GLOBMAP Leaf Area Index (LAI) Version 3 Description

Citation (Please cite this paper whenever these data are used)**:**
Liu, Y., R. Liu, and J. M. Chen (2012), Retrospective retrieval of long-term consistent global leaf area index (1981–2011) from combined AVHRR and MODIS data, J. Geophys. Res., 117, G04003, doi:10.1029/2012JG002084.

Product Description

GLOBMAP LAI Version 3 provides a consistent long-term global leaf area index (LAI) product (1981-2017) at 8km resolution on Geographic grid by quantitative fusion of Moderate Resolution Imaging Spectroradiometer (MODIS) and historical Advanced Very High Resolution Radiometer (AVHRR) data. The long-term LAI series was made up by combination of AVHRR LAI (1981–1999) and MODIS LAI (2000–2017). MODIS LAI series was generated from MODIS land surface reflectance data (MOD09A1) based on the GLOBCARBON LAI algorithm (Deng et al., 2006). The relationships between AVHRR observations (GIMMS NDVI (Tucker et al., 2005)) and MODIS LAI were established pixel by pixel using two data series during overlapped period (2000–2006). Then the AVHRR LAI back to 1981 was estimated from historical AVHRR observations based on these pixel-level relationships. Detailed descriptions of algorithm and evaluation of the algorithm see Liu et al. (2012).

Several changes have been made compared with the JGR paper:

(1). The MODIS C6 land surface reflectance products MOD09A1 was used to generate MODIS LAI in this GLOBMAP V3 products instead of C5 products.

(2). The clumping effects was considered at the pixel level by employing global clumping index map at 500m resolution (He et al., 2012) instead of land cover-specific clumping index in generation of MODIS LAI. And the new pixel-based AVHRR SR-MODIS LAI relationships were established based on these MODIS LAI series and used for AVHRR LAI retrieval.

(3). The cloud mask for MOD09A1 data were generated by a new cloud detection algorithm based on time series surface reflectance observations (Liu and Liu, 2013). And the contaminated pixels were filled by locally adjusted cubic spline capping approach (Chen et al., 2006), which is different from version 1.

Dataset Characteristics

Spatial Coverage	global [-180° W~180° E, -90° S~90° N]
Temporal Coverage	July, 1981 - December, 2017
Spatial Resolution	0.08°
Temporal Resolution	Half month (1981-1999), 8-day (2000-2017)
Projection	Geographic
Data Format	GeoTIFF, HDF
Input Data	AVHRR GIMMS NDVI (1981-1999) MODIS land surface reflectance (MOD09A1 C6) (2000-2017)
Scale	0.01
Valid Range	0, 1000

Reference

(1). Chen, J. M., F. Deng, and M. Chen (2006), Locally adjusted cubic-spline capping for reconstructing seasonal trajectories of a satellite-derived surface parameter, *IEEE Trans. Geosci. Remote Sens.*, 44, 2230-2238

(2). Deng, F., J. M. Chen, S. Plummer, M. Z. Chen, and J. Pisek (2006), Algorithm for global leaf area index retrieval using satellite imagery, *IEEE Trans. Geosci. Remote Sens.*, 44(8), 2219–2229.

(3). He, L. M., J. M. Chen, J. Pisek, C. B. Schaaf, and A. H. Strahler (2012), Global clumping index map derived from the MODIS BRDF product, *Remote Sens. Environ.*, 119, 118-130.

(4). Liu, R. G., and Y. Liu (2013), Generation of new cloud masks from MODIS land surface reflectance products, *Remote Sens. Environ.*, 133, 21-37.

(5). Tucker, C. J., J. E. Pinzon, M. E. Brown, D. A. Slayback, E. W. Pak,R. Mahoney, E. F. Vermote, and N. El Saleous (2005), An extended AVHRR 8-km NDVI dataset compatible with MODIS and SPOT vegetation NDVI data, *Int. J. Remote Sens.*, 26(20), 4485–4498.