



Technical aspects of the forest monitoring system

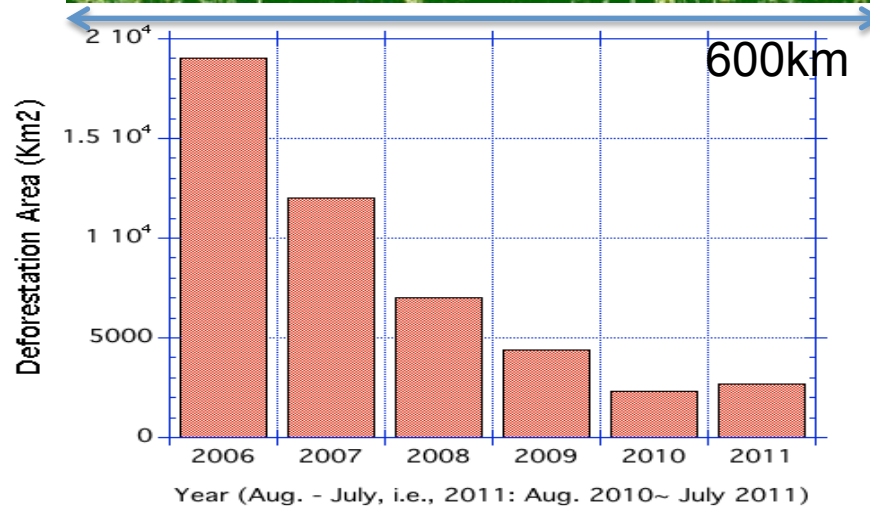
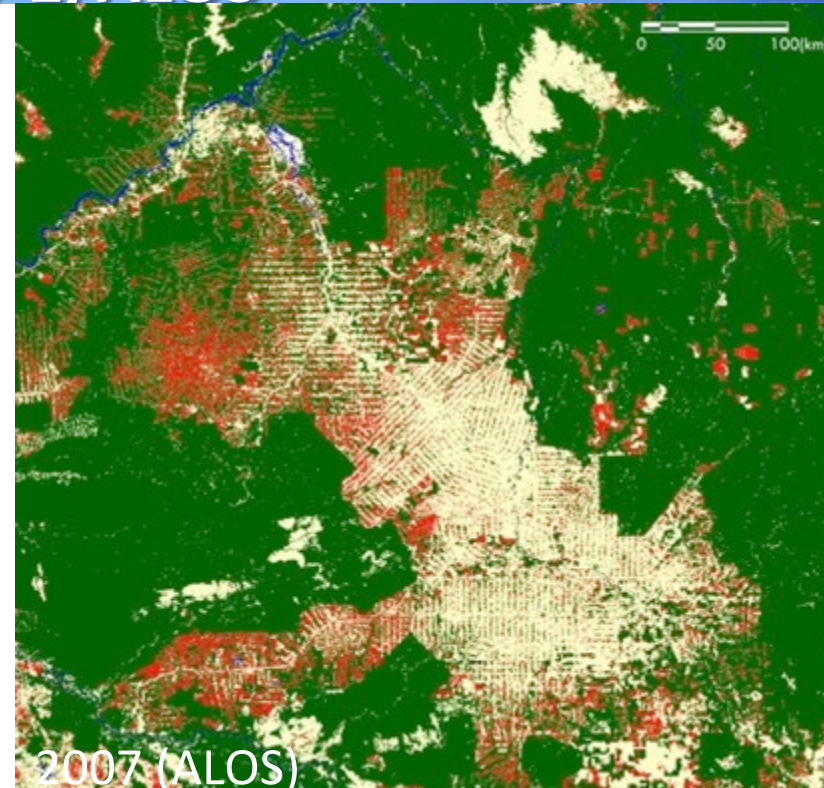
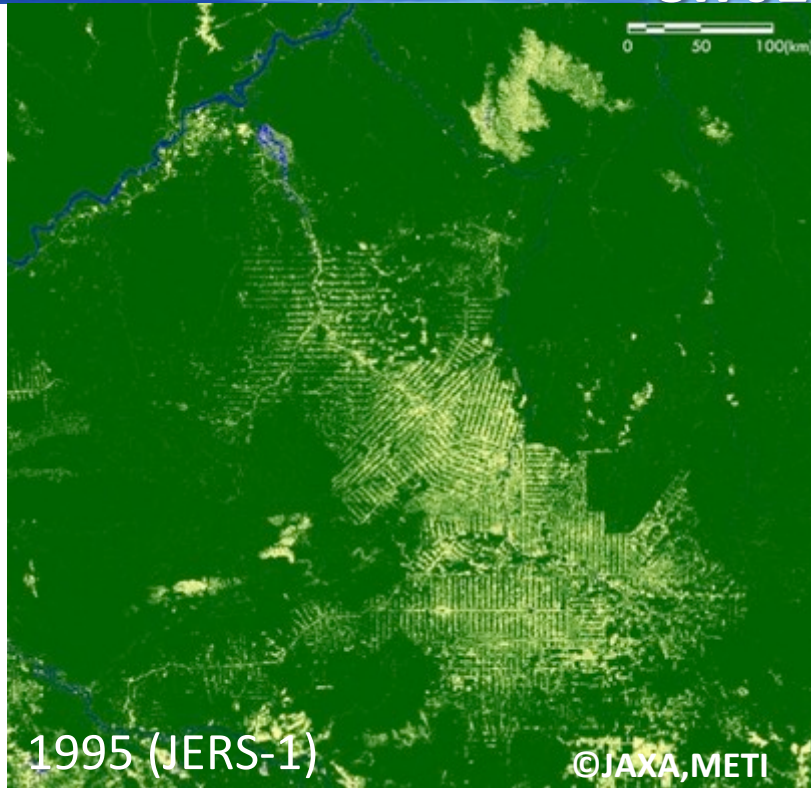
December 1, 2015

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Associate Principal Researcher, EORC/JAXA

Professor, Tokyo Denki University

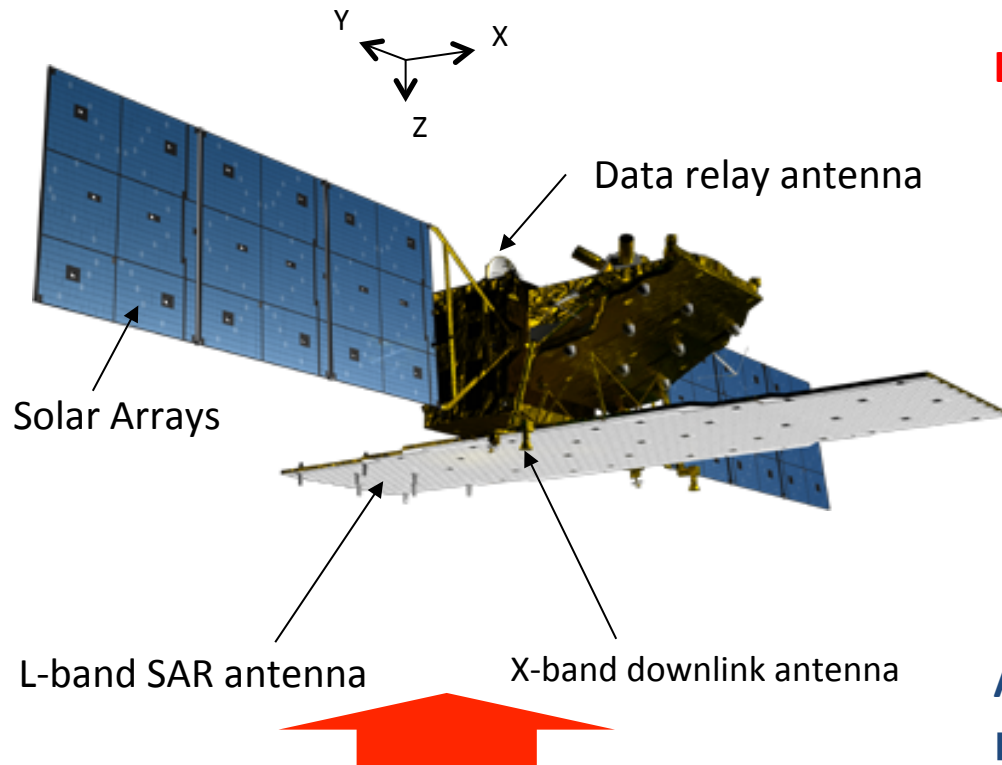
Deforestation Monitoring in Brazil by **L-band SAR** on JERS-1/ALOS



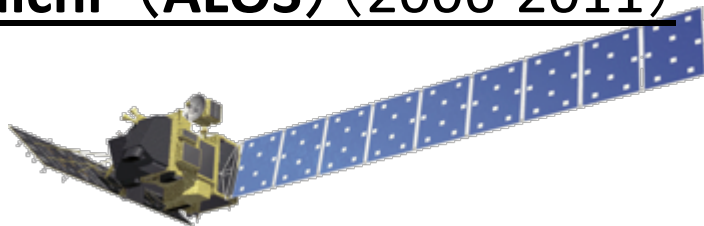
- Application for deforestation monitoring by provision of ALOS/SAR data to IBAMA (Brazilian Institute of Environment and Renewable Natural Resources)
- Contribution to declination of deforestation area in Brazil

Advanced Land Observing Satellite-2 "DAICHI-2" (ALOS-2)

ALOS-2 in-orbit configuration



"Daichi" (ALOS) (2006-2011)



ALOS-2/PALSAR-2 was launched on 24 May 2014, and is now operational.

