15th ARGO DATA MANAGEMENT MEETING

Ottawa
5th November - 7th October 2014

Version 1.0
14th November 2014

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1 Objectives of the meeting

The 15th ADMT meeting was hosted by OSD, DFO and MEOPAR, Ottawa, Canada. It started at 9am on the 5th November and finished at 12h00 on the 7th November. 41 persons from 11 countries and 29 institutes participated in the meeting.

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

- *Review the actions decided at the 14 th ADMT meeting to improve data formats and Bio-Argo data processing*
- *Feedback from monitoring the quality of Argo float data processing in Real time and Delayed mode*
- *Review Regional Argo Data Centre progress*
- *Report from 3rd Bio-Argo Workshop*

Prof Denis Hains, Director General of Canadian Hydrographic Service & Oceanographic Services. welcomed the participants to Ottawa. He introduced the activities of OSD, DFO and MEOPAR and pointed out that Argo underpins an increasing number of activities. Then, Dr Wendy Watson Wright, Assistant Director General and Executive Secretary, UNESCO Intergovernmental Oceanographic Commission also welcomed the ADMT participants to Canada and noted that Argo has done more to deliver free and open access to marine data than any other program. She was also pleased to see the support for Bio-Argo is expanding with good level of support.

2 Feedback from 14th AST meeting

Status:

With the ~3500 active floats, we are on average maintaining coverage at our original design, though some areas (far southern latitudes) remain slightly under sampled. There are about 500 floats operating in pilot extension missions - the sea ice zones, marginal seas, enhanced western boundary arrays. Thus, Argo is not oversampling compared to its original design.

The data stream is going through a major change due to the rapidly growing number of floats using high-bandwidth communications and delivery highly vertically resolved profiles. Soon high resolution profiles returns will dominate. Science uptake continues to grow steadily.

Evolution:

The IAST has a 'sketch' of what a future global design' might look like (~4200 active floats), but many details remain unknown and the design requires more rigorous justification and peer-review. A set of design activities need to occur for the boundary arrays, equatorial zone, deep Argo, high latitude Argo, and bio-Argo, along with a need for teams piloting these extensions to share experiences and technical issues. Argo must also strongly interface with international GOOS activities around these areas, such as the TPOS2020 project (equatorial), DOOS(Deep Observing Strategy), IMBER/IOCCP etc. Thus the IAST is considering forming specific task teams around potential mission extensions to help with design, liaison with our community and best practice. This will be resolved at IAST-16. Some enhancements are moving to sizeable regional pilots (SOCCOM, EuroArgo, AtlantOS) that will help answer many of the technical/scientific and cost questions needed to move to a credible global design. The joint Argo/GOSHIP/IOCCP workshop planned for late 2015 may also assist in moving a deep Argo design along.

Interactions with commercial partners/suppliers:

This was tried for one day at AST-15. While the interaction is very worthwhile, it did impact on the normal flow of the IAST. It was recognized that more opportunities to interact are needed, and a deliberate outreach and invitation to Argo science, technical and data workshops is seen as the best path forward.

Priorities:

The stress on the data system is recognized by the AST, particularly the major impact on normal business due to the translation to V3.1. The top priority is meeting our original goals, along with a focus on quality.

Some DACs are now funded to manage pilot bio and other extensions, but Argo cannot expect 'compliance' from all DACs as for many others these are completely unfunded extensions. Decoupling the management of core and other variables into two files has definitely helped diffuse this stress for many teams.

Summary:

The success of Argo has always relied on the success of the ADMT. Argo must evolve its design and this is in progress. The new (global) design must be scientifically justifiable, credible given available resources and it must not compromise the achievements of Argo to date. ADMT's input into this evolution and how it is managed is crucial and we must ensure ADMT members are part of the new Task Teams.

Action Brian to lead the definition of a set of metrics to monitor the quality of the Argo dataset and publish it on the AST and ADMT WWW

2.1 FAQ WWW pages

M. Scanderbeg presented on the Data FAQ webpage created last year. The page was created in response to action items at both ADMT and AST meetings that requested better documentation of data issues related the Argo data set. Following the presentation at ADMT-14, the webpage was made live last December. Since the development of the page, additional information has been added describing the core-Argo, b-file and m-file split in V3.1. An important part of the page was tracking the progress of conversion from V2 to V3. M. Scanderbeg suggested tracking this information at the GDACs monthly and linking to it from the Data FAQ page.

Next, M. Scanderbeg presented on updates to the Argo Beginner's Guide page on the AST website. The draft version is available here:

http://www.argo.ucsd.edu/Argo_date_guide_draft.html

There is a definite need for this page to be updated given the large changes that the Argo data system is experiencing right now. These changes include higher resolution profiles, more exotic variables, even higher reliance on data quality flags, etc. In addition, the links to the various documents associated with Argo needed to be updated. There are also more ways to get and/or view Argo data now – via monthly snapshots at the GDACs associated with DOIs, through gridded files, and through various data viewers. M. Scanderbeg requested information on additional gridded fields or data viewers to add to the web pages. Following the ADMT, updates will be made and the webpage should be upgraded by the end of 2014.

Action: Megan to include in the FAQ the points identified at the meeting.

Action :ADMT members to send feedback to Megan on the FAQ page :

http://www.argo.ucsd.edu/Data_FAQ.html

and the Argo Beginner guide:

http://www.argo.ucsd.edu/Argo_date_guide_draft.html

3 Feedback on BIO-Argo Workshop

The terms of reference of the Bio-Argo task team were presented with an emphasis on the development of Bio-Argo Data management in close interaction with the ADMT. The V3.1 of the Argo Format was also presented describing how the Core-Argo and Bio-Argo parameters will be

stored in the different files. (Core-Argo in the C-file, all Bio-Argo parameters in the b-file and Core-Argo plus Ocean state variables within Bio-Argo parameters in the merged file). The status of the documentation (Processing, RTQC, DMQC) for the different variables ready to be implemented was reviewed (O2, BBP, CHLA, Radiometry, NO3, pH).

Regarding O2, the SCOR group should write recommendations as to the processes required for DMQC of the existing Argo dataset and a workshop with DM operators should be subsequently organized. The SCOR group should also write recommendations about the in-air calibration procedure in close interaction with manufacturers. Furthermore, an inventory of the "in-air" measurements with optodes already sampled by certain floats should be undertaken.

Regarding CHLA, the "possible" bias in the relationship between satellite Chla and Chla-adjusted should be further investigated. Chla shows a good agreement with satellite observations. Chla-adjusted for quenching reveals a bias. The source of this bias is unknown but could be related to the calibration procedures for these sensors (the assumption of linearity of the relation between Chla vs fluorescence over the whole range of Chla concentrations). Additionally, the adjustment at depth within oxygen depleted areas should be refined. The RTQC for CHLA will be implemented at Coriolis and tested.

Regarding BBP, once the documentation on the RTQC will be finished, the RTQC will be implemented at Coriolis. There is also a need to complete the documentation on the processing of scattering sensors including FLNTU, FLBB. This will be done by LOV with the help of INCOIS, JAMSTEC.

Documentation for the processing of raw NO3 is nearly finished, as well as the document for processing radiometry. The writing of the documentation concerning RTQC for NO3 and radiometry and the processing of raw pH should be started soon.

The Bio Argo community needs better coordination. A web site will be created, documentation about good practices will be available and a DAC/national contact point will be identified for each interested country.

For more details see Bio-Argo meeting report. Brian King noted that a lot of attention seems to be focused on what needs to be fixed but we should recognize the incredible progress made by Bio-Argo. This needs to be acknowledged and they should be congratulated.

4 Status of Argo Program and link with Users

4.1 Review of the Actions from last ADMT

Sylvie Pouliquen reviewed the status of the action items from ADMT14. At ADMT14 it was decided to identify the high priority actions from routine and low priority ones. It has also been agreed to organize phone meetings (one in February, one in June) to better monitor progress and identify earlier when issues block progress. The February meeting focused on the high priority issues and the ones due for AST, while June focused on the rest of the actions. This has proven to be an efficient way of functioning and all DACs agreed to work the same way next year. Some DACs have been difficult to reach and an updated list of DAC contacts was assembled at the meeting. The status of the actions is:

- High: among the 6 actions decided 1 was done and 5 were partially done. These are linked to V3.1 format implementation which was harder than planed to implement
- Routine: Among the 23 actions 13 were done, 8 partially, 1 not done, 1 postponed after ADMT15

See complete status in Annex 3.

4.2 Argo Status and AIC development

The Argo Technical Coordinator, Mathieu Belbeoch, presented the status of Argo. The network has been slightly decreasing in the last 6 months but positive perspectives are in sight. This decrease is mainly the result of non-US contributions that have reached a plateau or are decreasing. China, however, shows some potential, and has just released the data of 130 additional equivalent floats, following a strong national effort of cooperation.

Upcoming cruises will deploy more than 500 floats in the next 6 months. Then if float reliability is improving – there are still too many early failures - Argo could approach the 4000 units by the AST meeting in 2015. However, AST has an on-going discussion on how to improve the overall quality of the Argo dataset, and some appropriate restrictions on equivalent contributions might be a solution. It should be noted that DM processing costs should be properly recognized and funded to make sure all new and equivalent floats have full data management processing covered without impacting existing groups.

He mentioned the need to better monitor this quality through appropriate indicators and metrics, in cooperation with OOPC and JCOMM OCG. The BioArgo network shows a very slow growth and one could ask if this is not underestimated. The team suggested adding a list of parameters to the index files for better monitoring and to help users find data, and provision of more detailed maps showing the different sensor packages.

Mathieu suggested we improve sharing of the different coverage maps (e.g. made at SIO or WHOI) or data layers useful for planning implementation such as ANDRO currents atlas, through more interoperable formats (e.g. netCDF, OGC standards, etc). Mathieu will help to make this happen.

He recalled then how planning was crucial to Argo and invited the ADMT to help PIs and deployment managers to maintain a simple text file for deployment plans, and machine to machine synchronization, including: ID (any); WMO;LAT;LON,DATE;SHIP;CRUISE;STATUS. This simple format will be used for all JCOMMOPS network planning, including cruise plans.

In addition, the AIC will develop the capacity to read V3 metadata files and monitor more metadata. He mentioned as well the importance of notifying deployments in advance so that sensitive cases can be smoothed before they become big issues.

Mathieu then presented a study of delays in data delivery to the GDACs which shows clear progress in the last two years (median delay of 12h vs 30h in 2012, and 90% of data published within 24h), and made a few last recommendations including: increase frequency of scheduled processing tasks, and on the fly processing of data if possible. As Iridium will be soon dominant in Argo, it is important to start thinking about substantially increasing the processing task frequency, designed initially to suit the Argos data delivery system (multiple message to assemble through long surface time). A few questions and areas for improvement remain for some DACs, and he will need to parse the US GDAC index file to better understand these problems.

Fixing a number of minor issues impacting only a few floats, which could be solved easily, would improve the DAC and GDACs checks (negative delays, positions on land, erratic locations or dates, GTS bulletins details, etc).

He mentioned also that many US Navy equivalent floats were not on GTS.

The Technical Coordinator finally presented the latest news about the JCOMMOPS office which will relocate to Brest very soon, with a strengthened team and ideal work conditions within Ifremer. This promises synergies, with the office in proximity to GOOS professional neighbors and the French Argo GDAC in particular.

He presented briefly latest and planned developments at JCOMMOPS including a new website that will be presented to the community for testing within a couple of months, targeting an official release by March 2015. He recalled that JCOMMOPS, though its ship coordinator, will provide appropriate

monitoring of planned and achieved cruises, and of data availability at CHHDO according to Argo requirements.

He concluded by recalling to the team the importance of opening discussions with the different initiatives that are serving integrated data (e.g. ERRDAP based TPOS experiment by NOAA/OSMC, IODE, EMODNET, GEO, Marine Explore, etc), or are preparing the future bases of data interoperability and suggested we regularly invite experts to the meeting to discuss these developments.

Action:

- ***AIC to make the link with the Centers that are integrating and redistributing Argo data and be sure they use our adjusted data and use the flags and report to ADMT***
- ***AIC to perform delay analysis on two GDACs and provide a report to DACs highlighting issues***

4.3 Citation index for Argo

An approach for the accurate citation of Argo data using a new DOI attached to each monthly snapshot of Argo data is in place at the Ifremer GDAC. These snapshots include the user and quality control manuals. A ".ris" file will be included as these are readily imported into bibliographic software and include the DOI so the DOI associated with a snapshot is clear to data users.

A proposal to move to one or two DOIs has been produced and verified by the research data alliance dynamic data working group and at the 2nd Ocean Data Interoperability Platform (ODIP) workshop (copy attached for the annex). The ODIP workshop included working through the semantics of citation with Simon Cox (CSIRO). A recent complication is a move by several significant journals to insist on the use of short identifiers which may preclude the use of date strings in the citation of the dataset. This complication is to be discussed at NODC the week after ADMT15, aiming for a solution, and followed by implementation in the coming year at NODC and Ifremer

5 Real Time Data Management

5.1 GTS status

MEDS routinely collects oceanographic data distributed on global telecommunication system (GTS). The total unique TESAC data are compiled from data received at three GTS nodes, Canada, Japan and Germany Meteorology offices. The total unique BUFR data are compiled from data received at Canada and Japan Meteorology offices. From November 2013 to October 2104, we received on average 11098 TESAC and 10497 BUFR messages each month. On average, 85% and 87% of TESAC and BUFR message reached the GTS within 24 hours of collection each month. For September and October 2014, approximately 15% of the TESAC messages were not transmitted as BUFR messages. Technically, one would expect to have more BUFR messages on the GTS than TESAC, because in BUFR messages we can send data with QC flags other than "1", while in TESAC we can only send data with a flag of '1'. There are no BUFR messages from the Korea or India DACs yet, but they have sent Anh Tran test messages to check for format. Hence it wouldn't take long before Korea and India will send data in BUFR format on the GTS.

Figure 1 and 2 showed the total number and timeliness of TESAC and BUFR messages of the Argo network on the GTS network. Figure 3 showed the number of 'extra' BUFR messages in comparison to the total number of TESACs on the GTS for each DAC that sent BUFR messages.

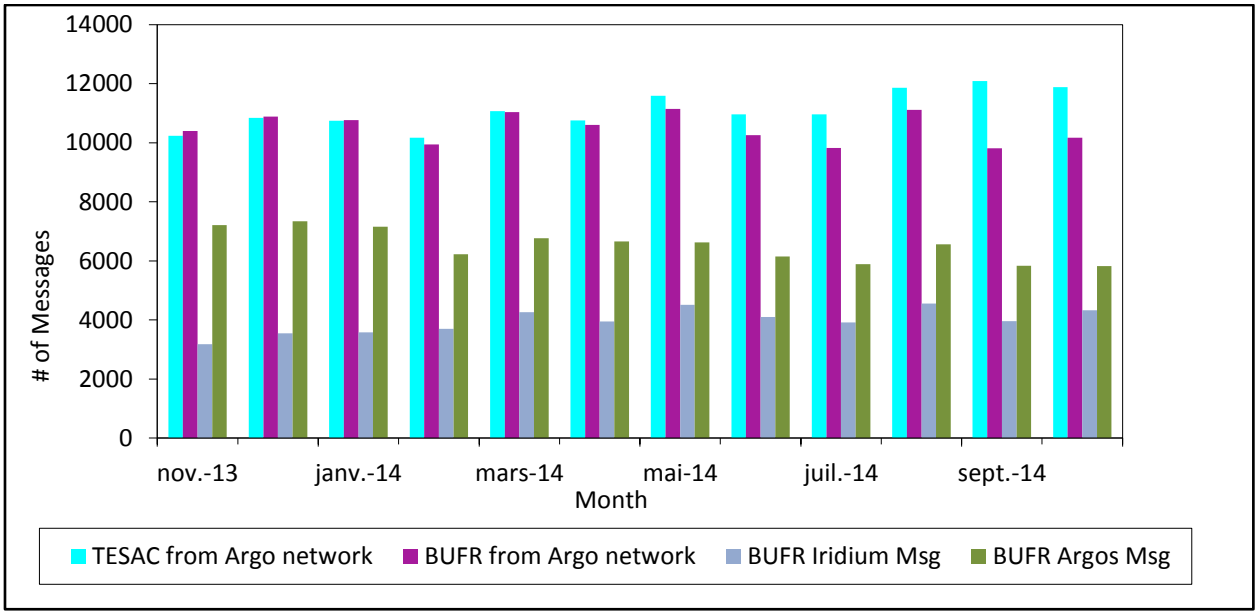


Figure 1: Total number of TESAC and BUFR messages on the GTS from global Argo network

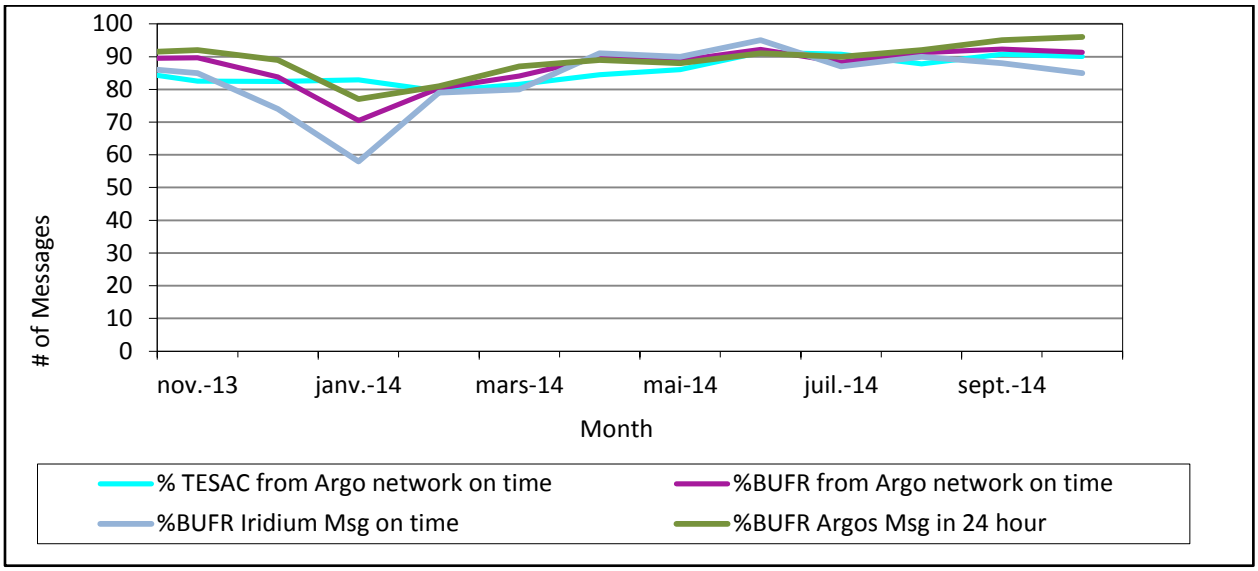


Figure 2: The timeliness of TESAC and BUFR messages on the GTS within 24 hours of collection from global Argo network

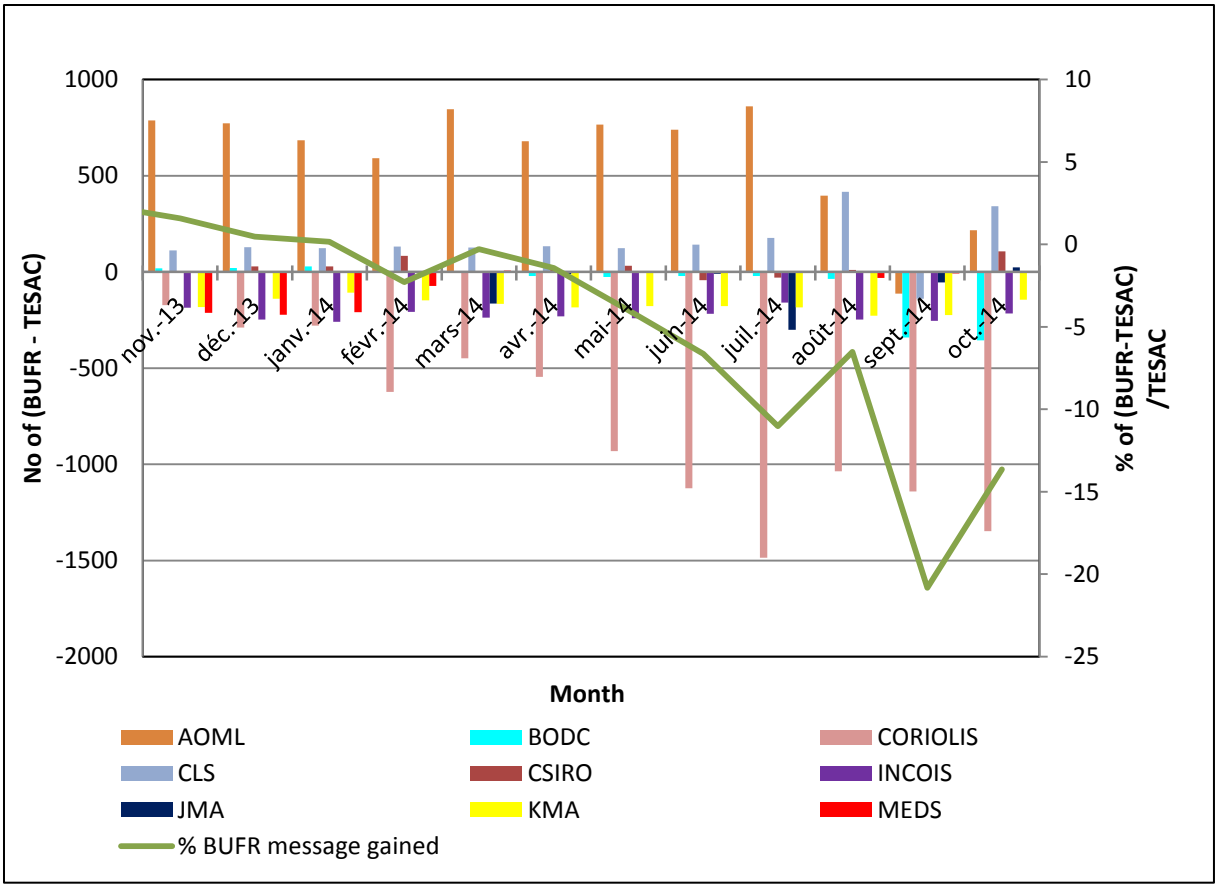
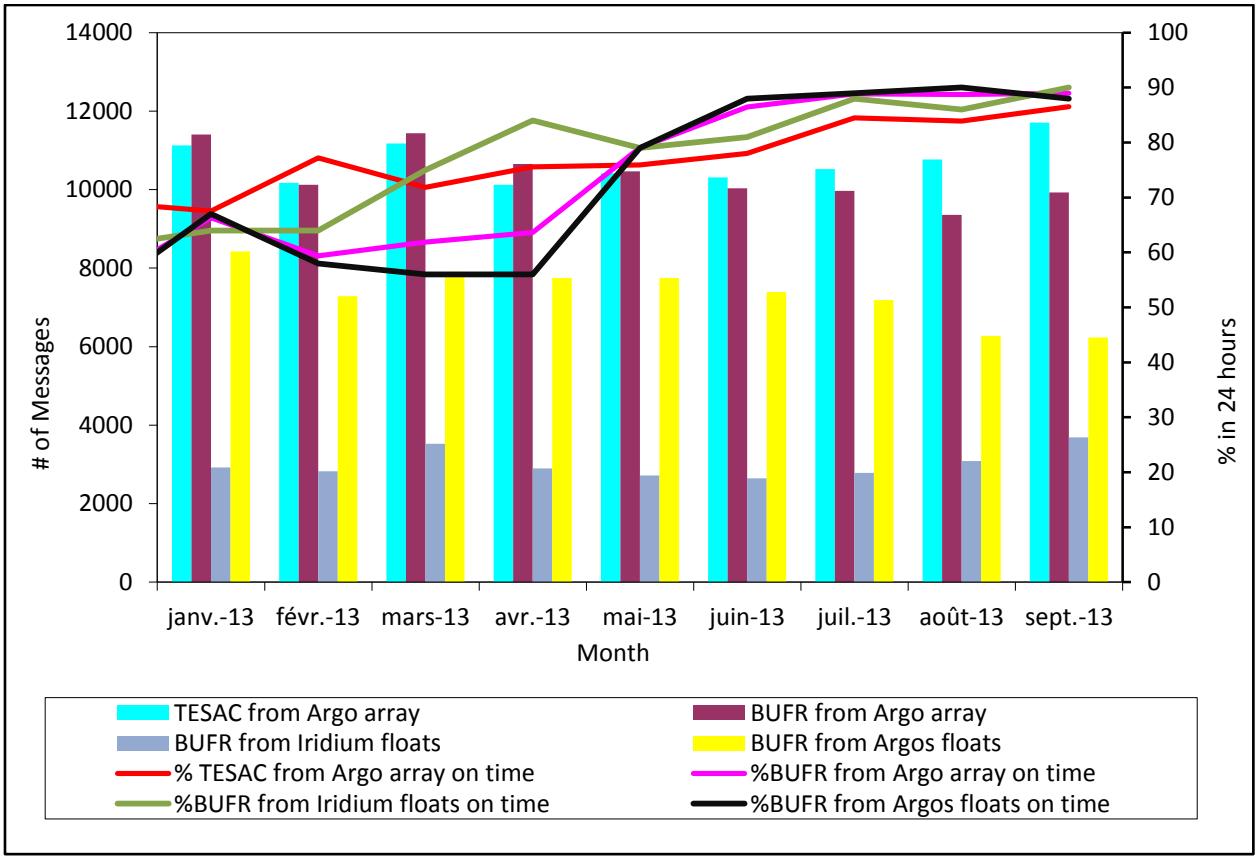


Figure 3: Number of BUFR message gained in comparison to the number of TESAC on the GTS for each DAC

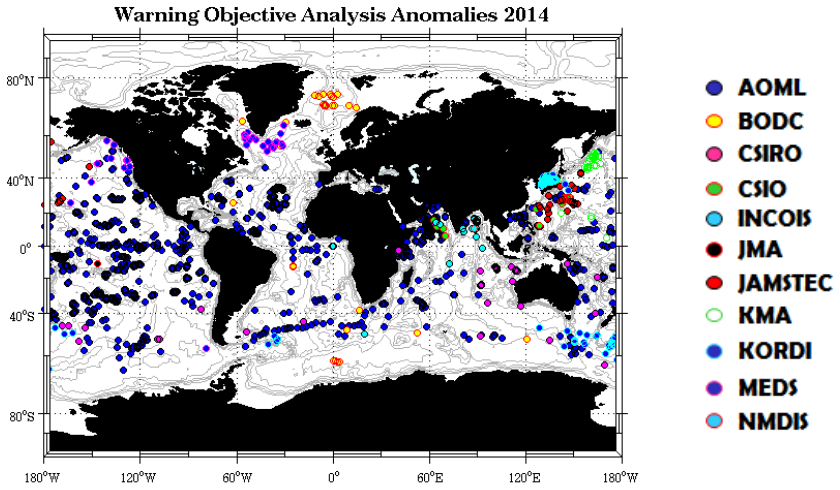


Actions

- ***Mike and Anh to perform a comparison of the content between GDAC and BUFR messages to be sure that profiles are complete ADMT16 Mike and Anh***
- ***Mathieu Belbeoch and Dacs to correct bad headers in some Tesac messages where SOV (a vessel code) was used instead SOF (the float code) for 5 DACS . Mathieu B to check the list and impact and contact the Dacs so they can fix it***
- ***Anh and Wataru to update the JMA and MEDS Java and Perl Converters so they can handle the generation of BUFR messages from Netcdf V3.1 files***
- ***Mathieu Ouellet will produce a Matlab encoder and decoder for BUFR and provide it to all***
- ***Anh and Dacs to investigate apparent blockage in BUFR distribution***

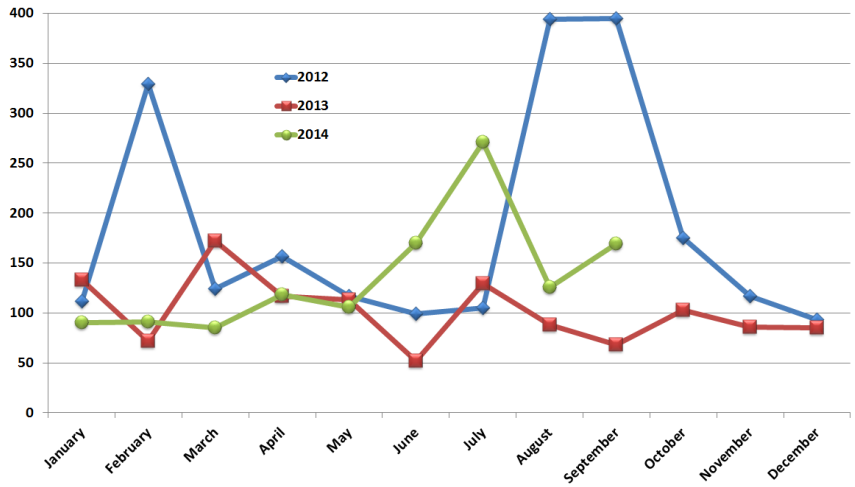
5.2 Status of profile anomalies at GDAC

Monthly reports are provided to each DAC to summarize all the anomalies that are detected during the month. The report is sent to argo-dm@jcommops.org and argo-dm-dm@jcommops.org .
The messages are available on the ftp site:
ftp://ftp.ifremer.fr/ifremer/argo/etc/ObjectiveAnalysisWarning/
and reports (pdf format) on:
ftp://ftp.ifremer.fr/ifremer/argo/etc/Report_ObjectiveAnalysisWarning/. The list of the email addresses where the messages are sent has been reviewed with all the DAC operators.



Location of the profiles with anomalies for the year 2014 (1st January till 28 October)

Statistics on anomalies show a mean around 125 profiles failed by month. For some DACs, the number increased from spring 2014; some peaks are observed in June and July. Some of the DACs have corrected the profiles and if necessary sent feedback to Coriolis. A few of them need to be contacted again to identify problems with reception of the messages and/or to understand corrections. There are not a lot of anomalies relative to the number of profiles submitted to the GDAC.



Evolution of the anomalies 'number for the last three years. High values in 2012 (February, August and September) are due to a re-run of the objective analysis on a large period and are not reflecting the anomalies detected monthly in real time.

A few profiles also have bad data that were not detected by the automatic tests, especially when the test result is smaller than the threshold of the gradient and spike tests, for levels shallower than 500 dbar. Without visual control and/or climatology tests, those profiles will keep getting into the Argo flow. A few of the others should have been detected by the automatic tests.

As at the last ADMT, other problems have been detected in the netcdf file format and are still occurring. This particularly affects the fields of adjusted parameters; when the data_mode is A, for some DACs only pressure adjusted is filled or adjusted_error is empty. This is the case for BODC, INCOIS, KMA, MEDS. All are in the process of correcting this or it has been done. INCOIS still has "old" RT files where the data_mode is R instead of A. For NMDIS, floats having delayed mode data at the last ADMT are now empty and others have DMQC values but name and data_mode are still 'R'.

They have to change the data_mode from R to D and to change the naming of the files from R<wmo_n°>_cycle.nc to D<wmo_n°>_cycle.nc. Some NMDIS DM files have been rejected and Coriolis will exchange with NMDIS to understand why. It is very important that the DACs provide feedback and fix anomalies in their files.

Action : Christine to identify the DACS where clearly some RTQC procedures are not properly implemented and warn them so that they can correct their code

5.3 Status of anomalies detected with Altimetry

The Altimetry check has been performed every four months again this year and automatic emails have been sent through the AIC database to the DM-operator and DAC responsible for the extracted floats. 82 floats are currently on the list. Feedback regarding only 12 of these has been received at this point. Some old anomalies have been recently corrected but some still remain. A new test was implemented two years ago that compares SLA/DHA differences to SLA/DHAadj differences. Additional floats are extracted with this new test and thus careful analysis by the PI is required.

About 50 % of the floats extracted show only one isolated very bad profile.

The general quality of the Argo dataset has showed stable statistics compared to last year. 971 242 Argo profiles with QC fields at '1' show very good agreement with co-located satellite altimeter observations with a correlation of 0.85 and rms difference of 25.3 % of the altimeter signal variance.

Because the objective analysis method and the altimetry check method detect very bad measurements, Susan thinks that it might be time to revisit the global range test and now use a regional range test. Sylvie indicates that a study in going at Ifremer to propose regional ranges. Results from this study will be presented next year at the Euro-Argo workshop. We must be careful since this might remove natural but extreme variability it may be possible to improve the tests without losing the underlying features.

5.4 Status of density test implementation

D files (all) and R files (reported within the last 90 days) were tested using the QC test #14. Files which had density inversions greater than 0.05 for D files or 0.03 for R files were written to a list so the DACs could check whether these were reasonable inversions (for D files) or there was an error (for R files).

These lists can be found at ftp.marine.csiro.au/pub/gronell/argo and files are named according to the DAC. Remember that PIs need to reassess the density structure after DMQC since this can introduce density inversions in some cases. The results were better than last year but we still had 34 R files which were not correctly flagged.

DAC	R files failed (dated in last 90 days)	D files failed	total failed	max density
AOML	17	576	593	1.7840 (R)
BODC	1	23	24	1.3895 (D)
CORIOLIS	4	162	166	0.8727 (R)
CSIO	10	43	53	2.4266 (D)
CSIRO	0	2	2	0.1626 (D)
INCOIS	0	2	2	0.0762 (D)
JMA	0	0	0	-
KMA	0	0	0	-
KORDI	0	0	0	-

MEDS	0	202	202	1.54897
NMDIS	0	0	0	-

If a PI determines that a density inversion in a D file is real, they can send me the file name I will exclude this file from further assessments. Please send these to Ann.Thresher@csiro.au

Action Ann to run adding PI name to the list and perhaps run over different sections of the water column. Dacs to provide feedback to Ann on density inversion that are real and should be in the exclusion list

5.5 Near surface SST measurement RTQC implementation at DACs

Near surface Argo data shallower than 5 dBar are now collected by four of the major float types:

- SOLO II
  - Sample every 1dbar up to 1dbar depth with pumped PSAL and TEMP, included in primary profile, top sample goes into secondary profile.
- PROVOR
  - Un-pumped primary CTD samples at 5 dbar
- APEX
  - Un-pumped TEMP data to within 1 dBar of surface
  - Auxiliary STS sensor
- NOVA
  - Un-pumped shallow primary CTD samples at < 5 dbar, older versions
  - Pumped CTD data up to 1 or 2 dBar, recent versions

The real time quality control procedure was been documented in the Argo QC manual in December 2013. Implementation of QC and delivery of data varies by group and is summarised as follows:

Group	Implementation of RTQC	Delivery of data
AOML	UW floats: RTQC applied SIO SOLO2 floats: Data part of core profile apart from uppermost sample. No RTQC for uppermost sample but DMODE applied.	UW floats: Data in V3 NetCDF except STS data, development on-going SIO SOLO2 floats: All but uppermost sample in core profile. Uppermost sample as secondary profile in DMODE (as not decoded by AOML)
BODC	Tests coded, implementation pending	Pending, V3 core mission data is the priority, likely early to mid 2015
IFREMER	PROVOR floats and a few APEX, unpumped data flagged '4'	Data included in primary profile, to be separated into NPROF=2
INCOIS	Near surface tests not implemented yet.	NST data merged with core data in a single profile. To be split into secondary profile.
MEDS	Near surface data from NOVA floats flagged 4	Delivered in core profile netcdf

JMA	Development on-going	Data to be delivered with the move to V3.1 formats.

Discussion of DMQC processes centered on user requirements. Do users need rough estimates of the differences between pumped and unpumped data or do they need something more accurate? The general conclusion is that accuracy requirements are not high. Currently, the raw data is good enough for their purposes but DMQC is a requirement for Argo data.

We also need to assess the dangers of pumping the CTD close to the surface. John Gilson has managed floats that pump to 1db for the past 3 years and only 2 of 200 have shown significant drift so this might be safe. He will produce a report for AST. This works only for autocorrecting floats, however.

An action has been taken by Annie Wong and Justin Buck to begin to work on DMQC of data from APEX floats with near-surface temperature firmware as these presently form the majority of the near-surface data.

6 Reference database

The last version available was provided in March 2013 (2013_V01), following ADMT13. From ADMT14, the work has been focused on the quality control of profiles within each wmo_box. Detailed analysis of the deep water for all wmo_boxes showed that few boxes have bad profiles, but some profiles showed a lot of noise when looked at closely.

A procedure has been defined for detecting those bad profiles and to remove them from the boxes, using the following steps: examine each box, plot the Theta-S diagram and zoom on deep water, analyse profile by profile, and perform a duplicates check. The same study for all new CTD data will be done before adding it to the reference database. At this time, the area 1 has been cleaned and the work has started for the area 3.

A new version (2014_V01) will be provided at the end of November 2014, including the quality control done on the boxes of area 1, OCL updates (2013), CTD data downloaded from the CCHDO website, new CTDs provided by scientists (AWI) and following the procedure to check QC in all boxes.

A discussion has started between Coriolis and CCHDO but we really should improve (and automate when possible) deliveries of recent CTD data from CCHDO and this should be provided in the netcdf format previously defined. It's now critical to determine whether CCHDO will be willing or able to provide the GOSHIP data that are a main source for the REFDB into the future. It may be necessary to convert from csv format to netcdf ourselves and more importantly, we need to know when a GOSHIP cruise has taken place so we can look for the data. It would be useful for the GOSHIP technical coordinator to alert us to these voyages so we can pull the data. However, the emphasis should be on quality and availability, not necessarily timeliness.

Megan presented a talk by Steve Diggs reporting on the status of the contribution of CCHDO to the RefDB. Steve pointed out that some PIs were still reluctant to provide access to their data for the REFDB as they were not confident that the data would not be used for other purposes. It was mentioned by some GOSHIP PIs present in the room that there was GOSHIP data sent to CCHDO that hadn't been provided to Ifremer. This needs to be fixed. And while WOD can provide a huge quantity of CTDs, the quality can be questionable.

From the discussion that followed Megan's presentation, there was an agreement that after more than 5 years of discussion the data flow between CCHDO and Ifremer is not working in the manner that was agreed. There is a large question of how much high quality data is missing. This needs to be fixed as soon as possible.

Actions:

- ***Steve to work with Christine to streamline data provision from CCHDO to Coriolis for CTD-REF DB***
- ***Action Susan with Dean to work at higher levels to solve the issue with link with CCHDO that is not working as smoothly as expected to feed the REF DB.***

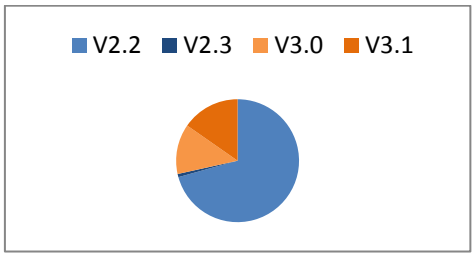
7 GDAC Status

7.1 Operation status at US-GDAC and Coriolis-GDAC

Thierry Carval and Mike Frost presented the status of activity for US and Coriolis GDACs, the Argo Global Data Assembly Centers. Once a week, the maps and statistics are updated.

The Status is available on http://www.argodatamgt.org/Monitoring-at-GDAC

In October 2014 there were a total of 10666 floats in the database with more than 1.3 million profile files.

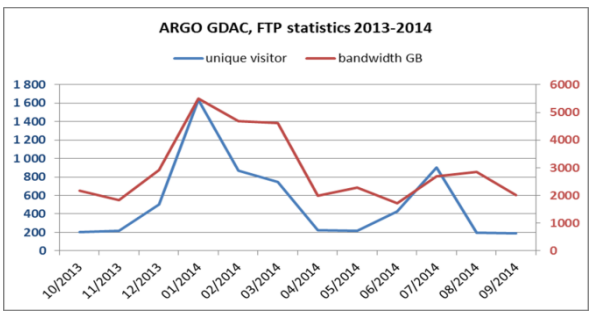


More than 1/3 of profile files are already in the new V3 formats.

Between 2013-2014, the number of metadata files increased by 10%, profile files increased by 8%, trajectory files increased by 17% , and delayed mode files increased by 8%. The steep increase in trajectory files is explained by the submission of delayed mode data which can effectively double the number of trajectory files since both RT and DM files are retained in the directories (whereas delayed mode profile files simply replace real-time profiles).

7.1.1 Operations of the ftp server

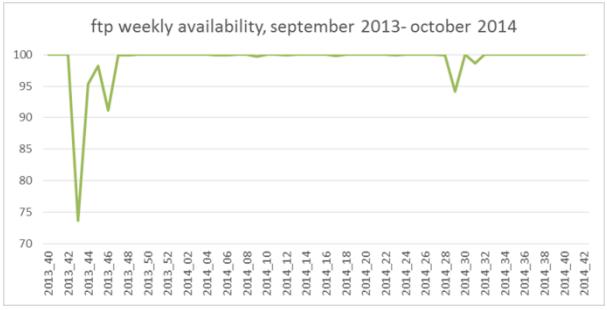
- Submitted files are automatically collected from the national DACs every 30 minutes.
- There is a monthly average of 526 unique visitors, performing 3170 sessions and downloading 3 Tbytes of data files.
- The graphics show a steep increase of activity on the GDAC FTP in January 2014. There is no clear explanation for this increase.



Coriolis GDAC ftp server is monitored by a Nagios agent. Every 5 minutes, a download test is performed. We faced 2 bad events in November 2013 and in July 2014.

- In November 2013 (weeks 43-47), we cumulated 3 days, 2 hours and 28 minutes of poor performance. This major problem was related a system instability on the linux cluster.
- In July 2014 (week 29), we cumulated 2 days of interruption.
  The Ifremer Internet service provider faced a router problem, somewhere between Brest and Paris.

For the last 3 months (August – October 2014), Nagios did not detect any Internet or ftp server problem.



The Argo greylist had 1248 entries on October 23rd 2014, compared to 1139 entries one year ago.

The greylist lists the floats sensors that report bad or suspicious data. When delayed mode quality control and adjustments are performed on a float in greylist, it is removed from the greylist.

7.1.2 New services

In July 2014 we opened a dedicated rsync server described on:
http://www.argodatamgt.org/Access-to-data/Argo-GDAC-synchronization-service
It provides a synchronization service between the "dac" directory of the GDAC with a user mirror.
From the user side, the rysnc service:

- Downloads the new files
- Downloads the updated files
- Removes the files that have been removed from the GDAC
- Compresses/uncompresses the files during the transfer
- Preserves the files creation/update dates
- Lists all the files that have been transferred (easy to use for a user side post-processing)

Examples

- Synchronization of a particular float
  rsync -avzh --delete vdmzrs.ifremer.fr::argo/coriolis/69001 /home/mydirectory/...
- Synchronization of the whole dac directory of Argo GDAC
  rsync -avzh --delete vdmzrs.ifremer.fr::argo/ /home/mydirectory/..

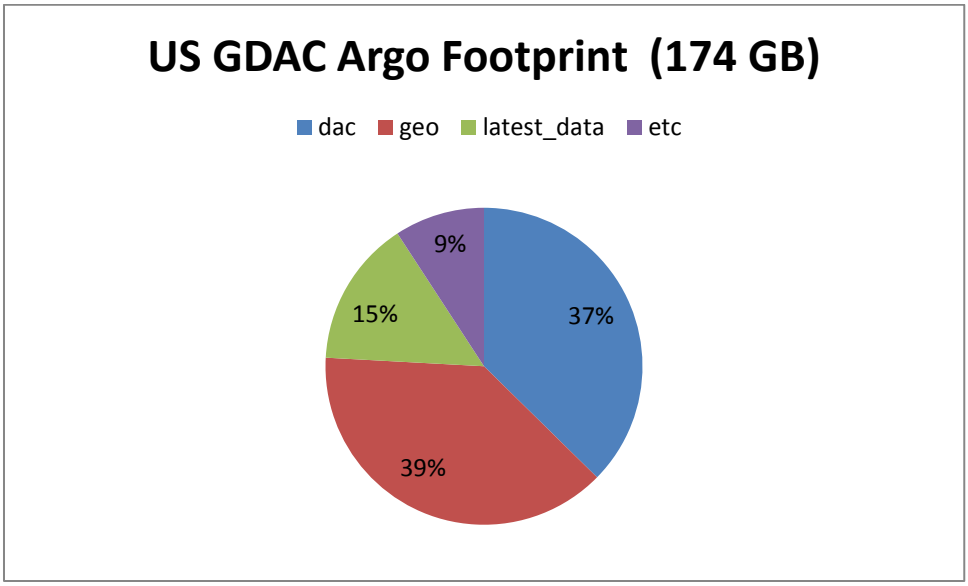
7.2 Status of Format Checking operations (D-Files checking) 15mn

Michael Frost presented the operational status of the US GDAC, as well as, the status of the enhanced file checker.

As of October 31st, 2014, the following shows the Argo footprint on the US GDAC

DAC	MetaData Files	Technical Files	Trajectory Files	Profile Files	D-Mode
AOML	5,027	5,065	5,998	703,401	487,933
BODC	472	455	420	47,448	31,221
Coriolis	1,887	1,873	1,801	170,498	111,734

CSIO	276	230	231	18,509	10,141
CSIRO	627	615	566	96,745	57,738
INCOIS	339	330	335	41,645	26,410
JMA	1,342	1,336	1,327	150,663	94,059
KMA	184	175	176	20,976	17,180
KORDI	119	115	119	15,473	0
MEDS	379	373	371	40,475	23,481
NMDIS	19	19	19	1,970	0
Totals	10,671	10,586	11,363	1,307,803	859,897



Operations of the ftp server

The US GDAC hosts an anonymous FTP server that allows download to all available Argo data that it currently has. This includes the Argo aggregate files, as well as, the raw NetCDF files that are received by the DACs. Additionally, the Argo index files are available for download as well. These index files are updated on the US GDAC approximately twice per hour.

US GDAC FTP server: ftp://usgodae.org/pub/outgoing/argo

Operations of the www server

The US GDAC hosts an apache webserver that allows the users to download Argo data via standard tools such as wget. Similar to the FTP server, all Argo data is available for download.

In addition the US GDAC hosts the 'USGODAE Argo GDAC data browser' that allows for limited querying capabilities (time, area, dac, etc).

US GDAC HTTP server: http://usgodae.org/pub/outgoing/argo
Argo Data Browser: http://usgodae.org/cgi-bin/argo_select.pl

Data synchronization

The US GDAC synchronizes with the French GDAC once per day at 1015 UTC. The process involves downloading all of the index files from the French GDAC and comparing them to the local US GDAC. After comparison, all necessary files are then downloaded and submitted normally into the US GDAC.

The typical synchronization takes approximately 15 minutes to complete each day. However, there are times when it takes much longer and we need to investigate. For example, on October 30th (yesterday), the synchronization took over 4 hours to complete. This was caused by a DAC submitting over 9000 files to the French GDAC, but not to the US GDAC. Thankfully, this is not really an issue, as after the job is performed the data is then available on both GDAC's.

Statistics of Argo data usage

HTTP Statistics

Date	Unique IPs	Hits	Gigabytes
Jan 2014	57	1189284	189
Feb 2014	47	12694	140
Mar 2014	50	14633	260
Apr 2014	298	9231	171
May 2014	271	9971	193
Jun 2014	30	2168	143
Jul 2014	46	166474	347
Aug 2014	51	46285	994
Sep 2014	52	156677	305
Oct 2014	445	118057	201

Enhanced file checker

The enhanced file checker will operate on every file that is received from the DAC's prior to them being accepted into the GDAC. Files that have errors will not be inserted into the GDAC. Files that have errors will cause an email to be sent to the responsible DAC. The main difference with this checker is that it will check for consistency amongst several of the parameters within the files.

A document that describes all of the checks that the enhanced file checker does will distributed via the argo-dm mailing list in October of 2014.

Also during October of 2014, a test was performed where the US GDAC collected all received NetCDF files and tested them with the new checker. Results were distributed to the DAC's. Several DAC's and DM operators did respond, but a few have not. We will need full response prior to deployment.

Plans are being made to provide this new code to the Coriolis so that they can test it out from within their infrastructure.

7.3 Upgrade to V3.1 historical T&S floats at GDAC

At the Liverpool data-management meeting (ADMT14), we agreed on a separation between core-Argo data and b-Argo data, with a new format V3.1. This topic was detailed in the format issues

session. The cost of converting historical data (typically delayed-mode data) to V3.1 will be significant for the DACs. The proposal that was put forward last year to let the GDAC convert the old files to V3.1 makes sense, but…

- The responsibility for the data and metadata distributed by the GDACs is on the DACs
- The GDACs do not change or enhance the data received from DACs
- The upgrade of historical data to V3.1 should be performed/managed by the DACs.
- The DACs have to provide the additional information to produce good V3.1 files
    - The detail of vertical sampling schemes (or decide to leave it empty)
    - The description of the float's mission (a majority of unique mission)

Coriolis DAC is converting its 2.2 and 3.0 files to 3.1 with a Matlab patch. When validated, this patch will be available to the DACs who need it.

The conversion has been performed in June for Provor data. The Coriolis DAC asked the delayed mode operators to carefully review the converted files. When we receive the green-light from delayed mode operators, the converted data files will replace the old ones on the GDAC. The similar conversion procedure will soon be performed for Coriolis Apex floats. Provor Bio-Argo Remocean profiles are all in version 3.1. The other files will move to V3.1 when historical and real-time data are both in version 3.1

Actions

- ***Thierry to contact Reiner Schlitzer/AWI to be sure that ODV can read and handle V3.1 files***
- ***Mike and Thierry : In case the content of the file (DATA-Mode, Platform number, DAC, cycle number,...) doesn't fit the File name submitted by the DAC then the file should be rejected by the file checker .***
- ***Mike and Thierry: Make Enhanced File checker operational***
- ***Mike and Thierry to take into account the flags(date and position) to generate the index file at both GDAC and put fill values when they have flag 3 or 4***
- ***Mike and Thierry to finalize the GDAC cookbook***
- ***Mike and Thierry to get statistics on access to the Geo directory from both GDACs***
- ***Thierry to add all of the current manuals and tables and DOI information to the contents of the monthly snapshots***
- ***Thierry to check that all the versions of the User and QC manuals are available on the ADMT WWW site***
- ***Mike and Thierry to create separate index files for b and M profile and traj files including list of parameters***
- ***Format Issues – edit User manual to reflect decision to remove PRES_QC from B files***

7.4 DAC decoder page/Standard_Format_ID

M. Scanderbeg presented the Argo Data Formats Table (https://docs.google.com/spreadsheet/ccc?key=0AitL8e3zpeffdENUQmszRlY3djYweGZhbnBZSU1fTFE&usp=sharing#gid=9) and described how the STANDARD_FORMAT_ID (SFI) might be updated. The table was created by M. Belbeoch based on information Jean-Philippe Rannou provided based on his work to create ANDRO. The idea of the Table is that each line corresponds to one decoder. Right now, the table is complicated and needs to be simplified, but bigger questions remain over the assignment of Standard Format IDs. The table is supposed to be current through 2012, at least for some DACs. How is the table updated in the future? How do DACs decide if a float format that is new to them already has a Standard Format ID? In addition, the SFI is composed of two parts – the first three digits correspond to float type and the last three digits correspond to a format reference. A difficulty arises when floats from different manufacturers use the same decoder, but their first three digits differ, making a non-unique STANDARD_FORMAT_ID.

There was considerable discussion on how DACs might determine if a new SFI is needed. This is manageable within a DAC, but becomes difficult when comparing with other DACs. It is useful to have floats that are decoded similarly grouped together, but it might be difficult to figure this out in the future.

M. Belbeoch and S. Wijffels both suggested that the manufacturers should attach version numbers to their float formats. M. Scanderbeg suggested that manufacturers be asked to have floats send back their version number.

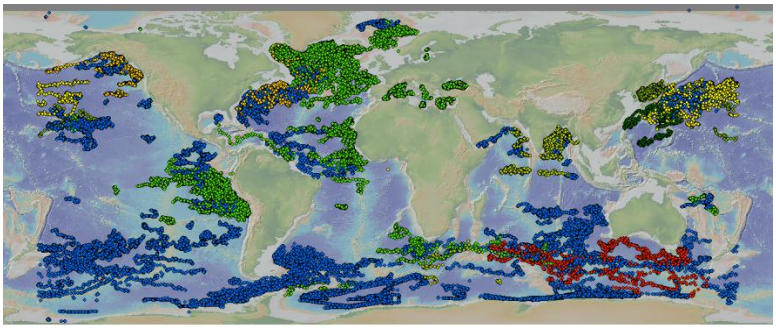
No resolution was reached on how to proceed with the STANDARD_FORMAT_ID. M. Scanderbeg, C. Schmidt, M. Belbeoch and U. Bhaskar will form a committee to study this further.

Action:.Working group to propose a way forward for the maintenance of the Standard Format Id table by ADMT16: Megan Claudia Mathieu and Uday

7.5 Upgrade to V3.1 historical T&S floats

The V3 format is necessary for floats that perform Argo core mission plus additional samplings:

- Near surface T/S (some hundred floats)
- Changing missions
- Bio-sensors (700 floats, oxygen, chlorophyll, pH, backscattering, …)
- …

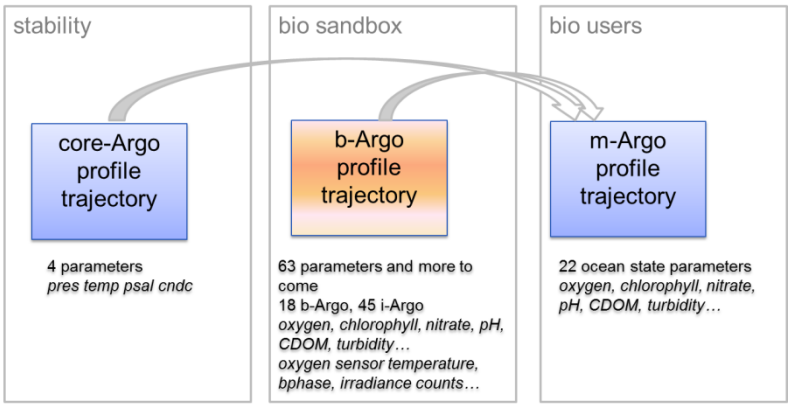


700 floats on GDACs provide more that P/T/S parameters

The Argo format V3.1 is described in the latest Argo user's manual, available from:

- http://www.argodatamgt.org/Documentation

The format V3.1 was adopted after Liverpool data-management meeting. Its main feature is the separation between core-Argo data and b-Argo data.



What is the link between core-Profiles and b-Profiles ?

- The PRES pressure profile is the simple and unambiguous link between the parameters in the core- and b-profiles. The same PRES is recorded in the core-Argo and b-Argo profile files.
- PRES is the only parameter duplicated in core-Argo and b-Argo profiles.
- The adjusted pressure parameter PRES_ADJUSTED is available in the core-Argo profile files. PRES_ADJUSTED is not duplicated in the b-Argo profile files.

Example of a float with a CTD and oxygen sensors
CTD profile : 2 dbar bin-averaged to 2000 dbar (no oxygen measurements)
Oxygen profile : 50 dbar discrete interval to 1000 dbar (no T&S)

Core-Argo profile file, N_PROF = 2, N_LEVELS = 1000
PRES = [2, 4, 6, ……2000]
= [50, 100, 150,…,1000, FillValue,…]
TEMP = [T2, T4, T6, ……T2000]
= [FillValue, ……]
PSAL = [S2, S4, S6, ……S2000]
= [FillValue, ……]

b-Argo profile file, N_PROF = 2, N_LEVELS = 1000
PRES = [2, 4, 6, ……2000]
= [50, 100, 150,…,1000,FillValue,……]
OXYGEN= [FillValue, ……]
= [O50, O100, O150,…O1000, FillValue,…]

Where are we now?

- The Argo user's manual version 3.1 is online
- Since July 10th GDACs accept V3.1
  - Metadata, Technical data, Core-Argo profiles, Core-Argo trajectories
- V3.1 multi-profile files for dac, geo and latest data (US GDAC ,To be Done at Coriolis GDAC)
- Updated format checker for metadata and core traj files
- Updated 'submit' process to correctly name these files

To come next

- Format checker for B-Argo profiles, B-Argo trajectories
- For bio-argo floats : V3.1 merged bio-profiles, V3.1 bio-merged index file
  - The merged profile files contain core and b-Argo parameters, intermediate parameters are ignored
  - Synchronization of b-profiles and b-trajectories will need an update.
- Transition from historic V2.3 and V3.0 to V3.1
  Each DAC may have his strategy
  - Reprocess existing files : BODC
  - Reprocess (RT) and patch (DM) existing files : Coriolis
    Ensure continuity between delayed-mode and real-time
- When completed at Coriolis DAC, the Matlab format conversion code will be available

Each DAC and participant delayed mode groups were queried about their plan to implement version 3.1 data formats. All DACs expect to move to V3.1 in 2014-2015. The KORDI DAC did not have a representative, however, delayed mode data from KORDI should appear in 2015, presumably in format version 3.1.

The following plan was agreed for V3.1 transition for new profiles and reprocessing of Traj/tech/meta files

	RT	Historical

AOML	Reprocessed in 3.0 no plan in 3.1 Equivalent	Reprocessed by DM operator Annie : convert all D files to 3.1 John : done in 3.1 for Argos Plan To be done for Iridium Paul : plan to use the Matlab tool PMEL Plan in next 12 months
BODC	Reprocess in V3.1 from database	Will do it for their floats
Coriolis	Done for RT	Converter for Provor (checked by Ifremer)and APEX (checked by BSH) and OGS (for the med)
CSIO	RT in 2015	????
CSIRO	Done for Meta, Profile (including B-File but were rejected), and Tech files. To be done in Traj	In progress for D-Files by patch
INCOIS	Working on it before end Nov	Will use the patch
JMA, JAMSTEC	Profile and Metafile conversion planned by AST16 for Argos. For Tech, Traj and iridium by ADMT16.	Profile and Metafile conversion planned by AST16 for Argos . For Tech, Traj and iridium by ADMT16
KMA	Testing 3.0, plan 3.1 by AST	A bit later for Historical
KORDI	??	??
MEDS	Meta and Profile files done, and traj within 3 months	At the same time
NMDIS	December (will convert Profiles first, then 2-3 more months for trajectory and meta)	At the same time

Action : DACs to provide new Real time profile meta traj and tech files in V3.1 as soon as possible
Action : DACs to provide historical profile meta traj and tech files in V3.1 as soon as practical

7.6 Revisit Metadata mandatory fields

The list of the mandatory and highly desirable was defined a few years ago but the list needs to be updated because some variables are not classified correctly. As the enhanced file checker may reject files on these criteria it's important to revise the list

Action Working group to revisit the mandatory metadata and highly desirable metadata list: Claudia, Ann and Mathieu

7.7 Bio-Argo parameter names

The current list of Argo parameter names including biogeochemical variables is available at:

http://www.argodatamgt.org/content/download/22516/155295/file/argo-parameters-list-core-and-b.xlsx

Argo terms have been mapped to both Climate Forecast (CF, http://cfconventions.org/standard-names.html) and SeaDataNet (SDN, http://www.seadatanet.org/Standards-Software/Common-Vocabularies) terms. This enables data interoperability with US and EU data assimilators and systems such as EMODnet and GEOSS. The Bio Argo group and BODC are able to help it other new parameters and mappings are required.

