COLLECTION 5 MODIS LAI/FPAR PRODUCTS

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Abstract:

MODIS LAI algorithm was substantially refined for the Collection 5 reprocessing to optimally use suite of MODIS observations from Terra and Aqua sensors. Refinements are based on advancements in RT theory, analysis of former versions of global time series of LAI product and product validation with field measurements. The Look-up-tables were regenerated for all vegetation types based on a new Stochastic RT model. The Collection 5 suite of LAI/FPAR products possesses higher quality retrievals than previous versions. The following 1-km products are operationally generated at NASA Science Computing Facilities (SCF): 8-day Terra and Aqua products, 8-days Combined Terra and Aqua product, and 4-day Combined Terra and Aqua product. In addition, monthly Collection 5 Terra products are processed and archived at the Boston University (BU) SCF. In this study, we analyzed Collection 5 LAI/FPAR products and compared them with Collection 4 LAI/FPAR products over a range of spatial and temporal scales: Global annual mean, Global monthly time-series, biome-based Global and Northern Hemisphere (>35N) analysis. For analysis we used Collection 4 (C4.1) and Collection 5 (C5) BU monthly Terra products. The LAI retrieval algorithm consists of two parts: main (Radiative Transfer based) and backup (empirical). The BU monthly compositing scheme consists of 3 main steps: 1) selection of data from 8-day MOD15A2 product; 2) assembling tile data into global map based on a global land cover; and 3) degrading from 1km resolution to 4km resolution. We focused on the following: 1) Enhancement in the number of high quality retrievals in Collection 5; 2) Utility of the product to improve retrievals under atmospheric contamination of surface reflectance (clouds, aerosols) and for dense vegetation under saturation of surface reflectance; 3) Utility of the product to improve temporal resolution of retrievals.

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