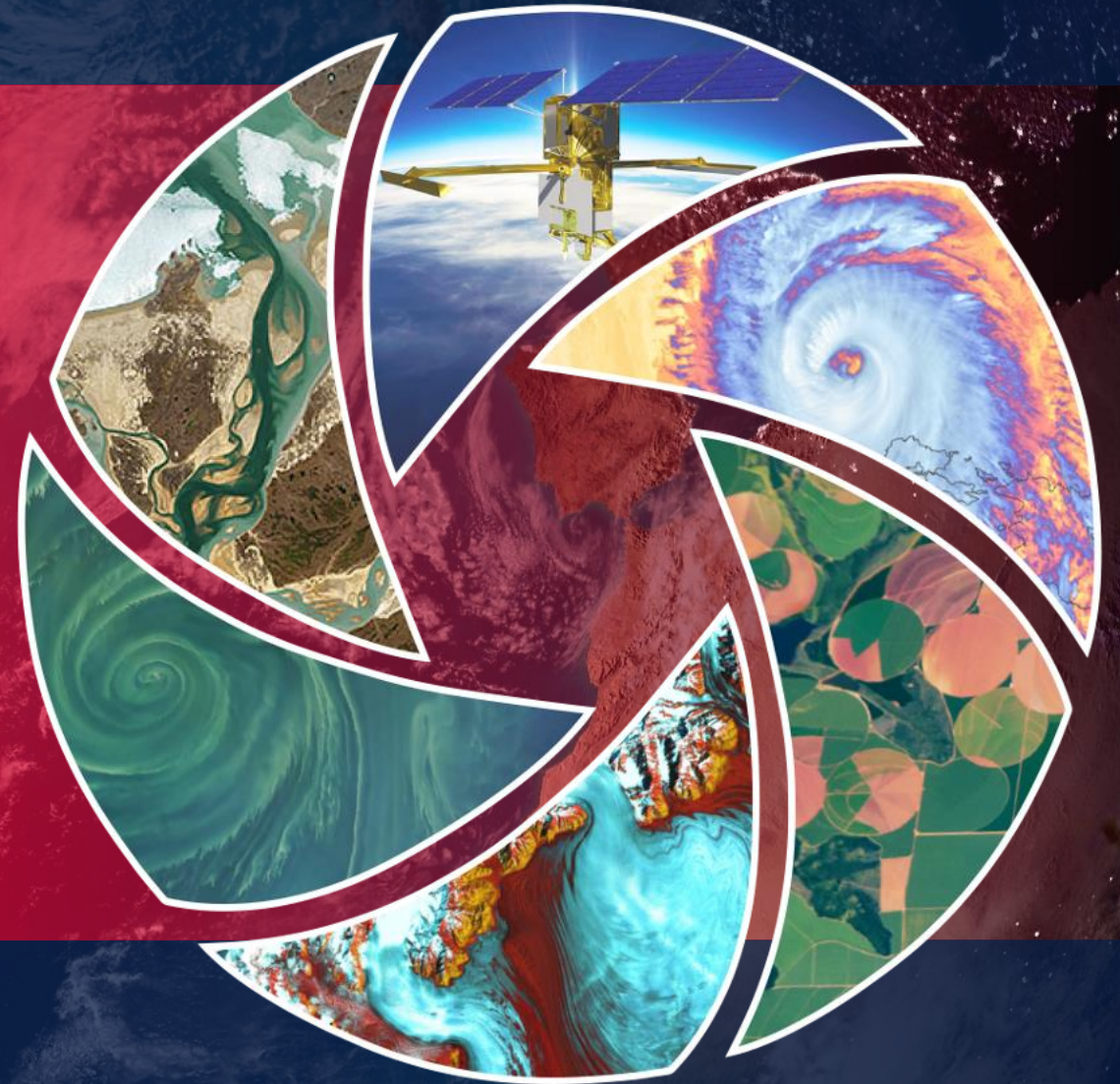


NASA Earth Science GIS Resources

January 2025

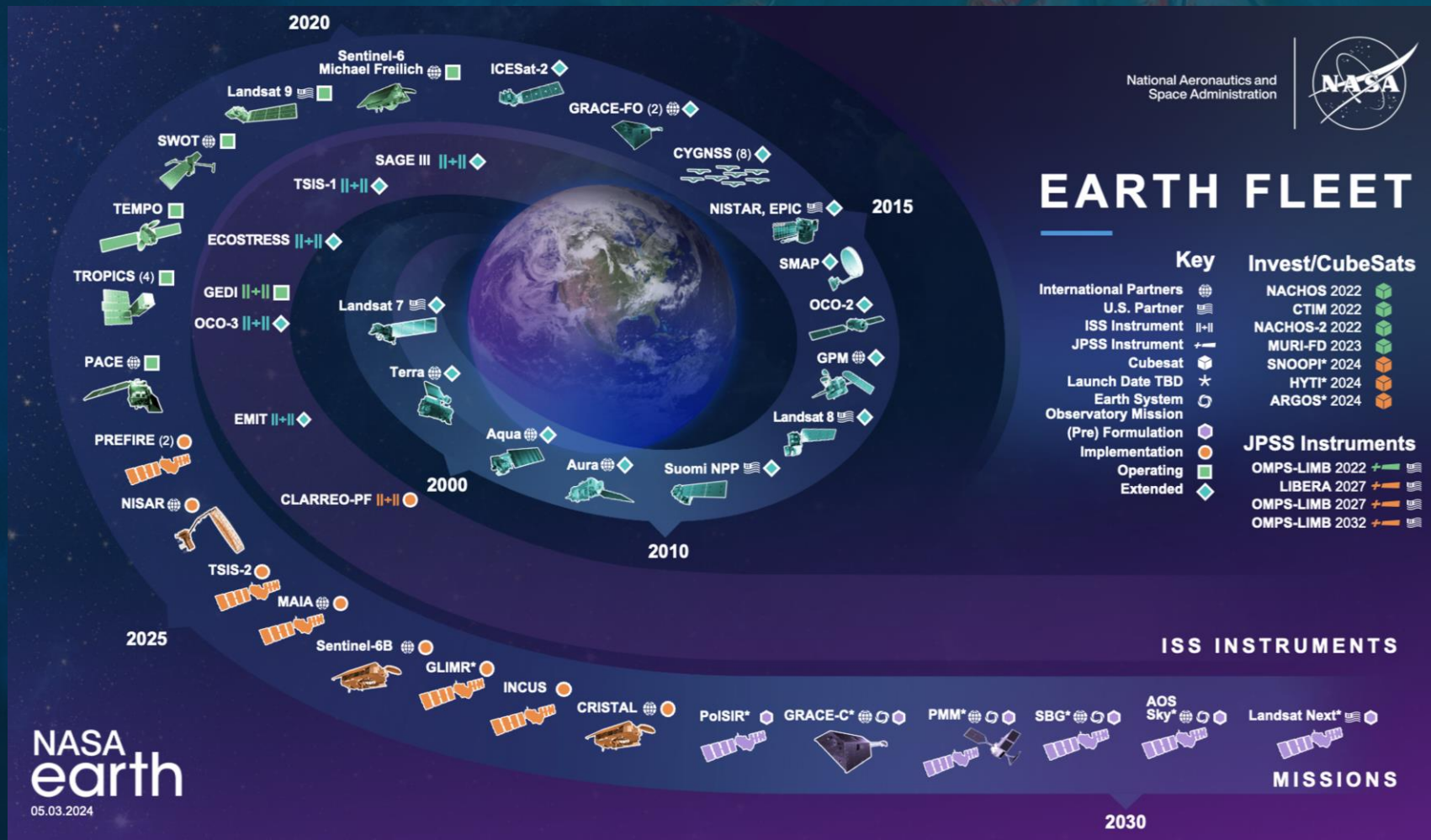
*State Government Users and Federal Interagency
Committees Joint Meeting*



NASA... Earth Science?

Yes! Not only does NASA look out at the cosmos, we also look back at our Earth!

A NASA satellite took this photo!

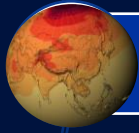


Who are we and why are we here?

NASA Earth Science Division: providing decades of data to help in understanding our planet's interconnected systems, from a global scale down to minute processes.



NASA produces data that is free to access & use for everyone!



