



**REMOTE SENSING INSTRUMENTS**

ISO 9001 : 2015 Certified

## About RSI

- Remote Sensing Instruments (RSI) is the first generation Indian company in the field of Remote Sensing and GIS.
- Started in the year 1985 as an opto-mechanical manufacturing unit, under TOT from NRSC, Dept. of Space.
- With computers disrupting the industry, RSI ventured into software & related services, introduced and distributed ERDAS all over India.
- RSI is a long standing total solution provider in the field of GIS and Remote Sensing with successful execution of 700+ projects all around the world.



## 35 YEARS OF EXCELLENCE

### **RSI 1.0**

1985 -1989

RSI Started as an opto-mechanical manufacturing unit with technical collaboration of NRSC, Dept. of Space. RSI manufactured Multispectral Additive Colour Viewer, Colour Composite Printer and Light Tables for which RSI had Indian IP rights and has deployed these equipment in every state of India.

### **RSI 2.0**

1989 -2000

With computers and technology disrupting the industry, RSI introduced and sold ERDAS all over India and neighboring countries. Later a JV (ERDAS INDIA) between ERDAS Inc and RSI was formed in 2000. It was renamed to RSI SOFTECH in 2009, currently involved in development and distribution of various software/products.

### **RSI 3.0**

1992 -2000

With growing need for RS and GIS related services in India, RSI started a new vertical which provide consultancy services like Digitization, GIS, Image Processing, Resource Mapping, etc. RSI also distributed GIS and RS related hardware.

### **RSI 4.0**

2000 -2018

RSI Service vertical further diversified into Urban Mapping, Large Scale Mapping using HRS/AP, Survey/Mapping (LiDAR, Drone, GPR, GPS, DGPS, ETS), Photogrammetry, GIS application development, Mineral Exploration, Monitoring and Evaluation, Town Planning, Satellite Data Sales, etc.

### **RSI 5.0**

2018 - Present

With new age technology making life much easier, RSI is focused to execute world class projects with help of revolutionary Machine learning, Deep learning and Artificial Intelligence technologies.

# EXPERTISE





EarthDaily  
analytics

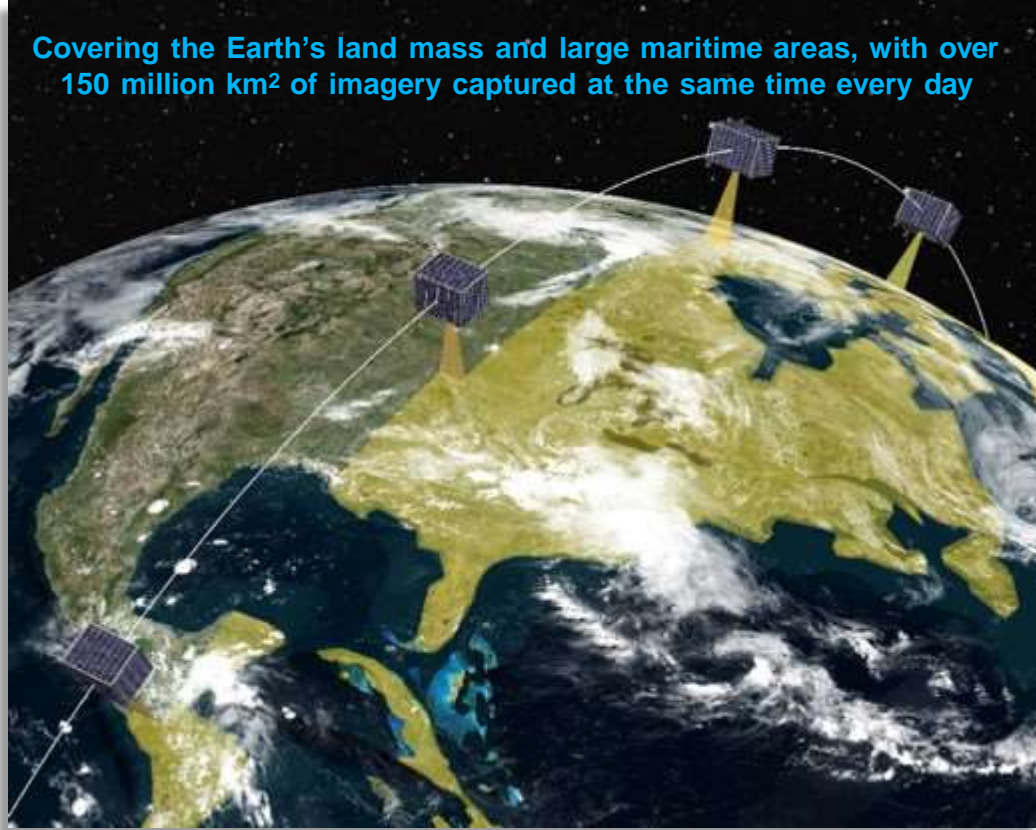


# EarthDaily Satellite Constellation

*Commercial Confidential*

# The EarthDaily Superspectral Satellite Constellation

Covering the Earth's land mass and large maritime areas, with over 150 million km<sup>2</sup> of imagery captured at the same time every day



In 2024, Vancouver-based EarthDaily Analytics will launch and operate the world's first satellite constellation capable of imaging the entire world, every single day, in an unprecedented 22 spectral bands:

- Rigorous scientific-quality imagery: high radiometric accuracy, high SNR, continuously cross-calibrated with Sentinel-2 (the gold standard science imaging mission)
- The world's first EO system designed, from the ground-up, to power machine-learning and *daily* artificial intelligence-ready geoanalytics applications and predictive analytics alerting—*on a global scale*

