













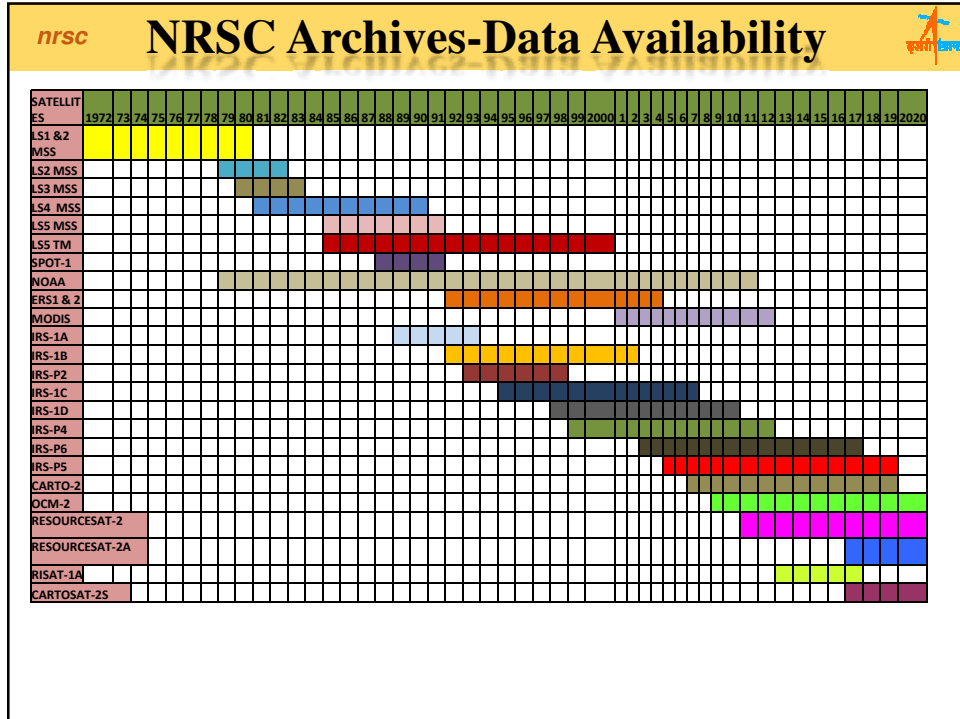
SATELLITE DATA PRODUCTS & ORDERING PROCEDURE

ISRO

D.Rama Devi
NRSC Data Centre
National Remote Sensing Centre, ISRO

nrsc Indian Remote Sensing Satellites (1988-2020)

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



nrsc Indian Earth Observation

- **Over India**
 - Acquired by NRSC from Ground Station at Shadnagar
- **Global**
 - Acquired through onboard SSR
 - Acquired through Antarctica Ground Station
 - Acquired through International Ground Stations

npsc
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

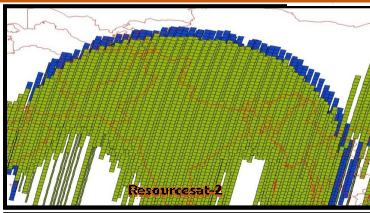
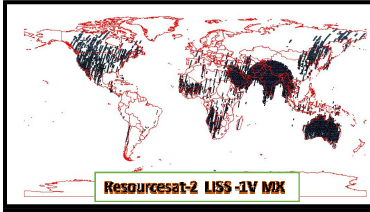
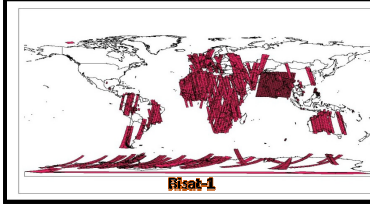
Cartosat-2 : (Decommissioned in Mar2019)

1m- Acquisitions based on the user demand

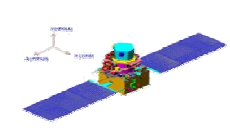



Cartosat-2s
 (PAN :0.6m and MX :1.6m)