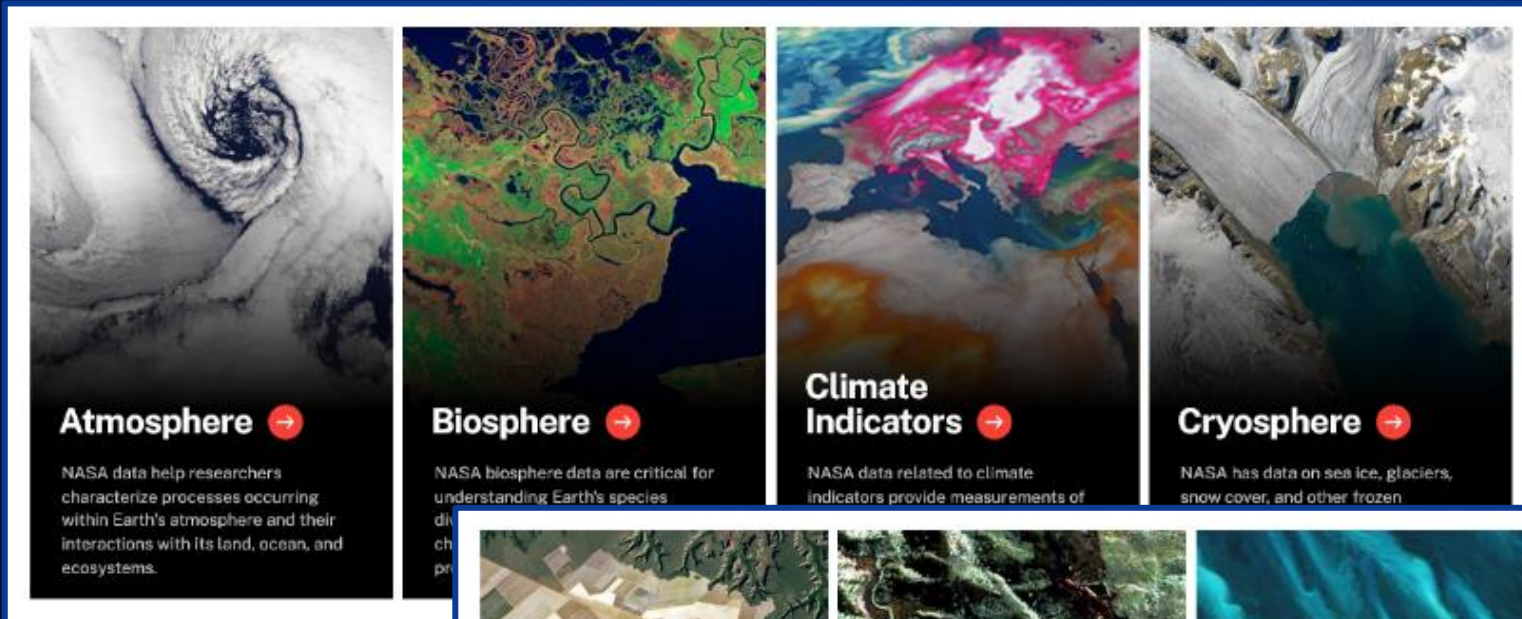
You can discover decades of data for anywhere in the world!



NASA offers tools & services for viewing, accessing, & interacting with data!

NASA has over **17,000** unique products & over **120** petabytes of Earth science data!

(free and open) Data for any Earth Science Field!



Atmosphere →
NASA data help researchers characterize processes occurring within Earth's atmosphere and their interactions with its land, ocean, and ecosystems.

Biosphere →
NASA biosphere data are critical for understanding Earth's species diversity and their interactions with the environment.

Climate Indicators →
NASA data related to climate indicators provide measurements of Earth's temperature, sea level rise, and other indicators.

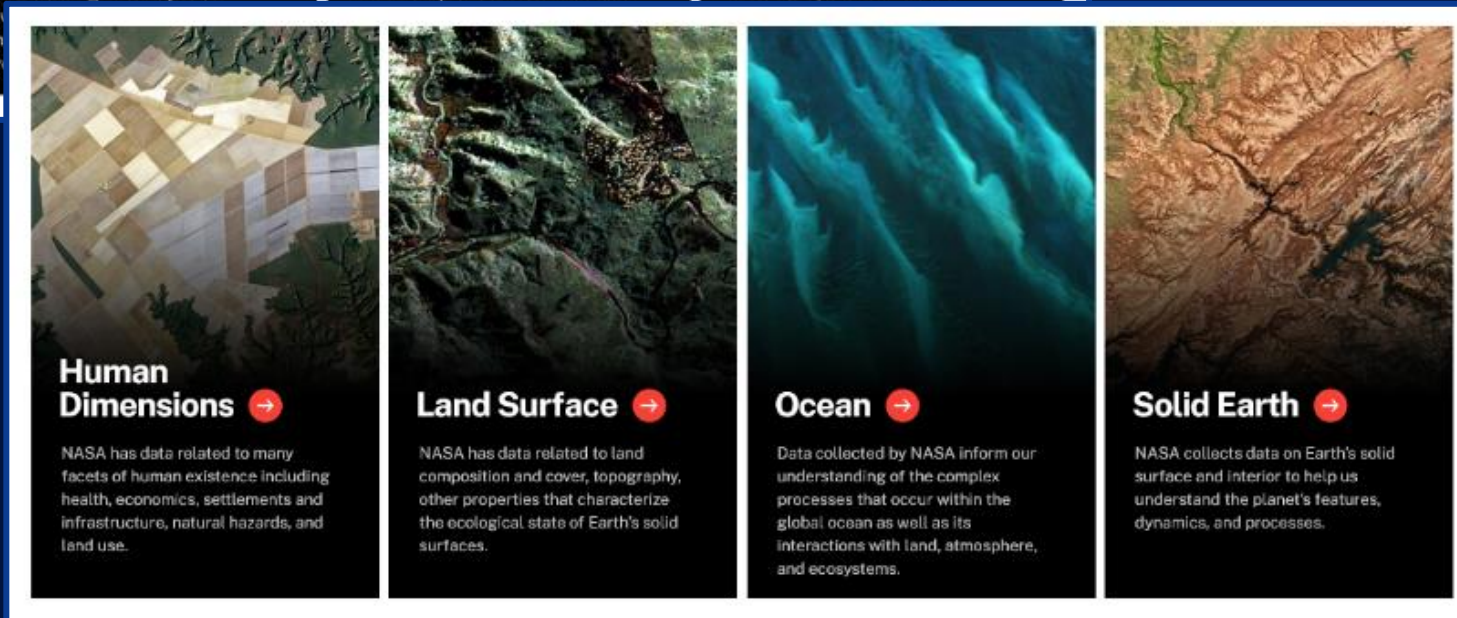
Topics Glossary

Access the data you need by drilling down to a specific Earth science discipline—or two, or three. Each topic functions as a data pathfinder, connecting you with datasets, tools, and resources to optimize your research.

Search topics

AB C D E F G H I K L M N O P R S T U V W

Ablation Zones/Accumulation Zones	Abyssal	Advection
Aeolian Landforms	Aerosol Backscatter	Aerosol Optical Depth/Thickness
Aerosol Particle Properties	Aerosols	Afforestation/Reforestation
Agricultural Expansion	Agricultural Lands	Agriculture Production
Air Mass/Density	Air Quality	Air Temperature
Airlow	Albedo	Alpine/Tundra
Altitude	Anthropogenic/Human Influenced Ecosystems	Aquaculture
Aquaculture Production	Aquatic Ecosystems	Aquatic Sciences
Aquifer Recharge	Aquifers	Arctic Oscillation
Atmosphere	Atmospheric Carbon Dioxide	Atmospheric Carbon Monoxide
Atmospheric Chemistry	Atmospheric Electricity	Atmospheric Feedbacks



Human Dimensions →
NASA has data related to many facets of human existence including health, economics, settlements and infrastructure, natural hazards, and land use.

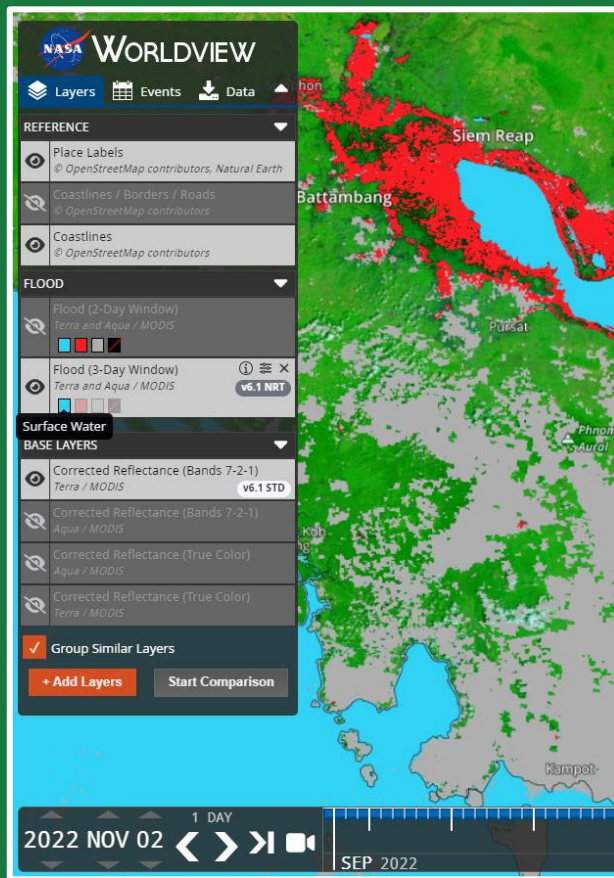
Land Surface →
NASA has data related to land composition and cover, topography, and other properties that characterize the ecological state of Earth's solid surfaces.

Ocean →
Data collected by NASA inform our understanding of the complex processes that occur within the global ocean as well as its interactions with land, atmosphere, and ecosystems.

