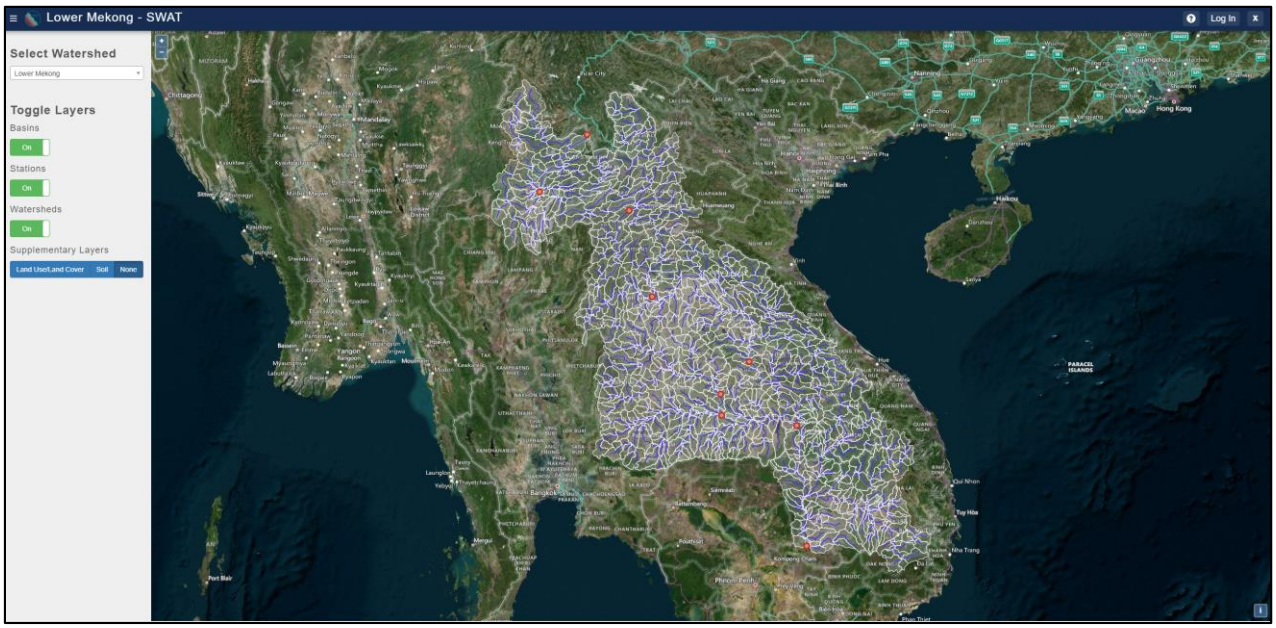
SWAT Data Viewer - User's Guide



Overview

The SWAT Data Viewer was developed to act as a virtual and open access data store for stakeholders and decision-makers to view and download SWAT model inputs and outputs for their area of interest. The app features various spatial and temporal data visualization interfaces (mainly in the form of maps and time-series plot). Unlike many of the SWAT related web applications, this application is completely modular meaning that it can be duplicated, customized and served from any server running the Tethys platform and can display the data from any valid SWAT model.

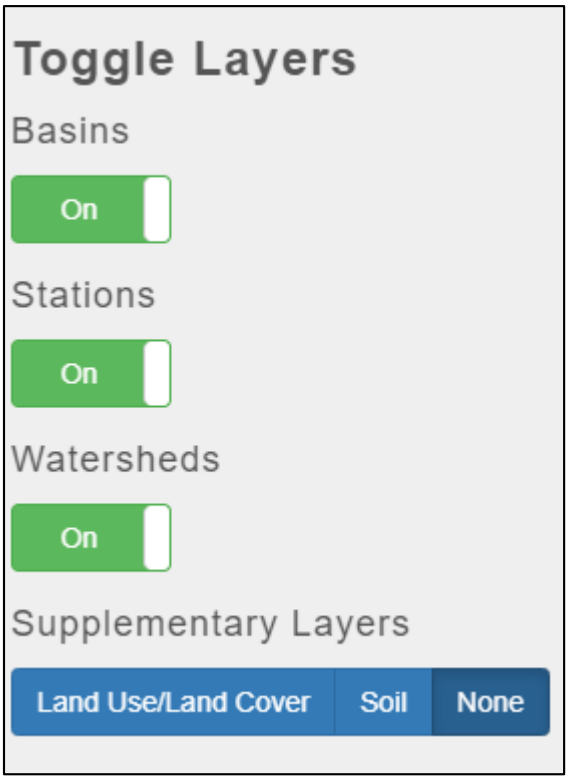
This tutorial will outline the various steps required to set up the app on your own server/computer.

