



# Delta-X Applications Workshop

May 4-5, 2022

## DATA MANAGEMENT PLAN AND DATA ACCESS

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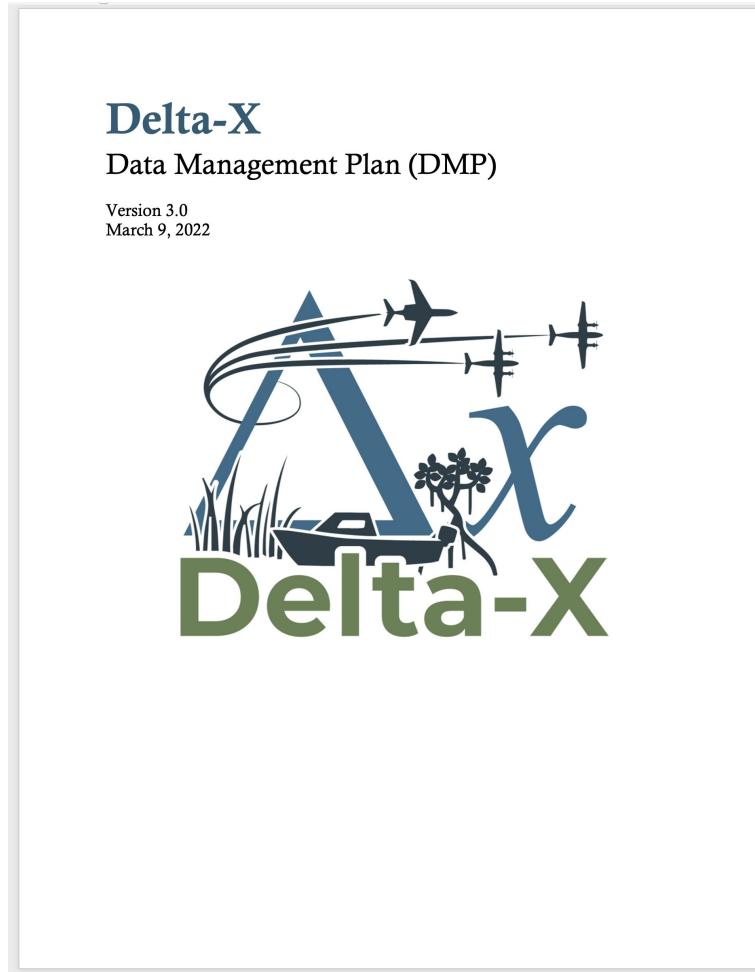
Jet Propulsion Laboratory  
California Institute of Technology

# NASA Data Open Access Requirements

(1)

All NASA Earth Venture-Suborbital Missions must have a Data Management Plan (DMP)

- Living document that describes all the data acquired for the mission and provides details about how/where the data were acquired, how it is processed, the product format, and quality & assurance processes. All models used or developed are also described in the document.



