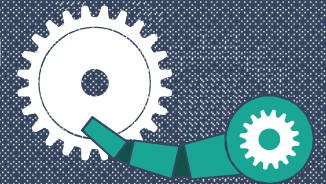


# Implementation of Indian Space Policy for Satellite Data Dissemination

## Bhoonidhi - ISRO's EO Data Hub



<https://www.bhoonidhi.nrsc.gov.in>

**Anupama Sharma**  
Bhoonidhi Team  
NRSC, IRSO

# Agenda

01

## Indian Space Policy 2023

Details of Indian Space Policy 2023 for Satellite Data Dissemination

02

## Implementation of Indian Space Policy at Bhoonidhi

Indian Space Policy implementation at Bhoonidhi for enable Open as well as Priced Data access

03

## Bhoonidhi Features & New Product Additions

Services enabled at Bhoonidhi for Browse and Access Satellite Data

04

## Bhoonidhi Vista

Near real time satellite data visualization for quick elementary analysis

05

## Upcoming Releases at Bhoonidhi

New features and applications scheduled releases



# Indian Space Policy 2023

Policy Details for Satellite Data Dissemination

# Indian Space Policy 2023



## Indian Space Policy 2023 Guidelines for satellite data dissemination

### Open Data

#### Open for All

Data products coarser than 5m spatial resolution " as is where is condition "

**FREE & OPEN FOR ALL**

Satellite sensors	Delivery from Archives
<ul style="list-style-type: none"> <li>Resourcesat Series -1/ 2/ 2A</li> <li>Oceansat series -1/ 2</li> <li>Scatsat -1, Ocat</li> <li>IRS-1A/1B/1C/1D</li> <li>Risat-1</li> <li>Landsat-8/9, Suomi-NPP, JPSS1</li> <li>Sentinal-1/2</li> <li>EOS-4, EOS-6 , <b>NISAR,..</b></li> </ul>	<p>Delivery : 1-10 min (for data available in On-line archive)</p> <p>3-24 hours : (for data available in Off-line archive or Fresh generation)</p>

### Priced Data

#### Priced Data (authorized access)

Data products finer than 5m - **FREE FOR GOVERNMENT ENTITIES** and **PRICED FOR PRIVATE** (non government entities thr' NSIL)

Satellite sensors	Delivery from Archives
<ul style="list-style-type: none"> <li>Cartosat - 1</li> <li>Cartosat - 2/2A/2B</li> <li>Cartosat-2S-PAN,MX</li> <li>Cartosat-3 - PAN, MX</li> <li>KOMPSAT - 3/3A</li> <li>NovaSAR</li> </ul>	<p>Delivery: 24 hours</p>

[https://www.isro.gov.in/media\\_isro/pdf/IndianSpacePolicy2023.pdf](https://www.isro.gov.in/media_isro/pdf/IndianSpacePolicy2023.pdf)



# Implementation at **Bhoonidhi**

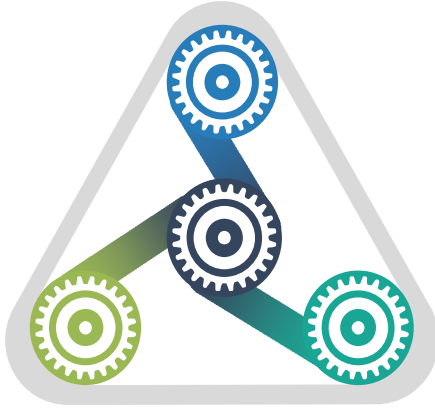
Indian Space Policy 2023 for Satellite Data Dissemination

# Data Dissemination @Bhoonidhi

IRS satellite data acquired by ISRO through its ground stations in India and abroad is made available through Bhoonidhi

## Data Dissemination Options

Based on the policy guidelines, user details and availability of data at online Bhoonidhi storage



### Open Data - Direct Download

Data coarser than 5m, Open for All, Directly can be downloaded (<https> download)

### Open Data - On Order

Data coarser than 5m, generated on demand, to be downloaded from sftp account

### Priced Data - On Order

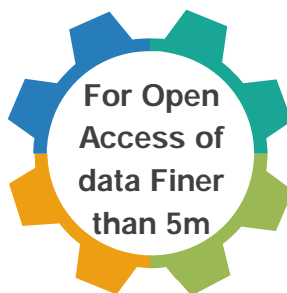
Data better than 5m, based on order to be downloaded from sftp account  
*through Bhoonidhi by NSIL*

Non-Government Entities may contact NSIL at [eodata@nsilindia.co.in](mailto:eodata@nsilindia.co.in) for any queries on pricing & terms of

# PRICED DATA Dissemination @Bhoonidhi

## DECLARATION OF GOVERNMENT ENTITY

- As per the New Space Policy, it is imperative to categorize the existing and new users at Bhoonidhi as GE (Government Entity) or NGE (Non Government Entity).
- A declaration form is to be submitted by the agencies desirous of registering as GE
- Once the form is received, verified and the organisation is accepted as "GE"
  - All the users registered with the official email ID with same domain name as that of the organisation will be tagged as "GE" automatically.
  - If the email domain or the organization name is not matching, users are to use 'Profile Update' service to update the email or the organization name.



Subject: Declaration of Government Entity Status for Satellite Data Dissemination at Free of Cost.

I, [Name], hereby declare on behalf of [Name of entity] that:

1. We are a Government Entity (GE) and we also understand that IRS Satellite data of any resolutions will be disseminated free of charges to Government entities as per Indian Space Policy 2023 and subsequent guidelines issued by Dept. of Space.
2. We are **not** falling under following category of Non-Government Entity (NGE) as per the Indian Space Policy 2023:
  - Companies incorporated under the Companies Act 2013.
  - Partnership firms established under the Limited Liability Partnership Act, 2008.
  - Registered Trusts/societies.
  - Associations of persons or bodies of individuals incorporated under relevant statutes in India.
3. We are requesting Satellite data for [Purpose] and undertake that IRS data provided by NRSC/ISRO will be used by us only and will not be re-distributed or made available to NGEs.
4. We understand that any misuse of this data or misrepresentation of our entity status may result in legal and financial consequences, including the responsibility for any tax liabilities arising from a false declaration as a government entity.
5. In support of above declaration, we provide the following information pertaining to our entity:
  - **Entity Name:**
  - **Central Govt./State Govt:**
  - **Ministry/Department:**
  - **PAO\* code:** (For Central Govt.) PAO code/Treasury code/Accounts office code (Assigned by C&AG or concerned Authority). (as applicable) for State Govt./UTs: ·
  - **Full office Address with pin code:**
  - **Focal point with official designation:**
  - **Full address of Focal point:**
  - **Phone Number of focal point:**
  - **Official Email Address:**
  - **Official Website:**
  - **GSTIN:**

I have read and understood the Indian Space Policy 2023 ([https://www.isro.gov.in/media\\_isro/pdf/IndianSpacePolicy2023.pdf](https://www.isro.gov.in/media_isro/pdf/IndianSpacePolicy2023.pdf)), End User License agreement (EULA) (<https://bhoonidhi.nrsc.gov.in/bhoonidhi/htmls/TnC.html>) and I further confirm that all the above information furnished is correct to the best of my knowledge and request that our entity may be registered as Government Entity (GE) in your data base, based on the above information provided, for IRS data dissemination.



# Bhoonidhi Features

Services at Bhoonidhi for Satellite Data Access



# Bhoonidhi ISRO's Earth Observation data hub

Bhoonidhi hosts huge repository of IRS and Non-IRS satellite data catalogue since 1988; fresh acquisitions added on a daily basis covering INDIA and surroundings; while facilitating regional distribution of Sentinel and LandSat-8/9 data in India.

We service open & commercial access for satellite data products across spatial and spectral resolutions; tools for near real time data visualization for geospatial and science applications

 <b>Browse &amp; Order</b>	 <b>VISTA</b> Visualize at Full Resolution	 <b>UPAGRAH</b> Orbit Viewer	 <b>Planner</b> Future Imaging
Search, View and Download CART Interface Direct download / Proforma (PI) and work order	Visualize daily acquired data. Temporal cycle based mosaic Quick animation over and AOI	Orbit Viewer Live satellite/orbit tracking time.	Plan for Imaging AOI of Future dates

The screenshot shows the Bhoonidhi website interface. At the top, there is a navigation bar with links for Home, Applications, About Us, Contact Us, and nrscc. Below the navigation bar is a large banner with the Bhoonidhi logo and a description of the data archive. Underneath the banner are logos for Bhoonidhi, VISTA, Bhoonidhi RESOURCES, Bhoonidhi PLANNeR, and UPAGRAH. The main content area is titled 'APPLICATIONS' and features a grid of four application tiles, each with a thumbnail image and a brief description:

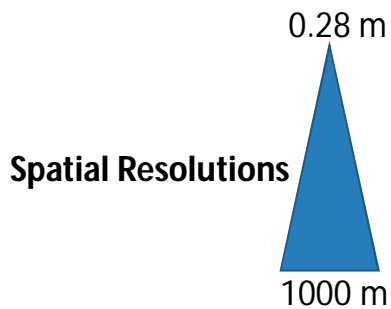
- Bhoonidhi Browse & Order:** Search, View and Download/Order open/priced data of various IRS missions, Landsat-8, Sentinel 1&2 and NovaSAR.
- Bhoonidhi VISTA:** Visualize the daily acquired data and temporal cycle based mosaic.
- Upagrah:** Orbit Viewer - Live satellite/orbit tracking and View of all satellites at given UTC time.
- Bhoonidhi PLANNeR:** With PLANNeR, users can look up the possibility & dates of potential acquisitions and submit requests for fresh acquisitions. The placement of a request necessitates user authorization. Upon acquisition, the data can be retrieved from Bhoonidhi. The application is now enabled for EOS-04.

# Data Diversity at Bhoonidhi

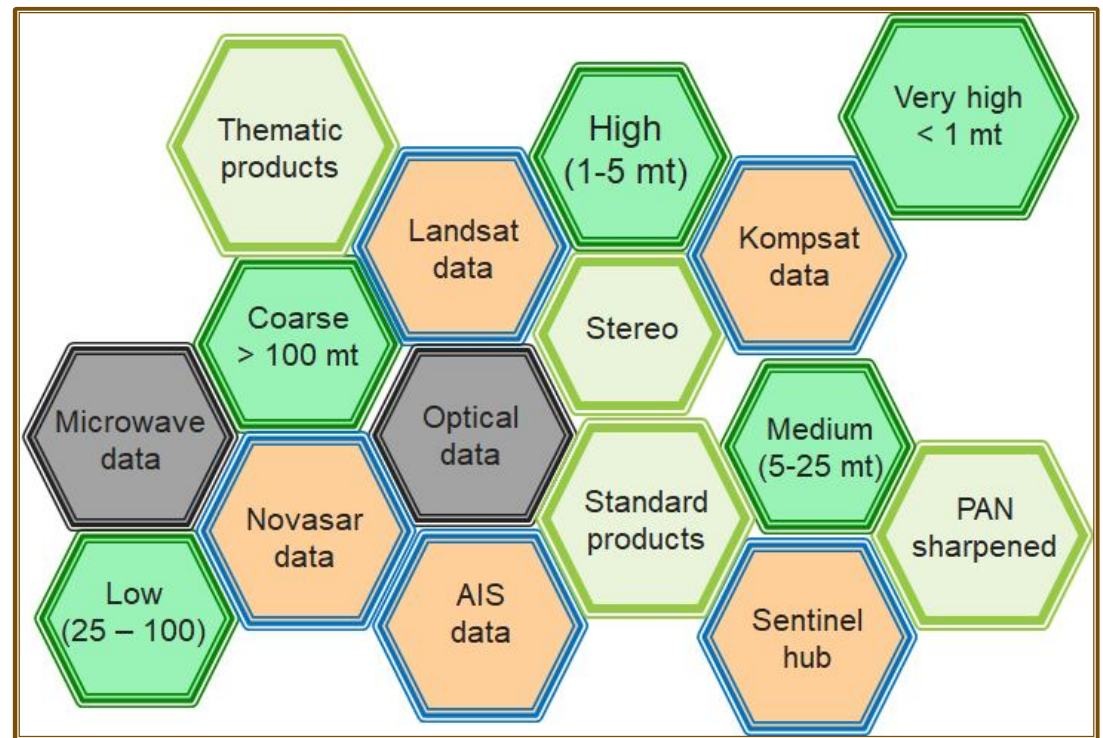
Satellites' data @ Bhoonidhi		
ResoureSat-2	EOS-04	CartoSat-1
ResoureSat-2A	RISAT-1	CartoSat-2
ResoureSat-1	Sentinel 1A	CartoSat-2E
IRS-1A	Sentinel 1B	CartoSat-3
IRS-1B	Soumi-NPP	KompSat-3
IRS-1C	JPSS1	KompSat-3A
IRS-1D	NOAA-11	Novasar (AIS)
EOS-06	NOAA-12	Novasar (SAR)
Oceansat-2	NOAA-14	Landsat-8
OceanSat-1	NOAA-16	Landsat-9
ScatSat-1	NOAA-17	Sentinel 2A
Aqua	NOAA-18	Sentinel 2B
Terra	NOAA-19	

