



EOSDIS Update

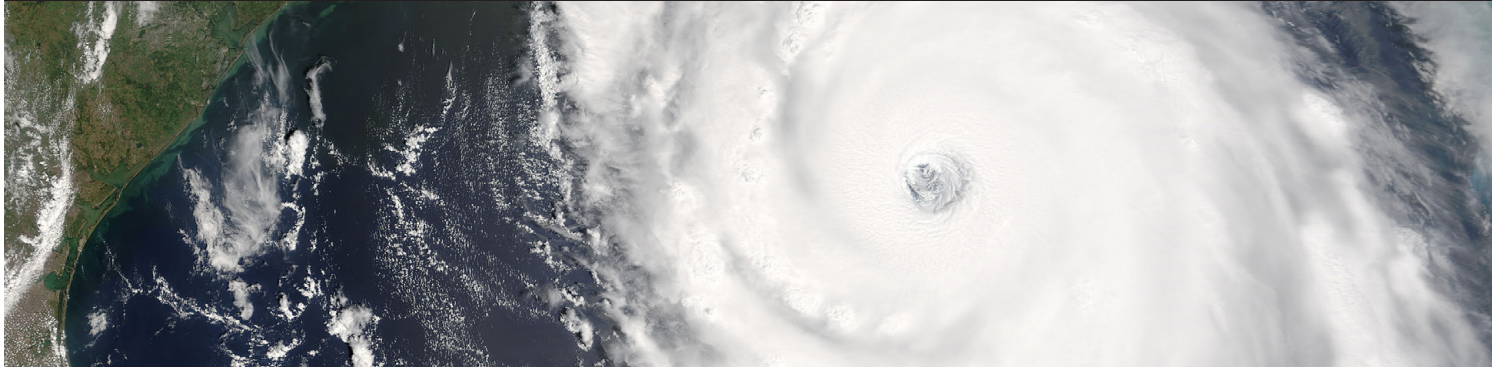
National Aeronautics and Space Administration



SUMMER 2020

Earth Science Data and Information System (ESDIS) Project

A PUBLICATION OF NASA'S EARTH OBSERVING SYSTEM DATA AND INFORMATION SYSTEM (EOSDIS), CODE 423



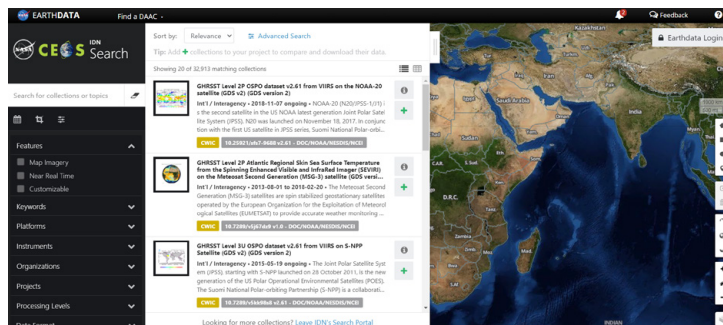
FEATURE ARTICLES

A Stronger International Resource for Earth Science Data Discovery

Enhancements to NASA's Global Change Master Directory (GCMD) create an even more powerful international resource for discovering Earth science data.

NASA's Global Change Master Directory ([GCMD](#)) and the docBUILDER online metadata authoring tool were deprecated by NASA's Earth Science Data and Information System (ESDIS) Project in June 2020. While no changes were made to the directory, all legacy GCMD links now redirect to the Committee on Earth Observation Satellites ([CEOS](#)) International Directory Network ([IDN](#)).

Since both the GCMD and the IDN were developed using the NASA Earth Observing System Data and Information System (EOSDIS) Common Metadata Repository ([CMR](#)) as their foundation, everything that was available through the GCMD is still available through the IDN. The CEOS IDN offers discovery access to the same legacy GCMD datasets using the power of the EOSDIS CMR with the added benefit of access to dataset granules (when available).



The IDN search portal has a look and feel very similar to the NASA Earthdata Search interface. Both the IDN and Earthdata Search use the EOSDIS CMR as a foundation. CEOS IDN image acquired on July 16, 2020.

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Unless otherwise noted, all articles written by Josh Blumenfeld, EOSDIS Science Writer.

GCMD [keywords](#) also remain an integral component enabling searches through the directory. The GCMD keywords describe Earth science data and services consistently and comprehensively in a hierarchical format and follow a codified governance process. The power of the keywords is in their ability to enable scientists to tag their data using a taxonomy of controlled scientific categories. This, in turn, allows those searching for data to discover datasets easily through the use of an established hierarchy.

A new tool for contributing metadata to the directory also is available: the draft Metadata Management Tool ([dMMT](#)). Users who would like to contribute metadata to the IDN using the dMMT may request access to the tool by emailing support@earthdata.nasa.gov.

Having the IDN as the primary international directory for Earth science data and related products is a logical

continuation of the ongoing evolution of the GCMD.

NASA developed the GCMD in the late 1980s, when metadata was just being recognized as a key component of information systems. The directory was a cornerstone of NASA's international collaboration and one of NASA's contributions to CEOS (which designated it the *IDN*). CEOS was established in 1984 with NASA as a charter member, and includes worldwide space agencies and research organizations that work together to coordinate civilian space observations of Earth and enhance the international exchange of data.

Questions about the GCMD transition can be submitted to support@earthdata.nasa.gov or directed to Valerie Dixon at valerie.dixon@nasa.gov. ■

Published July 22, 2020

New Imagery and Functionality Available in NASA Worldview

New VIIRS imagery from NOAA-20 along with new ways to evaluate and select imagery layers make NASA Worldview more useful than ever.

