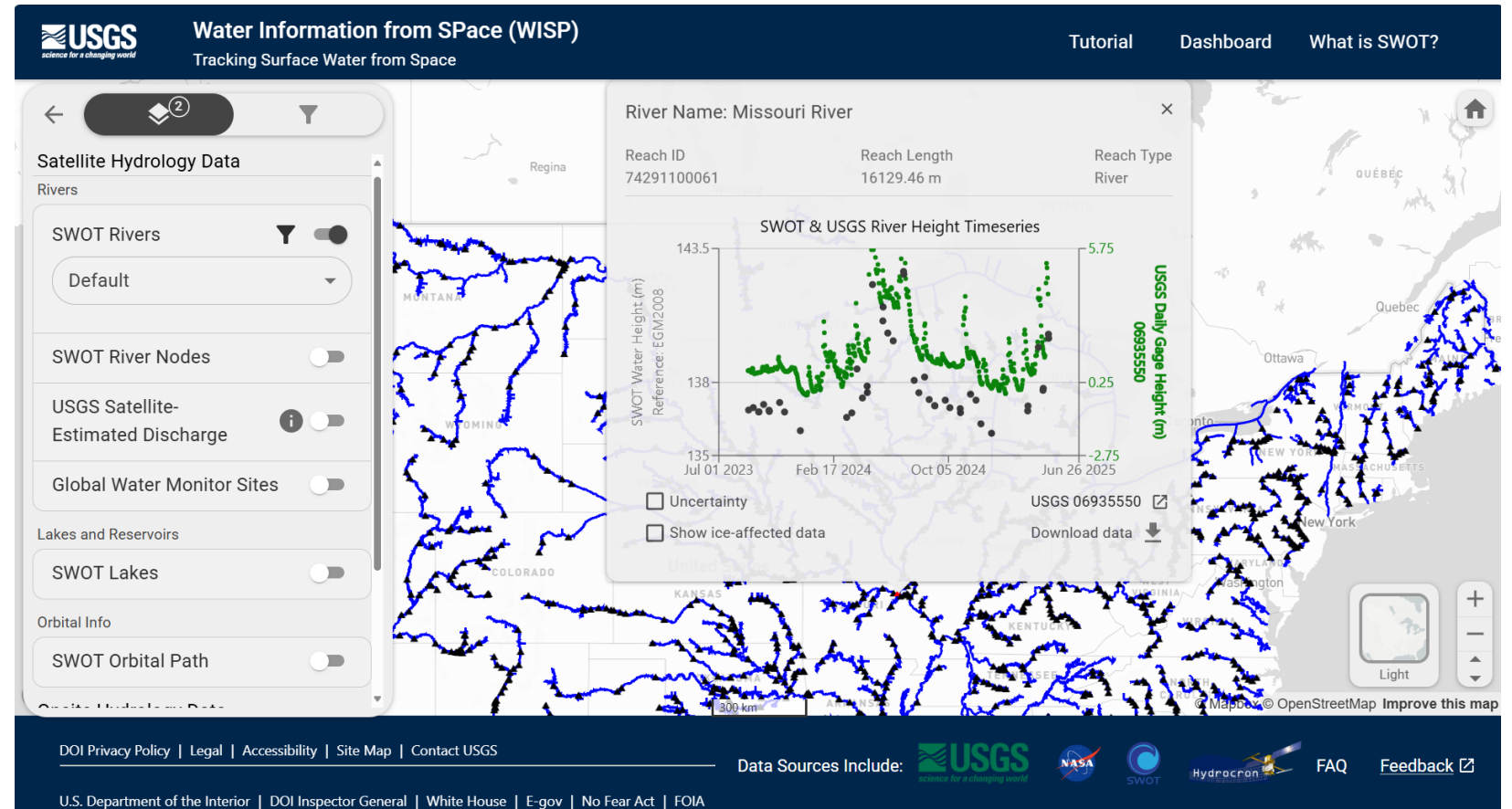


From Space to Solutions: Access, Visualization, and Analysis Services for SWOT Hydrology

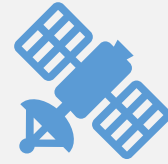
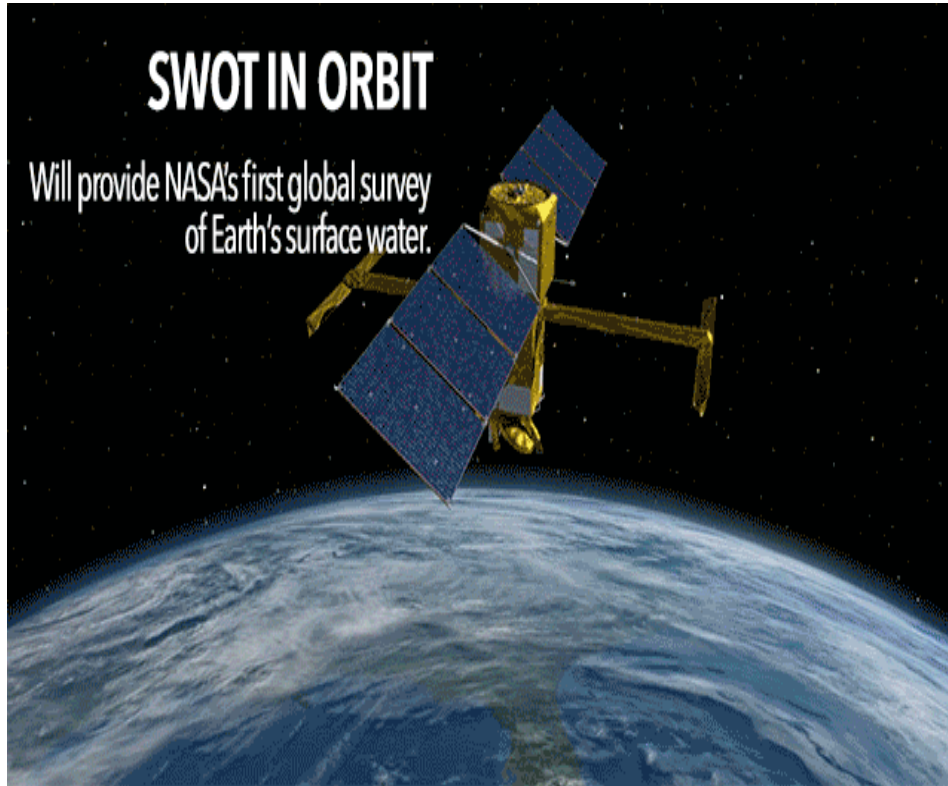
Water Information from Space