■ - Open Data  
■ - Priced Data  
■ - Partially priced

Swaths : 10km - 1400 km

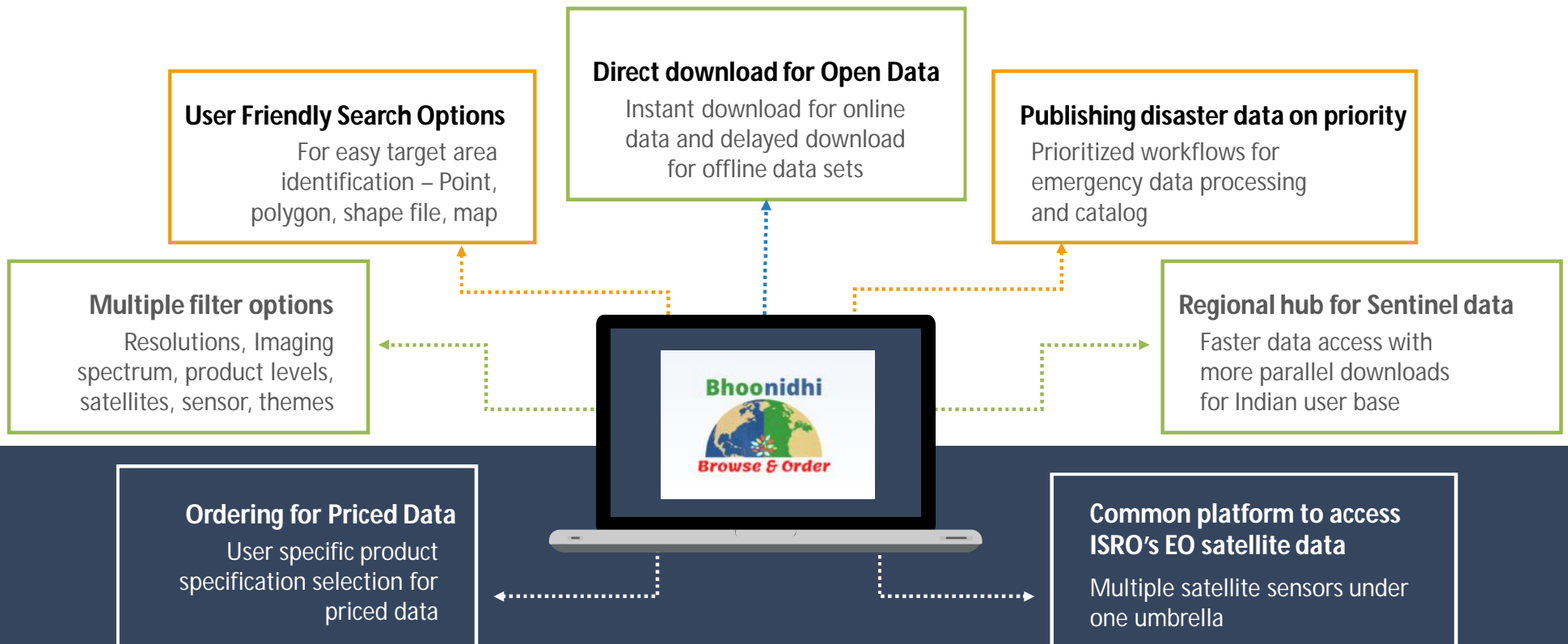


- Product types
- Foreign missions
- Resolutions
- Bands

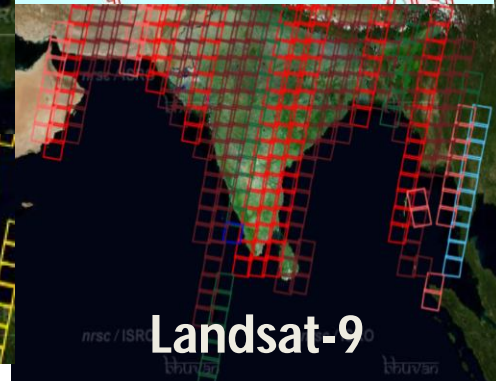
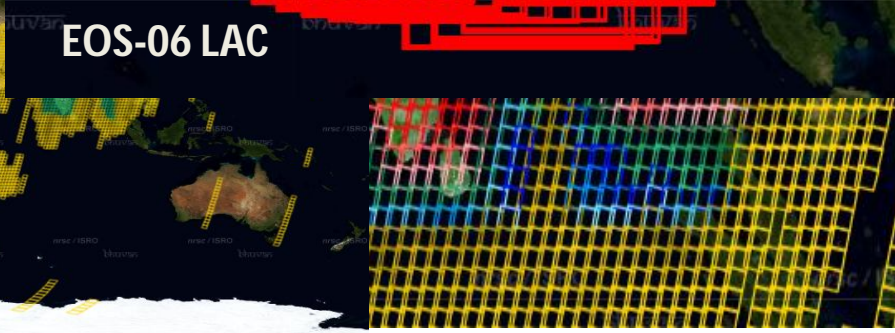
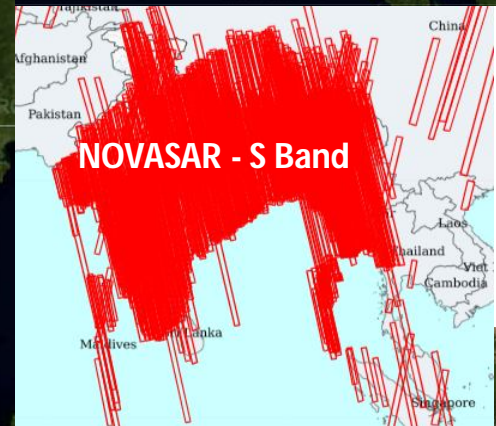
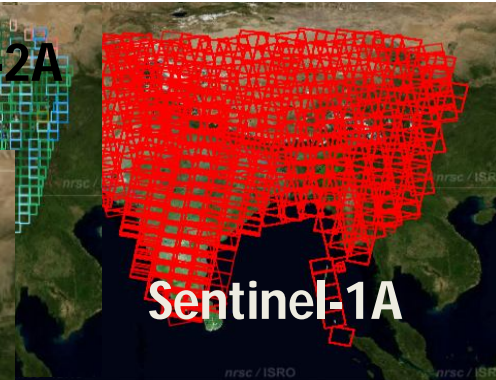
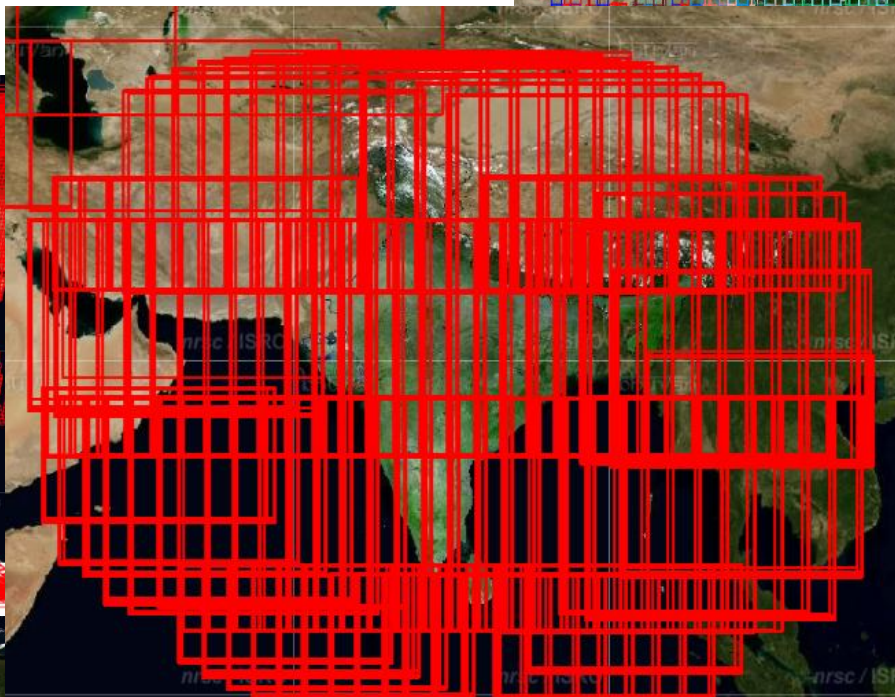
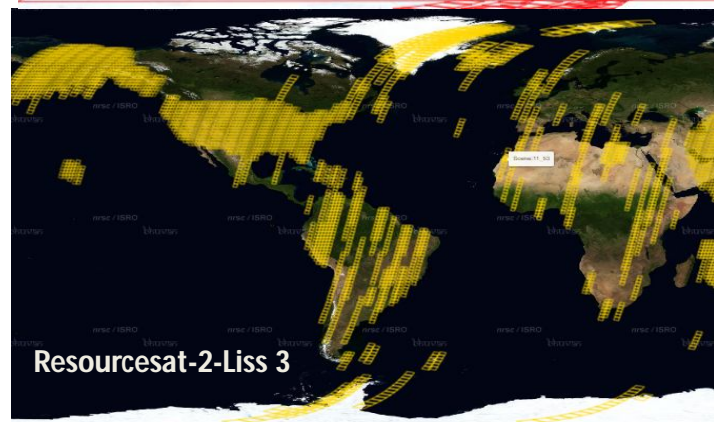
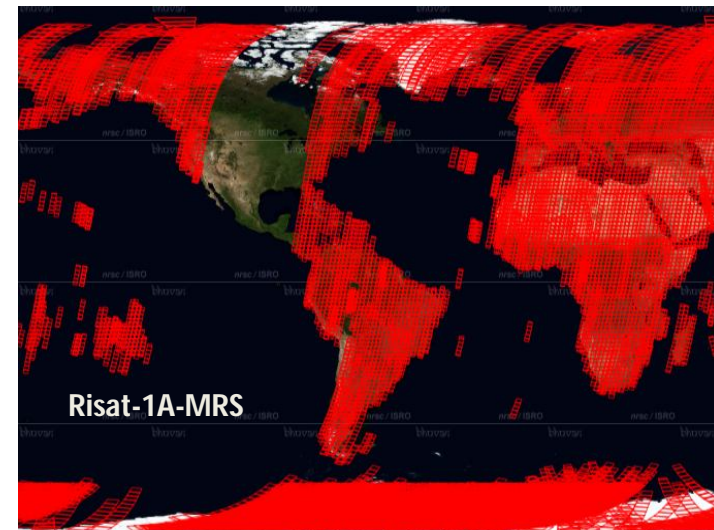


EO Products: GEOREF, GEO-ORTHO KIT, Surface reflectance, VALUE Added, Thematic, etc

# Bhoonidhi Features



# Data Archive



# Exploring EO Data

Can I see what are all the Open Data available ?

Can I see based if 30 m data is available ?

