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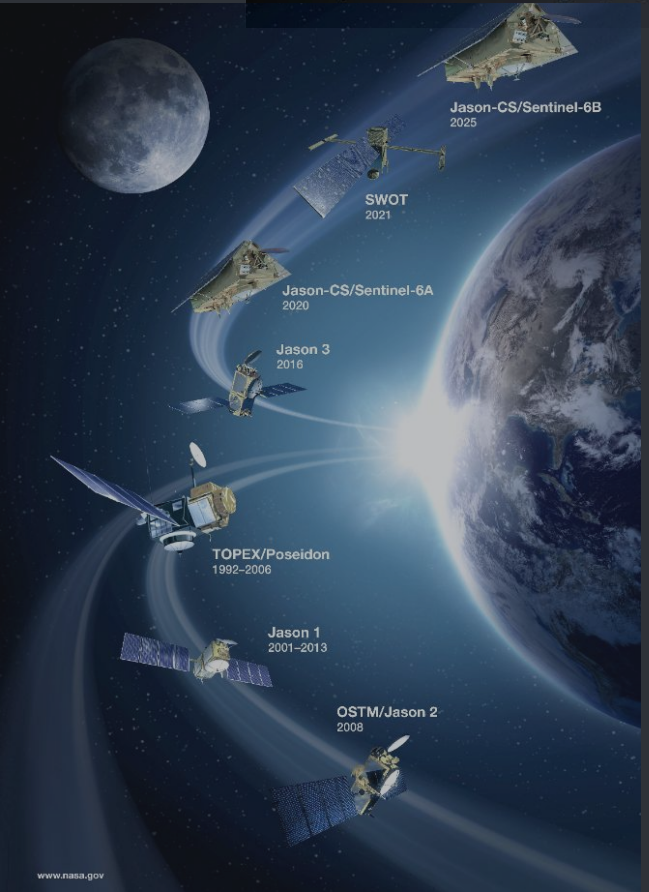
Physical Oceanography Distributed Active Archive Center



Ocean Data and Services Currently Available at PO.DAAC

Jessica Hausman[1], Catalina Oaida[2], Michelle Gierach[1], Michael Gangl[1], Suresh Vannan[1]

[1]Jet Propulsion Laboratory/California Institute of Technology

[2]Raytheon

Outline

SWOT Sampling and Datasets

Services available today

- Web Services (APIs)
- Dataset Landing Pages
- Search and Discovery - Earthdata Search
- Subsetting - HiTIDE
- Visualization - SOTO
- Recipes and Forum

Relevant Datasets available

Feedback from you

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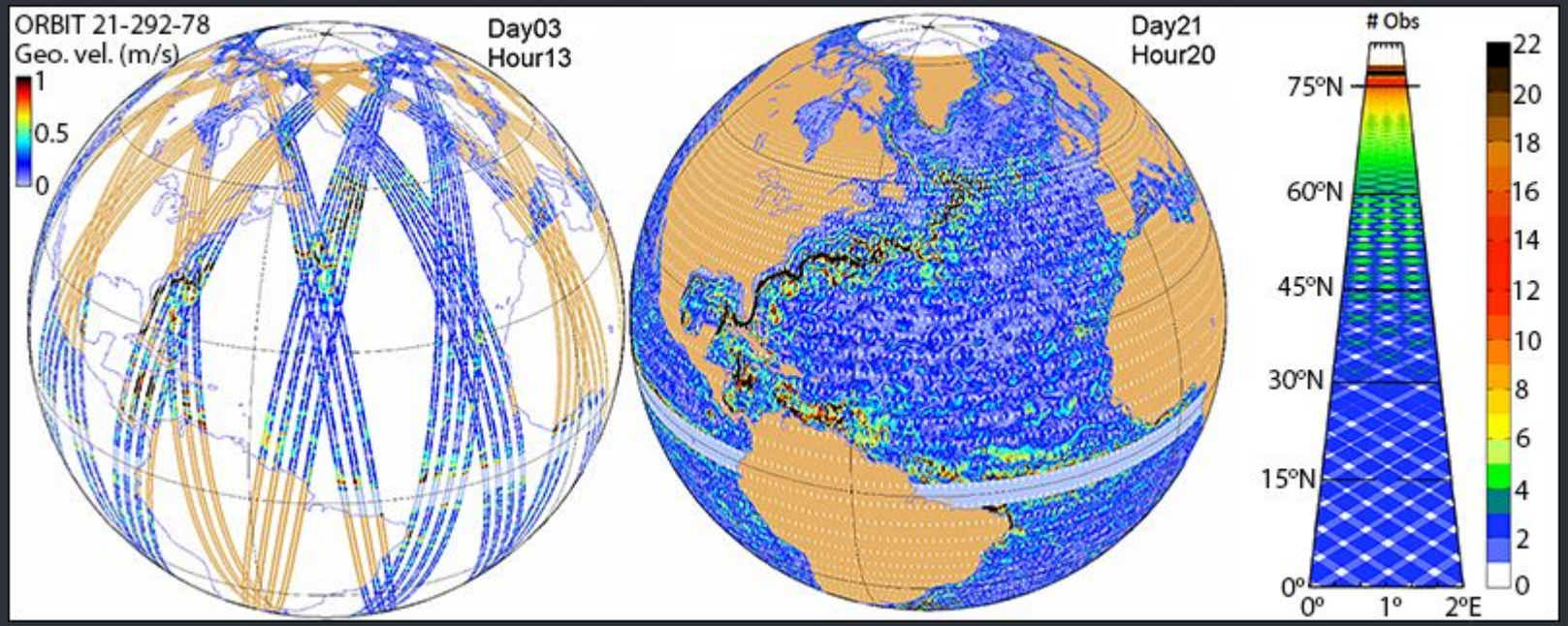
SWOT Swaths https://swot.jpl.nasa.gov/



SWOT's nominal coverage during its 3-year science orbit will include measurements between 78°N and 78°S collected over a period of 21 days. Maps show the coverage after 3 days (left) and the full 21 days (center) of a complete cycle. The color on the maps is the modeled surface currents for each track, with the surface geostrophic velocity shown in meters per second. The number of observations at a given latitude during the 21-day repeat period (using the northern latitude as an example) is shown at the far right.