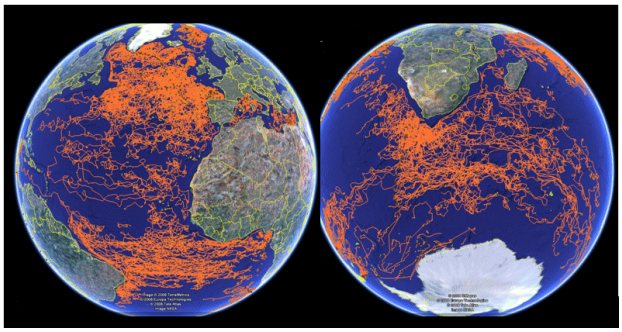
Action: Thierry to update the User manual according to meeting decisions including removing PRES_QC from the traj B files.

8 Trajectory issues

8.1 Status on Reprocessing of Trajectory from ANDRO DEP files

Based on Argo trajectory data, Michel Ollitrault and Jean-Philippe Rannou are regularly improving the "ANDRO" atlas of deep ocean currents. The ANDRO project provides a world sub-surface displacement data set based on Argo float data. The description of each processing step applied to float data can be found in: http://www.ifremer.fr/lpo/files/andro/ANDRO_JAOT_2013.pdf

See also: http://wwz.ifremer.fr/lpo/Produits/ANDRO



During ADMT12 in Seoul it was decided that the ANDRO project dataset could be used to populate the first delayed mode NetCDF trajectory files. From the ANDRO data set, the Argo delayed mode trajectories in format version 3.1 are now available on:

- ftp://ftp.ifremer.fr/ifremer/argo/etc/coriolis-custom/argo-andro-data

The delayed mode trajectories are described in ftp://ftp.ifremer.fr/ifremer/argo/etc/coriolis-custom/argo-andro-data/argo-andro-data_20141016.pdf

For each float:

- All ANDRO trajectory information has been transferred to an Argo V3.1 delayed mode trajectory file
- From GDAC profiles : pressure, temperature and salinity adjustments have been recorded in the adjusted parameters of the V3.1 trajectory file.

The Principal Investigators (PI) and DACs can decide to use or ignore the delayed mode trajectories created from ANDRO. In addition to delayed mode trajectory files, a series of profile files were "rescued" for each DAC. A "rescued" profile is a profile available with ANDRO, but not identified on the GDAC ftp site. Each DAC may decide to rescue or ignore these profiles. A total of 15 619 profiles available from ANDRO are not found on GDAC. These profiles may come from Argo equivalent floats, removed from GDAC, from profiles ignored in real-time because of bad CRC, or other reasons.

Action. Each DAC with PI/DM has to take the responsibility for the decision to use or not the ANDRO converted D-Traj files as a first version of their D-files. Each DAC/PI/D-Operator should do an assessment of some of their floats in order to define their strategy and report to ADMT. If

they decide to use the Andro files, then they should retrieve the D-traj files from Coriolis FTP site and submit them to GDAC as usual.

8.2 B-Traj format Version 3.x files – any outstanding issues?

The Dacs that have started to produce them don't see any outstanding issues so far.

8.3 Update of the DAC Cookbook

M. Scanderbeg reported on the status of the DAC Trajectory Cookbook. She noted that the current DAC Trajectory Cookbook has its own DOI and that V3+ traj files are available on the GDACs. The purpose of the cookbook is to match data that floats send to the correct measurement code. If DACs follow this, there should be consistent V3+ traj files across DACs. A few updates are being made in the current DAC cookbook. The changes consist of updating the wording regarding "mandatory" cycle timing variables, simplifying the APEX sections, splitting estimation methods into a separate annex, and adding more specific examples for unusual floats and how measurement codes may be assigned.

The primary measurement codes must be in the traj files if a float is programmed to experience that event. If no cycle timing information is available (either because the float doesn't send any information or because no estimates can be made in real time), fill value should be used.

For APEX floats, the APF8 floats send back no timing information. However, the transmission start time (TST) can be calculated based on the times of Argos transmissions. This time should be filled in real time. DACs are asked to refer to the method proposed in Annex C of the cookbook for the method to do this. It is important to get the "time from startup" into the correct place in the metafile.

For APF9 floats, more timing information is sent, although some of it needs to be extracted from the Auxiliary Engineering messages. For the latest version of the APF9i floats, 6 time stamps are sent in the data message the DACs receive. This should make it easier to include the proper cycle timing information in APEX floats in the future.

Finally, M. Scanderbeg stressed that when new float versions are released, there may be a need to update the DAC cookbook. Not all new versions require new instructions, but some will. It was agreed that M. Scanderbeg will coordinate with DACs and float experts to ensure this information is included in the cookbook.

8.4 Strategy for DMQC from Rtraj to Dtraj

M. Scanderbeg presented three possible steps that could be required to move an "R" cycle to a "D" cycle in the trajectory files. The first step was to apply corrections found in delayed mode to the <PARAM> variables wherever they occur in the cycle. The qc flags on the <PARAM> variables should also be applied. The second step would be to quality control cycle number. Some floats do not send their cycle number and it must be estimated. Errors occur and these should be fixed in delayed mode. The final requirement could be quality control of surface times and positions. It was suggested the first check would be to ensure that JULD measurements from Argos or Iridium were in chronological order. If not, the traj file can be sent back to DACs for reprocessing. Next, the JAMSTEC position QC procedure could be applied if not done in real time by the DAC. Finally, several optional tasks were listed including

- checking measurement codes were applied correctly

- estimates of timing information

- filling in measurement code 301 for the best calculated pres/temp during drift

- apply grounded flag

- ensure that JULD_ADJUSTED is in chronological order

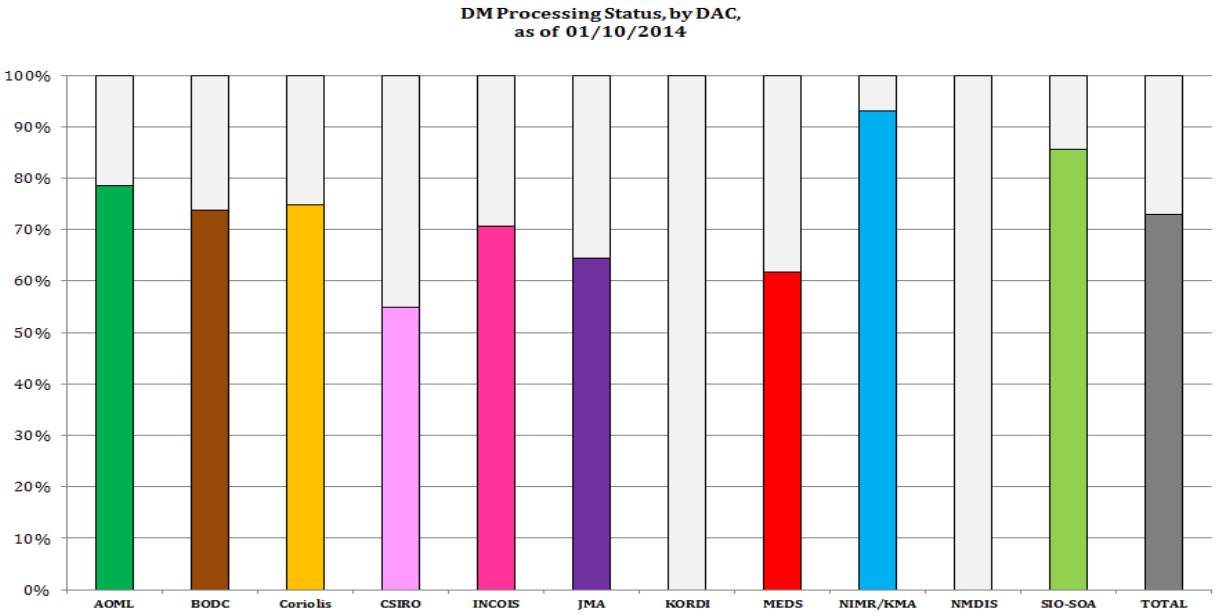
There was a discussion following the presentation about how this delayed mode process might begin. As an additional option to help with this, V3 files made from ANDRO data have now become available and might be used to help create delayed mode traj files. The conclusion was that DACs, PIs and delayed mode operators will be asked to consider how they might move forward with a delayed mode process for traj files. The files produced by ANDRO need to be studied and may or may not be used by PIs/dmode operators depending on their choices. It was pointed out that the float owner needs to be able to explain/justify their data files and it is ultimately their choice as to what goes into the files. It was agreed that most groups are not ready to think about developing a delayed mode process yet as they aren't even yet familiar with the v3 format and its measurement codes.

Note also that Andro only covers the period until the end of 2009. DACs need to work to fill this gap and move forward.

9 Delayed Mode Data Management

9.1 Status of D-Files provision (J Gilson M Belbeoch) (10mn)

Mathieu presented the status of D-File provision compared to the eligible profile numbers. About 70 % of D files have been processed and we can see a small decrease in most of the DACS. Some DACs still have no D files at all and some are clearly still 'orphaned'.



There has been a discussion of the orphan floats (see AIC report in Annex) and the fact that to be an Argo float, a float need to be DMQCed. We may need to enforce this.

KMA mentioned that there are taking charge of the DM of the KORDI floats which should move them forward. Sylvie mentioned that the European Orphan floats will be taken in charge by EuroArgo DM Operators (Ifremer, OGS, BSH and BODC).

The issue seems more difficult in the USA with the NAVOCEAN floats.

Action :

- ***Each Dac to update AIC list for the orphan floats whenever possible***
- ***ADMT chairs and GDAC with US-NODC to develop a set of options to handle orphan floats and Argo equivalent floats for which we do not have a DMQC pathway and submit those options to AST***

J Gilson ran a check on the anomalies found in the D files and pointed out that the number of D-Files with inconsistencies remained stable while they should be decreasing. Most of these anomalies will be blocked by the new file checker.

	AOML	BODC	Coriolis	CSIO	CSIRO	INCOIS	JMA	KMA	KORDI	MEDS	NMDIS	Total
<PARAM_ADJUSTED_QC> == '0' or ' '		76	29				1	3079		50		
<PARAM> == FillValue but <PARAM_QC> ~= '4','9'	13		3	32			3	1268				
POSITION_QC == 0 or ' '	5			1								
POSITION_QC/Position mismatch							20					
JULD error	3		3									
PROFILE_QC flag is bad (for example: not A-F)	67				2068							
<PARAM_ERROR> variable == ' ', but <PARAM_QC> ~= '4','9'	52	2	15	2			378	373		251		
<PARAM_ERROR> variable == '0'	1			1				1228				
"9' flag inconsistent between <PARAM> and <PARAM_ADJUSTED>	3781		58			6	181	572				
Total	**3922**	**78**	**108**	**36**	**2068**	**6**	**583**	**6520**	**0**	**301**	**0**	**13622**
Percentage of Dmode	**1**	**<1**	**<1**	**<1**	**5**	**<1**	**1**	**38**	**NaN**	**1**	**NaN**	**1,6**
Total Change from Last Report (Jan-2014)	**12**	**0**	**-126**	**0**	**2068**	**0**	**-854**	**615**	**0**	**0**	**0**	**1715**

9.2 Status of Southern Ocean Salinity profile QC comparison

A comparison of DMQC corrections presented at ADMT14 showed that there is some variation between DMQC groups in the percentage of Argo floats corrected for fresh versus salty salinity drift. The clearest example of this was for floats deployed poleward of 30S from SIO, which primarily corrected for freshening, and CSIRO which primarily corrected for saltier conditions. SIO and CSIRO agreed to pass a few of each others floats through DMQC. Both groups qualitatively confirmed the original salinity corrections applied were correct. Thus it is unlikely that subjective decisions or DMQC tools are the primary cause of the groups assigning salinity drift corrections of opposite signs to their respective floats. The source of this divergence should be investigated further.

9.3 The improvement of the DMQC method for Argo salinity data

Lu Shaolei from CSIO introduced an improved method for Argo salinity DMQC. In the traditional OW/WJO/BS method, fixed temporal and spatial parameters are used for mapping climatological salinity. However, the large temporal-spatial parameters usually reduce the estimated accuracy of the climatological salinity in regions where the salinities have relatively large horizontal gradient in depths of 1000~2000 m. In order to solve this problem, he introduced a Gradient-dependent Correlation Scale Method (GDCSM) to calculate the spatial scales in different regions, and reduced the temporal scale to 3-year. He also demonstrated two cases in Western Boundary Current (WBC) region using the improved method. The results show that the improved method can effectively correct the salinity drifts and offsets.

Susan pointed out that very large salinity offsets (>0.5) are to big for correction and should be rejected, not corrected.

9.4 Deep floats accuracy study and interim flagging schema for real Time (Susan Wijffels) (20mn)

Wijffels presented on behalf of Dave Murphy (SBE) and collaborators from NOAA, SIO, NIWA and CSIRO, on the interim results of an analysis of at-sea comparisons of prototype SBE-61 CTDs and ship-board SBE4s and bottle salts. Several SBE61s were deployed on a ship-board system from RV Tangaroa in June 2014. The preliminary results showed that while temperature measurements are meeting the requirements of a deep Argo mission, further work on both pressure and salinity is required. The field trials were extremely valuable and further opportunities will be needed to help the development of a CTD for a deep Argo mission.

Because of these issues with data deeper than 2000dbar, the AST has agreed on flagging of deep SBE41 data to indicate it is not yet suitable for research applications such as global change. Such data will be flagged with lower quality flags (2 and 3) in real time.

Action Annie to update QC manual for deep float, warning of the uncertainties of data quality below 2000db.

10 ARC status

10.1 North Atlantic ARC

We have checked 578 floats processed in delayed mode (DM) in the North Atlantic, North of 30°N. Among the 578 floats, 392 do not show a significant salinity drift or bias according to the PI decision and were not corrected in DM, the other 186 floats have been corrected by the PI.

For each of the 578 floats, we have run a slightly modified OW method. Compared to the OW original method, our configuration better takes into account the interannual variability, which has been

shown to induce spurious corrections with the standard OW method settings and provides an improved estimate of the error bars. The modified OW method has been described in more details in the following paper: http://www.coriolis.eu.org/News-Events/Newsletters/Coriolis-10

For each float, we have compared the original correction made by the PI and the result of the slightly modified OW method. We found 26 floats among 578 for which the salinity correction proposed by the PI differs significantly from our results. The 26 floats are listed on the NAARC web site :

http://www.argodatamgt.org/Argo-regional-Centers/North-Atlantic-ARC/Overall-consistency-of-DM-corrections

PIs or DM operators of the 26 floats have been informed and the DM corrections have been revised or revisions are in process. We plan to update these checks of the overall consistency of the delayed mode corrections in the NAARC region once a year.

10.2 South Atlantic ARC:

No new features were reported.

10.3 MedArgo ARC

Giulio Notarstefano presented the Argo status and the float activities in the Mediterranean and Black Seas. The historical float fleet consists of 245 floats and 23000 profiles. The majority of the profiles are from CTDs only but there are also several profiles acquired by Bio-Argo floats. The number of floats per year increased at a rate of about 30% per year in the last 5 years (2010-2014): there are more than 90 floats currently considered active in 2014 (considering the new deployments and the floats already working in the basin) and more than 70 floats per month reporting data this year. In term of profiles, more than 450 profiles per month have been acquired in 2014 and 20% are profiles acquired by Bio-Argo floats.

Some improvements have also been made to products that are posted in NRT on the Medargo web page: a new link to the OAO internet page was added and it is now possible to have a quick view of a Bio-Argo float information on three different sites: OGS, Coriolis and OAO. The graphic of the plots related to the float locations of the day has improved and includes new information on the contributors, telemetries used, parameters acquired and float models.

The DMQC activities of the physical variables (temperature and salinity) has continued; about 90% of the dead floats have been checked in DM and information or a technical report for each float is posted on the web. The reference dataset will soon be updated with more recent data.

Several new floats (29 platforms up to October) have been deployed in 2014 with the contribution of 4 countries (Italy, France, USA, Turkey) and also in the framework of Euroargo; 13 out of 29 are BioArgo floats. About 45 floats (29 Bio-Argo platforms) are expected to be deployed by the end of this year and in 2015. The collaborations already established with Malta and Lebanon will continue; a collaboration with Tunisia for operations in the Sicily Channel area is expected for the next year and contacts with Algerian scientists have been made.

The Mediterranean Sea requires a high level of cooperation between countries, particularly for beached floats and notifications.

10.4 Pacific ARC:

PARC continues to report its essential activities on its web sites. We have reported results of comparison between individual Argo TS profiles and gridded data (WOA05 and MOAA-GPV) and feedback QC status and results to PIs. PARC has links to Argo Products provided by IPRC, JAMSTEC, and KIOST on its web sites. NMDIS and CSIO have released new products, which are the objective velocity data in the global ocean and the objective analysis using Argo data in the global ocean (BOA-Argo), respectively. JAMSTEC has released two new products. One is the scientifically

QCed data of Deep NINJA, and the other is the Advanced automatic QC (AQC) Argo Data ver.1. The AQC Argo data will be improved in the near future.

Their analyses show a fairly high level of rejection of data in areas of western boundary currents. It was suggested that they should contact the float operators to get feedback on these rejections. Note that these rejections only affect the data provided to users who request this data set.

10.5 Southern Ocean ARC:

No new features were reported.

10.6 Indian ARC:

As part of the ARC activities of Indian ocean, INCOIS has undertaken the following activities:

1. Continuing conducting user awareness and data utilization workshops to bring about awareness among the students of various universities. Students are encouraged to use the Argo data for their MSc dissertations.
2. Projects were approved for three universities to develop visualization schemes which use Argo data to study TCHP relation to cyclones and develop data metric studies.
3. Development of new QC routines based on Latitude, Longitude patterns. This is tested on the Indian floats which failed the Altimetry tests. Can be used for regional range test in future.
4. Continued Data search and archeology of high quality CTDs for updating the Argo reference data base and also for use in DMQC of Argo data from various sister concerns.
5. Trained Navy officials on Quality control of profile data. Shared the in-house developed software for performing QC.
6. Continued archiving of temperature and salinity profile data from floats deployed by Indian and other countries in the Indian ocean and making them available through Web-GIS.
7. Assisted sister institute NIOT in assessing the quality of indigenized Argo float deployed in the Arabian Sea.
8. Continued to supply DVD of "Argo data and product for Indian Ocean" to students and other researchers with low bandwidth capabilities. This DVDs are built with GUI which has similar capabilities to that of a Web-GIS. As many as 300+ DVDs were sent free of cost to the users up on request.
9. Continue generation of value added products based on gridded products obtained from Objective and Variational Analysis methods. These value added products are made available on the web and also on the Live Access Server. Recording the publications arising out of this Argo gridded product. As many as 16 publications are recorded as of now.

11 GADR

Charles reported that the U.S. NODC continued to operate the Global Argo Data Repository (http://www.nodc.noaa.gov/argo/) during 2014. The size of Argo monthly snap shot (i.e., tar ball) continued to grow. The size of the latest Argo monthly tarred-zipped file is about 6.20 GB for October 2014 and is available at user's request only, because of the size of the file.

The number of monthly-averaged data downloaded from GADR has increased approximately 6.7%, to 113 GB in 2014. However, the number of monthly-averaged distinct hosts served went down from 2,325 in 2013 to 2,177 in 2014.

Action Item no. 27 from ADMT14 assigned to GADR was completed on April 2014. Argo data made available through GADR is a translation of the original Argo dataset in the Argo NetCDF format with the global attributes section enhanced to be compliant with the Attribute Conventions for Data Discovery (ACDD).

12 All other business

12.1 Summary of the 14th ADMT actions

Sylvie and Ann have elaborated an action list from the ADMT15 discussions and the list was reviewed, actions assigned to DACs/operators, deadlines identified and priorities set. It was agreed that to reach more timely accomplishment of the actions, bi-yearly phone meetings will continue to be organized by the chairs in February, before AST16 and June involving mainly the DAC managers.

12.2 Other business

Brian King announced a workshop to be held in Galway Ireland over 4 days in September 2015. This will be a combined GOSHIP, EuroArgo, IOCCP conference on Ocean Physics.More information will be sent soon on the Argo mailing lists.

There will also be a EuroArgo users workshop for one day just before AST in March in Brest. More information at http://www.euro-argo.eu/News-Meetings/News/5th-Euro-Argo-User-Workshop .

12.3 Location of next meeting

The location of ADMT16 is still under discussion and we invite suggestions from the ADMT members.

13 Annex 1 – Agenda

Wednesday 5th November

Welcome address *by Denis Hains, Director General of Canadian Hydrographic Service & Oceanographic Services.* (*15mn)*

Wendy Watson Wright, Assistant Director General and Executive Secretary, UNESCO Intergovernmental Oceanographic Commission

1. **Feedback from 15th AST meeting** : *Dean Roemmich/Susan Wijffels (30mn)*
   Update on FAQ pages – Megan Scanderbeg (5min)

Status on the actions 1

2. **Feedback on 3rd BIO-Argo Workshop (H Claustre) (1h00)**

3. **Status of Argo Program and link with Users (1h00)**

Status on the actions 8,9,10

- ***Review of the Action from last ADMT*** *(S Pouliquen) 15 mn*

- ***Argo Status* + Real-time Monitoring** : Summary of major anomalies detected each month, Requested actions from DACs. Trying to identify why some anomalies are not corrected. *(M Belbeoch) 15mn*
- **Status of delays in data delivery to the GDACs (***M.Belbeoch) Action 9 (15mn)*
- **Status of negative delays reported by GDACs** *(M Belbeoch) Action 8 (15mn)*

4. **Real Time Data Management (2h)**

Status on the actions : 4,5,6,7,12

- **GTS status**: *(A Tran) 20mn*
- **Status of delivery of BUFR to the GTS** *(all DACs) Actions 4,5,6,7 (15mn)*
- **Status of anomalies at GDAC** *(C Coatanoan) 20mn*
- **Status on Anomalies detected with Altimetry** *(S Guinehut) 20mn*
- **Status on density test implementation** *(Ann Thresher-Gronell to review) Action 12 (15mn)*
- **Status of real-time NST tests** *(J Buck) Action 11 (15mn)*

5. **Status of Argo Program and link with Users follow up (0h45)**

- **Citation Index for Argo Data** *(J Buck, T Carval, Ken Casey) 20mn*
- **Discussion on the way forward** (15mn)

6. **Progress on Argo Reference data base (0h30)**

Status on the action 14

- **Summary of the actions since ADMT-14 (**C Coatanoan)

Thursday 6th November

7. **GDAC Services (M Frost , T Carval) (1h00)**

Status on the actions : 15,16,17

- **Operation status at US-GDAC and Coriolis-GDAC** 30mn
- **Status of Format Checking operations (D-Files checking)** 15mn *Action 15*
- **Upgrade to V3.1 historical T&S floats at GDAC (all)** 15mn

8. **Format issues (2H00)**

The new formats mean a challenge for the DACs – how well are we implementing V3.1? what issues remain?
Status on the actions : 18,19,24,25

- **Status on providing link to DAC decoder page** *Action 24,25* **(**Megan Scanderbeg with input of all DACs)

- **Multiple sensors, multiple axes, bio-Argo floats : Status of implementation RT and DM** (T Carval, all DACs and DM-Operators)
- **Revisit Metadata mandatory fields**

9. **Trajectory from Argo data (2h00)**
   - **Status on Traj3 implementation at DACs** (all DACS)
   - **Status on Reprocessing of Trajectory from ANDRO DEP files** (T Carval/JP Rannou)
   - **Reprocessing historical data between end of ANDRO and Real-time**(all DACS)
   - **B-Traj format Version 3.x files – any outstanding issues?** (JP Rannou / J Gilson)
   - **Update on the DAC Cookbook** (Megan Scanderbeg)
   - **Strategy for DMQC from Rtraj to Dtraj *(30mn)*** *(A Wong/Megan Scanderbeg)*

10. **Delayed Mode Data Management (1h30)**
    - ***Status of D-Files provision*** (J Gilson M Belbeoch) (10mn)
    - **Status of Southern Ocean Salinity profile QC comparison (***E van Wijk/J Gilson) (30mn)*
    - **The improvement of the DMQC method for Argo salinity data** (Shaolei Lu) (15mn)
    - **Deep floats accuracy study and interim flagging schema for real Time** (Susan Wijffels) (20mn)

Friday 7th November

11. **ARCs: provide an information on what done and what is planned (1h30)**
    - **Update on ARC progress** (ARCs leaders) 15mn each
      - **North Atlantic** Cecile Cabanes/V Thierry
      - **South Atlantic** Claudia Schmid
      - **Mediterranean Sea** Gulio Nortastefano
      - **Pacific Ocean Kanato Sato**
      - **Indian Ocean** Uday Bhaskar
      - **Southern Ocean** Justin Buck

12. **GADR Status of the Archiving centre** (C Sun) **(0h30)**

Status on action 27

13. **Other topics (1h00)**
    - **Summary of the 15th ADMT actions** *(S Pouliquen, A Gronell Thresher)* **30mn**
    - **Location of 16th ADMT**

14 Annex 2 - Attendant List

First Name	Last Name	Company	Country
Ann	Thresehr	CSIRO Oceans and Atmosphere Flagship	Australia
Susan	Wijffels	CSIRO	Australia
Howard	Freeland	Argo	Canada
Denis	Gilbert	IML/DFO	Canada
Bob	Keeley	Retired	Canada
Mathieu	Ouellet	OSD-DFO	Canada
Anh	Tran	OSD-DFO	Canada
Mingmei	Dong	National Marine Data & Information Service	China
Yulong	Liu	National Marine Data and Information Service(NMDIS)	China
Zenghong	Liu	The Second Institute of Oceanography, SOA	China
Lu	Shaolei	The Second Institute of Oceanography	China
Xiaogang	XING	Ocean University of China	China
Mathieu	BELBEOCH	JCOMMOPS (IOC-WMO)	France
Yann	Bernard	CLS	France
Vincent	Bernard	IFREMER	France
Thierry	Carval	IFREMER	France
Hervé	CLAUSTRE	CNRS / LOV	France
Christine	COATANOAN	IFREMER	France
Stephanie	Guinehut	CLS	France
Antoine	Poteau	UPMC / CNRS	France
Sylvie	POULIQUEN	IFREMER	France
Catherine	Schmechtig	OOV-LOV-CNRS	France
Birgit	Klein	BSH	Germany
TVS	Udaya Bhaskar	INCOIS	India
Giulio	Notarstefano	OGS	Italy
Wataru	Ito	JMA	Japan
Kanako	Sato	JAMSTEC	Japan
Hyeongjun	Jo	NIMR/KMA	Korea
Lee	Joon-Soo	National Fisheries Research and Development Institute	Korea
Byunghwan	Lim	NIMR/KMA	Korea
Justin	Buck	BODC	United Kingdom
Brian	King	NOC	United Kingdom
Michael	Frost	NRL	USA
John	Gilson	Scripps Institution of Oceanography	USA

First Name	Last Name	Company	Country
Kenneth	Johnson	Monterey Bay Aquarium Research Institute	USA
Breck	Owens	Woods Hole Oceanographic Institution	USA
Robbins	P.E.	WHOI	USA
Stephen	Piotrowicz	NOAA/OAR	USA
Megan	Scanderbeg	Scripps Institution of Oceanography	USA
Claudia	Schmid	NOAA/AOML/PHOD	USA
Annie	Wong	University of Washington	USA

15 Annex 3 - ADMT14 Action List

On 29 actions : 14 Done 13 Partially 2 Not Done or Status unkown

	Action	Target Date	Responsibility	Priority	Status
1	Provide feedback to Megan on the FAQ page : http://www.argo.ucsd.edu/Data_FAQ.html	End December 2013	All ADMT members	R	done with the comments received. JAMSTEC will translate this FAQ page into Japanese and release it in Japan Argo web site (http://www.jamstec.go.jp/J-ARGO/index_e.html) by the end of november. Megan has updated the pages with the feedback she has received and the pages are active: http://www.argo.ucsd.edu/Data_FAQ.html KIOST had feedback.
2	Coriolis to perform monthly snapshot of the DAC directory (including Manual) and assign a DOI to the monthly snapshots	Starting October 2013	Coriolis	R	done
3	BODC and Coriolis to issue documentation or WWW page to teach users on how to use the Argo DOI	AST15	Thierry /Justin/Megan	R	done in pages http://www.argodatamgt.org/Access-to-data/Argo-DOI-Digital-Object-Identifier and http://www.argo.ucsd.edu/Acknowledging_Argo2.html
5	BOBC to solve the BUFR issue on iridium floats	AST15	BODC	R	The problem is understood and Will be solve while doing V3 in autumn. Test BUFR sent to Anh Tran for cross checking and also to IMD. We will start uploading the BUFR messages shortly.
8	DAC to check negative delays list sent by AIC	AST15	Mathieu AOML, BODC, CORIOLIS, CSIRO,INCOIS,KIOST, MEDS,KMA,SIO Thierry and Mathieu	R	The list was provided by Mathieu on the 6th May . To be analyzed by DACS. Done for Incois, JMA NEMO floats have only 255 profiles so if rolls over, then it overwrites earlier profiles so will now program to fix this and resubmit earlier profiles. For Coriolis most of the floats have been reprocessed because they had a bad cycle numberTo be checked with Mathieu if there are still anomalies CSIRO - this was an issue of file removal which has been fixed. the issue to be addressed between Thierry and Mathieu is how to reset the creation date because otherwise even if corrected the delay will stay negative
11	Update QC manual for Real time NST test and DMQC	ADMT15	Annie	R	done
22	Propose a list of units to be used both in tech and meta file for validation and comments by DACs	Dec 2013	Ann with DACs	R	Done - list distributed, comments included and list finalized

	Action	Target Date	Responsibility	Priority	Status
23	DACs to check the new standard reference tables (SENSOR_MODEL and SENSOR_MAKER, Mathieu Belbeoch), the updated core Argo configuration parameter table (Esmee van Wijk) and the new Bio Argo configuration parameter table (Catherine Schmechtig), to ensure that all their float types are covered. DACs to provide feedback to relevant person on any new required parameters that are not in the table.	15/11/2013end 2013	all DACs	R	JAMSTEC sent email to Esmee about Core Argo configuration parameter table. CSIRO done, Incois done, Done for Coriolis new data processing chain, frequent requests to Esmee (configuration), Catherine (bio-parameters) and Ann (technical parameters).Avalable at Reference Tables for PLATFORM, SENSOR, AND DATA_FORMATShttps://docs.google.com/spreadsheet/ccc?key=0AitL8e3zpeffdEtyVmN3a0hvUC1NMDJMcHILN2FMSIE&usp=drive_web#gid=1orhttp://tinyurl.com/nwpqvp2https://docs.google.com/spreadsheet/ccc?key=0AitL8e3zpeffdEtyVmN3a0hvUC1NMDJMcHILN2FMSIE&usp=sharing#gid=6The "SENSOR_MODEL" and "SENSOR" including Bio sensors are detailed, they are associated to a "SHORT SENSOR NAME". These short names are usedin the first version(V0.0) of the Bio Argo Configuration parameter names file (Bio_Argo_Configuration_Parameter_Names_V0.0.xlsx)
25	update User manual according to meeting decision	15-nov-13	Thierry	R	done for V3.0 The V3.1 was sent on the 23rd January
26	Correct the parameter name anomalies detected by Brian's audit	while doing V3	all concerned DACs	R	CSIRO - hopefully done with conversion to V3 but need audit
27	Correct the GADR multi-profile archive to be identical to GDAC holdings	AST15	Charles	R	done
28	prepare recommendation for manufacturer for AST meeting B6	AST15	Megan to coordinate	R	done - presentation given at AST but no further follow up with manufacturers. Megan will work with TWR and SBE regarding clock drift and how to minimize it. She will work with Jean-Philippe to develop a proposal for them.
29	update the DAC cookbook	end Nov 13	Megan	R	done; preparing another update in time for the ADMT meeting

16 Annex 4 - ADMT15 Action List

	Action	Target Date	Responsibility	Priority	Status
1	Include in the FAQ the points identified at the meeting Provide feedback to Megan on the FAQ page : http://www.argo.ucsd.edu/Data_FAQ.html and the Argo Beginner guide http://www.argo.ucsd.edu/Argo_date_guide_draft.html	End December 2014	Megan All ADMT members	R	
2	Contact Reiner Schlitzer/AWI to be sure that ODV takes into account V3.1 files	End December 2014	T Carval	R	
3	ADMT chairs and GDAC to develop a set of options to handle orphan floats and argo equivalent for which we do not have a DMQC pathway and submit those options to AST	AST16	Ann Sylvie Thierry Mike and Charles	R	
4	Each Dac to update AIC list for the orphan floats whenever possible	AST16	Dac	H	
5	AIC to make the link with the Centers that are integrating and redistributing Argo data and be sure they use our adjusted data and use the flags and report to ADMT	ADMT16	M Belbeoch	R	
	Real Time Data Stream				
6	Make a check on the content between GDAC and BUFR messages to be sure that profile are complete	ADMT16	Mike and Anh	R	
7	Correct bad header in Tesac - should use SOF instead of SOV - 5 DACS affected . Mathieu B to check the list and impact and warn the Dacs	ADMT16	Coriolis, CLS, UK, USA, KMA, MEDS	R	

	Action	Target Date	Responsibility	Priority	Status
8	JMA and MEDS update Java and Perl Converters from Netcdf V3.1 to new BUFR	AST16	Anh and Wataru	R	
9	Produce matlab encoder and decoder for BUFR and provide it to all	ADMT16	Mathie Ouellet	R	
10	Investigate apparent blockage in BUFR distribution	AST16	Anh with Dacs	R	
11	Identify the DACS where clearly some RTQC procedures are not properly implemented and warn them so that they can correct their code	ADMT16	Christine	R	
12	test on density inversion : Ann to run adding PI name to the list and perhaps run over different sections of the water column Dacs to provide feedback to Ann on density inversion that are real and should be in the exclusion list	ADMT16	Ann + all Dacs	R	PI name added - November 2014
13	AIC to perform delay analysis on two GDACs and provide a report to DACs highlighting issues	AST16	Mathieu	H	
14	Define a set of metrics to monitor the quality of the Argo dataset and publish it on the AST and ADMT WWW	AST16	BRIAN TO LEAD	R	a
15	Update QC manual for deep float, including warning of the uncertainties of data quality below 2000db	Dec 2014	Annie	R	
16	Propose DMQC on Apex unpumped NST	ADMT16	Annie and Justin	L	

	Action	Target Date	Responsibility	Priority	Status
	Reference Database				
17	Susan with Dean to work at higher levels to solve the issue with link with CCHDO that is not working as smoothly as expected to feed the REF DB.	AST15	Susan Dean	R	
18	Streamline data provision from CCHDO to Coriolis for CTD REF DB	AST15	Steve	R	
	Delayed Mode trajectory				
19	Each DAC with PI/DM has to take the responsibility for the decision to use or not the ANDRO converted D-Traj files as first version of D-files. Each DAC/PI/D-Operator should do assessment on some of their floats to be able to define their strategy and report to ADMT	ADMT16	alls Dacs with PI and DM	R	
	GDAC				
20	In case the content of the file (DATA-Mode, Platform number, DAC , cycle number,...) doesn't fit the File name submitted by the DAC then the file should be rejected by the file checker .	ASAP before AST16	Mike	H	
21	Make the Enhanced File checker operational	ASAP before AST16	Mike	H	
22	Revisit the metadata Mandatory and desirable metadata for File Checker	AST16	Claudia, Ann and Mathieu	R	
23	Take into account the flags(date and position) to generate the index file at both GDAC and put fill values when they have flag 3 or 4	AST16	Mike and Thierry	R	

	Action	Target Date	Responsibility	Priority	Status
24	Finalize the GDAC cookbook	ADMT16	Thierry and Mike	R	
25	DACs to provide new Real time profile meta traj and Tech file in V3.1	ASAP before ADMT16	all Dacs	H	
26	DACs to provide historical profile meta traj and tech files in V3.1 as soon as practical	ASAP before ADMT16	all DACs	H	
27	Get statistics on access to the Geo directory from both GDAC	ADMT16	Thierry and Mike	R	
28	in the monthly snaphots add all the current the manuals and tables and DOI information inside	AST16	Thierry and Mike	R	
29	Check in all the version of User and QC manual are available on ADMT WWW site	AST16	Thierry	R	
30	Create separate index files for b and M profile and traj files including list of parameters	ADMT16	Thierry and Mike	R	
	Format				
31	Propose a way forward for the maintenance of the Standard Format Id table	ADMT16	Megan Claudia and Mathieu Uday	R	
32	update User manual according to meeting decision	15-nov-14	Thierry	R	done

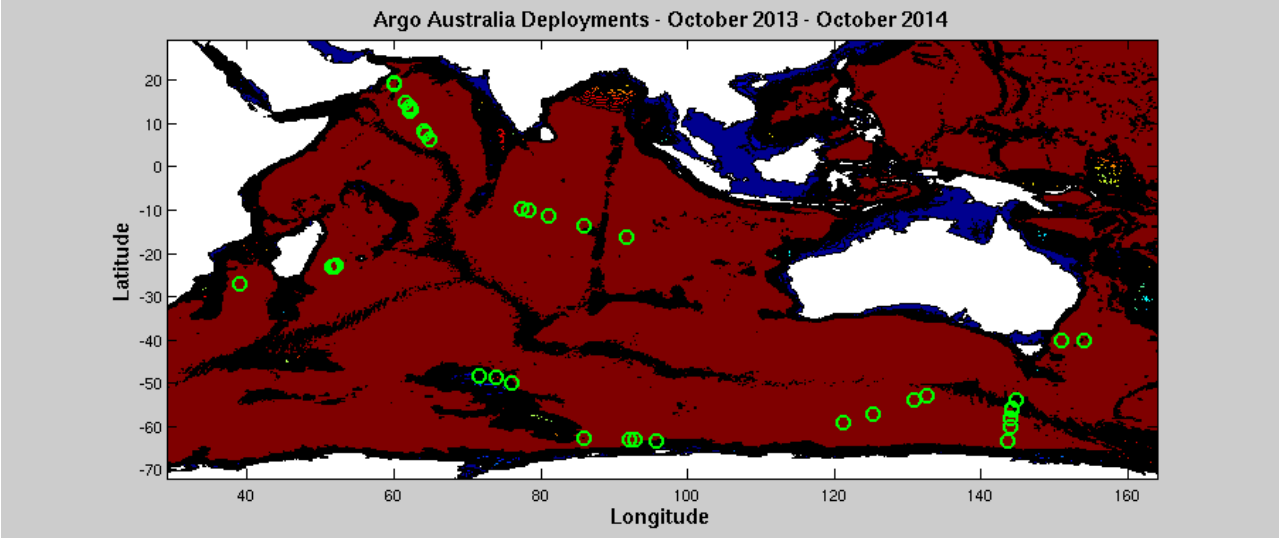
17 Annex 5 - National Reports

Australian Argo National Data Management Report
ADMT15
Ottawa CANADA – 5-7 November 2014

Ann Gronell Thresher for the Argo Australia Team (CSIRO, Bureau of Meteorology)

Status of Array

Australian deployments in 2013-14:



Australian Argo deployments between October 2013 and October 2014.
Green circles are new deployments

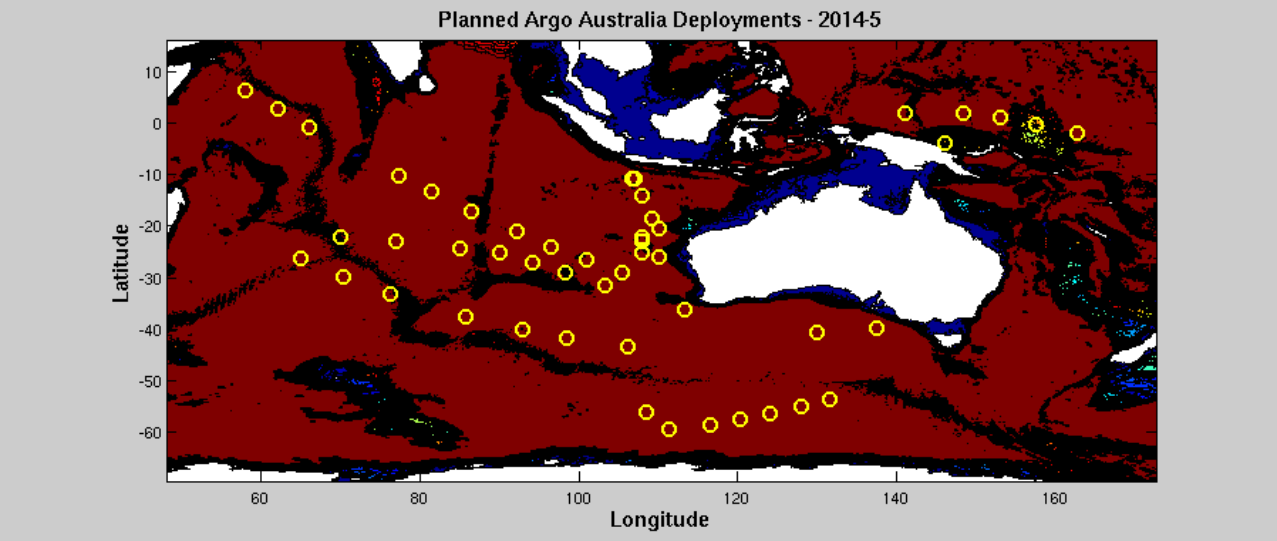
Australia has deployed 38 Argo floats since the last meeting, which is down for us. We deployed almost everything we had in the lab and have been awaiting both the summer deployment season and the arrival of new floats. Eleven have recently arrived, 18 have gone out on R/V *Kaharoa* and will be deployed in the next month or so and we have further deployment opportunities for 6 north of Papua New Guinea and more along IX12 between Perth and the Gulf of Arabia.

We currently have 362 active floats returning good data from a total of 623 deployments since 1999. We also have 55 floats in the lab or on ships about to be deployed. We hope to order a further 25 – 35 floats depending on funding outcomes. These purchases will help us to maintain float density in the South Indian and South Pacific Oceans.

We continue to assess the 'Proof of Concept' (new models as a test of the new technology) floats deployed two years ago, on accelerated profiling missions. We expect to finish this assessment before the end of the year.

Known deployment locations for the floats over the next year are shown below. We will continue to re-seed the Indian Ocean and South Pacific Ocean but some deployment locations are still to be decided.

Australian Deployment plans 2014-15:



Locations identified for new float deployments. We anticipate more than 50 deployments in the next year but it will depend on float deliveries and ship availability.

Significant improvements:
Most of our Iridium floats have now been moved from dial-up to RUDICS protocol. The remaining floats cannot be moved for technical reasons. This has helped reduce communication costs which are increasing again as the Australian dollar drops against the USD.

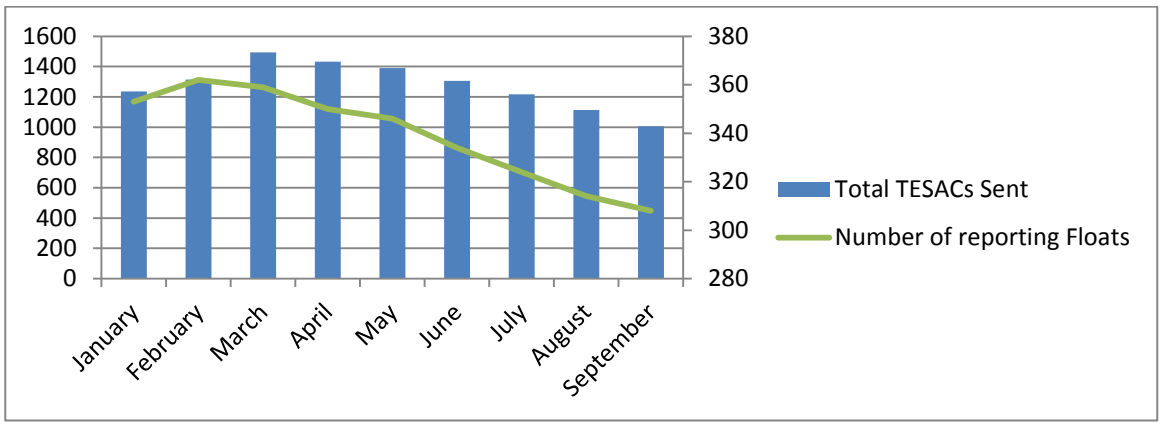
Software development:
Software development continues with the development of code to deliver V3.1 for all of the 4 file types. Trajectory files have only been partially completed. We can now provide trajectory version 3.1 files for our Argos floats but data from Iridium floats will require further coding; we are well advanced in this development. Profile, Metadata and Tech files are all being delivered in real-time in version 3.1, including Profile B files though some bio parameters remain in raw form only.

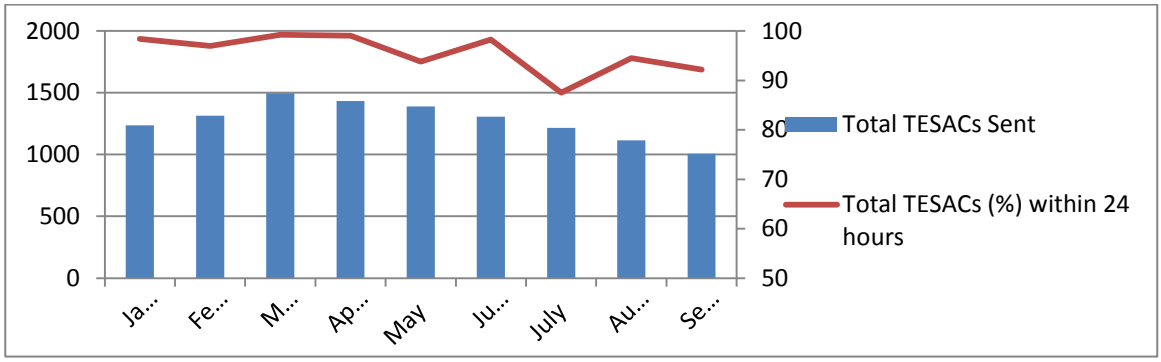
We have also distributed the V3.1 code to INCOIS and KIOST and they are working towards implementation.

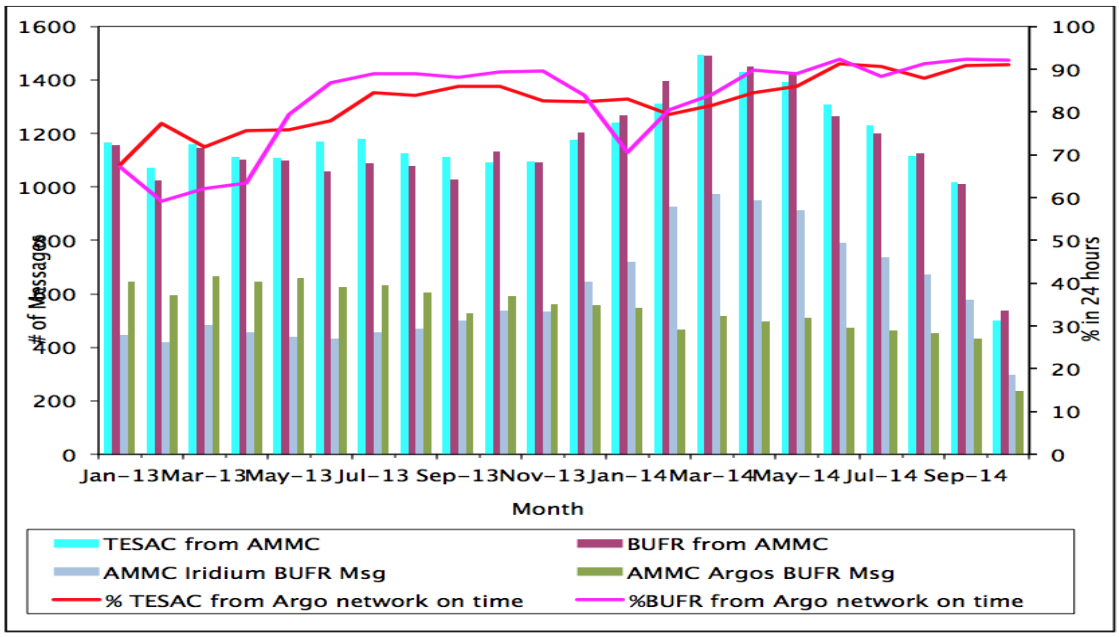
Data Acquisition and delivery to the GDACs and GTS:
Data processing has basically not changed. Raw data is processed within a maximum of 18 hours of delivery from either Argos or via Iridium. Argos data is processed twice – once as soon as practical, then again after 2-3 days to ensure we have the maximum number of reports and the best possible message. After passing through the real-time QC, all netcdf files are generated and the data is then sent via FTP to both GDACs. As insurance, we actually send each file 4 times in case of transmission failures. Our processing is mirrored at the Australian Bureau Of Meteorology (BoM) so each file is delivered 8 times in total, ensuring that the GDACs have the data if either CSIRO or BoM are offline for some reason. Problems this year appear to have been minimal though coding for various version 3.1 files has impacted deliveries to some degree.

The data is also issued to the GTS via TESAC messages immediately by the BoM. BUFR messages are now being generated and delivered to the GTS. We have confirmed that this data is being seen at the US GODAE.

Delays in data delivery appear to have improved but we will always have some floats that are under ice or have just been deployed and need processing before the data is sent out. Because the floats we are deploying tend to have the same formats as previous deployments, these delays are now minimal.







Data is available for delayed mode QC as soon as the real-time data is processed but only considered valid for DMQC after 12 months. The Delayed Mode report is appended below.

Additional Data Distribution:
As noted in previous years, the National Collaborative Research Infrastructure Strategy (NCRIS) funds the Integrated Marine Observing System (IMOS) which is a major source of Argo funding for Australia. As part of this initiative, it is required that we have a local data delivery pathway. IMOS is now serving Argo data as a mirror to the US GDAC through its data portal which can be accessed at:

http://imos.aodn.org.au/webportal/

All IMOS data, from all platform Facilities, can be accessed through this web site.

Float Performance:
Of the 621 floats we have deployed, 248 are now considered inactive. We have carried out a basic analysis of our float failures and find that the major attributable cause of loss is simply end of life and battery drain (102 floats), though 17 disappeared on deployment, some without any apparent cause. Thirty-two floats have also disappeared without any clear cause after varying periods of profiling, 34 have grounded and not returned, 32 had various failure modes and another 23 have leaked. Fifteen were lost under ice and never returned. Note that some floats were apparently affected by more than one failure mode.

We have had several floats perform for more than 10 years, and another 8 are still active and only months away from reaching this milestone. However, we are now finding that floats are disappearing in groups, after 8, 7½ and 7 years in the field. We suspect that this decrease in longevity is due to the change of mission to more active management of the park period and an

increase in the number of CTD samples collected during the park phase. This primarily affects Argos equipped floats at this point. Our iridium floats have not been in the field long enough to estimate a normal end of life for this combination of telecoms/continuous CTD profiling. The earliest were deployed 7 years ago, containing a full complement of lithium batteries, and battery voltages in these are still good. We still have no clear analysis of the impact using iridium communications, profiling continuously from 2000db, and reporting 240 park measurements will have on longevity and battery power in these floats.

In addition, we have 12 floats on our grey list, mainly for salinity sensor problems

Finally, we have 54 floats on the 'missing' list – half of these (27) are under ice.

Web Pages:

The Australian Argo Real Time web pages are updated with the most recent data during the processing of the reports from the floats. They are therefore up to date as soon as float data is received. We have added web pages that contain details of the technical data from our floats, aiding in the diagnosis of problems. This is now done as a float is processed making them up-to-date and easy to find. We have recently hired additional help for DMQC; the first priority is to catch up with our Delayed Mode processing of D files. We still have a backlog of web pages that are not up to date with our processing. As part of our reprocessing we aim to autogenerate these pages in time for the next ADMT. We have also hired someone to begin developing a DMQC method for our floats with oxygen data and hope to have this well under way before the next meeting.

Home page for Argo Australia (IMOS)
http://imos.org.au/argo.html

The Australian data portal can be found at:
http://www.imos.org.au/facilities/argo-australia.html ;

Information on individual floats can be found at:
http://www.marine.csiro.au/~gronell/ArgoRT/ ;

There are links to the technical pages for a float from each profile page.

Information on our DMQC process and floats can be found at:
http://www.marine.csiro.au/argo/dmqc/

Home page for DMQC documentation of floats:
http://www.cmar.csiro.au/argo/dmqc/html/Argo_DM.html
and
http://www.cmar.csiro.au/argo/dmqc/index.html

Statistics of Argo data usage:
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 local users find the data they need.

Argo usage is a difficult list to compile, as Argo data are now being used routinely by many researchers nationally and globally. Not much has changed in the past year. In addition to the information below, there are numerous publications from Australian researchers which have used Argo data and have appeared in the last year.

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 Bureau's Ocean Analysis
(http://www.bom.gov.au/oceanography/analysis.shtml)

- Argo data is also being used in the BLUElink ocean forecasting system.
  http://www.bom.gov.au/oceanography/forecasts/index.shtml

- We are also incorporating it as a high quality background data field for our upper ocean temperature QC programs (QuOTA archives, SOOP XBT QC).

We report usage to our funders IMOS – the Argo report can be found at:

http://imos.org.au/imospublications.html

Please see Appendix A for a list of research projects using Argo data in Australia.

Delayed Mode QC (DMQC) Report:

Australian DM Statistics (to 24 Oct 2014)	
D files submitted to GDAC	43422 + 17803 (new waiting to be submitted) = 61225
Total R files	52849
R files eligible for DMQC	37294
Total eligible files for DMQC	80716
Total files at GDAC	96271

Table 1. Delayed Mode processing statistics for the Australian array.

As the Australian Argo fleet expands, the number of eligible files available for Delayed Mode processing (those that are greater than 12 months old) continues to grow rapidly. Current DM statistics of eligible submitted D files at the GDAC are at 53%, with a further 17803 files processed and waiting to be submitted. If we are able to submit all our newly processed D files before the ADMT meeting, our D files statistics will be at 76%.

The Delayed Mode processing is operating in maintenance mode with older floats re-assessed once each year and new floats assessed when profiles are 12 months old. If a float is believed to be dead then we are processing the entire record (as long as profiles are more than 6 months old) in order to be as efficient as possible with our processing. We have been working on incorporating new data formats and float models into the data stream which has necessitated code revisions to deal with multi-profile files.

A challenge for our program is the significant increase in data volumes of the standard P, T and S data in the Delayed Mode data stream as well as the development of new processes to QC trajectory data and other parameters such as oxygen. We have been falling behind in the timely delivery of D files to the GDACs due to static resourcing (38% of eligible profiles delivered at the start of this year compared with 53% delivered end Oct 2014 and 63% in the preceding year).

The number of eligible files for DMQC has continued to increase, up from 60,000 last year to 80,000 this year. In May, we hired a new DM operator (Catriona Johnson) to help DMQC float data. Her time will be split between DMQC and the design and build of a database to hold DM, RT and technical and engineering information. Esmee has been training Catriona over the past 5 months and the DM group has been making slow and steady progress in catching up on file delivery. Significant effort is also going into the trajectory files (real-time processing to start, with DM processing to follow). We have hired a new person (Luke Wallace) who started in August, on a 12 month contract, to help develop software to QC Argo oxygen data. Luke has been working with Esmee over the past two months to make the existing DM software flexible enough to deal with oxygen and other BioArgo variables and is beginning work on the development of a method to QC oxygen data.

Appendix A.

A full and up-to-date list of Australian users for Argo data can be found at
http://imos.org.au/imospublications.html

A large number of Australian PhD students are using Argo data and it is an integral part of many collaborative research projects which rely on our outputs. Please see the IMOS web site for more details.

Argo Canada National Data Management Report

ADMT15

Nov 03 - 07, 2014

1. Status

Data acquired from floats: We are currently tracking 67 floats of which 48 report using Iridium satellite. Of these, 13 might be in trouble or might have failed to report within the last 6 months. Since the beginning of 2014, we deployed 9 floats from METOCEAN which report on Iridium satellite. Currently, we acquire Argo messages from Argos (through CLS) and Iridium (SBD packets through Joubeh, Rudics through CLS).

Data issued to GTS: All data are issued to the GTS in TESAC and BUFR format. On average, 85% of data were issued on the GTS within 24 hours in TESAC and BUFR between January and September 2014, respectively. Due to the transition of netCDF format from version 2.0 to 3.0, there were no BUFR messages sent by MEDS for November 2013 to January 2014. The timeliness of Argo data on the GTS for 2014 has improved in comparison to previous years due to an increase in frequency for data processing which changed from every six hours to every hour.

Data issued to GDACs after real-time QC: All of the profile, technical, trajectory and Meta files are transmitted to GDACs in netCDF format on an operational basis with some additional delay compared to the data sent on the GTS, because the two processes run on two different servers and the conversion process to netCDF takes a longer time. After some program modifications and optimization, the time delay between the GTS data and the data sent to GDACs has been significantly reduced.

Data issued for delayed QC: Data are available for delayed mode QC as soon as they are sent to the GDACs but only considered eligible for DMQC after 6 months.

Delayed mode data sent to GDACs: No eligible files were quality-controlled or re-quality controlled for salinity or pressure since October 2013.

Web pages:

http://isdm.gc.ca/isdm-gdsi/argo/index-eng.html

We maintain web pages that show float tracks and all data collected by Canadian floats. Links to both real-time and delayed mode data are also available for download directly from GDAC. The 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, reports of floats which distributed more than one TESAC within 18 hours and Canadian float performance statistics.

The Argo webpages previously hosted by the Institute of Ocean Sciences (Sidney, BC) are now hosted by the Oceanographic Services section (previously called ISDM). The webpages describe the Line-P products and other uses of Argo to monitor the N.E. Pacific. For more information about the product, go to:

http://www.isdm.gc.ca/isdm-gdsi/argo/canadian-products/index-eng.html

Statistics of Argo data usage: Argo data have been used to generate monthly maps and anomaly maps of temperature and salinity along line P in the Gulf of Alaska. Line P has been sampled for 50 years and has a reliable monthly climatology. For more information on the Line-P products and other uses of Argo to monitor the N.E. Pacific go to:

http://www.isdm.gc.ca/isdm-gdsi/argo/canadian-products/index-eng.html

The Canadian Meteorological Centre (Dorval, Québec) of Environment Canada has been assimilating real-time Argo data in "experimental" mode for more than one year. The official switch to "operational" mode is expected to occur as soon as a formal contract is in place for a data feed from CLS.