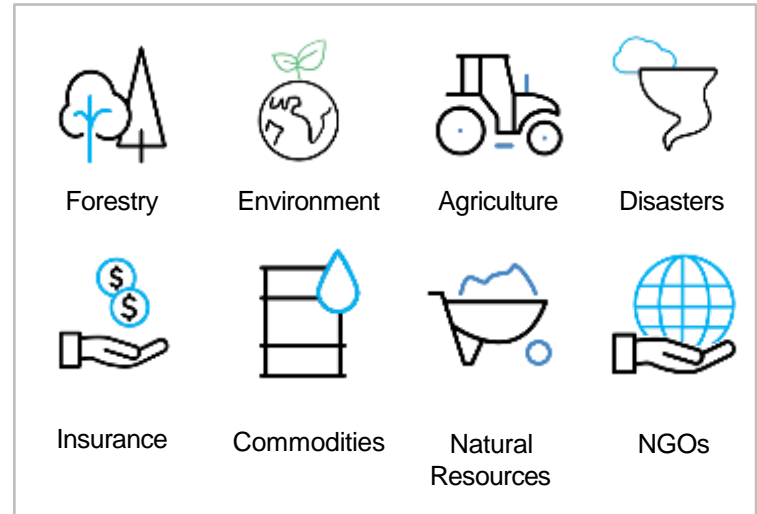
# Company Introduction

- EarthDaily Analytics Corp. (EDA)
  - Formed in early 2021 by Antarctica (NY Private Equity) from UrtheCast restructuring and recapitalization
- Current services businesses:
  - Provider of satellite imaging, data processing, and analytics for our customers in the Agriculture industry through our [Geosys](#) (“EarthDaily Agro”) division
  - Provider of highly calibrated scientific quality image data processing services through our ground-breaking, fully cloud native [EarthPipeline](#)
- In late 2023 and 2024, EarthDaily Analytics will launch the [EarthDaily Constellation](#), the world’s first earth observation system designed from the ground-up to produce scientific-quality imagery of the entire planet every day.
  - *Construction of the constellation began in September 2021*

# A Pressing Need for Global Monitoring

Many of the greatest challenges that the world faces require **high-cadence, scientific-quality satellite and AI-derived monitoring, change detection alerting, and predictive analytics, at scale:**

- Food security and farm soil protection
- Water optimization
- Climate change and carbon trading
- Deforestation of tropical rain forests
- Habitat protection
- ESG reporting and corporate accountability
- Disaster response
- National and allied security





# The Problem: Current Systems are Inadequate

Today's optical imaging satellite missions fall into three main categories:

## 1. Commercial high resolution and high-quality systems

- ✓ Useful for analytics, good revisit for small areas
- ✗ Do not offer broad-area coverage



## 2. Small/cheap “mini sat” and “micro sat” constellations

- ✓ Offer good coverage and revisit
- ✗ Produce poor-quality data and poor derived analytics



## 3. Government scientific satellite missions

- ✓ Offer high-quality that supports analytics
- ✗ Have limited revisit and coverage and poor cust. service



***None of today's satellite systems are fit-for-purpose for large scale, scientific-quality change detection***

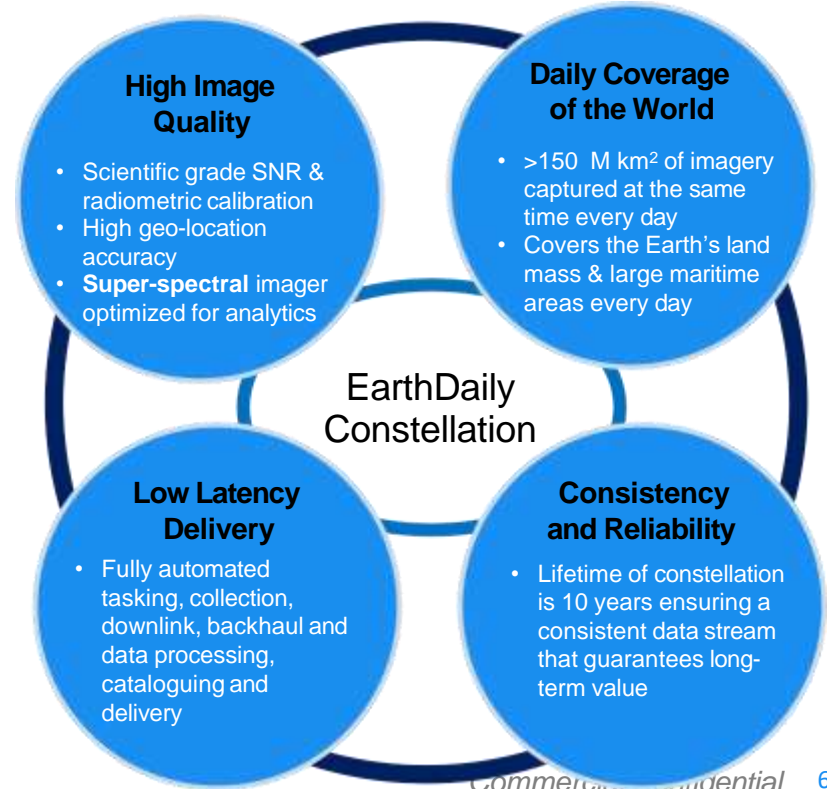
# The Solution: the EarthDaily Satellite Constellation

The world's first **super-spectral satellite** system with **daily global coverage & optimized for AI/ML applications** with unprecedented change detection capabilities

10 satellites (includes 1 in-orbit spare) image the world every day at 5 m GSD and with 22 spectral bands covering key wavelengths for analytics: Visible-NIR, SWIR & MWIR-Thermal

World-leading cloud-native ground processing system called the "**EarthPipeline**" uses proprietary IP to generate ultra-high quality "Analysis-Ready" image products & value added products in a fully automated manner – **built for huge scale and low-cost operations**

Image products support "direct-to-algorithm" enterprise grade applications utilizing AI and ML and require no humans in the loop



# EarthDaily has Unique Competitive Advantages

Key Business and Performance Metrics		SCIENCE MISSIONS		HGH RES MISSIONS	SMALL SAT MISSIONS		EarthDaily
		Sentinel-2	Landsat	MAXAR & AIRBUS	SuperDove (Planet)	Satellogic	
COVERAGE	Daily Coverage of nearly all of Earth's Land Masses	✗	✗	✗		✗	
	High Data Quality (Radiometric & Geometric Accuracy, High SNR)				✗	✗	
DATA QUALITY	GSD for VNIR data is < 5m	✗	✗				
	Visible & NIR bands						
	SWIR and Thermal Bands	✗		✗	✗	✗	
SERVICE	Automated Data Processing (Low cost and latency, high scalability)	✗	✗			✗	
	Commercial Delivery (SLA, ease of data access)	✗	✗				
	Long Term Data Supply (10 yrs)				✗	✗	

# The EarthDaily System is Fully Vertically-Integrated

## Upstream: Data Capture



### 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

## Midstream: Cloud Processing & Platform



### 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

## Downstream: Analytics Products & Services



### Value-Added Products:

- Automated generation of info products:
  - Cloud Free Analysis Ready Mosaics
  - Dynamic Land Cover Maps
  - Land Health (e.g., Crop Health Status)

