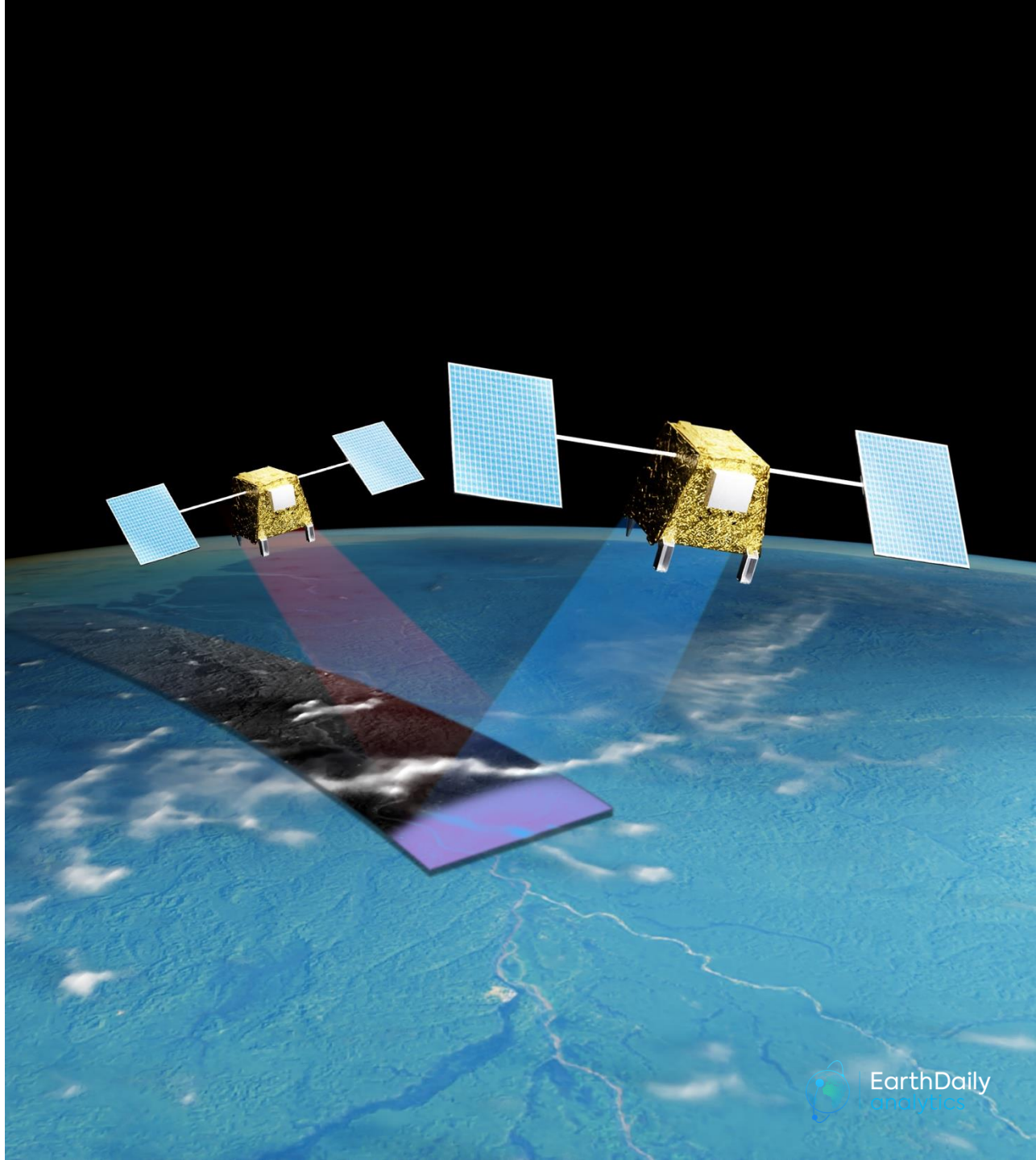
→ **Ag** – Yield Forecasts through-out season

→ **Fintech** – automated damage assessment for crop insurance, land valuation

→ **D&I** – Change detection alerts for situational awareness

Complement National Assets and High Resolution Collection Platforms

Everywhere, Everyday is a strategic capability. High resolution provides detail and evidence but only if it looks in the right place. The Earth Daily Capability sees all landmasses as well as the littoral and provides a sophisticated **Tipping** and **Cueing** capability with automation.



