Synspective

Application of SAR satellite data in planning and monitoring infrastructure projects

Aug. 27th 2025.

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Manager of Public & Enterprise Unit

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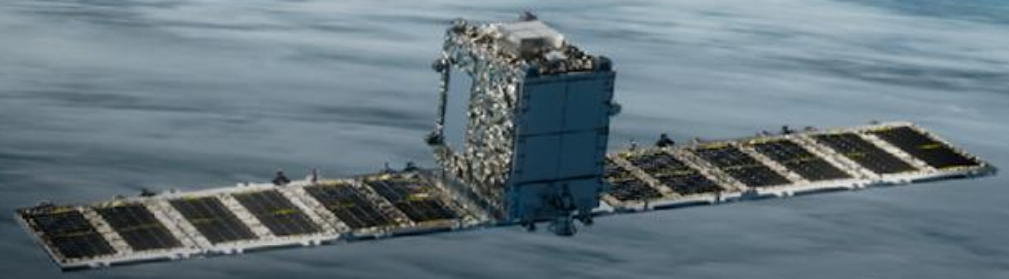

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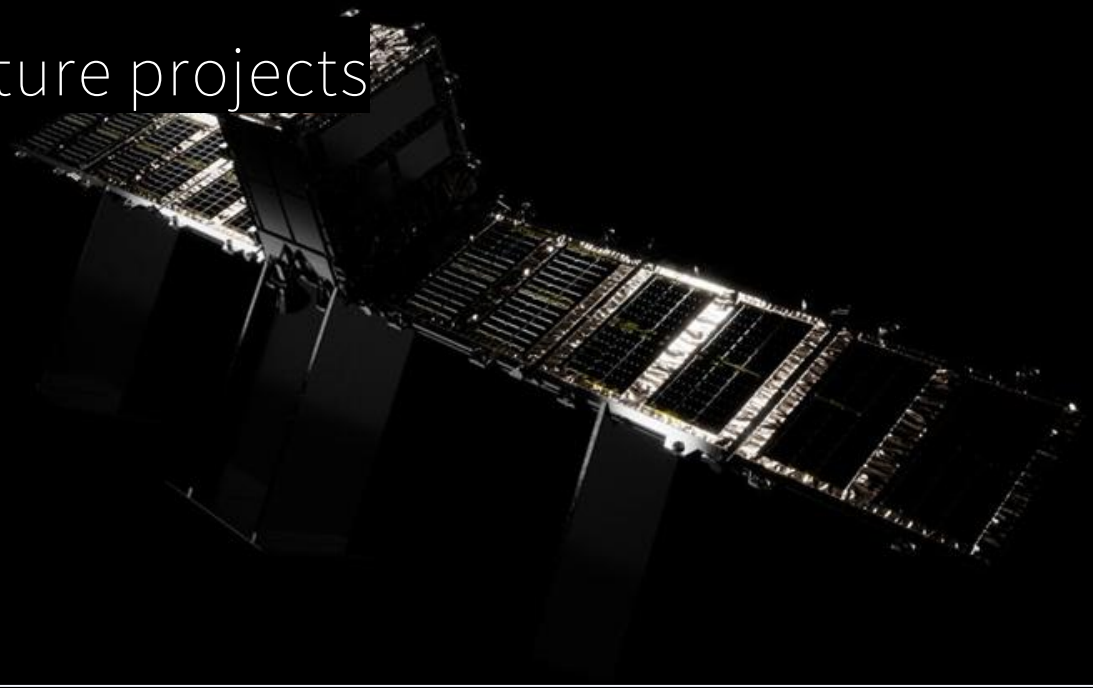
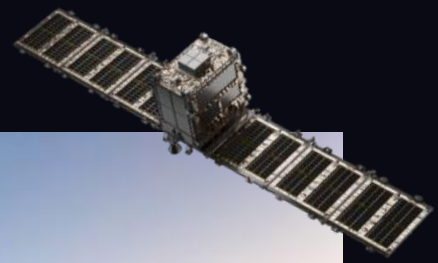


