

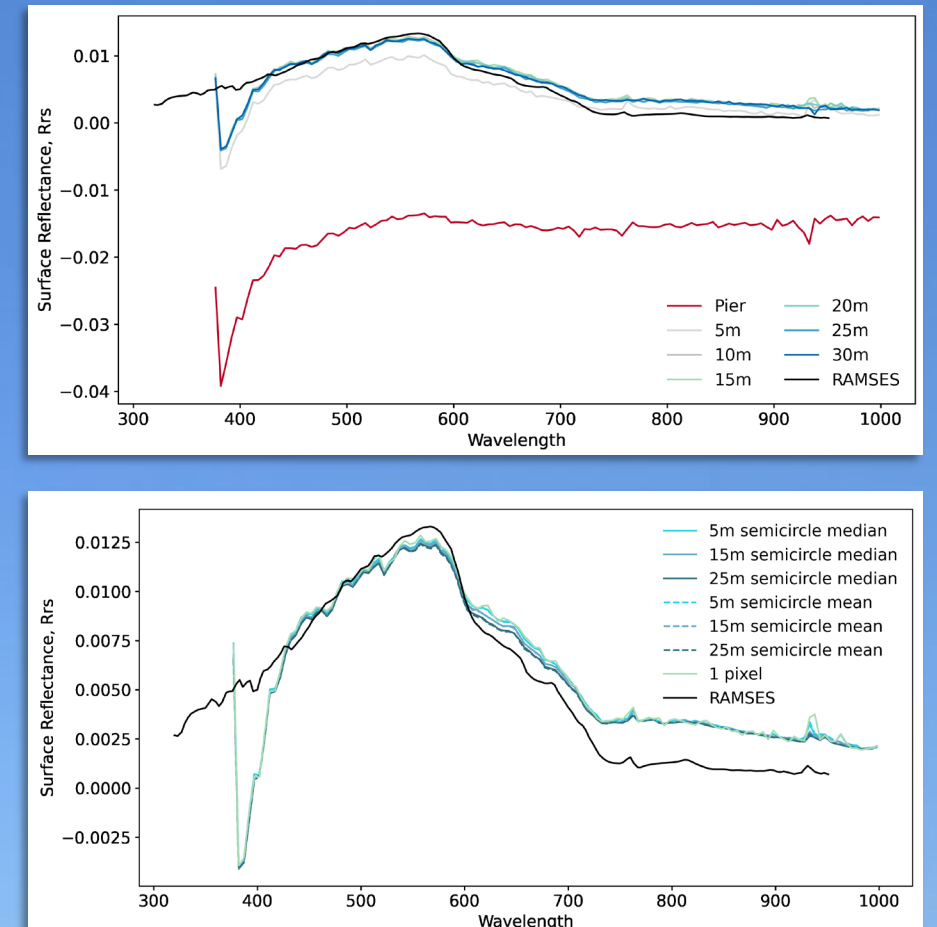
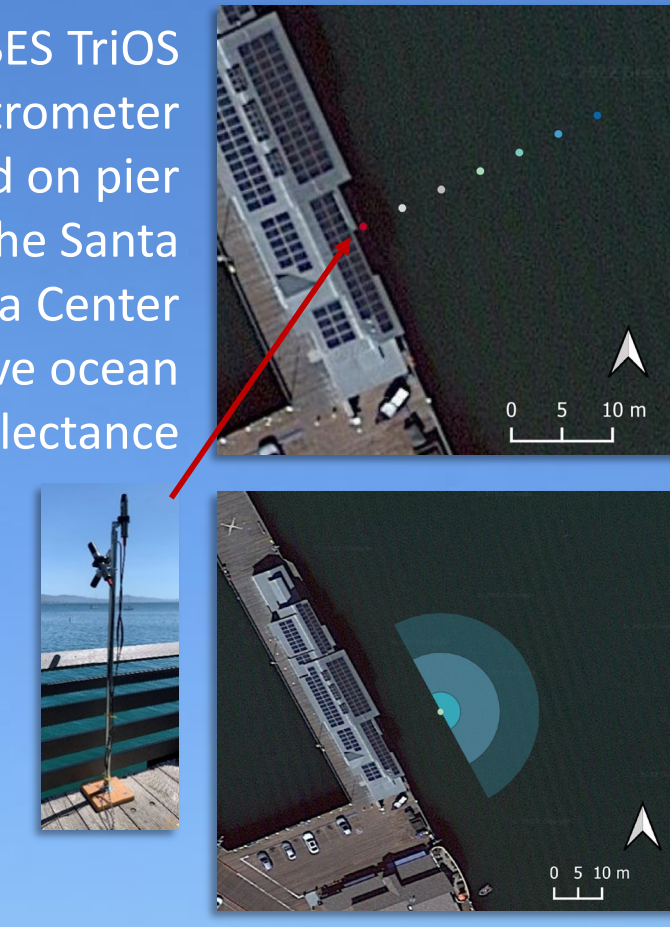
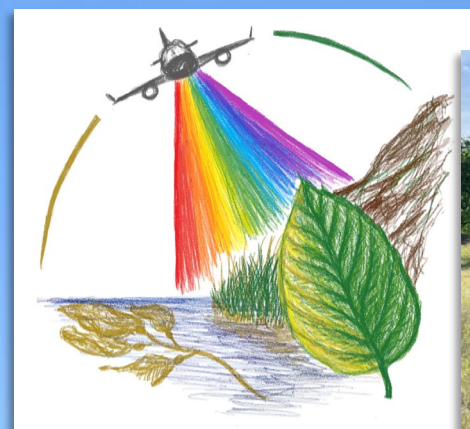
Data: Collection, Access & Utilization from an Applied Science Perspective

