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SEEING THE UNSEEN

NASA CSDA Program Vendor Focus – Pixxel

23 July 2025

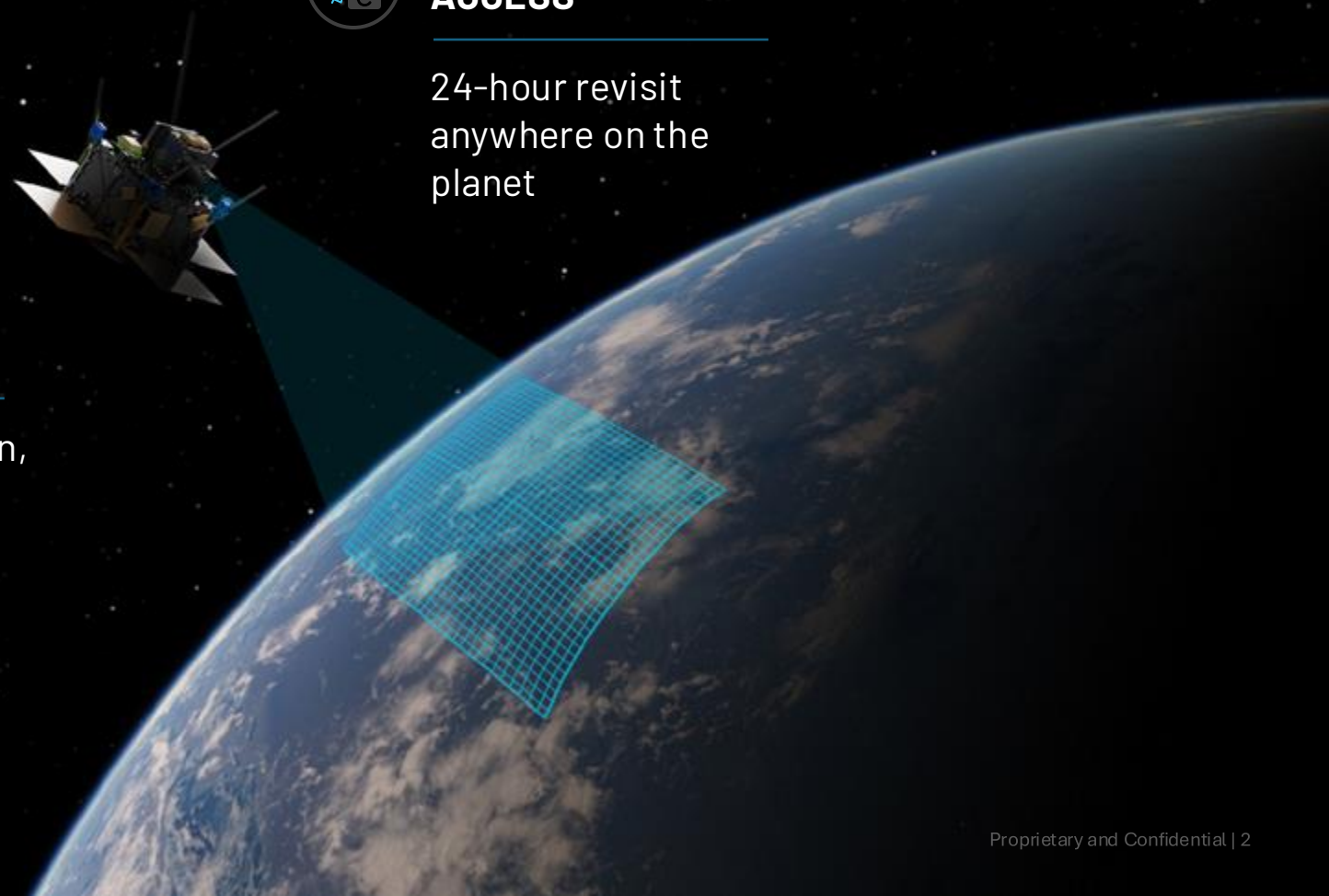
THE WORLD'S HIGHEST RESOLUTION HYPERSPECTRAL CONSTELLATION

COMPACT FORM FACTOR

50-150kg class of microsatellites

DAILY GLOBAL ACCESS

24-hour revisit anywhere on the planet



UNPRECEDENTED RESOLUTION

5M spatial resolution, Up to 250 bands

GLOBAL COVERAGE

Access to every part of the planet with 50X more information

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LAUNCH SCHEDULE

X1

JUNE 2021

TD-1
LAUNCHED
(30M VNIR)

X1

APR 2022

TD-2
LAUNCHED
(10M VNIR)

X1

NOV 2022

TD-3
LAUNCHED
(20M VNIR)

X6
VNIR

JAN – Q3 2025

3 LAUNCHED
3 PLANNED

X1

Q1 2026

HB-0
(8M VSWIR)

X18

2026-2027

18 SATELLITES
CONSTELLATION
COMPLETE
(VNIR + VSWIR)

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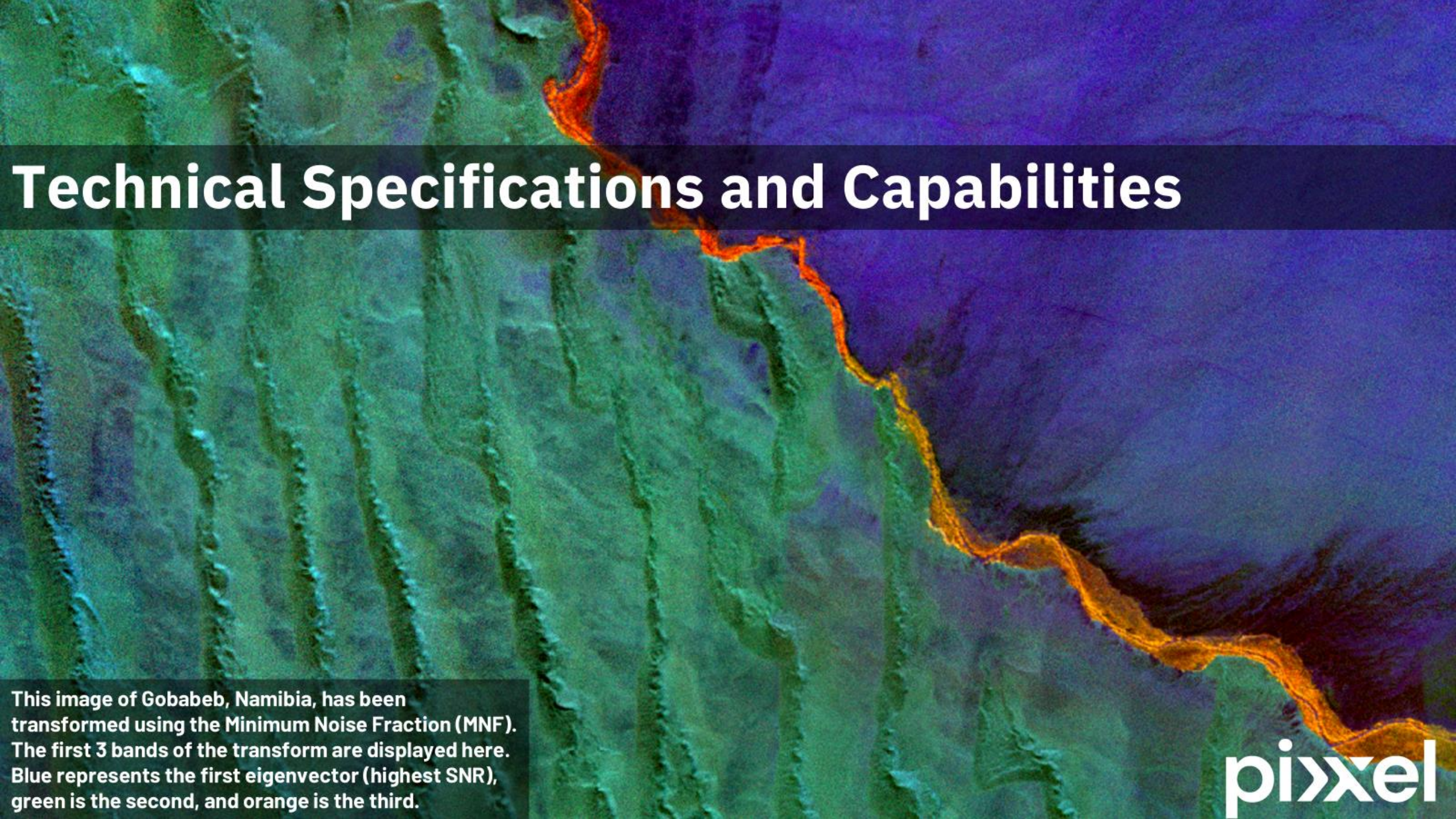
Technical Specifications and Capabilities



This image of Gobabeb, Namibia, has been transformed using the Minimum Noise Fraction (MNF). The first 3 bands of the transform are displayed here. Blue represents the first eigenvector (highest SNR), green is the second, and orange is the third.

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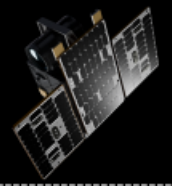
CONSTELLATION AND SENSOR OVERVIEW



FIREFLY

HONEYBEE

Total Sensors	12 satellites planned; 3 on orbit	6 satellites planned; 1st launch scheduled Q1 2026
Wavelength Range	470 - 900 nm (VNIR)	470 - 2500 nm (VSWIR)
Total Available Bands	135 bands	~150 VNIR, ~100 SWIR
Total Selectable Bands	45 bands	Total: 72, VNIR - 46, SWIR - 26
GSD	5.36 meters	5 meters
Swath*	40 km	10 km SWIR / 30 km VNIR
Orbit	Sun Synchronous Orbit (SSO), 97.65° inclination	Sun Synchronous Orbit (SSO), 97.45° inclination
Altitude	590 km	550 km (TBD)
Equator Crossing Time	10 - 11 AM	10 - 11 AM
Off-nadir Angle /Slew	+/- 30° (+/-20° recommended)	+/- 30° (+/-20° recommended)
Revisit Time	1 - 2 days (based on latitude)	1 - 4 days (based on latitude)
Cloud Cover Thresholds	<20%	<20%
Imagery Bit Depth	16 bit	16 bit