01 Company Overview

SAR Intelligence Company from Tokyo

2018 Establishment in Tokyo with its origin from a Japanese cabinet R&D program

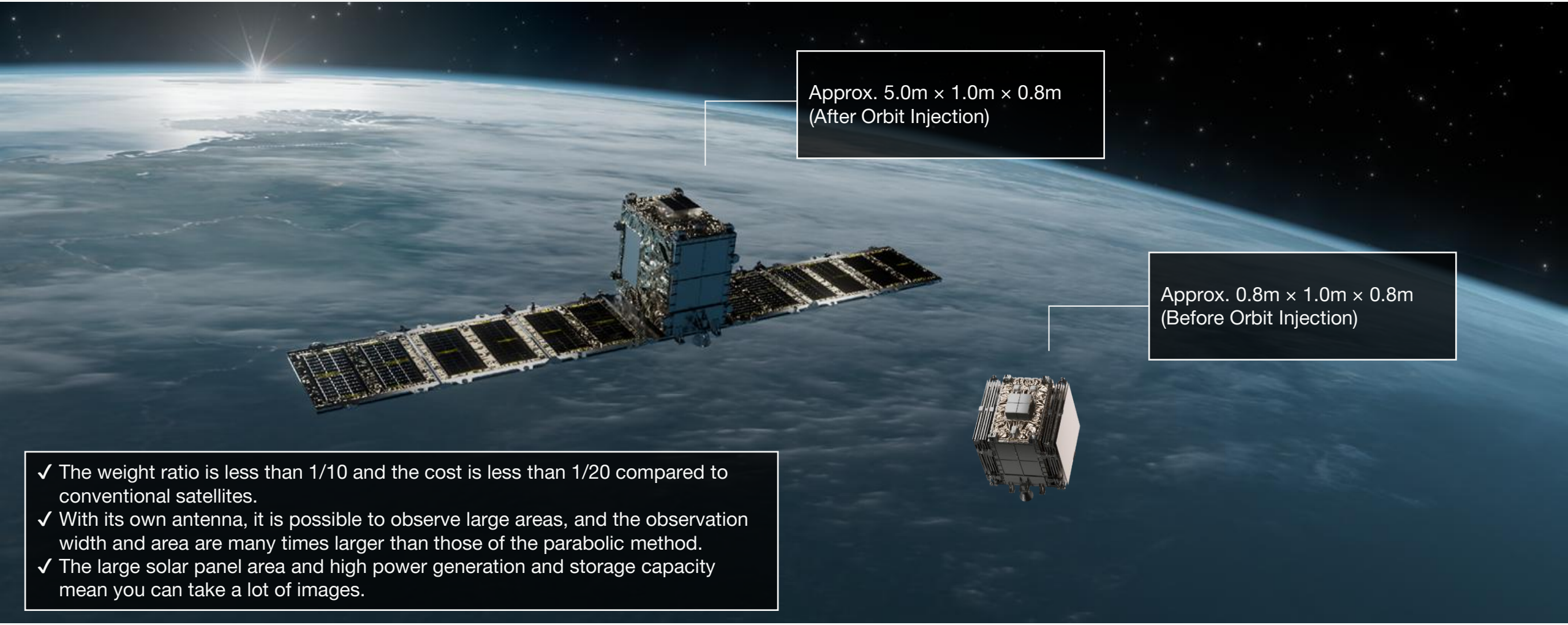
-**Small SAR Satellite** (Design + Manufacturing**)** + **Data** processing + Multi-Sensor **Analytics**
-Hundreds of Commercial projects with Global Gov + Enterprise
-220 Hot members from 23 countries !
-Global HQs in Tokyo, APAC HQs in Singapore, North + Latin America HQs in Colorado, USA
Europe Middle East & AFRICA HQs in EU (plan in 2026)
-6 Satellites launched, 4 operational today, 2 to add this year → **30 +** constellation in 2020's



02 Our SAR Satellite StriX

Our Satellite StriX

StriX is a satellite developed jointly by JAXA, the University of Tokyo, the Institute of Science Tokyo, and others, applying the results of the Cabinet Office's "Impulsing Paradigm Change through Disruptive Technologies Program (ImPACT)".



- ✓ The weight ratio is less than 1/10 and the cost is less than 1/20 compared to conventional satellites.
- ✓ With its own antenna, it is possible to observe large areas, and the observation width and area are many times larger than those of the parabolic method.
- ✓ The large solar panel area and high power generation and storage capacity mean you can take a lot of images.

Comparison of SAR satellite operators(1)

StriX offers world-class ground resolution and, through switching observation modes, can capture wide-area images that surpass those of other current satellite operators

Comparison of specifications for each satellite operator

Company name	Country	Year founded	Observation mode	Ground resolution	Imaging area
Synspective	Japan	2018	Staring spotlight mode (High-Resolution Mode)	0.25m	10km×3km
			Sliding Spotlight mode	0.5m	10km×10km
			Strip map mode (Wide-Area Mode)	2.6m	20km×50～70km
A	Finland	2014	High-Resolution Mode	0.25m	5km×5km
B	USA	2016	High-Resolution Mode	0.25m	5km×5km
C	USA	2015	High-Resolution Mode	0.25m	10km×10km
D	Japan	2005	High-Resolution Mode	0.46m	7km×7km

(1) Comparison with other companies is based on publicly available information from each company (as of early November 2024).; https://synspective.com/jp/press-release/2024/two_mode_highresolution/
(2) "-" indicates that the company has not disclosed the information.

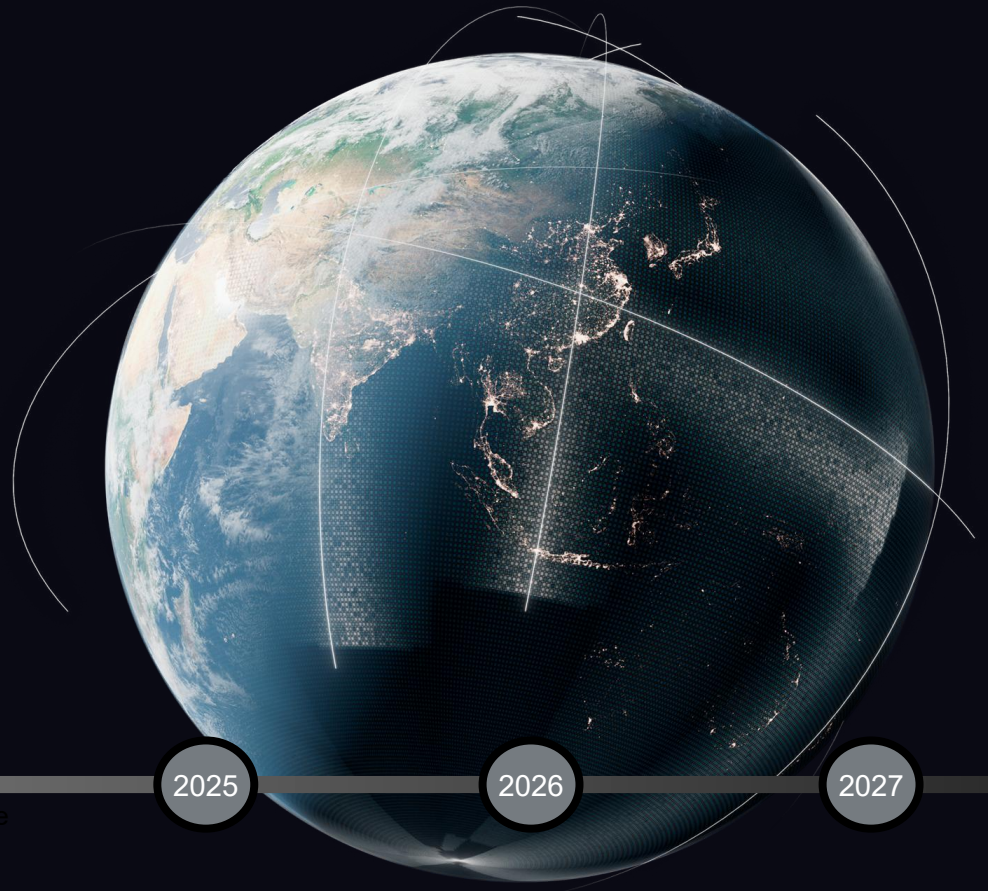
Get fresh EO data and useful past data anytime, anywhere