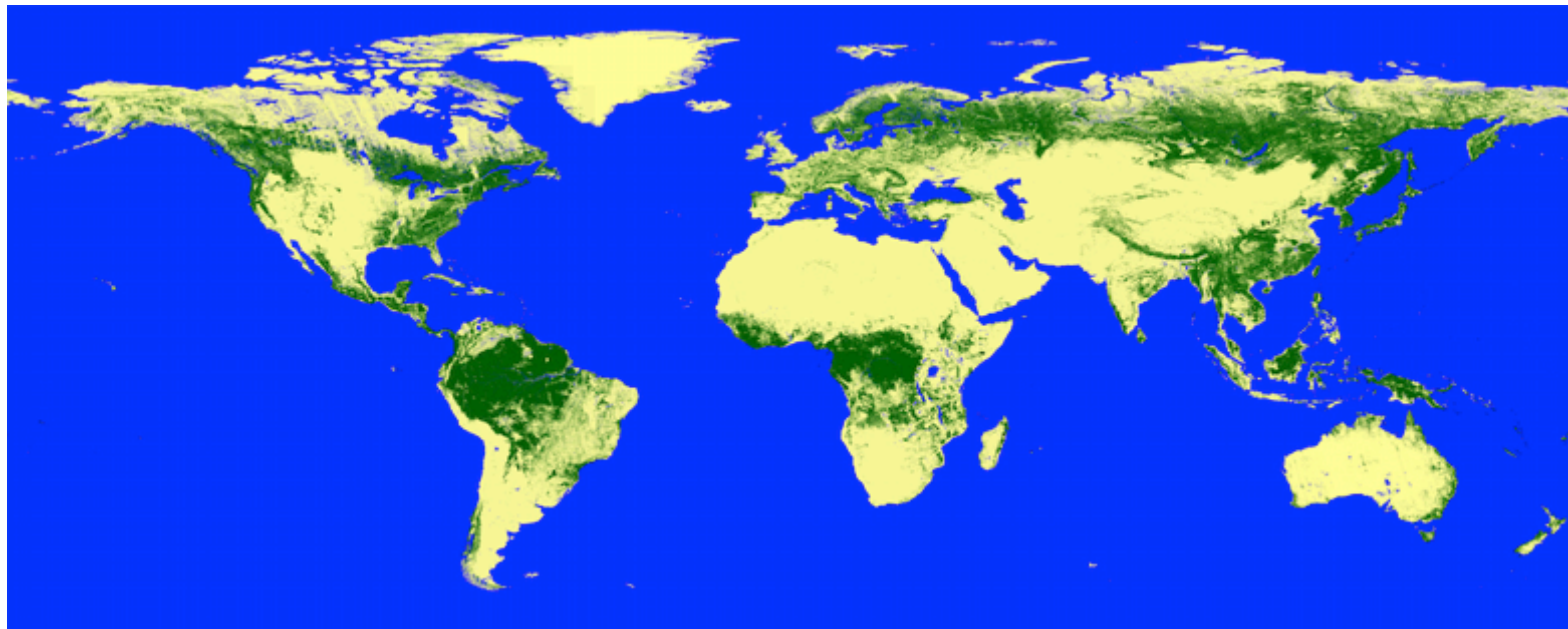
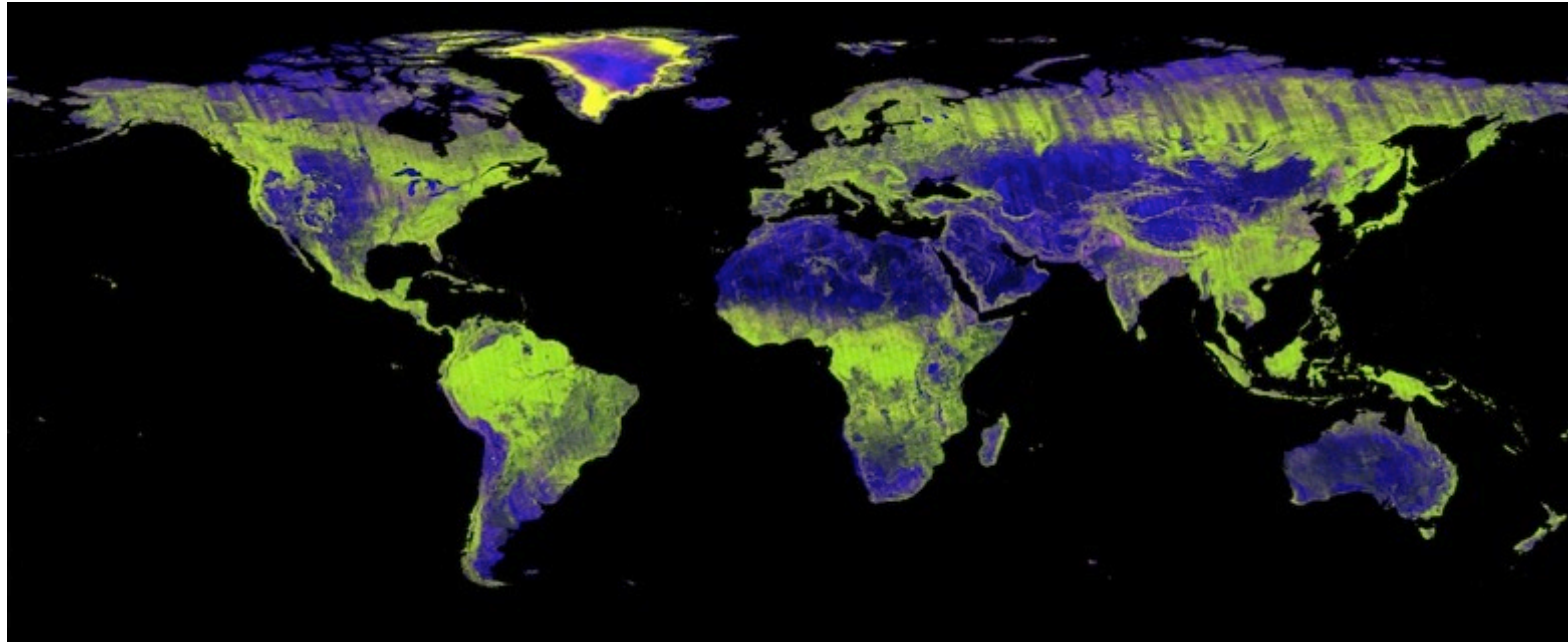
L-band Synthetic Aperture Radar-2 (PALSAR-2)

- Wide observable area (2,320km)
- Right-and-left looking function
- High resolutions (1-3m)
- Dual Polarization(HH+HV)
- ScanSAR – Strip Mode SAR
- **capable of observing day and night, and in all weather conditions.**
- **Succesor of ALOS/JERS-1 using same forest observation capabilty from 1990s**

ALOS-2 will achieve significant contributions to:

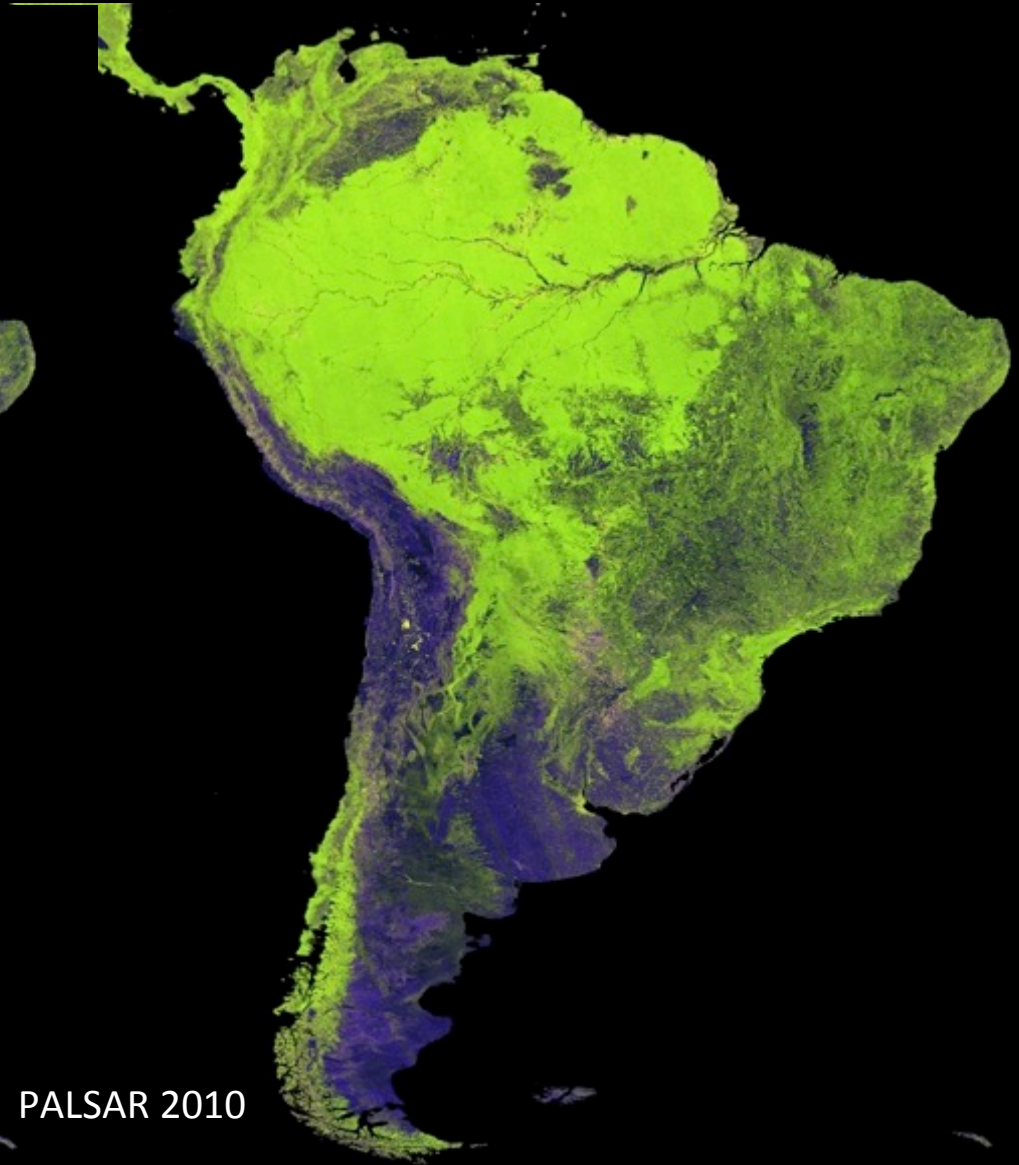
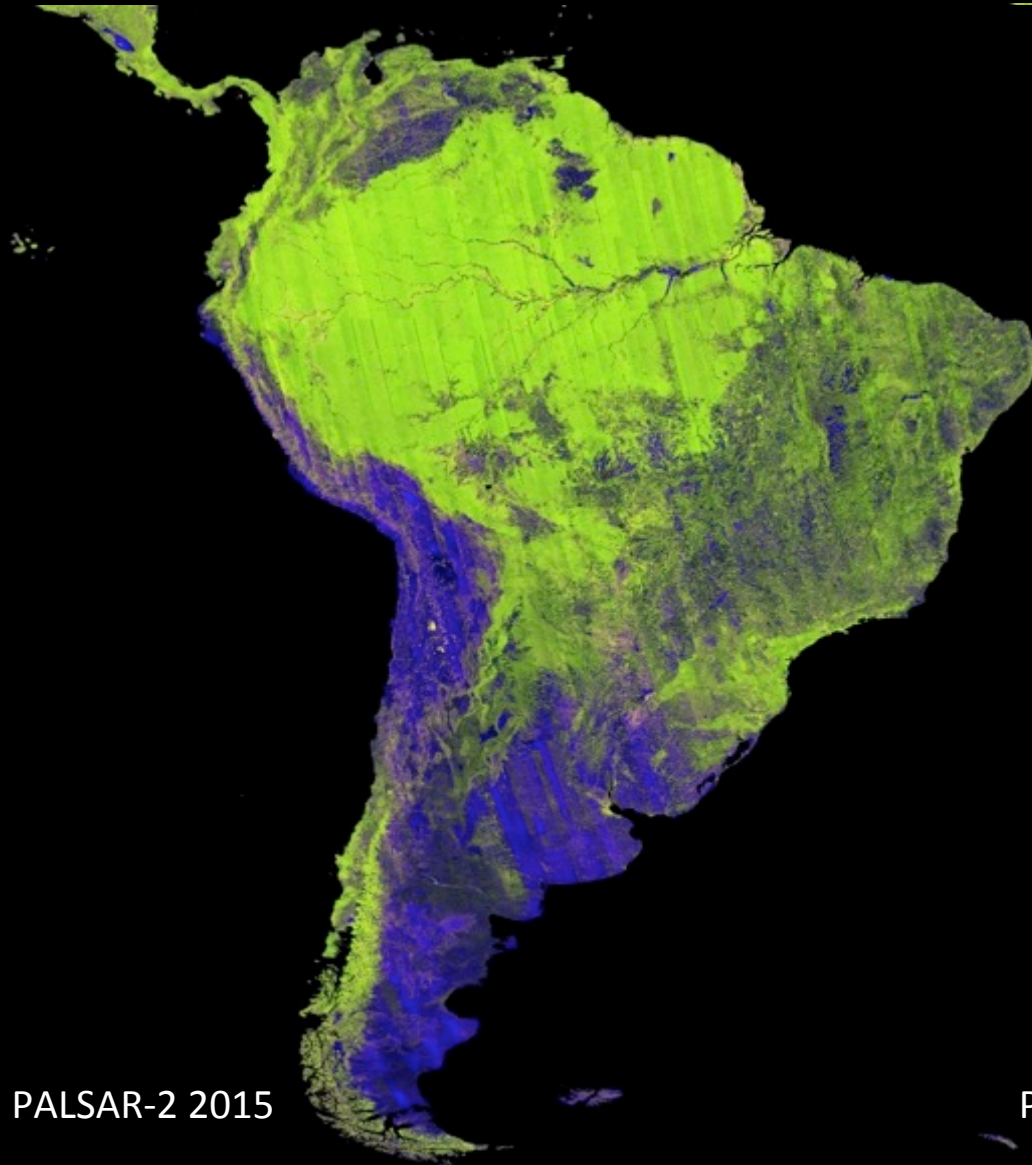
- Disaster Monitoring of Damage Areas
- Continuous updating of data archives related to national land and infrastructure
- Effective monitoring of cultivated areas
- Global monitoring of tropical rain forests to identify carbon sinks.

ALOS-2 PALSAR-2 Global Mosaic & Forest/Non-forest Map 2015 (25 m resolution, first generated)



25m PALSAR/PALSAR-2 Mosaic

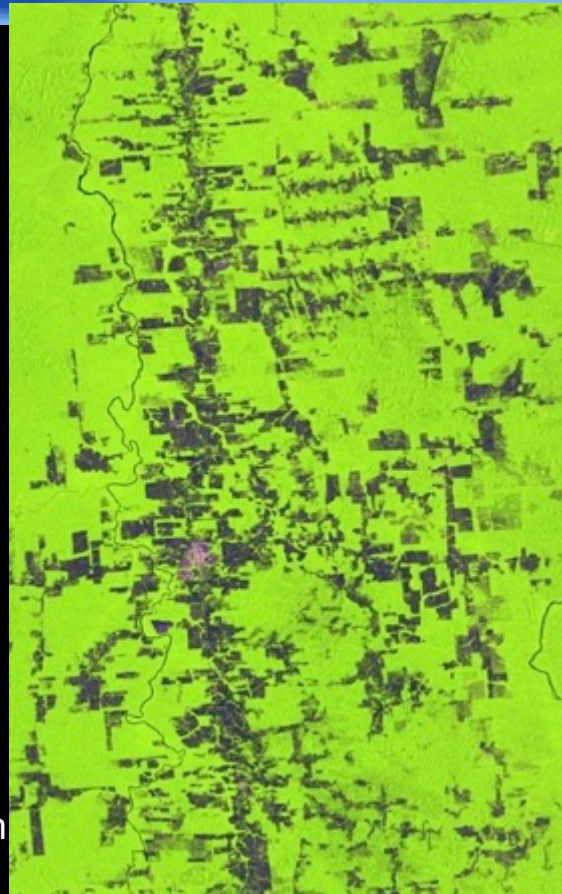
South America



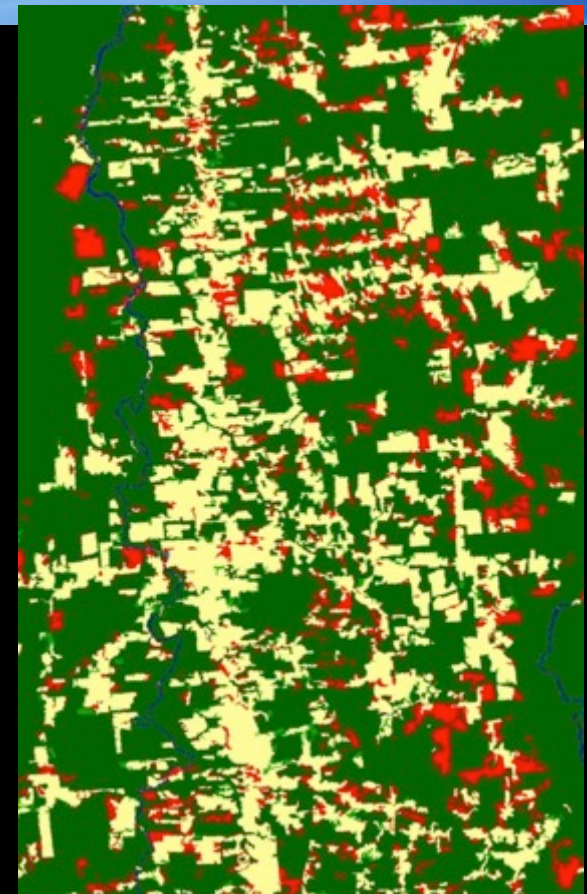
25m PALSAR/PALSAR-2 Mosaic



PALSAR-2 2015



PALSAR 2010

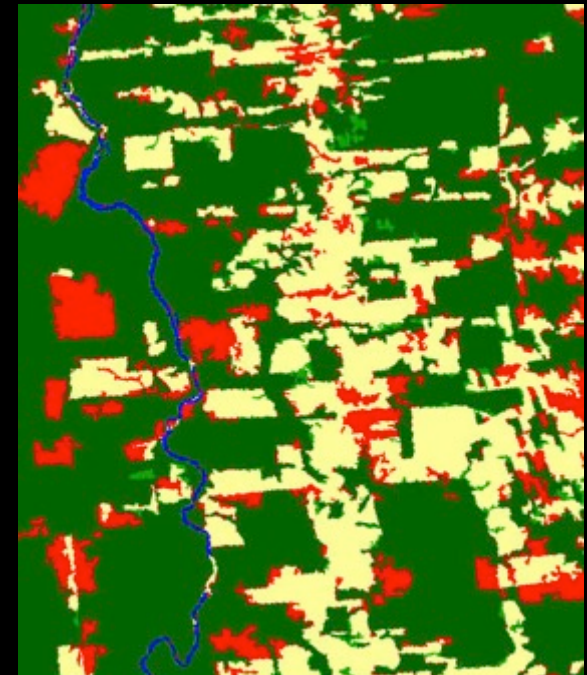


- : Forest
- : Non-Forest
- : Deforestation
- : Reforestation

South America
(Brazil)



