

Space to Farm: Space Technology in Agri-action

Geosmart India 2025

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India Sales Head

Axelspace Corporation

AXELSPACE

About Us

Official Name	Axelspace Corporation Axelspace Holdings Corporation
Main Office Location	3-3-3 Nihonbashi-Honcho, Chuo-ku, Tokyo
Business Content	AxelGlobe: Provision of satellite data solutions AxelLiner: Development, mass production and operation of microsatellites
Establishment	August 8, 2008
Capital Stock	14.29 billion JPY (including capital reserve)
Number of Employees	Approximately 170 (as of February 2025)



AXELSPACE's Satellite Track Record

We have developed and manufactured 11 microsattellites and operated them in orbit.

2013 2014 2017 2018 2019 2021 2024 2025



WNISAT-1

for



Succeeded in taking the first images as a commercial meteorological satellite. It observes the distribution of ice in the Arctic Ocean and provides safety information to ships passing through.



Hodoyoshi-1

for



60kg class microsatellite providing 6.7m resolution optical images. Demonstration for business application with three domestic companies.



WNISAT-1R

for



Observations using GNSS radio waves and basic experiments of optical communication, in addition to the missions of the previous satellite.

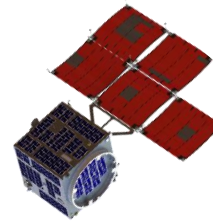


GRUS-1A

for



The first earth observation satellite for AxelGlobe. Equipped with two telescopes, it has a wide observation range of 55 km with a resolution of 2.5 m.



RAPIS-1

for



The first government satellite that JAXA ordered for its development and operation to a startup. Demonstration of new components in orbit.



GRUS-1B,C,D,E

for



The second launch for AxelGlobe. The four satellites were developed simultaneously, which was the first mass production case in Japan. AxelGlobe service with 5 satellites started in June.



PYXIS

for



Demonstration satellite for the new AxelLiner service. Utilization of Japan's first mass production system for microsattellites.



GRUS-3α

for



The mission aims to validate the optical system—including the telescope planned for use in GRUS-3, scheduled for launch in 2026—and the versatile satellite bus system for AxelLiner.

