

Hands-on Session: CMBhatt; CSSTEAP/IIRS

Open Source Data Access for Floods Disasters

Learning Objectives:

- Analyze open source disaster USGS portal for SRTM DEM; Landsat data; EOSDIS portal for flood disaster

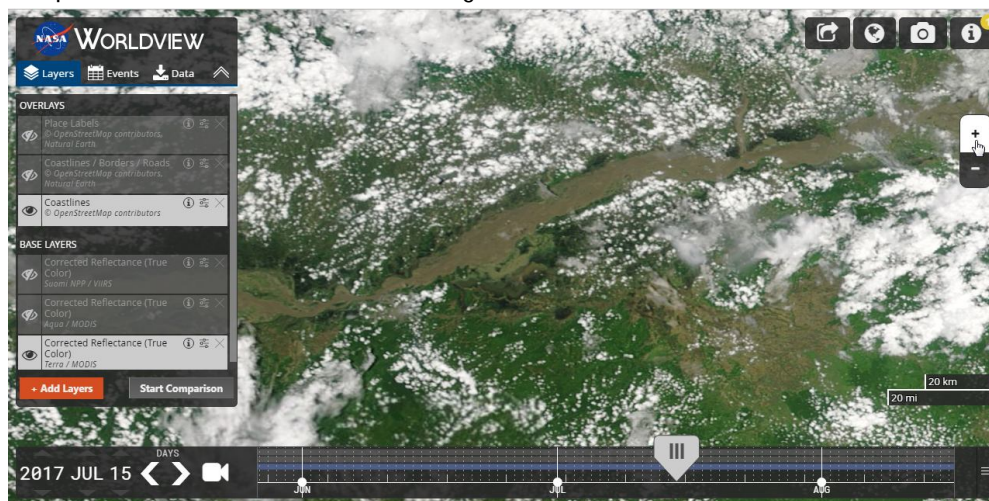
Handson-1: Accessing EOSDIS Worldview

1. Click on <https://worldview.earthdata.nasa.gov/>

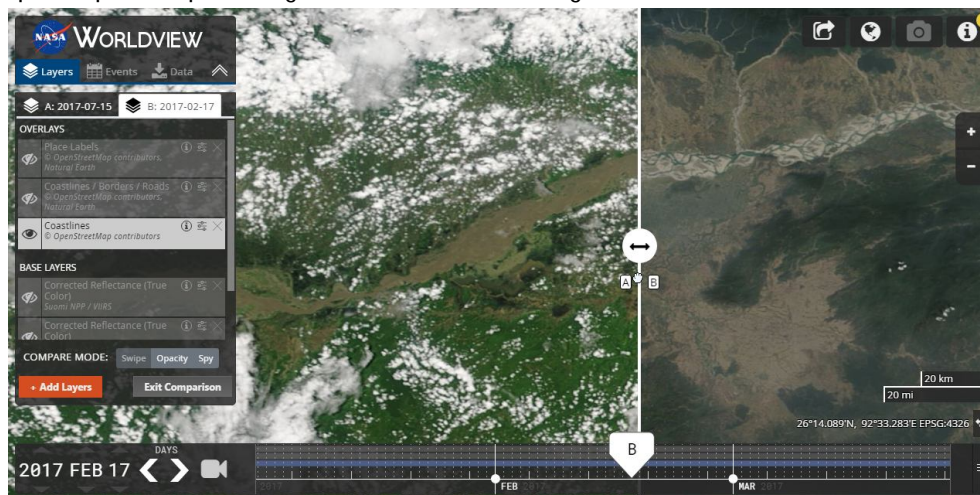
This app from NASA's EOSDIS provides the capability to interactively browse over 800 global, full-resolution satellite imagery layers and then download the underlying data. Many of the available imagery layers are updated within three hours of observation, essentially showing the entire Earth as it looks "right now". This supports time-critical application areas such as wildfire management, air quality measurements, and flood monitoring. Arctic and Antarctic views of many products are also available for a "full globe" perspective. Browsing on tablet and smartphone devices is generally supported for mobile access to the imagery.

Worldview uses the Global Imagery Browse Services to rapidly retrieve its imagery for an interactive browsing experience. While Worldview uses OpenLayers as its mapping library, GIBS imagery can also be accessed from Google Earth, NASA World Wind, and several other clients. We encourage interested developers to build their own clients or integrate NASA imagery into their existing ones using these services.

