

French National report on Argo – 2009

11th Argo Steering Team meeting

March 2010

1. The status of implementation (major achievements and problems in 2009)

- floats deployed and their performance

27 floats and 8 additional floats co-funded by the MFSTEP project have been deployed in 2009. The current position of the French active floats and the French float survival rate are displayed Figure 1 and Figure 2.

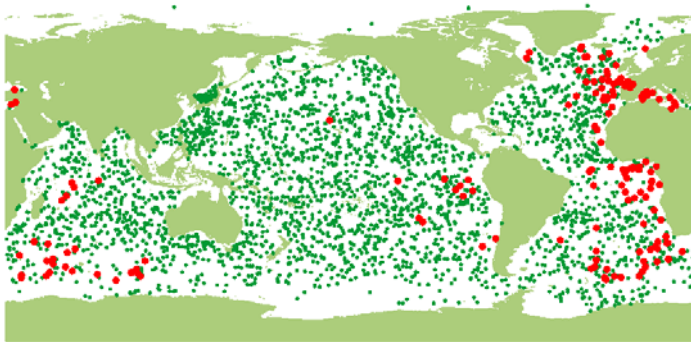


Figure 1: The large red dots represent the French active floats.

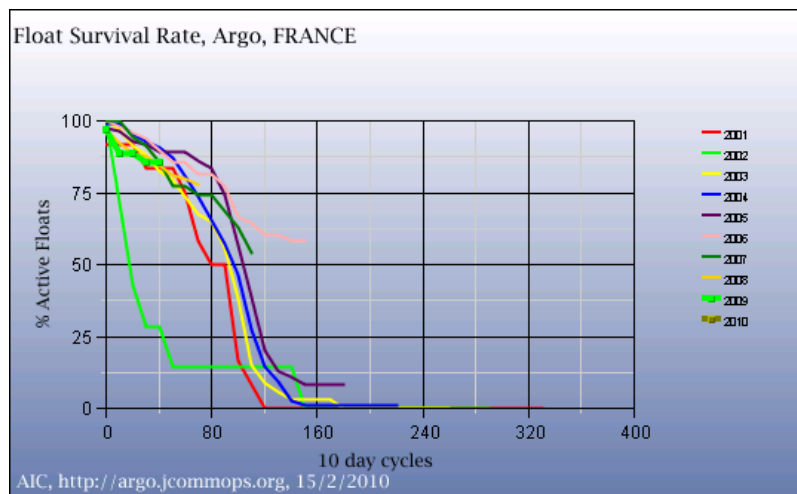


Figure 2: Float survival rate of the French floats

- technical problems encountered and solved
- status of contributions to Argo data management

Within Argo-France, Coriolis plays three roles in the Argo data management organization: Argo Data Assembly Centre, Global Data Centre, and leader of the North Atlantic Argo Regional Centre.

As Argo Data Assembly Center, Coriolis processes in Real Time and Delayed Mode float data deployed by France, by 5 European countries (Germany, Spain, Netherlands, Norway, Italy) and by 4

non European countries (Chili, Costa Rica, Mexico, Russia). Coriolis data center processes data coming from 1066 floats (506 Provor, 479 Apex, 80 Nemo and 1 Metocean floats) including 340 active floats in February 2010 (135 Provor, 184 Apex and 21 Nemo floats). Data are processed and distributed according to Argo recommendations. Some floats are deployed as part of scientific projects. The detail can be found on the Coriolis web site:

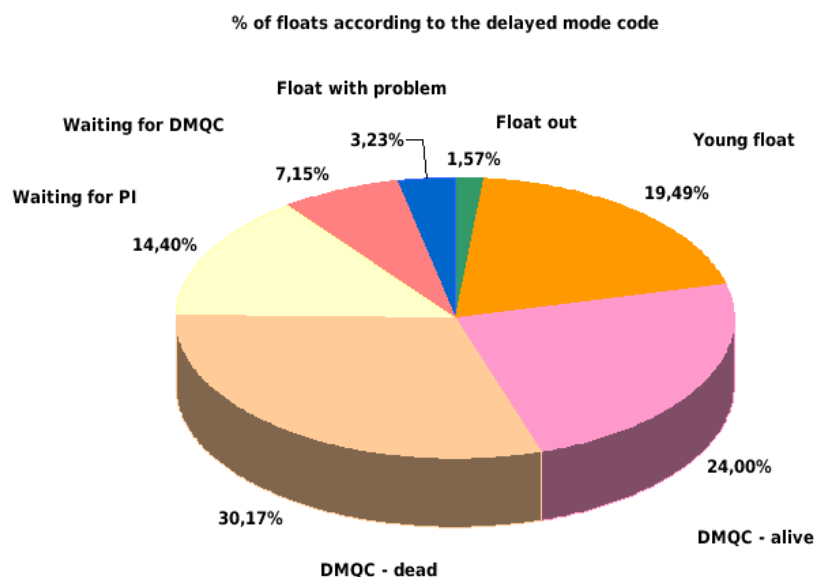
http://www.coriolis.eu.org/cdc/scientific_projects.htm

Coriolis operates one of the GDAC in close collaboration of FNMOC/USA. Coriolis also coordinates the North-Atlantic ARC activities and in particular the float deployment in Atlantic.