User Instructions

1. Select a watershed/SWAT model to view

In the left navigation pane select a watershed from the "Select Watershed" dropdown menu

After selecting a watershed, the map will automatically update to show the streams and subbasin layers for the selected watershed. You can then use the “Toggle Layers” buttons in the left navigation pane to show/hide different layers (depending on availability of those layers)

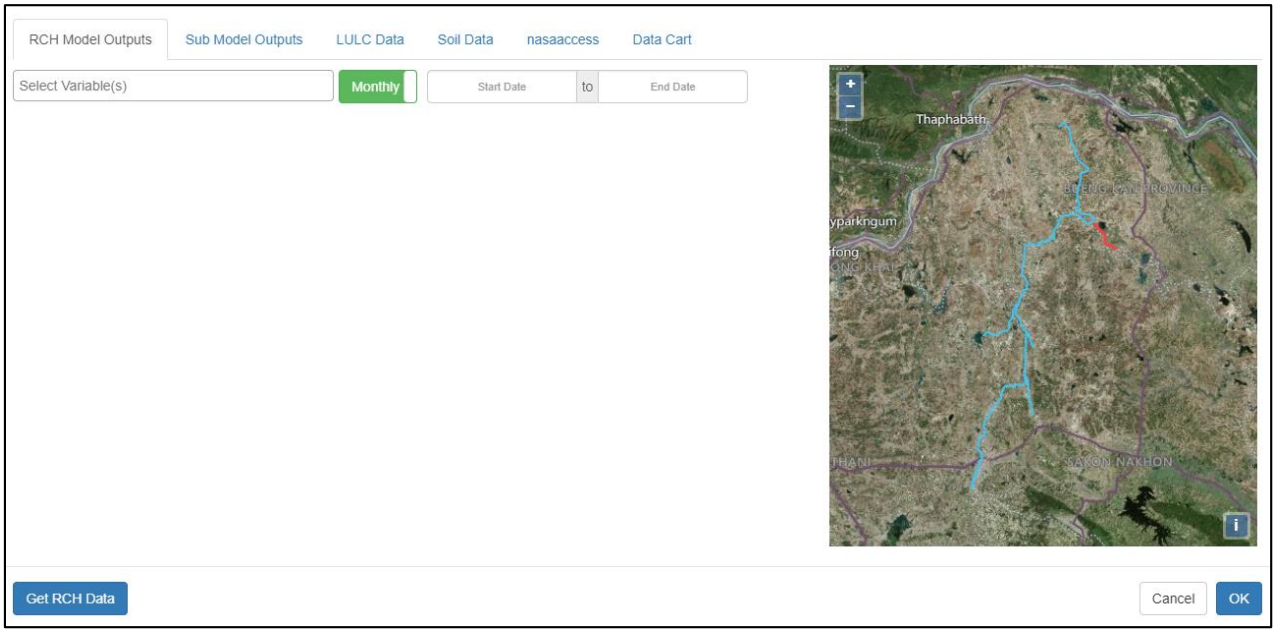


2. Select a stream or subbasin

a. In the main map view, zoom to the stream or subbasin you are interested in and click on the feature

Clicking on a station (red circle) will show a popup with more information

b. Clicking on a map feature will automatically open a new window that can be used for data querying at the selected stream/subbasin



