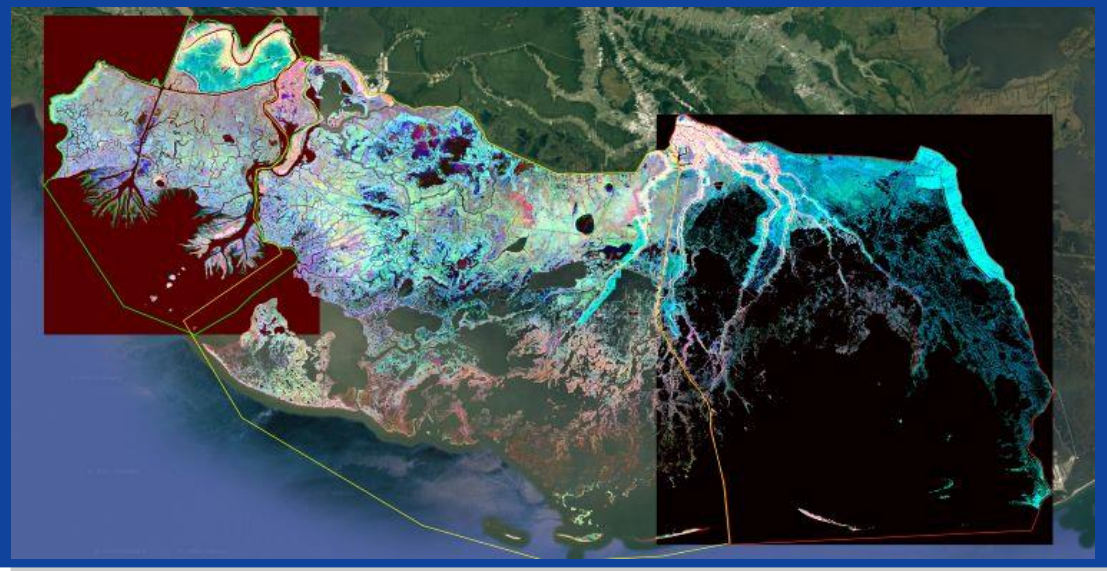
ORNL DAAC
DISTRIBUTED ACTIVE ARCHIVE CENTER
FOR BIOGEOCHEMICAL DYNAMICS

Delta-X Data Access and Archival at the Oak Ridge National Laboratory Distributed Active Archive Center (ORNL DAAC)

Delta-X Open Data Workshop and Science Team Meeting

June 5th, 2023

Matt Donovan, Geospatial Data Analyst
Yaxing Wei, Lead Scientist



Delta-X

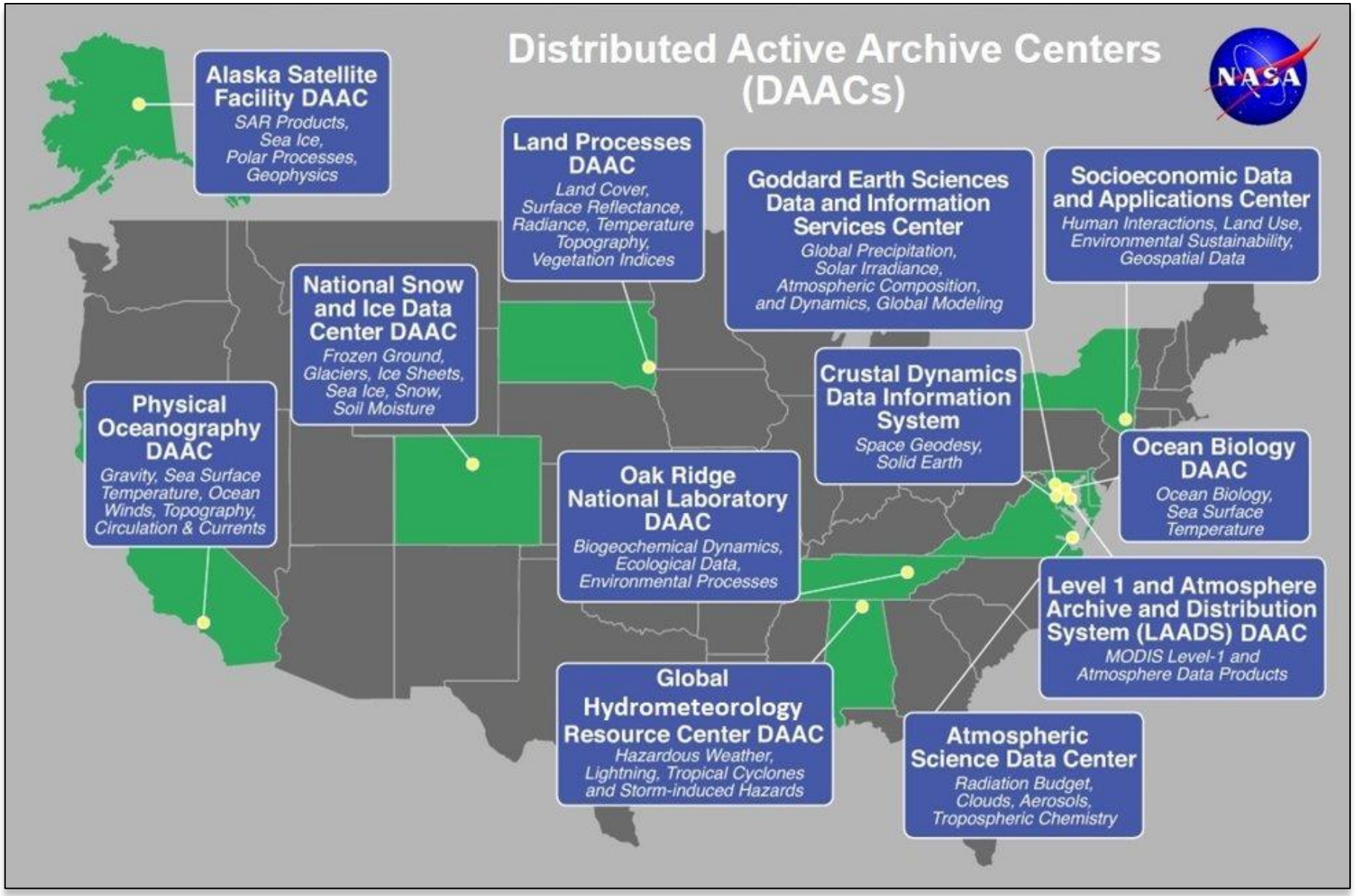
The Oak Ridge National Laboratory Distributed Active Archive Center for Biogeochemical Dynamics operates under an interagency agreement between NASA and the U.S. Department of Energy

U.S. DEPARTMENT OF ENERGY

NASA

EOSDIS Distributed Active Archive Centers

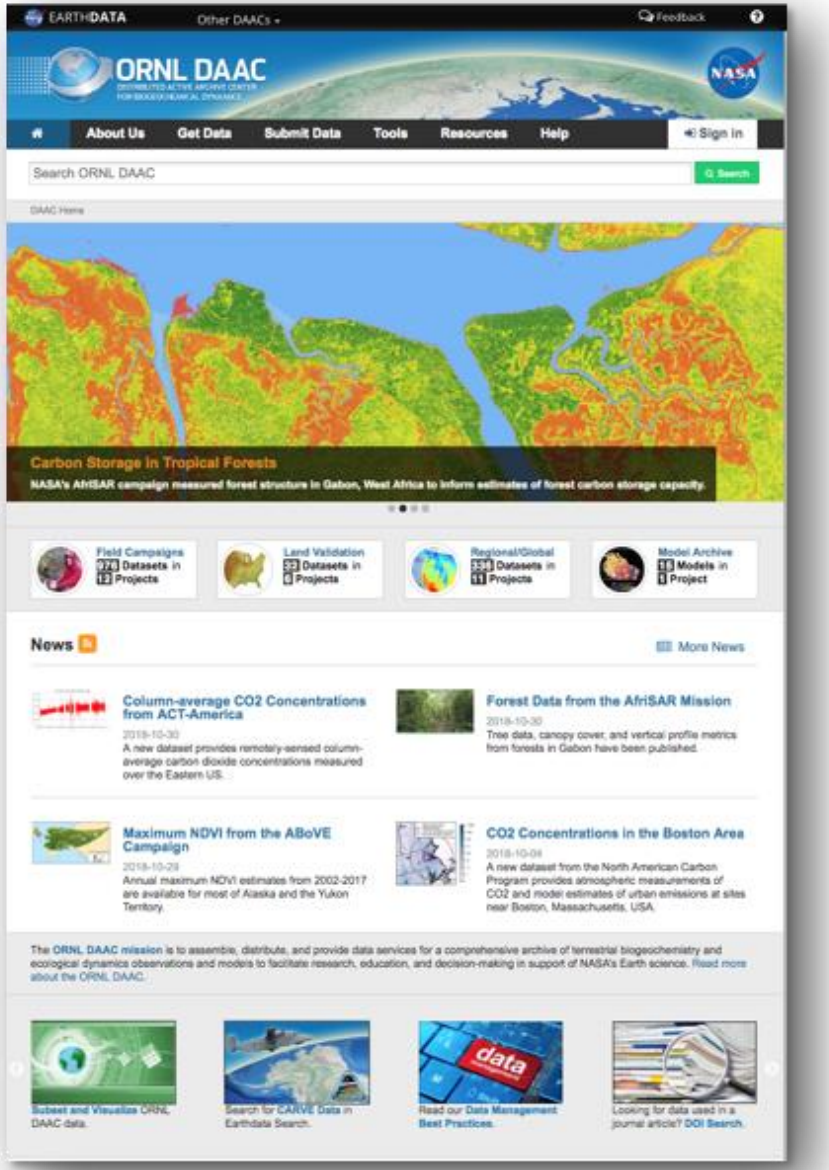
- EOSDIS = Earth Observing System Data and Information System
- Includes 12 discipline-oriented DAACs



The ORNL DAAC- https://daac.ornl.gov

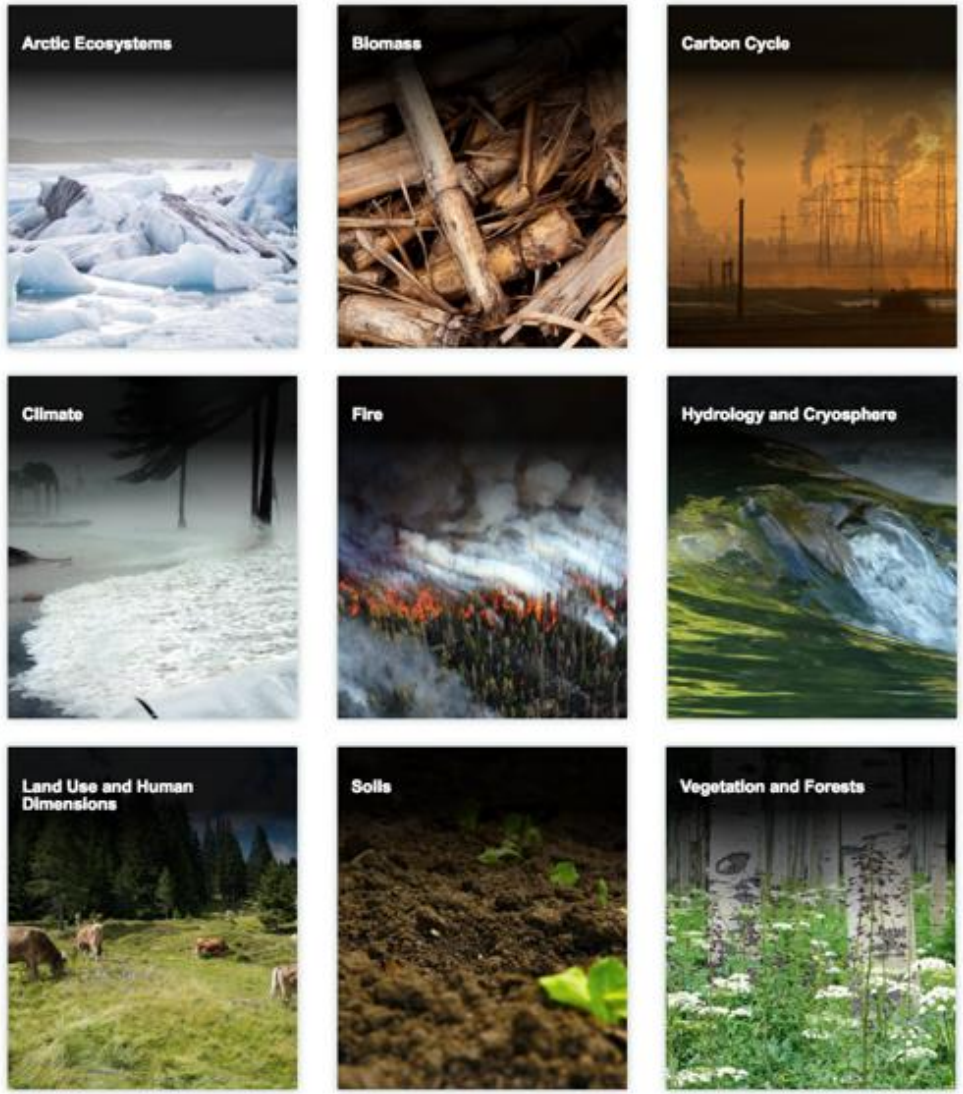
- Publishes and supports NASA data products relevant to Terrestrial Ecology, primarily field and airborne data

