Introduction to Japan Disaster Charter

For ICGS-SAR Workshop #3 Saga, Japan

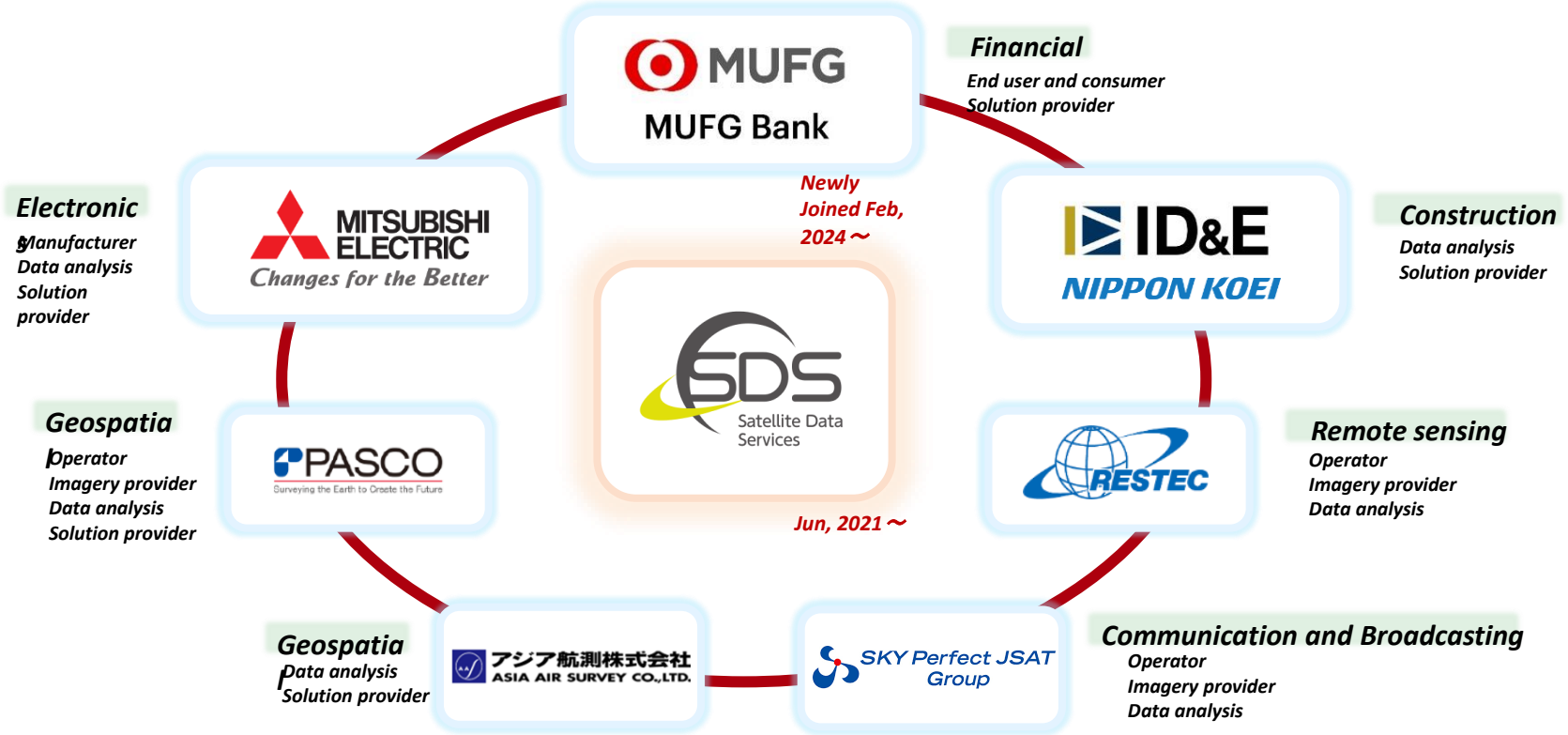
衛星データサービス企画株式会社
Satellite Data Services Co., Ltd.

8 November 2024

Kazutaka Kumeno

Satellite Data Services Co., Ltd. Founded!

