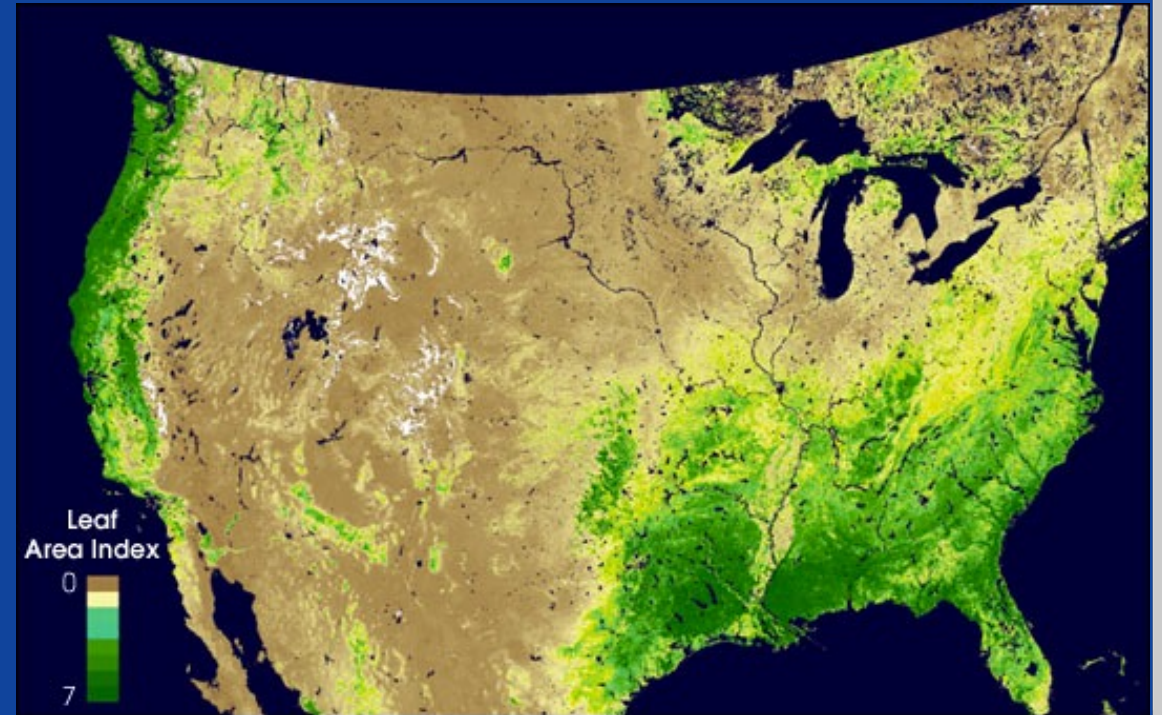


# Accessing Delta-X Data at the ORNL DAAC

Delta-X Open Data Workshop

November 17, 2021

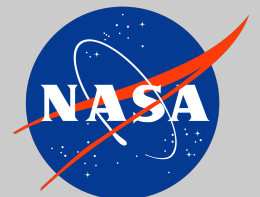
Matt Donovan, Geospatial Data Analyst



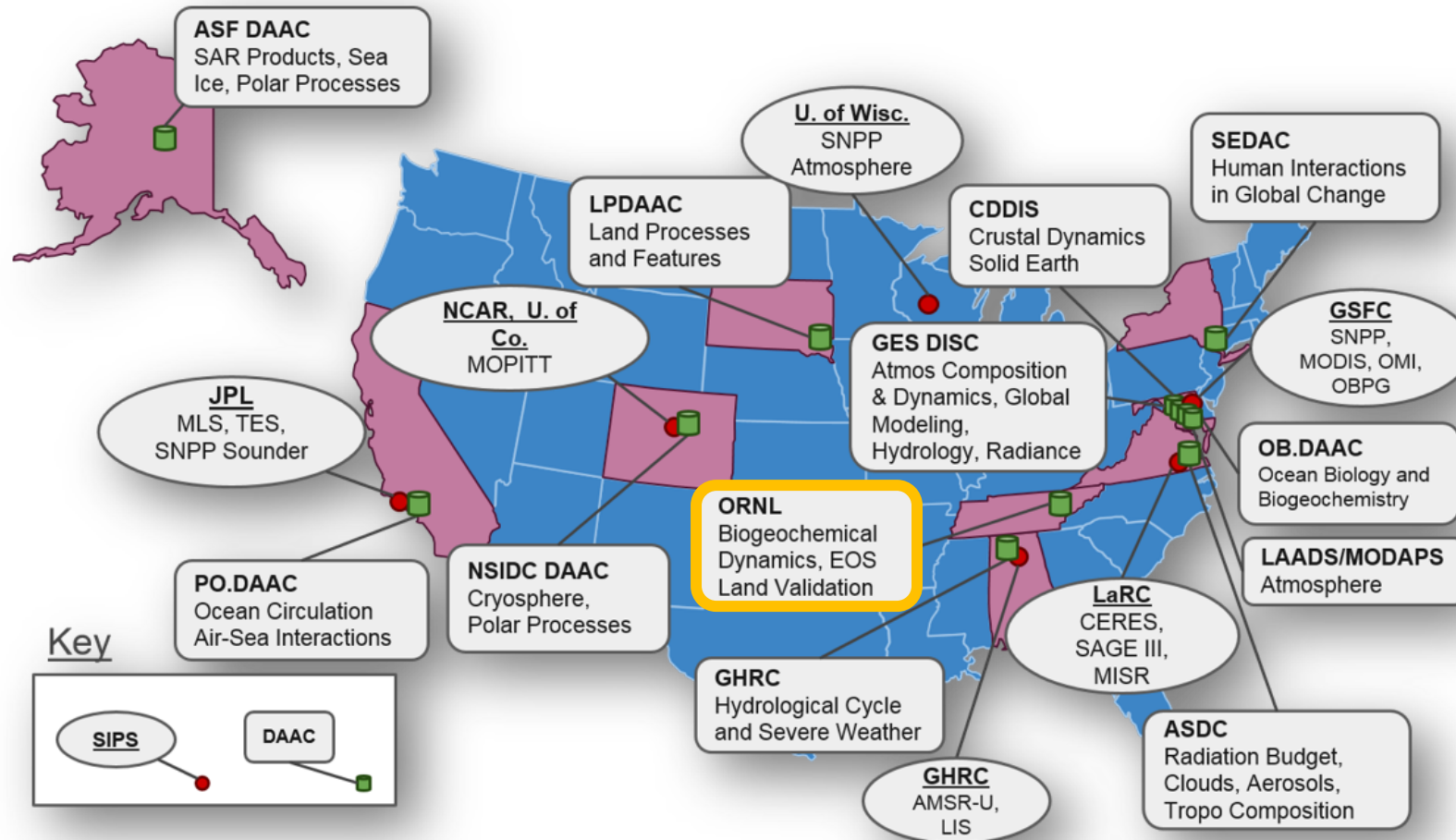
The Oak Ridge National Laboratory Distributed Active Archive Center for Biogeochemical Dynamics operates under an interagency agreement between NASA and the U.S. Department of Energy



**U.S. DEPARTMENT OF  
ENERGY**



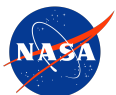
# EOSDIS Distributed Active Archive Centers



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

The **O**ak **R**idge **N**ational **L**aboratory **D**istributed **A**ctive **A**rchive **C**enter archives data produced by NASA's Terrestrial Ecology Program in support of NASA's Carbon Cycle and Ecosystems focus area.