2. Delayed Mode QC

As of October 2014, 18% of all eligible floats, active and inactive, had their profiles QCed visually and adjusted for pressure according to the latest delayed-mode procedures at least once. The salinity component of DMQC had been performed on 58% of eligible cycles.

3. GDAC functions

Canada forwards TESAC data to the GDAC in Brest and US NODC three times a week. Canada also monitors the timeliness of Argo data on the GTS in BUFR and TESAC format

4. Region Centre Functions

Canada has no regional centre function.

Chinese Argo National Data Management Report
ADMT-15
Ottawa, Canada, 3-7 November 2014

1. Status

1.1 Data acquired from floats

From November 2013 to October 2014, China acquired data from 231 floats, including 8 ARVOR, 121 PROVOR (17 PROVOR DO Iridium), and 101 APEX floats (including 17 Iridium and 2 Iridium+DO floats). Note that about 130 (81 floats are still active from November 2013 to October 2014) floats that were deployed by some special programs during 2010-2014 were added into "China Argo equivalent" program this year. These equivalent Argo floats are processed by China. It took a lot of time for us to reprocess all the data. About 82 floats including 16 APEX, 17 PROVOR DOI and 49 PROVOR CTS3 were deployed this year. The joining of these equivalent floats makes China contribute more to global Argo Project.

1.2 Data issued to GTS

CLS still helps us distribute Argo profiles on GTS. We are also looking for an appropriate way to submit Argo data through the GTS interface at China Meteorological Administration.

1.3 Data issued to GDACs after real-time

From the last ADMT, China submitted 9,323 R-files to GDACs after real-time QC. Among these profiles, 2,757 profiles are observed by Argo equivalent floats, and 3368 TS/DO profiles are obtained by 17 PROVOR DOI floats which measure a TS/DOXY profile every day. In October this year, CSIO submitted 6,965 profiles which were observed by China equivalent floats from 2010 to present.

1.4 Data issued for delayed QC

NMDIS has done delay-mode QC to all the floats we own, and now we are trying to release them in format 3.0 so the D-files will be submitted to GDAC later.

CSIO didn't submit any D-files to GDACs from the last ADMT, because it took us a lot of time to write decoding software for PROVOR DOI and PROVOR CTS floats.

1.5 Web pages

Two web pages are maintained by NMDIS, and CSIO. the China Argo Data Centre (http://www.argo.gov.cn) and the China Argo Real-time Data Centre (http://www.argo.org.cn). Both web pages provide the access to the float data, meta data, trajectory and their related plots.

2. Statistics of Argo data usage

Argo data have become an important data source in operational applications. NMDIS has developed a set of Argo data operational processing system, using the Argo data completely and the new algorithm to make 1º×1º degree monthly gridded TS products and calculate 5º×5º multilayer trajectory flow field. The National Marine Environmental Forecasting Centre (NMEFC) developed a reanalysis product of monthly temperature and salinity fields in tropical Pacific Ocean. Argo data are also used in their global ocean forecasting system, and their forecasting products in Indian, Pacific and global oceans can be accessed through website. CSIO developed a monthly gridded TS product during 2004-2013 based on Argo profiles over the global oceans, with a horizontal resolution of $1^o \times 1^o$, and its higher resolution ($1/2^o \times 1/2^o$) version is being developed.

There are 7 PIs from CSIO, FIO, East China Branch (SOA), South China Sea Institute of Oceanology (CAS), NMEFC, Navigation Guarantee Department (CNH) Ocean university of China (MoE), respectively, who have deployed floats. The new added 132 Argo equivalent floats were deployed by several China special programs.

3. Delayed Mode QC

On the basis of routine quality control, a joint quality control is conducted to the Argo profiles at NMDIS. A gridded data is generated based on a statistical and analytical method, and a distribution map is then plotted on which doubtable gridded data is able to be found out easily. After that, the original Argo data for the suspicious grid is found out to check the abnormal measurements. QC flags are then added after the comprehensive analysis. At CSIO, the surface pressure, CTM and OW corrections have been applied in DMQC system. They also developed a gradient-dependent scale parametric method to objectively estimate climatological salinity, and proposed an optimization scheme in which climatological salinity is used instead of observations from the float. Such an improved Argo salinity DMQC method is expected to improve the accuracy of correction where the sea water has a larger temporal and spatial variation.

4. GDAC Functions

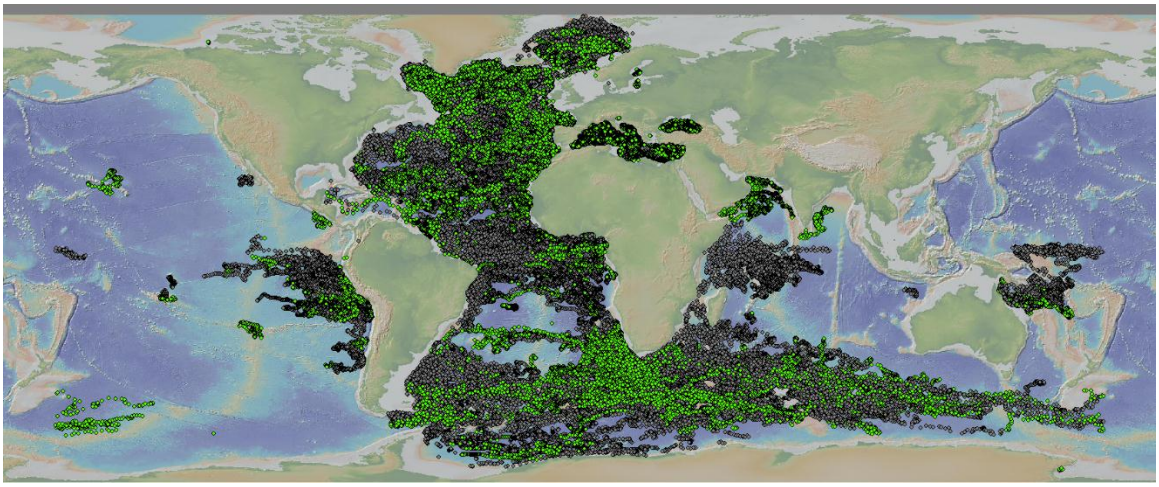
No

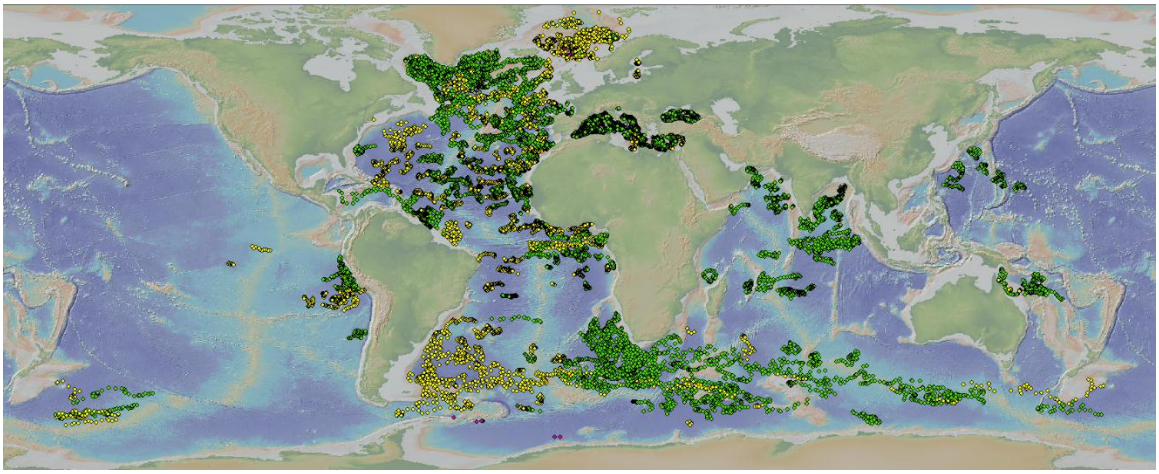
5. Regional Centre Functions

No

Argo data management report 2014
Coriolis DAC & GDAC

Data Assembly Centre and Global Data Assembly Centre
Annual report October 2013 - September 2014
Version 1.1
October 30th, 2014





DAC status

This report covers the activity of Coriolis data centre for a one year period from October 1st 2013 to September 30th 2014.

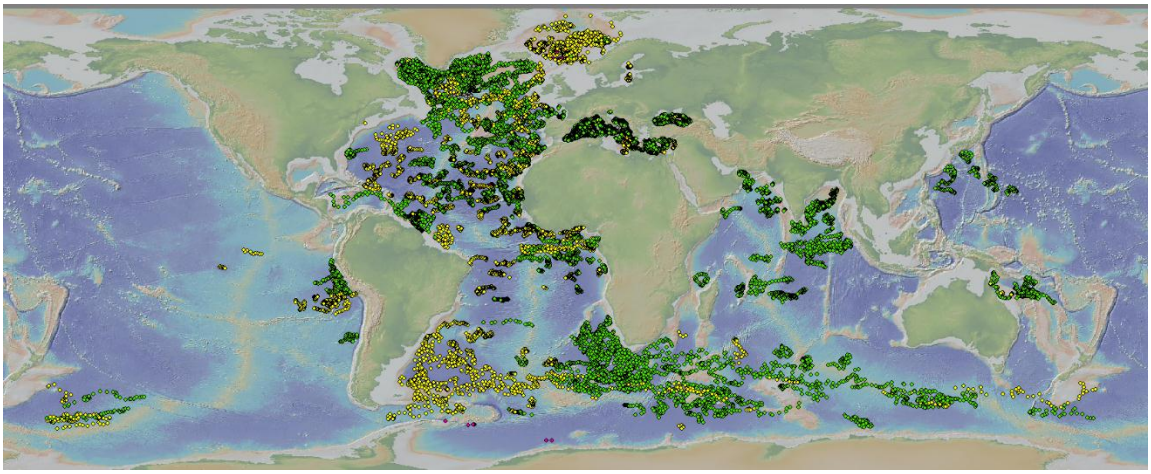
Data acquired from floats

These last 12 months, a total of **30 753 profiles from 687 active floats** was collected, controlled and distributed.

Compared to 2013, **the number of profiles increased by 40%, the number of floats increased by 5%.** The increase in profile number is mainly explained by new bio-Argo floats that perform more vertical profiles than typical core-Argo floats. We also started to split in 2 profiles the floats having pumped/unpumped CTD samplings.

The 687 floats managed during that period had 50 versions of data format:

- APEX 26 versions 262 floats
- NEMO 3 versions 7 floats
- NAVIS 1 version 1
- NOVA 1 version 6 floats
- PROVOR 19 versions 411 floats



Map of the 30 753 profiles from 687 floats managed by Coriolis this current year
Apex Nemo Nova Provor

Bio-geo-chemical sensors on Provor floats

We are developing a new data processing chain based on Matlab to manage data and metadata from Provor-Remocean floats. These are advanced type of floats performing bio-geo-chemical measurements. They are available in real-time from Argo GDAC or directly from:

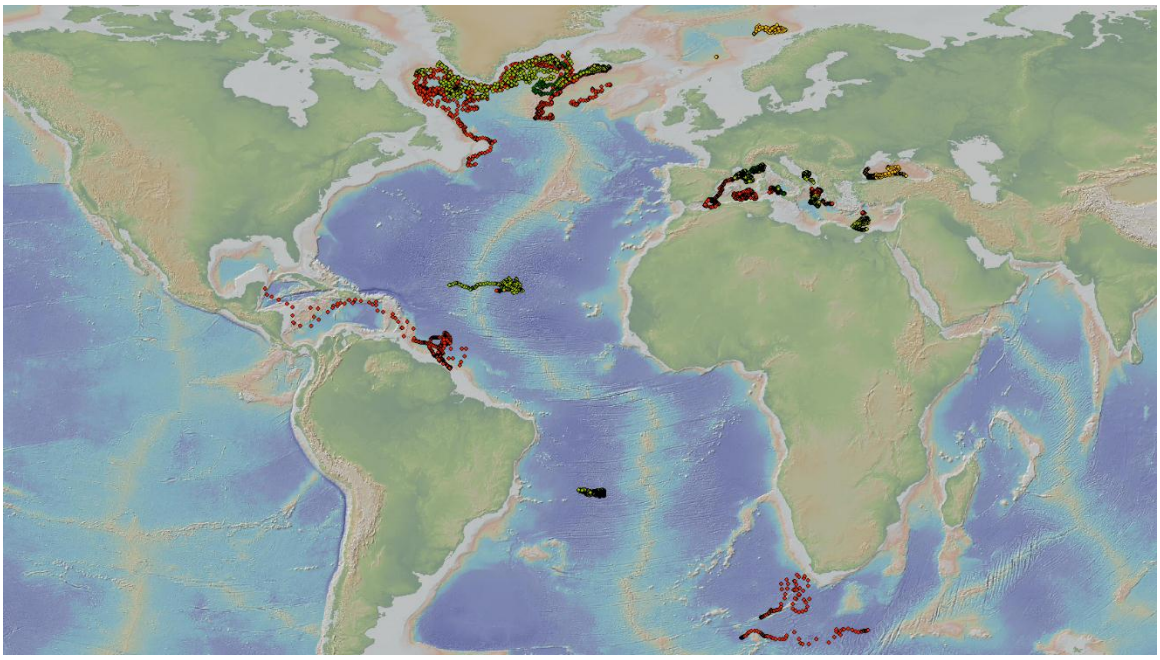
- ftp://ftp.ifremer.fr/ifremer/argo/etc/coriolis-custom/probio-draft/

Overview of Coriolis bio-Argo floats

- 60 Provor bio-Argo floats where deployed in 2013-2014
- Funded by NAOS and E-AIMS projects
- Iridium rudics bi-directional communication
- Six sensors are fitted on the floats
  - AANDERAA_OPTODE_4330 Aandera oxygen sensor
  - C_ROVER Wetlabs transmissiometer
  - ECO_PUCK Wetlabs fluorometer turbidity, scattering
  - SATLANTIC_OCR504 Satlantic Irradiance sensor
  - SBE41CP Seabird CTD sensor
  - SUNA_V2 Satlantic nitrate sensor
- 83 parameters managed : core-argo, b-argo, i-argo parameters
  These parameter include chlorophyll, turbidity, CDOM, back-scattering, UV, nitrate, bisulfide, pH, radiance, irradiance, PAR
- New behaviour of the floats : multiple profiles performed during a single cycle

© Antoine Poteau, Observatoire Océanologique de Villefranche (CNRS/UPMC)

Deployments of a bio-argo Provor in Ligurian sea

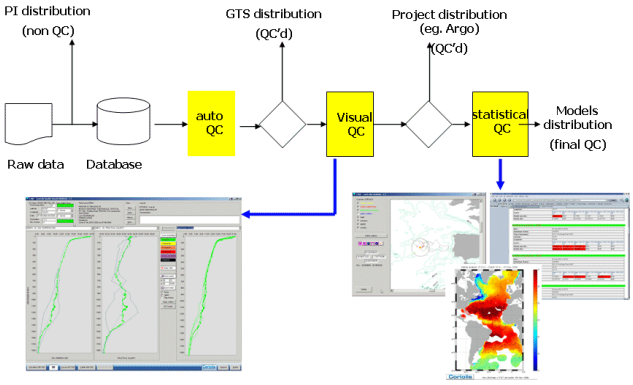


Map of the 60 bio-Argo Provor floats deployed in 2013-2014, they measure parameters such as chlorophyll, turbidity, CDOM, back-scattering, UV, nitrate, bisulfide, pH, radiance, irradiance, PAR.

Data issued to GTS

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

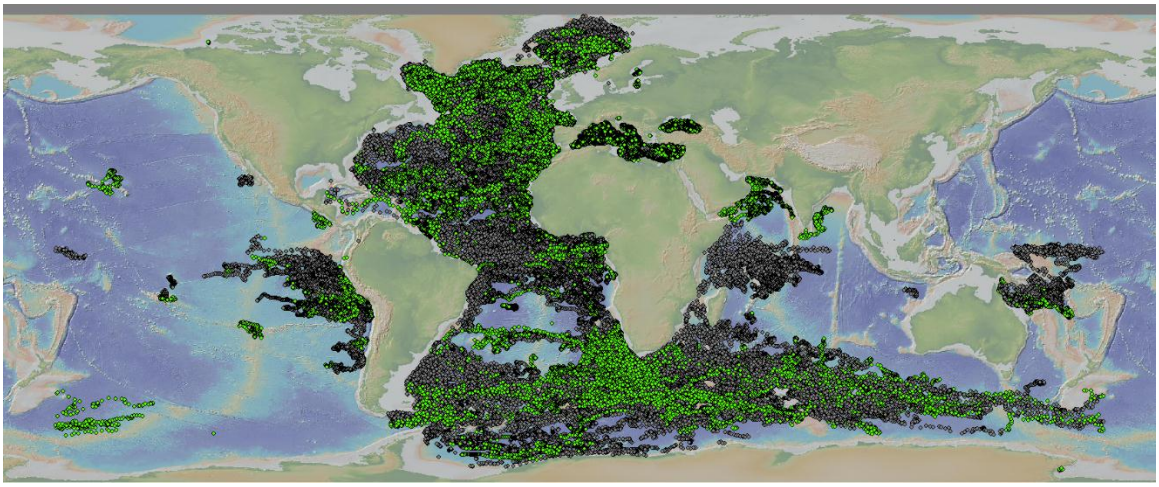
Once a day, floats data that are less than 21 days old are checked in an objective analysis (ISAS) that triggers alert and visual inspection for suspicious observations.



CORIOLIS DAC: Argo data flow

Data issued to GDACs after real-time QC

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



Map of real-time profiles (Argo NetCDF V3.0, V3.1) and delayed mode profiles (Argo NetCDF V2.4)
Real time : green dots, delayed mode : grey dots

Transition to Argo NetCDF format V3.1

Since May 17th 2013, the new profile files from Coriolis DAC are distributed in Argo NetCDF version 3.0. On October 7th 2013, all the existing real-time profile files from Coriolis DAC where transformed into version 3.0 files (43 964 files resubmitted).

Since September 2014, the Provor bio-Argo floats are distributed with Argo NetCDF V3.1 format: metadata, technical data, trajectory and profiles.

Gradually, all Coriolis files will be converted in Argo NetCDF 3.1. The transition will be performed by float type: for a given type, all files will be converted. We want to avoid a combination of different formats for a given float.

Data issued for delayed mode QC

Delayed mode profiles

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

Preparation of Argo delayed mode trajectories

An important activity was performed to extract delayed mode NetCDF V3 trajectory files from the Andro atlas of deep ocean currents. These trajectory file are proposed to Argo DACs.

The Andro trajectory TRAJ3 files are available for most of the DACs. Each DAC may decide to use these files to provide delayed mode trajectory on GDAC.

Coriolis DAC will use these files as its delayed mode trajectories for old floats versions.
The floats decoded with the recent Coriolis Matlab data processing will not use ANDRO for its delayed mode trajectories.

Delayed mode data sent to GDACs

An Argo delayed mode profile contains a calibrated salinity profile (psal_adjusted parameter).

A total of **11 986 new or updated delayed mode profiles** was sent to GDACs this year. The number of delayed mode profiles increased by 7%. **A total of 111 454 delayed mode profiles** where sent to GDACs since 2005.

Web pages

The web site of the French DAC is available at:

- http://www.coriolis.eu.org/Observing-the-Ocean/ARGO2

This web page describes all Argo floats:

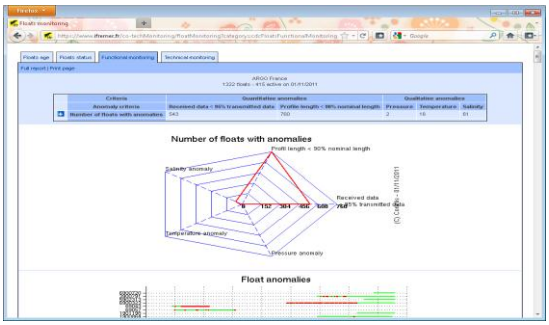
- http://www.ifremer.fr/co-argoFloats/
    - Individual float description and status (meta-data, geographic map, graphics : section, overlaid, waterfall, t/s charts)
    - Individual float data (profiles, trajectories)
    - FTP access
    - Data selection tool
    - Global geographic maps, GoogleEarth maps
    - Weekly North Atlantic analyses (combines Argo data and other measurements from xbt, ctd, moorings, buoys)

This web page describes all Argo floats interoperability services from Coriolis:

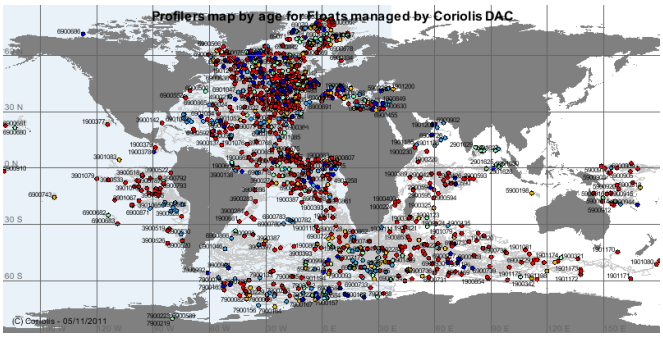
- http://www.coriolis.eu.org/Data-Products/Data-Delivery/Argo-floats-interoperability-services2
    - Display an individual float's data and metadata
    - Display an individual float's data and metadata in XML format
    - Display all Argo floats
    - Display a group of floats
    - Argo profiles and trajectories data selection
    - All individual float's metadata, profile data, trajectory data and technical data
    - Argo profiles data on OpenDAP, OGC-WCS and http
    - Argo data through Oceanotron data server
    - Argo profiles data through GCMD-DIF protocol
    - Argo data through RDF and OpenSearch protocols
    - Display Argo profiles and trajectories with GoogleEarth

Some pages of Coriolis web site are dedicated to technical monitoring:

- http://www.coriolis.eu.org/Data-Products/At-sea-monitoring

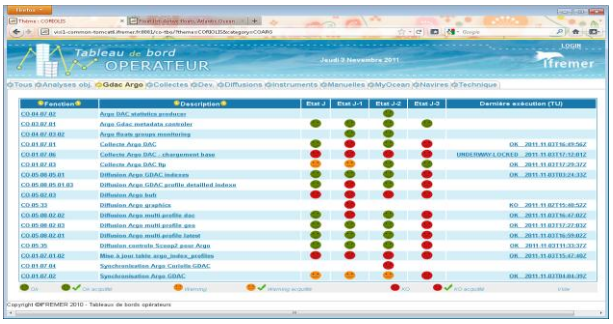


Example 1: technical monitoring of Argo-France floats

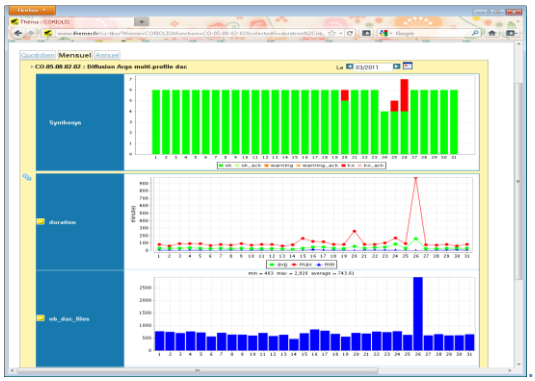


Example 2: age map of floats managed by Coriolis DAC.

Data centre activity monitoring: Coriolis operators perform an activity monitoring with an online control board.



Example 1: distribution activity on 03/11/2011. An operator has to perform a diagnostic on anomalies of Argo data distribution (red smileys). A series of small data base incidents explains the unusual situation.



Example 2: data distribution to GDAC activity in March 2011. On 26th, a bigger than usual data distribution delayed the update of DAC files.

Statistics of Argo data usage (operational models, scientific applications, number of National Pis…)

Operational oceanography models; all floats data are distributed to:

- French model Mercator (global operational model)
- French model Previmer (regional operational model)
- French model Soap (navy operational model)
- EU MyOcean models (Foam, Topaz, Moon, Noos)
- EuroGoos projects

Argo projects: this year, Coriolis data centre performed float data management for **50 Argo scientific projects and 50 PIs (Principal Investigators).**

List of Coriolis scientific PIs and project names

Name	nb floats
Holger GIESE	91
Christine Coatanoan	51
Sabrina SPEICH	50
Pierre-Marie Poulain	47
Virginie THIERRY	45
Birgit KLEIN	42
Bernard BOURLES	33
Andreas STERL	32
Pedro Joaquin VELEZ BELCHI	29
Sabrina SPEICH et Michel ARHAN	26
Fabrizio D'Ortenzio	23
Christophe MAES	20
Rena CZESCHEL	14
Hervé Claustre	13
Kjell Arne MORK	11
Laurent Coppola	11
Cecile CABANES	8
Xavier ANDRE	7
Bettina FACH	6
Violeta SLABAKOVA	5
Alban LAZAR	5
Xavier CARTON	5
Fabien DURANT	4
Gerard ELDIN	4
Dimitris KASSIS	4

Name	nb floats
Stephane BLAIN	4
Tero PUROKOSKI	4
Bert RUDELS	4
Nathanaële Lebreton	3
Detlef QUADFASEL	3
Gerd ROHARDT	3
Serge Le Reste	3
Jose Luis PELEGRI	3
Sunke SCHMIDTKO	2
C. PROVOST et N. BARRE	2
Louis PRIEUR	2
Frederic VIVIER	2
Hubert LOISEL	2
Stéphanie Louazel	2
Laurent BEGUERY	2
Jordi FONT	1
Conan Pascal	1
Juliet HERMES	1
Pascal Conan	1
Yves GOURIOU	1
Pascual ANANDA	1
Coppola Laurent	1
V. Dutreil and S. Le Reste	1
Alain SERPETTE	1

Project	nb floats
BSH	133
CORIOLIS	126
GOODHOPE	76
ARGOMED	41
RemOcean	41
ARGO Italy	38
DAP	32
NAOS	32
ARGO SPAIN	31
OVIDE	14
PIRATA	11
ARGO Norway	11
AMOP	9
CORIOLIS_OVIDE	9
ARGO Finland	8
GMMC-GEOVIDE	8
IFM	7
ARGO GEOMAR	7
GMMC GE MOOSE	6
DEKOSIM	6
EAIMS	5
SRI_LANKA	4
ARGO Bulgary	4
MEDARGO_IT	4
FLOPS	4

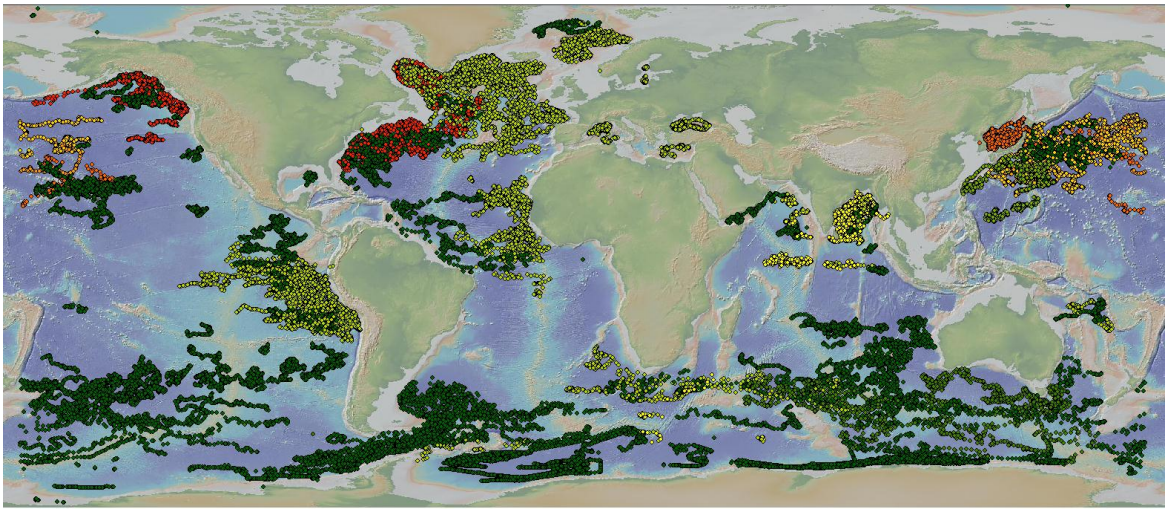
Project	nb floats
ARGO Greece	4
Argo-Italy	3
LEFE_GMMC_CNES	3
HYMEX	3
CORIOLIS_UPSEN	3
WEN	3
AWI	3
ASPEX	2
SHOM	2
MOOXY	2
Opportunité	2
TRACK2010	2
PROSAT	2
EGO2009	2
IFM-GEOMAR	2
EuroArgo	2
JERICO	1
GMMC_CNES	1
SOCIB	1
GMMC - GEOVIDE	1
Physindien	1
CONGAS	1
ARGO_LEBANON	1
PERSEUS	1
ASA	1

Products generated from Argo data …

Distribution of Argo oxygen observations to EU former CarboOcean project.

Once a week, all Argo floats data with oxygen observations are distributed to the German data centre Pangea using the OAI inter-operability protocol (Open Archive Initiative).
More on http://www.coriolis.eu.org/Data-Products/Data-Delivery/Argo-floats-interoperability-services2

This year, 11 863 new oxygen profiles from 249 floats were distributed.
A total of 73 622 oxygen profiles from 616 floats were distributed since 2004.

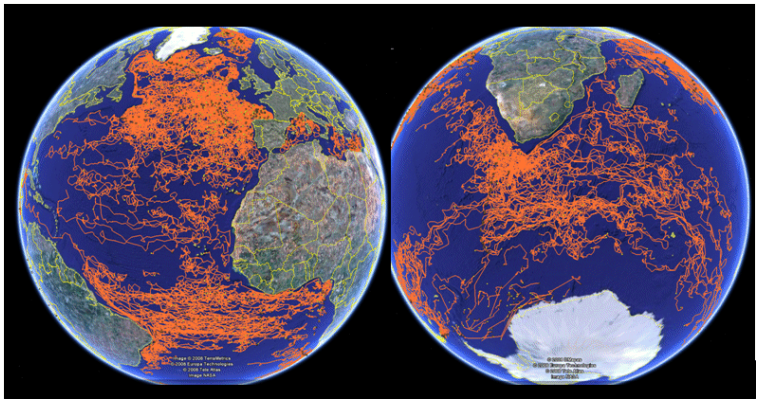


Oxygen profiles collected by all Argo partners since 2004: 73622 profiles from 616 floats.

Sub-surface currents ANDRO Atlas

Based on Argo trajectory data, Michel Ollitrault and the Ifremer team are regularly improving the "Andro" atlas of deep ocean currents. The ANDRO project provides a world sub-surface displacement data set based on Argo floats data. The description of each processing step applied on float data can be found in:

- http://www.ifremer.fr/lpo/files/andro/ANDRO_JAOT_2013.pdf
- See also : http://wwz.ifremer.fr/lpo/Produits/ANDRO



Argo trajectories from Coriolis DAC are carefully scrutinized to produce the "Andro" atlas of deep ocean currents.

Delayed mode trajectories recovered from ANDRO project

During ADMT12 in Seoul it was decided that the ANDRO project dataset could be used to populate the first delayed mode NetCDF trajectory files. From Andro data set, the Argo delayed mode trajectories in format version 3.1 are now available on:

- ftp://ftp.ifremer.fr/ifremer/argo/etc/coriolis-custom/argo-andro-data

The delayed mode trajectories are described in ftp://ftp.ifremer.fr/ifremer/argo/etc/coriolis-custom/argo-andro-data/argo-andro-data_20141016.pdf

The Principal Investigators (PI) and DACs can decide to use or ignore the delayed mode trajectories proposed from ANDRO.
In addition to delayed mode trajectory files, a series of profile files were rescued for each DAC. A "rescued" profile is a profile available with Andro, but not identified on the GDAC ftp site. Each DAC may decide to rescue or ignore these profiles.

DAC	nb rescued profiles
aoml	8545
bodc	378
coriolis	3770
csio	10
csiro	38
incois	1129
jma	485
kma	348
kordi	208
meds	708
Total	**15619**

Number of profiles available from ANDRO not found on GDAC

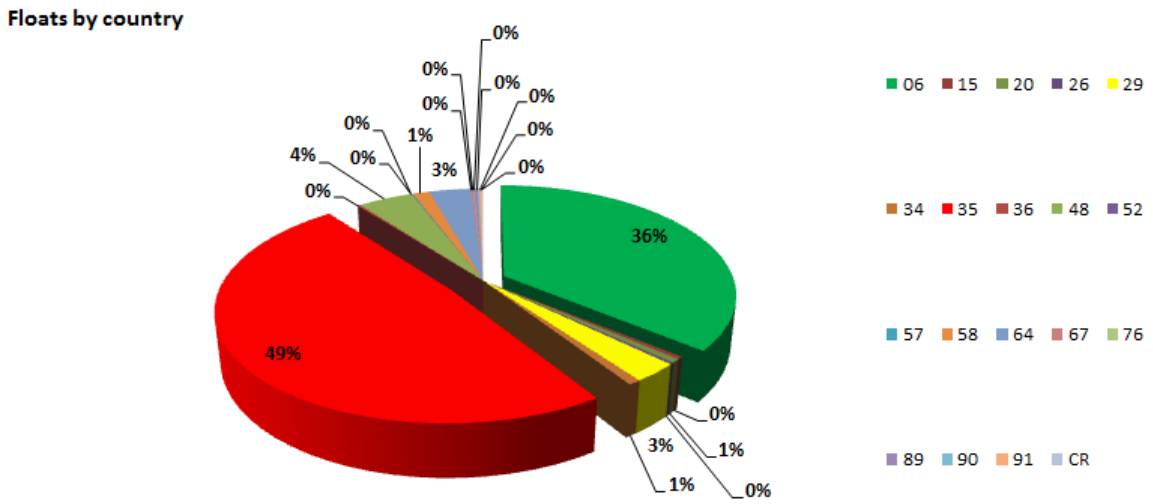
Delayed Mode QC

(Please report on the progress made towards providing delayed mode Argo data, how it's organized and the difficulties encountered and estimate when you expect to be pre-operational).

At the Coriolis data centre, we process the delayed mode quality control following four steps. Before running the OW method, we check carefully the metadata files, the pressure offset, the quality control done in real time and we compare with neighbor profiles to check if a drift or offset could be easily detected. As each year, we have worked on this way with PIs to strengthen the delayed mode quality control.

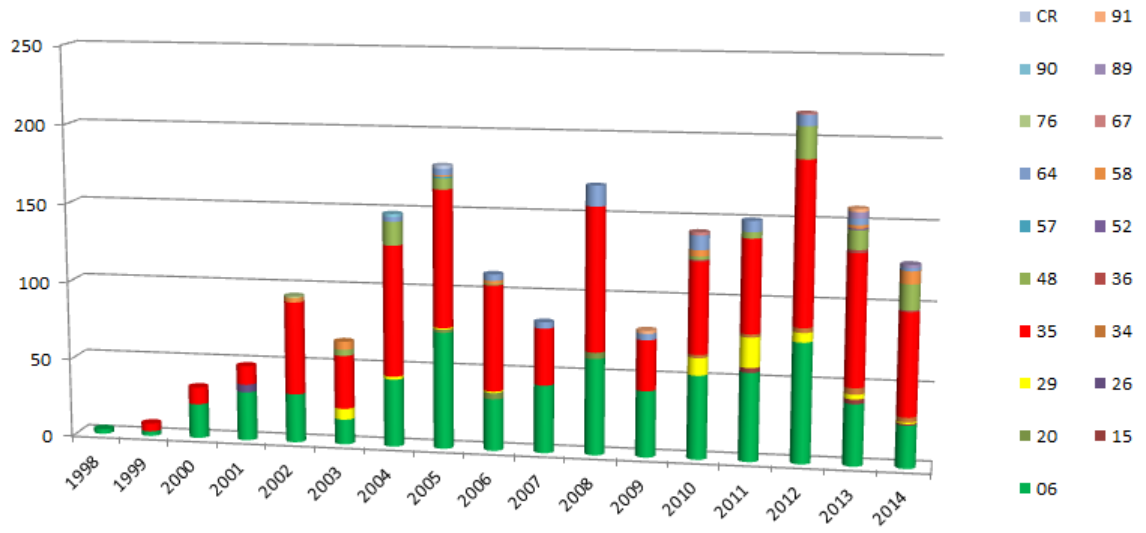
Some floats have been deployed from some projects, meaning a lot of PIs and a lot of time for explaining the DM procedure to all of them. A few PIs are totally able to work on DMQC following the four steps but this is not the case for most of them. Since the unavailability of the PIs leads to work by intermittence and then extend the period of work on the floats, we did the work with a private organism (Glazeo) to improve the realization of the DMQC, exchanging only with the PIs to validate results and discuss about physical oceanography in studied area. Working in this way, we largely improve the amount of delayed mode profiles.

For a few projects, there are still no identified operators to do DMQC, for instance the first run has been done by students which have now left institutes or are not available to carry on with this work. We have made a lot of progress with BSH (Marek Stawarz and now Birgit Klein) and some floats have been processed in DMQC or are in progress (we are finalizing delayed mode QC for some floats).



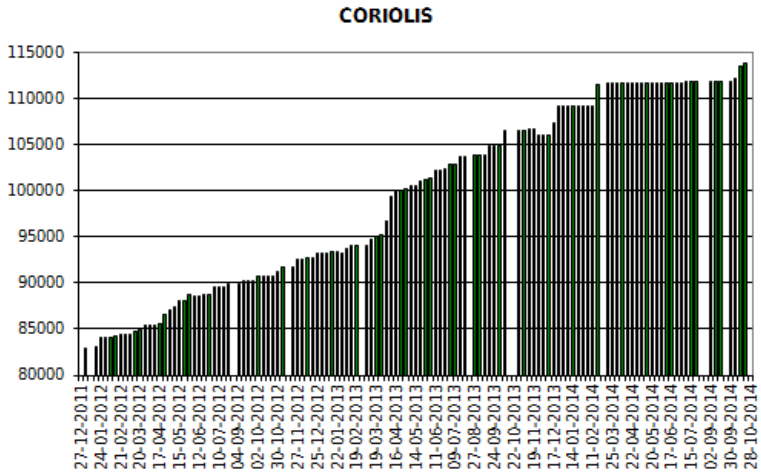
Percentage of floats by country in the Coriolis DAC.

Codes for the countries: 06 : Germany - 15 : Bulgaria - 20 : Chili – 26 : Denmark – 29 : Spain – 34 : Finland - 35 : France – 36 : Greece - 48 : Italy – 52 : Lebanon - 57 : Mexico - 58 : Norway – 64 : Netherlands – 67 : Poland – 76 : China – 89: Turkey - 90 : Russia – 91 : - South Africa - CR : Costa Rica

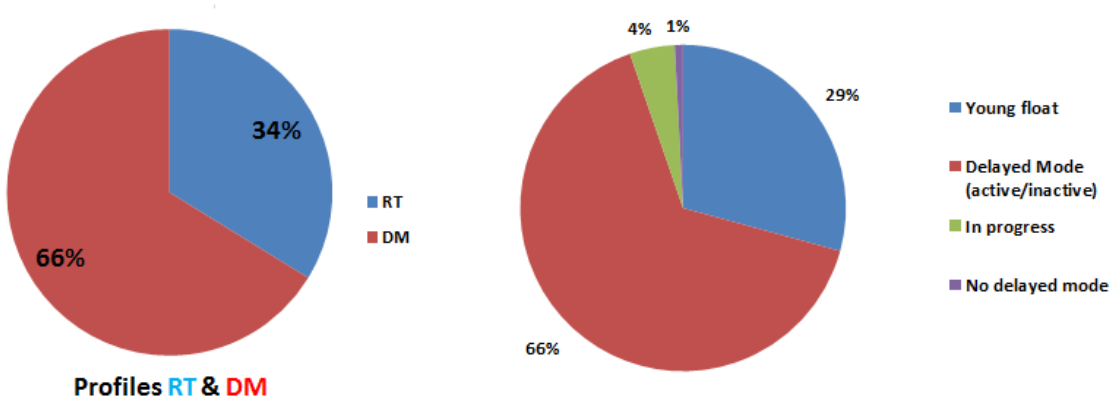


Number of floats by country and by launch's year in the Coriolis DAC

During the last year, 4517 new delayed mode profiles where produced and validated by PIs. A total of 113795 delayed mode profiles where produced and validated since 2005.

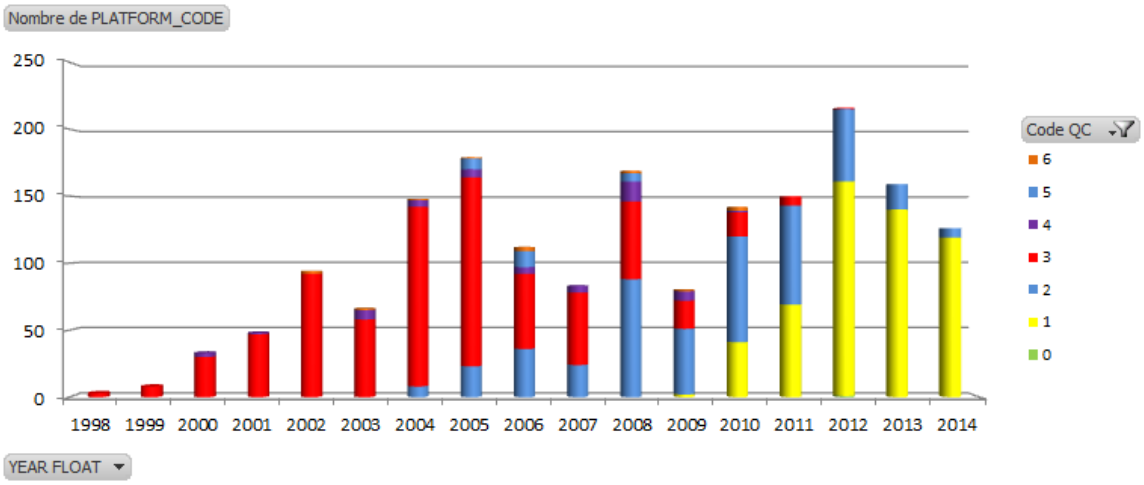


Evolution of the DM profiles' submission versus dates



Status of the floats processed by Coriolis DAC.
Left: in terms of profile percent and right: in terms of float percent (DM : delayed mode – RT : real time).

The status of the quality control done on the Coriolis floats is presented in the following plot. For the two last years (2012-2013), most of the floats are still too young (code 1) to be performed in delayed mode. For the year 2011, we are working on the DMQC of those floats, which should be available for the end of this year. The codes 2 and 3 show the delayed mode profiles for respectively active and dead floats.

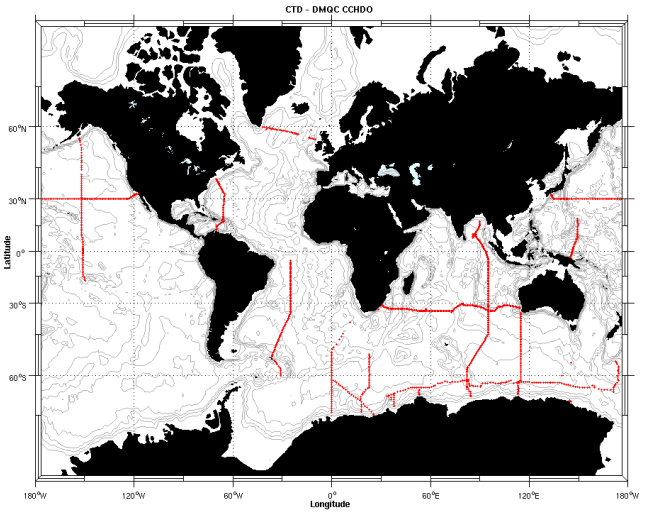


Status of the quality control done on profiles sorted by launch's year, code 1: young float, code 2: active float, DM done, code 3 : dead float, DM done; code 4 : DM in progress, code 5 : waiting for DM, code 6 : problems with float.

Reference database

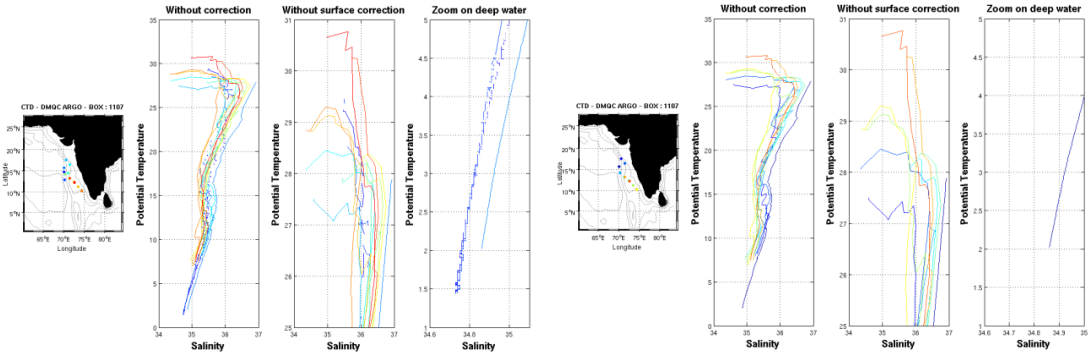
A new version CTD_for_DMQC_2014V01 is in preparation and will be provided in November 2014.

The November's version takes into account new CTD provided by the CCHDO (following figure) as well as feedbacks from users on quality of some profiles.



New CTD datasets downloaded on the CCHDO website.

The new version will also take into account best quality control on data (based on analysis of deep water). At this time, only updates on boxes in the area 1 have been corrected.



Example of updates - box 1107 : left previous version, right; updated version.

This version will be provided on the ftp site in smaller tar balls, one by wmo box area (1-3-5-7): for instance, CTD_for_DMQC_2014V01_1.tar.gz for all boxes starting with wmo 1, then we will have 4 tar files.

GDAC Functions

(If your centre operates a GDAC, report the progress made on the following tasks and if not yet complete, estimate when you expect them to be complete)

- National centres reporting to you
- Operations of the ftp server
- Operations of the www server
- Data synchronization
- Statistics of Argo data usage : Ftp and WWW access, characterization of users (countries, field of interest : operational models, scientific applications) …

National centres reporting to you

Currently, 11 national DACs submit regularly data to Coriolis GDAC.

The additional GTS DAC contains all the vertical profiles from floats that are not managed 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 22nd, the following files were available from the GDAC FTP site.

DAC	metadata files 2014	metadata files 2013	increase from last year	profile files 2014	profile files 2013	increase from last year2	delayed mode profile files 2014	delayed mode profile files 2013	increase from last year3	trajectory files 2014	trajectory files 2013	increase from last year4
AOML	5 191	4 750	9%	701 226	611 161	15%	485 436	445 834	9%	5 817	4 617	26%
BODC	472	435	9%	47 329	42 136	12%	31 221	31 221	0%	420	415	1%
Coriolis	1 884	1 693	11%	168 971	145 718	16%	111 454	104 902	6%	1 795	1 579	14%
CSIO	276	140	97%	18 325	11 623	58%	10 141	9 201	10%	201	137	47%
CSIRO	621	596	4%	96 450	79 427	21%	44 076	37 324	18%	566	566	0%
INCOIS	339	302	12%	41 529	37 007	12%	26 410	26 409	0%	335	299	12%
JMA	1 339	1 229	9%	150 463	138 226	9%	91 672	85 536	7%	1 325	1 215	9%
KMA	184	168	10%	20 925	18 358	14%	17 180	13 970	23%	176	160	10%
KORDI	119	119	0%	15 459	14 849	4%	0	0	#DIV/0!	113	119	-5%
MEDS	379	368	3%	40 432	37 911	7%	23 481	23 449	0%	371	362	2%
NMDIS	19	19	0%	1 963	1 622	21%	0	0		19	19	0%
Total	**10 823**	**9 819**	**10%**	**1 303 072**	**1 138 038**	**0**	**841 071**	**777 846**	**8%**	**11 138**	**9 488**	**17%**

Operations of the ftp server

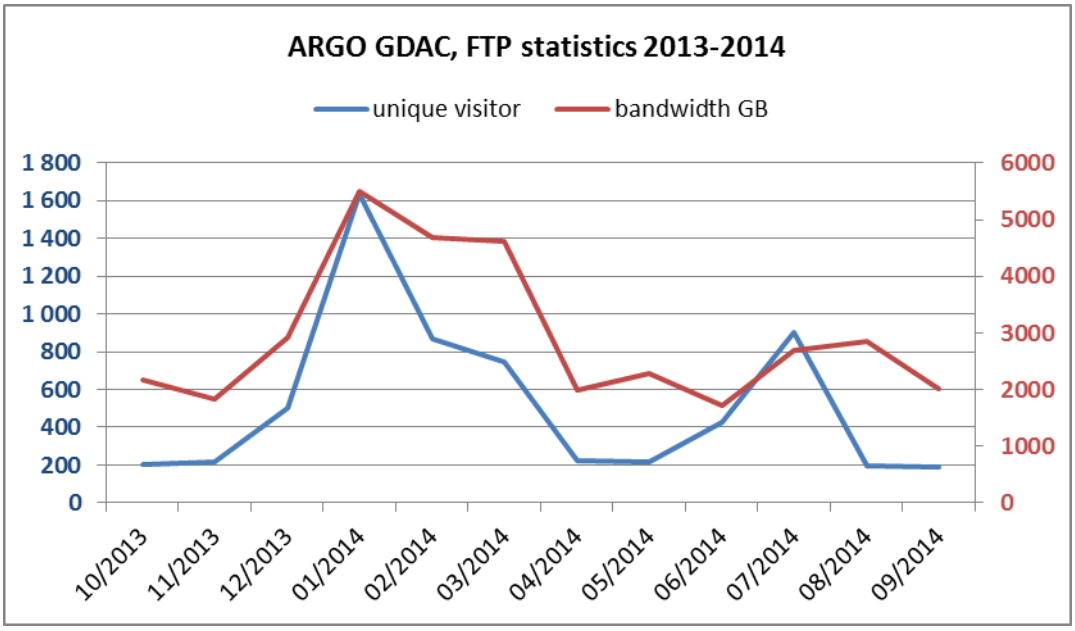
- Meta-data, profile, trajectory and technical data files are automatically collected from the national DACs ;
- Index files of meta-data, profile and trajectory are daily updated ;
- GDAC ftp address: ftp://ftp.ifremer.fr/ifremer/argo

Statistics on the Argo GDAC FTP server: ftp://ftp.ifremer.fr/ifremer/argo

There is a monthly average of 526 unique visitors, performing 3170 sessions and downloading 2940 gigabytes of data files.

The graphics show a steep increase of activity on GDAC FTP in January 2014. There is no clear explanation yet for that increase.

ARGO GDAC FTP statistics				
month	unique visitor	number of visits	hits	bandwidth GB
10/2013	202	2 537	6 026 215	2166
11/2013	214	2 351	4 242 190	1838
12/2013	499	2 958	3 884 042	2913
01/2014	1 634	4 360	3 786 613	5509
02/2014	867	3 181	7 075 494	4673
03/2014	744	3 311	6 815 564	4626
04/2014	224	2 710	6 458 830	1995
05/2014	219	3 104	4 587 936	2284
06/2014	426	3 280	2 465 725	1713
07/2014	901	3 915	4 024 710	2697
08/2014	194	3 236	4 589 316	2851
09/2014	191	3 095	6 381 900	2012
Average	**526**	**3 170**	**5 028 211**	**2 940**

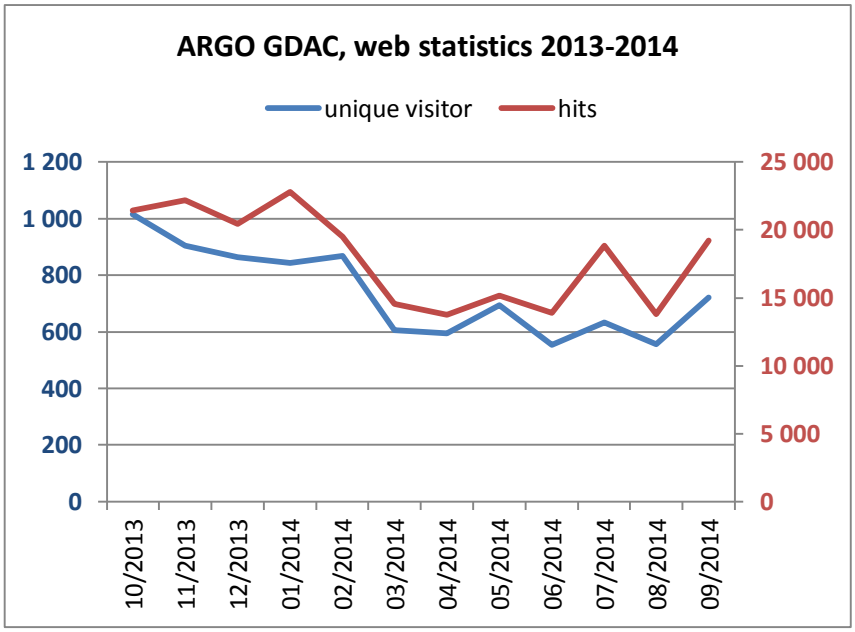


Statistics on the Argo data management web site: *http://www.argodatamgt.org*

There is a monthly average of 738 unique visitors, performing 1300 visits and 17 968 hits.

The graphics shows a slightly decreasing number of unique visitors.

ARGO GDAC web statistics					
month	**unique visitor**	**visits**	**pages**	**hits**	**bandwidth**
10/2013	1 015	1 865	6 563	21 425	854
11/2013	904	1 571	11 665	22 185	711
12/2013	864	1 770	11 692	20 464	1 005
01/2014	844	1 591	12 294	22 794	928
02/2014	869	1 570	11 268	19 507	916
03/2014	605	1 045	2 514	14 538	998
04/2014	595	1 044	2 242	13 761	1 110
05/2014	694	1 128	2 483	15 153	1 210
06/2014	554	856	1 716	13 888	1 030
07/2014	634	1 093	2 206	18 865	1 100
08/2014	556	880	1 941	13 810	995
09/2014	721	1 187	2 695	19 222	1 630
Average	**738**	**1 300**	**5 773**	**17 968**	**1 041**



Data synchronization

The synchronization with US-Godae server is performed once a day at 01:55Z.

The synchronization dashboard in October 2014: the daily synchronization time takes on average 50 minutes.

The 50 minutes of daily synchronization is too long and not normal. After investigation, we found that 1200 profile files existed on the US GDAC but not on Coriolis GDAC. But, once a day these 1200 files were rejected as non-valid files by the format checker. The DAC resubmitted these files, with a valid format on both US and Coriolis GDAC. The synchronization process now takes less than 10 minutes (mainly index comparison).

FTP server monitoring

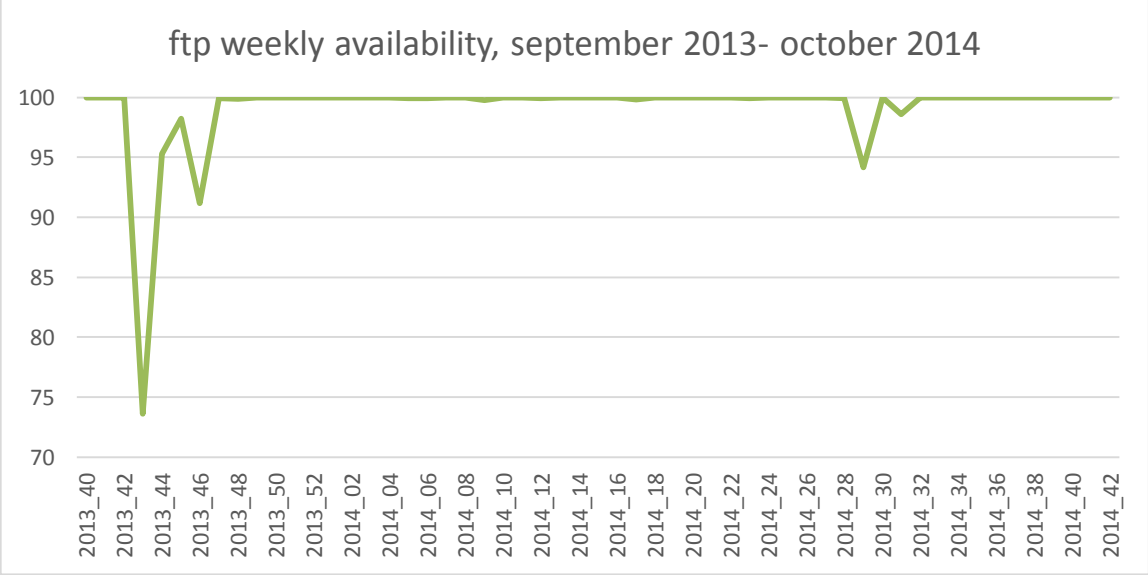
The Argo GDAC ftp server is actively monitored by a Nagios agent (http://en.wikipedia.org/wiki/Nagios).

Every 5 minutes, a download test is performed. The success/failure of the test and the response time are recorded. The FTP server is a virtual server on a linux cluster.

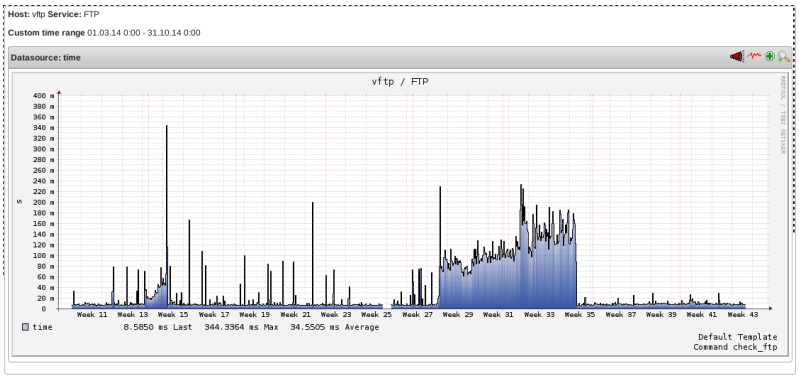
We faced 2 bad events in November 2013 and in July 2014.

- In November 2013 (week 43), we cumulated 3 days, 2 hours and 28 minutes of interruption. This major problem was related a system instability on the linux cluster.
- In July 2014 (week 29), we cumulated 2 days of interruption. The Ifremer Internet service provider faced a router problem, somewhere between Brest and Paris.

For the last 3 months (August – October 2014), Nagios did not detect any Internet or ftp server failure.



Nagios ftp monitoring: between September 2013 and October 2014



Nagios monitoring: duration of a test file download between March and October 2014

The file transfer time was significantly longer for some during week 29 (July 2014).