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

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

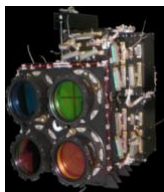


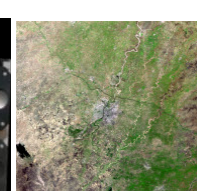




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Resourcesat-2/2A

- 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

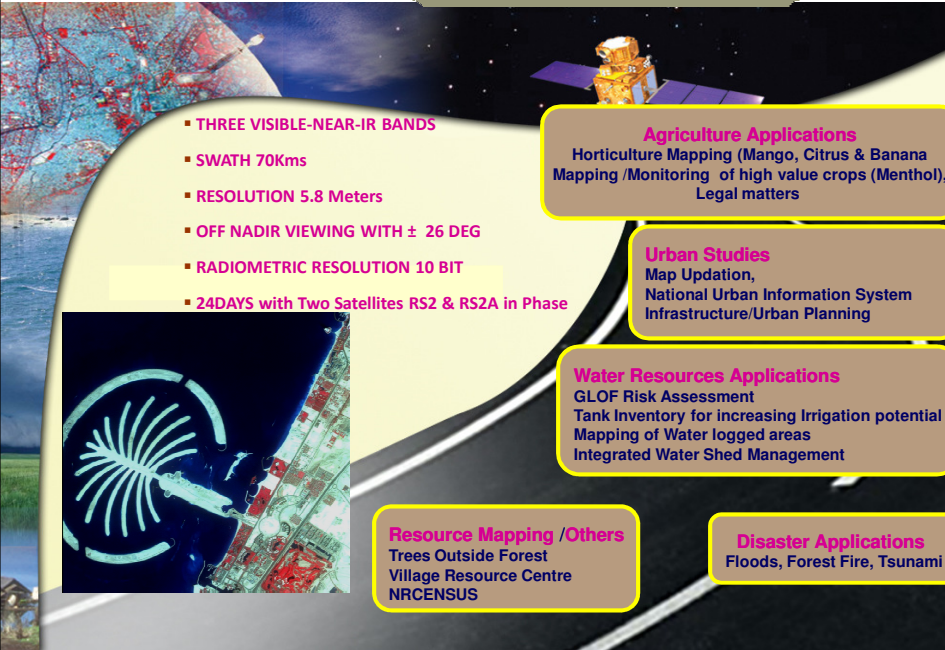
Environmental Studies
Land use/ land cover, Map updation,
Mapping of Water logging areas
Waste Land mapping,
Forest cover mapping

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

Soil Applications
Mapping Salt Affected Soils
Mapping of Land Degradation

National geomorphological and lineament mapping

LIV MX Sensor



- THREE VISIBLE-NEAR-IR BANDS
- SWATH 70Kms
- RESOLUTION 5.8 Meters
- OFF NADIR VIEWING WITH ± 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

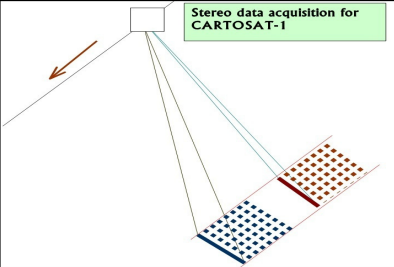
Water Resources Applications
GLOF Risk Assessment
Tank Inventory for increasing Irrigation potential
Mapping of Water logged areas
Integrated Water Shed Management

Resource Mapping /Others
Trees Outside Forest
Village Resource Centre
NRCENSUS

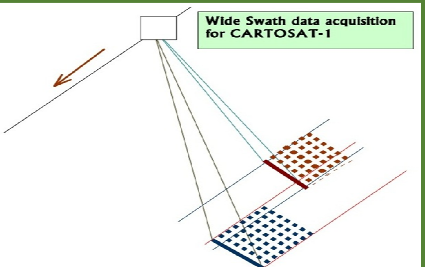
Disaster Applications
Floods, Forest Fire, Tsunami

nrsc Cartosat-1 Stereo & Wide Mono Modes कृषि विभाग

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

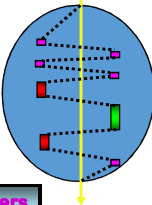
npsc

Cartosat-2 Specifications

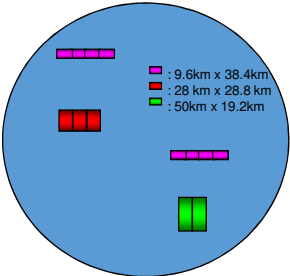


- Panchromatic band. Better than 1meter
- Swath 9.6km
- On-Board 64 GB Solid State Recorder
- Revisit Time : 4/5 days at equator.

