



**SATELLITE DATA PRODUCTS & ORDERING PROCEDURE**

**ISRO**

**K.Swarupa Rani**  
**NRSC Data Centre**  
**National Remote Sensing Centre, ISRO**

**nrsc Indian Remote Sensing Satellites (1988-2020)**

<b>1km</b> 30min	<b>IRS-1A &amp; 1B LISS-1&amp;2</b> (72.5/36.25m; 148km/74km)	<b>IRS-1C/1D WIFS</b> (188m/810km) LISS-3 (23/140km); PAN (5.8 m/70km)	<b>23m</b>
<b>360m</b> 2 days	<b>CARTOSAT -1 Stereo</b> PAN (2.5m/27km)	<b>Oceansat-1 OCM</b> (360m/1420km) MSMR	<b>5.8m</b>
<b>188m</b> 5 days	<b>CARTOSAT -2</b> PAN (1m/9.6km)	<b>Risat-1 – SAR</b> (1-50m/10-220km)	<b>2.5m</b>
<b>72m</b> 25 days	<b>Resourcesat-1,2/A</b> AWiFS (56m/740km) LISS 3 (23m/148km) LISS 4 Mx(5.8m/70km)	<b>Oceansat-2 OCM</b> (360m/1420km) Scatterometer, ROSA	<b>1m</b>
<b>55m</b> 5 days	<b>CARTOSAT -2C/2D/2E/2F</b> PAN (0.6m/9.6km) MX (1.6m/9.6km)		<b>1m</b>



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## Current Operational Satellites

**Resourcesat-2 /2A**  
 Systematic collections over the Indian cone  
 AWIFS, LISS III & LISS-1V 70km  
 (Improved Repetivity with 2 Satellites)

**Cartosat-1** (Decommissioned in Mar2019)  
 2.5m can be operated both in Stereo and Wide mono mode

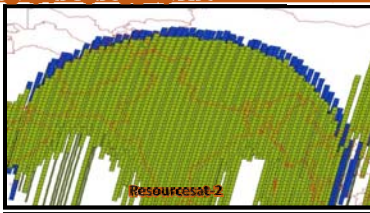
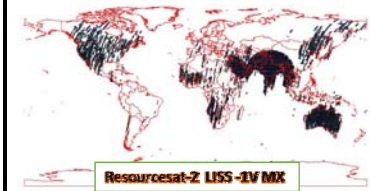
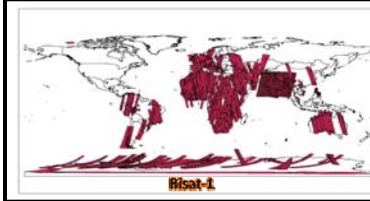
**Cartosat-2 :** (Decommissioned in Mar2019)

**1m- Acquisitions based on the user demand**

**Cartosat-2s**  
 (PAN :0.6m and MX :1.6m)

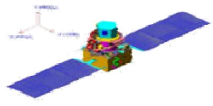



**Oceansat-2:**  
 360 m resolution data - 2 day repeat cycle  
 GAC – 8 days with 1 km resolution

**Foreign Satellites:** NOAA, MODIS, LANDSAT-7/8





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## Resourcesat-2/2A

- AWIFS: 56m Resolution and 740 km Swath**
- LISS-3: 23.5m Resolution and 141 Km Swath**
- LISS-4 MX camera: 5.8m Resolution and 70 Km swath**
- Repetivity: 3 days (AWiFS) to 24 days (LISS IV) &**
- Revisit: 5 days (LISS 4) with tilting 26 deg tilt**

SENSORS	SPECTRAL BANDS	Ground Resolution (meters)	Swath (km)	Radiometric Resolution (bits)	Repetivity (days)
LISS-III	B2 B3 B4 B5	23.5	141	10	24
LISS-IV Mono	B2 or B3 or B4	5.8	70	10	24
LISS-IV MX	B2 B3 B4	5.8	23.5 or 70	10	24
AWiFS	B2 B3 B4 B5	56	740	12	5

### AWiFS Sensor



**THREE VISIBLE-NEAR-IR BANDS AND ONE SWIR BAND**

- SWATH 740 KMS
- Resolution 56 Meters
- 2 DAY REPETIVITY.
- RADIOMETRIC RESOLUTION 10 BIT

**Agriculture Applications**  
 FASAL, NRCENSUS Crop Intensification, Yield Estimation, Pest effects on Crops, Crop Insurance, Mapping, Locust attack-Crop damage Assessment