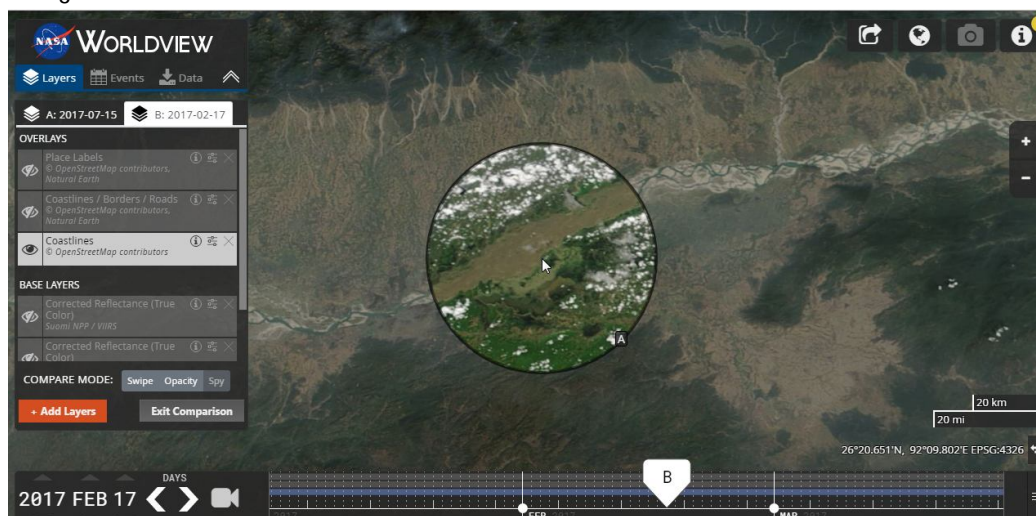
2. Pan and zoom to India/Assam Area→Define Pre-Image 15-July-2017 & Click on Start Comparison at bottom→Define Post Image 26-Feb-2017



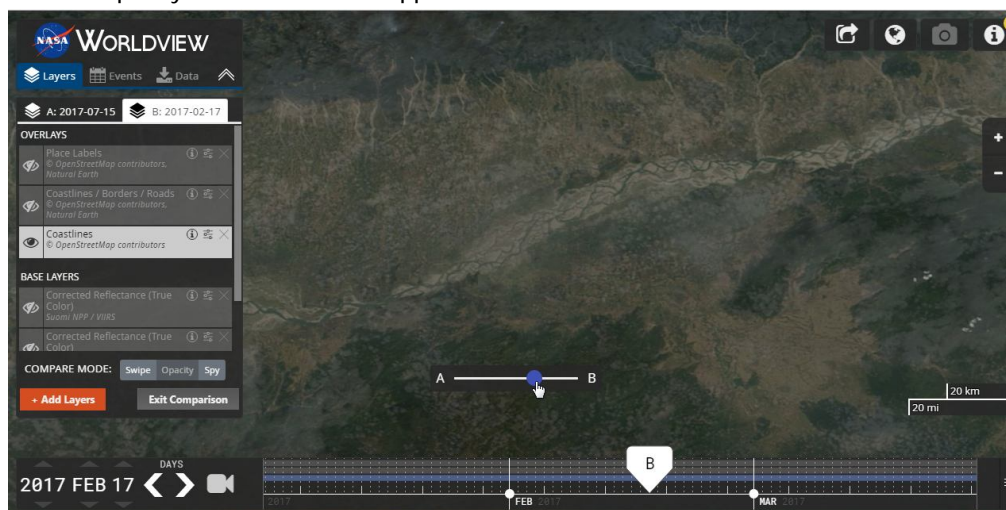
3. Swipe the pre and post images and observe the changes



