

National Aeronautics and
Space Administration

EARTHDATA

From Space to Solutions: Services for SWOT Hydrology Data

30 July 2025

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The Physical Oceanography Distributed Active Archive Center (PO.DAAC)



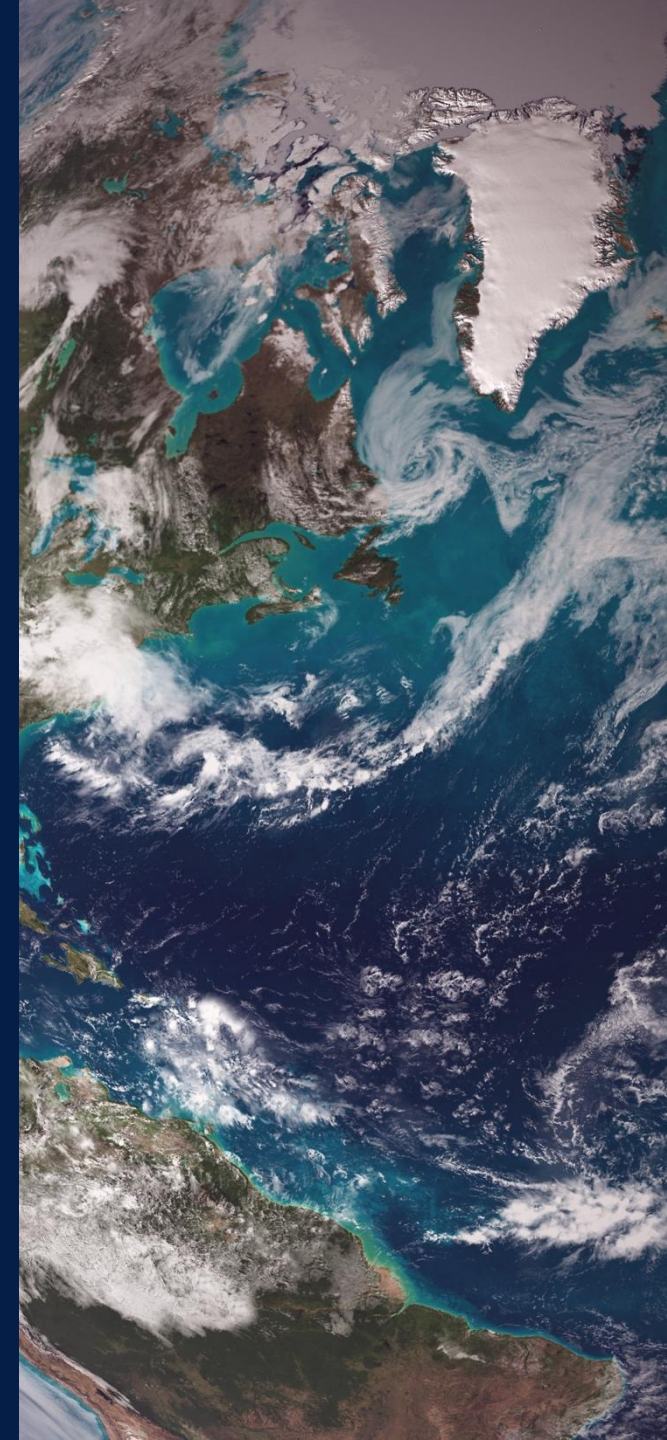
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Brief PO.DAAC & SWOT Introduction (Nikki Tebaldi)

Hydrocron API (Nikki Tebaldi)

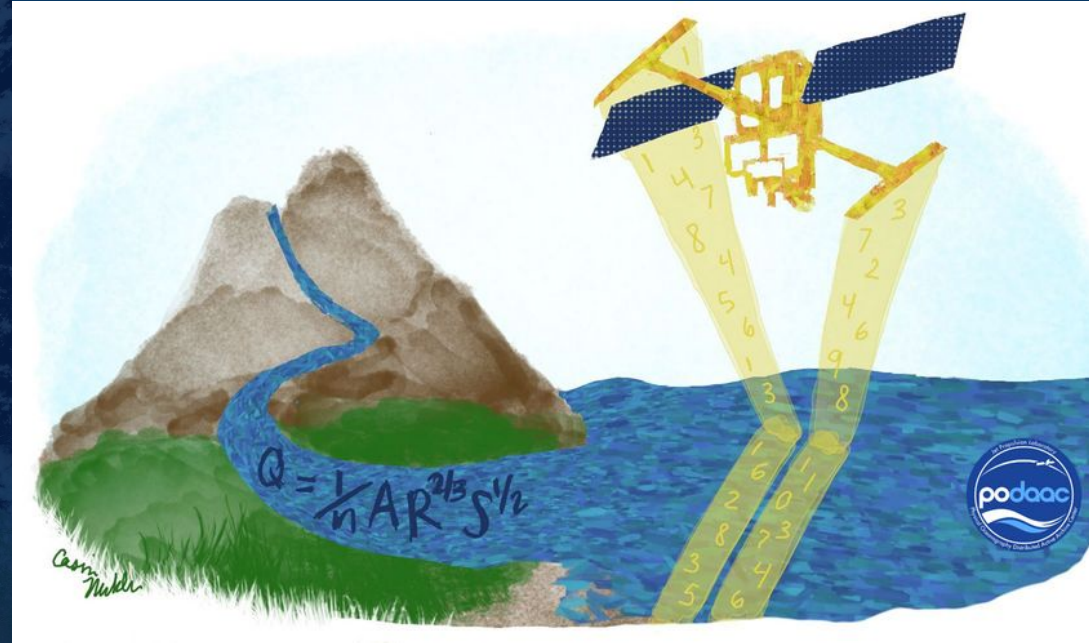
USGS WISP (Merritt Harlan)

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PO.DAAC and SWOT

Overview

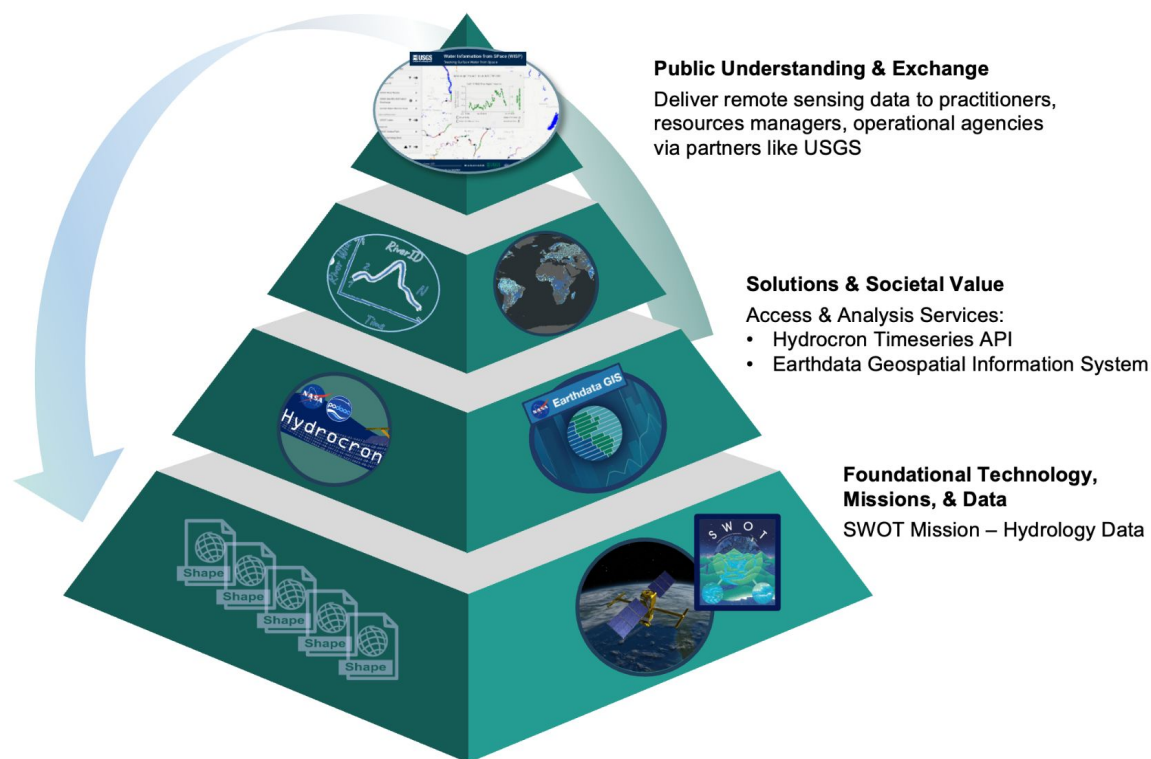


About PO.DAAC

<https://podaac.jpl.nasa.gov/>



- Physical Oceanography Distributed Active Archive Center (PO.DAAC)
- NASA Archive for Oceanography & Terrestrial Hydrosphere Data
- Data publication, access, & user support



Our Missions

ADEOS-II ▪ AQUA ▪
AQUARIUS/SAC-D ▪
COWVR-TEMPEST ▪
CYGNSS ▪ ECCO ▪ GEOS-3
▪ GHRSSST ▪ GRACE ▪
GRACE-FO ▪
ISS-RAPIDSCAT ▪ JASON 1
▪ JASON 3 ▪ LOCSS ▪
MEASURES-CCMP ▪
MEASURES-MUR ▪
MEASURES-PRE-SWOT ▪
MEASURES-SSH ▪ NSCAT ▪
OMG ▪ OPERA ▪
OSTM-JASON 2 ▪
QUIKSCAT ▪ S-MODE ▪
S-NPP ▪ SAILDRONE ▪
SEASAT ▪ SENTINEL-6 ▪
SMAP ▪ SPURS ▪ **SWOT** ▪
TERRA ▪
TOPEX-POSEIDON



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About SWOT data at PO.DAAC



NASA
EARTHDATA
earthdata.nasa.gov



PO.DAAC is the NASA data archive and distribution of SWOT Mission data, both **low rate (LR)** and **high rate (HR) data** products.

