

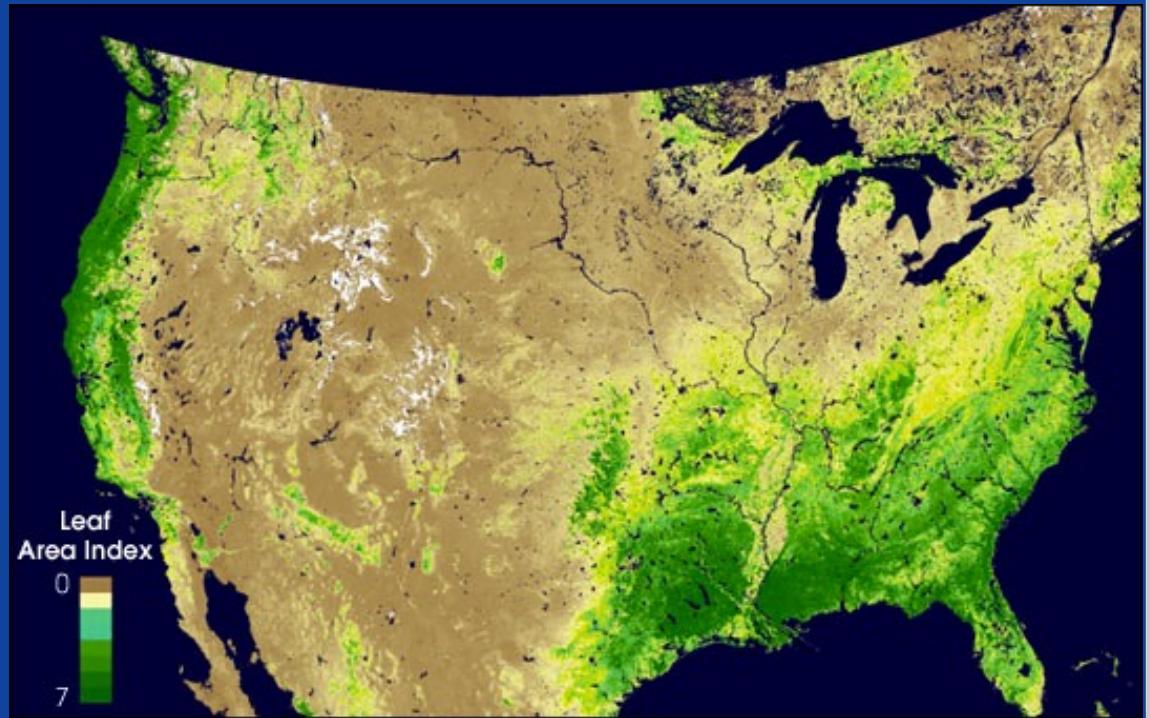
Accessing Delta-X Data at the ORNL DAAC

Delta-X Open Data Workshop
November 17, 2021

Matt Donovan, Geospatial Data Analyst



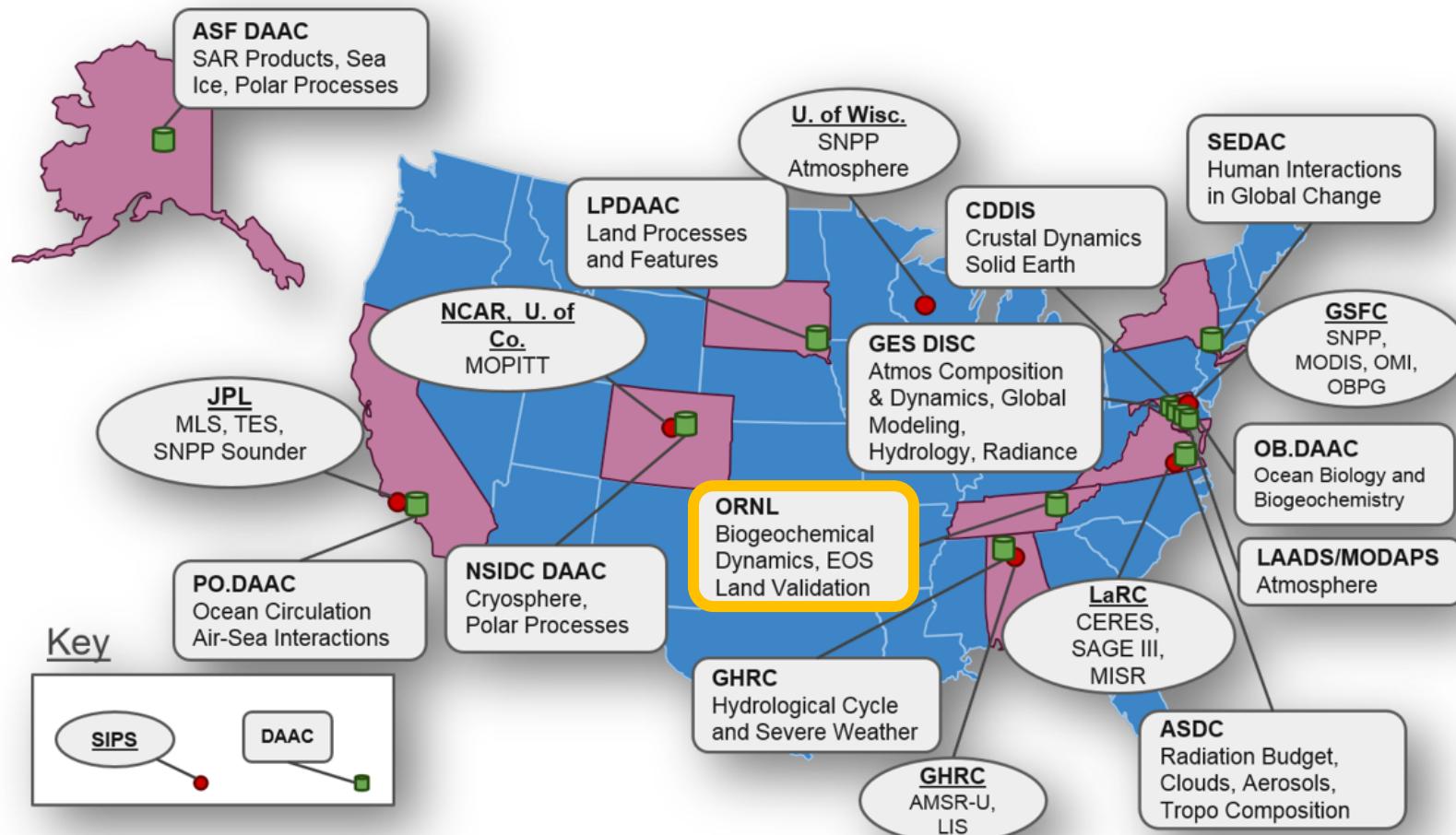
The Oak Ridge National Laboratory Distributed Active Archive Center for Biogeochemical Dynamics operates under an interagency agreement between NASA and the U.S. Department of Energy