EarthDaily for Defense & Intelligence

Change Detection ➔ Tipping & Cueing

Change Detection:
Apply automated target or application specific change detection algorithms to determine if an event has taken place

Tipping:
- If a change has been detected with sufficient reliability, then initiate a semi-automated process to determine if is worthy of taking a finer look
- Apply continuous deep learning on imagery to mimic decision-making process of operator leading to higher reliability and automation

Cueing:
Tasking a high-resolution sensor (SAR or optical) to take a finer look

Tipping:
5-m change detection with EarthDaily

Cueing:
50 cm Optical imagery

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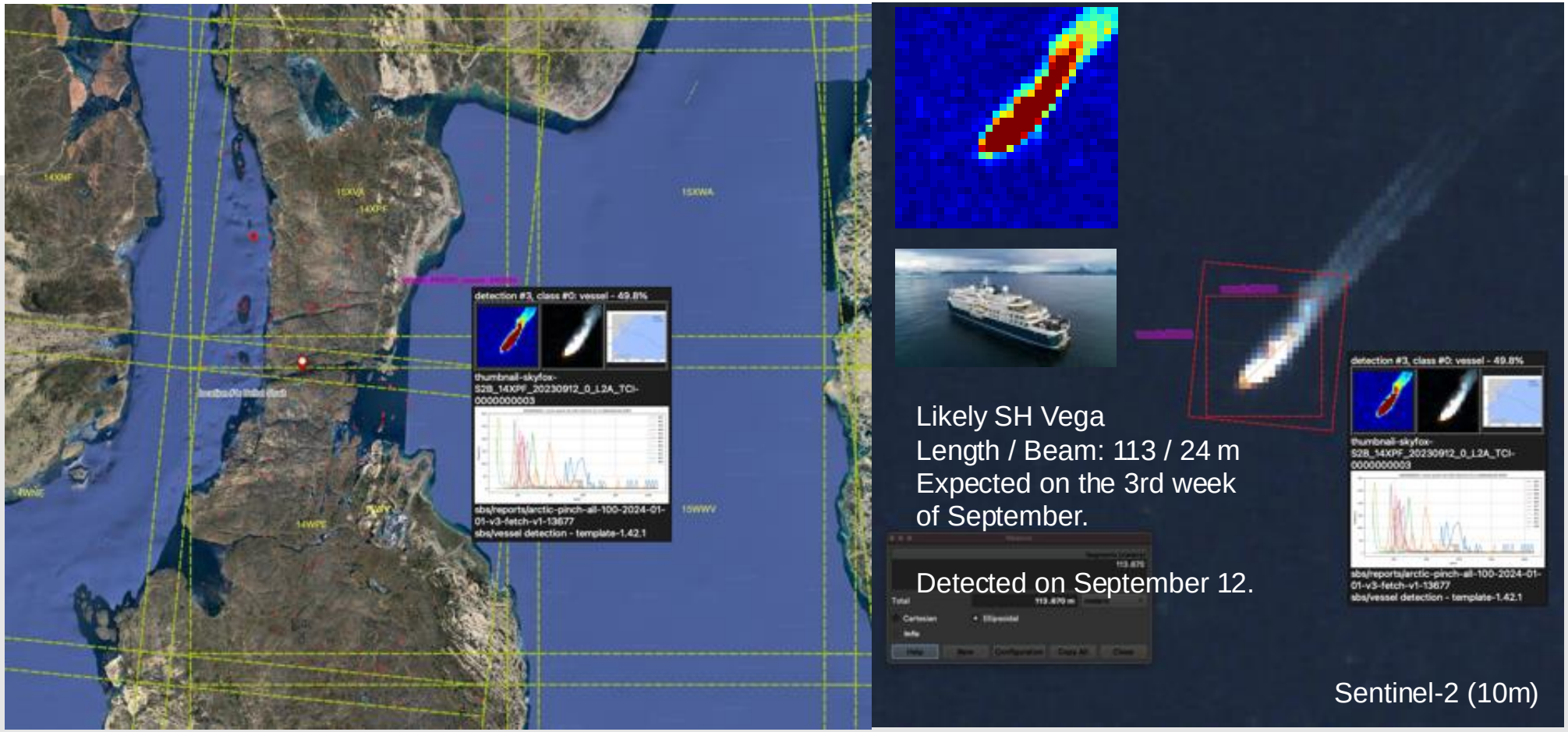
Accurate Global Daily Vessel Monitoring

11 VNIR bands optimized for spectral fingerprinting, accurate cloud masks reduce false positives, SWIR bands improve atmospheric and haze correction



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Persistent Daily Change Detection of Military Bases Globally