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Swot Sampling and Datasets

- 2 swaths each 64 km wide, with a nadir altimeter in the middle gap
- Ocean pixels/bins 2x2 km
- Hydrology
  - Rivers ≥100 m wide
  - Lakes ≥250 m wide
  - Pixel cloud has several resolutions
- **3.7PB** of L2 Data over life of mission
- Product Latency[1]
  - Available to users < 3 days from observation
  - Negligible impact to ocean errors
  - Slight height error increase (5.4 to 5.7 cm) to hydrology products
  - No impact to slope error to hydrology products

1. https://spark.adobe.com/page/OUbgO2h56fyX1/

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Caveats

- These tools and services are to demonstrate functionality of services. These may not be the same tools available on the cloud (except for Earthdata Search).
- The datasets are examples of parameters similar to what SWOT will measure. They do not represent the same resolution or noise of SWOT.

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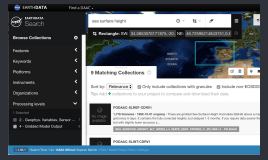
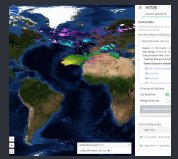
Select Tools and Services of Today vs. Tomorrow

Services Today

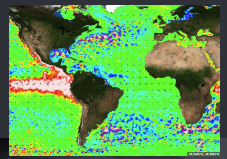
Dataset Landing Pages
Search & Discovery



Earthdata Search
Search & Discovery



HiTIDE
Subset & Visualize



SOTO
Visualize

Web Services

On the cloud

Search & Discover*

- Dataset Info*
- Search*
- Visualize*
- by parameter*
- by line, point, or polygon
- by spatial region*
- temporally*

Subset*

- by parameter*
- by line, point, or polygon, shp
- by spatial region*
- temporally*

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Web Services

- All the following services and tools API based and can be called programmatically
  - https://podaac.jpl.nasa.gov/ws
- PODAACPy - python wrapper for easily calling PO.DAAC services
  - 45k downloads
  - https://github.com/nasa/podaacpy
- Tools provide GUIs to allow exploring the tool and functionality, we recommend using APIs to operationalize the functionality

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Dataset Landing Page - Dataset Information

Earthdata Search

SEA_SURFACE_HEIGHT_ALT_GRIDS_L4_2SATS_5DAY_6THDEG_V_ VERSION 1 _1

PODAAC-SLREF-CDRV1

Abstract

These are gridded Sea Surface Height Anomalies (SSHA) above a mean sea surface, on 1/6th degree grid every 5 days. It contains the fully corrected heights, but delayed 1-3 months. If you require data sooner there is an interim dataset available, but with slightly lower accuracy at http://dx.doi.org/10.5067/SLINT-CDRV1. The gridded data are derived from the SSHA data of TOPEX/Poseidon, Jason-1, Jason-2 and Jason-3 as reference data from the level 2 swath data found at http://podaac.jpl.nasa.gov/dataset/MERGED_TP_J1_OSTM_OST_CYCLES_V3, plus ERS-1, ERS-2, Envisat, SARAL-AltiKa, CRyosat-2, depending on the date, from the RADS database. The gridding is done by the kriging method. The date given in the data is the center of the 5 day window.

SEARCH FOR GRANULES FROM THIS COLLECTION

Data Identification Fields:

Data Dates

Creation	2016-02-10T00:13:52.802Z
Last Revision	2017-04-28T05:01:46.000Z

Processing Level

4

Quality

Spatial Coordinates

Bounding Rectangle

N: 90.0 S: -90.0 E: 180.0 W: -180.0

Temporal Coverages

DateTime Ranges

1992-10-01 to now

PO.DAAC

All Products › Advanced Search: Text

MEaSUREs Gridded Sea Surface Height Anomalies Version 1812

SHARE THIS PAGE

https://podaac.jpl.nasa.gov/dataset/SEA_SURFACE_HEIGHT_ALT_GRID

Please contact us if there are any discrepancies or inaccuracies found below.

Information | Data Access | Documentation | Citation | Granule (File) Listing

DOI	10.5067/SLREF-CDRV2
Short Name	SEA_SURFACE_HEIGHT_ALT_GRIDS_L4_2SATS_5DAY_6THDEG_V_JPL1812
Description	These are gridded Sea Surface Height Anomalies (SSHA) above a mean sea surface, on 1/6th degree grid every 5 days. It contains the fully corrected heights, but delayed 1-3 months. If you require data sooner there is an interim dataset available, but with slightly lower accuracy at

