Argo Information Centre

TC Report – AST11

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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 Observing Program Support centre (JCOMMOPS).
The AIC is funded on a yearly basis via voluntary contributions from Australia, Canada, China, France, Germany, Rep. of Korea, India, the United Kingdom and the United States.

JCOMMOPS (and its AIC component) faces the challenge of strengthening its infrastructure, integrating the existing services better, developing a new generation of web services, and eventually extending its operations to new observing systems.
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), as of Feb. 2009.

⇨ See the Argo/SOT TC Terms of Reference in annex

In return, this permits to:
- Stabilize Argo/SOT TC position (with a funding under pressure)
- Hire a new I.T expert to work (half-time) for JCOMMOPS, as of September 2008.
- Develop further synergies with SOT (and SOOP in particular)
- Make available some mission budget Argo/SOT TC on the WMO side.

JCOMMOPS was formally expanded into a JCOMM Observing Program Support Centre at the JCOMM III session, and France was selected as the hosting country for the centre, through a partnership Ifremer/CLS.
Following up on this result, the partnership CLS/Ifremer is being strengthening its support to the centre:
- Y. Desaubies has started to work within JCOMMOPS (1/4 time) as Scientific Coordinator
- The software developer half-time position will be made full time (details being discussed with host)

The contract between IOC/UNESCO and CLS will be reviewed in order to make of the centre a true IOC/UNESCO Programme Office and strengthen the legal and logistical aspects.

On the other hand JCOMMOPS will seek new funding sources with the hosting country, with Europe (the EuroArgo initiative may help), and will develop synergies with other JCOMM/GOOS programmes (e.g: BioArgo, IOCCP/GOSHIP, MEOP, Gliders, GHRSST) as given in its new mandate. Also its role of international coordination will be completed by “Project Office” activities which remain to be adequately defined and funded.

⇨ See the new JCOMMOPS Terms of Reference in annex

2. AIC

TC Activities

The TC supports the Argo community on a wide range of issues that could be summarized in three keywords: **Assistance**, **Monitoring**, and **Cooperation**.
Many of these issues became routine activities:

- Network status monitoring
- Data management status monitoring
- Monthly Reporting
- Assistance to deployment planning, float retrieval, data distribution
- Assistance on EEZ issues, IOC Res. XX-6 & XLI-4 implementation
- Assistance to national programmes and PIs (ad hoc stats, maps, …)
- Support Centre (user desk, QC feedback relay)
- Information System technical maintenance and development
- Information System content management (float metadata, contacts, documents, news, …)
- International Cooperation, Donor Programmes
- JCOMMOPS Administration, development
- Links with SOT, DBCP, OceanSITES, IOC, WMO, JCOMM
- Media needs (photos, articles)
- *Assistance to new programmes (Marine Mammals, ITP, Bio-Argo, ...)*

As expected at AST10, 2009 was a challenging year for the TC:

- growing Argo activities
- management of the software developer
- design of the new Information System
- new responsibilities on the SOT programme
- growing JCOMMOPS administrative issues
- number of missions / meetings

The assistance provided to new programmes (basic tracking, GTS data distribution issues, etc) will not be sustained in order to focus on Argo issues.
The question remains open for new "BioArgo" floats, including oxygen floats.
The TC established the contact with these PIs, set up a basic (sometime manual) tracking system, and provide basic products.
There are some issues to solve regarding data distribution and metadata: e.g.
N floats where declared at AIC with oxygen data, P floats have the oxygen declared in the meta files and Q floats provide oxygen profiles.
Should the TC spend some time fixing this?

