L-band saturation level for aboveground biomass of dipterocarp forests in Peninsular Malaysia

ABSTRACT

This study was carried out in lowland and hill dipterocarp forests over the entire Peninsular Malaysia to determine the saturation level of aboveground biomass (AGB) that can be retrieved using L-band synthetic aperture radar (SAR) data. Mosaics of Phase Array Type L-Band SAR (PALSAR) onboard Japanese Advanced Land Observing Satellite (ALOS) were used. Fine-beam dual PALSAR mosaic in horizontalï horizontal (HH) and horizontalï vertical (HV) polarisations with spatial resolution of 25 m were acquired for year 2010. A total of 284 sample plots of AGB were measured on the ground in 2011 and 2012. Pixel-based regression was performed by correlating the AGB of sample plots with the corresponding backscatter on PALSAR data. AGB was estimated on 4.7 mil ha of forests. The backscatter on HV polarisation gave better estimation than HH. The HV backscatter showed good relationship with AGB at < 200 Mg ha-1 and tended to saturate at 200 Mg ha-1. About 1.65 billion Mg of AGB was found intact in the study area. The AGB ranged from 21 to 578 Mg ha-1 with average of 342 Mg ha-1. A spatially distributed map of AGB was produced.

Keyword: ALOS PALSAR; Polarisation; Backscatter; Limitation; Lowland and hill forests