



## CEOS Committee on Earth Observation Satellites



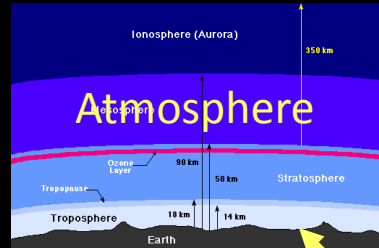
## ISRO Contributions to WGISS activities



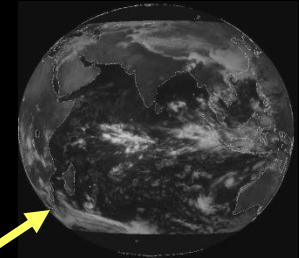
Nitant Dube  
Space Applications Centre, ISRO  
Ahmedabad, INDIA

# ISRO Earth Observation Missions

Meghatropiques,  
INSAT-3D Sounder



INSAT-3A,  
Kalpana-1, INSAT-  
3D



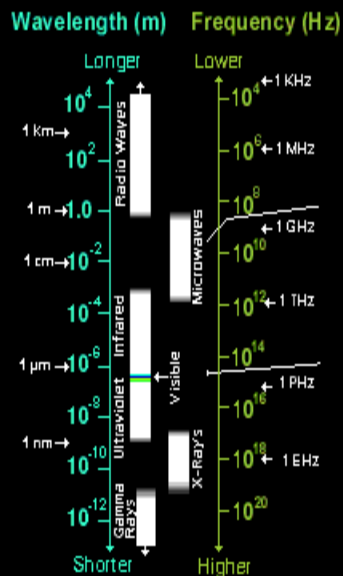
Meteorology

Oceansat-1&2  
IRS-P3

RISAT, Cartosat,  
Resourcesat, TE  
S, IMS, IRS-1A,  
1B, 1C, 1D, P3

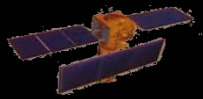
Oceanography

Land Applications



# Indian Remote Sensing Satellites:

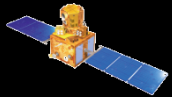
## Two Decades of Earth Observation Data



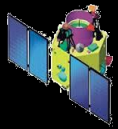
RISAT-1 2012



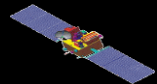
Megha-Tropiques  
2011



IRS-R2  
2011



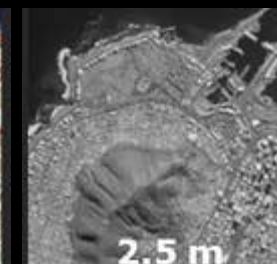
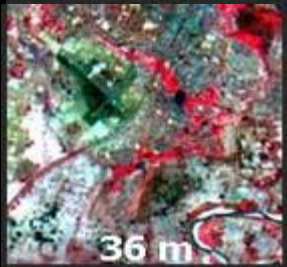
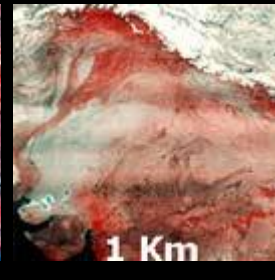
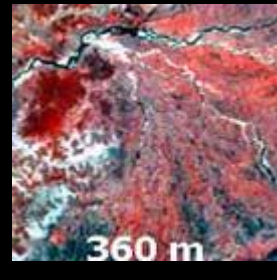
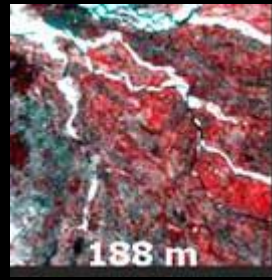
Cartosat-2B  
2010



IRS-O2  
2009



Cartosat-2  
& 2A  
2007&200



IRS-P6 2003



TES 2001



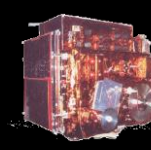
IRS-P4 1999



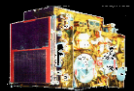
IRS-1D 1997



IRS-1C 1995



IRS-1B 1991



IRS-1A 1988



# ISRO Data Portals



<http://www.india-wris.nrsc.gov.in/>

INDIA WRIS (Water  
Resource Information  
System)



<http://applications.nrsc.gov.in/>

Land Use/Land Cover Information System



NNRMS : National Natural Resource  
Management System

<http://www.nnrms.gov.in/index.htm>

# Web Based Geospatial Data Dissemination & Services

NNRMS - NRDB



Bhuvan



MOSDAC



BHOOSAMPADA



India-WRIS



*inffras*



Decision Support Centre



Biodiversity Info. System



[dataportal.isro.gov.in](http://dataportal.isro.gov.in)