Near Real-time (*1)

All-Weather,
Day-and-Night

High-Resolution,
0.25 – 2.6 m (*2)

30 + Satellites
by 2030



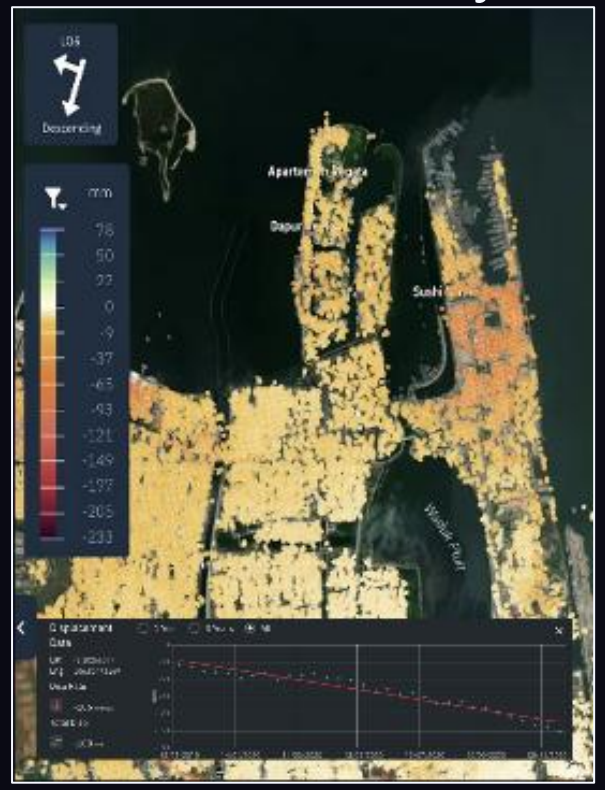
	2024	2025	2026	2027	2028
	Before				After
Number of satellites	4	6	11	20+	30+
Observation frequency	Daily	Every several hours	Every few hours		～Every hour

