

Introduction to Spatial Data -Data Download & Data Visualization

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Open-Source Data – Data Download: Rater Dataset

BHUVAN PORTAL – ISRO India



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Bhuvan - National Hydrology Project

Geospatial Hydro Products & Services

Features: Flood Early Warning | Evapotranspiration | Glacial Lakes | Snowmelt Runoff
Hydrological Modelling | Irrigation Management | Hydrological Drought Geoportals



Latest Updates Sri Pankaj Kumar, Secretary, DoWR, RD&GR, MoJ and Bhuvan - National Hydrology Project by Dr. K Sivan, Secretary, Dept. of Space and Chairman, ISRO on 29

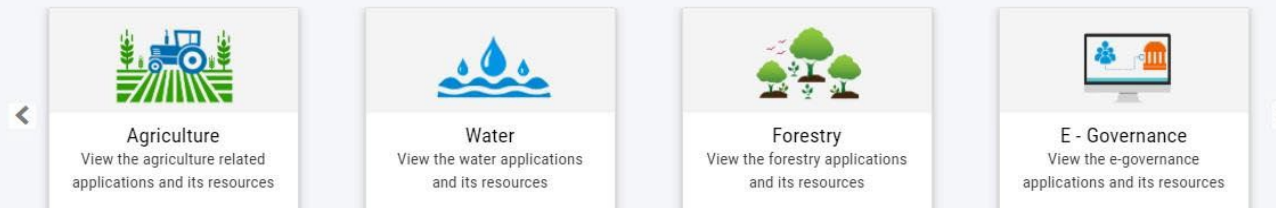
Visualisation & Free Download

Collaborative applications - Platform to share your data and create governance applications



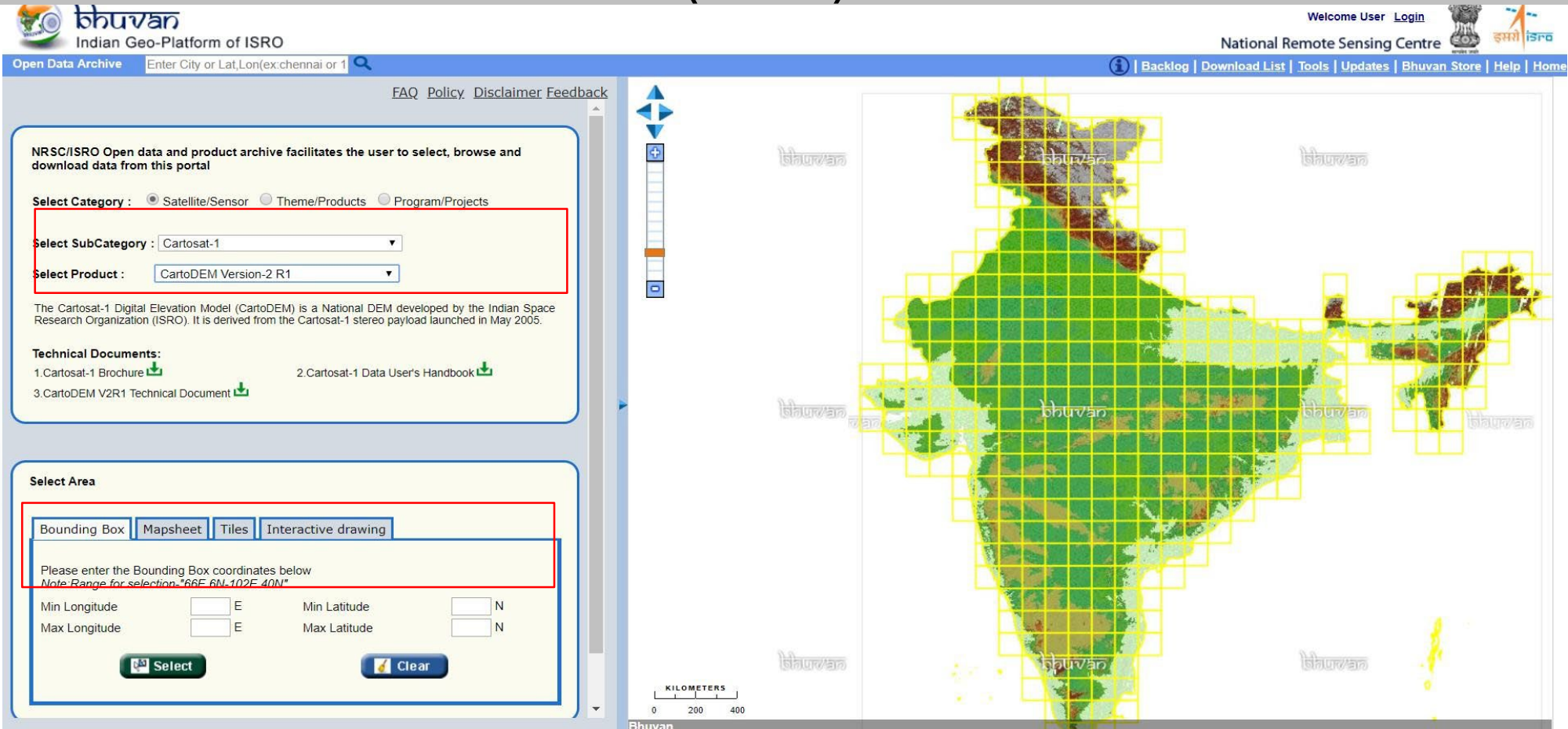
Application Sectors

Collaborative applications - Platform to share your data and create governance applications



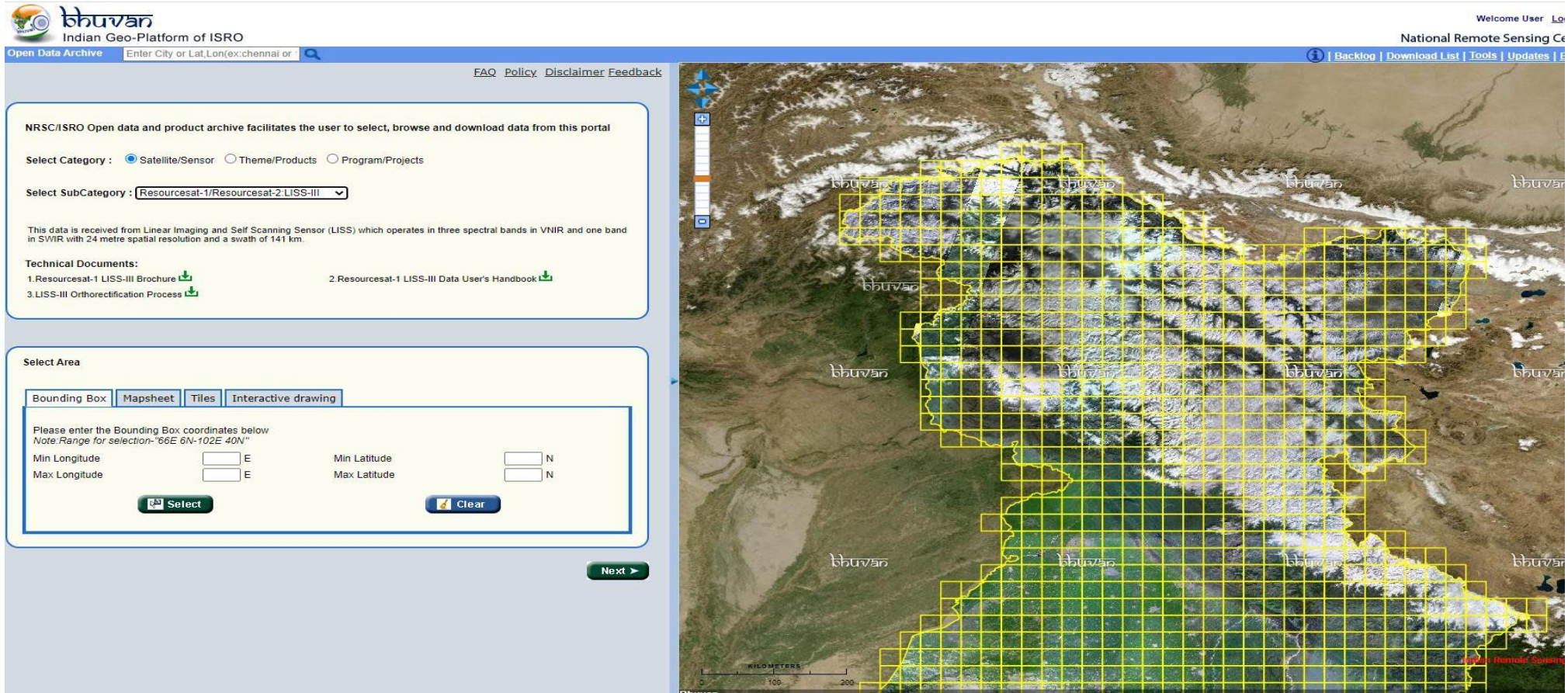
Downloads

DOWNLOADING OF CARTOSAT DIGITAL ELEVATION MODEL (DEM)



The screenshot displays the Bhuvan Indian Geo-Platform of ISRO interface. The main content area is titled "NRSC/ISRO Open data and product archive facilitates the user to select, browse and download data from this portal". It features a "Select Category" section with radio buttons for "Satellite/Sensor", "Theme/Products", and "Program/Projects". Below this, a "Select SubCategory" dropdown menu is set to "Cartosat-1", and a "Select Product" dropdown menu is set to "CartoDEM Version-2 R1". A "Technical Documents" section lists three documents: "1. Cartosat-1 Brochure", "2. Cartosat-1 Data User's Handbook", and "3. CartoDEM V2R1 Technical Document". The "Select Area" section includes tabs for "Bounding Box", "Mapsheet", "Tiles", and "Interactive drawing". The "Bounding Box" tab is active, showing a form to enter coordinates: "Please enter the Bounding Box coordinates below", "Note: Range for selection: 66E 6N-102E 40N", and fields for "Min Longitude", "Max Longitude", "Min Latitude", and "Max Latitude". A "Select" button and a "Clear" button are at the bottom of the form. On the right, a map of India is displayed with a yellow grid overlay, indicating the selected area. A scale bar at the bottom left shows distances in kilometers (0, 200, 400).

DOWNLOADING OF LISS III AND OTHER REMOTE SENSING SATELLITE DATASETS



The screenshot displays the Bhuvan Indian Geo-Platform of ISRO interface. The header includes the Bhuvan logo, navigation links (Open Data Archive, Enter City or Lat, Lon(ex:chennai or)), and user information (Welcome User, Log Out, National Remote Sensing Centre). The main content area is titled "NRSC/ISRO Open data and product archive facilitates the user to select, browse and download data from this portal". It features a "Select Category" section with radio buttons for "Satellite/Sensor" (selected), "Theme/Products", and "Program/Projects". Below this is a "Select SubCategory" dropdown menu set to "ResourceSat-1/ResourceSat-2 LISS-III". A descriptive text block states: "This data is received from Linear Imaging and Self Scanning Sensor (LISS) which operates in three spectral bands in VNIR and one band in SWIR with 24 metre spatial resolution and a swath of 141 km." Under "Technical Documents", there are links to "1.ResourceSat-1 LISS-III Brochure" and "2.ResourceSat-1 LISS-III Data User's Handbook". The "Select Area" section has tabs for "Bounding Box", "Mapsheet", "Tiles", and "Interactive drawing". The "Bounding Box" tab is active, showing a form to enter coordinates: "Please enter the Bounding Box coordinates below. Note: Range for selection- 66E 6N-102E 40N". The form includes input fields for "Min Longitude", "Max Longitude", "Min Latitude", and "Max Latitude", each with a directional indicator (E or N). There are "Select" and "Clear" buttons. A "Next" button is located at the bottom right of the form. On the right side of the interface, a satellite image of a coastal region is displayed with a yellow grid overlay, indicating the selected area for data download. A scale bar at the bottom left of the image shows distances up to 200 kilometers.



