Meeting Report South Atlantic Argo Regional Data Assembly Center (SARDAC) Cape Town, South Africa 12 to 14 May, 2005.

Executive Summary

Argo is an international program that provides a new and valuable source of data in the upper 2 kilometers of the world ocean. When fully implemented, the Argo array will consist of a global array of 3,000 autonomous profiling floats. The floats drift freely at a specified depth and typically surface every 10 days. During the ascent the floats collect profiles of temperature and salinity. When the surface is reached, data are transmitted via satellite to the Argo data centers. Argo floats are currently provided by 18 countries. Argo data are available in a timely manner (typically within 24 hours of collection) at no charge. The data are used for operational climate forecasting and research.

The concept of a global Argo array was initially based on the potential to deploy the floats from ships of opportunity (research vessels, cargo vessels, icebreakers, etc.). This philosophy of minimal cost for deployment remains the optimal method for insertion of the floats into the ocean. However, it has become obvious that in order to achieve the objective, it is necessary to involve a larger number of countries to the effort.

The international Argo community has established several levels of quality control. The final level of quality control is to be conducted at Regional Data Assembly Centers (RDAC) as outlined in the Report of the Argo Science Team 4th Meeting, March 12 to 14, 2002. The participants at this meeting resolved that "regional data centers may be contributed by a single national data center or may result from collaborations among two or more groups"

NOAA's Atlantic Oceanographic and Meteorological Laboratory (AOML) have been funded by the U.S. National Oceanographic Partnership Program to develop an RDAC for the South Atlantic. To entrain regional countries into the RDAC, AOML has convened several meetings. At an initial meeting held in Buenos Aires, November 2004 a group of South Atlantic institutions from Argentina, Brazil and South Africa decided to join the NOAA effort to develop an RDAC for the South Atlantic. During this meeting, the first South Atlantic Argo Regional Data Assembly Center (SARDAC) implementation meeting was planned. This implementation meeting took place in Cape Town, South Atlantic that included extensive participation from other regional nations. The National Oceanic and Atmospheric Administration (NOAA), the Benguela Environmental Fisheries Interaction and Training (Benefit) Program, the Benguela Current Large Marine Ecosystem Program (BCLME) and the University of Cape Town provided support for the meeting. Representatives of Angola, Argentina, Brazil, Namibia, Nigeria, South Africa, Uruguay and the United States attended the meeting. Also in attendance were representatives from the Argo Information Center and other Argo Regional Centers in the North Atlantic and the Southern Ocean.

The meeting was a total success. As a result, new data sources to be used for quality control were located, first steps towards establishing data exchange protocols, and the compilation of basic QC standards for the CTD data were taken. New deployment opportunities were realized, infrastructure support from new participant countries, in particular in western Africa, were pledged, and training opportunities for float deployments were initiated. The concept of donating Argo floats was extensively discussed and widely accepted by the participants. Finally, there was a proposal to initiate an Argo Training School for the South Atlantic (ATSSA) to educate regional scientists, educators, data managers, modelers and forecasters on the uses of Argo. The implementation of this proposal is presently being addressed.

The SARDAC will maintain a web site, which will track the progress of the center and disseminate pertinent information. For those countries with limited web access, data disks containing the information will be distributed. The completed meeting report can be obtained at (http://www.aoml.noaa.gov/phod/saardac).

Introduction

A meeting to develop cooperation and coordination for the Argo program in the South Atlantic was held in Cape Town, South Africa. The main objective of the meeting was to implement a South Atlantic ARGO Regional Data Assembly Center (SARDAC) among countries that bound the South Atlantic from 20°N to 45°S. The northern and southern boundaries were established to allow for overlap with the North Atlantic and Southern Ocean RDACs. The objectives of the RDACs have been defined by the International Argo Data Management Team and include:

- 1. Inter-compare the regional Argo profiles and compare the float data with recent quality controlled CTD/hydrographic data.
- 2. Provide feedback to the PIs on the performance of individual floats.
- 3. Provide standardized QC procedures for all the hydrographic data (CTD, XBT) collected in the area of interest.
- 4. Coordinate Argo float deployment plans for the region. Providing advice/guidance on regional deployment needs.
- 5. Once data coverage permits, the SARDAC will develop climatologies contributing to continental climate forecasts and make them available to the rest of Argo community.
- 6. Provide documentation of its procedures.
- 7. Assess and coordinate regional capabilities and knowledge.
- 8. Compare Argo data with model output and with assimilated fields.
- 9. Compile and distribute regional metadata.