- Facilitates use of NASA data in ways that address Terrestrial Ecology needs, particularly those doing site-based studies

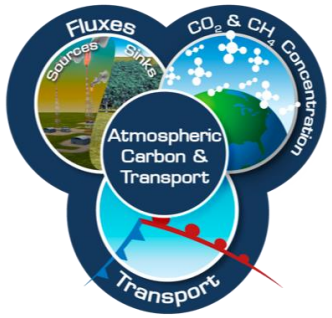


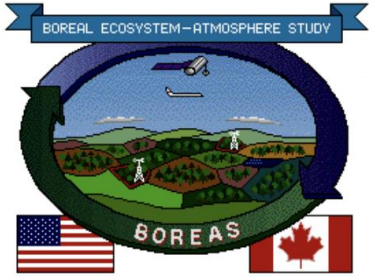
Data at ORNL DAAC

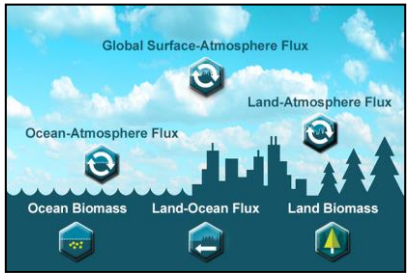
- 1790+ datasets
- 9 Science Themes
- 30,000+ users per year
- 36 Missions/Projects



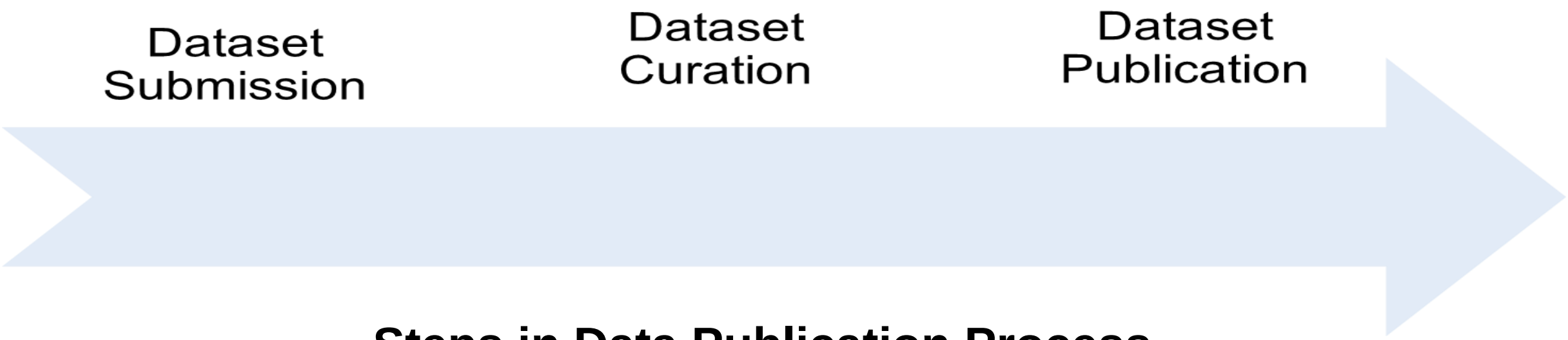
ORNL DAAC Data Products: Projects



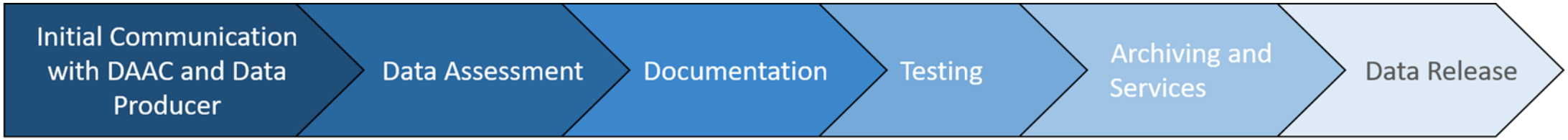




ORNL DAAC's Ingest Process



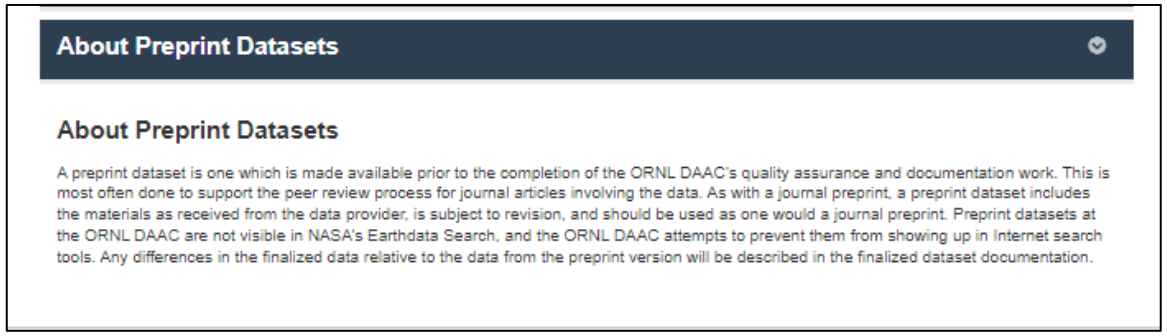
Steps in Data Publication Process

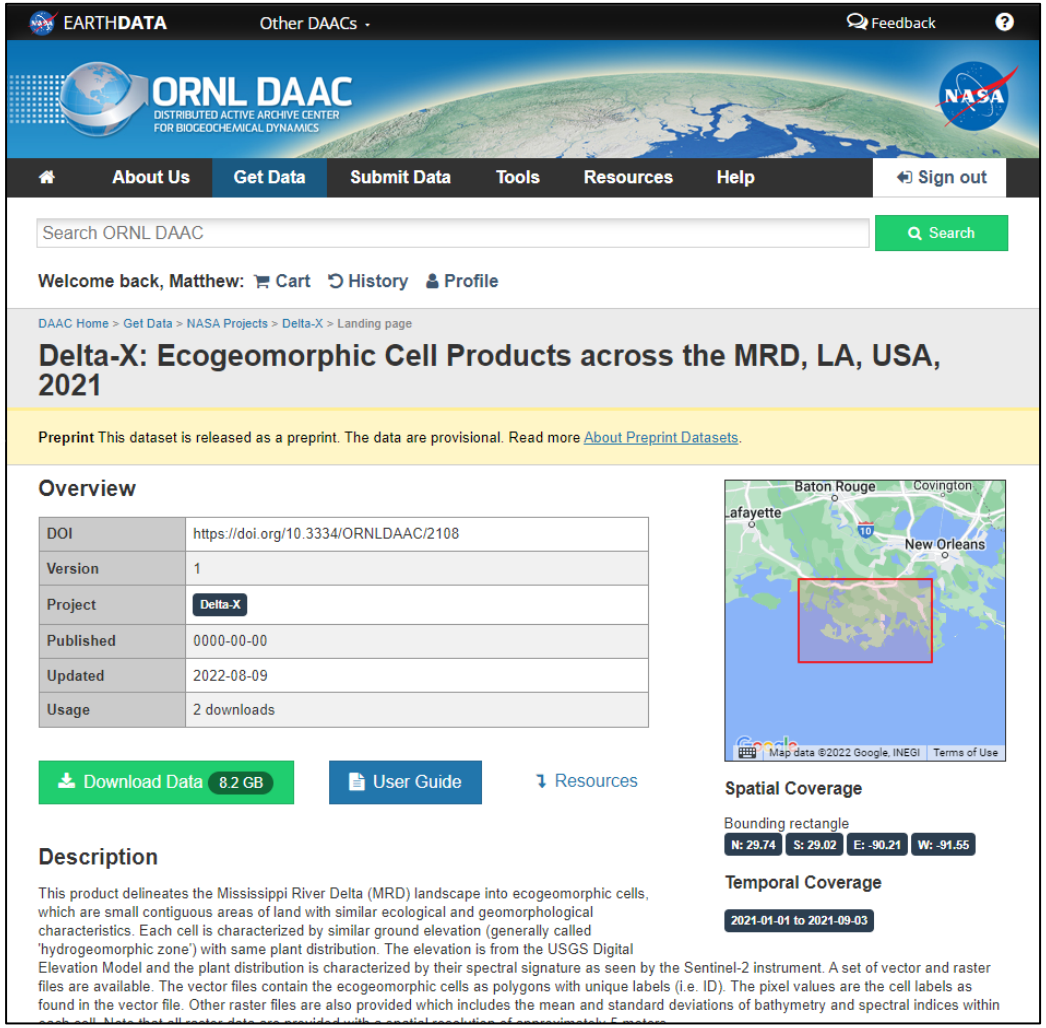


- Pending Submission – 0
- Pending QA - 7
- Pending Documentation – 0
- In PI Review - 1

ORNL DAAC's Pre-Print Datasets

- ORNL DAAC has a workflow for manuscript data that provides
  - Landing page
  - Data files
  - Skinny Documentation
  - Citation
  - DOI
- What a pre-print should NOT be (for now): data already known to be superseded or expected to be soon.
- What does "provisional" mean to you?