Established by a consortium of leading companies in the satellite data utilization business value chain, aiming to promote and expand the satellite data service market



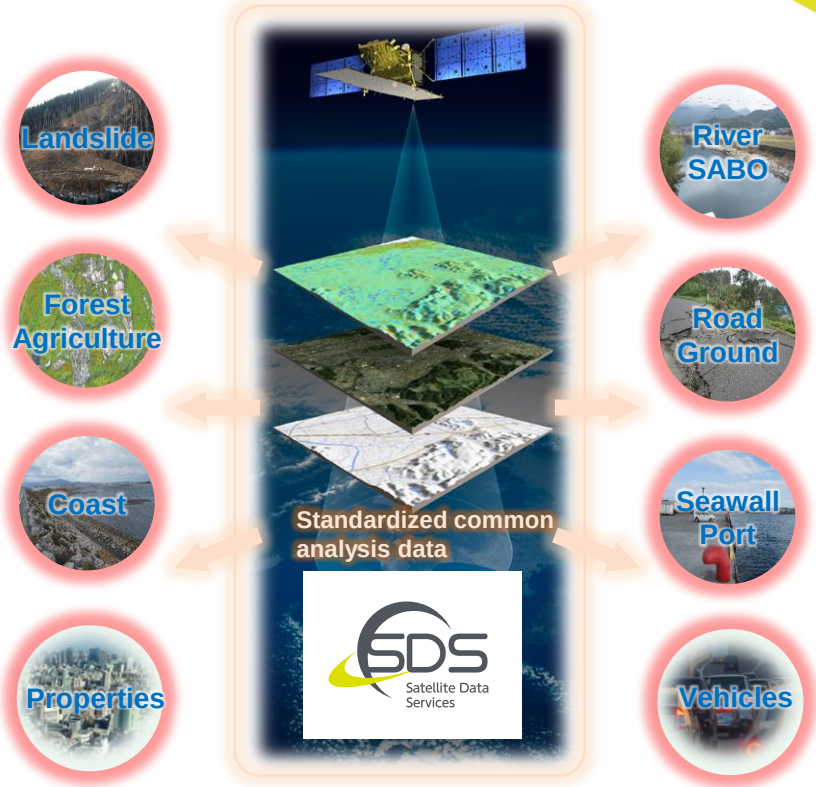
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Navigating the Sustainable Future

Our mission is to contribute to solving global social challenges and to make a positive impact on future society

Our Impact:

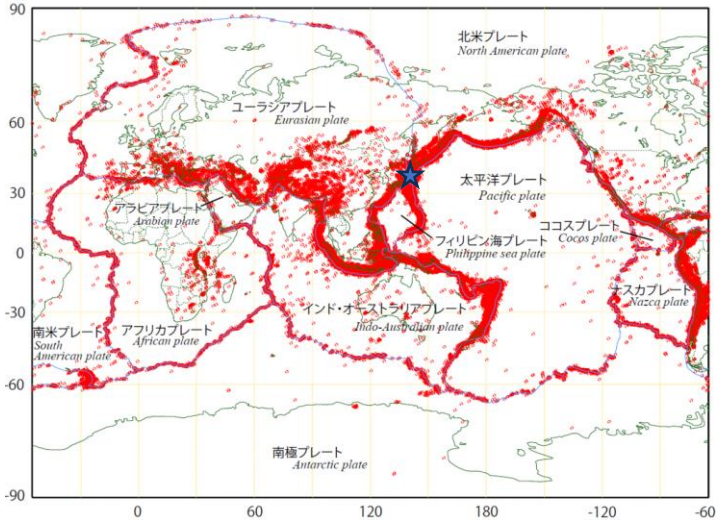
- ***Enhancing rapid disaster response and recovery***
  - ***Establishment of the "Japan Disaster Charter System"***
- ***Supporting digital transformation (DX) in administration, local governments, and private sectors***
  - ***Providing standardized common data for monitoring services for infrastructure, land, and properties***
- ***Offering objective evaluation tools for sustainable management from an ESG perspective***
  - ***Providing standardized common data for monitoring services to achieve carbon-neutrality***