*Firefly nominal collects are 40 x 40km

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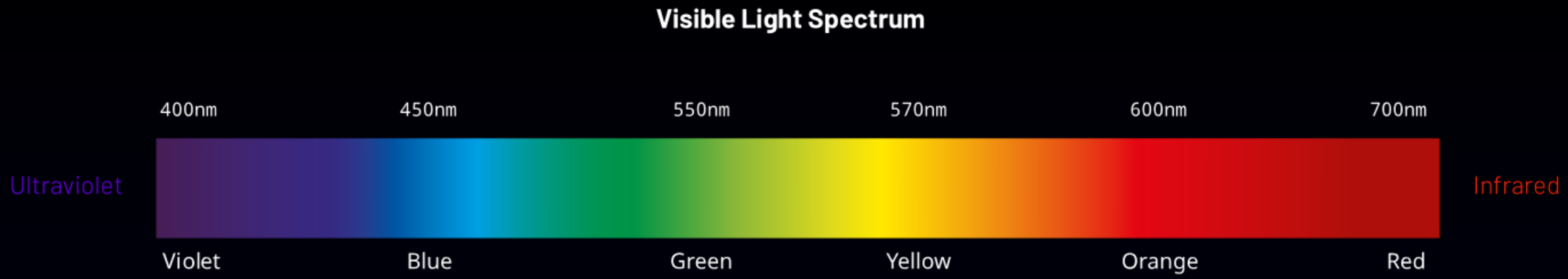
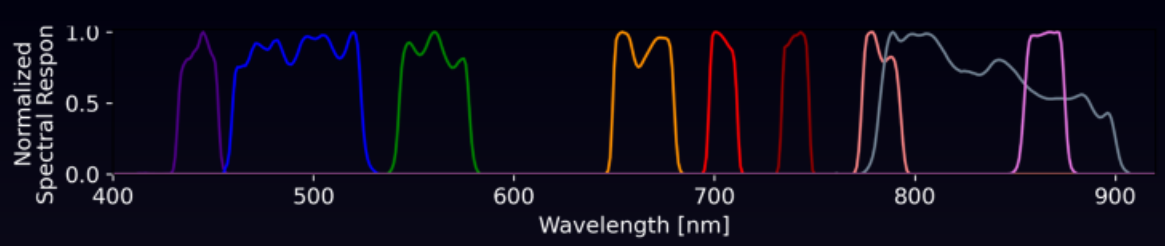
WHAT MAKES HYPERSPECTRAL SO SPECIAL?

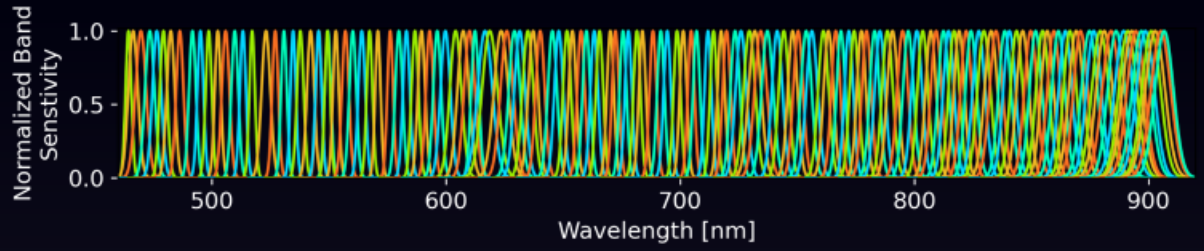
Hyperspectral imaging (HSI) is a technique that analyses a wide spectrum of light instead of just assigning primary colours (red, green, blue) to each pixel, effectively spectrally fingerprinting the Earth to provide more information on what is imaged.

WHAT IS HYPERSPECTRAL IMAGING?





Sentinel-2A Band Response



Pixxel's 5m HSI Band Response

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COMPARISON: SPECTRAL RESOLUTION

	FIREFLY			MULTISPECTRAL SATELLITE		
Colour	Range	Average Bandwidth	# of Bands	# of Bands	Range	Average Bandwidth
Blue	472 - 498 nm	3.8 nm	8	1	450 – 510 nm	60 nm
Green	501 - 567 nm	3.7 nm	20	1	510 - 580 nm	70 nm
Yellow/Orange	571 - 619 nm	5.0 nm	18	1	585 - 625 nm	40 nm
Red	622 - 696 nm	5.4 nm	24	1	630 - 690 nm	60 nm
Red-Edge	700 - 750 nm	4.7 nm	16	1	705 - 745 nm	40 nm
NIR	753 - 889 nm	6.9 nm	49	2	770 - 1040 nm	135 nm

FIREFLY DEFAULT SPECTRAL BAND COMBINATIONS

Developed by our hyperspectral scientists with a focus on selected applications

	VEGETATION	WATER	URBAN	TRANSITIONAL METAL	RARE EARTH ELEMENTS
Blue	4	2	4	7	3
Green	11	5	11	14	2
Yellow	-	1	-	6	8
Red	8	17	3	3	3
Red-Edge	16	14	-	11	6
NIR	4	6	27	4	23

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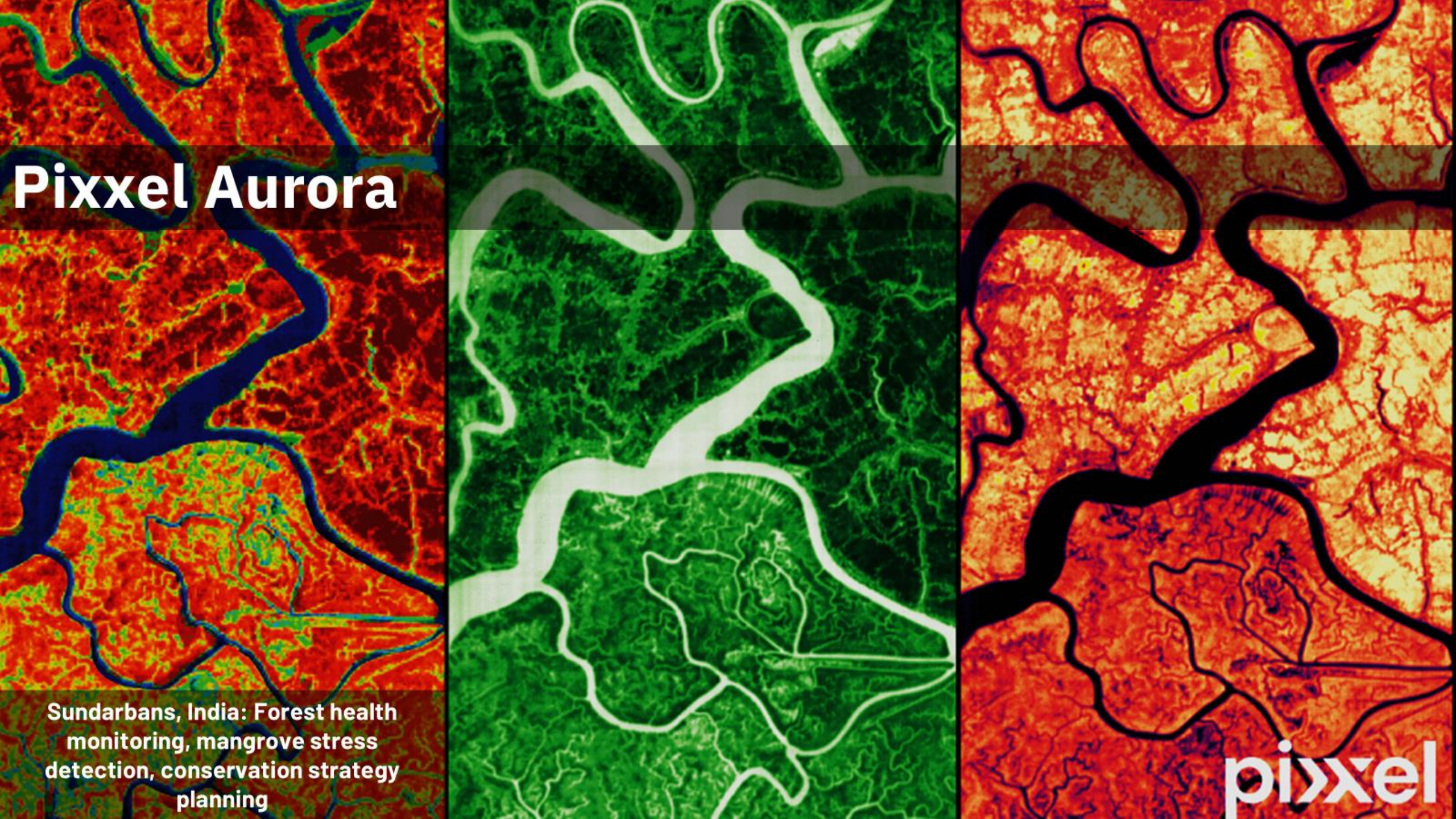
CSDA Data Availability

L2A	L1C
Bottom of Atmosphere (BOA) reflectance	Top of Atmosphere (TOA) reflectance
Radiometric corrected	Orthorectified (camera model and Copernicus DEM)
Atmospheric corrected	WGS84 projection
Geometric corrected	CE90 <5 meters
Remote Delivery	AWS, Azure, FTP, SFTP

Image file in geoTIFF | RGB thumbnail | footprint in geoJSON | ENVI header file | metadata XML


Pixxel Aurora
Sundarbans, India: Forest health monitoring, mangrove stress detection, conservation strategy planning
pixxel

AURORA OVERVIEW

01. Explore & Search

Draw or upload custom shapefile , search satellite imagery, and create AOI

02. Analytical Tools

50+ PRESET INDICES

Use preset indices like NDVI, NDWI etc.or Create custom indices. View composites and bands

03. Model Marketplace

Machine Learning and Statistics Models to use for deriving valuable information from an AOI

04. Insights & Workflows

Instantly generate automated key insights for your Area of Interest (AOI).

Split compare & Spectral graphs

Compare rasters in split view and Visualise changes of spectral data of different points on your Area of Interest (AOI).