Delta-X Data Management Plan

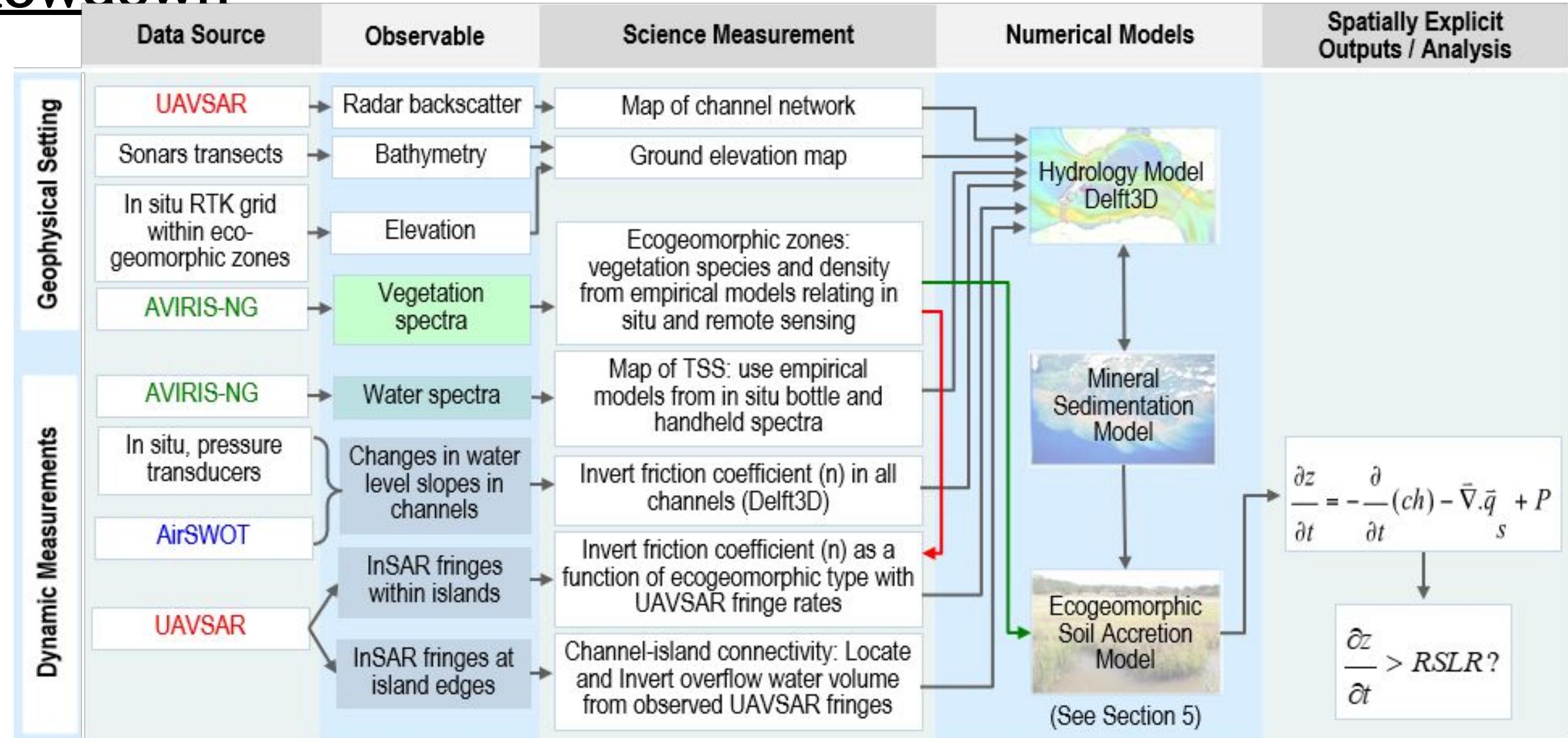
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Delta-X Data Management Plan

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# Delta-X: Measurements-to-Models

## Flowdown



# Delta-X NASA Airborne Instrument Collections

Instrument	Spring 2021	Fall 2021
UAVSAR	Collected (3 tidal stages)	Collected (2 tidal stages)
AVIRIS-NG	Collected	Collected
AirSWOT <i>Spring campaign ended April 24, 2021. Fall campaign ended Sept. 25, 2021.</i>	Collected (3 tidal stages)	Collected (3 tidal stages)

Extensive field data were acquired during each campaign.



# Spring and Fall 2021 Field / In Situ Data Collections

(1)

Field Measurements	Spring 2021	Fall 2021
Water level gauges	Collected	Collected
GPS	<i>Not collected</i>	Collected
Sonar	<i>Not collected</i>	Collected
ADCP (water velocity)	Collected	Collected
Total suspended sediments (TSS) concentration from discrete water samples	Collected	Collected
Particulate organic carbon (POC) concentrations	Collected	Collected
Water quality indicators	Collected	Collected
In situ remote-sensing reflectance $Rrs(l)$ of water from field spectrometer	Collected	Collected
In situ beam attenuation and particle size distribution from LISST sensor	Collected	Collected
Vegetation structure	Collected	Collected
Sediment core	Collected	Collected
Soil accretion (feldspar plots)	Collected	Collected



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Water quality indicators	Collected	Collected
In situ remote-sensing reflectance $Rrs(l)$ of water from field spectrometer	Collected	Collected
In situ beam attenuation and particle size distribution from LISST sensor	Collected	Collected
Vegetation structure method	Collected	Collected
Sediment core	Collected	Collected
Soil accretion (feldspar plots)	Collected	Collected



# Spring and Fall 2021 Field / In Situ Data Collections

## (2)

Field Measurements	Spring 2021	Fall 2021
Anemometers	<i>Not collected</i>	Collected
Turbidity sensor (within islands)	Collected	Collected
Suspended and bed-sediment samples for concentration and grain size (transects)	Collected	Collected
Fallout radionuclide ( $^{210}\text{Pb}$ , $^{137}\text{Cs}$ )	<i>Not collected</i>	Collected



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- All NASA Earth Venture-Suborbital Missions data and models are archived in a NASA Distributed Data Archive Center (DAAC)
  - Delta-X archive is at the Oak Ridge National Lab (ORNL) DAAC
  - This repository archives all final processed datasets and models
  - All the information from the DMP is included in a Product Description for each dataset


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## Delta-X

### 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.

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.

### Related Links

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

[Delta-X Project Site](#)

### Delta-X Datasets List

[Sign in](#) to download Delta-X datasets.