(*1) MTTA: Mean Time To Availability
(*2) Azimuth resolution

03 Solutions

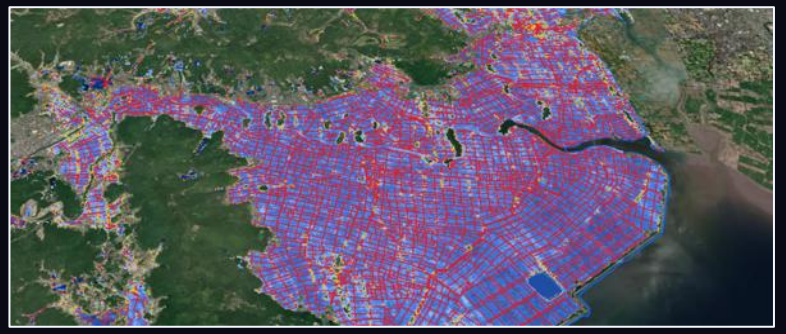
Our Analytics Solution

Ground/Infrastructure subsidence Analysis



Land Displacement Monitoring

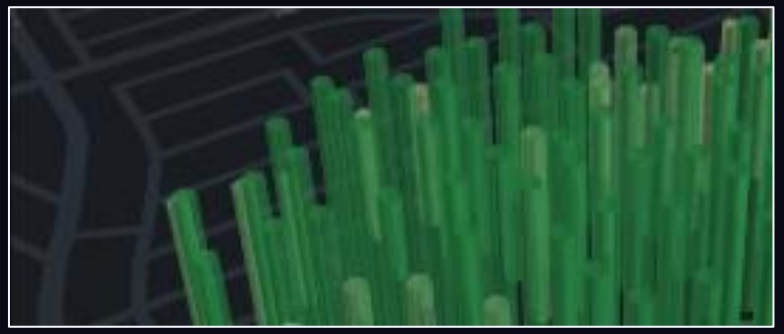
Disaster Assessment



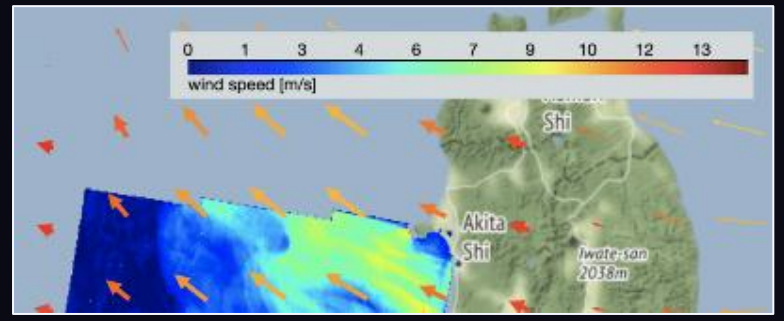
Flood Damage Assessment

Disaster Damage Assessment

Environment Analysis



Forest Inventory Management

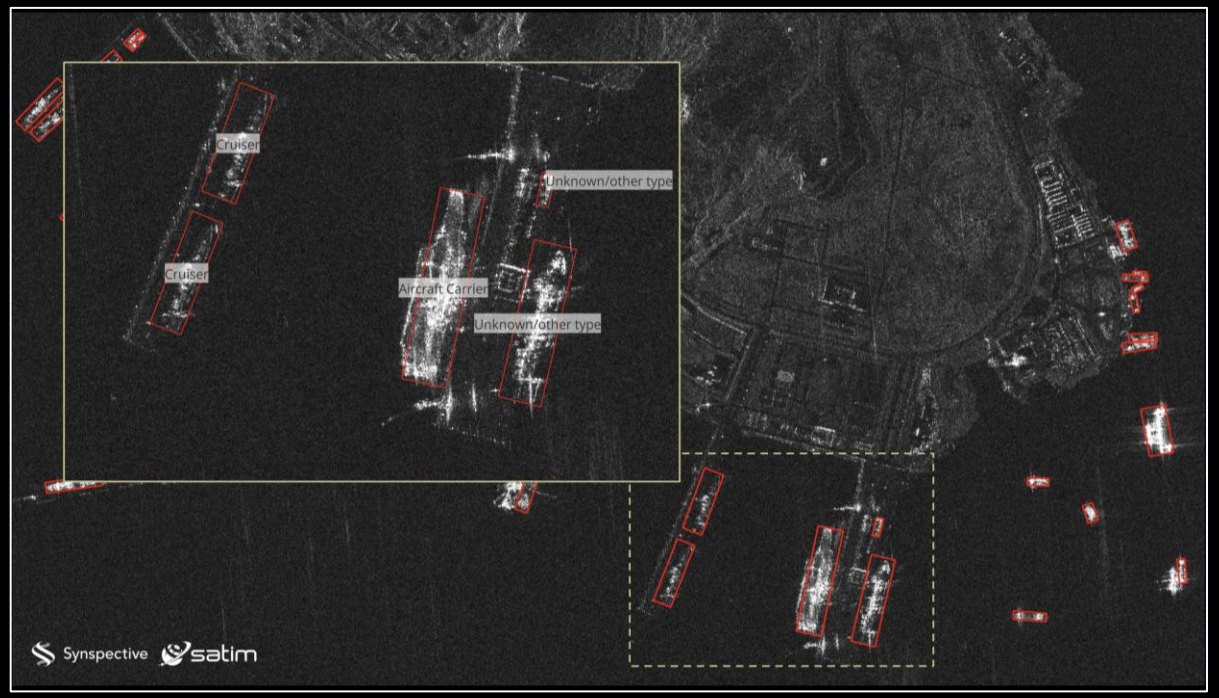


Offshore Wind and Wave

Our Analytics Solution

Object Detection and Classification (ODC)

StriX Vessel Detection and Classification



Features

Wide-area monitoring: Efficiently monitor vast ocean areas, coastlines, airports and remote areas

AI-based algorithms (ships and aircraft): Object detection using Satim OREC

Intelligent classification: Apply advanced algorithms to classify detected objects and assist in identification

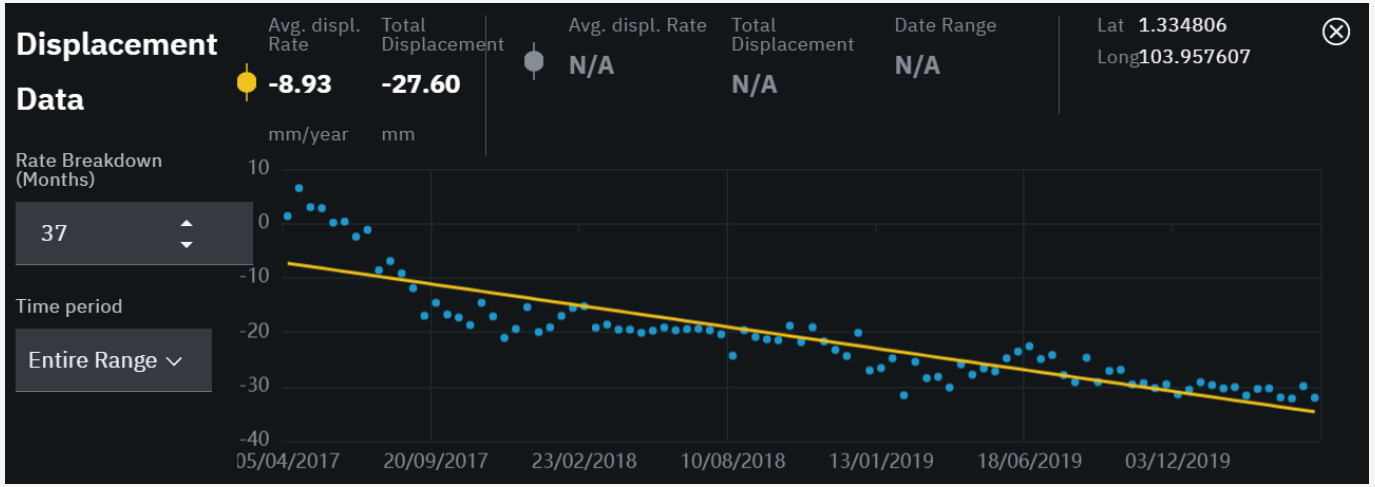
04 Application of SAR satellite data in planning and monitoring infrastructure projects

04-1. Advance identification of landslide risks ~ Planning stage ~

04-1. Advance identification of landslide risks ~ Planning stage ~

Request: There is a plan to build a railway or road, and customers would like to understand the risk of land displacement at the planned site (private land).

Solution: Using SAR satellite data, we grasped the amount of land displacement at the planned site over the past 10 years and evaluated the stability.

