



Committee on Earth Observation Satellites

2020 CEOS Chair Priorities

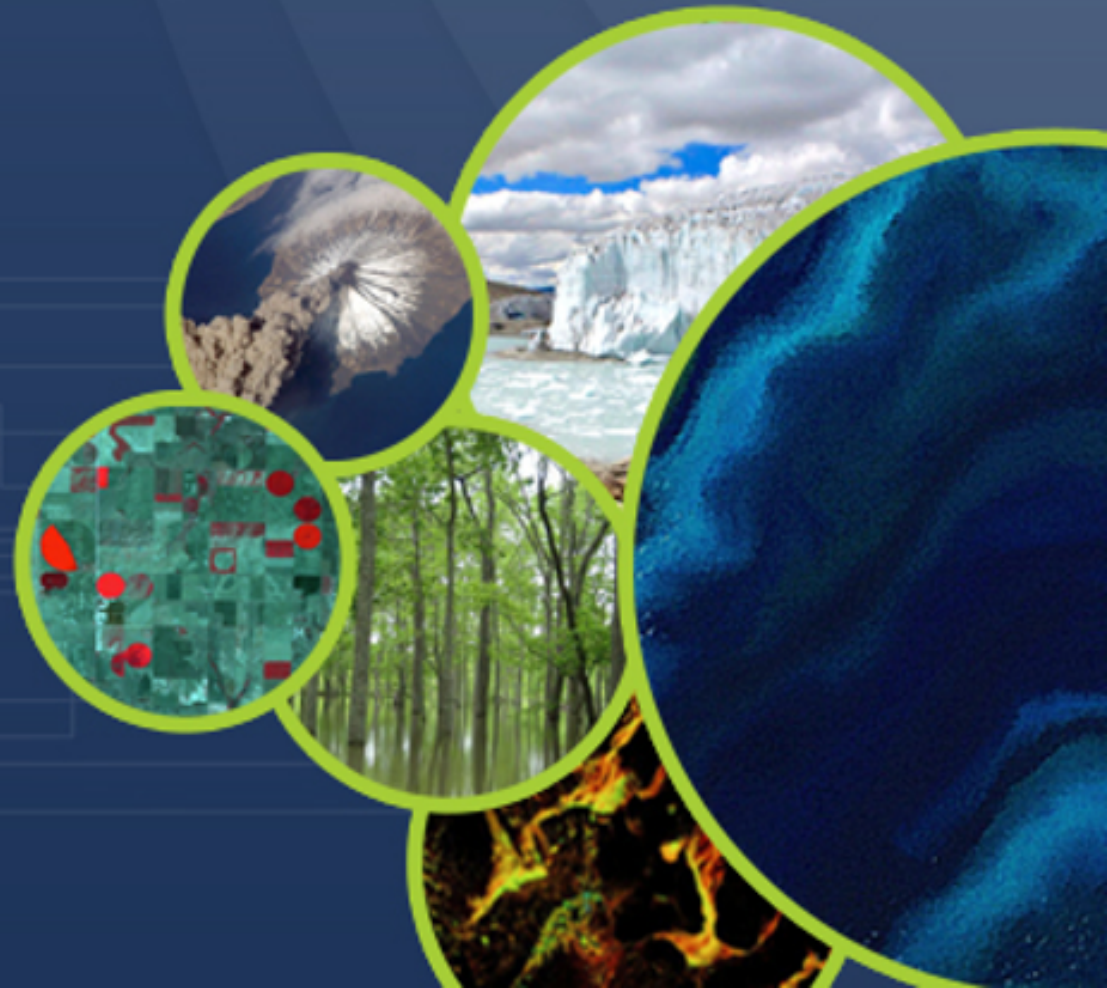
Raj Kumar, ISRO Chair Team

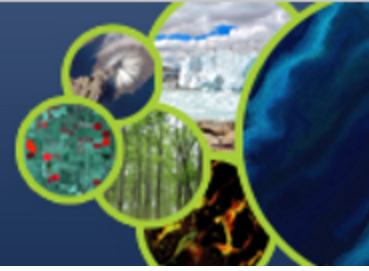
SIT-35

Agenda Item # 4.3

Virtual Meeting

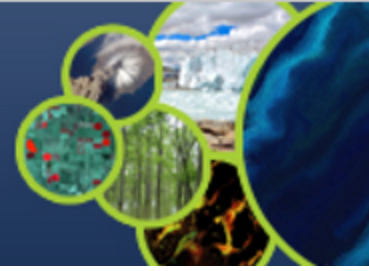
March 25-26, 2020





ISRO is pursuing the following initiatives:

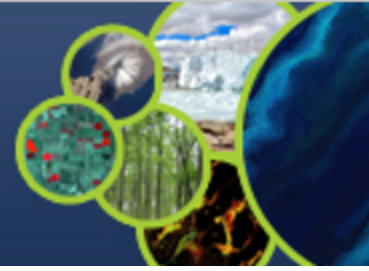
- 1. Focus on Virtual Constellation (VC) with regard to EO satellites - Gap analysis in priority areas, global studies....**
- 2. Applications focus on SDGs for BIMSTEC Region - Vegetation, LULC, Water etc.**
- 3. Renewable energy assessment (Solar & Wind) from Space**
- 4. Explore new tools for disasters management: Geo-Leo based solution !**



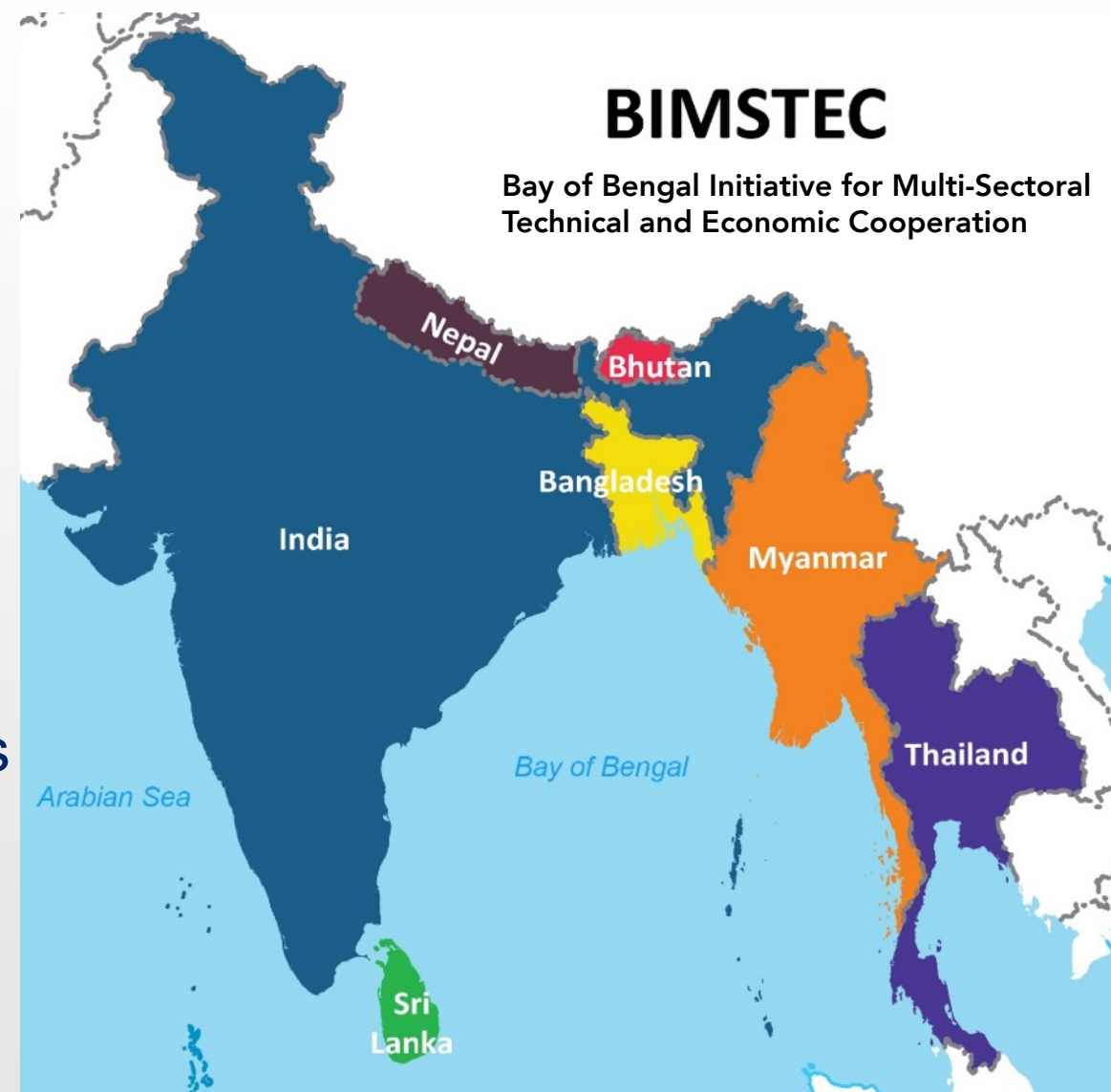
- Various LEO satellites are presently - operational, approved & planned
 - E.g. Winds, Forest ecosystem, Disaster situation
- Discussions on optimum coverage and observing system requirements
- Observation requirements may vary depending on the phenomena
- Need for Study teams to regularly analyse Operational / Approved / Planned missions, as part of Gap Analysis
- Discussions with GCOS for Gap Analysis and requirements