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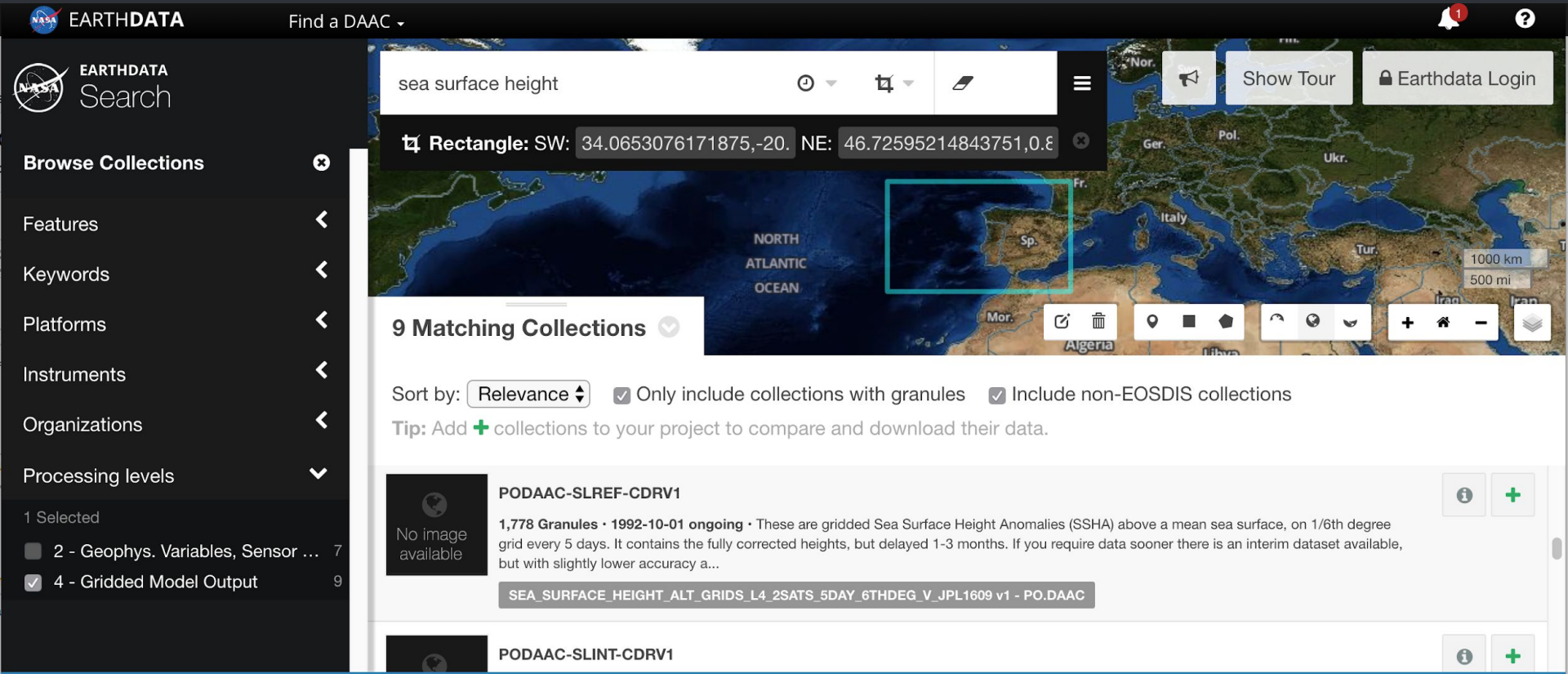
Earthdata Search - Search and Discovery

https://search.earthdata.nasa.gov



EARTHDATA Find a DAAC

sea surface height

Rectangle: SW: 34.0653076171875,-20. NE: 46.72595214843751,0.8

Back to Collections

PODAAC-SLREF-CDRV1 View details

Sort by: Start Date, Newest first Granule Search: Search Single or Multiple Granule IDs...

Showing 20 of 1,778 matching granules

ssh_grids_v1804_2017111012.nc		ssh_grids_v1804_2017090612.nc	
START	2017-11-10 00:00:00	START	2017-09-06 00:00:00
END	Not Provided	END	Not Provided

Granule Filters

PODAAC-SLREF-CDRV1

Temporal

Start End

YYYY-MM-DD HH:MM:S YYYY-MM-DD HH:MM:S

Recurring?

Data Access

Find only granules that have browse images.

Find only granules that are available online.

Orbit Spatial Parameters

Apply Clear

MONTH

PODAAC-SLREF-CDRV1

Jun Jul Aug Sep Oct Nov Dec Jan 2016 Feb

v 1.93.1 • Search Time: 1.4s • NASA Official: Stephen Berrick • FOIA • NASA Privacy Policy • USA.gov

