DATA BUOY COOPERATION PANEL
NINETEENTH SESSION

Angra dos Reis, 22-24 October 2003

FINAL REPORT

JCOMM Meeting Report No. 26

WORLD METEOROLOGICAL ORGANIZATION

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION (OF UNESCO)

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N O T E

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C O N T E N T S

General Summary of the Work of the Session

A. ORGANIZATIONAL COMPONENT

1. ORGANIZATION OF THE SESSION

1.1. OPENING OF THE SCIENTIFIC AND TECHNICAL WORKSHOP

1.1.1 The Scientific and Technical Workshop with DBCP-XIX was opened by the chairman of the panel, Mr Graeme Brough, at 09.30 hours on Monday, 20 October 2003, in the conference room of the Portogalo Suite Hotel in Angra dos Reis, Brazil. Mr Brough welcomed all participants to the session and to Brazil, and expressed his considerable appreciation, on behalf of all participants, to the Brazilian National Institute of Meteorology (INMET) for hosting the session and providing such congenial surroundings and facilities. He offered particular thanks to the local organizers, Mr Alaor dall'Antonia and Ms Janice Trotte, for their considerable efforts in preparing for and coordinating the meeting. He also offered his thanks to the workshop convenor, Mr Eric Meindl, for putting together such an interesting and challenging programme. Mr Brough then noted that a more formal opening to the DBCP session itself would take place on Tuesday afternoon, when the Director of INMET, Dr Antonio Divino Moura, and the Director of Hydrography and Navigation of the Brazilian Navy, Vice-Admiral Lucio Franco de Sa Fernandes, would both be present.

1.1.2 The list of participants in the workshop is given in an appendix to the workshop proceedings, which are published as a separate DBCP Technical Document.

1.2. OPENING OF THE SESSION

1.2.1 The nineteenth session of the DBCP itself was opened by the panel chairman, Mr Graeme Brough, at 14.00 hours on Tuesday, 21 October 2003, at the same location as the workshop. He welcomed participants to the session and once more thanked INMET for hosting it and providing such a congenial environment and facilities. He then introduced Vice-Admiral Lucio Franco de Sa Fernandes, Director of Hydrography and Navigation, Brazil.

1.2.2 On behalf of the Brazilian Navy, Admiral Lucio welcomed participants to the meeting and to Angra dos Reis. In doing so, he indicated that it was a great honour for him to address the meeting in particular in Angra, since this was a region which had a lot of significance in the history of Brazil, and also hosted the Brazilian Naval College. He thanked Dr Divino Moura, INMET and the IOC Rio GOOS Office, located in DHN, for hosting and organizing the meeting. Admiral Lucio then noted that Brazil was developing close collaboration and coordination among national institutions with interests in climate and weather prediction, and was thus providing substantive contributions to international projects and bodies such as PIRATA, GLOSS and the DBCP, in particular within the context of GOOS. He recognized that the South and Tropical Atlantic remained a relatively data sparse ocean region, for both weather prediction and climate studies, and that Brazil was fully aware of the need for such data. Although the economic situation in Brazil was currently very difficult, he nevertheless assured the panel that his country would make every effort to contribute to relevant international programmes and projects, including the work of the DBCP. He concluded by wishing participants a very fruitful meeting and an enjoyable stay in Brazil.

1.2.3 On behalf of INMET, Dr Antonio Divino Moura also welcomed participants to the meeting and to Brazil, at the same time expressing the appreciation of his Institute at being able to host such an important meeting. He recalled that the panel was a significant and successful mechanism for enhancing the quantity and quality of ocean data being made available via the GTS to operational agencies such as INMET. These data, in turn, greatly facilitated the task of these agencies in providing basic meteorological services to their user communities, as well as specialized services to particular sectors such as agriculture, as is the case in Brazil. He concluded by assuring the panel of the ongoing support of INMET and its officers throughout the session, and wished all participants a successful meeting and enjoyable stay in Angra and in Brazil.

1.2.4 On behalf of the Secretary-General of WMO, Professor G.O.P. Obasi, and the Executive Secretary IOC, Dr Patricio Bernal, the Secretariat representative also welcomed participants to the meeting and to Brazil. In doing so, he offered the sincere appreciation of both Organizations, the co-sponsors of JCOMM and the DBCP, to INMET for hosting the session in Brazil, noting that such hosting provided an excellent opportunity for the panel to introduce its work to Brazilian scientists and agencies, and also for panel members to interact directly with these local scientists. He offered special thanks to the local organizers, Mr Alaor dall'Antonia and Ms Janice Trotte, for their considerable efforts in preparing for the session and in making the local arrangements so effective for participants. The Secretariat representative stressed the ongoing importance of the panel and its work, both in directly supporting many of the major programmes of WMO and IOC, and also as a key component of the integrated ocean observing system coordinated through the Observations Programme Area of the Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology, JCOMM. He concluded by assuring participants of the full ongoing support of the Secretariat in their work, and wishing them a successful meeting and enjoyable stay in Brazil.

1.2.5 The list of participants in the session is given in *Annex I.*

1.3. ADOPTION OF THE AGENDA

1.3.1 The panel adopted its agenda for the session, which is given in *Annex II*.

1.4. WORKING ARRANGEMENTS

1.4.1 Under this agenda item, the panel decided on its working hours and other arrangements for the conduct of the session. The Secretariat introduced the documentation.

B. IMPLEMENTATION COMPONENT

2. IMPLEMENTATION REPORTS

2.1 TECHNICAL COORDINATOR

2.1.1 The technical coordinator, Mr Etienne Charpentier reported on his activities on behalf of the panel during the period 1 September 2002 to 31 August 2003. As for the previous years, he was employed by IOC and based at CLS, Toulouse, France. 27% of time was spent on SOOP and 2% on Argo (Argo TC training, supervision and support, team work). The rest of the time was devoted to the DBCP. He stressed that most of his time was spent on missions and related work (20%), user assistance (10%), BUFR code implementation (9%) and JCOMMOPS developments (8%).

2.1.2 During the period, the technical coordinator attended the following meetings:

(i) DBCP-XVIII and JTA-XXII sessions, Martinique, October 2002,
(ii) EGOS Management Committee meeting, Geneva, December 2002,
(iii) An instrumentation workshop and visit to IFREMER and IRD, Brest, January 2003,
(iv) A visit to the BOM, Melbourne, March 2003,
(v) Sixth session of I-GOOS, Paris, March 2003,
(vi) EGOS MC meeting, Madrid, May 2003,
(vii) IABP meeting, Tromsø, June 2003, and Second SOT meeting, London, July 2003.

2.1.3 The status of buoy programmes was presented. In August 2003, 211 moorings and 752 drifting buoys were reporting on the GTS globally (data received at Météo France). 313 drifters were reporting pressure, and 701 SST. Only 46 drifters were reporting wind. 84 barometer drifters were deployed in the Southern Ocean between 09/2002 and 08/2003 as part of the DBCP/SOBP. DBCP Members are committing 91 barometer drifters in SOBP for the next year.

2.1.4 The technical coordinator recalled the last DBCP session's recommendation to permit GTS distribution of all collected hourly drifting buoy data, since recent impact studies had shown a positive impact of such data on NWP. As a result, according to RNODC/DB, the average number of observations per drifting buoy per day increased by about 22% to reach a level of 14 obs./day in July 2003, while the number of operational drifting buoys at any time remained approximately constant around 770 buoys. About 350,000 drifting buoy observations are now submitted onto the GTS monthly.

2.1.5 User assistance consisted of assisting new buoy operators to set up their buoy programmes, discussing Argos message format issues, facilitating GTS distribution of the data, solving technical problems (e.g. missing data from GTS, duplicates), providing technical information (Argos, GTS), etc.

2.1.6 The technical coordinator assisted CLS/Service Argos in the development, testing, and implementation of the BUFR code within the Argos GTS sub-system. The code was operationally implemented in early July 2003. He coordinated the conduct of comprehensive sets of tests during the period April 2003 to June 2003 between Service Argos, the company in charge of the software developments, and a few meteorological services which volunteered to participate (e.g. ECMWF, Météo France, DWD). He also coordinated with the CBS ET/DRC in the definition of an appropriate BUFR template for buoy data and uploading of the BUFR tables within the CLS/Service Argos GTS sub-system database. Training of CLS/Service Argos staff regarding the BUFR code was also provided by the TC/DBCP.

2.1.7 The technical coordinator continued development and operations of JCOMMOPS. The database had to be tuned to make it more efficient and new data were loaded into it (e.g. buoy monitoring statistics, GDP deployment log, Canadian moorings). During the summer of 2003, a student developed for JCOMMOPS an application which will permit to query for deployment opportunities which are referenced in the database. Other new applications developed during the intersessional period include a "real-time" dynamic map (last 7-day track, updated daily), monthly status by country histograms, a web form for PMOCs to report systematic errors (QC guidelines), display of histograms and time series computed based upon the buoy monitoring statistics, monthly GTS status maps and lists.

2.1.8 Much discussion took place within the DBCP Evaluation Group during the last intersessional period. This was mostly related to spiky pressure data in heavy sea conditions. A new DBCP-M2-TEST Argos message format was proposed to help investigations.

2.1.9 The TC/DBCP also coordinated design of a metadata collection mechanism scheme with buoy operators and the Action Groups. This issue will be discussed during this DBCP meeting under agenda item 8.6.4 (buoy deployment notification scheme).