# Bhuvan: One-stop versatile web based Earth Observation Visualisation System

1. Access to 3D geospatial data
2. Access to Rich information on Natural Resources in geo-spatial domain
3. Real time fusion and streaming of massive raster and feature data on the fly
4. Robust API with rich capabilities to utilize in a wide range of applications and systems



www.bhuvan.nrsc.gov.in

www.bhuvan.nrsc.gov.in

...get the visualisation advantage

Gateway to Indian Earth Observation

# Gateway to Indian EO Data Products & Services



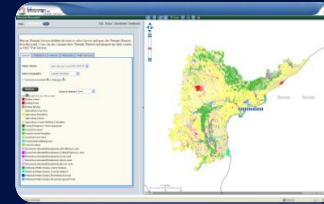
## Visualisation



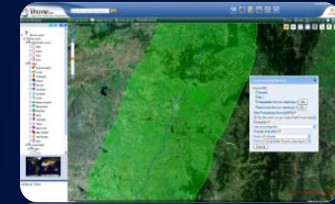
## Data Archive



## Thematic Services



## Geo-Processing



**Project Specific**  
"Multi theme and Multi User  
Utilities"



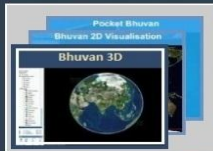
Bhuvan - A Geoportal of Indian Space Research Organization and gateway to Indian Earth Observation Data Products and Services Showcasing Indian Earth Observation Capabilities in Multi-sensor, Multi-platform and Multi-temporal domain with capabilities to overlay thematic information, interpreted from such imagery, as vector layers.

### Recent Updates

- AWIFS data(56m) of Indian region for the year 2010 is available for download
- LISS III data(24m) of Kutch region(Gujarat state) for the year 2011 is available for download
- Vegetation Fraction (VF) and NDVI products are available for download
- Digital Database of LULC is available for download (Clip & Ship through

### Visualization

One stop versatile visualization system showcasing the Indian imaging capabilities in 2D, 3D mode and on Mobile.



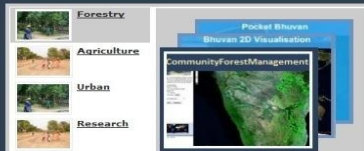
### Services

Free Data Download through NOEDA and thematic data as Web Service from Bhuvan-Thematic.



### Projects

Showcase of different Projects and Research activities carried out using Bhuvan



[Click here to go to Bhuvan Home Page](#)


Copyright © 2011 ISRO

- EO Data/ Products Exceeds 14 Terrabytes
- 3D Plugin download since Aug 2009 > 5 lakhs
- 19000 Unique users / month
- ~ 72000 EO image downloads since Sep 2011

**OGC Website of the Month – Dec'2010**



# NOEDA: NRSC Open EO Data Archive

 **Bhuvan** Beta  
NRSC Open EO Data Archive-NOEDA

Welcome User! [Login](#) [Backlog](#) [Download List](#)

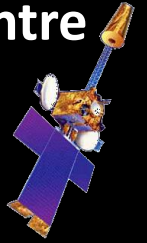
[Find](#)  [Go](#) [FAQ](#) [Policy](#) [Disclaimer](#) [Feedback](#)

- ☐ **Cartosat-1 DEM 1 arc seconds**  
**29-Sept-2011:19794**
- ☐ **Resourcesat-1 Ortho AWiFS data 56 meter**  
**29-Sept-2011:7004**
- ☐ **Resourcesat-1: Ortho LISS-III data 24 meter**  
**02-Jan-2012:42676**

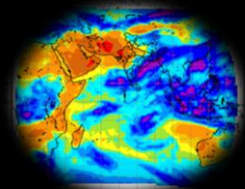
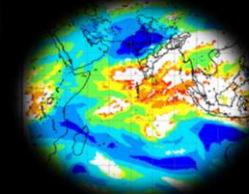
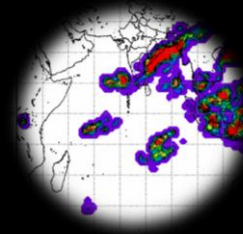
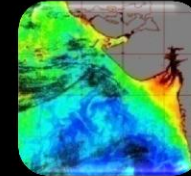
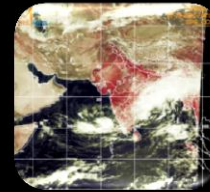




# Meteorological and Oceanographic Satellite Data Archival Centre (MOSDAC)



- 1) Satellite Data and Services for Meteorology and Ocean Applications
- 2) Automatic Weather Station Data archival and Dissemination
- 3) Real time Monitoring of Cyclones
- 4) Weather forecast (24Hr, 48Hr & 72Hr) over India at 5Km resolution using the Weather Research and Forecasting Model.



