

JICA-JAXA

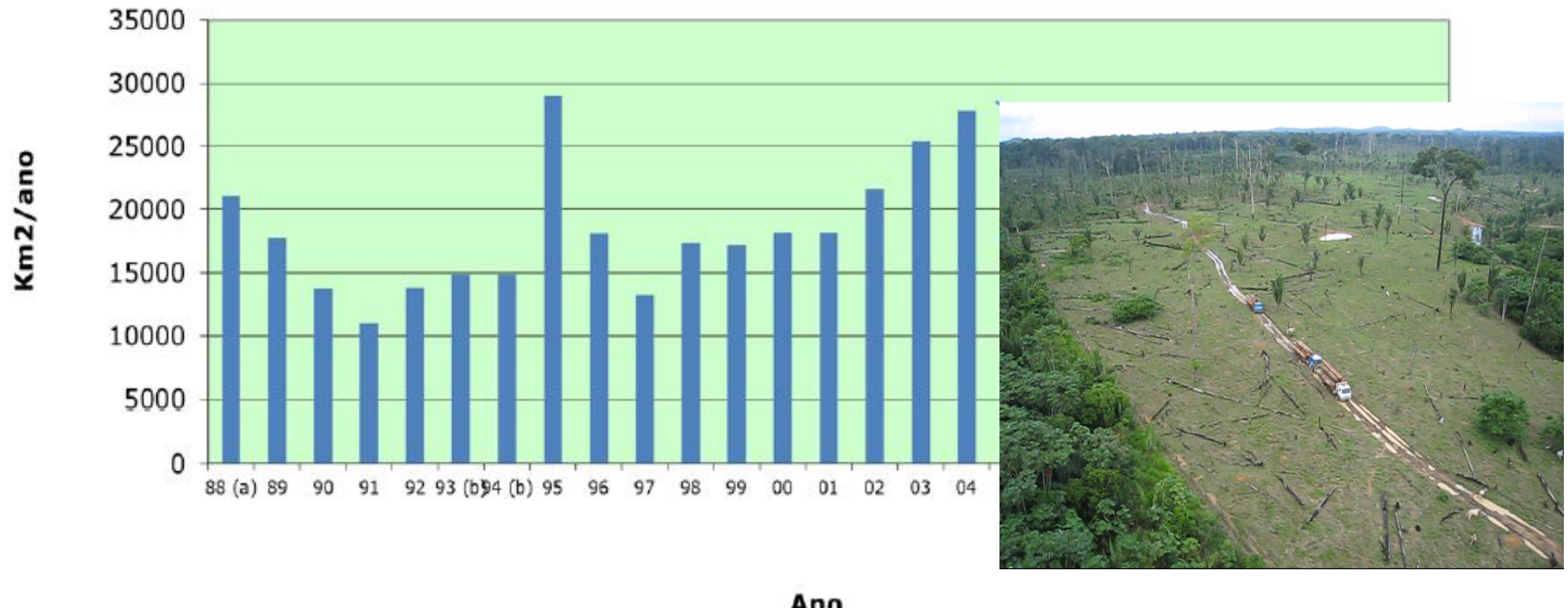
Forest Early Warning System in the Tropics
(JJ-FAST)

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SDCG-11 meeting April 10, 2017, Ho chi Min City

Previous operation in Brazil

Annual Deforestation in the Legal Amazon



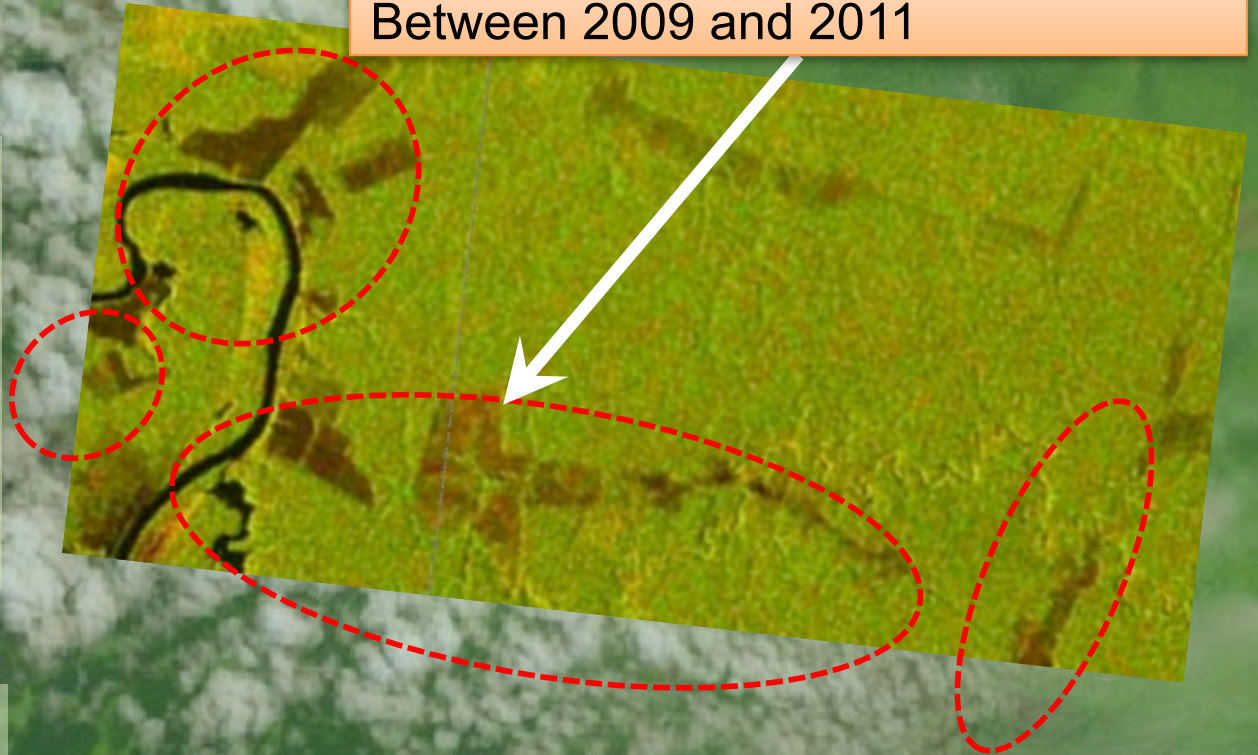
- Brazilian government has been tackling illegal deforestation using optical satellite images (Landsat) since 2004.
- JAXA-IBAMA implemented the ALOS/PALSAR illegal deforestation monitoring system in 2007.
- **Challenge was deforestation detection in the rainy season.**



ALOS

Landsat 5 Image on 2011/09/07

Forest Density Difference by ALOS
Between 2009 and 2011



Almost a half period of a year, the Amazon Forest is covered with clouds.

The PALSAR can detect deforestation even in the rainy season or night time.