Invitations to the meeting were sent to those individuals from institutions that wish to participate in the activities of the SARDAC. In the invitation, potential areas of participation and contributions were defined as follows:

- 1. Provision of platforms for float deployment, particularly in data sparse areas.
- 2. Provision and facilitation of local logistic support.
- 3. Provision of ARGO floats.
- 4. Provision of T and S profile data for quality control of ARGO data.

- 5. Provision of data services (centralized metadata base management).
- 6. Generation of data products.
- 7. Capacity building.

In response to this invitation, representatives of Angola, Argentina, Brazil, Namibia, Nigeria, South Africa, Uruguay and the United States attended the meeting. Also in attendance were representatives from the Argo Information Center and the North Atlantic and the Southern Ocean RDACs.

After presentations from the Argo representatives and the country participants (see attached Agenda and Participants Presentations) the plenary split into three working groups with the following chairpersons and objectives:

Working Group 1: Logistics (Chaired by Silvia L. Garzoli)

Objective: To identify regional platforms for float deployment, to provide new infrastructure support in the form of port access and ship riders, to provide Argo floats, and deployment training when needed.

Working Group 2: Data and products (Chaired by Claudia Schmid)

Objective: Achieve the final stage of scientific quality control of the data and determine which products should be generated.

Working Group 3: Training and Education (Chaired by Bob Molinari)

Objective: Initiate an Argo Training School for the South Atlantic to educate regional scientists, educators, data managers, modelers and forecasters about Argo; to generate material explaining Argo to primary and secondary school students; and to identify product demonstrating the value of Argo to regional countries.

Results from these working groups discussions are attached to this report.

After a plenary discussion of the WG results, it was decided to:

- Accept the recommendations of the working groups and begin achieving the recommended actions items.
- Coordinators for each group were designated: WG 1: Fabian Vetere, Argentine Naval Hydrographic Service; WG 2: Claudia Schmid, NOAA/AOML; WG 3: Bob Molinari, NOAA/AOML. Silvia L. Garzoli will continue the overall coordination of the SAARDAC.
- Maintain a web page at AOML that will post the achievements of the SARDAC. CDs with the same information will be distributed to designated contacts in participating countries with insufficient bandwidth to access the AOML web site.
- Conduct a follow-up meeting in a year. A proposal was presented to plan the next meeting in Brazil. In coordination with a meeting of the GOOS Regional Alliance being structured by Argentina, Brazil and Uruguya. Another proposal was to have the meeting at an existing Argo Data Assembly Center (e.g., AOML, Miami, US; Ifremer, Brest, France).

Report from Working Group 1 Logistics

Silvia L. Garzoli

This working group discussed the following main issues: provision of platforms, provision of Argo floats, and deployment training.

Provision of platforms:

- The discussion on provision of platforms was based on the need to cover those regions where the absence of ship availability or fast dispersion requires seeding of floats. To attack this problem, participants from the different countries in the region provided information on local ship availability and offered their vessels for deployments.
- Another important support offered in particular form the participants countries from Africa, was logistical support. In some cases, commercial vessels that can potentially be used for deployment have ports of call in which no contacts are available to provide local infrastructure. The possibility of use of commercial lines between South Africa and West Africa, and Brazil and South Africa will be explored. Participants from Angola, Namibia and Nigeria would provide logistic support for these lines. They would coordinate their efforts with South Africa (Responsible: Isabel Ansorge, University of Cape Town) and Benefits (Responsible: Chris Duncombe Rae, University of Maine).
- The western side of the basin will be supported by joint efforts between Argentina, Brazil and Uruguay.
- If needed to fill up gaps, participant countries will offer their available vessels for deployment (this will be done on the basis of extending existing cruises; limited funds may be available to pay for this effort). (Coordinator for the Americas: Fabian Vetere, and coordinator for West and South Africa: Isabelle Ansorge)

• Participant countries will help in identifying Research Vessels arriving to the zone (request of clearances) and the local Argo participants will contact the vessels in search for new deployment possibilities.

Provision of Argo floats:

The acknowledgement of the participating countries was largely discussed.

- The possibility of donation of floats will be explored and made effective.
- All countries will provide Argo with a technical point of contact.

