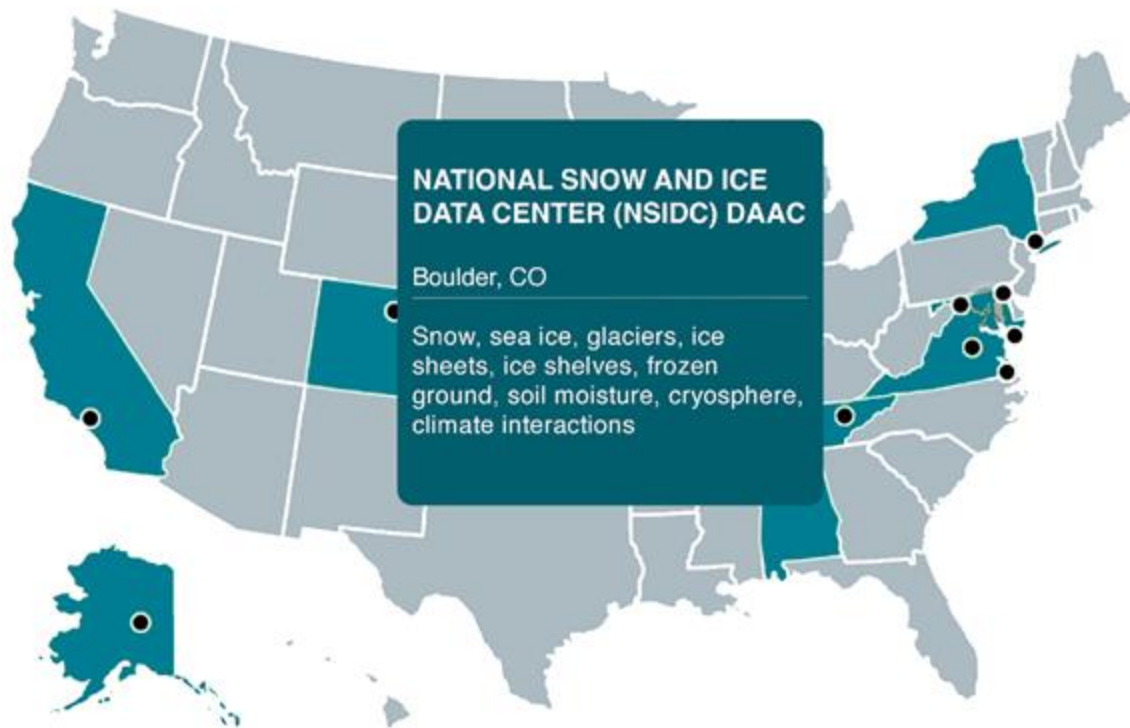# ICESAT-2 DATA PRODUCTS, TOOLS AND SERVICES AT NSIDC DAAC

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National Snow and Ice Data Center (NSIDC) DAAC