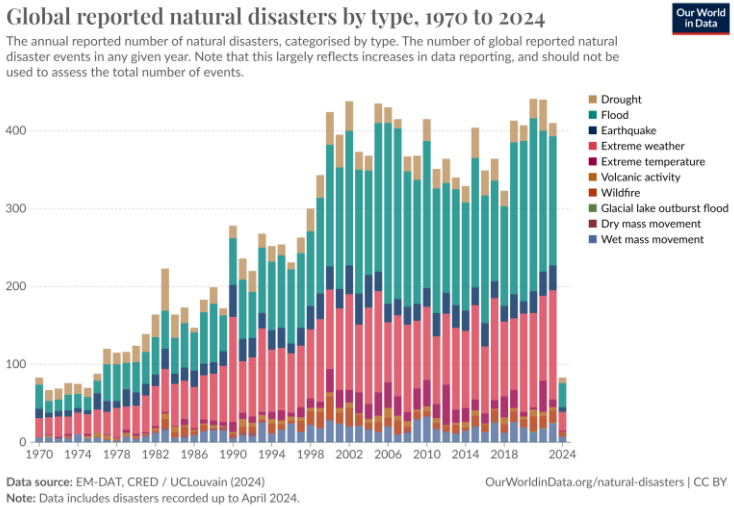
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1．Japan Disaster Charter Initiative

Due to the effects of global warming and Japan's unique topography and geographical conditions, Japan is susceptible to natural disasters, and in recent years, their frequency and severity have been increasing. This is also similar trend globally.



Earthquake epicenter (JMA web page)

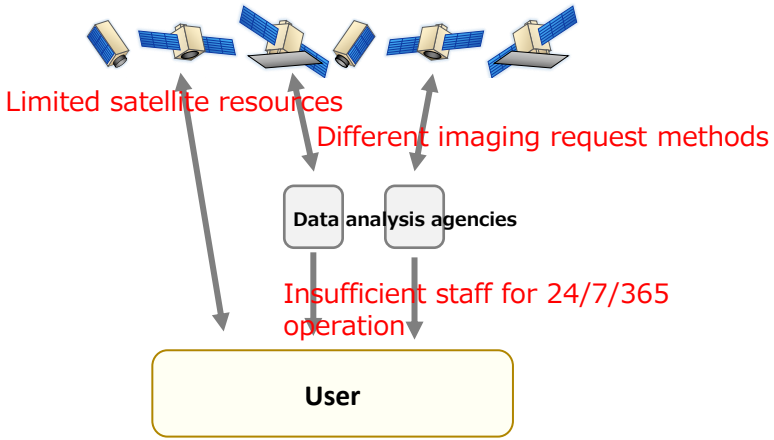


The importance of satellite-based monitoring for various disasters has become extremely high, including floods and landslides caused by typhoons, as well as building and ground damage caused by earthquakes.

1. Japan Disaster Charter Initiative

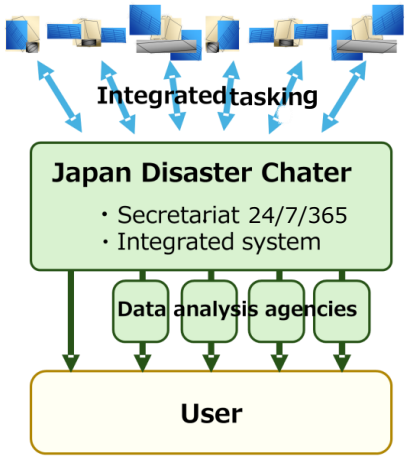
The Japan Disaster Charter is a framework that utilizes satellite resources from around the world to provide wide-area disaster monitoring data during initial disaster response, recovery and reconstruction.

Current situation



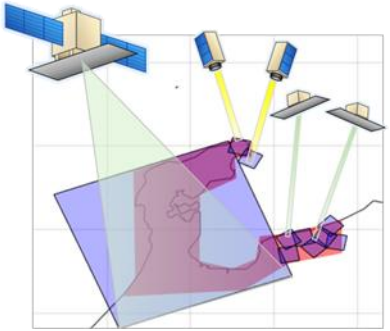
There were challenges in providing rapid and sufficient information during disasters…

Going forward



Virtual Constellation

large-scale core satellites **small constellation satellites**



Smart Tasking

Managed by a 24-hour integrated system, combining wide-area monitoring with large satellites and agile-detailed monitoring with small satellites enables comprehensive and rapid understanding of disasters.

