

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

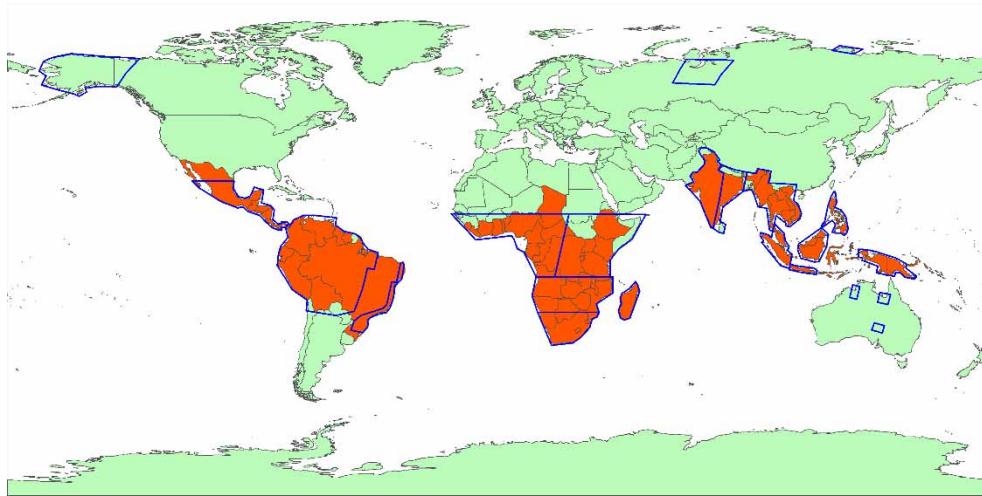
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²JAXA

About JJ-FAST

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

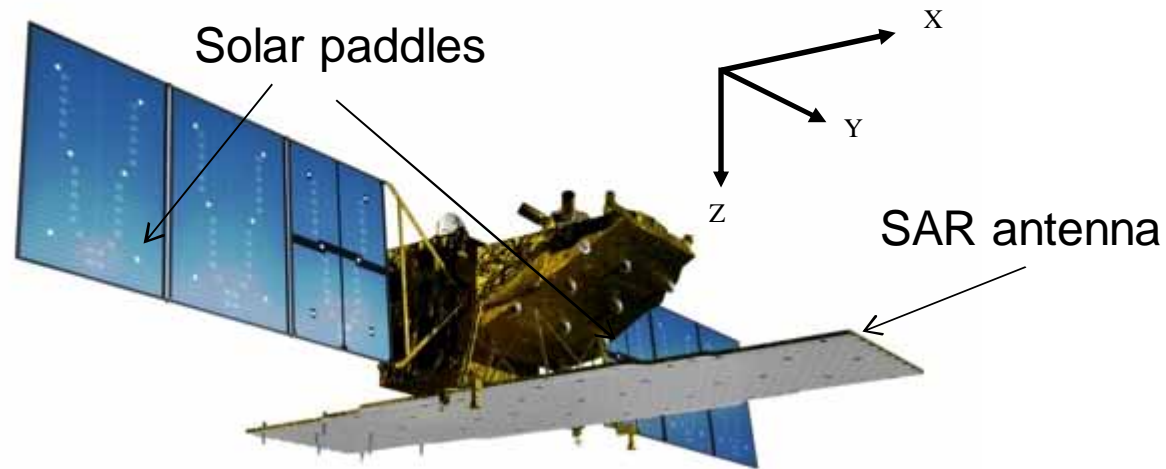


- “Free access from PCs and mobile devices” from anywhere in the world.
- “Deforestation in a rainy season” is detected through SAR sensor (PALSAR-2 (L-band SAR))

