

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

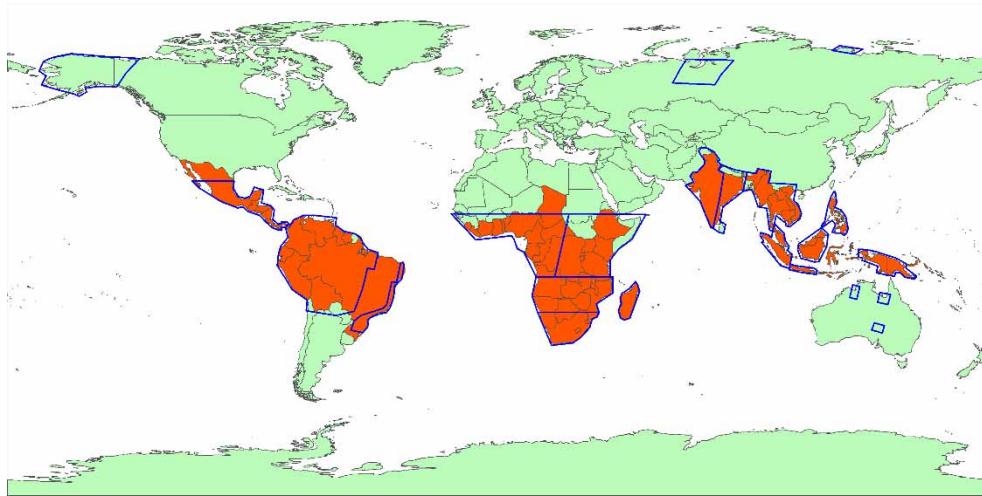
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## About JJ-FAST

- “Every ~1.5 month” Global Tropical forest observation
- “Cover 61 countries” containing tropical forest

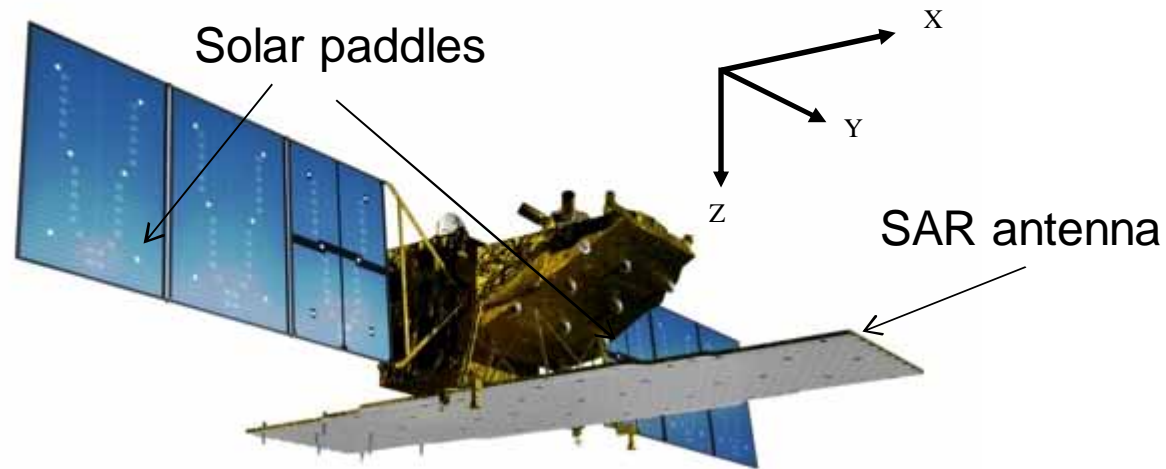


- “Free access from PCs and mobile devices” from anywhere in the world.
- “Deforestation in a rainy season” is detected through SAR sensor (PALSAR-2 (L-band SAR))

