Release Notes

MODIS LDOPE Tools – Release 1.4

We are pleased to announce the availability of Drop 3 of the MODIS Land Data Operational Product Evaluation (LDOPE) software tools. These tools were developed by the LDOPE at the NASA Goddard Space Flight Center, for assessing the quality of MODIS Land (MODLAND) products. The tools have been developed with feedback from the MODLAND Science Team (ST) and incorporate the scientific knowledge, experience and insights gained during the substantial MODLAND product development period. They have been distributed in versioned drops within the ST in response to ST bug fix requests and requests for new functionality.

A subset of the LDOPE QA tools has been made available to the MODLAND product user community in three separate drops (1, 2, and 3). This release (1.4) contains the final Drop 3 of the LDOPE Tools for the Solaris (2.8), Linux (Redhat 7.3), SGI/IRIX 6.4, and Windows operating systems. Drop 2 of the LDOPE Tools was previously released in July 2003, supporting the platforms mentioned above. The Linux (Redhat 7.3) and SGI/IRIX 6.4 versions of drop 1 tools were previously released in December 2002, and the Solaris (2.8) and Windows versions were released in March, 2003. Several of the tools may also be used to manipulate non-MODLAND HDF-EOS products. The tools are distributed via the Internet from the LP DAAC with full documentation and installation instructions.

The tools are written in C and may be run at the command line or called from scripts and other packages. They are invoked using an UNIX-like command and argument syntax. For details on command syntax see the user guide and the glossary distributed with this release. The following table describes the tools included in this release. For additional details on each of the tools see the user guide or run the tool with the –help option.

Drop 3

comp_sds_hist	Print the histogram of SDS values (frequency and values), excluding no-data and missing values, of specified SDSs in any MODIS Land HDF-EOS data product.
comp_sds_range	Print the observed range, excluding no-data and missing values, of specified SDSs in a MODIS Land HDF-EOS data product.
comp_sds_stat	Print summary statistics (mean, standard deviation, minimum, maximum and number of observations) of any SDS, excluding no-data and missing values, of a MODIS Land HDF-EOS data product.

comp_sds_values	Print the unique values found in specified SDSs of a MODIS Land HDF-EOS data product. This tool is most useful for summarizing the data distribution of SDSs that have only a small number of values (e.g., the MODIS Land HDF-EOS snow and fire products).
convert_l1b_data	Convert MODIS L1B data to Top of Atmosphere (TOA) reflectance for the MODIS reflective bands and TOA radiance for the MODIS emissive bands and write these to 2D HDF SDS(s) that can be read by commercial of the shelf (COTS) software. The conversion is performed using the scale and off-sets defined in the MODIS L1B product metadata.
cp_proj_param	Has been updated to be compatible with the MODIS Reprojection Tool, and to allow projection of all MODIS land tile products that have 'lost' their geolocation metadata (for example, through manipulation using the LDOPE Tools or other software).
create_mask	Apply relational and logical operators to one or more SDS in one or more MODIS Land HDF-EOS data products to create an output 2D HDF SDS that can be read by conventional COTS. For example, create a binary SDS that shows the pixel locations where only good quality, non-cloudy, 16-day vegetation index values with a land cover type = 3 are present.
create_sds_ts_stat	Create a summary statistic HDF file containing one or more output 2D SDS that describe the mean, standard deviation, minimum, maximum, sum, and number of observations, computed on pixel wise basis from a time series of input MODIS Land HDF-EOS data products.
geolocation	Compute the geographic latitude and longitude of a MODIS Land L2G/L3/L4 pixel coordinate.
math_sds	Perform simple arithmetic on two input SDSs of the same or different MODIS Land HDF-EOS data products and output the results to a 2D SDS.
read_sds_attributes	Print the attributes of one or more SDS of MODIS Land HDF-EOS data products.
subset_sds	Create spatial subset SDS(s) from one or more SDS of a MODIS Land HDF-EOS data product.
tile_id	Compute the MODIS Land L2G/L3/L4 tile id for a given latitude and longitude. This tool identifies the MODIS Land tile that corresponds to a known geographic location.
transpose_sds	Transpose one or more SDS in a MODIS Land HDF-EOS data product by rotating the SDS 180 degree in clockwise direction This tool enables qualitative comparison of MODIS Aqua and Terra Level 2 or Level 1 granules.

Drop 2

Tool Name	Description
cp_proj_param	Copy projection metadata into an HDF file that is defined in the MODLAND Integerized Sinusoidal projection or Sinusoidal projection. The HDF file may then be reprojected using the EDC reprojection tool. This allows reprojection of MODLAND product SDS(s) filtered or masked by LDOPE QA tools or other software.
mask_sds	Mask one of more SDS of a MODLAND product file and output the SDS values at pixels where the mask criteria are met and output fill values elsewhere.
read_pixvals	Read MODLAND product values at specified pixel locations.
read_proj_param	Read the projection parameter information of a L2G/L3/L4 MODLAND HDF-EOS product. This information is needed to project non-MODLAND data into registration with a geolocated MODLAND product.

Drop 1

Tool Name	Description
enlarge_sds	The inverse of companion tool *reduce_sds*. Simulate finer resolution data by pixel replication.
mosaic_sds	Create a spatial mosaic of SDSs from different L3 MODLAND products. Specified SDSs are spatially arranged based either on their geolocation or in a user specified manner.
read_meta	Print the ECS core and archive metadata and SDS attributes of any MODLAND product.
read_l2g	The MODLAND L2G products store one or more L2 observations for each L2G pixel in a series of layers (that reflect the MODIS orbit overpass and swath sensing geometry) in a compressed run length encoded format. This tool reads the L2G format and writes user specified layers to output 2D HDF Science Data Sets (SDSs) that can be read by commercial of the shelf (COTS) software.
reduce_sds	Generate reduced spatial resolution MODLAND product SDSs by sub-sampling or averaging. Handle the MODLAND product no-data and missing values. This may be used to reduce data volumes, and to quickly enable analysis of the different MODLAND product spatial resolutions (250m, 500m, 1km), or to enable comparison with other coarser spatial resolution data sets.

reduce_sds_rank	Several MODLAND products (e.g., MOD43) and related MODIS products (e.g., MOD35) contain multidimensional SDSs. This tool converts multidimensional (3D or 4D) SDS to a series of 2D HDF SDSs that can be read by conventional COTS.
sds2bin	Convert an SDS of any HDF-EOS file to a flat binary image format.
unpack_sds_bits	The MODLAND product per-pixel QA information and other information such as the land-sea mask, logical criteria used by the algorithm, and cloud state are stored in an efficient bit encoded manner. This tool decodes requested bit fields and writes them to 2D HDF SDSs that can be read by conventional COTS.