7th ARGO DATA MANAGEMENT MEETING

Tianjin
1st - 3rd November 2006

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1. Objectives of the meeting

The 7th Argo Data Management meeting was hosted by NMDIS and the meeting was opened by Prof. Shaohua Lin, as director General of NMDIS, together with Dr. Haiqing Li, Director-general of the Department of International cooperation, SOA and Dr. Xiaoming LI, Director-General of the Department of Marine Environmental Monitoring, SOA.

S Pouliquen dedicated this Data Management meeting to our colleague G Loaec who passed away on the 23rd of October. He had been a key actor in France in marine technology, electronics and autonomous instruments. Designer of Marvor and Provor, he was managing at Ifremer the lagrangian and profiling float programs. He was also promoting autonomous instrument technology and enjoyed exchanging with our community.

The objectives that had been fixed for the meeting were the following:

- Review the actions decided at 6th ADMT meeting to improve Real-Time data flow (considering all aspects of the system from transmission from the float to arrival at GDAC and accessibility of data by users)
- Review status of Delayed-Mode quality control after DMQC-2 meeting in WHOI and take necessary actions to move to systematic implementation
- Review the metrics regarding Argo program to document future (and if possible past) growth and performance of:
    - the Argo array
    - the Argo data system (performance indicators, problem reporting)
    - the uses being made of Argo RT and DM data (user monitoring)
    - visibility to scientific and operational results achieved thanks to Argo program and ensuring the visibility of these metrics.
- Review the Regional Data Centre status, their implementation plan and the difficulties they are experiencing.
- Review and take steps to put in place appropriate Argo data archive functions including the detailed specification of possible distribution of Argo data and analysis tools via DVD

39 persons from 9 countries attended this meeting. All countries involved in Argo data management were represented.

2. Feedback from 7th AST meeting

Due to unfortunate circumstances, Howard Freeland was not able to attend. He prepared a talk that was presented by Brian King, also an AST member. See Howard's talk in annex 5.

3. Status of the Argo Program

Sylvie Pouliquen presented an overview of the ADMT accomplishments. Only 11 of the 32 actions from ADMT #6 were completed and a few others were partially completed. Of great concern was the fact that several were not even started. We decided not to redo the past but move forward after analyzing the reasons of what happened this year. We may have been too optimistic on the maturity of some subjects; some actions have suffered of not enough directions given by the action leaders. The critical points are those related to the consistency of the real-time processing and the monitoring of the services provided to ARGO community. It was agreed that a lot of progress has been made on delayed mode processing and that the main difficulties should be behind us. It is not obvious why the ADMT did not make more progress during the past year but it was stressed that we must strive to make

progress toward developing a consistent and valuable dataset. The 7th meeting action list is in Annex 4 and was defined by taking into account priorities from the steering team and manpower available at national level.

All aspects of the data system will require significant effort. Several issues were recognized as being very important, including:

- Real-time processing consistency and monitoring
- Identifying problems; providing a problem reporting facility for users; rapid response to problems
- Development of a reference database for delayed-mode QC
- The backlog of delayed-mode QC processing
- Development of the RDAC capabilities

Each of these issues is discussed in greater detail below.

An overview of the Argo program and the status of the Argo Information Center were presented by Mathieu Belbeoch. There were 2602 active floats in October 2006 and it is projected that the 3000 float target will be achieved in the spring of 2007. The global distribution maps show that some areas still require additional floats and others will require new floats, since the existing floats in the area are aging.

Five new South American countries became Argo contributors during 2005 and 2006.

All floats except those from Russia now have a responsible DAC. MEDS and AOML agreed to investigate whether they could accept responsibility for these remaining floats; MEDS because the floats are in a region where MEDS has many floats already and AOML because the floats may be models for which they already have decoders.

Mathieu reported that the AIC information system is essentially finalized. He spends about 10% of his time doing development work with the remaining time spent on monitoring and coordination work. He issues reports to the argo-dm and argo-st mailing lists every 2 weeks containing a variety of information regarding the floats. *The co-chair emphasized that these reports are very useful tools and that everyone should be reviewing them and take the appropriate actions to correct the deficiencies detected by AIC.*

Mathieu stressed that it is *essential* that float deployers provide notifications through the AIC prior to deployment. This is a requirement of IOC resolution XX-6 and some floats are being deployed without notification, which could cause the Argo program problems.

An issue for the AIC: The AIC needs a centralized, independent access point for tracking Iridium floats. (The AIC has easy access to the positions of the ARGOS floats through CLS)

The new AIC website has been deployed (including new hardware) and has a wealth of information available regarding Argo the program and floats.

Then the question to improve the communication both with external users but also internally within Argo was addressed. Argo wants to acquire the capability to record the problems detected by users, keep track of the answers provided and the delay to answer and provide to ADMT and AST acces to the archive so that we can use this material to identify issues to be solved. The AIC has added a problem reporting e-mail address and will be developing an infrastructure to ensure that reports are properly handled on a daily basis. More information regarding this “Support System” will be forthcoming soon. Argo participants are requested to delay promoting the new address until the procedures to ensure proper handling are finalized.

4. Real Time Data Processing

Argo Floats Available Only On GTS: It was reiterated that the AIC reports (referred to earlier) include a list of floats that are reporting only the GTS. DACs should review this list and correct problems as required.

The AIC also has a list of historical floats that were not handled by any DAC. DACs are requested to review this list and inform the ADMT chairs if they will be able to accept responsibilities for these floats and, if so, when.

Status of Argo data on GTS

Anh Tran reported on the status of Argo float reports on the GTS. Overall, most of the GTS problems reported last year have been corrected. The following details were reported:

- Timeliness: Generally between 80% and 90% of the TESACs are on the GTS within 24 hours.
- Duplicates: Most of the duplicate problems have been resolved during the year. *The remaining duplicate problem will be corrected soon*; it was the result of a misunderstanding by new personnel at a DAC.
- Unrealistically large pressure values: Corrected.
- Bad instrument codes: Generally this has been corrected. A few remain.
- Inconsistent observation times: There are still some large differences between the observation times reported on the GTS and the GDAC. *This needs more study and correction.*
- Pressure reported on the GTS: Floats inserted on the GTS by CLS are still reporting pressure instead of depth. CLS is aware of the problem and will correct the problem. *See the Argos presentation later in the report.*

MEDS (Anh Tran) will continue to monitor the status of GTS reports and will provide the information to Mathieu to be included in the bi-weekly AIC reports.

Coding Practices for Missing Salinity: DACs have been using different practices when reporting missing salinities on the GTS. It was decided that all DACS would adopt the following practice: if salinities are missing at some levels, they will be encoded in the message as slashes ("/"). If salinities are missing (or bad) at ALL levels, the salinity can be omitted from the message.

Pressure/Depth in the GDAC GTS directory: The data in the GTS directory of the GDACs were converted from depth to pressure during the year. *Some further investigation is required to determine if the floats that were reporting pressure on the GTS have had the depth-to-pressure incorrectly applied and, if so, corrected.*

Argos Processing Enhancements for Argo

No one from CLS was present at the meeting. Mathieu Belbeoch presented a talk by Philippe Gros.
Argos 3: The new Argos 3 capabilities will be available soon. For Argo, this will provide the capability for more data to be transmitted, shorter surface times, and two-way communication with the floats.

GTS Formats and Templates:

- Correctly processing 154 Argo floats (see next item)
- A module is being tested to convert pressure to depth and should be installed soon
- The "profile gap" problem was corrected by fixing the density inversion test
- Changed encoding of missing salinity to use "/" in July 2006.
- Can handle 20-bit (6 templates) and 28-bit (2 templates) APEX floats, including DOXY sensors

The ArgosWeb is a new website for accessing Argos data online. See https://www.argos-sytem.org/cwi/.

Distribution to the GDAC

Christine Coatanoan presented the results of her investigation of Argo data at the French GDAC.

Information was presented on the flow of delayed-mode data, anomalies in the meta-data, and anomalies in the profile data. Though the flow of delayed-mode greatly increased this year, there is still a large backlog of real-time profiles that need to be processed through the delayed-mode process; also a concern of the DMQC-2 workshop.

The number of meta-data anomalies has dramatically decreased during the year, primarily since the transition to format version 2.2. This year a weekly check of the metadata files is done at Coriolis GDAC and the DACs have access to the remaining problems they have at http://www.coriolis.eu.org/cdc/metadataArgo/cdcMetadataArgos.asp . These anomalies will be included in the bi-weekly report generated by AIC.

Results were presented of problems found with the real-time QC checks. These fell into two categories: 1) inconsistent application of the QC checks and 2) required updates to the QC procedures.

1) The inconsistent application of QC checks: C. Coatanoan will have a "reference set of profiles" available soon after the meeting. AOML has kindly volunteered to provide examples of "pressure decreasing" and "frozen profile" errors. The DACs are asked to give high priority to the task of applying their QC procedures to this data, reviewing the results, and correcting their procedures where necessary. A few DACs committed to completing the process by Christmas-time with a few stating they would need until the end of January or early February.

2) Updates to the QC procedures:

- Density inversion test: The density inversion test needs to re-written so that it is performed top-to-bottom and bottom-to-top.
- Maximum pressure test: The "maximum pressure test", which was discussed and accepted previously, needs to be implemented by all DACS..
- Bottom spike test: The "bottom spike" test had previously been removed. Bottom spikes are an ongoing problem and a QC test to reliably flag them would be very desirable.
- Profile offsets: Profiles with large offsets in the middle of the profile were observed. There is currently no test that catches these but one should be possible.

Thierry Carval will update the density inversion and maximum pressure QC tests with the agreed-upon changes. In the user manual

Godae-QC Intercomparison Pilot Project

M Ignaszewski gave a brief overview of a presentation by Jim Cummings for the Godae symposium. The goal of the pilot project is to develop a "call sign database" that will collect the profile observation QC results, including Argo floats, from 6 operational centers. The database will allow QC results to be inter-compared and may be useful for the ADMT to access the efficacy of the RT QC tests. The ADMT has suggested that J Cummings approach the AST to discuss how the Argo program will interact with the Godae QC Pilot project.

5. Trajectory from Argo data

A delayed mode trajectory meeting was held is Korea just before the ADMT7 meeting. The report is available at http://www.coriolis.eu.org/cdc/meetings/ATW2_report_v1.pdf . B King highlighted where actions were necessary from the ADMT group.

All of the time information related to the beginning and the end of the ascent and descent of a float are essential information to calculate trajectories. Some of these information are transmitted by the float, others need to be calculated in a specific way for each platform (Apex, Solo, Provor). B King has presented the status of the problems detected for each DAC organized by platform and DAC.

Some problems are linked to metadata files not properly filled. Others are linked to the timing information that are not calculated properly. Others are linked to cycles that are not numbered properly when a cycle is missing.

B King will provide specification of the mandatory information that need to be filled, the way to calculate the times for each platform type, as well as instructions to record missing cycles (a record must be inserted with the known information + fill value for the missing information). DACs agreed to do their best to correct their files before AST8 in March 2007.

To be able to store the delayed mode trajectory information, additional parameters are needed and the ADMT format group will make a proposal. M Ignaszewski will implement a file checker for trajectory files according to the specification from the trajectory group. The checker will warn DACs of non-compliant files… This checker will be run monthly.

The AIC will study, with B King, how to monitor the progress made.

Finally, as DM trajectories will probably be calculated periodically from a central point, from an image at T0 of the trajectory files available at GDACs and submitted to GDAC at T0+n, while new cycles may continue to be processed and distributed in RT, the ADMT group felt necessary to study the data flow, to propose a way to integrate these two data flow without any loss of data.

6. Delayed Mode data processing

The DMC2 meeting was held in WHOI/USA beginning of October and 22 persons attended representing half of the teams operating in delayed mode (DM). The complete report can be found at http://www.coriolis.eu.org/cdc/meetings/DMQC2_report_v2.pdf

Most of the DM operators are making progress (AOML/SIO, AOML/UW, AOML/PMEL, Coriolis, Csio, Jamstec, Meds, Csiro), some have submitted few files and are prepared to upload files soon (AOML/WHOI, BODC, Incois) and one hasn't started yet (Korea).

The result of the peer review is pretty good and a complete report will be issued for AST8. Some inconsistencies have been found but were more related to the interpretation of scientific features versus sensor problems due to less expertise on the area of the peer reviewers. Therefore there is no reprocessing of the submitted files envisaged for any DAC as there is no real divergence in the processing, as was the case at the DMQC-1 workshop in 2005. This reveals that most of the DM operators now have the expertise with the ARGO DM tools.

The need for a cookbook for new DM operators is still considered as important, but it is delayed to later in 2007 when expertise on the new DM tool (OW), merging WJO and BS, will be acquired as it guides a lot more the DM operator.

In order to better estimate the accuracy of the ARGO data in RT, it was decided that statistics on the correction applied would be necessary. This activity will be taken by AIC under specification provided by the DM group.

The characteristic of the OW tool merging WJO and BS tools is now available and has been intensively used at UW, SIO and WHOI. It improves the estimation of drift trend and operator

interpretation of how to split the series. There is a need to test in North Atlantic against BS software (action Coriolis).

65 floats are at present providing oxygen data from SBE43 or Aanderaa optode 3830 sensors. There is still a lot of work to be done at the scientific level in order to do DMQC on oxygen data but the first results are encouraging. A Wong will indicate in QC manual that we don't have an agreed method to correct the DOXY measurements. *She also requested that the notice be put on the GDACs.* The only action at present for ADMT it to be sure that the fields describing the sensor are filled properly (e.g. SENSOR_MAKER ="AANDERAA" ;SENSOR_MODEL ="Aanderaa Oxygen Optode 3830").

The DMQC-2 recommended applying persistence of the latest offset calculated in DM to the profile data processed in real time. The offset is calculated from the bottom part (500db to 2000db) of the latest DM profile as the average of the difference between PSAL_ADJUSTED and PSAL. The adjustment will be done retrospectively in the RT profiles that have not yet been processed in DM. Each national DAC has to define, with their DM-operators, who will do the retrospective adjustment. The recommendation is that PSAL_ADJUSTED_QC=PSAL_QC in R-files until there is a study made by a DAC that provides new elements proving that the QC needs to be re-done. Australia has been doing since day one RT adjustment from historical CTD and should consider applying DM offset when available.

The present recommendation is to apply cell thermal mass correction only in DM. This correction requires some metadata to be filled in the metadata file: sensor-type (SBE41, SBE41CP) and for CP the mode used (spot sampling or continuous) + ascent rate. As the list is longer than the one provided at last AST meeting, it was requested that G Johnson clearly specify the needs. It was also noticed that mode can be changed over time via downlink facilities (iridium, Argos3). A study will also be carried out by J Gilson to see if applying the thermal mass correction in RT will reduce the number of good points rejected by the automatic QC tests (spikes and density inversion).

DMQC-2 recommended not applying any PRES correction in RT for APEX floats until more studies are carried out by AST. A Gronell mentioned that the PAINE sensor, that used to be on APEX before the DRUCK sensor replaced it, is more biased and therefore suggests revisiting this issue at AST for this sensor. G Johnson mentioned after the meeting by email that Ametek pressure sensors had the tendency to also report values higher than correct at the surface .

DMQC-2 didn't endorse the systematic use of Argo data in the reference DB for DMQC as there is a risk of introducing biases. Nevertheless they recommend using nearby floats as additional information to decide whether or not a correction is necessary. No further action was raised at DMQC level and it was recommended to AST to revisit the philosophy underlined by introducing floats in the reference database. ADMT team highlighted again that in poorly sampled areas or highly variable ones like Indian Ocean or Southern Ocean, this issue is critical.

DMQC-2 provided in a set to rules that to be implemented at GDAC file checker for D-file submissions; non-compliant files will be rejected and sent back to originator.

Finally B King suggested that floats without DM-operator should be identified and suggested that institutes consider the possibility to get funds to take on board these additional floats if they are in their area of expertise. AOML has already done this for some WOCE floats.

7. Reference data base

Last year it was decided to rely on CCHDO to update the reference DB that was derived from WOD2001 by A. Wong. In practice it took about nine months to define with CCHDO a process to get periodic update by FTP of the new data submitted at CCHDO. One month ago, Coriolis received a CD of the data received by CCHDO since January 2001. In the meantime, each DM operator has

continued to improve the database for his area and we have at present 4 different reference DB (SeHyd for the Pacific, IOHB for the Indian, BS + ATL CTD or Hydrobase for the Atlantic). Finally WOD2005 was release by NODC-USA and we don't know how much CCHDO data are inserted in this issue as it seems that no formal data transfer from CCHDO to NODC exist. .

It was agreed that we didn't want to build a substitute to the NODCs' network but work with it to get more easily the data we need. Therefore each DAC should encourage at least the PI's they are working with and their national NODC to send their CTD more rapidly. All RDAC that have collected regional datasets should make them available to CCHDO and/or NODC /USA. CCHDO and NODC/USA should ensure both-way links in order to CCHDO to provide us with all the CTD available even if they have only been sent to NODC-USA. Finally ADMT should consider presenting the ARGO needs to the NODCs at next the IODE meeting.

As the manpower available at different DAC is not infinite, following the recommendations provided by DMQC2 we have decided to progress in three steps:

- End 2006:
  - Provide a WWW page at GDAC that provide links to the different Regional Reference Databases
  - JAMSTEC to provide the addresses to download both SeHYD for the WJO and IOBH DB for OW
  - Coriolis to provide the ATL CTD collected from partners
  - JB Salle to provide ORSI+WOCE DB for southern ocean
- June 2007
  - JAMSTEC to make available the SeHYD and IOBH DB for OW
  - WHOI to provide Hydrobase ATL for OW
  - Coriolis to update WOD2001 with WOD2005 and CCHDO and RDAC data taking into account the DMQC2 recommendations
  - CCHDO & NODC/USA to collaborate in order for CCHDO to provide complete CTD updates to Argo
- ADMT8
  - Coriolis to set up the updating procedure to integrate CCHDO input on a yearly basis

It was recommended to only update the reference database with CTD, to have a way to put an ID on each CTD to avoid duplicates and to set up a good naming and versioning convention to identify the reference DB. "ArgoYYYYVxx" was suggested: xx would usually be 01 as a yearly update is envisaged but it allows issuing intermediate version in a year if an important set of data is submitted.

8. Format issues

BUFR Format

Takashi Yoshida reported on the status of the transition to BUFR. The BUFR working group made significant progress during the past year. The proposed template has received WMO approval, a cross-validation was carried out between JMA, MEDS, and US Navoceano, and these results were presented to the ICT-ISS in September 2006.

During 2007, parallel operational distribution of BUFR messages will begin. JMA intends to begin operational distribution in the next few months. Full transition to BUFR will take place in 2012, as per the WMO schedule.

Two encoders to produce BUFR messages from Argo netCDF files have been developed and are available to DACs (or others): a PERL version developed by JMA and a Java version developed by MEDS.

It was decided that DOXY and trajectory data would not be distributed on the GTS at this time. This decision will be revisited as new requirements are identified.

Standardized Technical Parameter Names

Ann Thresher presented a proposal to standardize the parameter names used in the technical files. The current state of total anarchy makes the files difficult to use. The proposal establishes a set of rules for naming technical parameters and establishes a set of names for the current commonly used set of names. Both the rules and the names will be documented in the User's Manual; the list of commonly used names will be expanded through consultation with Provor experts.

The proposal will require that the allowed length of the parameter name be increased to at least 64. This is a low impact format change and can be undertaken by the DACs at their own pace.

9. GDACs

D-file Version Tracking

Sylvie Pouliquen presented the results from a mailing list discussion on the issue of D-file version tracking. (Background: users want to know when a parameter they are interested in is updated so that they can update their data sets and ignore changes to files that are not of interest to them.)

The conclusion is that the user has the information needed to make this decision in CALIBRATION_DATE if the parameter has been adjusted in real-time or if DMQC has been applied (and the file is properly filled out). (UPDATE_DATE is the relevant date otherwise.)

It was decided that OPeNDAP already supports this type of query and that no new GDAC support will be developed. An example of a Matlab query is available on the Coriolis website. This decision will be revisited if this does not meet user requirements.

Other GDAC Items

The "status of the GDACs" item on the agenda was abbreviated in the interest of time, especially considered that there were not many GDAC improvements made during the year. The biggest change at the GDACs was the transition to the new format at the end of March 2005.

It was acknowledged that synchronization is still an issue. The GDACs have committed to improving the synchronization in time for the AST meeting in March.

It was also noted that both GDACs will try to implement CDFSync during the coming year.

10. Argo Regional Centers

As suggested at last AST meeting all RDAC accepted to change their name into Argo Regional Centers(ARC). All ARC have reported on the progress made last year on the mandatory and optional activities

North Atlantic-ARC: It's coordinated by Coriolis and involves France, Germany, Spain, Netherlands, Canada, UK, USA and Italy that coordinate Mediterranean Sea activities. Sylvie Pouliquen presented the NA-ARC activities that can be divided in four categories:

- Coordination of the deployment over the Atlantic. The plans for next year are not yet defined as budget are under discussion in most of the institutes.

- DMQC activities: collaboration between partners and in particular Germany and France as allowed acquiring more expertise on DMQC processing in the area. New CTD data have been collected in the area and will be sent to CCHDO.
- Consistency of Argo data over the North Atlantic. The method, presented at last DMQC2, is based on the use of objective mapping to identify suspicious values in float data. Out of 11,500 profiles tested, about 5 anomalous profiles were identified. The anomalies have been notified to the corresponding DACs and have been corrected. In addition, the procedure allows pointing out some floats that were not consistent with the reference climatology and/or the floats nearby. Coriolis has plans to transfer the method to pre-operational end of 2007 if the remaining scientific studies are successful..
- Product development and in particular a new climatology for North Atlantic based on 2000-2005 analysis will soon be made available.

South Atlantic Arc: It involves USA, Brazil, Argentina, Uruguay, South Africa, Namibia, Angola, Nigeria. . The list of vessels for float deployment opportunities are made available by AOML and it works pretty well. As very few DM data are available in this area, much of the work on consistency checks as been done in research method using statistical method. Despite a number of emails it seems difficult to get more CTD than the ones already sent to NODC-USA. As a capacity building initiative, AOML is organizing next December a workshop on Argo for African countries in Ghana. A number of products, mainly developed for other projects, are available via SA-ARC www site.

Indian ARC: It involves India, Australia and Japan. It was pointed out that it was difficult to coordinate the float deployment activities in the area because countries are not providing information. *Reminders via AST may be useful.* Nevertheless periodic statistics on floats (deployed, active, drifts, percentage of floats in water from deployment, etc) are generated. CTD from India and recent cruises are collected and part of them has already been sent to Coriolis. Concerning consistency over the basin, as delayed mode is difficult in Indian Ocean, preliminary activities on float to float and float to CTD comparison are started. Main activities are related to ease provide access to Indian ocean Argo floats, together with other data and to build value added products. Acquisition of Argo data from GDAC and made available all Indian Ocean floats from ARC web.

Pacific ARC: It involves mainly USA, Japan, Canada, Korea, Australia, China. Two meetings have been organized but not all the institutes expressed interest. A lot of work at present is done for coordination and setting up the activities. Built on the expertise of the contributors, most activities were on optional tasks on data serving by IPRC (DAPPER, DCHART, TSANA) , products (IPRC and Jamstec , Korea) The issue of consistency on a basin has not yet been addressed but will be done next year by JAMSTEC. Aside from funding issues, which are not to be understated, the issue of combining all floats in the Pacific in one center, or by one group, may not make sense. Perhaps Regional Centers focused on dynamical regions (e.g. marginal seas, equatorial currents, etc.) would make more sense. Finally important outreach activities have been conducted: IPRC, for example, is working with SOPAC to produce regionally relevant data products for South Pacific Island nations. JAMSTEC is involved in educational outreach, and is continuing a successful collaboration between Argo scientists and lower school education (with local fisheries schools).

Southern Ocean-ARC: It involves BODC for the Southern Atlantic and Australia for Southern Indian. There is still no institute willing to take care of Southern Pacific. Activities did not progress much in 2006 because of lack of man resources at BODC (priority was put on DMQC activities). BODC and CSIRO plan to work on consistency next year when enough delayed mode data are available. Activities for collecting more UK CTD collection were conducted and will soon be sent to CCHDO and NODC-USA.

More collaboration between different ARCs should be encouraged as we should benefit from each others.

11. GADR

The complete activity report of the GADR, hosted by NODC-USA, can be found in the annex 6 of this report. GADR is synchronizing periodically with USA-GDAC and archive these data on a monthly basis. The number of users, mainly non-scientist ones, increases regularly. GADR manager provides feedback to GDACs when he discovers anomalies which help to improve the system.

In collaboration with China, within PRIDE program, NODC has developed a DVD that integrate ARGO data with GTSPP ones and provide useful browsing and sub-setting tools. In this context C Sun developed a strategy of fixing the confusion of reporting profiling float pressure as depth on GTS that could be used at GDAC for the GTS directory.

At ADMT 5 and 6 meetings it was agreed that it would not be good for ARGO to issue a DVD with non-corrected float data and therefore the distribution has to be delayed until enough delayed mode data is process. It's still not the case now. Therefore C Sun needs a letter stating that there is a request from Argo to NODC for being able to burn DVD and distribute it when delayed mode processing will have recovered a significant part of its backlog. *It was also reminded that the data on this DVD will have to be in GDAC NETCDF format. Since the C Sun has* updated the contents of the Argo Global Data Resource DVD (now Draft Version 3.) as of 20 November 2006. The data on this draft DVD are in the GDAC NetCDF format and as stored at the US NODC as the date of 15 November 2006. The contents of this draft DVD can be viewed on http://argo.nodc.noaa.gov. There are links on the Web page which allow users to download the compressed files of the draft DVD or an ISO9660 image which individual can download and burn his/her own DVD.

GADR has at present the capability to burn DVD on request. It was also asked to C Sun to put on an FTP site the image of the present ARGO DVD for individual to be able to burn their DVD themselves if needed.

12. Other issues

All participants expressed great thanks to their host for their hospitality and their kindness.

Australia proposed to host the meeting as a backup solution. At the time when the report is issued, no other proposal has been received.

13. Annex 1 Agenda of the 7th Argo Data Management Meeting

Objectives of the meeting:

- Review the actions decided at 6 th ADMT meeting to improve Real-Time data flow (considering all aspects of the system from transmission from the float to arrival at GDAC and accessibility of data by users)
- Review status of Delayed-Mode quality control after DMQC-2 meeting in WHOI and take necessary actions to move to systematic implementation
- Review the metrics regarding Argo program to document future (and if possible past) growth and performance of:
    - *the Argo array*
    - *the Argo data system (performance indicators, problem reporting)*
    - *the uses being made of Argo RT and DM data (user monitoring)*
    - *visibility to scientific and operational results achieved thanks to Argo program and ensuring the visibility of these metrics.*
- Review the Regional Data Centre status, their implementation plan and the difficulties they are experiencing.
- Review and take steps to put in place appropriate Argo data archive functions including the detailed specification of possible distribution of Argo data and analysis tools via DVD

Schedule: Meeting will start at 9am and finish around 1730 on Wednesday and Thursday. We plan to finish around 1400 on Friday to allow people to catch plane more easily.

The meeting will be opened Prof. Shaohua Lin, as director General of NMDIS , together with Mr.Haiqing Li,Director-general of the Department of International cooperation, SOA and Mr. Xiaoming LI, Director-General of the Department of Marine Environmental Montoring,SOA.

1 Feedback from 7th AST meeting : (30mn) Howard Freeland

2 Status of Argo Program ((1h 1/2)

Status of Argo Program ((1h 1/2)
The Argo Technical Coordinator will report on the status of the Argo program and on the development of the Argo Information Centre.The implementation of metrics defined by the ADMT to monitor the performance of the data system will be discussed. The results of the Argo users survey and the proposal for a problem reporting mechanism will be presented. The ADMT will discuss on how to improve the communication on Argo and facilitate the access to scientific products. Status on the actions 4,6,7

- ***Review of the Action from last ADMT*** *(S Pouliquen)*
- ***Argo Status*** (M Belbéoch)
- ***Development of the AIC*** (M Belbéoch)
- ***Communication with users*** (M Belbéoch)

3 Real Time Data Management (2:00 hours)

Review the Argo real time data stream, the status of actions from ADMT-5 and identify new actions needed to improve the volume, timeliness of delivery and quality and ease of Argo RT data.

6th meeting Actions:5-13-17-18-19-20-21-29-30-31-32

- Real-time availability: 15mn (M Belbeoch)
  - Argo floats only available on GTS and not at GDAC
  - Historical Dataset action 5
- GTS status: 30mn
  - Timeliness of data delivery: Review evidence provided by the MEDS statistics on the timeliness of data delivery via GTS. (A Tran)
  - Real Time processing correction at CLS- Actions 30-31 (P Gros)
  - Status GTS problems - Actions 29-30-31-32 (M Ignaszewski)
- Distribution to GDAC (C Coatanoan): 30mn
- Consistency of RT QC checks between DACs (C Coatanoan) - Action 20: 20mn
- Correction in RT of pressure for APEX floats using the SURFACE-PRESSURE technical parameter (A Tresher) Action 17: 15mn
- GODAE –QC pilot project (M Ignaszewski on behalf of J Cumming) 20 mn

4 Trajectory from Argo data (1h)

- Feedback from Trajectory Workshop in Korea - Action13 (B King)

5 DAC Services (1h)

What's new at GDACs and Improve services for users.

6th meeting Actions: 2-3-12

- What's new at Coriolis and US Gdacs (T Carval, M Ignaszewski)
- Dfile version tracking (S Pouliquen)
- Status of GDAC synchronization improvements (Mark Ignaszewski)
- New needs?

6 Format issues (2H00)

While format is pretty well standardized for measurements and qc flags, experience at GDACS shows that there are discrepancies both at metadata and technical and history levels that ought to be resolved to the benefit of the community. A lot of discussions occurred by email during the year but decisions need to be taken.

6th meeting Actions: 10-11-14-15-16

- BUFR Format (T Yoshida)
- "Highly" desirable metadata fields/ extension to other file types.
- Technical Files (A Tresher)

7 Delayed mode data management

Action items: 22 23 24 25 Agenda to be proposed by Brian and Annie.

The goal is to provide a feedback for the DMQC-2 meeting and to take decision on action plans at ADMT level.

a. **Review status of D files at GDAC** (B King) 1h
   Summary of DMQC-2 (ADMT-6 action item #25)

Peer review of D files (ADMT-6 action item #23) & progress from intercomparison exercise (AST-7 action item #7, repeated in #51)

b. Testing the new WHOI salinity calibration tool (ADMT-6 action item #22) (A Wong) 30mn

c. Delayed-mode qc for dissolved oxygen (Taiyo Kobayashi) 30mn

d. Other recommendations from DMQC-2 (B King) 1h
- Real-time salinity drift & offset adjustment (ADMT6- action 18)
- Real-time thermal mass adjustment (AST-7 action items #4 & #5, repeated in #31 & #32)
- Real-time pressure adjustment for Apex floats
- Inclusion of "good" Argo profiles in reference database

e. Other issues (A Wong) 30mn
- Compulsory fields to be filled in "D" files (ADMT-6 action items 11 & 12)
- Other recommendations to GDAC file checker for "D" files
- Some glitches from the May 06 format change
- Argo QC Manual, extra statement to be inserted in GDACs & QC Manual

8 Progress on Argo Reference data base (1h)

Action items 26-27-28

- Summary of the actions since ADMT-6 (S Pouliquen) 15mn
- Recommendation from DMQC-2 for a central reference database: baseline, future update, naming convention, etc (A Wong) 30mn
- discussion

9 RDACs: provide an information on what done and what is planned (3h30)

Each RDAC is invited to provide information on the progress made during the past year especially to start implementing the mandatory activities

RDACS status and plan (30mn per RDAC)
- Atlantic (S Pouliquen & C Schmid)
- Indian (M Ravichandran)
- Pacific (J Potemra)
- Southern Ocean (L Rickards)

10 GADR (1h)

Status on Argo DVD, plans for regional versions. GADR progress to comply with Argo requirements.