NATIONAL SNOW AND ICE DATA CENTER (NSIDC) DAAC

Boulder, CO

Snow, sea ice, glaciers, ice sheets, ice shelves, frozen ground, soil moisture, cryosphere, climate interactions
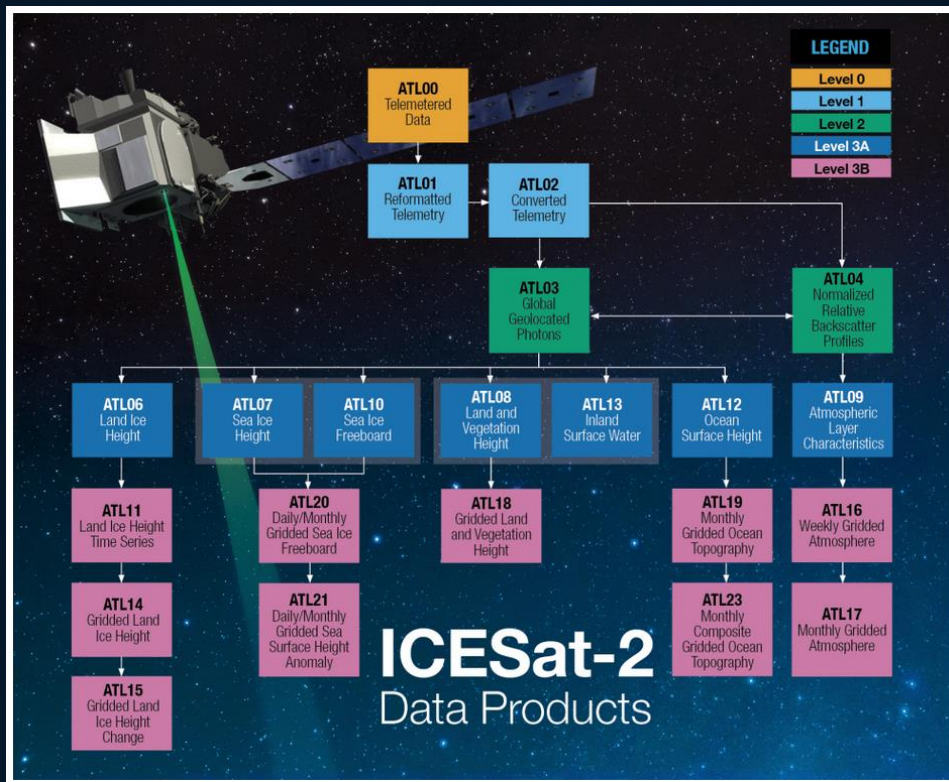
- One of the 12 DAACs within the NASA's Earth Observing System Data and Information System (EOSDIS)

- Program within NSIDC, CIRES, CU Boulder

- Data from several NASA Missions and Programs including ICESat-2, ICESat, IceBridge, SMAP, MODIS, VIIRS and more

https://www.earthdata.nasa.gov/eosdis/daacs

ICESAT-2 DATA PRODUCTS AT NSIDC DAAC

ICESat-2 STANDARD DATA PRODUCTS

ICESat-2 Data Products

https://nsidc.org/data/icesat-2/products

- ATL02-ATL23
  - Available for on-prem and cloud download or direct access in the cloud
  - ~45 day latency

- Quick look data sets:
  - Sea ice height (ATL07QL), land and vegetation height (ATL08QL), atmospheric layer characteristics (ATL09QL), sea ice freeboard (ATL10QL), inland surface water (ATL13QL)
  - ~3 day latency

- Future data sets:
  - ATL24 – bathymetry
  - ATL25 – lake ice

- Future quick look data sets:
  - Geolocated photons (ATL03QL), gridded sea ice freeboard (ATL20QL), lake ice (ATL25QL)

- Current version 6: 26 December 2018 – 31 July 2024

- Version 7 expected in spring 2025 with cloud-optimized HDF5 files for ATL03, and potentially others

Data Discovery, Documents, Tools and Services

NSIDC DAAC ICESAT-2 MISSION PAGE

Standard products (ATL02-ATL23)

Related Data

- ICESat-2 ATL derived data sets
  - Grounding zone for antarctic ice shelves
  - Sea ice thickness (along-track and gridded)
  - Boreal biomass density
  - Sea ice melt pond characteristics
- Calibration/Validation data
- Pre-launch airborne simulation data

https://nsidc.org/data/icesat-2

NSIDC DAAC ICESAT-2 MISSION PAGE

User guides, ATBD's and other related documentation

Help articles

ICESat-2 related data announcements

User support at nsidc@nisdc.org

https://nsidc.org/data/icesat-2

DATA SET SPECIFIC LANDING PAGES

User Guide:
Comprehensive product documentation on file structure, variable info, data acquisition, etc.

Citation:

https://nsidc.org/data/atl03

DATA SET SPECIFIC LANDING PAGES

Subscribe:
Sign up to receive email updates of the data set e.g. new versions or data access changes during the cloud transition

Service:
Levels of service model for all data sets at NSIDC. ATL03-ATL23 are designated at **Comprehensive** support

https://nsidc.org/data/atl03

DATA SET SPECIFIC LANDING PAGES

Access and tools for the data product

Known issues, ATBDs, Data Dictionaries, User Guides

Help articles for the data product

https://nsidc.org/data/atl03

ICESat-2 Data Access and Tools

HTTPS File System →

Get Data **Tags to distinguish tool function**

Quickly download a few files using a web browser, or access data through a command-line utility such as WGET.

