

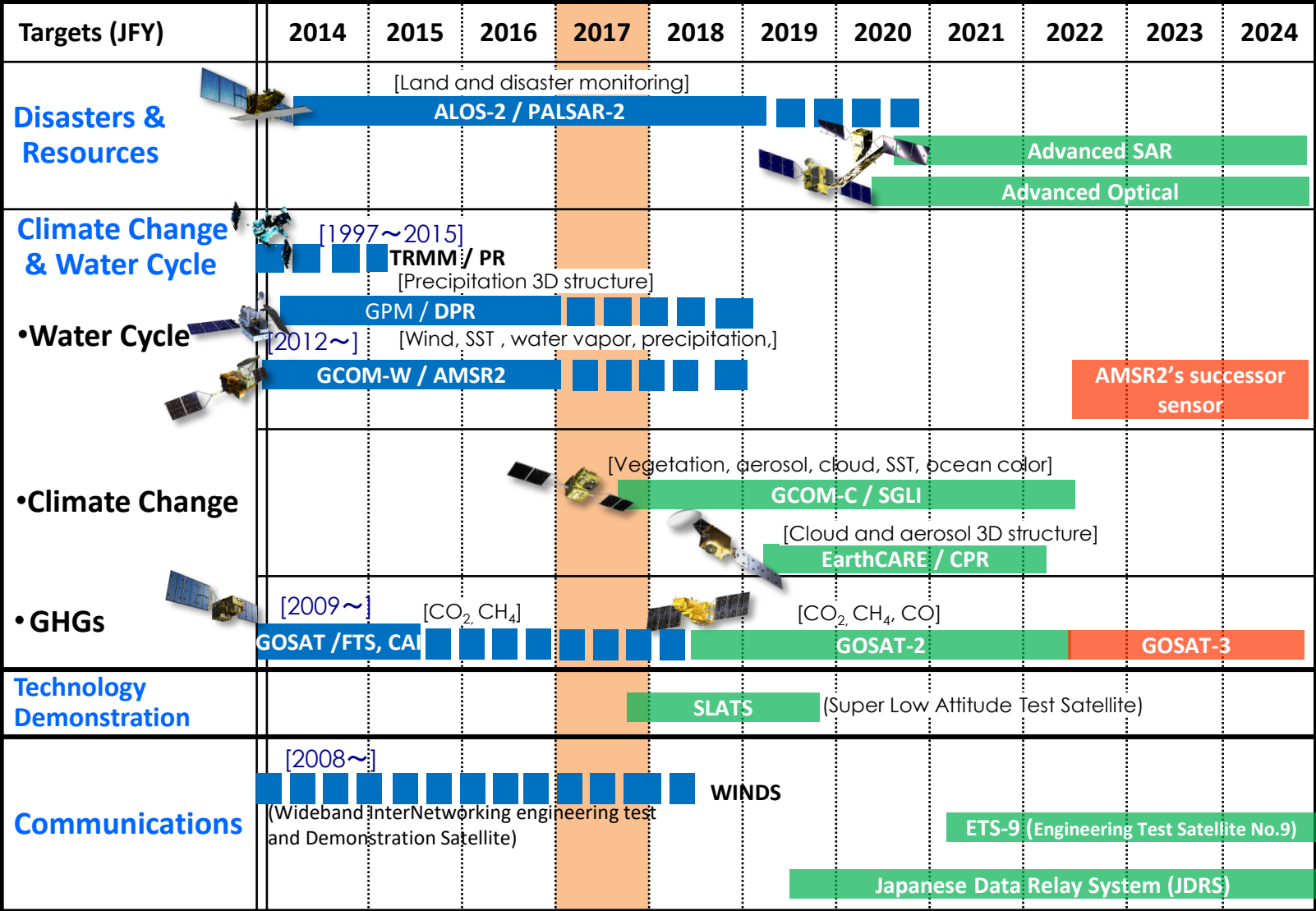
JAXA's Earth Observation and Introduction to the GEO Global Forest Observations Initiative

Sep 19, 2017

Japan Aerospace Exploration Agency

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Schedule of JAXA Satellites



Mission status: ■ On orbit (■ ■ ■ Extended Life Period) ■ Development ■ Study

JAXA's priority issues for societal benefit

1. Disaster Risk Management



Volcano Monitoring



Flood early warning



Landslide Monitoring

2. Climate Change (Mitigation/Adaptation)



Mitigation

Forest Monitoring



Mitigation

GHG Monitoring



Adaptation

Prediction of extreme weather



Global Forest
Observations Initiative



GFOI.ORG



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[@GFOI FOREST](https://@GFOI_FOREST)

