

Argo Information Centre

TC Yearly Report

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1. Background

The international Argo Information Centre (AIC) is participating in the activities of the Argo Project Office and of the JCOMM in situ Observing Platform Support centre (JCOMMOPS).

The AIC is funded on a yearly basis via voluntary contributions from the United States, Canada, France, Australia and the United Kingdom.

In 2007 **China**, **India**, and **Germany** also began providing funds for the AIC.

It is recalled the importance of the IOC and WMO secretariats support in seeking funding for JCOMMOPS and the AIC.

In the context of the development of JCOMMOPS, it has been proposed to extend the Argo TC activities to the Ship Observation Team (VOS, SOOP). See JCOMMOPS Report.

2. Activities

Since 2001 the Argo TC has been working according to the following lines of action: assistance, monitoring, and cooperation.

Appropriate tools were created to facilitate such activities and most of TC tasks have matured enough to become routine activities.

While existing tools can certainly be improved and new tools developed, the AST could propose some new priorities for the Coordinator. Argo is entering its maintenance phase.

What are the challenges facing Argo on an international plan?

Argo needs more support in term of funding (float, ship time) and new partners are needed. Some issues need to be clarified through direct contacts (see China comments on recent TC visit). New communities (e.g. Bio-Argo, gliders) need some help and want to be associated with the Argo initiative.

How the TC should be involved in such challenges?

2.1 Summary

In 2007 progress has been made on the following issues:

- Improve Argo implementation monitoring and planning:
 - o improve and document the notification mechanism
 - o develop new products (maps, statistics, GIS data layers, web pages, text file exports)
- Improve Argo Data distribution monitoring:
 - o New set of statistics on real-time and delayed-mode profiles
- Rationalize the support to Argo users
 - o Support Centre developed
- Improve monthly reporting to PIs/Programmes Managers, float operators and data managers
- Upgrade the JCOMMOPS information System:
 - o New server installed and configured

- Software upgrade (in particular the GIS)
- Routine scripts and procedures reviewed and rationalized (in particular the GIS data layers update and text files export)
- Finalisation of the new AIC website
 - Stability
 - 24/7 monitoring set up
 - Many details and content reviewed
 - Audience Tracking system set up (including Project Office website)
- International issues
 - Reporting to Member States on the status of their EEZs
 - New tools developed to monitor floats entering EEZs
 - New tools developed to monitor beached floats
 - Cooperation initiated with new partners (e.g.: Gabon, Morocco)

The monthly report continues to be enhanced and improved each month. Operators have regularly provided feedback to the AIC between the reports. It permits to the TC to rationalize some labour intensive tasks, and to keep a regular contact with float operators in order to fix a set of details on float metadata. It is to be noted that many Argonauts outside the AST and ADMT mailing would like to receive a copy of the report. Should TC send the report to the general Argo mailing list?

It is to be noted that the requests concerning the use of Argo photos, maps, has dramatically increased in 2007. It demonstrates very good media coverage for the 3000th float milestone.

The work load regarding JCOMMOPS issues has naturally grown up since 2001. The Argo co-chairs have recognized the TC growing responsibility in developing and operating JCOMMOPS, and have agreed to update the TC Terms of Reference to reflect this change in scope (see JCOMMOPS report).

It is planned to host more students (local and international) at the AIC to investigate on the development of new products and services for Argo. Funding sources are being identified and a set of subjects is being prepared.

2.2 Missions

2007 TC Missions:

Visit Ifremer / IRD / Meteo-France (with TC DBCP), Brest, **France**
 EURO Argo, and North Atlantic Argo Regional Centre #2 meetings, Brest, **France**
 Argo Steering Team#8, IOC, Paris, **France**
 ABE-LOS #7, Libreville, **Gabon**
 JCOMM OCG, Geneva, **WMO Switzerland**
 Visit SIO/SOA, Hangzhou, **China**
 Argo Data Management Team#8, Hobart, **Australia**
 GEO Ministerial Summit, Cape Town, **South Africa**
 ABE-LOS informal workshop, Washington, **USA**

Proposed Missions for 2008:

Euro-Argo kick-off meeting, Brest, Ifremer, France (done)
 Bio-Argo #1 meeting, Villefranche, France (done)
 Argo Steering Team#9, Exeter, UK

ABE-LOS #8 Paris, IOC, France
IOC/GOOS & JCOMMOPS, IOC, France
ADMT #9 Hawaii, USA
Euro-Argo Users Workshop, NOC, UK

If budget permits it:

IOC Assembly
Visit new Argo contributor INCOIS, Hyderabad, India
Visit new Argo contributor, Germany
New participating Countries (Morocco, Gabon, other)
Visit to Scripps Project Office

The TC mission budget has remained the same since 2001 (15 000 US\$).
It starts to be problematic, considering the life cost increase (7 years) and the growth of Argo activities.
The extension of TC activities to SOT coordination could be an opportunity to strengthen TC mission budget.

