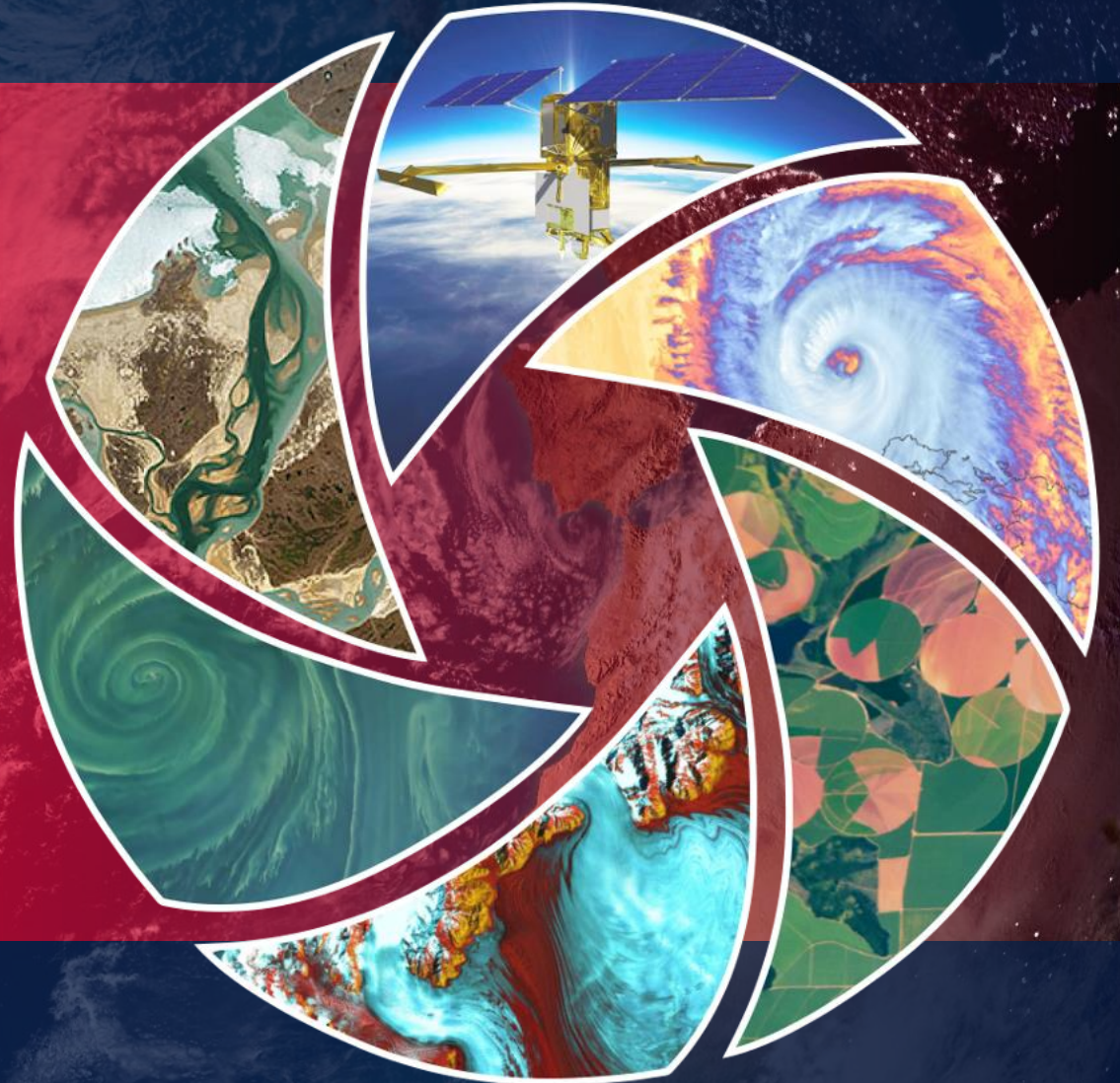


# NASA Earth Science GIS Resources

*September 2025*

*North Carolina Local and Federal Government  
Committee Meeting*

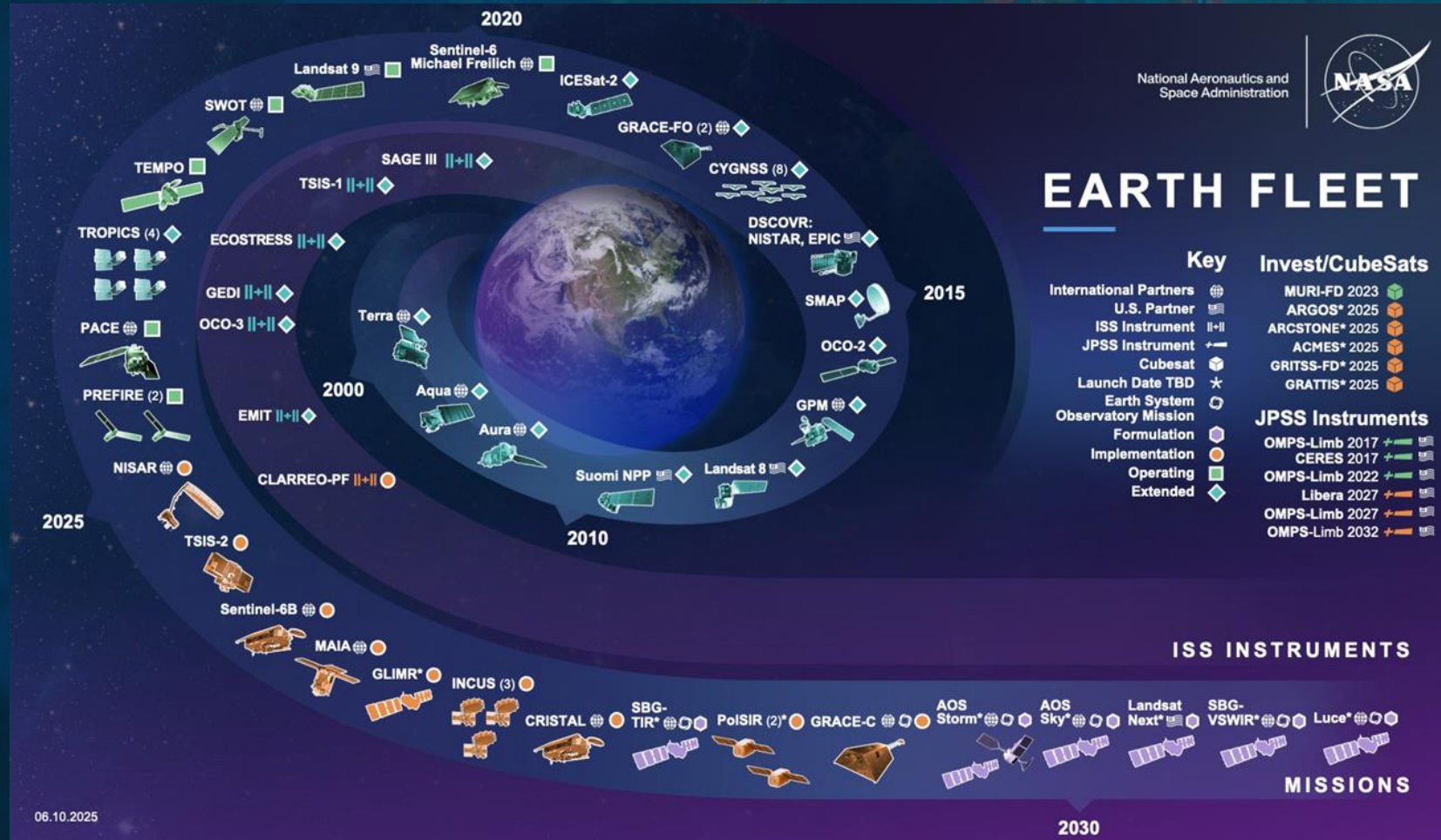




# NASA... Earth Science?

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

A NASA  
satellite took  
this photo!





(free and open)

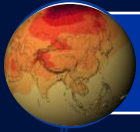


# Who are we and why are we here?

**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!

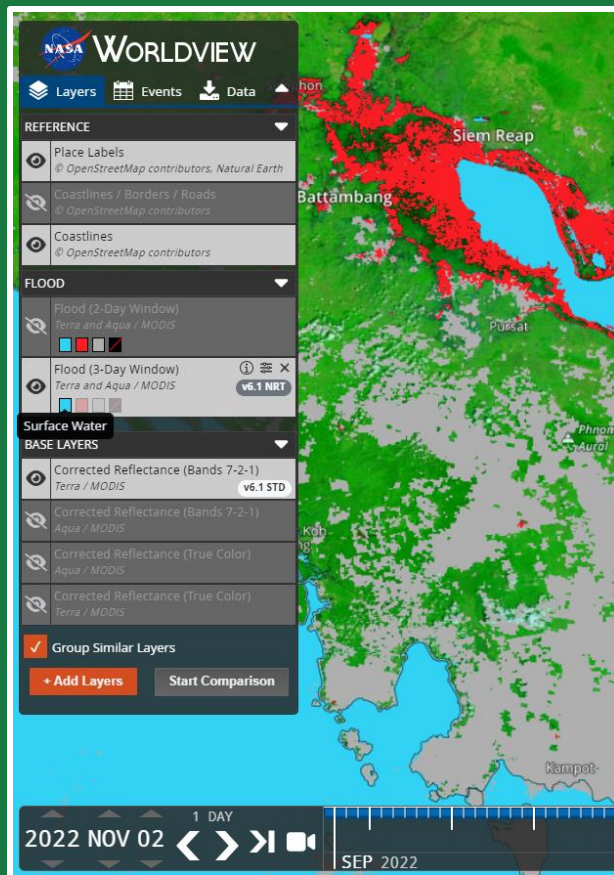


NASA offers tools & services for viewing, accessing, & interacting with data!

