



NASA GES DISC's Data and Applications

Binita KC, PhD
Dave Meyer, PhD
Jennifer Wei, PhD
Mohammad Khayat, PhD

Science Dialogue Series
Gandaki Province Academy of Science and Technology (GPAST)
Pokhara, Nepal
June 22, 2022 (tentative)



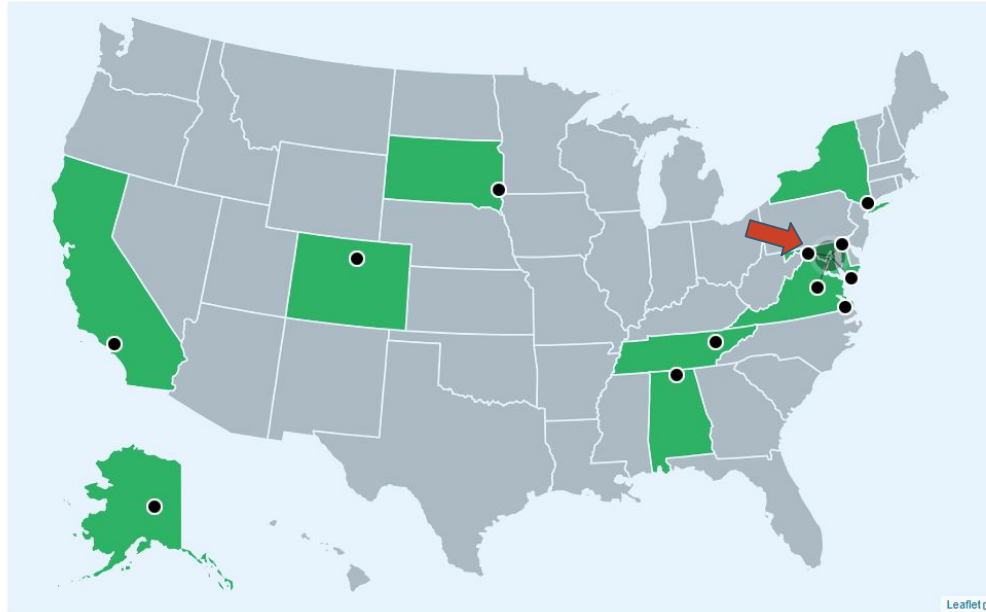
Outline

- Introduction to GES DISC (Distributed Active Archive Center- DAAC)
- Data Holding and their Application areas
- Access data from GES DISC and Earthdata Search
- Publicly available tools and services
 - Subsetting Tools
 - Giovanni (Use cases)
- User Guides
- Help Desk
- Additional Resources for users





12 NASA Distributed Active Archive Centers (DAACs)





The GES DISC: Who We Are

The Goddard Earth Sciences Data and Information Services Center (GES DISC) is one of the 12 **NASA Distributed Active Archive Centers (DAACs)** that manages, archives and distributes data as part of NASA's Earth Observation Systems Data and Information System (EOSDIS). We provide the support for the **archive and distribution** of the data from a range of **satellite observations, models, ground measurements, and field campaigns**.

- Archives total volume > **3.4 Petabytes** consisting of >**150 million data files** covering >**3000 public and restricted collections**.
- Multi-disciplinary data holdings include observations and model data of:
 - **atmospheric composition**
 - **water/energy cycles**
 - **climate variability**
- Through various available tools and services, the GES DISC provides users with **multi-sensor and model visual comparisons** and data access for a number of **projects spanning several disciplines**.

<https://disc.gsfc.nasa.gov>



GESDISC



The GES DISC: Who We Are

- **Who we are**
 - GES DISC (Goddard Earth Sciences (GES) Data and Information Services Center)
 - Data are free and open to public
 - Data and Services adhere to FAIR (Findability, Accessibility, Interoperability, Reusability) data principles
- **What we do - the **Bridge** between **Data** and **Science****
 - Core DAAC function and value-added services
 - Data Publication Support
- **GES DISC's value-added services**
 - Web search service
 - Level 2 Subsetter
 - Level 3/4 Regridder & Subsetter
 - Giovanni activities



GES DISC data holdings

1400+ data collections being curated

Atmospheric composition missions:

- Nimbus 1-7* BUV, SBUV, TOMS
- Shuttle SBUV*
- UARS*
- Aqua AIRS
- Aura HIRDLS*, OMI, MLS
- ACOS*
- SNPP Sounder, OMPS
- JPSS-1 Sounder, OMPS
- OCO-2/3
- Copernicus Sentinel 5P
- TOVS Pathfinder*

Water cycle/precipitation missions:

- TRMM*
- GPM
- SMERGE
- TROPICS

* end-of-mission/project

Climate variability/solar missions:

- SORCE
- TCTE
- TSIS
- CAR

Model data:

- MERRA*/MERRA-2
- NLDAS, GLDAS, FLDAS, NCA-LDAS

Research-derived data:

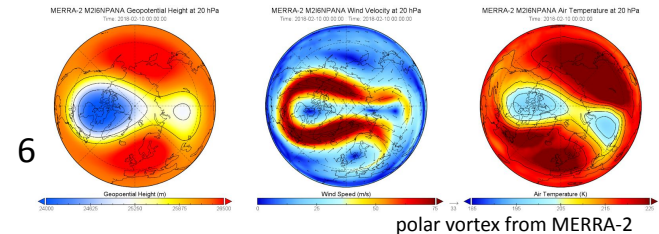
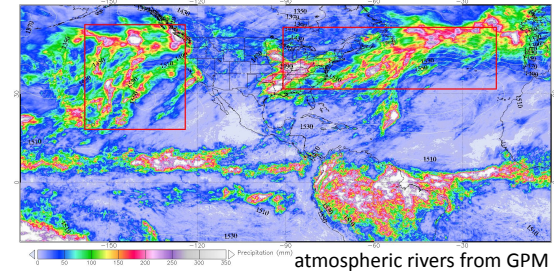
- MEaSUREs
- Carbon Monitoring System

Near-real time:

- AIRS
- MLS

Recent/future assigned missions:

- GeoCarb
- JPSS-2



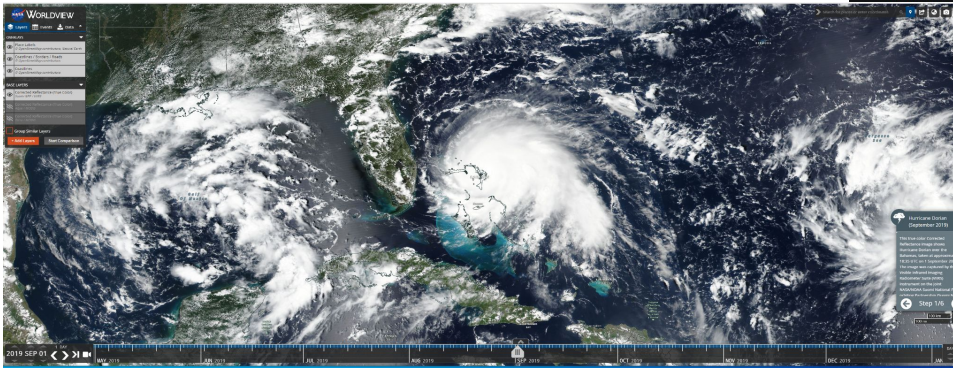


I need Data for my Research. Where do I get started?

