Gridded MODIS vegetation indices product for northern Eurasia

The gridded MODIS vegetation indices product presents gridded statistical summaries of standard 0.05 CMG MODIS Terra Vegetation Indices Monthly product MOD13C2 (Huete et al, 2002) collection 5. The product is intended for use in Giovanni system focused on regional (NEESPI) analysis of surface processes and climate modeling. The vegetation indices product is generated at 1 degree spatial resolution yearly starting from 2000. The product is generated from the 0.05 degree Climate Modeling Grid global coverage product.

File naming convention

VI.CM1.YYYYMM.CCC. hdf

Where VI is the identification of the Vegetation Indices Product
        CM1 indicates Climate Modeling 1 degree grid
        YYYY is a four digit number for year (e.g. 2003)
        MM is a two digit number for month (e.g. 01)
        CCC is a three digit number for MODIS collection (e.g. 005)

e.g. VI.CM1.200101.005.hdf

File format

Format:	HDF
Data type:	floating point
Dimension:	360 x 100
Resolution:	1 x 1 degree
Upper left corner:	-180, 90
Fill Value:	-1.00

Products description

The gridded MODIS land cover product includes 4 datasets representing mean vegetation indices and percentages of fill values and cells with high quality observations of the original 0.05 degree input cells within 1 degree cells.

The gridded MODIS land cover product includes the following datasets:
SDS1 – mean NDVI
SDS2 – mean EVI
SDS3 – percent fill values
SDS4 – percent GOOD quality data

Mean NDVI

Simple mean NDVI (Normalized Difference Vegetation Index) was calculated from MOD13C2 sds1 CMG 0.05 Deg Monthly NDVI only for cells within valid NDVI range. Cells with

Fill_Values were not included in the analysis. The dataset is produced with full global coverage. Land/water mask is accepted from the original dataset resolution 0.05 degrees. Grid cells with no land surface are assigned the "_FillValue" – 1.0.

Mean EVI

Simple mean EVI (Enhanced Vegetation Index) was calculated from MOD13C2 sds2 CMG 0.05 Deg Monthly EVI only for cells within valid EVI range. Cells with Fill_Values were not included in the analysis. The dataset is produced with full global coverage. Land/water mask is accepted from the original dataset resolution 0.05 degrees. Grid cells with no land surface are assigned the "_FillValue" – 1.0.

Percent Fill Values

Percent Fill Values is calculated from the original 0.05 degree resolution dataset as

$$\text{Percent Fill Values } = (\text{Fill\_Cell\_Count} * 100) / 400$$

where Fill_Cell_Count is the number of the 0.05 degree cells with the Fill Value within the 1 degree cell, and 400 is the total number of 0.05 degree cells within the aggregated 1 degree cell. The output values are rounded to the nearest integer. Percent Fill Values were calculated for each 1 degree cell. No "_FillValues" are assigned to this layer.

Percent GOOD Quality Data

Percent GOOD Quality Data is calculated from MOD13C2 sds13 CMG 0.05 Deg Monthly pixel reliability only for cells within the valid range of values.

$$\text{Percent GOOD Quality Data} = (\text{Count\_GOOD\_pixel} * 100) / \text{Count\_NonFill\_Cell}$$

where Count_GOOD_pixel is the number of 0.05 degree cells flagged as "GOOD" (value 0) quality within the aggregated 1degree cell, Count_NonFill_Cell is the number of 0.05 degree cells within the valid range of pixel reliability values within the aggregated 1 degree cell. The output values are rounded to the nearest integer. Percent GOOD Quality Data are calculated for each 1 degree cell. No "_FillValues" are assigned to this layer.

Additional Sources:

MODIS Vegetation Index (MOD13) User Guide
http://tbrs.arizona.edu/project/MODIS/index.php

MODIS Vegetation Index (MOD13) Algorithm Theoretical Basis Document
http://modis.gsfc.nasa.gov/data/atbd/atbd_mod13.pdf

References:

Huete, A., Didan, K., Miura, T., Rodriguez, E.P., Gao, X., Ferreira, L.G., 2002. Overview of the radiometric and biophysical performance of the MODIS vegetation indices. Remote Sensing of Environment, 83 (1-2): 195-213.

Miura, T., Huete, A., Yoshioka, H., 2000. Evaluation of sensor calibration uncertainties on vegetation indices for MODIS. IEEE Transactions on Geoscience and Remote Sensing, 38 (3): 1399-1409.