

Downloading Climate data from Internet into ArcGIS

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Purpose

The purpose of this exercise to demonstrate: (a) the steps involved in downloading climate (precipitation and temperature) data from the National Climatic Data Center (NCDC), and (b) to import the location of the station and its associated time-series data into ArcGIS.

NCDC GIS Portal

There are two ways to download climate data from NCDC: traditional web interface and GIS portal. A GIS portal is just a map interface on top of the underlying data which eventually takes you to a web interface to download the data. NCDC GIS portal is available at <http://gis.ncdc.noaa.gov/maps/>

NCDC's Map Services

HOME SEARCH

NCDC GIS Map Services Index

Index > Maps Services Index

GIS Map Services provide specialized dynamic mapping capabilities for datasets and products archived at NCDC. These capabilities included advanced searching, data access to various pdf and text output, timeseries and wind-rose graphing, accumulation maps, and historical mapping of observed and summarized data.

Map Services Links by Category

United States

- 15 Minute Precipitation
- Hourly Precipitation
- Hourly Surface Data
- Daily Surface Data
- Local Climatological Data (LCD)
- CDOP Summary of the Month

Global

- Monthly Extremes
- NWS Next Generation RADar (NEXRAD) Level II/III
- Climate Reference Network (CRN)
- Climate Indices
- Annual Climatological Summary
- NIDIS North American Drought Monitor

MAPS HELP

Choose the category of maps from the left (United States, Global, Surface Data, Precipitation) by clicking on the category headers.

Once clicked, a list of maps for that specific category will be displayed.

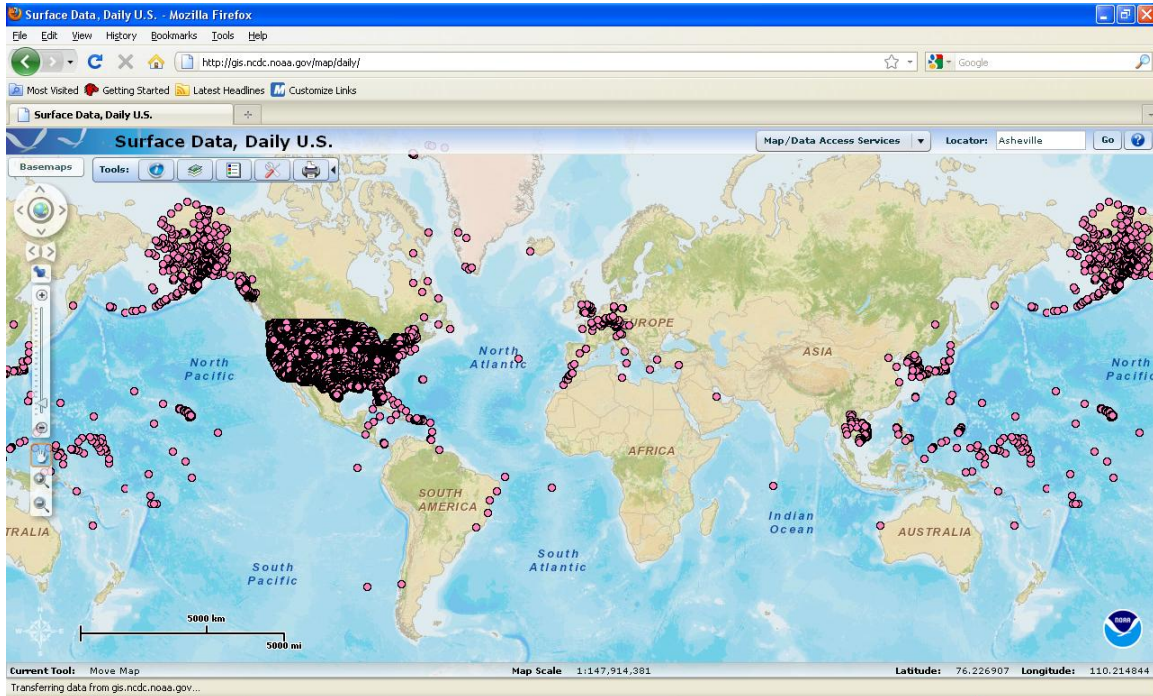
Then, click on each map image or header to be taken to that specific map.