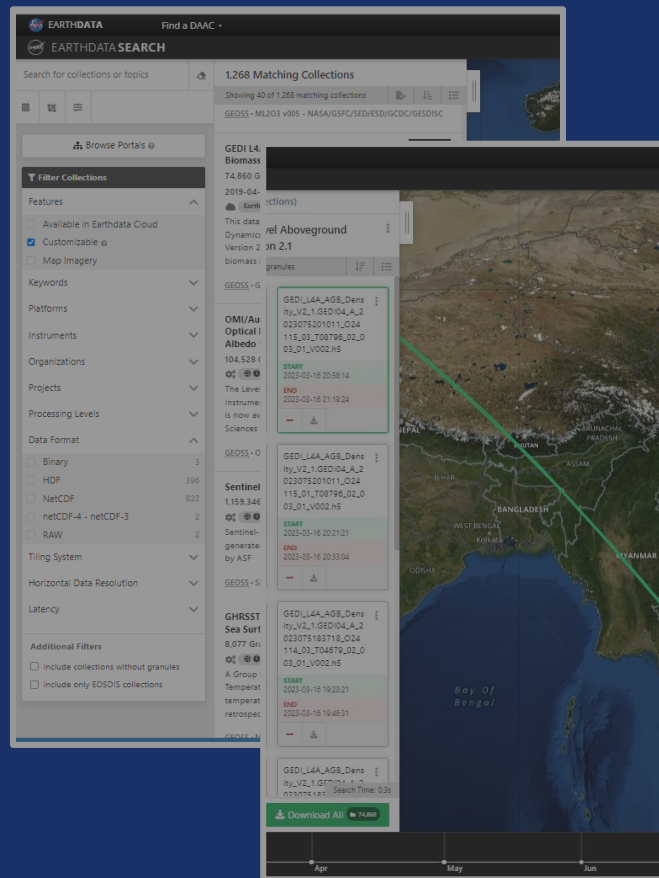
Solid Earth →
NASA collects data on Earth's solid surface and interior to help us understand the planet's features, dynamics, and processes.

Discovery & Access Methods

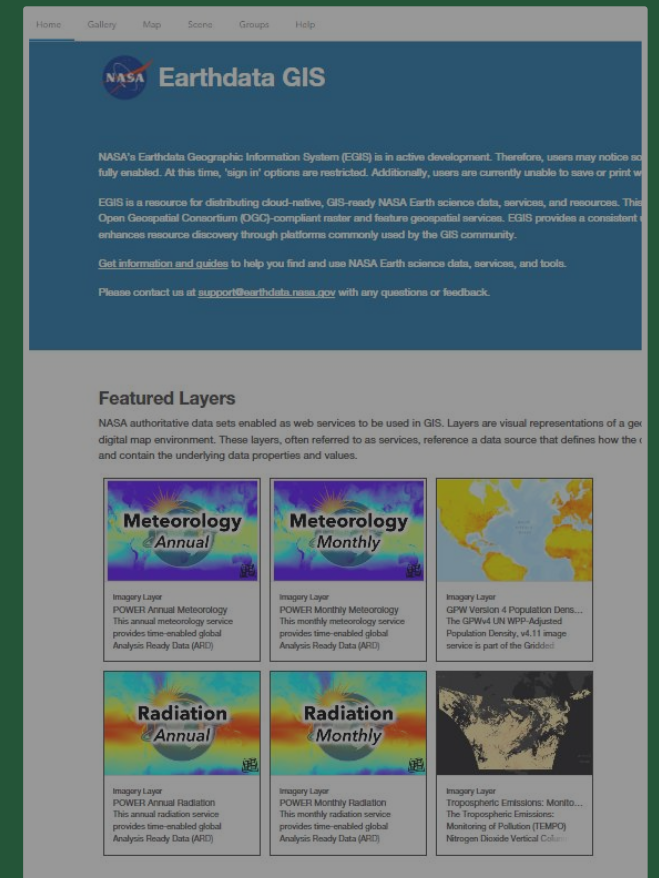
Worldview *visualize & browse imagery*



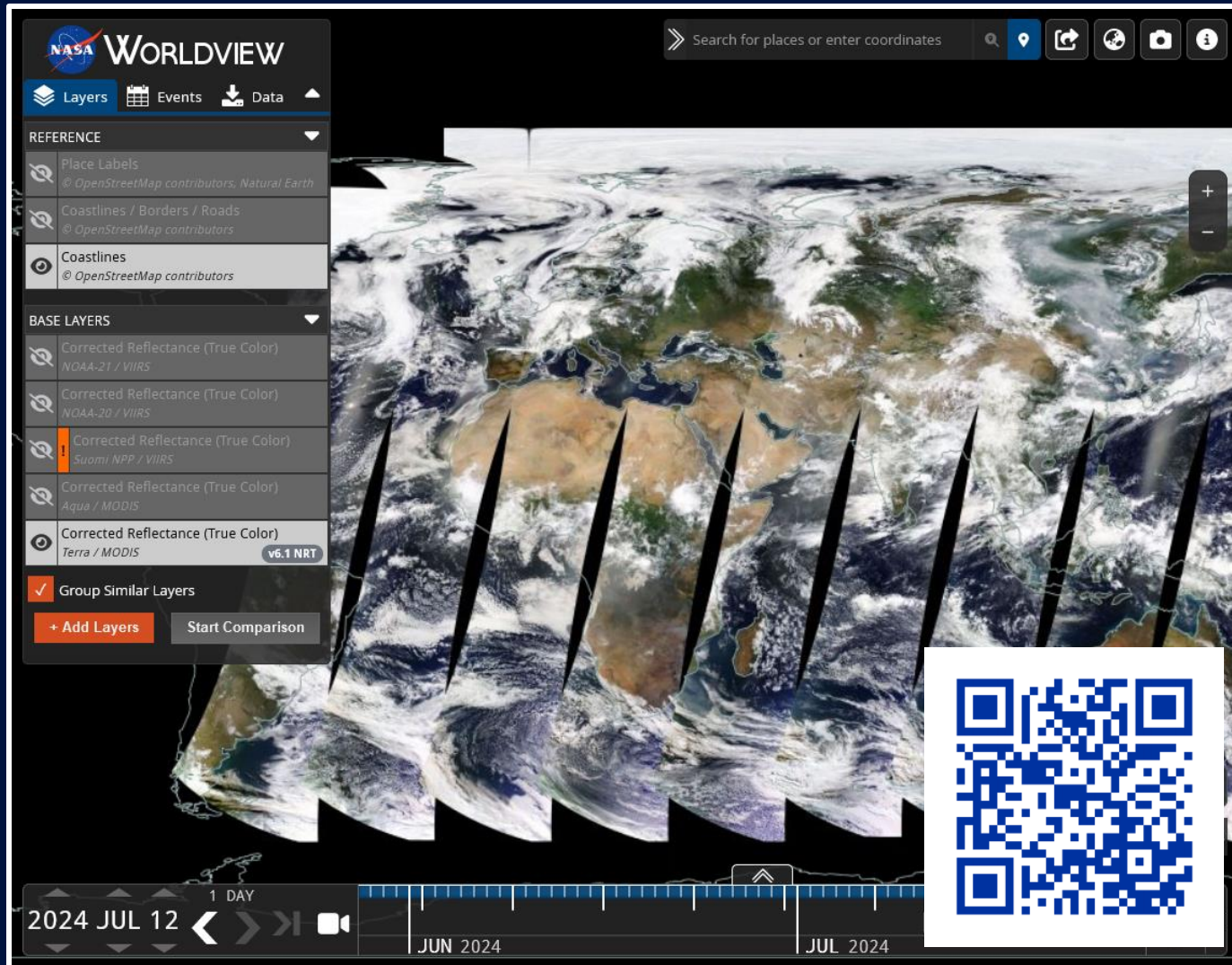
Earthdata Search *export & download data files*



Earthdata GIS (EGIS) *GIS services, maps, & apps*



Worldview: Discover Browse Imagery

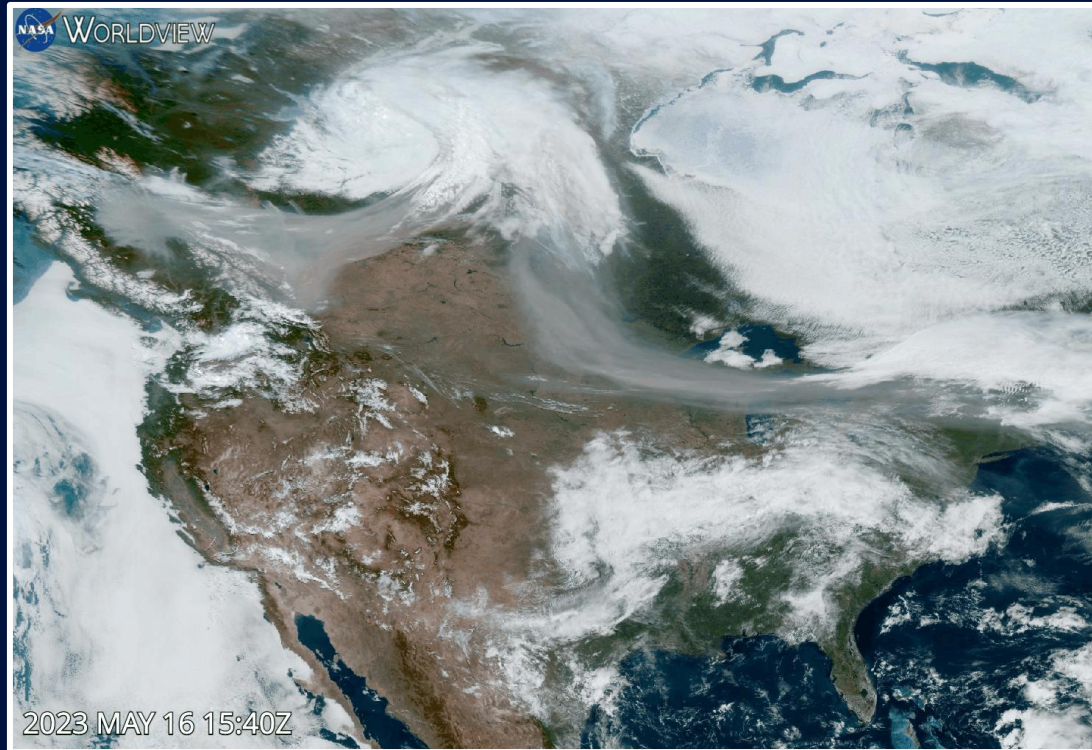


Interactively browse ~1,000 global, full-resolution satellite imagery layers, known as the Global Imagery Browse Services (GIBS)

