2021 Delta-X Open Data Workshop

November 17, 2021

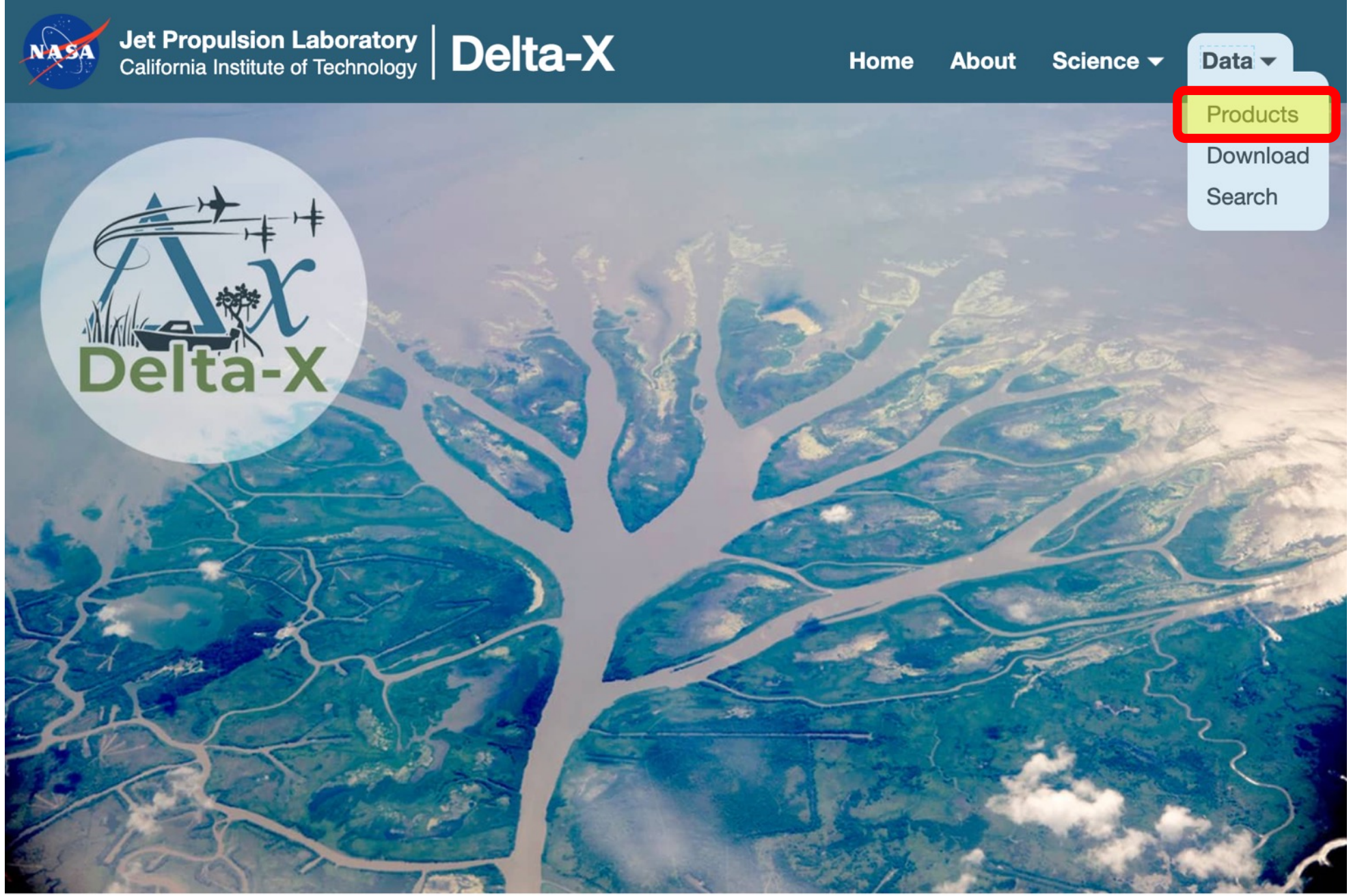
Delta-X Website

Summary

River deltas and their wetlands are drowning as a result of sea level rise and reduced sediment inputs. The Delta-X mission (NASA EVS-3) will determine which parts will survive and continue to grow, and which parts will be lost. The Delta-X team has completed their Spring and Fall 2021 airborne and field campaigns. Learn about the data and how to access it.

Agenda

2:00 PM Introduction to Delta-X
2:20 PM Datasets
2:50 PM Data Location & Access
3:40 PM Discussion & Questions
4:00 PM End of workshop



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

Products

Data Products

Data Collected

Here are the **field data** that were collected during the Spring and Fall 2021 campaigns:

Instrument	Spring 2021	Fall 2021
Acoustical Doppler Current Profiler (ADCP)	Collected	Collected
Anemometers	*Not collected*	Collected
Fallout radionuclide	*Not collected*	Collected
Feldspar plots (soil accretion)	Collected	Collected
GPS	*Not collected*	Collected
Laser In-situ Scattering & Transmissometry (LISST)	Collected	Collected
Particular Organic Carbon (POC) concentrations	Collected	Collected
Sediment concentration & grain size	Collected	Collected
Sediment core	Collected	Collected
Sonar	*Not collected*	Collected
Total Suspended Solids (TSS)	Collected	Collected
Turbidity within islands	Collected	Collected
Vegetation structure	Collected	Collected
Water level gauges	Collected	Collected
Water quality indicators	Collected	Collected
Water reflectance	Collected	Collected

Here are the **airborne data** that were collected during the Spring and Fall 2021 campaigns:

Instrument	Spring 2021	Fall 2021
UAVSAR	Collected (high, low, rising tides)	Collected (high, rising tides)
AVIRIS	Collected	Collected
AirSWOT	Collected (high, low, rising tides)	Collected (high, low, rising tides)

Products

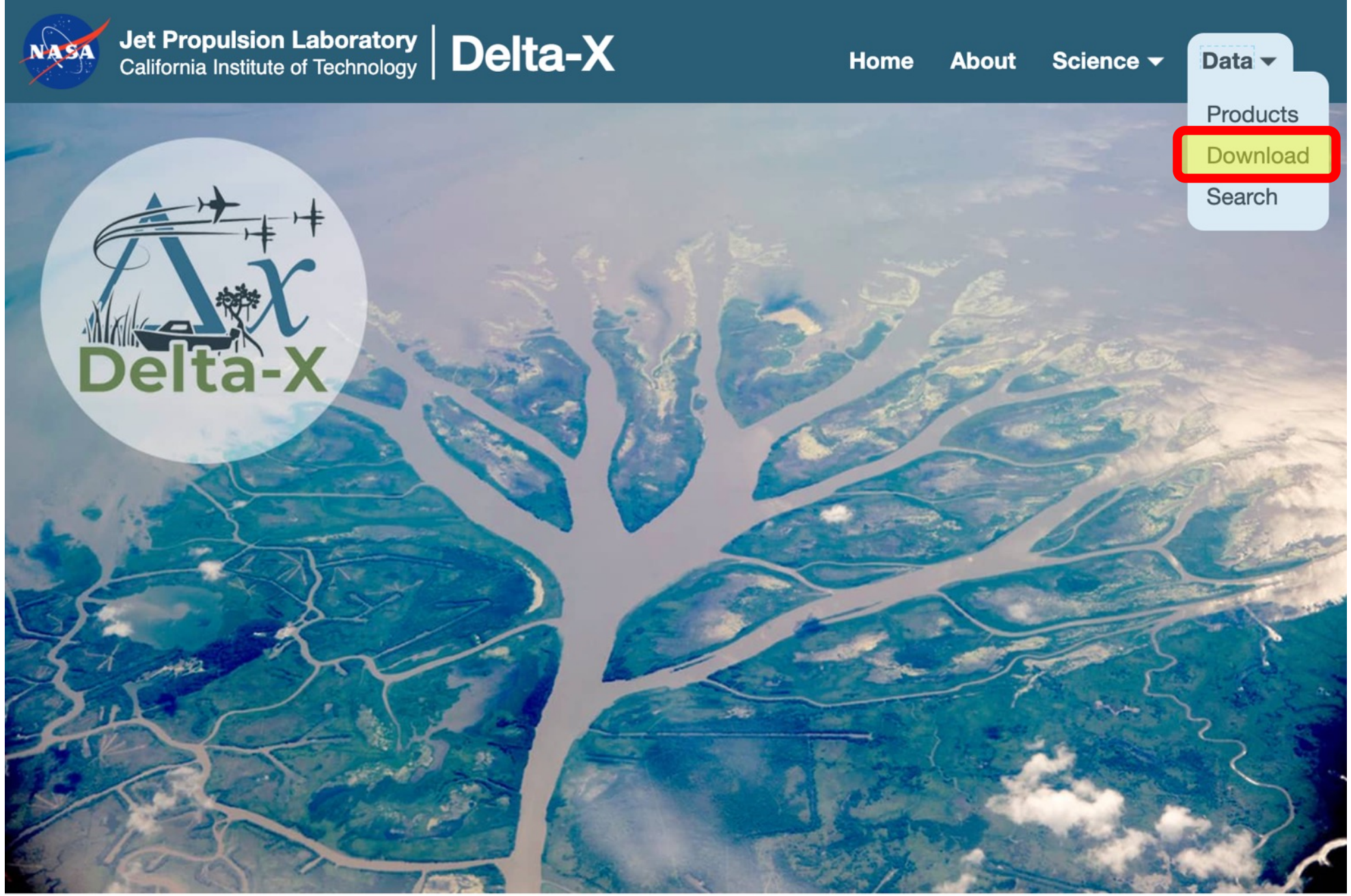
Delta-X delivers **L0-L4 data products** progressively by level.