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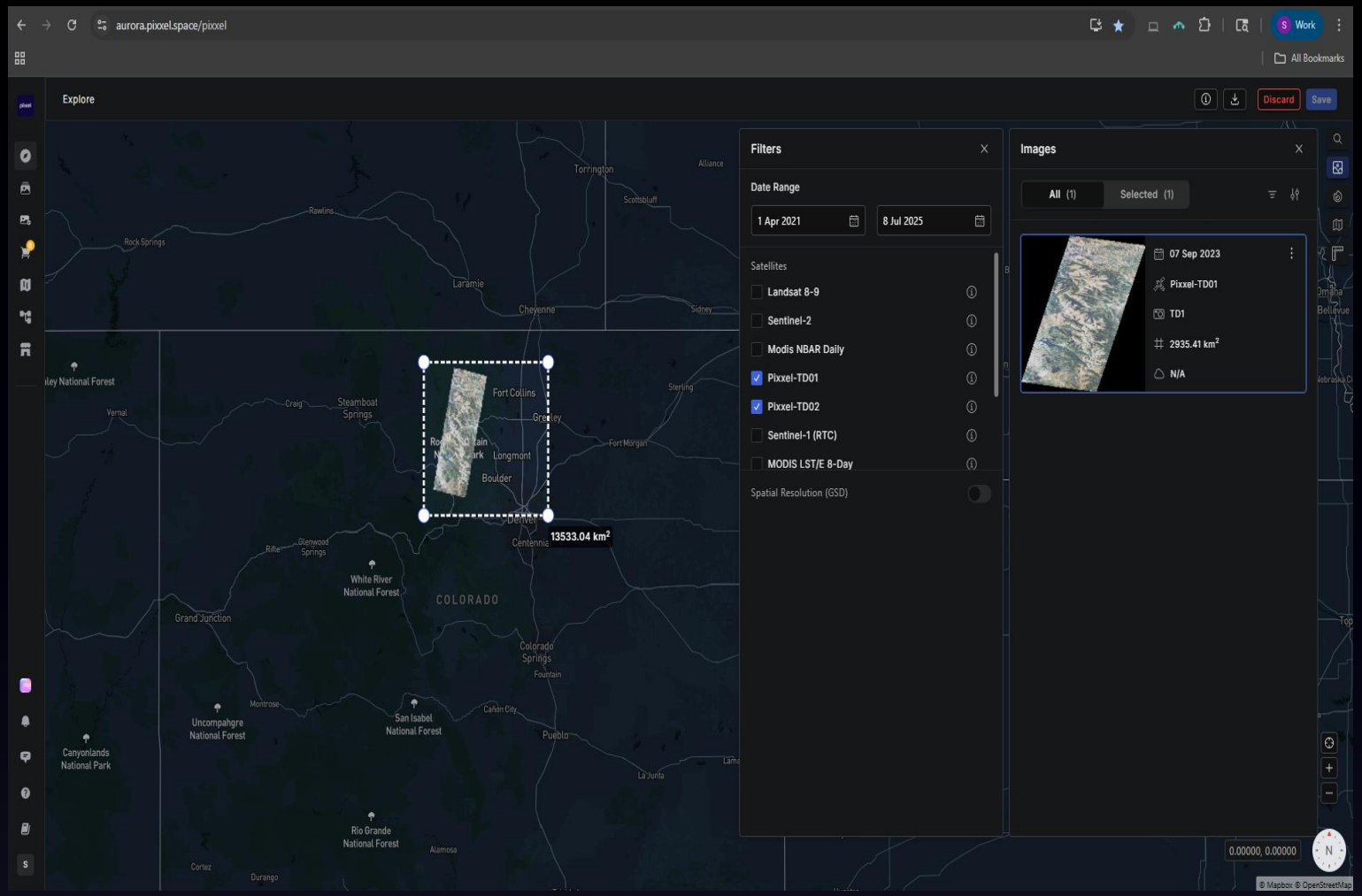
EXPLORE AND SEARCH

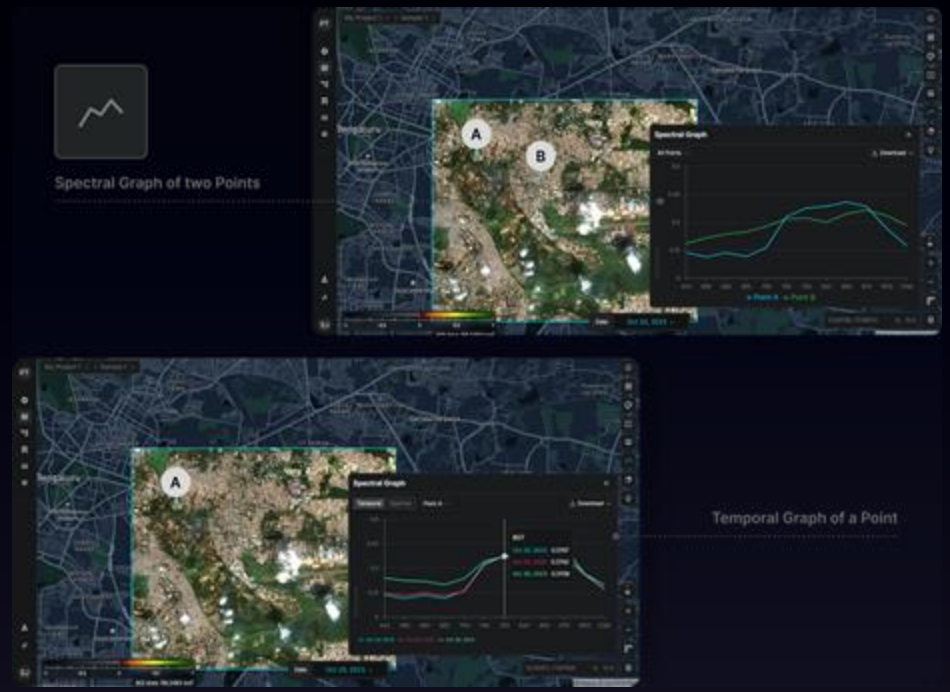
Accessible via URL, the Aurora Explore and Search function allows users to draw or upload custom shapefiles for tasking purposes, or search the catalog of previously captured images, including Pixxel data as well as data from other civil assets.



ANALYSIS

Aurora comes with over 50 preset indices, and enables creation of custom indices. Visualize and analyze data in Aurora the moment it's uploaded.

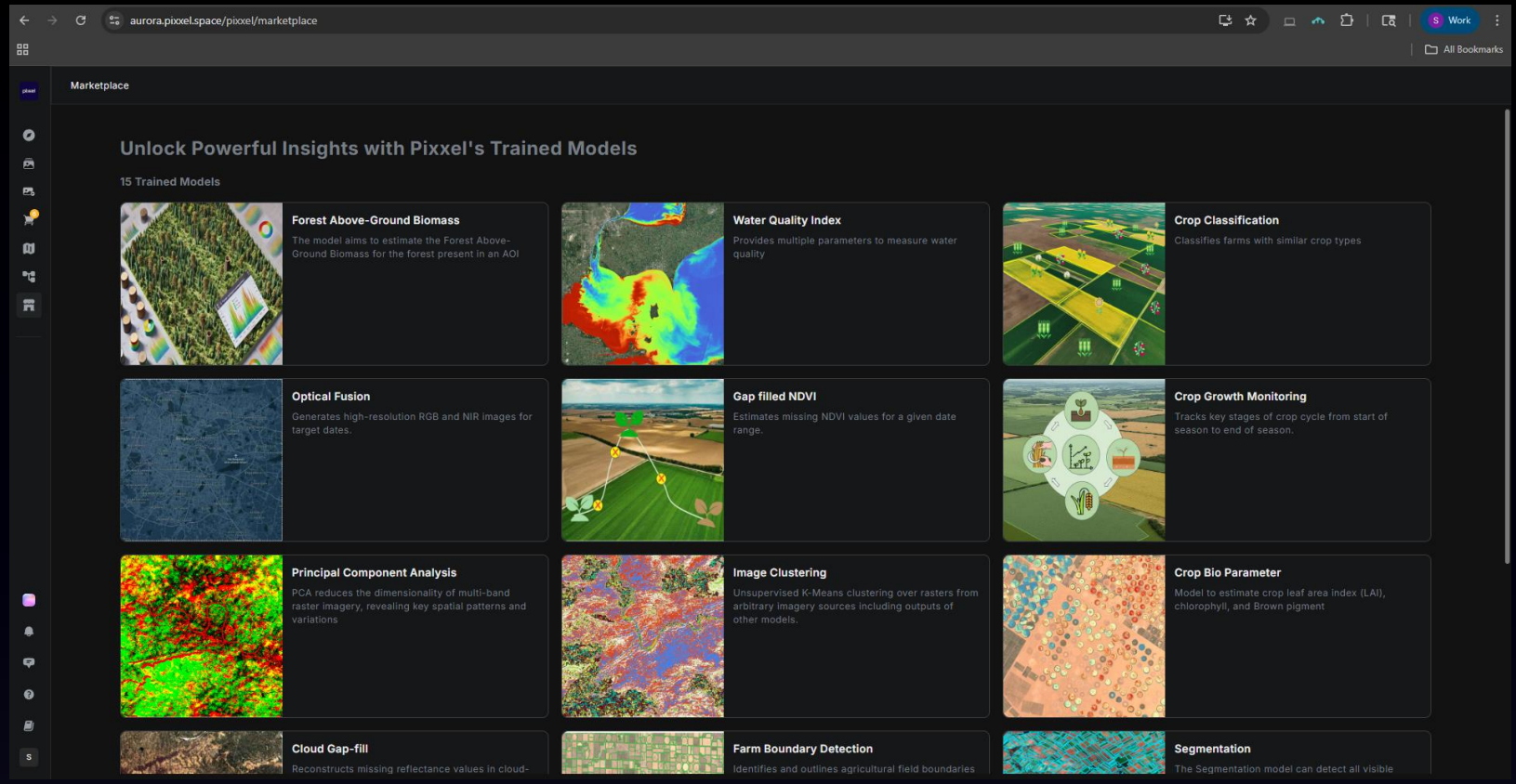
- Indices on Aurora: NDVI, NDWI, NDBI, VARI, NBRI, EVI2-2, SAVI, Rededge2 etc
- Split Compare: to compare 2 raster files in a split view
- Spectral Signature: Spectral Graph and Temporal Graph



MODEL MARKETPLACE

Aurora is the hub of Pixxel's in-house ML and statistical models enabling users to derive valuable information from their AOI.

Model Marketplace is a one-stop solution to find all the models available, as well as complementary documentation on how each model works.