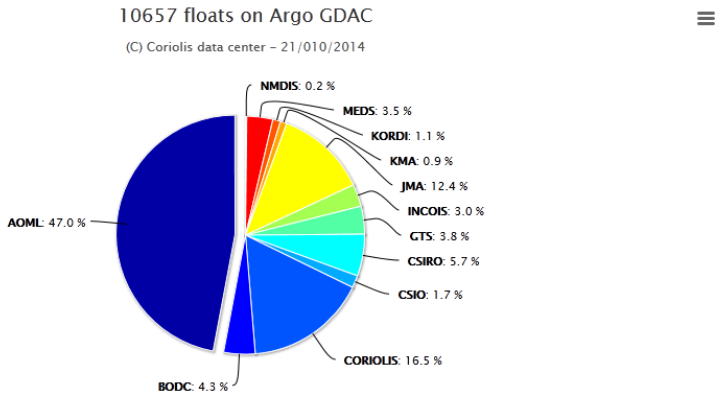
Grey list

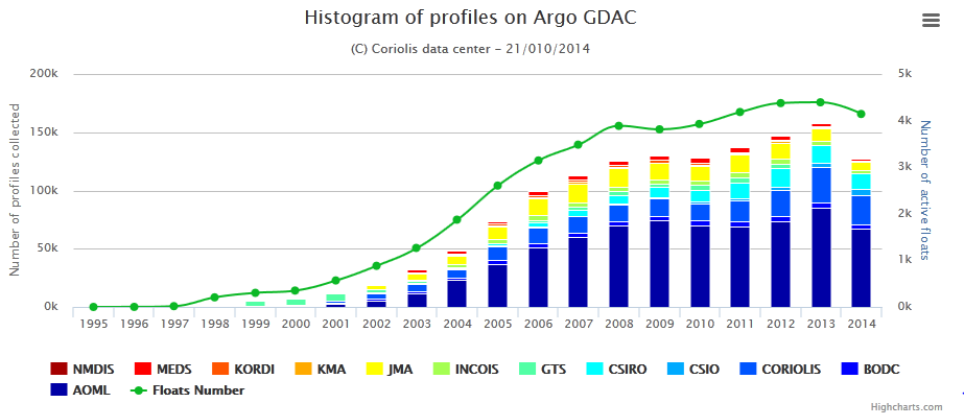
According to the project requirements Coriolis GDAC hosts a grey list of the floats which are automatically flagged before any automatic or visual quality control. **The greylist has 1248 entries** (October 23rd 2014), compared to 1139 entries one year ago.

DAC	nb floats in greylist
AOML	913
BODC	51
CSIO	62
NMDIS	8
Coriolis	25
INCOIS	1
JMA	161
KMA	9
KORDI	9
MEDS	9
Total	1248

Statistics on GDAC content

The following graphics display the distribution of data available from GDAC, per float or DACs. These statistics are weekly updated on : http://www.argodatamgt.org/Monitoring-at-GDAC





Mirroring data from GDAC: rsync service

In July 2014, we installed a dedicated rsync server called vdmzrs.ifremer.fr described on:

- http://www.argodatamgt.org/Access-to-data/Argo-GDAC-synchronization-service

This server provides a synchronization service between the "dac" directory of the GDAC with a user mirror. From the user side, the rysnc service:

- Downloads the new files
- Downloads the updated files
- Removes the files that have been removed from the GDAC
- Compresses/uncompresses the files during the transfer
- Preserves the files creation/update dates
- Lists all the files that have been transferred (easy to use for a user side post-processing)

Examples

Synchronization of a particular float

- rsync -avzh --delete vdmzrs.ifremer.fr::argo/coriolis/69001 /home/mydirectory/...

Synchronization of the whole dac directory of Argo GDAC

- rsync -avzh --delete vdmzrs.ifremer.fr::argo/ /home/mydirectory/...

Argo DOI, Digital Object Identifier on monthly snapshots

A digital object identifier (DOI) is a unique identifier for an electronic document or a dataset. Argo data-management assigns DOIs to its documents and datasets for two main objectives:

- Citation: in a publication the DOI is efficiently tracked by bibliographic surveys
- Traceability: the DOI is a direct and permanent link to the document or data set used in a publication

Argo documents DOIs

- Argo User's manual: http://dx.doi.org/10.13155/29825

Argo GDAC DOI

- Argo floats data and metadata from Global Data Assembly Centre (Argo GDAC) http://dx.doi.org/10.12770/1282383d-9b35-4eaa-a9d6-4b0c24c0cfc9

Argo GDAC monthly snapshots DOIs

- Snapshot of 2014 month 09: http://dx.doi.org/10.12770/bc3de4fa-6668-4e0e-bae3-102c6d9c8ddd
- Snapshot of 2014 month 08: http://dx.doi.org/10.12770/57b95b6a-ef27-47db-b14f-f8cb7c729793

Regional Centre Functions

Check of the overall consistency of the delayed mode corrections in the North Atlantic

We have checked 578 floats processed in delayed mode (DM) in the North Atlantic, North of 30°N. Among the 578 floats, 392 do not show a significant salinity drift or bias according to the PI decision and were not corrected in DM, the other 186 floats have been corrected by the PI.

For each of the 578 floats, we have run a slightly modified OW method. Compared to the OW original method, our configuration better take into account the interannual variability, that was shown to induce spurious corrections with the standard OW method settings and provides an improved estimate of the error bars. The modified OW method has been described in more details in the following paper:

http://www.mercator-ocean.fr/content/download/2058/15810/version/1/file/Newsletter%2350-final.pdf

For each float, we have compared the original correction made by the PI and the result of the slightly modified OW method. We found 26 floats among 578 for which the salinity correction proposed by the PI differs significantly from our results. The 26 floats are listed on the NAARC web site:

http://www.argodatamgt.org/Argo-regional-Centers/North-Atlantic-ARC/Overall-consistency-of-DM-corrections

Pis or DM operators of the 26 floats have been informed and the DM corrections have been revised or revisions are in process.

We plan to update these checks of the overall consistency of the delayed mode corrections in the NAARC region once a year.

WMO Number	Float Model	Deployment date	Centre	PI	Old DM correction revised ?
1900076	PROVOR CTF2	11/09/2002	IF	Virginie THIERRY	YES on 2014-02
1900078	PROVOR CTF2	15/09/2002	IF	Virginie THIERRY	YES on 2014-02
4900211	PROVOR CTF2	17/03/2002	IF	Virginie THIERRY	YES on 2014-02
4900215	PROVOR CTF2	11/05/2002	IF	Virginie THIERRY	YES on 2014-02
4900223	PROVOR CTF2	17/06/2002	IF	Virginie THIERRY	YES on 2014-02
4900225	PROVOR CTF2	18/06/2002	IF	Virginie THIERRY	YES on 2014-02
6900045	PROVOR CTF2	25/07/2001	IF	Virginie THIERRY	YES on 2014-02
6900166	APEX SBE APF7	07/05/2002	IF	Virginie THIERRY	YES on 2014-02
6900162	PROVOR CTF2	13/10/2001	IF	Virginie THIERRY	YES on 2014-02
6900176	PROVOR CTF2	26/06/2002	IF	Virginie THIERRY	YES on 2014-02
6900395	PROVOR CTS3	13/06/2006	IF	Virginie THIERRY	YES on 2014-02
69032	PROVOR CT	23/04/2000	IF	Christine COATANOAN	YES on 2014-02
69039	PROVOR CT	25/09/2000	IF	Christine COATANOAN	YES on 2014-02
69043	PROVOR CT	05/04/2001	IF	Christine COATANOAN	YES on 2014-02
4900350	APEX SBE APF7	19/09/2003	IF	Juergen FISCHER	NOT YET
4900352	APEX SBE APF7	24/09/2003	IF	Juergen FISCHER	NOT YET
6900160	APEX SBE APF7	02/08/2001	IF	Walter ZENK	NOT YET
6900515	APEX SBE APF8 SN	05/06/2007	IF	Birgit KLEIN	NOT YET
6900560	APEX APF9A F/W	27/08/2008	IF	Birgit KLEIN	NOT YET
6901064	APEX-APF9A	04/07/2011	IF	Holger GIESE	NOT YET
4900412	PROVOR-SBE	10/11/2003	ME	Howard Freeland	NOT YET
4900627	APEX-SBE	22/10/2005	ME	Howard Freeland	NOT YET
4900635	APEX-SBE	19/05/2006	ME	Howard Freeland	NOT YET
4900681	APEX-SBE	23/09/2005	ME	Howard Freeland	NOT YET
4900682	APEX-SBE	27/05/2006	ME	Howard Freeland	NOT YET
6900614	APEX-SBE	16/05/2010	BO	Jon Turton	NOT YET

Argo Data Management Team 2014
CLS Report

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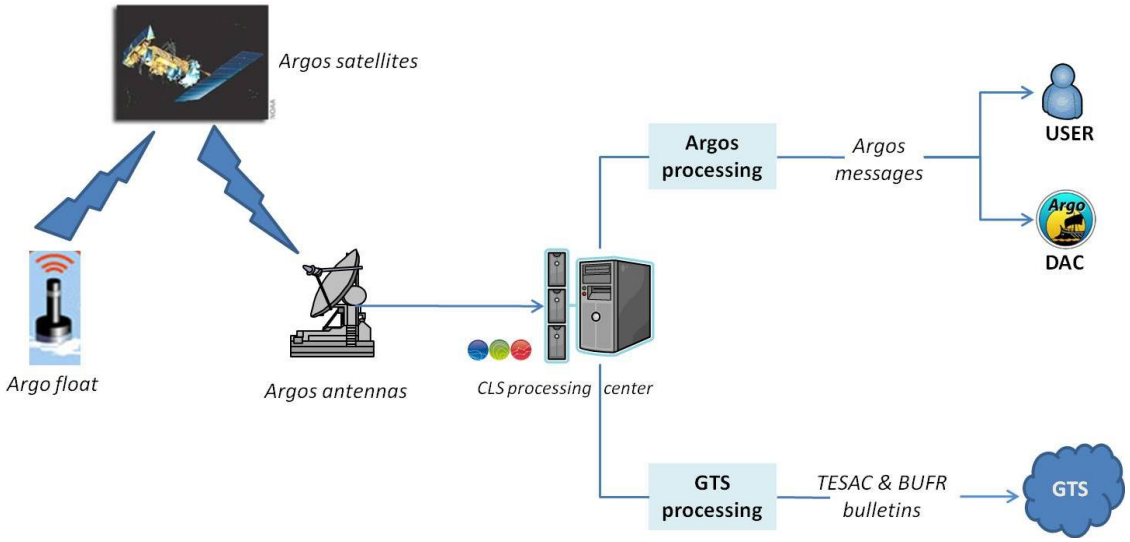
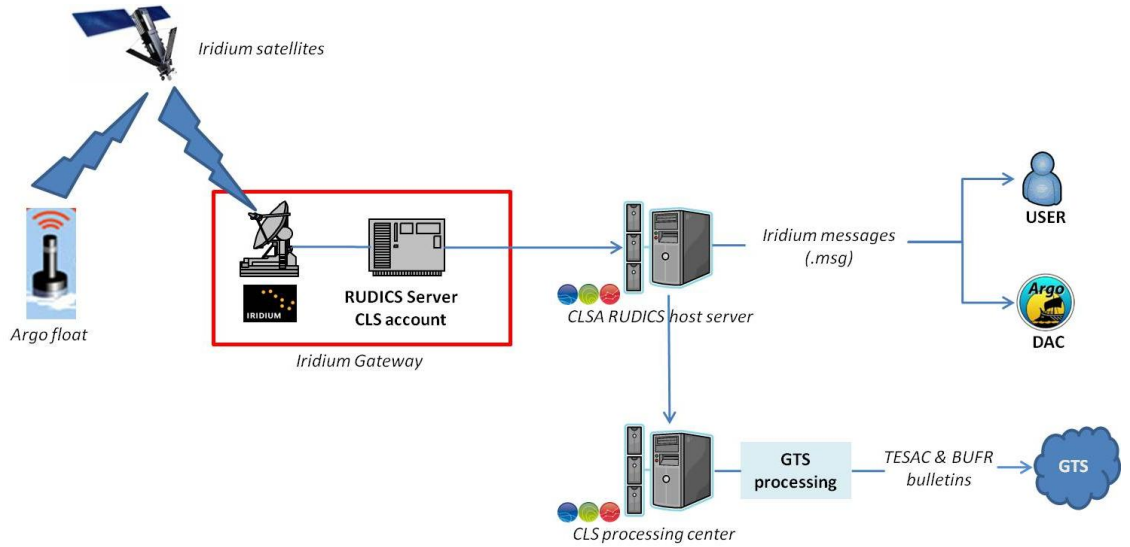
1. CONTEXT

The CLS Company, responsible for Argos system and Iridium services provider, has a DAC (Data Assembly Center) function for Argo programs which do not have real time processing capabilities. Argo data are processed operationally 24/7 by CLS processing centers (Toulouse, France and Largo, USA) and inserted into the GTS trough Meteo-France or the NWS insertion points.

In October 2014 CLS processed in real-time 94 Argo floats (61 with Argos and 33 with Iridium satellite system) for the GTS distribution. Data for these floats are sent via ftp to Meteo-France (Toulouse) in TESAC and BUFR bulletins and then Meteo-France put them on the GTS (Global Telecommunication System). Figures below summarize the Argo data flow since their transmission by the float until their dissemination on the GTS with Argos and Iridium satellite systems.





2. STATUS OF THE CLS DAC IN AUGUST 2013

- **Data acquired from floats :**
    - 146 floats were declared in the CLS GTS database
    - 94 floats disseminated data profiles on GTS
    - 52 floats are inactive (no more transmission*) or grey listed (failing status)
    - 794 profiles from CLS were sent on GTS in October 2014

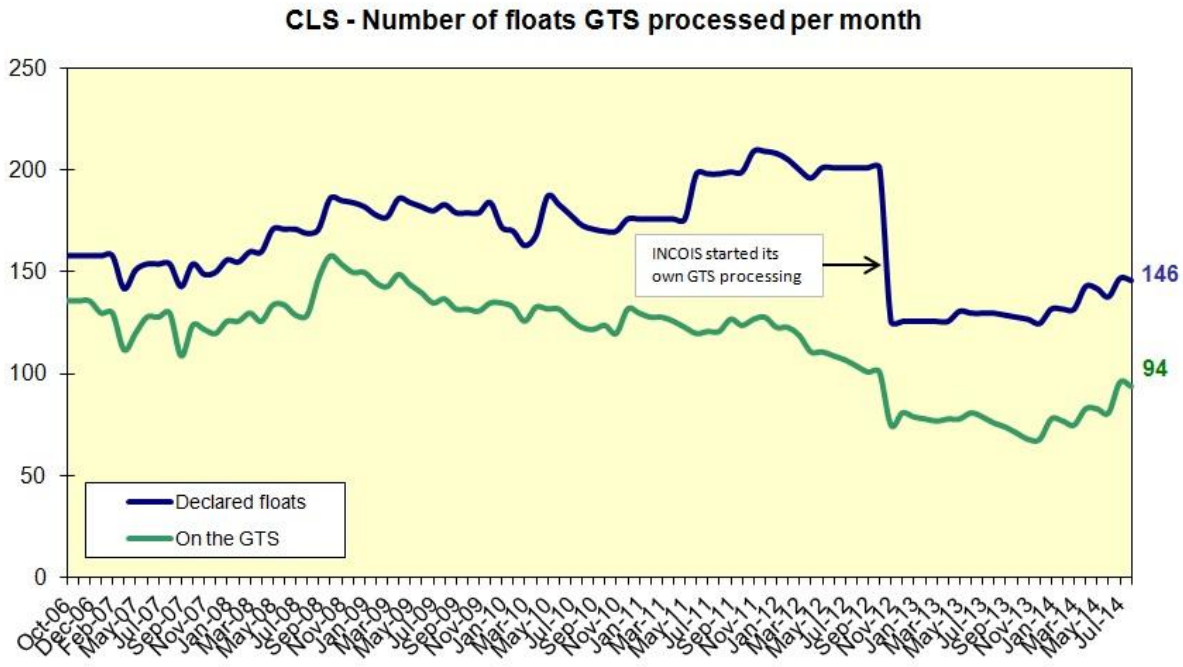
**A float stays 3 years in the CLS GTS database without transmission before to be removed definitely.*

- **Description of the 146 floats :** CLS processed in real time floats for Argo program which are not hosted by a national DAC:
    - 105 SOA floats (China)
    - 17 FIO floats (China)
    - 24 KORDI floats (Korea)

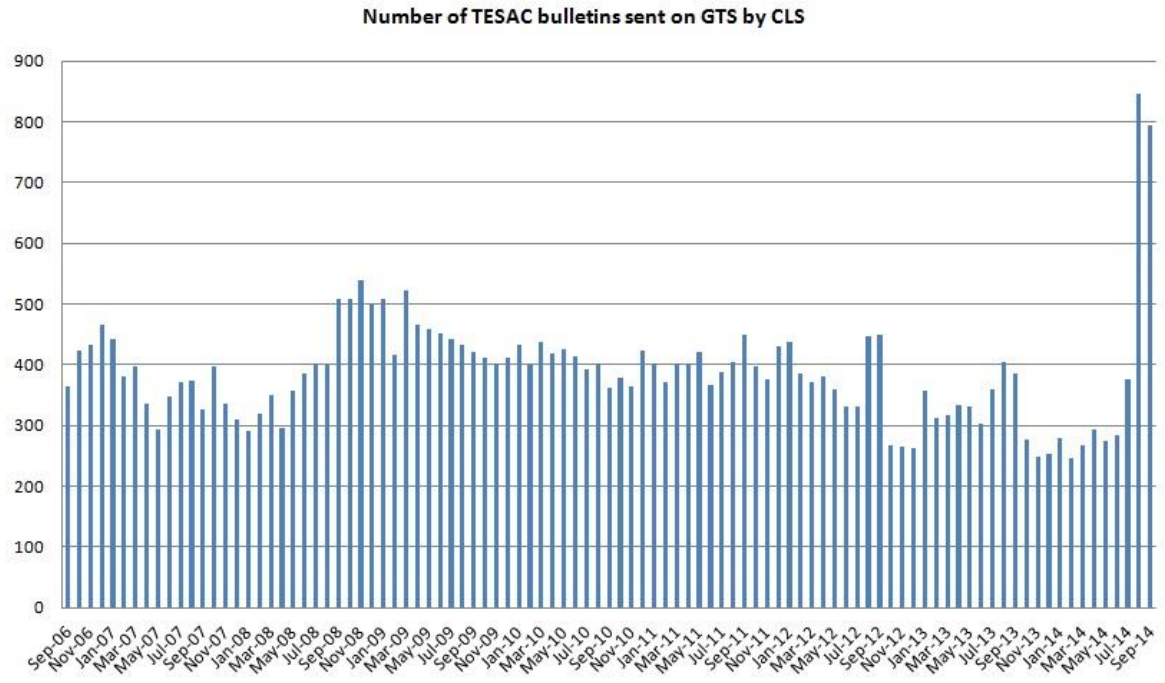
These floats are Teledyne Webb Research Apex or NKE Provor floats with 12 different data formats.

- **Data issued to GTS:** All data processed by CLS are distributed on the GTS by way of Meteo-France (GTS header LFVW) or by the National Weather Service (GTS header KARS) when the French center is in backup. This operation is automatically performed and GTS bulletins are sent to Meteo-France every 2 minutes. Before the encoding in TESAC and BUFR bulletins, Argo data are filtered by Argo QC procedure. 4 817 profiles were relayed onto GTS from September 1st, 2013 to September 31th, 2014 (source: Météo-France).

- **Argo Real Time processing monitoring:** All different data formats are referenced and each format has a dedicated template (processing model) in the CLS GTS database. Each month, a monitoring is made for Argo floats present in the CLS GTS database:
    - Argos transmissions in the last month are checked for all floats,
    - GTS disseminations in the last month are checked for all floats,
    - New floats to be set up for GTS are implemented in CLS GTS data base at each beginning of month with a list (table 10: “Floats to be set up for GTS”) provided by JCOMMOPS (M. Belbeoch) in the Argo Information Centre Monthly Report.
    - Active floats to be grey listed are removed from the CLS GTS database at each beginning of month with a list (table 15: “Active floats Grey list”) provided by JCOMMOPS (M. Belbeoch) in the Argo Information Centre Monthly Report.



Status of CLS Argo GTS processing



Number of profiles sent (in TESAC and BUFR) on the GTS by CLS per month

-

- **Number of bulletins:** The number of GTS bulletins with Argo data has been multiply by 2 in summer 2014 due to the processing of new Iridium Chinese floats (FIO) cycling every day.

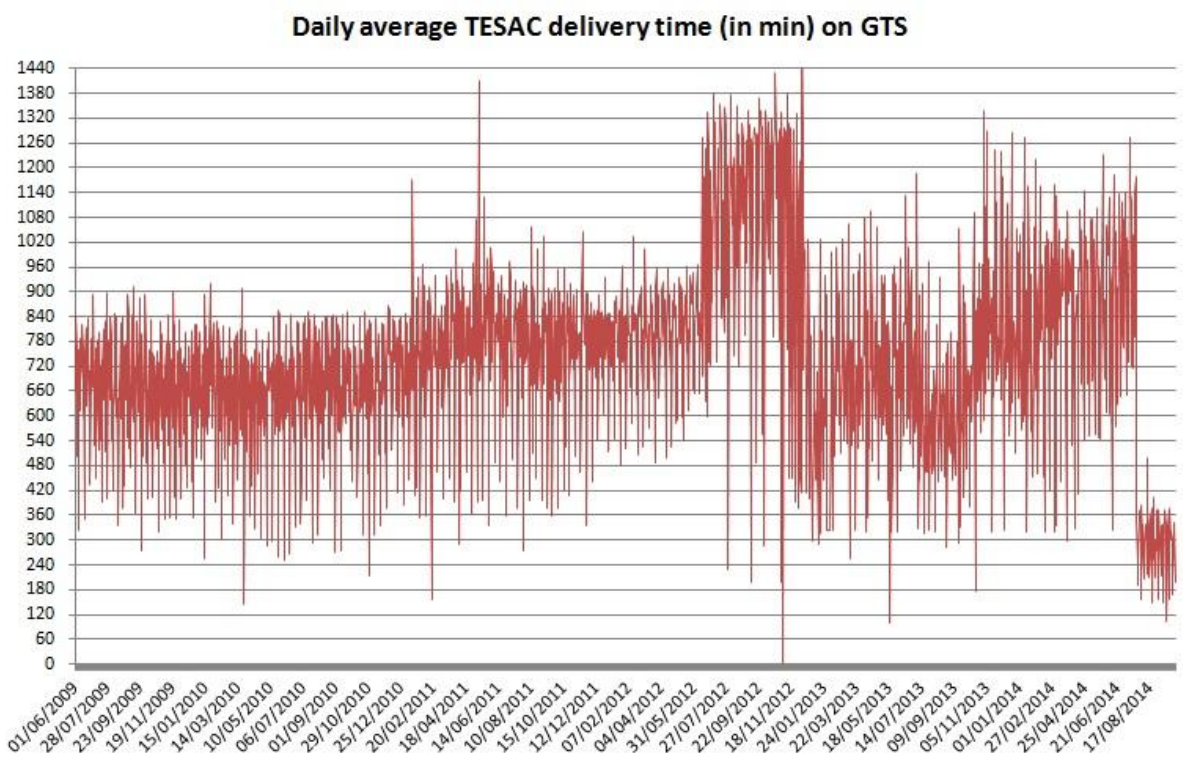
- **Web pages**: All GTS observations (profiles for Argo) are available on https://argos-system.cls.fr/cwi/Logon.do. It consists of a user access to his observation data.

- **BUFR format**: BUFR bulletins are produced in addition of TESAC bulletins for all floats GTS processed by CLS (header: IOPX92 LFVW) since August 2009.

- **Missing pressure levels in BUFR:** In order to decrease the number of missing levels in BUFR bulletins**,** a SQL patch will be applied end of June 2012 to extend the BUFR bulletin construction period to 20 hours.

- **INCOIS floats**: Upon INCOIS request CLS has stopped the GTS processing for all Indian Argo floats on the October 16th, 2012 at 11H UTC. GTS processing for INCOIS floats is now performed by INCOIS in Hyderabad and displayed on the GTS via New Delhi.

- **Time of delivery on GTS**: A monitoring delay tool, specified with JCOMMOPS is operational since September 2008 at CLS. The average time of TESAC delivery on GTS is shown in the graph below. The strong decrease of the average GTS delivery time in summer 2014 is due to the increasing number of SOA and FIO Iridium floats.



3. ARGOS SYSTEM STATUS

3.1. SPACE SEGMENT

During beginning 2013 - 2014, Operational Argos Services where opened for two Argos-3 payload (Metop-B, SARAL) and two Argos-2 payload was decommissioned (NOAA-17, NM and NOAA-16, NL). Argos instruments are now onboard 6 POES's spacecrafts.

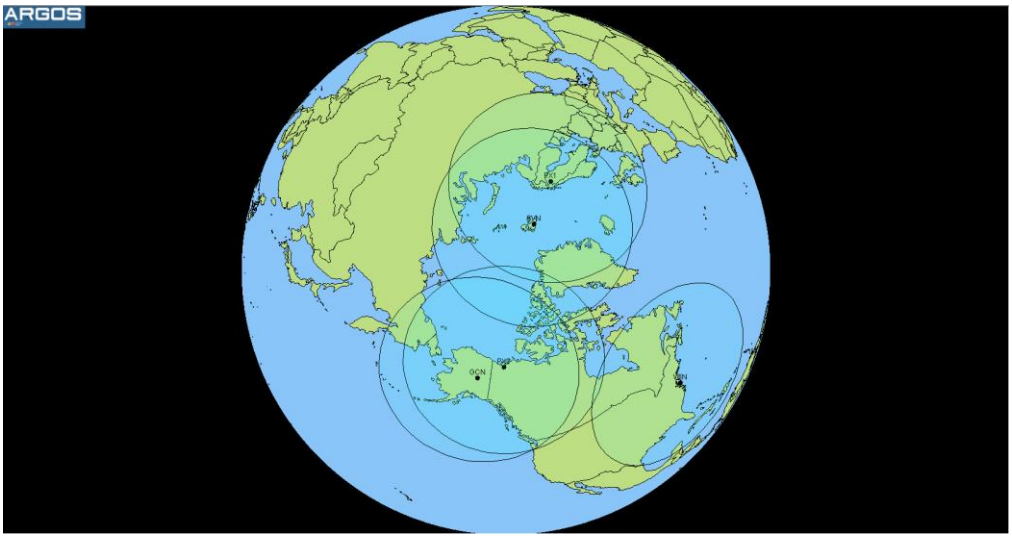
Current operational status of the Argos constellation:

Satellites	Launch date	Instrument	High Data rate and Downlink capabilities
SARAL	25 February 2013	Argos-3	X
METOP-B (MB)	17 September 2012	Argos-3	
NOAA-N' (NP)	6 February 2009	Argos-3	
METOP-A (MA)	19 October 2006	Argos-3	X
NOAA-18 (NN)	20 May 2005	Argos-2	
NOAA-15 (NK)	13 May 1998	Argos-2	

3.2. GROUND SEGMENT

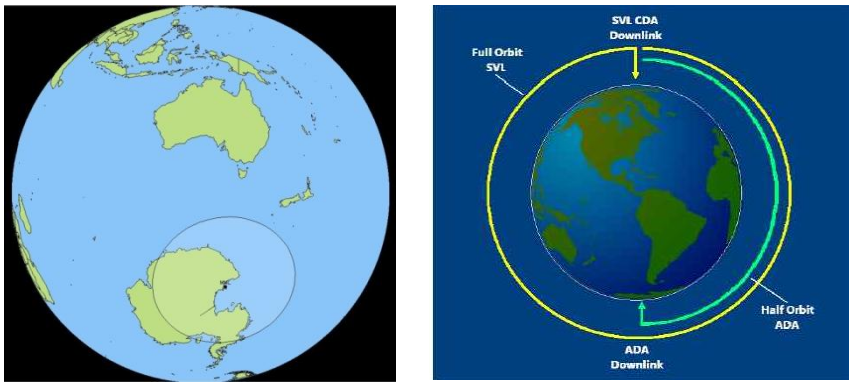
Global antennas network: The Argos global antennas network is composed by seven stations:

- The two NOAA global stations of Fairbanks and Wallops acquire the global recorded telemetry transmitted by N15, N16, N18 and N19.
- The EUMETSAT global receiving station of Svalbard acquires the global recorded telemetry transmitted by Metop-A and Metop-B as well as the 2 daily blind orbits of N19 for NOAA stations.
- The NOAA Svalbard antenna that delivers NOAA 15/16/18 blind orbits for Fairbanks and Wallops when not in conflict with NOAA-19.
- Inuvik (Canada) and Kiruna (Sweden) stations for SARAL operated by EUMETSAT.



The Argos Global antenna network (without McMurdo)

- Data recovery from MetOp-B will occur at Svalbard and McMurdo (ADA). Timeliness benefit of McMurdo data recovery is for MetOp-B only. MetOp-A data will continue to NOAA on a best effort basis and without the timeliness benefits of half orbit dumps at McMurdo.



METOP-B Mc Murdo Global antennas coverage and principle

Real time antenna network: Improvements are still focused on redundancy locations and coverage extension. Today, both Toulouse and Lanham processing centers receive Argos real-time data from 65 stations located all over the world.

In 2014, CLS has continued the Real-Time Antenna Upgrade Project that consists of upgrading selected antennas in order to be compatible with NOAA, METOP and SARAL. This project also aims to optimize in terms of performance the real-time receiving stations network.

In 2013, the real-time network is quite steady with 2 new ground stations added:

- Tahiti station (French Polynesia) operated by Meteo France
- Bali (Indonesia) station operated by CLS

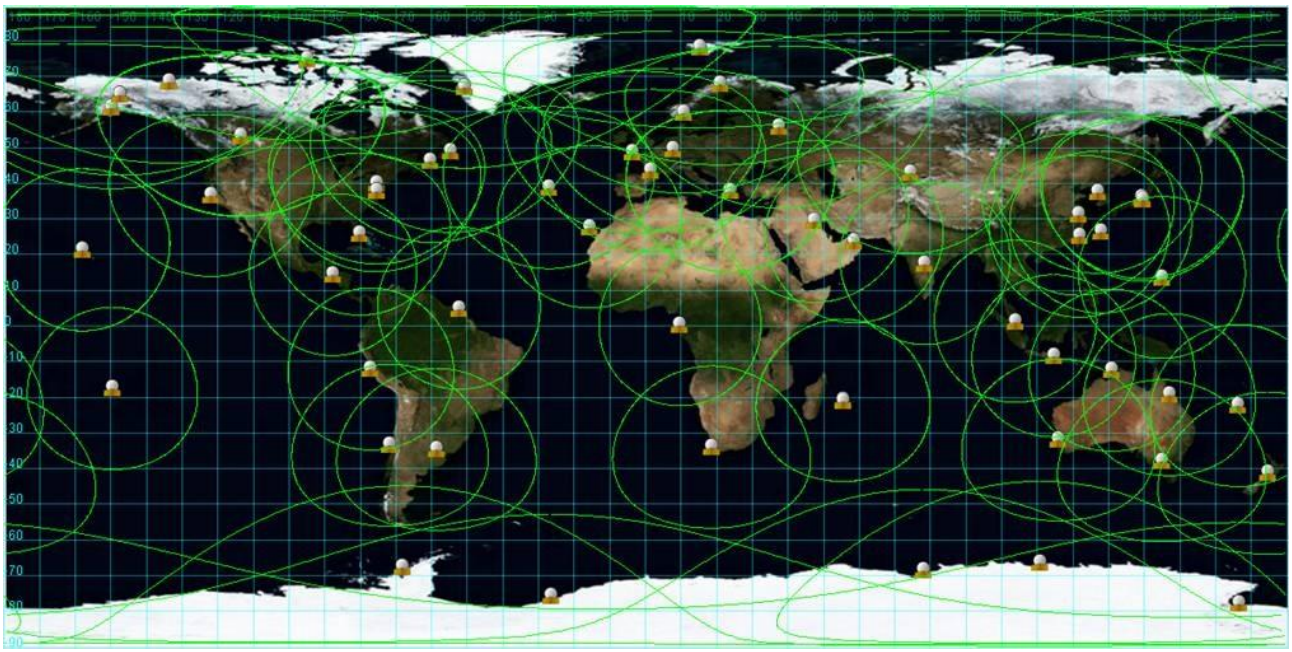
These two new stations are part of the HRPT-A4 project and are compatible will all Argos satellites: NOAA, METOP and SARAL.

New Argos HRPT Tahiti station

The HRPT ground stations operated by IRD have been removed in 2013 from the network due to operation maintenance difficulties (Noumea, Cayenne, La Réunion…).

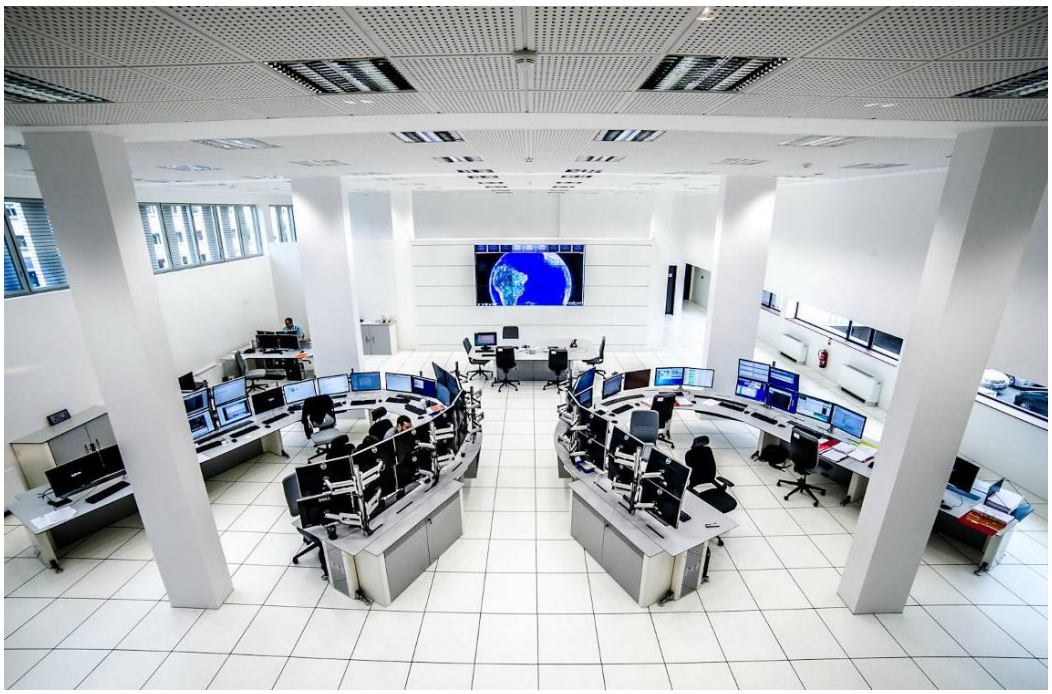
The real-time Argos ground station network consists of about 65 antennas. If most of them are capable of receiving NOAA POES satellites data, 22 out of these 65 stations receive METOP satellites data and, for the moment, only 10 receive SARAL data.

In 2013, CNES and CLS efforts were still focused on increasing the number of ground stations capable of receiving POES, METOP and SARAL data. This is what we call the HRPTA4 project consisting in adding new antennas as well as upgrading a set of existing antennas in order to be compatible with all the satellites in orbit. This project also aims at optimizing performances of the real-time receiving stations network with fewer stations for better performances. Here below are displayed the Argos HRPT coverage world map.



May 2014 Argos Real-time coverage map

Processing centers: The two global processing centers in Toulouse and Lanham were nominal over 2013 and first semester of 2014. Redundancy is used at least once a month (Up to two times on one month). Redundancy means all Argos users rerouted to CLS or CLSA during an anomaly on the nominal global processing center.



CLS Toulouse Control Room

Each CLS global processing center is autonomous and can work alone. In normal mode, both processing centers receive, process and distribute Argos data to:

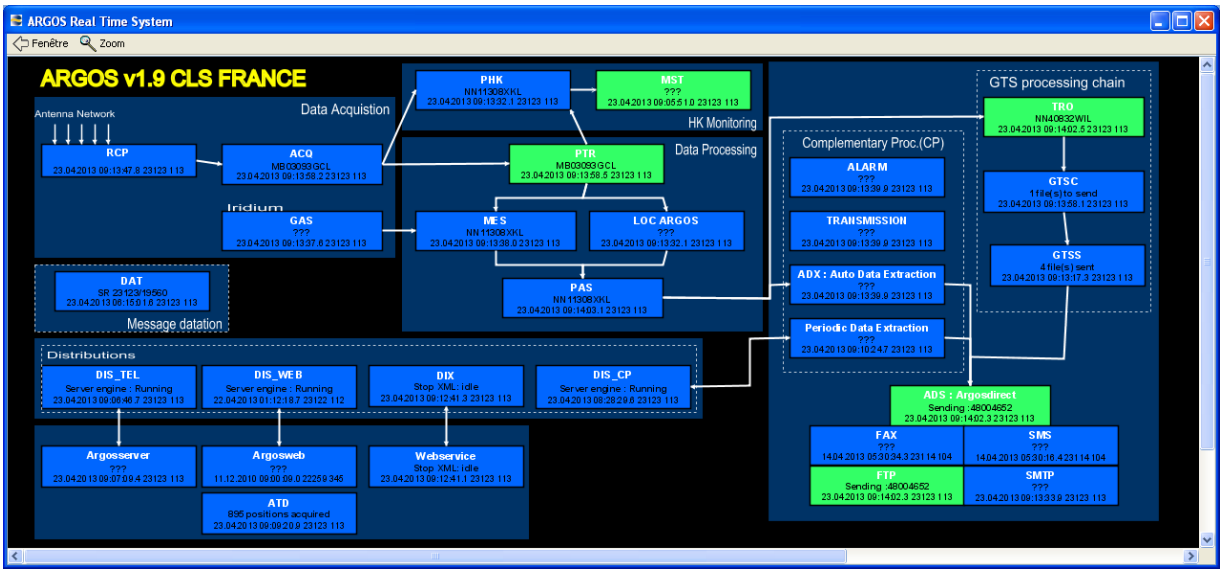
- North American users for CLS America
- Users of the rest of the world for CLS France

In case of problem with one of the two centers, the other one stays alive and is capable of receiving, processing and distributing Argos data to ALL users. The switch to the remaining alive center is completely transparent for the users. It means that the users continue to receive or to access to their data, without changing anything on their side, as if nothing has happened.

The CLS Argos processing chain: Composed of different software modules, the processing chain is in charge of receiving and processing the Argos data issued from the satellites and acquired by the global and real-time ground stations networks.

Argos data are processed in terms of collect and location, and stored into a database.

The processing chain is also in charge of distributing the data by ADS (Automatic Distribution System) or allowing users to access to their data using Telnet, ArgosWeb or the web services.



Synoptic of the CLS Argos processing chain

In order to monitor the Argos processing centers, statistics are produced in real-time:

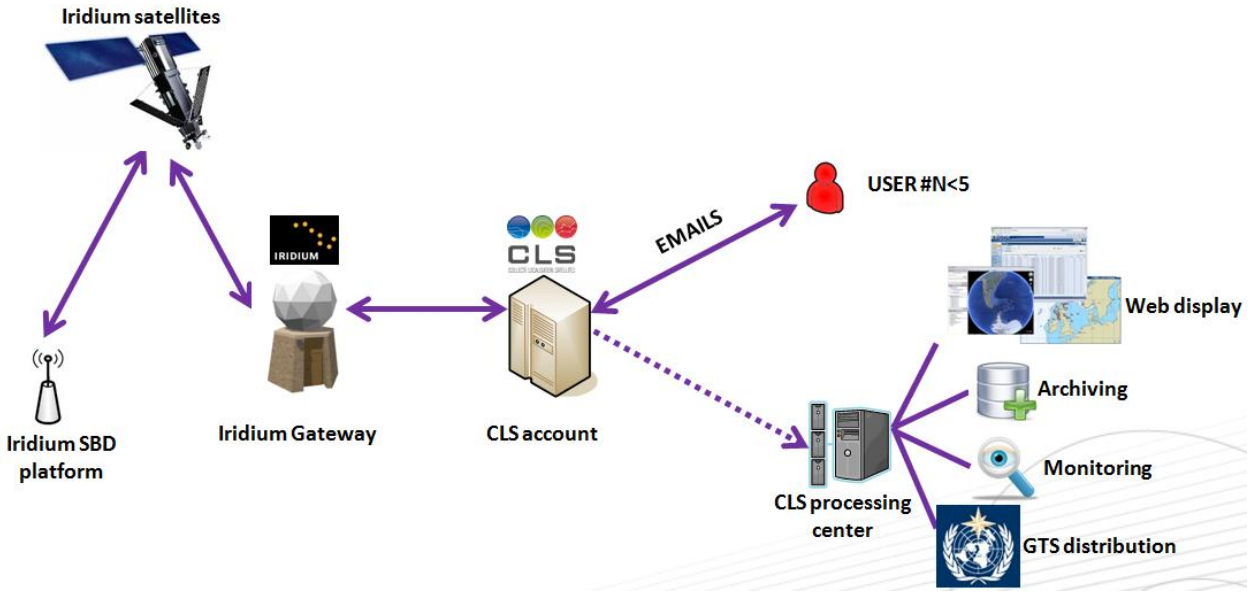
- on the availability of Argos data distribution tools,
- on the data delivery time for sample platforms,
- on Argos location delivery time for sample platforms,
- and on the percentage of data available in less than one hour.

In 2013, the processing performance indicator is 97,57%. This indicator corresponds to the percentage of real time datasets processed in less than 10 minutes (Between Pre-Processing component PTR and PAS component in charge of inserting data in database for user requesting). This number does not include periods when French site was in backup mode on the US site.

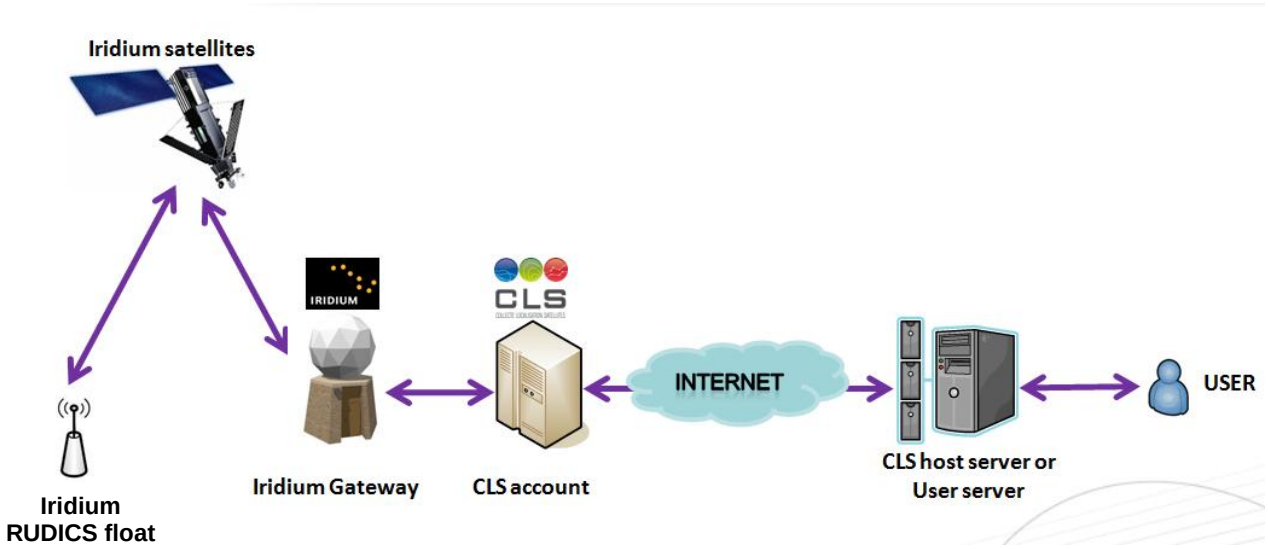
4. CLS IRIDIUM DATA SERVICES

CLS, exclusive operator of the Argos system since 1986 now also provides dedicated Iridium data services to ocean platforms (profiling floats, gliders, drifting buoys…) since 2007. Thanks to a VAR (Value Added Reseller) agreement with Iridium, CLS is an Iridium data provider for Argo. It's already the case for several Argo programs as in France, UK, Germany, Italy, Norway, Spain, Bulgaria, Turkey, China, India, South Africa, Brazil and Japan.

CLS is providing all Iridium services (RUDICS, CSD and SBD) for all type of floats from all manufacturers. Thanks to a long-standing partnership with main floats manufacturers (Teledyne, NKE, Optimare, SeaBird, Metocean…) Iridium services activation and transmission tests are performed easily.



The Iridium SBD communication service at CLS



The Iridium RUDICS communication service at CLS

CLS and CLS America processing centres are linked with an IP connection to the Iridium Gateway receiving Iridium raw data from floats in real-time, then process and distribute them to the Argo users by email or FTP. The service is fully operational 24/7. If needed, GTS real-time processing (TESAC and BUFR bulletins) can be done by CLS. For all further information, please contact Mr. Yann Bernard at ybernard@cls.fr.

Argo Germany National Report 2014

October 2014

Birgit Klein, BSH

1. The status of implementation (major achievements and problems in 2014)

Data acquired from floats:

Most of the floats deployed by Germany are operated by BSH but additional funding has been acquired by various research institutes. BSH deployed 60 floats in 2014, 18 floats purchased in 2014 were kept in store to serve deployment cruises early 2015 and 3 additional floats needed repair and will be re-delivered in 2015. The Alfred-Wegener-Institute (AWI) has planned to deploy additional 20 floats in the Atlantic Sector of the Southern Ocean and in the Weddell Sea between December 2014 and January 2015. 7 floats will be deployed by GEOMAR in the Pacific. This gives a total of 87 German float deployments until the end of 2014.

Currently (October 28th, 2014) 111 German floats are active (Fig.1) and the total number of German floats deployed within the Argo program increased to 663.

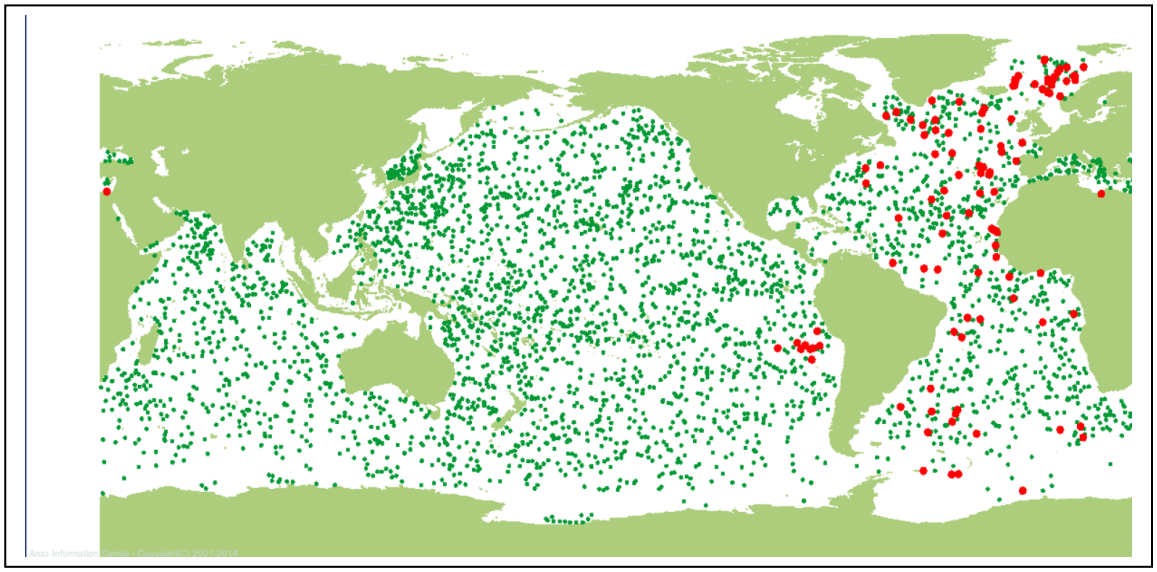


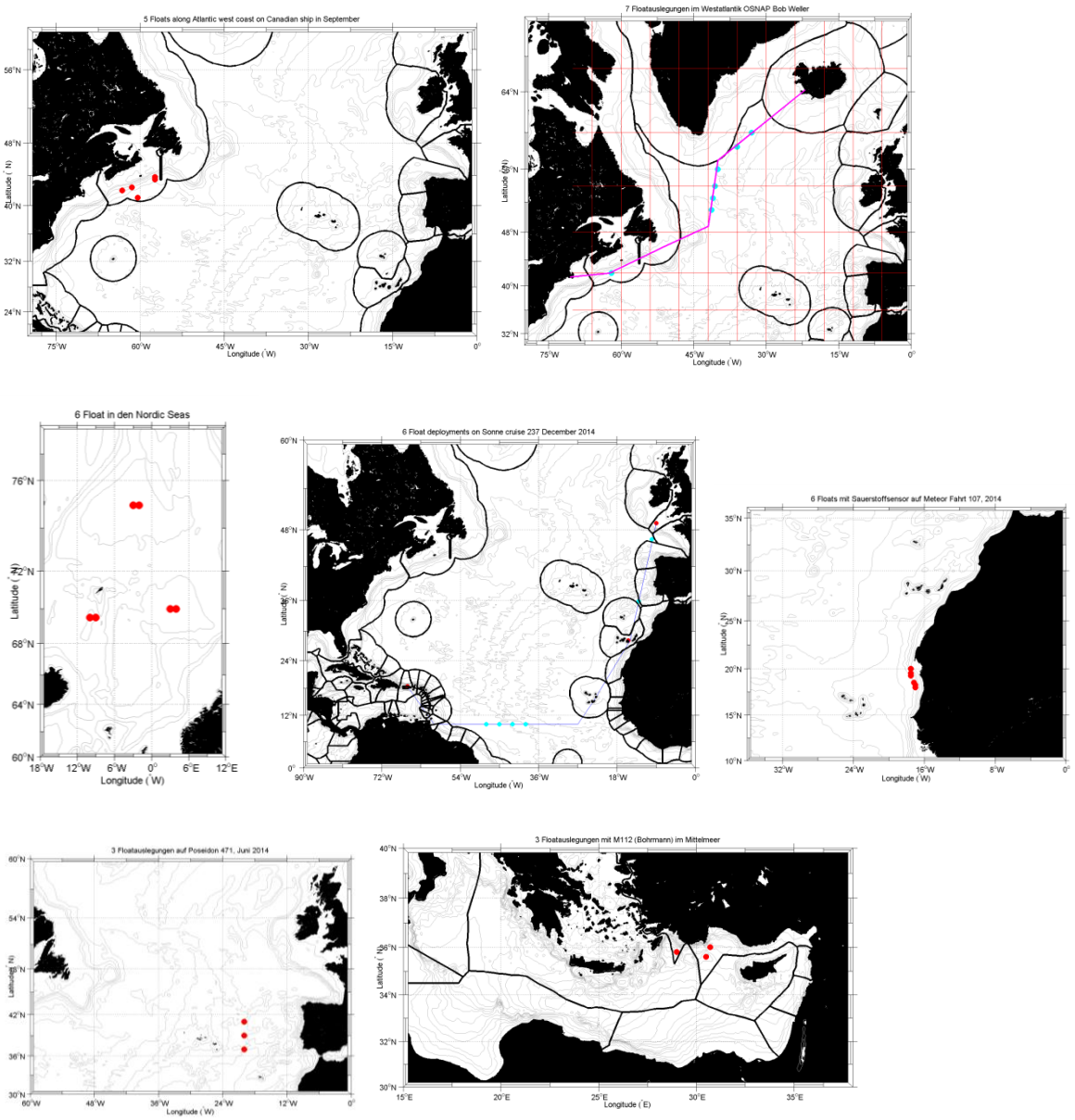
Fig. 1: Locations of active German floats (red) with active international floats (green) (Argo Information Centre, February 2014).

In the past most of the German floats were APEX floats purchased from Webb Research, but a smaller amount of floats were manufactured by the German company OPTIMARE. The company has been working in close collaboration with the AWI and has developed a float type suitable for partially ice covered seas. These floats are equipped with an ice sensing algorithm which prevents the float from ascending to the surface under ice conditions and prevents it from being crushed. Float profiles are stored internally until they can be transmitted during ice free conditions. In the last year three manufacturers supplied the floats purchased by BSH: ARVOR floats from NKE and NOVA floats from METOCEAN. Additionally 14 APEX floats were supplied by WEBB/TELEDYNE as replacement for floats which had problems with their alkaline batteries.

We had discovered major technical problems with the alkaline batteries in our APEX floats deployed since 2010. Until early 2014 more than 30 floats expired early with life cycles of about 700-800 days. The technical data send back from the floats indicate a sudden loss of battery voltage to values of around 7 volt during the last profile and increased battery consumption during the previous cycles. We had contacted TELEDYNE/WEBB about the problem and it was discovered that the floats were experiencing 'energy flue' because of a design change in the floats. As a possible fix against the premature fail of the entire battery pack due to failure of an individual alkaline battery a diode had been installed in the design in 2004, but was removed again in 2009/2010. WEBB/TELEDYNE has offered 14 floats in compensation for the malfunctioning floats in 2014 and we are expecting more replacements in 2015.

Most of the German floats deployed in 2014 are standard TS floats, but 6 floats deployed by BSH and 7 floats deployed by GEOMAR carried additional oxygen sensors. Deployment was carried out mostly on research vessels but also with the help of the German Navy. The research vessels comprised Canadian, German, UK, and US ships.

The deployment locations for 2014 are shown in Fig. 2a-j.



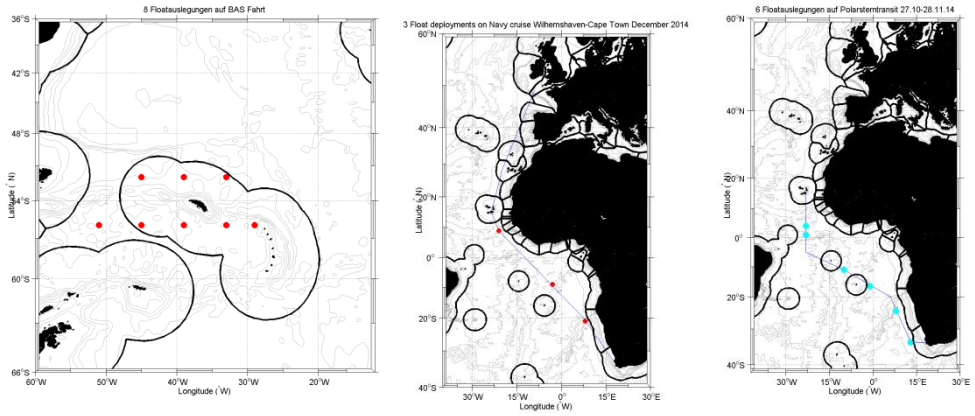


Fig. 2a-j: Deployment cruises and positions for 2014.

Germany has joined the new European Research Infrastructure Consortium EURO-ARGO-ERIC which was established in July 2014 in Brussel by 9 founding countries (France, Germany, United Kingdom, Italy, Netherlands, Norway, Greece, Poland and Finland).

2. Deployment plan for 2015

The deployment plans for 2014 will comprise about 71 floats from BSH in the Atlantic, the Nordic Seas, Indian Ocean and the Southern Ocean. The priority of our deployments is grid completion and extension of the core Argo array into the seasonally ice covered oceans in the Nordic Seas and the Southern Ocean. The 71 BSH floats are resulting from 40 floats purchased from funds for 2015, 18 floats remaining from 2014, 3 repairs, and ~10 replacements by WEBB/TELEDYNE for floats with energy flue. Contacts with researchers on potential deployment cruises have been established and we will decide on deployment positions until the end of the year. The German Navy has been contacted about potential deployments in the Indian Ocean during the regular survey operations.

3. Commitments to Argo data management

Data issued to GTS

The profiles for all German floats are processed by Coriolis and are distributed on the GTS by way of Meteo-France.

Data issued to GDACs after real-time QC

The real-time data processing for all German floats is performed at the Coriolis Center in France. Data processing follows the procedures set up by the Argo Data Management Team.

Data issued for delayed QC

The delayed mode processing is distributed between the various German institutions contributing to Argo, depending on their area of expertise. The Alfred-Wegener Institute is responsible for the Southern Ocean and GEOMAR is processing the Pacific floats. IfM-Hamburg together with BSH are processing the German floats in the Nordic Sea, while BSH is covering the tropical, subtropical and subpolar Atlantic. German floats in the Mediterranean on the other hand are processed by MEDARGO. The sharing of delayed-

mode data processing will be continued in the coming years, but BSH will cover all German floats which have not been assigned to a PI. BSH has also adopted some European floats which did not have a DMQC operator assigned to them, such as national Argo programs from the Netherlands, Denmark, Norway, Finland and Poland. All German institutions have been working in close collaboration with Coriolis and delayed mode data have been provided on a 6 monthly basis. Delays in delayed-mode data processing have occurred occasionally due to changes in personal and delay in data transmission in the Southern Ocean due to ice coverage. Delayed-mode data processing follows the rules set up by the Data Management Team. The DMQC process is well underway and no major delays have been encountered.

Delayed mode data send to GDACs

All delayed mode profiles from BSH have been sent to the Coriolis GDAC node. The total number of available profiles from German floats is 47416 (October 28th, 2014), the number of DM profiles is 41472. The percentage of DM profiles with respect to the total number of profiles is about 87%.

4. Summary of national research and operational uses of Argo data

Web pages

BSH is maintaining the Argo Germany Web site. The URL for the Argo Germany is:

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

It provides information about the international Argo Program, German contribution to Argo, Argo array status, data access and deployment plans. It also provides links to the original sources of information.

Statistics of Argo data usage

Currently no statistics of Argo data usage are available. The German Navy uses Argo data on a regular basis for the operational support of the fleet and uses their liaison officer at BSH to communicate their needs.

Products generated from Argo data

A key aspect of the German Argo program is to develop a data base for climate analysis from Argo data, to provide operational products for interpretation of local changes and to provide data for research applications.

Argo data are being used by many researchers in Germany to improve the understanding of ocean variability (e.g. circulation, heat storage and budget, and convection), climate monitoring and application in ocean models.

Germany contributes to the NARC and contributes recent CTD data to the Argo climatology.

Argo National Data Management Report (2014)
India

1. Status

- **Data acquired from floats**
  India has deployed 39 new floats (including 16 AROVORs, 3 PROVORs and 10 Bio-Argo PROVORs from NKE) between October 2013 and October 2014 in the Indian Ocean taking its tally to 343 floats so far. Out of these 118 floats are active. All the active floats data are processed and sent to GDAC.

