

BHOONIDHI

ISRO EO Data Hub



ANUPAMA SHARMA

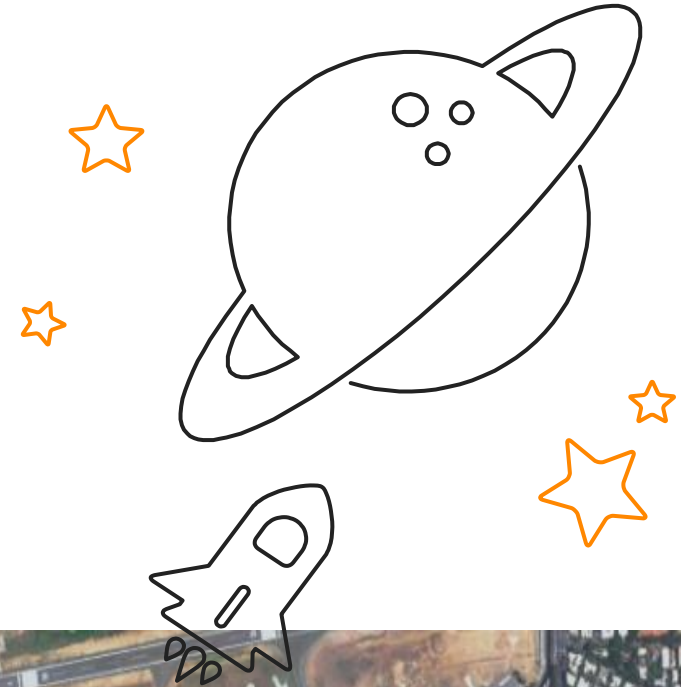
Bhoonidhi Team

WPDSD/ DPSG/ NRSC/ ISRO

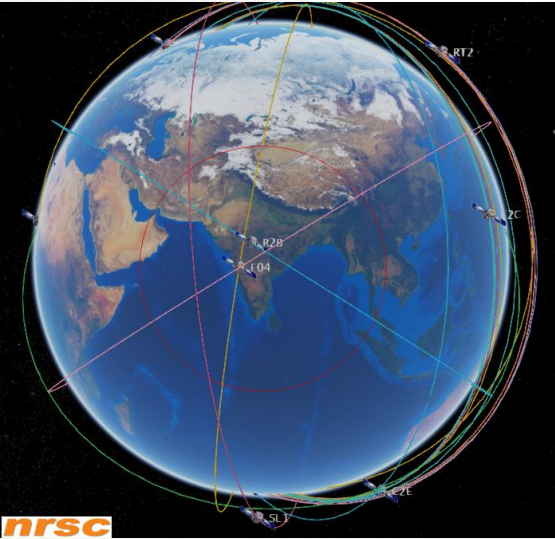
URL: <https://bhoonidhi.nrsc.gov.in>

Presentation Roadmap

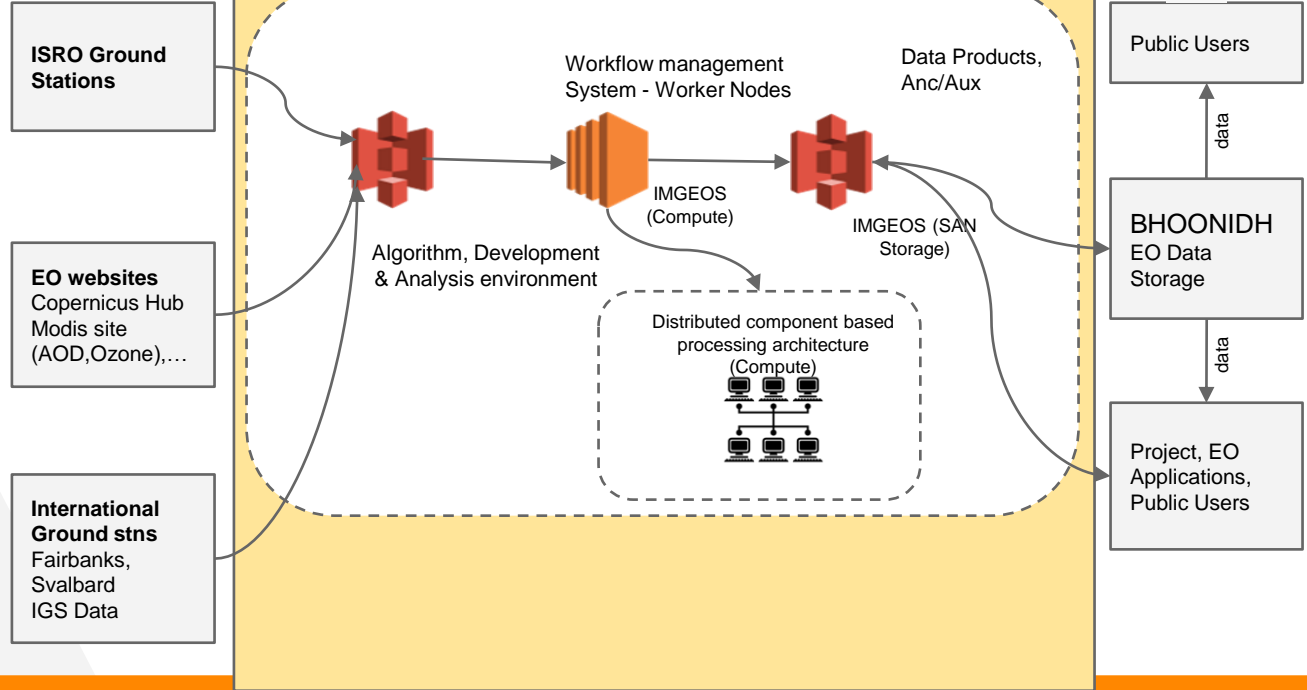
- ▶ IMGEOs Processing network
- ▶ Bhoonidhi – ISRO EO Data Hub
- ▶ Data Access Services
- ▶ Data Diversity
- ▶ Data Archive
- ▶ Use case for Data Access



IMGEOS Processing Network – How Data gets generated



nrsc



Bhoonidhi

ISRO EO Data Hub

Bhoonidhi enables access to our extensive archive of Remote Sensing data from 46 satellites, including Indian and Foreign Remote Sensing sensors acquired over 33 years.

