Surveying the Earth to Create the Future

Application of Remote Sensing Technology for Environmental Field in Indonesia ~Detection of Disaster Impacts and Monitoring of Land Use Changes from the Space~

INDONESIA - JAPAN

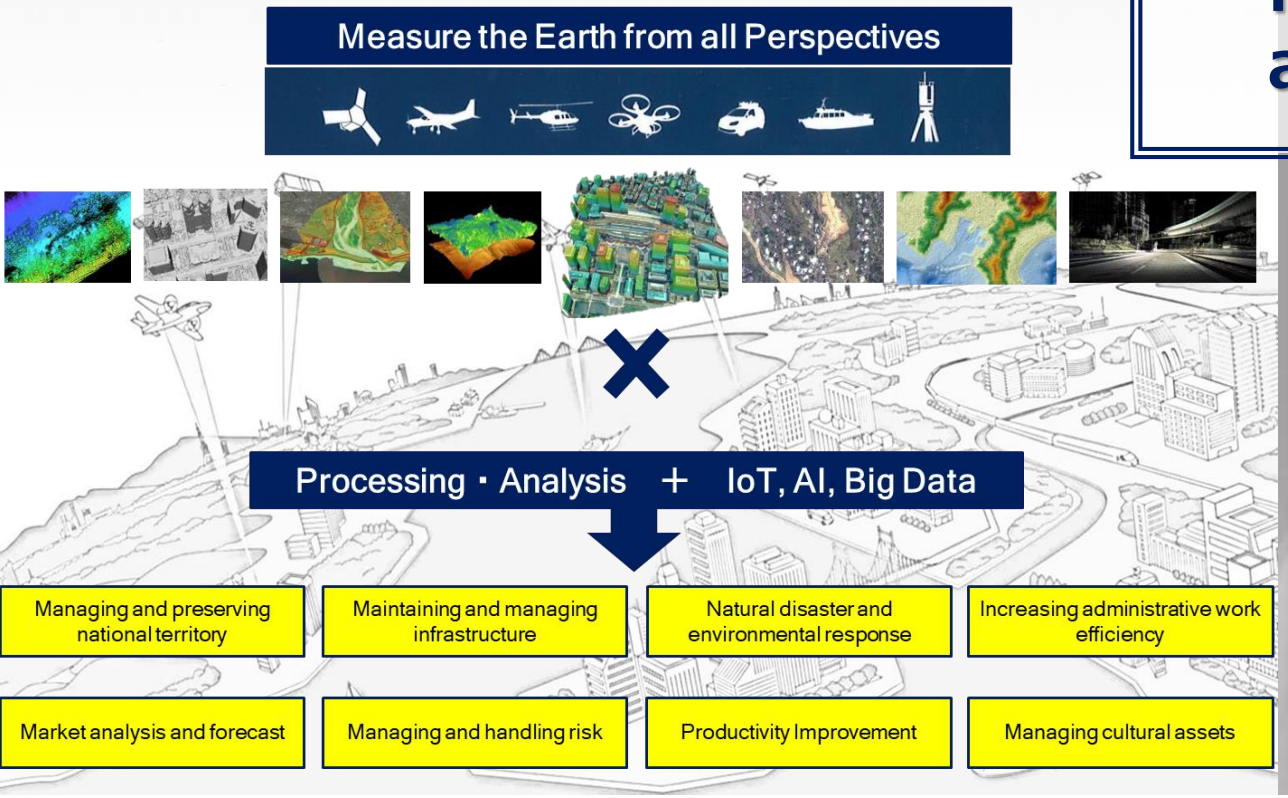
ENVIRONMENTAL WEEK 14, January 2021

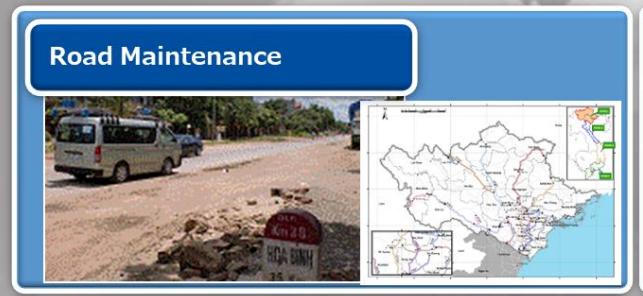
PASCO
Surveying the Earth to Create the Future

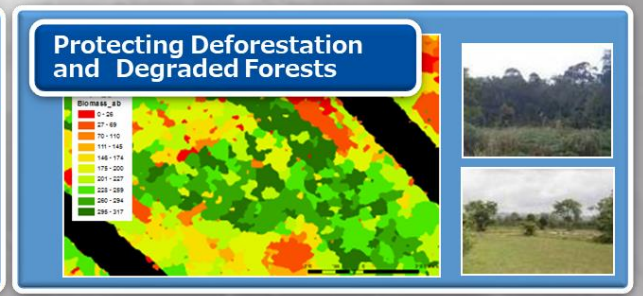
PASCO CORPORATION Company Profile

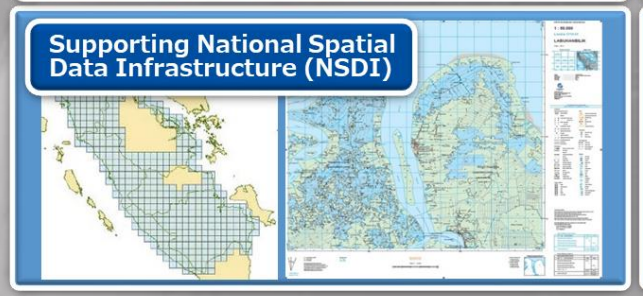
“Surveying the Earth to Create the Future”

- Geospatial Information Solution Services for Japan and overseas
- National Spatial Data Infrastructure for Smart City and Countermeasures against Global Warming