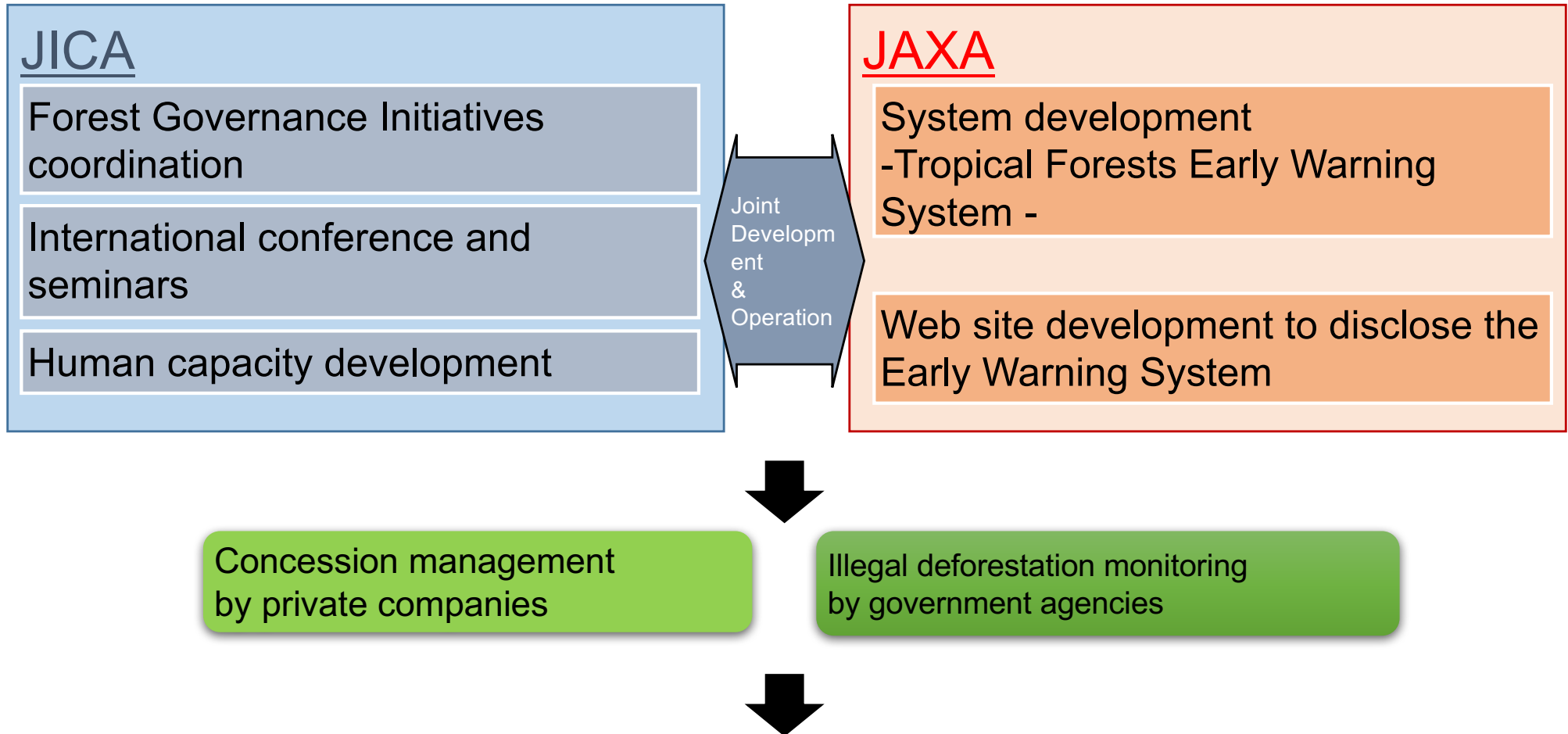
IBAMA (Brazilian Institute of Environment and Renewable Natural Resources) and DPF (Federal Police Department) implemented the project.

During the Project...

Year	Detection of Deforestation	Illegal Logging
2010	1,007	140
2011 (stopped in April)	176	11

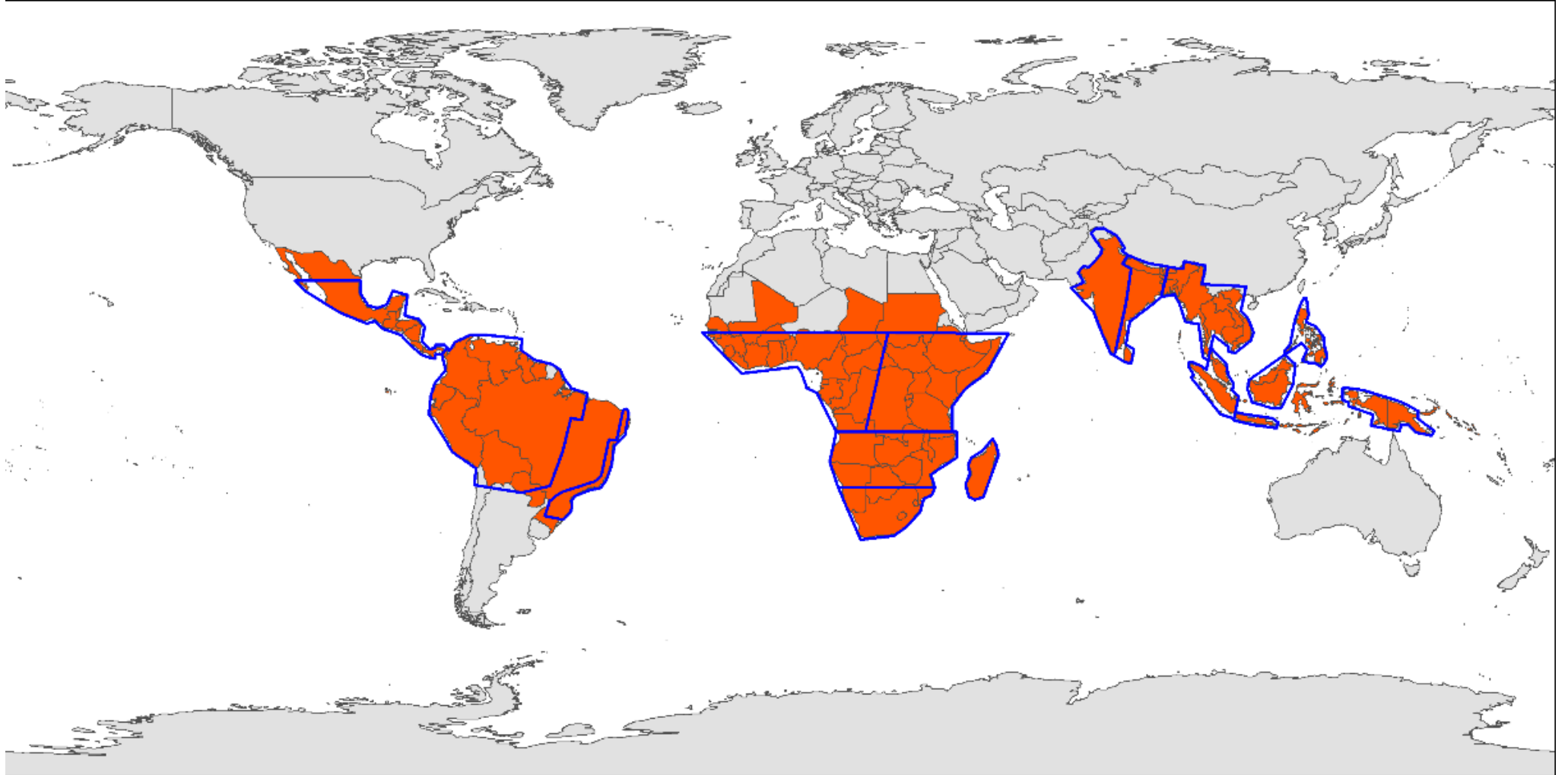
New Tropical Forest Early Warning System with **PALSAR-2** *JJ-FAST*

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



Contributing to “Improvement of Forest Governance in Tropical Forest”

Target Area: Approximately 16.6 million km²



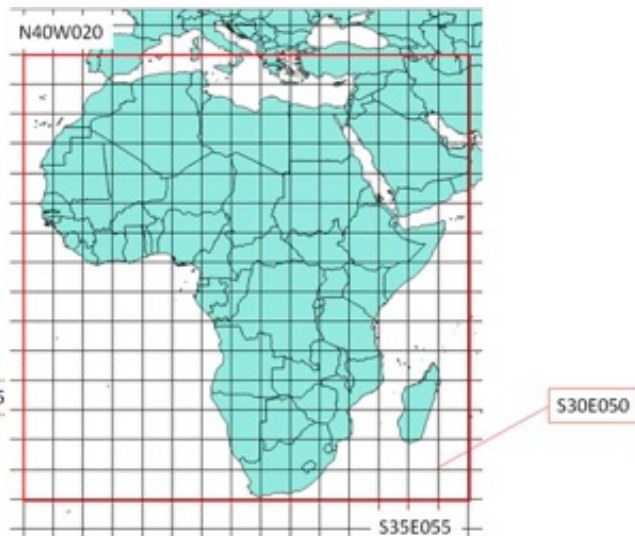
Target area

Target area (9 times a year)