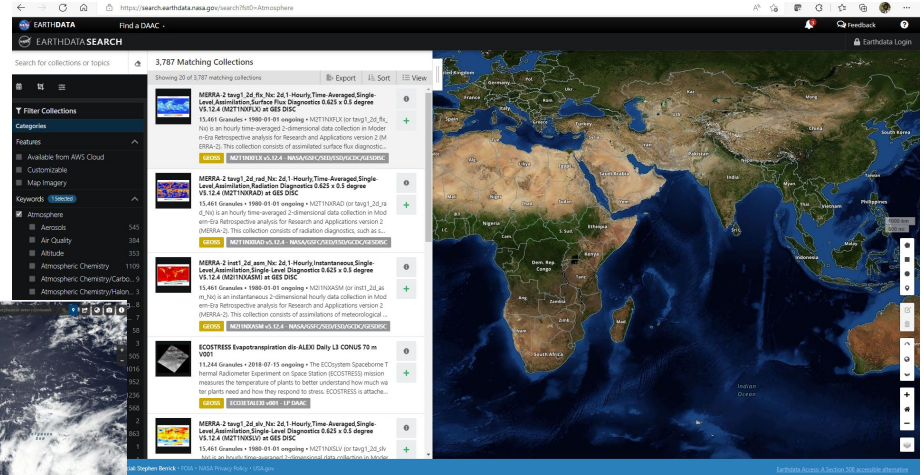
All the NASA Earth Science data is publicly available !

- 1) Earthdata search
- 2) Worldview- visualization
- 3) Individual DAAC webpage

Search By: Events, Layers and Data



NASA [Worldview](https://worldview.earthdata.nasa.gov/) <https://worldview.earthdata.nasa.gov/>



[Earthdata Search \(nasa.gov\)](https://search.earthdata.nasa.gov/search)
<https://search.earthdata.nasa.gov/search>

[Earthdata Search FAQ](https://www.earthdata.nasa.gov/faq)
<https://www.earthdata.nasa.gov/faq>



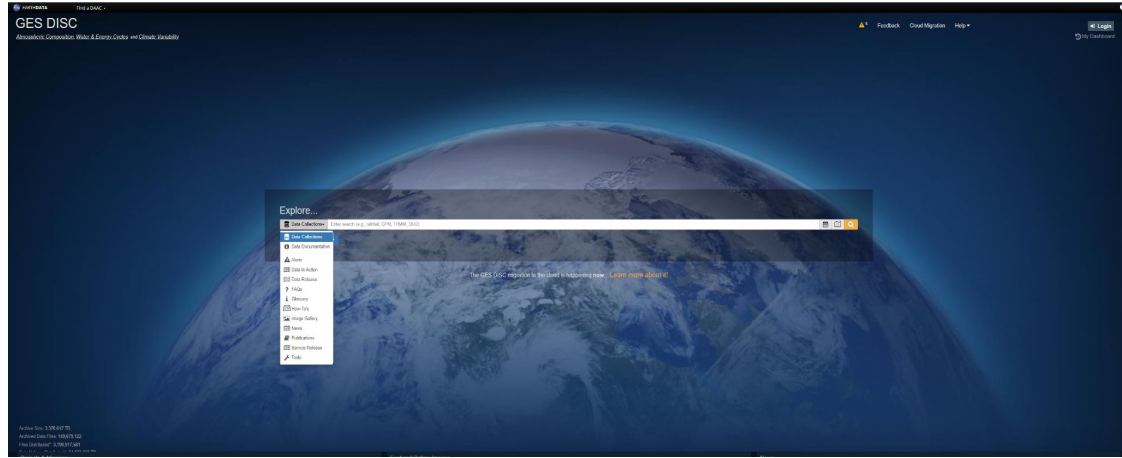
GESDISC



GES DISC- <https://disc.gsfc.nasa.gov/>

We provide:

- Data and Documentation
- Download and Subsetting Services
- Publications
- News articles
- Data-in- Action
- How-To guides
- Jupyter Notebooks
- FAQs
- Cloud resources



GESDISC



Step 2: Keyword Search “Rainfall”

GES DISC Data Collections

Find a DAAC

Atmospheric Composition, Water & Energy Cycles, and Climate Variability

Keyword Search

Refine your search

Want to focus your search?

- Add more keywords to your search (e.g., surface precipitation).
- Use the filters in 'Refine By'.

Image	Dataset	Source	Version	Time Res.	Spatial Res.	Process Level	Begin Date	End Date
	TRMM (TMPA/3B43) Rainfall Estimate L3 1 month 0.25 degree x 0.25 degree V7 (TRMM_3B43_7)	Models TMPA	7	1 month	0.25° x 0.25°	3	1998-01-01	2019-12-31
	TRMM (TMPA) Precipitation L3 1 day 0.25 degree x 0.25 degree V7 (TRMM_3B42_Daily_7)	Models TMPA	7	1 day	0.25° x 0.25°	3	1998-01-01	2019-12-31
	GPIM IMERG Final Precipitation L3 1 day 0.1 degree x 0.1 degree V06 (GPIM_3IMERGDF_06)	Models IMERG	06	1 day	0.1° x 0.1°	3	2000-08-01	2021-09-30
	TRMM (TMPA) Rainfall Estimate L3 3 hour 0.25 degree x 0.25 degree V7 (TRMM_3B42_7)	Models TMPA	7	3 hours	0.25° x 0.25°	3	1997-12-31	2019-12-31
	GPIM IMERG Final Precipitation L3 Half Hourly 0.1 degree x 0.1 degree V06 (GPIM_3IMERGHH_06)	Models IMERG	06	30 minutes	0.1° x 0.1°	3	2000-06-01	2021-09-30
	TRMM (TMPA-RT) Near Real-Time Precipitation L3 1 day 0.25 degree x 0.25 degree V7 (TRMM_3B42RT_Daily_7)	Models TMPA	7	1 day	0.25° x 0.25°	3	2000-03-01	2020-01-01
	MERRA-2 (svap1_2d_tke_Nx_2d 1-hourly Time-Averaged Single-Level Assesment Surface Flux Diagnostics V5 12.4 (M211NOFLX 5.12.4)	The second Modern-Era Retrospective analysis for Research and Applications NOT APPLICABLE	5.12.4	1 hour	0.5° x 0.625°	4	1980-01-01	2022-04-30

GES DISC Search: Showing 1 - 25 of 76 datasets associated with rainfall



GESDISC



Step 3: Dataset Landing Page

Back to search results

Global Precipitation Measurement

GPM IMERG Final Precipitation L3 1 day 0.1 degree x 0.1 degree V06 (GPM_3IMERGDF)

View Full-size Image

The Integrated Multi-satellite Retrievals for GPM (IMERG) is the unified U.S. algorithm that provides the multi-satellite precipitation product for the U.S. GPM team. Version 06 is the current version of the data set. Older versions will no longer be available and have been superseded by Version 06. This dataset is the GPM Level 3 IMERG "Final" Daily 10 x 10 km (GPM_3IMERGDF) derived from the half-hourly GPM_3IMERGHH. The derived result represents the final estimate of the Daily accumulated precipitation. The dataset is produced at the NASA Goddard Earth Sciences (GES) Data and Information Services Center (DISC) by simply summing the valid precipitation retrievals for the day in GPM_3IMERGHH and giving the result in (mm). The latency of the derived "Final" Daily product depends on the delivery of the IMERG "Final" Half-Hourly produ... [more](#)