Level	Description
L0	Field data (in situ)
L1	Raw remote sensing data
L2	Georeferenced remote sensing data
L3	Remote sensing measurements
L4	Science products

Delta-X begins with airborne and field 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**.

Here is the list of products that will be delivered:

Level	Deliverable Products
0	In situ only: vegetation structure, RTK, GPS, ADCP, sonar, accretion, water level, TSS
1	UAVSAR single-look complex (SLC) images, quad-polarized
1	AVIRIS-NG hyperspectral
1b	UAVSAR interferometric products
1b	AirSWOT interferogram
2	UAVSAR georeferenced interferometric products
2	AirSWOT georeferenced interferogram
2	AVIRIS-NG reflectance
2b	AVIRIS-NG bidirectional reflectance distribution function
3	UAVSAR area maps of water level vs. time (georeferenced) UAVSAR channels > 10 m wide AirSWOT water-surface elevation vs. time AVIRIS-NG hydrogeomorphic zones AVIRIS-NG aboveground biomass AVIRIS-NG water quality (sediment concentration)
4	Map of bathymetry/elevation Map of friction coefficient in channels Map of friction coefficient in wetlands Relationship of friction coefficient with vegetation structure Calibrated hydrodynamic model for Mississippi River Delta (MRD) Discharge in channels from model Flow of water from model Mineral sediment deposition across landscape from model Map of vegetation belowground biomass Calibrated NUMAN/MEM for MRD Ecosystem biomass from model Map of soil accretion at annual time steps to year 2100 Validated soil accretion at annual time steps to year 2024



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

Download

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)

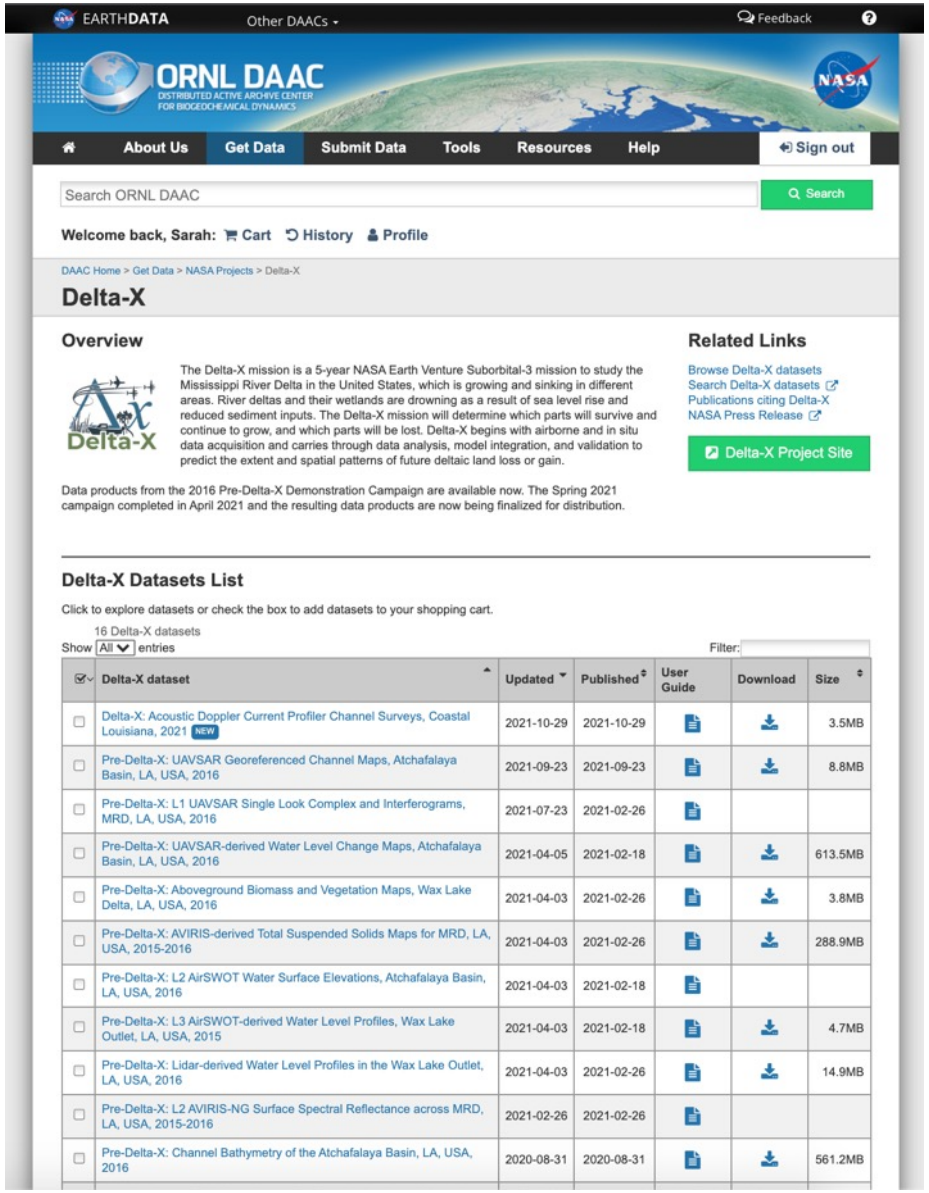
UAVSAR L1 SLC quad-pol stack data is available on the project website.
NOTE: **UAVSAR login required**.