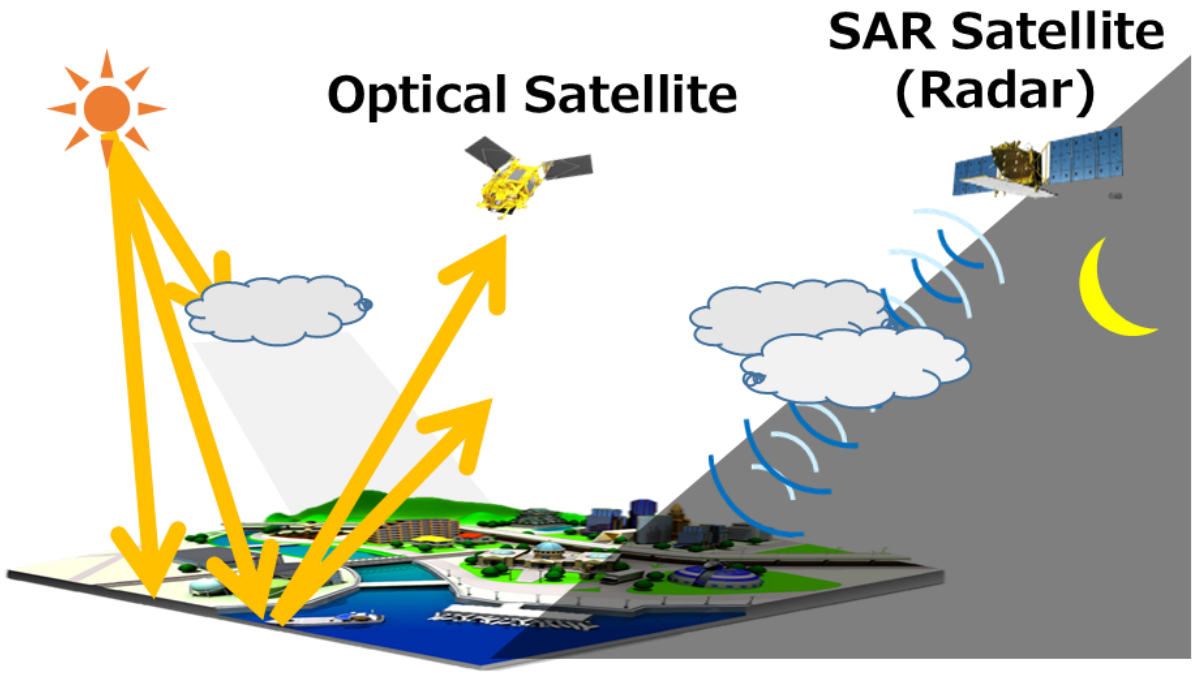


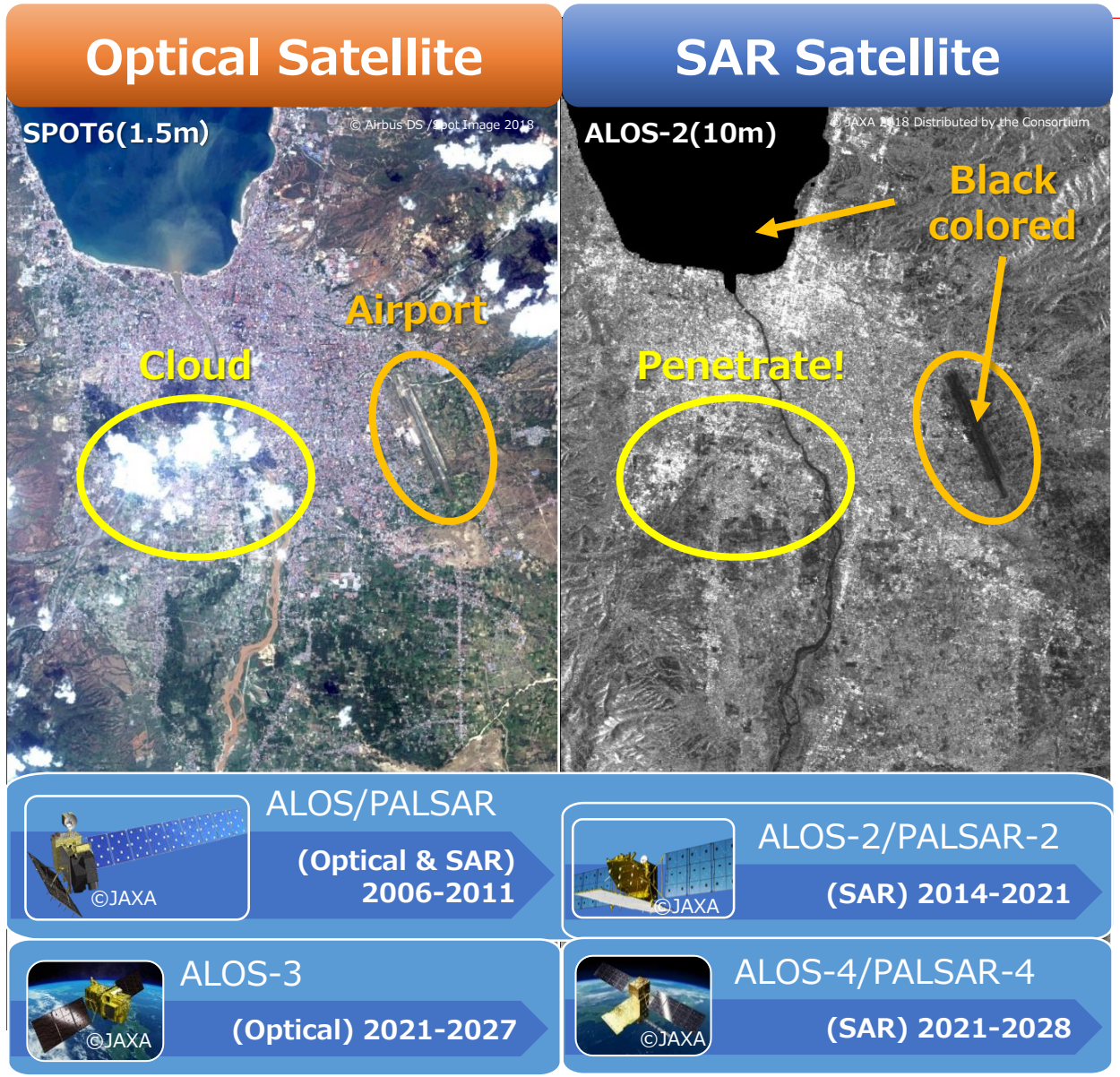


Earth Observation Satellite

Our satellite business mainly deals with two types of the earth observation satellites.

- **OPTICAL** satellite: expresses things in a form close to what humans see
- **SAR** satellite: visualizes conditions that humans cannot perceive