21 Delta-X datasets

Show All  entries

Filter:

<input checked="" type="checkbox"/>	Delta-X dataset	Updated	Published	User Guide	Download	Size	SDAT
*	<a href="#">Delta-X: Aboveground Biomass and Necromass across Wetlands in the MRD, LA, USA, 2021</a> <small>NEW</small>	2022-04-25	2022-04-25				
*	<a href="#">Delta-X: Belowground Biomass and Necromass across Wetlands in the MRD, LA, USA, 2021</a> <small>NEW</small>	2022-04-25	2022-04-25				
*	<a href="#">Delta-X: AVIRIS-NG L1B Spectral Radiance Products, Mississippi River Delta, USA, 2021</a> <small>NEW</small>	2022-04-21	2022-04-21				
*	<a href="#">Delta-X: UAVSAR Interferometric L1B Products, Atchafalaya and Terrebonne Basins, 2021</a> <small>NEW</small>	2022-04-21	2022-04-21				
*	<a href="#">Delta-X: UAVSAR Single Look Complex (SLC) Stack L1 Products, Louisiana, USA, 2021</a> <small>NEW</small>	2022-04-21	2022-04-21				
*	<a href="#">Delta-X: Acoustic Doppler Current Profiler Channel Surveys, Coastal Louisiana, 2021</a>	2021-10-29	2021-10-29			3.5MB	

[https://daac.ornl.gov/cgi-bin/dataset\\_lister.pl?p=41](https://daac.ornl.gov/cgi-bin/dataset_lister.pl?p=41)

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DELTA-X DAAC

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[https://daac.ornl.gov](#) > [cgi-bin](#) > [dataset\\_lister](#) :

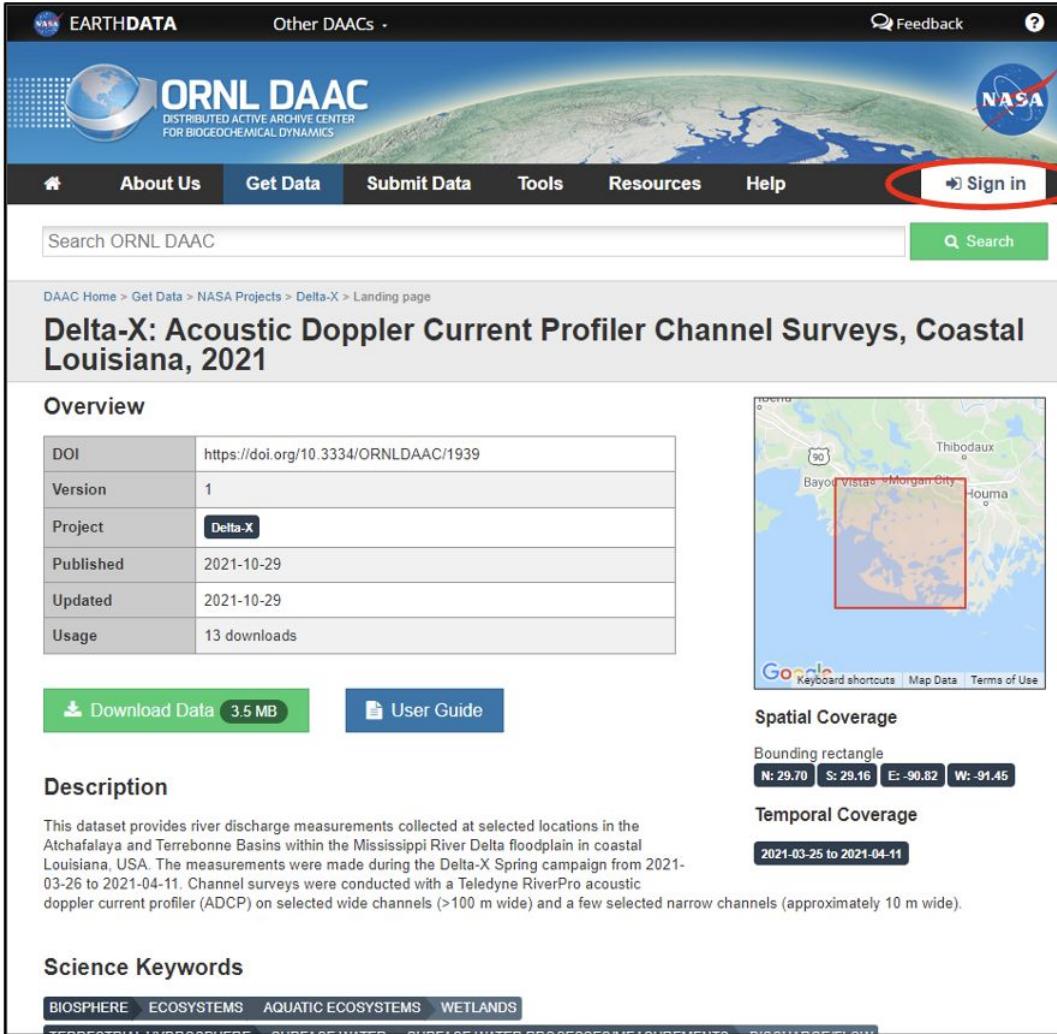
### Delta-X - ORNL DAAC

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 ...