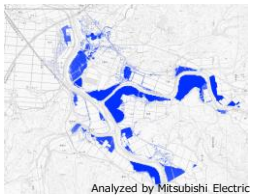
1. Japan Disaster Charter Initiative

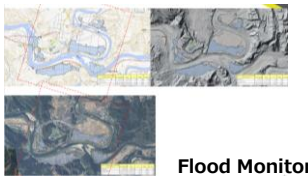
This year, under the social challenges resolution project of the Cabinet Office of Japan known as BRIDGE, it is undergoing demonstration to achieve institutionalization and the establishment of its system.

Chater Secretariat	National Research Institute for Earth Science and Disaster Resilience, Mitsubishi Electric Corporation, **Satellite Data Services Co., Ltd.** Remote Sensing Technology Center of Japan, Fujitsu Limited
Service Overview	"Utilize a wide variety of satellites through a one-stop service" ●Conduct emergency observations using a diverse range of satellites, including wide-area, high-resolution, optical, and radar satellites. ●Capture images with the most suitable satellites based on the type of disaster, time of occurrence, scale, and weather, and provide analysis results tailored to user needs. ●Operate 24 hours a day, 365 days a year. ●The Charter Office handles contracts and coordination with different satellite providers for each satellite.
User	Disaster-related ministries, designated administrative agencies, designated public institutions, local governments, private sector (electric power, railways etc)
Satellite	1. ALOS-2/4 (Japan) 2. Private small satellites: Synspective, Institute for QPS, Axelspace (Japan), Capella, Satellogic (USA) 3. Private commercial satellites: SPOT, Pleiades (France), CSK/CSG (Italy)

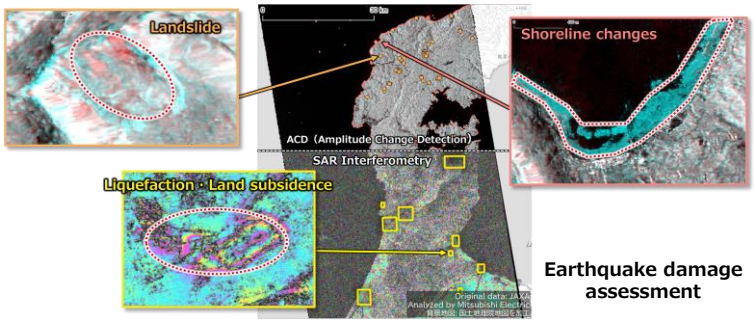








Flood Monitoring



Earthquake damage assessment

Disaster situation analysis

2. Demonstration Results of Japan Disaster Charter 2024

Typhoons and linear rainbands occur frequently, **leading to a high demand for SAR**, which is not affected by weather conditions, and it is being extensively observed and utilized.