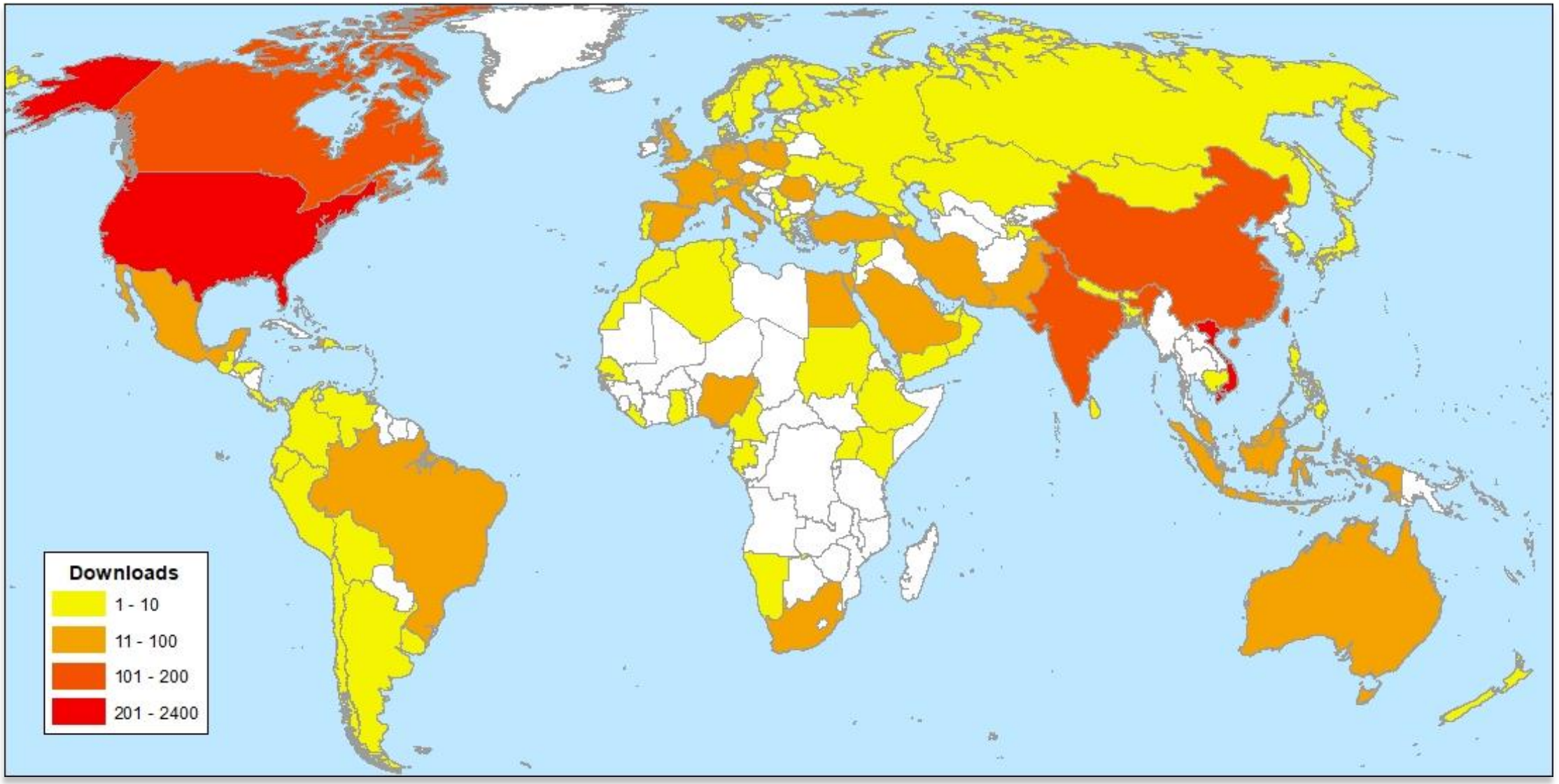
ORNL DAAC's Delta-X Dataset Updates/Versions

- Spatio-temporal appends or minor data change
  - Change in minor version number (e.g., V1 -> V1.1)
  - DOI and citation remains the same
  - New data files are just added to the existing dataset
  - **16 Delta-X datasets that have been appended or have had minor updates.**
- Updated data values due to broad corrections/change in algorithms
  - Change in version number (e.g., V1 -> V2)
  - DOI and citation changes
  - The older version is superseded by the new version. Older versions are never deleted and can be made available upon request.
  - **16 Delta-X datasets have new versions (V2 – V4)**
- Gray areas do exist; if in doubt, a conversation will take place.

Version History

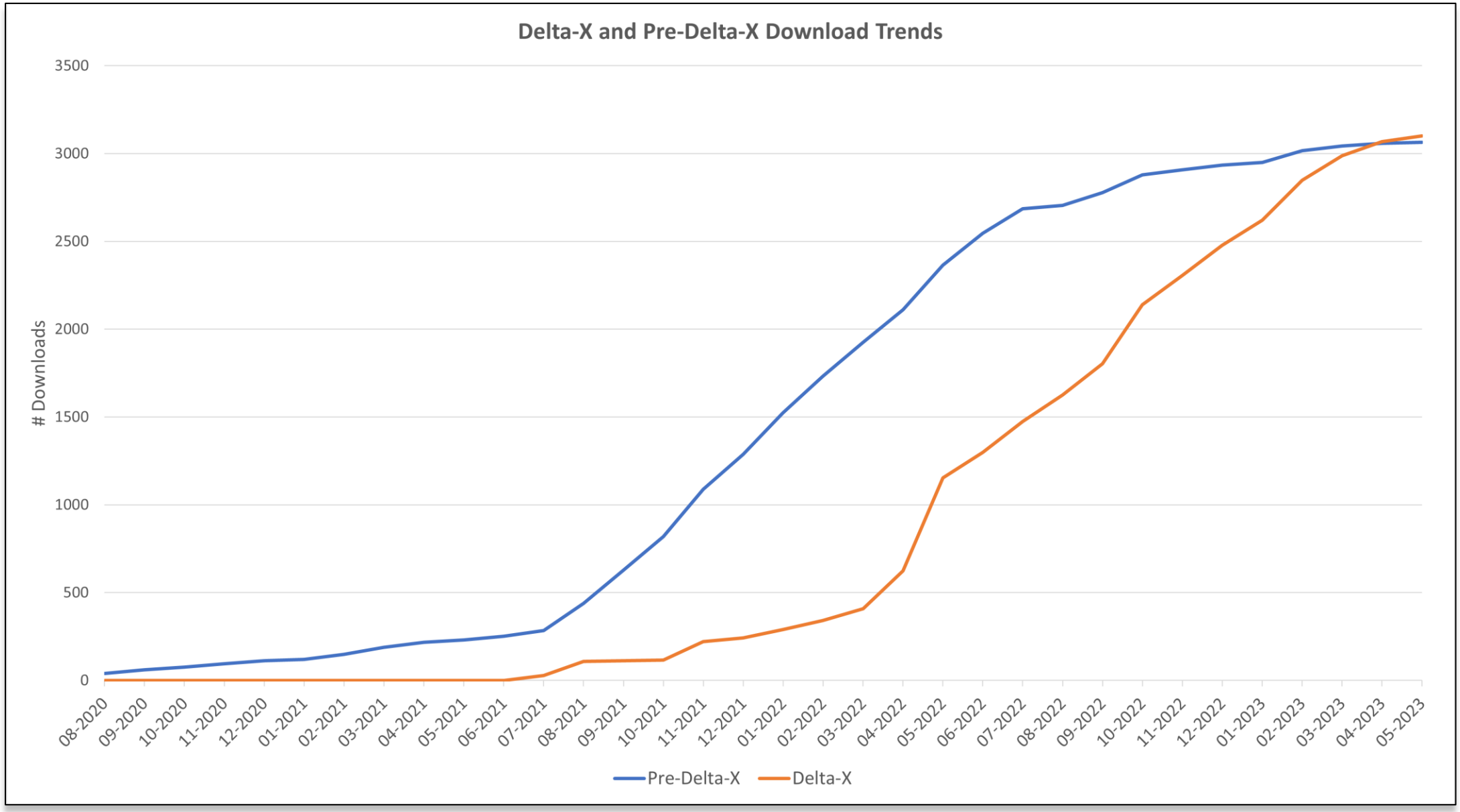
Version	Dataset Title	Published
1	Delta-X: Acoustic Doppler Current Profiler Channel Surveys, Coastal Louisiana, 2021	2021-10-29
2	Delta-X: Acoustic Doppler Current Profiler Channel Surveys, MRD, Louisiana, 2021, V2	2022-09-23