Discover imagery within minutes to hours of it being acquired as well as imagery from the past few decades

Catalog accessible via time-enabled OGC WMS end point

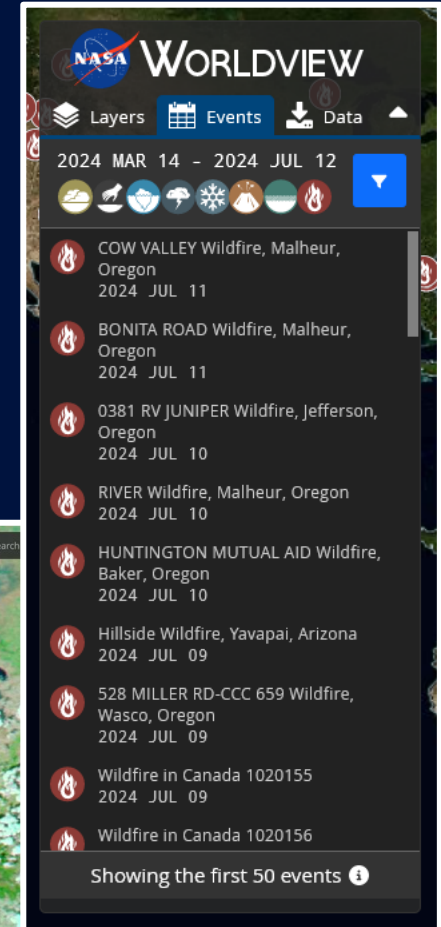
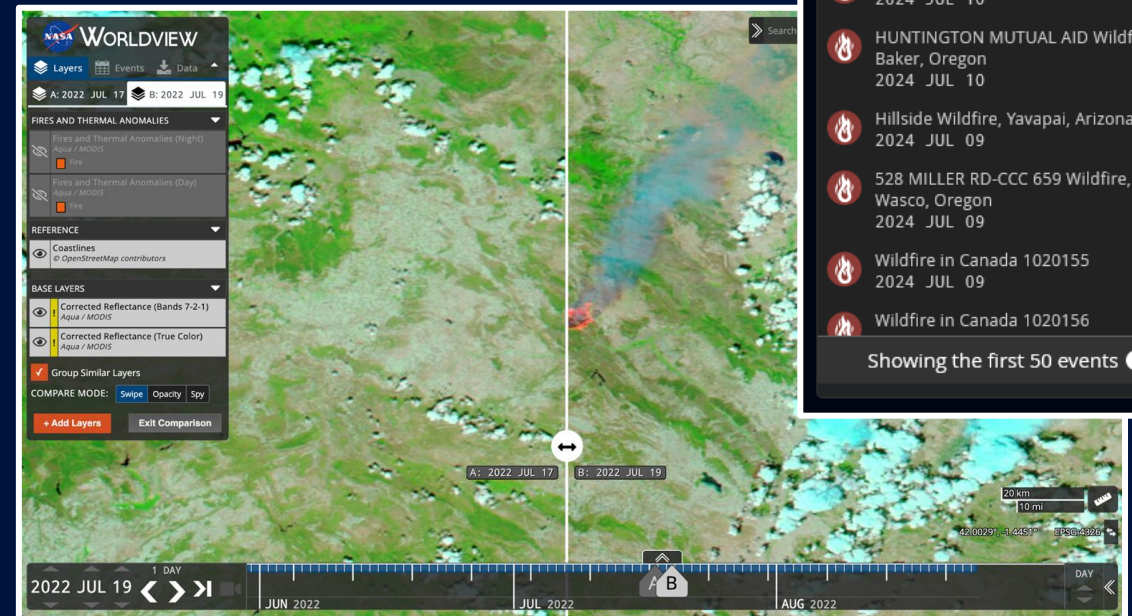
Worldview: Discover Browse Imagery



↑ **Animation:** Users can create animations & export to imagery as GIFs.

→ **Events:** Users can explore a recent events

↓ **Comparison:** Users can compare imagery side by side using a swipe tool.



Worldview: Discover Browse Imagery

NASA WORLDVIEW

Layers Events Data

Downloading data will be performed using NASA's Earthdata Search application.

Why are some layers not available?

Corrected Reflectance (True Color)
NOAA-21 / VIIRS

- Near Real-Time - v2 ⓘ
- **Near Real-Time - v2 ⓘ**
- Near Real-Time - v2 ⓘ
- Near Real-Time - v2 ⓘ

Corrected Reflectance (True Color)
NOAA-20 / VIIRS

- Near Real-Time - v2.1 ⓘ
- **Near Real-Time - v2.1 ⓘ**
- Near Real-Time - v2.1 ⓘ
- Near Real-Time - v2.1 ⓘ

Corrected Reflectance (True Color)
Suomi NPP / VIIRS

- **Near Real-Time - v2 ⓘ**

Set Area of Interest

Available granules for 2024 JUL 15:
6 of 241 (1.06 GB) ⓘ

DOWNLOAD VIA EARTHDATA SEARCH

1 DAY
2024 JUL 15 MAY 2024

41.4491°, -73.1722°
37.1422°, -78.9754°

Leaving Worldview

NASA EARTHDATA SEARCH

You are about to be transferred to the NASA Earthdata Search tool. This tool is used to download data granules using the selected layer, area of interest, and current date.

Show More Info

COLLECTION:
Near Real-Time - v2
VIIRS/JPSS2 Imagery Resolution 6-Min L1B Swath 375m NRT

LAYER:
Corrected Reflectance (True Color)
NOAA-21 / VIIRS

DATE:
2024 JUL 15

Continue

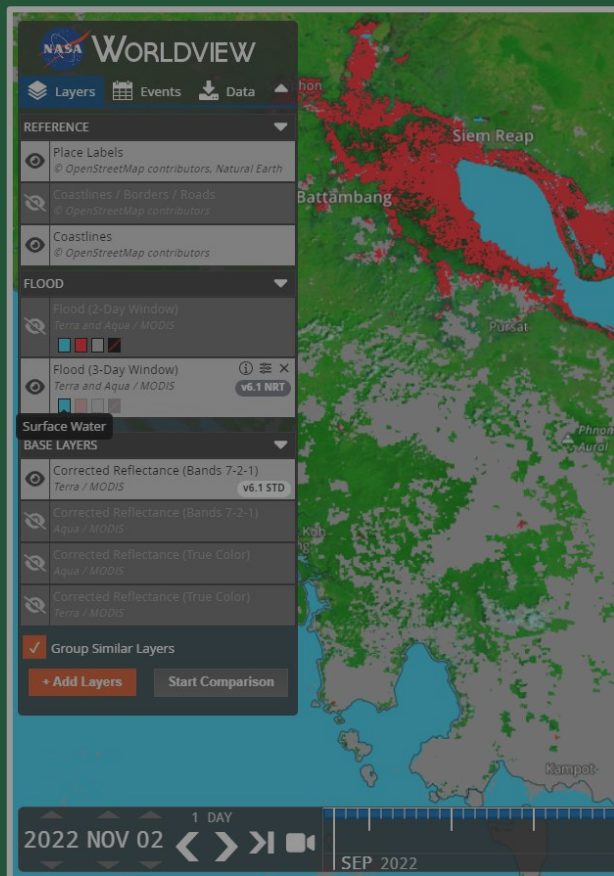
Do not show this message again.

Data Access: Users can now link directly to the data visualized!