4. Click on Spy option on Bottom under Compare Mode. Observe Spy mode for pre and post changes

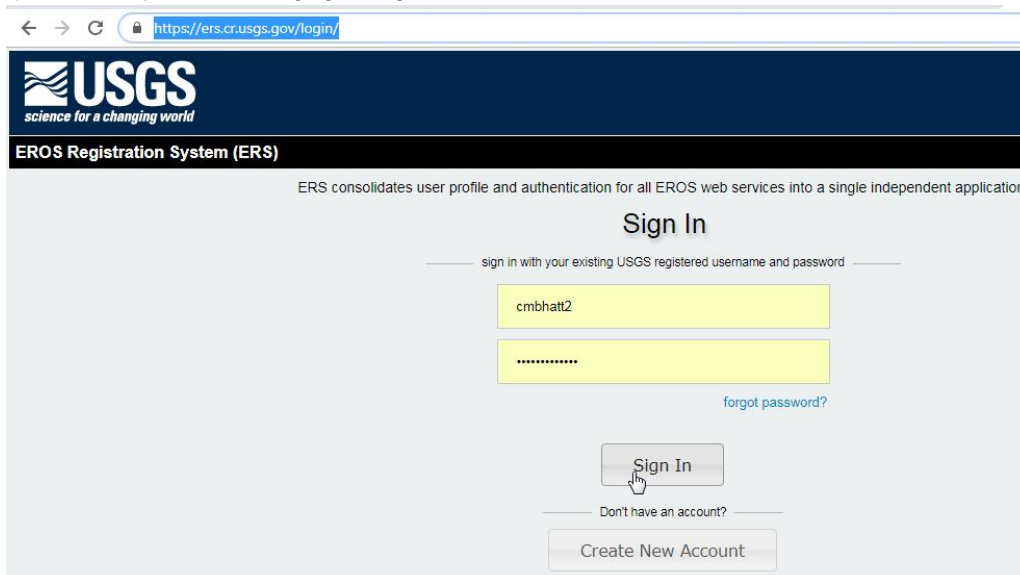


5. Click on Opacity mode and see its application

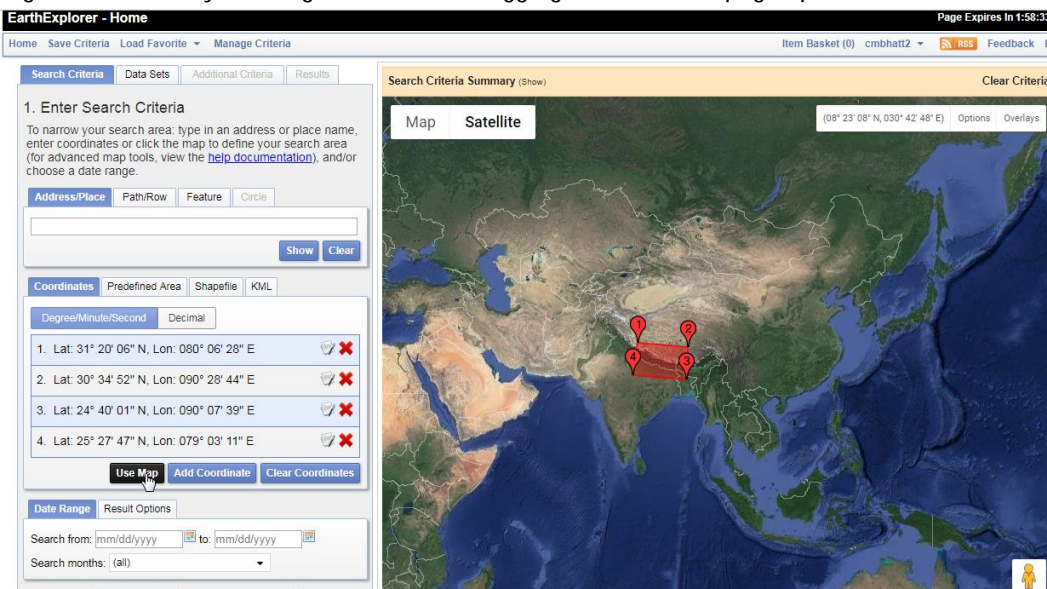


Handson -2: Accessing SRTM Elevation Data

1. Open link <https://ers.cr.usgs.gov/login/>



2. Login to the site, by creating new account. Logging below shown page opens



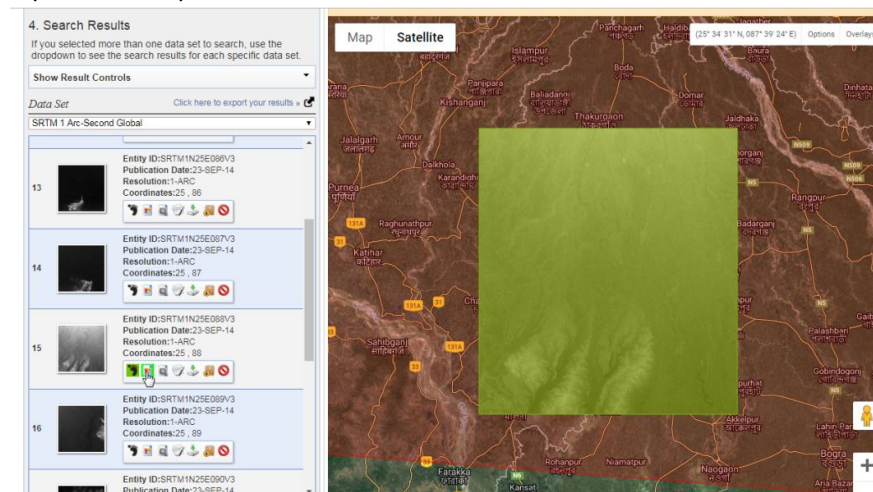
3. Click on Search Criteria First Tab→Click on Use Map Option→ To select the area of interest→Click on four points to define your area
4. There are many other options for defining area of interest using coordinates, shape file etc. please explore



5. Next click on Datasets Tab on top→of the datasets opened on left panel move to Digital Elevation→Click on SRTM→Select SRTM 1 Arc Second Global data→Click on Search Tab at bottom.