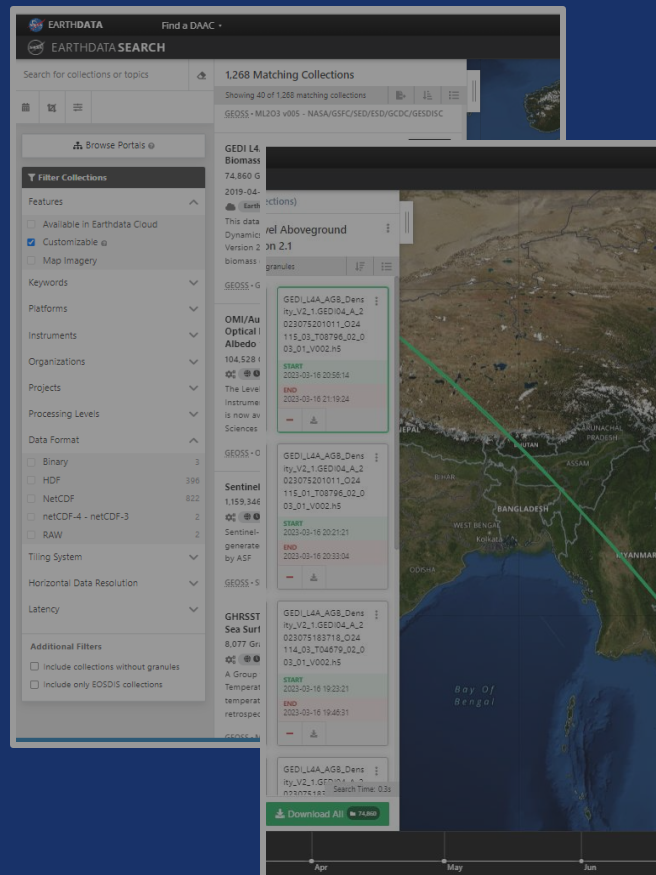
**Our goal is to make our data  
more accessible to GIS users!**

# Discovery & Access Methods

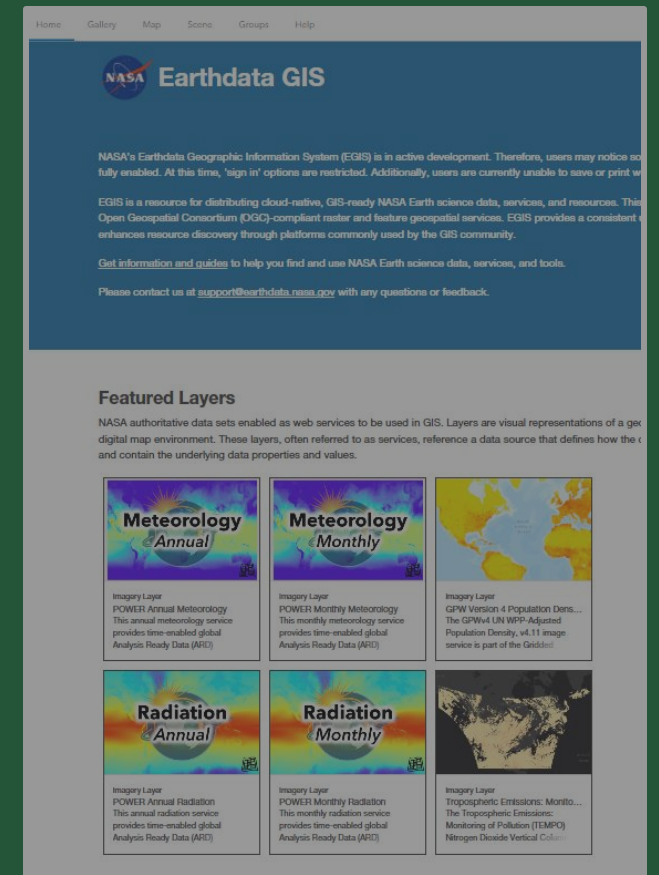
## Worldview *visualize & browse imagery*



## Earthdata Search *export & download data files*



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





# Worldview: Discover Browse Imagery

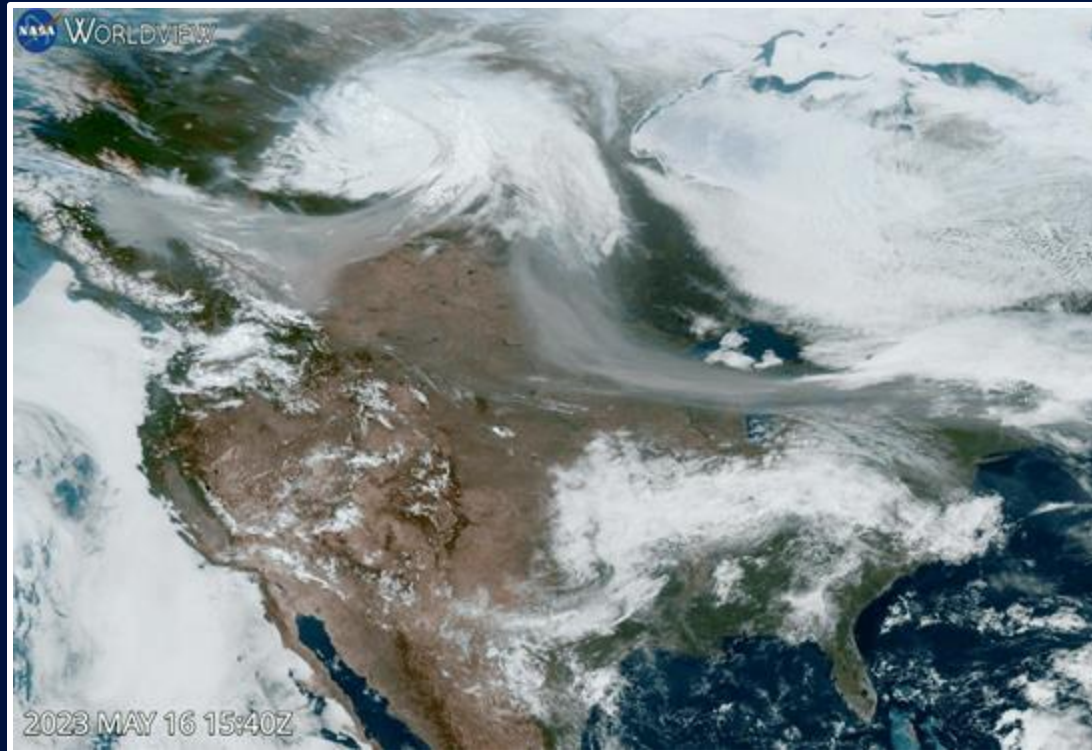


**Interactively browse ~1,000 global, full-resolution satellite imagery layers, known as the Global Imagery Browse Services (GIBS)**

**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.

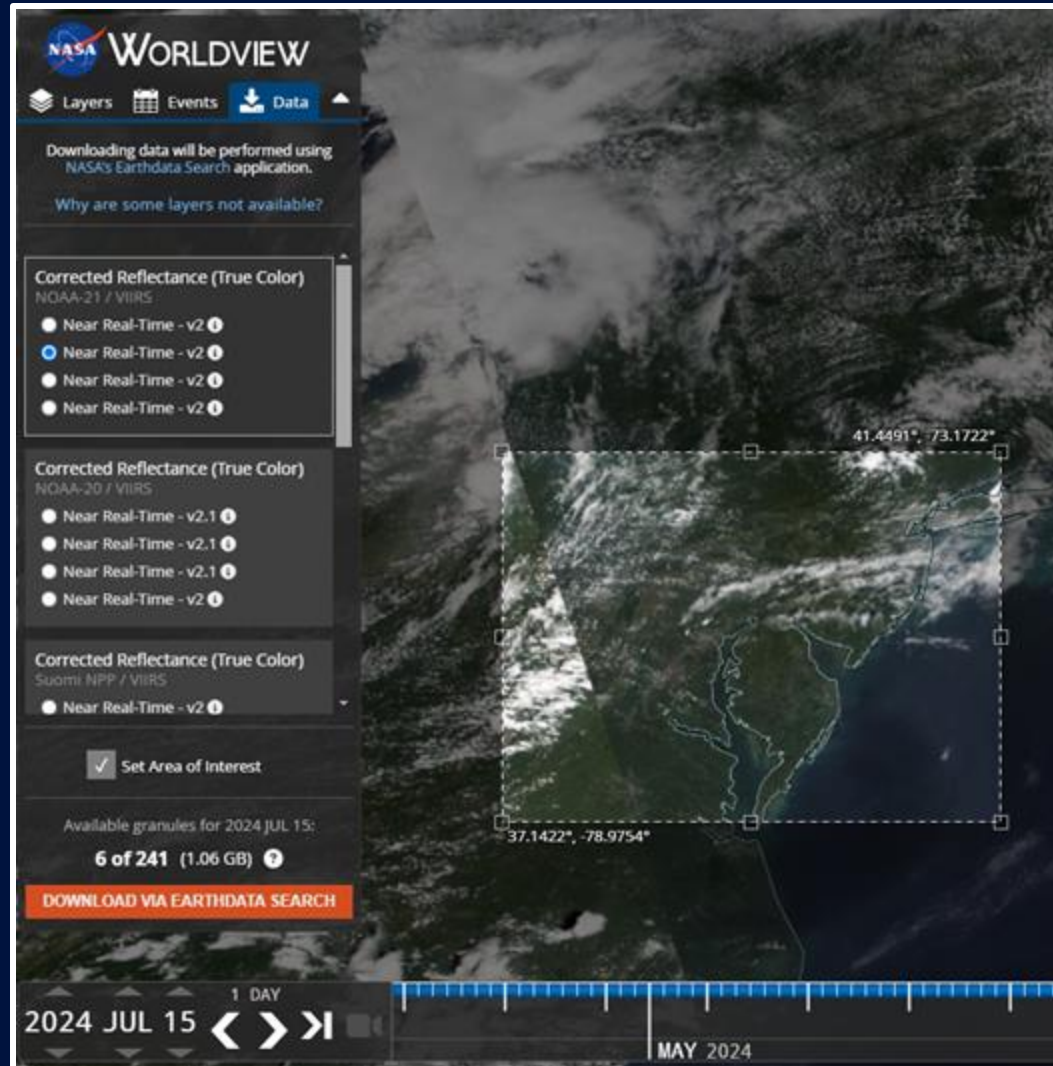
→ **Events:** Users can explore a recent events

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





# Worldview: Discover Browse Imagery



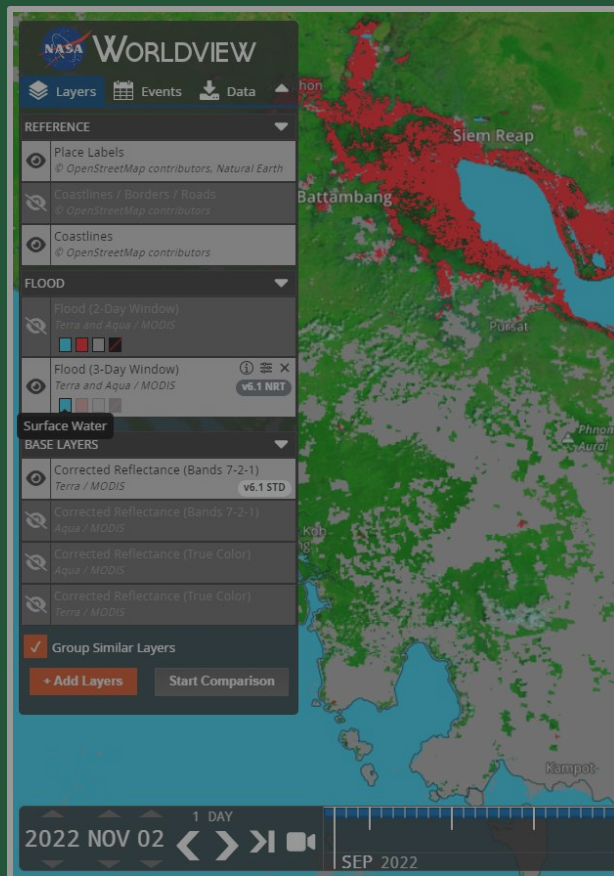
**Data Access:** Users can now link directly to the data visualized!