New imagery from the NOAA-20 satellite, easier ways to filter and discover available imagery, and the ability to have a distraction-free view of imagery



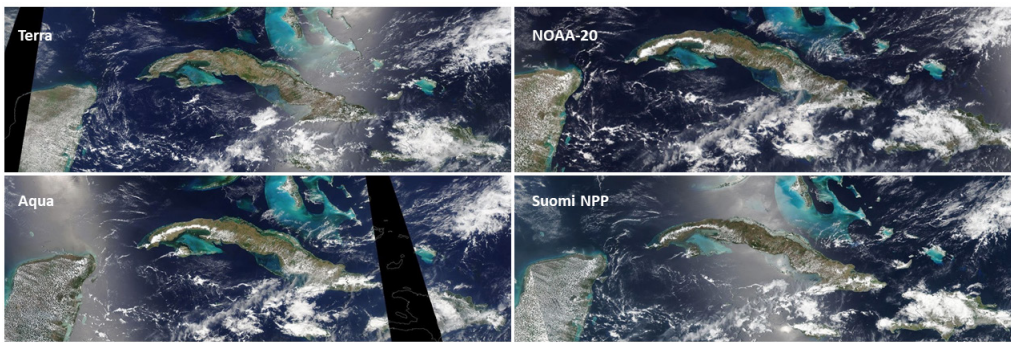
This NOAA-20/VIIRS Corrected Reflectance (True Color) image of Tropical Depression Cristobal moving into the southern U.S. was acquired on June 8, 2020. NASA Worldview image.

without menus, buttons, or timelines are the most recent enhancements to the [NASA Worldview](#) interactive data visualization application. These new additions complement [features that went live earlier in 2020](#), including enhancements to the Layer Picker and new ways

to work with layers that include classification types (such as the Land Cover Type layer).

A key addition is seven new Visible Infrared Imaging Radiometer Suite (VIIRS) imagery layers from the NOAA-20 satellite: three Corrected Reflectance daily base map layers (True Color, false color with Bands M3-I3-M11, and false color with Bands M11-I2-I1), two Brightness Temperature (Day and Night) layers, and two Fire and Thermal Anomalies (Day and Night) layers.

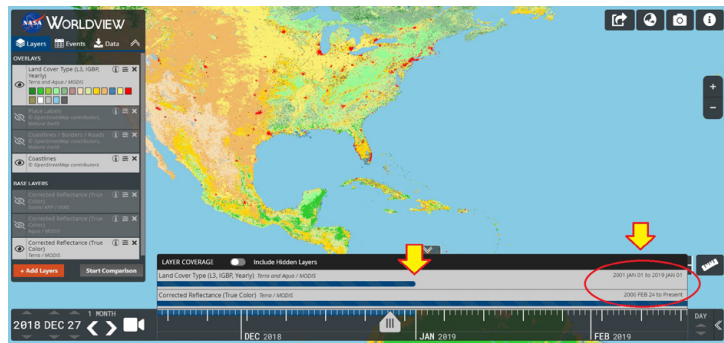
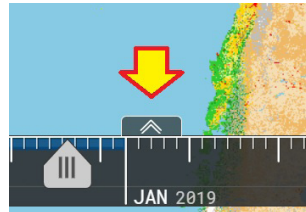
The addition of VIIRS imagery from NOAA-20 provides not just another source for Worldview imagery, but also another time for which imagery is acquired – NOAA-20 crosses the equator 50 minutes prior to the joint NASA/NOAA Suomi National Polar-orbiting Partnership (Suomi NPP) satellite. This means that Worldview users now have access to four sets of Corrected Reflectance and Fires and Thermal Anomalies (Day and Night) layers: Moderate Resolution Imaging Spectroradiometer (MODIS) imagery from NASA's Terra and Aqua satellites and VIIRS imagery from the Suomi NPP and NOAA-20 satellites. Having similar imagery from four separate satellites ensures continuity of data from older spacecraft (such as Terra and Aqua) and newer spacecraft (such as Suomi NPP and NOAA-20), which is critical when older missions retire.



Four satellites, four Corrected Reflectance (True Color) views of Cuba acquired on May 4, 2020. Clockwise from upper left: Terra/MODIS passes over the equator at approximately 10:30 am and 10:30 pm, local time; NOAA-20/VIIRS crosses the equator at approximately 12:20 pm and 12:20 am, local time; Suomi NPP/VIIRS crosses the equator at approximately 1:30 pm and 1:30 am, local time; Aqua/MODIS crosses the equator at approximately 1:30 pm and 1:30 am, local time. Interactively explore the Terra/MODIS image at <https://go.nasa.gov/2NkKHBd>. NASA Worldview image.

Along with new imagery, new Worldview features make it easier to work with and view imagery.

The Timeline Availability Panel enables users to easily view dates that have imagery available for the data product they wish to explore. This has become increasingly important as more imagery products have been added to the system from different missions, many of which have different time ranges for their availability. To turn the Timeline Availability Panel on or off, simply click on the two upward pointing chevrons above the timeline (image at right). Once the panel is open, colored bars indicate date ranges for all imagery layers selected, including imagery layers that are selected, but not active (image below).