Delta-X Downloads

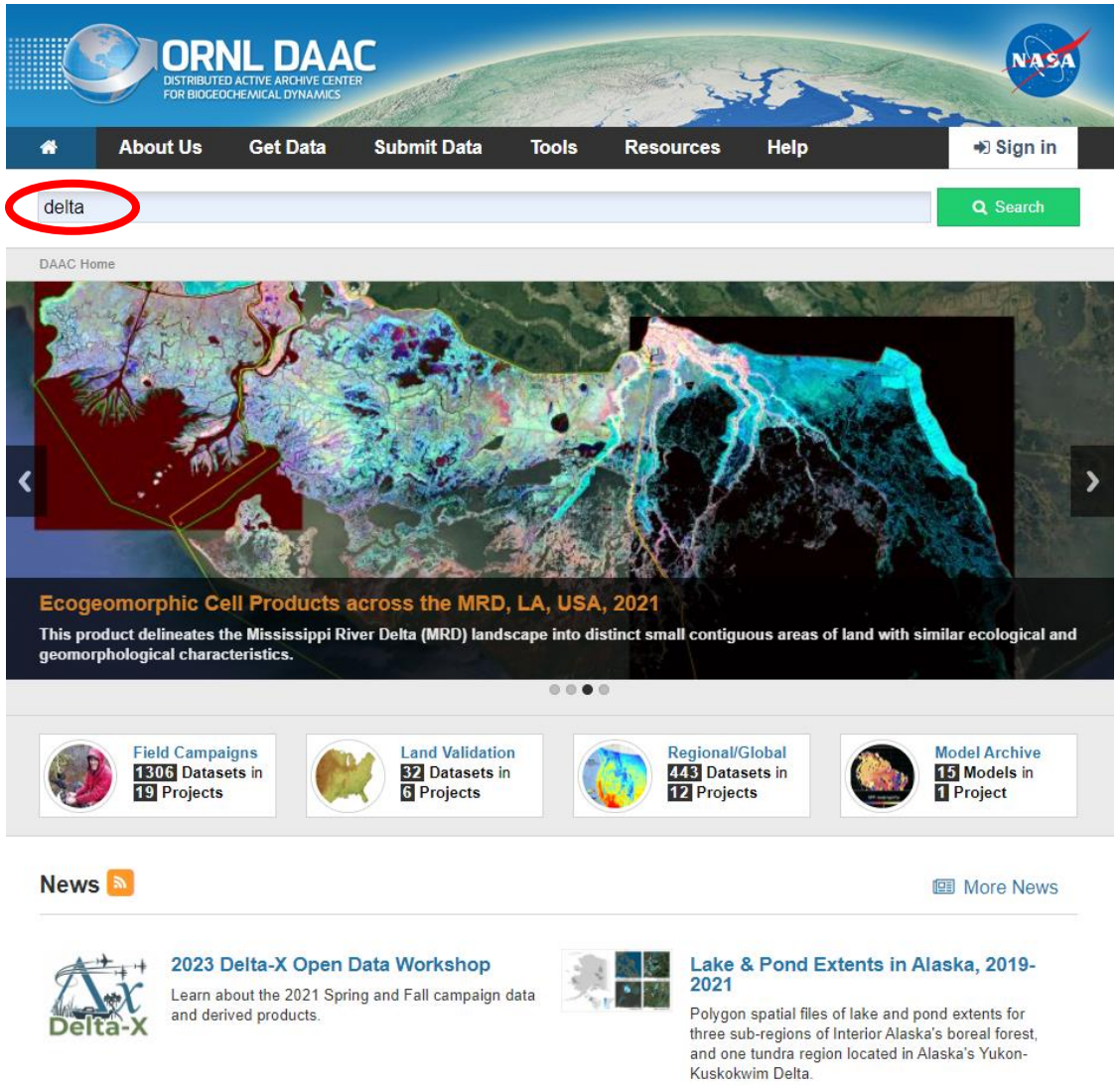


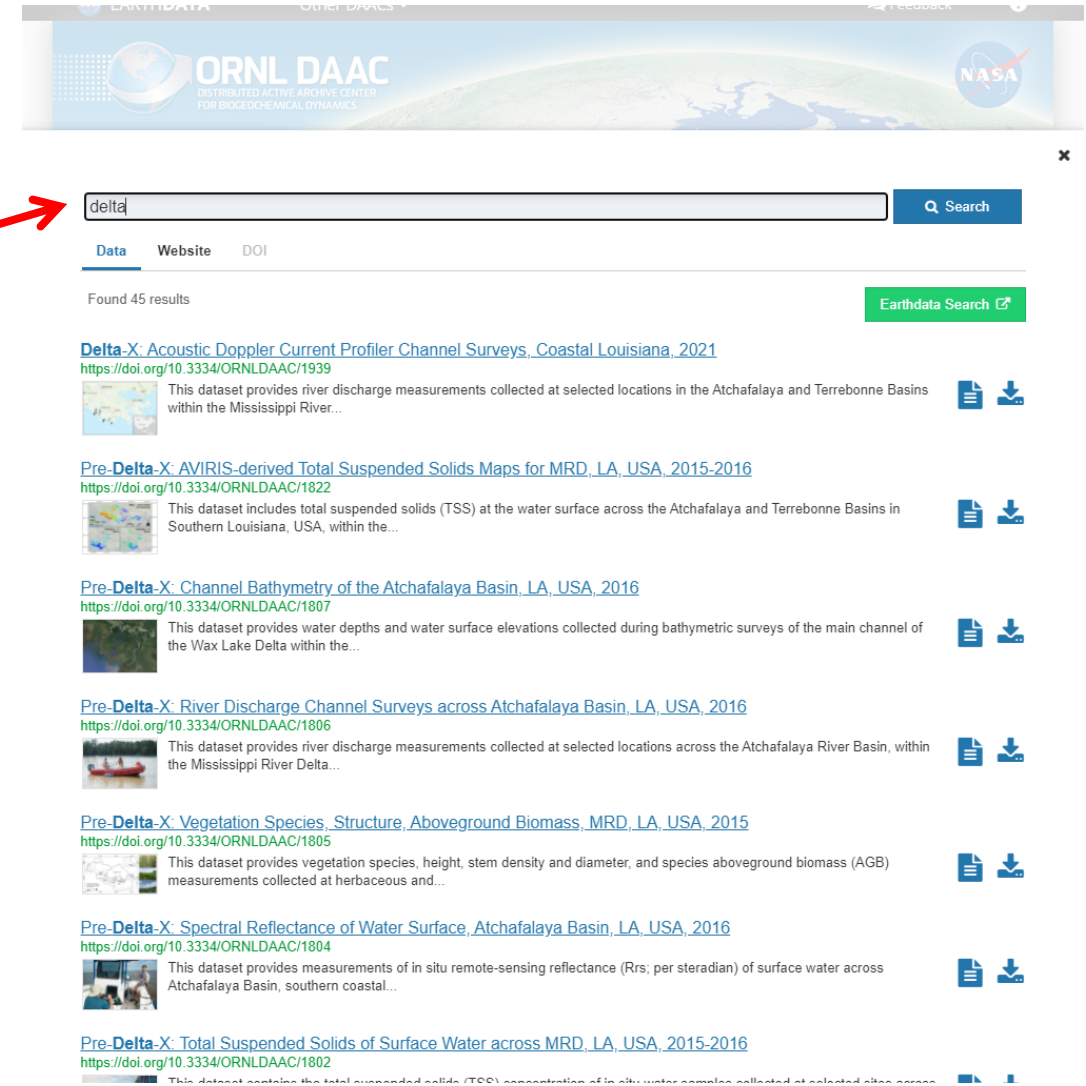
*Country of origin self-reported by users

Delta-X Downloads

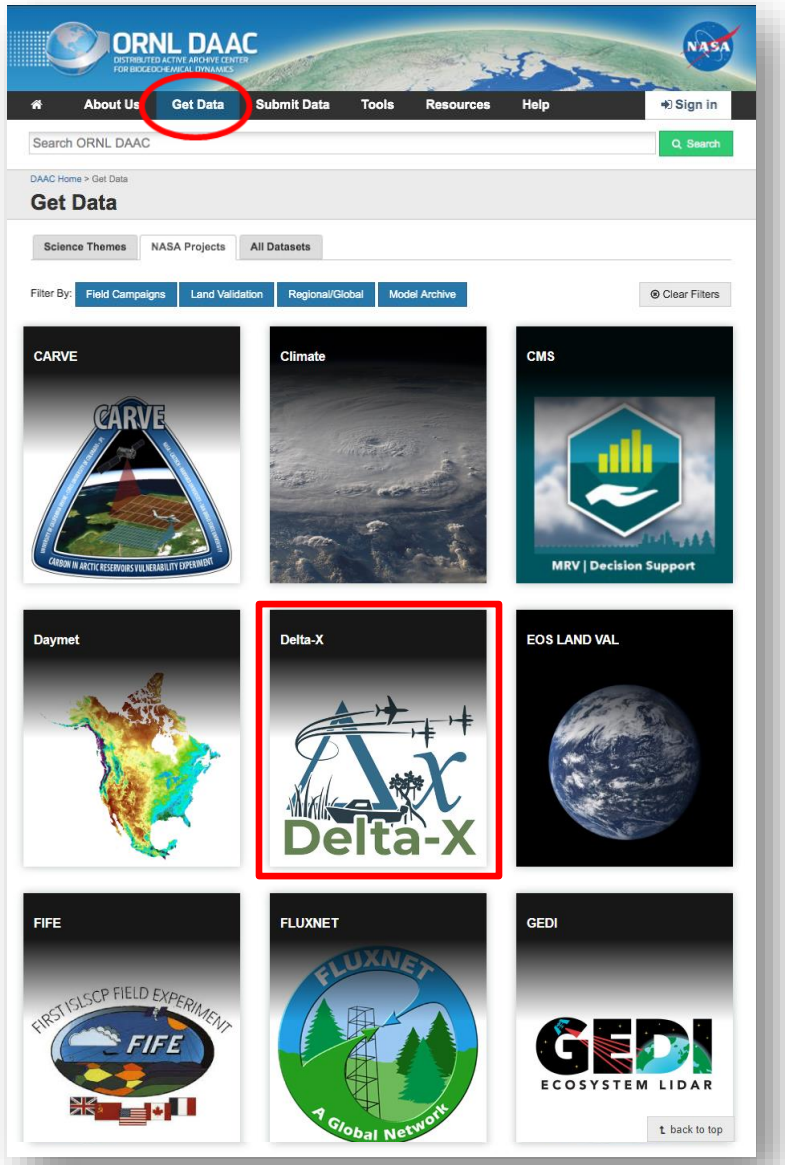


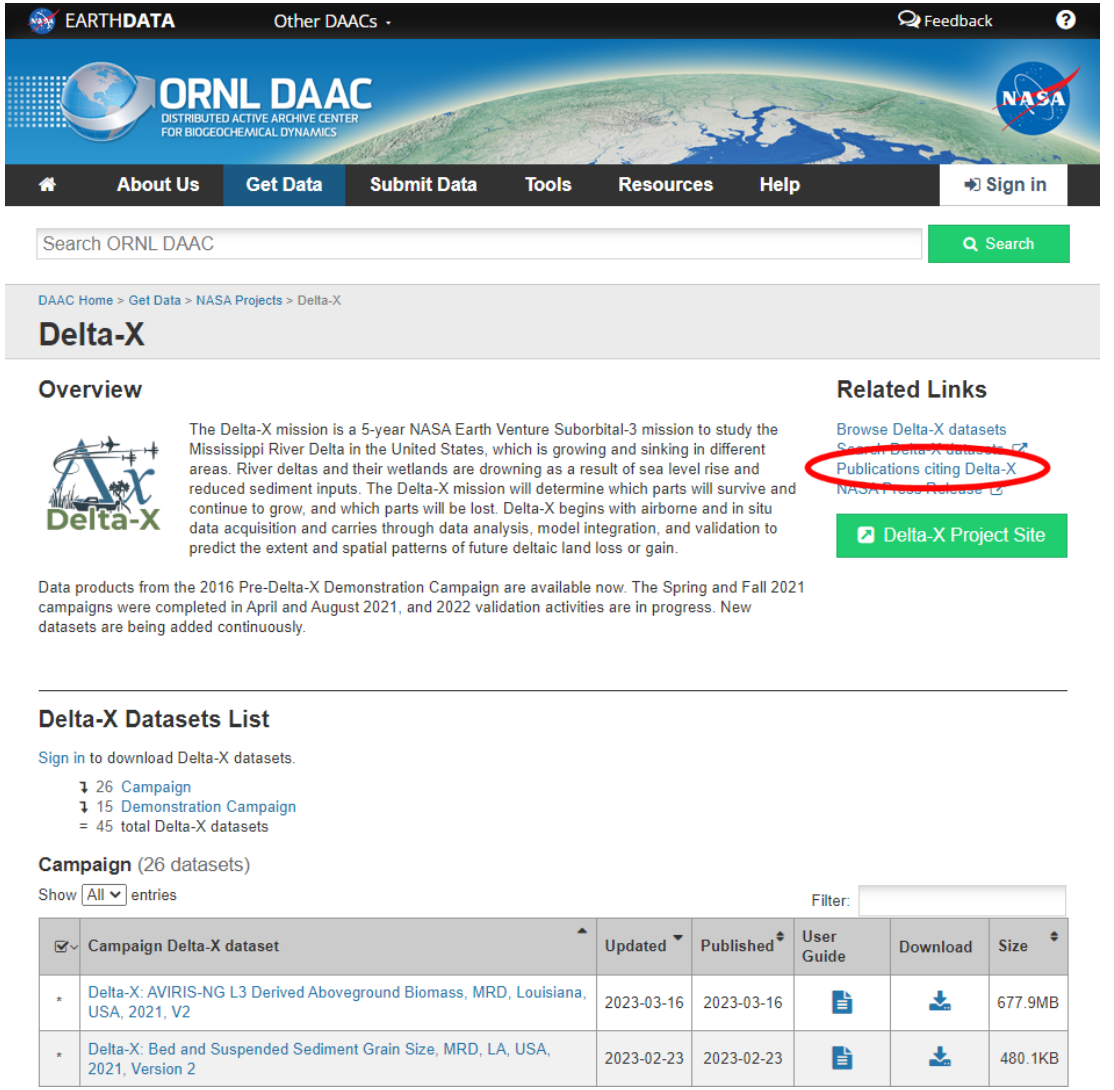
Searching for Data at ORNL DAAC





Data organization by NASA program





Publications

Publications Citing Delta-X

The following 30 publications cited the Delta-X project.

