



# Hands-on Session: Preparing Data For CREST Model

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# Searching HydroSHEDS



# Download Data

USGS HydroSHEDS - Windows Internet Explorer  
http://hydrosheds.cr.usgs.gov/  
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**USGS**  
science for a changing world

## HydroSHEDS

Data Produced by:



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### HydroSHEDS

(Hydrological data and maps based on SHuttle Elevation Derivatives at multiple Scales)

HydroSHEDS is a mapping product that provides hydrographic information for regional and global-scale applications in a consistent format. It offers a suite of geo-referenced data sets (vector and raster) at various scales, including river networks, watershed boundaries, drainage directions, and flow accumulations. HydroSHEDS is based on high-resolution elevation data obtained during a Space Shuttle flight for NASA's Shuttle Radar Topography Mission (SRTM).



Amazon Basin

Rivers derived at 500 m resolution  
0 500 1000  
Kilometers

Detailed River Network (click to zoom)



# Launch HydroSHEDS Download Site Viewer

EROS Customer Services, or the [maintainer](#) of these pages for assistance', and 'ow size and a warning will be given if your browser does not meet minimum or'."/>

Internet Explorer

view USGS datasets.

[Launch HydroSHEDS Download Site Viewer](#)

[View User Instructions](#)

ers may not be able to support full interactive capabilities. Additionally,

contact [EROS Customer Services](#), or the [maintainer](#) of these pages for assistance

ow size and a warning will be given if your browser does not meet minimum or

# HydroSHEDS Download Site Viewer

The screenshot shows a web browser window displaying the HydroSHEDS Download Site. The browser's address bar shows the URL <http://gisdata.usgs.gov/website/HydroSHEDS>. The page features the USGS logo and the title "HydroSHEDS Download Site". A central map displays a world map with yellow hatched areas indicating the regions covered by the data. To the left of the map is a toolbar with various navigation and tool icons, including a "Zoom" section with magnifying glass icons, a "Query" section with an information icon, and a "Tools" section with icons for pan, zoom, and print. To the right of the map is a "Scale Information" section showing a scale bar and the text "Scale ~ 1:270,317,459". Below the scale information is a "Layers" section with a list of layers: "HydroSHEDS", "Boundaries", and "Elevation". The footer of the page contains the text "U.S. Department of the Interior | U.S. Geological Survey | USGS for Earth Resources Observation and Science (EROS)". The browser's status bar at the bottom indicates "Done" and "Internet | Protected Mode: Off".



# Define Tiled Download Area

The screenshot displays the HydroSHEDS web application interface within a browser window. The browser's address bar shows the URL `http://gisdata.usgs.gov/website/Hy`. The page title is "HydroSHEDS provides free online data with NED, SRTM, Landsat, maps, orthoimagery, elevation and more - ...". The main content area features a map of a region with a grid of green and brown tiles, indicating a tiled download area. The map is overlaid with a yellow boundary. To the left of the map is a toolbar with icons for navigation and tool use. Below the toolbar is a "Downloads" section with a red box highlighting a download icon. To the right of the map is a "Scale Information" panel showing a scale of approximately 1:52,755,421 and a "Layers" panel with three layers: "HydroSHEDS", "Boundaries", and "Elevation". The footer of the page includes the text "U.S. Department of the Interior | U.S. Geological Survey | USGS for Earth Resources Observation and Science (EROS)".



# List all available data

The screenshot shows a data catalog interface. On the left is a vertical list of data products. On the right is a details view for a selected product.

**Data List (Left):**

- 3sec GRID: Void-filled Elevation
- 3sec GRID: Conditioned Elevation
- 3sec GRID: Drainage Directions
- 3sec BIL: Void-filled Elevation
- 3sec BIL: Conditioned Elevation
- 3sec BIL: Drainage Directions
- 15sec GRID: Void-filled Elevation
- 15sec GRID: Flow Accumulation
- 15sec GRID: Drainage Directions
- 15sec BIL: Void-filled Elevation
- 15sec BIL: Drainage Directions
- 15sec BIL: Flow Accumulation
- 15sec SHAPE: River Network
- 15sec SHAPE: Drainage Basins (Beta)
- 30sec GRID: Void-filled Elevation**
- 30sec GRID: Drainage Directions**
- 30sec GRID: Flow Accumulation**
- 30sec BIL: Void-filled Elevation
- 30sec BIL: Drainage Directions
- 30sec BIL: Flow Accumulation
- 30sec SHAPE: River Network**
- 30sec SHAPE: Drainage Basins (Beta)**

**Details View (Right):**

Page [1]

Click on a row to view tile details

File Name
as_dem_30s_grid










Page [1]

