README Document for

MODIS Monthly 1km Vegetation Index Products in Giovanni

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Summary:

The MODIS monthly 1 km vegetation index products in Giovanni are processed from the Collection-5 MODIS standard monthly 1 km vegetation index products (MOD13A3.005 and MYD13A3.005), covering Monsoon Asian Integrated Regional Study (MAIRS) region (0^o – 60^oN, 60^oE – 150^oE). The original 10x10 degree tiled sinusoidal projected data are mosaic and re-projected onto equidistant cylindrical projection (or Equirectangular projection) with the nearest point sampling method.

Product Name:

Short Name: MOD13A3_MAIRS.005

Long Name: MODIS/Terra Vegetation Indices Monthly L3 1km MAIRS Region

Sensor/Platform: MODIS/Terra

Short Name: MYD13A3_MAIRS.005

Long Name: MODIS/Aqua Vegetation Indices Monthly L3 1km MAIRS Region

Sensor/Platform: MODIS/Aqua

Data Set Characteristics:

Temporal coverage	MOD13A3_MAIRS.005: 2000.02 - present MYD13A3_MAIRS.005: 2002.07 - present
Spatial coverage	0^o – 60^oN, 60^oE – 150^oE
Temporal resolution	Monthly
Resolution	1 km at Equator (0.008992^o x 0.008992^o)
Projection	cylindrical equidistant (Equirectangular)
Data format	HDF4
File Size	~ 131 MB compressed
Dimension	6672x 10008
First data point location	60^oN, 60^oE

File Name Convention:

MAIRS_<product>_L3_<version>_<YYYYMMDD>.hdf

Where:

<product> = MOD13A3 for data from MODIS/Terra

MYD13A3 for data from MODIS/Aqua

<version> = processing version, the current version is v005

<YYYYMMDD> = year, month, day

Parameters:

Each data file contains four scientific data sets (SDS) (i.e., parameters or HDF layers). They are:

SDSName	LongName	Unit	Data Type	Fill Value	Scaling (slope/offset)
1_km_monthly_NDVI	monthly NDVI	NDVI	short	-3000	10000./0.
1_km_monthly_EVI	monthly EVI	EVI	short	-3000	10000./0.
1_km_monthly_VI_Quality	monthly VI Quality	Bits	short	65535	1.0/0.

Based on previous study, the V005 MOD13 products include a single Quality layer (Table below, from LP DAAC product page) pertinent to both NDVI and EVI for reducing data volume as well as user confusion with multiple Quality layers.

Bit 0 is the least significant (read bit words right to left)

bit	Long Name	Value	Key
0–1	MODLAND_QA	00	VI produced, good quality
		01	VI produced, but check other QA
		10	Pixel produced, but most probably cloudy
		11	Pixel not produced due to other reasons than clouds
2–5	VI usefulness	0000	Highest quality

		0001	Lower quality
		0010	Decreasing quality
		0100	Decreasing quality
		1000	Decreasing quality
		1001	Decreasing quality
		1010	Decreasing quality
		1100	Lowest quality
		1101	Quality so low that it is not useful
		1110	L1B data faulty
		1111	Not useful for any other reason/not processed
6–7	Aerosol quantity	00	Climatology
		01	Low
		10	Average
		11	High
8	Adjacent cloud detected	1	Yes
		0	No
9	Atmosphere BRDF correction performed	1	Yes
		0	No
10	Mixed Clouds	1	Yes
		0	No
11–13	Land/Water Flag	000	Shallow ocean
		001	Land (Nothing else but land)
		010	Ocean coastlines and lake shorelines
		011	Shallow inland water
		100	Ephemeral water
		101	Deep inland water
		110	Moderate or continental ocean
		111	Deep ocean
14	Possible snow/ice	1	Yes
		0	No
15	Possible shadow	1	Yes
		0	No

Data Access Methods:

Direct FTP:

ftp://neespi.gsfc.nasa.gov/data/s4pa/Vegetation_Indices

Giovanni (online visualization and analysis):

http://gdata1.gsfc.nasa.gov/daac-bin/G3/gui.cgi?instance_id=mairs_monthly_hres

Processing Methods:

The data sets are processed by using MODIS Reprojection Tool (MRT) (https://lpdaac.usgs.gov/lpdaac/tools/modis_reprojection_tool) release 4.0 from the USGS and NASA land processes and distributed active archive center (LP DAAC). First, the original monthly 1km vegetation index products (MOD13A3.005 and MYD13A3.005) were downloaded for all tiles over the Asian monsoon region. Then, programs **mrtmosaic** and **resample** were run under batch mode with the following setting:

SPATIAL_SUBSET_TYPE = INPUT_LAT_LONG

SPATIAL_SUBSET_UL_CORNER = (60.0 60.0)

SPATIAL_SUBSET_LR_CORNER = (0.0 150.0)

RESAMPLING_TYPE = NN (nearest point)

OUTPUT_PROJECTION_TYPE = ER (equi-rectangular projection)

OUTPUT_PROJECTION_PARAMETERS = (6371007.181 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0)

DATUM = NoDatum

OUTPUT_PIXEL_SIZE = 1000

Data Quality:

The near point method is used for re-sampling. The data quality of each grid point is remained same as the input data. In Giovanni, no quality filtering is performed. Therefore, all valid data points at all quality levels are participated in analysis.

Detailed information about algorithm and validation and data quality of the input data, please read relevant MODIS ATBD and land validation page at https://lpdaac.usgs.gov/lpdaac/products/modis_products_table/vegetation_indices/monthly_l3_global_1km/mod13a3

Input data source:

The input data of this data set are MOD13A3.005 and MYD13A3.005, downloaded from USGS and NASA land processes and distributed active archive center https://lpdaac.usgs.gov/.