2nd ARC meeting October 28, 2008

reminder of goals of ARCs:
essential: regional analysis & feedback to PIs
optional: float deployments, new quality control tests, products

PARC

Partnership with 7 countries
Responsibility by institutions: CSIRO, JAMSTEC, IPRC, SIO

Biggest challenge is communication

JAMSTEC: has nice web pages up with float status by nationality and deployment plans by country. They expanded their responsibility to include the southern ocean (below 30S), which was action item 9. They provide diagnostic pages for PIs with detailed information. They provide products for regional analysis and maps to find anomalies (monthly).

Future plans: semi-realtime automatic processing; using new regional analysis. List data that pass, do not pass process.
Float CTD intercomparison.

SIO: Pacific Marine Atlas is distributed as CD and DVD which help Pacific Island nations to get value from Argo.
They are involved in SEREAD – education/outreach and provide materials for south pacific island countries.

IPRC contribution: their focus is more on research, i.e. Less focused on quality control. They have developed some nice products, for example the YoMaHa data set. They provide vertically gridded data sets on standard depths of hydrography, velocity at the surface and at the parking depth. They also provide the data for downloading, currently ascii files. They plan to transition to Netcdf files in future.

They have experimental web page for data products showing ensemble, seasonal, monthly climatology, barrier layer thickness (mean and standard deviation), surface velocity (mean and standard deviation)
Data access: Near-realtime updates (10-day).
Looking hard for external funding to keep this going. This requires focus on products.

Canada does QC for some PI-less floats.

NAARC

In 2008 the progress have mainly been done on coordination within Europe through the EURO-ARGO projects with involves all the EU countries contributing or willing to contribute to Argo (http://www.euro-argo.eu/) . This 3-year project started in January 2009 and aims at sustaining Ergo in Europe for the next 10-20 years. Europe should be able to maintain an array of 800 floats (deploy 250 per year in which 50 for regional seas better coverage)

Not much work has been done concerning coordination with the SAARC except for deployment activities.

Coriolis coordinates Deployment planning in Atlantic

Within Euro-Argo :

- delayed-mode quality control in regional seas have been organized .OGS is taking care of all the MED and Black Seas floats, BSH or the Nordic seas, BODC for Irish floats.
- facilitate the involvement of new EU countries by providing data processing facilities(Coriolis and BODC)
- Strengthen link with user groups. 63 scientists from 9 countries attended the first meeting last June in Southampton; Next one is planned in Italy in June 2009 and training session on float technology and Data access will be organized.
- Developments of data consistency methods : comparison with Altimetry , anomalies from Arivo-08 Climatology, consistency with neighbors
- Improvement on float technology : Iridium and Argos3 on PROVOR/Arvor to reduce time at surface and therefore beaching in marginal seas, Improve under ice behavior of NEMO
- Reference data base: collection works well in North Atlantic. Efforts in Med Sea on going to get data from African nations, Turkey, …
- Improvement of Trajectory data (Ollitrault et al) in order to generate a trajectory atlas

We have identified the need of "more intelligent" tools /Better strategy for deployment planning that would take into account the float displacement, the age,… in order to better identify areas where reseeding is important. NAARC would like to collaborate with others on this issue

From User meting we have identified the needs to improve the introduction to Argo data than on UCSD web site (something should be proposed within Euro-Argo) Users have also express the need for higher resolution profiles in upper 20 m and continue running CTD to 2m (surface is better) and in some area for deeper than 2000m profiles.

Euro-Argo offer to do delayed-mode quality control of NAVO floats in Mediterranean Sea if they agree (by Italy). Do we need them to agree – if we want to be polite: yes. AOML will contact them (wait for email from NAARC on this).

IOARC

Collaboration with CSIRO to install their processing software for real-time data at INCOIS.
All IO floats are on the INCOIS web page, and are available from their web page.
Acquired IO CTD data and supplied them to CORIOLIS and NODC-USA.
Challenge: PIs do not want to share data within EEZ.
Repository of XBT and CTD is maintained at INCOIS.
IO hydrobase with collaboration of JAMSTEC (Taiyo)
IO atlas using neural network approach and objective analysis was finished
Workshop in July 2008 – 30 speakers presented papers on use of Argo data.
Quality control is not satisfactory – need more strict qc procedures. Real-time float profiles appear as bulls eye in objective analysis if sensor is drifting (or other problems exist).
Perform objective analysis on 10-day basis at selected depths.
Data coverage map to detect data holes
Challenge: manpower.