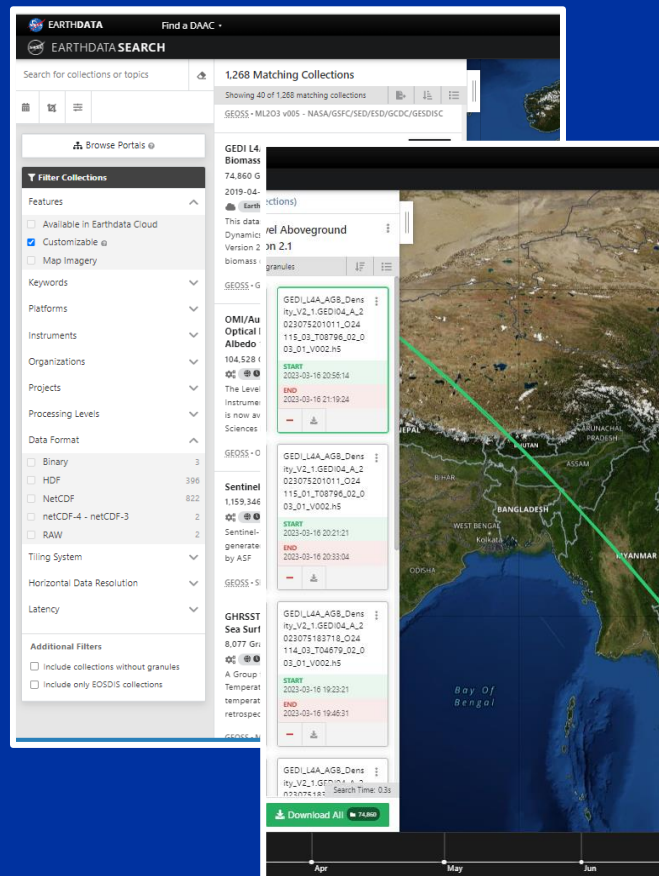
See granules available and estimated size before being directed to download

Discovery & Access Methods

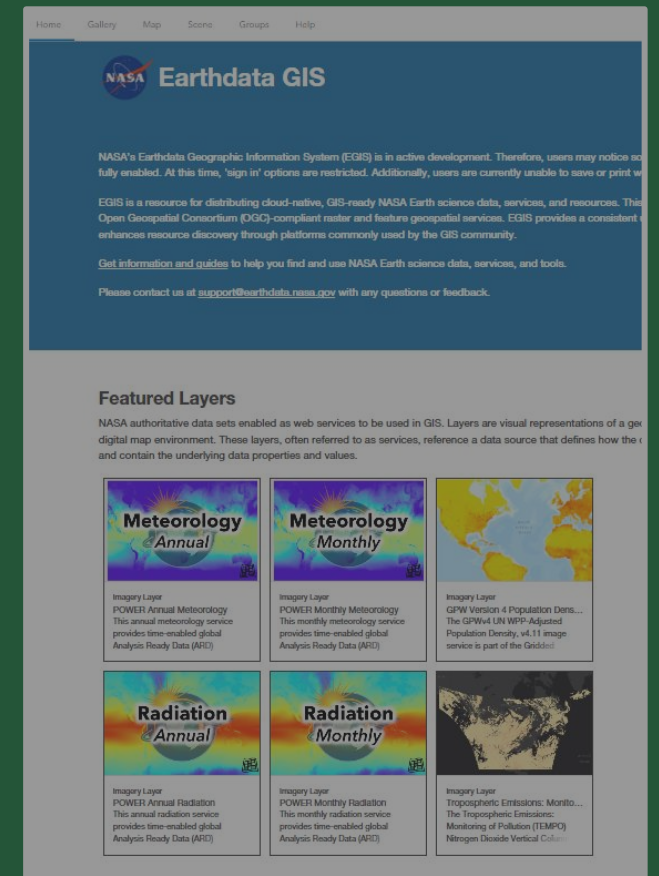
Worldview *visualize & browse imagery*



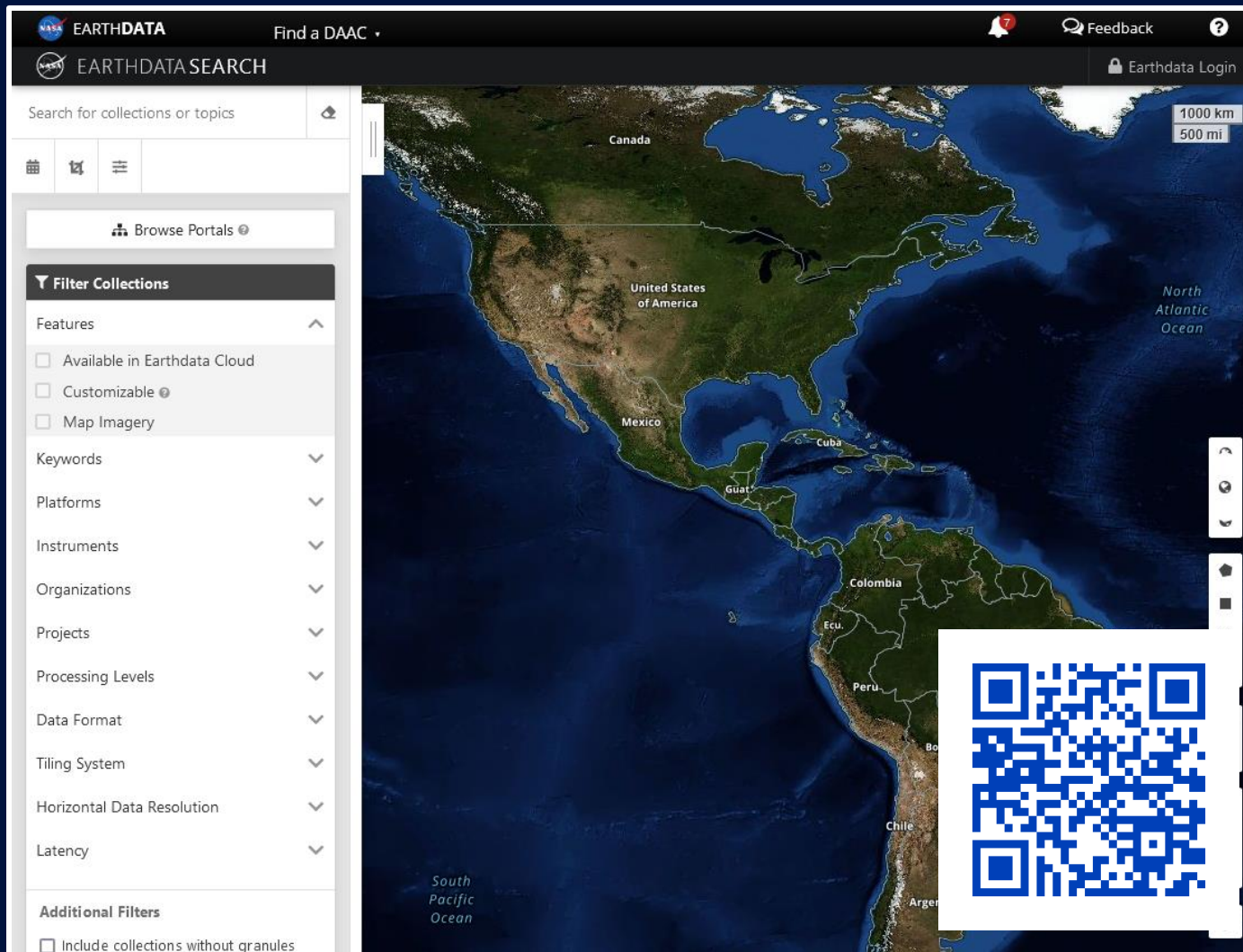
Earthdata Search *export & download data files*



Earthdata GIS (EGIS) *GIS services, maps, & apps*



Earthdata Search: Download Data



Earthdata Search provides **discovery, filtering, visualization & access** to all of NASA's Earth Science data.

This includes **thousands** of data collections.

~1400 collections are now **customizable**

Earthdata Search: Download Data

The screenshot shows the Earthdata Search interface. On the left, there is a 'Filter Collections' sidebar with 'Features' (Available in Earthdata Cloud, Customizable, Map Imagery) and 'Keywords' (3 Selected). Under 'Keywords', 'Atmosphere' is checked, with sub-categories like Aerosols (766), Air Quality (checked), Carbon Monoxide (118), Emissions (75), Lead (1), Nitrogen Oxides (47), Particulates (43), Smog (4), Sulfur Oxides (29), Tropospheric Ozone (129), Turbidity (14), Visibility (5), and Volatile Organic Compounds (65). Other categories include Altitude (268), Atmospheric Chemistry (1408), and Atmospheric Chemistry/Carbon... (7). The main area displays '7 Matching Collections' with details for the first three results, including granule counts and descriptions.

The platform offers free-text search & filtering by science area (keyword), platform, and/or instrument.

This interface allows users to specify search criteria. It includes 'Start' and 'End' date/time fields (YYYY-MM-DD HH:mm:ss), a 'Recurring?' checkbox, and 'Apply' and 'Clear' buttons.

Filter by date/time & spatial region

This interface shows options for selecting a spatial region: Polygon, Rectangle, Point, Circle, and File (KML, KMZ, ESRI, ...).

The screenshot shows a map view of search results for MODIS/Terra Land Surface Temperature/Emissivity 5-Min L2 Swath 1km V006. The map displays a color-coded temperature/emissivity distribution over the United States. Below the map, there is a table of granules with columns for Start, End, and other metadata. A 'Download All' button is visible for the 17 granules.