- The Argo DVD, issue of regional versions (C Sun)
- Status of the Archiving centre (C Sun)

11 Other topics

14. Annex2: List of Participants

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15. Annex 3 6th ADMT meeting action list

OVERALL STATUS: 32 Actions

- 11 done
- 3 done at some Dacs and not at others
- 11 on going actions
- 1 cancelled
- 6 not done

	Action	Target Date	Responsibility	Status
	General Actions			
1	Update User Manual and QC manual	December 2005	T Carval & Annie Wong	Done
2	Dfiles version tracking system to be defined	March 2006	Mark Ignaszewski and Thierry Carval	Under Investigation to be discussed at next ADMT meeting
3	Make GDAC synchronization more robust	March 2006	GDACs	on going
4	Implement voluntary user registration at the GDACs and AIC	January 2006	GDACs, ATC	Done via the user survey that Mathieu has started
5	DACs to report the status and plans to reduce the backlog of GTS-only files on the GDAC to ADMT chairs	January 2006	ADMT chairs and DACs	On going
6	Define monitoring requirements and implement them at the AIC		ADMT chairs, Technical Coordinator	Started
7	Design and implement a simple problem reporting system		ADMT Chairs, ATC, GDAC managers	Started
	AST Actions			
8	AST to define whether or not thermal inertial lag should be corrected in real time by DACS	AST meeting January 2006	D Roemmich	Done see AST report
9	AST to provide guidelines to include "good" Argo Profile in the reference database	AST meeting January 2006 or prior to 2nd DM workshop	D Roemmich	Done see AST report
	Format Actions			

10	Control that the information on Sensor is properly defined in metadata files	End 2005	Dac Managers	MEDS Done OTHER DACS ?????
11	DM operator to provide the list of "highly desirable" fields to be filled in Dfiles	December 2006	B King and A Wong to coordinate with DM operators	Started A proposal will be made at DMQC2
12	GDAC to update file checker to check the “highly desirable” Dfile fields	January 2006	Mark Ignaszewski and Thierry Carval	Not done need inputs from action 11
13	Define list of “highly desirable” parameters for trajectory files	May 2006	B King	Not done
14	Standardize technical file parameter names	January 2006 (for AST)	A Thresher (coordinator)	A proposal is under construction by ANN to be presented at ADMT
15	Implement the format changes that were agreed	January 2006	Mark & Thierry to coordinates with DACs	Done on the 22nd March
16	Finalize BUFR format and present it to WMO	December 2005	T Yoshida and E Charpentier	Done
	Real-time QC Actions			
17	Contact WEBB to clarify the usage of SURFACE-PRESSURE technical parameter in Realtime	End 2005	A Tresher	A proposal has been made by ANN to be discussed at ADMT
18	Dac to implement in realtime last constant offset calculated in DMQC	ASAP	All Dacs	MEDS Done: OTHER DACS ????
19	Continue the study on extrapolation in realtime of last (slope,offset) calculated in delayed mode	2nd DM workshop	V Thierry /B King	Cancelled because of lack of man power at Ifremer
20	Develop standard QC test dataset	December 2005	Coriolis	Started but nothing yet distributed to DACs
21	Validate proper real-time QC checks using standard test dataset		Coriolis to coordinate with DACs	Not done need input from action 20
	Delayed-Mode QC Actions			
22	Dac to test the Merged WJO-BS method for DMQC		Volunteer Dacs : Coriolis	Started

23	Peer review of the Dfiles available on Gdacs	March 2006	B King to coordinate	Done (sees DMQC2 report)
24	Provide with the DelayedMode QC manual a cookbook with a set of documented example that should help the DM operators to process consistently	January 2006-	A Wong to coordinate	Postponed after ADMT7th
25	Organize the second DM workshop	Mid 2006	AnnieWong et Brian King to coordinate	Done
	Reference Dataset Actions			
26	Argo director to provide to CCHDO list of PIs liable to provide recent CTD	Jan 2006	J Gould	Not done
27	Dac to make sure recent CTD transferred to CCHDO	ASAP	All Dacs	Not done
28	Coriolis to organize with CCHDO CTD transfer to provide a global reference database for ARGO	March 2006	J Swift and S Pouliquen	Started Coriolis received a cd from CCHDO and is planning the merging with WOD2005 end 2006 early 2007
	Data Problem Actions			
29	Vertical coordinate of GTS profiles on the GDACs to be converted to pressure		Coriolis GDAC	Done
30	Resolve “profile gap” problem	December 2005	CLS	Done
31	On GTS implement conversion from pressure to depth	December 2005	CLS & KMA	Done at KMA Investigation started at CLS
32	Investigate and solve time differences between GTS and GDAC profiles	January 2006	AOML, JMA, INCOIS & KMA	Done at KMA For JMA, Investigation has been made. No way to improve the situation at the DAC Done for Incois Done for AOML

16. Annex 4 7th ADMT Action List

	Action	Target Date	Responsibility	Status
	Monitoring Actions			
1	AIC to integrate MEDS statistics on GTS problems as well as Coriolis metadata check in the bi-monthly report	M Belbeoch	End 2006	
2	AIC to implement and document a reliable Argo user desk behind the support@argo.net email to ensure that all request are processed and to provide history of the request to the ADMt and AST partners.	M Belbeoch	AST8	
3	Promote the support@argo.net via the Argonautics newsletter, at GDAC at AIc when the system is in place	M Belbeoch	After action 2	
4	From information provided in AIC report, Dac managers to inform AIC and ADMT chairs for each historical float only received by GTS whether or not they will be able to generate the netcdf files	Dac managers	End 2006	
5	AIC to monitor the progress on reducing the historical GTS backlog	M Belbeoch	March 2007	
6	AIC to implement periodic statistics to measure the progress on ARGO data management activities	M Belbeoch		
7	Checklist for mew RT operators	A Tran & S Contardo	ADMT8	
8	More visibility to be provided to RAC from ARGO WWW sites (argo.net, AST, GDCA)	M Belboch Megan T Carval M Ignaszewski	End 2006	
9	RDAC managers to change to name on their WWW to ARC(Argo Regional Argo)	ARC managers	End 2006	
	Trajectory Actions			
10	Dacs to correct they metadata and trajectory files according to the specification from Trajectory team	Dac managers	AST8	
11	AIC to monitor the progress	M Belbeoch	AST8	

12	Data flow for delayed mode processing of trajectory files to be proposed	S Pouliquen to coordinate	AST8	
13	Argo-traj-dm mailing list to be set up by AIC	M Belbeoch	End November 2006	
14	GDAC to implement file checker on trajectory files according to trajectory group specification	B King and M Ignaszewski	AST8	
	GDAC Actions			
15	GDACs to correct problems in synchronization	M Ignaszewski and T Carval	AST8	
16	GDACS to implement CDFSync on their servers	M Ignaszewski and T Carval	ASAP	
17	Gdacs and DACs to clean up the remaining 2.1 files form GDACs	M Ignaszewski to coordinate	AST8	
	Real-time QC Actions			
18	MEDS or AOML to process the two pacific ocean Russian floats from argos messages to send them to GDAC	A Tran or C Schmid		
19	BODC to stop generating duplicates on GTS	S Contardo	March 2007	
20	CLS to report depth instead of pressure on the GTS (Action from ADMT6)	P Gros	End 2006	
21	On GTS when PSAL is missing in a triplet, replace it by / and transmit T and Depth	T Carval for Coriolis A Gronell T Yoshida	When accepted by MF for Coriolis End 2006 for Australia and Japan	
22	In GTS directory, if we know that the dac has been sending pressure instead of depth, not do the depth to pressure conversion	T Carval C Sun	ADMT8	
23	Finalize the standard test dataset and send it to Dac managers together with the updated QC manual (Maximum pressure and density tests)	C Coatanoan & T Carval	End November 2006	
24	Dac managers to test their QC procedure and correct it if necessary	Dac Managers	End January 2007	
25	RT working group to investigate automatic QC procedure could be improved bottom spike	A Gronell to coordinate	ADMT8	

	Delayed-Mode QC Actions			
26	Coriolis to test OW software against BS in North Atlantic	C Coatanoan	AST8	
27	Dacs to implement persistence of the last delayed mode offset in RT as well as on the cycles in between the last cycle processed in DM and the present one	Dac managers	AST8	
28	G Johnson to clearly define the sensor information needed in metadata for Thermal mass correction	G Johnson	End 2006	Close see email on the 28th November 2006
28b	J Gilson to see if applying the thermal mass correction in RT will reduce the number of good points rejected by the automatic QC tests (spikes and density inversion)	J Gilson	AST8	
29	AIC to identify the float without DM operators	M Belbeoch	AST8	
30	GDAC to implement a DFile checker according to Annie Wong's specification that will reject non conform files	M Ignaszewski	AST8	
	Reference Dataset Actions			
31	Coriolis to set up links to the Baseline Reference Databases defined in DMQC2 report	S Pouliquen	End 2006	
32	Jamstec and WHOI to provide SeHyd IOBH and ATL_Hydrobase in non-interpolated format for OW software	Jamstec and WHOI	ASAP	
33	Coriolis to update these baselines DB with WOD2005 + CCHDO and provide it as a unique reference DB	C Coatanoan	June 2007	
34	Coriolis to set up a yearly basis update of the DB as well as a version control identification	C Coatanoan	ADMT8	
35	CCHDO and NODC-USA to ensure that CDT needed by ARGO and submitted to NODC-USA by national NODCs will be transmitted to Coriolis for reference DB updating	C Sun to coordinate	ADMT8	
	Format Actions			
36	Format group to propose a solution to store Apex_Up and Apex_down metadata	Format group	ASAP	
37	User manual to be modified to includes the delayed mode parameters for trajectory	B King and T Carval	January 2007	

38	Format group to propose an update of metadata file to be able to handle the new information needed for Thermal mass correction	T Carval to coordinate	AST8	
39	T Carval to update manual to explain how to handle change in metadata with iridium or Argos3	T Carval	End 2006	
40	Canada and Japan to provide their tool to convert netcdf to BUFR	Y Takashi A Tran	ASAP	
41	Table 14 for technical name parameter to be finalize and included in user manual	A Gronell C Schmid S Le Reste	End 2006	
42	Dacs to resubmit their technical files in one batch	DAC	ASAP after action 42 closed	
	ARC			
43	ARC to set up consistency check over a basin at least in prototype mode	ARC managers	ADMT8	
	GADR			
44	Put on an FTP site an image of the DVD for individual ARC to be able to burn on demand their own DVD	C Sun	End 2006	Close 20Th November 2006
45	Write a letter to NODC-USA for DVD burning activity	Co-Chair and C Sun to prepare for AST chairs to take the action		

17. Annex 5 Report to ADMT-7 from Howard Freeland

It is with great regret that I was unable to be with you today in China. As most of you will know I have suddenly discovered that I have no budget for Canadian Argo at the moment and am already more than 6 months into our fiscal year. This is embarrassing as I am sure you can all imagine. The decision to cancel was not taken lightly and I was advised that I had to save money wherever I can.

Overall, I wanted to present a very positive message to the Argo Data Management Team, we are actually doing very well and a lot of the credit belongs with the data team. We made some good decisions a very long time ago and the one critical "good decision" was the one whereby a data management team was created on day #2 and became a critical part of the development of the Argo concept. If my memory serves me correctly our first Chairman of an Argo Data Management Team was Bob Molinari who deserves a lot of credit for setting the early direction.

Argo has achieved a great deal:-

1. We have an active array of 2600 Argo floats, thanks in part to improvements in float technology and lifetime.
2. We have deployed a global array.
3. We deliver Argo data in near real-time with high standards of quality.

So, while there is still a great deal to accomplish, the joint efforts of all the participants in Argo have led to enormous achievements.

As I was getting ready for this meeting I decided to poll a number of scientists who I know are using Argo data, in some cases very heavily, but who have never been part of any Argo team. They are meteorologists or oceanographers making use of this rich new source of data. I had questions concerning access to data, timeliness etc, and asked how well we were doing. The messages back were overwhelmingly positive. Data access is excellent, timeliness is excellent etc. There were a few negative comments and these were interesting. In general my reaction was that the negatives were actually wrong and I will address these with scientists individually. For example, one scientist commented that it wasn't possible to determine the drift depth of an Argo float. Indeed, that information is not in the profile files, but it IS in the metadata files. This scientist handles netCDF easily and knows that there are files such as 4900073_traj.nc but seems not to be aware of files like 4900073_meta.nc where this information is easily found. Perhaps the real message here is that we need an "Argo Data for the Complete Idiot" guide, that is perhaps even simpler than the Argo data primer that John Gould prepared. Or perhaps we are not doing quite a good enough job in explaining to scientists how to access data. I should have asked those I polled if they had seen John's Argo Data Primer. Among the negative comments I received there were none that I felt had not already been addressed, in all cases the only problem might be one of communicating that information.

There are a few real problems in the data system. I suspect you all know what they are.

1) I did receive positive comments on the quality of the real-time data set. Comments were also made that some corrections still need to be made by the user as data does sometimes drift significantly outside of plausible climatology. We have reason to be fairly positive about the real-time data stream. The Canadian experience I believe is pretty typical with at least 70% of profiles passing the DMQC with no change recommended. However, 30% do require changes and in some cases these changes are large enough that a scientific user would notice the offset. I know that Anh Tran has been feeding the results of DMQC back to the RT data. The process I believe is a very simple one, apply the most recent recommended offset to the RT data. If we believe that DMQC is a useful process then this must improve the RT data. Perhaps there are alternative schemes that would provide a better correction, but something this simple does not seem hard to implement and I'd recommend that this sort of correction be implemented more widely. Quite simply, if we believe the DMQC results then we know that the RT data stream can be better, and that is the product we should be supplying.

2) A critical requirement placed on Argo operators is compliance with the requirements of the IOC resolution XX-6. At the last AST meeting in India we discovered a significant discrepancy between the number of floats launched by one country and the number notified with through the AIC. This problem was discovered and corrected in short order. However, in the most recent report from Mathieu Belbéoch there is a list of 15 floats that are reporting on the GTS, reporting to the GDACs, but have never been notified through the AIC. This actually is potentially a serious problem, it would become a problem if one of those floats entered the EEZ of another country. I would like to appeal to all of you to take this process very seriously. The notifications are not merely a polite way of telling each other what has been launched, this is a process that is designed to leave us in compliance with the Law of the Sea. A group called ABELOS (Advisory Board of Experts, Law of the Sea) had a rancorous meeting a few months ago about potential changes to the reporting system being requested by one country. The problem is still with us and will arise again at the next ABELOS meeting. In the meantime it would be of enormous assistance to the AST and to anyone interested in the free and unfettered exchange of Argo data, if we ensured that all float-deploying nations remain in full compliance with the IOC resolution.

3) You will be having lengthy discussions about DMQC. Dean and I have both had very positive reports about the second DM Workshop. Thanks are due to Brian King and Sudheer Joseph for a job well done. I have seen their meeting report and also received a report from Ron Perkin. We have to be concerned about the backlog. We are both aware that many Argo operators are on the point of completing large uploads of D mode files, and that is excellent. We are dismayed by the comment that Argo is acquiring new profiles faster than D files are being uploaded. This would suggest that we will never catch up and that is a deep concern.

Finally, I've been asked to comment on items coming up that might affect the data system. There are an increasingly large number of floats being deployed carrying oxygen sensors and other sensors, also an increasingly large number of floats being deployed that use Iridium. Oxygen is already coded into the Argo netCDF files and is handled transparently. The AST has examined the issue of "novel sensors" on several occasions and do feel that the reporting of T, S and P remains the core mission for Argo. Among other things that might be sampled, dissolved oxygen does have peculiar interest and I (HJF) am very happy that DOXY is built into the Argo netCDF files. We do not see overwhelming pressure for the inclusion of other variables. For individual experiments other items might be added to a float, such as fluorescence, wind speed, rainfall or velocity, but we do not view those as key components of the Argo mission. Rather we would hope that these floats will report only T, S and P, plus oxygen if available, as the core mission.

In our meetings with users a commonly-requested item is true sea-surface temperature. We note, for example, that Dick Reynolds uses no Argo data in his monthly compilations of SST maps for the globe. He believes that Argo data are compromised by the fact that we turn off the SeaBird sensors at a depth of 4 or 5 decibars. I have been in discussions with WRC about this issue and they are willing to add a separate temperature sensor that would operate at a lower accuracy than the SeaBird sensors but at a higher frequency. On the Canadian floats we acquire near-surface samples typically at pressures of 20, 10 and 4 decibars. Supposing during the ascent phase we turned on a high-frequency temperature sensor at a pressure of 25 dbar and sampled at intervals of, perhaps, 10 cm to the surface. This high-frequency profile could likely be tied at 20, 10 and 4 dbar to the good observations from the SeaBird sensor and forced to fit those observations in a least-squares sense, and I see no reason why this should not be part of the RT data stream.

Webb Research are prepared to supply some experimental units and I have expressed interest in acquiring a small number as part of our next order. Perhaps I should have mentioned this to Anh Tran first. I would be interested in any guidance the data team might have regarding the implementation of such a system.

I hope you have a good and productive meeting.

18. Annex 6 National Reports 2006

Argo National Data Management Report for Australian

Argo National Data Management Report for Canada

Argo National Data Management Report for China

Argo National Data Management Report for French DAC

Argo National Data Management Report for Germany

Argo National Data Management Report for India

Argo National Data Management Report for Japan

Argo National Data Management Report for Korea

Argo National Data Management Report for UK

Argo National Data Management Report for United States

Argo National Data Management Report for French GDAC

Annual Report for U.S GDAC

Global Argo Data Repository Status Report of US NODC

Argo Information Centre Annual Report

19. Annex 7 - Argo Data Users Survey

Australian Argo National Report

ADMT7

1 – 3 November 2006

Ann Gronell (CSIRO) and Lisa Cowen (Australian BOM)

Argo Australia had a successful year in 2006. We have prepared and deployed 39 floats since this time last year. Two of these went missing immediately due to an operational error. Unfortunately, one of these was our first float with a transmissometer on board. We have just deployed the second transmissometer float and have received its first transmission.

In March, we had our national Argo Australia meeting in Sydney, hosted by the Royal Australian Navy (RAN). As a result of this meeting, RAN arranged to purchase 20 floats as an extra contribution to our normal float procurement. This was a tremendous contribution to the Argo program by the Navy. It is hoped that this has now set a precedent but funding is dependent on the RAN budgets so we don't know if this will be repeated.

As a result of the RAN float purchase, we have 58 floats waiting to be deployed. Ten are now on a RAN ship headed for the North West Shelf region and 8 have just left Hobart on Aurora Australis headed for the Southern Ocean. Thirty-six of the remaining 40 are either undergoing preparation and having lithium batteries installed, or are awaiting a deployment opportunity. Four floats have been held in our laboratories after we detected problems during preparation. In addition, two floats were purchased this year with Iridium transmitters – these will be kept at our laboratory until we are completely familiar with this new system.

This year, we requested new features from Webb Research Corporation for the Apex floats. The new floats profile on deployment so we get an immediate profile from the float after launch. They also report two 4.5 day average P/T values, from the drift portion of the cycle, for each profile. None of these new floats have been deployed yet.

We currently have 102 active floats from a total of 122 deployments. Of these, 5 are probably under ice and waiting for summer conditions before returning more profiles. Table 1 shows a summary of our float performance.

Float Status	Number of Floats	Range of Cycles Received before failure
Died from battery failure:	7	101-133
Disappeared on deployment	5	0
Died from grounding or running ashore	8	14-89
Died from Druck pressure sensor failure	1	56 (27 good profiles)
Disappeared without apparent cause	2	48-121
In ice (still considered active)	(5)	
Recovered and on shore	1	
Still active	99	149+ cycles
Total deployed	122	

Table 1. Float performance and reasons for failure.

The Bureau of Meteorology has funded CSIRO to redevelop all Argo software for real-time data processing. This work is almost complete and will allow faster integration of new floats into the system, a more streamlined generation of netcdf data files and provision of trajectory files (this has been neglected by Argo Australia until now). In addition, features such as thermal lag corrections when they are approved by the science committee will also be included. Floats will also be processed as soon as a complete profile arrives, speeding up the delivery process. Once this has been completed, it is anticipated that the Bureau will take on the processing of netcdf data files as well as the generation of the tesac messages and their submission to the GTS. Argo Australia data processing will then be completely operational within the Australian Bureau of Meteorology.

1. Status

a) Data acquired from floats – all data is being acquired from the floats.

b) Data issued to GTS – all data should be submitted to the GTS by the Bureau of Meteorology within 24 hours of the profile. In practice, just over 3000 tesacs were sent to the GTS from Argo Australia from October 2005 to September 2006, with 72% being delivered within 24 hours of surface time. Of the 867 "late" tesacs, 44 of these were linked with new deployments. A significant number of tesacs were delivered late during May and June, due to an unfortunate combination of operator error and operator holidays. With the development of the new Argo processing software, such occurrences should be rare in the future.

c) Data issued to GDACs after real-time QC – data are currently sent to the GDACS as soon as the profile is processed by CSIRO. This will shortly be taken over by the Bureau making the process operational.

d) Data issued for delayed QC – data is available for DMQC immediately.

e) Delayed data sent to GDACs – some delayed data has been submitted to the GDACS after initial problems with the formats.

f) Web pages – our local web pages are automatically updated as each float reports. These can be found at: http://www.per.marine.csiro.au/argo/index.html

g) Argo data is downloaded to a local mirror once a week. It is then converted to a Matlab format with an index table to help users find the data they need. The data is being used with other data on the GTS to inform the Bureau of Meteorology's Seasonal Climate Outlook and is used in a dynamical climate forecast system (POAMA). As part of this the data are ingested into the BMRC Ocean Analysis (http://www.bom.gov.au/bmrc/ocean/results/climocan.htm). The data is also being used in the Blue Link ocean forecasting system. We are also incorporating it as a high quality background data field for our upper ocean temperature QC programs.

h) Research use is rapidly increasing with uses from eddy studies, mixed layer studies, global sea level and heat content analyses, and many more. BLUELink model outputs and the BMRC Seasonal Climate Outlook are two major products from Argo data in Australia.

2. Delayed Mode QC

Delayed Mode QCd data is being delivered to the GDACS on a semi-regular basis. Approximately 23% of our data has now been submitted in delayed mode. A clear process for DMQC is now setup, but we continue to struggle with expert judgement on salinity drifts and other pathologies in difficult floats. We have just hired, through the ACE CRC, a new data processing person to work on the routine aspects of DMQC. We expect our delivery of DMQC data to speed up significantly as this person works through the data backlog.

3. GDAC functions – N/A

4. Regional Centre Functions

We are a small part of the Pacific RDAC and so will leave reporting to the other members.

Argo National Data Management Report for Canada – 2006

1. Status

Data acquired from floats: Currently we are tracking 102 active floats. Of these, 12 may be in trouble or may have failed. We are tracking 15 floats with Aanderaa sensors, and 10 floats with pressure activation and the deep profile first (DPF) feature. Oxygen data currently aren't quality controlled in real-time. Floats which experience salinity drifts based on delayed-mode quality control are corrected in real-time before sending to GTS and GDACs.

Data issued to GTS: All of the data are issued to the GTS. On average 82 % of data are issued to the GTS within 24 hours of the float reporting. Longer delays are usually caused by incomplete sets of messages received from the float, or messages that failed CRC checks, or there is a problem with network disruption. However, all of the delayed data are issued to the GTS and GDACs.

Data issued to GDACs after real-time QC: we are sending trajectory, profile, technical and Meta files to the GDACs on the same schedule as they are issued to the GTS.

Data issued for delayed QC: We routinely send data to the PI at the Institute of Ocean Sciences (IOS) on the same schedule as the data are issued to the GTS.

Delayed data sent to GDACs: the PI is routinely using the Wong et al software which produces "R" and "D" NetCDF files. He regularly returns data to us. We have the software that transform the data into the latest format version of NetCDF, updates our database and sends the delayed mode files to the GDACs. Floats which have salinity corrected in real-time based on delayed mode quality control are reporting as mode "A".

Web pages: we maintain pages that show float tracks, and all of the data collected for all of the Canadian floats. Both real-time and delayed mode data are also available to download, but we alert viewers that the official version resides at the GDACs. Pages are updated daily.

We also show some information about the global programme including the position of floats over the previous months, the success rate of meeting the 24 hours target for getting data to the GTS at various GTS insertion points, the number of messages transmitted, report of floats that distributed more than one TESAC in 60 hours and the statistic of Canadian float performance.

Readers may go to:
http://www.meds-sdmm.dfo-mpo.gc.ca/meds/Prog_Int/Argo/ArgoHome_e.html
for more information

Statistic of Argo data usage: We currently have three PIs. Argo data have been used to generate monthly maps and anomaly maps of temperature, salinity along line P in the Gulf of Alaska. Line P has been sampled for 50 years and has good control on monthly climatology. For more information, you can go to:
http://www.pac.dfo-mpo.gc.ca/sci/osap/projects/argo/LineP_e.htm

2. Delayed Mode QC

Ron Perkin (at IOS) handles delayed mode quality control processing for all of the Canadian floats. All of the delayed mode data of Canadian floats are up-to-date at the GDACs. In the future the delayed mode quality control process will be transferred to Mathieu Ouellet at ISDM in Ottawa, because Ron has retired. ISDM will process with Cell Thermal mass correction for floats with sensor types (SBE 41 or SBE41CP) in the coming year.

3 GDAC functions

Canada forwards TESAC data to the GDAC in Brest three times a week

4. Regional Centre function

Canada has no regional center function.

Argo National Data Management Report

China Argo Data Center

The 7th Argo Data Management Team Meeting, NMDIS, CHINA

1. Status

China Argo Data Center has processed data from 30 Argo floats deployed by SIO/SOA, including 12 active floats by the end of September 2006. All profiles are transmitted to GDACs in real-time after RTQC. All profiles are issued via GTS at CLS, and the incomplete profile problem has been resolved with the help of CLS. About 1200 T/S profiles have been transmitted to GDACs by the end of September 2006. The WJO method has been applied to all the floats for salinity calibration, and 388 DMQCed profiles have been sent to GDACs.

The China Argo Data Center website (http://www. cadc.org.cn and (http://www.argo.org.cn) are set up in Chinese and English. All the global Argo profiles data, meta data and deployment information are all managed by database and updated everyday automatically. The users are able to access to the data conveniently on the website including netCDF raw data, Near real-time data, meta data, trajectory data, delayed-mode data. These data are also available via FTP.

The data products including the T-S, T-P diagram, waterfall maps are all updated every day. The Pacific temperature and salinity horizontal distribution map and section distribution map are being developed now. Base on the Park J.J. et cl method, the Pacific ocean current is also figured out. But the QC system for the Argo trajectory data is urgent to set up.

Argo data has been used to study water masses, mid-depth current, upper ocean response to tropical cyclones *et al*. Institute of Atmospheric Physics (Chinese Academy of Sciences) is improving a 3-D ocean data assimilation system using Argo and TAO data. Dr. Wang Guihua reconstructed the 3-D T/S and current fields with Argo data in Pacific Ocean based on an improved EOF

method. Dr. Xie Jiping deduced the mid-depth currents using Argo trajectories, and developed a method to reduce the estimate errors based on Kalman Filter.

2. Delayed-mode QC

Until now, sensor drift or offset have been found out in 6 out of 30 Argo floats and 388 profiles have been updated into GDACs. WJO method, BS method and WHOI Argo delayed-mode tool are all applied to calibrate the Argo salinity profiles in China Argo Data Center. It's found that the reference dataset is more critical for the calibration results than the mapping scales or the methods by test. So a new historical dataset is being developed by China Argo Data Center based on WOD01 Dataset and the late CTD data.

Thermal mass correction is also applied to the Argo salinity profiles. The thermal lag is not obvious in Chinese Argo salinity profiles. Only 38 profiles of the Chinese total 932 profiles have salinity thermal lag greater than 0.01. All the 38 profiles are located at strong thermocline region. Most of them distribute in the Kuroshio area where the thermocline is about 0.01~0.2°C/m and 100m deep.

Surface pressure correction is implementing now. For surface pressure data are not provided by Provor Argo floats, the final correction of the surface pressure is not release yet.

argo data management

Argo data management
October 25, 2006
Ref : cordo/dti-rap/06-118
Version 1.1

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

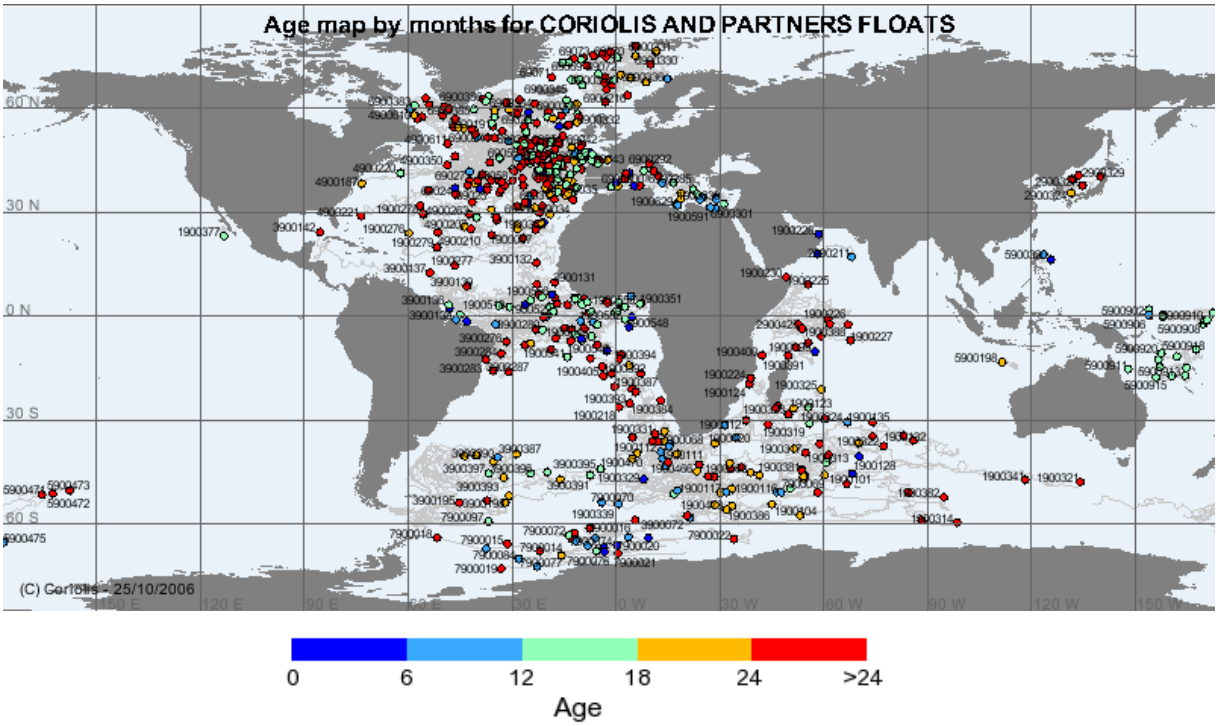
The web site of the French DAC is available at : http://www.coriolis.eu.org/cdc/

It provides :

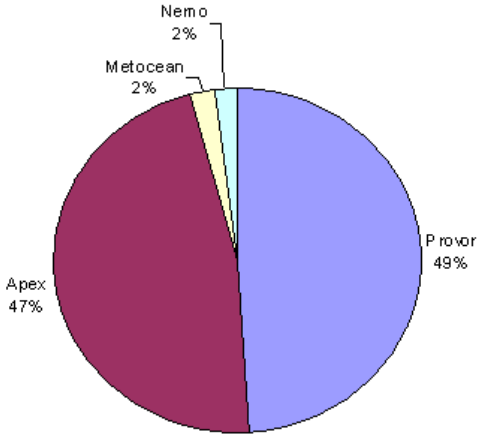
- Individual float description and status (meta-data, geographic map, graphics : section, overlayed, waterfall, t/s charts)
- Individual float data (profiles, trajectories)
- FTP access ;
- Data selection tool ;
- Global geographic maps ;
- Weekly North Atlantic analyses (combines Argo data and other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

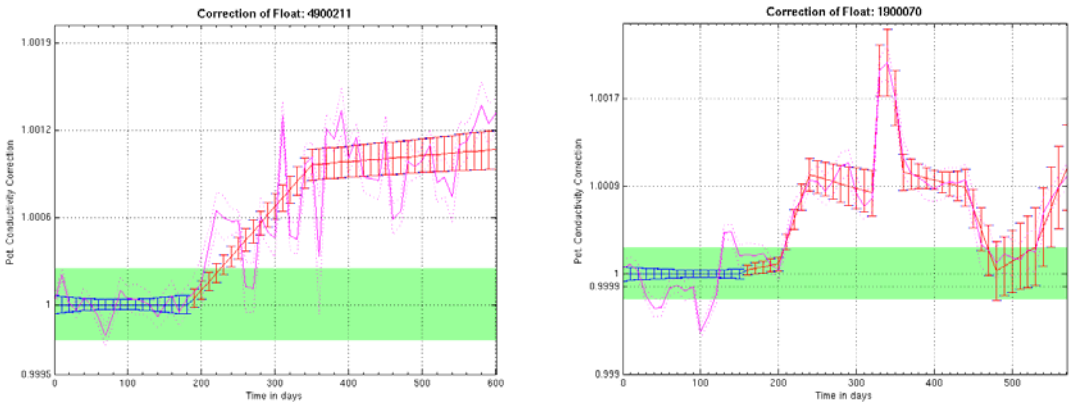


Figure. 1.

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).

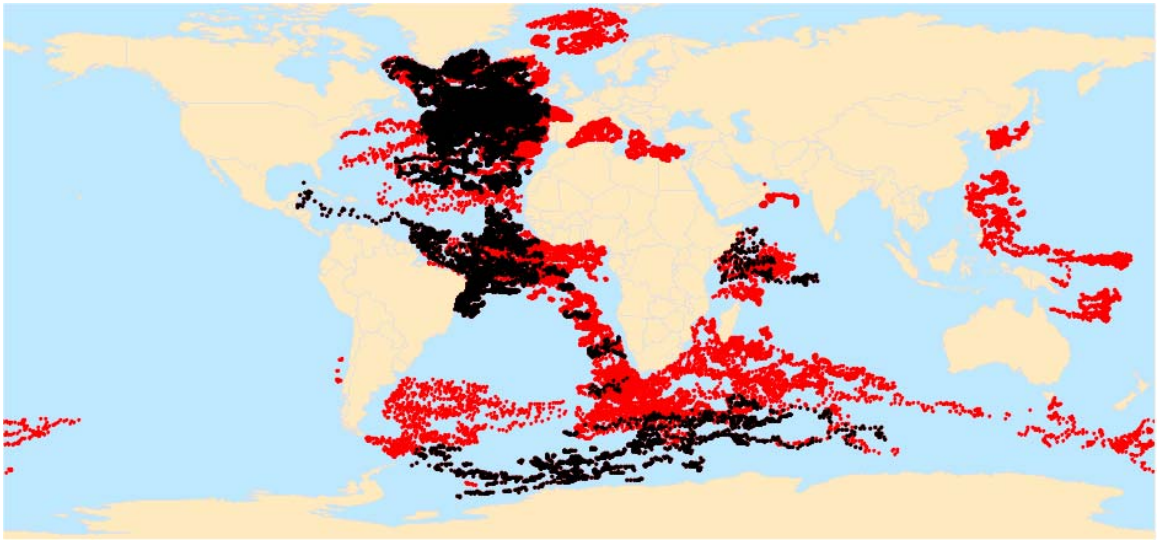


Figure 2. In black, French and German floats which have been processed in DMQC. In red, others Coriolis floats which have to be processed in DMQC.

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.

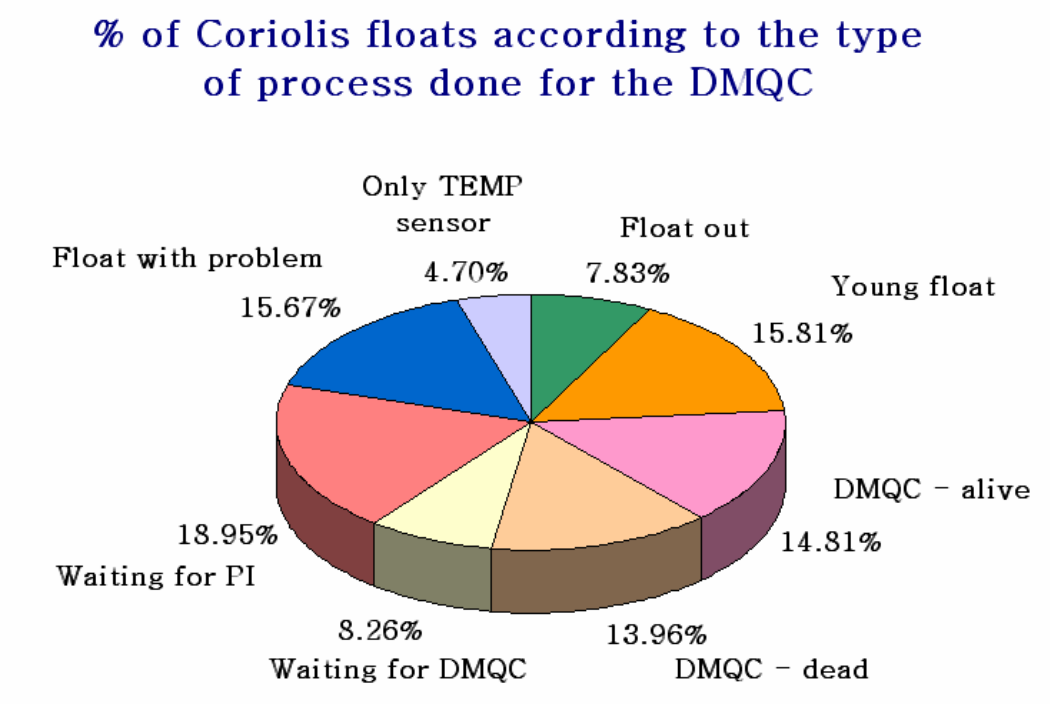


Figure 3. % of Coriolis floats ccording to the type pf process done for the DMQC.