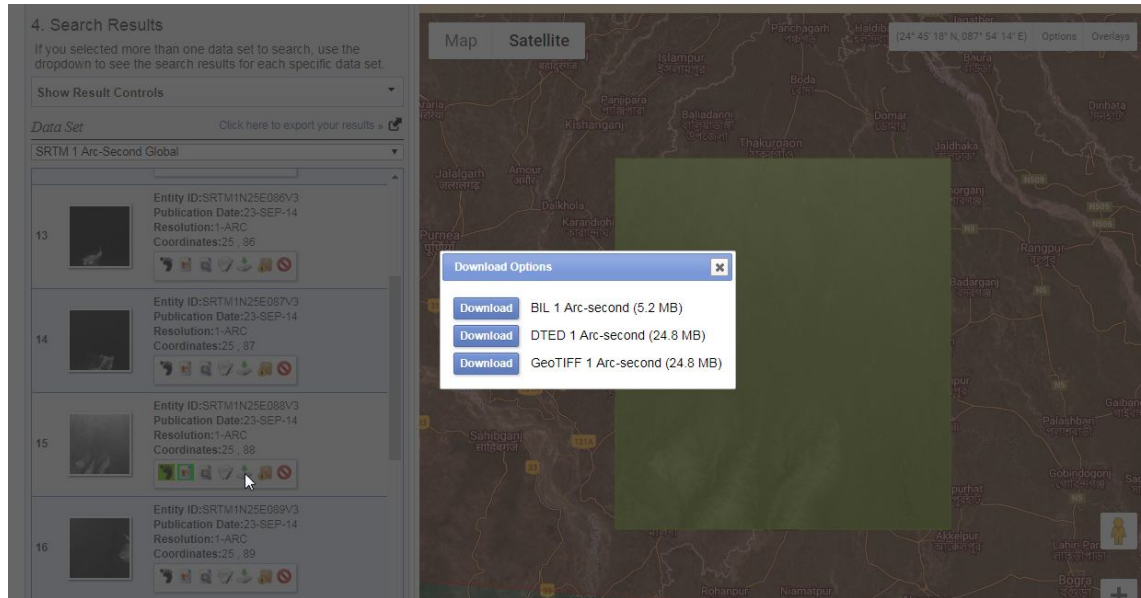
Shuttle Radar Topography Mission (SRTM) was flown aboard the space shuttle *Endeavour* February 11-22, 2000. The radars used during the SRTM mission were actually developed and flown on two *Endeavour* missions in 1994. The C-band Spaceborne Imaging Radar and the X-Band Synthetic Aperture Radar (X-SAR) hardware were used on board the space shuttle in April and October 1994 to gather data about Earth's environment. The interferometric radar technology was used for the SRTM mission to collect data, which compared two radar images or signals taken at slightly different angles. This mission used single-pass interferometry, which acquired two signals at the same time by using two different radar antennas. An antenna located on board the space shuttle collected one data set and the other data set was collected by an antenna located at the end of a 60-meter mast that extended from the shuttle. Differences between the two signals allowed for the calculation of surface elevation. *Endeavour* orbited Earth 16 times each day during the 11-day mission, completing 176 orbits. SRTM successfully collected radar data over 80% of the Earth's land surface between 60° north and 56° south latitude with data points posted every 1 arc-second (approximately 30 meters).