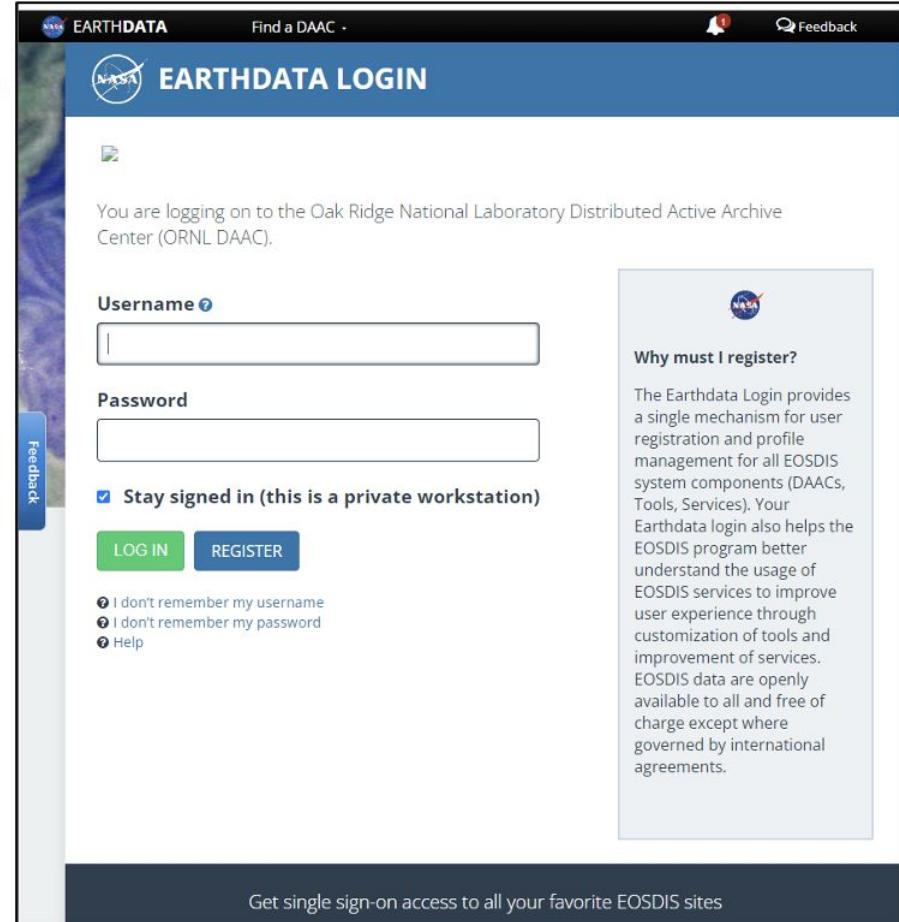
In addition to the published datasets, the ORNL DAAC hosts preprints of the data that are not in the list but can be accessed if you have a link. These are final or near-final datasets still under review.

# Accessing Datasets Via ORNL DAAC Site

Sign in using an Earthdata Login:



The screenshot shows the ORNL DAAC website homepage. At the top right, there is a 'Sign in' button with a red circle around it. A red arrow points from this button to the 'Sign in' button on the Earthdata Login page shown in the adjacent screenshot. The main content area displays information about a dataset titled 'Delta-X: Acoustic Doppler Current Profiler Channel Surveys, Coastal Louisiana, 2021'. It includes sections for 'Overview', 'Spatial Coverage' (with a map of the study area), 'Temporal Coverage' (from 2021-03-25 to 2021-04-11), and 'Science Keywords' (BIOSPHERE, ECOSYSTEMS, AQUATIC ECOSYSTEMS, WETLANDS). There are also 'Download Data' and 'User Guide' buttons.



The screenshot shows the Earthdata Login page. It features a login form with fields for 'Username' and 'Password', and a checked checkbox for 'Stay signed in (this is a private workstation)'. Below the form are links for forgotten credentials and help. To the right, there is a sidebar with a 'Why must I register?' section explaining the purpose of the login. At the bottom, a call-to-action button says 'Get single sign-on access to all your favorite EOSDIS sites'.