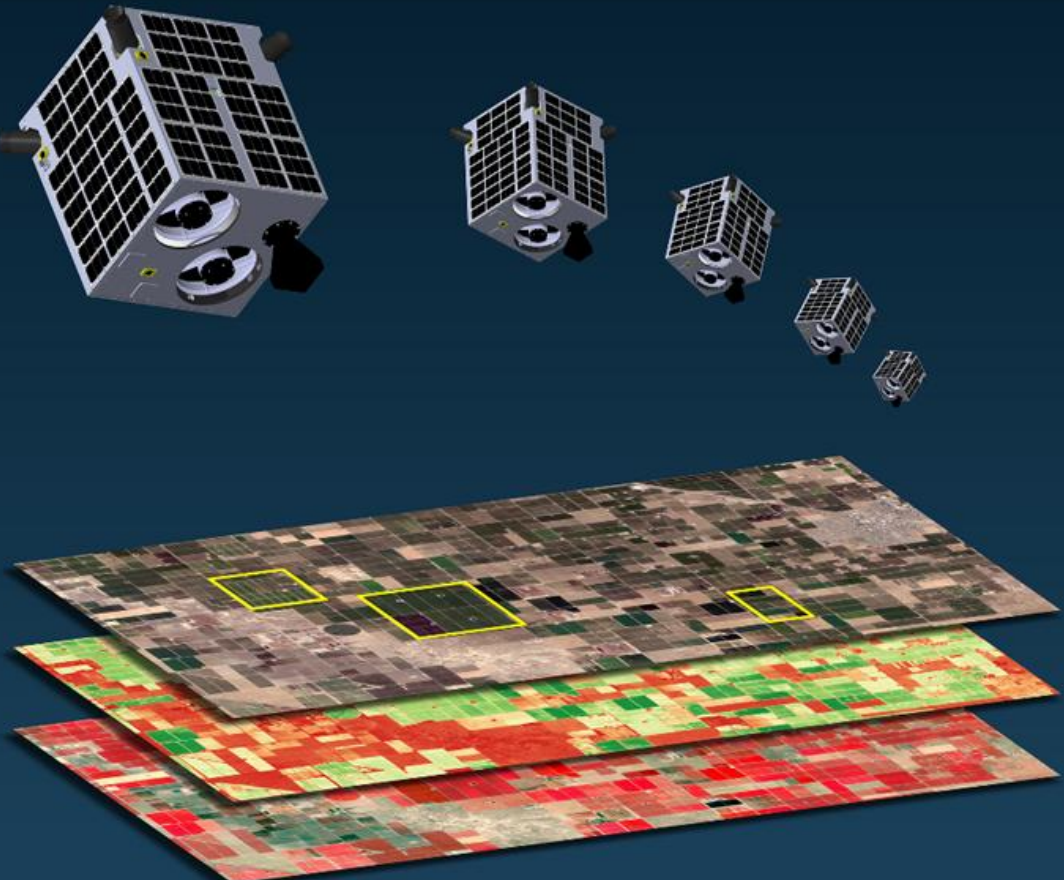


AxelGlobe










Earth Observation Platform

What is AxelGlobe?

Providing insights for streamlining business and making quick decisions.

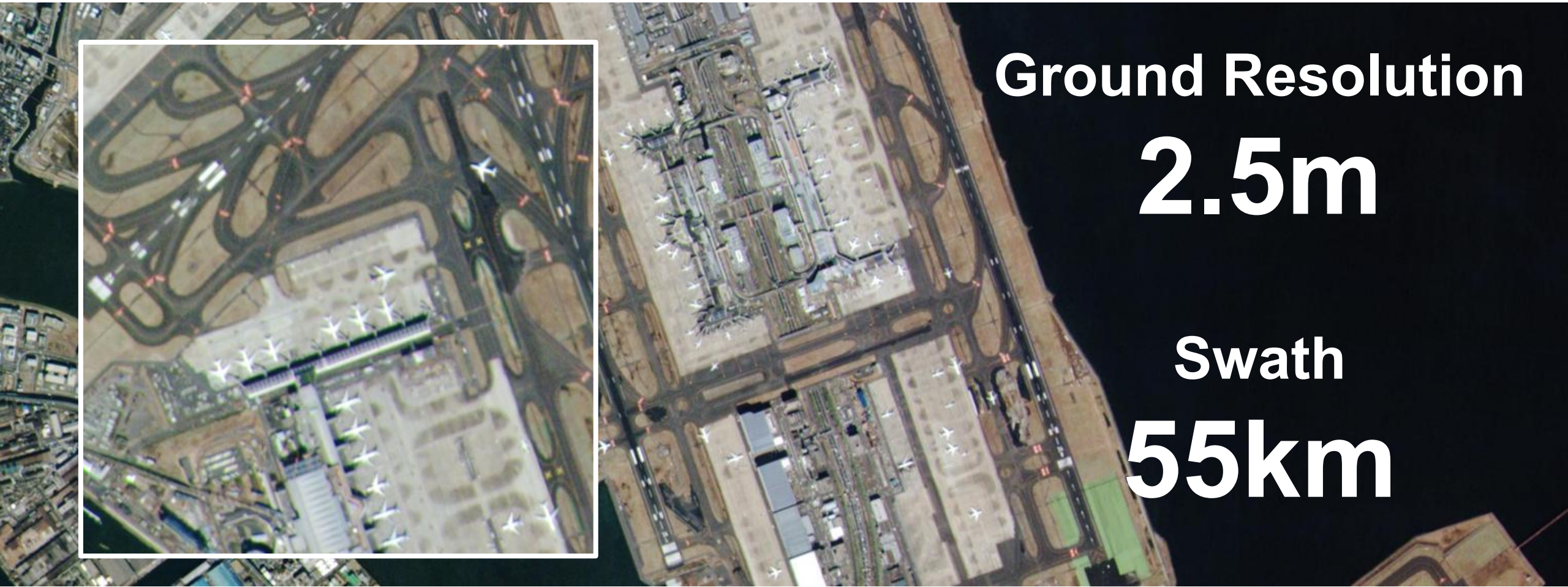


Earth observation platform using our satellite constellation allows users to understand situations and changes that are difficult to capture from the ground.

Finance and Insurance 	Environment 	Media 	Agriculture 
Infrastructure Management 	Land Management 	Forest Management 	Disaster Monitoring 
Etc. 			

Example of earth observation: Haneda Airport

The GRUS satellite is equipped with two optical telescopes, and it achieves both a wide observation range and high resolution.

