NASA Satellite-based Earth Observation Systems and Hydrological Modeling Enhance Capacity Building in the Lower Mekong River Basin

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GLDASpolyCentroid
Generate air temperature input files as well as air temperature stations file from NASA GLDAS remote sensing products.

GPMpolyCentroid
Generate rainfall input files as well as rain station file from NASA GPM remote sensing products.

Downloading and reformatting tool for NASA Earth observation data products
Mohammed et al. (2018)

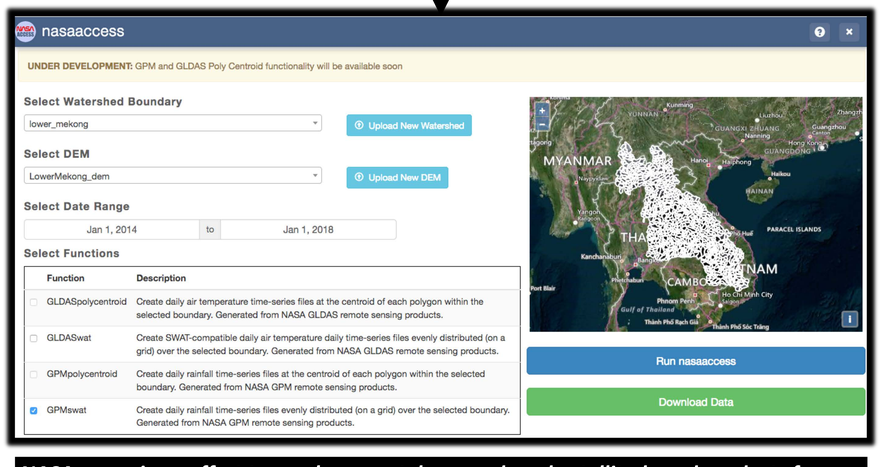
GLDASwat
Generate SWAT air temperature input files as well as air temperature stations file from NASA GLDAS remote sensing products.

GPMswat
Generate SWAT rainfall input files as well as rain stations file from NASA GPM remote sensing products.

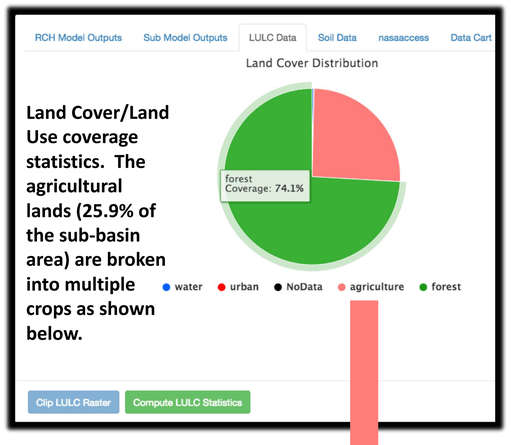
HIGHLIGHTS

- SWAT online & NASAaccess Tethys web apps and R library package were developed for hydroclimatic applications.
- The web apps presented are modular and can be hosted anywhere (public or private servers).
- The tools presented provide easy access and retrieval capabilities to climate data for any watershed formatted to be compatible with SWAT or any other hydrological model.
- The Web apps presented address needs for SWAT easy access and visualization functionalities.
- The benefit of this work is seen on bridging the gap for non-technically trained stakeholders and decision makers charged with water and climate management decisions.

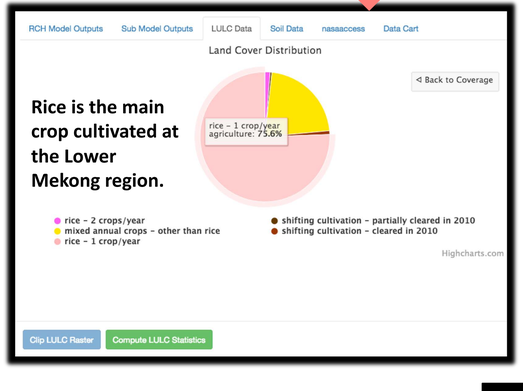
NASAaccess is a web app and R library package developed to access, process, format and obtain climate data from NASA servers for any watershed.



