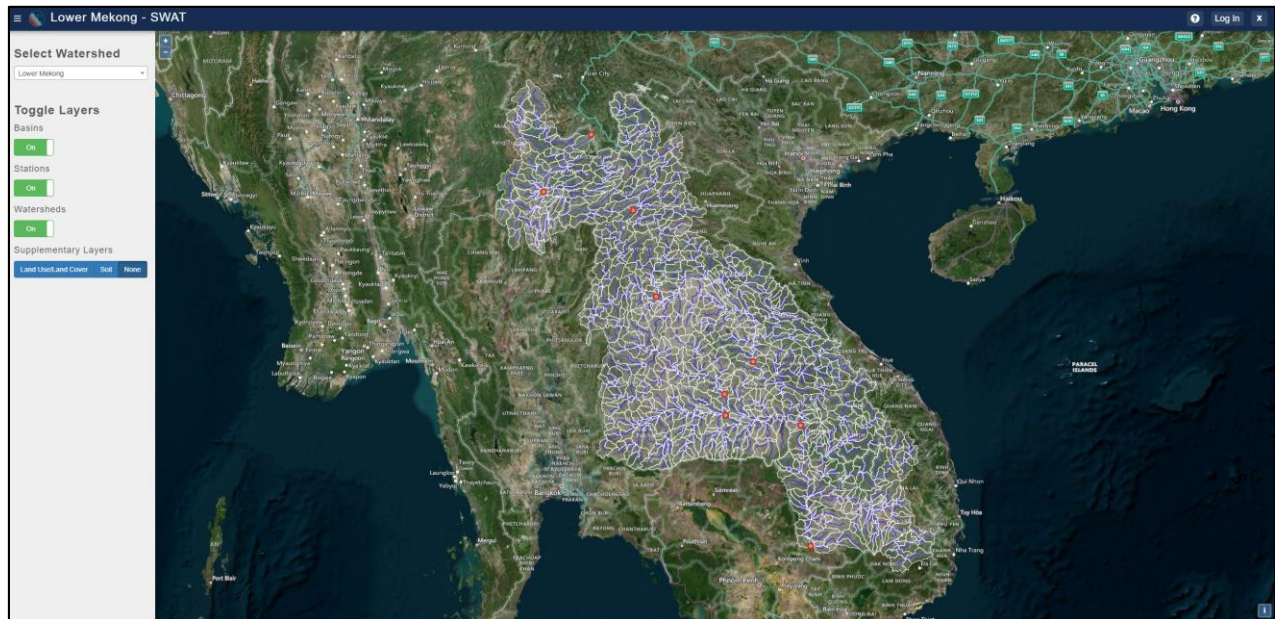


SWAT Data Viewer - User's Guide



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

Select Watershed

Lower Mekong

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)