U.S. DEPARTMENT OF
ENERGY



EOSDIS Distributed Active Archive Centers



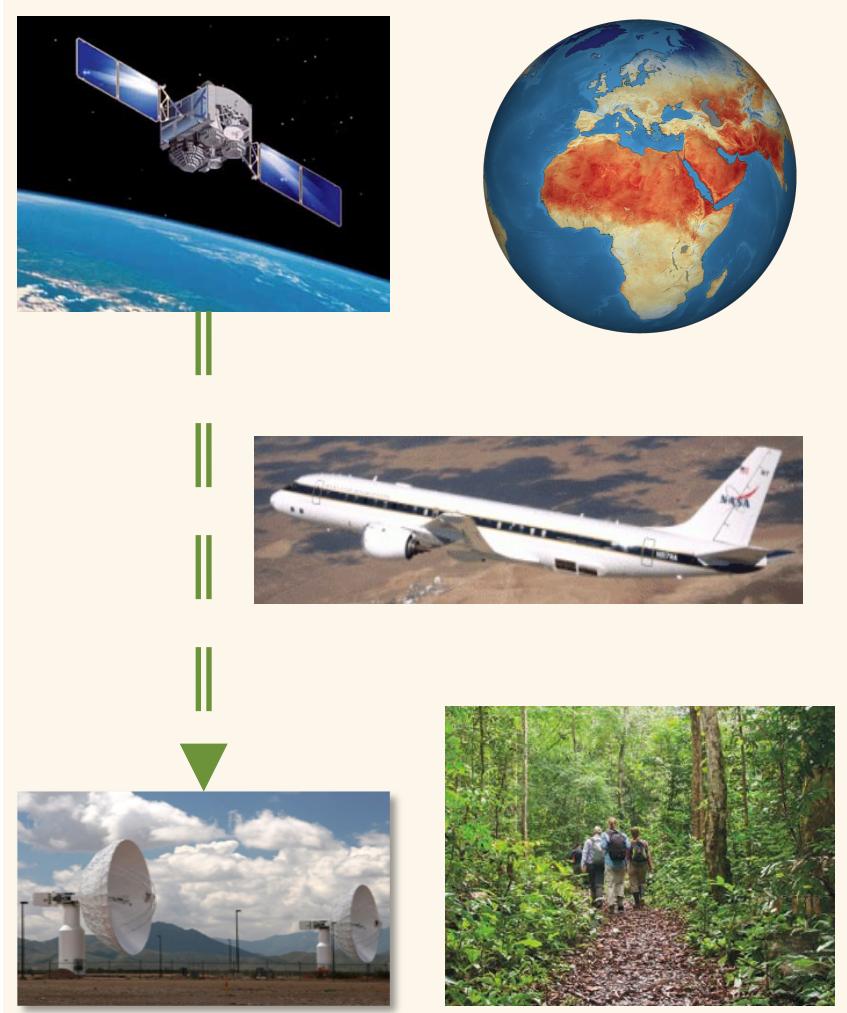
The ORNL DAAC- <https://daac.ornl.gov>

The **Oak Ridge National Laboratory Distributed Active Archive Center** archives data produced by NASA's Terrestrial Ecology Program in support of NASA's Carbon Cycle and Ecosystems focus area.

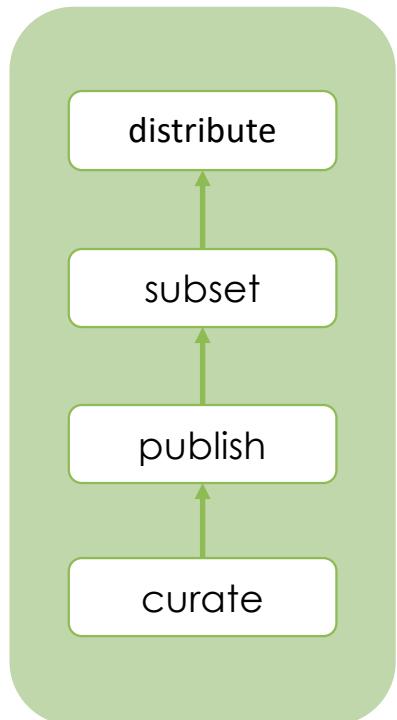
The screenshot shows the ORNL DAAC website homepage. At the top, there is a navigation bar with links for "About Us", "Get Data", "Submit Data", "Tools", "Resources", "Help", and "Sign In". Below the navigation bar is a search bar labeled "Search ORNL DAAC". The main content area features a large map of West Africa with green and red color coding, overlaid with river networks. A banner below the map reads "Carbon Storage in Tropical Forests" and "NASA's AfriSAR campaign measured forest structure in Gabon, West Africa to inform estimates of forest carbon storage capacity." Below the map, there are four categories: "Field Campaigns" (32 datasets in 12 projects), "Land Validation" (3 datasets in 1 project), "Regional/Global" (35 datasets in 11 projects), and "Model Archive" (13 models in 1 project). The "News" section contains three recent articles: "Column-average CO2 Concentrations from ACT-America" (published 2018-10-30), "Forest Data from the AfriSAR Mission" (published 2018-10-30), and "Maximum NDVI from the ABoVE Campaign" (published 2018-10-29). At the bottom, there are four promotional cards: "Subset and Visualize ORNL DAAC data.", "Search for CARVE Data in Earthdata Search.", "Read our Data Management Best Practices.", and "Looking for data used in a journal article? DOI Search."



What does the ORNL DAAC do?



DAAC



Users

research

applications

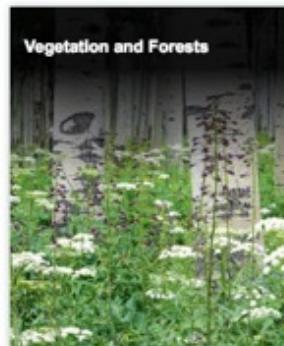
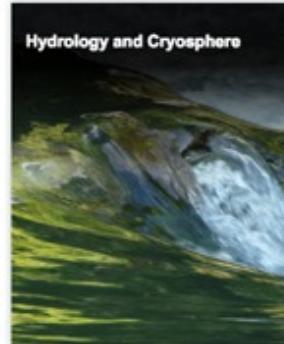
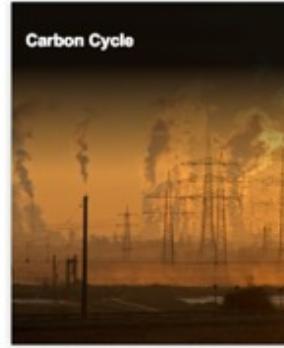
education

public

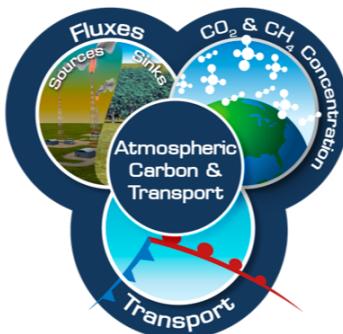
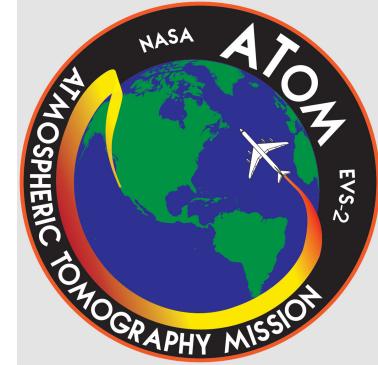