Relevant to **Oceanography**, **Terrestrial Hydrology**, **Coastal** user communities



Ocean



Hydro



Coast

Access includes **download**, **in-cloud** (AWS) direct data access, and **data services**



Select HR Products Available:

- **L2_HR_PIXC** Water Mask Pixel Cloud NetCDF
- **L2_HR_PIXCVec** Pixel Cloud Vector Attribute NetCDF
- **L2_HR_Raster** Raster NetCDF
- **L2_HR_RiverSP** River Vector Shapefile
- **L2_HR_LakeSP** Lake Vector Shapefile
- **L2_HR_RiverAvg** Cycle Average River Vector Shapefile
- **L2_HR_LakeAvg** Cycle Average Lake Vector Shapefile



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SWOT_L2_RiverSP (shapefile)

Description: Vectors of river reaches (~10 km long) and nodes (~200 m spacing) in prior river database.

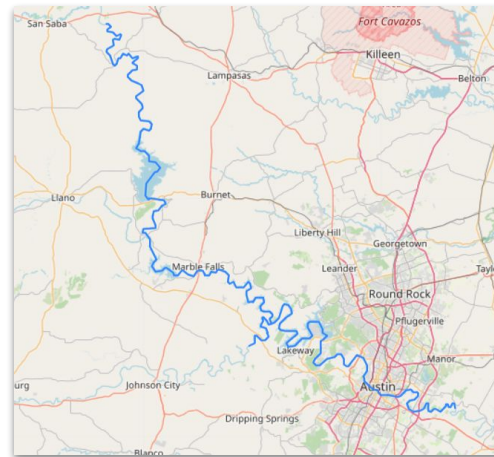
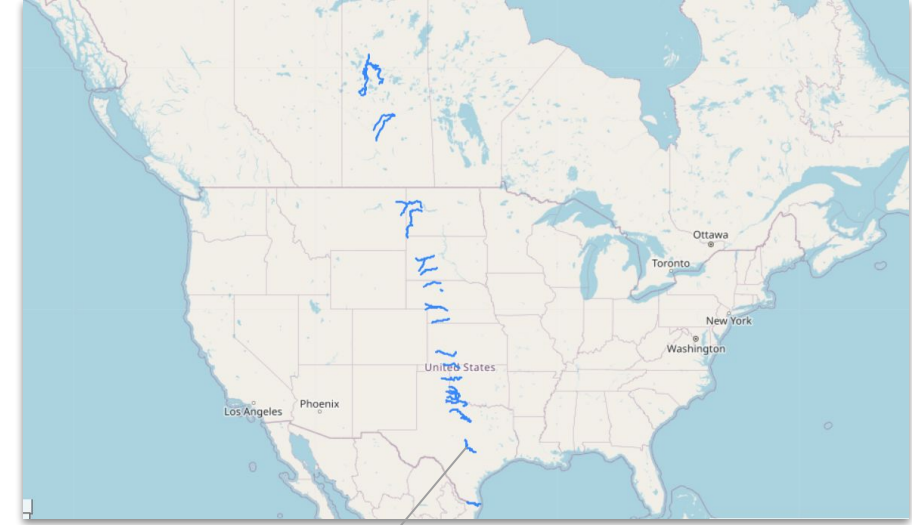
Extent Format: continent-scale swath

Variables: water surface elevation, slope, width, derived discharge*

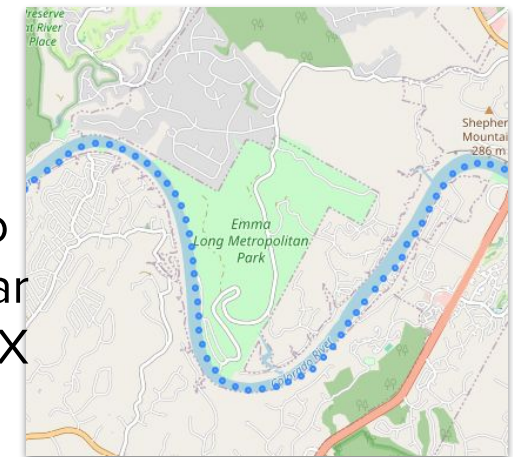
Subcollections:

- SWOT_L2_RiverSP_reach
- SWOT_L2_RiverSP_node

*forthcoming



Reach file



Node file



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SWOT_L2_LakeSP (shapefile)

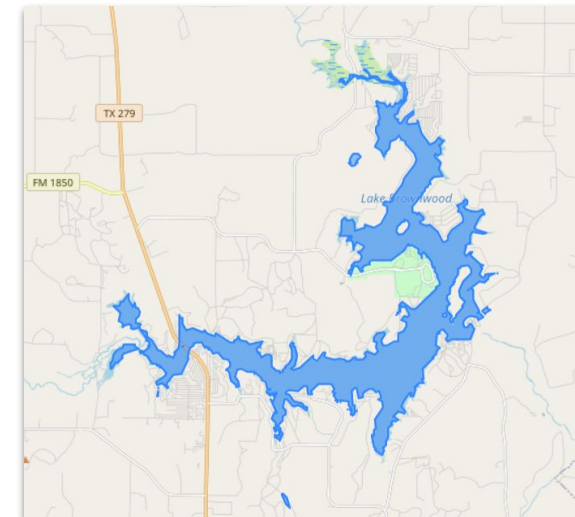
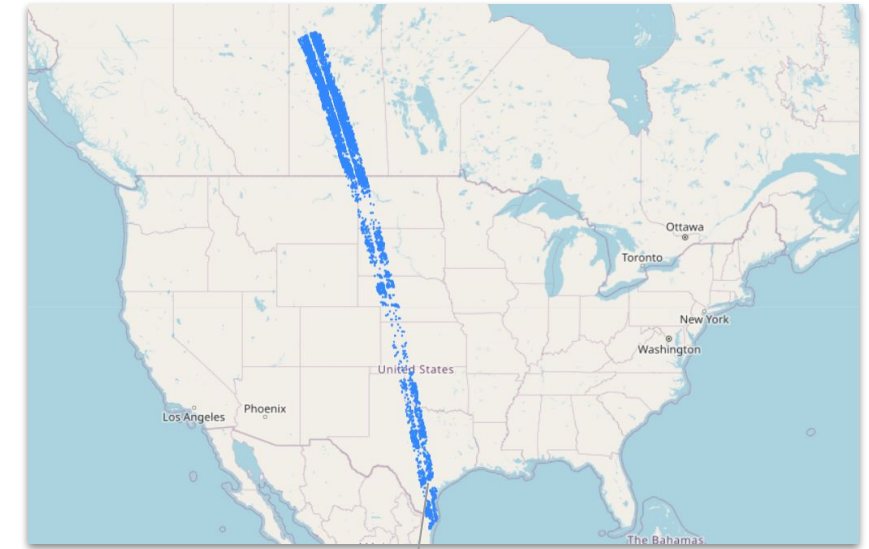
Description: Vectors of lakes in prior lake database and detected features not in the prior river or lake databases.

Extent Format: continent-scale swath

Select Variables: water surface elevation, area, derived storage change

Subcollections:

- SWOT_L2_LakeSP_obs
- SWOT_L2_LakeSP_prior
- SWOT_L2_LakeSP_unassigned



Lake
Brownwood,
TX



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Hydrocron API

Nikki Tebaldi

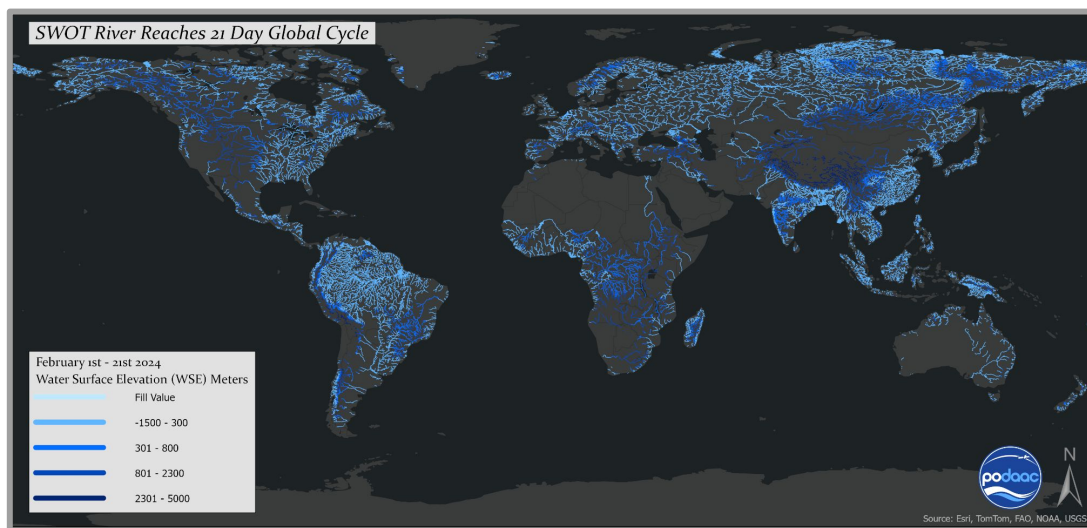
A time-series API for the SWOT HR data products

