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argo data management

ARGO DATA MANAGEMENT REPORT FRENCH DAC

Argo National Data Management Report of France

October 2006

Introduction

This document is the annual report of the French Argo Data Assembly Centre (DAC) for 2006.

The French DAC is supported by the Coriolis project , a joint project for operational oceanography.

1. Status of the DAC

- Data collected from floats
    - 680 floats including 353 active instruments
    - 42342 profile files, including 14475 delayed mode profiles
    - 674 trajectory files
    - 532 technical data files

- Description of the 351 floats :
    - 353 active floats in October 2006
    - Provor (337), Apex (349), Metocean (14), Nemo (15)
    - 42 versions of floats : 14 versions of Provor, 22 versions of Apex, 4 versions of Nemo, 2 versions of Metocean
    - Deployed by 13 countries (Chile, Costa Rica, Denmark, France, Germany, Italy, Mexico, Netherland, Norway, Russia, Spain)
    - Operated by 35 scientific projects (Good-Hope, Mersea, MFSTEP, Tropat, Weccon…)

During the past year, in coordination with CLS Argos we have processed Apex 28 bits format floats which are not hosted by a national DAC.
We also quality control the data circulating on GTS from floats with no national DAC.

- Data issued to GTS

All data processed by Coriolis are distributed on the GTS by way of Meteo-France. This operation is now automatically performed. After applying the automatic Argo QC procedure, the Argo profiles are inserted on the GTS every 2 hours. So, Argo profiles are now inserted on the GTS 365 days per year, 24 hours a day.

- Data issued to GDACs after real-time QC

All meta-data, profiles and trajectory data are sent to Coriolis and US-Godae GDACs. This distribution is automated.

Technical data are regularly issued to the GDACs

- Data issued for delayed QC

All profile files are sent to PIs for delayed QC. Most of the Atlantic data handled by Coriolis are checked by the European project Mersea.

- Delayed data sent to GDACs

Annie Wong et al method has been adapted to North Atlantic environment to produce the delayed mode data for Gyroscope project (Lars Boehme). The method evolved with Christine Coatanoan, Virginie Thierry and Philippe Galaup has been updated to split the time-serie of the floats . A total of 15763 delayed modes profiles was sent to the GDAC.

- Web pages

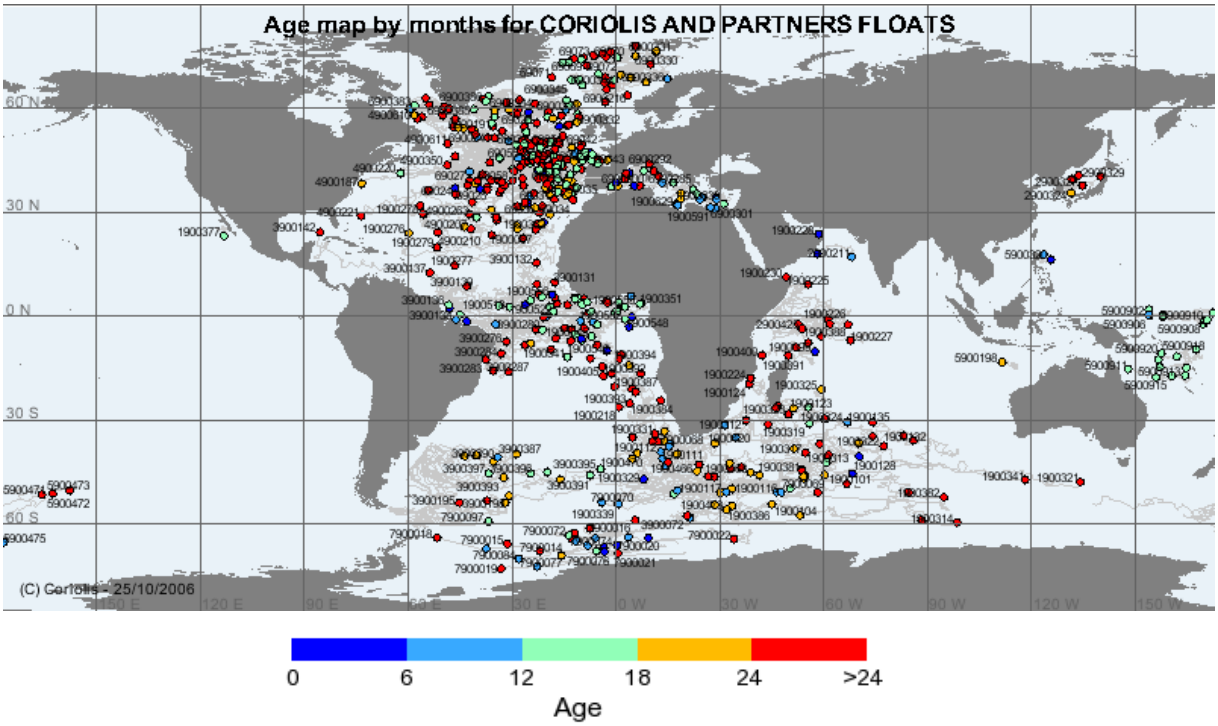
The web site of the French DAC is available at : http://www.coriolis.eu.org/cdc/

