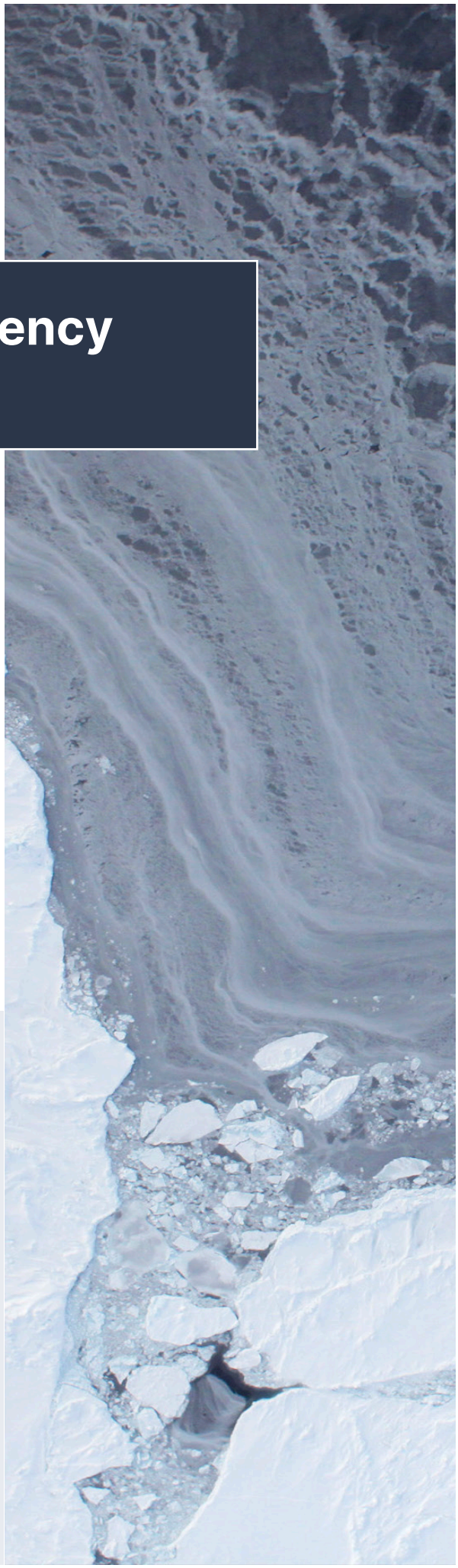
National Aeronautics and Space Administration

Training Resources: Low Latency ICESat-2/ATLAS Products



Summary

Low Latency ICESat-2/ATLAS Products, a Satellite Needs Working Group (SNWG) solution, reduce the latency of five existing ICESat-2 products from 45 days to three days. These products are also known as ICESat-2 Quick Look Products.

A number of training resources relevant to this solution are aggregated into five categories (specified below). For more information about this solution, visit the Low Latency ICESat-2/ATLAS Products webpage.

Table of Contents

Fundamentals of Remote Sensing

This category's resources provide an introduction to remote sensing techniques used to develop this solution.

The Fundamentals of LiDAR for ICESat-2	PDF presentation from NASA's Applied Remote Sensing Training (ARSET) program that provides training on Light Detection and Ranging (LiDAR) remote sensing with a focus on ICESat-2 LiDAR data.
Sensing Our Earth from Above	Webpage providing background information about LiDAR remote sensing from NASA Langley Research Center. Information provided includes the basics of LiDAR, examples of LiDAR campaigns, and planned improvements.
The Basics of LiDAR - Light Detection and Ranging - Remote Sensing	Tutorial from the National Science Foundation (NSF) on LiDAR remote sensing data and how it is used to measure vegetation such as trees.

Missions and Instruments

This category's resources describe the missions and instruments used to develop this solution.

ICESat-2 Mission Website - Goddard Space Flight Center (GSFC)	ICESat-2 mission website with links to information about the mission and other relevant resources such as mission-related news and events.

