Online Training Course

on

Discovery and Use of Operational Ocean Data Products and Services

Organized by

International Training Centre for Operational Oceanography (ITCOO)

ESSO-INCOIS, MoES, Hyderabad, India

Aug 31 - 04 Sep, 2020

ravikumar.jha@incois.gov.in

INCOIS Marine Data Services

- **IN-SITU**

  Argo, CTD, XBT, XCTD, Bio-Argo

- **Remote Sensing**

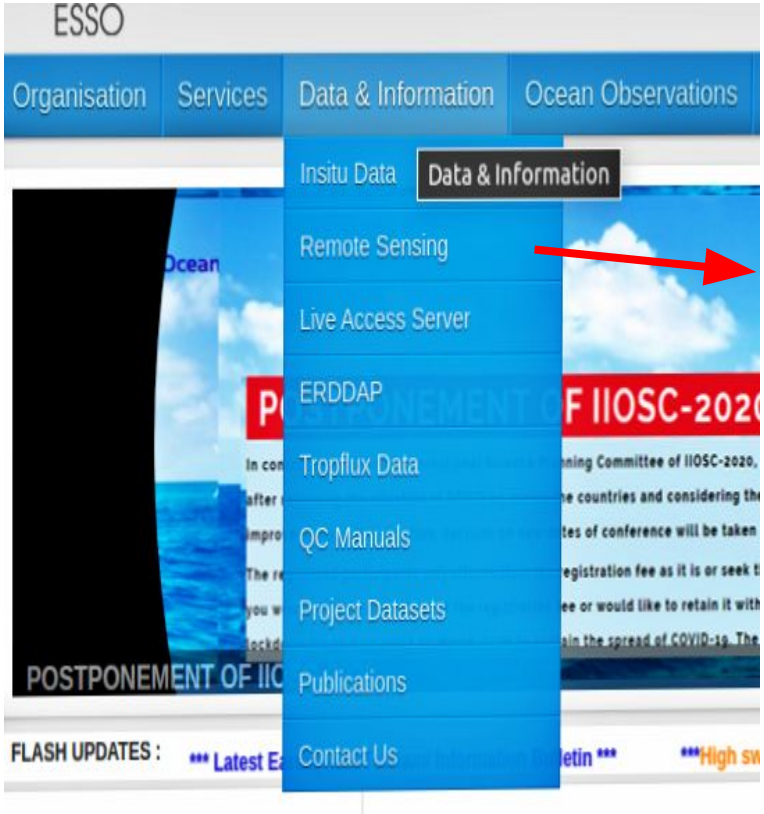
  NOAA (AVHRR, AVHRR-AMSR), MODIS

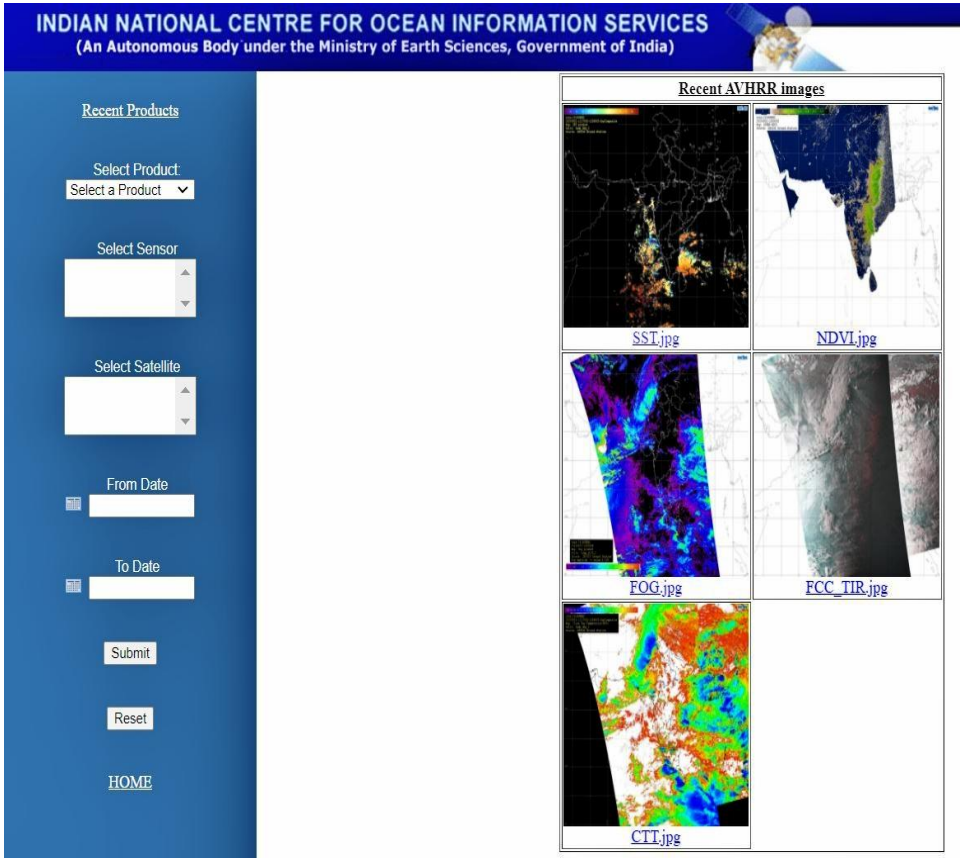
- **Model Data**

  MOM, ROMS, HYCOM

Data types	Parameters
In situ	
• Argo (las)	• temperature/ salinity
• Moored buoys (odis)	• air pressure
• Drifting buoys (odis)	• air temperature
• Tide gauge (odis)	• wind speed and direction
• Bottom pressure recorders (odis)	• water temperature
• XBT observations (odis)	• wave height and direction
• Current meters (odis)	• current speed and direction
• HF Radars (odis)	• wave parameters
• Automatic Weather Stations (odis)	• SST and air temperature
• Wave Rider Buoys (odis)	• atmospheric pressure
• Wave Height Meter (odis)	• sea surface currents
• CTD (odis)	• sea level
Remote sensing	
• MODIS/Terra and Aqua (las)	• SST
• OCM-1&2/Oceansat-2 (las)	• chlorophyll
• TMI (las)	• sea level, SST
• Quicksat & ASCAT (las)	• rainfall