Show 10 entries Filter:

Year	Citation	Dataset or Project
2023	Donatelli, C., P. Passalacqua, K. Wright, G. Salter, M.P. Lamb, D. Jensen, and S. Fagherazzi. 2023. Quantifying Flow Velocities in River Deltas via Remotely Sensed Suspended Sediment Concentration. Geophysical Research Letters. 50(4). https://doi.org/10.1029/2022GL101392	Pre-Delta-X: Channel Bathymetry of the Atchafalaya Basin, LA, USA, 2016
2023	Donatelli, C., P. Passalacqua, K. Wright, G. Salter, M.P. Lamb, D. Jensen, and S. Fagherazzi. 2023. Quantifying Flow Velocities in River Deltas via Remotely Sensed Suspended Sediment Concentration. Geophysical Research Letters. 50(4). https://doi.org/10.1029/2022GL101392	Pre-Delta-X: AVIRIS-derived Total Suspended Solids Maps for MRD, LA, USA, 2015-2016
2022	Cortese, L. and S. Fagherazzi. 2022. Fetch and distance from the bay control accretion and erosion patterns in Terrebonne marshes (Louisiana, USA). Earth Surface Processes and Landforms. 47(6):1455-1465. https://doi.org/10.1002/esp.5327	Delta-X
2022	Greenberg, E., D.R. Thompson, D. Jensen, P.A. Townsend, N. Queally, A. Chlus, C.G. Fichot, J.P. Harringmeyer, and M. Simard. 2022. An Improved Scheme for Correcting Remote Spectral Surface Reflectance Simultaneously for Terrestrial BRDF and Water?Surface Sunglint in Coastal Environments. Journal of Geophysical Research: Biogeosciences. 127(3). https://doi.org/10.1029/2021JG006712	Delta-X
2022	Jensen, D.J., K.C. Cavanaugh, D.R. Thompson, S. Fagherazzi, L. Cortese, and M. Simard. 2022. Leveraging the Historical Landsat Catalog for a Remote Sensing Model of Wetland Accretion in Coastal Louisiana. Journal of Geophysical Research: Biogeosciences. 127(6). https://doi.org/10.1029/2022JG006794	Pre-Delta-X: Total Suspended Solids of Surface Water across MRD, LA, USA, 2015-2016
2022	Jensen, D.J., K.C. Cavanaugh, D.R. Thompson, S. Fagherazzi, L. Cortese, and M. Simard. 2022. Leveraging the Historical Landsat Catalog for a Remote Sensing Model of Wetland Accretion in Coastal Louisiana. Journal of Geophysical Research: Biogeosciences. 127(6). https://doi.org/10.1029/2022JG006794	Pre-Delta-X: Spectral Reflectance of Water Surface, Atchafalaya Basin, LA, USA, 2016
2022	Jensen, D.J., K.C. Cavanaugh, D.R. Thompson, S. Fagherazzi, L. Cortese, and M. Simard. 2022. Leveraging the Historical Landsat Catalog for a Remote Sensing Model of Wetland Accretion in Coastal Louisiana. Journal of Geophysical Research: Biogeosciences. 127(6). https://doi.org/10.1029/2022JG006794	Delta-X
2022	Nordio, G. and S. Fagherazzi. 2022. Storm Surge and Tidal Dissipation in Deltaic Wetlands Bordering a Main Channel. Journal of Geophysical Research: Oceans. 127(3). https://doi.org/10.1029/2021JC017655	Delta-X
2022	Oliver-Cabrera, T., C.E. Jones, Z. Yunjun, and M. Simard. 2022. InSAR Phase Unwrapping Error Correction for Rapid Repeat Measurements of Water Level Change in Wetlands. IEEE Transactions on Geoscience and Remote Sensing. 60:1-15. https://doi.org/10.1109/TGRS.2021.3108751	Delta-X

Pre-Delta-X: Channel Bathymetry of the Atchafalaya Basin, LA, USA, 2016

Overview

DOI	https://doi.org/10.3334/ORNLDAAC/1807
Version	1
Project	Delta-X
Published	2020-08-31
Updated	2020-08-31
Usage	223 downloads
Citations	5 publications cited this dataset

Download Data 561.2 MB User Guide Resources

Description

This dataset provides water depths and water surface elevations collected during bathymetric surveys of the main channel of the Wax Lake Delta within the Mississippi River Delta (MRD)

Spatial Coverage

Bounding rectangle

N: 29.96 S: 28.98 E: -90.36 W: -91.91

Temporal Coverage

2016-10-16 to 2016-10-20

Publications Citing Pre-Delta-X: Channel Bathymetry of the Atchafalaya Basin, LA, USA, 2016

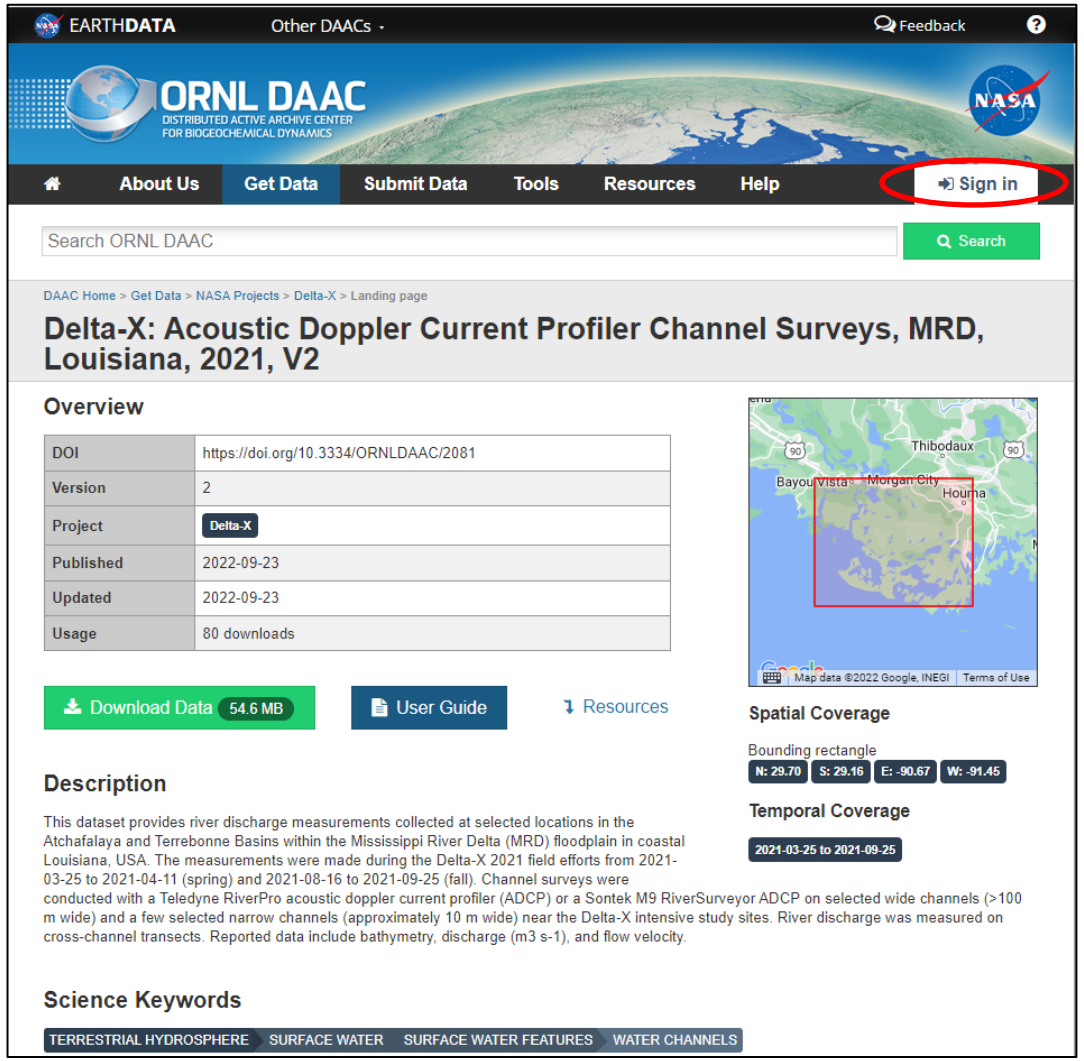
The following 5 publications cited the product Pre-Delta-X: Channel Bathymetry of the Atchafalaya Basin, LA, USA, 2016.

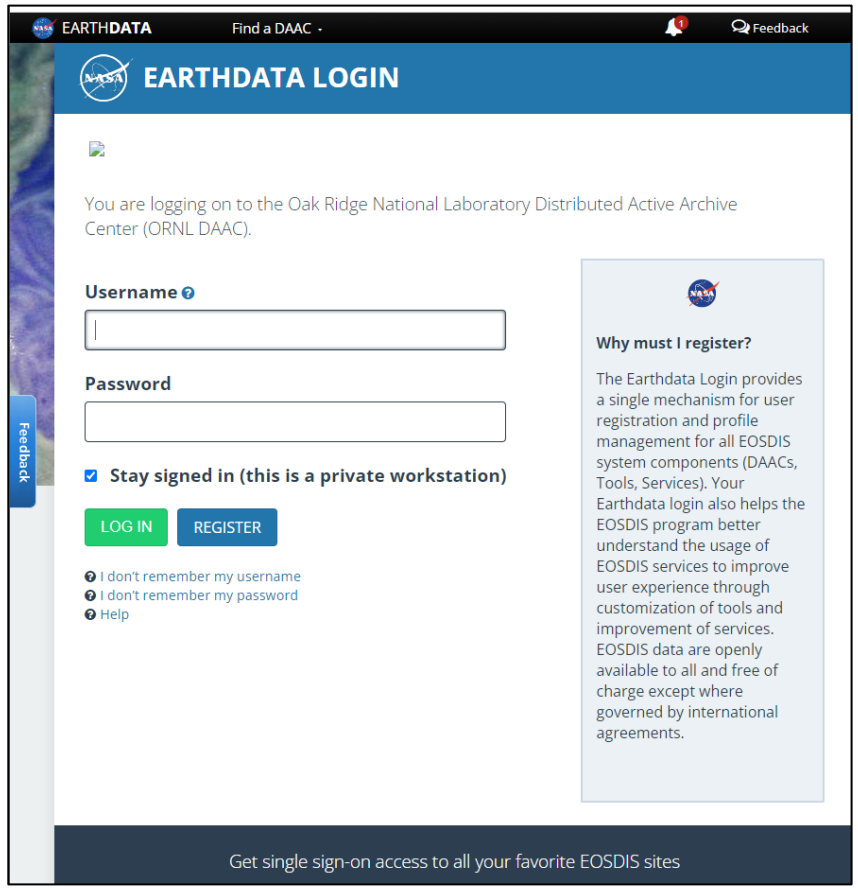
Show 10 entries Filter:

Year	Citation
2023	Donatelli, C., P. Passalacqua, K. Wright, G. Salter, M.P. Lamb, D. Jensen, and S. Fagherazzi. 2023. Quantifying Flow Velocities in River Deltas via Remotely Sensed Suspended Sediment Concentration. Geophysical Research Letters. 50(4). https://doi.org/10.1029/2022GL101392
2022	Shafiei, H., A. Soloy, I. Turki, M. Simard, N. Lecoq, and B. Laignel. 2022. Numerical investigation of the effects of distributary bathymetry and roughness on tidal hydrodynamics of Wax Lake region under calm conditions. Estuarine, Coastal and Shelf Science. 265:107694. https://doi.org/10.1016/j.ecss.2021.107694
2022	Wright, K., P. Passalacqua, M. Simard, and C.E. Jones. 2022. Integrating Connectivity Into Hydrodynamic Models: An Automated Open? Source Method to Refine an Unstructured Mesh Using Remote Sensing. Journal of Advances in Modeling Earth Systems. 14(8). https://doi.org/10.1029/2022MS003025
2022	Zhang, X., C.E. Jones, T. Oliver-Cabrera, M. Simard, and S. Fagherazzi. 2022. Using rapid repeat SAR interferometry to improve hydrodynamic models of flood propagation in coastal wetlands. Advances in Water Resources. 159:104088.

Accessing Datasets Via ORNL DAAC Site

Sign in using an Earthdata Login:





Accessing Datasets Via ORNL DAAC Site

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Map data ©2022 Google, INEGI | Terms of Use

Spatial Coverage

Bounding rectangle

N: 29.70 S: 29.16 E: -90.67 W: -91.45

Temporal Coverage

2021-03-25 to 2021-09-25

Description

This dataset provides river discharge measurements collected at selected locations in the Atchafalaya and Terrebonne Basins within the Mississippi River Delta (MRD) floodplain in coastal Louisiana, USA. The measurements were made during the Delta-X 2021 field efforts from 2021-03-25 to 2021-04-11 (spring) and 2021-08-16 to 2021-09-25 (fall). Channel surveys were conducted with a Teledyne RiverPro acoustic doppler current profiler (ADCP) or a Sontek M9 RiverSurveyor ADCP on selected wide channels (>100 m wide) and a few selected narrow channels (approximately 10 m wide) near the Delta-X intensive study sites. River discharge was measured on cross-channel transects. Reported data include bathymetry, discharge (m3 s-1), and flow velocity.