KALPANA 1 – acquired half hourly  
INSAT3A – CCD – 5 / 10 acquisitions / day  
INSAT3A-VHRR – 8 acquisitions per day  
ISRO AWS – 1000+ stations & AMS – 22 stations  
OSCAT Winds  
Megha-tropique data to be soon made available  
EUMETCAST – 2TB archived daily

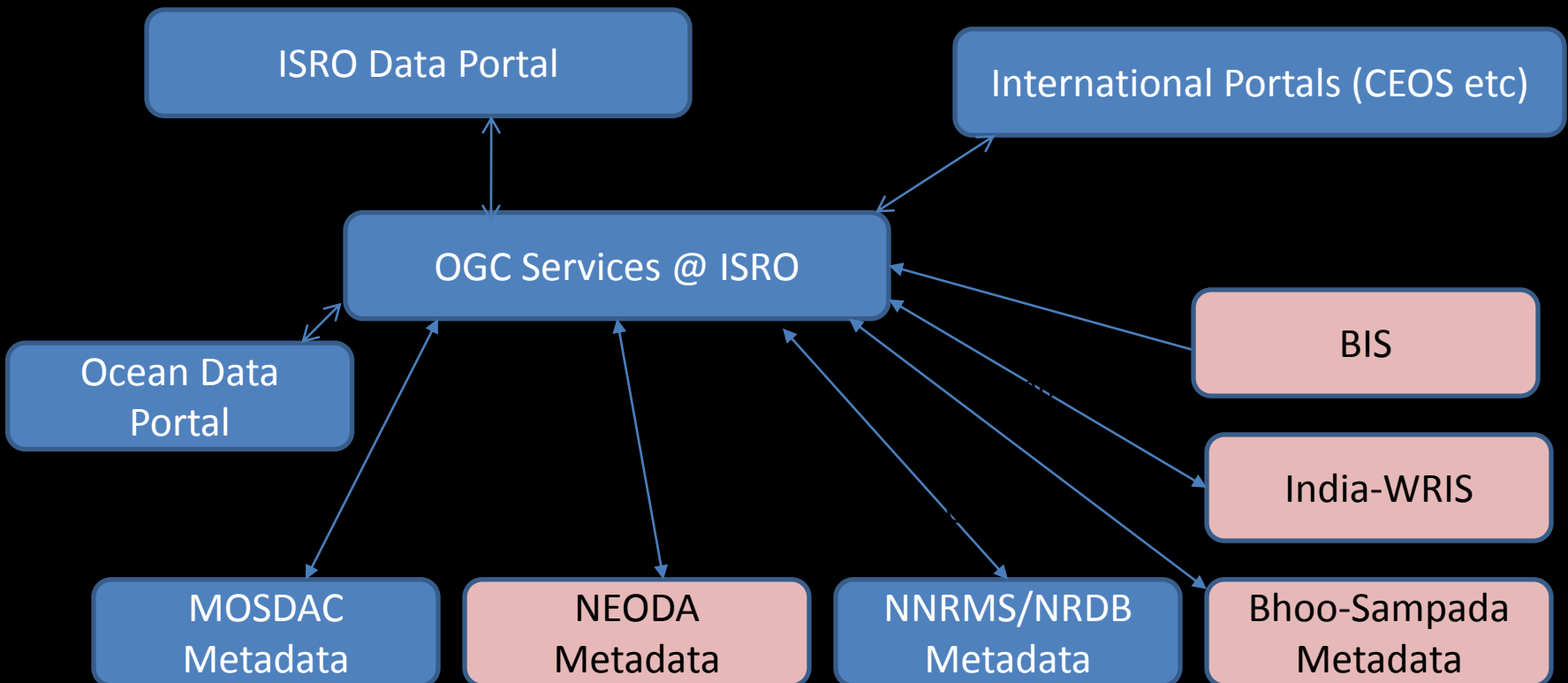
<http://www.mosdac.gov.in>

# ISRO Contribution: IDN

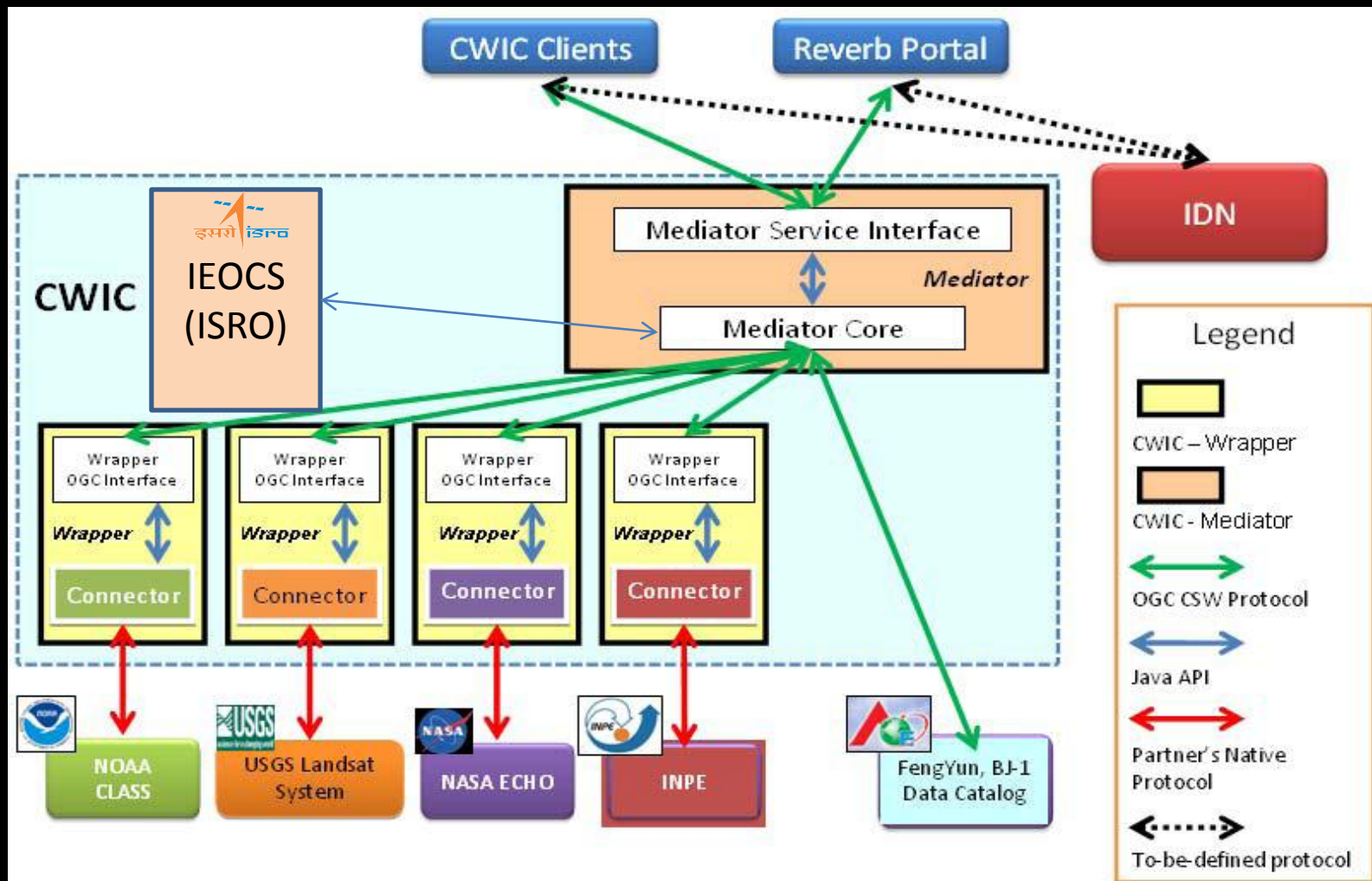
- International Directory Network
  - Registration of ISRO Earth Observation resources as part of IDN
    - Satellites
    - Data Centres
    - Satellite Data
    - Information and Services

# ISRO Contribution: Technology Exploration

- Development of ISRO Earth Observation Catalogue System (IEOCS) and Integrate the same with CWIC