Data at ORNL DAAC

- 1550+ datasets
- 9 Science Themes
- 30,000+ users per year
- 35 Missions/Projects



NASA Projects



Carbon Monitoring System



Datasets Published as Preprint

DAAC Home > Get Data > NASA Projects > Delta-X > Landing page

Delta-X: Turbidity and Water Pressure Measurements, Mike Island in Wax Lake Delta, LA

Preprint This dataset is released as a preprint. The data are provisional. Read more [About Preprint Datasets](#).

Overview

DOI	https://doi.org/10.3334/ORNLDAAAC/1993
Version	1



- Goal: Make data available quickly
- Minimal DAAC review performed; data in “as-received” state
- Comments received may not be addressed until normal archival process
- DOI will resolve and will not change



Datasets Published as Preprint

DAAC Home > Get Data > NASA Projects > Delta-X > Landing page

Delta-X: Turbidity and Water Pressure Measurements, Mike Island in Wax Lake Delta, LA

Preprint This dataset is released as a preprint. The data are provisional. Read more [About Preprint Datasets](#).

Overview

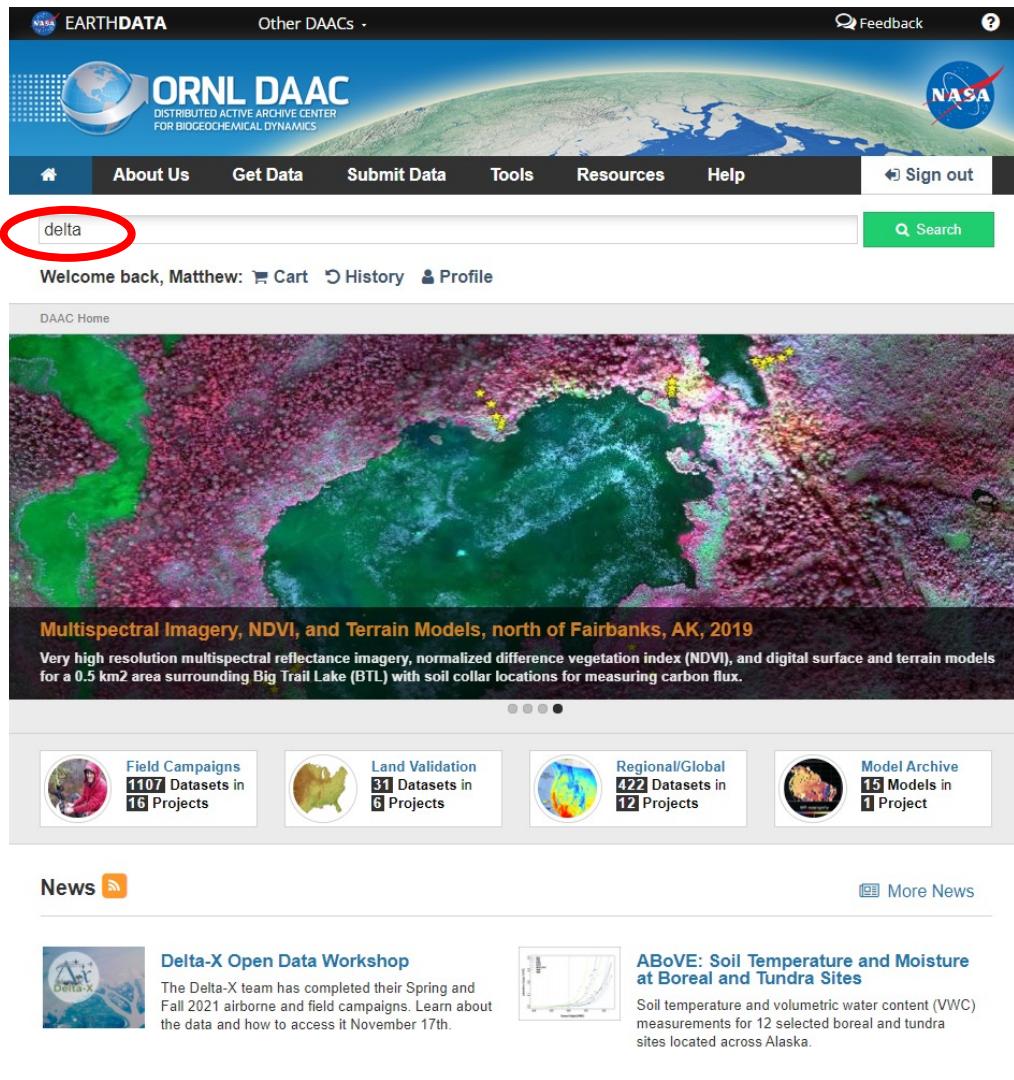
DOI	https://doi.org/10.3334/ORNLDaac/1993
Version	1



- ***DOI link will be needed to access***
- Will not be discoverable via search or listed as a dataset via the ORNL DAAC website.
- Metadata is incomplete



Searching for Data at ORNL DAAC



The screenshot shows the ORNL DAAC homepage. At the top, there's a navigation bar with links for 'About Us', 'Get Data', 'Submit Data', 'Tools', 'Resources', 'Help', and 'Sign out'. Below the navigation bar is a search bar containing the word 'delta', which is circled in red. A red arrow points from the search bar on the left towards the search results on the right.

Welcome back, Matthew: [Cart](#) [History](#) [Profile](#)

DAAC Home

Multispectral Imagery, NDVI, and Terrain Models, north of Fairbanks, AK, 2019

Very high resolution multispectral reflectance imagery, normalized difference vegetation index (NDVI), and digital surface and terrain models for a 0.5 km² area surrounding Big Trail Lake (BTL) with soil collar locations for measuring carbon flux.