25m PALSAR/PALSAR-2 Mosaic

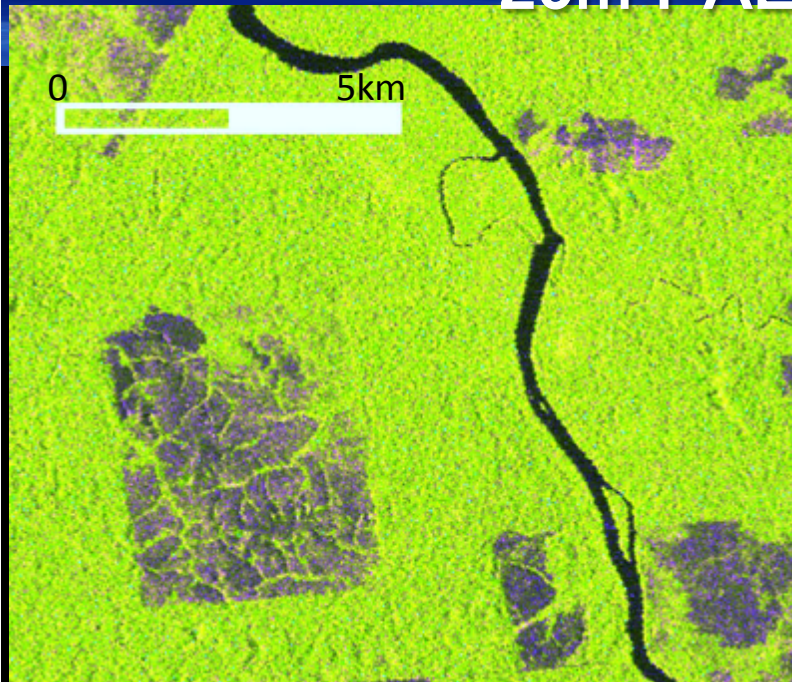


PALSAR 2010

South America (Brazil)

- : Forest
- : Non-Forest
- : Deforestation
- : Reforestation

25m PALSAR/PALSAR-2 Mosaic



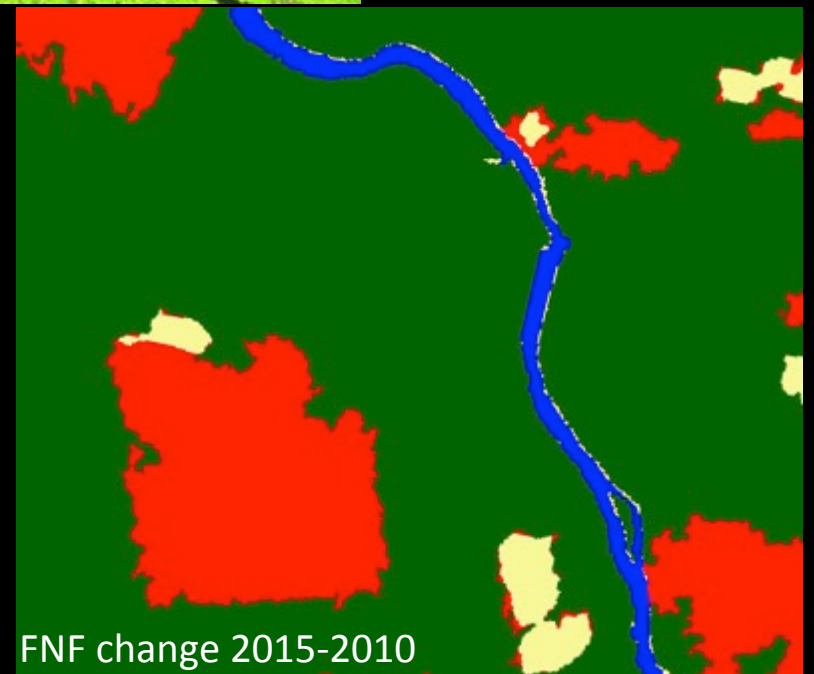
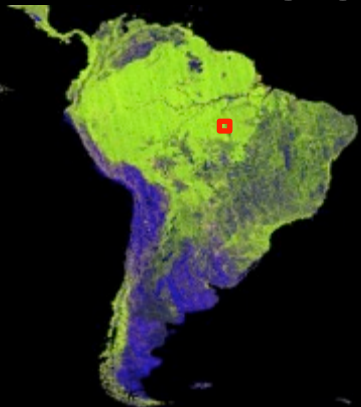
PALSAR-2 2015



PALSAR 2010

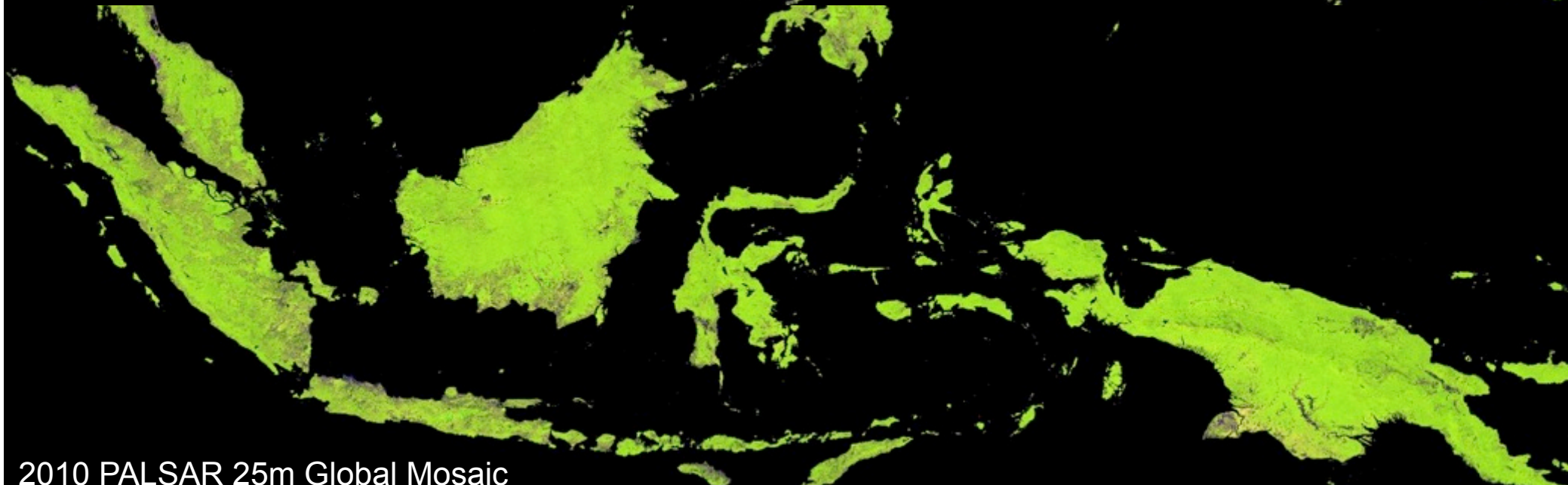
- : Forest
- : Non-Forest
- : Deforestation
- : Reforestation