Japanese L-band SAR satellites

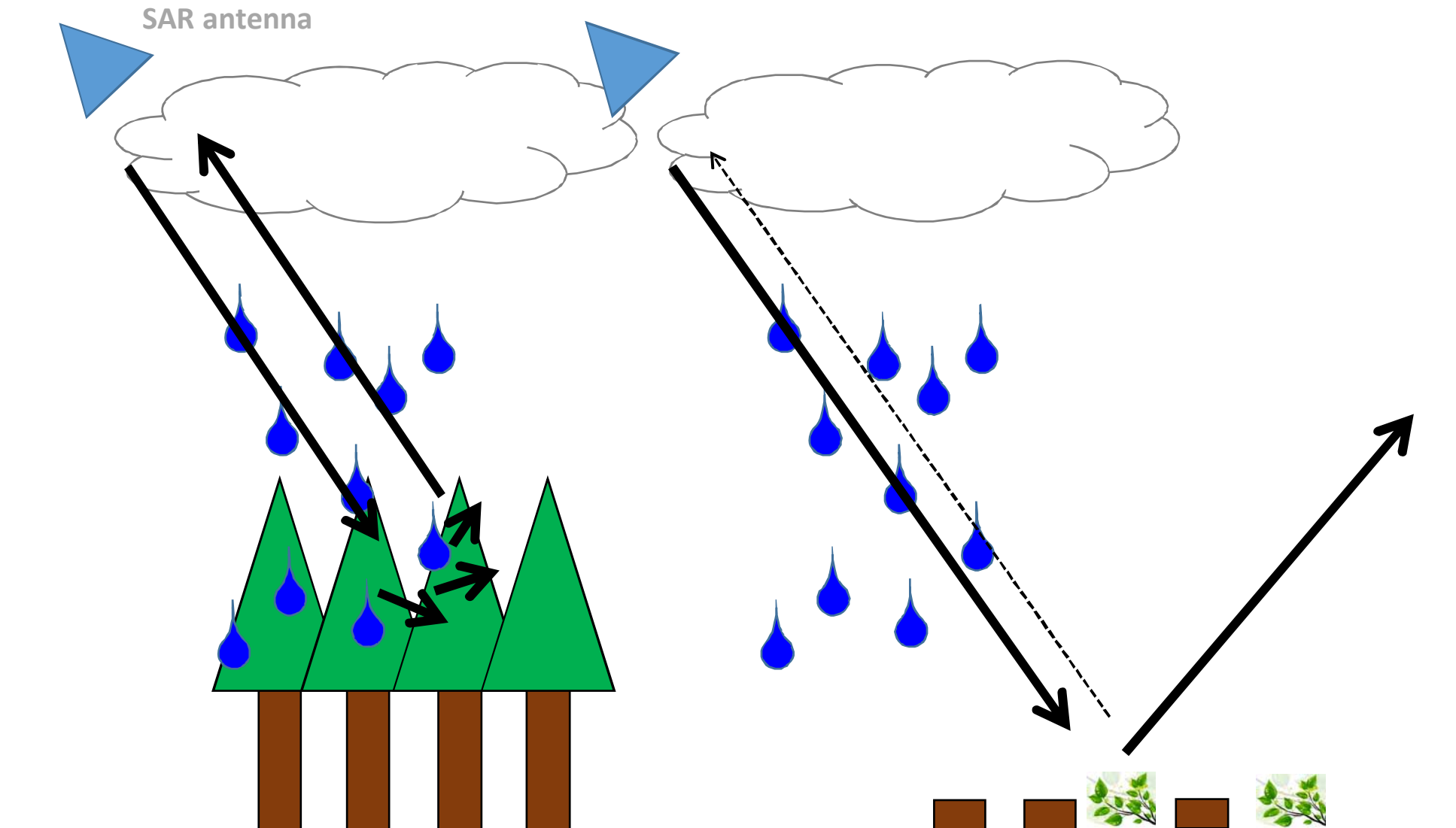
for monitoring forest & tree cover

	JERS-1	ALOS	ALOS-2
Operation	1992 – 1998	2006 – 2011	2014 – (in operation)
Revisit time	44 days	46 days	14 days
Sensor	(L-band SAR)	PALSAR (L-band SAR), PRISM, AVNIR-2	PALSAR-2 (L-band SAR)
Observation swath	75 km	35– 350 km	25 – 490 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