It provides :

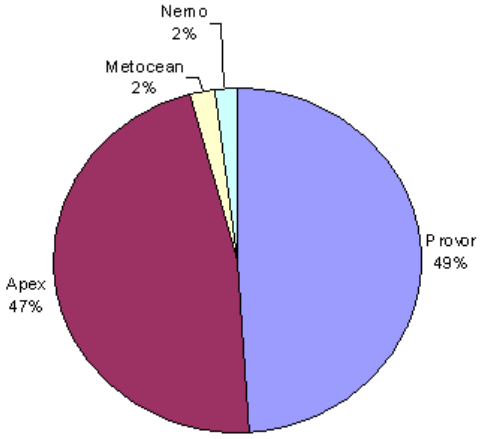
- Individual float description and status (meta-data, geographic map, graphics : section, overlayed, waterfall, t/s charts)
- Individual float data (profiles, trajectories)
- FTP access ;
- Data selection tool ;
- Global geographic maps ;
- Weekly North Atlantic analyses (combines Argo data and other measurements from xbt, ctd, moorings, buoys) ;
- Some animations.

Since last report, new functionalities have been implemented on the Coriolis web site:

- Floats monitoring statistics: http://www.coriolis.eu.org/cdc/coriolis_floats_monitoring.htm



Coriolis DAC : geographical distribution of floats in October 2006



Coriolis DAC : type of floats in October 2006

2. Delayed Mode QC

At the Coriolis data center, the data proceed through the Böhme and Send's software, with few modifications as spliting the data series in various segments as shown in Figure 1. The characteristics of the correction applied on each segment are saved for different purposes (creation of the "D" files, statistics, re-processing of the DMQC, etc).

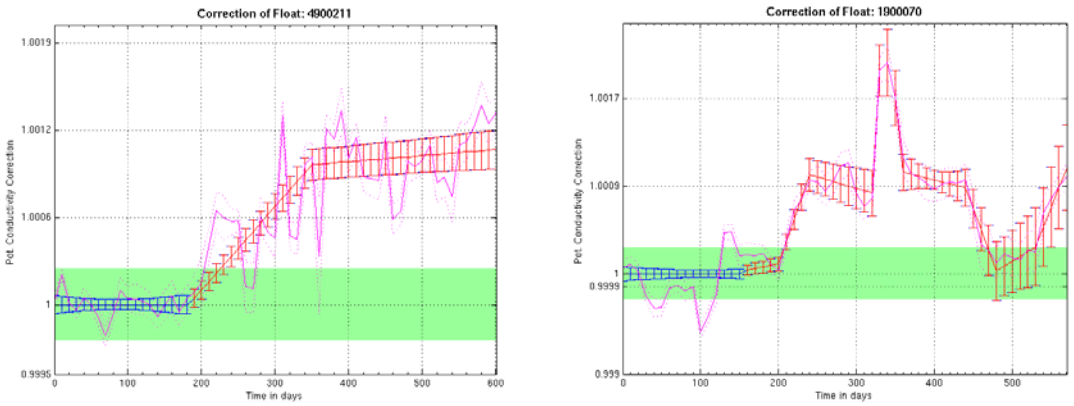


Figure. 1.

All the floats have been reviewed according to the update of the software. The new version has been submitted to the GDAC at the end of 2005. New floats have been processed and submittted to GDAC in February 2006 and during the summer 2006. The delayed mode on the North Atlantic Ocean has been yet processed (Figure 2).