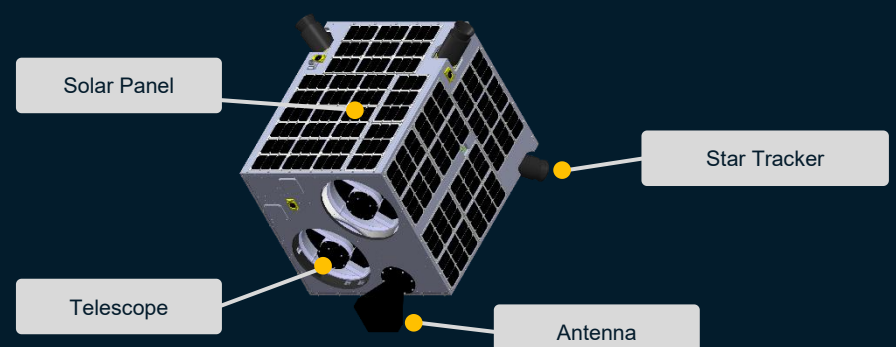


Ground Resolution
2.5m






Swath
55km

GRUS-1 Earth observation satellite

100 kg-class optical microsatellite developed and operated by AXELSPACE.



The diagram shows a 3D perspective of the GRUS-1 satellite. It is a small, rectangular satellite with a grid of solar panels on top. Four components are labeled with white boxes and lines pointing to their locations: 'Solar Panel' on the top surface, 'Star Tracker' on the right side, 'Telescope' on the front face, and 'Antenna' on the bottom front.

	Number of Satellites:	5* (as of August 2024)
	Ground Resolution:	2.5m
	Revisit Period:	2-3 Days
	Swath:	55km
	Spectral Bands:	Panchromatic, BGR, Red Edge, Near infrared (NIR)

*One of these satellites is currently not in commercial use

Orbital altitude	585 km, Sun-synchronous sub-recurrent orbit	
Equator passage time	10:40-11:00 (local time)	
Spectral Bands	Name	Wavelength range (nm)
	Panchromatic	450-900
	Blue (B)	450-505
	Green (G)	515-585
	Red (R)	620-685
	Red Edge	705-745
	Near Infrared (NIR)	770-900
Ground Resolution *at nadir	Panchromatic: 2.5 m Multispectral: 5.0m	
Swath *at nadir	55km	
Longest collection length	1,000 km	
Sensor bit depth	12-bit	

GRUS-3

Extensive observations
with **High frequency**

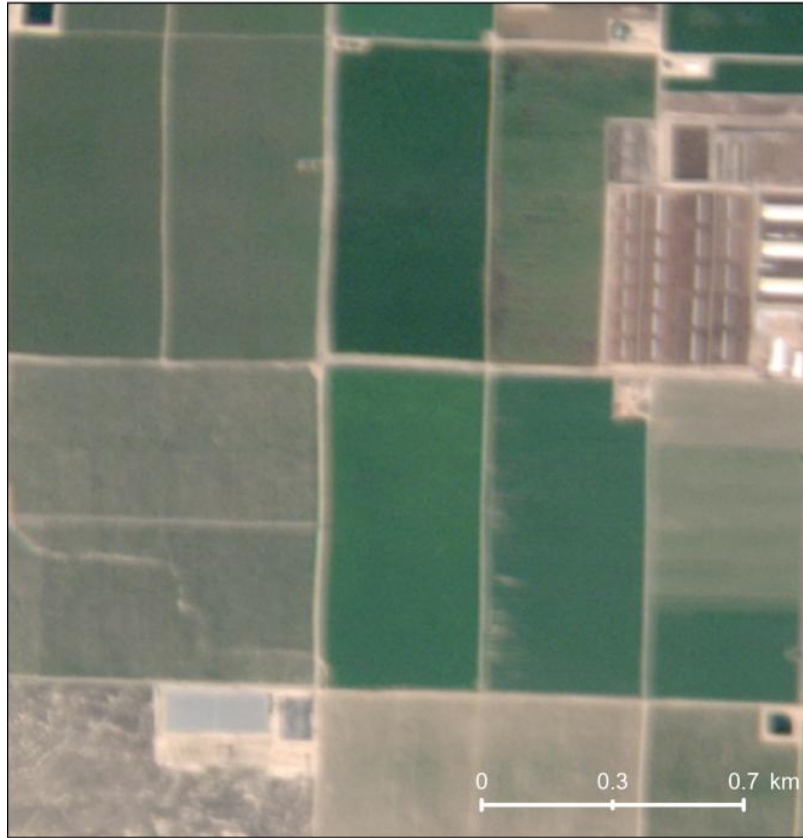
7 sats

Planned for Launch
in **2026**

Image comparison between GRUS-3* and GRUS-1

More accurately identify changes in crop condition and use for regular monitoring