We have looked at DEM Data here  
And you can download other Data



# Download the 30s DEM, FDR, FDC and Drainage Basins

- as\_dem\_30s.zip
- as\_dir\_30s.zip
- as\_acc\_30s.zip
- as\_riv\_30s.zip

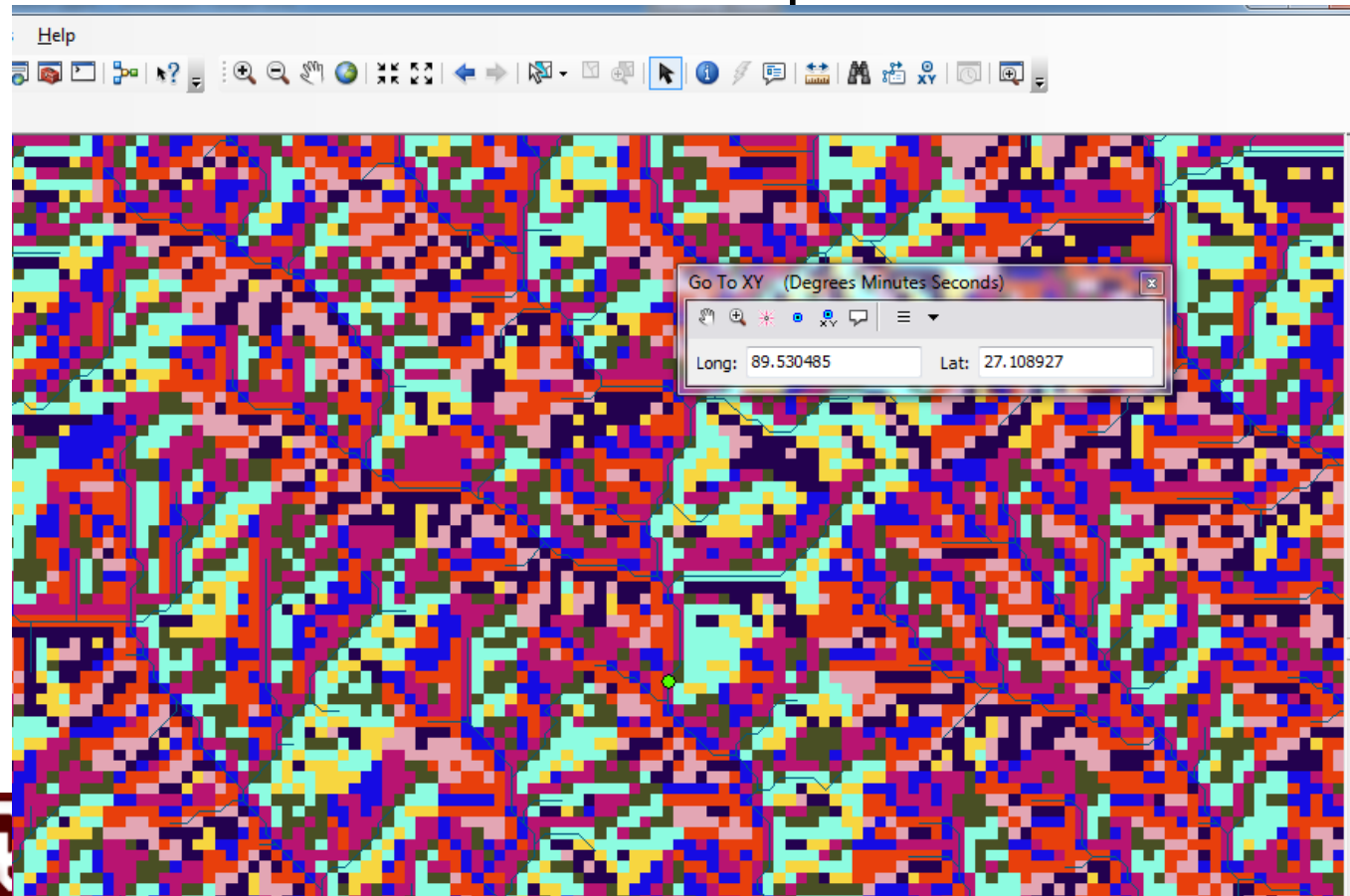
 as_acc_30s	3/22/2012 12:40 AM	File folder	
 as_dem_30s	3/22/2012 12:41 AM	File folder	
 as_dir_30s	3/22/2012 12:41 AM	File folder	
 as_riv_30s	3/22/2012 12:47 AM	File folder	
 as_acc_30s.zip	11/15/2010 10:02 ...	WinRAR ZIP 压缩...	33,455 KB
 as_dem_30s.zip	11/15/2010 9:52 AM	WinRAR ZIP 压缩...	57,595 KB
 as_dir_30s.zip	11/15/2010 9:57 AM	WinRAR ZIP 压缩...	17,103 KB
 as_riv_30s.zip	11/15/2010 10:37 ...	WinRAR ZIP 压缩...	36,528 KB
 HydroSHEDS_TechDoc_v10.pdf	2/28/2007 11:00 PM	Adobe Acrobat D...	180 KB

# ArcMap



# Add the four layers to the ArcMap and fine the outlet location

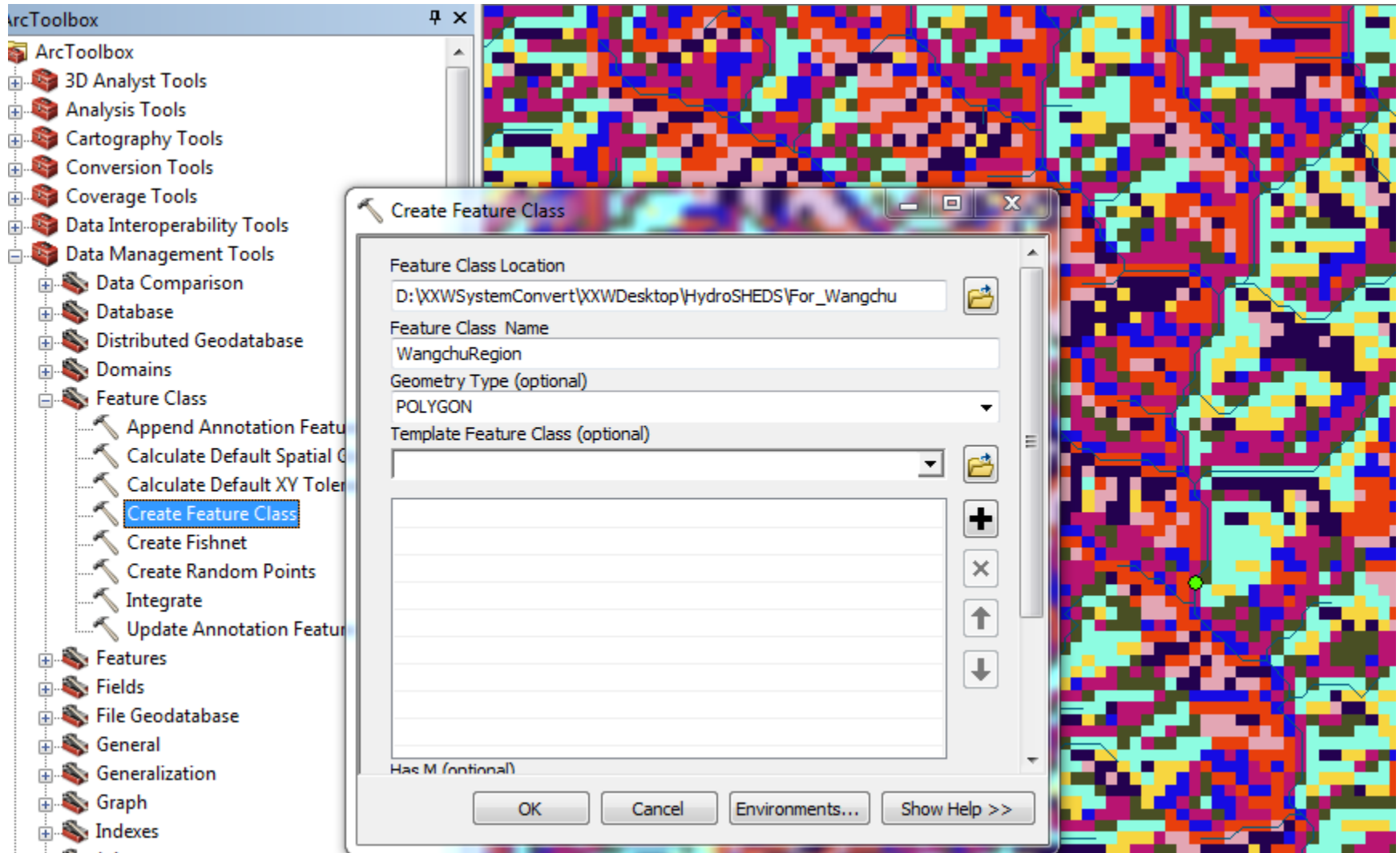
- Add the layers to the ArcMap
- Use **Go To XY** Tool to find the outlet location  
Long: **89.530485**, Lat: **27.108927**
- Zoom to the location and add point to this location