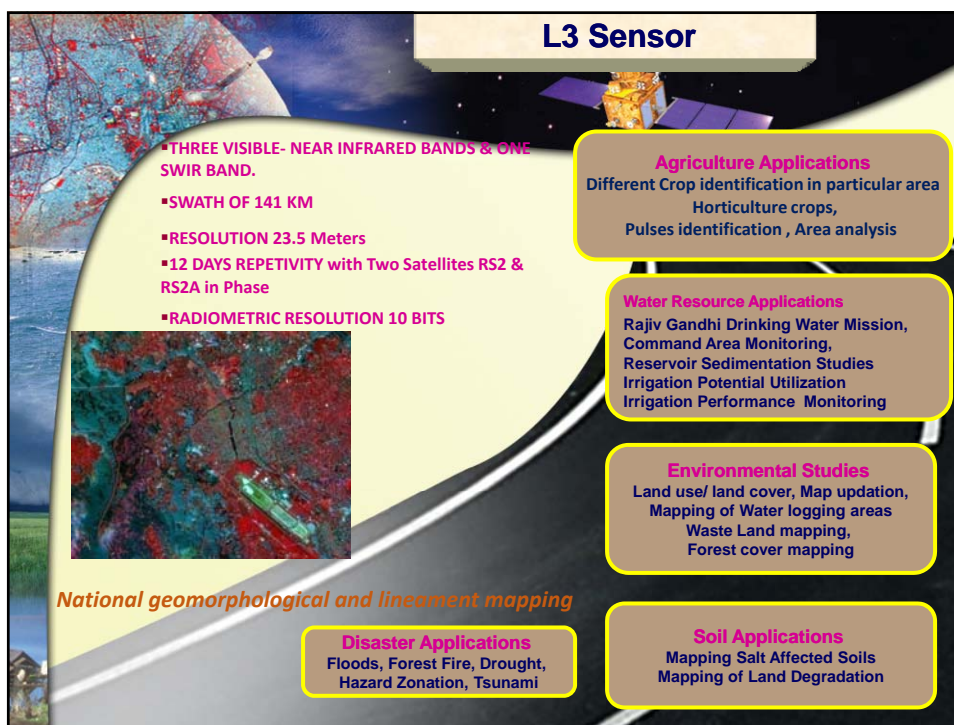
**Forest & Environmental Studies**  
 Automated Detection of Forest Cover Loss

**Water Resources Applications**  
 Snow Melt Run off Forecast  
 Snow Cover & Glacier Mapping

**Disaster Applications**  
 Floods, Forest Fire, Drought



### L3 Sensor



**THREE VISIBLE- NEAR INFRARED BANDS & ONE SWIR BAND.**

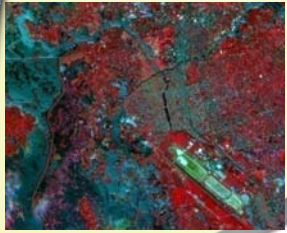
- SWATH OF 141 KM
- RESOLUTION 23.5 Meters
- 12 DAYS REPETIVITY with Two Satellites RS2 & RS2A in Phase
- RADIOMETRIC RESOLUTION 10 BITS

**Agriculture Applications**  
 Different Crop identification in particular area  
 Horticulture crops,  
 Pulses identification , Area analysis

**Water Resource Applications**  
 Rajiv Gandhi Drinking Water Mission,  
 Command Area Monitoring,  
 Reservoir Sedimentation Studies  
 Irrigation Potential Utilization  
 Irrigation Performance Monitoring

**Environmental Studies**  
 Land use/ land cover, Map updation,  
 Mapping of Water logging areas  
 Waste Land mapping,  
 Forest cover mapping

**Soil Applications**  
 Mapping Salt Affected Soils  
 Mapping of Land Degradation



*National geomorphological and lineament mapping*

**Disaster Applications**  
 Floods, Forest Fire, Drought,  
 Hazard Zonation, Tsunami



### LIV MX Sensor

- THREE VISIBLE-NEAR-IR BANDS
- SWATH 70Kms
- RESOLUTION 5.8 Meters
- OFF NADIR VIEWING WITH  $\pm 26$  DEG
- RADIOMETRIC RESOLUTION 10 BIT
- 24DAYS with Two Satellites RS2 & RS2A in Phase

**Agriculture Applications**  
Horticulture Mapping (Mango, Citrus & Banana)  
Mapping /Monitoring of high value crops (Menthol),  
Legal matters

**Urban Studies**  
Map Updation,  
National Urban Information System  
Infrastructure/Urban Planning

**Water Resources Applications**  
GLOF Risk Assessment  
Tank Inventory for increasing Irrigation potential  
Mapping of Water logged areas  
Integrated Water Shed Management

**Resource Mapping /Others**  
Trees Outside Forest  
Village Resource Centre  
NRCENSUS

**Disaster Applications**  
Floods, Forest Fire, Tsunami

### nrsc Cartosat-1 Stereo & Wide Mono Modes भारतीय अंतरिक्ष अनुसंधान संगठन

Stereo data acquisition for CARTOSAT-1

Wide Swath data acquisition for CARTOSAT-1

	Stereo acquisition	Wide swath acquisition
Swath	27.5 km	55km
Repetivity	126 days	63 days
Adjacent Path	22 days	11 days
Camera View angles	-5° & +26° Forward +5° & -26° Reverse	+15° & -15°


**Systematic collections with spatial Resolution 2.5m**

**Cartosat-1 is acquired based on the referencing scheme at regular intervals.**

**Hence data will be available as per the Repetivity throughout the Country within 2 months**

## CARTOSAT-1 PAN sensor

High-Resolution near-instantaneous stereo data with spatial resolution of 2.5m & 10 bit quantization.




