

Remote Sensing and GIS for Rural Development Process Technology

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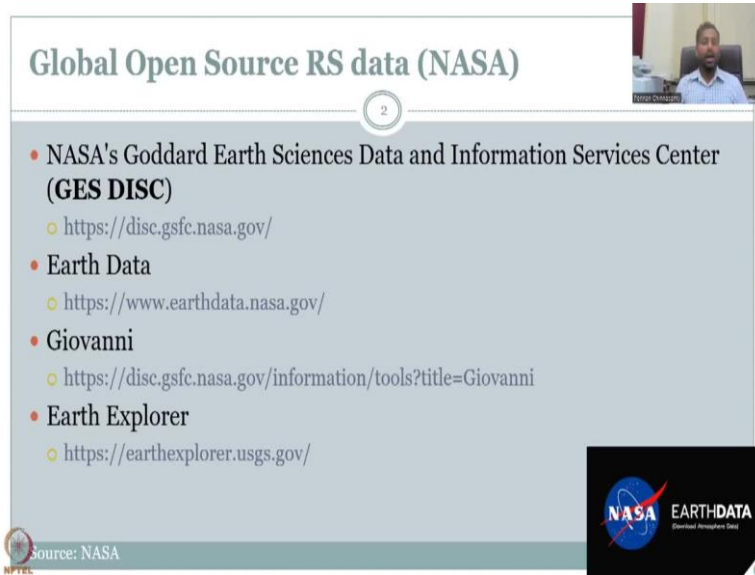
Lecture no. 05

Intro to Remote Sensing Data for Rural Development:

NASA datasets for soil moisture and climate

Hello, everyone, welcome to NPTEL course on Remote Sensing and GIS for Rural Development. This is week 3, lecture 5. In this week, we have been looking at different remote sensing products, both Indian and overseas like US, NASA datasets that can be used for Indian regions.

(Refer Slide Time: 00:46)

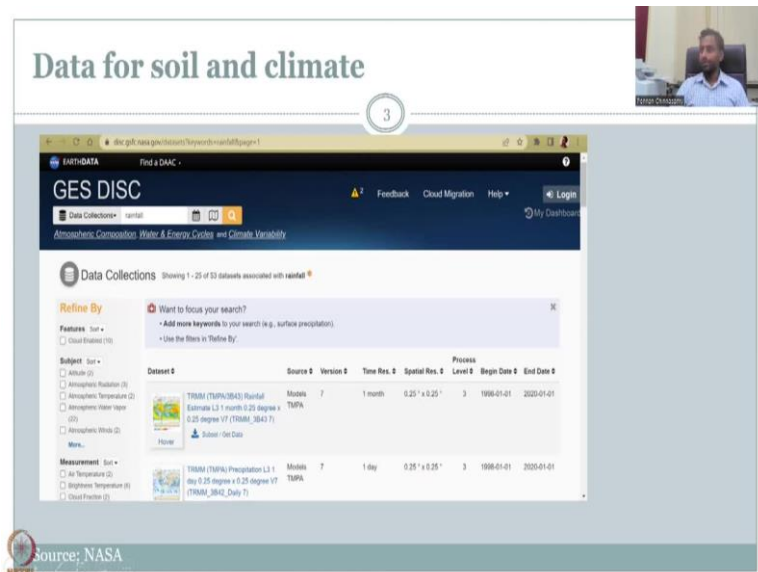


The slide is titled "Global Open Source RS data (NASA)" and features a small video inset of the professor in the top right corner. The main content is a list of four NASA resources, each with a corresponding URL. The slide also includes a NASA logo and the text "EARTHDATA Download OpenSource Data" in the bottom right corner, and "Source: NASA" in the bottom left corner.

- NASA's Goddard Earth Sciences Data and Information Services Center (GES DISC)
 - <https://disc.gsfc.nasa.gov/>
- Earth Data
 - <https://www.earthdata.nasa.gov/>
- Giovanni
 - <https://disc.gsfc.nasa.gov/information/tools?title=Giovanni>
- Earth Explorer
 - <https://earthexplorer.usgs.gov/>

In the last lecture, we have looked at NASA's GES DISC data set, whereas you also have Earth Data and Giovanni, Earth Explore. Every single link has its own tutorials online, I would recommend you to take those because it gets updated by NASA often, since you are using the data, it is always good to take the tutorials from there resource also. Here I am introducing that for Indian regions.

(Refer Slide Time: 01:23)



In the last slide, we have the last lecture, we had looked at the data that is available for water resources and we looked specifically on rainfall and then we looked at the resolution of rainfall, soil and climate. Here you do not get soil type in this data set, you will not get a soil type, but more different depths of soil, moisture, see the Indian data set where mobile driven data set it was one value of soil moisture the units were meter cube by meter cube.

Here the units will be kg meters per kg meter square. Either way, this unit less because the top and the bottom numerator denominator will cancel each other. So, the point, here is you will find different data sets at different resolutions, more importantly you will find that different depths. This was not readily available for the Indian data sets 1. And number 2 is maybe you will not be getting me recent datasets here you can even get yesterday's data and then you can work on some algorithms models or you can go to the village and then look at some areas of interest.

Whereas a google data set it is having a time lag which means there is a time difference from when you can access the data. The other part we look at is the resolution, the resolution is much, much higher better in this data set because they have more sophisticated instruments and data processing systems the data is at a higher spatial and temporal resolution compared to the Bhuvan once.

Again, the Bhuvan ones are not purely driven by India data sets it does have a collaboration of different NASA sentinel and other data.

(Refer Slide Time: 03:45)

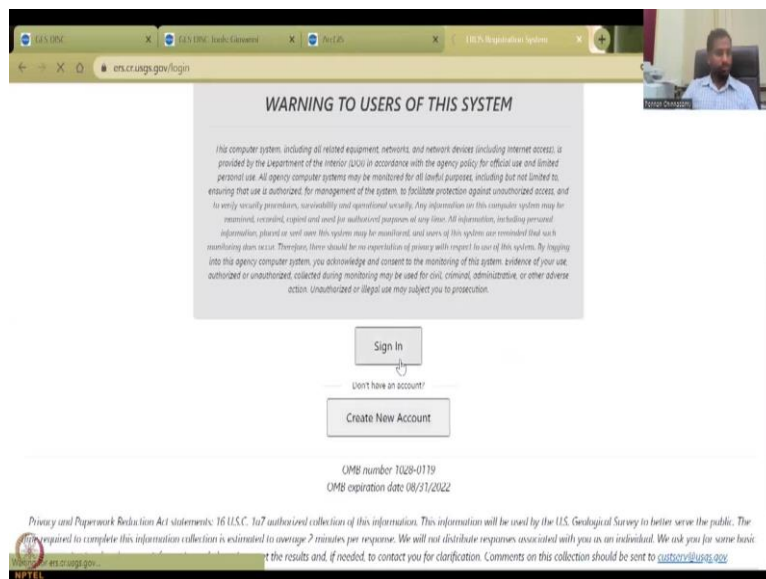
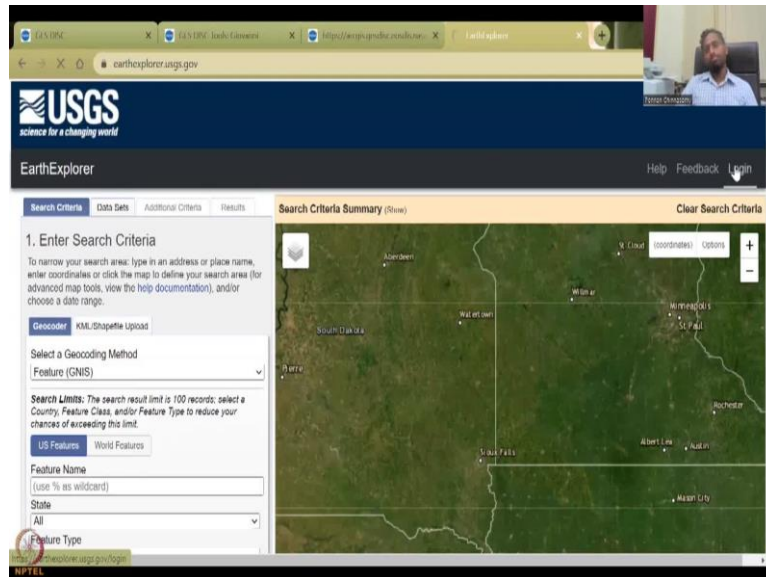
The screenshot shows the NASA Earth Data GES DISC homepage. At the top, there's a navigation bar with 'EARTH DATA', 'Find a DAAC', and utility links like 'Feedback', 'Cloud Migration', and 'Help'. The main header reads 'GES DISC' with sub-categories: 'Atmospheric Composition', 'Water & Energy Cycles', and 'Climate Variability'. A central 'Explore...' section features a search bar for 'Data Collections' and buttons for 'Browse Data by Category', 'Visualize Data', and 'Access GIS'. A banner below states 'The GES DISC migration to the cloud is happening now. Learn more about it!'. At the bottom, statistics show 'Archive Size: 3,372,354 TB' and 'Archived Data Files: 149,703,338'. Navigation tabs for 'Projects & Missions', 'Featured Gallery Images', and 'News' are visible.

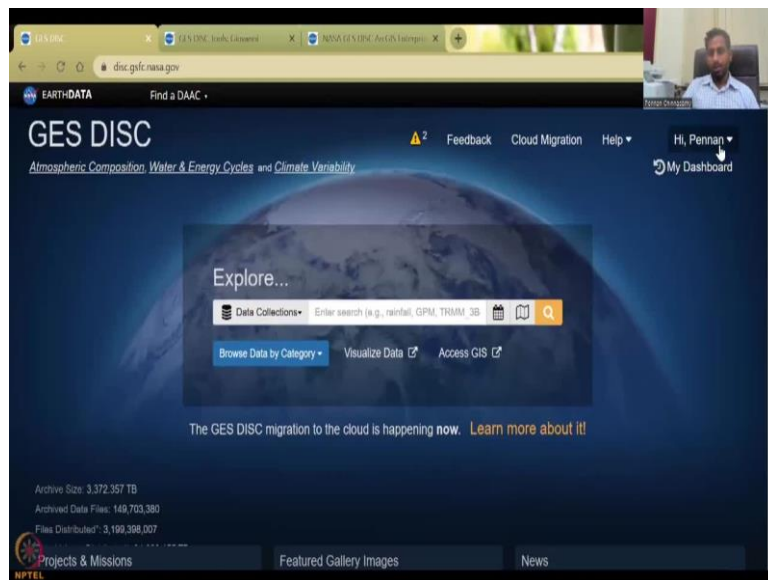
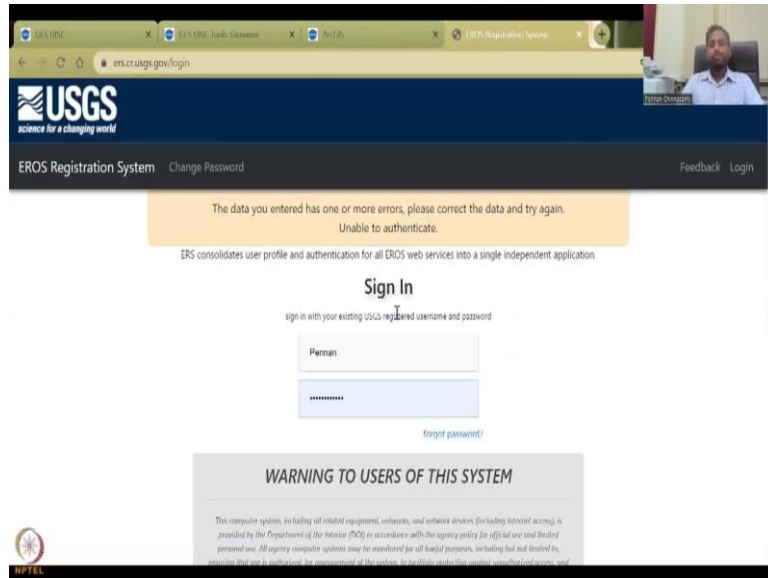
This screenshot displays the 'Featured Gallery Images' section. It features three circular data visualizations: a polar projection map of the Arctic region, a cross-sectional diagram of atmospheric layers, and a polar projection map of the Antarctic region. Below these images is a progress indicator showing '0000000000'. To the right, a 'NEWS' sidebar lists recent updates, including 'December 2022 global surface air temperatures and precipitation' (Jan 4, 2023) and 'November 2022 global surface air temperatures and precipitation' (Dec 8, 2022). A footer menu contains sections for 'Science Focus Areas', 'Tools', 'News', 'Resources', and 'About Us'.

This screenshot shows the 'Featured Gallery Images' section with a different featured image: a 3D globe of Earth. The layout is identical to the previous slide, with the same 'NEWS' sidebar and footer menu. The progress indicator below the globe image shows '0000000000'. The browser's address bar shows the URL 'https://disc.gsfc.nasa.gov/portal/home'.

So, let us jump into the accessing the data set again, I will share the website we already had looked at the previous class which is the GES DISC. Here I also wanted to give you some input on the different tools they have. So, I will click the Giovanni, GIS and the link that we have Earth Day data US GES Earth Explorer.

(Refer Slide Time: 04:21)





So, these I did not cover the previous one so let us look at Earth Explorer. I can the login is the same but we could just log in once again. One Login is enough for all the login systems now it is getting logged in. So, it is multiple logins that been where so I have to first go through response. So, it is already here my Hi, Pennan.

(Refer Slide Time: 04:55)

Back to tools

Giovanni

Giovanni is a web application that provides a simple, intuitive way to visualize, analyze, and access Earth science remote sensing data, particularly from satellites, without having to download the data.

[Launch GIOVANNI](#)

OR

click on a sample plot image below to load the plot criteria into Giovanni and generate the plot for yourself.

Giovanni overlay map showing prevailing spring winds and AOD from West Africa

click on a sample plot image below to load the plot criteria into Giovanni and generate the plot for yourself.

Giovanni overlay map showing prevailing spring winds and AOD from West Africa

Time-Averaged Map Seasonal Time Series Scatter Plot Correlation Map

Giovanni supports a variety of visualizations including time-averaged map, area-averaged time series, scatter plot, difference time series, accumulation map and time-averaged overlay map.

EARTHDATA Find a DAAC

GIOVANNI

 The Bridge Between Data and Science, v 4.37 Feedback Help Log out (pennan)

Select Plot: Time Averaged Map

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

Select Region (Bounding Box or Shape): -180,-90,180,90

- Maps
 - Time Averaged Map**
 - Map, Recurring Averages
 - Time Averaged Overlay Map
 - Map, Accumulated
- Animation
 - Limited to 365 time steps
- Map, Difference of Time Averaged
- Comparisons
 - Map, Correlation

- Scatter, Area Averaged (Static)
- Scatter (Interactive) Limited to 30000 points
- Scatter (Static)
- Scatter, Time-Averaged (Interactive) Limited to 30000 points
- Time Series
 - Time Series, Area-Averaged Differences
 - Time Series, Area-Averaged
 - Howmoller, Longitude-Averaged
 - Howmoller, Latitude-Averaged
- Time Series, Recurring Averages
- Miscellaneous
 - Histogram
 - Zonal Mean
- Vertical
 - Cross Section, Latitude-Pressure
 - Cross Section, Longitude-Pressure
 - Cross Section, Time-Pressure
 - Vertical Profile

Responsible NASA Official: [Angela Li](#) Privacy Powered by [Mapbox](#) Contact Us

Reset Plot Data Go to Results

giovanni.gsfc.nasa.gov/giovanni/#service=MpAndStartTime-&endtime=

EARTHDATA Find a DAAC

GIOVANNI The Bridge Between Data and Science v 4.37 Feedback Help Log out (pennan)

Select Plot: Animation Limited to: 365 time steps

Select Date Range (UTC): YYYY-MM-dd 00:00 to YYYY-MM-dd 23:59
Valid Range: 1948-01-01 to 2023-01-10
Please specify a start date.

Select Region (Bounding Box or Shape): -180,-90,180,90

Select Variables

Observations: Model (1260) Observation (705)

Disciplines: Aerosols (265) Atmospheric Chemistry (232) Atmospheric Dynamics (772) Cryosphere (18) Hydrology (646) Ocean Biology (17) Oceanography (39) Water and Energy Cycle (796)

Measurements

Number of matching Variables: 0 of 1965 Total Variable(s) included in Plot: 0
Please select 1 variable

Keyword: Search Clear

Reset Plot Data Go to Results

Responsible NASA Official: [Agneta Li](#) Web Curator: [M. Hoque](#)

giovanni.gsfc.nasa.gov/giovanni/#service=MpAndStartTime-&endtime=

EARTHDATA Find a DAAC

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Select Plot: Animation Limited to: 365 time steps

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

Select Region (Bounding Box or Shape): -180,-90,180,90

Select Variables

Observations: Model (1260) Observation (705)

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Select Plot: Animation Limited to: 365 time steps

Select Date Range (UTC): 2022-01-01 00:00 to 2023-01-10 23:59
Please specify an end date.