Dr. Merritt Harlan

U.S. Geological Survey
Hydrologic Remote
Sensing Branch



Overview



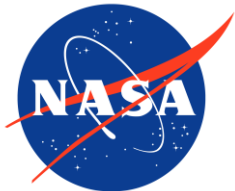
Surface Water Ocean
Topography (SWOT)
background



Public Data Portal: Water
Information from Space
(WISP)

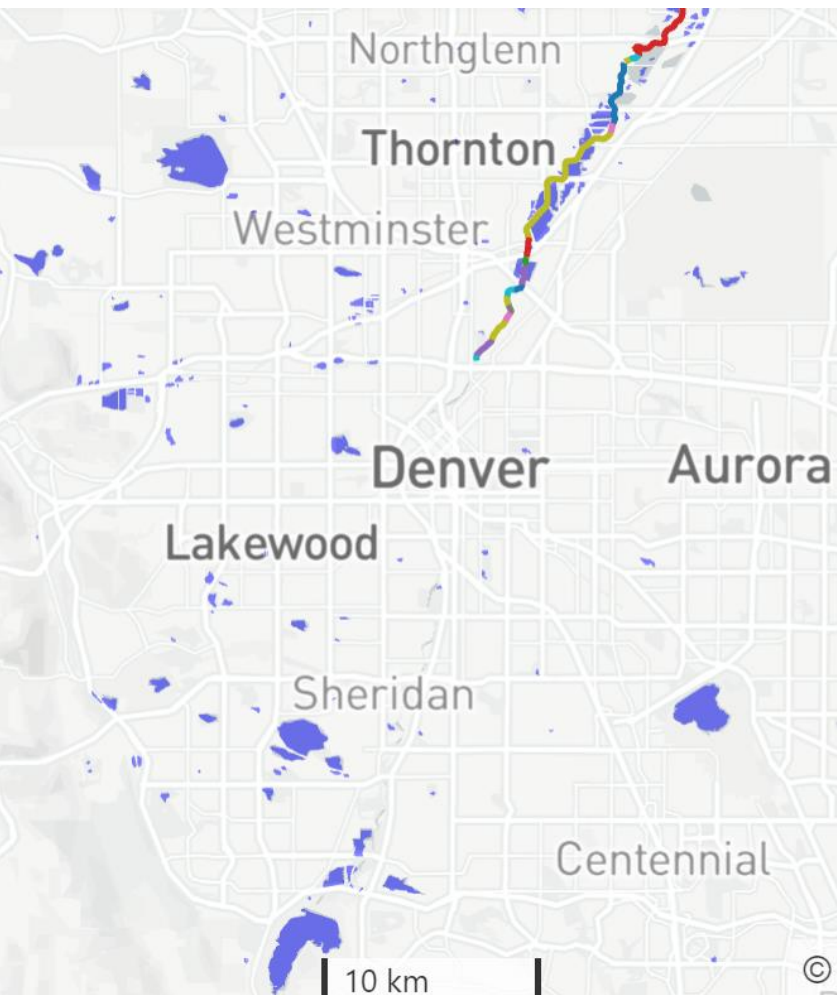


Water Management
Applications with SWOT
Data

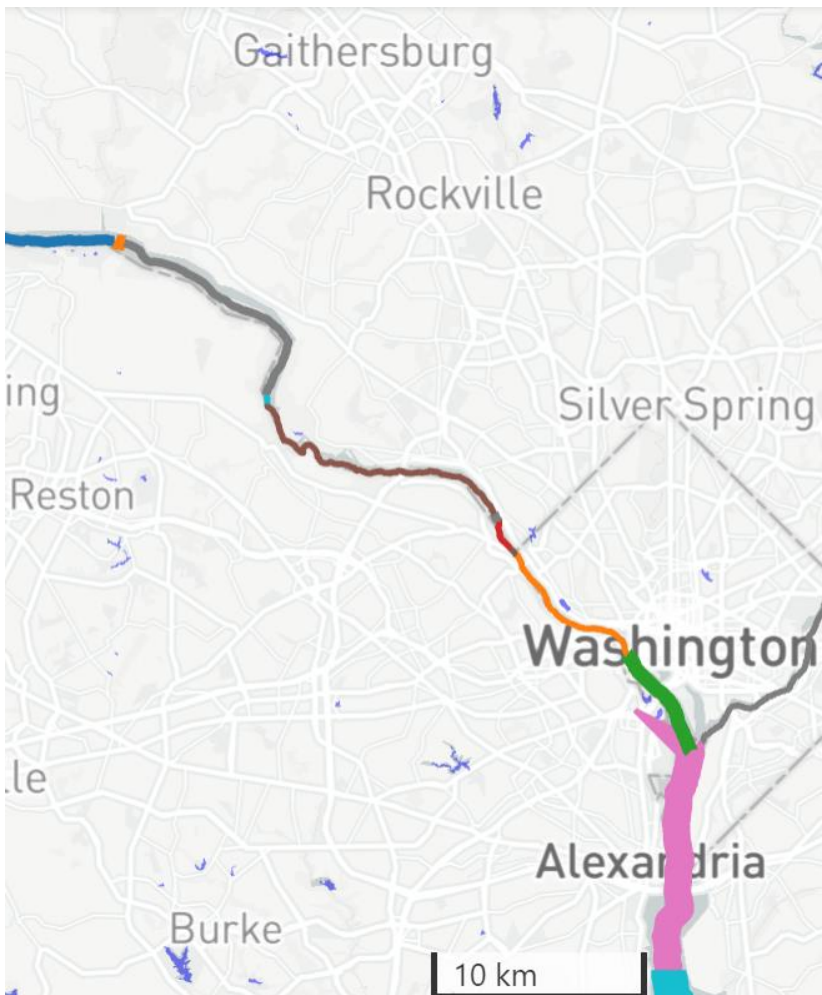