We also facilitate the Regional distribution of Sentinel and LandSat-8 data in India.



VISTA
Viewer of ISRO Satellites

Bhoonidhi
STATS

Bhoonidhi
Browse & Order

Bhoonidhi
API

UPAGRAH
Orbit Viewer

APPLICATIONS



Bhoonidhi Browse & Order

Search, View and Download/Order open/priced data of various IRS missions, Landsat-8, Sentinel 1&2 and NovaSAR

[VISIT →](#)



Bhoonidhi Vista

Visualize the daily acquired data and temporal cycle based mosaic

[VISIT →](#)



Upagrah

Orbit Viewer - Live satellite/orbit tracking and View of all satellites at given UTC time.

[VISIT →](#)

Products @Bhoonidhi

- Surface reflectance product
- Cartosat-1 Stereo products
- Cartosat-1 CartoDEM products
- Soatsat-1, NPP-Soumi, JPSS1 – Open data products

Features @Bhoonidhi

- Image un-publish
- GST details integration
- Order Cancellation
- Upgraded location database

NEW RELEASE!

Bhoonidhi Data Access - How You get data

Bhoonidhi



Browse & Order

FREE&OPEN

Search, View and Download ,
Paid CART Interface,
Proforma (PI) ,
Place workorder

PRICED

[https..
SFTP..](https://bhoonidhi.nrsc.gov.in/bhoonidhi/index.html)

bhoonidhi.nrsc.gov.in/bhoonidhi/index.html

VISTA

Visualize at Full Resolution

Visualize the NRT daily acquired data and temporal cycle based mosaic,

Quick animation of a point AOI

For Online Analysis

bhoonidhi.nrsc.gov.in/vista/index.html

UPAGRAH

Orbit Viewer

Orbit Viewer - Live satellite/orbit tracking

Quick View of all satellites at predicted UTC time.

For Online Analysis

bhoonidhi.nrsc.gov.in/upagrah

Data Diversity @Bhoonidhi – What EO Data

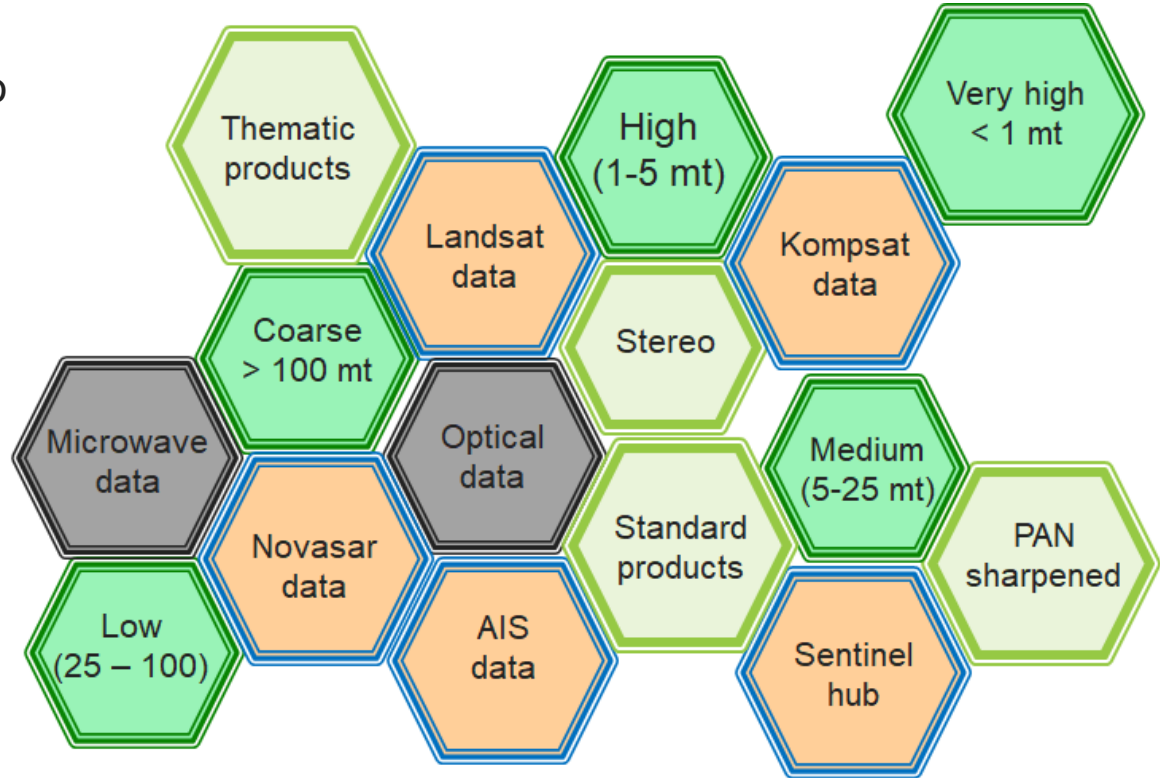
- Product types
- Foreign missio
- Resolutions
- Bands

NEW RELEASE!