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

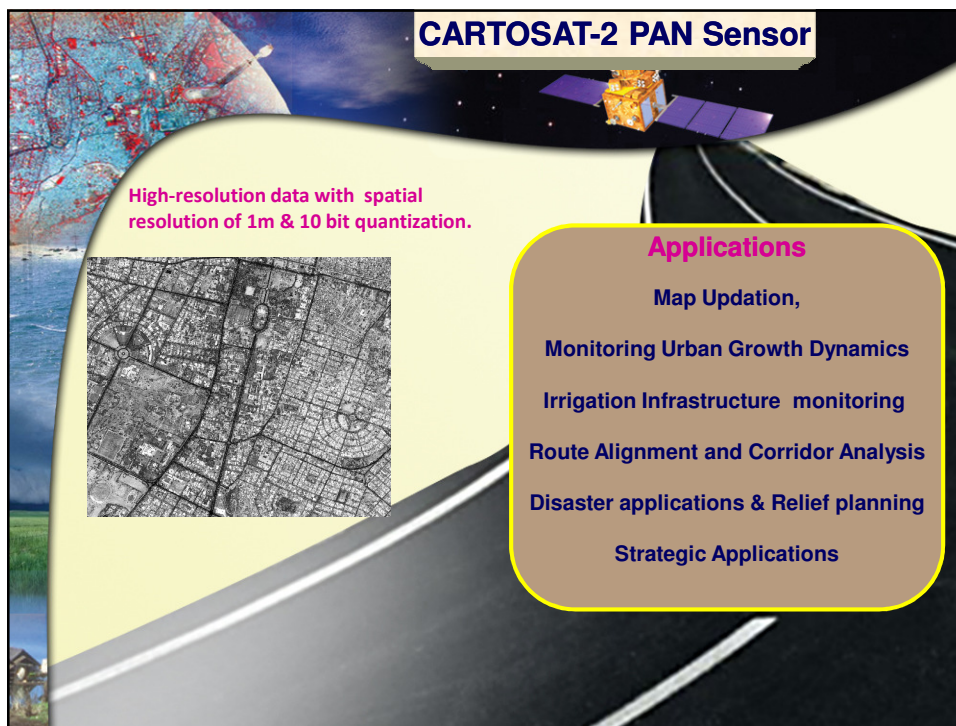


Paint Brush mode

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

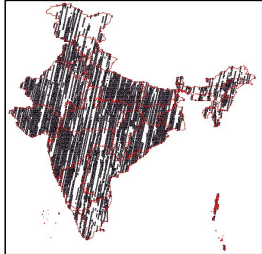
Standard products & merged products

Modes operated :

Sensor modes:

- Spot
- Strip
- Paint Brush

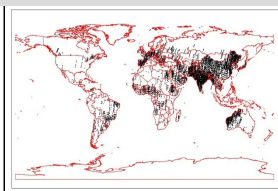
India cloud-free acquisitions



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.




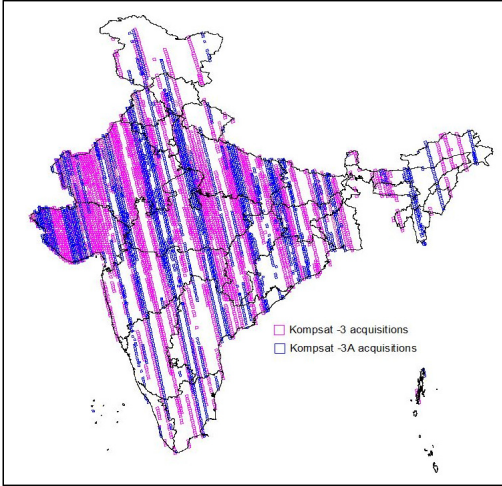
Applications

- 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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Kompsat 3 & 3A






■ Kompsat -3 acquisitions
■ Kompsat -3A acquisitions

To support high resolution data demands Kompsat 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