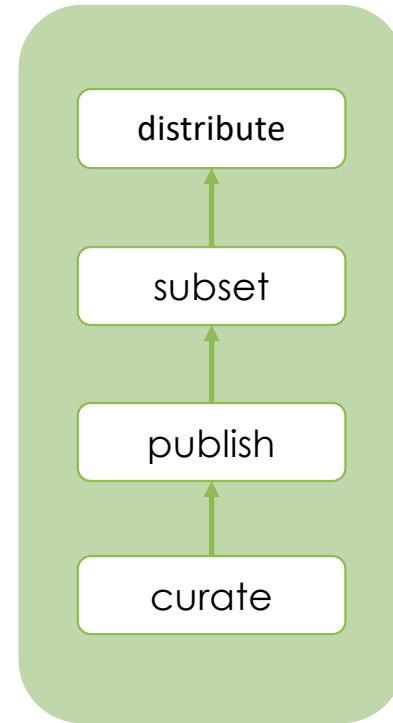
The screenshot shows the ORNL DAAC website homepage. At the top, there is a navigation bar with the ORNL DAAC logo, the text "ORNL DAAC DISTRIBUTED ACTIVE ARCHIVE CENTER FOR BIOGEOCHEMICAL DYNAMICS", and a NASA logo. Below the navigation bar is a search bar labeled "Search ORNL DAAC" with a "Search" button. The main content area features a large map of West Africa with a color-coded overlay representing carbon storage. Below the map is a headline: "Carbon Storage in Tropical Forests" and a sub-headline: "NASA's AIRSAR campaign measured forest structure in Gabon, West Africa to inform estimates of forest carbon storage capacity." Underneath the map are four icons representing different data categories: "Field Campaigns" (77 Datasets in 12 Projects), "Land Validation" (22 Datasets in 1 Projects), "Regional/Global" (23 Datasets in 11 Projects), and "Model Archive" (11 Models in 1 Project). A "News" section follows, with a "More News" link. There are four news items, each with a small image and a title: "Column-average CO2 Concentrations from ACT-America" (2018-10-30), "Forest Data from the AfrisAR Mission" (2018-10-30), "Maximum NDVI from the ABoVE Campaign" (2018-10-29), and "CO2 Concentrations in the Boston Area" (2018-10-04). At the bottom, there is a paragraph about the ORNL DAAC mission and four small icons with text: "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."



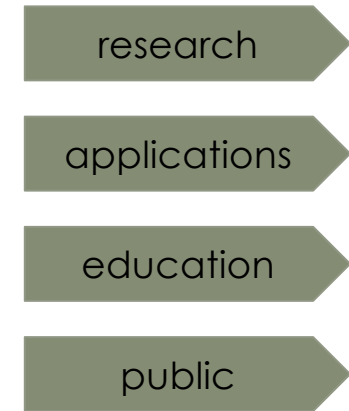
# What does the ORNL DAAC do?



## DAAC



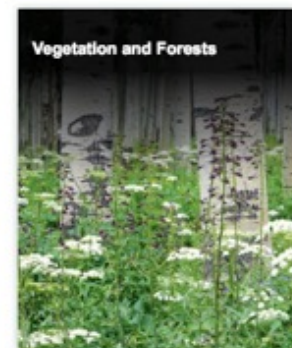
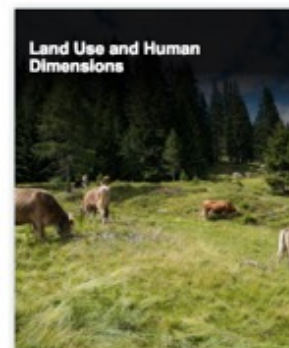
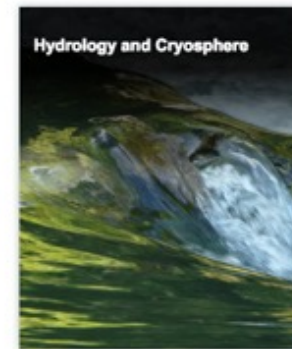
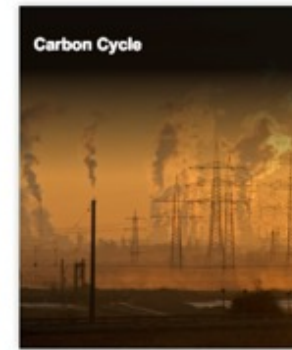
## Users



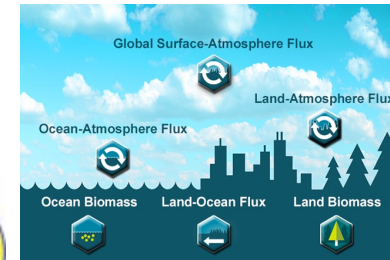
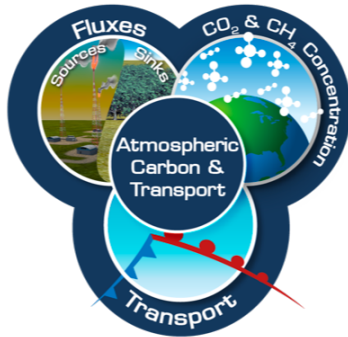
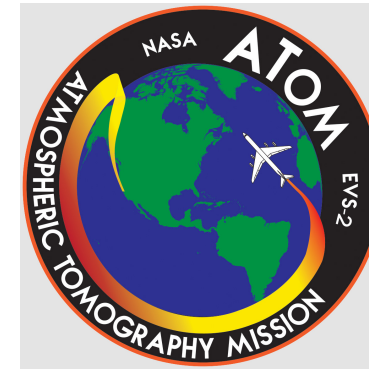