Toggle Layers

Basins

On

Stations

On

Watersheds

On

Supplementary Layers

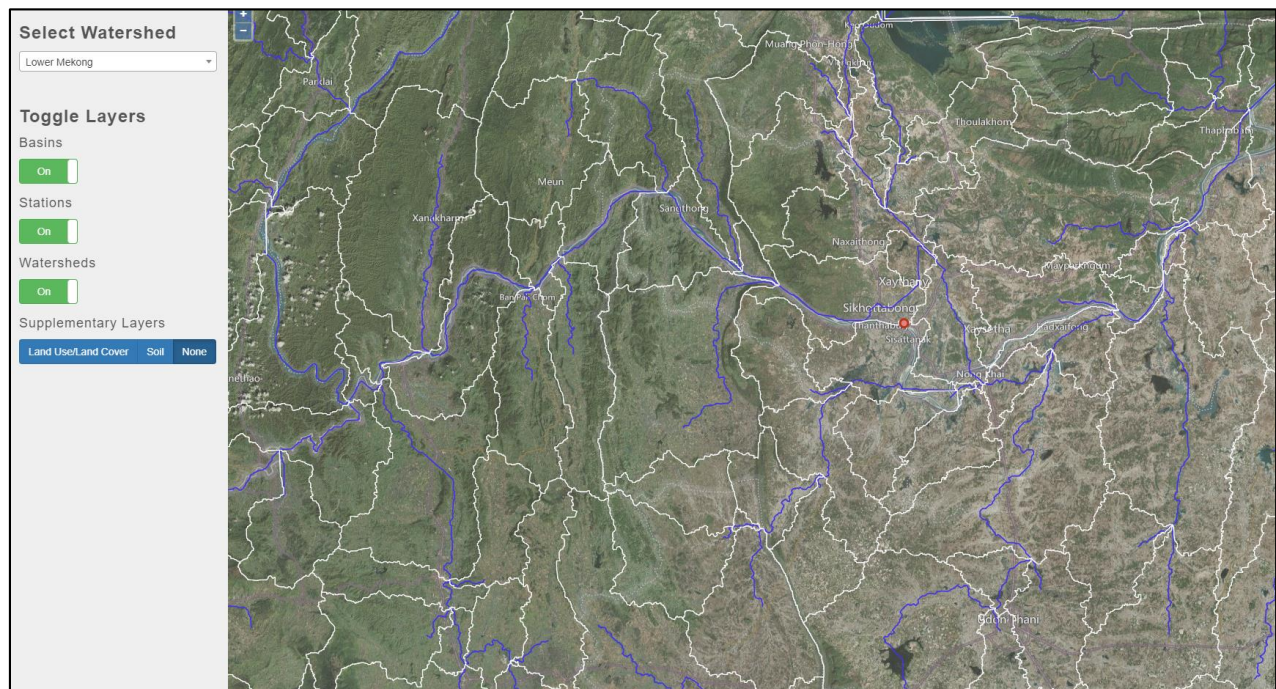
Land Use/Land Cover

Soil

None

2. Select a stream or subbasin

- 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

RCH Model Outputs Sub Model Outputs LULC Data Soil Data nasaaccess Data Cart

Select Variable(s) Monthly Start Date to End Date

Get RCH Data Cancel OK

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

- a. Select variable(s) to view time series

Select Variable(s)