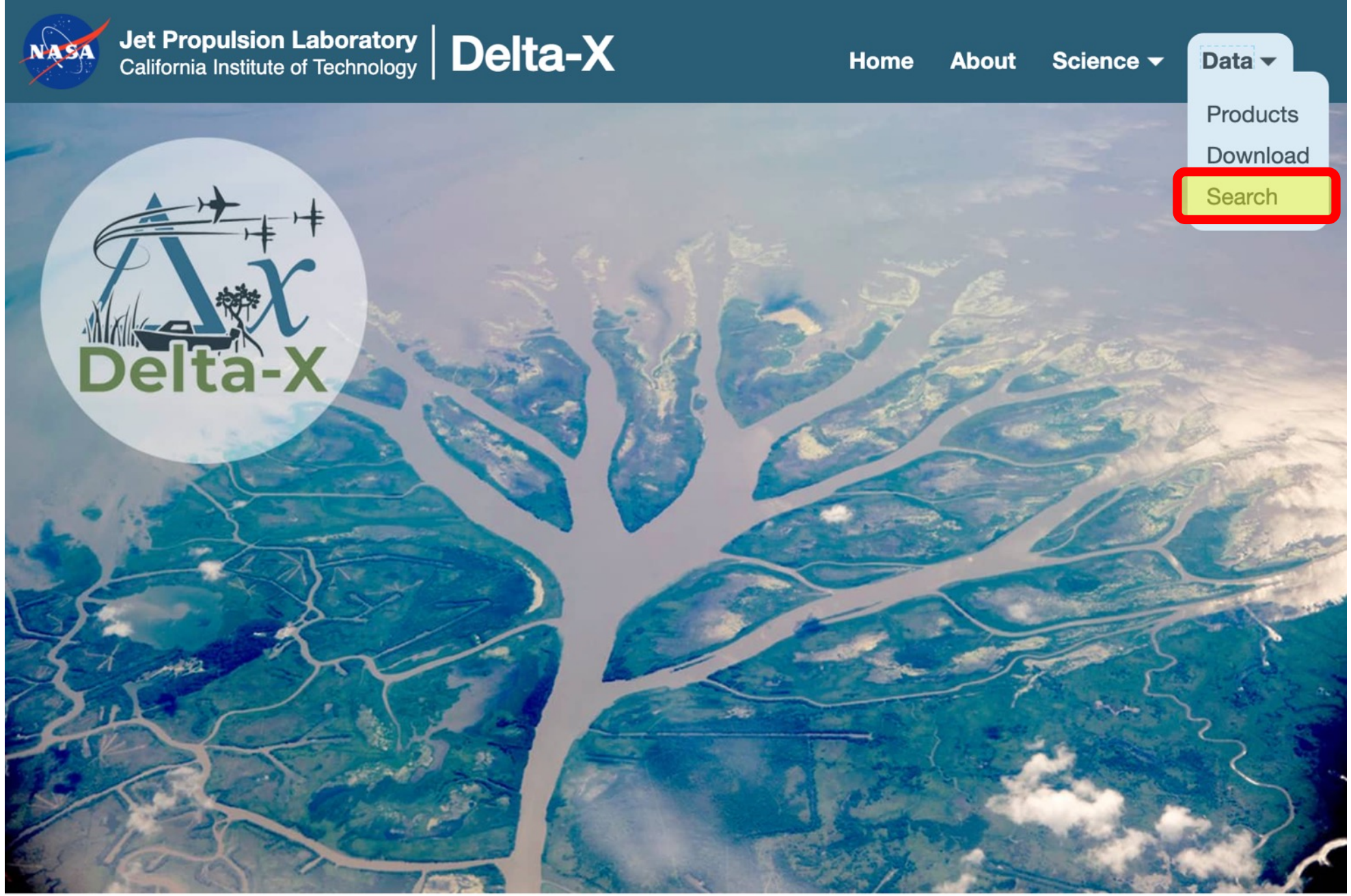
- atchaf_06309_02 (Mar 27–Apr 2, 2021), Atchafalaya River Delta, LA
- atchaf_19809_02 (Mar 27–Apr 2, 2021), Atchafalaya River Delta, LA
- wterre_16300_02 (Apr 5–7, 2021), West Terrebonne Basin, LA
- wterre_34202_02 (Apr 5–7, 2021), West Terrebonne Basin, LA
- eterre_08705_02 (Apr 12–18, 2021), East Terrebonne Basin, LA
- eterre_27309_01 (Apr 12–18, 2021), East Terrebonne Basin, LA