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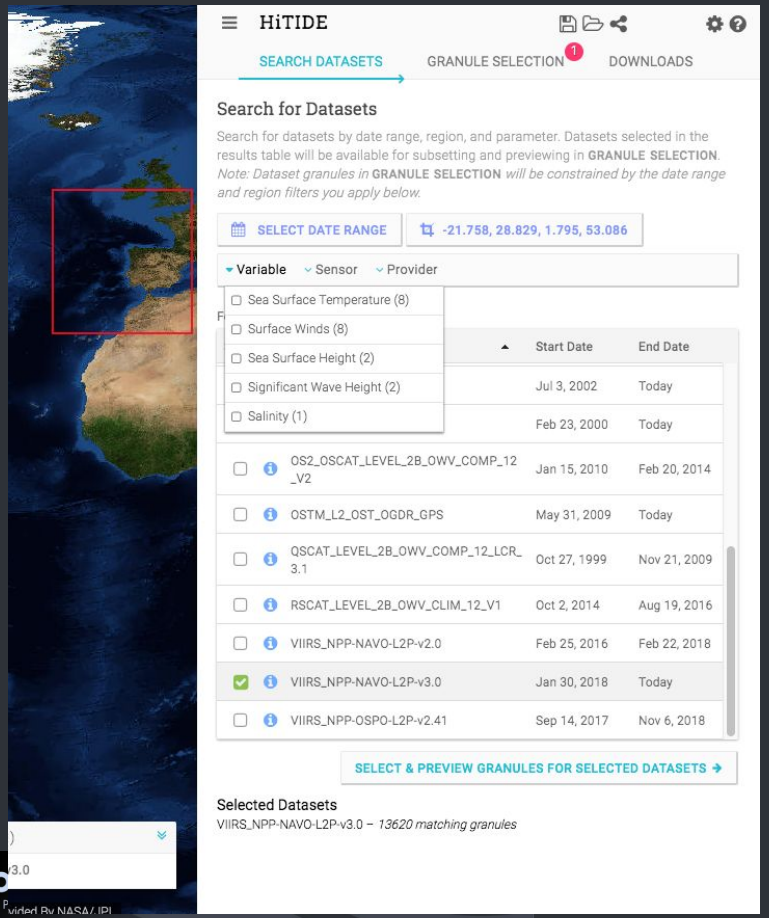
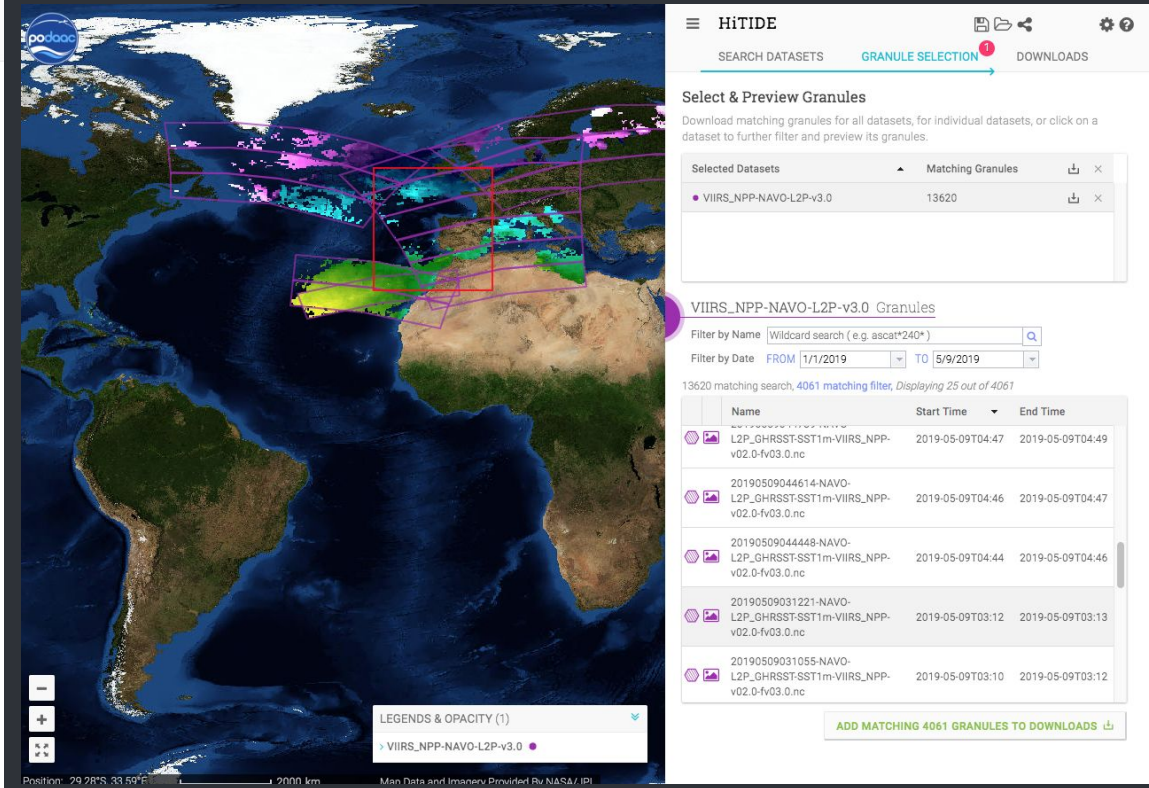
HiTIDE - Subsetting

https://podaac-tools.jpl.nasa.gov/hitide





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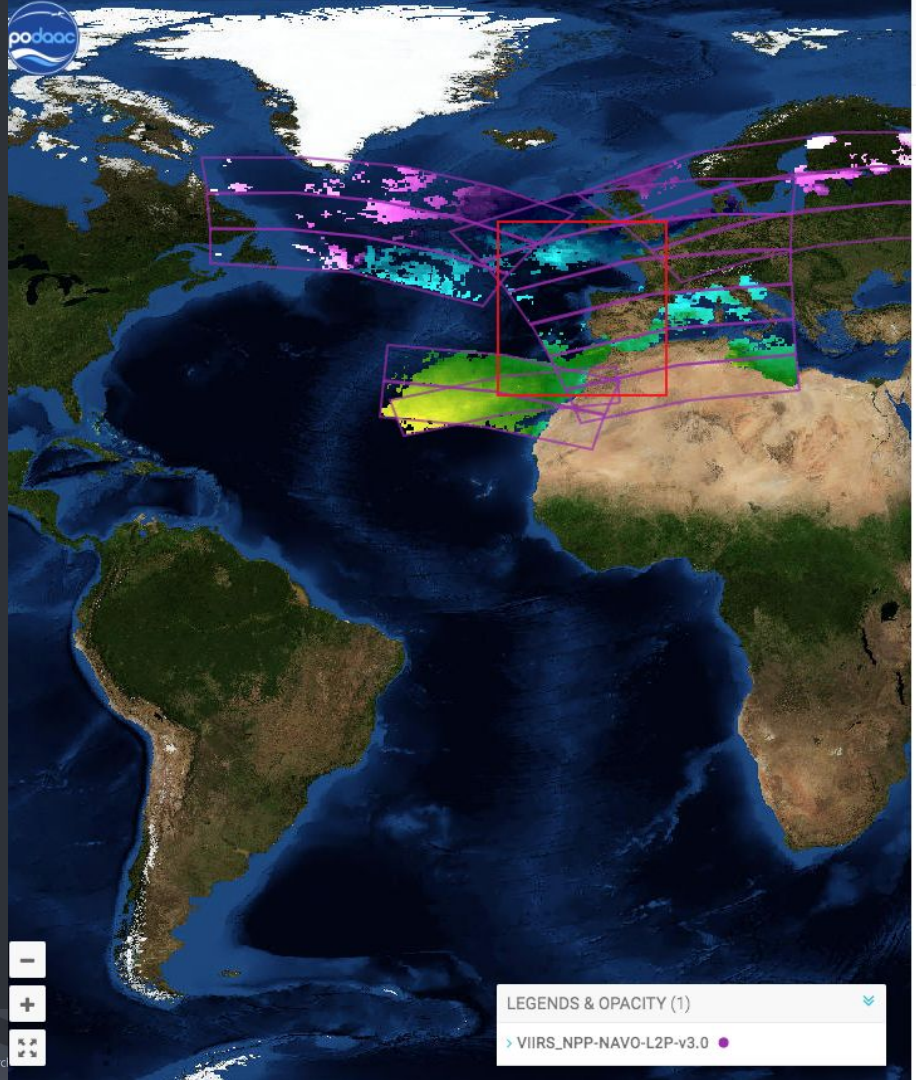