GFOI Overview

- GFOI coordinates international assistance to developing countries on forest monitoring and GHG accounting.
- Through collaborative action, GFOI partners seek to achieve complementarity and avoid duplication in their assistance
- Informal partnership of countries and institutions



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GFOI Partners

- Founded under Group on Earth Observations (GEO) in 2011
 - First work plan was 2012-13.
 - Operational ever since.
- Lead partners: currently Australia, Norway, USA, FAO & CEOS.
- Experts from UNFCCC, IPCC, World Bank FCPF, universities, technical and policy experts and other
- Open to new partners.



GFOI Components



Capacity Building

Works directly with countries, through the US SilvaCarbon and UNREDD-FAO programmes, to help develop national forest monitoring systems and associated capacities. This includes providing training in GFOI products and tools.



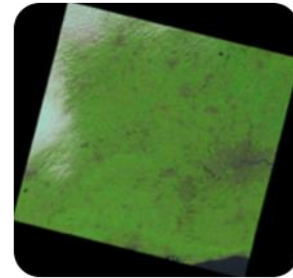
Methods and Guidance

Systematic workflow approach to forest monitoring and MRV. Provides direct links between UNFCCC decisions and the IPCC good practice and other guidance materials.



Space Data Coordination

Works with the world's civil space agencies, through CEOS, to ensure the long-term and worldwide acquisition of the core satellite datasets needed by countries to monitor their forests on an ongoing basis.



R&D Coordination

Coordinating the development of new technologies, datasets and methods for forest monitoring in a manner that best meets REDD+ countries' needs and priorities.



GFOI Leads and Office

The GFOI Leads provide overall oversight of the Initiative. The Office provides overall coordination and administrative support to the Leads Group, GFOI components, activities and partners.

GFOI Phase 2

- In response to the GFOI Review (2016) GFOI Phase 2 is being developed
 - Seeking to better align GFOI with the current global context, inc the Paris Agreement
- Renewed focus on collaboration for the benefit of developing countries
- Structured coordination mechanisms to simplify cooperation and make it easier for partners to attain and extract net benefits, including:
 - (i) Country needs and gaps assessments
 - (ii) Joint work planning to meet priority needs and gaps
 - (iii) Collaborative implementation, utilizing comparative advantages etc
 - (iv) Foster a network of experts and organizations to address obstacles to progress
 - (v) Improved communications and exchanges of information, expertise and resources.
- Continue with four components, with an expansion of scope for the newly named Data Component.



Progress to date

- Provided operational guidance on MRV for REDD+: a first of its kind
 - Now being used to inform updated IPCC guidance (2019)
- Assured annual wall-to-wall coverage of all the world's forested regions with remote sensing data in support of reporting by countries
- Delivered complementary capacity building assistance to directly target developing country needs
- Established a forum of self-resourced experts to collaboratively address obstacles to progress
- Connected countries, donors, technicians, academia, space agencies under the one forum.



GFOI 2017 Plenary in Vietnam



- GFOI Plenary 2017 in Ho Chi Minh City, Viet Nam, April 11 and 12 2017
- Hosted by Ministry of Agriculture, Vietnam, Training and International cooperation Division Forest Inventory and Planning Institute (FIPI), Vietnam
- <http://www.gfoi.org/gfoi-plenary-2017-presentations/>