Hydrocron

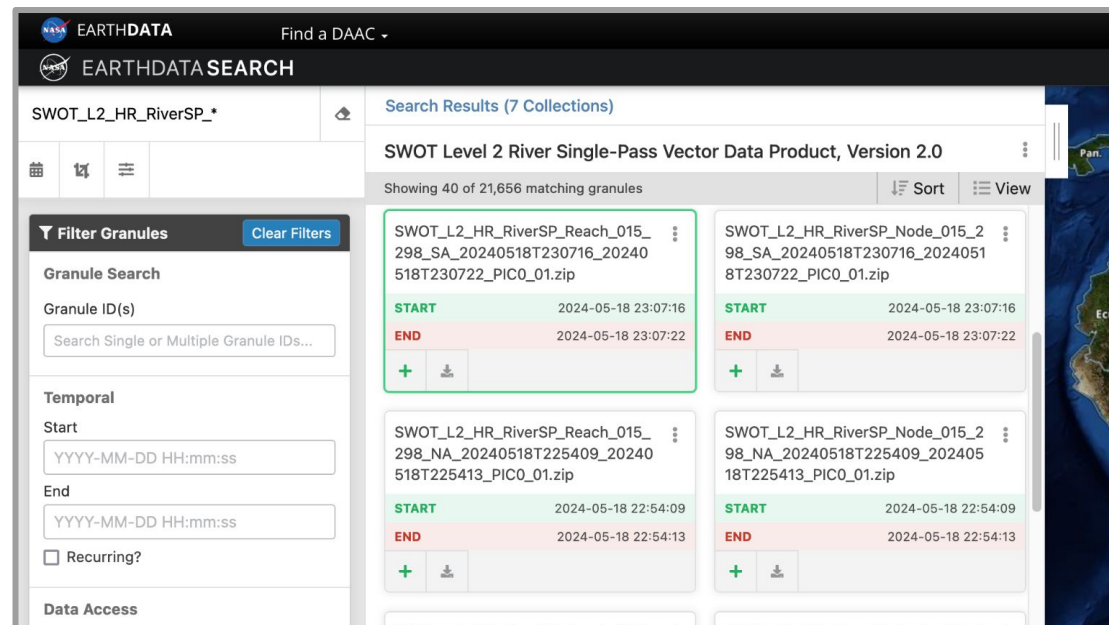


Overview

SWOT Hydrology Data Products



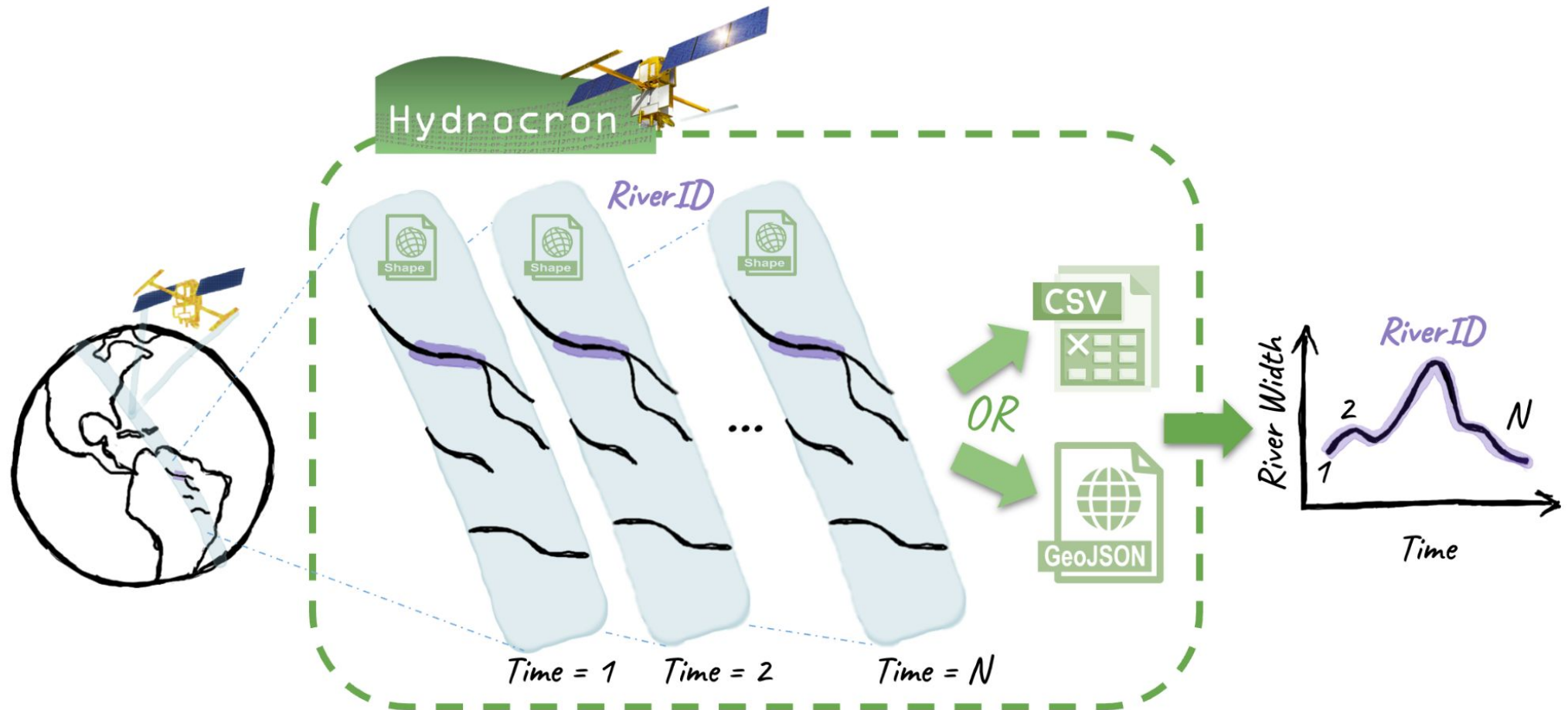
SWOT river and lake data products are distributed as shapefiles where each file contains all features for a continent at one cycle pass.



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Overview

Hydrocron API to retrieve SWOT Hydrology data products



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Overview

DATABASE

Ingests SWOT granules for river reaches, river nodes, and prior lakes.

Ingests the most recent forward processing CRID (PICO-X) and prioritizes the reprocessing CRID (PGC0) when overwriting data.



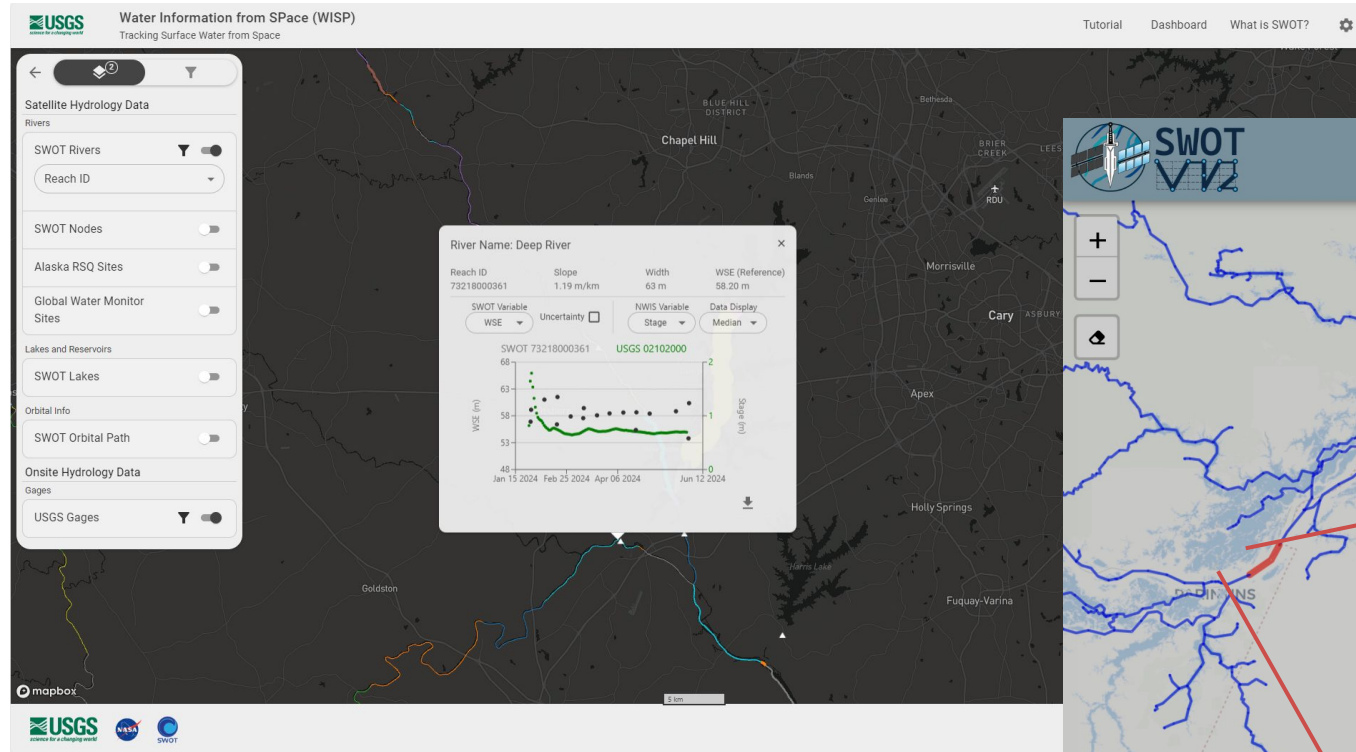
- Average response size: 232 bytes
- Average response time: 1,828.6 milliseconds
- Average number of hits: 107.5

API

1. Receives user requests.
2. Queries the Hydrocron database.
3. Formats the query results.
4. Returns the query results as a response to the user.