3. Querying/viewing SWAT outputs from the {RCH/SUB} Model Outputs Tabs

a. Select variable(s) to view time series

b. Select a date range

c. Click 

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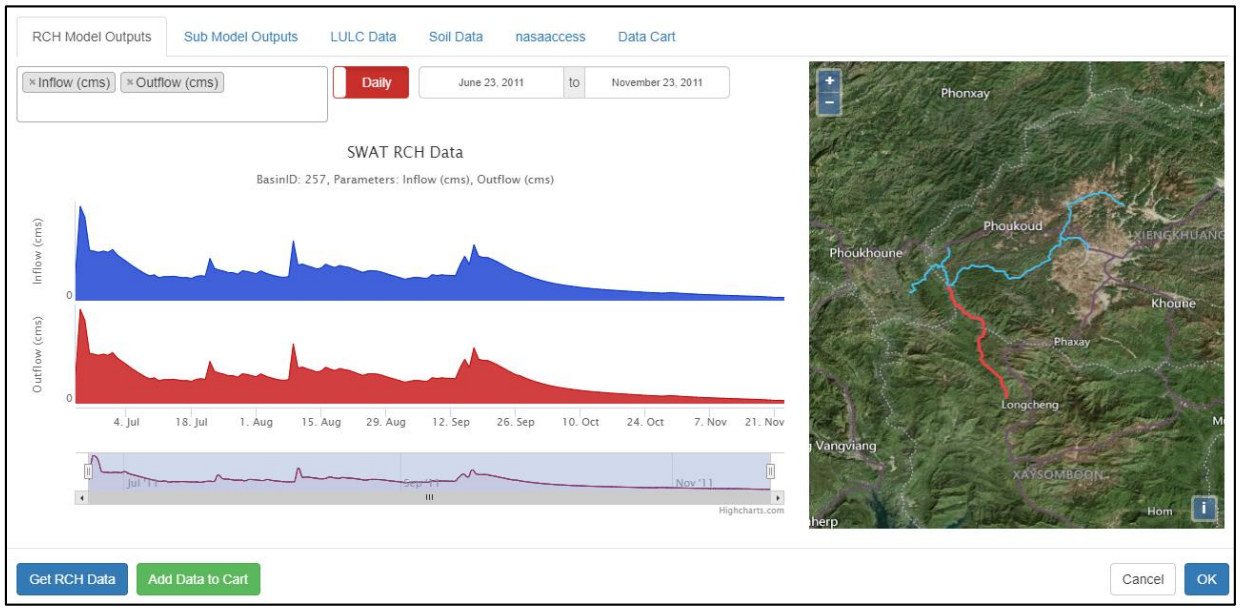
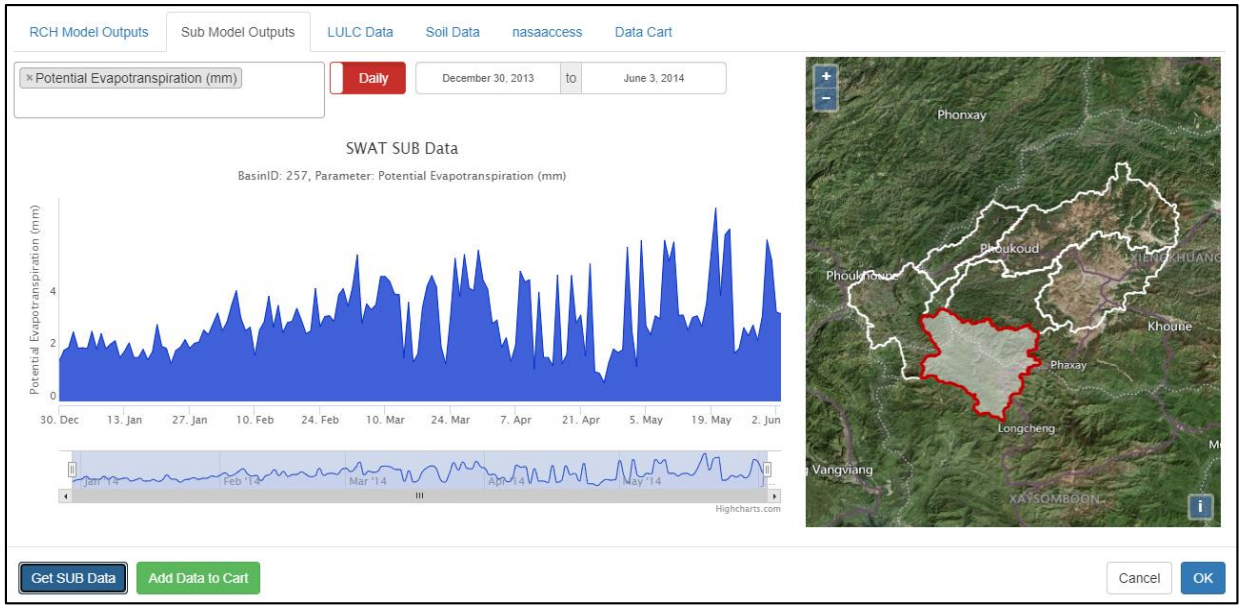
to query data for the watershed/SWAT model, stream, variable(s), and date range you selected