**Layers**

- as\_riv\_30s
- as\_dem\_30s  
Value  
High : 8247  
Low : -158
- as\_dir\_30s  
-1  
0  
1  
2  
4  
8  
16  
32  
64  
128
- as\_acc\_30s  
Value  
High : 3588262  
Low : 1

# Open Toolbox and create a new feature class

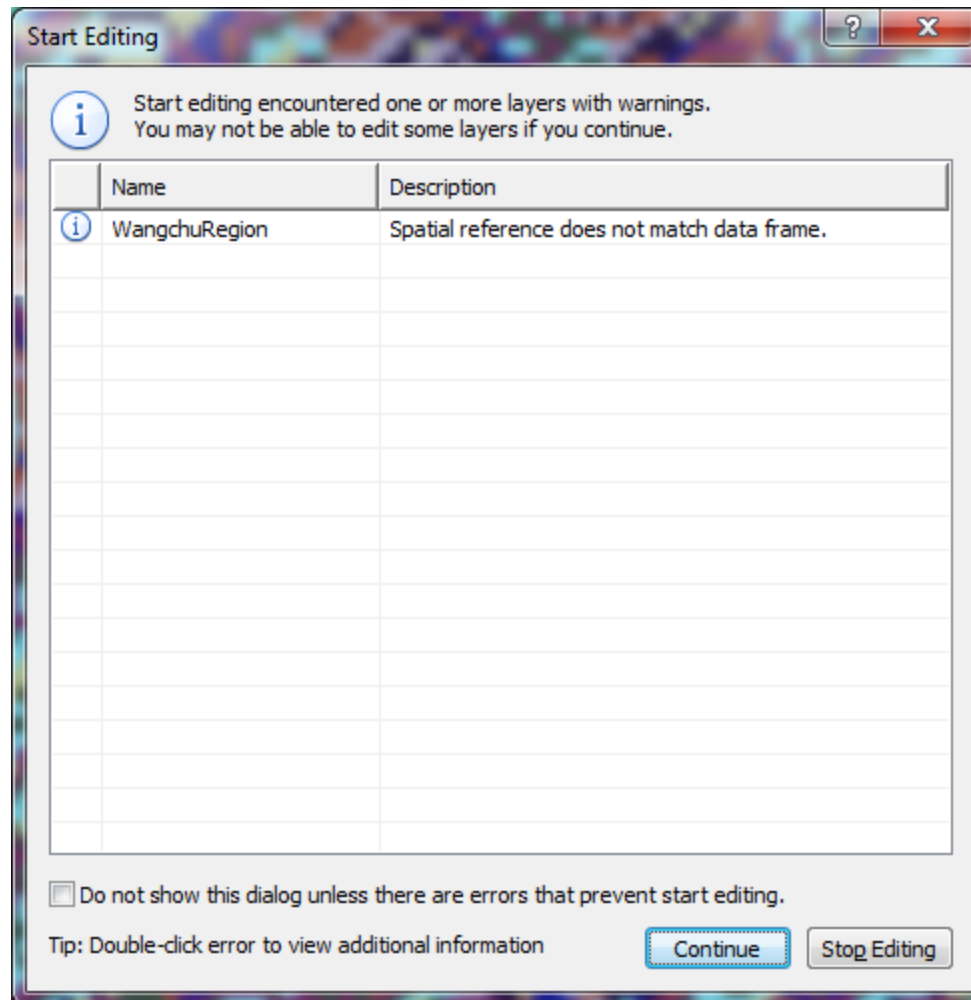


# Edit WangchuRegion

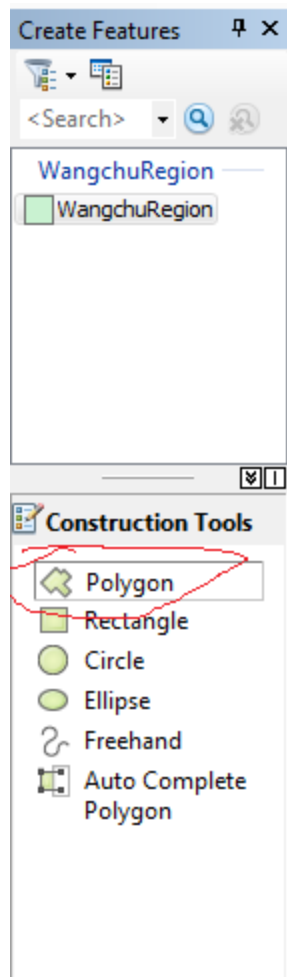
The screenshot displays a GIS software interface. On the left is a legend for the 'WangchuRegion' layer, which includes several sub-layers: 'as\_dir\_30s' with a color-coded legend (values: -1, 0, 1, 2, 4, 8, 16, 32, 64, 128), 'as\_dem\_30s' with a grayscale legend (Value High: 824, Low: -158), and 'as\_acc\_30s' with a grayscale legend (Value High: 358, Low: 1). The main map area shows a colorful, pixelated terrain. A context menu is open over the map, listing various actions. The 'Edit Features' option is selected, and a sub-menu is visible with the following options: 'Start Editing', 'Define New Types Of Features...', and 'Organize Feature Templates...'. Other menu items include 'Copy', 'Remove', 'Open Attribute Table', 'Joins and Relates', 'Zoom To Layer', 'Zoom To Make Visible', 'Visible Scale Range', 'Use Symbol Levels', 'Selection', 'Label Features', 'Convert Labels to Annotation...', 'Convert Features to Graphics...', 'Convert Symbology to Representation...', 'Data', 'Save As Layer File...', 'Create Layer Package...', and 'Properties...'.

# Warning

- Click the **Continue**

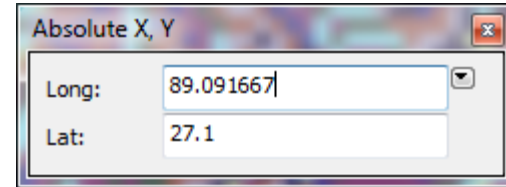


# Add Polygon



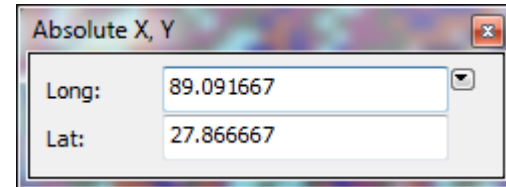
# Add Points

- Click **F6** and **input** the location (**long: 89.091667; lat: 27.1**), **Enter**



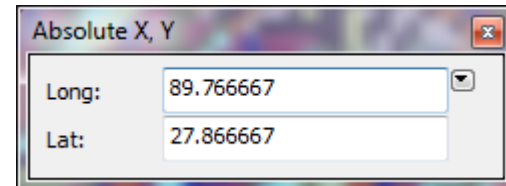
A screenshot of a software dialog box titled "Absolute X, Y". It contains two input fields: "Long:" with the value "89.091667" and "Lat:" with the value "27.1".

- Click **F6** and **input** the location (**long: 89.091667; lat: 27.866667**), **Enter**



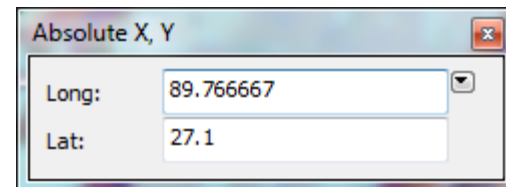
A screenshot of a software dialog box titled "Absolute X, Y". It contains two input fields: "Long:" with the value "89.091667" and "Lat:" with the value "27.866667".

- Click **F6** and **input** the location (**long: 89.766667; lat: 27.866667**), **Enter**



A screenshot of a software dialog box titled "Absolute X, Y". It contains two input fields: "Long:" with the value "89.766667" and "Lat:" with the value "27.866667".

- Click **F6** and **input** the location (**long: 89.766667; lat: 27.1**), **Enter**

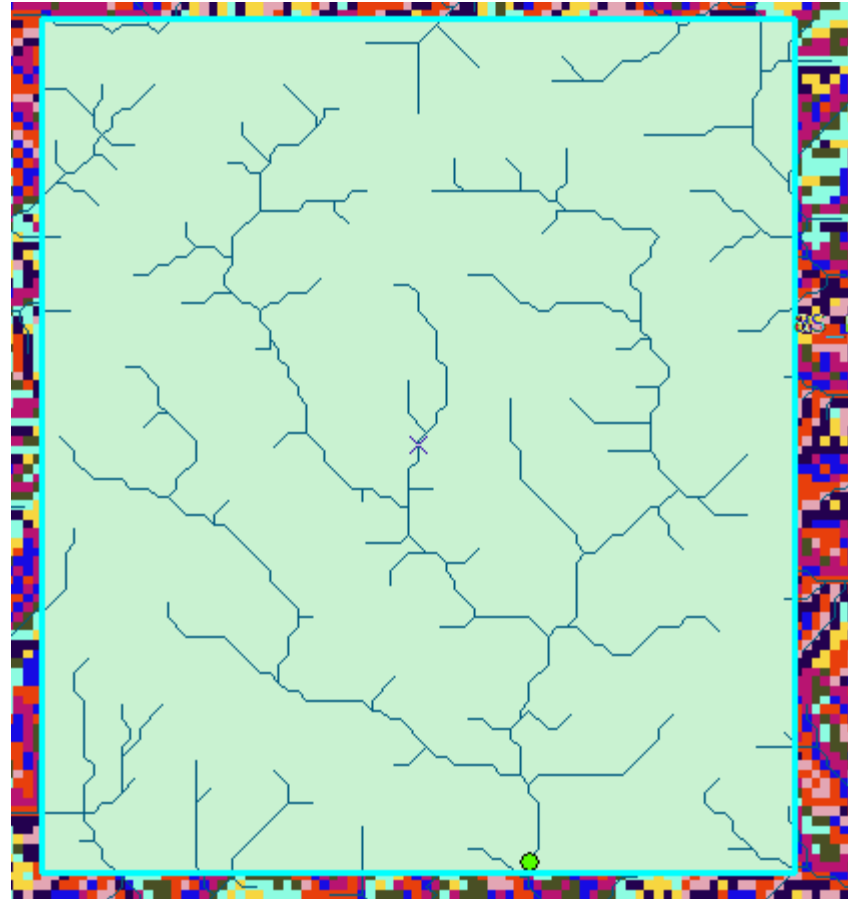


A screenshot of a software dialog box titled "Absolute X, Y". It contains two input fields: "Long:" with the value "89.766667" and "Lat:" with the value "27.1".