Select Region (Bounding Box or Shape): -180,-90,180,90

Select Variables

Observations: Model (1260) Observation (705)

Disciplines: Aerosols (265) Atmospheric Chemistry (232) Atmospheric Dynamics (772) Cryosphere (18) Hydrology (646) Ocean Biology (17) Oceanography (39) Water and Energy Cycle (796)

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Responsible NASA Official: [Agneta Li](#) Web Curator: [M. Hoque](#)

giovanni.gsfc.nasa.gov/giovanni/#service-MpAndStartTime=2022-01-01T00:00:00Z&endTime=2022-12-31T23:59:59Z

EARTHDATA Find a DAAC

GIOVANNI The Bridge Between Data and Science v 4.37 Feedback Help Log out (pennan)

Select Plot: Animation | Select Date Range (UTC): 2022-01-01 00:00 to 2022-12-31 23:59 | Select Region (Bounding Box or Shape): -180,-90,180,90

Number of matching Variables: 0 of 1965
Please select 1 variable

Keyword:

Select Variables

- Observations
 - Model (1260)
 - Observation (705)
- Disciplines
 - Aerosols (265)
 - Atmospheric Chemistry (232)
 - Atmospheric Dynamics (772)
 - Cryosphere (18)
 - Hydrology (646)
 - Ocean Biology (117)
 - Oceanography (39)
 - Water and Energy Cycle (796)
- Measurements

Select a Shape:

Reset Plot Data Go to Results

giovanni.gsfc.nasa.gov/giovanni/#service-MpAndStartTime=2022-01-01T00:00:00Z&endTime=2022-12-31T23:59:59Z&box=62.57818,5693.991408,40.9131

EARTHDATA Find a DAAC

GIOVANNI The Bridge Between Data and Science v 4.37 Feedback Help Log out (pennan)

Select Plot: Animation | Select Date Range (UTC): 2022-01-01 00:00 to 2022-12-31 23:59 | Select Region (Bounding Box or Shape): 62.57818,5693.991408,40.9131

Number of matching Variables: 0 of 1965
Please select 1 variable

Keyword:

Select Variables

- Observations
 - Model (1260)
 - Observation (705)
- Disciplines
 - Aerosols (265)
 - Atmospheric Chemistry (232)
 - Atmospheric Dynamics (772)
 - Cryosphere (18)
 - Hydrology (646)
 - Ocean Biology (117)
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 - Water and Energy Cycle (796)
- Measurements

Select a Shape:

Reset Plot Data Go to Results

giovanni.gsfc.nasa.gov/giovanni/#service-MpAndStartTime=2022-01-01T00:00:00Z&endTime=2022-12-31T23:59:59Z&box=62.57818,5693.991408,40.9131

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Number of matching Variables: 0 of 1965 | Total Variable(s) included in Plot: 0
Please select 1 variable

Keyword: Search Clear

Select Variables

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 - Model (1260)
 - Observation (705)
- Disciplines
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 - Atmospheric Chemistry (232)
 - Atmospheric Dynamics (772)
 - Cryosphere (18)
 - Hydrology (646)
 - Ocean Biology (117)
 - Oceanography (39)
 - Water and Energy Cycle (796)
- Measurements

Evaporation
Evapotranspiration
evaporation
Evaporation rate
evapotranspiration
Evap
Evaporation from turbulence
Evaporation loss
evaporation from bare soil
Evap subl of convective precipitation

Reset Plot Data Go to Results

giovanni.gsfc.nasa.gov/giovanni/#service-MpAndStartTime=2022-01-01T00:00:00&endTime=2022-12-31T23:59:59Z&bbox=42.5781,8.5693,9

EARTHDATA Find a DAAC

GIOVANNI The Bridge Between Data and Science v 4.37 Feedback Help Log out (pennan)

Keyword: Search Clear

Model (31)

Disciplines

- Atmospheric Dynamics (1)
- Hydrology (34)
- Water and Energy Cycle (30)

Measurements

Platform / Instrument

Spatial Resolutions

Temporal Resolutions

Special Features

Portal

Variable	Units	Source	Temp. Res.	Spat. Res.	Begin Date	End Date
<input type="checkbox"/> Potential evapotranspiration (NLDAS_NOAH0125_M_v2.0)	W m-2	NLDAS Model	Monthly	0.125°	1979-01-01	2022-11-30
<input type="checkbox"/> Potential evapotranspiration (NLDAS_NOAH0125_H_v2.0)	W m-2	NLDAS Model	Hourly	0.125°	1979-01-02	2022-12-01
<input type="checkbox"/> Total evapotranspiration (NLDAS_NOAH0125_M_v2.0)	kg m-2	NLDAS Model	Monthly	0.125°	1979-01-01	2022-11-30
<input type="checkbox"/> Total evapotranspiration (NLDAS_NOAH0125_H_v2.0)	kg m-2	NLDAS Model	Hourly	0.125°	1979-01-02	2022-12-01
<input checked="" type="checkbox"/> Total evapotranspiration (FLDAS_NOAH01_CP_GL_M_v001)	kg m-2 s-1	FLDAS Model	Monthly	0.1°	2019-01-01	2022-12-31
<input type="checkbox"/> Anomaly of Total evapotranspiration (FLDAS_NOAH01_C_GL_MA_v001)	kg m-2 s-1	FLDAS Model	Monthly	0.1°	1982-01-01	2022-10-31
<input type="checkbox"/> Climatology (1982-2016) of Total evapotranspiration (FLDAS_NOAH01_C_GL_MC_v001)	kg m-2 s-1	FLDAS Model	Monthly	0.1°	1982-01-01	2016-12-31
<input type="checkbox"/> Evapotranspiration (NCALDAS_NOAH0125_D_v2.0)	kg m-2 s-1	NCALDAS Model	Daily	0.125°	1979-01-02	2016-12-31
<input type="checkbox"/> Total evapotranspiration (FLDAS_NOAH01_C_GL_M_v001)	kg m-2 s-1	FLDAS Model	Monthly	0.1°	1982-01-01	2022-10-31

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Reset Plot Data Go to Results

giovanni.gsfc.nasa.gov/giovanni/#service-MpAndStartTime=2022-01-01T00:00:00&endTime=2022-12-31T23:59:59Z&bbox=42.5781,8.5693,9

EARTHDATA Find a DAAC

GIOVANNI The Bridge Between Data and Science v 4.37 Feedback Help Log out (pennan)

Keyword: Search Clear

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Platform / Instrument

Spatial Resolutions

Temporal Resolutions

Special Features

Portal

Variable	Units	Source	Temp. Res.	Spat. Res.	Begin Date	End Date
<input type="checkbox"/> Potential evapotranspiration (NLDAS_NOAH0125_M_v2.0)	W m-2	NLDAS Model	Monthly	0.125°	1979-01-01	2022-11-30
<input type="checkbox"/> Potential evapotranspiration (NLDAS_NOAH0125_H_v2.0)	W m-2	NLDAS Model	Hourly	0.125°	1979-01-02	2022-12-01
<input type="checkbox"/> Total evapotranspiration (NLDAS_NOAH0125_M_v2.0)	kg m-2	NLDAS Model	Monthly	0.125°	1979-01-01	2022-11-30
<input type="checkbox"/> Total evapotranspiration (NLDAS_NOAH0125_H_v2.0)	kg m-2	NLDAS Model	Hourly	0.125°	1979-01-02	2022-12-01
<input type="checkbox"/> Total evapotranspiration (FLDAS_NOAH01_CP_GL_M_v001)	kg m-2 s-1	FLDAS Model	Monthly	0.1°	2019-01-01	2022-12-31
<input type="checkbox"/> Anomaly of Total evapotranspiration (FLDAS_NOAH01_C_GL_MA_v001)	kg m-2 s-1	FLDAS Model	Monthly	0.1°	1982-01-01	2022-10-31
<input type="checkbox"/> Climatology (1982-2016) of Total evapotranspiration (FLDAS_NOAH01_C_GL_MC_v001)	kg m-2 s-1	FLDAS Model	Monthly	0.1°	1982-01-01	2016-12-31
<input checked="" type="checkbox"/> Evapotranspiration (NCALDAS_NOAH0125_D_v2.0)	kg m-2 s-1	NCALDAS Model	Daily	0.125°	1979-01-02	2016-12-31
<input type="checkbox"/> Total evapotranspiration (FLDAS_NOAH01_C_GL_M_v001)	kg m-2 s-1	FLDAS Model	Monthly	0.1°	1982-01-01	2022-10-31

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Reset Plot Data Go to Results

giovanni.gsfc.nasa.gov/giovanni/#service-MpAndStartTime=2022-01-01T00:00:00&endTime=2022-12-31T23:59:59Z&bbox=42.5781,8.5693,9

EARTHDATA Find a DAAC

GIOVANNI The Bridge Between Data and Science v 4.37 Feedback Help Log out (pennan)

Keyword: Search Clear

Model (31)

Disciplines

- Atmospheric Dynamics (1)
- Hydrology (34)
- Water and Energy Cycle (30)

Measurements

Platform / Instrument

Spatial Resolutions

Temporal Resolutions

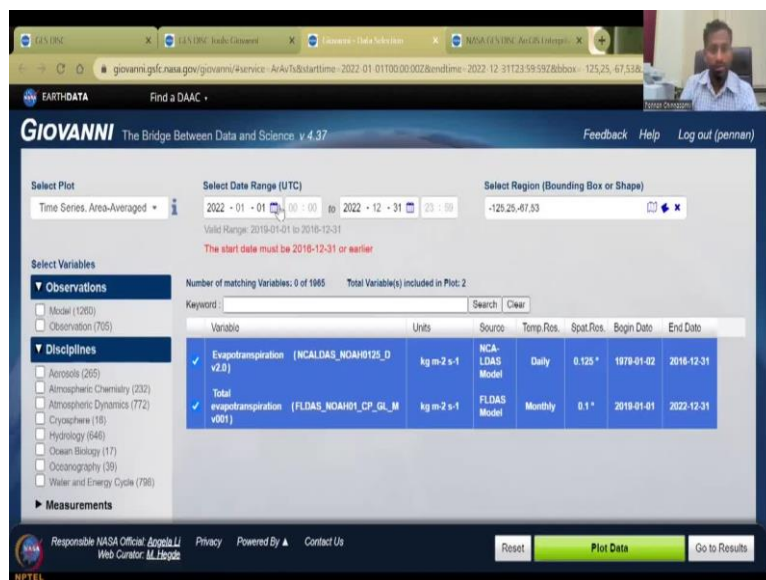
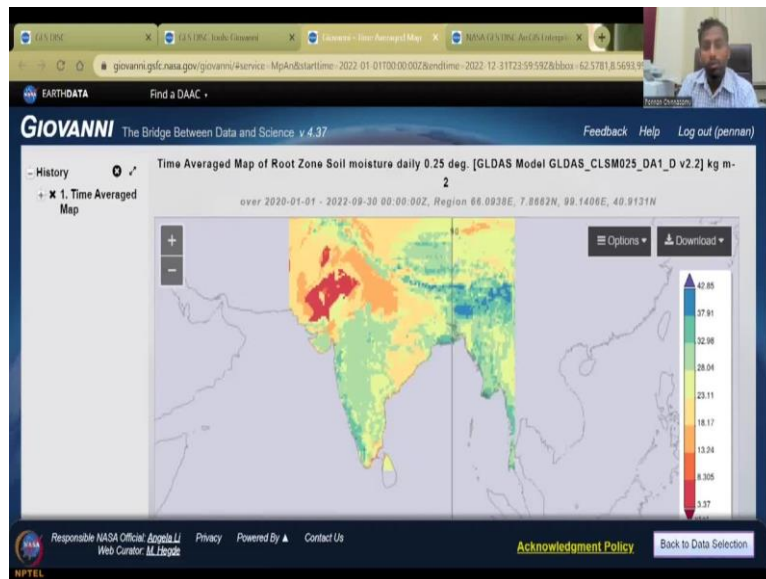
Special Features

Portal

Variable	Units	Source	Temp. Res.	Spat. Res.	Begin Date	End Date
<input type="checkbox"/> v2.0	kg m-2 s-1	2 Model	Monthly	0.625°	1980-01-01	2022-11-30
<input type="checkbox"/> Transpiration (NLDAS_NOAH0125_M_v2.0)	W m-2	NLDAS Model	Monthly	0.125°	1979-01-01	2022-11-30
<input type="checkbox"/> Potential evaporation (NLDAS_FORA0125_M_v2.0)	kg m-2	NLDAS Model	Monthly	0.125°	1979-01-01	2022-11-30
<input type="checkbox"/> Direct evaporation from bare soil (NLDAS_NOAH0125_M_v2.0)	W m-2	NLDAS Model	Monthly	0.125°	1979-01-01	2022-11-30
<input type="checkbox"/> Potential evapotranspiration (NLDAS_NOAH0125_H_v2.0)	W m-2	NLDAS Model	Hourly	0.125°	1979-01-02	2022-12-01
<input type="checkbox"/> Total evapotranspiration (NLDAS_NOAH0125_H_v2.0)	kg m-2	NLDAS Model	Hourly	0.125°	1979-01-02	2022-12-01
<input type="checkbox"/> Potential evaporation (NLDAS_FORA0125_H_v2.0)	kg m-2	NLDAS Model	Hourly	0.125°	1979-01-01	2022-12-01
<input type="checkbox"/> Transpiration (NLDAS_NOAH0125_H_v2.0)	W m-2	NLDAS Model	Hourly	0.125°	1979-01-02	2022-12-01
<input type="checkbox"/> Direct evaporation from bare soil (NLDAS_NOAH0125_H_v2.0)	W m-2	NLDAS Model	Hourly	0.125°	1979-01-02	2022-12-01
<input checked="" type="checkbox"/> Total evapotranspiration (FLDAS_NOAH01_CP_GL_M_v001)	kg m-2 s-1	FLDAS Model	Monthly	0.1°	2019-01-01	2022-12-31
<input type="checkbox"/> Total evapotranspiration (FLDAS_NOAH001_G_CA_D_v001)	kg m-2 s-1	FLDAS Model	Daily	0.01°	2000-10-01	2023-01-04

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Reset Plot Data Go to Results



So, launch Giovanni. You come to Giovanni tool It is a tool that helps you simple, intuitive way to visualize, analyze and access the data. So, let us look at it. And you can make these plots readily time average map, seasonal time series, and then scatterplot, correlation map etc. So, as I said, we need a seasonal time series or a map correlation, comparison between maps we can do. So here, I have a scatter, plot time average interactive, we will be doing a seasonal map, which is not available for we will do animation. Also, let us do an animation, 365 by time steps, so daily, you can do so let us do 2022, Jan 1 to December end.

So, if you are making a presentation, for an entity etc, you can do this quickly. We have the bounding boxes, but again, just click it hold on to the mouse and draw the box, you can close this box. And then let us say we want evapotranspiration. So, one of the parameters in the model that we need to use for role water resource management and rural development is

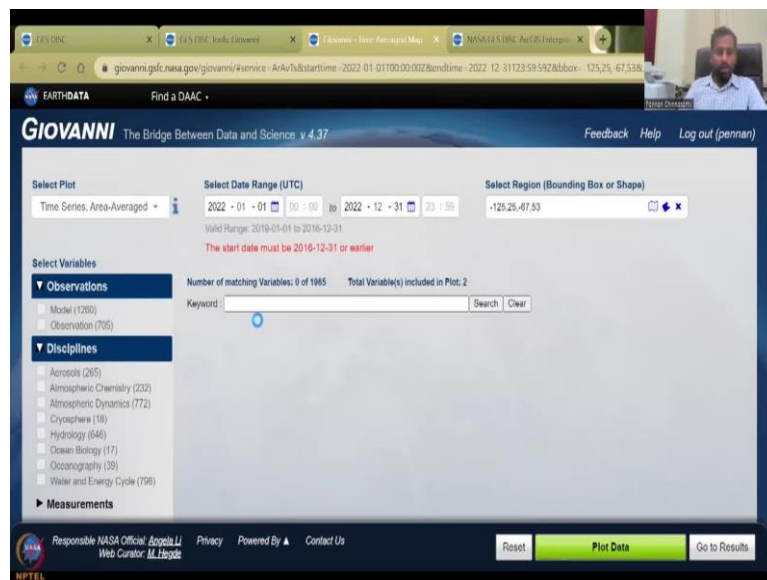
controlling the evapotranspiration. It is a loss out of the system? So, you need to make sure you reduce it.

So, the units is kg per meter square, very similar to millimeters. So, let us say that we are going to do an hourly, monthly daily, I think daily would be better. So, let us do the daily one here. But the date is not available. So, this has end dates to 2022 from 2000 and then total evapotranspiration daily. And then there is a monthly so let us do the monthly and then go to results where you are so it has plotted the results well.

So, for the box that we have made, it has downloaded the data, you can go to back to Data Selection and do the animation. So, this is, it has no data for this so you can select this bounding box, which is good. Plot data does not do 2022. So, let us stop here. But I have shown you how to take data at different time steps and then do an animation all we can do a time average map we do not need a map we need a time series.

So, you can say a time area average differences or just a time series, recurring averages for Indian region and for that particular date, it does struggle a little bit. That is good. Now the start date must be 2016 12 13 or earlier for the given data set. It is not letting us do it.

