PIRATA-7.5 Meeting Report Fortaleza, CE September 14, 2000

(based on notes by J. Lorenzzetti, rapporter of the PIRATA-7.5 meetin, and additional notes and post-comments by J. Servain, Chair of PIRATA-SC)

1 FR/BR 2000 – 2001 Cruises, vandalism and sensor calibration

- 1.1 <u>France</u>: PIRATA-FR7 cruise was achieved in July-August (Abidjan-Pointe Noire) on the IFREMER's R/V La Thalassa. This was a 40-day cruise back to back with the multi-disciplinary oceanographic cruise Equalant-2000. During that cruise, Soul ("zéro partout") was deployed for the third time, and Blues (silent from June 2000) was removed with its tower missing. The 11 sensors removed from Blues being sent to Seattle.
- 1.2 Servain: It was the first time that a French PIRATA cruise was fully completed without the direct assistance from some PMEL's engineer. The whole ATLAS mooring duty was only achieved by Francis Gallois, one of the IRD engineer (presently based at Noumea).
- 1.3 McPhaden: This was an interesting experiment with a good success (all the sensors of Soul are operational).
- 1.4 Next PIRATA-FR8 cruise will be carried out using the IFREMER's R/V L'Atalante, from November 15 (Dakar, Sénégal) to December 01 (Port Gentil, Gabon), 2000.
- 1.5 The mooring stations to be serviced during PIRATA-FR8 are Java, Valse and Gavote.
- 1.6 The Yoyo system and the 3 current meter (2 deep classical and 1 shallow ADCP) moorings, all near Java, will be also removed during the same cruise.
- 1.7 Moorings Rhythm and Blues were serviced in November 1999; one drifted (March 2000) and was removed during PIRATA-FR6 (April 2000). The other one was vandalized in June 1999 (tower missing), and was removed during PIRATA-FR7/Equalant-2000 (July 2000). It was proposed to stop these two sites; from now on they will be discontinued during the consolidation phase.
- 1.8 IRD's ship (R/V Antéa) is still with technical problems with her motors in Abidjan. There is now a juridical process with balance of expertise's. First, the engines must be repaired (beginning of 2001?), then modifications (about 4-5 months) in the Aframe will be done. This ship will not be available for PIRATA probably before September 2001. If the Antéa is not yet available at this time, it is expected that the IFREMER's R/V Atalante will be used again by end of 2001.
- 1.9 <u>Brazil</u>: Next PIRATA-BR-IV will be carried out using the DHN's R/V Antares ship. Due to a planned maintenance in this ship (Jan, Feb and first days in March) a delay of two months is expected.
- 1.10 Beginning of PIRATA-BR-IV cruise: between end of March and mid April 2001 from Fortaleza.
- 1.11 All the 6 Brazilian PIRATA sites will be serviced during this 2001 cruise.
- 1.12 For the next cruises (2002 onwards), DHN has offered two other ships (Barao de Teffe and Graca Aranha) but has withdrawn the Antares as an option for PIRATA

during the consolidation phase. This is an important point considering that McPhaden has stated that these two ships are not suited for the job.

- 1.13 Bureaucratic problems at customs in Brazil related to NOAA/PMEL equipment are still being resolved. Sensors from last PIRATA-BR-III cruise are still in Brazil. We expect this problem to be solved soon.
- 1.14 McPhaden's comments: related to last item: limited inventory and long time to receive sensor back at Seattle after cruises might be a serious problem for PMEL. Furthermore, important delay in post-calibration could implicate problem for a good calibration of data; efforts should be done in order to shorten this turn around time.
- 1.15 Lorenzzetti (also supported by Ilana Wainer): the Oceanographic Institute of the University of São Paulo (IOUSP) has a lab for calibration of oceanographic instruments. If this facility could be certified to do the calibration of PIRATA sensors, this would facilitate the logistics. At this point in time it is not clear, however, what should be the level of investment necessary to make that facility to meet the requirements of accuracy and timeliness.
- 1.16 McPhaden: NOAA-PMEL calibration lab is open for a visit of IOUSP personnel.
- 1.17 Post-comment: Such calibration should also be done at Natal when the Climate Center becomes operational there.