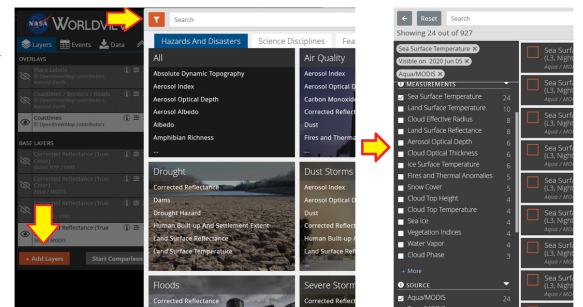


Open Timeline Availability Panel showing available imagery for the Terra and Aqua MODIS Land Cover Type data product. Lower gray bar with blue line indicates dates of available Terra/MODIS Corrected Reflectance (True Color) imagery; text in right side of bar (inside circle under right arrow) indicates this imagery is available from February 24, 2000 to present. Upper gray bar with blue line indicates that Land Cover Type imagery is not available past January 1, 2019 (center arrow); text in right side of bar (inside circle) indicates this imagery is available from January 1, 2001 to January 1, 2019. NASA Worldview image.

The NASA Worldview team also enhanced the functionality of the Layer Picker through the addition of a faceted search option. This feature enables users to more efficiently search through and select more than

900 imagery layers by specifically targeting the imagery attributes desired (e.g., source, period, day or night, etc.).

To enter the imagery layer faceted search panel, simply click on the orange “+ Add Layers” button at the bottom



After clicking on the orange “+ Add Layers” button (left image, lower arrow), the faceted search panel can be accessed by either typing in the Search bar or clicking on the orange filter icon (left image, upper arrow). Use the faceted search to narrow available imagery by selecting criteria in several facets (right image). NASA Worldview image.

of the layer box on the left side of the main window to open the imagery layer category panel. The faceted search panel appears by either typing in the search bar or clicking on the “filter” icon in the upper left corner of the panel.

Use the faceted search panel to narrow an imagery search using several filters. Facet categories include:

- Coverage: Filter layers that are available on the current date being viewed or for static layers that are always available regardless of date, such as the Blue Marble composite image or the place names layer.
- Category: Filter layers using the same categories shown in the Layer Picker panel under the three tabs at the top of the panel (Hazards and Disasters, Science Disciplines, Featured).
- Measurements: Filter by the type of measurement shown in the imagery (precipitation rate, water vapor, aerosol optical depth, etc.).
- Source: Filter by specific satellite or sensor/instrument.

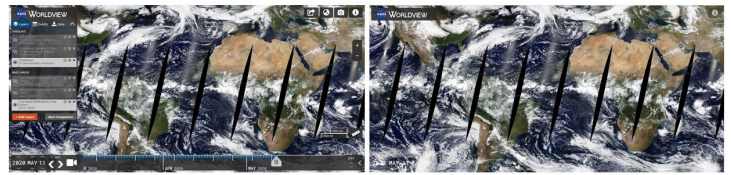
- Period: Filter imagery by temporal resolution (day, month, year, etc.).
- Day/Night: Filter imagery by whether the layer shows daytime or nighttime imagery.

Finally, and as an added bonus, the Worldview team created a new Distraction Free Mode that removes menus, buttons, timelines, and other elements that overlay imagery.



Entering Distraction Free Mode is easy – simply click on the information box (“i”) in the upper right corner of Worldview and select Distraction Free at the bottom of the drop-down menu.

Here what the Worldview window looks like with Distraction Free off (left image) and on (right image):



With Distraction Free Mode on (right image), it's easy to concentrate on just the imagery. NASA Worldview images.

To exit Distraction Free Mode, simply go back to the information button in the upper right corner and turn the feature off.

Using Worldview has never been easier. Check out Worldview today, and see how new imagery and features make it even easier to interactively explore our dynamic planet. ■

Published June 23, 2020

Data User Profiles

NASA Earth Science Data User Profiles highlight our diverse end-user community worldwide and show you not only how these data are being used for research and applications, but also where these data are being used – from the plains of West Texas to the Sea of Oman and everywhere in-between. You'll also learn where you can download the datasets in each feature.

<https://earthdata.nasa.gov/learn/user-resources/who-uses-nasa-earth-science-data-user-profiles>

Dr. Eric Bullock

Post-Doctoral Researcher; Center for Remote Sensing, Boston University, Boston, MA



Deforestation is taking a toll on the Amazon and other areas of high biodiversity. Dr. Eric Bullock uses Earth observation data to explore the consequences of land use and land cover change in these areas.

<https://go.nasa.gov/3cbQPW8>

Dr. David Lagomasino

Assistant Professor, Department of Coastal Studies, East Carolina University, Greenville, NC; Research Scientist, East Carolina University Coastal Studies Institute, Wanchese, NC



Coastal ecosystems are some of Earth's most biologically diverse environments, especially coastal mangrove forests. Dr. Lagomasino uses Earth observing data to study these vital biomes.

<https://go.nasa.gov/3819J1z>

Dr. Sparkle Malone

Assistant Professor, Department of Biological Science, Florida International University, Miami, FL



Global climate change is leading to shifts in vital ecosystems. Dr. Malone uses Earth observation data to explore how a changing climate impacts ecosystem structure and function.

<https://go.nasa.gov/2XoJ0qj>

DATA CHATS



Katie Baynes

NASA EOSDIS System Architect*

For NASA EOSDIS System Architect Katie Baynes, having NASA Earth observing data in the commercial cloud will foster not only a new community of data users, but also new communal ways of using these data.

*Katie Baynes is currently the Deputy Program Executive for NASA's Earth Science Data Systems (ESDS) Program.