Note: Online maps require Internet Explorer 6 or better, Mozilla Firefox 3+, and Safari 4+ and Flash Player 9+ to properly display

Need to create your own maps instead of just viewing online? [Access NCDC GIS Web and Google Map Services >>](#)

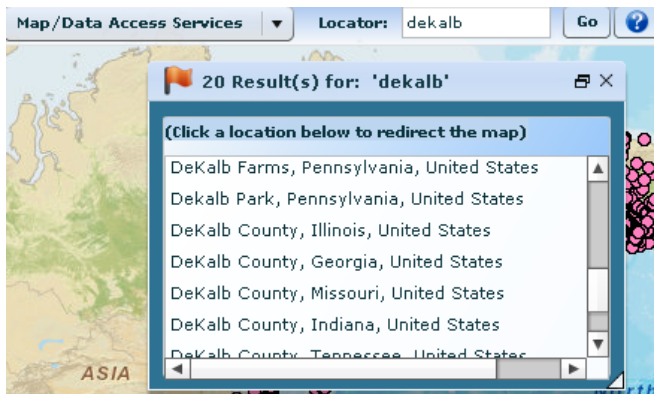
The NCDC GIS portal provides access to more than 350,000 global locations to get climate data. More information on these locations and related products is available on the

NCDC website. Data can be accessed at local, regional, national and global scale for varying time intervals. In this tutorial, we are interested in getting daily precipitation and temperature data for one or more stations in Sr. Joseph Watershed in northeast Indiana. To get daily climate data, **click** on the *Daily Surface Data* link, and you will get the actual (global) map interface shown below.

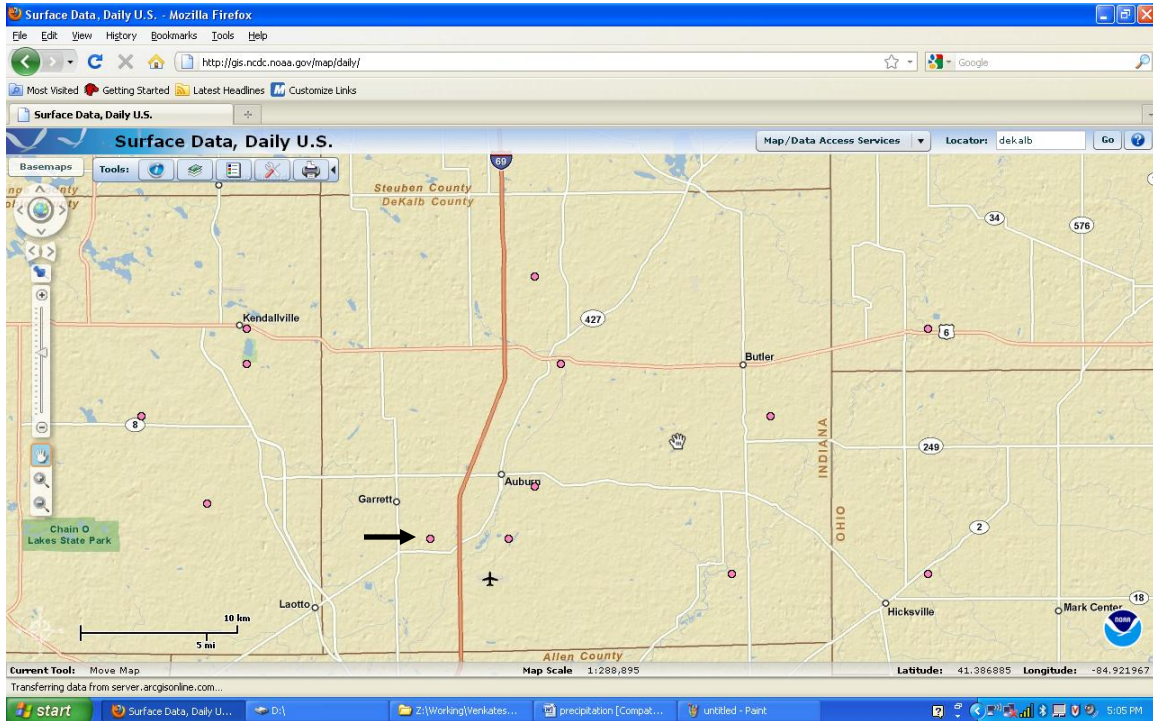



In the *Locator* search box on the top-right corner, enter any information related to a station to see a detailed map of that station including its location. In this tutorial, we will use the county name (De Kalb) to search for climate stations. **Type** DeKalb (or dekalb) in the locator window, and **push** the *Go* button.

If multiple counties with the same name are found, you will get a list of corresponding locations as shown below.




Scroll down this list, and **click** on De Kalb County, Indiana to make our area of interest visible on the map interface.



You should then see De Kalb County in Indiana along with the climate station locations displayed as dots (pink in this case) as shown in the above screen shot. Besides using a search query to get to this location, GIS tools available on the basic tools menu can also be used to interact with the map and get to any area of interest. To check the availability of data, **select** the *Identify Location* tool , and **click** on a colored dot next to Garrett (shown by an arrow in the above figure). The interface will then display the information related to the selected station in a table along with link to the data and more information as shown below:

Results

U.S. Daily Surface Data

Get Selected Data Click below for access:  Data

<input type="checkbox"/>	Station	Period of Record	COOPID	WBANID	Country	State	County
<input type="checkbox"/>	GARRETT	2008/12 - 2010/12	123206	99999	UNITED STATES	IN	DEKALB
<input checked="" type="checkbox"/>	GARRETT 1 S	1989/02 - 2010/12	123207	99999	UNITED STATES	IN	DEKALB

The tabular information presented above also gives information on when the data collection began at this station (Begin Date) and the date of the last record in the dataset (End Date). **Check** the box next to Garrett 1 S (COOPID: 123207), and **click** on *Get Selected Data* button to access data at this station. The next interface invoked from this

link will ask you whether you want simplified or advanced option to download data. The simplified option will give you a fixed number of variables (precipitation, maximum temperature, minimum temperature, snowfall, and snow depth) for any specified time period; whereas with advanced option, you can choose what variables should be included in the dataset. For this exercise, we will go with the simplified option to keep our life simple and get the job done!