Science Keywords

TERRESTRIAL HYDROSPHERE > SURFACE WATER > SURFACE WATER FEATURES > WATER CHANNELS

TERRESTRIAL HYDROSPHERE > SURFACE WATER > SURFACE WATER PROCESSES/MEASUREMENTS > DISCHARGE/FLOW

BIOSPHERE > ECOSYSTEMS > AQUATIC ECOSYSTEMS > WETLANDS

Data Use and Citation

Christensen, A.L., J.M. Mallard, J. Nghiem, M. Simard, T.M. Pavelsky, and M.P. Lamb. 2022. Delta-X: Acoustic Doppler Current Profiler Channel Surveys, MRD, Louisiana, 2021, V2. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/2081

Download citation from Datacite

RIS BibTex Other

Crosscite Citation Formatter

This dataset is openly shared, without restriction, in accordance with the EOSDIS Data Use Policy. See our Data Use and Citation Policy for more information.

Data Files

Check the box next to the files you want to order and then click the 'Add Checked Items' button to order files. Click on the file link to see the file or save it. Click the 'Add Dataset' button to order the complete dataset.

266.2 MB in 773 Files

Show 25 entries Filter:

Data File (Granule)	Size	Start Date	End Date	Lat	Lon
ADCP_20210325-154526_WLO_VP-MW-center_001_Rep1_Bathy.csv	60.2 KB	2021-03-25	2021-03-25	29.51	-91.45
ADCP_20210325-154526_WLO_VP-...-center_001_Rep1_Velocity.csv	1.1 MB	2021-03-25	2021-03-25	29.51	-91.45
ADCP_20210325-155519_WLO_VP-MW-center_002_Rep2_Bathy.csv	47.3 KB	2021-03-25	2021-03-25	29.51	-91.45
ADCP_20210325-155519_WLO_VP-...-center_002_Rep2_Velocity.csv	860.2 KB	2021-03-25	2021-03-25	29.51	-91.45

Delta-X: Acoustic Doppler Current Profiler Channel Surveys, MRD, Louisiana, 2021, V2

Get Data

Documentation Revision Date: 2022-09-23

Dataset Version: 2

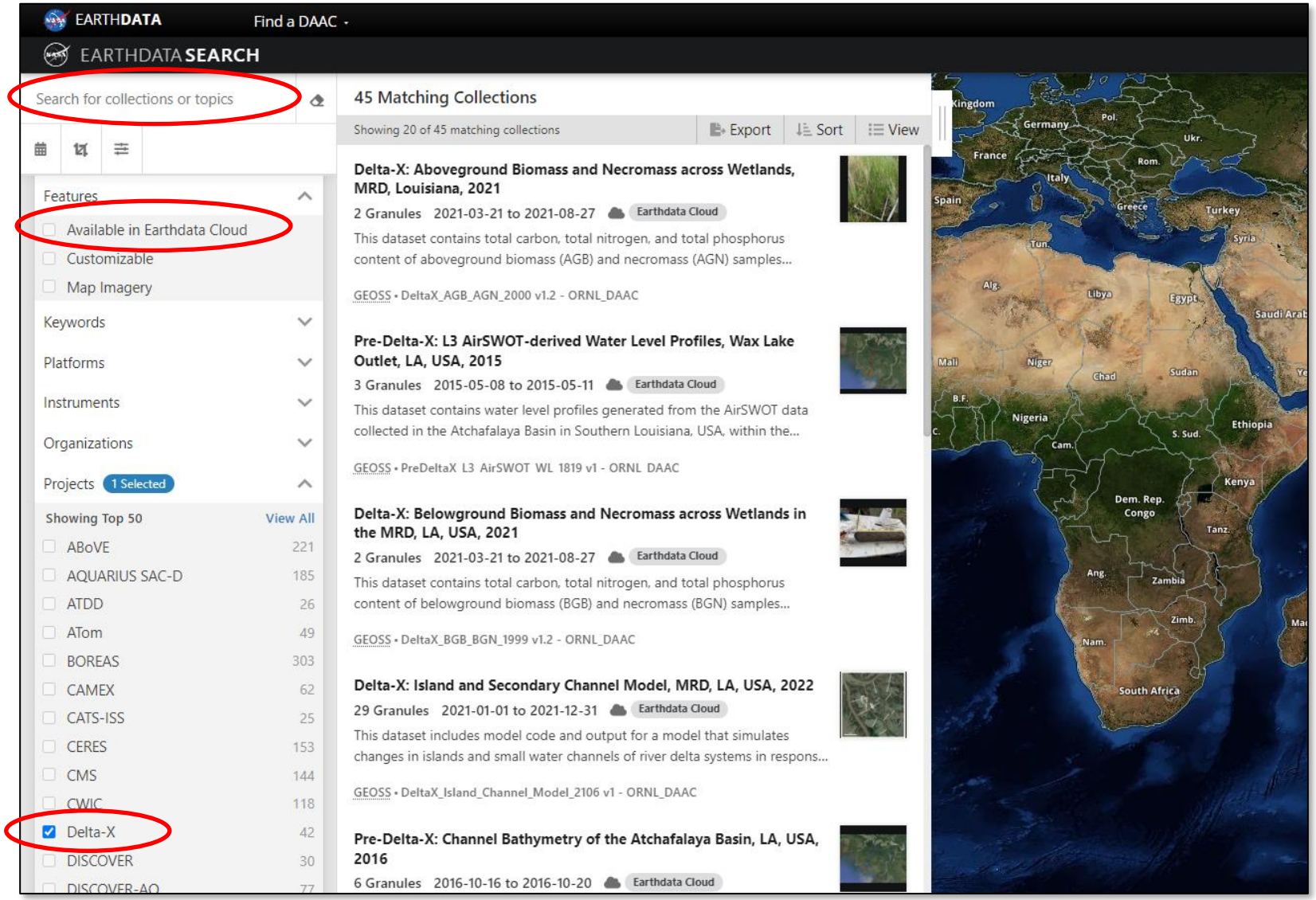
Summary

This dataset provides river discharge measurements collected at selected locations in the Atchafalaya and Terrebonne Basins within the Mississippi River Delta (MRD) floodplain in coastal Louisiana, USA. The measurements were made during the Delta-X 2021 field efforts from 2021-03-25 to 2021-04-11 (spring) and 2021-08-16 to 2021-09-25 (fall). Channel surveys were conducted with a Teledyne RiverPro acoustic doppler current profiler (ADCP) or a Sontek M9 RiverSurveyor ADCP on selected wide channels (>100 m wide) and a few selected narrow channels (approximately 10 m wide) near the Delta-X intensive study sites. River discharge was measured on cross-channel transects. Reported data include bathymetry, discharge (m3 s-1), and flow velocity.

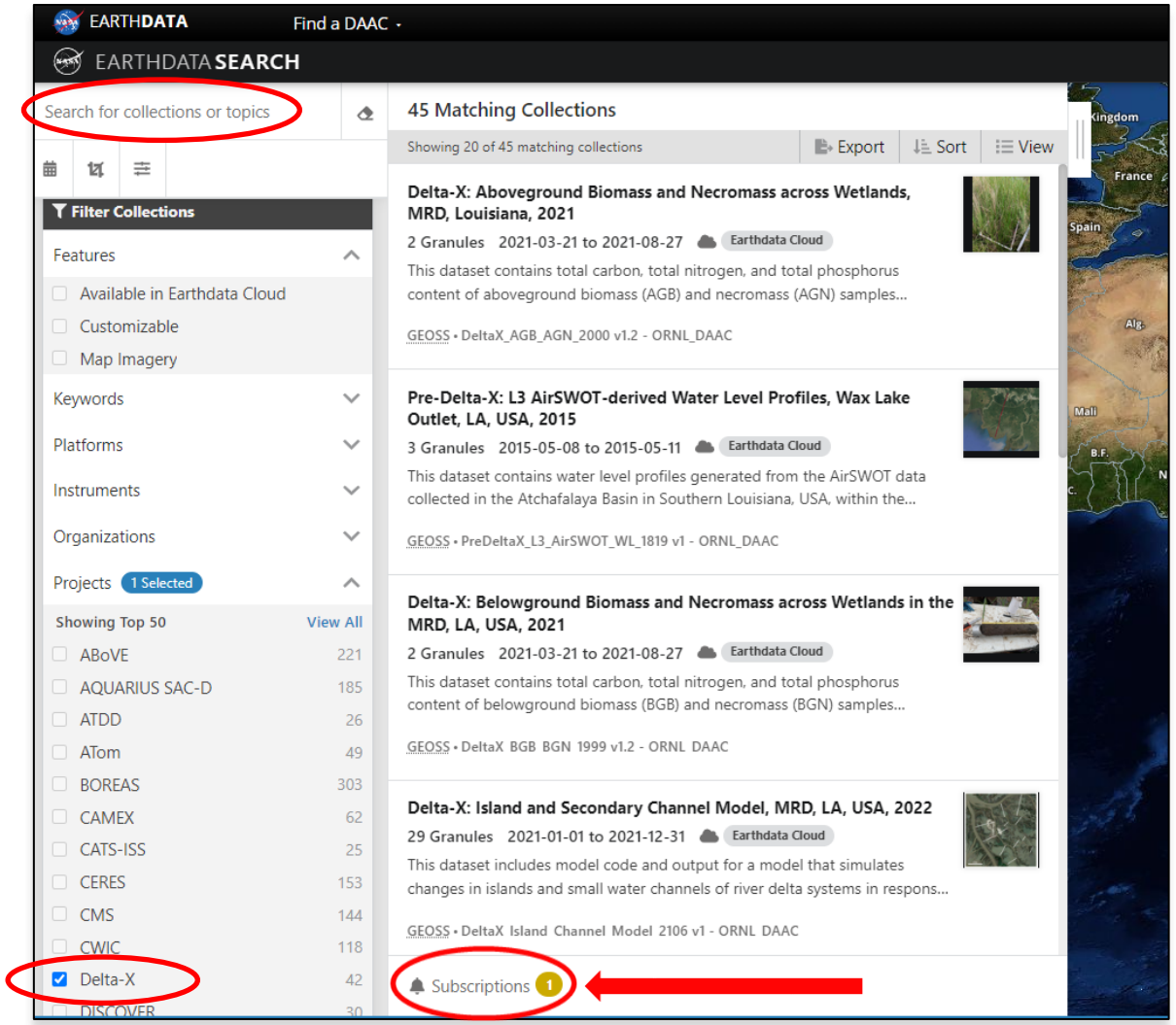
This dataset includes 771 files in comma-separated values (*.csv) format and 2 files in compressed Keyhole Markup Language (*.kmz) format.