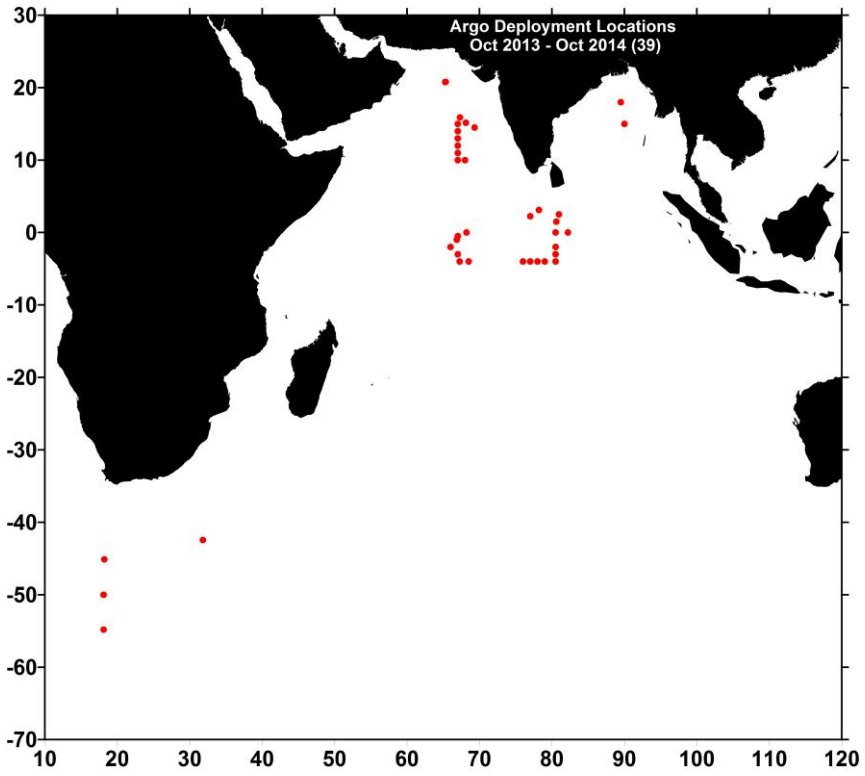


Fig. Location of Argo floats deployed by India

- **Data issued to GTS**
  All the active floats data is being distributed via RTH New Delhi. However there seems to be a problem in these messages being received by some centres. Test BUFR messages are sent to MEDs for cross checking and also to IMD for testing. Transmission will start shortly.

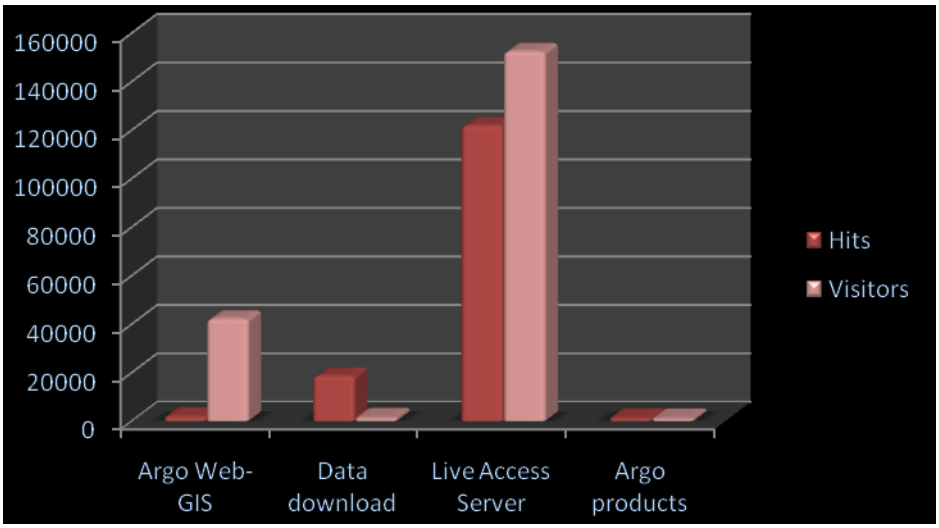
- **Data issued to GDACs after real-time QC**
  All the active floats (118) data are subject to real time quality control and are being successfully uploaded to GDAC. RT s/w obtained in collaboration with CSIRO is extensively used for the same. The support of CSIRO in term of the Real Time S/W is highly acknowledged.

- **Data issued for delayed QC**
  In total 61% of the eligible profiles for DMQC are generated and uploaded to GDAC.

- **Web pages**
    - INCOIS is maintaining Web-GIS based site for Indian Argo Program. It contains entire Indian Ocean floats data along with trajectories. Further details can be obtained by following the link http://www.incois.gov.in/Incois/argo/argo_home.jsp. 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 Indian and Indian Ocean floats are generated and maintained in INCOIS web site. The density maps for aiding people for new deployments are made available on a monthly basis. For full details visit http://www.incois.gov.in/Incois/argo/argostats_index.jsp.
- **Trajectory**

  A total of **343 trajectory** netcdf files were processed and uploaded to the GDAC. The process of generation of trajectory netcdf files undergoes quality checks like position, time, cycle number, etc., and corresponding quality status is assigned to each parameter. Finally a visual check is performed to verify that there are no missing cycles without cycle numbers and to check the surface time intervals.
- **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. See the references below.



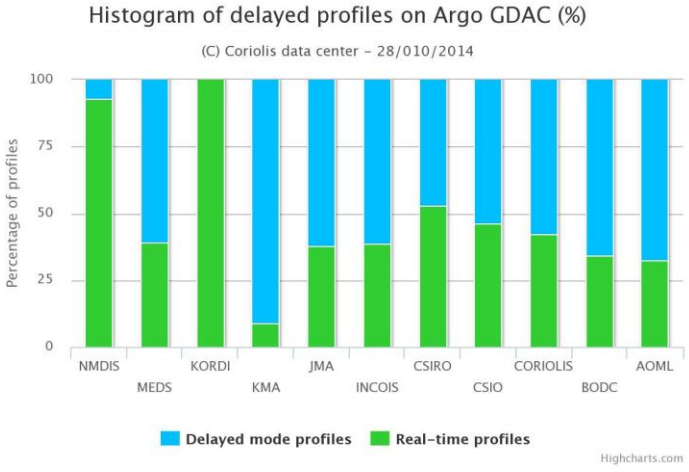
INCOIS Argo web page statistics (for the past one year) are as shown below

Page	Hits	Visitors
Argo Web-GIS	2011	42187
Data download	18642	1527
Live Access Server	121897	152467
Argo products	1428	1247

- **Products generated from Argo data**
  1. Value added products obtained from Argo data are continued. The methodology for generating the gridded product is changed to variational analysis method. 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. Version 2.1 of DVD on "Argo data and products for the Indian Ocean" is released to public for use with data corresponding to 2013 being updated. This DVD consists of ~ 2,35,000 profiles and products based on the Argo T/S. A GUI is provided for user to have easy access to the data. As many as 300 DVDs were supplied to various users from institutions and universities.
  3. To cater to many users of INCOIS LAS, it is enhanced in term of capacity. New Server is procured and new products viz., model outputs, new wind products (ASCAT), fluxes are made available. We plan to add more and more products as per the request received from the users in future. For further details visit http://las.incois.gov.in.

2. Delayed Mode QC

- INCOIS started generating and uploading D files to GDAC form July 2006, and as of today, profiles belonging to all eligible floats have been subjected to DMQC.
- Advanced Delayed Mode Quality Control s/w developed by CSIRO is being put to use successfully. Using this s/w all the eligible floats are reprocessed to tackle pressure sensor offset problems, salinity hooks, thermal lag corrections, salinity drifts.
- Lack of enough historical background data is hindering the DMQC processing. But majority of the Indian floats are found not to have big drifts in the salinity sensors.
- About 61% of the eligible profiles are subjected to DMQC and the delayed mode profiles are uploaded on to GDAC.



3. GDAC Functions

INCOIS is not operating as a GDAC.

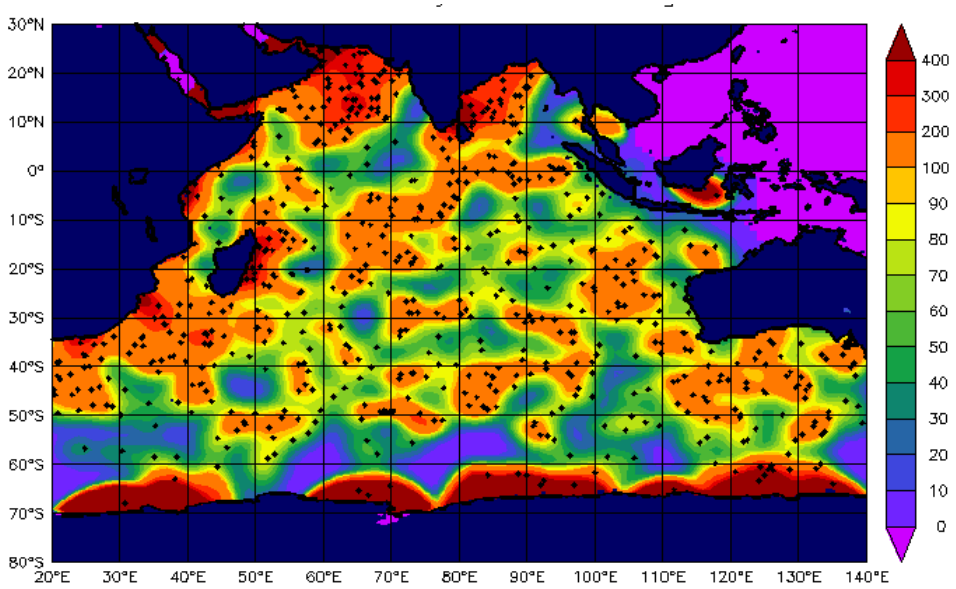
4. Regional Centre Functions

- 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 1x1 box for monthly and 10 days and monthly intervals. These gridded data sets are made available through INCOIS Live Access Server (ILAS). Users can view and download data/images in their desired format.
- Additionally SST from TMI, AMSRE and Wind from ASCAT, Chla from MODIS and OCM-2 are also made available on daily and monthly basis.
- Data Sets (CTD, XBT, Subsurface Moorings) are being acquired from many principle investigators. These data are being utilized for quality control of Argo profiles.
- 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 30 Oct, 2014 is shown below.



Publications:

INCOIS is actively involved in utilization of Argo data in various studies pertaining to Indian Ocean. Also INCOIS is encouraging utilization of Argo data by various universities by funding them. Some of the publications resulted from Argo data are given below:

1. Akhil, V. P., F. Durand, M. Lengaigne, J. Vialard, M. G. Keerthi, V. V. Gopalakrishna, C. Deltel, F. Papa, and C. de Boyer Montégut, 2014: A modeling study of the processes of surface salinity seasonal cycle in the Bay of Bengal, *Journal of Geophysical Research: Oceans*, **119**(6), 3926-3947, http://dx.doi.org/10.1002/2013JC009632.
2. Girishkumar, M. S., K. Suprit, J. Chiranjivi, T. V. S. Udaya Bhaskar, M. Ravichandran, R. V. Shesu, and E. Pattabhi Rama Rao, 2014: Observed oceanic response to tropical cyclone Jal from a moored buoy in the south-western Bay of Bengal, *Ocean Dyn.*, 1-11, http://dx.doi.org/10.1007/s10236-014-0689-6.
3. Kumar, P. B., J. Vialard, M. Lengaigne, V. S. N. Murty, G. R. Foltz, M. J. McPhaden, S. Pous, and C. de Boyer Montégut, 2014: Processes of interannual mixed layer temperature variability in the thermocline ridge of the Indian Ocean, *Climate Dynamics*, 1-21, http://dx.doi.org/10.1007/s00382-014-2059.
4. Bhaskar, T. V. S. U., R. V. Seshu, E. P. R. Rao, and R. Devender, 2013: GUI based interactive system for Visual Quality Control of Argo data, *Indian Journal of Geo-Marine Sciences*, **42**(5), 580-586, http://nopr.niscair.res.in/handle/123456789/24791.
5. Bhaskar, T. V. S. U., C. Jayaram, and E. P. Rama Rao, 2013: Comparison between Argo-derived sea surface temperature and microwave sea surface temperature in tropical Indian Ocean, *Remote Sensing Letters*, **4**(2), 141-150, http://dx.doi.org/10.1080/2150704X.2012.711955.

Argo National Data Management Report – Italy (2014)

1. Status

- **<u>Data acquired from floats</u>:** 243 floats were deployed in the Mediterranean and in Black Seas between 2000 and 2014 (the floats temporal distribution is shown in Figure 1a) and 22989 profiles were acquired. The temporal and spatial distribution of these profiles is depicted in Figure 1, sorted by the main parameters measured by the floats (bio-geochemical, dissolved oxygen and CTD). A total of 29 floats were deployed in 2014 (with the contribution of 5 countries) in crucial areas in order to try to maintain the spatial coverage as much homogeneous as possible. More than 70 floats per months have been operated simultaneously in the basin in 2014 and more than 4000 profiles have been acquired up to September 2014 by different float models (Figure 1b).

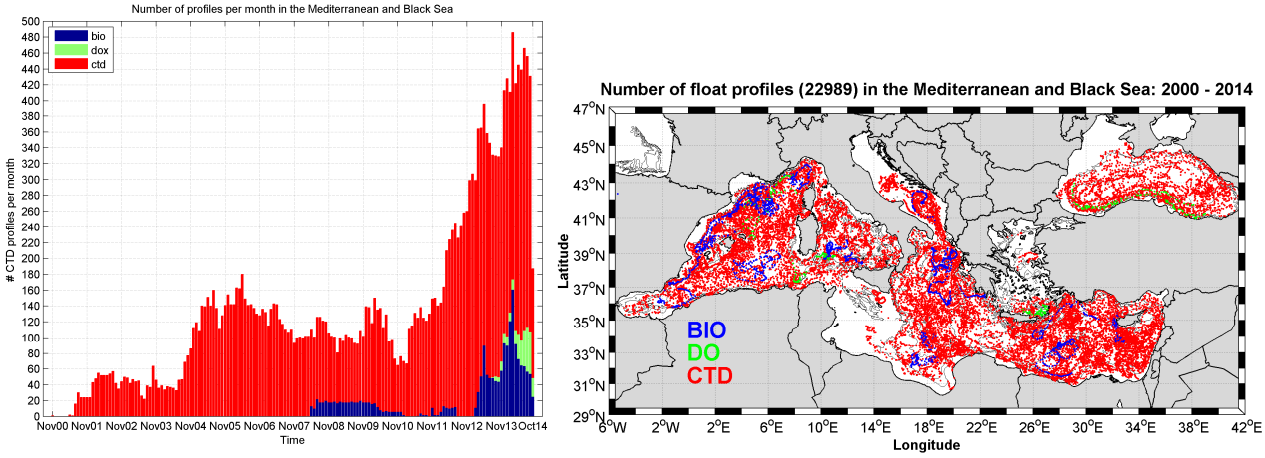


Figure 1. Temporal (left panel) and spatial (right panel) distribution of float profiles in the Mediterranean and Black Sea between 2000 and 2014.

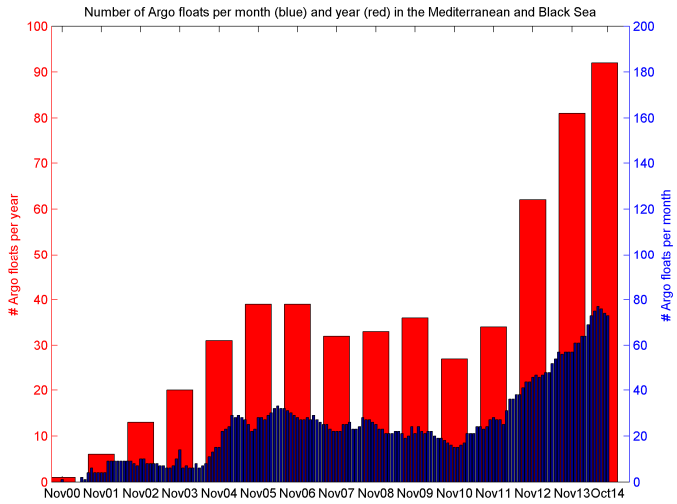


Figure 1a. Monthly (blue bars) and yearly (red bars) distribution of Argo floats in the Mediterranean and Black Sea between 2000 and 2014.

The number of profiles acquired by BioArgo floats till the end of 2014 is expected to be double (about 1000 profiles) with respect to year 2013 (contributors: France with NAOS project and Italy with ArgoItaly project) and the data collected by the "standard" CTD Argo floats will increase by about 13% (about 4000 profiles) with respect to last year. A large increase of oxygen profiles took place in 2014 thanks to the contribution of France, Greece, Bulgaria, Turkey and EuroArgo who deployed several floats equipped with an oxygen sensor in the Western Mediterranean, Aegean and Black Seas (Figure 1b).

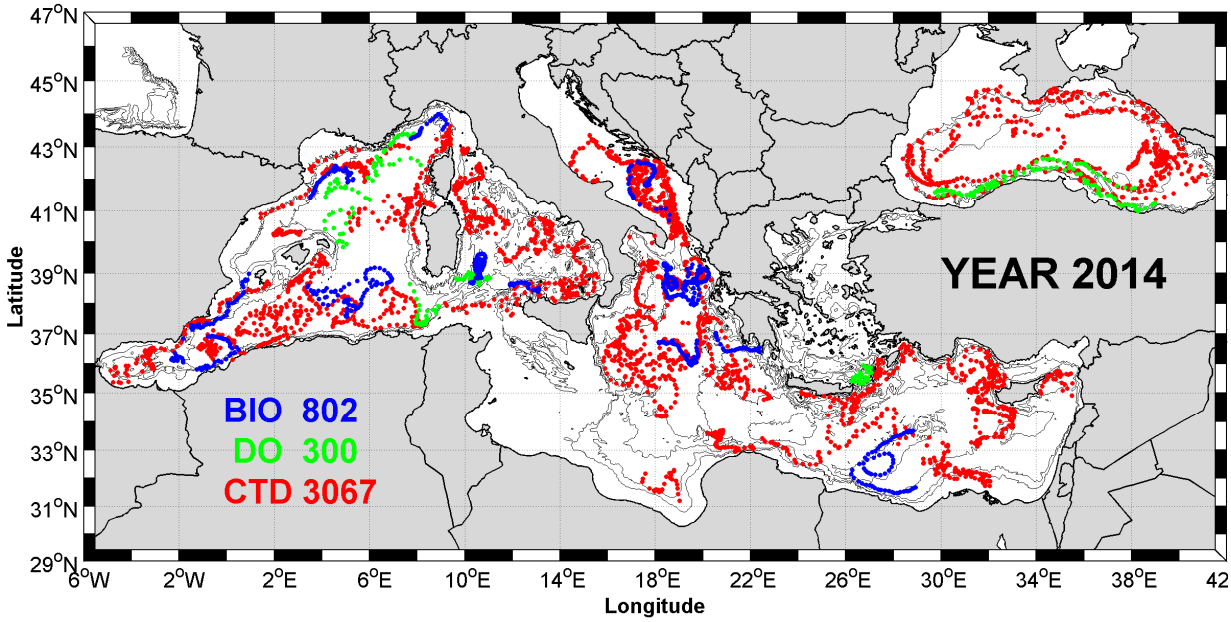


Figure 1b. Spatial distribution of profiles collected by Argo floats in 2014 (January-September) in the Mediterranean and Black Sea: BioArgo floats (blue dots), Argo floats equipped with the oxygen sensor (green dots) and standard Argo floats with CTD (red dots).

- **Web pages:**

The MedArgo web page (http://nettuno.ogs.trieste.it/sire/medargo/active/index.php) has been maintained and tables and graphics have been updated in near real time. The graphic has been improved and new figures have been posted: in particular, details about the float models, sensors onboard, type of transmissions have been added. The floats deployed during 2014 have been added to the web page as soon as the technical information are available. The float positions are plotted daily (Figure 2); the monthly and the whole trajectories are also provided (Figure 3). Links with the GDAC center (Coriolis) are also available for downloading both the real-time and delayed-mode float profiles. A new link with the Laboratoire d'Oceanographie de Villefranche (OAO - Oceanographic Autonomous Observations) has been set in order to provide more detailed information about Argo floats equipped with biogeochemical sensors.

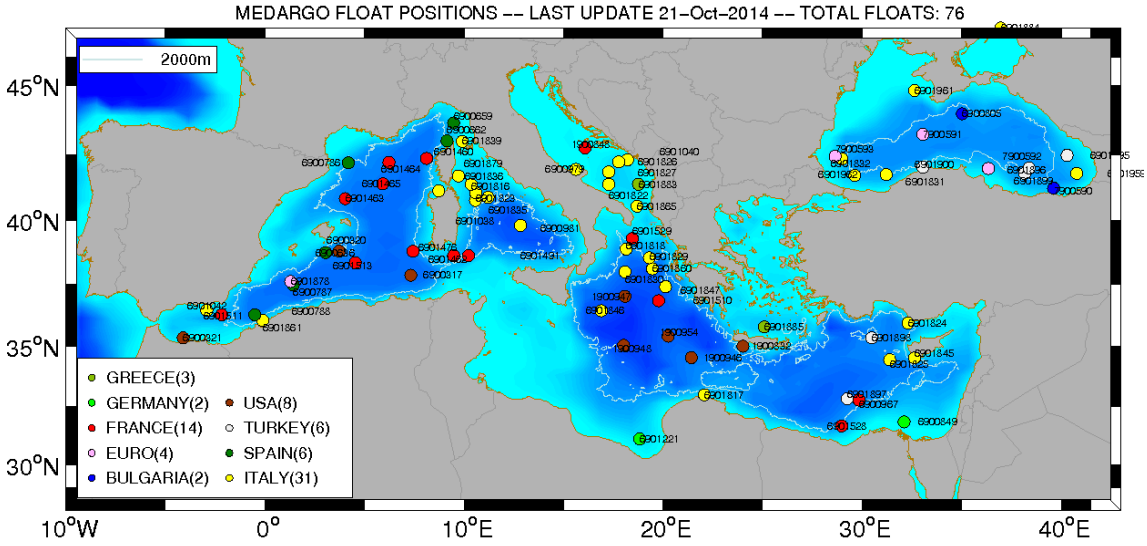


Figure 2. MedArgo float positions as of 21 October 2014 (updated daily).

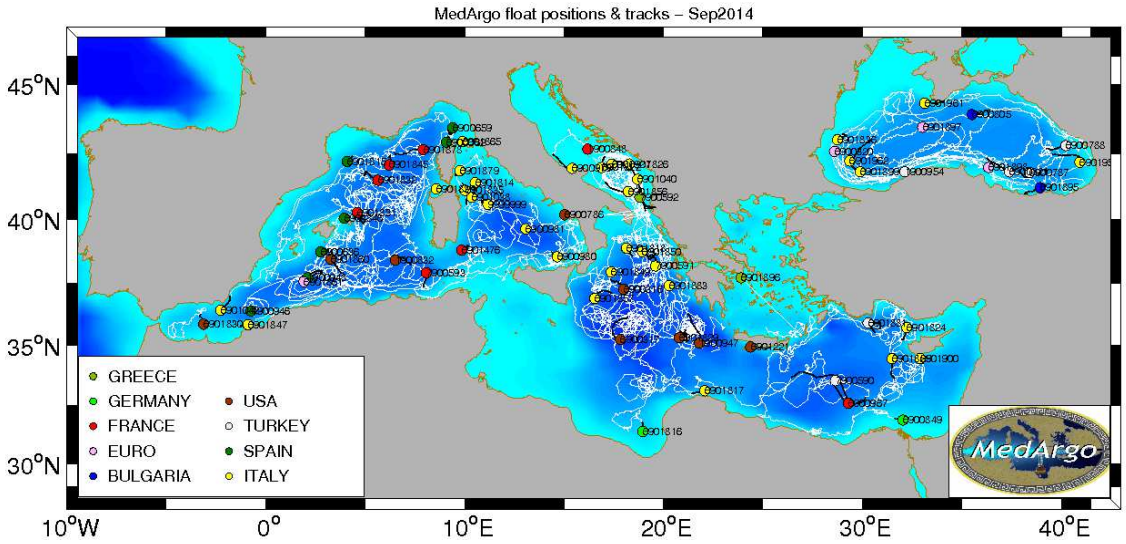


Figure 3. MedArgo float positions and tracks (September 2014). The monthly tracks are in black while the entire float trajectories are in white.

- **Statistics of Argo data usage:** (operational models, scientific applications, number of National Pis…):

  a. An abundant Argo dataset is available in the Mediterranean Sea in the last 10 years (between 2004 and 2014) thanks to the MedArgo Program (Poulain et al., 2007) and several projects involving the use of autonomous profiling floats. The amount of data collected by the Argo floats provides an opportunity to investigate the recent hydrological changes of the Modified Atlantic Water (MAW) and the Levantine Intermediate Water (LIW) in a marginal sea like the Mediterranean at sub-basin scale (Notarstefano et al., 2009). The identification of the core of the MAW and LIW is made possible through a salinity-signature approach, by looking at the salinity maximum and minimum values in each profile, for the LIW and MAW respectively. The aim of this work is to analyze the variability of these two water masses of the Mediterranean Sea and their respective depth and salinity trends (work in progress).

	LIW		MAW	
Sub-basins	**Salinity (S* yr^{-1})**	**Depth (dbar* yr^{-1})**	**Salinity (S* yr^{-1})**	**Depth (dbar* yr^{-1})**
Alboran	**0.0017±0.0011**	**11±5.4**	0.0038±0.04	-0.34±0.8
Algerian	0.00014±0.00 14	**2.2±1.7**	0.0081±0.014	**-0.49±0.32**
Catalan	**-0.0021±0.0012**	3.6±4.9	-0.0011±0.0083	**0.54±0.44**
Ligurian	0.00037±0.0015	**6±3.2**	-0.0068±0.0083	0.32±0.36
Thyrrhenian	**0.0048±0.0014**	**5.7±2.8**	**-0.014±0.012**	0.24±0.32
Sicily Ch.	0.0046±0.014	5.6±6.9	0.0033±0.04	0.33±1.5
Ionian	**0.0085±0.0012**	**6.2±2.1**	**0.03±0.01**	-0.17±0.59
Adriatic	**0.049±0.01**	**47±18**	**0.06±0.044**	-0.1±1.2
Cretan	**0.013±0.0064**	0.25±4.4	0.0025±0.013	**-1.4±1.4**
Levantine	-0.0024±0.0065	**-7.3±3.1**	**-0.012±0.0093**	0.37±0.94

Figure 4. Summary of the LIW and MAW cores trends of salinity and depth in the various sub-basins of the Mediterranean Sea.

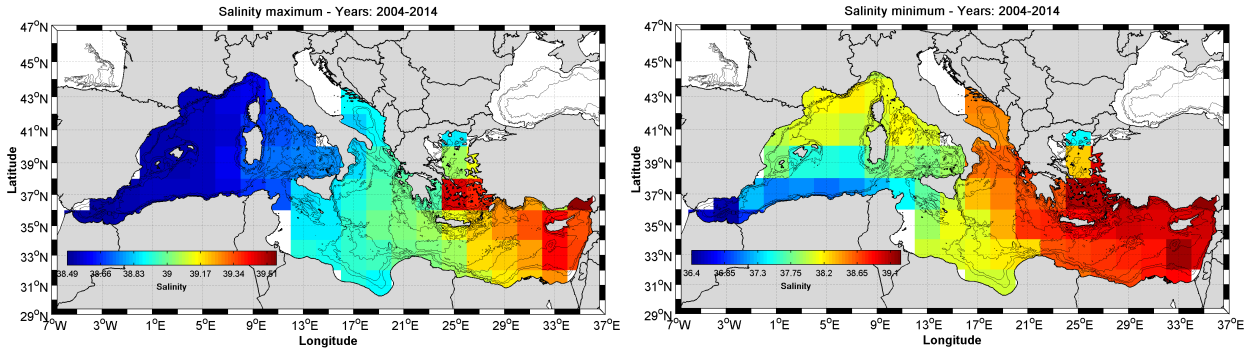


Figure 5. Mean pressure salinity of the LIW core (left panel) and MAW core (right panel) in 2X2 degrees squares.

b. The MedArgo data are routinely assimilated in numerical forecasting models (MFS) (Figure 6).

- **<u>Products generated from Argo data</u>:**
  a. Daily maps of float positions (Figure 2)
  b. Monthly maps of float positions and track (Figure 3)
  c. Float data are assimilated in numerical forecasting models by INGV (MFS); daily and weekly maps of Mediterranean ocean forecasting system are produced (Figure 6).

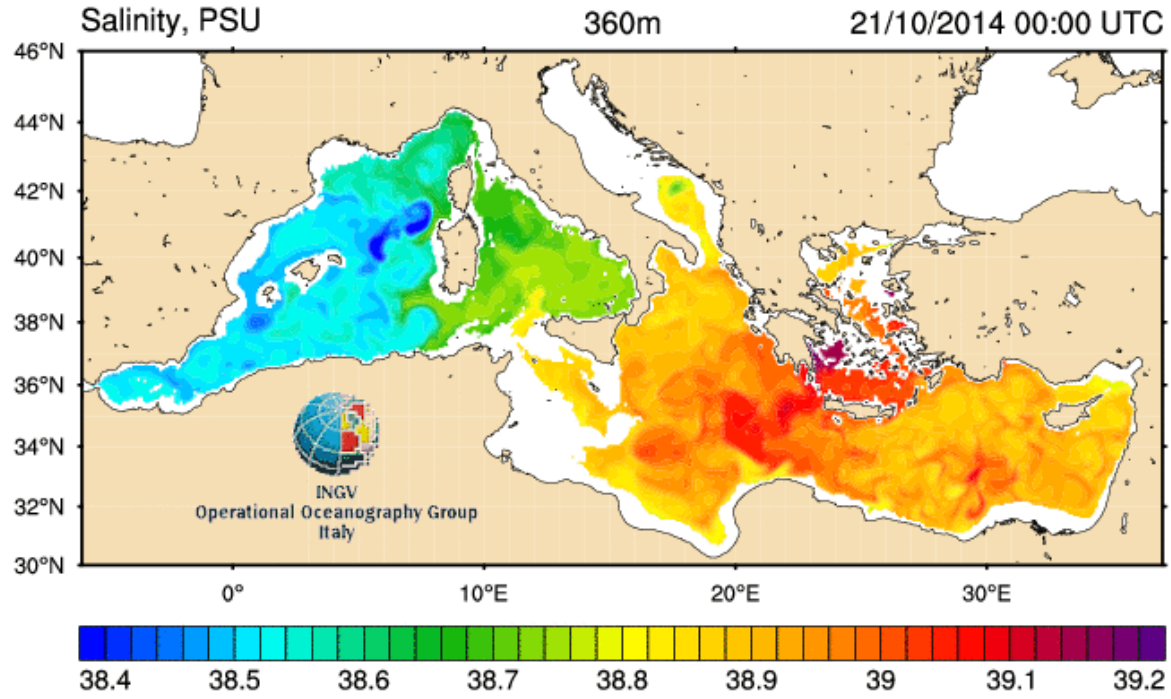


Figure 6. Daily mean forecasting model of salinity (360 meter deep, about the mean LIW depth).

2. Delayed Mode QC

OGS has continued to carry out the DMQC for the Argo data in the Mediterranean. Any possible surface pressure offsets were examined using the Metadata and Technical data files; different procedures were applied to correct this pressure offset depending on the float type, following the standard method proposed by the Argo community. The OW method in conjunction with other procedures is adopted to conduct the quality control analysis for the salinity data.

Additional historical reference data for the Mediterranean and Black Seas have been recently found and will be soon uploaded and transformed in the correct format to be used by the DMQC procedure; the current reference dataset consists of 35527 profiles between 2000 and 2014 (Figure 7).

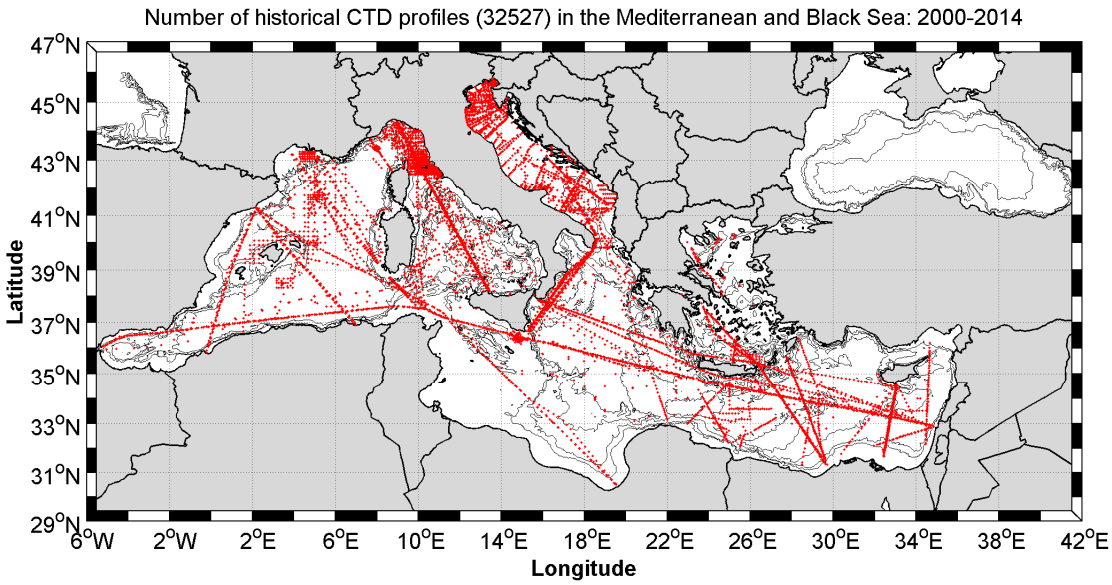


Figure 7. Location of the historical CTD data, spanning from 2000 to 2014, used in the DMQC.

The DMQC method has been applied to about 90% of the floats which died between 2000 and 2014 in the Mediterranean Sea: they were quality controlled in delayed-mode for salinity, temperature and surface pressure and the respective D-files will be sent to GDAC soon. So far, the majority of the DM checked floats, whose D files were sent to the GDAC, can be considered as well calibrated. The DMQC report/info of each float can be downloaded by the MedArgo web page (http://nettuno.ogs.trieste.it/sire/medargo/all/table_out_all.php).

3. Regional Centre Functions

MedArgo is the Argo Regional Centre for the Mediterranean and the Black Sea. OGS, who coordinates the MedArgo activities, established several collaborations with European and non-European countries (Bulgaria, France, Spain, Greece, Germany, Turkey, Malta, Romania and Lebanon) in order to set the planning and the deployment coordination of floats; future collaborations will be extended also to Tunisia and Algeria in 2015 for operations in the Sicily Channel and to monitor the Algerian Current. Moreover, as part of these cooperations the float data are transferred in near real time to MedArgo and 29 new floats have been deployed in the Mediterranean and Black Sea during 2014 (Figure 13).

2014 deployments

- 7 BioArgo-France (1 ProvBio, 6 Provor DO)
- 15 Argo-Italy (12 Arvor, 2 ProvBio, 1 ProvNut)
- 2 Argo-Turkey (2 Provor DO)
- 2 Euro (1 Arvor A3, 1 Provor DO) (E-AIMS, Perseus)
- 3 USA (3 Apex)

29 new floats (5 countries)

Figure 13. 2014 float deployments in the Mediterranean Sea

There are 62 active Argo floats in the Mediterranean Sea and 14 in the Black Sea as of October 2014. About 45 floats (about 20 floats equipped with biogeochemical sensors) will be deployed in late 2014 and in 2015 (Figure 14): about 35 in the Mediterranean Sea and 10 in the Black Sea, including the contributions of many countries.

Deployments/Collaborations plans for end 2014 and 2015

BULGARIA: ??
ITALY: 1 Med (2014), 10 Med (2015), 4 BIO Med (2015), 2 BS (2015)
FRANCE: 14 bio in Med (NAOS), ??
GREECE: 1 Med (2014), 3 Med (2015)??
SPAIN: 1 Med (2014), 3 Med (2015)??
GERMANY: 2 Med (2014) ,3 Med (2015)??
TURKEY: ??
ROMANIA: 1 BS (bio) (2014)
USA: ??

45 new floats should be deployed before the end of 2015

Figure 14. Deployments plans for 2015.

Argo National Data Management Report of Japan, 2014

1. Status

The Japan DAC, the Japan Meteorological Agency (JMA), has processed data from 1337 Japanese Argo and Argo-equivalent floats including 183 active floats as of October 10th, 2014. There are ten Japanese PIs who agreed to provide data to the international Argo data management. The DAC is acquiring ARGOS messages from CLS and getting IRIDIUM messages via e-mail in real-time, thanks to the understanding and the cooperation of PIs. Almost all profiles from those floats are transmitted to GDACs in the netCDF format and issued to GTS using TESAC and BUFR codes after real-time QC on an operational basis.

The Japan Agency for Marine-Earth Science and Technology (JAMSTEC) has done the Delayed Mode QC for all Japanese floats. JAMSTEC acquired the ARGOS messages for 8,293 profiles via CLS and the Iridium messages via e-mail, RUDICS and dial-up access for delayed QC from October 10th, 2013 to October 27th, 2014. JAMSTEC sent 6,139 delayed profile files (D-files) to GDACs through the Japan DAC, JMA, during the period. Submission of delayed profile files was slowed down during the last year because we have been upgrading our analysis system in order to provide V3.1 meta-files and profile files. Since the new analysis system will be completed by the next spring, we are trying to get the submission rate as before.

Web pages:

Japan Argo

http://www.jamstec.go.jp/J-ARGO/index_e.html

This site is the portal of Japan Argo program. The outline of Japanese approach on the Argo program, the list of the publication, and the link to the database site and PIs, etc. are being offered.

Real-time Database (JMA)

http://ds.data.jma.go.jp/gmd/argo/data/index.html

This site shows global float coverage, global profiles based on GTS TESAC and BUFR messages, and status of the Japanese floats.

Delayed mode Database (Argo JAMSTEC)

http://www.jamstec.go.jp/ARGO/argo_web/argo/index_e.html

JAMSTEC's website shows mainly Japanese float list, trajectory map, profile chart, and QCed float data. Moreover, the position and trajectory maps of all floats of the world as well as Japanese floats by using Google Map. Brief profile figures of the selected floats are also shown. This site also shows global maps based on objective analysis (temperature, salinity, potential density, dynamic height, geostrophic current, mixed layer depth, etc.).

Statistics of Argo data usage:

Operational models of JMA

MOVE/MRI.COM-G (Multivariate Ocean Variation Estimation System/ Meteorological Research Institute Community Ocean Model - Global)

JMA has been operating the MOVE/MRI.COM-G for the monitoring of El Niño and the Southern Oscillation (ENSO) and for initialization of the seasonal prediction model (JMA/MRI-CGCM). The MOVE/MRI.COM-G consists of an ocean general circulation model (OGCM) and an objective analysis scheme.
For details please visit:
http://ds.data.jma.go.jp/tcc/tcc/products/elnino/move_mricom_doc.html

JMA/MRI-CGCM (Coupled ocean-atmosphere General Circulation Model of JMA)

JMA has been operating JMA/MRI-CGCM as a seasonal prediction model and an ENSO prediction model. The oceanic part of this model is identical to the OGCM used for the MOVE/MRI.COM-G.
For detail please visit:
http://ds.data.jma.go.jp/tcc/tcc/products/elnino/jmamri_cgcm_doc.html

MOVE/MRI.COM-WNP (Multivariate Ocean Variation Estimation System/ Meteorological Research Institute Community Ocean Model - Western North Pacific)

MOVE/MRI.COM-WNP provides daily and monthly products of subsurface temperatures and currents for the seas around Japan and northwestern Pacific Ocean.

Other operational models

JCOPE2 (Japan Coastal Ocean Predictability Experiment)

JCOPE2 is the model for prediction of the oceanic variation around Japan which is operated by Research Institute for Global Change of JAMSTEC. JCOPE2 is the second version of JCOPE, developed with enhanced model and data assimilation schemes. The Argo data are used by way of GTSPP. The hindcast data 6 months back and the forecast data 3 months ahead are disclosed on the following web site: http://www.jamstec.go.jp/frcgc/jcope/. More information is shown in
http://www.jamstec.go.jp/frcgc/jcope/htdocs/e/home.html.

FRA-JCOPE2

FRA-JCOPE2 is the reanalysis data created by assimilating most of available observation data into the JCOPE2 ocean forecast system. The high horizontal resolution of 1/12 deg. is used in order to describe the oceanic variability associated with the Kuroshio-Kuroshio Extension, the Oyashio, and the mesoscale eddies from January 1993 to December 2009. Collaboration with Japanese Fishery Research Agency (FRA) has allowed us to assimilated huge amount of in-situ data around Japan. FRA-JCOPE2 reanalysis data are openly available. The website, http://www.jamstec.go.jp/frcgc/jcope/vwp/, provides information about downloading and interactively visualizing the reanalysis data for users.

FRA-ROMS

FRA-ROMS is the nowcast and forecast system for the Western North Pacific Ocean developed by Fisheries Research Agency (FRA) based on the Regional Ocean Modeling System (ROMS). FRA started the operation in May 2012. The forecast oceanographic fields are provided every week on the website http://fm.dc.affrc.go.jp/fra-roms/index.html/.

Products generated from Argo data:

Products of JMA

El Niño Monitoring and Outlook

JMA issues the current diagnosis and the outlook for six months of ENSO on the following web site. The outputs of the MOVE/MRI.COM-G and the JMA/MRI-CGCM can be found here.
http://ds.data.jma.go.jp/tcc/tcc/products/elnino/index.html

Subsurface Temperatures and Surface Currents in the seas around Japan

The following parameter outputs of the MOVE/MRI.COM-WNP can be found onhttp://ds.data.jma.go.jp/gmd/goos/data/database.html.

- Daily, 10day-mean and Monthly mean subsurface temperatures at the depths of 50m, 100m, 200m and 400m analyzed for 0.1 x 0.1 degree grid points.
- Daily Surface Currents for 0.1 x 0.1 degree grid points.

Products of JAMSTEC

MOAA (Monthly Objective Analysis using the Argo data)

MOAA is the global GPV data set which was made by monthly OI objective analysis using Argo and TRITON mooring data. Various maps have been made using MOAA, and opened to the public on the Argo JAMSTEC web site,
http://www.jamstec.go.jp/ARGO/argo_web/MapQ/Mapdataset_e.html.
We have produced the new data set, which is produced through a 10-day global ocean analysis by optimal interpolation based on Argo, TRITON and available CTD data in the near future.

Objectively mapped velocity data at 1000 dbar derived from trajectories of Argo floats

The gridded velocity data at 1000 dbar is made by optimal interpolation analysis using YoMaHa'07. This dataset has been disclosed since October 2009. This dataset are updated every 6 months. This data is opened to the public on the Argo JAMSTEC web site,
http://www.jamstec.go.jp/ARGO/argo_web/G-YoMaHa/index_e.html.

MILA GPV (Mixed layer data set from Argo floats in the global ocean)

JAMSTEC has produced a data set of gridded mixed layer depth with its related parameters, named MILA GPV. This consists of 10-day and monthly average data and monthly climatology data in the global ocean

using Argo temperature and salinity profiles. We have fixed bugs of programs, and the updated data set will be released on the Argo JAMSTEC web site soon,
http://www.jamstec.go.jp/ARGO/argo_web/MILAGPV/index_e.html.

Scientifically quality-controlled profile data of Deep NINJA observations

We have released a product of a quality-controlled data set of Deep NINJA observations for convenient use on scientific/educational purposes. The quality-control was led by JAMSTEC on the basis of mainly comparisons with highly accurate shipboard CTD observations conducted at float deployments. Its detailed information has been provided on the Argo JAMSTEC web site:
http://www.jamstec.go.jp/ARGO/deepninja/.

2. Delayed Mode QC

Based on the mutual agreement by PIs in Japan in 2006, JAMSTEC has done the DMQC for all Japanese floats.
JAMSTEC has submitted the delayed mode files of 93,926 profiles to GDACs as of October 27th, 2014.
The procedure of DMQC in JAMSTEC is as follows.

(JAMSTEC floats and the most of Argo-equivalent floats)

1. (within 10days) data re-acquisition from CLS, bit-error repair (if possible), real-time processing, position QC, visual QC
2. (within 180days) surface pressure offset correction, cell TM correction (Apex only)
3. (after 180days) WJO and OW salinity correction, the definitive judgement by experts, D-netCDF file making

(Argo-equivalent floats that had ceased by 2007)

JMA executes real-time processing again by using the latest procedure. The procedure after real-time processing is executed by JAMSTEC according to the procedure describe above.

The OW software is mainly operated instead of WJO. The calculation result of WJO has been used at the definitive judgment. In order to decide the best parameter value, JAMSTEC will continue to use both OW and WJO.

3. GDAC Functions

The JAMSTEC ftp server has been providing the mirror site of GDACs since 2003.
ftp://ftp2.jamstec.go.jp/pub/argo/ifremer/
ftp://ftp2.jmastec.go.jp/pub/argo/fnmoc/

4. Regional Centre Functions

JAMSTEC operates PARC in cooperation with IPRC and CSIRO and has extended the responsible region into the whole Pacific including the Southern Ocean by request of AST-9 (Action item 9) since April 2008.
JAMSTEC is providing the float monitoring information in the Pacific region (e.g., float activity watch, QC status, anomaly from objective analysis, diagnosis plot for sensor correction, etc.), reference data set for DMQC (SeHyD and IOHB), the link to the CTD data disclosure site of Japanese PIs, some documents, and some QC tools on the following web pages (http://www.jamstec.go.jp/ARGORC/). JAMSTEC will plan to release ascii files of temperature and salinity profile data of Argo which are converted from the netcdf profile files. JAMSTEC also plan to release Argo temperature and salinity profile data put through more advanced automatic checks than real-time quality controls. Both two types of data, which have been required by many researchers, are useful for analyses using variable software. These data also expect to increase users of Argo data in not only ocean/atmosphere scientists but also any other fields. Moreover, JAMSTEC is going to release parts of the Argo Climatology for use in OW salinity calibration software released by CCHDO, which are divided into marginal seas and open ocean in Pacific. This is useful for the delayed mode operators of Pacific Argo PIs to make better Argo Climatology for the OW without contaminating any CCHDO data in the other basins.

Argo National Data Management Report

KMA (Republic of Korea)

1. Status
   - Data acquired from floats
     In this year, KMA deployed additional 15 Argo floats in the middle of July. Thus, KMA operates 59 active floats that is profiling in the East Sea/Sea of Japan and North Pacific Ocean. During Jan.-Oct. 2014, 1,985 real-time data of KMA were sent to GDAC.

   - Data issued to GTS
     KMA completed to make the BUFR format of Argo float recently and notified RTH Tokyo to provide the BUFR data through GTS on October 28, 2014. It will take about 2 months by distribution of the new data through GTS.

   - Data issued to GDACs after real-time QC
     KMA is generating the updated Argo data by the Argo data management manual v 3.0 and will send to GDAC updated files after complete to check the data. It will be the end of this year.

   - Web pages
     KMA is operating the Argo Korea web page.
     The URL is http://argo.nimr.go.kr. It provides profile data and status of Argo floats to the public.

- Delayed data sent to GDACs
  Recently, KMA sent to GDAC profile data of WMO ID:2901252 float. It is included Dissolve Oxygen data and float 2901252 was deployed in 2012. We will send the data of DO floats deployed in 2013 to GDAC as well by the end of this year.

2. Delayed Mode QC
   - National Fisheries Research and Development Institute/ Korea Oceanographic Data Center (NFRDI/KODC) finished density inversion QC for all KMA/NIMR D-files, and flagged as “4” for bad and uncorrectable data in 95 profiles. NFRDI/KODC is currently preparing new threshold of DM density inversion test for KMA/NIMR Argo floats and this research will be finished by the end of this November.

   - NFRDI/KODC is responsible for Delayed mode QC (DMQC). During Nov. 2013-October 2014, NFRDI/KODC has sent 16,810 D-files to the GDACs after DMQC.

3. Regional Centre Functions
   - KMA will deploy additional 17 Argo floats in 2015.

Argo National Data Management Report 2014
United Kingdom

1. Status

It has been an exciting but difficult year for UK Argo data management. Progress is being made within BODC to cope with the demands of sustaining core Argo mission effort and evolving internal data systems to cope with the evolution of Argo to new sampling strategies.

Almost all of the available effort this year has been used in training of new staff, sustaining real time processing, and the transition to V3 Argo format files. The complexity of new sampling strategies and biogeochemical Argo floats necessitated a complete rewrite of the software used to produce Argo files at BODC. The new version so extensible and should be sufficiently adaptive to cope with on-going and proposed enhancements to the Argo array. This software enhancement is in the late stages of testing before a formal transition to V3 formats for core Argo shortly after ADMT15. Production of draft files containing BODC hosted biogeochemical data is planned for January 2015.

- Staff changes

Following the resignation of Clare Davis in December 2013; to make UK Argo data activity more resilient to staff changes BODC Argo data management is now split between Justin Buck, Katie Gowers, and Charlotte Williams. Katie Gowers brings sea-level data knowledge and experience to the team and Charlotte recently finished a PhD in biogeochemical oceanography. As in previous years the training load created delays which are primarily on trajectory work, Argo V3 formats, Argo near-surface data processing, and delayed mode quality control. This split of work and sharing of expertise between more people should to reduce the impact of any future staff changes.

- Data acquired from floats

Data from all UK floats are received at BODC by automatic download from the CLS database every 12 hours. Table 1 summarises the deployments and data received according to float type. BODC endeavors to set up floats for distribution of data to GTS and GDACS within a week of deployment. BODC also handles data from Irish, Mauritian and Portuguese floats. There are currently 168 active floats being processed by BODC.

Table 1: A summary of setup of float data distribution data acquired from floats managed by BODC in the year preceding 31st October 2014 according to float type and Country.

Float Type	Deployment by country		
	UK Core Argo	UK Bio-Argo	Mauritius Core Argo
APEX APF9a – near surface temperature	17		2
APEX APF9i	6		
NAVIS – core Argo configuration	6		
PROVOR II – biogeochemical E-AIMS configuration		3*	
NAVIS BGCi – E-AIMS configuration		3*	
Totals	29	6	2

* The setup of distribution from NAVIS and PROVOR BGC floats is on-going and expected to be complete in late 2014.
5595 profiles were processed in the last year with approximately 300 profiles unprocessed from PROVOR and NAVIS BGC floats. These will be caught up in the coming months. The break down by float type is summarized in Table 2.

Table 2: A summary of setup of float data distribution data acquired from floats managed by BODC in the year preceding 31st October 2014 according to float type and Country.

Float type	Number of profiles
APEX APF8, Argos communications, core mission	592
APEX APF8, Argos communications, core mission with ice detection	137
APEX APF9, Argos communications, core mission	48
APEX APF9, Argos communications, core mission with near surface sampling	3194
APEX APF9, Argos communications, core mission with ice detection	484
APEX APF9, Iridium communications, core mission	720
APEX APF9, Iridium communications, biogeochemical sampling	229
NAVIS, Iridium communications, core mission	184
NOVA, Iridium communications, core mission	7

- Data issued to GTS

Data from all BODC hosted floats are sent to the GTS every 12 hours. Almost 100% of TESACs messages are available within 24 hours. Occasional disruptions occurred due to email server failures and server problems.
Delays in production and transmission of BUFR format messages identified by Anh Tran (ISDM) for floats with Iridium communications will be resolved in later 2014 with the move to V3 format core Argo files.

- Data issued to GDACs after real-time QC

All BODC hosted data received at BODC are passed through the agreed real-time quality control tests within one hour of the data arriving at BODC. All data that have been processed at BODC are queued for transfer to both GDACs which occurs twice a day. Any file that fails to be transferred is queued for the next transfer attempt.

- Data issued for delayed QC

All delayed QC on BODC hosted floats is done within BODC. See section 2 for the current status.

- Delayed data sent to GDACs

All delayed QC on BODC hosted floats is done within BODC and forwarded to the GDACS the same day that delayed mode quality control is complete for a profile. See section 2 of this report for the current status of this activity.

- Web pages

UK Argo has a new website (http://www.ukargo.net/ , screenshot in Figure 1), the material is an amalgamation of content from BODC, the National Oceanography Centre and the UK Met Office. There is also an associated facebook page (https://www.facebook.com/UKArgofloats , screenshot in Figure 2) setup to post news updates.

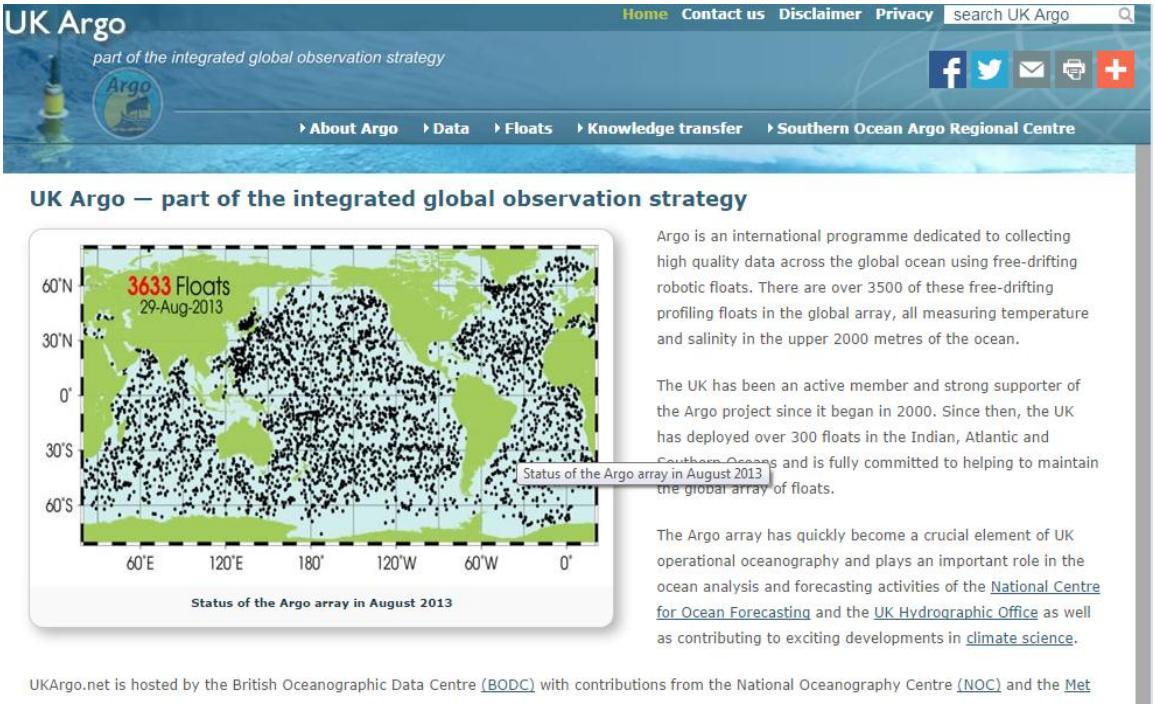


Figure 1: Screenshot of the new UK-Argo website

Figure 2: Screenshot of the UK-Argo Facebook page

- Statistics of Argo data usage (operational models, scientific applications, number of National Pis…)

Highlights of operational Argo data usage by the UK Met Office include:

- Argo data are assimilated into the operational FOAM system. This provides short-range ocean forecasts and coupled ocean-atmosphere forecasts, and products are available to operational and research users through MyOcean (information available from http://www.myocean.eu/web/69-myocean-interactive-catalogue.php?option=com_csw&view=details&product_id=GLOBAL_ANALYSIS_FORECAST_PHYS_001_015).
- Forecasts are also provided to the Royal Navy and other customers. FOAM is also used to initialize the coupled seasonal forecasts.
- The EN4 product has been released and is available from http://www.metoffice.gov.uk/hadobs/en4/ , Good et al. (2013) describes the production of the EN4 dataset. EN4 contains a consistently quality controlled set of profile temperature and salinity data (from Argo and many other sources), as well as an objective analysis with uncertainty estimates at 1 degree, monthly resolution, from 1900 to present.
- Argo data are also used to validate high resolution SST analyses, OSTIA, and the GHRSST Multi-Product Ensemble (GMPE).
- On-going work at the UK Met Office is an assessment of the impact of Argo data within a coupled data assimilation system to investigate whether Argo data has an impact on weather phenomena prediction.

- Products generated from Argo data …

The National Oceanography Centre have generated a 4D optimal interpolation product of Argo data for the N Atlantic, 0 to 50 degrees N, 2.5 degree x 20 dbar x 10 day resolution, for the years 2000 to 2013. There is also a special run along the RAPID line at 26N in the Atlantic. These have been made openly available by anonymous FTP, contact Brian King for details.

- Argo DOIs

The proposal to mint a new DOI for each monthly snapshot of data is now operational at Ifremer.

Discussions on how Argo can move to a single DOI (jointly between NODC and Ifremer) for ease of citation and monitoring of data usage was progressed at the following meetings:

- Research Data Alliance (RDA) working group on dynamic data citation
- Third Ocean Data Interoperability Platform (ODIP) annual workshop

The concepts of using a single DOI are sound but the issue has been complicated by the insistence of a number of high profile journals that short DOIs are used to cite data (this may preclude the use of additional data criteria in a citation). This is to be discussed further the week after ADMT15.

- Funding outlook

The funding outlook for Argo data management in the UK is favorable. NERC/NOC continued their highly valued, long standing, and essential funding of one staff member within BODC. Additionally, the E-AIMS project has contributed towards adaptations needed for the processing of Bio-Argo data. The amount of data management resource and negotiation within the Argo community

needed for E-AIMS was significantly underestimated and this has caused delays in data distribution that should be resolved in early 2015.

The on-going SenseOCEAN project, although not strictly Argo, will help reduce the demands on data systems by introducing metadata at the sensor level and beginning to define standards for data from a new generation of oceanic carbon and bio-optical sensors.

As part of the Euro-Argo research infrastructure the European Directorate-General for Maritime Affairs and Fisheries (DG MARE) will be funding operational Argo deployments and BODC will be one of the European DACs and delayed mode institutes to receive data management support to host float processing.

BODC are part of 3 submitted European Horizon 2020 proposals that include data management resource specifically for Argo activity:

- AtlantOS, data management resource for Nitrate sensors, final decision due on 21st November
- $ENVRI_{PLUS}$, data management resource for implementation of oceanic carbon sensors, this proposal is led by the Integrated Carbon Observation System (ICOS) research infrastructure (RI)
- ISOPOD, analysis of international data standards and how they relate to Argo data.

2. Delayed Mode QC

The OW software is being used at BODC with latest reference data available from Coriolis (CTD climatology and Argo profile climatology for guidance). 73% of BODC hosted floats profiles eligible for delayed mode QC have been processed ad submitted to the GDACs in D-mode.

Staff changes and the extra workload required for the transition to Argo V3 formats and setting up of data processing for Bio-Argo floats mean that delayed mode quality control has not been run yet this year. This essential and high priority activity will need to resume before the next Argo Steering Team meeting.

There are 42604 profiles eligible for delayed mode quality control at BODC and 31224 (73%) are currently processed in delayed mode.

3. GDAC Functions

Section not applicable to the UK.