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Data Collection: SBG High Frequency Timeseries (SHIFT) Field Campaign

An airplane carrying the Airborne Visible/Infrared Imaging Spectrometer - Next Generation (AVIRIS-NG) instrument takes reflectance measurements simultaneously with in situ field teams to monitor ocean and land cover changes at a frequent timescale to help design the future Surface Biology & Geology (SBG) satellite.

RAMSES TriOS Spectrometer deployed on pier behind the Santa Barbara Sea Center to observe ocean surface reflectance



Data Access: Developing Coding Tutorials & Curating Resources

Mississippi River Heights Exploration:
 Working with In Situ Measurements and Satellite Hydrology Data in the Cloud

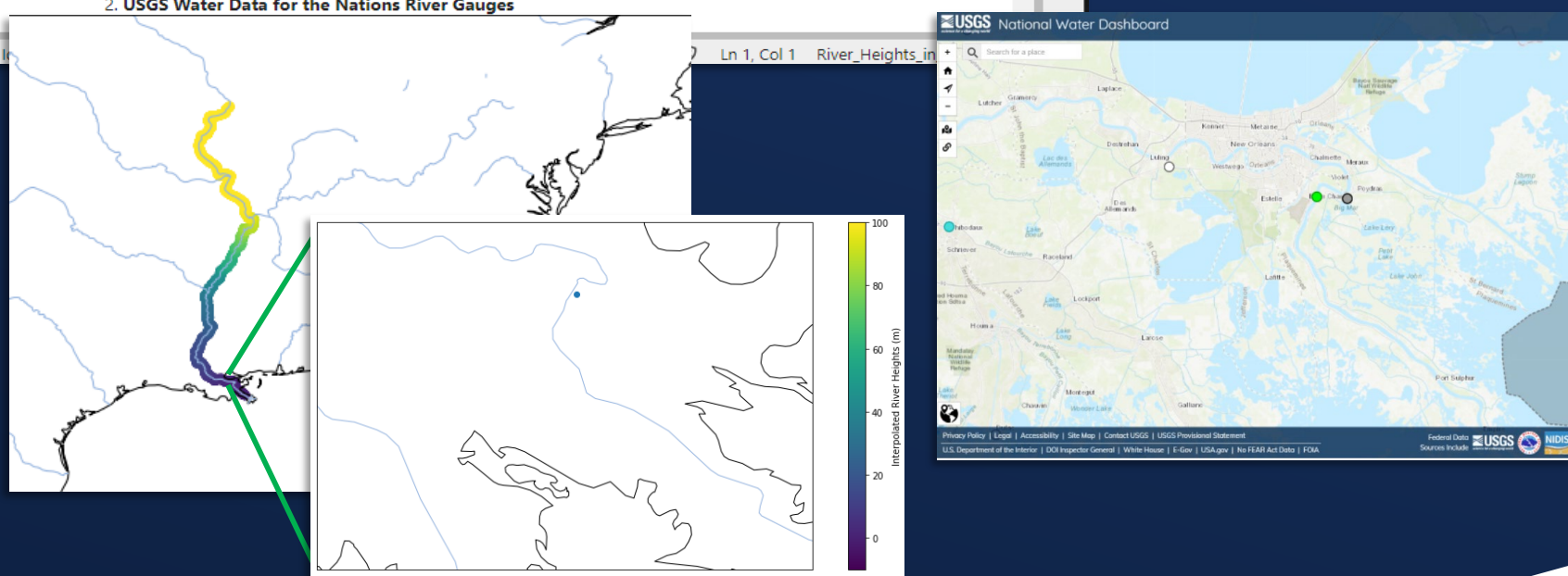
Learning Objectives

- Access data from the cloud (Pre-SWOT MEASURES river heights) and utilize in tandem with locally hosted datasets (USGS gauges)
- Search for products using Earthdata Search GUI
- Access datasets using xarray and visualize

Datasets

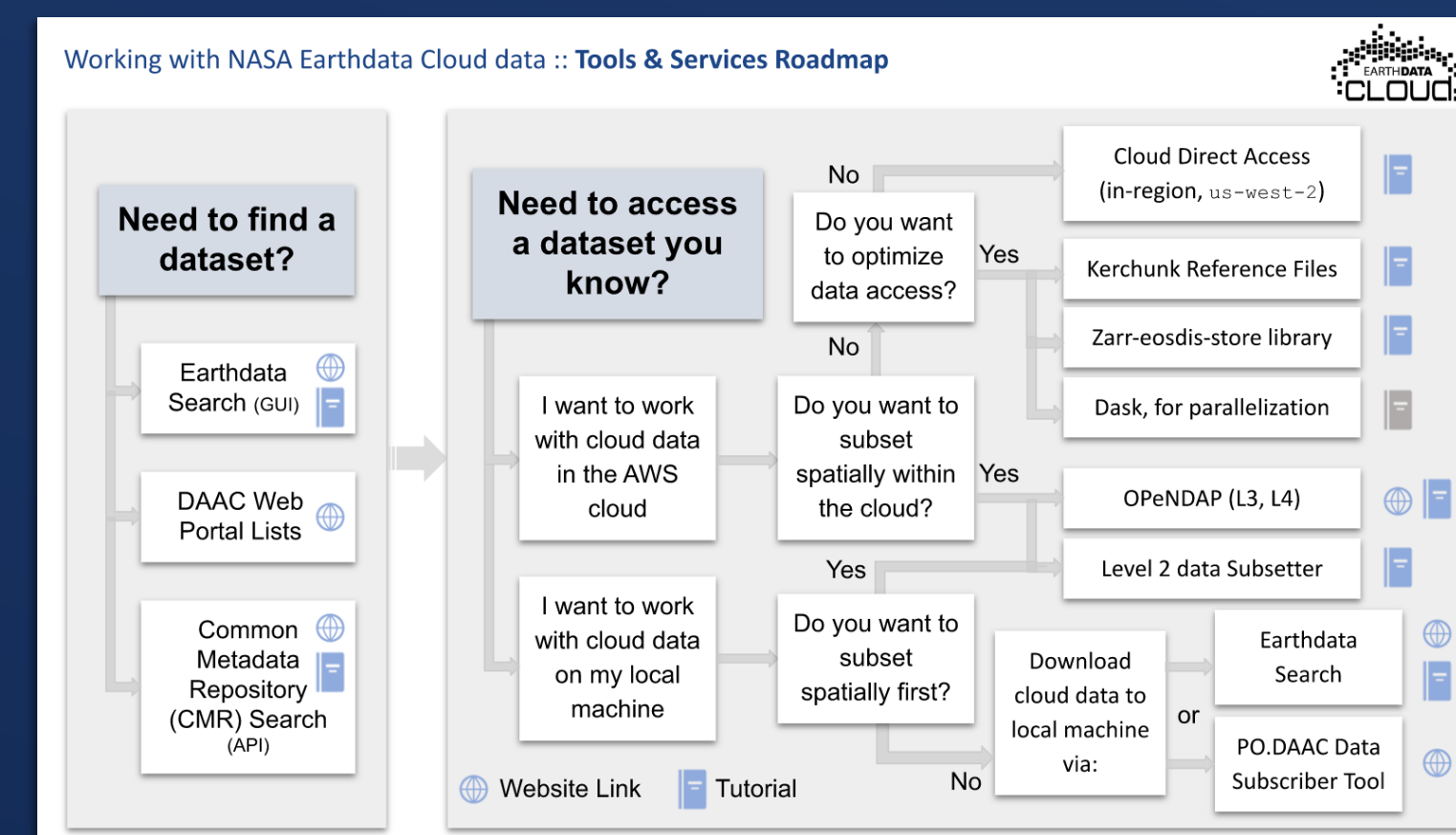
- PRESWOT_HYDRO_GRRATS_L2_DAILY_VIRTUAL_STATION_HEIGHTS_V2
- USGS Water Data for the Nations River Gauges