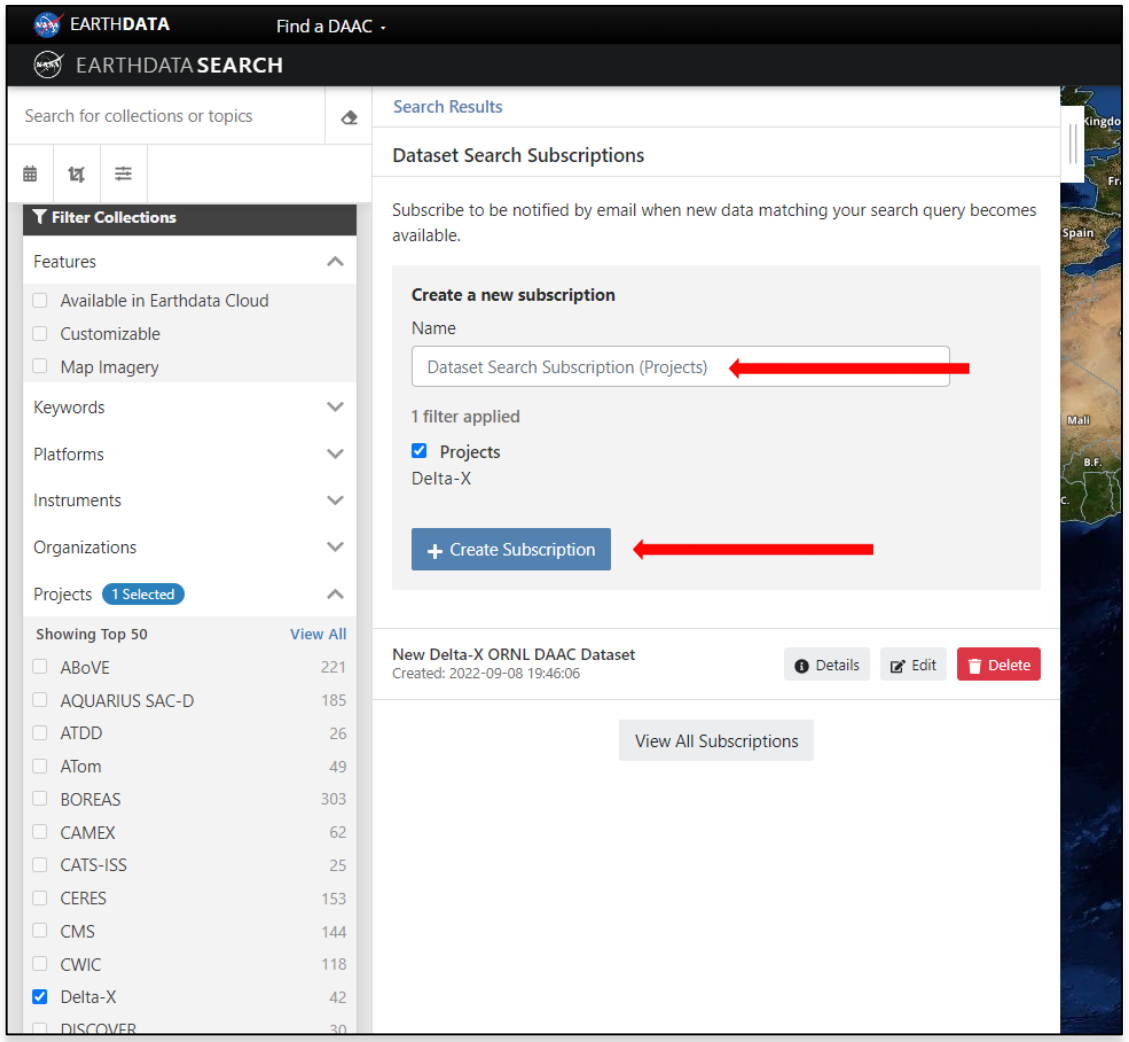
Figure 1. Locations of river discharge measurements (black triangles) in the Atchafalaya and Terrebonne Basins within the Mississippi River Delta (MRD) floodplain in coastal Louisiana, U.S. Measurements were taken by Delta-X project in March and April 2021. Source: DeltaX_RiverDischarge_Spring2021.csv

Accessing Datasets Via Earthdata Search: https://search.earthdata.nasa.gov



Create a Search Subscription and Receive Automatic Emails About New or Updated Delta-X Datasets





Create a Search Subscription and Receive Automatic Emails About New or Updated Delta-X Datasets

Email Subscription Notification

CS

cmr-support@earthdata.nasa.gov
To Donovan, Matt

Reply | Reply All | Forward

Mon 2022-10-17 10:34 AM

You have subscribed to receive notifications when new collections are added that match the following search query:

```
has_granules_or_cwic=true&data_center_h[]=Oak Ridge National Laboratory Distributed Active Archive Center (ORNL DAAC)&project_h[]=Delta-X
```

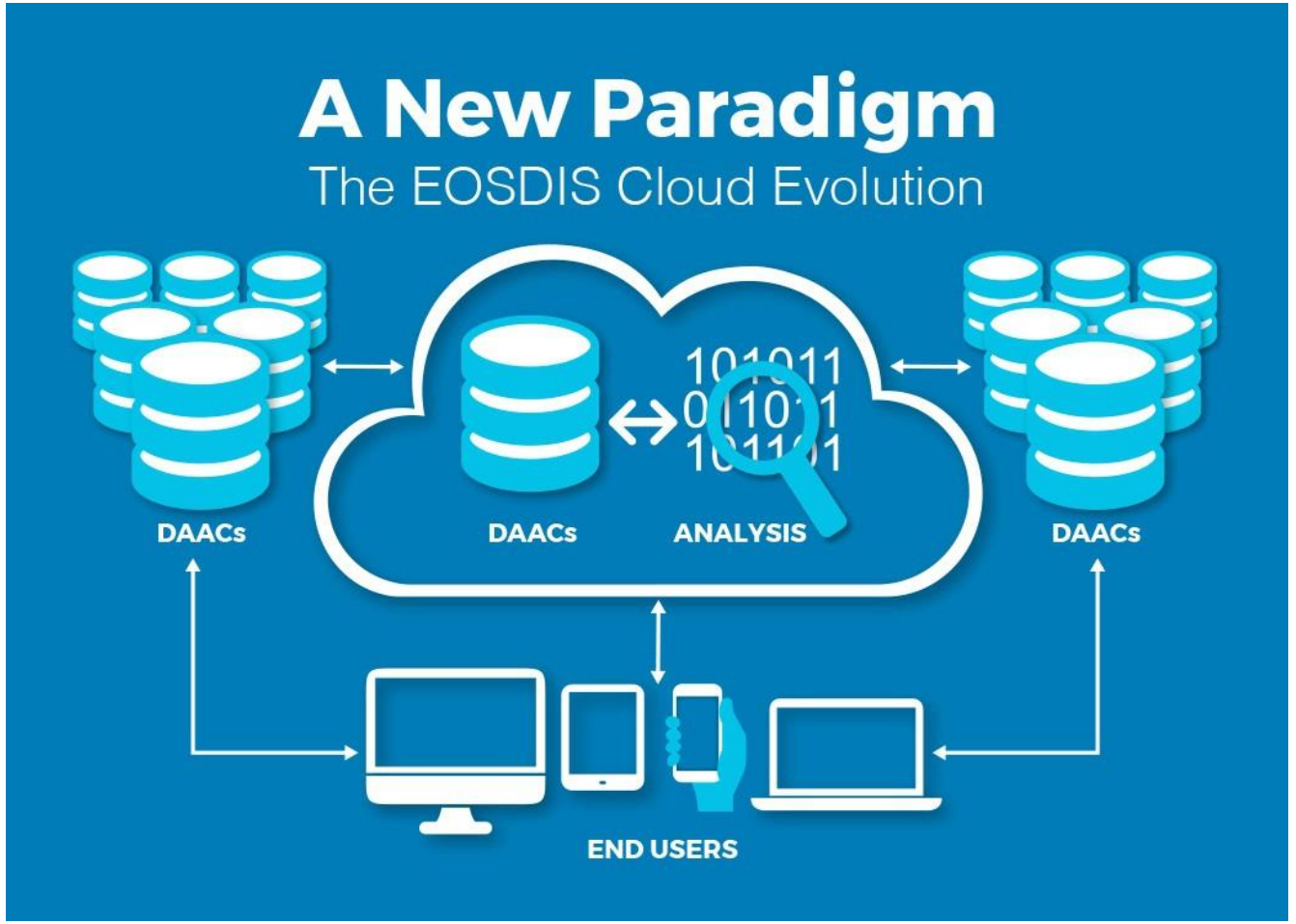
Running the query with a time window from 2022-09-27T15:28:43.446Z to 2022-10-17T14:33:36.679Z, the following collections have been added or updated:

- https://cmr.earthdata.nasa.gov:443/search/concepts/C2515316743-ORNL_CLOUD/2
- https://cmr.earthdata.nasa.gov:443/search/concepts/C2515316269-ORNL_CLOUD/2

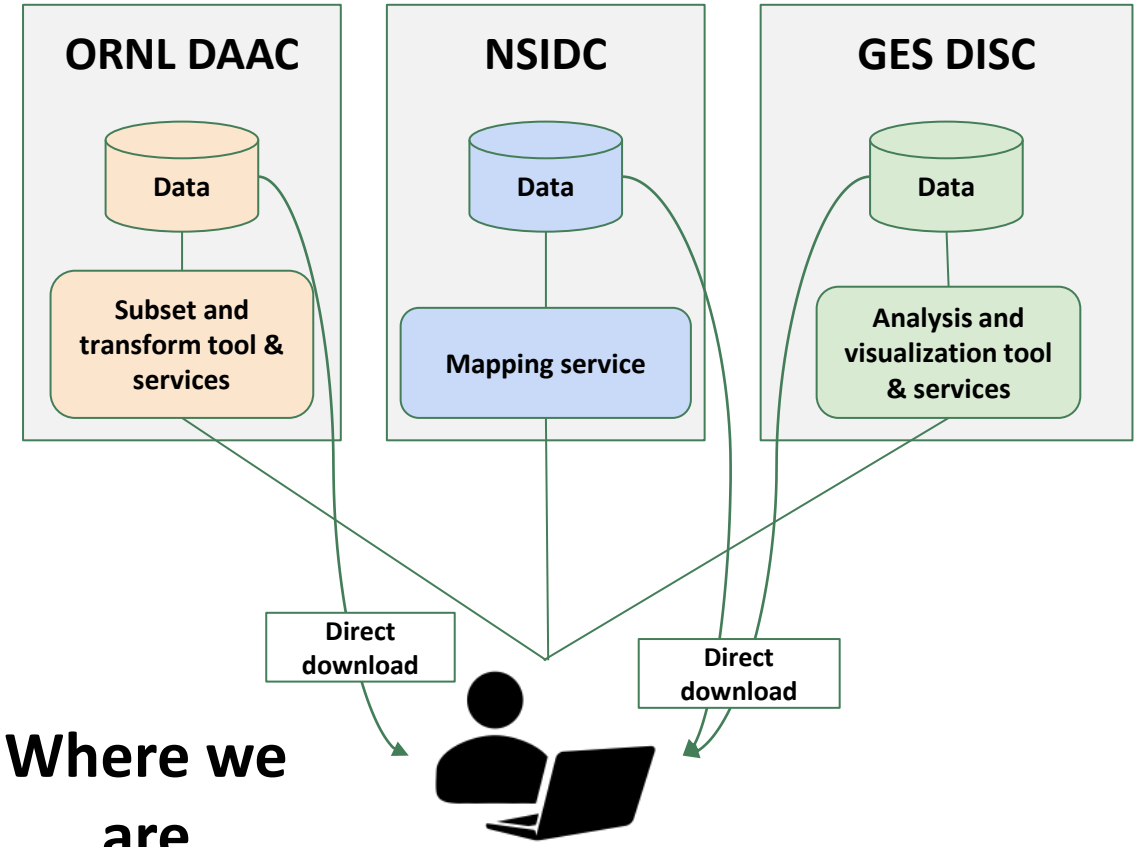
To unsubscribe from these notifications, or if you have any questions, please contact us at cmr-support@earthdata.nasa.gov.