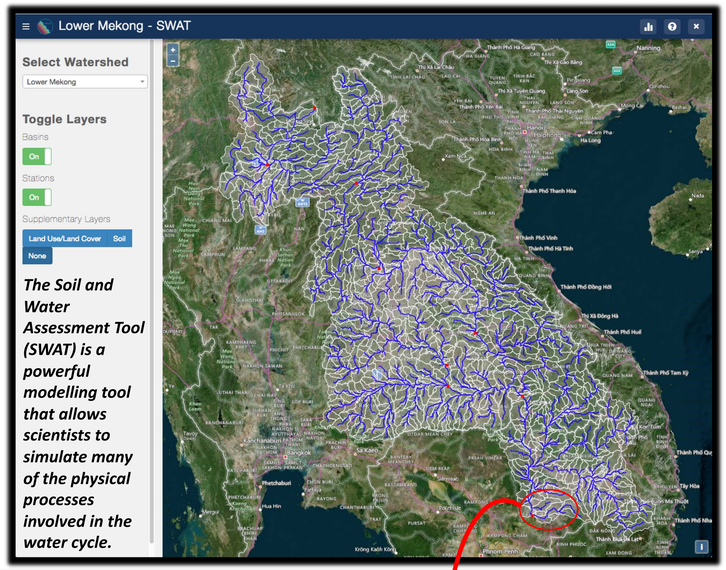
NASAaccess is an effort to employ remotely-sensed, and satellite-based products for hydrological modeling experiments.



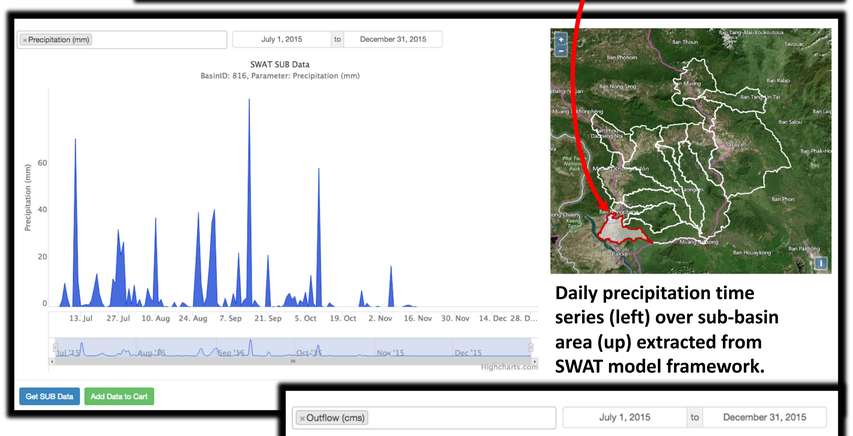
Land Cover/Land Use coverage statistics. The agricultural lands (25.9% of the sub-basin area) are broken into multiple crops as shown below.



Rice is the main crop cultivated at the Lower Mekong region.

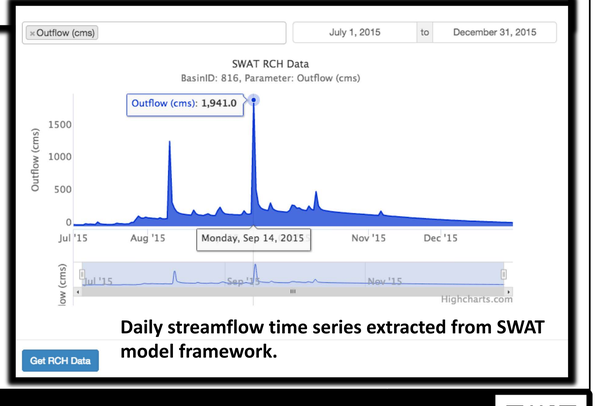


The Soil and Water Assessment Tool (SWAT) is a powerful modelling tool that allows scientists to simulate many of the physical processes involved in the water cycle.



Daily precipitation time series (left) over sub-basin area (up) extracted from SWAT model framework.

SWAT online is a web visualization software created from a set of modular web applications that can be duplicated, customized, and run by any organization or individual interested in visualizing and sharing data from SWAT.



Daily streamflow time series extracted from SWAT model framework.

Mohammed, I. N., Bolten, J., Srinivasan, R., & Lakshmi, V. (2018). Improved hydrological decision support system for the Lower Mekong River Basin using satellite-based earth observations. *Remote Sensing, 10*(6), 885. https://doi.org/10.3390/rs10060885

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