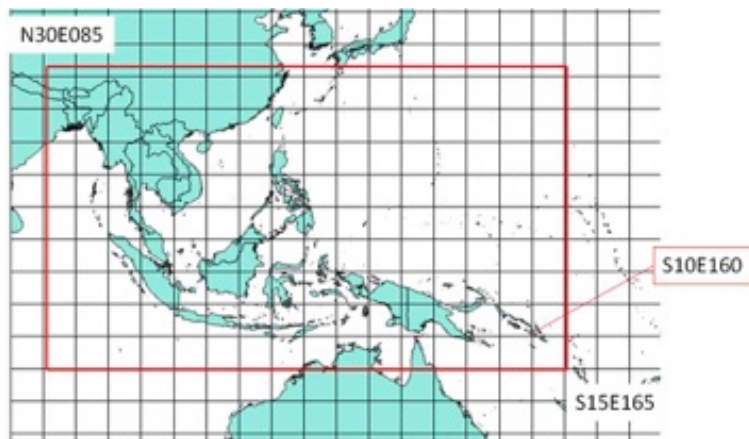
2016モザイク作成範囲を以下に示す



南米



アフリカ



東南アジア

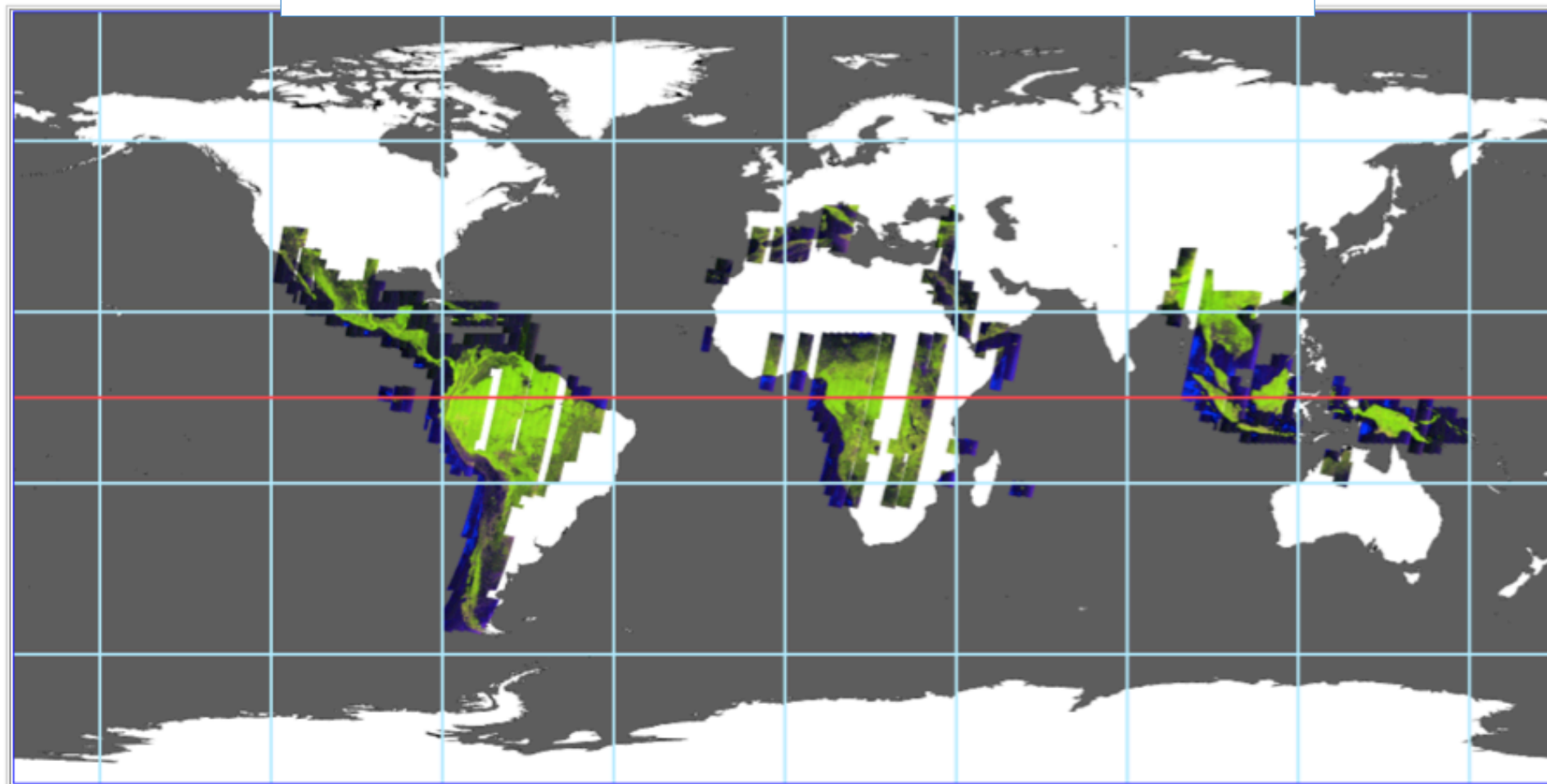
回帰数	観測開始日	観測終了日
45回帰	2016/3/28	~ 2016/4/10
48回帰	2016/5/9	~ 2016/5/22
51回帰	2016/6/20	~ 2016/7/3
53回帰	2016/7/18	~ 2016/7/31
56回帰	2016/8/29	~ 2016/9/11
59回帰	2016/10/10	~ 2016/10/23
62回帰	2016/11/21	~ 2016/12/4
65回帰	2017/1/2	~ 2017/1/15
68回帰	2017/2/13	~ 2017/2/26

