

Downloading Satellite Imagery

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There are many kinds of information from satellites that can be helpful for different things. It's important for people to know which satellite data to get for their specific needs. One of the primary considerations is the spatial resolution which provides information about how clear objects on the ground can be imaged. High spatial resolutions will be able to image smaller objects well, but will increase computational requirement if the analysis is to be performed over a large area. In contrast, coarse spatial resolution datasets can provide large scale (country-level or global-level) datasets which can be analysed with minimal computational requirements, but they fail to identify objects smaller than a few hundred metres. To understand the difference between resolutions, see the below figure.



Figure: On the left is a Cartosat image which is a very high resolution image that provides a great level of detail. The second image is a medium resolution image which provides some information but the clarity is poor. The third image is a coarse resolution image with very few details depicted.

Below, we categorize satellite datasets based on their spatial resolution and highlight some of the applications they can be used for.

	High resolution	Medium Resolution	Coarse Resolution
Spatial Resolution	<5 m/pixel	5-100 m/pixel	>100 m/pixel
Applications	<ul style="list-style-type: none">- Cadastral mapping- Urban planning- Precision agriculture- Disaster management	<ul style="list-style-type: none">- District level agricultural statistics- Natural resource mapping- Disaster risk reduction- District to state level land cover studies	<ul style="list-style-type: none">- Ocean monitoring- Atmospheric studies- Global land cover studies
Examples of Indian satellites	Cartosat 1, 2 ,3 series	Linear Imaging Self Scanning Sensor (LISS) III at 23.5m/pixel, LISS IV at 5.8m/pixel, AWIFS at 56m/pixel	Ocean Colour Monitor, INSAT 3D

Examples of Global satellites	Skysat, Planetscope, SPOT, WorldView	Sentinel -2 series, Landsat series, ASTER	MODIS
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In the next section, we demonstrate how some of the Indian datasets can be downloaded from the Bhoonidhi portal. In the final section, we detail the procedure for downloading datasets using the Earth Explorer Portal.

Downloading satellite datasets using ISRO's Bhoonidhi Portal

Below, we detail the steps to access coarse resolution OCM-2 datasets. The OCM dataset is freely available to Indian users and can be accessed from the ISRO Bhoonidhi platform

1. The Bhoonidhi portal of ISRO can be accessed at <https://bhoonidhi.nrsc.gov.in/>. The landing page appears as follows:



2. Click on Bhoonidhi Browse and Order (outlined in red above) to be redirected to the following webpage:



3. Login to the portal. If you do not have a login ID, sign up and create your login ID by filling out the information requested.

Sign In

[Login](#)

Don't have an account? [Sign Up](#)
 Forgot your password?

[HOME](#)

4. See the figure below:

Explore Archives PI Actions Utilities

Search-Criteria Search-Results Cart

(a) Area of Interest ☒

Location

Polygon

Shapefile

(b) ☒ Existing Shapefile ☐ User Shapefile

Shapefile **(c)**

(d)

Map Sheet

Events

Date range

(e)

Product

Application

Theme

Application

Satellite-Sensor

Resolution

Source

(g) ☒ Open_Data

☐ JPSS1_VIIRS_Level-1_Day-Night

☐ JPSS1_VIIRS_Level-1_Imagery

☐ JPSS1_VIIRS_Level-1_Moderate

(h) ☒ OceanSat-2_OCM(GAC)_L1C

☐ Suomi-NPP_VIIRS_Level-1_Day-Night

☐ Suomi-NPP_VIIRS_Level-1_Imagery

☐ Suomi-NPP_VIIRS_Level-1_Moderate

☐ Priced

(f)

Advanced Filters ☐

(j)

Tell Us What You Think!