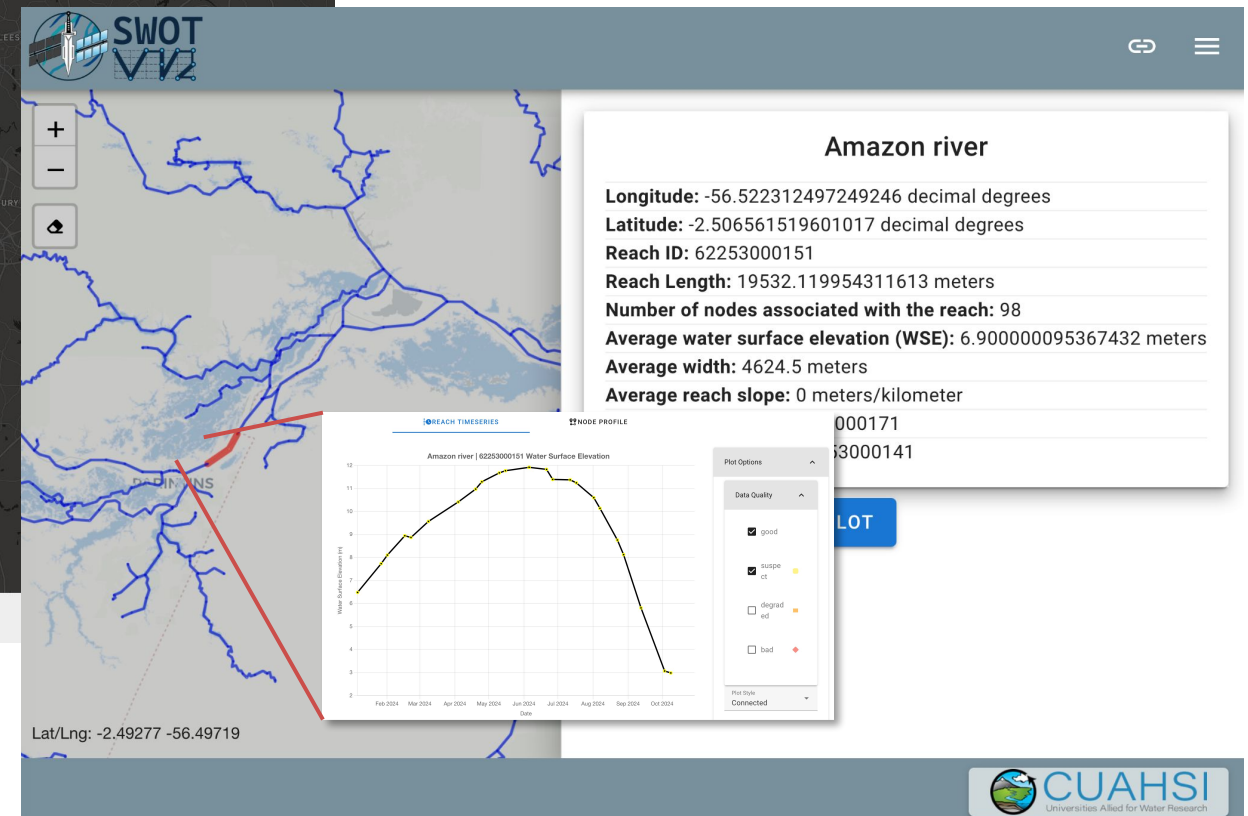


Hydrocron powers web apps & dashboards



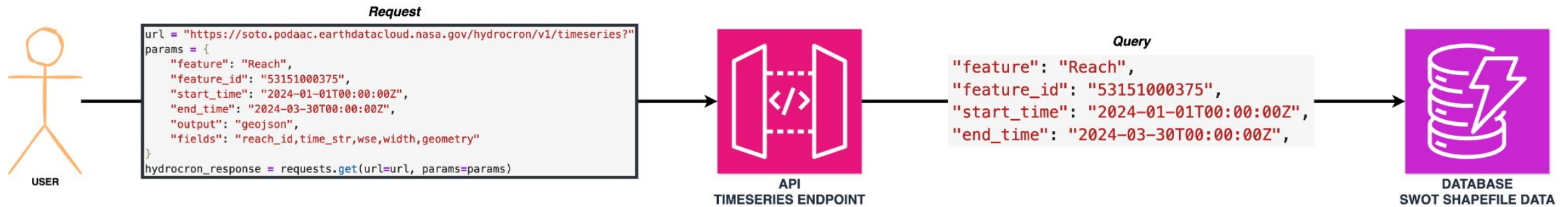
<https://apps.usgs.gov/wisp>

<https://swotvis.cuahsi.io/>



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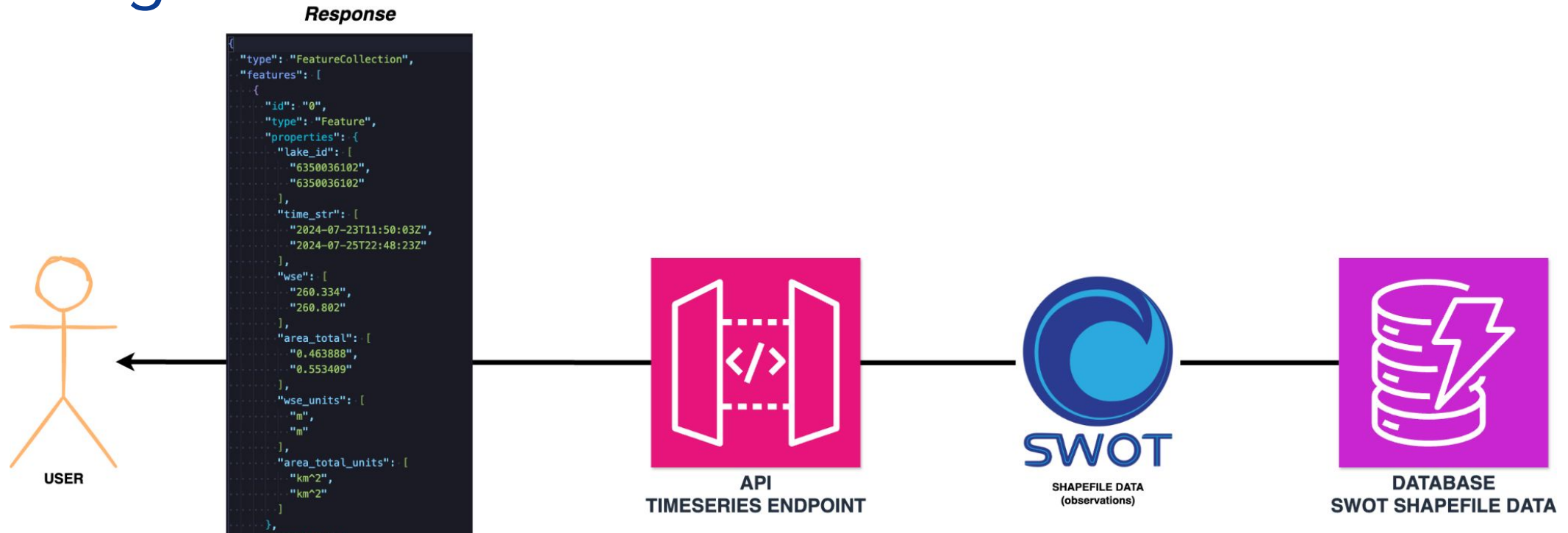
Usage



1. The user queries the Hydrocron API with specific query parameters
2. The API uses the feature, feature_id, start_time, and end_time parameters to query the Hydrocron database



Usage



3. The database query returns results with the SWOT shapefile data.
4. The API formats the query results using the fields and output parameters.
5. The API returns a response to the user.



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Request

URL

<https://soto.podaac.earthdatacloud.nasa.gov/hydrocron/v1/timeseries?>

Request Parameters

feature	feature_id
start_time	output
end_time	compact
fields	collection_name

<https://podaac.github.io/hydrocron/timeseries.html#request-parameters>



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Request

Navigate to results via a link

https://soto.podaac.earthdatacloud.nasa.gov/hydrocron/v1/time-series?feature=PriorLake&feature_id=6350036102&start_time=2024-07-20T00:00:00Z&end_time=2024-07-26T00:00:00Z&fields=lake_id,time_str,wse,area_total,quality_f,collection_shortcode,crid,PLD_version,range_start_time&output=geojson



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```
status: "200 OK"
time: 449.468
hits: 2
▼ results:
  csv: ""
  ▼ geojson:
    type: "FeatureCollection"
    ▼ features:
      ▼ 0:
        id: "0"
        type: "Feature"
        ▼ properties:
          lake_id: "6350036102"
          time_str: "2024-07-23T11:50:03Z"
          wse: "260.334"
          area_total: "0.463888"
          quality_f: "1"
          collection_shortcode: "SWOT_L2_HR_LakeSP_2.0"
          crid: "PIC0"
          PLD_version: "105"
          range_start_time: "2024-07-23T11:44:34Z"
          wse_units: "m"
          area_total_units: "km^2"
        ▼ geometry:
          type: "Point"
          ▼ coordinates:
            0: -42.593814622368335
            1: -19.822473820359825
      ▼ 1:
        id: "1"
        type: "Feature"
        ▼ properties:
          lake_id: "6350036102"
          time_str: "2024-07-25T22:48:23Z"
          wse: "260.802"
          area_total: "0.553409"
          quality_f: "1"
```

Request

Use Python (or other programming language) to retrieve results