Display of search results on a map to preview images (browse)

Earthdata Search: Download Data

The screenshot shows the Earthdata Search interface. At the top, it says "EARTHDATA SEARCH" and "Find a DAAC". Below that, there's a search bar and a "1,268 Matching Collections" header. A list of collections is shown, with the first one being "GHRSSST Level 4 MUR Global Foundation Sea Surface Temperature Analysis (v4.1)". A red box highlights a "Supports customization:" tooltip that lists: "Spatial subset", "Temporal subset", "Variable subset", "Reformat", and "Combine". Another red box highlights a row of icons below the collection title, including a gear, a globe, a clock, and a document. A third red box highlights the "Customizable" checkbox in the "Filter Collections" sidebar.

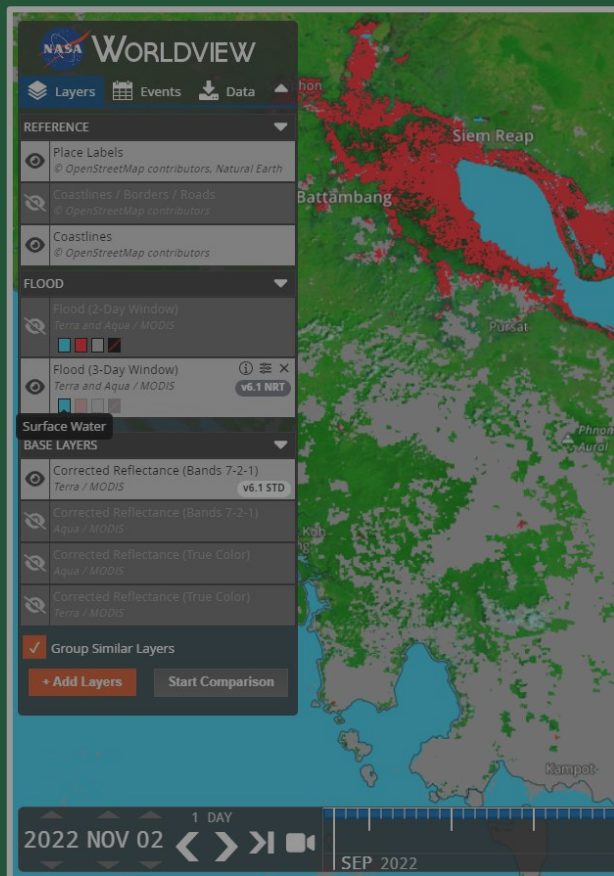
This dialog box is titled "Reformat Output (Optional)". It contains a section for "Output File Format" with a dropdown menu. The menu is open, showing three options: "No Reformatting" (selected), "No Reformatting", and "GeoTIFF".

This dialog box is titled "Projection Options". It contains a section for "Re-projection Options" with a dropdown menu. The menu is open, showing four options: "Geographic" (selected), "No Change", "Geographic", "Universal Transverse Mercator", and "Polar Stereographic".

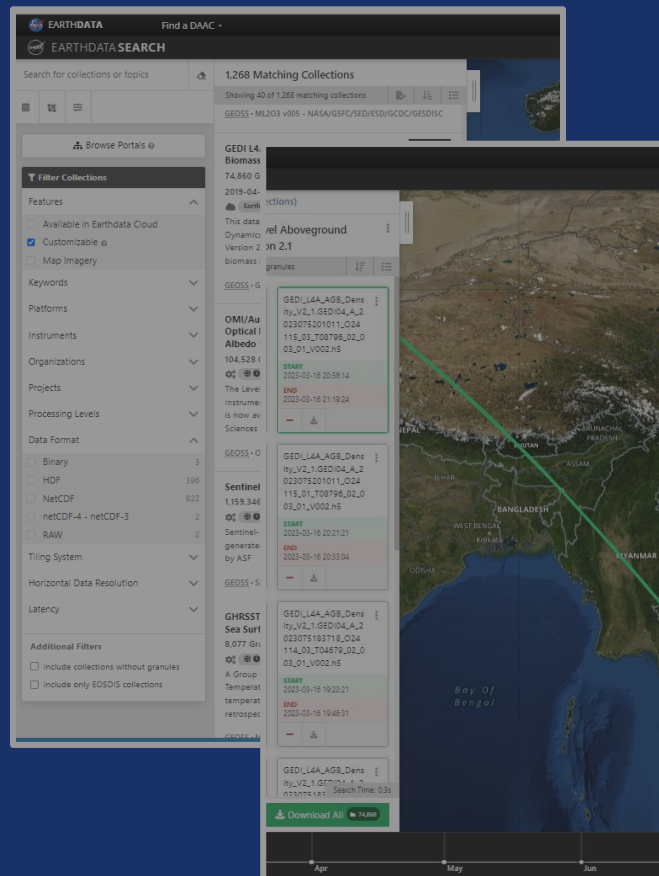
Customization: temporal, spatial, and variable subsetting and

Discovery & Access Methods

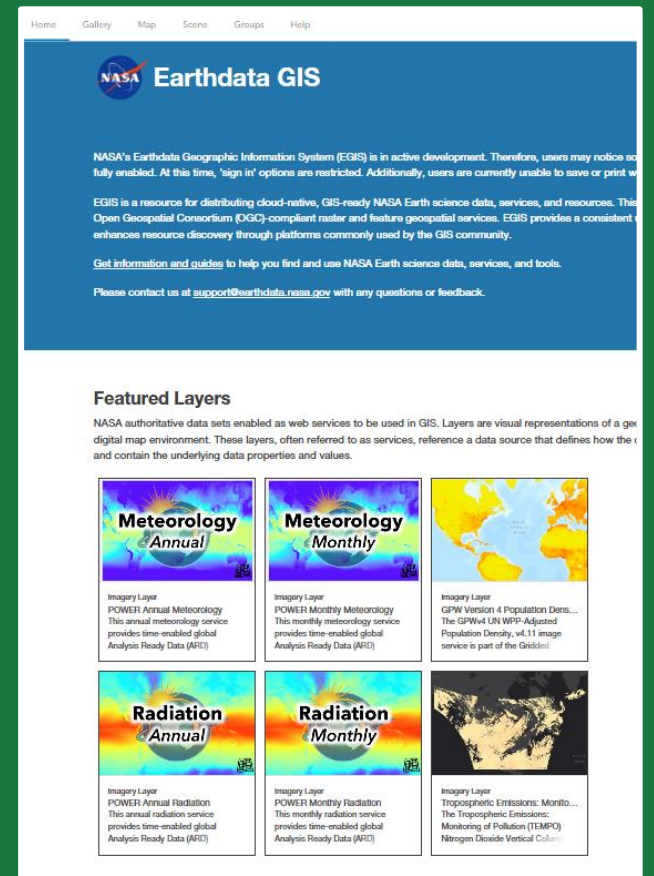
Worldview *visualize & browse imagery*



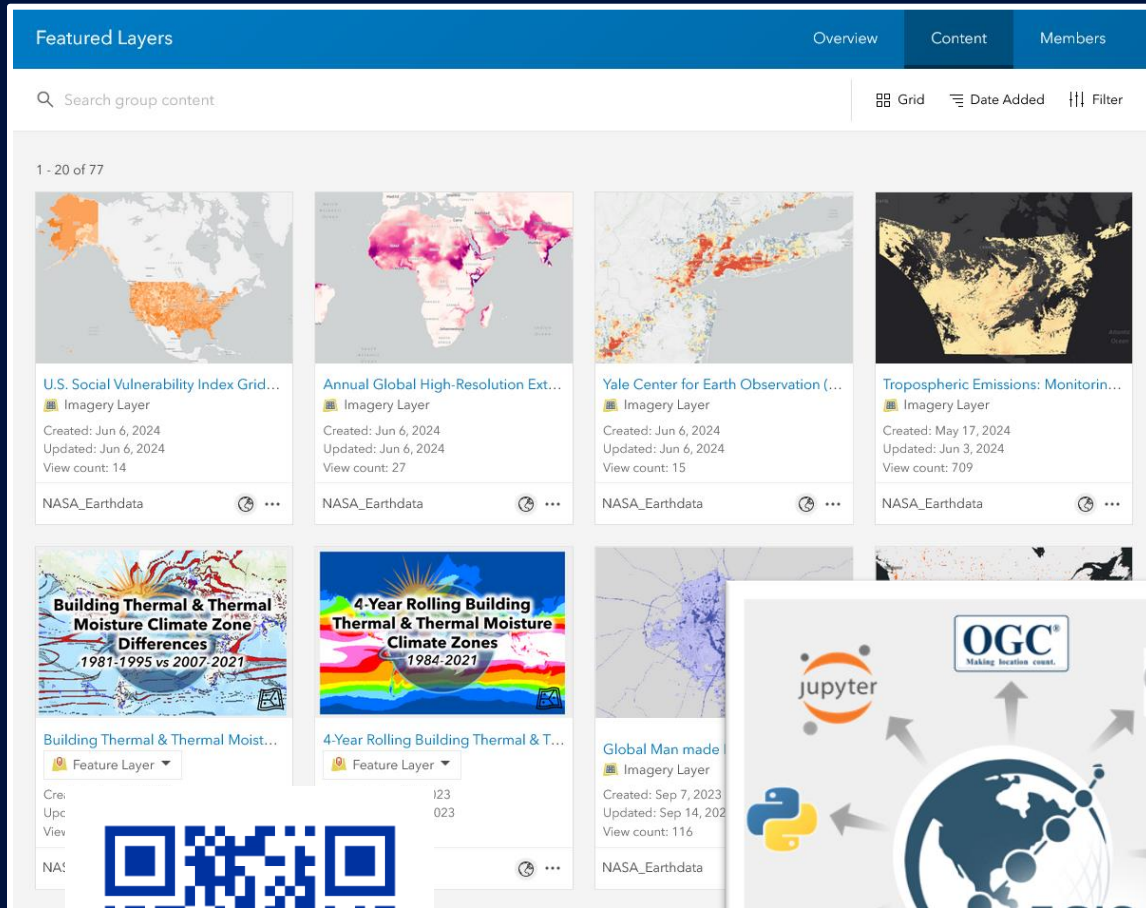
Earthdata Search *export & download data files*