NASA Earthdata Cloud Data Access Guide

Type: Service

NASA Earthdata Cloud (AWS S3) →

Get Data **Link to tool/service**

Access data directly from the NASA Earthdata Cloud via Amazon Web Services Simple Storage Service (AWS S3). This access option is only available when working within the us-west-2 region and requires additional AWS S3 credentials.

NASA Earthdata Cloud Data Access Guide
AWS S3 Credentials

Type: Service   View Metadata

Customized Programmatic Data Access Service →

Get Data Customize

Programmatically request selected data products through our API. This tool is valuable for selecting just the parameters you need from big data sets. Apply spatial and temporal filters, subsetting, reformatting, and reprojection.

Programmatic Data Access Guide

Type: Service   **Last updated:** April 2023   View Metadata

NASA Earthdata Search →

Visualize Search & Discover Get Data

Search and order data from all NASA DAACs using spatial and temporal filters in a map interface. Reformatting, reprojecting, and subsetting options are available for some data sets.

How to search, order, and customize data with NASA Earthdata Search

Type: Web Application

OpenAltimetry →

Visualize Get Data Search & Discover Customize

Discover, access, and visualize data from NASA's ICESat and ICESat-2 missions. **Supported software languages:** Python

Help article   **Link to instructional guide**

Type: Web Application   View Metadata

Customization Capabilities:
Spatial Subsetting,Temporal Subsetting

Output Formats:
ASCII,CSV,HDF5

earthaccess →

Get Data Search & Discover

earthaccess is a python library to search and access NASA Earth science data with just a few lines of code.
Supported software languages: Python

GitHub Repository

Type: Downloadable Software

Last updated: February 2024

View Metadata

Teaser for NSIDC DAAC Tutorial
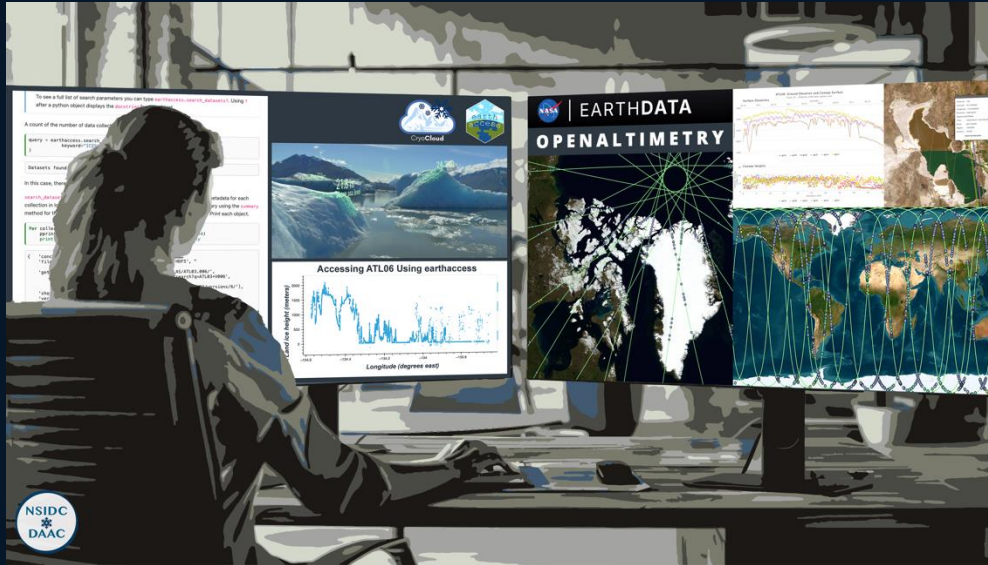
Monday 18:00-19:30