6. Explore the output tiles of SRTM DEM obtained from Search.

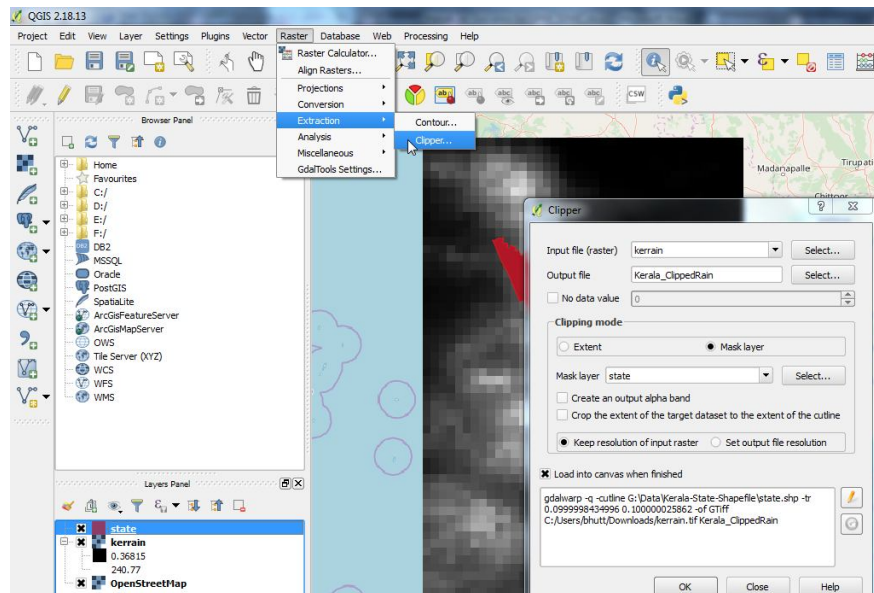


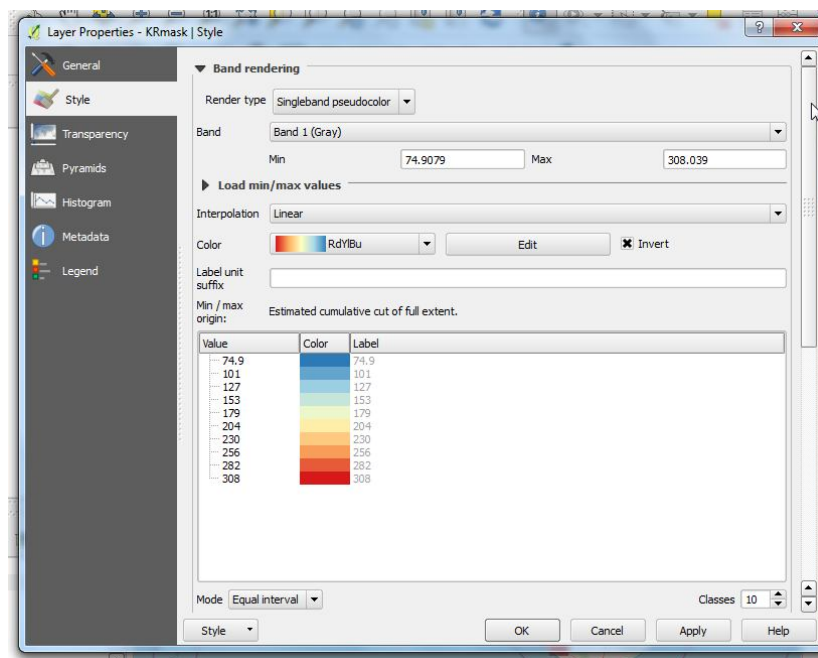
7. Click on the icons adjacent to browse tiles→first is footprint of tile; second is preview of data; metadata; download etc.

8. Click on Download icon and select geotiff format



9. Add this data to QGIS and go to →Properties Symbology →Select the Render Type as Singleband Pseudocolor→In Color ramp, select Red-Yellow-Blue (RdYlBu) color palette→Keep the default Min and Max values – Below the color display, change the Mode to Equal Interval and Classes to 10→ Click Classify→Click Apply then OK