3. Information System

3.1 General Issues

In 2007 a new server was set up and has brought the JCOMMOPS Information System onto an improved IT configuration.

The AIC website was improved and has reached a stable state. 2 instances of the web application are now deployed to improve stability and load balancing.
In addition, AIC main web services are monitored by CLS operators, 24/7, and procedures were defined to restore the services in case of unexpected failure.
The procedure is operational since late February.
The logistic contract between AIC and its host CLS covers now all expenses (hardware, software) and includes the maintenance and the monitoring of the global system. This will free some working time for the TC and facilitate some issues related to a potential relocation of JCOMMOPS.

At 6 and 18 UTC, users can notice a delay (for a ten of minutes) in website loading. This is due to the bi-daily update of the database and GIS files. New scripts are implemented to decrease this delay to the minimum.

One of the weaknesses of the AIC information system is that it fully relies on the actual Argo TC. To guarantee the maintenance of the system in the long term, a full documentation will be written to guide the next Argo TCs in operating the AIC.

3.2 Planning & Notification

This core function of the AIC has been reviewed, improved and documented with the aim to provide a global and regular view on the Argo planning, up to a year in advance.
This information is vital for:

- The implementation and maintenance of the global array
- The project transparency and accordance with international rules
- The cooperation within Argo and with other panels (e.g. DBCP)

Careful planning is a critical activity that should contribute to making Argo an operational and sustainable programme.

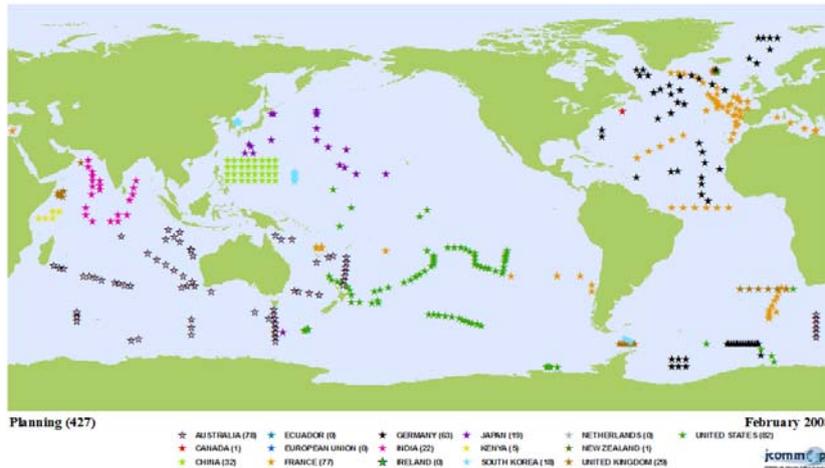
While progresses were made in the last year, it is needed to keep the pressure on float operators to obtain plans in advance.

In any case the TC will be pleased to assist the different Argo programmes in this exercise. It is to be noted that the interface allows entering information on additional sensors, which is important for Law of the Sea issues.

New web pages were developed or improved.

Planning status is monitored carefully through the monthly report.

Documentation will be completed according to latest modifications of the interface.

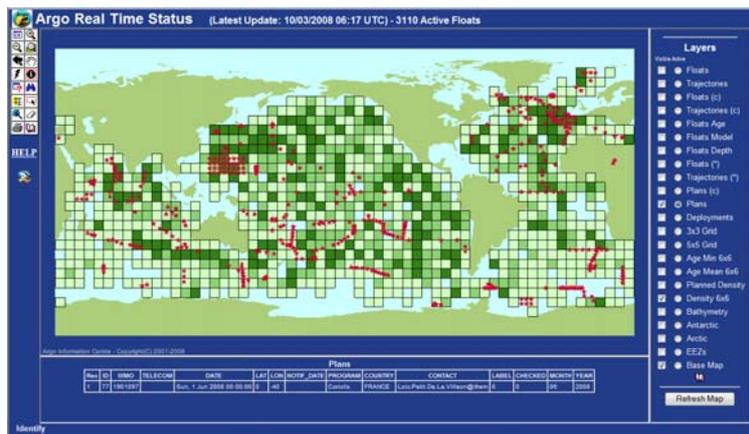


The system allows recording of draft plans that will be finalized gradually by float operators. E.g.: China plans to deploy 32 units in the west Pacific in 2008. It is particularly useful to display such information.