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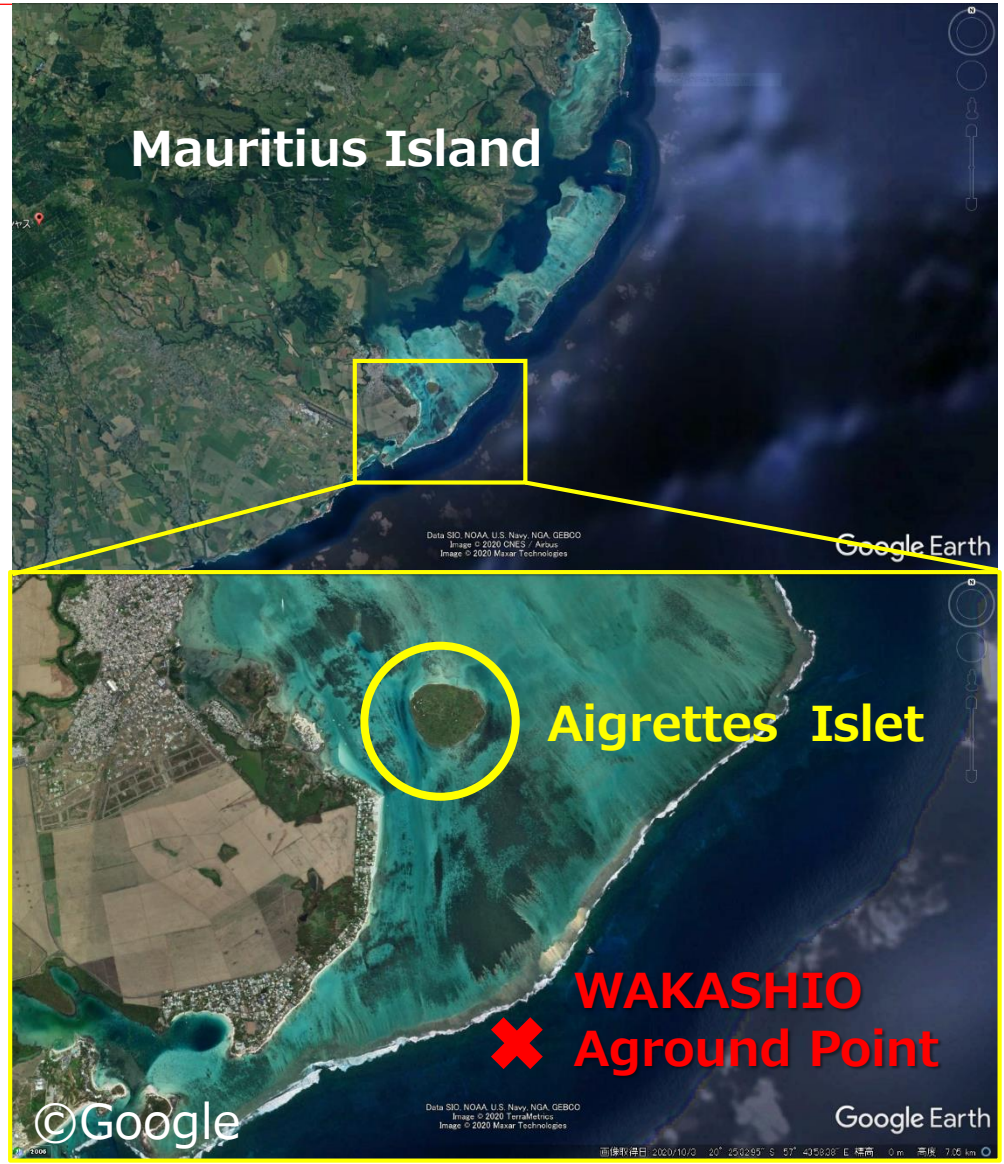
Oil Spill detection in Mauritius



Oil leaking from stranded ship toward the island

August 15:
Before Cargo Ship Split

August 23:
Wreckage of a part of
a cargo ship

Flood and Oil Spill detection in Saga, Japan

ISSUE

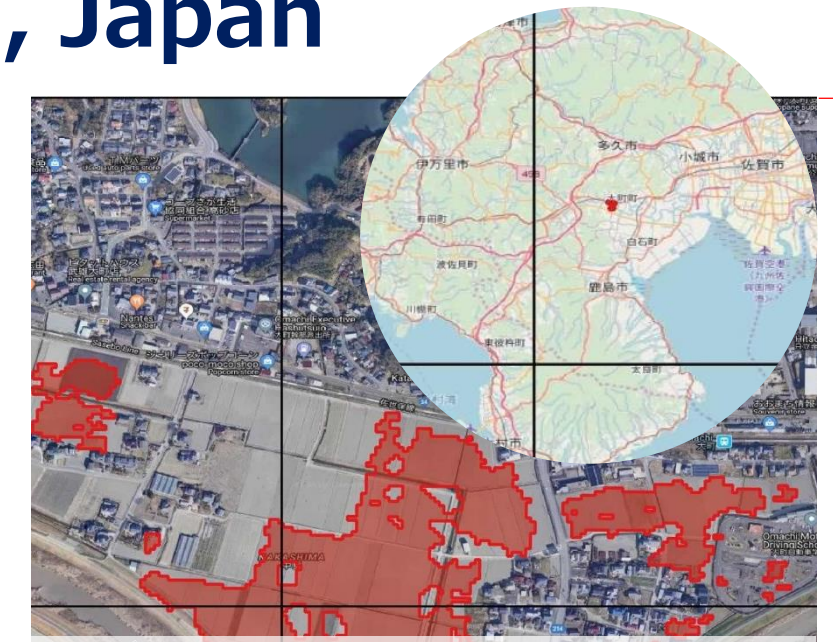
In August 2019, about 54,000 liters of oil spilled from the factory in Saga Prefecture due to heavy rain.

APPROACH

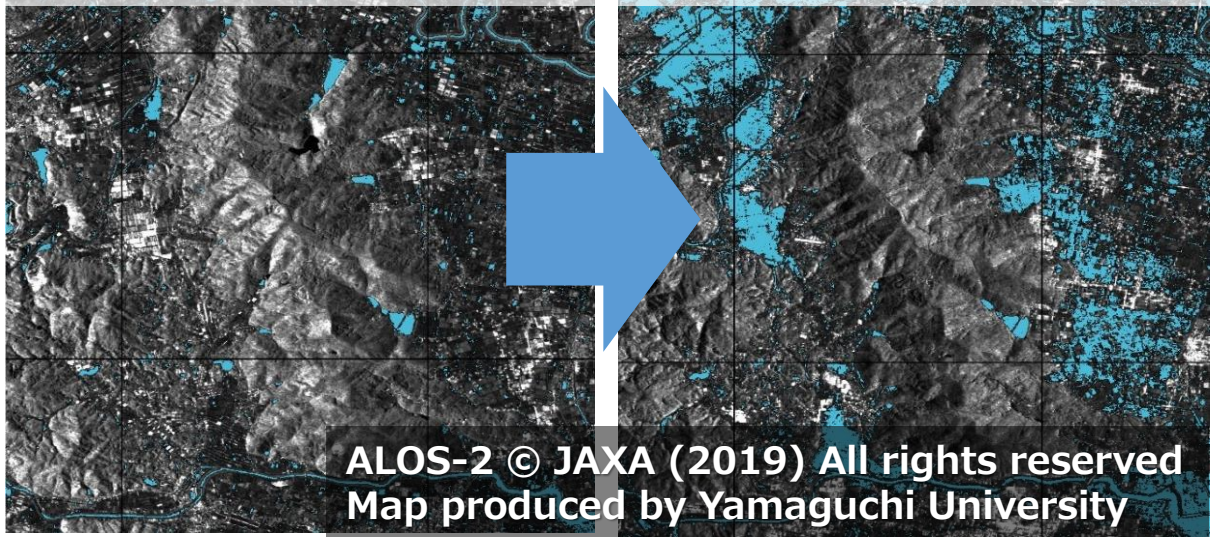
Using SAR images before and after the accident, it is possible to grasp the extent of flooding and oil spill by the difference of reflection intensity.