See granules available and estimated size before being directed to download

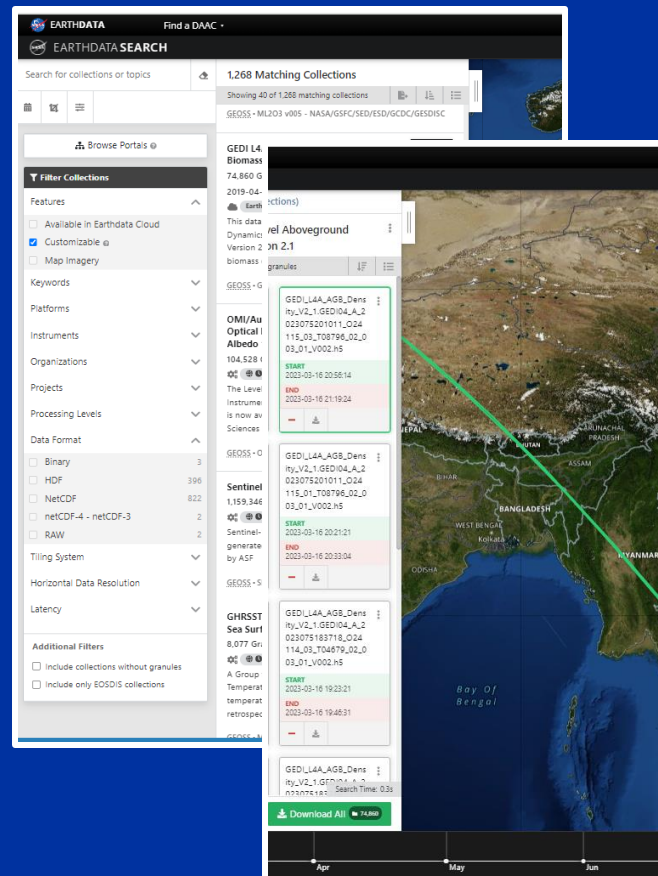


# Discovery & Access Methods

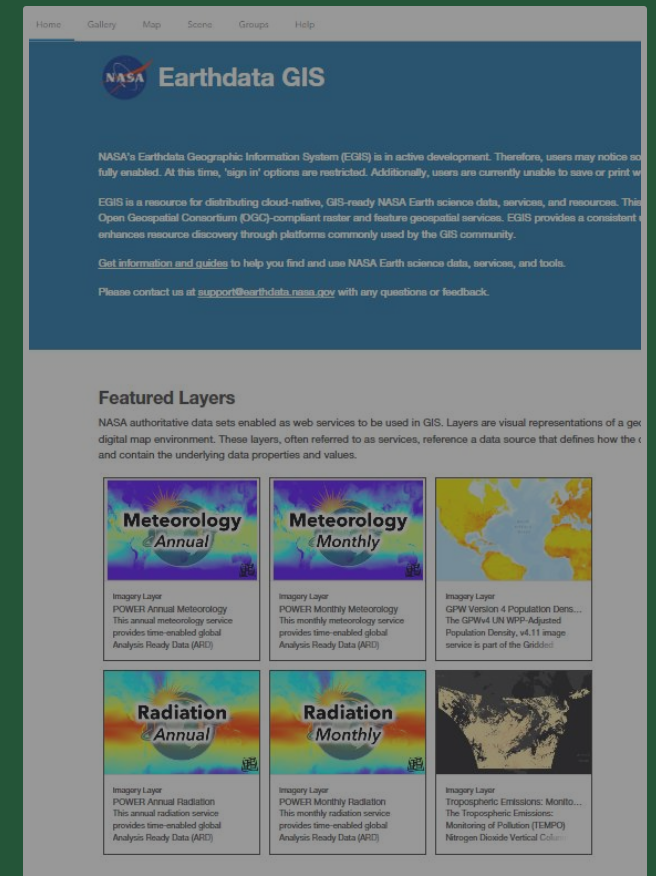
## Worldview *visualize & browse imagery*



## Earthdata Search *export & download data files*

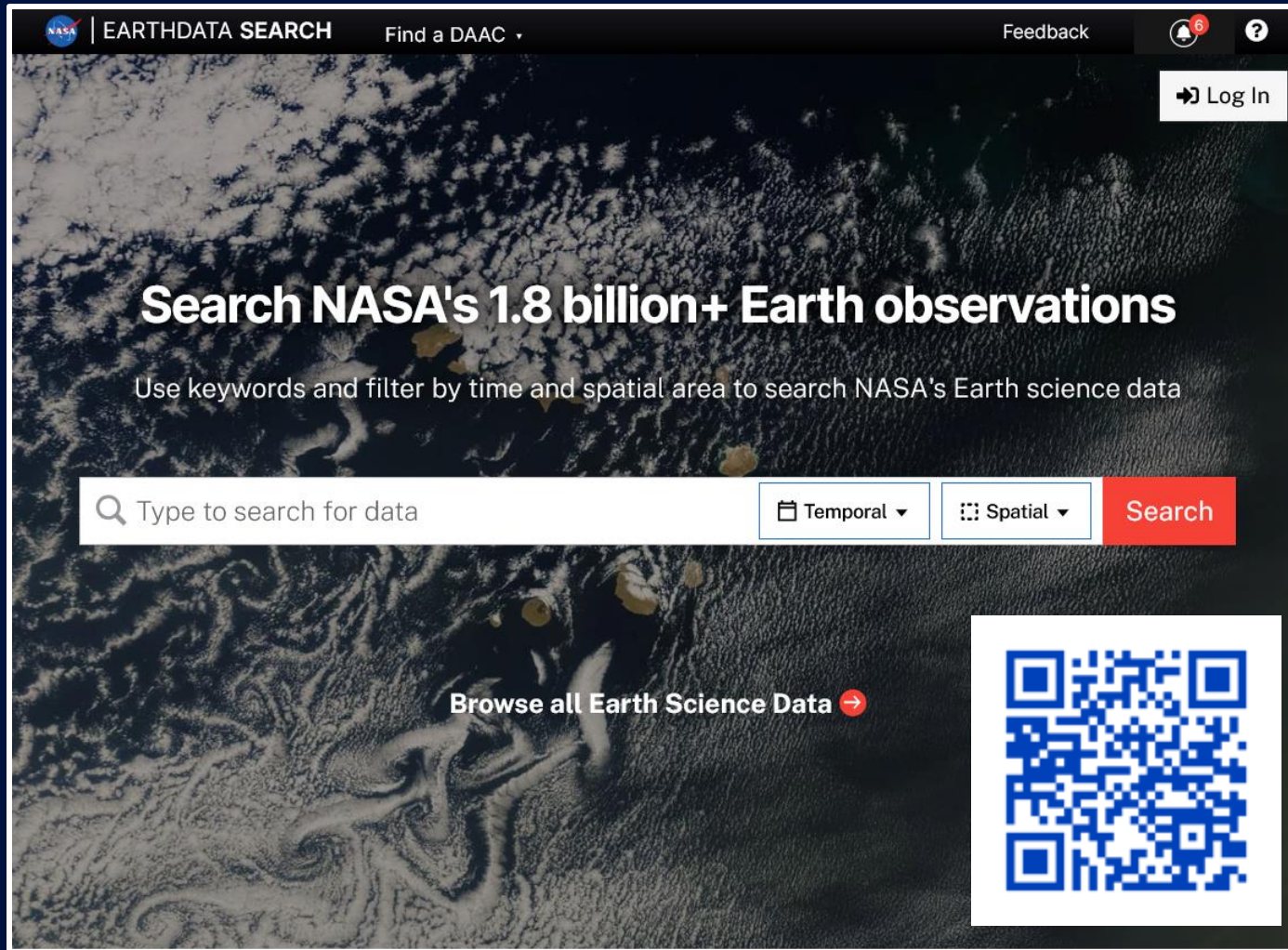


## Earthdata GIS (EGIS) *GIS services, maps, & apps*



[link to a video tutorial,](#)  
[link to a "How To" guide](#)