UAVSAR flight lines

Preliminary data

*No **preliminary** data products available yet.*



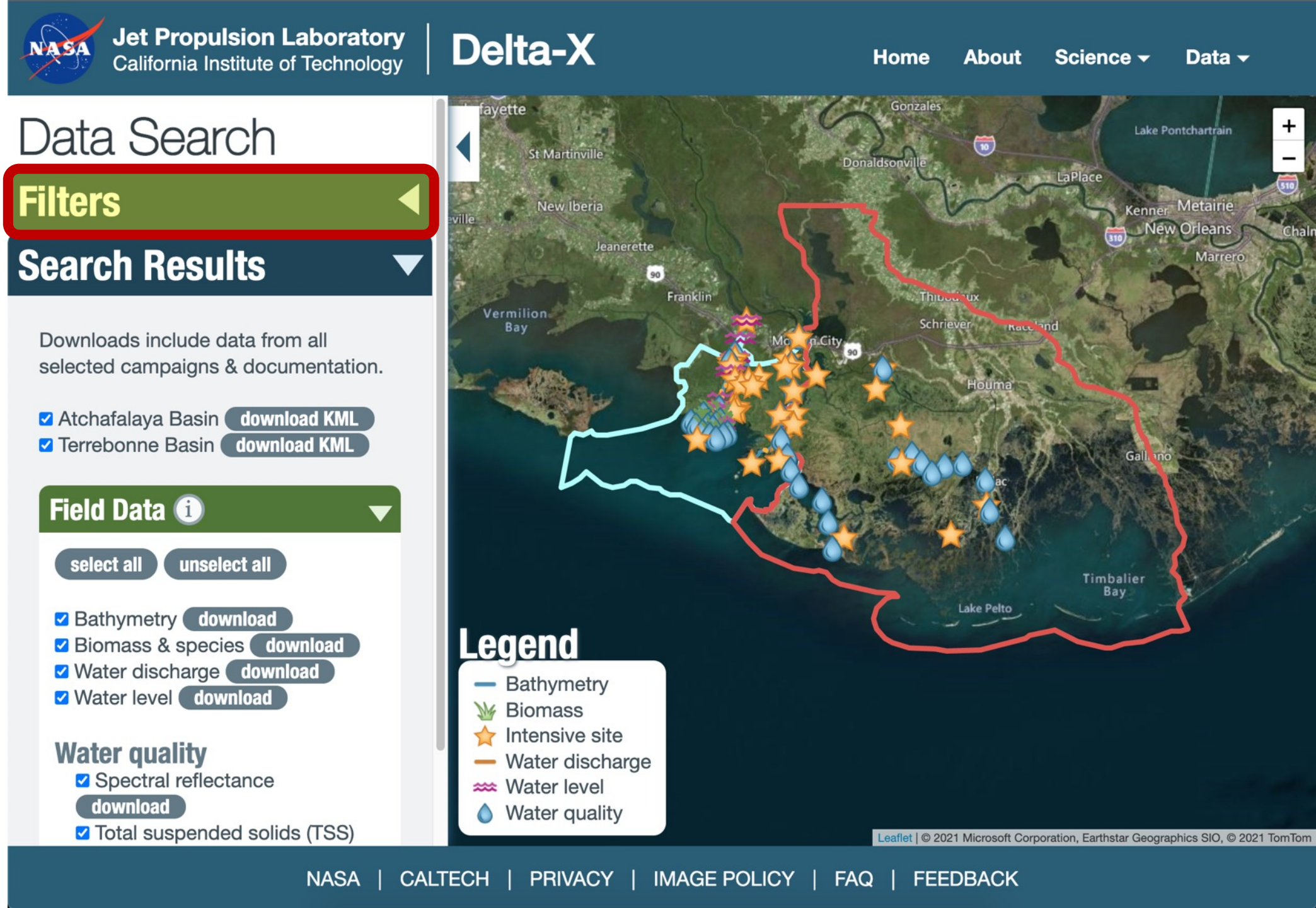


River deltas and their wetlands are drowning as a result of sea level rise

Search

Explore the data in a map interface

Currently only includes Pre-Delta-X field data

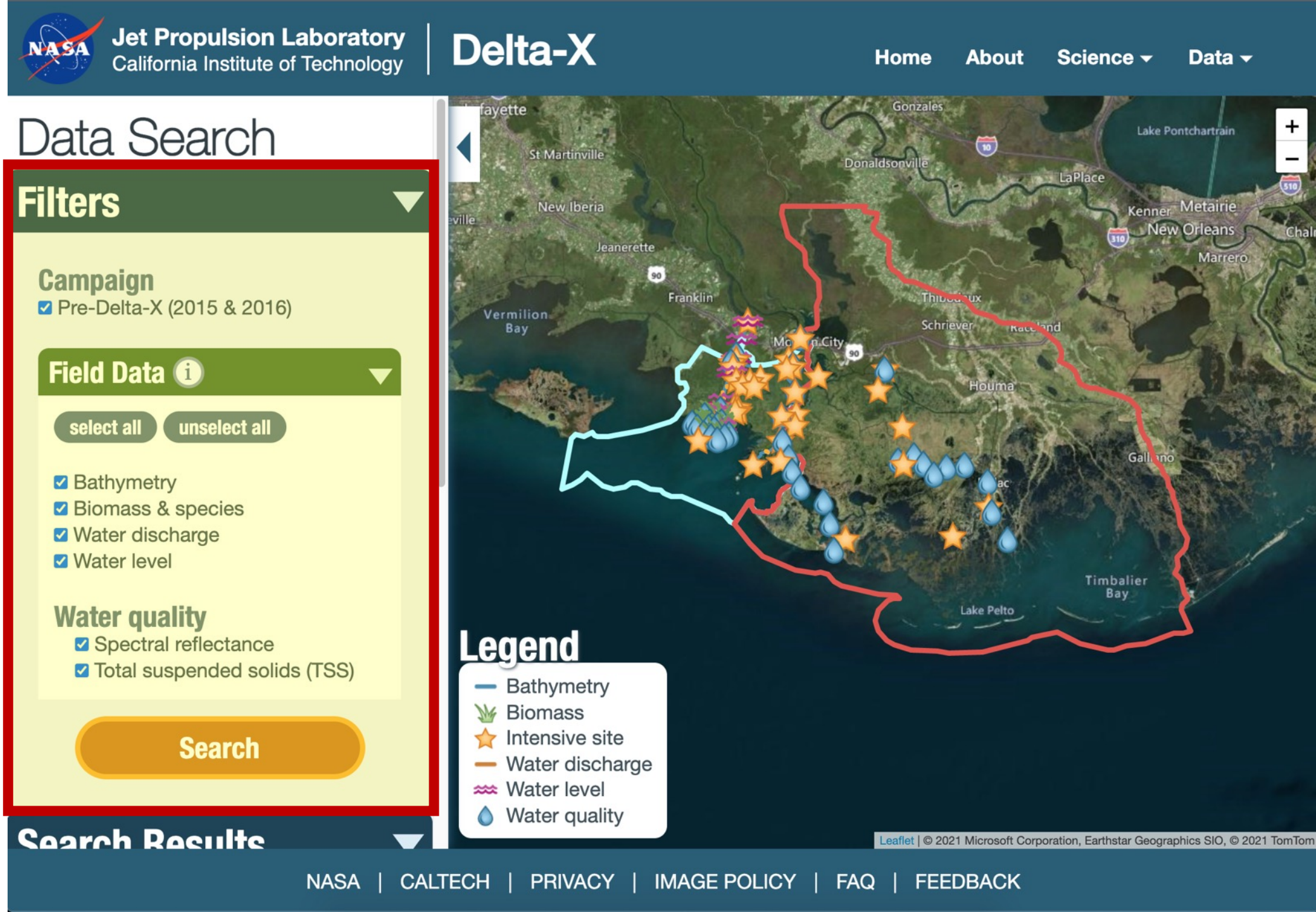


Search

Filters (search criteria)

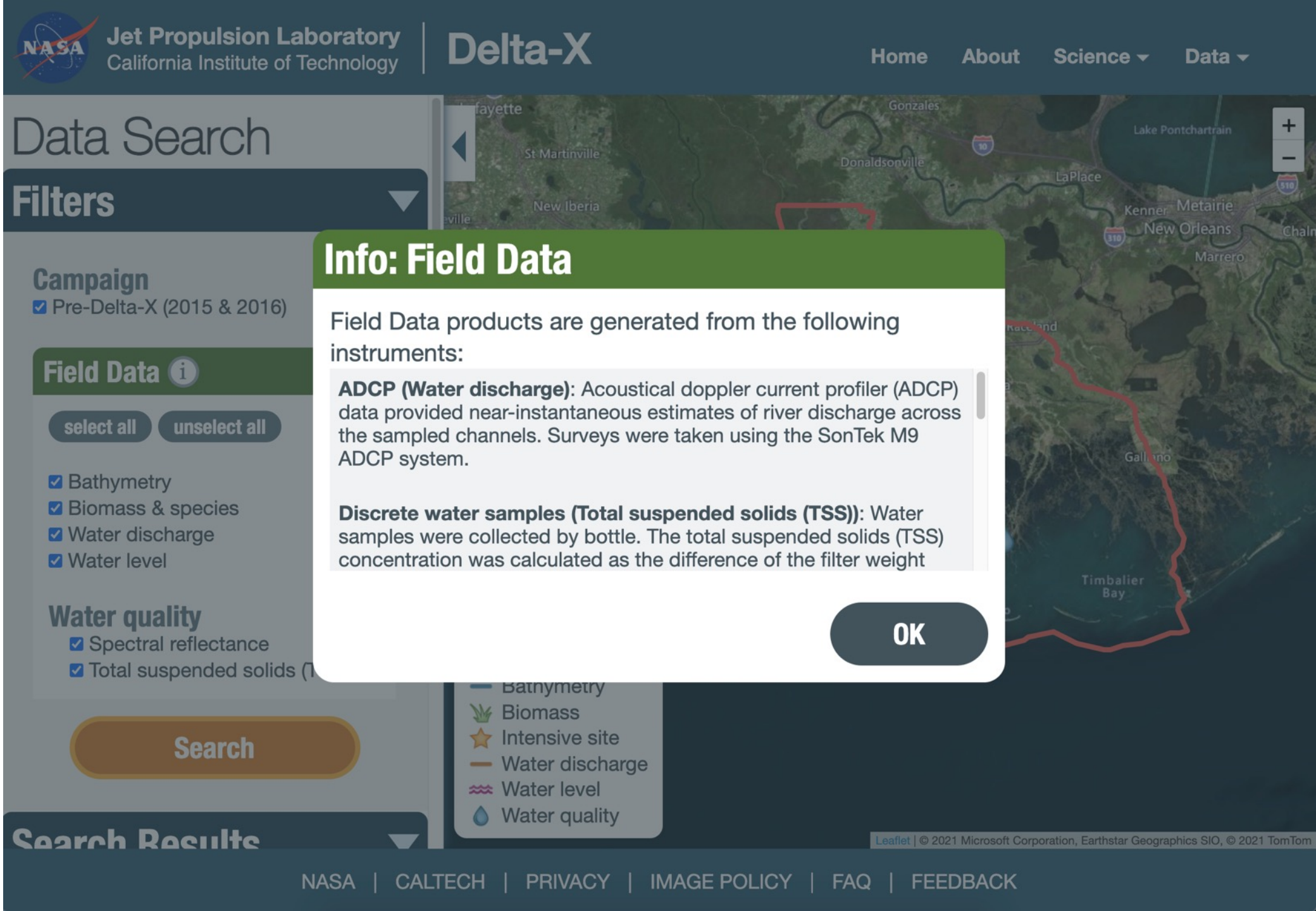
- campaigns
- datasets

Information button (i)



