Remote Sensing and GIS for Rural Development Process Technology
Professor. Pennan Chinnasamy
Centre for Technology Alternatives for Rural Areas (CTARA)
Indian Institute of Technology, Bombay
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.

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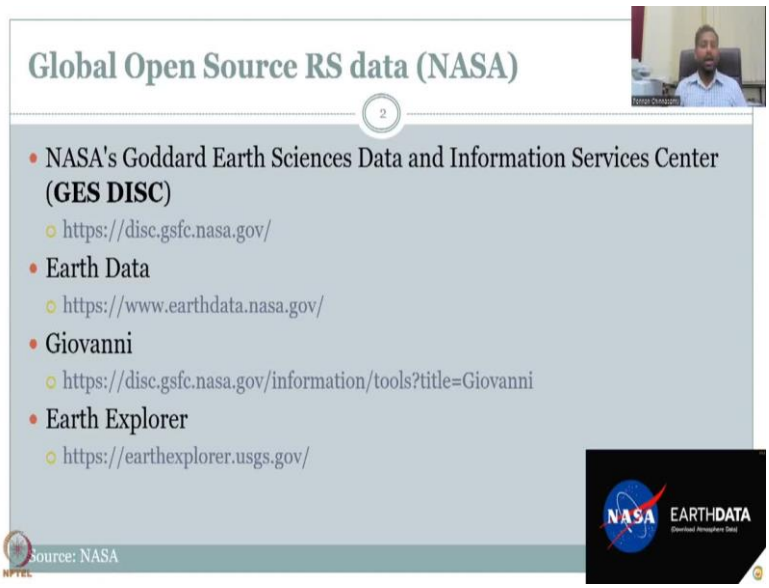

In the last lecture, we have looked at NASA's GES DISC data set, whereas you also have Earth Data and Giovanni, Earth Explore. Every single link has its own tutorials online, I would recommend you to take those because it gets updated by NASA often, since you are using the data, it is always good to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

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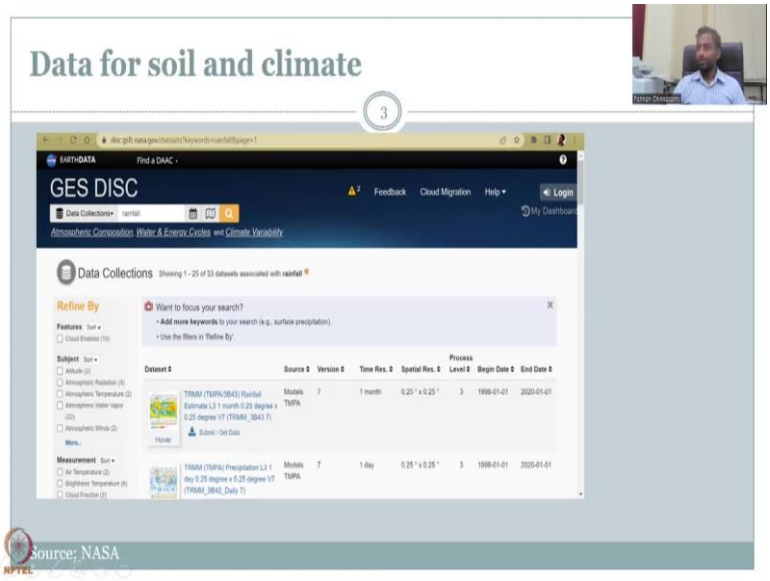

In the last slide, we have the last lecture, we had looked at the data that is available for water resources and we looked specifically on rainfall and then we looked at the resolution of rainfall, soil and climate. Here you do not get soil type in this data set, you will not get a soil type, but more 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.

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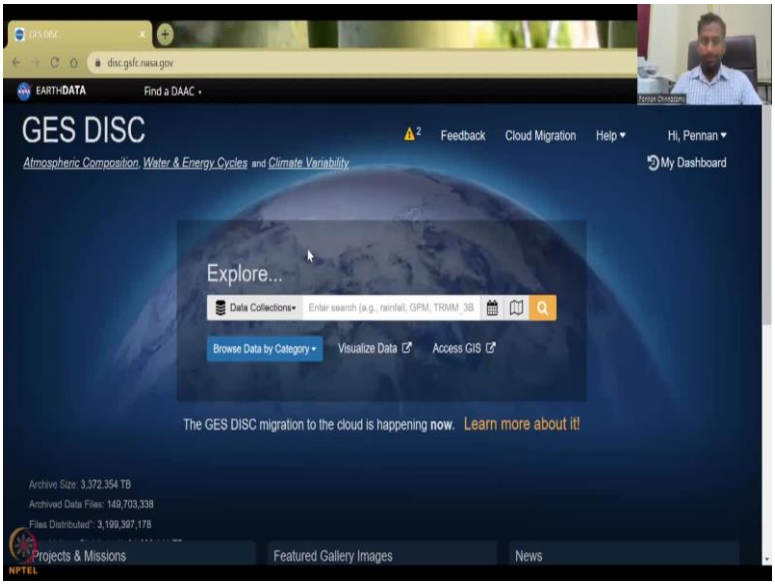

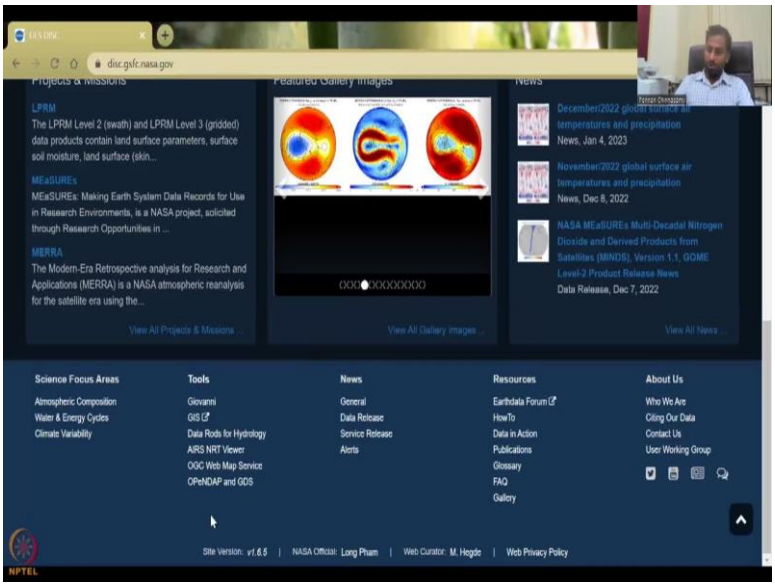

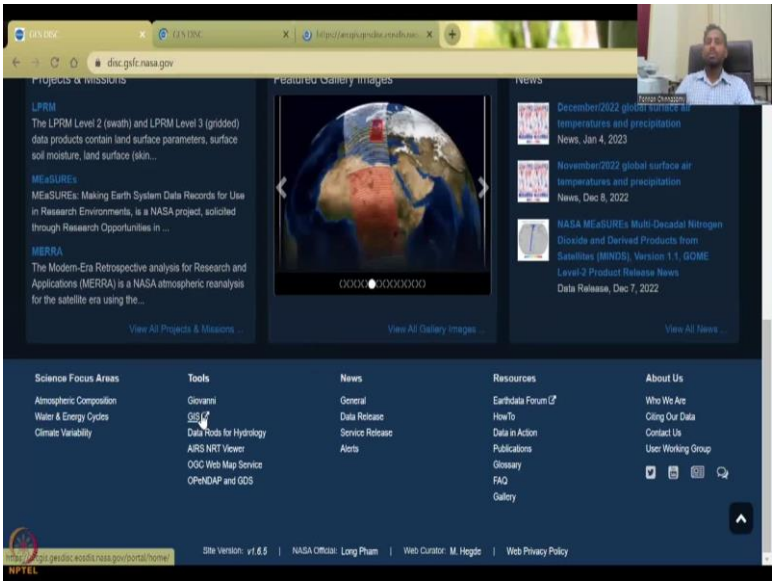

So, let us jump into the accessing the data set again, I will share the website we already had looked at the previous class which is the GES DISC. Here I also wanted to give you some input on the different tools they have. So, I will click the Giovanni, GIS and the link that we have Earth Day data US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

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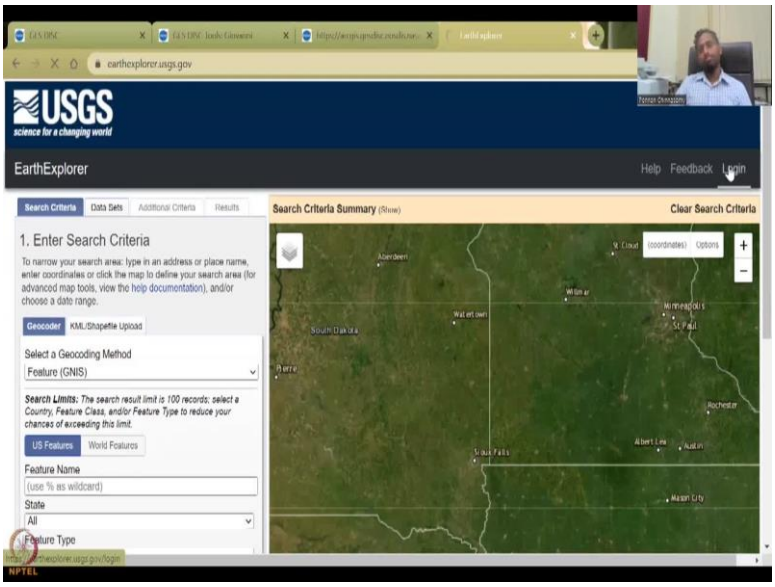

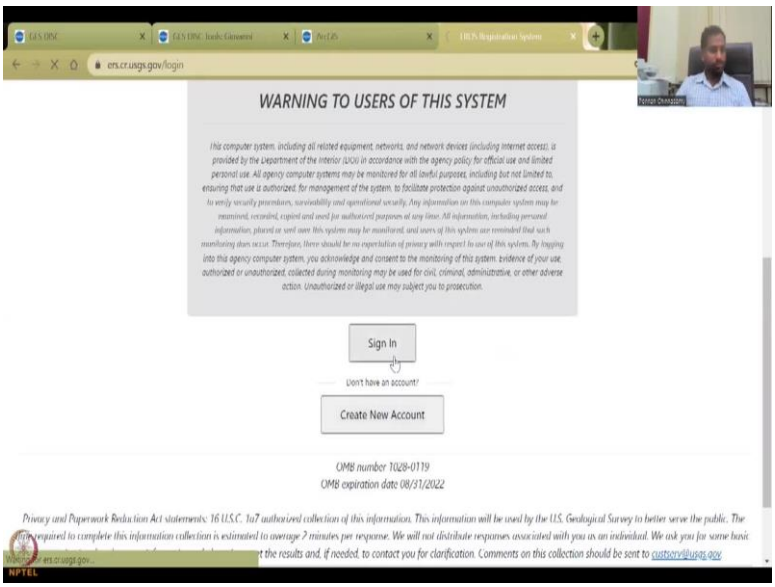

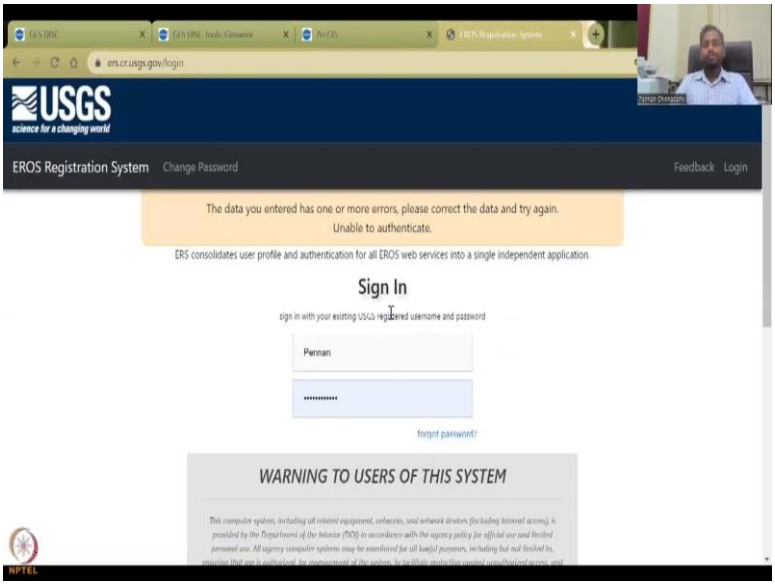

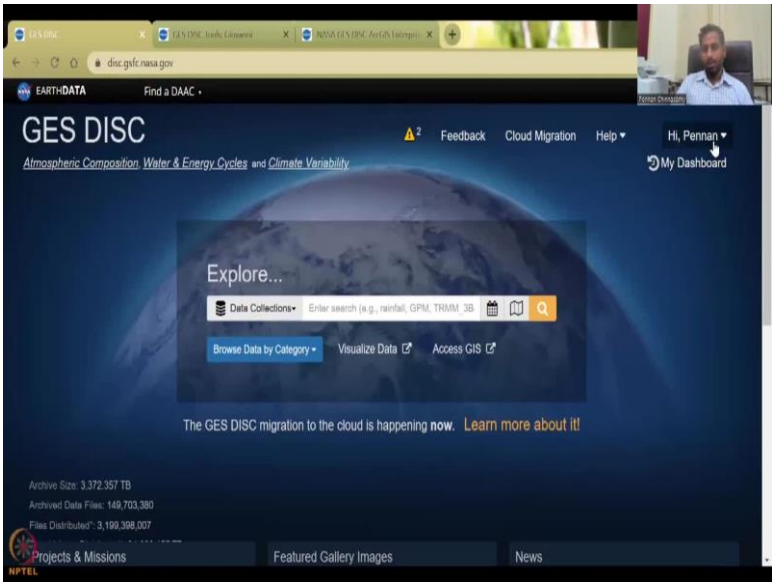

So, these I did not cover the previous one so let us look at Earth Explorer. I can the login is the same but we could just log in once again. One Login is enough for all the login systems now it is getting logged in. So, it is multiple logins that been where so I have to first go to through response.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

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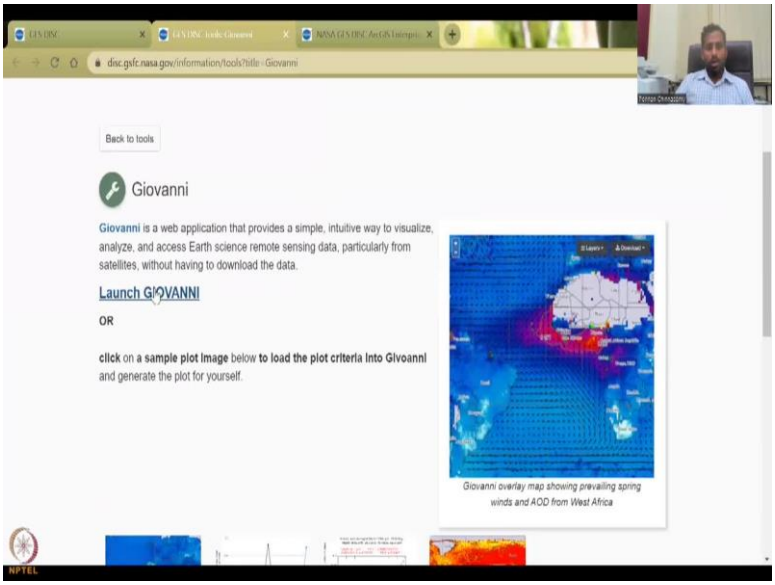