### Applications

- Map Updation,
- Monitoring Urban growth dynamics
- DEM Applications
- Route Alignment and Corridor Analysis
- Irrigation Infrastructure Mapping
- Disaster Applications & Relief planning
- Water Shed Management
- Strategic Applications
- Geological Applications

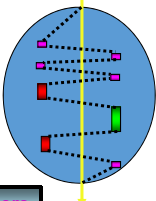
*nrs*

## Cartosat-2 Specifications

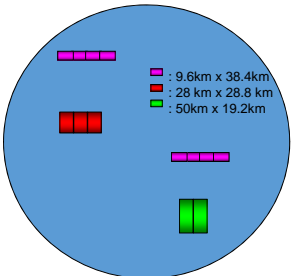


- Panchromatic band. Better than 1meter
- Swath 9.6km
- On-Board 64 GB Solid State Recorder
- Revisit Time : 4/5 days at equator.

Revisit period in days	Across-Track tilt limit ( in deg)	Resolution in meters
4	+/- 25.25	0.8 – 1.0
9	+/- 12.62	0.8 – 0.85



Spot/ Strip mode

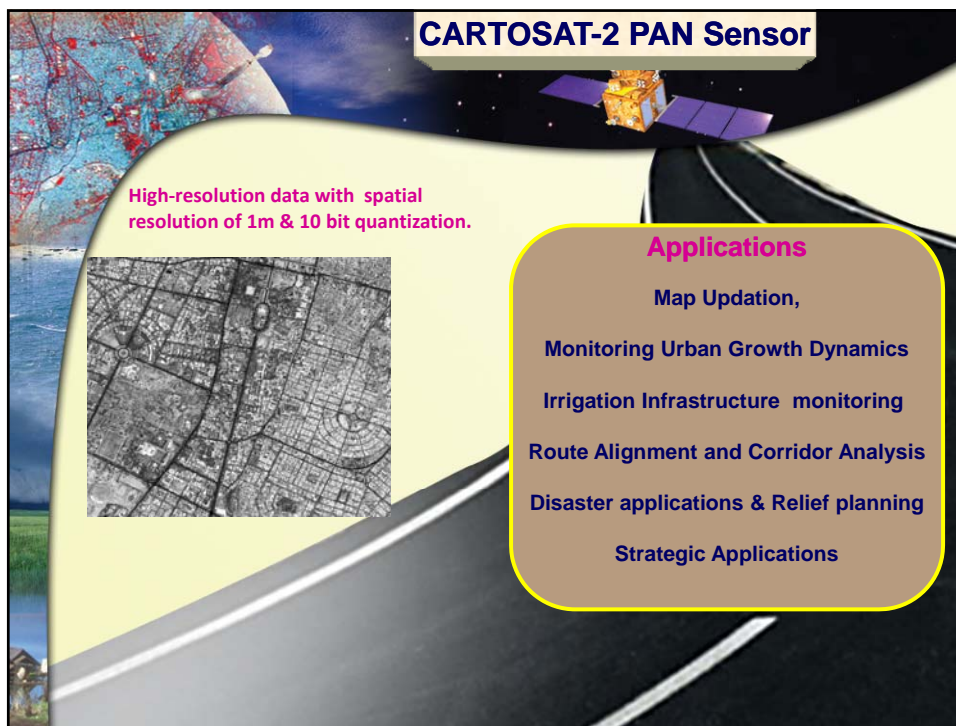


Paint Brush mode

**Non systematic collections**

*Cartosat-2 data is targeted for the user requests. Hence data is not available at regular intervals over the entire Country*


## CARTOSAT-2 PAN Sensor



High-resolution data with spatial resolution of 1m & 10 bit quantization.

**Applications**

- Map Updation,
- Monitoring Urban Growth Dynamics
- Irrigation Infrastructure monitoring
- Route Alignment and Corridor Analysis
- Disaster applications & Relief planning
- Strategic Applications

**npsc**
Cartosat-2S


**Cartosat-2(S)**

**60cm PAN and 1.6m MX**  
**Swath – 9.6 km**  
**Request based planning**


**Standard products & merged products**

**Modes operated :**

**Sensor modes:**

- Spot
- Strip
- Paint Brush

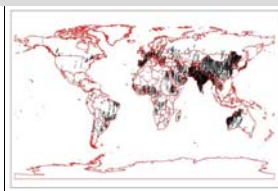
**India cloud-free acquisitions**



Total number of scenes : 19,635  
 Area in Sq Km: ~ 15,90,435

Parameter / Mission	CartoSat-2C, 2D, 2E & 2F	
	PAN	MX
Sensor name	PAN	MX
Spectral range (µm)	0.45-0.90	0.45-0.86
Channels (bands)	1	4
Resolution (m)	0.65	1.6
Swath width (km)	10	10
Data quantization (bit)	11	11

**Global Cloud-free acquisitions**



Area in Sq Km: ~1,01,07,099

## CARTOSAT-2S PAN & MX Sensor

High-resolution data with spatial resolution of 0.65m PAN & 1.6m MX of 10 bit quantization.