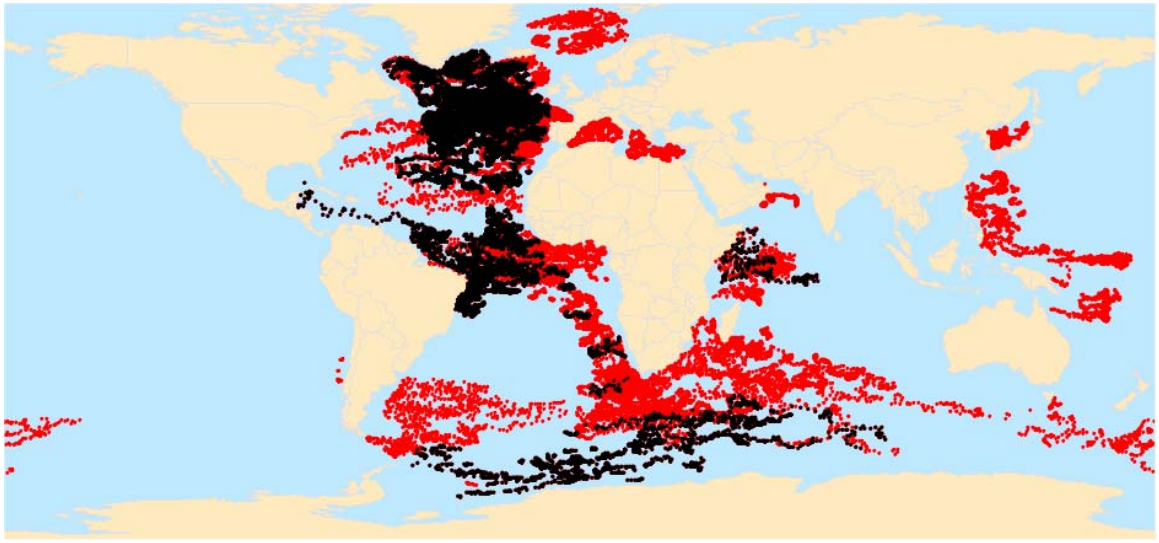


Figure 2. In black, French and German floats which have been processed in DMQC. In red, others Coriolis floats which have to be processed in DMQC.

For the floats deployed in the South Oceans, we have problems to process all the float data in delayed mode QC because of the lack of data in the reference database.

For the German floats, the delayed mode QC is carried out by the BSH centre, AWI Institut and GEOMAR, which use the Böhme and Send's software. Some exchanges are still in progress to share recent CTD data and to provide them in the framework of the RDAC.

The figure 3 indicates the percent of coriolis floats according to the type of process done for the DMQC.