Field Campaigns: 1107 Datasets in 16 Projects | Land Validation: 31 Datasets in 6 Projects | Regional/Global: 422 Datasets in 12 Projects | Model Archive: 15 Models in 1 Project

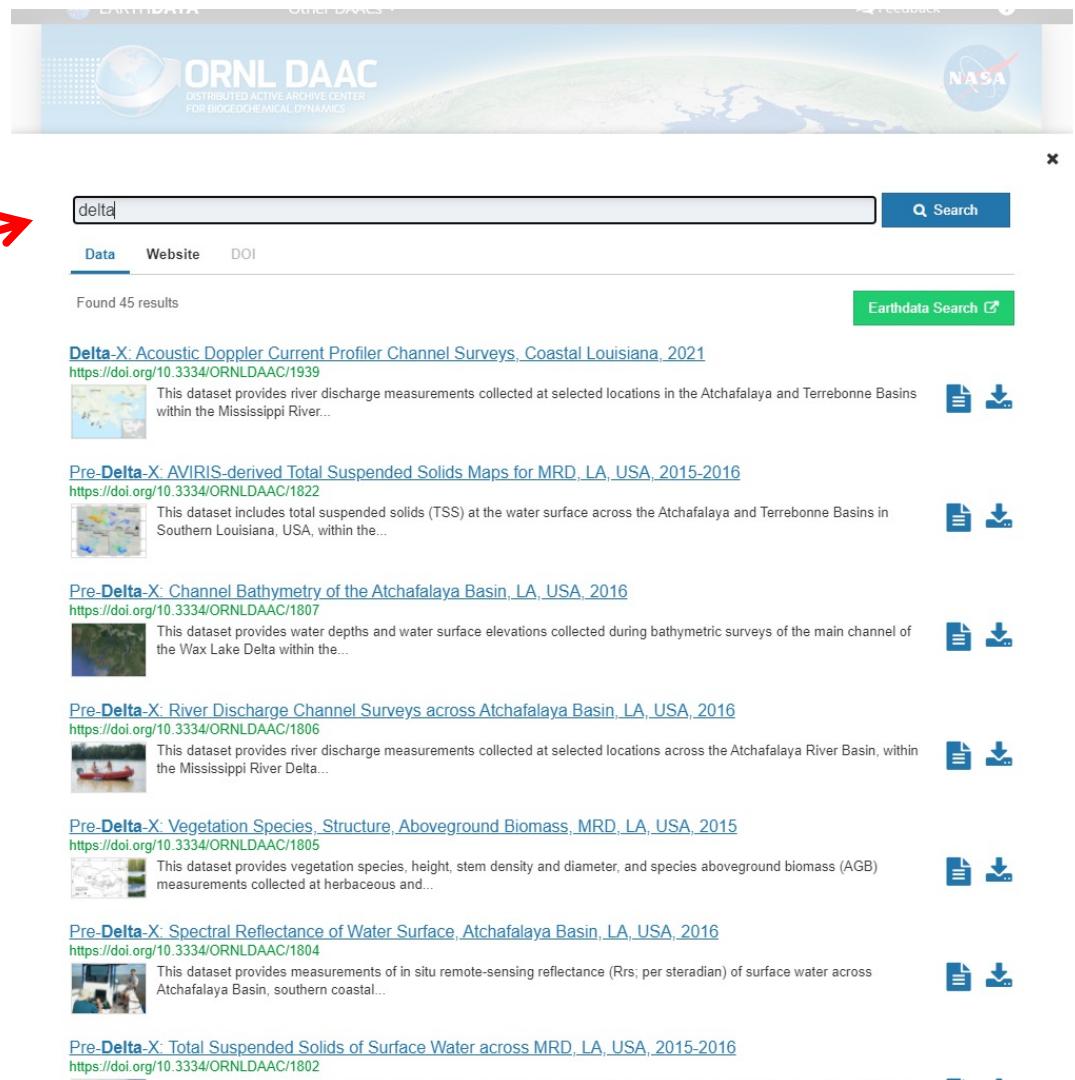
News  More News

Delta-X Open Data Workshop

The Delta-X team has completed their Spring and Fall 2021 airborne and field campaigns. Learn about the data and how to access it November 17th.

ABOVE: Soil Temperature and Moisture at Boreal and Tundra Sites

Soil temperature and volumetric water content (VWC) measurements for 12 selected boreal and tundra sites located across Alaska.



The screenshot shows the Earthdata search results page with the query 'delta' entered in the search bar. A red arrow points from the search bar on the left towards the search results on the right.

Found 45 results

Delta-X: Acoustic Doppler Current Profiler Channel Surveys, Coastal Louisiana, 2021
<https://doi.org/10.3334/ORNLDaac/1939>
This dataset provides river discharge measurements collected at selected locations in the Atchafalaya and Terrebonne Basins within the Mississippi River...

Pre-Delta-X: AVIRIS-derived Total Suspended Solids Maps for MRD, LA, USA, 2015-2016
<https://doi.org/10.3334/ORNLDaac/1822>
This dataset includes total suspended solids (TSS) at the water surface across the Atchafalaya and Terrebonne Basins in Southern Louisiana, USA, within the...

Pre-Delta-X: Channel Bathymetry of the Atchafalaya Basin, LA, USA, 2016
<https://doi.org/10.3334/ORNLDaac/1807>
This dataset provides water depths and water surface elevations collected during bathymetric surveys of the main channel of the Wax Lake Delta within the...

Pre-Delta-X: River Discharge Channel Surveys across Atchafalaya Basin, LA, USA, 2016
<https://doi.org/10.3334/ORNLDaac/1806>
This dataset provides river discharge measurements collected at selected locations across the Atchafalaya River Basin, within the Mississippi River Delta...

Pre-Delta-X: Vegetation Species, Structure, Aboveground Biomass, MRD, LA, USA, 2015
<https://doi.org/10.3334/ORNLDaac/1805>
This dataset provides vegetation species, height, stem density and diameter, and species aboveground biomass (AGB) measurements collected at herbaceous and...

Pre-Delta-X: Spectral Reflectance of Water Surface, Atchafalaya Basin, LA, USA, 2016
<https://doi.org/10.3334/ORNLDaac/1804>
This dataset provides measurements of in situ remote-sensing reflectance (Rrs; per steradian) of surface water across Atchafalaya Basin, southern coastal...

Pre-Delta-X: Total Suspended Solids of Surface Water across MRD, LA, USA, 2015-2016
<https://doi.org/10.3334/ORNLDaac/1802>
This dataset contains the total suspended solids (TSS) concentration of in situ water samples collected at selected sites across...



Data organization by NASA program

The screenshot shows the 'Get Data' section of the ORNL DAAC website. At the top, there's a navigation bar with links for About Us, Get Data, Submit Data, Tools, Resources, Help, Sign in, and a search bar. Below that, a breadcrumb trail shows 'DAAC Home > Get Data'. The main area is titled 'Get Data' and includes tabs for Science Themes, NASA Projects, and All Datasets. A filter bar allows users to 'Filter By' Field Campaigns, Land Validation, Regional/Global, or Model Archive, with a 'Clear Filters' button. The page displays a grid of project cards:

- CARVE
- Climate
- CMS
- Daymet
- Delta-X** (this card is highlighted with a red border)
- EOS LAND VAL
- FIFE
- FLUXNET
- GEDI

A small 't back to top' link is at the bottom right.