- Surface Refelctance from Liss-3 & AWIFS
- Ortho from IRS-1A/1B/1C/1D
Liss-1,Liss-2 ,Liss-3
- Cartosat-1 Stereo
- Cartosat-1 2.5 DEM
- Scatsat-1, NPP-Soumi, JPSS1

Upcoming...

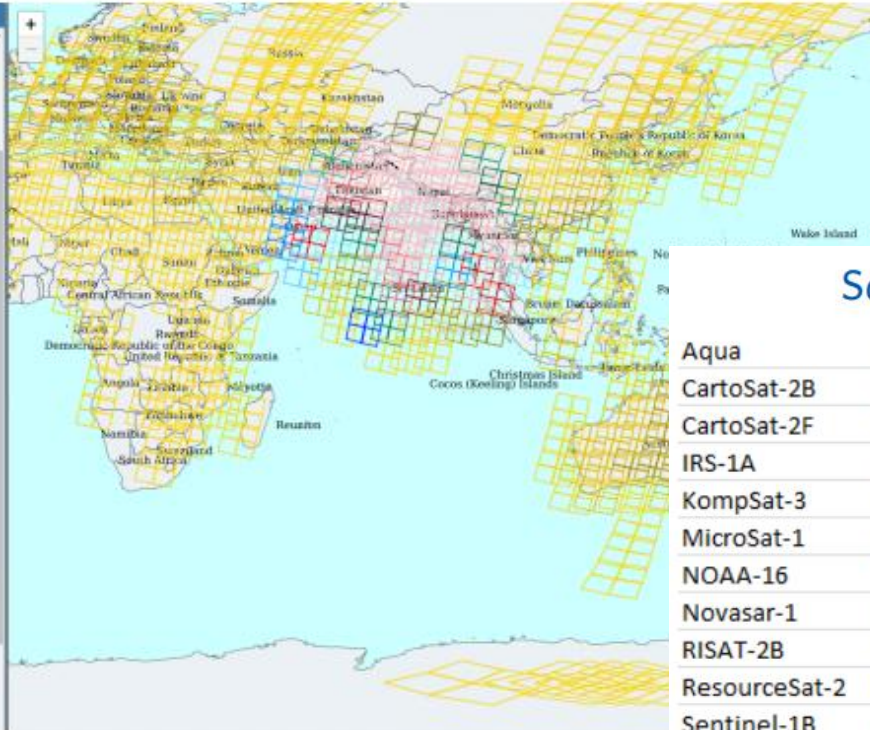
- Landsat-8 –collection-2
- Landsat-9
- Cyclewise NDVI, NDWI from Awifs



Data Availability – How much EO Data

ResourceSat-2 AWiFS Data availability Sample View

Satellite	Data Availability	
CartoSat-2E	06/13/2016 - 08 date	View
CartoSat-2F	01/01/2017 - 08 date	View
CartoSat-3	06/19/2020 - 08 date	View
HYSIS	09/19/2018 - 08 date	View
IRS-1A	03/19/1988 - 05/01/1991	View
IRS-1B	08/01/1991 - 09/01/1998	View
IRS-1C	12/28/1995 - 09/21/2007	View
IRS-1D	09/27/1997 - 01/20/2018	View
KompSat-3	01/01/2016 - 08 date	View
KompSat-3A	01/01/2016 - 08 date	View
LandSat-5	01/04/1986 - 10/29/2001	View
LandSat-8	01/01/2017 - 08 date	View
MicroSat-1	01/14/2018 - 01/14/2019	View
NOAA-11	08/25/1994 - 09/13/1994	View
NOAA-12	03/14/1994 - 11/04/1995	View
NOAA-14	04/03/1995 - 09/22/2018	View
NOAA-16	06/20/2001 - 07/15/2013	View
NOAA-17	09/20/2005 - 12/31/2018	View
NOAA-18	09/20/2005 - 10/09/2008	View
NOAA-19	04/29/2010 - 07/15/2013	View
Novasar-1	04/01/2010 - 08 date	View
OceanSat-1	05/26/1995 - 09/08/2018	View
OceanSat-2	12/01/2009 - 08 date	View
RISAT-1	05/08/2012 - 03/17/2017	View
RISAT-2B	05/24/2019 - 08 date	View
RISAT-2B1	12/14/2019 - 08 date	View
RISAT-2B2	11/19/2019 - 08 date	View
ResourceSat-1	05/08/2003 - 10/09/2018	View
ResourceSat-2	09/01/2010 - 08 date	View
AWiFS	05/08/2011 - 08 date	View
LISIS	06/01/2015 - 08 date	View
LISIS(MONO)	05/08/2011 - 08 date	View
LISIS(MC2)	05/08/2011 - 08 date	View
LISIS(MC3)	05/08/2011 - 08 date	View
LISIS(MC7)	05/08/2011 - 08 date	View



Satellite Data Availability

Aqua	CartoSat-1	CartoSat-2	CartoSat-2A
CartoSat-2B	CartoSat-2C	CartoSat-2D	CartoSat-2E
CartoSat-2F	CartoSat-3	GSAT29	HYSIS
IRS-1A	IRS-1B	IRS-1C	IRS-1D
KompSat-3	KompSat-3A	LandSat-5	LandSat-8
MicroSat-1	NOAA-11	NOAA-12	NOAA-14
NOAA-16	NOAA-17	NOAA-18	NOAA-19
Novasar-1	OceanSat-1	OceanSat-2	RISAT-1
RISAT-2B	RISAT-2B1	RISAT-2B2	ResourceSat-1
ResourceSat-2	ResourceSat-2A	ScatSat-1	Sentinel-1A
Sentinel-1B	Sentinel-2A	Sentinel-2B	Terra

Features – How to find Data

- ▶ User friendly search options to ease target area identification:
- ▶ Multiple satellite and sensors, resolutions, date range
- ▶ Event-based input specifications
- ▶ Natural language text based search options
- ▶ AOI specification using free draw on map, shapefile, polygon, points, pre-defined locations.
- ▶ Additional filtering based on cloud, polarisation, sub-scene, path, row.
- ▶ ePayment through Non-Tax Receipt Portal (NTRP) (<https://bharatkosh.gov.in>) – interface @Bhoonidhi will be enabled soon.