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.

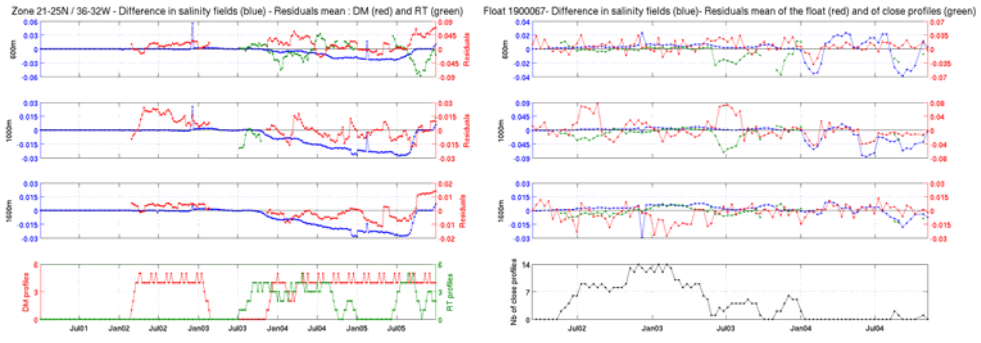


Figure 1. 1) evolution of salinity fields and residuals values in a specific area (a 4°*4° zone). 2) evolution of salinity fields and residuals values along a float displacement (in a 4°*4° zone around the profile location).

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.

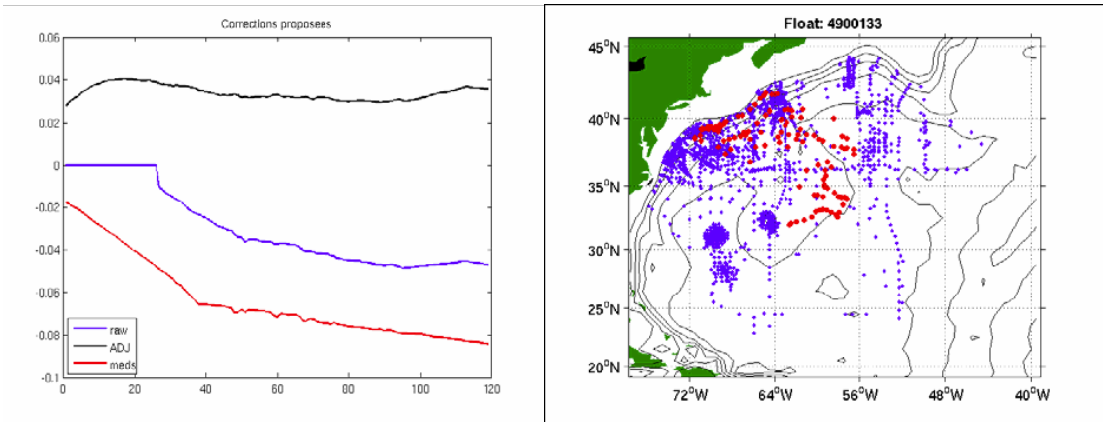


Figure 2. Salinity corrections for float 4900133. Correction applied by Meds and used to generate the PSAL_ADJUSTED fields (red) – Correction to apply on the PSAL data estimated from the statistical method used at Coriolis (blue) – Correction to apply on the PSAL_ADJUSTED data estimated from the statistical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

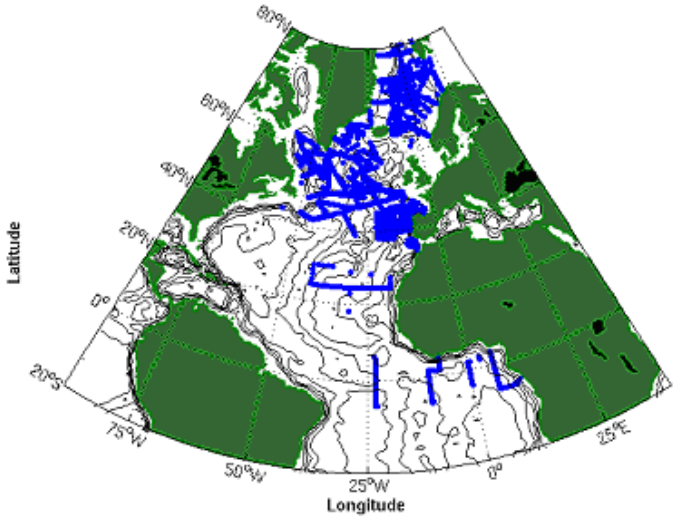


Figure 3. Location of the cruises available in the North Atlantic for the period between 1996 and 2005.

Argo National Data Management report for Germany

1. Status

Four Gernan groups have deployed floats which contribute to ARGO: AWI (Alfred-Wegner Institut, Bremerhaven), BSH (Bundesamt für Seeschifffahrt und Hydrographie, Hamburg), the IFM-GEOMAR (Leibnitzinstitut für Meereswissenschaften, Kiel) and the IFM-HH(Institut für Meereskunde, Hamburg). The real-time data acquisition for all German groups is performed by Coriolis, which issues the data to GTS and performs the real-time QC. The real-time data from the four projects are send for delayed mode quality control (DMQC) back to the four groups. Each of the four groups is responsible for their own data, performs the delayed mode QC and then sends data back to the GDAC (Coriolis).

Basic Web pages exist for all 4 projects.
http://www.awi-bremerhaven.de/Research/IntCoop/Oce/weccon.html

http://www.german-argo.de/

http://www.ifm-geomar.de/index.php?id=argo

http://www.mersea.eu.org/Insitu-Obs/1-Insitu-Floats.html

Statistics of data use are difficult to quantify. About 7 PI are working on ARGO data for scientific applications. ARGO data are not assimilated into operational models, but at the ZMAW they are assimilated into the ECCO model. There are no standard products generated from ARGO data, so far only maps for scientific purposes.

2. Delayed mode QC

Each of the four groups handles their own data for delayed mode QC and is responsible for providing these data to the GDACs. Delayed mode QC is generally done on a half-yearly basis. Within the joint German-ARGO project (AWI, BSH, IFM_GEOMAR) extensive collaboration exists and several meetings have dealt with the issue of delayed mode QC.

AWI presently operates 26 active floats, 22 of which are under ice-covered regions and are not communicating with the satellites at the moment. Delayed mode procedures have been set-up at the AWI and controlled data have been sent to Coriolis since the beginning of 2006. Due to the lack of data in the austral winter season, it would be preferable to perform the delayed mode QC on yearly intervals to get a better view of the salinity trends. The historical data base is poor in the southern Ocean and fronts in the ACC are also an issue.

BSH presently operates 49 active floats. Delayed mode procedures have been set-up at the BSH on a half-yearly basis and controlled data have been send to Coriolis twice since the beginning of 2006. The data base in the central Atlantic is in general good and no major problems have been encountered. The project is considered to be pre-operational.

The IFM-GEOMAR presently operates 39 active floats. Delayed mode procedures have been set-up at the IFM-GEOMAR on a half-yearly basis and controlled data from the Atlantic have been send to Coriolis since the beginning of 2006. There was a delay in processing 4 floats in the Indian Ocean, but they are currently being processed. Apart from on-going minor software adjustments, the project is considered to be pre-operational.

The IFM-HH presently operates 22 active floats. The programs for delayed mode QC have been implemented and DMQC will be performed on a half-yearly basis. The operational area is the Nordic Sea. Problems with the boundary currents are envisioned.

3. GDAC Functions

None

4. Regional Centre Functions

None

Argo National Data Management Report (2006) – India

1. Status

- **Data acquired from floats**
  India had deployed 118 floats so far. Out of these 78 floats are active. All the active floats data are processed and sent to GDAC.

- **Data issued to GTS**
  Presently we do not have GTS access and hence we could not send Indian floats data to GTS. Up on our request CLS ARGOS is still continue to Indian floats data in TESAC format to GTS.

- **Data issued to GDACs after real-time QC**
  All the active floats (78) data are subject to real time quality control and are being sent to GDAC with in 24 hrs of acquisition.

- **Data issued for delayed QC**
  Out of 118 floats deployed, 93 floats are eligible for DMQC. 59 floats are subjected to DMQC.

- **Delayed data sent to GDACs**
  Out of 59 floats, only 357 profiles from 4 floats are uploaded to GDAC. The reason for not uploading is mentioned in item.2.

- **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. Apart from the floats deployed by India, data from floats deployed by other nations in the Indian Ocean are received from the Argo Mirror and made available in the INCOIS website. User can download the data based on his requirement.

- **Statistics of Argo data usage**
  Argo data is widely put to use by various Organisations/ Universities/ Departments. Indian Meteorological Department (IMD) is using Argo data for their operational purpose. Scientists, Students and Researchers from INCOIS, NIO, SAC, C-MMACS, NRSA, IITM, NCMRWF, IISc etc are using Argo data in various analysis. Many paper based on Argo data were also published in reputed journals.

  INCOIS Argo web page statistics (for the past one year) are as shown below

Page	Hits	Visitors
Argo Web-GIS	3141	402
Data download	6317	114
Live Access Server	230	32
Argo products	440	38

- **Products generated from Argo data**
  Many products are generated using Argo temperature and salinity data. The Argo T/S data are first objectively analysed and this gridded output is used in deriving value added products. More on this can be see in the RDAC functions.

2. Delayed Mode QC

INCOIS started generating and uploading D files to GDAC form July 2006, and as of today, 357 profiles belonging to 4 floats have been uploaded. John Gilson's GUI is extensively used at different stages of DMQC. It is appreciated that he extended whole hearted support in setting up the GUI and slight modifications required due to platform change. So far 59 floats have been subjected to DMQC; But D files for all could not be uploaded due to some of the four issues listed below. These issues were raised at DMQC-2 for expert advice: and solutions were suggested for some of them.

1. Handling cases of PNP profiles
2. Handling cases of Thermal inversions
3. Handling cases of wrong positions,
4. Handling near shelf cases,
5. Handling cases of missing single and multiple profiles

As per the update form the DMQC-2, more files will be uploaded in near future.

As per suggestions form DMQC-2 Thermal lag correction and monitoring of pressure sensor drift will be taken up in near future. Expansion of Reference data sets and experiments with incorporation of good Argo data in to reference data base is to be continued as per guidelines provided at DMQC-2. Considering the volume of work involved additional manpower will be employed for realizing the timely progress in DMQC.

3. GDAC Functions

INCOIS is not operating as a GDAC.

4. Regional Centre Functions

- Acquisition of Argo data from GDAC corresponding to floats other than deployed by India and made them available on INCOIS web site.
- Delayed Mode Quality Control
  (Refer 2.0 above)
- Data from the Indian Ocean regions are gridded into 3x3 box for monthly and 10 day intervals. These gridded data sets are made available through Live Access Server (LAS). Users can view and download data/images in their desired format.
- Data Sets (CTD, XBT) have been provided to CORIOLIS, IFREMER for integration into the Reference Data Sets, used for Delayed Mode Quality Control.
- Value added products:
  Two types of products are currently being made available to various user from INCOIS web site. They are:
  (i) Time series plots corresponding to each float (only for Indian floats). This include the following plots:

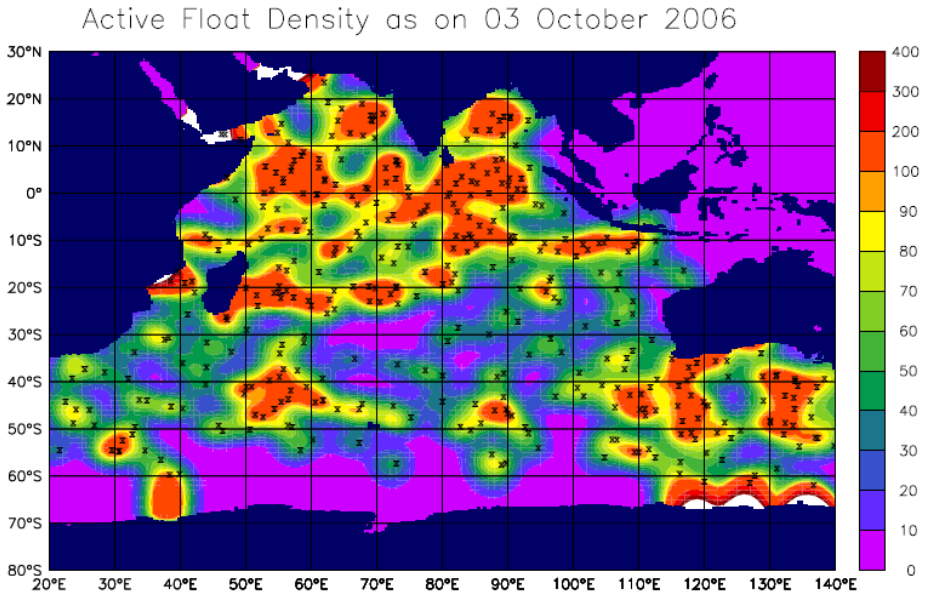
- Water fall plots
- Surface pressure
- Bottom most pressure
- Surface temperature
- Bottom most temperature
- Surface salinity
- Bottom most salinity
- Trajectory of float
- T/S plots.

(ii) Spatial plots using the objectively analysed from all the Argo floats data deployed in the Indian Ocean. This includes:

- Temperature (at 0, 75, 100, 200, 500, 1000 meters)
- Salinity (at 0, 75, 100, 200, 500, 1000 meters)
- Geostrophic Currents (at 0, 75, 100, 200, 500, 1000 meters)
- Mixed Layer Depth, Isothermal Layer Depth
- Heat Content up to 300 mts
- Depth of 20 deg and 26 deg isotherms

These valued added products can be obtained from the following link http://www.incois.gov.in/Incois/argo/products/argo_frames.html

- Regional Co-ordination for Argo floats deployment plan for Indian Ocean. The float density in Indian Ocean as on Oct 03, 2006 is shown below.



Argo National Data Management Report 2006, Japan

1. Status

The Japan DAC, Japan Meteorological Agency, has processed data from 583 Argo and Argo-equivalent floats including 359 active floats as of October 3, 2006. There are nine Japanese PIs who agreed to provide data to the international Argo data management. The DAC is acquiring ARGOS messages from all the active floats in real-time. All profiles from those floats are transmitted to GDACs in netCDF format and issued to GTS using TESAC code after real-time QC on an operational basis. JMA will start issuing Argo BUFR messages when the BUFR common sequence descriptor for Argo (315003) and the corresponding template come into force.

JAMSTEC applies delayed QC to Japanese Argo data. 12026 delayed profiles from 281 floats have been sent to GDACs as of October 3, 2006.
JMA and JAMSTEC established Argo web sites. The former shows global float coverage, global profiles based on GTS TESAC messages, and status of Japanese floats (http://argo.kishou.go.jp/). JAMSTEC shows the tables, trajectories and the profiles of all floats that it is responsible for and provides search function for the profiles (http://www.jamstec.go.jp/ARGO/). JAMSTEC also provides GDAC mirror site (ftp://ftp.jamstec.go.jp/pub/argo/) and Pacific Argo Regional Center web site (http://www.jamstec.go.jp/ARGORC/).

JMA uses Argo data for its operational oceanographic and climate prediction models. Surface temperature (observations at the shallowest level) data are useful sources of for its operational SST analysis and ground truth for satellite observations. Oceanographic products such as current, subsurface and surface temperature maps are operationally provided on the JMA web site. JAMSTEC generates oceanographic products such as temperature, salinity, density, dynamic height anomaly and relative geostrophic current by using an Optimal Interpolation technique. JAMSTEC also provided mixed layer properties, statistics on the technical side of a profiling float, and some scientific statistics on auto-correlation coefficient of temperature and salinity profiles.

2. Status of the ADMT6 actions

- To reduce the backlog of GTS-only files (action #5): done
- Properly defined sensor information in metadata files (action #10): Sensor information is not sufficient 18 files among 583 as of October 6, 2006. The DAC is taking action.
- Real-time implementation of last constant offset (action #18): Operational communication to share the constant offset between the DM operator and DAC is being established.
- Time differences between GTS and GDAC profiles (action #32): in some cases, the first time and position message is available after other time and position messages. There is no way to improve the situation at the DAC side for these cases.

3. Delayed Mode QC

Since the last ADM meeting in Tokyo in November 2005, JAMSTEC improved the efficiency of DMQC automatic process and has greatly increased the number of the submitted D-netCDF file from 768 to 12026.
JAMSTEC compiled historical data sets such as SeHyD (Selected Hydrographic Dataset) for the Pacific Ocean and IOHB (Indian Ocean HydroBase) for the Indian Ocean and makes salinity adjustment by WJO method using these reference data sets.
Regarding all APEX floats, JAMSTEC corrects pressure using surface pressure and recalculates salinity.

4. Regional Center Functions

The Pacific Argo Regional Center (PARC) is cooperatively run by JAMSTEC, IPRC, and CSIRO. A local web site for the PARC was established by IPRC in November 2005. JAMSTEC provides this site a float location map, a float status table, T and S anomalies of all floats and the OI products of the Pacific Ocean. JAMSTEC is planning to publish SeHyD and IOHB and other QC related information (e.g. a diagnostic plot) on this website.

Argo National Data Management Report of Korea

1. Status

- Data acquired from floats

Deployment of Korea Argo floats

Year	Organization	Number of deployed Argo floats (GTS)				Total
		East/Japan Sea	Northwest Pacific	Antarctic Ocean & others	subtotal	
2001	KMA	3(0)	7(0)		10(0)	18(3)
	KORDI	5(3)	1(0)	2(0)	8(3)	
2002	KMA	5(2)	10(1)		15(3)	25(6)
	KORDI	6(3)		4(0)	10(3)	
2003	KMA	5(3)	10(2)		15(5)	33(19)
	KORDI	8(6)		10(8)	18(14)	
2004	KMA	5(5)	10(10)		15(15)	38(30)
	KORDI	13(7)		10(8)	23(15)	
2005	KMA	5(5)	10(10)		15(15)	33(33)
	KORDI	10(10)		8(8)	18(18)	
2006	KMA	5(5)	10(10)		15(15)	33(33)
	KORDI	13(13)		5(5)	18(18)	
Total		83(62)	58(33)	39(29)	**KMA 85(53) KORDI 95(71)**	180(124)

※ KMA: Korea Meteorological Administration

KORDI: Korea Ocean Research and Development Institute

- Data issued to GTS

Within 24 hours of data collection, the deployment all data of KMA Argo floats are issued to GTS by KMA in Korea.

Within 24 hours of data collection, the deployment all data of KORDI Argo floats are issued to GTS by CLS in France.

- Data issued to GDACs after real-time QC

RTQC system at KORDI is so flexible that it can handle data from different type of profilers. Prior to communicating the Argo datasets to GDAC, the KORDI ARGO dataset is processed by CLS, France for dissemination to GDAC.

KMA RTQC system produces profile data, metadata, technical data and trajectory data with TESAC and NetCDF format from raw data with 32byte hexa

format in real time. Those 4 types of data are transmitted into GTS network and GDAC. The RTQC system is being upgraded by following the suggestions in the 6th ADM and Argo quality control manual ver. 2.1 and user's manual ver. 2.1.

- Data issued for delayed QC

The KODC has been working for delayed QC, following WJO_BS method. KORDI has also been developing delayed mode QC schemes and salinity calibration methods for data obtained in the East/Japan Sea.

- Delayed data sent to GDACs

Delayed data after DMQC to GDACs will be sent in near future.

- Web pages

The KMA has operated and upgraded Argo web page, which consists of RTQC data linked to KMA (http://argo.metri.re.kr). The KODC has operated oceanographic information system for pelagic fishery based on Argo data. Its webpage is http://kodis.nfrdi.re.kr/argo. KORDI has also operated Argo webpage (http://argo.kordi.re.kr).

- Statistics of Argo data usage

National Pis are Dr. Yong-Hoon Youn from KMA and Dr. Moon-Sik SUK from KORDI. Many scientists have applied the ARGO data to the researches and operational oceanography. For example, data assimilation, circulation of the East/Japan Sea, and operation of oceanographic information system for pelagic fishery

- Products generated from Argo data …

Park, Y.-G., K.-H. Oh, K.-I. Chang, and M.-S. Suk, 2004: Intermediate level circulation of the southwestern part of the East/Japan Sea estimated from autonomous isobaric profiling floats, Geophys. Res. Lett., 31, L13213, doi:10.1029/2004GL020424

Oh, K.-H., Y.-G. Park, and M.-S. Suk, 2004: Accuracy and stability of temperature and salinity obtained from ARGO floats, [the Sea] J. of Korean Society of Oceanography *(in Korean) (accepted)*

Park, Y.-G., K.-H. Oh, K.-I. Chang, and M.-S. Suk, 2003: Intermediate level circulation of the southwestern part of the East/Japan, 1st Argo Science Workshop, 12-14, Nov. 2003, Tokyo.

Yong-Hoon Youn, Pankajakshan Thasathil, Homan Lee, 2003: Are the Older ARGO-Floats More Vulnerable to Fouling and Associated Salinity Drift Compared to that of Later Deployments?, 1st Argo Science Workshop, 12-14, Nov. 2003, Tokyo.

Homan Lee, Tae-Hee Kim, Jang-Won Seo, and Yong-Hoon Youn, 2003: Mean flow and variability at the Upper Portion of the East Sea Proper Water in the southwestern East Sea with APEX Floats. 1st Argo Science Workshop, 12-14, Nov. 2003, Tokyo.

You-Soon Chang, Homan Lee, Jang-Won Seo, and Yong-Hoon Youn, 2003: Error analysis with Argo data : On the ability of an OGCM to simulate the temperature and salinity in the western Pacific. 1st Argo Science Workshop, 12-14, Nov. 2003, Tokyo.

Yong-Hoon Youn, Homan Lee, You-Soon Chang, and Pankajakshan Thadathil, 2005: Validation of salinity data from ARGO floats: comparison between the older ARGO floats and that of later deployments. Journal of Korean Earth Science Society, v26(2), 129-136.

Park, JongJin, Kuh Kim, and William. R. Crawford, 2004, Inertial currents estimated from surface trajectories of ARGO floats. *Geophysical Research Letter,* 31, L13307,doi:10.1029/2004GL020191.

Park, JongJin, K. Kim, and B. A. King, 2004, Global Statistic of Inertial Motions, Geophysical Research Letter, 32, L14612, doi:10.1029/2005GL023258.

You-Soon Chang, Yong-Hoon Youn, 2005, Application of ARGO data. The 3rd Korea-Russia Joint workshop on climate change and variability, June 7-8, 2005, KMA, Korea

Park, JongJin, K. A. Park, K. Kim, and Y. H. Youn, 2005, Upper ocean response to Typhoons and Tropical Storms: Salinity change, AMS annual meeting, Sandiago, USA.

Yong-Hoon Youn, You-Soon Chang, Homan Lee, and Ji-Ho Kim, 2006, ARGO program and data application in METRI/KMA, 2nd Argo Science Workshop, submitted

You-Soon Chang, Chang-Woo Cho, and Yong-Hoon Youn, 2006, Validation of numerical model in the Pacific Ocean with ARGO data, 2nd Argo Science Workshop, submitted.

2. Delayed Mode QC

The PIs are responsible for DM and dissemination of the DMQC data to GDAC under collaborating with the KODC. To carry out DMQC, the KODC has been collecting and analyzing data of oceanographic observations in the East/Japan Sea for a reference dataset. The reference data were obtained from 69 fixed stations bimonthly in the eastern coast of Korea since 1994 by NFRDI in Korea and 284 stations in the East/Japan Sea in 1999 and 2000 by the office of Naval Research in USA.

The program using WJO_BS method has been reinstalled and applied to test calibration for a number of floats in the East/Japan Sea with new reference dataset by the KODC. Its results are analyzing in detail.

Argo National Data Management Report For UK

1. Status

- *Data acquired from floats* - Data from all UK floats are received at BODC by automatic download from the CLS database every 12 hours. We plan to change the frequency to every 6 hours.
- *Data issued to GTS* - Data from all UK floats are sent to the GTS every 12 hours. There is a problem of duplicates to fix, which we plan to fix at the beginning of 2007.
- *Data issued to GDACs after real-time QC* - All UK data received at BODC are passed through the agreed real-time quality control tests within 3 hours of the data arriving at BODC. All data that have been processed at BODC are queued for transferred to both GDACs which occurs twice a day. Any file that fails to be transferred is queued for the next transfer attempt the next day.
- *Data issued for delayed QC* - All UK float data are ready to be subjected to delayed mode quality control procedures.
- *Delayed data sent to GDACs* – The WJO software is being used at BODC and work on sending delayed-mode data to the GDACs is ongoing.
- *Web pages* - BODC hosts the main data information and access pages. These pages include a list of the current status of all UK floats deployed, automatic request system for all UK float data, links to both GDACs and other Argo related sites and an interactive map giving information on last known positions, deployment positions and direct links to profile plots of the last profile reported by every float. Other information about Argo is also available.
- *Statistics of Argo data usage* – During the last year, UK metadata, trajectory and profile files have been requested by users through BODC website. Metadata files have been provided to University of Valencia (Spain), NUIG (Ireland), NOCS (UK) and University of Washington (US). Trajectory files have been requested by NUIG (Ireland) and JAEA (Japan). Profile files have been requested by NUIG (Ireland), NOCS (UK) and University of Exeter (UK).
- *Products generated from Argo data* - Data from all Argo floats are assimilated in to the Forecasting Ocean Assimilation Model (FOAM) run at the Met Office.

2. Delayed Mode QC

Due to staff absences, resignations and resources, progress on delayed mode processing at BODC has been quite slow. However, during summer 2006, a temporary member of staff, Andy Dale worked on the delayed mode processing for 3 months and made some progress on this. During this time 44 floats were processed which is a significant proportion of the total UK floats. These floats were mainly from the Indian Ocean and South Atlantic with a few from North Atlantic and Southern Ocean. The decisions reached have been checked and

agreed by the PI, Brian King and are now ready to be submitted to the GDACs. However, due to some problems with our NetCDF generation code, these profiles have not yet been submitted as D files. This is currently a main priority and it is hoped that progress will be made and the D mode files will be generated and submitted before the end of 2006.

The D mode profiles previously submitted in 2005 have some problems that we are aware of (e.g. PRES_ADJUSTED and TEMP_ADJUSTED are not filled) so these will also be resubmitted.

Around 70 floats are currently outstanding and awaiting delayed mode processing. This doesn't include floats less than one year old or the 18 North Indian Ocean floats. The North Indian Ocean floats have been set a low priority for now as it is hoped we will collaborate with INCOIS on these in the future. The new reference database being put together by Coriolis will be of great benefit when processing our Southern Ocean floats.

We are currently using the WJO software and plan on implementing the new OW software in the coming year. SURFACE_PRESSURE is inspected at BODC, but no pressure adjustment is made at present. We do not apply a cell thermal mass correction in delayed mode yet as we have not fully compiled a comprehensive list of sensor types and operation.

The date at which we would be in a position of continuously staying up to date with the delayed mode processing is uncertain at present and is dependent on our resources.

4. Regional Centre Functions

BODC hosts the main data information pages. These pages contain Forecast Ocean Assimilation Model (potential temperature, salinity and velocity at five metres and 995.5 m) and an interactive map giving information on last known positions, deployment positions and direct links to both GDACs ftp sites.

Drake Passage cruise CTD data have been collected. They will be sent to CCHDO as soon as they have passed BODC quality controls.

Argo National Data Management Report of United States

November 1st 2005 - October 12th 2006

1. Status

- **Data acquired from floats:**

a- November 2005 to October 2006

Floats deployed:	*412*
Floats failed on launch:	*7*
Floats reporting:	*1157*
Profiles quality controled:	*46,232*

b- 1997 to October 2006

Floats deployed:	*1895*
Floats failed on launch:	*40*
No reports more than 30 days, considered inactive:	*698*

- **Data issued to GTS:**

During the reporting period, Service Argos and AOML put *40,528* profiles on GTS.

- **Data issued to GDACs after real-time QC:**

During the reporting period, *46,232* netcdf profiles, technical and trajectories netcdf files and 408 new meta netcdf files have been issued to both GDACs.
Total numbers of netcdf files issused: *139,104.*
In addition all netcdf files were resubmitted after correction of the variable INST_REFERENCE.

- **Data issued for delayed QC:**

Data is provided to the PIs and the delayed mode QC center daily on:
ftp://ftp.aoml.noaa.gov/phod/pub/ARGO_FTP/argo/nc

- **Data sent to GDACs after delayed QC:**

16,353 delay mode profile files have been submitted. 20,570 delay mode profile files have been resubmitted (mostly because of corrections of the variable INST_REFERENCE).

- **Web pages:**

The URL for the US Argo Data Assembly Center is:
http://www.aoml.noaa.gov/phod/ARGO/HomePage/
It provides links to:

- Documentation.
- Operations.
- South Atlantic Regional Data Assembly Center
- FTP Services.
- Related Sites.

- **Products generated from Argo data are available through two web sites:**
  http://www.aoml.noaa.gov/phod/sardac/products/index.php currently shows three products 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.
    - Seasonal climatologies of temperature and salinity (maps, senctions and scatter plots of the profiles, for 30°S-40°S, provided by Ariel Troisi).
    - Maps and cross-sections that depict the annual mean state in the upper ocean.
    - Maps of altimetry and geostrophic currents.

  http://www.aoml.noaa.gov/phod/ARGO/Operations/html/ 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 monthly maps depicting locations of Argo and XBT profiles.

2. Delayed mode QC

Scripps group:

Scripps has prepared and sent to the GDAC 18,316 delayed-mode (Dmode) profile files. In the past year, the number of Dmode files from SIO has increased by 7904 At present, 98% of the SIO files which are eligible for Dmode processing have been completed. We define a cycle as being Dmode eligible if it is older than 12 months. The majority of the remaining 2% are cycles which have become eligible since the last Dmode processing cycle which occurred from April 2006 to July 2006. However, a small number of profiles have been withheld from submission when it is felt that a longer profile record is necessary for the determination of a salinity correction.

In the next year approximately 10,900 additional SIO measured Argo profiles will become eligible for Dmode. This increase is primarily caused by the larger number of floats in the SIO Argo array. We expect to be able to complete Dmode processing for these increased numbers of profiles as they become eligible.

SIO is in the process of testing the new OW salinity adjustment tool presented at the last DMQC Workshop in October 2006. It is expected that the new OW tool will be applied to newer SIO floats that have not previously entered the Dmode process. Floats with previous Dmode work completed will continue to use the older WJO tool which has been found to be effective in the areas with SIO floats.

University of Washington group:

As of Oct 06, UW delayed-mode qc is 55% complete. Data sparse regions (e.g. Southern Ocean & South Indian Ocean) remain a problem.The remaining 50% is awaiting the new OW tool and the new reference database.

PMEL group:

The PMEL Argo group has investigated the sensor response errors (primarily the conductivity cell thermal mass error) and their correction for SBE-41 and SBE-41CP CTDs. A manuscript describing this analysis (Johnson et al., 2006) has now been accepted for publication. A matlab function for performing the conductivity cell thermal mass correction is available upon request from Gregory.C.Johnson@noaa.gov. The correction has been discussed at a number of Argo meetings, including ADMT-6, AST-7, and DMQC-2. The correction is now recommended for DMQC, and its possible application in real-time is slated to be discussed again at ADMT-7. In the last year the PMEL Argo group has made significant progress on DMQC of PMEL Argo and PMEL Argo equivalent floats. We now have a float DMQC system up and running at PMEL, with a lot of much appreciated help and advice from John Gilson. We have performed DMQC on many floats and forwarded about 5000 D-files to AOML. PMEL has about 5700 profiles that are older than one year, so we are currently around 700 profiles behind our target. We have been notified of some minor glitches in very small fraction of the PMEL-generated D-files. We need to investigate these glitches and fix them. In addition, we are going to modify our processing slightly for subsequent DMQC runs based on information learned from participating in the DMQC-2 workshop. Our float DMQC procedure currently consists of the following steps:

1. Automated correction of any pressure drifts and the effect of these pressure drifts on salinity.
2. Automated correction of conductivity cell thermal lag errors.
3. Visual inspection and modification of quality control flags for adjusted pressure, temperature, and salinity using the SIO GUI.
4. Running the WJO version 2.0 system and adjusting run parameters to get appropriate recommended salinity adjustments.
5. Accepting or rejecting the WJO recommendations on the basis of comparison with nearly historical and Argo float profiles using the SIO GUI.

Reference:

Johnson, G. C., J. M. Toole, and N. G. Larson. 2006. Sensor corrections for Sea-Bird SBE-41CP and SBE-41 CTDs. Journal of Atmospheric and Oceanic Technology, accepted.

WHOI group:

Spent a lot of time developing the new OW tool. Submitted the first set of Dmode data.

3. RDAC

The South Atlantic Argo Regional Data Assembly Center (SARDAC) is coordinating the effort of countries with interest in the Atlantic from 20°N to 40°S.
The web site for the South Atlantic Regional Data Assembly 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. Work is done on the final stage of the Argo delayed-mode quality control.

Deployment opertunities provided by countries participating in SARDAC 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 and Brazil).

Training and education: A workshop in Ghana will take place in December 5-7, 2006 to address issues relating to regional capacity to use newly available Argo float technology to monitor, predict and mitigate the adverse impacts of variations in ocean temperatures, salinity and currents on the Atlantic countries of Africa (Morocco south to South Africa).