SWOT is monitoring surface water at vast spatial scales

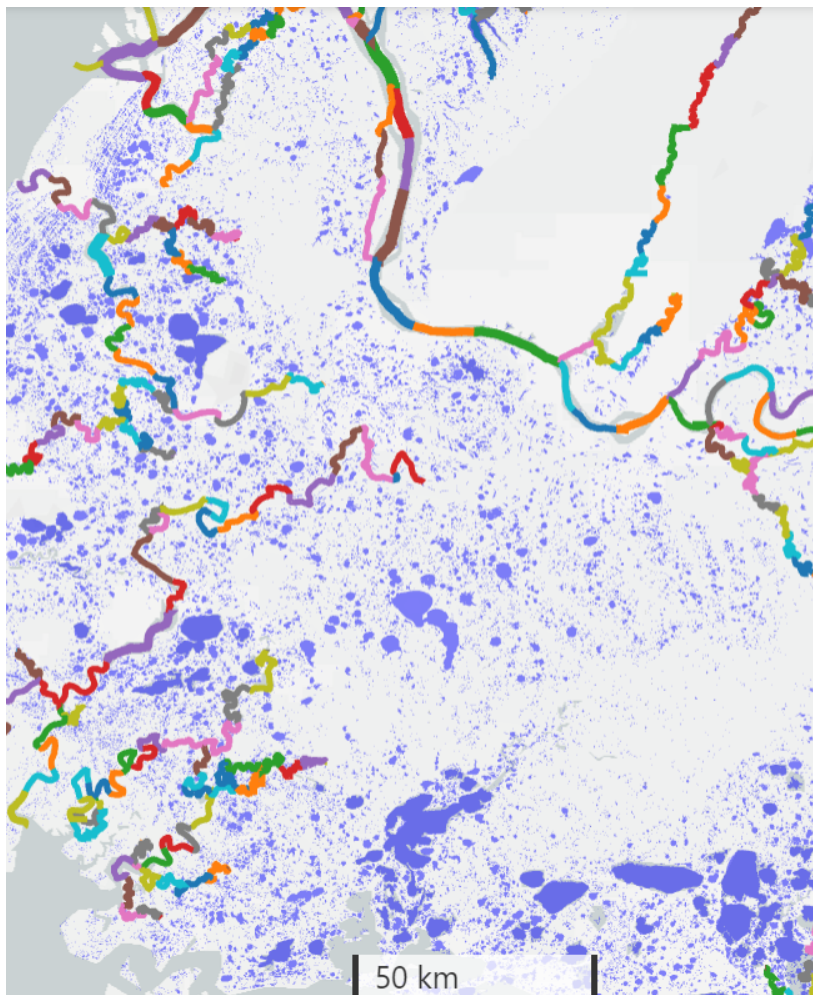
Denver, CO



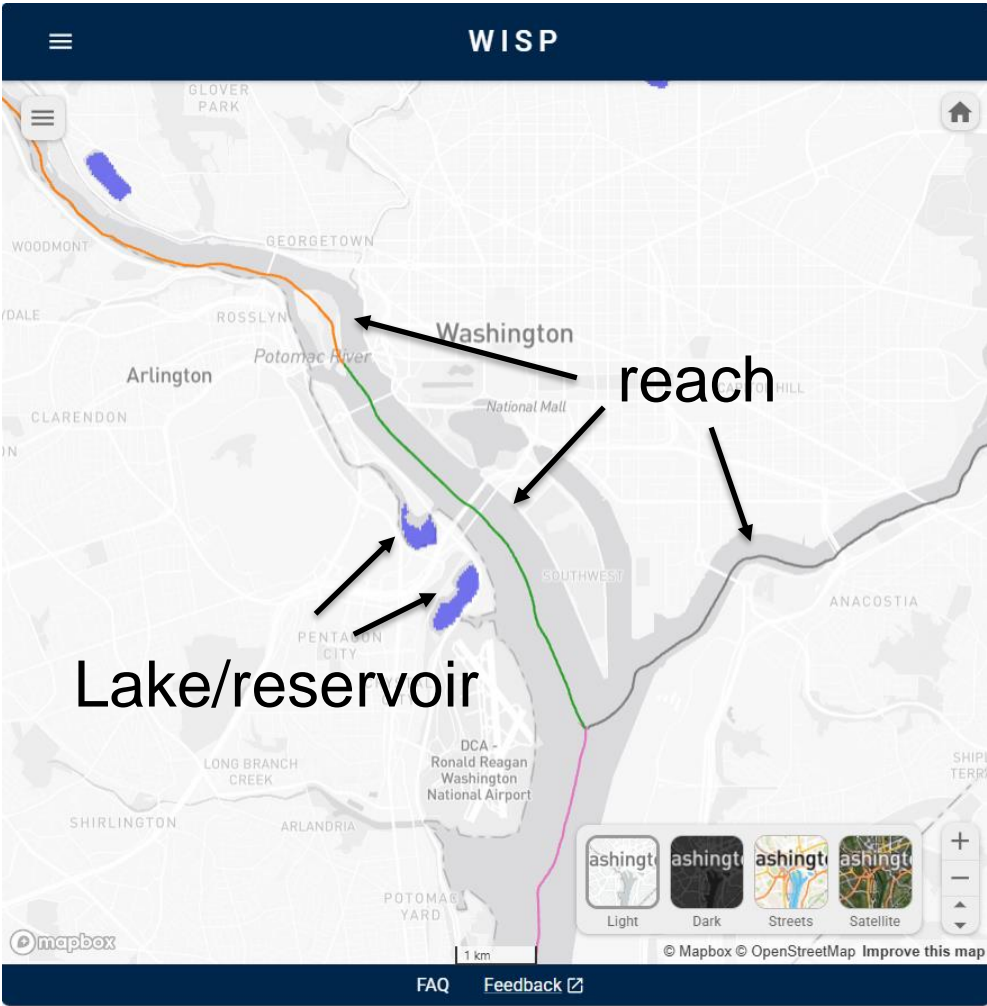
Washington, DC



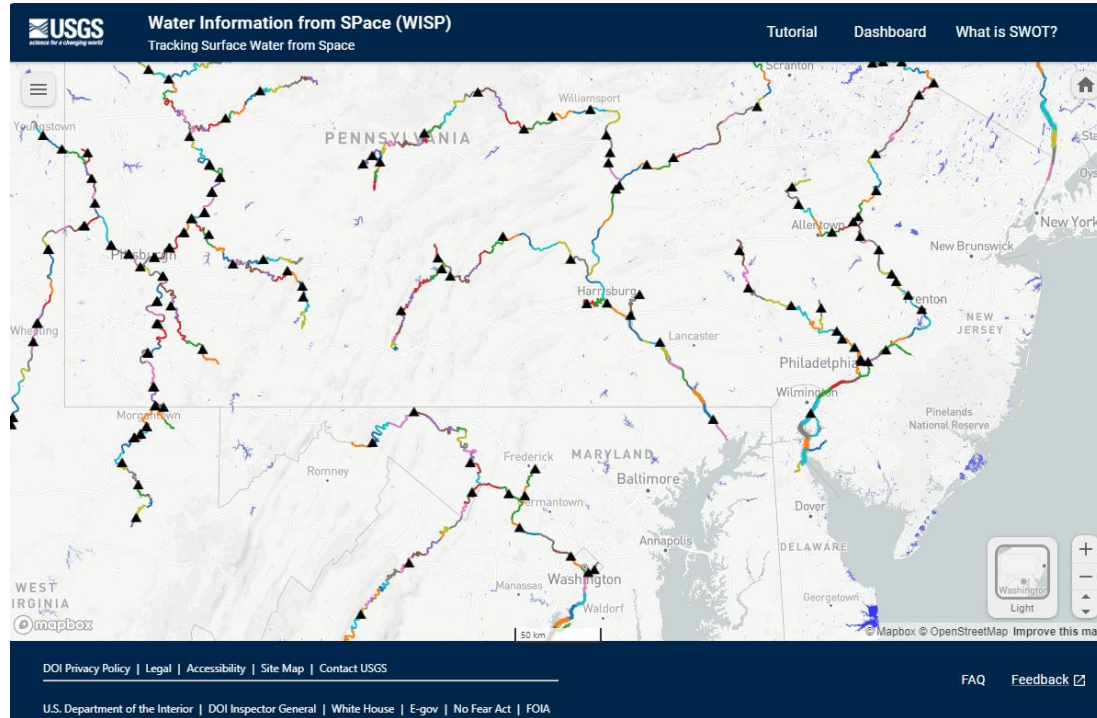
Yukon Delta, AK



SWOT measured water features

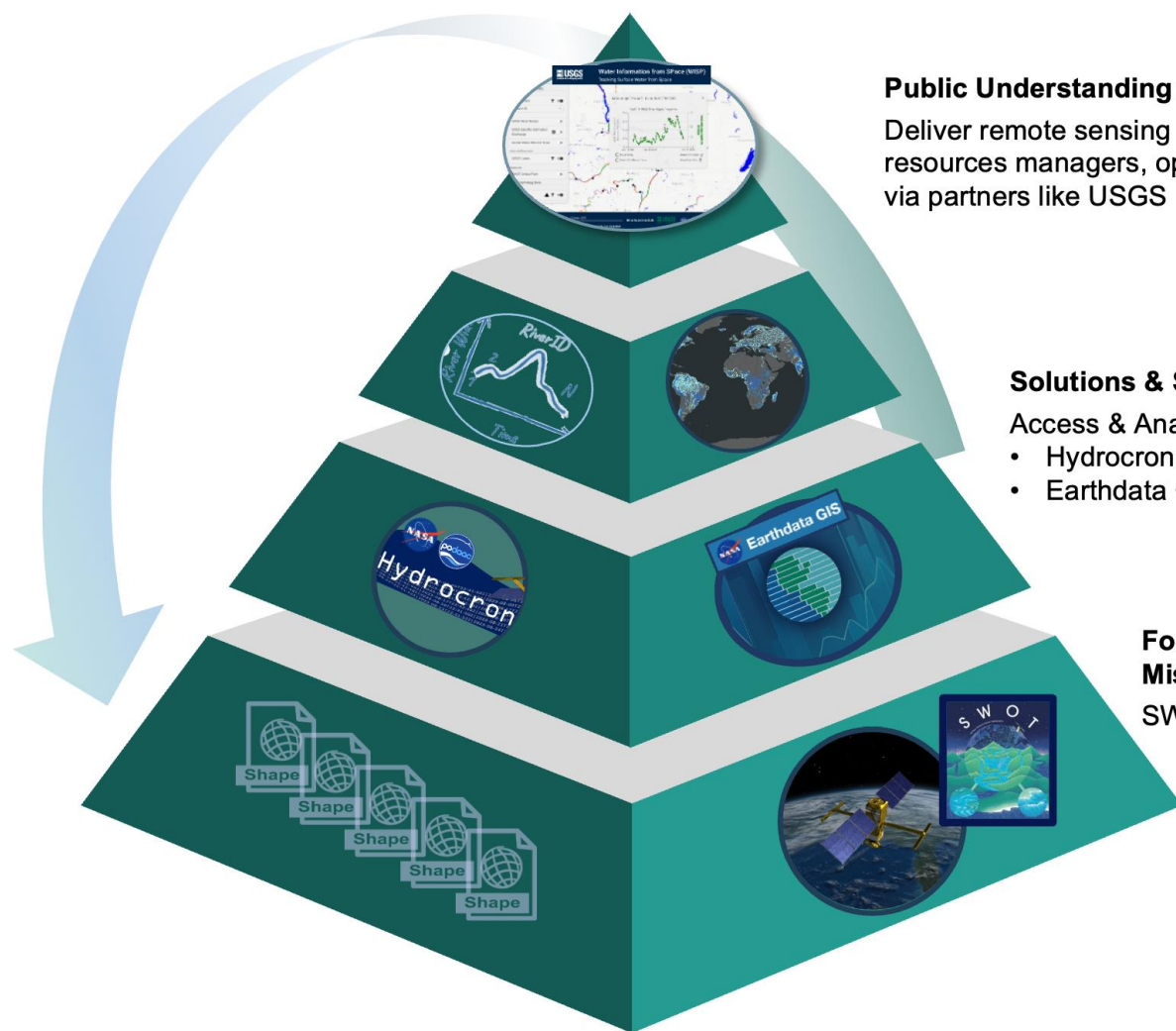


Public Data Portal: Water Information from Space (WISP)