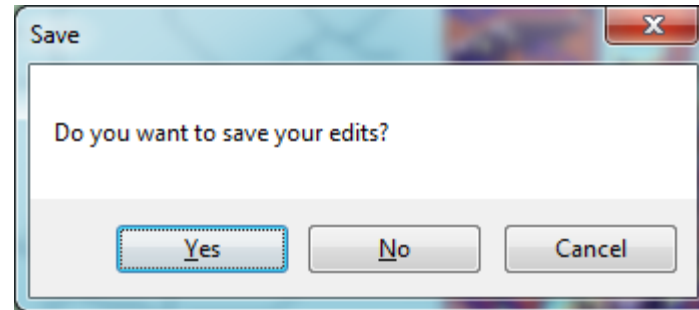
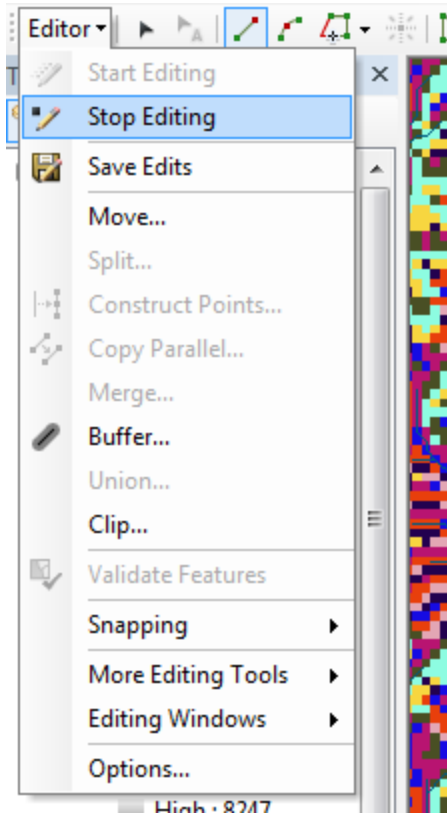
- Click **F2**