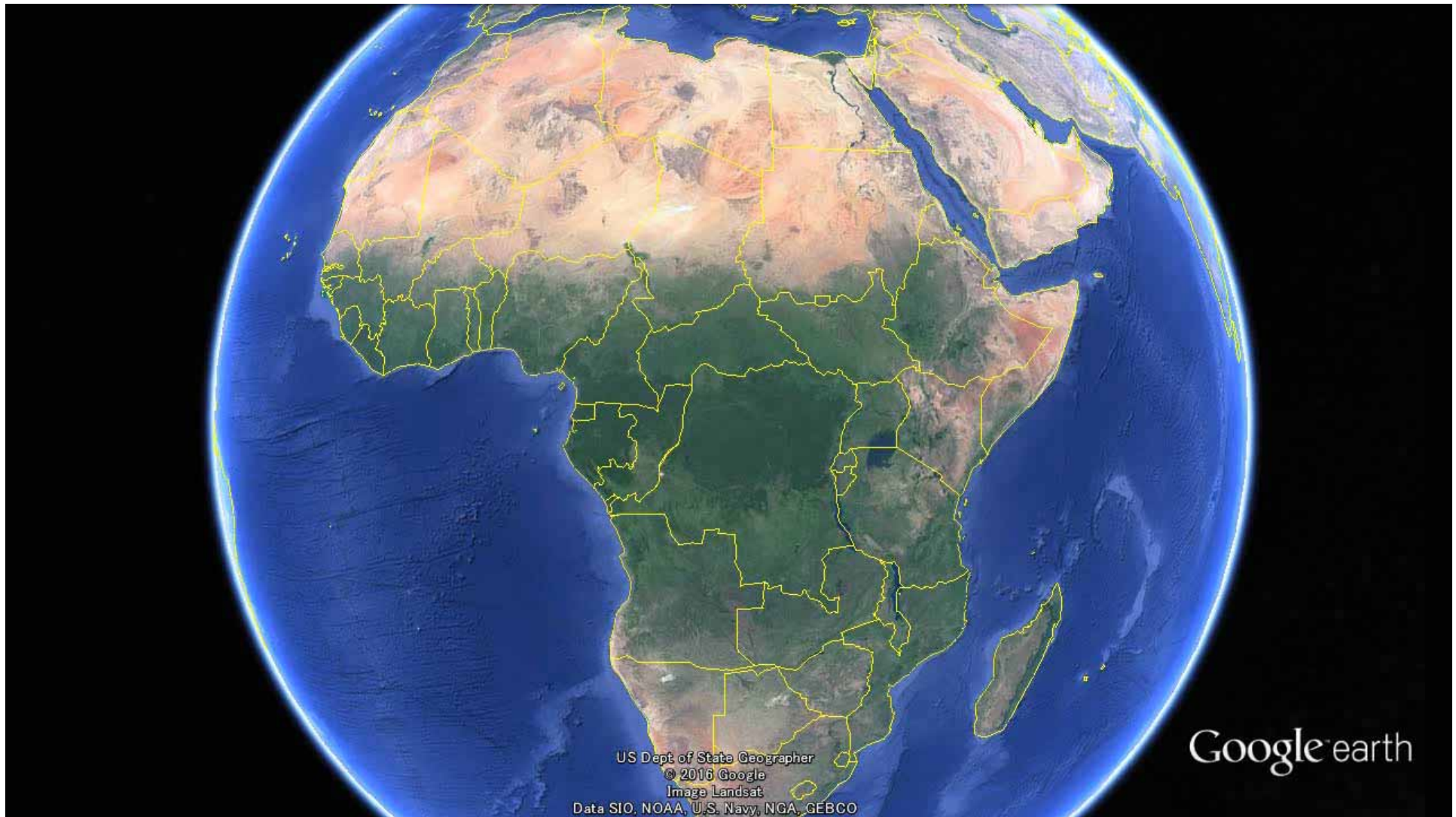
“L-band SAR satellite” series have been operated only in Japan!

"L-band SAR" is useful for forest monitoring



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

Africa/Democratic Republic of Congo



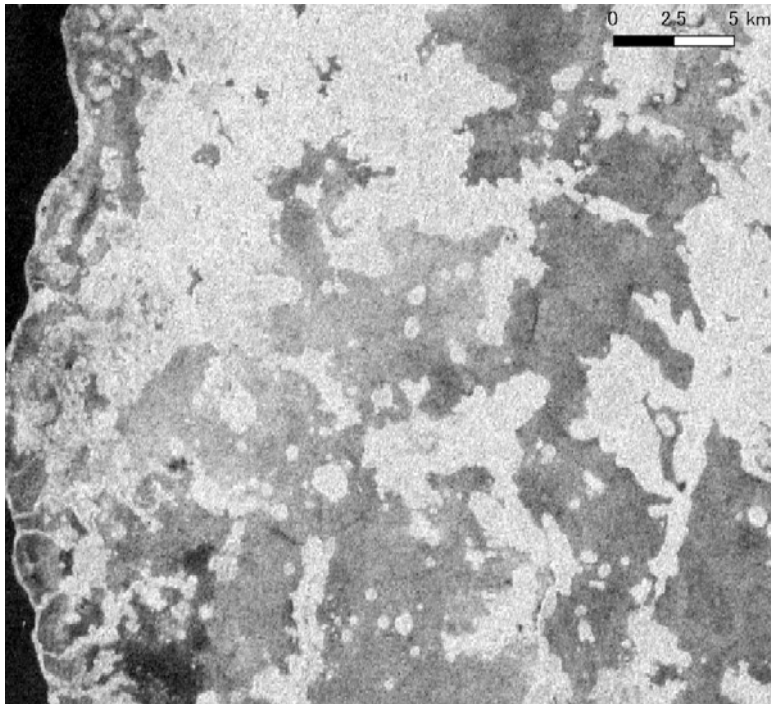
US Dept of State Geographer
© 2016 Google
Image Landsat
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Google earth