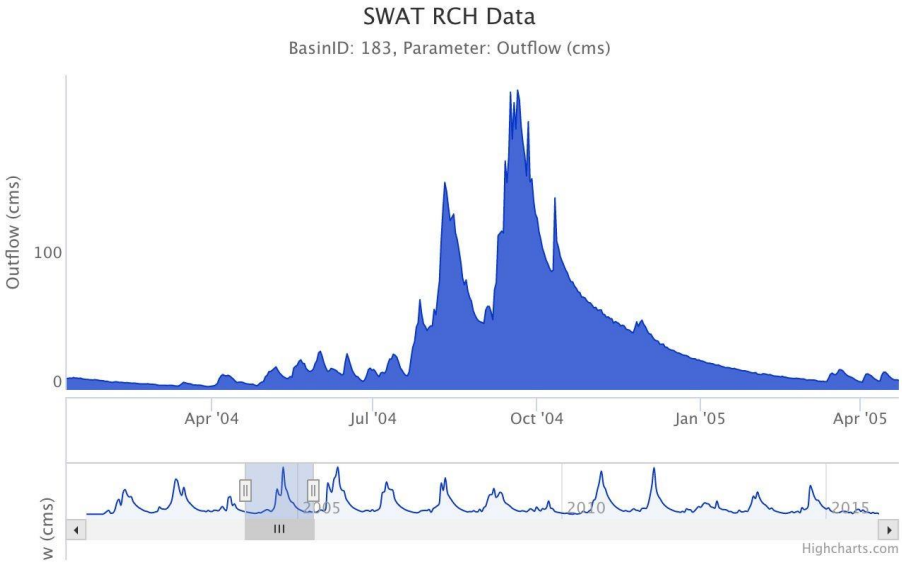
d. Explore time series by toggling between Daily and Monthly data