Argo Regional Coordinators are invited to use AIC products to maintain their system:

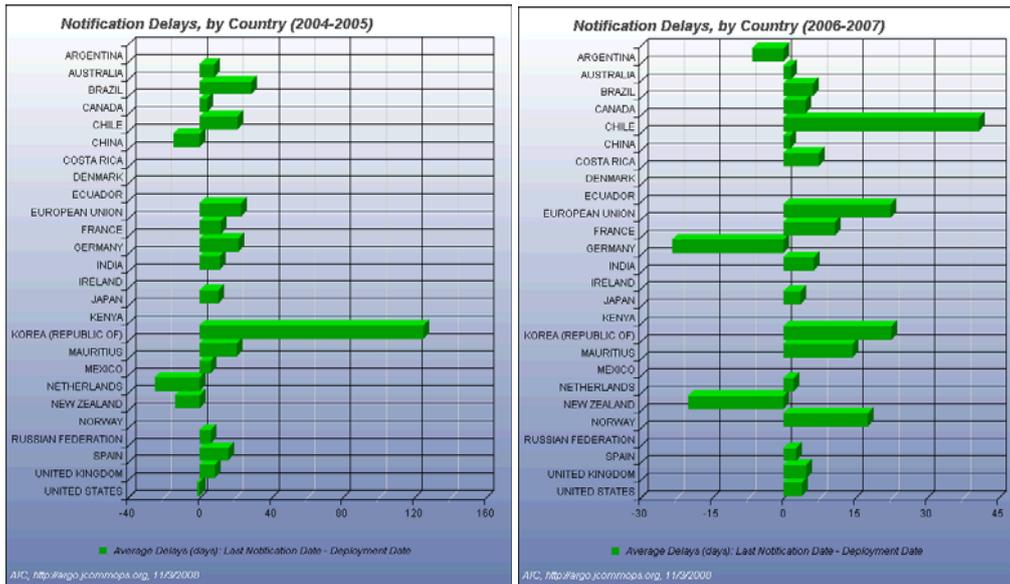
- GIS files: [ftp.jcommops.org/Argo/Status/ShapeFile/plans.*](http://jcommops.org/Argo/Status/ShapeFile/plans.*)
- Text file: [ftp.jcommops.org/Argo/Status/plans.txt](http://jcommops.org/Argo/Status/plans.txt)

These files are updated twice a day. TC will investigate the possibility to update these more often to check easily on the maps deployment locations (and avoid deployment positions on land).



The Interactive Map permits overlays of all layers and optimize the deployment strategies of platform operators.

<http://argo.jcommops.org/website/Argo>



The charts above represent the average delay (days) between the Last Notification Date and the Deployment Date for the period 2004-2005 and 2006-2007. Final notification is generally sent in the week following the deployment when operators receive the latest feedback from the ship. **This is acceptable as long as a first notification is made before the deployment.**

3.3 Deployment Opportunities

This is an area where all needs to be done.

There is no tool available today to identify easily a deployment opportunity.

In addition to the Argo PIs usual deployment opportunities, the AIC could help in identifying new opportunities to fill a specific gap.

The first source of information comes from the cruises used within Argo. That is why it is important to share information on Argo deployment plans.

Some progress was recently made with the POGO initiative:

<http://www.pogo-oceancruises.org/cruises/>

We can expect to find more information in the POGO database in the coming months.

TC will cooperate with POGO to link this information to the Argo needs.

The involvement of the TC in SOT coordination would be an opportunity to provide information on VOS and SOOP planned cruises.

In general it is planned to share information between all JCOMMOPS observing systems deployment opportunities/plans. This should be made possible when JCOMMOPS will recruit a new I.T. resource.

Cooperation with new countries (see section 5) could bring some punctual (but more modest) opportunities.

3.4 Network Monitoring

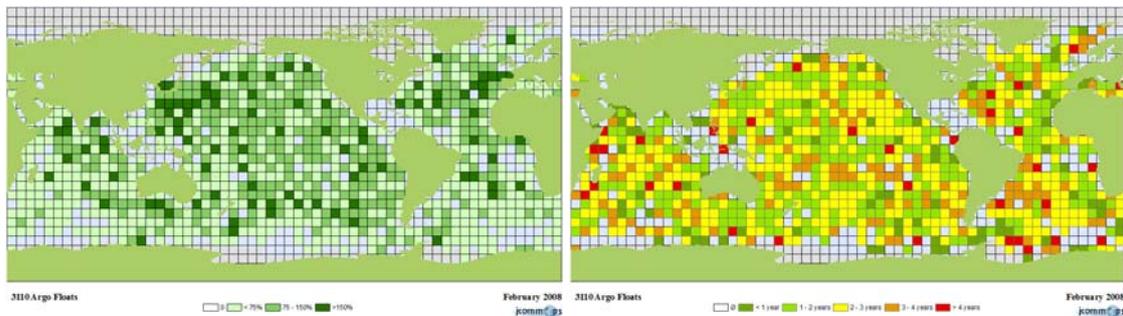
The GIS files organization and update was completely reviewed to improve performance, maintenance and archiving of geographical information.