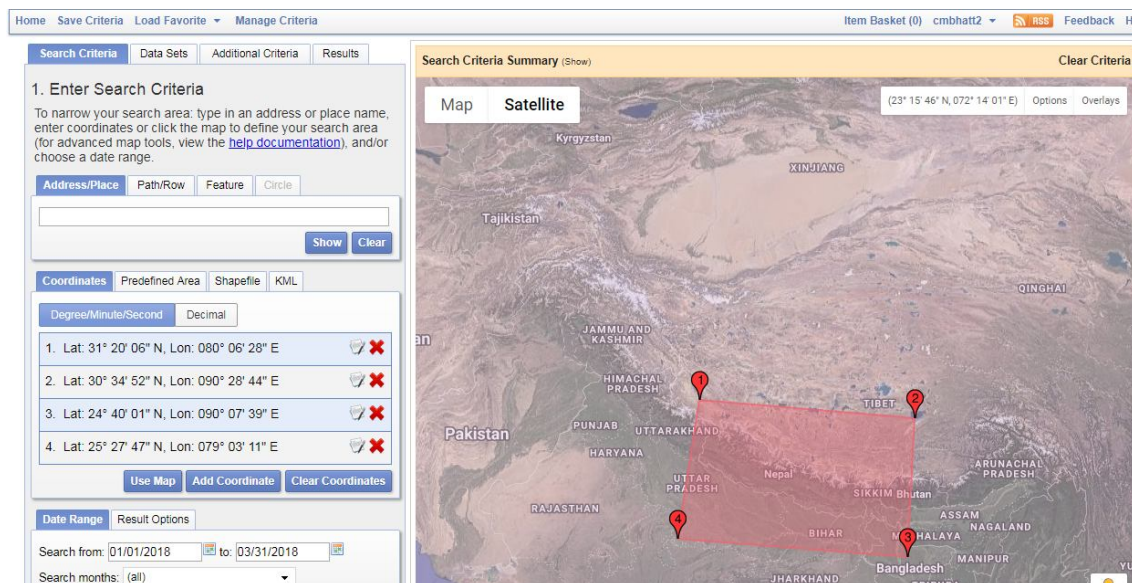


10. Right click on the file → go to Properties Transparency → Make the Global Opacity to ~50%--
→ Click Apply and OK

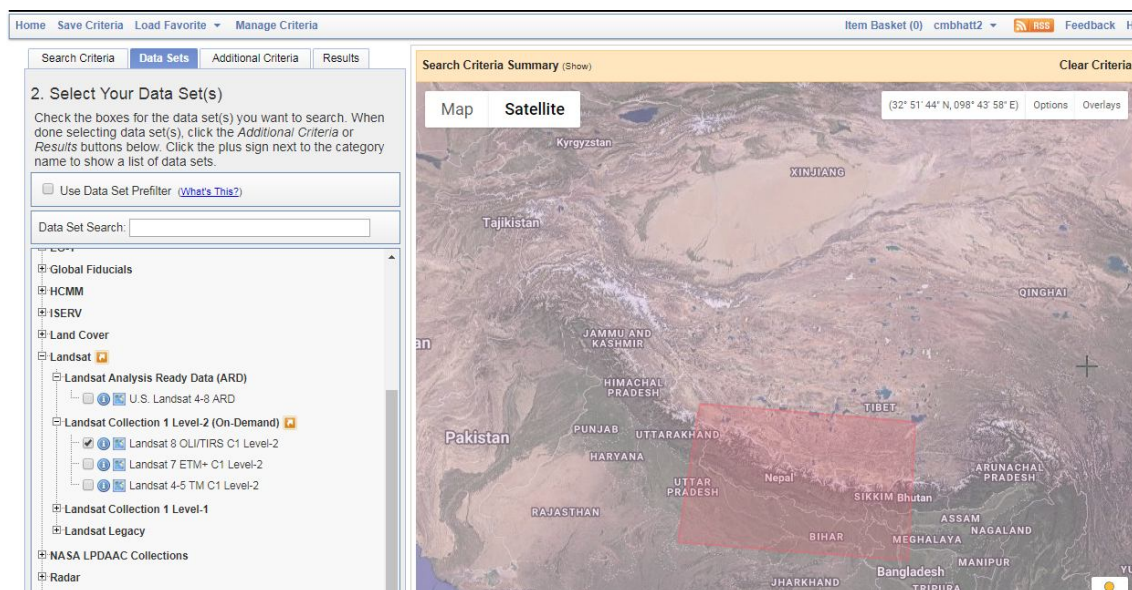
1. What is the elevation range?

Handson -3: Accessing Landsat data

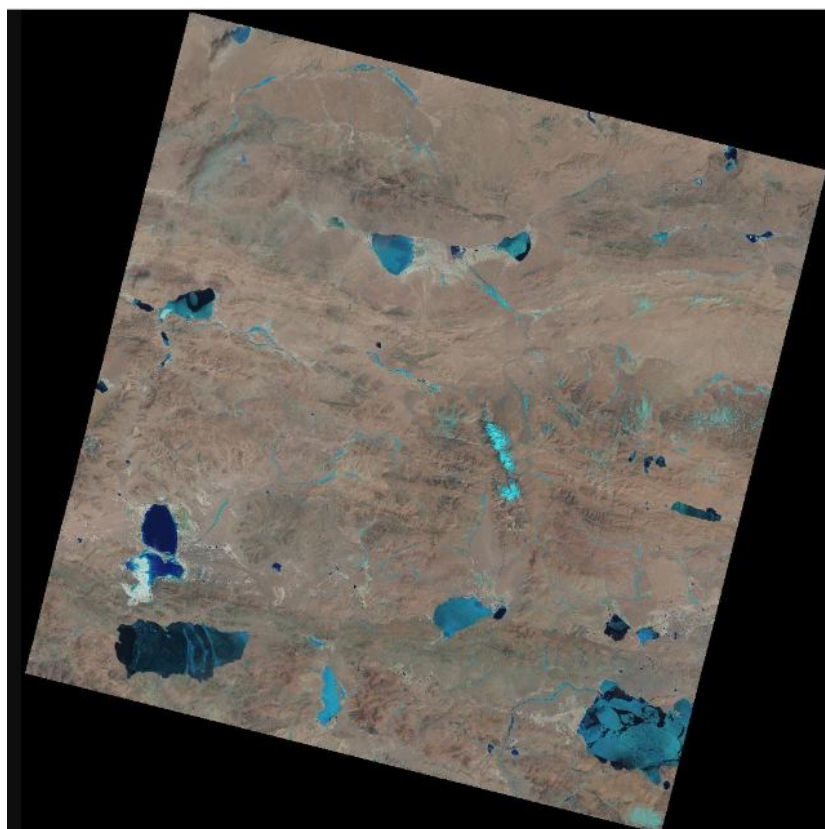
1. Open link <https://earthexplorer.usgs.gov/>
2. Define Search Area→Define time range→Define datasets