2 Problem and possible solution in the data return

- 2.1 There is presently a problem in the PIRATA data return (only 66%). This is mainly due to vandalism in the eastern basin. But there could also be data losses due to technical problems (anemometer failure at Reggae?). For comparison, in the past year TAO data return was 89% overall. In the Pacific, 80% data return is considered success.
- 2.2 Lorenzzetti: considering the importance of wind data, would it be feasible to have an additional wind sensor at each buoy? (i.e. the wind sensor at Reggae did not work from a few days after the deployment in March 2000).
- 2.3 McPhaden: technically this is feasible, but would require re-engineering for changes to Argos formats, on-board processing software, buoy hardware and perhaps additional battery. Another kind of wind sensor is being analyzed at the moment (a sonic anemometer is under study), but this is a long-term development.
- 2.4 One possible solution to solve the loss of data could be servicing of each buoy twice a year, using some additional opportunity service.
- 2.5 Post-comment: At term (2004-2005?), a fast R/V, based at Natal, dedicated to the full operational oceanography in the Tropical Atlantic, could easily do the job, including a twice-a-year service for the whole tropical Atlantic region.
- 2.6 It is the last "chance" for the Soul mooring deployed (for the third time) in August 2000. Indeed this site is very "dangerous" because a lot of tuna ships have activities in the area. Busalacchi suggested implementing the German technology (presented during PIRATA-WE-1) in this area. With this technology, only a small float used for data transmission appears at the surface. McPhaden was skeptical with this solution and Lorenzzetti added that it does not guarantee against vandalism.
- 2.7 Post-comment by McPhaden: PMEL has contacted IFM/Kiel for a description of their mooring design.
- 2.8 Servain announced that an engineer student is now working at IRD-Brest (July 2000 July 2001) in order to imagine, assemble and test an acoustic system (with

transmission of the biomass via Argos) which will allow to understand the behavior (attraction/repulsion) of the fish below the ATLAS mooring after emission of various natural and artificial sounds. A first fully tested system is not expected before PIRATA-FR9 (end of 2001).

3 Status of extra instrumentation

- 3.1 The tide-gauge of São Tomé (under the responsibility of IRD) is now fully operational (including the atmospheric pressure) with data delivery on the PIRATA-France Web page and routinely transmission of the data to the international Sea-Level Center at Hawaii.
- 3.2 Met buoy at 44W-Eq.: a feasible is to take advantage of an existence Brazilian buoy anchored very closely to this position (about 45W, just South of the Equator) and presently used for navigation signage purposes. Met. instruments could be installed on this float. The Brazilian Navy recently agreed with the idea.
- 3.3 The tide-gauge of Atol das Rocas (under the responsibility of INPE) is working but the Argos transmission is not yet operational. Also again a problem with the tide-gauge of SPSPR (under the responsibility of the Brazilian Navy), not working.
- 3.4 XBT lines: a servicing ship of the Brazilian Navy from Natal to SPSPR could be used every two or three months for an XBT line. For this, a project should be written to CIRM, the Brazilian Commission which is responsible for the islands. Janice Trotte mentioned that an XBT line is not part of the original PIRATA project; therefore for this activity, a special project should be prepared. Lorenzzetti asked Ilana about her interest in taking this task. She argued that she is not familiar with this and is lacking time to commit to this task, therefore declining the recommendation.
- 3.5 Post-comment: A Met instrumented tower (with basic variables and high frequency turbulent measurements) is scheduled for installation at SPSPR in 2001 (that was previously scheduled to be set at Atol das Rocas). This is a project lead by IOUSP (Jacyra Soares and Amauri Oliveira) in cooperation with INPE (Claudio Solano) and technical support of the Brazilian Navy.
- 3.6 CTD PIRATA data: a standard format for CTD PIRATA data must be agreed. A suggestion was put forward by McPhaden that the same format used for Pacific data could be used. A NOAA CTD processing software is available if needed. Jacques Servain stated that Jacques Grelet, a IRD engineer working in Abidjan with CTD data (and familiar with PIRATA affairs), could lead an effort in processing all PIRATA CTD data and help with the common formatting of this data. Marcio Vianna will take the lead to collect the Brazilian CTD data and forward it to Servain. PMEL will send the software package information for the job.

4 Pilot phase ending - Consolidation phase starting

- 4.1 France: end of Pilot phase and the beginning of consolidation phase will be effective at the end of next Cruise PIRATA-FR8 in November 2000.
- 4.2 Brazil: end of Pilot phase and the beginning of consolidation phase will be effective at the end of next Cruise PIRATA-BR-IV in March-April 2001.