観測回帰詳細

各回帰別のScanSARモザイクを以下に示す

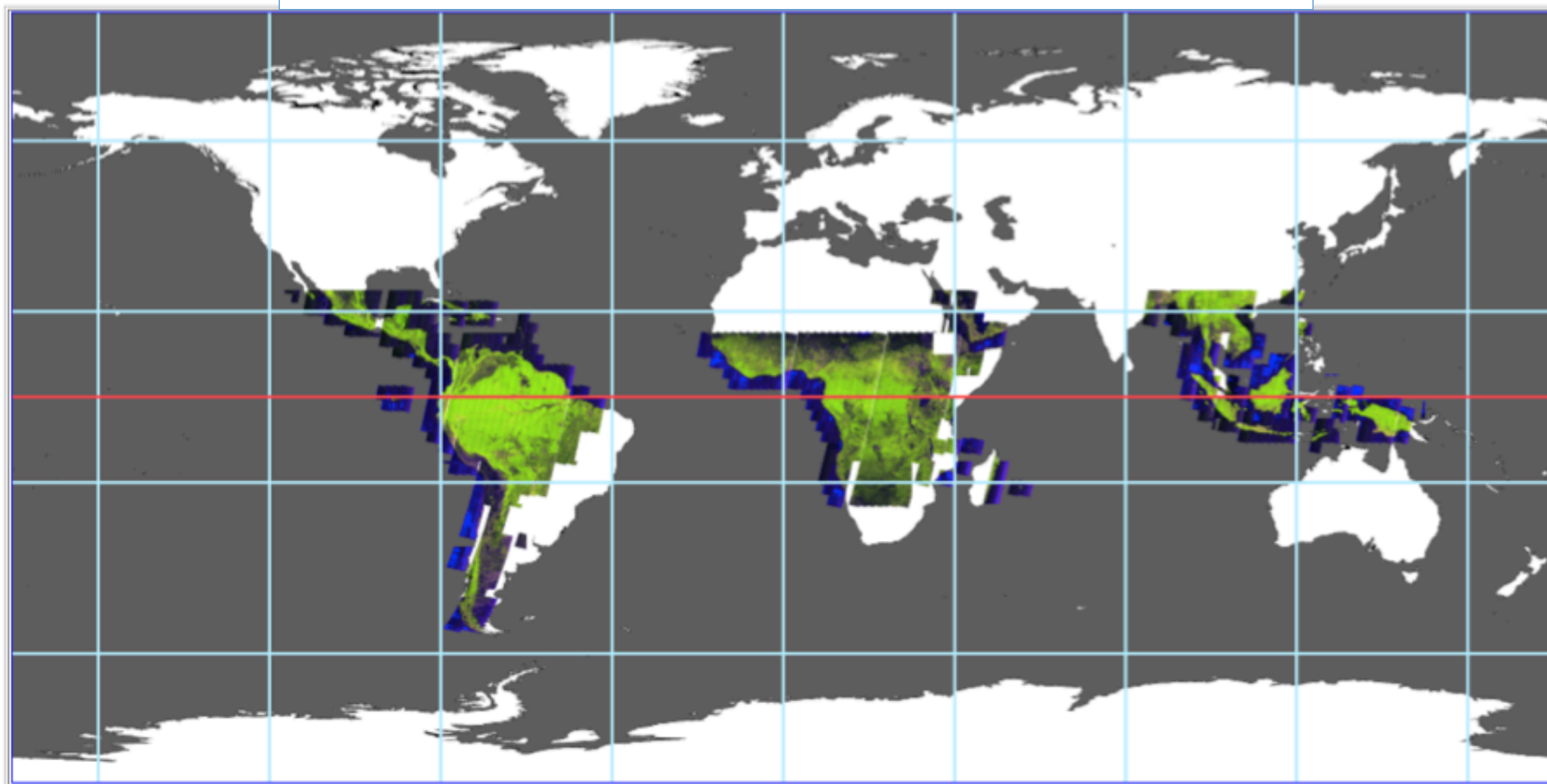
45回帰

PALSAR-2 50m ScanSAR



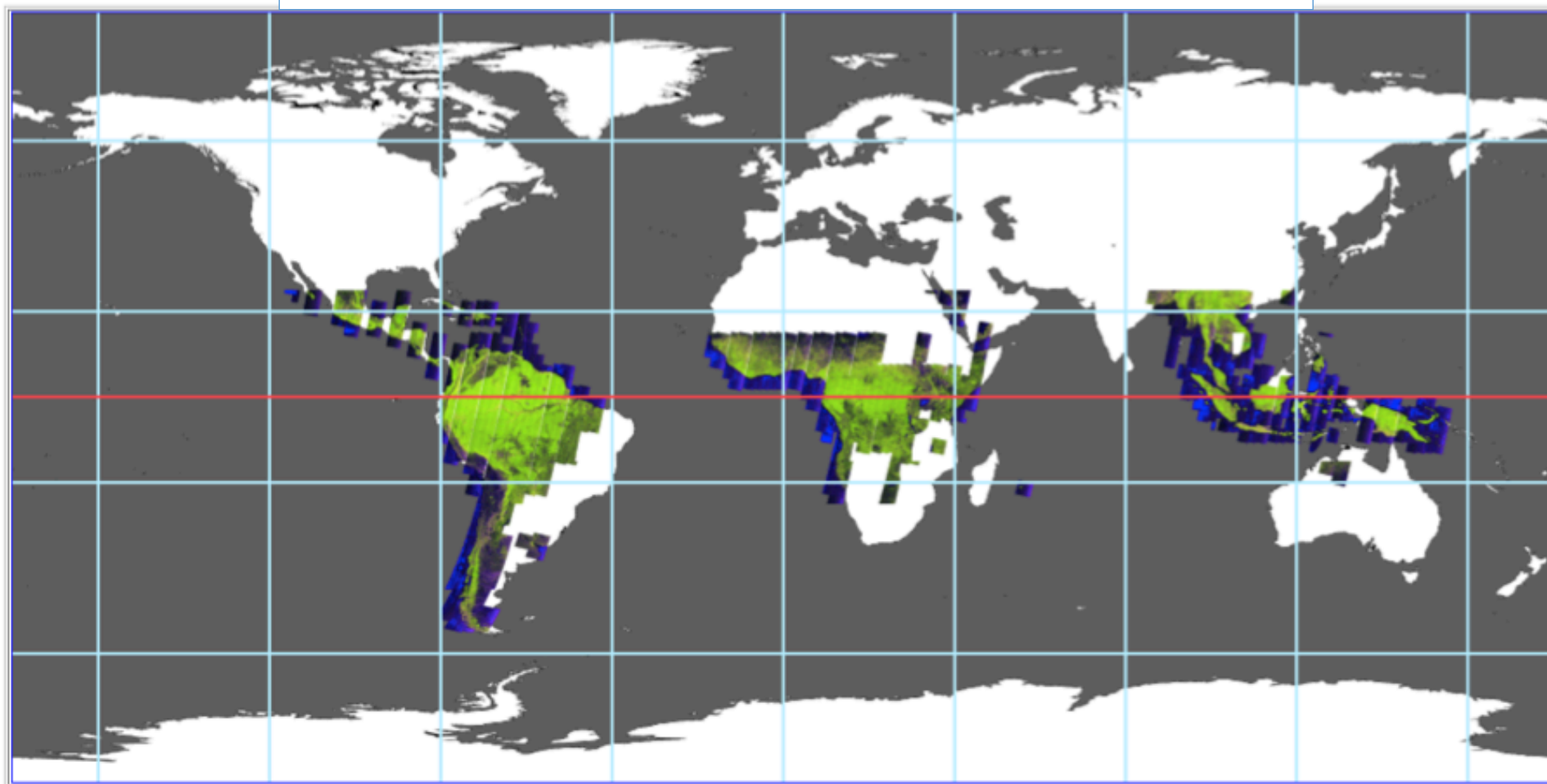
48回帰

PALSAR-2 50m ScanSAR