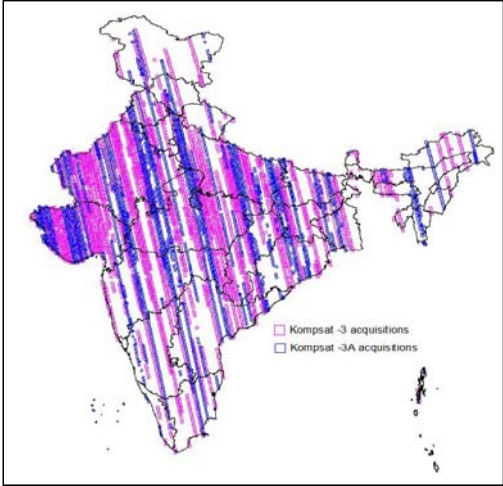
**Applications**

- Urban & Town Planning
- Map Updation
- Monitoring Urban Growth Dynamics
- Route Alignment & Corridor Analysis
- Mining Surveillance System
- Disaster Applications & Relief planning
- Micro water shed management
- Strategic Applications
- Audit

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## Komsat 3 & 3A






Komsat -3 acquisitions  
 Komsat -3A acquisitions

To support high resolution data demands Komsat 3 & 3A data are acquired and processed at NRSC.

**Resolutions:**  
*Pan: 50cm, 70 cm*  
*MX: 2.25m*

Data is available from Jan 2018




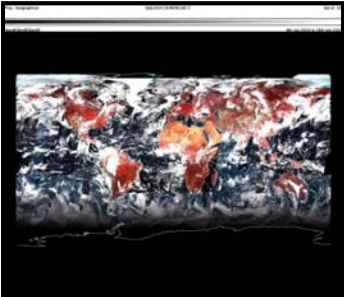
**nrsc** **Cartosat-3S** 

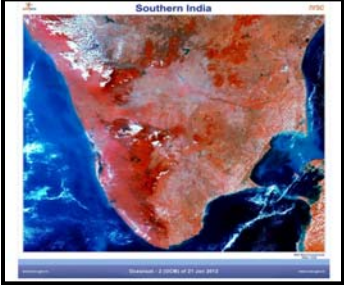
**Launched on 27Nov2019**

**Payloads**

- High resolution PAN (0.45 to 0.9um) with 0.25m resolution
- High resolution Multispectral 4-bands VNIR with 1m resolution
- Swath = 17Km
- Radiometric Resolution = 12bit
- Both PAN & MX to be collected at the same time for generation of PAN sharpened data.
- Systematic collections over the Country

**nrsc** **Oceansat-2** 





**Payloads :OCM, Scatterometer, ROSA**

A global mission, providing continuity of ocean colour data and wind vector in addition to characterization of lower atmosphere and ionosphere from ROSA payload.

**Global data acquisition of Ocean colour**

- 8 day cycle - 1km resolution global products through NRSC Website

**Scatterometer Wind Products**

- Real Time products -90minutes data uploads. (Decommissioned in Feb 2014)
- **Data Dissemination Mechanism**
- Established Ground station at INCOIS
- EUMETCAST, NRSC Website for free data products
- Through direct ordering

### RISAT-1 (First Indian Microwave Satellite)

Radar Satellite-1 (RISAT-1) is a Microwave Remote Sensing Satellite carrying a Synthetic Aperture Radar (SAR) Payload operating in C-band (5.35 GHz), which enables imaging of the surface features during both day and night under all weather conditions.

**LAUNCHED APR2012**

*Swath Selectability: 107km - 659km*

*S/C Roll Bias: ±36deg*


*Repeativity: 25 days*


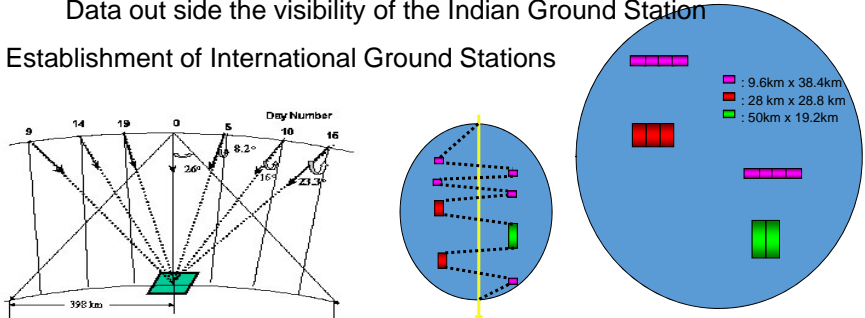
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### PAYLOAD MODES - RISAT 1

P/L MODES	Swath	Resolution
<b>Coarse Resolution (CRS)</b> 12 beams	<b>223 km</b>	<b>50 m</b>
<b>Medium Resolution (MRS)</b> 6 beams	<b>115 km</b>	<b>25 m</b>
<b>Fine Resolution (FRS1) single beam</b>	<b>25 km</b>	<b>3m</b>
<b>Fine Resolution (FRS2) single beam</b>	<b>25 km</b>	<b>9m</b>
<b>High Resolution (HRS) single beam</b>	<b>10 x10km</b> <b>10X100 km</b>	<b>1m</b>