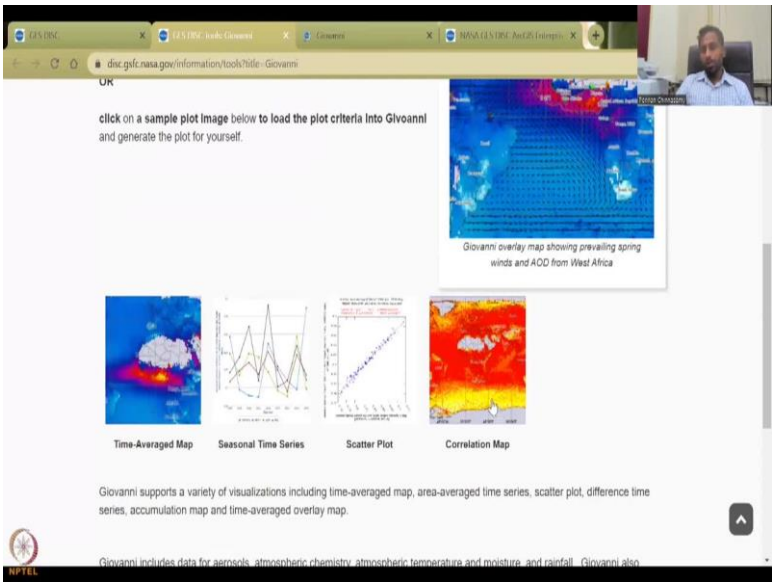

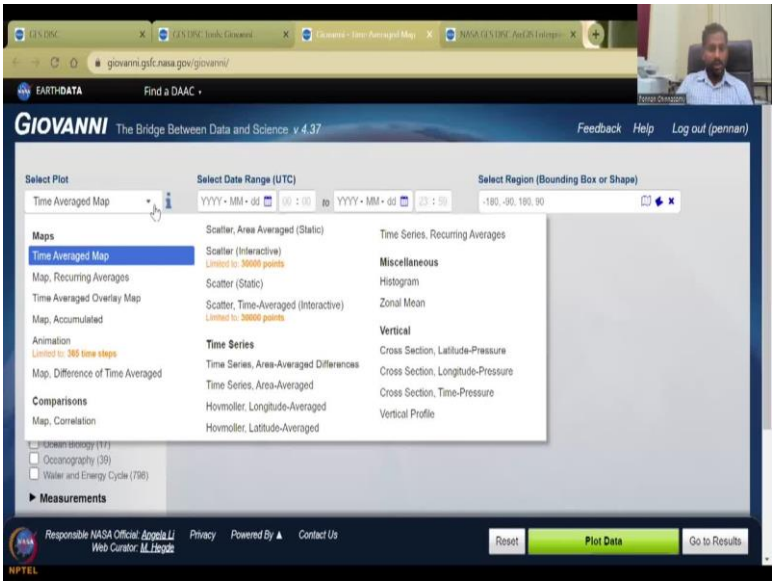

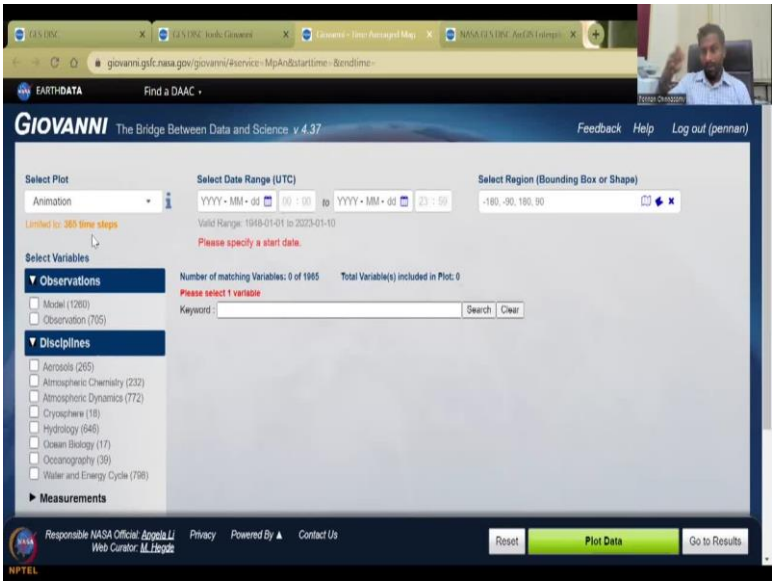
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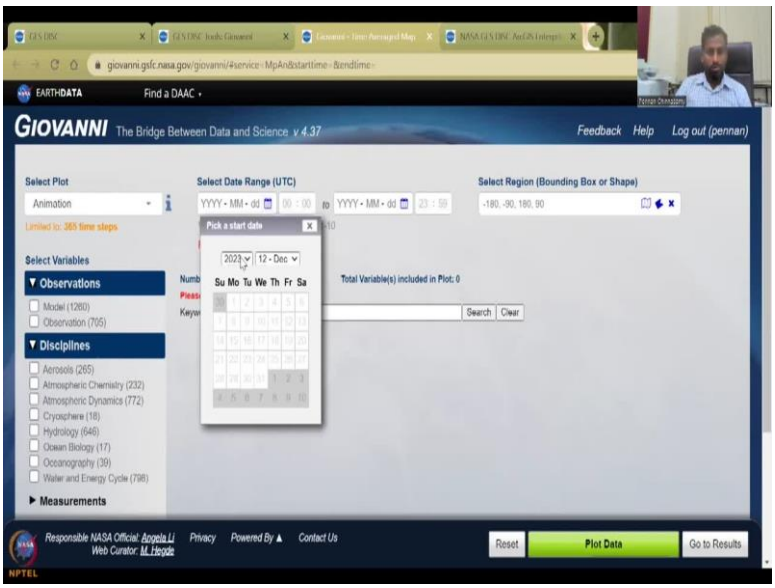
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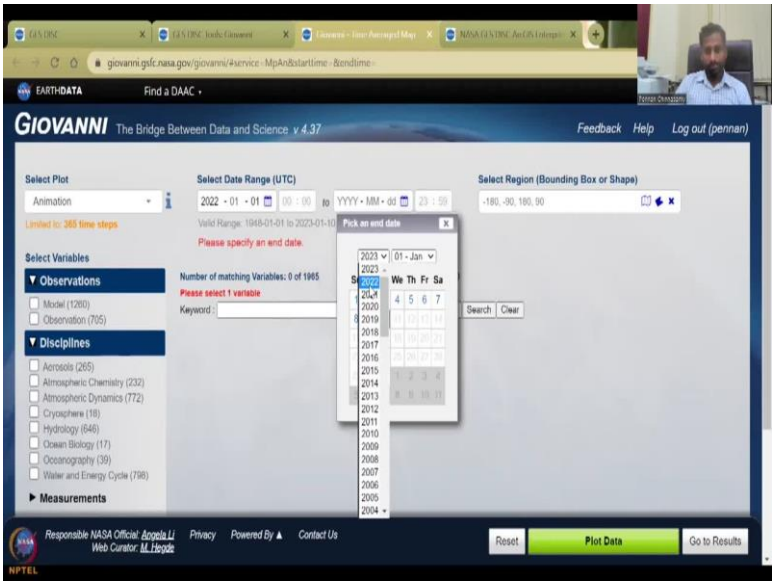
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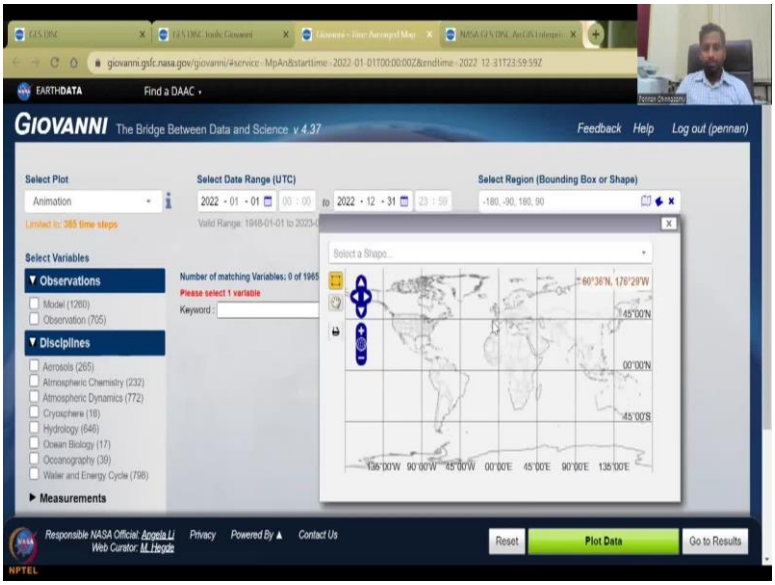
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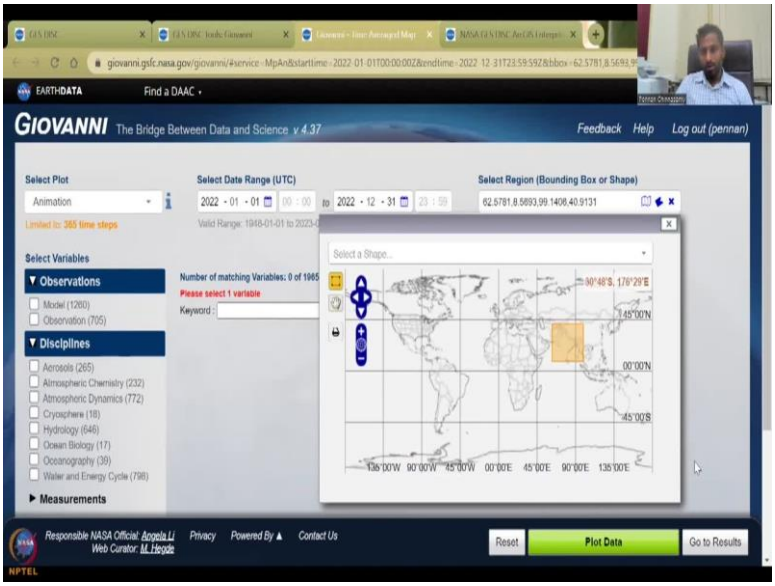
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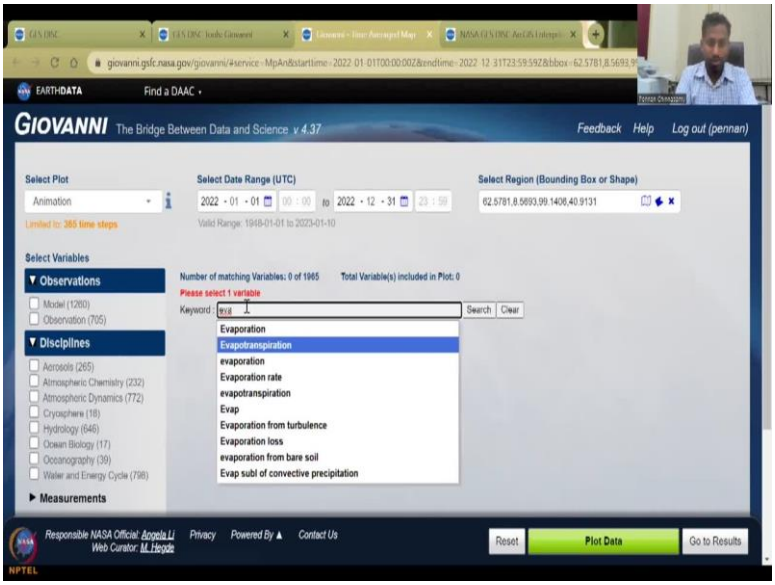
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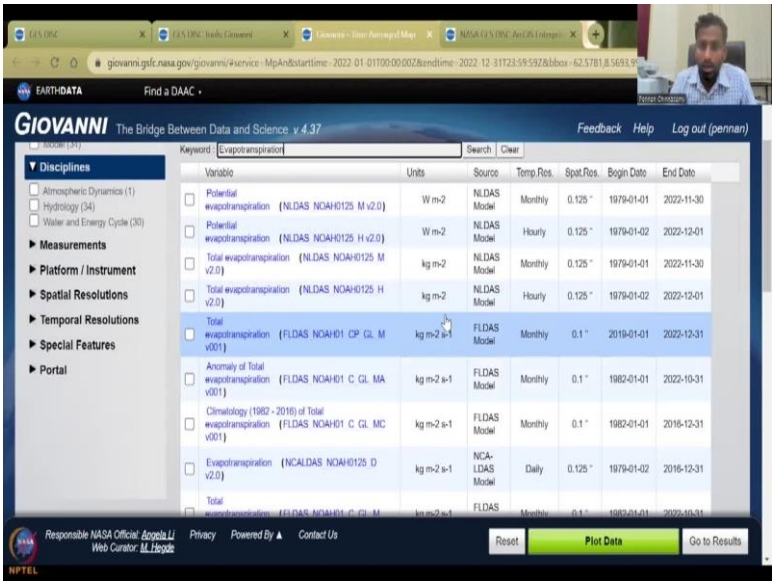
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Feedback Help Log out (pennan)
Keyword : Evapotranspiration
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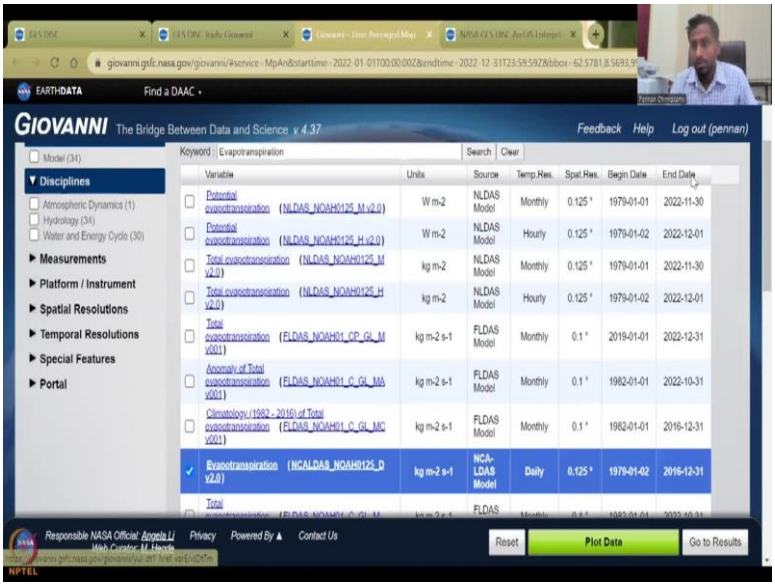
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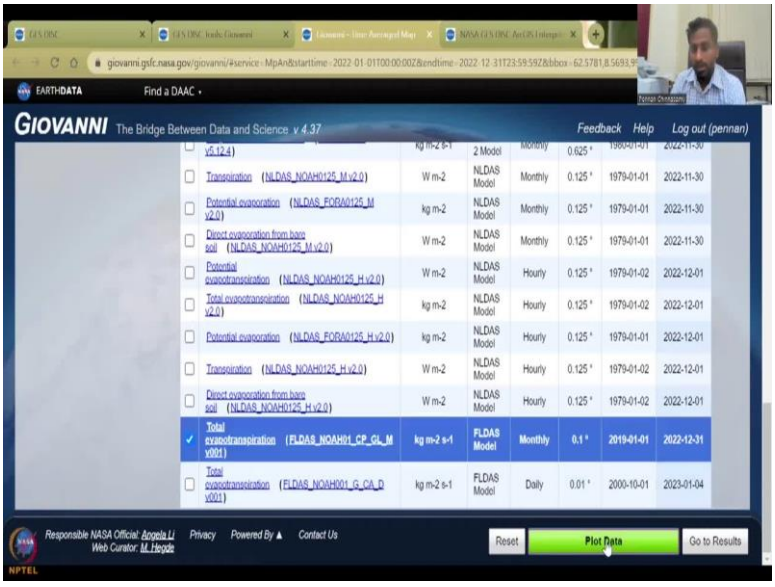
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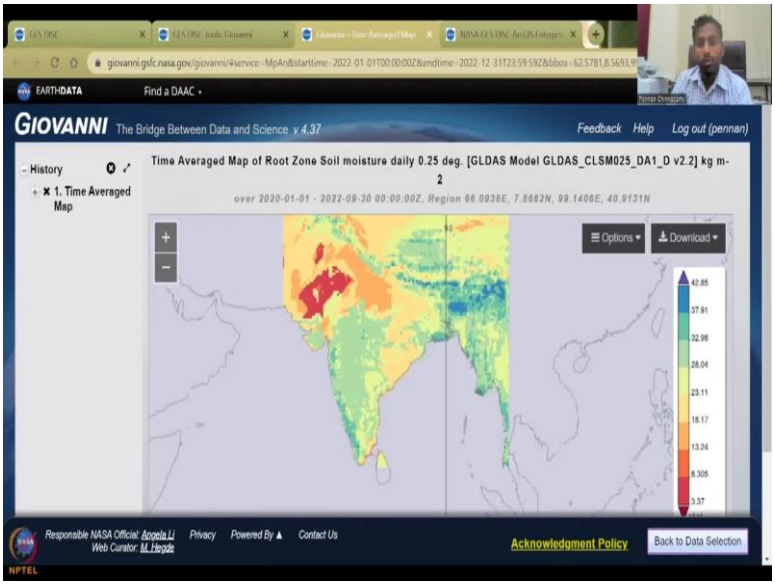

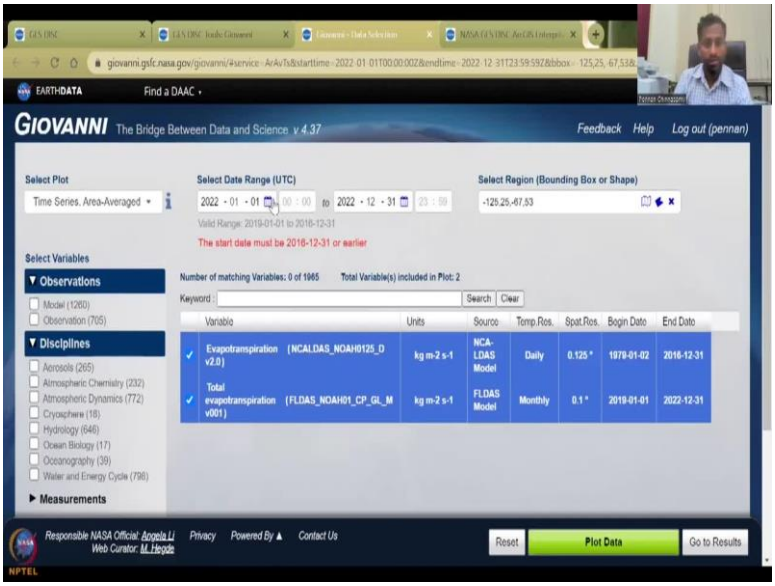

So, launch Giovanni. You come to Giovanni tool It is a tool that helps you simple, intuitive way to visualize, analyze and access the data. So, let us look at it. And you can make these plots readily time average map, seasonal time series, and then scatterplot, correlation map etc. So, as I said, we 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.

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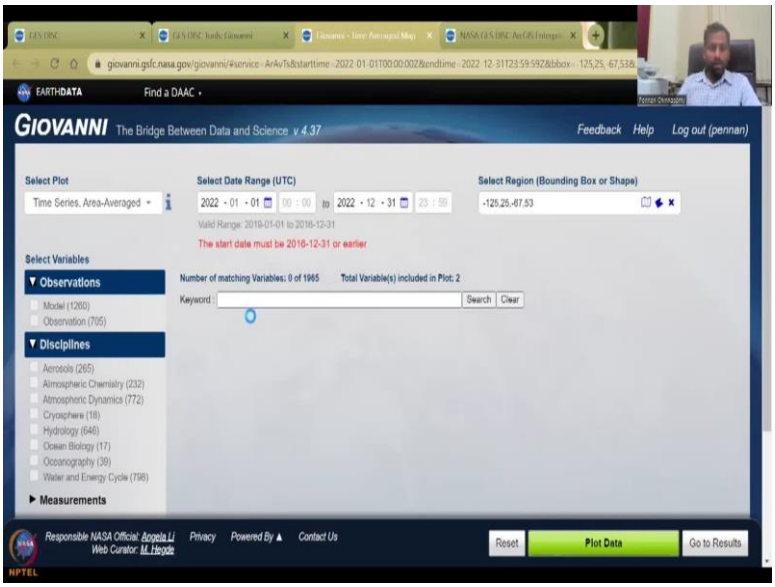

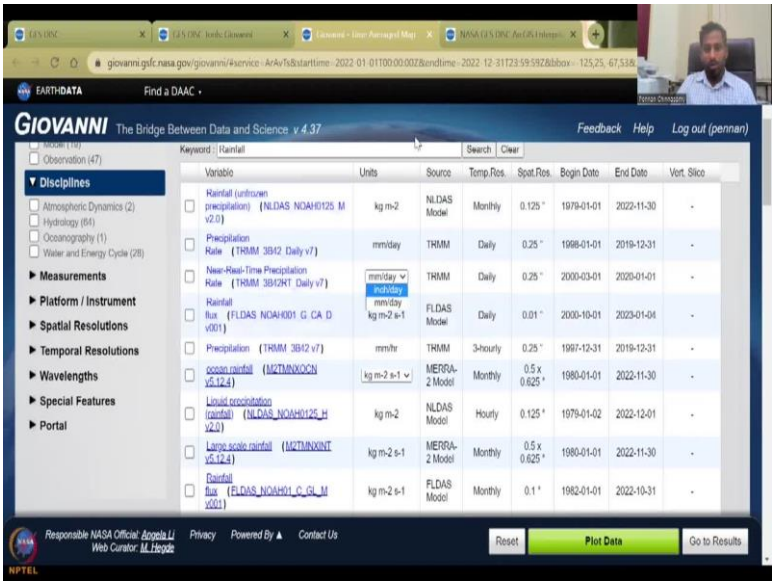
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Feedback Help Log out (pennan)
Keyword: Rainfall
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Variable Units Source Temp.Res. Spat.Res. Begin Date End Date Vert. Slice
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Feedback Help Log out (pennan)
Rainfall flux (FLDAS_NOAH01_CP_GL_M v001) kg m-2 s-1 FLDAS Model Monthly 0.1 ° 2019-01-01 2022-12-31
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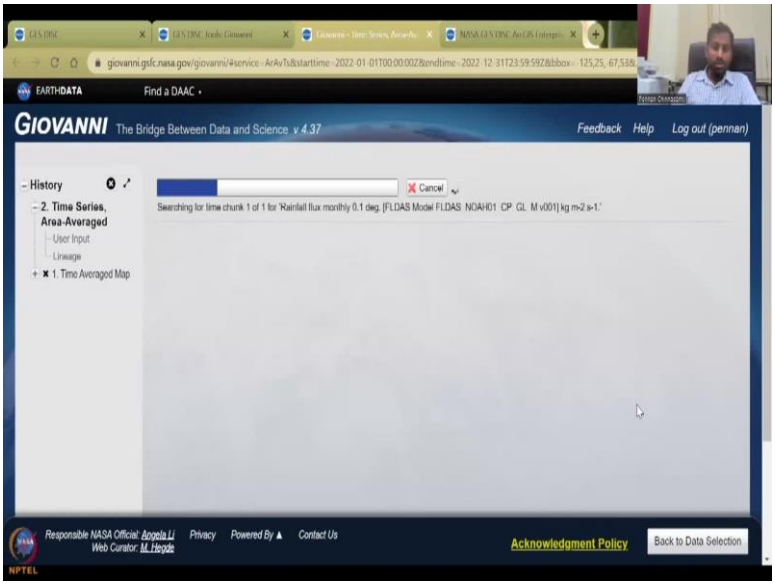
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Feedback Help Log out (pennan)
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2. Time Series, Area-Averaged
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So, let us just refreshing then you can also select between model or observation 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.