# Data at ORNL DAAC

- 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	<a href="https://doi.org/10.3334/ORNLDAAC/1993">https://doi.org/10.3334/ORNLDAAC/1993</a>
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	<a href="https://doi.org/10.3334/ORNLDAAC/1993">https://doi.org/10.3334/ORNLDAAC/1993</a>
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

**EARTHDATA** Other DAACs - Feedback ?

**ORNL DAAC**  
DISTRIBUTED ACTIVE ARCHIVE CENTER  
FOR BIOGEOCHEMICAL DYNAMICS

Home About Us Get Data Submit Data Tools Resources Help Sign out

delta Search

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 km<sup>2</sup> 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.



delta Search

Data Website DOI

Found 45 results Earthdata Search

**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

ORNL DAAC  
DISTRIBUTED ACTIVE ARCHIVE CENTER  
FOR BIOGEOCHEMICAL DYNAMICS

Search ORNL DAAC

DAAC Home > Get Data

## Get Data

Science Themes | NASA Projects | All Datasets

Filter By: Field Campaigns | Land Validation | Regional/Global | Model Archive

ORNL DAAC  
DISTRIBUTED ACTIVE ARCHIVE CENTER  
FOR BIOGEOCHEMICAL DYNAMICS

Search ORNL DAAC

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

## Delta-X

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

Overview

The Delta-X mission is a 5-year NASA Earth Venture Suborbital-3 mission to study the Mississippi River Delta in the United States, which is growing and sinking in different areas. River deltas and their wetlands are drowning as a result of sea level rise and reduced sediment inputs. The Delta-X mission will determine which parts will survive and continue to grow, and which parts will be lost. Delta-X begins with airborne and in situ data acquisition and carries through data analysis, model integration, and validation to predict the extent and spatial patterns of future deltaic land loss or gain.

Related Links

- [Browse Delta-X datasets](#)
- [Search Delta-X datasets](#)
- [Publications citing Delta-X](#)
- [NASA Press Release](#)

[Delta-X Project Site](#)

Data products from the 2016 Pre-Delta-X Demonstration Campaign are available now. The Spring 2021 campaign completed in April 2021 and the resulting data products are now being finalized for distribution.

### Delta-X Datasets List

Click to explore datasets or check the box to add datasets to your shopping cart.