In-situ river heights from United States Geological Survey (USGS) gage



Cloud Pre-SWOT MEASURES river heights from radar altimetry

Earthdata Cloud Cookbook Cheatsheets & Guides



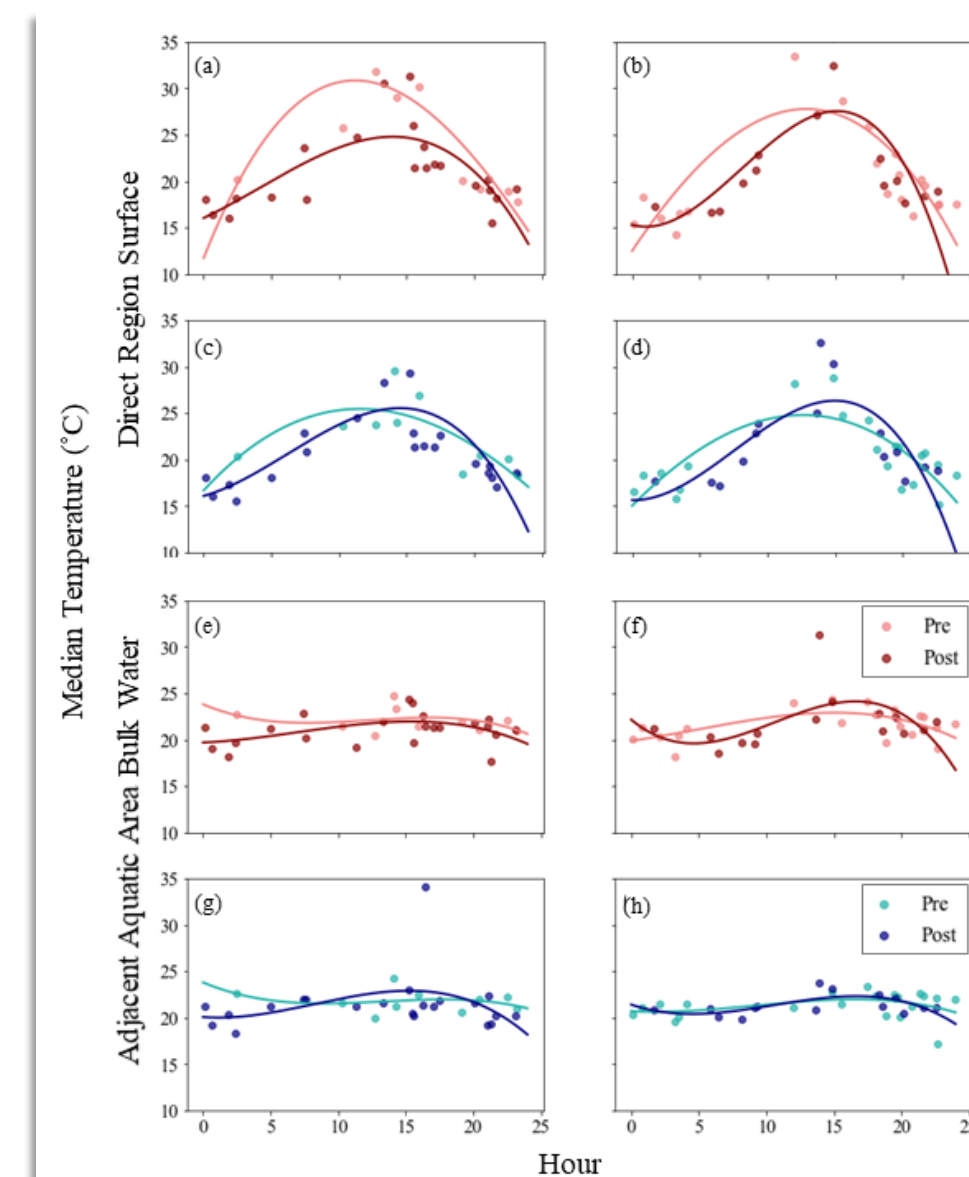
<https://nasa-openscapes.github.io/earthdata-cloud-cookbook/cheatsheet.html>