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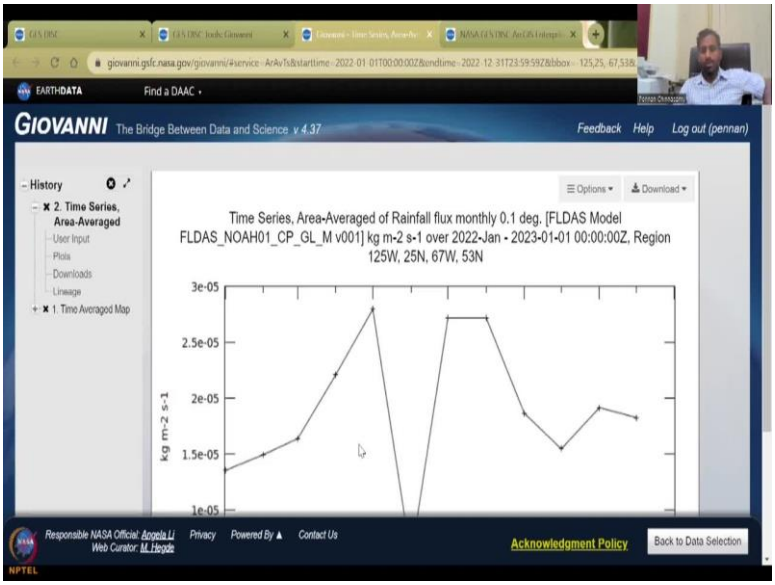

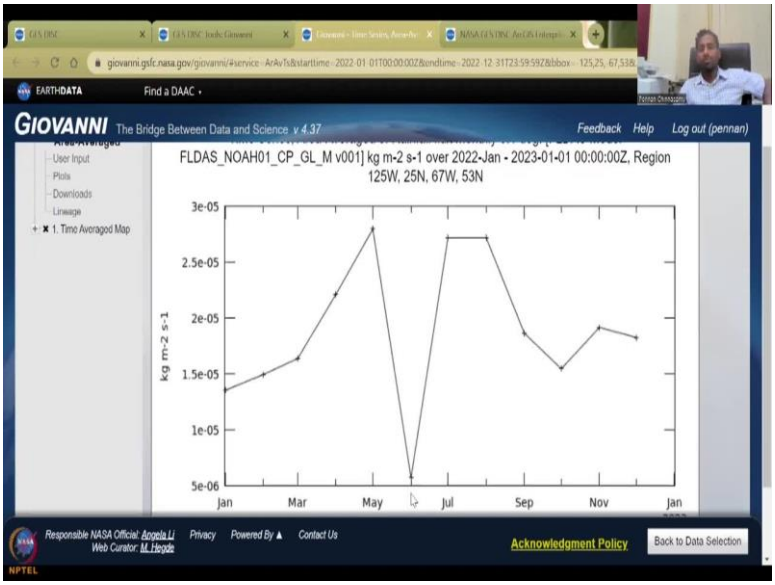
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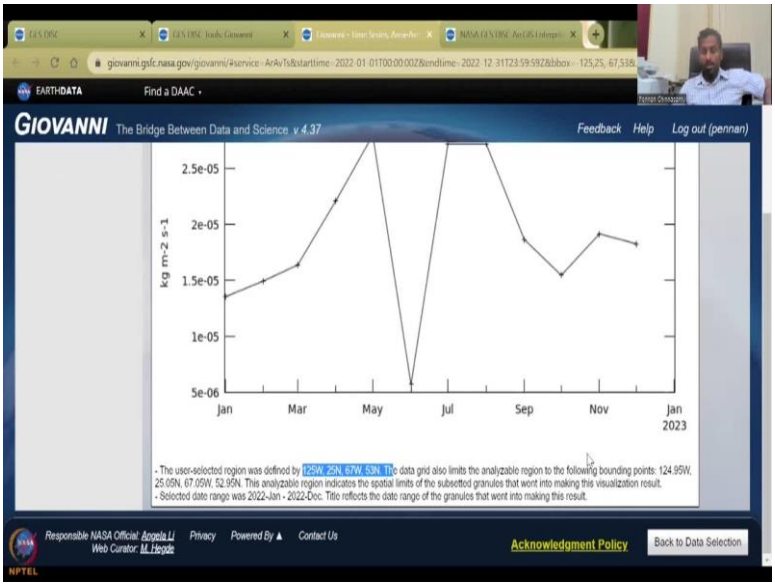
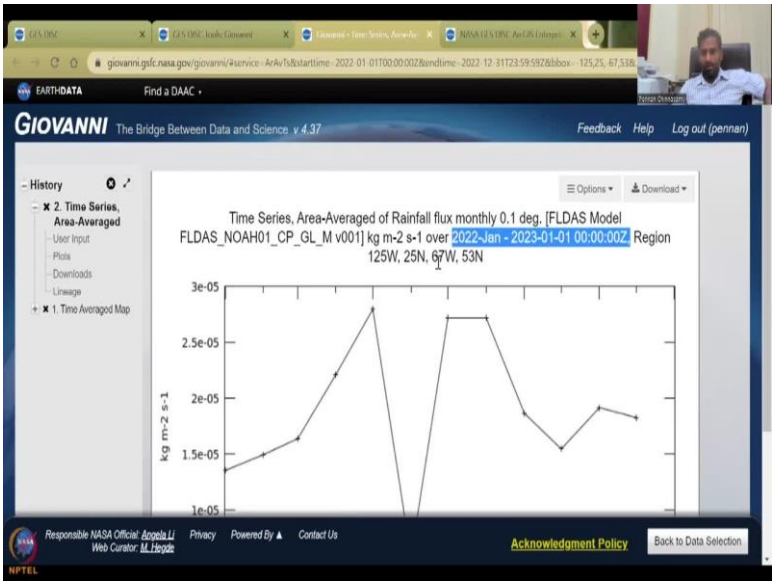
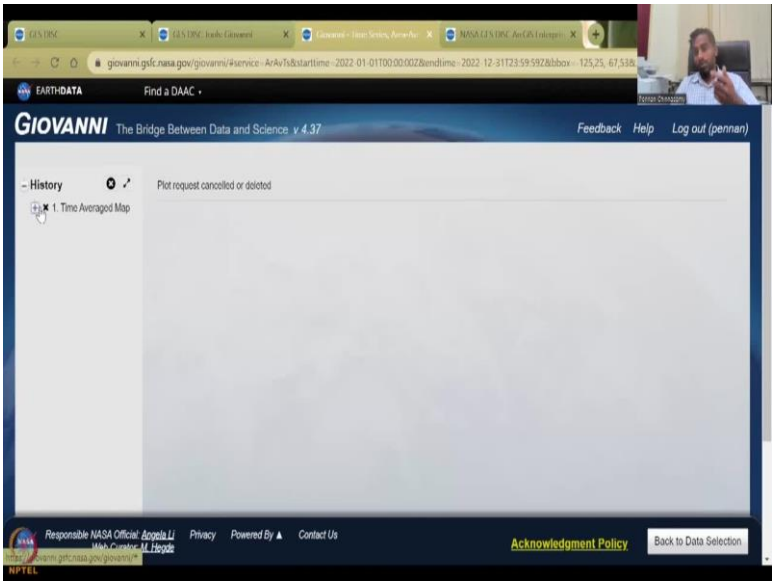
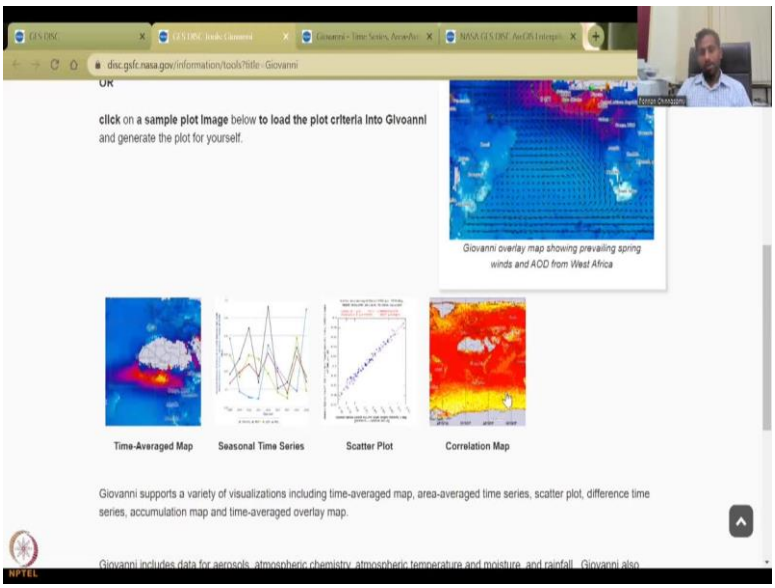
125W, 25N, 67W, 53N
kg m-2 s-1
Jan Mar May Jul Sep Nov Jan
Acknowledgment Policy
Back to Data Selection


GIOVANNI The Bridge Between Data and Science v 4.37
Feedback Help Log out (pennan)
kg m-2 s-1
Jan Mar May Jul Sep Nov Jan 2023
- The user-selected region was defined by 125W, 25N, 67W, 53N. The data grid also limits the analyzable region to the following bounding points: 124.95W, 25.05N, 67.05W, 52.95N. This analyzable region indicates the spatial limits of the subsetted granules that went into making this visualization result.
- Selected date range was 2022-Jan - 2022-Dec. Title reflects the date range of the granules that went into making this result.
Acknowledgment Policy
Back to Data Selection


GIOVANNI The Bridge Between Data and Science v 4.37
Feedback Help Log out (pennan)
History
2. Time Series, Area-Averaged
Time Series, Area-Averaged of Rainfall flux monthly 0.1 deg. [FLDAS Model
FLDAS_NOAH01_CP_GL_M v001] kg m-2 s-1 over 2022-Jan - 2023-01-01 00:00:00Z, Region
125W, 25N, 67W, 53N
kg m-2 s-1
Acknowledgment Policy
Back to Data Selection

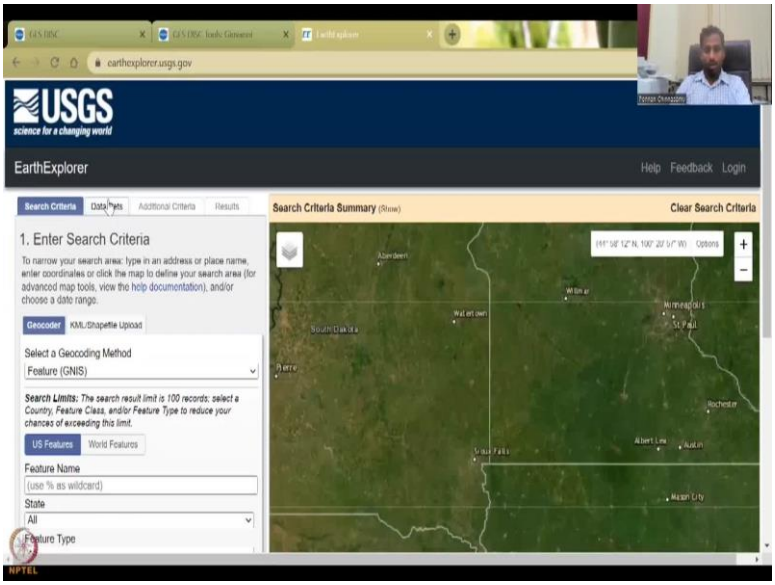


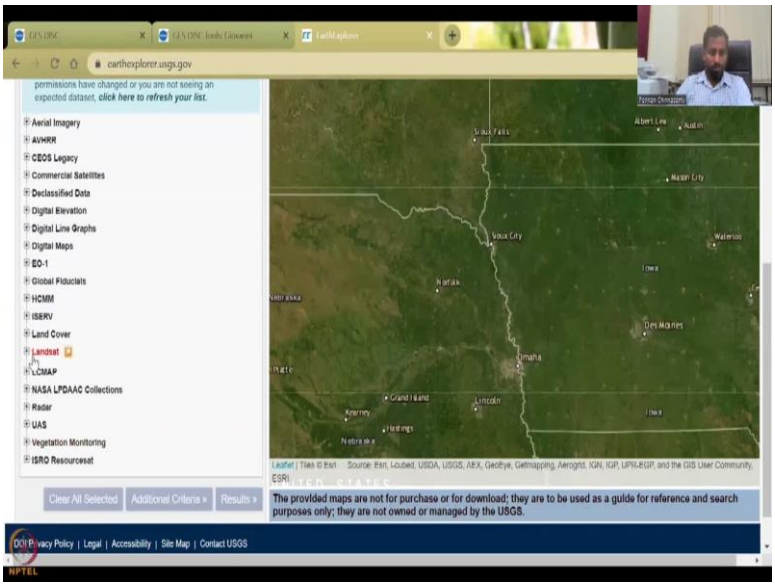


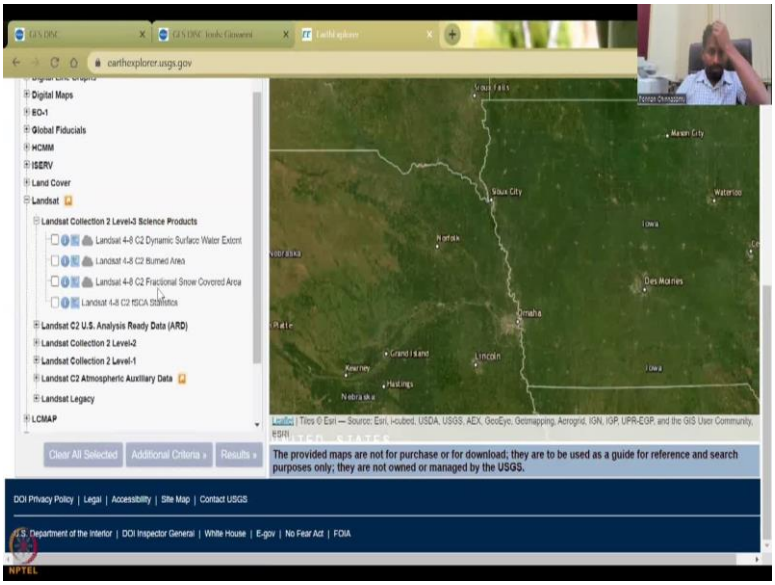
So, now you have a time series of rainfall data and the units you can double check at what units you want you just have to double change the units into your particular unit but the dates are correct Jan to Jan the user selected this bounding box and for that bounding box you have types is of data so, 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.

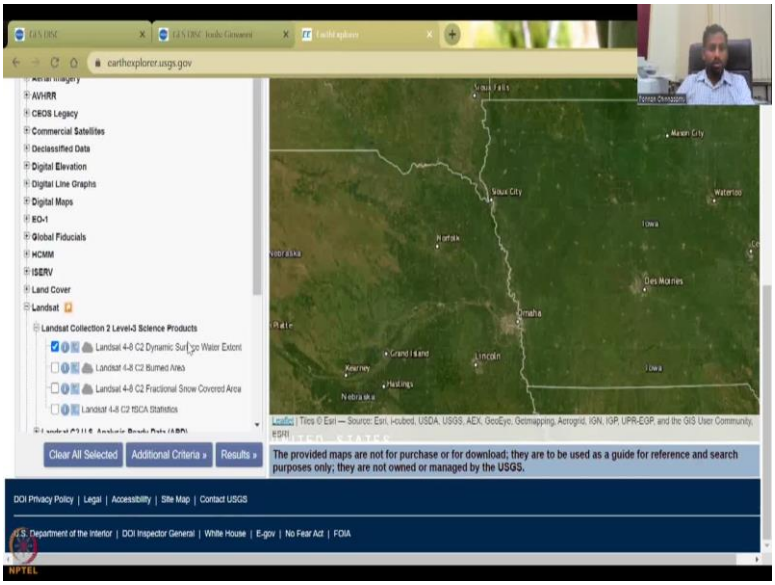
Again, this is not a per point so you can only download as an image and put it in here values so that for at reason we do not normally take time series data, but you can always take a map and then from the map you can extract the data. So, all these can be done. Correlation maps can also be done.