TC 2009 Missions

JCOMM OCG, Paris (March)
AST10, ASW3 Hangzhou (March)
Libreville, Gabon (April)
Scripps, Argo Project Office /Google workshop) (April)
Geneva, SOT V (May)
~~Euro-Argo, Italy (June)~~
Germany: Argo agencies, float manufacturer (September)
OceanObs09, Italy (September)
ADMT10 (hosted by AIC with CLS, October)
JCOMM III, Morocco (November)
Brest, Ifremer (Gabon meeting, JCOMMOPS/Y. Desaubies) (December)

TC 2010 Missions
IOC/UNESCO, Paris. Meeting with new IOC Executive Secretary, W. Watson Wright (March)
AST11, San Diego, (March)
GTSPP (Ostende) (May)
Brest, Ifremer (May)
Euro Argo, Paris (June)
IOC 50th anniversary/ Ex. Council (June)
India, Rep. of Korea when possible.
Visit AOML/SOOP chair
Morocco donor programe
Gabon Training Workshop

Monthly Report
The "monthly" report continues to be enhanced and improved each month with new products. TC starts to work on the report by the end of each month, and release it as soon as possible, after a set of checks and communications with float operators. This takes generally between one and two weeks.

6 Reports were made in 2009 (10 in 2008).
Report could be done more regularly if some time could be found to make appropriate developments. For now too much time is spent on formatting and fixing technical details.
Also when the TC is away for missions or vacations nobody can backup.

Anyway, the best will be done to ensure the production of a report every two months and target a routine monthly reporting.

The latest monthly report includes many yearly statistics on the array status:
http://argo.jcommops.org/FTPRoot/Argo/Doc/2010-01-02_AIC.pdf

Information System
The development of the new system has been slow down for a number of issues (see above) and you can't make miracles with a half-time I.T. person. But the substantial time spent in training and familiarizing the developer on JCOMMOPS services will definitely payback in 2010.

A new (Oracle) database server was set up and its design is being optimized to handle various platform concepts (e.g.: buoys/floats, ships, sites) and a large volume of observations statistics.
The 10 years experience in handling similar information will permit to simplify dramatically the design and allow more flexibility and more efficiency in the development of products.
The improvement of the Oracle technology in the last decade will definitely boost the performances.
Database design and synchronisation with main data sources (Argos, GTS, GDACs) should be operational by April 2010.
All new developments will then be made on this new database with the target to release the first web services early 2011.

On the other hand a new GIS server is being set up to evaluate most recent GIS technologies.
Our challenge here is to allow the generation on the fly of map services resulting of GIS analyses (density, intersection with EEZ, etc).

The core web services will be developed around the following toolbox:

- define groups of platform via complex queries
- map the results (GIS, Google Earth, etc)

- produce statistics and allow comparisons between different groups
- edit multiple platforms metadata from planning to end

- define a group of observations (does not exist today via the web)
- map/stats on the results

- save users/profile favourite monitoring products ("my JCOMMOPS")

Iridium

The delivery of Iridium data to Argo customers is decentralized and heterogeneous. Hence the AIC can't synchronize efficiently its tracking system with Iridium floats.
This starts to be a serious issue.
In addition the tracking system is not "independent" and the transparency of the Argo array is no more ensured. Many services of the AIC won't work (how to remind a PI to process a float, how track a beached float, how track a float back on-line, how track floats within EEZ, etc).

⇨ **The AIC needs to link with Iridium data before data reach customers …**

Network Planning & Monitoring

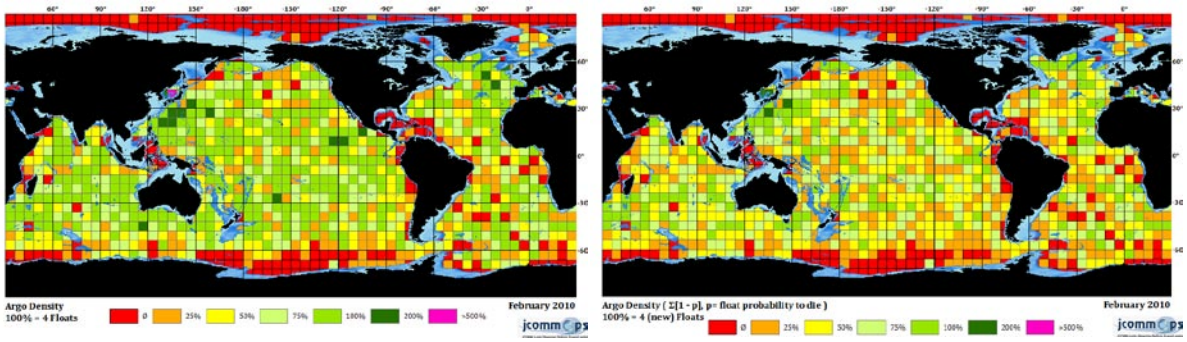
Under the guidance of the AST co-chairs, and in cooperation with some AST members, the TC designed a scoring system for the deployment plans.
This scoring system is encouraging float operators to deploy their floats where it is needed for the global array maintenance.
It can be also used by manufacturers to prioritize their float delivery in period of crisis as we had this year with the SBE sensor issue.