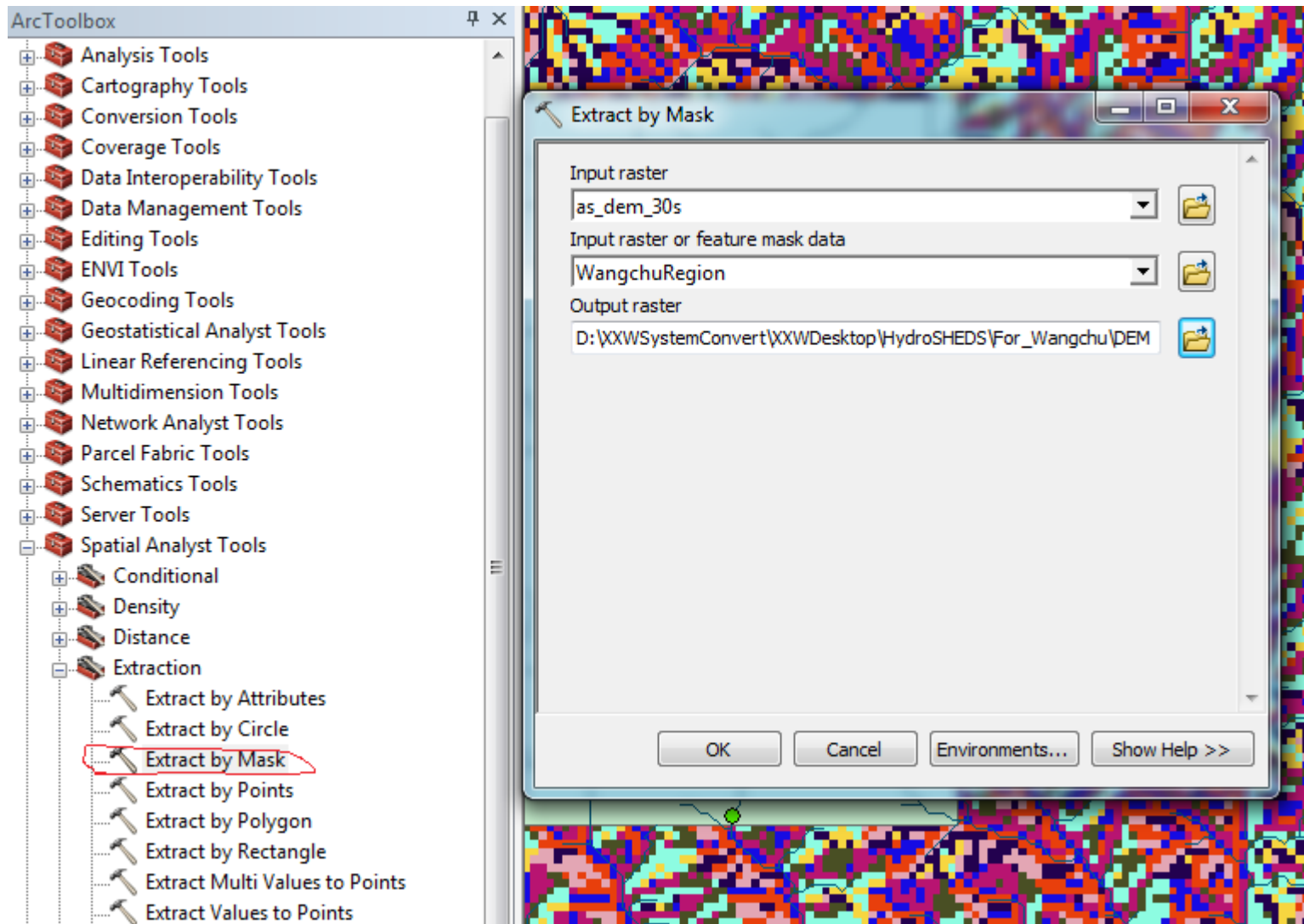
# Edit the New FeatureClass



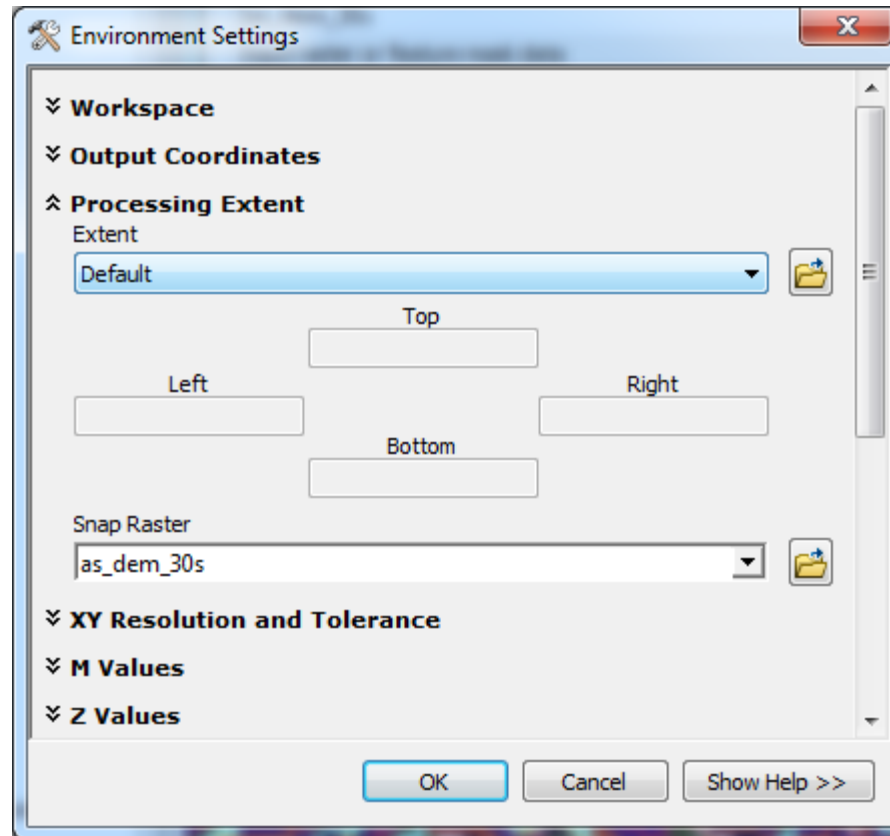
# Stop Editing



# Get the Extract by Mask tool from toolbox



# Configure