2.1.10 The full report of the technical coordinator is given in Annex III. The panel expressed its considerable appreciation to Etienne Charpentier for the work which he had accomplished during the past intersessional period and for his outstanding ongoing support for the panel, its action groups and members.

2.2 ACTION GROUPS AND RELATED PROGRAMMES

2.2.1 Under this agenda item, the panel was presented with reports by its action groups, viz:

- the European Group on Ocean Stations (EGOS) (verbal presentation by Mr Frank Grooters, representing the EGOS officers);
- the International Arctic Buoy Programme (IABP) (verbal presentation by Ms Elizabeth Horton, on behalf of the IABP officers);
- the International South Atlantic Buoy Programme (ISABP) (verbal presentation by Mr Louis Vermaak, ISABP technical coordinator);

- the International Buoy Programme for the Indian Ocean (IBPIO) (verbal presentation by Mr K. Premkumar, representing the IBPIO);
- the Global Drifter Programme (GDP) (verbal presentation by Mr Steve Cook, GDP representative);
- the Tropical Moored Buoys Implementation Panel (TIP) (verbal presentation by Mr Paul Freitag, representing the TIP)
- the North Pacific Data Buoy Advisory Panel (verbal presentation by Mr Ron McLaren, representing the NPDBAP).

Summaries of the presentations are reproduced in *Annex IV*. As usual, the full reports of the action groups will be reproduced in the panel's annual report.

2.3 NATIONAL REPORTS

2.3.1 The panel had received written and/or verbal reports on current and planned buoy programmes from Argentina, Australia, Brazil, Canada, Chile, France, India, Ireland, Japan, Malaysia, Netherlands, New Zealand, Republic of Korea, South Africa, United Kingdom, and USA. As usual, these written reports, as well as others submitted to the Secretariat before 30 November 2003, would be published in the panel's annual report.

2.3.2 The panel noted with interest a status report by Mr Eric Meindl on changes occurring within the National Oceanic and Atmospheric Administration (NOAA) as the result of its comprehensive programme review in 2002. The transition of operational observing systems from NOAA Research into operational elements was proceeding, although cautiously. The transition of the Deep-ocean Assessment and Reporting of Tsunamis (DART) array to NOAA's National Weather Service (NWS) was successfully completed at the end of September 2003. However, progress on the transition of the Tropical Atmosphere Ocean (TAO) array, also to the National Data Buoy Center (NDBC) of NWS, has been slow due to emerging user desires to better integrate data from diverse sources of observations, and concern over possible impacts and the technical obsolescence and replacement of existing TAO hardware.

2.4 ARGO SCIENCE TEAM AND ARGO INFORMATION CENTRE

2.4.1 The panel noted with interest the report by Steve Piotrowicz on this topic. As of October 2003, the Argo programme had 923 active platforms deployed throughout the world ocean and expected to reach one thousand by the end of the year, placing the programme one-third of the way towards its objective of 3,000 floats.

2.4.2 The remarkable success of Argo had been due to a number of factors including building international scientific and political consensus on the value of the observations; clear and defined objectives that are well understood; well-developed sampling protocols; and a data dissemination programme that provided free and open access of Argo data to a spectrum of users. Argo was a part of the integrated ocean observing system which, when combined with data from other in situ observational platforms and remotely-sensed data (e.g. altimetry), provided unprecedented data for users of ocean observations, especially global and regional assimilation activities on all temporal scales.

2.4.3 Observational needs were developing in areas where voluntary observing ships and research vessels did not transit frequently, especially in the South Pacific and several areas of the Southern Ocean. The programme was planning to place a major effort into deploying instruments in these areas over the next two years using dedicated research vessels, which would also enable coincident CTD casts being conducted at launch sites. Technical evolution of the instruments continued, including (i) the introduction of advanced telecommunications technologies to allow more data to be transmitted much more rapidly, resulting in reduced power requirements for telemetry, power which can then be applied to sampling an increasing number of pressure levels, and reducing the time of exposure of instruments at the surface; (ii) increasing the deployment of

floats that are capable of profiling to 2,000 meters everywhere in the world's oceans; (iii) and the long term stability of salinity sensors.

2.4.4 Argo data were available from two global data acquisition centres, the Coriolis Centre in Brest, France (http://www.coriolis.eu.org/) and the U.S. GODAE server in Monterey, California (http://www.usgodae.org/argo/argo.html). The long-term archive for Argo data was the U.S. National Oceanographic Data Centre (http://www.nodc.noaa.gov/). The Argo Information Centre (AIC) located in Toulouse, France, was established to serve a number of needs including the implementation of IOC Resolution XX-6 on a float deployment notification mechanism. It also provided real-time monitoring of the performance of the system through a number of monitoring and query tools accessible by any party through the AIC web site (http://argo.jcommops.org).

2.5 EVALUATION SUBGROUP

2.5.1 The chairperson of the Evaluation Group, Ms Elizabeth M. Horton, reported that, during the intersessional period, a data problem was detected in the Southern Ocean under certain high sea state conditions. Some of the atmospheric pressure values being reported by some drifters showed spikes, which prompted their removal from GTS distribution. She noted that this pressure spiking problem was not new; the global drifter community at times in the past had experienced similar spiking problems.

2.5.2 It was recognized that accurate pressure data were required by marine forecasters. So some solution should be sought to retain good pressure values being reported by questionable buoys, while removing spiky data from GTS distribution.

2.5.3 In light of the fact that it was unclear whether the spiking problem was caused under special circumstances not well-handled by the current de-spiking algorithm, or by an engineering design of some component of the drifter, a DBCP-M2-TEST format was suggested (see *Annex V*). This test format was intended to provide manufacturers with guidelines to solve the spiking problem. The DBCP Evaluation Group Chair recommended that, during the intersessional period, this format be reviewed by the drifter community, and asked for comments. Some testing was under way, and additional testing was planned.

2.5.4 The panel thanked the Chairperson and the Evaluation Group for the work undertaken so far on its behalf. It approved the testing mechanism developed in that context. It recognized that it was presently difficult to flag on the GTS the messages coming from this testing, since the BUOY code was frozen and it would take some time to adapt the BUFR code. It nevertheless recommended that consideration be given to such possible flagging.

2.5.5 The panel accepted with appreciation that Ms Horton would continue to act as the chairperson of the Evaluation Group.

3. NEW ACTION GROUPS

3.1 No proposals for new action groups were received by the panel.

4. REVIEW OF THE DBCP IMPLEMENTATION STRATEGY

4.1 The panel recalled that it had reviewed its Implementation Strategy at its previous session and agreed that this review process should continue at each annual meeting, in view of changes in the organizational environment surrounding ocean observations, as well as ongoing developments in requirements for buoy data and advances in buoy technology. In this context, it undertook a further review of the latest version of the strategy.

4.2 In particular the panel recognized that its aims and objectives continued to develop and that many of the issues that had dominated panel activities in its early sessions had been superseded by other challenges, such as those posed by new organizational structures (for example JCOMM)

and new observing systems (for example Argo). The panel therefore agreed that it must work proactively to maintain its position as an authoritative and influential force in ocean observation, and that this aim should be incorporated within its Implementation Strategy.

4.3 No other major modifications were proposed during the meeting; however, participants were requested to continue the review after the meeting, and to pass any additional suggestions for modifications to the vice-chairman, David Meldrum, by 30 November 2003 at the latest. The panel agreed that, in view of its highly dynamic nature, the Implementation Strategy should continue to be published and made available only through the DBCP web site, as was the case at present. In addition, the panel agreed that it should regularly review and update as necessary in the light of developments, its aims, objectives and terms of reference. It therefore requested the Secretariat to include a specific item to this effect on the agenda of future meetings.

4.4 As noted in paragraph 2.1.3 a Southern Ocean Buoy Programme (SOBP), supported largely by existing DBCP action groups, now forms part of the DBCP Implementation Strategy. For the period September 2003 to August 2004 the following contributions have been offered to the SOBP:

Country	Buoys purchased	Barometer upgrades	Total
Australia	5	10	15
France	0	5	5
New Zealand	5	5	10
South Africa	0	24	24
USA	37	0	37
Total	47	44	91

5. JCOMM ACTIVITIES RELEVANT TO THE DBCP

5.1 The panel noted with interest a report on activities, either under or associated with JCOMM, which had taken place since DBCP-XVII and was of direct interest to the panel.

5.2. The following JCOMM-related meetings had taken place during the intersessional period:

(i) Second Implementation Planning Meeting for the WIOMAP Project, Mauritius, 1 November 2002. This meeting reviewed and revised the project document, which will be circulated for formal approval by participating agencies in the region in late 2003. It is expected that the observations component of the project, when implemented, will include, inter alia, both drifting and moored buoys, for which the panel or the IBPIO may be required to provide technical advice;

(ii) First session of the JCOMM Task Team on Resources, Paris, 3-4 February 2003. A major outcome of this meeting was the decision to establish a data base of potential funding sources for JCOMM activities;

(iii) Second session of the JCOMM Management Committee, Paris, 5-8 February 2003.

(iv) First session of the Expert Team on Waves and Surges, Halifax, 11-14 June 2003, followed by a training workshop on wave and surge forecasting, in the same venue. The team is, inter alia, trying to document existing sources of measured wave data, as well as make a selection of preferred wave buoys for satellite and model calibration and verification;

(v) Second session of the Ship Observations Team, London, 28 July-1 August 2003, preceded by the fourth project meeting for VOSClim, and a second international workshop for PMOs, in the same venue. The team, inter alia, established an Expert Group on Instrument testing, of which Ms Elizabeth Horton is a member;

(vi) First session of the Expert Team on Data Management Practices, Ostend, 15-18 September 2003.