- status of delayed mode quality control process

As of today, about 50% of the French floats have been controlled in delayed mode and about 22% of the floats are waiting for DMQC.

Last year, a second delayed mode control has been done to the old GYROSCOPE floats to take into account recent knowledge of the DMQC process (pressure correction, OW method). The delayed mode data of those floats are better but this led to a delay in the DMQC of more recent floats.



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

Since 2000, France has provided a significant contribution to the growing Argo array. 455 French floats and 68 floats co-funded by European Union have been deployed in different geographic areas. The deployments meet specific French requirements but they also contribute to the global array.

Year	Man/Year	French floats	Co-funded EU floats	Total
2000		11		11
2001	3	12		12
2002	6	7	4	11
2003	9	34	20	54
2004	15	85	18	103
2005	15	89	11	100
2006	12	51	14	65
2007	12	36		36
2008	12	90		90
2009	12,6	35		35
Total(2000-2009)		450	63	517
2010	12,6	95		

Tableau 1: (Man/year column) Man power dedicated to Argo for coordination activities, float preparation, deployment and data management activities (GDAC,DAC, NAARC, DMQC) within Argo-France. (French floats column) French floats contributing to Argo deployed by year. (Co-funded EU floats column) EU floats are the additional floats co-funded by European Union within the Gyroscope, Mersea and MFSTEP projects. Estimated value is given for 2010.

The French Argo Project is funded by the ministry of Research and by local administrations (Britanny region, Finistère department, city of Brest) mostly through Ifremer but also through other french institutes involved in oceanography (CNES, IRD, INSU, Météo-France) and in a lesser proportion by the ministry of Defense through SHOM. Ifremer and SHOM plan to buy between about 50 and 15 floats respectively in 2009 and beyond. As part of the Euro-Argo preparatory phase, Ifremer (for the Argo-France project) works with its funding ministry (mainly research ministry) to agree on a long-term funding level and commitment. Together with its European partners, Ifremer also works with the European commission to set up a long term EC funding to Argo.

In parallel to the Euro-Argo initiatives and to sustain the commitments of France in Argo, a proposal has been submitted to the French agencies to identify Argo-France project as a research observatory. When obtained, the agreement is valid for 10 years.

Overall the level of support, additional to float purchase, is as indicated in Tableau 1 (man power for coordination activities, float preparation, deployment and data management activities).

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.

According to the current deployment plan, 95 floats will be deployed in 2010. Deployments plans of 35 floats are already known and shown Figure 3.

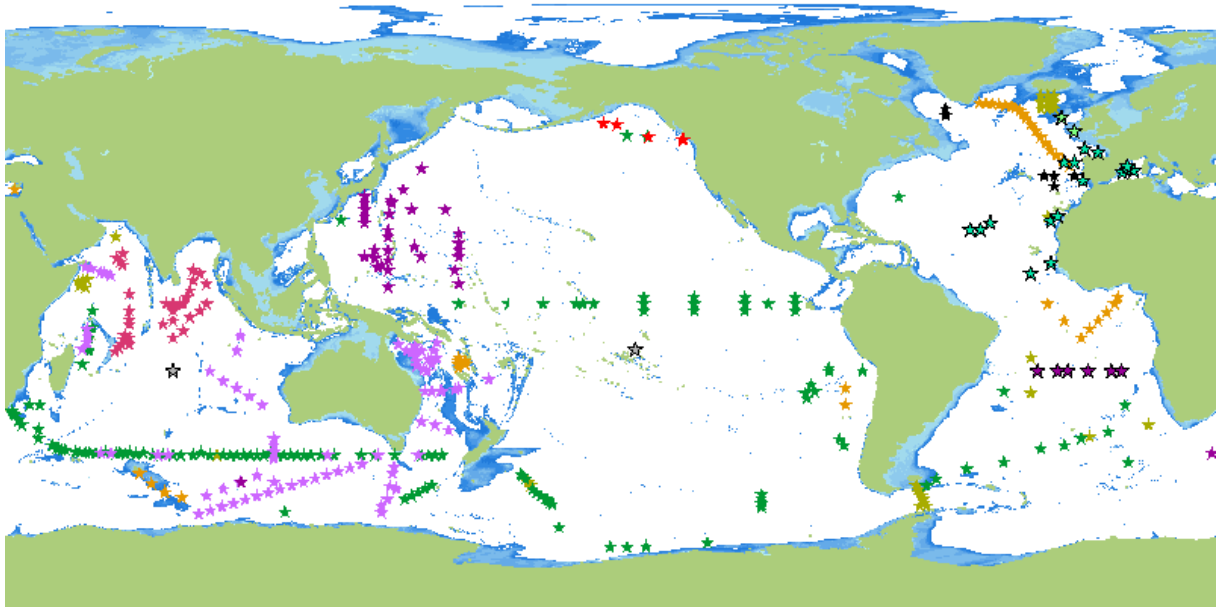


Figure 3: Deployment plan. The orange stars represent the French deployment plan for 2010.