Bhuvan-Thematic Services

← → ↻ 🏠 📄 bhuvan-app1.nrsc.gov.in/thematic/thematic/index.php 🔍 ☆ 📁 📱 🌐

AWS ARG NETWO... Giovanni Gmail Maps Normalized Differe... Landsat 8 Bands | L... Landsat Surface Re... SDMA | Flood Haza... LST Calculation NDVI, NDBI & amp;... Enhancing the Lan... MODIS/Terra Temp... >> 📁 All Bookmarks

bhuvan
Indian Geo-Platform of ISRO

Thematic Services Enter City or Lat_Lon(ex:chennai) 🔍

Welcome User [Login](#)  
National Remote Sensing Centre [Add WMS Layer](#) [Updates](#) [Bhuvan Store](#) [Help](#) [Home](#)

[FAQ](#) [Policy](#) [Disclaimer](#) [Feedback](#)

Bhuvan-Thematic Services facilitate the users to select, browse and query the Thematic Datasets from this portal. Users can consume these Thematic Datasets and integrate into their systems as OGC Web Services.

Search **Statistics** Analysis Metadata WebServices Overlay

Select Theme Land Use Land Cover(50K):2015-16 ▾

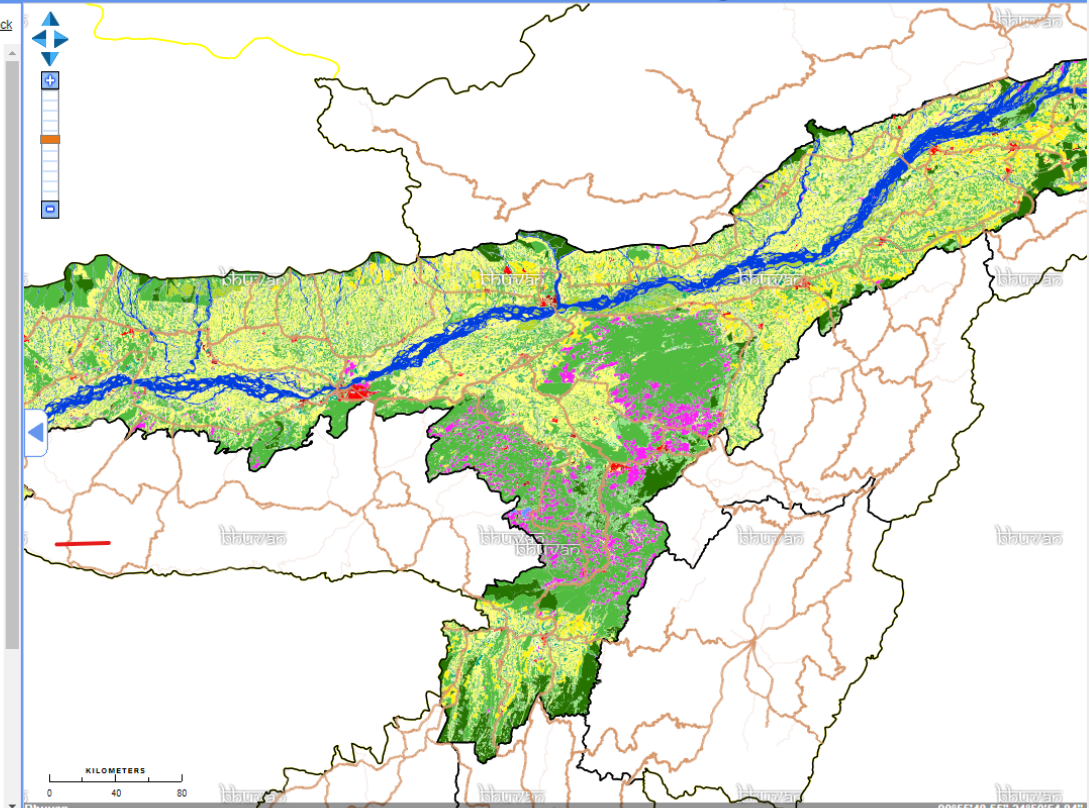
Select State ASSAM ▾

1. Technical document 📄 2. Map 📄 Statistics 📄

[Remove](#) Zoom to District **Select** ▾

Use Info Tool to get the Information on click.

- Builtup, Urban
- Builtup, Rural
- Builtup, Mining
- Agriculture, Crop land
- Agriculture, Plantation
- Agriculture, Fallow
- Agriculture, Current Shifting Cultivation
- Forest, Evergreen / Semi evergreen
- Forest, Deciduous
- Forest, Forest Plantation
- Forest, Scrub Forest
- Forest, Swamp/Mangroves
- Grass/Grazing
- Barren/unculturable/Wastelands, Salt Affected Land
- Barren/unculturable/Wastelands, Gullied/Ravinous Land
- Barren/unculturable/Wastelands, Scrub land
- Barren/unculturable/Wastelands, Sandy area



DOWNLOADING OF HIGH- RESOLUTION DIGITAL ELEVATION MODEL (SRTM - DEM) DATASET FROM EARTH

EarthExplorer Manage Criteria





Search Criteria Data Sets Additional Criteria Results

4. Search Results
If you selected more than one data set to search, use the dropdown to see the search results for each specific data set.

Show Result Controls

Data Set Click here to export your results »

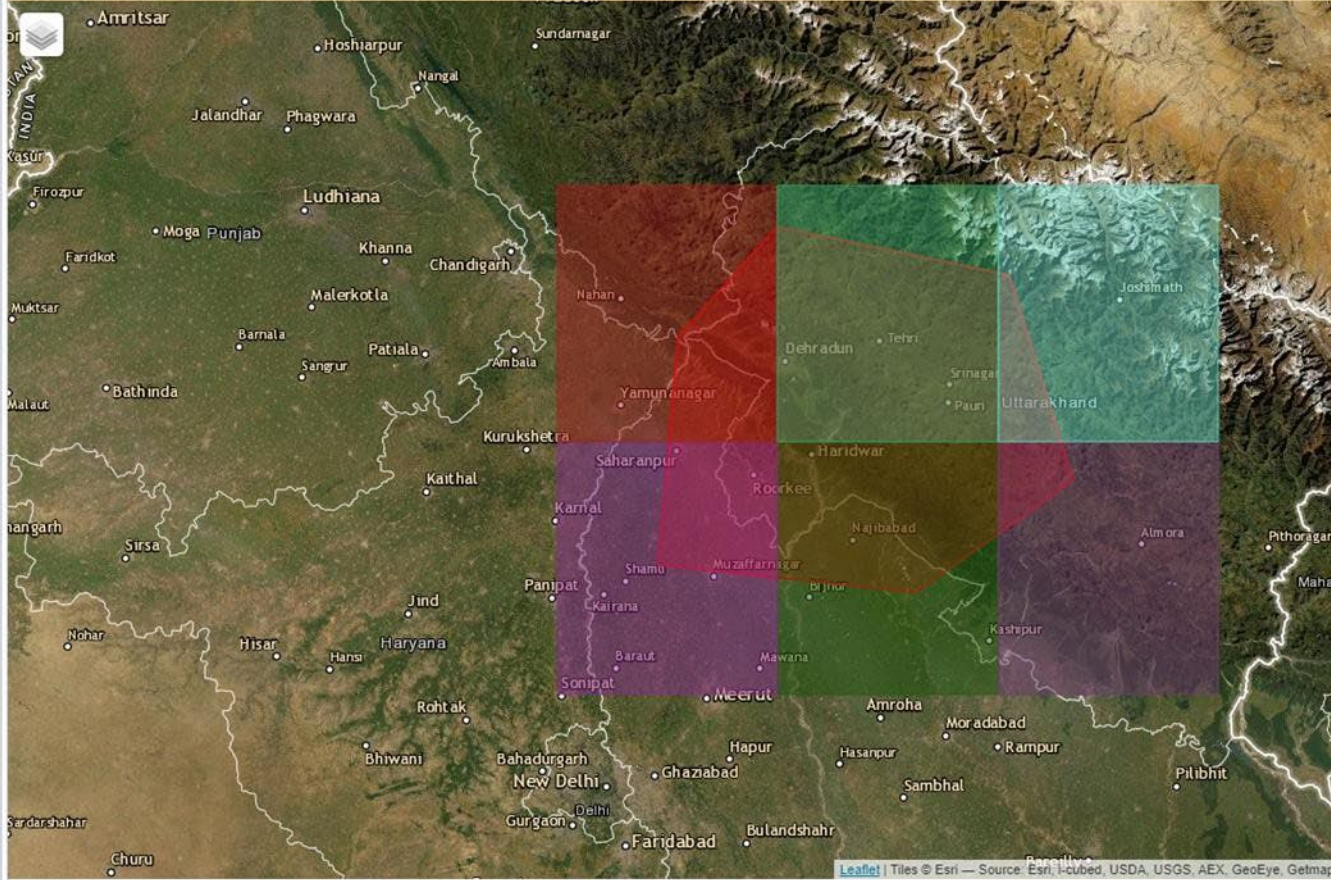
SRTM 1 Arc-Second Global

	Entity ID: SRTM1N29E079V3 Publication Date: 2014-09-23 00:00:00-05 Resolution: 1-ARC Coordinates: 29 , 79
	Entity ID: SRTM1N30E077V3 Publication Date: 2014-09-23 00:00:00-05 Resolution: 1-ARC Coordinates: 30 , 77
	Entity ID: SRTM1N30E078V3 Publication Date: 2014-09-23 00:00:00-05 Resolution: 1-ARC Coordinates: 30 , 78
	Entity ID: SRTM1N30E079V3 Publication Date: 2014-09-23 00:00:00-05 Resolution: 1-ARC Coordinates: 30 , 79

« First « Previous 1 of 1 Next » Last »

View Item Basket » Submit Standing Request »

Search Criteria Summary (Show)



The provided maps are not for purchase or for download; it is to be used as a guide for reference and search purposes only.

<https://earthexplorer.usgs.gov/>

DOWNLOADING OF HIGH- RESOLUTION REMOTE SENSING DATASET FROM EARTH EXPLORER WEBSITE

Explorer - Home

Home

1 New System Message

Login

Register

RSS

Feedback

Search Criteria

Data Sets

Additional Criteria

Results

2. Select Your Data Set(s)

Check the boxes for the data set(s) you want to search. When done selecting data set(s), click the *Additional Criteria* or *Results* buttons below. Click the plus sign next to the category name to show a list of data sets.