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

WISP uses Hydrocron API to access SWOT data



Public Understanding & Exchange

Deliver remote sensing data to practitioners, resources managers, operational agencies via partners like USGS

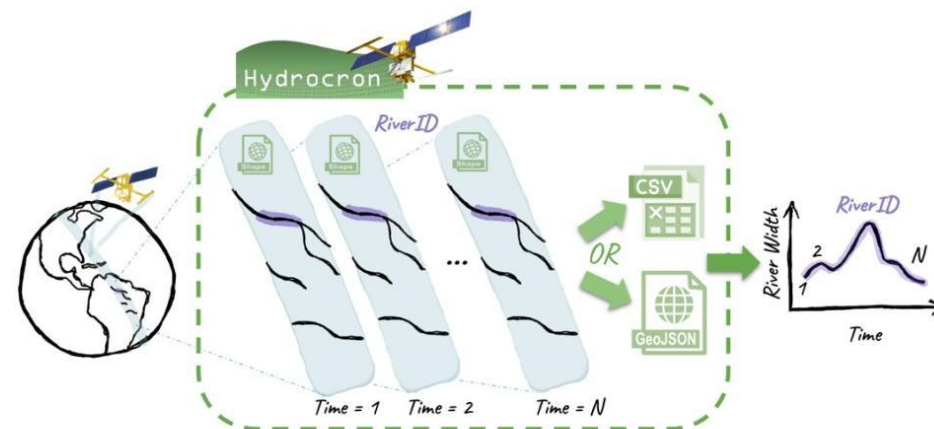
Solutions & Societal Value

Access & Analysis Services:

- Hydrocron Timeseries API
- Earthdata Geospatial Information System

Foundational Technology, Missions, & Data

SWOT Mission – Hydrology Data



←

1

⌵

Satellite Hydrology Data

Rivers

SWOT Rivers

Default

SWOT River Nodes

USGS Satellite-Estimated Discharge

Global Water Monitor Sites

Lakes and Reservoirs

SWOT Lakes

Orbital Info

SWOT Orbital Path

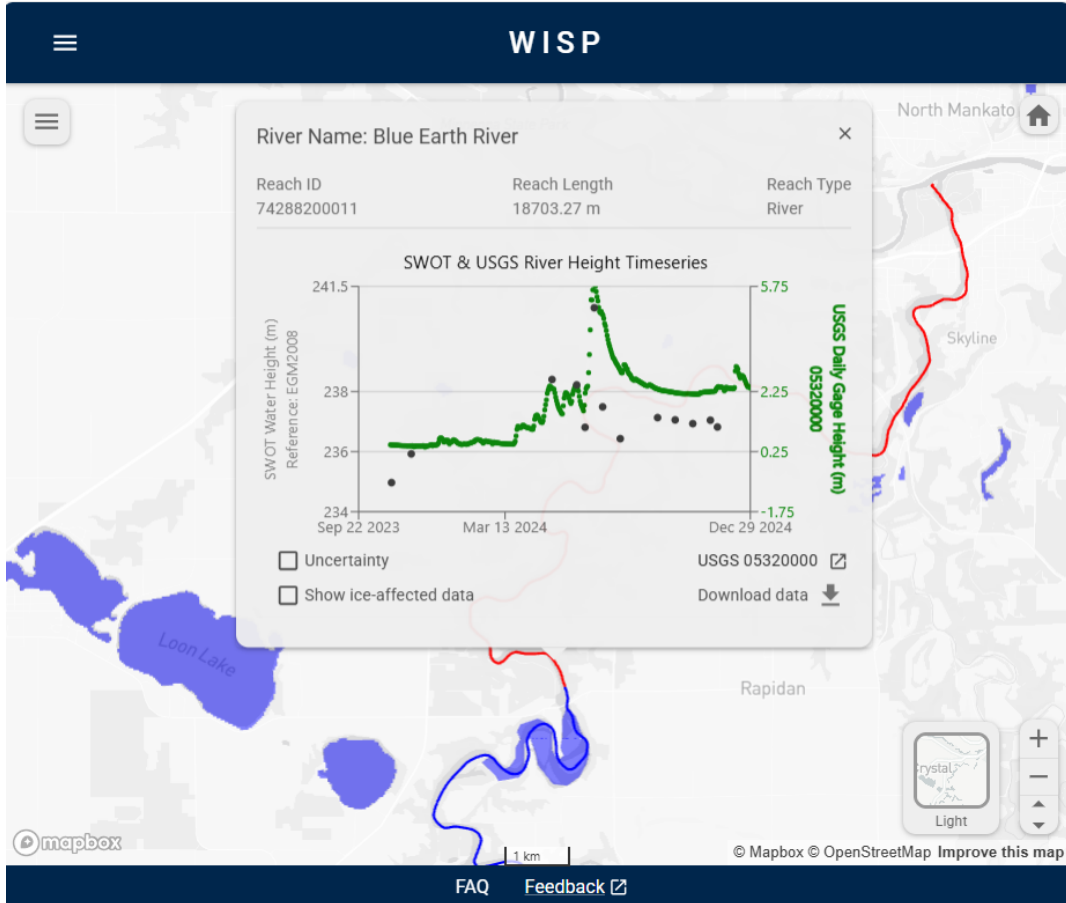
Onsite Hydrology Data

Gages

USGS Gages






SWOT is capturing flood events



ANDREW WEINZIERL/FOR THE ASSOCIATED PRESS