5.3. Following proposals from the Management Committee, a JCOMM logo and brochure had been prepared, with substantial support from Météo France and the Australian Bureau of Meteorology, respectively. The logo will be used on all JCOMM publications in the future, as well as all JCOMM-related web sites.

5.4. The JCOMM web site has been re-designed and upgraded a little, and is now accessible through a simplified URL: http://www.jcommweb.net. In addition, there are new web sites for real-time marine forecast and warnings (http://weather.gmdss.org) and for the VOS programme and panel (http://www.bom.gov.au/jcomm/vos/). Both can be accessed directly from the JCOMM home page, and the latter also from JCOMMOPS.

5.5. The panel noted with interest that a special seminar to celebrate the 150th anniversary of the International Maritime Conference, Brussels, August 1853, was to take place in Brussels on 17-18 November 2003, to be followed by the second International Workshop on Advances in Marine Climatology (CLIMAR-2). Both were sponsored by JCOMM, and the panel urged its members to participate where possible and appropriate.

5.6 The panel noted with interest and appreciation a presentation by Mike Johnson, Chairperson of the JCOMM Observations Programme Area Coordination Group (OCG), in which he particularly emphasized the importance of the DBCP in providing international coordination of data buoy operations globally. Drifting and moored buoys were central components of the global ocean observing system, which was a composite of complementary in situ, satellite, data, and modelling subsystems. Each subsystem brought its unique strengths and limitations. Together they built the whole.

5.7 It was noted that there was presently significant international momentum for implementation of a global observing system. The GCOS *Second Adequacy Report to the UN Framework Convention on Climate Change (UNFCCC)*, in particular, had called for "urgent action" by the Parties to implement global coverage by the in situ networks. The Subsidiary Body for Scientific and Technological Advice (SBSTA) saw the *Adequacy Report* as an "opportunity to build momentum among governments." Although these activities were identified for climate requirements, marine services in general would be improved greatly by implementation of the global coverage called for by GCOS. At the same time that GCOS and the UNFCCC were bringing this imperative to the attention of governments, the recent Earth Observation Summit was bringing a similar message that went beyond climate. He stressed that the JCOMM panels were particularly well positioned to provided the logistics and organizational infrastructure needed to implement the international global arrays.

5.8 The OCG recognized the challenge and emphasized the importance of DBCP planning for advancing the global drifter array from the present 800 buoys to 1250 buoys and for extending the tropical moored buoy network across the Indian Ocean. Consideration for future integration with the emerging ocean observatories network was also encouraged. All of these data buoy advancements were called for by the GCOS *Adequacy Report*.

5.9 The panel recognized that it was becoming more important in several countries for observing system managers to provide routine products that were designed for non-scientists and decision-makers. A major challenge for the Observations Programme Area was to develop easy to understand performance reports that could help in evaluating the effectiveness of the observing system and help in efforts to convince governments to provide the funding needed to meet global implementation targets. The OCG was working to develop standard base maps showing required global coverage against what was presently in place. It was noted that JCOMMOPS had made good progress in standardized mapping over the past year. Much work was being done by JCOMMOPS, DBCP members, and other partners around the world to evaluate observing system status and effectiveness. The OCG was working to bring together elements of this work in order to develop summary reports illustrating how advancements toward global coverage improve the

adequacy of the observational information that is essential for monitoring the state of the ocean and marine meteorology.

5.10 The panel agreed on the importance of its continued involvement in and support for the integrating work of the OCG, of which its chairman and technical coordinator are both members. It also agreed that specific reference to the findings of the GCOS Adequacy Report and the UNFCCC/SBSTA should be included in the Implementation Strategy, since they provided significant support to its own efforts to enhance buoy networks worldwide.

6. SCIENTIFIC AND TECHNICAL WORKSHOP

6.1 Under this agenda item, the panel reviewed briefly the results of the preceding workshop, at which some 14 papers had been presented, under the general themes of:

- research applications
- operational applications
- buoy technology and communications

The panel expressed its appreciation to Mr Eric Meindl for his excellent work in organizing and chairing the workshop. It agreed that, as before, the proceedings should be published in the DBCP Technical Document series, on CD-ROM only, and also made available via the DBCP web site. To this end, all presenters were requested to make the full versions of their papers available to Mr Meindl, in electronic form (preferably MS Office compatible format), by 30 November 2003 at the latest.

6.2 The panel further agreed that the 2004 workshop should, if possible, focus on three main themes:

- Vision and possibilities/technological developments - including technology and network performance demand (applications pull); and buoy/instrument developments (technology push);
- Operational enhancements – evaluation/analysis; data communications and data assimilation; performance and efficiency benchmarking; new systems and practices;
- Applications – research and operational data applications; case studies, with a particular focus on the north Indian Ocean.

The panel accepted the kind offer of Mr Ken Jarrott (Australia) to undertake the organization of this workshop.

7. DATA AND INFORMATION EXCHANGE

7.1 REPORTS BY BUOY DATA MANAGEMENT CENTRES

7.1.1 Under this agenda item, the panel reviewed the reports of the IOC International Oceanographic Data and Information Exchange (IODE) Responsible National Oceanographic Data Centre (RNODC) for drifting buoys, operated by the Marine Environmental Data Service (MEDS) of Canada; and of the JCOMM Specialized Oceanographic Centre (SOC) for drifting buoys, operated by Météo-France. A summary of the reports is reproduced as *Annex VI*. As usual, the full reports of the data management centres will be published in the panel's annual report. The panel expressed its appreciation to both MEDS and Météo-France for their ongoing efforts on its behalf.

7.1.2 Regarding the number of duplicate and semi-duplicate buoy messages that are distributed on the GTS as identified by MEDS, the panel requested the technical coordinator to discuss the issue with MEDS with a view to identifying and implementing solutions.

7.2 INFORMATION EXCHANGE

Web site

7.2.1 The panel reviewed the media that it used to inform members and users of its activities and to provide general and technical information to the community. The web site is hosted by AOML, Silver Spring, Maryland (http://www.dbcp.noaa.gov/dbcp/). Specific pages of the DBCP web site were regularly updated to reflect changes. No major changes were made in the past year to the web site, which now includes comprehensive information about the Panel and its activities. New products or tools are now preferably implemented onto the JCOMMOPS web site (see paragraph 8.5.3).

7.2.2 The DBCP Internet Technical forum is available via JCOMMOPS at http://forum.jcommops.org/ and is shared with SOOP and Argo. The DBCP forum can be used by buoy operators for uploading information they believe might be useful to the buoy community or for debating technical issues.

7.2.3 A number of mailing lists are now being used for the exchange of technical information amongst buoy operators, DBCP members, and monitoring centres. Details on the mailing lists and how to register can be obtained at http://www.jcommops.org/mailing_lists.html#DBCP (information on other JCOMMOPS mailing lists, including for SOOP, Argo, and the SOT can also be obtained from this web page).

Publications

7.2.4 The DBCP recently published the following documents within its Technical Document series, both available on CD-Rom:

- No. 22: Research, Applications and Developments Involving Data Buoys, DBCP Workshop, Martinique, October 2002 (also available via the web at http://www.dbcp.noaa.gov/dbcp/doc/DBCP-22/start.htm).
- No. 23: DBCP Annual Report for 2002 (also available via the web at http://www.dbcp.noaa.gov/dbcp/doc/DBCP-23/DBCP23.pdf).

The WOCE Surface Velocity Programme Barometer Drifter Construction Manual (No. 4, revision 1.2, 12/2002) was slightly updated to reflect the fact that the Vaisala AIR-SB-2A barometer was not available anymore. On the other hand, Vaisala was added to the list of suppliers.

The Argos GTS sub-system Reference guide (No. 2, revision 1.3, 10/2003) was updated substantially to include BUFR encoding capability, new data processing modules, and automatic quality control tests recently implemented for Argo.

The following publications needed to be reviewed and updated:

- No. 3: Guide to data collection and location services using Service Argos (revision needed to take Argos-2 generation and downlink capabilities into account)
- No. 4: The WOCE SVP Barometer Drifter Design Reference (revision needed to take new size of SVPB into account).

The following new publications should be prepared during the next intersessional period:

- DBCP-XIX Workshop proceedings
- DBCP annual report for 2003.

Other media

7.2.5 *JCOMMOPS News*: The panel noted with interest a proposal by JCOMMOPS to add a "News" section to its web site. News related to the DBCP, SOOP, and Argo programmes would appear on the JCOMMOPS home page and could be added easily, provided that short articles, including one or two pictures, were provided to the technical coordinator for inclusion. The panel therefore invited interested panel members to regularly provide the technical coordinator with information on their buoy programmes, technical developments, and applications once JCOMMOPS had implemented such facilities. Eric Meindl suggested adding in the future JCOMMOPS news section links to other news sections from web sites where articles interesting the community can be found (e.g. NDBC, PMEL). The technical coordinator informed the panel that this was feasible.

7.2.6 *Brochure*: The panel recognized that the brochure had only recently been revised and reprinted in three languages. Since such reprinting of hard copies was an expensive exercise, it agreed that a new hard copy version should not be prepared more frequently than every five years. At the same time, it decided that a web-based version, in pdf format, could easily and inexpensively be prepared at more frequent intervals, to reflect developments in the panel and its activities. It therefore requested panel members to inform the Secretariat and technical coordinator of any modifications which might be required in the brochure, so that a revised version might be prepared for the web site.