This information is updated twice a day and available on line in the planning interface, in the web GIS, and Google Earth. A summary by cruise is provided in the monthly report.

⇨ This tool makes sense only if float operators enter their deployment plans on-line

Method is detailed in the following report:
http://argo.jcommops.org/FTPRoot/Argo/2009-04-05-AIC.pdf

Two density maps are available via the web to assist operators to optimize their deployment plans:



The first one sum the active floats (not greylisted, not beached) on a 6x6 box, and normalizes the result on the Argo target.
The second sum the (1-p) values, where p is the float probability to die, function of its age.

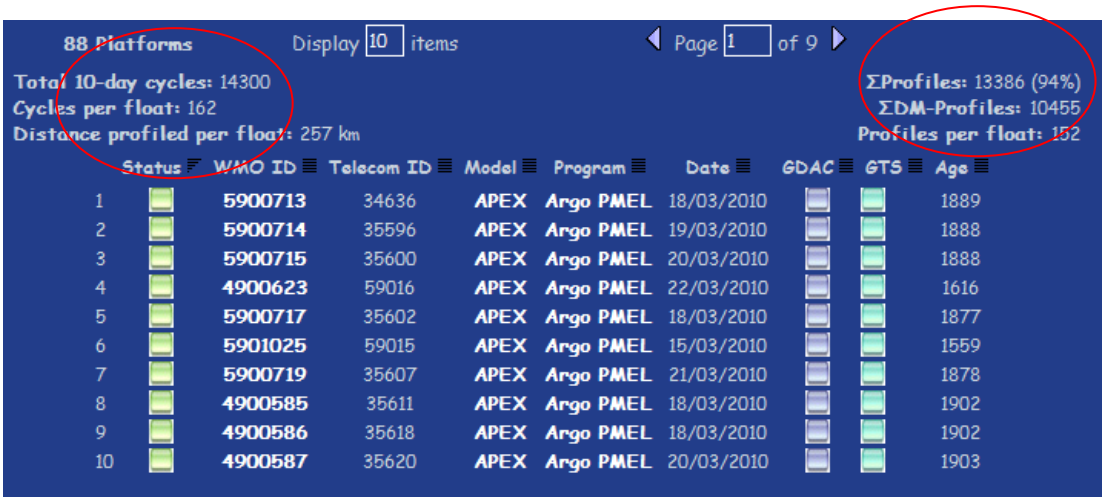
Those maps are also available in Google Earth:
http://argo.jcommops.org/FTPRoot/Argo/Status/ARGO_DENSITY.kmz

Planned improvements:

- Design a density map with values on a 1°x1° grid
- Make the scoring system real-time