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

The screenshot shows the Earthdata Search interface. A red circle highlights the search bar at the top left. The main area displays a list of 8,439 matching collections, with 20 shown per page. The first few items listed are:

- 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.

A map of Europe and Africa is visible on the right side of the interface.



# NASA Data Open Access Requirements

(3)

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  - Delta-X archive is at the Oak Ridge National Lab (ORNL) DAAC
  - This archives all final processed datasets
  - All the information from the DMP is included in a Product Description for each dataset
- The Delta-X project also maintains a searchable database for both preliminary and final products.



## Data Download

### Final datasets

Final Delta-X (and Pre-Delta-X) products are made available to download at the **Oak Ridge National Laboratory Distributed Active Archive Center (ORNL DAAC)**.

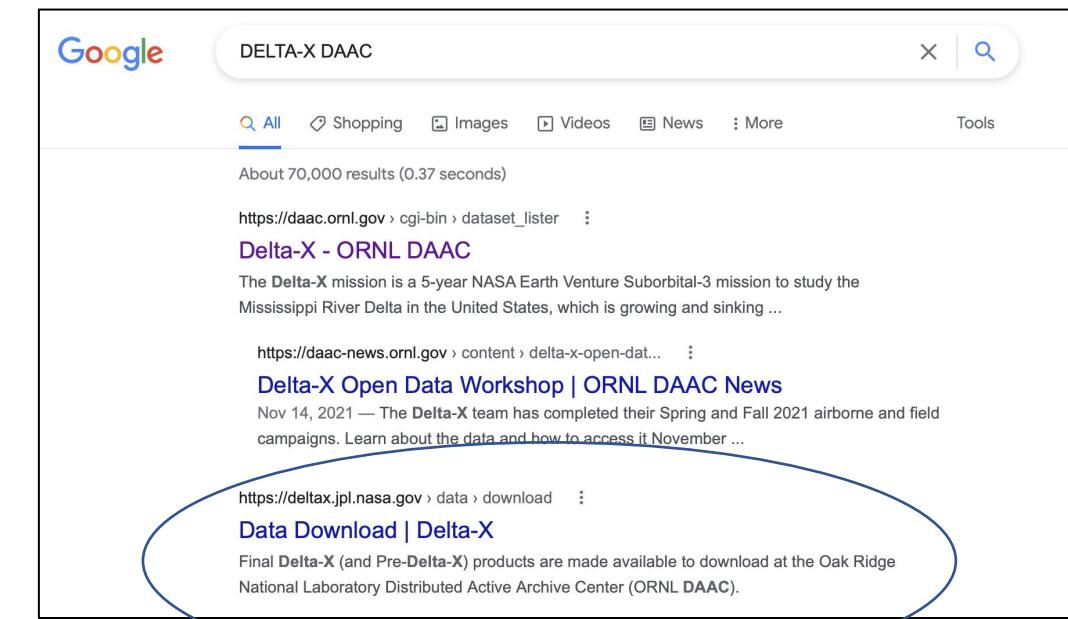
[View datasets at the ORNL DAAC](#)

### Level 1 (raw remote sensing data)

UAVSAR L1 SLC quad-pol stack data is available on the project website.  
NOTE: **UAVSAR login required**.

- [atchaf\\_06309\\_02](#) (Mar 27–Apr 2, 2021), Atchafalaya River Delta, LA
  - [atchaf\\_19809\\_02](#) (Mar 27–Apr 2, 2021), Atchafalaya River Delta, LA
  - [wterre\\_16300\\_02](#) (Apr 5–7, 2021), West Terrebonne Basin, LA
  - [wterre\\_34202\\_02](#) (Apr 5–7, 2021), West Terrebonne Basin, LA
  - [eterre\\_08705\\_02](#) (Apr 12–18, 2021), East Terrebonne Basin, LA
  - [eterre\\_27309\\_01](#) (Apr 12–18, 2021), East Terrebonne Basin, LA
- 
- [atchaf\\_06309\\_03](#) (Sep 5–13, 2021), Atchafalaya River Delta, LA

<https://deltax.jpl.nasa.gov/data/download/>



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**Delta-X - ORNL DAAC**  
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 ...

<https://daac-news.ornl.gov/content/delta-x-open-dat...> ::  
**Delta-X Open Data Workshop | ORNL DAAC News**  
Nov 14, 2021 — 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 ...

<https://deltax.jpl.nasa.gov/data/download> ::  
**Data Download | Delta-X**  
Final Delta-X (and Pre-Delta-X) products are made available to download at the Oak Ridge National Laboratory Distributed Active Archive Center (ORNL DAAC).