Specifically, the workshop will:

- Address the integration of Argo data with other satellite and in-situ observations to fully utilize the ocean observing system
- Train participants from 10 or more western African countries in Argo float technology and its application to monitor conditions in the eastern Atlantic
- Train participants in data management, quality control and reporting to international Argo standards
- Review the availability of temperature and salinity profile data for ARGO calibration and QC purposes
- Encourage data collection and collation (SST, SSS, T and S profile data) through guidance from regional center and provision of data products.
- Demonstrate tools for the integration of SST, SSS, T and S profile and surface current from Argo data and other in situ (e.g., .XBT, CTD) and satellite (e.g., altimetry, SST, ocean color) data collected in the region to generate operational data products,
- Enhance both human and infrastructure capacity of local scientists in operational oceanography
- Provide inputs to policy makers with respect to coastal and shelf sea management in the region
- Assess capacity needs and assist with capacity building (including cross-training and technology transfer).
- Make recommendations to regional operational centers in Africa (meteorology and oceanography) about applications of Argo data combined with other oceanographic observations to climate variability and change, climate prediction and oceanic analyses (e.g., for Red Tide forecasts)
- Targeted towards scientists at operational centers and relevant research institutions in East and southern Africa.

argo data management

Argo data management
October 27th, 2006 version 1.3
Ref : cordo/dti-rap/06-117
Thierry Carval

ARGO DATA MANAGEMENT REPORT
FRENCH GDAC

Introduction

This document is the annual report of the French Argo Global Data Assembly Centre (GDAC) for 2006.
The French GDAC is supported by the Coriolis project, a joint project for operational oceanography.

Argo GDAC Functions

National centres reporting to you

Currently, 9 national DACs submit regularly data to the French GDAC.

The additional GTS DAC contains all the vertical profiles from floats that are not handled by a national DAC. These data come from GTS and GTSPP projects. The GTS profiles are quality controlled by the French DAC (Coriolis).

On October 24th, the following files were available from the GDAC FTP site :

- AOML, USA
  - File types: meta-data, trajectory, technical and profile
  - 1909 meta-data files accepted
  - 120510 profile files accepted including 36824 delayed mode profiles
  - 1854 trajectory files accepted
  - 1406 technical data files accepted
- BODC, United Kingdom
  - File types: meta-data, trajectory and profile
  - 204 meta-data files accepted
  - 12274 profile files accepted, including 396 delayed mode profiles
  - 191 trajectory files accepted
  - 0 technical data files accepted
- Coriolis : Denmark, France, Germany, Italy, Netherland, Norway, Spain
  - File types: meta-data, trajectory, profile and technical
  - 680 meta-data files accepted
  - 42342 profile files accepted, including 14475 delayed mode profiles
  - 674 trajectory files accepted
  - 532 technical data files accepted
- CSIO, China (HZ)
  - File types: meta-data, trajectory, technical and profile
  - 32 meta-data files accepted
  - 1227 profile files accepted, including 388 delayed mode profiles
  - 30 trajectory files accepted
  - 24 technical data files accepted
- CSIRO, Australia
  - File types: meta-data, trajectory, profile and technical
  - 121 meta-data files accepted
  - 7094 profile files accepted, including 497 delayed mode profile
  - 31 trajectory files accepted
  - 80 technical data files accepted
- INCOIS, India
  - File types: meta-data, trajectory and profile
  - 123 meta-data files accepted
  - 9381 profile files accepted, including 357 delayed mode profile
  - 114 trajectory files accepted

        - 0 technical data files accepted
    - JMA, Japan
        - File types: meta-data, trajectory, profile and technical
        - 586 meta-data files accepted
        - 41580 profile files accepted, including 12026 delayed mode profiles
        - 585 trajectory files accepted
        - 490 technical data files accepted
    - KMA, Korea
        - File types: meta-data, trajectory, profile and technical
        - 106 meta-data files accepted
        - 4053 profile files accepted, including 0 delayed mode profile
        - 78 trajectory files accepted
        - 53 technical data files accepted
    - MEDS, Canada
        - File types: meta-data, trajectory, technical and profile
        - 197 meta-data files accepted
        - 11753 profile files accepted, including 9015 delayed mode profiles
        - 192 trajectory files accepted
        - 149 technical data files accepted
    - GTS (data collected by GTSPP)
        - File type : meta-data, profile
        - 399 meta-data files accepted
        - 23903 profile files accepted, 0 delayed mode profile

Operations of the ftp server

- Meta-data, profile, trajectory and technical data files are automatically collected from the national DACs ;
- Index files of meta-data, profile and trajectory are daily updated ;
- GDAC ftp address: ftp://ftp.ifremer.fr/ifremer/argo

Operations of the OpenDAP data access

Using OpenDAP, Argo data appears to you as a local file, like a network file system over the web.
http://www.coriolis.eu.org/cdc/opendap-dods_distribution.htm
http://www.ifremer.fr/cgi-bin/nph-dods/data/in-situ/argo

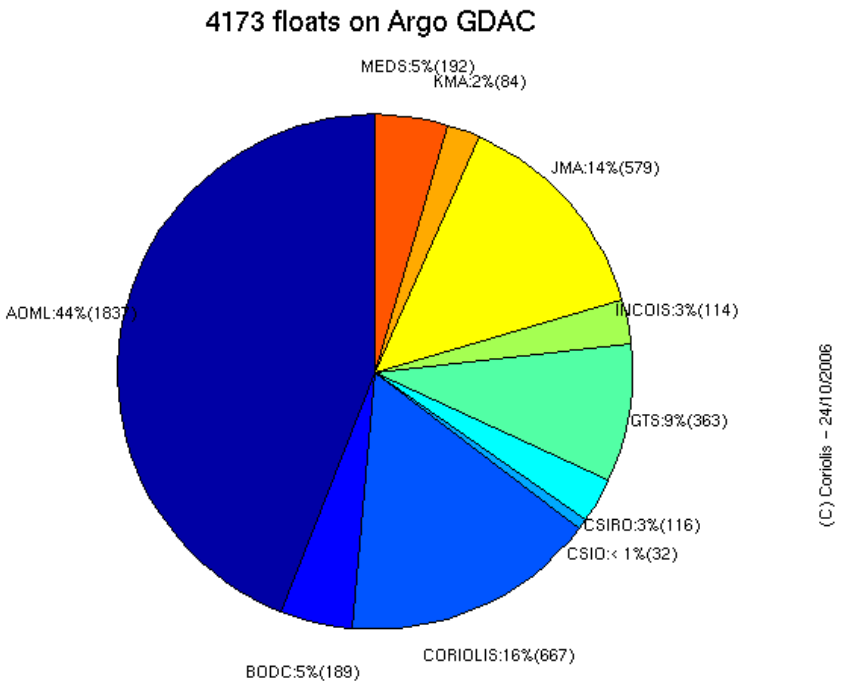
Operations of the www server

Ifremer maintains a web site with real-time and delayed mode data or meta-data collected by GDAC. The following features are available :

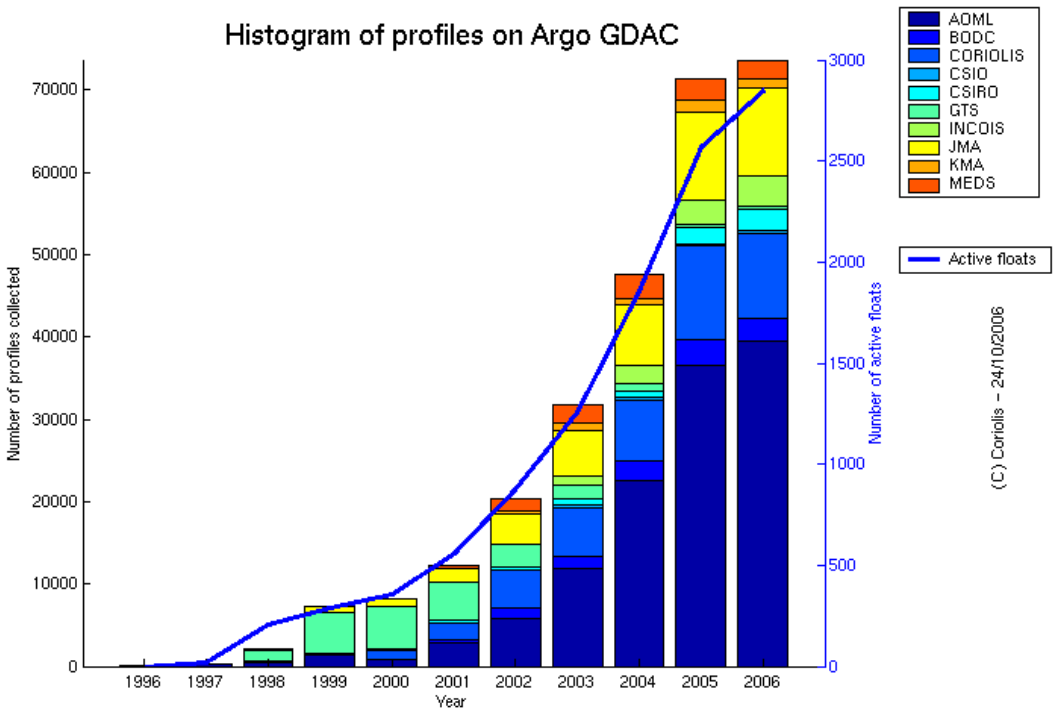
- Display of Argo profiling floats
  - http://www.coriolis.eu.org/cdc/floats/cdcFloats.asp
  - Display all active/old floats per ocean
  - Display technical informations and graphics for floats and measurements
  - Distribute data in Argo NetCdf format or medatlas Ascii format.
- Web data selection interface :
  http://www.coriolis.eu.org/cdc/dataSelection/cdcDataSelections.asp
  - Select data by date, location and meta-data informations
  - Select Argo data and additional profiles from GTSPP program (XBT, CTD, buoys)
  - Distribute data in Argo NetCdf format or medatlas Ascii format.
- Display GDAC monitoring statistics
  http://www.coriolis.eu.org/cdc/argo_gdac_monitoring.htm
- Meta-data files monitoring
  Once a week, a global monitoring of Argo meta-data files is performed.
  - A list of 24 highly desirable meta-data parameters is defined.
  - For each float of each DAC, each missing or incorrect highly desirable parameter is pointed out
  - http://www.coriolis.eu.org/cdc/metadataArgo/cdcMetadataArgos.asp
- Argo data area selection
  The user enters the boundaries of an area. For each float that crossed this area, all profile data are delivered to user.
  - http://www.coriolis.eu.org/cdc/ArgoZonalDataSelection/cdcArgoZonalDataSelections.asp

Data synchronization

- Implemented on 20/02/2003, the synchronization with US-GDAC is performed once a day.
  All meta-data, profile and trajectory files available on US-GDAC and missing or older on Coriolis GDAC are collected.

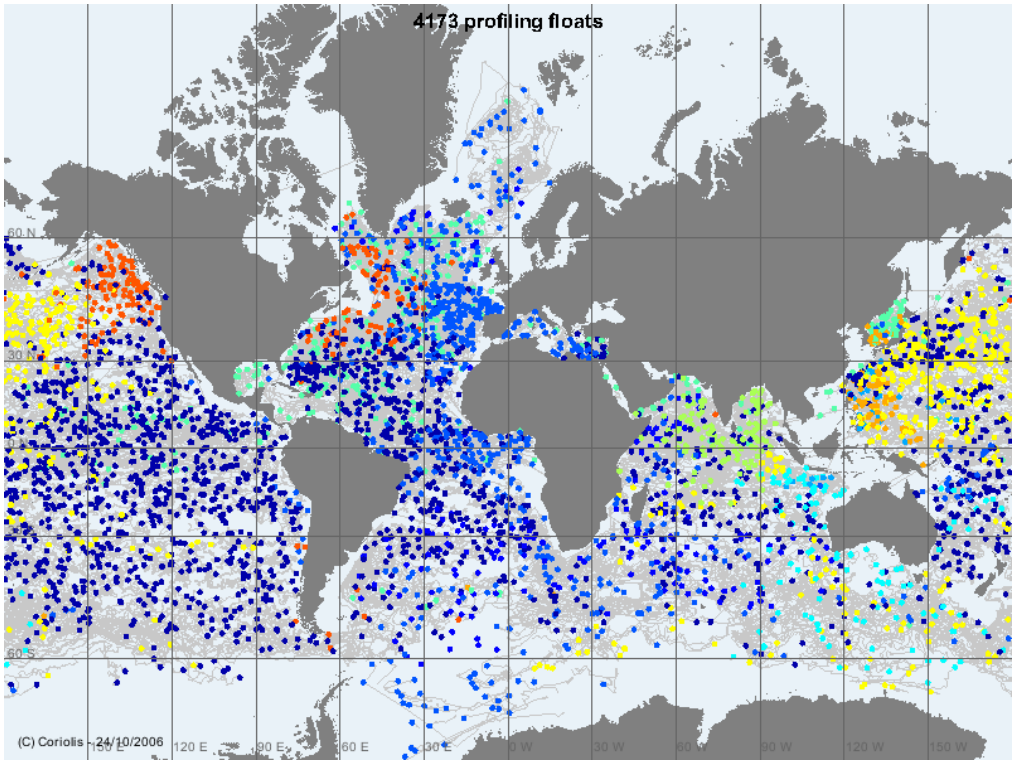


Argo GDAC : floats distribution per DAC in October 2006

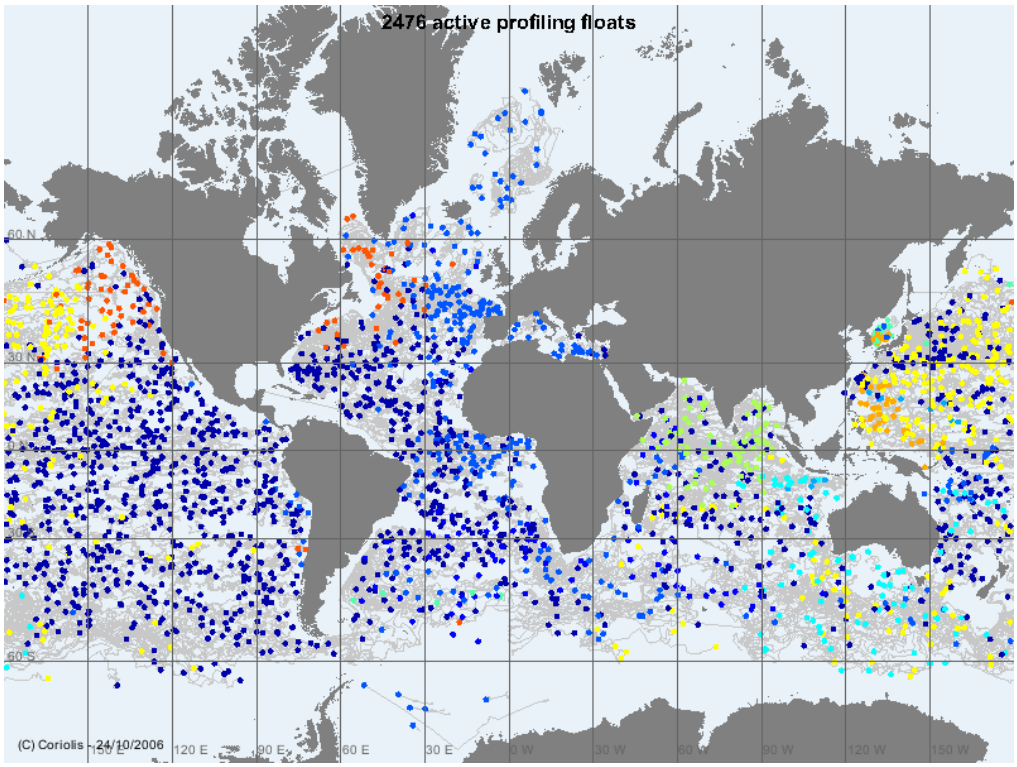


Argo GDAC : profiles distribution per DAC in October 2006

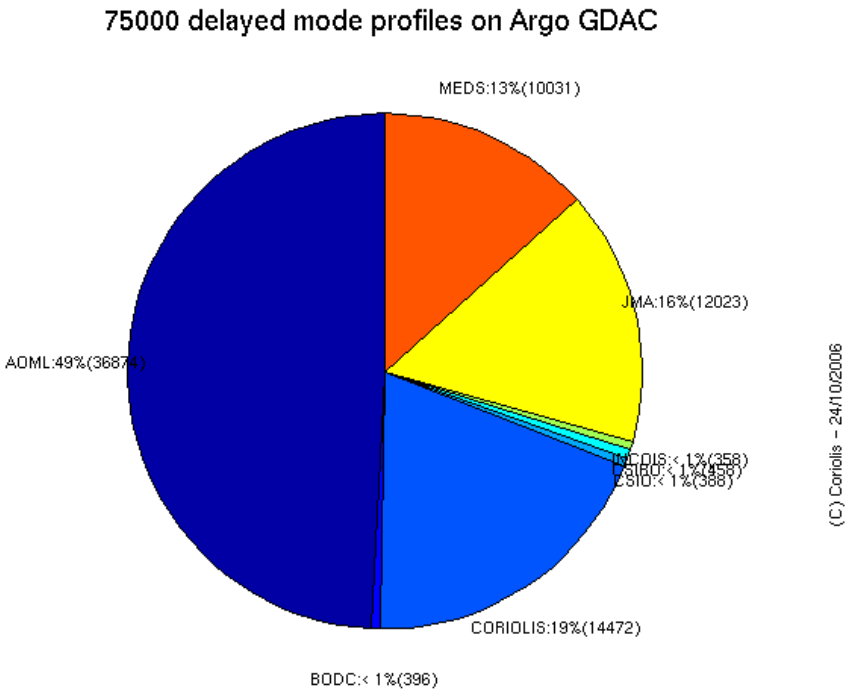
Warning : the blue line displays the total number of active floats during a year. This total is different than the floats active at a particular day.



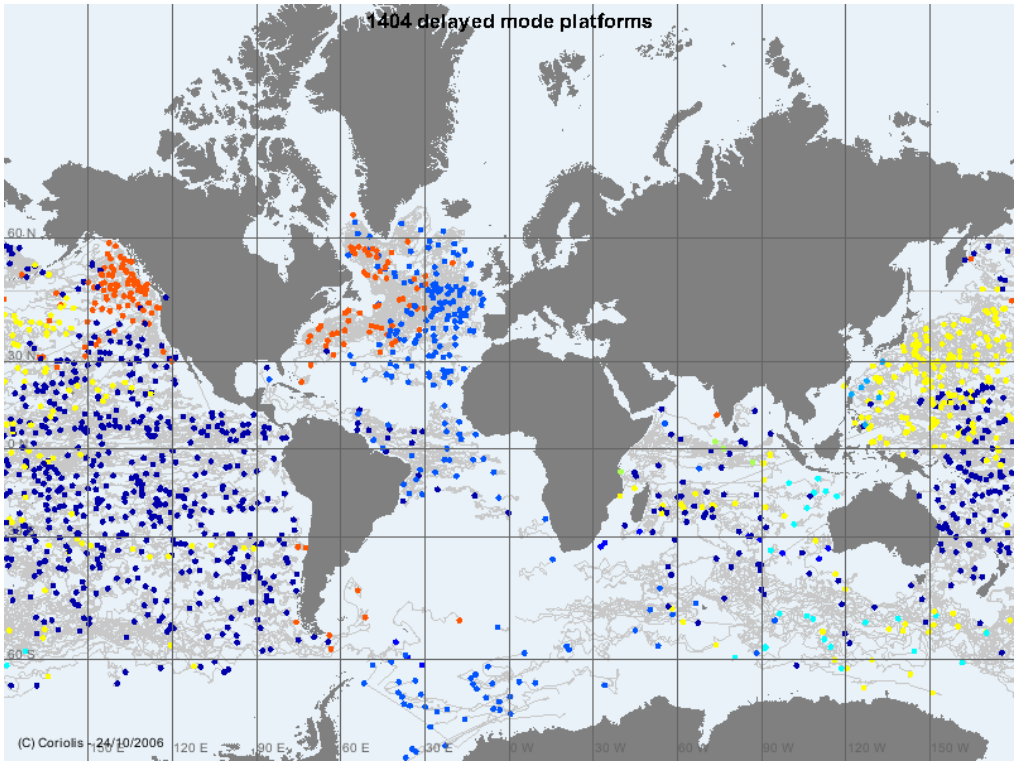
Argo profiling floats availables from GDAC in October 2006
(This map includes active and old floats)



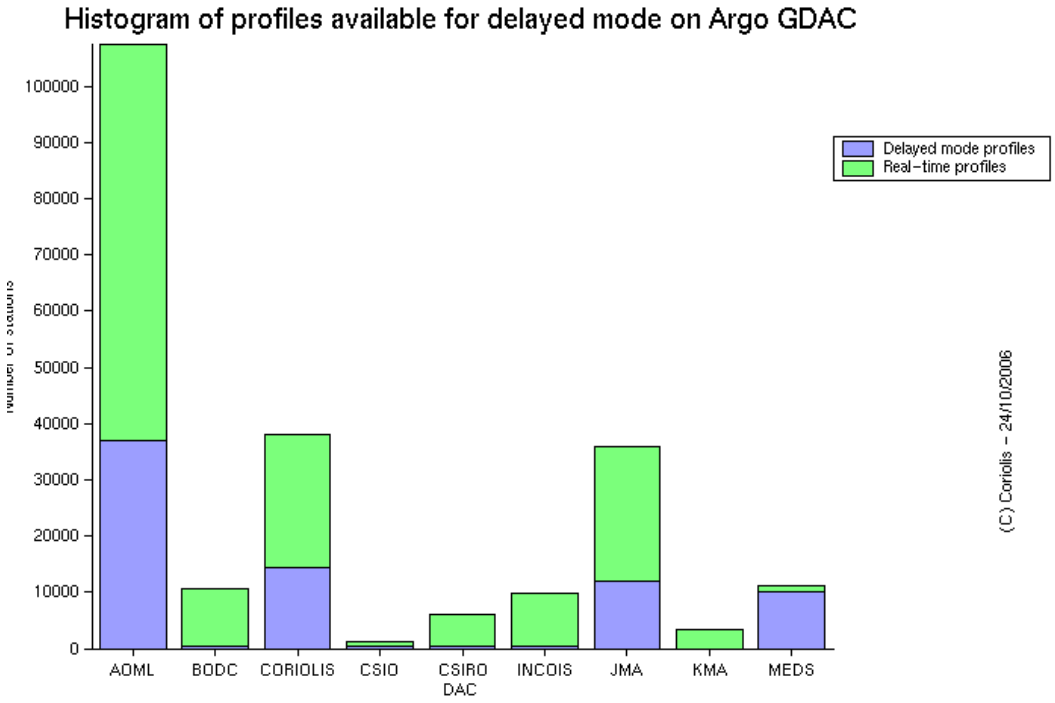
Active Argo profiling floats availables from GDAC in October 2006



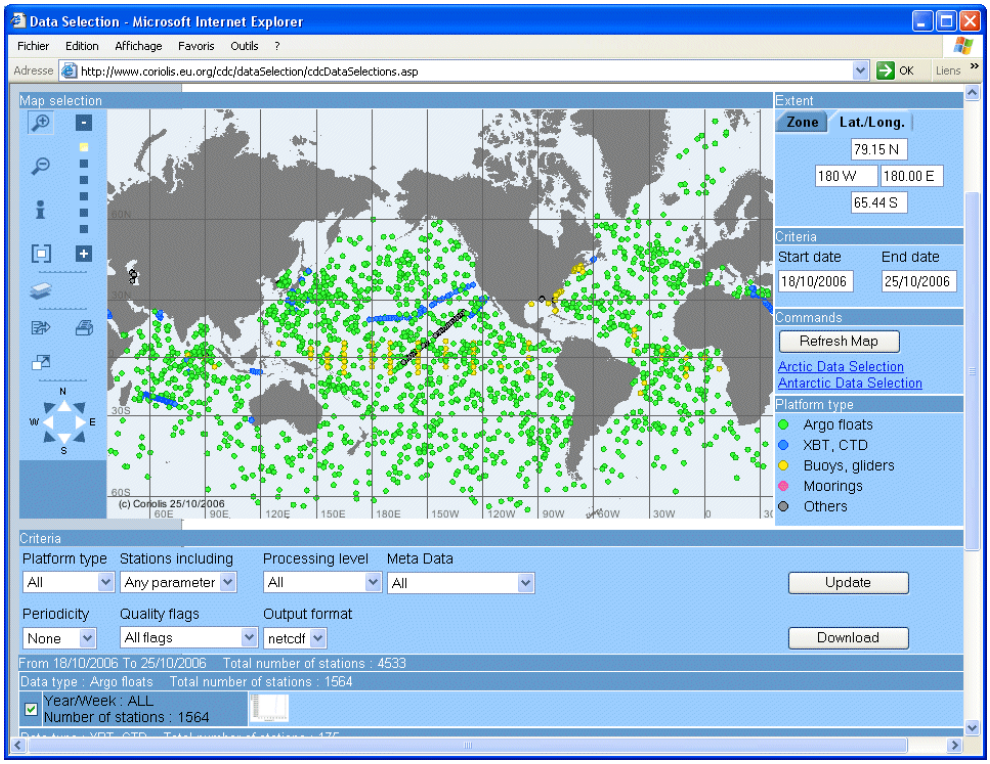
Argo GDAC : delayed-mode profiles distribution per DAC in October 2006



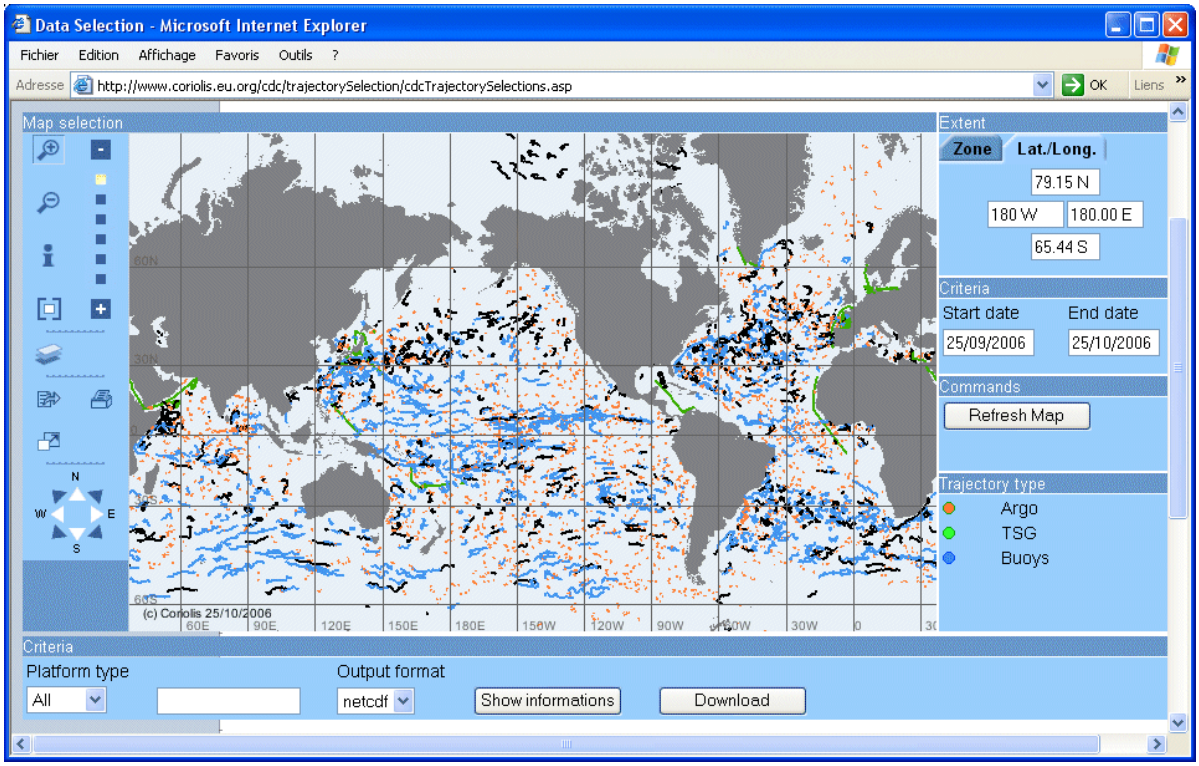
Argo profiling floats with delayed-mode profiles availables from GDAC in October 2006



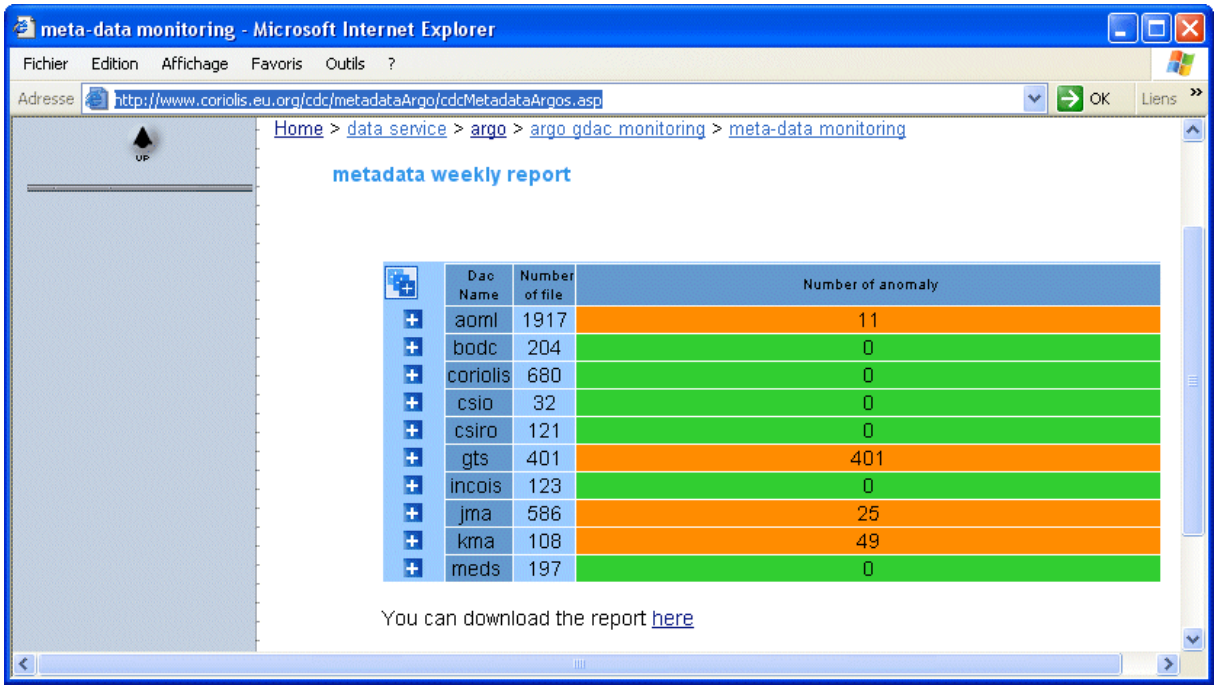
Argo GDAC : delayed-mode profiles available for delayed-mode in October 2006



Argo and other GTSPP profile data available from the data selection interface, for the month of October 2006
(green dots : Argo profiles, blue dots : GTSPP XBT profiles, yellow dots : GTSPP buoys)



Argo and other trajectory data available from the data selection interface, for the month of October 2006
(Orange lines : Argo trajectories, blue lines : DBCP buoy trajectories, green lines : Gosud thermosalinographs)

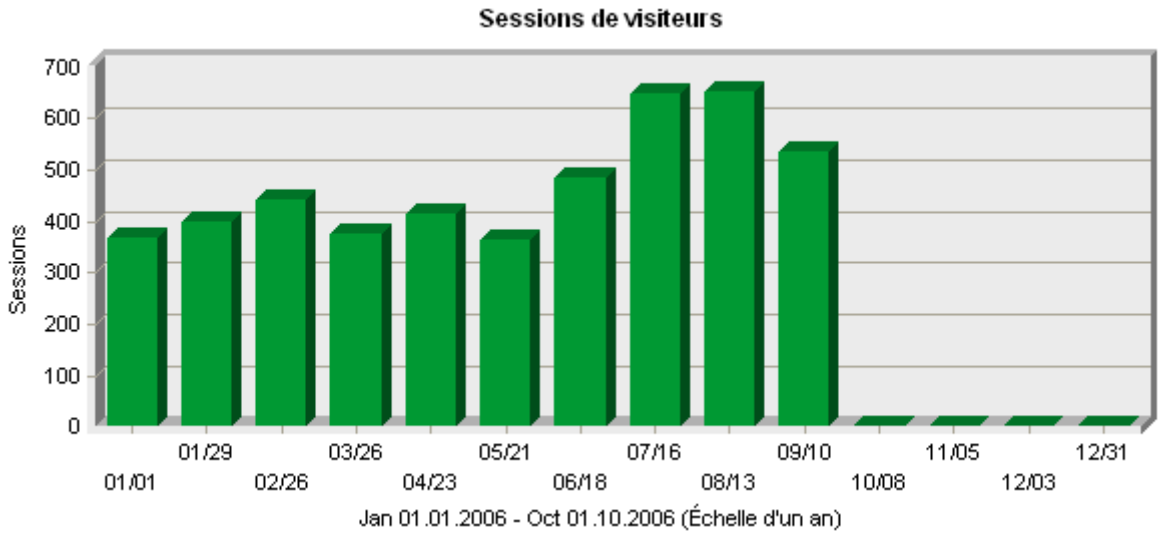


New feature : meta-data files monitoring
A list of 24 highly desirable meta-data parameters is defined. For each float of each DAC, each missing or incorrect highly desirable parameter is pointed out

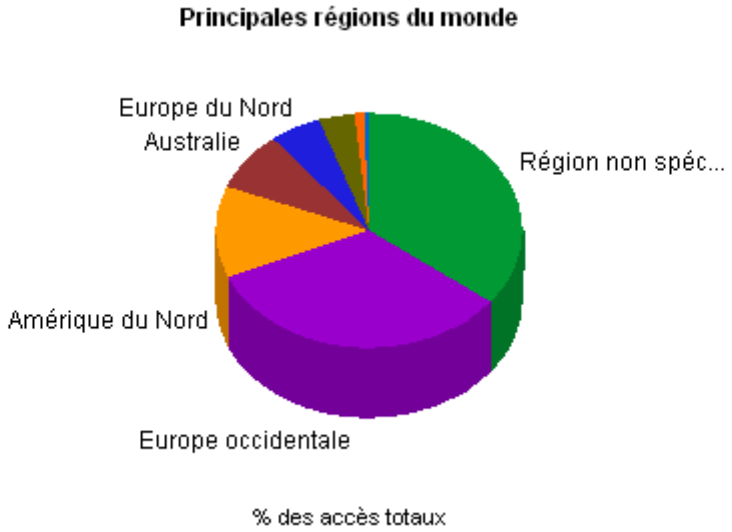
Use statistics from GDAC FTP site

From January to September 2006, the GDAC FTP server recorded

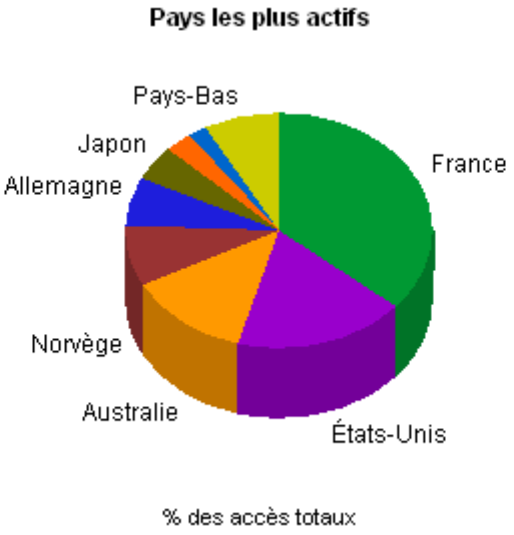
- 4 687 sessions
- 456 different visitors
- 2 425 433 file transfers.
- 8 851 daily file transfers (average)