- Access ICESat-2 and CryoSat-2 from cloud

- Plot data from both missions in the same map

- Using earthaccess to access ICESat-2

- Using cs2eo query and script to download CryoSat-2

Thursday 17:00-18:00

- In-depth demo on earthaccess

- If requested: OpenAltimetry demo

Transition of Data and Tools to Earthdata Cloud

NASA Earth science data in the cloud

NASA DAACs are migrating data and tools to the NASA Earthdata Cloud to respond to growing data volumes and to take advantage of cloud benefits.
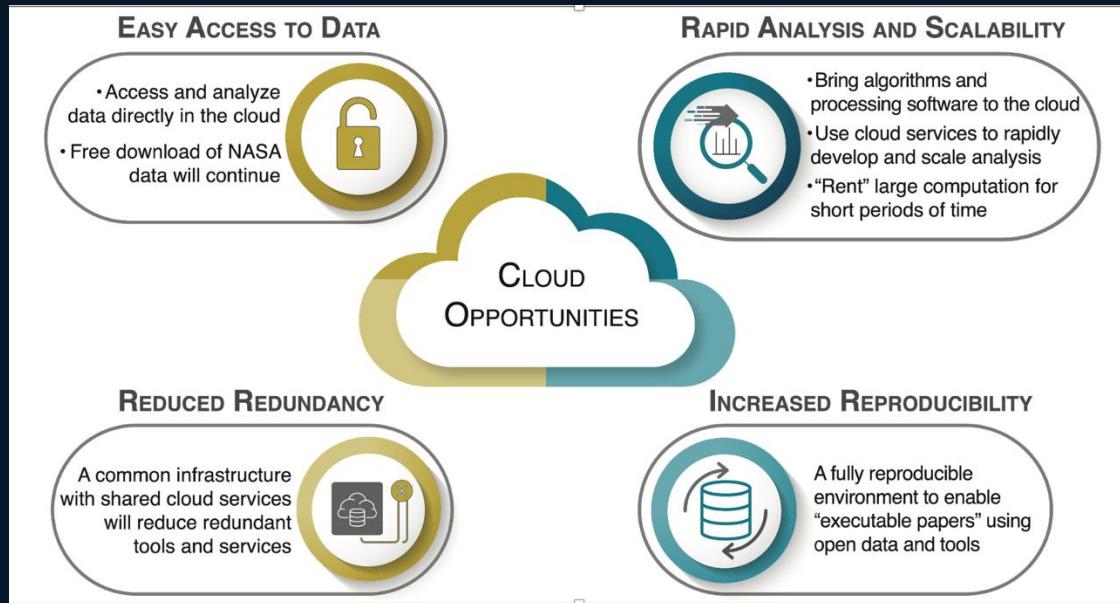
ICESat-2 in Earthdata Cloud

Current Status

- ICESat-2 standard data products (ATL02-ATL23) available from on-prem system and cloud

- Transformation services (subsetting & reformatting) available on-prem

- Supporting user transition to cloud data access

Next 2 Years

- ICESat-2 Quicklook and related datasets made available in the cloud

- Establish critical transformation services in the cloud

- Shut off on-prem data access and transformation services

• All data are available for download from on-prem or cloud at no cost to the user

CLOUD RESOURCES

- NSIDC DAAC general resources on finding data in the cloud, downloading cloud data, and working in the cloud:
  - NSIDC cloud access guide
  - NSIDC GitHub tutorials

- ICESat-2 specific resources in the CryoCloud Cookbook:
  - Introduction to NASA Earthdata Cloud and ICESat-2
  - NASA Earthdata Cloud and data access using earthaccess and icepyx

- NASA Openscapes Earthdata Cloud Cookbook
  - Very comprehensive resource
  - Includes resources on learning how to work with data in the cloud, tutorials, workshops, etc.

ICESAT-2 DATA DISTRIBUTION METRICS

- ATL02-ATL23 standard products downloaded from on-prem system (28 May 2019 – 31 July 2024):
  - 8,914 registered distinct users from 133 countries
  - 54,852,912 science file downloads
  - Top countries: China, USA, India, UK, Canada

- Cloud metrics (29 September 2022 – 31 July 2024)
  - 1404 registered distinct users of 74 countries
  - 1,816,414 science files accessed
  - Top countries: China, USA, India, UK, Canada

- Quick look data sets (22 March 2022 – 31 July 2024):
  - 475 registered distinct users of 52 countries
  - 53,153 science file downloads
  - Top countries: USA, China, India, Brazil, Canada

THANK YOU