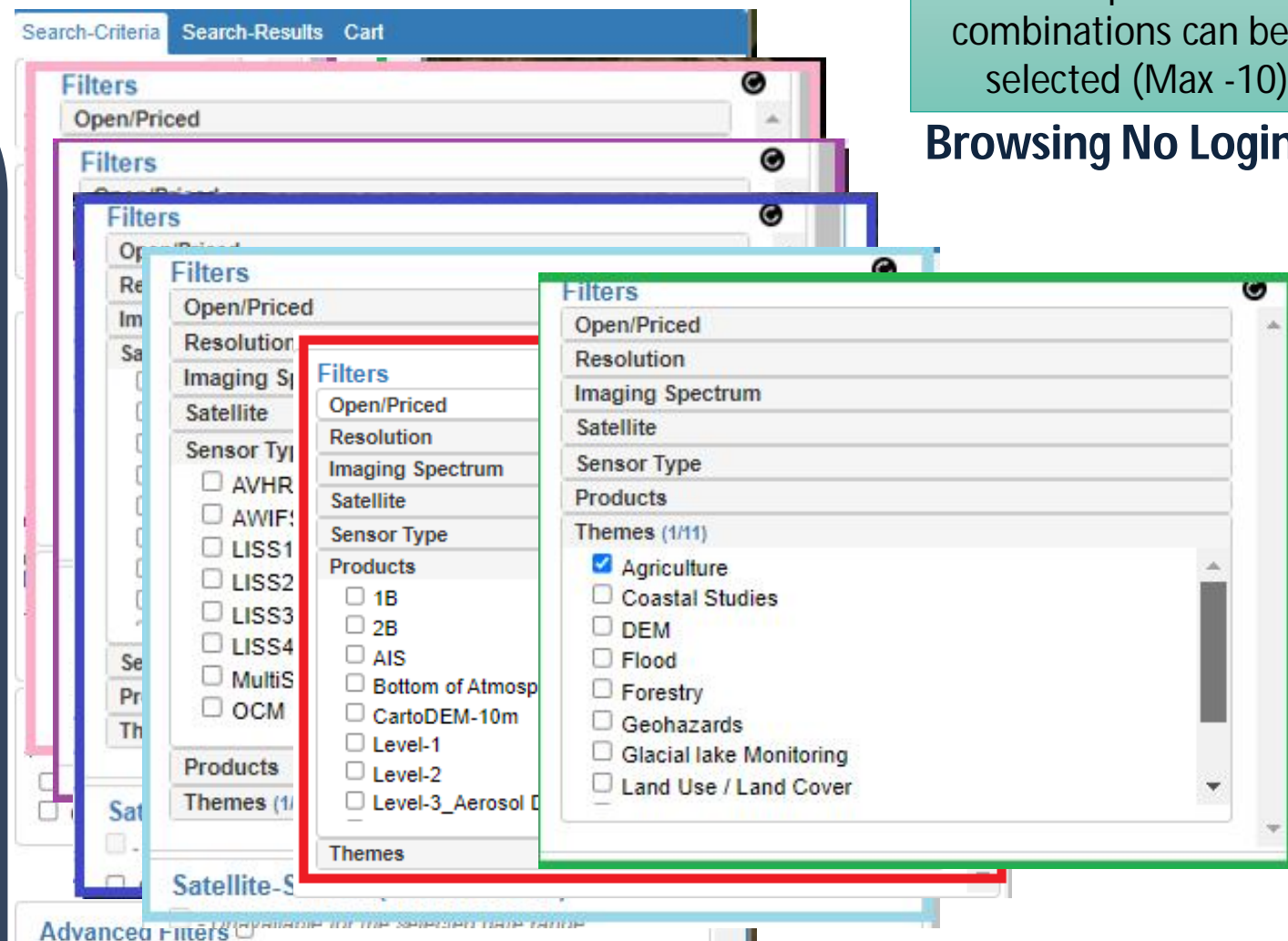
Can I see which Microwave or optical data is available ?

Can I search based on Satellites ?

Can I search based on Imaging sensors/modes ?

Can I search based on Products and processing level?

Can I search which products available for Agriculture applications ?



The screenshot displays a search interface with several overlapping filter panels. The panels are color-coded: pink, purple, blue, cyan, red, and green. The red panel highlights the 'Filters' section with options like Open/Priced, Resolution, Imaging Spectrum, Satellite, Sensor Type, Products, and Themes. The green panel highlights the 'Themes' section with options like Agriculture, Coastal Studies, DEM, Flood, Forestry, Geohazards, Glacial lake Monitoring, and Land Use / Land Cover. The interface also shows a search bar, a search criteria dropdown, and a search results section.

FILTERS are OPTIONAL

Multiple FILTERS combinations can be selected (Max -10)

**Browsing No Login**

# Data Dissemination Modes

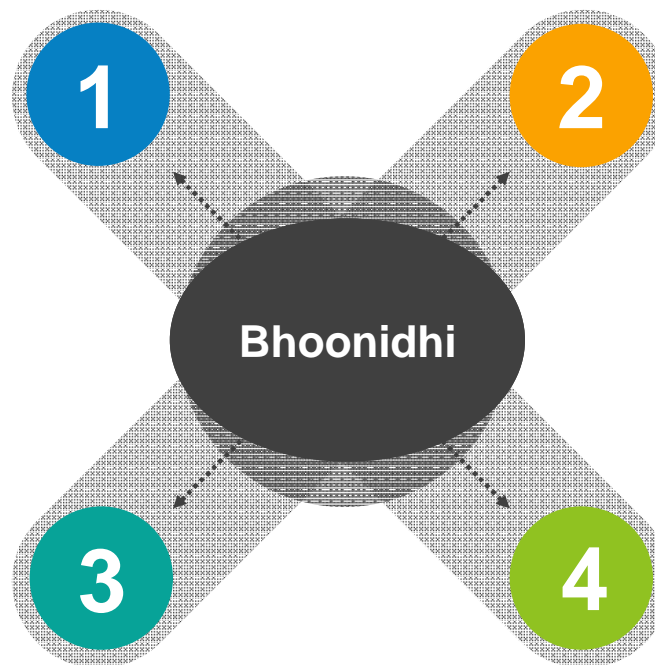
## GUI Based Direct Download



Open data products added to cart through Bhoonidhi **Browse & Order** can be directly downloaded by clicking the (download button) adjacent to the respective product.

## Batch Downloader Tool

Facilitates bulk download of open data products. Users can select from their Open data Cart Search IDs and download the products added to Open data Cart using the tool



## sftp based download

- Priced data
- On demand generated Open data

## API based download

Programmatically enable machine-to-machine data transfer

# Bhoonidhi API

Bhoonidhi APIs for data-search and download facilitate users to automate browsing for satellite data products and the download process at their end.



## 1 Authentication

This API allows you to get authenticated and receive tokens that enable search and download API access.

## 2 Search

This API enables various search options across collections of satellite-sensors. The data-search API is developed over STAC catalog, thus allowing STAC format GET and POST requests, making search interoperable.

## 3 Download

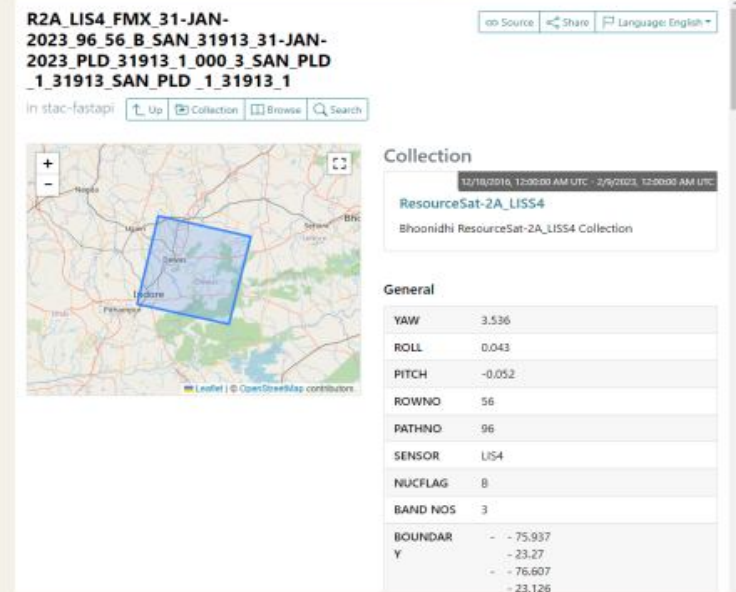
This API allows to download the open data products hosted at Bhoonidhi.

## Bhoonidhi STAC

STAC (Spatio Temporal Asset Catalogue), is a standardized way to expose collections of spatial temporal data. It is driving a uniform means for indexing, discovering and describing geospatial assets.

Bhoonidhi – STAC is a standard conforming API exposing NRSC's EO data catalogue, which will enable users to use STAC API / STAC clients integrated and Opensource projects like STAC browser / QGIS / User centric applications at Bhoonidhi, to discover & access data.

The STAC catalogue can be queried for a given area of interest and can also be filtered from various metadata fields associated with satellite imagery.



R2A\_LIS4\_FMX\_31-JAN-2023\_96\_56\_B\_SAN\_31913\_31-JAN-2023\_PLD\_31913\_1\_000\_3\_SAN\_PLD\_1\_31913\_SAN\_PLD\_1\_31913\_1

in stac-fastapi | Up | Collection | Browse | Search

Collection  
12/18/2023, 12:00:00 AM UTC - 2/6/2023, 12:00:00 AM UTC  
ResourceSat-2A\_LISS4  
Bhoonidhi ResourceSat-2A\_LISS4 Collection

General

YAW	3.536
ROLL	0.043
PITCH	-0.052
ROWNO	56
PATHNO	96
SENSOR	LIS4
NUCFLAG	B
BAND NOS	3
BOUNDAR Y	- - 75.937 - - 23.27 - - 76.607 - - 23.126



# Open Data - EOS-06 data

Explore Archives PI Actions Utilities
Search-Criteria Search-Results Cart
Search-Criteria Search-Results Cart
Search-Criteria Search-Results Cart

**Area of Interest**

Location Polygon Shapefile

---

**Date range**

10 January 2024

---

**Filters (Optional)**

**Open/Priced**

**Resolution**

**Imaging Spectrum**

Satellite (137)

EOS-06

Aqua

CartoSat-1

CartoSat-2

CartoSat-2E

CartoSat-3

EOS-04

IRS-1A

IRS-1B

IRS-1C

**Sensor Type**

**Products**

**Themes**

---

**Satellite-Sensor (select max 10)**

- Unavailable for the selected date ran

**OpenData\_DirectDownload**

EOS-06\_OCM(GAC)\_L1C

EOS-06\_OCM(GAC)\_L2C-A

EOS-06\_OCM(GAC)\_Chlorc

EOS-06\_OCM(GAC)\_L2C-D

EOS-06\_OCM(GAC)\_L2C-N

EOS-06\_OCM(GAC)\_L2C-R

**Open\_Data** Priced

**Direct Download Cart**

Cart Date: 31 January 2024

1 2 3 4 5

... 15 Next

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

	Sat_Sen: E06_OCM_GAC_F_L1C Scene: 6231_106_11 Dop: 31-Jan-2024 Pricing: OpenData_DirectDownk	
	Sat_Sen: E06_OCM_GAC_F_L1C Scene: 6231_106_12 Dop: 31-Jan-2024 Pricing: OpenData_DirectDownk	
	Sat_Sen: E06_OCM_GAC_F_L1C Scene: 6231_106_13 Dop: 31-Jan-2024 Pricing: OpenData_DirectDownk	
	Sat_Sen: E06_OCM_GAC_F_L1C Scene: 6203_94_11 Dop: 29-Jan-2024 SID: 20240131_92L013470	
	Sat_Sen: E06_OCM_GAC_F_L1C Scene: 6231_106_14 Dop: 31-Jan-2024 Pricing: OpenData_DirectDownk	
	Sat_Sen: E06_OCM_GAC_F_L1C Scene: 6203_94_12 Dop: 29-Jan-2024 SID: 20240131_92L013470	
	Sat_Sen: E06_OCM_GAC_F_L1C Scene: 6231_106_15 Dop: 31-Jan-2024 Pricing: OpenData_DirectDownk	
	Sat_Sen: E06_OCM_GAC_F_L1C Scene: 6203_94_13 Dop: 29-Jan-2024 SID: 20240131_92L013470	
	Sat_Sen: E06_OCM_GAC_F_L1C Scene: 6231_106_16 Dop: 31-Jan-2024 Pricing: OpenData_DirectDownk	
	Sat_Sen: E06_OCM_GAC_F_L1C Scene: 6203_94_14 Dop: 29-Jan-2024 SID: 20240131_92L013470	
	Sat_Sen: E06_OCM_GAC_F_L1C Scene: 6231_106_17 Dop: 31-Jan-2024 Pricing: OpenData_DirectDownk	
	Sat_Sen: E06_OCM_GAC_F_L1C Scene: 6203_94_15 Dop: 29-Jan-2024 SID: 20240131_92L013470	
	Sat_Sen: E06_OCM_GAC_F_L1C Scene: 6231_106_18 Dop: 31-Jan-2024 Pricing: OpenData_DirectDownk	
	Sat_Sen: E06_OCM_GAC_F_L1C Scene: 6203_94_16 Dop: 29-Jan-2024 SID: 20240131_92L013470	
	Sat_Sen: E06_OCM_GAC_F_L1C Scene: 6231_106_19 Dop: 31-Jan-2024 Pricing: OpenData_DirectDownk	
	Sat_Sen: E06_OCM_GAC_F_L1C Scene: 6203_94_17 Dop: 29-Jan-2024 SID: 20240131_92L013470	

