

ALOS PALSAR ScanSAR in support of the Brazilian Forest Monitoring Program

Project objectives

PALSAR ScanSAR imagery as an additional source of information for the DETER system and to publish recent deforestation areas (warnings) while overcoming the frequent cloud cover over the Amazonia region

Results

- ALOS PALSAR image Database (SIMA)
- Methodological procedure based on PALSAR ScanSAR multitemporal approach
- PALSAR ScanSAR deforestation polygons (100m) compatible to PRODES deforestation mapping (30 m).
- PALSAR ScanSAR better detected deforestation bigger than 1.0 km².
- Problems to solve:
 - Topographic effects
 - Rainy season
 - Soil moisture, local rainfall, flooded areas
 - Straightforward segments classification

- Agreement of 83% with PRODES deforestation mapping, 62% of DETER, corresponding to 85% of deforestation area for the study site

- Deforestation areas can be detected before DETER Alerts – forest degradation.

K&C Science Team

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Study sites. Brazilian Legal Amazon: Altamira, Novo Progresso and Itaituba (Pará); Nova Mutum, Nova Ubiratã, and Gaúcha do Norte (Mato Grosso)

PALSAR ScanSAR Multi-Data Methodology

ScanSAR segments x DETER

PRODES	PALSAR 2007	PALSAR 2008
Forest	6	14
D1987	0	2
D2000	0	0
D2003	0	0
D2004	0	1
D2005	0	0
D2006	0	3
D2007	24	5
D2008	7	34
D2009	1	25
TOTAL	38	84
% Deforest	61.91	83.33
% Foresta	38.09	16.67

ScanSAR segments x DETER

Month	DETER	PALSAR 2008
May	9	4
June	22	13
July	18	14
August	29	25
September	1	2
October	68	5
November	6	0
December	0	0
TOTAL	153	63

DETER warnings detected by ScanSAR segments

DETER Warnings	DETER Warnings 2008 (May-Aug)	
	Number of polygons	Area (km ²)
ScanSAR Segments	48	81.63
NO ScanSAR Segments	30	38.46
Study Area	78	182.95
	% Total	% Average
	84.63	3.20
	22.20	0.97

Software development to detect deforestation based on ALOS PALSAR ScanSAR data over Mato Grosso

ALOS PALSAR ScanSAR normalized

coregistered and multi-temporal speckle filtering

Segmentation and deforestation detection

PRODES mapping and DETER warnings deforestation comparison

ALOS PALSAR data used

PARÁ: ALOS PALSAR ScanSAR - path (RSP406), descending mode (WB1, K&C format),

slant range, HH polarization: 2007-05-28, 2007-07-13, 2007-08-28, 2008-01-13, 2008-05-30, 2008-08-30

Mato Grosso: ALOS PALSAR ScanSAR - path (RSP403), descending mode (WB1, K&C format), slant range, HH polarization: 2010/01/13

Other data sources

PRODES – 2009 (<http://www.obt.inpe.br/prodes>)

DETER – 2007 and 2008 (<http://www.obt.inpe.br/deter>)

TM/Landsat : 226/68(10/03/18), 226/69 (09/03/15 and 09/10/01)

Softwares: ENVI, SarScape, SPRING and TerraView

Deforestation segments from ALOS PALSAR ScanSAR 2008 classification

PALSAR K&C ScanSAR
 2007-08-30 (R), 2007-07-13 (G), 2007-05-28

Deforestation ALOS PALSAR ScanSAR 2010

PRODES mask 10/01/13

PALSAR ScanSAR

Deforestation detection (09/10/01)

Landsat Comparison

- Water bodies
- Forest degradation
- Recent deforestation