Training:

 Argentina and South Africa, and starting soon Brazil, have been already deploying Argo floats. NOAA already provided technical training for deployments to Argentina, Brazil and South Africa. It was decided that the current expertise of these countries will be used to train new participant countries in South America and Western Africa.

Report from working Group 2 Data and Products Claudia Schmid

The basic need for the Argo project is to have sufficient data for the scientific quality control. The more is known about the hydrographic data, the better the results of this quality control will be. In addition Argo encourages the collection of a CTD profile at float deployment sites whenever possible. Argo and the whole research community would also profit from the permission to develop products from data that are not fully public.

Participants in the South Atlantic Regional Data Assembly Center (SARDAC) are interested in consultative services; help with the standardization of quality control (QC) procedures; training for QC and data management. They are also interested in easy access to products and data.

Both the participants and the SARDAC need to identify contact persons that will act as focal points in the growth of the collaboration.

Action items for this working group include the establishment of data exchange protocols and agreements and the compilation of basic QC standards for the CTD data; the definition of additional products, training needs and other development requirements; and to find out what each participant can contribute to the SARDAC.

Topics

- 1. Informative
- 2. Argo's wish list
- 3. Participants wish list
- 4. Identify focal points (NODCs, PIs, etc.)
- 5. Identify what each participant will bring to the party
- 6. Members of this working group

Informative

- Reference data set = all data relevant to Argo delayed-mode QC (flagged/restricted data will not be made public)
- Flagged/restricted data: PI decides (levels to be defined)
- Argo delayed mode QC = adjust p, T and S
- Argo data = data collected by profiling floats
- NODC = National data center.
- Focal point = Examples: NODCs or other data centers, PIs, government agency, individual, institutes, etc.
- RDAC = Argo Regional Data Assembly center

• GDAC = Argo Global Data Assembly Center

Action item: define levels of restriction Argo's wish list

- Encourage CTD at the deployment
- Reference data set:
 - Focal points provide profiles whenever available
- Exchange procedures
- Meta data including qc history
- Data formats
 - Focal points provide current standard QC procedures and meta data standards.
 - Focal points: list the current calibration/QC capabilities

Action items:

- Establish data exchange protocols and agreements
- Compile basic QC standards

Participants wish list

- Consultative services
 - Establishing participation
 - Defining own requirements
 - Providing guidelines
- Identify Argo RDAC focal point
- Reference data set
 - Ask RDAC to provide basic standard QC procedures and meta data standards
 - Training for QC, data management, etc.
- Access to Argo data, reference dataset and products
 - o www, CDs, other media (technology limited)

Action items:

- Participants must define additional products
- Participants must define training and other development requirements

Focal points

Examples: NODCs, PIs, data center, government agency, individual, institutes, etc.

Action items:

- Define focal point terms of reference
- Identify focal points

Identify what each participant will bring to the party

Action item: compile what each participant can provide

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Members of this working group

Action item: look for volunteers from other countries

Report from Working Group 3 Training and Education Bob Molinari

1) Training:

Objective: Initiate an Argo Training School for the South Atlantic (ATSSA) to educate regional scientists, educators, data managers, modelers and forecasters about Argo.

Action Items:

The advanced training discussed particularly for scientists, is beyond the scope of SARDAC. Thus mechanisms to provide the training and to obtain the funds for this activity will be identified. Many of the action items given below address these issues.

a) Regina Folorunsho

- i) Generate a 2-page document summarizing ATSSA objectives for presentation to potential funding agencies
- ii) Contact IOC for support

b) Chris Reason

- i) Contact START for support
- ii) Contact ACMAD for support

c) Bob Molinari

- i) Contact NOAA for support
- ii) Contact AMMA to combine AMMA's December science meeting with ATSSA meeting

d) Silvia Garzoli

i) Contact IAI for support

c) Mathien Belboech

i) Add list of African and South American scientist to Argo mailing list

2) Education:

Objective: Generate material explaining Argo to primary and secondary school students

Action items:

a) Bob Molinari

i) Contact NOAA for production of documentary film, brochure, posters

3) Products

Objective: Generate products demonstrations value of Argo to regional countries

Action items:

a) Bob Molinari

- i) Generate maps of horizontal distribution of SST, mixed layer depth, heat content, thermocline depth, etc.
- Generate time-distance plots from XBT data collected along South Atlantic transects.