Actions Taken:

- Session on Scatterometer Constellation proposed in CGMS-48
- Session was proposed in IOVWST-2020
- Plan to discuss separately now with IOVWST and OVW-VC members
- Plans made to discuss with concerned Agencies

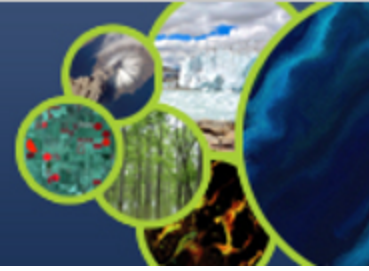


- Capacity building for BIMSTEC
- Organize harmonized long term datasets
- LULC Change, Rice crop monitoring
- Initial datasets processed
- CEOS CARD4L self-assessment format document is generated.
- Landsat-8 OLI Data for Nepal, Bhutan and Bangladesh 2014-2019 is under ingestion
- Discussions with BIMSTEC countries for applications development to fulfil CEOS SDGs
- Discussions with SIT Chair Team
- CSIRO offered to work with in DataCube
- WGCapD for Capacity Building





Features of present DateCube & Activities Remaining



Features

- Advanced Product search based on Lat/Lng, Area name and Path Row Schema.
- Direct visualization of product at native resolution without downloading.
- On-the-fly channel selection while viewing dataset for user defined Color composites and Band Math.
- Data swipe functionality. Time series animation builder.
- Single Task Processing Page which allow process, visualize, analyse, manage on a single map page.
- Layer Management, allow user to add their SHAPEFILE, GEOJSON, WMS, WCS & WFS Layer on map
- Customization of Pixel Drill Plots directly in browser, allowing user to analyse and plot time series data

Action Remaining

- Comprehensive Comparative analysis between RS-2/2A LISS-3 OSR Product and Landsat-8 OLI Data
- From Data analysis point of view, Jupyter based virtual lab to user for custom user tasks & processing
- Currently, only Cloud mask field in per-pixel metadata. Need Cloud shadow, Topographic Shadow etc.
- Applications development in consultation with BIMSTEC and integrated with AVID
- Discussions with SIT Chair Team & WGISS



On Fly Channel Selection & Task Composed Page for AVID



AVID Product View

Products

Product Code: R2ALS300139317031510954
Date Of Pass: 15-MAR-2017
Left Right Enabled

Product Code: R2ALS300037017010210954
Date Of Pass: 02-JAN-2017
Left Right Enabled

On The Fly Channel Selection

Data Cube Visualization

BIMSTEC Data Cube

The regions visualized on the map represent the various Data Cubes that are present and ingested on the system.