Bhoonidhi VISTA & Upagrah

Satellite Data and Orbit Trace Viewing Applications

Bhoonidhi Vista- See data as it comes

Overview

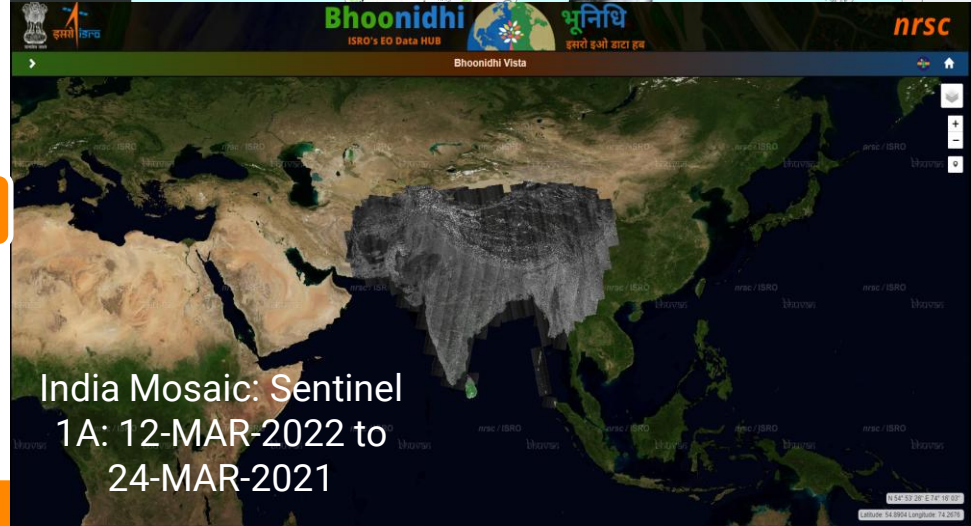
- Data Visualization service at Bhoonidhi providing full resolution data visualization capability in an interactive way using an online map

Salient Features

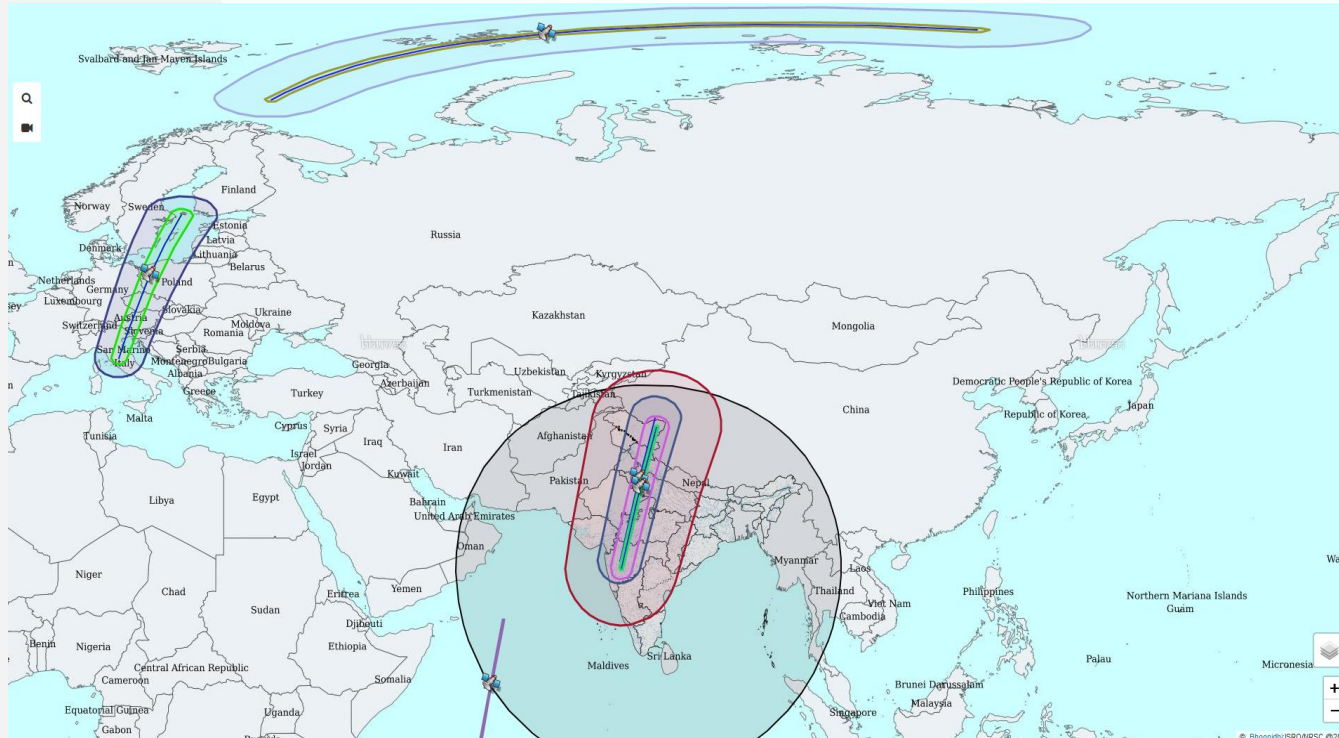
- Multi Mission- Multi Sensor support
- Visualize as and when available
- Multiple Visualization Options (Day-wise and between dates)
- Time Series Animation