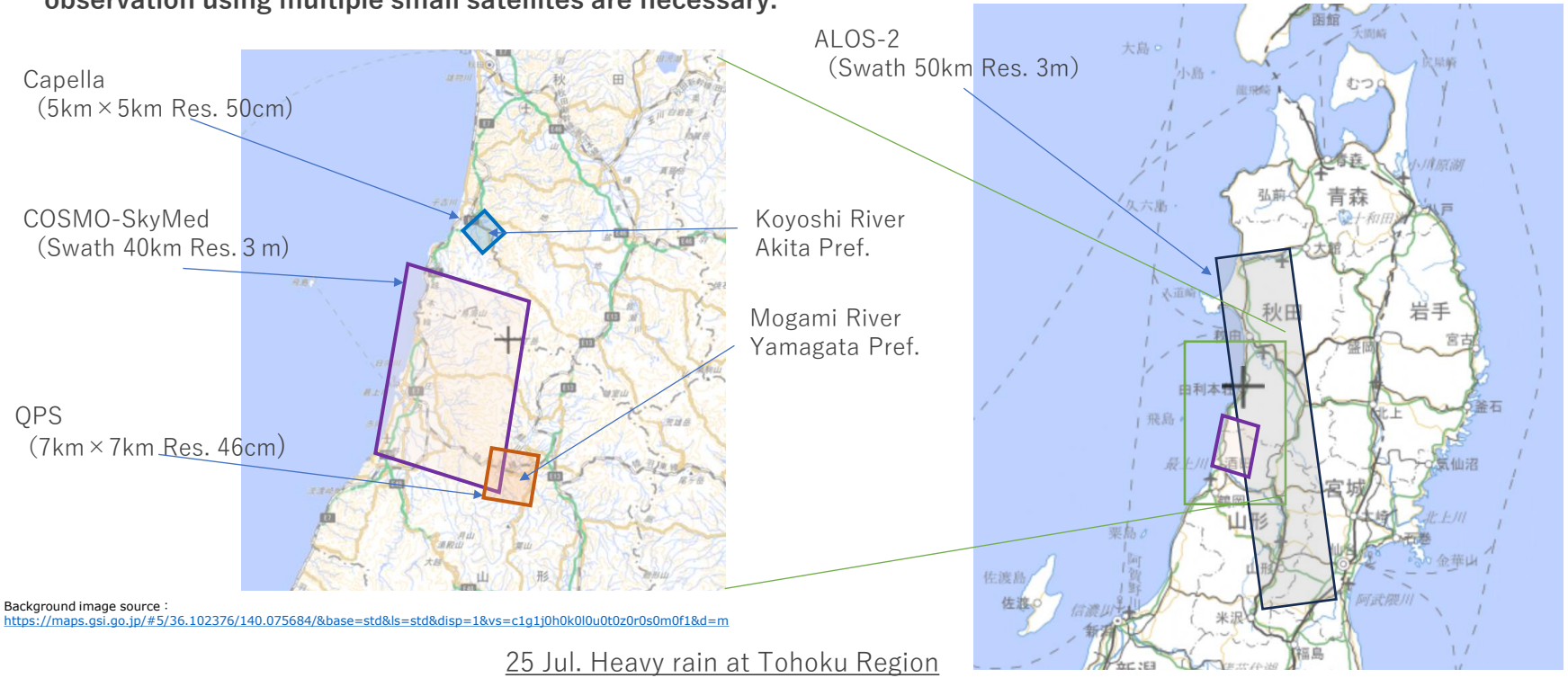
	Date	Target Disaster	Observation area	Collaborative user	Satellites		Notes
					SAR	Optical	
1	25, Jul	Heavy Rain Tohoku Region	Akita Pref.	MILT(*)	ALOS-2, QPS, Capella, CSK	—	
2	8, Aug	Earthquake Hyuga-nada	Miyazaki Pref.	MILT	ALOS-2, QPS, StriX, Capella	GRUS	
3	11, Aug	Typhoon No.5	Iwate Pref.	MILT	ALOS-2, StriX	—	
4	15, Aug	Typhoon No.7	Chiba Pref.	Railway Company	StriX, Capella	Pleiades	The Pleiades image was almost entirely covered by clouds.
5	29, Aug	Typhoon No.10	Saga Pref.	Saga Pref.	（StriX, Capella）	—	Preparation Only. The observation was not conducted as the weather improved.
6	21, Sep	Heavy Rain Noto Peninsula	Ishikawa Pref.	MILT	ALOS-2, StriX, Capella,	—	
7	24, Sep			Electric Power Company	ALOS-2	SPOT	

* Ministry of Land, Infrastructure, Transport and Tourism

2. Demonstration Results of Japan Disaster Charter 2024

Examples of Combined Observations Using Multiple Satellites (Large Wide-Area and Small High-Resolution)

To fully understand the extent of flooding in multiple rivers, wide-area observation like that of ALOS and pinpoint observation using multiple small satellites are necessary.



Background image source :
https://maps.gsi.go.jp/#5/36.102376/140.075684/&base=std&ls=std&disp=1&vs=c1g1j0h0k0l0u0t0z0r0s0m0f1&d=m

25 Jul. Heavy rain at Tohoku Region

2. Demonstration Results of Japan Disaster Charter 2024

Examples of Combined Observations Using Multiple Satellites (Large Wide-Area and Small High-Resolution)