3. Select Landsat→Landsat8



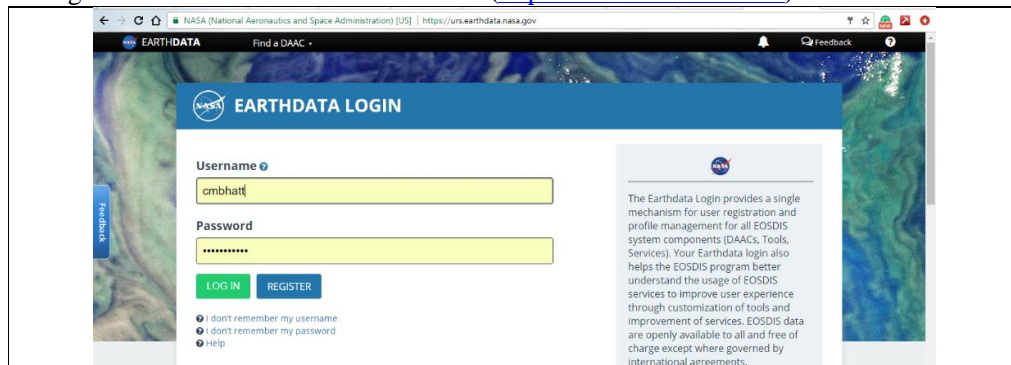
4. Click on Search Results Tab
5. Click on footprints→image→see browse image→download image in geotiff



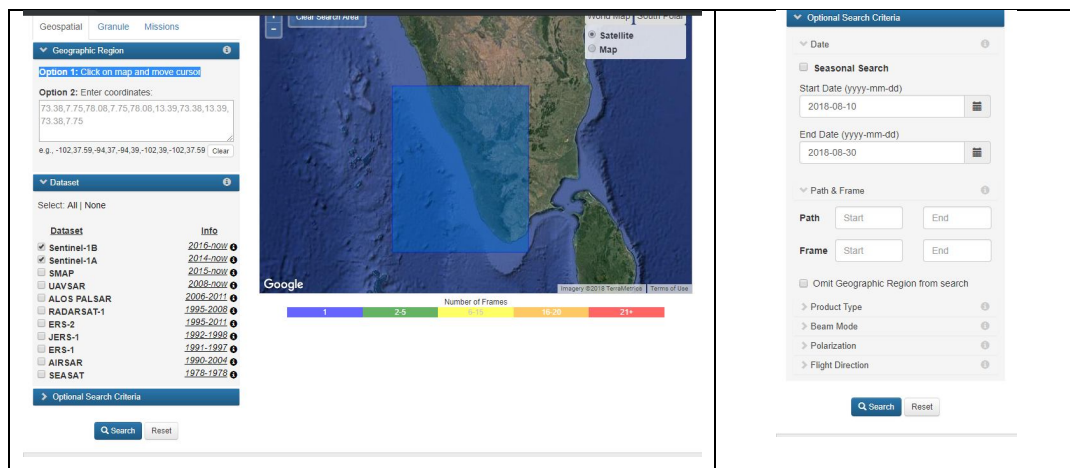
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Handson-4: Accessing Sentinel-1 Data

1. Download Sentinel data available through NASA's [Alaska Satellite Facility \(ASF\)](https://www.asf.alaska.edu/sentinel/) [Distributed Active Archive Center \(DAAC\)](https://www.asf.alaska.edu/sentinel/) by registering at register for [Earth Observing System Data and Information System \(EOSDIS\)](https://urs.earthdata.nasa.gov/) [Data](https://urs.earthdata.nasa.gov/) also can be accessed free of charge by registering at the Sentinels Scientific Data Hub (<https://scihub.esa.int/dhus>).

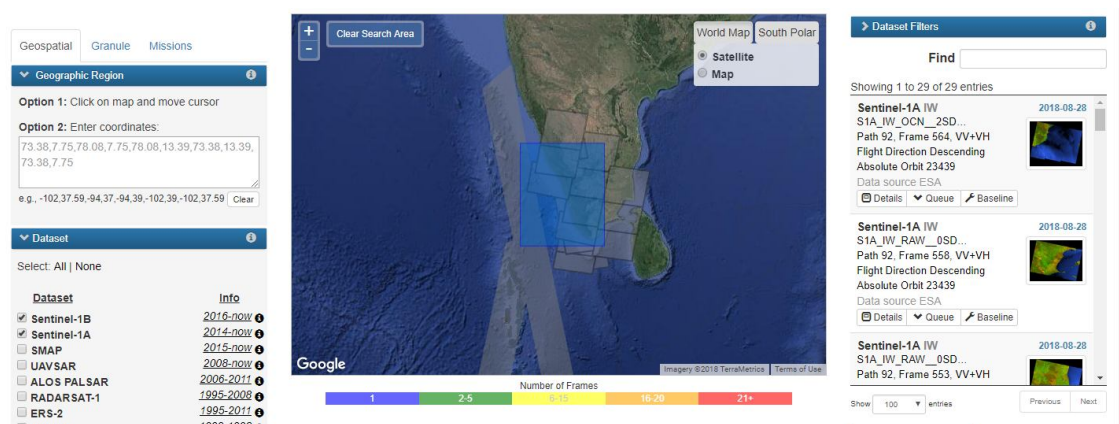


2. Click on Geographic Region Tab on Left panel → **Option 1:** Click on map and move cursor, draw the extent of region
3. Click on Dataset Tab on Left panel → Select Sentinel-1A,& B