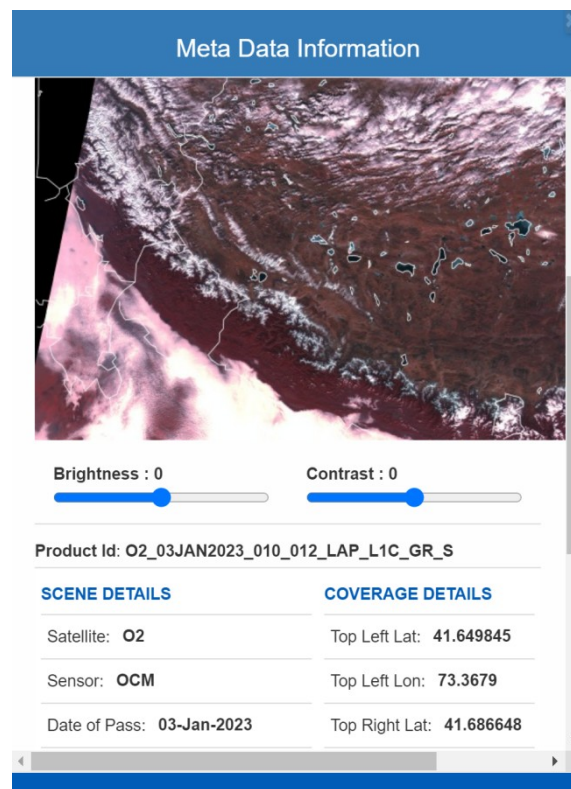
Once you are logged in, you can fill out the required information columns on the left to access the satellite data of your interest. We are demonstrating the example of coarse resolution dataset OCM for East Sikkim and the dates 1 January 2023 to 1 March 2023. Perform the following steps for this:

- a. Click on shapefile
 - b. Click on existing shapefile
 - c. Choose your desired district from the drop down
 - d. Click on the location icon
 - e. Choose the desired dates
 - f. Set resolution to coarse resolution
 - g. Set source as Optical
 - h. Check the box priced and select LISS III BOA
 - i. Click Submit
5. A list of images available appears.

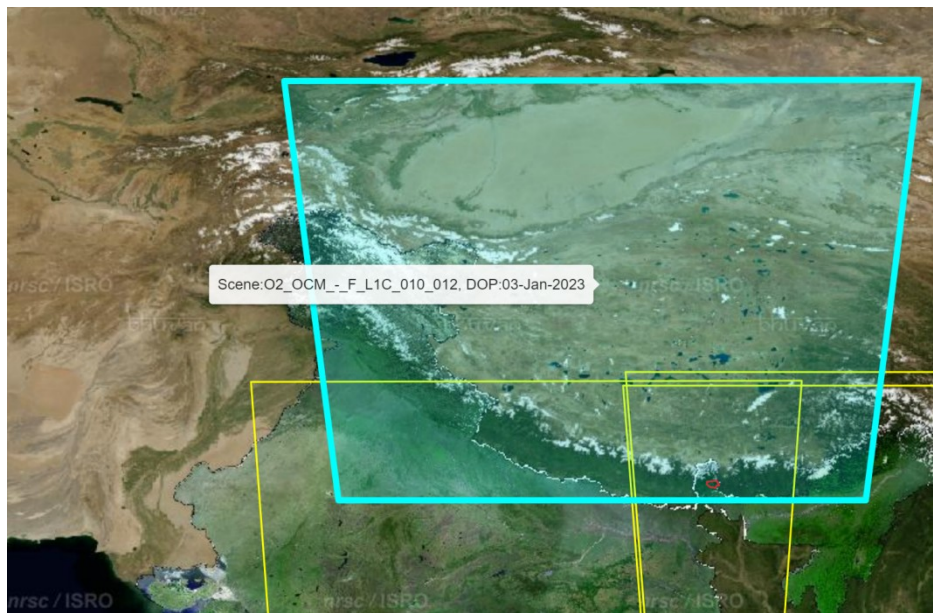


There are a few icons next to the images which are explained as follows:

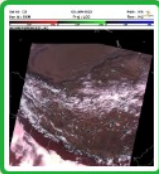
- a. Metadata view button: On clicking this button, a pop up with a view of the image as well as the information about the image such as satellite, sensor, date and time of acquisition etc appears.







- b. Image extents: This button will depict on the map window the boundary of the image selected. The boundary appears in cyan colour. The yellow boundaries are the boundaries of the other images in the list.



- c. Publish on map: This button is used to display the satellite image in the map view. Using this, we can check if the area of our interest is visible in the selected satellite image or no. This option is deactivated for OCM
- d. Add to cart: This option is to add the image to cart for download. Upon selecting this button, a notification specifying added to open data cart appears.