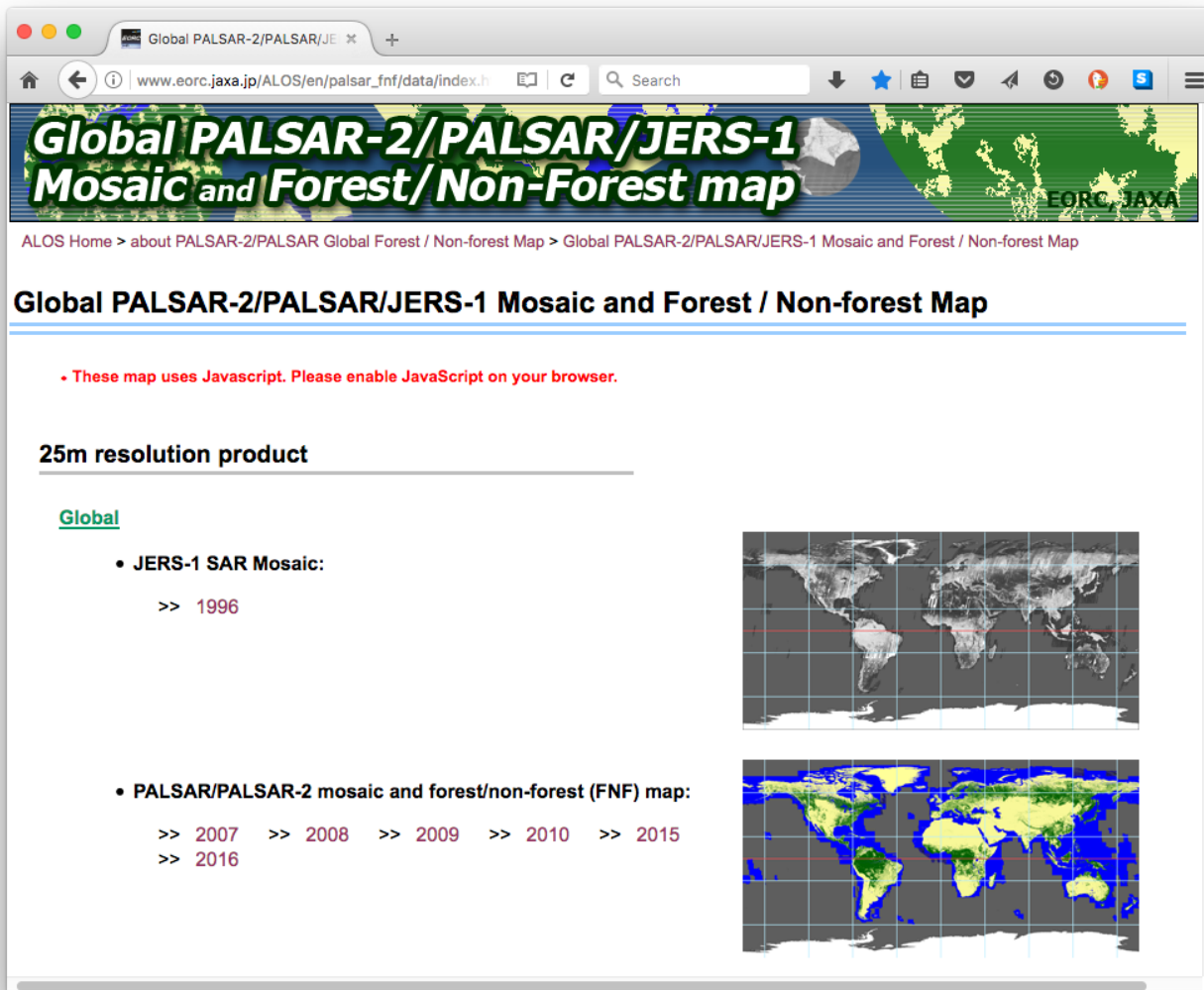
JAXA contributions to GFOI

JAXA has been an active member of the GOI since its establishment in 2011 (and previous to that, in the GEO Forest Carbon Tracking Task – GEO-FCT).

JAXA involvement

- GFOI Leads Group
 - CEOS Representative (Prof. M. Shimada) from JAXA
- Space Data Coordination
 - Member of SDCG Executive (steering) group
 - Contributing with SAR data from JERS-1, ALOS-1 and ALOS-2 missions
 - 25m global annual mosaics
 - PALSAR-2 data to GFOI R&D programme
 - Organising CEOS agency support to GFOI R&D Programme
- Methods & Guidance
 - CEOS Representative (Dr. A. Rosenqvist) to the MGD Advisory Group