Remote Sensing





Recent Products

Select Product:
Sea Surface Temp

Select Sensor
AVHRR
MODIS

Select Satellite
METOP-1
METOP-2
NOAA-17

From Date
01/08/2020

To Date
30/08/2020

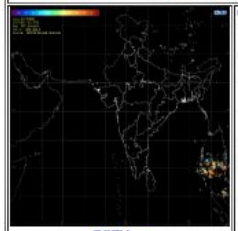
Submit

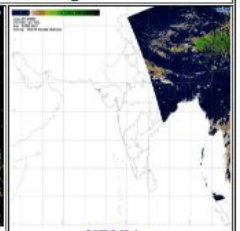
Reset

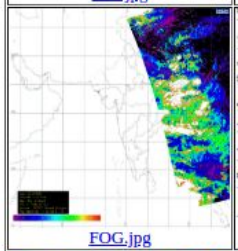
HOME

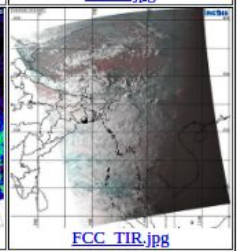
For archive data kindly contact pattabhi@incois.gov.in

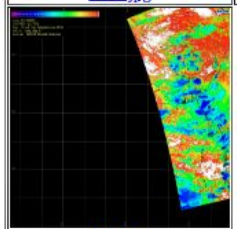
Recent AVHRR images


SST.jpg


NDVI.jpg


FOG.jpg


FCC_TIR.jpg


CTT.jpg

List of Images

20200830-174100Z-metop-1-sst.jpg
Download JPG GeoTiff

20200830-155610Z-metop-1-sst.jpg
Download JPG GeoTiff

20200830-142140Z-metop-1-sst.jpg
Download JPG GeoTiff

20200830-142140Z-155610Z-NightComposite-metop-1-sst.jpg
Download JPG GeoTiff

20200830-142140Z-155610Z-174100Z-NightComposite-metop-1-sst.jpg
Download JPG GeoTiff

20200830-044720Z-metop-1-sst.jpg
Download JPG GeoTiff

20200830-030900Z-metop-1-sst.jpg
Download JPG GeoTiff

20200829-161710Z-metop-1-sst.jpg
Download JPG GeoTiff

20200829-050820Z-metop-1-sst.jpg
Download JPG GeoTiff

20200828-163810Z-metop-1-sst.jpg
Download JPG GeoTiff

20200828-052950Z-metop-1-sst.jpg
Download JPG GeoTiff

20200827-040920Z-metop-1-sst.jpg
Download JPG GeoTiff

20200826-172130Z-metop-1-sst.jpg
Download JPG GeoTiff

20200826-153910Z-metop-1-sst.jpg
Download JPG GeoTiff

20200826-153910Z-172130Z-NightComposite-metop-1-sst.jpg
Download JPG GeoTiff

20200826-043000Z-metop-1-sst.jpg
Download JPG GeoTiff

20200826-025310Z-metop-1-sst.jpg
Download JPG GeoTiff

20200825-174510Z-metop-1-sst.jpg
Download JPG GeoTiff

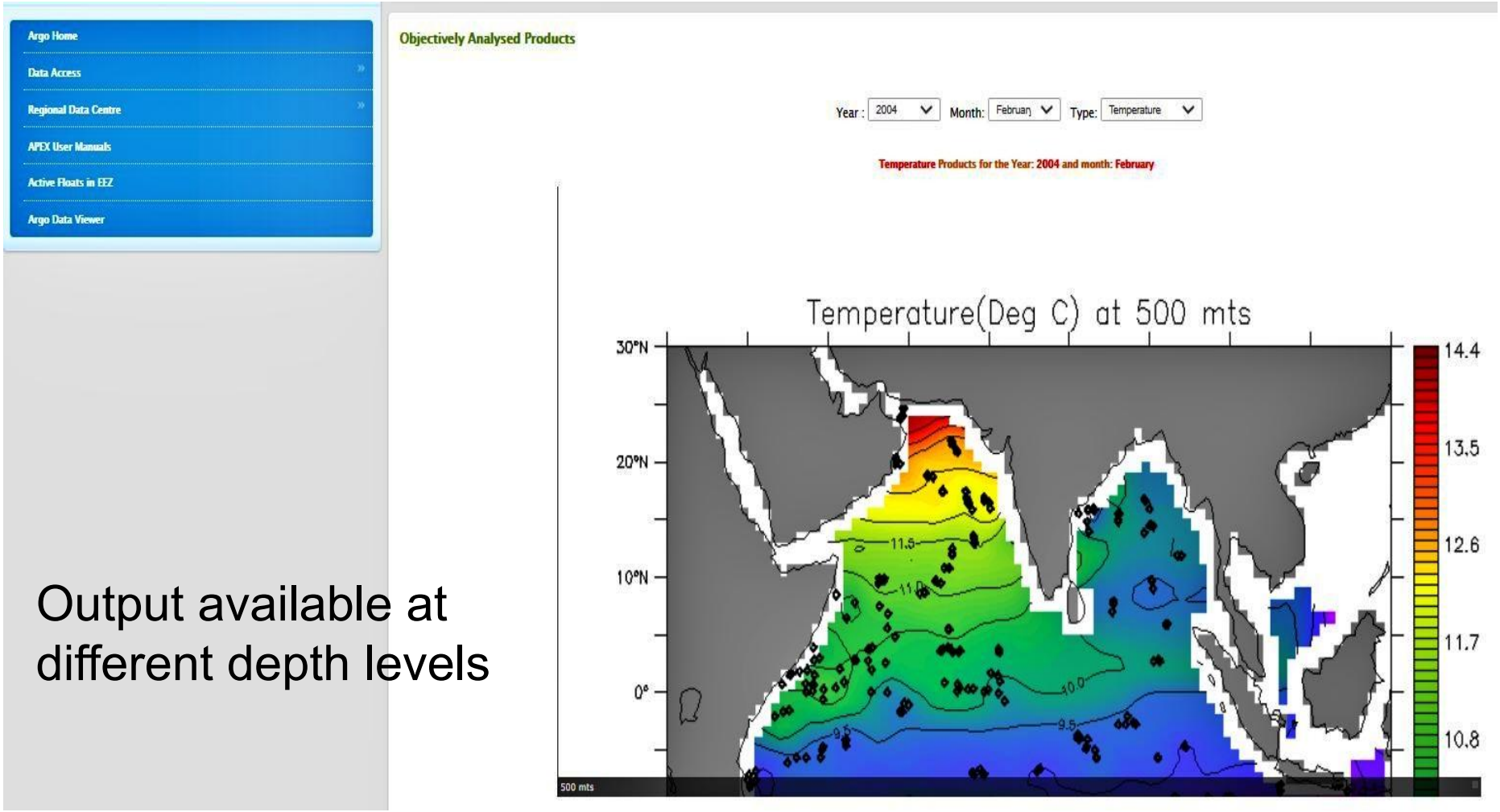
20200825-155940Z-metop-1-sst.jpg
Download JPG GeoTiff