June 25, 2024 flooding event in Blue Earth River at the Rapidan Dam in Minnesota






Satellite Hydrology Data


Rivers

SWOT Rivers  


Default 

SWOT River Nodes 


USGS Satellite-Estimated Discharge  

Global Water Monitor Sites 

Lakes and Reservoirs


SWOT Lakes 

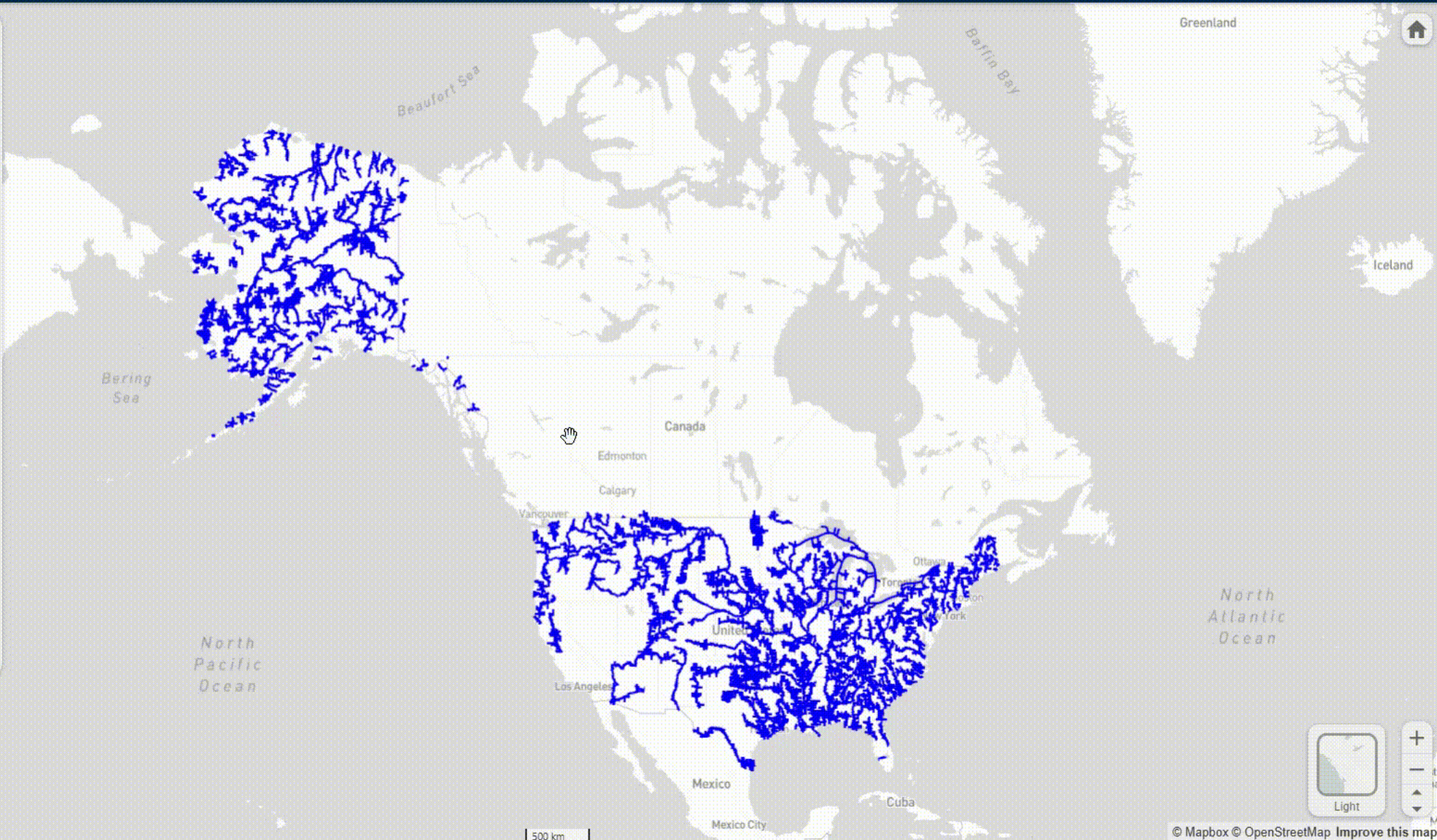
Orbital Info

SWOT Orbital Path 

Onsite Hydrology Data

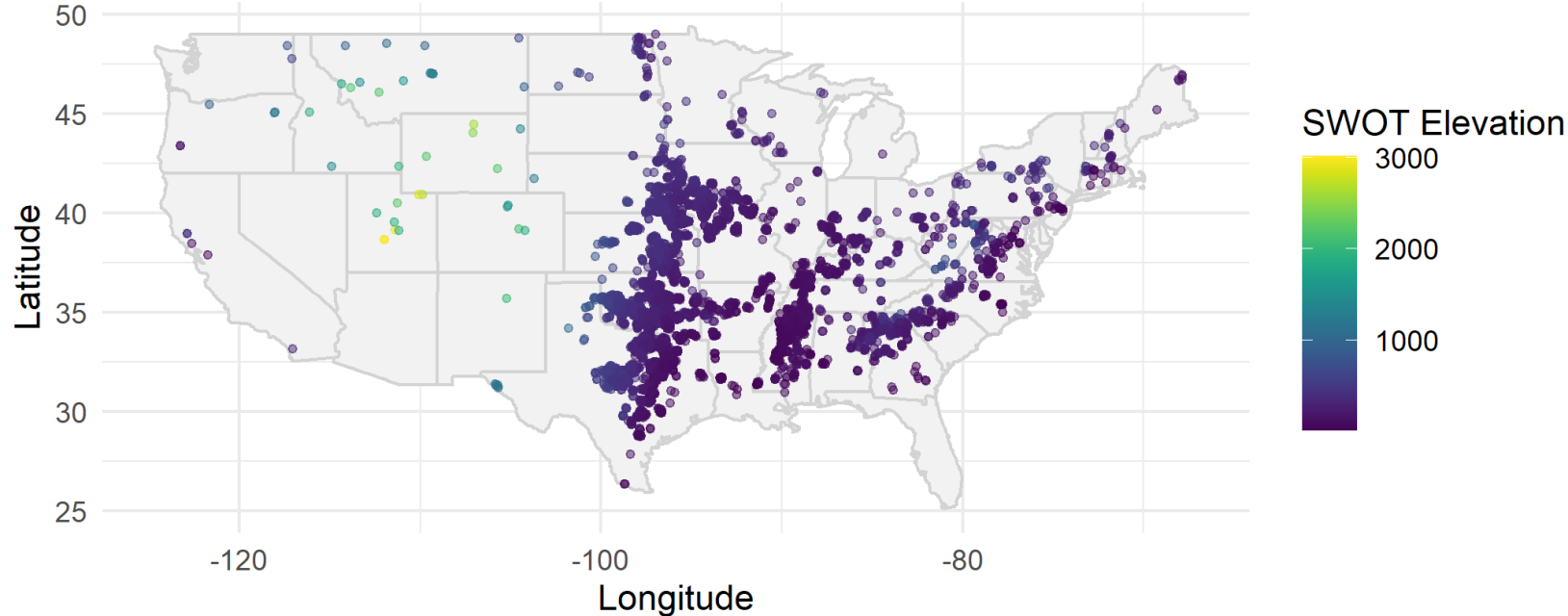
Gages

USGS Gages 



SWOT is measuring USDA flood control and irrigation dams

U.S. Department of Agriculture
SWOT-observable dams and reservoirs
(n = 6,491)