# Earthdata Search: Download Data



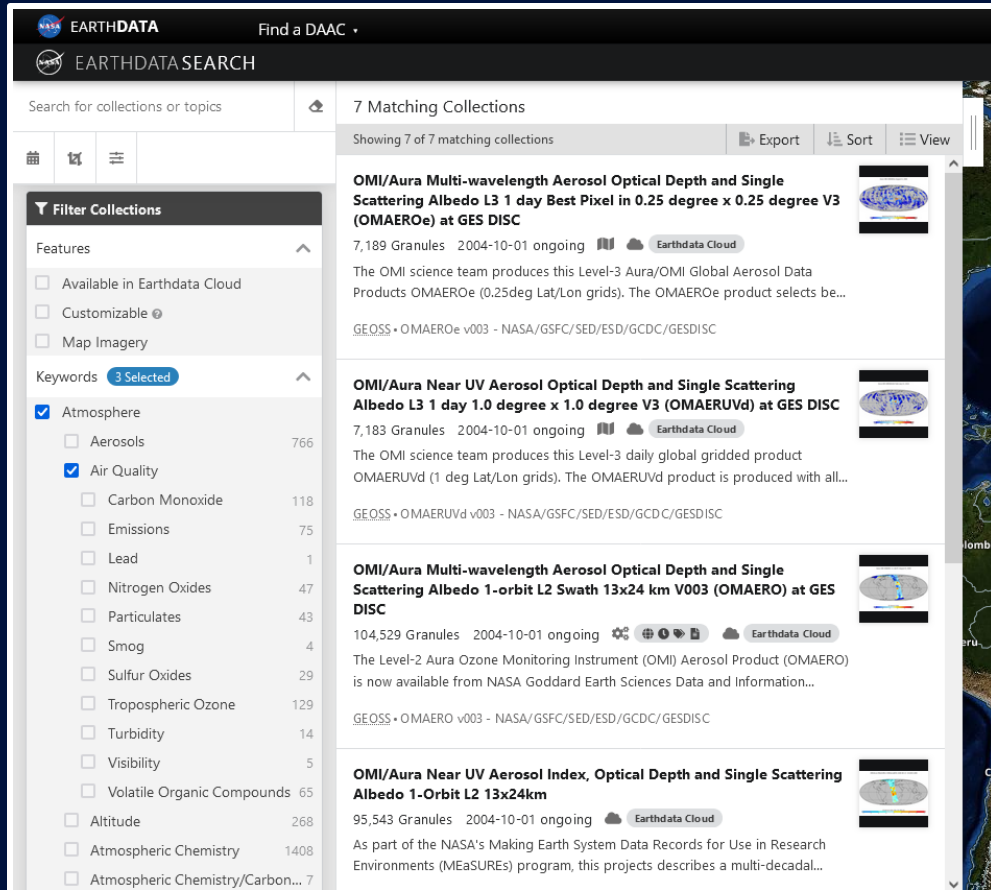
Earthdata Search provides **discovery, filtering, visualization, & access** to all of NASA's Earth Science data.

This includes **more than 11,000** data collections.

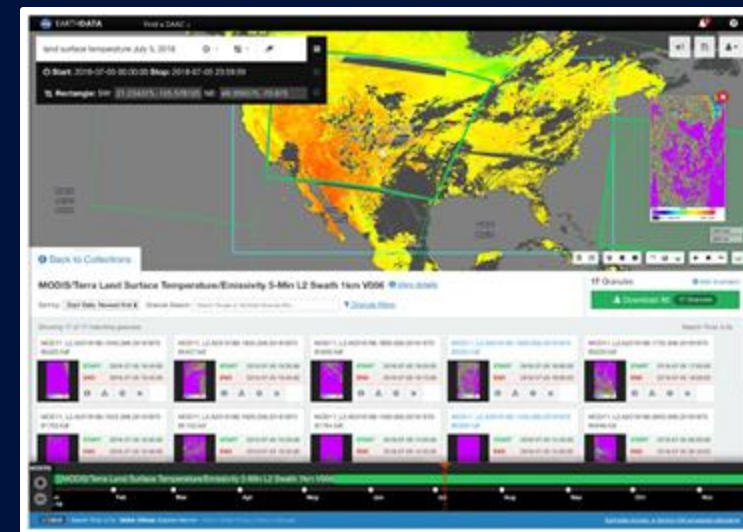
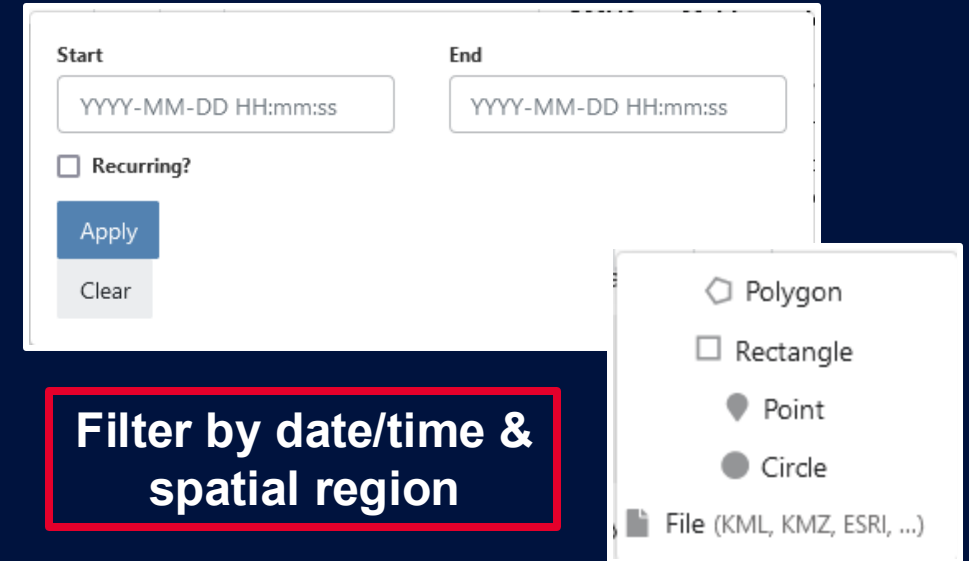
Over 1,245 collections are now **customizable**



# Earthdata Search: Download Data



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



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

# Earthdata Search: Download Data

The screenshot shows the Earthdata Search interface. On the left, the 'Filter Collections' sidebar has the 'Customizable' checkbox checked. A red box highlights this checkbox. In the main results area, a red box highlights a callout that says 'Supports customization:' with icons for 'Spatial subset', 'Temporal subset', 'Variable subset', 'Reformat', and 'Combine'. Another red box highlights the icons for 'Spatial subset', 'Temporal subset', and 'Variable subset' below the callout. The search results show '1,268 Matching Collections' and a specific result for 'GHRSSST Level 4 MUR Global Foundation Sea Surface Temperature Analysis (v4.1)'.

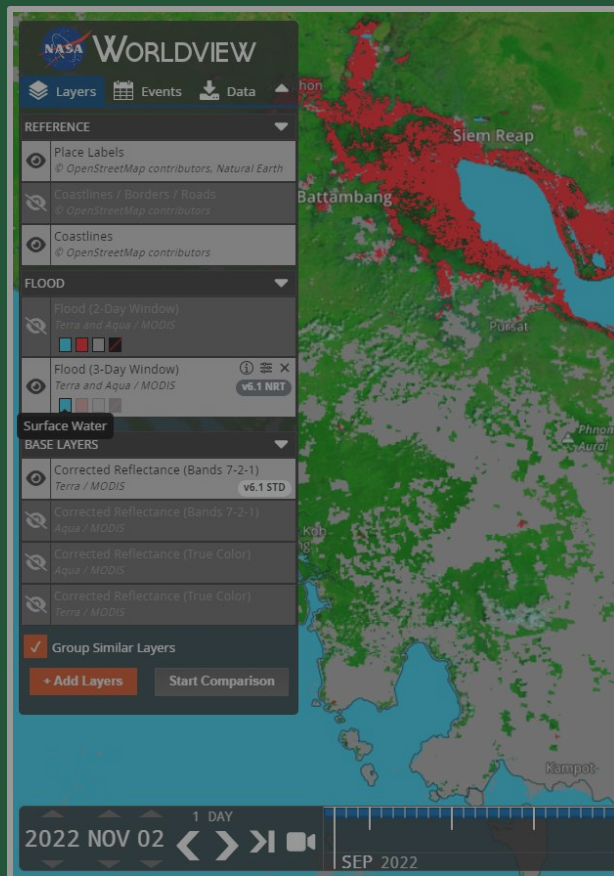
The screenshot shows two panels from the Earthdata Search interface. The top panel, 'Reformat Output (Optional)', has a dropdown for 'Output File Format' with options 'No Reformatting', 'No Reformatting', and 'GeoTIFF'. The bottom panel, 'Projection Options', has a dropdown for 'Re-projection Options' with options 'Geographic', 'No Change', 'Geographic', 'Universal Transverse Mercator', and 'Polar Stereographic'.

**Customization: temporal, spatial, and variable subsetting**

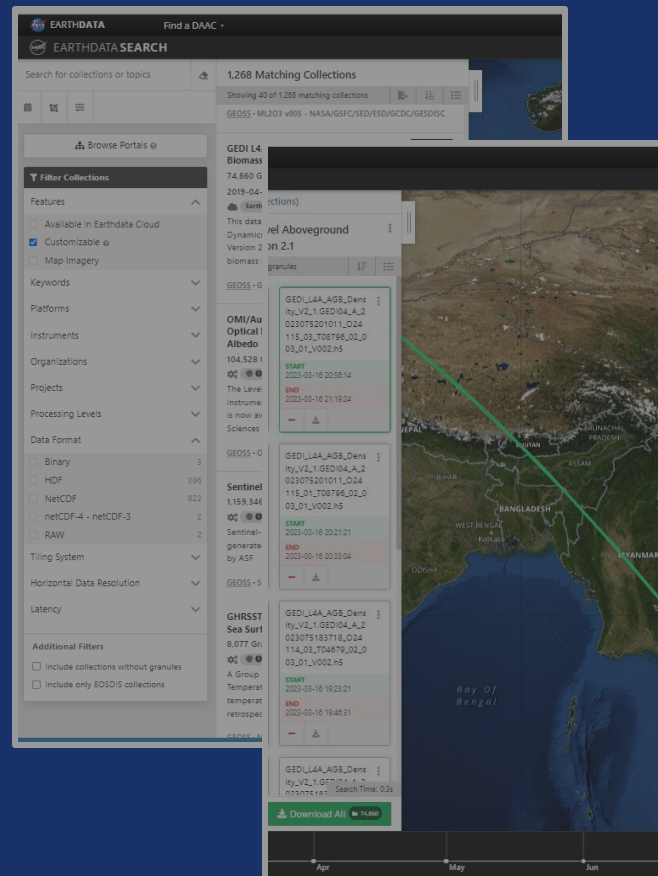


# Discovery & Access Methods

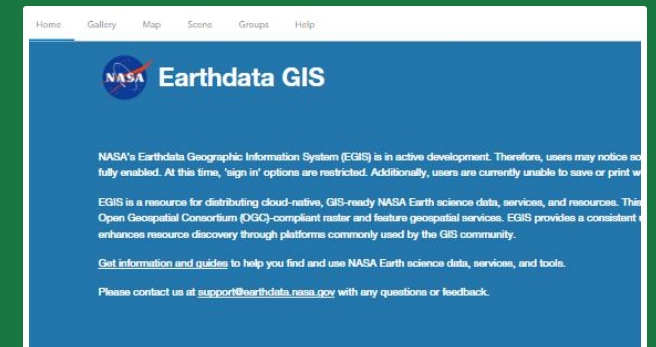
## Worldview *visualize & browse imagery*



## Earthdata Search *export & download data files*

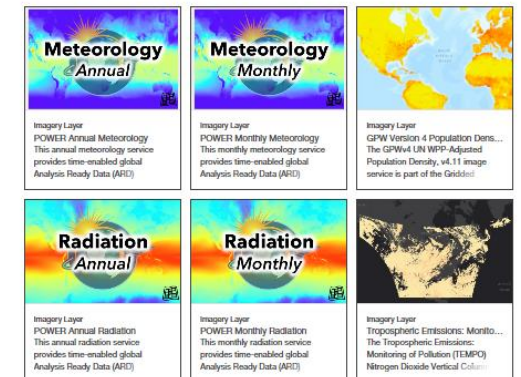


## Earthdata GIS (EGIS) *GIS services, maps, & apps*



### Featured Layers

NASA authoritative data sets enabled as web services to be used in GIS. Layers are visual representations of a geographic digital map environment. These layers, often referred to as services, reference a data source that defines how the data is accessed and contain the underlying data properties and values.