# Japanese L-band SAR satellites

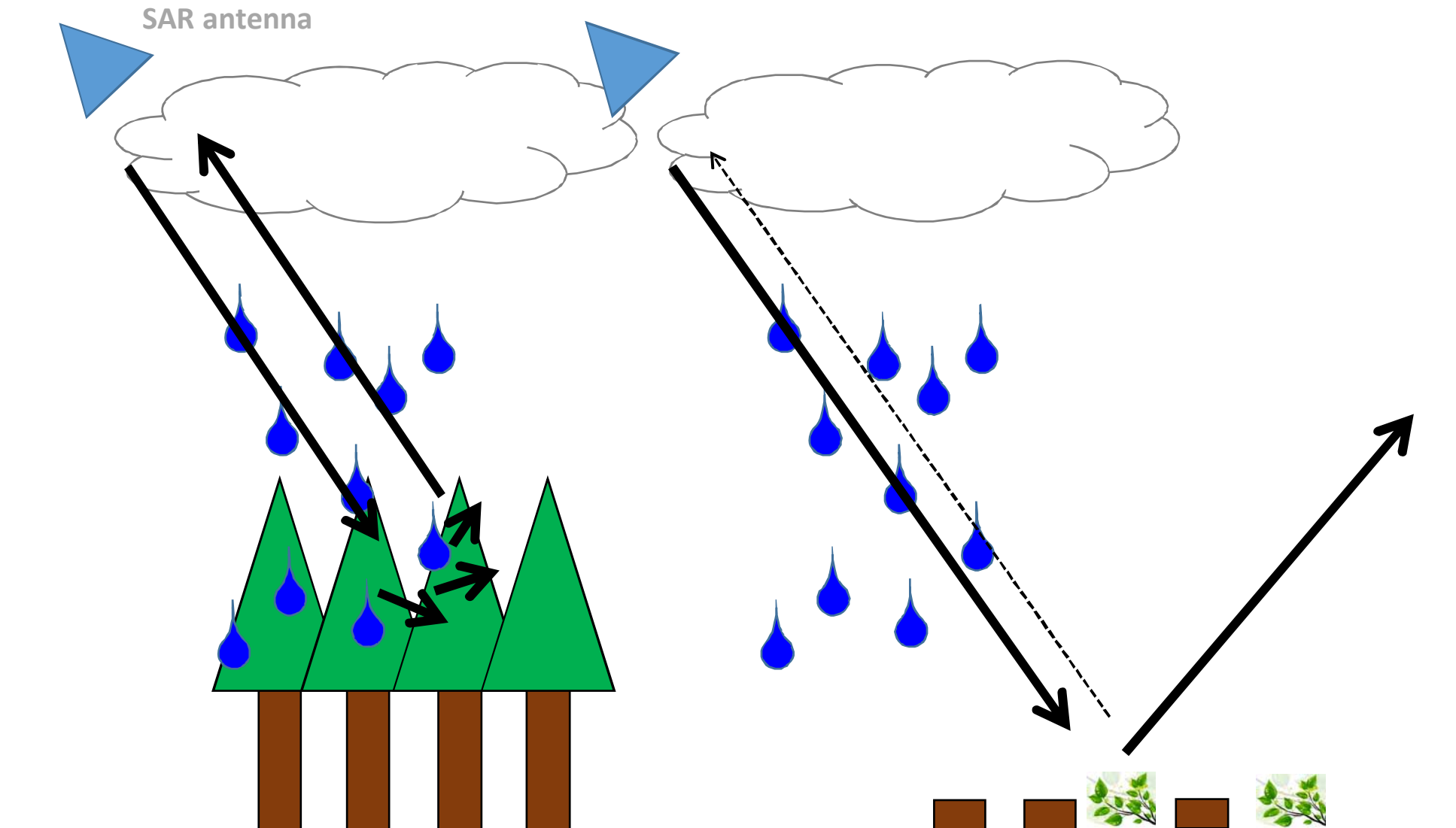
for monitoring forest & tree cover

	JERS-1	ALOS	ALOS-2
Operation	1992 – 1998	2006 – 2011	<b>2014 – (in operation)</b>
Revisit time	44 days	46 days	14 days
Sensor	<b>(L-band SAR)</b>	PALSAR ( <b>L-band SAR</b> ), PRISM, AVNIR-2	PALSAR-2 ( <b>L-band SAR</b> )
Observation swath	75 km	35– <b>350</b> km	25 – <b>490</b> km
Resolution	18 m	Range : 10 m to 100 m Azimuth: 10 m to 100 m	Range : 3 m to 100 m Azimuth: 1 m to 100 m