4. Regional Centre Functions

Four organizations participate in the Southern Ocean Argo Regional Centre - BODC (Atlantic Ocean Sector), CSIRO (“Australian sector”), JAMSTEC (Pacific Ocean Sector) and the University of Washington (Indian Ocean Sector).
BODC hosts the main data and information web pages which have been migrated to the new UK Argo website (http://www.ukargo.net/southern_ocean_argo_regional_centre/). These pages contain an animation of the Forecast Ocean Assimilation Model (FOAM) outputs (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.

5. References

'Good, S. A., M. J. Martin and N. A. Rayner, 2013. EN4: quality controlled ocean temperature and salinity profiles and monthly objective analyses with uncertainty estimates, Journal of Geophysical Research: Oceans, 118, 6704-6716, doi:10.1002/2013JC009067'

US NATIONAL DATA MANAGEMENT REPORT

October 2013-October 2014

15th ADMT MEETING

OTTAWA, CANADA

STATUS

US Argo Data Assembly Center at AOML

The US Argo Data Assembly Center (DAC) at AOML is responsible for the processing of Argo data obtained from all floats deployed by US institutions. As of October 29 2014, the US Argo DAC has 1967 active floats (Figure 1). These floats have transmitted data at least once during the last 30 days.

US institutions deployed 398 Argo floats all over the World (Figure 2). Up to date maps with the deployment positions can be found online at: ww.aoml.noaa.gov/phod/argo/opr/php_forms/deployment_maps.php. These maps link to data collected by the floats.

During the time period analyzed for this report 77,566 profiles were submitted to GTS in TESAC format, 83% of these profiles reached the GTS in the first 24 hours and 90% in less than 36 hours. For the submission to the GDAC the numbers are 88,317 profiles with 89% available in 24 hours. Including the trajectory and technical files results in more than 260,000 files submitted to the GDACs. Regularly updated recent performance statistics of our data transmissions to GTS and GDACs are available online at: http://www.aoml.noaa.gov/phod/argo/opr/ (an example is shown in Figure 3).

The US Argo DAC reduced the time elapsed between acquisition of Argo profiles and the real distribution of profiles by implementing a new processing schedule that performs the real-time data processing three times a day. This change includes transmissions of data to both Global Data Assembly Centers (GDAC) in NetCDF format and to GTS in the TESAC and BUFR formats. After this transition, 93% of the profiles reached GTS in the TESAC format and 95% reached the GDACs in 24 hours.

During the reporting period AOML started distributing profiles in version 3.0. For floats with added sensors the real-time NetCDF files were recreated to

facilitate the transition to the new formats. In addition, delayed-mode profile, trajectory and meta files in format 3.x were passed on to the GDACs after verification. The US DAC also processed and distributed the data from the first deep Argo float.

The US Argo DAC has continued its involvement in deployment planning, finding ships of opportunity and providing ship riders for selected cruises.

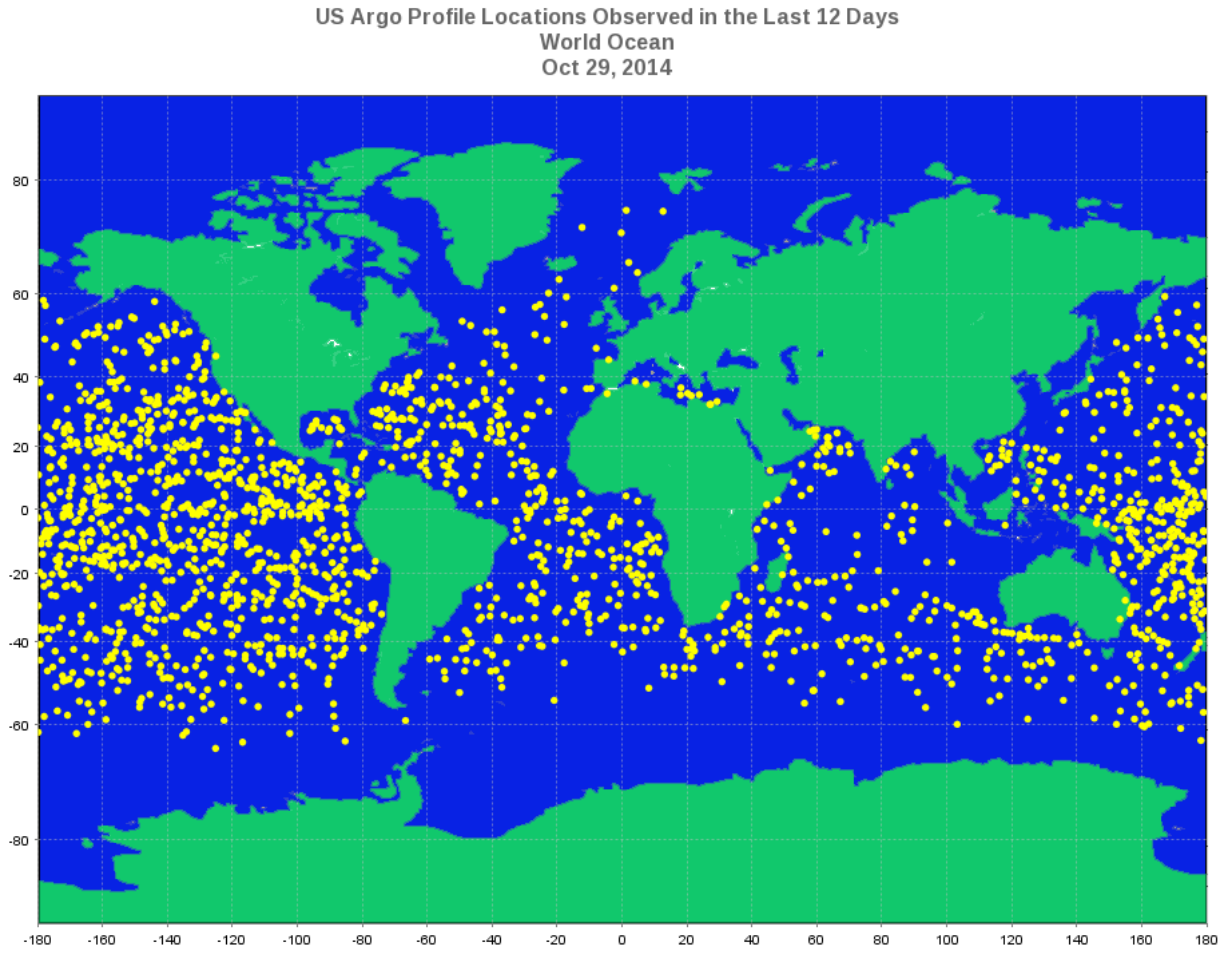


Figure 1: map of active floats.

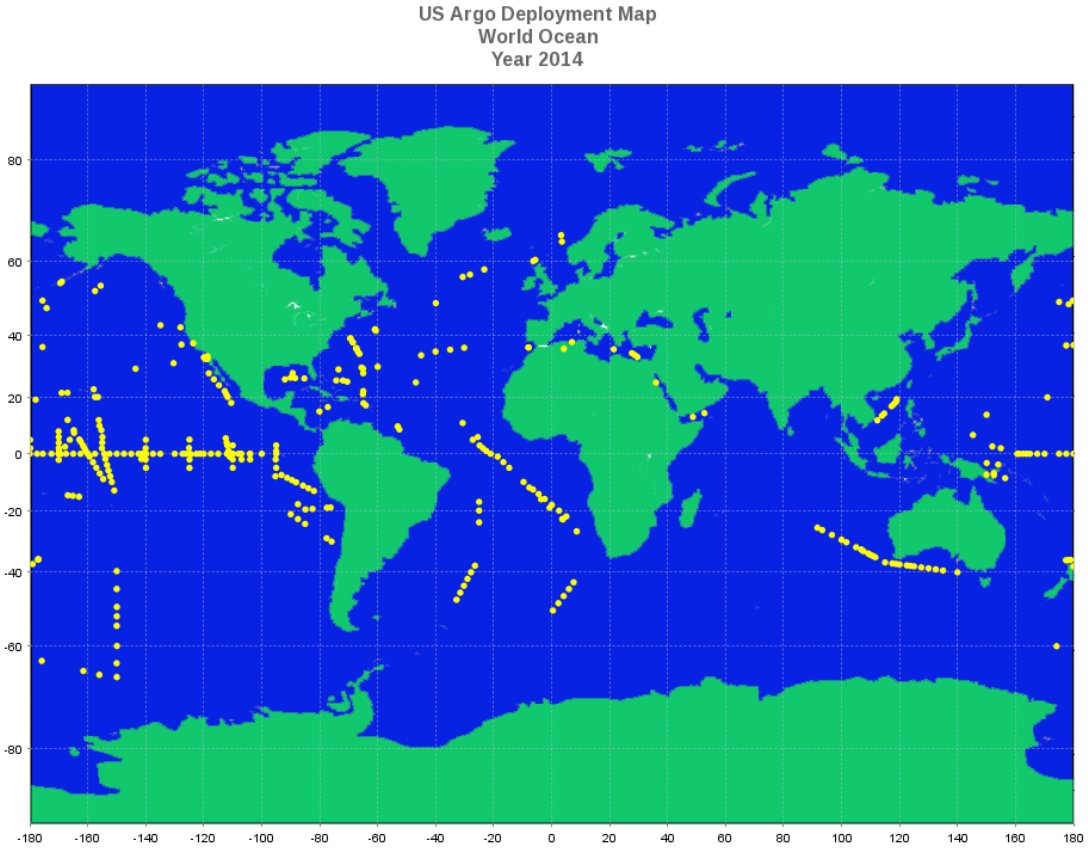


Figure 2: Map of deployment positions.

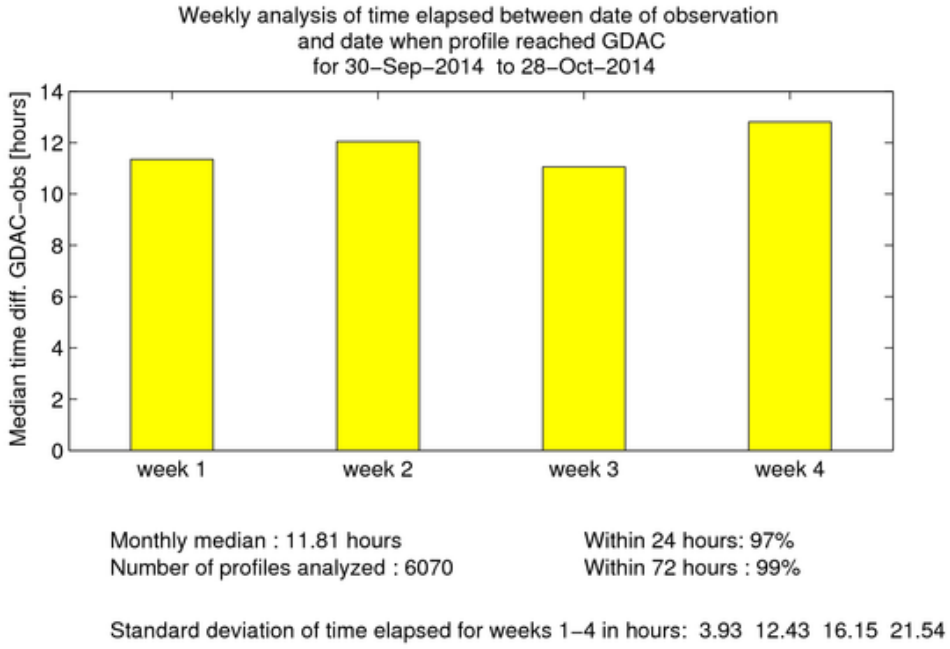


Figure 3: GDAC distribution statistic for the most recent 4 week period.

Software Development at the US Argo DAC

Three new Argos decoders have been developed and implemented during the reporting period. Changes to the existing Argos software were made to include the NST data parallel to the primary profile. Changes to the Argos software also enabled us to process Short Cycling Argos floats.

A new software package for Iridium floats transmitting their data via RUDICS was developed for the purpose of decoding STS profiles (near surface salinity and temperature) for float types with and without Oxygen profiles. Adapting to these new requirement was relatively easy because of the new table driven decoder that has been developed last year to handle multiple formats with minimal code changes.

Changes to the delayed-mode processing were done to allow DM operators to ftp tar balls in addition to nc files to our ftp server. This allows faster processing of large numbers of files.

A new software package to quality control the data and generate NetCDF profile files in format 3.0 was made operational in July that can currently handle floats with up to two profiles in a given cycle fully. Modifications are currently done to expand the software to fully process cycles with N_PROF=3 and 4 (to accommodate STS with and without oxygen as well as NST floats).

The US Argo DAC is maintaining a website that provides documentation and information about the operations:
http://www.aoml.noaa.gov/phod/argo/index.php

DELAYED MODE QC:

After Delay mode quality control AOML receives the Argo profiles from US delayed-mode operators and verifies their contents to ensure soundness of the files. Recently we started accepting these files in the new Argo NetCDF format version 3.0.

Each US Argo institution has provided information on their delayed-mode processing which was added to this report.

University of Washington

As of October 2014, University of Washington had submitted 174,361 delayed-mode files (D-files) to the GDACs via AOML. These comprised of: 162,497 D-files belonging to University of Washington (UW); 11,864 D-files belonging to the KESS project from University of Hawaii (UH). Production of D-files in V3.1 began in September 2014.

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

Wood Hole Oceanographic Institute

In the period October 1, 2013 to September 30, 2014, WHOI deployed 100 Argo floats. Of these 83 were MRV S2A while 17 were WHOI-SOLO. Deployments took place from 11 vessels including R/V Knorr, R/V Ronald Brown, R/V Endeavor, R/V Atlantic Explorer, R/V Okeanos Explorer, CCGS Hudson, SA Agulhas II, FRS Algoa, SSV Corwith Cramer, M/V Maersk Vilnius, and M/V Derby D.

During this period 326 unique floats reported a total of 11,534 profiles of temperature and salinity.

As of October 22, 2013, WHOI floats collected 129,258 profiles, of which 91,084 have passed through delayed-mode quality control.

Scripps Institution of Oceanography

Scripps Institution of Oceanography (SIO) has evaluated, as part of delayed-mode quality control (DMQC), a total of 145,006 Argo stations (profiles). This is an increase of approximately 19,712 stations (540 nominal float years) since the previous United States Argo National Data Management Report (October, 2013). At present, 98.6% of the DMQC eligible, SIO stations have been completed. Here we define a station as being DMQC eligible if it was sampled more than 12 months ago . The above numbers include all SIO performed delayed-mode stations, including SIO Argo floats, all Argo New Zealand floats, 30 Argo-Equivalent floats provided to Argo by Dan Rudnick as

part of the 'Origins of the Kuroshio and Mindanao Current' and 'ASIRI' projects, and 3 floats donated to Argo Mexico.

SIO expects to be able to continue to maintain a high DMQC completion percentage during the coming year and will continue to revisit the profile data of most floats every 7 months. The standard consensus DMQC procedures for SOLO/SOLOII profile data were continued in 2014. The Argo Program is in the process of converting between the V2.2 NetCDF format and the V3.1 NetCDF format, comprising modifications to the profile, trajectory and meta files. To date 73.7% of SIO DMQC profile files available at the GDAC have been formatted to V3.1 NetCDF. The remaining backlog, older Argos floats which are still operational, will be converted to V3.1 as they receive their final DMQC.

During the year, continuing effort was expended in the DMQC of the trajectory data from an additional 87 inactive SIO Argos SOLO floats. This most notably includes the estimation of float cycle timing, including float arrival and departure from the surface, and the full quality control of all Argos position data. This brings the total number of V3.1 DMQC trajectory NetCDF data available from SIO Argos floats to 727. DMQC on additional Argos SOLO trajectory data will be ongoing as the floats cease sending new data. SIO has started the DMQC of trajectory files from SOLOII Iridium floats, as V3.1 trajectory NetCDF with partial DMQC applied have begun to be posted to the GDAC.

Scripps has actively participated in forwarding Argo Program priorities during the year. Most notably by Megan Scanderbeg in co-developing and documenting the Version 3.1 trajectory file. SIO continues to update quasi-quarterly both the Argo Climatological Dataset for OW salinity calibration and a census of format errors identified in delayed-mode NetCDF profile files.

Scripps continues to work with float developers (IDG[1], MRV) to add capabilities to the SOLOII/S2A float type. Additions this year include a more efficient profile packing scheme (developed by Breck Owens), 'MEASUREMENT_CODE'-like data fields to aid in assignment of float data in NetCDF V3.1, and a more complete tracking of bi-directional mission modification commands which are transmitted to the float. It has been shown that an active relationship between SIO and the float providers has resulted in the collection of data able to minimize later DMQC tasks, and maximize

the usability of the data in real-time. The same goal has led SIO to retain data decoding control for all SIO Iridium float data.

Finally, SIO Argo and IDG deployed two V0.3 prototype Deep SOLO floats during 2014. Both are still active, returning profiles down to over 5500 dbar (the depth of the ocean floor). SIO has developed the capability to process these floats data in DMQC.

Pacific Marine Laboratory

As of 23 October 2014, PMEL had a total of 71,139 D-files at the GDAC, all more than one year old, comprising 71% of the total of 100,305 PMEL profiles that were older than one year at that time. Two years ago, on 22 October 2012, PMEL had a total of 60,082 D-files at the GDAC. Of these, 57,530 were more than one year old, comprising 85% of the total of 67,616 PMEL profiles that were older than one year at that time. So, our DMQC backlog has grown.

This increased DMQC backlog arose mostly from delays owing to a very busy year of fieldwork for our DMQC lead, Kristene McTaggart, who went to sea on three long hydrographic cruises and processed the CTD/O2 data from them. In addition to that, we undertook a major maintenance effort on PMEL DQMC software. A government mandated upgrade to our data processing computer, along with a MATLAB upgrade to a version with the native NetCDF interface required major changes to the SIO GUI that we use for flagging, as well as minor changes to the OW code. While we were making those changes, we also changed our directory structure to allow for faster processing. Following that, we spun up on conversion of formats 2.2 and 3.0 to 3.1, which required more modifications to the SIO GUI and OW code. We also wrote new code for DMQC of 2-dbar profiles from our growing array of Iridium floats.

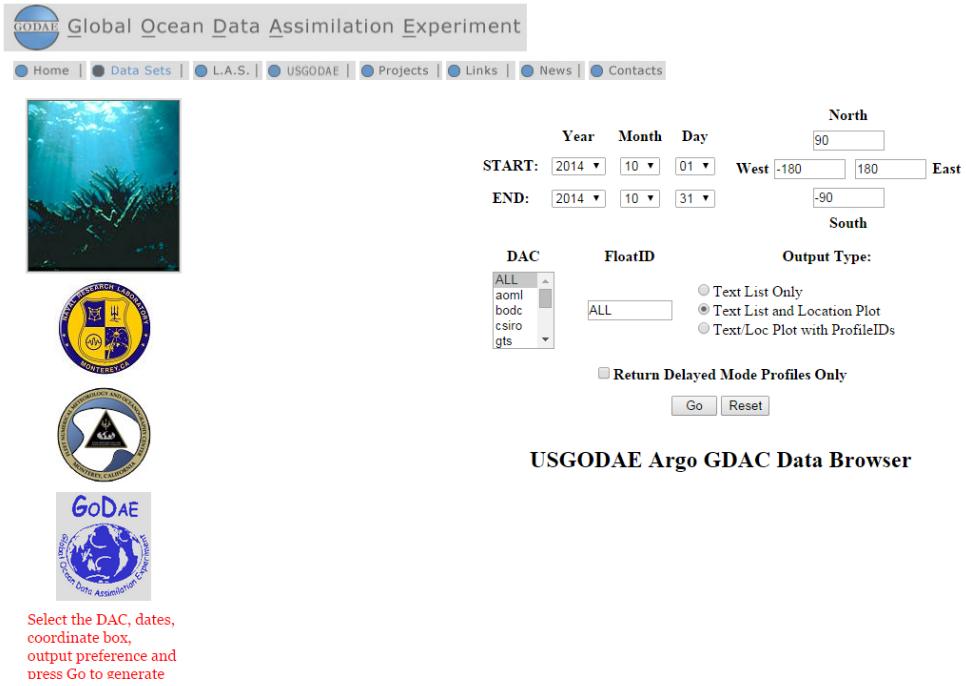
We are now working on clearing our DMQC backlog in the following order: 1. All floats with profiles identified as problematic by altimetry QC. 2. All floats with profiles flagged as problematic by objective analysis. 3. All floats with profiles flagged as problematic by the Gilson format check. 4. Inactive Iridium floats with profiles that have yet not undergone DMQC. 5. Inactive Argos floats with profiles that have not yet undergone DMQC. 6. Remaining active Iridium floats. 7. Remaining active Argos floats.

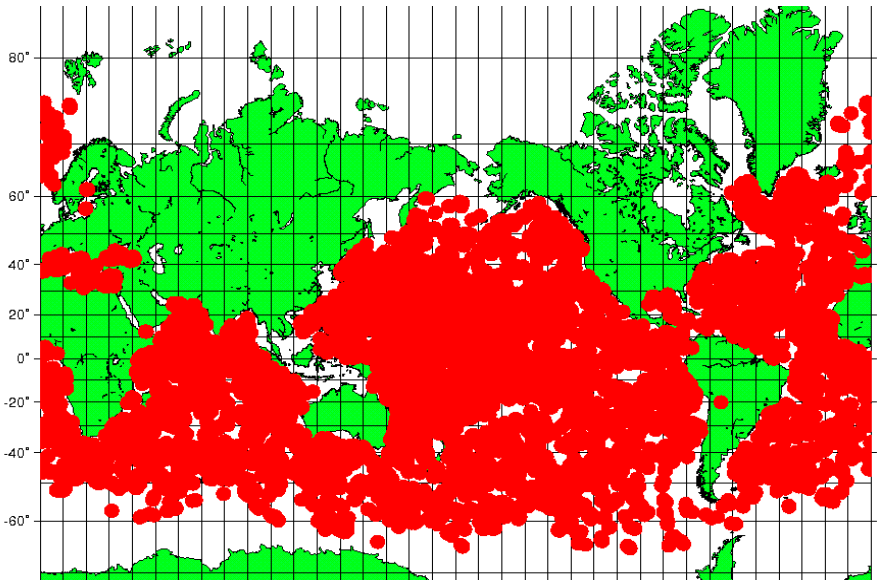
The PMEL float DMQC procedure currently consists of the following steps: We perform an automated correction, with visual check, of reported pressure drifts and correction for the effect of these pressure drifts on salinity, as well as an automated correction of conductivity cell thermal lag errors following Johnson et al. (2007). We do visual inspection and modification of quality control flags for adjusted pressure, temperature, and salinity using the SIO GUI. We overwrite the raw Param_QC flags during this step as required. We use OW Version1.1 with SeHyD_090408 as a historical database for recently deployed floats and adjust run parameters to get appropriate recommended salinity adjustments. We accept or reject the OW recommendations on the basis of comparison with nearly historical profiles using the SIO GUI.

South Atlantic Argo Regional Center at AOML

Currently no funding is available for the final stage of the delayed-mode quality control. Activities related to float deployments are continued in close collaboration with WHOI.

Argo Data Management report 2014
US GDAC (Global Data Assembly Center)
October 31st, 2014





GDAC Functions

(If your centre operates a GDAC, report the progress made on the following tasks and if not yet complete, estimate when you expect them to be complete)

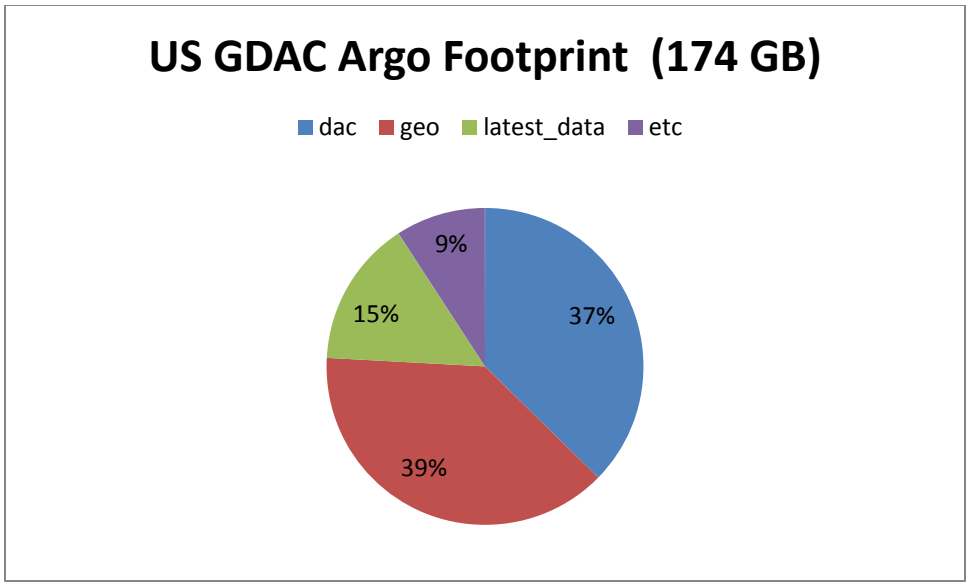
- National centres reporting to you
- Operations of the ftp server
- Operations of the www server
- Data synchronization
- Statistics of Argo data usage : Ftp and WWW access, characterization of users (countries, field of interest : operational models, scientific applications) …

National centres reporting to you

Currently, 9 of the National DACs submit regularly to the US GDAC. The other DACs use the Coriolis as a proxy, and the US GDAC downloads the data from this proxy.

As of October 31st, 2014, the following shows the Argo footprint on the US GDAC.

DAC	MetaData Files	Technical Files	Trajectory Files	Profile Files	D-Mode
AOML	5,027	5,065	5,998	703,401	487,933
BODC	472	455	420	47,448	31,221
Coriolis	1,887	1,873	1,801	170,498	111,734
CSIO	276	230	231	18,509	10,141
CSIRO	627	615	566	96,745	57,738
INCOIS	339	330	335	41,645	26,410
JMA	1,342	1,336	1,327	150,663	94,059
KMA	184	175	176	20,976	17,180
KORDI	119	115	119	15,473	0
MEDS	379	373	371	40,475	23,481
NMDIS	19	19	19	1,970	0
Totals	10,671	10,586	11,363	1,307,803	859,897



Operations of the ftp server

The US GDAC hosts an anonymous FTP server that allows downloads of all available Argo data that it currently has. This includes the Argo aggregate files, as well as, the raw NetCDF files that are received by the DACs. Additionally, the Argo index files are available for download as well. These index files are updated on the US GDAC approximately twice per hour.

US GDAC FTP server: ftp://usgodae.org/pub/outgoing/argo

Operations of the www server

The US GDAC hosts an apache webserver that allows the users to download Argo data via standard tools such as wget. Similar to the FTP server, all Argo data is available for download.

In addition the US GDAC hosts the 'USGODAE Argo GDAC data browser' that allows for limited querying capabilities (time, area, dac, etc).

US GDAC HTTP server: http://usgodae.org/pub/outgoing/argo
Argo Data Browser: http://usgodae.org/cgi-bin/argo_select.pl

Data synchronization

The US GDAC synchronizes with the French GDAC once per day at 1015 UTC. The process involves downloading all of the index files from the French GDAC and

comparing them to the local US GDAC. After comparison, all necessary files are then downloaded and submitted normally into the US GDAC.

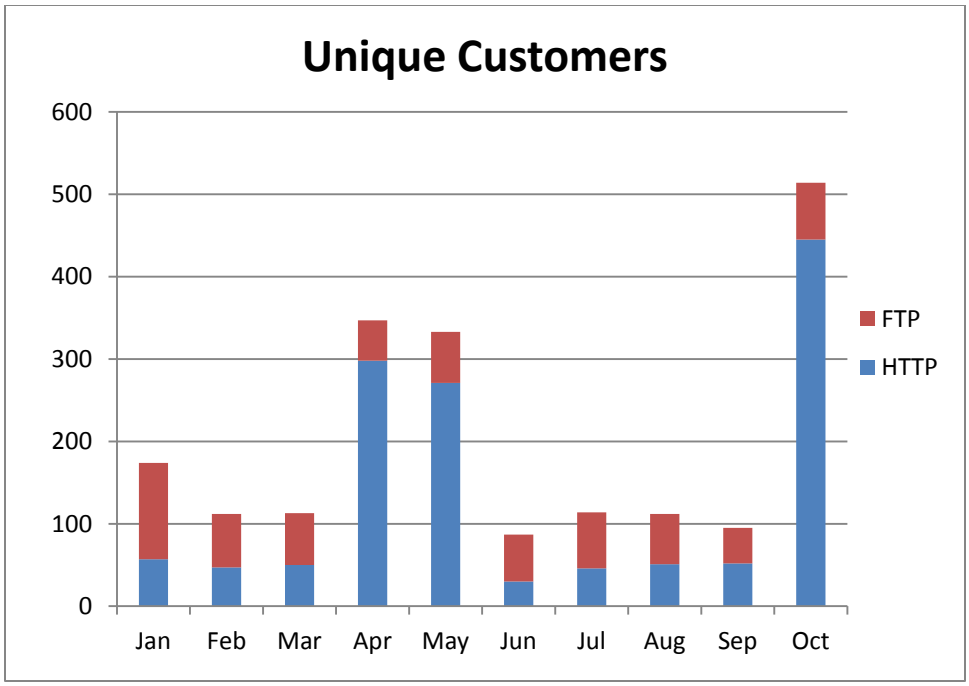
The typical synchronization takes approximately 15 minutes to complete each day. However, there are times when it takes much longer and we need to investigate. For example, on October 30th (yesterday), the synchronization took over 4 hours to complete. This was caused by a DAC submitting over 9000 files to the French GDAC, but not to the US GDAC. Thankfully, this is not really an issue, as after the job is performed the data is then available on both GDAC's.

Statistics of Argo data usage

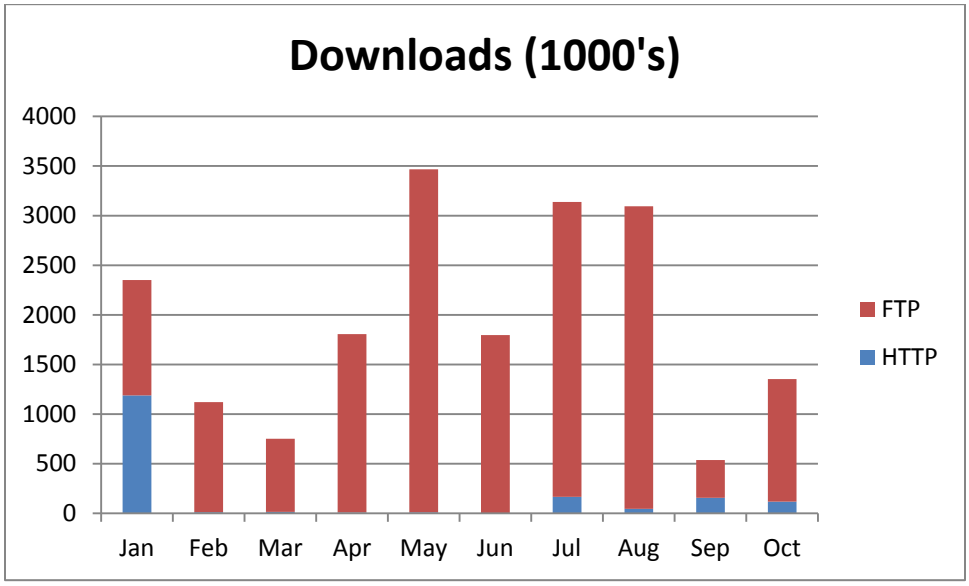
HTTP Statistics

Date	Unique IPs	Hits	Gigabytes
Jan 2014	57	1,189,284	189
Feb 2014	47	12,694	140
Mar 2014	50	14,633	260
Apr 2014	298	9,231	171
May 2014	271	9,971	193
Jun 2014	30	2,168	143
Jul 2014	46	166,474	347
Aug 2014	51	46,285	994
Sep 2014	52	156,677	305
Oct 2014	445	118,057	201

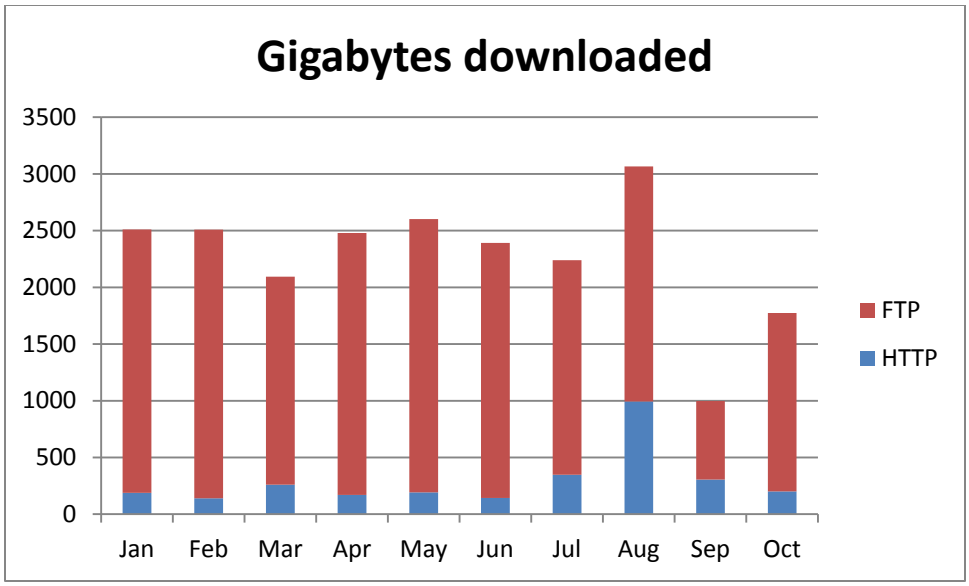
The following chart shows the unique customers downloading Argo data per month.



The following chart shows individual successful downloads in 1000's. One successful download would equate to one Argo file being downloaded, regardless of size.



The following charts shows how many gigabytes worth of Argo has been downloaded per month.



Visitors

The following list shows the countries that have downloaded Argo data from the US GDAC. Sadly, I don't have the statistics that illustrate the percentages.

Australia (AUS)
Belgium (BEL)
Brazil (BRA)
Canada (CAN)
Chile (CHL)
China (CHN)
Denmark (DNK)
Fiji (FJI)
France (FRA)
Germany (DEU)
Hong Kong (HKG)
India (IND)
Indonesia (IDN)
Italy (ITA)
Japan (JPN)
Korea Republic of (KOR)
Macau (MAC)
Malaysia (MYS)
Mexico (MEX)
Netherlands (NLD)
New Zealand (NZL)
Norway (NOR)
Poland (POL)
Puerto Rico (PRI)

Samoa (WSM)
South Africa (ZAF)
Spain (ESP)
Switzerland (CHE)
Taiwan; Republic of China (ROC) (TWN)
United Kingdom (GBR)
United States (USA)

Issue(s)

On April 10th, 2014 the US GDAC was affectively removed from the network from approximately 0300PST until 1400PST due to a perceived vulnerability.

Argo Data Management Team #15 Meeting

Report by JCOMMOPS/Argo Information Centre,
M. Belbéoch,
Nov. 2014

This document provides a report on the development of the Argo program, from the data and metadata flow perspective. ADMT members are invited to feedback and keep a number of actions in mind.

⇨ Proposed Actions to follow up

1. Network Growth

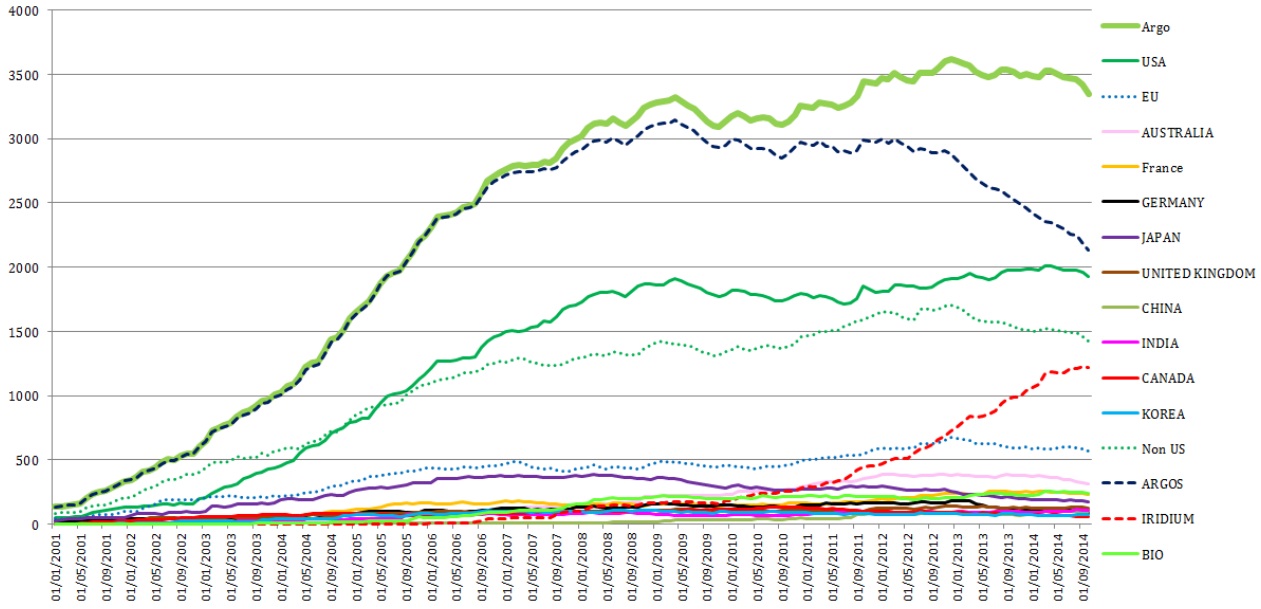


FIGURE 1: GROWTH OF MAIN NATIONAL CONTRIBUTIONS AND OTHER ARGO NETWORKS

The number of floats providing data at GDACs is above the initial design target (3200), but has been regularly decreasing in the last months. This trend is observed on most of national contributions except on USA. To note that Argo China is about to release 130 float data at GDACs after a strong effort of national cooperation.
The Iridium telecommunication system will be soon dominant in the Argo fleet.
The BioArgo network is progressing, but very slowly since 2008.
Argo GDACs will serve soon 1 million of DM high quality profiles.

With 1.3 million profiles available, Argo has covered most areas of the ocean. Un-sampled zones remain near Mexico, Galapagos, Angola basin, in some marginal seas (Caribbean, Indonesian) and very high latitudes.

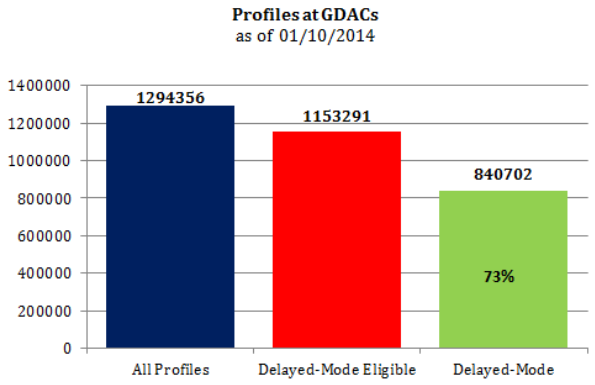


FIGURE 2: RT, DM ELIGIBLE, DM PROFILES AVAILABLE AT GDACS

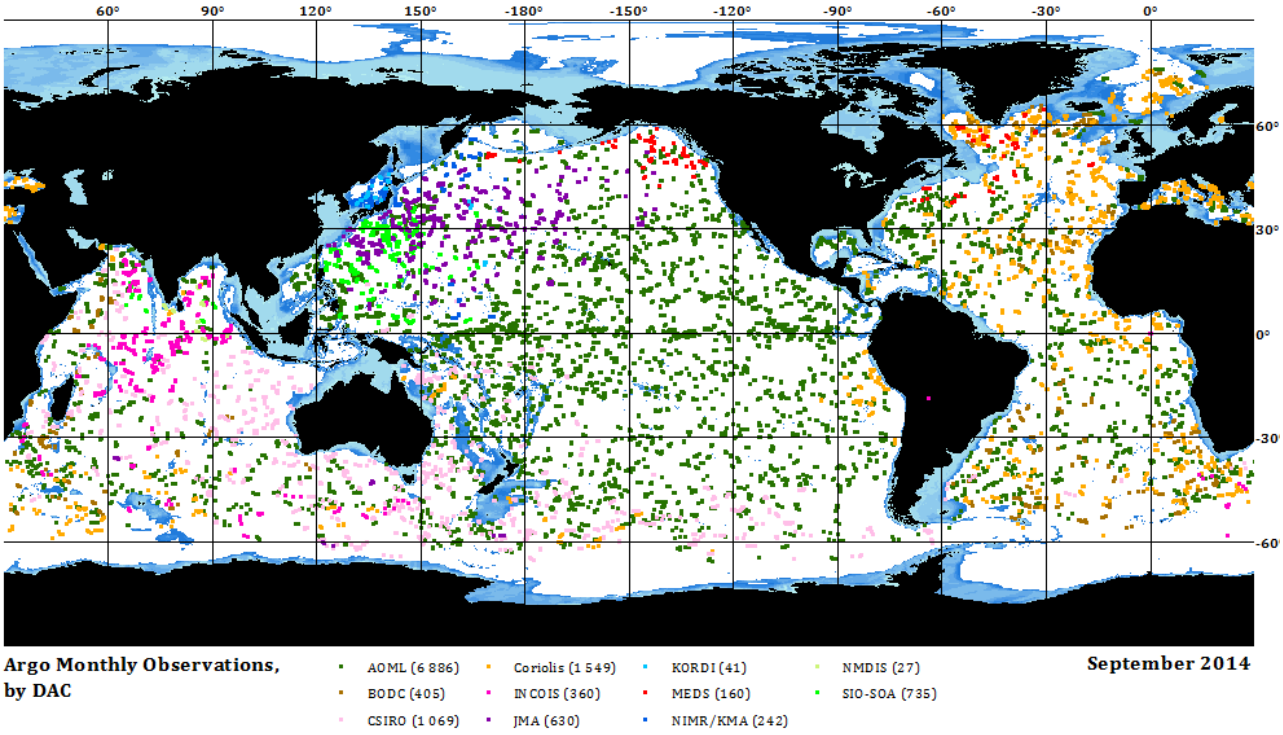


FIGURE 3: 09/2014 PROFILES

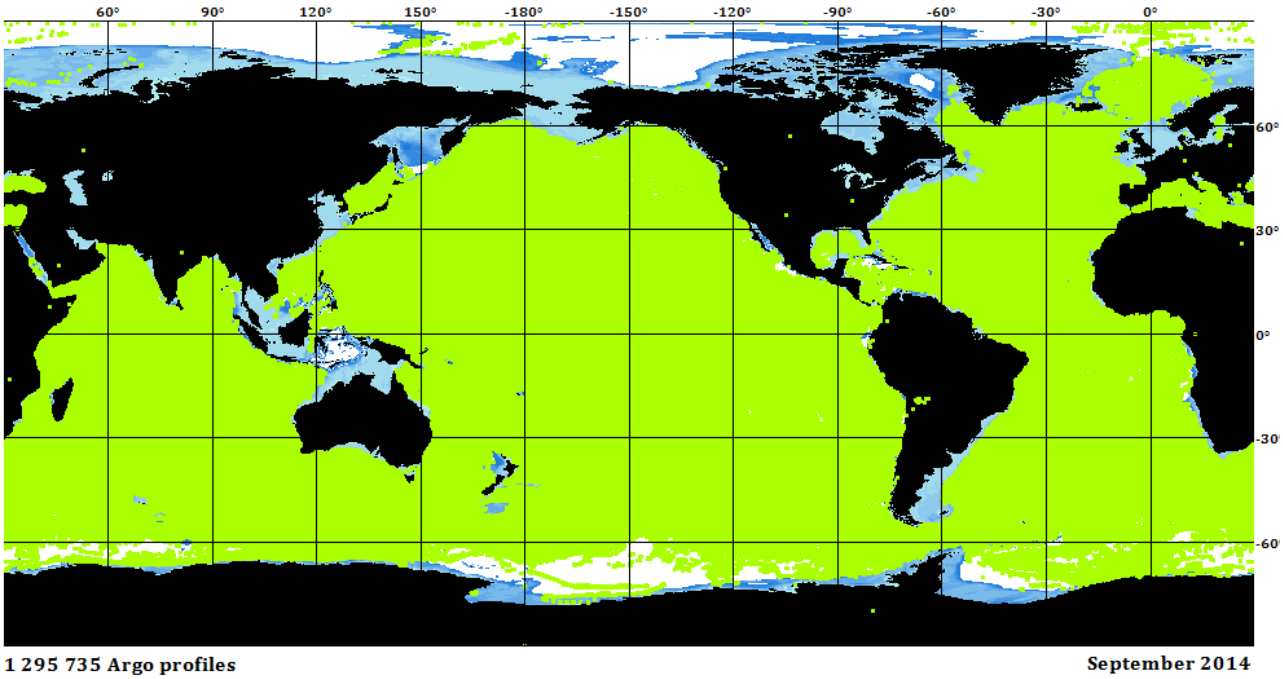


FIGURE 4: ALL PROFILES AS OF 09/2014

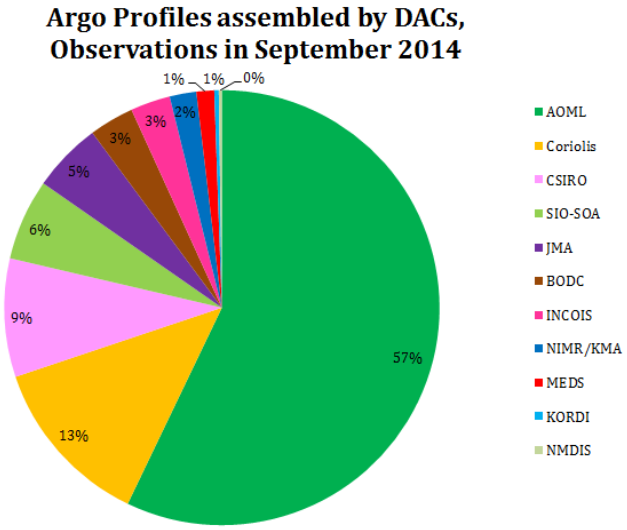


FIGURE 5: SEPT. 2014 OBS DISTRIBUTION BY DACS

DAC	OBS	FLOATS
AOML	6956	1985
Coriolis	1550	441
CSIRO	1072	324
SIO-SOA	735	90
JMA	630	181
BODC	405	143
INCOIS	360	112
NIMR/KMA	242	59
MEDS	160	61
KORDI	41	14
NMDIS	27	9
TOTAL	12178	3419

TABLE 1: SEPT. 2014 OBS/FLOATS BY DACS

2. Network Distribution

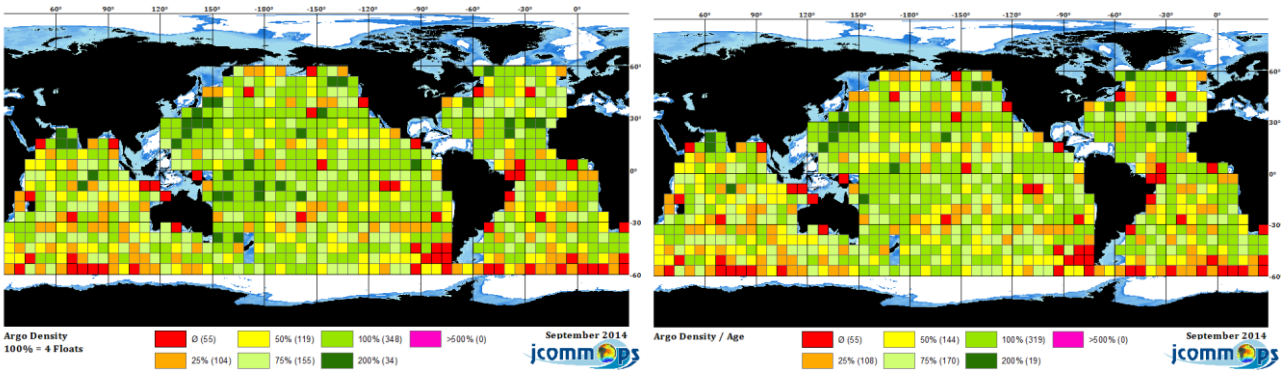


FIGURE 6, 7: PERCENT OF INITIAL ARGO DESIGN ACHIEVED IN SEPTEMBER 2014

Many Argo groups produce sparseness maps, according to different criteria, time windows, etc. While main gaps are identified more or less similarly in each of these maps, it could be interesting to share them more widely and routinely.

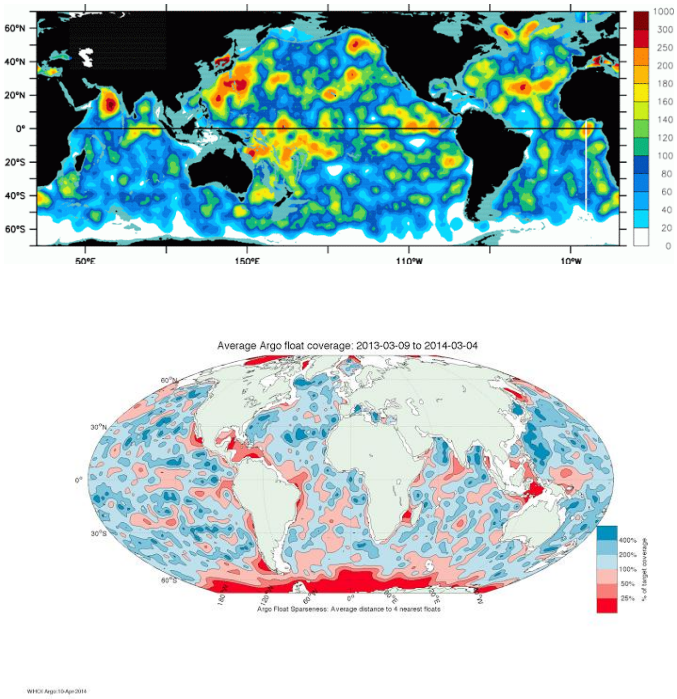


FIGURE 8, 9: SIO, WHOI MAPS TO GUIDE DEPLYMENT PLANNING

⇨ *DACs and PIs producing maps to set up and maintain a web service, or either update data routinely on the web in netCDF format (or other "standard" format), so that web services can be set up by the AIC (and API) and information consumed widely.*

3. Deployment Planning

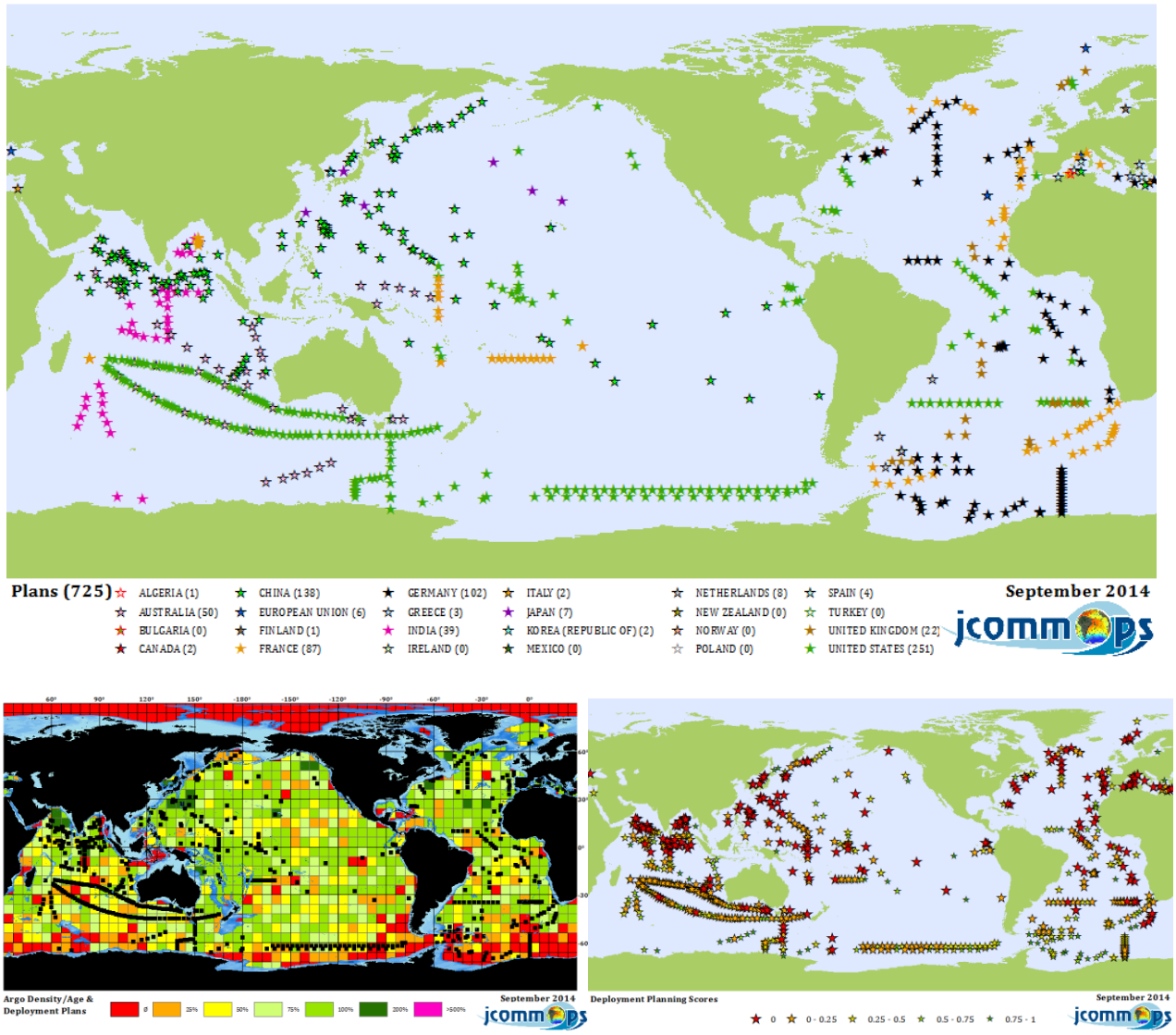


FIGURE 10,11,12: ARGO DEPLOYMENT PLANNING

In 2014, 45 different active Argo "Programs" (amongst 108), within 30 countries (including European Union) are deploying floats. The use of appropriate program and country is not a minor issue. It impacts statistics and bilateral/multilateral responsibilities.

⇨ As specific attribute should be added (e. g. PROGRAM, JCOMMOPS_PROGRAM) to clarify this in metadata or use the existing PROJECT_NAME accordingly.

Cooperation between these groups with regard to planning is crucial to optimize network distribution, share deployment opportunities, and avoid overlapping initiatives.
Every year different teams target the same deployment areas and learn it at the last moment or too late because plans are not registered at the AIC.

The AIC suggests planning deployments as follow, through a standard and simple format maintained on ftp.jcommops.org/Argo/PLANS/ for each Argo group, and updated gradually. Planning is maintained by one "Deployment Manager" in each program. Same contact point can take care of different Argo programs.

DRAFT PLANNING

ID (any); WMO;**LAT;LON,DATE**;SHIP;CRUISE;STATUS (STATUS=0, probable plan)

ID (any); WMO;**LAT;LON,DATE;SHIP;CRUISE**;STATUS (STATUS=1, ship/cruise identified)

ID (any); **WMO**;**LAT;LON,DATE;SHIP;CRUISE**;STATUS (STATUS=2, plan confirmed)

NOTIFICATION

It is recalled that each Argo Program takes the responsibility to notify the deployment of floats via the AIC, to IOC Member States (Argo National Focal Points). Depending on location, national policies, bilateral issues, deployment outside high seas may require some authorizations.
This remark is also valid for equivalent contributions that arrive years after in the system.

- ⇨ Notification should happen BEFORE any data distribution
- ⇨ Notify deployment failures as well
- ⇨ Notify redeployments after recovery (preferably with a new WMO ID)

When the plan is confirmed (STATUS=2), deployment plans can be notified via the AIC with more metadata:

- Manually on-line (operational)
- Submitting metadata in US metafile format (semi operational)
- Submitting metadata in standard V3 Argo netCDF format (not yet operational)

- ⇨ All Argo groups to maintain a draft plan text file
- ⇨ AIC to develop V3 metadata file parsing/loading
- ⇨ AIC mandatory metadata = metadata file mandatory attributes

4. Delays

DEFINITIONS

DATE_OBS: from netCDF file
DATE_UPDATE: from netCDF file (updated at each resubmission)
DATE_CREATION_GDAC: First time file is available on GDAC FTP (never updated)
DATE_UPDATE_GDAC: (updated at each resubmission)

DELAY = DATE_CREATION_GDAC - DATE_OBS = total delay
DELAY2 = DATE_UPDATE_GDAC – DATE_UPDATE = delay added by DAC to GDAC transfer?

SUMMARY

Since the audit made late 2012 by the AIC and DACs on real-time data management practices, the delays have substantially improved. There is however room for improvement for a few DACs, and in particular to process iridium floats earlier. The delay introduced by the GDAC might be as well improved.

Almost 90 % of profiles reach now the GDACs within the 24h target, with a median time of 12h.
Today GDACs distribute more data (in volume) in real-time (<24h) than GTS.
However the percentage of GTS data published in real-time is still higher, mainly because GDACs accept data after the 30 days limit for GTS.

Beyond the temporary processing of new floats or equivalent contributions, most of DACs have an average delay below 24h. The longer you wait to check this metric, the higher it will be as many profiles will be published with large delays, sometimes more than a year after observation.

For a number of DACs, we can see clearly a distribution in two cycles which show that a large part of the fleet is still using Argos system with a ~12 hours surface time impacting the delays or maybe an issue with GDAC (profiles arrive via synchronization, not directly).