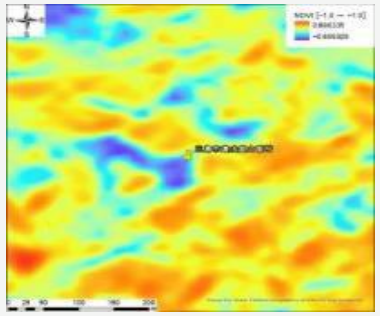


04-2. Landfill detection ~ Investigation stage ~

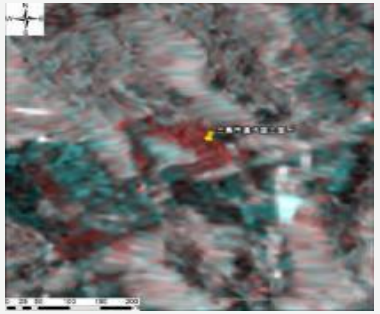
04-2. Landfill detection ~ Investigation stage ~

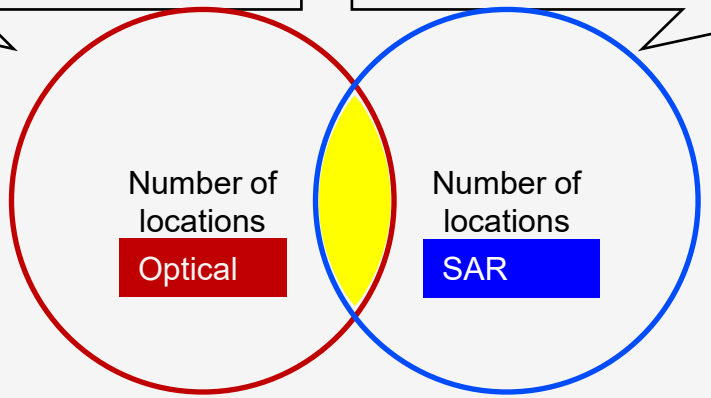
Request: The client wants to extract all newly landfill constructed in the past five years (since on-site inspections are time-consuming and costly, the client wants to use satellite data to minimize the on-site inspections).

①Optical satellite data analysis
Extracting vegetation changes from satellite image data from two periods



② SAR satellite data analysis
Extracting changes in radar reflection from satellite image data collected over two periods



