CASA Forest Cover Change Data Sets

General Description

Deforestation and forest fires are global land cover changes that can be caused by both natural and human factors. Although monitoring forest fires in near-real time is critical for operational wildfire management, mapping historical wildfires in a spatially explicit fashion is also important for a number of reasons, including climate change studies (e.g., examining the relationship between rising temperatures and frequency of fires), fuel load management (e.g., deciding when and where to conduct controlled burns), and carbon cycle studies (e.g., quantifying how much CO_2 is emitted by fires and for emissions reduction efforts under the United Nations programs for Reducing Emissions from Deforestation and Degradation -- REDD).

Reliable maps of global forest cover change are frequently years out-of-date. Consequently, there is a pressing need to develop and distribute NASA remote sensing data sets for monitoring and verifying land cover change and forest disturbances in a timely, low-cost, and accurate manner. Satellite data from instruments such as NASA's Moderate Resolution Imaging Spectroradiometer (MODIS) offers a consistent and cost-effective method for mapping forest cover change. MODIS data are obtained freely with global daily cover products. Product data sets from the MODIS sensor been developed at NASA Ames Research Center by the CASA (Carnegie Ames Stanford Approach) ecosystem modeling team. These data sets are based on comparison of MODIS global vegetation index (VI) images at the exact same time period each year (ending of March, June, September, and December) in consecutive years. Thresholds for detecting forest cover change have been published by the investigators in peer-reviewed journals (see **References Cited** below). The CASA team updates its global forest change data sets as soon as the newest quarterly MODIS worldwide VI image at 5.6-km spatial resolution is available.

Publication References Cited

Karpatne, A., X. Chen, Y. Chamber, V. Mithal, M. Lau, K. Steinhaeuser, S. Boriah, M. Steinbach, and V. Kumar, C. Potter, and S. Klooster, 2012, New algorithms for detecting forest fires on a global scale from MODIS time series analysis, *Remote Sensing of Environment* (in review).

Potter, C., V. Kumar, S. Klooster, and R. Nemani, 2007, Recent history of trends in vegetation greenness and large-scale ecosystem disturbances in Eurasia, *Tellus B*, 59, 260-272.

Potter, C., P. Tan, V. Kumar, C. Kucharik, S. Klooster, V. Genovese, W. Cohen, and S. Healey, 2005, Recent history of large-scale ecosystem disturbances in North America derived from the AVHRR satellite record, *Ecosystems*, 8(7), 808.

Metadata Documentation

All data set files are global coveage rasters in ascii, .hdf or .tif format

Each grid cell is equal area coverage of 0.05 degrees latitude and longitude (5.6 kilometer resolution)

Row, Column Dimensions: 3600 x 7200

Map boundaries in decimal degrees of latitude/longitude:
Xmin = 180.00 W, Xmax = 180.00 E, Ymin = 90.00 S, Ymax = 90.00 N

Projection: Geographic (Climate Modeling Grid - CMG)

Data Values: 1 = Forest Change Detected

Missing values are labeled as zeros.

Months are labeled jan = 1 … dec =12

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