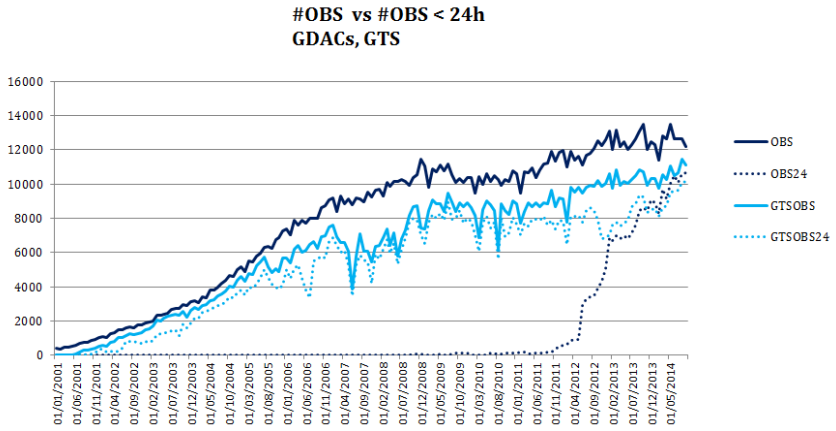


FIGURE 13: GROWTH OF PROFILE DISTRIBUTION GDACS/GTS

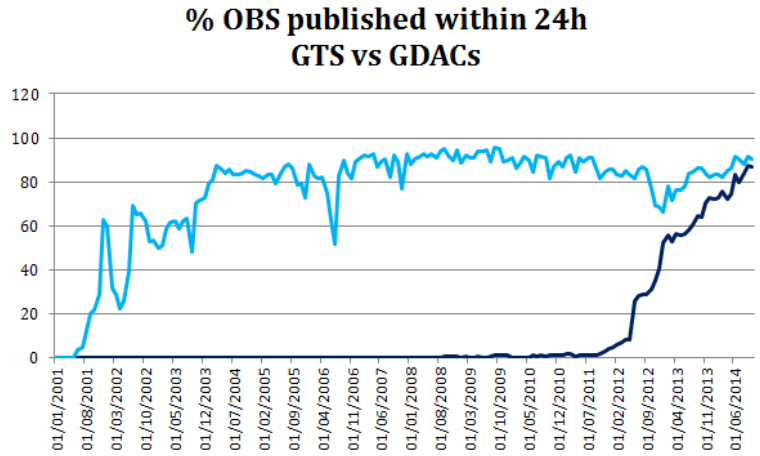


FIGURE 14: EVOLUTION OF % OF DATA PUBLISHED WITHIN 24H

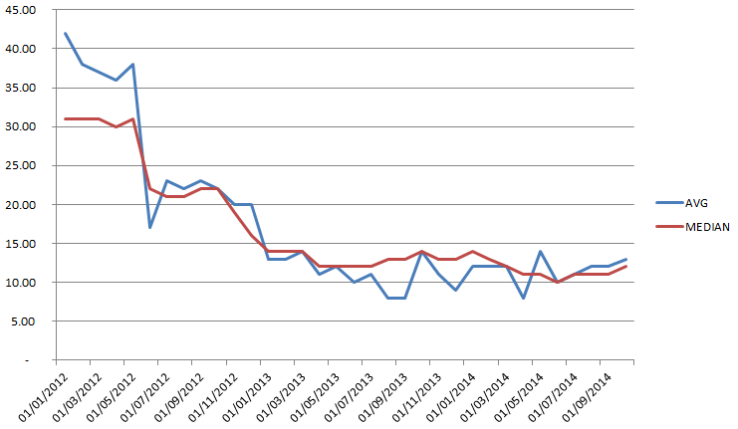
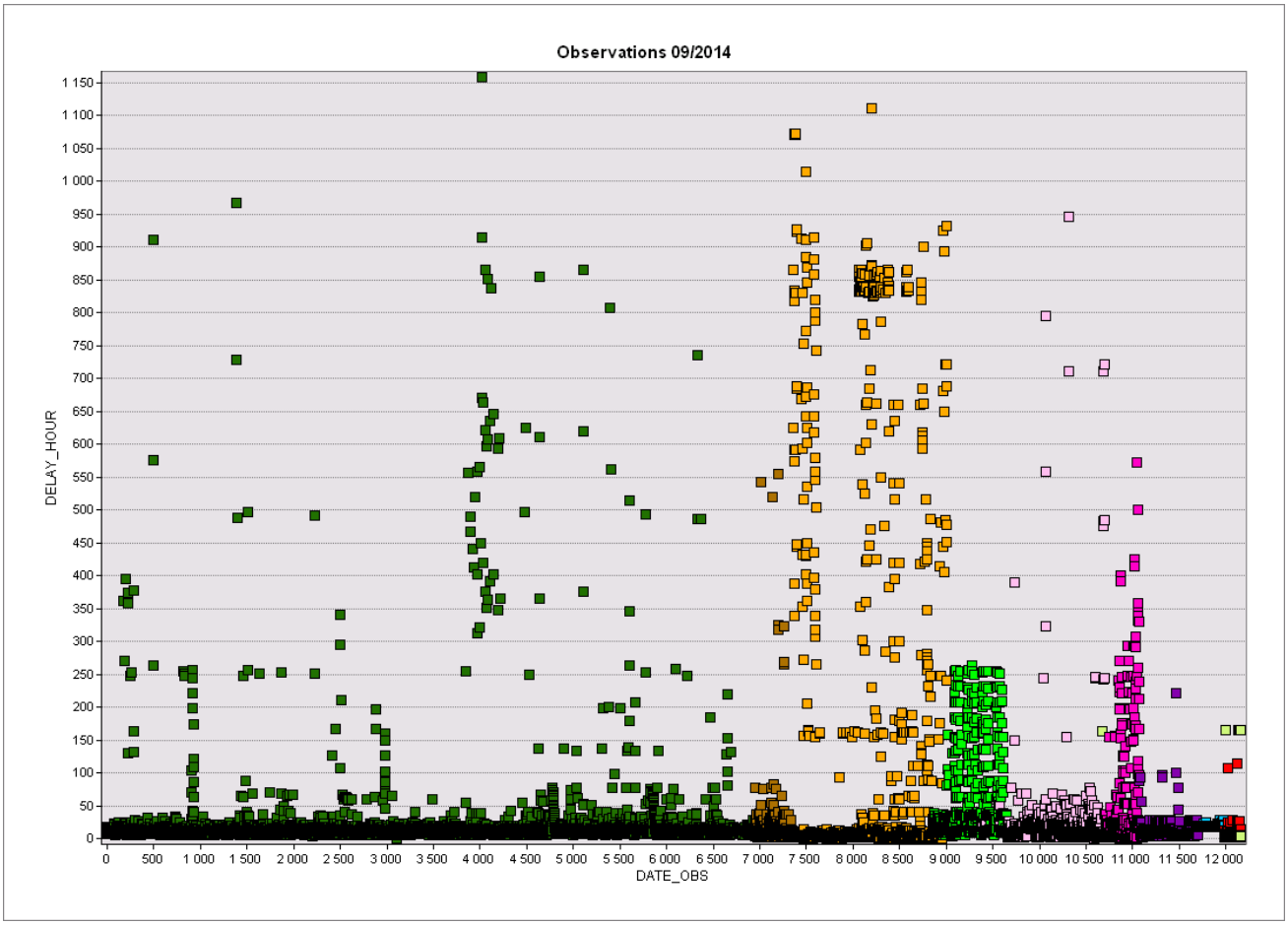


FIGURE 15: EVOLUTION OF AVG AND MEDIAN DELAYS (DELAYS > 100 H EXCLUDED)

The information required to calculate delays at GDACs is not available or reliable before early 2012.



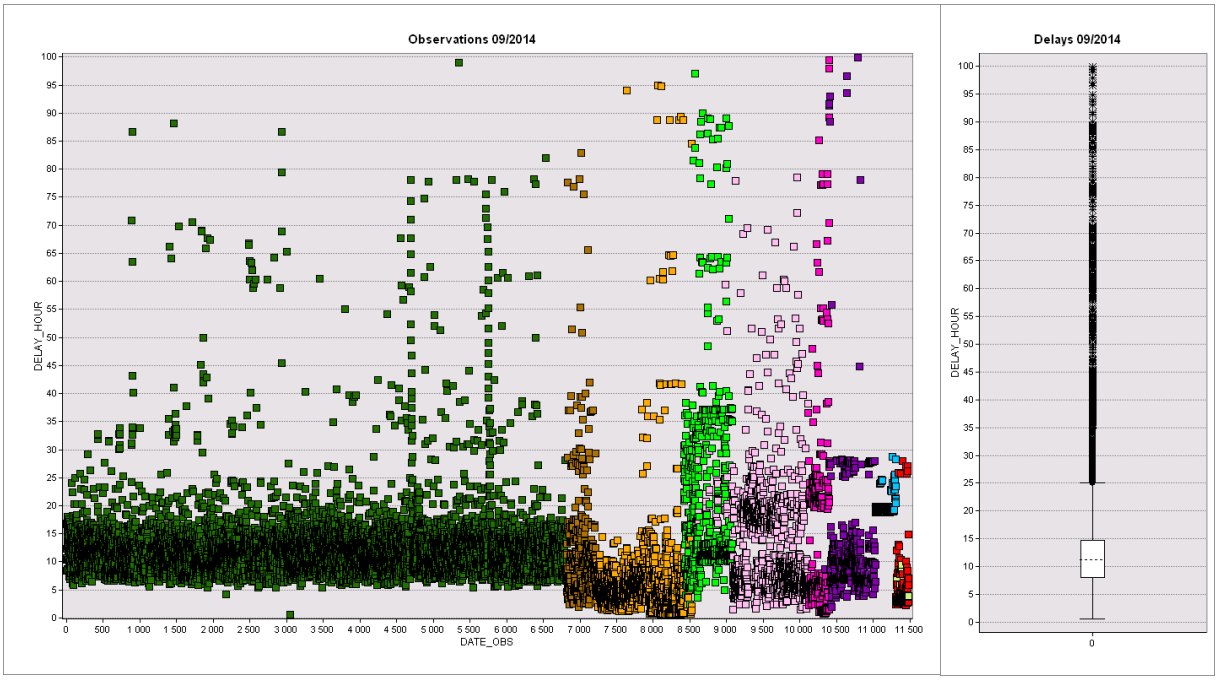


FIGURE 16, 17, 18: (OBS-GDACS) DELAYS 09/2014 & ZOOM ON DELAYS<100

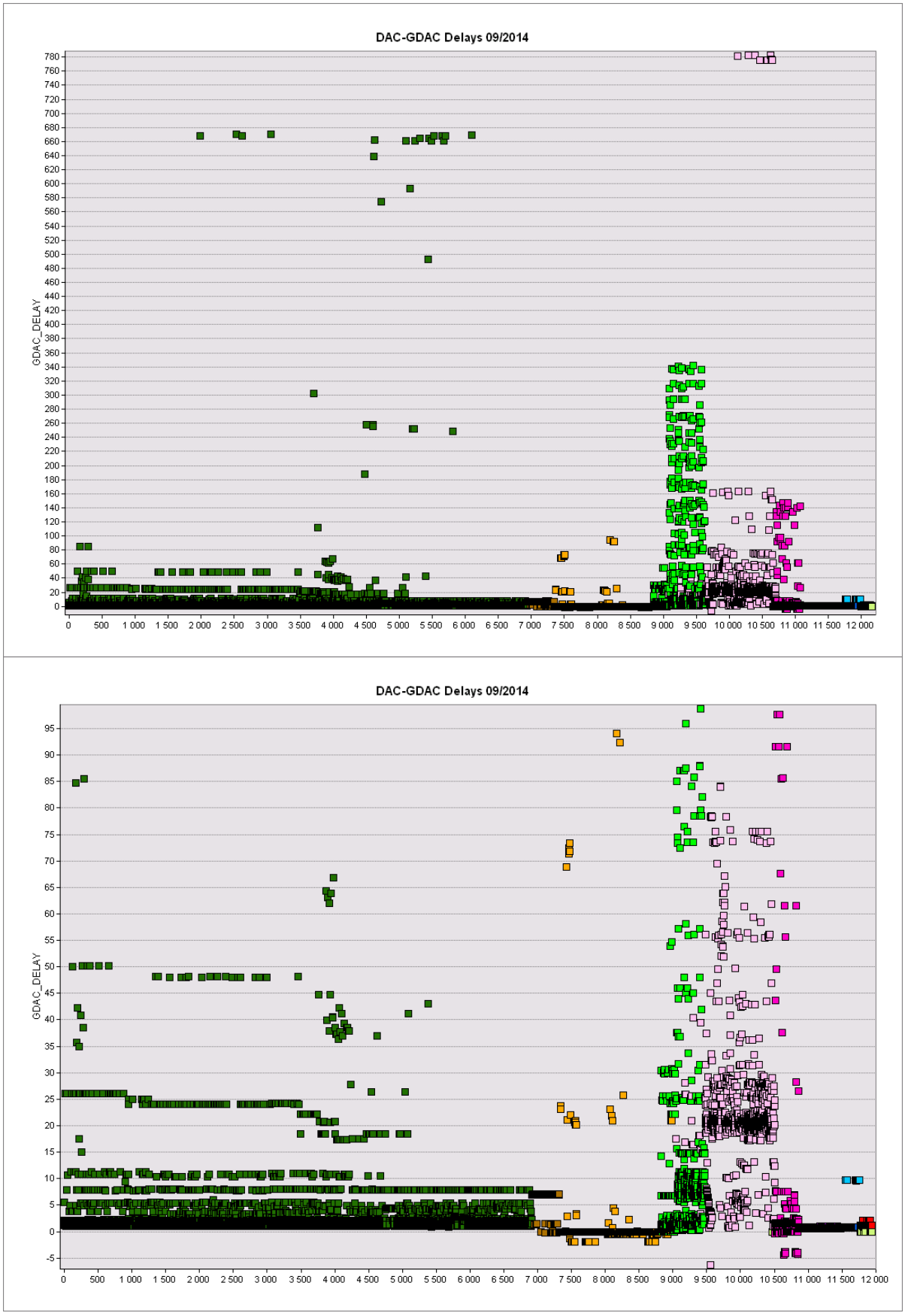


FIGURE 19, 20: DELAYS 09/2014 & ZOOM ON DELAYS<100 ("DELAY2")

DETAILS by DAC

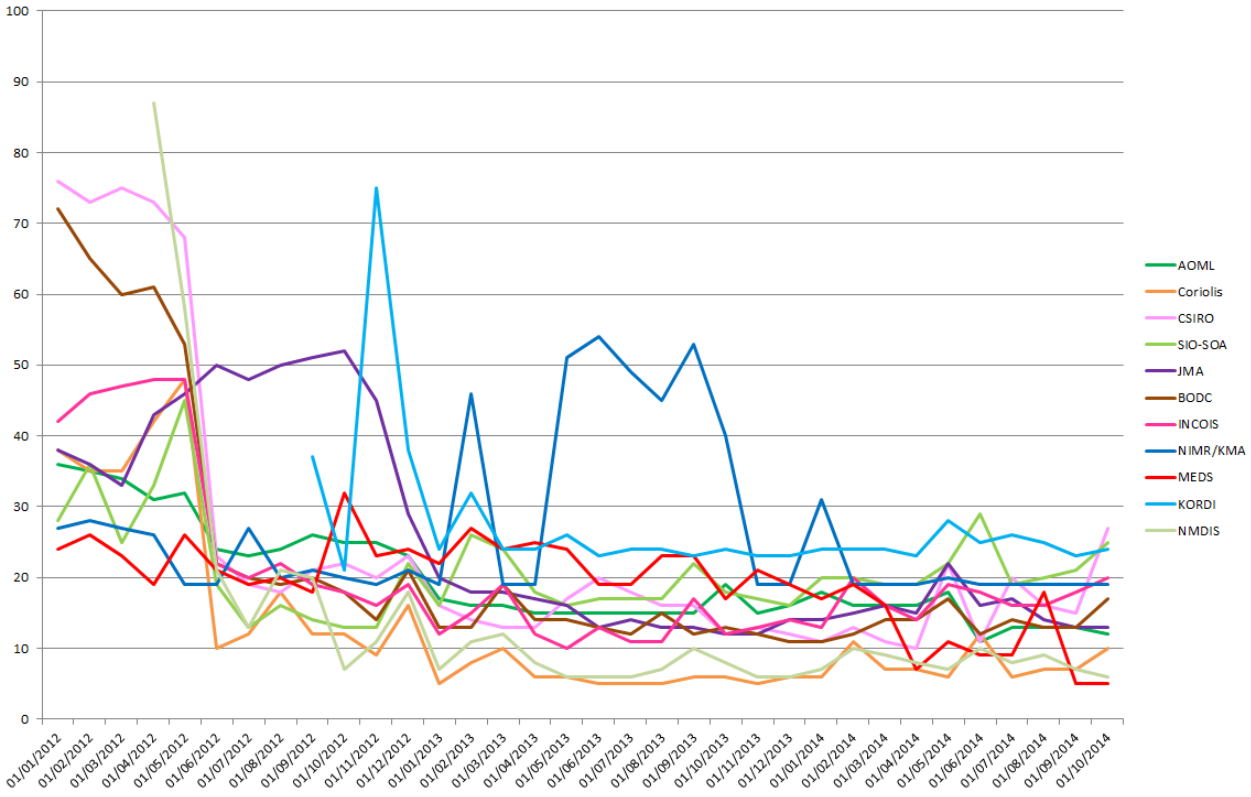


FIGURE 21: EVOLUTION OF AVG DELAYS (DELAYS > 100 H EXCLUDED)

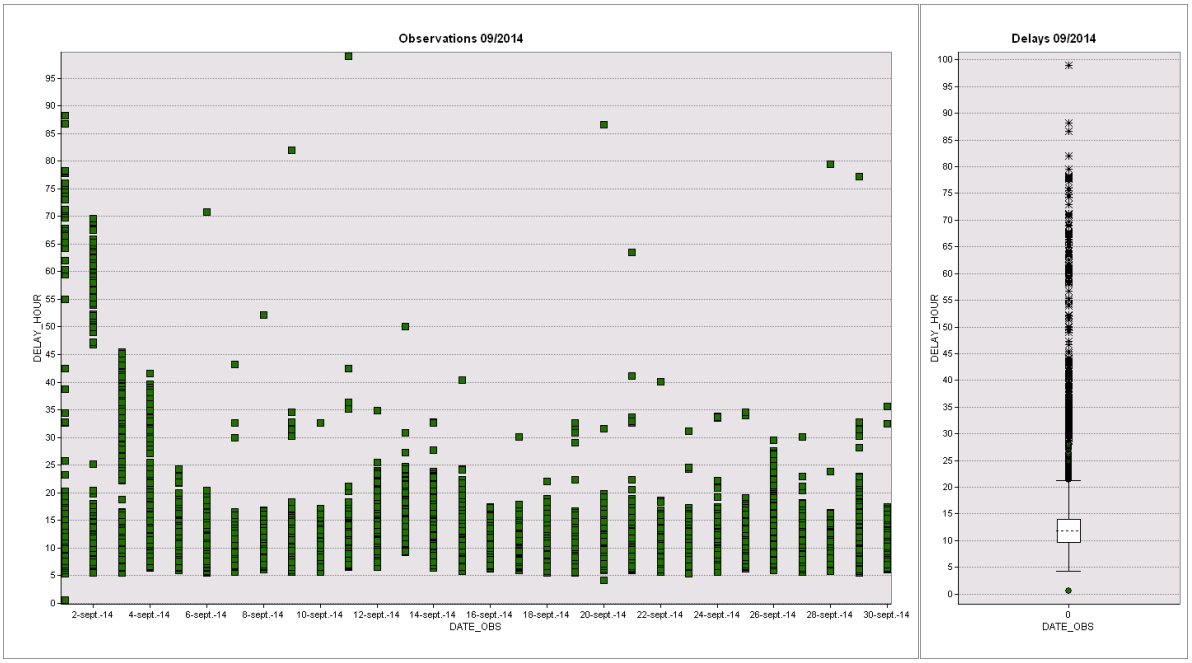


FIGURE 22, 23: AOML DELAYS 09/2014

Some delays for Iridium floats could certainly be improved.

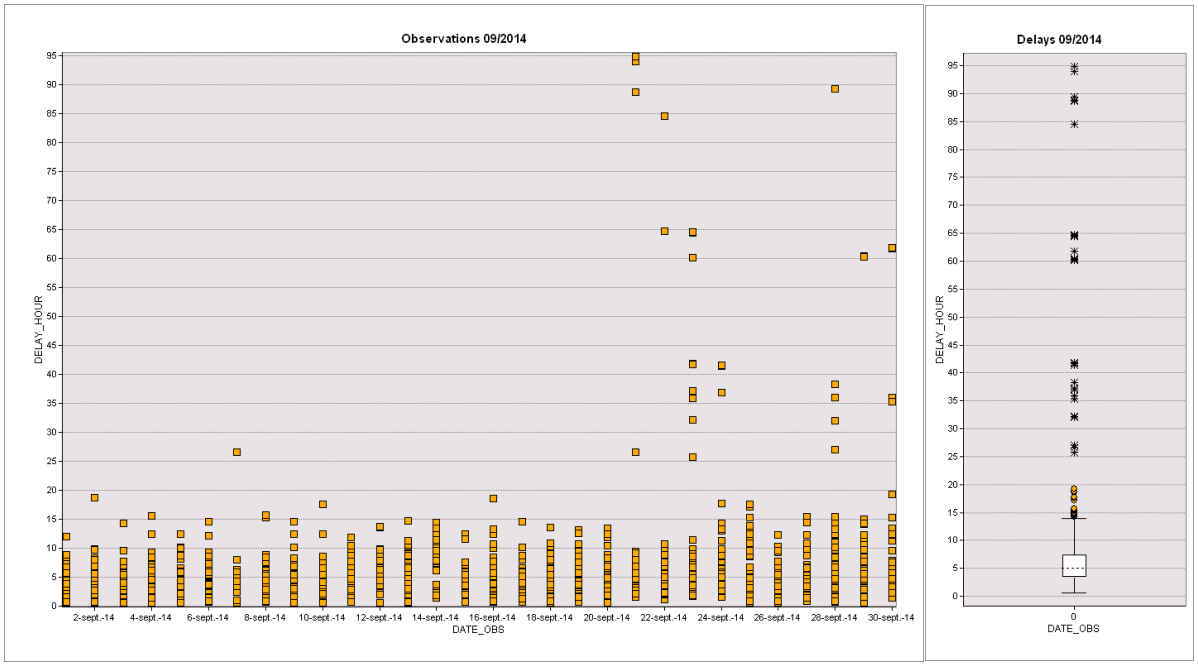


FIGURE 24, 25: CORIOLIS DELAYS 09/2014

How these delays can be so low with 80% Argos floats?
This can be ex partially by negative delays (GDAC_CREATION_DATE – DATE_UPDATE).

⇨ To check further

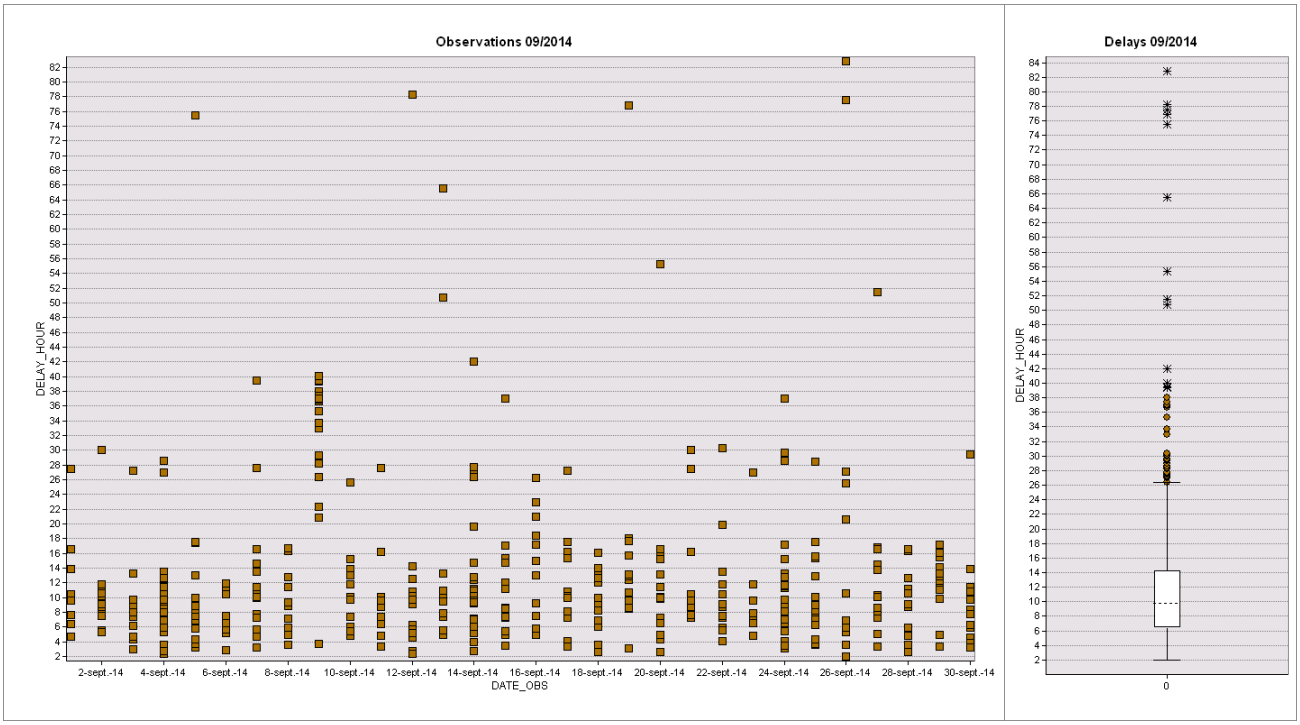


FIGURE 26, 27: BODC DELAYS 09/2014

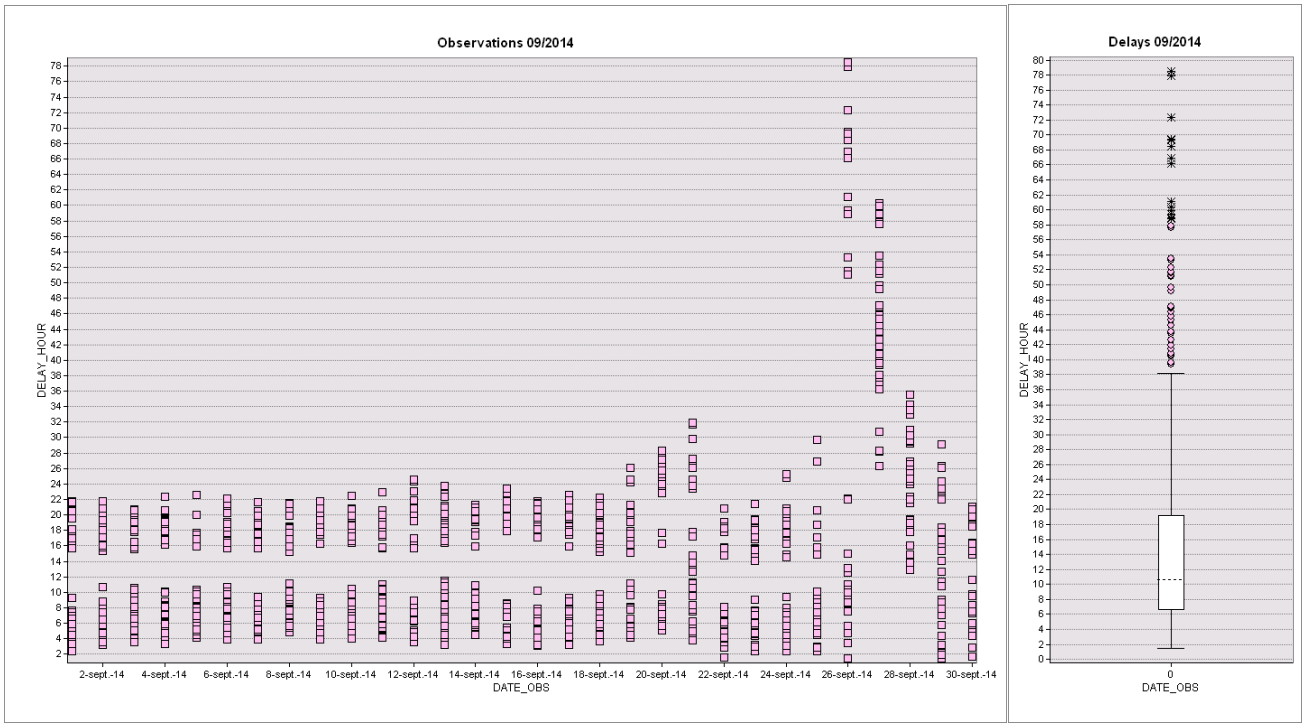


FIGURE 28, 29: CSIRO DELAYS 09/2014

The two steps distribution appearing on the plot may be explained by i) the rather equal share Argos/Iridium float and ii) some additional delay added at GDAC level, and data appearing only after GDAC synchronization.

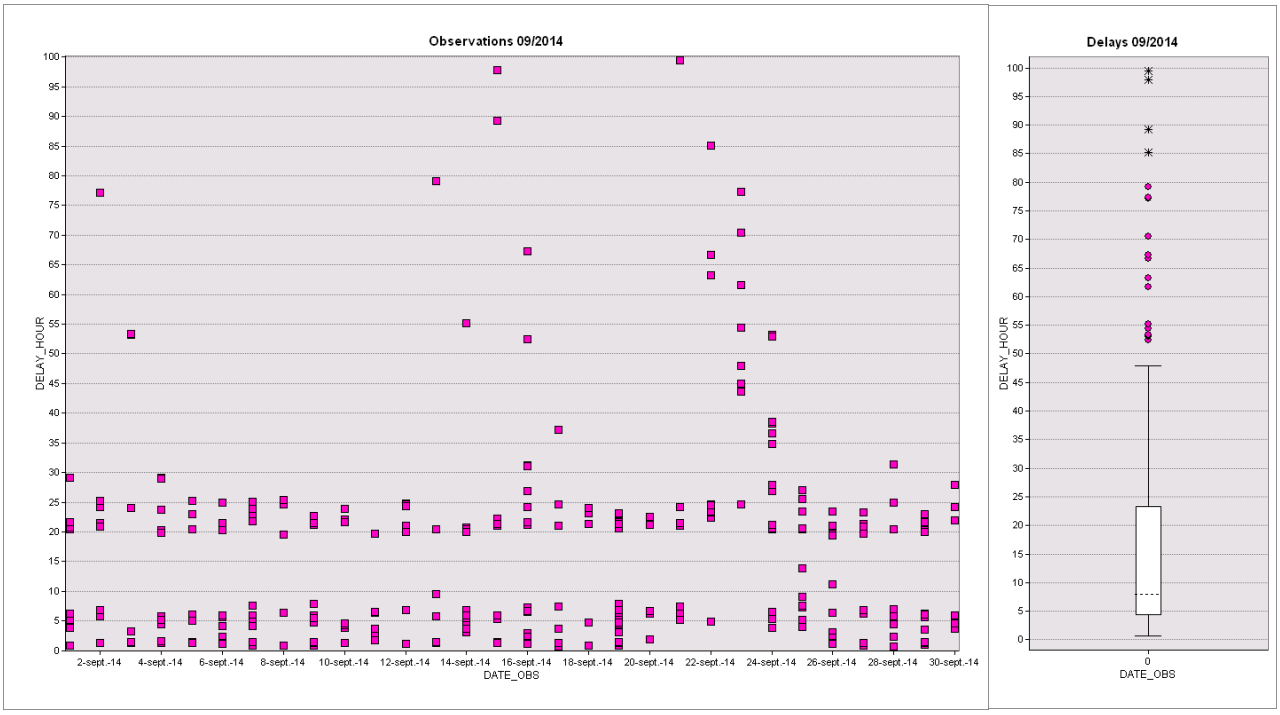


FIGURE 30, 31: INCOIS DELAYS 09/2014

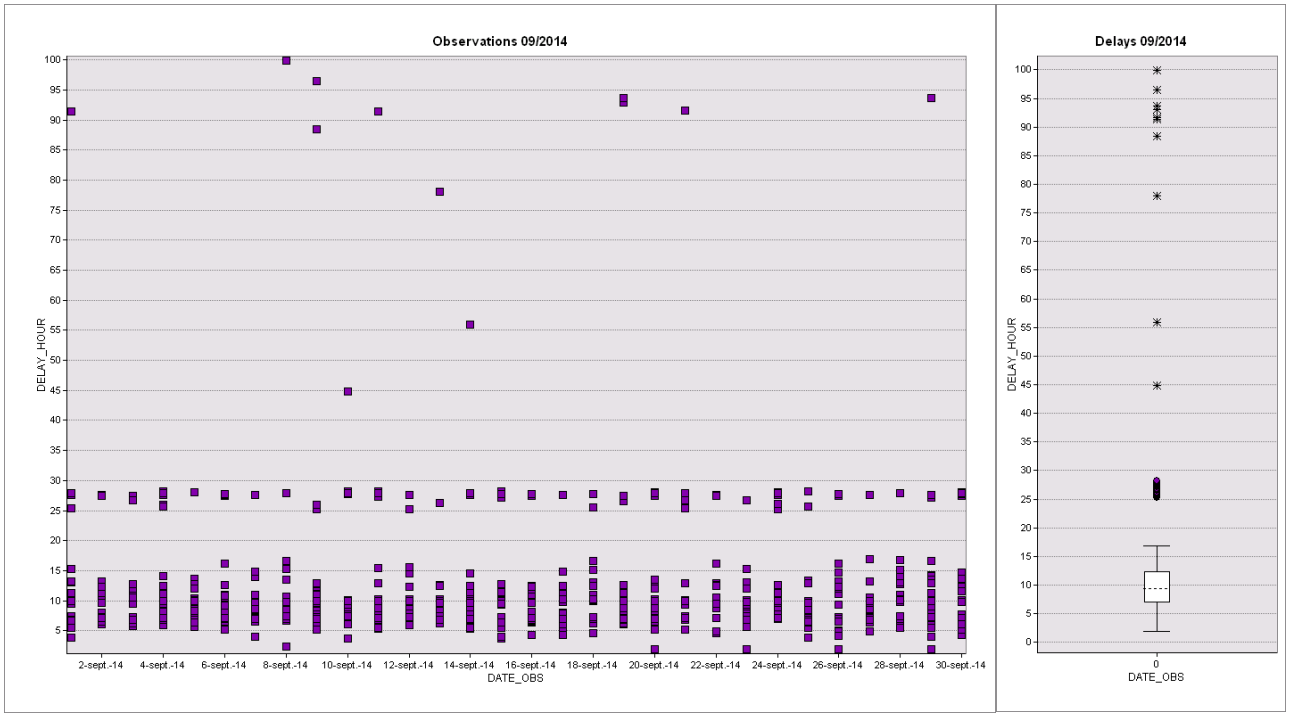


FIGURE 32, 33: JMA DELAYS 09/2014

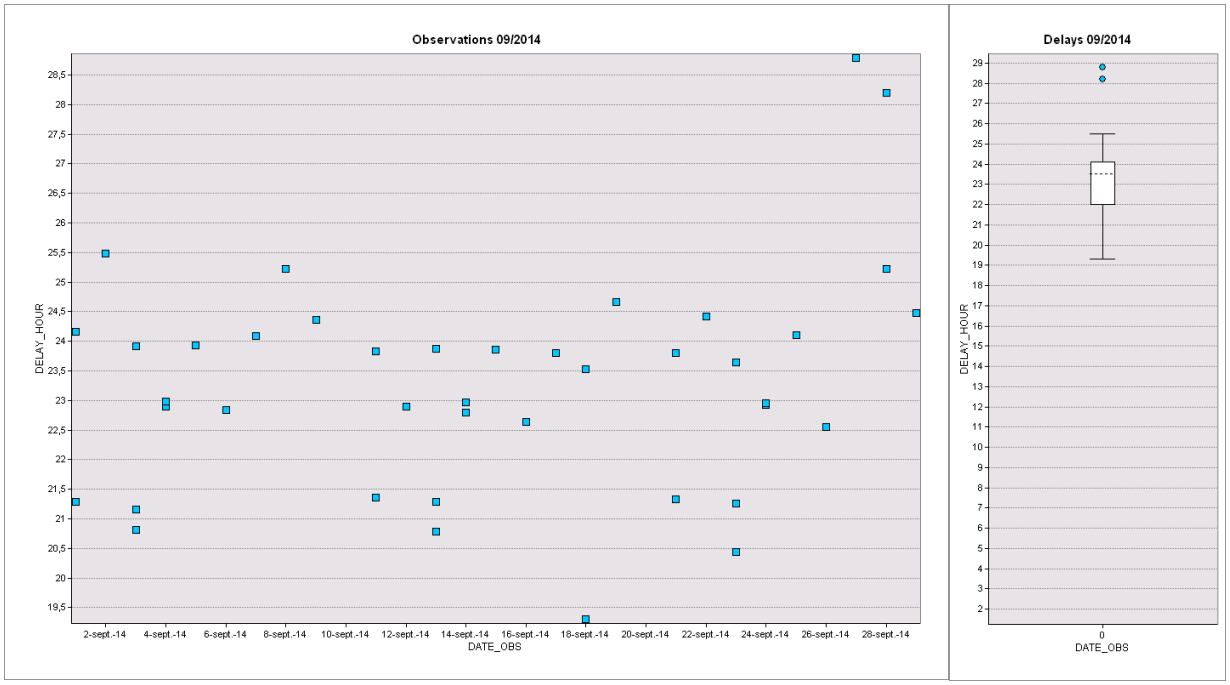


FIGURE 34, 35: KORDI DELAYS 09/2014

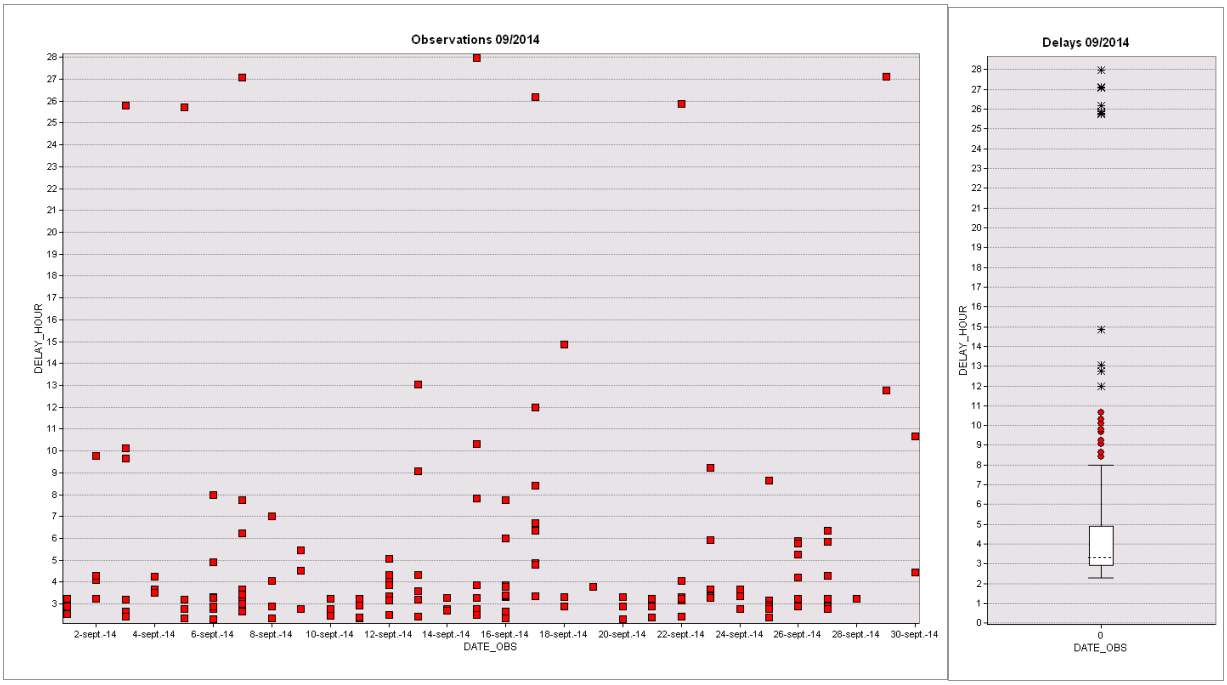


FIGURE 36, 37: MEDS DELAYS 09/2014

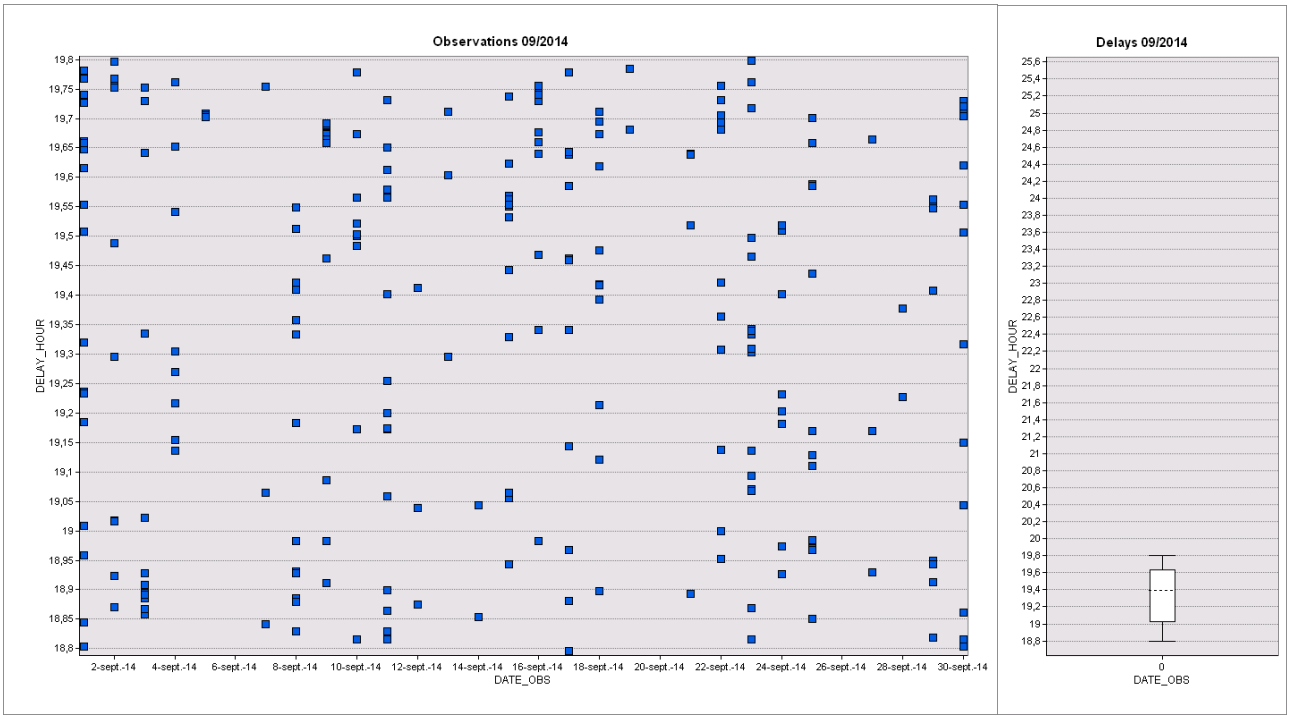


FIGURE 38, 39: NIMR/KMA DELAYS 09/2014

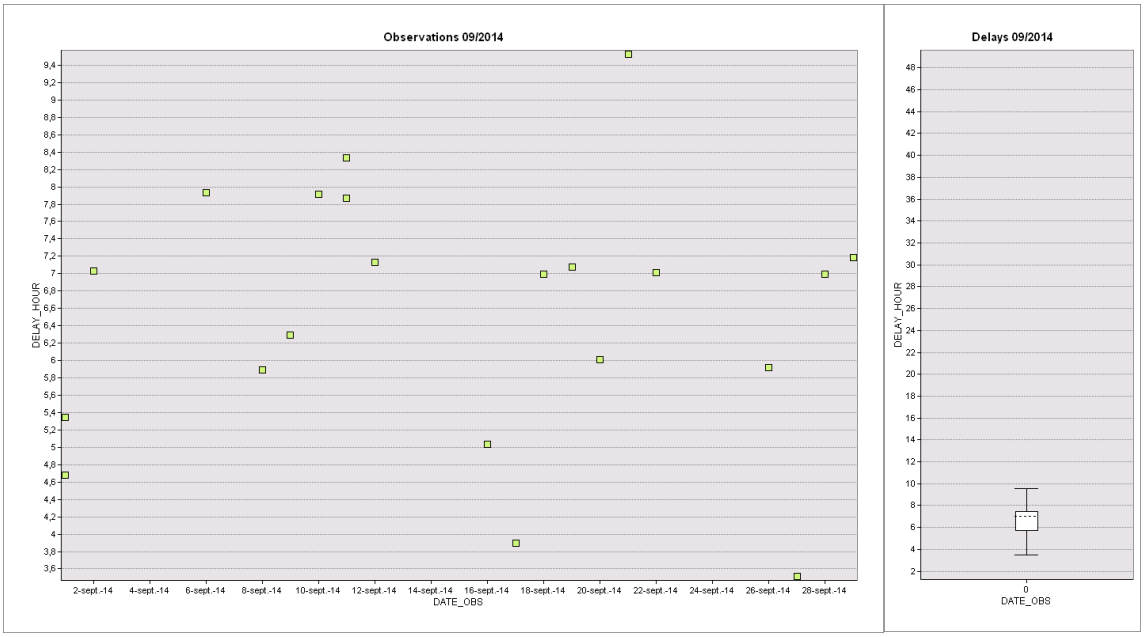


FIGURE 40, 41: NMDIS DELAYS 09/2014

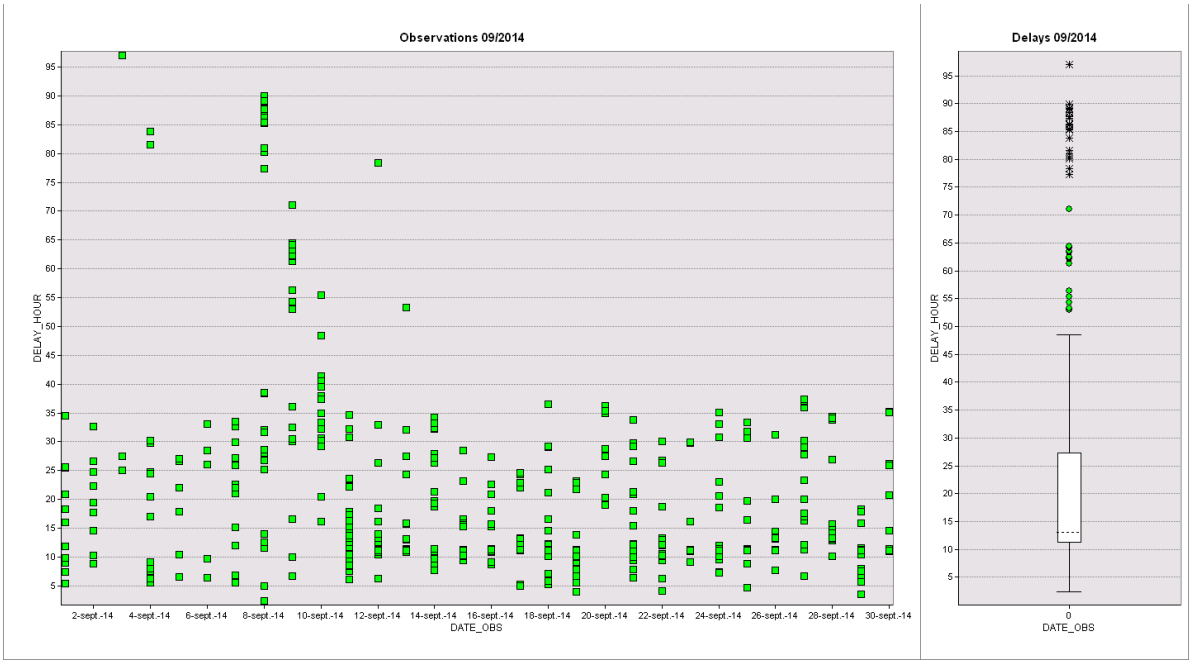


FIGURE 42, 43: SIO-SOA DELAYS 09/2014

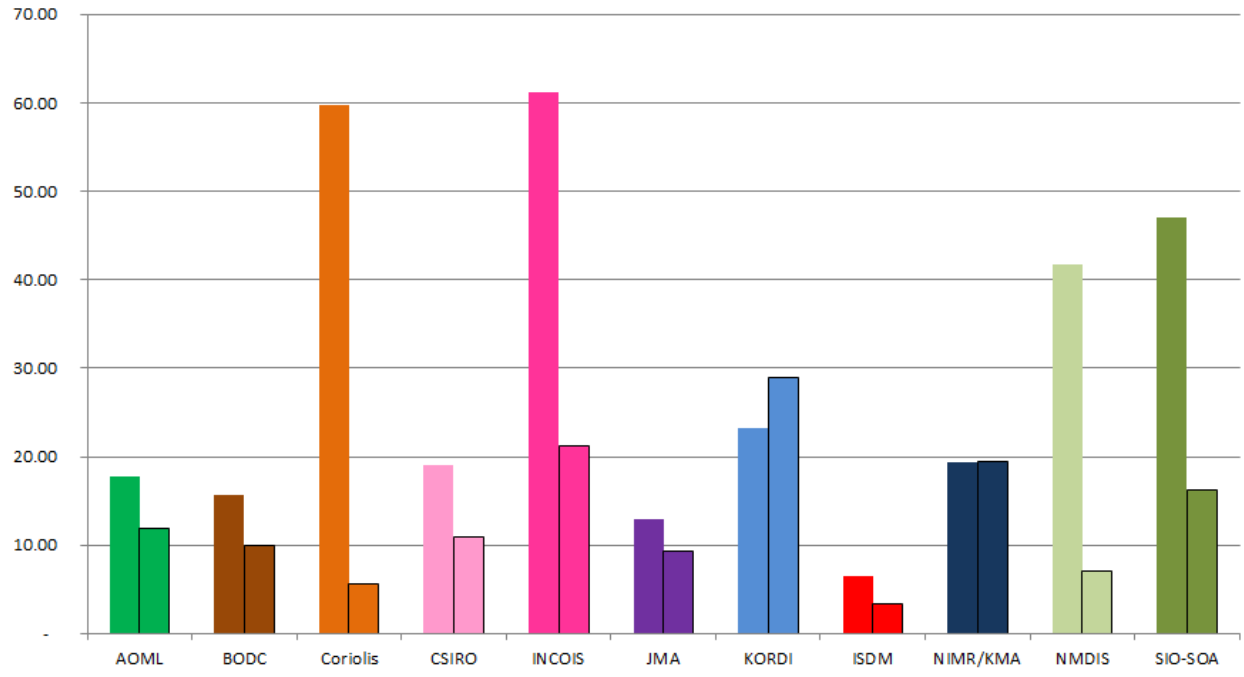


FIGURE 44: AVG AND MEDIAN DELAYS (HOURS), AS OF 09/2014

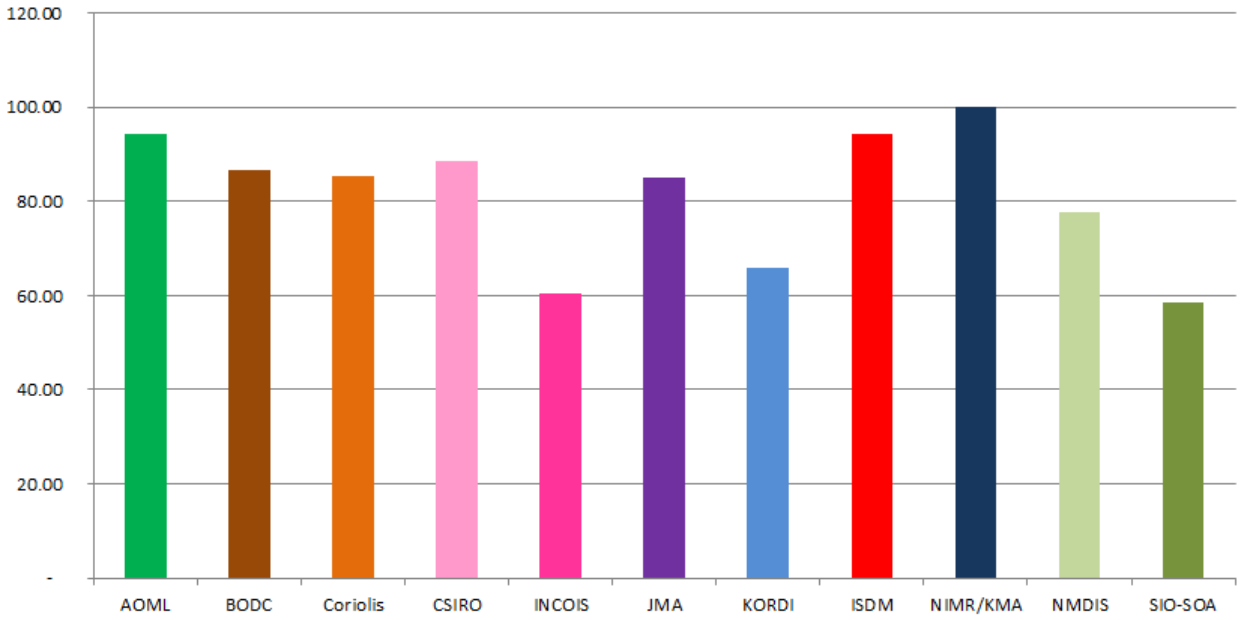
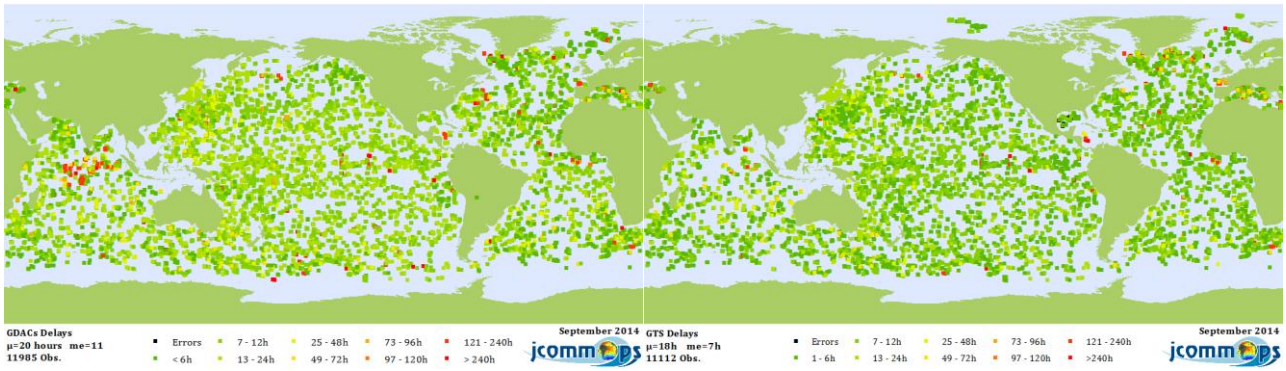


FIGURE 45: % PROFILES PUBLISHED WITHIN 24H

DAC	AVG (h)	MEDIAN	#OBS 24h	#OBS	% 24h	Delays <0 (Errors)
AOML	17.70	11.957	6546	6932	94.43	15
BODC	15.75	9.907	346	400	86.50	
Coriolis	59.68	5.6	1238	1453	85.20	6
CSIRO	19.09	10.959	945	1067	88.57	
INCOIS	61.15	21.192	218	360	60.56	
JMA	12.89	9.35	536	630	85.08	
KORDI	23.29	29	27	41	65.85	
ISDM	6.57	3.32	151	160	94.38	
NIMR/KMA	19.34	19.397	242	242	100.00	
NMDIS	41.71	7.079	21	27	77.78	
SIO-SOA	47.09	16.2875	429	734	58.45	
ALL	35.90	11.5	10699	12046	88.82	21

TABLE 2: DELAYS FOR DACS 09/2014



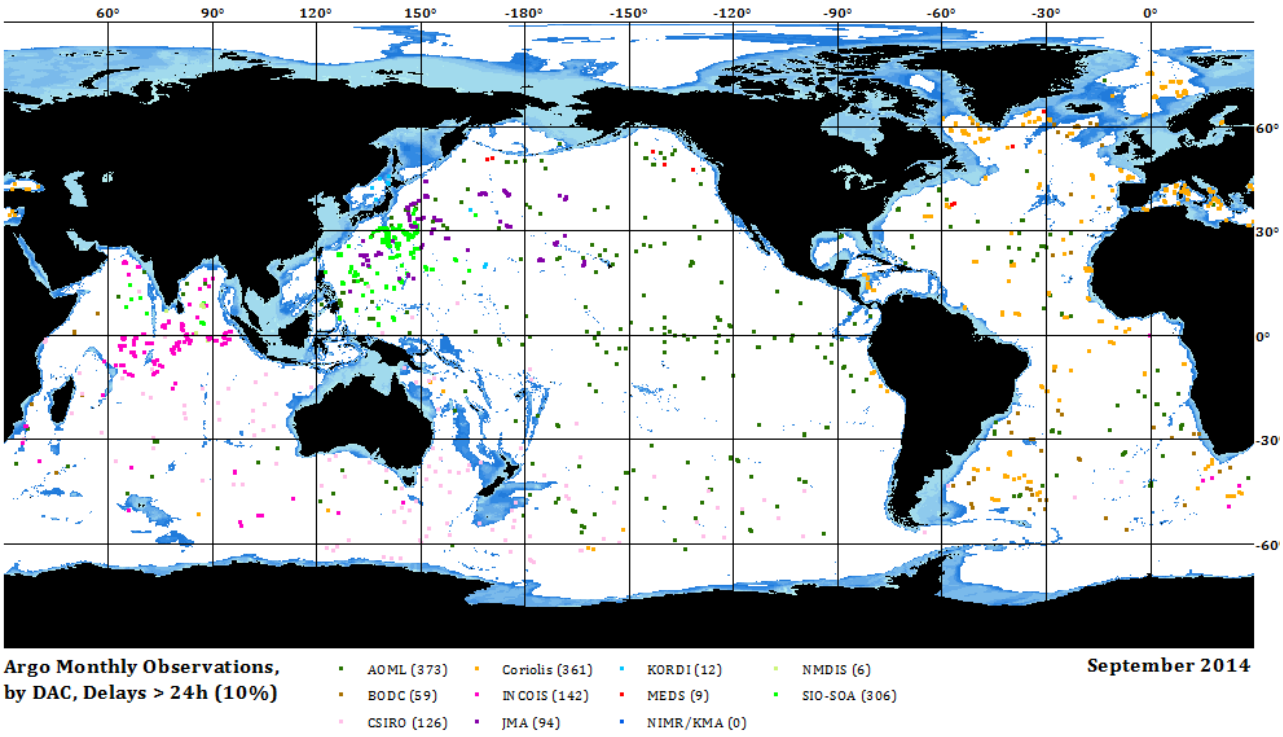


FIG 46, 47, 48: GEOGRAPHICAL DISTRIBUTION OF DELAYS GDACS, GTS, ZOOM ON DELAYS > 24H

5. DM Processing

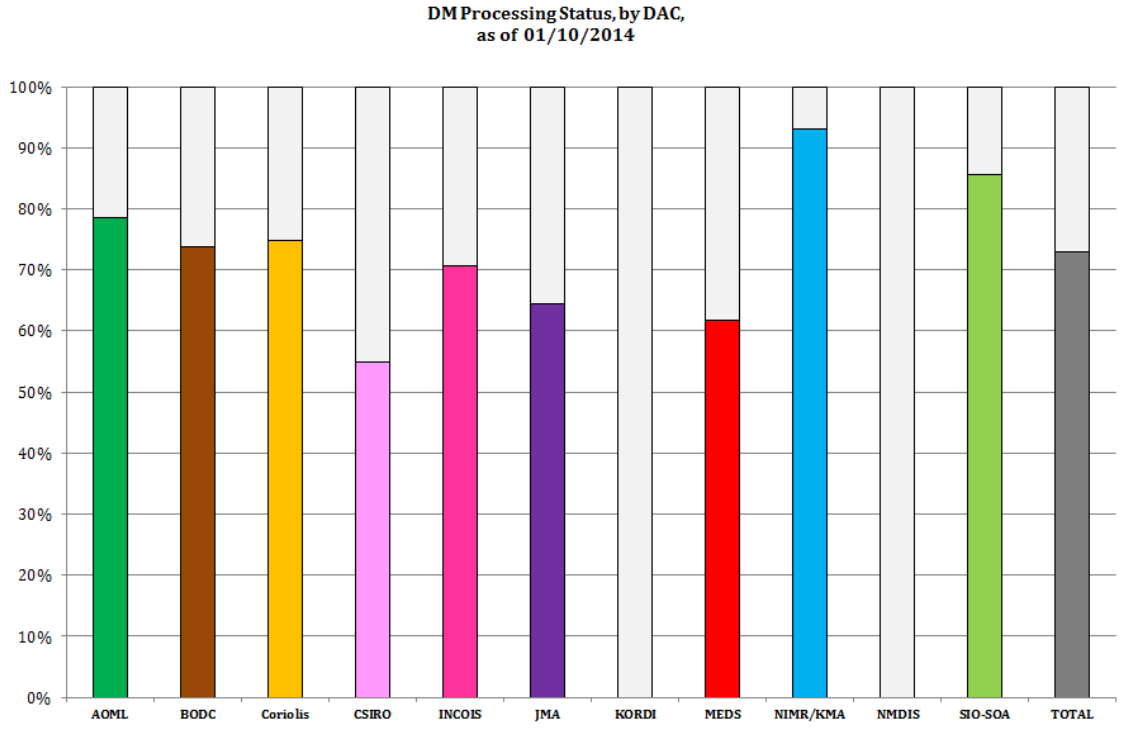


FIG 49: DELAYED MODE PROCESSING STATUS BY DAC AS OF 01/10/2014

DAC	OBS	DM	DM_ELIGIBLE	%
AOML	696615	485434	617522	78.6
BODC	47058	31221	42352	73.7
Coriolis	167772	111443	149148	74.7
CSIRO	95745	44076	80352	54.9
INCOIS	41306	26410	37329	70.7
JMA	149668	91316	141692	64.4
KORDI	15431	0	14875	0
MEDS	40320	23481	38057	61.7
NIMR/KMA	20710	17180	18472	93
NMDIS	1943	0	1635	0
SIO-SOA	17788	10141	11857	85.5
TOTAL	1294356	840702	1153291	72.9