South America



FNF change 2015-2010

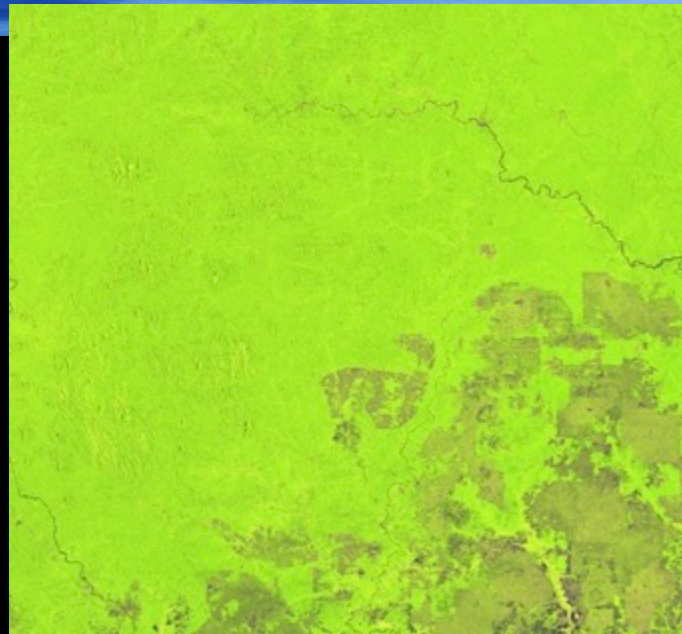
25m PALSAR/PALSAR-2 Mosaic



25m PALSAR/PALSAR-2 Mosaic



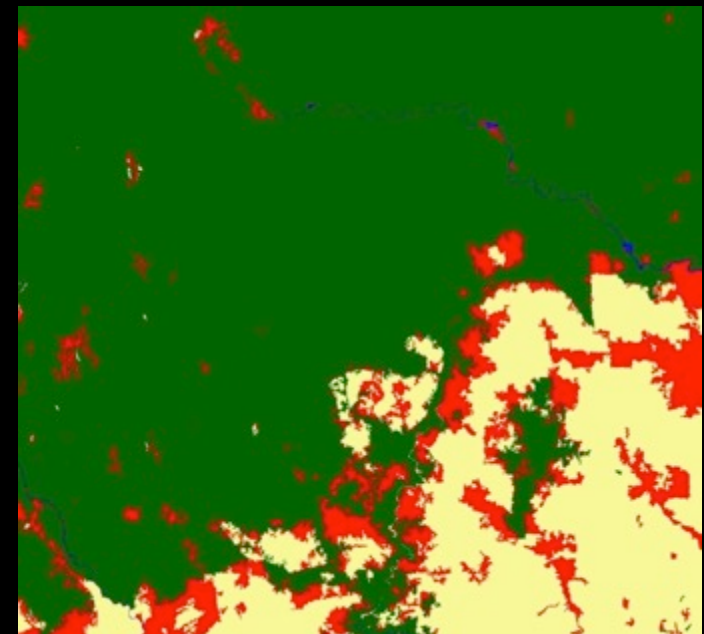
PALSAR-2 2015



PALSAR 2010

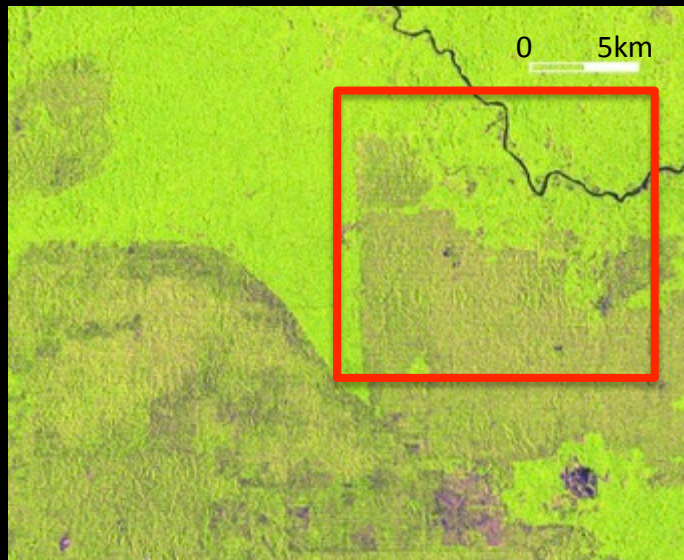
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Indonesia (Kalimantan)



FNF change 2015-2010

25m PALSAR/PALSAR-2 Mosaic



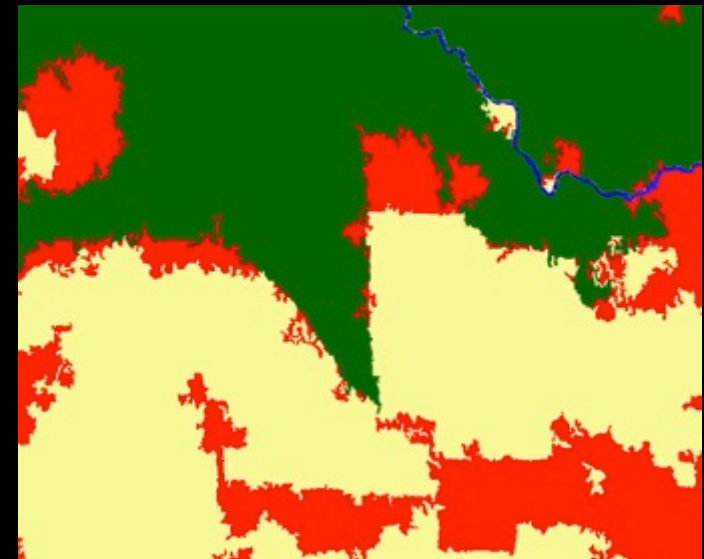
PALSAR-2 2015



PALSAR 2010

- : Forest
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- : Deforestation
- : Reforestation

Indonesia (Kalimantan)



25m PALSAR/PALSAR-2 Mosaic



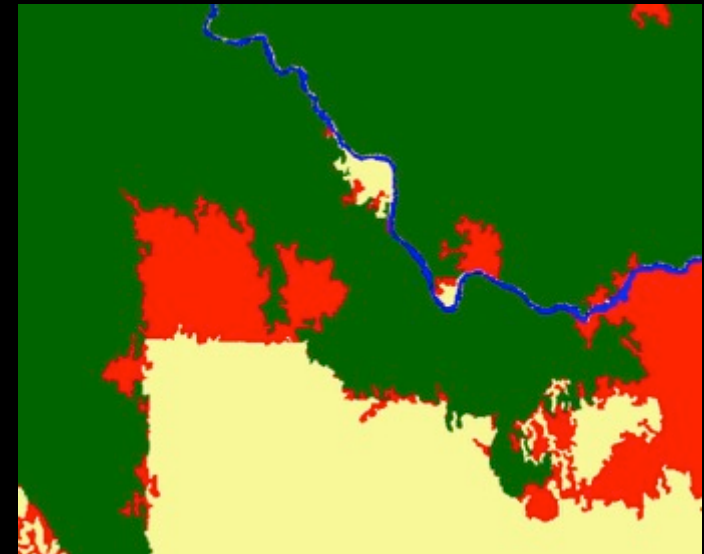
PALSAR-2 2015



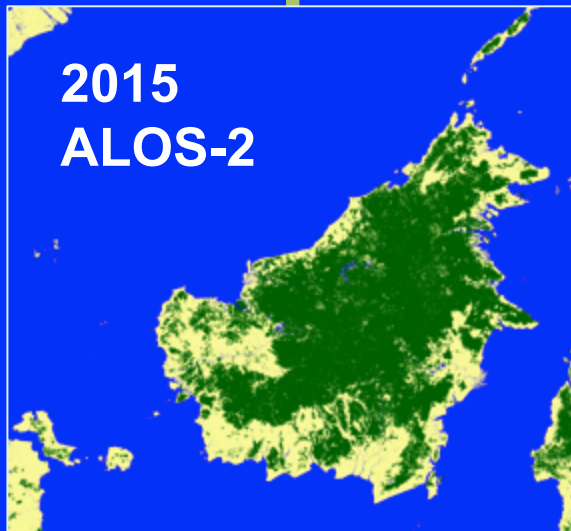
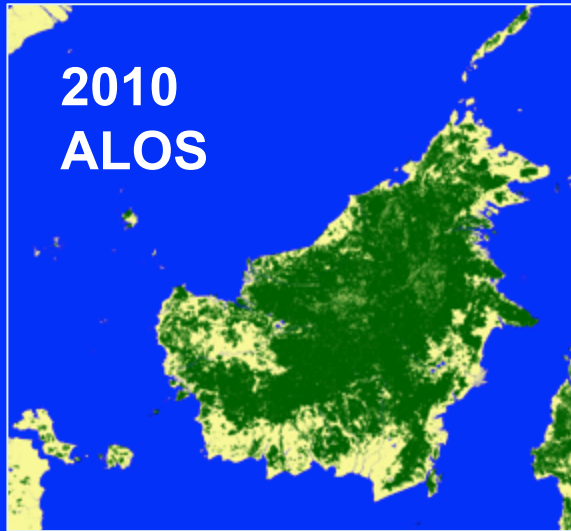
PALSAR 2010

- : Forest
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Indonesia (Kalimantan)