<https://earthdata.nasa.gov/learn/data-chat/data-chat-katie-baynes>



Mark McInerney

NASA EOSDIS Project Deputy Project Manager-Technical

The technical requirements for moving NASA EOSDIS data into the commercial cloud are enormous. Mark McInerney oversees this effort and helps ensure these data are interoperable with similar data from other agencies.

<https://earthdata.nasa.gov/learn/data-chat/data-chat-mark-mcinerney>

ANNOUNCEMENTS

New Dataset of Greenland Ice Sheet DEMs Available at NASA's PO.DAAC

A dataset with digital elevation models (DEMs) of the Greenland Ice Sheet is the latest release from NASA's Oceans Melting Greenland (OMG) mission.

A new dataset with gridded digital elevation models (DEMs) of Greenland Ice Sheet outlet glaciers is available through NASA's Physical Oceanography Distributed Active Archive Center (PO.DAAC). The dataset, OMG Glacial Elevations from

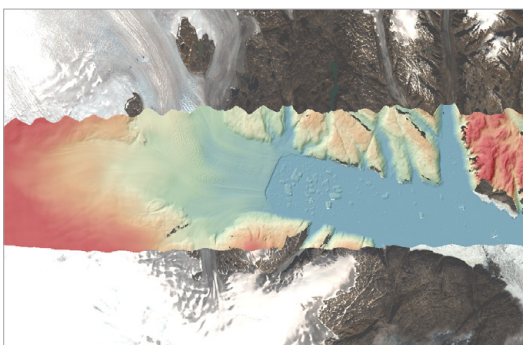


Image created from OMG GLISTIN-A data showing the elevation of Helheim Glacier and Sermilik Fjord in southeast Greenland. The glacier flows from left to right (approximately west to east), from areas of high elevation (red) down to sea level (blue). The DEM is shaded by surface slope to highlight surface features revealed by elevation measurements: the crevassing and cracking of the glacier surface as it accelerates downstream, the calving front where the glacier meets the ocean, and the broken icebergs floating within the fjord. The fjord is bordered by mountains several hundred meters tall (orange and red), showing the vertical scale of the ice inland of Helheim glacier relative to sea level. The DEM is overlain on a 'Natural Color' Landsat 8 image. Image Courtesy NASA/JPL-Caltech.

GLISTIN-A Ver. 1 (DOI: [10.5067/OMGEV-GLNA1](https://doi.org/10.5067/OMGEV-GLNA1)), is part of the Oceans Melting Greenland (OMG) mission and is created from data collected by the Glacier and Land Ice Surface Topography Interferometer-Airborne (GLISTIN-A) radar.

GLISTIN-A campaigns were performed in 2016, 2017, 2018, and 2019 using a NASA Gulfstream III jet aircraft to generate high-resolution, high-precision elevation measurements of Greenland's coastal glaciers. GLISTIN-A is an airborne single-pass interferometric Ka-band radar that provides digital elevation maps of the glaciers and surrounding areas near the glacier's termination points. This new dataset facilitates analysis of year-to-year glacier surface elevation changes, and the dataset's 50-meter horizontal resolution DEMs can be used to quantify ice volume change near glacier termini. These data, along with observations of airborne marine gravity and ship-based observations of sea floor geometry, are part of a revolutionary dataset for modeling ocean/ice interactions for improved estimates of global sea level rise.

Greenland's ice sheet contains enough water to raise global sea levels by as much as 7.4 meters (25 feet), according to the OMG mission website. The objective of NASA's five-year (2015-2020) OMG mission is to better understand the



ocean's role in melting Greenland's glaciers. Using a combination of airborne, in situ, and seaborne resources, OMG is gathering data about water temperature and glaciers around Greenland to assess how fast the ice sheet is melting and how fast global sea levels will rise as a consequence of this melting.

PO.DAAC is NASA's Earth Observing System Data and Information System (EOSDIS) DAAC responsible for data and related information pertaining to the physical processes and conditions of the global oceans, including measurements of ocean winds, temperature, topography, salinity, circulation and currents, and sea ice. PO.DAAC is located at NASA's Jet Propulsion Laboratory in Pasadena, California.

Learn More

PO.DAAC OMG mission page: <https://podaac.jpl.nasa.gov/OMG>

Download GLISTIN-A data using PO.DAAC Drive: <https://podaac-tools.jpl.nasa.gov/drive/files/allData/omg/L3/elevation/GLISTINA>