☐ Use Data Set Prefilter
 [\(What's This?\)](#)

Data Set Search:

Aerial Imagery

AVHRR

CEOS Legacy

Commercial Satellites

Declassified Data

Digital Elevation

Digital Line Graphs

Digital Maps

EO-1

Global Fiducials

HCMM

ISERV

Land Cover

Landsat

NASA LPDAAC Collections

Radar

Sentinel

UAS

Search Criteria Summary (Show)

Clear Criteria

Map

Satellite

28° 14' 50" N, 086° 57' 06" E

Options

Overlays

<https://earthexplorer.usgs.gov/>


Open-Source Data – Data Download: Vector Dataset

Survey of India - Administrative Boundary/ Shapefile


onlinemaps.surveyofindia.gov.in/Digital_Product_Show.aspx

AWS ARG NETWORK... Giovanni Gmail Maps Normalized Differ... Landsat 8 Bands | L... Landsat Surface Ref... SDMA | Flood Hazard LST Calculation NDVI, NDBI & More

भारतीय सर्वेक्षण विभाग | Survey of India Skip to main content | A+ A A-

 भारतीय सर्वेक्षण विभाग
SURVEY OF INDIA
विज्ञान और प्रौद्योगिकी विभाग
Ministry of Science & Technology

Onlinemaps Portal
Online Services to Citizen, Business & More

 DST@50
Department of Science & Technology





Home | Products | Contents Of Geo Spatial Data Guidelines | Pricing Policy | Download SOI Fonts | Contact Us | Sign In | 0

Filters

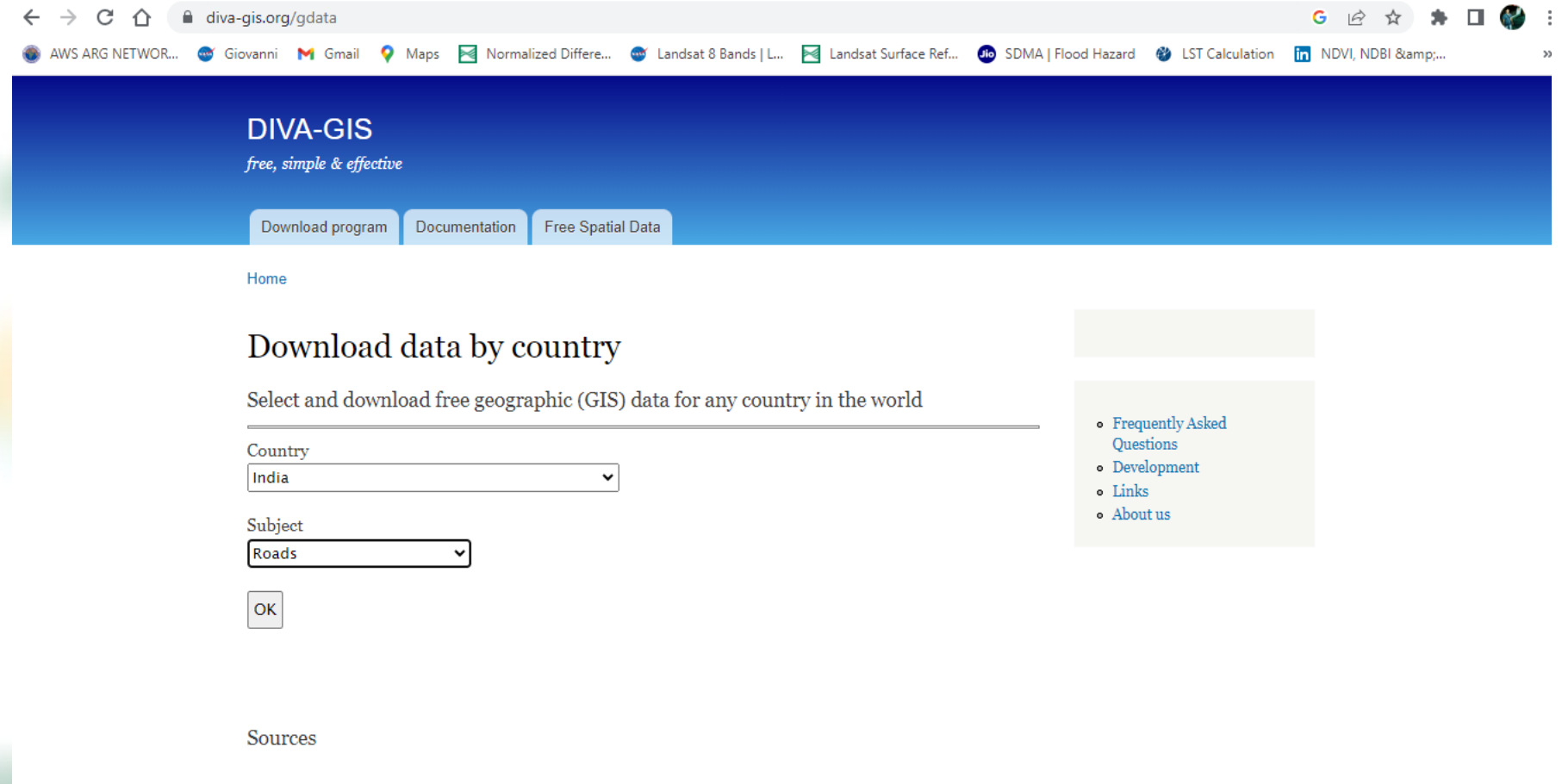
Digital Product

- ☐ All Product
- ☐ Topographical Map
- ☐ Digital Vector Database
- ☒ Administrative Boundary Database
- ☐ Digital Terrain Model
- ☐ Geo-Referenced Colour Raster
- ☐ Digital Geographical Map

Administrative Boundary Database

 <p>Product Code: OVSF/1M/6 Price: ₹ 0/- Type: SHAPEFILE Content: 1:1 M Sheet Entire country Upto Taluk level with HQ</p>	 <p>Product Code: OVSF/1M/7 Price: ₹ 0/- Type: SHAPEFILE Content: 1:1 M Sheet Entire country Upto Distt. level with HQ</p>	 <p>Product Code: OVSF/1M/8 Price: ₹ 0/- Type: SHAPEFILE Content: 1:1 M Sheet State Upto Taluk level with HQ Click to Buy</p>	 <p>Product Code: OVSF/1M/9 Price: ₹ 0/- Type: SHAPEFILE Content: 1:1 M Sheet State Upto Distt. level with HQ Click to Buy</p>
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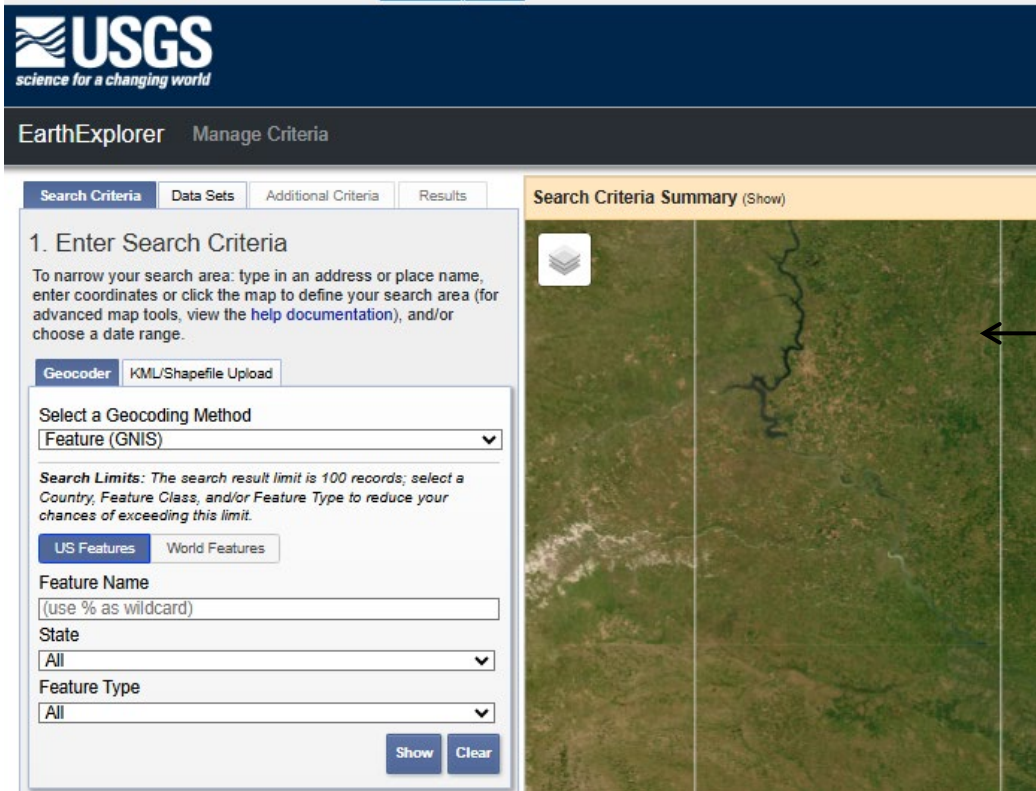
DIVA GIS - Administrative Boundary/ Shapefile



The screenshot shows the DIVA-GIS website interface. The browser address bar displays 'diva-gis.org/gdata'. The website has a blue header with the text 'DIVA-GIS' and the tagline 'free, simple & effective'. Below the header are three tabs: 'Download program', 'Documentation', and 'Free Spatial Data'. The main content area is titled 'Download data by country' and includes the instruction 'Select and download free geographic (GIS) data for any country in the world'. There are two dropdown menus: 'Country' with 'India' selected and 'Subject' with 'Roads' selected. An 'OK' button is located below the subject dropdown. On the right side, there is a sidebar with a list of links: 'Frequently Asked Questions', 'Development', 'Links', and 'About us'. The footer of the website shows the word 'Sources'.

<https://diva-gis.org/data.html>

Data Visualization: Elevation Dataset - SRTM



USGS
science for a changing world

EarthExplorer Manage Criteria

Search Criteria Data Sets Additional Criteria Results

Search Criteria Summary (Show)

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
All

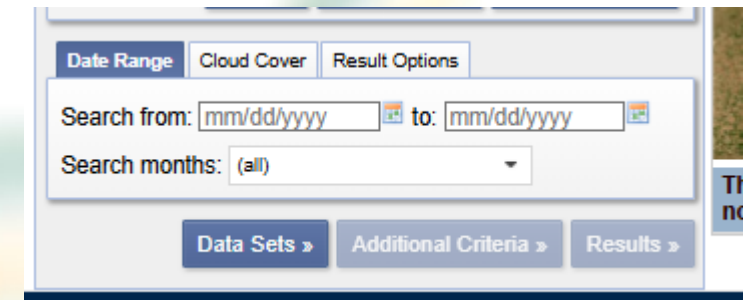
Show Clear

Step 1: Here, you can:

- Upload your Study area in form of KML/KMZ or shapefile (vector).
- Create a polygon of your choice on the map
- Use the area displayed on the map as your study area.