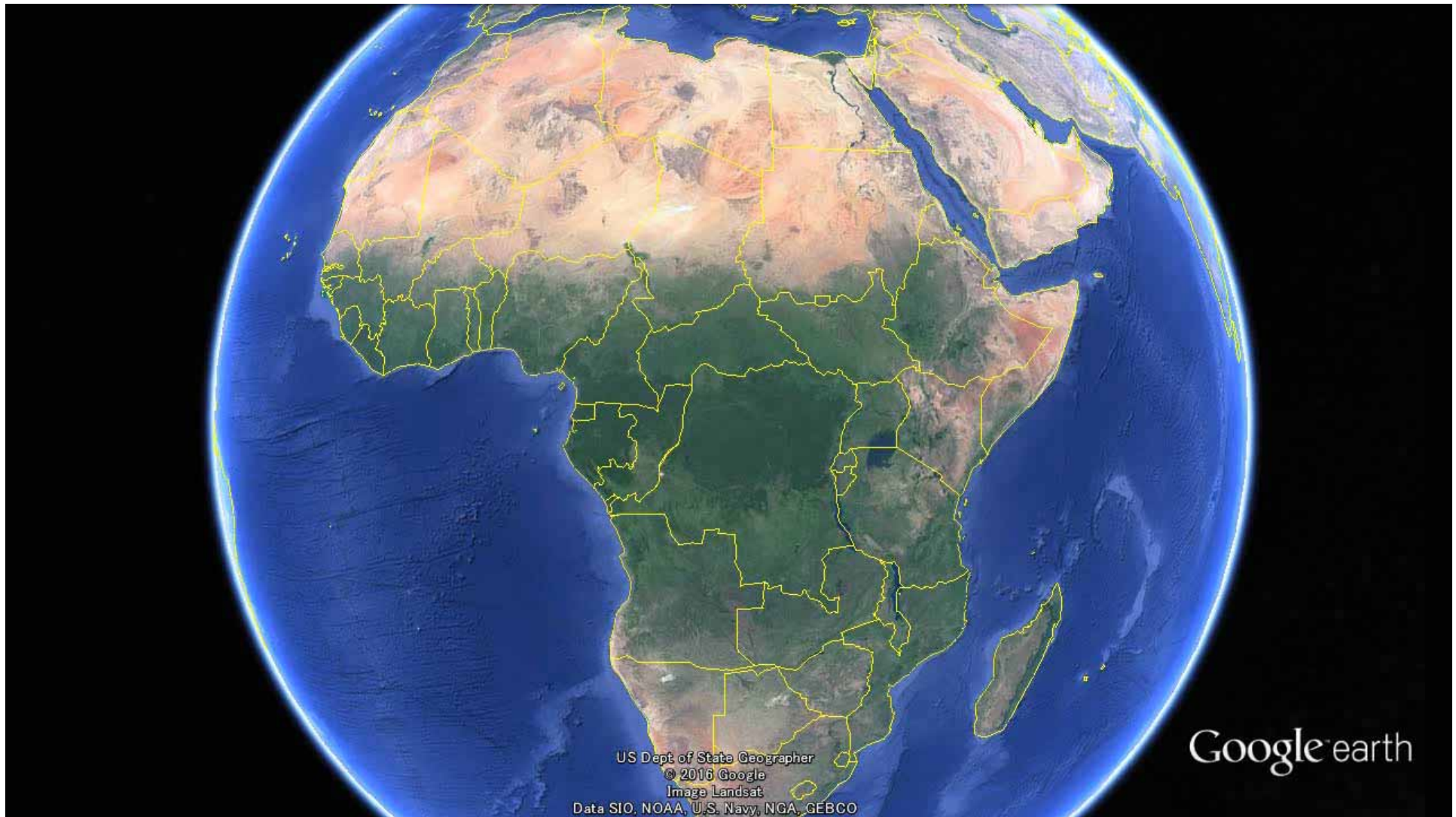
**“L-band SAR satellite” series have been operated only in Japan!**

# "L-band SAR" is useful for forest monitoring



Higher image contrast between "forest" and "non-forest" (L-band SAR)

# Africa/Democratic Republic of Congo



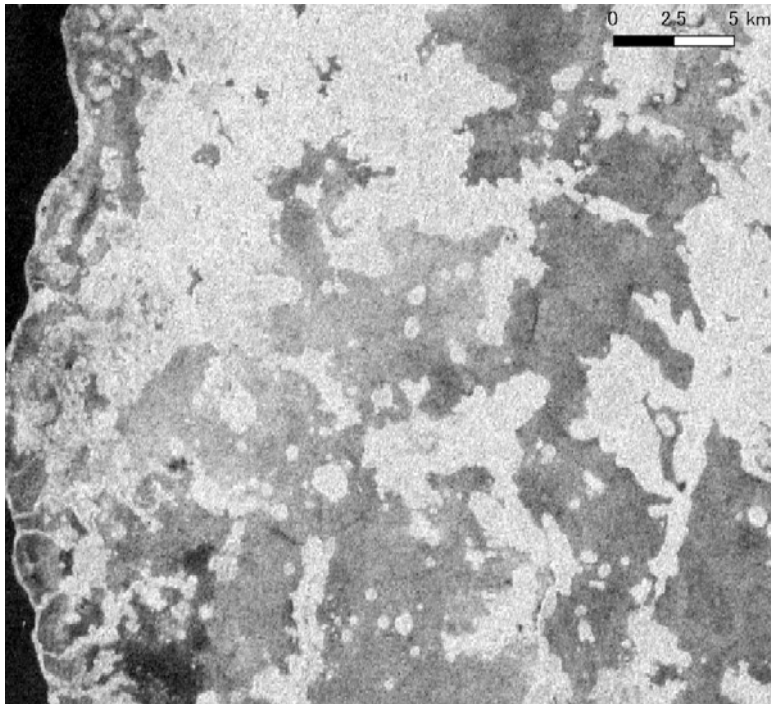
US Dept of State Geographer  
© 2016 Google  
Image Landsat  
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Google earth