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nrsc Available Satellite Data at NRSC 		
High Resolution	Medium Resolution	Coarse Resolution
Cartosat-2S (0.6m Pan and 1.6m MX)	Resourcesat-1,2,2A (LISS-3 23.5m)	Resourcesat-1,2,2A (AWiFS 58m)
Cartosat-2 (1m Pan)	IRS 1C,1D, Resourcesat-1,2,2A (LISS-3 23.5m)	Oceansat-1 & 2 (OCM 360m)
Cartosat-1 (2.5m Pan)	IRS-1A,1B (LISS-1 72.5m) IRS-1A,1B (LISS-2 36.25m)	IRS-1C,1D (WiFS 188m)
IRS 1C,1D (5.8m Pan)	LANDSAT (TM 30m and MSS 80m)	MODIS (AQUA/TERRA)
Resourcesat-1,2,2A (5.8m LISS IV-MX)		NOAA (AVHRR – 1Km)

nrsc Why Payload Programming 	
<ul style="list-style-type: none"> <li>• Systematic planning to build National/Global Archives</li> <li>• User data requirement not met from the archives and future data requirements</li> <li>• At present, Payload programming is carried out for Cartosat-1, Cartosat-2, 2B, 2S, Oceansat-2, Resourcesat-1,2,2A &amp; RISAT 1</li> <li>• Improved capabilities of the sensors Tilttable cameras / different modes of acquisitions</li> <li>• On-board recorders Data out side the visibility of the Indian Ground Station</li> <li>• Establishment of International Ground Stations</li> </ul>	

## nrsc Types of Programming service.....

Three types of programming are carried out

- normal, urgent and emergency.

Requests for normal programming have to reach T-10 before the date of acquisition

Urgent programming two days before the date of acquisition

Emergency requests for disaster management can be placed with twenty-four hour notice.

## nrsc Types of Data Products

### **Georeferenced Orthokit**

- The scene is first accuracy improved using reference image and then georeferenced with Mean Height and corresponding RPC is computed.
- *Suitable when Orthorectification can be done at user end. Generated with TAT  $\leq 24$ hrs.*

### **Georeferenced (Terrain corrected)**

- The Scene is terrain corrected and geo-location accuracy improved using reference image in an automatic process. Generally suitable for the users who require data with moderate accuracy.
- Ready to use product with TAT  $\leq 24$ hrs

### **Orthorectified products**

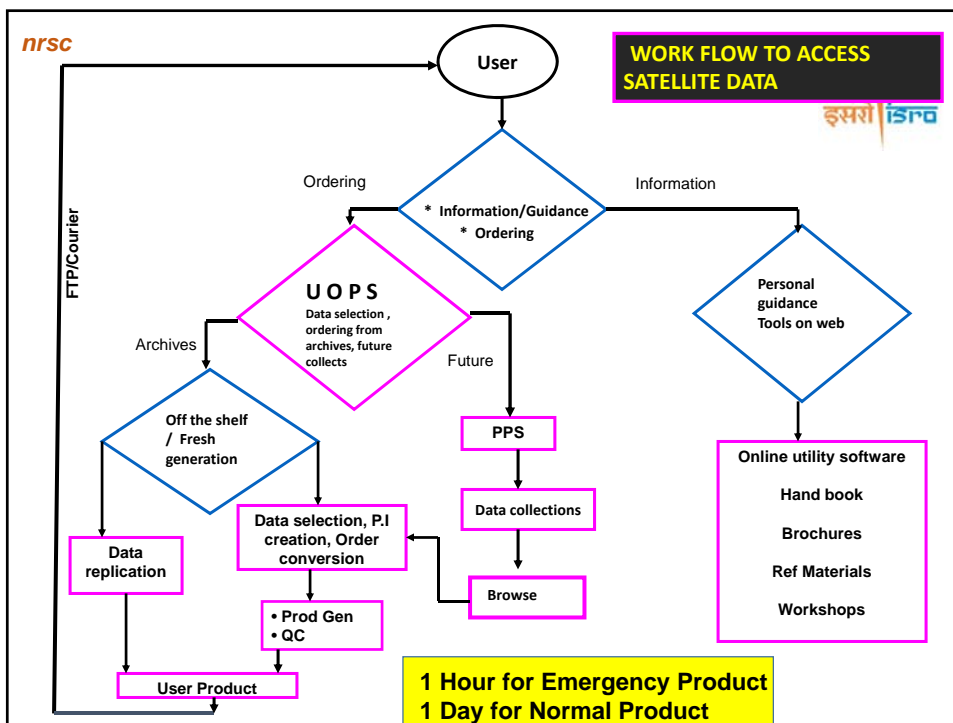
- Map accurate Product that has accurate positional information and precise measurement of features. Image scale is constant through out the image.
  - Generated through interactive and semi-automatic process. They have better Geo-location accuracies when compared to Terrain corrected products.
  - Ready to use product with TAT  $\geq 1$ week
- .....Contd

**nrsc** **Types of Data Products**

**Information products:**  
 Derived from satellite imagery to get specific information about the intended application

Examples:

- Normalised difference Vegetation Index:(NDVI) for getting vegetation information
- Digital Elevation Model (DEM) to get height information
- Surface Water Layer to get water information of lakes, reservoirs.