WORKFLOWS

Visual Programming

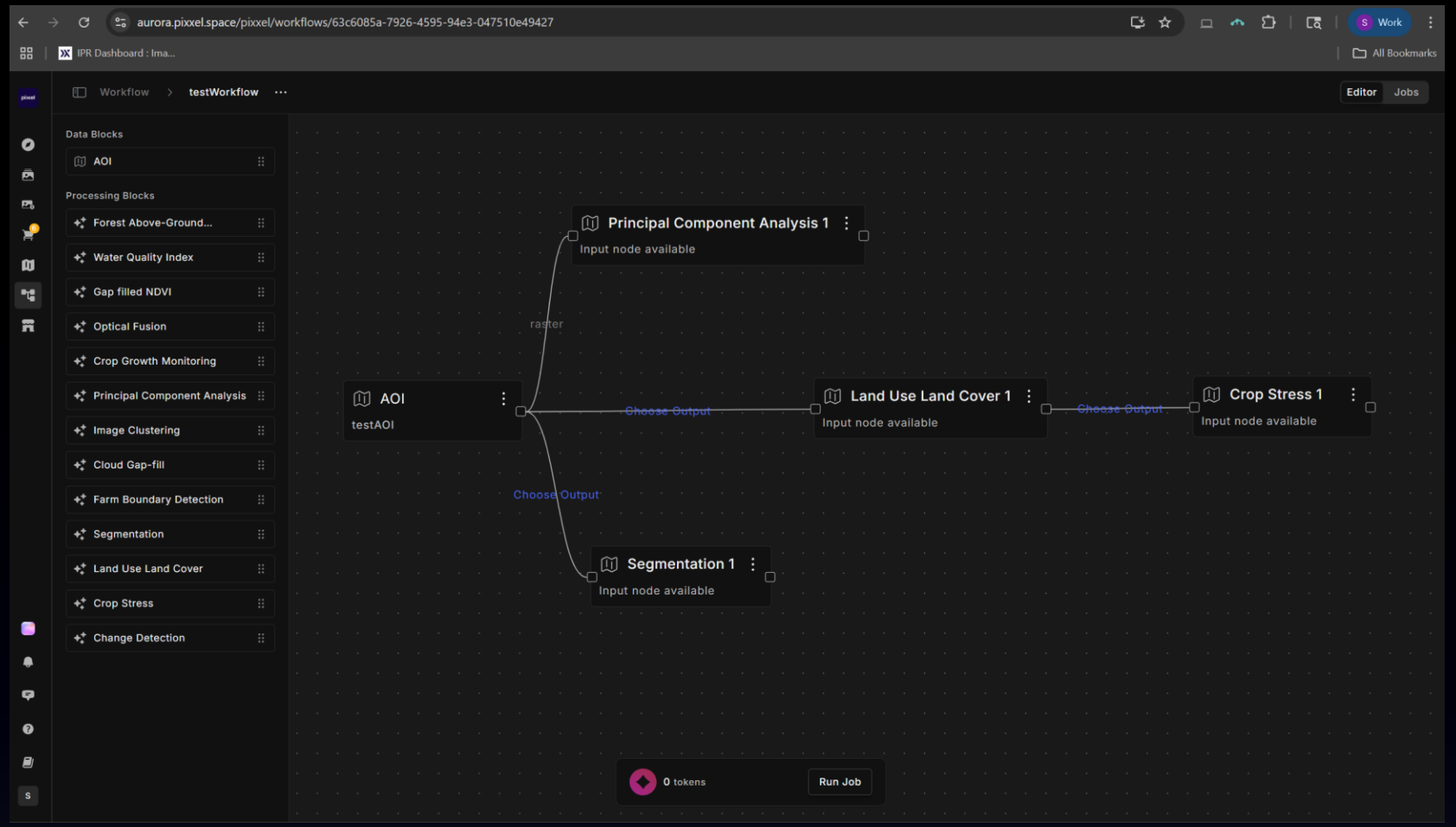
Aurora enables generation of custom workflows using simple block-based programming

Design your Workflow

Users can visually design an efficient process using data and processing blocks, streamlining the analysis of satellite images and AOI data.

Run and Get Output

Once the workflow is set up, users can run a job. Each job represents an instance of the workflow.



USER SERVICES

Saloum River Delta, Senegal: Coastline change detection, salinity level tracking, fishery resources protection

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HELP CENTER

https://support.pixxel.space

01 | Product Level Guides

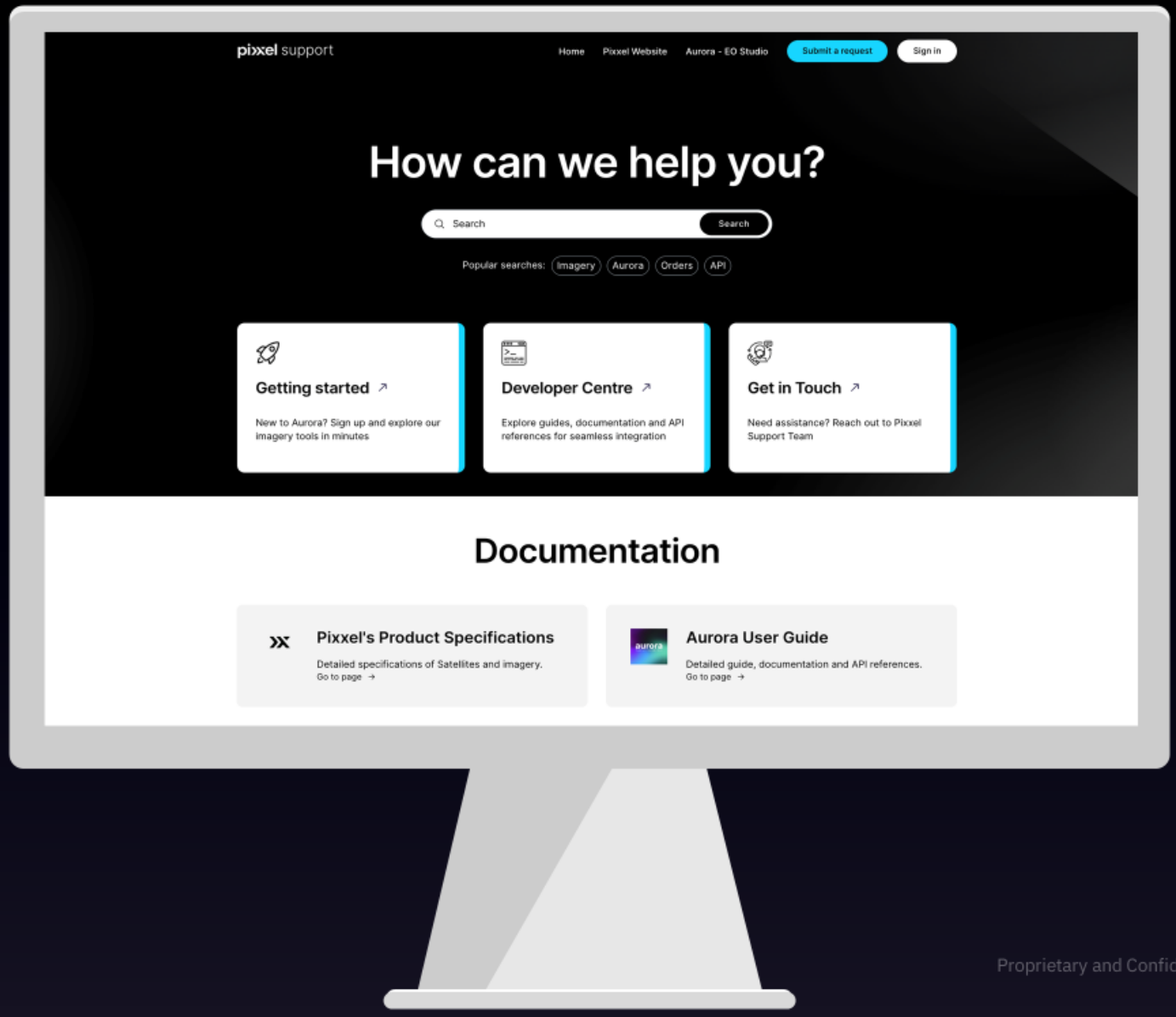
02 | HSI Basics

03 | Frequently Asked Questions (FAQ)

04 | Community Forum

05 | Contact Support

05 | Knowledge Base



SUPPORT PLANS

Plans	Basic	Standard	Premium
Pixxel Help Centre	✓	✓	✓
Email Support	✓ (24x5)	✓ (24x5)	✓ (24x7)
Chatbot, Phone Support and Whatsapp Support	✗	✓ (24x5)	✓ (24x7)
First Response and Status Update Frequency - Normal	First Response: 48 - 96 hours Business Hours Status Update: 48 - 96 hours Business Hours	First Response: 24 hours Business Hours Status Update: 48 hours Business Hours	First Response: 8 hours Business Hours Status Update: 24 hours Business Hours
First Response and Status Update Frequency - High	First Response: 48 - 96 hours Business Hours Status Update: 48 - 96 hours Business Hours	First Response: 24 hours Business Hours Status Update: 48 hours Business Hours	First Response: 8 hours Business Hours Status Update: 24 hours Business Hours
Designated Customer Success Manager	✗	✓	✓
Pricing	Free	✓	Contact Sales

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SCIENCE USE CASES AND APPLICATIONS

Ganga River Delta, India: Soil moisture monitoring and vegetation health

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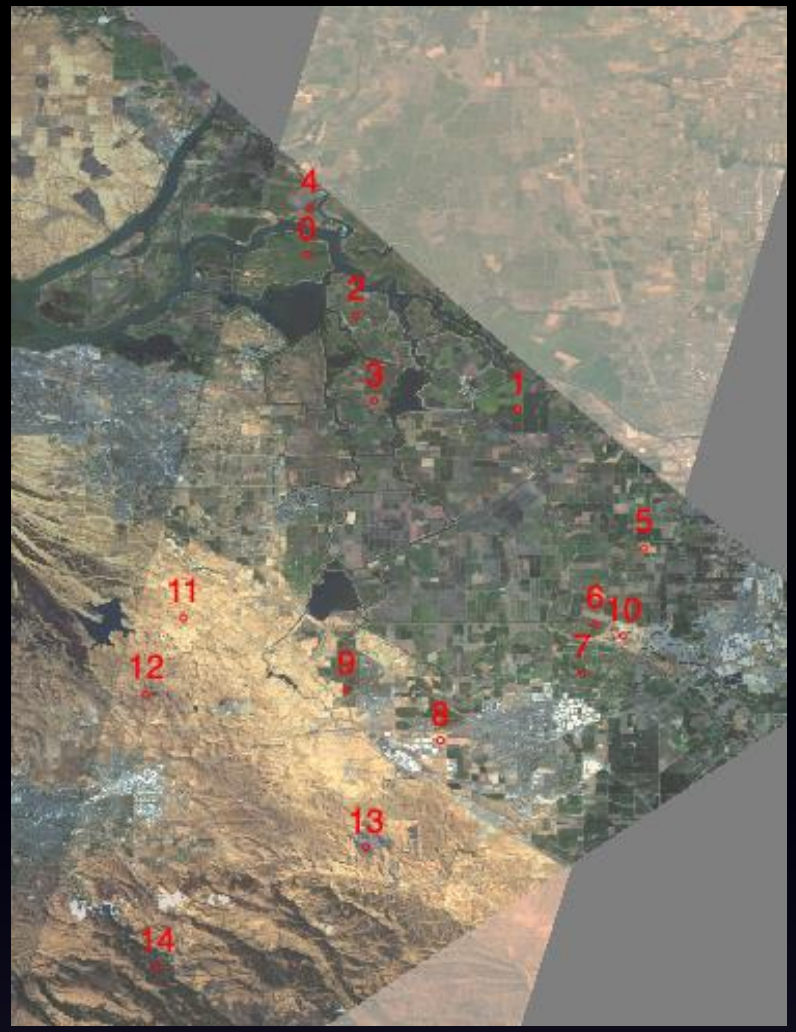
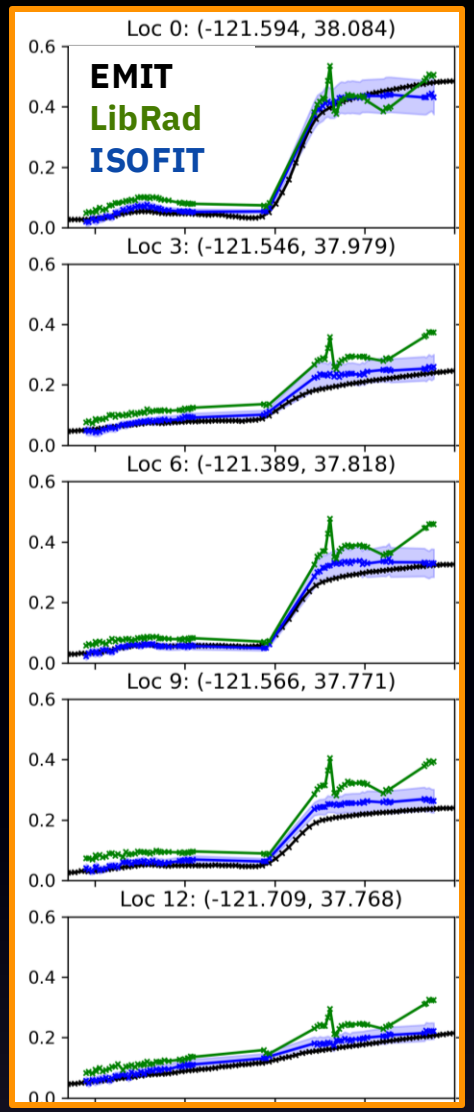
ATMOSPHERIC CORRECTION & NASA SYNERGY