New stats

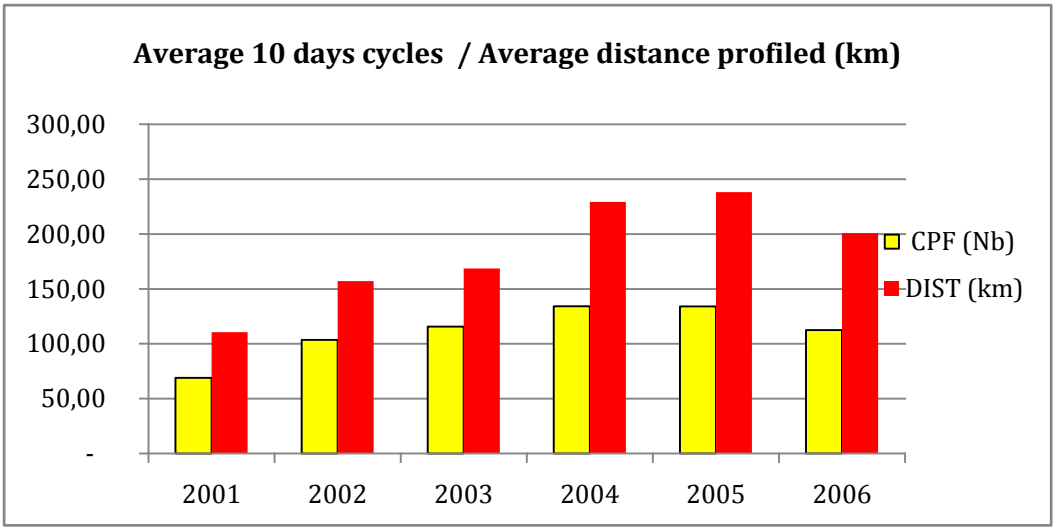
Some simple statistics were added to the float search engine following suggestion by AST co-chairs:



	Status	WMO ID	Telecom ID	Model	Program	Date	GDAC	GTS	Age
1		5900713	34636	APEX	Argo PMEL	18/03/2010			1889
2		5900714	35596	APEX	Argo PMEL	19/03/2010			1888
3		5900715	35600	APEX	Argo PMEL	20/03/2010			1888
4		4900623	59016	APEX	Argo PMEL	22/03/2010			1616
5		5900717	35602	APEX	Argo PMEL	18/03/2010			1877
6		5901025	59015	APEX	Argo PMEL	15/03/2010			1559
7		5900719	35607	APEX	Argo PMEL	21/03/2010			1878
8		4900585	35611	APEX	Argo PMEL	18/03/2010			1902
9		4900586	35618	APEX	Argo PMEL	18/03/2010			1902
10		4900587	35620	APEX	Argo PMEL	20/03/2010			1903

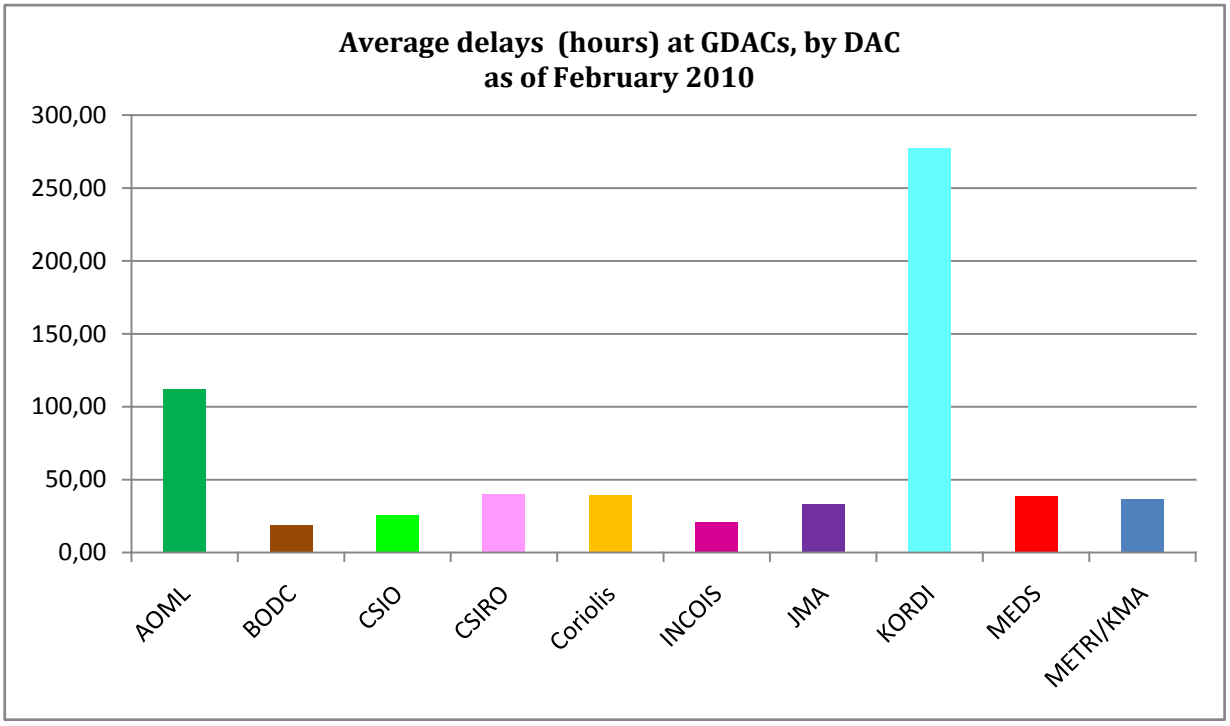
e.g: 2005 PMEL floats have made in average 162 cycles, have profiled 257 km, produced 152 profiles per float ...