Missions and Sensors Supported

- Sentinel 1A: SAR
- Sentinel 2A and 2B: MSI
- Resourcesat-2: AWIFS, LISS-3 and L4MX
- Resourcesat-2A: AWIFS, LISS-3 and L4MX, **C2S coming**



Bhoonidhi Upagrah- Where is the Sat Now



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

Bhoonidhi Roadmap

Coming up @Bhoonidhi

Bhoonidhi Roadmap – When expected New RS Data Policy is approved

Open Data Policy Guidelines	Satellite sensors	Basic Data delivery & Defined quantity
<p>Data products coarser than 5 m resolution “ as is where is condition “</p> <p>FREE & OPEN</p>	<ul style="list-style-type: none"> ➤ Resourcesat Series -1/2/2A, IRS-1A/1B/1C/1D ➤ Oceansat series -1/2 ➤ Scatsat -1, Ocat ➤ SARAL ➤ Risat-1, EOS-4 ➤ Landsat-8, Suomi-NPP, JPSS1, Sentinel-1/2, NovaSAR(as per Policy) 	<ul style="list-style-type: none"> ✓ HTTPS based Delivery ✓ API based Delivery <p>TAT would be different for recent & older data</p>
<p>Data products 5m upto 0.5 m resolution</p> <p>FREE for Govt and R&D Priced for Private</p>	<ul style="list-style-type: none"> ➤ Cartosat-1 ➤ Cartosat-2/2A/2B ➤ Cartosat-2S ➤ Cartosat-3-MX ➤ KOMPSAT -3/3A 	<ul style="list-style-type: none"> ✓ SFTP based delivery ✓ API based Delivery
<p>Data products submeter upto 0.5 m resolution with Authorization</p> <p>FREE for Govt and academic Priced for Private</p>	<ul style="list-style-type: none"> ➤ Cartosat-3- PAN 	<ul style="list-style-type: none"> ✓ SFTP based delivery ✓ API based Delivery

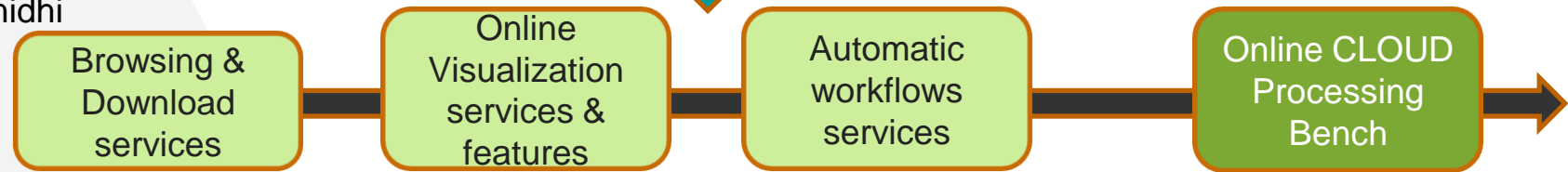
Bhoonidhi Roadmap - Making Data easily accessible

Standard Products: Georeferenced / Orthorectified, Surface Reflectance

Derived: DEM, AIS, Sigma naught Products, Cycle wise Mosaics, Merged Products, Brightness Temperature, Geophysical products for Land and Ocean, NDVI Mosaics,..

Advanced Products: ARD, Quality Layers, object Vectors using AI/ML Techniques, CAL-VAL

Bhoonidhi



Browse & Order

Bhoonidhi-VISTA
Bhoonidhi-Upgrah
Bhoonidhi-Sahayak

Bhoonidhi-API-Lib
Bhoonidhi-APIs

Bhoonidhi- ODP Engine

Users



Data Downloads at Customer End

NRT online Assessment & Monitoring without download with Online Help services

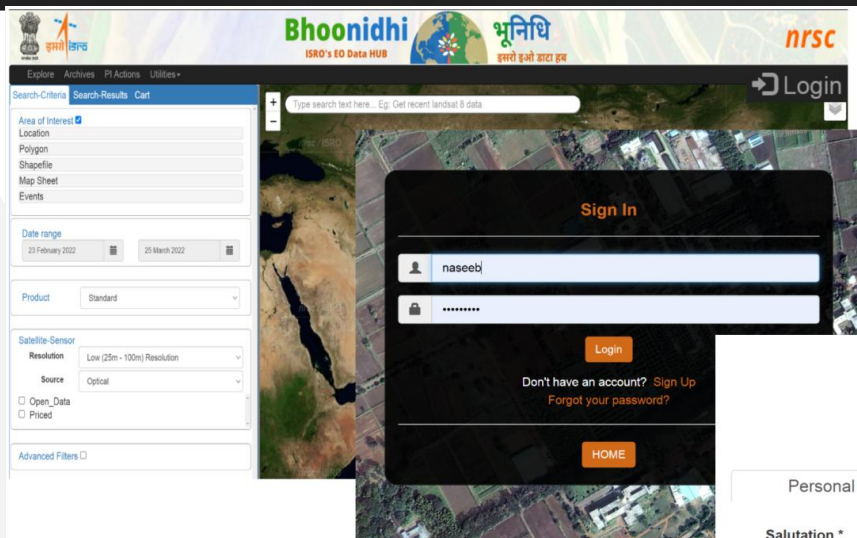
Machine to Machine Data exchange with Subscription SLA's

Tools Kit for Image arithmetic's, time series analysis, NRT Infra monitoring , AI/ML models verification , Information Products

Use case for Data Access

Simple steps to access Priced/ Open satellite data @Bhoonidhi

Register & Login



The screenshot shows the Bhoonidhi website interface. On the left, there is a search criteria panel with fields for Area of Interest, Location, Polygon, Shapefile, Map Sheet, and Events. Below these are filters for Date range (23 February 2022 to 23 March 2022), Product (Standard), and Satellite-Sensor (Resolution: Low (25m - 100m), Source: Optical). There are also checkboxes for Open_Data and Priced, and an Advanced Filters section.

