

## MODIS Data Tools Available Through the Land Processes DAAC

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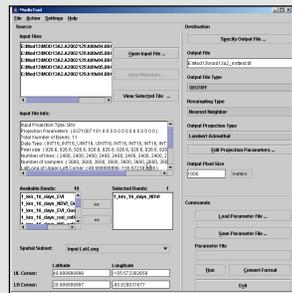
### Introduction

The Land Processes DAAC (LP DAAC) anticipated that the community of land processes data users would need special software tools for handling the land data products that would be distributed in HDF-EOS format and in the Integerized Sinusoidal (ISIN) and Sinusoidal (SIN) projections. As an interim strategy towards satisfying these requirements, the LP DAAC collaborated in the development of several software tools. These tools include the MODIS Reprojection (MRT) Tool, the MRT Swath tool and the Land Data Operational Product Evaluation (LDOPE) tools. The MRT, MRTSwath, and LDOPE software provide a multitude of functionality for users of MODIS land products. The LP DAAC has also developed a MODIS data extraction script for the ease of accessing MODIS data types from the Data Pool. The tools can be accessed from <http://lpdaac.usgs.gov/datatools.asp>.

### MODIS Reprojection Tool (MRT)

The MRT provides reading of data files in HDF-EOS format (MODIS Level-2G, Level-3, and Level-4 land data products), mosaicking of several MODIS tiles or images, subsetting of a geographic area or specific science data sets, performing geographic transformation to a different map projection, and writing the output to file formats (generic binary, GeoTIFF) other than HDF-EOS. This tool can be invoked as a Graphical User Interface (GUI) or from the command-line. The platforms supported are Unix (Sun, SGI), Windows (9x, 2000, NT, XP), and Linux. There are no restrictions on the use or redistribution of this software.

Example of mosaicking and reprojecting MODIS/Terra Vegetation Indices NDVI files from sinusoidal to the lambert azimuthal equal area projection.



Graphical user interface of the MRT



MODIS/Terra Vegetation Indices NDVI global image in the sinusoidal projection

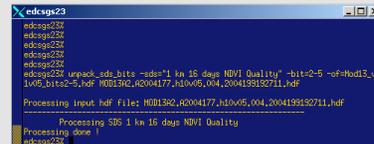


Mosaic of 18 MODIS/Terra NDVI tiles (MOD13A2) of the United States in the lambert azimuthal equal area projection

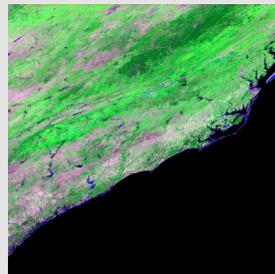
### LDOPE Tools

The MODIS LDOPE software tools were developed by Sadashiva Devadiga, Yi Zhang and David Roy at the LDOPE facility, NASA Goddard Space Flight Center, to assist with the analysis and quality assessment of the MODIS Land (MODLAND) products. The tools have been developed with feedback from the MODLAND science team and incorporate the scientific knowledge, experience and insights gained during the substantial MODLAND product development period. The LDOPE tools are invoked as stand-alone executables from the command-line. The software is supported on Irix, Solaris, Linux, and Windows operating systems. Although there are no distribution or re-use constraints associated with this software, developers using or modifying this software should credit the original authorship of these tools.

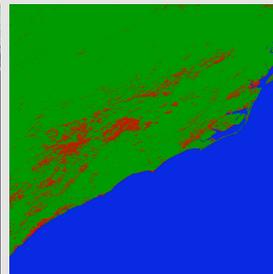
Determining the NDVI usefulness of the MODIS/Terra Vegetation Indices NDVI 1km (MOD13A2)



Command-line function of unpack\_sds\_bits – decodes requested bit fields of the Quality Assurance (QA) Science Data Sets (SDSs) contained within the MODIS land products HDF-EOS format



MODIS/Terra Vegetation Indices MIR/NIR/Red bands as RGB

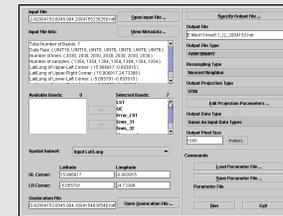


Bits 2-5 unpacked are depicted above  
 Green – good quality  
 Red – fair to poor quality  
 Blue – not useful quality

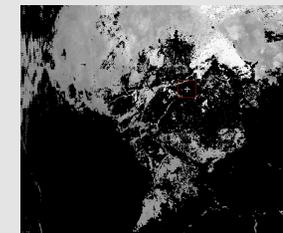
### MRT Swath Tool

The MODIS Swath Reprojection Tool (MRTSwath) provides the capability to transform MODIS Level-1B and Level-2 land products from HDF-EOS swath format to a uniformly, gridded image that is geographically referenced according to user-specified projection and resampling parameters. Correction for oversampling between scans as a function of increasing (off-nadir) scan angle is performed (correction for bow-tie effect). This tool can be invoked as a Graphical User Interface (GUI) or as a standalone executable from the command-line. The platforms supported are Unix (Sun, SGI), Windows (9x, 2000, NT, XP) and Linux. There are no restrictions on the use or redistribution of this software.

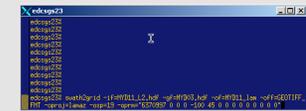
Gridding the Land Surface Temperature of the MODIS/Terra Level 2 Swath Product (MOD11\_L2)



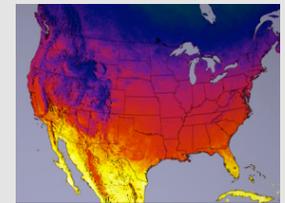
Graphical user interface of MRTSwath Tool



View of the original MODIS/Terra MOD11\_L2 swath product representing off-nadir effects



Command-line function of MRTSwath Tool



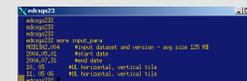
MODIS/Terra Land Surface Temperature gridded and resampled to the lambert azimuthal equal area projection

### MODIS Data Pool Extraction Tool (MODextract)

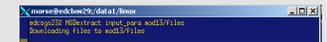
The MODextract is a script that enables a user to locate and extract (FTP-pull) MODIS land Level-2G and Level-3 gridded products from the LP DAAC Data Pool. The script may be invoked as a command-line or batch job. The command syntax is as follows:

MODextract <Terra/Aqua> <input parameter file> <output directory>

<input parameter file> - Formatted file used to navigate to the desired data. This includes product shortname and version (<http://lpdaac.usgs.gov/modis/dataproducts.asp>), data acquisition date/range, and horizontal and vertical tile(s) locations.



Sample of input parameter file



Command-line execution of MODextract