Such statistics will be exploited further, as shown in the monthly report:



To be noted that the values of the "distance profiled" have to be taken with caution as many operators declared a default profiling depth of 2000m while the float is not going so deep in average. So values may be a bit optimistic.
This is being fixed gradually.

Coriolis GDAC has improved its detailed index file so that delays can be measured properly:
ftp://ftp.ifremer.fr/ifremer/argo/etc/argo_profile_detailled_index.txt.gz



To be noted by the way that the average delay for an observation to reach the GDACs (the users) was 81 hours in February. This delay is 20 hours for GTS distribution.

Argo & Google Ocean

The Google earth Argo layer is still under development.
The software developer at JCOMMOPS is focusing on this application.

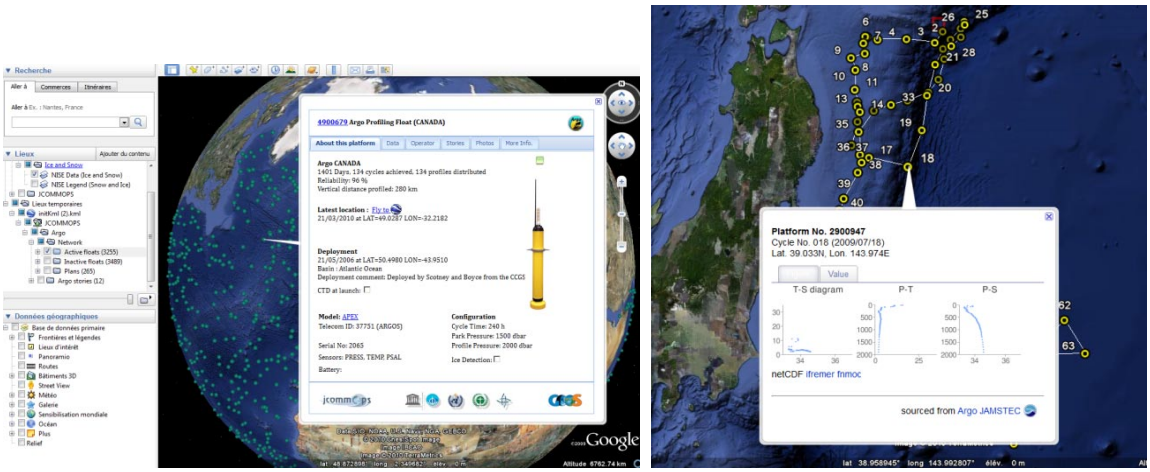
The original plan was to:

1) Provide general information on Argo via a "tour"
2) Improve the existing Argo balloon for the 3000 floats
3) Include T/S/Anomalies monthly (Argo only) products at key levels
4) Tell stories on ocean state, oriented on climate issues

The general KML is generated on the fly and includes:
Active Floats/Inactive Floats/Deployment Plans/Float Stories
http://www.jcommops.org/jcommops-kml/WebObjects/jcommops-kml.woa/wa/initKml?prog=argo

The Argo balloon is displayed when user click on a float or directly using the following link, or the Argo toolbar:
http://www.jcommops.org/jcommops-ptf/WebObjects/jcommops-ptf.woa/wa/wmoKml?code=4900587&prog=Argo

Content is also generated on the fly.