20200825-142430Z-metop-1-sst.jpg
Download JPG GeoTiff

20200825-142430Z-155940Z-NightComposite-metop-1-

In Situ

- INCOIS HOME >> Data & Information >> In Situ Data >> Argo



Output available at different depth levels

Live Access Server (LAS)

https://las.incois.gov.in

- The Live Access Server (LAS) is a highly configurable web server designed to provide flexible access to geo-referenced scientific data (since 1994)
- It provides visualization, comparison and substituting of multi-dimensional scientific data for web users
- LAS functions as a virtual window, supports Windows, Unix / Linux platform with netcdf output
- This is Ferret based application, though tools (Matlab,GrADS) can also be used
- Opendap is available for LAS for global recognition. It is a framework to deliver the output and capable for dissemination
- LAS in INCOIS (I-LAS) is being maintained since 2010

Products available on INCOIS Live Access Server (las.incois.gov.in)

Product	Availability Period
Objectively Analyzed Argo (10 days & Monthly)	Jan 2002–Till date
AMSRE (3 day & monthly)	June 2002–Till date
NOAA High resolution SST	Sep 1981–Till date
NOAA SST (INCOIS ground station)	2008–Till date
WHOI Air – Sea Fluxes	Jan 1985–Jul 2010
OCEAN Analysis (MOM –GODAS)	Jan 2003–Jun 2011
Ocean Color Monitor (OCM1)	Jan 2003–Apr 2006
QuikScat Wind products	Aug 1999–Nov 2009
TMI (3 day and monthly)	Jan 1998–Till date
ASCAT wind products	November 2008–Till date

Pattabhi et al. 2018

List of products on I-LAS

- Argo derived Products
  > Agro derived products (SST), Value added products (MLD)
  > Gridded products (OA and VAM)
- ASCAT wind product
  > wind speed and wind stress (eastward and northward)
- Microwave data products
  > AMSR-E, AMSR-2
  > TMI
- New Global Climatology (NIO)
  > Temperature and Salinity
- NOAA
  > AVHRR and AVHRR-AMSR
- Ocean colour products
  > OCM-1 : Chlorophyll
  > OCM-2 : Chlorophyll-a

ESSO - Indian National Centre for Ocean Information Services

(An Autonomous Body under the Ministry of Earth Sciences, Govt. of India)

Home | Live Access Server | Opendap/F-TDS | Statistics | Online Documentation | Video Tutors | FeedBack | About | Contact

Data Set | Update Plot | < | One Plot | Annotations | Plot Options

29.88 N | 20.13 E | 139.88 E | 29.88 S

Compute: None over: Area

Maps
- Latitude-Longitude

Line Plots
- Time
- Longitude
- Latitude

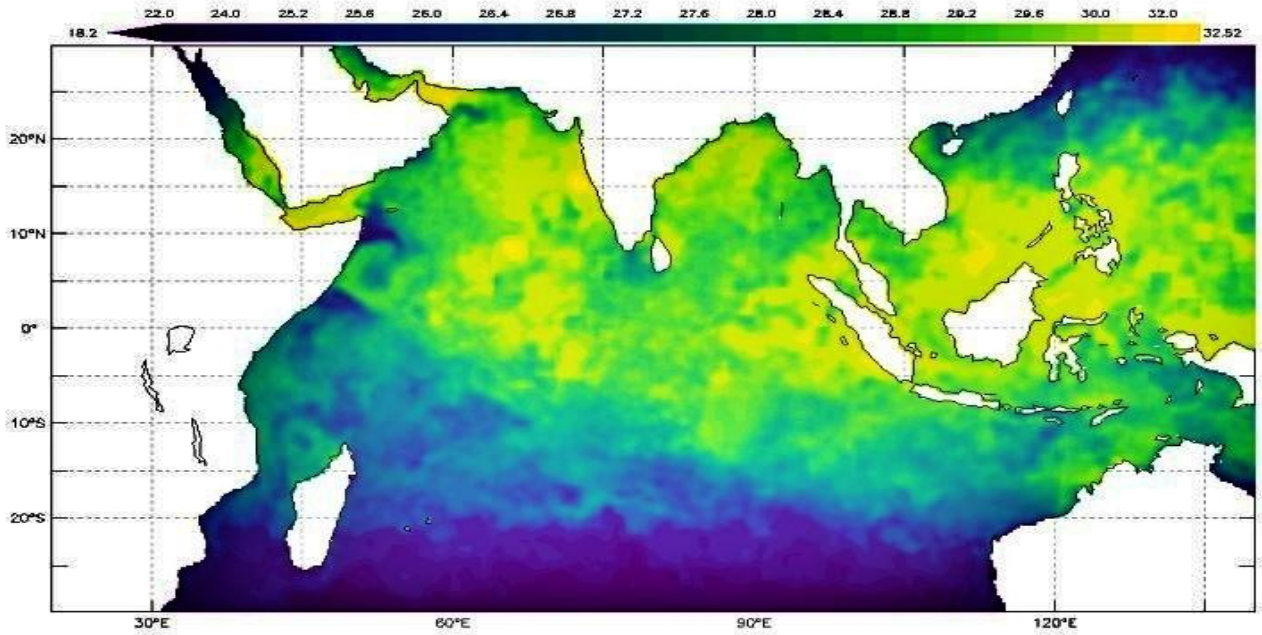
Hovmoller Plots
- Longitude-time
- Latitude-time

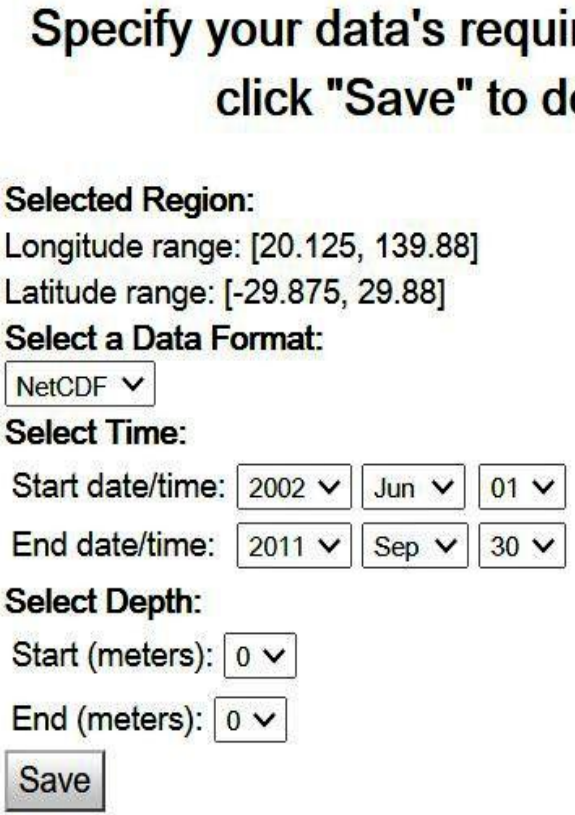
Print... | Link... | Animate | Correlation Viewer | Google Earth | Show Values | Export to Desktop Application | Save As...