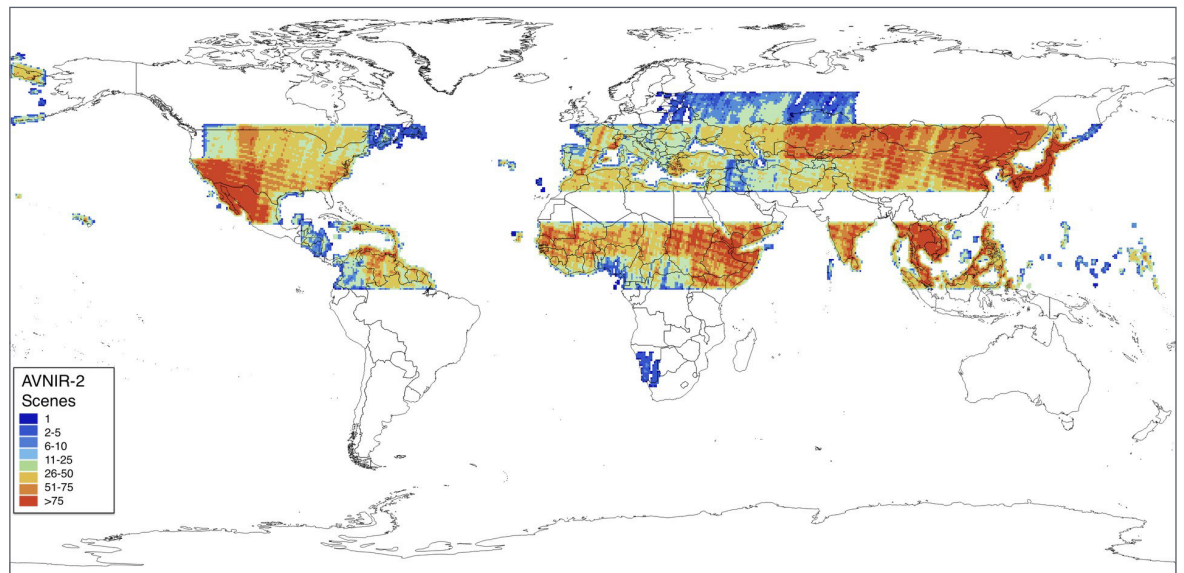
Explore OMG mission data: <https://omg.jpl.nasa.gov/portal/browse/> ■

Published May 13, 2020

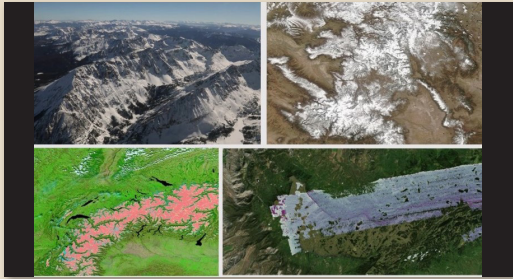
ALOS AVNIR-2 Ortho Rectified Image Product Availability

Need optical data?
Advanced Land
Observation Satellite
(ALOS) Advanced

Visible and Near Infrared Radiometer type 2 (AVNIR-2) Ortho-Rectified Image products created by the Japan Aerospace Exploration Agency (JAXA) are now available through NASA's Alaska Satellite Facility Distributed Active Archive Center (ASF DAAC) as a result of a partnership between NASA and JAXA. New products are added daily. Discover and access these data: <https://search.asf.alaska.edu/#/?dataset=AVNIR> ■

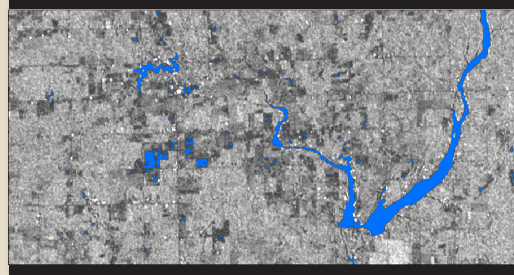


WEBINARS NASA EARTHDATA



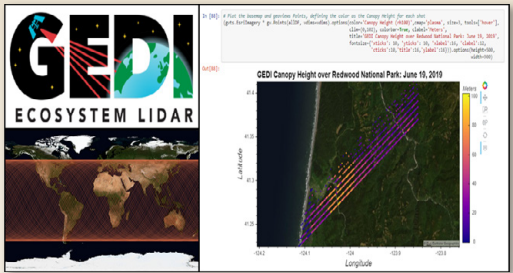
Let It Snow!
Accessing and Analyzing Snow Data at the NSIDC DAAC

<https://youtu.be/zXzrQbaxlB4>



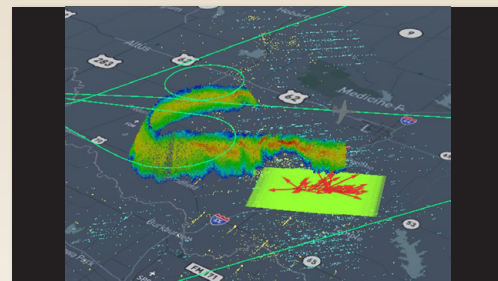
Special Two-Part SAR Webinar: Part 2- Applications of SAR Data in GIS Environments

<https://youtu.be/gcZL2-ixTiY>



Getting Started with Global Ecosystems Dynamics Investigation (GEDi) Lidar Data

<https://youtu.be/UlrCC1Xp-wk>



Improving the DAAC User Experience with Cloud-based Capabilities

https://youtu.be/XzOmHN2_dRE



Special Two-Part SAR Webinar: Part 1- Introduction to Synthetic Aperture Radar (SAR) Data

