

New Global Forest/Non-Forest Maps from ALOS PALSAR data (2007-2010)

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Four global mosaics of Advanced Land Observing Satellite (ALOS) Phased Arrayed L-band Synthetic Aperture Radar (SAR) HH and HV polarization data were generated at 25 m spatial resolution using data acquired annually from 2007 to 2010. Variability in L-band HH and HV gamma-naught for forests was observed between regions, with this attributed to differences in forest structure and vegetation/surface moisture conditions. Region-specific backscatter thresholds were therefore applied to produce from each annual mosaic, a global map of forest and non-forest cover from which maps of forest loss and gain were mapped. Using a combination of Degree Confluence Project (DCP), Forest Resource Assessment (FRA) and Google Earth images as ground data, the overall agreement was 85 %, 91 % and 95 % respectively. Using 2007 as a baseline, decreases of 0.040 and 0.028 dB (with a 0.006 dB confidence level) were observed in the HH and HV gamma-naught respectively suggesting a decrease in forest area and increased smoothing of the global surface at the L-band radar observation. The maps provide a new global resource for documenting the changing extent of forests and contributing to ongoing monitoring through integration with historical (1992-1998) Japanese Earth Resources Satellite (JERS-1) SAR and forthcoming (from 2014) ALOS-2 PALSAR-2 data.

Keywords: SAR, forest/non-forest, SAR mosaic