HiTIDE

SEARCH DATASETS | GRANULE SELECTION 1 | DOWNLOADS 5

Downloads

Review the selections you have made then submit them for processing. We will zip and email you the results.

REVIEW GRANULES SELECTED FOR DOWNLOAD

VIIRS_NPP-NAVO-L2P-v3.0 — 1 Granule(s)

Region: -21.758, 28.829, 1.795, 53.086
Date Range: 2019/01/01 *to* 2019/05/09
Granule Name Filter: *None*
Selected Granule Name(s)
Select Extraction Variables

- sea_surface_temperature
- sst_dtime
- sses_bias

Enter email address

Cut Scanline

Merge Granules

DOWNLOAD SELECTED GRANULES

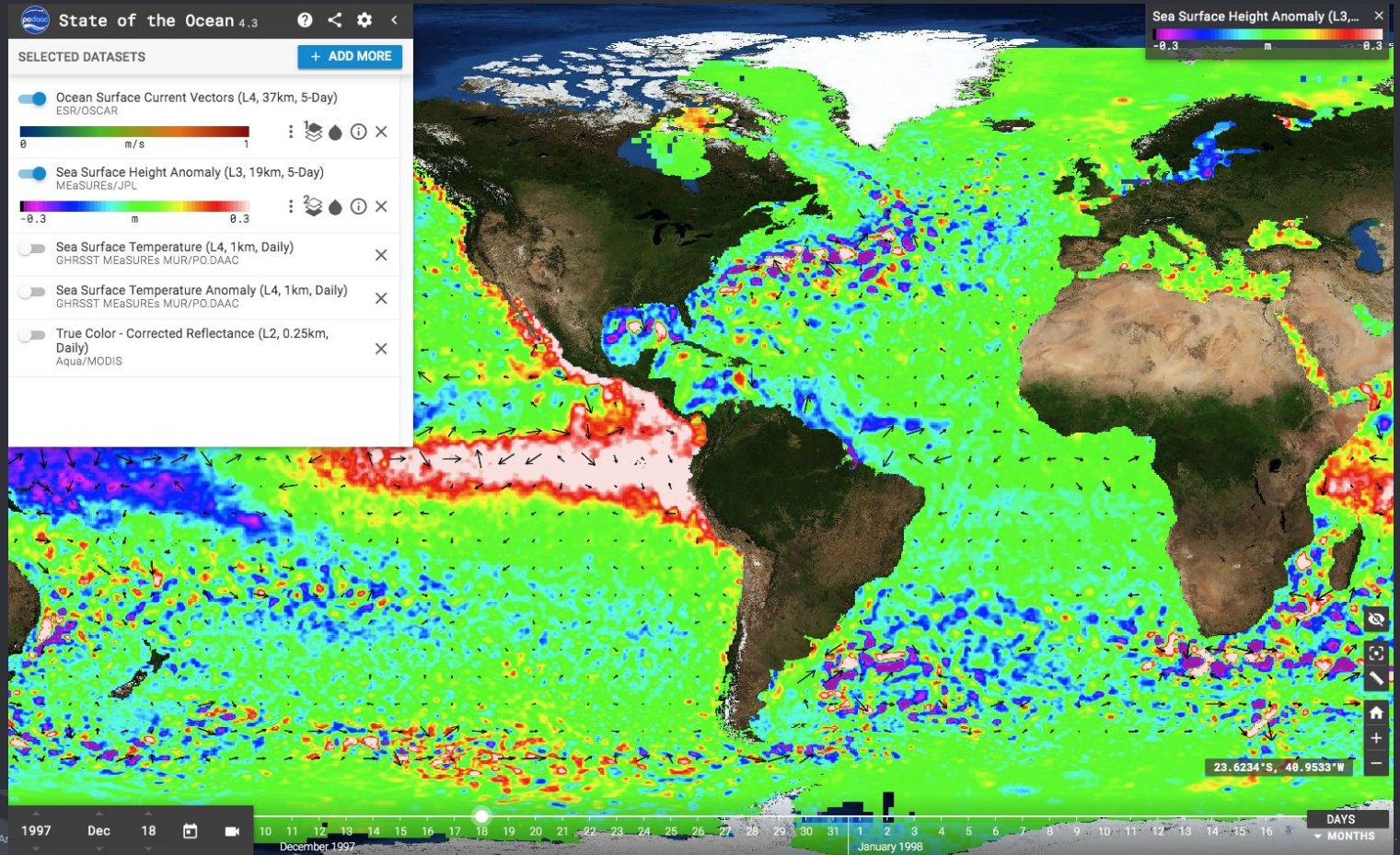
Note: Once submitted, downloads cannot be canceled.