Step 2: You have to fill in the Date Range and Cloud Cover

For elevation we have taken the year as 2014.
It is preferable if the cloud cover in imagery is less than 10%

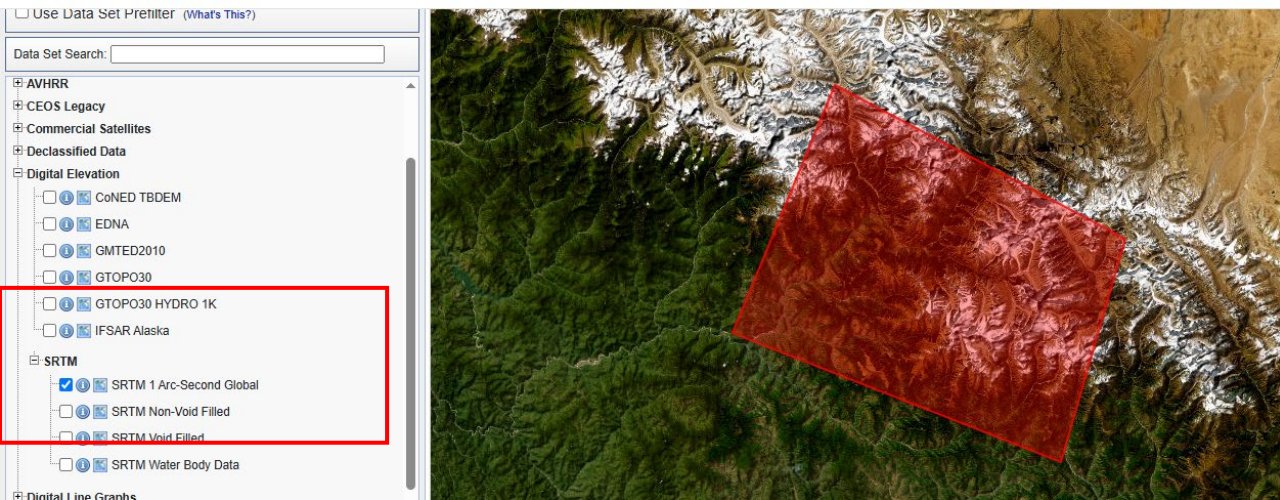


Date Range Cloud Cover Result Options

Search from: mm/dd/yyyy to: mm/dd/yyyy

Search months: (all)

Data Sets > Additional Criteria > Results >

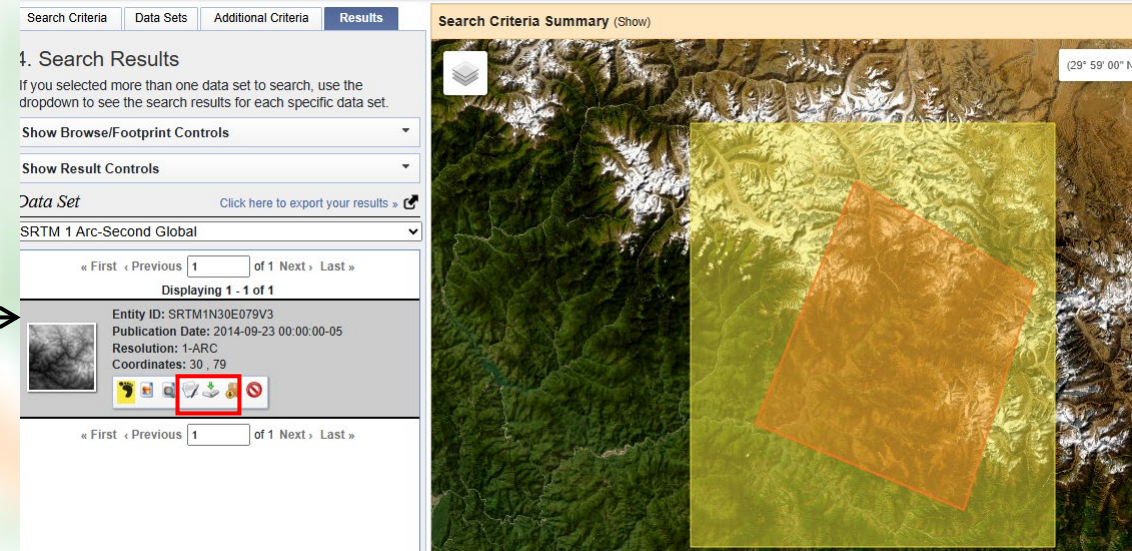


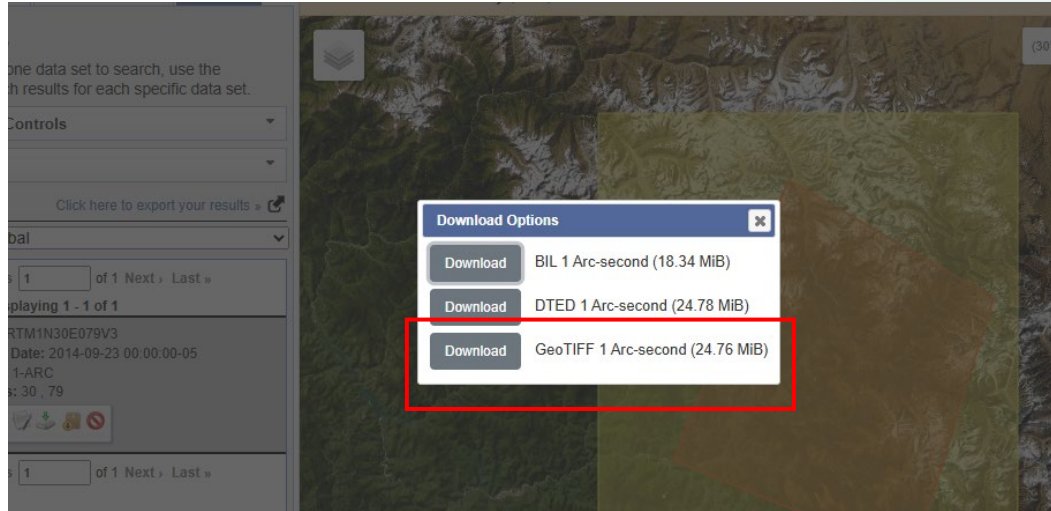
Step 3: For elevation, USGS provides SRTM data, check the “SRTM 1 Arc-Second Global” Option in the list

Step 4: The footprint option allows you a visual representation of the area the imagery covers.

Select the imagery that covers your study area completely.

Sometimes, you might need to download more than 1 imagery to cover your study area.

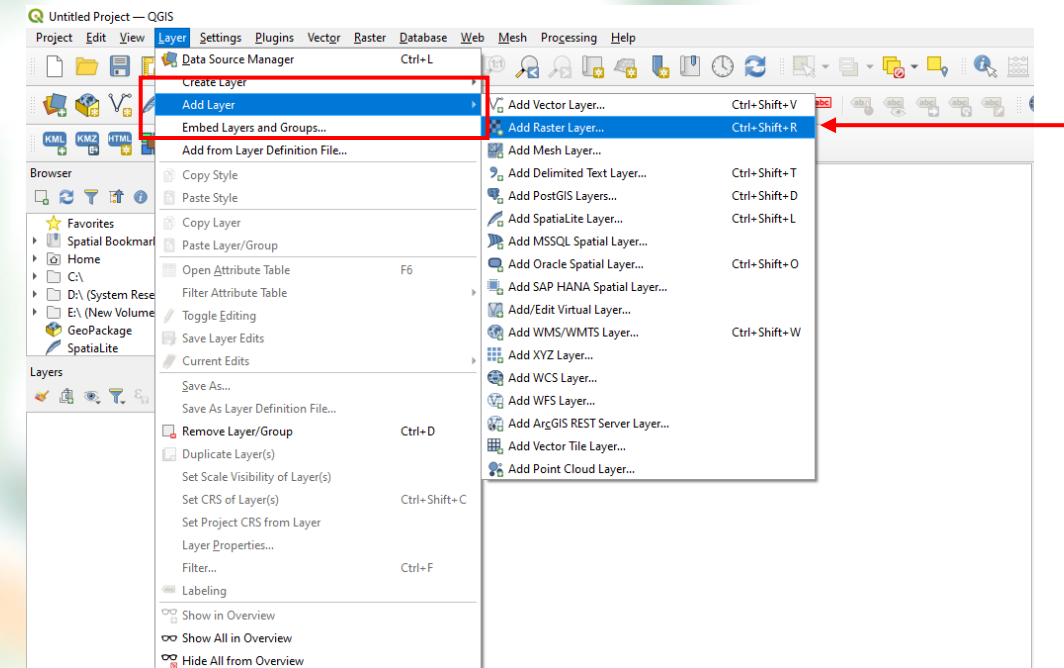


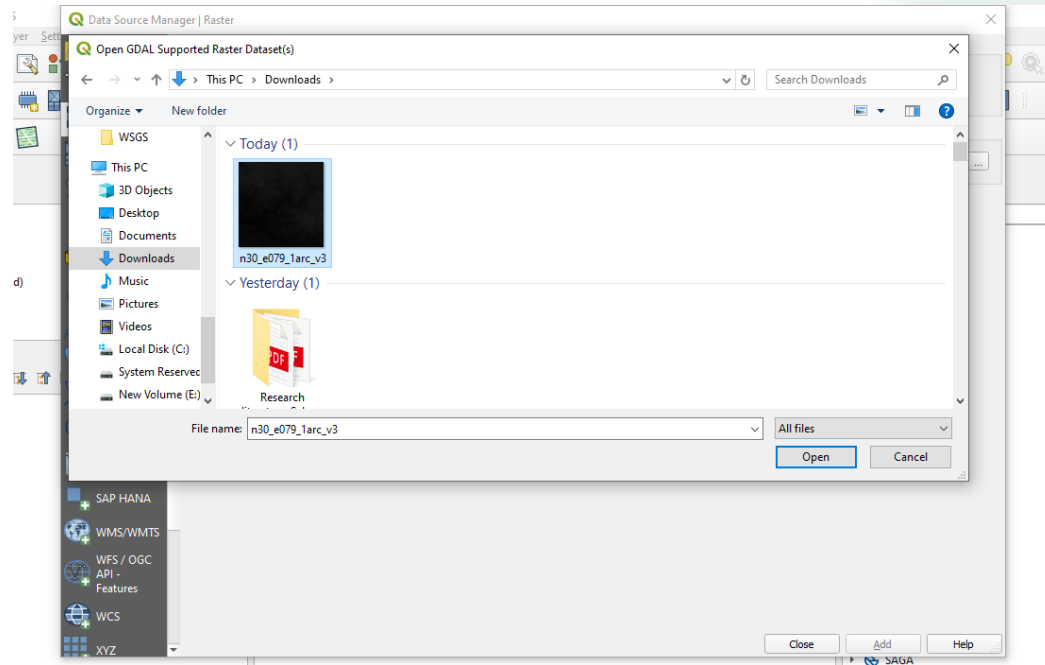


Step 5: Click on the download Icon and select the last option “GeoTIFF 1 Arc-second” for downloading.