Search

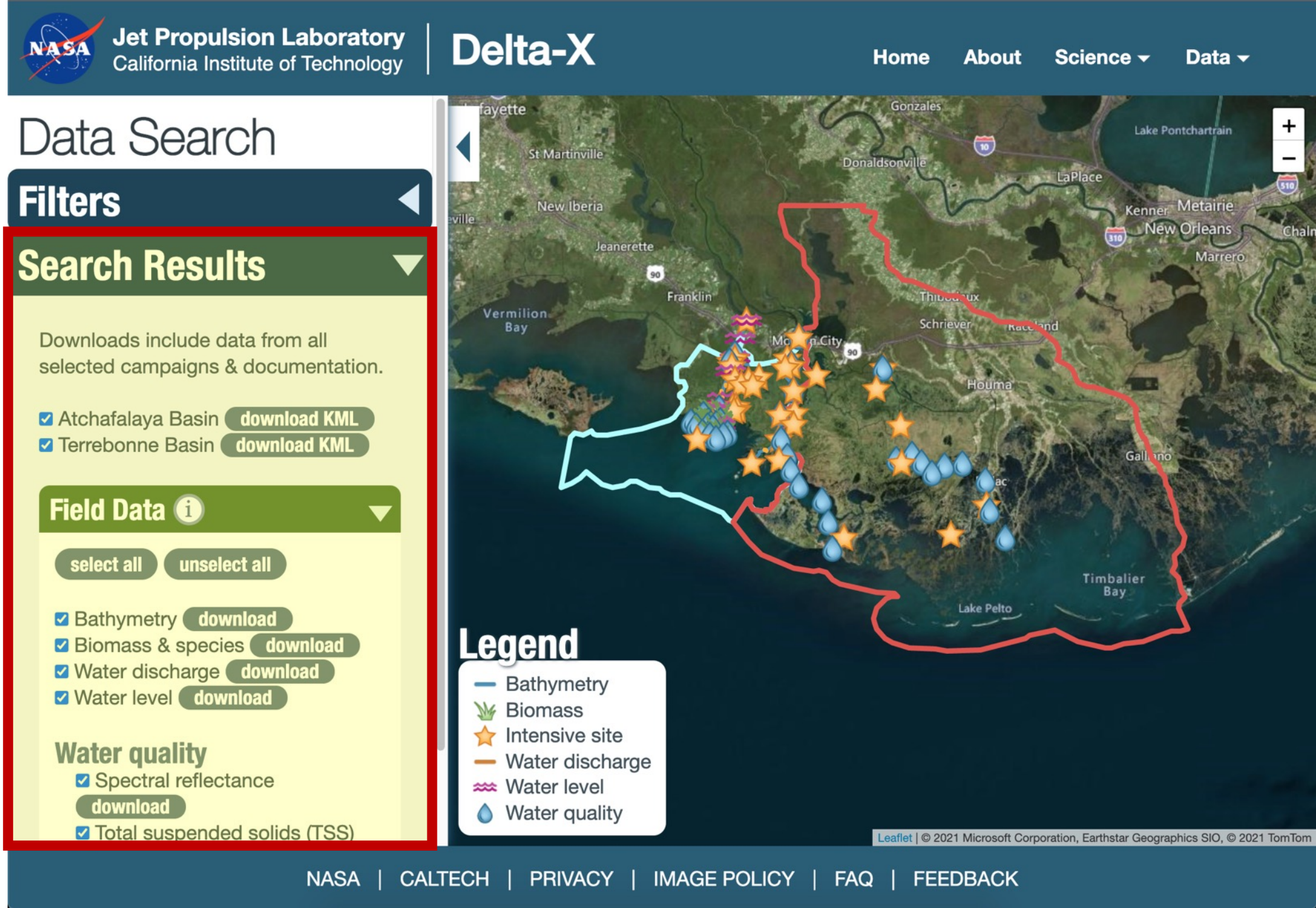
Instrument information pop-up



Search

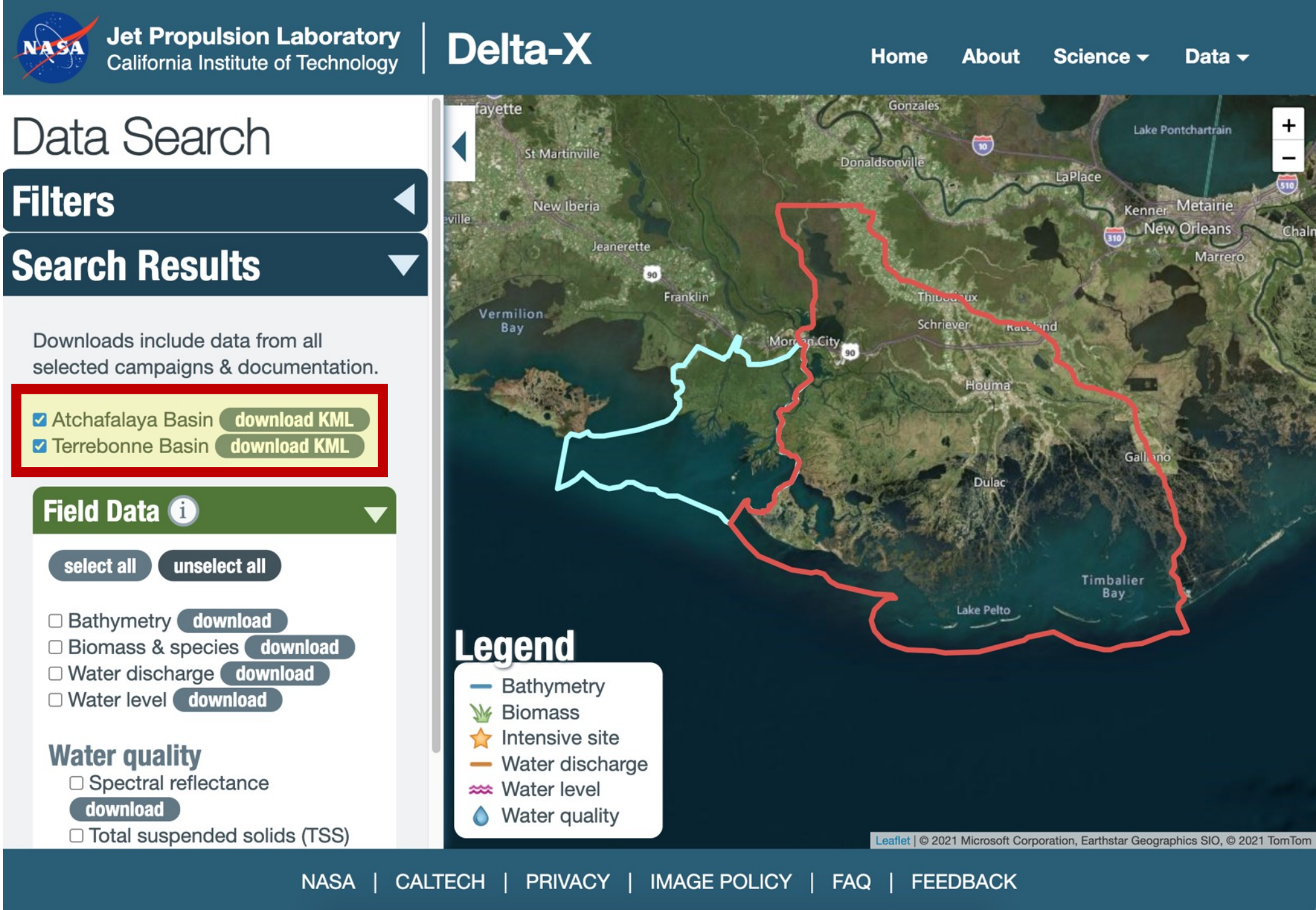
Results

select/unselect checkboxes



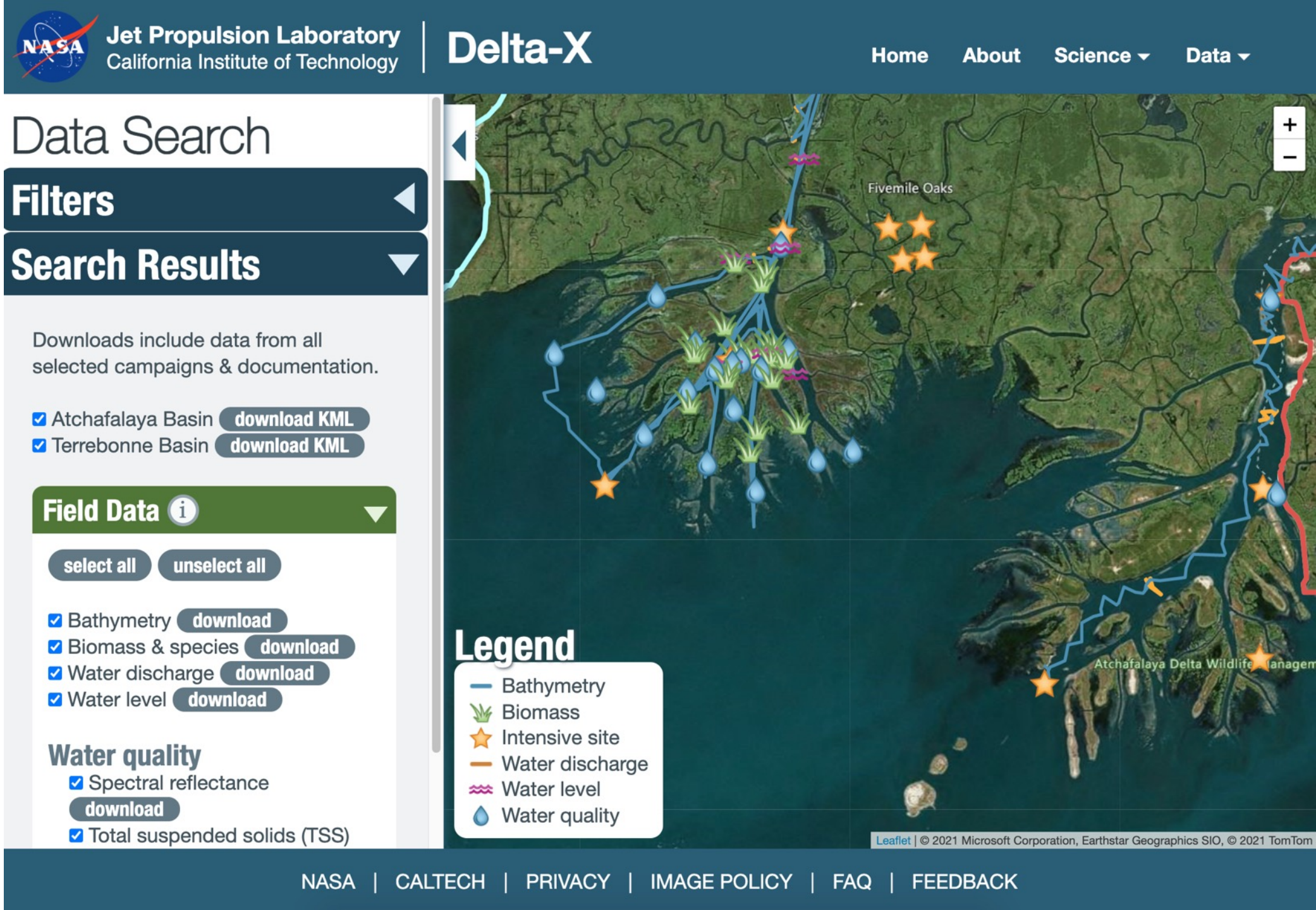
Search

Basin KML files



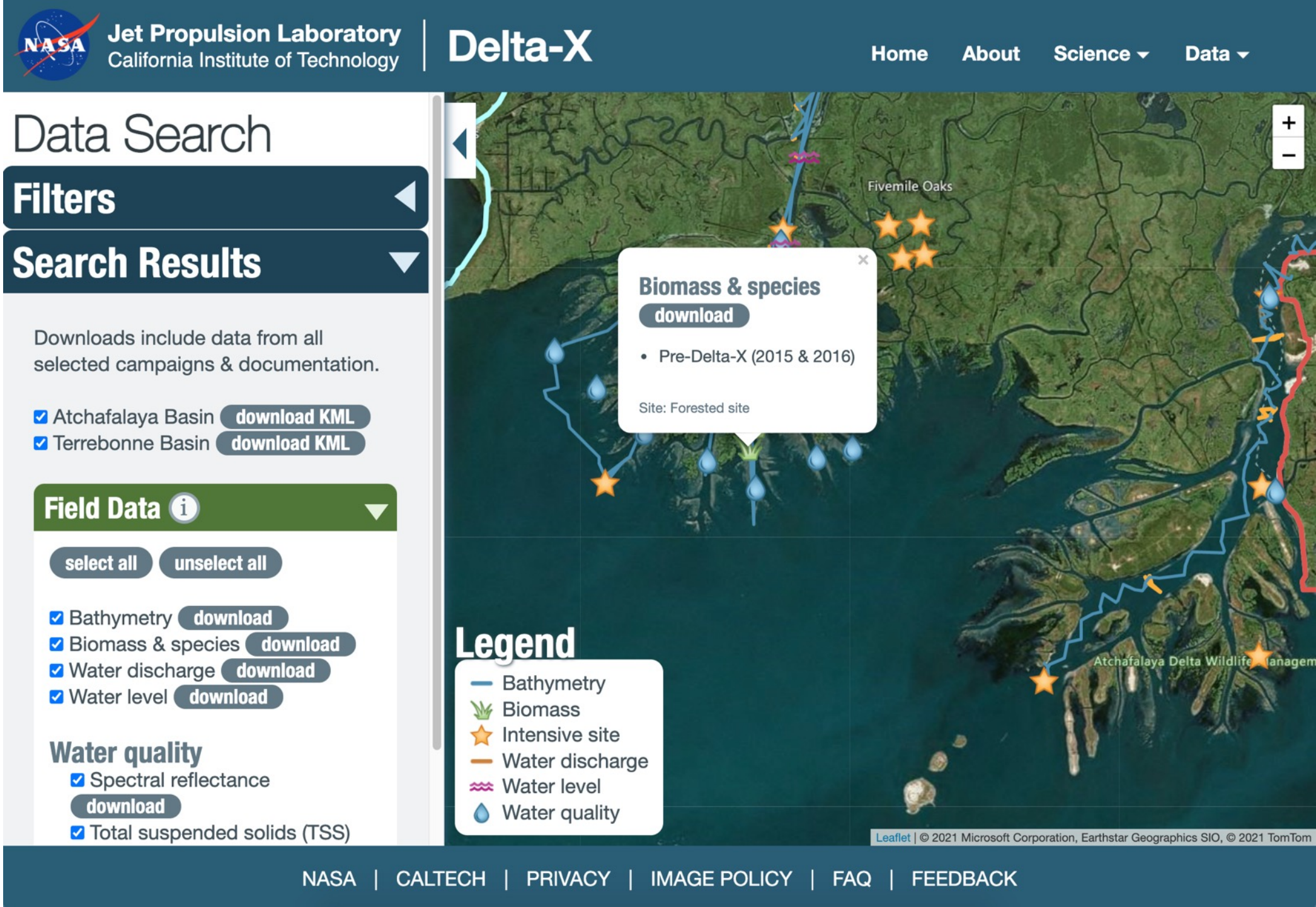
Search

Map legend & items



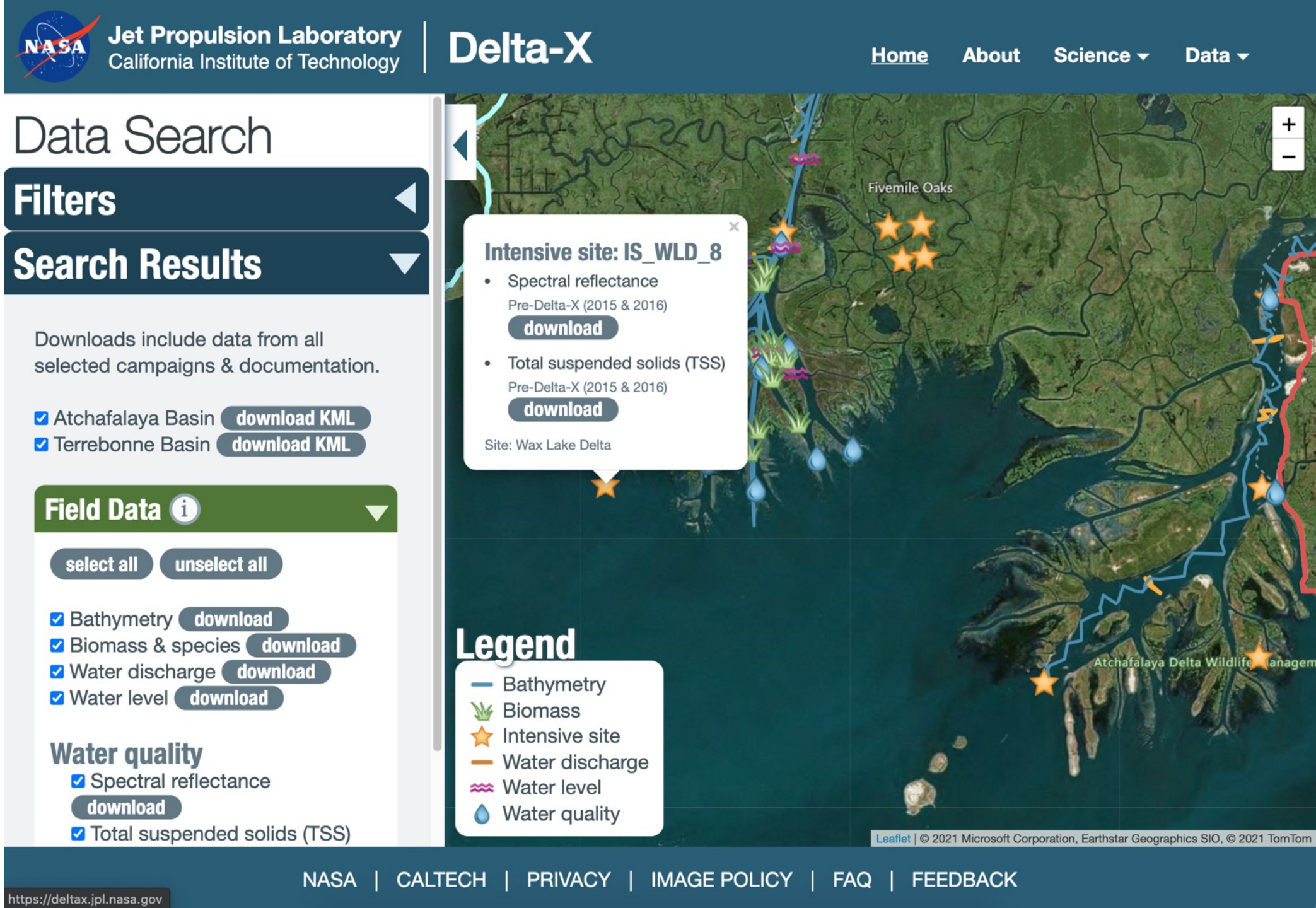
Search

Map items



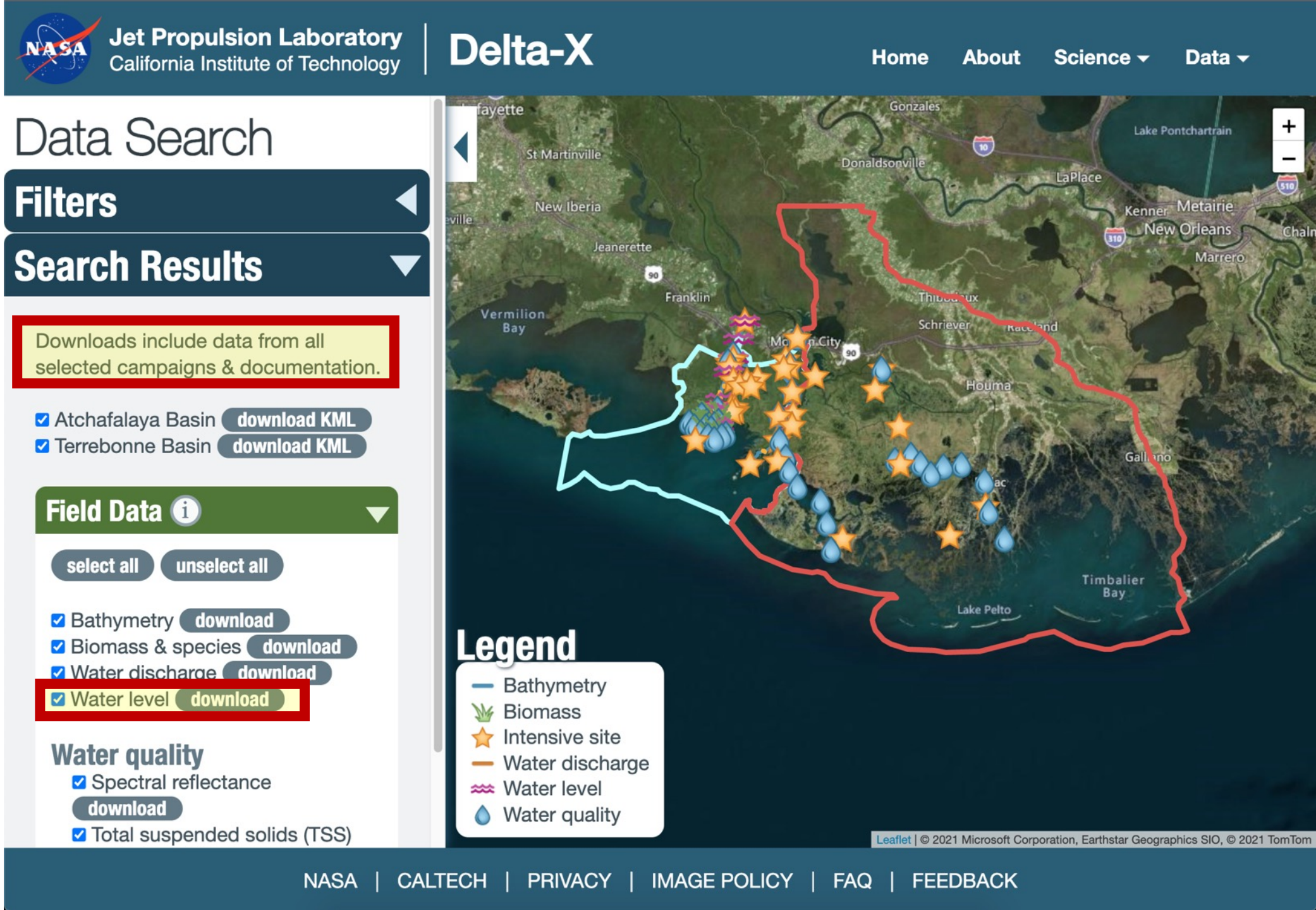
Search

Intensive site



Search

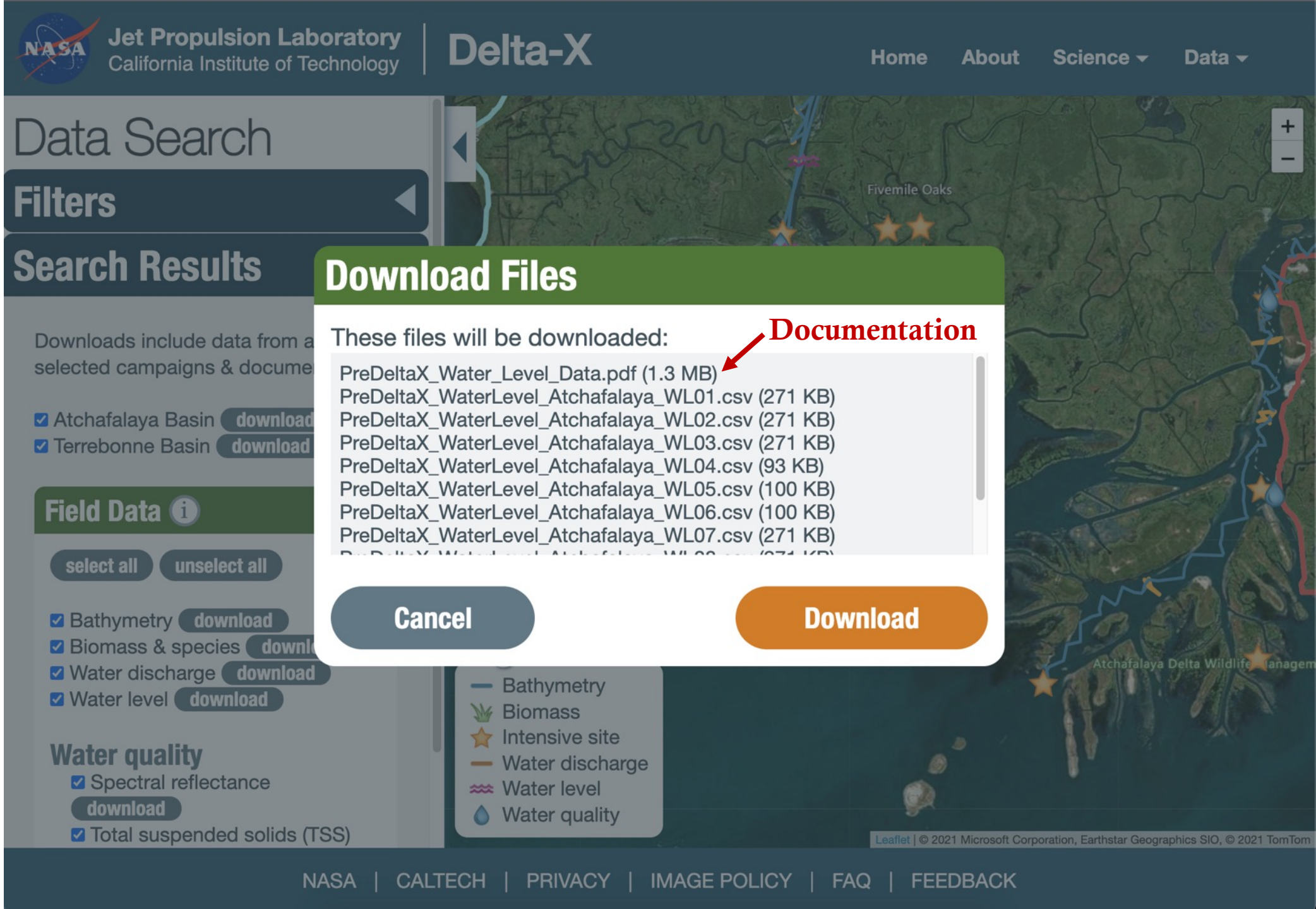
Download example



Search

Download example: pop-up

Downloads a gzip file



Search

Name	Date Modified	Size	Kind
water-level	Today at 10:51 AM	--	Folder
water-level-fall-2016	Nov 11, 2021 at 9:56 AM	--	Folder
PreDeltaX_Water_Level_Data.pdf	Nov 11, 2021 at 9:51 AM	1.3 MB	PDF Document
PreDeltaX_WaterLevel_Atchafalaya_WL01.csv	Jan 7, 2021 at 5:14 PM	169 KB	Comm...et (.csv)
PreDeltaX_WaterLevel_Atchafalaya_WL02.csv	Jan 7, 2021 at 5:14 PM	171 KB	Comm...et (.csv)
PreDeltaX_WaterLevel_Atchafalaya_WL03.csv	Jan 7, 2021 at 5:14 PM	169 KB	Comm...et (.csv)
PreDeltaX_WaterLevel_Atchafalaya_WL04.csv	Jan 7, 2021 at 5:14 PM	91 KB	Comm...et (.csv)
PreDeltaX_WaterLevel_Atchafalaya_WL05.csv	Jan 7, 2021 at 5:14 PM	95 KB	Comm...et (.csv)
PreDeltaX_WaterLevel_Atchafalaya_WL06.csv	Jan 7, 2021 at 5:14 PM	95 KB	Comm...et (.csv)
PreDeltaX_WaterLevel_Atchafalaya_WL07.csv	Jan 7, 2021 at 5:14 PM	178 KB	Comm...et (.csv)
PreDeltaX_WaterLevel_Atchafalaya_WL08.csv	Jan 7, 2021 at 5:14 PM	178 KB	Comm...et (.csv)
PreDeltaX_WaterLevel_Atchafalaya_WL09.csv	Jan 7, 2021 at 5:14 PM	178 KB	Comm...et (.csv)
PreDeltaX_WaterLevel_Atchafalaya_WL10.csv	Jan 7, 2021 at 5:14 PM	92 KB	Comm...et (.csv)

Documentation