YOUR DOWNLOADS

Start Time	Status
Jul 13, 2017 — 9:03:13 AM	DONE – DOWNLOAD LINKS
Feb 8, 2018 — 1:58:24 PM	DONE – DOWNLOAD LINKS

State Of The Ocean (SOTO) - Visualization

https://podaac-tools.jpl.nasa.gov/soto



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You are not alone

- Webinars
  - Goodbye FTP, New Ways to Access NASA's Physical Oceanography Data at PO.DAAC
  - Discover, Access, and Subset NASA Physical Oceanography Data
- Recipes
  - Data Recipes on the Forum
  - 59 topics, hundreds of replies and thousands of views on all things PO.DAAC data, access, and analysis
- Forums

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Datasets

- MEaSUREs Integrated Multi-Mission Ocean Altimeter Data for Climate Research
  - Swath Sea Surface Height Anomaly
  - Gridded Sea Surface Height Anomaly
- MEaSUREs Pre-SWOT Hydrology
  - Virtual river station heights
  - Lake/reservoir surface water area extent
  - Lake/reservoir water height
- VIIRS Sea Surface Temperature
- GRACE and GRACE-FO

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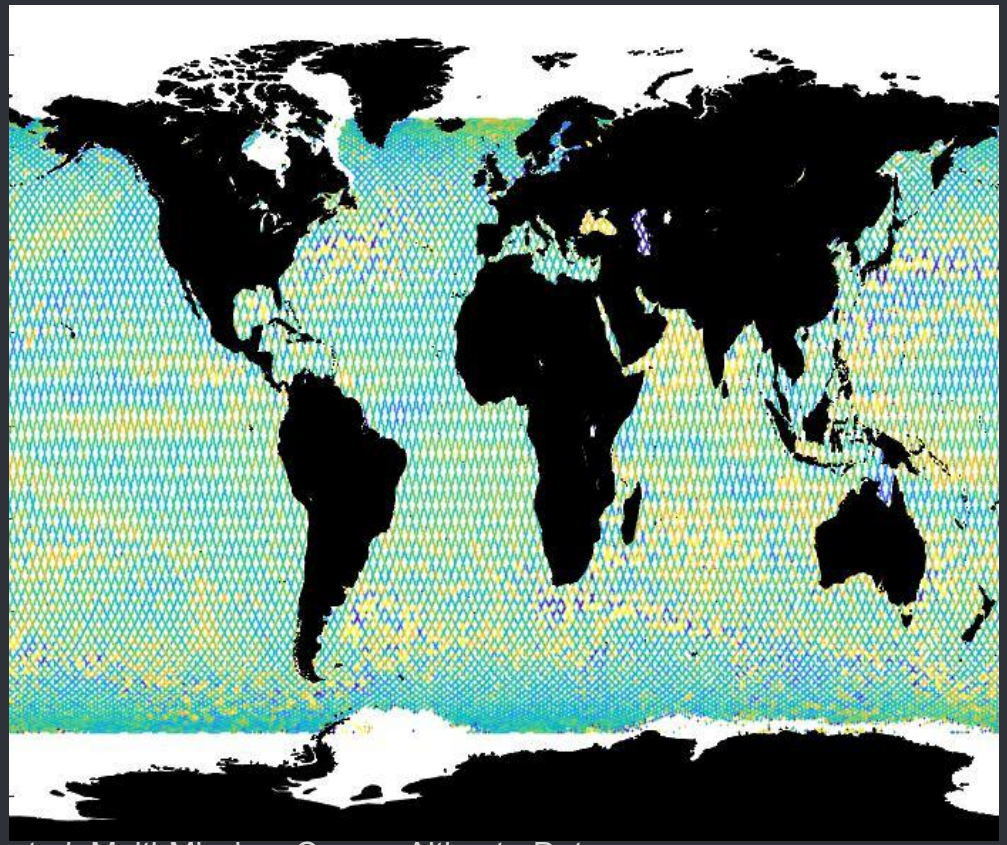
MEaSUREs Integrated Multi-Mission Ocean Altimeter Data for Climate Research

Swath Sea Surface Height Anomaly

- ~11 km footprint
- 5 day resolution
- Starts September 1992
- Removes biases and cross-calibrates between TOPEX/Poseidon and the Jason series
- DOI: 10.5067/ALTTS-TJ142



For more information see: https://podaac.jpl.nasa.gov/Integrated_Multi-Mission_Ocean_AltimeterData