TABLE 3: DM PROCESSING STATUS BY DAC AS OF 01/10/2014

PROGRAM	OBS	DM	DM ELIGIBLE	%	DM OPERATOR
Argo UW	203079	161742	183623	88	Wong, Annie
Argo SIO	155125	139742	138668	101	Gilson, John
Argo WHOI	124076	87221	112940	77	Robbins, P. E.
Argo JAMSTEC	104262	74809	99462	75	Sato, Kanako
Argo PMEL	114515	69054	98219	70	McTaggart, Kristene
Argo AUSTRALIA	86711	42685	73474	58	van Wijk, Esmee
Argo eq. NAVOCEANO	50465	319	42064	1	
Argo INDIA	41306	26410	37329	71	Bhaskar , TVS Udaya
Argo CANADA	39476	22932	37213	62	Ouellet, Mathieu
Argo UK	40691	26926	36539	74	Buck, Justin
Coriolis	25358	15285	21372	72	Thierry, Virginie
Argo NIMR/KMA	20710	17180	18472	93	In-Seong, Han
Argo eq. JMA	20456	7799	17916	44	Sato, Kanako
Argo BSH	18870	15523	16218	96	Klein, Birgit
Argo KORDI	15431	0	14875	-	In-Seong, Han + Southen Ocean?
Argo eq. JAMSTEC	13627	3994	13128	30	Sato, Kanako
Argo eq. UH	11864	11864	11864	100	Wong, Annie
Coriolis-Good Hope	13532	7083	11831	60	Speich, Sabrina
Argo CHINA	17712	10100	11813	85	Zenghong, Liu
Argo IFM-GEOMAR	7798	7195	7413	97	Stawarz, Marek
Gyroscope	7184	6990	7184	97	Thierry, Virginie
Argo AUSTRALIA eq.	9034	1391	6878	20	van Wijk, Esmee
Argo NETHERLANDS	7278	4764	6733	71	Klein, Birgit
Argo eq. SAGE	5478	4143	5478	76	Sato, Kanako
Coriolis-CONGAS	5152	1706	5118	33	Serpette, Alain
Coriolis-OVIDE	5238	2741	4572	60	Thierry, Virginie
Argo SPAIN	5747	160	4553	4	Argo Spain DM Operator
Argo GERMANY	4462	3986	4350	92	Klein, Birgit
MERSEA	4186	3677	4186	88	Latarius, Katrin
Argo eq. AOML	3903	0	3903	-	
Argo UW-MBARI eq.	5634	0	3785	-	Wong, Annie
Argo eq. BSH	3295	3295	3295	100	Klein, Birgit
Argo eq. IFM	3263	3227	3263	99	Klein, Birgit
Argo eq. UHH	3274	3096	3173	98	Latarius, Katrin
Coriolis-EGEE	3097	3095	3097	100	Bourles, Bernard
MEDARGO	3050	2149	3050	70	Poulain, Pierre-Marie
Argo WHOI eq. IR	2998	2990	2998	100	Robbins, P. E.
Argo AWI	2805	1628	2780	59	Rohardt, Gerd
Argo NEW ZEALAND	3010	2712	2706	100	Gilson, John
Coriolis-DRAKE	2725	2576	2678	96	Barré, Nicolas
Argo eq. ESP-OMZ	2491	1698	2491	68	Ulloa, Osvaldo
Argo UK eq.	2467	2463	2467	100	Buck, Justin
Coriolis-PIRATA	3271	1799	2378	76	Bourles, Bernard
Argo UW eq. SPURS	2973	0	2366	-	Wong, Annie
Coriolis-FLOSTRAL	2362	2357	2362	100	Morrow, Rosemary

Argo SIO eq. (OKMC)	3895	2510	2349	107	Gilson, John
Argo ARGENTINA	2411	1904	2271	84	Robbins, P. E.
Argo BRAZIL	2284	1699	2184	78	Robbins, P. E.
Argo eq. AWI	2144	1973	2144	92	Rohardt, Gerd
Coriolis-FRONTALIS	2128	2128	2128	100	Delcroix, Thierry
Coriolis-BIOArgo	2633	984	2113	47	Coatanoan, Christine
Argo eq. PMEL	2086	2085	2086	100	McTaggart, Kristene
Coriolis-FLOPS	2112	1979	2068	96	Eldin, Gerard
Coriolis-remOcean	3235	0	2025	-	
Argo ITALY	3940	58	1945	3	Poulain, Pierre-Marie
Coriolis-TRACK	1952	1842	1884	98	?
Argo eq. POMME	1881	1881	1881	100	Thierry, Virginie
Argo IRELAND	2073	920	1818	51	Buck, Justin
Argo eq. TU	1754	167	1754	10	Sato, Kanako
Coriolis-PROSAT	1715	1289	1704	76	Coatanoan, Christine
Argo CHINA SOA	1943	0	1635	-	
Argo NORWAY	1817	1503	1598	94	Latarius, Katrin
Coriolis-EGYPT	1461	885	1461	61	Taupier Letage, Isabelle
Argo eq. IFM2	1390	1390	1390	100	Klein, Birgit
Argo eq. VOCALS	1305	212	1186	18	Robbins, P. E.
Argo eq. FSU	1135	0	1110	-	
Argo MAURITIUS	1321	734	1100	67	Buck, Justin
Argo eq. HNFRI	977	0	977	-	Sato, Kanako
Argo eq. TNFRI	918	0	918	-	Sato, Kanako
Argo eq. OIST	968	0	831	-	Sato, Kanako
Argo FINLAND	1029	210	784	27	
Coriolis-CANOA	785	0	744	-	Coatanoan, Christine
DEKOSIM	1014	0	689	-	
NAOS-France	1630	0	648	-	
Argo ECUADOR	713	669	614	109	Wong, Annie
Argo KENYA	638	591	556	106	Wong, Annie
Argo JMA	516	0	516	-	Sato, Kanako
BulArgo	643	0	507	-	
Coriolis-SPICE	551	0	490	-	Maes, Christophe
Argo RUSSIA	472	281	472	60	Ouellet, Mathieu
Argo eq. NDBC	433	0	433	-	
Argo eq. ORI	372	372	372	100	Sato, Kanako
Argo CHILE	372	268	372	72	Ouellet, Mathieu
Argo DENMARK	360	360	360	100	Klein, Birgit
Argo MEXICO	464	101	353	29	Coatanoan, Christine / Gilson, John
Argo UW-UA eq.	346	0	346	-	Wong, Annie
Argo eq. NRIFS	308	0	308	-	Sato, Kanako
EuroArgo	392	284	285	100	?
Argo POLAND	206	206	206	100	?
Argo SOUTH AFRICA	224	169	189	89	Speich, Sabrina
Argo UK Bio	260	0	182	-	Buck, Justin

Argo eq. IRELAND	178	178	178	100	Buck, Justin
Argo GABON	207	90	175	51	Robbins, P. E.
Argo UW-APL eq.	2037	0	143	-	Wong, Annie
Meridian Goodhope	119	119	119	100	Speich, Sabrina
Argo GREECE	190	0	98	-	Poulain, Pierre-Marie
Argo COSTA RICA	82	0	82	-	Coatanoan, Christine
Argo SAUDI ARABIA	68	0	68	-	Buck, Justin
Argo eq. CHINA	52	52	52	100	Coatanoan, Christine
Argo SRI LANKA	76	41	44	93	
Argo eq. NIPR	28	28	28	100	Sato, Kanako
Argo eq. UM-OSU	26	0	26	-	
Argo LEBANON	52	0	11	-	Klein, Birgit
Argo eq. TSK	4	4	4	100	Sato, Kanako
Argo WHOI-MRV eq.	14	0	0	-	Robbins, P. E.
Argo SIO eq (ASIRI)	425	30	0	100	Gilson, John
E-AIMS	151	0	0	-	

TABLE 4 DM PROCESSING STATUS BY PROGRAM/DM OPERATOR.

⇨ List of DM operators to be reviewed (not error free), order by number of profiles eligible

6. Minor issues

NEGATIVE DELAYS

WMO	DAC	CYCLE_NB
6901510	Coriolis	110
6901631	Coriolis	24
6901631	Coriolis	23
6901493	Coriolis	57
6901525	Coriolis	193
6901510	Coriolis	111
5904171	AOML	49
5904171	AOML	50
5904178	AOML	40
5904178	AOML	41
5904178	AOML	42
5904178	AOML	43
5904563	AOML	18
6900112	AOML	267
5904171	AOML	48
5904171	AOML	47
5903710	AOML	32
5902216	AOML	203
4900858	AOML	205

2901467	AOML	20
4901047	AOML	184

TABLE 5: OBS WITH NEGATIVE DELAYS (POTENTIAL DECODING ERRORS) 09/2014

PROFILES ON LAND

DAC	WMO	CYCLE_NB
Coriolis	6900463	256
Coriolis	6900463	257
Coriolis	6900463	253
Coriolis	6901883	57
INCOIS	2902092	65
INCOIS	2902092	66
KORDI	2900921	255
KORDI	2900921	256
KORDI	2900921	257

TABLE 6: LASTEST PROFILES ON LAND (09/2014)

As of September 2014, 2412 profiles for 159 floats are located on land (GIS analysis).

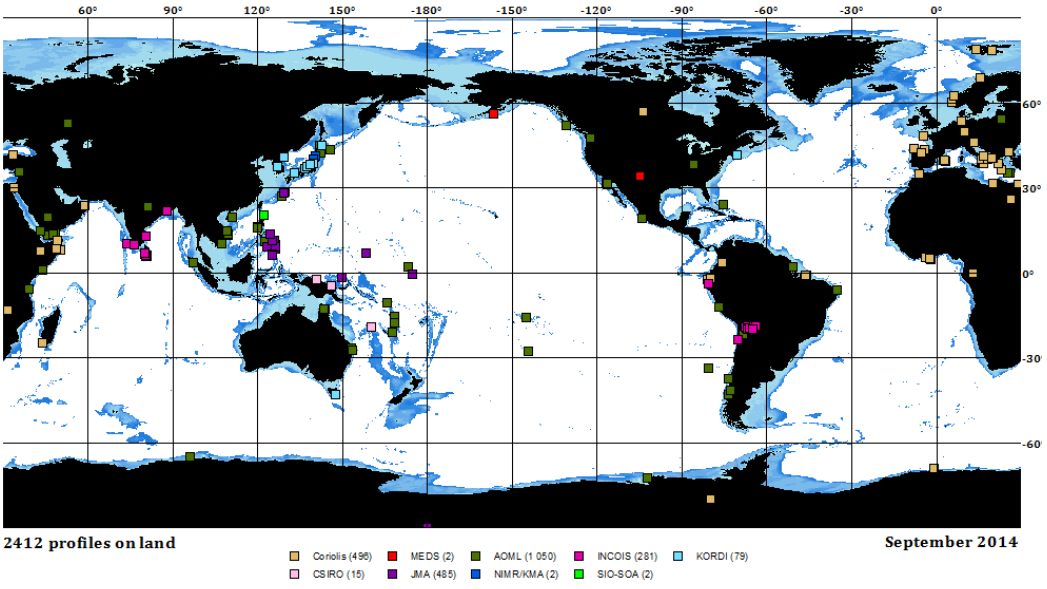


FIG 50: LOCATIONS AND NUMBER OF PROFILES ON LAND, BY DAC

⇨ DACs can check the detailed list here

MISC.

Profiles are sometimes distributed with OBS_DATE > SYSDATE or OBS_DATE < 1990. These should be rejected by checkers for more efficient problem detection.
The geo/ directory carry this error creating wrong directories e.g. 2017/

Profiles can be distributed with locations (0;0) and should be rejected by checkers.
Profiles can be distributed with locations outside [-90;90] and [-180;180] and should be rejected by checkers.

Why the two geo/ directories at GDACs have files with different size? (H. Freeland noticed)

20140720_prof.nc	Oct 29 07:19	29179k	20140720_prof.nc Oct 27 07:23 12501k
20140721_prof.nc	Oct 29 07:16	29383k	20140721_prof.nc Oct 27 07:23 14717k
20140722_prof.nc	Oct 29 07:13	26505k	20140722_prof.nc Oct 27 07:22 12088k
20140723_prof.nc	Oct 29 07:11	30728k	20140723_prof.nc Oct 28 07:58 13142k
20140724_prof.nc	Oct 29 07:07	32981k	20140724_prof.nc Oct 28 07:57 12538k
20140725_prof.nc	Oct 29 07:04	29011k	20140725_prof.nc Oct 28 07:56 18624k
20140726_prof.nc	Oct 25 19:01	35483k	20140726_prof.nc Oct 29 10:58 13519k
20140727_prof.nc	Oct 29 07:02	21056k	20140727_prof.nc Oct 27 07:20 10304k
20140728_prof.nc	Oct 29 07:00	25110k	20140728_prof.nc Oct 28 07:56 14240k
20140729_prof.nc	Oct 29 06:58	22461k	20140729_prof.nc Oct 28 07:55 10992k
20140730_prof.nc	Oct 29 06:56	29278k	20140730_prof.nc Oct 27 07:18 12491k
20140731_prof.nc	Oct 29 06:54	28507k	20140731_prof.nc Oct 27 07:17 14151k

ftp://ftp.ifremer.fr/ifremer/argo/geo/pacific_ocean/2014/07/ (LEFT)
ftp://usgodae.org/pub/outgoing/argo/geo/pacific_ocean/2014/07/ (RIGHT)

7. Missing floats

WMO	T_TYPE	MODEL	D_DATE	COUNTRY	PROGRAM	BASIN
5904237	IRIDIUM	APEX	19/06/2013	AUSTRALIA	Argo AUSTRALIA	Pacific Ocean
5904238	IRIDIUM	APEX	19/06/2013	AUSTRALIA	Argo AUSTRALIA	Pacific Ocean
5904240	IRIDIUM	APEX	20/06/2013	AUSTRALIA	Argo AUSTRALIA	Pacific Ocean
4901760	IRIDIUM	NOVA	27/09/2013	CANADA	Argo CANADA	Atlantic Ocean
4901757	IRIDIUM	NOVA	02/10/2013	CANADA	Argo CANADA	Atlantic Ocean
6901151	IRIDIUM	PROVOR_III	14/10/2013	EUROPEAN UNION	E-AIMS	Atlantic Ocean
6901152	IRIDIUM	PROVOR_III	14/10/2013	EUROPEAN UNION	E-AIMS	Atlantic Ocean
6902546	IRIDIUM	PROVOR_III	20/01/2014	EUROPEAN UNION	E-AIMS	Atlantic Ocean
6901627	IRIDIUM	ARVOR	10/06/2014	EUROPEAN UNION	E-AIMS	Mediterranean Sea
6902042	IRIDIUM	NEMO	10/07/2014	EUROPEAN UNION	E-AIMS	Arctic Ocean
6902019	IRIDIUM	APEX	21/08/2014	FINLAND	Argo FINLAND	Atlantic Ocean
7900360	IRIDIUM	NEMO	25/12/2012	GERMANY	Argo AWI	Atlantic Ocean
7900371	IRIDIUM	NEMO	30/12/2012	GERMANY	Argo AWI	Atlantic Ocean
7900358	IRIDIUM	NEMO	03/01/2013	GERMANY	Argo AWI	Atlantic Ocean
7900408	IRIDIUM	NEMO	05/01/2013	GERMANY	Argo AWI	Atlantic Ocean
7900405	IRIDIUM	NEMO	07/01/2013	GERMANY	Argo AWI	Atlantic Ocean
6902583	IRIDIUM	NOVA	18/09/2014	GERMANY	Argo BSH	Atlantic Ocean
6902584	IRIDIUM	NOVA	19/09/2014	GERMANY	Argo BSH	Atlantic Ocean
6902585	IRIDIUM	NOVA	20/09/2014	GERMANY	Argo BSH	Atlantic Ocean
6902588	IRIDIUM	NOVA	20/09/2014	GERMANY	Argo BSH	Atlantic Ocean
6902566	ARGOS	APEX	21/09/2014	GERMANY	Argo BSH	Atlantic Ocean

6902586	IRIDIUM	NOVA	21/09/2014	GERMANY	Argo BSH	Atlantic Ocean
6902587	IRIDIUM	NOVA	22/09/2014	GERMANY	Argo BSH	Atlantic Ocean
6902589	IRIDIUM	NOVA	25/09/2014	GERMANY	Argo BSH	Atlantic Ocean
6902567	ARGOS	APEX	28/09/2014	GERMANY	Argo BSH	Atlantic Ocean
6902557	ARGOS	ARVOR	30/09/2014	GERMANY	Argo BSH	Atlantic Ocean
6902558	ARGOS	ARVOR	30/09/2014	GERMANY	Argo BSH	Atlantic Ocean
6902559	ARGOS	ARVOR	30/09/2014	GERMANY	Argo BSH	Atlantic Ocean
6902560	ARGOS	ARVOR	30/09/2014	GERMANY	Argo BSH	Atlantic Ocean
6902561	ARGOS	ARVOR	30/09/2014	GERMANY	Argo BSH	Atlantic Ocean
6902562	ARGOS	ARVOR	30/09/2014	GERMANY	Argo BSH	Atlantic Ocean
6902563	ARGOS	APEX	30/09/2014	GERMANY	Argo BSH	Atlantic Ocean
2902126	IRIDIUM	ARVOR	11/03/2014	INDIA	Argo INDIA	Indian Ocean
2902142	IRIDIUM	ARVOR	10/08/2014	INDIA	Argo INDIA	Indian Ocean
6901848	IRIDIUM	ARVOR	10/04/2014	ITALY	Argo ITALY	Mediterranean Sea
2902408	IRIDIUM	NEMO	26/06/2014	JAPAN	Argo eq. OIST	Pacific Ocean
4902032	ARGOS	ARVOR	15/11/2013	JAPAN	Argo JAMSTEC	Pacific Ocean
2901731	IRIDIUM	PROVOR	20/07/2014	KOREA (REPUBLIC OF)	Argo NIMR/KMA	Pacific Ocean
6901157	IRIDIUM	NAVIS_A	15/11/2013	UNITED KINGDOM	Argo UK Bio	Atlantic Ocean
6901158	IRIDIUM	NAVIS_A	17/11/2013	UNITED KINGDOM	Argo UK Bio	Atlantic Ocean
6901159	IRIDIUM	NAVIS_A	22/01/2014	UNITED KINGDOM	Argo UK Bio	Atlantic Ocean
4901560	IRIDIUM	NAVIS_A	20/07/2013	UNITED STATES	Argo PMEL	Pacific Ocean
4901575	IRIDIUM	NAVIS_A	13/08/2013	UNITED STATES	Argo PMEL	Pacific Ocean
4901577	IRIDIUM	NAVIS_A	09/02/2014	UNITED STATES	Argo PMEL	Pacific Ocean
5904298	IRIDIUM	NAVIS_A	30/07/2014	UNITED STATES	Argo PMEL	Pacific Ocean
5904322	IRIDIUM	NAVIS_A	07/08/2014	UNITED STATES	Argo PMEL	Pacific Ocean
5904097	IRIDIUM	APEX	29/01/2013	UNITED STATES	Argo UW	Pacific Ocean
5904393	IRIDIUM	S2A	01/09/2013	UNITED STATES	Argo WHOI	Pacific Ocean
5904388	IRIDIUM	S2A	02/09/2013	UNITED STATES	Argo WHOI	Pacific Ocean
1901707	IRIDIUM	SOLO_W	03/03/2014	UNITED STATES	Argo WHOI	Atlantic Ocean
4901673	IRIDIUM	SOLO_W	05/05/2014	UNITED STATES	Argo WHOI	Atlantic Ocean
4901676	IRIDIUM	SOLO_W	08/05/2014	UNITED STATES	Argo WHOI	Atlantic Ocean
4901674	IRIDIUM	SOLO_W	10/05/2014	UNITED STATES	Argo WHOI	Atlantic Ocean

TABLE 7: FLOATS DEPLOYED BUT NO DATA, AS OF 09/2014

WMO	PROGRAM	TELECOM	T_TYPE	MODEL	AGE	DAC	GDAC
6900110	Argo eq. NAVOCEANO	103567	ARGOS	APEX	1092	AOML	YES
2901402	Argo eq. NAVOCEANO	103604	ARGOS	APEX	1057	AOML	YES
1900946	Argo eq. NAVOCEANO	111151	ARGOS	APEX	921	AOML	YES
1900947	Argo eq. NAVOCEANO	111152	ARGOS	APEX	920	AOML	YES
1900948	Argo eq. NAVOCEANO	111153	ARGOS	APEX	920	AOML	YES
2901434	Argo eq. NAVOCEANO	103608	ARGOS	APEX	904	AOML	YES
2901435	Argo eq. NAVOCEANO	103609	ARGOS	APEX	904	AOML	YES
2901425	Argo eq. NAVOCEANO	111161	ARGOS	APEX	893	AOML	YES
2901427	Argo eq. NAVOCEANO	111954	ARGOS	APEX	892	AOML	YES

2901430	Argo eq. NAVOCEANO	111958	ARGOS	APEX	892	AOML	YES
6900114	Argo eq. NAVOCEANO	103610	ARGOS	APEX	865	AOML	YES
5902165	Argo eq. NAVOCEANO	103624	ARGOS	APEX	856	AOML	YES
5902162	Argo eq. NAVOCEANO	103618	ARGOS	APEX	853	AOML	YES
2901415	Argo eq. NAVOCEANO	111947	ARGOS	APEX	829	AOML	YES
2901418	Argo eq. NAVOCEANO	111950	ARGOS	APEX	829	AOML	YES
5902169	Argo eq. NAVOCEANO	103628	ARGOS	APEX	816	AOML	YES
4901523	Argo eq. NAVOCEANO	103636	ARGOS	APEX	808	AOML	YES
4901524	Argo eq. NAVOCEANO	103637	ARGOS	APEX	805	AOML	YES
4901526	Argo eq. NAVOCEANO	103639	ARGOS	APEX	793	AOML	YES
2901413	Argo eq. NAVOCEANO	111945	ARGOS	APEX	789	AOML	YES
2901416	Argo eq. NAVOCEANO	111948	ARGOS	APEX	789	AOML	YES
5903452	Argo eq. NAVOCEANO	112804	ARGOS	APEX	777	AOML	YES
5903451	Argo eq. NAVOCEANO	112800	ARGOS	APEX	776	AOML	YES
6900317	Argo eq. NAVOCEANO	111156	ARGOS	APEX	773	AOML	YES
6900316	Argo eq. NAVOCEANO	111155	ARGOS	APEX	772	AOML	YES
4901535	Argo eq. NAVOCEANO	112814	ARGOS	APEX	764	AOML	YES
4901536	Argo eq. NAVOCEANO	112816	ARGOS	APEX	761	AOML	YES
4901533	Argo eq. NAVOCEANO	112809	ARGOS	APEX	760	AOML	YES
2901447	Argo eq. NAVOCEANO	103635	ARGOS	APEX	757	AOML	YES
2901444	Argo eq. NAVOCEANO	103632	ARGOS	APEX	753	AOML	YES
5904191	Argo eq. NAVOCEANO	112818	ARGOS	APEX	753	AOML	YES
5903454	Argo eq. NAVOCEANO	112801	ARGOS	APEX	752	AOML	YES
4901534	Argo eq. NAVOCEANO	112813	ARGOS	APEX	728	AOML	YES
4901541	Argo eq. NAVOCEANO	112817	ARGOS	APEX	705	AOML	YES
3901144	Argo eq. NAVOCEANO	112820	ARGOS	APEX	700	AOML	YES
2901398	Argo eq. NAVOCEANO	112824	ARGOS	APEX	692	AOML	YES
2901403	Argo eq. NAVOCEANO	112825	ARGOS	APEX	681	AOML	YES
5903453	Argo eq. NAVOCEANO	112808	ARGOS	APEX	676	AOML	YES
3901146	Argo eq. NAVOCEANO	112822	ARGOS	APEX	633	AOML	YES
3901147	Argo eq. NAVOCEANO	112826	ARGOS	APEX	632	AOML	YES
2901450	Argo eq. NAVOCEANO	121180	ARGOS	APEX	565	AOML	YES
2901448	Argo eq. NAVOCEANO	121163	ARGOS	APEX	564	AOML	YES
6900319	Argo eq. NAVOCEANO	112838	ARGOS	APEX	537	AOML	YES
6900318	Argo eq. NAVOCEANO	112837	ARGOS	APEX	536	AOML	YES
4901570	Argo eq. NAVOCEANO	112833	ARGOS	APEX	480	AOML	YES
4901569	Argo eq. NAVOCEANO	112832	ARGOS	APEX	476	AOML	YES
2901451	Argo eq. NAVOCEANO	103580	ARGOS	APEX	421	AOML	YES
2901453	Argo eq. NAVOCEANO	117597	ARGOS	APEX	421	AOML	YES
2901456	Argo eq. NAVOCEANO	111956	ARGOS	APEX	389	AOML	YES
2901461	Argo eq. NAVOCEANO	122227	ARGOS	APEX	389	AOML	YES
2901458	Argo eq. NAVOCEANO	121187	ARGOS	APEX	385	AOML	YES
5904327	Argo eq. NAVOCEANO	121177	ARGOS	APEX	385	AOML	YES
5904326	Argo eq. NAVOCEANO	121176	ARGOS	APEX	385	AOML	YES
5904325	Argo eq. NAVOCEANO	121175	ARGOS	APEX	385	AOML	YES
5904203	Argo eq. NAVOCEANO	121161	ARGOS	APEX	385	AOML	YES

2901457	Argo eq. NAVOCEANO	121186	ARGOS	APEX	385	AOML	YES
2901454	Argo eq. NAVOCEANO	103619	ARGOS	APEX	385	AOML	YES
5904204	Argo eq. NAVOCEANO	121169	ARGOS	APEX	385	AOML	YES
2901460	Argo eq. NAVOCEANO	122226	ARGOS	APEX	385	AOML	YES
2901459	Argo eq. NAVOCEANO	121188	ARGOS	APEX	384	AOML	YES
5904328	Argo eq. NAVOCEANO	121178	ARGOS	APEX	384	AOML	YES
5904329	Argo eq. NAVOCEANO	121179	ARGOS	APEX	381	AOML	YES
5904207	Argo eq. NAVOCEANO	121174	ARGOS	APEX	381	AOML	YES
5904201	Argo eq. NAVOCEANO	103596	ARGOS	APEX	381	AOML	YES
2901462	Argo eq. NAVOCEANO	122228	ARGOS	APEX	380	AOML	YES
4901642	Argo eq. NAVOCEANO	121159	ARGOS	APEX	332	AOML	YES
4901641	Argo eq. NAVOCEANO	117598	ARGOS	APEX	332	AOML	YES
4901647	Argo eq. NAVOCEANO	121160	ARGOS	APEX	321	AOML	YES
5904538	Argo eq. NAVOCEANO	156000	IRIDIUM	APEX	317	AOML	YES
2901465	Argo eq. NAVOCEANO	122229	ARGOS	APEX	317	AOML	YES
2901464	Argo eq. NAVOCEANO	121168	ARGOS	APEX	316	AOML	YES
2901468	Argo eq. NAVOCEANO	132889	ARGOS	APEX	209	AOML	YES
2901466	Argo eq. NAVOCEANO	132884	ARGOS	APEX	208	AOML	YES
5904206	Argo eq. NAVOCEANO	121173	ARGOS	APEX	205	AOML	YES
5904205	Argo eq. NAVOCEANO	121172	ARGOS	APEX	205	AOML	YES
1900951	Argo eq. NAVOCEANO	121150	ARGOS	APEX	201	AOML	YES
1900952	Argo eq. NAVOCEANO	121151	ARGOS	APEX	200	AOML	YES
1900953	Argo eq. NAVOCEANO	121152	ARGOS	APEX	200	AOML	YES
1900954	Argo eq. NAVOCEANO	121153	ARGOS	APEX	197	AOML	YES
6900320	Argo eq. NAVOCEANO	121154	ARGOS	APEX	193	AOML	YES
4901667	Argo eq. NAVOCEANO	132900	ARGOS	APEX	193	AOML	YES
6900321	Argo eq. NAVOCEANO	121155	ARGOS	APEX	189	AOML	YES
4901644	Argo eq. NAVOCEANO	121166	ARGOS	APEX	189	AOML	YES
4901643	Argo eq. NAVOCEANO	121165	ARGOS	APEX	188	AOML	YES
6900322	Argo eq. NAVOCEANO	121170	ARGOS	APEX	184	AOML	YES
4901669	Argo eq. NAVOCEANO	132902	ARGOS	APEX	177	AOML	YES
4901668	Argo eq. NAVOCEANO	132901	ARGOS	APEX	176	AOML	YES
2901469	Argo eq. NAVOCEANO	111160	ARGOS	APEX	145	AOML	YES
4901645	Argo eq. NAVOCEANO	121167	ARGOS	APEX	128	AOML	YES
2901470	Argo eq. NAVOCEANO	150887	IRIDIUM	APEX	119	AOML	YES
5904539	Argo eq. NAVOCEANO	112803	ARGOS	APEX	109	AOML	YES
5904566	Argo eq. NAVOCEANO	112836	ARGOS	APEX	109	AOML	YES
5904542	Argo eq. NAVOCEANO	112828	ARGOS	APEX	109	AOML	YES
5904562	Argo eq. NAVOCEANO	112830	ARGOS	APEX	109	AOML	YES
4901670	Argo eq. NAVOCEANO	132903	ARGOS	APEX	109	AOML	YES
5904563	Argo eq. NAVOCEANO	112831	ARGOS	APEX	108	AOML	YES
6900373	Argo eq. NAVOCEANO	130792	ARGOS	APEX	106	AOML	YES
4901671	Argo eq. NAVOCEANO	132904	ARGOS	APEX	106	AOML	YES
4901672	Argo eq. NAVOCEANO	132907	ARGOS	APEX	106	AOML	YES
2901467	Argo eq. NAVOCEANO	132885	ARGOS	APEX	81	AOML	YES
4901646	Argo eq. NAVOCEANO	132888	ARGOS	APEX	70	AOML	YES

4902057	Argo eq. NAVOCEANO	132890	ARGOS	APEX	61	AOML	YES
4902058	Argo eq. NAVOCEANO	132891	ARGOS	APEX	59	AOML	YES
5904157	Argo UW	8820	IRIDIUM	APEX	133	AOML	YES
5904150	Argo UW	8401	IRIDIUM	APEX	69	AOML	
4901707	Argo WHOI	1186	IRIDIUM	SOLO_W	21	AOML	YES
1901844	Argo MAURITIUS	103831	ARGOS	APEX	231	BODC	
3901492	Argo UK	45857	ARGOS	APEX	181	BODC	
3901493	Argo UK	58868	ARGOS	APEX	181	BODC	
6901167	Argo UK	126877	ARGOS	APEX	101	BODC	
2901633	Argo CHINA SOA	90793	ARGOS	PROVOR	1212	CLS	YES
2901631	Argo CHINA SOA	90790	ARGOS	PROVOR	1212	CLS	YES
2901632	Argo CHINA SOA	90791	ARGOS	PROVOR	1209	CLS	YES
7900290	Argo BSH	40850	ARGOS	NEMO	359	Coriolis	
6901910	Argo BSH	133794	ARGOS	APEX	150	Coriolis	
1901364	Argo BSH	133787	ARGOS	APEX	125	Coriolis	
1901365	Argo BSH	133788	ARGOS	APEX	125	Coriolis	YES
6900877	Argo BSH	99731	ARGOS	APEX	121	Coriolis	
6900876	Argo BSH	99730	ARGOS	APEX	120	Coriolis	
1901360	Argo BSH	133783	ARGOS	APEX	119	Coriolis	
1901361	Argo BSH	133784	ARGOS	APEX	119	Coriolis	YES
1901363	Argo BSH	133786	ARGOS	APEX	119	Coriolis	
1901362	Argo BSH	133785	ARGOS	APEX	119	Coriolis	
6902565	Argo BSH	141217	ARGOS	APEX	31	Coriolis	
6902016	Argo FINLAND	138239	ARGOS	APEX	161	Coriolis	
6902015	Argo FINLAND	138238	ARGOS	APEX	161	Coriolis	
6901631	Coriolis-OVIDE	6142110	IRIDIUM	ARVOR	119	Coriolis	YES
6901484	Coriolis-remOcean	lovbio040b	IRIDIUM	PROVOR_III	299	Coriolis	YES
2901266	Argo INDIA	93459	ARGOS	APEX	1381	INCOIS	YES
2901297	Argo INDIA	102520	ARGOS	APEX	1371	INCOIS	YES
2901298	Argo INDIA	102521	ARGOS	APEX	1361	INCOIS	YES
2901300	Argo INDIA	102523	ARGOS	APEX	1361	INCOIS	YES
2901301	Argo INDIA	102529	ARGOS	APEX	1361	INCOIS	YES
2901299	Argo INDIA	102522	ARGOS	APEX	1360	INCOIS	YES
2901302	Argo INDIA	102524	ARGOS	APEX	1360	INCOIS	YES
2901303	Argo INDIA	102528	ARGOS	APEX	1351	INCOIS	YES
2901306	Argo INDIA	102527	ARGOS	APEX	1351	INCOIS	YES
2901307	Argo INDIA	102513	ARGOS	APEX	1320	INCOIS	YES
2901308	Argo INDIA	6864	IRIDIUM	APEX	1270	INCOIS	YES
2901309	Argo INDIA	6865	IRIDIUM	APEX	1268	INCOIS	YES
2901314	Argo INDIA	6866	IRIDIUM	APEX	1231	INCOIS	YES
2901311	Argo INDIA	6867	IRIDIUM	APEX	1230	INCOIS	YES
2901313	Argo INDIA	6863	IRIDIUM	APEX	1229	INCOIS	YES
2901315	Argo INDIA	6861	IRIDIUM	APEX	1221	INCOIS	YES
2901318	Argo INDIA	6859	IRIDIUM	APEX	1220	INCOIS	YES
2901319	Argo INDIA	6390	IRIDIUM	APEX	1219	INCOIS	YES
2901321	Argo INDIA	6857	IRIDIUM	APEX	1219	INCOIS	YES

2901323	Argo INDIA	6432	IRIDIUM	APEX	1219	INCOIS	YES
2901325	Argo INDIA	6809	IRIDIUM	APEX	1219	INCOIS	YES
2901326	Argo INDIA	6435	IRIDIUM	APEX	1219	INCOIS	YES
2901332	Argo INDIA	7645	IRIDIUM	APEX	1135	INCOIS	YES
2901331	Argo INDIA	7639	IRIDIUM	APEX	1134	INCOIS	YES
2901327	Argo INDIA	7690	IRIDIUM	APEX	1132	INCOIS	YES
2901336	Argo INDIA	7625	IRIDIUM	APEX	1126	INCOIS	YES
2901337	Argo INDIA	102512	ARGOS	APEX	1041	INCOIS	YES
2901338	Argo INDIA	102511	ARGOS	APEX	1041	INCOIS	YES
2901339	Argo INDIA	102510	ARGOS	APEX	1041	INCOIS	YES
2901340	Argo INDIA	102514	ARGOS	APEX	1038	INCOIS	YES
2901341	Argo INDIA	74981	ARGOS	APEX	1021	INCOIS	YES
2901342	Argo INDIA	75216	ARGOS	APEX	1021	INCOIS	YES
2901344	Argo INDIA	75352	ARGOS	APEX	1012	INCOIS	YES
2901345	Argo INDIA	75353	ARGOS	APEX	1011	INCOIS	YES
2901348	Argo INDIA	75379	ARGOS	APEX	1011	INCOIS	YES
2901349	Argo INDIA	75380	ARGOS	APEX	1011	INCOIS	YES
2901346	Argo INDIA	75410	ARGOS	APEX	1011	INCOIS	YES
2901343	Argo INDIA	75226	ARGOS	APEX	1010	INCOIS	YES
2901350	Argo INDIA	75415	ARGOS	APEX	1001	INCOIS	YES
2902073	Argo INDIA	4730	IRIDIUM	APEX	827	INCOIS	YES
2902099	Argo INDIA	130410	ARGOS	ARVOR	472	INCOIS	YES
2902095	Argo INDIA	130403	ARGOS	ARVOR	471	INCOIS	YES
2902094	Argo INDIA	130405	ARGOS	ARVOR	471	INCOIS	YES
2902096	Argo INDIA	130414	ARGOS	ARVOR	471	INCOIS	YES
2902097	Argo INDIA	130413	ARGOS	ARVOR	471	INCOIS	YES
2902101	Argo INDIA	130422	ARGOS	ARVOR	471	INCOIS	YES
2902102	Argo INDIA	130404	ARGOS	ARVOR	471	INCOIS	YES
2902098	Argo INDIA	130415	ARGOS	ARVOR	471	INCOIS	YES
2902100	Argo INDIA	130407	ARGOS	ARVOR	471	INCOIS	YES
2902106	Argo INDIA	130419	ARGOS	ARVOR	462	INCOIS	YES
2902108	Argo INDIA	130416	ARGOS	ARVOR	462	INCOIS	YES
2902103	Argo INDIA	130406	ARGOS	ARVOR	461	INCOIS	YES
2902107	Argo INDIA	130418	ARGOS	ARVOR	461	INCOIS	YES
2902109	Argo INDIA	130412	ARGOS	ARVOR	461	INCOIS	YES
2902110	Argo INDIA	130420	ARGOS	ARVOR	452	INCOIS	YES
2902111	Argo INDIA	130417	ARGOS	ARVOR	451	INCOIS	YES
2902112	Argo INDIA	130421	ARGOS	ARVOR	451	INCOIS	YES
2902105	Argo INDIA	130409	ARGOS	ARVOR	421	INCOIS	YES
2902132	Argo INDIA	135404	ARGOS	ARVOR	172	INCOIS	YES
2902133	Argo INDIA	135406	ARGOS	ARVOR	171	INCOIS	YES
2902139	Argo INDIA	135405	ARGOS	ARVOR	82	INCOIS	
2902140	Argo INDIA	135408	ARGOS	PROVOR_II	82	INCOIS	YES
2902141	Argo INDIA	137932	ARGOS	APEX	81	INCOIS	YES
2902134	Argo INDIA	137926	ARGOS	APEX	81	INCOIS	YES
2902135	Argo INDIA	137927	ARGOS	APEX	81	INCOIS	YES

2902137	Argo INDIA	137931	ARGOS	APEX	81	INCOIS	YES
2902138	Argo INDIA	135403	ARGOS	ARVOR_C	80	INCOIS	YES
2902136	Argo INDIA	135401	ARGOS	ARVOR_C	79	INCOIS	
2902143	Argo INDIA	135409	ARGOS	PROVOR	72	INCOIS	YES
2902150	Argo INDIA	135410	ARGOS	PROVOR_II	72	INCOIS	YES
2902147	Argo INDIA	137935	ARGOS	APEX	71	INCOIS	YES
2902148	Argo INDIA	137934	ARGOS	APEX	71	INCOIS	
2902149	Argo INDIA	137933	ARGOS	APEX	71	INCOIS	
2902151	Argo INDIA	137928	ARGOS	APEX	71	INCOIS	YES
2902152	Argo INDIA	137929	ARGOS	APEX	61	INCOIS	
2902153	Argo INDIA	137930	ARGOS	APEX	61	INCOIS	YES

TABLE 8: FLOATS NOT AVAILABLE ON GTS

PROGRAM	TELECOM	T-TYPE	MODEL	AGE	DAC	GTS
Argo NIMR/KMA	127464	ARGOS	APEX	448	NIMR/KMA	YES
Argo eq. OIST	118169	IRIDIUM	NEMO	38	JMA	YES
Argo JAMSTEC	394	IRIDIUM	NAVIS_A	40	JMA	YES
Argo INDIA	135405	ARGOS	ARVOR	82	INCOIS	
Argo INDIA	135401	ARGOS	ARVOR_C	79	INCOIS	
Argo INDIA	137934	ARGOS	APEX	71	INCOIS	
Argo INDIA	137933	ARGOS	APEX	71	INCOIS	
Argo INDIA	137929	ARGOS	APEX	61	INCOIS	
Argo BSH	40850	ARGOS	NEMO	359	Coriolis	
Argo BSH	133794	ARGOS	APEX	150	Coriolis	
Argo BSH	133787	ARGOS	APEX	125	Coriolis	
Argo BSH	99731	ARGOS	APEX	121	Coriolis	
Argo BSH	99730	ARGOS	APEX	120	Coriolis	
Argo BSH	133783	ARGOS	APEX	119	Coriolis	
Argo BSH	133786	ARGOS	APEX	119	Coriolis	
Argo BSH	133785	ARGOS	APEX	119	Coriolis	
Argo BSH	141217	ARGOS	APEX	31	Coriolis	
Argo FINLAND	138239	ARGOS	APEX	161	Coriolis	
Argo FINLAND	138238	ARGOS	APEX	161	Coriolis	
Argo ITALY	21827	IRIDIUM	PROVOR_III	251	Coriolis	YES
Argo ITALY	11259	IRIDIUM	PROVOR_III	153	Coriolis	YES
Argo ITALY	6152119	IRIDIUM	ARVOR	61	Coriolis	YES
Argo ITALY	105012	IRIDIUM	ARVOR	36	Coriolis	YES
Coriolis	1372050	IRIDIUM	ARVOR_C	92	Coriolis	YES
Coriolis	1330399	IRIDIUM	ARVOR_C	91	Coriolis	YES
Coriolis-BIOArgo	lovbio067c	IRIDIUM	PROVOR_III	99	Coriolis	YES
NAOS-France	lovbio072c	IRIDIUM	PROVOR_III	49	Coriolis	YES
NAOS-France	132017	ARGOS	ARVOR	19	Coriolis	YES
Argo MAURITIUS	103831	ARGOS	APEX	231	BODC	
Argo UK	58868	ARGOS	APEX	181	BODC	

Argo UK	45857	ARGOS	APEX	181	BODC	
Argo UK	126877	ARGOS	APEX	101	BODC	
Argo PMEL	199	IRIDIUM	NAVIS_A	41	AOML	YES
Argo PMEL	237	IRIDIUM	NAVIS_A	40	AOML	YES
Argo PMEL	239	IRIDIUM	NAVIS_A	40	AOML	YES
Argo PMEL	324	IRIDIUM	NAVIS_A	35	AOML	YES
Argo PMEL	323	IRIDIUM	NAVIS_A	31	AOML	YES
Argo PMEL	329	IRIDIUM	NAVIS_A	29	AOML	YES
Argo PMEL	330	IRIDIUM	NAVIS_A	24	AOML	YES
Argo PMEL	333	IRIDIUM	NAVIS_A	20	AOML	YES
Argo UW	41394	ARGOS	APEX	72	AOML	YES
Argo UW	39525	ARGOS	APEX	70	AOML	YES
Argo UW	8401	IRIDIUM	APEX	69	AOML	
Argo WHOI	7196	IRIDIUM	S2A	43	AOML	YES
Argo WHOI	1175	IRIDIUM	SOLO_W	38	AOML	YES
Argo WHOI	7134	IRIDIUM	S2A	23	AOML	YES

TABLE 9: FLOATS NOT AVAILABLE AT GDACS

Some of these missing float on GTS are due to a problem with MF statistics prepared for AIC and will be fixed soon.

Some profile data distributed on GTS with float codes, are not properly distributed at GDACs (no metadata, QC flags, etc): e.g. ITP, ALAMO.
They are however available at GDACs directory, via a raw conversation of TESAC messages:
ftp://ftp.ifremer.fr/ifremer/argo/etc/gts/

Bulletin headers should normally start with SOF and not SOV as we can see in some cases:
- LFPW SOVF93: 6901681, 6901682, 6901879...
- CWOW SOVD02: 4901729
- EGRR SOVX02: 1901062
- KWBC SOVX10: 1901418, 1901616, 1901638...
- LFVW SOVX92: 2900205, 2901550, 2901552...

8. JCOMMOPS/AIC

INFRASTRUCTURE

By November 2014, after ADMT, the consolidated JCOMMOPS Team will settle in its new offices in Ifremer/Brest, aside of Coriolis. A strong day to day collaboration with one of the Argo GDAC and EuroArgo project office is anticipated. Office will be inaugurated aside the AST 2015 meeting and will benefit from a strong support (including financial) from the local authorities.
A new full time software engineer was recruited in August 2015; Anthonin Lizé (France).
A new coordinator was recruited for DBCP and OceanSITES coordination; Champika Gallage (Canada).

DEVELOPMENTS

The synchronization of the JCOMMOPS database with its many heterogeneous metadata sources was reviewed using ETL software (Extract, Transform, Load). A grant was just provided to JCOMMOPS for

the use of FME software for free.

JCOMMOPS will report in depth on such tool in the future as it could be interesting to the ADMT and DACs. Maybe some are already using it.

Since the previous software engineer left JCOMMOPS in March 2014, and let a 4 months gap, most of the web developments were made with two students during the summer. One of the students is staying 6 more months at JCOMMOPS to finalize the work.

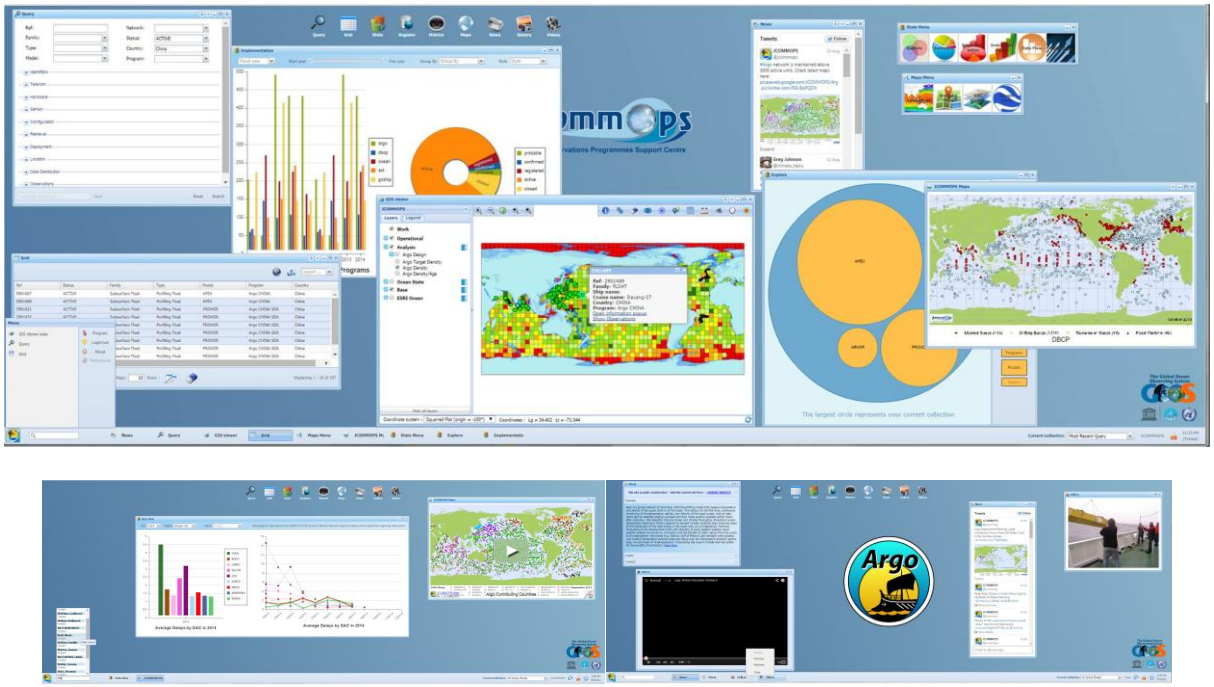


FIG 51, 52 , 53: OVERVIEW OF THE JCOMMOPS DASHBOARD

This system is based on an API (including a GIS API) that allows consuming/uploading of metadata through web services, or through the embedding of widgets on any website, or through integration within a real-time Dashboard. Website uses extensively a Java web applicative server and a set of rich JavaScript libraries. It presents itself like a desktop (windows like). Such Dashboard allows customization from any perspective (JCOMMOPS individual programmes, Member States/Countries, international/national/regional program manager, manufacturer, data manager, ocean or custom basin, maritime zone, parameter, etc). Any user can define, and record, a set of platforms or observations, through a complex query, that will be the base of all statistics, maps and widgets. Any new query or platform sample selection will refresh the whole dashboard. Widgets can persist on the dashboard on request. Hence the whole community will be able to have its own customized dashboard, updated in real time.

A complete GIS viewer is developed and includes many tools: on the fly projection, density and hot spots calculation, data display, temporal data management, intersection calculation, measure tools, high resolution printing geoprocessing services, transparency/symbology management, graphical or attribute selection, etc. Viewer shows different groups of layers including Base Maps, Ocean State maps, Analysis maps (targets and status), and of course Operational Layers (platform locations, observations), based on the current collection. The Viewer was developed in cooperation with ArxIT Company, and presented at the yearly ESRI meeting.

The management of planning for platform deployments and cruises was particularly finalized to

encourage a broad and efficient use by the community. It works with the standard format presented above.

Access of classic JCOMMOPS products such as monthly maps, and archives is facilitated and homogenous. Finally pdf reports can be generated after assembling a specific set of widgets.

Website will propose the metrics and indicators specified during the OSMC/OOPC/JCOMMOPS meeting for specific observing systems.

Such tool should definitely ease whole community monitoring need, and in particular technical coordinators that will have all their reporting tools ready at any time, freeing time for analysis instead of manual statistics production, very time consuming.

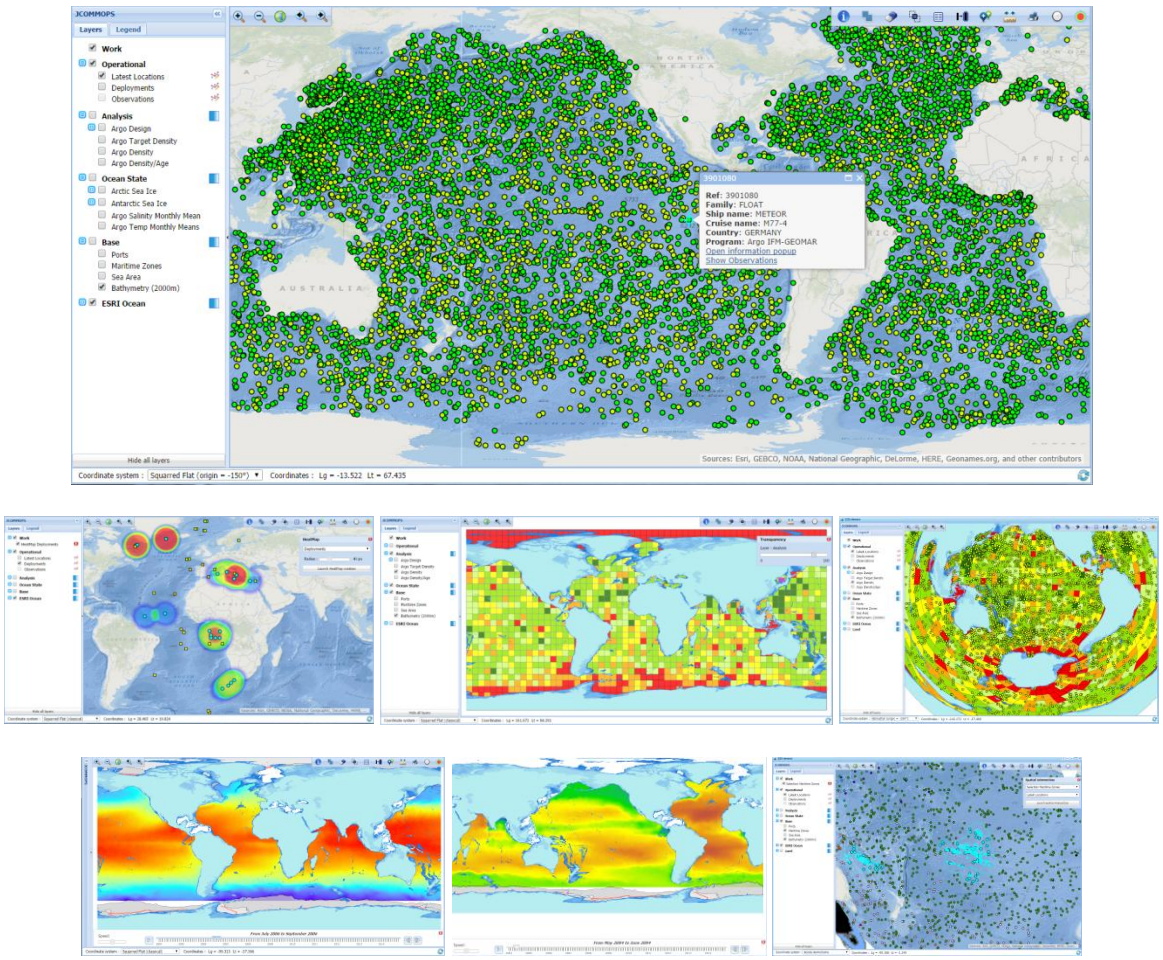


FIGURE 54 -….: OPERATIONAL RT LAYERS, ANALYSIS LAYERS, OCEAN STATE LAYERS (PRODUCED AT SCRIPPS, NOAA, IFREMER, RDAC, ETC), TIME ENABLED, FLOATS INTERSECTING EEZ OR ANY POLYGON…

JCOMMOPS is developing finally a mobile app to facilitate deployment management (on board ships), ancillary ship data distribution on GTS, and networks monitoring.

OUTREACH

JCOMMOPS will as well actively participate in the UNESCO/GEO YouthMobile competition, "empowering youth with the skills and confidence to develop mobile Apps for sustainable development". Data source for this contest will focus on Argo and more generally GOOS data. http://youthmobile.org

On March 21st, we (Belbeoch, Scanderbeg, Claustre, Freeland) will organize an Argo/GOOS Educational workshop in Brest after AST meeting at the Oceanopolis aquarium. ADMT members, and marine data scientists involved in outreach activity at national level are encouraged to participate.

JCOMMOPS is setting up a number of partnerships with civil society and industry to raise funds, sponsor instruments, promote and optimize observing networks, develop educational activities. Late 2014 Barcelona World Race and Volvo Ocean Race will deploy profiling floats.

SUMMARY OF ACTIONS

A number of on-going actions are under AIC radar concerning Argo data flow:

- ⇨ Synchronize with US GDAC detailed index file to calculate delays
- ⇨ Gather BUFR statistics from Meteo-France
- ⇨ Develop metrics and indicators to monitor the quality of the Argo dataset
  - Within ADMT
  - Within JCOMM OCG, OOPC activities
- ⇨ Discuss the STANDARD_FORMAT_ID issue with manufacturers
  - See dedicated agenda item
  - Governance?
- ⇨ Harmonize metadata between JCOMMOPS, GTS codes, Argo netCDF, and other initiatives such as SeaDatanet in Europe
  - Ship/cruise metadata in particular
- ⇨ Develop read/write capacity (webservices) for Argo NetCDF V3+ metadata files
- ⇨ Release JCOMMOPS API and new web services beta version by Dec. 2014, gather feedback before launch in March 2015
- ⇨ Release JCOMMOPS Mobile App
- ⇨ Develop outreach activities with the Argo dataset
  - AST 2015: Educational Workshop
  - UNESCO Youth Mobile Competition

Latest Argo Maps:

https://picasaweb.google.com/112615107763535351524/ArgoMaps

ftp.jcommops.org/Argo/maps/LATEST/

http://argo.jcommops.org/maps.html

Charles reported that the U.S. NODC continued to operate the Global Argo Data Repository (http://www.nodc.noaa.gov/argo/) during 2014. The size of Argo monthly snap shot (i.e., tar ball) continued to grow. The size of the latest Argo monthly tarred-zipped file is about 6.20 GB for October 2014 and is available at user's request only, because of the size of the file.

The number of monthly-averaged data downloaded from GADR was increased, approximately 6.7 %, to 113 GB in 2014. However, the number of monthly-averaged distinct hosts severed went down from 2,325 in 2013 to 2,177 in 2014.

Action Item no. 27 from ADMT14 assigned to GADR was completed on April 2014. Argo data made available through GADR is a translation of original Argo with the global attributes section the Argo NetCDF format enhanced in compliance with the Attribute Conventions for Data Discovery (ACDD).