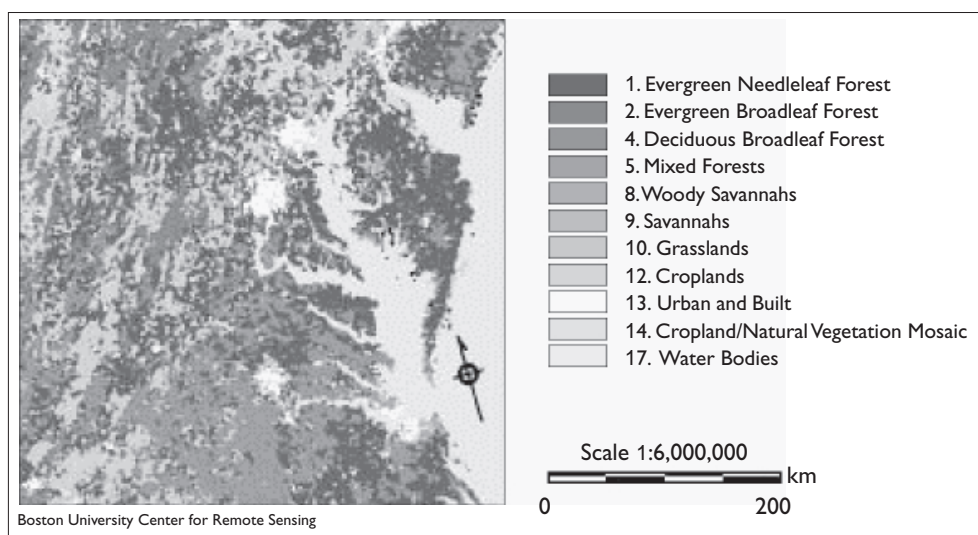# MODIS Land Cover Type (MOD 12)

Product Description

This Level 3 product contains land cover type and land cover change parameters, which will be produced at 1-km resolution on a quarterly basis beginning 18 months following launch of the Terra and Aqua platforms. In the period 6-18 months after launch, prototype products will be made available. The land cover parameter identifies 17 categories of land cover following the IGBP global vegetation database, which defines nine classes of natural vegetation, three classes of developed lands, two classes of mosaic lands, and three classes of nonvegetated lands (snow/ice, bare soil/rocks, water). The land cover change parameter quantifies subtle and progressive land-surface transformations as well as major rapid changes. As such, it is not a conventional change product that only compares changes in land cover type at two times but combines analyses of change in multispectral-multitemporal data vectors with models of vegetation-change mechanisms to recognize both the type of change and its intensity. It will highlight interannual variability in particular. In addition to the basic 1-km product, summary products containing proportions of land covers and change characteristics will be available at one-quarter, one-half, and 1-degree resolutions. These products are prepared independently from the 250-m Land Cover Change Product and use a different algorithm.

Research and Applications

This product is used for biophysical and biogeochemical parameterization of land cover for input to global- and regional-scale models of climate, hydrologic processes, and biogeochemical cycling. Examples of biogeophysical parameters keyed to land cover include leaf-area index, vegetation density, and FPAR. Other parameters are biomass permanence and energy-transfer characteristics of the land surface.

Data Set Evolution

Recent attempts to produce regional-scale land cover datasets use coarse spatial resolution and high-temporal-frequency data from the AVHRR instrument aboard the NOAA series of meteorological satellites. Most of these efforts have used the Normalized Difference Vegetation Index (NDVI) parameter derived from these data. The NDVI generally quantifies the biophysical activity of the land surface and as such does not provide land cover directly. The MODIS land cover algorithm draws from information domains well beyond those used in these efforts including directional surface reflectance, texture, vegetation index, acquisition geometry, land-surface temperature, and snow/ice cover derived from the MODIS instruments on both Terra and Aqua. The algorithm will use a hybrid decision-tree neural-network classifier. Product validation will be based on a network of about 400 test sites. High-resolution imagery (e.g., Landsat) will be used to establish truth

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1. Evergreen Needleleaf Forest
2. Evergreen Broadleaf Forest
4. Deciduous Broadleaf Forest
5. Mixed Forests
8. Woody Savannahs
9. Savannahs
10. Grasslands
12. Croplands
13. Urban and Built
14. Cropland/Natural Vegetation Mosaic
17. Water Bodies

Scale 1:6,000,000

0   200 km

Land Cover Classes in a Mid-Atlantic Subset of the North American Prototype of the MODIS Land Cover Product, September 1999.

for the sites, which will be used to train the land-cover classifier and validate the products. The validation procedure will characterize the accuracy of the product as well as provide information that can be used in spatial aggregation to provide land cover data and land cover change data at coarser resolutions.

Suggested Reading

Justice, C. *et al.*, 1998.

Running, S.W. *et al.*, 1994.

Running, S.W. *et al.*, 1995.

Salisbury, J.W., and D.M. D'Aria, 1992.

Snyder, W., and Z. Wan, 1996.

Strahler, A. *et al.*, 1995.

Wan, Z., and J. Dozier, 1996.

Wan, Z., and Z.-L. Li, 1997.

MODIS Land Cover Type Summary

Coverage: Global, clear-sky only

Spatial/Temporal Characteristics: 1 km, 1/4°, 1/2°, 1°/seasonal (96-day)

Key Science Applications: Biogeochemical cycles, land cover change

Key Geophysical Parameters: Land cover type, land cover change

Processing Level: 3

Product Type: Standard, post-launch

Maximum File Size: 16 MB

File Frequency: 289/96-day

Primary Data Format: HDF-EOS

Additional Product Information: http://modis-land.gsfc.nasa.gov/products/ products.asp?ProdFamID=10

DAAC: EROS Data Center

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