GRUS-1



GRUS-3



*GRUS-3 images shown above are simulated using NAIP / USDA imagery

Use Cases of AxelGlobe: # Applications

Visualization of land use change x Real Estate

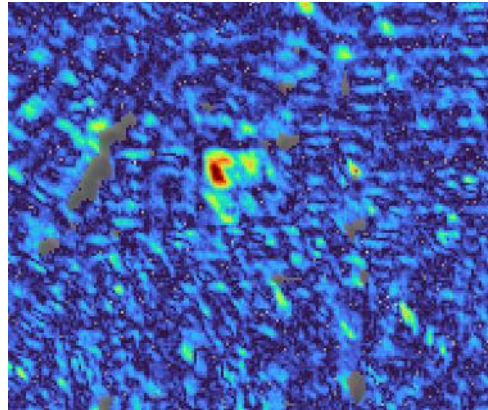
Satellite imagery reveals changes in land use and is combined with registration information to obtain up-to-date real estate data.



February 28, 2024



May 3, 2024



Results of the difference analysis

Insights: Detected that demolition of 4,700 m² of land was in progress over a 20day period

Crop condition analysis x Environment

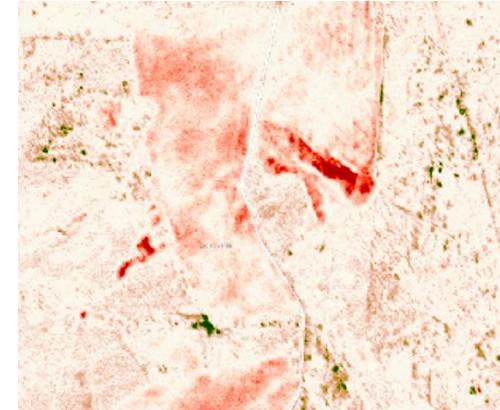
Combining crop condition analysis with genomics analysis using satellite imagery to understand soil and water quality and the effects of climate change.



August 26, 2024



October 1, 2024



Results of the difference analysis

Insights: Revealed that organic matter decreased in red areas and increased in green areas