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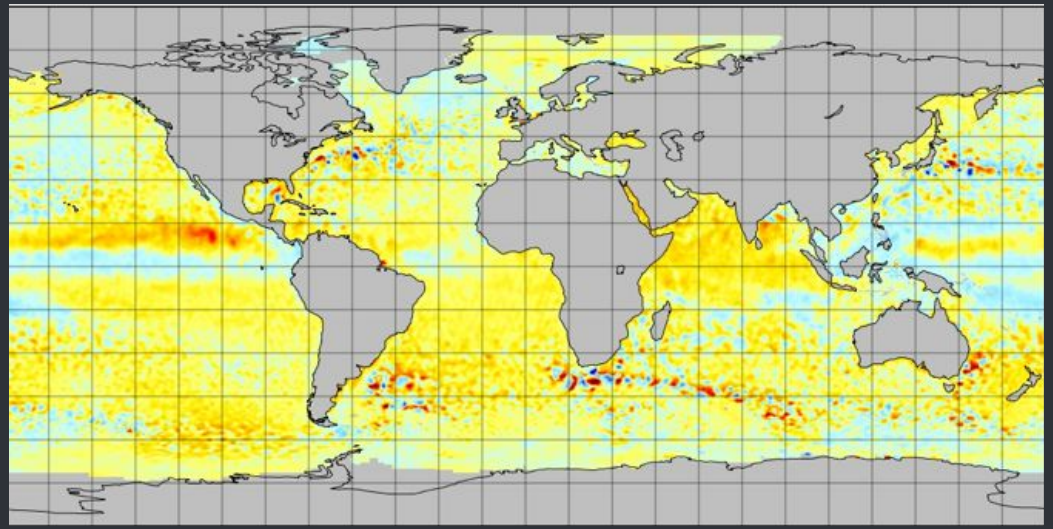
MEaSUREs Integrated Multi-Mission Ocean Altimeter Data for Climate Research

Gridded Sea Surface Height Anomalies

- ⅙ degree grid
- 5 day resolution
- Starts September 1992, with lag ~6 months from present
- Includes TOPEX/Poseidon and Jason series
- DOI: 10.5067/SLREF-CDRV2



For more information see: https://podaac.jpl.nasa.gov/Integrated_Multi-Mission_Ocean_AltimeterData

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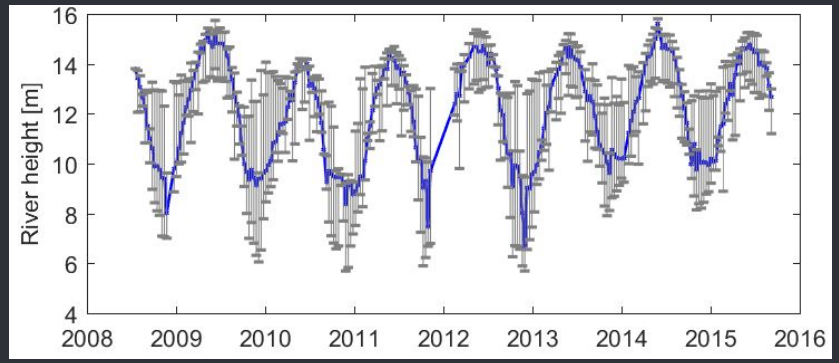
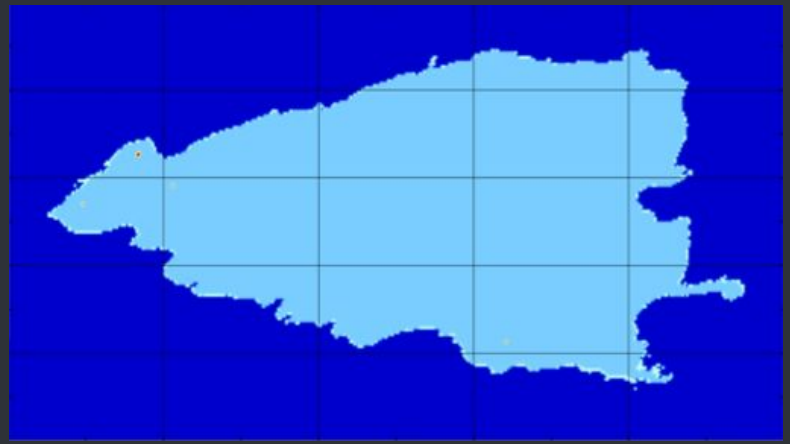
MEaSUREs Pre-SWOT Hydrology

- GRAATS river heights time series
  - DOI: 10.5067/PSGRA-SA2V1
  - 2002-2010 Envisat
  - 2008-2016 Jason-2
- GREALM Lake heights time series
  - DOI: 10.5067/UCLRS-GREV1
  - 10/1992-10/2016
- Lake area
  - DOI: 10.5067/UCLRS-AREV1
- Lakes from TOPEX/Poseidon & Jason series
  - 1992-2016
- Has satellite quality flags
- Files are water body specific





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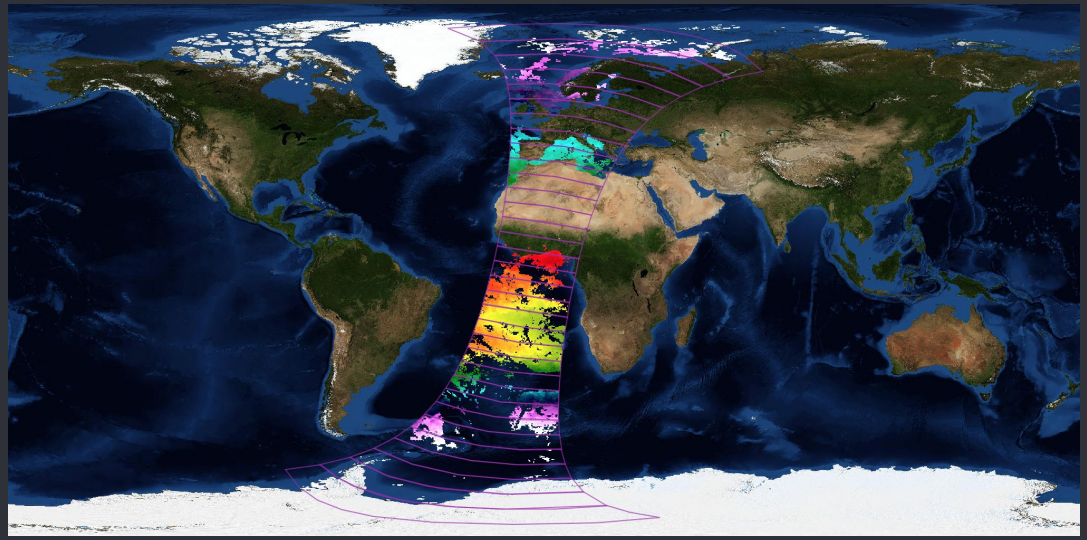
VIIRS Sea Surface Temperature