Jet Propulsion Laboratory  
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# Delta-X

Home About Science ▾

Data ▾

Products

Download

Search



River deltas and their wetlands are drowning as a result of sea level rise



# Data Search

## Filters

### Campaign

Pre-Delta-X (2015 & 2016)

### Field Data i

[select all](#) [unselect all](#)

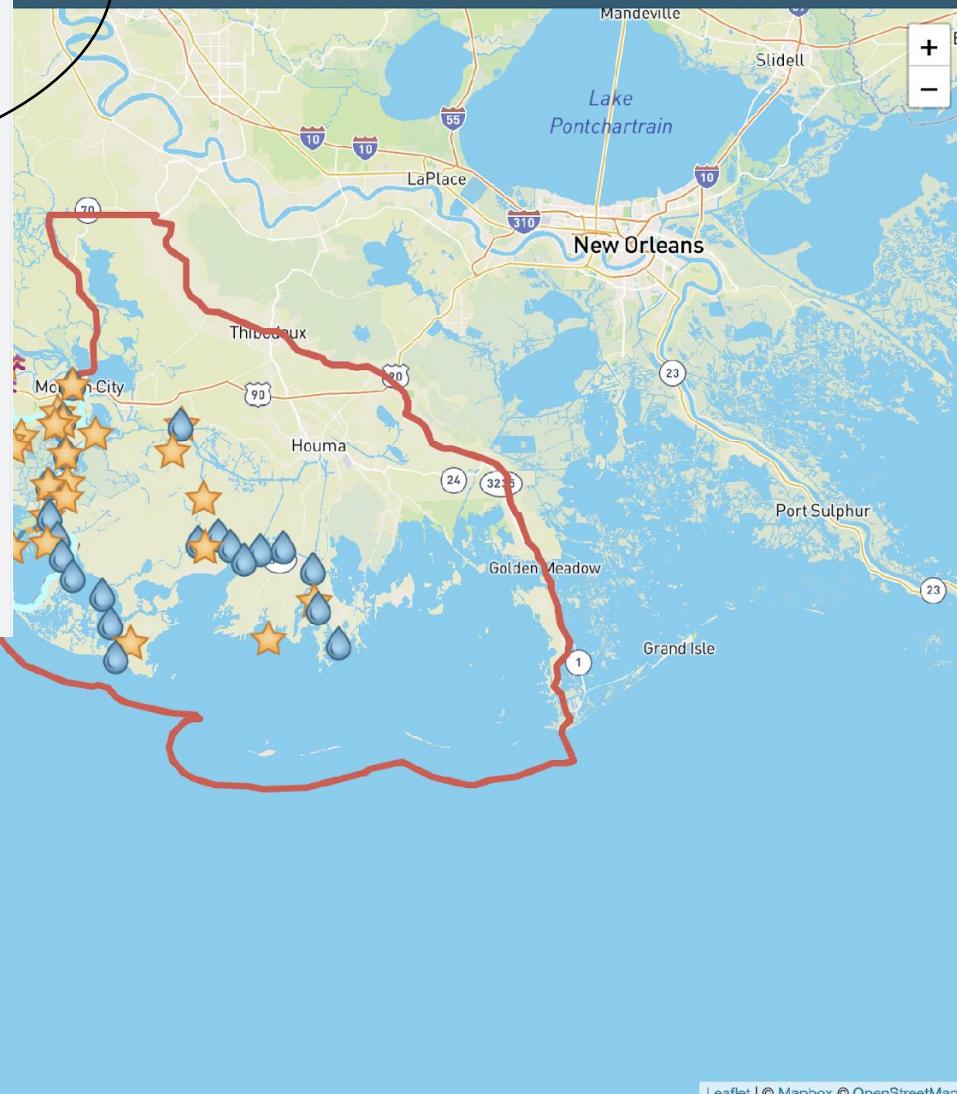
- Bathymetry
- Biomass & species
- Water discharge
- Water level

### Water quality

- Spectral reflectance
- Total suspended solids (TSS)

**Search**

[Home](#) [About](#) [Science ▾](#) [Data ▾](#)