(Refer Slide Time: 11:46)



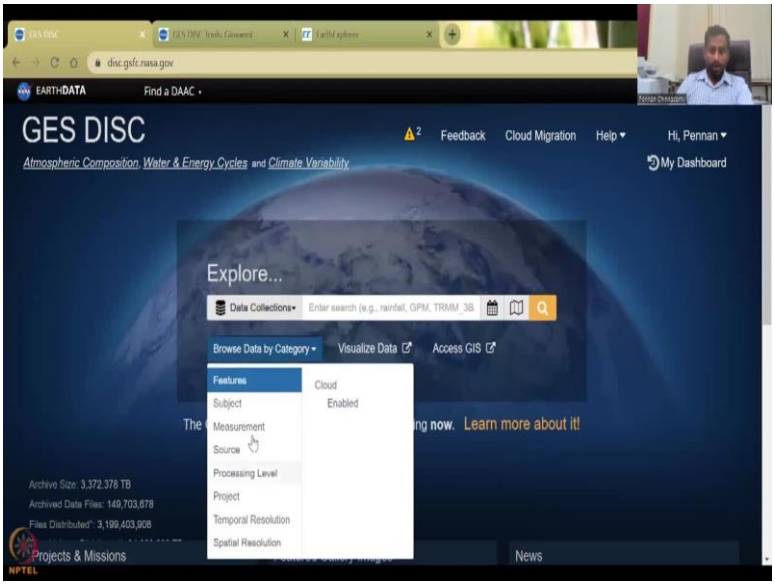


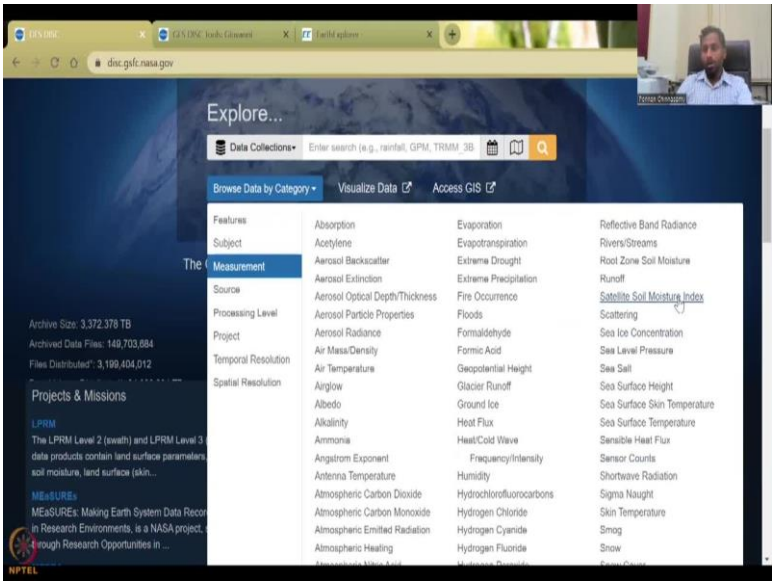


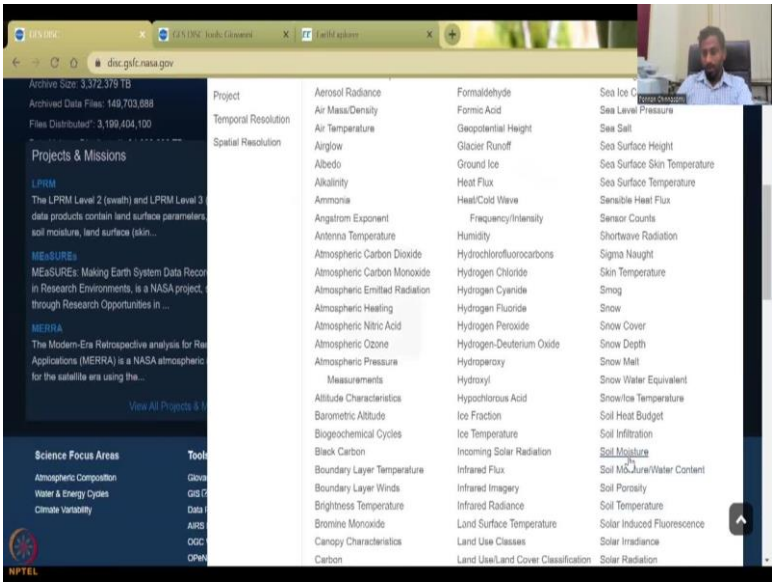


Earth explorer is also quick that you can do analysis and stuff. You can actually look at the data set here. So, it is the same thing data set search, search for rainfall. Or you can actually click these images and see where you want. Let us do Landsat, Landsat is the land use land cover of our radars 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)

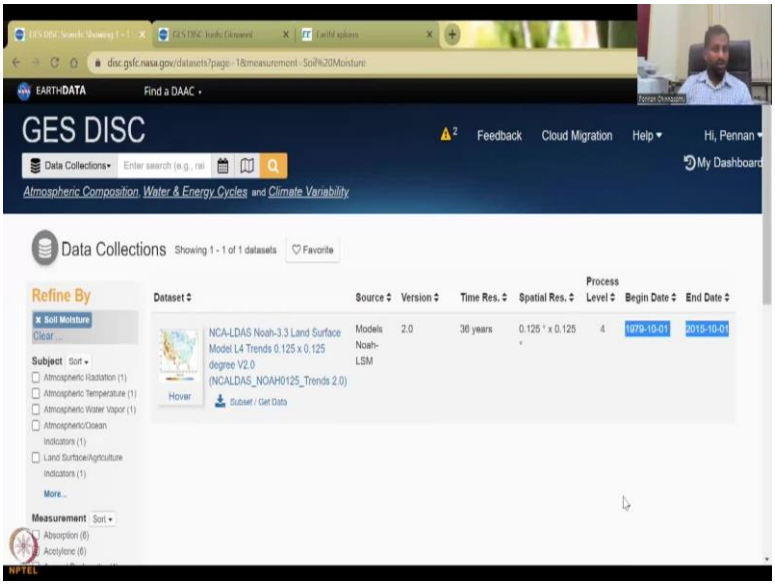


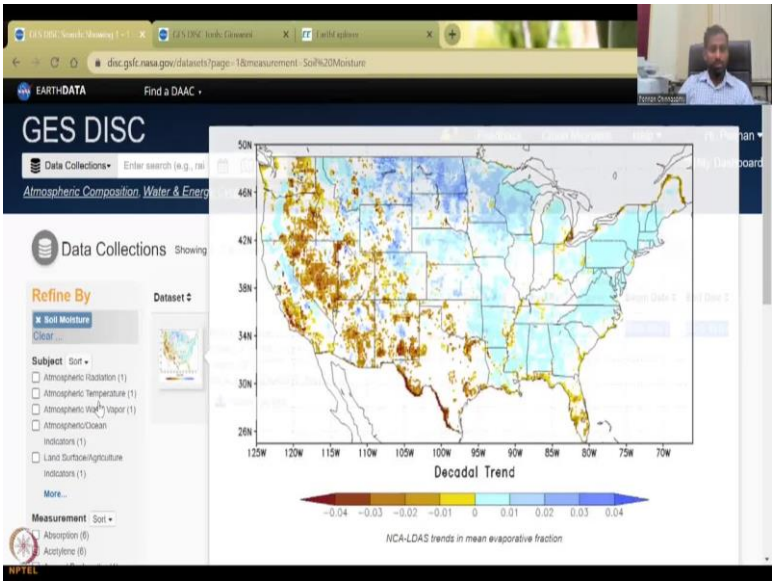


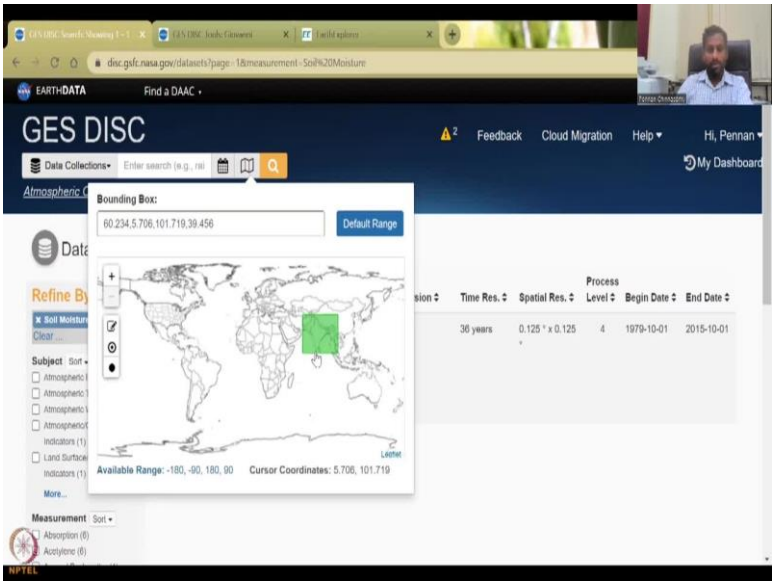


So, that is one we are going to go into now the Browse by Category and measurement. And we want soil moisture index. Let us see what all the soil we have roots zone soil moisture. And we also have soil moisture. So, let us just click add soil moisture.

(Refer Slide Time: 13:13)



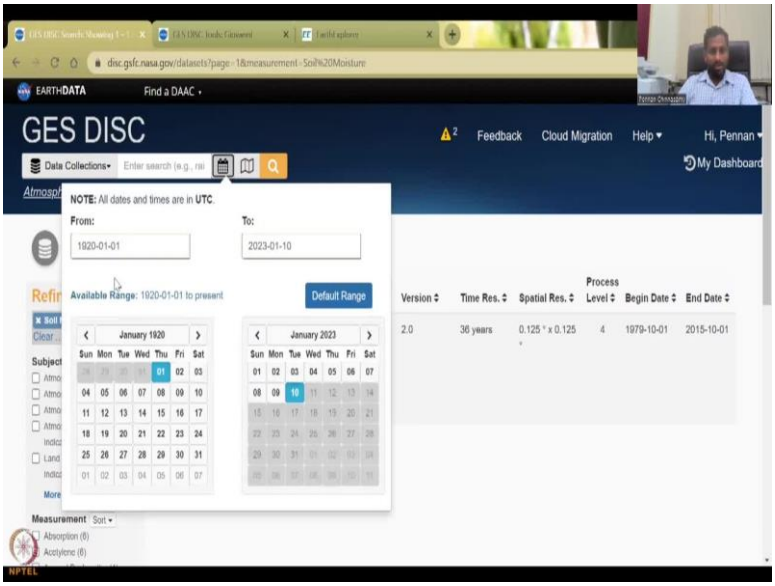


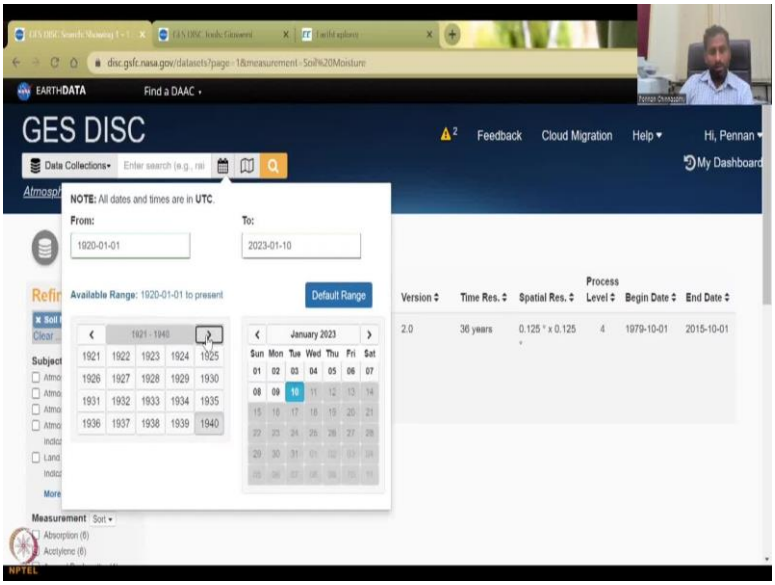


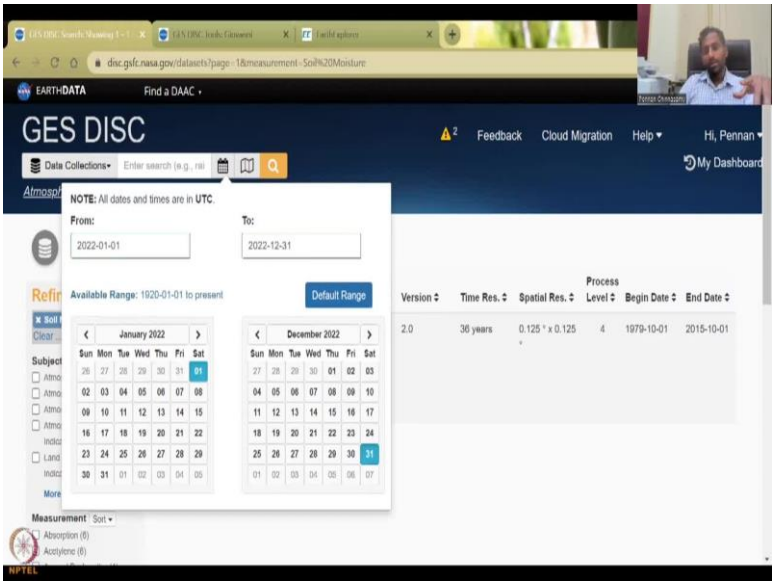
So, there is one data set 36 years time resolution, just the whole from 1979 to 2015. Let us click at, as a dataset, but it does not have India, we could see that it is only for US. So, we will not be able to use this data set. So, we can go back here and first let us put the bounding box click on this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



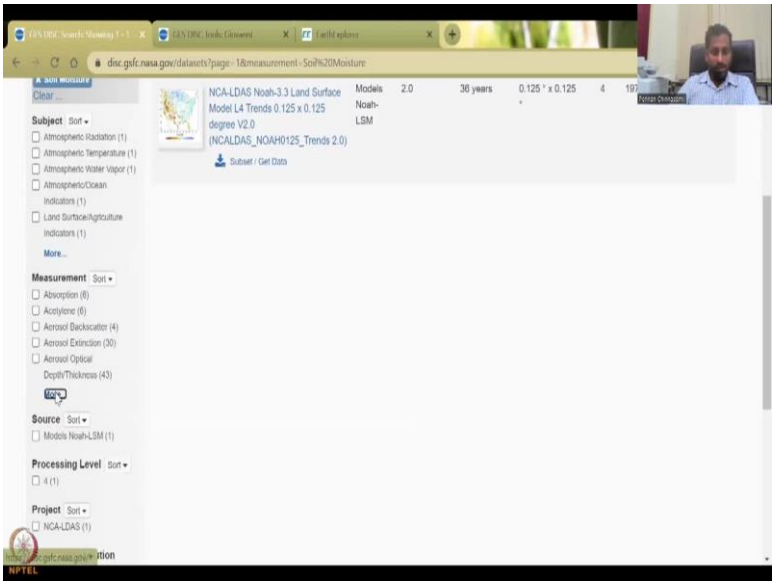


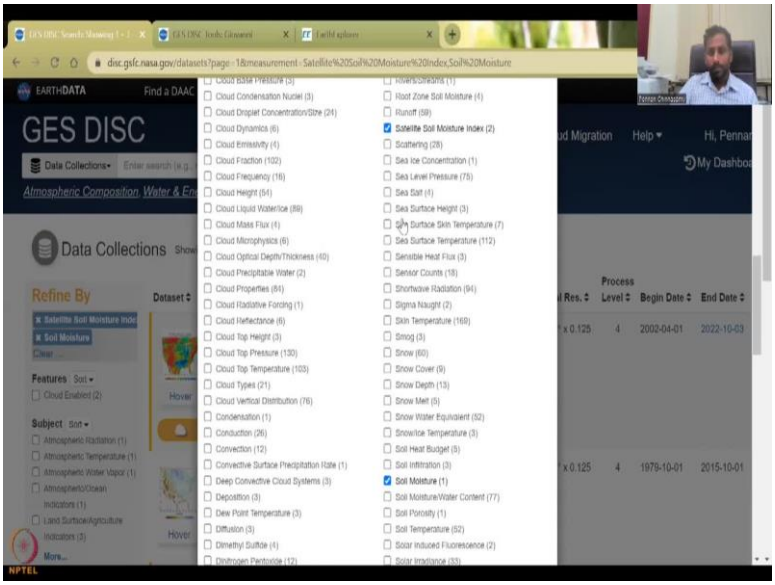


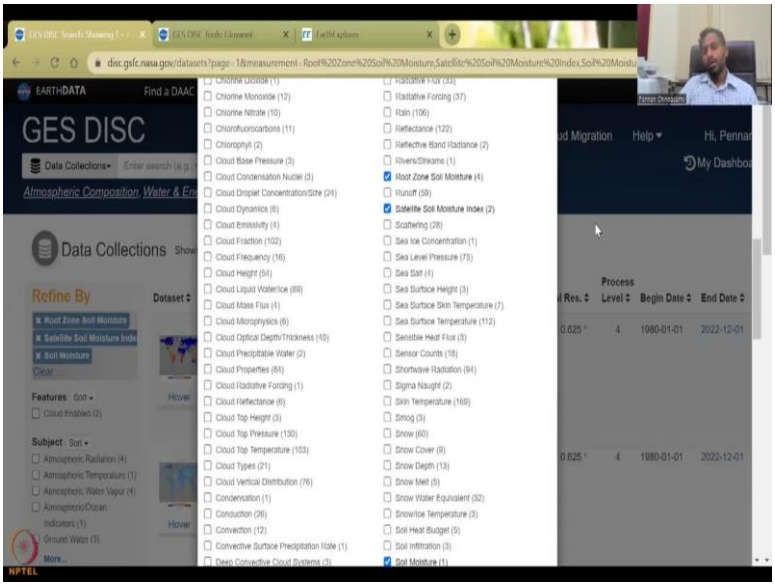
Time series again let us just pick one year we do not want such a big year. You can click the years the years will come. We want to 2022 let us just use 2022. Jan 1 to December 31. Here there is no enter button so do not worry about it just click somewhere outside it will come to make sure you can click 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.

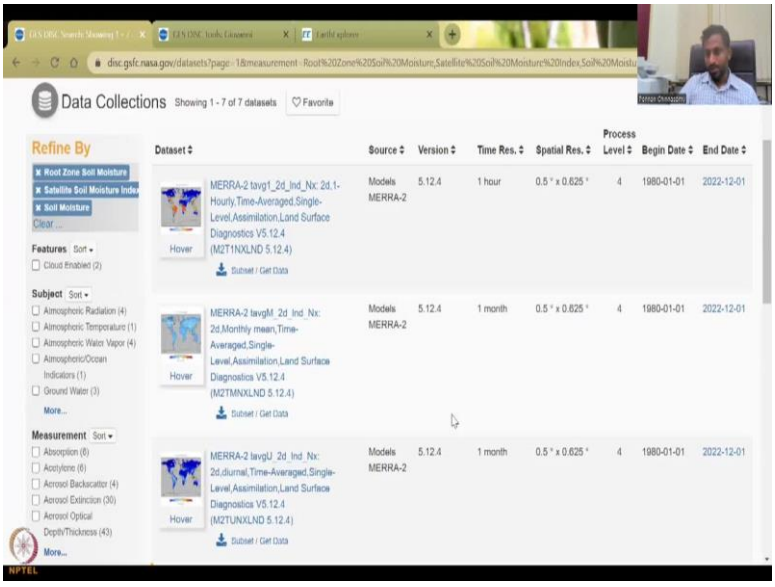
Now, what you need to do is we are going to look at climate variables which are your precipitation your snow cover evapotranspiration etc.