Pixxel TD1 & EMIT Cross Calibration





- Pixxel leverages a modified implementation of NASA JPL's ISOFIT (Imaging Spectrometer Optimal Fit) atmospheric correction framework to generate accurate surface reflectance from Firefly radiance data.
- Transparent and reproducible processing steps
- Aligned with NASA calibration and validation standards, supporting robust cross-mission comparisons
- Builds on algorithms vetted and validated across EMIT, AVIRIS, and SBG campaigns
- Outputs are compatible with NASA hyperspectral data holdings, enabling seamless integration and co-analysis.

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APPLICATIONS
VEGETATION MONITORING

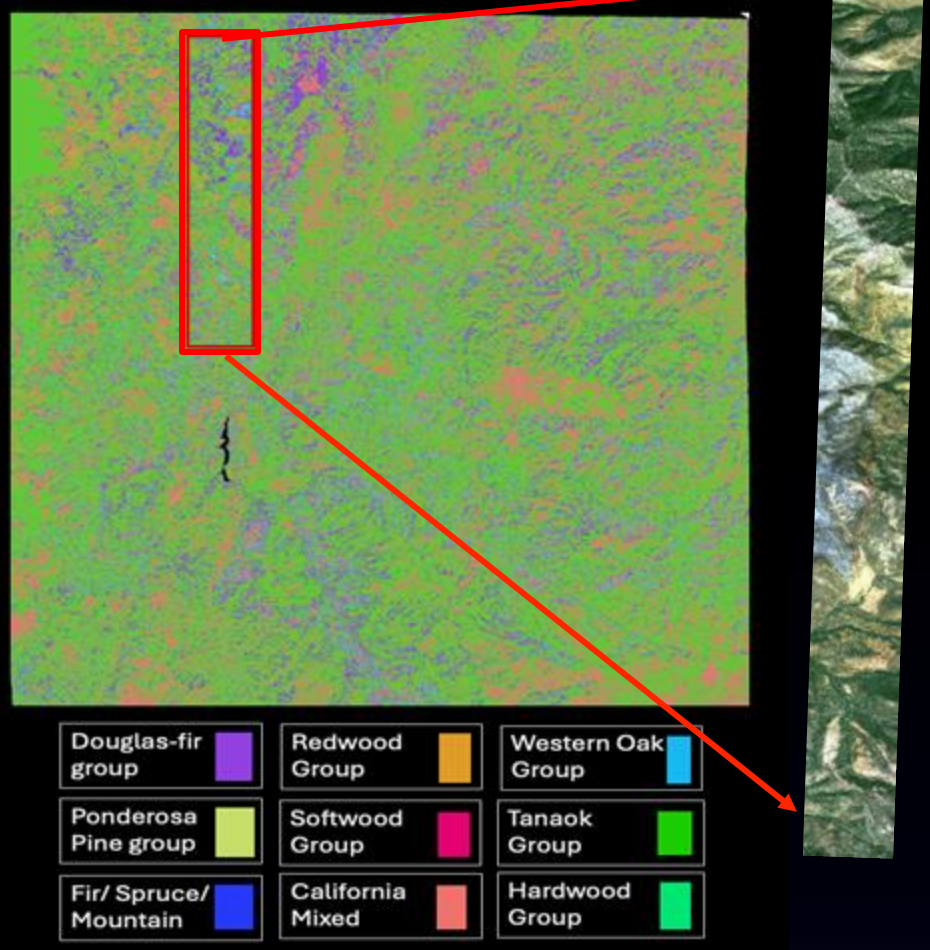
Crop Stress Monitoring

Pixxel TD1

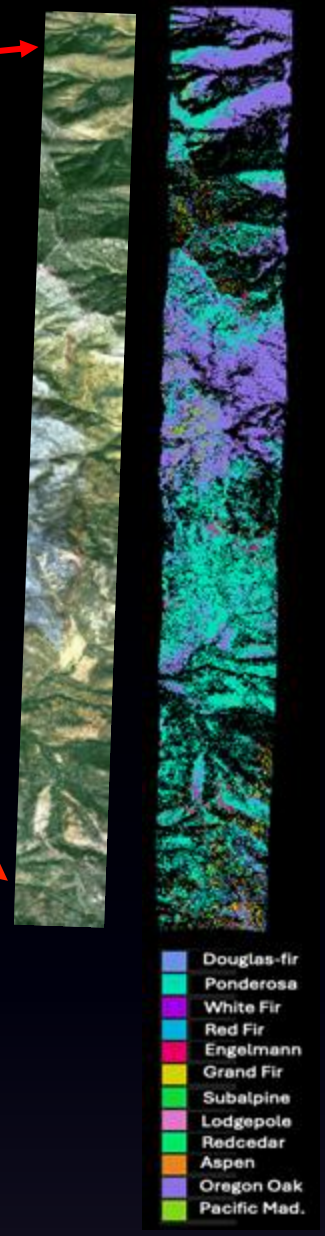
Central Valley, California, USA

SHASTA TRINITY NATIONAL FOREST

MAJOR GROUP TYPES



DOMINANT SPECIES



BIODIVERSITY

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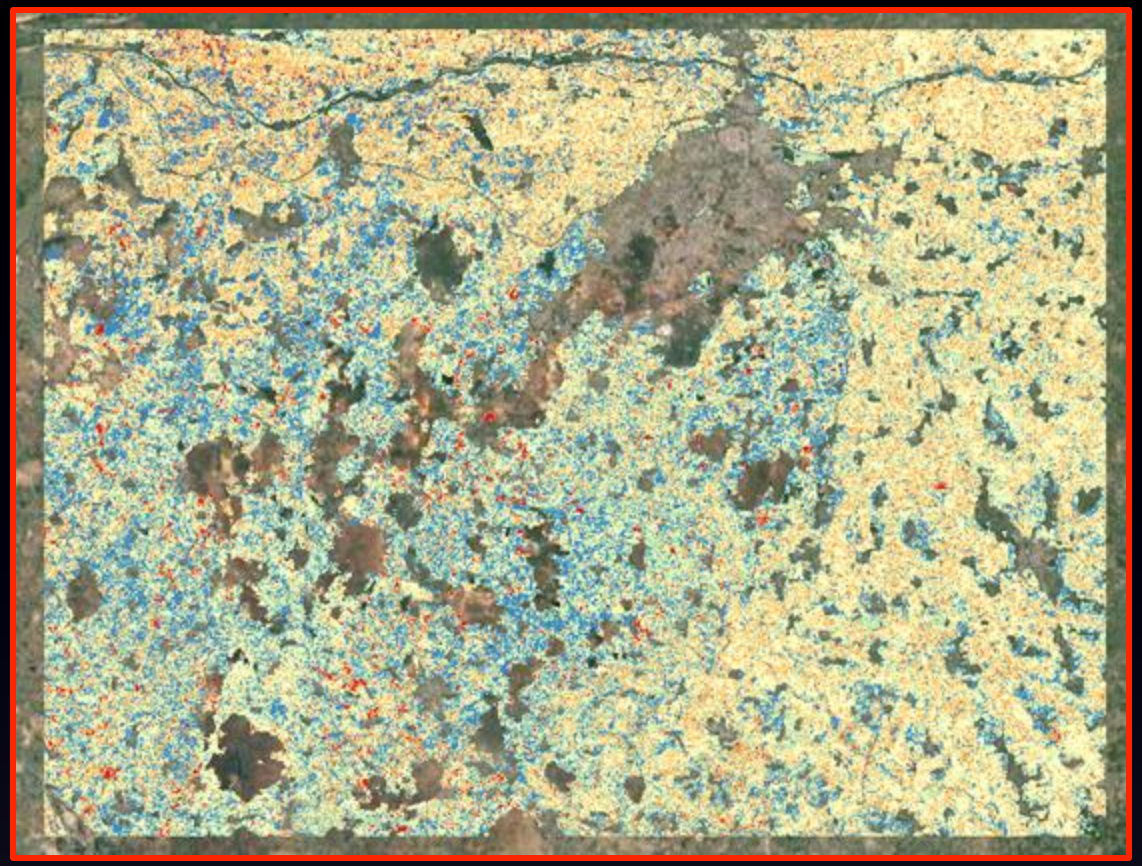
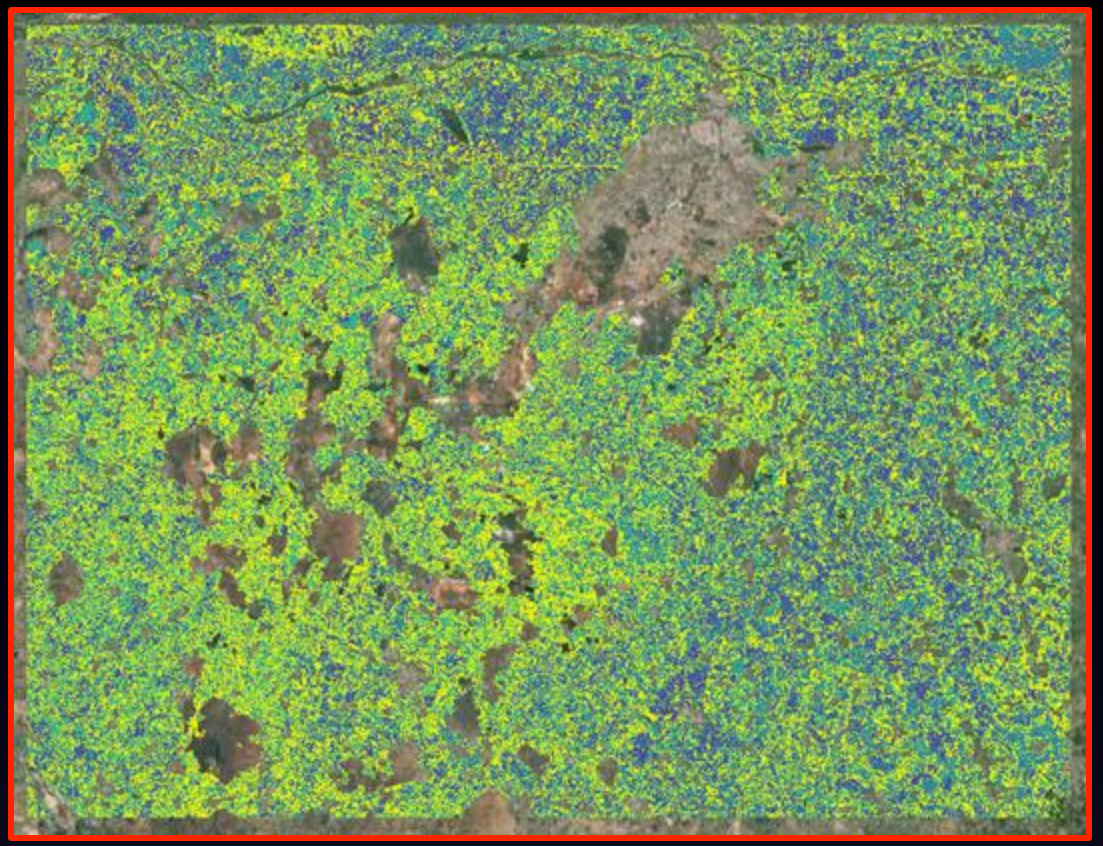
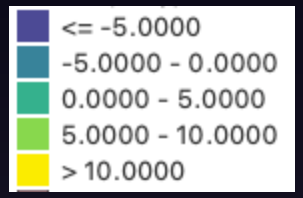
APPLICATIONS
TRAIT MAPPING