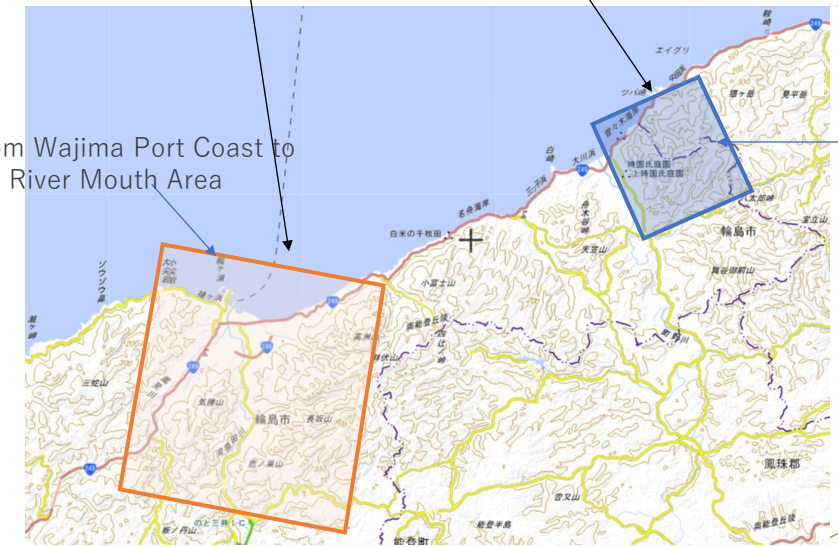
StriX（10km×10km、Res. 90cm）

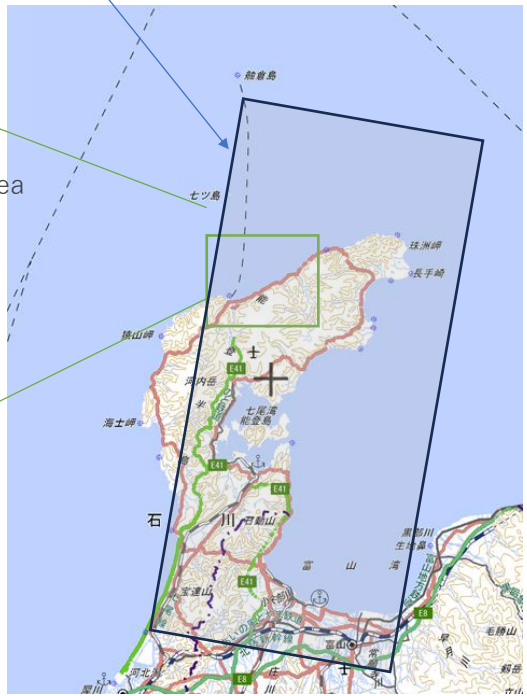
Capella（5km×5km、Res. 50cm）

ALOS-2（Swath 50km　Res. 3m）

From Wajima Port Coast to the River Mouth Area

Wajima city
Sosogi Coast to the Area around Suzuya River





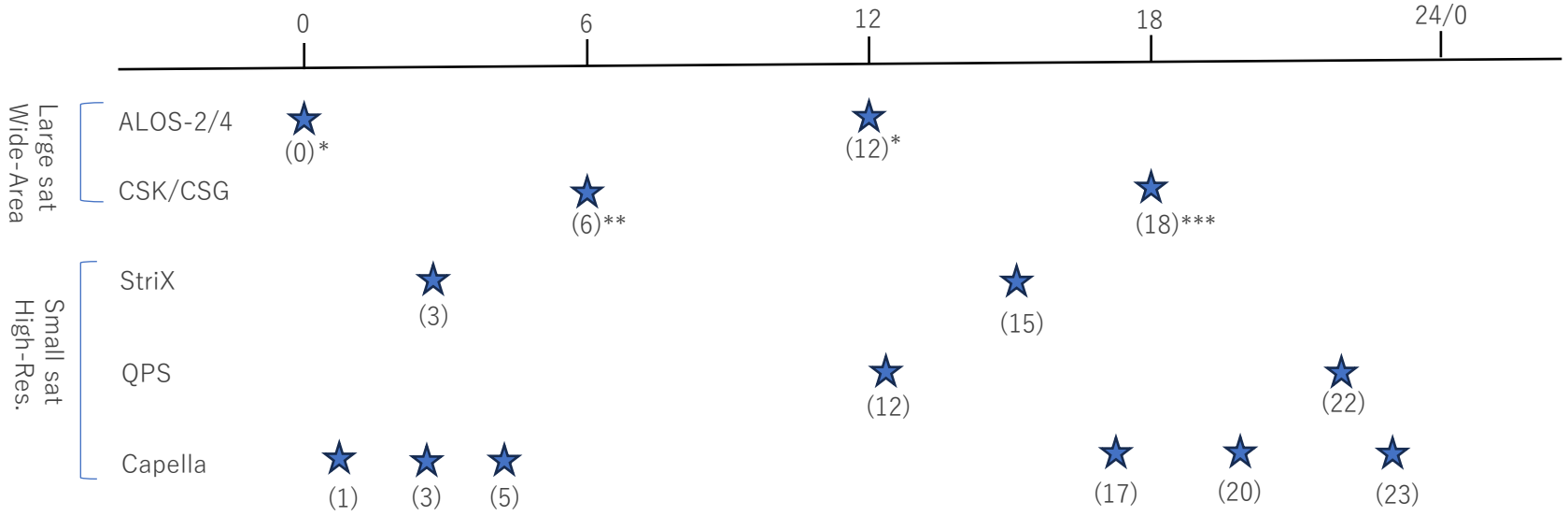
背景地図出典：国土地理院ウェブサイト
（https://maps.gsi.go.jp/#5/36.102376/140.075684/&base=std&ls=std&disp=1&vs=c1g1j0h0k0l0u0t0z0r0s0m0f1&d=m）