EFFECT

Estimate the damage of flooding and oil spilling and to prevent oil spreading and to make plans for collection, disposal, etc.

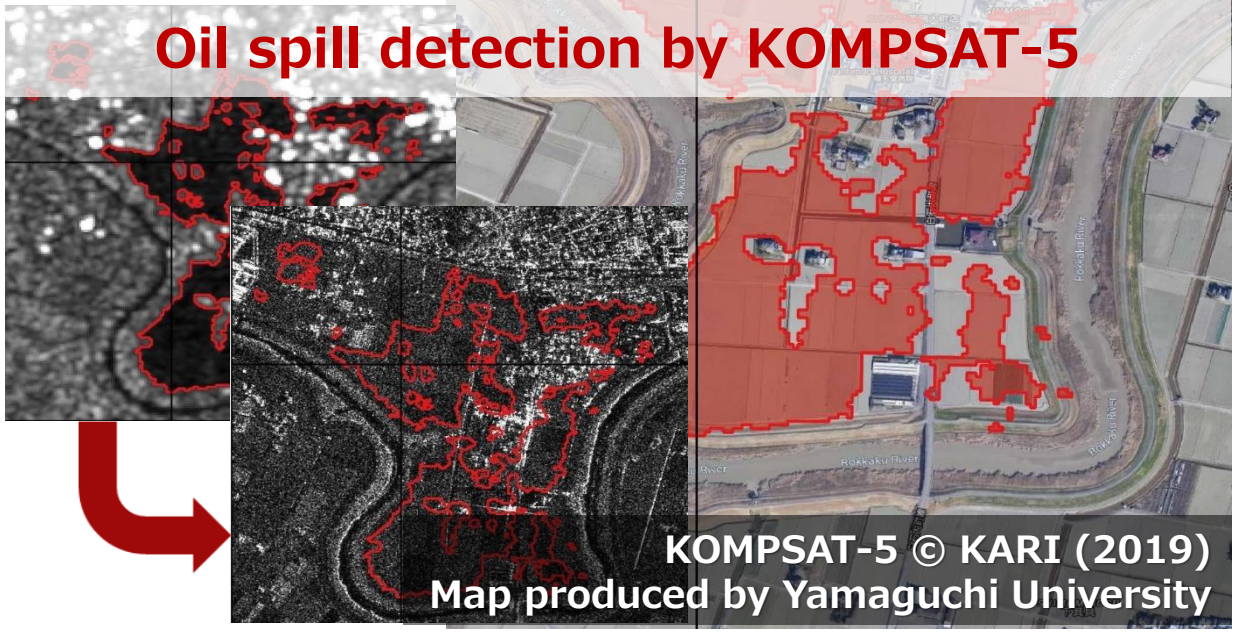


Flooding detection by ALOS-2



ALOS-2 © JAXA (2019) All rights reserved
Map produced by Yamaguchi University

Oil spill detection by KOMPSAT-5



KOMPSAT-5 © KARI (2019)
Map produced by Yamaguchi University

Coastline Monitoring in Northern Java

ISSUE

Shoreline recession has become a severe problem in recent years due to the accelerated utilization of coastal areas. It is necessary to assess the damage in coastal regions effectively.

APPROACH

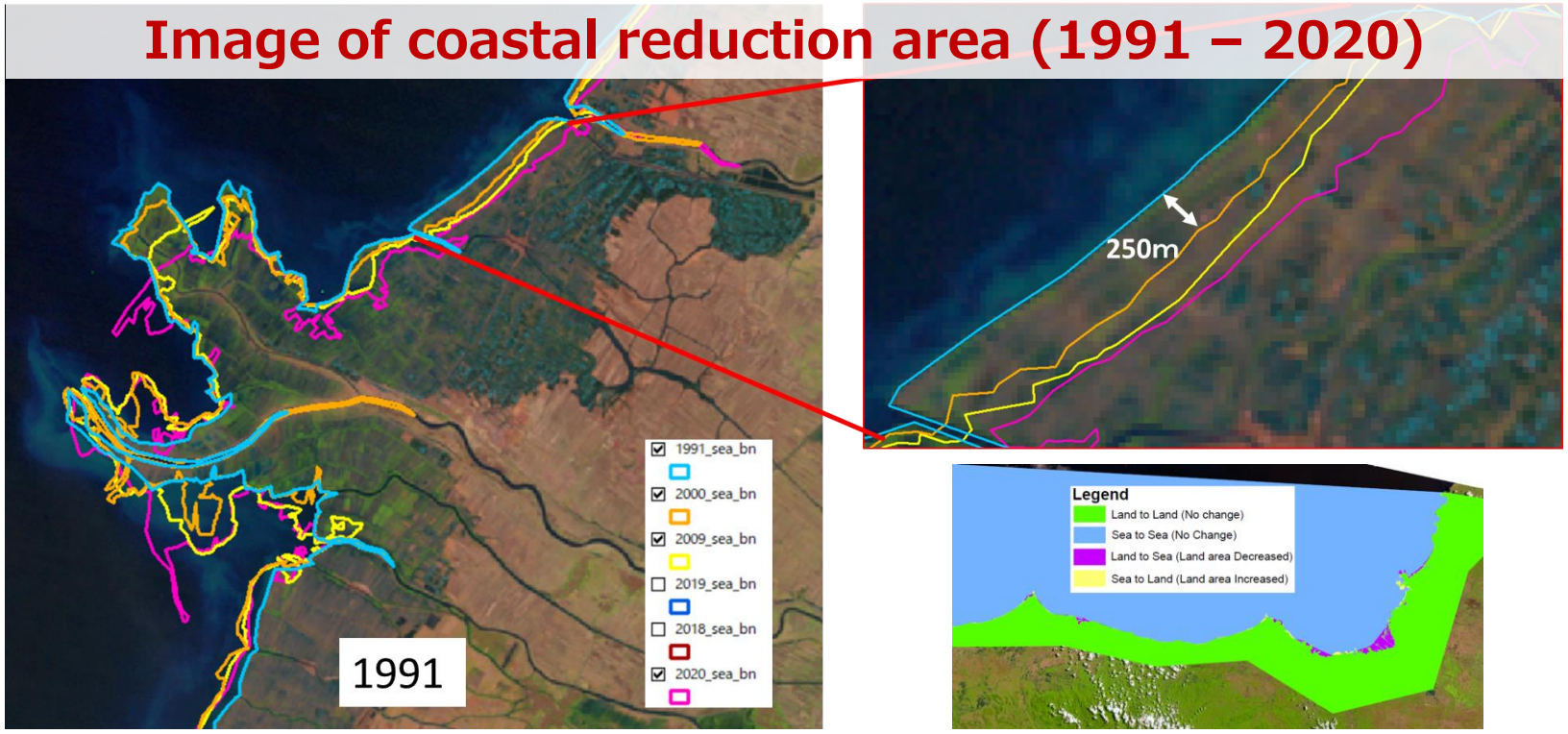
To quantitatively analyze the shoreline change and the natural coast's decrease rate, we carried out time series analysis using free satellite images.