(Refer Slide Time: 09:00)



giovanni.gsfc.nasa.gov/giovanni/execute-ArAr?tsstarttime=2022-01-01T00:00:00&endtime=2022-12-31T23:59:59Z&bbox=-125.25,67.538

EARTHDATA Find a DAAC

GIOVANNI The Bridge Between Data and Science v 4.37 Feedback Help Log out (pennan)

Keyword: [Rainfall] Search Clear

Disciplines:

- Atmospheric Dynamics (2)
- Hydrology (84)
- Oceanography (1)
- Water and Energy Cycle (28)

Measurements:

- Rainfall (rainbow precipitation) (NLDAS_NOAH0125_M v2.0)
- Precipitation Rate (TRMM_3B42_Daily v7)
- Near-Real-Time Precipitation Rate (TRMM_3B42RT_Daily v7)
- Rainfall flux (FLDAS_NOAH001_G_CA_D v001)
- Precipitation (TRMM_3B42 v7)
- ocean_rainfall (M2TMNOCN v5.12.4)
- Liquid precipitation (rainfall) (NLDAS_NOAH0125_H v2.0)
- Large-scale rainfall (M2TMNOCN v5.12.4)
- Rainfall flux (FLDAS_NOAH01_G_CA_M v001)

Variable	Units	Source	Temp. Res.	Spot Res.	Begin Date	End Date	Vort. Sicos
Rainfall (rainbow precipitation) (NLDAS_NOAH0125_M v2.0)	kg m-2	NLDAS Model	Monthly	0.125°	1979-01-01	2022-11-30	-
Precipitation Rate (TRMM_3B42_Daily v7)	mm/day	TRMM	Daily	0.25°	1998-01-01	2019-12-31	-
Near-Real-Time Precipitation Rate (TRMM_3B42RT_Daily v7)	mm/day	TRMM	Daily	0.25°	2000-03-01	2020-01-01	-
Rainfall flux (FLDAS_NOAH001_G_CA_D v001)	kg m-2 s-1	FLDAS Model	Daily	0.01°	2000-10-01	2023-01-04	-
Precipitation (TRMM_3B42 v7)	mm/hr	TRMM	3-hourly	0.25°	1997-12-31	2019-12-31	-
ocean_rainfall (M2TMNOCN v5.12.4)	kg m-2 s-1	MERSA-2 Model	Monthly	0.5 x 0.625°	1980-01-01	2022-11-30	-
Liquid precipitation (rainfall) (NLDAS_NOAH0125_H v2.0)	kg m-2	NLDAS Model	Hourly	0.125°	1979-01-02	2022-12-01	-
Large-scale rainfall (M2TMNOCN v5.12.4)	kg m-2 s-1	MERSA-2 Model	Monthly	0.5 x 0.625°	1980-01-01	2022-11-30	-
Rainfall flux (FLDAS_NOAH01_G_CA_M v001)	kg m-2 s-1	FLDAS Model	Monthly	0.1°	1982-01-01	2022-10-31	-

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Reset Plot Data Go to Results

giovanni.gsfc.nasa.gov/giovanni/execute-ArAr?tsstarttime=2022-01-01T00:00:00&endtime=2022-12-31T23:59:59Z&bbox=-125.25,67.538

EARTHDATA Find a DAAC

GIOVANNI The Bridge Between Data and Science v 4.37 Feedback Help Log out (pennan)

Keyword: [Rainfall]

Variable	Units	Source	Temp. Res.	Spot Res.	Begin Date	End Date	Vort. Sicos
Rainfall (rainbow precipitation) (NLDAS_NOAH0125_M v2.0)	kg m-2	NLDAS Model	Monthly	0.125°	1979-01-01	2022-11-30	-
ocean_rainfall (M2TMNOCN v5.12.4)	kg m-2 s-1	MERSA-2 Model	Monthly	0.5 x 0.625°	1980-01-01	2022-11-30	-
Large-scale rainfall (M2TMNOCN v5.12.4)	kg m-2 s-1	MERSA-2 Model	Monthly	0.5 x 0.625°	1980-01-01	2022-11-30	-
Convective rainfall (M2TMNOCN v5.12.4)	kg m-2 s-1	MERSA-2 Model	Monthly	0.5 x 0.625°	1980-01-01	2022-11-30	-
Liquid precipitation (rainfall) (NLDAS_NOAH0125_H v2.0)	kg m-2	NLDAS Model	Hourly	0.125°	1979-01-02	2022-12-01	-
<input checked="" type="checkbox"/> Rainfall flux (FLDAS_NOAH01_CP_GL_M v001)	kg m-2 s-1	FLDAS Model	Monthly	0.1°	2019-01-01	2022-12-31	-
Rainfall flux (FLDAS_NOAH001_G_CA_D v001)	kg m-2 s-1	FLDAS Model	Daily	0.01°	2000-10-01	2023-01-04	-
Rainfall (FLDAS_NOAH01_G_CA_D v001)	kg m-2 s-1	FLDAS Model	Daily	0.01°	2000-10-01	2023-01-04	-
Daily accumulated precipitation (combined microwave-RF estimates; Early Run) (GPM_3IMERGCF v02)	mm	GPM	Daily	0.1°	2000-06-01	2023-01-08	-

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Reset Plot Data Go to Results

giovanni.gsfc.nasa.gov/giovanni/execute-ArAr?tsstarttime=2022-01-01T00:00:00&endtime=2022-12-31T23:59:59Z&bbox=-125.25,67.538

EARTHDATA Find a DAAC

GIOVANNI The Bridge Between Data and Science v 4.37 Feedback Help Log out (pennan)

History:

- 2. Time Series, Area-Averaged
 - User Input
 - Lineage
- 1. Time Averaged Map

Searching for time chunk 1 of 1 for 'Rainfall flux monthly 0.1 deg. [FLDAS Model FLDAS_NOAH01_CP_GL_M v001] kg m-2 s-1'

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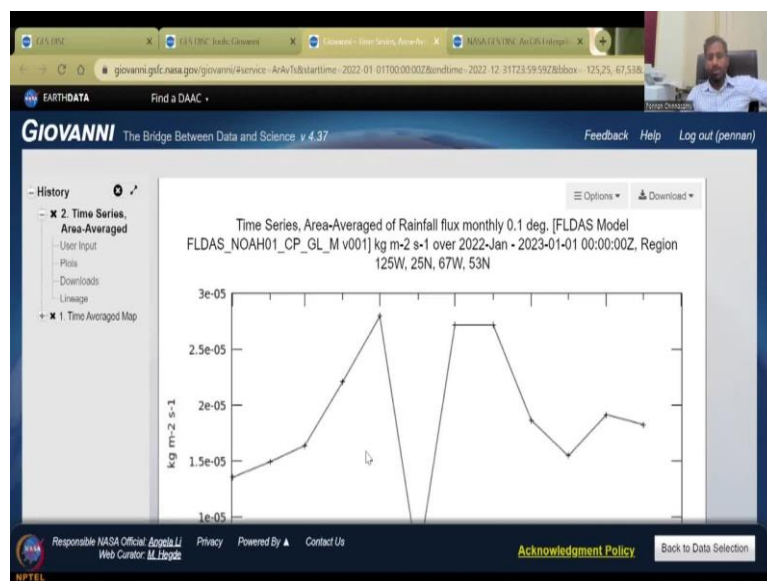
Acknowledgment Policy Back to Data Selection

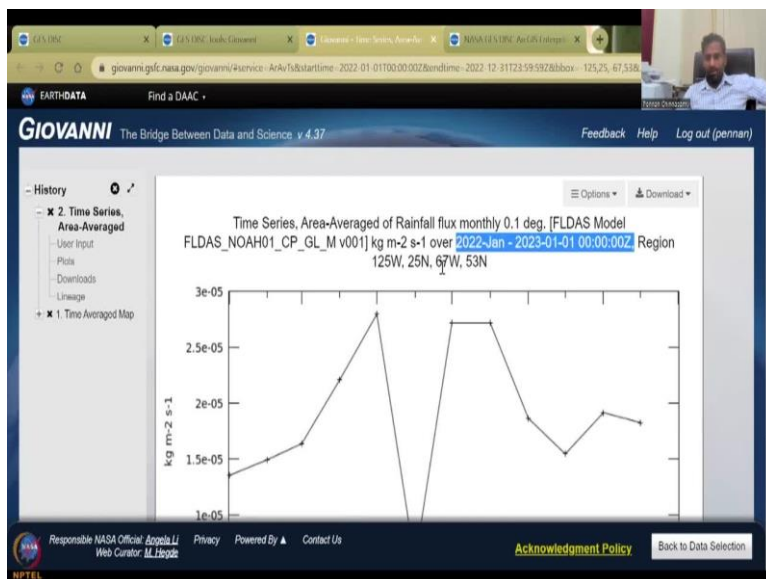
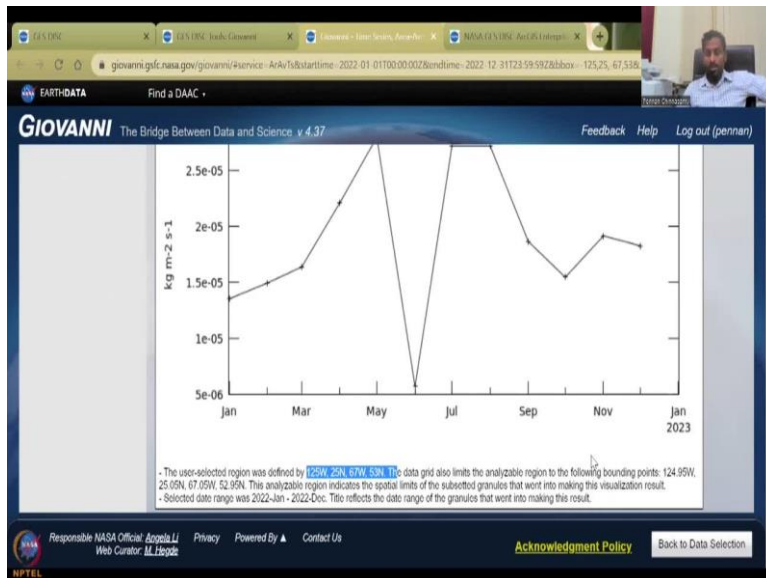
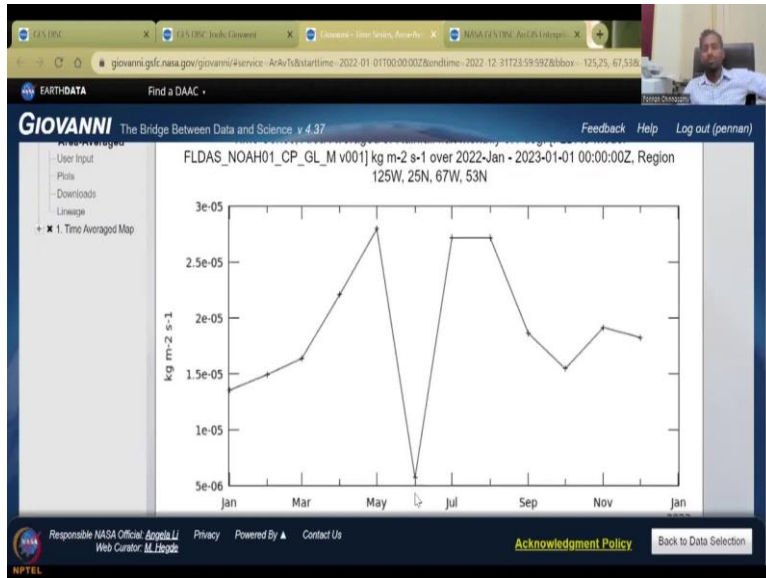
So, let us just refreshing then you can also select between model or observation data so you have your model and observation data. Observation data is also good. We can definitely look into multiple, multiple factors. So, let us not do evapotranspiration, we can do rainfall, so rainfall does take up, so I will just take these two out. And then precipitation rate or you want to precipitation millimeters per day, or millimeters inches per day you can select on those.

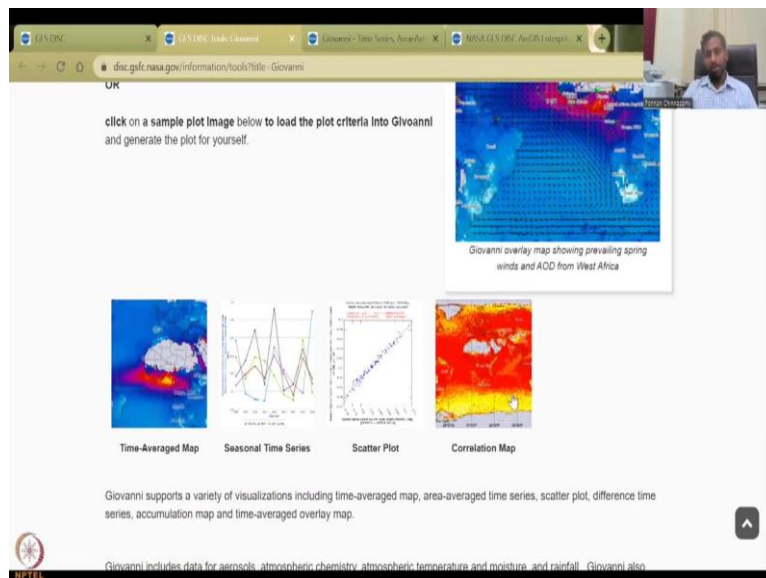
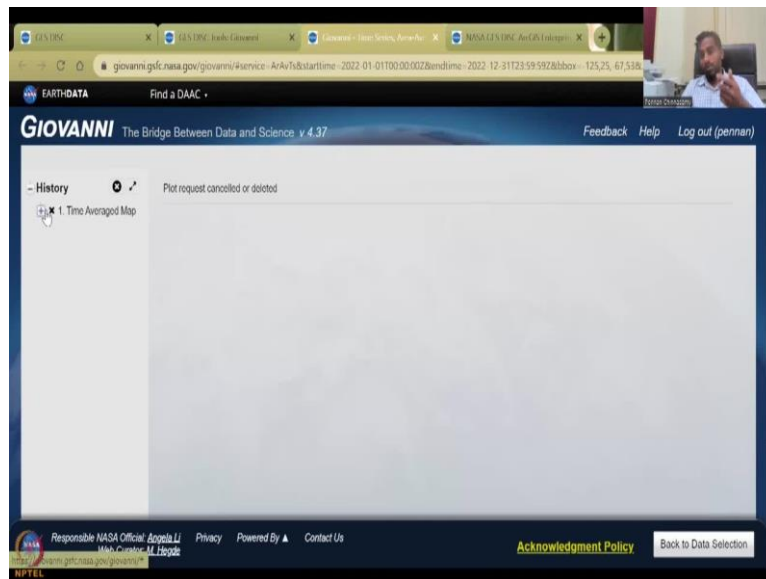
Let us do millimeters per day. But we do not have the data that long. So, let us come down to the data set that comes in 2022. This one has so you can always look at the model in what models they are use FLDAS monthly. So, it is now running the data, evapotranspiration was tricky, so, we will just ignore that, but we are just looking at a time series of average area average.

So, for a particular area what is the time series of the data? So, that is what it is calculating now, and I hope we did India part. So, let it come Yes.

(Refer Slide Time: 10:32)







So, now you have a time series of rainfall data and the units you can double check at what units you want you just have to double change the units into your particular unit but the dates are correct Jan to Jan the user selected this bounding box and for that bounding box you have types is of data so, it has the date and for that region, what is per day what is the average? It plots plus plus. Here it is monthly Jan, Feb, March you can see the monthly average rainfall, it could be average it may total rainfall also, time series is area average rainfall flux monthly. So, all these data you could download.

Again, this is not a per point so you can only download as an image and put it in here values so that for at reason we do not normally take time series data, but you can always take a map and then from the map you can extract the data. So, all these can be done. Correlation maps can also be done.

(Refer Slide Time: 11:46)

The screenshot shows the EarthExplorer search interface. The left sidebar contains the following sections:

- 1. Enter Search Criteria**
 - To narrow your search area: type in an address or place name, enter coordinates or click the map to define your search area (for advanced map tools, view the help documentation), and/or choose a date range.
 - Geocoder** KML/Shapefile Upload
 - Select a Geocoding Method: Feature (GNIS)
 - Search Limits:** The search result limit is 100 records; select a Country, Feature Class, and/or Feature Type to reduce your chances of exceeding this limit.
 - US Features | World Features
 - Feature Name (use % as wildcard)
 - State: All
 - Feature Type

The main area displays a map of the central United States with a search criteria summary and a 'Clear Search Criteria' button.

The screenshot shows the dataset selection page. The left sidebar lists various data categories:

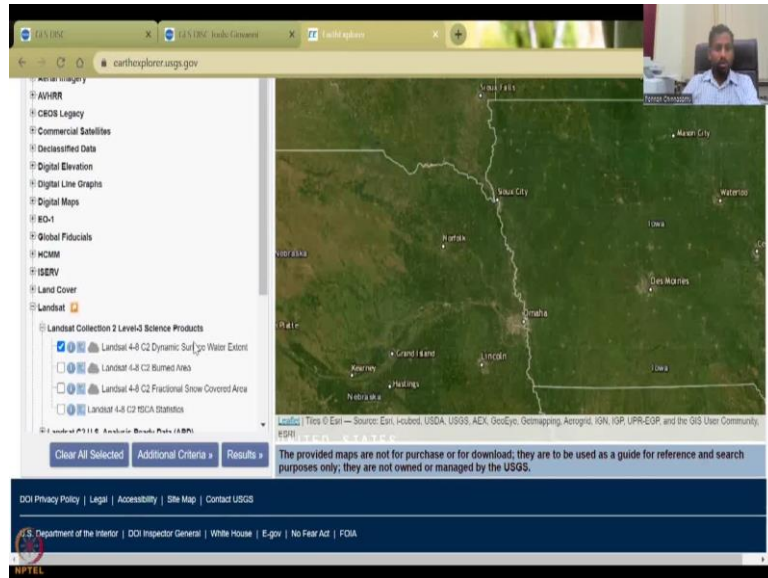
- Aerial Imagery
- AVHRR
- CEOS Legacy
- Commercial Satellites
- Declassified Data
- Digital Elevation
- Digital Line Graphs
- Digital Maps
- EO-1
- Global Products
- HCOM
- ISERV
- Land Cover
- Landsat**
- LCMAP
- NASA LPDAAC Collections
- Radar
- UAS
- Vegetation Monitoring
- ISRO Resources

The 'Landsat' category is selected, and a list of datasets is shown below. A message at the bottom states: "The provided maps are not for purchase or for download; they are to be used as a guide for reference and search purposes only; they are not owned or managed by the USGS."