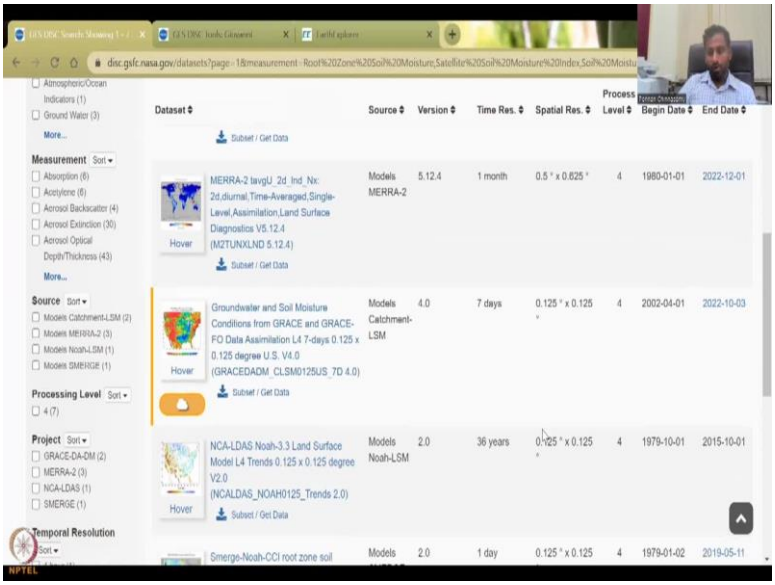
(Refer Slide Time: 15:25)

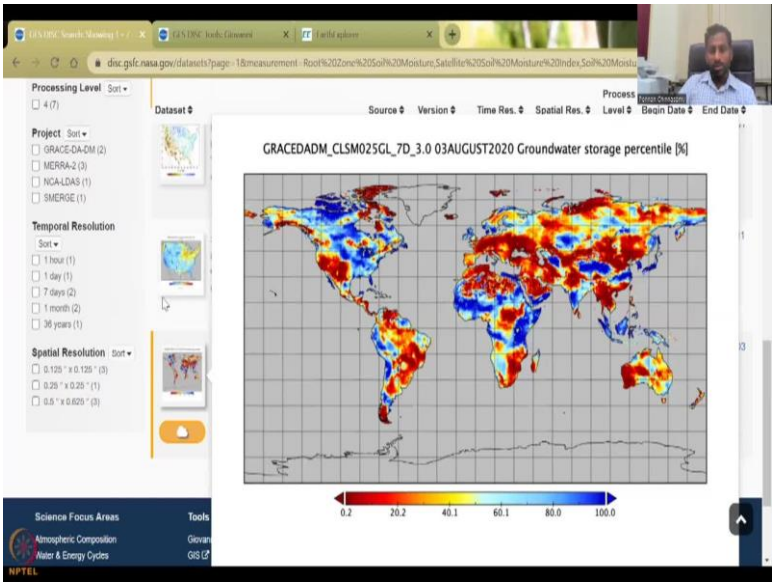


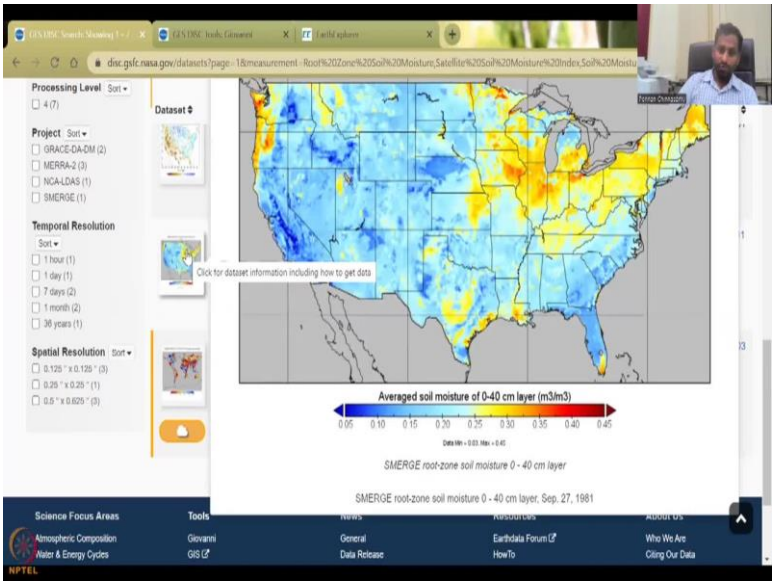

GES DISC
Data Collections
Refine By
Satellite Soil Moisture Index (2)
Soil Moisture (1)
Root Zone Soil Moisture (4)
NPTEL


GES DISC
Data Collections
Refine By
Root Zone Soil Moisture
Satellite Soil Moisture Index
Soil Moisture
NPTEL


Data Collections Showing 1 - 7 of 7 datasets
Refine By
Root Zone Soil Moisture
Satellite Soil Moisture Index
Soil Moisture
MERRA-2 tavg1_2d_lnd_Nx: 2d,1-Hourly,Time-Averaged,Single-Level,Assimilation,Land Surface Diagnostics V5.12.4 (M2T1NXLND 5.12.4)
MERRA-2 tavgM_2d_lnd_Nx: 2d,Monthly mean,Time-Averaged,Single-Level,Assimilation,Land Surface Diagnostics V5.12.4 (M2TMNXLND 5.12.4)
MERRA-2 tavgU_2d_lnd_Nx: 2d,diurnal,Time-Averaged,Single-Level,Assimilation,Land Surface Diagnostics V5.12.4 (M2TUNXLND 5.12.4)
NPTEL

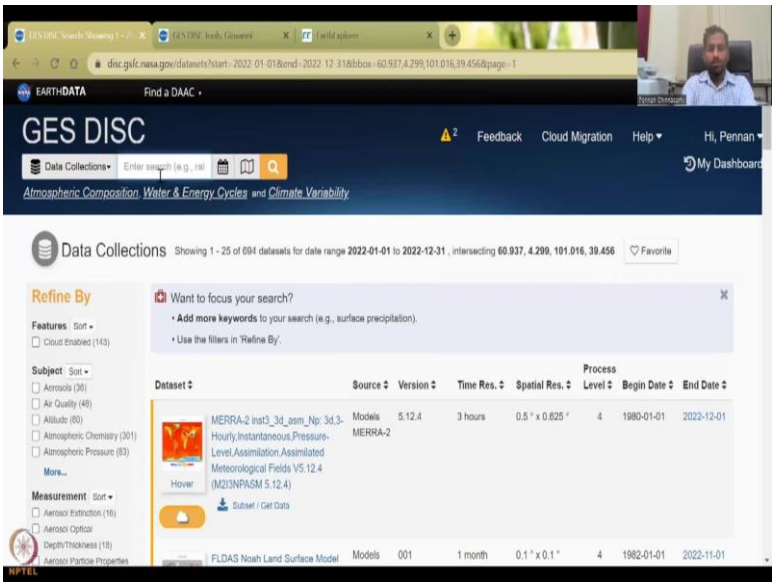

Dataset
Source
Version
Time Res.
Spatial Res.
Process Level
Begin Date
End Date
MERRA-2 tavgU_2d_lnd_Nx: 2d,diurnal,Time-Averaged,Single-Level,Assimilation,Land Surface Diagnostics V5.12.4 (M2TUNXLND 5.12.4)
Models MERRA-2
5.12.4
1 month
0.5 ° x 0.625 °
4
1980-01-01
2022-12-01
Groundwater and Soil Moisture 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
Measurement
Source
Processing Level
Project
Temporal Resolution
Hover
Subset / Get Data

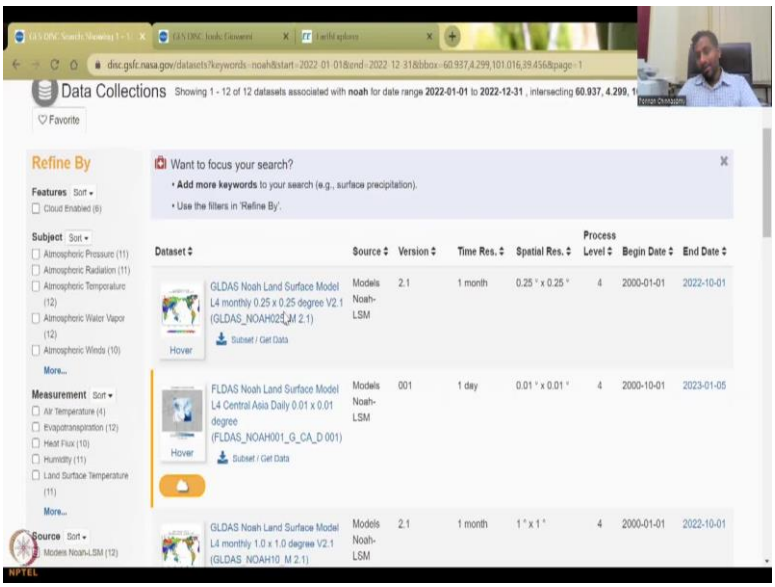

GRACEDADM_CLSM025GL_7D_3.0 03AUGUST2020 Groundwater storage percentile [%]
0.2
20.2
40.1
60.1
80.0
100.0
Science Focus Areas
Atmospheric Composition
Water & Energy Cycles
Tools
Giovanni
GIS

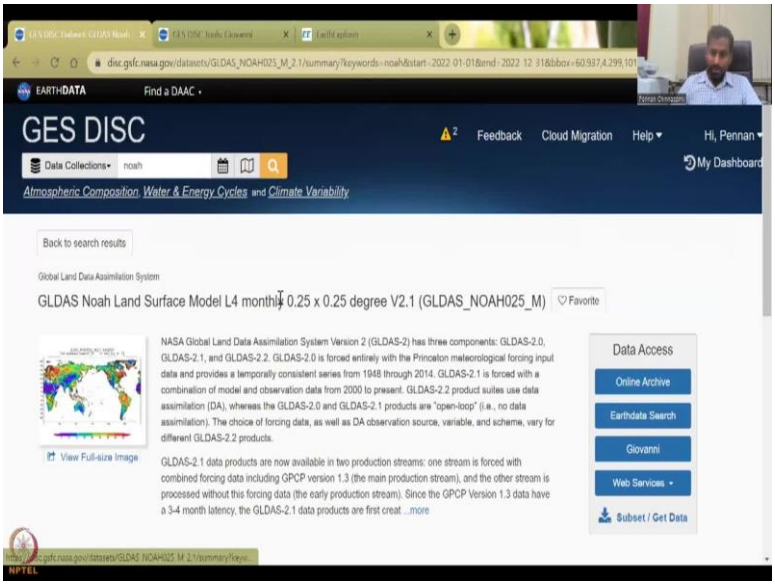

Click for dataset information including how to get data
Averaged soil moisture of 0-40 cm layer (m3/m3)
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
SMERGE root-zone soil moisture 0 - 40 cm layer
SMERGE root-zone soil moisture 0 - 40 cm layer, Sep. 27, 1981
Science Focus Areas
Atmospheric Composition
Water & Energy Cycles
Tools
Giovanni
GIS
General
Data Release
Earthdata Forum
HowTo
Who We Are
Citing Our Data

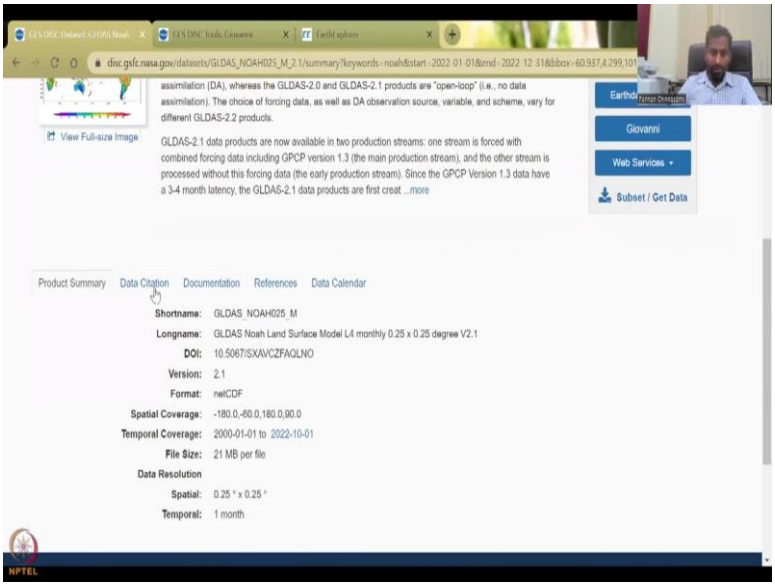
So, you can actually take the measurements go here and say I need soil, moisture or you can have root zone moisture and these are properties soil porosity or properties. So, you can have root zone soil moisture and close. So, automatically it poplins it and there is a data range that is given up to March 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)






GES DISC
EARTHDATA
Find a DAAC
Feedback
Cloud Migration
Help
Hi, Pennan
My Dashboard
Data Collections
noah
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 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 creat ...more
Data Access
Online Archive
Earthdata Search
Giovanni
Web Services
Subset / Get Data
NPTEL


View Full-size Image
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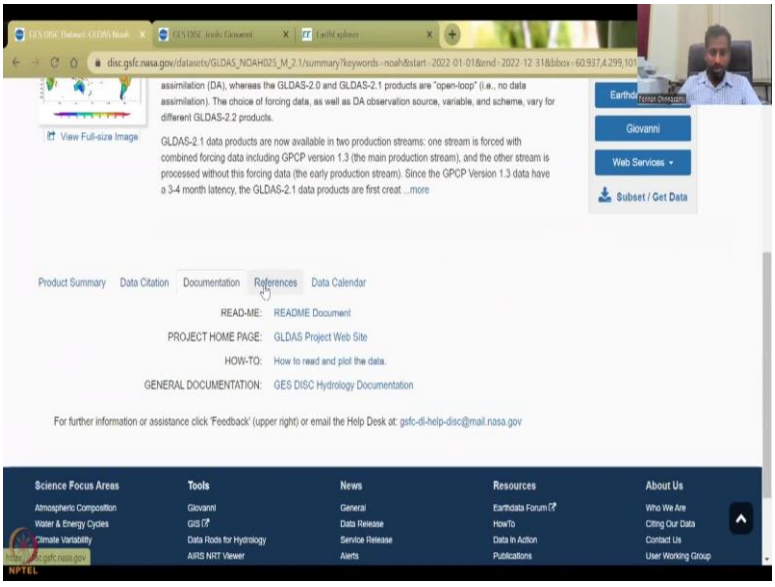
Web Services
Subset / Get Data
Product Summary
Data Citation
Documentation
References
Data Calendar
Shortname: GLDAS_NOAH025_M
Longname: GLDAS Noah Land Surface Model L4 monthly 0.25 x 0.25 degree V2.1
DOI: 10.5067/SXAVCZFAQLNO
Version: 2.1
Format: netCDF
Spatial Coverage: -180.0,-60.0,180.0,90.0
Temporal 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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Web Services
Subset / Get Data
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: gsfc-dl-help-disc@mail.nasa.gov
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Water & Energy Cycles
Climate Variability
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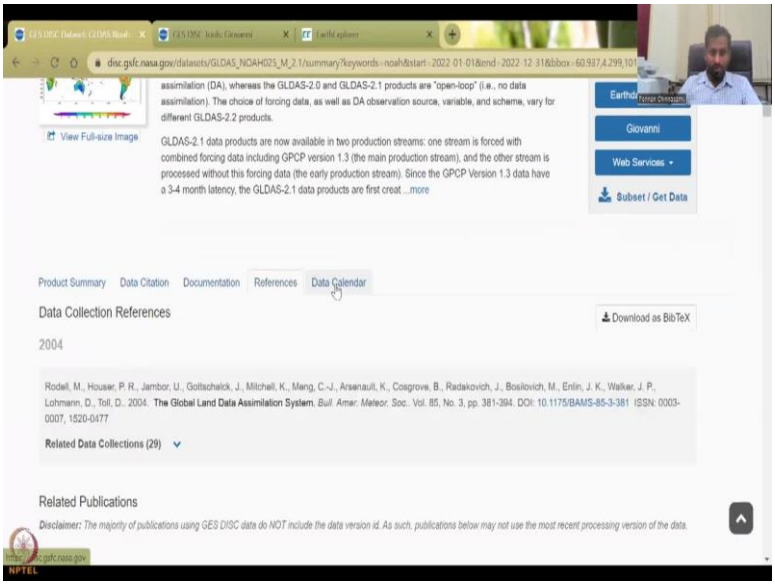
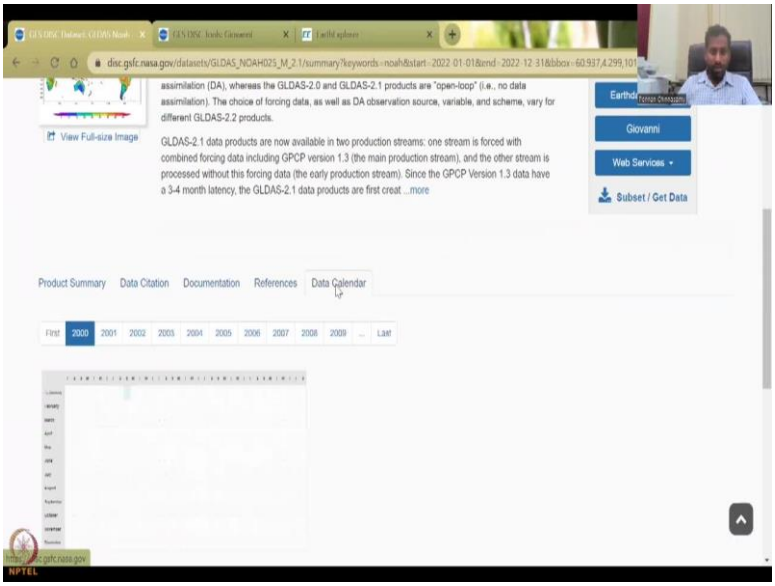
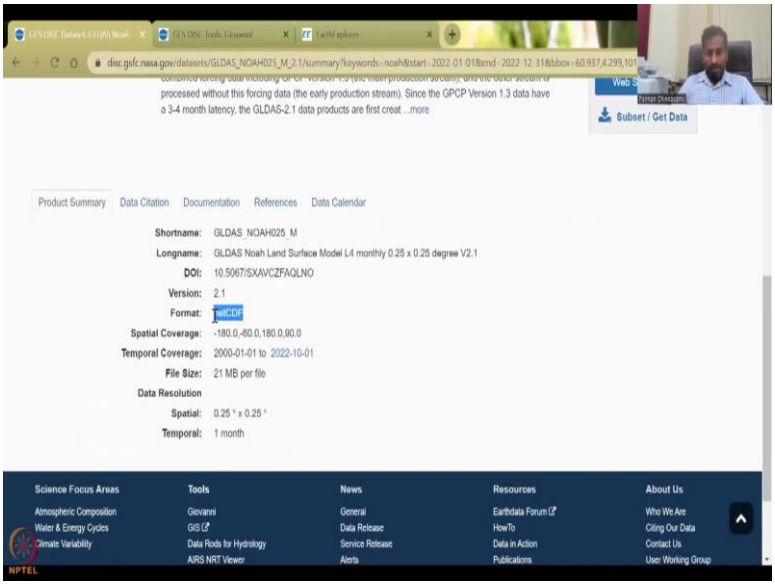
AIRS NRT Viewer
News
General
Data Release
Service Release
Alerts
Resources
Earthdata Forum
HowTo
Data in Action
Publications
About Us
Who We Are
Citing Our Data
Contact Us
User Working Group
NPTEL