# Earthdata GIS: GIS Services, Maps, & Apps

The screenshot displays the Earthdata GIS web application. At the top, there are tabs for 'Featured Layers', 'Overview', 'Content', and 'Members'. Below the tabs is a search bar labeled 'Search group content' and filters for 'Grid', 'Date Added', and 'Filter'. The main content area shows a grid of featured layers and apps. The first row includes 'U.S. Social Vulnerability Index Grid...', 'Annual Global High-Resolution Ext...', 'Yale Center for Earth Observation (...)', and 'Tropospheric Emissions: Monitorin...'. Below this, there is a section titled 'Featured Apps' with a description: 'Applications provide a focused experience for interacting with maps and data. These resources can include web maps with additional widgets, StoryMaps, sites, dashboards, and more. Apps provide a specific purpose and targeted functionality. Apps can be easily embedded and shared with others.' The second row of featured apps includes 'Building Thermal & Thermal Moisture Climate Zone Differences 1981-1995 vs 2007-2021', 'Web Mapping Application Sentinel-1 Interferometric Coherence and B...', and 'The Prediction Of Worldwide Energy Resources (POWER) Project'. A QR code is located in the bottom left corner of the screenshot. A 'View gallery' button is at the bottom right.

Featured Layers

Overview Content Members

Search group content

Grid Date Added Filter

1 - 20 of 77

U.S. Social Vulnerability Index Grid...  
Imagery Layer  
Created: Jun 6, 2024  
Updated: Jun 6, 2024  
View count: 14  
NASA\_Earthdata

Annual Global High-Resolution Ext...  
Yale Center for Earth Observation (...)  
Tropospheric Emissions: Monitorin...

### Featured Apps

Applications provide a focused experience for interacting with maps and data. These resources can include web maps with additional widgets, StoryMaps, sites, dashboards, and more. Apps provide a specific purpose and targeted functionality. Apps can be easily embedded and shared with others.

Building Thermal & Thermal Moisture Climate Zone Differences 1981-1995 vs 2007-2021  
Building Thermal & Thermal Moist...

Web Mapping Application  
Sentinel-1 Interferometric Coherence and B...  
StoryMap tutorial describing the image services available from the Alaska Satellite Facility (ASF) for the Global Seasonal Sentinel-1

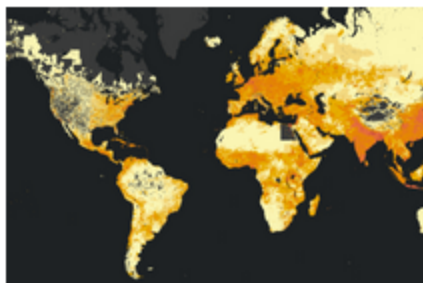
The Prediction Of Worldwide Energy Resources (POWER) Project  
Provides color & meteorological data from NASA research for support of renewable energy, building energy efficiency, & agricultural needs.  
In this StoryMap, through text, GIFs, videos, and interactive map content, viewers can become more familiar with the NASA Prediction Of

View gallery

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!**

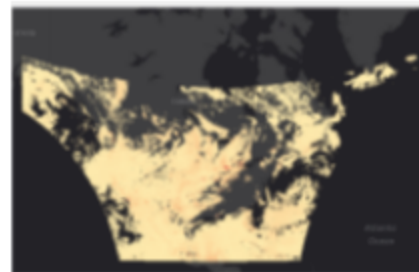




### Gridded Population of the World, Version 4 (GPW...

Image Service By [NASA\\_Earthdata](#)

Gridded Population of the World, Version 4 (GPW) Population Density, Revision 11. Published on: 2018-12-31T00:00:00.000Z. Created by Center for Earth Science Information Network - CIESIN - Columbia University. Published by NASA Socioeconomic Data Applications Center (SEDAC)....



### TEMPO Nitrogen Dioxide (NO2) Tropospheric Ver...

Image Service By [NASA\\_Earthdata](#)

The Tropospheric Emissions: Monitoring of Pollution (TEMPO) Nitrogen Dioxide Vertical Column Troposphere Provisional layer provides information on the amount of nitrogen dioxide in the troposphere, available as approximately one-hour scans for daylight hours over North America, from August 2023 to...



### Early IMERG Precipitation Rate (GPM\_3IMERGHHE...

Image Service By [NASA\\_Earthdata](#)

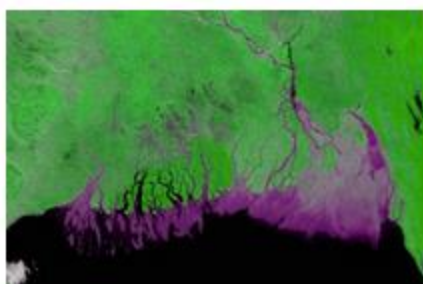
Image service for IMERG Early Run data product, showing precipitation rate in mm/hr at 30-minute intervals in time. Information on map configuration, color bar, and other details available in the Description.



### POWER Annual Radiation

Image Service By [bmacpher\\_NASA](#)

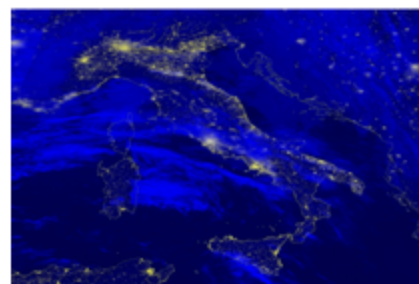
This annual radiation service provides time-enabled global Analysis Ready Data (ARD) parameters from 1984 to 2023 for the NASA Prediction Of Worldwide Energy Resource (POWER) Project's communities.



### Vegetation - Surface Reflectance (MODIS)

Image Service By [NASA\\_Earthdata](#)

This daily visualization represents a "false color" band combination (1-2-1) of data continuously collected by the MODIS instrument on the Terra satellite and is used for identifying vegetation changes, drought, and flood.



### Black Marble Nighttime Blue/Yellow Composite (V...

Image Service By [NASA\\_Earthdata](#)

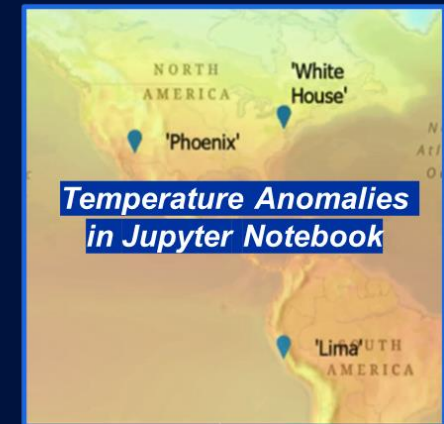
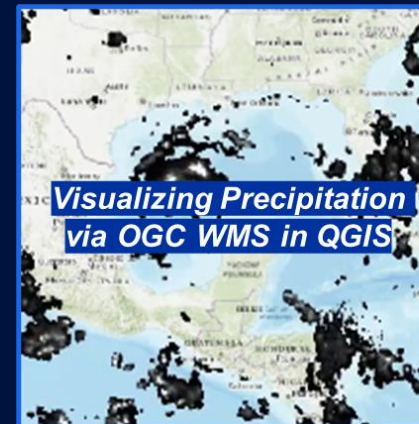
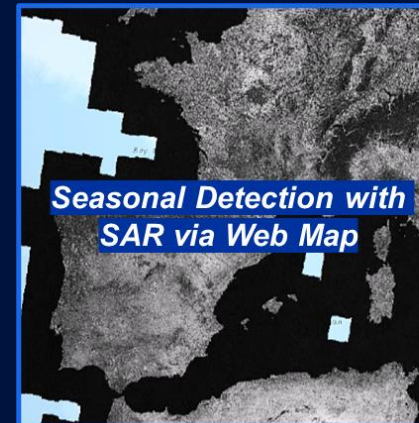
This visualization represents a "false color" band combination (DNB-DNB-M15) of data continuously collected by the VIIRS instrument on the Suomi-NPP satellite and is useful for identifying and monitoring changes in nighttime lights from cities, fires, boats, and other phenomena.