The screenshot shows the Landsat dataset selection page. The left sidebar lists various Landsat products:

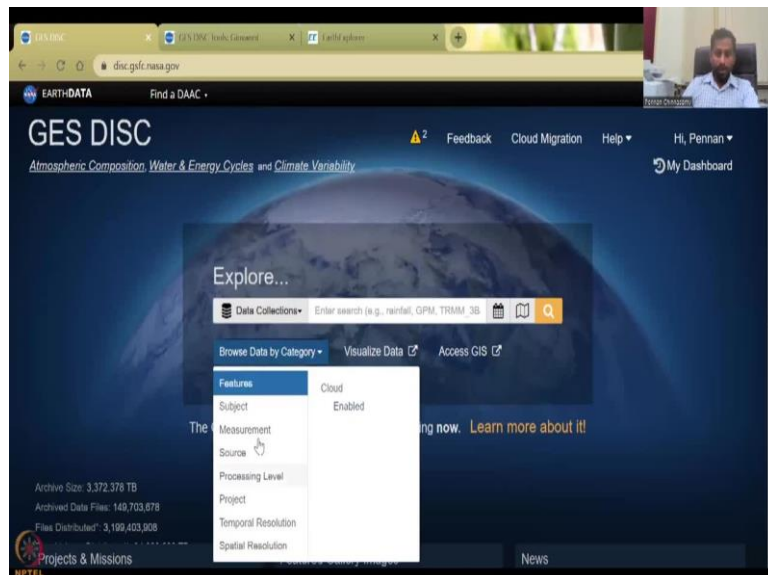
- Digital Maps
- EO-1
- Global Products
- HCOM
- ISERV
- Land Cover
- Landsat**
 - Landsat Collection 2 Level-3 Science Products
 - Landsat 4-8 C2 Dynamic Surface Water Extent
 - Landsat 4-8 C2 Burned Areas
 - Landsat 4-8 C2 Fractional Snow Covered Area
 - Landsat 4-8 C2 TSSA Disturbances
 - Landsat C2 U.S. Analysis Ready Data (ARD)
 - Landsat Collection 2 Level-2
 - Landsat Collection 2 Level-1
 - Landsat C2 Atmospheric Auxiliary Data
 - Landsat Legacy
- LCMAP

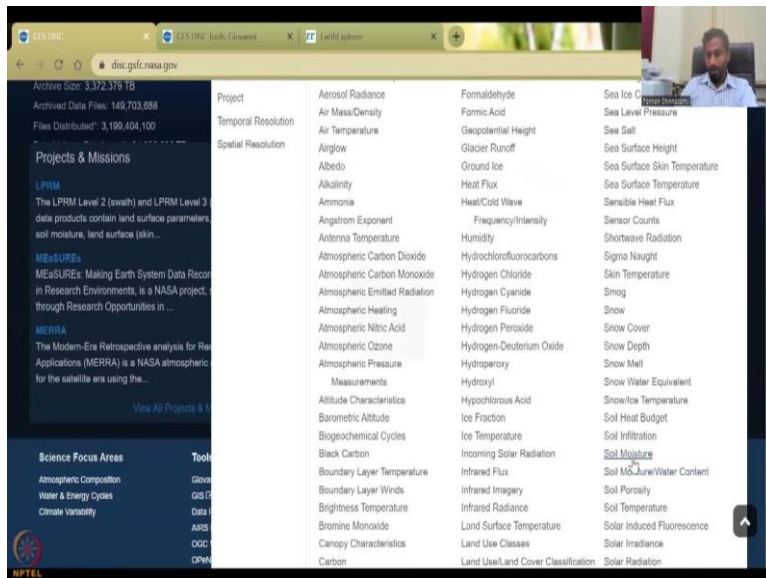
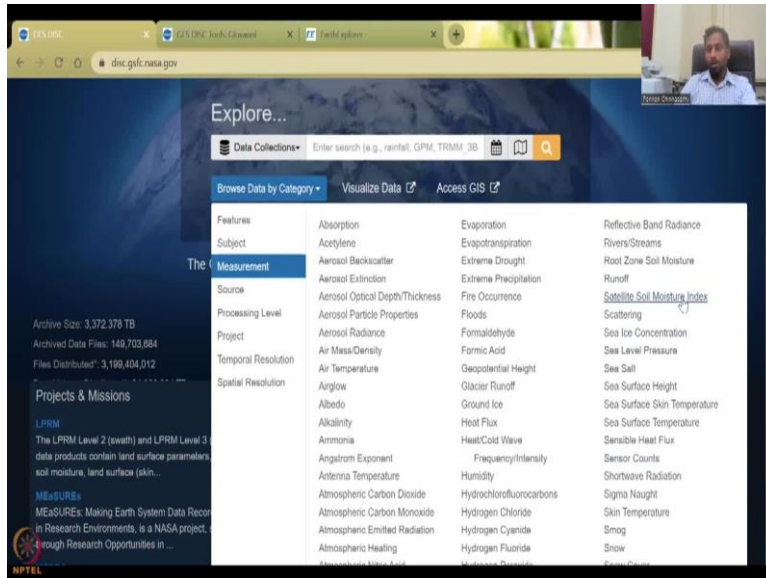
The 'Landsat Collection 2 Level-3 Science Products' section is expanded, showing several datasets with checkboxes. A message at the bottom states: "The provided maps are not for purchase or for download; they are to be used as a guide for reference and search purposes only; they are not owned or managed by the USGS."



Earth explorer is also quick that you can do analysis and stuff. You can actually look at the data set here. So, it is the same thing data set search, search for rainfall. Or you can actually click these images and see where you want. Let us do Landsat, Landsat is the land use land cover of our radars for the soil moisture, but we can do the Landsat. Landsat Dynamic surface water extent you can like similarly to the previous exercise, you can actually give date, date range and location where you want the data to be mapped. It is searching so let it search, while we come back here.

(Refer Slide Time: 12:49)

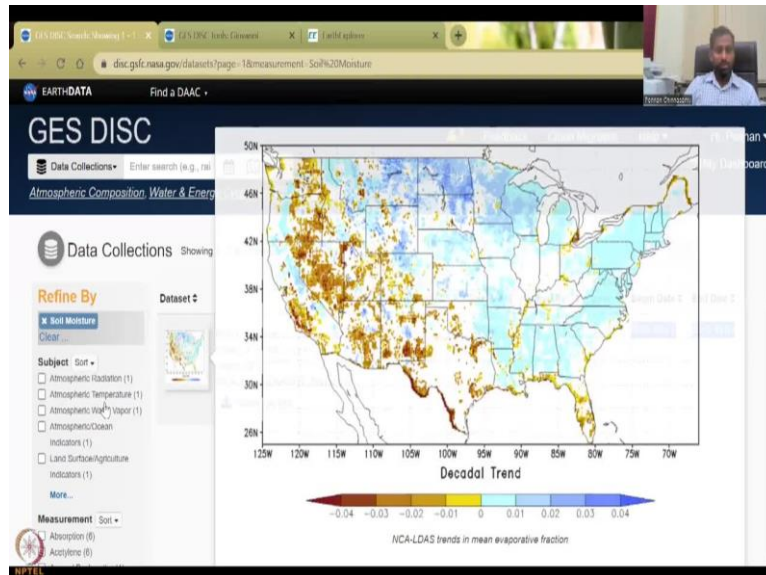




So, that is one we are going to go into now the Browse by Category and measurement. And we want soil moisture index. Let us see what all the soil we have roots zone soil moisture. And we also have soil moisture. So, let us just click add soil moisture.

(Refer Slide Time: 13:13)

The screenshot shows the NASA Earth Data GES DISC website. The page title is "Data Collections" and it shows "Showing 1 - 1 of 1 datasets". The "Refine By" section is set to "Soil Moisture". The "Subject" section includes "Atmospheric/Irradiation (1)", "Atmospheric/Temperature (1)", "Atmospheric/Water Vapor (1)", "Atmospheric/Clean Indicators (1)", and "Land Surface/Agriculture Indicators (1)". The "Measurement" section includes "Absorption (6)" and "Acetylene (6)". The "Dataset" table shows one dataset: "NCA-LDAS Noah-3.3 Land Surface Model L4 Trends 0.125 x 0.125 degree V2.0 (NCA-LDAS_NOAH0125_Trends 2.0)". The table columns are "Dataset", "Source", "Version", "Time Res.", "Spatial Res.", "Process Level", "Begin Date", and "End Date". The values for the dataset are: "Models", "2.0", "36 years", "0.125° x 0.125°", "4", "1979-10-01", and "2015-10-01".

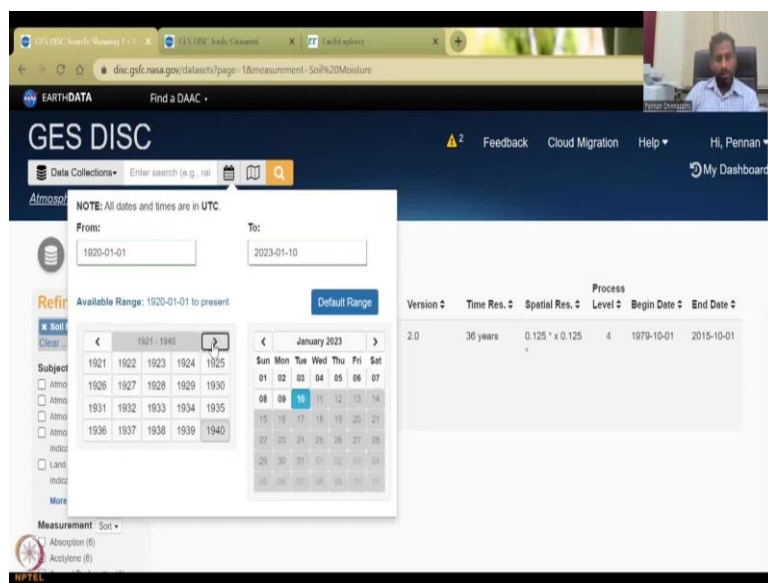
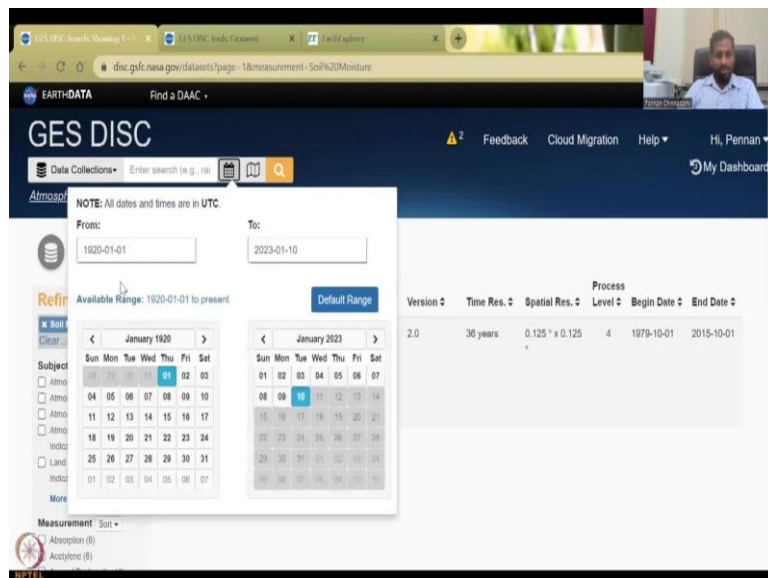


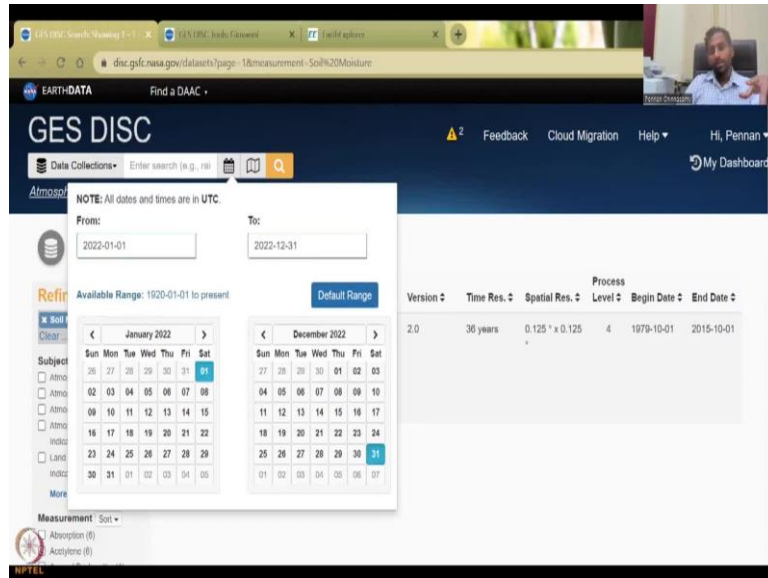
The screenshot shows the NASA Earth Data GES DISC website with a bounding box tool. The "Bounding Box" field contains the coordinates "60.234,5.706,101.719,39.456". The "Default Range" button is visible. The "Available Range" is "-180, -90, 180, 90" and the "Cursor Coordinates" are "5.706, 101.719". The "Refine By" section is set to "Soil Moisture". The "Dataset" table shows one dataset: "NCA-LDAS Noah-3.3 Land Surface Model L4 Trends 0.125 x 0.125 degree V2.0 (NCA-LDAS_NOAH0125_Trends 2.0)". The table columns are "Dataset", "Source", "Version", "Time Res.", "Spatial Res.", "Process Level", "Begin Date", and "End Date". The values for the dataset are: "Models", "2.0", "36 years", "0.125° x 0.125°", "4", "1979-10-01", and "2015-10-01".

So, there is one data set 36 years time resolution, just the whole from 1979 to 2015. Let us click at, as a dataset, but it does not have India, we could see that it is only for US. So, we will not be able to use this data set. So, we can go back here and first let us put the bounding box click on this square rectangle, draw the box, hold on the mouse click and then hold on the mouse and release.

So, maybe I will do it again. You can clear we mark this just escape or we do it again. So, press this box cancel, press and then draw hold this click left in the pointer left arrow key and then draw a box and then leave it, the new box will be overlapped. Or you can put the numbers here which is also correct, available date is full. So, let us do that.

(Refer Slide Time: 14:24)

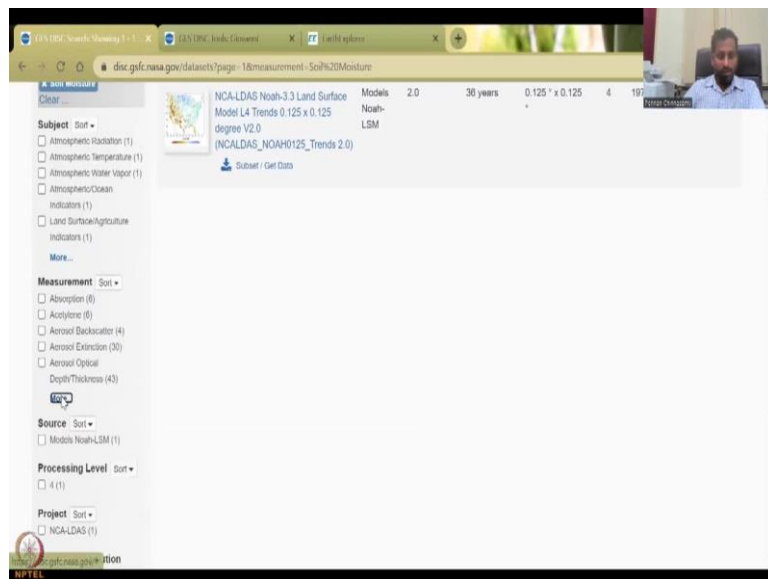




Time series again let us just pick one year we do not want such a big year. You can click the years the years will come. We want to 2022 let us just use 2022. Jan 1 to December 31. Here there is no enter button so do not worry about it just click somewhere outside it will come to make sure you can click the data again. The date data is has been stored, the map data has been stored and then click back, you can click back or click back here it will remove the image.

Now, what you need to do is we are going to look at climate variables which are your precipitation your snow cover evapotranspiration etc.

(Refer Slide Time: 15:25)



GES DISC Data Collections

Refine By

- Root Zone Soil Moisture
- Satellite Soil Moisture Index
- Soil Moisture

Features

- Cloud Enabled (2)

Subject

- Atmospheric Radiation (1)
- Atmospheric Temperature (1)
- Atmospheric Water Vapor (1)
- Atmospheric/Ocean
- Indicators (1)
- Land Surface/Agriculture
- Indicators (3)

Measurement

- Absorption (8)
- Acetylene (6)
- Aerosol Backscatter (4)
- Aerosol Extinction (30)
- Aerosol Optical Depth/Thickness (43)

Dataset

- Cloud BSR (188)
- Cloud Condensation Nuclei (3)
- Cloud Droplet Concentration/Size (24)
- Cloud Dynamics (6)
- Cloud Emisivity (4)
- Cloud Fraction (102)
- Cloud Frequency (18)
- Cloud Height (54)
- Cloud Liquid Water/Ice (88)
- Cloud Mass Flux (4)
- Cloud Microphysics (6)
- Cloud Optical Depth/Thickness (40)
- Cloud Precipitable Water (2)
- Cloud Properties (84)
- Cloud Radiative Forcing (1)
- Cloud Reflectance (6)
- Cloud Top Height (3)
- Cloud Top Pressure (130)
- Cloud Top Temperature (103)
- Cloud Types (21)
- Cloud Vertical Distribution (76)
- Condensation (1)
- Convection (26)
- Convection (12)
- Convective Surface Precipitation Rate (1)
- Deep Convective Cloud Systems (3)
- Deposition (3)
- Dew Point Temperature (3)
- Diffusion (3)
- Dimethyl Sulfide (4)
- Hydrogen Peroxide (12)
- Hydroxyl Radical (1)
- Ice Nuclei (1)
- Root Zone Soil Moisture (4)
- Runoff (58)
- Satellite Soil Moisture Index (2)
- Scattering (28)
- Sea Ice Concentration (1)
- Sea Level Pressure (75)
- Sea Salt (4)
- Sea Surface Height (3)
- Sea Surface Skin Temperature (7)
- Sea Surface Temperature (112)
- Sensible Heat Flux (3)
- Sensor Counts (18)
- Shortwave Radiation (94)
- Sigma Height (2)
- Skin Temperature (160)
- Smog (3)
- Snow (60)
- Snow Cover (9)
- Snow Depth (13)
- Snow Melt (6)
- Snow Water Equivalent (52)
- Snowflake Temperature (3)
- Soil Heat Budget (3)
- Soil Infiltration (3)
- Soil Moisture/Water Content (77)
- Soil Porosity (1)
- Soil Temperature (52)
- Solar Induced Fluorescence (2)
- Solar Irradiance (33)

Process

Res.	Level	Begin Date	End Date
0.625°	4	2002-04-01	2022-10-03
0.625°	4	1979-10-01	2015-10-01

GES DISC Data Collections

Refine By

- Root Zone Soil Moisture
- Satellite Soil Moisture Index
- Soil Moisture

Features

- Cloud Enabled (2)

Subject

- Atmospheric Radiation (4)
- Atmospheric Temperature (1)
- Atmospheric Water Vapor (4)
- Atmospheric/Ocean
- Indicators (1)
- Ground Water (3)