i. You can zoom to a specific event by adjusting the time slider bar

 that is located below the time series plot



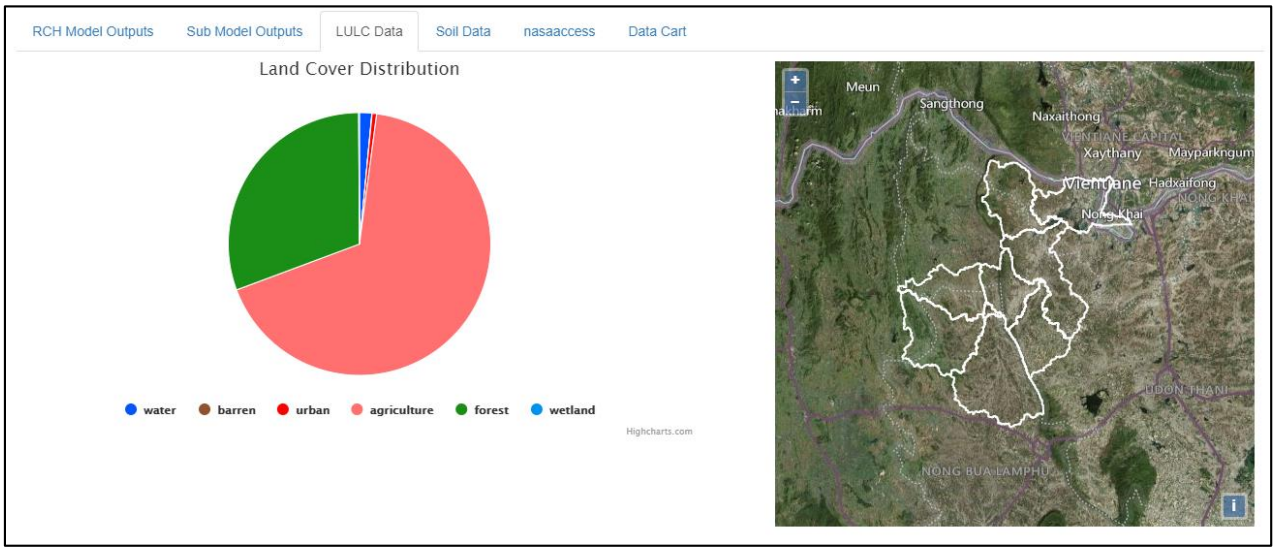
4. Saving data queries to the Data Cart

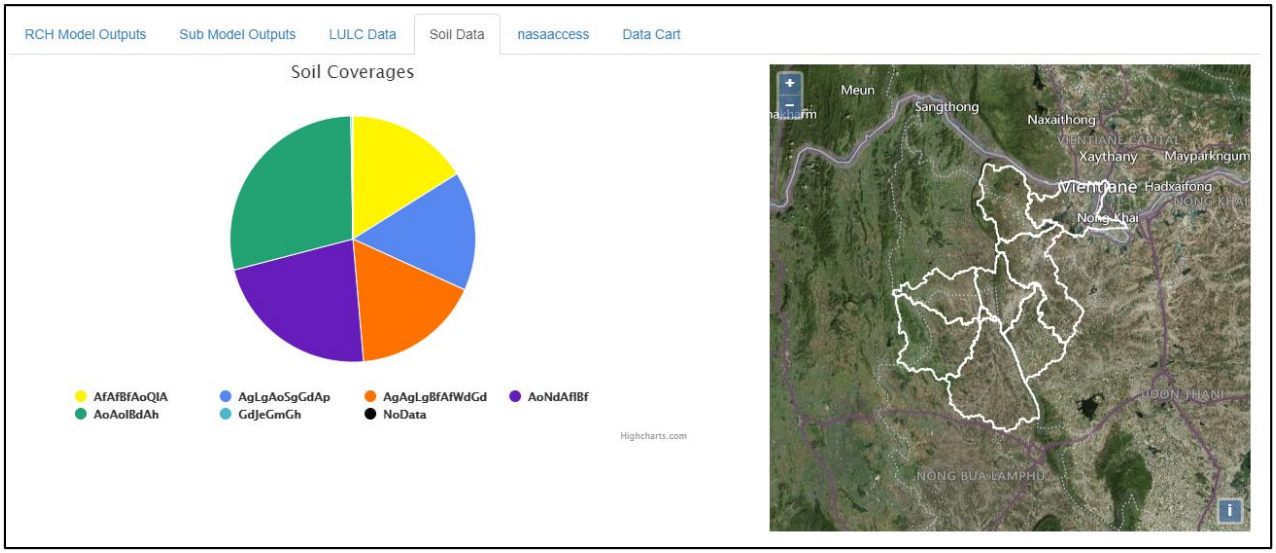
a. If you want to download the time series as a csv file, click the Add Data to Cart button to write the file to your "cart".
   i. When you are finished querying data, navigate to the "Data Cart" tab to download all the data you have added to the cart.

5. Compute land use/land cover and soil coverage percentages in the "{LULC/Soil} Data" tabs

Click the Clip and Compute to clip the lulc/soil raster of the entire watershed to the upstream boundary of the selected stream/subbasin button and to compute the coverage percentages for each unique lulc/soil class within the upstream subbasin boundary

i. Note: The lulc data is separated into classes and subclasses. The initial pie chart shows only the high level classes (i.e. agriculture, forest, etc.). You can "drill down" to see the subclass coverage percentages by clicking on the pie chart section of any of the classes. The first two images below show the class and subclass pie charts highlighting the different agricultural lulc types.