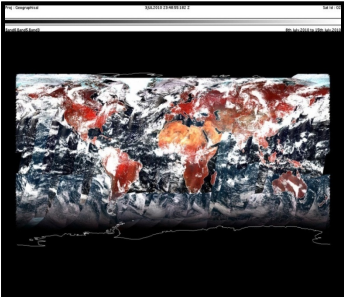
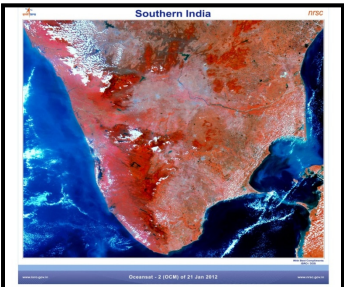
Payloads

- High resolution PAN 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


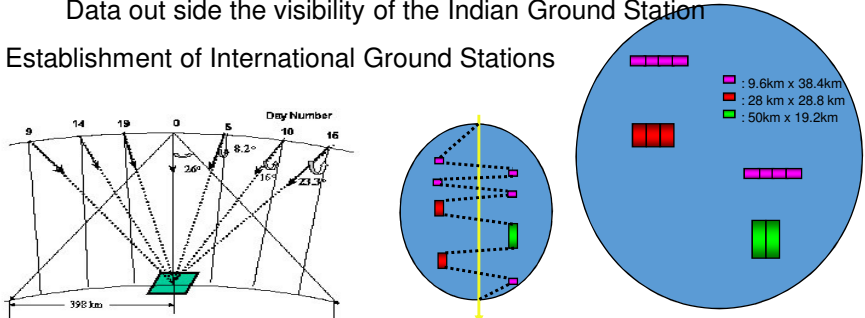
19

PAYLOAD MODES - RISAT 1

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

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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"> Systematic planning to build National/Global Archives User data requirement not met from the archives and future data requirements At present, Payload programming is carried out for Cartosat-1, Cartosat-2, 2B, 2S, Oceansat-2, Resourcesat-1,2,2A & RISAT 1 Improved capabilities of the sensors Tilttable cameras / different modes of acquisitions On-board recorders Data out side the visibility of the Indian Ground Station Establishment of International Ground Stations 	

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 ≤ 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 ≤ 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 ≥ 1 week
-Contd

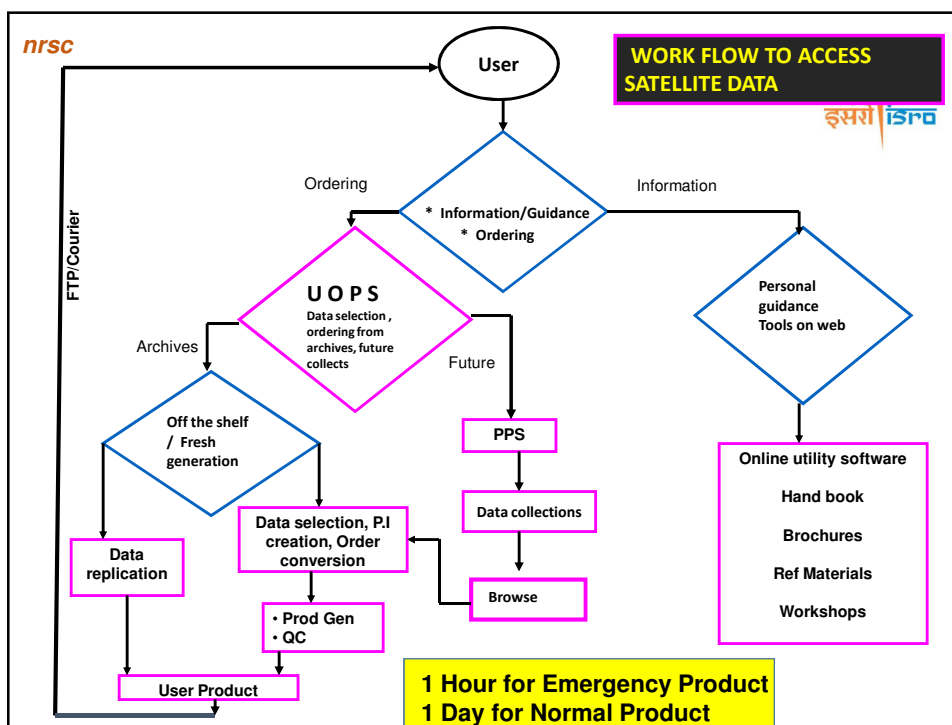
nrsc **Types of Data Products**

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			
High Resolution			
S No	Product Type	Accuracy (CE90) in meters	Price
1.0	PAN (1 m) (Cartosat-2)		
1.1	Mono Geo referenced/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) (Resourcesat-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
Medium Resolution			
S No	Product Type	Accuracy (CE90) in meters	Price
5.0	LISS III (24 m) (Resourcesat-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) (Resourcesat-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
Low Resolution			
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

nrsc **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


nrsc **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

nrsc **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

nrsc **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)

nrsc **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.