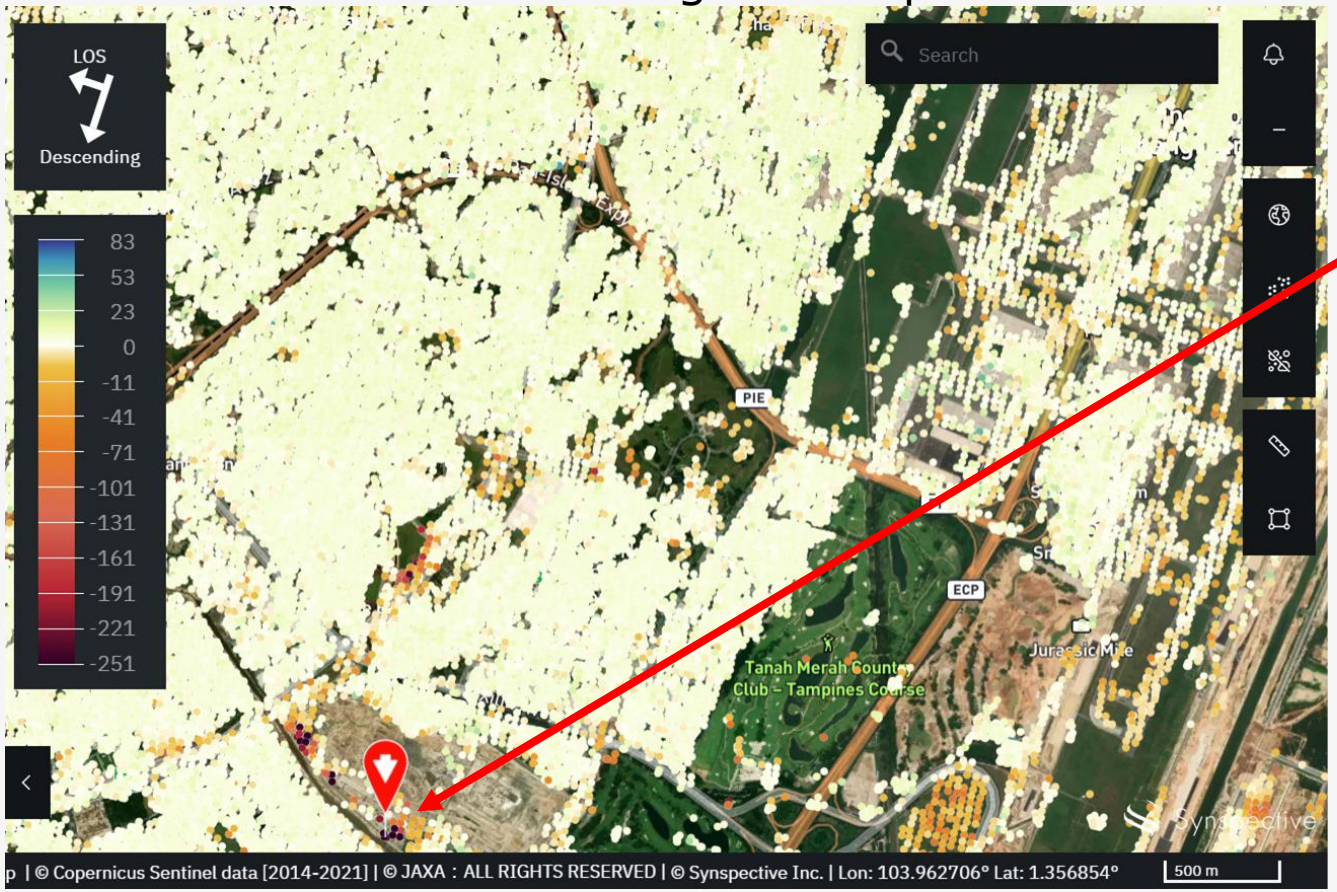


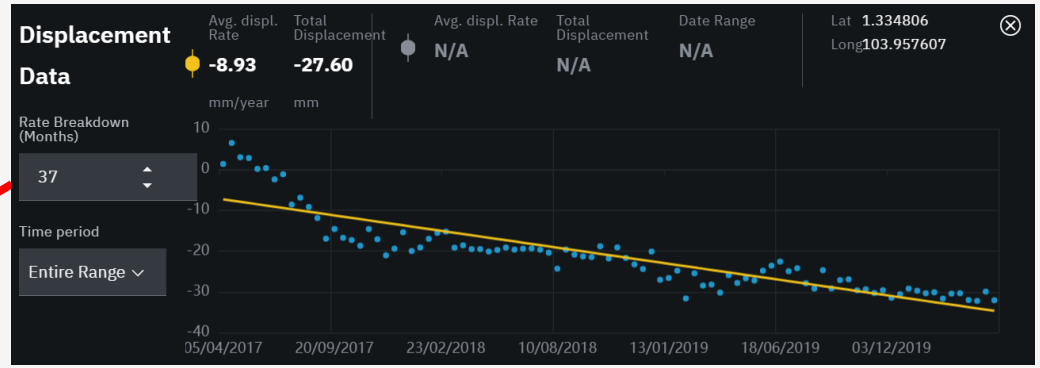
Solution: Using SAR and optical satellites, we extracted areas that were likely to be landfill sites. The highly accurate extraction results reduced the client's workload.

04-3. Land Displacement Monitoring
~ During and after construction stage ~

LDM : Land Displacement Monitoring

"Land Displacement Monitoring (LDM)" provided by Synspective is a solution that uses **SAR satellite images to analyze and detect wide-area ground movements in millimeters**. It is a web service that displays the relative changes in the ground surface and artificial structures over time, and enables wide-area monitoring of multiple sites around the world at the same time.





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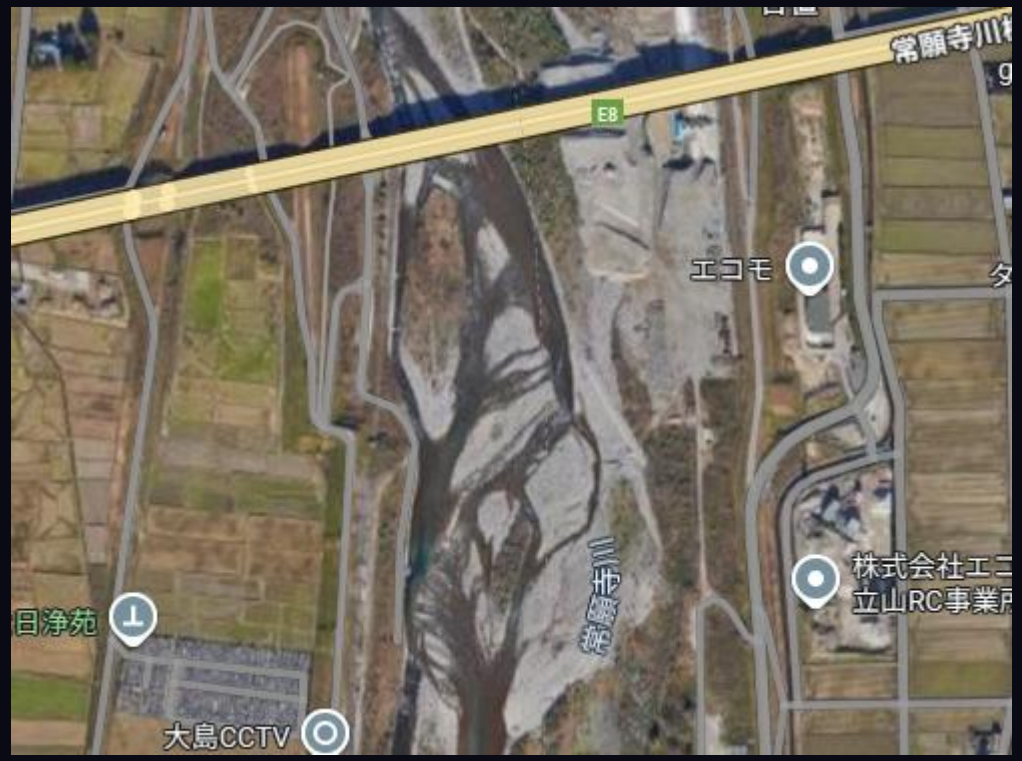
Multiple usage records in Japan and overseas

- ✓ Government of Country A: Understanding the impact of land subsidence
- ✓ General contractor A: Understanding the impact of underground construction projects
- ✓ Resource development company A: Understanding the risk of land subsidence from underground natural resource mining