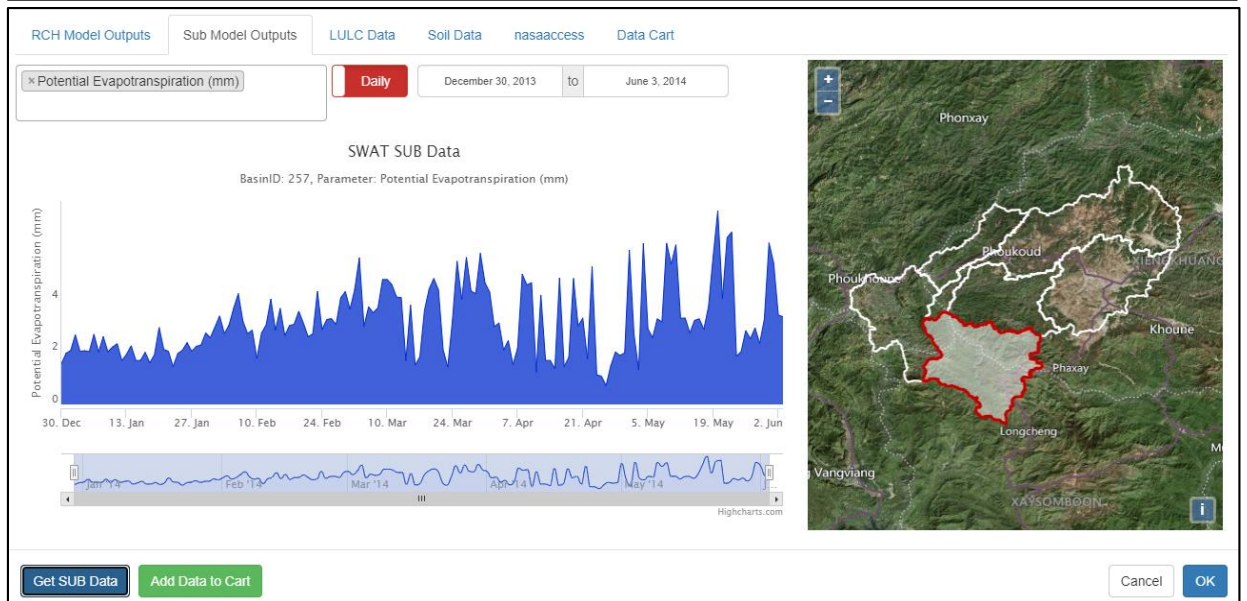
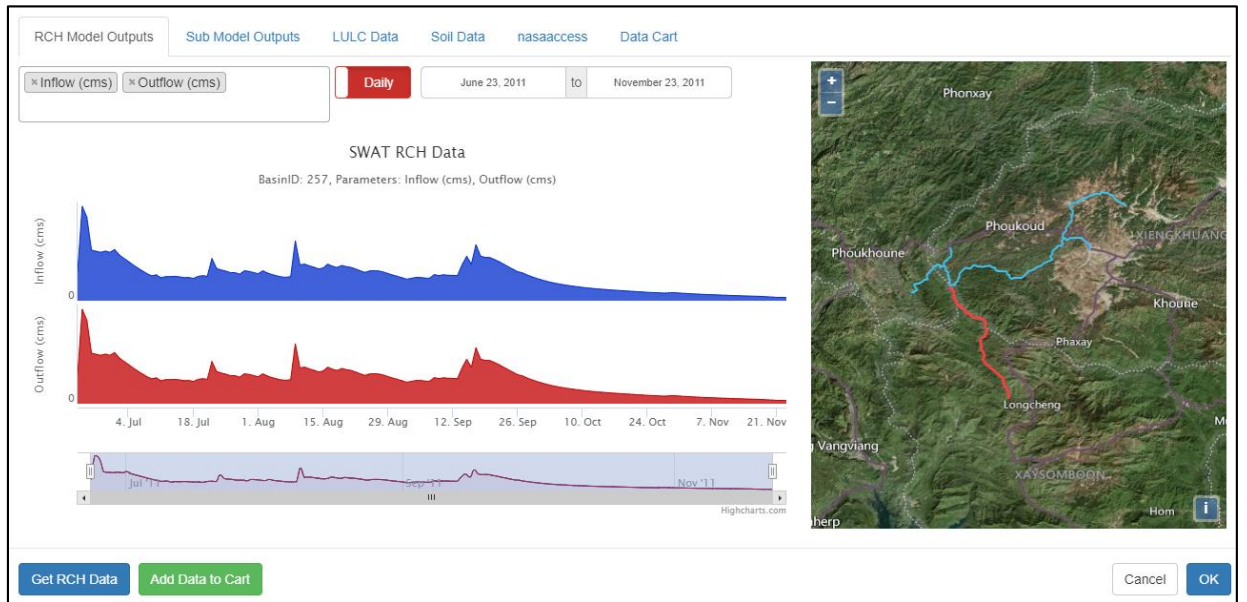
- b. Select a date range

Start Date

to

End Date

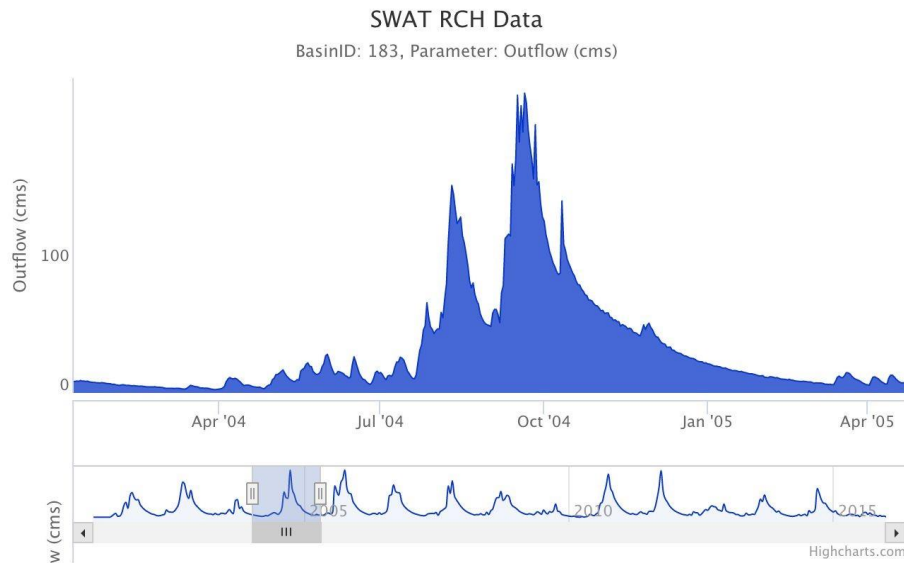
- c. Click [Get RCH Data](#) / [Get SUB Data](#) to query data for the watershed/SWAT model, stream, variable(s), and date range you selected
- d. Explore time series by toggling between Daily and Monthly data