## Legend

- Bathymetry
- Biomass
- ★ Intensive site
- Water discharge
- ~~~ Water level
- Water quality

Leaflet | © Mapbox © OpenStreetMap

# Data Search

## Filters

## Search Results

Downloads include data from all selected campaigns & documentation.

- Atchafalaya Basin [download KML](#)
- Terrebonne Basin [download KML](#)

### Field Data i

[select all](#) [unselect all](#)

- Bathymetry [download](#)
- Biomass & species [download](#)
- Water discharge [download](#)
- Water level [download](#)

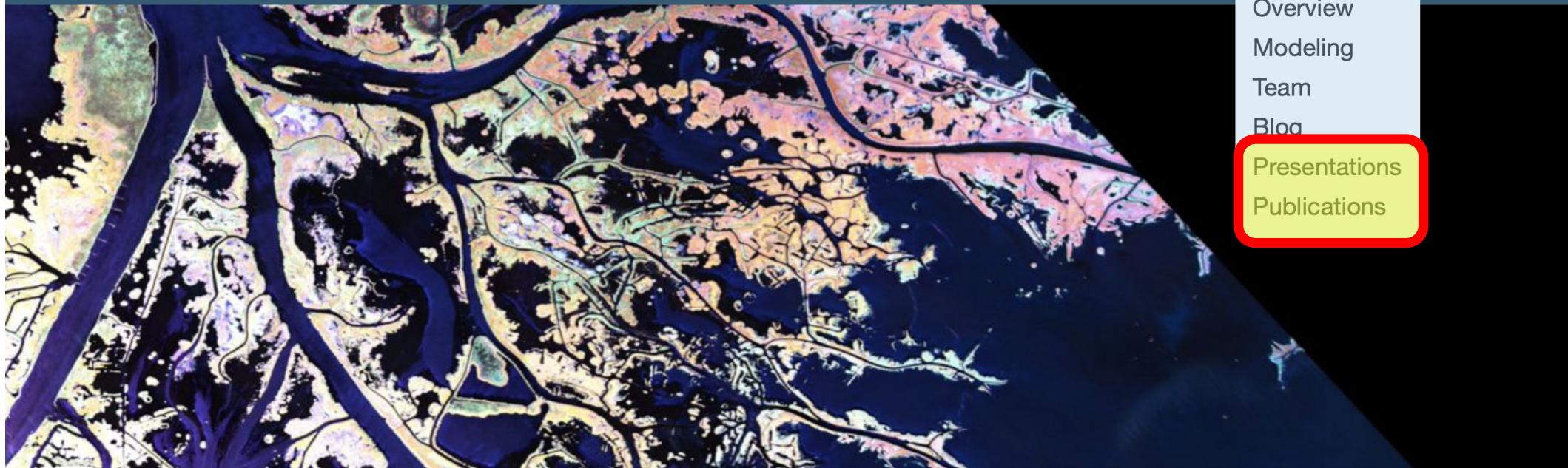
### Water quality

- Spectral reflectance [download](#)
- Total suspended solids (TSS) [download](#)

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    - Delta-X archive is at the Oak Ridge National Lab (ORNL) DAAC
    - This archives all final processed datasets
    - All the information from the DMP is included in a Product Description for each dataset
  - The Delta-X project also maintains a map-searchable database for both preliminary and final products
  - Any public presentation or publication from the Delta-X project must make available all Delta-X campaign data used in the work at the time of presentation.
    - If final Delta-X products are used, provide link to the archive in the talk
    - Preliminary data are linked on the Delta-X website
    - This does not apply to pre-Delta-X campaign data, but in some cases the data/models are linked.

[Overview](#)[Modeling](#)[Team](#)[Blog](#)[Presentations](#)[Publications](#)

## Publications

Nordio, G. and Fagherazzi, S., Storm surge and tidal dissipation in deltaic wetlands bordering a main channel. *Journal of Geophysical Research: Oceans*, p.e2021JC017655.

DOI: [10.1029/2021JC017655](https://doi.org/10.1029/2021JC017655)

Greenberg, E., Thompson, D.R., Jensen, D.J., Townsend, P.A., Queally, N., Chlus, A., Fichot, C.G., Harringmeyer, J. and Simard, M., 2022. An improved scheme for correcting remote spectral surface reflectance simultaneously for terrestrial BRDF and water-surface sunglint in coastal

## Publications

Nordio, G. and Fagherazzi, S., Storm surge and tidal dissipation in deltaic wetlands bordering a main channel. *Journal of Geophysical Research: Oceans*, p.e2021JC017655.  
DOI: [10.1029/2021JC017655](https://doi.org/10.1029/2021JC017655)

Greenberg, E., Thompson, D.R., Jensen, D.J., Townsend, P.A., Qually, N., Chlus, A., Fichot, C.G., Harringmeyer, J. and Simard, M., 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*, p.e2021JG006712.  
DOI: [10.1029/2021JG006712](https://doi.org/10.1029/2021JG006712)

Zhang, X., Wright, K., Passalacqua, P., Simard, M., & Fagherazzi, S., 2022. Improving channel hydrological connectivity in coastal hydrodynamic models with remotely-sensed channel networks. *Journal of Geophysical Research: Earth Surface*, 127.

[View data & model](#) | DOI: [10.1029/2021JF006294](https://doi.org/10.1029/2021JF006294)

Cortese, L. and Fagherazzi, S., 2021. Fetch and distance from the bay control accretion and erosion patterns in Terrebonne marshes (Louisiana, USA). *Earth Surface Processes and Landforms*.  
DOI: [10.1002/esp.5327](https://doi.org/10.1002/esp.5327)

Zhang, X., Jones, C.E., Oliver-Cabrera, T., Simard, M. and Fagherazzi, S., 2022. Using rapid repeat SAR interferometry to improve hydrodynamic models of flood propagation in coastal wetlands. *Advances in Water Resources*, 159, p.104088.