In the center, a search bar contains the text "Type search text here... Eg. Get recent landsat 8 data". To the right, there is a "Login" button.

Overlaid on the search results is a dark "Sign In" modal. It contains two input fields: one for the username "naseeb" and one for a password represented by dots. Below the password field is a "Login" button. At the bottom of the modal, there are links for "Don't have an account? Sign Up" and "Forgot your password?", and a "HOME" button.

Bhoonidhi Registration

Personal Info	Address	Contact Details	Submit Registration
Salutation *	Ms		
Full name *	Ankitha		
Gender	female		
Login Id *	ankitha		
password *		
User Type *	Central Government		

Product Search Inputs

- ▶ Area of Interest
- ▶ Date Range
- ▶ Product Type
- ▶ Resolution
- ▶ Satellite-Sensor
- ▶ Events
- ▶ Advanced Filters

Explore Archives PI Actions Utilities -

Search-Criteria Search-Results Cart

Area of Interest

Location

Place Name ▼

Hyderabad,Telangana,India
17.361, 78.474

Latitude

Longitude

Area(km)

Polygon

Shapefile

Map Sheet

Events

Date range

23 February 2022 25 March 2022

Product

Standard ▼

Standard

Stereo

AIS

Thematic

Satellite-Sensor

Resolution

Low (25m - 100m) Resolution ▼

Very high (0m - 1m) Resolution

High (1m - 5m) Resolution

Medium (5m - 25m) Resolution

Low (25m - 100m) Resolution

Coarse (100m - 1000m) Resolution

Source

Optical ▼

Open_Data

- LandSat-8_OLI+TIRS_Standard
- Sentinel-2A_MSI_Level-1C
- Sentinel-2A_MSI_Level-2A
- Sentinel-2B_MSI_Level-1C
- Sentinel-2B_MSI_Level-2A

Priced

- ResourceSat-2_AWIFS
- ResourceSat-2A_AWIFS_BOA
- ResourceSat-2A_AWIFS

Advanced Filters

LandSat-8_OLI+TIRS_Standard

Cloud Less Than % 100

Sentinel-2A_MSI_Level-2A

Cloud Less Than % 100

ResourceSat-2_AWIFS

Cloud Less Than % 100

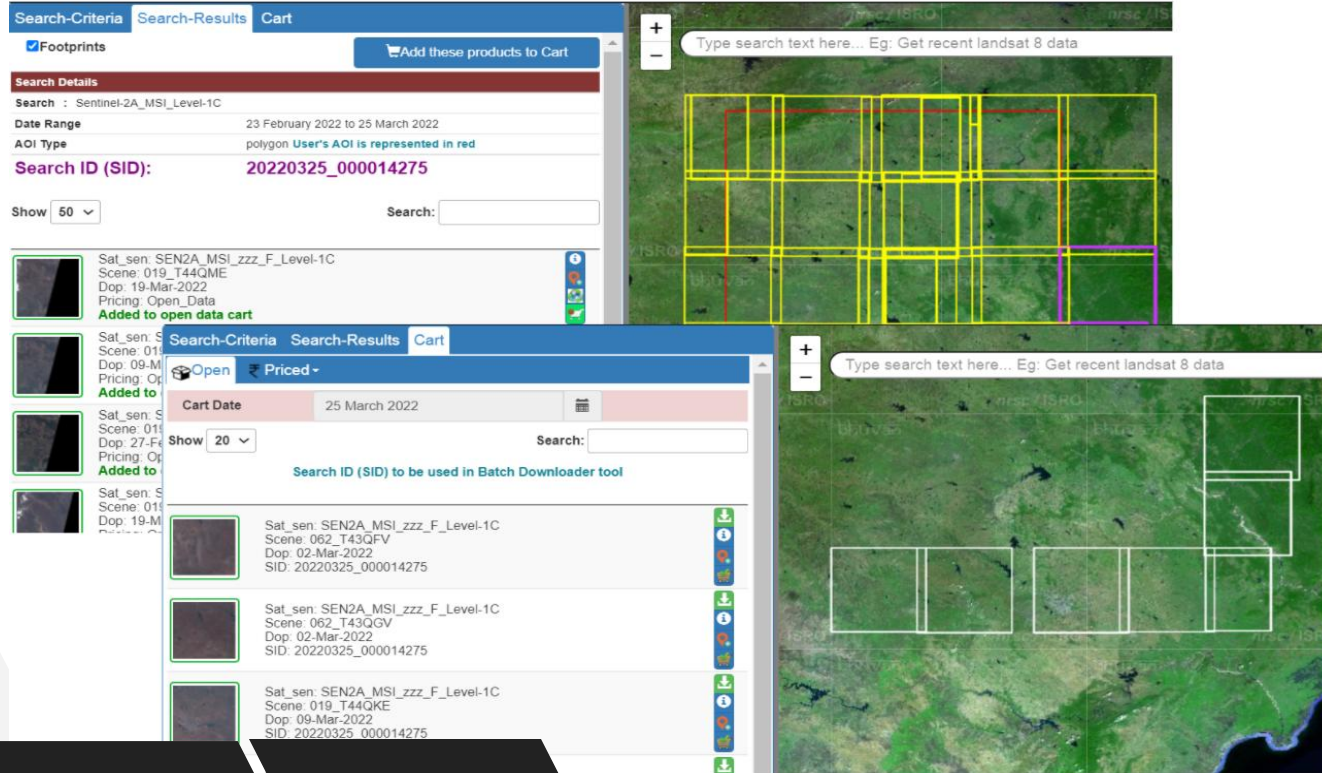
Coverage

FullScene ▼

FEEDBACK

Tell Us How You Think

Search & Download



The screenshot displays the NRSC Open Data portal interface, which is divided into several sections:

- Search-Criteria / Search-Results / Cart:** A navigation bar at the top of the search results page.
- Search Details:** A section containing search parameters:
 - Search: Sentinel-2A_MSI_Level-1C
 - Date Range: 23 February 2022 to 25 March 2022
 - AOI Type: polygon **User's AOI is represented in red**
 - Search ID (SID): 20220325_000014275
- Search Results Table:** A table listing search results with columns for image thumbnails, metadata, and actions.