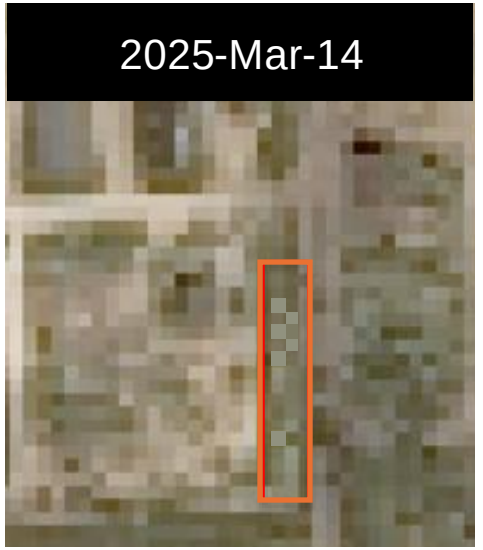
EDC will **monitor every military base every day** to understand activity and trends

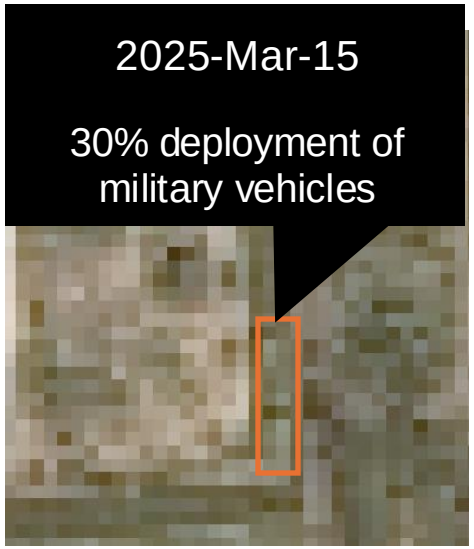
Delivers reliable change monitoring with scientific quality and same imaging time and viewing geometry

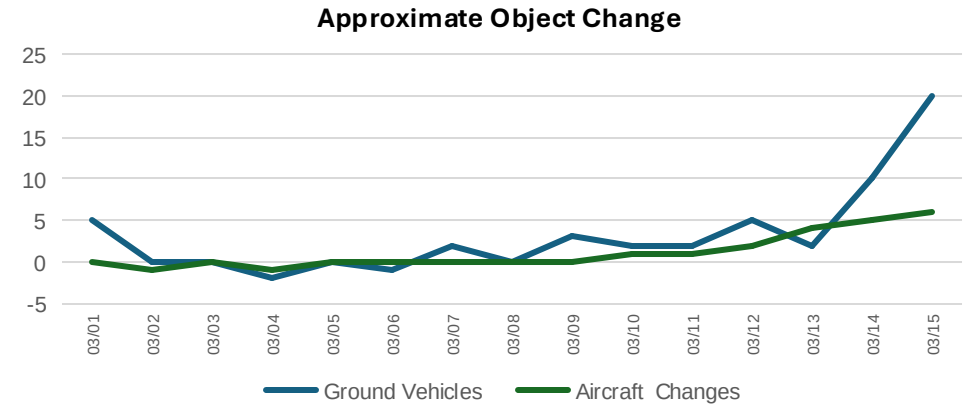
11 VNIR spectral bands optimized for **spectral fingerprinting**

High-Res Baseline

Daily Monitoring (5m sim)