Documentation,Publication, Product Summary

Product Summary

Data Citation

Documentation

References

Data Calendar

Shortname: GPM_3IMERGDF

Longname: GPM IMERG Final Precipitation L3 1 day 0.1 degree x 0.1 degree V06

DOI: 10.5067/GPM/IMERGDF/DAY06

Version: 06

Format: netCDF

Spatial Coverage: -180 0 -90 0 190 0 90 0

Temporal Coverage: 2000-06-01 to 2021-06-30

File Size: 12 MB per file

Data Resolution

Spatial: 0.1 ° x 0.1 °

Temporal: 1 day

Science Focus Areas

Atmospheric Composition

Water & Energy Cycles

Climate Variability

Tools

Overview

Data Tools for Hydrology

DISC Viz

AIRS NRT Viewer

DISC Web Map Service

GPM/IMERG and DISC

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Citing Our Data

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User Working Group

Site Version: v7.0.4.5 | NASA Official: Long Pham | Web Curator: M. Hegde | Web Privacy Policy

Data Access

Online Archive

Earthdata Search

Glovis

Web Services

Subset / Get Data

[GES DISC Dataset: GPM IMERG Final Precipitation L3 1 day 0.1 degree x 0.1 degree V06 \(GPM_3IMERGDF 06\)](#)



GESDISC



Data Documentation

Find a DAAC

GES DISC

Atmospheric Composition, Water & Energy Cycles and Climate Variability

Data Collections

random

Feedback

Cloud Migration

Help

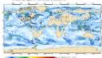
Login

My Dashboard

Back to search results

Global Precipitation Measurement

GPM IMERG Final Precipitation L3 1 day 0.1 degree x 0.1 degree V06 (GPM_3IMERGDF)



View Full-size Image

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The latency of the derived "Final" Daily product depends on the delivery of the IMERG "Final" Half-Hourly produ...more

Product Summary

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ALGORITHM THEORETICAL BASIS DOCUMENT (ATBD)

IMERG_ATBD_V06.pdf

PI DOCUMENTATION

Release notes, New Morphing algorithm

PI DOCUMENTATION

IMERG Technical Documentation

PI DOCUMENTATION

IMERG Quality Index

PI DOCUMENTATION

Caveats for IMERG extension into TRMM era

READ-ME

README Document

IMPORTANT NOTICE

IMERG Release Notes

ANOMALIES

GPM and partner sensors anomalous events

PROJECT HOME PAGE

GPM Project Home Page

For further information or assistance click "Feedback" (upper right) or email the Help Desk at: helpdesk@disc.gsfc.nasa.gov

Read Data Documents

Data Access

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Earthdata Search

Giovanni

Web Services

Subset / Get Data

Science Focus Areas

Atmospheric Composition

Water & Energy Cycles

Climate Variability

Tools

Giovanni

Data Tools for Hydrology

DOYr

AIRS NRT Viewer

OGC Web Map Service

ORNLDAAC and GDS

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Earthdata Forum

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Why We Are

Citing Our Data

Contact Us

User Working Group

[GES DISC Dataset: GPM IMERG Final Precipitation L3 1 day 0.1 degree x 0.1 degree V06 \(GPM_3IMERGDF 06\)](#)

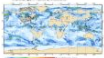


Related Publications

DATA ACQUISITION METHODS

Global Precipitation Measurement

GPM IMERG Final Precipitation L3 1 day 0.1 degree x 0.1 degree V06 (GPM_3IMERGDF)



View Full-size Image

The Integrated Multi-satellite Retrievals for GPM (IMERG) is the unified U.S. algorithm that provides the multi-satellite precipitation product for the U.S. GPM team. Version 06 is the current version of the data set. Older versions will no longer be available and have been superseded by Version 06.

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The latency of the derived "Final" Daily product depends on the delivery of the IMERG "Final" Half-Hourly produ... more

Data Access

[Online Archive](#)

[EarthData Search](#)

[Giovanni](#)

[Web Services](#)

[Subset / Get Data](#)

Product Summary

Data Citation

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Data Calendar

Data Collection References

2020

GLOBAL PRECIPITATION MEASUREMENT PRECIPITATION PROCESSING SYSTEM, File Specification. 2020. URL: ftp://gpmweb2.gsfc.nasa.gov/pub/GPMfiles/spec/filespec_CFM.pdf

Related Data Collections (221)

2011

Joyce, Robert J., Xie, Pingping. 2011. **Kalman Filter-Based CMORPH**. *J. Hydrometeor.* Vol. 12, No. 6, pp. 1547-1563. DOI: [10.1175/JHM-D-11-022.1](https://doi.org/10.1175/JHM-D-11-022.1) ISSN: 1525-755X, 1525-7541

Related Data Collections (7)

2004

Hong, Yang, Hsu, Kuo-Lin, Sorooshian, Soroosh, Cao, Xiaogang. 2004. **Precipitation Estimation from Remotely Sensed Imagery Using an Artificial Neural Network Cloud Classification System**. *J. Appl. Meteor.* Vol. 43, No. 12, pp. 1834-1863. DOI: [10.1175/JAM2173.1](https://doi.org/10.1175/JAM2173.1) ISSN: 0894-8763

Related Data Collections (7)

Related Publications

Disclaimer: The majority of publications using GES DISC data do NOT include the data version ID. As such, publications below may not use the most recent processing version of the data.

2022

Chaudhri, Aksharshita, Liu, Yuesi. 2022. **Influence of major typhoons on ocean, atmosphere and air quality of Northwest Pacific during August 2020**. *Atmospheric Environment*. Vol. 271, pp. 118923. DOI: [10.1016/j.atmosenv.2021.118923](https://doi.org/10.1016/j.atmosenv.2021.118923) ISSN: 1352-2310

Related Data Collections (4)

2021

Chen, Yongzhe, Feng, Xiaoming, Fu, Bojie. 2021. **An improved global remote-sensing-based surface soil moisture (RSSM) dataset covering 2003–2018**. Vol. 13, No. 1, pp. 1-31. DOI: [10.5194/essd-13-1-2021](https://doi.org/10.5194/essd-13-1-2021) ISSN: 1896-3508

Related Data Collections (1)

[GES DISC Dataset: GPM IMERG Final Precipitation L3 1 day 0.1 degree x 0.1 degree V06 \(GPM_3IMERGDF 06\)](#)



Data Access Methods

GES DISC Data Collections [Search](#)

[Atmospheric Composition](#) [Water & Energy Cycles](#) [Land & Ocean Dynamics](#) [Climate Variability](#)

[Back to search results](#)

Global Precipitation Measurement

GPM IMERG Final Precipitation L3 1 day 0.1 degree x 0.1 degree V06 (GPM_3IMERGDF)

 [View Full size Image](#)

