# **Snow Water Equivalent Processing**

#### April 2018

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Updated July 2016 – new input data source (NOHRSC/NASA)

Updated September 2017 – new version (Version 7) of SWE data in netcdf format Updated January 2018 – remove Excel charts function from process, now created with GeoEngine Updated April 2018 - Moving process to new python development/production servers. When started there will no longer produce the charts, also added writing an output to new web storage.

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## Data

NASA is processing the data instead of NOHRSC since January 2016, the link for the data is <a href="https://portal.nccs.nasa.gov/lisdata\_pub/FEWSNET/Asia\_LIS7\_2018/">https://portal.nccs.nasa.gov/lisdata\_pub/FEWSNET/Asia\_LIS7\_2018/</a>

a) NASA\_LIS\_NOAH36\_201610020000.d01.nc

```
Abbreviations:

YYYY - year (e.g. 2013)

YY - year (e.g. 13)

MM - month

DD - day

cty - region (e.g. afg, irq, pak, taj)

ctyddd - region boundaries (e.g. afgbsn, irq, pak, taj)
```

# **Required Software/Access**

- a) ArcGIS 10 and python
- b) Access to python development/production (DEV/PROD) servers
- c) Access to earlywarning.cr.usgs.gov web storage for data staging

# **Data processing**

# Python script for daily scheduled run

The python script is running daily as a scheduled task and no manual processing is needed.

#### **Model Setup**

- Script is set up to process the day with actual date (on 8/20 processing 8/20)
- The python script is set up as a scheduled task every day.
- There is a log file, documenting each processing run, located on the python DEV/PROD servers under D:\FEWS\DataPortal\logs
- LEAP YEAR NOTE: If the processing year is a leap year, NASA doesn't provide the Feb 29<sup>th</sup>.

  Therefore, to not have a missing day in the year for EWX data, those files have a Julian date of 1 offset.

```
data.x.059.tif = Feb 28th data.x.060.tif = Mar 1^{st} \rightarrow this would be in leap year Feb 29th data.x.061.tif = Mar 2nd data.x.365.tif = Dec 31^{st} This way all years always have 365 days.
```

#### **Python Script Description**

#### Part 1: Download Snow Depth grid

Download input NOAH file from <a href="http://portal.nccs.nasa.gov/lisdata\_pub/FEWSNET/Asia\_LIS7\_YYYY/">http://portal.nccs.nasa.gov/lisdata\_pub/FEWSNET/Asia\_LIS7\_YYYY/</a> NASA\_LIS\_NOAH36\_201610020000.d01.nc

- 1) Unzip .tgz file to retrieve file for swe in mm LIS\_NOAH32\_Asia\_swe\_mm\_ YYYYMMDD00.tif
- 2) Set values < 0 to 0

```
>> Save as
```

<data\_path>\Asia\CentralAsia\Daily\SWE\geotiff\YYYY\LIS\_NOAH32\_Asia\_swe\_mm\_YYYYMMD
D.tif

#### Part 4: Create Anomaly grid

```
3) SWE grid – mean SWE = Difference (mean => WY2001-2002 to WY2015-2016) 
>> Save as 
<data_path>\Asia\CentralAsia\Daily\SWE\geotiffdif\YYYY\swe_difYYYYMMDD.tif
```

#### Part 3: Create SWE Graphic

- 4) Create graphics for regions (IRQ)
- 5) Open map templates for the regions in the Central Asia Data Portal (ctyddd SWE.mxd)
- 6) Add NOHRSCswe1.lyr file and replace data source from downloaded SWE grid
- 7) Change title in map to reflect the processing date
- 8) Export to PNG and PDF format
  - >> Save as

<data\_path>\Asia\CentralAsia\Daily\SWE\graphics\YYYY\swYYYMMDD.png or .pdf

#### Part 5: Create Snow Depth Difference Graphic

- 9) Create graphics for 4 regions (AFGBSN, AFGDAM, TAJ, PAK, IRQ)
- 10) Add swe\_diff\_20150101.lyr file to ArcMap template and replace data source with SWE Difference .tif file
- 11) Change title in map to reflect the processing date
- 12) Export to PNG and PDF format
  - >> Save as

<data\_path>\Asia\CentralAsia\Daily\SWE\\graphics\\YYYY\\saYYYYMMDD.png or .pdf

#### Part 6: Data Delivery

13) Upload Graphics to location \\scienceweb1\shared\fews
The SWE maps are deliverables and need to be staged on \\scienceweb1\shared\fews AND

<web\_data> when completed (included in daily model run). Each region has its own

folder.

Folder locations (<web data>):

asia\\centralasia\\daily\\swe\\graphics and anomaly\graphics asia\\middleeast\\iraq\\daily\\swe\\graphics and anomaly\graphics

#### Part 7: Helpful Notes

- Every year on October 1 starts a new season
- In a leap year Feb 29 is not processed
- NASA data contact: Jossy Jacob (jossy.p.jacob@nasa.gov)

# Manual processing with python script

Once in a while the daily input data is not yet available when the scheduled script is scheduled. If the input data is a day or more delayed then the script needs to be run manually until caught up. Run the batch script allregions\_daily\_swe.py located <data\_portal>l\bin in command prompt and enter the date to be processed as arguments after the script name. This script will run all regions at once.

```
Command Prompt

Microsoft Windows [Uersion 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

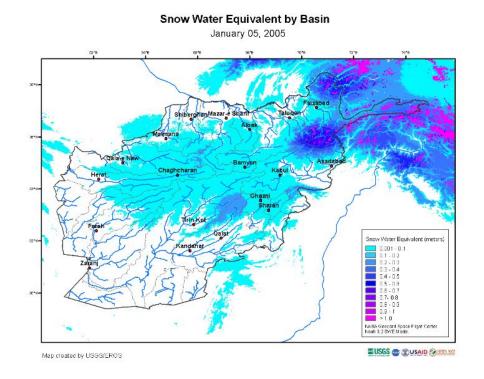
C:\Windows\system32>D:

D:\>D:\FEWS\DataPortal\bin\allregions_daily_swe.py 2017 09 28_
```

## **Results**

## Maps

Maps are created using ArcMap 10.3.1. Regions are Central Asia and all subregions.



## Daily Snow Water Equivalent Difference Anomaly