Key Features of AxelGlobe for Agriculture

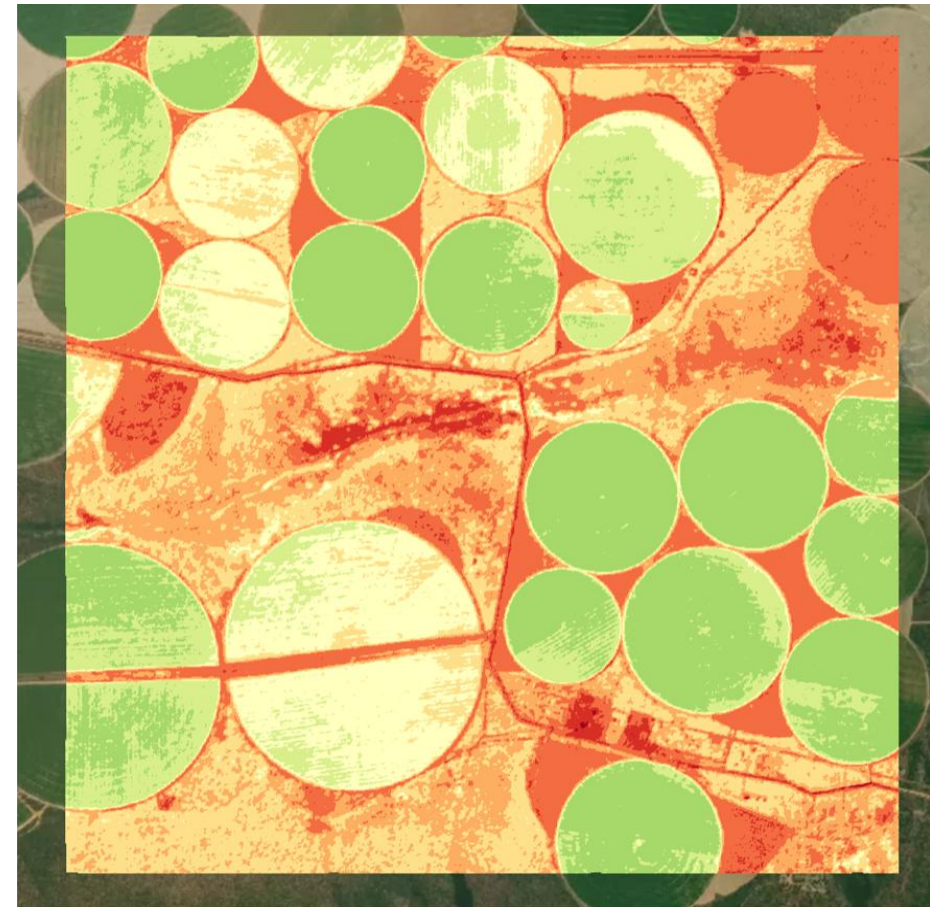
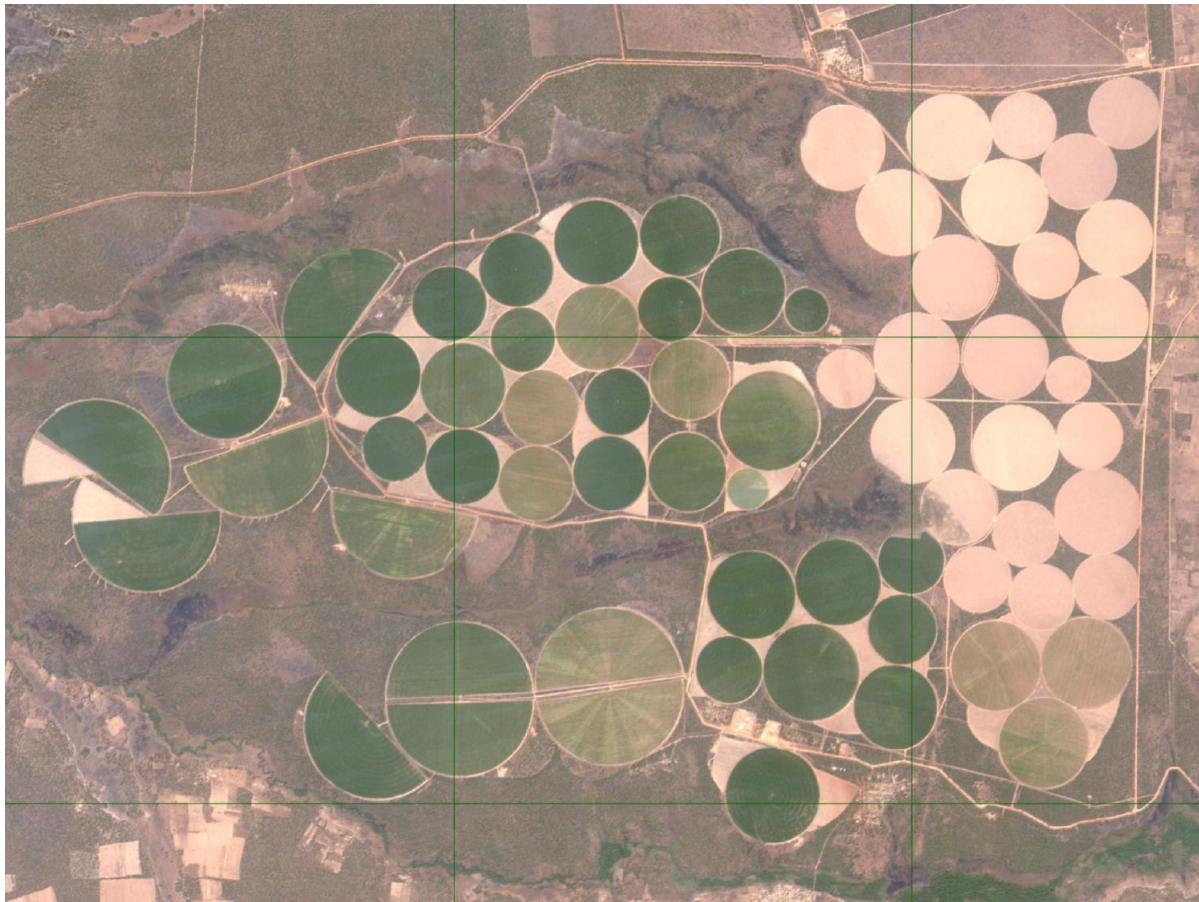
- ✓ **High Spatial Resolution:** Panchromatic images at 2.5 meters and multispectral images at 5 meters, enabling detailed monitoring of crop health and soil conditions.
- ✓ **Frequent Revisit Times:** The GRUS satellites offer daily revisit capabilities, ensuring timely data for dynamic agricultural environments
- ✓ **Multispectral Imaging:** Equipped with bands including Red-Edge and Near-Infrared, AxelGlobe facilitates advanced vegetation analysis, such as Vegetation Indices and crop stress detection.
- ✓ **Global Coverage:** Provides imagery for any location worldwide, supporting large-scale agricultural monitoring.