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



that is located below the time series plot



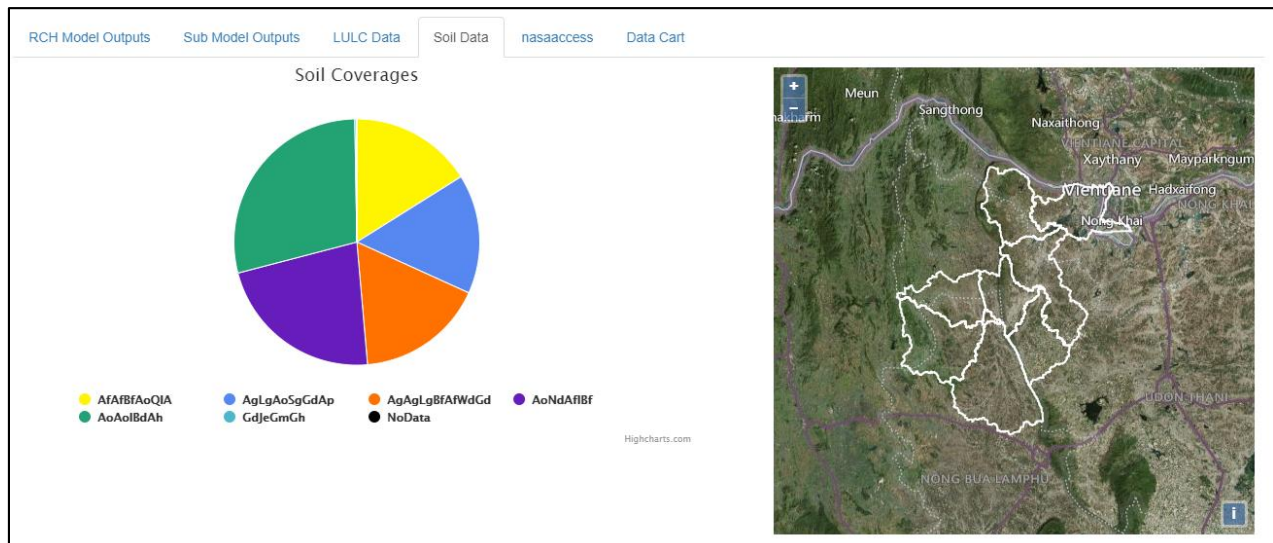
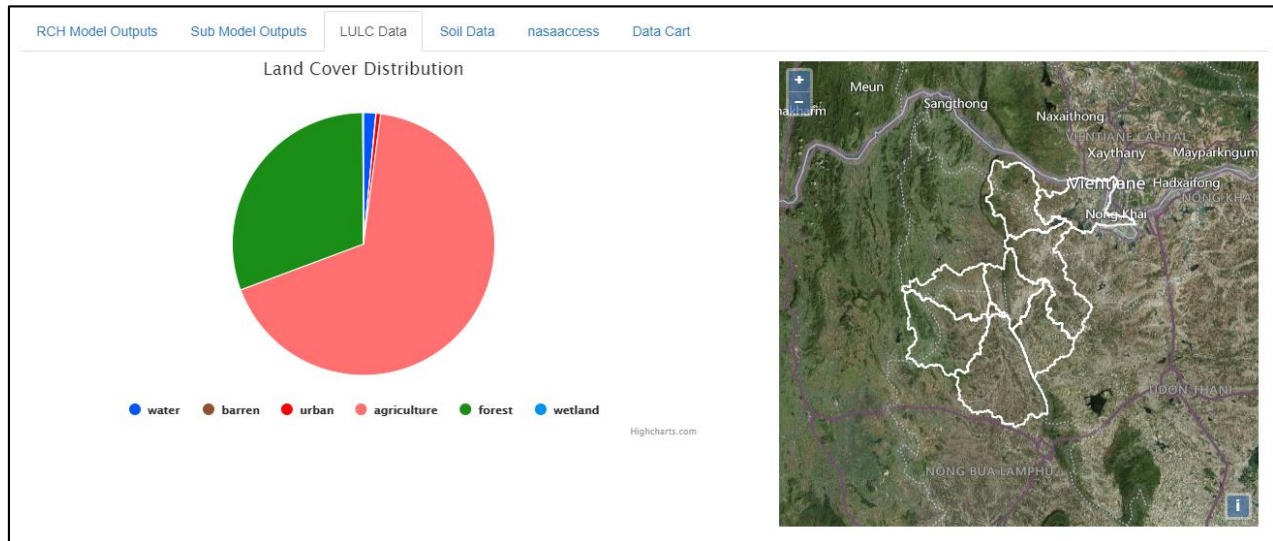
4. Saving data queries to the Data Cart