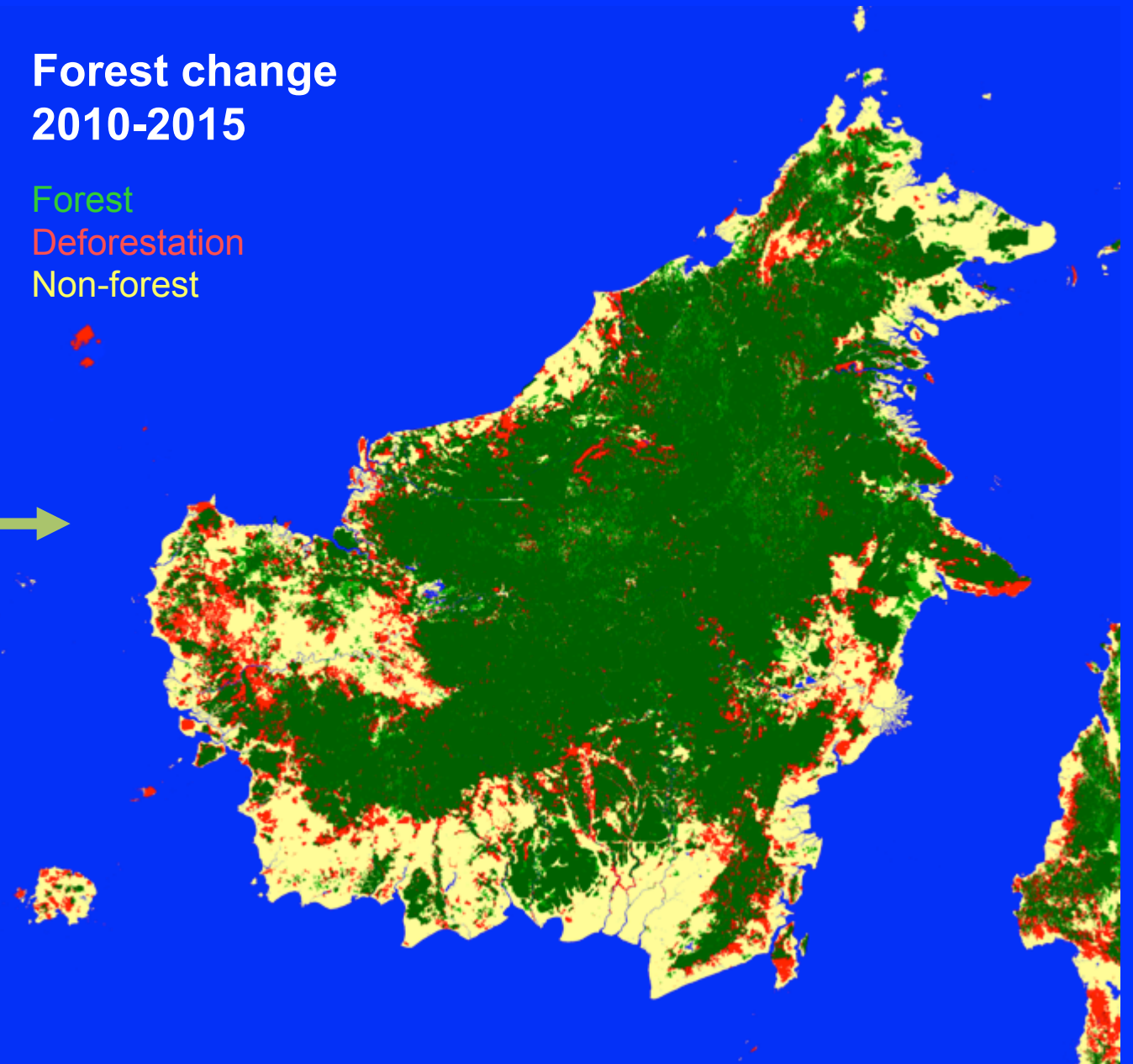


Forest Change in Borneo

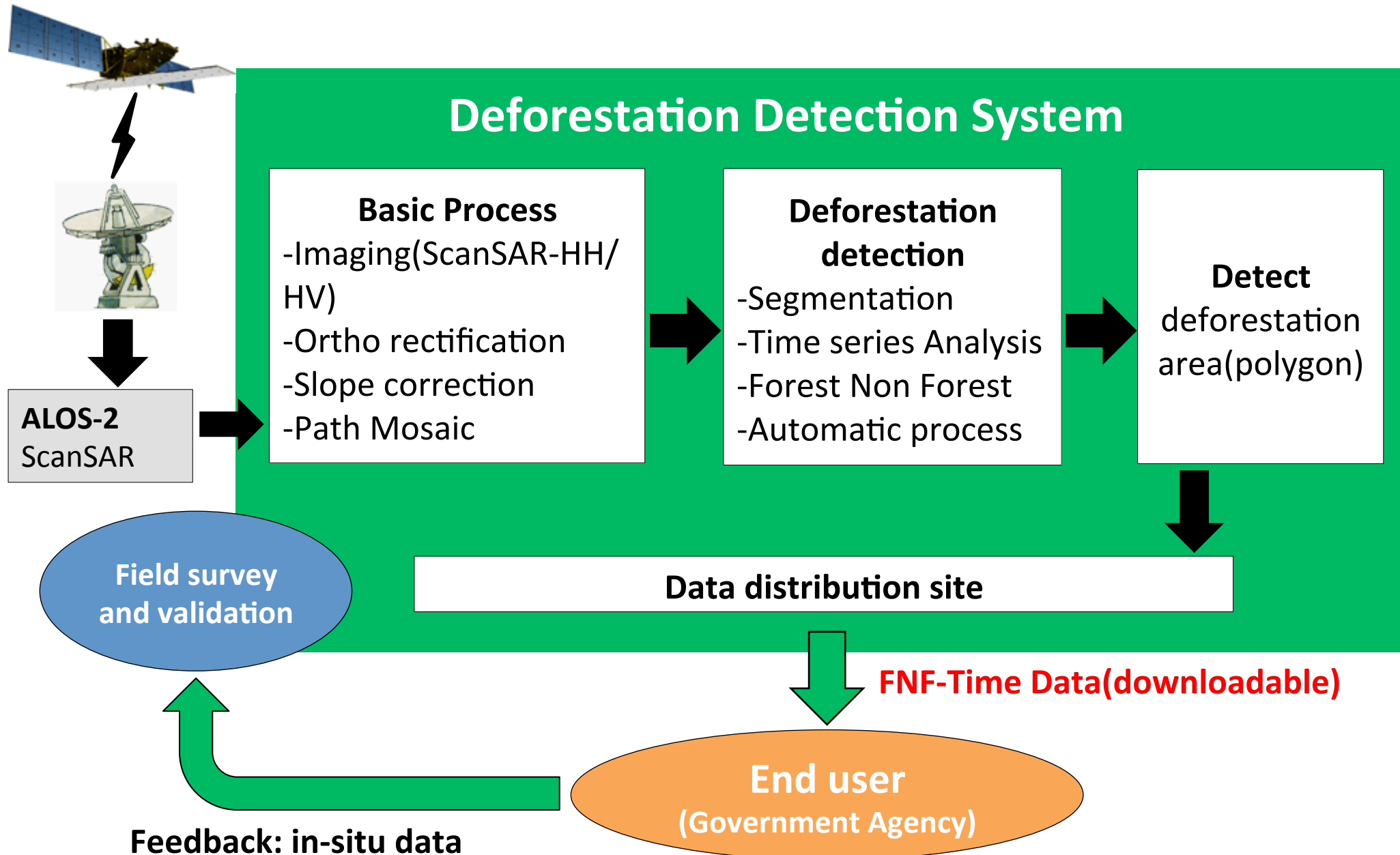


Forest change
2010-2015

Forest
Deforestation
Non-forest

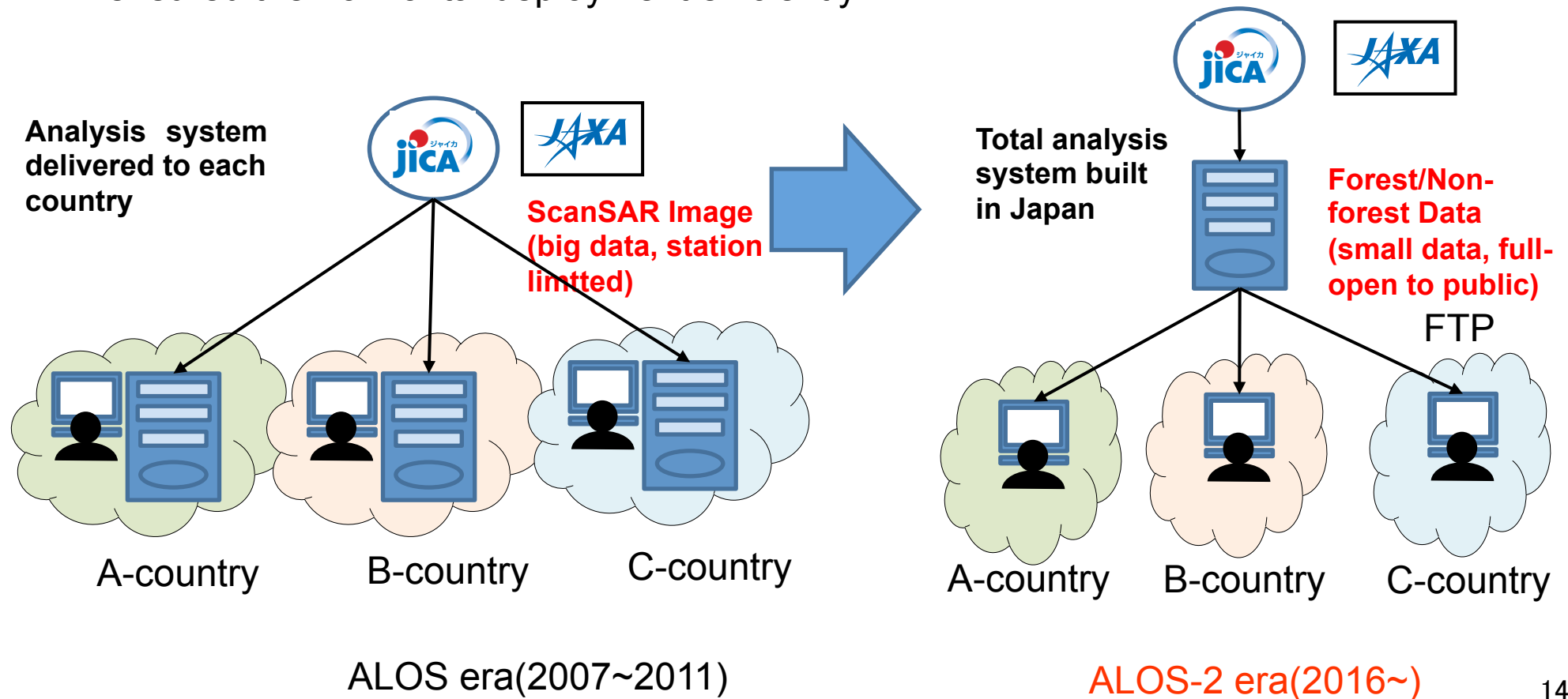


Quick Deforestation Detection using ALOS-2



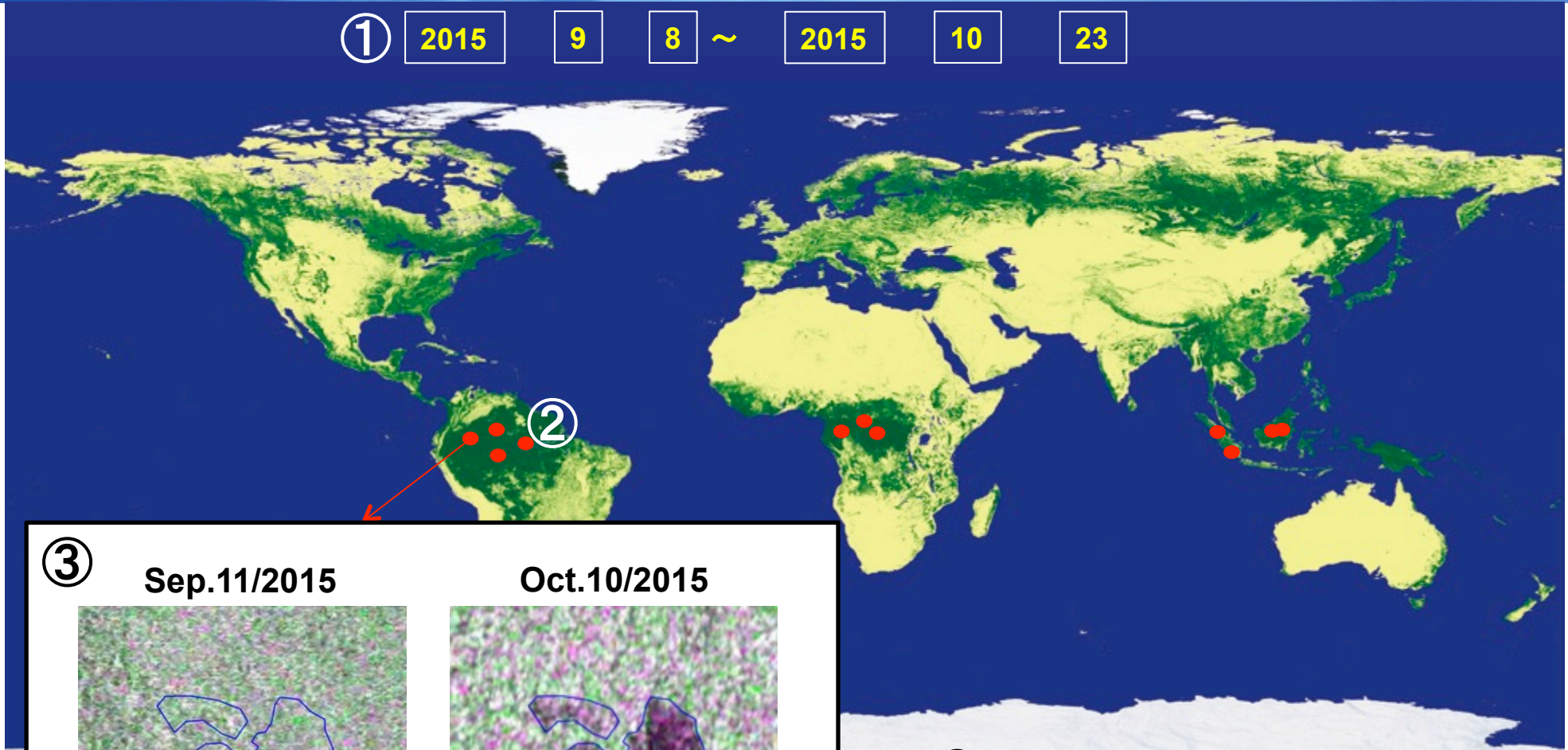
Concept of the analysis system

- JICA plans to expand their project internationally to such as Peru, Columbia(South America), Myanmar(Asia), Gabon(Africa), etc., not only Brazil deforestation Monitoring Project.
- At that time, it is not to be installed analysis system in each country, but it will be constructed a Forest change detection system for intensive analysis. It will be ensured the horizontal deployment efficiently.



Data distribution site(Tentative)

① 2015 9 8 ~ 2015 10 23



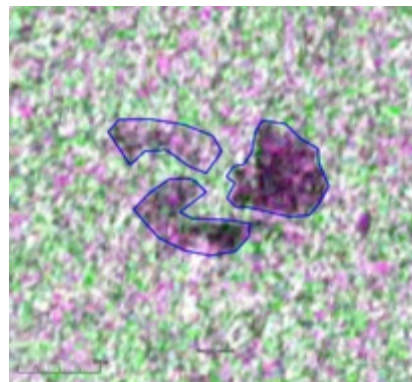
③

Sep.11/2015



Browed image

Oct.10/2015



Polygon download

- ① Select date
> Display forest change area as red dot
- ② Select area(dot)
> Display extended images
- ③ Browse before and after of deforestation and download polygon data



