

MODIS Snow Cover Extent Processing

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Updated Aug 28, 2018 - CY - added scheduler task name

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Data

Following files are needed to run the python script:

- 8-day Maximum Snow Extent (MOD10A2.005) from the LP DAAC ftp site [n4ftl01u.ecs.nasa.gov](ftp://n4ftl01u.ecs.nasa.gov). The file location and name is /MOST/MOD10A2.AYYYYJJJ.h##v##.005.2013266132445.hdf

Abbreviations:

YYYY – year (e.g. 2013)

YY - year (e.g. 13)

JJJ – julian day (e.g. 001)

cty – region (e.g. sce, irq)

- tile number

Required Software/Access

- ArcGIS 10 and python
- Python module pywin32 for access to MS Office applications, such as Excel (Shariar's presentation)
- Access to [n4ftl01u.ecs.nasa.gov](ftp://n4ftl01u.ecs.nasa.gov) for data download
- Access to web data location for data staging

Data processing

Python script for process

This script is scheduled to run from a weekly scheduled task. The Asia level download and convert to tif occurs when the Central Asia region script is executed, this produces an Asia level tif. All other regions depend on this Asia level tif.

Since this data is produced irregularly, and we want to use the scheduled task, the download function will check the date on the last Asia level tif, and then compute the process date(the next 8 day period) from that date. It uses that process date to check for new data.

If there is data available for the process date, the Central Asia script will download it and process its outputs, as well as produce the Asia level tif for the process date. The other regions will look for the last Asia tif, and use that date as their process date. The scripts will also check to see if the expected outputs for that process date already exist, and if so, the scripts will log a message that there is no new data available and exit.

This automatic date selection can be overridden by running the scripts manually and passing a date in the form of YYYY JJJ along with the required step argument.

If doing a manual run and no new data is found for the date provided, the processes for all regions will log the message for no new data and exit.

The scheduled task used is **FEWS_NET_Tasks\8-Day_SCE_Asia** which runs at **6:00 PM** on Friday of every week.

Setup

- Script is set up to process an 8-day period as soon as it is available from the LP DAAC ftp site.
- Shariar's presentation- The python script used for processing is named MODISSnowCover_manual_https.py. The script will prompt first for the number for which part to execute (1) MSE grid, (2) comparison maps, (3) excel chart, then for input of year, and julian day of the start of the period.
- There is a logfile created, documenting each processing run, at \\SnowProducts\MODISSnowCoverExtent\Logfiles
-
- Cheryl's presentation-
- The python scripts use the to run are:
 - <dataportal>\bin\asia\centralasia\8day\modissnowcoverextent\centralasia_8day_snowcoverextent.py
 - <dataportal>\bin\asia\middleeast\iraq\8day\modissnowcoverextent\iraq_8day_snowcoverextent.py
- The scripts take a step, year(4-digit) and julian date as arguments.
- The steps are (1) Download data, (2) MSE grid, (3) comparison maps, or (0) Do all steps.

Python Script Description

Part 1: download and mosaic MODIS tiles

- 1) Download all required MODIS tiles from n4ftl01u.ecs.nasa.gov
- 2) Extract the 1. Subdataset from the hdf file → Maximum_Snow_Extent
- 3) Mosaic the extracted data using a cellsize of 0.0045 (450 m)
>> Save as
\\DataPortal\data\Asia\CentralAsia\8day\MODISSnowCoverExtent\geotiff\MSE\YYYY\YYYYJJJ.Maximum_Snow_Extent.tif

Part 2: Create comparison and snow cover maps

- 4) Open map templates to create maps \\DataPortal\templates\snow\
 - a. ctyMonth.mxd → current vs. monthly avg
 - b. ctyPeriod.mxd → current vs. previous period
 - c. ctyYear.mxd → current vs. previous years period
 - d. cty.mxd → map of region with snow cover extent grid
- 5) Add layer file \\DataPortal\templates\snow\SnowCoverAll.lyr
Replace data source of layer file with actual/previous snow grid YYYYJJJ.Maximum_Snow_Extent.tif
- 6) Replace placeholders 'text_current' and 'text_previous' with the date of the processing period
- 7) Export maps as PNG and PDF
>> Save as
\\DataPortal\data\Asia<CentralAsia or MiddleEast>\cty\8day\MODISSnowCoverExtent\graphics
 - a. cty__YYYYJJJ_pm.png and .pdf (previous month and current period)
 - b. cty__YYYYJJJ_pp.png and .pdf (previous period and current period)
 - c. cty__YYYYJJJ_py.png and .pdf (previous year and current period)

Part 3: Data Delivery

- 8) Upload Maps to <your_web_path>.
The charts and maps are deliverables and need to be staged on <your_web_path> when completed (included in python script). Each region has its own folder.

Part 4: Calculate Percentage of Snow covered Area for every basin and create table(Shariar's presentation)

- 1) Reproject snow grid to Clarke_1866_Albers
- 2) Create percentage of area covered with snow above 1500m (Iraq) and 2500m (all others)
- 3) Create zonal mean as table using boundary grid \\DataPortal\templates\snow \cty_snowbasins.tif
>> Save as
\\DataPortal\data\Asia\CentralAsia\cty\8day\MODISSnowCoverExtent\table\SnowTables\YYYY\cty_YYYYJJ.dbf

Part 4: Create Graphic with snow area % (Shariar's presentation)

- 4) Open Excel sheet \\DataPortal\data\Asia\CentralAsia\cty\8day\MODISSnowCoverExtent\table\cty_SnowExtentFromNSIDC.xlsx and table cty_YYYYJJJ.dbf
- 5) Copy values from dbf table (Column D) to Excel sheet tab SWEYYYY

6) Copy values from SWEYYYY to corresponding tab (#_Cross)

7) Export Charts

>> Save as \\DataPortal\data\Asia\CentralAsia\cty\8day\MODISSnowCoverExtent\chart \chartname.gif

Folder location:

<your_web_path>\asia\centralasia\8day\swe\modis\graphics

<your_web_path>\asia\middleeast\iraq\8day\swe\modis\graphics

Part 6: Helpful Notes

Results

Charts

irqbsn
1_Elazig.gif
2_Malatya.gif
3_Siirt.gif
4_Bingol.gif
5_Tunceli.gif
6_Diyarbakir.gif
7_Greater-zab.gif
8_Lesser-zab.gif
9_Diyala.gif
10_Bakhtaran.gif
11_Dezful.gif
12_Lorestan.gif
13_Masjed-e-soleyman.gif
14_Bagistas.gif
15_Palu.gif
16_Gazantep.gif
17_Silopi.gif

Charts are created using MS Excel. The table has the naming convention of the different regions of the charts.

Note: At the beginning of the snow year(Oct), the spreadsheets used to generate the charts require manual editing.

1. The “Cross*” sheets will need to have the new year added as a heading in row 1, ie 18-19
2. Add a page for the new year, ie SWE2019. Copy the previous year, empty data cells and update dates in column A
3. Update each “Depletion*” sheet, the data selection to change the earliest years data to the new year’s data, ie 15-16 legend entry is changed to point to 18-19 data. To do this, right click on the chart and select “Select Data” to access the edit menu for the data. Finally move the new year to the top of the legend.

Maps

Maps are created using ArcMap 10.3.1. Maps shown are for the Afghanistan extent.