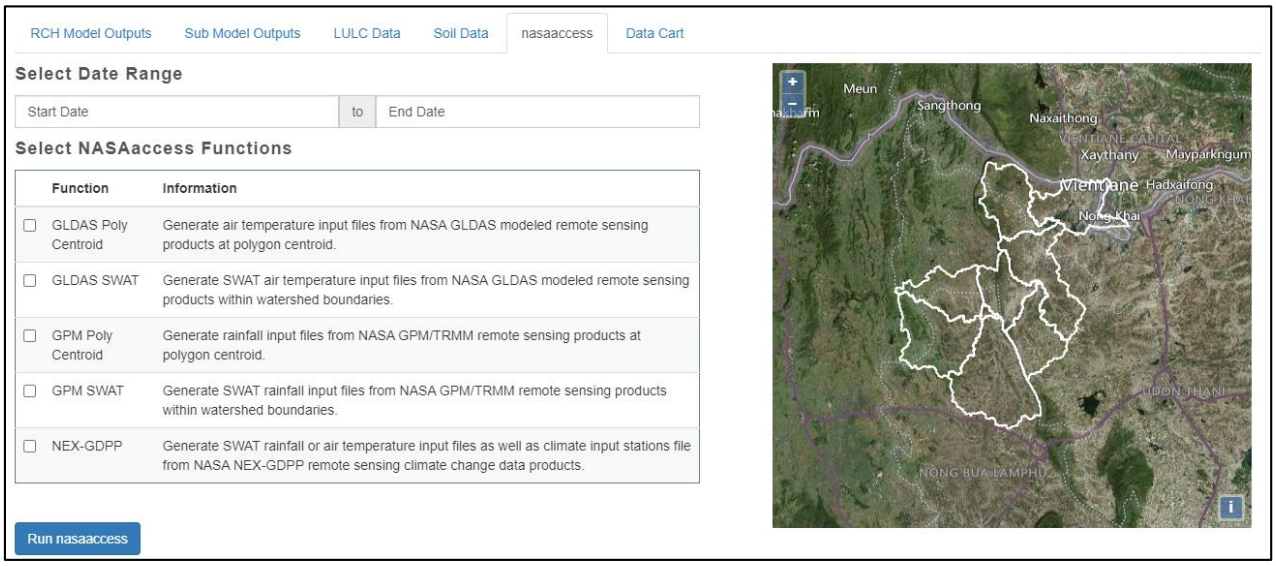
6. Run nasaaccess functions on subsetted watershed boundary

For more information on nasaaccess and the nasaaccess web application, see the “nasaaccess - User’s Guide” tutorial.

The SWAT Data Viewer provides a simple interface for calling the nasaaccess process for the selected upstream subbasin extent.

a. Select a date range

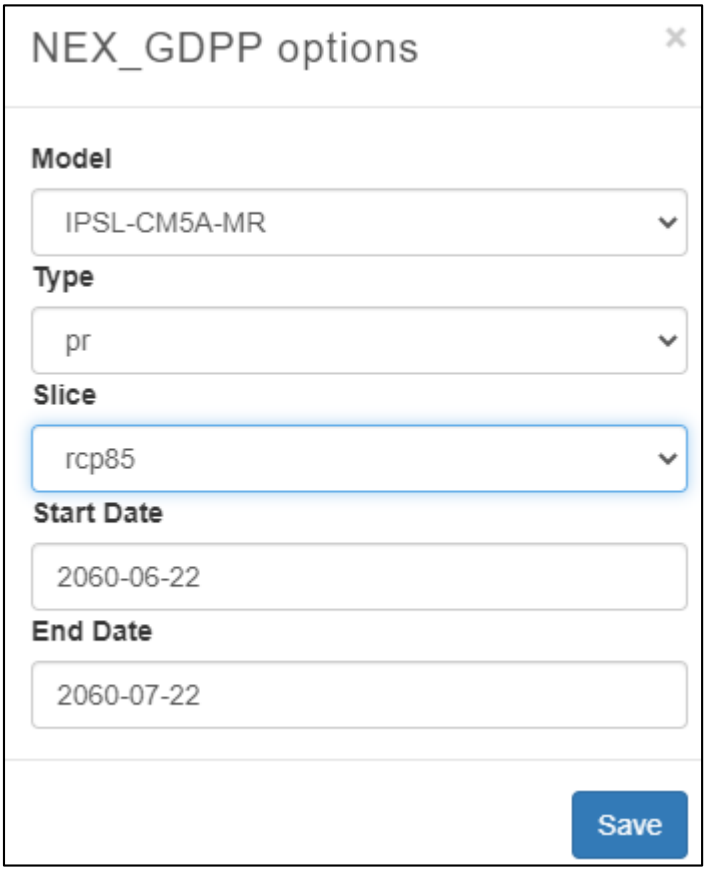
b. Select the nasaaccess functions you want to run



The nasaaccess functions other than NEX-GDPP will take five arguments.