nrsc Products, Accuracies & Price			
<b>High Resolution</b>			
S No	Product Type	Accuracy (CE90) in meters	Price
1.0	PAN (1 m) (Cartosat-2)		
1.1	Mono Georeferenced/Ortho kit 9.6 km x 9.6 km	100	1,460
1.2	Ortho Corrected 9.6 km x 9.6 km	15	1,670
2.0	PAN - A/F (2.5 m) (Cartosat-1)		
2.1	Mono Georeferenced/Ortho kit 27.5 km x 27.5 km	50	3,240
2.2	Stereo Ortho kit 27.5 km x 27.5 km	220	3,640
2.3	Ortho Corrected 27.5 km x 27.5 km	15	4,300
2.4	CartoDEM 14 km x 14 km	15	4,070
3.0	LISS - 4 MX (5 m) (Resourcasat-1,2)		
3.1	Georeferenced/Ortho kit 23.5 km x 23.5 km	50	1,000
3.2	Georeferenced/Ortho kit 70 km x 70 km	50	2,790
3.3	Ortho rectified 70 km x 70 km	20	5,910
4.0	Microwave (1m - 50m) (RISAT-1)		
4.1	Georeferenced SAR (FRS-1/FRS-2/MRS/CRS)	200	2,990
<b>Medium Resolution</b>			
S No	Product Type	Accuracy (CE90) in meters	Price
5.0	LISS III (24 m) (Resourcasat-2)		
5.1	Georeferenced/Ortho kit 141 km x 141 km	100	2,480
5.2	Ortho rectified 141 km x 141 km	50	4,140
6.0	AWiFS (56 m) (Resourcasat-2)		
6.1	Full Scene Georeferenced 740 km x 740 km	150	4,900
6.2	Full Scene Ortho rectified 740 km x 740 km	100	9,020
6.3	Quadrant Georeferenced /Ortho kit 370 km x 370 km	150	2,710
6.4	Quadrant Ortho Rectified kmx370 km	370 100	3,880
<b>Low Resolution</b>			
S No	Product Type	Accuracy (CE90) in km	Price
7.0	OCM (360 m) (Oceansat-2)		
7.1	Georeferenced 1420 km x 1420 km	1.5	1,890
7.2	Geo Physical 1420 km x 1420 km	1.5	600

## nrsc User Order Processing system (UOPS)

UOPS provides integrated online satellite data browsing, selection, ordering and data dissemination services for registered users.

Data Selection & Ordering can be done using the following options

- Polygon based
- Point
- Shape file
- Mapsheet
- Location
- Date based

**Other Services:**

- Nominal coverage of each Satellite
- Quotations
- Order Status
- Subscription
- FTP Download
- Different type of products available

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## Ordering Procedure



- All users must be registered for placing the orders online through UOPS
- Orders must be accompanied with 100% advance payment
- Payment can be made online by means of RTGS/NEFT or Demand Draft drawn in favour of "Pay & Accounts Officer, NRSC"
- Due to differential pricing, it is mandatory to mention the category i.e., DOS, State, Central, Academic & Private

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## Subscription Service



The objective of this ordering service is to

- Provide an automated continuous supply of products (IRC & IRQ)
- Fresh acquisitions
- Specified AOI of Indian region
- 12 months period
- Discounted rate (1/3 rd of the original cost)
- Minimum order area 10,000 Sq.Kms
- Subscription service can be placed for Polygon or shape file

### **Advantage**

- One time Service Request, order need not be placed every time

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## Discounts Offered



- To encourage users to utilize Indian Remote Sensing Satellite data, a provision of volume discount is administered
  - ✓ 3%, for orders more than Rs.10 lakhs
  - ✓ 5%, for orders more than Rs. 25 lakhs
  - ✓ 10%, for orders more than Rs. 1 Crore
- 50% discount on respective user category for archived data older than 2 years from the date of acquisition
- 5% discount for FTP mode of delivery

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## Remote Sensing Data Policy 2011



All the data resolutions up to 1m resolution shall be distributed on a non-discriminatory basis and as on “as requested basis”

All data better than 1m resolution will be supplied after excluding sensitive areas as below:

- All Government Ministries/ Departments/ PSUs/ Autonomous bodies/ Govt. Educational Institutions can obtain the data without any further clearance with safe custody certificate.
- Private sector users recommended by at least one Government Agency can obtain the data without any further clearance.
- Other Private, Foreign and other users can obtain the data after further clearance from an inter-agency High Resolution Image Clearance Committee (HRC)

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## Licensing Policy




- With respect to licensing mechanism, three schemes are proposed.
  - ✓ Base license (single user) – this permits use of IRS data by a single user
  - ✓ Work Group license – this permits use of IRS data by 2 to 20 user groups within the same organization/ institution. An additional charge of 20% on the corresponding category price would be levied on such request.
  - ✓ Enterprise License – this permits the use of IRS data by more than 20 user groups within the country across organization/ institution, an additional charge of 40% on the corresponding category price would be levied on such request.
- It is proposed to charge 3 times the base price for those data requirement that could be web hosted by any user (other than ISRO/DOS) for non-commercial use.