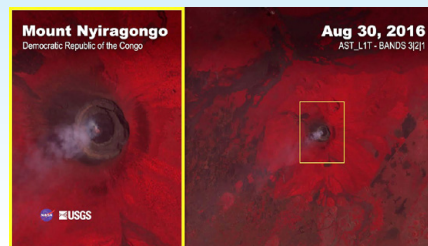
<https://youtu.be/qlSXbrrR8dM>

SPECIAL FEATURE VIDEOS



LP DAAC Prospectus: 2019-2021

<https://youtu.be/pCuE007qEqI>

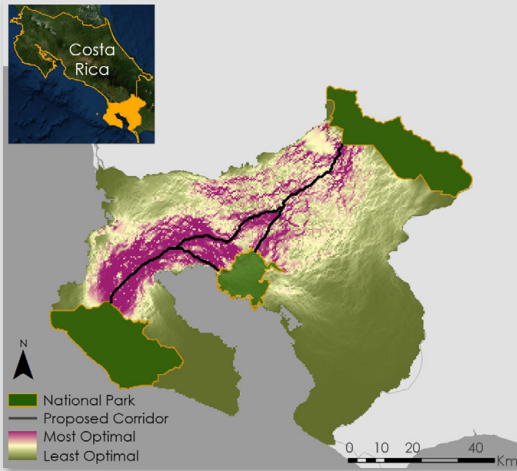


18 Years of Volcanic Eruptions: Mount Nyiragongo, Democratic Republic of the Congo

<https://youtu.be/RbDrHpEbMGw>

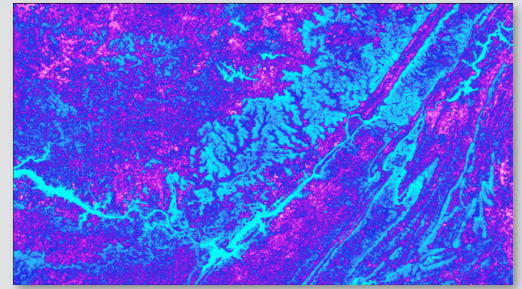
HIGHLIGHTS: DATA IN ACTION

Highlights from the NASA DEVELOP National Program Summer 2019 Term



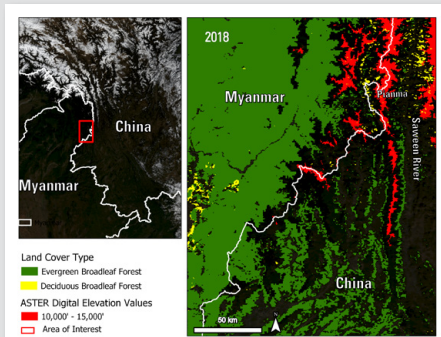
<https://bit.ly/2QoBCJ2>

Highlights from the NASA DEVELOP National Program Fall 2019 Term



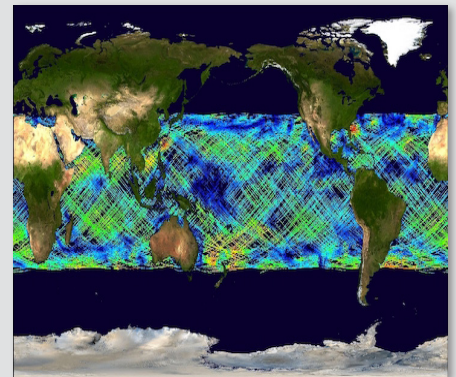
<https://bit.ly/34z65fE>

The Black Snub-Nosed Monkey: Differentiating and Discovering Suitable Habitat Using MODIS Land Cover Products and Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) Digital Elevation Models



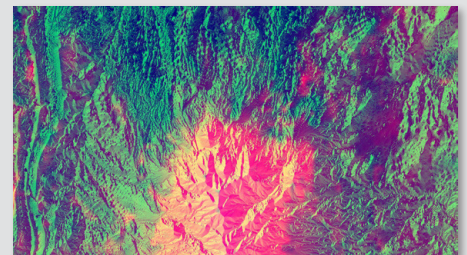
<https://bit.ly/38mRpQC>

NASA's Cyclone Global Navigation Satellite System (CGNSS) mission – tracking winds from space



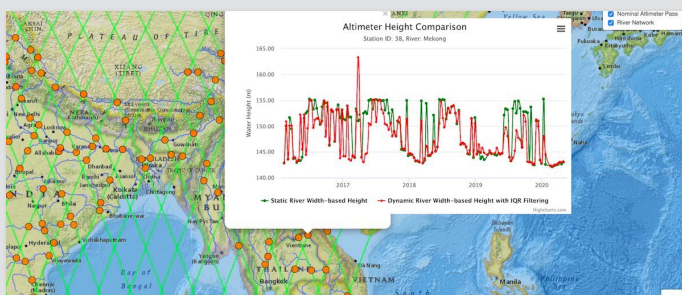
<https://go.nasa.gov/3gwhfUX>

Highlights from the NASA DEVELOP National Program Spring 2020 Term



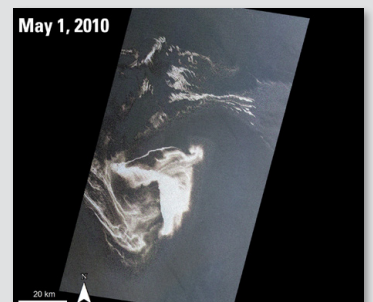
<https://bit.ly/3jn0Rbj>

A River Runs Through It – Observation and Management



<https://go.nasa.gov/2QtXGBY>

Innovative Use of ASTER Data to Study Oil Spills

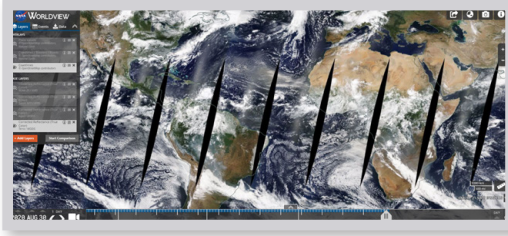


<https://bit.ly/3aXjUWu>



DATA Recipes & Tutorials

Video Tutorial: Getting Started with NASA Worldview

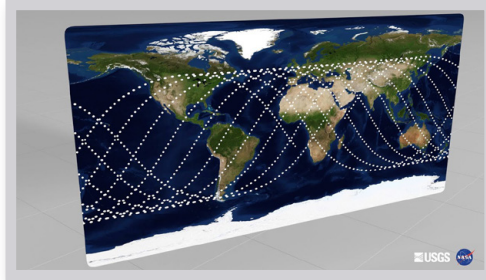


During this demonstration, we will introduce you to the NASA Worldview imagery mapping and visualization application. This

tool provides the capability to interactively browse over 900 global, full-resolution satellite imagery layers.