The Integrated Multi-satellite Retrievals for GPM (IMERG) is the unified U.S. algorithm that provides the multi-satellite precipitation product. Version 06 is the current version of the data set. Older versions will no longer be available and have been superseded by Version 06. This dataset is the GPM Level 3 IMERG "Final" Daily 10 x 10 km (GPM_3IMERGDF) derived from the half-hourly GPM_3IMERGHH. The (DISC) by simply summing the valid precipitation retrievals for the day in GPM_3IMERGHH and giving the result in (mm). The latency of the derived "Final" Daily product depends on the delivery of the IMERG "Final" Half-Hourly products. [more](#)

[Product Summary](#) [Data Citation](#) [Documentation](#) [References](#) [Data Calendar](#)

Data Collection References

2020

GLOBAL PRECIPITATION MEASUREMENT PRECIPITATION PROCESSING SYSTEM. File Specification. 2020. URL: <ftp://gpmnet2.gps.cosda.nasa.gov/pub/GPM/>

[Related Data Collections \(221\)](#)

2011

Joyce, Robert J., Xie, Pingping. 2011. *Kaiman Filter-Based CMORPH. J Hydrometeorol.* Vol. 12, No. 6, pp. 1547-1563. DOI: 10.1175/JHM-D-11-022.1 ISSN: 1525-7555

[Related Data Collections \(7\)](#)

2004

Hong, Yang, Hsu, Kuo-Lin, Sorooshian, Soroosh, Gao, Xiangang. 2004. *Precipitation Estimation from Remotely Sensed Imagery Using an Artificial Neural Network Class*

[Related Data Collections \(7\)](#)

Related Publications

Disclaimer: The majority of publications using GES DISC data do NOT include the data version id. As such, publications below may not use the most recent processing version of the data.

2022

Get GPM IMERG Final Precipitation L3 1 day 0.1 degree x 0.1 degree V06 data

Estimated size of results
7,792 days, 7,792 links, 87.68 GB

Download Method [?](#)

Download Method: [Get Original Files](#) [Reset](#)

- ☒ **Get Original Files**
Generate unmodified file links directly from the archive.
- ☐ **Get File Subjects using OPeNDAP** [?](#)
Generate file links supporting geo-spatial search and crop and selection of variables and dimensions, in netCDF or ASCII formats.
- ☐ **Get File Subjects using the GES DISC Subsetter** [?](#)
Generate file links supporting geo-spatial search and crop, selection of variables, and regridding, in netCDF format.

Method Options [?](#)

Refine Date Range: 2000-06-01 to 2021-09-30 [Reset](#)

NOTE: All dates and times are in UTC.

From: To:

Available Range: 2000-06-01 to 2021-09-30

June 2008

Sun	Mon	Tue	Wed	Thu	Fri	Sat
25	26	27	28	29	30	01
02	03	04	05	06	07	08
09	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	01	02	03	04	05	06

September 2021

Sun	Mon	Tue	Wed	Thu	Fri	Sat
26	27	28	29	30	01	02
03	04	05	06	07	08	09
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
01	02	03	04	05	06	07

Output format [?](#)

File Format: [Reset All](#) [Get Data](#)

Data Access Methods:
https://disc.gsfc.nasa.gov/datasets/GPM_3IMERGDF_06/versions/latest, [subsetting services](#)

[GES DISC Dataset: GPM IMERG Final Precipitation L3 1 day 0.1 degree x 0.1 degree V06 \(GPM_3IMERGDF 06\)](https://disc.gsfc.nasa.gov/datasets/GPM_3IMERGDF_06/versions/latest)



How-To guides (Jupyter Notebooks)

GES DISC Search: Showing 1 - 25 of 27 how-to's associated with rainfall

How to find the max precipitation value of a Region of Interest (ROI) using an ArcGIS image service (Jupyter Notebook)

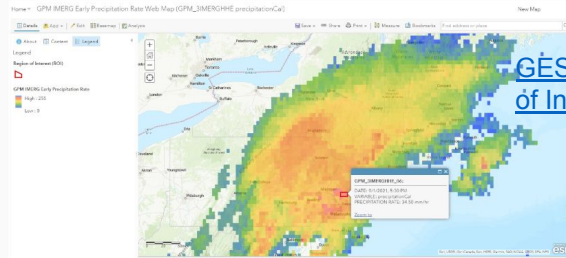
Download the companion Jupyter Notebook

Overview:

The goal of this tutorial is to inform the user on how to find the maximum precipitation rate (mm/hr) using an ArcGIS image service as data input, via a Jupyter Notebook (JN) for a defined Region of Interest (ROI). The ArcGIS image service used in the notebook is the "GPM_3IMERGHR6_00 (imageryServer)" ArcGIS REST service (Huffman et al., 2015).

Example:

For this example, we are using "GPM IMERG Early Precipitation Rate" data as the input to find the max precipitation value of a ROI for a specific time range. The NASA GES DISC ArcGIS Enterprise landing page hosts the mapping interfaces of this data through a web map, web app, Web Mapping Service (WMS), and direct image service link. Hurricane Ida is the weather event determining the time and place for the analysis. The current date and time, and geographic ranges are specifically set in the JN for a +115 sq-mi area in Marville, NJ, USA, during the heavy rainfall impacts on the Northeastern United States from Hurricane Ida remnants between August 29th, 2021, at 12:00 AM EST and September 3rd, 2021, at 12:00 AM EST, using the GPM_3IMERGHR6_00 ArcGIS Image Service as the data source. However, any date and time ranges can be applied by editing the JN code included in this documentation. See Figure 1 below for a visualization of the GPM IMERG Web Map when Hurricane Ida's heavy rainfall impacts pass over the ROI on September 1st, 2021, at 5:30 PM EST, at a precipitation rate of 34.50 mm/hr (Huffman et al., 2015), causing major flash flooding in the area.



GES DISC How-To's: How to find the max precipitation value of a Region of Interest (ROI) using an ArcGIS image service (Jupyter Notebook)



[GES DISC How-To's: How to Access MERRA-2 Data using OPeNDAP with Python3 and Calculate Daily/Weekly/Monthly Statistics from Hourly Data](#)



[Back to news](#)



Extremely cold Texas in February 2021 - one of the coldest Februarys in four decades: The story told with NLDAS-2 data

by: Xiaohua Pan and Hualan Rui (NASA/GSFC/GES DISC) - Updated: Apr 19, 2021

Rigid cold weather hit the state of Texas in February 2021. We characterized this extreme weather event using hourly and monthly data from the Phase 2 North American Land Data Assimilation System (NLDAS-2) datasets. The datasets are mainly downloaded through the Thematic Real-time Environmental Distributed Data Services (THREDDS) Data Server (TDS) and Data Rods.

Introduction

Frigid cold weather hit the state of Texas in February 2021. This weather event became particularly notable in worldwide news because of the consequent widespread [Texas Power crisis](#) (Wikipedia, last accessed on March 30, 2021). This crisis exacerbated the woes of the [devastating COVID-19 pandemic](#) (Wikipedia, last accessed on March 30, 2021), which has lasted more than a year.

Listed below is a series of questions regarding this extreme cold weather event in February 2021, which we will address in this article:

- How severe was the winter storm in February 2021?
- Is February 2021 the coldest February in Texas since 1979?
- Is February 2021 the snowiest February in Texas since 1979?
- Is 2021 the coldest winter in Texas since 1979?
- Is Texas "exempt" from global warming?