EFFECT

A time series analysis using satellite images shows that the coastline has receded by 250 m.

Example of shoreline change analysis

Image of coastal reduction area (1991 – 2020)

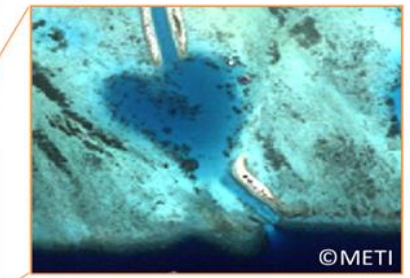


Seagrass Survey in Seribu

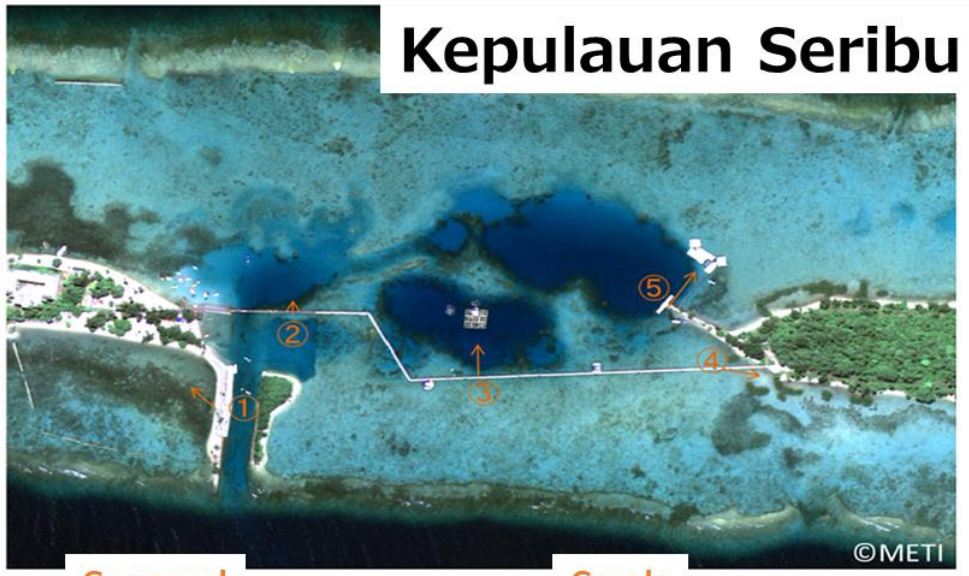
ISSUE An efficient monitoring method for seagrass beds is needed.

APPROACH The high-resolution optical satellite enables periodic monitoring.

EFFECT Time-Series data is required to understand the decline and recovery of seagrass beds over a wide area.



- **Seaweed, corals, mangroves, and piers** are identified.
- Satellite images and photos make it possible to grasp the distribution of seagrass beds over a wide area as a time-series image, and includes the purpose of monitoring the habitats of various organisms such as corals, mangroves, and lagoons.

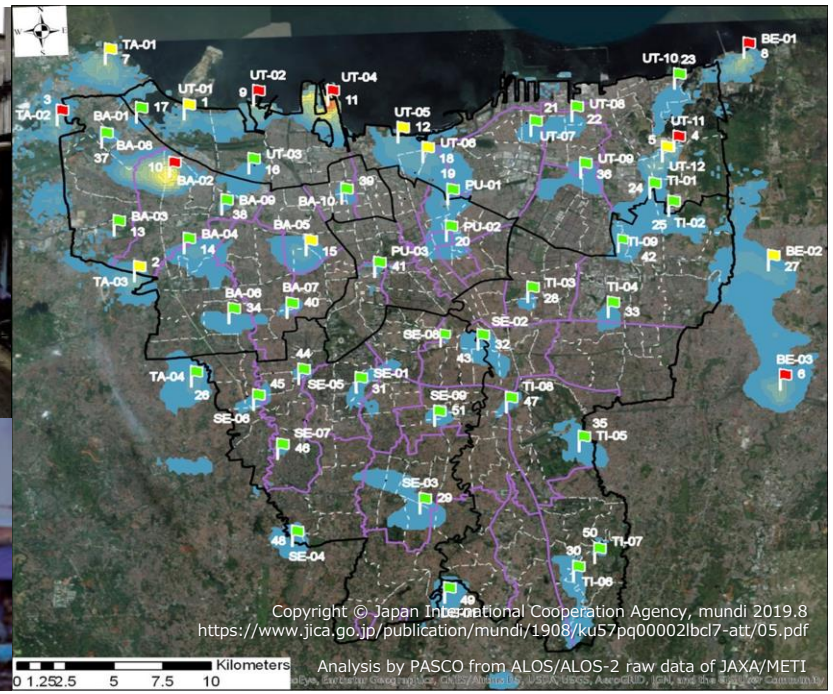


Land Subsidence in Jakarta

ISSUE Large-scale land subsidence occurred due to groundwater extraction, and evidence was needed to grasp the situation in time series for countermeasures.

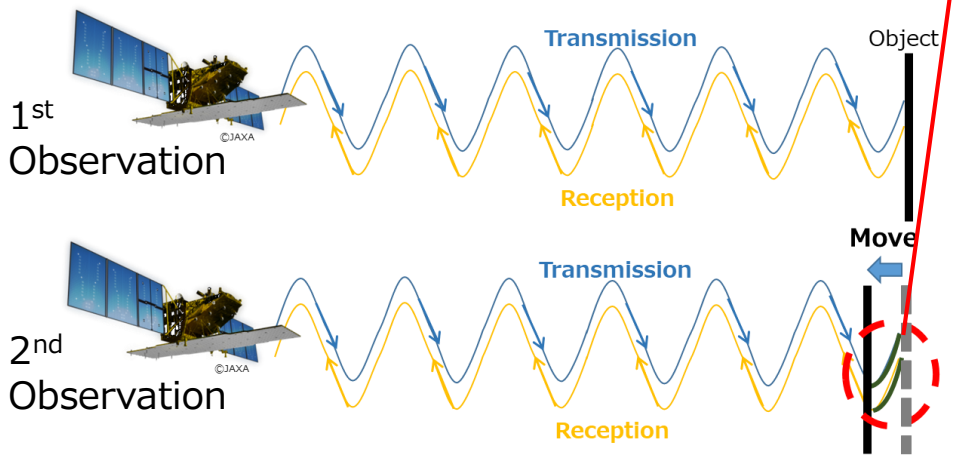
APPROACH Using SAR satellite, it is possible to grasp the settlement from the relative error in time series over a wide area.