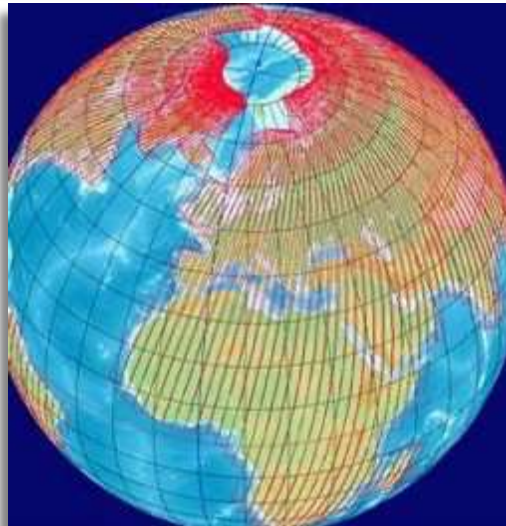
### Big Data Analytics Services:

- 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



# Uniquely Optimized for Geoanalytics at Scale

- ✓ Spectral bands optimized for geoanalytics and cross-calibration with other sensors (e.g., Sentinel-2)
- ✓ High SNR for geoanalytics
- ✓ Ultra-stable spacecraft pointing system and precise orbit control enabling high geo-location accuracy
- ✓ Wide swath enabling improved calibration
- ✓ Integrated and highly automated cloud-based processing and calibration system
- ✓ Highly accurate cloud masks to allow direct use in machine learning and AI algorithms
- ✓ State-of-the-Art “Geoanalytics Infrastructure” at scale



High radiometric accuracy with continuous cross-calibrated with Sentinel-2 (same orbit)

**Radiometric Accuracy < 5%**

Ultra-stable spacecraft pointing system and precise orbit control enabling high geo-location accuracy

**Geolocation < 6m RMSE**

22 TB data stream pipelined on the cloud within hours

**Nominally delivered in under 12 hours enabling rapid actionable response (through much faster delivery is available)**

Long-duration of service (10 years mission life)

# World-Class Industrial Team Creating Scientific Class Satellites for True Enterprise Grade Change Detection and Analytics

## Camera optical systems, and payload integrator

Previously developed world-class government science instruments



Primary Cameras

## Pre-Launch Camera Calibration and Characterization

Top Tier Physicists with extensive pre-launch calibration experience for science missions

## Satellite, Launch, Satellite Control System and Operations

Disruptive systems integrator with a successful track record on multiple missions



## Provides the OneWeb bus under contract to Loft Orbital

Established satellite bus provider with deep industry experience



OneWeb satellite

## Payload electronics for all camera systems

Proven track record of electronics delivery for space missions

## Thermal camera using proprietary microbolometer detector

World-leader in innovative thermal cameras

**EarthDaily payload procurement contracts in Quebec total approximately \$60M**

Commercial Confidential

# The EarthDaily Satellites

The EarthDaily Constellation has 10 satellites, equi-spaced around a sun-synchronous orbit with a 10:30 a.m. equator crossing time.

Total Mass: 200 kg  
 Payload Mass: 74 kg  
 Spectral Bands: 22  
 Swath Width: 240 km  
 Power Generation: 500 W  
 Downlink Max Rate: 2 Gbps  
 Propulsion: Electric, 800 m/s

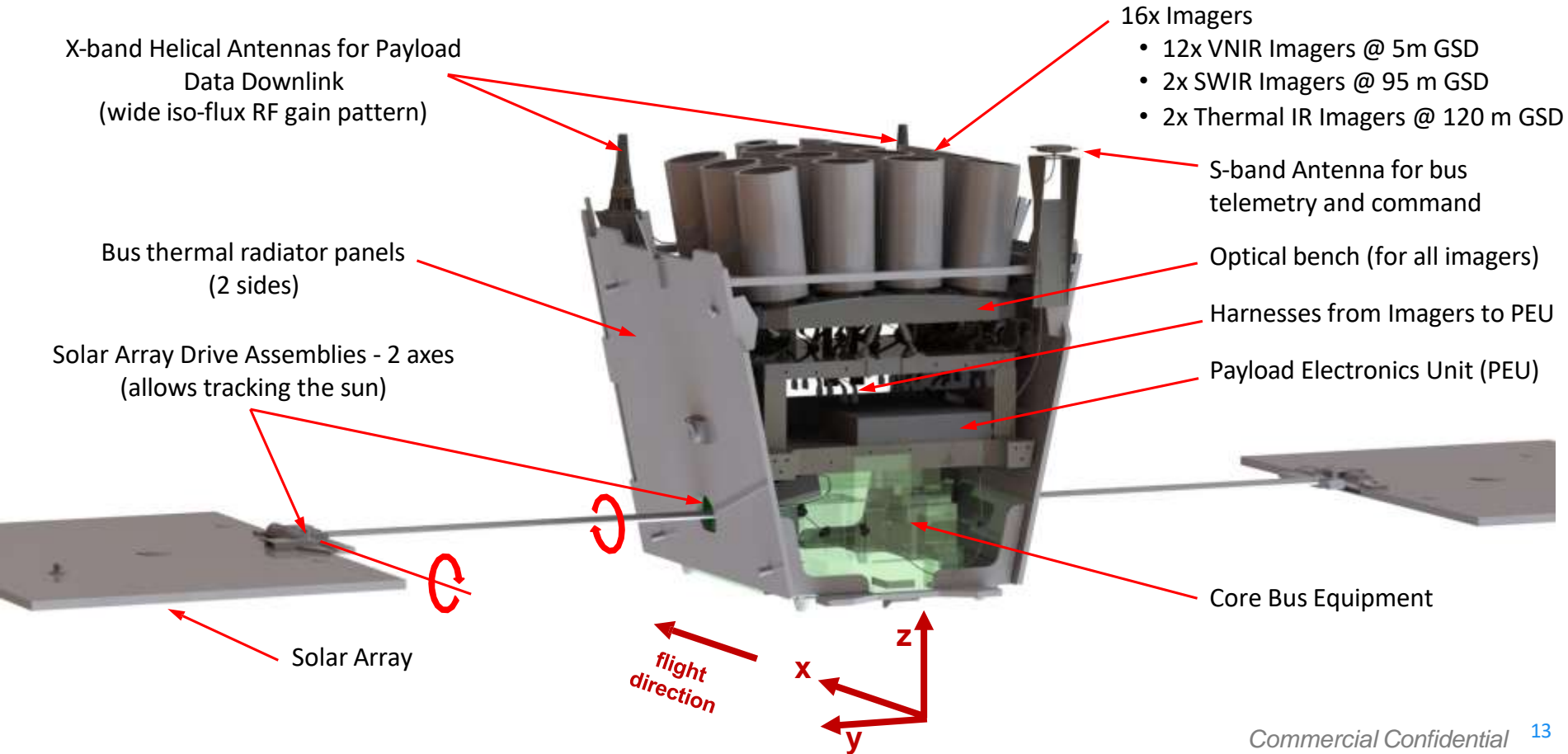


Visible	Near IR	Shortwave IR	Thermal IR
Aerosol 1	Red Edge 1	Water Vapour 2	Wildfire
Blue	Red Edge 2	Aerosol 2	Thermal 1
Turquoise	Red Edge 3	Cirrus	Thermal 2
Green	Near Infrared	Snow / Ice	Thermal 3
Yellow	Water Vapour 1	Methane Ref	Thermal 4
Red		Methane	