# Africa/Democratic republic of Congo

Area: North part of Kinshasa

## Deforestation observed



July 24, 2015



July 22, 2016

➔  
1 years

Forest concession?  
Covert to agriculture area?



Deforestation area is represented by darker gray color by SAR image

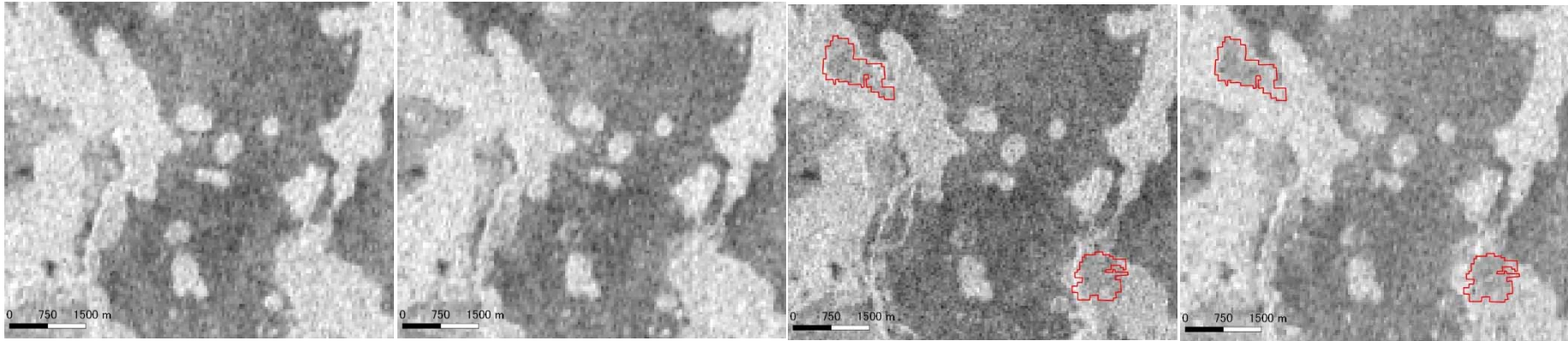
Dry Season

Rainy Season



PALSAR-2

Deforestation



Jul. 24, 2015

Sep. 4, 2015

Oct. 16, 2015

Jan. 8, 2016

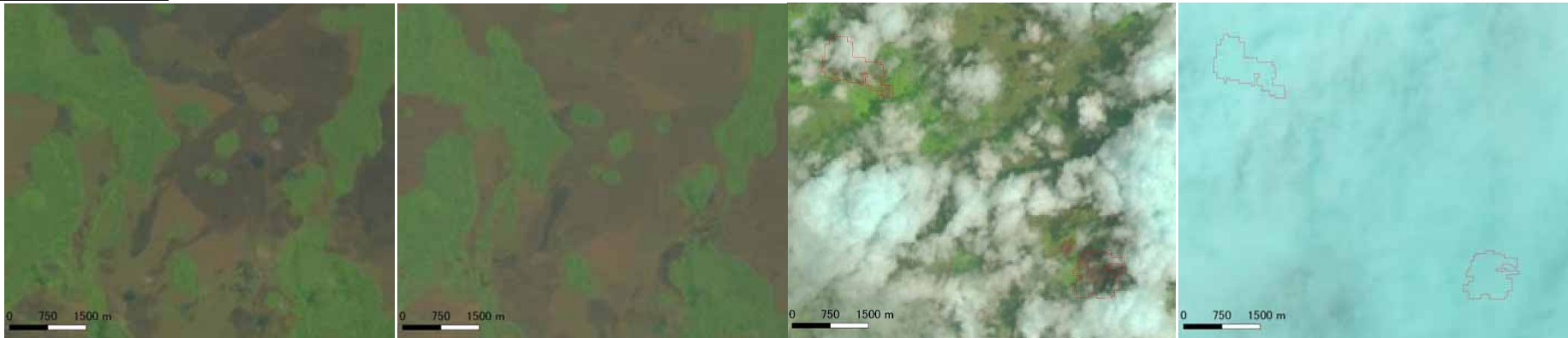
42 days

42 days

84 days

Landsat-8

Deforestation?