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Pre-Delta-X: Water Levels across Wax Lake Outlet, Atchafalaya Basin, LA, USA, 2016

Get Data

Documentation Revision Date: 2020-08-25

Dataset Version: 1

Summary

This dataset provides absolute water level elevations derived for 10 locations across the Wax Lake Delta, Atchafalaya Basin, in Southern Louisiana, USA, within the Mississippi River Delta (MRD) floodplain. Field measurements were made during the Pre-Delta-X campaign on October 13-20, 2016. Relative water level measurements were recorded every five minutes during a one-week period using in situ pressure transducers (Solinst) to measure water surface elevation change with millimeter accuracy. The Solinst system combines a total pressure transducer (TPT) and a temperature detector. Once underwater, the TPT measures the sum of the atmosphere and water pressure above the sensor. Atmospheric pressure fluctuations must be accounted for to obtain the height of the water column above the TPT. An absolute elevation correction was applied to the water level data using an iterative approach with the USGS Calumet Station water level height and Airborne Snow Observatory (ASO) lidar water level profiles. These Pre-Delta-X water level measurements served to calibrate and validate the campaign's remote sensing observations and hydrodynamic models.

Pre-Delta-X was a joint airborne and field campaign in the MRD beginning Spring 2015 and continuing through Fall 2016. The Pre-Delta-X campaign conducted airborne (remote sensing) observations and field (in situ) measurements to characterize delta hydrology, water quality (e.g., total suspended solids), and vegetation structure. These data facilitate the continued development of sampling methods, algorithms, and models to support the upcoming airborne and field campaigns (2021–2023) in support of the Delta-X mission.