*Extensive pre-launch calibration campaign and continuous in-orbit cross calibration to government science satellites (e.g., Landsat-9 & Sentinel-2) will provide scientific grade quality*

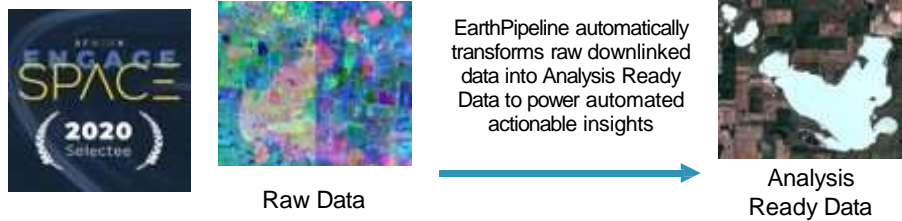


# Spacecraft Configuration



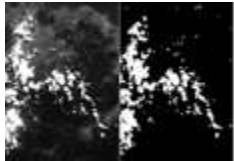
# EarthPipeline Applies the Latest Breakthroughs in Computer Vision & Machine Learning to Remote Sensing

## World's only Ground Segment Pipeline Software as a Service

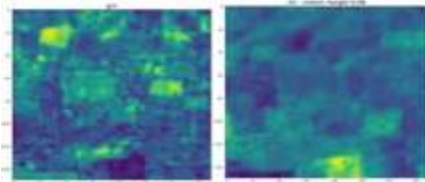


### Accurate Cloud Masking Driven by Deep Learning

Image    Cloud Mask









### Proprietary computer vision algorithms ensure high-quality band registration even for challenging scenes and spectral bands



- ✓ Automated Commissioning
- ✓ Calibration
- ✓ Image Processing
- ✓ Quality Assurance

## EarthPipeline Highlights

-  \$30M invested in over 8 years of development
-  Developed by team of experts who developed past world-class ground segments including the WorldView and RapidEye constellations
-  US DoD Space Challenge winner - selected as one of 26 technologies, out of ~800 space companies, that are expected to revolutionize the space industry
-  Validated by USGS representative (the leading US government remote sensing organization) – same reviewer who demonstrated large 100% error in Planet data
-  Showcased by MSFT and offered as validated SaaS solution within AWS
-  Backed by proprietary algorithms and several patents and leverages rigorous physical modelling and the latest advancements in computer vision and machine learning



# Scientific Quality is Key to Delivering Operational Decision Making

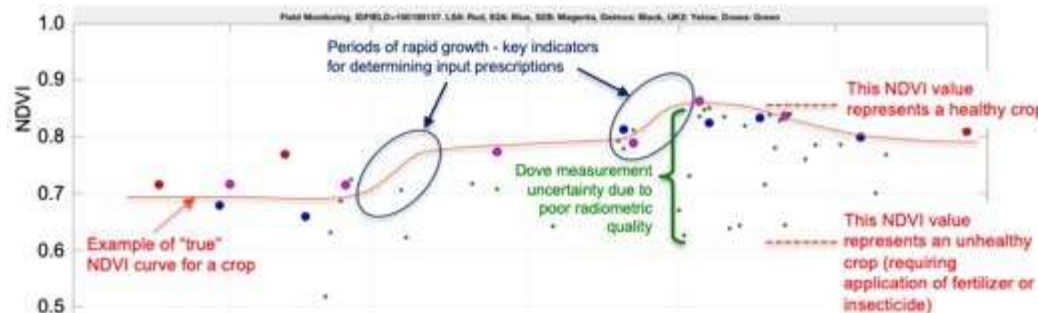
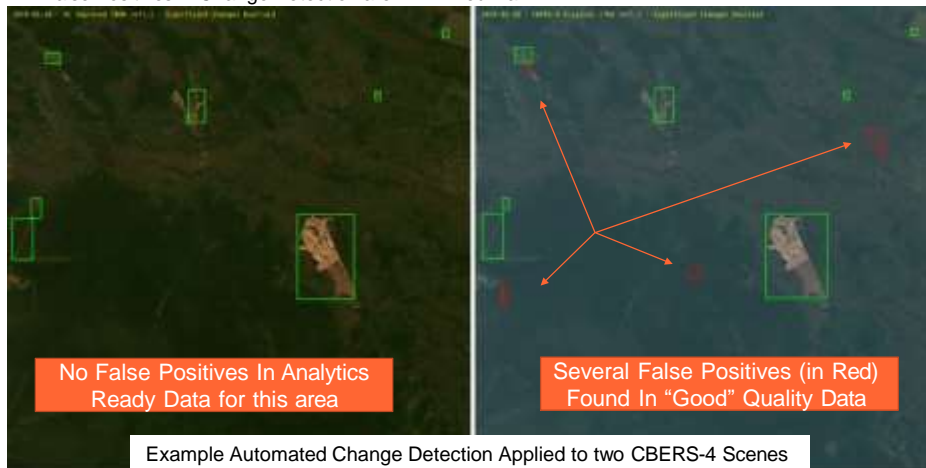
**Lack of scientific quality leads to many false positives** making automated change detection due to false positives

- "Analysis Ready Data" (ARD) is needed to extract insights

## ML/AI Driven Analytics needs ARD

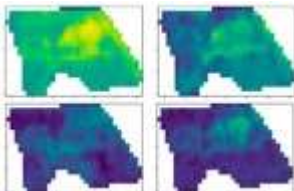
- Without ARD end users can spend 80% of their time normalizing data which is time consuming and not scalable
- Cannot see subtle changes without high quality data

