Argo National Data Management Report of United States

13th Argo Data Management meeting
October 1st 2011 – September 30th 2012

1. Status

Data acquired from floats deployed during:
a) October 1st 2011 – September 30th 2012
Floats deployed: 429
Floats reporting: 364
Floats not reporting for more than 30 days: 65
Profiles quality controlled: 72,709

b) 1997 to September 30th , 2012
Floats deployed: 4477
Floats reporting: 1816
Floats not reporting for more than 30 days: 2390
Floats failed on launch: 113
Profiles quality controlled: 473,990

Data issued to GTS:
During the reporting period, the US DAC distributed 61,097 profiles on GTS. About 82% of profiles were available in less than 24 hours and 93% in less than 36 hours.

The US DAC sent 63,429 profiles in BUFR format to GTS.

Data issued to GDACs:
We distributed 74,251 profiles in each GDAC; using IFREMER statistics tables we calculated that 47% of NETCDF profiles reached the Global data center in less than 24 hours and 86% of our files in less than 36 hours.

During the reporting period, we also distributed updated corresponding technical and trajectory files for each float, as well as 429 new meta NETCDF files have been issued to both GDACs. Total numbers of NETCDF files issued was about 223,142 files.

We reprocessed 987 floats and created 147,623 profiles to update the technical files to comply with new requirements and technical names approved during last meeting.

Developments at the US DAC:
Migration of the data processing system to a new faster computer, which required adaptations to a newer version of the operating system.

Wrote four new decoders for Iridium floats and one new decoder for Argos floats. These new decoders required some changes to existing decoders, the quality control procedures and the programs generating

the NETCDF files. In addition, all decoders for floats with oxygen sensors were improved based on the guidelines developed by the Argo Data Management Team. These improvements resulted in the reprocessing of the profiles from 256 affected floats.

Collection of log files from APEX floats using Iridium as well as the SBD messages from SOLO floats using Iridium. The log files and SBD messages are provided to the US Argo DAC by the float providers. The US Argo DAC is working with the float providers to get these records for older floats. The US Argo DAC also started collecting the data providing the error ellipses for the position for floats using CLS.

Using the global index table for meta data from IFREMER to ensure that US floats have unique WMO identifiers and thus avoid problems with distribution of our profiles to the GDACs.

Generating a figure regularly to monitor the time elapsed to reach GTS for our NETCDF profiles using the BUFR format. The figure will be added to AOML web site.

Web pages:
The URL for the US Argo Data Assembly Center is:
http://www.aoml.noaa.gov/phod/argo/index.php
It provides links to:
- Documentation.
- Operations.
- South Atlantic Regional Data Assembly Center
- FTP Services.
- Related Sites.

Operational products generated from Argo data are available at:
http://www.aoml.noaa.gov/phod/argo/opr/index.php this web site shows profiles, sections, trajectories and pressure records for individual floats processed at the US Argo DAC. This page also shows summary tables of active and inactive floats, statistics related to data distribution via GTS and GDACs, and monthly maps depicting locations of Argo and XBT profiles.

2. Delayed mode QC

Scripps Group:

Scripps Institution of Oceanography (SIO) has evaluated, as part of delayed-mode quality control (DMQC), a total of 110,800 Argo stations (profiles). This is an increase of approximately 16,242 stations (445 float years) since the previous United States Argo National Data Management Report (October, 2011). At present, 99.6% of the DMQC eligible, SIO stations have been completed. Here we define a station as being DMQC eligible if it was sampled more than 12 months ago . The above numbers include all SIO performed delayed-mode stations, including SIO floats, all Argo New Zealand floats, and 10 Argo-Equivalent floats provided to Argo by Dan Rudnick as part of the Origins of the Kuroshio and Mindanao Current project.

SIO expects to be able to continue to maintain a high DMQC completion percentage during the coming year and will continue to revisit most floats every 6 months.

The DMQC procedures for SOLO/SOLOII floats mentioned in past reports were continued into 2012. Updates to the Argo Climatological Data Set for OW salinity calibration were created quarterly

throughout the year.

SIO has continued the transition from the IDG SOLO float utilizing the ARGOS transmission system to the IDG SOLOII / MRV S2A utilizing the Iridium transmission system. By early November, 2012 over 25% or the SIO float array is estimated to be SOLOII/S2A floats. The last ARGOS SOLO was deployed in March 2012. The remaining IDG inventory of SOLO hardware is being reduced by deploying limited numbers of SOLO with similar firmware to that found in the SOLOII and Iridium transmission systems.   While the transition to the SOLOII, and the Iridium transmission system, has introduced slightly modified DMQC procedures, the greater vertical sampling resolution in the ascending profile and worldwide 2000dbar pressure range has tended to result in fewer subjective delayed-mode decisions.