Jul. 27, 2015

Aug. 28, 2015

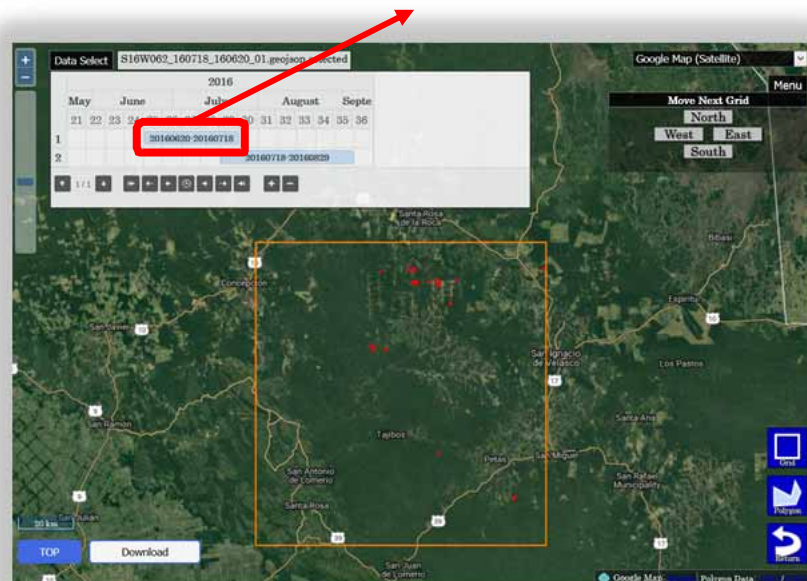
Oct. 15, 2015

Jan. 3, 2016

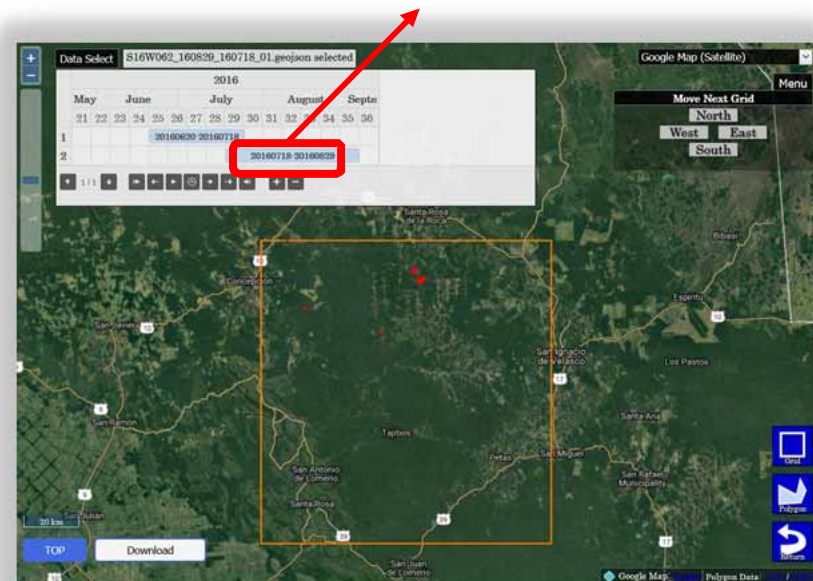
# *JJ-FAST* system launches from **NOW!**

## Example in Bolivia

May 20 – July 18, 2016



July 18 – August 29, 2016



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





# 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 61 country</u>	
Target date	May 9, 2016 – Aug. 29, 2016	March 28, 2016 – <b>1.5 month after a PALSAR-2 observation</b>			
Obs. frequency	~9 times/year				
Min. size of detection	5 ha				1ha?
Detection algorithm	Visual inspection (Semi-automatic)		Core* (Semi-automatic)	Core (Automatic)	Core + Advanced** (Semi-automatic)

\* Core algorithm \*\* Advanced algorithm

# Deforestation detection algorithm

	Visual inspection	Core algorithm	Advanced algorithm
Who	Operators	Program	
Process	Semi-automatic	Automatic	
Data used	Dual data analysis (before and after the deforestation) HV polalization		Time series analysis HH & HV polalization
Note		<ul style="list-style-type: none"> <li>• Use the image segmentation</li> <li>• Use the optimal thresholding</li> </ul>	<ul style="list-style-type: none"> <li>• Combined with the core algorithm</li> <li>• Precipitation considered</li> <li>• Texture may be used.</li> </ul>

***JJ-FAST***

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