Recent download history

- E06\_OCM\_GAC\_29JAN2024\_029023112072\_6202\_STG000GND\_94\_20\_F.zip  
1.65.9/96.2 MB • 6 seconds left
- E06\_OCM\_GAC\_29JAN2024\_0290\_6202\_STG000GND\_94\_19\_F.zip  
69.3 MB • Done
- E06\_OCM\_GAC\_29JAN2024\_029020757009\_6202\_STG000GND\_94\_13\_F.zip  
54.5 MB • 2 minutes ago
- E06\_OCM\_GAC\_29JAN2024\_029020438004\_6202\_STG000GND\_94\_12\_F.zip  
64.8 MB • 2 minutes ago
- E06\_OCM\_GAC\_29JAN2024\_029020119004\_6202\_STG000GND\_94\_11\_F.zip  
71.3 MB • 2 minutes ago

Search-Criteria Search-Results Cart

Open\_Data

Type search text here... Eg: Get recent landsat 8 data





# Open Data - Resourcesat 2/2A data

**Bhoonidhi ISRO's EO Data HUB**

Search-Criteria Search-Results Cart

Date range: 09 December 2023

**Filters**

**Open/Priced**

**Resolution**

**Imaging Spectrum**

**Satellite (2/37)**

**Sensor Type**

**Products (1/23)**

- Bottom of Atmosphere
- Level-3\_Tiles
- Standard
- 1B
- 2B
- AIS
- CartoDEM-10m
- Level-1
- Level-2

**Themes**

**Satellite-Sensor (select max 10)**

- Unavailable for the selected date range
- OpenData\_DirectDownload
  - ResourceSat-2\_AWIFS\_Standard
  - ResourceSat-2\_LISS3\_Standard
  - ResourceSat-2\_LISS4(MX70)\_Sta
  - ResourceSat-2A\_AWIFS\_Standard
  - ResourceSat-2A\_LISS3\_Standard
  - ResourceSat-2A\_LISS4(MX70)\_S

**Search-Results**

Thumbnail	Sat_Sen: RS2 LIS3 - F_Standard	Scene: 065586_108_45	Dop: 09-Dec-2023	Pricing: OpenData_DirectDownload
	Sat_Sen: RS2 LIS3 - F_Standard	Scene: 065586_108_45	Dop: 09-Dec-2023	Pricing: OpenData_DirectDownload
	Sat_Sen: RS2 LIS3 - F_Standard	Scene: 065586_108_46	Dop: 09-Dec-2023	Pricing: OpenData_DirectDownload
	Sat_Sen: RS2 LIS3 - F_Standard	Scene: 065586_108_47	Dop: 09-Dec-2023	Pricing: OpenData_DirectDownload
	Sat_Sen: RS2 LIS3 - F_Standard	Scene: 065586_108_48	Dop: 09-Dec-2023	Pricing: OpenData_DirectDownload
	Sat_Sen: RS2 LIS3 - F_Standard	Scene: 065586_108_49	Dop: 09-Dec-2023	Pricing: OpenData_DirectDownload
	Sat_Sen: RS2 LIS3 - F_Standard	Scene: 065586_108_50	Dop: 09-Dec-2023	Pricing: OpenData_DirectDownload
	Sat_Sen: RS2 LIS3 - F_Standard	Scene: 065586_108_55	Dop: 09-Dec-2023	Pricing: OpenData_DirectDownload
	Sat_Sen: RS2 LIS3 - F_Standard	Scene: 065586_108_59	Dop: 09-Dec-2023	Pricing: OpenData_DirectDownload
	Sat_Sen: RS2 LIS3 - F_Standard	Scene: 065586_108_60	Dop: 09-Dec-2023	Pricing: OpenData_DirectDownload

**Direct Download Cart**

Cart Date: 09 December 2023

Iter Results: Previous 1 2 3 4 Next

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

Thumbnail	Sat_Sen: RS2 LIS3 - F_Standard	Scene: 065586_108_45	Dop: 09-Dec-2023	SID: 20231209_ZUE011677
	Sat_Sen: RS2 LIS3 - F_Standard	Scene: 065586_108_45	Dop: 09-Dec-2023	SID: 20231209_ZUE011677
	Sat_Sen: RS2 LIS3 - F_Standard	Scene: 065586_108_46	Dop: 09-Dec-2023	SID: 20231209_ZUE011677
	Sat_Sen: RS2 LIS3 - F_Standard	Scene: 065586_108_47	Dop: 09-Dec-2023	SID: 20231209_ZUE011677
	Sat_Sen: RS2 LIS3 - F_Standard	Scene: 065586_108_48	Dop: 09-Dec-2023	SID: 20231209_ZUE011677
	Sat_Sen: RS2 LIS3 - F_Standard	Scene: 065586_108_49	Dop: 09-Dec-2023	SID: 20231209_ZUE011677
	Sat_Sen: RS2 LIS3 - F_Standard	Scene: 065586_108_50	Dop: 09-Dec-2023	SID: 20231209_ZUE011677

**Map View:** Type search text here... Eg: Get recent landsat 8 data

**RS2 - LiSS3/ AWiFS**

**R2A - LiSS3/ AWiFS**

**Recent downloads**

- R2309DEC2023065586010800047PSANS TUC00GTFDf.zip (67.4/169 MB • 24 seconds left)
- R2309DEC2023065586010800048000 TUC00GTFDf.zip (73.3/152 MB • 18 seconds left)
- R2309DEC2023065586010800045PSANS TUC00GTFDf.zip (112/151 MB • 6 seconds left)
- Bhoonidhi-Open Data Release 1.pptx (3.2 MB • 13 minutes ago)
- Observations\_Bhoonidhi Staging system\_8thDec.docx (126 KB • 19 hours ago)
- NV\_A\_E\_07DEC2023\_zzz\_zzz\_zzz\_zzz\_0300\_zzz\_zzz\_zzz\_ST00000XD\_zzz\_zzz\_zi



# Open Data - EOS-04 data

**Bhoonidhi**  
ISRO's EO Data HUB

Search-Criteria Search-Results Search-Criteria Search-Results Cart

Date range: 09 December 2023

**Filters**

- Open/Priced
- Resolution
- Imaging Spectrum
- Satellite (1/39)
  - Aqua
  - CartoSat-1
  - CartoSat-2
  - CartoSat-2E
  - CartoSat-3
  - EOS-04
  - EOS-06
  - GSAT29
  - IRS-1A
- Sensor Type
- Products
- Themes
- Satellite-Sensor (select multiple)
  - Unavailable for the selected data
  - OpenData\_DirectDownload
    - EOS-04\_SAR(CRS)\_...
    - EOS-04\_SAR(MRS)\_...
    - EOS-04\_SAR(MRS)\_...
  - OpenData\_OnOrder
  - Priced

Sat_Sen	Scene	Dop	Pricing
E04_SAR_MRS	10024_10024_12630_10	09-Dec-2023	OpenData_DirectD
E04_SAR_MRS	10024_10024_12630_11	09-Dec-2023	OpenData_DirectD
E04_SAR_MRS	10024_10024_12630_12	09-Dec-2023	OpenData_DirectD
E04_SAR_MRS	10024_10024_12630_13	09-Dec-2023	OpenData_DirectD
E04_SAR_MRS	10024_10024_12630_14	09-Dec-2023	OpenData_DirectD
E04_SAR_MRS	10024_10024_12630_15	09-Dec-2023	OpenData_DirectD
E04_SAR_MRS	10024_10024_12630_16	09-Dec-2023	OpenData_DirectD
E04_SAR_MRS	10024_10024_12630_17	09-Dec-2023	OpenData_DirectD

Recent downloads

- E04\_SAR\_MRS\_09DEC2023\_10024\_12630\_11\_SAN\_STUC00ETD\_H\_HV\_D\_P.zip  
8.2/579 MB • 8 minutes left
- E04\_SAR\_MRS\_09DEC2023\_10024\_12630\_10\_SAN\_STUC00ETD\_H\_HV\_D\_P.zip  
33.5/565 MB • 2 minutes left
- R2309DEC2023065586010800047PSANS TUC00GTDF.zip  
169 MB • 12 minutes ago
- R2309DEC2023065586010800046PSANS TUC00GTDF.zip  
152 MB • 12 minutes ago
- R2309DEC2023065586010800045PSANS TUC00GTDF.zip  
151 MB • 12 minutes ago
- Bhoonidhi-Open Data Release 1.pptx  
3.2 MB • 24 minutes ago



# Priced Data Ordering

172.19.2.131 says  
Latest Pro-forma Invoice (PI) generated:703 dated 15 Mar 2022 02:12:14 PM. Please use 'PI Actions' for further action if needed.

Explore Archives PI Actions Utilities -

Search-Criteria Search-Results Cart

Open ₹ Priced -

01 March 2022 15 March 2022 Get SID(s)

Select Search ID (SID)

20220315\_000000109  
20220307\_000000018  
20220307\_000000017  
20220305\_000000034

Get Details

Show 20 Search:

Sat\_sen: E04\_SAR\_FR1\_F\_R  
Scene: 296\_73\_40  
Dop: 05-Mar-2022  
SID: 20220315\_000000109

Sat\_sen: E04\_SAR\_FR1\_F\_F  
Scene: 402\_159\_2  
Dop: 12-Mar-2022  
SID: 20220315\_000000109

Sat\_sen: E04\_SAR\_FR1\_F\_F  
Scene: 402\_159\_3  
Dop: 12-Mar-2022  
SID: 20220315\_000000109

Sat\_sen: E04\_SAR\_FR1\_F\_F  
Scene: 402\_159\_4  
Dop: 12-Mar-2022  
SID: 20220315\_000000109

Sat\_sen: E04\_SAR\_FR1\_F\_H  
Scene: 404\_123\_21  
Dop: 09-Mar-2022  
SID: 20220315\_000000109

Sat\_sen: E04\_SAR\_FR1\_F\_H  
Scene: 404\_123\_22  
Dop: 09-Mar-2022  
SID: 20220315\_000000109

Sat\_sen: E04\_SAR\_FR1\_F\_H  
Scene: 404\_123\_23  
Dop: 09-Mar-2022  
SID: 20220315\_000000109

Sat\_sen: E04\_SAR\_FR1\_F\_H  
Scene: 404\_123\_24  
Dop: 09-Mar-2022  
SID: 20220315\_000000109

Product Type: ST\_Standard  
Processing Level: E\_Enhanced Georef  
Enhancement: K\_Single Look Complex Slant range  
0\_Raw  
N\_Multi Look Ground range  
Z\_Normalized Radar Backscatter  
E\_Enhanced Georef  
Resampling: E\_Enhanced Georef  
Format: T\_GeoTIFF  
Dispatch Mode: FTP  
Datum: WGS 84  
Product Res: 33.0  
Priority: Normal  
No of copies: 1  
Quality:

Cost

Cost type: scene (Rs)  
No of scenes: 2  
Priority Charges: 0.00  
Discounts: 0.00