SAARC

AOML is focusing on the development on the last stage of the quality control, which involves comparisons with climatology and nearby profiles from floats, XBTs, CTDs.
A prototype web page has been put on AOML's SAARC page (http://www.aoml.noaa.gov/phod/sardac/index.php, under 'new').
The link is http://www.aoml.noaa.gov/phod/sardac/post_dmqc/delay_mode.html

AOML is also involved in capacity building projects in Africa and South America.
Information on this is available on the SAARC web page.
The web page also provides access to various products (e.g. Mixed layer properties).

SOARC

Annie is hoping to do something for Indian ocean sector soon. JAMSTEC took over pacific sector. Overall lack of resources. Hope on Euro-Argo (see NAARC presentation).
CSIRO has no resources for SOARC. Deployment planning BODC is trying to have deployment planning tool related to pogo. Cruises that may or may not be useful for Argo. In collaboration with AIC. Information by cruise operators does not have latitude, longitude range, but rather the name of regions. Trying to keep database up to date.

CSIRO has managed to get more southern ocean CTD data. Hard to get them to agree to release the data (tendency is to hold on to them for a couple of years).

Quality Control

Comments & ideas regarding SAARC approach:
Create overview plots by PI.

List of available “regional analysis products for QC” including contact information.
Send reports to DM operator and AIC

Nikolai: Altimetry quality control has limitations where surface currents are strong. Dynamic topography at 100m may, e.g., be only the ACC. Practical implication: altimetry quality control can only catch very obvious problems. When going deep, then we have to be careful because of reference level. Distinction between new science and a problem is important.

Gridded products distribution through AST web page:

Make available under “Argo data and how to get it”.
One page per product. Description and example plots if available.
Use pdf for documentation, one-line description that links to product page.
Currently some links go to ftp sites others go to web page. Need to make uniform.
Uniform wording “optimal interpolation” versus “objective analysis”.

Questions:
Two pages – one for model based one for statistical products? Yes.
Did somebody look at model-based products? Yes. Hard to find.
Separate tab on AST web page?
Links from other Argo web sites – ARCs, AIC, …?
What criteria are appropriate for the products?

- Global, regional?
- Free access to data?
- Argo or only mixed data sets?
- Data format?

Make sure description is good enough to tell the user what the differences between similar products are.
Do we need intermediate pages?
Should we simply provide links directly to the page of the product (better than to the home page)?
Problem with direct download: hard to for originator to track who is using the data.
Possible: click here “for data set home page” and click here “for download”?

Can the data be “restricted access only”?

To add products to AST page - need: one-line description, link to documentation, access to data (ftp, web or email address).

Data viewers: easy access to educators, scientists, …
Who has viewers?
Do other groups have viewers that can be linked to AST page?
Is the AST page a good place to showcase viewers?

OceanDataView is generally available. Any others?
OceanDataView works fine if people know how to use it (awful plots if wrong parameters are chosen for gridding). Dean could not figure out how to look at 4-d dataset. 3-d is OK.

Charles: Dchart, Epic, Java Ocean Atlas. Mentioned another one?

Thierry: Dmap(?). Working on Ocean Geospatial Consortium Standard – can add Argo to it.

Megan: Ferret – can handle 4-d. How user-friendly are the tools?

Sylvie: Link to them from tool area at AIC as well.

Products

Best way to generate products. Best done through ARC, because:
- ARC can interact best with regional users.
- By developing products ARCs contribute to the final consistency check of the data.

Making a global product is easier than making a regional product.

Assist regional users to get Argo data – need to identify products and delivery methods (regional database through a local server)

Development strategy:
1. Identify users
2. Identify gaps/user needs, identify existing products
3. Determine delivery mechanisms
   - data formats
   - delivery methods (web, DVD, hard copy, …)
   - update schedules

4. Actual making of products
5. In making products, feedback to PI’s (Quality Control)

6. Feedback from users
7. Credit to product developers/PIs

Steve: Can we charge them? Not NOAA, but Universities can.

Dean: Problem is to identify users willing to pay and finding new users that do not know about Argo yet.

Commercializing Argo will be a threat to Argo, because a lot of institutions can not afford it, and commercial companies (fisheries) will have access

Nikolai: even asking for registration can scare away users. Would not even hope that users will pay for their data

Last years table: has not been changed since Hobart. Encourage ARCs to update it.

Should we maintain/update the table? Yes, would make Megan's work easier to chase down people.