```
url = "https://soto.podaac.earthdatacloud.nasa.gov/hydrocron/v1/timeseries?"
params = {
    "feature": "Reach",
    "feature_id": "53151000375",
    "start_time": "2024-01-01T00:00:00Z",
    "end_time": "2024-03-30T00:00:00Z",
    "output": "geojson",
    "fields": "reach_id,time_str,wse,width,geometry"
}
hydrocron_response = requests.get(url=url, params=params)
```



Request Parameters

“feature”: string, *required* → Either: “Reach”, “Node” or “PriorLake”

“feature_id”: string, *required*

- PriorLakes have the format CBBNNNNNT (e.g., 2710046612) taken from PLD (SWORD for rivers)
- C=Continent, B=Basin, N=Lake Counter, T=Type
- Reaches have the format CBBBBBRRRRRT (e.g., 78340600051)
- Nodes have the format CBBBBBRRRRRNNNT (e.g., 12228200110861)
- C=Continent, B=Basin, R=Reach, N=Node, T=Type

“start_time”: string, *required*
→ YYYY-MM-DDTHH:MM:SSZ (e.g., 2023-08-04T00:00:00Z)

“end_time”: string, *required*
→ YYYY-MM-DDTHH:MM:SSZ (e.g., 2023-08-04T00:00:00Z)

“collection_name”: string → SWOT_L2_HR_LakeSP_2.0 (*default*) or SWOT_L2_HR_LakeSP_D

“fields”: string, *required* → comma separated list (without any spaces), [see documentation on Fields](#)

“output”: string → Either “csv” or “geojson”

“compact”: string → Either “true” or “false”



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Response

Default response returns a JSON response that contains CSV or GeoJSON with extra info like:

- status
- time (time to return response)
- hits (number of observations)
- results (formatted results)

The properties in the results are specified with the 'fields' request parameter.

The response format is specified with the 'output' request parameter.

<https://podaac.github.io/hydrocron/timeseries.html#response-format>



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```
status: "200 OK"
time: 429.065
hits: 2
▼ results:
  csv: ""
  ▼ geojson:
    type: "FeatureCollection"
    ▼ features:
      ▼ 0:
        id: "0"
        type: "Feature"
        ▼ properties:
          lake_id: "6350036102"
          time_str: "2024-07-23T11:50:03Z"
          wse: "260.334"
          area_total: "0.463888"
          wse_units: "m"
          area_total_units: "km^2"
        ▼ geometry:
          type: "Point"
          ▼ coordinates:
            0: -42.593814622368335
            1: -19.822473820359825
      ▼ 1:
        id: "1"
        type: "Feature"
        ▼ properties:
          lake_id: "6350036102"
          time_str: "2024-07-25T22:48:23Z"
          wse: "260.802"
          area_total: "0.553409"
          wse_units: "m"
          area_total_units: "km^2"
        ▼ geometry:
          type: "Point"
          ▼ coordinates:
            0: -42.590727027987064
            1: -19.822613018107482
```

'fields'
request
parameter

Response codes

Code	Reason
200	Request has succeeded and response has been returned to the user.
400*	'Bad Request': This indicates that the end user entered the parameters incorrectly in their query or time series data could not be located for the feature ID. The API attempts to send a response as to which parameter was incorrect.
413	'Payload Too Large': The user attempted to retrieve a response that was too large. This is triggered for queries that exceed 6mb.
500	'Internal Server Error': Internal API error.
415	'Unsupported Media Type': The user send an invalid <code>Accept</code> header.

*The 400 code is also currently returned for queries where no time series data could be located for the request specified feature ID.



Response errors

Navigate to results via a link with invalid output parameter:

https://soto.podaac.earthdatacloud.nasa.gov/hydrocron/v1/timeseries?feature=PriorLake&feature_id=6350036102&start_time=2024-07-20T00:00:00Z&end_time=2024-07-26T00:00:00Z&fields=lake_id,%20wse,%20&output=image

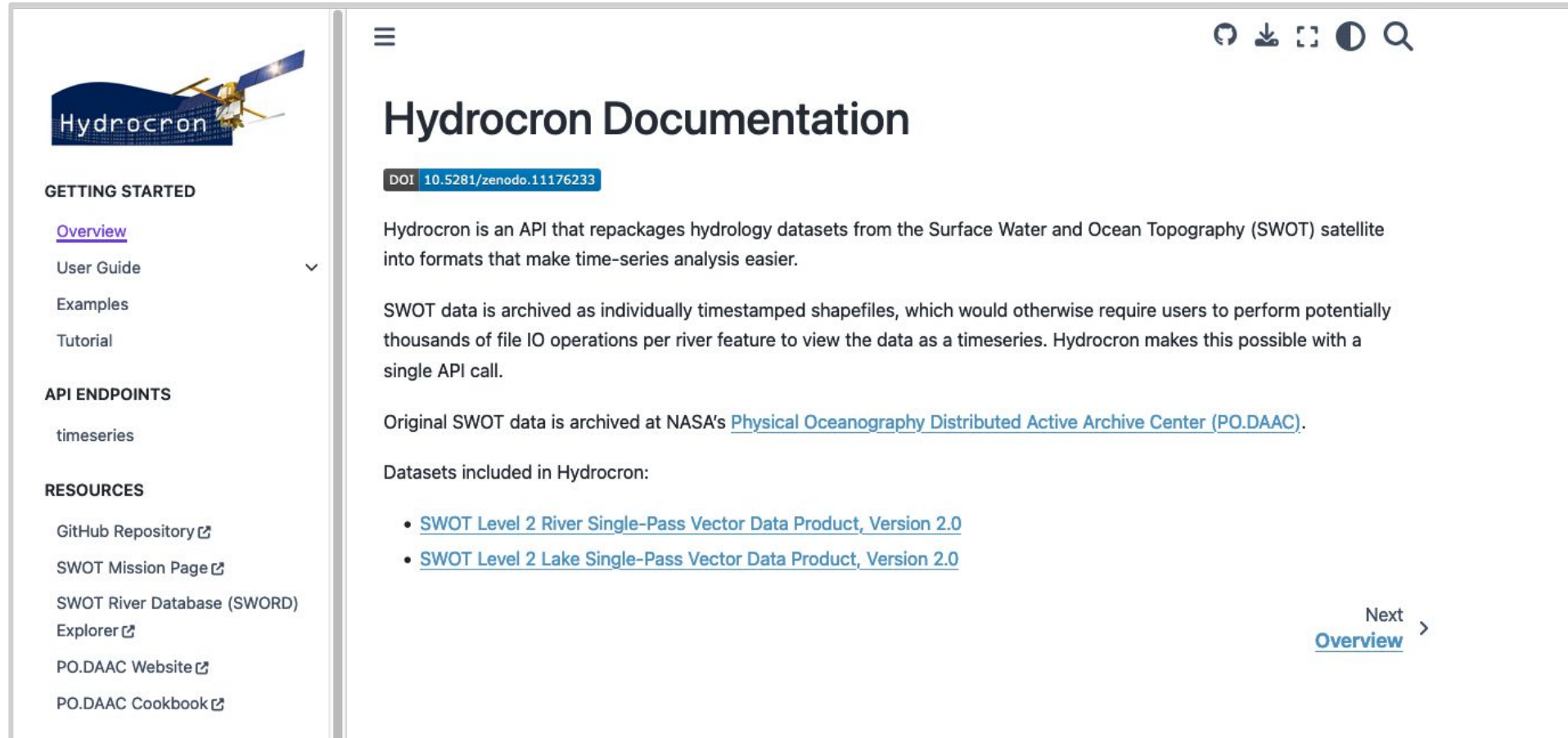
```
{  
  "error" : "400: output parameter should be csv or geojson, not: image"  
}
```



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Documentation

Documentation link: <https://podaac.github.io/hydrocron>



The screenshot shows the Hydrocron Documentation page. On the left is a sidebar with the Hydrocron logo (a satellite) and a navigation menu. The menu includes sections: GETTING STARTED (with links for Overview, User Guide, Examples, and Tutorial), API ENDPOINTS (with a link for timeseries), and RESOURCES (with links for GitHub Repository, SWOT Mission Page, SWOT River Database (SWORD) Explorer, PO.DAAC Website, and PO.DAAC Cookbook). The main content area on the right is titled 'Hydrocron Documentation' and includes a DOI badge (DOI 10.5281/zenodo.11176233). The text describes Hydrocron as an API that repackages hydrology datasets from the Surface Water and Ocean Topography (SWOT) satellite into formats for time-series analysis. It explains that SWOT data is archived as individually timestamped shapefiles, which Hydrocron simplifies into a single API call. It also mentions that original SWOT data is archived at NASA's Physical Oceanography Distributed Active Archive Center (PO.DAAC). A list of datasets included in Hydrocron is provided: SWOT Level 2 River Single-Pass Vector Data Product, Version 2.0 and SWOT Level 2 Lake Single-Pass Vector Data Product, Version 2.0. At the bottom right of the main content area, there is a 'Next Overview' link with a right arrow.

Hydrocron

GETTING STARTED

- [Overview](#)
- [User Guide](#)
- [Examples](#)
- [Tutorial](#)

API ENDPOINTS

- [timeseries](#)

RESOURCES

- [GitHub Repository](#)
- [SWOT Mission Page](#)
- [SWOT River Database \(SWORD\) Explorer](#)
- [PO.DAAC Website](#)
- [PO.DAAC Cookbook](#)

Hydrocron Documentation

DOI 10.5281/zenodo.11176233

Hydrocron is an API that repackages hydrology datasets from the Surface Water and Ocean Topography (SWOT) satellite into formats that make time-series analysis easier.

SWOT data is archived as individually timestamped shapefiles, which would otherwise require users to perform potentially thousands of file IO operations per river feature to view the data as a timeseries. Hydrocron makes this possible with a single API call.

Original SWOT data is archived at NASA's [Physical Oceanography Distributed Active Archive Center \(PO.DAAC\)](#).

Datasets included in Hydrocron:

- [SWOT Level 2 River Single-Pass Vector Data Product, Version 2.0](#)
- [SWOT Level 2 Lake Single-Pass Vector Data Product, Version 2.0](#)

Next [Overview](#) >

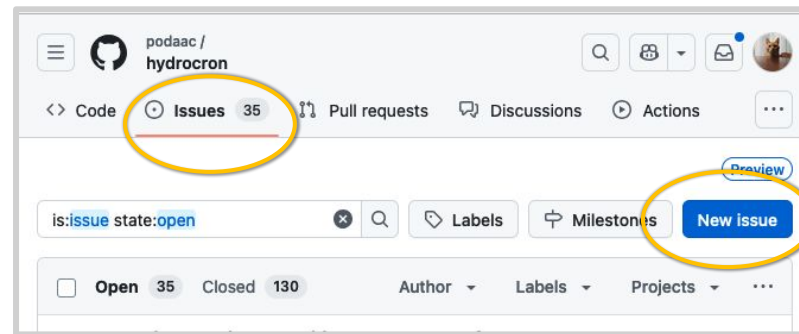


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GitHub Repository

Repository link: <https://github.com/podaac/hydrocron>

- You can submit a GitHub issue if you would like to request a new feature/functionality or have found a bug.