Argument	Description
Start date	First day that the user wants to obtain data for
End date	Last day that the user wants to obtain data for

The NEX-GDPP function needs the following arguments



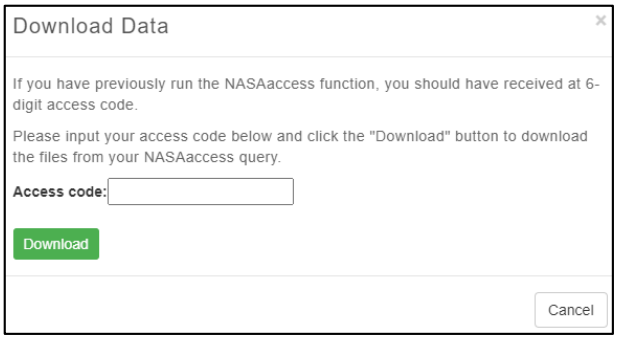
Argument	Description
Start date	First day that the user wants to obtain data for
End date	Last day that the user wants to obtain data for
Model	A climate modeling center and name from the the World Climate Research Programme WCRP global climate projections through the Coupled Model Intercomparison Project 5 CMIP5 (e.g., IPSL-CM5A-MR which is Institut Pierre-Simon Laplace CM5A-MR model).
Type	A flux data type. It's value can be 'pr' for precipitation or 'tas' for air temperature.
Slice	A scenario from the Representative Concentration Pathways. It's value can be 'rcp45' , 'rcp85', or 'historical'.

c. Click 

d. Submit your email address

i. Depending on the size of the boundary, date range, and the number of functions you select, the nasaaccess process may take some time. Your email will be used to notify you when your data is ready to download.

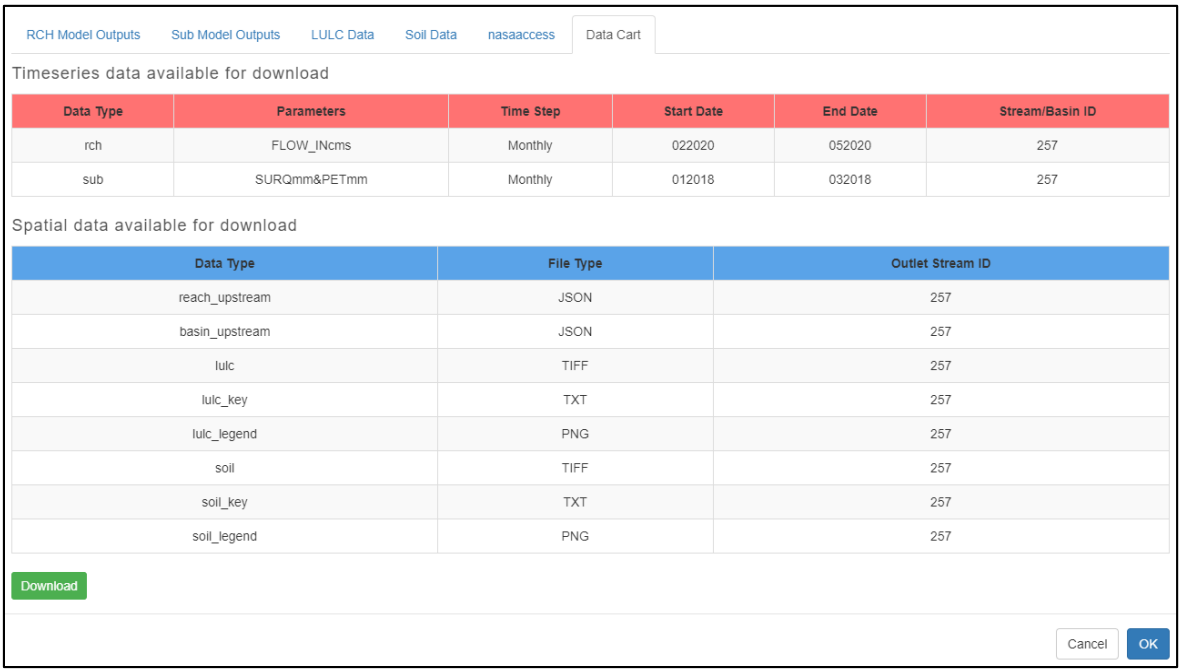
e. Follow the link in the email and download your data from the application by clicking on any of the subbasin/stream, navigate to nasaaccess tab and click Download Data button. Enter the code that you received in the email and click "Download"



7. Download spatial and time-series data for further analysis

All of the spatial data that you've created during your session (upstream stream reaches, upstream subbasins, upstream lulc, and upstream soil files) and any of the time series queries that you elected to add to your cart were saved to your "Data Cart".

a. Navigate to the "Data Cart" tab



b. Verify that all the data you want to download is listed there

c. Click