Measurement

- Absorption (8)
- Acetylene (6)
- Aerosol Backscatter (4)
- Aerosol Extinction (30)
- Aerosol Optical Depth/Thickness (43)

Dataset

- Chlorine Dioxide (11)
- Chlorine Monoxide (12)
- Chlorine Nitrate (10)
- Chlorofluorocarbons (11)
- Chromophyll (2)
- Cloud Base Pressure (3)
- Cloud Condensation Nuclei (3)
- Cloud Droplet Concentration/Size (24)
- Cloud Dynamics (6)
- Cloud Emisivity (4)
- Cloud Fraction (102)
- Cloud Frequency (16)
- Cloud Height (54)
- Cloud Liquid Water/Ice (88)
- Cloud Mass Flux (4)
- Cloud Microphysics (6)
- Cloud Optical Depth/Thickness (40)
- Cloud Precipitable Water (2)
- Cloud Properties (84)
- Cloud Radiative Forcing (1)
- Cloud Reflectance (6)
- Cloud Top Height (3)
- Cloud Top Pressure (130)
- Cloud Top Temperature (103)
- Cloud Types (21)
- Cloud Vertical Distribution (76)
- Condensation (1)
- Conduction (26)
- Convection (12)
- Convective Surface Precipitation Rate (1)
- Dew Point Temperature (3)
- Diffusion (3)
- Dimethyl Sulfide (4)
- Hydrogen Peroxide (12)
- Hydroxyl Radical (1)
- Ice Nuclei (1)
- Root Zone Soil Moisture (4)
- Runoff (58)
- Satellite Soil Moisture Index (2)
- Scattering (28)
- Sea Ice Concentration (1)
- Sea Level Pressure (75)
- Sea Salt (4)
- Sea Surface Height (3)
- Sea Surface Skin Temperature (7)
- Sea Surface Temperature (112)
- Sensible Heat Flux (3)
- Sensor Counts (18)
- Shortwave Radiation (94)
- Sigma Height (2)
- Skin Temperature (160)
- Smog (3)
- Snow (60)
- Snow Cover (9)
- Snow Depth (13)
- Snow Melt (6)
- Snow Water Equivalent (52)
- Snowflake Temperature (3)
- Soil Heat Budget (3)
- Soil Infiltration (3)
- Soil Moisture (1)

Process

Res.	Level	Begin Date	End Date
0.625°	4	1980-01-01	2022-12-01
0.625°	4	1980-01-01	2022-12-01

GES DISC Data Collections

Showing 1 - 7 of 7 datasets

Refine By

- Root Zone Soil Moisture
- Satellite Soil Moisture Index
- Soil Moisture

Features

- Cloud Enabled (2)

Subject

- Atmospheric Radiation (4)
- Atmospheric Temperature (1)
- Atmospheric Water Vapor (4)
- Atmospheric/Ocean
- Indicators (1)
- Ground Water (3)

Measurement

- Absorption (8)
- Acetylene (6)
- Aerosol Backscatter (4)
- Aerosol Extinction (30)
- Aerosol Optical Depth/Thickness (43)

Dataset

Dataset	Source	Version	Time Res.	Spatial Res.	Level	Begin Date	End Date
MERRA-2 lavg1_2d_ind_Nc_2d.1-Hourly,Time-Averaged,Single-Level,Assimilation,Land Surface Diagnostics V5.12.4 (M2TMNLND 5.12.4)	Models MERRA-2	5.12.4	1 hour	0.5° x 0.625°	4	1980-01-01	2022-12-01
MERRA-2 lavgM_2d_ind_Nc_2d.Monthly mean,Time-Averaged,Single-Level,Assimilation,Land Surface Diagnostics V5.12.4 (M2TMNLND 5.12.4)	Models MERRA-2	5.12.4	1 month	0.5° x 0.625°	4	1980-01-01	2022-12-01
MERRA-2 lavgU_2d_ind_Nc_2d.diurnal,Time-Averaged,Single-Level,Assimilation,Land Surface Diagnostics V5.12.4 (M2TMNLND 5.12.4)	Models MERRA-2	5.12.4	1 month	0.5° x 0.625°	4	1980-01-01	2022-12-01

disc.gsfc.nasa.gov/datasets/.../page=1&measurement=Root%20Zone%20Soil%20Moisture,Satellite%20Soil%20Moisture%20Index,Soil%20Moisture

Atmospheric/Ocean Indicators (1)
Ground Water (3)
More...

Measurement Sort ▾
 Absorption (6)
 Acetylene (6)
 Aerosol Backscatter (4)
 Aerosol Extinction (30)
 Aerosol Optical Depth/Thickness (43)
 More...

Source Sort ▾
 Models CatchmentLSM (2)
 Models MERRA2 (3)
 Models NoahLSM (1)
 Models SMERGE (1)
 More...

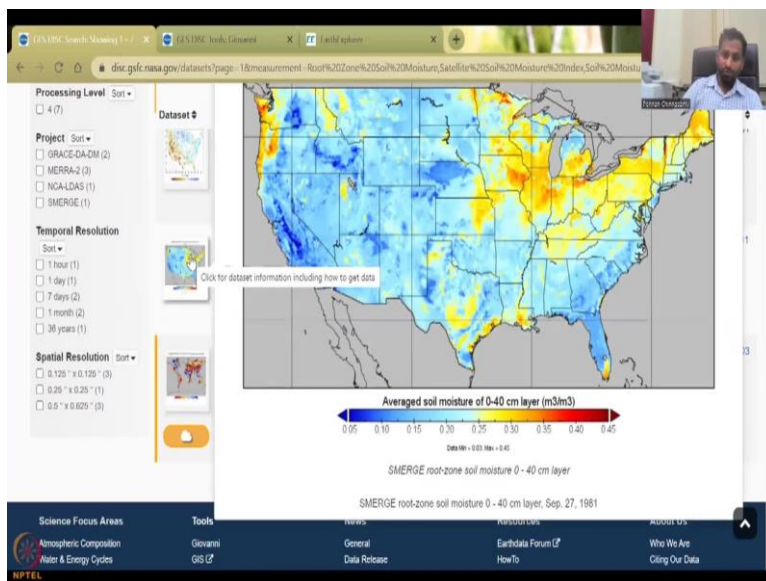
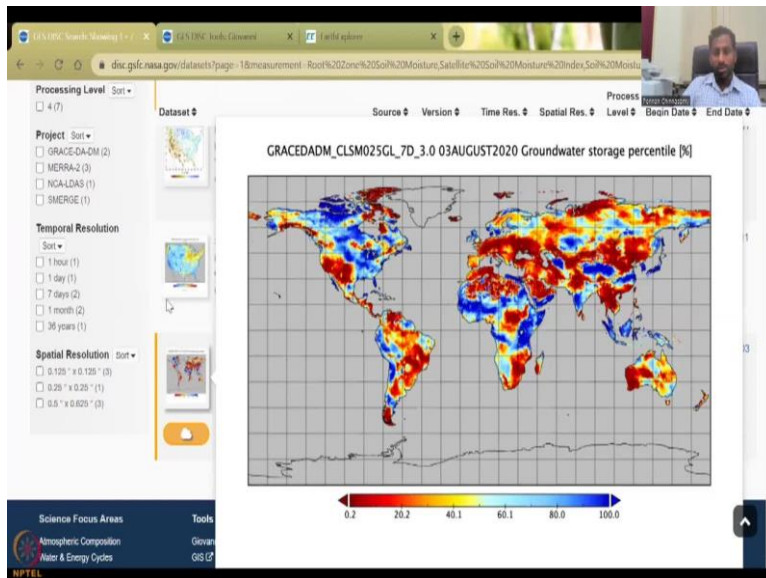
Processing Level Sort ▾
 4 (7)
 More...

Project Sort ▾
 GRACE-DA-DM (2)
 MERRA-2 (3)
 NGA-LDAS (1)
 SMERGE (1)
 More...

Temporal Resolution Sort ▾
 1 hour (1)
 1 day (1)
 7 days (2)
 1 month (2)
 36 years (1)
 More...

Spatial Resolution Sort ▾
 0.125° x 0.125° (3)
 0.25° x 0.25° (1)
 0.5° x 0.625° (3)
 More...

Dataset	Source	Version	Time Res.	Spatial Res.	Level	Begin Date	End Date
MERRA-2 langU_2d_Ind_Nx_2d_durnal,Time-Averaged,Single-Level,Assimilation,Land Surface Diagnostics V5.12.4 (M2TLNKLND 5.12.4)	Models MERRA-2	5.12.4	1 month	0.5° x 0.625°	4	1980-01-01	2022-12-01
Groundwater and Soil Moisture Conditions from GRACE and GRACE-FO Data Assimilation L4 7-days 0.125 x 0.125 degree U.S. V4.0 (GRACEDADM_CLSM0125US_7D 4.0)	Models Catchment-LSM	4.0	7 days	0.125° x 0.125°	4	2002-04-01	2022-10-03
NCA-LDAS Noah-3.3 Land Surface Model L4 Trends 0.125 x 0.125 degree V2.0 (NCALDAS_NOAH0125_Trends 2.0)	Models Noah-LSM	2.0	36 years	0.125° x 0.125°	4	1979-10-01	2015-10-01
SMERGE-Noah-CCI root zone soil	Models	2.0	1 day	0.125° x 0.125°	4	1979-01-02	2019-05-11



So, you can actually take the measurements go here and say I need soil, moisture or you can have root zone moisture and these are properties soil porosity or properties. So, you can have root zone soil moisture and close. So, automatically it poplins it and there is a data range that is given up to March is good groundwater and soil moisture conditions for GRACEDADM, etcetera. You might see only the US regions in some but it does have all the regions because you have given the condition like that.

(Refer Slide Time: 16:12)

The screenshot shows the NASA EarthData GES DISC search results page. The search criteria are 'noah' and the date range is '2022-01-01 to 2022-12-31'. The results show 12 datasets associated with 'noah'. The table below summarizes the visible datasets:

Dataset	Source	Version	Time Res.	Spatial Res.	Process Level	Begin Date	End Date
MERRA-2 Inst_3d_asm_Np_3d.3	Models	5.12.4	3 hours	0.5° x 0.625°	4	1980-01-01	2022-12-01
Hourly Instantaneous Pressure-Level Assimilation Assimilated Meteorological Fields V5.12.4 (M213NPASM 5.12.4)	MERRA-2						
FLDAS Noah Land Surface Model	Models	001	1 month	0.1° x 0.1°	4	1982-01-01	2022-11-01

The screenshot shows the NASA EarthData GES DISC search results page with refined filters. The search criteria are 'noah' and the date range is '2022-01-01 to 2022-12-31'. The results show 12 datasets associated with 'noah'. The table below summarizes the visible datasets:

Dataset	Source	Version	Time Res.	Spatial Res.	Process Level	Begin Date	End Date
GLDAS Noah Land Surface Model L4 monthly 0.25 x 0.25 degree V2.1 (GLDAS_NOAH025_M 2.1)	Models	2.1	1 month	0.25° x 0.25°	4	2000-01-01	2022-10-01
FLDAS Noah Land Surface Model L4 Central Asia Daily 0.01 x 0.01 degree (FLDAS_NOAH010_CA_D 001)	Models	001	1 day	0.01° x 0.01°	4	2000-10-01	2023-01-05
GLDAS Noah Land Surface Model L4 monthly 1.0 x 1.0 degree V2.1 (GLDAS_NOAH10_M 2.1)	Models	2.1	1 month	1° x 1°	4	2000-01-01	2022-10-01

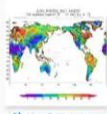
GES DISC Find a DAAC

Atmospheric Composition Water & Energy Cycles and Climate Variability

Back to search results

Global Land Data Assimilation System

GLDAS Noah Land Surface Model L4 monthly 0.25 x 0.25 degree V2.1 (GLDAS_NOAH025_M) Favorite



View Full-size Image

NASA Global Land Data Assimilation System Version 2 (GLDAS-2) has three components: GLDAS-2.0, GLDAS-2.1, and GLDAS-2.2. GLDAS-2.0 is forced entirely with the Princeton meteorological forcing input data and provides a temporally consistent series from 1948 through 2014. GLDAS-2.1 is forced with a combination of model and observation data from 2000 to present. GLDAS-2.2 products utilize data assimilation (DA), whereas the GLDAS-2.0 and GLDAS-2.1 products are "open-loop" (i.e., no data assimilation). The choice of forcing data, as well as DA observation source, variable, and schema, vary for different GLDAS-2.2 products.

GLDAS-2.1 data products are now available in two production streams: one stream is forced with combined forcing data including GPCP version 1.3 (the main production stream), and the other stream is processed without this forcing data (the early production stream). Since the GPCP Version 1.3 data have a 3-4 month latency, the GLDAS-2.1 data products are first created ...more

Data Access

- Online Archive
- Earthdata Search
- Giovanni
- Web Services
- Submit / Get Data

NPTEL

GLDAS-2.1 data products are now available in two production streams: one stream is forced with combined forcing data including GPCP version 1.3 (the main production stream), and the other stream is processed without this forcing data (the early production stream). Since the GPCP Version 1.3 data have a 3-4 month latency, the GLDAS-2.1 data products are first created ...more

Product Summary Data Citation Documentation References Data Calendar

Shortname: GLDAS_NOAH025_M

Longname: GLDAS Noah Land Surface Model L4 monthly 0.25 x 0.25 degree V2.1

DOI: 10.5067/SXAVCFAGLNO

Version: 2.1

Format: netCDF

Spatial Coverage: -180.0,-60.0,180.0,90.0

Temporal Coverage: 2000-01-01 to 2022-10-01

File Size: 21 MB per file

Data Resolution

Spatial: 0.25° x 0.25°

Temporal: 1 month

NPTEL

GLDAS-2.1 data products are now available in two production streams: one stream is forced with combined forcing data including GPCP version 1.3 (the main production stream), and the other stream is processed without this forcing data (the early production stream). Since the GPCP Version 1.3 data have a 3-4 month latency, the GLDAS-2.1 data products are first created ...more

Product Summary Data Citation Documentation References Data Calendar

READ-ME: README Document

PROJECT HOME PAGE: GLDAS Project Web Site

HOW-TO: How to read and plot the data.

GENERAL DOCUMENTATION: GES DISC Hydrology Documentation

For further information or assistance click 'Feedback' (upper right) or email the Help Desk at: gfc-dl-help-disc@mail.nasa.gov

Science Focus Areas

- Atmospheric Composition
- Water & Energy Cycles
- Climate Variability

Tools

- Giovanni
- GIS
- Data Tools for Hydrology
- ARIS NRT Viewer

News

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- Data Release
- Service Release
- Alerts

Resources

- Earthdata Forum
- HowTo
- Data In Action
- Publications

About Us

- Who We Are
- Cling Our Data
- Contact Us
- User Working Group

NPTEL

(Refer Slide Time: 17:14)

Product Summary | Data Citation | Documentation | References | Data Calendar

Shortname: GLDAS_NOAH025_M
Longname: GLDAS Noah Land Surface Model L4 monthly 0.25 x 0.25 degree V2.1
DOI: 10.5067/SXAVCZFAQLNO
Version: 2.1
Format: NetCDF
Spatial Coverage: -180.0,-40.0,180.0,90.0
Temporal Coverage: 2000-01-01 to 2022-10-01
File Size: 21 MB per file
Data Resolution
Spatial: 0.25° x 0.25°
Temporal: 1 month

Science Focus Areas: Atmospheric Composition, Water & Energy Cycles, Climate Variability
Tools: Giovanni, GIS, Data Tools for Hydrology, ARS NRT Viewer
News: General, Data Release, Service Release, Alerts
Resources: Earthdata Forum, HowTo, Data in Action, Publications
About Us: Who We Are, Citing Our Data, Contact Us, User Working Group

GLDAS Noah Land Surface Model L4 monthly 0.25 x 0.25 degree V2.1 (GLDAS_NOAH025_M)

NASA Global Land Data Assimilation System Version 2 (GLDAS-2) has three components: GLDAS-2.0, GLDAS-2.1, and GLDAS-2.2. GLDAS-2.0 is forced entirely with the Princeton meteorological forcing input data and provides a temporally consistent series from 1948 through 2014. GLDAS-2.1 is forced with a combination of model and observation data from 2000 to present. GLDAS-2.2 product suites use data assimilation (DA), whereas the GLDAS-2.0 and GLDAS-2.1 products are "open-loop" (i.e., no data assimilation). The choice of forcing data, as well as DA observation source, variable, and scheme, vary for different GLDAS-2.2 products.

GLDAS-2.1 data products are now available in two production streams: one stream is forced with combined forcing data including GPCP version 1.3 (the main production stream), and the other stream is processed without this forcing data (the early production stream). Since the GPCP Version 1.3 data have a 3-4 month latency, the GLDAS-2.1 data products are first created without it, and are designated as Early Products (EPs), with about 1.5 month latency. Once the GPCP Version 1.3 data become available, the GLDAS-2.1 data products are processed in the main production stream and are removed from the Early Products archive.

This data product, reprocessed in January 2020, is GLDAS-2.1 Noah monthly 0.25 degree data from the main production stream and it is a replacement to its previous version.

The monthly data product was generated through temporal averaging of GLDAS-2.1 Noah 3-hourly data simulated with the Noah Model 3.6 in Land Information System (LIS) Version 7. The data product contains 36 land surface fields from January 2000 to present. The GLDAS-2.1 data are archived and distributed in NetCDF format. The GLDAS-2.1 products supersede their corresponding GLDAS-1 products.