Stakeholder: compass

"Did tidal wetland restoration efforts increase thermal habitat suitability for the endangered Delta Smelt?"



Tule Red and Winter Island restoration projects were completed in 2019. We analyzed 68 ECOSTRESS scenes of temperature over summer months 2018-2021.



Median surface temperature for the direct wetland region (a-d) or median modeled bulk water temperature within the 500m buffer region (e-h) plotted against hour of the day before and after wetland restoration for (a,e) Tule Red ebb, (b,f) Tule Red flood, (c,g) Winter Island ebb, and (d,h) Winter Island flood for ECOSTRESS images captured at tidal stages between 2-4ft. Polynomial regression lines added only for visualization purposes.

- No statistical median temperature difference identified after restoration from the Wilcoxon rank-sum test.
- Tidal wetland restoration intends to increase endangered species food production, not necessarily to decrease temperature

Data Utilization: ECOSTRESS to Evaluate Tidal Wetland Restoration Actions



National Aeronautics and Space Administration

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 California Institute of Technology
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www.nasa.gov

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Publications:

- Gustine, R., Nickles, C., Lee, C., Crawford, B., Hestir, E., Khanna, S. (2022). Applying ECOSTRESS to Evaluate Diurnal Thermal Habitat Suitability and Tidal Wetland Restoration Actions in the San Francisco Estuary. *In Prep*
- Hossain, F., Das, P., Srinivasan, M., Tsontos, V., Oaida, C., Nickles, C., McNelis, J., Bonnema, M., Picot, N., Pena Luque, S., Doorn, B., Vinogradova-Shiffer, N., Andral, A., Gaultier, L., Jayaluxmi, I., Zhu, J., Fernando, D., Hasan, F., Fatima, B., Ahsan, M., Dhanya, C.T., Jayasinghe, S., Meechaiya, C., Barajas, M., Balakrishnan, V., Eldardiry, H., Elkholy, M., Abdelrazek, A., Fenoglio Marc, L., Durand, M., Wei, R., Pavelsky, T. (2022). Building User-Readiness for Satellite Earth Observing Missions: the Case of the Surface Water and Ocean Topography (SWOT) Mission. *AGU Advances, Accepted*
- Hall, C., Scwizer, L., Oaida, C., Armstrong, E., McNelis, J., Nickles, C., Studer-Ellis, G., Wang, J., & Gierach, M. (2022). Transforming to Open Science in the Cloud Using NASA Earth Science Data. *Limnology and Oceanography Bulletin*, 31: 51-52 doi:10.1002/lob.10491

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