5 November 2012

MODIS Terra and Aqua Collection 6 Level 1, Cloud Mask and Atmospheric Profile Products Released

The MODIS science team has completed and released the Collection 6 (C6) reprocessing of the Terra and Aqua Level 1 (L1), Cloud Mask and Atmospheric Profile products. The MODIS/Terra C6 L1B product has improvements based on the long-term calibration and characterization of the instrument that do not currently need to be implemented for the MODIS/Aqua instrument. Improvements have been made to the cloud mask and atmospheric profile algorithms as well. Summaries of these changes as well as the C5/6 production schedule are given below.

The Terra products were released on 5 November 2012 while the Aqua products were originally released with a separate announcement in July 2012 (http://ladsweb.nascom.nasa.gov/news/news071812.html). The following text combines as appropriate the Terra and Aqua announcements on the LAADS distribution site home page, along with updated reference link for the C6 cloud mask and profile products.

Calibrated Radiance and Reflectance Updates

The MODIS Characterization Support Team (MCST) implemented several improvements in calibration methodology for the C6 L1 Terra/MODIS product (MOD01). For the Reflective Solar Bands (RSBs), the major change for C6 is a revised methodology that supplemented the performance trending of the on-board calibrator observations (Solar Diffuser and moon) with long-term trending of selected pseudo-invariant Earth targets. This change removes a long-term drift observed in the C5 dataset and improves the characterization of the angle dependence of the scan mirror reflectivity. For both the MODIS/Terra and Aqua Thermal Emissive Bands (TEB), a revised approach for derivation of the offset and nonlinear calibration coefficients improves retrievals for cold scenes. The uncertainties for both RSB and TEB were updated, and time-dependent Look Up Tables (LUTs) are included for the first time.

Details:

http://mcst.gsfc.nasa.gov/calibration/collection_6_info

Geolocation Updates

MODIS Geolocation (MOD02) has been updated with an improved C6 algorithm, ancillary data and look-up tables. Geolocation updates include the use of an improved 500 m land/water mask and global elevation model, a new 500 m geolocation offsets, a new 1 km water fraction field and an improved 1km geolocation in rapidly varying terrain. For improved geolocation accuracy, C6 also includes updated geometric parameters and improvements in the long-term trend based on the entire Terra and Aqua records.

Details:

http://mcst.gsfc.nasa.gov/sites/mcst.gsfc/files/meetings_files/STM2012_Cal_Wolfe.pdf

Cloud Mask and Atmospheric Profile Updates

The MODIS Cloud Mask (MOD35/MYD35_L2) and Atmospheric Profile (MOD07/MYD07_L2) products have been updated with C6 algorithms.

Cloud Mask updates include use of NDVI background maps to fine-tune classifications over desert and vegetated surfaces. The C6 product adds a "cloud adjacency flag" and adjusts night classifications to use thresholds based on total precipitable water. The new product better detects transmissive cirrus and reduces "probably cloudy" retrievals in very humid tropical conditions. Thick smoke and aerosols are also better distinguished from cloud by the new algorithm.

Atmospheric Profile updates include use of a new layer scheme for total precipitable water and application of spectral shifts with some adjustment seen in dry cases. Spectral adjustments and new radiative transfer modeling have improved Total Ozone retrieval comparisons against OMI and surface measurements.

Details:

http://modis-atmos.gsfc.nasa.gov/products_C006update.html

Production Schedule

MODIS/Terra C6 L1, Cloud Mask and Atmospheric Profile forward production has started and will continue in parallel with MODIS/Terra C5 L1 forward production. A similar MODIS/Aqua C6 L1, Cloud Mask and Atmospheric Profile reprocessing was released in July 2012 and the MODIS Aqua C6 changes are also in forward production. The C6 atmosphere reprocessing is expected to complete in Jan/Feb 2013 and the C6 land reprocessing is expected to be completed Fall 2013.

To enable the MODIS community to evaluate and gracefully switch over to the C6 products, the C5 forward processing will continue at least one year after the reprocessing of the corresponding C6 products completes. In addition, the C5 products will be kept in the on-line archive for another year after the C5 forward processing ends. At that time, a golden data set of the C5 data will be kept on-line (as was done for prior collections).