Click on Continue with SIMPLIFIED Options. Finally, you will get to the interface from which you can download the data! Change the From date to 01/2007 and To date to 08/2009, and press the Continue button.

NNDC CLIMATE DATA ONLINE	
Daily data for 1 stations (List appears below)	
Selected Meteorological Element(s): PRCP, TMAX, TMIN, SNOW, SNWD, TOBS	Date Range (Year / Month): (See notes) From 2007 01 To 2009 08 Through 12/2010 Selected Output Format: Web Form Output via FTP
<input type="button" value="Continue"/> <input type="button" value="Clear Selections"/> <input type="button" value="Previous Page"/> <input type="button" value="New Search"/>	

You will then get an inventory of data that will be provided including file size and output format. Click on the Inventory Review check box, enter your valid email address and click push Submit Request.

NNDC CLIMATE DATA ONLINE	
SOD - Surface Data, Daily - US & some non-US (Notice: Will be replaced by GHCN-Daily 8/2011), Request Summary	
Selected Stations - includes 1 stations (See selected stations below)	
Selected Meteorological Element(s): 'PRCP', 'TMAX', 'TMIN', 'SNOW', 'SNWD', 'TOBS'	Date Range (Year / Month): 2007/01 to 2009/08 Selected Output Format: Web Form Selected Output Media: FTP Total Data Rows Available: 192 - View Inventory Output File Size Estimate (bytes): 256000
<input checked="" type="checkbox"/> Inventory Review: I have reviewed the Inventory File to see if the elements/dates desired are included before ordering. Some time periods or elements may be missing. For daily data, there are often missing days and/or missing elements (eg, temperature) in the data received.	
IMPORTANT! Please enter a valid email address below so we can notify you when your request has finished processing.	
E-mail Address: <input type="text" value="youremail@email.com"/>	
<input type="button" value="Submit Request"/>	

Email address is used to notify you when the data is ready for download. Typically for small data requests (such as the one in this tutorial), the data is available immediately as you will see in the next window (shown below) after submitting the request.

NNDC CLIMATE DATA ONLINE

SOD - Surface Data, Daily - US , Request Verification

Your SOD - Surface Data, Daily - US request - CDO01703671 has been submitted for processing.

You will be notified by email at vmerwade@purdue.edu when processing has completed for your request.

NOTICE! Click on the following URL to access your files: <http://www1.ncdc.noaa.gov/pub/orders/CDO6073742017532.html>

Click on the access URL to get the data.

NOTICE!

From the time you submitted your request it may be several minutes (to several hours for larger volumes) before your **web form** is available. **For this reason it is recommended that you bookmark this web page for future reference and access to your web form.** You will also receive email notification when your web form is ready.

File Contents	Access URL	File Size Estimate (bytes)
SOD - Surface Data, Daily - US - Web Form	http://www1.ncdc.noaa.gov/pub/orders/6073742017532.dat.html	96000
SOD - Surface Data, Daily - US - ASCII File	ftp://ftp.ncdc.noaa.gov/pub/orders/6073742017532.txt	15360
SOD - Surface Data, Daily - US - Inventory	http://www1.ncdc.noaa.gov/pub/orders/6073742017532inv.txt	610
Station List	http://www1.ncdc.noaa.gov/pub/orders/6073742017532stn.txt	501

You can download the data either through a web form or as an ASCII file. Lets use ASCII format, and click on the .txt file to get the data. Save the file (as dekalb.txt) in your working directory.

Things to do on your own and turn-in:

- 1) Copy and rename the streamflow geodatabase from the previous lab with a new name (say *timeseries.mdb*).

- 2) Create a point for 123207 in the same feature class (Gauge) where stream gauges are stored.
- 3) Repeat the process (downloading data and creating point) for two more stations: 335438 in Williams County, Ohio; and 203823 in Hillsdale County, Michigan.
- 4) Upload precipitation data for these three stations in TimeSeries table.
- 5) Comment on the current state of our geographic and time series data (e.g. Can we distinguish between climate and streamflow station? What will happen to TimeSeries table if we also add temperature for both climate stations in this table)
- 6) Using Excel, convert streamflow from cfs to inch/day and plot rainfall and streamflow together for nearby stations. Comment on what you see in the plot.