In particular, the GIS files generation for active floats was re-coded.

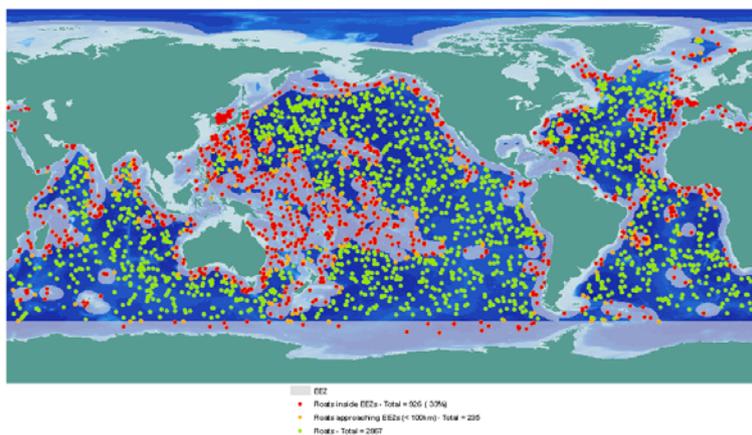
The files include much more Argo metadata (telecommunication systems used, beached floats, sensors used, RT or DM profiles available at GDACs, grey-listed floats) which permits to design a new set of maps. The related text file will replace in the future the old “status.txt”, which is by the way the most downloaded file for all JCOMMOPS activities.

All other files generation will be designed following this new code.

http://argo.jcommops.org/FTPRoot/Argo/Status/argo_active.txt



A simple view of the Argo network density which help in identifying gaps on a 6°x6° grid (Normalized on the 3°x3° Argo standard) and a simple view of the Argo network Age (Mean for 6°x6°) to anticipate future gaps. Data layers are produced on a monthly basis. It is planned to update them bi-daily as for all other mapping products.



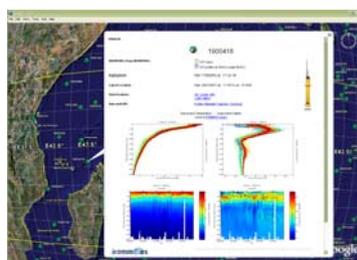
The map shows that more than **30%** of the Argo array is operating within EEZs.

A bi-daily text file includes all active floats that entered EEZs:

http://argo.jcommops.org/FTPRoot/Argo/Status/argo_eez.txt

The Argo KML files were substantially improved (see below) and now include data charts (produced by IFREMER), key metadata, links to all official data files (at GDACs), and links to national/regional websites proposing products for individual floats.

KML files are now served in a zipped format (KMZ) which is lighter to download but can still be read directly by GE.



This application is extremely useful for the tracking of beached floats and communication (e.g. live demonstration)

<http://argo.jcommops.org/FTPRoot/Argo/Status/status.kmz>
<http://argo.jcommops.org/FTPRoot/Argo/Status/inactive.kmz>

3.5 Misc. website update

- Many bugs/details fixed
- FAQs section reviewed, new FAQs recorded
- Support Centre developed and whole “HELP” section reviewed
- Documents section reviewed. Many documents, press releases, e-papers loaded.
- Pictures/Photos gallery enriched on the [FTP](#) site
- New mailing lists created
- New metadata (DACs, DM/RT profiles, grey-list, sensors) enrich float search engine and Data Monitoring pages.
- Key Argo links and shortcuts added on the [Argo toolbar](#) (85 users)
- Delayed-Mode operators contacts recorded
- New “Float of the month” section. Submit your float to Megan Scanderbeg at the Project Office (mscanderbeg@ucsd.edu)
- Argo portal improved: <http://www.argo.net> (key links added)
- Instrumentation page: Floats Spec. reviewed with manufacturers
- Argo links page clarified, completed
- Notification/Planning interface reviewed

3.6 Audience

Late January an audience tracking system (Google Analytics) was set up to monitor AIC and Project Office websites traffic.