The first tab **"About this platform"** contains general information about the float, its status and provides access to the trajectory (generated by JAMSTEC web services) which allows a quick view on individual profiles distributed at GDACs, and use of text data.
Latest profile plot is provided by JMA.
The link to the Argos trajectory data (with ellipses of errors) will be added soon here:

The second tab **"Data"** aims to include GDACS and DACs products about the float data, and also global diagnostic tool such as the Altimetry QC stats from CLS/Coriolis or Surface pressure plots from CSIRO. Whenever the diagnostic page is an image, it is included directly in the balloon, otherwise the link is displayed.

The third tab **"Operator"** aims to give visibility to the float operator initiative, agencies and people involved, and offer another set of diagnostic plots and links.

E.g.: A float operated by SIO has data products at GDACs, DAC (AOML), SIO, and in misc. websites. This balloon gives a single point of access for all this information.

The fourth tab **"Stories"** includes the float of the month stories maintained by the Project Office.

The fifth tab **"Photos"** includes a slideshow for deployment photos if any. These photos are stored in the http://picasaweb.google.com/JCOMMOPS/Argo# Argo album. Just add a proper "tag" with the WMO id.
Try with http://www.jcommops.org/jcommops-ptf/WebObjects/jcommops-ptf.woa/wa/wmoKml?code=7900233&prog=Argo

The last tab **"More Info."** provides additional info, legend for pictures, acknowledgements, copyrights, etc.

The Argonauts are invited to comment and make suggestions on the beta version.

The AIC has made a tour of all Argo websites to gather the links that permit to include the diagnostic plots in the balloon.
Please keep the AIC aware of your developments and changes.
All these links can be found here:
http://wo.jcommops.org/cgi-bin/WebObjects/Argo.woa/wo/Weblink_List.wo
select "Platform Diagnostic Pages" on the popup menu.

AIC website audience

The website audience has dropped by 15% in 2009 compared to 2008.
It is interesting to note that this audience has decreased with users from Americas (-15%) or Europe (-30%) or Asia (-9%) but it has increased in Oceania (+8%) and Africa (+32%).
To be noted that the "float of the month" audience has decreased by 30% so it is needed to promote it more widely. An email to the Argo general mailing list would be good each time a float story is added.

ADMT#10Meeting Action List:

1) Calculate time delay for getting RT/DM files onto the GDACS. Investigate files slowly arriving
- ⇨ RT Done. See charts and maps in monthly report
- ⇨ RT Done also for GTS data
- ⇨ Detailed stats on DM profiles processing included in monthly report

2) Study how to keep information on sensor failures (Greylist)
- ⇨ To be discussed with T. Carval.

3) Investigate on the content of the existing netCDf metadata files and make suggestions for improvements.
- ⇨ Target ADMT11
- ⇨ Right timing as the AIC meta-database is being redesigned

3. International Issues

e-Notification

For all equivalent floats an additional note will be attached to the electronic notification:

"The owner of this float has agreed to share data within the Argo data system, and the Argo Information Centre tracks this float for information and can provide some support if needed. However this profiling float was not deployed under the aegis of the international Argo program, and may not comply with Argo best practices."

Bilateral Notification

The AIC set up a routine system for assisting USA to notify floats that might drift into Argentinean, Peruvian and Turkish EEZs.
See: http://argo.jcommops.org/FTPRoot/Argo/EEZ/

Every day, any group of floats entering into a predefined area (EEZ + 100 nm) is listed with key metadata. The list can be attached to a template notification letter to be sent bilaterally.