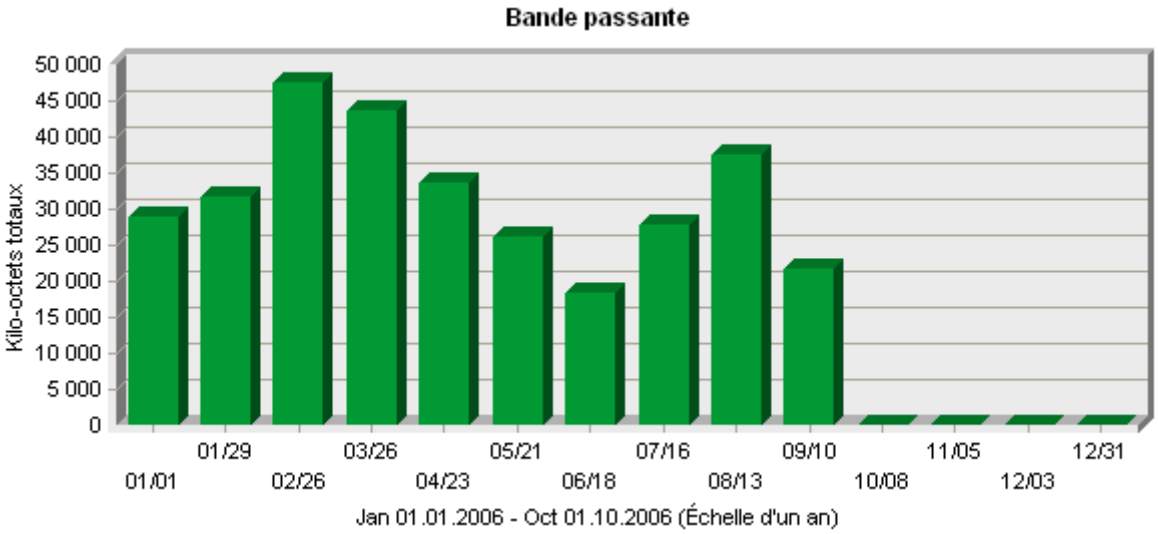
Number of FTP sessions on GDAC, from January to September 2006



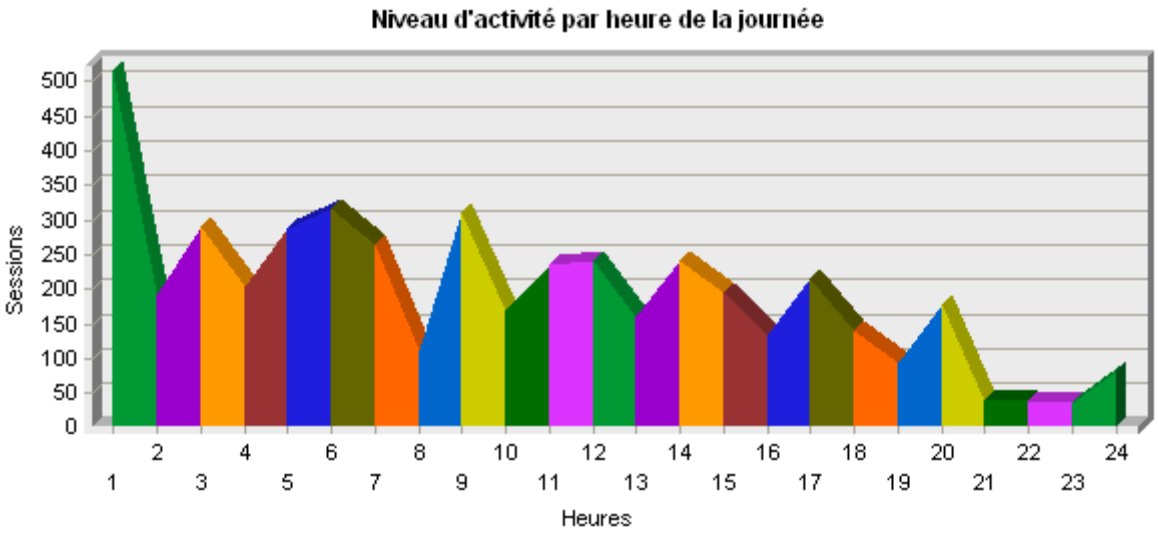
Origin of FTP sessions, main areas, from January to September 2006



Origin of FTP sessions, main countries, from January to September 2006



FTP monthly bandwidth, from January to September 2006



FTP activity level per hour of the day, from January to September 2006

US GDAC Annual Report

ADMT #7

November 2006

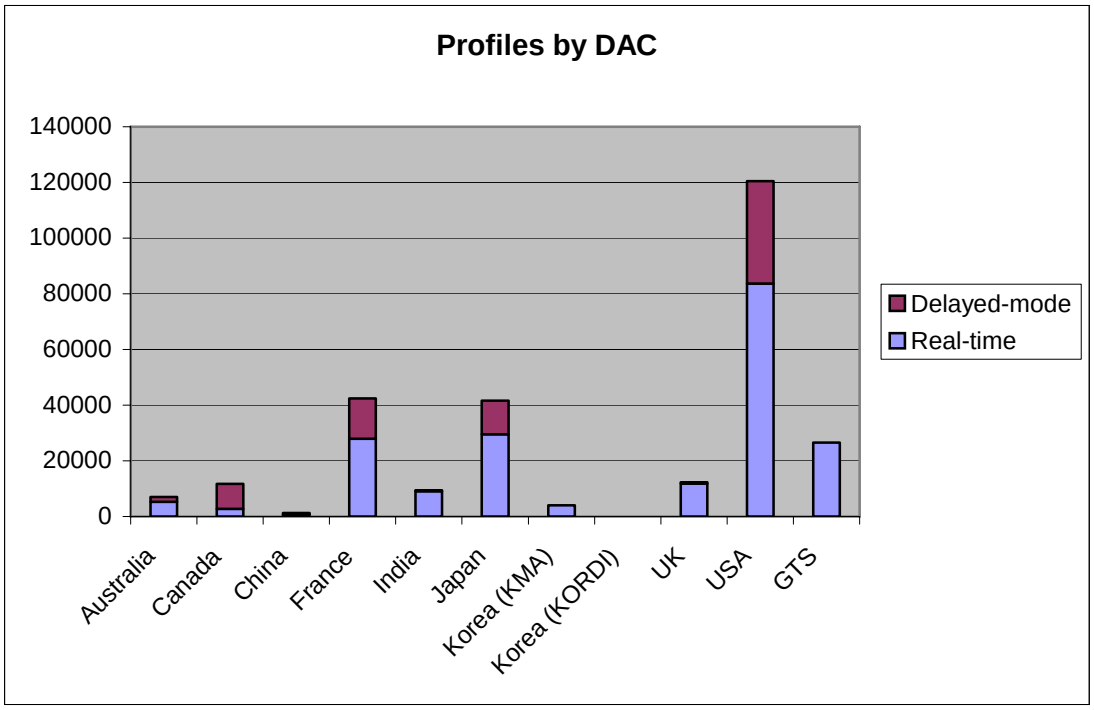
DACs reporting

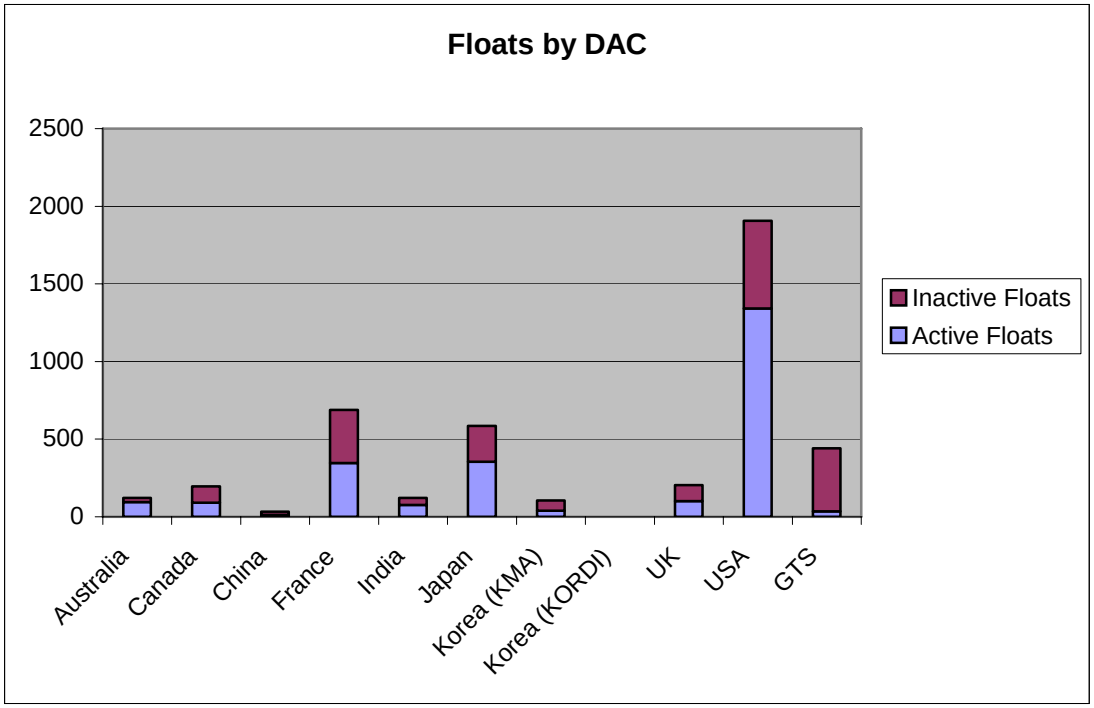
- 10 DACs (plus the GTS) reporting
    - KORDI added in October/November 2006
- 4,402 total floats (2,502 active)
- The GTS DAC now comprises 1.4% of the active floats. This will be further reduced in the coming months as the KORDI DAC becomes fully functional.

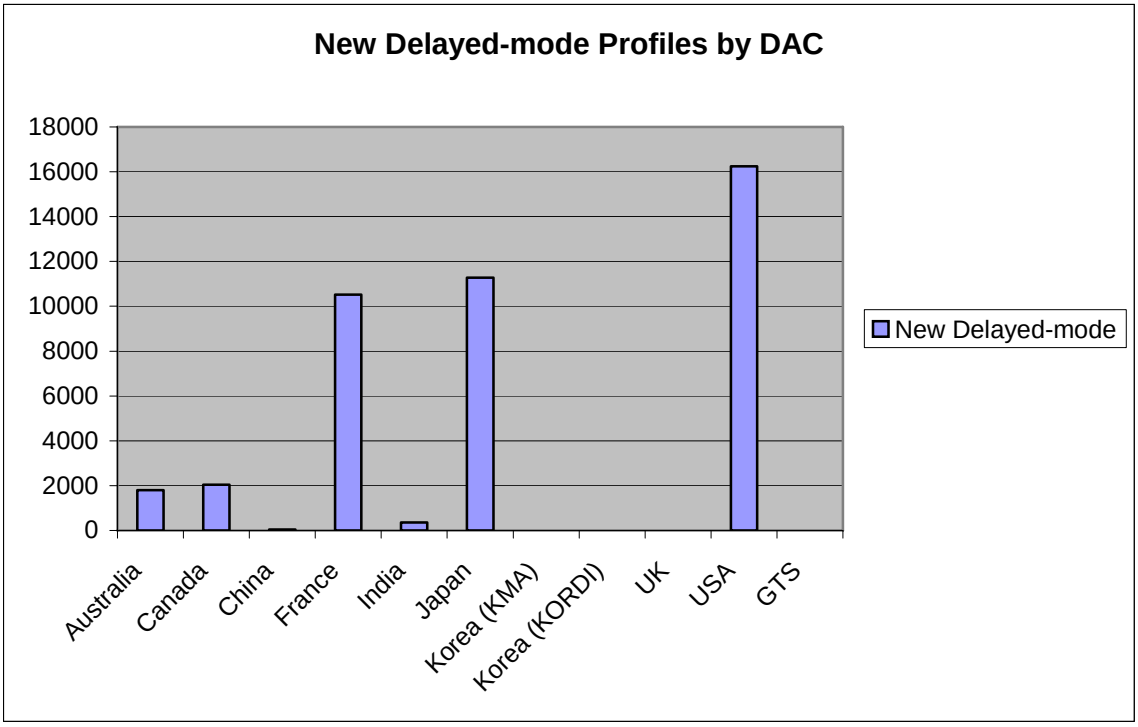
Changes This Year

- Format Change: The format of all the files on the GDACs were transitioned to version 2.2 in March of this year. Some files still exist on the GDAC in Version 2.1. An inventory of the GDAC will be performed and the DACs will be requested to update the files.
- Atlantic Ocean basin definition: The definition of the Atlantic Basin was modified to include all observations in the Arctic Ocean (observations north of 66^{o} north)

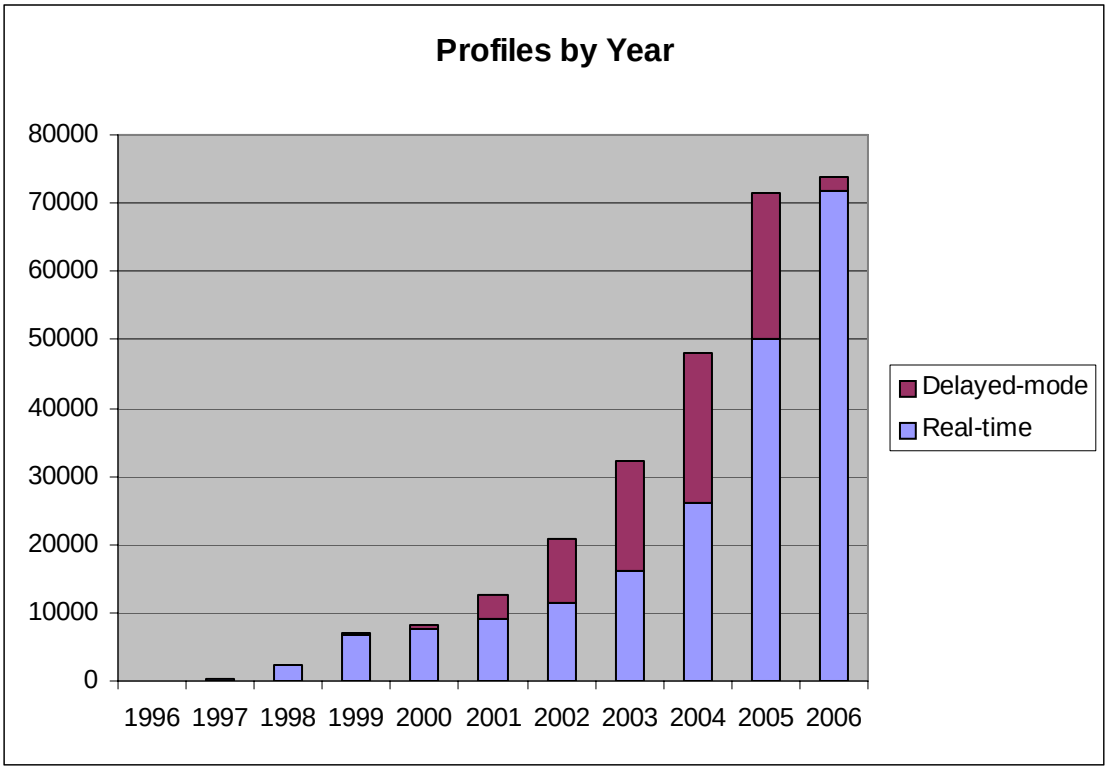
Floats and Profiles by DAC

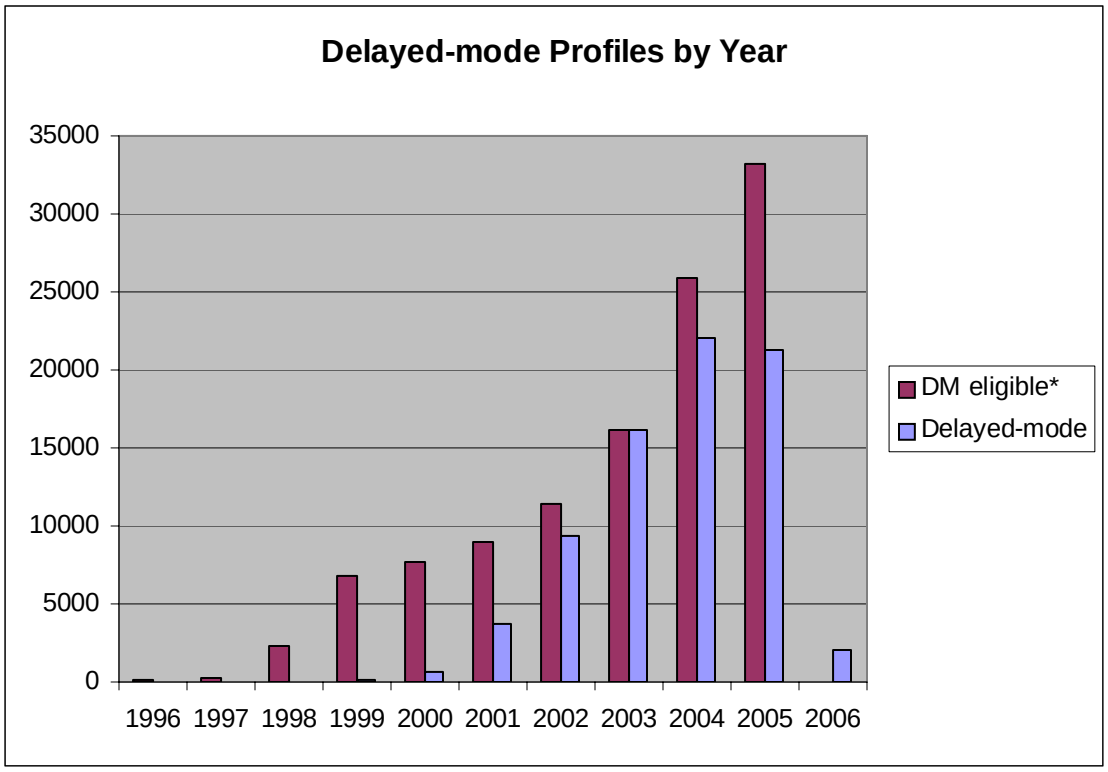





New Delayed-mode Profiles by DAC
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
Australia
Canada
China
France
India
Japan
Korea (KMA)
Korea (KORDI)
UK
USA
GTS
New Delayed-mode

Profiles by Year





(* Note: DM eligible profiles are real-time profiles older than 12 months)

FTP Server Operation

- Processing of incoming DAC files: every 30 minutes
  - includes updates to index files
- Generation of float multi-profile files: every 1 hour
- Generation of geographic multi-profile files: every 6 hours (00, 06, 12, 18 UTC)
- Generation of latest-data multi-profile files: every 12 hours (00, 12 UTC)
- Synchronization with French GDAC: every 12 hours (00, 12 UTC)

WWW Server Operation

The Argo Web interface consists of:

- HTTP and FTP direct access to all GDAC data and metadata files
- OPeNDAP access to all GDAC NetCDF data and metadata files
- Custom Data Browser Application:
  - Allows selection of profiles by:
    - region, time, DAC, Float ID, and Delayed-mode status
  - Generates an optional location plot for selected profiles
  - Provides quick preview plots of salinity and temperature profiles, and float track
  - Provides download of profile, trajectory or technical data for all, or a selected subset of matching profiles/floats

- Live Access Server
  - Provides extensive selection criteria
  - Generates plots for property/depth (waterfall), property/property, pie (surface expression of profile data), Gaussian filled, or metadata (time/location)
  - Generates ASCII tab delimited table output for selected profiles
  - Generates Ferret/COARDS compatible NetCDF output for selected profiles
  - Generates Float Operations plots: Float Track, and Waterfall Plots
  - Custom Argo plot options

- Dapper OPeNDAP server installation under development

Synchronization

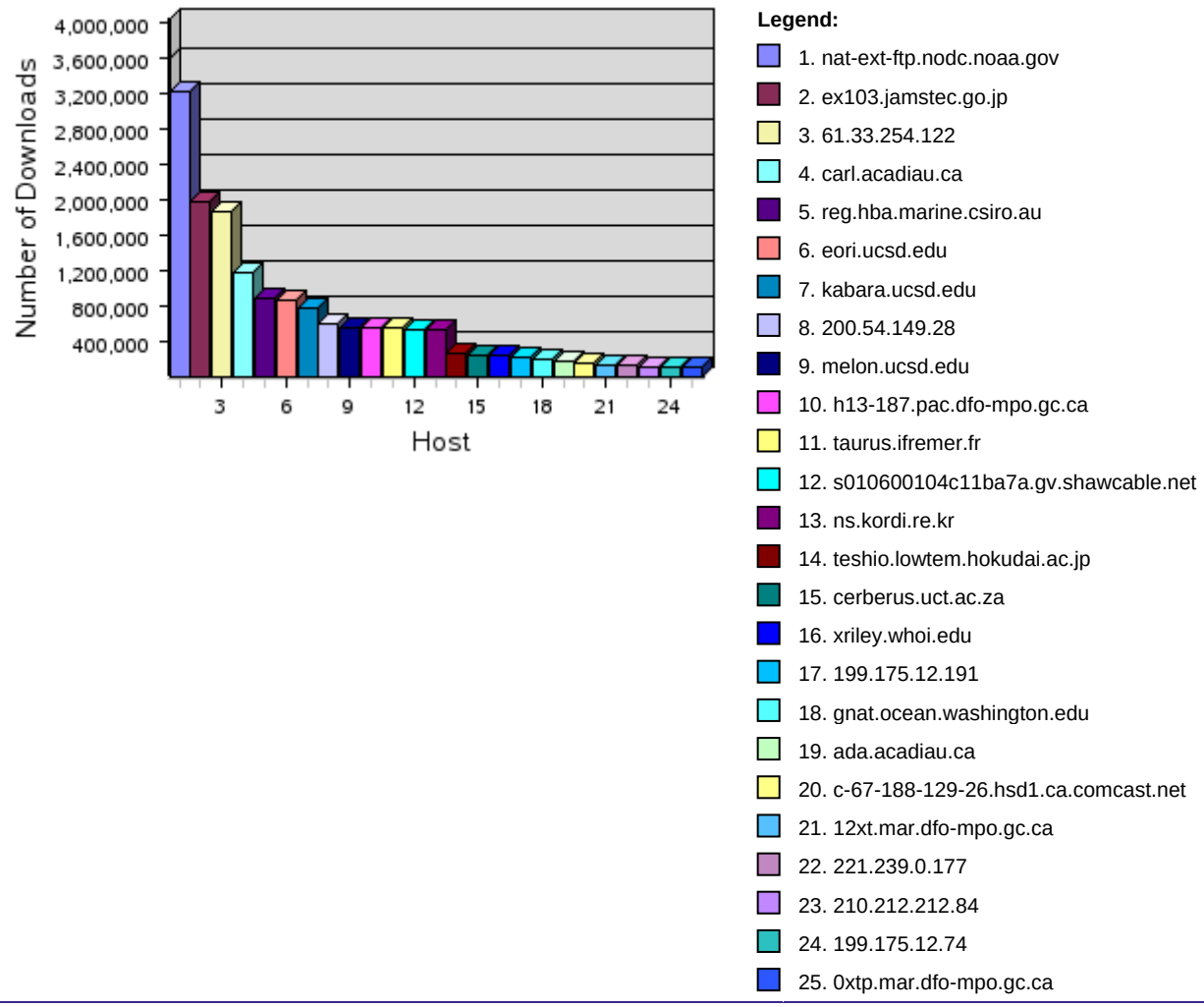
- Meta-data, Trajectory, and Profile files being synchronized with the French GDAC twice per day at 0000 and 1200 UTC.
- GTS files present on US GDAC are retrieved only through synchronization with French GDAC. (Coriolis formats GTS files into Argo NetCDF format.) GTS files are fully synchronized.
- Detailed synchronization discrepancy report being generated for further discussion with the personnel with the French GDAC

Usage Statistics

FTP Statistics

USGODAE Monthly FTP: Host Summary | September 1, 2005 - September 30, 2006

Most Frequent Hosts



	Host	Last Session	Total Time Online	Downloads	Sessions
1.	nat-ext-ftp.nodc.noaa.gov	Sept. 7, 2006 at 6:41 p.m.	3764 hours, 59 minutes, 36 seconds	3,215,030 (19.0%)	4,202 (31.7%)
2.	ex103.jamstec.go.jp	Sept. 30, 2006 at 7:22 p.m.	3030 hours, 27 minutes, 1 second	1,977,657 (11.7%)	1,292 (9.7%)
3.	61.33.254.122	Sept. 30, 2006 at 3:00 p.m.	678 hours, 4 minutes, 11 seconds	1,855,666 (11.0%)	64 (0.5%)
4.	carl.acadiau.ca	Sept. 24, 2006 at 5:08 a.m.	644 hours, 52 minutes, 9 seconds	1,164,761 (6.9%)	58 (0.4%)

5.	reg.hba.marine.csiro.au	Sept. 30, 2006 at 6:03 p.m.	504 hours, 56 minutes, 4 seconds	867,952 (5.1%)	624 (4.7%)
6.	eori.ucsd.edu	Sept. 24, 2006 at 9:05 a.m.	308 hours, 39 minutes, 4 seconds	848,468 (5.0%)	89 (0.7%)
7.	kabara.ucsd.edu	Sept. 26, 2006 at 2:03 p.m.	157 hours, 13 minutes, 58 seconds	763,850 (4.5%)	42 (0.3%)
8.	200.54.149.28	Sept. 20, 2006 at 1:30 p.m.	415 hours, 7 minutes, 16 seconds	596,201 (3.5%)	61 (0.5%)
9.	melon.ucsd.edu	Sept. 14, 2006 at 9:18 p.m.	325 hours, 29 minutes, 48 seconds	543,204 (3.2%)	30 (0.2%)
10.	h13-187.pac.dfo-mpo.gc.ca	Sept. 22, 2006 at 10:17 p.m.	213 hours, 21 minutes, 12 seconds	539,336 (3.2%)	16 (0.1%)
11.	taurus.ifremer.fr	Sept. 30, 2006 at 8:37 p.m.	313 hours, 56 minutes, 11 seconds	537,109 (3.2%)	259 (2.0%)
12.	s010600104c11ba7a.gv.shawcable.net	Sept. 12, 2006 at 7:11 a.m.	295 hours, 18 minutes, 16 seconds	532,725 (3.2%)	28 (0.2%)
13.	ns.kordi.re.kr	June 7, 2006 at 11:46 p.m.	377 hours, 22 minutes, 34 seconds	524,957 (3.1%)	110 (0.8%)
14.	teshio.lowtem.hokudai.ac.jp	Feb. 28, 2006 at 2:00 a.m.	109 hours, 46 minutes, 10 seconds	256,680 (1.5%)	6 (0.0%)
15.	cerberus.uct.ac.za	May 2, 2006 at 6:23 p.m.	300 hours, 54 minutes, 29 seconds	236,537 (1.4%)	16 (0.1%)
16.	xriley.whoi.edu	Sept. 1, 2006 at 8:21 p.m.	65 hours, 10 minutes, 44 seconds	235,758 (1.4%)	5 (0.0%)
17.	199.175.12.191	Feb. 3, 2006 at 6:45 p.m.	143 hours, 33 minutes, 3 seconds	204,139 (1.2%)	9 (0.1%)
18.	gnat.ocean.washington.edu	Aug. 23, 2006 at 11:13 p.m.	92 hours, 49 minutes, 4 seconds	195,504 (1.2%)	54 (0.4%)
19.	ada.acadiau.ca	Nov. 2, 2005 at 12:00 a.m.	45 hours, 8 minutes, 1 second	169,214 (1.0%)	3 (0.0%)
20.	c-67-188-129-26.hsd1.ca.comcast.net	Jan. 23, 2006 at 4:24 a.m.	40 hours, 50 minutes, 24 seconds	150,905 (0.9%)	9 (0.1%)
21.	12xt.mar.dfo-mpo.gc.ca	Nov. 24, 2005 at 5:37 p.m.	46 hours, 42 minutes, 29 seconds	126,598 (0.7%)	3 (0.0%)
22.	221.239.0.177	July 9, 2006 at 8:14 a.m.	867 hours, 19 minutes, 31 seconds	113,752 (0.7%)	354 (2.7%)
23.	210.212.212.84	Sept. 26, 2006 at 7:37 a.m.	83 hours, 48 minutes, 52 seconds	107,228 (0.6%)	49 (0.4%)
24.	199.175.12.74	Sept. 28, 2006 at 3:46 p.m.	204 hours, 18 minutes, 54 seconds	104,531 (0.6%)	260 (2.0%)
25.	0xtp.mar.dfo-mpo.gc.ca	Sept. 20, 2006 at 1:36 a.m.	61 hours, 18 minutes, 43 seconds	99,236 (0.6%)	14 (0.1%)
Hosts represented: 25 out of 436 (5.7%)		Downloads represented: 15,966,998 out of 16,893,416 (94.5%) Sessions represented: 7,657 out of 13,270 (57.7%)			

Page Help

This report reveals the IP address from which visitors came to your site. Use this report to identify where you should focus your marketing and sales efforts.

Host - The IP address or network name of a visitor's computer. If this column only displays IP addresses (100.100.100.100), host name resolution is turned off in both NetTracker and your FTP server. NetTracker also displays the IP address when it is unable to resolve a host name.

Last Session - The date and time of the most recent session by this host.

Total Time Online - The amount of time this host has spent on your site.

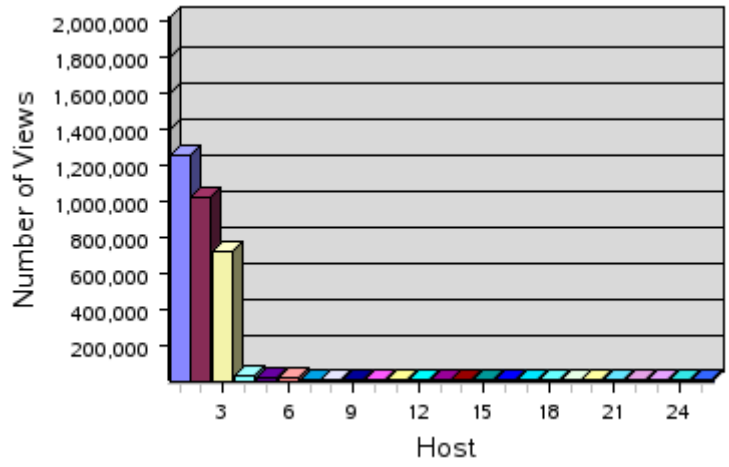
Downloads - The number of downloads by this host.

Sessions - The number of sessions by this host.

HTTP Statistics

USGODAE Monthly Web: Host Summary — September 1, 2005 - August 31, 2006

Most Frequent Visitors (Hosts)



Legend:

1. alcatraz.nodc.noaa.gov
2. greatblue.pmel.noaa.gov
3. potomac.ngdc.noaa.gov
4. c-24-18-225-1.hsd1.wa.comcast.net
5. joey.ocean.fsu.edu
6. 137.229.33.92
7. adelie.pmel.noaa.gov
8. ten-cache1-vif-1.tenet.saix.net
9. ten-cache1-vif-3.tenet.saix.net
10. ten-cache1-vif-2.tenet.saix.net
11. channel.mit.edu
12. 211.64.148.148
13. hermes.ocean.fsu.edu
14. fw1.nio.org
15. 210.212.212.94
16. 210.212.212.82
17. usgodae2.usgodae.net
18. ex102.jamstec.go.jp
19. 222.124.24.51
20. cache2s.kishou.go.jp
21. cache1s.kishou.go.jp
22. sd.cache.nlanr.net
23. xray.soest.hawaii.edu
24. 221.239.0.177
25. w68816.ocean.navo.navy.mil

	Host	Last Visit	Total Time Online	Views	Visits
1.	alcatraz.nodc.noaa.gov	Aug. 31, 2006 at 08:00	200 hours, 19 minutes, 16 seconds	1,249,562 (39.5%)	171 (1.2%)
2.	greatblue.pmel.noaa.gov	Aug. 26, 2006 at 09:08	38 hours, 28 minutes, 8 seconds	1,019,446 (32.2%)	40 (0.3%)

3.	potomac.ngdc.noaa.gov	Aug. 31, 2006 at 09:00	83 hours, 8 minutes, 57 seconds	719,033 (22.7%)	43 (0.3%)
4.	c-24-18-225-1.hsd1.wa.comcast.net	July 6, 2006 at 18:53	17 hours, 14 minutes, 44 seconds	27,088 (0.9%)	25 (0.2%)
5.	joey.ocean.fsu.edu	Aug. 30, 2006 at 16:10	21 hours, 55 minutes, 42 seconds	16,105 (0.5%)	21 (0.2%)
6.	137.229.33.92	Aug. 31, 2006 at 20:01	7 hours, 47 minutes, 5 seconds	15,229 (0.5%)	693 (5.0%)
7.	adelie.pmel.noaa.gov	Oct. 13, 2005 at 02:05	41 minutes, 47 seconds	10,581 (0.3%)	1 (0.0%)
8.	ten-cache1-vif-1.tenet.saix.net	July 26, 2006 at 09:37	57 hours, 2 minutes, 23 seconds	10,373 (0.3%)	51 (0.4%)
9.	ten-cache1-vif-3.tenet.saix.net	June 29, 2006 at 18:18	58 hours, 7 minutes, 43 seconds	9,689 (0.3%)	55 (0.4%)
10.	ten-cache1-vif-2.tenet.saix.net	June 29, 2006 at 17:18	51 hours, 6 minutes, 55 seconds	9,260 (0.3%)	57 (0.4%)
11.	channel.mit.edu	Oct. 22, 2005 at 22:23	43 hours, 3 minutes, 58 seconds	8,026 (0.3%)	140 (1.0%)
12.	211.64.148.148	June 12, 2006 at 10:32	4 hours, 15 minutes, 1 second	7,964 (0.3%)	5 (0.0%)
13.	hermes.ocean.fsu.edu	July 10, 2006 at 19:37	54 minutes, 35 seconds	2,867 (0.1%)	4 (0.0%)
14.	fw1.nio.org	Aug. 31, 2006 at 06:38	54 hours, 10 minutes, 50 seconds	2,493 (0.1%)	204 (1.5%)
15.	210.212.212.94	Aug. 31, 2006 at 09:15	17 hours, 15 minutes	1,759 (0.1%)	82 (0.6%)
16.	210.212.212.82	April 20, 2006 at 05:07	10 hours, 31 minutes, 9 seconds	1,677 (0.1%)	82 (0.6%)
17.	usgodae2.usgodae.net	Aug. 29, 2006 at 13:01	44 hours, 59 minutes, 19 seconds	1,360 (0.0%)	466 (3.4%)
18.	ex102.jamstec.go.jp	Aug. 31, 2006 at 07:02	44 hours, 4 minutes, 17 seconds	1,341 (0.0%)	570 (4.2%)
19.	222.124.24.51	July 19, 2006 at 06:36	17 hours, 51 minutes, 25 seconds	1,121 (0.0%)	30 (0.2%)
20.	cache2s.kishou.go.jp	Aug. 29, 2006 at 10:41	4 hours, 29 minutes, 23 seconds	968 (0.0%)	143 (1.0%)
21.	cache1s.kishou.go.jp	Aug. 29, 2006 at 10:51	7 hours, 58 seconds	886 (0.0%)	138 (1.0%)
22.	sd.cache.nlanr.net	June 30, 2006 at 06:02	3 hours, 24 minutes, 23 seconds	862 (0.0%)	2 (0.0%)
23.	xray.soest.hawaii.edu	Aug. 9, 2006 at 23:25	5 hours, 22 minutes, 49 seconds	799 (0.0%)	11 (0.1%)
24.	221.239.0.177	July 14, 2006 at 06:35	24 hours, 30 minutes, 22 seconds	751 (0.0%)	88 (0.6%)
25.	w68816.ocean.navo.navy.mil	Aug. 9, 2006 at 14:21	5 hours, 23 minutes, 26 seconds	644 (0.0%)	20 (0.1%)
Hosts represented: 25 out of 4,639 (0.5%)		Views represented: 3,119,884 out of 3,163,568 (98.6%) Visits represented: 3,142 out of 13,724 (22.9%)			

Page Help

This report reveals the company or Internet Service Provider from which visitors come to your site. For example, if your main business is with other businesses (Business-to-Business), use this report to identify the companies on which you should focus your marketing and sales

efforts.