We will respond to each question using hourly and monthly data from the Phase 2 North American Land Data Assimilation System (NLDAS-2) dataset. Specifically, we used the NLDAS-2 Primary Forcing (FORA) 2-meter (2-m) air temperature data, derived from the analysis fields of the National Centers for Environmental Prediction (NCEP) North American Regional Reanalysis (NARR) with certain adjustments (Xia et al., 2009; Mocko 2012b). Note that the unit of temperature has been converted from the original Kelvin to Fahrenheit in this article. In addition, we also examined snowfall data from the Noah Land-Surface Model (LSM, Xia et al., 2012a; Mocko 2012a). The snowfall data are directly derived from the observation-based total precipitation in the primary forcing data using a partitioning threshold: if air temperature is below 0°C, then the precipitation is taken as snowfall (Xia et al., 2012c).

NLDAS is a collaborative project among several organizations (see the [NLDAS project website](#)), and its data can be accessed from the NASA Goddard Earth Sciences Data and Information Services Center ([GES DISC](#)). NLDAS-2 data can be downloaded with various data services at the GES DISC, including two services especially developed for time series analysis which are used extensively in this article, i.e., the Thematic Real-time Environmental Distributed Data Services (THREDDS) Data Server (TDS) and [Data Rods](#). The NLDAS-2 data have a spatial resolution of $1/6^\circ$ and a temporal range from January 1979 to the present (Xia et al., 2012b, c). Its relatively short latency (around four days) enables its use to characterize ongoing weather events.

How severe was the winter storm in February 2021?

A large area of North America, as well as northern Mexico, suffered from extreme windy and icy weather in the middle of February 2021, due to the impact of a major North American winter storm (Wikipedia, Last accessed on March 30, 2021) occurring during the period February 13–17, 2021. In particular, on February 16, 2021, an area of below-freezing temperatures, i.e., temperature less than 32° F (Figure 1, blue colors), extended from Canada to as far as northern Mexico, according to the hourly NLAS-2 Primary Forcing 2-meter air temperature data. The air temperature dropped to between -10° F in Texas. Texas and the two largest cities in Texas, Dallas (32.76° N, 96.80° W) and Houston (29.77° N, 95.37° W), are highlighted in Figure 1 and studied further below.

As shown in Figure 2, freezing temperatures lasted for almost five days (112 hours, February 15-19, 2021) in Houston, where the *power outage crisis* consequently occurred (Texas Tribune, last accessed on March 30, 2021), evident in the NLDAS-2 First Forcing 2-m air temperature data. In comparison, freezing temperatures lasted even longer in Dallas, more than nine days (222 hours, February 13-21, 2021); luckily, this city experienced less severe power outages. The hourly air temperature in both cities on February 16, 2021 was significantly below the 3-month mean temperature of 53.36°F and 46.14°F, respectively (refer to the minimum and mean shown in the text within the figure). Since Texas is unaccustomed to such extensive freezing weather conditions, the infrastructure for power supply and fuel, such as natural gas pipelines, had not been designed accordingly, leading to failures which induced power outages. Eventually, the air temperature rose to near normal, from a minimum of 8.67°F on February 16 to a maximum of 80.78°F on February 23, in Houston, a huge difference of 72°F. In Dallas, the sharp difference between the minimum and maximum temperatures was even greater (by 2°F).

Figures & Tables

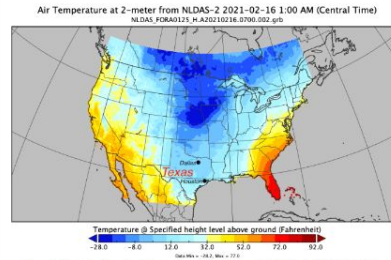


Figure 1. Map of the 2-meter air temperature ($^{\circ}\text{F}$) on February 16, 2021, 1:00 AM (Central Time) over the United States and portions of Canada and Mexico, based on the hourly NLDAS-2 Primary Forcing data. Texas and its two largest cities, Dallas and Houston, are highlighted.

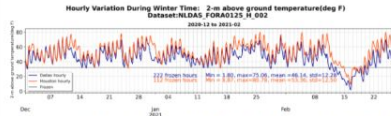


Figure 2. Hourly variation of 2-m air temperature ($^{\circ}\text{F}$) in two cities in Texas, Dallas (blue curve) and

Spatial Coverage

 North America (Longitude: -125.0 to -67.0; Latitude: 25.0 to 53.0)

Time Range

🕒 1979-01-01 to 2021-02-28

Get Data

Hourly NLDAS Primary Forcing Data V002
Monthly NLDAS Primary Forcing Data V002
Hourly NLDAS Noah Land Surface Model Data V002
Monthly NLDAS Noah Land Surface Model Data V002
MERRA-2 (avgM, 2d_siv_Nk, 2d) monthly mean Time-Averaged, Single-Level Assumtion, AIRS-Level
Diagnostics V5.12.4
Aqua/AIRS L3 Daily Standard Physical Retrieval (AIRS only) 1 degree x 1 degree V7.0 (AIRS3STD)
FLDAS Noah Land Surface Model L4 Global Monthly 0.1 x 0.1 degree (FLDAS_NOAH01_C_GL_M)

Related Phenomena



Tags & Keywords

NLDAS

North American Land Data Assimilation System

NASA GESDISC



GIS Service

- Image Service : [GES DISC ArcGIS Enterprise](#)
 - IMERG Early Image services
 - Access to a large amount of data without the user needing to store and process the data
 - Quickly open, view, and analyze data
 - Temporal Span- June 1, 2000-Present
- Themed web maps, web apps and story maps from [Earthdata GIS data pathfinder](#)
 - [Drought](#)
 - [Monitoring Flood](#)
 - [Observing Tropical Storms](#)
 - [Cyclone Amphan \(arcgis.com\)](#)
 - [Post Assessment of Hurricane Dorian in the Bahamas](#)
 - Water Levels in reservoir
 - [Lake Victoria Rising Water Levels - Overview](#)



Home Gallery Map Scene Groups Content Organization

GES DISC ArcGIS Enterprise

Featured Maps and Apps

GPM IMERG Early Precipitation Rate Web Map

GPM IMERG Early Precipitation Rate

GPM IMERG Early Precipitation Rate (WMS)

GPM IMERG Early Precipitation Rate Web App

Welcome to the Goddard Earth Science Data and Information Services Center GIS home page!
Currently we offer content for the Integrated Multi-satellite Retrievals for Global Precipitation Measurement (IMERG) Early product. Feel free to browse the gallery or content tabs or follow the links below directly to the services and web maps we provide.

[GPM IMERG Early Web map](#)
[Image Service Landing Page](#)
[Direct Image Service Link](#)

Monitoring Drought using NASA Earth Observation Data

August 29, 2021

Drought is a period when precipitation levels are below normal, resulting in water-related problems, such as reduced soil moisture and groundwater. This reduction in water availability is detrimental to vegetation health, contributing to general evaporative stress in plants and a lack of water for irrigation. This in turn leads to slowed crop growth, severe crop damage and possibly food insecurity. Drought can also cause a general water shortage needed for human health, energy production, and many other aspects of society.

Evaporative stress, precipitation, soil moisture, plant greenness, changes in vegetation, and population layers are all available in the app in Figure 1. Analysis of these datasets provides a means to monitor in near real time the conditions that lead up to and result from drought, as well as how humans may be affected. The layers in the Drought Web App are NASA global datasets; more detailed descriptions of each layer are provided below.