Thumbnail	Sat_sen	Scene	Dop	Pricing	Action
	SEN2A_MSI_zzz_F_Level-1C	019_T44QME	19-Mar-2022	Open Data	Added to open data cart
	SEN2A_MSI_zzz_F_Level-1C	019_T44QKE	09-Mar-2022	Open Data	Added to open data cart
	SEN2A_MSI_zzz_F_Level-1C	019_T44QKE	27-Feb-2022	Open Data	Added to open data cart
	SEN2A_MSI_zzz_F_Level-1C	019_T44QKE	19-Mar-2022	Open Data	Added to open data cart
- Map Interface:** A satellite map on the right side of the page showing the search area. A red polygon represents the user's AOI. A yellow grid is overlaid on the map, and a search bar at the top right contains the text "Type search text here... Eg: Get recent landsat 8 data".
- Cart Section:** A separate window or section showing the cart with a "Cart Date" of 25 March 2022. It lists items added to the cart:

Thumbnail	Sat_sen	Scene	Dop	SID	Action
	SEN2A_MSI_zzz_F_Level-1C	062_T43QFV	02-Mar-2022	20220325_000014275	Download, Share, Print, etc.
	SEN2A_MSI_zzz_F_Level-1C	062_T43QGV	02-Mar-2022	20220325_000014275	Download, Share, Print, etc.
	SEN2A_MSI_zzz_F_Level-1C	019_T44QKE	09-Mar-2022	20220325_000014275	Download, Share, Print, etc.

Search

Select

Add to Cart

Download

Priced Data

Browsing FREE

Search-Criteria: RS2

Footprints

[Add these products to Cart](#)

December 2021 to 25 March 2022

polygon User's AOI is represented in red

Search: 20220325_000014334

Show 50

Search: 561

Sat_sen RS2_LIS4_FMX_F
Scene: 56152_100_66_D
Dop: 13-Feb-2022
Pricing: Priced
Added to Priced cart

Sat_sen RS2_LIS4_FMX_F
Scene: 56152_100_65_B
Dop: 13-Feb-2022
Pricing: Priced

Sat_sen RS2_LIS4_FMX_F
Scene: 56152_100_66_B
Dop: 13-Feb-2022
Pricing: Priced
Added to Priced cart

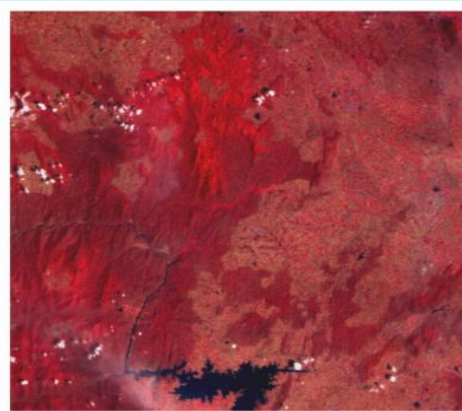
Sat_sen RS2_LIS4_FMX_F
Scene: 56152_100_65_D
Dop: 13-Feb-2022
Pricing: Priced

Showing 1 to 4 of 4 entries (filtered from 62 total entries)

[Add these products to Cart](#) [Load more results](#)



Meta Data Information



Brightness : 45

Contrast : -10

Meta Data Information

Product Id
RS2_LIS4_FMX_13-FEB-2022_100_65_B_SAN_56152_13-FEB-2022_PLD_56152_1_000_432_SAN_SSRN_1_56159_SAN_SSRN_2_56169_1

SCENE DETAILS	COVERAGE DETAILS
Satellite: RS2	Top Left Lat: 12.544
Sensor: LIS4	Top Left Lon: 77.642
Date of Pass: 13-Feb-2022	Top Right Lat: 12.412
Imaging Orbit No: 56162	Top Right Lon: 78.276
Ground Orbit No: 56152	Bottom Right Lat: 11.791
Path: 100	Bottom Right Lon: 78.131
Scene No: 65	Bottom Left Lat: 11.924
Sensor Specification: RS2_LIS4_FMX_F	Bottom Left Lon: 77.499
Scene Specification: 56152_100_65_B	Center Latitude: 12.168
Roll: 2.237	Center Longitude: 77.886
Quality: 1	

Search

Select

Cart

Generate
PI

Generate
Order

Priced Data

Product Details for RS2_LIS4_FMX_F **Pricing** Indian

Product Type ST_Standard **Dispatch Mode** FTP

Processing Level 1_Radiometric **Datum** WGS 84

Enhancement 00_Digital **Product Res** 5.0

Projection 0_No_Projection **Priority** Normal

Resampling 0_No_Resampling **No of copies** 1

Format O_Orthokit **Quality** Quality Check

Cost

Cost type: scene (Rs)

No of scenes: 2 **Unit Rate** 1070.00

Priority Charges: 0.00 **IGST / CGST / SGST** 0.0 / 0.0 / 0.0

Discounts: 0.00 **Final** 2140.00

[Add Product Specifications](#)