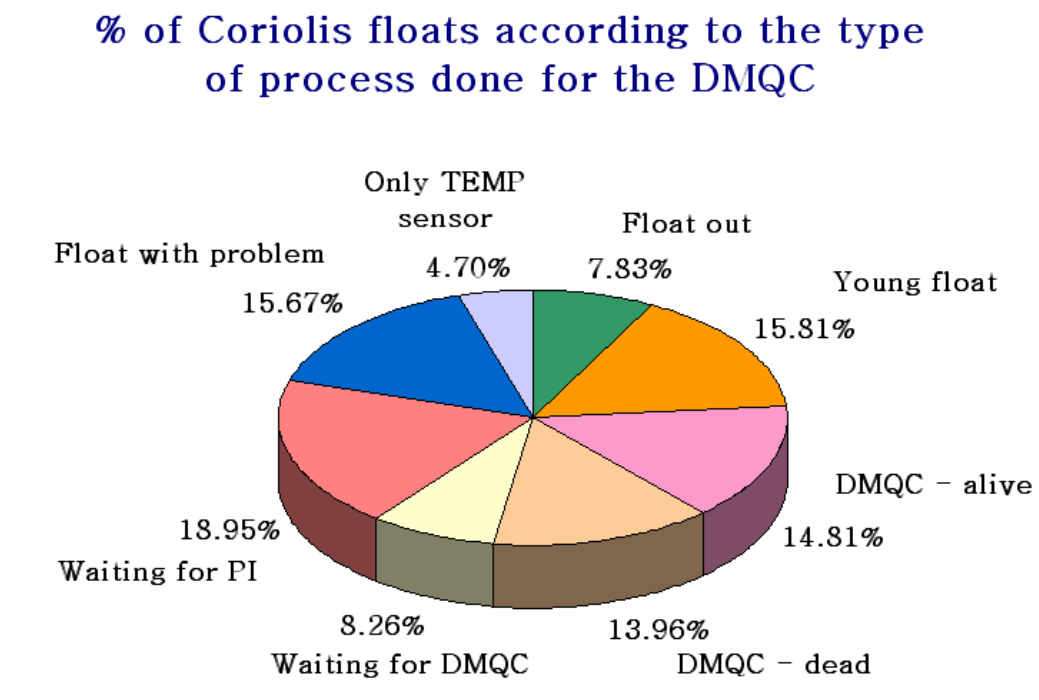


Figure 3. % of Coriolis floats ccording to the type pf process done for the DMQC.

3. GDAC functions

The French GDAC is supported by the Coriolis project, a joint project for operational oceanography.

See French GDAC report ref. CORDO/DTI-RAP/06-117.

4. Regional centre functions

Partners involved in Argo Activities in the North Atlantic (80°N to 20°S) have decided to collaborate with each other and the South Atlantic Argo Regional DAC (SAARDAC) to establish the North Atlantic Argo RDAC (NAARDAC). According to the main defined directions, Coriolis has progressed in consistency and reference database :

- The Coriolis analysis system has been used to check the consistence of the delayed-mode data set at basin scale. The analysis is focused on the North-Atlantic and performed weekly analysis of T and S at different levels, between 20°N-70°N and between 80°W-10°E over the period January 2001-December 2005. The analysis offers the possibility to compare a profiler to neighboring profilers and to the climatology used to perform the analysis. Residuals (difference between the data and the analysis) represent the misfit between nearby data or a discrepancy between the data and the reference climatology. In region where the climatology does not represent the mean for the considered time period, residuals will tend to be the same for all profilers. Errors due to sensor problems behave differently, since they tend to be correlated along the sensor trajectory, or life time. So for each float, trajectory, residuals diagram and residuals time series have been looked at. From this visual inspection, we have pointed out few floats. Although a difference in salinity fields is observed, that does not necessarily imply that there is an error with the applied correction. To check it, the evolution of salinity fields is analyzed in parallel to floats residuals values. If residuals means are low, it means that delayed-mode values are consistent with close CTD data and therefore must be considered as new information in the region. On the contrary, if these residuals values are high, delayed-mode data are then in contradiction with historical data and the float must be reanalyzed.

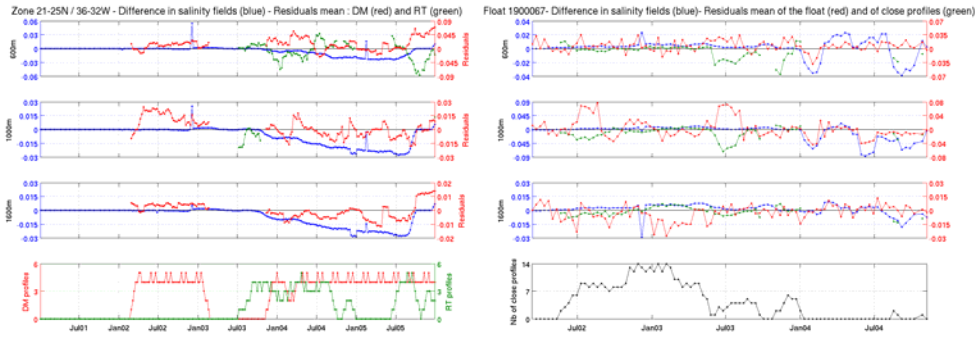


Figure 1. 1) evolution of salinity fields and residuals values in a specific area (a 4°*4° zone). 2) evolution of salinity fields and residuals values along a float displacement (in a 4°*4° zone around the profile location).

An other work allowed to compare corrections applied by MEDS and Coriolis and used to generate the PSAL_ADJUSTED fields. The corrections estimated

from the both DACs on the same float are differents (figure 2) and seems to be explained by a different reference database but needs be confirmed.