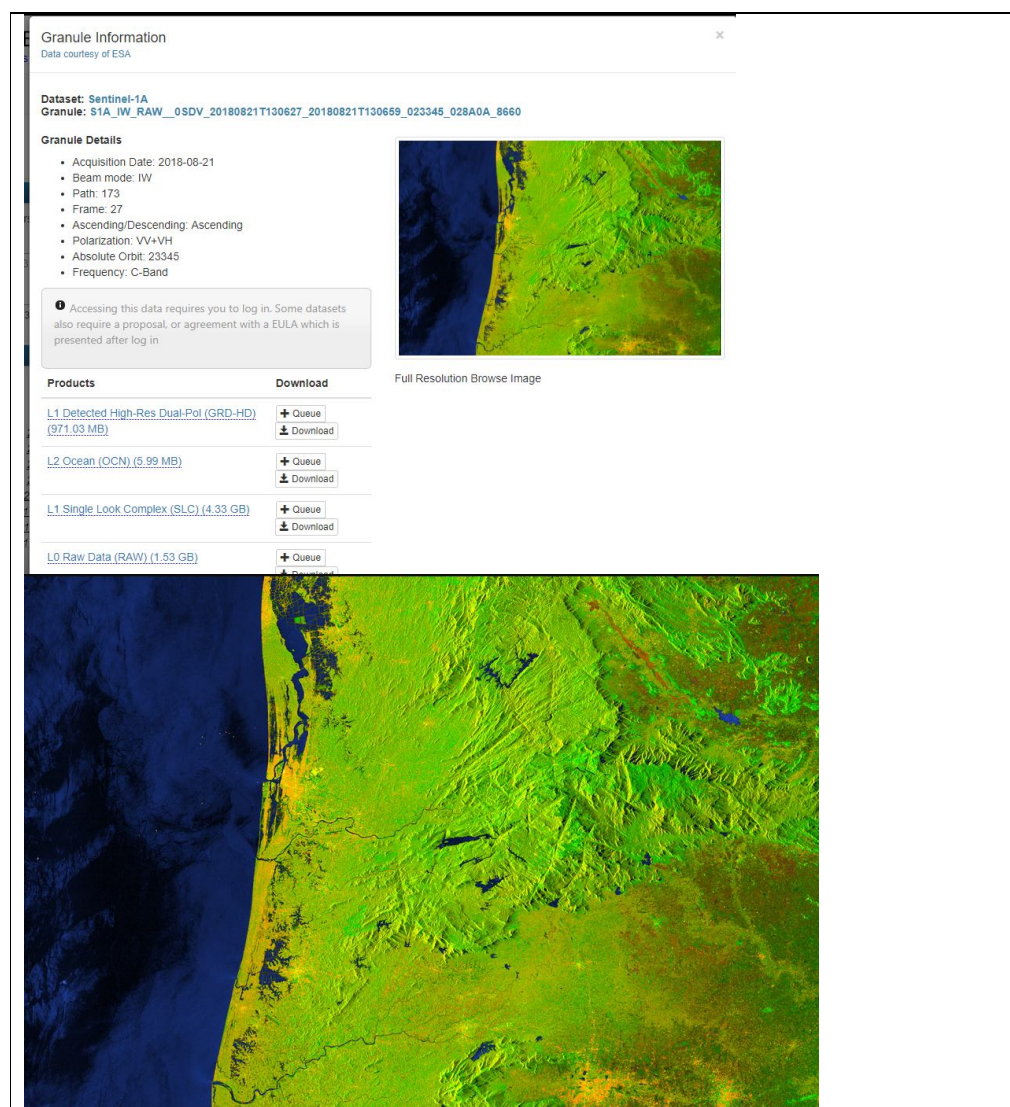


4. Click on Optional Criteria Tab on Left panel → Select dates
5. Click on Search

**“Utilization of Space based and Geospatial information for achieving the targets of the Sendai Framework for Disaster Risk Reduction”
during 04 – 08th December, 2018**



6. Search returns with scenes available
7. Click on scene with 21-Aug-2018 date to see the metadata and preview
8. Click on full resolution browse image



9. For downloading data by Clicking on First data *L1 Detected High-Res-Dual-Pol (GRD-HD) under Products*. Level-1 Ground Range Detected (GRD) Sentinel-1 data incorporates already some basic preprocessing.

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