the Environments

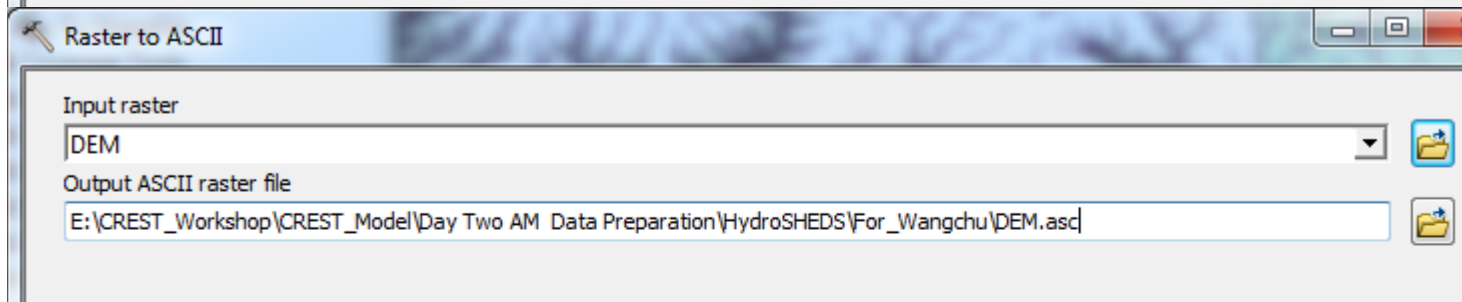
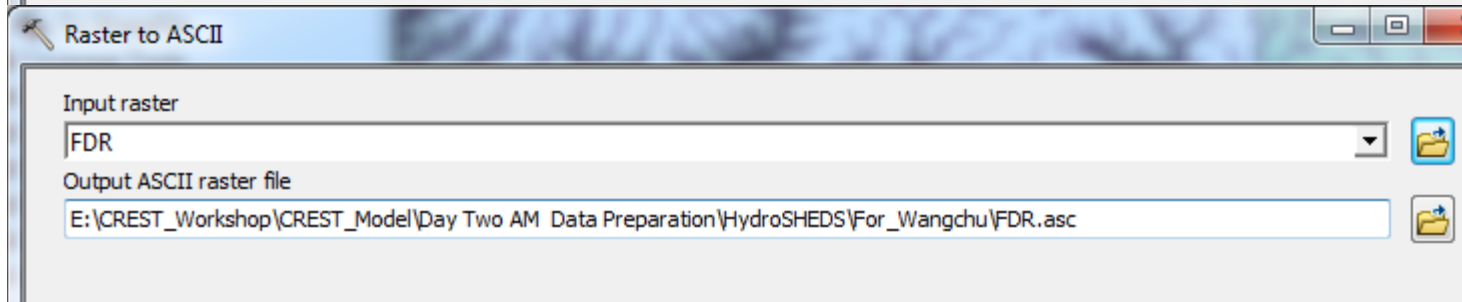
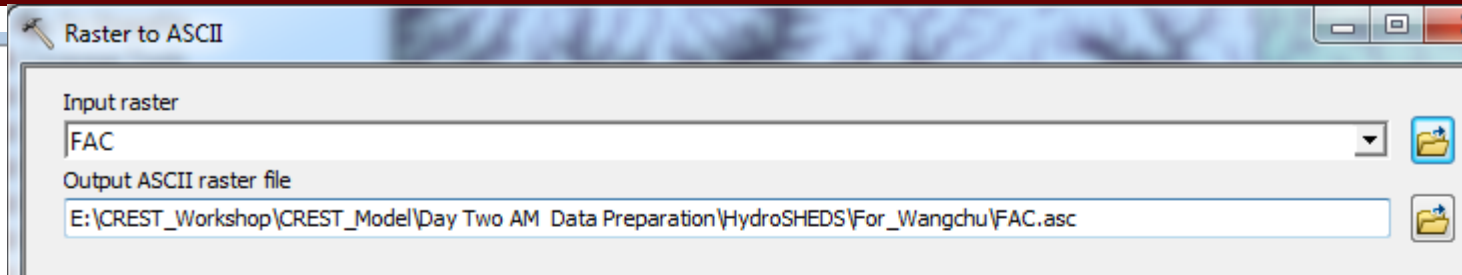
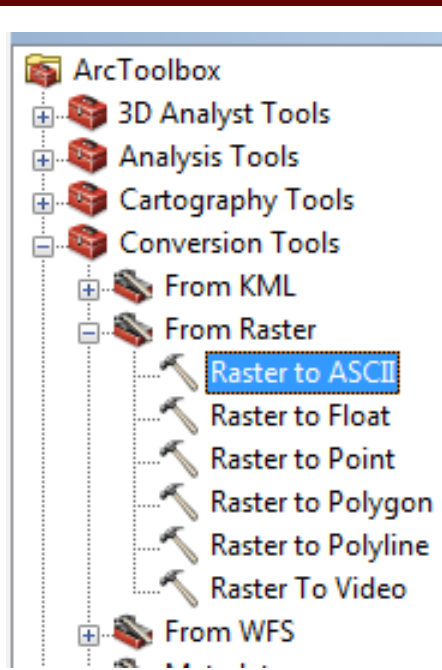