Unit Rate  
IGST / CGST / SGST  
Final

Selected Products

Satellite-sensor	Product code	Dispatch mode	Datum	Product res	Priority	Copies
E04_SAR_FR1_F_R	STUCMDPTV	FTP	WGS 84	3.0	Normal	1
E04_SAR_FR1_F_F	STUCYGPTV	FTP	WGS 84	3.0	Normal	1
E04_SAR_FR1_F_H	ST0000KTV	FTP	WGS 84	3.0	Normal	1
E04_SAR_FR2_F_V	ST0000KCV	FTP	WGS 84	9.0	Normal	1

Total Cost : Rs 21160  
User Ref: E04Order

Order Status Monitor

15 March 2022 15 March 2022 Get Orders  
405109 Submit

Order Status

Order Placed  Order Confirmed  Pre Production   
In Production  Ready for Delivery  Order Delivered

SAT	SEN	DOP	Status	Orbit	Product Code	Priority
1	E04	SAR	2022-03-05	CONFIRMED	296	STUCMDPTD 3
2	E04	SAR	2022-03-12	CONFIRMED	402	STUCYGPTD 3
3	E04	SAR	2022-03-12	CONFIRMED	402	STUCYGPTD 3
4	E04	SAR	2022-03-12	CONFIRMED	402	STUCYGPTD 3
5	E04	SAR	2022-03-09	CONFIRMED	357	ST0000KTD 3
6	E04	SAR	2022-03-09	CONFIRMED	357	ST0000KTD 3
7	E04	SAR	2022-03-09	CONFIRMED	357	ST0000KTD 3
8	E04	SAR	2022-03-09	CONFIRMED	357	ST0000KTD 3
9	E04	SAR	2022-03-09	CONFIRMED	357	ST0000KTD 3
10	E04	SAR	2022-03-09	CONFIRMED	357	ST0000KTD 3
11	E04	SAR	2022-03-09	CONFIRMED	357	ST0000KTD 3
12	E04	SAR	2022-03-09	CONFIRMED	357	ST0000KTD 3
13	E04	SAR	2022-03-09	CONFIRMED	357	ST0000KTD 3
14	E04	SAR	2022-03-09	CONFIRMED	357	ST0000KTD 3

Search

Show 20 Search:

15 17 48 E 74 39 41

Search Select Cart Generate PI Generate Order

# New Products now available at Bhoonidhi

SNo	Products	Access Mechanism
1	2.5m posting Cartosat-1 DSM Products	On-Order
2	EOS-06 OCM-3 GAC 1km 8-day NDVI Product (Globe)	Direct Download (April 2023 onward)
3	EOS-06 OCM-3 LAC 360m 8-day NDVI Product (India)	Direct Download (April 2023 onward)
4	EOS-06 - rolling 4km 8-day GAC global - Chlorophyll (CHL), Aerosol Depth (AOD), Diffused Attenuation (DA), Total Suspended Matter (TSM)	Direct Download (January 2024 onward)
5	EOS-06 -rolling 500m 8-day LAC India - Chlorophyll (CHL), Aerosol Depth (AOD), Diffused Attenuation (DA), Total Suspended Matter (TSM)	Direct Download (January 2024 onward)
6	Cartosat-3 PAN Sharpened and PAN product at 45 cm resolution	On-Order
7	EOS-04 500m Soil Moisture Data Products	Direct Download (November 2023 onward)
8	EOS-04 Polarimetric Data products	On-Order
9	EOS-04 level-2B Terrain Normalized (ARD) Product	Direct Download (February 2024)
10	Resourcesat-2 AWiFS - 5-day, 15-day Full India Image Composites at 100m	Direct Download
11	Resourcesat-2 AWiFS - 30-day Full India Image Composites at 100m	Visualization
12	Ortho Products from legacy Mission (1988-2005)	On-Order

# New tool / Utilities at Bhoonidhi

## 1 SARPOLTOOL

Multi-mission SAR toolbox equipped with FCC generation, Sigma0 generation and ship detection, and other related tool for geospatial analysis for SAR data along with EOS-4 data products.

## 2 Image Viewer

Tool for visualizing satellite data product images with capability of minimum radiometric enhancement and distance and area measurement. This software utility supports several file formats and various spatial and radiometric resolutions of remote sensing Image data.

## 3 NetCDF to GeoTIFF Conversion

Tool to convert NetCDF Level 1C/2C data products to Geotiff format for Oceansat-3 OCM sensors to make it accessible via open source packages e.g. COTS packages



# Bhoonidhi Vista

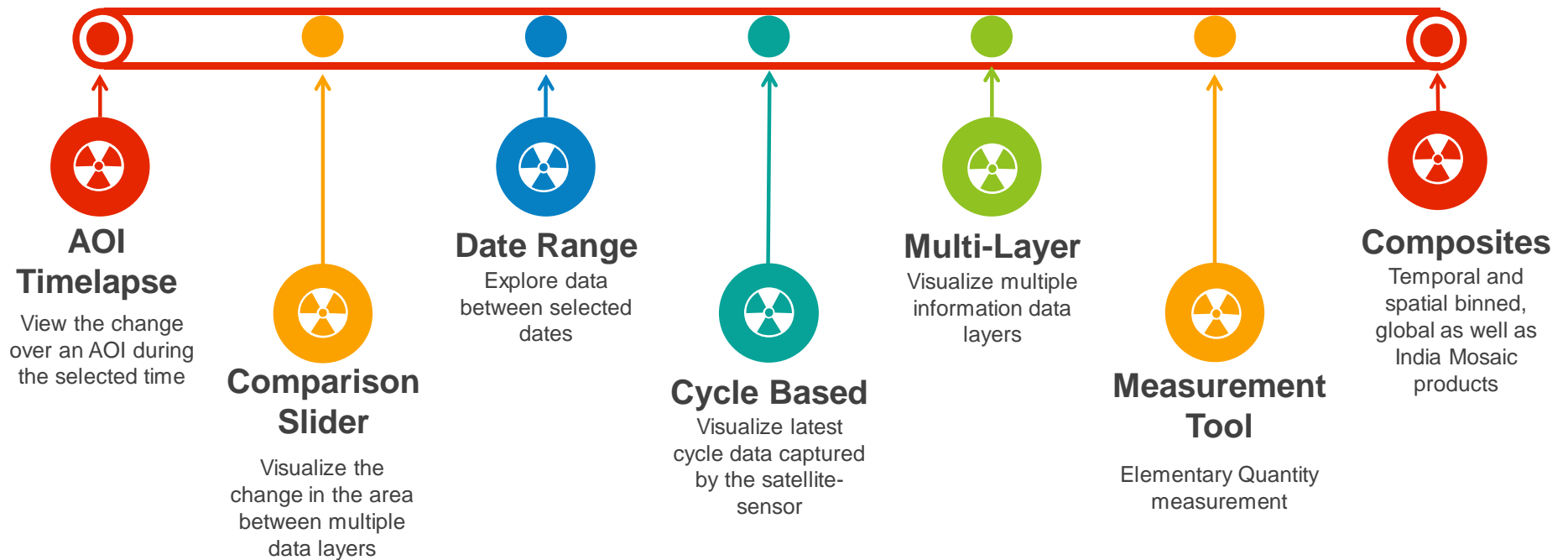
Near Realtime Satellite Data Visualization

# Bhoonidhi Vista

## Online Visualization of Multi-mission EO Data

Bhoonidhi VISTA (Visualization of Terrestrial Acquisitions) provides multi-mission-sensor data visualization; users can visualize the latest view of India captured by Indian and other EO sensors in native resolution

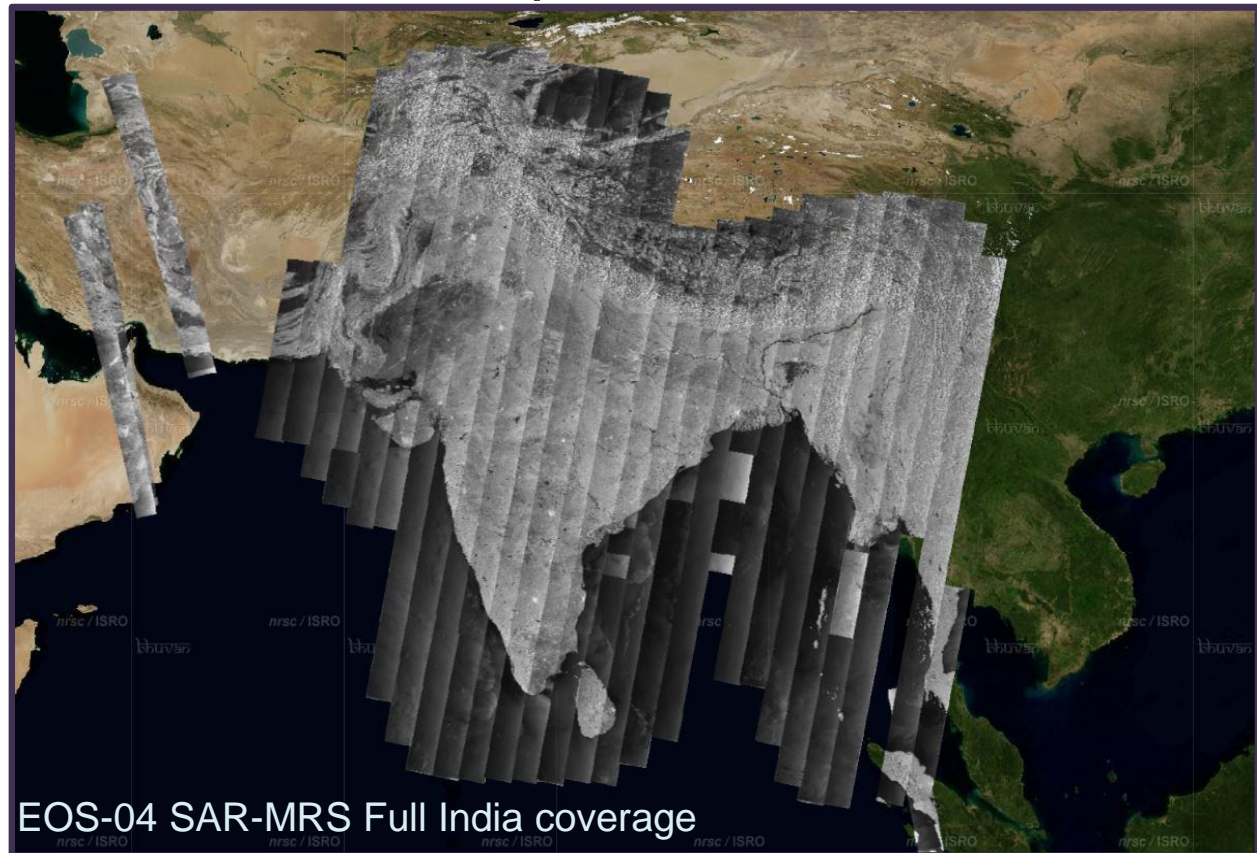
Users have been using Vista for Glacier Monitoring, Water resource Monitoring, Flood Impact Assessment and other applications.