DATASET: NOAA High Resolution SST AVHRR AMSR (data provided by the NOAA OAR ESRL)
VARIABLE: Daily sea surface temperature (degrees C)
Z (meters) : 0
TIME : 01-JUN-2002 00:00

LAS 8./Ferret 7.6 NOAA/PMEL

Print | + | Daily sea surface temperature | Z (meters): 0 | Date/Time: 2002 | Jun | 01





Output:

B83B94E5CBE54FE00C51D5A34761216A_ferret_listing.nc

Type: NC File (.nc)

Live Access Server

INCOIS LIVE ACCESS SERVER: Property-Property Viewer

Update Plot | Print

Help **Latitude, Longitude and Time Constraints:**

29.88 N

20.13 E | 139.88 E

29.88 S

Start date/time: 2002 Jun 01

End date/time: 2002 Jun 02 Reset

Start (meters): 0

End (meters): 0

Variable Constraints: Add a variable constraint...

Apply 17.75 < sst <= 33.25

Apply 4.5 < anom <= 3.3

Annotations

DATA SET: NOAA High Resolution SST AVHRR AMSR (data provided by the NOAA OAR ESRL)
VARIABLE: Daily sea surface temperature (degrees C) vs Daily sea surface temperature anomalies (degrees C)
LONGITUDE: 20.125E to 139.88E
LATITUDE: 29.875S to 29.88N
Z (meters) : 0
TIME : 01-JUN-2002 00:00

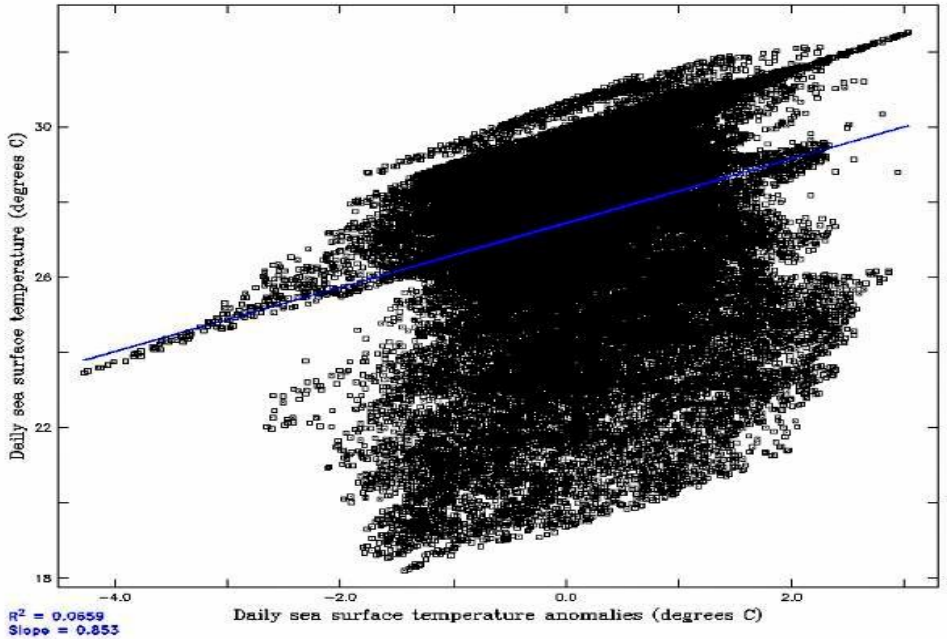
LAS 8./Ferret 7.6 NOAA/PMEL

Help

Daily sea surface temperature

as a function of Daily sea surface temperature anomalies

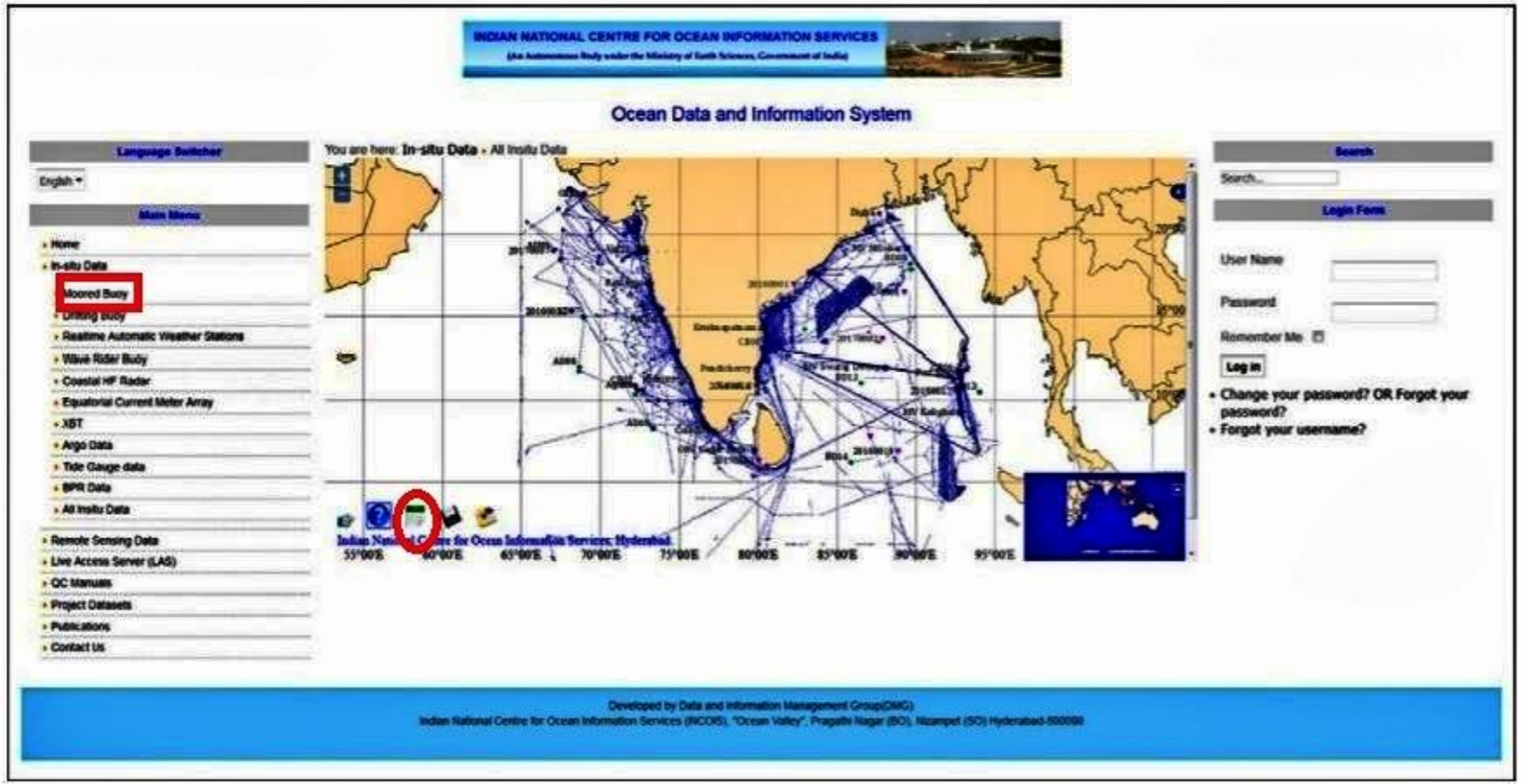
Colored By Daily sea surface temperature



