Argo Steering Team (AST-13)

National Report – India
(Submitted by M Ravichandran)

1. The status of implementation

1.1a Floats deployment

During the year 2011-12, India has deployed 48 floats so far in the Indian Ocean taking the total to 254.

1.1b performance Analysis of Floats deployed

Out of 254 floats deployed so far 106 floats are active. Out of these 106 active floats 76 floats are less than 3 years old.

1.1c Software support of CSIRO for DMQC

CSIRO extended their support for upgradation of the software to process IRIDIUM floats deployed by India. Similarly, University of Washington group has helped INCOIS in setting up RUDICS server at INCOIS and provided training for Lithium battery replacement in Apex floats for longer life of floats. We take this opportunity to thank CSIRO and University of Washington team for sharing the software, support and training.

1.2 Technical problems encountered and solved

None

1.3 Status of contributions to Argo data management

- Data acquired from floats
  India had deployed 254 floats so far. Out of these 106 floats are active. All the active floats data are processed and sent to GDAC.
- Data issued to GTS
  India started uploading TESAC format messages to GTS via New Delhi RTH from June 2011. Plans are in progress to generate data in BUFR format to be uploaded on to GTS soon.
- Data issued to GDACs after real-time QC
  All the active floats (106) data are subjected to real time quality control and are being sent to GDAC.
- Web pages
  INCOIS is maintaining Web-GIS based site for Indian Argo Program. It contains entire Indian Ocean floats data along with trajectories. Further details can be obtained by following the link:
  http://www.incois.gov.in/incois/argo/argo_home.jsp.
- Statistics of Argo data usage
  Argo data is widely put to use by various Organisations/ Universities/Departments. INCOIS Argo web page statistics (for the past one year) are as shown below:

Page	Views	Visitor
Argo Web-GIS	910	427
Data downloads	823	1203
Live Access Server	1,81,107	91,074
Argo products	1271	608

1.4 Status of Delayed Mode Quality Control process

With the support from CSIRO, DMQC s/w developed at CSIRO is installed at INCOIS and majority of the problems are resolved.

- Using this s/w reprocessing of all the eligible floats data is done. Around 154 floats were passed through the DMQC s/w and the following problems are tackled
    - Pressure Sensor offsets.
    - Salinity drift.
    - Salinity Hooks.
    - TBTO problems.
    - TNPD problems. etc
- Around 75 % of FLOATS are DMQCied for INCOIS DAC.
    - Lack of CTD profiles in some of the region in North Indian Ocean is still a critical problem, when decision is to be taken for the complicated cases.

1.5 Trajectory files status:

A total of 254 trajectory netcdf files were processed and uploaded to the GDAC. The process of generation of trajectory netcdf files undergoes quality checks like position, time, cycle number, etc., and corresponding quality status is assigned to each parameter.

2. Present level of and future prospects for national funding for Argo including a summary of the level of human resources devoted to Argo.

Indian Argo Project is a 5 year Program from April 2007 to March 2012 fully funded by Ministry of Earth Sciences, (MoES), Govt. of India. Funding is secured upto 2012 for deployment of 200 Argo floats (40 floats per year), Data management activities, Data analysis, etc. Similar amount of funding has been secured for the next five year plan (2012-2017).

3 Permanent and 2 temporary scientific/technical personal are working under Indian Argo project, which include personal for deployment of Argo floats, Data system, Analysis of Data, etc. Efforts are underway to get more manpower during next five year plan (April, 2012-March, 2017)

3. Summary of deployment plans (level of commitment, areas of float deployment) and other commitments to Argo (data management) for the upcoming year and beyond where possible.

India committed to deploy floats in the Indian Ocean wherever gap exists. India has committed 40 floats per year for the next five year. . After ascertaining the gap region and cruise plan of MoES research vessels, these floats will be deployed. The existing data management resources will continue for the next 5 year term.

4. Summary of national research and operational uses of Argo data as well as contributions to Argo Regional Centers.

Operational: All Argo data are being routinely assimilated in Ocean Model for providing Global ocean analysis. This analysis is being used by Met department for initialization of coupled ocean-atmosphere for seasonal forecast of Monsoon. From the year 2011, India could provide seasonal forecast of monsoon using dynamical model wherein Ocean analysis (with assimilation of Argo) is an important contribution. The analysis products are being made available at INCOIS live access server (las.incois.gov.in)

Research: Argo data are being widely used for many applications to understand the Indian Ocean dynamics, cyclone and monsoon system in relation to heat content, thermosteric component of sea level and validation of OGCM.

INCOIS is hosting Indian Ocean ARC, wherein all floats data from the Indian Ocean region are archived and distributed apart from many products

5. Issues that your country wishes to be considered and resolved by the Argo Steering Team regarding the international operation of Argo. These might include tasks performed by the AIC, the coordination of activities at an international level and the performance of the Argo data system. If you have specific comments, please include them in your national report.

Nil

6. As part of an action item from AST-9 aimed to improve CTD cruise data being added to the reference database by Argo PIs, it is requested that you include the number and location of CTD cruise data uploaded by PIs within your country to the CCHDO website in the past year. These cruises could be used for Argo calibration purposes only or could be cruises that are open to the public as well.

CTD data collected by INCOIS during the last two years will be sent to CCHDO soon.

7. Argo bibliography

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