ArcDayMet Toolbox (version 1.0)

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Overview

The ArcDayMet Toolbox is a free / open source python toolbox for ArcMap 10.2 and above that makes getting DayMet data from within ArcMap easy. This project was made possible with the assistance of the Prairies Region of the Canadian Wildlife Service.

This document provides basic use instructions for the installation and use of the tool. Users are encouraged to visit the DayMet website (https://daymet.ornl.gov/) for details on the DayMet data itself.

Installation

This installation assumes you can download and put files in a location where they will not be accidentally altered or deleted. ArcDayMet requires the use of the program "curl" because of limitations of the version of Python that comes with ArcMap 10.2. The installation steps are as follows:

1. Download the ArcDayMet.pyt file
2. Download the correct version of curl for your computer (http://www.paehl.com/open_source/?download=curl_751_0_ssl.zip).
3. Unzip the curl_751_0_ssl.zip file and extract the curl.exe file from it.
4. Copy both the curl.exe file and the ArcDayMet.pyt files to a location where they won't be altered accidentally such as C:\Users\<your user account>\AppData\Roaming\ESRI\Desktop10.2\ArcToolbox\My Toolboxes
5. Open ArcMap
6. Open ArcToolbox
7. Right-click at top and choose Add Toolbox...
8. From the look in drop down list select the location of your file. If you used the folder suggested above it will be in Toolboxes and then My Toolboxes
9. Select ArcDayMet.pyt and click open
10. Open ArcToolbox again
11. Right-click at top and choose Save Settings and To Default

Usage Overview

The ArcDayMet Toolbox has the following work-flow design:

1. Open a Shape File or GeoDatabase Point Layer in ArcMap with the locations of each place you want to extract weather data for

2. Open the ArcDayMet tool setting the layer, unique point ids, optional group ids and aggregate measures and start and end years and final output file name.

3. Run the tool and wait. Note that this will run in the background and may take some time if the number of points is large.

Please note that running ArcDayMet takes some time and run time will increase with more years and more points. ArcDayMet works by sending data requests to the DayMet website. If too many requests are sent close together it could crash the DayMet server and thus the data pulling process. To avoid server overload and crashes the ArcDayMet tool rests for two seconds between each data request.

Tool Details

The ArcDayMet Toolbox consists of one tool to pull data from the DayMet server.

Extract DayMet Data

The Extract tool gets information for each point in the input layer for the user specified year range. During operation this tool will create a single file for each location which will later be removed.

Input values for this tool are:
- **Point Layer** – Only point layers are permitted and the should not include multi-point features. These are the locations which will be used to extract DayMet data.
- **Point Id Field** - The name of the field with unique values for each point.
- **DayMet Variables** – One or more of the following DayMet variables can be selected:
  - Maximum Temperature
  - Minimum Temperature
  - Shortwave Radiation
  - Vapor Pressure
  - Snow-water Equivalent
  - Precipitation
  - Day Length
- **Start Year** – This is the first year to pull data. It can not be earlier than 1980.
- **End Year** – This is the last year to pull data. The maximum is one year before the current year.
- **Data Processing** – One of two processing options must be selected:
  - Return Raw Data
  - Return Raw Data and Aggregates
- **Group Field** – If Raw Data and Aggregates is selected then all the points are aggregated together by unique combinations of Day, Year and Group Field values.
- **Aggregate Measures** – One or more of the aggregate measures below can be selected. Note that minimum and maximum exclude NULL values but other measures do not.
  - Mean
  - Median
  - Variance
  - Standard Deviation
  - Count
  - Sum
  - Maximum
  - Minimum
- **Output File** – This is the name of the csv file that ArcDayMet will create. If aggregate data output is selected then the output will create two files. The selected file name and the selected file name plus "_aggregate". For example "test.csv" and "test_aggregate.csv".