Sat_Sen: O2_OCM_-_F_L1C
Scene: 010_012
Dop: 03-Jan-2023
Pricing: Open_Data
Added to open data cart

6. Finally, to download the image, perform the following steps:
- Select the Cart tab
 - Click on confirm to download

Open Priced

Off the shelf Cart

Cart Date: 04 October 2023

Show: 20 Filter Results

Search ID (SID) to be used in Batch Downloader tool

	Sat_Sen: O2_OCM_-_F_L1C Scene: 011_012 Dop: 01-Jan-2023 SID: 20231004_000036277	
	Sat_Sen: O2_OCM_-_F_L1C Scene: 010_012 Dop: 03-Jan-2023 SID: 20231004_000036277	

Showing 1 to 2 of 2 entries Previous 1 Next

Confirm

- c. The download button turns green once confirmed. Click on the download option. The file will automatically start download.

Sat_Sen: O2_OCM_-_F_L1C
Scene: 010_012
Dop: 03-Jan-2023
SID: 20231004_000036277

Downloading satellite datasets using Earth Explorer Portal

In addition to the reflected energy, several additional data products can be derived using satellites. This includes elevation, temperature, precipitation, land cover maps etc. In this exercise, we will download the elevation datasets from the United States Geological Survey's Earth Explorer portal.

1. Type <https://earthexplorer.usgs.gov/> to get:

USGS science for a changing world

EarthExplorer Help Feedback Login

Search Criteria Data Sets Additional Criteria Results

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

Polygon Circle Predefined Area

Degree/Minute/Second Decimal

Search Criteria Summary (Show) Clear Search Criteria

Map showing the United States with search coordinates (42° 47' 57" N, 099° 18' 19" W) and various place names.

2. Login to the portal using your credentials. If you don't have a login ID, please create a login ID using the signup form.

Sign In

— sign in with your existing USGS registered username and password —

ritu.anilkumar@gmail.com

.....

[forgot password?](#)

3. Once you are signed in, perform the following steps:
 - a. in the map window, zoom in to the location of your interest and click on the map to drop points to demarcate your study area.
 - b. You may also add dates of your interest by clicking the calendar option
 - c. Click on data sets to choose which satellite data you wish to download.

The screenshot shows the EarthExplorer web application. On the left is a sidebar with search criteria options. The main area is a map of a mountainous region. Three red callout boxes with arrows point to specific features: (a) points to a red-shaded polygon on the map; (b) points to the 'Date Range' section in the sidebar; (c) points to the 'Data Sets' button at the bottom of the sidebar. The top of the page has navigation links like 'Manage Criteria', 'Item Basket', 'Help', 'Feedback', and 'Logout'. The bottom of the map area has a disclaimer: 'The provided maps are for informational purposes only and are not owned or managed by the USGS.'

(a) Click on the map to demarcate the

(b) Select the date range of

(c) Click on data

4. Once you have selected data sets, scroll to digital elevation and select SRTM.

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:

- ☒ Commercial Satellites
- ☒ Declassified Data
- ☒ Digital Elevation
 - ☐ CoNED TBDEM
 - ☐ EDNA
 - ☐ GMTED2010
 - ☐ GTOPO30
 - ☐ GTOPO30 HYDRO 1K
 - ☐ IFSAR Alaska
 - ☒ SRTM
 - ☐ SRTM 1 Arc-Second Global
 - ☐ SRTM Non-Void Filled
 - ☒ SRTM Void Filled
 - ☐ SRTM Water Body Data
- ☒ Digital Line Graphs
- ☒ Digital Maps
- ☒ EO-1

5. Click on results to view available data that satisfies the criteria

6. The available images are listed:



Entity ID: SRTM3N27E088V2

Publication Date: 2012-10-01 00:00:00-05

Resolution: 3-ARC

Coordinates: 27 , 88









7. To download the image, click on the  icon. A popup appears as below:

Download Options

Download

BIL 3 Arc-second (1.91 MiB)

Download

DTED 3 Arc-second (2.77 MiB)

Download

GeoTIFF 3 Arc-second (2.76 MiB)

8. Choose the geotiff file and click download. The file will be downloaded.