The GLDAS-2.1 simulation started on January 1, 2000 using the conditions from the GLDAS-2.0 simulation. This simulation was forced with National Oceanic and Atmospheric Administration (NOAA) Global Data Assimilation System (GDAS) atmospheric analysis fields (Derber et al., 1991), the disaggregated Global Precipitation Climatology Project (GPCP) V1.3 Daily Analysis precipitation fields (Adler et al., 2003; Huffman et al., 2001), and the Air Force Weather Agency's Agricultural Meteorological modeling system (AGRMET) radiation fields. The simulation used with GDAS and GPCP

Data Access: Online Archive, Earthdata Search, Giovanni, Web Services, Submit / Get Data

Global Land Data Assimilation System

GLDAS Noah Land Surface Model L4 monthly 0.25 x 0.25 degree V2.1 (GLDAS_NOAH025_M) Favorite

NASA Global Land Data Assimilation System Version 2 (GLDAS-2) has three components: GLDAS-2.0, GLDAS-2.1, and GLDAS-2.2. GLDAS-2.0 is forced entirely with the Princeton meteorological forcing input data and provides a temporally consistent series from 1948 through 2014. GLDAS-2.1 is forced with a combination of model and observation data from 2000 to present. GLDAS-2.2 product suites use data assimilation (DA), whereas the GLDAS-2.0 and GLDAS-2.1 products are "open-loop" (i.e., no data assimilation). The choice of forcing data, as well as DA observation source, variable, and scheme, vary for different GLDAS-2.2 products.

GLDAS-2.1 data products are now available in two production streams: one stream is forced with combined forcing data including GPCP version 1.3 (the main production stream), and the other stream is processed without this forcing data (the early production stream). Since the GPCP Version 1.3 data have a 3-4 month latency, the GLDAS-2.1 data products are first created without it, and are designated as Early Products (EPs), with about 1.5 month latency. Once the GPCP Version 1.3 data become available, the GLDAS-2.1 data products are processed in the main production stream and are removed from the Early Products archive.

This data product, reprocessed in January 2020, is GLDAS-2.1 Noah monthly 0.25 degree data from the main production stream and it is a replacement to its previous version.

The monthly data product was generated through temporal averaging of GLDAS-2.1 Noah 3-hourly data simulated with the Noah Model 3.6 in Land Information System (LIS) Version 7. The data product contains 36 land surface fields from January 2000 to present. The GLDAS-2.1 data are archived and distributed in NetCDF format. The GLDAS-2.1 products supersede their corresponding GLDAS-1 products.

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Data Access: Online Archive, Earthdata Search, Giovanni, Web Services, OPENDAP, GDS, THREDDS Data

NetCDF is a particular format where multiple images are kept in one file, you will have to physically click and open each file. For now, do not worry about it, because you will also be able to download single file by just putting a single time series. Since we have put a multiple time series all the data will be put in one file. But for you normally how I do it is just take one data and then delete it.

So, you can read here about the data and what are the products it gives. You can go to the online archive, you can go to web services, you can open data, all these, these required some coding, so do not worry about it if you do not know. But Earth data search is good and Giovanni is also good.

(Refer Slide Time: 18:08)

hydro1.gesdisc.cosdis.nasa.gov

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Access to GFS DISC data requires all users to be registered with the Earthdata Login system. Data continue to be free of charge and accessible via HTTPS. Access to data via anonymous FTP is no longer available. Detailed instructions on how to register and receive authorization to access GFS DISC data are provided [here](#).

GFS DISC Users who deploy scripting methods to list and download data in bulk via anonymous FTP are advised to review the [How to Download Data Files from HTTPS Service with wget](#) recipe that provides examples of GNU wget commands for listing and downloading data via HTTPS.

Once registered, you can [click here](#) to authorize "NASA GFS DISC DATA ARCHIVE" application.

Name	Last modified	Size
Parent Directory	-	-
2020	2020-10-19 17:44	-
2021	2020-10-19 17:44	-
2022	2020-10-19 17:44	-
2023	2020-10-19 17:44	-

hydro1.gesdisc.cosdis.nasa.gov

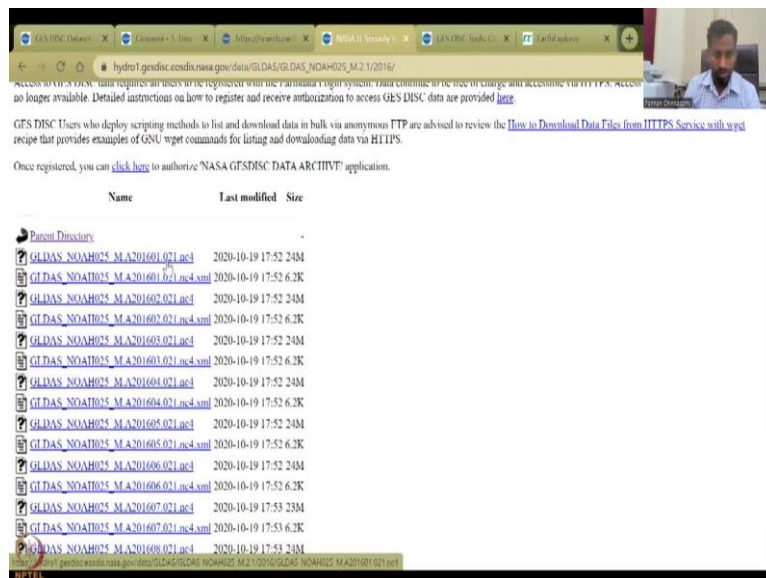
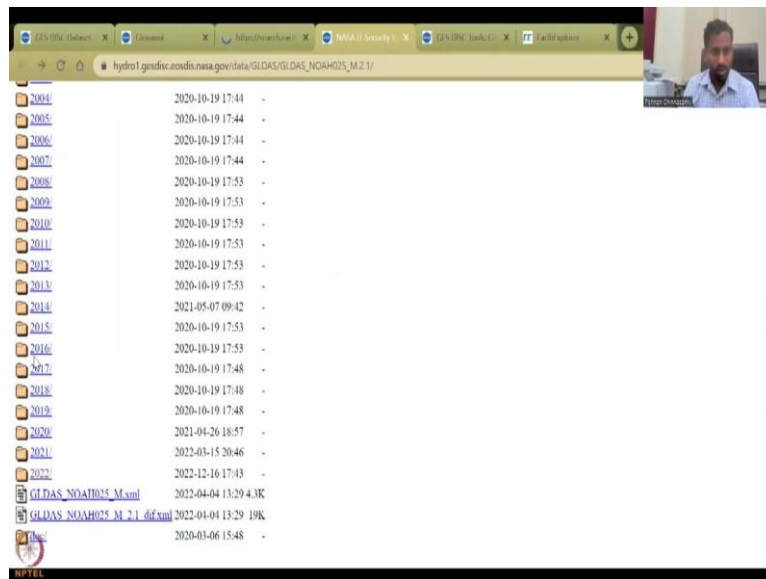
By accessing and using this information system, you acknowledge and consent to the following: You are accessing a U.S. Government information system, which includes: (1) this computer; (2) all computers connected to this network including end user systems; (3) all devices and storage media attached to this network or to any computer on this network; and (5) cloud and remote information services. This information system is provided for U.S. Government-authorized use only. You have no reasonable expectation of privacy regarding any communication transmitted through or data stored on this information system. At any time, and for any lawful purpose, the U.S. Government may monitor, intercept, search, and seize any communication or data transiting, stored on, or traveling to or from this information system. You are NOT authorized to process classified information on this information system. Unauthorized or improper use of this system may result in suspension or loss of access privileges, disciplinary action, and civil and/or criminal penalties.

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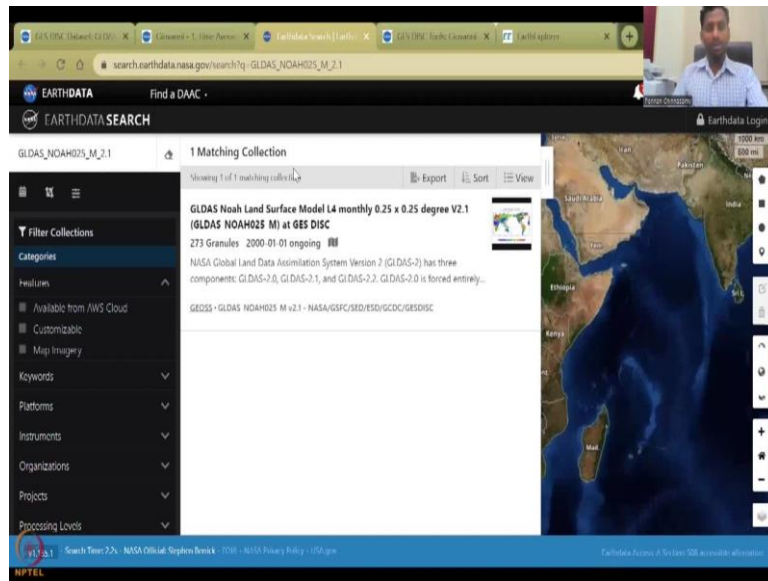
Once registered, you can [click here](#) to authorize "NASA GFS DISC DATA ARCHIVE" application.

Name	Last modified	Size
Parent Directory	-	-
GLDAS_NOAH025_M2A202201.021.nc4	2022-04-13 17:59	2.0M
GLDAS_NOAH025_M2A202201.021.nc4.xml	2022-04-13 17:59	6.2K
GLDAS_NOAH025_M2A202202.021.nc4	2022-05-17 15:48	2.0M
GLDAS_NOAH025_M2A202202.021.nc4.xml	2022-05-17 15:48	6.2K
GLDAS_NOAH025_M2A202203.021.nc4	2022-06-15 20:34	2.0M
GLDAS_NOAH025_M2A202203.021.nc4.xml	2022-06-15 20:34	6.2K
GLDAS_NOAH025_M2A202204.021.nc4	2022-07-08 22:31	2.0M
GLDAS_NOAH025_M2A202204.021.nc4.xml	2022-07-08 22:31	6.2K
GLDAS_NOAH025_M2A202205.021.nc4	2022-08-15 22:18	2.0M
GLDAS_NOAH025_M2A202205.021.nc4.xml	2022-08-15 22:18	6.2K
GLDAS_NOAH025_M2A202206.021.nc4	2022-09-16 14:48	2.0M

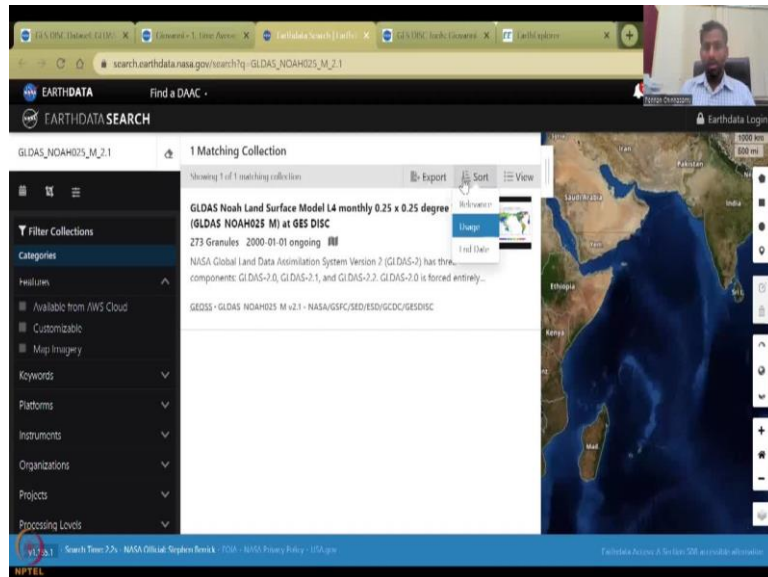


So, here I have clicked the desktop based data acquisition, and you can click the year folder always the year month and date, so year month and date and the version is given. So, you can see how all the data is being stored for December and only available on 22. But here you have the data for 2016 01 02. So, the first date is missing but the other dates are there. So, these are monthly, so you can get the monthly 1 2 3 4 5 6 7 8 9 10 11 12. So, monthly estimates are there.

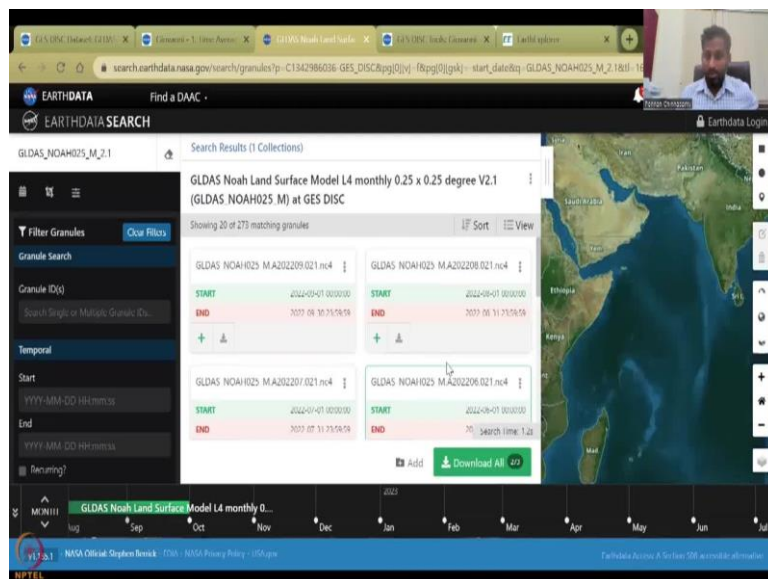
(Refer Slide Time: 18:54)



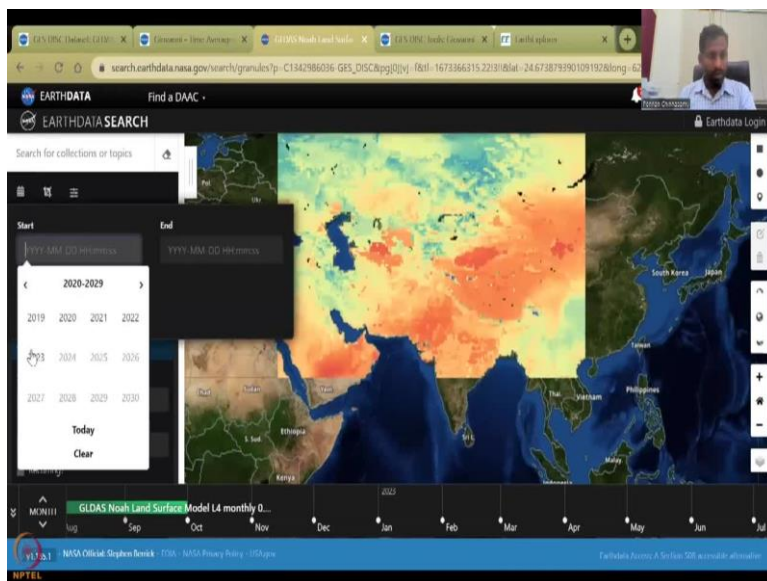
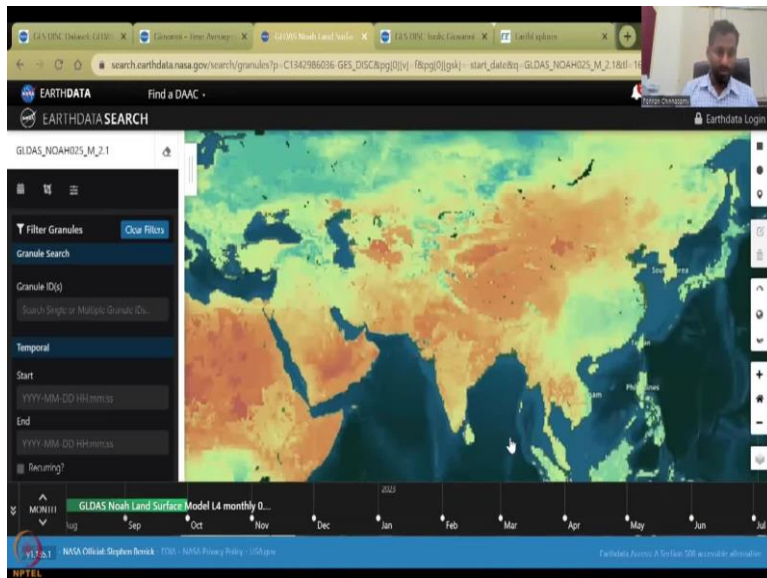
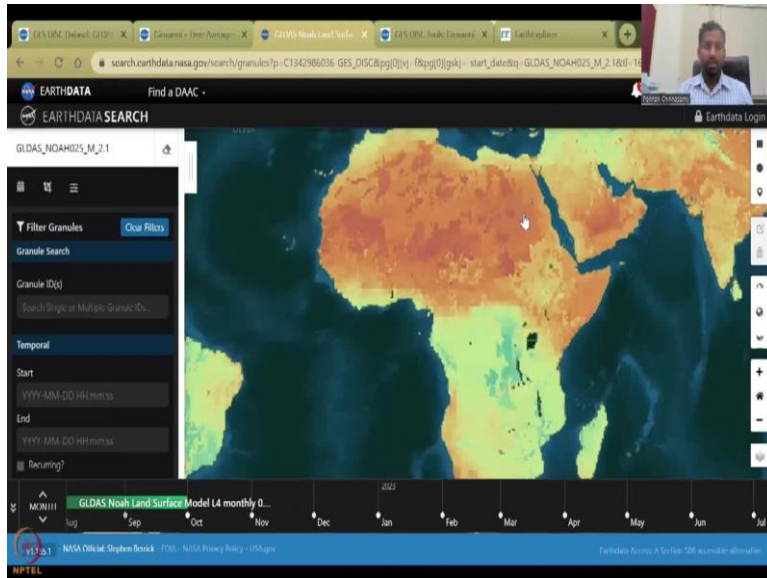
This screenshot shows the Earthdata Search interface. The search results for 'GLDAS_NOAH025_M_2.1' are displayed, showing one matching collection. The collection details include the title 'GLDAS Noah Land Surface Model L4 monthly 0.25 x 0.25 degree V2.1 (GLDAS_NOAH025_M) at GES DISC', 273 granules, and a start date of 2000-01-01. A description explains that this is part of the NASA Global Land Data Assimilation System Version 2 (GLDAS-2), which has three components: GLDAS-2.0, GLDAS-2.1, and GLDAS-2.2. The interface includes a filter sidebar on the left, a map on the right, and a video feed in the top right corner.



This screenshot is similar to the previous one, but with a 'Download' button highlighted in the 'Actions' menu for the collection. The 'Download' button is located next to the 'View' button in the top right of the collection card.