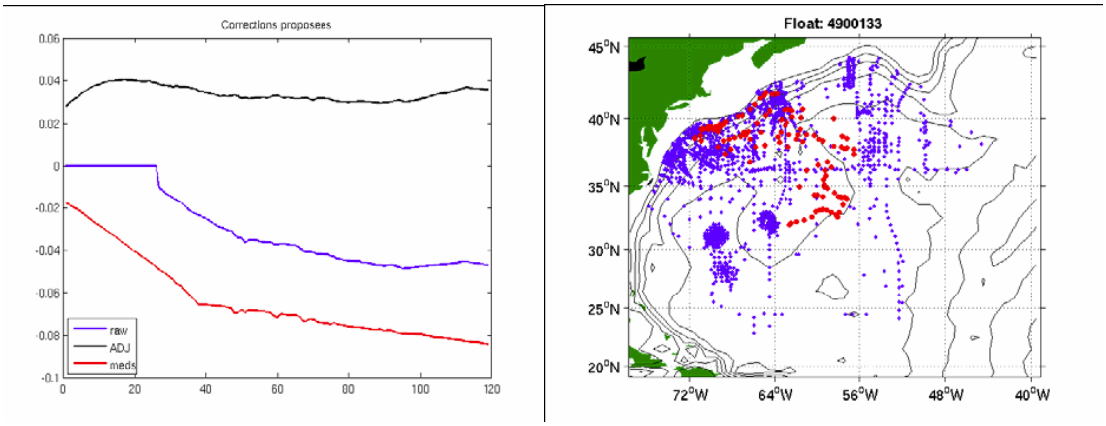


Figure 2. Salinity corrections for float 4900133. Correction applied by Meds and used to generate the PSAL_ADJUSTED fields (red) – Correction to apply on the PSAL data estimated from the statistical method used at Coriolis (blue) – Correction to apply on the PSAL_ADJUSTED data estimated from the statistical method used at Coriolis (black).

- In the framework of the Reference Database development for the delayed mode quality control, Coriolis can provided some CTD data carried out in the North Atlantic Ocean by German and French scientists (Table 1). Some of these cruises have been provided with the dataset of the Bohme and Send's DMQC method. Others dataset have been provided by Canadian DAC (for the Labrador Sea), BSH institute (cruises between 1998 and 2004 – still in progress) and French scientists. From the BSH, some cruises (ANTXV-4, ARKXIV-2, ARKXV-3, ANTXVI-2, ANTXVIII-3, ANTXV-2) including Antartic and Artic areas, and done on the Polarsten ship, have been sent to Coriolis. The cruises are presented in the Figure 2.

Table 1: Details of North Atlantic cruises available between 1996 and 2005

Date	Cruise	Region, related projects	Chief scientist
June 2003	A16N	North Atlantic WOCE	?
1996-1998	ARCANE	North East Atlantic Ocean	B. Le Cann
1999-2000	EQUALANT	Equatorial Atlantic OCean	Y. Gouriou & B. Bourlès
27-05-2000 05-06-2000	GSNS	Greenland and Norwegian Seas	?
2002	OVIDE	North East Atlantic Ocean	H. Mercier
2000-2001	POMMIER POMME 0-1-2-3	North East Atlantic Ocean	Y. Desaubies L. Prieur M. Bianchi J.C. Gascard P. Mayzaud
March 2002	POSEIDON 284	Las Palmas - Ponta Delgarda	Oschlies / P. Kähler
June 2002	POSEIDON 290	From St.Johns, Canada to Reykjavik, Island	J. Holfort

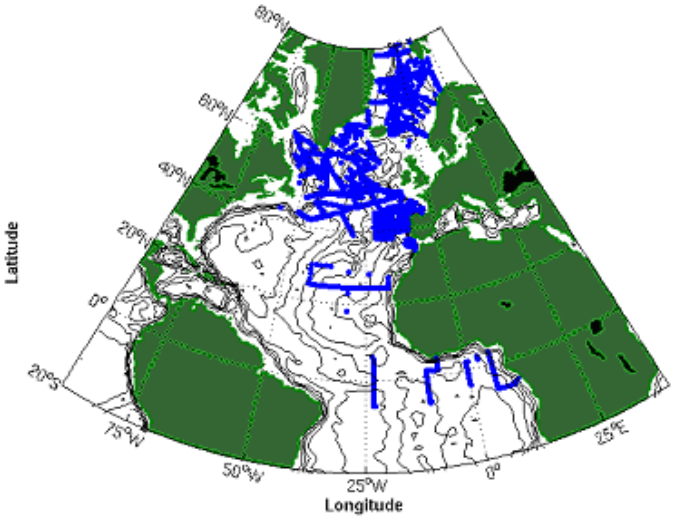


Figure 3. Location of the cruises available in the North Atlantic for the period between 1996 and 2005.