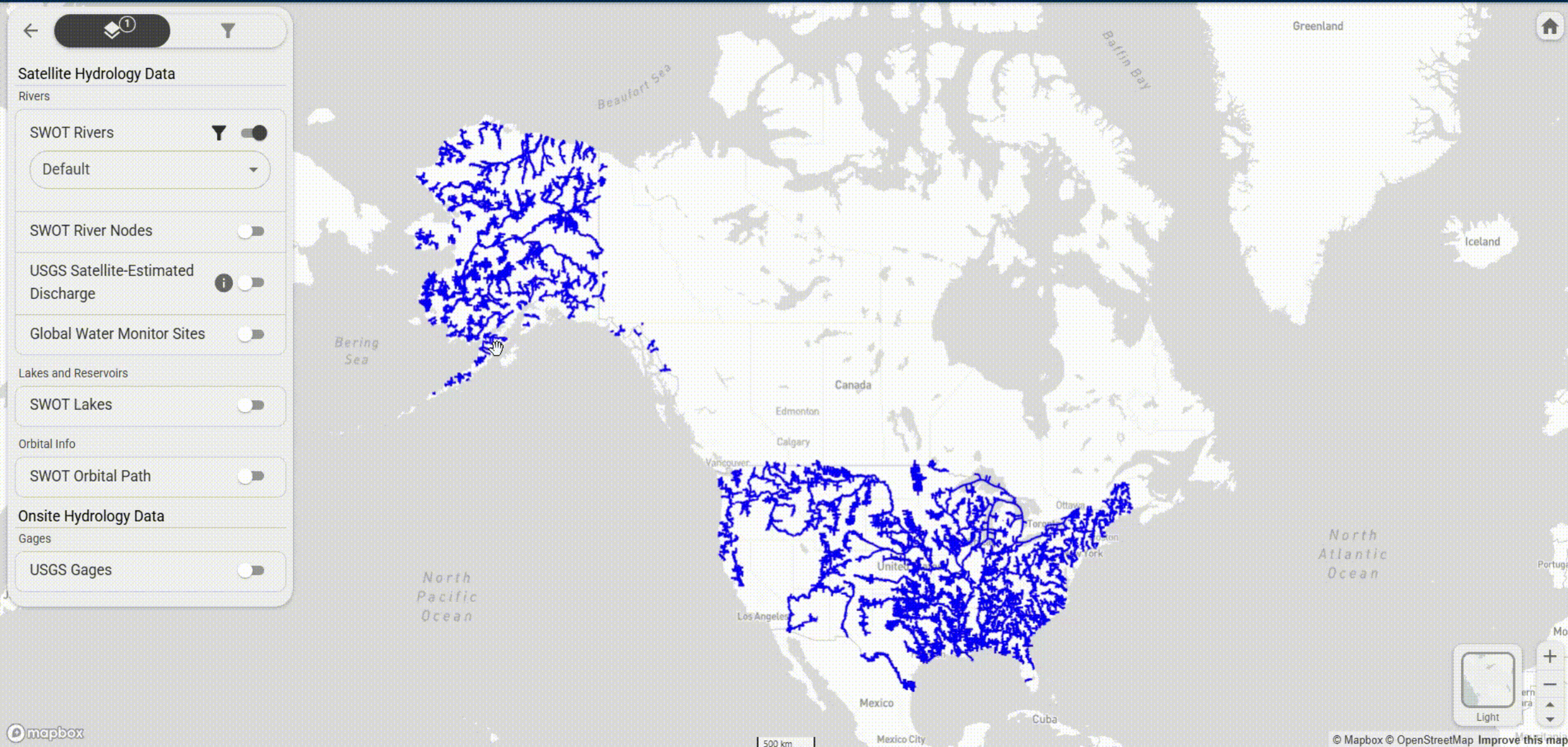


United States
Department of
Agriculture

Natural Resources Conservation Service



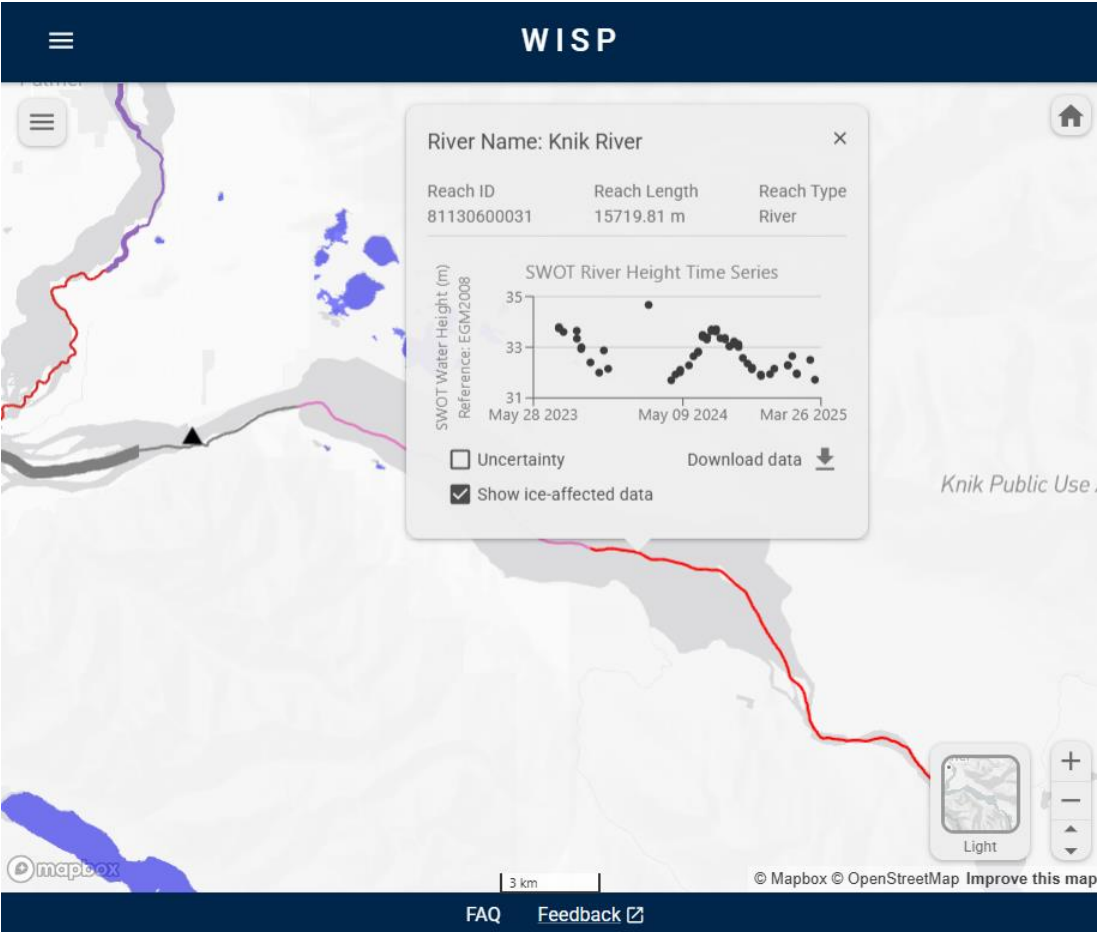
Oklahoma Flood Control Dam
managed by NRCS