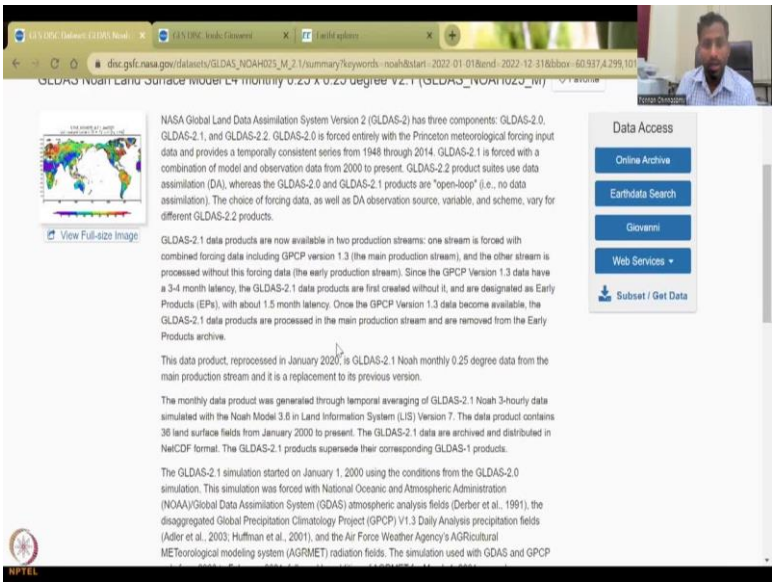


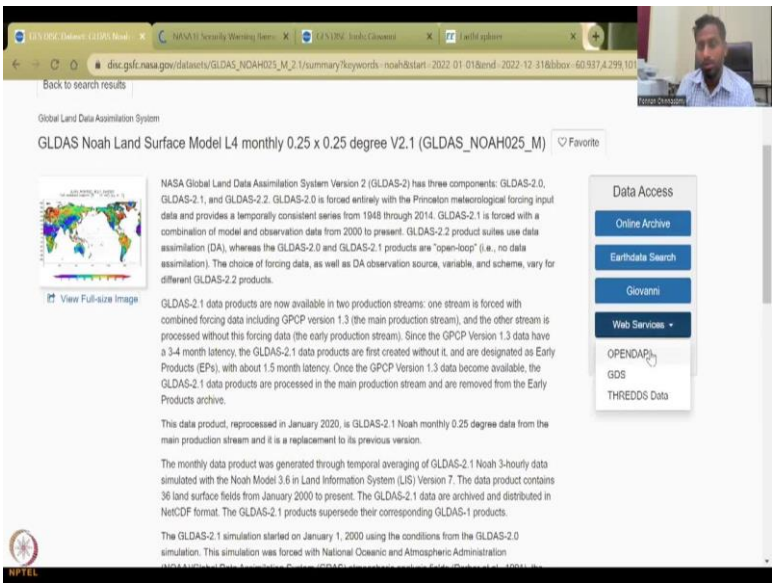


When you click search we did not specify it here. So, let us double check the date it is fine. area is fine. So, soil moisture, normally I use this one let us use a NOAH is the model. So, GLDAS NOAH is a land driven model and it has all the parameters that are required for your hydrological water balance. So, I will just show you by clicking this and then see what data is available. Data citation documentation, references data calendar from which year to which year it has been taken. And what type of format the data is stored.

(Refer Slide Time: 17:14)



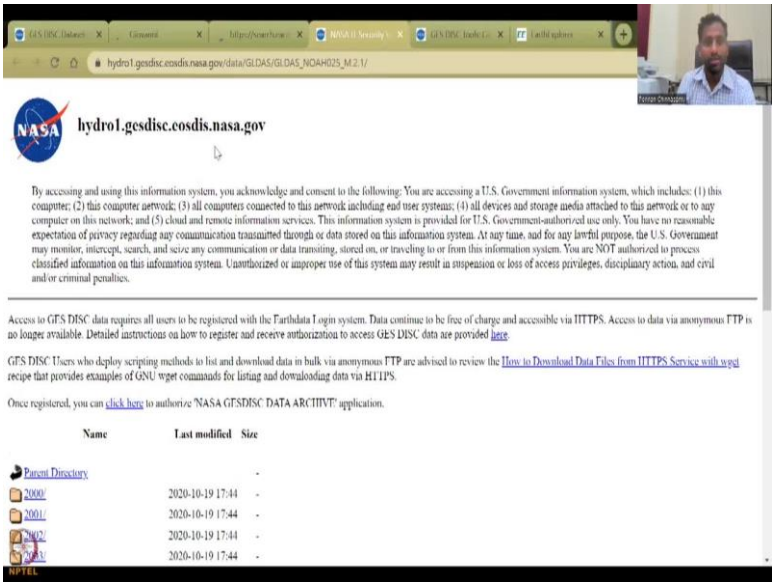


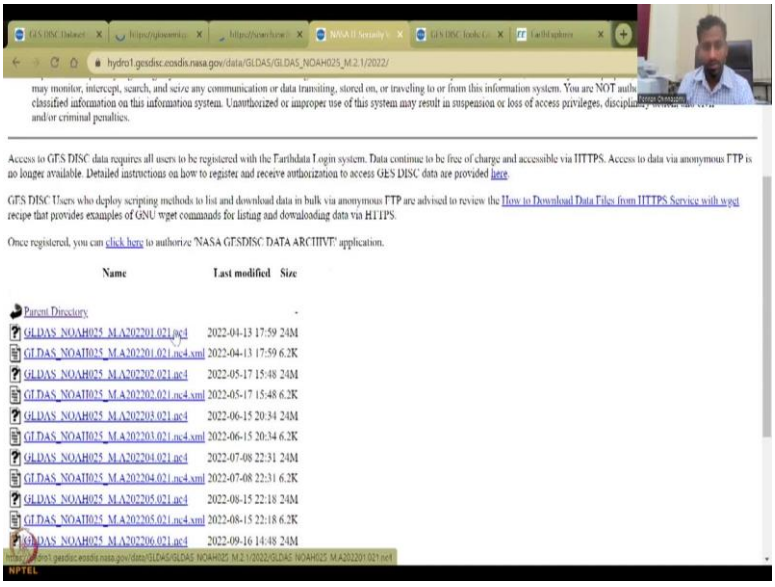


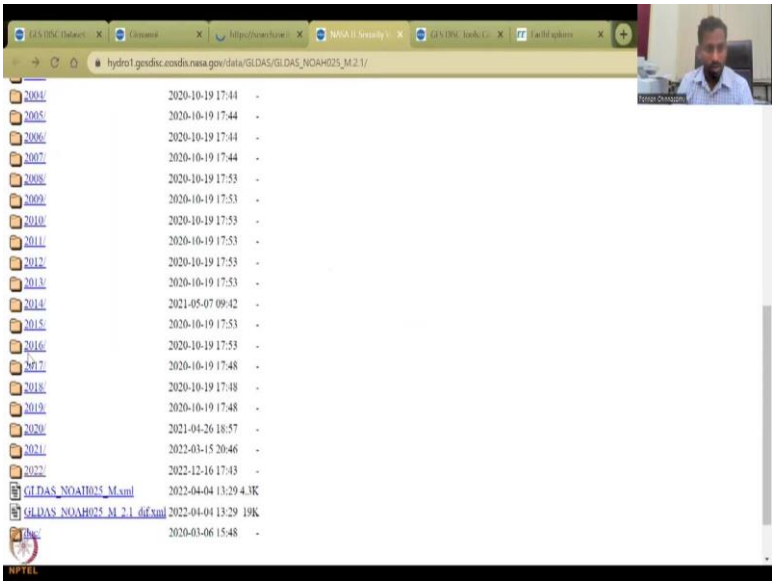
NetCDF is a particular format where multiple images are kept in one file, you will have to physically click and open each file. For now, do not worry about it, because you will also be able to download single file by just putting a single time series. Since we have put a multiple time series all the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

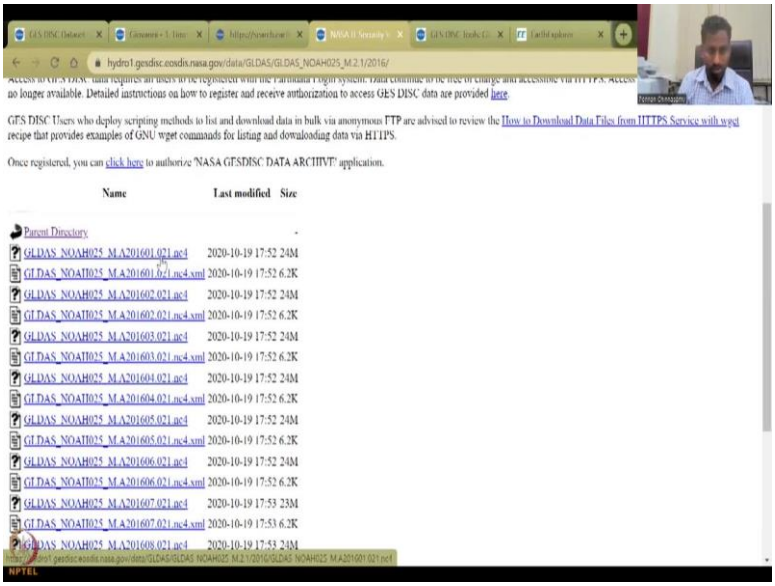
So, you can read here about the data and what are the products it gives. You can go to the online archive, you can go to web services, you can open data, all these, these required some coding, so do not worry about it if you do not know. But Earth data search is good and Giovanni is also good.

(Refer Slide Time: 18:08)









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.

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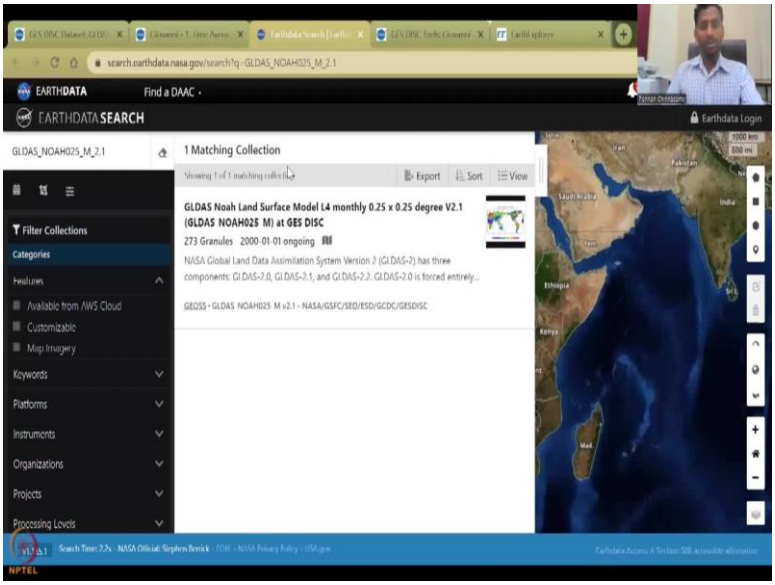

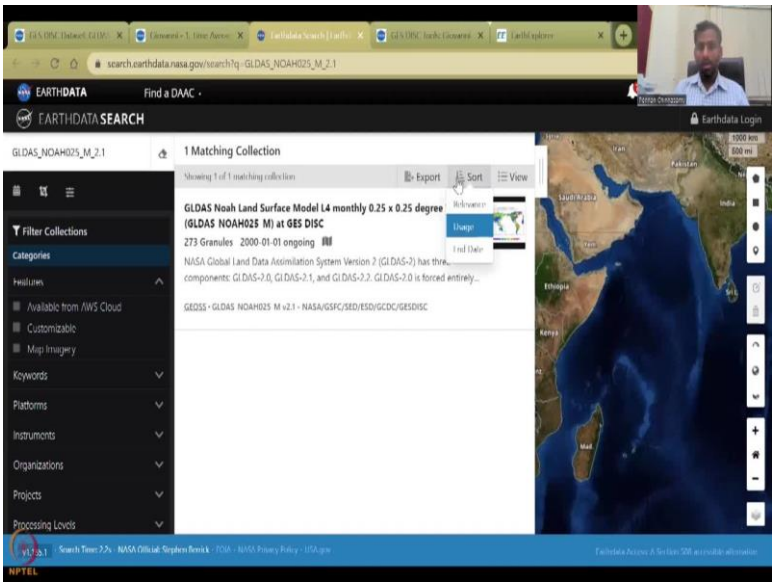

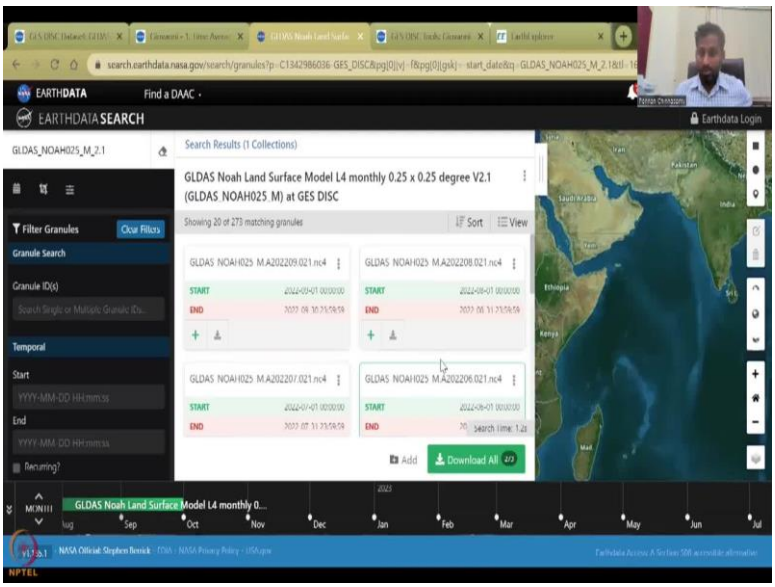

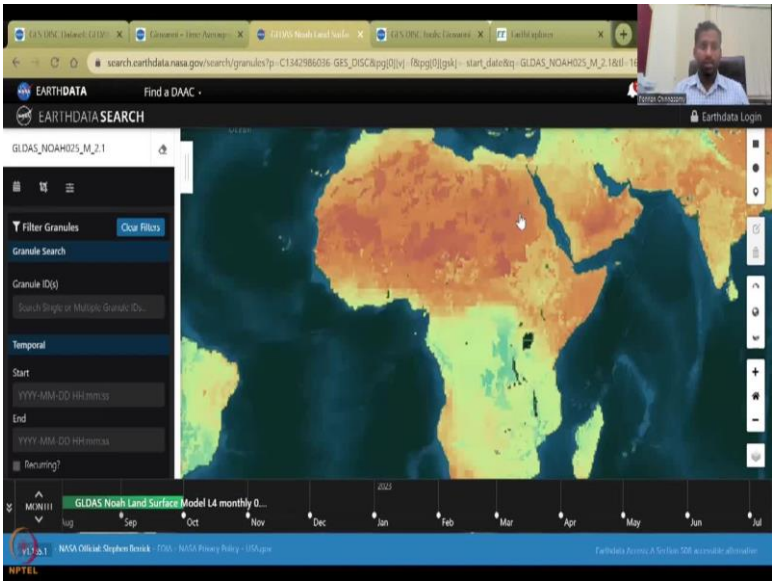
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Find a DAAC
EARTHDATA SEARCH
Earthdata Login
GLDAS_NOAH025_M_2.1
Filter Granules
Clear Filters
Granule Search
Granule ID(s)
Temporal
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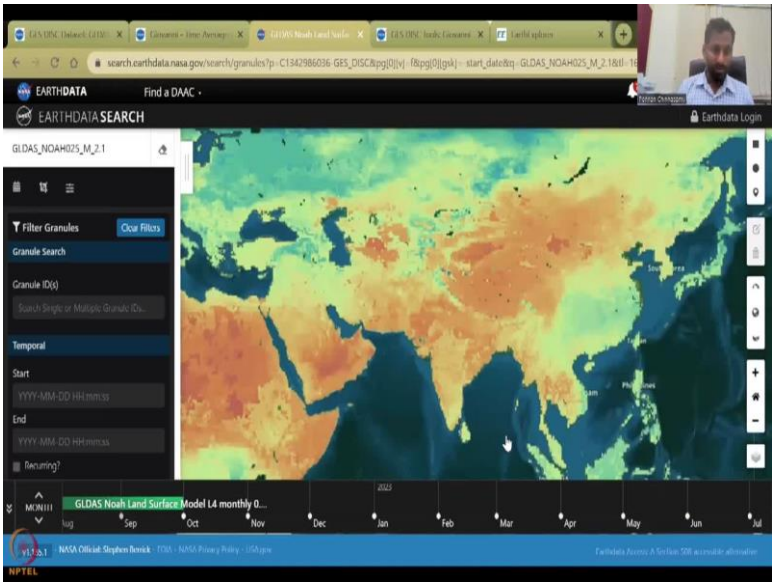
End
Recurring?
GLDAS Noah Land Surface Model L4 monthly 0...
NASA Official: Stephen Berrick
NPTEL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NASA Official: Stephen Berrick
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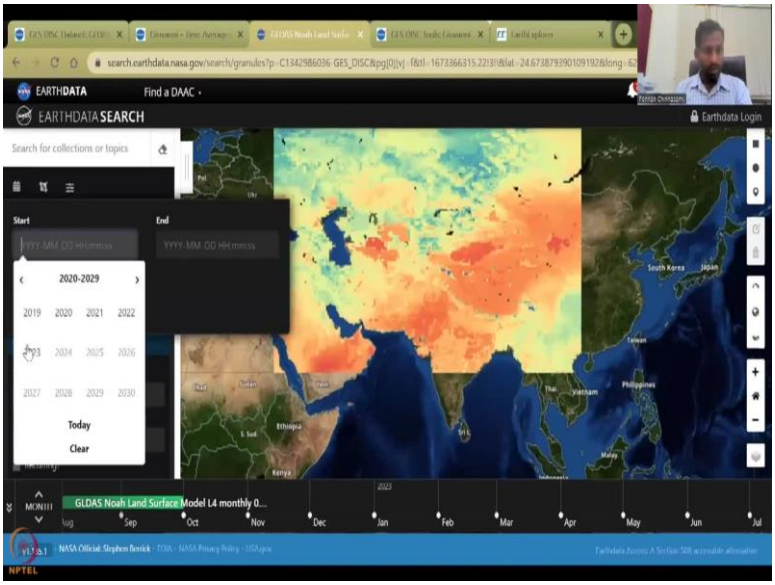
EARTHDATA
Find a DAAC
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Search for collections or topics
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2020-2029
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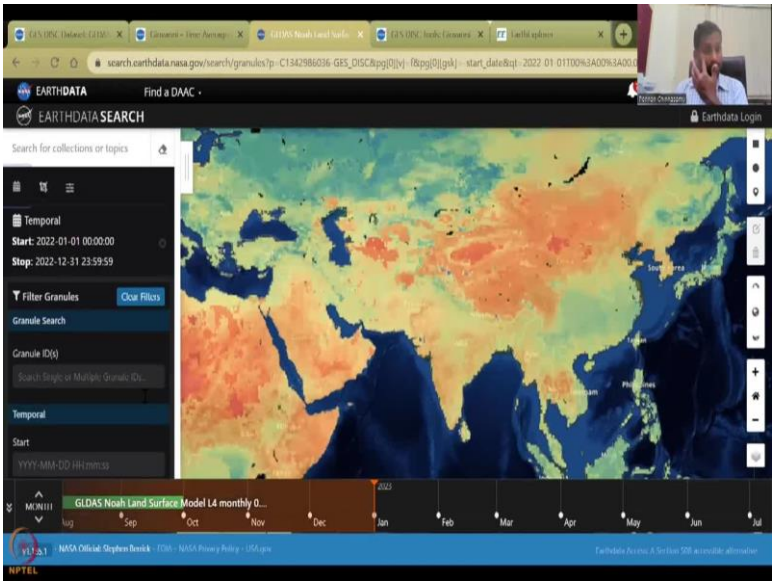
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EARTHDATA SEARCH
Earthdata Login
Search for collections or topics
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Start: 2022-01-01 00:00:00
Stop: 2022-12-31 23:59:59
Filter Granules
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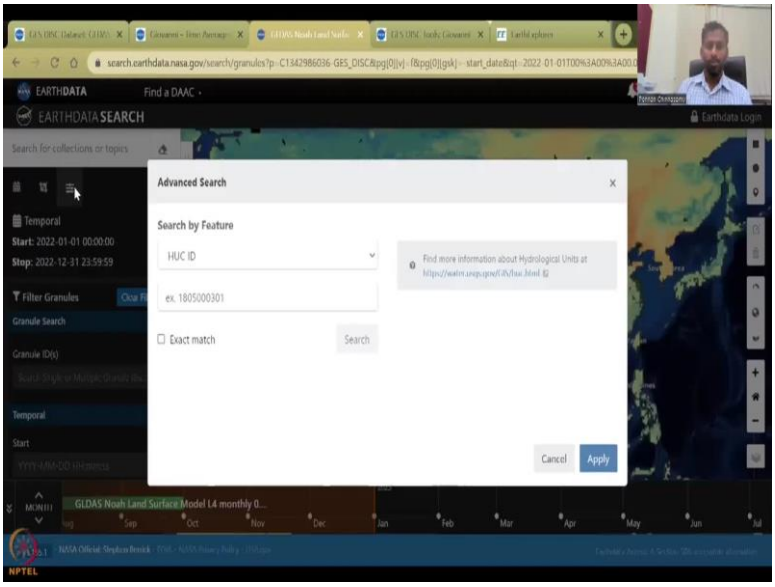
GLDAS Noah Land Surface Model L4 monthly 0...
NASA Official: Stephen Berrick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Earthdata Login
Advanced Search
Search by Feature
HUC ID
ex. 1805000301
Exact match
Search
Cancel
Apply
GLDAS Noah Land Surface Model L4 monthly 0...
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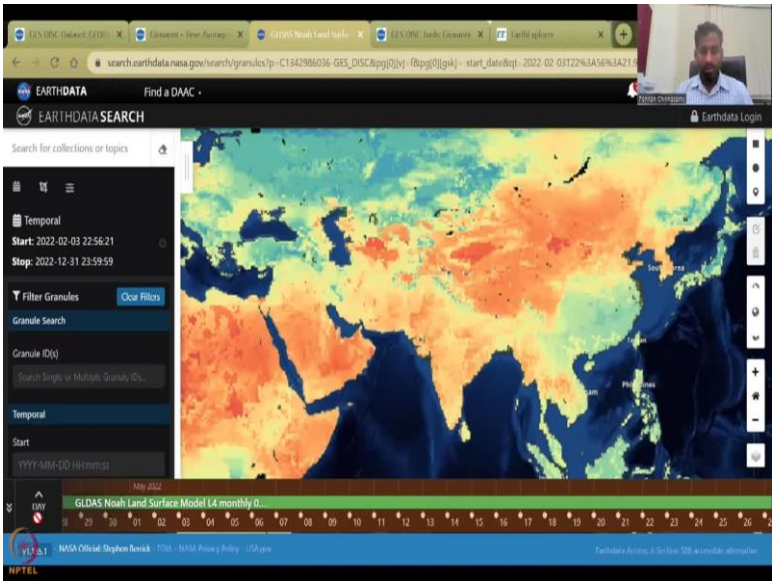
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Earthdata Login
Search for collections or topics
Temporal
Start: 2022-02-03 22:56:21
Stop: 2022-12-31 23:59:59
Filter Granules
Granule Search
Granule ID(s)
Temporal
Start
YYYY-MM-DD HH:mm:ss
GLDAS Noah Land Surface Model L4 monthly 0...
NASA Official: Stephen Berrick