Earthdata GIS (EGIS) *GIS services, maps, & apps*



Earthdata GIS: GIS Services, Maps, & Apps

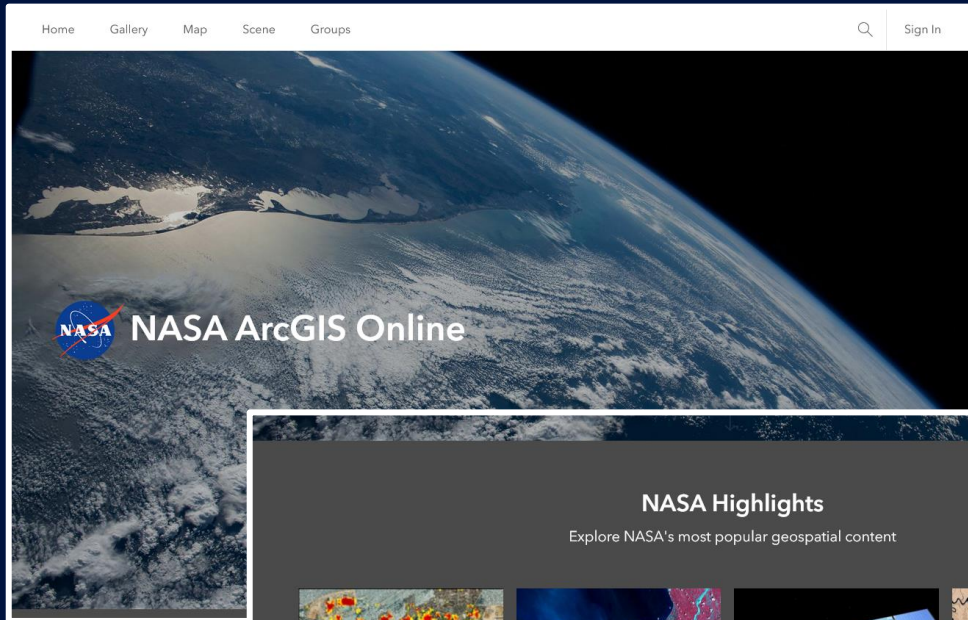


Earthdata GIS is a resource for distributing cloud-native, GIS-ready NASA Earth Science data, services, & resources. These include ArcGIS & Open Geospatial Consortium (OGC)-compliant raster & feature geospatial services.

175 image & 25 feature services offered!



NASA AGOL: Integrate NASA GIS Data



NASA has lots of data, layers, & maps available in the ArcGIS Online Platform, ready to be integrated into your next project or study.

NASA Highlights

Explore NASA's most popular geospatial content

<p>NASA Products for the Explosi...</p>	<p>Monitoring Flood Conditions u...</p>	<p>GIS at NASA (2023) Geographic Information Systems - going beyond mapping! Providing powerful capabilities to visuali...</p>	<p>Monitoring Drought using NAS...</p>
<p>Tropospheric Emissions: Monit... The Tropospheric Emissions: Monitoring of Pollution (TEMPO) Nitrogen Dioxide Vertical Column</p>	<p>Water States - Corrected Reflec... This visualization represents a "false color" band combination (M3-I3-M11) of data continuously colle...</p>	<p>The Prediction Of Worldwide Energy Resources (POWER) Project Provides solar & meteorological data from NASA research for support of renewable energy.</p>	<p>POWER Data Access Viewer POWER Data Access Viewer (DAV) supports access to community-based to analysis ready</p>



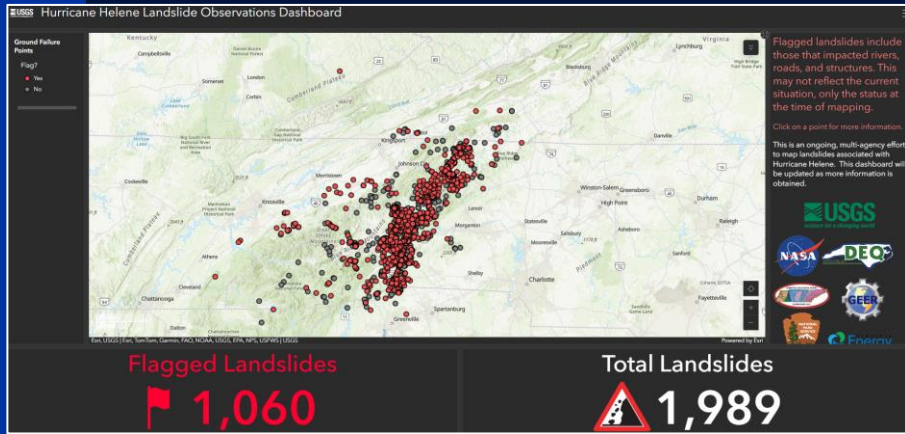
The ArcGIS Living Atlas of the World

ArcGIS Living Atlas of the World is the foremost collection of geographic information from around the globe. It includes maps, apps, and data layers to support your work.

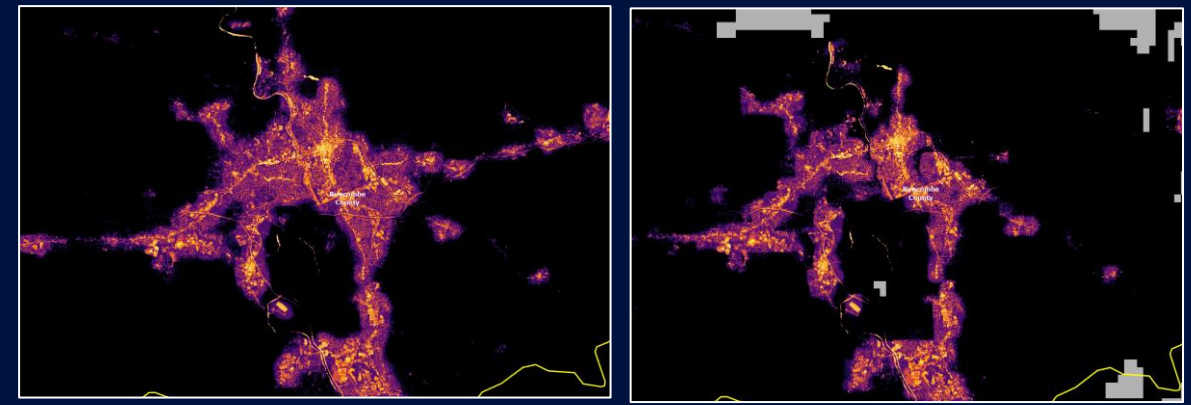
The screenshot shows the ArcGIS Living Atlas of the World website. At the top, there is a navigation bar with the Esri logo and links for ArcGIS, Industries, About, and Support. Below this is a dark header with the site title and navigation options: Home, Browse (highlighted), Apps, and Blog. A search bar contains the text "NASA Earthdata". Below the search bar is a row of icons representing different categories: All, Trending, Basemaps, Imagery, Boundaries, People, Infrastructure, and Environment. Further down, there are filters for content types, time, regions, and content ownership, along with a "Sort by" dropdown set to "Relevance". The main content area displays two search results for NASA Earthdata layers, each with a thumbnail map and a brief description.