Use the filtering options below to hide or show specific subsets of ingested data. Clicking a region on the map will populate the area below with additional information about the clicked regions.

Selecting one of these cards will create a pop up with specific details about the area and a link where a sample cube can be created based on the area.

Task Composed Page for AVID

AVID

Task Composer

Path	Row
49	32
49	33
49	34
108	54
108	55
109	54
109	55

Search Data

ARD GeoBox **off**

Path-Row GeoBox **on**

Mobile Version

AVID

Task Composer

Compose Task | Task History

1 Task Selection

Select Task *
Custom Mosaic

Next

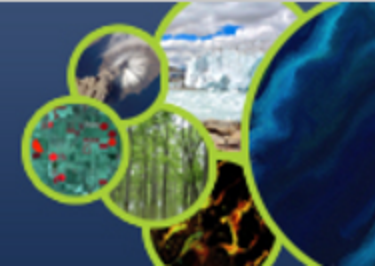
2 Satellite Selection

3 Region Selection

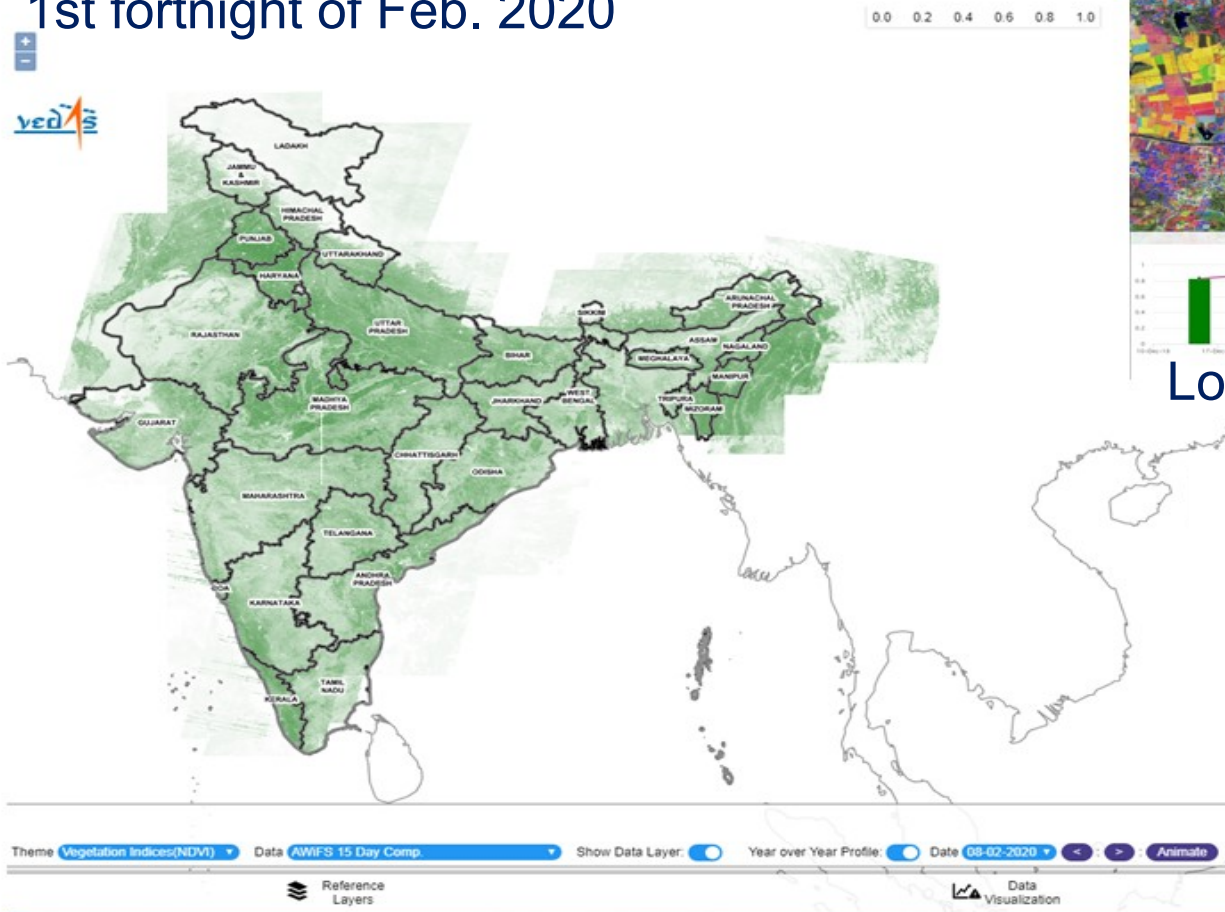
4 Date Selection

5 AOI Selection

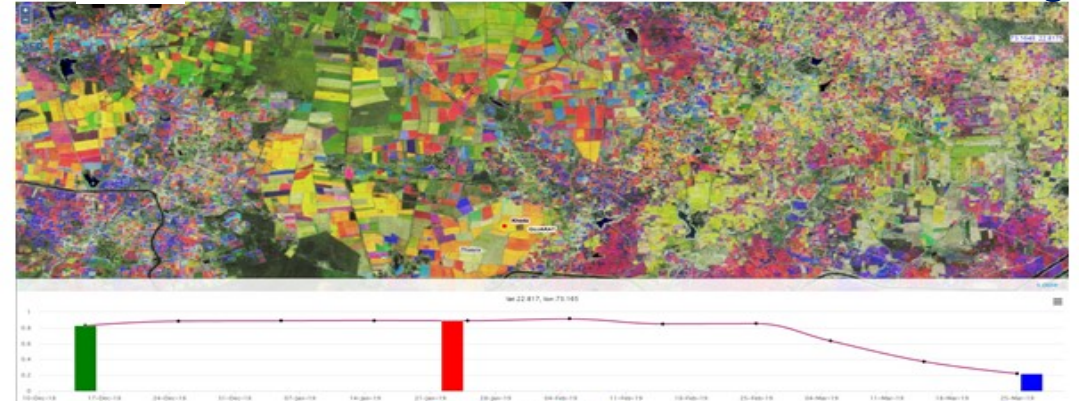
6 Additional Options



All India AWiFS max. NDVI composite for 1st fortnight of Feb. 2020

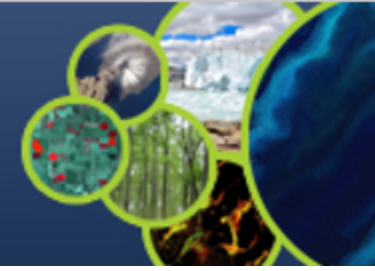


Sentinel NDVI RGB for field level monitoring

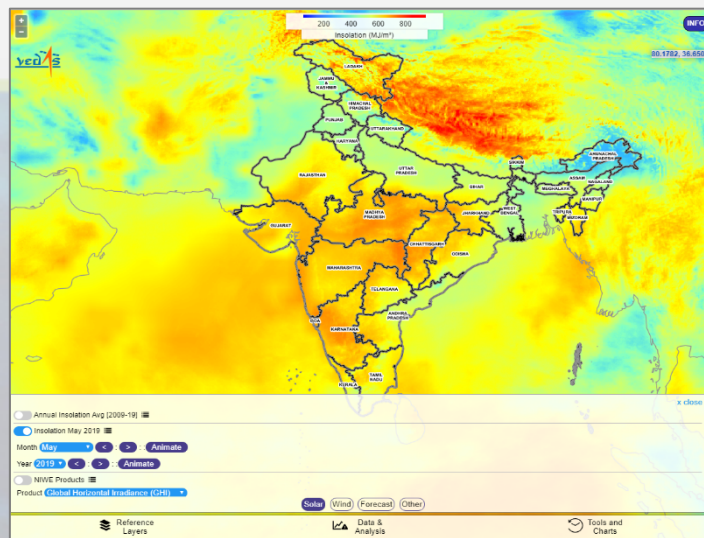


Long term trend analysis 20 years of MODIS



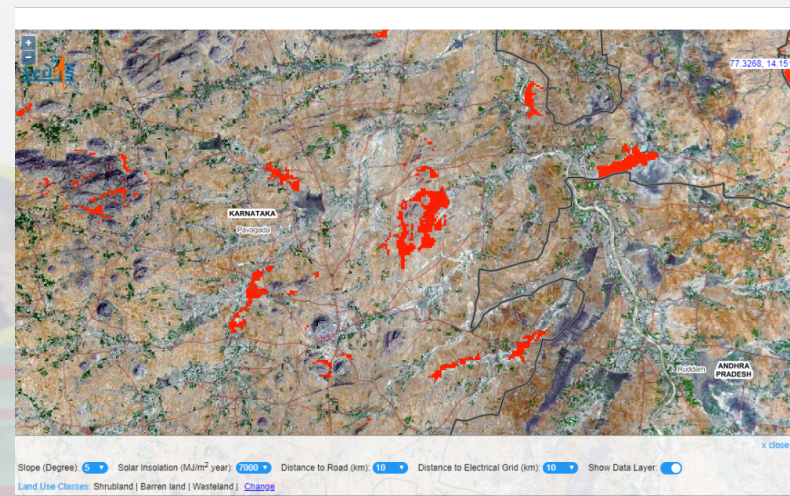