[View data](#) | DOI: [10.1016/j.advwatres.2021.104088](https://doi.org/10.1016/j.advwatres.2021.104088)

Oliver-Cabrera, T., Jones, C.E., Yunjun, Z. and Simard, M., 2021. InSAR Phase Unwrapping Error Correction for Rapid Repeat Measurements of Water Level Change in Wetlands. *IEEE Transactions on Geoscience and Remote Sensing*.  
[View data](#) | DOI: [10.1109/TGRS.2021.3108751](https://doi.org/10.1109/TGRS.2021.3108751)

Hariharan, J., Wright, K. and Passalacqua, P., 2020. dorado: A Python package for simulating passive particle transport in shallow-water flows. *Journal of Open Source Software*, 5(54), p.2585.  
[Paper \(PDF\)](#) | DOI: [10.21105/joss.02585](https://doi.org/10.21105/joss.02585)

Denbina, M., Simard, M., Rodriguez, E., Wu, X., Chen, A. and Pavelsky, T., 2019. Mapping water surface elevation and slope in the mississippi river delta

## Presentations

- [2021 AGU Fall Meeting](#)
- [2021 Open Data Workshop](#)

### 2021 AGU Fall Meeting

December 13–17 | New Orleans, Louisiana

#### ORAL PRESENTATIONS

EP31B-06: Seasonality and Asynchrony of Bank Vegetation and Riverine Suspended Sediment Concentrations in Global Deltas  
[Abstract](#)

John M. Mallard, Tamlin Pavelsky, Evan B Goldstein, Simon Topp, and Matthew Ross

EP31B-07: Assessing global changes in extents and trends in river deltas with the Landsat catalog  
[Abstract](#)

Daniel Jensen, Marc Simard, Alexandra Christensen, and Charles Marshak

EP34C-01. Vegetation promotes water retention in deltaic wetlands [Abstract](#)  
Sergio Fagherazzi, Xiaohu Zhang, Paola Passalacqua, Cathleen Jones, and Marc Simard

EP34C-04. Improving channel hydrological connectivity in coastal hydrodynamic models with remote-sensed channel networks  
[Abstract](#)

Xiaohu Zhang, Kyle A Wright, Paola Passalacqua, Marc Simard, and Sergio Fagherazzi

EP34C-05. (Model) Form Follows Function: Connectivity-Preserving Mesh Construction using Multi-Source Remote Sensing and Image Processing  
[View data & model](#) | [Abstract](#)  
Kyle A Wright and Paola Passalacqua

EP34C-06. Mapping Suspended Sediment Properties in the Louisiana Delta Using Airborne Imaging Spectroscopy for Modeling of Sediment Dynamics  
[Abstract](#)

Joshua P Harringmeyer, Nilopthal Ghosh, Matthew W. Weiser, David R Thompson, Xiaohui Zhu, and Cedric G Fichot

EP34C-07: Recent decline in wind-driven wave energy decreases nearshore sediment availability to Louisiana salt marshes  
[Abstract](#)  
Cedric G Fichot, Song Jin, Sergio Fagherazzi, Steven E Lohrenz, Yongxue Liu

EP52A-01. Washload or bed sediment entrainment? Predicting mud concentrations in Wax Lake Delta, Louisiana.  
[View data & model](#) | [Abstract](#)

Gerard Salter, Kyle A Wright, Justin Anh-Khoa Nghiem, Gen Li, Kenny Thai, Paola Passalacqua, Daniel Jensen, Marc Simard and Michael P. Lamb

# Summary

- At this workshop, you will be shown the scope of the data available from the Delta-X mission, where to obtain it, and provided information about what it shows and how to use it.
- ORNL: [https://daac.ornl.gov/cgi-bin/dataset\\_lister.pl?p=41](https://daac.ornl.gov/cgi-bin/dataset_lister.pl?p=41)
  - THE ORNL DAAC ARCHIVES THE FINAL VERSIONS OF ALL DATASETS AND MODELS.
- DELTA-X SITE: <https://deltax.jpl.nasa.gov>, <https://deltax.jpl.nasa.gov/data/download/>

# EOSDIS Distributed Active Archive Centers