View tutorial: https://youtu.be/nW8JZJ-5g_0

Video Tutorial: Understanding GEDI Mission Orbits

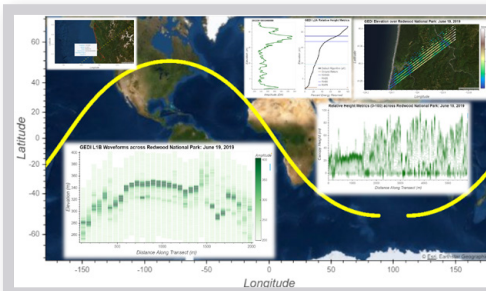


The joint NASA/University of Maryland Global Ecosystem Dynamics Investigation (GEDI) mission is a full-waveform lidar instrument

aboard the International Space Station (ISS) that produces detailed observations of the 3D structure of Earth's surface. GEDI precisely measures forest canopy height, canopy vertical structure, and surface elevation, and enhances our understanding of global carbon and water cycle processes, biomass estimates, biodiversity, and habitat. This video explores the unique GEDI orbit as it relates to the orbit of the ISS. The first part of the video explains the orbit of the ISS. The second part of the video shows several months of GEDI orbits at a global scale.

View Tutorial: <https://youtu.be/wxgrxvAKpTo>

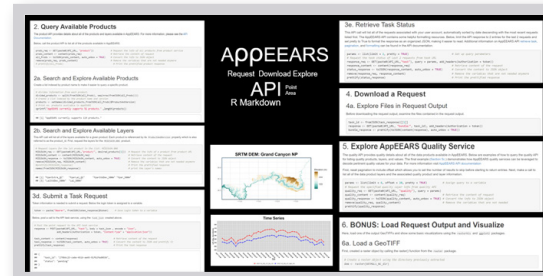
Getting Started with GEDI L1B-L2 Data in Python Jupyter Notebook Tutorial Series



These tutorials developed by NASA's Land Processes Distributed Active Archive Center (LP DAAC) show how to use Python to open

GEDI Level 1B-Level 2 files, visualize the full orbit of GEDI points (shots), subset to a region of interest, visualize GEDI full waveforms, and export subsets of GEDI science dataset (SDS) layers as GeoJSON files that can be loaded into GIS and/or Remote Sensing software programs. **Getting Started with L1B Data:** <https://bit.ly/3bbn5Kj>; **Getting Started with L2A Data:** <https://bit.ly/3bgvqsk>; **Getting Started with L2B Data:** <https://bit.ly/3hk9Cvx>

Getting Started with the AppEEARS API in R Tutorial Series



These tutorials demonstrate how to use R to connect to the Application for Extracting and Exploring Analysis Ready

Samples (AppEEARS) application programming interface (API), query the AppEEARS API for a list of available products, to submit either a point or area based sample request, download the request, understand how to work with the AppEEARS Quality API, and load the results into R for visualization. These tutorials were developed by NASA's LP DAAC.

Point Request: <https://bit.ly/3hL6Mq6>;

Area Request: <https://bit.ly/2Ey319f>

How to Navigate the New PO.DAAC Web Portal



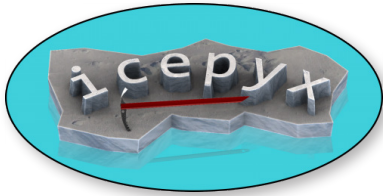
NASA's Physical Oceanography DAAC (PO.DAAC) has transitioned towards a web portal that is content centered and data driven, with personalized user experiences

that are supplemented with efficient search and discovery capabilities. This video tutorial showcases the new look and feel, and shows how to navigate the web portal. **View tutorial:** <https://go.nasa.gov/32HRDQ8>



DATA Recipes & Tutorials (continued)

Learn How to Use icepyx: Python Software Library to Access and Work with ICESat-2 Data

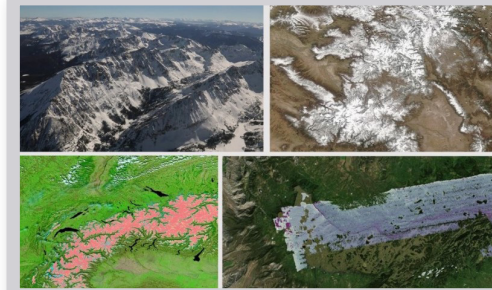


A new python software library called icepyx is available for accessing and working with NASA Ice, Cloud, and land Elevation Satellite-2 (ICESat-2) data. Acting as a wrapper around Application

Programming Interfaces (APIs) supported by NASA's National Snow and Ice Data Center Distributed Active Archive Center (NSIDC DAAC), icepyx enables data acquisition in as few as three lines of code.