False Positives in Change Detection are Minimized via ARD

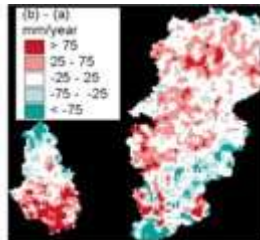




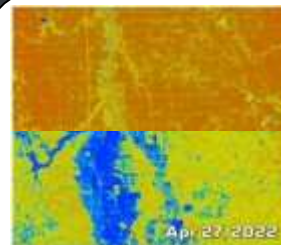
Forest  
Management



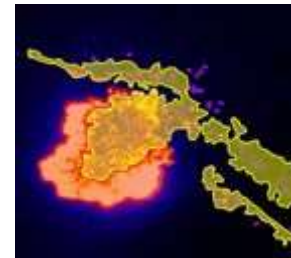
Agriculture



Water  
Management



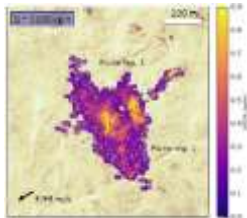
Disaster  
Response



Wildfires

# EarthDaily Constellation

*A Research and Policy Powerhouse for Managing Natural Systems*



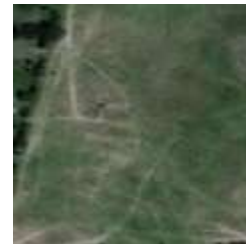
Climate  
Mitigation



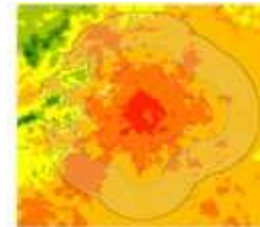
Development  
Oversite



Resource  
Development



Boarder  
Security

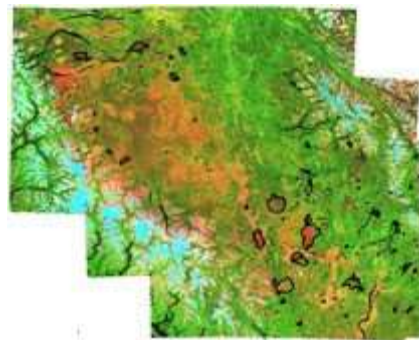


Urban Health  
and Well being

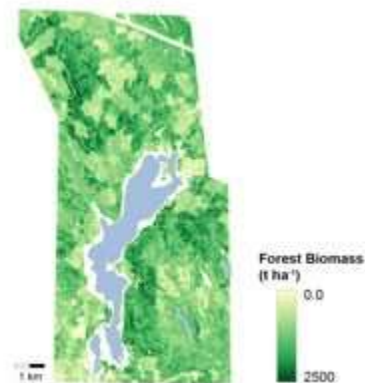
# Forest Management

- The whole value change of forest management improves with:
  - Improved temporal revisit for mosaics cloud free opportunities.
  - Improved spectral resolution to better discriminate different for forest inventories
  - Improved resolution for improved forest tracking accuracy.

- ### Regional Forest
- Identification
  - Classifications
  - Inventories



- Fire fuels inventory assessment
- Moisture mapping for fire risk

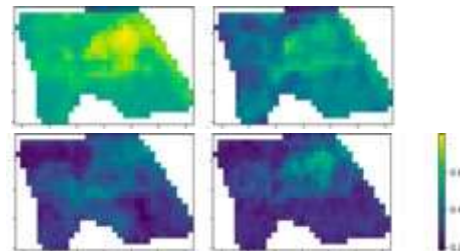


- Biomass
- Health
- Growth
- Change

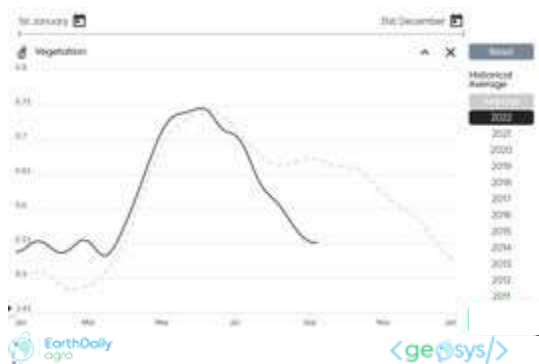
# Agriculture Time Series Data

- Practices Oversight,
- Food Security Insights,
- Research and Development,
- Water supply management

- Agriculture Practices,
- Managed Wetlands,
- Organic Carbon in soil

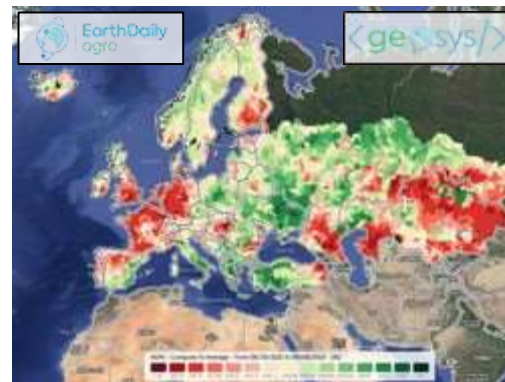


**Agriculture Carbon Management**



**Agriculture Data Time Series**  
(example from EDAGro)

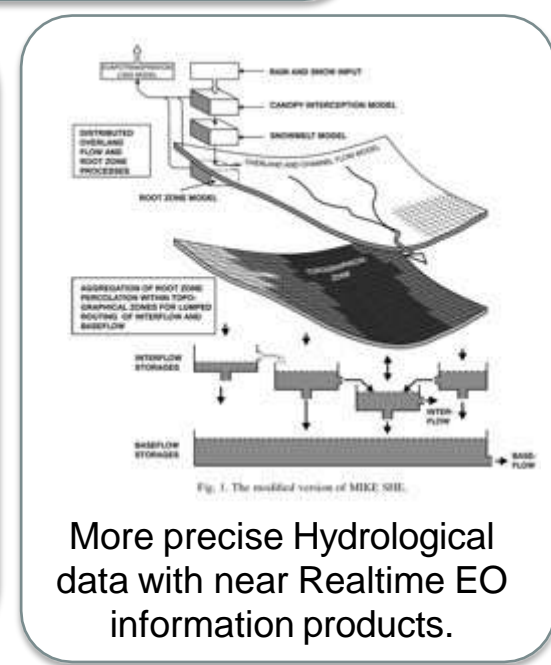
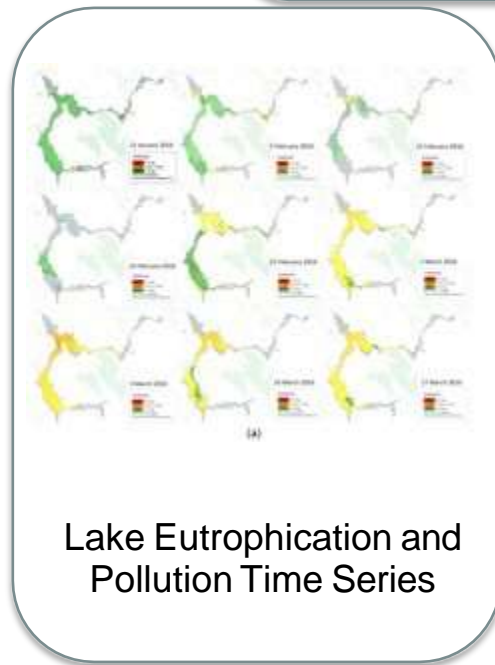
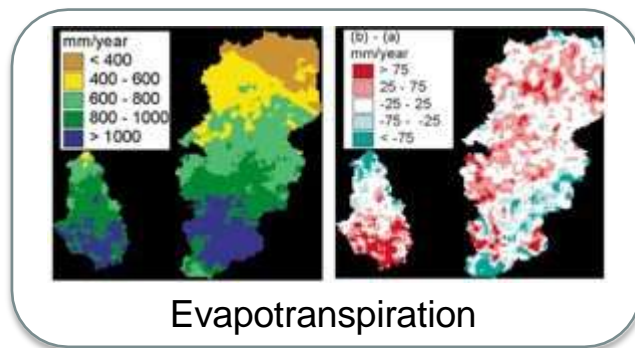
*EDAGro's 30 years of experience informs this mission for agriculture insights.*