# Earthdata GIS: GIS Services, Maps, & Apps



EGIS grants users access to NASA Earthdata through open science tools via **OGC compliant services, common web APIs, & Native SDKs.**

**Analysis Ready Data as a Service – Use Cases:**





# Enabling GIS at NASA: Earthdata GIS



The screenshot shows the Earthdata GIS homepage. At the top is a navigation bar with links: Home, Gallery, Map, Scene, Groups, and Help. Below this is a blue header with the NASA logo and the text "Earthdata GIS". A dashed white box highlights the text "A NASA-Managed ArcGIS Enterprise...". The main content area has a blue background with the text "Earthdata GIS" and a paragraph describing NASA's Earthdata Geographic Information System (EGIS) as a resource for distributing cloud-native, GIS-ready NASA Earth Science data, services, and resources. It mentions that these include ArcGIS and Open Geospatial Consortium (OGC)-compliant raster and feature geospatial services. To access the full NASA Earth observation repository for data download, it directs users to visit "Earthdata Search". Below this, it states that EGIS is actively deploying new services and directs users to the Gallery to see the full list of publicly available content. The "Featured Layers" section follows, with a paragraph explaining that NASA authoritative data sets are enabled as web services to be used in GIS. Layers are visual representations of a geographic dataset in a digital map environment. These layers, often referred to as services, reference a data source that defines how the data should be visualized and contain the underlying data properties and values. Three featured layers are shown: "POWER Annual Radiation" (Imagery Layer), "Tropospheric Emissions: Monitoring of Pollution (TEMPO) Version 03 Level 3 Gridded Nitrogen Dioxide (NO2) Tropospheric Vertical Column (Provisional)" (Imagery Layer), and "Low Elevation Coastal Zone (LECZ) Urban-Rural Population and Land Area Estimates, Version 3" (Imagery Layer). Each layer has a thumbnail image and a link to "Open in Map Viewer".

Home Gallery Map Scene Groups Help

**Earthdata GIS**

**Earthdata GIS**

NASA's Earthdata Geographic Information System (EGIS) is a resource for distributing cloud-native, GIS-ready NASA Earth Science data, services, and resources. These include ArcGIS and Open Geospatial Consortium (OGC)-compliant raster and feature geospatial services\*. To access to the full NASA Earth observation repository for data download, please visit [Earthdata Search](#).

EGIS is actively deploying new services, please visit the Gallery to see the full list of publicly available content.

**Featured Layers**

NASA authoritative data sets enabled as web services to be used in GIS. Layers are visual representations of a geographic dataset in a digital map environment. These layers, often referred to as services, reference a data source that defines how the data should be visualized and contain the underlying data properties and values.

**POWER Annual Radiation**  
Imagery Layer  
Open in Map Viewer

**Tropospheric Emissions: Monitoring of Pollution (TEMPO) Version 03 Level 3 Gridded Nitrogen Dioxide (NO2) Tropospheric Vertical Column (Provisional)**  
Imagery Layer  
Open in Map Viewer

**Low Elevation Coastal Zone (LECZ) Urban-Rural Population and Land Area Estimates, Version 3**  
Imagery Layer  
Open in Map Viewer

A NASA-Managed  
ArcGIS Enterprise...

...that enables the publishing of  
authoritative NASA ES layers in the  
ArcGIS Living Atlas of the World (LAW)



The screenshot shows the ArcGIS Living Atlas of the World (LAW) website. At the top is a navigation bar with links: Home, Browse, Apps, Blog, Contribute, and My Favorites. Below this is a search bar with the text "NASA Earthdata". A row of icons represents different categories: All, Trending, Basemaps, Imagery, Boundaries, People, Infrastructure, and Environment. Below the icons are filters for "All content types", "All time", "All regions", "Esri-only content", and "Authoritative-only content". The results are sorted by "Title". There are 33 results displayed. The first two results are "Annual Global High-Resolution Extreme Heat Estimation" and "Black Marble Nighttime Blue/Yellow Composite (VIIRS)". The next two results are "Burn Scar - Corrected Reflectance (MODIS / Aqua)" and "Burn Scar - Corrected Reflectance (MODIS / Terra)". Each result has a thumbnail image and a link to "Open in Map Viewer".

esri ArcGIS Industries About Support

ArcGIS Living Atlas of the World

Home Browse Apps Blog Contribute My Favorites

Search Examples

All Trending Basemaps Imagery Boundaries People Infrastructure Environment

All content types All time All regions Esri-only content Authoritative-only content Sort by: Title

33 Results

**Annual Global High-Resolution Extreme Heat Estimation**  
Image Service By NASA\_Earthdata  
Annual Global High-Resolution Extreme Heat Estimates (GEHE), 1983-2016. Published on: 2023-05-05. Created by Tuholske, C., P. Peterson, C. Funk, and K. Caylor. Published by NASA Socioeconomic Data and Applications Center (SEDAC). Version: 1.00. Learn more:  
Authoritative Open in Map Viewer

**Black Marble Nighttime Blue/Yellow Composite (VIIRS)**  
Image Service By NASA\_Earthdata  
This visualization represents a "false color" band combination (DNB-DNB-M15) of data continuously collected by the VIIRS instrument on the Suomi-NPP satellite and is useful for identifying and monitoring changes in nighttime lights from cities, fires, boats, and other phenomena.  
Authoritative Open in Map Viewer

**Burn Scar - Corrected Reflectance (MODIS / Aqua)**  
Image Service By NASA\_Earthdata  
This daily visualization represents a "false color" band combination (7-2-1) of data continuously collected by the MODIS instrument on the Aqua satellite and is useful for distinguishing burn scars from naturally low vegetation or bare soil.  
Authoritative Open in Map Viewer

**Burn Scar - Corrected Reflectance (MODIS / Terra)**  
Image Service By NASA\_Earthdata  
This daily visualization represents a "false color" band combination (7-2-1) of data continuously collected by the MODIS instrument on the Terra satellite and is useful for distinguishing burn scars from naturally low vegetation or bare soil.  
Authoritative Open in Map Viewer

Burn Scar - Corrected Reflectance (VIIRS / NOAA-20)  
Burn Scar - Corrected Reflectance (VIIRS / Suomi-NPP)

Earthdata Article



A satellite image of a hurricane, showing a well-defined eye and spiral cloud bands, serves as the background for the slide. The image is in shades of teal and dark blue.

# Resources

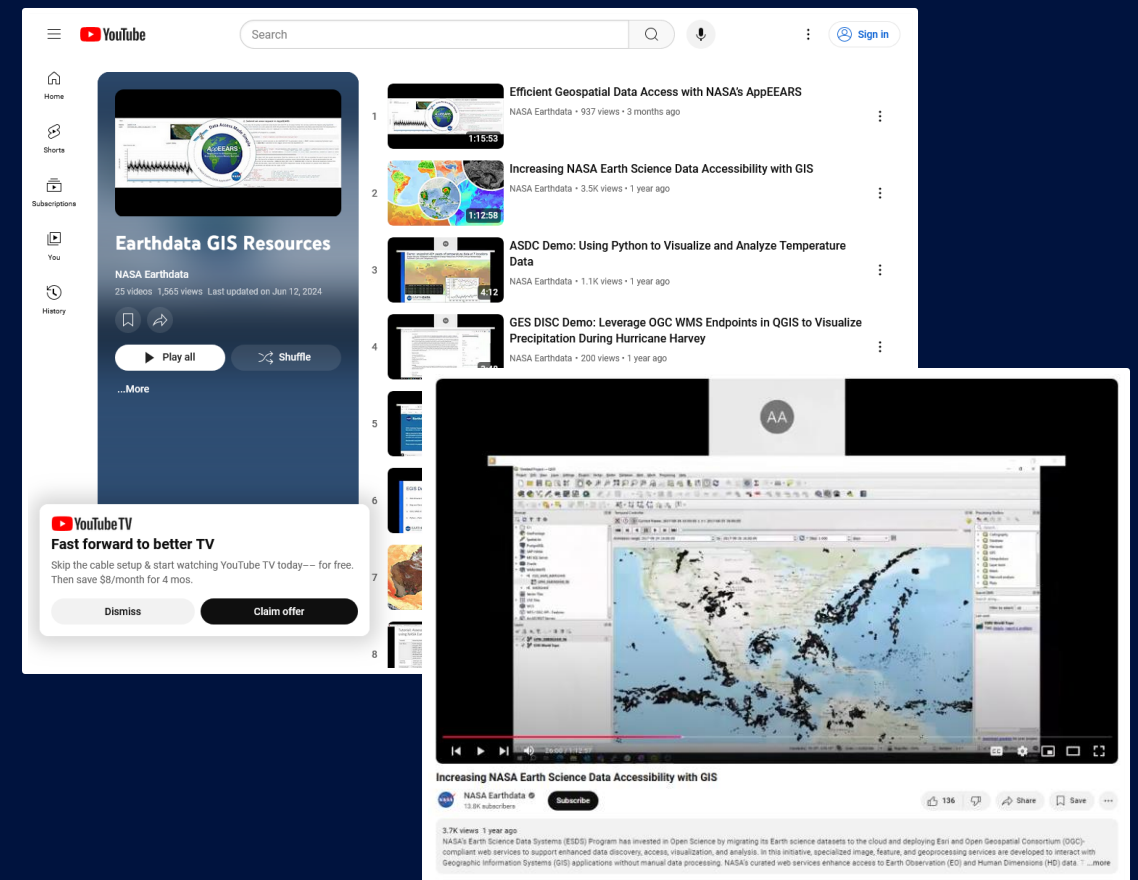
How can you start your NASA Earth Science data journey?



# Resources: Earthdata GIS Pages

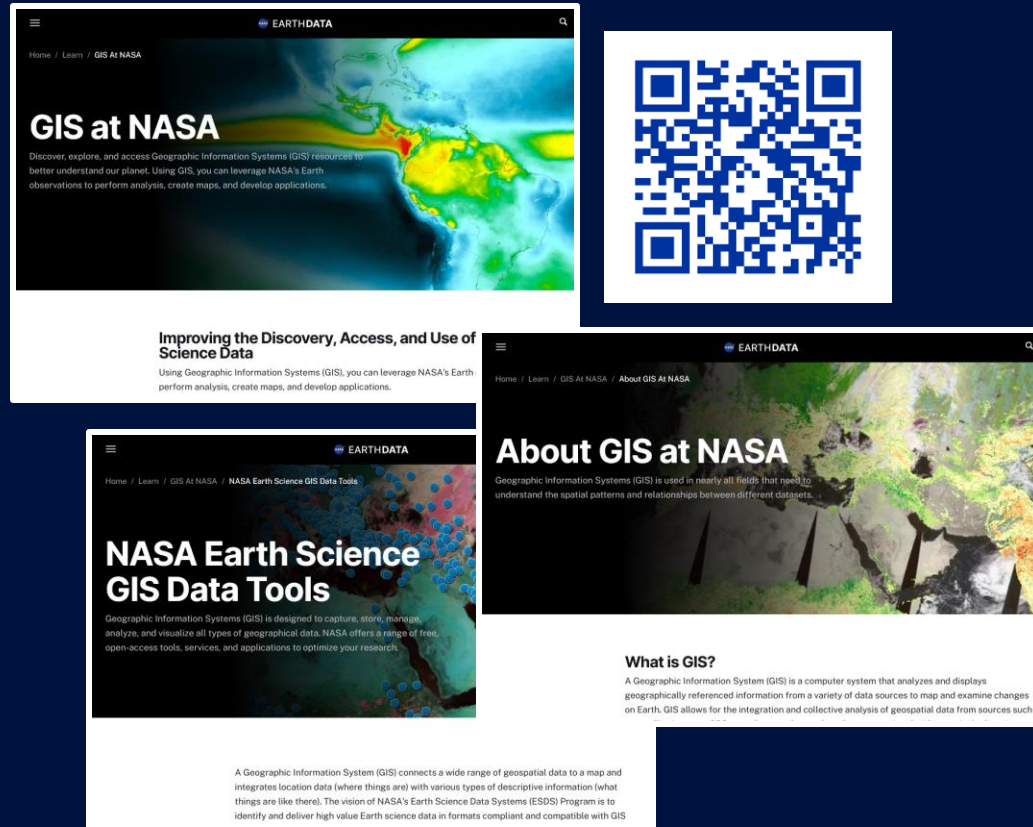


The Earthdata [GIS Playlist](#) has videos specific to the GIS-minded users.