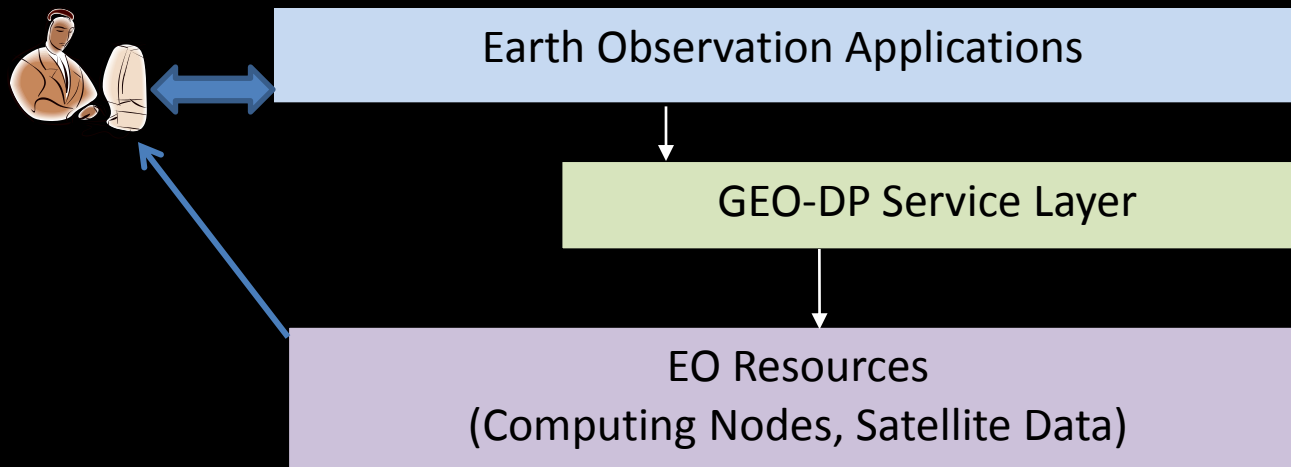






# ISRO Contribution: Technology Exploration

- Propose to Study
  - GEO-DP : Global Earth Observation Data Processing System
    - A WEB Services based Software Framework for carrying out user specific processing on large archives of open EO data