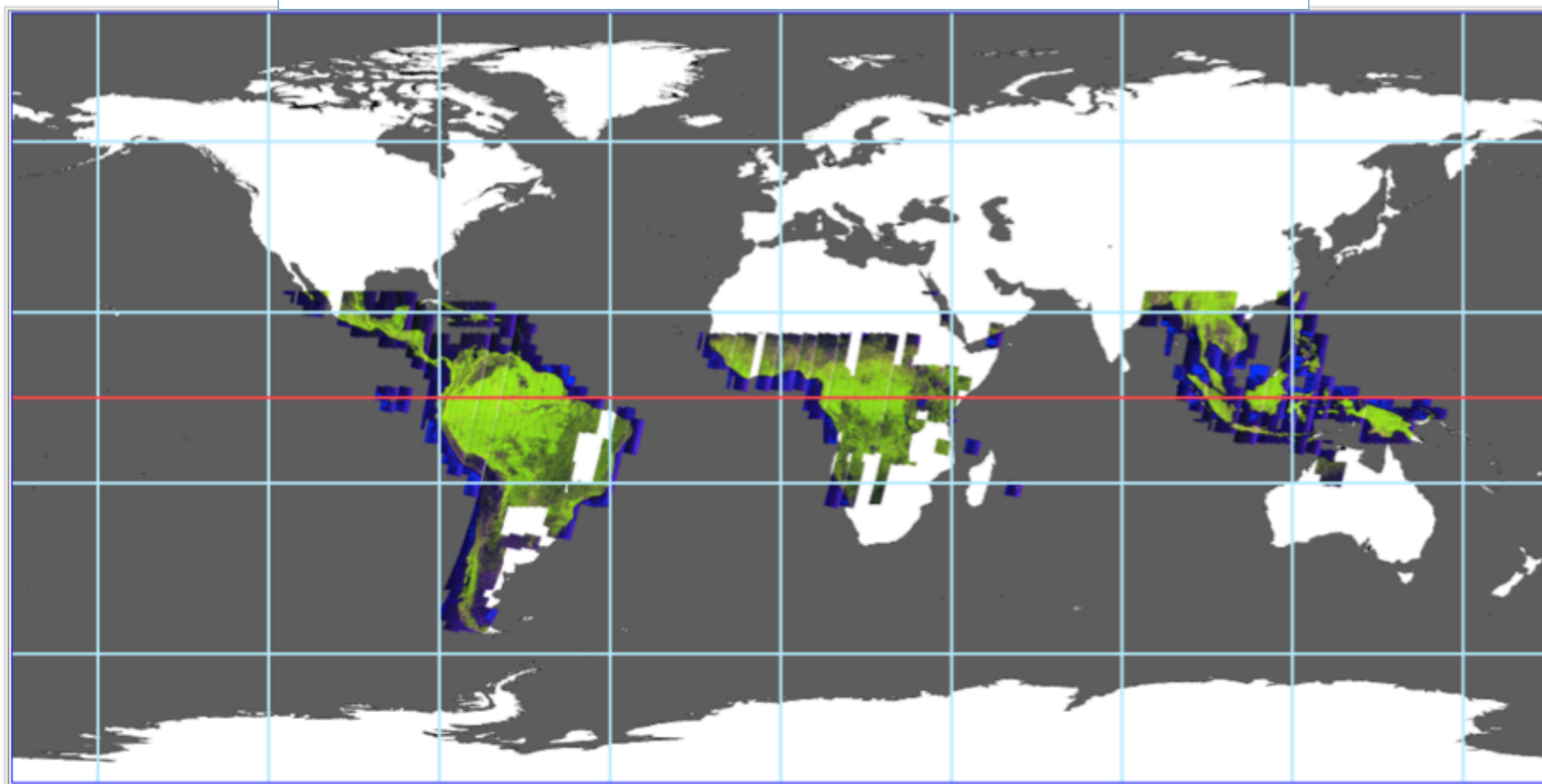
51回帰

PALSAR-2 50m ScanSAR



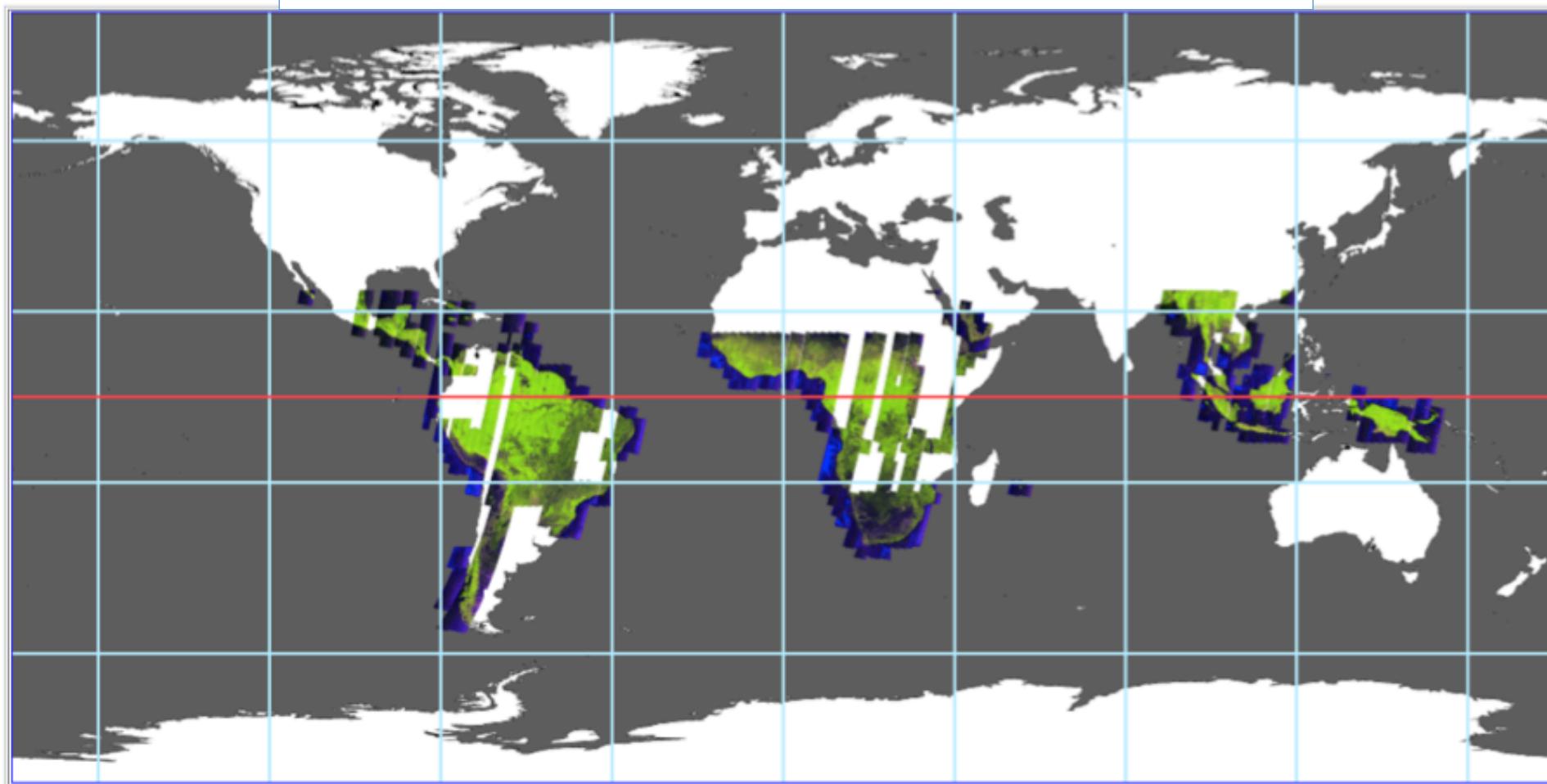
53回帰

PALSAR-2 50m ScanSAR



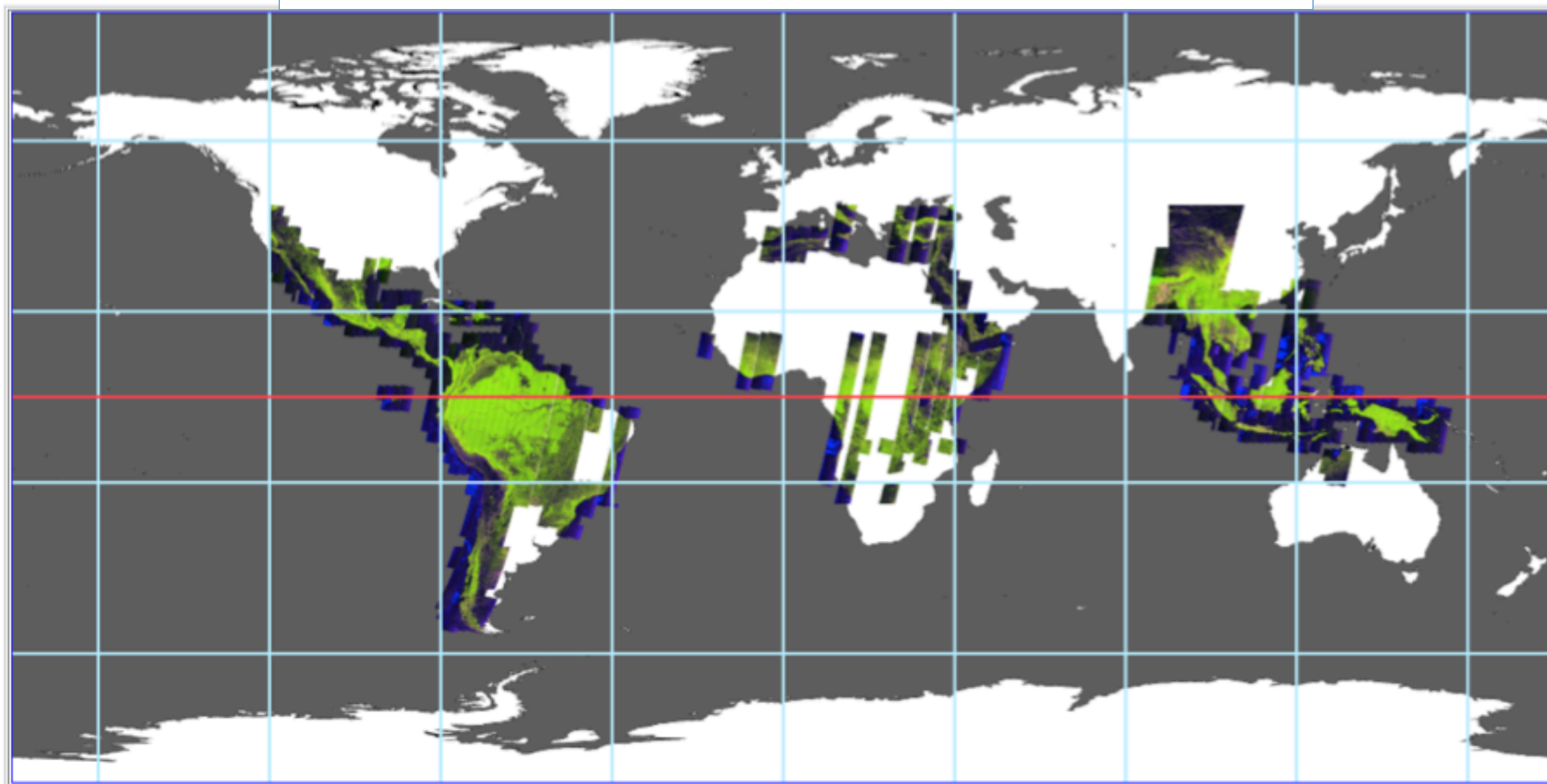