There are 10 data files with this dataset in comma-separated value (.csv) format.

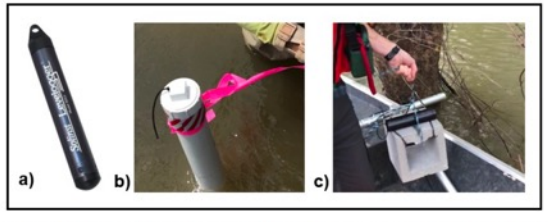

Figure 1. Water level pressure transducer field deployment. a) A total pressure transducer (TPT) to measure water level changes (Solinst; 6.25 in long). b) Installation of a TPT in shallow water within a PVC pipe. The pipe is embedded into the sediment with the TPT 20 cm above the bottom of the channel. c) Installation of a TPT in deep water attached to a concrete block. The TPT is protected inside the small black PVC pipe. The TPT must be above the block once sitting on the bottom of the channel. The rope is attached to a nearby tree or post for later retrieval. Source: Thomas et al. 2019

Citation

Simard, M., M.W. Denbina, D.J. Jensen, and R. Lane. 2020. Pre-Delta-X: Water Levels across Wax Lake Outlet, Atchafalaya Basin, LA, USA, 2016. ORNL DAAC, Oak Ridge, Tennessee, USA. https://doi.org/10.3334/ORNLDAAC/1801

Data

	A	B	C	D	E	F	G	H	I
1	basin	site_id	latitude	longitude	bias	calibration_source	time	absolute_water_level_NAVD88	absolute_water_level_WGS84
2	Atchafalaya	Wax_Lake_1	29.7018	-91.3735	0.09	ASO_Lidar	10/13/16 23:45	0.672	-25.082
3	Atchafalaya	Wax_Lake_1	29.7018	-91.3735	0.09	ASO_Lidar	10/13/16 23:50	0.668	-25.086
4	Atchafalaya	Wax_Lake_1	29.7018	-91.3735	0.09	ASO_Lidar	10/13/16 23:55	0.664	-25.09
5	Atchafalaya	Wax_Lake_1	29.7018	-91.3735	0.09	ASO_Lidar	10/14/16 0:00	0.66	-25.094
6	Atchafalaya	Wax_Lake_1	29.7018	-91.3735	0.09	ASO_Lidar	10/14/16 0:05	0.657	-25.097