The screenshot shows the 'Delta-X' mission page on the ORNL DAAC website. At the top, there's a navigation bar with links for About Us, Get Data, Submit Data, Tools, Resources, Help, Sign out, and a search bar. The user is logged in as 'Matthew'. The main area is titled 'Delta-X' and includes a sub-navigation bar with links for DAAC Home, Get Data, NASA Projects, and Delta-X. The page features an 'Overview' section with a brief description of the mission, a 'Related Links' sidebar with links to browse datasets, search datasets, publications, and press releases, and a 'Delta-X Project Site' button. Below the overview is a section for 'Delta-X Datasets List' with a table of datasets:

Dataset	Updated	Published	User Guide	Download	Size
Delta-X dataset	2021-10-29	2021-10-29	User Guide	Download	3.5MB
Delta-X: Acoustic Doppler Current Profiler Channel Surveys, Coastal Louisiana, 2021 <small>NEW</small>	2021-10-29	2021-10-29	User Guide	Download	3.5MB
Pre-Delta-X: UAVSAR Georeferenced Channel Maps, Atchafalaya Basin, LA, USA, 2016	2021-09-23	2021-09-23	User Guide	Download	8.8MB
Pre-Delta-X: L1 UAVSAR Single Look Complex and Interferograms, MRD, LA, USA, 2016	2021-07-23	2021-02-26	User Guide	Download	
Pre-Delta-X: UAVSAR-derived Water Level Change Maps, Atchafalaya Basin, LA, USA, 2016	2021-04-05	2021-02-18	User Guide	Download	613.5MB
Pre-Delta-X: Aboveground Biomass and Vegetation Maps, Wax Lake Delta, LA, USA, 2016	2021-04-03	2021-02-26	User Guide	Download	3.8MB
Pre-Delta-X: AVIRIS-derived Total Suspended Solids Maps for MRD, LA, USA, 2015-2016	2021-04-03	2021-02-26	User Guide	Download	288.9MB



Accessing Datasets Via ORNL DAAC Site

Sign in using an Earthdata Login:

The screenshot shows two pages related to dataset access:

Left Page: Dataset Landing Page

- Header:** NASA EARTHDATA, ORNL DAAC (DISTRIBUTED ACTIVE ARCHIVE CENTER FOR BIOGEOCHEMICAL DYNAMICS)
- Top Navigation:** Home, About Us, Get Data (highlighted), Submit Data, Tools, Resources, Help, Sign in (circled in red).
- Search Bar:** Search ORNL DAAC.
- Breadcrumbs:** DAAC Home > Get Data > NASA Projects > Delta-X > Landing page.
- Title:** Delta-X: Acoustic Doppler Current Profiler Channel Surveys, Coastal Louisiana, 2021
- Overview Table:**

DOI	https://doi.org/10.3334/ORNLDaac/1939
Version	1
Project	Delta-X
Published	2021-10-29
Updated	2021-10-29
Usage	13 downloads
- Download Buttons:** Download Data (3.5 MB) and User Guide.
- Description:** This dataset provides river discharge measurements collected at selected locations in the Atchafalaya and Terrebonne Basins within the Mississippi River Delta floodplain in coastal Louisiana, USA. The measurements were made during the Delta-X Spring campaign from 2021-03-26 to 2021-04-11. Channel surveys were conducted with a Teledyne RiverPro acoustic doppler current profiler (ADCP) on selected wide channels (>100 m wide) and a few selected narrow channels (approximately 10 m wide).
- Science Keywords:** BIOSPHERE, ECOSYSTEMS, AQUATIC ECOSYSTEMS, WETLANDS.
- Spatial Coverage:** Bounding rectangle: N: 29.70 S: 29.16 E: -90.82 W: -91.45.
- Temporal Coverage:** 2021-03-25 to 2021-04-11.