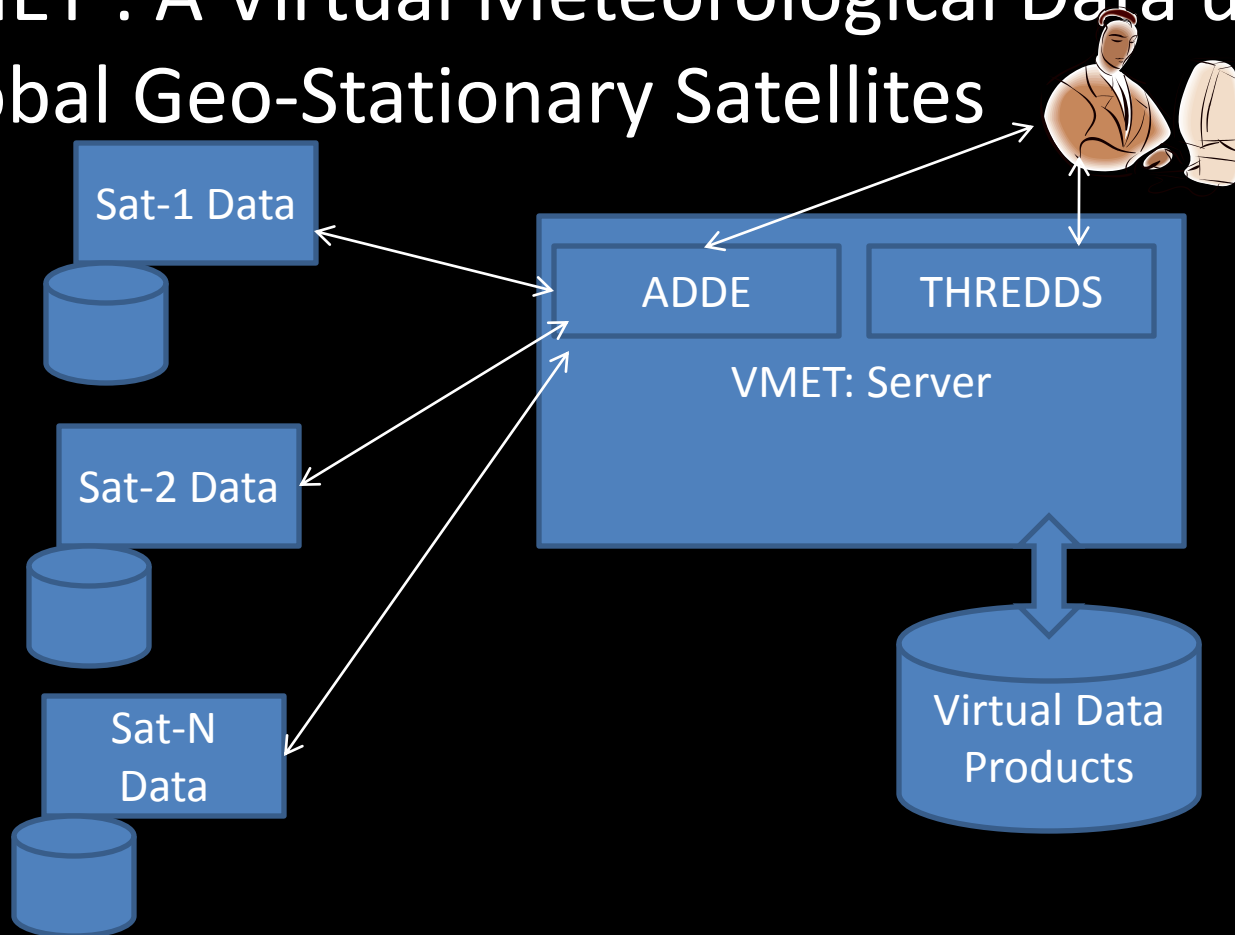
# ISRO Contribution: Data Stewardship

- Study Report on ISRO Earth Observation Data Archives
- CF (Climate and Forecast) compliant Data Products Format
- Demonstration of capability to generate Quick/Browse Products as part of Study and circulate products to CEOS members for feedback



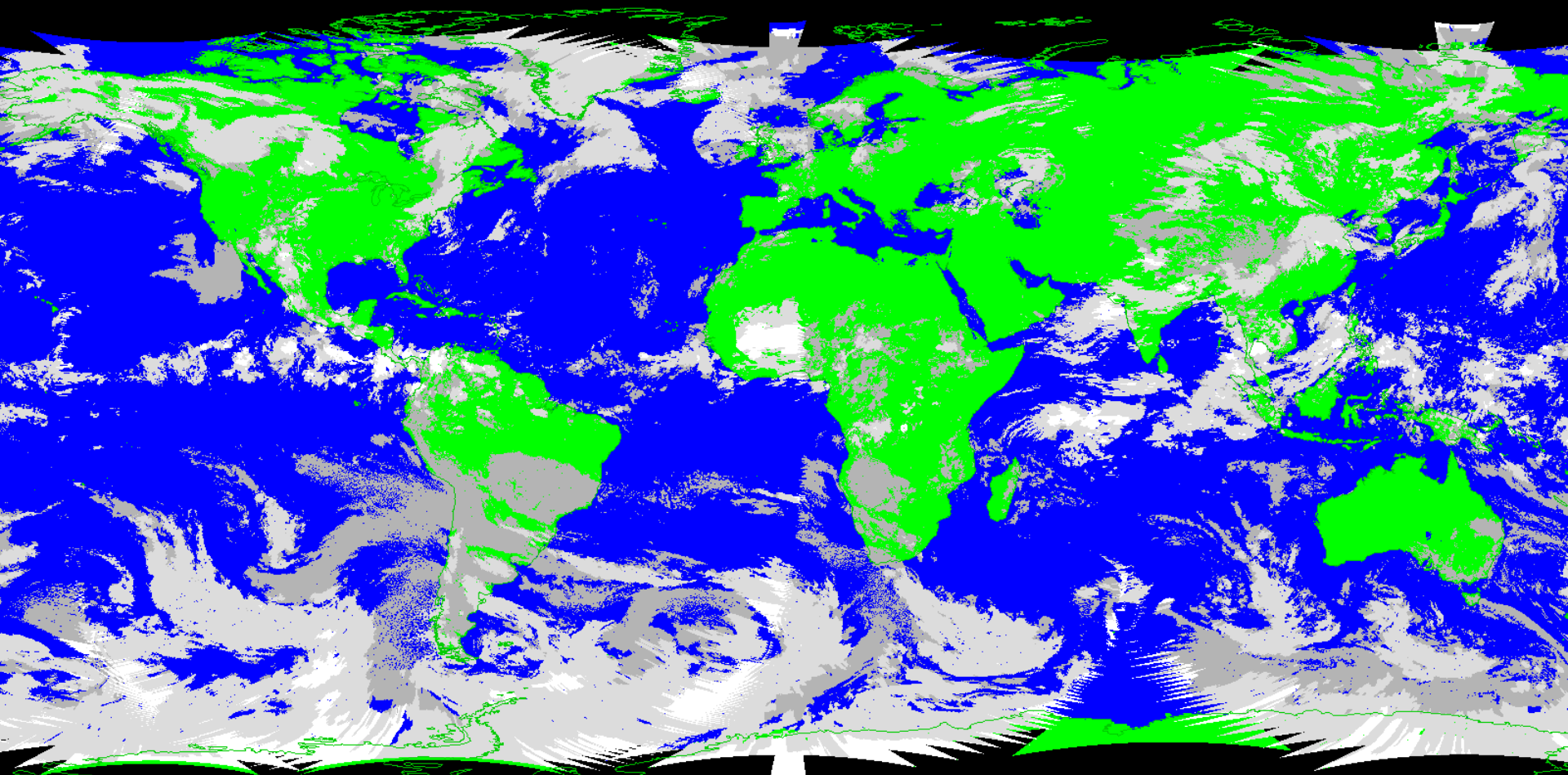
# ISRO Contribution: Virtual Constellation