Going through table now to update information from ARCs that are present:

- Coriolis – updated, language E & F
- MEDS – no change except, language E & F, but – see below.
- JAMSTEC – updated, language E & J
- JMA – updated, language E & J
- KMA/METRI – no change, language E & K
- KORDI – no change, language K
- NFRDI - no change, language E & K
- AOML – no change, language E
- IPRC/UH – updated, language E
- UCSD/SIO – new, language E
- FNMOC (before: NAVO) – updated, language
- INCOIS – updated, language E
- CSIRO – no change, language E
- IOS – new, language E & F

For all: added start time & frequency of update.

Need:

- Refine 'what is a product'. MEDS, for example has listed sections by float as products. Then we have to redo some of the rows on the table.

WOD - Steve Diggs

Getting CTD data is hard.
NODC can not get/handle data that are not public, that remains the role of CCHDO, Coriolis. Charles does not fully agree, but caveat, that it is hard.
Can NODC help Argo to track down non-public data.
Made progress getting P18 (through southern ocean), Lynne Talley data from 2006 around Southwest America, I6 data (through southern ocean).
Pis that deploy floats and have CTD: what's in it for me if I give the profiles to Argo.

ARCs need to provide meta data about cruises that were done (excel spread sheet will do) – WOD will try to get the data (and also take care of reformatting the data to WOD format).
Biggest delay in getting data into a data center is to get the dialog to the PI started.
Is not worried about the USA – WOD has the contacts already.

Who will volunteer to provide information to WOD in form of providing excel tables.

- Good place to start is AIC web page that has information on CTDs at float deployment sites (not always, depends on the notification by the float deployer).
- Canada: Howard Freeland volunteers.
- Germany: WOD is tracking the Polarstern (easy) and has contacts to the PIs.
- UK: is at BODC – but is not straight forward to get for outsiders
- France it's at Ifremer
- Japan: Steve will talk with them later
- USA: UNOLS has the lists, also NSF funds a list that collects information on CTD observations performed. Annie: are repeat hydrography lines getting to Coriolis. They are almost ready to be passed on. Palmer cruises - wherever the ship goes, it is likely that CTD data are collected. Tracking ice research breakers is probably a good way to go.
- International: also efforts underway to have a list similar to the USA list from NSF.
- Russia: Steve has not heard much from Russia. Brian: best data sets from Russia are Good Hope data sets. Nikolai M.: data mining contract to get data from far east Russia. Had been in contact with Levitus. PIs are not authorized to share data. Need to approach data center to get in situ data. Sometimes one can get climatology. Sometimes it is possible to get “daily climatology in small bins” almost as good as profiles. Annie thinks that UW has some Russian profiles (from float deployments).

AIC

Going over DM operator list to assign DM operators to orphan floats:

- What to do about the AOML Argo equivalent floats. 29 are T only. 1 has salinity. List shows only 29 since two had the same WMO ID. Ask Mathieu what he recommends we can do. Assign new WMO ID to one of them?
- FSU Argo eq. floats: some are north of New Zealand, some are in Gulf of Guinea and some are in North Atlantic. Nicolai Wienders in charge? Some are “historical”? Delegate the task to US Argo (Dean) to find out more and decide what to do.
- NAVO Argo eq. floats: Med Sea – see NAARC
- Mathieu will send the list again and send the appropriate information to national programs to solve problems related to their orphan floats.
- Encourages ARCs to make more use of the ARC mailing lists to communicate within ARCs.

Show links to individual floats (at ARC or DAC level) at AIC.

How can a DM operator get at the altimetry qc status information available on the AIC? Mathieu will ask Stephanie to add ability to know which cycle has a problem and if it is a D or R profile.

User and PI feedback

Feedback from DM workshop: Recommendation that ARCs compile a list of papers on climate change in their region. Example: papers from Brian on variability of SAMW in the Indian Ocean. Idea is that ARCs act as brokers between the DM operators active in a region. DM operator needs local knowledge if the ocean changed and the reference data set is not sufficient for DM QC or needs to be treated.
Maybe better if DM operators send references to ARCs for relevant papers and the ARCs make them available.
AST: main concern is detecting errors in the data set. ARCs to play a major role in that. If ARCs do not feel they can fulfill that function, then the AST will have to find a solution.
Annie's suggestion was to get the DM operators involved in some way in the regional QC. Feeling from that workshop is that operators are trending towards looking at batches of floats in a region. Familiarization with regional characteristics helps with the QC. Idea is to pick their brains on how their experience can help the ARCs fulfill their work. How can we encourage the DM operators to come to the next ADMT meeting week.
Interaction item between ARCs and DM operators was on DM workshop agenda – many of them said: what is an ARC? Maybe hold a DM meeting with an ARC agenda item during next years ADMT meeting week. Goal is to open communication link between DM operators and ARCs.