Host - A company or Internet Service Provider. If this column only displays IP addresses (100.100.100.100), host name resolution is turned off in both NetTracker and your Web server. NetTracker also displays the IP address when it is unable to resolve a host name.

Last Visit - The date and time of the most recent visit by this host.

Total Time Online - The amount of time this host has spent on your Web site.

Views - The number of views this host has seen of your Web site.

Visits - The number of visits from this host.

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Global Argo Data Repository Status Report of US NODC for 2006

November 2006

1. Summary

This report is intended as the US National Oceanographic Data Center's (NODC) input for the 7th Argo Data Management Team annual meeting at the National Marine Data and Information Service of China, Tianjin, China from 31 October to 3 November 2006. The report summarized the user statistics and the highlights of the Global Argo Data Repository (GADR) activities since the 6th Argo Data Management Meeting in Tokyo, Japan in November 2005. It also described issues regarding the effectiveness and efficiency of transferring files between the NODC and the US Argo Global Data Assembly Center located at Monterey, CA.

2. GADR Functions and Operations

The NODC operates the Global Argo Data Repository (GADR), known as the Argo long-term archive, for managing and archiving the Argo data and information. The GADR performs six functions as defined at the 4th ADMT meeting in Monterey, CA:

- Archive profiles, metadata, trajectory and technical information received from the GDAC on a monthly basis.
- Provide tools to allow transformation of Argo netCDF data into other forms.
- Provide usage statistics, data system monitoring information and problem reporting facility.
- Provide data integration tools to allow client to get Argo float data combined with data collected with other instruments.
- Provide hardcopy data sets for distribution to users.
- Provide offsite storage of data.

3. Usage Statistics

3.1. HTTP Server Statistics

This analysis was produced by analog 5.24 (http://www.analog.cx). We use the following basic definitions:

- The number of **distinct hosts** is the number of different computers requests has come from. The host is the computer (often called the "client"), which has asked for a file.
- The file might be a page (i.e., an HTML document) or it might be something else, such as an image. By default filenames ending in (case insensitive) .html, .htm, or / count as pages.
- The number of **requests** is the total number of files downloaded, including graphics.The total requests counts all the files which have been requested, including pages, graphics, etc. (Some people call this the number of hits). The requests for pages only count pages.

One user can generate many requests by requesting lots of different files, or the same file many times.

Figure 1 illustrates the number of monthly distinct hosts served by the GADR from 1 October 2005 to 30 September 2006. The monthly average of distinct hosts served by the GADR increased dramatically from 1304 to 1,959 or 50% increased during the period of Year 2005.

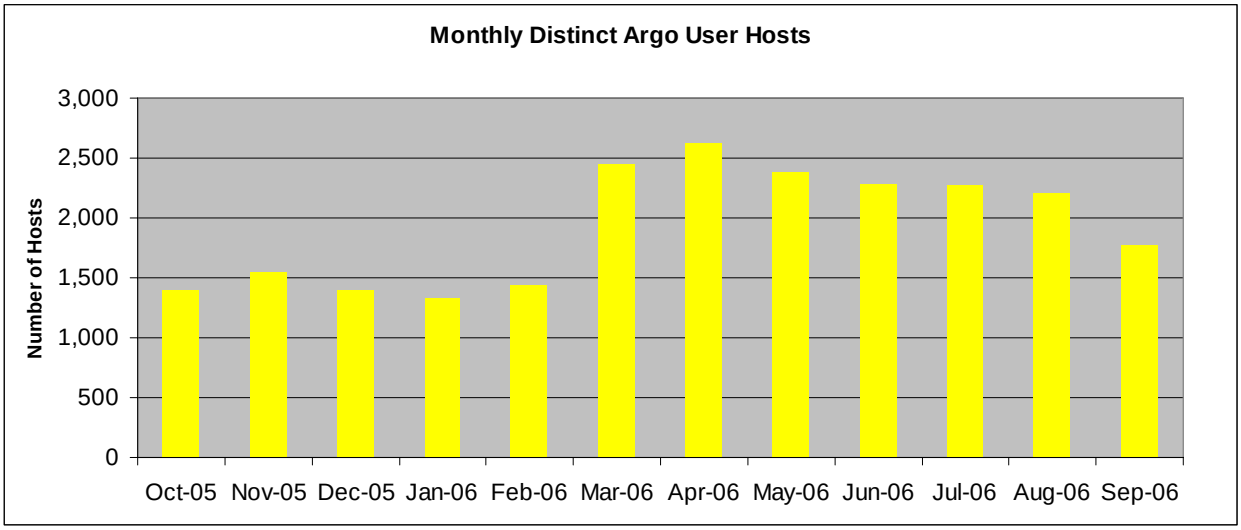


Figure 1 Monthly distinct hosts of the Argo data users

The following figure illustrates the monthly Argo data (in GB) downloaded from the GADR Web site over the past 12 months ending September 2006. The GADR receives an average of 375,267 requests per month and the monthly-averaged Argo data requests increased to 12.52 GB from 9.93 GB in 2005.

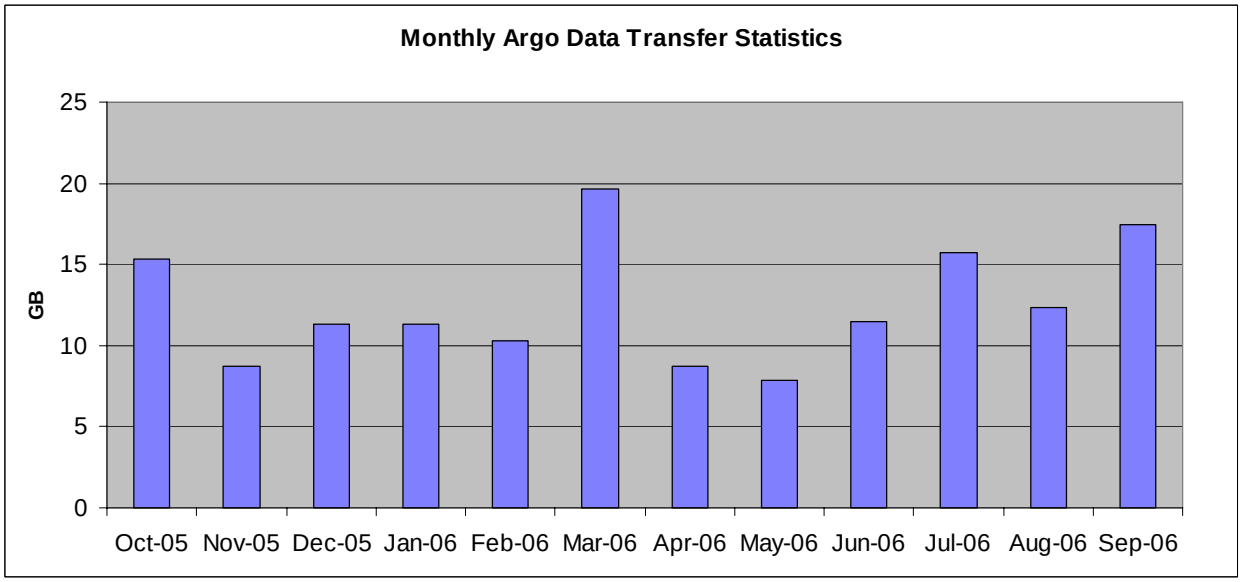


Figure 2 Monthly data transfer statistics of the Argo data.

3.2. User Domain Breakdown

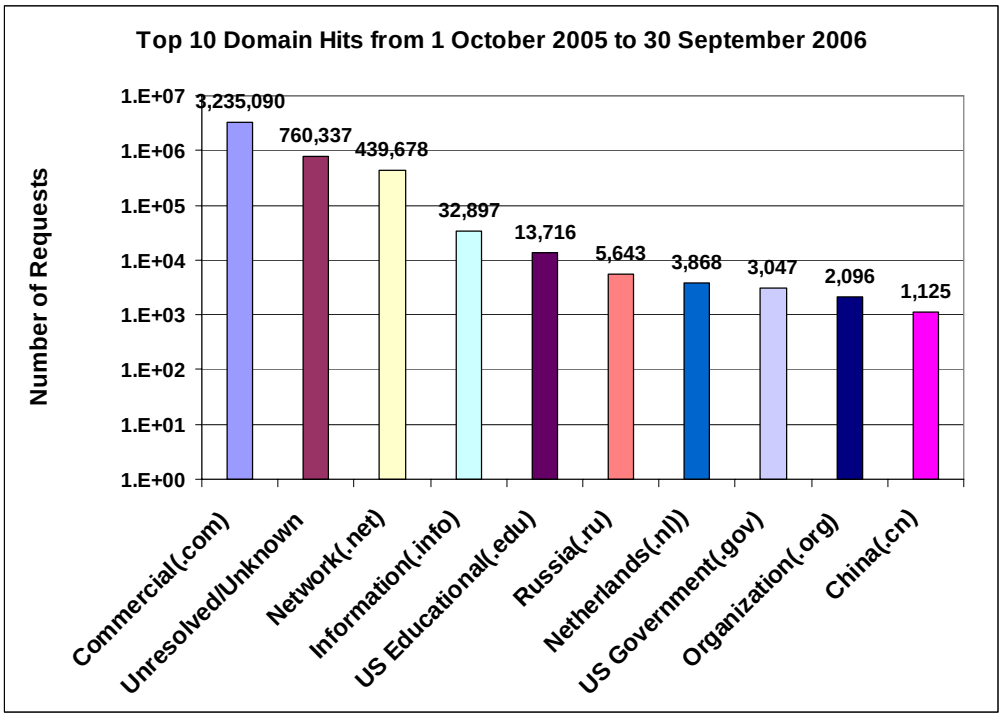


Figure 3 Top 10 domain hits

3.3. User Organization Breakdown

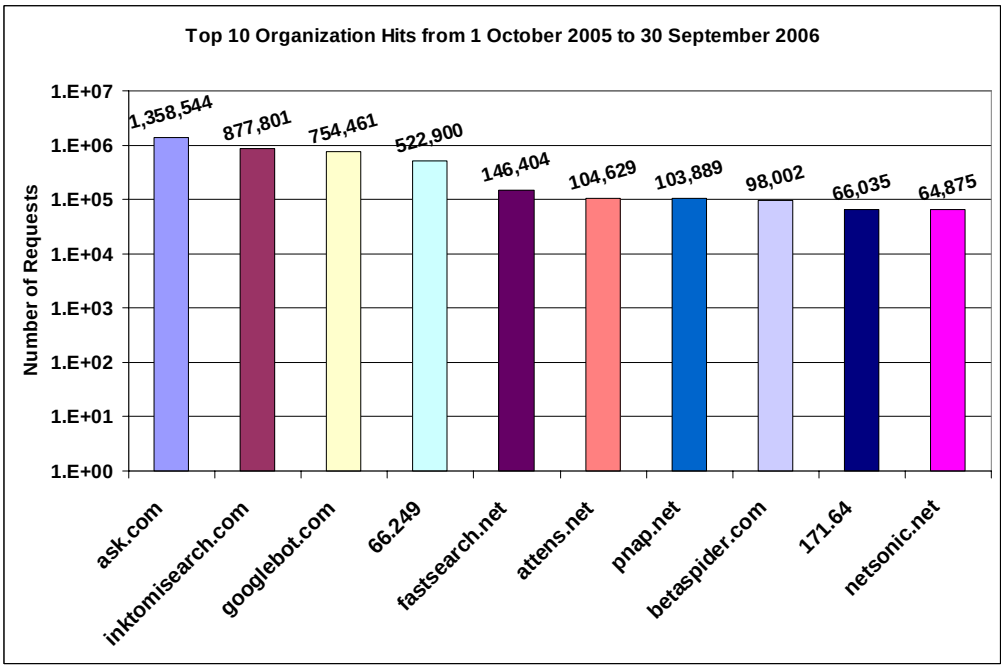


Figure 4 Top 10 organization hits

4. Highlights of Activities

4.1. Improved File Transfer Protocol – The NODC has ceased using the traditional file transfer protocol (FTP) for transferring files between the GADR and the US GDAC, Monterey, CA. Instead, a local mirror of the Argo data is populated using the "mirror" facility of the UNIX "lftp" command. The GDAC's files are copied from "http://www.usgodae.org/ftp/outgoing/argo/", the "geo" subdirectory is skipped, and files which are no longer present on that site are removed from the local mirror. This command is run three times daily, at 12am, 5am, and 8am UTC, so that the mirror should be completed by about 11 am UTC.

4.2. Populate the delayed-mode QC's data on the GADR HTTP server at http://www.nodc.noaa.gov/argo

4.3. Developed a conceptual design of the Argo relational database and an ASCII format for loading the GDACs NetCDF format.

4.4. Developed a strategy of fixing the confusion of reporting profiling float pressure as depth on GTS.

4.5. Tested the Linux "*K3b*" software for burning the Argo Global Data Resource CD/DVD. "*K3b*" is optimized for desktop environment applications of the Linux/UNIX workstations. Being licensed under the GNU General Public License (GPL), it is more cost effective ("free") and efficient than using commercial off-the-shelf (COTS) computer software.

5. Issues

5.1. Duplicated float identification numbers

Table 1 shows float's WMO identification numbers in the "gts" directory that are duplicated with floats appeared in the other directories such as "aoml", "coriolis", "csiro", "incois", and "jma" as the date of 1 October 2006. They need to be resolved.

Table 1 A list of duplicates of floats in the "gts" directory.

WMO Float ID Number	Data Center Directory	WMO Float ID Number	Data Center Directory	WMO Float ID Number	Data Center Directory	WMO Float ID Number	Data Center Directory
2900093	aoml	2900382	aoml	6900216	coriolis	2900586	jma
2900095	aoml	2900383	aoml	6900216	coriolis	2900587	jma
2900096	aoml	2900384	aoml	6900216	coriolis	2900588	jma
2900093	aoml	2900392	aoml	6900216	coriolis	2900615	jma
2900095	aoml	6900101	aoml	6900216	coriolis	4900905	jma
2900096	aoml	6900102	aoml	6900222	coriolis	5901214	jma
2900093	aoml	69016	coriolis	6900223	coriolis	5901499	jma
2900095	aoml	69017	coriolis	5901158	csiro	5901500	jma
2900376	aoml	69018	coriolis	2900530	incois		
2900381	aoml	69021	coriolis	2900754	incois		

Argo Information Centre
Report

Argo TC, M.Belbeoch
ADMT #7, China, October 2006

1. Background

The international Argo Information Centre (AIC) is participating in the activities of the Argo Project Office (APO) and of the JCOMM in situ Observing Platform Support centre (JCOMMOPS).
The AIC is funded on a yearly basis via voluntary contributions of United States, Canada, France, Australia and United Kingdom.

2. TC Activities

It has been necessary to build an Information System from scratch so the working time dedicated to developments was substantial during the first years of AIC activities (2001-2004).
The acceleration of the Argo implementation (1000 floats deployed in 2005) and the growing Argo community have naturally led the TC to limit the developments (from 50% of working time to 10%).
Hence the effort required to develop, test and deploy the final AIC website had to be spread over the 2 last years.

Remark
During 2005, the growing number of deployments has forced the TC to constantly "run after the floats", performing labour-intensive tasks on a daily basis. After discussions with the Argo exec., it has been decided to update the float database (adding new floats) on a weekly basis. Total float number is frozen between the updates.

In 2006, the management of the float database has been gradually rationalized through the use of weekly procedures, reports, and web administration applications.
The Argo TC has today appropriate tools to check the status of an active fleet of 2500 units with about 80 new deployments per month.
Time spent on this task is reasonable; on average, 1 day per week and another day each month are necessary to keep the float database up to date, taking into account available tools.

The following are given practical examples of regular tasks performed by the TC (non exhaustive).

Routine Tasks:

Daily

- Check the information system is working and fix any problems occurring
- Answer (email) support requests concerning any aspect of the Argo project
- Check "meta database" content and integrity
- Check log files and daily batches worked without error
- Recall to notify new float deployments if needed
- Notify deployments if needed (for new programmes)
- Team work with TC DBCP
- Supervise students being trained at JCOMMOPS (if any)

Weekly

- Maintain up to date Argo Status (add new floats, check float parameters, check potential revivals, inactive floats, etc) => write report (*)
- Check log files and weekly batches worked without error
- Track floats with no data distribution (GTS & GDACs) => write report (*)
- Take steps to set up data distribution for DAC-less programmes.

- Add pertinent news on the website (Argo websites updates, deployment opportunity, float retrieval stories , new contributions, etc)

Monthly

- Prepare Argo status maps => write report to argo@jcommops.org(*)
- Clean float trajectories and archives
- Check log files and monthly batches worked fine
- Analyse monthly reports, graphs and maps produced, to look for discrepancies. Alert community and/or suggest solutions if needed
- Administrative tasks (regarding IOC, JCOMMOPS)

Yearly

- Coordinate donor programmes (including shipping, technical assistance)
- Coordinate retrieval procedures
- Think of new ideas and recommendations that could be made to the AST/ADMT to improve overall coordination and effectiveness
- Review website content.
- Reports to AST, ADMT and DBCP on AIC activities
- Beached/Retrieved floats status => write report for AST(*)
- Argo implementation => write report(*)
- Think of and prepare new training subject(s) for potential students at JCOMMOPS
- JCOMMOPS annual budget (IOC, WMO, CLS). Plan future expenditures with DBCP TC.

Biennial

- Review websites to ensure that they are well targeted and provide the best demonstration of the value of the Argo project
- Think of new monitoring and metadata tools

(*) In the past, such reports have been provided sporadically until today. The AIC will continue to rationalize and automate (at least some parts) these reports for a routine production.

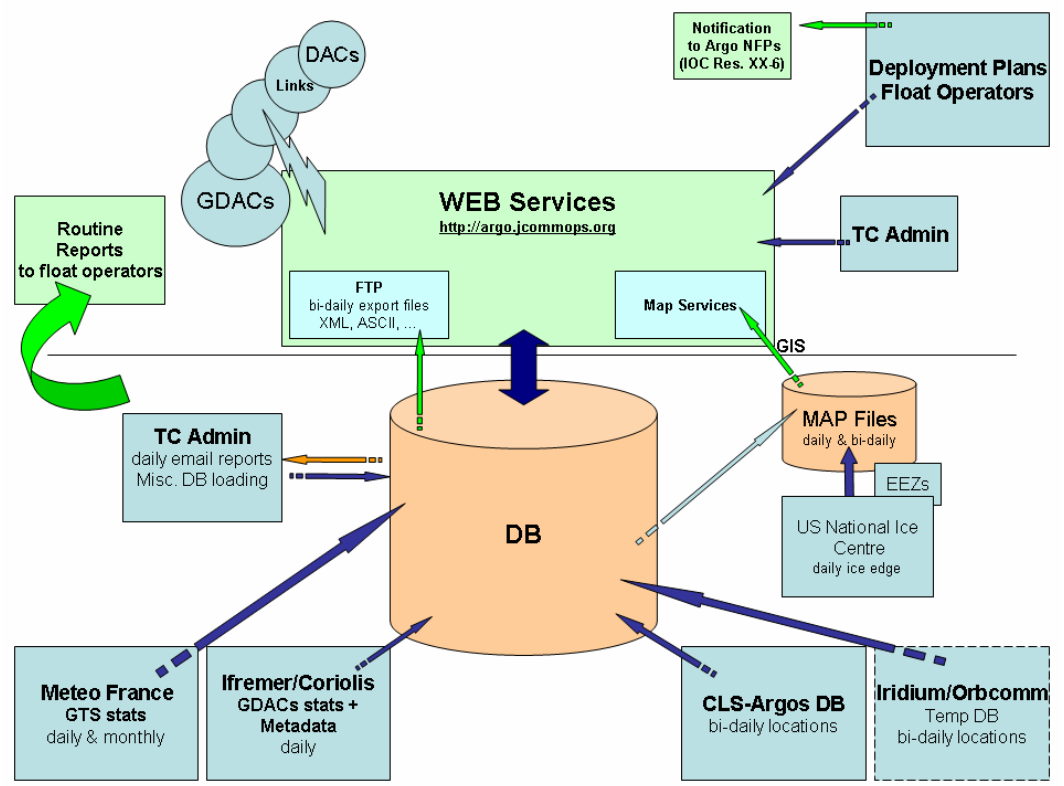
Ad hoc tasks

- Provide material (statistics, maps, charts, presentations) on demand
- Update database/website (contacts, meetings, etc)
- Develop/finalize web applications
- Develop/finalize scripts (to check database or produce status files)
- Add new metadata to the system (sensors, deployment method, beached floats)
- Maintain/Install hardware/software (Administration of 3 servers)
- Investigate new floats/programmes to include them in Argo
- Represent the "Argo customer", within CLS, if problems occur (to speed up solutions)
- Assist CLS to solve GTS issues
- Prepare presentations on Argo , JCOMMOPS, etc
- Write general abstracts on Argo (e.g. press releases)
- Write letters in collaboration with IOC/WMO to build donor programmes (customs, foreign affairs) and invite new countries to join the Argo project
- Mailing Lists maintenance (8 Argo lists + GEO: ocean-united@jcommops.org)
- Prepare missions/visits

3. AIC Information System

a. Background

The AIC website is the tip of the AIC Information System iceberg and is used routinely by the TC to achieve various international coordination tasks which require accurate and up to date information management. The system routinely assimilates information from heterogeneous sources, then checked and re-distributed in various ways (see information flow diagram below).

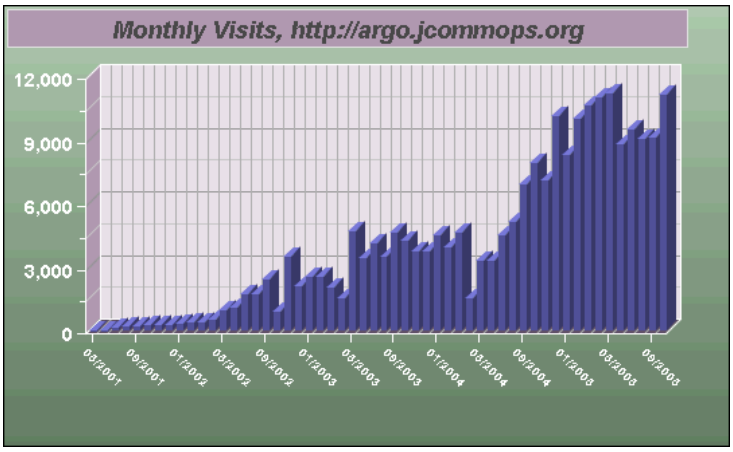


AIC Information flow diagram

b. Audience

The AIC services are primary dedicated to the Argo community and not to the public.
The following chart shows a constant growth in the website usage since the AIC establishment in 2001.
In November 2005 we observed an average of 11000 sessions per month. This level of user visits has been maintained during 2005-2006.
The audience is truly international (180 countries logged) and main users are from USA (60%), France, Japan, UK, Canada, Germany, China, Korea, Australia, Spain, Netherlands and India (in order of usage level).

This growth in usage is seen as a positive result of the Argo project and AIC as it demonstrates that the AIC is used by a larger audience than planned and additionally demonstrates the excellent visibility of the Argo project.



AIC audience 2001-2005

(The definition of a user visit is always an approximation; here it is a sequence of page requests with the same IP address, and with a maximal interval between page requests of 30 min).

Since April 2005 a survey has been conducted to obtain feedback from the Argo data user community. The results will be published during the next Argo Data Management team meeting.

To the question *"How well are you satisfied of the AIC services?"* 83% of respondents replied from Good to Excellent, 15% average and 1 % bad.
To the question *"What improvements would you recommend?"* some interesting proposals were:

- improve website speed and stability (ongoing)
- provide hard copies of content to developing countries (ongoing on Argo CDROM)
- add a real-time density coverage layer to the interactive map (JCOMMOPS issue)
- Add a web form to ask for WMO Ids (to be discussed with WMO)

These proposals will be considered for future plans of the AIC.
This survey was made before the release of the new site; it is likely to have a better audience and feedback in the future.

c. New AIC website

The year 2006 marks an important milestone in the AIC development as a new website has been released following 2 years of effort to deploy the system on new hardware and software architectures.
The new website was officially released late September. As is expected with any major website upgrade, it will need an additional effort of optimization before reaching a truly stable state.

The dynamic web application previously deployed on a low specification WinNT server has been migrated to a more powerful UNIX/MacOSX server and upgraded with many new components.
The JCOMMOPS graphical design (produced by the AIC previously) has finally been applied to the new site.
The website includes, in particular, a new deployment notification interface (gathering more metadata), an improved float search engine, an improved float details page linked to many national DAC products, more statistics on project development, new statistics on national/regional contributions, new statistics on floats lifetime, and a photos/pictures gallery.

d. New Products

New AIC website
http://argo.jcommops.org

Most of the features in the previous website have been improved and many details have been fixed.
Some of the new features of the website are:

Dynamic Web (See Annex or key links and sample charts)

Remark: The rotating Argo globe (produced by IOS/Canada) has been removed from the home page for performance reasons (too heavy animated gif).

1) Argo OPERATIONS

Home

- New Homepage (visibility to all participating countries and access to national statistics)

Implementation

- New static page on “What is Argo”
- New page on participating countries including a chronology, a yearly deployment table and a bar chart on active floats and their data distribution.
- New deployment notification interface (more metadata gathered, list of deployment plans per basin, text sent to Argo focal points reviewed)
- New section on retrieval of beached floats (list of beached floats, retrieved floats, safety guide)

Monitoring

- New statistics on project status
- New statistics on national, “sub-national” contributions (network growth, age distribution, float decay, float models, yearly deployments, link to interactive map)
- New float search engine

Map Room

- Nothing really new except a page on Google Earth files

Instrumentation

- Float decay chart available for all floats and each float model

Data

- Statistics on data flow (Internet, GTS) tuned
- Support section – to be discussed with ADMT

2) COMMON (JCOMMOPS) SECTIONS

Platforms

- New Float search engine: many more criteria to build the query regarding platform status, deployment, equipments, latest location, data distribution, cycle, lifetime.
- Many more fields can be displayed (or hidden) on the query result page
- Access to a statistics page for the float group defined (age distribution, drifting/profiling pressure, decay charts)
- Platform Inspect page completed (more metadata, links to DACs products, link to interactive map, Argo netCDF metadata explorer developed)

Documents

- Links to documents checked and updated, Argo papers and press releases added

Gallery

- Photos gallery added and gradually enriched.

Help

- Site Map added

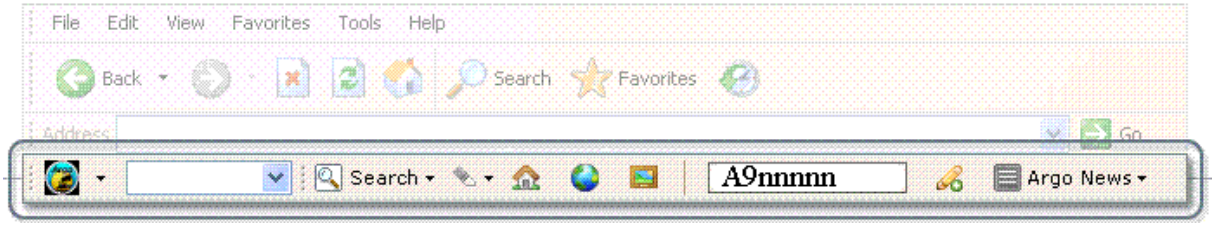
Maps

- A daily ice edge layer (partnership with US National Ice Centre) has been added to the interactive map and is also used in monthly maps production.
- Google earth files are now produced bi-daily (active & inactive floats, trajectories)
- Monthly map generation has been automated (near fully) and maps are produced in PNG for the web pages and in PDF for high resolution requirements.
- The AIC produces on-demand Argo maps as well.

The AIC Toolbar

This gadget is unfortunately restricted to Internet Explorer (5.0+) and Firefox (1.01+) users.
Amongst other things it permits the user to (see picture below) :

- search from anywhere on the web with Google search engine
- search the AIC database (platforms, contacts, news, documents, glossary)
- gain instant access to key links (Argo project Office, Interactive Map, Notification, Latest status map).
- gain access to latest Argo news
- gain instant access to an Argo float by its WMO Id



This toolbar will be gradually enriched with Argonauts' proposals.
It has been installed by 25 Argonauts.

e. Operations

The latest web configuration is designed to automatically re-launch a service that has failed. However this does not cover all cases of failures, so another procedure is required to approach the 24/7 services, though for AIC, 24/7 support is not as important as it is for organizations such as data distribution centres.
In this regard, the AIC benefits from the CLS logistical support which monitors many operations.
Hence, the main services provided on-line, particularly the website and mapping system, are now monitored 24/7 by CLS operators.
If services are down, then operators see a warning message on their control screens and can apply the procedure to launch them again.
This new procedure will be tested and refined in the following months and AIC services should be fully operational by early 2007.

4. Data Management

The AIC participates in the Argo Data Management Team activities, encouraging standardization, regional collaboration, promoting data flow, and providing specific tools to facilitate data management set up and to monitor the Argo Data System.

Assistance for data distribution
Some national Argo programmes have not yet developed such capabilities, or have no dedicated funding for data management (focusing e.g. on implementation aspects).
In that case, the AIC coordinates the data management set up with voluntary centres ready to take upon the float processing. In practice, such assistance is offered by CLS for the GTS distribution and Coriolis for the GDACs distribution.

National Data Centres
National contact points, report on-line on the different steps achieved concerning real-time or delayed–mode data management.
National Argo websites proposing products on individual floats are now linked with the AIC website (see Annex).

Daily monitoring of data distribution
Data distribution on Internet (GDACS) and on the GTS is still monitored on a daily basis and is compared to the floats officially notified at the AIC.
Some scripts are running daily to retrieve information from Meteo-France (GTS) and Coriolis (GDAC) and then merge it with the AIC float data.
Float operators in charge of data management set up are encouraged to use such lists to detect potential omissions and check if data are effectively published through the appropriate channels.
The status of data distribution is routinely sent to the ADMT through reports and summarized on the website.
A new table has been added on-line regarding the “DAC-less” floats (directory “/gts” at GDACs).

Metadata
The AIC database deals now with more metadata and particularly with the float cycle information impacting lifetime statistics.
A netCDF Argo metadata explorer has been plugged into the “Platform Detail” page and metadata file content can be loaded in the database to augment the information provided by float operators during the deployments notification procedure.

Support
A proposal to build a complete Support Centre at the AIC will be discussed during the next ADMT meeting.
The idea would be to archive and reply as appropriate to the queries on Argo and particularly on Argo data use.

It is to be noted that this is a task manually done by the TC on a daily basis (or by data centres). So this initiative will permit to integrate, automate, rationalize and archive existing mechanisms.

For now the generic email address support@argo.net has been set up and points to the TC mailbox.
A complete (and dynamic) web section will be developed on the new AIC website.
The on-line support centre would:

- recall sources of information and documentation available

- propose a browser for archived question/answers

- propose a simple web form to enter the query (including a field for a WMO Id, and a pop up menu to select issues)

It is needed to list the different issues (e.g.: general, instrumentation, web access, real time or delayed mode data use, data formats, QC procedures, GTS issues, problem on an individual float or profile, education) and find some voluntary experts to reply related queries.

The system would record the information in the database and route the query to the TC and other appropriate experts.
If a WMO Id is given, the float operators owning the platform (PI) would be automatically cc.
If no issue is selected or message directly sent to support@argo.net, then the TC would answer directly or manually forward the query to experts as appropriate.

Developments required to build this support centre will be minimal as most of the elements required are already implemented in the AIC database and web services.

Survey
A data user’s survey was set up in April at:
http://www.surveymonkey.com/s.asp?u=460472024285
Results will permit to better know our user’s community and will be published at the next ADMT meeting. (See dedicated document).

5. International Issues

New participants
The AIC encourages and coordinates multilateral collaborations through “float donations” in order to build capacity for new participating countries.