EFFECT Recognize the historical subsidence and the government will promote consensus building, and DKIJKT and the Ministry of Public Works work for countermeasures.



Using 2 times SAR images, deformation can be detected!

Difference in phases of two observations



Assessment of Damage caused by the Sulawesi Earthquake

ISSUE

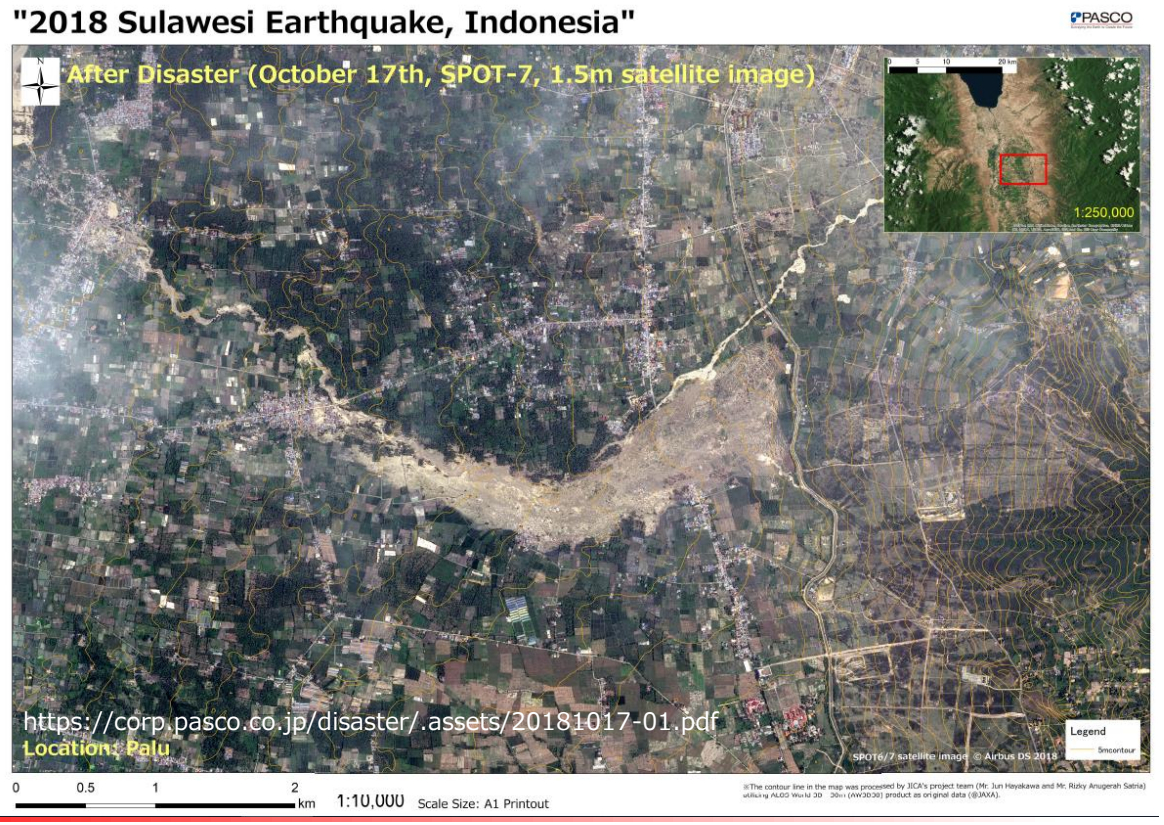
Need to quickly grasp the area and range of landslide, and its terrain characteristic in Central Sulawesi caused by the Sulawesi Island earthquake in September 2018.

APPROACH

By superimposing the contour lines generated from the pre-disaster image and the satellite info, people can analyze the relationship between the change of the land condition and the topography.

EFFECT

Identifying tsunami inundation areas and large landslide areas can be possible. Using satellite enables analysis of land trends at disaster sites and contribute to rapid recovery planning.



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Deforestation (JJ-FAST: JICA-JAXA Forest Early Warning System)

ISSUE

The world's forests, mainly tropical forests, have decreased by an average of 4.7 million hectares per year between 2010 to 2020.

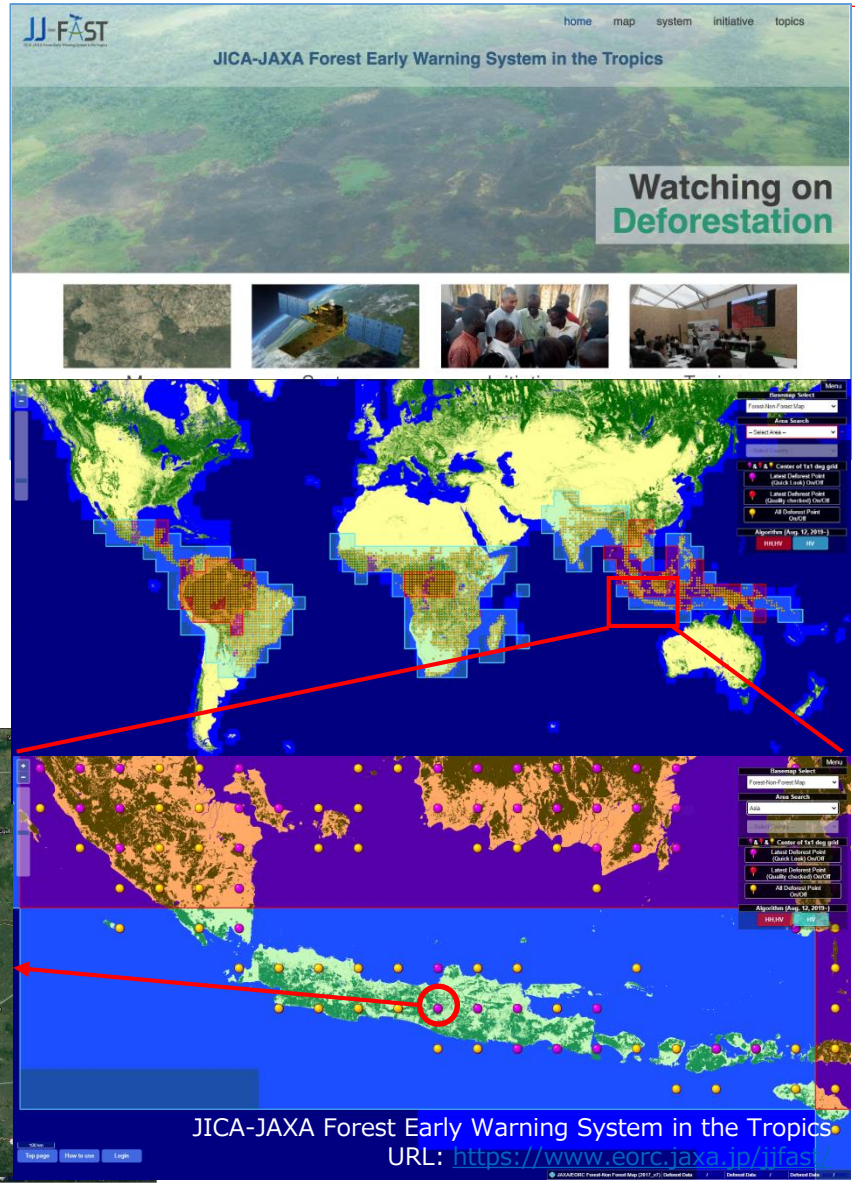
From Global Forest Resources Assessment 2020 URL: http://www.fao.org/3/ca9825en/CA9825EN.pdf