# Bhoonidhi Vista

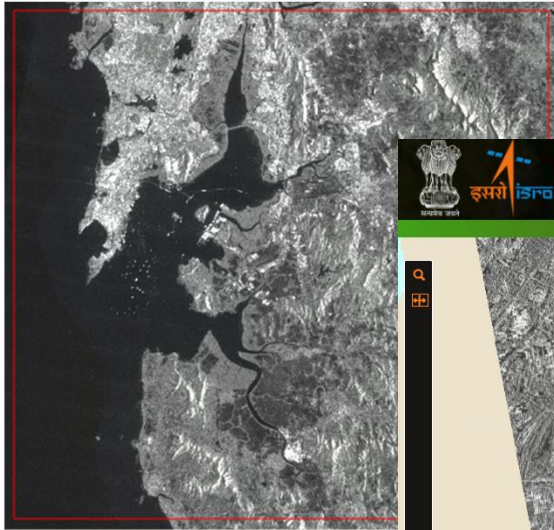
Showcases how India looked in the recent past in near real time

- Full resolution display of satellite data products
- Acquisition to Vista in less than 4 hours
- Insights for change detection and quick analysis for fast response for disaster impact

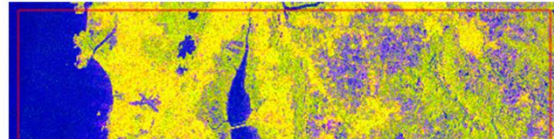




# Bhoonidhi Vista



EOS-04 SAR-MRS HV(lef

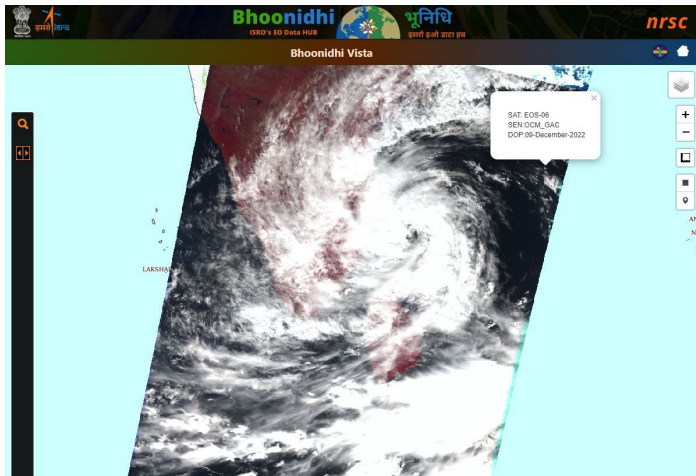


Shri Atal Bihar Bajpayee Trans Harbour Link  
(EOS-04 FRS-1)

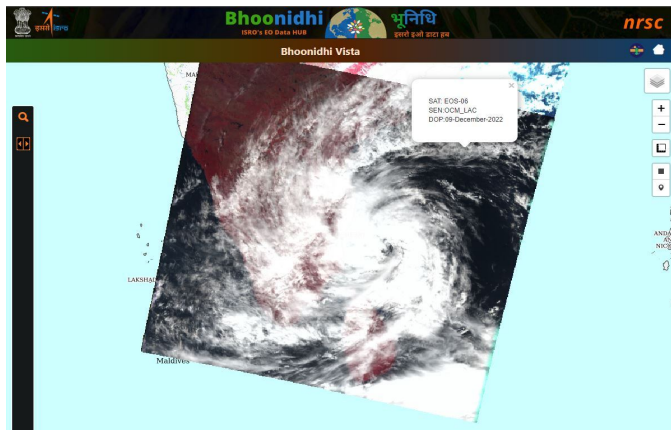


The main interface of the Bhoonidhi Vista web application. It features a header with the ISRO logo, the text 'इसरो ISRO' and 'भूनिधि' (Bhoonidhi) in Hindi, and 'ISRO's EO Data HUB' and 'इसरो इओ डाटा हब' (ISRO EO Data Hub) in English. The central part of the interface displays a large, detailed grayscale SAR image of the coastal area, overlaid with a grid. On the left side, there is a search bar and a zoom control. On the right side, there are navigation controls like zoom in (+), zoom out (-), and a home button. The bottom right corner shows the coordinates: 'N 19° 02' 32" E 72° 58' 24" Longitude: 19.0423 Longitude: 72.9733'. The NRSC logo is visible in the top right corner of the interface.