This year 3 more donor programmes have been initiated:

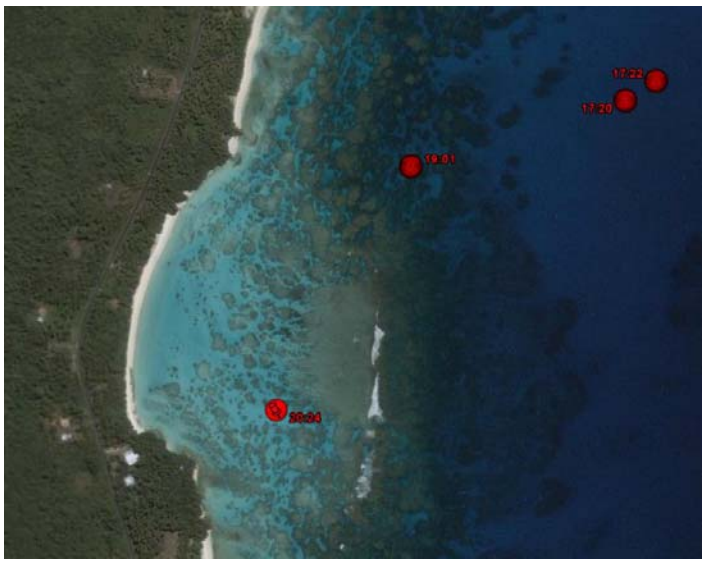
- Dominican Republic (2 floats)
- Ecuador (2 floats)
- Kenya (5 floats)

The AIC (with IOC & WMO assistance) will investigate the possibility of increasing the number of countries supporting Argo in the Caribbean region.

Retrieval of beached floats
The AIC is likely to be the first contact point in identifying grounded floats and assist, as appropriate, in coordinating communications between all parties in the retrieval procedure.

A new Argo label has been produced by Scripps. It is lighter (so that it will not affect float ballasting if the sticker is lost during its mission) and distributed to float manufacturers.

A dedicated section of the new website provides the list of beached/grounded floats, a safety and the list of retrieved floats. Progresses are tracked through distribution of weekly reports. It is to be noted that a float which beached in Somalia could not be shipped back to its owner because of the instability of the country, despite hundreds of phone calls and emails, to coordinate its return.



Les scientifiques recherchent des flotteurs perdus en mer

Les scientifiques de l'Institut de recherche pour le développement (IRD) enregistrent des pertes d'appareils océanographiques d'enregistrement largués à la dérive.

En 2004, vingt flotteurs de l'IRD avaient été mis à l'eau et ils ont dérivé dans l'océan. Dix-neuf d'entre eux sont toujours actifs à ce jour (ils sont construits pour avoir une vie nominale de quatre ans dans l'eau de mer). D'autres scientifiques que ceux de Nouméa ont conduit des opérations identiques à travers le monde, ce qui s'est traduit par la mise en service de 2 531 flotteurs au total.

Or, il semblerait que plusieurs d'entre eux se sont perdus dans la région proche de l'archipel calédonien, au cours des derniers mois. Les chercheurs font donc appel à la population, plus particulièrement celle des îles Loyauté. Lifou en tête, qui en trouverait échoués ou au fond de l'eau, sur le récif.

Informations précieuses

- Il est fort probable que ces flotteurs reposent au fond des océans, explique Christophe Maes, de l'IRD Nouméa. Mais si, par une chance incroyable, certains venaient à s'échouer sur une plage, il serait très intéressant pour les scientifiques de les récupérer, non pas pour les réutiliser, ni pour leur valeur marchande qui est nulle après un séjour de plusieurs années en mer, mais pour la calibration des instruments scientifiques qui sont à bord et l'étude de leur dérive dans le temps. -

Les flotteurs ont la forme de tubes d'un à deux mètres de longueur équipés d'une grosse antenne jaune à l'extrémité supérieure.

- Si une personne trouve un tel objet, demande Christophe Maes, qu'elle n'essaye pas de l'ouvrir au risque de détruire les enregistrements mais qu'elle me contacte plutôt à l'IRD, au 26 10 00, pour que nous puissions récupérer les précieuses informations et faire progresser ainsi notre connaissance du comportement dynamique de l'océan. -

Hervé Girard

Christophe Maes (à gauche) et Francis Gallois, de l'IRD, présentent un des flotteurs qui ont été mis à l'eau en 2004. (Photo Jean-Michel Buvo)

Les points répartis sur la carte montrent le nombre des flotteurs qui sont passés dans notre région depuis le début de cette année.

Le projet Coriolis

Mis en œuvre par l'Ifremer (Institut français de recherche pour l'exploitation de la mer), Coriolis répond à un programme international de recherche ayant pour objectif de créer, à l'échelle du globe, un système opérationnel de prévision des courants océaniques et des variations climatiques. La fiabilité recherchée va, dans le temps, de l'échelle du mois à celle des décennies et, géographiquement, de l'échelle du bassin maritime à celle de la Terre.

Coriolis est le nom du centre de traitement des données des flotteurs déployés par la France, l'Allemagne, le Danemark et le Royaume-Uni dans plusieurs projets nationaux et européens. En collaboration avec le Marine environment data service canadien, il collecte et qualifie toutes les données de température et de salinité distribuées sur le réseau mondial de la météorologie (système mondial de télécommunications : SMT). Depuis janvier 2003, il alimente chaque semaine le modèle courantologique (projet Mercator) et assure aussi, depuis novembre 2001, une distribution quotidienne pour les besoins du modèle d'océan SOAP développé par le Service hydrographique et océanographique de la Marine (SHOM). Le dispositif emploie un réseau de satellites et de systèmes de mesure en mer dont les appareils océanographiques d'enregistrement dérivant.

Toutes les données du centre de traitement sont disponibles sous 24 heures sur le site internet du centre Coriolis <http://www.coriolis.eu.org>.

The 4 latest surface locations (Google Earth) for a float lost in Lifou island lagoon (New Caledonia) & the call for a lost float in the local newspaper.

Retrieval procedure is usually a long and time consuming process but is a good opportunity to strengthen the regional support to the Argo project.

Capacity Building
A workshop is scheduled for December 2006 in Ghana to address issues relating to regional capacity building on Argo data access and.
The Argo TC will attend it and give talks on Argo International issues and Argo websites use.
In addition, Webb Research (a float manufacturer) has agreed to donate a float for this event.

6. Communication

In 2006 TC participated in the following events and initiatives that contribute to the promotion of the project:

- UNESCO 60th Birthday: talk on ocean Obs. Systems and Argo (along with P.Bernal/Tsunami issues and E. Desa/Capacity Building)
- Argo Article in Mercator Newsletter
- Argo Article in Thalassa (French magazine)
- Argo float shown on French national TV news

- Ongoing: educational initiative being prepared with CNES (Argonautica)

7. Planning

Planning for 2006-2007 can be summarized as follow:

- Continue to address any issue with the new website
  Highlight the Argo project's good health on the website (participate in the value demonstration of Argo)

- Rationalize the update of float database (almost achieved)

- Develop tools to assist deployment planning (produce map files of deployment plans and future array status (+ 1 year, etc)

- Develop the Support Centre section

- Produce a real-time density coverage layer for interactive map

- Improve Argo Portal www.argo.net (to be discussed within the Argo Project Office)

- Rationalize the reporting
  Weekly reports to AST, ADMT (on Argo status)
  Monthly status report to all Argonauts
  Yearly report on Argo implementation

- Finalize the float retrieval procedure

- Finalize the donor programme and foster participation by new countries

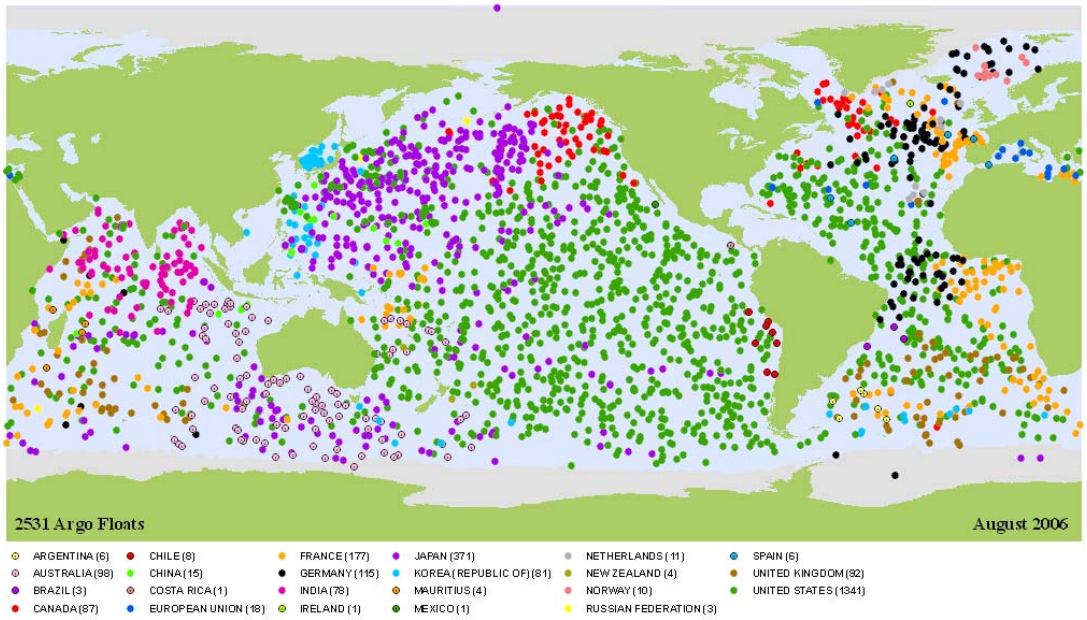
- Establish new contacts, e.g. POGO research cruise database to provide better information on deployment opportunities

- Improve (modestly) Argo media coverage via direct contacts or educational initiatives

(The new Argo Logo designed by IOS/Canada)

Appendix

- Examples of new (and improved) products available @ http://argo.jcommops.org



New monthly map design

(View shifted ten degrees east to give more visibility to Med. Sea - legend production automated)

Float Funding (24) — Funded

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
ARGENTINA	0	0	0	0	0	0	0	0	0	6	6
AUSTRALIA	0	0	4	6	0	12	8	5	62	23	120
BRAZIL	0	0	0	0	0	0	0	0	3	0	3
CANADA	2	0	1	0	30	38	31	30	28	31	191
CHILE	0	0	0	0	0	0	0	0	4	4	8
CHINA	0	0	0	0	0	5	16	8	0	6	35
COSTA RICA	0	0	0	0	0	0	0	0	2	0	2
DENMARK	0	0	0	0	5	0	0	0	0	0	5
EUROPEAN UNION	0	0	0	1	10	70	4	17	7	1	110
FRANCE	0	0	6	11	12	7	34	85	89	43	287
GERMANY	0	3	3	22	21	14	26	45	74	26	234
INDIA	0	0	0	0	0	11	23	30	45	11	120
IRELAND	0	0	0	0	0	0	2	0	0	0	2
JAPAN	1	12	12	6	40	76	129	118	109	82	585
KOREA (REPUBLIC OF)	0	0	0	0	16	25	32	32	35	13	153
MAURITIUS	0	0	0	0	0	0	1	2	0	2	5
MEXICO	0	0	0	0	0	0	0	0	2	0	2
NETHERLANDS	0	0	0	0	0	0	0	3	4	4	11
NEW ZEALAND	0	0	0	0	2	2	0	2	1	3	10
NORWAY	0	0	0	0	0	3	6	0	0	2	11
RUSSIAN FEDERATION	0	0	1	0	0	2	0	2	0	0	5
SPAIN	0	0	0	0	0	0	7	2	1	1	11
UNITED KINGDOM	0	0	0	0	30	37	37	45	29	22	200
UNITED STATES	22	10	36	70	129	150	314	443	506	367	2047

Official deployments table, by country

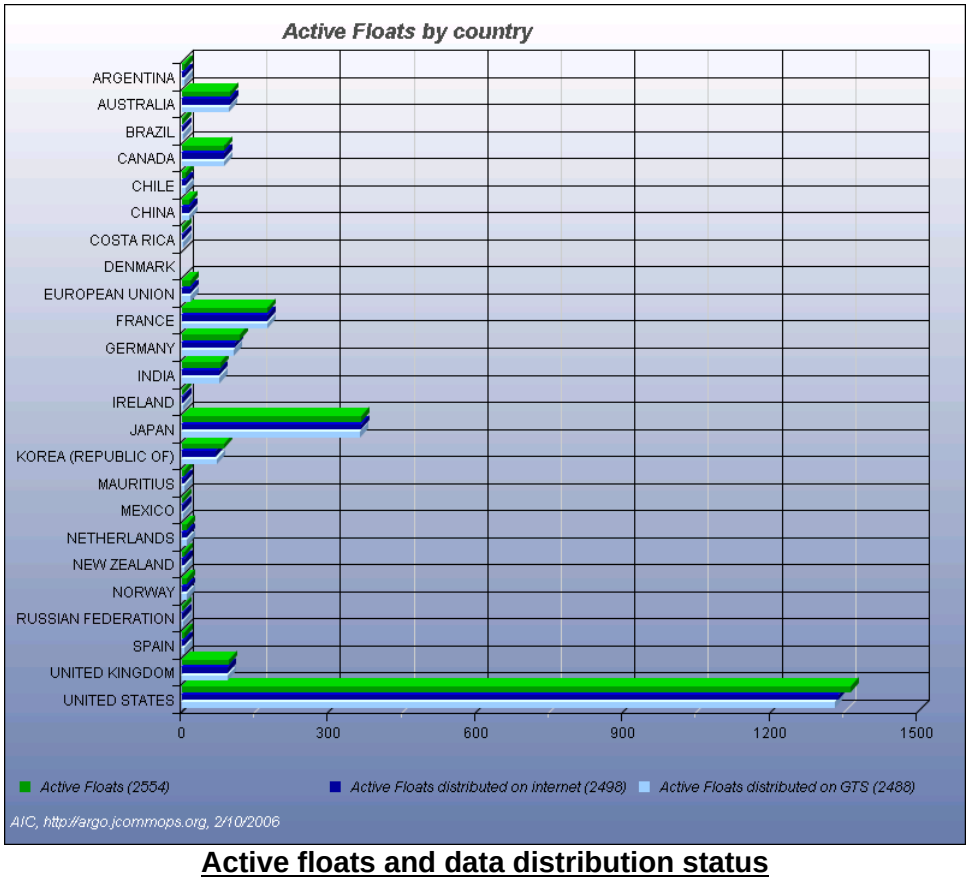
UNITED STATES

Click on a program for more details.

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total	Fleet status		
Argo eq. AOML	14	0	0	13	2	0	0	0	0	0	29	5	100%	100%
Argo eq. NAVOCEANO	0	0	0	19	7	22	18	20	9	17	112	33	100%	100%
Argo eq. PMEL	0	0	0	0	10	12	0	0	0	0	22	1	100%	100%
Argo WHOI	0	0	0	0	26	34	97	93	132	109	491	341	98%	99%
Argo SIO	0	0	0	15	77	10	90	126	141	123	582	357	97%	98%
Argo UW	0	1	0	23	4	71	103	119	108	59	488	385	96%	96%
Argo eq. NDBC	0	0	0	0	3	1	0	0	0	0	4	0	0%	0%
Argo eq. UW	8	9	36	0	0	0	0	0	0	0	53	0	0%	0%
Argo PMEL	0	0	0	0	0	0	1	59	86	57	203	189	100%	100%
Argo eq. WHOI	0	0	0	0	0	0	4	0	0	0	4	0	0%	0%
Argo eq. FSU	0	0	0	0	0	0	0	7	0	0	7	6	100%	100%
Argo eq. UH	0	0	0	0	0	0	1	19	28	0	48	42	100%	100%
Argo eq. UW-UA	0	0	0	0	0	0	0	0	2	2	4	3	100%	100%
Total	22	10	36	70	129	150	314	443	506	367	2047	1362		

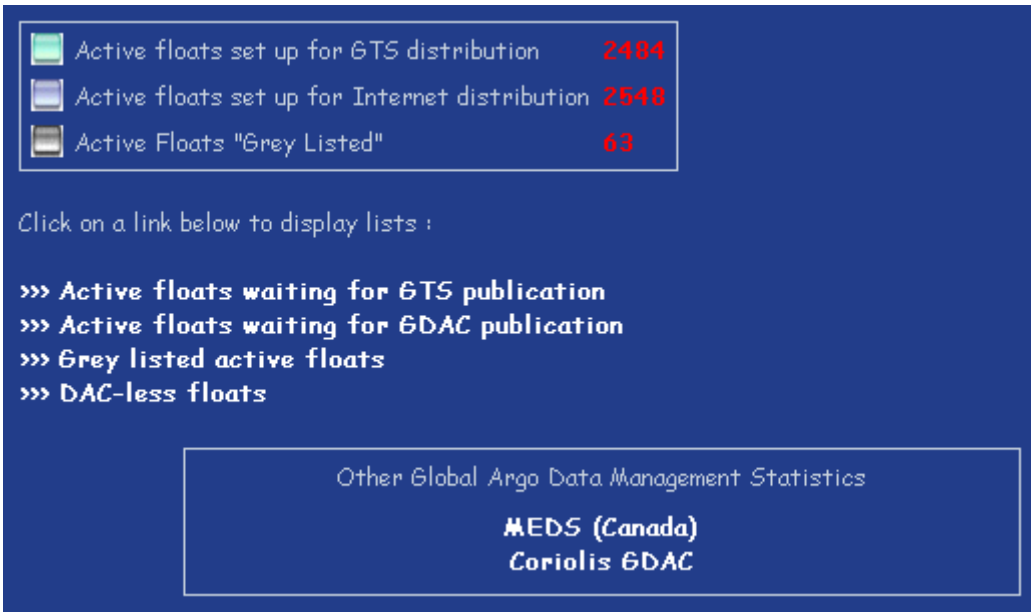
Legend ...

Details for a specified country



Active floats and data distribution status

(Chart also available for, programs, basins, and float models)



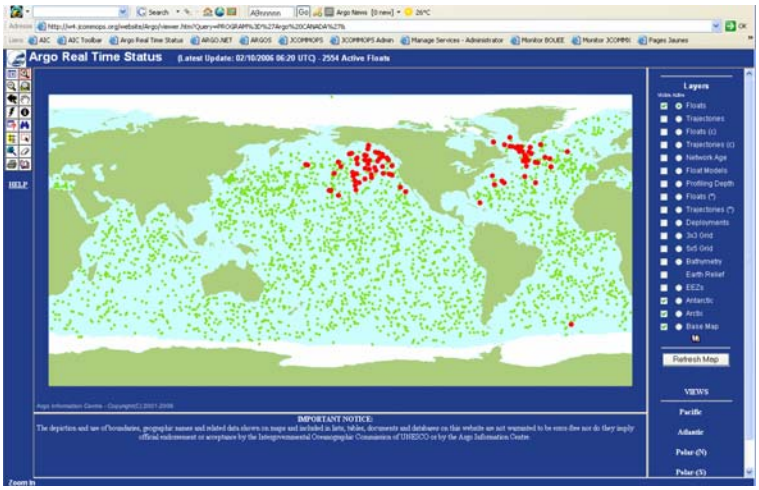
54 Active floats are waiting for GTS publication:

WMO Id	Program	Telecom Id	Model	Age (days)	DAC
5900853	Argo AUSTRALIA	41558	APEX	541	CSIRO
6900326	Argo BSH	30710	NEMO	12	Coriolis
6900327	Argo BSH	30712	NEMO	0	Coriolis
1900518	Argo IFM-GEOMAR	54128	NEMO	490	Coriolis
1900517	Argo IFM-GEOMAR	54127	NEMO	490	Coriolis
2900763	Argo INDIA	23582	APEX	2	CLS
4900898	Argo JAPAN	60144	APEX	80	JMA
2900670	Argo JAPAN	66067	APEX	30	JMA
2900668	Argo JAPAN	60113	APEX	31	JMA
2900454	Argo KORDI	4670	Provor	27	Coriolis
2900789	Argo KORDI	25957	APEX	27	CLS
2900792	Argo KORDI	25984	APEX	29	CLS
2900609	Argo KORDI	23219	APEX	320	CLS
3900322	Argo KORDI	50786	APEX	640	CLS

...

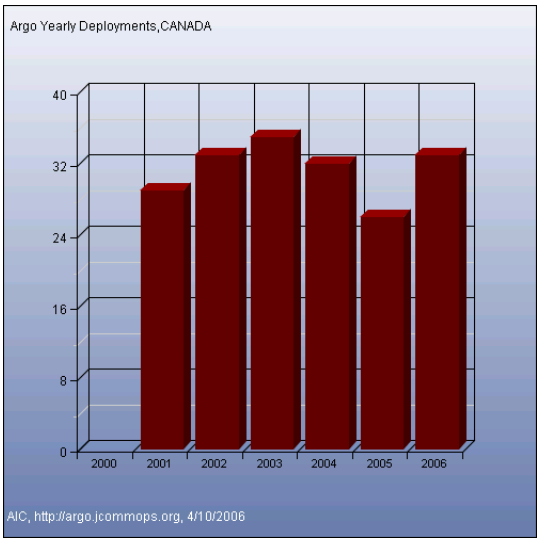
Data distribution status

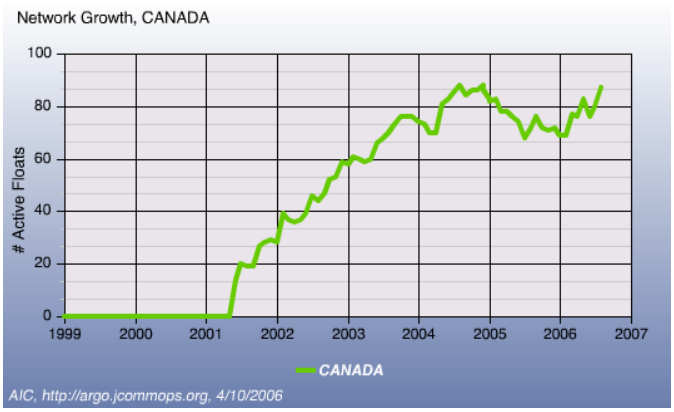
Data distribution is monitored on a daily basis, float per float, on the two channels of distribution.



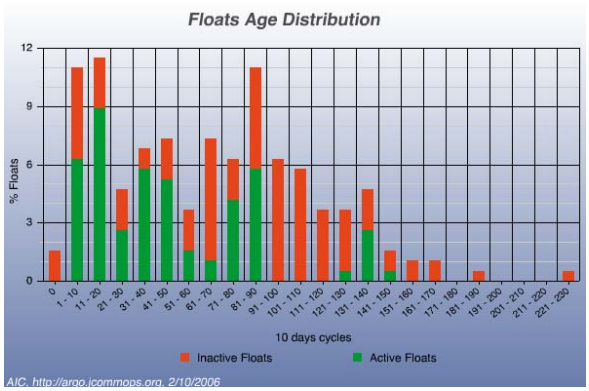
Canadian active fleet,

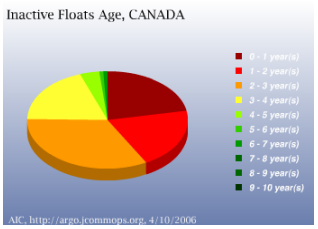
(Every country or program can gain direct access to its fleet on the map)

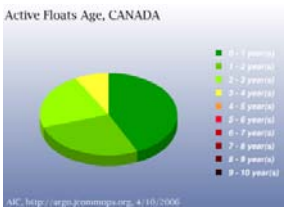




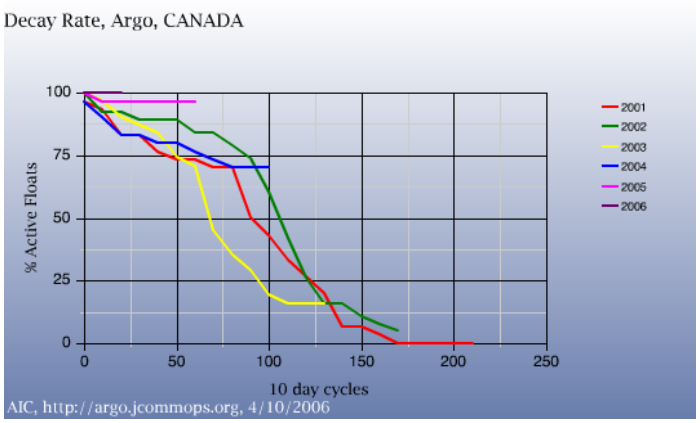
(a,b)

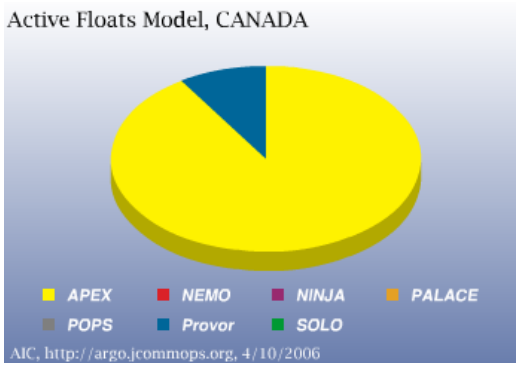




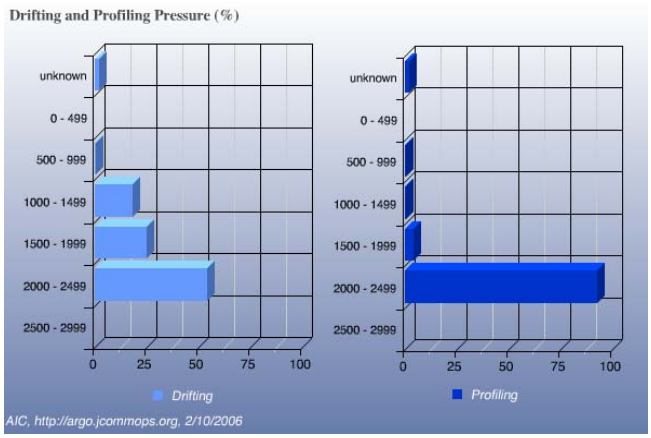


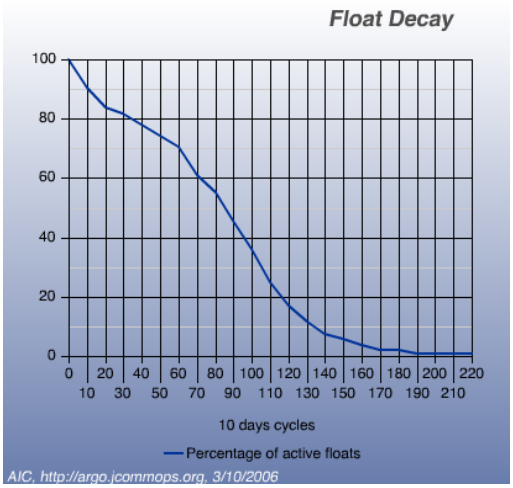
(c,d,e)





(f,g)





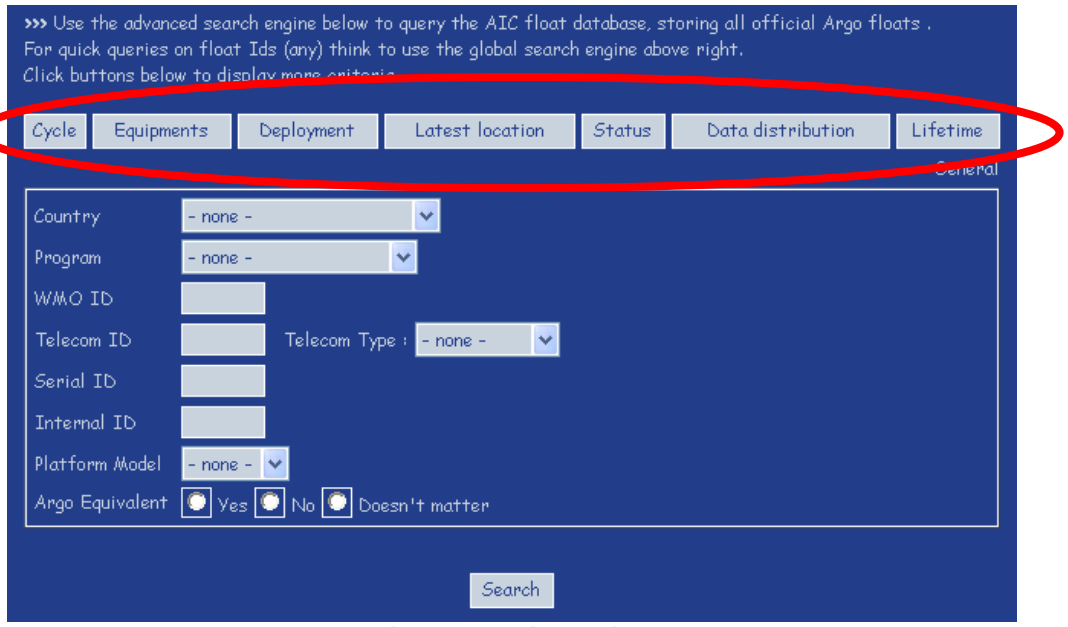
(h,i)

Descriptive statistics (e.g.) for the Canadian fleet

a) Yearly deployment bar chart
b) Network growth (active floats/time)
c,d,e) Age distribution bar/pie charts
f) Decay rate for each generation of floats (yearly)
g) float models distribution pie chart
h) Drifting and profiling pressure bar charts
i) Float decay for all (dead) Canadian floats

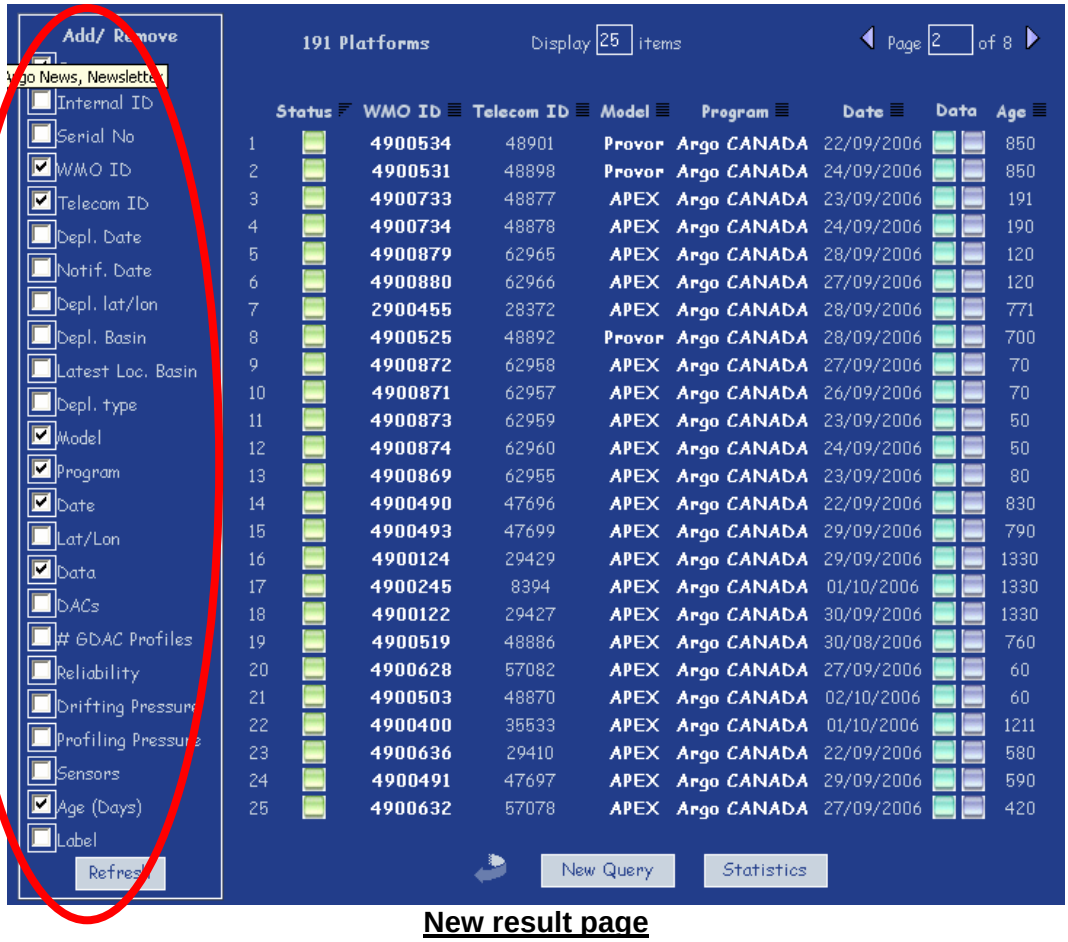
Remark:

All of these statistics can be generated on the fly for any float group defined by the float search engine (see below).