Ocean Data and Information System (ODIS)

http://odis.incois.gov.in/

- ODIS provide ocean data and data products required for both research and operational oceanography
- The data received from various observing systems in real-time at different communication systems are assembled and standardized
- ODIS was designed and developed using open access data management and web access tools like MySQL, UMN MapServer and OpenLayers
- It serves as an end-to-end ocean data management system



Ocean Data and Information System at INCOIS for dissemination of in situ data (Shesu et al., 2013)

Moored Buoy OMNI

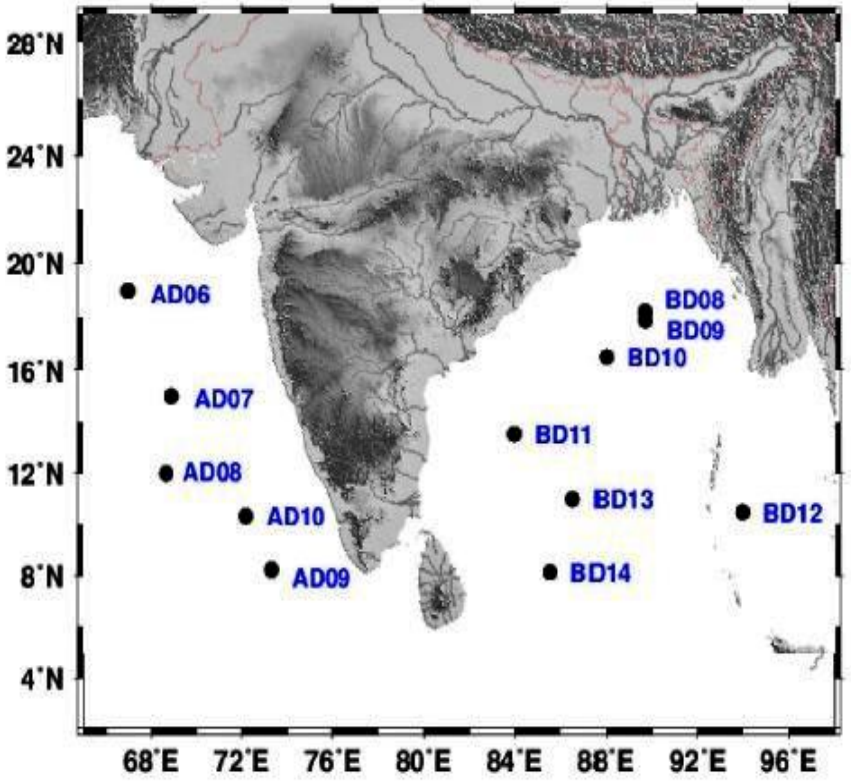
- OMNI provides High resolution real-time Data.
- Record both meteorological and oceanographic parameters

  > air temperature, pressure, surface winds, radiation, rainfall, humidity

  > surface temperature, conductivity, surface layer currents

- Currently 12 active buoys
- Deploy and maintained by NIOT; data processing and dissemination through INCOIS

Moored buoy >> Data Access



INDIAN NATIONAL CENTRE FOR OCEAN INFORMATION SERVICES

(An Autonomous Body under the Ministry of Earth Sciences, Government of India)

Ocean Data and Information System

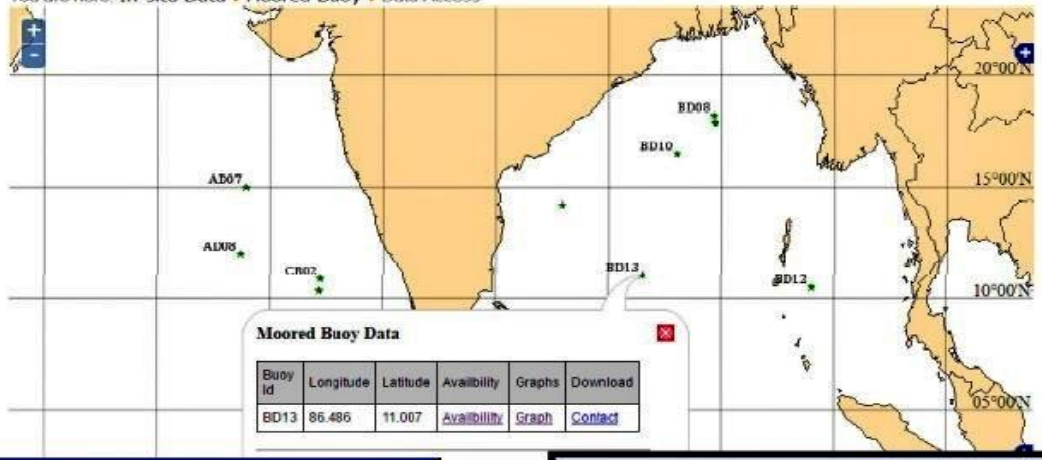
Language Switcher

English

Main Menu

- Home
- In-situ Data
  - Moored Buoy
    - Data Access
  - Drifting Buoy
  - Realtime Automatic Weather Stations
  - Wave Rider Buoy
  - Coastal HF Radar
  - Equatorial Current Meter Array
  - XBT
  - Argo Data
  - Tide Gauge data

You are here: In-situ Data ▸ Moored Buoy ▸ Data Access



Moored Buoy Data

Buoy Id	Longitude	Latitude	Availbility	Graphs	Download
BD13	86.486	11.007	Availbility	Graph	Contact

Search

Search...