Back Up

JAXA Activities

Space Transportation



Human Space Activities



Astronaut Kimiya YUI
Expedition 44,45 Crew

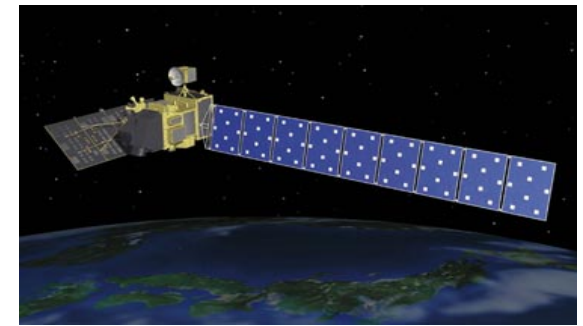
Aviation Program



Space Science



Satellite Program

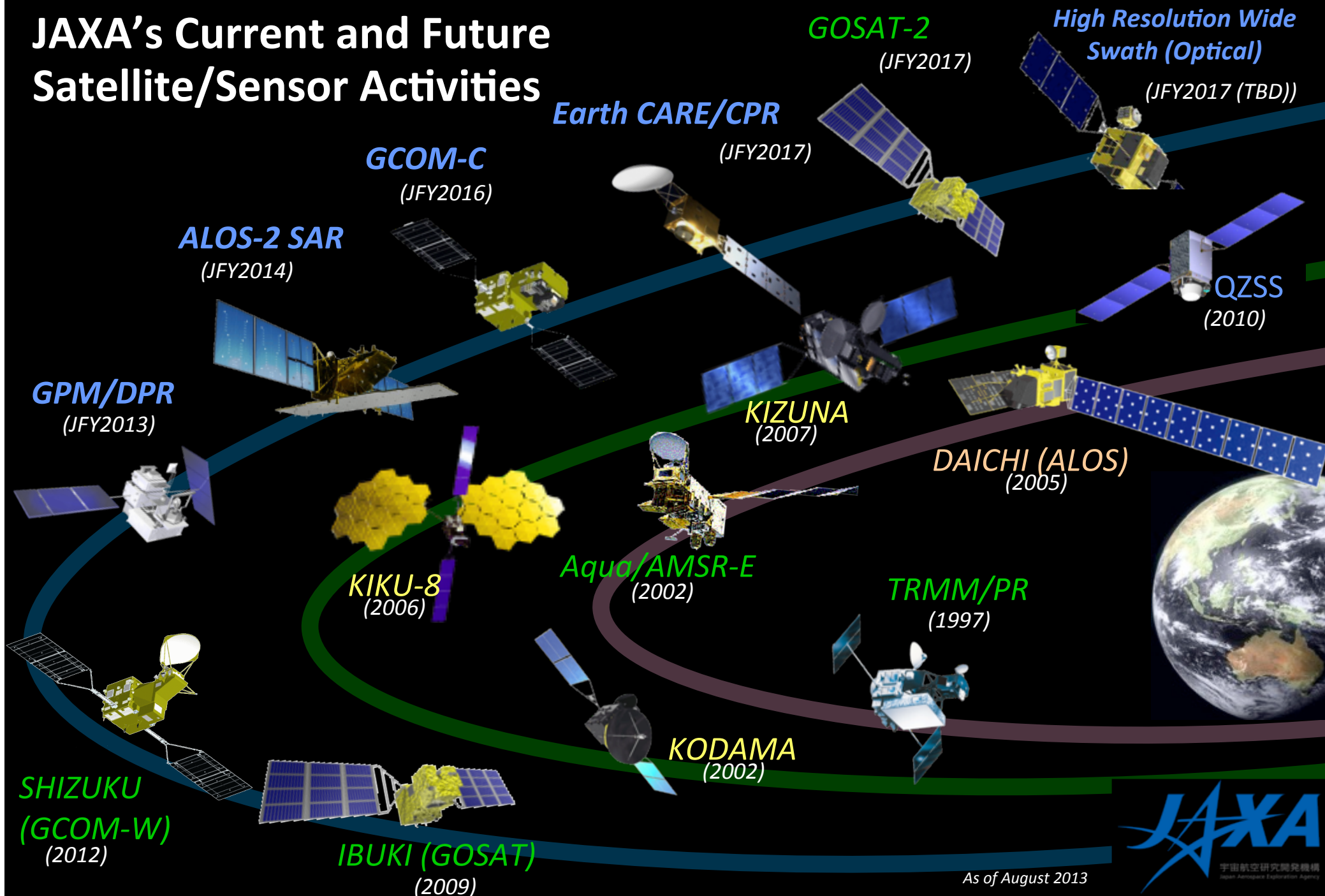


Lunar & Planetary Exploration Program



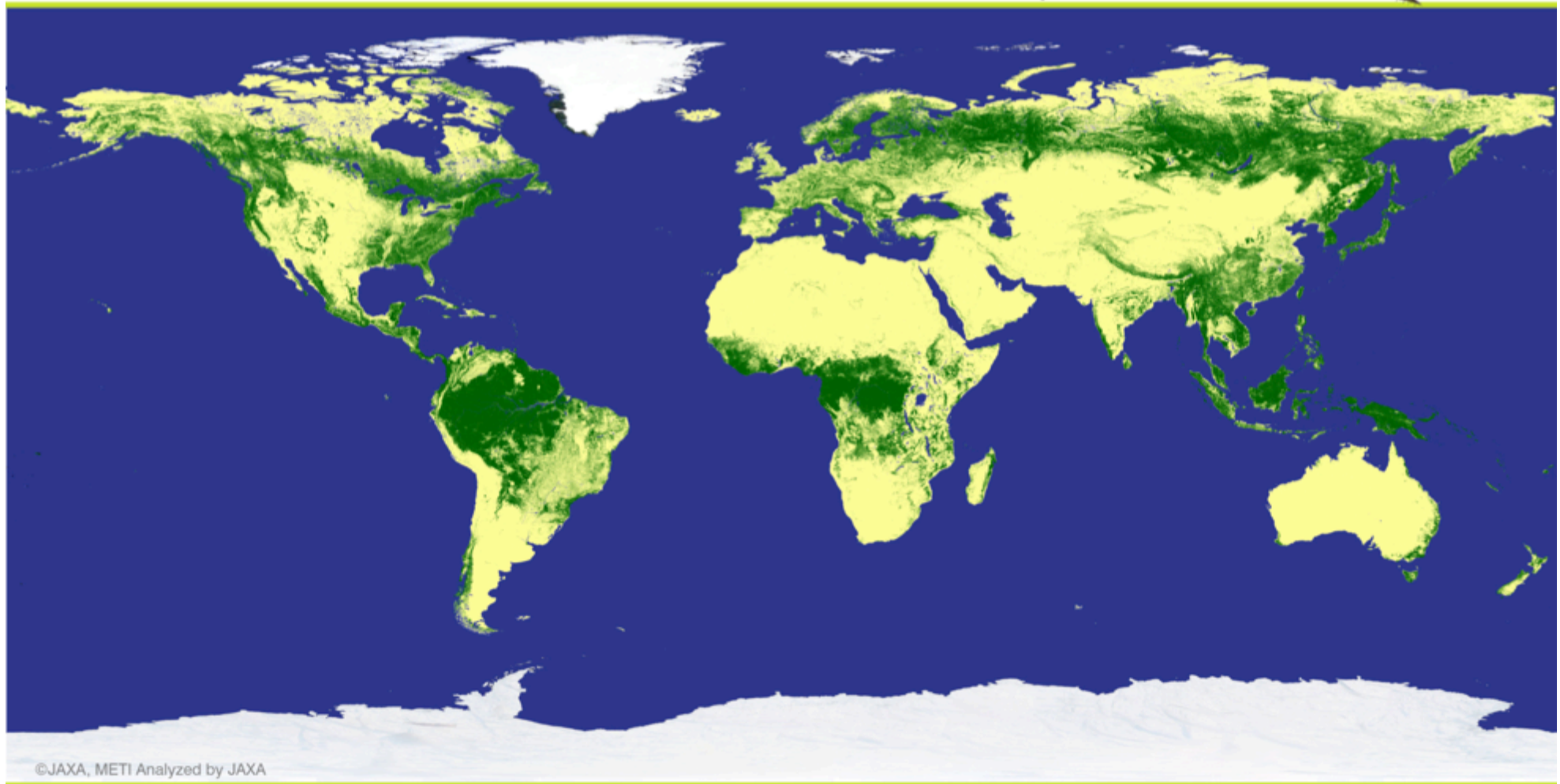
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JAXA's Current and Future Satellite/Sensor Activities



10m Global Forest/Non-Forest Map by ALOS/PALSAR

PALSAR 10m Global Forest/Non-Forest Map 2009

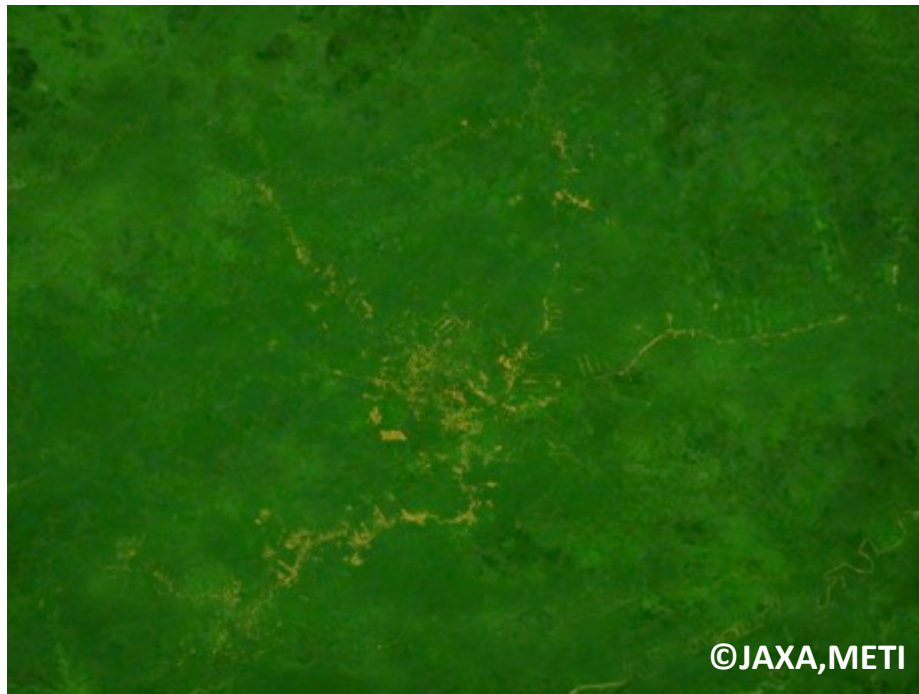


©JAXA, METI Analyzed by JAXA

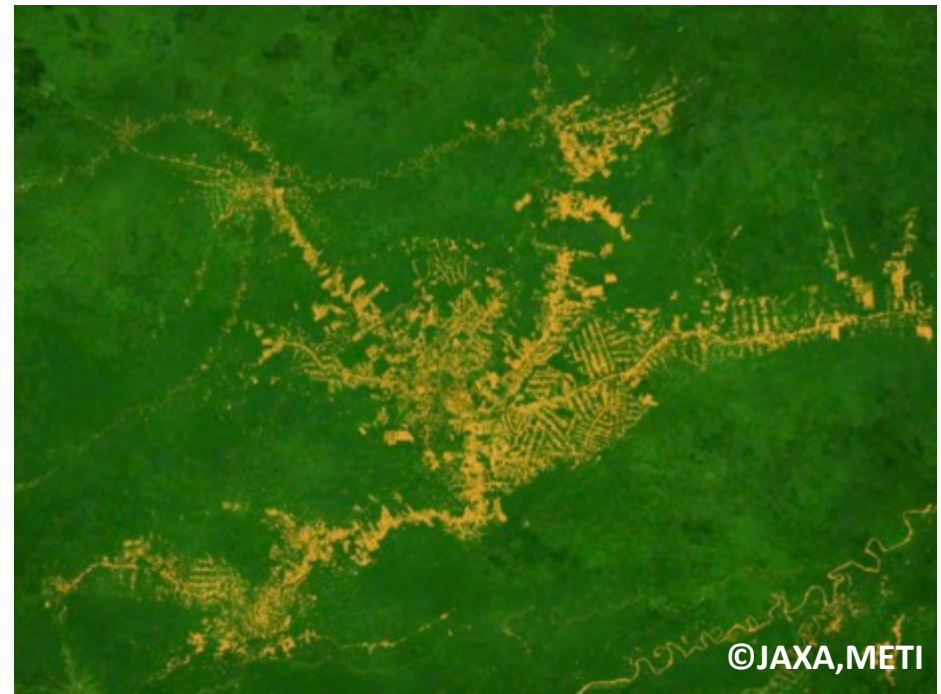
● : Forest ● : Non-Forest ● : Water

Forest/non-forest map is the important geophysical information on investigating the temporal forest land change, terrestrial causes on global warming, and proceeding the activity on Reducing the Emission from Deforestation and forest Degradation plus (REDD+).

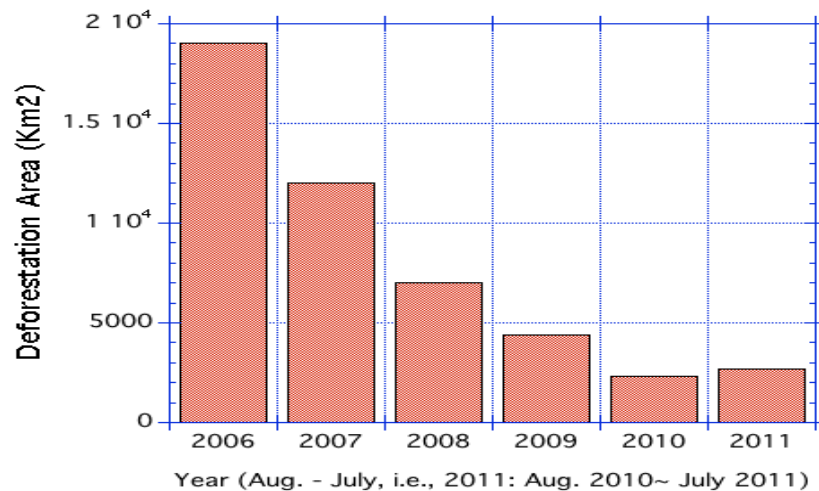
Deforestation Monitoring in Brazil by JERS-1/ALOS



1995 (JERS-1)



2007 (ALOS)



- Application for deforestation monitoring by provision of ALOS/ SAR data to IBAMA (Brazilian Institute of Environment and Renewable Natural Resources)
- Contribution to declination of deforestation area in Brazil

Forest cover change in Rondonia, Brazil)

2009 (ALOS/PALSAR)

13 years

1996 (JERS-1/SAR)