Coriolis will continue to run the Coriolis Dac and the European GDAC as well as coordinating the North Atlantic Arc activities. Within the Euro-Argo project development will be carried out to improve anomalies detection at GDAC both in RT and DM, to monitor in real time the behaviour of the European fleet and to improve data consistency check within NA-ARC.

France also contributes to the funding of the AIC.

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

A key aspect of the French Argo program is to develop the capabilities to fully exploit Argo data for operational forecasting as well as research applications. Therefore Coriolis has developed together with MERCATOR (The French operational oceanography forecast centre) a strong connection with the French research community via the Mercator-Coriolis Mission Group (GMMC). It consists of about one hundred researchers (with some turnover each year) following a scientific announcement of opportunities and call for tender. Its task is to support the Mercator and Coriolis scientific activities and to participate in product validation. As part of the scientific announcement of opportunities mentioned previously (GMMC), PIs can be selected to deploy floats within their scientific experiments. The list of experiments during which floats were deployed are available through the Coriolis web site (http://www.coriolis.eu.org/cdc/scientific_projects.htm). Additional projects including Argo data in their analysis are also funded by other institutes (CNES, IFREMER, INSU, SHOM, Météo-France).

Operational ocean forecasting. All Argo data (alongside with other in-situ and remotely sensed ocean data) are routinely assimilated into the MERCATOR operational ocean forecasting system run by the MERCATOR-Ocean structure. Assessments have clearly demonstrated the positive impact of Argo data on ocean analyses and predictions.

Ocean science. Argo data are being used by many researchers in France to improve the understanding of ocean properties (e.g. circulation, heat storage and budget, and mixing), climate monitoring and on how they are applied in ocean models (e.g. improved salinity assimilation, ...). List of scientific

publications is available through the Argo web site (<http://www-argo.ucsd.edu/FrBibliography.html>) The French Argo Users' Group provides a forum for engagement between these scientists and the French Argo program.

Argo France coordinates the North-Atlantic Argo Regional Center. Besides coordinating deployment in the North-Atlantic, Argo France is working on method to improve data consistency check in the North-Atlantic and to detect TNPD Apex floats with large negative pressure sensor drift.

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

Ten years after the beginning of the Argo program, information concerning the functioning of some floats is already lost. The value of the Argo data is increasing with years and in 20 years from now, Argo data will be even more valuable than today. We have to ensure that our current knowledge is saved to avoid problems such as those concerning XBT and their fall rate for instance.

Argo data are supposed to be used for the monitoring of climate change signal. Climate change is a very sensible topic. Can we guarantee that the current DM Argo data can be used for climate change studies? Do we provide enough information relative to those data? Can a user outside the Argo community find all necessary information to use the data as he should do?

The Argo format has been designed according to the nominal float cycle. New capabilities are now available and the range of possibility is growing very fast:

- New sensors
- Measurements on different vertical axis for a given platform
- Near surface data
- Iridium transmission
- Two way communications that allow changes in the float mission
- Etc...

The Argo format has not been designed to manage all those configurations. In addition, one might expect that in the future even new data or configurations will show up. Can we keep adding new data or keep fitting new configuration in the existing Argo format? I have no clear answer to this question.

6. To continue improving the number of 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

Since 2000, data from 4 French cruises have been uploaded to the CCHDO website.

Line	Cruise name	Ship	Cruises dates yyyy/mm/dd		Chief scientist	Country
			From	to		
AR15	EQUALANT	THALASSA	2000/07/24	2000/08/21	Yves Gouriou	FRA
IR06E		MARION DUFRESNE	2000/09/09	2000/10/03	Michèle Fieux	FRA
A025	OVIDE02	THALASSA	2002/06/11	2002/07/11	Herlé Mercier	FRA

A025	OVIDE04	THALASSA	2004/06/05	2004/07/06	Thierry Huck	FRA
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7. List of publications in which a french scientist is involved.

Peer reviewed publications

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- Daget, N., A. T. Weaver and M. A. Balmaseda, 2009: Ensemble estimation of background-error variances in a three-dimensional variational data assimilation system for the global ocean. *Q. J. R. Meteorol Soc.*, 135, 1071-1094, DOI: 10.1002/qj.412.
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Other publications

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