GFOI Core Data sets: JAXA Annual Global L-band SAR mosaics



The screenshot shows a web browser window with the URL www.eorc.jaxa.jp/ALOS/en/palsar_fnf/data/index.htm. The page title is "Global PALSAR-2/PALSAR/JERS-1 Mosaic and Forest/Non-Forest map". Below the title, there is a navigation breadcrumb: "ALOS Home > about PALSAR-2/PALSAR Global Forest / Non-forest Map > Global PALSAR-2/PALSAR/JERS-1 Mosaic and Forest / Non-forest Map". The main heading is "Global PALSAR-2/PALSAR/JERS-1 Mosaic and Forest / Non-forest Map". A red message states: "These map uses Javascript. Please enable JavaScript on your browser." Below this, there is a section for "25m resolution product" with a "Global" link. Two main data sets are listed: "JERS-1 SAR Mosaic" with a link to "1996", and "PALSAR/PALSAR-2 mosaic and forest/non-forest (FNF) map:" with links for years 2007, 2008, 2009, 2010, 2015, and 2016. Two world maps are displayed: the top one is a grayscale SAR mosaic, and the bottom one is a color-coded FNF map showing forest in green and non-forest in blue.

GFOI Core Data Set – 25 m L-band SAR mosaics

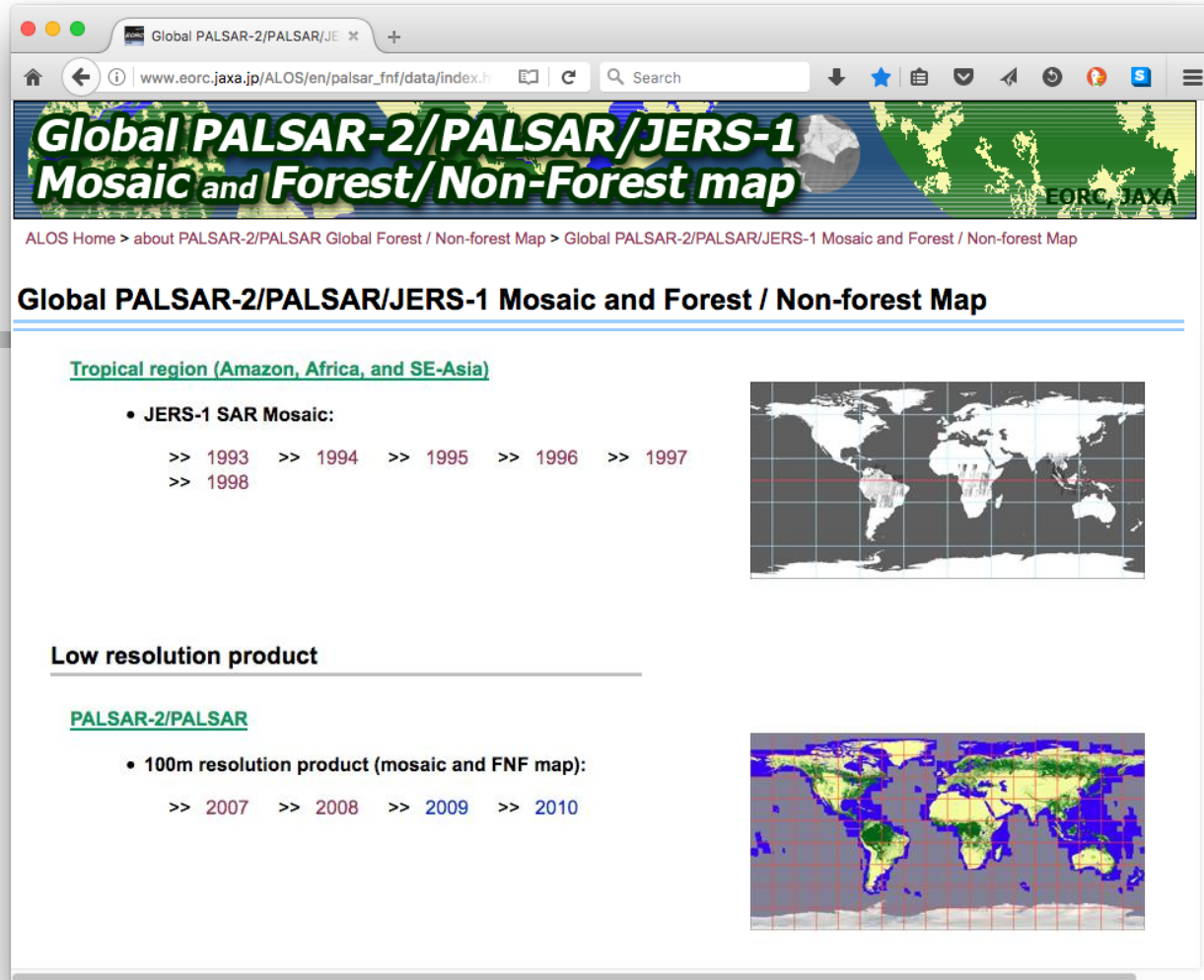
Global coverage

- PALSAR-2 2016 (New)
- PALSAR-2 2015
- PALSAR 2007 – 2010
- JERS-1 ~1996

- Free download at:
http://www.eorc.jaxa.jp/ALOS/en/palsar_fnf/fnf_index.htm

GFOI Core Data sets: JAXA Annual Global L-band SAR mosaics