7.2.7 *Port Technology International*: The technical coordinator mentioned that he was contacted recently by Port Technology International, which publishes a magazine on a quarterly basis for port authorities and related industry. PTI asked whether the DBCP was interested in regularly providing input to the magazine, under conditions yet to be defined. The panel recognized that this might be a good opportunity for establishing links with the industry for deployment purposes, addressing the vandalism issue, and for potential funding. It invited the technical coordinator to investigate the conditions under which the DBCP might provide input, and interested panel members to provide the technical coordinator with appropriate materials so that he can prepare, if at all possible, an initial article to be included in the magazine.

8. TECHNICAL ISSUES

8.1. QUALITY CONTROL

8.1.1 The technical coordinator presented quality control tools and systems available for buoy data. Different systems exist for quality control of real-time data, scientific data, and archived data. For real-time data, in addition to simple automatic quality control tests as implemented within the Argos GTS sub-system, the DBCP quality control guidelines provide a mechanism for monitoring centres (PMOCs) to comment on detected systematic errors and suggest corrective action to the buoy operators in charge of GTS distribution (PGC). Scientific data are taken care of by the Global Drifter Centre at AOML, and archived data by RNODC/DB at MEDS (e.g. filtering of duplicates, flagging of dubious locations).

8.1.2 Regarding the DBCP QC guidelines, it was noted that a lot of spam messages were circulating on the list. Action was suggested to tentatively solve this problem (see *Annex VI*). The panel requested the technical coordinator to work with MEDS and Iceland in order to find possible solutions to this problem (e.g. filtering). During the period July 2002 to June 2003, 54 quality information messages were issued by PMOCs through the mailing list. Participating PMOCs included MSC, MSNZ, IMO, JMA, SAWS, NCEP, ECMWF, Météo France, BOM, and UKMO. The decrease in the number of messages compared to last year (119) is not alarming but most probably reflects increased confidence of NWP centres in the quality of the data. The panel noted with appreciation efforts by the BOM to begin production of buoy monitoring statistics based on output from the BOM NWP model. The technical coordinator reported that he had developed a new tool at JCOMMOPS for PMOCs to report quality information regarding specific buoys via a web page. This tool is complementary to the buoy-qc mailing list. Quality information reports posted

onto the web page are directly stored in the JCOMMOPS database and forwarded to the PGCs. The panel asked the technical coordinator to make sure that such messages are also automatically posted onto the mailing list. This tool can potentially be used for VOS data, as required by OCG-I and SOT-II, provided that the list of VOS ships is also uploaded into the database (using WMO-No. 47).

8.1.3 The technical coordinator listed all the tools available from Member States and JCOMMOPS which provide information on the quality of buoy data. These include detailed monitoring reports (e.g. UKMO semestrial) and miscellaneous web products (e.g. Météo France). Details can be found on the DBCP web site in the quality control section.

8.1.4 Evaluation of the quality of the data show that air pressure RMS from all buoys, when compared to the ECMWF model, is relatively stable, of the order of 1 hPa. The percentage of gross errors (ECMWF) is of order of 1%. However, the RMS for SVPB drifters has increased from about 0.7 hPa to about 1.2 hPa in the last 12 months. Similarly, the percentage of gross errors for wind speed data from SVPBW has substantially increased since April 2003, from about 0.5% to about 3%, while the RMS remains relatively stable at about 2.2 m/s. The panel invited the evaluation group to look into these potential problems. The RMS for SST data compared to the NCEP model is of the order of 0.7 C.

8.2. CODES

Implementation of BUFR within the Argos GTS sub-system

8.2.1 The technical coordinator reported on the development and implementation of the BUFR encoding capability within the Argos GTS sub-system. Following DBCP-XVII recommendations, developments started in January 2002 and progress was reported at the 18th DBCP session. Developments continued during the last intersessional period and work was completed in April 2003. Extensive tests had been conducted between April and June 2003 with active participation from the Czech Hydrometeorological Institute (CHMI), ECMWF, Deutscher Wetterdienst (DWD), Météo France, Service Argos, JCRI, and the Technical Coordinator. Test BUFR reports and their decoded content can be downloaded from the JCOMMOPS ftp site at ftp://ftp/jcommops.org/gts/test/bufr/.

8.2.2 After validation, operational implementation of the new software at Service Argos was achieved on 1 July 2003 at the French Argos Global Processing Centre (FRGPC, Toulouse), and on 3 July 2003 at the US Argos Global Processing Center (USGPC, Largo). All buoys which reported on the GTS from Service Argos in BUOY format are now reporting in both formats, i.e. BUOY and BUFR. Buoy data will continue to be distributed in BUOY format for an undefined period, probably several years.

8.2.3 GTS bulletin headers used for BUFR reports have the following form:

- "**IOZX*ii* LFPW**" for the bulletins issued from the FRGPC, Toulouse, France
- "**IOZX*ii* KARS**" for the bulletins issued from the USGPC, Largo, USA

Values for ***ii*** will remain the same as for the BUFR bulletin headers used for GTS distribution of the data in BUOY format. So for example data normally distributed in BUOY code under "SSVX02 KARS" will also be distributed in BUFR under "IOZX02 KARS". The current list of GTS bulletin headers used for distribution in BUOY format is available at: http://www.dbcp.noaa.gov/dbcp/1gbh.html.

A formal description of WMO BUFR tables can be found on the WMO web site at: http://www.wmo.ch/web/www/documents.html#CodeTables

8.2.4 The version of the code tables indicated in the BUFR report is 11, i.e. the version number for the descriptors which are awaiting validation and which are described as such on the WMO

web page listed above. Note that the current version of BUFR tables is 9 at this point. Similarly, the template which is used is the one that was agreed upon at the last meeting of the CBS Expert Team on Data Representation and Codes, Arusha, 17-21 February 2003.

Benefits of BUFR for GTS distribution of buoy data

8.2.5 The technical coordinator presented an overview of the basic advantages of using BUFR for GTS distribution of buoy data. These include (i) flexibility for adding new variables or metadata, (ii) compression to reduce overall GTS data volume, and (iii) possibility to transmit higher resolution data. For example, with the presently agreed upon template for buoy data, there are a number of variables included which could not previously be distributed in BUOY format (i.e. data collection and/or location system, platform transmitter ID, platform or transmitter battery voltage, submergence, drogue status, ice thickness, temperature of barometer, height of instrument, wind gust, precipitation, and global radiation).

8.2.6 The panel noted that BUFR compression was not presently implemented within the Argos GTS sub-system and agreed that compression would permit to substantially reduce the message length of BUFR reports on the GTS. It therefore proposed that such BUFR compression should be included in the Argos GTS sub-system.

8.2.7 The technical coordinator informed the panel that JCOMMOPS had developed a java decoder which can be used for monitoring purposes. Interested panel members were invited to contact the technical coordinator if they wished to obtain a copy of the software, including source code, which is available free of charge.

BUFR template for buoy data and required descriptors

8.2.8 After consultation with key DBCP Members, some modifications to the template that would be used for GTS distribution of buoy data in BUFR were proposed by the technical coordinator to the CBS Expert Team on Data Representation and Codes. The ET met in Arusha, 17-21 February 2003 and basically adopted the proposed modifications (see final report of the meeting at http://www.wmo.ch/web/www/DPS/reports/ET-DRC-Arusha-2003.doc).

8.2.9 The adopted template is given in *Annex VII*. Small changes might still be required to this template so the panel asked the technical coordinator to coordinate this with panel members and to liaise with the CBS ET/DRC.

8.3. ARGOS SYSTEM

Operations

8.3.1 The panel noted with interest a presentation by CLS and Service Argos Inc. on the present status and future enhancements of the Argos system. Argos systems operated aboard 7 NOAA satellites in 2003. Four of these were second generation systems (Argos 2) on board NOAA 15(K), NOAA 16(L), NOAA 17(M) and ADEOS-II. The two satellites currently designated as operational by NOAA remained NOAA 16 and NOAA 17. Thus, expanded receiver bandwidth was available operationally and all Argos users were urged to take advantage of the improved performance possible by transmitting outside the Argos 1 band. The real-time (bent pipe) data receipt performance continued to improve with the addition of 5 new regional stations during the last 12 months: Oslo, Las Palmas, Singapore, Hatoyama, Santiago. The receiving network now counted 33 stations.

8.3.2 The global processing centres at Largo and Toulouse continued to operate without any problem with an operational reliability of 99.9%. The Internet was the primary communication link to receive and distribute data. Largo and Toulouse global centres were linked by an Internet link and a 128K ISDN backup. A 2 Mbits link had been added to the 1 Mbits Internet access of CLS and would soon be implemented in the SAI global centre. Data availability continued to improve

with 87% of the real-time data being available within 30 minutes and 2/3 of the Argos data being retrieved in real-time.

Enhancements

8.3.3 Regarding computers and software, most of the work had been dedicated to the Argos 2001 project and the work of the Argos Downlink. As per Argos 2001, the Argos new user interface on the web was completed and the data access module made available to users in April 2003. The Argos 2001 step 2, namely the upgrade of value-added services such as Automatic Data Distribution, Databank, Equipment monitoring was to be completed at the end of 2003. As per the third step, the redesign of the Argos processing system, specifications were completed and developments were starting. This redesign encompassed enhanced location procedures, the processing of multiplexed messages, merging of all the current GTS data processing facilities.