Login Form

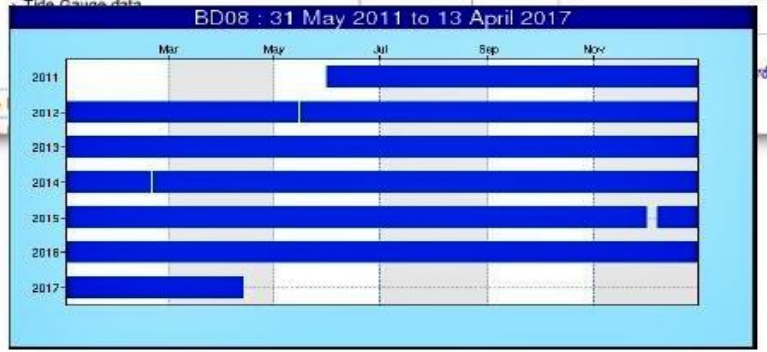
User Name

Password

Remember Me

Log in

- Change your password? OR Forgot your password?
- Forgot your username?



- Serve different type of data at unifies platform
- Simple and consistent data server to download subsets of scientific datasets
- Outputs are available in many formats as as .html table, ESRI .asc and .csv, Google Earth .kml, OPeNDAP binary, .mat, .nc, ODV .txt, .csv, .tsv, .json, and .xhtml
- ERDDAP can also return a .png or .pdf image with a customized graph or map.

Protocol	Description
griddap datasets	Griddap lets you use the OPeNDAP hyperslab protocol to request data subsets, graphs, and maps from gridded datasets (for example, satellite data and climate model data). griddap documentation
tabledap datasets	Tabledap lets you use the OPeNDAP constraint/selection protocol to request data subsets, graphs, and maps from tabular datasets (for example, buoy data). tabledap documentation
"files" datasets	ERDDAP's "files" system lets you browse a virtual file system and download source data files. WARNING! The dataset's metadata and variable names in these source files may be different than elsewhere in ERDDAP! You might prefer using the dataset's Data Access Form instead. "files" documentation
WMS datasets	The Web Map Service (WMS) lets you request an image with data plotted on a map. WMS documentation

ERDDAP HOME >> GRIDDED DATASETS >> MAKE A GRAPH

Grid DAP Data	Sub-set	Table DAP Data	Make A Graph	WMS	Title	Sum-mary	Meta-data	Back-ground Info	RSS	E mail	Institution	Dataset ID
data			graph	M	AMSR2 Monthly Global Data		M	background	RSS		INCOIS	AMSR2_mnt_Global
data			graph	M	AMSRE 3Day Global Data		M	background	RSS		INCOIS	AMSRE_3DAY_GLOBAL
data			graph	M	AMSRE Monthly Global Data		M	background	RSS		INCOIS	AMSRE_MONTHLY_GLOBAL
data			graph	M	Daily ASCAT global wind field		M	background	RSS		ifremer	ascat_daily_datasets
data			graph	M	Daily-OI-V2, final, Data (Ship, Buoy, AMSR-E, AVHRR, GSFC-ice)		M	background	RSS		INCOIS	NOAA_AVHRR_AMSR_datasets
data			graph	M	Daily-OI-V2, final, Data (Ship, Buoy, AVHRR, GSFC-ice)		M	background	RSS		INCOIS	NOAA_AVHRR_datasets
data			graph	M	Data from a local source.		M	background	RSS		???	AMSR2_3day_Global
data			graph	M	INCOIS ARGO 10 Day data Kessler-McCreary Methodology		M	background	RSS		INCOIS	incois_argo_10day_McCreary
data			graph	M	INCOIS ARGO 10 day data Variational Analysis Methodology		M	background	RSS		INCOIS	incois_argo_10d_VAM
data			graph	M	INCOIS ARGO Monthly data Kessler-McCreary Methodology		M	background	RSS		INCOIS	incois_argo_mnt_McCreary
data			graph	M	INCOIS ARGO Monthly data Variational Analysis Methodology		M	background	RSS		INCOIS	incois_argo_mnt_VAM
data			graph	M	INCOIS argo SST data Weekly		M	background	RSS		INCOIS	incois_argo_sst_weekly
data			graph	M	INCOIS Oceansat 2 OCM Data		M	background	RSS		INCOIS	incois_oceansat2_datasets
data			graph	M	INCOIS Quickscat Daily Data		M	background	RSS		INCOIS	incois_quickscat_daily_datasets
data			graph	M	INCOIS Quickscat Monthly Data		M	background	RSS		INCOIS	incois_quickscat_mnt_datasets
data			graph	M	INCOIS TMI 3Day Data		M	background	RSS		INCOIS	incois_tmi_3day_datasets
data			graph	M	INCOIS TMI Monthly Data		M	background	RSS		INCOIS	incois_tmi_mnt_datasets
data			graph		INCOIS Value Added Products		M	background	RSS		INCOIS	incois_valueadded_products_datasets
data			graph	M	IRS P4 OCM-Chlorophyll		M	background	RSS		INCOIS	IRS_chlorophyll_datasets
data			graph	M	Monthly ASCAT global wind field		M	background	RSS		ifremer	ascat_mnt_datasets

Dataset Title: **AMSR2 Monthly Global Data** ✉ RSS
Institution: INCOIS (Dataset ID: AMSR2_mnt_Global)
Information: Summary | License | Metadata | Background | Data Access Form

Graph Type: surface
X Axis: longitude
Y Axis: latitude
Color: SST

Dimensions	**Start**	**Stop**
time (UTC)	specify just 1 value →	2020-07-15T00:00:00Z
latitude (degrees_north)	-30.0	30.0
longitude (degrees_east)	30.0	120.0