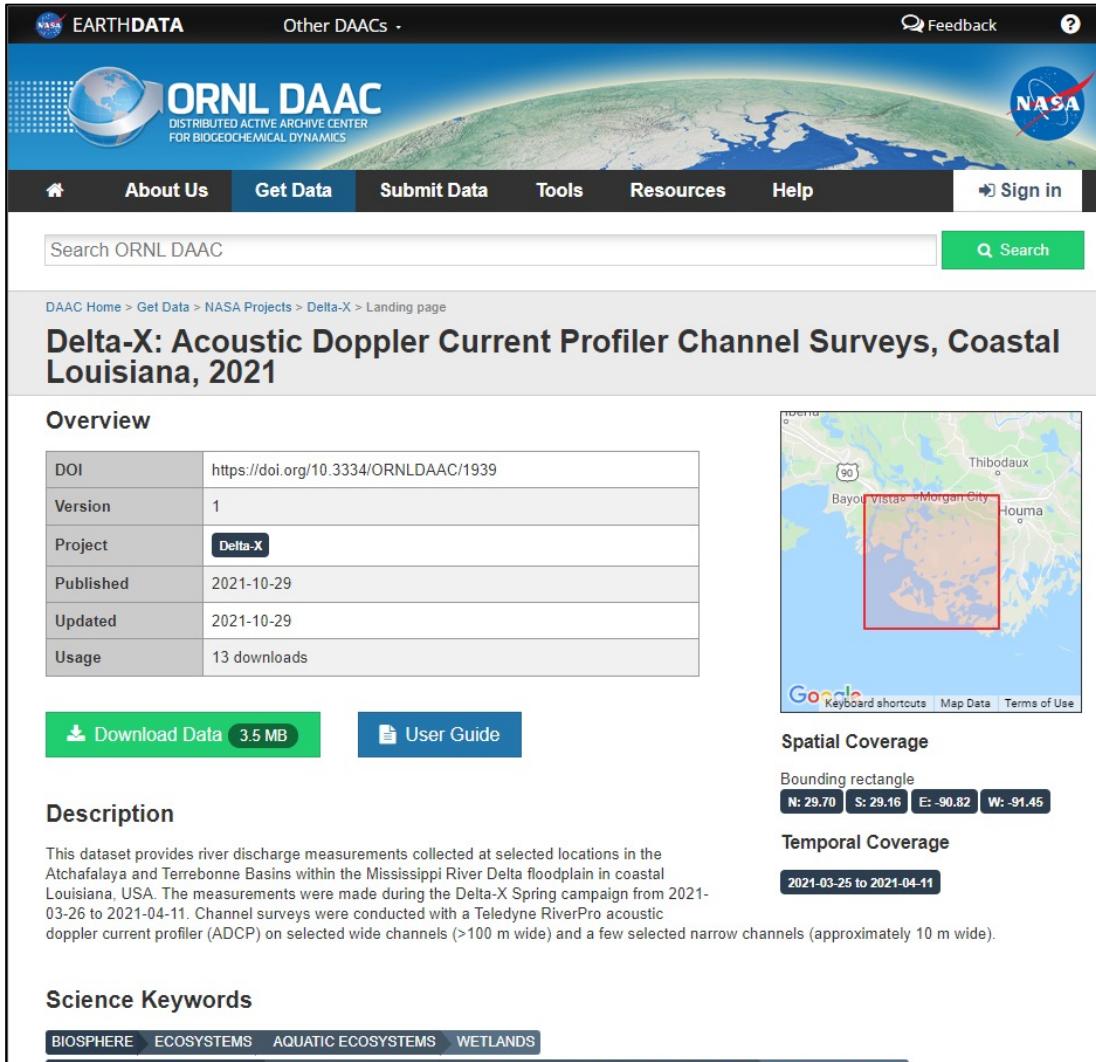
Right Page: EARTHDATA LOGIN

- Header:** NASA EARTHDATA, Find a DAAC, Feedback.
- Text:** You are logging on to the Oak Ridge National Laboratory Distributed Active Archive Center (ORNL DAAC).
- Form Fields:** Username, Password, Stay signed in (this is a private workstation) (checkbox checked).
- Buttons:** LOG IN, REGISTER.
- Links:** I don't remember my username, I don't remember my password, Help.
- Text Area:** Why must I register? (The Earthdata Login provides a single mechanism for user registration and profile management for all EOSDIS system components (DAACs, Tools, Services). Your Earthdata login also helps the EOSDIS program better understand the usage of EOSDIS services to improve user experience through customization of tools and improvement of services. EOSDIS data are openly available to all and free of charge except where governed by international agreements.)
- Footer:** Get single sign-on access to all your favorite EOSDIS sites.



Accessing Datasets Via ORNL DAAC Site

Delta-X ADCP Dataset:
<https://doi.org/10.3334/ORNLDAAAC/1939>



The screenshot shows the ORNL DAAC dataset landing page for the Delta-X ADCP dataset. The page features a header with the NASA Earthdata logo, the ORNL DAAC logo, and a search bar. The main content area displays the dataset title, "Delta-X: Acoustic Doppler Current Profiler Channel Surveys, Coastal Louisiana, 2021". Below the title is an "Overview" section containing a table with dataset metadata. To the right of the overview is a map of the Mississippi River Delta region, specifically the Atchafalaya and Terrebonne Basins, with a red bounding box indicating the survey area. Further down the page are sections for "Description" and "Science Keywords", along with a "User Guide" button and a "Download Data" button.

DOI	https://doi.org/10.3334/ORNLDAAAC/1939
Version	1
Project	Delta-X
Published	2021-10-29
Updated	2021-10-29
Usage	13 downloads

Description
This dataset provides river discharge measurements collected at selected locations in the Atchafalaya and Terrebonne Basins within the Mississippi River Delta floodplain in coastal Louisiana, USA. The measurements were made during the Delta-X Spring campaign from 2021-03-26 to 2021-04-11. Channel surveys were conducted with a Teledyne RiverPro acoustic doppler current profiler (ADCP) on selected wide channels (>100 m wide) and a few selected narrow channels (approximately 10 m wide).

Science Keywords
BIOSPHERE ECOSYSTEMS AQUATIC ECOSYSTEMS WETLANDS

Spatial Coverage
Bounding rectangle
N: 29.70 S: 29.16 E: -90.82 W: -91.45

Temporal Coverage
2021-03-25 to 2021-04-11



Accessing Datasets Via Earthdata Search:

<https://search.earthdata.nasa.gov>

EARTHDATA SEARCH

Search for collections or topics

8,439 Matching Collections

Showing 20 of 8,439 matching collections

Export Sort View

SENTINEL-1A_SLC
1,148,653 Granules • 2014-04-03 ongoing • Sentinel-1A slant-range product

SENTINEL-1A_SLC v1 - ASF

SENTINEL-1B_SLC
767,077 Granules • 2016-04-25 ongoing • Sentinel-1B slant-range product

SENTINEL-1B_SLC v1 - ASF

SENTINEL-1A_DUAL_POL_GRD_HIGH_RES
976,861 Granules • 2014-04-03 ongoing • Sentinel-1A Dual-pol ground projected high and full resolution images

SENTINEL-1A_DP_GRD_HIGH v1 - ASF

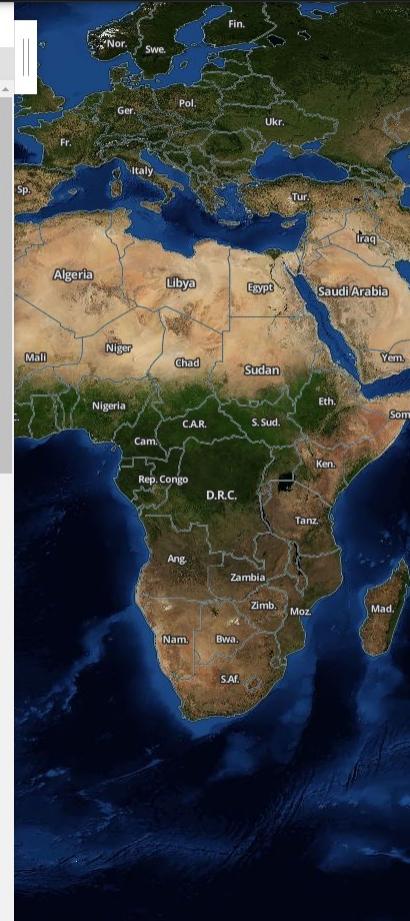
SENTINEL-1B_DUAL_POL_GRD_HIGH_RES
676,853 Granules • 2016-04-25 ongoing • Sentinel-1B Dual-pol ground projected high and full resolution images

SENTINEL-1B_DP_GRD_HIGH v1 - ASF

ASTER Global Digital Elevation Model V003
22,912 Granules • 2000-03-01 to 2013-11-30 • The ASTER Global Digital Elevation Model (GDEM) Version 3 (ASTGTM) provides a global digital elevation model (DEM) of land areas on Earth at a spatial resolution of 1 arc second (approximately 30 meters).

MAP IMAGERY ASTGTM v003 - LP DAAC

ECOSTRESS Land Surface Temperature and Emissivity Daily L2 Global 70m V001
227,732 Granules • 2018-07-09 ongoing • The ECOSTRESS mission measures the temperature of plants to better understand the health and productivity of vegetation on Earth.