- 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 subsetting 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.

- Select a date range

Select Date Range

| | | |
|------------|----|----------|
| Start Date | to | End Date |
|------------|----|----------|

- Select the nasaaccess functions you want to run

[RCH Model Outputs](#)
[Sub Model Outputs](#)
[LULC Data](#)
[Soil Data](#)
[nasaaccess](#)
[Data Cart](#)

Select Date Range

Start Date
to
End Date

Select NASAaccess Functions

| Function | Information |
|--|--|
| <input type="checkbox"/> GLDAS Poly Centroid | Generate air temperature input files from NASA GLDAS modeled remote sensing products at polygon centroid. |
| <input type="checkbox"/> GLDAS SWAT | Generate SWAT air temperature input files from NASA GLDAS modeled remote sensing products within watershed boundaries. |
| <input type="checkbox"/> GPM Poly Centroid | Generate rainfall input files from NASA GPM/TRMM remote sensing products at polygon centroid. |
| <input type="checkbox"/> GPM SWAT | Generate SWAT rainfall input files from NASA GPM/TRMM remote sensing products within watershed boundaries. |
| <input type="checkbox"/> NEX-GDPP | Generate SWAT rainfall or air temperature input files as well as climate input stations file from NASA NEX-GDPP remote sensing climate change data products. |

Run nasaaccess

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

NEX_GDPP options

Model

IPSL-CM5A-MR

Type

pr

Slice

rcp85

Start Date

2060-06-22

End Date

2060-07-22

Save

| 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 [Run nasaaccess](#)
- 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”

Download Data

If you have previously run the NASAaccess function, you should have received a 6-digit access code.

Please input your access code below and click the "Download" button to download the files from your NASAaccess query.

Access code:

Download

Cancel

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

RCH Model OutputsSub Model OutputsLULC DataSoil DatanasaaccessData Cart

Timeseries data available for download

| Data Type | Parameters | Time Step | Start Date | End Date | Stream/Basin ID |
|-----------|--------------|-----------|------------|----------|-----------------|
| rch | FLOW_INcms | Monthly | 022020 | 052020 | 257 |
| sub | SURQmm&PETmm | Monthly | 012018 | 032018 | 257 |

Spatial data available for download

| Data Type | File Type | Outlet Stream ID |
|----------------|-----------|------------------|
| reach_upstream | JSON | 257 |
| basin_upstream | JSON | 257 |
| lulc | TIFF | 257 |
| lulc_key | TXT | 257 |
| lulc_legend | PNG | 257 |
| soil | TIFF | 257 |
| soil_key | TXT | 257 |
| soil_legend | PNG | 257 |

Download

CancelOK

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