GFOI Core Data Set – L-band SAR mosaics



The screenshot shows a web browser window with the URL www.eorc.jaxa.jp/ALOS/en/palsar_fnf/data/index.htm. The page title is "Global PALSAR-2/PALSAR/JERS-1 Mosaic and Forest/Non-Forest map". Below the title, there is a navigation path: "ALOS Home > about PALSAR-2/PALSAR Global Forest / Non-forest Map > Global PALSAR-2/PALSAR/JERS-1 Mosaic and Forest / Non-forest Map". The main heading is "Global PALSAR-2/PALSAR/JERS-1 Mosaic and Forest / Non-forest Map". Underneath, there is a section for "Tropical region (Amazon, Africa, and SE-Asia)" with a sub-heading "JERS-1 SAR Mosaic:". Below this, there are links for the years 1993, 1994, 1995, 1996, 1997, and 1998. To the right of these links is a world map showing the tropical regions highlighted in red. Below this section, there is a section for "Low resolution product" with a sub-heading "PALSAR-2/PALSAR". Below this, there is a sub-heading "100m resolution product (mosaic and FNF map):" with links for the years 2007, 2008, 2009, and 2010. To the right of these links is a world map showing the low resolution product highlighted in blue and green.

Regional (pan-tropical)
coverage (25m)

- JERS-1: 1996 – 1998 (New)

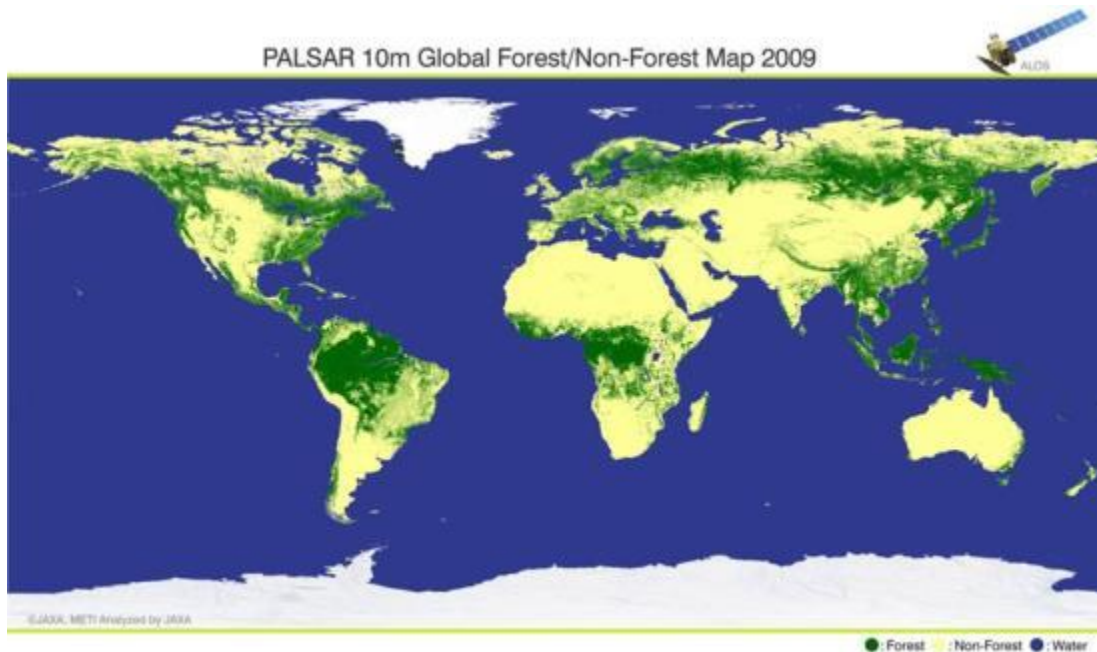
Global low resolution (100m)
coverage

- JERS-1: 1996 – 1998 (New)