16 Delta-X datasets

Show  All  entries

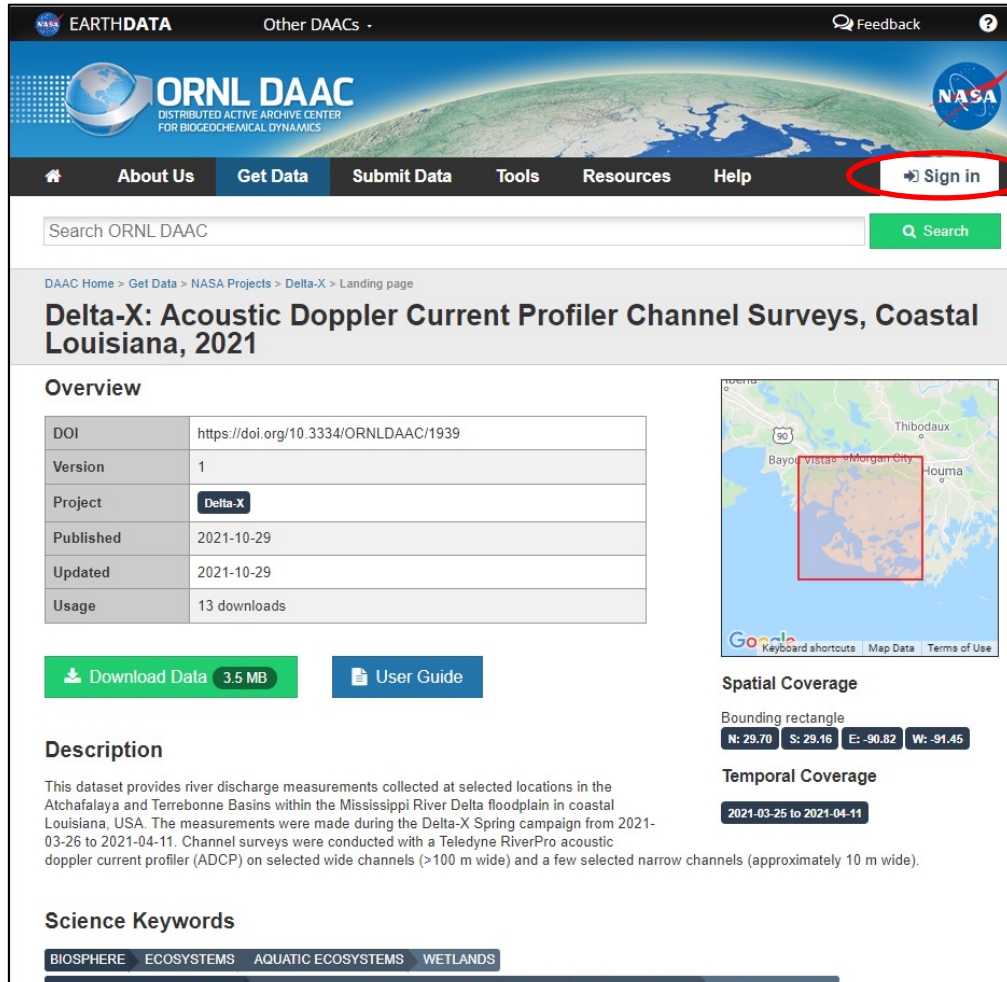
<input checked="" type="checkbox"/>	Delta-X dataset	Updated	Published	User Guide	Download	Size
<input type="checkbox"/>	Delta-X: Acoustic Doppler Current Profiler Channel Surveys, Coastal Louisiana, 2021 <small>NEW</small>	2021-10-29	2021-10-29	<a href="#">User Guide</a>	<a href="#">Download</a>	3.5MB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





# Accessing Datasets Via ORNL DAAC Site

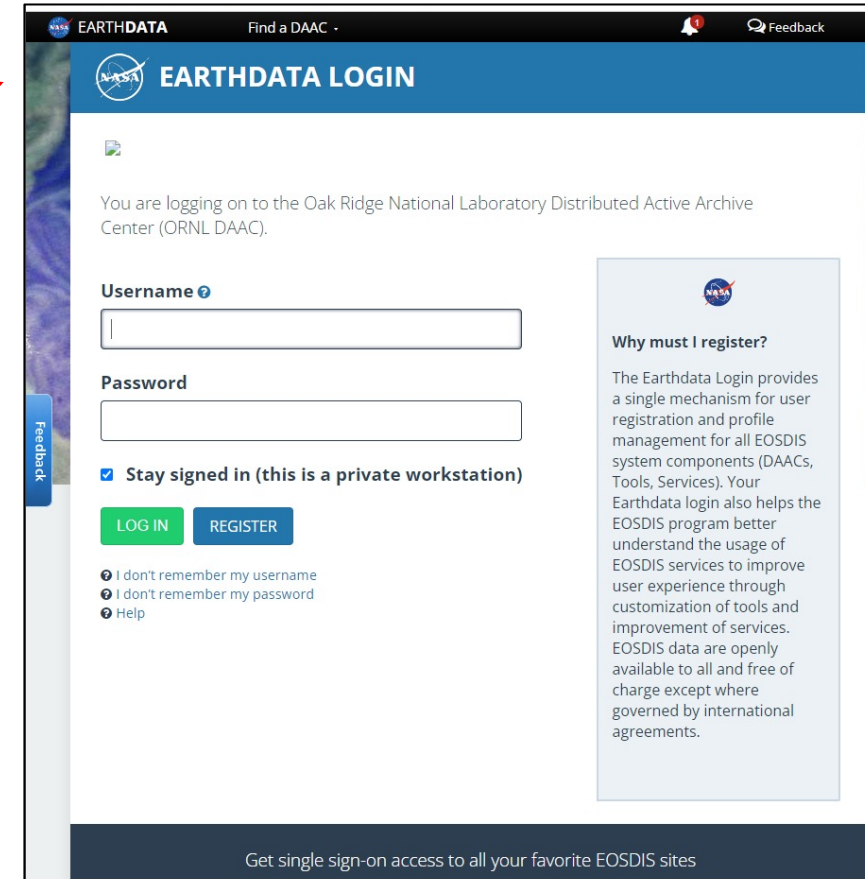
Sign in using an Earthdata Login:



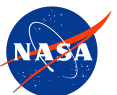
The screenshot shows the ORNL DAAC website interface. The top navigation bar includes 'About Us', 'Get Data', 'Submit Data', 'Tools', 'Resources', 'Help', and a circled 'Sign in' button. Below the navigation bar is a search bar and a breadcrumb trail: 'DAAC Home > Get Data > NASA Projects > Delta-X > Landing page'. The main content area features a title 'Delta-X: Acoustic Doppler Current Profiler Channel Surveys, Coastal Louisiana, 2021' and an '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

Below the table are buttons for 'Download Data 3.5 MB' and 'User Guide'. A map shows the spatial coverage of the dataset, and a table below it provides bounding rectangle coordinates (N: 29.70, S: 29.16, E: -90.82, W: -91.45) and temporal coverage (2021-03-25 to 2021-04-11). Science keywords include BIOSPHERE, ECOSYSTEMS, AQUATIC ECOSYSTEMS, and WETLANDS.

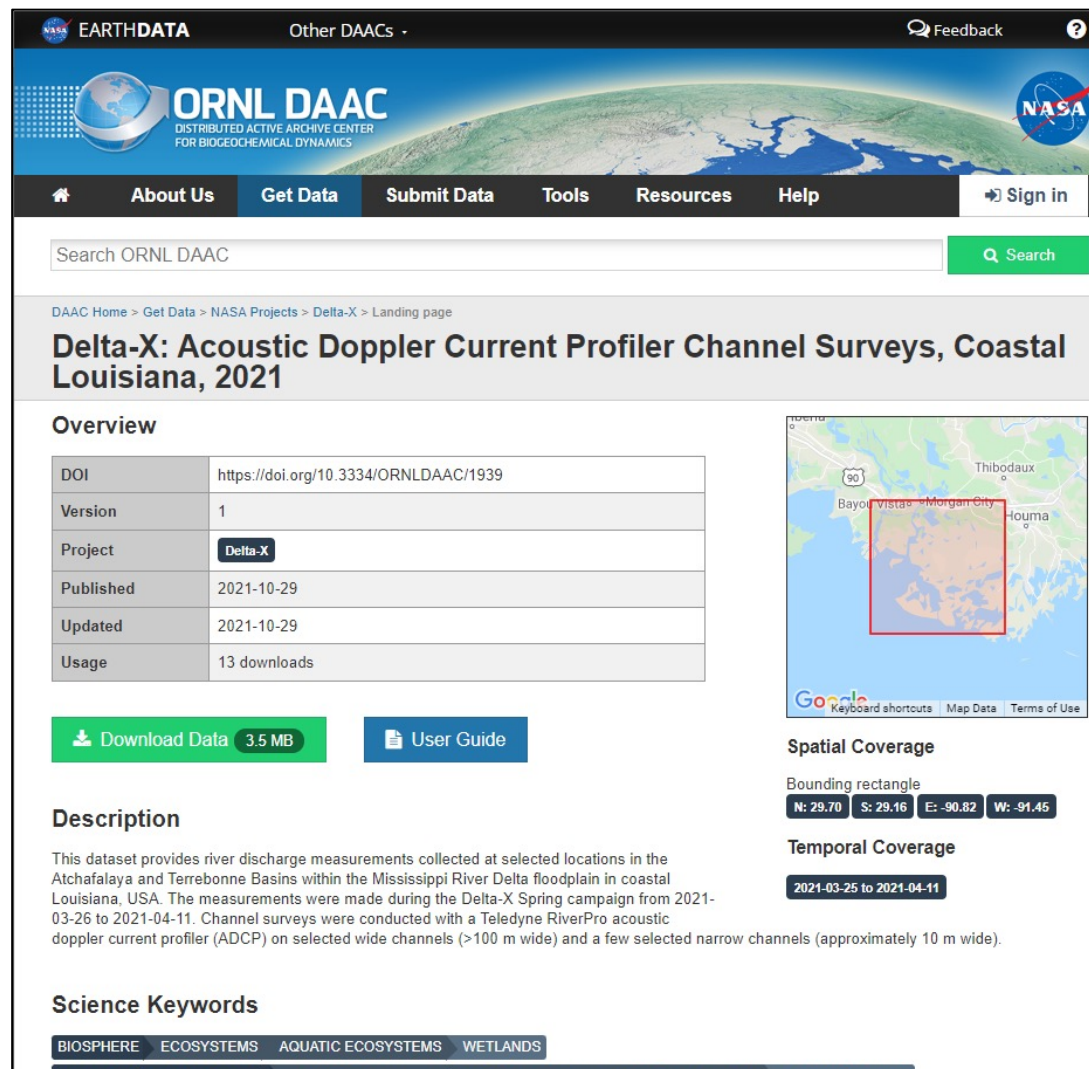


The screenshot shows the Earthdata Login page. The top navigation bar includes 'Find a DAAC' and a 'Feedback' button. The main content area features a 'Sign in' button, a message 'You are logging on to the Oak Ridge National Laboratory Distributed Active Archive Center (ORNL DAAC).', and input fields for 'Username' and 'Password'. A checkbox labeled 'Stay signed in (this is a private workstation)' is checked. Below the input fields are 'LOG IN' and 'REGISTER' buttons. A sidebar on the right contains the text 'Why must I register?' and a paragraph explaining the benefits of Earthdata Login. At the bottom, a dark blue bar contains the text '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/ORNLDAAC/1939>