- Propose
- VMET : A Virtual Meteorological Data using Global Geo-Stationary Satellites



Cloud Map  
Product

04-July-2012, 06:00 GMT



Data From : \*GEOS-E, \*GEOS-W, \*METEOSAT, \*MTSAT, KALPANA-1  
\*Data accessed through ADDE server ([satepsanone.nesdis.noaa.gov](http://satepsanone.nesdis.noaa.gov))



Thank You

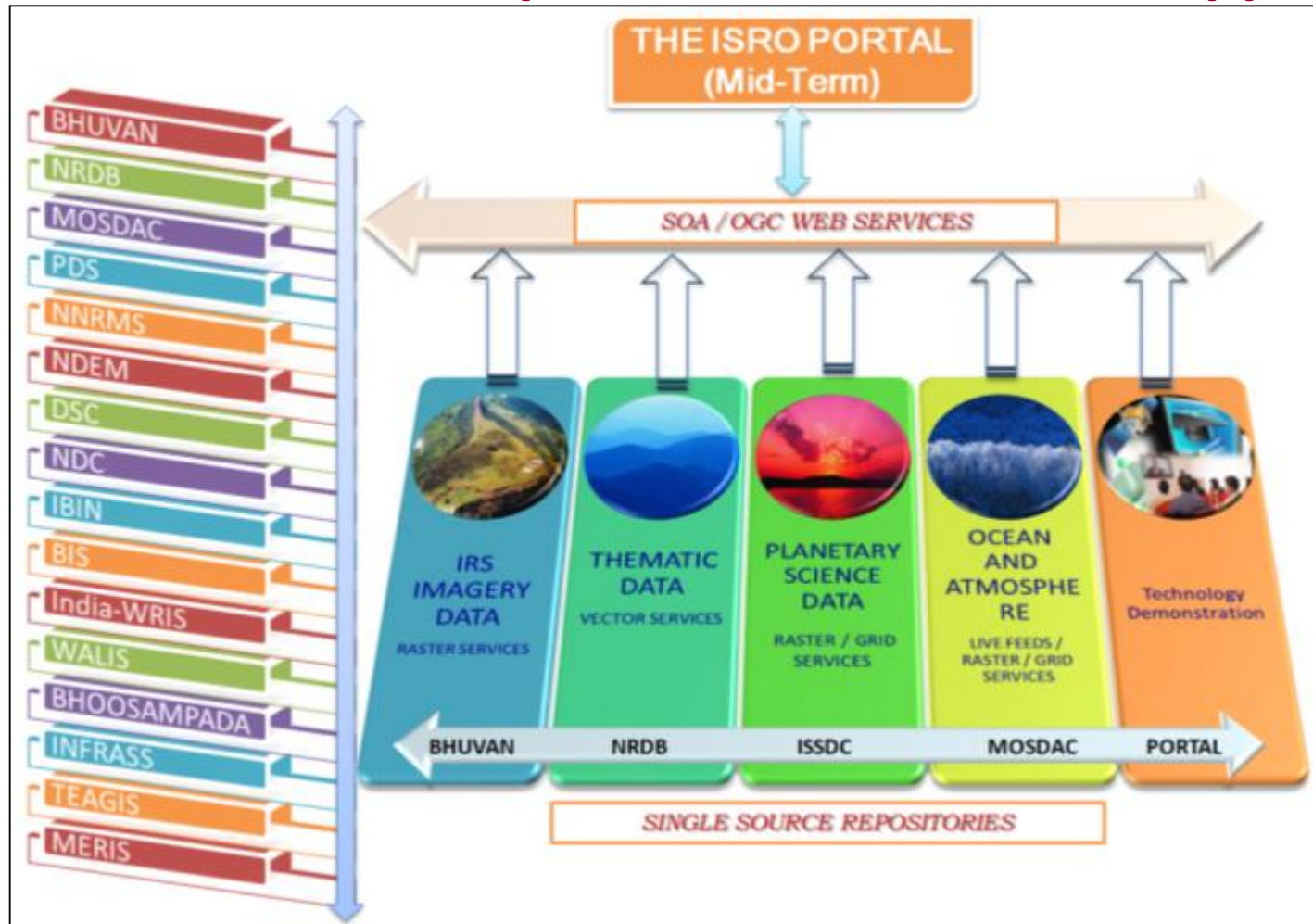




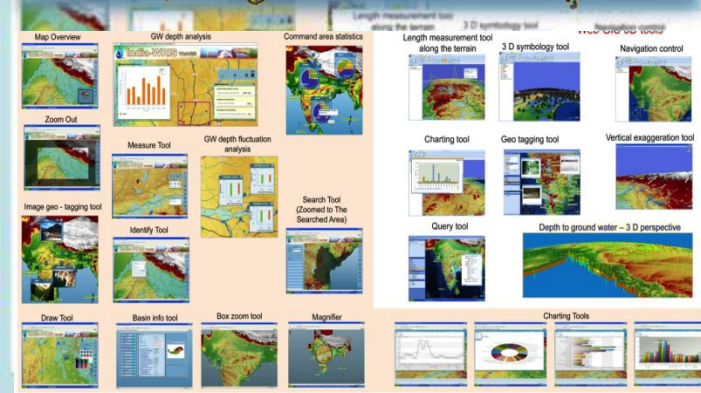
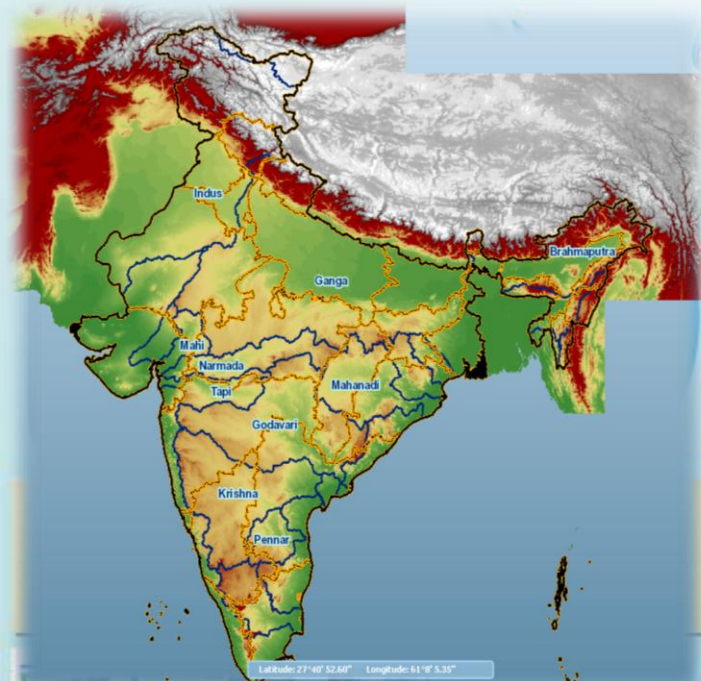
# WGISS Activities Overview

- Interest Group
  - Technology Exploration
    - Search and Share data using OGC compliant Web Services. CEOS WGISS Information Catalogue (CWIC)
  - International Directory Network
    - Registry of metadata describing data, services and resources.
  - Data Stewardship
    - Data Archive, Format and Data Life Cycle Models
  - Virtual Constellation

# Unified ISRO Geoportal – An innovative approach



- Harmonizing all the Geospatial efforts of ISRO through a common gateway - “Unified ISRO Geoportal” - Distributed computing environment to enhance the outreach
- Services under (i) Land & Water; (ii) Ocean & Atmosphere; (iii) Data visualization and download; (iv) Disaster Management services and (e) Planetary sciences.



Geo-Visualization & Processed data

Joint effort of ISRO & CWC

- Joint effort of ISRO and Central Water Commission.
- Single Window solution for all water resources data and information.
- India-WRIS (Ver 2.0) with 12 major info systems having 108 spatial layers released on March 22, 2012.
- Basin-wise reports and Watershed atlas of the country

• The Beta version with some of the important databases launched on December 7, 2010.

• Capacity building of CWC official has also been undertaken