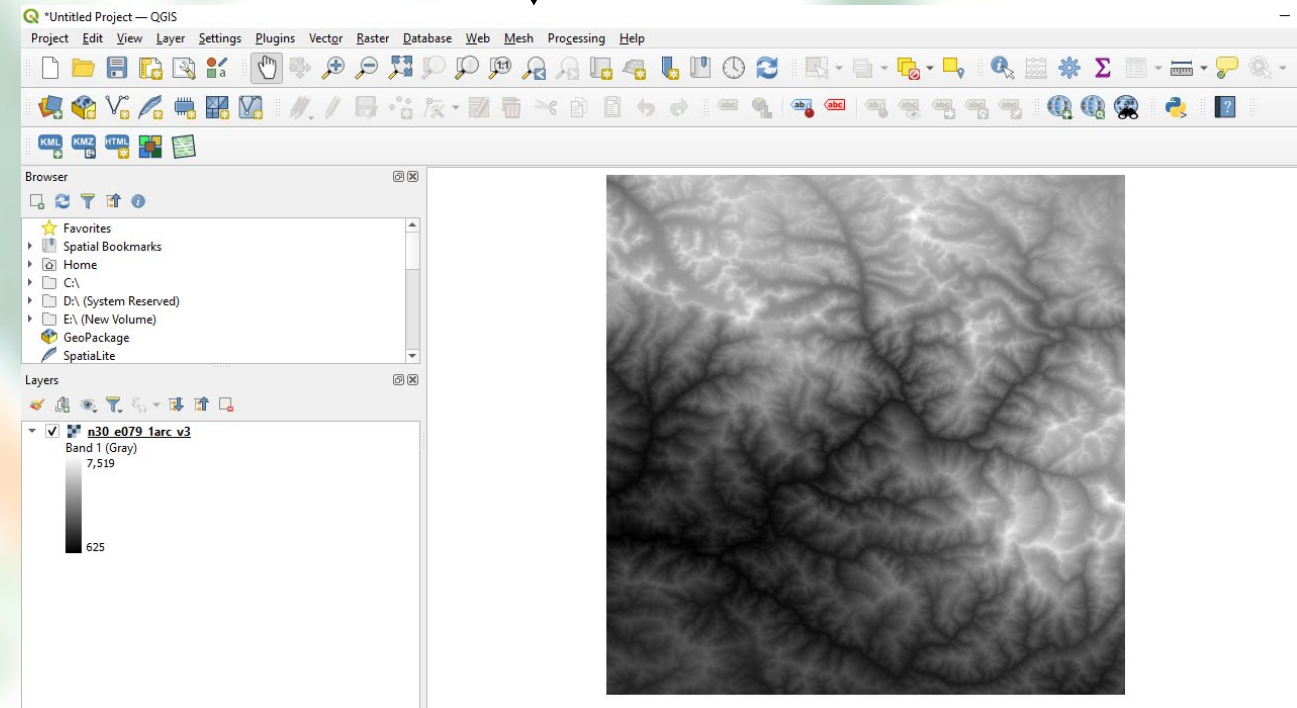
Step 6: Once the download is complete, Open the GeoTIFF file on QGIS Software.

Layer > Add Layer > Add Rater Layer





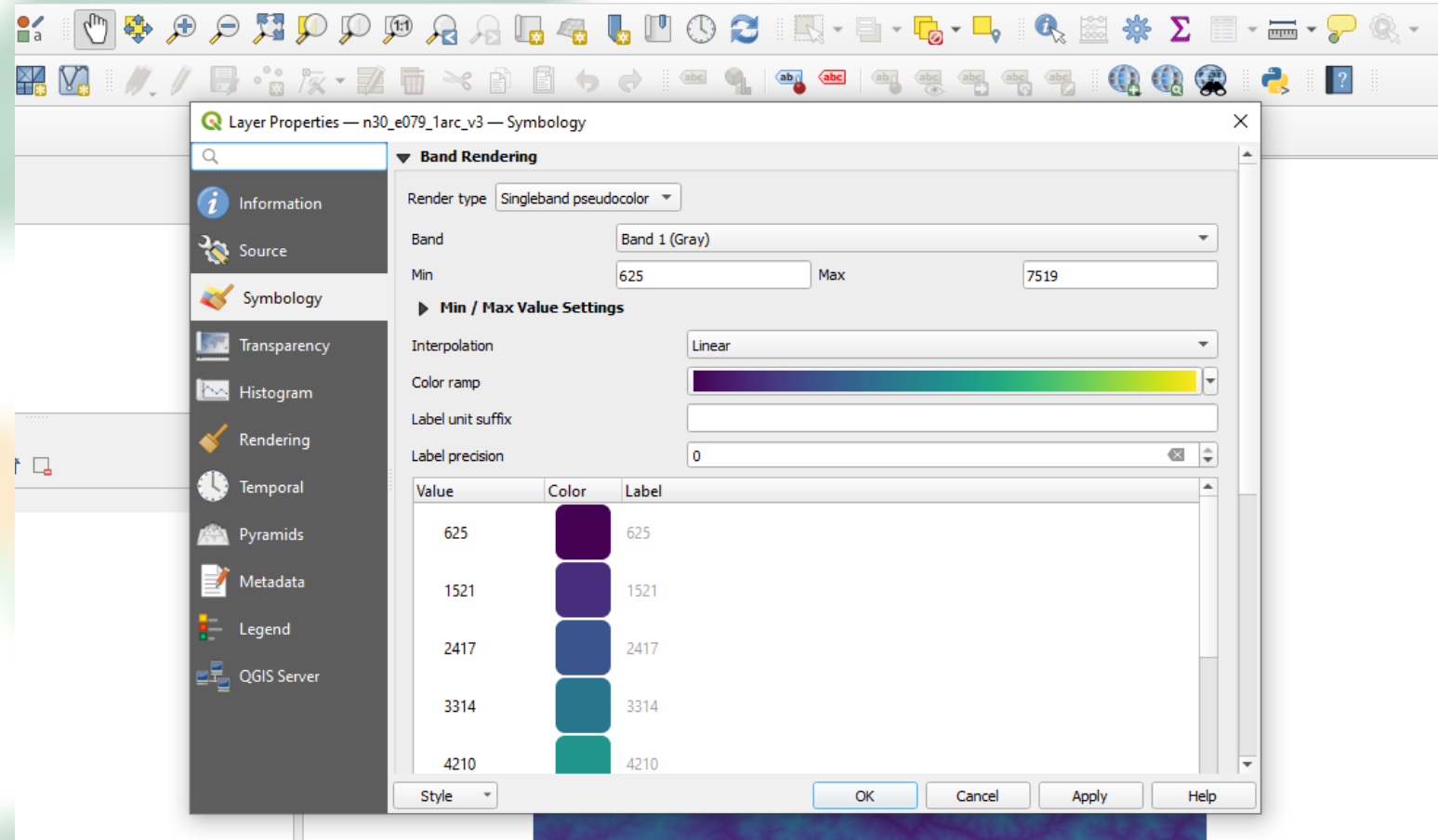
Step 7: Select the file to be opened and it will be displayed on QGIS like this:

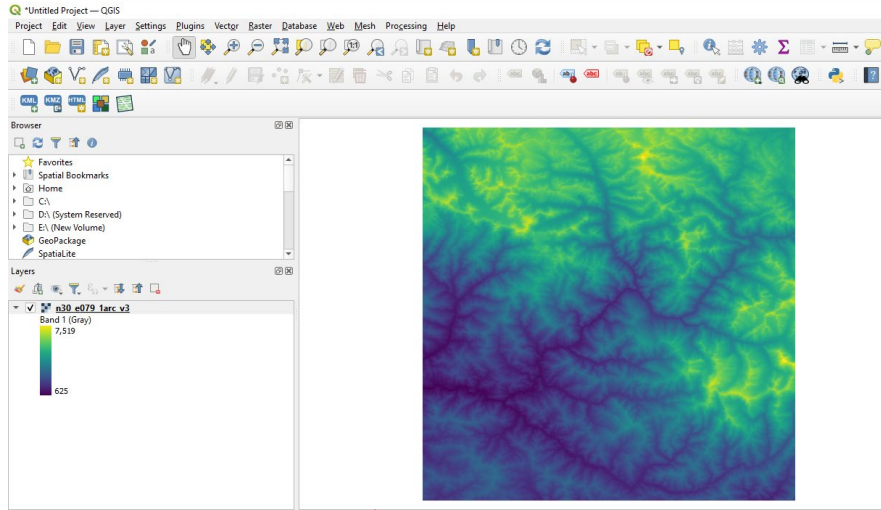


Step 8: Right click on
layer>Properties>Symbology

Step 9: Click the ‘singleband grey’
option > In the drop down, select
‘singleband pseudocolor’ > select
the color palette of your choice

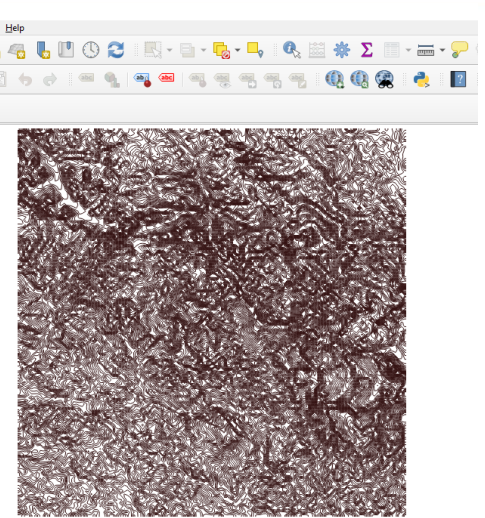
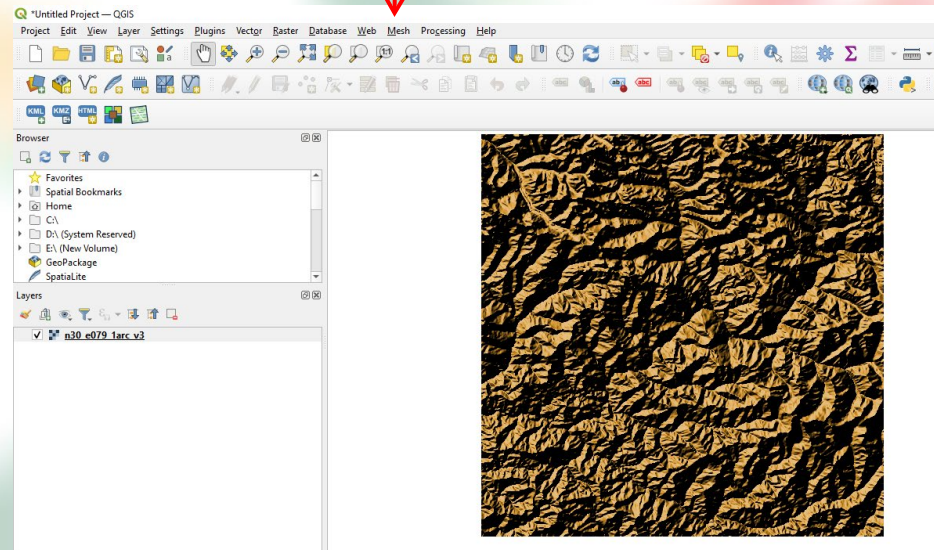
Step 10: Explore Other options of
Visual Representation of DEM,
apart from ‘Singleband
pseudocolor’