# Get DEM, FDR and FAC

- You will get DEM
- Then extract FDR and FAC using the same method
- At last, you will have three grid file (DEM, FDR and FAC)



# Convert DEM, FDR and FAC to ASCII Files



# Setup The CREST Model

- Unzip “Template\_For\_CREST\_Model.zip”
- Delete all the files in “Basics” Folder
- Put the DEM.asc, FDR.asc and FAC.asc into the “**Basics**” Folder



# Modify the Model Area using DEM.asc

```
0 10 20 30 40 50
1 ncols 82
2 nrows 93
3 xllcorner 89.0916666666665
4 yllcorner 27.0999999999999
5 cellsize 0.00833333333333333
6 NODATA_value -9999
7 -9999 -9999 -9999 -9999 -9999 -9999 -9999 -9999 -999
8 4572 4560 4551 4543 4540 4536 4535 4534 4532 4533 45
9 4614 4621 4598 4563 4543 4536 4534 4534 4533 4533 45
10 4761 4800 4734 4647 4620 4582 4562 4548 4548 4570 45
11 4661 4680 4738 4778 4691 4662 4615 4586 4578 4576 45
12 4626 4567 4567 4652 4625 4579 4547 4540 4531 4563 46
13 4700 4701 4582 4488 4560 4551 4488 4472 4535 4585 46
```

```
0 10 20 30 40 50 60 70 80
1 #####
2 # CREST Project File Format (Version more than 2.0)
3 #####
4 Version = 2.0
5 #####
6 # MODEL AREA
7 #####
8 NCols = 81 # Number of columns
9 NRows = 92 # Number of rows
10 xllCorner = 89.0916666666665
11 yllCorner = 27.0999999999996
12 CellSize = 0.00833333333333333 # Grid resolution in m
13 NODATA_value = -9999.
14 #####
15 # MODEL Run Time Information
16 #####
17 TimeMark = d #y (year) ;m (month) ;d (day) ;h (hour) ;u (minute) ;s (second)
18 TimeStep = 1
19 StartDate = 20010101
20 LoadState = no
```





# Create Steam.Def and run CREST Model

- Create a **Stream.Def** file and write **2** in this file
- **Run the Batch File**

```
C:\Windows\system32\cmd.exe

720 2002-12-21
721 2002-12-22
722 2002-12-23
723 2002-12-24
724 2002-12-25
725 2002-12-26
726 2002-12-27
727 2002-12-28
728 2002-12-29
729 2002-12-30
730 2002-12-31

The results of the Outlet is:
  NSCE:      0.72000918
  Bias(%):   3.95736555
  CC:        0.85950001

Run end date and time (yyyy/mm/dd hh:mm:ss): 2012/04/03 6:17:51
Elapsed run time: 1.735 Seconds

Project: Wangchu_CREST_U6_Daily is finished!

D:\XXWSsystemConvert\XXWDesktop\Template_For_CREST_Model>Pause
Press any key to continue . . .
```

# TRMM V6 Data

- <http://mirador.gsfc.nasa.gov/cgi-bin/mirador/presentNavigation.pl?tree=project&project=TR>

Keyword Projects Science Areas

Keyword Projects Science Areas

Results 1 - 8 for TRMM\_3B42 (1 second)

**TRMM 3-Hourly 0.25 deg. TRMM and Other Satellites Precipitation Product** [info](#)

The following services are available for the data set(s). Whenever you add files to the shopping cart, you will be presented with options for selecting these services.  
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[Add Selected Files To Cart](#) [Add All Files in All Pages To Cart](#)