Study Area
Pudukottai and Thanjavur





LAI (m^2m^2)



Chlorophyll Content (ug/m^2)

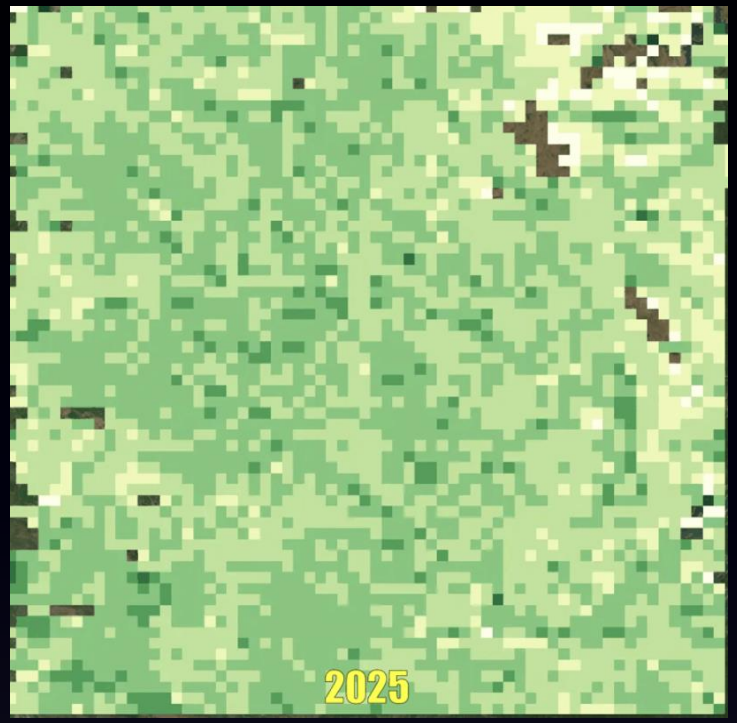
APPLICATIONS
BIOMASS AND CARBON

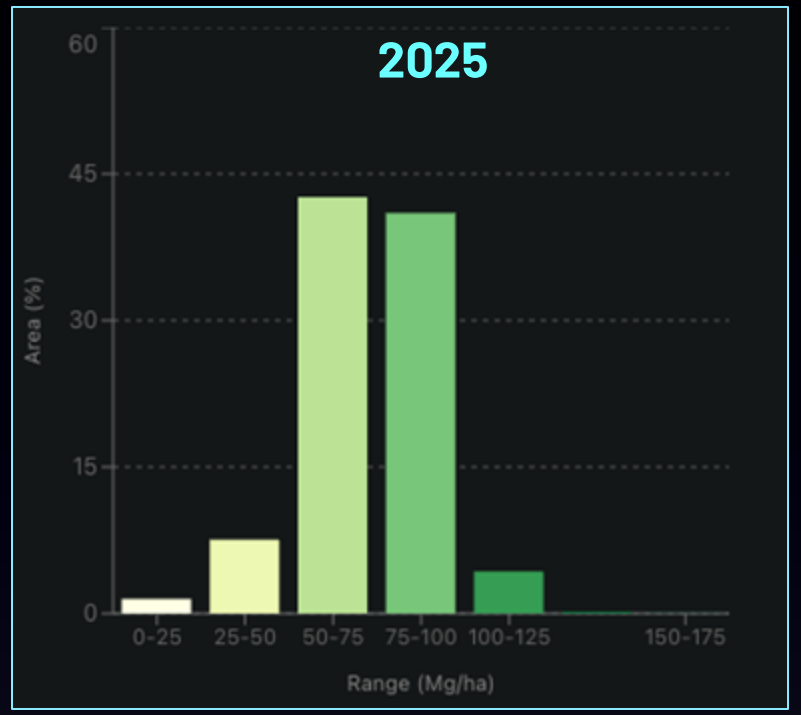
Forest Above Ground Biomass (FAGB)

- 0-25
- 25-50
- 50-75
- 75-100
- 100-125

(Mg/ha)

Study Area
Erumely, India





Complimentary to NASA holdings and associated missions:

- **GEDI (Global Ecosystem Dynamics Investigation)** using LiDAR
- **NISAR** (launching 2024–2025) for global biomass monitoring using SAR
- **Carbon Monitoring System (CMS)** program fusing multi-modal datasets

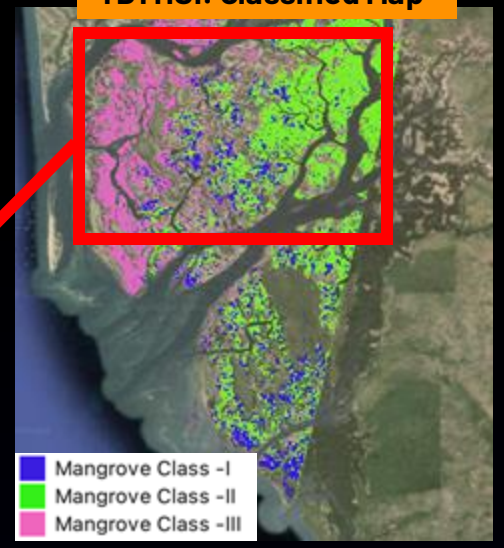
- REDD+ and carbon credit validation
- Forest restoration tracking
- Climate policy modeling

APPLICATIONS
BLUE CARBON

Study Area
Saloum Delta, Senegal

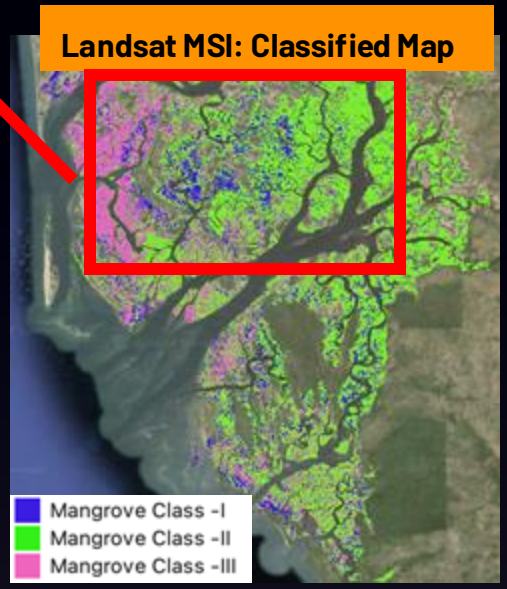
Ground Truth

TD1 HSI: Classified Map



Pixxel Accuracy: 94.5 %

Landsat MSI: Classified Map



Landsat Accuracy: 86.5 %

TD2 – 15 Class LULC

- Grassland
- Wooded Dryland - I
- Ocean
- Mangrove Type - I
- Dry land - I
- Wooded Dryland - II
- Wetland
- River
- Mangrove Type - II
- Ocean (Brackish) - II
- Dryland - II
- Ocean (Brackish) - I
- River -II
- Mangrove Type - III
- Barren

Supports:

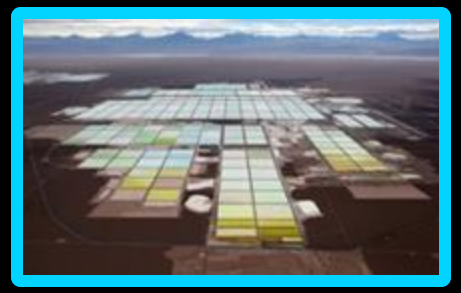
- UNEP's Blue Carbon Initiative
- IPCC Tier 2/3 carbon reporting methods
- NASA's Carbon Monitoring System (CMS)