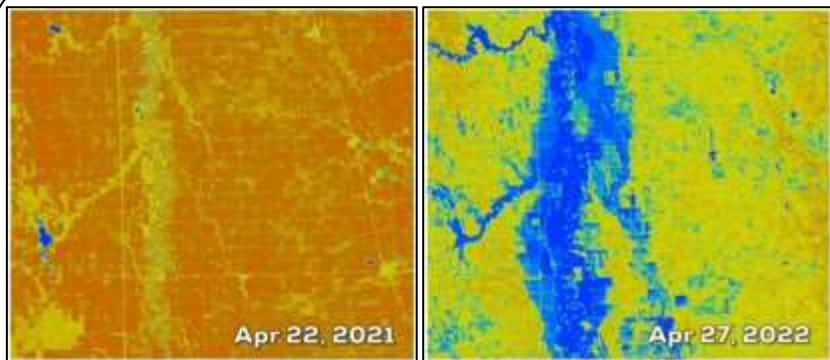
**National Scale Vegetation Vigor**  
(example from EDAGro)

# Water Management

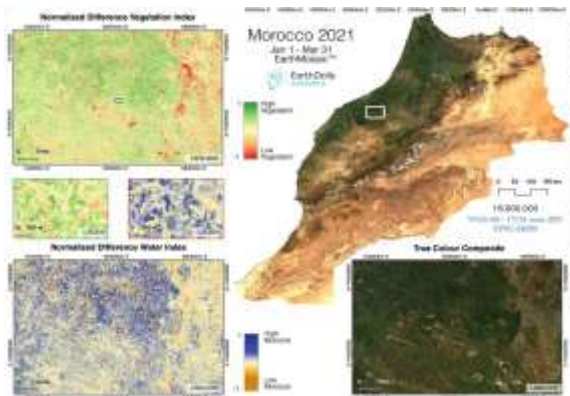
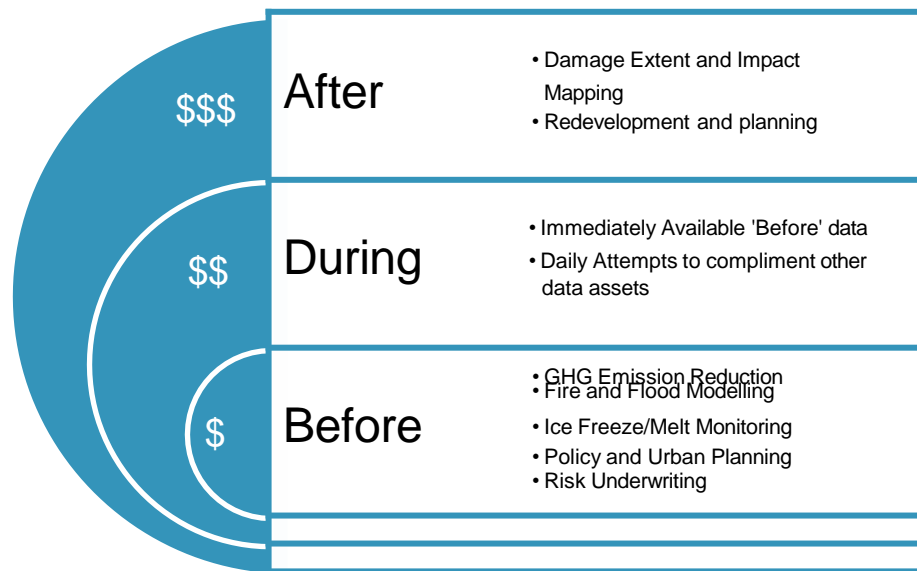
- Map Impervious Surfaces:
  - Reduce rainfall errors
  - Reduce model uncertainty
- Measure Leaf Area Index (LAI)
  - Improved hydrograph simulations
  - Evapotranspiration (Canopy Evaporation, Soil Evaporation)
- Water Health
  - Algae Blooms
  - Suspended Sediment
  - Industrial Runoff