<input checked="" type="checkbox"/> Select All in Page <input type="checkbox"/> File Names/Descriptive File Names	Start Time
<input checked="" type="checkbox"/> <a href="#">3B42.110630.21.6A.HDF.Z (0.37 MB)</a> One Click Download: <a href="#">HDF (FTP)</a>   <a href="#">HDF (HTTP)</a>   <a href="#">NetCDF</a>   <a href="#">KMZ</a>   <a href="#">OPeNDAP</a>	2011-06-30 19:30:00 <a href="#">Metadata</a>
<input checked="" type="checkbox"/> <a href="#">3B42.110630.18.6A.HDF.Z (0.38 MB)</a> One Click Download: <a href="#">HDF (FTP)</a>   <a href="#">HDF (HTTP)</a>   <a href="#">NetCDF</a>   <a href="#">KMZ</a>   <a href="#">OPeNDAP</a>	2011-06-30 16:30:00 <a href="#">Metadata</a>
<input checked="" type="checkbox"/> <a href="#">3B42.110630.15.6A.HDF.Z (0.37 MB)</a> One Click Download: <a href="#">HDF (FTP)</a>   <a href="#">HDF (HTTP)</a>   <a href="#">NetCDF</a>   <a href="#">KMZ</a>   <a href="#">OPeNDAP</a>	2011-06-30 13:30:00 <a href="#">Metadata</a>
<input checked="" type="checkbox"/> <a href="#">3B42.110630.12.6A.HDF.Z (0.40 MB)</a> One Click Download: <a href="#">HDF (FTP)</a>   <a href="#">HDF (HTTP)</a>   <a href="#">NetCDF</a>   <a href="#">KMZ</a>   <a href="#">OPeNDAP</a>	2011-06-30 10:30:00 <a href="#">Metadata</a>
<input checked="" type="checkbox"/> <a href="#">3B42.110630.9.6A.HDF.Z (0.36 MB)</a> One Click Download: <a href="#">HDF (FTP)</a>   <a href="#">HDF (HTTP)</a>   <a href="#">NetCDF</a>   <a href="#">KMZ</a>   <a href="#">OPeNDAP</a>	2011-06-30 07:30:00 <a href="#">Metadata</a>
<input checked="" type="checkbox"/> <a href="#">3B42.110630.6.6A.HDF.Z (0.37 MB)</a> One Click Download: <a href="#">HDF (FTP)</a>   <a href="#">HDF (HTTP)</a>   <a href="#">NetCDF</a>   <a href="#">KMZ</a>   <a href="#">OPeNDAP</a>	2011-06-30 04:30:00 <a href="#">Metadata</a>
<input checked="" type="checkbox"/> <a href="#">3B42.110630.3.6A.HDF.Z (0.35 MB)</a> One Click Download: <a href="#">HDF (FTP)</a>   <a href="#">HDF (HTTP)</a>   <a href="#">NetCDF</a>   <a href="#">KMZ</a>   <a href="#">OPeNDAP</a>	2011-06-30 01:30:00 <a href="#">Metadata</a>
<input checked="" type="checkbox"/> <a href="#">3B42.110630.0.6A.HDF.Z (0.34 MB)</a> One Click Download: <a href="#">HDF (FTP)</a>   <a href="#">HDF (HTTP)</a>   <a href="#">NetCDF</a>   <a href="#">KMZ</a>   <a href="#">OPeNDAP</a>	2011-06-29 22:30:00 <a href="#">Metadata</a>

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NASA Search Results

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# FEWS NET PET



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Home > Global Data Portal > Global PET Data Download

## Global PET Data Download

The Year Collection of daily PET images are ~25 Mb per file (Y where YYYY is the 4 digit year. These are UNIX .tar.gz files cc data files.

The Month Collection of daily PET images are ~2 Mb per file (pet\_YYYYMM.tar.gz where YYYY is the 4 digit year and MM is files containing a months daily (28-31) data files.

The individual day PET images are ~60-70 Kb per file (day). YYYY is the 4 digit year, MM is the 2 digit month of year and DD is the 2 digit day of month. Each daily PET file whether by itself or within the month or year collections is a UNIX .tar.gz file which contains the ARC/INFO created .bil image and related files (i.e. .bil, .blw, .hdr, .stx) for that day.

For a full description of the daily PET data, [click on this link](#).

Choose your preferred download:

Year	Yearly PET Download	Monthly Daily PET	Current Daily PET
2011	~25 Mb per download	~2 MB per download	~65-70 KB per download
2010			
2009			
2008			
2007			
2006			
2005			
2004			
2003			
2002			
2001			

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FEWS NET PET



About 13,900,000 results (0.28 seconds)

### FEWS NET Data Portals

[earlywarning.usgs.gov/fews/global/web/dwn/globalpet.php](http://earlywarning.usgs.gov/fews/global/web/dwn/globalpet.php)

USGS USAID logo, FEWS NET logo ... The Year Collection of daily PET images are ~25 Mb per file (year). The naming convention is pet\_YYYY.tar.gz where ...

### FEWS NET Data Portals

[earlywarning.usgs.gov/fews/global/web/readme.php?symbol=pt](http://earlywarning.usgs.gov/fews/global/web/readme.php?symbol=pt)

USGS USAID logo, FEWS NET logo ... The daily global potential evapotranspiration (PET) is calculated from climate parameter data that is extracted from Global ... You've visited this page 2 times. Last visit: 10/17/11

### (WRSI - Early Warning and Environmental Monitoring Program - USGS

[earlywarning.usgs.gov/Haiti/readme/wsreadme.php](http://earlywarning.usgs.gov/Haiti/readme/wsreadme.php)

The most important inputs to the model are precipitation and potential evapotranspiration (PET). FEWS NET at the USGS calculates daily PET values for Africa at ...



D:\XXWSYSTEMCONVERT\XXWDesktop\pet\_2001.tar.gz\pet\_2001.tar\pet\_2001\

File Edit View Favorites Tools Help

Add Extract Test

D:\XXWSys

Name

- et010101.tar....
- et010102.tar....
- et010103.tar....
- et010104.tar....
- et010105.tar....
- et010106.tar....
- et010107.tar....
- et010108.tar....
- et010109.tar....
- et010201.tar....
- et010202.tar....
- et010203.tar....
- et010204.tar....
- et010205.tar....
- et010206.tar....
- et010207.tar....
- et010208.tar....
- et010209.tar....
- et010210.tar....
- et010211.tar....
- et010212.tar....
- et010213.tar....
- et010214.tar....

1 object(s) selected

et010101.tar.gz - WinRAR

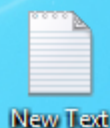
文件(F) 命令(C) 工具(S) 收藏夹(O) 选项(N) 帮助(H)



et010101.tar.gz - TAR+GZIP 压缩文件, 解包大小为 130,739 字节

名称	大小	压缩后大小	类型	修改时间
..			Folder	
et010101.bil	130,320	?	文件 bil	7/27/2005 8:54 ...
et010101.blw	222	?	文件 blw	7/27/2005 8:54 ...
et010101.hdr	176	?	文件 hdr	7/27/2005 8:54 ...
et010101.stx	21	?	文件 stx	7/27/2005 8:54 ...

总计 130,739 字节 (4 个文件)



# Practice

**Please practice this lecture until  
you can do it by yourself**



Thanks for your attention!