Selected Products

Satellite-sensor	Product code	Dispatch mode	Datum	Product res	Priority	Copies	Quality	No of scenes	Cost	Other Params	Action
RS2_LIS4_FMX_F	ST000010V	FTP	WGS 84	5.0	Normal	1	NA	2	2140.00	-	

Total Cost : Rs 2140

User Ref: testPI **Ref Date** 25 March 2022

[Generate Pro-forma Invoice \(PI\)](#)

Explore Archives PI Actions Utilities

Show 10 entries Search:

Selection	PI Number	PI Date	Get PI Details	Show Footprints
<input checked="" type="checkbox"/>	15276	20-MAR-2022	Details	Footprints
<input type="checkbox"/>	14302	21-MAR-2022	Details	Footprints
<input type="checkbox"/>	10790	04-MAR-2022	Details	Footprints
<input type="checkbox"/>	9730	24-FEB-2022	Details	Footprints
<input type="checkbox"/>	9725	24-FEB-2022	Details	Footprints
<input type="checkbox"/>	7391	10-FEB-2022	Details	Footprints
<input type="checkbox"/>	7390	10-FEB-2022	Details	Footprints
<input type="checkbox"/>	7375	10-FEB-2022	Details	Footprints
<input type="checkbox"/>	7354	10-FEB-2022	Details	Footprints
<input type="checkbox"/>	7008	08-FEB-2022	Details	Footprints

Showing 1 to 10 of 326 entries 1 row selected

Previous 1 2 3 4 5 - 33 Next

[Delete PI](#) [Save PI PDF](#) [Generate Order](#)

Account Number: 0100700

Shipping Address

Full Name: * NASEEB Designation: * S Engineer

Department: * NRSC Company Name: * NRSCGCC

Address Line 1: * BALANAGAR Address Line 2: * BALANAGAR

City: * HYDERABAD State: * Andhra Pradesh

Country: * INDIA Zip Code: * 517503

Email: * bhoomidh@npsc.gov.in Enter GST TRN Number

[Continue](#)

Explore Archives PI Actions Utilities

Order Status Monitor Search ID Monitor Order Status Monitor

25 March 2022 25 March 2022 [Get Orders](#)

22792 [Submit](#)

Order Status

Order Placed Order Confirmed Pre Production

In Production Ready for Delivery Order Delivered

Show 20 entries Search:

SAT	SEN	DOP	Status	Orbit	Product Code	Priority
1	RS2	LIS4	2022-02-13	CONFIRMED	56152	ST000010D 6
1	RS2	LIS4	2022-02-13	CONFIRMED	56152	ST000010D 6
1	RS2	LIS4	2022-02-13	CONFIRMED	56152	ST000010D 6
2	RS2	LIS4	2022-02-13	CONFIRMED	56152	ST000010D 6
2	RS2	LIS4	2022-02-13	CONFIRMED	56152	ST000010D 6
2	RS2	LIS4	2022-02-13	CONFIRMED	56152	ST000010D 6

Showing 1 to 6 of 6 entries Previous 1 Next



Search

Select

Cart

Generate
PIGenerate
OrderMonitor
Order

THANK YOU ...

3D Satellite trace



NEW Standard Production Flow | Level '0' | DP | Interactive Data Analysis | Enterprise Reports | Resource

Reports

Exit Full Screen

- DP Reports
 - Level 0 Reports
 - Data
 - SWFM
 - Processing Status
 - Detailed View
 - Quick View
 - View Schedules
 - Archival History
 - Partial Dump Status
 - Daily Report

Completed	In-Progress	Waiting	Failed	Warning
E04-152-SAN DOP:24-FEB-2022	E04-153-SAN DOP:24-FEB-2022	E04-160-SAN DOP:24-FEB-2022		
PASS_SCH	PASS_SCH	PASS_SCH		
PASS_ING	PASS_ING	PASS_ING		
<i>Details</i> TAT	<i>Details</i> TAT	<i>Details</i> TAT		
PASS_QUAL	PASS_QUAL	PASS_QUAL		
OAT-SSR	OAT-SSR	OAT-SSR		
CHAIN COM...	CHAIN COM...	CHAIN COM...		
SAR-SSR:21	SAR-SSR:22	SAR-SSR:24		
CHAIN COM...	CHAIN COM...	CHAIN COM...		
TRX-SSR	TRX-SSR	TRX-SSR		
CHAIN COM...	CHAIN COM...	CHAIN COM...		

Acquisition Monitoring

Normal Product Monitoring

Reqnr* 22 Reqno* 400238 Pno Sno Search

At Master At Scheduler Yet to be taken by Scheduler Completed Rejected

Reqnr:22 Reqno:400238 Account:6-4461 NDC User:ots User Ref.:

Showing 1-5 of 27 [Get Next](#) [Get All Pnos.](#) [Show All WCs](#) [Show Shipping Address](#)

Request Id:22-400238-1-1	NDCIN:24-FEB-2022	TAT:0 Day(s) 0 hours 4 minutes	Get DQE Params	
BHOONIDHI	DPS	AUQC	OSAR	DESP(Archive)
Request Id:22-400238-2-1	NDCIN:24-FEB-2022	TAT:0 Day(s) 0 hours 4 minutes	Get DQE Params	
BHOONIDHI	DPS	AUQC	OSAR	DESP(Archive)
Request Id:22-400238-3-1	NDCIN:24-FEB-2022	TAT:0 Day(s) 0 hours 3 minutes	Get DQE Params	
BHOONIDHI	DPS	AUQC	OSAR	DESP(Archive)
Request Id:22-400238-4-1	NDCIN:24-I			
BHOONIDHI	DPS	AUQC		

Data Products Chain Monitoring



Image publish