Africa/Democratic republic of Congo

Area: North part of Kinshasa

Deforestation observed



July 24, 2015



- When?**
- Find illegal deforestation
 - Manage forest concession

July 22, 2016

➔
1 years

Forest concession?
Covert to agriculture area?



Deforestation area is represented by **darker gray** color by SAR image

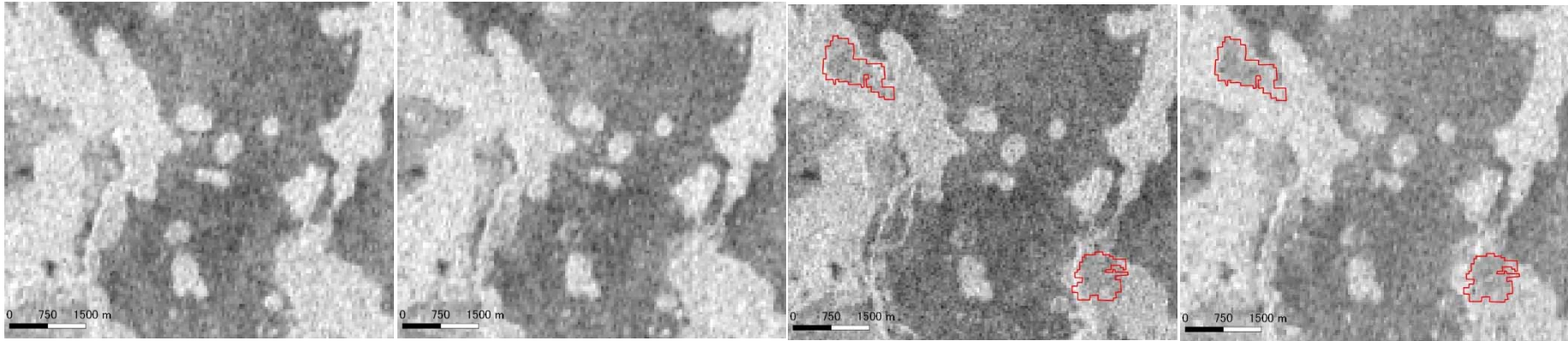
Dry Season

Rainy Season



PALSAR-2

Deforestation



Jul. 24, 2015

Sep. 4, 2015

Oct. 16, 2015

Jan. 8, 2016

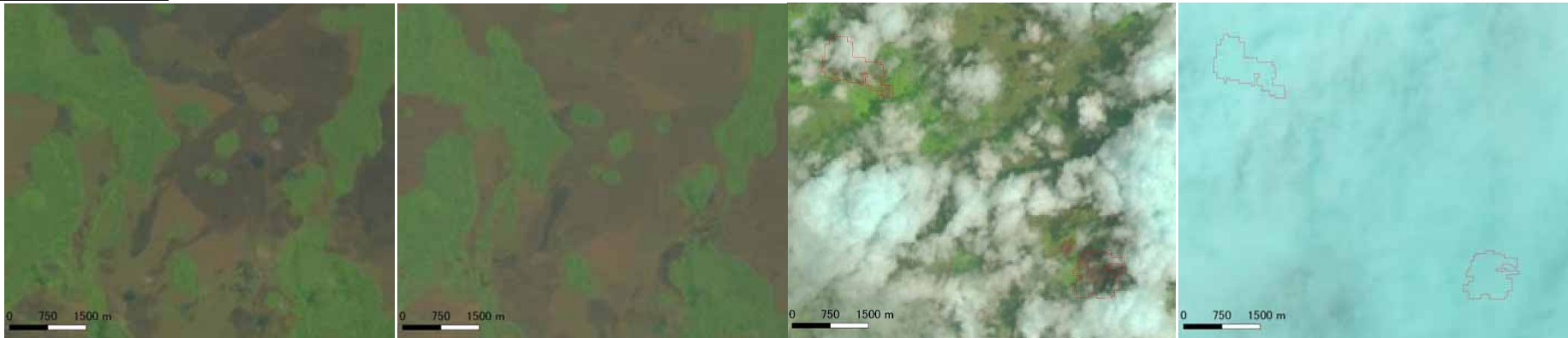
42 days

42 days

84 days

Landsat-8

Deforestation?