8.3.4 To improve the performance of the Oracle Database Service, a 4th computer was added to both global processing centres.

8.3.5 ADEOS-II (MIDORI-II) was successfully launched on 14 December 2002. ADEOS-II was the first satellite that carries an ARGOS two-way instrument allowing users to send messages to their platforms equipped with Argos two-way platforms (called PMT - Platform Messaging Transceiver). In early May, the ADEOS-II was declared operational and the Argos uplink data were made available to all users under the standard service, thus providing a third satellite.

8.3.6 Initial operations of the Argos Downlink with prototype PMT showed very positive results, in particular in terms of data throughput increase. By taking benefit of the new interactive data collection capability, demonstrations have shown that as many as 20 or more different Argos messages can be successfully transmitted and received error-free by the satellite in a single 10 minute satellite pass. This would be particularly beneficial to the Argo programme, to reduce the surface time of the floats from several hours to less than one hour. The Argos PMTs will be available for testing and integration into platforms in late 2003.

8.3.7 In order to enhance the timeliness of Argos data, especially in tropical areas, cooperation with the Brazilian space agency, INPE, was ongoing. INPE had 3 satellites in orbit and planned to launch 5 more within the next 4 years, all compatible with Argos-2. Preliminary tests showed that these satellites provided 40% of additional data in tropical regions around Brazil.

8.3.8 CNES and CLS accomplished a preliminary study which demonstrated that the integration of a stand alone Brazilian station was feasible. The study between INPE and CLS was continuing. The antenna sub-system was available off-the-shelf from a manufacturer involved in the Jason programme. Any decision to finalize a cost analysis and to present it to OPSCOM/JTA was dependent upon two factors:

- A strong users' requirement for enhanced latency time in any equatorial region of the world.
- The confirmation from INPE that their actual constellation is going to be replaced within the expected time frame.

Related to the data exchange between CNES and INPE the status was the following:

- CNES/CLS was receiving raw data transmitted from INPE.
- INPE was doing the technical evaluation of data transmitted from CLS and is analyzing ways to formalize the data exchange.

8.3.9 CLS/Service Argos reminded the panel that it had, at the panel's request, developed facilities to allow GTS insertion of data collected by other satellite systems. To date, this facility remained unused.

Argos QC for Argo

8.3.10 QC of Argo data was implemented in the Argos processing centres on 15 October 2003. The QC includes climatology tests, dedicated profile tests such as spike, gradient, density inversion tests, and “on land” platform tests. These tests could also be beneficial to drifters and moored buoys, and interested users were invited to make contact with their Argos user office regarding implementation.

8.4. NEW COMMUNICATION TECHNIQUES AND FACILITIES

8.4.1 Under this agenda item, the panel reviewed an updated report on developments in satellite communication systems prepared by its vice-chairman, Mr David Meldrum. During the intersessional period consolidation amongst the range of systems being planned or launched had continued, largely in response to financial pressures. However some signs of stability were starting to emerge, and the systems that remained offered a range of facilities that could well encompass all envisaged buoy and float applications in terms of data throughput capability, geographical coverage and the like.

8.4.2 In particular, the panel recalled workshop presentations on the Iridium system that had outlined the potential of this system for real time interactive communications at high data rates, and a new approach to data acquisition, management and distribution. In this context, the panel also was pleased to note an ongoing US Navy ONR programme that had funded the distribution and support of 100 Iridium modems for evaluation by the ocean observations community.

8.4.3 The panel also noted with approval the successful implementation of a two-way Argos communication system on board the Japanese ADEOS-II satellite, and urged the data buoy community to cooperate with CLS/Service Argos in evaluating this new system in as wide a range of scenarios as possible.

8.4.4 The panel remained aware that the financial viability of some of the operational systems still caused concern in some quarters, and that no system currently offered the range of data dissemination and quality control services that were available to users of Argos. Nonetheless, the panel recognized the potential benefits of the new systems, and urged users of these systems to make use of the ftp facilities developed by CLS/Service Argos to allow GTS insertion of such data.

8.4.5 Regarding the new NOAA polar orbiting system, NPOESS, to be launched in 2009, the panel noted the request of the representative of NESDIS, Mr Rob Bassett, to participate in a requirements specification exercise. The panel, in recognizing the importance of NPOESS to its future activities, therefore requested its technical coordinator to work with the Action Groups to define their future requirements for data from polar orbiters.

8.4.6 The panel thanked Mr Meldrum for his review, and requested the technical coordinator to make the tabulated summary available on the DBCP web site. It considered that a regular review of communication options was central to its objectives, and requested Mr Meldrum to again present an updated report to its next session.

8.5 JCOMMOPS

8.5.1 The technical coordinator presented the activities of JCOMMOPS during the past intersessional period. He recalled that the JCOMM *in situ* Observing Platform Support Centre (JCOMMOPS) was established by JCOMM-I in June 2001. JCOMMOPS is operated by the DBCP, SOOP, and Argo Coordinators. DBCP, SOOP, and Argo provide the resources needed to run JCOMMOPS. The Centre basically provides support in an integrated way for implementation and operations of the DBCP, SOOP, and Argo programmes. A complete description of JCOMMOPS, including terms of references, can be found at:
http://www.jcommops.org/doc/jcommops/jcommops.htm.

8.5.2 In addition to daily coordination to facilitate implementation and operations of DBCP, SOOP, and Argo programmes, JCOMMOPS provides specific tools via its web site. The technical coordinator recalled that before the 18th session of the DBCP the following had been achieved: implementation and design of (i) static web site, (ii) database, (iii) Geographical Information System (GIS), (iv) dynamic web applications, and (v) on-line database access. During the past intersessional period, the following developments were made: (i) new redesigned web site, (ii) database tuned and loaded with new data (e.g. statistics, GTS daily), (iii) new GIS maps (e.g. daily dynamic drifter track map, high resolution static maps), and (iv) new dynamic web application (monthly status, monthly GTS report, histograms, time series, and quality control feedback web page).

8.5.3 In August 2003, the following JCOMMOPS services were available for the DBCP:

Integrated products

- Platform status by country (monthly histogram for drifting buoys, moored buoys, floats; XBT part still to be developed)
  http://w3.jcommops.org/cgi-bin/WebObjects/PTFcountry
- Monthly GTS report (input from 5 countries, originally the SOOP monthly BATHY report, see annex):
  http://w3.jcommops.org/cgi-bin/WebObjects/GTSReport
- JCOMMOPS status maps (summary of all types of maps produced plus links):
  http://www.jcommops.org/status_maps.html
- Monthly JCOMMOPS GTS status maps (high resolution map)
  ftp://ftp.jcommops.org/GTS/Maps/
- Deployment opportunities (static pages so far, information will be added in the database and a dedicated application (query) to search for specific opportunities will be developed):
  http://www.jcommops.org/depl_opport/depl_opport.html (see annex)
- Allocation of WMO numbers and ship call signs to specific transmitting platforms (buoys, floats, XBTs):
  http://w3.jcommops.org/cgi-bin/WebObjects/WMO_Telecom (see annex)
- List of contact points:
  http://w3.jcommops.org/cgi-bin/WebObjects/Search.woa/wa/contact
- List of electronic mailing lists:
  http://www.jcommops.org/mailing_lists.html
- List of meetings (dynamic application, query, document lists, etc):
  http://w3.jcommops.org/cgi-bin/WebObjects/Search.woa/wa/meeting
- JCOMMOP generic database search Engine:
  http://w3.jcommops.org/cgi-bin/WebObjects/Search
- Glossary and list of acronyms:
  http://w3.jcommops.org/cgi-bin/WebObjects/Search.woa/wa/glossary

DBCP

- DBCP monthly dynamic status map (zoom, click on buoy):
  http://w3.jcommops.org/WebSite/DBCP (see annex)
  DBCP real-time dynamic map (updated daily, zoom, click on buoy)
  http://w3.jcommops.org/WebSite/DBCP_RT
- Application to relay quality information from PMOCs to PGCs via a dedicated web page (potentially usable for VOS provided that WMO Pub. 47 is routinely imported into JCOMMOPS database)
  http://w3.jcommops.org/cgi-bin/WebObjects/QCRelay
- Monthly DBCP GTS status by country (high resolution map)
  ftp://ftp.jcommops.org/DBCP/Maps/

- Histograms showing difference between buoy data distributed on GTS and first guess field
  http://w3.jcommops.org/cgi-bin/WebObjects/Histogram
- Time series regarding the quality of buoy data (from buoy monitoring statistics)
  http://w3.jcommops.org/cgi-bin/WebObjects/StatsSeries.woa/wa/progDirect?prog=DBCP)
- Links to products developed and made available elsewhere such as the Information Service Bulletin on non-Drifting Ocean Data Acquisition Systems (ODAS) which is operated by MEDS:
  http://www.meds-sdmm.dfo-mpo.gc.ca/odas/main.htm

8.5.4 For the next intersessional period the following developments are planned: (i) query form for deployment opportunities (nearly completed), (ii) Moving database and tools to a new faster server, (iii) implementation of a backup system, (iv) continuation of the implementation of TC/DBCP tools onto the JCOMMOPS server so that they can be available to the community via the web, (v) improved ergonomics and map and graph browsing, (vi) list of DBCP buoys online, (v) a news section directly displayed from the home page, and (vi) indication of the percentage of DBCP array covered (i.e. % of 1250 drifters).