< We are working to continually to increase the number of **NASA layers available in the Living Atlas of the World**

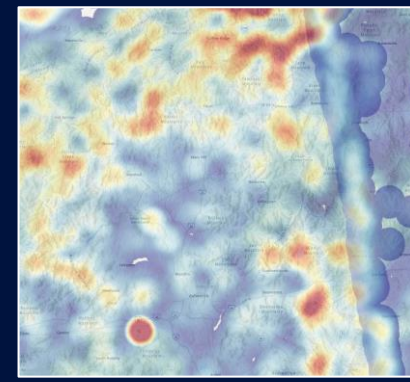
Applying Science: NASA Disasters Program



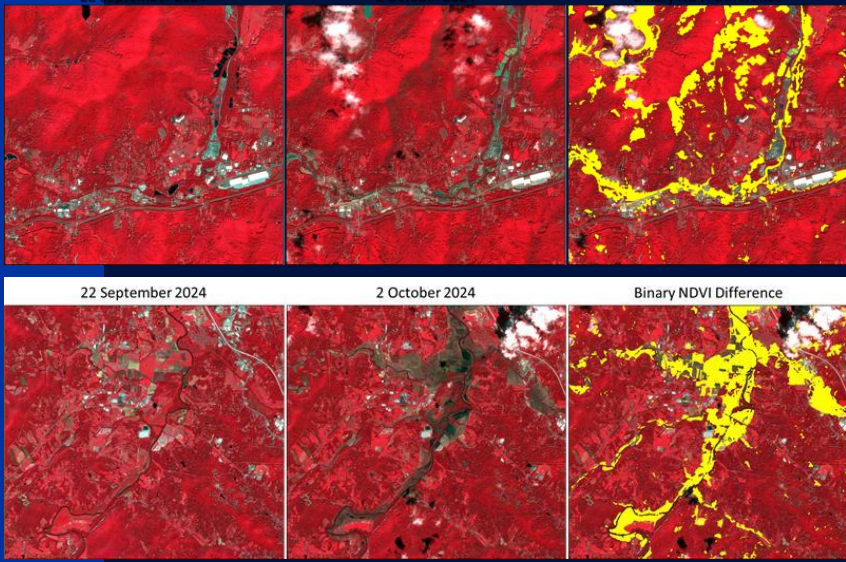
Right: Black Marble HD Night Lights Power Outage Map for Asheville, NC, Pre-event (Left) and Post-event (Right)



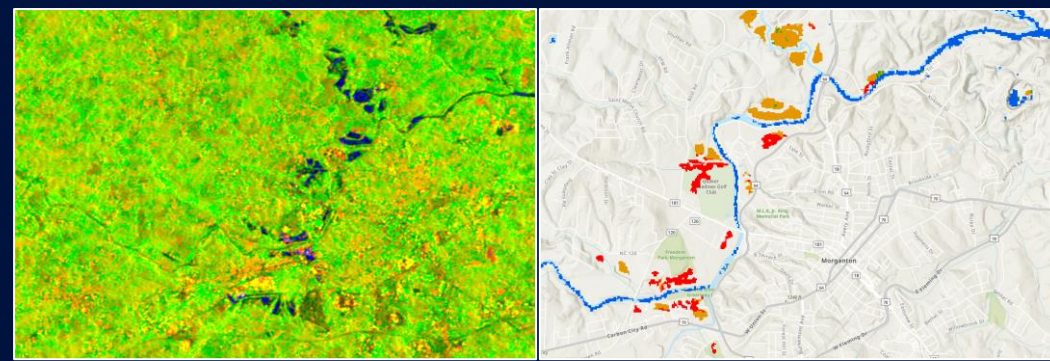
In an interagency collaborative effort, the DRCS supported mapping of landslides using optical imagery, with locations of landslides mapped on the USGS Landslide Dashboard



Left: Landslide Proximity Heat Map for the Asheville, NC area, utilizing ESA Sentinel-1 data to detect potential landslides.



NDVI Change Detection (Top) east of Asheville, NC (Bottom) southwest of Fletcher, NC



Classified Post-Event Flood Map (right) based on ESA Sentinel-1 data (left) for Morganton, NC.

DISASTERS NASA Products for Hurricane Helene				

Product Gallery from Hurricane Helene



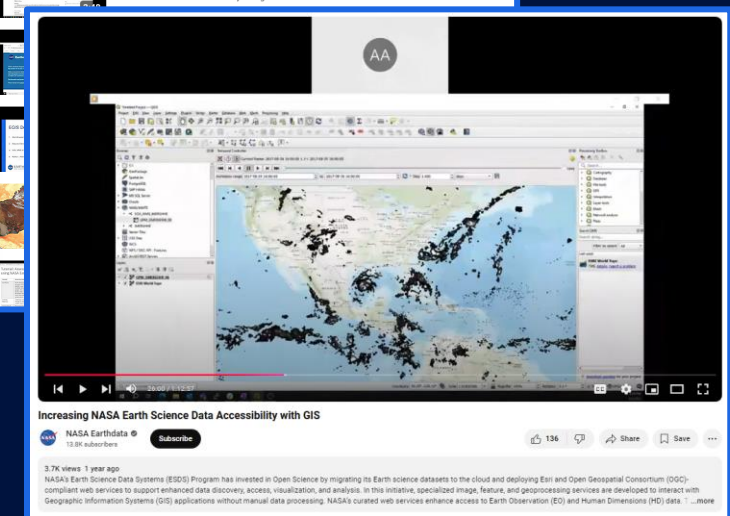
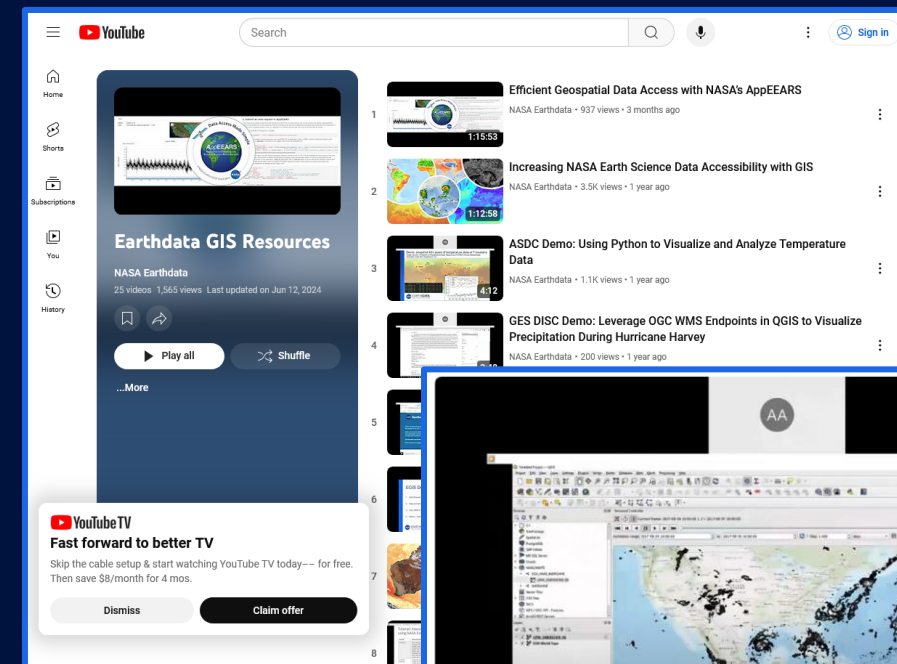
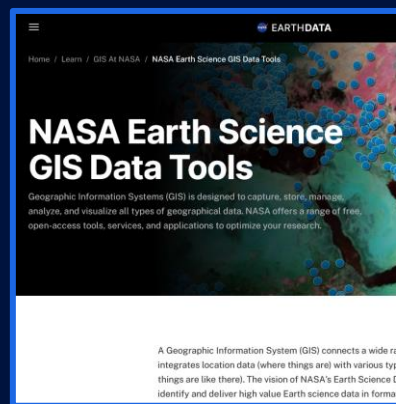
Resources

How can you start your NASA Earth Science data journey?

Resources: Earthdata GIS Pages



The Earthdata GIS Playlist has videos specific to the GIS-minded users.



The Earthdata GIS Webpages contain & link to many helpful learning resources as well as info about various GIS data, tools, & services at NASA!

Resources: Earthdata Forum

Ask questions directly to NASA Subject Matter Experts & read through Data Recipes!

The screenshot shows the Earthdata Forum homepage. At the top, there's a navigation bar with 'EARTHDATA' and 'Find a DAAC'. Below that, a search bar and several filter buttons are visible: 'Answered', 'Discipline', 'DAAC', 'Projects', 'Services/Usage', 'Dates', and 'Author'. A 'Reset all filters' button and a 'Match Any' dropdown are also present. Below the filters, there's an 'Announcements' section with a post titled 'NASA POWER v10 Data Released'. A 'Post New Question' button is also visible. The main content area is titled 'Questions and Comments' and contains a table of questions with columns for 'Replies' and 'Last post'. The table lists several questions, including 'Tips for posting good questions on the Earthdata Forum', 'SWOT HiTIDE downloads different date range', 'MODIS L1B Offsets', 'The information provided at MODIS specification website', and 'Pace data export'.

The screenshot shows a forum post titled 'DAAC Data Recipes' by user 'asdc_user_services' on Tue Oct 27, 2020 1:42 pm America/New_York. The post content reads: 'This page provides links to the Data Recipe resources (also called How-To or Tutorials) available from Earthdata Forum member DAACs. The titles below the link for each DAAC are examples of the topics covered. The number in brackets indicate the total number of available resources covering additional topics. For an introduction on how to use the Forum please view our recorded webinar: YouTube Link: <https://youtu.be/kCKyQscsXWA>'.

The screenshot shows a dropdown menu for 'Services/Usage'. The menu is open, showing a list of options: 'Select', 'Select', 'Algorithms', 'Cloud', 'Data Access', 'Data Download', 'Data Processing', 'Data Recipes', 'Data Search', 'Data Visualization', 'Documentation', 'FAQ', 'General Science', 'Giovanni', 'GIS Tools', 'SeaDAS', and 'SOOT'. The 'GIS Tools' option is highlighted in blue.

Have any questions?

We look forward to engaging with you in the future!