- Web Application and Mobile app for monthly and yearly Solar energy potential.
- Solar site selection tool for identification of potential areas based on multi-parameter filters including: slope, distance to grid, roads and landuse type.
- Offshore monthly Wind energy Potential.
- Discussions underway with GEO-VENER Team for integration



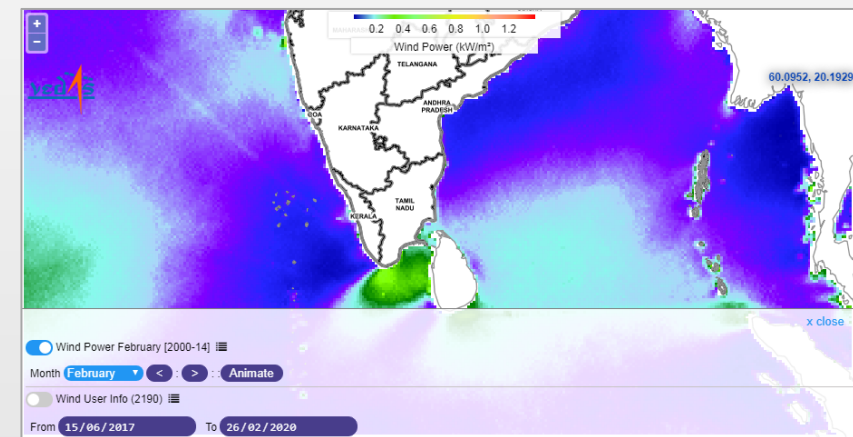
Solar Energy Potential

CEOS SIT-35 , Virtual Meeting, March 25-26, 2020



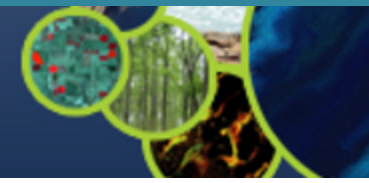
Solar Site Selection tool

URL: <https://vedas.sac.gov.in>



Wind Energy Potential (Offshore)