- ⇨ Such system can be adapted for any country and any maritime zone.

But it appears to not be practical on the long run (ask feedback from US Argo).

Beached Floats
The design of the "large Argo label" has been slightly reviewed to show the red symbol "DO NOT OPEN".
Manufacturers were invited to order directly labels to the printing company.
Scripps will send a new pack of "small Argo label" to the AIC.

It was decided to restrict the use of the Argo label for some equivalent floats.
An appropriate written note will be sent to the manufacturers.
In particular all future NAVOCEANO floats won't be equipped with the Argo label.

Official Argo program PIs are invited to seriously feedback on pending issues.
The AIC has the role to inform PIs on the status of their beached floats, provide instruction to secure the floats to local people, and thank them for their assistance.
In any case the retrieval procedure as to be driven by the PI unless specific instructions are provided to the AIC.

Note that NOAA has provided the AIC with a stock of "Atlas of the Ocean" to be sent in return of the help received to secure the floats.
We could improve this package with some more material.
Any suggestion and offer from an AST member country will be welcome.

We have seen a number of redeployment of beached floats by local individuals or local oceanographers.
When the redeployment is successful we have to have a new float record in term of tracking and data distribution (with a new WMO Id).
Why not then reclassify the float under the nation that helped to secure and redeploy the float**.**

This would permit to:
- Thank the nation that helped Argo
- Extend the international support to Argo
- Humanize the observing system by telling the related stories
- Transfer the responsibility in case of new beaching
- Keep statistics clean at the AIC. Such new deployment would increase artificially the number of float funded for a given program/country.

- ⇨ **The AST is invited to feedback on this suggestion.**

Donor Programmes

Kenya: The 5 floats have been successfully deployed by US Navy. End of the story.

Gabon: One of the most successful cooperation so far, thank to US Argo.
- 3 floats shipped in Gabon
- Workshop set up to explain how to deploy floats and raise a national Argo program
- 3 floats successfully deployed by Navy

- Donation celebrated at Foreign Affairs Minister in presence of high profile people with full media coverage.
- 2010 Training Workshop (in French) for west African countries being prepared with US Argo, US Navy and Argo France.

⇨ Main difficulty for the future: lack of physical oceanography cursus at University.

Morocco:
- Float donation by France celebrated at JCOMM III.
- Contact established with Met Services and deployment planning being set up;

Colombia will celebrate this year the 200th anniversary of its independence and a number of events will be celebrated. In particular it was proposed by the Colombian Commission for Oceanography to deploy some floats as part of maritime events. Colombia is a strategic place within South America with an access both on the Pacific and Caribbean regions.

Peru, Ivory Coast, Indonesia, Cape Verde, Sri Lanka, Togo, and Rep. Dominican are waiting for a donor programme.

Contacts have been established with **Seychelles** authorities to facilitate float deployments within its EEZ (by Australia) and evaluate the potential deployment opportunities.

4. Planning

Beyond AIC routine activities, and AST/ADMT suggestions and action items, planning for 2010 can be summarized as follow:

- Continue to produce/improve the AIC Monthly Report
- Ensure at least a report every two months
- Continue to encourage/assist float operators to notify of deployment plans.

- Finalize the Google Ocean Argo Layer
- Finalize the design of the new database
- Set up synchronisation with main data sources (Argos, GTS, GDACs)
- Fix the issue of Iridium float tracking
- Set up a new GIS server
- Start developments of new web services

- Exploit further detailed index files to develop appropriate monitoring tools

- Work (with AST and JCOMM) on new monitoring products demonstrating how Argo is meeting its requirements.
- Work with Y. Desaubies on Argo issues

- Continue to assist in the float retrieval activities
- Continue to foster participation by new countries through donor programmes

- Work with Y. Desaubies on JCOMMOPS issues
- Work with IOC to renew the MoU with host
- Investigate possibilities to strengthen JCOMMOPS resources with (ship coordinator) via discussions with GOSHIP, CCHDO.