APPROACH

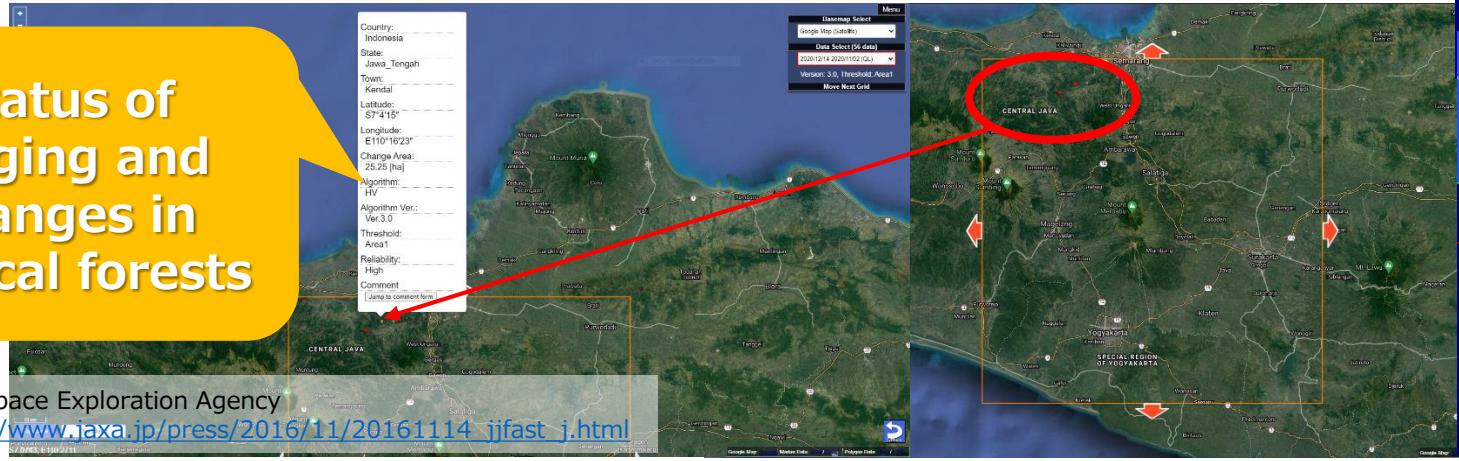
Monitoring of deforestation can be conducted **every 45 days** by periodic observation over a wide area using SAR satellites that penetrate clouds.

EFFECT

JJ-FAST users have access to the Internet, and they can see how tropical forests are changing.



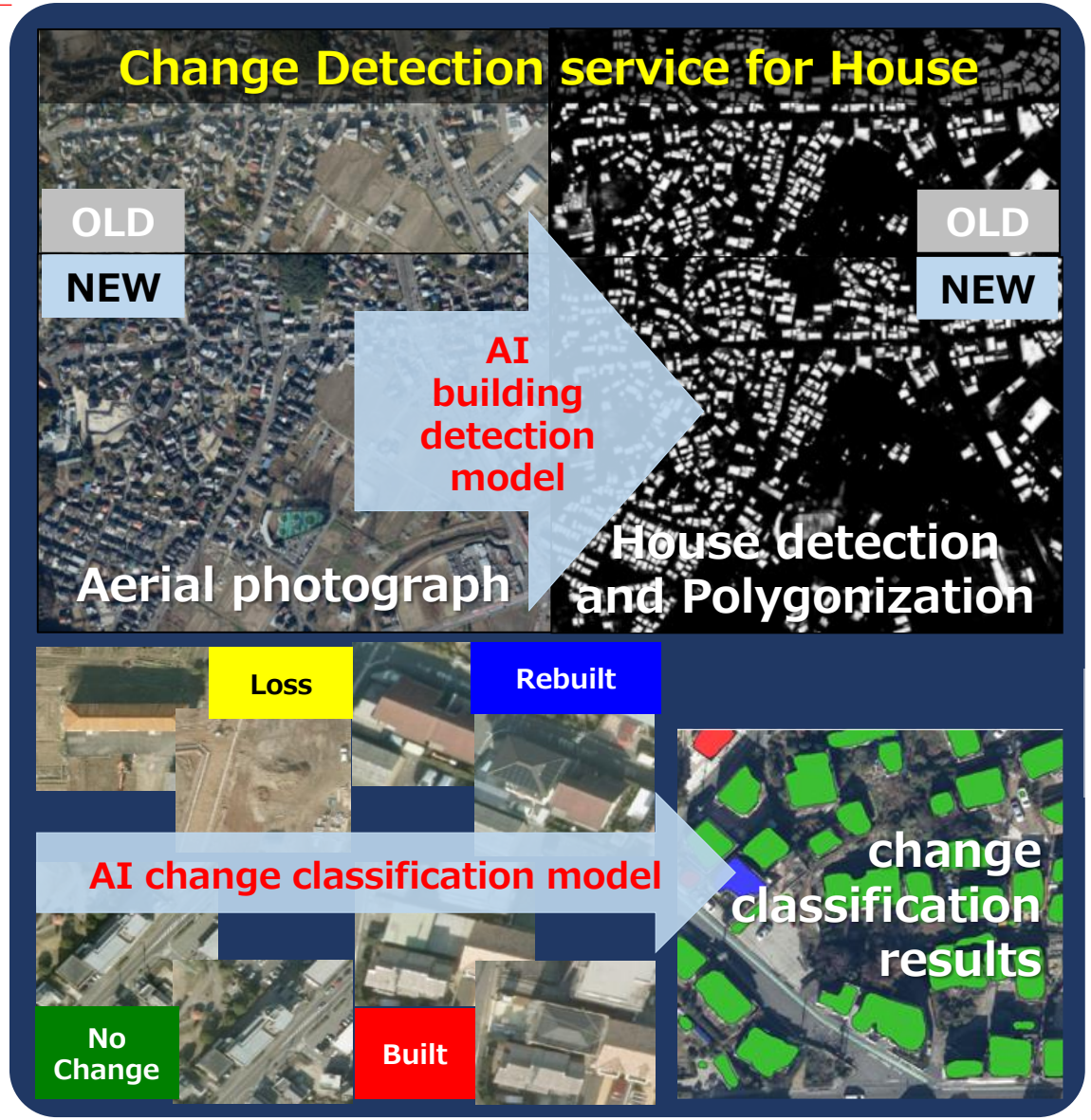
Status of logging and changes in tropical forests