The screenshot shows the ORNL DAAC website interface. At the top, there is a navigation bar with links for 'About Us', 'Get Data', 'Submit Data', 'Tools', 'Resources', 'Help', and 'Sign in'. A search bar is located below the navigation bar. The main content area features the title 'Delta-X: Acoustic Doppler Current Profiler Channel Surveys, Coastal Louisiana, 2021'. Below the title is an 'Overview' section with a table of metadata. To the right of the table is a map of the study area in Louisiana, with a red bounding box indicating the spatial coverage. Below the map are sections for 'Spatial Coverage' and 'Temporal Coverage'. The 'Description' section provides details about the data collection process. At the bottom, there are 'Science Keywords' including 'BIOSPHERE', 'ECOSYSTEMS', 'AQUATIC ECOSYSTEMS', and 'WETLANDS'.

DOI	<a href="https://doi.org/10.3334/ORNLDAAC/1939">https://doi.org/10.3334/ORNLDAAC/1939</a>
Version	1
Project	Delta-X
Published	2021-10-29
Updated	2021-10-29
Usage	13 downloads

**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

**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



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

The screenshot displays the Earthdata Search interface. At the top, the NASA logo and 'EARTHDATA' are visible, along with a search bar containing the text 'Search for collections or topics'. Below the search bar, the page shows '8,439 Matching Collections' and 'Showing 20 of 8,439 matching collections'. The interface includes a sidebar with 'Filter Collections' and 'Additional Filters' sections. The main content area lists several datasets with their respective granule counts and descriptions. A map of the world is visible on the right side of the interface.