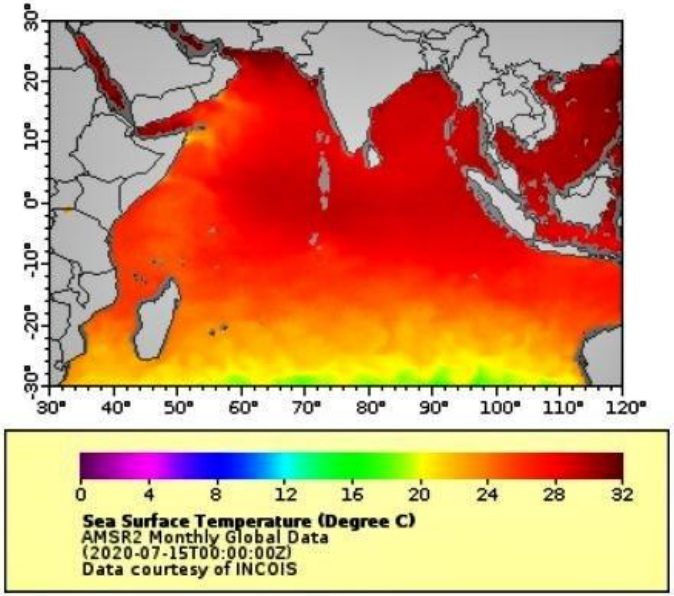
Graph Settings

Color Bar: Continuity: Scale:
Minimum: Maximum: N Sections:
Draw land mask:
Y Axis Minimum: Maximum: Ascending

Redraw the Graph (Please be patient. It may take a while to get the data.)

Optional:
Then set the File Type: .htmlTable (File Type information)
and Download the Data or an Image
or view the URL: /erddap/griddap/AMSR2_mnt_Global.htmlTable?SST%5B(2020-07-15T0
(Documentation / Bypass this form)

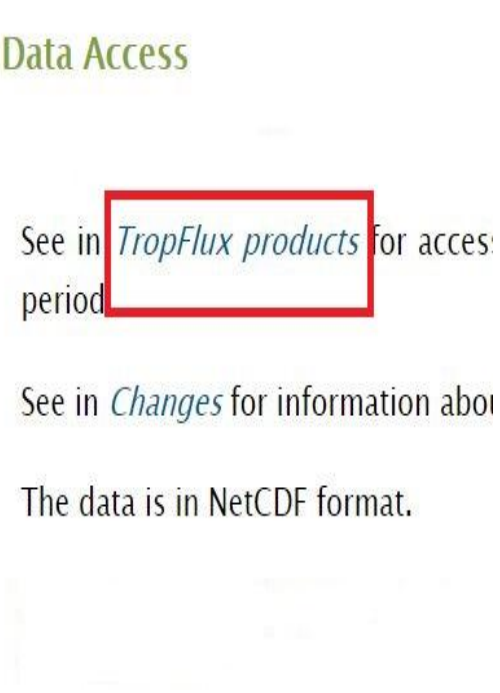
Click on the map to specify a new center point.
Zoom: Data | Out 8x | Out 2x | Out | In | In 2x | In 8x



Set file type as your choice, viz. png for download image etc.

TropFlux

- Aims at providing daily, timely, accurate air-sea heat and momentum flux data for the entire Indian ocean region
- Data available since 1979
- TropFlux data is freely available for research and education purposes.



Note: To download TropFlux data, registration is required.

Offline Data via DVDs

- Argo data and products for Indian Ocean consisting of 2 lakhs+ profiles is prepared and being distributed to students and researchers
- Upon registration, DVD contains software with Graph User Interface, similar feature to traditional Web GIS where in the user can search, query, visualize and download the data of their choice
- For huge data sets, FTP platform can be provided to download the desire data

Argo Home
Data Access
Regional Data Centre
APEX User Manuals
Active Floats in EEZ
Argo Data Viewer

Indian Ocean Argo Data Viewing Application

About Argo Data Viewing Application

A new version (2.2) of the "Argo Data and Products for Indian Ocean" is available for download. It is sequel to the version 2.1 developed by the Data Management and Information Group (DMG) of the Indian National Centre for Ocean Information Services (INCOIS), Hyderabad, India. The data can be interactively obtained by using the interface software developed in Java. This application works on Windows operating system and can be best view in 1024 X 768 screen resolution.

Salient Features of this Product

- GUI for easy navigation, browsing, data extraction with user defined spatial and temporal domains
- Spatial Coverage : 20°E – 140°E and 70°S – 30°N
- Temporal Coverage : January 2001 – April 2017
- Number of Argo Floats : 2863 Argo floats deployed by India and other countries in the Indian Ocean
- Number of Profiles : ~3,21,445 Temperature and Salinity Profiles collected by Argo Floats, excluding profiles in the Exclusive Economic Zone(EEZ)
- Value Added Products: Temperature, Salinity and Geostrophic Currents (0, 75, 100, 200, 500, 1000 M depths), Heat Content up to 300 M, Mixed Layer Depth, Isothermal Layer Depth, Depth of 20deg and 26 deg Isotherms, Dynamic Height
- T/S Plots : Plots of temperature and salinity of a single profile and all profiles from a float can be viewed with a single mouse click
- Filtering & Sorting :
  - Enhanced querying option for filtering and retrieving specific data of interest
  - Objectively analyzed data products in NetCDF format

Contents of the Software product

- **dbase** : This folder consists of the Argo databases and netcdf files
- **documents** : This folder consists of the supporting, help documents and manuals
- **html pages** : This folder consists of the supporting pages
- **images** : This folder consists of the supporint images
- **products** : This folder consists of the images of the various products
- **jre** : This folder contains the java runtime environment to execute the software application
- **lib** : This folder contains the necessary library files to execute the application
- **Latest\Updates** : This folder consists of the latest argo data to be updated.
- **argo.bat** : This file is used to execute the ADV software application.

Support

For Software support, please contact Geetha (geetha[at]incois[dot]gov[dot]in) or Uday (uday[at]incois[dot]gov[dot]in).