04-4. Water Disaster Management

Use Case:道路・堤防の経年変化箇所（富山県中新川郡立山町日置地内）

- ○：堤防上の幅６ｍの舗装道路は識別できる
- ○：砂州の形状が明確に識別できる
- ×：草が生い茂っている堤防表面は確認できない（周囲との違いが不明瞭）

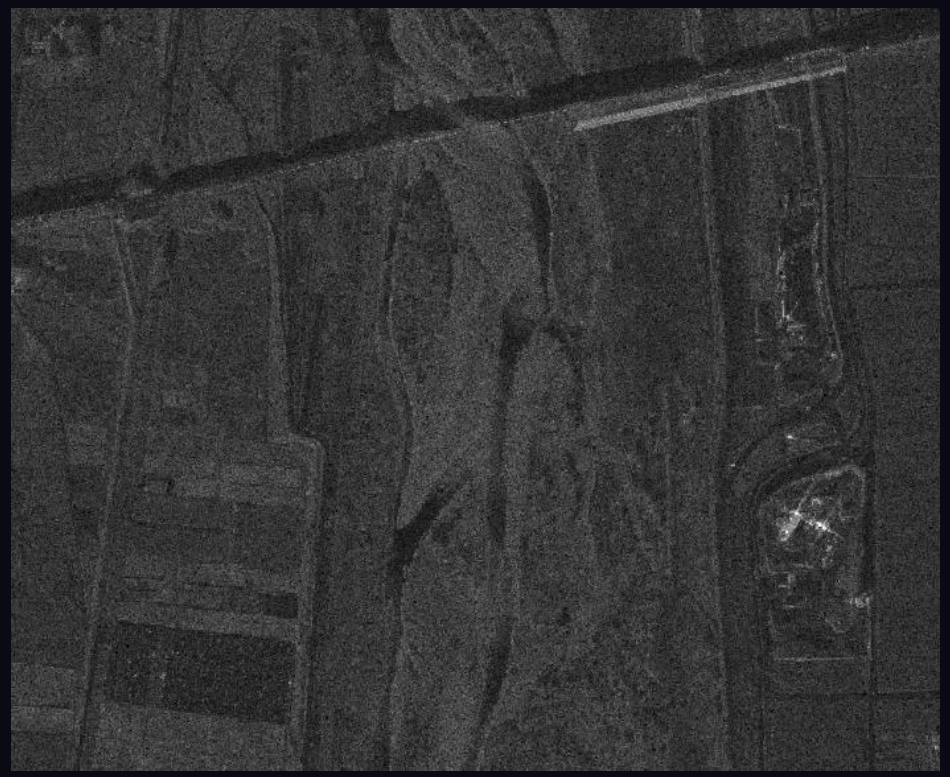


※Source: 左図：GoogleMap、右図：2025年8月20日撮像StriX-4Sliding Spotlight2 (0.46x0.5), Descending, Left, 19.4度

Use Case:道路・堤防の経年変化箇所（富山県中新川郡立山町日置地内）

参考検討：

- ST4（0.46x0.25）およびSL2(0.46x0.5)において撮像結果を比較したが、堤防を対象とした識別においては大差が見られなかった



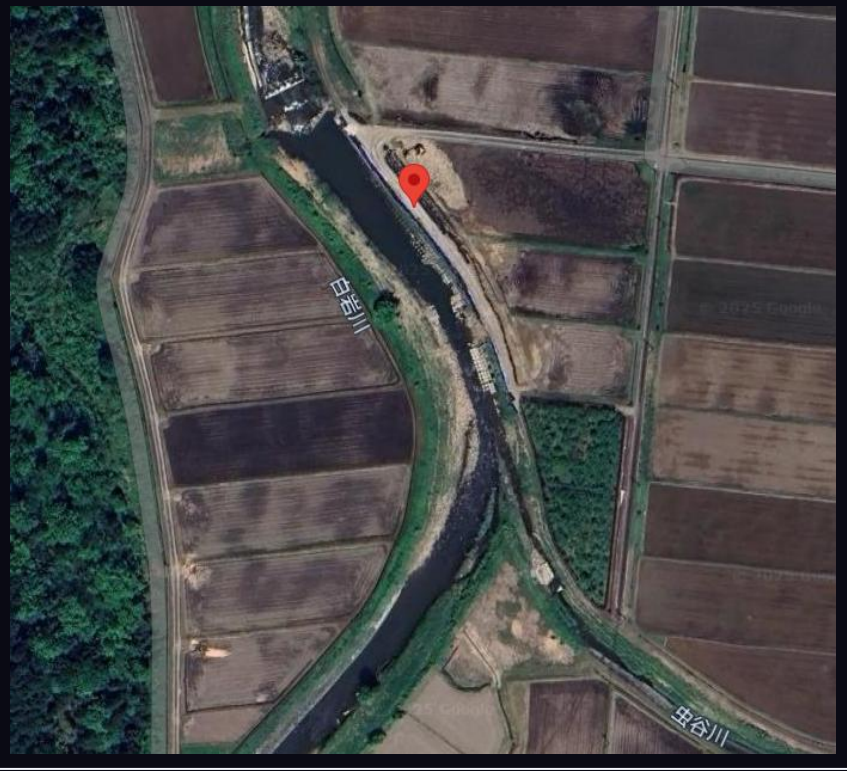
Staring Spotlight4 (0.46x0.25)による撮像結果

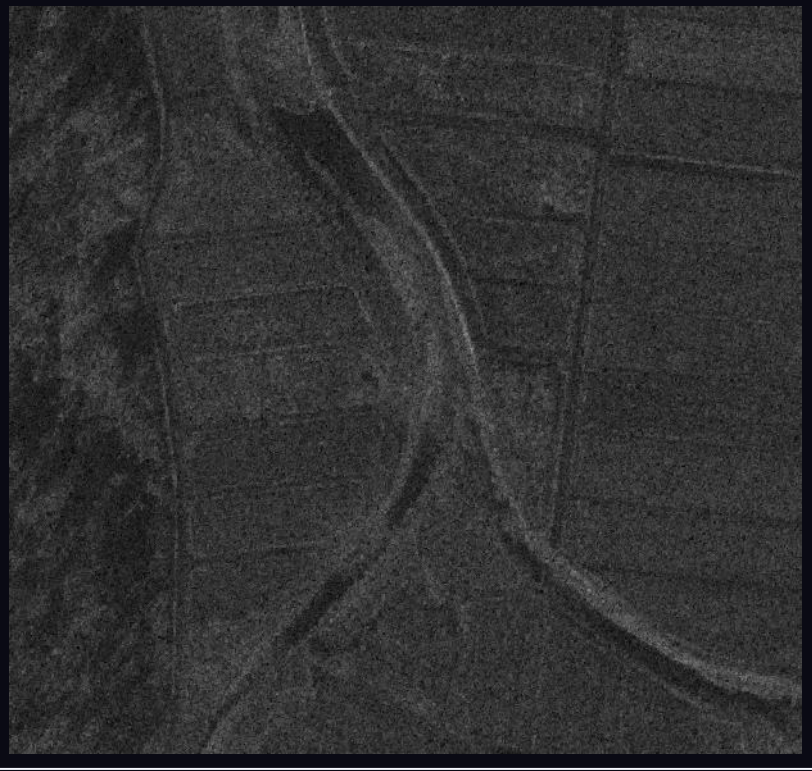
StriX-4Sliding Spotlight2 (0.46x0.5)による撮像結果