- Approximately 1 week lag time between publishing on the ORNL DAAC website and the Earthdata Cloud
- Not clear if the dataset is new or updated

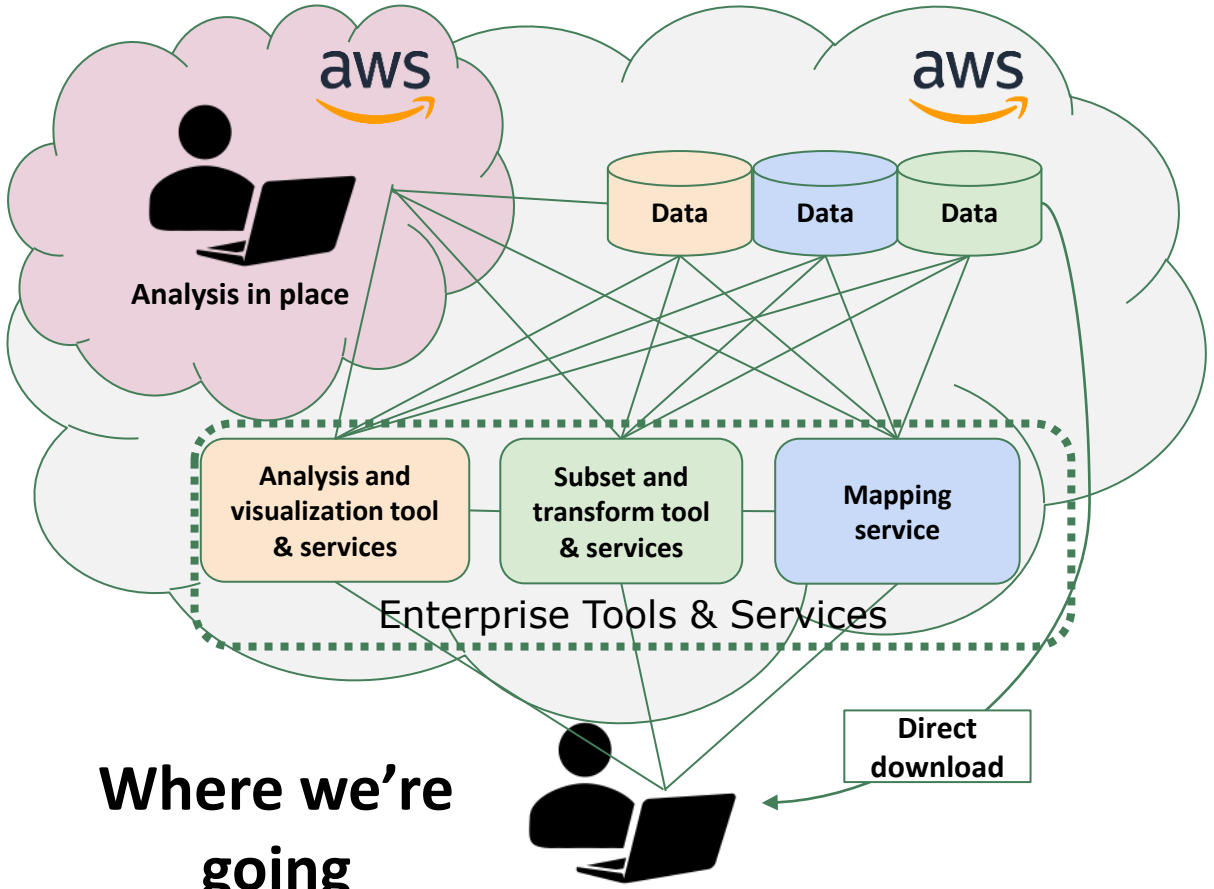
Earthdata Cloud



https://earthdata.nasa.gov/eosdis/cloud-evolution



Where we are



Where we're going

What will stay the same?

- All NASA Earth Science data will still be free and open to public.
- Existing data services (including direct download) will continue to work without disruption

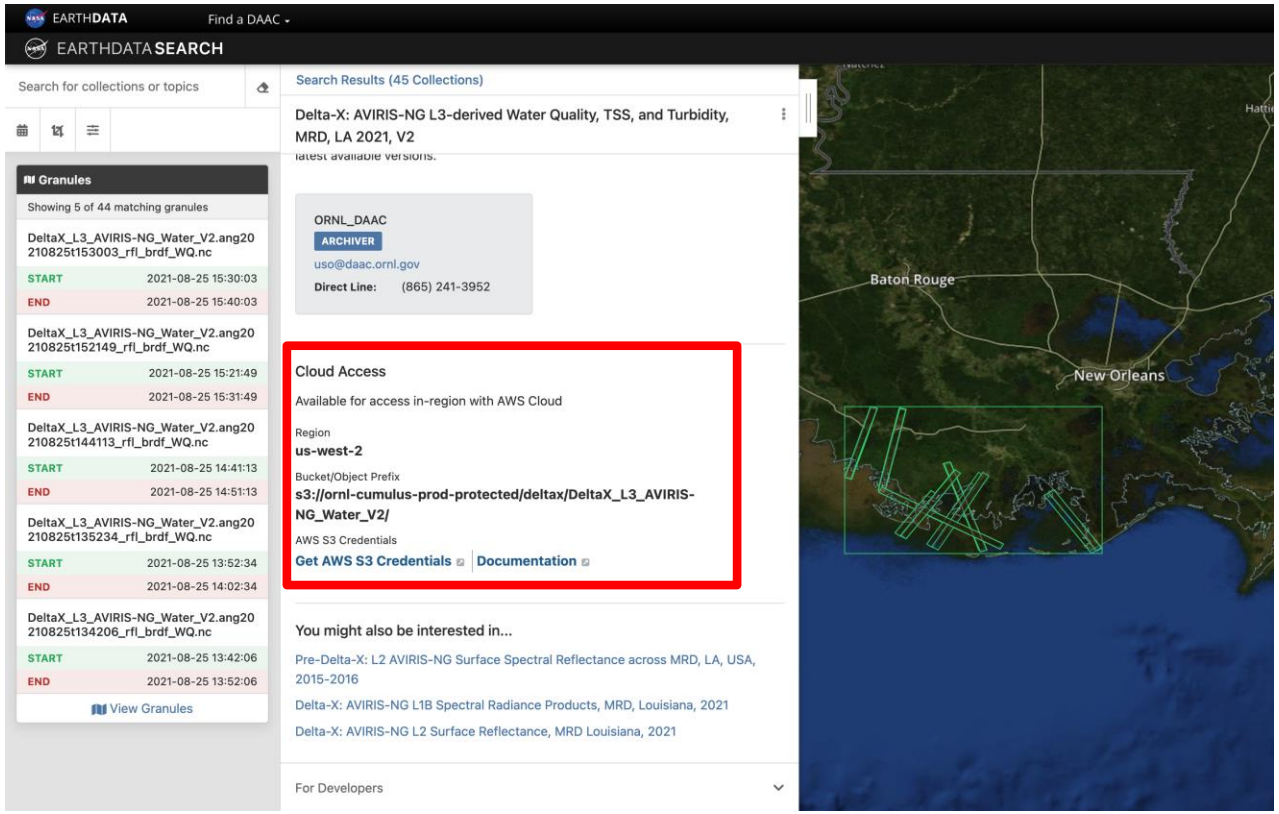
What will change?

- It will be easier for DAACs to collaborate and develop tools that work with more datasets, now that they always have direct access to each other's data.
- *New* options for analyzing data and developing tools "in place" in the cloud, without needing to download data.

Source and Credit: Alexey Shiklomanov

Earthdata Cloud Migration Status

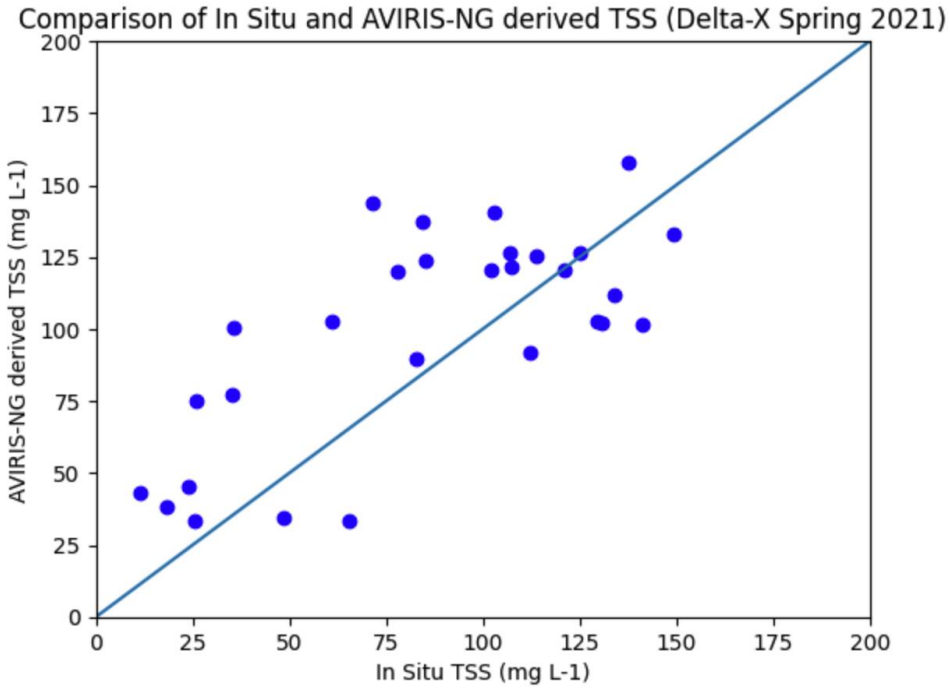
- The ORNL DAAC has migrated about 87% of our data (by volume)
- All finalized Delta-X data are available in Earthdata Cloud
  - Preprint data are not in Earthdata Cloud
  - Data are available both on-prem and in Earthdata Cloud
  - S3 direct access is available in AWS us-west-2 region



On-going Efforts

- Converting data into "cloud-optimized" formats
  - Cloud-optimized GeoTIFF (CoG), NetCDF, Zarr, etc.
- Making data available through ESDIS Enterprise Tools & Services
  - OPeNDAP, Harmony, Enterprise GIS, etc.
  - Support on-the-fly data visualization, subsetting, transformation, etc.

```
### Retrieve data
for key in insitu_to_pixel:
    print('key: ', key)
    if key in tss_values_aviris:
        print('In Situ data: ', tss_values_insitu[key], ' AVIRIS data: ', tss_values_aviris[key])
    else:
        tss_values_insitu[key] = data_insitu.iloc[key]['tss_concentration']
        aviris_fn = insitu_to_aviris[key]['filename']

        print(insitu_to_aviris[key]['opendap'])
        dap_dataset = open_url(insitu_to_aviris[key]['opendap'])
        var_tss = dap_dataset['TSS_loglog_PLSR7_380_900_nm']
        var_wmask = dap_dataset['Water_Mask']
        var_cmask = dap_dataset['Cloud_Mask']

        x = insitu_to_pixel[key]['x']
        y = insitu_to_pixel[key]['y']
        print('x: ', x, ', y: ', y)

        tss_aviris = float(var_tss[x-1:x, y-1:y].data)
        wmask_aviris = float(var_wmask[x-1:x, y-1:y].data)
        cmask_aviris = float(var_cmask[x-1:x, y-1:y].data)

        if tss_aviris > -9999 and wmask_aviris == 1 and cmask_aviris == 0:
            tss_values_aviris[key] = tss_aviris
            print('AVIRIS data: ', tss_aviris, ', Water mask: ', wmask_aviris, ', cloud mask: ', cmask_aviris)
        else:
            tss_values_aviris[key] = -9999.0
            print('Invalid AVIRIS data values. AVIRIS data: ', tss_aviris, ', Water mask: ', wmask_aviris, ', cloud mas

        print('In Situ data: ', tss_values_insitu[key], ' AVIRIS data: ', tss_values_aviris[key])
```



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END