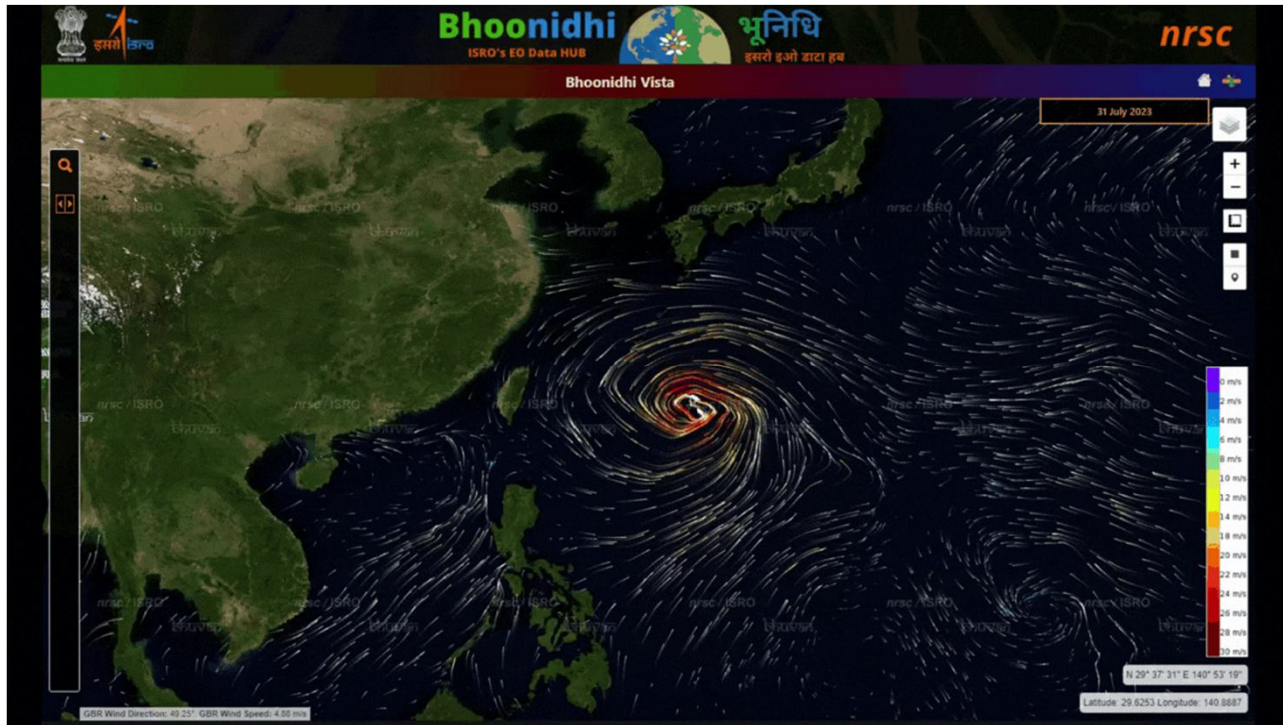
# Bhoonidhi Vista - Cyclone Monitoring



**EOS-06 OCM GAC (Mandous)**



**EOS-06 OCM LAC (Mandous)**

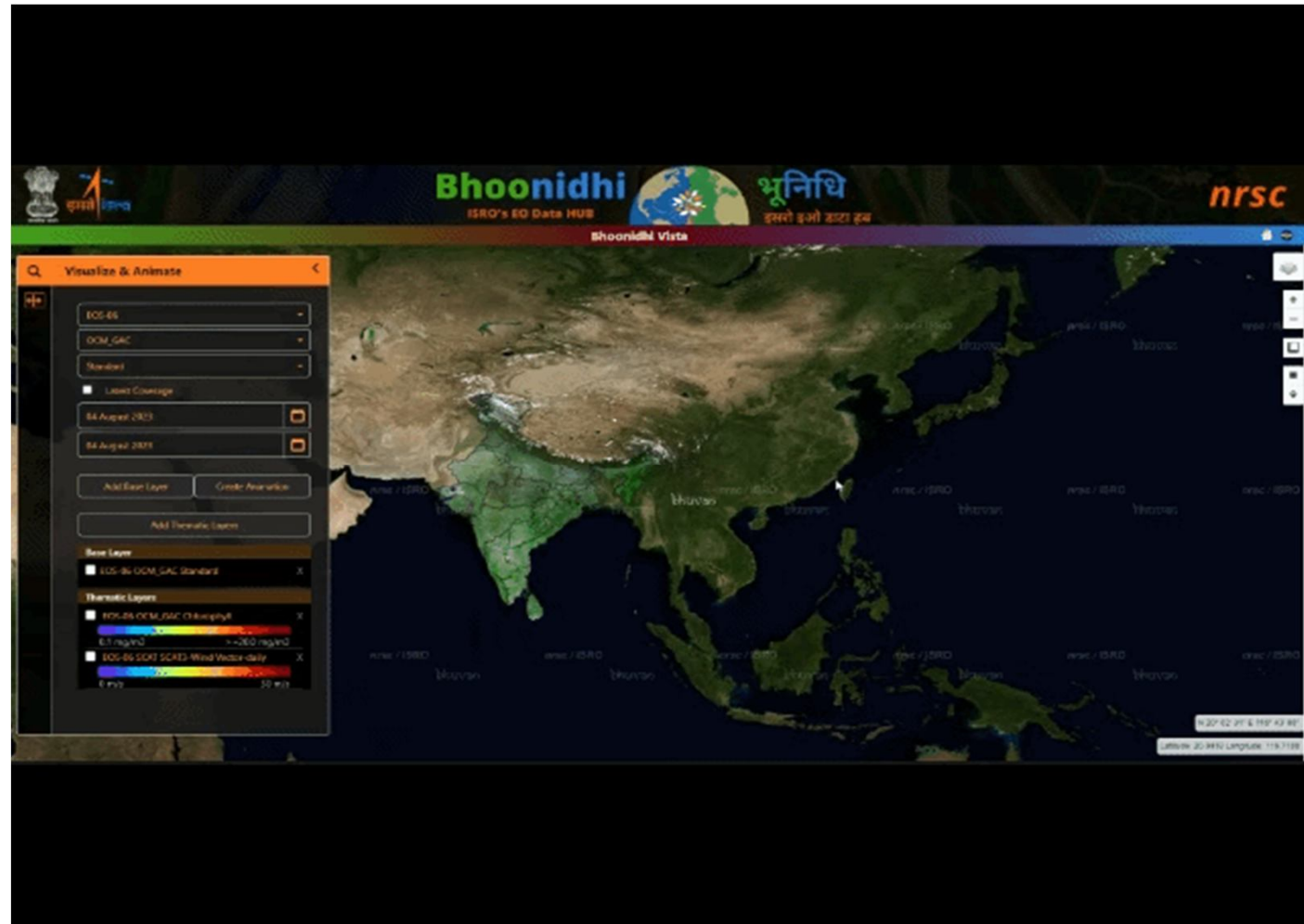


**EOS-06 SCAT (Typhoon Khanun)**

# Bhoonidhi Vista

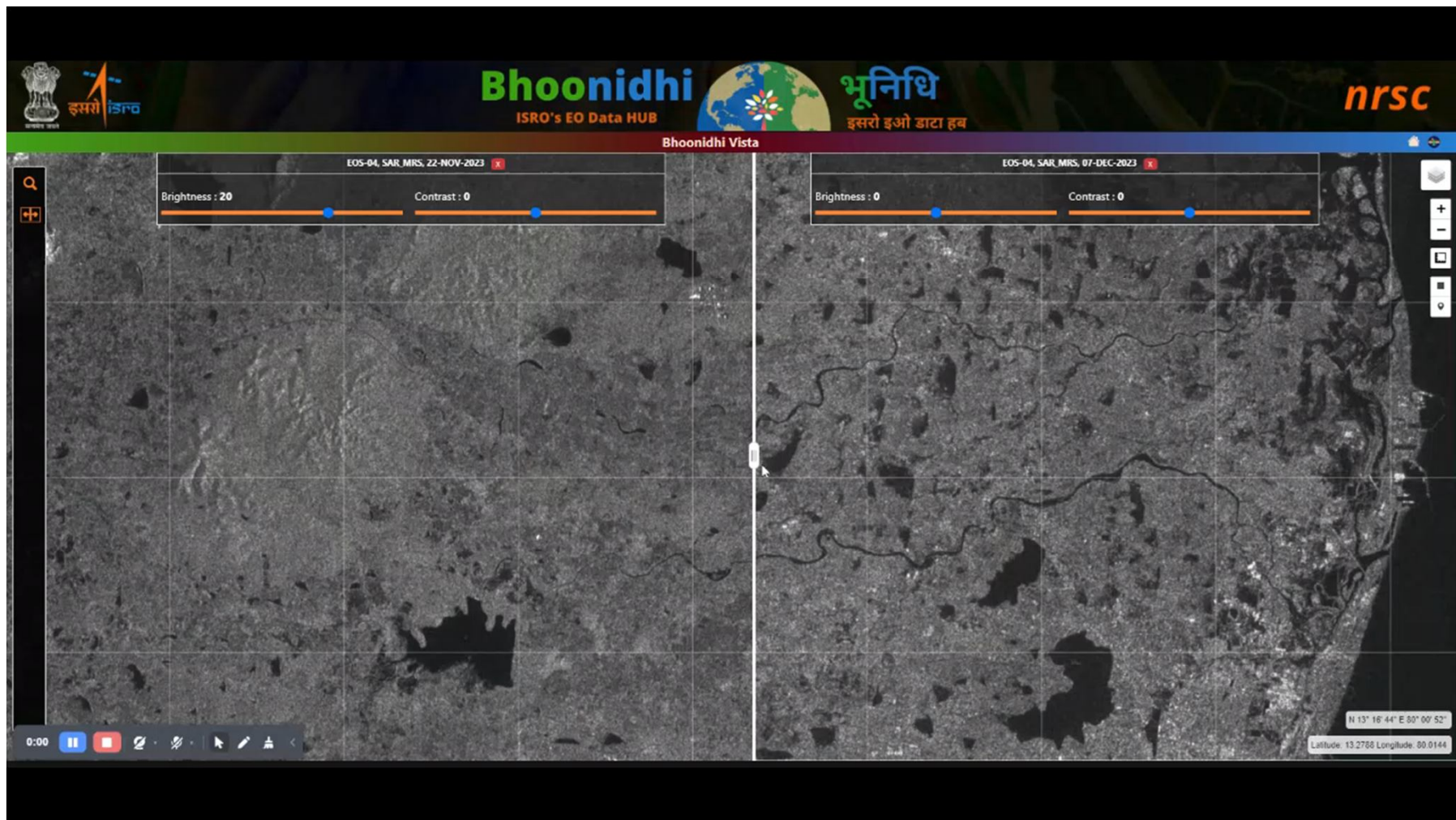
## Multi Layer Data Visualization

### E06: GAC & SCAT3

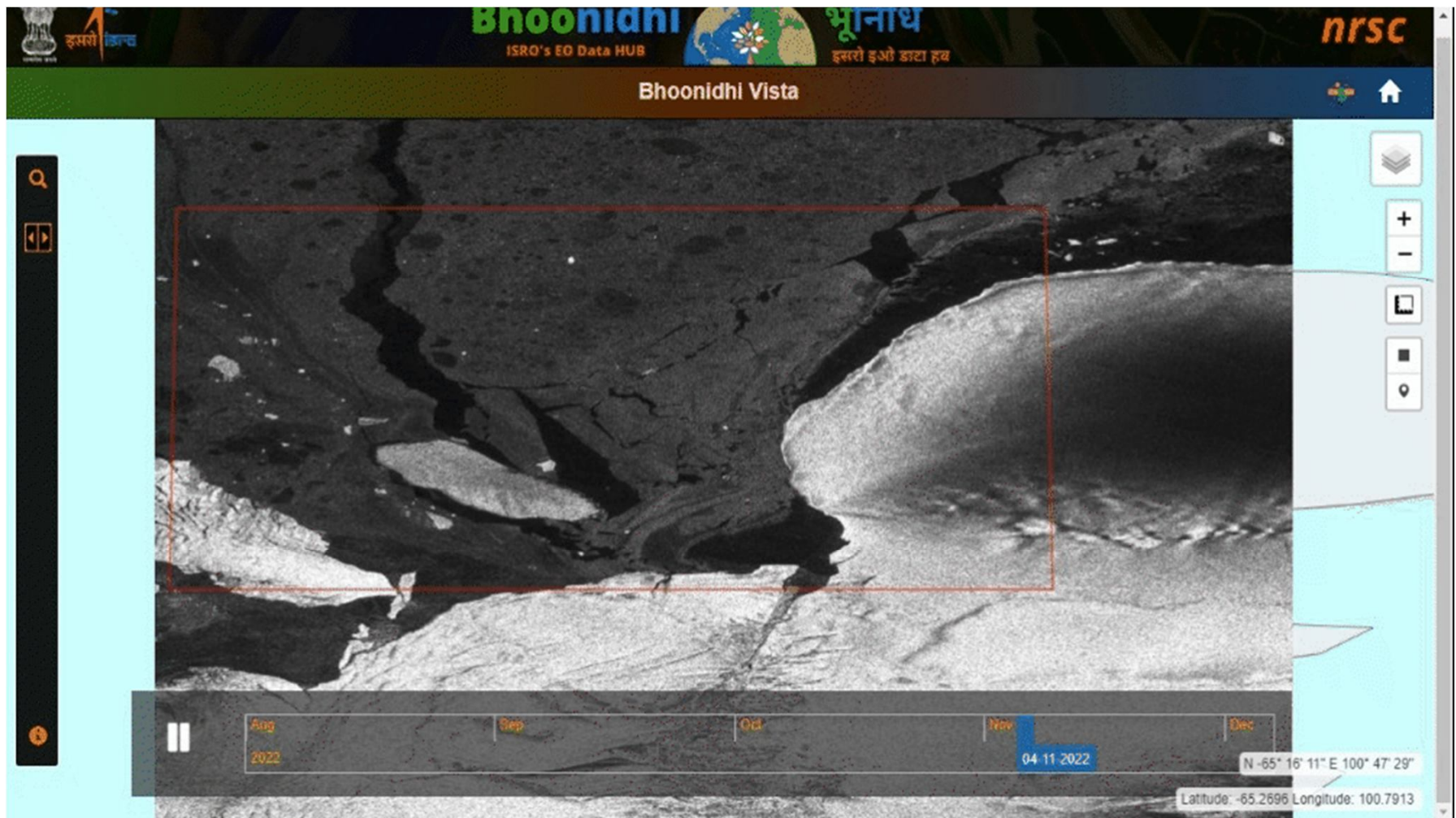


EOS-06 SCAT (Typhoon Khanun)

# Cyclone Michuung Dec-2023 (Chennai)



# Time Lapse for Change Detection





# Measurement Tool – Linear and Area

The screenshot shows the Bhoonidhi Vista interface. At the top, there are logos for ISRO, NRSC, and the Bhoonidhi logo with the text "ISRO's EO Data HUB" and "भूनिधि इसरो इओ डाटा हब". Below the logos is the text "Bhoonidhi Vista". The main area displays a grayscale SAR image of a river with a bridge. A white box with a red 'x' in the top right corner is overlaid on the image, containing the text "Linear measurement" and "1.91 Kilometers (1.19 Miles)". Below the text are two icons: a magnifying glass and a trash can, with the labels "Center on this line" and "Delete" respectively. On the left side, there is a sidebar with the title "Visualize & Animate". It contains several dropdown menus: "EOS-04", "SAR\_CRIS", and "HV". Below these is a checkbox labeled "Latest Coverage" which is checked. There are two date selection fields, both showing "10 October 2022". Below the date fields is a "View Data" button. At the bottom of the sidebar, there is a "Time Interval : 3 seconds" label and a slider control. Below the slider is an "Animate Data" button.

Cyclone Mandous  
E04 SAR FR1  
(08/Dec/2022)

The screenshot shows the Bhoonidhi Vista interface. At the top, there are logos for ISRO, NRSC, and the Bhoonidhi logo with the text "ISRO's EO Data HUB" and "भूनिधि इसरो इओ डाटा हब". Below the logos is the text "Bhoonidhi Vista". The main area displays a grayscale SAR image of a city. A white box with a red 'x' in the top right corner is overlaid on the image, containing the text "Area measurement" and "2,597,748 Sq Meters (641.93 Acres)". Below the text is another line of text: "7.15 Kilometers (4.45 Miles) Perimeter". At the bottom of the box are two icons: a magnifying glass and a trash can, with the labels "Center on this area" and "Delete" respectively. The background image shows a city with a river and a bridge.

Prayagraj Bridge Measurement with E04 SAR CRS (10/Oct/2022)



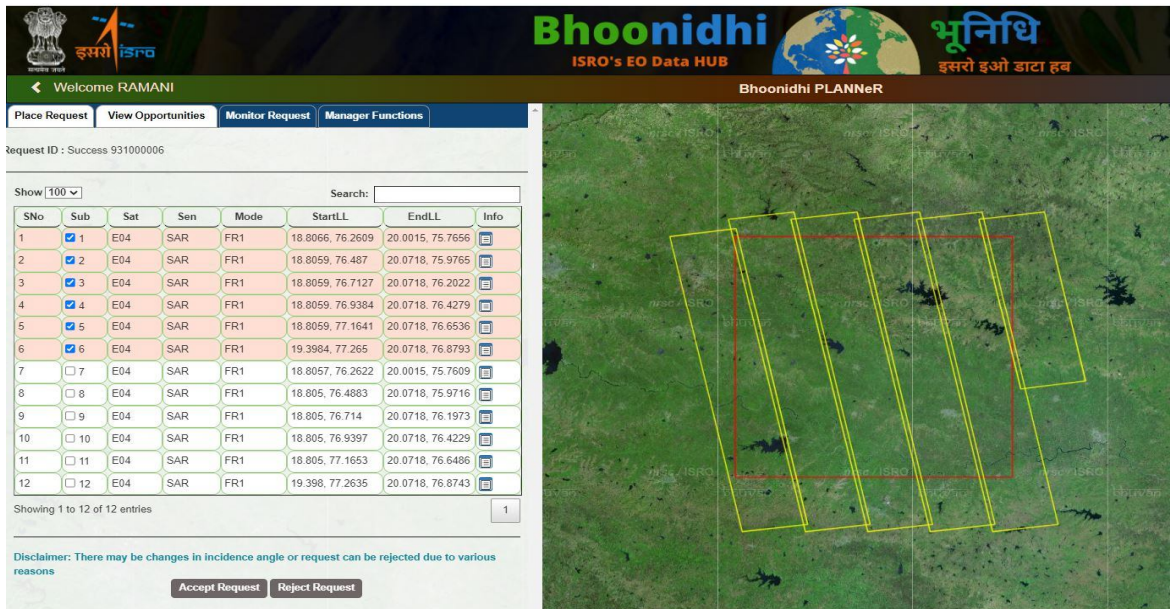
# Bhoonidhi Planner and Upagrah

Planning future acquisitions for the satellite

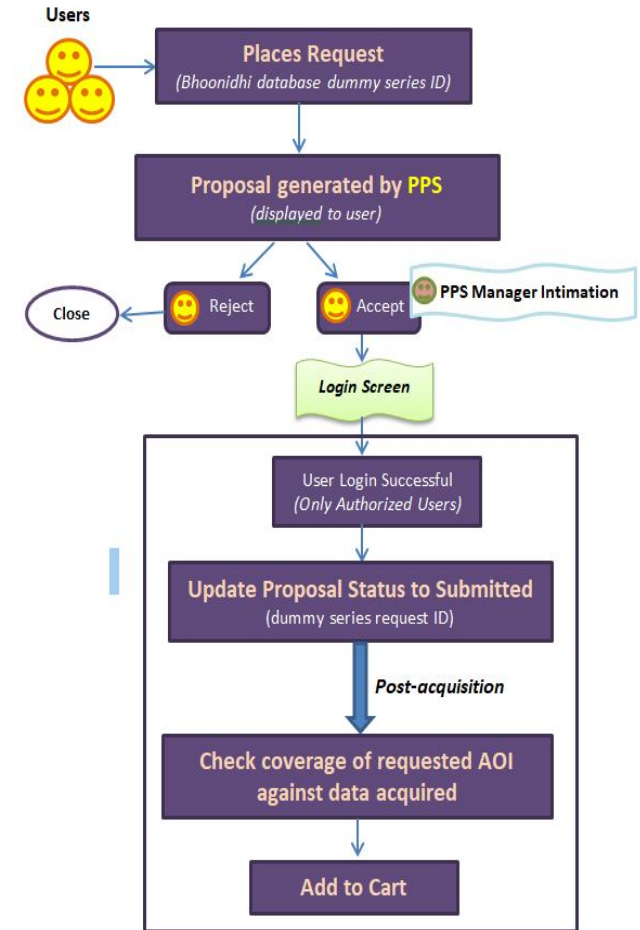
# Bhoonidhi - PLANNeR

Request Placing Service at Bhoonidhi which allows users to submit request for fresh acquisitions for EOS-04.