※Source: 左図：GoogleMap、右図：2025年8月20日撮像StriX-4Sliding Spotlight2 (0.46x0.5), Descending, Left, 19.4度

Use Case:河川の氾濫リスク箇所（富山県中新川郡立山町四谷尾地内）

- ○：堤防上の改修区間はある程度識別できる
- ○：砂州、澪筋の形状が明確に識別できる



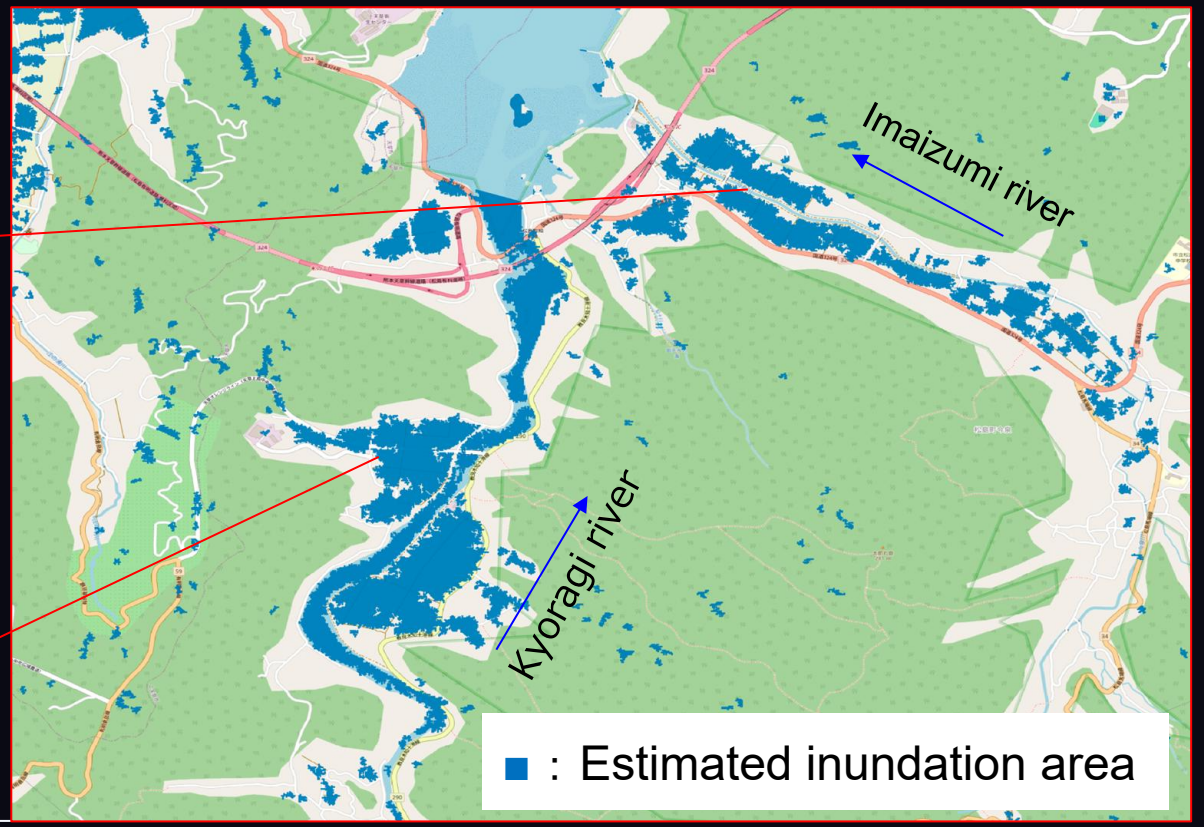


※Source: 左図：GoogleMap、右図：StriX-4Sliding Spotlight2 (0.46x0.5), Descending, Left, 19.4度

Use Case: Inundation Analysis of the Kamiamakusa city in August 2025

- August 11, 12:40 Tasking
- August 11, 15:47 Image capture
- August 11, 16:27 Data provided
- August 11, 19:00 Flood analysis results provided

Rapid monitoring enables faster decision-making for evacuation and flood prevention activities.



※Source: Chiju National Highway Live Camera (https://livecam.asia/kumamoto/kamiamakusa/chijukokudou.html), Sonobe District Live Camera (https://livecam.asia/kumamoto/kamiamakusa/kamiamakusa-sonebe.html)

04-4. Key challenges and solutions in adopting geospatial intelligence for infrastructure systems

04-4. Key challenges and solutions in adopting geospatial intelligence for infrastructure systems

1. New technology cannot be applied because it is not recognized by regulations and standards

   Collaboration with the government is necessary (anchor tenancy)

2. The accuracy of new technology needs to be demonstrated

   Collaborate with customers in various fields to increase the number of case studies

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