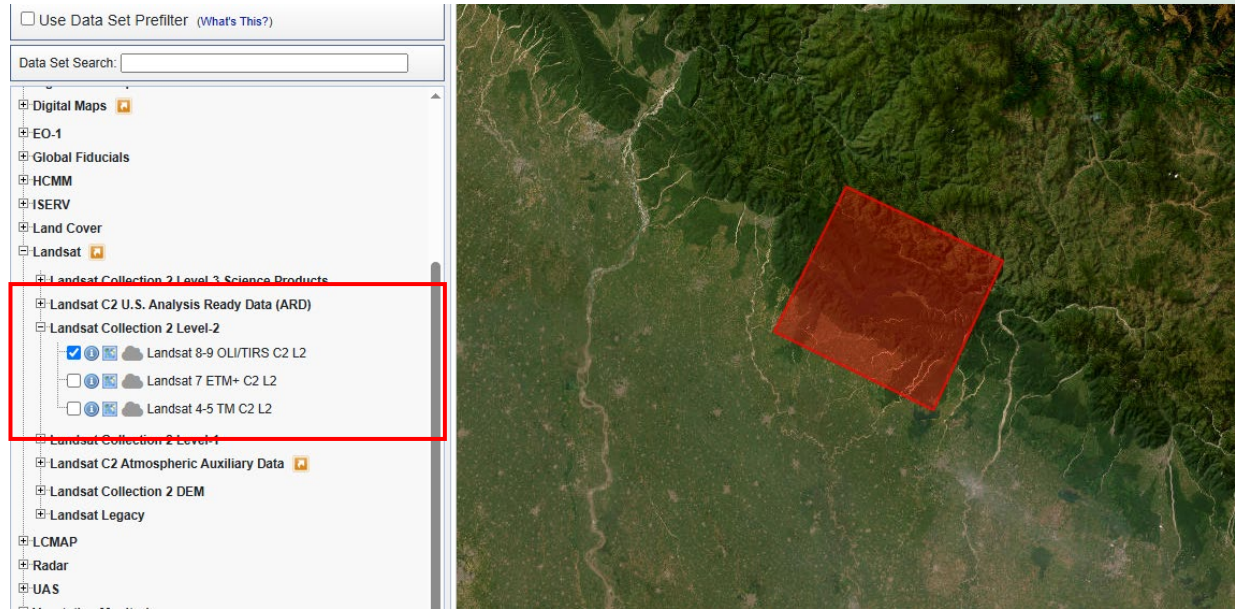
Singleband Pseudocolor

Hillshade



Contours

Data Visualization: True Color Composite and False Color Composite



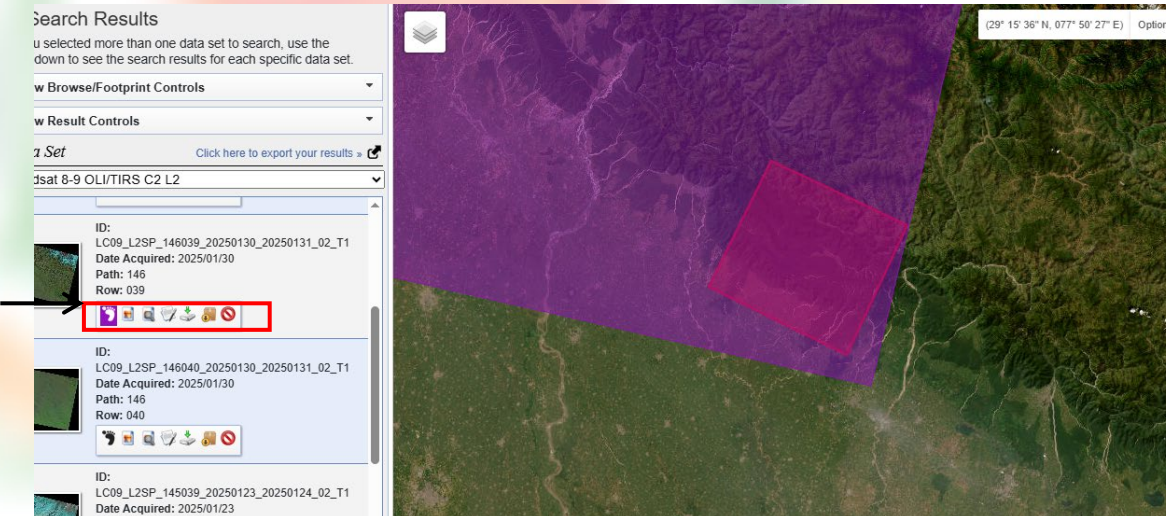
Step 1: Select Appropriate Satellite to download the imagery.

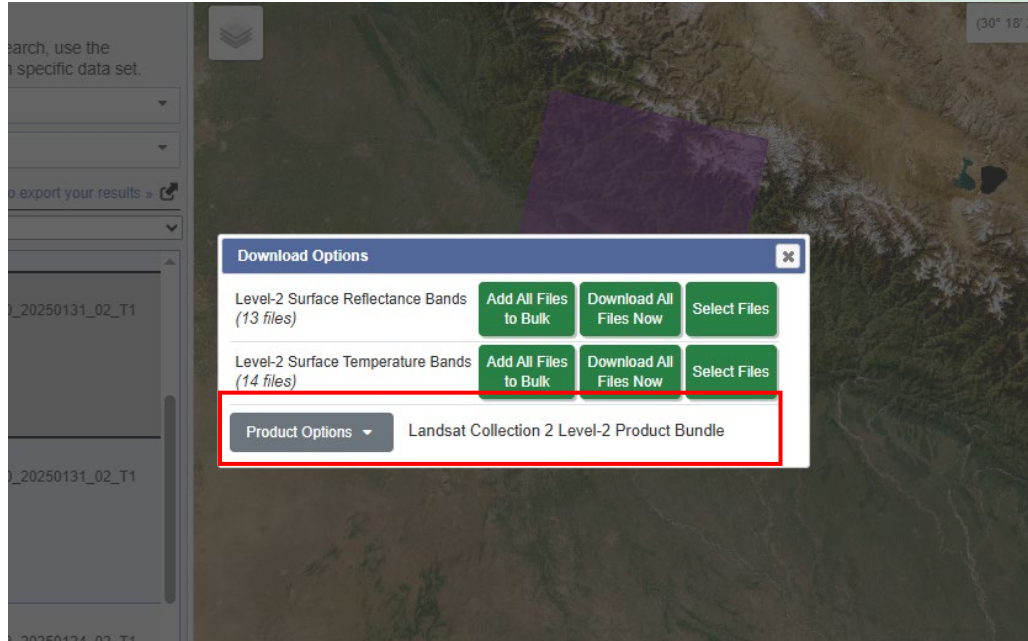
Here, we have selected **Landsat 9** Imagery for demonstration.

Step 2: The footprint option allows you a visual representation of the area the imagery covers.

Select the imagery that covers your study area completely.

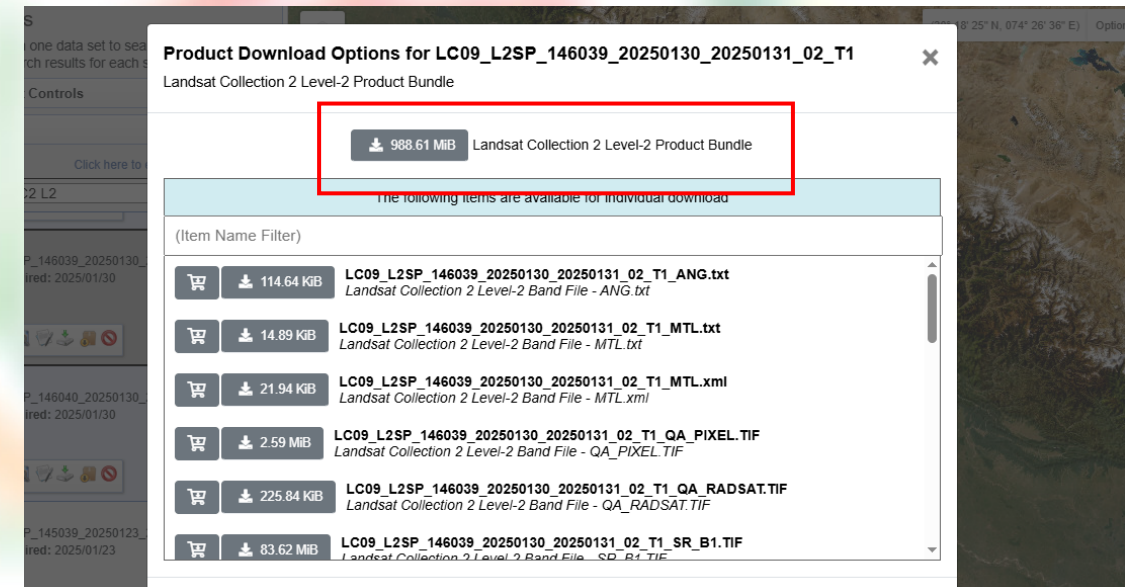
Sometimes, you might need to download more than 1 imagery to cover your study area.

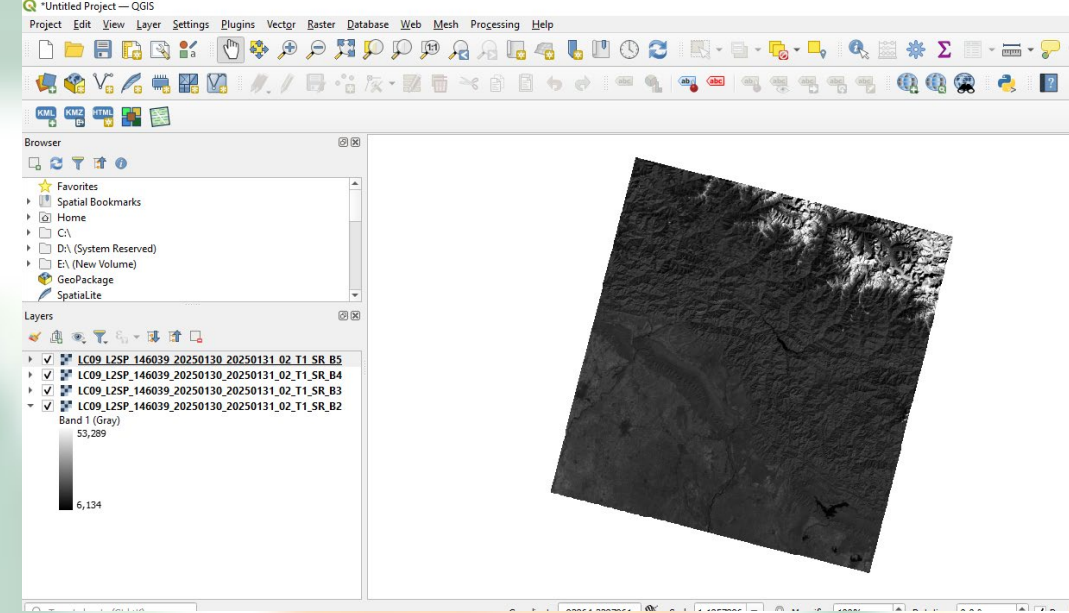
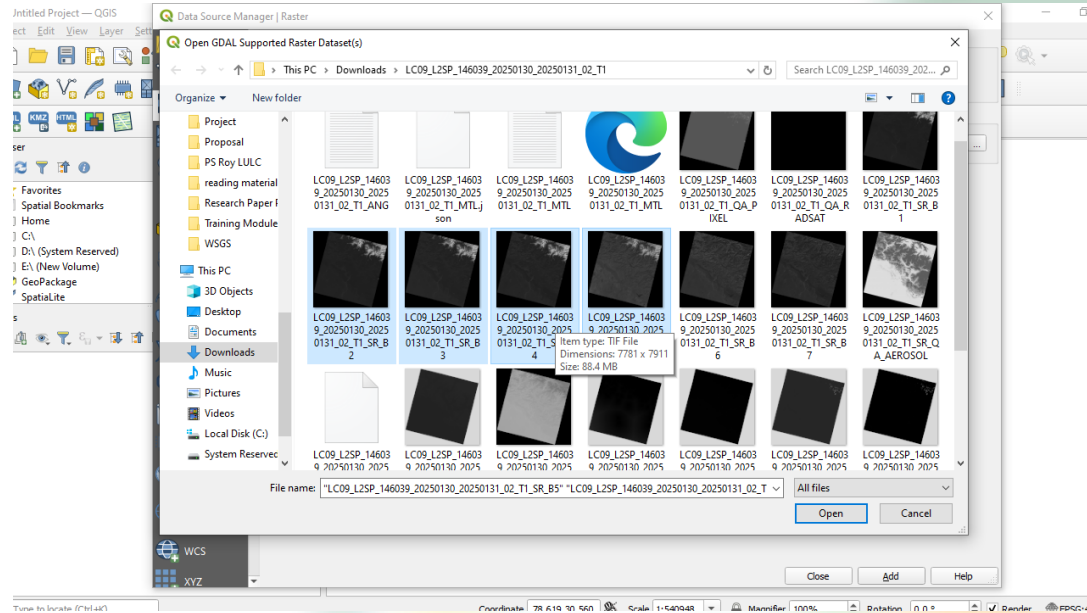




← **Step 3:** Select “Product Options”, A dialogue box will be further expanded.
Download the bundle file.