**Filter Collections**

**Categories**

Features

- Available from AWS Cloud
- Customizable
- Map Imagery
- Near Real Time

Keywords

Platforms

Instruments

Organizations

Projects

Processing Levels

Data Format

Tiling System

Horizontal Data Resolution

**Additional Filters**

- Include collections without granules
- Include only EOSDIS collections

**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

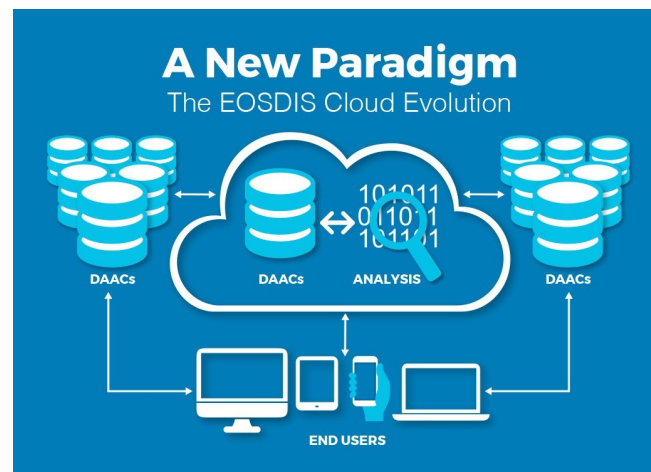
**ASTER Global Digital Elevation Model V003**  
22,912 Granules - 2000-03-01 to 2013-11-30 - The ASTER Global Digital Elevation Model (GDEM) Version 3 (ASTGTM) provides a global digital elevation model (DEM) of land areas on Earth at a spatial resolution of 1 arc second (approximately 30 meters).  
MAP IMAGERY ASTGTM v003 - LP DAAC

**ECOSTRESS Land Surface Temperature and Emissivity Daily L2 Global 70m V001**  
227,732 Granules - 2018-07-09 ongoing - The ECOSystem Spaceborne Thermal Radiometer Experiment on Space Station (ECOSTRESS) mission measures the temperature of plants to better understand the carbon cycle.

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

# Earthdata Cloud and Delta-X

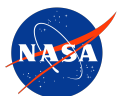
- Earthdata Cloud will enable new science advancement using commercial cloud tools
  - <https://earthdata.nasa.gov/eosdis/cloud-evolution>
- All Delta-X data will be in Earthdata Cloud shortly after finalization at the ORNL DAAC
  - Preprint data is not in Earthdata Cloud
  - Data are available both on-prem (through [daac.ornl.gov](http://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

EARTHDATA Find a DAAC -  
EARTHDATA SEARCH

Delta-X 14 Matching Collections

Showing 14 of 14 matching collections

**Filter Collections**

Categories

Features

- Available from AWS Cloud
- Customizable
- Map Imagery
- Near Real Time

**Pre-Delta-X: L2 A Atchafalaya Basin**  
312 Granules • 2016  
water surface elev. Basin in coastal Louisiana were collected by the National Water Research Institute (NWRI) of the United States Geological Survey (USGS).

**Pre-Delta-X: Water Surface Elevation, Atchafalaya Basin, LA, USA, 2016**  
10 Granules • 2016  
Absolute water level averaged over 1 day.

Search Results (14 Collections)

**Pre-Delta-X: L2 AirSWOT Water Surface Elevations, Atchafalaya Basin, LA, USA, 2016**

Showing 20 of 312 matching granules

PreDeltaX_L2_AirSWOT.utm_m0m_20150511083958.corr.tif	
<b>START</b>	2015
<b>END</b>	2015
<input type="button" value="+"/>	<input type="button" value="Download"/>

- View details
- Filter granule

PreDeltaX_L2_AirSWOT.o5m_20150511083958.ann	
<b>START</b>	2015
<b>END</b>	2015
<input type="button" value="+"/>	<input type="button" value="Download"/>

```
PreDeltaX_L2_AirSWOT.utm_m0m_20150511083958.corr.tif
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  }
]
```





# Spatial Data Access Tool (SDAT)

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

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)

EARTHDATA Other DAACs Feedback

ORNL DAAC

Spatial Data Access Tool (SDAT)  
Geospatial Data Visualization/Download based on OGC Standards

About SDAT Citation Help

Welcome, Yaxing Profile Sign out

Science Disciplines Projects

All (194) (1) Agriculture (7) Atmosphere (45) Biological Classification (1) Biosphere (124) Climate Indicators (4) Cryosphere (5)  
Field Investigation (6) Human Dimensions (27) Land Surface (108) Oceans (5) Spectral/Engineering (5) Terrestrial Hydrosphere (22) Other (0)

NEW

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

First 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 Last

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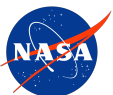
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# Pre-Delta-X data in SDAT

[https://webmap.ornl.gov/ogc/dataset.jsp?ds\\_id=1818](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.



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