- L2 swath
- Pixel ~750 m along-track x 750 m cross-track (SWOT 2 km x 2 km)
- One file is 576 km x 3060 km
- DOI: 10.5067/GHVRS-2PN30



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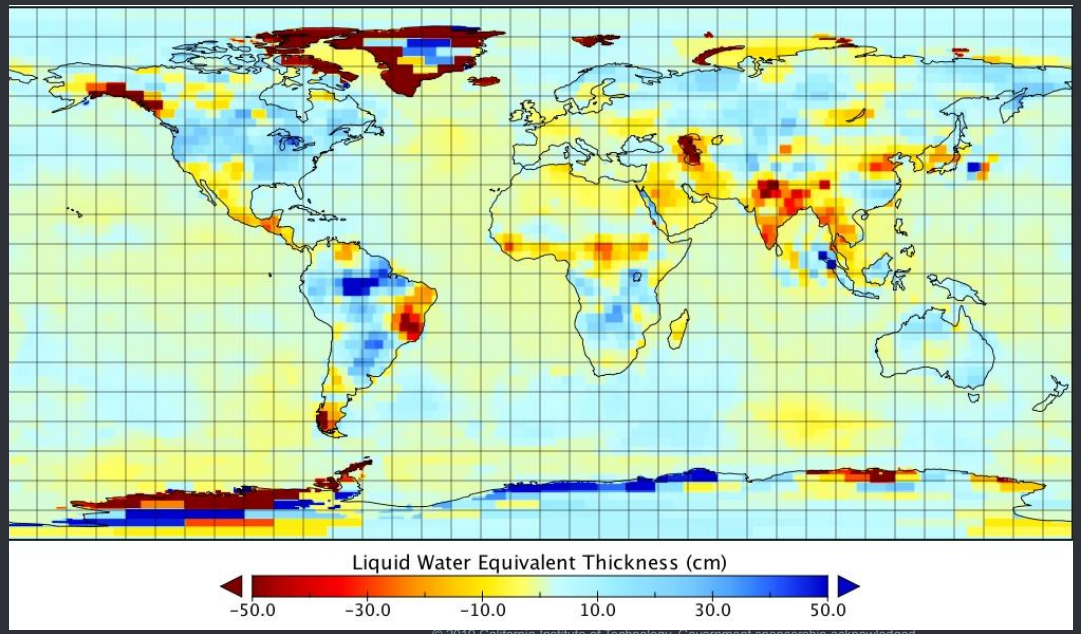
GRACE and GRACE-FO

- Gravity Recovery and Climate Experiment (GRACE) detects gravity fields, which is converted to water mass/storage changes in the ocean and land
- GRACE 2002-2017
- GRACE-FO launched 22 May 2018
- Mascon grids
  - 0.5 degree spatial resolution
  - DOI: 10.5067/TEMSC-3MJC6



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Upcoming Datasets

- Jason-CS/Sentinel-6
  - Launches November 2020
  - Will be archived on the cloud
- Simulated data from the SWOT project

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Thank you!

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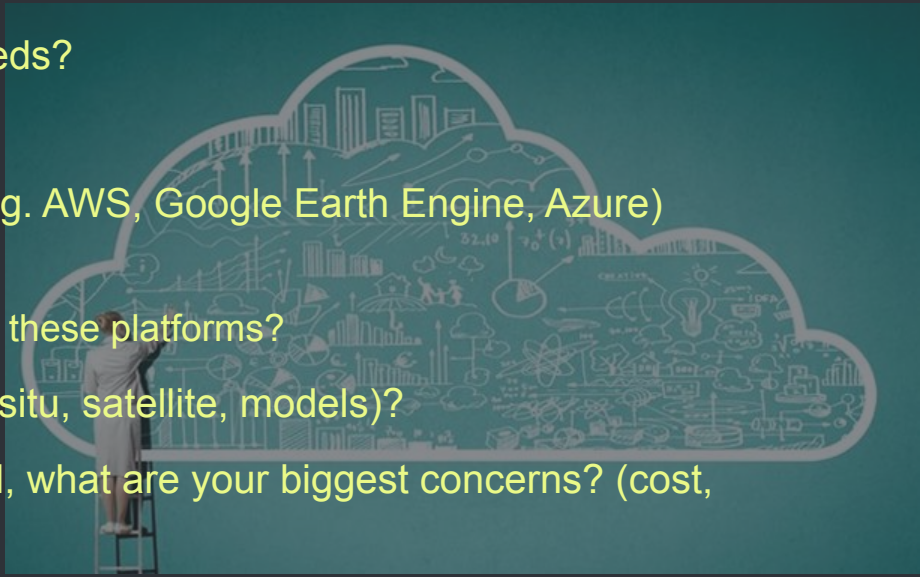
What about you?

- Do the planned functionalities meet your needs?
  - If not, what do you need?
- Do you currently use any cloud platforms (e.g. AWS, Google Earth Engine, Azure)
  - If so, how do you use them, functionality?
    - what are current pain points with using these platforms?
- What are the data you use sourced from (in situ, satellite, models)?
- For those thinking about moving to the cloud, what are your biggest concerns? (cost, deployments, scalability, security?)



Please answer the questions at **https://tinyurl.com/y3a3zzwl**

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