56回帰

PALSAR-2 50m ScanSAR



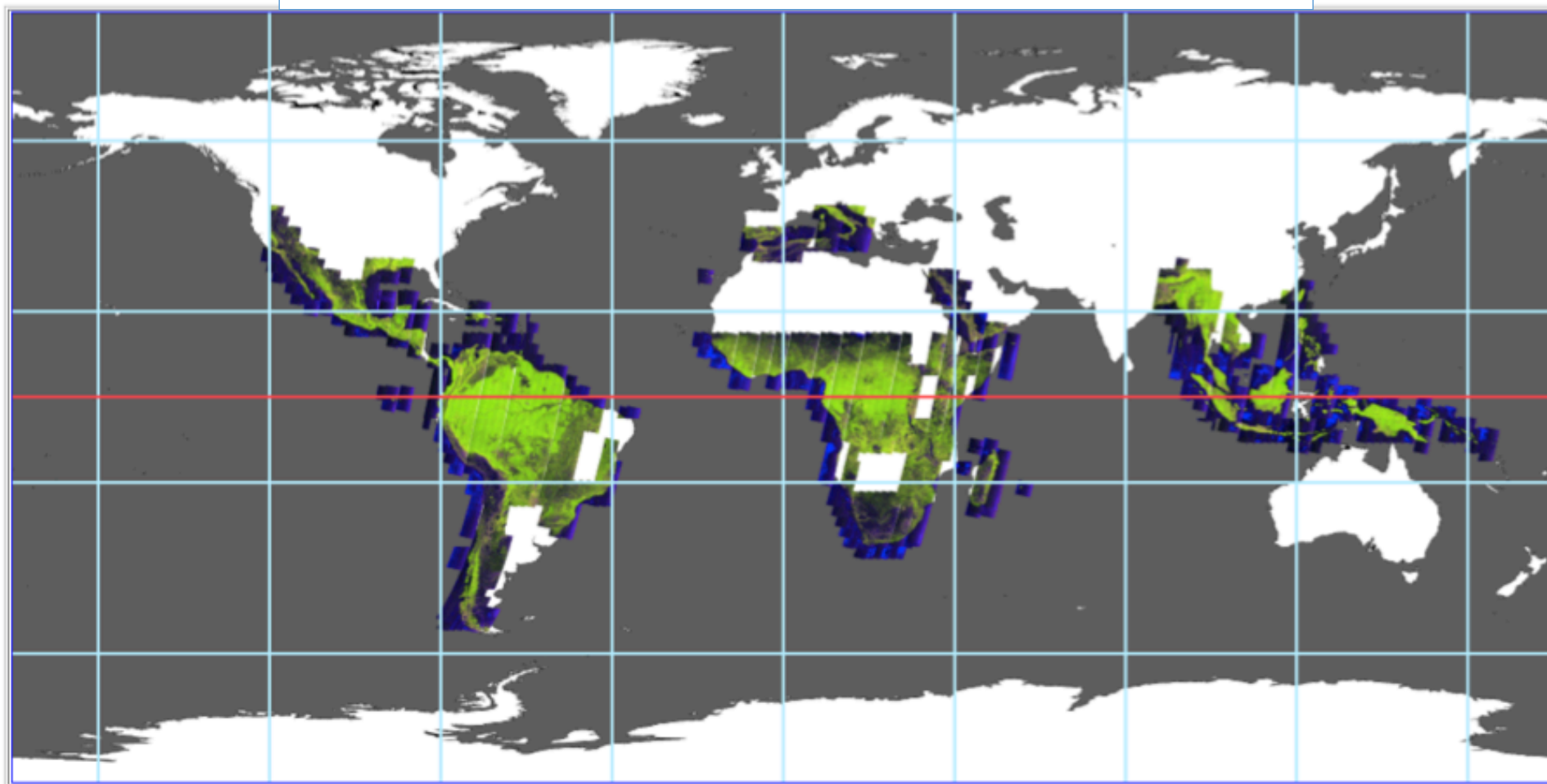
59回帰

PALSAR-2 50m ScanSAR



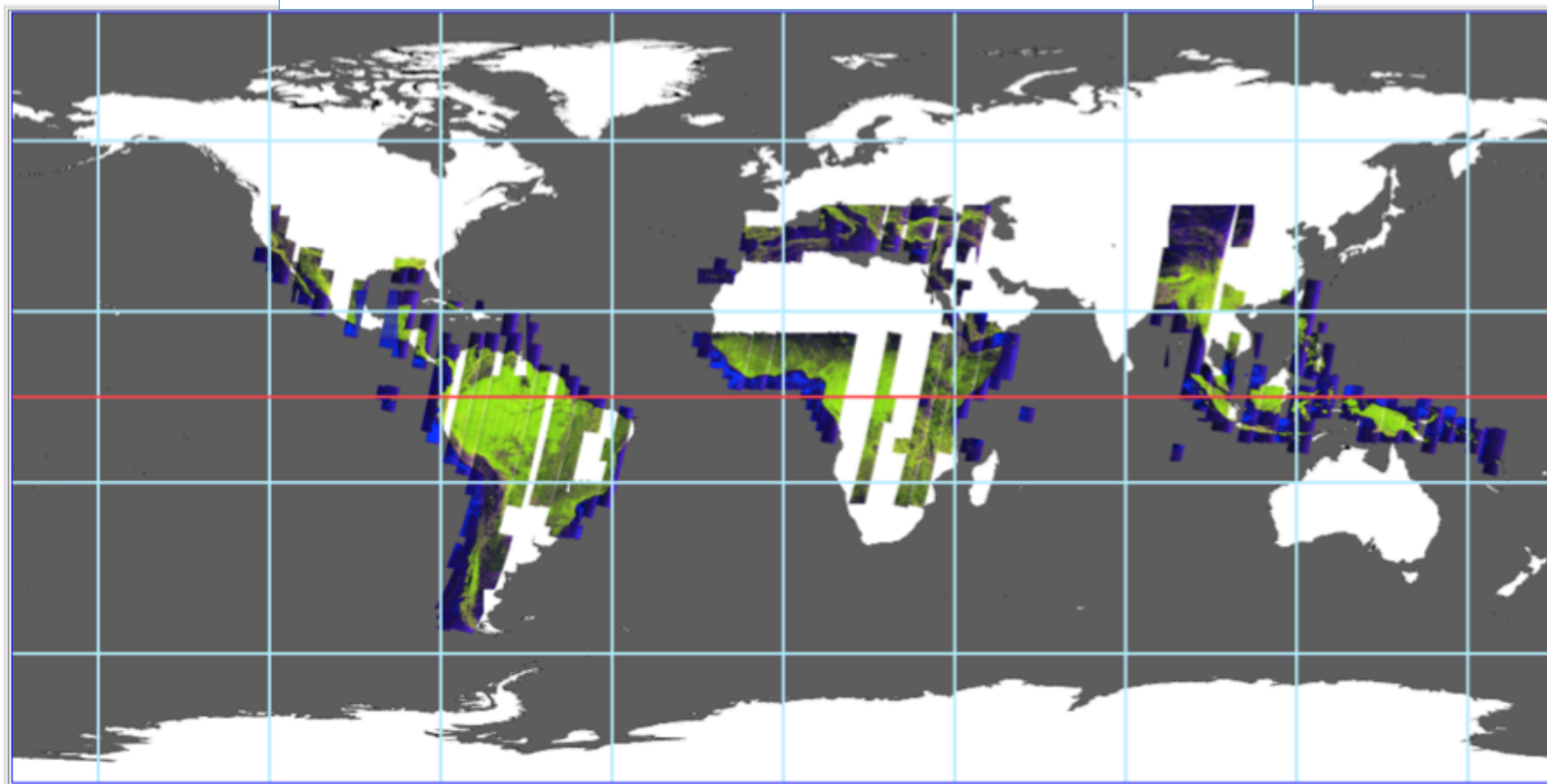
62回帰

PALSAR-2 50m ScanSAR