- Please see our contributing guide if you would like to contribute to Hydrocron:
<https://github.com/podaac/hydrocron/blob/develop/CONTRIBUTING.md>



DEMO



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Resources

Please reach out if you would like to join our monthly Hydrocron meetings!
(nicole.tebaldi@jpl.nasa.gov)

Resources:

- [Hydrocron Documentation](#)
- [Hydrocron GitHub](#)
- [Hydrocron Python Notebook Tutorial](#)
- [Advanced Hydrocron Tutorial in the PO.DAAC Cookbook](#)
- [Prior Lake Database \(PLD\) and SWOT River Database \(SWORD\) information on the PO.DAAC Cookbook](#)

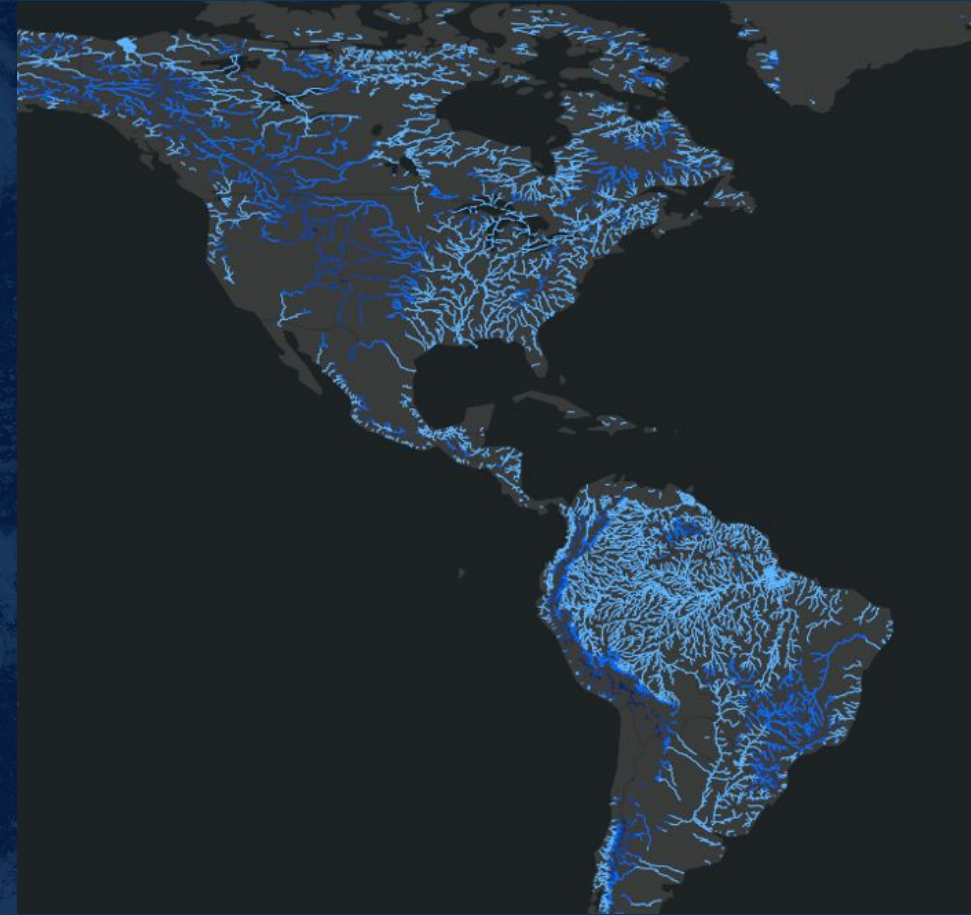


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SWOT River Reach EGIS Feature Service

Nicholas Tarpinian

Access, visualize, and analyse SWOT HR Level 2 River
Reach data in GIS tools.



SWOT EGIS Feature Service

- SWOT HR River Reaches collection is available as a **GIS Feature Service!**
- Built through NASA's Earthdata GIS (EGIS) enterprise initiative.
- Both the full back catalog of Version C (2.0) and forward stream with Version D.
- Available as an ArcGIS REST Service and Open Geospatial Consortium (OGC) endpoints.
- Allowing users to analyze and visualize SWOT HR Rivers in tools such as ArcGIS Pro, QGIS or Jupyter Notebooks.



EARTHDATA

Earth Science Data Systems Geographic
Information Systems Team (EGIST)



Open
Geospatial
Consortium.



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SWOT EGIS Feature Service

- SWOT HR River Reaches Feature Service will have two different services for each Version (vC (2.0) and vD):
- **SWOT_L2_HR_RiverSP_reach_vD/vC** which includes the full attribute table records.
- **SWOT_L2_HR_RiverSP_reach_vD/vC_BASIC** which only includes select “Basic” attributes (see [SWOT L2 HR RiverSP Product Description Doc](#) for definition of “basic”).
 - This will allow for quicker load times as there won't be as many records to load.
- Services will have zoom level extents of 1:5,000 (City Parcel) - 1:10,000,00 (Continent).



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Home Gallery Map Scene Groups Help

Earthdata GIS

Earthdata GIS

NASA's Earthdata Geographic Information System (EGIS) is a resource for distributing cloud-native, GIS-ready NASA Earth Science data, services, and resources. These include ArcGIS and Open Geospatial Consortium (OGC)-compliant raster and feature geospatial services*. To access to the full NASA Earth observation repository for data download, please visit [Earthdata Search](#).

EGIS is actively deploying new services, please visit the [Gallery](#) to see the full list of publicly available content.

*Core functionality is available for EGIS web services; however, some unique behaviors persist. Please see our [Expected Behavior and Known Limitations](#) for more details.

[Get information and guides](#) to help you find and use NASA Earth science data, services, and tools.

Please contact us at support@earthdata.nasa.gov with any questions or feedback.

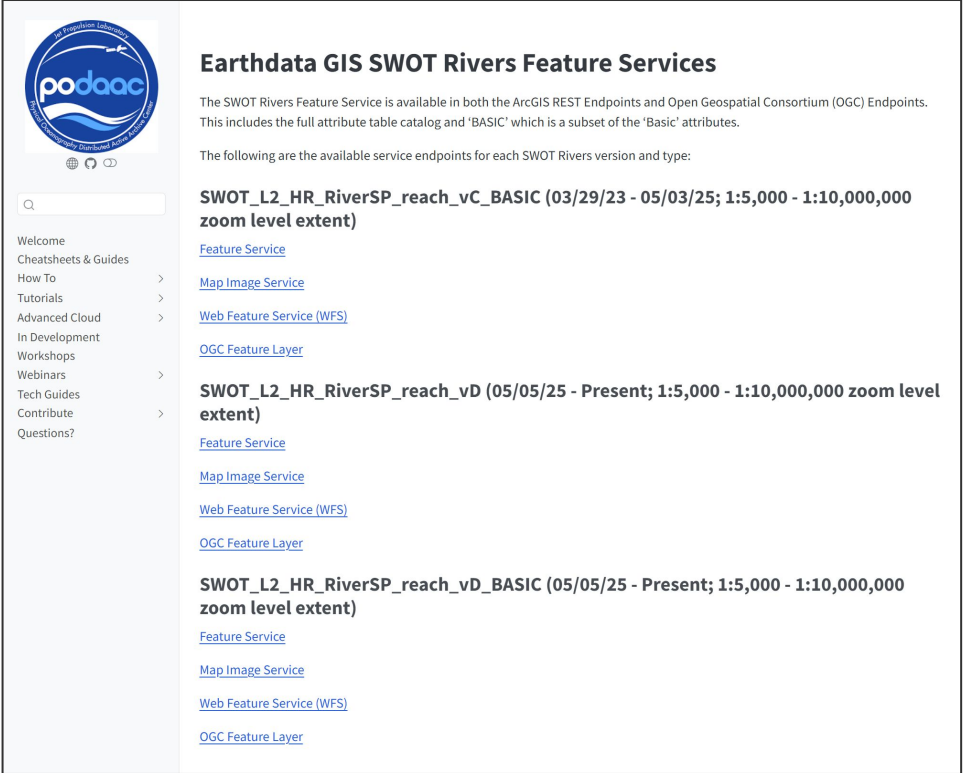
Featured Layers

NASA authoritative data sets enabled as web services to be used in GIS. Layers are visual representations of a geographic dataset in a digital map environment. These layers, often referred to as services, reference a data source that defines how the data should be visualized and contain the underlying data properties and values.

Imagery Layer NASA Carbon Monitoring Syste... Global mangrove distribution, aboveground biomass, and canopy height in the 2000s estimated by...	Imagery Layer TEMPO Formaldehyde (HCHO) ... This formaldehyde (HCHO) image service provides information on the amount of formaldehyde (mol/m³)...	Imagery Layer Annual Global High-Resolution ... Annual Global High-Resolution Extreme Heat Estimates (GHEE), 1983-2016. Published on:	Map Image Layer SWOT Level 2 River Reach Sing... Surface Water and Ocean Topography (SWOT) Level 2 River Single-Pass Vector Data Produ...
Imagery Layer POWER Monthly Meteorology This monthly meteorology service provides time-enabled global Analysis Ready Data (ARD)	Imagery Layer Global Annual PM2.5 Grids fro... The Global Annual PM2.5 Grids from MODIS, MISR and SeaWiFS Aerosol Optical Depth (AOD), 1998-2010	Imagery Layer POWER Monthly Radiation This monthly radiation service provides time-enabled global Analysis Ready Data (ARD)	Imagery Layer Gridded Population of the Worl... Gridded Population of the World, Version 4 (GPWv4): Population Density, Revision 11. Published

SWOT EGIS Feature Service - Access

- Feature service access will be available through the [EGIS Homepage](#).
- Service endpoints will be available as the following:
 - ArcGIS REST API:
 - Feature Service: Visualization and querying of attribute table records.
 - Map Image Service: Dynamic tiling for quick visualization.
 - Open Geospatial Consortium (OGC):
 - Web Feature Service (WFS): Querying a subset of the feature service.
 - OGC Feature Layer: Similar to WFS but with updated standards and faster response.