GIOVANNI

The Bridge Between Data and Science v 4.37

[Feedback](#)[Help](#)[Log out \(jimacker\)](#)**Removal of Product LPRM_AMSRE_D_RZSM3_001 on June 27, 2022 ...** [1 of 1 messages] [Read More](#)**Select Plot**

Time Averaged Map

**Select Date Range (UTC)**YYYY - MM - dd  00 : 00 to YYYY - MM - dd  23 : 59

Valid Range: 1948-01-01 to 2022-06-02

Select Region (Bounding Box or Shape)

-180, -90, 180, 90

**Select Variables****▼ Observations**

- ☐ Model (1878)
- ☐ Observation (951)

▼ Disciplines

- ☐ Aerosols (295)
- ☐ Atmospheric Chemistry (281)
- ☐ Atmospheric Dynamics (948)
- ☐ Cryosphere (25)
- ☐ Hydrology (1105)
- ☐ Ocean Biology (167)
- ☐ Oceanography (204)
- ☐ Water and Energy Cycle (1269)

► Measurements**► Platform / Instrument****► Spatial Resolutions**

Number of matching Variables: 0 of 2829

Total Variable(s) included in Plot: 0

Keyword :

Visualization Selection

Faceted Search

Time Period Selection

Keyword Search

Region-of-Interest Selection



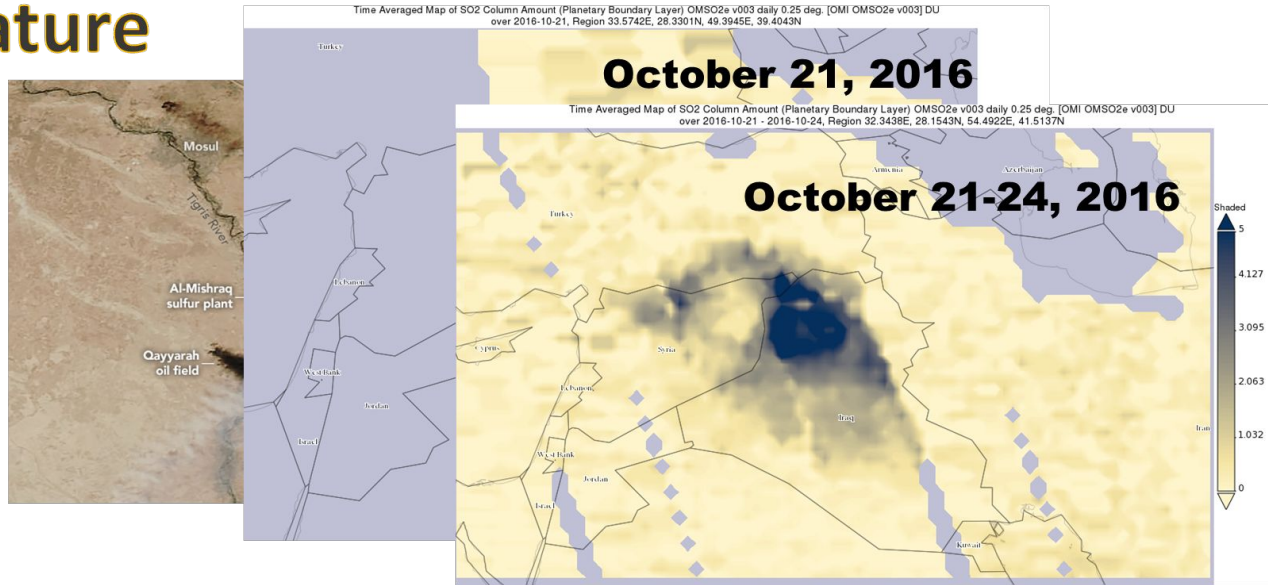
Responsible NASA Official: [Angela Li](#)
Web Curator: [M. Hegde](#)

[Privacy](#)

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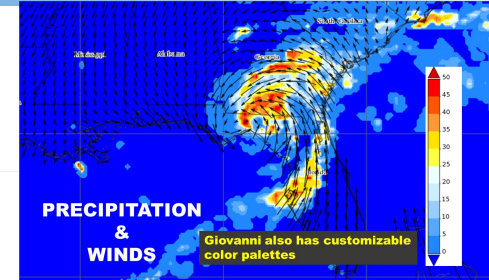
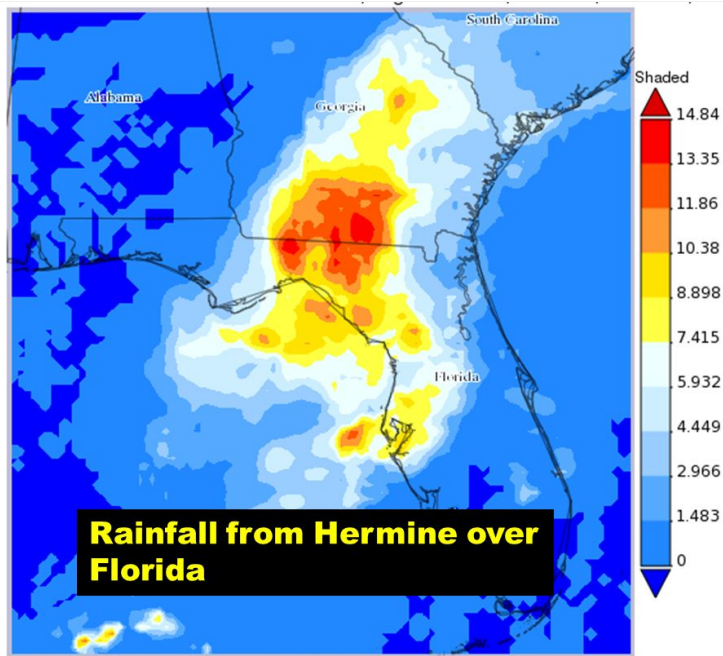
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Interactions between humanity and nature