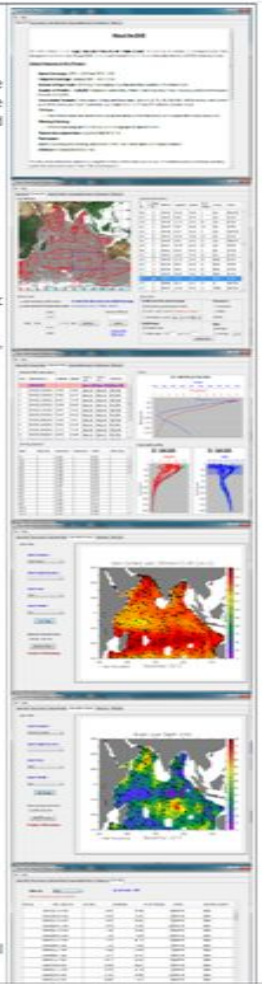
How to Download

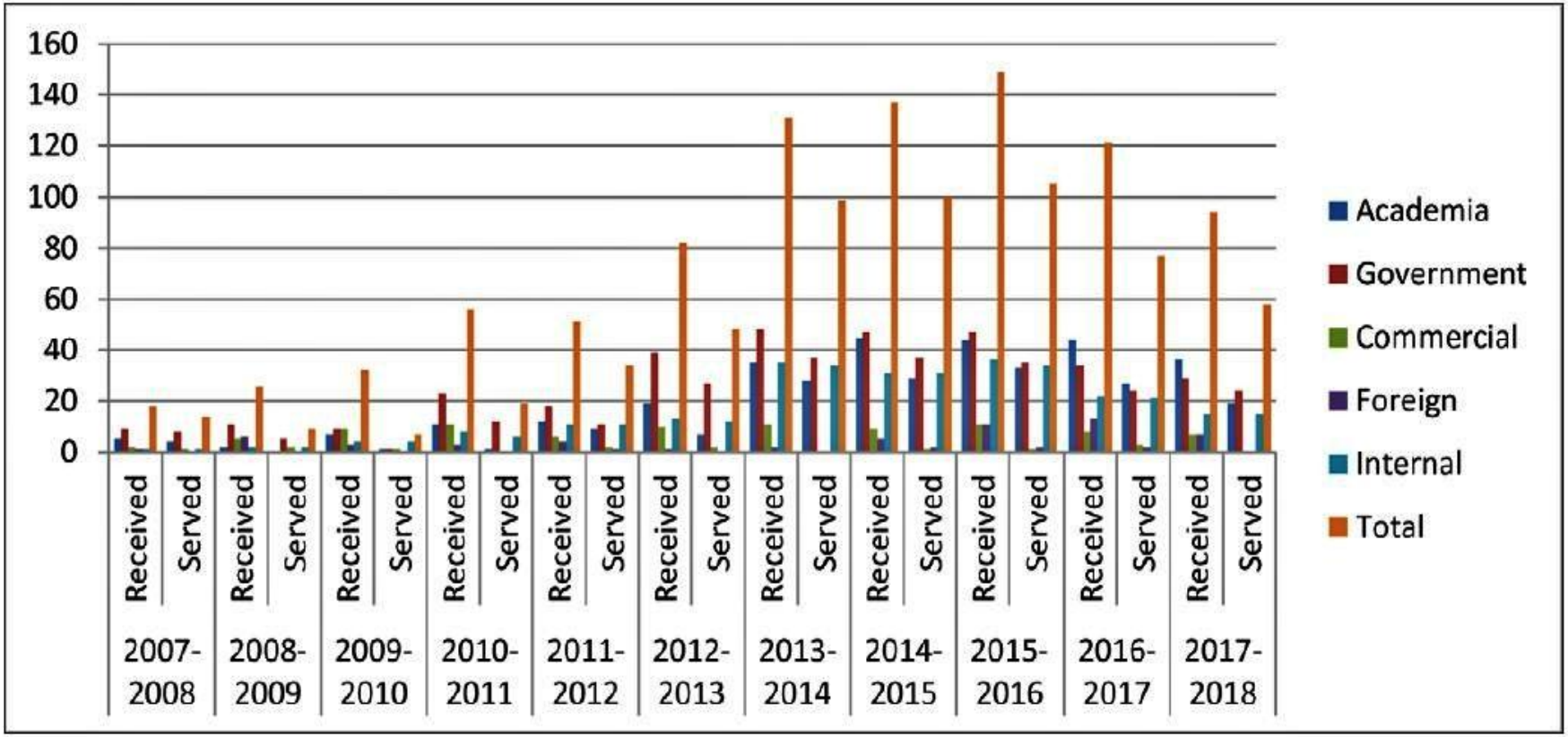
Click here for Download

How to acknowledge data plotted in the software:

The following paper must be cited while publishing any paper/report based on the data in the software.

"Argo Data and Products of Indian Ocean for Low Bandwidth Users, G. Geetha, T.V.S. Udaya Bhaskar, E. Pattabhi Rama Rao, International Journal of Oceans and Oceanography, Vol 5, Issue 1, pp 1 – 8, 2011."





Distribution of the different types of requests processed (Pattabhi et al. 2018)

DATA REQUISITION FORM

DATA REQUISITION FORM

1. Institution / Dept. Address:
2. Name & designation of the officer requiring data:
3. Details of data requirement:

Parameters	Platform / Instrument	Period

4. Project for which the above data is required and the project cost:
5. Please indicate whether the data is required for:
   a. Own research
   b. Sponsored & consultancy projects *
6. If it is for consultancy project, whether the project has obtained the approval from Central/State Government, if so, please provide the details:

7. **CERTIFICATE OF UNDERTAKING:**
   a. Data supplied are exclusively for the use of the organization only.
   b. The data will be used only for the purpose for which it is supplied.
   c. These data shall not be passed on to any other party or agency (India/abroad) either in part, in full or in any form. If needed, prior approval should be taken from Indian National Centre for Ocean Information Services for the same under special circumstances.
   d. Due acknowledgement shall be given to Indian National Centre for Ocean Information Services for the source of data in all reports / publications etc. made by you.

Signature of the Officer (Requisite)

Signature of the Head of the Institution

Station:
Date & office seal:

Note:
* In the sponsored and consultancy projects, INCOIS will be charging for the data to be supplied as per INCOIS norms.

References

Bhaskar et al; 2007. *An operational objective analysis at INCOIS for generation of value added products*, Technical Report, Report No. INCOIS-MOG-ARGO-TR-04-2007.

Devender et al; 2013. *INCOIS Live Access Server: A platform for serving Geo-Spatial data of Indian Ocean*. Int. J. of Oceans and Oceanography, 7(2): 143–151.

Pattabhi et al; 2009. *Ocean data and Information System (ODIS) and web based services*. The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, XXXVII. Part B4. Beijing 2008.

Pattabhi et al; 2018. *Marine Data Services at National Oceanographic Data Centre-India*. Data Science Journal, 17: 11, pp. 1–7.

Shesu et al; 2013. *Open source architecture for web-based oceanographic data services*. Data Science Journal

THANK YOU!!

Limno Tech