8.6 OTHER TECHNICAL ISSUES

8.6.1 Deployment opportunities

8.6.1.1 The technical coordinator reported on current developments at JCOMMOPS for collecting and providing information on ship and air deployment opportunities for drifting buoys, Argo floats, XBTs, VOS, and for servicing of moored buoys in the high seas. The goal is to facilitate identification of deployment opportunities for programme managers (i) who join the community and have no experience in the deployment of such instruments, and (ii) for those who are willing to deploy instruments in area where they are not used to do so. For the time being information is available in static html format via the JCOMMOPS web site at http://www.jcommops.org/depl_opport/depl_opport.html but developments are underway to provide a dynamic application where a buoy operator interested to make deployments in a given ocean area for a given period would go and get the required information from the database through a query form. A student, Mathieu Lopes, worked at JCOMMOPS during the summer of 2003 to implement such developments. The developments should be finalized during the next intersessional period. An algorithm was used to identify all ship routes and deployment opportunities available in the database that intersect with selected latitude/longitude box and period. A relevance index is associated with every deployment opportunity listed so that those with higher probability to be useful are listed first. For example, if a programme manager asks for deployment opportunities in a box that intersects with the Norwegian Sea and the North Atlantic Ocean, deployment opportunities attached to the Norwegian Sea will be given a higher probability than those attached to the North Atlantic solely.

8.6.1.2 However, it was noted that, in reality, deployment opportunities are most of the time not precisely made available in terms of space and time. Rough indications of ocean area or ship routes and periods of the year when opportunities could be available might, however, be sufficient for programme managers provided that an appropriate point of contact is indicated. These points of contact who are routinely dealing with shipping companies can then provide more detailed information on actual deployment opportunities. Points of contact are therefore essential in such a system.

8.6.1.3 The panel thanked JCOMMOPS for the development of the dedicated application and agreed that in order for such tools to work efficiently, information on deployment opportunities must routinely be made available to JCOMMOPS, even rough information. JCOMMOPS was tasked to enter such information into its database whenever opportunities are made available to it. The system being developed will also permit designated points of contact to enter information directly in the database (connection via username/password). The panel therefore asked its members to look

through the DBCP list of contact points for logistical facilities and check its accuracy. It also requested the Secretariat to investigate the possibility to expand the list to become a more general JCOMM list, since such deployment facilities could potentially be used for other types of instruments such as floats, XBTs, etc.. Contacts from the list will be invited to register to the JCOMMOPS database in order to obtain a username and password so that they can directly add information in the database via the web. The panel also invited its members to make any information on deployment opportunities regularly available to the technical coordinator (e.g. quarterly). Submitted information can include the contact person, the ship name and call sign, the type of ship, the ship route (precisely scheduled or generic route), fee, availability of onboard crew, indication whether technicians can ride on the ship, specific comments, and a map.

8.6.2 GTS delays and the reactivation of Lannion

8.6.2.1 The NOAA/NESDIS representative, Rob Bassett reported that the US Argos Operations Committee (OPSCOM) received a letter from the chairman of the Data Buoy Cooperation Panel (DBCP). The DBCP letter outlined the significant impact of the Argos data delay caused by the Polar-orbiting Operational Environmental Satellite (POES) “blind” orbits. In addition the Chairman of the JTA had written to the co-chairs of the OPSCOM conveying the request of JTA participants to consider a solution to the blind orbit problem. As requested during DBCP-XVIII, CLS and Météo France investigated the Lannion site and confirmed that Lannion retains a limited capability to recover “blind” orbit data and is restricted to smaller data sets (Stored TIROS Information Processor [STIP]) at 2 of 3 download frequencies (1698 MHz and 1707 MHz), however, not on a 7 day, 24 hour basis. NOAA/NESDIS reviewed the DBCP and JTA participant concerns, coordinated similar requirements from other users and evaluated the cost/benefits of the Lannion and Barrow sites. A consolidated requirement for POES “blind” orbit data was presented to NESDIS management for decision and was approved for implementation at the Barrow site. Barrow is installing communication and equipment upgrades to become fully operational by early 2004. The “blind” orbit data requirement is subject to POES operational priorities and the availability of satellite recorder time. Currently there is limited recorder time on the operational satellites (NOAA 16 and 17) due to recorder failures and other higher priority missions. Therefore there is not sufficient recorder time for any "blind orbit" downloads anywhere (Lannion or Barrow) until some of the higher priority requirements are discontinued or the larger data sets [Local Area Coverage (LAC) or Global Area Coverage (GAC)] can be partially downloaded, thereby making available some recorder time to playback the "blind” orbit data. This situation is not likely to change until the launch of NOAA-18 (2004) which will have a full suite of operational, digital recorders.

8.6.3 Vandalism

8.6.3.1 The panel recalled that, at DBCP-XVIII, it had discussed the ongoing problem of vandalism of ocean data buoys, in particular a proposal from Mr K. Premkumar (India) to publicize the importance of data buoys through various media outlets, as a possible way of combating such vandalism*. “The panel agreed that such an action might indeed have value in publicizing the existence and value of ocean data buoys among fishermen and other marine users. It therefore requested the Secretariat to write to relevant National Meteorological Services, requesting them to take such action through their national/private media outlets. It also requested the Secretariat to discuss with IHO about the possibility for similar actions through the weekly Notices to Mariners and similar outlets.”*

8.6.3.2 As a follow-up to this discussion, the Secretariat had prepared and issued a JCOMM joint circular letter (JCL) containing the proposal. There has not been, as yet, any further discussion with IHO on the issue.

8.6.3.3 The panel noted with interest and appreciation that KNMI, Netherlands had, in 2001 and on the basis of a small information leaflet prepared by the technical coordinator, included information on ocean data buoys and their applications in an information booklet for mariners and fishermen, and that this appeared to have had some positive impact. In addition, the South African Weather

Service had, following receipt of the JCL, taken the initiative to include information on ocean data buoys in media weather bulletins, as suggested.

8.6.3.4 The panel expressed its appreciation for these initiatives. It recognized the potential value of the leaflet prepared by the technical coordinator, and requested him to review and update this as appropriate, and to make it available on the DBCP web site. The Secretariat was then requested to again contact relevant international organizations, such as IHO, IMO, FAO, as well as international fishery bodies such as the International Tuna Commission, on the issue of vandalism, to provide them with the leaflet and to request them to distribute it widely among their member countries and institutions. It also requested the Secretariat to send a reminder to Member States at an appropriate time regarding the need to publicize widely the value and applications of buoy data through media outlets.

8.6.4 Buoy deployment notification scheme

8.6.4.1 The technical coordinator reported on discussions which took place during the last intersessional period regarding the establishment of a global buoy deployment notification mechanism as a scheme to collect metadata. This discussion is related to previous discussions with the JCOMM Expert Team on Marine Climatology on ODAS metadata, and DBCP discussions regarding a manufacturer's specifications sheet. The scheme was discussed with EGOS, GDP, and IABP. Those involved in the discussion were Anne Hageberg, EGOS Technical Secretary, Graeme Ball, BOM, Sarah North, UKMO, Pierre Blouch, Météo France, Steve Cook, GDP, and Elizabeth Horton, Navoceano, and the Technical Coordinator of the DBCP.

8.6.4.2 The goal is to establish an efficient and consistent scheme for collecting metadata, and to limit any additional workload on the side of the buoy operators. The database needed for the proposed collection mechanism to work properly can be implemented separately from the JCOMM ODAS metadata database (JOMDB). Hence it is proposed to implement two databases: one called DBCP metadata collection database (DBCP-MDB) and dedicated to the collection of the metadata from drifting and moored buoys, and one (i.e. JOMDB) for the delivery of the collected metadata plus other metadata of ODAS which are not data buoys (e.g. rigs and oil platforms). The collected data from DBCP-MDB would therefore be made available to JOMDB, JCOMMOPS, and the Action Groups. Operational and research users would access the metadata through JOMDB. The scheme would also permit to maintain a consistent JCOMMOPS database useful for enhanced global coordination, quality or instrument evaluation purposes, reliable, comprehensive, and up to date programme status, including for the Action Groups.

8.6.4.3 To feed the DBCP-MDB, a two step approach is being proposed, i.e. (1) by the buoy manufacturer upon buoy purchase as they are in the best position to provide most of the required information (e.g. buoy characteristics, Argos ID, etc.), and (2) by the buoy operator upon deployment to provide complementary information (e.g. WMO number, deployment data and position, etc). Step-1 would be a buoy operator's requirement with the manufacturer and would therefore limit workload for those purchasing the buoys. Such a scheme would be optional for the buoy operators but would be recommended by the DBCP.

8.6.4.4 The panel agreed that dedicated web pages yet to be developed should be user-friendly for the manufacturers and should be designed in such a way as to limit the workload for them. For a batch of identical ordered buoys, the manufacturer would go to a dedicated web page and enter the required information (e.g. name of manufacturer, name of agency purchasing the buoys, date of purchase Argos IDs, type of buoy, name of Argos message format, calibration information). Templates for previously used batches of buoys should be made available for copy and paste so that the manufacturer entering information into the system would not necessarily start from scratch.

8.6.4.5 The panel agreed that it would be very useful to develop such a scheme provided that the existing scheme by the Global Drifter Centre can easily be adapted while minimizing the required developments by GDC, as substantial efforts had already been made by the GDC in this regard.