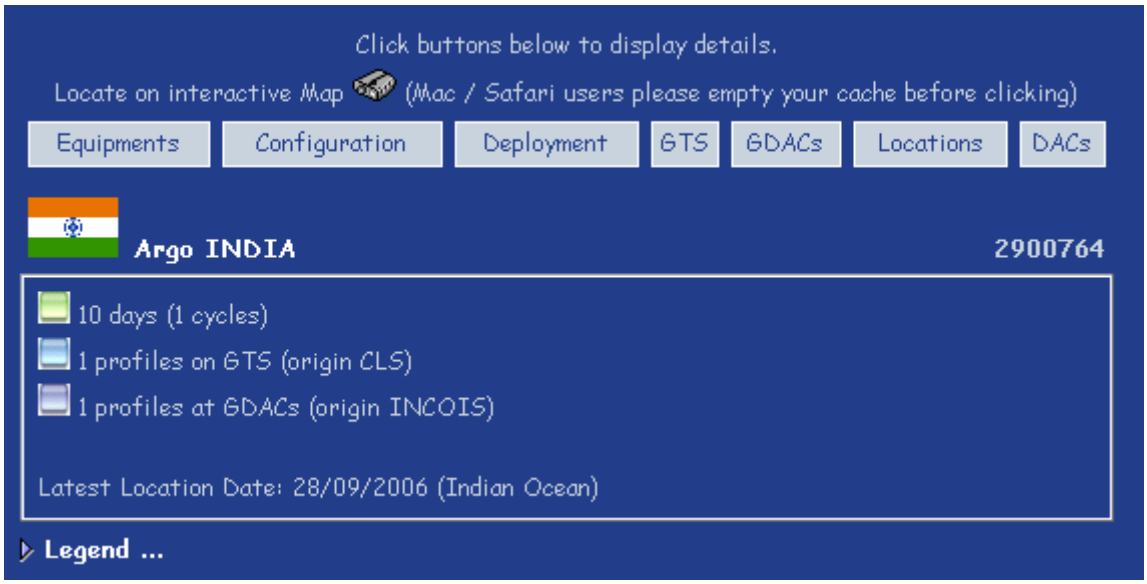
Float Search Engine

(query interface with many new criteria)



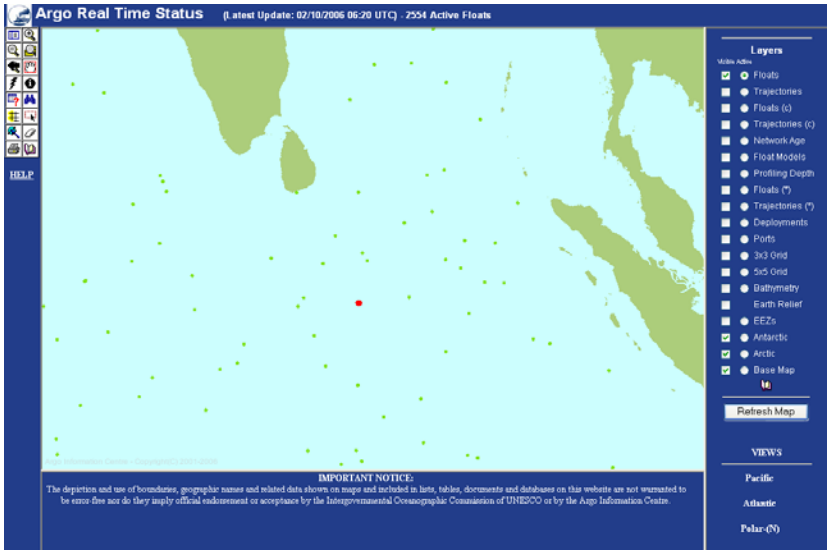
New result page

(Many new parameters to be displayed or hidden)



Platform Inspect Page

All information recorded in the database for a platform is visible here, including:



Direct zoom on interactive map to locate the platform

(Vice versa, any click on a platform on the map leads to the “Platform Inspect Page”)

Equipments

Internal Id	MRC
Serial No	2935
Telecom type	ARGOS
Telecom Id	23561
Manuf. date	
Sensors	Sub T WP Sub S
Battery	Alkaline 14.7V
Argo Label	☐

APEX

Close

Configuration

Float Cycle	10
Cycle Time	240.00 hours
Surface Time	- No data -
Drift Pressure	2000
Profile Pressure	2000
Park & Profile	1
Ice detection software	☐

Close

Deployment

Equipments and configuration

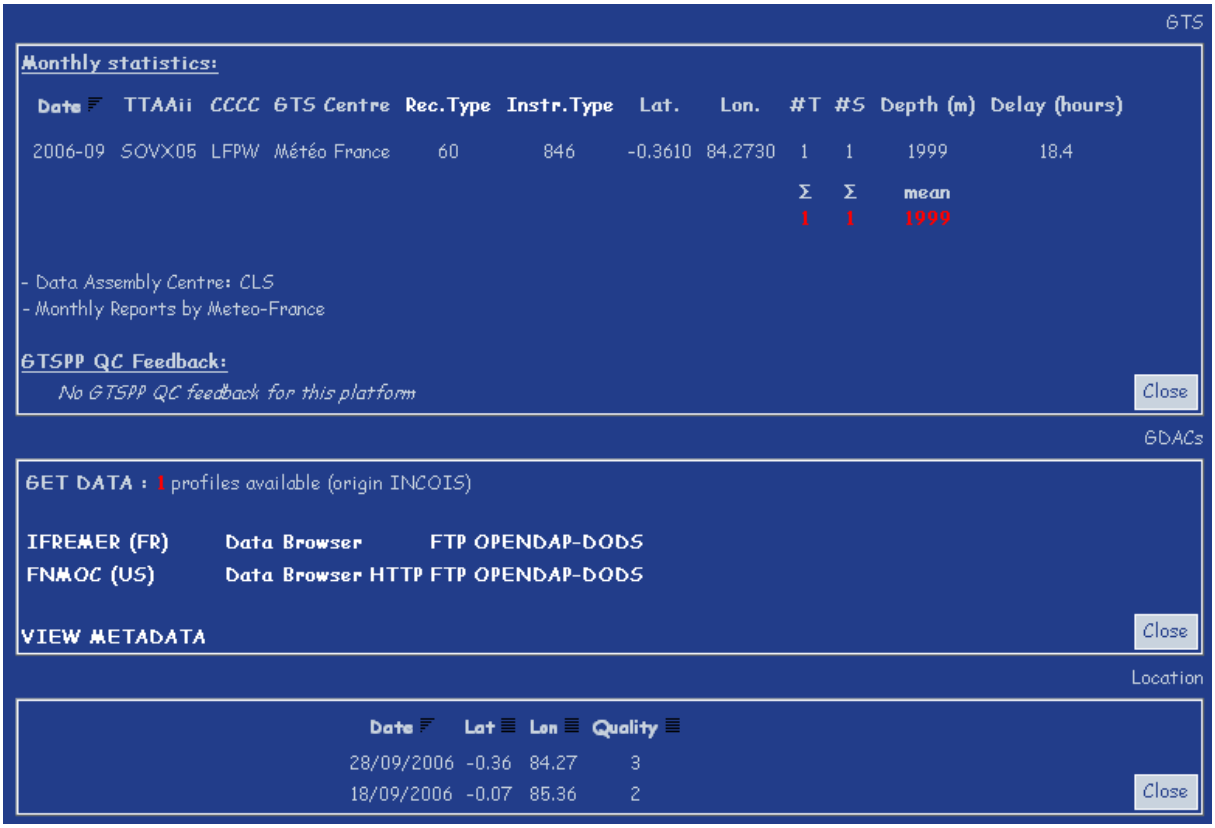
Deployment

Depl. date	18/09/06
Depl. Lat	0.0000
Depl. Lon	85.0000
Basin	Indian Ocean
Depl. Country	INDIA
Depl. type	R/V
Depl. ship	R/V
Depl. Method	MANUAL
Depl. Height	1.0
Depl. Speed	0.00
Package type	- No data -
Call Sign	
Weather	- No data -
Sea state	- No data -
Wind speed	- No data -
CTD at launch	☑
Comments	

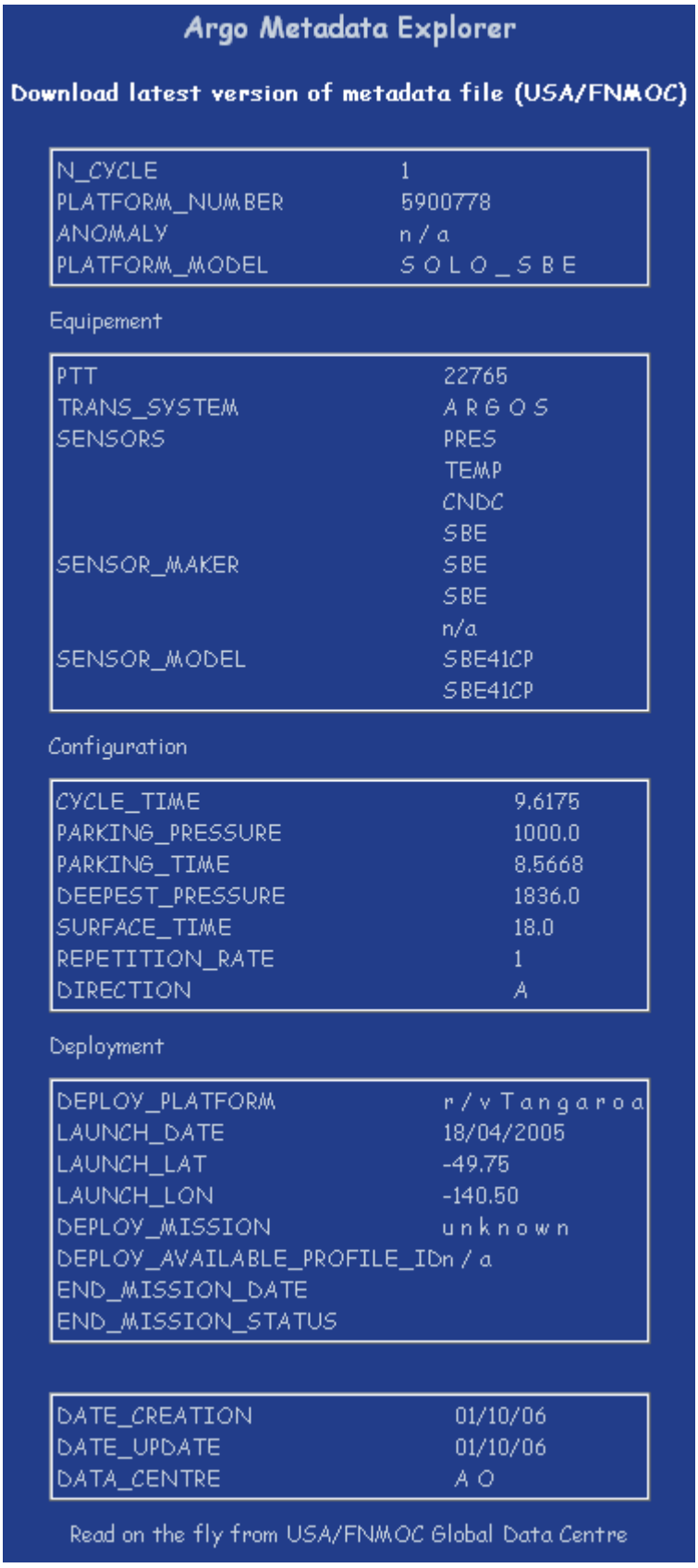
Notification date: 19/09/2006

Close

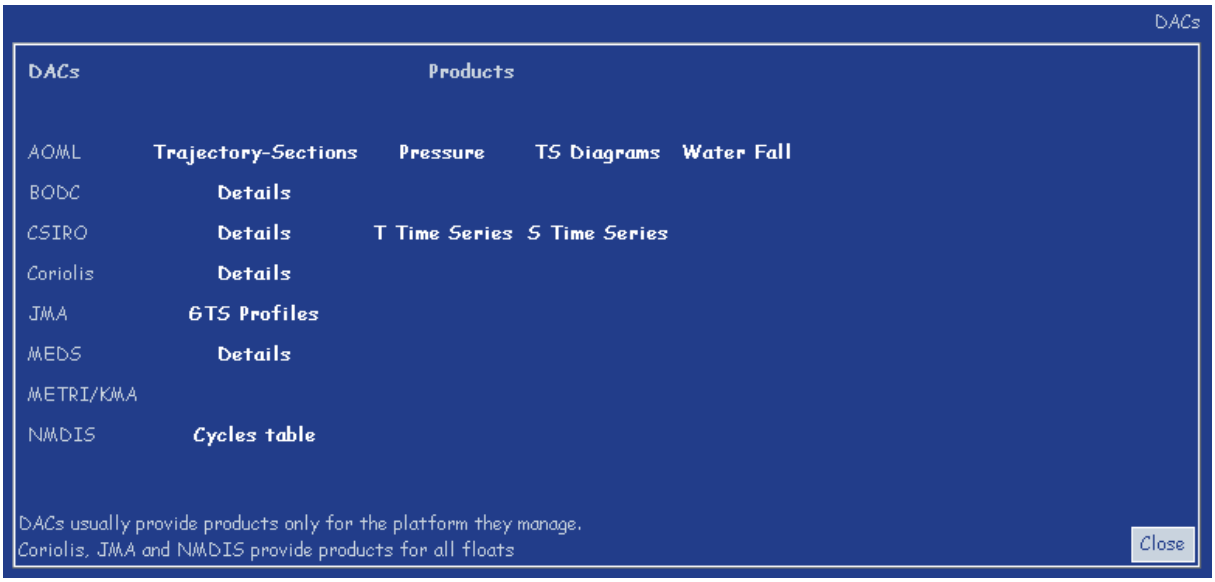
Deployment Conditions



Monthly GTS Statistics, Access to Data (and metadata files) at GDACs, list of locations
(The TC in admin mode can edit any element and particularly flag the wrong locations on the fly or swap the two location solutions of the Doppler/Argos location system – which is a common cause of errors)

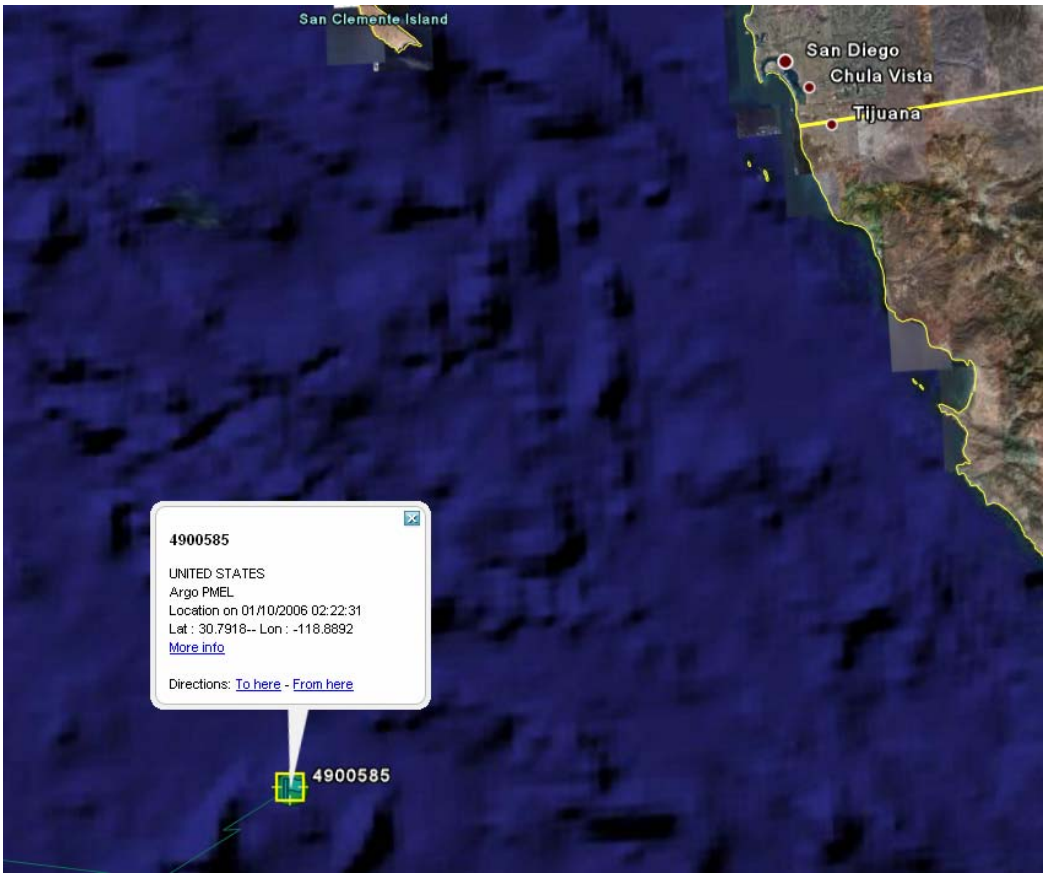


Argo netCDF Metadata file explorer



Links to national DAC products

(All DAC websites providing products on an individual float are linked here)



Zoom on a float near San Diego with Google Earth

(a click on More info will open the Platform Inspect Page)

One week of AIC website audience:

Application Statistics					
	Transactions	Average Transaction Time	Average Idle Time	Moving Average* Transaction Time	Moving Average* Idle Time
Overall	7906	0.874	77.217	0.716	62.180
Component Actions	7330	0.888	NA		NA
Direct Actions	576	0.688	NA		NA
Started at	11:58:05 on Thu, Oct 05 2006 Europe/Paris				
Running time	7 days, 3 hours, 29 minutes, 49 seconds				

* The sample size for Moving Averages is 100 transactions.

Sessions Statistics	
Total Sessions Created	2519.00
Session Rate	0.23
Avg. Transactions Per Session	3.14
Sample Size For Moving Avg.	10.00
Current Active Sessions	378.00
Peak Active Sessions	378.00
Moving Avg. Session Life	83.46
Moving Avg. Transactions Per Session	2.49
Avg. Session Life	94.38
Peak Concurrent Sessions at 15:27:50 on Thu, Oct 12 2006 Europe/Paris	

Memory Usage (bytes)	
Total Memory	530,907,136
Free Memory	128,629,808

Avg. Memory Usage Per Session (bytes)	
Total Memory	702,171
Free Memory	-309,996

Component Action Statistics				
Name	Served	Min	Avg	Max
N_Inspect	3	0.196	**1.710**	4.372
Doc_List	45	0.000	**0.235**	0.856
Data_Tools	5	0.001	**0.301**	0.483
Photos_Query	42	0.000	**0.433**	1.149
Argo_Participants	4	0.001	**1.777**	6.118
N_List	85	0.000	**1.466**	18.669
Map_Latest	49	0.000	**9.280**	122.590
Map_GIS_Home	23	0.000	**0.313**	0.624
Project_Status	56	0.000	**2.049**	29.811
Program_Inspect	24	0.000	**1.082**	5.457
Weblink_Edit	1	0.440	**0.440**	0.440
Photos_List	121	0.000	**2.346**	62.227
Help_Home	17	0.001	**0.474**	2.342
Participants_Home	19	0.001	**0.759**	5.026
Map_Home	81	0.000	**0.479**	2.780

More than 200 dynamic components …

…

Map_Query	8	0.175	**0.331**	0.532
Implementation_Retrieval_Home	1	0.582	**0.582**	0.582
Main	4531	0.000	**0.808**	15.033
Loc_Edit	5	0.368	**0.416**	0.507
Map_Misc	1	0.346	**0.346**	0.346
Web_MailingList	2	0.337	**0.400**	0.464
Data_ADMT_Home	3	0.170	**0.353**	0.451
FloatDecay_	6	0.000	**0.002**	0.008
Map_List	18	0.000	**1.727**	5.278
Meeting_List	2	0.000	**0.140**	0.281
Version_List	11	0.001	**0.413**	1.718
Contact_Search	1	0.649	**0.649**	0.649
Instrumentation_Links	2	0.388	**0.401**	0.414
Implementation_EEZs	2	5.399	**5.512**	5.626
Status_Files	9	0.000	**0.151**	0.520
Platform_Inspect	296	0.000	**0.398**	2.691
Weblink_Home	15	0.000	**0.584**	1.767
Doc_Edit	13	0.255	**0.297**	0.442
Weblink_List	5	0.156	**0.247**	0.469
Monitoring_Home	34	0.000	**0.339**	0.614
N_Query	32	0.000	**0.483**	0.784
Instrumentation_Doc	4	0.000	**0.280**	0.571
N_Edit	54	0.000	**1.942**	5.477
Platform_Query	289	0.000	**0.421**	1.662
Data_Home	40	0.000	**0.333**	0.892
Implementation_Deployment_Status	5	7.311	**7.489**	7.683

… plus direct “Web services” used by mapping systems or AIC toolbar

Direct Action Statistics				
Name	Served	Min	Avg	Max
notification	18	0.214	**0.406**	0.548
default	31	0.001	**1.540**	2.143
ptf	238	0.012	**0.936**	9.185
WOStata	1	0.108	**0.108**	0.108
country	4	0.905	**1.631**	3.369
maps	8	4.969	**7.003**	15.420
search	21	0.913	**1.182**	2.179
ptfSearch	1	0.321	**0.321**	0.321
status	1	0.449	**0.449**	0.449
map	8	1.970	**2.113**	2.206
floatDecay	245	0.001	**0.050**	1.022

These tools permit to track the use of the AIC dynamic website in order to improve the most used components and detect the problematic ones (regarding loading time).
On this example, during one week, 2500 sessions have been created, the home page has been loaded 4500 times, 300 queries have been made on the float search engine, etc.

- Key AIC URLs

All of the following URLs are accessible from http://argo.jcommops.org

Export Files

- **Status files (ASCI, csv)**
  - Active floats, latest location
    http://w3.jcommops.org/FTPRoot/Argo/Status/status.txt
    http://w3.jcommops.org/FTPRoot/Argo/Status/status.txt.gz
  - All Argo official deployments
    http://w3.jcommops.org/FTPRoot/Argo/Status/deployments.txt
    http://w3.jcommops.org/FTPRoot/Argo/Status/deployments.txt.gz
  - All floats locations
    http://w3.jcommops.org/FTPRoot/Argo/Status/loc.txt
    http://w3.jcommops.org/FTPRoot/Argo/Status/loc.txt.gz

- **Google Earth Files:**
  - http://w3.jcommops.org/FTPRoot/Argo/Status/status.kml (Active floats - latest locations)
  - http://w3.jcommops.org/FTPRoot/Argo/Status/status_full.kml (Active floats - latest locations and trajectories)
  - http://w3.jcommops.org/FTPRoot/Argo/Status/status_inactive.kml (Inactive floats - latest location and trajectories)

Dynamic Pages

- Interactive Map: http://w4.jcommops.org/website/Argo

- Latest status map by country:
  http://w3.jcommops.org/FTPRoot/Argo/Maps/status.png
  http://w3.jcommops.org/FTPRoot/Argo/Maps/status.pdf (High res.)

- Latest Argo maps:
  http://wo.jcommops.org/cgi-bin/WebObjects/Argo.woa/wa/maps

- 'ArgoV' ESRI Map Service available on http://w4.jcommops.org

- Float Detail Page (replace X by the 7 digits WMO Id):
  http://wo.jcommops.org/cgi-bin/WebObjects/Argo.woa/wa/ptf?wmo=X

- Participating countries/programs statistics (replace X by country/prog. name):
  http://wo.jcommops.org/cgi-bin/WebObjects/Argo.woa/wa/country?country=X
  http://wo.jcommops.org/cgi-bin/WebObjects/Argo.woa/wa/prog?prog=X

- Float Model Statistics (replace X by APEX, SOLO, Provor, etc)

http://wo.jcommops.org/cgi-bin/WebObjects/Argo.woa/wa/model?model=X

- Deployment notification
  http://wo.jcommops.org/cgi-bin/WebObjects/Argo.woa/wa/notification

- Project Status
  http://wo.jcommops.org/cgi-bin/WebObjects/Argo.woa/wa/status

- Contact List (replace X by AST, ADMT, NFPs, …)
  http://wo.jcommops.org/cgi-bin/WebObjects/Argo.woa/wa/gp?group=X

- Data Distribution Status
  http://wo.jcommops.org/cgi-bin/WebObjects/Argo.woa/wa/dataStats

Mailing Lists

argo@jcommops.org
Argo General Mailing List (~700 subscribers)

argo-dm@jcommops.org
Argo Data Management (137)

argo-dm-dm@jcommops.org
Argo Data Management - Delayed Mode (43)

argo-dm-format@jcommops.org
Argo Data Management - Data Formats (37)

argo-dm-rt@jcommops.org
Argo Data Management - Real Time (37)

argo-exec@jcommops.org
Argo Executive (13)

argo-st@jcommops.org
Argo Steering Team (44)

argo-tech@jcommops.org (71)
Argo Technical mailing list (with manufacturers)

Additionally, JCOMMOPS maintains DBCP and SOOP mailing lists and new lists for GEO: ocean-united@jcommops.org, for JCOMM news jcomm-news@jcommops.org.

19. Annex 7 - Argo Data Users Survey

Argo TC, October 2006

1. Background

An on-line survey has been set up by the AIC in May 2006.
Survey will stay open for one year.
As of October 2006, **66** users replied to the survey.

Survey address: http://www.surveymonkey.com/s.asp?u=460472024285

2. Results

1. You are:

		Response Percent	Response Total
An Argo Project Manager/Principal Investigator		10.6%	7
An Oceanographer/Marine Scientist/Researcher		**62.1%**	**41**
A Marine Meteorologist		1.5%	1
A Modeller		12.1%	8
A Float Technical Expert		4.5%	3
An Argo data user		37.9%	25
A student		12.1%	8
General Public		6.1%	4
View Other (please specify)		6.1%	4
	Total Respondents		**66**
	(skipped this question)		0

2. Where are you located?

		Response Percent	Response Total
Africa		1.5%	1
Americas (Mexico & North)		**27.7%**	**18**
Americas (South of Mexico)		7.7%	5
Antarctica		0%	0
Asia		**27.7%**	**18**
Europe		21.5%	14
Oceania		6.2%	4
View Other (please specify)		7.7%	5
	Total Respondents		**65**
	(skipped this question)		1

Remark:

Most of answers come from oceanographers and data users which demonstrate that the target of the survey is almost reached.
Others: College faculty (physics), sensor manufacturer, Argo national management, JCOMM secretariat.

3. You work in a:

	Response Percent	Response Total
Government Research Laboratory	**41.5%**	**27**
Operational Centre	10.8%	7
Data Centre	6.2%	4
University	32.3%	21
International/Intergovernmental Organization	3.1%	2
Commercial Company	6.2%	4
View Other (please specify)	9.2%	6
Total Respondents		**65**
(skipped this question)		1

4. What is your main source of information on Argo?

	Response Percent	Response Total
Argo Information Centre	**29.2%**	**19**
Argo Project Office	23.1%	15
Data Centres web sites	26.2%	17
National Argo web sites	10.8%	7
Documents	4.6%	3
Brochure	1.5%	1
View Other (please enter URL)	4.6%	3
Total Respondents		**65**
(skipped this question)		1

Question 5: "What improvement to the Argo Project Office website?:"

- Speed
- section on who is using Argo data
- FAQ section: What is Argo? How are the floats located? Are the current datasets complete? What is the difference between the two GDACs and the DACs?
- Forum to answer and discuss questions/doubts about Argo data use
- Better bibliography
- More visibility for developing countries involvement
- Animation on the float mission
- "beginner's guide to accessing Argo data" in HTML and on the AIC website
- More visibility to oxygen pilot project
- Look and feel consistency with AIC and argo.net

Question 7: "What improvement to the Argo AIC website?:"

- speed
- web form to order WMO Ids
- Argo real time density coverage on interactive map
- Interactive map too slow
- Access to download publications
- Hard copies to developing countries

Remarks:
Most of these proposals are interesting and will be taken into account.
Some have already been implemented on the new AIC website.
It is to be noted that most of the information required already exists on the websites.
This demonstrates the substantial improvements that have to be made on websites navigation.
The idea of an integration of both sites should be discussed.

Argo core mission is deep T/S profiling and not oxygen so the visibility to such projects will probably stay marginal. But a minimum effort can be done.
On the new AIC website it is possible to query the float database to gather all float measuring dissolved oxygen and some maps of new sensors will be regularly issued.

Substantial efforts have been made by the AIC to foster participation in Argo by developing countries and to give them an appropriate visibility. This will effort will be continued.
Hard copies of website content will be available on the Argo CDROM.
Access to download publications is closed to the public and requires subscription (not free) to papers. This is clearly a problem and particularly for developing countries.

6. How well are you satisfied of the Argo Information Centre services ?

		Response Percent	Response Total
Excellent		18.6%	11
Very Good		25.4%	15
Good		**40.7%**	**24**
Average		13.6%	8
Bad		1.7%	1
Very Bad		0%	0
Poor		0%	0
	Total Respondents		**59**
	(skipped this question)		7

AIC users are pretty satisfied of the services proposed.
This survey was made before the release of the new AIC site; it is likely to have a better audience and feedback in the future.

Question 8: "What improvement would you recommend for the Argo brochure?"

- Most of users skipped this question or replied the brochure was fine.
- regular updates
- more understandable for policy makers by reducing all technical terms

9. You plan to use Argo data for:

		Response Percent	Response Total
Oceanographic Research		**82.3%**	**51**
Operational Oceanography		30.6%	19
Climate Research		43.5%	27
Environment		9.7%	6
Ocean Analysis Products		33.9%	21
Technology Issues		8.1%	5
View Other (please specify)		8.1%	5
	Total Respondents		**62**
	(skipped this question)		4

10. You area of interest is:

		Response Percent	Response Total
Global		**45.5%**	**30**
Atlantic Ocean		9.1%	6
Atlantic - North		16.7%	11
Atlantic - Equatorial		7.6%	5
Atlantic - South		4.5%	3
Pacific Ocean		15.2%	10
Pacific - North		13.6%	9
Pacific - Equatorial		12.1%	8
Pacific - South		9.1%	6
Indian Ocean		21.2%	14
Arctic Ocean		4.5%	3
Southern Ocean		15.2%	10
Mediterranean Sea		4.5%	3
View Other (please specify)		1.5%	1
	Total Respondents		**66**
	(skipped this question)		0

11. Where do you access Argo data?

		Response Percent	Response Total
Argo Global Data Centre – Coriolis (FR mirror)		46%	29
Argo Global Data Centre – GODAE (USA mirror)		**52.4%**	**33**
Global Telecommunication System of WMO		12.7%	8
Argo Regional Data Centres		22.2%	14
CDROM		3.2%	2
View Elsewhere (please specify)		7.9%	5
	Total Respondents		**63**
	(skipped this question)		3

Question 10: "You area of interest"

There are no strong requirements for implementing Argo in marginal seas (Caribbean, Gulf of Mexico, etc).

Question 11: Others data sources:

- ASCII mirror program in Canada
- GTSPP
- No access …
-

12. What data format do you prefer?

	Response Percent	Response Total
netCDF	**67.8%**	**40**
ASCII	47.5%	28
TESAC	3.4%	2
BUFR	1.7%	1
View Other (please specify)	5.1%	3
Total Respondents		**59**
(skipped this question)		7

13. How often do you download Argo data?

	Response Percent	Response Total
Every hour	0%	0
Every 3 hours	0%	0
Every 6 hours	0%	0
Bi-daily	0%	0
Daily	14.3%	8
Weekly	21.4%	12
Monthly	**39.3%**	**22**
Yearly	21.4%	12
View Other (please specify)	12.5%	7
Total Respondents		**56**
(skipped this question)		10

14. You access data at GDACS via:

	Response Percent	Response Total
http	45.5%	25
ftp	**60%**	**33**
Live Access Server	20%	11
subscription	0%	0
View Other (please specify)	7.3%	4
Total Respondents		**55**
(skipped this question)		11

15. Which data files do you use at GDACs?			
		Response Percent	Response Total
Individual Profiles		52.9%	27
Multi Profiles		**66.7%**	**34**
Trajectories		43.1%	22
Technical Data		19.6%	10
Metadata		33.3%	17
	Total Respondents		**51**
	(skipped this question)		15

16. Which additional data you would like to use? (This implies equipping the floats with new sensors)			
		Response Percent	Response Total
Sea Surface Temperature		**61.5%**	**32**
Sea Surface Salinity		57.7%	30
Wind/Rain gauge (acoustic)		38.5%	20
Dissolved Oxygen		51.9%	27
Biological		38.5%	20
View Other (please specify)		13.5%	7
	Total Respondents		**52**
	(skipped this question)		14

Remark:

An additional SST sensor is probably the only one that could be added to the floats on a global scale. First tests are being made by University of Washington Argo group.
All the other sensors will have prohibitive costs, energy or bandwidth needs and will clearly impact the lifetime of the floats and the Argo core mission.
But they should be taken into account for the implementation of other elements of the Global Ocean Observing System.

17. How well are you satisfied with the data access at GDACs ?

FR GDAC						
	Very Good	**Good**	**Average**	**Bad**	**Very Bad**	**Response Total**
General data access	30% (8)	**52% (14)**	11% (3)	0% (0)	7% (2)	**27**
Web Interface	17% (4)	**57% (13)**	22% (5)	0% (0)	4% (1)	**23**
FTP server	30% (7)	**43% (10)**	26% (6)	0% (0)	0% (0)	**23**
Live Access Server	7% (1)	**50% (7)**	29% (4)	14% (2)	0% (0)	**14**
Subscription	21% (3)	**43% (6)**	29% (4)	7% (1)	0% (0)	**14**
Data quality	20% (5)	**56% (14)**	24% (6)	0% (0)	0% (0)	**25**
Data timeliness	22% (5)	**43% (10)**	35% (8)	0% (0)	0% (0)	**23**
Data quantity	29% (6)	**57% (12)**	14% (3)	0% (0)	0% (0)	**21**
Data accuracy	19% (4)	**52% (11)**	24% (5)	0% (0)	5% (1)	**21**
USA GDAC						
	Very Good	**Good**	**Average**	**Bad**	**Very Bad**	**Response Total**
General data access	**55% (11)**	35% (7)	10% (2)	0% (0)	0% (0)	**20**
Web Interface	41% (7)	**47% (8)**	12% (2)	0% (0)	0% (0)	**17**
FTP server	**52% (11)**	33% (7)	14% (3)	0% (0)	0% (0)	**21**
Live Access Server	21% (3)	**50% (7)**	29% (4)	0% (0)	0% (0)	**14**
Subscription	20% (2)	**60% (6)**	20% (2)	0% (0)	0% (0)	**10**
Data quality	35% (7)	**55% (11)**	10% (2)	0% (0)	0% (0)	**20**
Data timeliness	**55% (11)**	35% (7)	10% (2)	0% (0)	0% (0)	**20**
Data quantity	28% (5)	**56% (10)**	17% (3)	0% (0)	0% (0)	**18**
Data accuracy	29% (5)	**41% (7)**	18% (3)	0% (0)	12% (2)	**17**
					Total Respondents	**43**
					(skipped this question)	23

Remarks:

- good load balance between the two GDACs
- no access in http for the ftp server files at FR GDAC
- good general feedback for both GDACs

18. How well are you statisfied with the data access on the GTS of WMO?						
	Very Good	**Good**	**Average**	**Bad**	**Very Bad**	**Response Total**
General data access	22% (5)	**70% (16)**	4% (1)	0% (0)	4% (1)	**23**
Data quality	23% (5)	**45% (10)**	23% (5)	5% (1)	5% (1)	**22**
Data timeliness	23% (5)	**55% (12)**	14% (3)	5% (1)	5% (1)	**22**
Data quantity	25% (5)	**55% (11)**	15% (3)	0% (0)	5% (1)	**20**
Data accuracy	23% (5)	**41% (9)**	27% (6)	5% (1)	5% (1)	**22**
					Total Respondents	**23**
					(skipped this question)	43

19. What do you think of the Argo data support ?						
	Very Good	**Good**	**Average**	**Bad**	**Very Bad**	**Response Total**
Documentation	27% (13)	**49% (24)**	22% (11)	2% (1)	0% (0)	**49**
Response to queries	29% (12)	**48% (20)**	19% (8)	5% (2)	0% (0)	**42**
					Total Respondents	**50**
					(skipped this question)	16

Question 20: suggestions regarding the Argo data system:

- Better documentation on QC procedures (too general)
- Need for high quality delayed mode data
- netCDF files too heavy. ASCII easier to use.
- Unify the trajectory data format
- Regular access problems on Coriolis map selection tool (nice tool but overloaded?)

About 30 users provided there email address to be informed of future changes and improvements of the Argo data service.

3. Conclusion

Some general remarks:

- good general feedback
- interesting proposals to improve websites
- no feedback from Africa
- ASCII format preferred by 50% of users

These first results are quite interesting but we should invite more users to fill the survey.
I hope there are more than 66 users of Argo data in the reality …
That would be particularly helpful top get more feedback from the modellers' community.

So I invite all DACs (global, national, regional, long-term) to really promote this on-line survey on their websites and eventually propose additional questions.