21 Sep. Heavy Rain at Noto Peninsula

3. Toward Future

Timeline Reduction (imaging opportunities)

Here is an example of the current observation timing of SAR satellites used in this year's demonstration. To conduct timely observations in the event of a disaster, improving imaging opportunities is essential. **It is anticipated to continuously increase the number of satellites (large wide-area sat and agile high-res small sat) in various LSTs.**



*A request is not allowed.
Sharing government-captured images is permitted.

** A request must be submitted 38 hour before the observation.

*** A request must be submitted 26 hour before the observation.

3. Toward Future

Timeline Reduction (Fully automated end-to-end system)

The human-based 24-hour operation is burdensome. To reduce the workload and shorten the timeline, it is important to fully automate the process from collecting user requests to tasking and providing interpretation information.

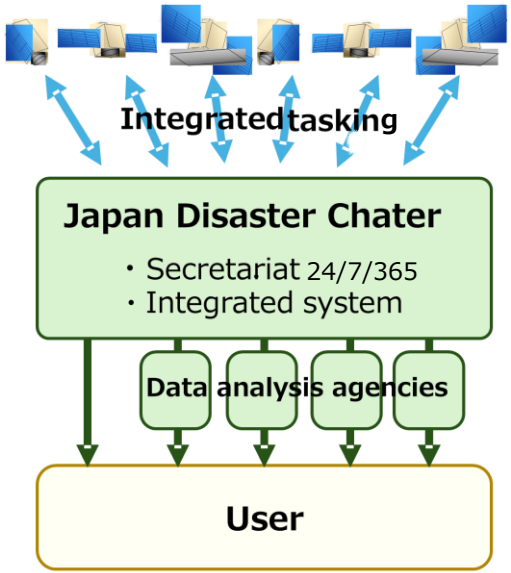
Current situation



・Manually collected User Requests (E-mail, Phone…)

・Manually tasking each satellite (AOI selected by meeting)

・Making data analysis report for each customer



Going forward

Fully Automated





・Automated User Requests Collection (Triggering System)

・Smart Tasking & Order System

・Automated Data Analysis

Achieving a Fully Automated Virtual Constellation for Rapid & Comprehensive Disaster Monitoring !

ICGS-SAR
INTERNATIONAL COORDINATION GROUP FOR SPACEBORNE SAR MISSIONS

Thank you !



Overview of Satellite Data Services Co., Ltd.	
Company name	Satellite Data Services Co., Ltd.
Address	4-6-1 Iidabashi, Chiyoda-ku, Tokyo, 21 Towa Building
Representative	Kazutaka Kumeno (seconded from Mitsubishi Electric)
Date of incorporation	June 2021
Shareholders	Mitsubishi Electric, MUFG Bank, ID&E Holdings, Pasco, SKY Perfect JSAT, Asia Air Survey, Remote Sensing Technology Center of Japan (RESTEC)
Capital Stock	410 million yen

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