EDC can Complement National Assets and High Resolution Collection Platforms

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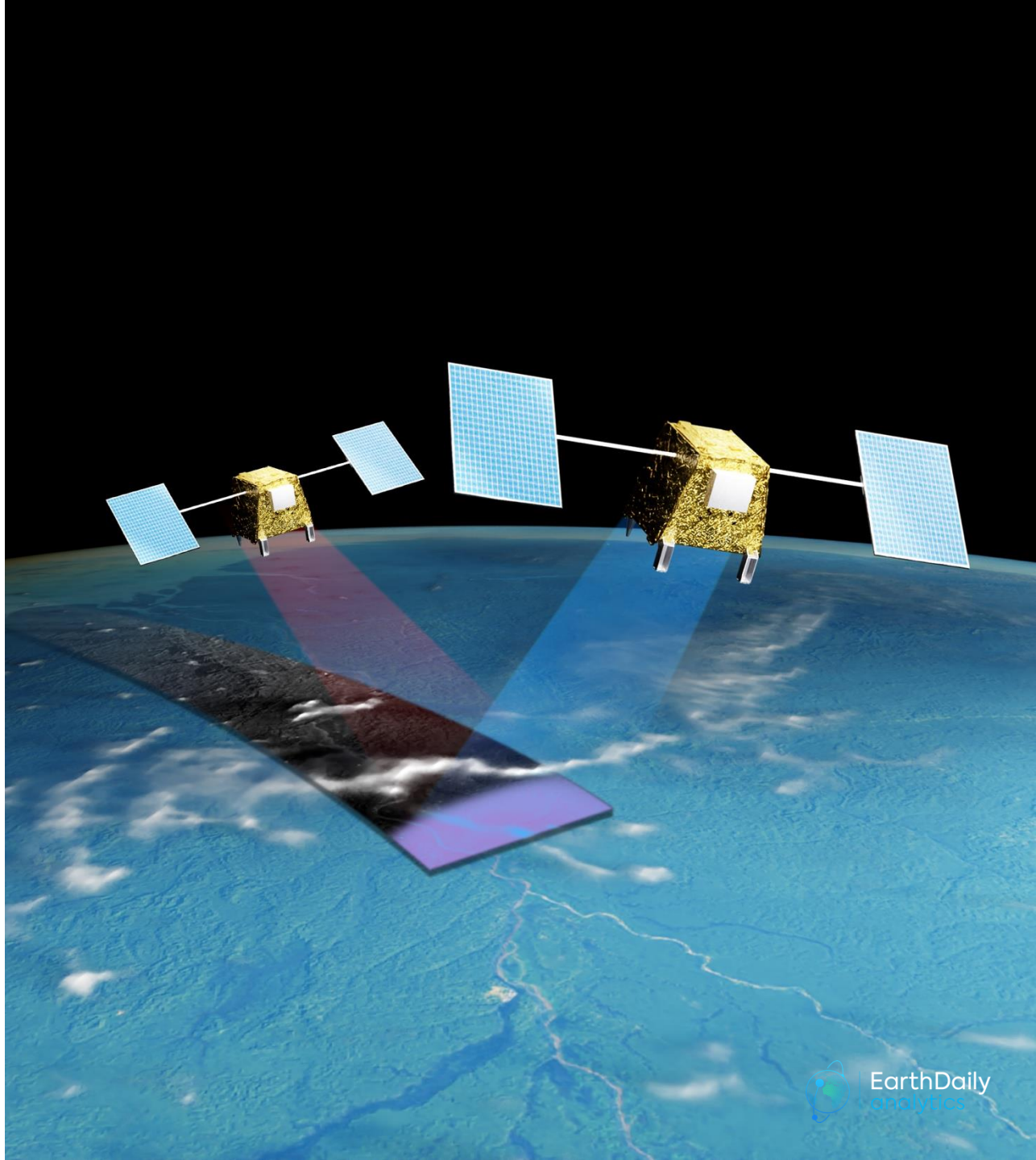
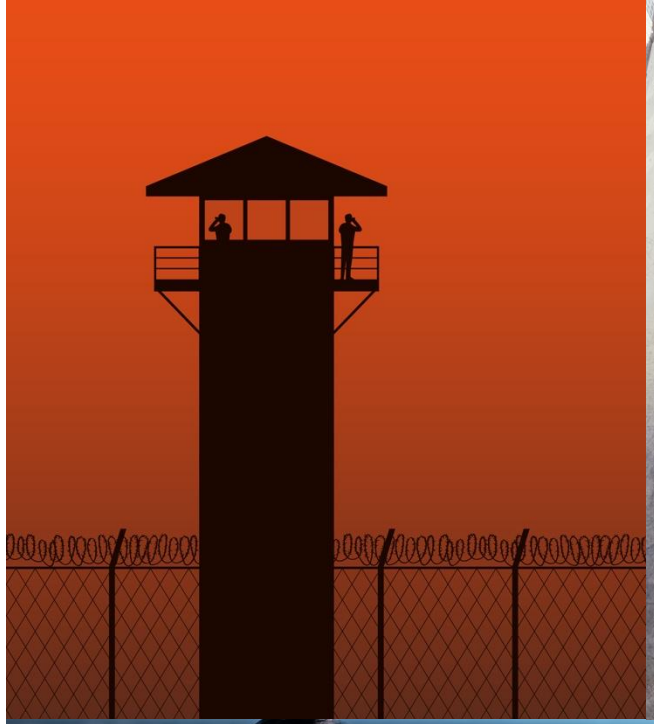


Defense & Intelligence "First Indication"

The global daily coverage offered by the EarthDaily constellation data will offer a strategic capability for automated analytics to detect threats, movement of forces, military assets, and infrastructure changes

Changes, anomalies, & patterns for objects of interest can be automatically detected daily by their features and spectral “fingerprints”. This capability allows analysts to track movements, analyze suspicious patterns, and identify anomalous behaviour



Contact EarthDaily

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Headquarters
Canada
33 – 1055 Canada Pl
Vancouver, BC V6C 0C3
marketing@earthdaily.com
+1 778 658 0482

North America – Headquarters
United States
7365 Kirkwood Court N., Suite 150
Maple Grove, MN 55369

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Questions?

Everywhere, Everyday

Pete Round VP BD Defence and Intelligence

Peter.round@earthdaily.com

+44 (0) 7775 336023