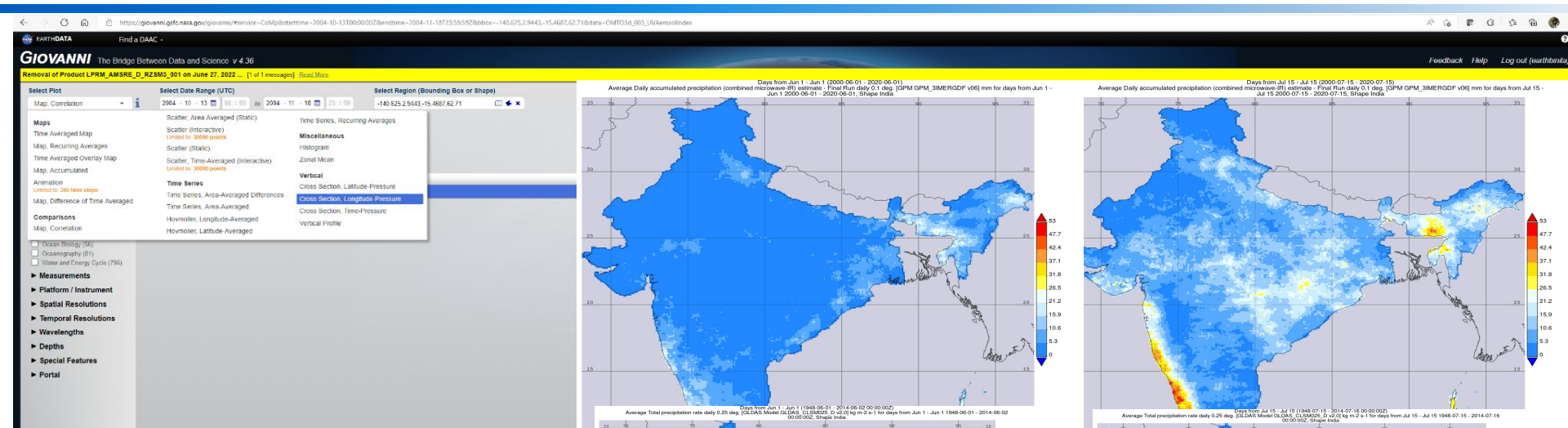


Giovanni allows rapid data averaging over user-specified time periods

Natural Events



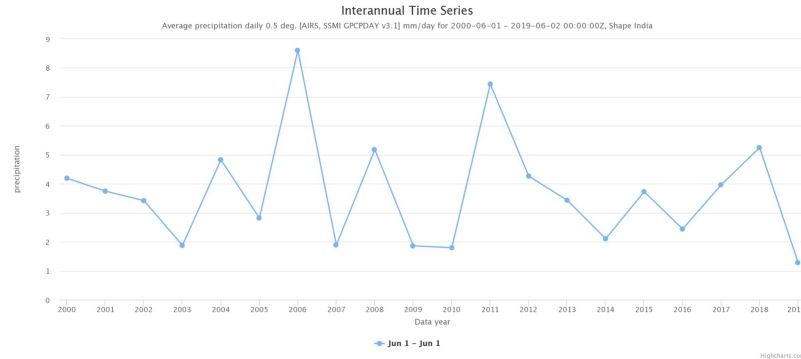
Recurring- Time average map and time series



Indian Monsoon Season - Avg. onset date (T.N. Krishnamurti) [monsoon](#) | [meteorology](#) | [Britannica](#)

- GLDAS Total precipitation rate (1948 - 2014)
- IMERG Final (2000 - 2020)

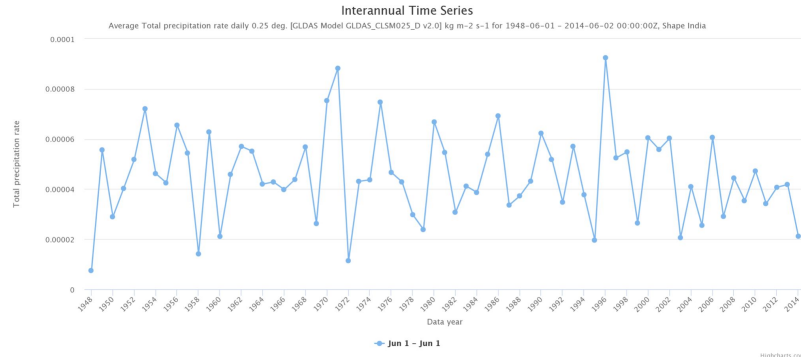
Indian Monsoon Season - Avg. onset date



GPCP

June 1

[monsoon](#) | [meteorology](#) | [Britannica](#)



GLDAS

June 1



User Assistance

GES DISC Help Desk:
gsfc-dl-help-disc@mail.nasa.gov

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Ask Questions at earthdata forum:
<https://forum.earthdata.nasa.gov/>



Contact Us Page

Contact Us

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Starting August 1st, 2018, access to GES DISC data requires all users to be registered with the Earthdata Login system. Data continues to be free of charge and accessible via HTTPS. Access to data via FTP

Email

Send an email message to the GES DISC Help Desk for assistance at gsfc-dl-help-disc@mail.nasa.gov. **But** before you do, **please** include as much of the information listed below in your message, if possible.

- Your Earthdata login **username** (PLEASE DO NOT INCLUDE PASSWORDS)
- The specific URL (Web address) for the page or data set you were attempting to access
- The **date and time** you experienced the issue
- Your computer **IP address** (If you do not know your IP address, use www.whatismyip.org to get it)
- The general type of **computer** you are using
- The name of the **data product**, **data set**, or **data variable** you were searching for
- The **access method** you are using (browser, script)
- If browser, the **web browser** and its **configuration** to accept cookies
- If script, the **script version** (script v1)
- If not, the **last version** (last v1)
- The **platform** you are using (Mac, PC, Linux) and **operating system** and the current version name and number
- The **application** you were using (downloads, Web, Command, etc.)
- Any **specific error messages** seen on your screen

Giovanni User?

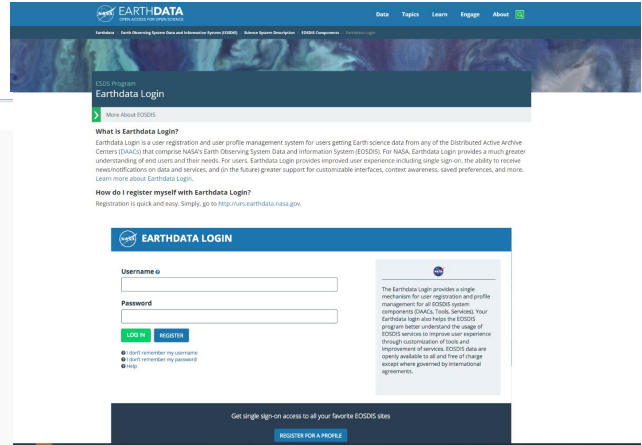
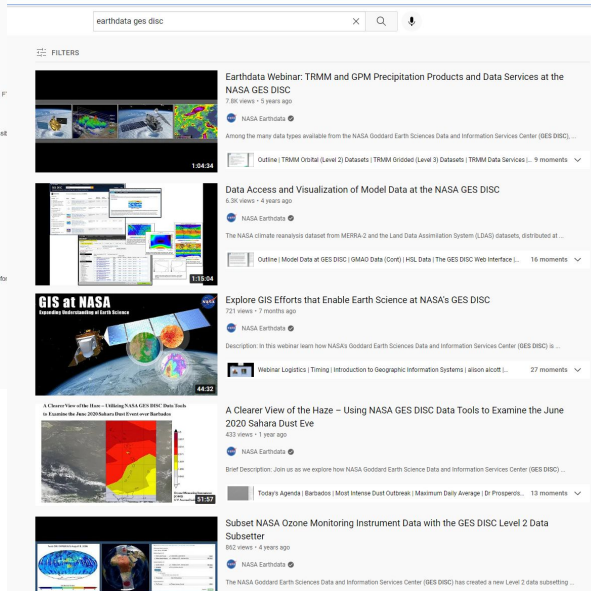
If you encounter an error message, or have a question about something created with Giovanni, click the **"Feedback"** button. This will create an **Error Report** email message for the Help Desk capturing info added via.

Why is this information useful?

- Including the details you need to access our site enables us to identify messages in our system log related to the issue, which will aid in resolving it
- Including your IP address also helps us to identify your interaction with the site, and may indicate if there is a problem with your access to our site
- Including the Web browser you were using, along with the application, data product, and computer operating system, allows us to better evaluate what you were attempting to do
- Knowing your general area of research may allow us to propose new or other data products or analysis methods that may be useful to you

Phone

To speak with our Help Desk between the hours of 9:00 AM and 5:00 PM, US EST/EDT, please call 301-814-5524. For fax at any time, dial 301-614-5526.