SWOT data in Alaska help design of safer bridges





Knik River Bridge near Anchorage, AK









Satellite Hydrology Data


Rivers

SWOT Rivers  


Default 

SWOT River Nodes 


USGS Satellite-Estimated Discharge  

Global Water Monitor Sites 

Lakes and Reservoirs


SWOT Lakes 

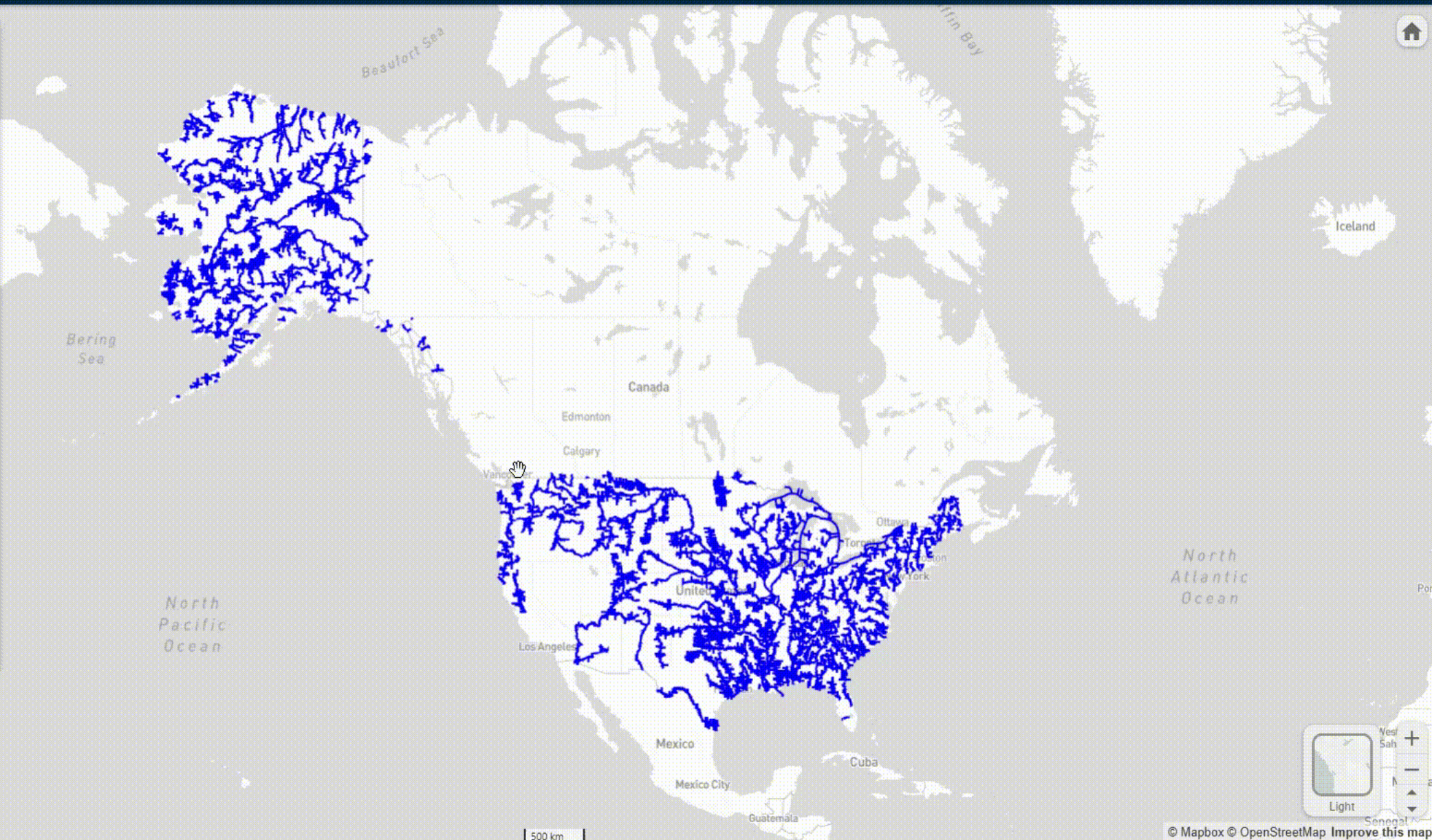
Orbital Info

SWOT Orbital Path 

Onsite Hydrology Data

Gages

USGS Gages 

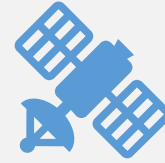
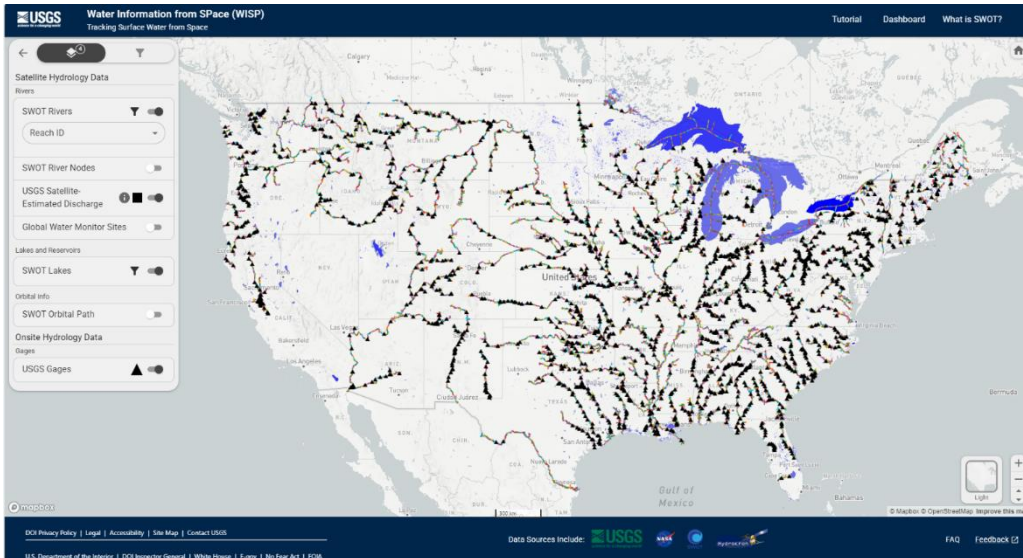


Conclusions

***Contact me with any questions,
feedback, or ideas!***

Dr. Merritt Harlan, mharlan@usgs.gov

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



SWOT measures vast numbers of lakes, reservoirs, and rivers globally



U.S. SWOT data are publicly accessible through WISP



Discover your own use for SWOT data on WISP!

Thanks for listening - Questions?

- WISP link: <https://apps.usgs.gov/wisp>
- WISP developers: Chuck Hansen, Colin Keating, Tom Bergamaschi, James Merges, Kyle O'Connor (USGS California Water Science Center)
- Hydrocron link: <https://podaac.github.io/hydrocron/intro.html>
- SWOT. (2024). *SWOT Level 2 River Single-Pass Vector Data Product*. NASA Physical Oceanography Distributed Active Archive Center. <https://doi.org/10.5067/SWOT-RIVERSP-2.0>
- Greguska, F., Tebaldi, N., McDonald, V. V., & Nickles, C. (2024). *Podaac/hydrocron: 1.4.0rc5*. Zenodo. <https://doi.org/10.5281/zenodo.13774808>

***Contact me with any questions,
feedback, or ideas!***

Dr. Merritt Harlan, mharlan@usgs.gov