# Disaster Response

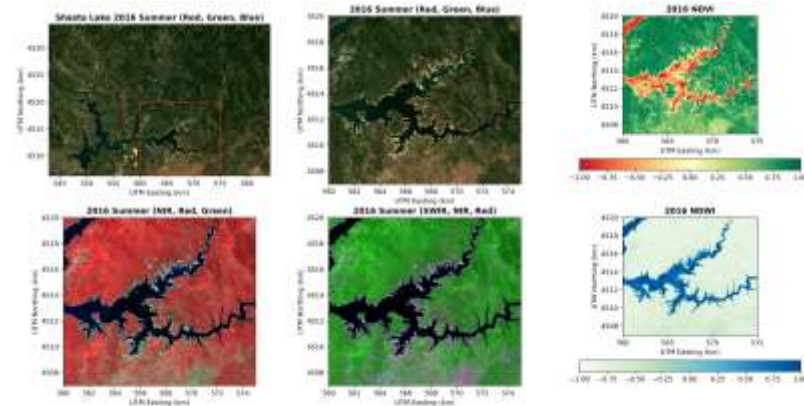


*Flood Extent (Red River Floods, USA)*



*National Seasonal Mapping For Mid-Term Impacts*

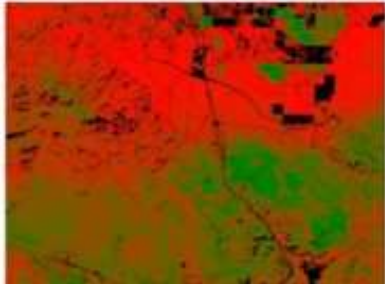
*(Optional EarthMosaics Products)*



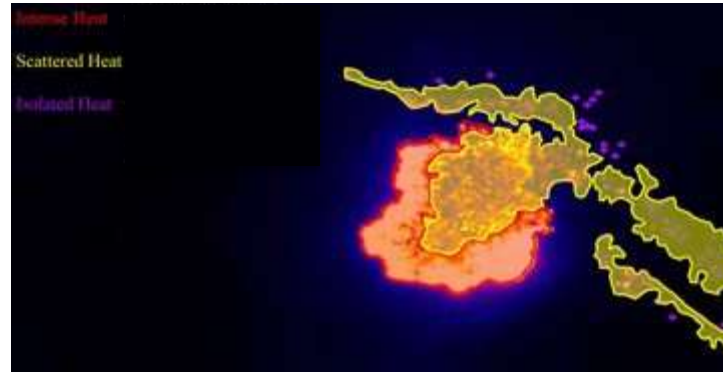


# Wildfire Management, Response, and Impacts

- 22 Spectral bands enable a holistic solution from a single platform at higher satellite resolution than currently available:
  - **Visible and Near-Infrared** for Plant health and phenology
  - **Shortwave Infrared** for fuels and deeper characterization
  - **Thermal Infrared** for fire radiative power



**Fire Management**  
*Fuels and Inventories*



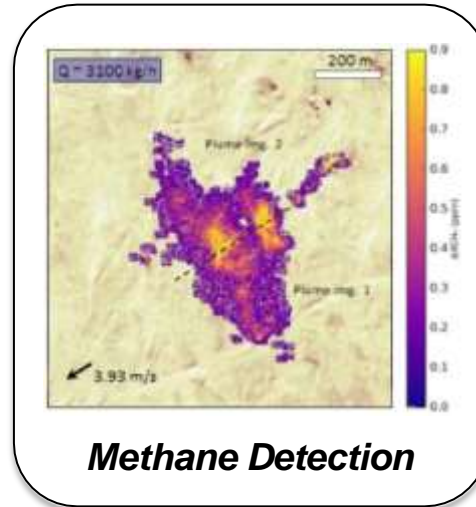
**Fire Response**



**Fire Impacts:**  
*Australia - 2020*

# Climate Change Mitigation and Environment Protection

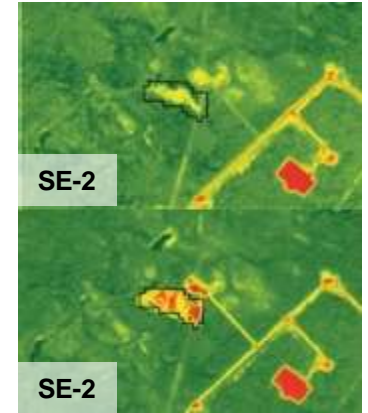
- Climate mitigation activities span industries, geographies, and can operate at country scale, making EDC ideally suited.
- EDC assists climate mitigation through supporting the reduction of GHGs Emissions:
  - Land-Use Landcover Change
  - Methane emissions
  - Forest Carbon
  - Agriculture Practices
  - Water Management
  - Environmental policy
  - Environmental auditing



*Land Cover Land Use*



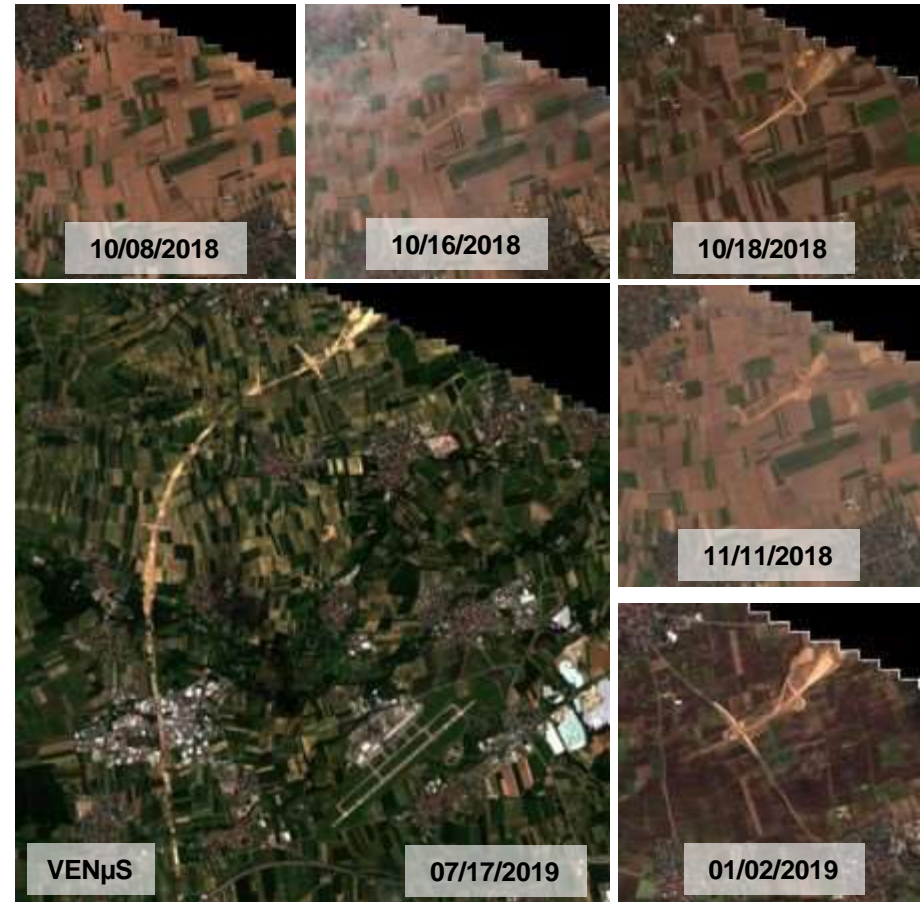
*Plant Health*



**Environmental Management**

# Development Oversight

- Complete coverage of capital projects in urban to remote locations.
- Daily progress updates and oversight
- Auditing execution of tasks such as land clearing



# Natural Resource Development and Monitoring

- Resource exploration through geology and mineral mapping, including plant/lichen characterization
- Resource extraction monitoring through local and regional plant phenology and health