The panel asked the technical coordinator to visit GDC in early 2004 and discuss how this could be achieved.

8.6.4.6 The panel also noted that EGOS was in the process of developing its own metadata database, that the technical coordinator was involved in this exercise, and that it would probably not require substantial additional resources to use it as a global DBCP-MDB. It therefore asked the technical coordinator to write to EGOS in order to seek agreement from EGOS in this regard.

8.6.4.7 The panel also noted with interest the offer from China to implement and run the JOMDB. It thanked China for its kind offer and agreed with this proposal. It invited China to establish contact with the technical coordinator in order to discuss technical details.

8.6.5 *Other communications technical issues*

8.6.5.1 The NOAA/NESDIS representative, Rob Bassett reported on three Argos technical issues. The first issue concerns the electronic processing of the Argos System Use Agreement (SUA). This new management tool is web based and compatible with CLS web services that provide the capability to electronically submit the Argos SUA. The goal of this effort is to streamline the SUA review process amongst the Argos Participating Agencies (NOAA, CNES, JAXA) and reduce processing time from 14 to 7 days.

8.6.5.2 Mr Bassett also reported on the preliminary results of an independent survey of satellite data telemetry capabilities. The survey focused on 6 satellite systems (Argos DCS, GOES DCS, Globalstar, Inmarsat, Iridium, ORBCOMM). A matrix of several technical parameters was compiled. Panel members were invited to review and comment on the preliminary matrix. The final matrix will be available to the public on the NOAA Argos web site (http://noaasis.noaa.gov/ARGOS).

8.6.5.3 The last technical issue concerns the impact of the METOP (2005) direct broadcast data on the existing High Resolution Picture Transmission (HRPT) network that collects NOAA POES data. Mr Bassett noted that the METOP data format and delivery is not compatible with the POES HRPT network. NOAA/NESDIS is studying this problem and will produce specifications for a Direct Broadcast station that can receive data from both satellite systems. Early study results indicate that significant hardware and software upgrades will be required. NOAA/NESDIS is investigating the possible upgrade of a limited number of HRPT sites that support NOAA National Weather Service requirements. None the less, the current HRPT network will continue to receive POES data through the life of NOAA N' (2009).

C. ADMINISTRATIVE COMPONENT

9. REPORTS

9.1 CHAIRMAN AND VICE-CHAIRMEN

Chairman

9.1.1. The chairman reported that his eighth year of chairmanship of the DBCP has continued to be most interesting and challenging. The main activities during the year are summarized in the following paragraphs.

9.1.2. The chairman noted that progress has been made on most items in the intersessional work plan and action is in hand on all the remaining matters. The chairman wished to record his appreciation for the work of panel members and especially the efforts of the two vice chairmen, the technical coordinator, and the Secretariat in advancing the work plan.

9.1.3. The level of activities this year has been somewhat lower than in previous years, however a number of matters were undertaken and are worthy of note. In response to matters raised at the Panel's last session, the chair wrote to the co-chairs of the Argos Operations Committee, Mr D Benner and Mr C Gal, of NESDIS and CNES respectively, concerning the impact of the closure of the Lannion Earth station in 1996 on the increased delays of real-time datasets. The letter requested that NESDIS give early consideration to the reinstatement of Lannion, and requested CLS/Service Argos and Météo France to work together to define and cost the necessary action to re-open the station. In a parallel action, and following a proposal from the DBCP to JTA-XXII, the JTA chair had written to the co-chairs of the Argos OPSCOM with the same message.

9.1.4 The chair also wrote to the UK Met Office seeking the upgrading of the communications link to the Falklands to improve the real-time data collection in the Southern Atlantic. Reports on these matters will be discussed during the appropriate agenda items.

9.1.5. In January, the chair had discussions with the chairman of the Observations Coordination Group, Stan Wilson, concerning preparations for the JCOMM MAN-II meeting. In particular, it was noted that the major challenge for the DBCP is to investigate methods to facilitate an increase in buoy numbers from the present numbers to approx. 1250 drifters. In order to achieve this goal, it was suggested that as an initial step, the DBCP should consider a more structured interaction between requirement-setting and implementing panels. While the OOSDP, OOPC, OceanObs99, Ocean.US/Airlie House Report, and Needler et al. present the conceptual requirements for observations, there is a general interface issue between the OOPC and JCOMM with regard to observational requirements. A more formal interaction would possibly enable a more coherent strategy to be developed for assisting in the funding submissions for ocean observing systems. Reports from the JCOMM MAN-II meeting will be presented at the relevant agenda item.

9.1.6. The chairman also reported that he had been maintaining close liaison with the SOT and Argo communities of JCOMM during the year. The coordination and cooperation among the groups is constantly growing, and is proving to be most beneficial to all the parties involved. While he noted that there were a number of issues that were unique to platform type, he emphasized that there were a number of issues that were very similar across all components. He recommended that the panel members keep in close contact with all SOT and Argo developments, and look to take advantage of any mutual opportunities. He also suggested that members try and support all cross-organizational initiatives wherever possible.

9.1.7. The chairman reported that there have been a range of very important issues involving the DBCP's Action Groups over the year. These groups have enjoyed another successful and productive year, and have continued to contribute to the ongoing success of the panel in their respective advancement of buoy matters. While there has been an amount of movement in group membership during this year, the overall progress has been unaffected. In addition, the chairman noted with interest the success of the SVPB Evaluation Group, convened by Ms E. Horton from Navoceano, that operated during the year.

9.1.8. The chairman highlighted the continuing production of technical documents in the DBCP series - covering the Annual Report for 2002, and the Technical Presentations made at the Eighteenth Session (on CD).

9.1.9. The chairman expressed his appreciation of the assistance of the two vice-chairmen during the intersessional period, particularly with respect to representing the panel at various international meetings. He also expressed his thanks to the technical coordinator and the Secretariat.

Vice-chairmen

9.1.10 During the period, the activities of Mr E. Meindl, vice-chair for North America, focused on Scientific and Technical Workshops of the DBCP. This included final preparation of workshop materials from DBCP-XVIII, as well as their submission to WMO/IOC for final editing and

distribution to Panel attendees on CD ROM. He also coordinated arrangements for the workshop for DBCP-XIX in Rio de Janeiro.

9.1.11. He also consolidated materials and prepared the national report for the United States. During the year, he communicated with several panel members by telephone and e-mail regarding miscellaneous buoy matters.

9.1.12. During the intersessional period, the main DBCP-related activities in which Mr D. Meldrum, vice-chair for Europe, was involved were as follows:

(i) **Mobile satellite systems.** A close watch was kept on developments in this area, and an updated information paper produced for DBCP-XIX. As noted on previous occasions, many of the new systems are unlikely to offer satisfactory oceanic coverage. Several also continue to experience severe financial difficulties, forcing a number of regroupings and closures. On the positive side, most systems have now recognized the importance of offering a data service, with some important players now actively promoting data products.

(ii) **DBCP Implementation Plan.** This was updated to reflect developments occurring during the intersessional period.

(iii) **Falklands LUT.** Contact was made with relevant personnel within the UK Met Office to determine and define in more detail the obstacles preventing this LUT from passing datasets to Argos for processing and GTS insertion. As a result of this and other initiatives, it seems likely that this LUT will come on line in early 2004.

(iv) **Chairman's correspondence.** Letters were drafted on behalf of the DBCP chair regarding panel issues such as the above and the withdrawal of the Lannion ground station.

9.1.13 The panel expressed its considerable appreciation to the chairman and vice-chairmen for the very valuable work which they had undertaken on behalf of the DBCP during the past intersessional period.

9.2 SECRETARIAT

9.2.1 The panel noted with appreciation that the Secretariat had continued to undertake a number of activities on behalf or in support of the DBCP during the past intersessional period. These included publication and distribution of the Annual Report for 2002 and the proceedings of the 2002 Technical Workshop; continued management of the panel's funds, as well as the employment and missions of the technical coordinator; close liaison with JCOMM, in particular in the development of coordination and integration procedures; liaison with CBS on codes and other matters; with other IOC and WMO technical commissions and regional associations (or equivalent bodies) on relevant issues; and with CLIVAR, GCOS, GOOS, SCOR and WOCE; presentations on the DBCP and other *in situ* marine observing activities to various forums; maintenance of the WMO buoy ID number register; support for the DBCP Action Groups as required.

9.2.2 The panel noted that both Fourteenth World Meteorological Congress and the 22nd IOC Assembly took place during the intersessional period, and that the DBCP and its work continued to receive high praise and support from the governing bodies.

9.2.3 The panel carefully reviewed the list of National Focal Points for the DBCP and the register of WMO buoy ID numbers, which were presented by the Secretariat. .As agreed at DBCP-XVI, a list of national focal points for logistic support for JCOMM observing systems in general has been compiled and is maintained on the JCOMM web site.

9.2.4 The panel recalled that work has been undertaken over the past several years within IOC to define an IOC oceanographic data exchange policy. Those efforts eventually succeeded at

IOC-XXII through the adoption of an "IOC Oceanographic Data Exchange Policy" (Resolution XXII-6).

9.2.5 The panel noted with interest that IOC-XXII had discussed the role of IOC in the development of standards for ocean research and operational oceanography. Upon the instruction of the Executive Council, the Executive Secretary IOC had consulted with JCOMM on existing and planned future initiatives for the development of standards. The JCOMM Management Committee, at its 2nd Session (Paris, February 2003), welcomed the initiative and agreed on the role of IOC in codifying the standards needed for operational oceanography. The Management Committee also agreed that the first step should be to compile the information, list what was available, and advertise it through the JCOMM web site. It considered that a 3–6 month consultancy over a 1- to 2-year period was necessary to compile the available information, starting with the protocols recommended by WOCE and JGOFS, including the protocols that had been developed for the SOOP, VOS and DBCP programmes, and by other international bodies, such as ICES.