- Provision to view possibility & dates of acquisitions to all users.
- Authorized users allowed to submit planning requests.
- The request will be honored as per the feasibility



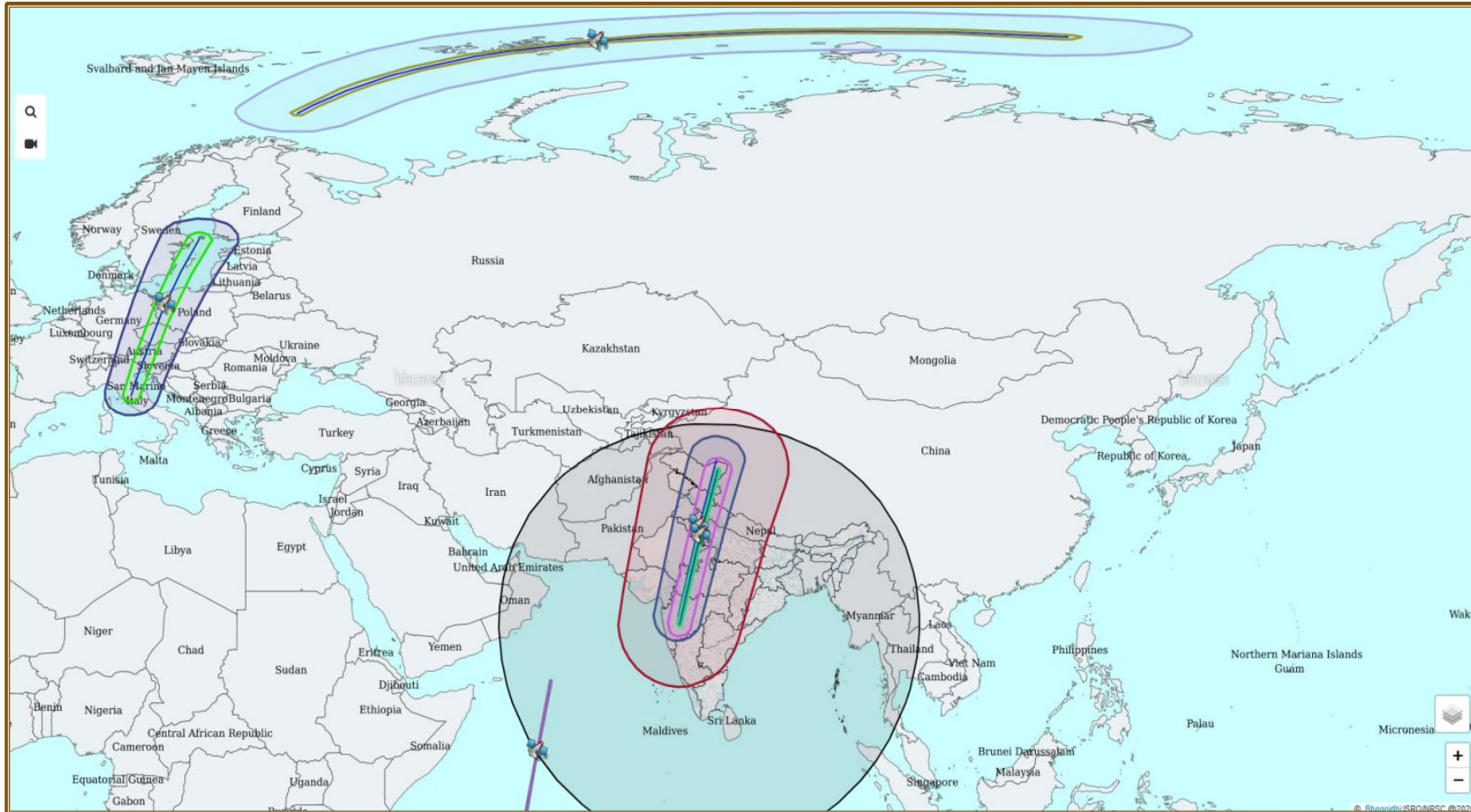
SNo	Sub	Sat	Sen	Mode	StartLL	EndLL	Info
1	<input checked="" type="checkbox"/>	E04	SAR	FR1	18.8066, 76.2609	20.0015, 75.7656	
2	<input checked="" type="checkbox"/>	E04	SAR	FR1	18.8059, 76.487	20.0718, 75.9765	
3	<input checked="" type="checkbox"/>	E04	SAR	FR1	18.8059, 76.7127	20.0718, 76.2022	
4	<input checked="" type="checkbox"/>	E04	SAR	FR1	18.8059, 76.9384	20.0718, 76.4279	
5	<input checked="" type="checkbox"/>	E04	SAR	FR1	18.8059, 77.1641	20.0718, 76.6536	
6	<input checked="" type="checkbox"/>	E04	SAR	FR1	19.3984, 77.265	20.0718, 76.8793	
7	<input type="checkbox"/>	E04	SAR	FR1	18.8057, 76.2622	20.0015, 75.7609	
8	<input type="checkbox"/>	E04	SAR	FR1	18.805, 76.4883	20.0718, 75.9716	
9	<input type="checkbox"/>	E04	SAR	FR1	18.805, 76.714	20.0718, 76.1973	
10	<input type="checkbox"/>	E04	SAR	FR1	18.805, 76.9397	20.0718, 76.4229	
11	<input type="checkbox"/>	E04	SAR	FR1	18.805, 77.1653	20.0718, 76.6486	
12	<input type="checkbox"/>	E04	SAR	FR1	19.398, 77.2635	20.0718, 76.8743	






# Bhoonidhi Upagrah

- Track Satellites live
- Predict the position of satellite at a future time
- View the nominal swaths of the payloads





# Bhoonidhi Resources



Tutorial Videos

Help Documents

Archives

- BWS #1 - Nov 2022

Stories

Sample Products

## Bhoonidhi! Workshop Archives

BWS #1 - Bhoonidhi Workshop 1 - 07 November 2022

**Topic**

- 1-BWS#1 Sensors & Image Planning
- 2-BWS#1 Optical Products
- 3-BWS#1 Microwave\_Dataproducs
- 4-BWS#1 Customized Products
- 5-BWS#1 Pricing & Licensing
- 6-BWS#1 Bhoonidhi
- 7-BWS#1 Bhoonidhi Vista - O
- 8-BWS#1 Bhoonidhi Upcomin
- 9-BWS#1 Bhoonidhi End to E
- 10-BWS#1 Usecases

## Bhoonidhi! Sample Products

Search:

<b>Cartosat-1</b>	Specifications
Cartosat-1 PAN A	Download
Cartosat-1 Stereo PRODUCT1	Download
Cartosat-1 Stereo PRODUCT2	Download
<b>CartoDEM</b>	Specifications / Disclaimer
Cartosat-1 - DEM - P5_PAN_CD_N30_250_E079_375_DEM	Download
Cartosat-1 - OIM - P5_PAN_CD_N30_250_E079_375_OIM	Download
<b>Cartosat-2S</b>	Specifications / Disclaimer
Cartosat-2S PAN - PRODUCT	Download
Cartosat-2S MX - PRODUCT	Download
<b>Cartosat-3</b>	Specifications / Disclaimer
Cartosat-3 PAN - PRODUCT	Download
Cartosat-3 MX - PRODUCT	Download
<b>EOS-04</b>	Specifications
EOS-04 MRS - PRODUCT	Download
EOS-04 FRS1 - PRODUCT	Download
EOS-04 CRS - PRODUCT	Download
<b>Resourcesat-2A</b>	
Resourcesat-2A LISS4-FMX - PRODUCT	Download



Showing 1 to 20 of 30 entries

1 2

## Bhoonidhi! Tutorial Videos

Bhoonidhi Login

Check Data Availability

Multiple searches into single order

NovaSAR L1 Product Ordering

## Bhoonidhi! Help Documents

Search:

**Title**

- LandSat Products Description
- Sentinel 1 Product Specification
- Sentinel 2 Product Specification
- NovaSAR Product Release Note
- NRSC Satellite Data Ordering
- SFTP Products Download Help
- Bhoonidhi User Manual

# Upcoming Releases

### Bhoonidhi Codelab

Bhoonidhi Codelab is a fully managed Jupyterhub interface to access Bhoonidhi hosted satellite image datasets, process them with different open source libraries built into the environment through a web browser.

The users are provided with a persistent storage and can access data sets hosted on Bhoonidhi with a built in python library. Using this platform Users can develop software to process and analyze satellite data sets and download the results directly from the browser.

CodeLab\_CDC (1) Last Checkpoint: 15/02/2023 (unsaved changes)

View Insert Cell Kernel Widgets Help Not Trusted Python 3 (ipy)

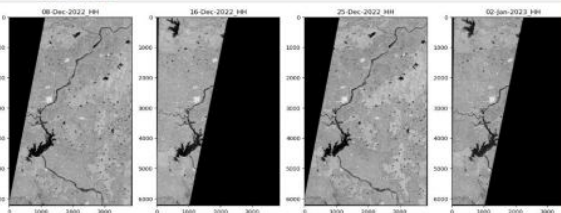
340000 360000 380000 400000

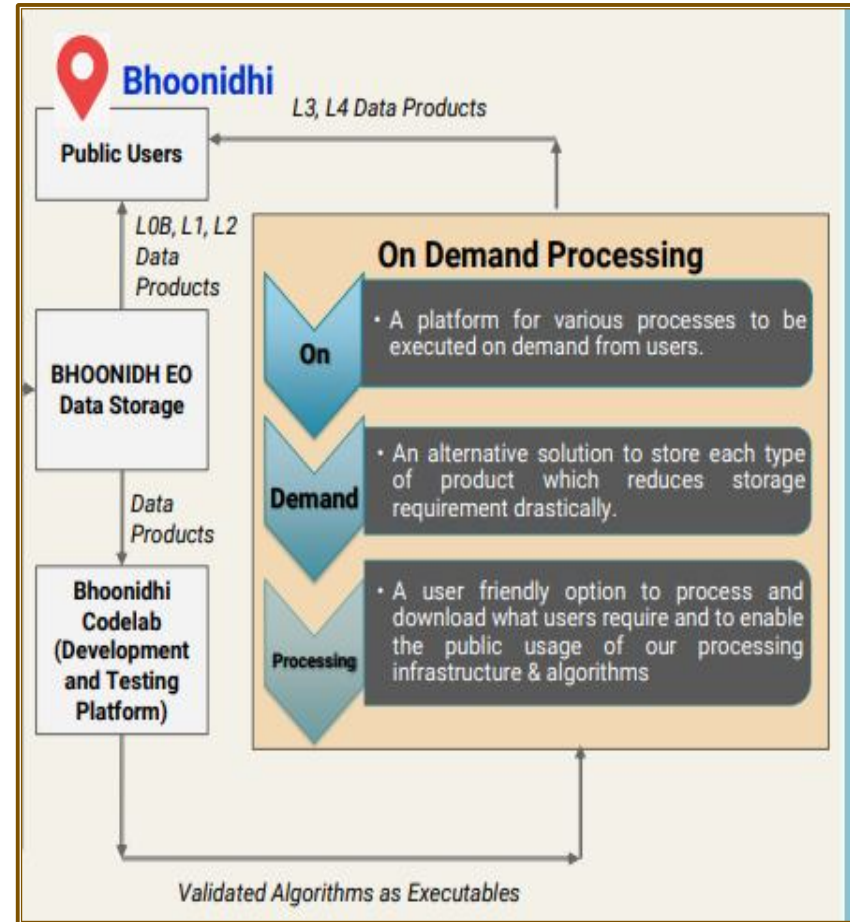
<<AxesSubplot: >

**Visualization**

The block below enhances the `rs_0` product that has been subsampled, resampled and reprojected. Note that we are treating any backscatter below -100 dB as Not a Number and discarding it for any analysis.

```
def enhancer(img, iq=2, sq=97):
    return np.clip(img, np.percentile(img[img>100].flatten(), iq), np.percentile(img[img>100].flatten(), sq))
fig, ax = plt.subplots(1, 4, figsize=(16, 16))
count = 0
for i in range(4):
    for j in range(4):
        if count>stack.shape[2]:
            ax[j].imshow(enhancer(stack[:, :, count]), cmap='gray')
            ax[j].set_title(datas[count])
            count = count+1
```





# Thank You



- Bhoonidhi Team  
NRSC / ISRO

Continuous additions of new  
satellite data, products,  
access mechanism

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Please write to us for your feedback or any queries at  
[bhoonidhi@nrsc.gov.in](mailto:bhoonidhi@nrsc.gov.in)