We will learn more in the coming months about the websites audience but we already have a few interesting elements (see annex):

AIC (one month of tracking):

- International audience (strong audience from AIC funding countries and main Argo participants)
- 2700 unique visitors identified
- 3800 visits
- ~3.30 min. on site / visit
- ~4 pages / visit
- Most of traffic comes from referring sites
- 100–150 visits / day during the week
- Main pages: Float search engine, Planning/Notification interface, Interactive Map, News & “Float of the month”, Map Room.
- Bad referencing with Google (dynamic site issue)

Project Office (only 15 days of tracking):

- International audience (strong US audience)
- 1850 unique visitors
- 2285 visits
- ~1 min on site / visit
- 1.5 pages / visit
- Main pages: Argo general, photos and bibliography
- ~25% from referring sites
- Good referencing with Google
- 100-150 visits/day

4. Data Management

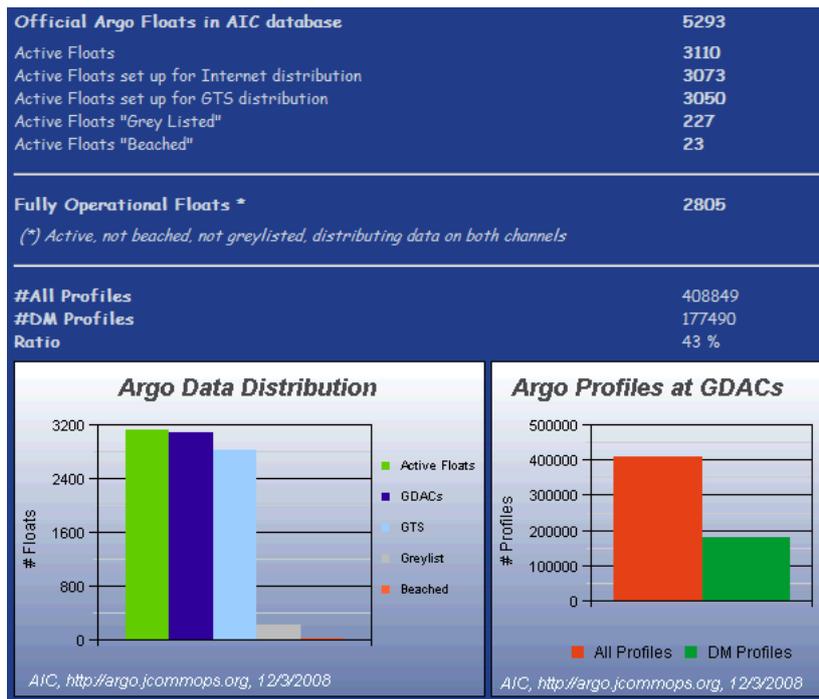
Float data distribution is verified at the AIC on GTS (daily + monthly stats from Meteo-France) and at Argo GDACs (daily stats from Ifremer).

As a consequence of this daily tracking (tables and statistics are available on-line) and the monthly reports, the global Argo data distribution is almost perfect: 98.8% of the Argo fleet distribute data as appropriate at a given time. The data managers are invited to keep an eye on the remaining 1.2% to not “waste” real time profiles used by operational centres.

It is needed to better exploit GTS and GDACs statistics, to be able to detect if a particular float stopped to distribute data during a given period. Data are in the database, appropriate monitoring tools will be developed.

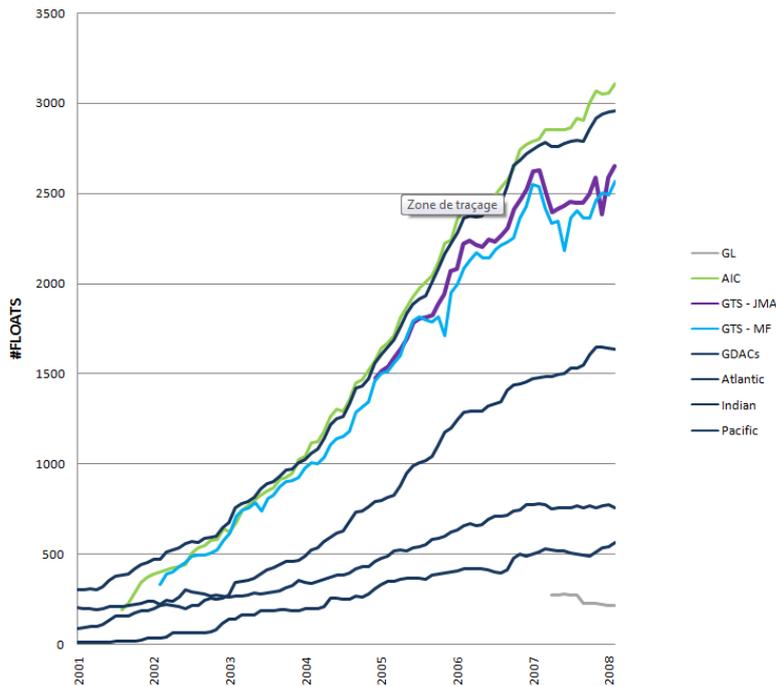
New developments:

- Daily update from Argo GDACs improved for delayed-mode files tracking, grey-listed floats, and “/gts” directory
- New dynamic charts for real-time and delayed mode Argo data distribution (global Argo, by country or programme)
- Summary put in AIC Monthly Report (see below)
- Database is being modified to produce accurate statistics on network growth (see below)



A summary of the Argo data distribution status

Argo Network Growth

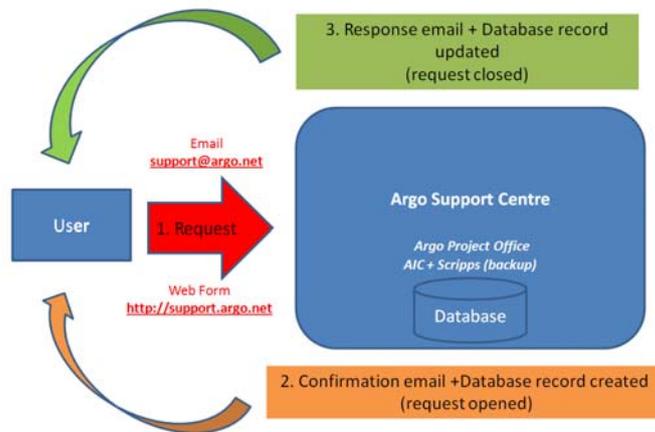


*This graph demonstrates:
the consistency between AIC and GDACs counts
the decrease of GTS profiles distribution due to the grey-list
the problem of Meteo-France rejecting all TESAC including some “/”*

The AIC plans to manage more efficiently metadata concerning float cycles (key element for reliability statistics), Argos data formats (key element for data decoding).

Support Centre:

The Argo user community is growing and increasingly diverse. The user support activities need to be strengthened and organized properly within the AIC. Feedback from all project participants, from data users to data providers needs to be managed with a simple and efficient mechanism.



In order to process the queries in a structured and timely manner, a centralized procedure has been set up. The Argo Project Office (Argo TC + M. Scanderbeg / Scripps) provides an operational user desk via <http://support.argo.net> and support@argo.net

This procedure will permit archival of requests and generation of reports to the AST and the ADMT. The form allows sending feedback on an individual float data.

A few requests were already processed through this system concerning:

- *float metadata files (incomplete for "/gts" directory data)*
- *Data downloading difficulties at GDACs*
- *Argo generalities (e.g.: float end of life)*
- *Access to data in ASCII*
- *Information on all official float deployments*
- *Data in Red Sea*
- *Impossible downloading big data files at GDACs*

It is suggested to promote this address on ALL Argo websites. It is not the case today. Interface will be gradually improved.

ADMT#8 Meeting Action List:

1) **Provide access to the support@argo.net question/answer database to AST/ADMT chairs.** Completed:

http://wo.jcommops.org/cgi-bin/WebObjects/Argo.woa/wo/Support_Requests.wo

I decided to make the requests public so users can check their request was recorded. Most interesting question/answers can be tagged "FAQ".

- 2) **Establish an Argo user mailing list.** Completed: argo-du@icommops.org
 ⇒ Need to subscribe appropriate users (keeping in mind upcoming EURO-Argo data users meeting)
- 3) **Provide to AST chairs the list of operators that notify with delay their floats.**
 Completed
 See section 3.2 or use shortcut
http://wo.icommops.org/cgi-bin/WebObjects/Argo.woa/wo/N_Stats.wo
- 4) **Include J. Gilson report on suspicious floats/profile detected.** No input for now.
- 5) **Modify the text to the Support Centre to encourage users to report on data quality.**
 Completed. To improve.
- 6) **Argo forum to be set up.** Completed: argo-forum@icommops.org
 An Argo blog was set up as well: <http://argo3000.blogspot.com>

5. International Issues

New participants

The AIC encourages and coordinates multilateral collaborations through “float donations” in order to build capacity for new participating countries, identify new deployment opportunities, and finally help to implement and maintain a global array.

The donation contract was recently approved by UNESCO legal affairs (see annex).

Preparing the deployment of a few units by a new country is a time consuming task (email + phone). It takes generally between one and two years.

The demand is increasing and difficult to satisfy in a timely manner.

This Kenya case below illustrates how difficult it is to organize such initiatives. We need, as far as possible, to find some **reliable deployment opportunities**.