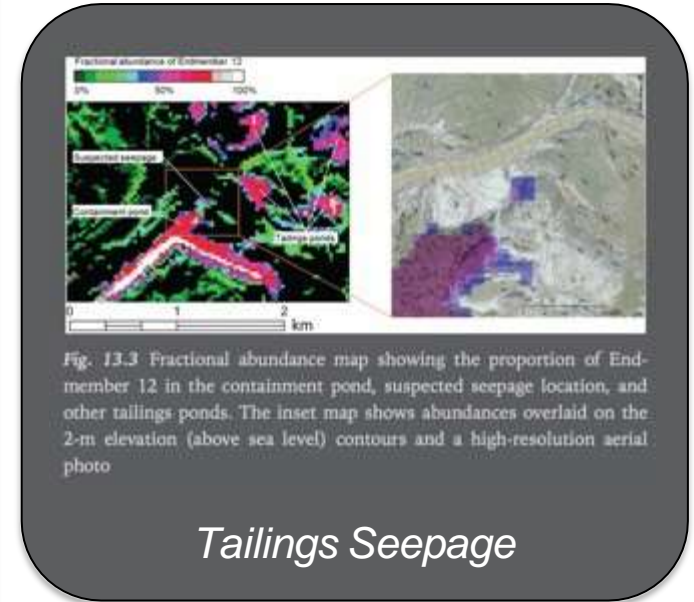


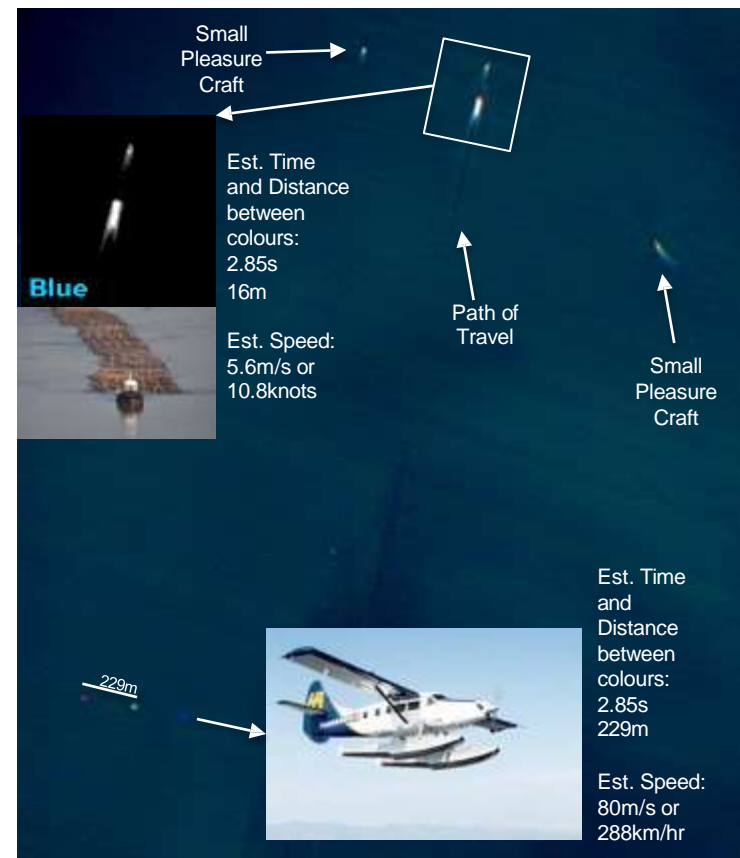
Fig. 13.3 Fractional abundance map showing the proportion of End-member 12 in the containment pond, suspected seepage location, and other tailings ponds. The inset map shows abundances overlaid on the 2-m elevation (above sea level) contours and a high-resolution aerial photo

# Border and Coastal Security

- Continuous Imaging of National Border
- Daily Change detection
- Identification of human activities
- Coastal ship characterization



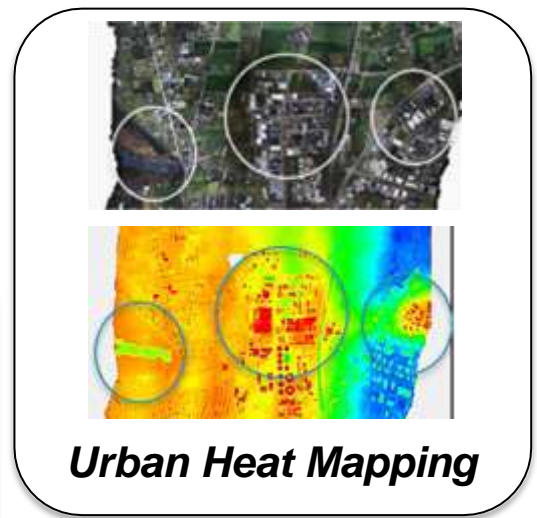
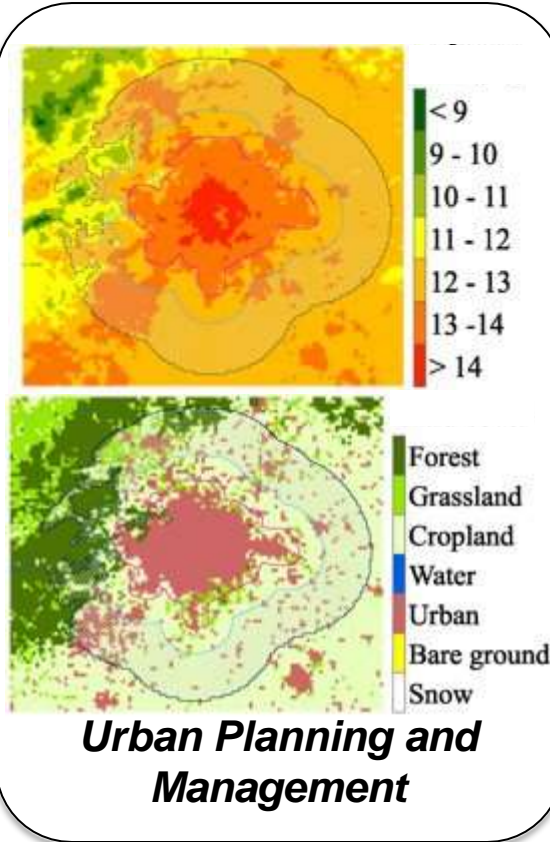
**Path  
Identification**



**Costal Activities**

# Urbanization Mapping and Heat Mapping

- Daily Monitoring in optical-thermal combinations enable regulators to make better and informed decisions through:
  - Green space management and Oversight
  - Urban heat impacts and change
  - Regulatory compliance (e.g. water usage)
  - Energy efficiency opportunities and outcome tracking (e.g. building heat loss)





Thank You