Note: Individual bands can be downloaded from the list below as per the purpose of the study .

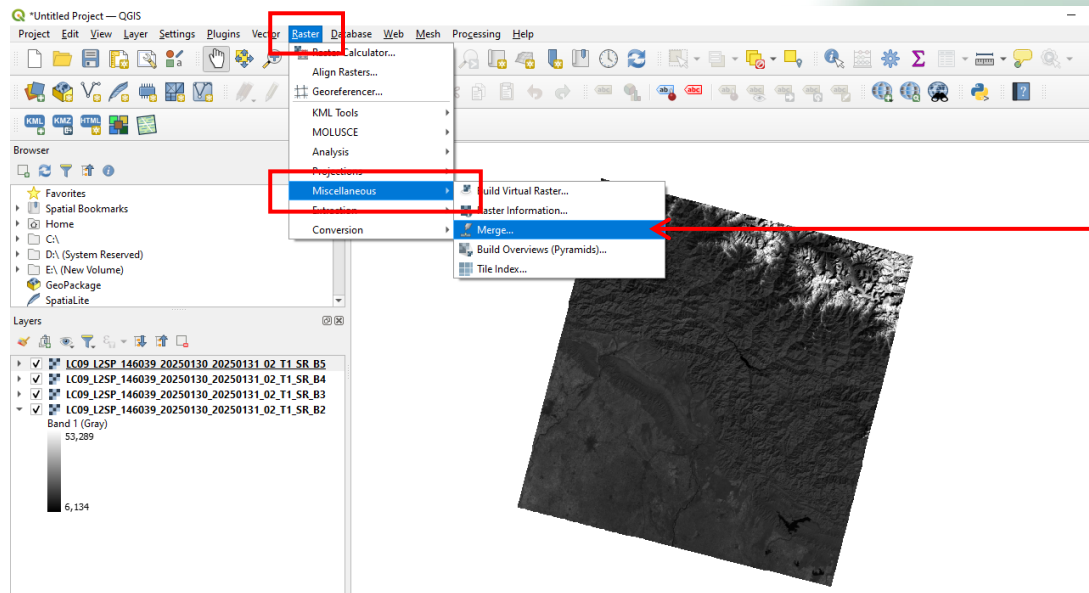




Step 4: Add Bands 2, 3, 4 and 5 to make True Color Composite and False Color Composite.

True Color Composite - A true color composite (TCC) is a satellite image created by assigning red, green, and blue (RGB) color channels to the corresponding red, green, and blue spectral bands, resulting in a visual representation of the Earth as it would appear to the human eye.

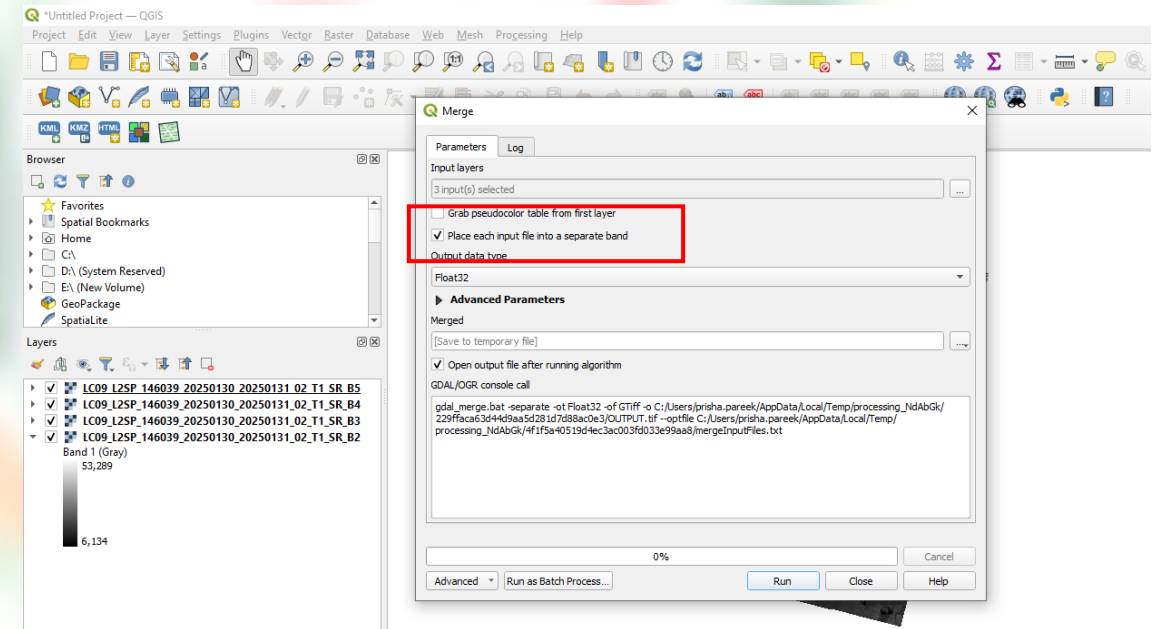
In Landsat 9: Red band is Band 4; Green band is Band 3 and Blue band is Band 2.

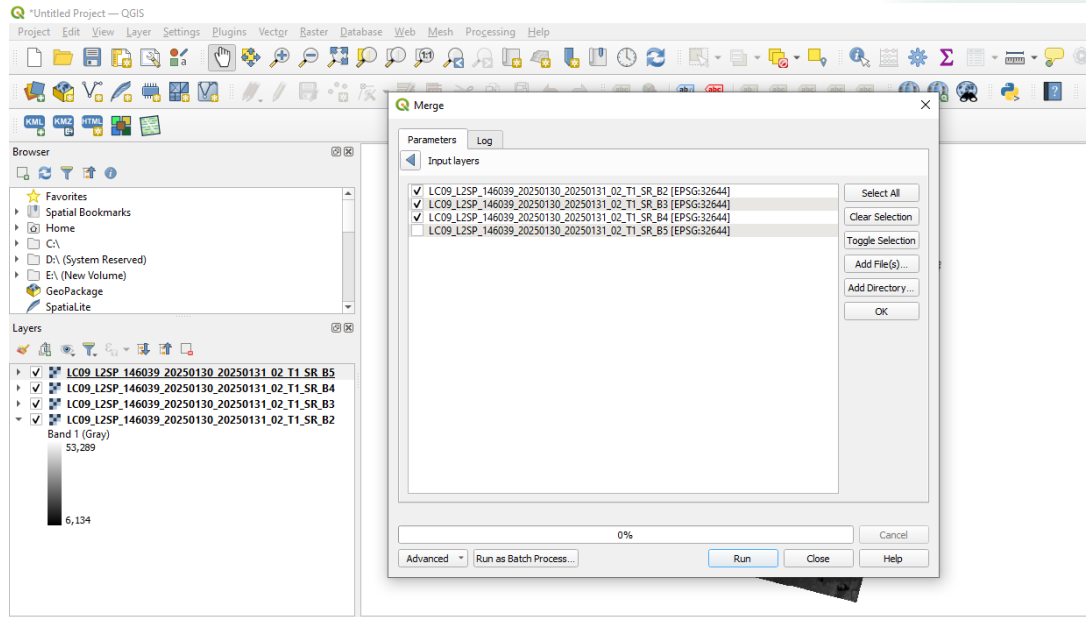


Step 5: Go to Raster > Miscellaneous > Merge

Step 6: A dialogue box will appear that will help you merge the 3 separate bands into 1.

Make sure to check the “Place each input file into separate band” option



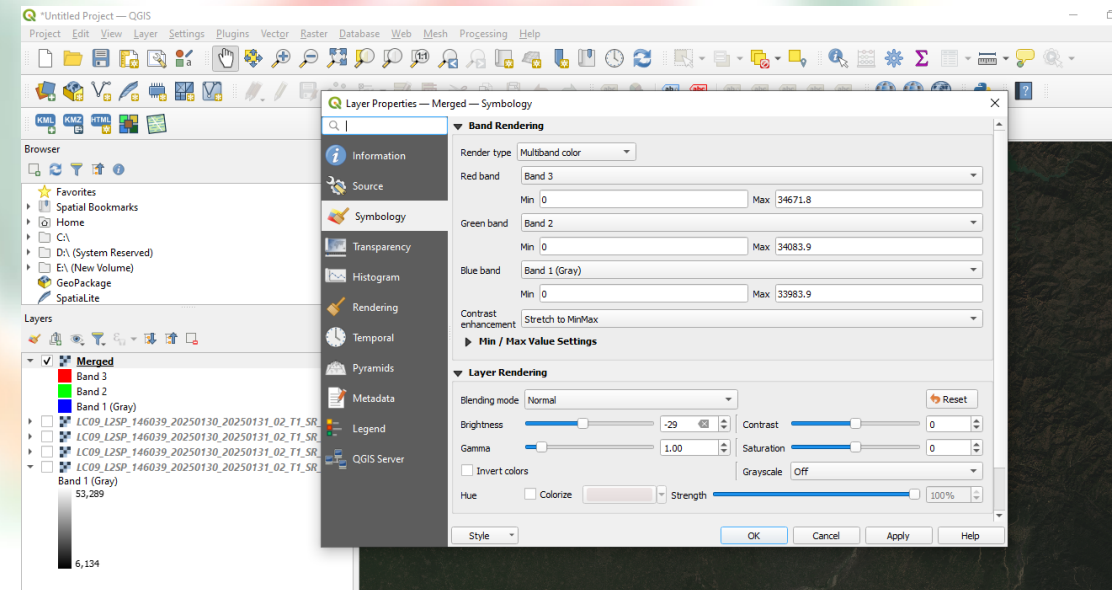


Step 7: Select the required 3 bands for the process.