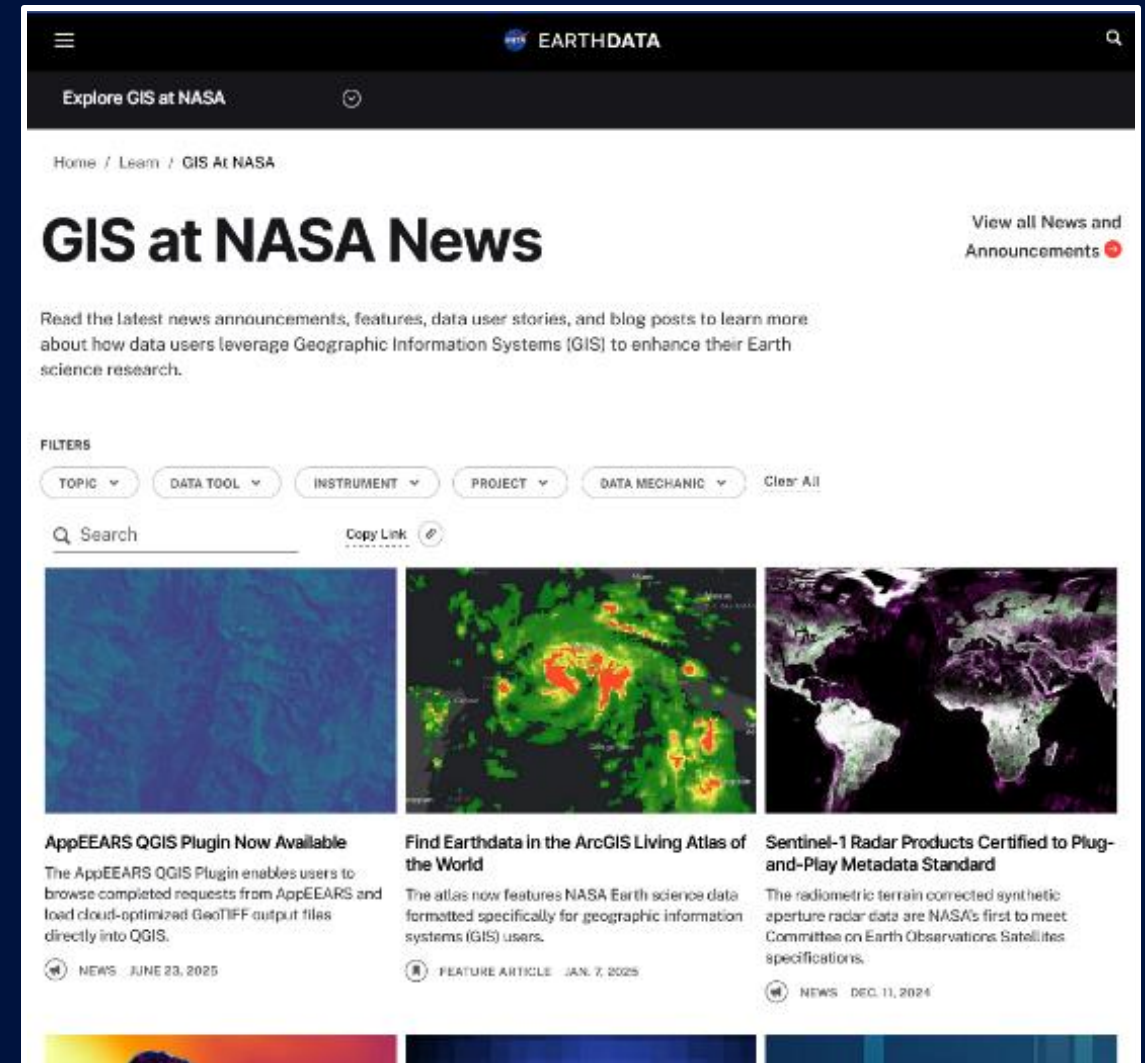


The Earthdata GIS Webpages contain & link to many helpful learning resources as well as info about various **GIS data, tools, & services at NASA!**

# Resources: Earthdata GIS Pages



**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 GIS Pages



## Improving the Discovery, Access, and Use of Science Data

Using Geographic Information Systems (GIS), you can leverage NASA's Earth observations to perform analysis, create maps, and develop applications.



A Geographic Information System (GIS) connects a wide range of geospatial data to a map and integrates location data (where things are) with various types of descriptive information (what things are like there). The vision of NASA's Earth Science Data Systems (ESDS) Program is to identify and deliver high value Earth science data in formats compliant and compatible with GIS.



## What is GIS?

A Geographic Information System (GIS) is a computer system that analyzes and displays geographically referenced information from a variety of data sources to map and examine changes on Earth. GIS allows for the integration and collective analysis of geospatial data from sources such

downloading.

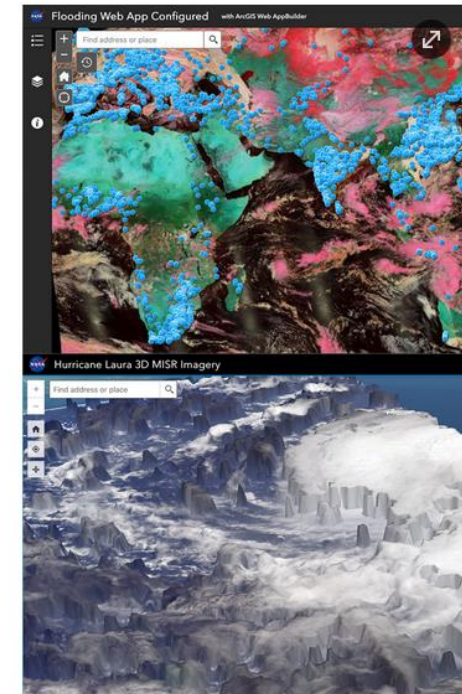
## Earthdata GIS

Earthdata GIS is a resource for distributing cloud-native, GIS-ready NASA Earth Science data, services, and resources. This includes over 200 ArcGIS and Open Geospatial Consortium (OGC)-compliant raster and feature geospatial services. EGIS grants users access to these geospatial services through open science tools such as OGC compliant services, common web APIs, and Native SDKs. Through Earthdata GIS, users can also explore learning and data discovery resources such as thematic applications and ArcGIS StoryMaps.

Furthermore, within NASA's homepage on ArcGIS Online (AGOL [AGOL](#)), you can explore a diverse range of data, layers, and maps, ready to be integrated into your next project or study. NASA Earth Science is continuously working increase the number of NASA layers available in the ArcGIS Living Atlas of the World (LAW [LAW](#)). The LAW is an ever evolving and growing collection of ready-to-use geographic information from around the globe, tailored to be easy to use within a variety of GIS applications.

## AppEEARS

The Application for Extracting and Exploring



**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 header with the NASA logo, 'EARTHDATA', and a search bar. Below the header, there's a banner with the text 'Welcome to the Earthdata Forum! Here, the scientific user community can ask questions, share data, and learn from NASA Subject Matter Experts (SMEs), NASA Earthdata Archive Centers (DAACs), and other contributors, discuss data access, and learn about data products and services.' The main navigation bar includes 'Quick links', 'Help', 'Guided Tour', and 'Login'. The 'Home' link is also visible. Below the navigation bar, there's a search bar and a filter section. The filter section includes 'GIS Tools' (selected), 'Answered', 'Discipline', 'DAAC', 'Projects', 'Services/Usage' (highlighted with a red box), 'Dates', 'Author', 'Reset all filters', and 'Match Any'. The 'Services/Usage' dropdown menu is open, showing a list of options: Data Access, Data Download, Data Processing, Data Product Development Guide, Data Recipes, Data Search, Data Upload, Data Visualization, Documentation, earthaccess, Earthdata Cloud, Earthdata Search, FAQ, GCMD Keywords, General Science, Giovanni, GIS Tools (checked), HyP3 On-Demand Processing, Near Real Time/NRT, and OpenSARLab. The main content area displays a list of questions and comments, including 'Subsetting GEDI L2A with Harmony', 'Reprojecting S3B-OLCI Level-2 Reduced Resolution Data', 'NASA ARSET - Introduction to NASA Earthdata Search', 'Pace data export', and 'GeoSpatial Live Imaginary Data for Datacube'. The right sidebar shows a table of questions with columns for 'Replies' and 'Last post'.