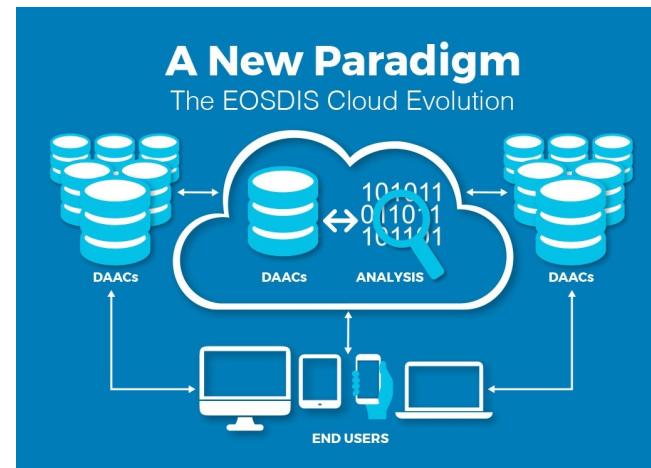


v1.158.3 • Search Time: 0.9s • NASA Official: Stephen Barrick • FOIA • NASA Privacy Policy • USA.gov



Earthdata Cloud and Delta-X

- Earthdata Cloud will enable new science advancement using commercial cloud tools
 - <https://earthdata.nasa.gov/eosdis/cloud-evolution>
- All Delta-X data will be in Earthdata Cloud shortly after finalization at the ORNL DAAC
 - Preprint data is not in Earthdata Cloud
 - Data are available both on-prem (through daac.ornl.gov) and in Earthdata Cloud
- Migration is in-progress
 - 960 of 8500 EOSDIS datasets so far



Earthdata Cloud benefits

- Direct S3 access to data available when working in AWS US-West-2 region.
- Data organized in cloud-optimized formats, for example cloud-optimized geotiff (CoG), to facilitate cloud-based data analysis
- Integration with EOSDIS-wide tools, such as Harmony, OPeNDAP, and ArcGIS Server (in progress), depending on data formats.

Note: We are working to make these services more visible. Today, the service information is only in the CMR metadata (next slide).



Finding and accessing cloud datasets

The screenshot illustrates the process of finding and accessing cloud datasets through the EARTHDATA SEARCH platform.

Left Panel (Search Results):

- The interface includes a sidebar with "Filter Collections" options: Categories, Features, and AWS Cloud filters.
- The "Available from AWS Cloud" checkbox is checked, highlighted by a yellow arrow.
- The search results show 14 matching collections, with the first one displayed in detail.
- The detailed view for "Pre-Delta-X: L2 AirSWOT Water Surface Elevations, Atchafalaya Basin, LA, USA, 2016" shows 312 granules.
- A yellow arrow points to the "View details" button for the first granule entry.

Right Panel (Dataset Details):

- The page displays the JSON metadata for the dataset.
- Yellow arrows point to three specific links:
 - A direct download link via S3: https://s3://ornl-cumulus-prod-protected/deltax/PreDeltaX_L2_AirSWOT/data/20150511083958/utm_m0m_20150511083958.corr.tif
 - A link to the ORNL DAAC Data Set Documentation (USER'S GUIDE): https://daac.ornl.gov/DELTAx/guides/PreDeltaX_L2_AirSWOT.html
 - A link to the Data Set Landing Page DOI URL (DATA SET LANDING PAGE): <https://doi.org/10.3334/ORNLDAC/1818>



Spatial Data Access Tool (SDAT)

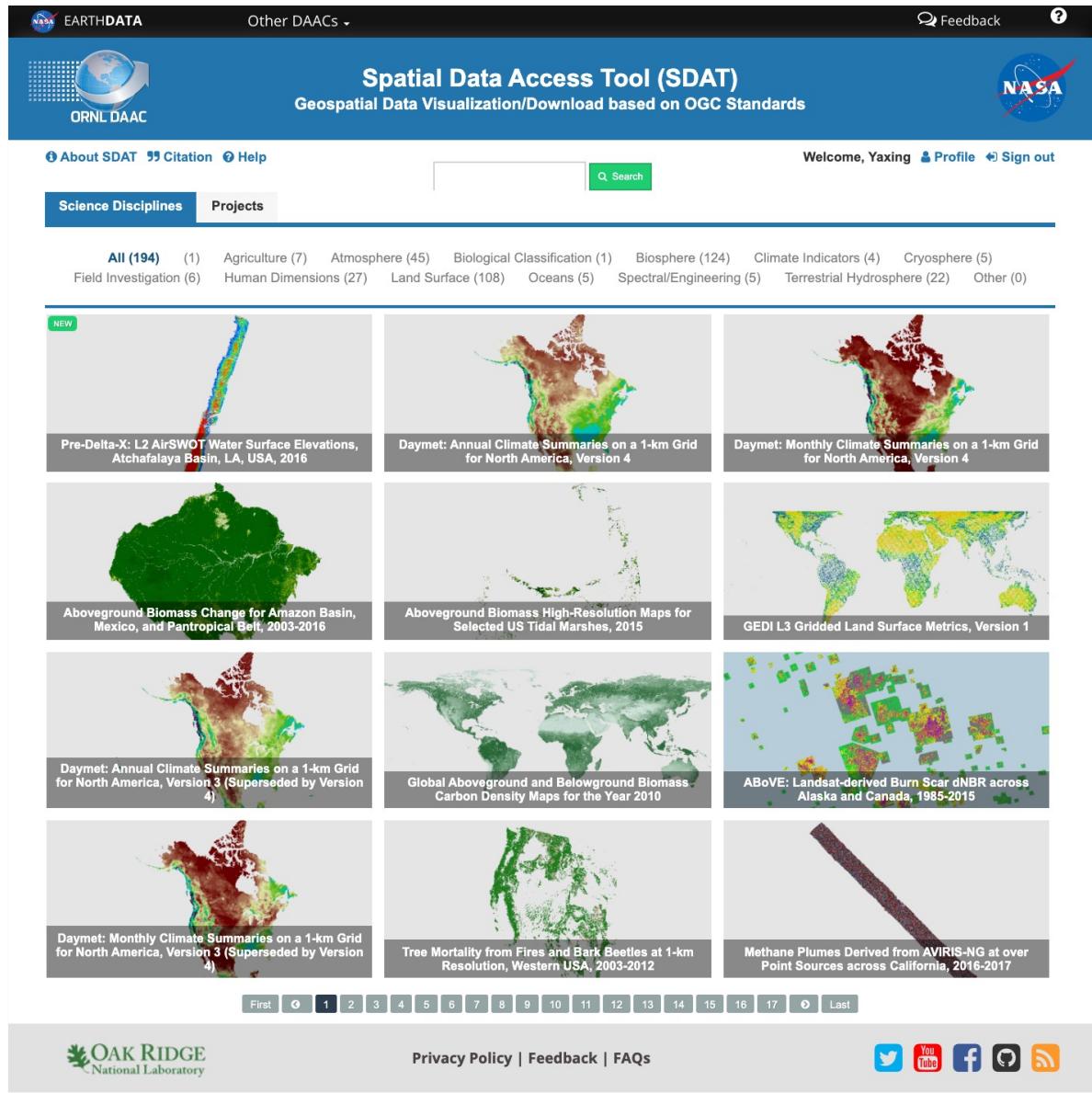
Visualize
Subset
Regrid
Reformat
Reproject

... all from your
web browser or
your codes!

