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New global 25m-resolution PALSAR mosaic and forest/non-forest map (2007-2010) - version 1

1. Summary

Japan Aerospace Exploration Agency, JAXA, has produced the 4 year-25m spacing global PALSAR mosaics, that Advanced Land Observing Satellite (ALOS)/ Phased array Type L-band SAR (PALSAR) collected globally from 2007 to 2010 using the accurate SAR processing^{1,2,3}). JAXA also produced the first version of the 10m spaced global forest/non-forest map experimentally 2010^{4,5}). This time, we have produced the new forest/non-forest map (FNF-map) (validation version) by precisely evaluating the mosaic data regionally and temporally and comparing with the optical data (Google Earth images) and ground truth data⁶). Fig. 1 shows the FNF map of 2007, 2008, 2009, and 2010. FNF-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+). This map was validated within the accuracy of 90% in comparison with three types of the ground truth data.

JAXA allows everyone to downloading the 25m data freely in order to utilize the L-band SAR data for the forest application. And Low-resolution version "FNF100" is also released at the same time. FNF100 is 100m resolution Forest/Non-Forest data reduced from the 25m original data.

The above accuracy was obtained from the random analysis between the truth data and the FNF globally. Since the forest definition depends on the country, this FNF-map needs to be improved more.

We are looking forward to hearing the comment and the request for improving this FNF in future.

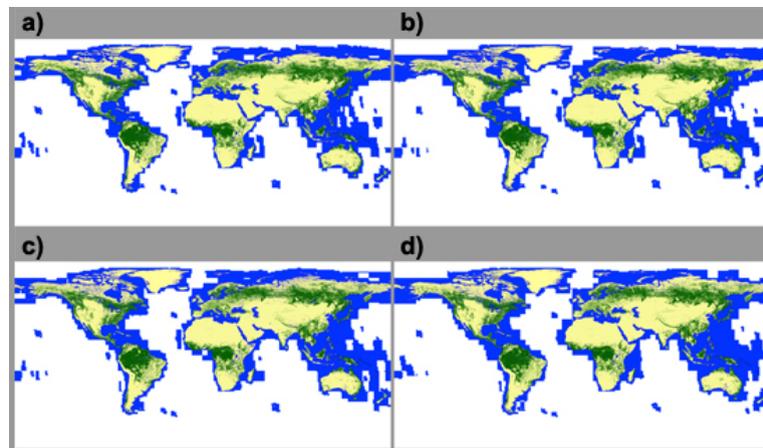


Fig. 1: New Forest/Non-forest map (a) 2007, b) 2008, c) 2009, d) 2010)

2. Data details

One unit Data contains PALSAR HH, HV backscatter , forest/non-forest map, local incidence angle, mask info. (layover, shadowing, ocean flag, effective flag, void flag), total dates from the launch. SAR backscatter data is slope corrected and ortho-rectified using the SRTM3, and the radiometrically calibrated⁷).

25m resolution data

Characteristic	Description
Unit	1 degree latitude-longitude geographical unit
Reference location	Latitude and longitude of north west corner
Coordinate system	Latitude-longitude coordinate
Spacing	0.8 arcsec unit providing the spacing at 25m
Resolution of SAR image	36 m (azimuth) × 20 m (range)

Number of pixels and lines	4500 pixels × 4500 lines
Data volume	40.5 MB (per tile)
Contents	Normalized radar cross-section, gamma-naught in HH and HV, mask information (ocean flag, effective area, void area, layover, shadowing), local incidence angle, total dates from the ALOS launch (1:30:Jan. 24, 2006:UTC)
No of tiles per year	2007: 27062, 2008: 27163, 2009: 27703, 2010: 27923

FNF100

Characteristic	Description
Unit	10 degree latitude-longitude geographical unit
Reference location	Latitude and longitude of north west corner
Coordinate system	Latitude-longitude coordinate
Spacing	3.2 arcsec unit providing the spacing at 25m
Number of pixels and lines	1125 pixels × 1125 lines
Data volume	2.5 MB (per tile)
Contents	0: NoData 1: Water 2: Blank 3: Non-Forest 4: Forest (10-25%) 5: Forest (26-50%) 6: Forest (51-75%) 7: Forest (76-100%)
No of tiles per year	2007: 367, 2008: 369, 2009: 376, 2010: 370

3. Data download method

To download the PALSAR mosaic and FNF data, first, user registration is necessary through the following URL (your email address is necessary).

http://www.eorc.jaxa.jp/ALOS/en/palsar_fnf/registration.htm

After accessing the URL and filling the questions, pre-registration will be conducted (This does not mean that the registration is complete). Then, you may receive the URL for the final registration.

After this process, you can download the data from the following URL.

http://www.eorc.jaxa.jp/ALOS/en/palsar_fnf/data/index.htm

4. Copyright

It is prohibited to re-distribute the PALSAR mosaic and FNF data as is that users download in accordance with Section 3. However, users can use the PALSAR mosaic and FNF data as is for research and publish thesis or research report, and modify the PALSAR mosaic and FNF data and publish or re-distribute such modified data. In such cases, data source shall be appropriately acknowledged as follows;

- In case of use of the PALSAR mosaic and FNF data as is:
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It is prohibited to use the PALSAR mosaic and FNF data for commercial, profit-making purposes without JAXA's consent. If users wish to use the PALSAR mosaic and FNF data for such purposes, please make contact to JAXA in accordance with Section 5.

5. Contact

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6. Reference

- 1) K&C mosaic home

http://www.eorc.jaxa.jp/ALOS/en/kc_mosaic/kc_mosaic.htm

2) PALSAR 10m mosaic:

http://www.eorc.jaxa.jp/ALOS/en/guide/pal_10m_mosaic_dl.htm

3) M. Shimada, O. Isoguchi, T. Tadono, and K. Isono, "PALSAR Radiometric and Geometric Calibration," IEEE Trans. GRS, vol. 47, no. 12, pp.3915-3932, Dec 2009.

4) M. Shimada and T. Otaki, "Generating Continent-scale High-quality SAR Mosaic Datasets: Application to PALSAR Data for Global Monitoring," IEEE JSTARS Special Issue on Kyoto and Carbon Initiative, vol. 3, Issue 4, 2010, pp.637-656.

5) Shimada, M.; Isoguchi, O.; Motooka, T.; Shiraishi, T.; Mukaida, A.; Okumura, H.; Otaki, T.; Itoh, T., "Generation of 10m resolution PALSAR and JERS-SAR mosaic and forest/non-forest maps for forest carbon tracking," Geoscience and Remote Sensing Symposium (IGARSS), 2011 IEEE International , vol., no., pp.3510,3513, 24-29 July 2011
doi: 10.1109/IGARSS.2011.6049978

6) Masanobu Shimada, Takuya Itoh, Takeshi Motooka, Manabu Watanabe, Shiraishi Tomohiro, Rajesh Thapa, and Richard Lucas, "New Global Forest/Non-forest Maps from ALOS PALSAR Data (2007-2010)," Remote Sensing of Environment, accepted April 4, 2014
DOI=10.1016/j.rse.2014.04.014.

7) Global forest/non-forest:

http://www.eorc.jaxa.jp/ALOS/en/guide/forestmap_oct2010.htm

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