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## Foreign Satellite Data to Indian Users



- MDA Corporation, Canada for Radarsat-1, Radarsat-2 and ENVISAT (archived) Microwave data.
- DigitalGlobe, USA for Quickbird , Worldview-1,2, & 3, IKONOS High Resolution Satellite data.
- Air Bus Defence & Space for Pleiades data
- Satrec initiative for Kompsat data
- Urthecast for Deimos data
- Skymap global for Triplesat and GF2 data
- RESTEC, JAPAN for ALOS PALSAR
- SPOT Image for SPOT series
- USGS for Carona, EO-1 Satellites

**nrsc** **Open - EO Data Free Downloads** 

**BHUVAN**

LISS – 3 (Ortho rectified Mosaicable tiles)  
- One set /year

AWIFS - (Ortho rectified Mosaicable tiles)  
- 3 season data /year

CARTOSAT-1 - 30m DEM

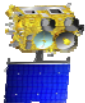

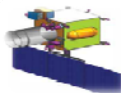
IMS-1 HySI - 2008-2012 (Spectrally Binned)

**OCEANSAT-2 PORTAL**

OCM GAC - 8 day cycle

OSCAT – 01Apr 11 to Feb 2014

**Future Missions**

**Resourcesat-3, 3A & 3S**

**HRSAT Constellation: 3 satellites (PAN 1m & MX 2m Swath 15km)**

**RISAT: RISAT-1A**

**NISAR**

**OCEANSAT-3/3A**

**GISAT: HR Missions from Geo orbit**



**nrsc Resourcesat-3 Sampler**

Improved resolution of Along track stereo & Multi spectral imaging capability **(Continuation of Cartosat-1)**

Parameters/Sensors	PAN Aft (-5) /Fore (+26)	Multi spectral (MX)
Resolution (m)	1.25 sampling	2.5
Spectral range (nm)	Mono(PAN) : 450-900	MX: Blue : 450-520 Green : 520-590 Red : 620-680 NIR : 770-860
Swath (km)	60	60
Repetivity /Revisit (days)	48 / 4	48 / 4

**nrsc Resourcesat-3 & 3A**

**Continuation of Resourcesat-2 & 2A**

**ALISS-3C VNIR**  
 10 m / 280 km  
**ALISS-3C SWIR**  
 23 m / 280 km  
**ATCOR-C**  
 240 m / 280 km

**VNIR Bands**  
 B1 (0.45-0.52  $\mu\text{m}$ )  
 B2 (0.52-0.59  $\mu\text{m}$ )  
 B3 (0.62-0.68  $\mu\text{m}$ )  
 B4 (0.77-0.86  $\mu\text{m}$ )

**SWIR**  
 B5 (1.55-1.7  $\mu\text{m}$ )  
**ACTOR**  
 0.4 - 1  $\mu\text{m}$

Spectral Range: 0.4-1  $\mu\text{m}$ ,  
 Spectral Width: 2.5 nm


--- 4km overlap


10deg


**ALISS-3A VNIR**  
 20 m / 326 km  
**ALISS-3A SWIR**  
 23 m / 326 km  
**ATCOR-A**  
 240 m / 326 km


**ALISS-3B VNIR**  
 20 m / 326 km  
**ALISS-3B SWIR**  
 23 m / 326 km  
**ATCOR-B**  
 240 m / 326 km

10deg

nrsc <b>HRSAT</b> 		
<b>Constellation of 3 Satellites</b>		
Parameters/Sensors	PAN Aft (-5) /Fore (+26)	Multi spectral (MX)
Resolution (m)	1m	2m
Spectral range (nm)	Mono(PAN) : 450-900	Mx: Blue : 450-520 Green : 520-590 Red : 620-680 NIR : 770-860
Swath (km)	15	15
Repetivity /Revisit (days)	67/3	67/3
Radiometric Resolution	11	11

nrsc <b>RADAR Imaging Satellite</b> 	
<p><b>RISAT-1A-Mission</b></p> <ul style="list-style-type: none"> <li>Continuity Mission of RISAT-1</li> </ul>	<p><b>Payload</b></p> <ul style="list-style-type: none"> <li>Operating in C-band (5.35 GHz), which enables imaging of the surface features during both day and night under all weather conditions.</li> </ul>
<p><b>NISAR:</b> Collaborative mission (NASA-ISRO SAR)</p>	<p>L &amp; S band SAR</p>
<p>Global repetitive mapping mission with Interferometric SAR (InSAR) capability</p>	

nrsc <b>Oceansat-3 Highlights</b> 		
Parameter	Earlier	Present
<b>Ocean Color Monitor</b>		
No. of OCM Bands	8	13
OCM Coverage	Lat 45N,45S	Full sunlit duration
Swath	1440Kms	1440Kms
Tilt of OCM	± 20°	± 20°
Digitization-OCM	12 bits	14/16 bits
Resolution	LAC 360mtrs/GAC 1km	LAC 360mtrs/GAC 1km
SNR	360	Min 1000
<b>Sea Surface Temperature Monitoring</b>		
No of SST bands	-----	2(two)
Coverage	-----	Continuous
<b>Scatterometer</b>		
Scatterometer Frequency	13.515 GHz (Ku Band)	13.515 GHz (Ku band)
Resolution of Scatterometer	25 x 46 km	25 x 46 km
Swath width of Scatt.	1400 km / 1800 km	1400 km / 1800 km

nrsc <b>Geo Imaging Satellite (GISAT)</b> 	
<b>Evolution:</b>	
LEO platform	Good spatial resolution, Poor temporal resolution
GEO platform	Good temporal resolution Poor spatial resolution
That's how GISAT was conceived with the following objective.....	
<p><u><b>“To tap new functionalities hitherto not covered by existing LEO &amp; GEO Missions like fast revisit capability, real time monitoring, high resolution multi spectral and hyper spectral imaging - all on a single, agile, jitter free platform”</b></u></p>	