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.

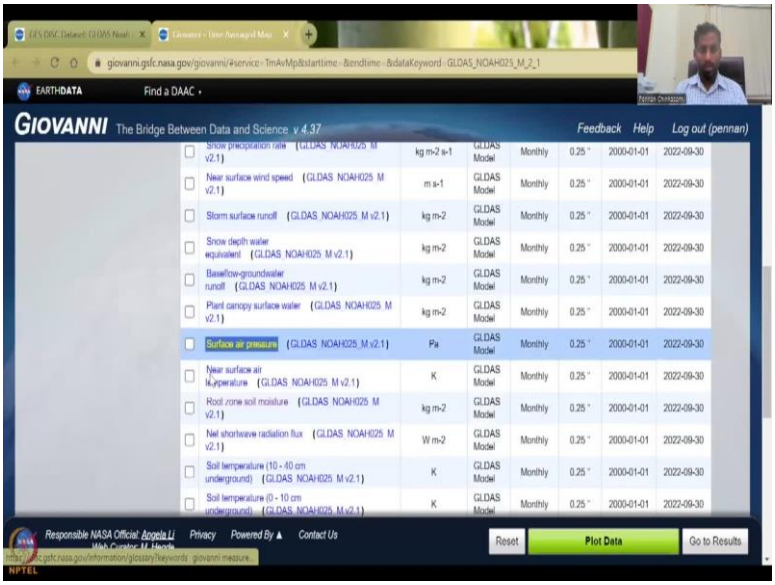
So, for example, if I click here only that single granule or single image will be downloaded. So, let us close this for a minute. And you can see here behind it is being populated the data all the data that we took for the entire globe has been populated for GLDAS NOAH. And you can actually edit it for 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.

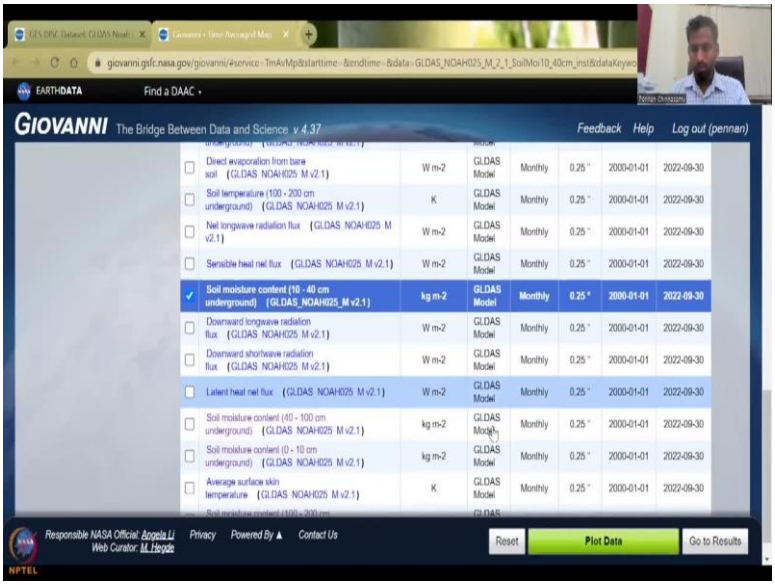
So, now it will get updated and you can also create an area of interest. And you can compare, compare the features between two to Grands two to two images. Good. So, what we need is you can download it as a month. So, this is your data you have downloaded, or you have asked Giovanni or data to say, I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

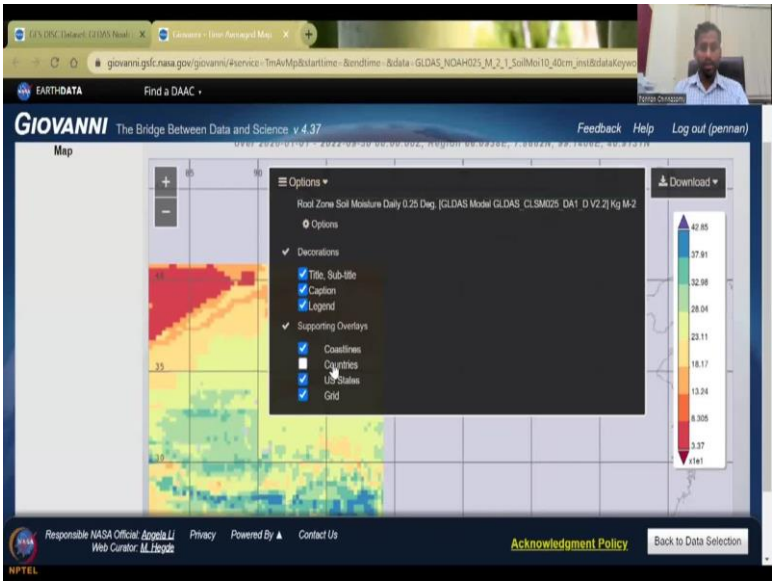
So, each month, you can look at the data using the slider, you can click the month, you can click the days if you want the day, a particular day you want you can take and you can take it off, if it is too much, taking your time, so you can also use all these tools, but do not I will say, do not get distracted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

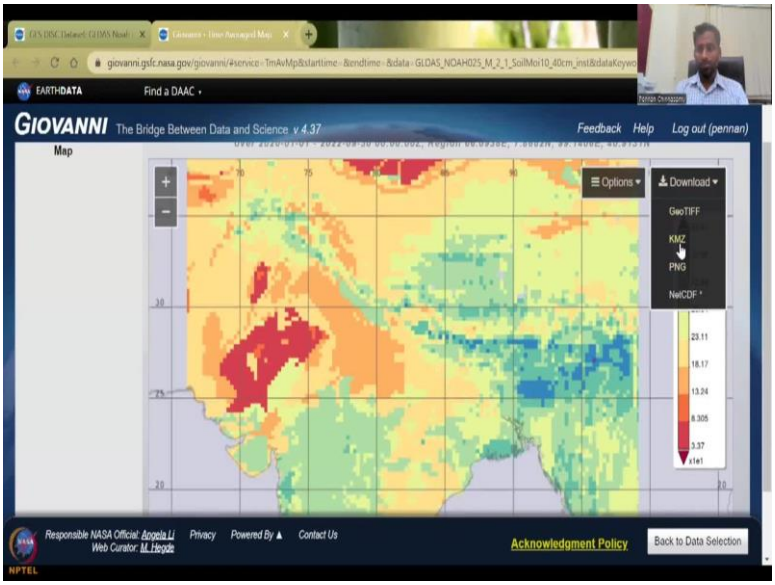
In one of the experiments coming soon, we will teach you how to use QGIS, download a data of particular data. So, we will not go searching like how we did searching here, this is just for you to introduce the buttons, where you can click what you can do let me close it just for the internet. And you 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)



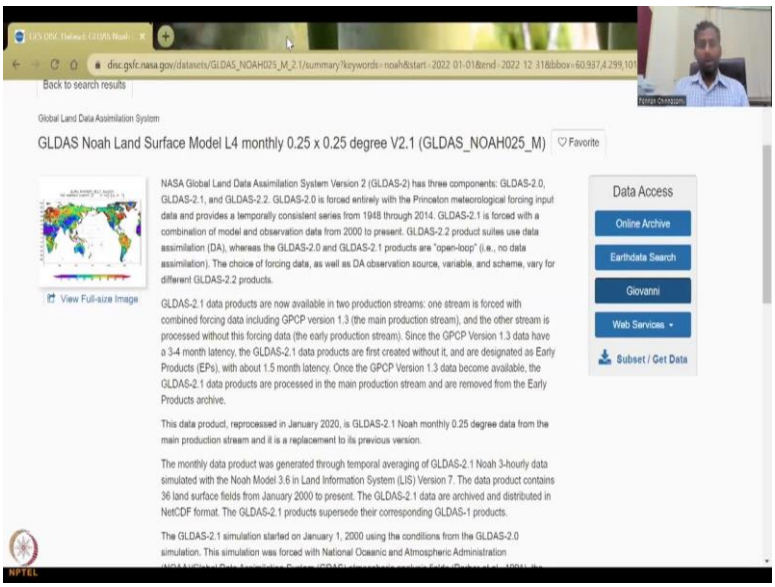


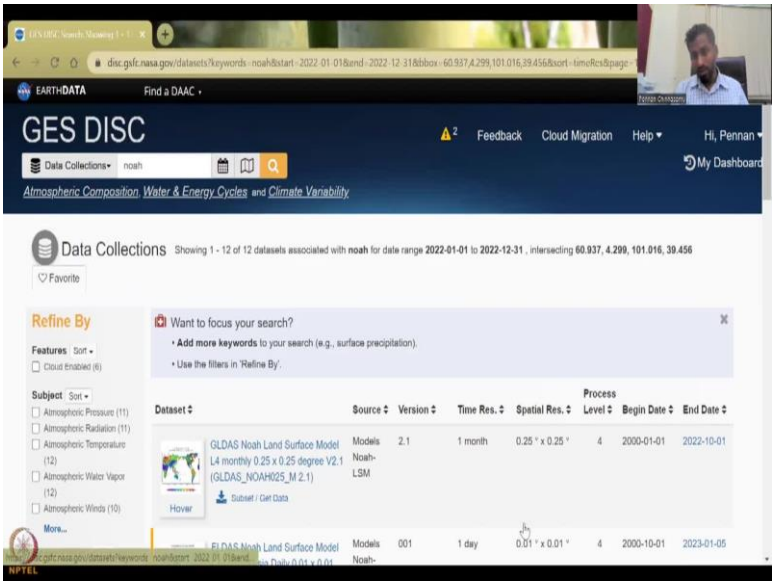




So, as I said I need only soil moisture for a particular zone you can click here go to results it will plot. So, it will be very carefully looking at how to download the data in different formats like here download as GeoTIFF, KMZ, PNG and NetCDF here. NetCDF will pull all of it together whereas GeoTIFF,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

(Refer Slide Time: 22:16)

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GES DISC
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 12 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
Subject
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 Noah-LSM
2.1
1 month
0.25 ° x 0.25 °
4
2000-01-01
2022-10-01
Hover
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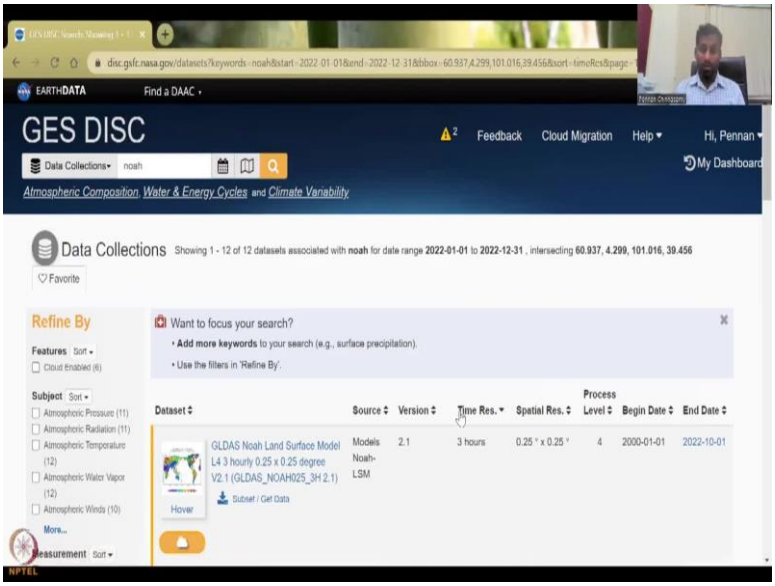
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noah
Atmospheric Composition, Water & Energy Cycles and Climate Variability
Data Collections Showing 1 - 12 of 12 datasets associated with noah for date range 2022-01-01 to 2022-12-31 , intersecting 60.937, 4.299, 101.016, 39.456
Favorite
Refine By
Want to focus your search?
Add more keywords to your search (e.g., surface precipitation).
Use the filters in 'Refine By'.
Features
Subject
Measurement
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_NOAH025_3H 2.1)
Models Noah-LSM
2.1
3 hours
0.25 ° x 0.25 °
4
2000-01-01
2022-10-01
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Subset / Get Data
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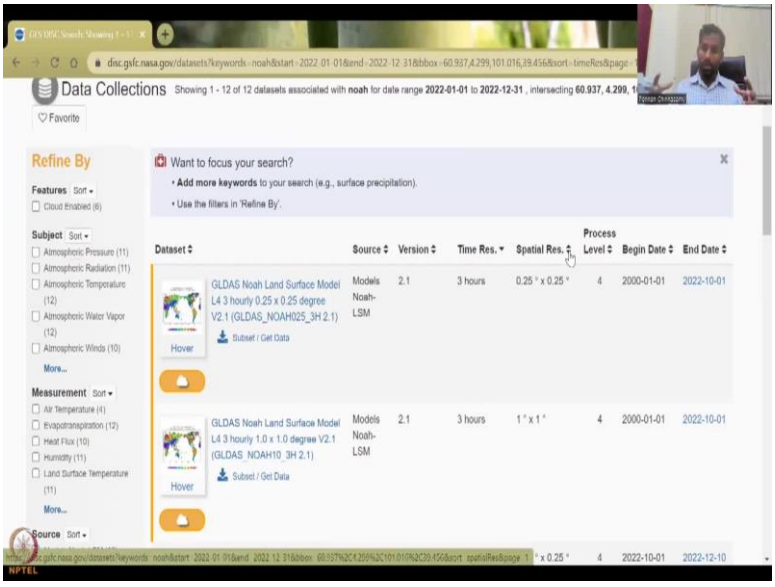
Data Collections Showing 1 - 12 of 12 datasets associated with noah for date range 2022-01-01 to 2022-12-31 , intersecting 60.937, 4.299,
Favorite
Refine By
Want to focus your search?
Add more keywords to your search (e.g., surface precipitation).
Use the filters in 'Refine By'.
Features
Subject
Measurement
Source
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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_NOAH025_3H 2.1)
Models Noah-LSM
2.1
3 hours
0.25 ° x 0.25 °
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Hover
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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
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2000-01-01
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2022-12-10
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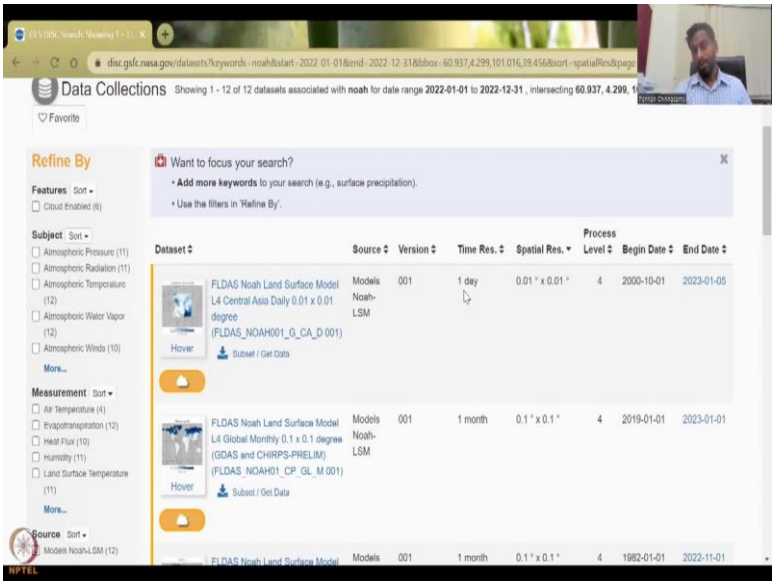
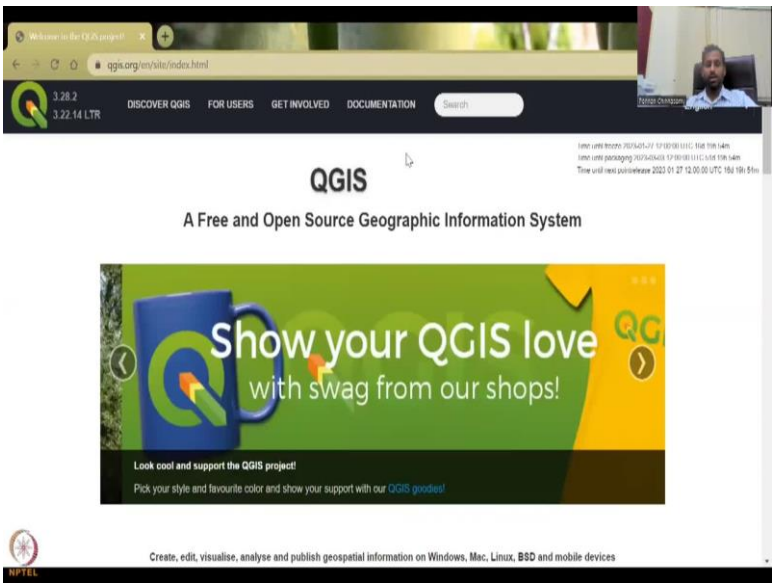