*Primarily for
Geotiffs.

Help and Tutorial:
[https://webmap.ornl.gov/ogc/help/
sdat_help_index.html](https://webmap.ornl.gov/ogc/help/sdat_help_index.html)

<https://webmap.ornl.gov/ogc>



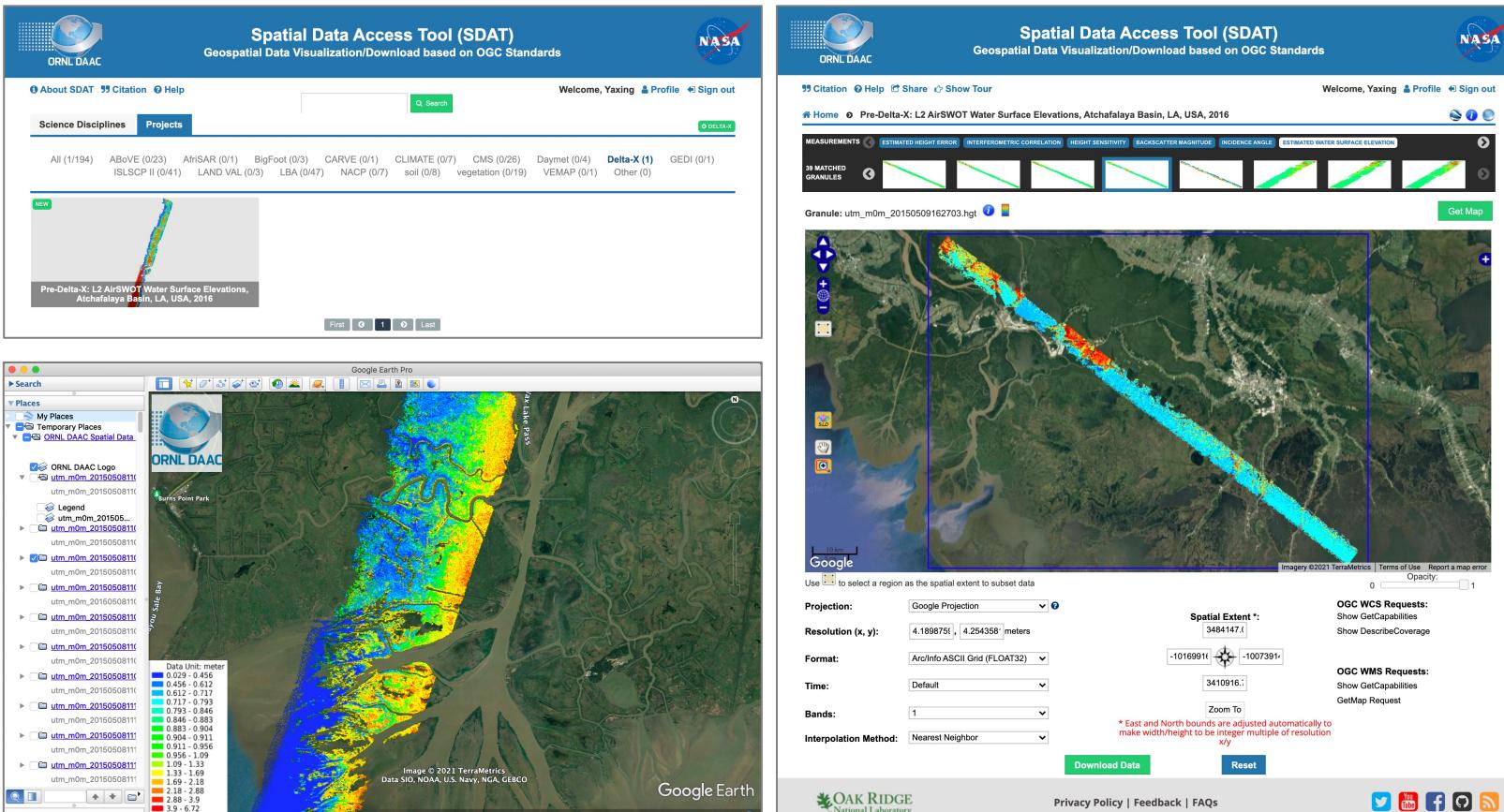
The screenshot shows the SDAT homepage with a search bar and navigation links. Below is a grid of 12 map thumbnails, each with a title:

- Pre-Delta-X: L2 AirSWOT Water Surface Elevations, Atchafalaya Basin, LA, USA, 2016
- Daymet: Annual Climate Summaries on a 1-km Grid for North America, Version 4
- Daymet: Monthly Climate Summaries on a 1-km Grid for North America, Version 4
- Aboveground Biomass Change for Amazon Basin, Mexico, and Pantropical Belt, 2003-2016
- Aboveground Biomass High-Resolution Maps for Selected US Tidal Marshes, 2015
- GEDI L3 Gridded Land Surface Metrics, Version 1
- Daymet: Annual Climate Summaries on a 1-km Grid for North America, Version 3 (Superseded by Version 4)
- Global Aboveground and Belowground Biomass Carbon Density Maps for the Year 2010
- ABoVE: Landsat-derived Burn Scar dNBR across Alaska and Canada, 1985-2015
- Daymet: Monthly Climate Summaries on a 1-km Grid for North America, Version 3 (Superseded by Version 4)
- Tree Mortality from Fires and Bark Beetles at 1-km Resolution, Western USA, 2003-2012
- Methane Plumes Derived from AVIRIS-NG at over Point Sources across California, 2016-2017

At the bottom are links for First, Last, and page numbers 1 through 17, followed by a navigation bar with links for Privacy Policy, Feedback, and FAQs, and social media icons.



Pre-Delta-X data in SDAT



https://webmap.ornl.gov/ogc/dataset.jsp?ds_id=1818

Explore data files of the Pre-Delta-X L2 AirSWOT Water Surface Elevation dataset in SDAT. Visualize data interactively in a Web browser (right) or Google Earth (lower-left) and subset data using user-selected parameters.



Get more from the ORNL DAAC

- ORNL DAAC Learning Resources: <https://daac.ornl.gov/resources/learning/>
- Questions/Help: <https://forum.earthdata.nasa.gov/>
- NASA EOSDIS Social Media
 - [Twitter](#)
 - [Facebook](#)
 - [YouTube](#)