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What is Earthdata Login?
Earthdata Login is a user registration and user profile management system for users getting Earth science data from any of the Distributed Active Archive Centers (DAACs) that comprise NASA's Earth Observing System Data and Information System (EOSDIS). For NASA, Earthdata Login provides a much greater understanding of end users and their needs. For users, Earthdata Login provides improved user experience including single sign-on, the ability to receive news/notifications on data and services, and (in the future) greater support for customizable interfaces, context awareness, saved preferences, and more. Learn more about Earthdata Login.

How do I register myself with Earthdata Login?
Registration is quick and easy. Simply go to <http://urs.earthdata.nasa.gov>.

EARTHDATA LOGIN

Username

Password

LOG IN **REGISTER**

- I don't remember my username
- I don't remember my password
- Help

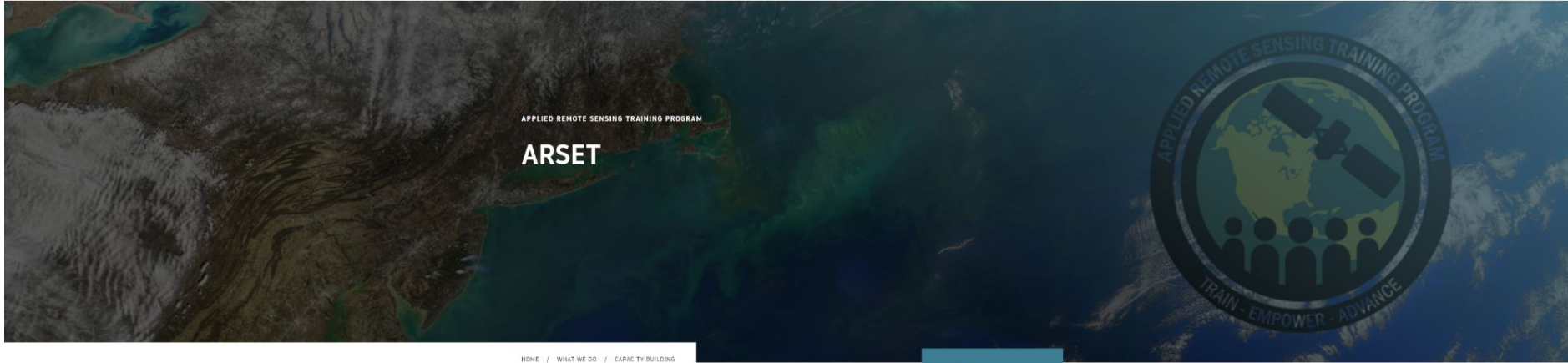
The Earthdata Login provides a single mechanism for user registration and profile management for all EOSDIS system components (DAACs, Tools, Services). Your Earthdata login also helps the EOSDIS program better understand the usage of EOSDIS services to improve user experience through customization of tools and improvement of services. EOSDIS data are openly available to all and free of charge except where governed by international agreements.

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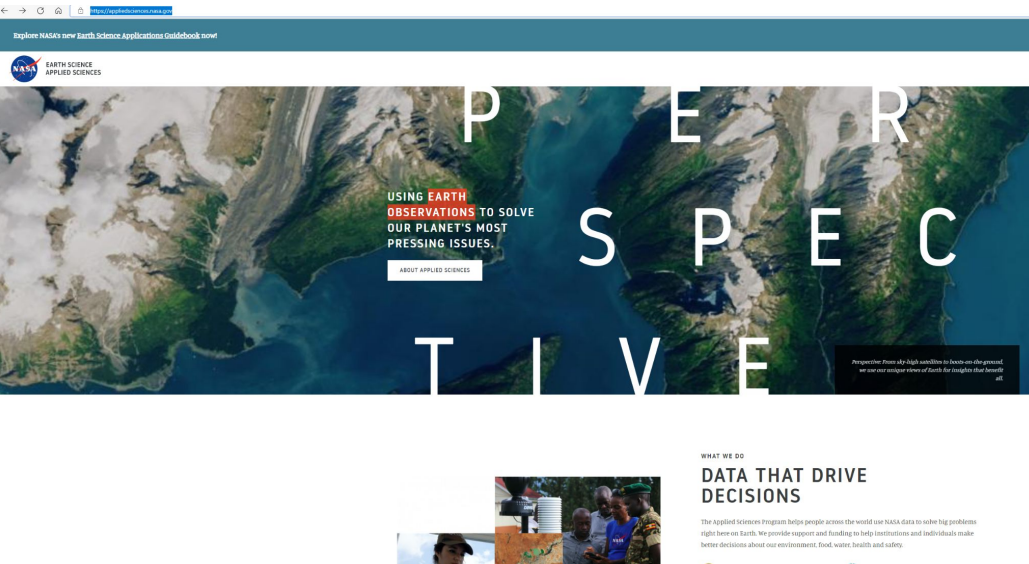
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Additional Resources

- **Alaska Satellite Facility (ASF) DAAC** <https://asf.alaska.edu/>
 - Synthetic Aperture Radar (SAR)
- **Atmospheric Science Data Center (ASDC)** <https://asdc.larc.nasa.gov/>
 - Radiation budget, clouds, aerosols, and tropospheric composition
- **Crustal Dynamics Data Information System (CDDIS)** <https://cddis.nasa.gov/>
 - Space geodesy
- **Global Hydrometry Resource Center (GHRC) DAAC** <https://ghrc.nsstc.nasa.gov/home>
 - Lightning, tropical cyclones, and storm-induced hazards
- **Goddard Earth Sciences Data and Information Services Center (GES DISC)** <https://disc.gsfc.nasa.gov/>
 - Atmospheric composition, atmospheric dynamics, global precipitation, solar irradiance:
- **Land Processes DAAC (LP DAAC)** <https://lpdaac.usgs.gov/>
 - Land cover, surface reflectance, radiance, temperature, topography, vegetation indices
- **Level 1 and Atmosphere Archive and Distribution System (LAADS) DAAC** <https://ladsweb.nascom.nasa.gov>
 - MODIS Level 1 and atmosphere products
- **National Snow and Ice Data Center (NSIDC) DAAC** <https://nsidc.org/daac>
 - Snow, sea ice, glaciers, ice sheets, ice shelves, frozen ground, soil moisture, cryosphere, climate interactions
- **Oak Ridge National Laboratory (ORNL) DAAC** <https://daac.ornl.gov/>
 - Snow, sea ice, glaciers, ice sheets, ice shelves, frozen ground, soil moisture, cryosphere, climate interactions
- **Ocean Biology DAAC (OB.DAAC)** <https://oceancolor.gsfc.nasa.gov/>
 - Ocean color, sea surface temperature, sea surface salinity
- **Physical Oceanography DAAC (PO.DAAC)** <https://podaac.jpl.nasa.gov/>
 - Gravity, ocean winds, sea surface temperature, ocean surface topography, sea surface salinity, circulation
- **Socioeconomic Data and Applications Center (SEDAC)** <https://sedac.ciesin.columbia.edu/>
 - Human interactions in the environment





Questions ?