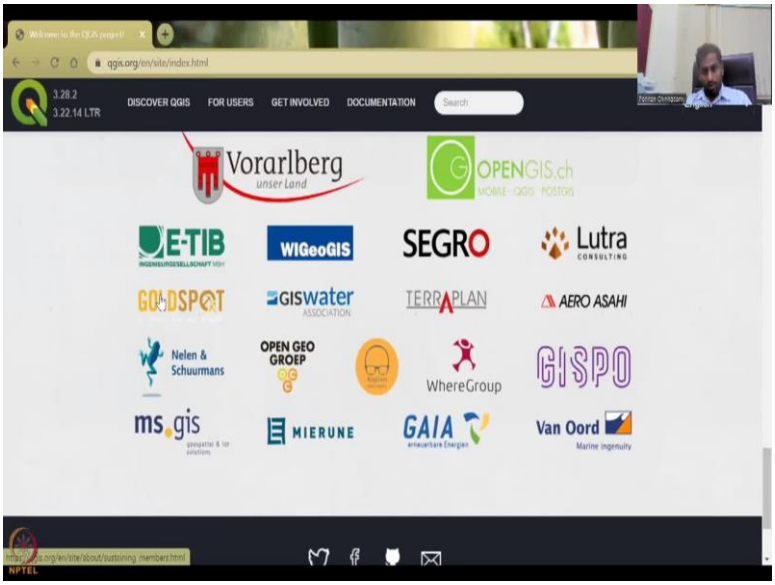
So, we have one through the GLDAS GIS and etcetera. So, whatever you want in terms of data you can type here if it is there, it will come. Be very, very careful in accessing the resolution you want. You want a monthly do it here click it will be 3 hours every 3 hours it gives data. Spatial resolution 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)

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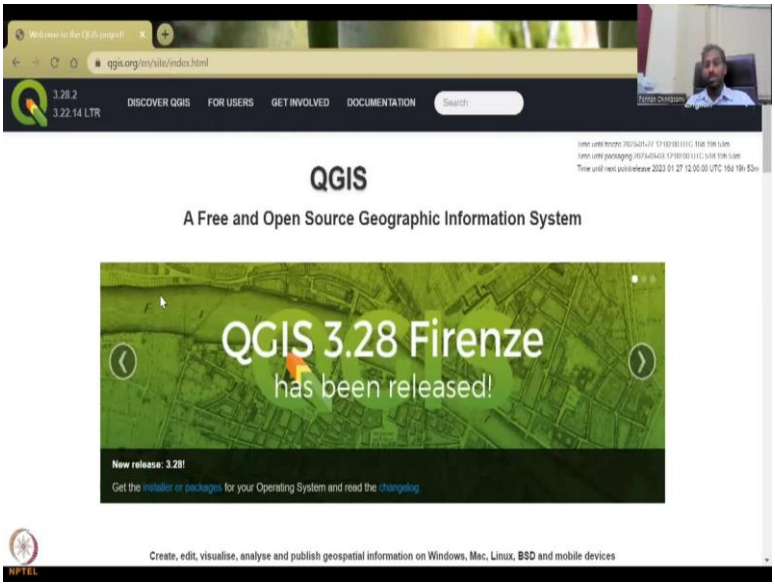
qgis.org/en/site/index.html
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3.22.14 LTR
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has been released!
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Get the installer or packages for your Operating System and read the changelog
Create, edit, visualise, analyse and publish geospatial information on Windows, Mac, Linux, BSD and mobile devices
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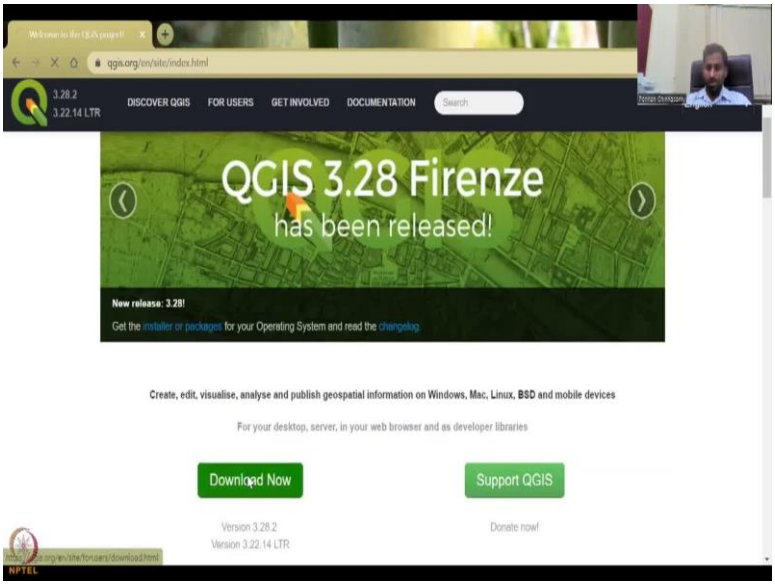
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So, to analyze all this data, what do you need? You need a software and that is a GIS software. So, I will be introducing GIS concepts in the next lecture onwards. What is GIS? Why do we need GIS and within the GIS we will be using only two formats? 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.

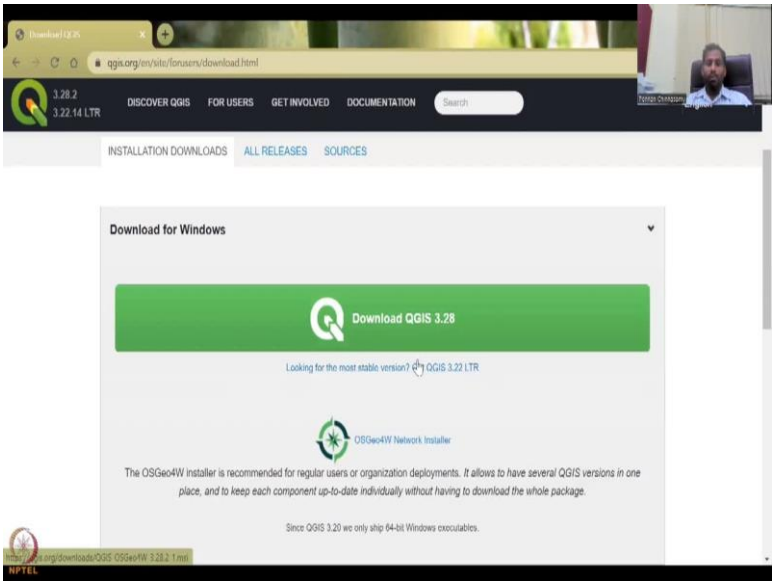
QGIS is the open source GIS software. Normally GIS software is very very expensive if you buy the proprietary software, but open source software is good. So, I will be introducing GIS in the next lecture series week. Today, I want to give you in the remaining five minutes, what is this software so that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

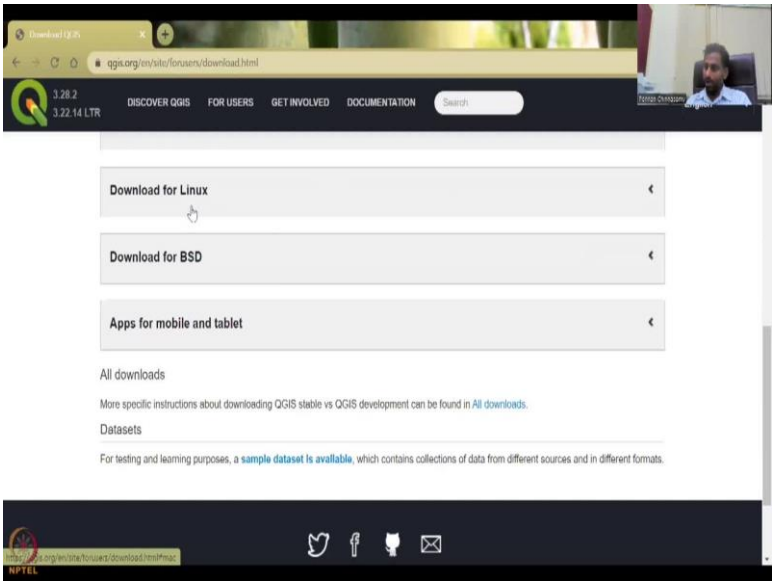
So, you can go to this link to download the software, let us let me take you to this link. So, what you will find here is the project, first, let me open the project, project based website., so just type QGIS, Google search, you will find this one or you can have this link, it does get updated. So that 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.

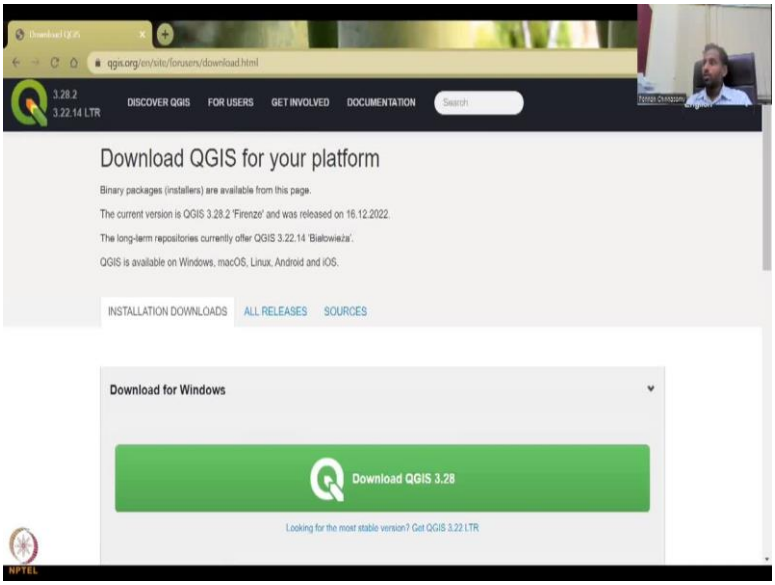
But most importantly, you will find all the people that are using this software here and it is even the space agencies of European nations use this because it is very very expensive to buy the software and only some people are using it if you make it open source and lot of people take part in building 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)



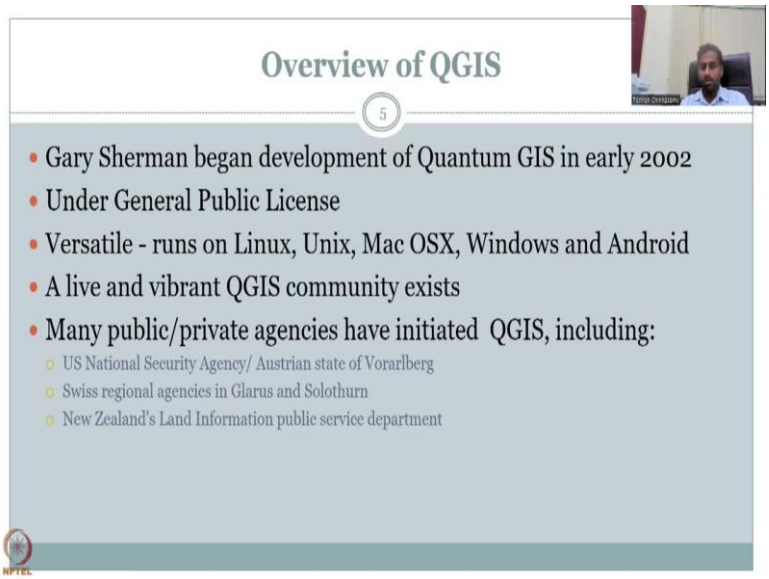




The new version is here, it always says the newest version is 3.28 but you will always go for the most stable version. So, it is 3.22 which is lesser than 3.28. But it is more stable, which means all the errors, bugs, everything is taken care. Any software if it is new will have some issues and errors. 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)



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.

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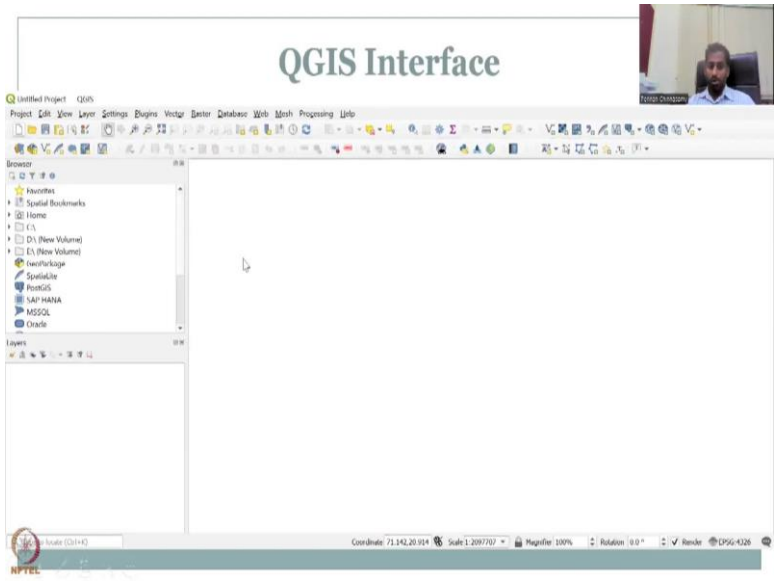

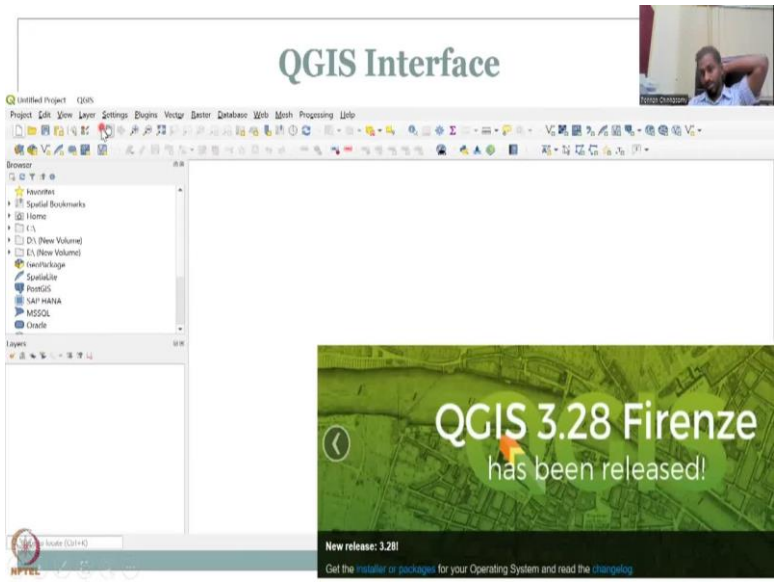

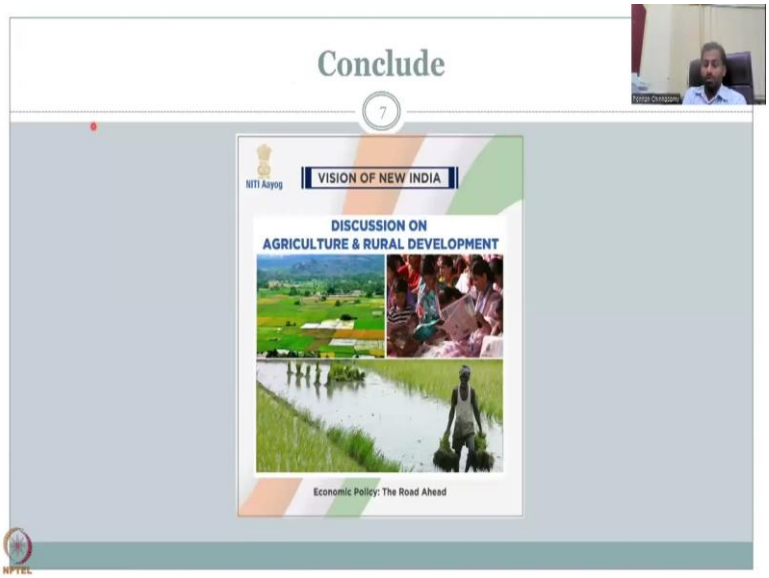

And this is how the interface looks like you have a good real estate real estate means an area for putting the maps adding the maps and then I adding layers for analysis. Here is where the information of the layers come across. So, here is where you put down the data. And here is where the data information 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.