Earthdata GIS SWOT Rivers Feature Services

The SWOT Rivers Feature Service is available in both the ArcGIS REST Endpoints and Open Geospatial Consortium (OGC) Endpoints. This includes the full attribute table catalog and 'BASIC' which is a subset of the 'Basic' attributes.

The following are the available service endpoints for each SWOT Rivers version and type:

SWOT_L2_HR_RiverSP_reach_vc_BASIC (03/29/23 - 05/03/25; 1:5,000 - 1:10,000,000 zoom level extent)

- [Feature Service](#)
- [Map Image Service](#)
- [Web Feature Service \(WFS\)](#)
- [OGC Feature Layer](#)

SWOT_L2_HR_RiverSP_reach_vD (05/05/25 - Present; 1:5,000 - 1:10,000,000 zoom level extent)

- [Feature Service](#)
- [Map Image Service](#)
- [Web Feature Service \(WFS\)](#)
- [OGC Feature Layer](#)

SWOT_L2_HR_RiverSP_reach_vD_BASIC (05/05/25 - Present; 1:5,000 - 1:10,000,000 zoom level extent)

- [Feature Service](#)
- [Map Image Service](#)
- [Web Feature Service \(WFS\)](#)
- [OGC Feature Layer](#)



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SWOT EGIS Feature Service - Access

Content Landing page

SWOT_L2_HR_RiverSP_reach_vD_BASIC

OverviewDataVisualization



Surface Water and Ocean Topography (SWOT) Level 2 River Single-Pass Vector Data Product, Version D (SWOT_L2_HR_RiverSP_D) with Basic Attributes.
Feature layer by nicholas.k.tarpinian
Item created: Jul 17, 2025 Item updated: Jul 18, 2025 View count: 19

Open in Map Viewer

Open in Scene Viewer

Open in ArcGIS Desktop

Metadata

Access points

Description

The SWOT Level 2 River Single-Pass Vector Data Product (SWOT_L2_HR_RiverSP_D) provides hydrologic measurements for predefined river reaches and nodes, derived from high-resolution radar observations collected by the Ka-band Radar Interferometer (KaRin) aboard the SWOT satellite. This product reports water surface elevation, slope, width, area, and discharge estimates for each reach, along with corresponding node-level details. All features are defined by the Prior River Database (PRD), which encodes river geometry and topology across global basins.

Each granule covers a single satellite pass over one or more continents and includes two ESRI shapefiles: one for river reaches (as polylines) and one for nodes (as points). Shapefile attributes include both SWOT-derived measurements and metadata from the PRD. Water surface elevations are referenced to the WGS84 ellipsoid and are corrected for geoid height and solid Earth, load, and pole tides. Measurements are aggregated from lower-level pixel detections (PIXC product) assigned to hydrologic features via the auxiliary PIXCVec product. The product also includes consensus and algorithm-specific river discharge estimates, both unconstrained and constrained by historical gauge data.

The RiverSP product provides reach-scale hydrologic variables suitable for analyzing inland water dynamics, estimating discharge, and monitoring river changes over time. It enables direct integration with the PRD-defined river network and supports applications in large-scale hydrologic modeling, basin monitoring, and water resource management. Data are distributed in shapefile format with metadata and attribute definitions aligned to GIS and hydrologic standards.

This collection is a sub-collection of its parent: <https://doi.org/10.5067/SWOT-RIVERSP-D>

This service includes a subset of the "Basic" attributes. "Basic" attributes are intended for users interested in the KaRin measurements as provided. For more info on the differences between "Basic" and "Expert" attributes please review the [Product Description Document \(PDD\)](#).

For question about this service, please contact podaac@podaac.jpl.nasa.gov

Layers

SWOT_L2_HR_RiverSP_reach_vD_BASIC
Line layer

Terms of Use

"Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not constitute or imply its endorsement by the United States Government or the Jet Propulsion Laboratory, California Institute of Technology."

Details

Source: Feature Service
Size: 1 KB
ID: a5573390413f4350a8ce7ecc69ded590
☆☆☆☆

Share

Owner
nicholas.k.tarpinian

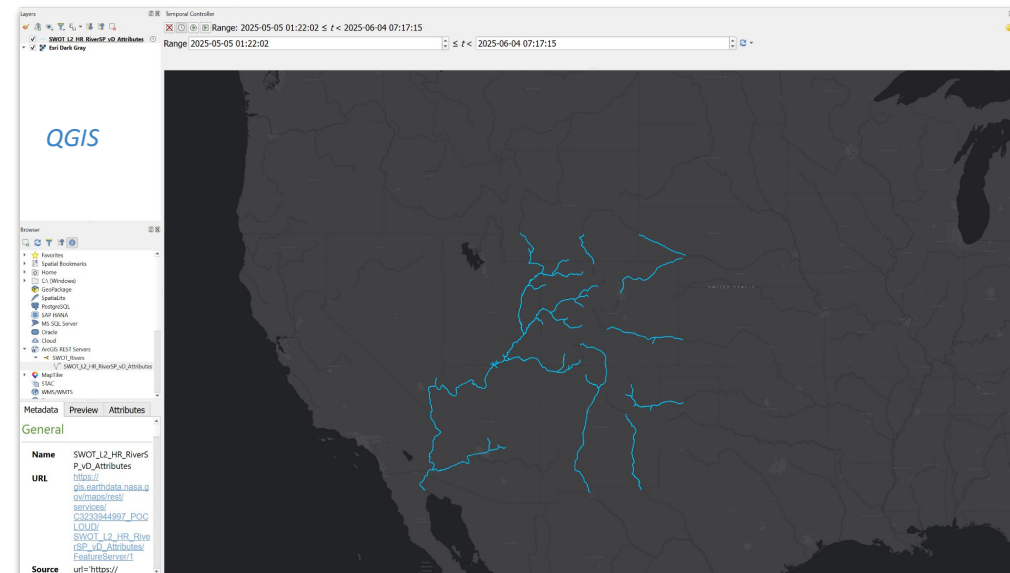
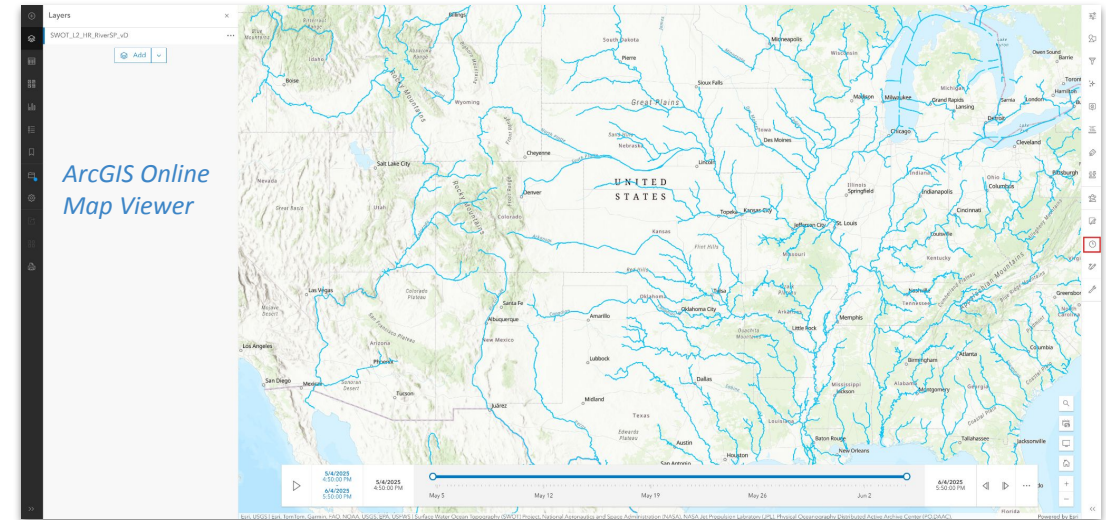
Tags
SWOT, Hydrology, River Reach, NASA, PODAAC, Earth Science, Earth Data

Credits (Attribution)
Surface Water Ocean Topography (SWOT) Project, National Aeronautics and Space Administration (NASA), NASA Jet Propulsion Laboratory (JPL), Physical Oceanography Distributed Active Archive Center (PO.DAAC).

URL
<https://gis.earthdata.nasa.gov/imag>

Help
Feature layers
Feature layers (developer)