5 Ocean current measurements during the Consolidation phase

5.1 ADCP's: Lorenzzetti stated that final preparation is being made at INPE to send two ADCPs RD Instruments Workhorse 300 kHz to Jacques Servain by October 2000.

Recall that initial plans were for one of these systems to be installed at Jazz (Eq-23W) during the first PIRATA-BR cruises. The other ADCP should have due to be used primarily as a backup for that site.

- 5.2 After acceptation of such a proposal by the French PNEDC, one of the two Brazilian ADCPs will be installed by Christine Provost (CNRS-LODYC) close to the (new) PIRATA Jazz site (about 20W-Eq.). Since Christine has a third ADCP, the French oceanographers will have three ADCPs. A suggestion was made to have another ADCP station (the position of which has to be decided), with the third equipment used as a spare for both sites. Suggestion: the second ADCP should be placed where there is the maximum variability of the zonal advection.
- 5.3 The priority for the PIRATA-SC is that there will be an ADCP maintained at Jazz. The eventuality for a second ADCP site will be under the responsibility of Christine.
- 5.4 Requirement: Christine Provost must agree to provide the ADCP data as soon as they are processed. She will not have proprietary rights on the data.
- 5.5 A letter will be soon drafted by the PIRATA-SC Chair (agreed by all PIRATA-SC) to be sent to Christine, with the 2 main issues: (i) priority of measurements at 20W-Eq. and (ii) free data availability.

6 Commitments

- 6.1 A long and confusing discussion occurred about the Brazilian commitments in PIRATA (during the next Consolidation phase), especially for servicing the northern PIRATA sites (Reggae, Forro, Lambada) which are very far from the Brazilian base of the Antares (namely Rio de Janeiro). The confusion arose mainly because all the assistance (with few exceptions!) "understood" during the meeting PIRATA-WE-1 (which was hold at the same place that PIRATA-7.5, just the days before) that the NOAA/AOML could propose some participation in such servicing. It became clear that issue is more under the responsibility of the PRB than of PIRATA-SC.
- 6.2 Post-comment: a post-debriefing-meeting occurred at INPE in São José dos Campos by September 22 with the attendance of INPE and DHN representatives, Divino Moura and the PIRATA-SC Chair. That issue was debated. Both a clarification and an action plan (outside PIRATA-SC responsibility) are underway. The PRB will be informed of that and will deliberate upon.

7 PIRATA-8 Meeting and New PIRATA

- 7.1 Next PIRATA meeting (PIRATA-8) in May or June 2001 in Paris (or Brest or Toulouse)
- 7.2 A CLIVAR-TAV meeting could be arranged back to back with this meeting.
- 7.3 During the last CLIVAR-Atlantic meeting in Natal (April 2000) a suggestion was made that an observing system for the Atlantic need be implemented with the inclusion of other observation systems in addition to the current ATLAS moorings.
- 7.4 Busalacchi: PIRATA project has to decide if it continues to be only the mooring buoy project or its scope has to be expanded to be the Tropical Atlantic observing system. This decision is very important and need to be made before the CLIVAR meeting in December 2000.
- 7.5 Post-comment: From phone calls between the PIRATA-SC and S. Garzoli and various other discussions with other PIRATA people after PIRATA-7.5, it seems that a broader agenda is needed for the next tropical Atlantic meeting (PIRATA-8 +

meeting type "COSTA") could be held in Paris during one week in May or June 2001. Agreements could point out to the need of a tropical Atlantic coordination in the ocean-climate observing system, including all the observational issues (ATLAS mooring, drifters, Argo floats, XBTs, satellite data,). A coordinating mechanism is needed and could take the form of a coordinating committee and several panels representing different type of observing sensors, and so on.

7.6 Moura and Servain (including post-comment): the envisaged larger observational system in the tropical Atlantic could keep the PIRATA acronym (Program for the Implementation of a Research Array in the Tropical Atlantic -one could use the word Regional in place of Research, if desired). This new PIRATA, encompassing all needed type of sensors, in addition to moorings, could take advantage of technical operational bases, as for instance the future Natal operational basis (especially if we have a dedicated ship based there), and "Co-laboratories for tropical Atlantic Ocean data dissemination and Research" as described by V. Mehta (e-mail from October 3, 2000). Maintaining the acronym PIRATA is very attractive to many people within PIRATA and a good sign to potential additions, given the success experienced so far by PIRATA.