nrsc **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

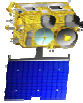

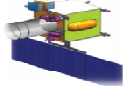
IMS-1 HySI - 2008-2012 (Spectrally Binned)

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

इसरो डिस्टो

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 μm)
B2 (0.52-0.59 μm)
B3 (0.62-0.68 μm)
B4 (0.77-0.86 μm)

SWIR
B5 (1.55-1.7 μm)
ACTOR
0.4 - 1 μm

Spectral Range: **0.4-1 μm** ,
 Spectral Width: **2.5 nm**

--- 4km overlap

ALISS-3A VNIR
20 m / 326 km

ALISS-3A SWIR
23 m / 326 km

ATCOR-A
240 m / 326 km


10deg


10deg


ALISS-3B VNIR
20 m / 326 km


ALISS-3B SWIR
23 m / 326 km

ATCOR-B
240 m / 326 km

nrsc HRSAT 		
Constellation of 3 Satellites		
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 RADAR Imaging Satellite 	
<p>RISAT-1A-Mission</p> <ul style="list-style-type: none"> Continuity Mission of RISAT-1 	<p>Payload</p> <ul style="list-style-type: none"> Operating in C-band (5.35 GHz), which enables imaging of the surface features during both day and night under all weather conditions.
<p>NISAR: Collaborative mission (NASA-ISRO SAR)</p>	<p>L & S band SAR</p>
<p>Global repetitive mapping mission with Interferometric SAR (InSAR) capability</p>	

nrsc Oceansat-3 Highlights 		
Parameter	Earlier	Present
Ocean Color Monitor		
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
Sea Surface Temperature Monitoring		
No of SST bands	-----	2(two)
Coverage	-----	Continuous
Scatterometer		
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 Geo Imaging Satellite (GISAT) 	
Evolution:	
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.....	
<u>“To tap new functionalities hitherto not covered by existing LEO & 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”</u>	

GISAT Mission			
Parameters			
Band	Channels (μm)	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		

nrs **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



Cartosat-2 Series
Part of Vatican City
Acquired on 26th June 2016



SAMPLE IMAGES OF CATOSAT 2S



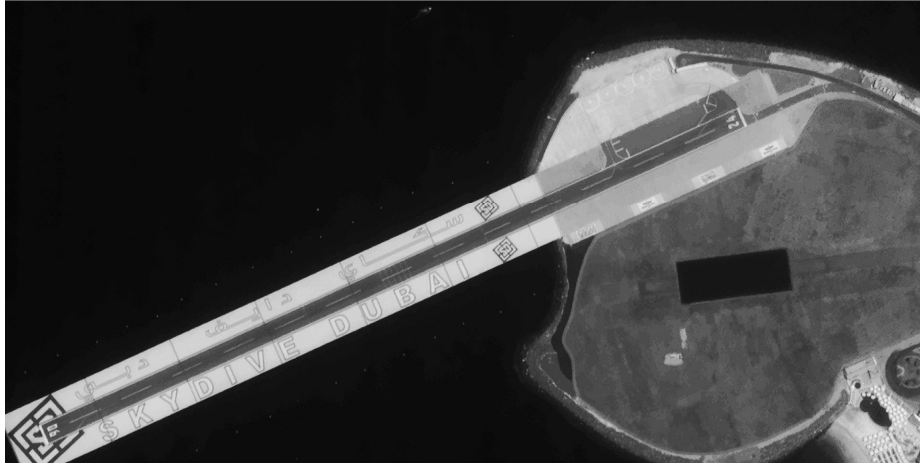
Cartosat Series, PAN
Part of Dubai



SAMPLE IMAGES OF CATOSAT 2S



Cartosat Series, PAN
Part of Dubai



SAMPLE IMAGES OF CATOSAT 2S

Chidambaram Temple India Acquired on 08th Jul 2016