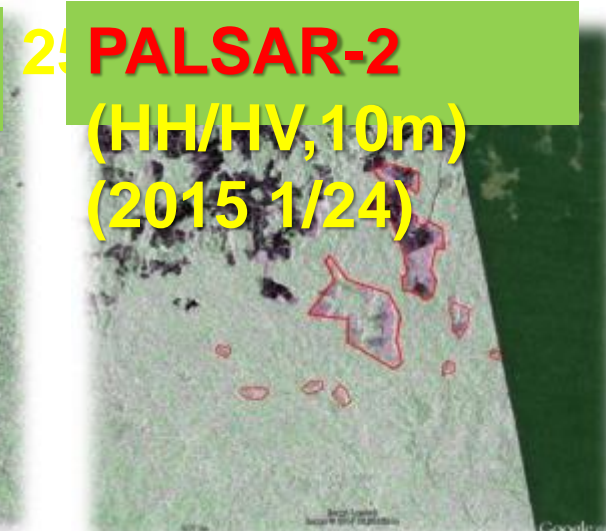
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Global Forest/Non-forest Map



L-band SAR (PALSAR, PALSAR-2) is more suitable for forest monitoring than C- and X-band SAR, since L-band SAR is not affected by the fine structure on the ground and can readily distinguish forested and deforested areas



JICA-JAXA Forest Early Warning System in the Tropics (JJ-FAST)

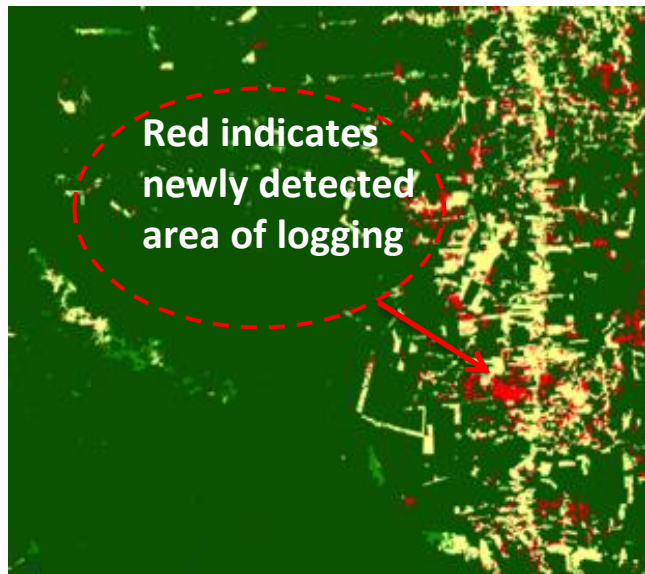


ALOS-2

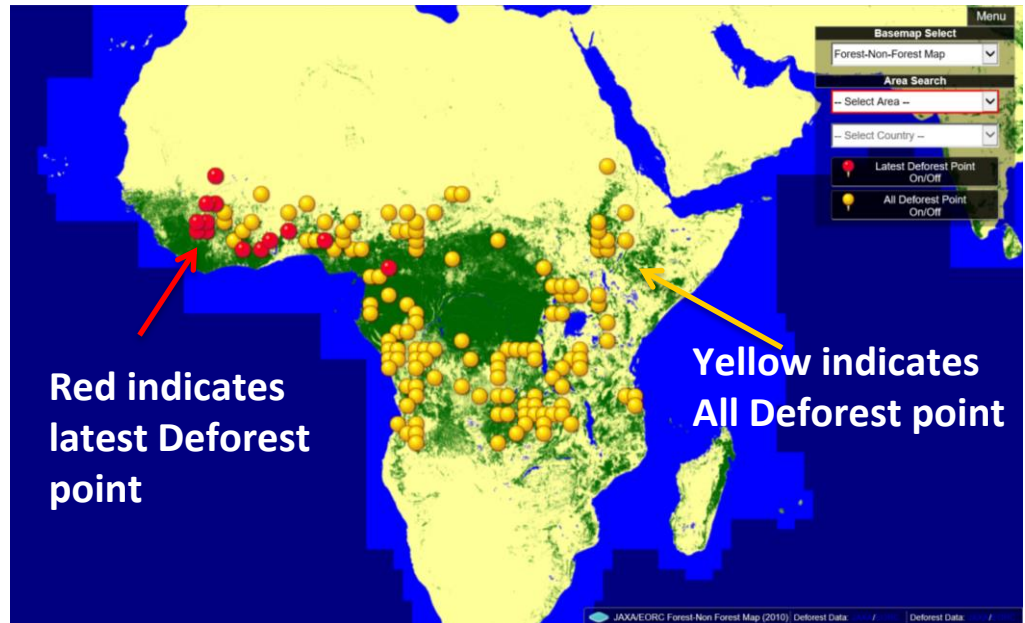
Broad Ground Surface Observation by Radar Capable of Penetrating Clouds