Jul. 27, 2015

Aug. 28, 2015

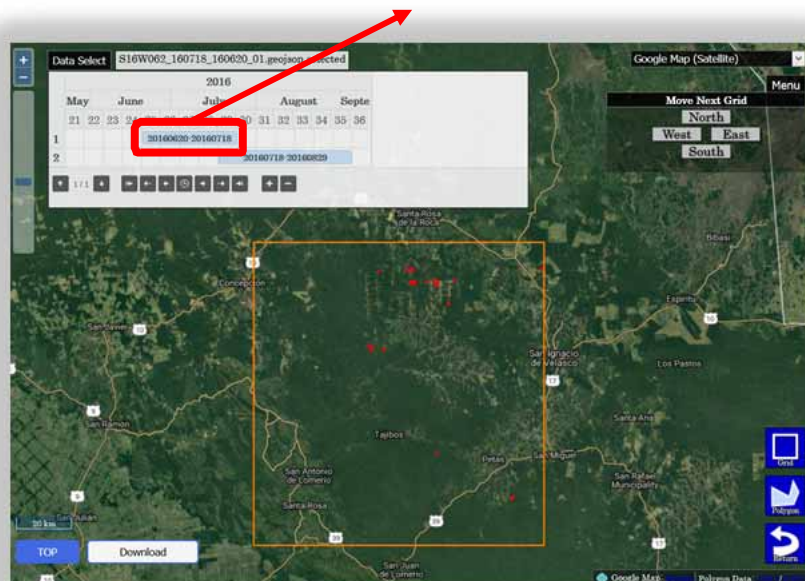
Oct. 15, 2015

Jan. 3, 2016

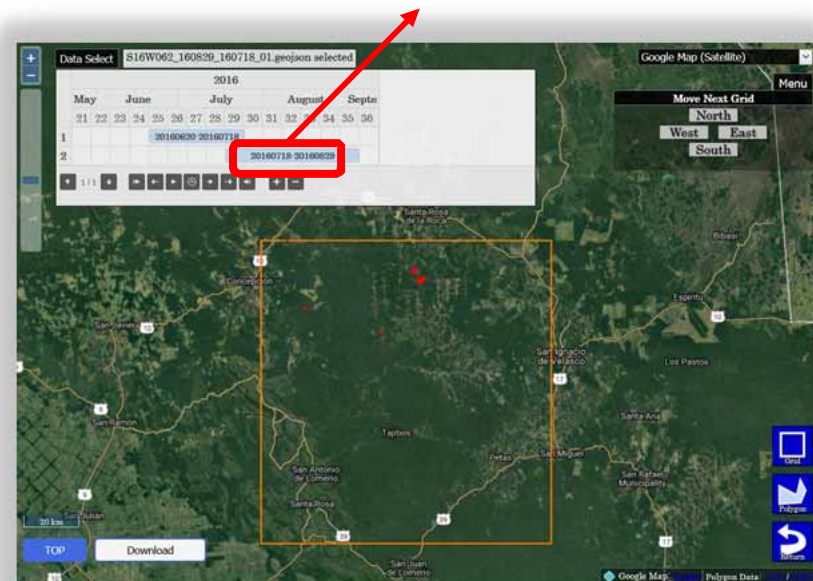
JJ-FAST system launches from **NOW!**

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 – 1.5 month after a PALSAR-2 observation			
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"> • Use the image segmentation • Use the optimal thresholding 	<ul style="list-style-type: none"> • Combined with the core algorithm • Precipitation considered • Texture may be used.

JJ-FAST

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