Learn more about icepyx: <https://bit.ly/2DmTOjj>

Access and Compare Snow Depth and Snow Cover Data



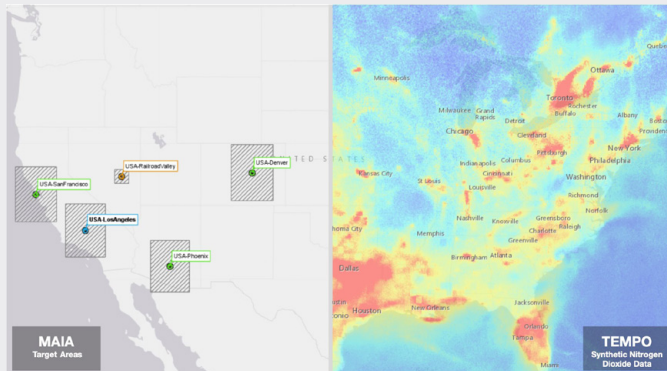
This Jupyter Notebook tutorial demonstrates how to access and compare coincident snow data from NASA's NSIDC DAAC across in-situ, airborne, and

satellite platforms from NASA's SnowEx, Airborne Snow Observatory (ASO), and MODIS data sets, respectively.

Access tutorial: <https://bit.ly/2GbanQh>

STORYMAP

Introduction to MAIA & TEMPO



Upcoming NASA missions will study air quality and its impact on human health at unprecedented temporal and spatial scales. The Multi-Angle Imager for Aerosols (MAIA) mission, which is currently in development and slated for launch in 2022, will observe global particulate matter; the Tropospheric Emissions: Monitoring Pollution (TEMPO) mission, also slated for launch in 2022, will observe hourly ozone and nitrogen dioxide for the Continental United States.

Learn more about these future missions in this new ArcGIS StoryMap created by NASA's Atmospheric Science Data Center (ASDC).

View StoryMap: <https://arcg.is/XyPma>

DATA PATHFINDERS

Earthquakes and Volcanoes

<https://earthdata.nasa.gov/learn/pathfinders/disasters/earthquakes-and-volcanoes>

Extreme Heat

<https://earthdata.nasa.gov/learn/pathfinders/disasters/extreme-heat>

Cyclones

<https://earthdata.nasa.gov/learn/pathfinders/disasters/cyclones>

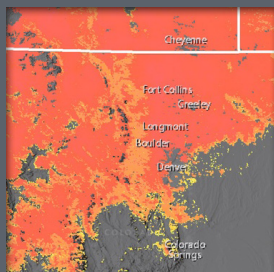
Geographical Information Systems (GIS)

<https://earthdata.nasa.gov/learn/pathfinders/gis-pathfinder>

COVID-19

<https://earthdata.nasa.gov/learn/pathfinders/covid-19>

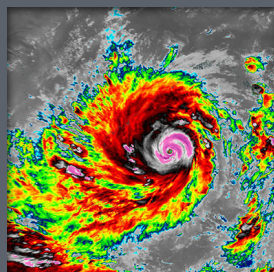
Summer 2020 NASA Earthdata Images



Record Breaking Early Snowfall in Boulder, Colorado

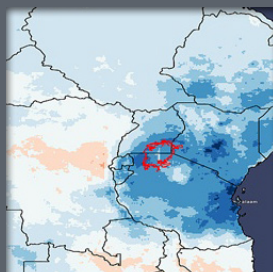
<https://earthdata.nasa.gov/mastheads>

(Published 5/18/20)



Tropical Cyclone Amphan in the Bay of Bengal

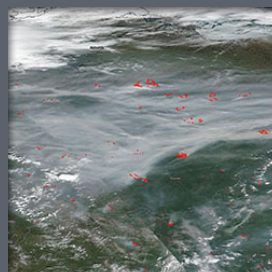
<https://go.nasa.gov/3g8WEXO>



Looking at Rainfall Anomalies in Africa and South America

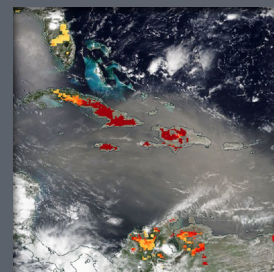
<https://earthdata.nasa.gov/mastheads>

(Published 6/22/20)



Fires and Smoke in Eastern Russia

<https://go.nasa.gov/2zclKV1>



Dust over the Atlantic Ocean

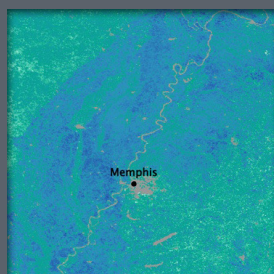
<https://earthdata.nasa.gov/mastheads>

(Published 7/13/20)



Western Europe at Night

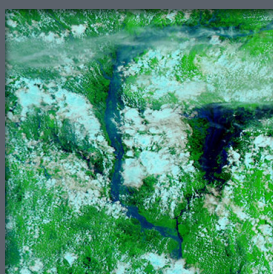
<https://go.nasa.gov/2Wi2nT0>



Surface Biogenic Carbon Fluxes

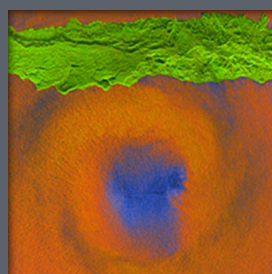
<https://earthdata.nasa.gov/mastheads>

(Published 7/6/20)



Flooding along the Brahmaputra River, Bangladesh

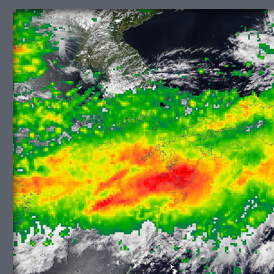
<https://go.nasa.gov/2ELf82l>



Tracking Tropical Cyclones from Space

<https://earthdata.nasa.gov/mastheads>

(Published 7/20/20)



Heavy Rains Over Kyushu Island, Japan

<https://go.nasa.gov/31XZE4l>

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