And run the command.

Step 8: Right click on the newly formed layer in the “Layers” column and select properties.

A dialogue box will appear. Select “Multiband color” in render type. Change the sequence of the bands as shown in the image.



•Vegetation:

•Healthy vegetation usually appears green, while unhealthy or stressed vegetation may appear brown or yellow.

•Water:

•Water bodies typically appear blue to black. Clear water might appear darker, while turbid or shallow water might appear lighter in color.

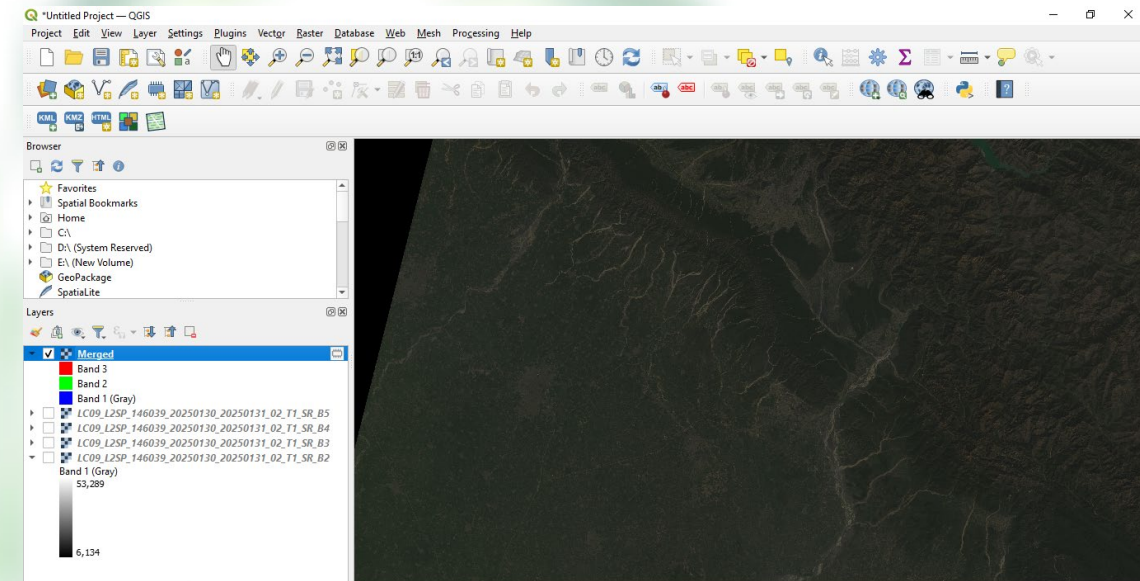
•Land:

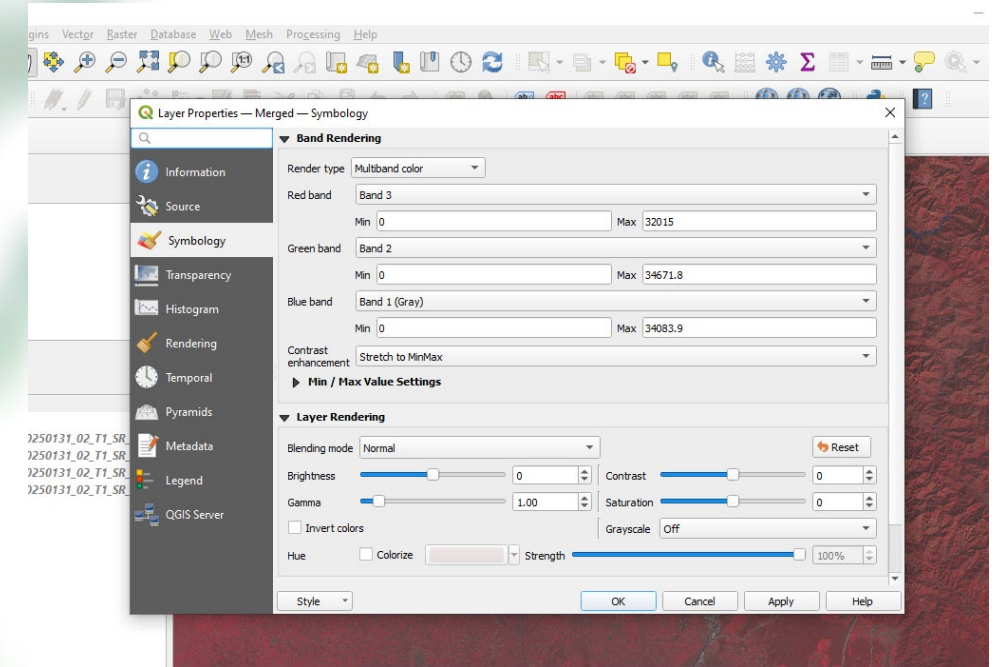
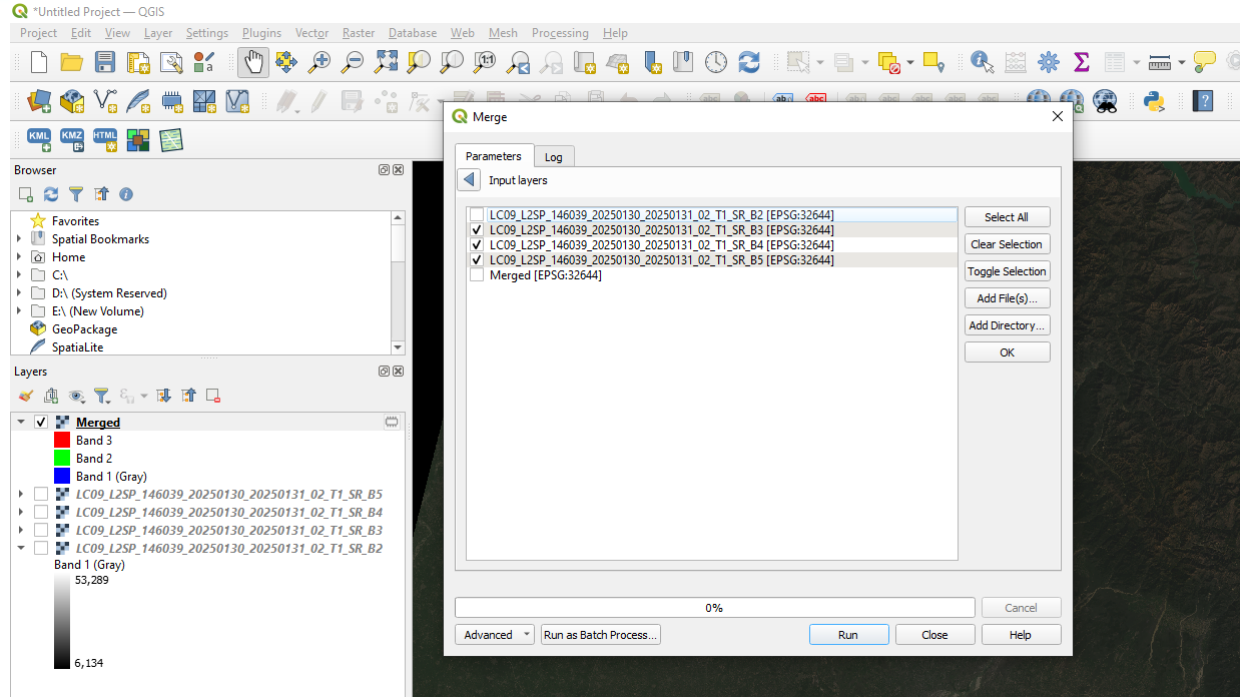
•Bare ground and impervious surfaces (roads, buildings) appear in shades of gray, brown, or tan.

•Other Features:

•Depending on the specific satellite and sensor, other features like snow or ice can appear in distinct colors within the TCC.

Interpretation of True Color Composite





False Color Composite: A false color composite (FCC) is a multispectral image where the red, green, and blue channels represent bands of the electromagnetic spectrum other than the visible red, green, and blue, allowing visualization of features not easily seen in natural color images. Here, we will be using Near Infrared (NIR), Red and Green.

In Landsat 9: NIR band is Band 5; Red band is Band 4 and Green band is Band 3.

Vegetation:

- Red : Healthy, dense vegetation often appears in shades of red in FCCs because of high reflectance in the near-infrared (NIR) region.
- Brown: Areas with sparse vegetation or deciduous trees might appear brown.

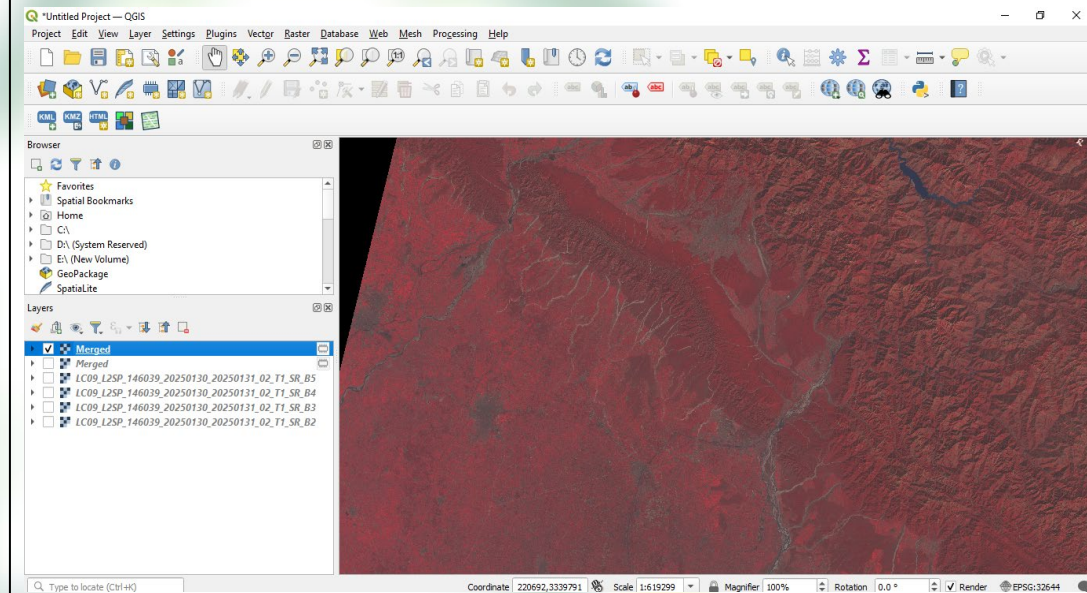
Water:

- Black or Dark Blue: Clear water often appears as dark blue or even black.
- Light Blue: Turbid or shallow water may appear as light blue or even turquoise.

Built-up Areas:

- Dark Blue to Bluish-Green: High-density built-up areas can appear as dark blue to bluish-green.
- Light Blue: Low-density built-up areas may show up in light blue.

Interpretation of False Color Composite



Additional Resources:

- SRTM - <https://www.usgs.gov/centers/eros/science/usgs-eros-archive-digital-elevation-shuttle-radar-topography-mission-srtm-1>
- TCC & FCC Sentinel – 2 - <https://custom-scripts.sentinel-hub.com/custom-scripts/sentinel-2/composites/>
- TCC & FCC Landsat Series - https://gsp.humboldt.edu/olm/Courses/GSP_216/lessons/composites.html