This screenshot shows the granules view for the collection 'GLDAS Noah Land Surface Model L4 monthly 0.25 x 0.25 degree V2.1 (GLDAS_NOAH025_M) at GES DISC'. It displays 20 of 273 matching granules. Each granule entry shows its ID, start, and end dates. For example, one granule has ID 'GLDAS_NOAH025_M_A202209.021.nc4', start date '2022-09-01 00:00:00', and end date '2022-09-01 00:00:00'. The interface includes a filter sidebar on the left, a map on the right, and a video feed in the top right corner.



EARTHDATA SEARCH
 Find a DAAC · Earthdata Login

Search for collections or topics

Temporal
 Start: 2022-01-01 00:00:00
 Stop: 2022-12-31 23:59:59

Filter Granules [Clear Filters](#)
 Granule Search
 Granule ID(s)
 Search Single or Multiple Granule IDs

Temporal
 Start
 YYYY-MM-DD HH:mm:ss

GLDAS Noah Land Surface Model L4 monthly 0...
 2022
 Jan Feb Mar Apr May Jun Jul

NASA Official: Stephen Rebeck · FTM · NASA Privacy Policy · USA.gov
 Earthdata Access & Service: 200 accessible alternatives

EARTHDATA SEARCH
 Find a DAAC · Earthdata Login

Search for collections or topics

Temporal
 Start: 2022-01-01 00:00:00
 Stop: 2022-12-31 23:59:59

Filter Granules [Clear Filters](#)
 Granule Search
 Granule ID(s)
 Search Single or Multiple Granule IDs

Temporal
 Start
 YYYY-MM-DD HH:mm:ss

GLDAS Noah Land Surface Model L4 monthly 0...
 2022
 Jan Feb Mar Apr May Jun Jul

NASA Official: Stephen Rebeck · FTM · NASA Privacy Policy · USA.gov
 Earthdata Access & Service: 200 accessible alternatives

Advanced Search
 Search by Feature
 HUC ID
 ex. 1805000301
 Exact match
 Search
 Cancel Apply

Find more information about Hydrological Units at <http://water.usgs.gov/delta.html>

EARTHDATA SEARCH
 Find a DAAC · Earthdata Login

Search for collections or topics

Temporal
 Start: 2022-02-03 22:56:21
 Stop: 2022-12-31 23:59:59

Filter Granules [Clear Filters](#)
 Granule Search
 Granule ID(s)
 Search Single or Multiple Granule IDs

Temporal
 Start
 YYYY-MM-DD HH:mm:ss

GLDAS Noah Land Surface Model L4 monthly 0...
 May 2022
 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

NASA Official: Stephen Rebeck · FTM · NASA Privacy Policy · USA.gov
 Earthdata Access & Service: 200 accessible alternatives

So, in the third data, you can click here and say Export Data as CSV or JSON. You can also view the data as a list or table, you can click the data to understand more about the data you will see like there are a lot of collections. So, this is what I said each one is each month. So, this is 2022 9 months and this is the eighth month seven months so you can only download this if you want, or you can add the data to your whole download.

So, for example, if I click here only that single granule or single image will be downloaded. So, let us close this for a minute. And you can see here behind it is being populated the data all the data that we took for the entire globe has been populated for GLDAS NOAH. And you can actually edit it for just your data timeframe. So, here again, you will have to put the timeframe. We have said 2022 Jan, first up to 2022 December 31. Apply.

So, now it will get updated and you can also create an area of interest. And you can compare, compare the features between two to Grands two to two images. Good. So, what we need is you can download it as a month. So, this is your data you have downloaded, or you have asked Giovanni or data to say, I want these data, right? You can actually play with the slider and say, I know I want only this month and it gets updated.

So, each month, you can look at the data using the slider, you can click the month, you can click the days if you want the day, a particular day you want you can take and you can take it off, if it is too much, taking your time, so you can also use all these tools, but do not I will say, do not get distracted by all the tools all you want is to download the data so that we can export it in the QGIS.

In one of the experiments coming soon, we will teach you how to use QGIS, download a data of particular data. So, we will not go searching like how we did searching here, this is just for you to introduce the buttons, where you can click what you can do let me close it just for the internet. And you can also download the data. So, all this we have seen here is the same data as I said and you can have in multiple multiple formats.

(Refer Slide Time: 21:39)

The screenshot shows the GIOVANNI web interface with a list of data products. The selected product is 'Surface air pressure' (GLDAS_NOAH025_M v2.1) with units of Pa. Other products include Snow precipitation rate, Near surface wind speed, Storm surface runoff, Snow depth water equivalent, Baseline-groundwater runoff, Plant canopy surface water, Near surface air temperature, Root zone soil moisture, Net shortwave radiation flux, Soil temperature (10-40 cm underground), and Soil temperature (0-10 cm underground).

Product Name	Units	Model	Frequency	Resolution	Start Date	End Date
<input type="checkbox"/> Snow precipitation rate (GLDAS_NOAH025_M v2.1)	kg m-2 s-1	GLDAS Model	Monthly	0.25°	2000-01-01	2022-09-30
<input type="checkbox"/> Near surface wind speed (GLDAS_NOAH025_M v2.1)	m s-1	GLDAS Model	Monthly	0.25°	2000-01-01	2022-09-30
<input type="checkbox"/> Storm surface runoff (GLDAS_NOAH025_M v2.1)	kg m-2	GLDAS Model	Monthly	0.25°	2000-01-01	2022-09-30
<input type="checkbox"/> Snow depth water equivalent (GLDAS_NOAH025_M v2.1)	kg m-2	GLDAS Model	Monthly	0.25°	2000-01-01	2022-09-30
<input type="checkbox"/> Baseline-groundwater runoff (GLDAS_NOAH025_M v2.1)	kg m-2	GLDAS Model	Monthly	0.25°	2000-01-01	2022-09-30
<input type="checkbox"/> Plant canopy surface water (GLDAS_NOAH025_M v2.1)	kg m-2	GLDAS Model	Monthly	0.25°	2000-01-01	2022-09-30
<input checked="" type="checkbox"/> Surface air pressure (GLDAS_NOAH025_M v2.1)	Pa	GLDAS Model	Monthly	0.25°	2000-01-01	2022-09-30
<input type="checkbox"/> Near surface air temperature (GLDAS_NOAH025_M v2.1)	K	GLDAS Model	Monthly	0.25°	2000-01-01	2022-09-30
<input type="checkbox"/> Root zone soil moisture (GLDAS_NOAH025_M v2.1)	kg m-2	GLDAS Model	Monthly	0.25°	2000-01-01	2022-09-30
<input type="checkbox"/> Net shortwave radiation flux (GLDAS_NOAH025_M v2.1)	W m-2	GLDAS Model	Monthly	0.25°	2000-01-01	2022-09-30
<input type="checkbox"/> Soil temperature (10-40 cm underground) (GLDAS_NOAH025_M v2.1)	K	GLDAS Model	Monthly	0.25°	2000-01-01	2022-09-30
<input type="checkbox"/> Soil temperature (0-10 cm underground) (GLDAS_NOAH025_M v2.1)	K	GLDAS Model	Monthly	0.25°	2000-01-01	2022-09-30

The screenshot shows the GIOVANNI web interface with a list of data products. The selected product is 'Soil moisture content (10-40 cm underground)' (GLDAS_NOAH025_M v2.1) with units of kg m-2. Other products include Dried evaporation from bare soil, Soil temperature (100-200 cm underground), Net longwave radiation flux, Sensible heat net flux, Downward longwave radiation flux, Downward shortwave radiation flux, Latent heat net flux, Soil moisture content (40-100 cm underground), Soil moisture content (0-10 cm underground), and Average surface skin temperature.

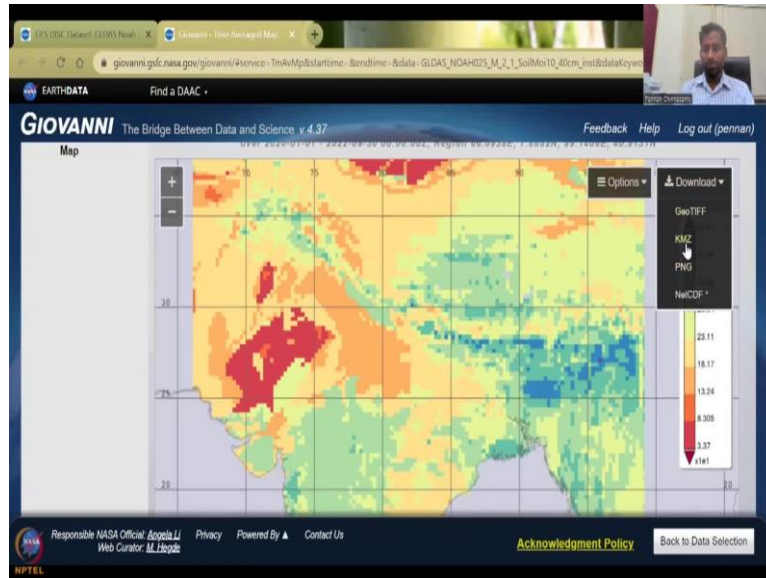
Product Name	Units	Model	Frequency	Resolution	Start Date	End Date
<input type="checkbox"/> Dried evaporation from bare soil (GLDAS_NOAH025_M v2.1)	W m-2	GLDAS Model	Monthly	0.25°	2000-01-01	2022-09-30
<input type="checkbox"/> Soil temperature (100-200 cm underground) (GLDAS_NOAH025_M v2.1)	K	GLDAS Model	Monthly	0.25°	2000-01-01	2022-09-30
<input type="checkbox"/> Net longwave radiation flux (GLDAS_NOAH025_M v2.1)	W m-2	GLDAS Model	Monthly	0.25°	2000-01-01	2022-09-30
<input type="checkbox"/> Sensible heat net flux (GLDAS_NOAH025_M v2.1)	W m-2	GLDAS Model	Monthly	0.25°	2000-01-01	2022-09-30
<input checked="" type="checkbox"/> Soil moisture content (10-40 cm underground) (GLDAS_NOAH025_M v2.1)	kg m-2	GLDAS Model	Monthly	0.25°	2000-01-01	2022-09-30
<input type="checkbox"/> Downward longwave radiation flux (GLDAS_NOAH025_M v2.1)	W m-2	GLDAS Model	Monthly	0.25°	2000-01-01	2022-09-30
<input type="checkbox"/> Downward shortwave radiation flux (GLDAS_NOAH025_M v2.1)	W m-2	GLDAS Model	Monthly	0.25°	2000-01-01	2022-09-30
<input type="checkbox"/> Latent heat net flux (GLDAS_NOAH025_M v2.1)	W m-2	GLDAS Model	Monthly	0.25°	2000-01-01	2022-09-30
<input type="checkbox"/> Soil moisture content (40-100 cm underground) (GLDAS_NOAH025_M v2.1)	kg m-2	GLDAS Model	Monthly	0.25°	2000-01-01	2022-09-30
<input type="checkbox"/> Soil moisture content (0-10 cm underground) (GLDAS_NOAH025_M v2.1)	kg m-2	GLDAS Model	Monthly	0.25°	2000-01-01	2022-09-30
<input type="checkbox"/> Average surface skin temperature (GLDAS_NOAH025_M v2.1)	K	GLDAS Model	Monthly	0.25°	2000-01-01	2022-09-30

The screenshot shows the GIOVANNI web interface displaying a map of Root Zone Soil Moisture Daily 0.25 Deg. The map includes a legend, options, and a color scale. The legend is expanded to show 'Decorations' (Title, Sub-title, Caption, Legend) and 'Supporting Overlays' (Coastlines, Countries, US States, Grid). The color scale ranges from 3.37 to 42.85 kg m-2.

Map Options:

- Options
- Decorations
 - Title
 - Sub-title
 - Caption
 - Legend
- Supporting Overlays
 - Coastlines
 - Countries
 - US States
 - Grid

Color Scale: 42.85, 37.91, 32.98, 28.04, 23.11, 18.17, 13.24, 8.305, 3.37



So, as I said I need only soil moisture for a particular zone you can click here go to results it will plot. So, it will be very carefully looking at how to download the data in different formats like here download as GeoTIFF, KMZ, PNG and NetCDF here. NetCDF will pull all of it together whereas GeoTIFF, KMZ PNG each date, each date is a single file.

(Refer Slide Time: 22:16)

Global Land Data Assimilation System

GLDAS Noah Land Surface Model L4 monthly 0.25 x 0.25 degree V2.1 (GLDAS_NOAH025_M)

NASA Global Land Data Assimilation System Version 2 (GLDAS-2) has three components: GLDAS-2.0, GLDAS-2.1, and GLDAS-2.2. GLDAS-2.0 is forced entirely with the Princeton meteorological forcing input data and provides a temporally consistent series from 1948 through 2014. GLDAS-2.1 is forced with a combination of model and observation data from 2000 to present. GLDAS-2.2 product suites use data assimilation (DA), whereas the GLDAS-2.0 and GLDAS-2.1 products are "open-loop" (i.e., no data assimilation). The choice of forcing data, as well as DA observation source, variable, and schema, vary for different GLDAS-2.2 products.

GLDAS-2.1 data products are now available in two production streams: one stream is forced with combined forcing data including GPCP version 1.3 (the main production stream), and the other stream is processed without this forcing data (the early production stream). Since the GPCP Version 1.3 data have a 3-4 month latency, the GLDAS-2.1 data products are first created without it, and are designated as Early Products (EPs), with about 1.5 month latency. Once the GPCP Version 1.3 data become available, the GLDAS-2.1 data products are processed in the main production stream and are removed from the Early Products archive.

This data product, reprocessed in January 2020, is GLDAS-2.1 Noah monthly 0.25 degree data from the main production stream and it is a replacement to its previous version.

The monthly data product was generated through temporal averaging of GLDAS-2.1 Noah 3-hourly data simulated with the Noah Model 3.6 in Land Information System (LIS) Version 7. The data product contains 36 land surface fields from January 2000 to present. The GLDAS-2.1 data are archived and distributed in NetCDF format. The GLDAS-2.1 products supersede their corresponding GLDAS-1 products.

The GLDAS-2.1 simulation started on January 1, 2000 using the conditions from the GLDAS-2.0 simulation. This simulation was forced with National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Prediction (NCEP) reanalysis data from 1979 to 2000.

Data Access

- Online Archive
- Earthdata Search
- Giovanni
- Web Services
- Submit / Get Data

GES DISC Find a DAAC

Feedback Cloud Migration Help Hi, Pennan My Dashboard

Data Collections noah

Atmospheric Composition Water & Energy Cycles and Climate Variability

Data Collections Showing 1 - 12 of datasets associated with noah for date range 2022-01-01 to 2022-12-31, intersecting 60.937, 4.299, 101.016, 39.456

Favorite

Refine By

Want to focus your search?

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

Features Sort

- Cloud Enabled (6)

Subject Sort

- Atmospheric Pressure (11)
- Atmospheric Radiation (11)
- Atmospheric Temperature (12)
- Atmospheric Water Vapor (12)
- Atmospheric Winds (10)

More...

Dataset	Source	Version	Time Res.	Spatial Res.	Process Level	Begin Date	End Date
GLDAS Noah Land Surface Model L4 monthly 0.25 x 0.25 degree V2.1 (GLDAS_NOAH1025_M 2.1)	Models Noah-LSM	2.1	1 month	0.25° x 0.25°	4	2000-01-01	2022-10-01
GLDAS Noah Land Surface Model L4 3 hourly 0.25 x 0.25 degree V2.1 (GLDAS_NOAH1025_3H 2.1)	Models Noah-LSM	2.1	3 hours	0.25° x 0.25°	4	2000-01-01	2022-10-01
GLDAS Noah Land Surface Model L4 3 hourly 1.0 x 1.0 degree V2.1 (GLDAS_NOAH10_3H 2.1)	Models Noah-LSM	2.1	3 hours	1° x 1°	4	2000-01-01	2022-10-01

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- Atmospheric Temperature (12)
- Atmospheric Water Vapor (12)
- Atmospheric Winds (10)

More...

Measurement Sort

Dataset	Source	Version	Time Res.	Spatial Res.	Process Level	Begin Date	End Date
GLDAS Noah Land Surface Model L4 3 hourly 0.25 x 0.25 degree V2.1 (GLDAS_NOAH1025_3H 2.1)	Models Noah-LSM	2.1	3 hours	0.25° x 0.25°	4	2000-01-01	2022-10-01
GLDAS Noah Land Surface Model L4 3 hourly 1.0 x 1.0 degree V2.1 (GLDAS_NOAH10_3H 2.1)	Models Noah-LSM	2.1	3 hours	1° x 1°	4	2000-01-01	2022-10-01

GES DISC Find a DAAC

Feedback Cloud Migration Help Hi, Pennan My Dashboard

Data Collections noah

Atmospheric Composition Water & Energy Cycles and Climate Variability

Data Collections Showing 1 - 12 of datasets associated with noah for date range 2022-01-01 to 2022-12-31, intersecting 60.937, 4.299, 101.016, 39.456

Favorite

Refine By

Want to focus your search?

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

Features Sort

- Cloud Enabled (6)

Subject Sort

- Atmospheric Pressure (11)
- Atmospheric Radiation (11)
- Atmospheric Temperature (12)
- Atmospheric Water Vapor (12)
- Atmospheric Winds (10)

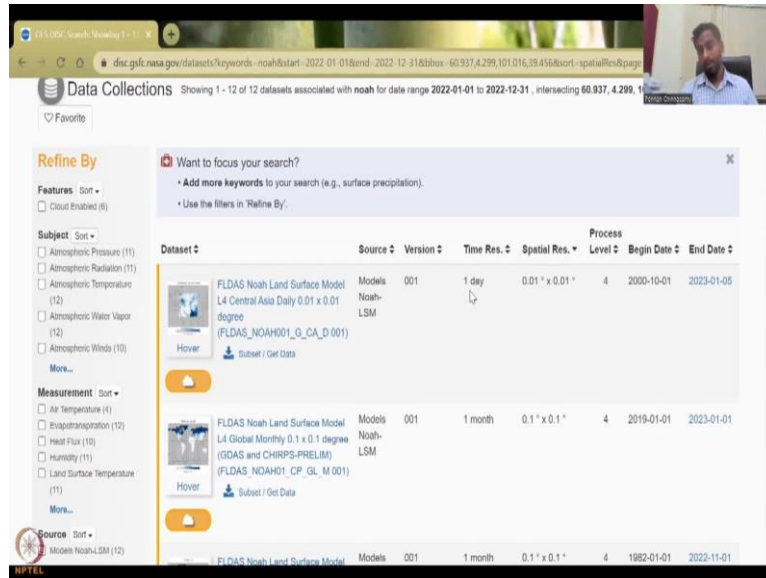
More...