The new contract will help in securing the different responsibilities.

AST members are invited to contact the TC to organize cooperation with the countries listed below.

In general well funded programme could reserve 1-2 % of their floats for cooperation.

This initiative is the best way to:

- Transfer floats anywhere avoiding custom taxes legally.
- Deploying a float for free in a foreign EEZ (and avoiding bureaucracy).
- Strengthen the international and regional support to Argo.
- Fill some small gaps in specific areas
- Thank countries helping to retrieve beached floats

Ireland joined Argo recently (and Euro-Argo) with 4 floats deployed.

This year the following programmes have been finalized thanks to the University of Washington and with WMO support:

Ecuador: 3 floats successfully deployed by the Ecuador Navy

Kenya: 5 floats transferred successfully and to be deployed by the Kenyan Navy.

Unfortunately the local situation has frozen the initiative. We will probably need to find a new deployment opportunity or ship the floats elsewhere.

Additionally, contacts have been established with the following countries:

- **Gabon:** Argo TC met Foreign Affairs minister. To follow up with a donor programme. Possibility to fund floats within a few years. A deployment opportunity is being defined with Navy.
- **Greece:** Possibility to fund floats being investigating (following Euro-Argo meeting).
- **Morocco:** letter sent to different departments to organize a workshop to promote Argo, identify the partners ready to start an Argo programme and transfer floats from France and USA. Waiting official reply.
- **Ivory Coast:** to organize a donor programme. Ivory Coast established an Argo Centre and is waiting for floats. Formal request received from the “Centre de Recherches Oceanologiques” Director to participate in a donor programme. Local contacts are looking for a beached float near Abidjan.
- **Indonesia:** Contact established with the recently established SEACORM (Southeast Asian Centre for Ocean Research Monitoring). Deployment opportunities identified in I.O and Banda Sea. Ready for donor programme.
- **Cape Verde, Sri Lanka** helped to retrieve stranded floats: Ready for donor programme.
- **Rep. Dominican:** Ready for donor programme.
- **Columbia:** letter sent by the AIC to help scientist to get funding for 4 floats from DIMAR/CCCP. Failed. A non-governmental organization could fund the project.
- **Togo** preparing a deployment opportunity. Ready for donor programme.
- **Philippines:** A global initiative should be prepared to retrieve beached floats, donate new floats, and help to start an Argo initiative.
- **South Africa:** following GEO summit, SAEON (South African Environmental Observation Network) investigates the possibility to fund 2 units per year. Possibility to fund “bio-Argo” floats as well.
- **Malaysia:** SEAFDEC plans to purchase a few units in 2008
- **Tanzania:** floats deployed for UK. Looking for beached floats.

Bio-Argo#1 meeting

TC attended the first Bio-Argo meeting in January and presented the development of the Argo programme.

This enthusiastic community would like to be associated with Argo (as the ArgO2 group) and implement a global array of bio-optical floats measuring mainly T/S, O2, chlorophyll/fluorescence, backscattering, and eventually radiance/irradiance.

This is an opportunity for Argo to develop its end users community, to be associated with multi-disciplinary applications related to climate change and to the “green operational oceanography”, to obtain some support from new agencies (ocean color products validation via in-situ), to gain access to biologist ship time, etc.

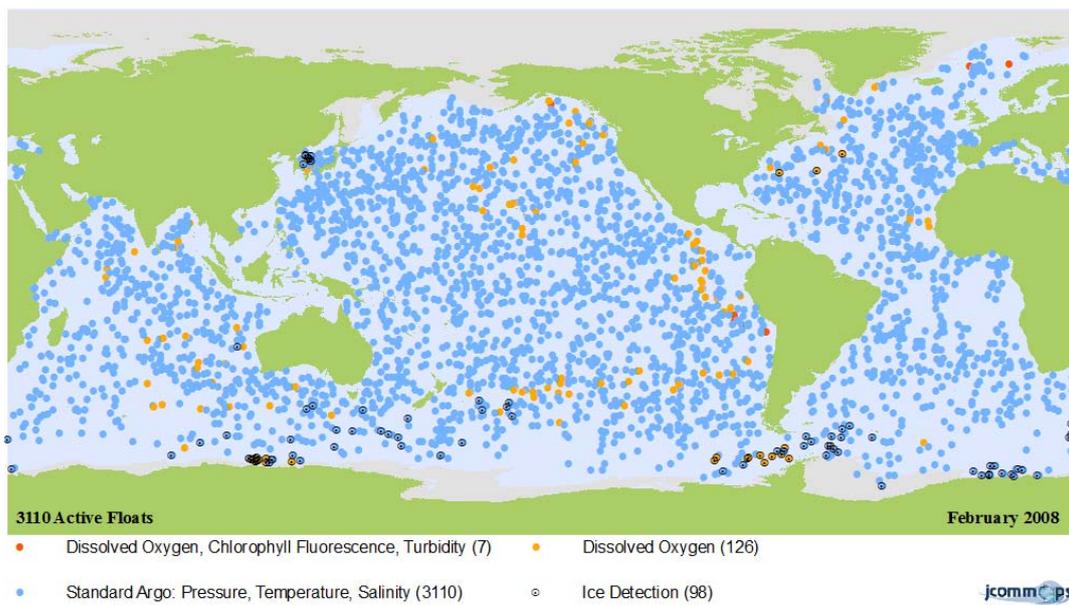
Of course the group is aware of the need to not impact Argo core mission and will estimate