Agricultural Applications

- **Crop Health Monitoring:** Detect early signs of stress, disease, or nutrient deficiencies.
- **Yield Prediction:** Estimate potential yields to optimize harvest planning.
- **Irrigation Management:** Assess soil moisture levels for efficient water usage.
- **Pest and Disease Detection:** Identify affected areas promptly to mitigate spread.
- **Field Mapping:** Create accurate maps for better field management.

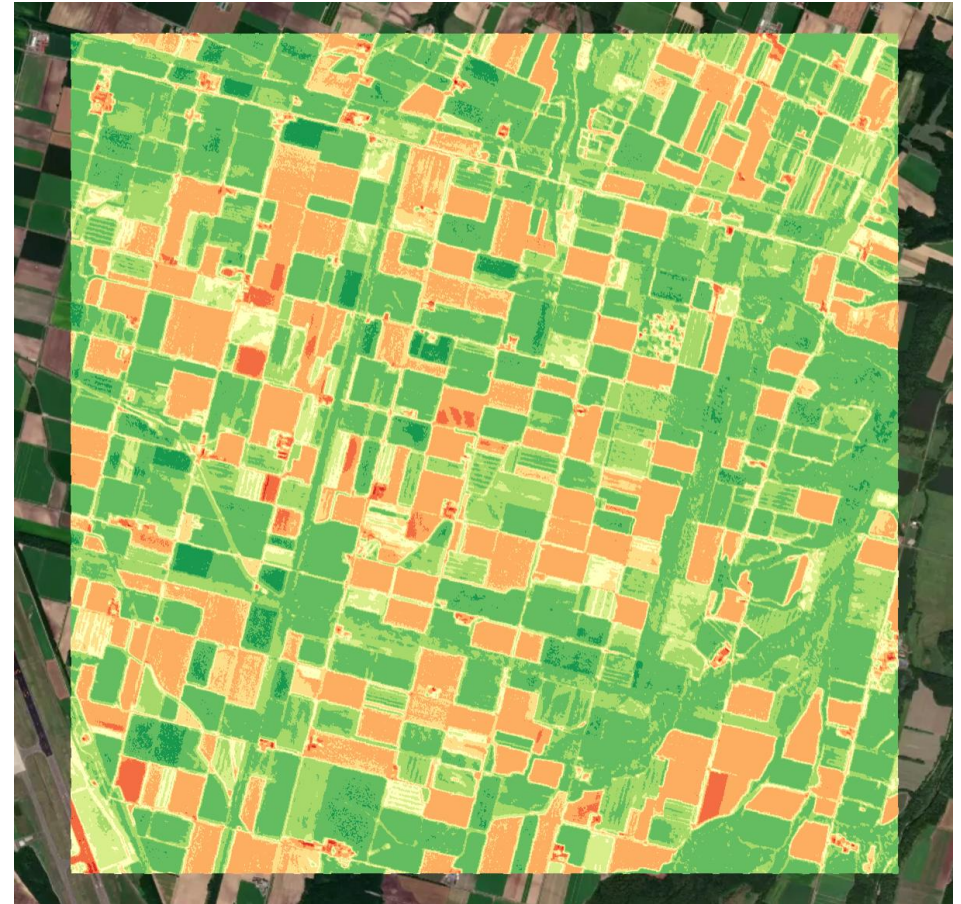
NDVI

Zambia, Center pivots (NDVIはイメージ)



NDVI

Obihiro(帯広), Japan



NDVI

Mogi Mirim, São Paulo, Brazil



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