Measurement Sort

- Air Temperature (4)
- Evapotranspiration (12)
- Heat Flux (10)
- Humidity (11)
- Land Surface Temperature (11)

Source Sort

Dataset	Source	Version	Time Res.	Spatial Res.	Process Level	Begin Date	End Date
GLDAS Noah Land Surface Model L4 3 hourly 0.25 x 0.25 degree V2.1 (GLDAS_NOAH1025_3H 2.1)	Models Noah-LSM	2.1	3 hours	0.25° x 0.25°	4	2000-01-01	2022-10-01
GLDAS Noah Land Surface Model L4 3 hourly 1.0 x 1.0 degree V2.1 (GLDAS_NOAH10_3H 2.1)	Models Noah-LSM	2.1	3 hours	1° x 1°	4	2000-01-01	2022-10-01



So, we have one through the GLDAS GIS and etcetera. So, whatever you want in terms of data you can type here if it is there, it will come. Be very, very careful in accessing the resolution you want. You want a monthly do it here click it will be 3 hours every 3 hours it gives data. Spatial resolution will be bigger to course compared to a smaller resolution time. So, that is a given time if you have daily you can have a very focused pixel, but if you have 3 hours then the pixel is too big this is 25 by 25 Kilometers.

So, you have to understand, do I want a 25 by 25 Kilometers or 10 meters resolution if it is 10 meter I will make this one. So, this is kind of very, very high resolution, spatially and you have one day. So, one degree is 100 kilometers, right? And 0.25 is 25 kilometers, here it is 0.01. So, you should be able to get high resolution imagery data with this and very, very new date, but the time, the time resolution is only once per day. It is not every day, so it is not every hour 3 hours like that we can take data.

So, with this I will stop with the NASA site the data and other things. Now let us go into the remaining part of the presentation.

(Refer Slide Time: 24:08)

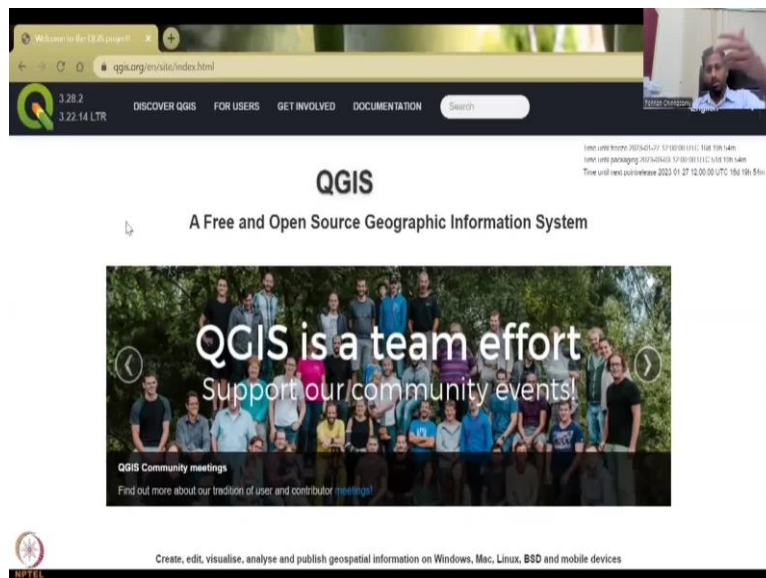
Open Source GIS Software

4

- <https://qgis.org/en/site/forusers/download.html>



NPTEL

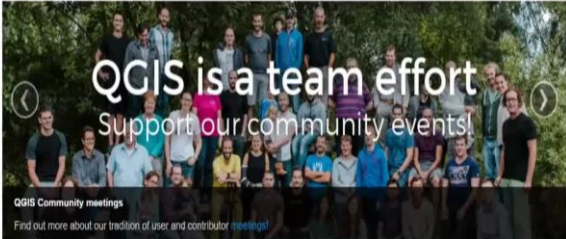


3.28.2
3.22.14 LTR

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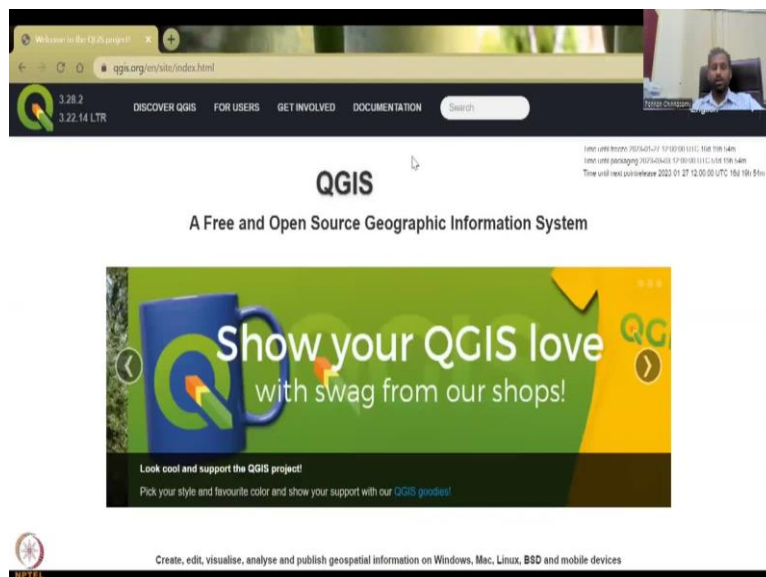


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3.28.2
3.22.14 LTR

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So, to analyze all this data, what do you need? You need a software and that is a GIS software. So, I will be introducing GIS concepts in the next lecture onwards. What is GIS? Why do we need GIS and within the GIS we will be using only two formats? It is a vector format or a raster format the data and we need a platform or software that where we can put the data and analyze it and that is a QGIS software that we I will be teaching.

QGIS is the open source GIS software. Normally GIS software is very very expensive if you buy the proprietary software, but open source software is good. So, I will be introducing GIS in the next lecture series week. Today, I want to give you in the remaining five minutes, what is this software so that you can start downloading or I will have a session on downloading rules.

So, you can go to this link to download the software, let us let me take you to this link. So, what you will find here is the project, first, let me open the project, project based website., so just type QGIS, Google search, you will find this one or you can have this link, it does get updated. So that is why I have kept it. So, you will have all these QGIS about and who runs the system, I will give you the presentation also the details.

But most importantly, you will find all the people that are using this software here and it is even the space agencies of European nations use this because it is very very expensive to buy the software and only some people are using it if you make it open source and lot of people take part in building the software then everyone can use it and that is the model they use. So, very nice model very futuristic model thinking of every every student.

For example, IIT professors are given this the same course I give for IIT students. So, the same course is now available for every student to NPTEL. So, similar to that here it is open and free, they do not get some donations or project money, but it is kept open for free for everyone. So, the link I given is to download. So, you can download now, the new version.

(Refer Slide Time: 27:04)

The screenshot shows the QGIS website's download page for Windows. The browser address bar displays "qgis.org/en/site/forusers/download.html". The page header includes navigation links: "DISCOVER QGIS", "FOR USERS", "GET INVOLVED", and "DOCUMENTATION", along with a search bar. Below the header, there are tabs for "INSTALLATION DOWNLOADS", "ALL RELEASES", and "SOURCES". The main content area is titled "Download for Windows" and features a prominent green button labeled "Download QGIS 3.28". Below this button, a link points to "Looking for the most stable version? Get QGIS 3.22 LTR". Further down, there is a section for the "OSGeo4W Network Installer" with a brief description: "The OSGeo4W installer is recommended for regular users or organization deployments. It allows to have several QGIS versions in one place, and to keep each component up-to-date individually without having to download the whole package." A note at the bottom states, "Since QGIS 3.20 we only ship 64-bit Windows executables."

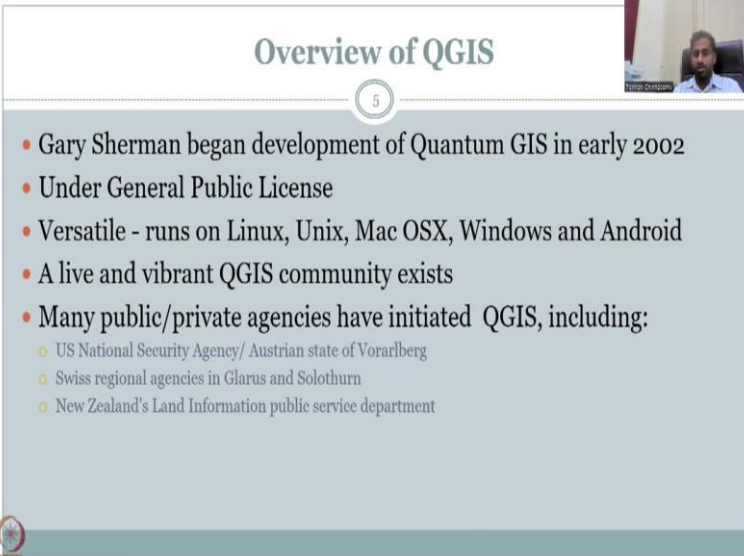
This screenshot shows the lower portion of the QGIS download page. It lists three categories: "Download for Linux", "Download for BSD", and "Apps for mobile and tablet", each with a left-pointing arrow. Below these is a section titled "All downloads" with a link to "More specific instructions about downloading QGIS stable vs QGIS development can be found in All downloads." A "Datasets" section follows, with a note: "For testing and learning purposes, a sample dataset is available, which contains collections of data from different sources and in different formats." At the bottom, there are social media icons for Twitter, Facebook, GitHub, and Email, and a URL: "https://qgis.org/en/site/forusers/download.html#faq".

The screenshot shows the QGIS download page with a summary of platform availability. The main heading is "Download QGIS for your platform". Below it, the text states: "Binary packages (installers) are available from this page. The current version is QGIS 3.28.2 'Firenze' and was released on 16.12.2022. The long-term repositories currently offer QGIS 3.22.14 'Białowieża'. QGIS is available on Windows, macOS, Linux, Android and iOS." The navigation tabs "INSTALLATION DOWNLOADS", "ALL RELEASES", and "SOURCES" are visible. The "Download for Windows" section is expanded, showing the "Download QGIS 3.28" button and the link to "Looking for the most stable version? Get QGIS 3.22 LTR".

The new version is here, it always says the newest version is 3.28 but you will always go for the most stable version. So, it is 3.22 which is lesser than 3.28. But it is more stable, which means all the errors, bugs, everything is taken care. Any software if it is new will have some issues and errors. And that is what a beta version we call here the beta version is 3.28 the one which is a newest which is rich in features, but still it is not stable, it may crash.

So, the 3.22 LTR is the best current resolution. And for different operating software's Mac, Linux, BSD tablets, you have different software's to download, let me go back to the presentation. So, what we did is this is the logo of QGIS and how it has evolved.

(Refer Slide Time: 28:06)



The slide is titled "Overview of QGIS" and is numbered "5". It features a list of bullet points and a small video inset in the top right corner showing a man speaking. The bullet points are:

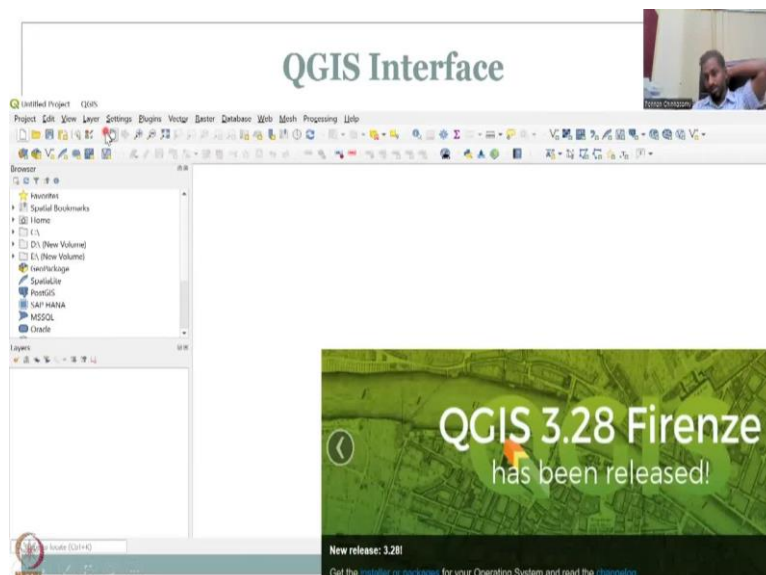
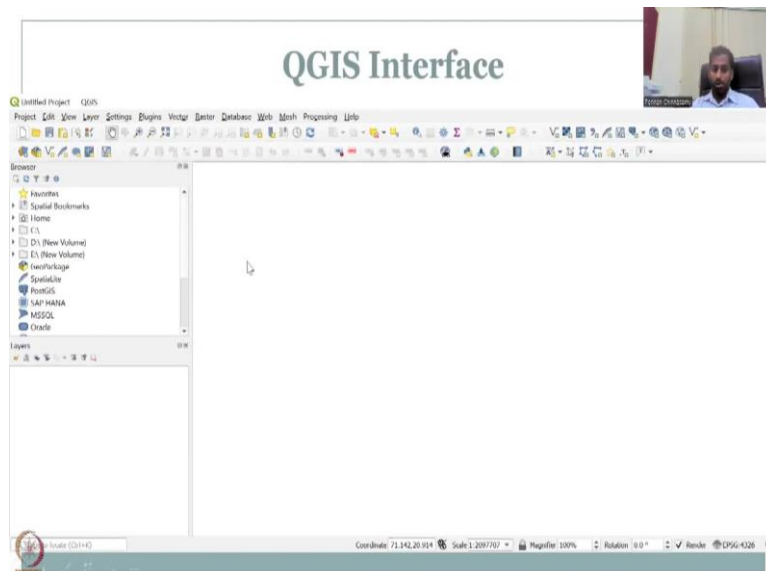
- Gary Sherman began development of Quantum GIS in early 2002
- Under General Public License
- Versatile - runs on Linux, Unix, Mac OSX, Windows and Android
- A live and vibrant QGIS community exists
- Many public/private agencies have initiated QGIS, including:
 - US National Security Agency/ Austrian state of Vorarlberg
 - Swiss regional agencies in Glarus and Solothurn
 - New Zealand's Land Information public service department

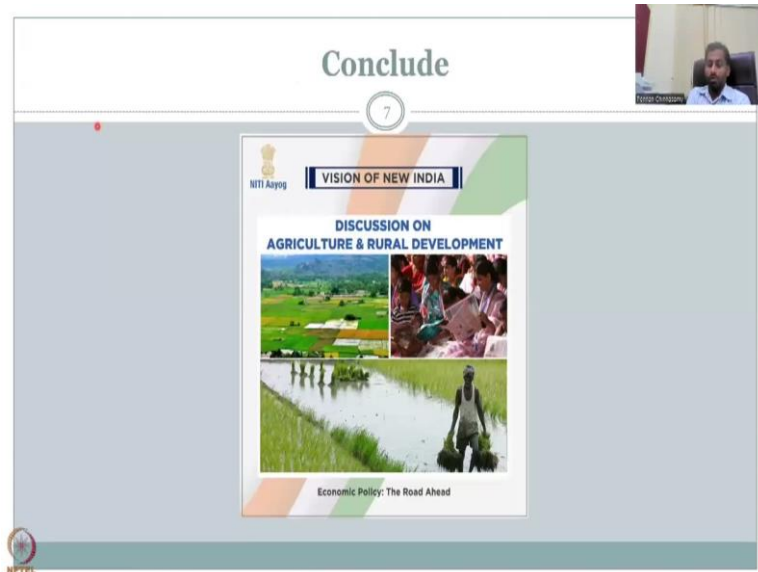
Overview of QGIS it was first started by Mr. Gary Sherman. In early 2002. Not too long ago, it was created under the Public License general public, anyone can use it and very versatile runs on Linux, Unix, Macs or office windows Android, any software, I always this QGIS has been propelled to be useful. As I said, when you talk about satellite launches, and using supercomputers, you cannot put up proprietary software because it is heavy. And each time you have to update it.

Whereas this open source, you can run it and then take the software out again upload it again and then use in multiple systems. So, the computer has multiple nodes, you cannot put the software on every node. So, here if it is open source, you can definitely populate every normal software. It is alive and vibrant community. Why is this important? Because you can post a question ask answers and they will communicate with you in a very lively fashion. So, right now we have the chat GPT going on. It is like that you go there you type a question. And then come back a day or two later someone will be answering those questions.

And these are driven by volunteers. So, no one gets paid for answering the questions. But they do it so that everyone learns the software. So, many public and private agencies have initiated QGIS, including the US National Security Agency, the Austrian state of Vorarlberg, Swiss regional agencies in Glarus and Solothurn, New Zealand's Land Information public service department, so all of them are using QGIS.

(Refer Slide Time: 29:49)





And this is how the interface looks like you have a good real estate real estate means an area for putting the maps adding the maps and then I adding layers for analysis. Here is where the information of the layers come across. So, here is where you put down the data. And here is where the data information is stored. And then all these are tools, the tools that help you to navigate and do the analysis etcetera.

I have been using the previous versions because with each version update, not many tools are getting updated. So, I prefer to use a stable version 3.28 is the newest as I said, but 3.22 is the most stable version. So, I hope the link I have given you. You will be using for downloading and installing QGIS. We will again try to have a hands-on session on how to download and install QGIS because it is going to be very important for the later part of the course. I hope we will get you all using this QGIS software. With this, I conclude today's lecture. I will see in lecture, week 4. Thank you.