GISAT Mission			
Parameters			
Band	Channels ( $\mu\text{m}$ )	Spatial Resolution (meter)	Swath (km)
MX-VNIR (6 Channels)	0.45 - 0.52	42	495
	0.52 - 0.59		
	0.62 - 0.68		
	0.71 - 0.74		
	0.77 - 0.86		
0.845 - 0.875			
HyS-VNIR (158 Channels)	0.4 - 0.87 $\Delta\lambda \sim 5 \text{ nm}$	320	163
HyS-SWIR (256 Channels)	0.9 - 2.5 $\Delta\lambda \sim 7 \text{ nm}$	191	191
MX-LWIR (6 Channels)	7.1 - 7.6	1180	378
	8.3 - 8.7		
	9.4 - 9.8		
	10.3 - 11.3		
	11.5 - 12.5		
13.0 - 13.5			

**npsc**

## Geo Imaging Satellite (GISAT)

### Imaging from Geostationary orbit

- **High resolution multi-spectral VNIR (HRMX-VNIR): 50m resolution**
  - ❖ *Multispectral Visible and Near IR (VNIR) imaging for quick monitoring of disasters, natural hazards & calamities, episodic events and any short-term events during the Sun shine period covering the Indian landmass and coastal regions*
- **Hyper spectral VNIR: 320m resolution**
- **Hyper spectral SWIR (HyS-SWIR): 192m resolution**
  - ❖ *To generate Hyper spectral imageries in VNIR and Shortwave Infrared (SWIR) bands to generate spectral signatures for agriculture, forestry, mineralogy, oceanography and other such remote sensing applications over a limited area*
- **High resolution Multi-spectral (HRMX-TIR): 1.5km Resolution**
  - ❖ *To observe the Indian subcontinent and the Earth disk visible from GEO in Long Wave Infrared (LWIR) bands for meteorological applications on 24 hour basis.*

### SAMPLE IMAGES OF CATOSAT 2S

BIKANER – RAJASTHAN



### SAMPLE IMAGES OF CATOSAT 2S

Cartosat-2 Series  
Part of Rome  
Acquired on 26 June 2016

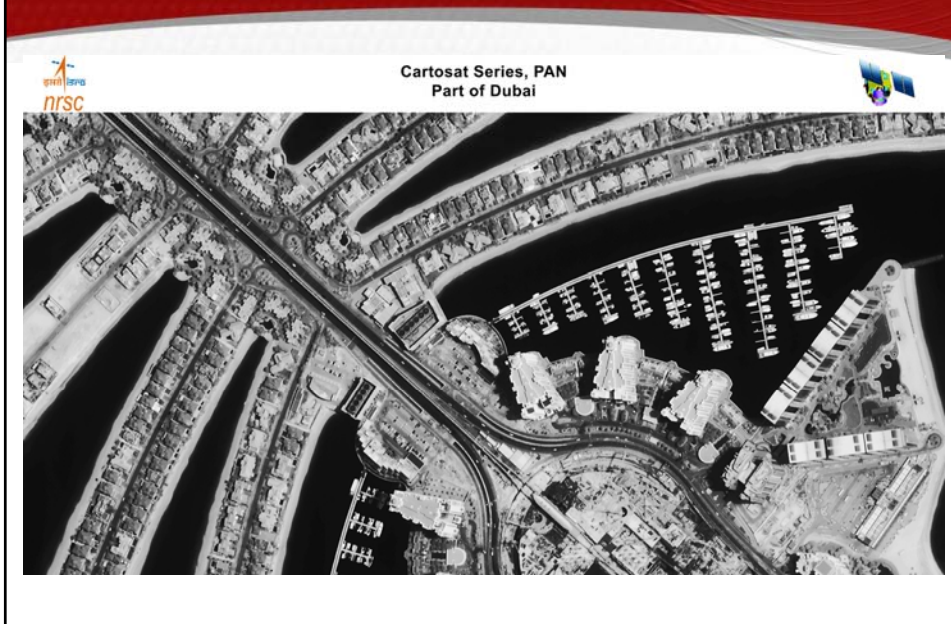




### SAMPLE IMAGES OF CATOSAT 2S



### SAMPLE IMAGES OF CATOSAT 2S



### SAMPLE IMAGES OF CATOSAT 2S



Cartosat Series, PAN  
Part of Dubai



### SAMPLE IMAGES OF CATOSAT 2S

Chidambaram Temple India Acquired on 08<sup>th</sup> Jul 2016