Japan Aerospace Exploration Agency
URL: https://www.jaxa.jp/press/2016/11/20161114_jjfast_j.html

JICA-JAXA Forest Early Warning System in the Tropics
URL: https://www.eorc.jaxa.jp/jjfast/

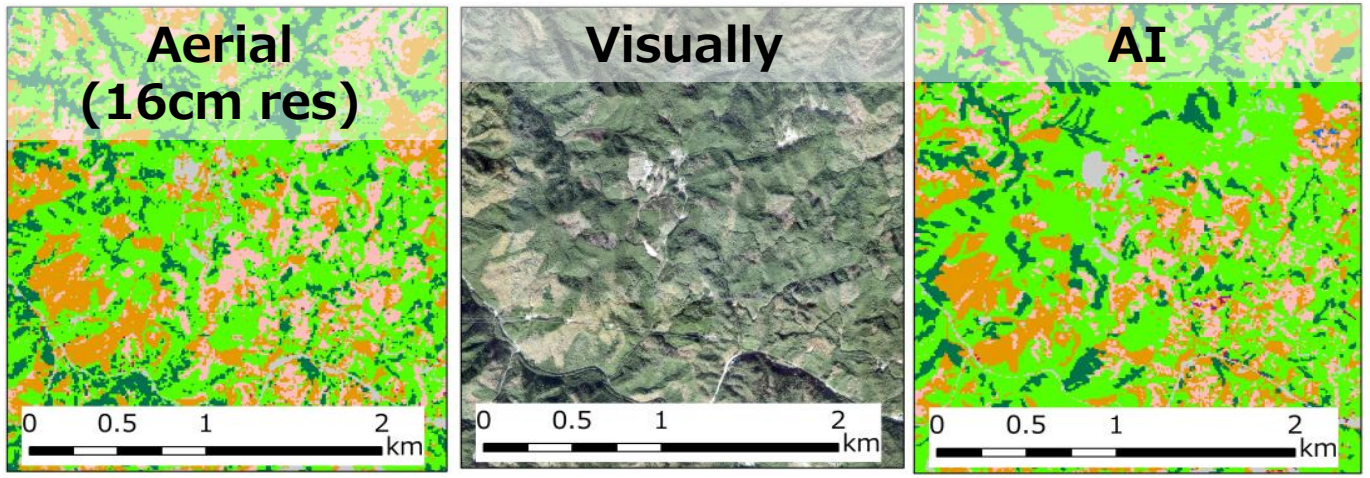
Future Services ;AI x Platform for Geospatial Analysis



Classification of Tree species

- Specialized engineers used to identify species using aerial photographs, but it has become possible to identify species at a lower cost by utilizing AI and satellite images.

Accuracy of 90% at a specific position

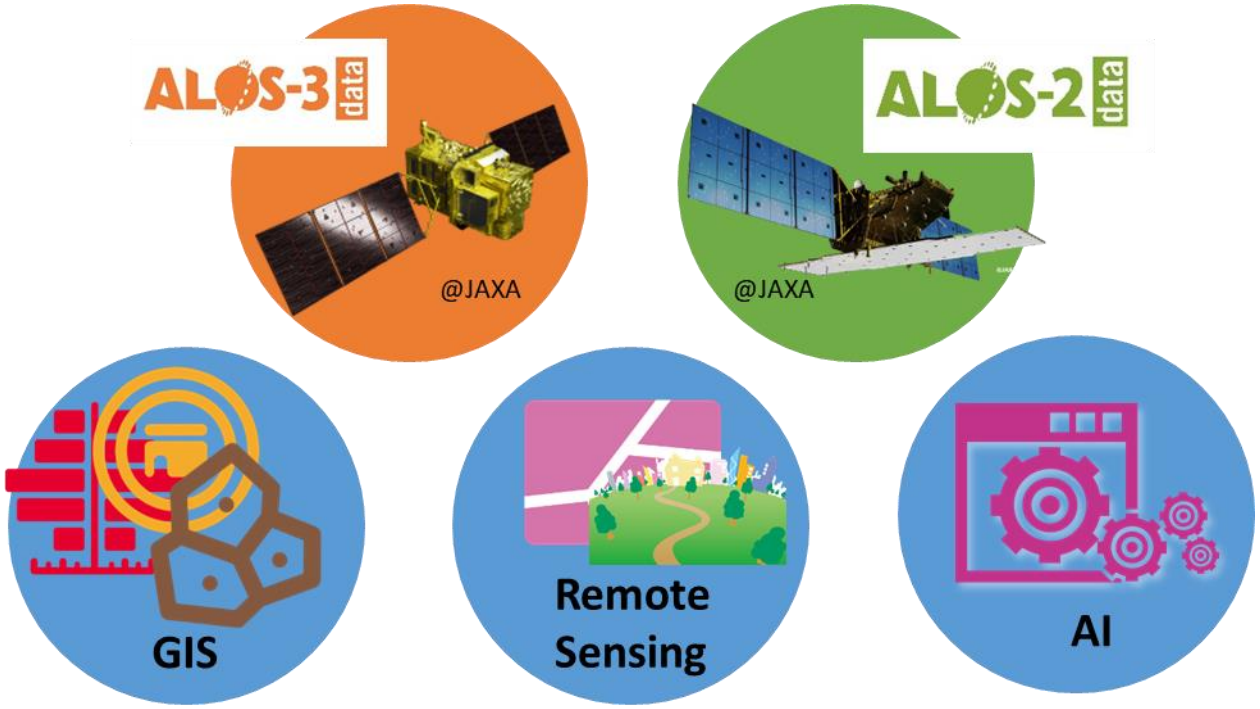


CLOSING

Provision of
DATA resources

Provision of
TECHNICAL resources

With local office
and partners



Further information for technical services and partnership
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We provide our best services to contribute Indonesia's environmental conservation efforts.