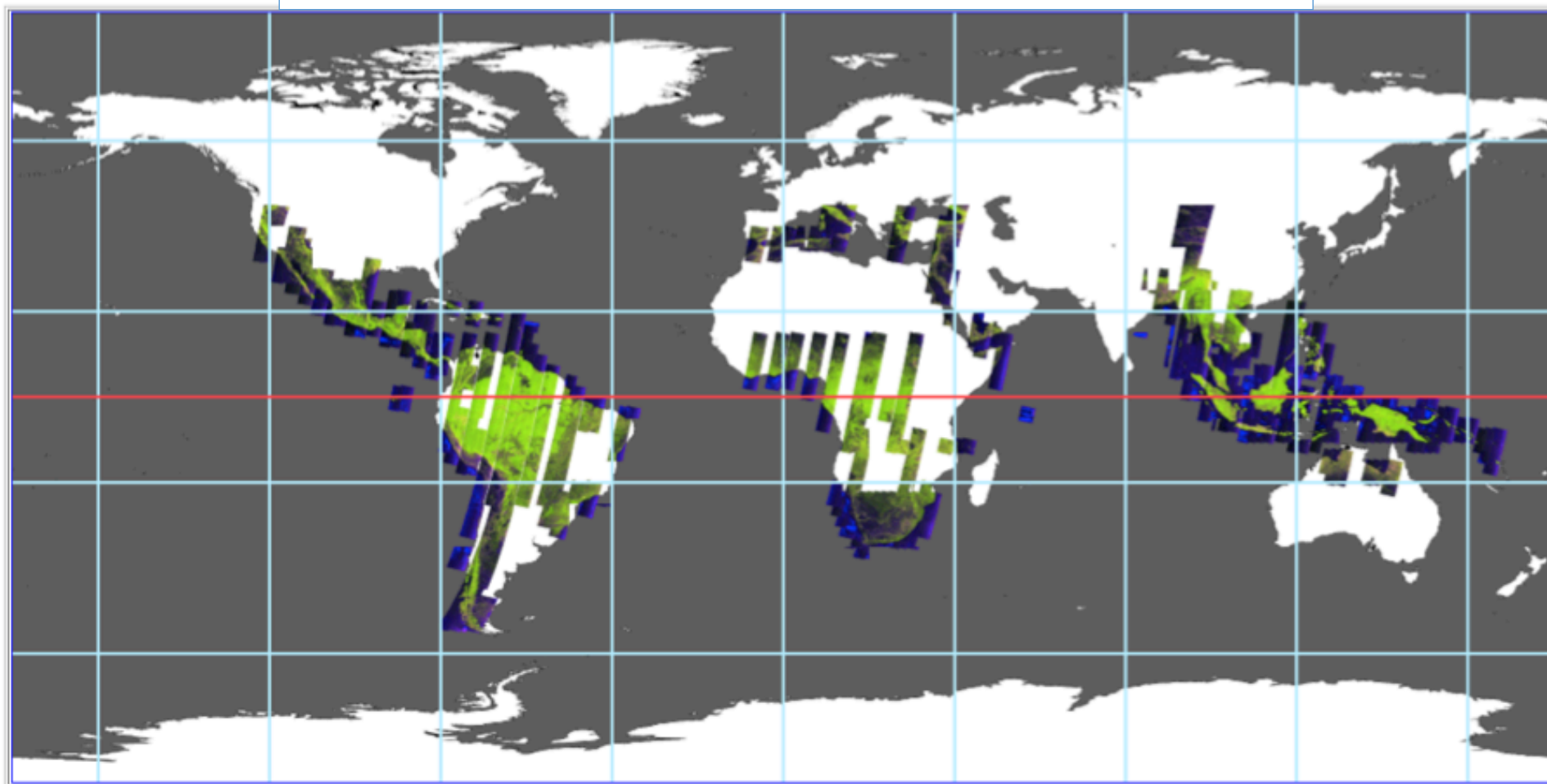
65回帰

PALSAR-2 50m ScanSAR



68回帰

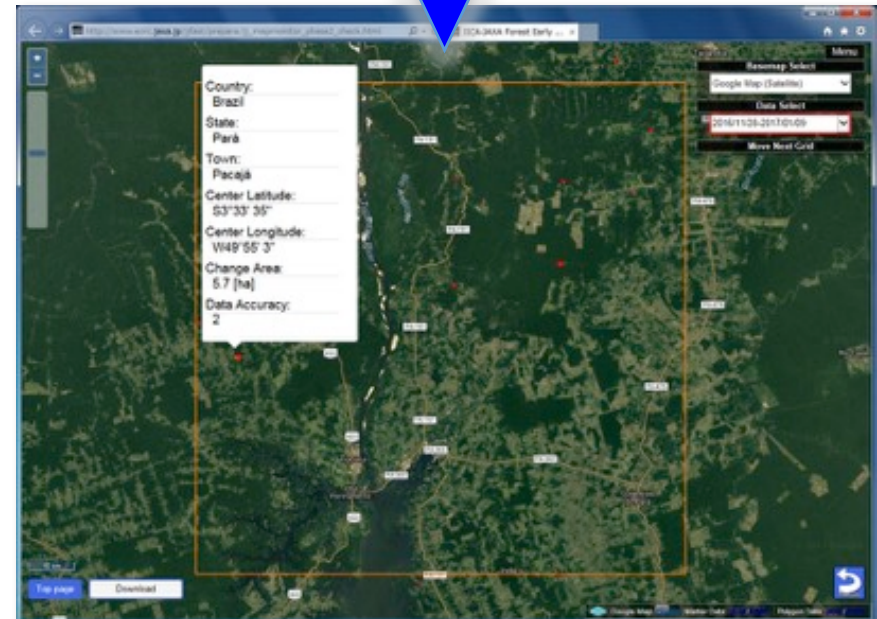
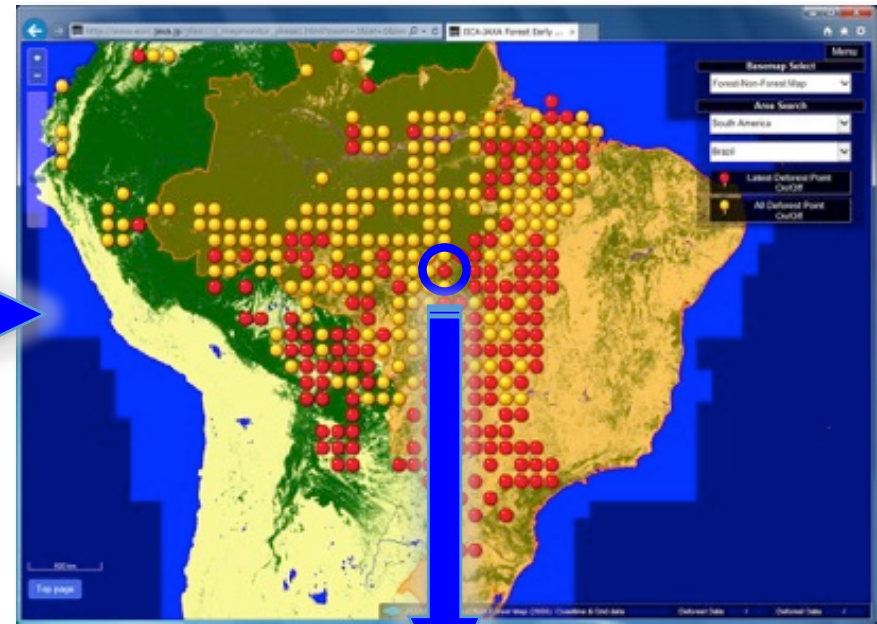
PALSAR-2 50m ScanSAR