Replies	Last post
1	by <b>LP DAAC - dgolon</b> Tue Jun 03, 2025 10:21 am America/New_York
3	by <b>mdsummer</b> Fri May 09, 2025 1:04 am America/New_York
0	by <b>ASDC - rkey</b> Wed Apr 02, 2025 12:03 pm America/New_York
6	by <b>onurkaraca87a</b> Wed Jan 29, 2025 4:53 pm America/New_York
1	by <b>Earthdata - jbreannan424</b> Fri Dec 27, 2024 10:17 am America/New_York



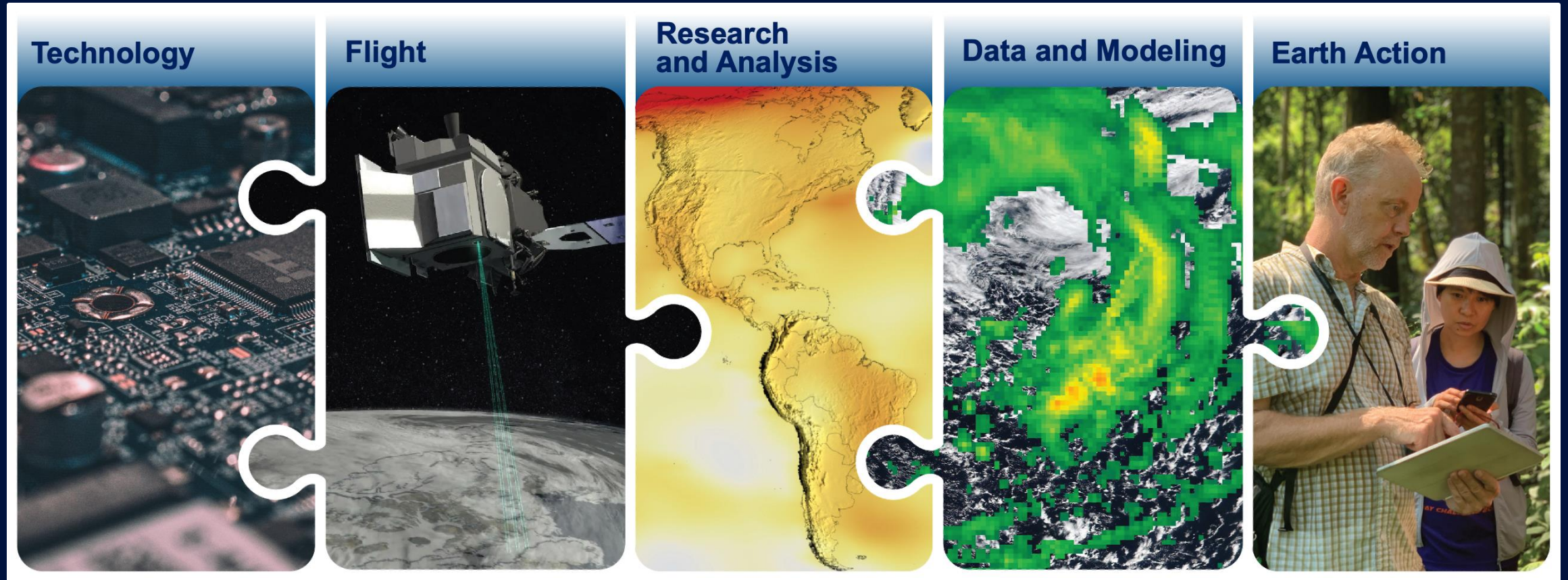
A satellite image of a hurricane, showing a well-defined eye and spiral cloud bands, is the background. The image is overlaid with a semi-transparent teal color. In the center, the text "Earth Action" is written in a large, white, serif font.

# Earth Action

Supporting your Data Journey



# Resources: Earth Action





# Resources: Earth Action

To foster the usage of NASA's observation & modeling data, NASA's Earth Action Program supports interaction & partnerships within US government, international agencies, large/small businesses & the general public to inform specific applications & decisions in these key areas:



**Earth Mission  
Engagement**



**Wildland  
Fires**



**Climate &  
Resilience**



**Energy &  
Infrastructure**



**Ecological  
Conservation**



**Agriculture**



**Disasters**



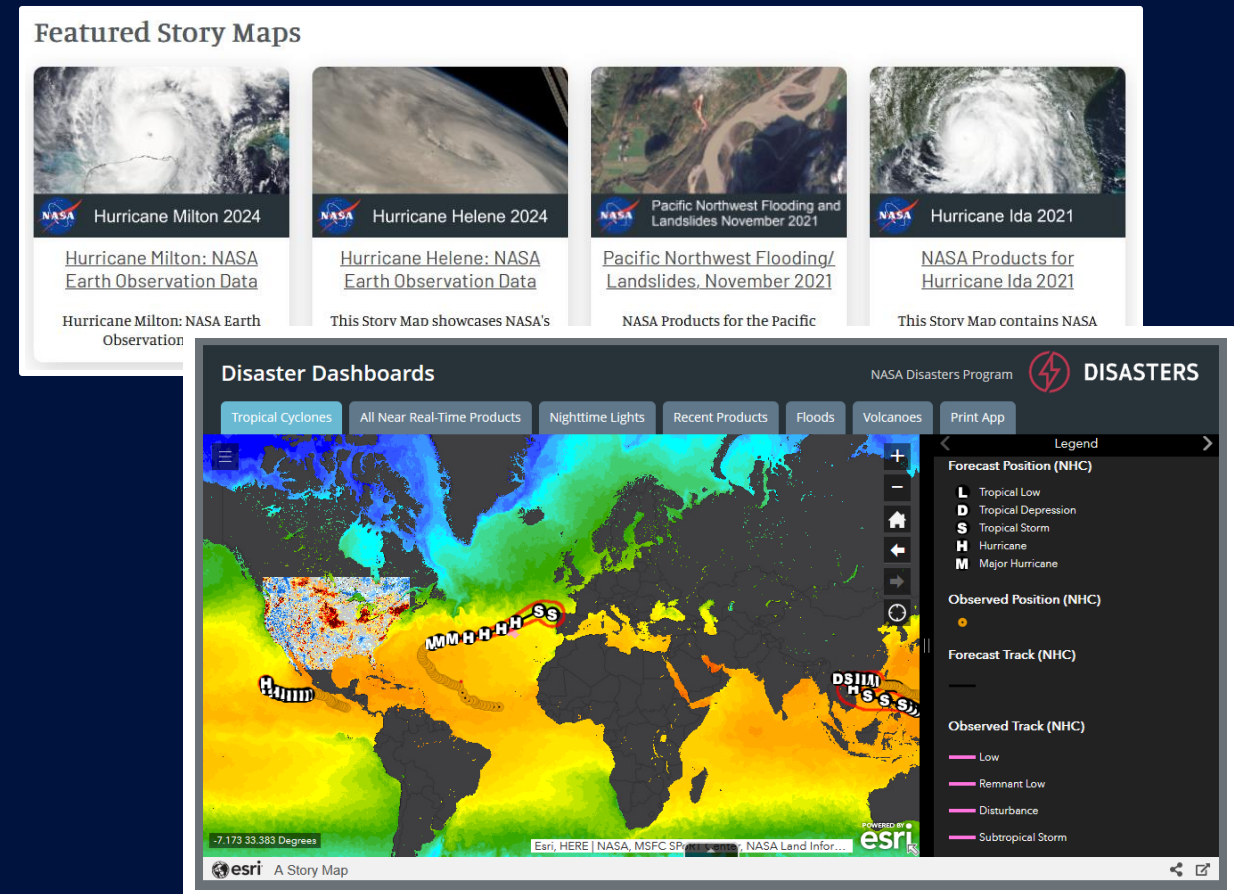
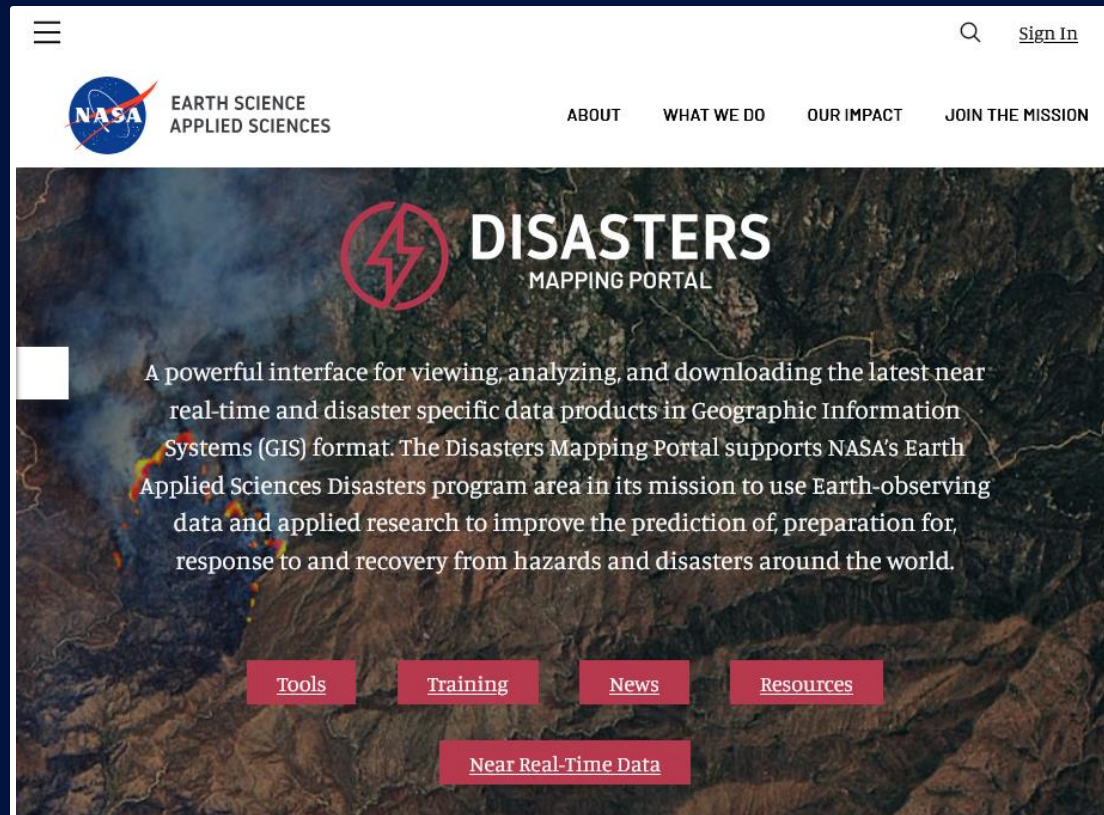
**Water  
Resources**



**Health &  
Air Quality**

# Resources: Earth Action - Disasters

The NASA Disasters Program advances science and builds tools to help communities make informed decisions for disaster planning. They develop free and accessible resources that use Earth Observations to reveal how natural hazards interact with vulnerability, exposure, and coping capacity in a changing climate.





A satellite view of Earth from space, showing the Western Hemisphere. The Americas are visible on the left, and the Atlantic Ocean is on the right. The image is used as a background for the slide.

# Have any questions?

We look forward to engaging with you in the future!