Access point

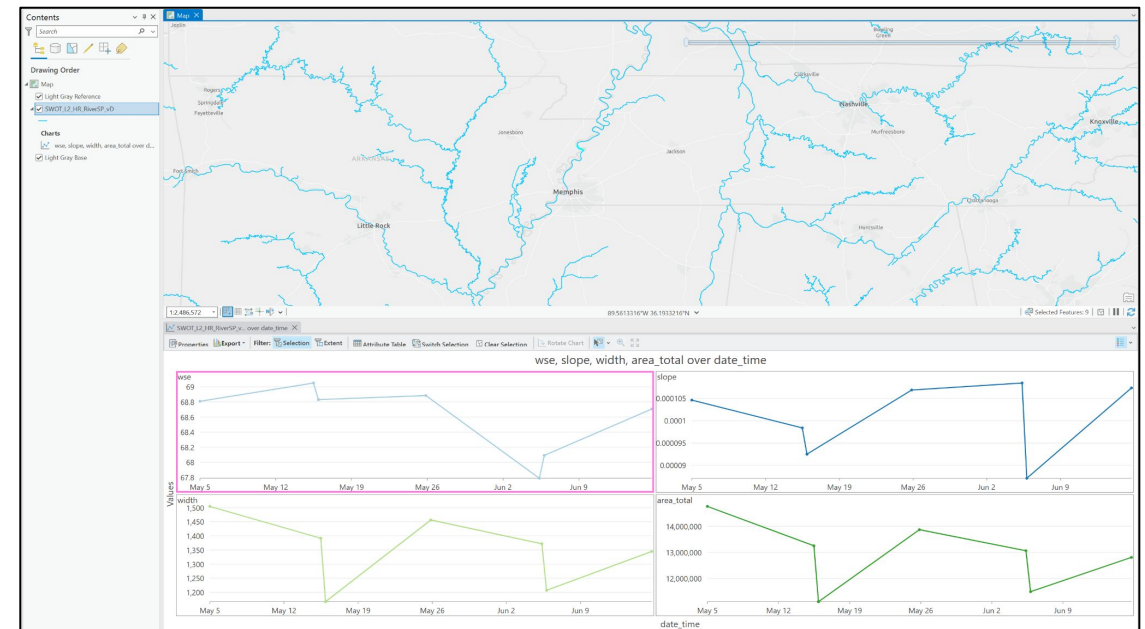
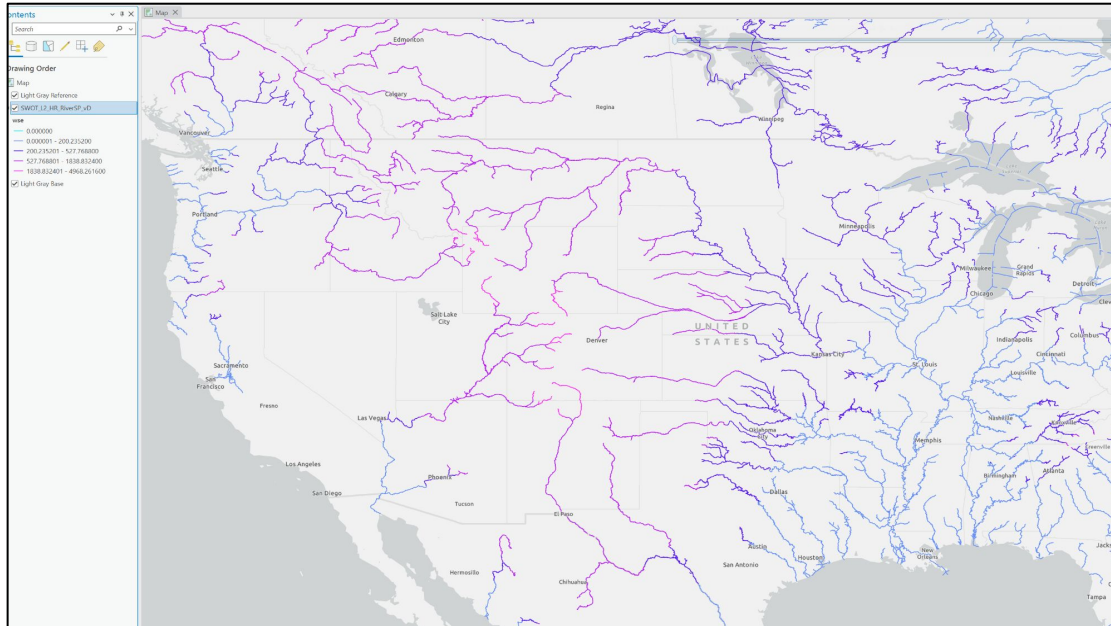


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SWOT EGIS Feature Service - Analysis

Select **capabilities** enabled by the SWOT River Reach Feature Service:

ArcGIS Pro Image Examples



- Visualizing river reach data in ArcGIS Pro based on specific variables/attributes; e.g. water surface elevation (WSE), slope, width, etc.
- Changing symbology with graduated or bivariate colors.

- Selecting river reaches via bounding box for region of interest.
- Plotting time series charts for selected water feature (e.g. river reach) or for global layer (if no feature selected)



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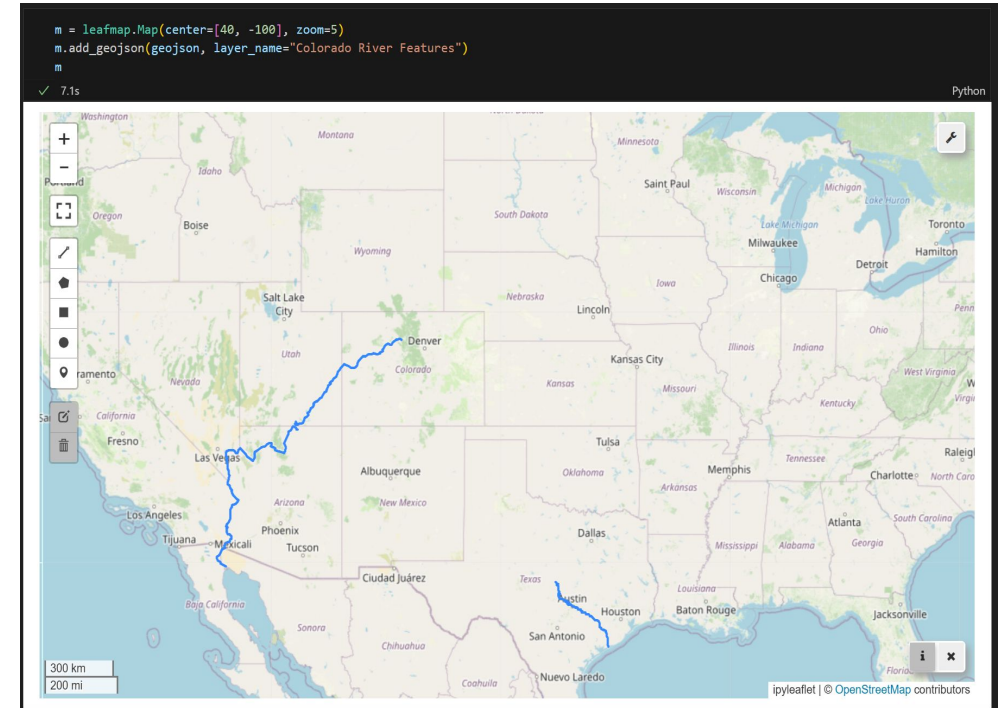
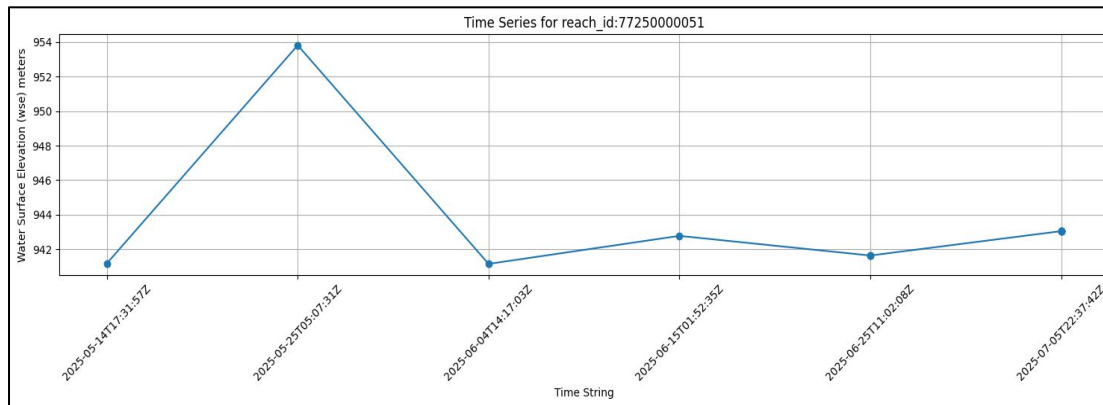
SWOT EGIS Feature Service - Python

- Through Python we can easily query the endpoint.
- Using open source interactive GUI libraries like leafmap to visualize data.
- Query specific variables & reach ids to plot a time series chart.

```
url = "https://gis.earthdata.nasa.gov/image/rest/services/C3233944997_POCLLOUD/SWOT_L2_HR_RiverSP_reach_vD_BASIC/FeatureServer/1/query"
params = {
    "where": "river_name='Colorado River'", # Change to your river reach of interest
    "outFields": "**",
    "f": "geojson",
    "resultRecordCount": 10000
}

response = requests.get(url, params=params)
geojson = response.json()
print("Status code:", response.status_code)
print("response:", response.text[:500])
```

Python



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DEMO



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SWOT EGIS Feature Service - Resources

- List of the available service endpoints can be found here:
https://podaac.github.io/tutorials/notebooks/GIS/SWOT_Rivers_EGIS_Service.s.html
- User guides can be found here:
 - Cookbook: https://podaac.github.io/tutorials/quarto_text/GIS.html
 - EGIS access:
https://podaac.github.io/tutorials/notebooks/GIS/SWOT_EGIS_access.html
 - Python:
https://podaac.github.io/tutorials/notebooks/GIS/SWOT_EGIS_access_Python.html
- Feedback is welcome to help improve these services.
 - [Feedback Form](#)



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Image source: <https://www.mgmgeoservices.com/basic-2d-gis-work>



Tools for accessing SWOT data - Cheatsheet



Ocean



Hydro



Coast



Learn/Information

- PO.DAAC Dataset Mission Page and Landing Pages <https://podaac.jpl.nasa.gov/SWOT?sections=data>



Find Data - Map GUI interface

- Search & Access in *Earthdata Search*
<https://search.earthdata.nasa.gov/search?q=SWOT%20HR&long=-0.0703125>



Access - Command line/automated scripts

- Subscriber/Downloader https://podaac.github.io/tutorials/quarto_text/SWOT.html



Access & Subset - GUI

- HiTIDE <https://hitide.podaac.earthdatacloud.nasa.gov/>



Access - Cloud native, Big data, ML

- in-cloud access available: [example for LR ocean](#), [example for HR hydro](#)



Access & Explore - APIs/GIS Services:

- **Hydrocron Timeseries API** for SWOT HR Rivers and Lakes
- GIS web services: **SWOT HR River Reaches Feature Service** through NASA Earthdata GIS (EGIS); works with Esri (e.g. ArcGIS) and open source tools like QGIS and jupyter notebooks



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EARTHDATA

earthdata.nasa.gov

<https://podaac.jpl.nasa.gov/>

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*Thank
You!*

USGS WISP

<https://apps.usgs.gov/wisp>

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