About JJ-FAST

- WEB-based Quick deforestation information system using the time series PALSAR-2 ScanSAR (English and Japanese)
- Target info: Deforestation polygon and timing
- Method: Segmentation – differentiation based method
- “Free access from PCs and mobile devices(iPad or so)” from anywhere in the world with low speed internet condition.
- “Deforestation in a rainy season” is detected through SAR sensor (PALSAR-2 (L-band SAR))
- Observation frequency “Every 42 days”
- Latency: 3 weeks -> in future (1 week: goal)
- “Cover 77 countries as of now” containing tropical forest: 80 countries in Nov. 2017
- Launched in Nov. 2016 and Nov. 2017 for full operation
- Spatial resolution of the Image : 50m
- Minimum detection size of the polygon: 5ha (1 ha in near future)
- **Downloadable: deforestation polygons and their 16 bit TIFF image,**
- **Guideline: Language (English, French, Spanish)**

JJ-FAST web site

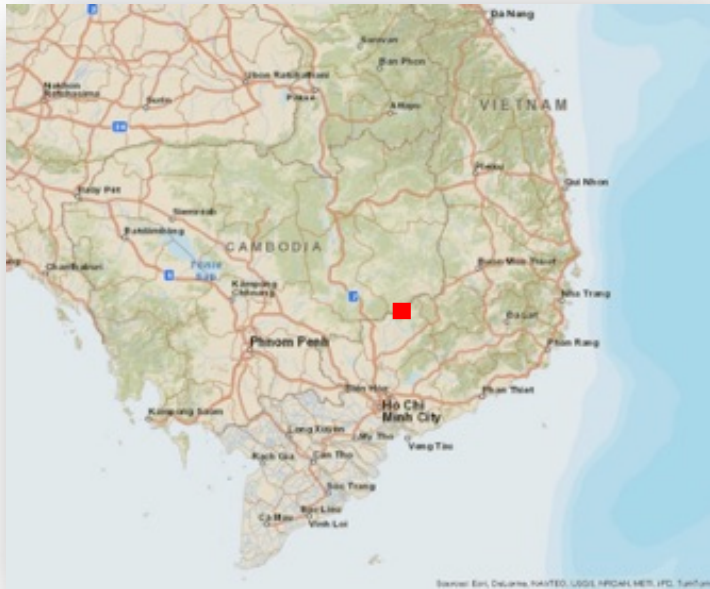


- ❖ Display deforestation timing, size, Latitude & Longitude
- ❖ Enable to down load PALSAR-2 image & polygon free of charge.

<http://www.eorc.jaxa.jp/jjfast/>



Deforestation detection with PALSAR-2



Peripheral of Bu Gia Map National Park

Deforestation detection during a rainy season

Dry Season

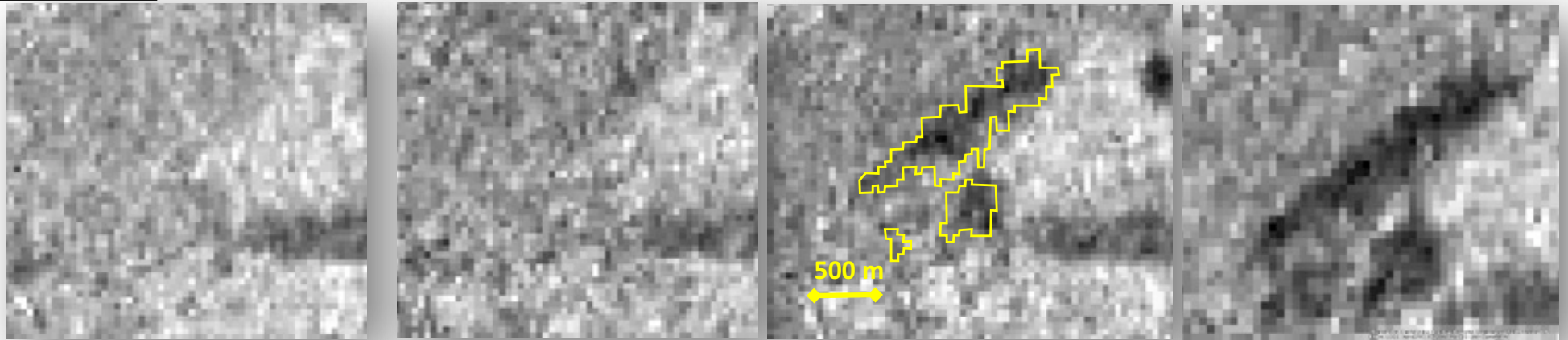
Rainy Season

Dry Season



PALSAR-2

Deforestation



Jun. 26, 2016

Jul. 24, 2016

Sep. 4, 2016

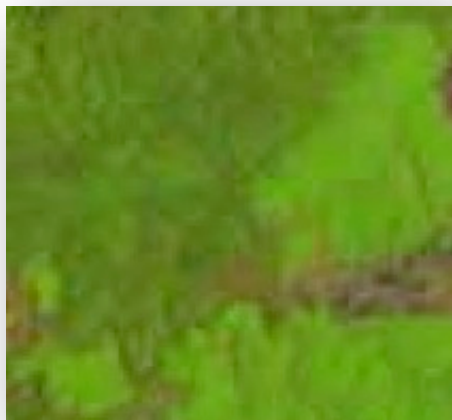
Oct. 16, 2016

Landsat-8

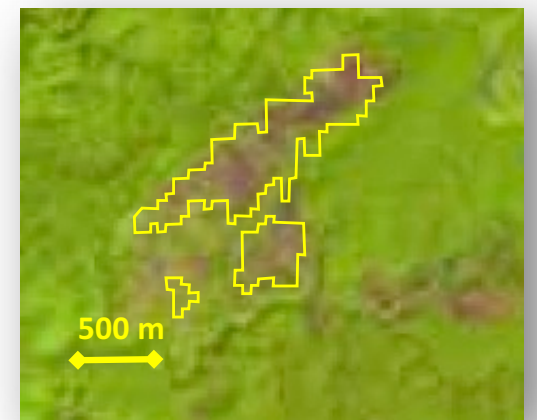
28 days

42 days

42 days



Mar. 31, 2016



Nov. 10, 2016

Schedule

	JFY 2016		JFY 2017		JFY 2018
	11	12-3	4-9	10-3	4-
International meeting	▲COP22 (Morocco)	△ACTO △COMIFAC? △SADC?		▲A meeting (Tokyo)	
Target countries	<u>Amazon</u>	Amazon <u>Africa</u>	Amazon Africa	<u>All 77</u> <u>country</u>	
Target date	May 9, 2016 – Aug. 29, 2016	March 28, 2016 – 1.5 month after a PALSAR-2 observation			
Obs. frequency	9 times/year				
Min. size of detection	5 ha				1ha?

* Core algorithm ** Advanced algorithm

JJ-FAST

<http://www.eorc.jaxa.jp/jjfast/>



JJ-FAST

- **WEB-based Quick deforestation information system using the time series PALSAR-2 ScanSAR (English and Japanese)**
- **JICA-JAXA-TDU-RESTEC**
- **Deliverable: deforestation info of 5ha unit accessible even low internet speed, i.e., @REDD+ country and using iPad or so.**
- **Resolution 5ha -> 1 ha (goal)**
- **Access condition: Open**
- **Downloadable: 50m-FNF (Pantropical region), 16 bit TIFF images (limited area), updated 45 days at each region with latency of 3~4 weeks (shorter in future).**
- **Service areas: ~60 countries (Nov. 2016), updated to ~80 countries (Nov. 2017-)**
- **Guideline: Language (English, French, Spanish)**