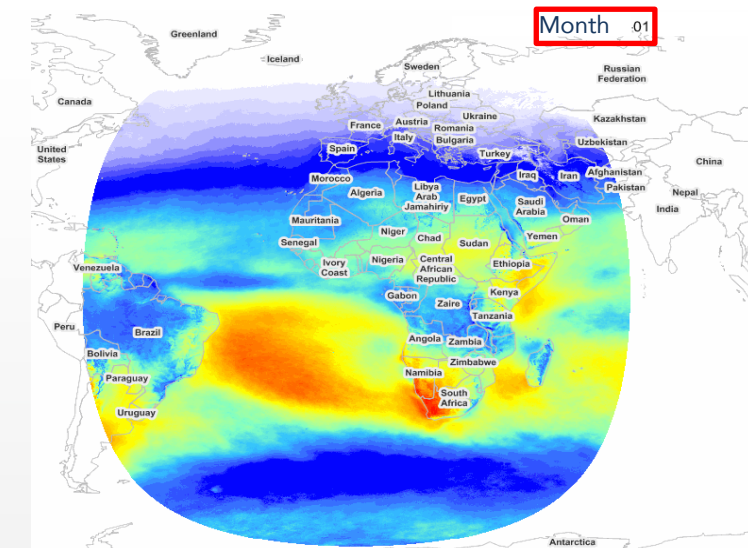
Solar Insolation over Africa



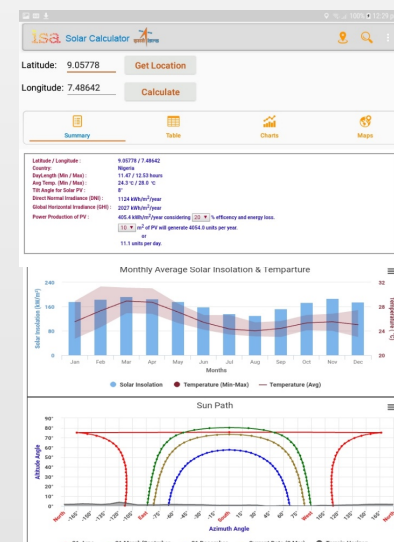
- Web Application and Mobile app developed for monthly/yearly Solar energy potential of Africa
- Solar Site Selection tool for Africa
- Mobile app for computing solar energy potential at given location

Future

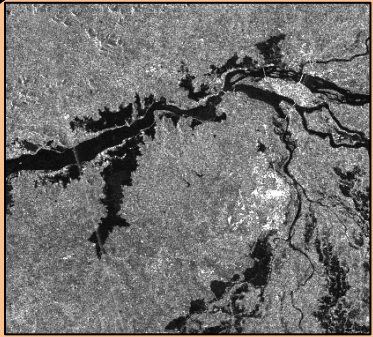
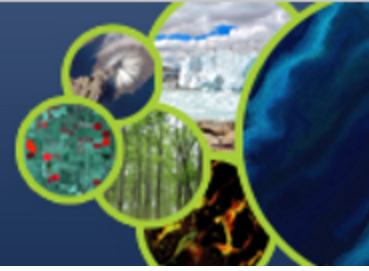
- Site Selection tool for identifying Solar and Wind energy potential sites for entire World.
- WebGIS application for Solar and Wind Energy Potential Visualisation of entire World.
- Solar and Wind Calculator Mobile App for selected location on World Map.



Monthly Solar Insolation



Solar Calculator App for Africa



Satellite Data

ISRO has launched several Geo-Leo Satellites and a few Satellites are proposed

- GEO Satellites - INSAT-3D / 3DR; **GISAT-1**,
- LEO Satellites-ResourceSat-2 / 2A; **RISAT-1A/1B**, **NISAR**, **(DMC-SAR)**, **ResourceSat-3**, ...
- DEM – CartoDEM, ...



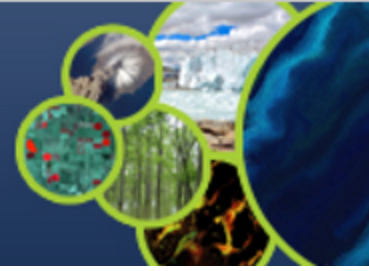
Disaster Applications

- Improved Flood Monitoring using GEO-LEO-SAR
- Forest Fire Danger Index



On-line Processing Tools

- Online satellite data processing tools
- Proto-type initiative for International Charter



Based on ISRO proposed activities, following points discussed

- Further discussions on ISRO's proposal for Flood Pilot
- Possibility of initiating a Pilot on Forest Fire Danger Index
- CEOS WGDisasters Chair suggestion on exploring the utility of ISRO strengths and integrating on-line tools
- Needs to be discussed further.

THANK YOU