The SOLOII/S2A transmits more scientifically important data than older SIO floats. Newer information includes increased cycle timing information, near-surface temperature and salinity, and optional high-resolution profile data (up to 1 Hz). Significant effort has been expended to prepare and submit this additional data so that it can be distributed through the Argo data set. SIO is ready to perform delayed-mode quality control on this data.

University of Washington Group:

As of October 2012, University of Washington had submitted 134,671 delayed-mode files (D-files) to the GDACs via AOML. These are comprised of:

- 122,807 D-files belonging to University of Washington (UW), representing about 90% of UW profiles older than 12 months.

- 11,864 D-files belonging to the KESS project from University of Hawaii (UH), representing 100% of all UH KESS profiles.

Delayed-mode evaluation of conductivity sensor drift was done by using the statistical comparison method of OW (2009), in conjunction with the CTD reference database issued by Coriolis. The latest version was CTD_for_DMQC_2012V01, issued by Coriolis in 2012. Visual comparison with nearby good Argo data was used to complement the statistical method of OW. Results from Stephanie Guinehut's altimetry test were also taken into account as part of the delayed-mode evaluation process.

Delayed-mode adjustment of APEX pressure data were carried out as per the Argo QC Manual. Checking for Truncated Negative Pressure Drift (TNPD) continued because many UW APEX floats that used the old Apf-8 controller were still active.

PMEL group:

As of 22 October 2012, PMEL had a total of 60,082 D-files at the GDAC. Of these, 57,530 were more than one year old – 85% of the total of 67,616 PMEL profiles that were older than one year at that time. At the time that last year's report was written, PMEL had a total of 39,724 D-files at the GDAC. Of these 39,774 were more than one year old – 74% of the total of 53,939 PMEL profiles that were older than one year at that time. We have made significant progress in clearing the backlog of D-files, and hope to continue that progress in the coming year.

The PMEL float DMQC procedure currently consists of the following steps: We perform an automated

correction, with visual check, of reported pressure drifts and correction for the effect of these pressure drifts on salinity, as well as an automated correction of conductivity cell thermal lag errors following Johnson et al. (2007). We do visual inspection and modification of quality control flags for adjusted pressure, temperature, and salinity using the SIO GUI. As of this summer, we now overwrite the raw Param_QC flags during this step as required. We use OW Version1.1 with SeHyD_090408 as a historical database for recently deployed floats and adjust run parameters to get appropriate recommended salinity adjustments. We accept or reject the OW recommendations on the basis of comparison with nearly historical and Argo float profiles using the SIO GUI. We are continuing use of WJO Version2.0 instead of OW Version1.1 with most floats that began DMQC using the former system. We still have to modify our routines to accommodate the growing number of PMEL Iridium floats with 2-dbar vertical resolution.

 WHOI Group:

3. South Atlantic Argo Regional Center

The South Atlantic Argo Regional Center (SAARC) is coordinating the effort of countries with interest in the Atlantic from 20ºN to 40ºS.

The web site for the South Atlantic Argo Regional Center (http://www.aoml.noaa.gov/phod/sardac) provides background information, the report from the meeting with interested countries in May 2005, links to products and data servers.

Deployment opportunities provided by countries participating in SAARC can be found here: http://www.aoml.noaa.gov/phod/sardac/logistics/opportunities/index.php

A float donation program has been put in place. This program facilitates the float deployment in remote regions and provides regional data to the volunteers in participating countries (e.g. Argentina, Brazil, Kenya, Gabon).

Float deployments: 55 floats were deployed in the SAARC region by AOML.

Products generated from Argo data are available at:
http://www.aoml.noaa.gov/phod/sardac/products/index.php currently shows four type of products that are derived from hydrographic profiles collected by Argo floats and other instruments:
  • Properties of the mixed layer (thickness, temperature and heat storage rate) as monthly fields.
  • Maps and cross-sections that depict the annual and semi-annual mean state in the upper ocean.
  • Maps of altimetry and geostrophic currents.

Post-DMQC Analysis (data consistency check): Development of the Post-DMQC Analysis is near completion. The October 17 run of 979 floats in the SAARC region is currently being evaluated prior to being released to the community by the end of the year. Once this is done the results will be posted here: http://www.aoml.noaa.gov/phod/sardac/post_dmqc/delay_mode.html and the delayed-mode oper-ators will be informed about significant findings.