ICESat-2 Mission Page - NASA Science	ICESat-2 mission page providing an overview of the mission, articles highlighting specific applications of ICESat-2 data such as sea ice monitoring and vegetation height measurements, and links to other relevant information.
ICESat-2 Technical Specs	Webpage outlining technical specifications of ICESat-2 including orbital and coverage information.
Space Lasers	Webpage providing an overview of the Advanced Topographic Laser Altimeter System (ATLAS) instrument on the ICESat-2 platform.

Data Products and Descriptions

This category's resources describe the solution's resulting data products and provide other descriptive materials.

ICESat-2 Quick Look Products: SNWG Solution Fact Sheet	SNWG solution fact sheet for the ICESat-2 Quick Look products that includes an overview of the solution, its scientific and societal benefit, and data specifications such as temporal coverage and spatial resolution.

ATLAS/ICESat-2 Expedited Data (i.e. Quick Look products)	Webpage describing and providing access to expedited data from ICESat-2's ATLAS instrument. Also known as "Quick Look" data, these subsets of ATLAS/ICESat-2 data include sea ice height, sea ice freeboard, land and vegetation height, atmospheric layer characteristics, and inland surface water measurements.
New Quick Look ICESat-2 Products Released Through the National Snow and Ice Data Center Speed the Delivery of Data to Users	Article describing the ICESat-2 Quick Look product specifications, with details on the five new Quick Look data products and their uses.
FAQs on ICESat-2 Quick Looks	Frequently Asked Questions (FAQs) about what ICESat-2 Quick Look data products are and how to find them.
ICESat-2 Data Descriptions	ICESat-2 data products, including Quick Look products, available through NASA's National Snow and Ice Data Center (NSIDC). NSIDC hosts the dataset landing page, user guide, data access point, announcements, and other critical documentation.
ICESat-2 Product Overviews	Webpage providing high-level descriptions of each ICESat-2 product distinguished by product level. There are five Level 3a products that have Quick Look versions. These products are outlined in yellow in the graphic.

Data Access and Code Examples

This category's resources provide links to access the solution's data as well as open source code for using the data.

Earthdata Search - ICESat-2 Quick Look Products	Access ICESat-2 Quick Look products through Earthdata Search.
OpenAltimetry	OpenAltimetry data visualization and discovery tool, used for browsing ICESat and ICESat-2 data.
ICESat-2 Data Access & Services	PDF presentation from NASA ARSET demonstrating how to access ICESat-2 data and use associated services for data visualization.
NSIDC Data Tutorials	GitHub repository created by NSIDC with various open-source Jupyter notebooks on how to access and work with ICESat-2 data.
icepyx: Python tools for obtaining and working with ICESat-2 data	Open-source Python library for working with ICESat-2 data. Resources include installation instructions, tool user guides, and an outline of the Query, Unify, Explore SpatioTemporal (QUEST) module that extends icepyx functionality to other datasets.
ICESat-2 SlideRule	Website for SlideRule Earth, a cloud-based data processing service for Earth science datasets such as ICESat-2 data products.

Use Case and Application Examples

This category's resources provide examples of the solution in-use as well as other potential scientific applications of the data.

ICESat-2 Applications	PDF presentation describing potential applications of ICESat-2 data.
Mapping and Monitoring Lakes and Reservoirs with Satellite Observations	Tutorial provided by NASA ARSET that presents a case study for monitoring water level height with ICESat-2 data.
ICESat-2 Applications: White Papers	Webpage linking to a series of white papers describing how ICESat-2 measurements can help improve decision making around specific environmental issues, including water management and disaster observations.
Hacking ICESat-2: How an Open Science Workshop Helped Scientists Wrangle Big Data	Article highlighting the ICESat-2 Hackweek, with links to blog pages from the planners, facilitators, and participants where they discuss their experience working with ICESat-2 data.
ICESat-2 Hackweek Learning Resources	GitHub site hosting resources from the 2020 ICESat-2 Hackweek.

Contact Information

Need additional help using this solution? Let us know what gaps or questions still exist, what tools interest you, and/or how you want to apply this solution. We are happy to connect you with more information and ongoing efforts to fill those gaps. Contact us at info@snwg-impact.net.