7	Atchafalaya	Wax_Lake_1	29.7018	-91.3735	0.09	ASO_Lidar	10/14/16 0:10	0.653	-25.101
8	Atchafalaya	Wax_Lake_1	29.7018	-91.3735	0.09	ASO_Lidar	10/14/16 0:15	0.65	-25.104
9	Atchafalaya	Wax_Lake_1	29.7018	-91.3735	0.09	ASO_Lidar	10/14/16 0:20	0.646	-25.107
10	Atchafalaya	Wax_Lake_1	29.7018	-91.3735	0.09	ASO_Lidar	10/14/16 0:25	0.643	-25.111
11	Atchafalaya	Wax_Lake_1	29.7018	-91.3735	0.09	ASO_Lidar	10/14/16 0:30	0.64	-25.114
12	Atchafalaya	Wax_Lake_1	29.7018	-91.3735	0.09	ASO_Lidar	10/14/16 0:35	0.637	-25.117
13	Atchafalaya	Wax_Lake_1	29.7018	-91.3735	0.09	ASO_Lidar	10/14/16 0:40	0.634	-25.12
14	Atchafalaya	Wax_Lake_1	29.7018	-91.3735	0.09	ASO_Lidar	10/14/16 0:45	0.631	-25.123
15	Atchafalaya	Wax_Lake_1	29.7018	-91.3735	0.09	ASO_Lidar	10/14/16 0:50	0.627	-25.126
16	Atchafalaya	Wax_Lake_1	29.7018	-91.3735	0.09	ASO_Lidar	10/14/16 0:55	0.625	-25.129
17	Atchafalaya	Wax_Lake_1	29.7018	-91.3735	0.09	ASO_Lidar	10/14/16 1:00	0.622	-25.132
18	Atchafalaya	Wax_Lake_1	29.7018	-91.3735	0.09	ASO_Lidar	10/14/16 1:05	0.619	-25.135
19	Atchafalaya	Wax_Lake_1	29.7018	-91.3735	0.09	ASO_Lidar	10/14/16 1:10	0.616	-25.138
20	Atchafalaya	Wax_Lake_1	29.7018	-91.3735	0.09	ASO_Lidar	10/14/16 1:15	0.614	-25.14
21	Atchafalaya	Wax_Lake_1	29.7018	-91.3735	0.09	ASO_Lidar	10/14/16 1:20	0.611	-25.142

Delta-X Data Search: future development

Level	Description
L0	Field data (in situ)
L1	Raw remote sensing data
L2	Georeferenced remote sensing data
L3	Remote sensing measurements
L4	Science products

More datasets will be added throughout the mission:

- Pre-Delta-X campaign (2015–2016):
  - Remote sensing data (L2 & L3)
- Delta-X campaigns (Spring & Fall 2021):
  - Field data (L0)
  - Remote sensing data (L2 & L3)
  - Science products (L4)

Thank you.

Questions?