Manage forest sustainably using satellite data of monitoring forest changes

JICA-JAXA **Forest Early Warning System in the Tropics (JJ-FAST)** service started from November 2016. Logging area information analyzed by ALOS-2 is provided for authorities and governments. It is accessible by anyone with PCs or mobile devices more easily than ever before.



Detection of logging area (Brazil)



Currently the information of Amazon area, Central & Southern Africa are available. The target area will be expanded to 77 countries in tropical areas in early of 2018.

IPCC GHG Inventory Guidelines

- ◆ Parties of the Paris Agreement are required to submit Nationally Determined Contributions (NDC) every 5 years.
- ◆ Reporting of national GHG emissions and removals is required to comply with the guidelines adopted by IPCC. The guidelines are important to enhance transparency framework for building mutual trust and confidence and promote effective implementation of the Paris agreement.
- ◆ Developed in 2006, and will be refined in 2019

○ Existing Guideline (IPCC Developed in 2006)

“Even the availability of satellite-borne sensors for greenhouse gas concentration measurements will not fully resolve this problem, due to limitations in spatial, vertical and temporal resolution.”

○ 43rd Session of the IPCC (in 2016, Kenya)

“To maintain the scientific validity of 2006 IPCC Guidelines, certain refinement may be required, taking into account scientific and other technical advances that have matured sufficiently since 2006.”

○ 44th Session of the IPCC (in 2017, Thailand)

“Lead authors must consider all recent scientific developments and national methods used by countries in their inventories.”

○ Refinement of Guideline (2019)

In addition to the ground networks, there is aim for Satellite data to be included as one of methods to support accuracy of national GHG emissions and removals. (As reference data)

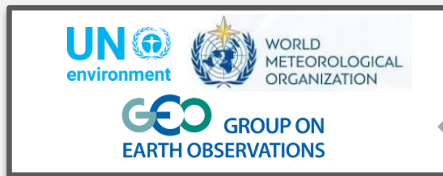


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“Road to IPCC Guidelines”

◆ Support coordination with IPCC



IPCC Guidelines
(to be refined in 2019)

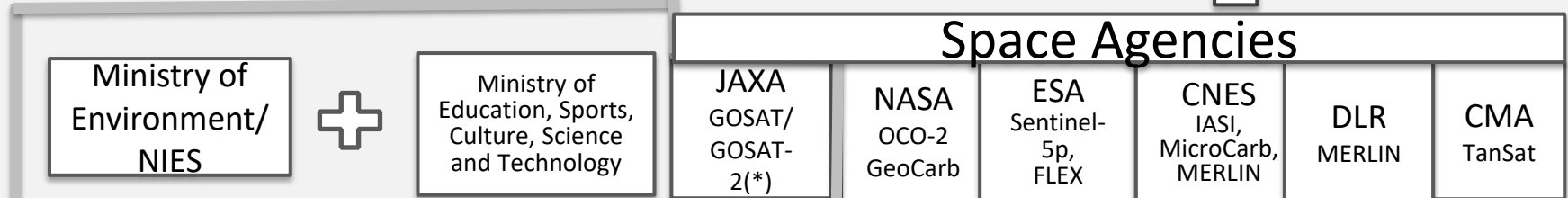


◆ Develop methodology document to support for national statistician to use GHG data for the accuracy of the greenhouse gases inventory.

- ◆ Provide high accurate data set and documents (ATBT)
- ◆ Calibrations and validation for quality control

CEOS

Provide and share GHG data



*GOSAT/GOSAT-2 are joint projects by Ministry of Environment, NIES and JAXA .