APPLICATIONS

MINING & WATER

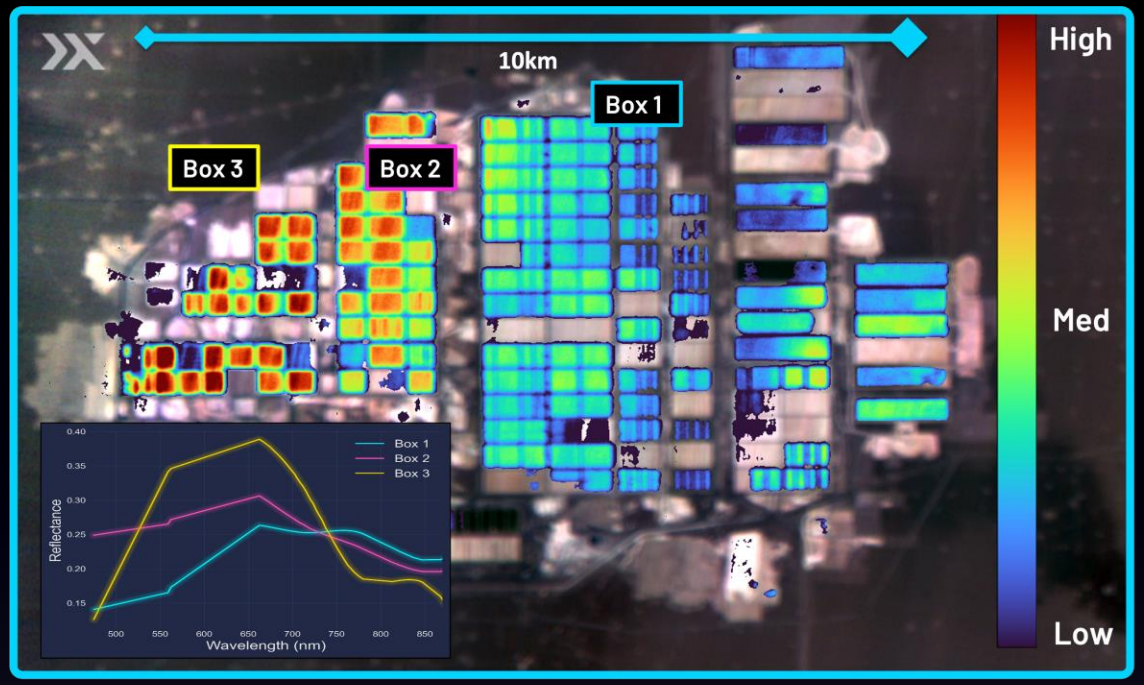
Harmful Algal Bloom Monitoring

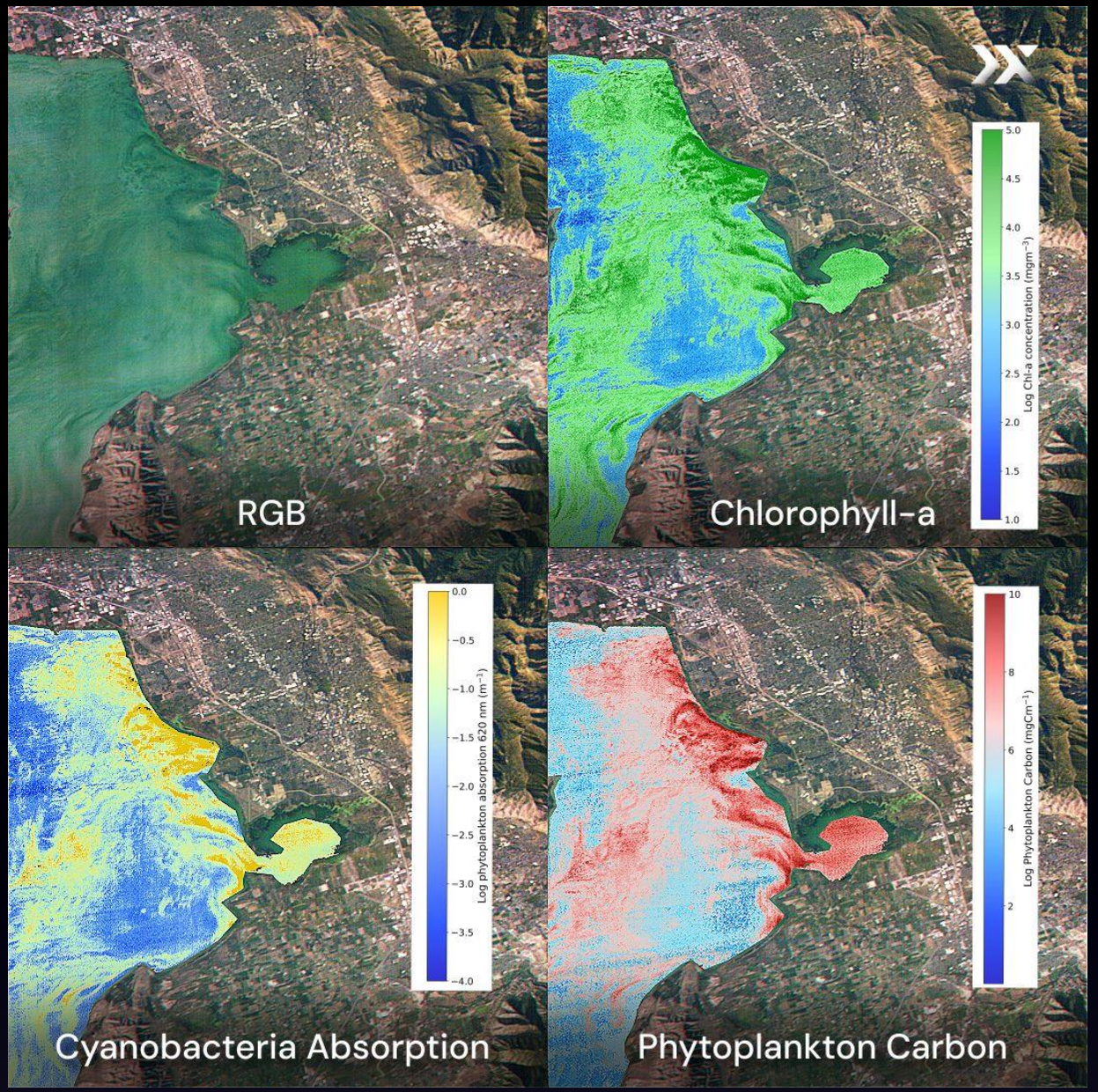
Utah Lake, USA



Li Evaporation Pond Monitoring

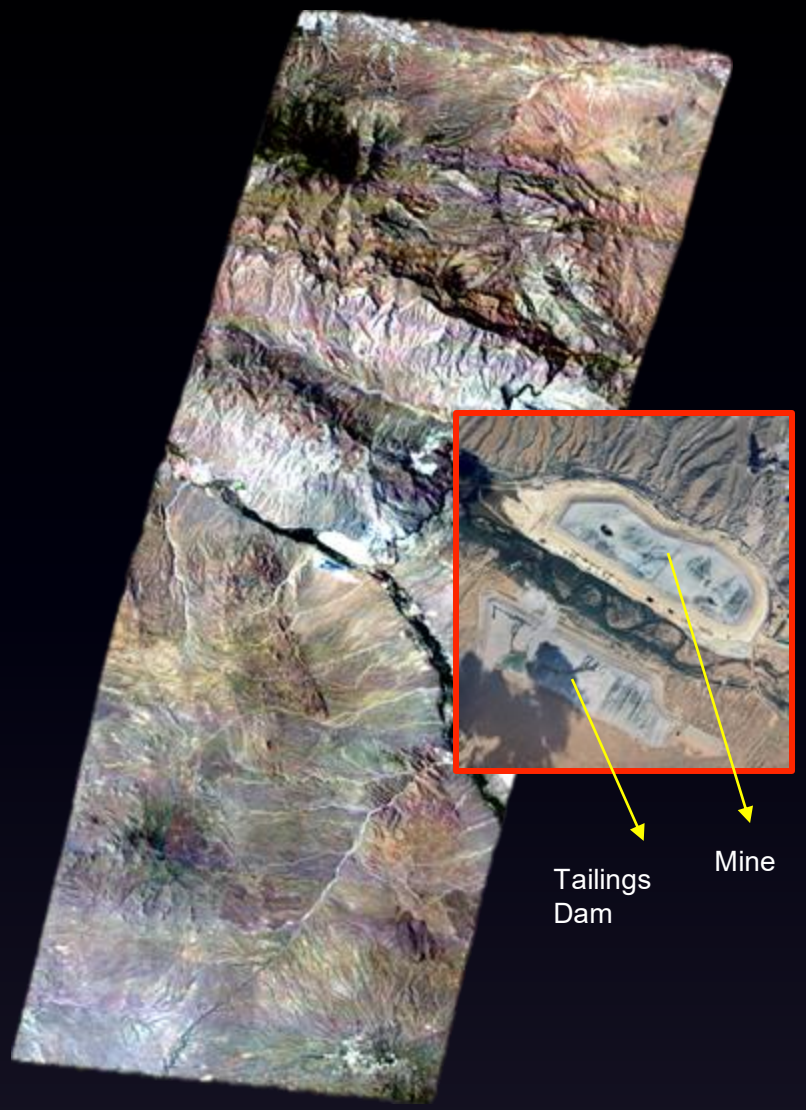
Salar de Atacama, Chile



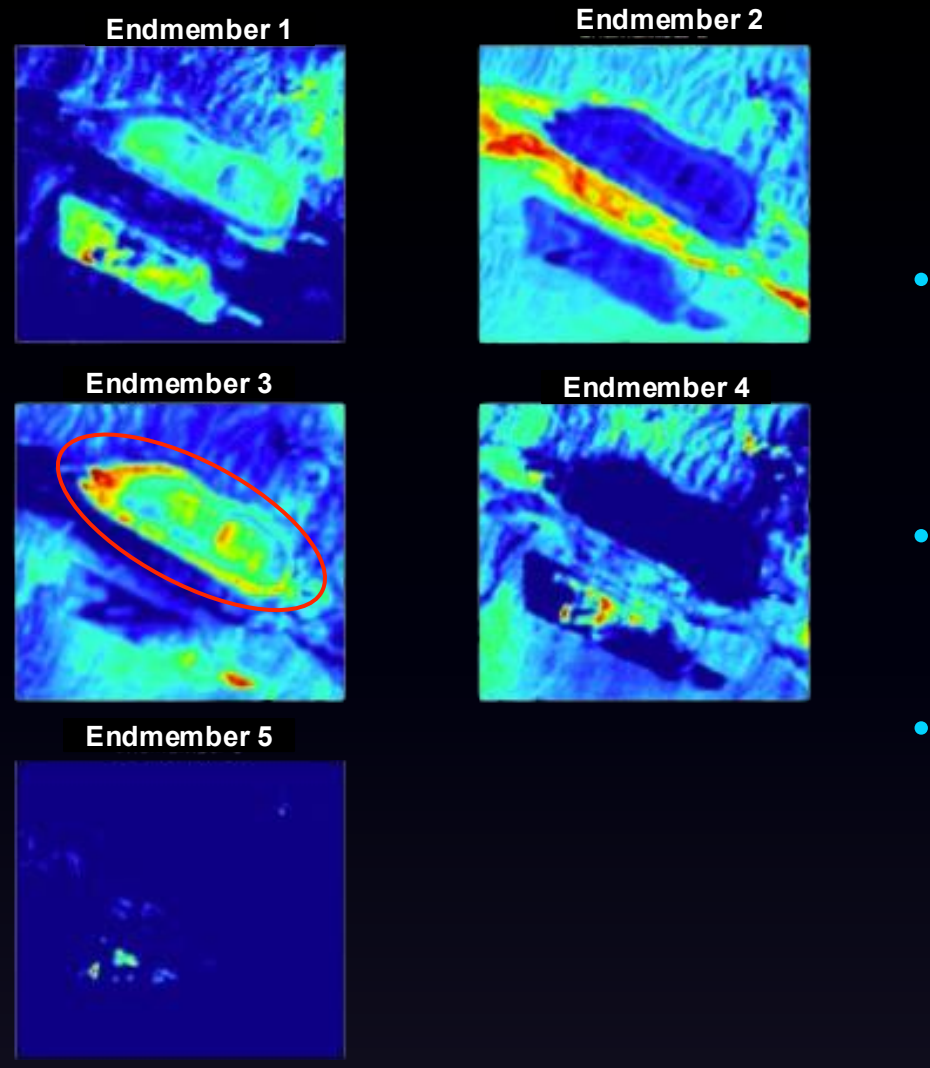


APPLICATIONS
TAILINGS DAMS

Copper Smelt Mine in USA



Abundance Maps using Pixxel - TD1 Data

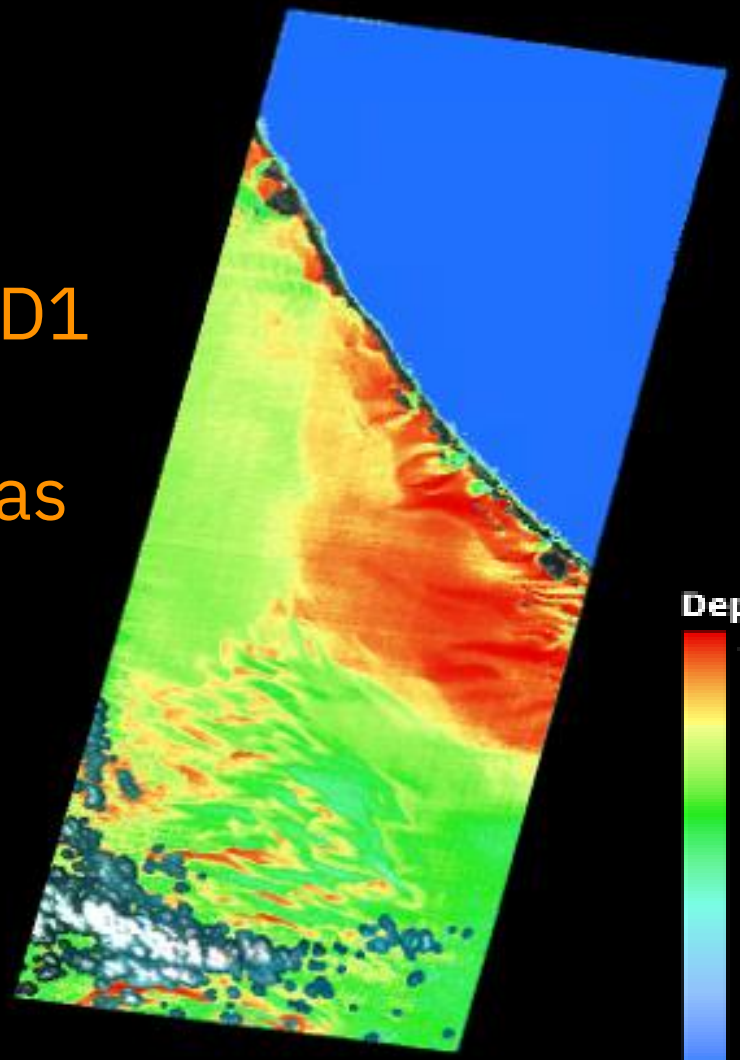


- Mineral signatures across the tailings footprint
- Residual process chemicals
- Possible leakage zones

APPLICATIONS

SATELLITE DERIVED BATHYMETRY (SBD)

Pixxel TD1
30m
Bahamas

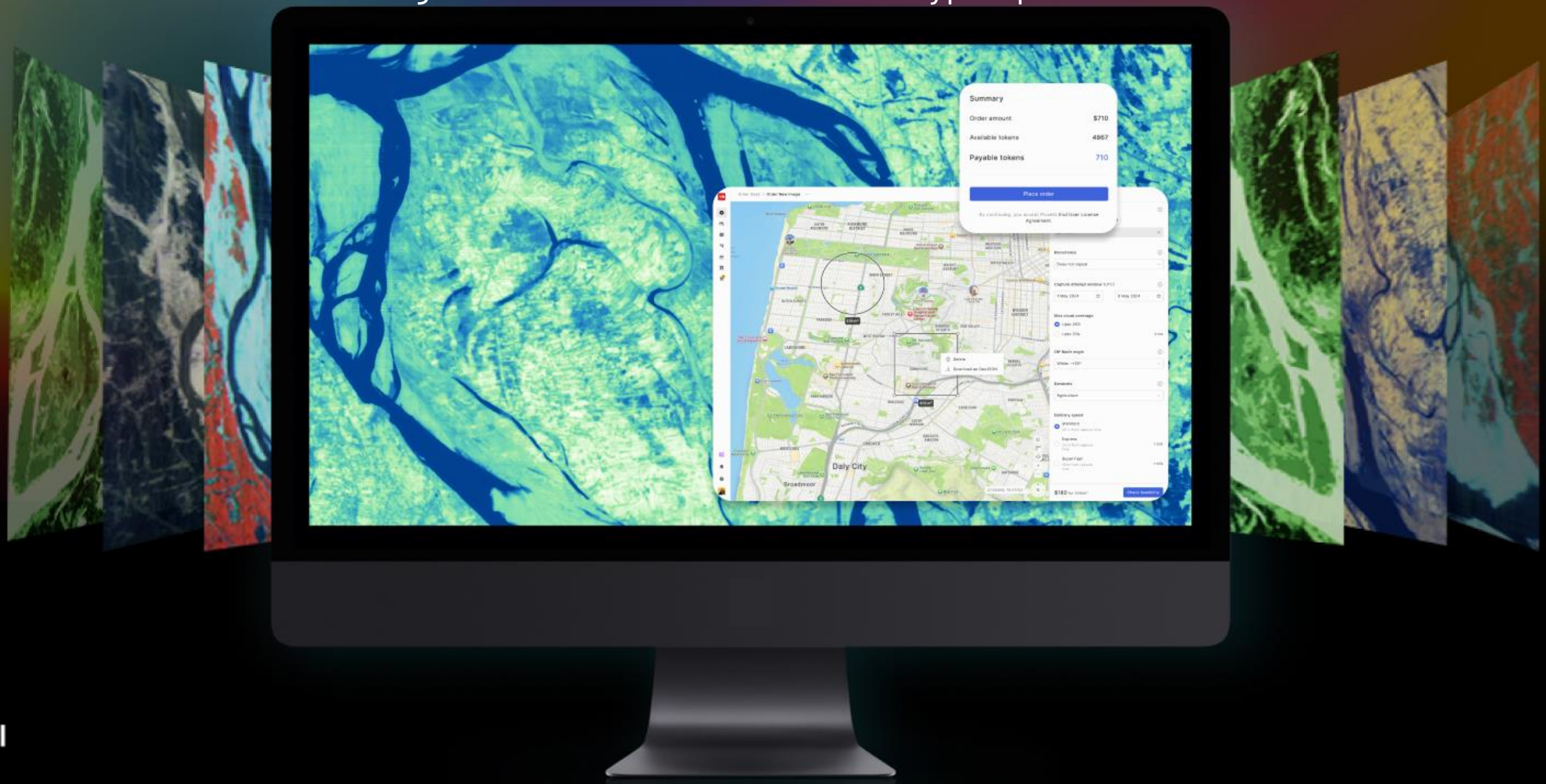


- Coral Reef Mapping, disaster prep, and port planning
- Scalable augmentation to sonar/LiDAR

How to access data outside of the CSDA program:

INTRODUCTION TO ORDER DESK

Designed for streamlined access to hyperspectral data



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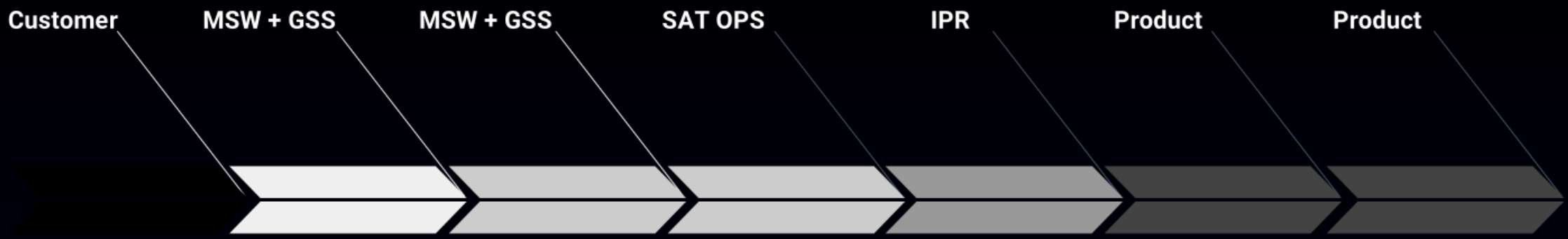
ORDER WORKFLOW



Order Desk

Customer places the order through the Aurora or API

Feasibility Check

System checks for feasibility and provides feedback on the order parameters

Request Repository

All the requests are stored until they are scheduled

Operations

Scheduling and downlinking the images

Processing

Processing the raw images to analytics ready L2A

Delivery

Image is delivered to customer through Aurora or API

Archive

All the images are stored in the archive

ARCHIVE AND TASKING

TASKING

- Flexible: ≥ 7 days
- Expedited: 3-6 days
- Critical: ≤ 2 days
- Assured: Guaranteed collect on that specific date

Min. Order Size: 10 x 10 km

MONITORING

Tasking Order that takes images of a location over a period of time at a defined cadence.

Min. Order Size: 10 x 10 km

IMAGE ARCHIVE

Easy access to our future archive of satellite images: search, preview, select, purchase, and download

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For Additional Resources & Contact Info:

Allyson Jenkins: Allyson@pixxel.space
Spencer Warhman: Spencer@pixxel.space
Jeremy Kravitz: Jeremy@pixxel.space

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