If ARCs were to not do regional analysis, then who would do it? The only others would be the DM operators. Would they have time for that? In some regions the DM operators could do it. In other regions there are no DM operators who could do it. SIO could, for example, take a basin-wide view in the Pacific (since they have floats everywhere). In other regions a DM operator may have a very small area. Regional analysis is the first step that ARCs need to do to get good regional products.

Essential role of ARCs:

- Perform regional analysis of all the Argo data in the region to assess its internal consistency as well as its consistency with recent shipboard CTD data
- Provide feedback to PIs about the results of the regional analysis and possible outliers
- Facilitate development of a Reference Data Base for delayed mode quality control
- Prepare and distribute Argo data products

Optional role of ARCs:

- Coordinate Argo deployment for the region
- Develop new Q/C tests for region

- Provide delayed-mode Q/C for regions without such capabilities
- Compare Argo data to models and assimilated fields
- Provide documentation of the procedures done at the ARC

Insert slides from summary of ARC meeting (action items)

Summary

Issues:

1. The utility of ARCs was discussed, and there was general agreement that ARCs are worthwhile.
2. The "essential" and "optional" tasks of regional centers were reviewed, and it was agreed that these are still appropriate. Perhaps one recommendation would be for each ARC to specific a) who is responsible for each item, b) what resources are required, perhaps c) a timeline and/or plan for these
3. Communication with PIs (or lack thereof) remains a concern
4. Resources continue to be a hurdle, both in terms of personnel and funding.
5. Steve Diggs discussed the CCHDO CTD program and stressed the need for communication between those organizing cruises and his program that will archive CTD data. Perhaps the ARCs can be the brokers for this?
6. Lot's of discussion on Argo products and product development. Do we want to include at some level, s/w support (e.g., providing input on things like ferret, JOA, etc.)?
7. There was a bit of discussion on co-ordination/dialog between ARCs, product developers and DMQC operators. It was agreed that this would be a very useful thing.
8. Deployment planning

Action Items 1 - web interface:

1. add links to AIC on regional center pages
2. share scripts that display data/products (netcdf/kml/gis translations)
3. produce and add a link to a reference list, regional specific, for climate/water mass variability for DMQC operators to use for understanding relevant issues; who does what…

Action Items 2 – products:

1. need to define precisely what we mean by Argo data products
2. need to come up with a useful, complete listing of product descriptors/qualifiers; this will be used to refine products table (table headings)
3. complete table; perhaps provide mechanism for update mechanisms; who to host this?
4. how to coordinate product development; issues include referencing originator, regional/global, documentation, etc.

5. work with Megan on gridded products web catalog
6. Provide uniform language for gridded data sets, e.g., "optimal interpolation" vs. "objective analysis"

Action Items 3 – communication:

1. different ARCs seem to be doing this to varying degrees; individual ARCs may need to re-visit how work is communicated within each ARC
2. ARCs should try to provide points of contact to Steve Diggs and CCHDO for planned/performed cruises
3. problems found when qc'ing data (either through product development or otherwise) needs to get back to PI's. It was recommended that this be done via the AIC (i.e., send this back to Mathieu)
4. the next meeting will involve DMQC operators, perhaps devoting the majority of the meeting to developing a collaboration between these two groups (reference data sets, procedures, experiences, etc.)

Action Items 4 – education/outreach:

1. continue education, outreach activities (e.g. deployment and data acquisition training for African Nations)
2. need to promote Argo, demonstrate value of the program to regional communities/countries; do this through ARCs
3. Continue improvement of Argo Marine Atlas; perhaps use ARCs as method for distribution/user feedback
4. AST to display list of data viewers

Action Items – deployment planning:

1. Provide maps of float location, age, data quality (float quality)
2. Work on logistics (e.g., how to share information on potential deployment opportunities (AIC, BODC, JAMSTEC, AOML, Coriolis)

Comments to summary at ADMT meeting:

1. Annie: suggested deleting 'Action item 1 bullet 3 (link to reference list)'. DM operators have the expertise, whereas the AICs do not have that expertise at this time.
Brian: the regional characteristics page may not be limited to literature list – should therefore be non-public.
Agreed to have the list at a DM QC website.

2. Dean is concerned about data product versus product. Jim thinks that classification is good. Have to think about it.