the costs in term of battery, telecommunications, float lifetime. Some dedicated pilot studies are being prepared (many tests have been done by UW already).

The addition of small optical sensors should present minimal adverse effects on the Argo floats while providing important links to biogeochemistry in general and carbon science in particular.

These projects should speed up the development of new telecommunications systems on floats (Iridium, Argos 3) as more bandwidth is required.

The standard design of the Argo array (3°, 10 days) seems to fit with their scientific needs, even if in some region, ancillary arrays will be required.



As shown on this map, Argo is already associated with bio-optical community.

This will probably bring some complexity regarding data management (standards to be defined) and in particular Law of the Sea issues as there is more sensibility with sensors related to the exploitation of marine resources. The use of such sensors could carry additional obligations or restrictions.

In agreement with AST co-chairs, TC offered his support as it is the case today for all “equivalent” Argo programmes.

Next meeting will be held by the end of the year and will probably see the “friends of oxygen” and Bio-Argo groups joining their efforts.

Retrieval of beached floats

This is an increasingly time consuming task. The Argo label affixed to most of floats has proven its worth. More and more “Samaritans” contact the AIC when they find a float. The list of beached floats and the status of retrieval procedure is tracked on-line and in monthly report. About 60 floats are awaiting retrieval. About 30 units were successfully retrieved, secured and shipped back to their owner (since 2001).

In many cases it is necessary to send a technician prior to the shipping, to prepare the instrument (in particular when instruments are equipped with Lithium batteries).

This provides an excellent opportunity to establish contacts in new regions and communicate on Argo to coastal communities.

According to the latest monthly report we have 7 units that were located thanks to a local assistance and secured.

Exclusive Economic Zones, Law of the Sea

The work of the IOC/ABE-LOS group is progressing.

The Argo TC participates in the work and provides a concrete example with the implementation of the [IOC Resolution XX-6](#).

Argo is seen as a good example of an ocean observation programme, in particular regarding its transparency, and how it encourages international cooperation.

The AIC (and further JCOMMOPS) is being recognized as the ideal tool to inform Member States about deployment planning, platforms metadata and data access.

The notification procedure set up by the AIC could be recognized and formalized through a new Resolution (see Annex).

As recalled in the documentation all Argo programmes should take care to:

- Designate a person (representing the Institution) to enter the deployment plans in the AIC website
- Regularly update the information
- Notify the plans when they are finalized
- Make sure that the information entered is correct
- Not deploy Argo floats directly into EEZs without any kind of agreement.

In addition to the web/email based notification procedure, letters (prepared by the AIC and sent by the IOC Executive Secretary) on the status of floats within or entering in the EEZs were sent to some IOC Member States. This will establish or re-confirm the formal contact for each Member State and possibly assist in updating the list of Argo National Focal Points. Next report will be prepared for China.

6. Planning

Beyond AIC routine activities, and AST (and ADMT) suggestions, planning for 2008 can be summarized as follow:

- Continue to encourage/assist float operators to notify of deployment plans
- Continue to address any issues with the new website
- Improve JCOMMOPS Information System operational status
- Review AIC/JCOMMOPS Information System documentation
- Improve the AIC Monthly Report
- Improve the Support Centre
- Work on metadata: cycle and Argos/Iridium data formats
- Improve data distribution monitoring (GTS/GDACs)
- Finalize bi-daily files generation (GIS, text, Google Earth)
- Continue to issue reports on EEZ status to IOC Member States.
- Improve the Argo websites (work with Megan)
- Review all mailing lists subscribers

- Update Argo communication material: presentation, poster.
- Continue to assist in the float retrieval activities
- Continue to foster participation by new countries through donor programmes
- Improve (modestly) Argo media coverage via direct contacts or educational initiatives
- Assist Bio-Argo initiatives
- work on deployment opportunities

Annex: see pdf attachments.