9.2.6 The JCOMM Ship Observations Team further addressed this issue in detail at its second session (London, July 2003). *"The meeting decided to establish an SOT Expert Group on Instrument Testing, to liaise with CIMO in addressing these issues. The meeting agreed that the convenor of the expert group should ideally have a knowledge of, or an affiliation with, CIMO. It therefore accepted with appreciation the offer of David Evans, JCOMM liaison representative to CIMO, to chair the group. The remaining three members of the expert group would be drawn from the VOSP, SOOPIP and ASAPP. Additional members of the expert group would include representatives of other interested groups or invited instrument experts (GOOS, IODE) on an ad-hoc basis."* Terms of reference and membership of the group are given in Appendix D. The panel noted with satisfaction that the group includes, inter alia, Ms Beth Horton, chair of the DBCP Evaluation Subgroup, as a liaison member.

9.2.7 Finally on this issue, the panel noted that the IOC Assembly had stressed the view that capacity-building in standards development and use merited special attention, with a view to enabling all Member States to participate fully in international ocean research and operational oceanographic programmes. It had instructed the Executive Secretary to develop a work plan and budget for this activity and to bring this initiative to the attention of Member States with a view to finding adequate resources.

10. FINANCIAL AND ADMINISTRATIVE MATTERS

10.1. FINANCIAL SITUATION

10.1.1 The panel considered the financial statements provided by IOC and WMO as follows:

(i) Finalized IOC account 1 June 2002 - 31 May 2003;
(ii) Interim WMO account 1 January 2002 - 31 August 2003;
(iii) Provisional WMO statement of estimated income and expenditure to 31 May 2004.

These statements are reproduced in *Annex VIII*. The panel approved and accepted these various statements as appropriate.

10.2. CONTRACTS

10.2.1 The contracts established by IOC/UNESCO for the employment and logistic support for the position of the technical coordinator were considered and approved by the panel.

10.3. FUTURE COMMITMENTS

10.3.1 The panel recalled that, at its seventeenth session (Perth, October 2001), it had agreed on the following arrangement with its technical coordinator:

(i) Mr Charpentier would be requested to inform the chairman, every year "Y" by the 1st of October, of his wish, or otherwise, to continue to work as technical coordinator of the panel for the period 1 June "Y+1" to 31 May "Y+2". Should that information be a wish to continue, the panel in turn would agree to retain him as technical coordinator, subject to the availability of funds;

(ii) At any time, should Mr Charpentier decide to give up the position, he would be required to inform the panel as soon as possible, and in any case preferably six months in advance, of his decision, as well as to assist in the recruitment and training of his successor, in order to ensure as full continuity as possible in the work of the panel's technical coordinator.

10.3.2 According to that arrangement, Mr Charpentier addressed the chairman on 25 September, to inform him of his intent to, in principle, continue working as technical coordinator of the panel for the period 1 June 2004 - 31 May 2005. The panel therefore agreed to continue the employment of Mr Charpentier as its technical coordinator for the year 1 June 2004 to 31 May 2005. In doing so, it once more thanked him most sincerely for his work on behalf of the panel, its members and JCOMM in general.

10.3.3 The panel recalled that the actions recommended at DBCP-XVII to remove the short-term operating budget deficit in 2001 had been successful, and that the budget in 2003 continued in the black, despite the non-receipt of a small number of invoiced contributions for both 2002 and 2003 (see also agenda item 10.1). In addition:

(i) The problem in 2001 of excessive publications costs had been overcome, partly through an increased use of CD-ROM and web publications only, and partly through the relay funding of publications costs through the WMO regular budget;

(ii) The JTA had, at its session in 2001, agreed to the DBCP proposal to fund the costs associated with maintaining an independent JTA chairman in 2002 directly through the JTA, and this arrangement had continued successfully in 2003.

Both these actions had been successful, from the point of view of the panel, in stabilizing its expenditures at a level appropriate to the income. It therefore agreed that the same publications policy should apply in 2004 and future years. It also recommended to JTA-XXIII to continue to fund the independent JTA chairman position through the JTA, using the DBCP trust fund as a relay mechanism.

10.3.4 On this basis, the panel adopted a budget for 2004/05, which is given in *Annex X*. The scale of provisional contributions required to balance expenditures under this budget is given in *Annex X*, on the assumption that contributions will again be received from SOOP participants similar to those in the current year.

10.3.5 The panel recalled that JCOMM-I had noted with appreciation the contributions being made by several countries towards the maintenance of the technical coordinator position, which was assuming even greater importance with the implementation of JCOMMOPS. At the same time "…Whilst appreciative of these voluntary contributions, the Commission nevertheless recognized that it might be time to introduce some more formal and secure funding mechanism, to ensure the continuity of the position of technical coordinator of the DBCP and SOOP. It therefore requested the DBCP and SOOPIP to address that question and make relevant proposals to the PA Observations Group." (See paragraph 8.2.8 of the final report of JCOMM-I.) The panel had discussed the issue at its 18th session (see para. 10.3.5 of the final report), and supported the decision of the JCOMM Ship Observations Team to establish a small task team on JCOMMOPS development, to prepare a development plan for consideration by the JCOMM Observations Coordination Group. A draft of such a plan was first reviewed by the second session of the SOT (London, July 2003), which generally supported proposals to expand the scope and work of the centre to also include support for the VOS and ASAP Panels. A number of suggestions for modifications to the draft proposal were made, and the task team was requested to present the

revised draft proposal to the second session of the Observations Coordination Group (tentatively April 2004) for consideration and further action. The panel supported these developments, and requested that it be kept closely informed of any decisions made on the issue by the OCG and the Management Committee.

10.4. REVIEW OF THE DUTIES OF THE TECHNICAL COORDINATOR

10.4.1 Under this agenda item, the panel reviewed the existing arrangements for the employment of the technical coordinator, as well as the sharing of his activities between the panel and the Ship-of-Opportunity Programme. The panel decided that these arrangements were suitable for the foreseeable future, subject to review at each panel session. In addition, as discussed in detail under items 5 and 8.5 above, the technical coordinator was now an integral component, along with the Argo technical coordinator, of the new JCOMMOPS centre.

D. CONCLUDING COMPONENT

11. RECOMMENDATIONS TO THE ARGOS JTA

11.1 Under Agenda item 8.2 concerning distribution of data in BUFR code in the Argos GTS processing sub-system, the panel agreed that it would be desirable to employ data compression to achieve significant reduction in message length. It therefore requested the chairman to bring a recommendation to the Argos JTA to enhance the current GTS BUFR encoder to include data compression.

12. WORKPLAN

12.1 As in previous years, the panel reviewed and updated its operating procedures, as well as the overall work plan for itself and the technical coordinator for the coming intersessional period. These work plans are given in *Annex XI*.

13. ELECTION OF THE CHAIRMAN AND THE VICE-CHAIRMEN OF THE PANEL

13.1 The panel noted with regret that both the outgoing chairman, Mr Graeme Brough, and the vice-chair for North America, Mr Eric Meindl, had recently retired or would shortly be retiring from their national agencies, and were consequently unable to continue as officers of the panel. It expressed its considerable appreciation and thanks to both for the many years of outstanding service which they had provided to the panel and its members.

13.2 The panel recognized that a number of countries in Asia were now actively involved in ocean data buoy programmes and the work of the panel, and that it was important for the panel to encourage and support these programmes to the extent possible. It therefore agreed that it should establish an additional vice-chair position for Asia, to assist in this process.

13.2 The panel elected Mr David Meldrum, formerly vice-chair for Europe, as its chairman for the coming intersessional period. It also elected Ms Elizabeth Horton as its vice-chair for North America, Mr Louis Vermaak as its vice-chair for the Southern Hemisphere, and Mr K. Premkumar as its vice-chair for Asia.

14. DATE AND PLACE OF THE NEXT SESSION

14.1 The panel recalled its agreement at DBCP-XVIII that the session in 2004 would, in principle, be hosted by India. It was therefore pleased to accept the confirmation from the National Institute of Ocean Technology to host DBCP-XX in Chennai, India, subject as always to a similar agreement by JTA-XXIII. Tentative dates for the session were agreed as 18-22 October 2004.

14.2 Bearing in mind its general policy to alternate, as much as possible, the annual meetings between hemispheres, the panel also noted with appreciation the tentative offer from South Africa to host the 2005 session, as usual towards the end of October, most probably in Cape Town.

15. CLOSURE OF THE SESSION

15.1 In closing the session, the chairman, Mr Graeme Brough, thanked all participants for their contributions to what had been, once again, a very productive session. He also thanked his fellow DBCP officers and all panel members for their support and enthusiasm throughout the time of his chairmanship, which had greatly facilitated his own tasks, and wished the new officers and the panel ongoing success in the future. He concluded by also thanking the Secretariat for its ongoing support, both during the annual panel sessions and throughout the intersessional period.

15.2 Speaking on behalf of all participants, the Secretariat representative once again thanked the outgoing chairman, Graeme Brough, and the outgoing vice-chairman, Eric Meindl, for their enthusiastic and dedicated service to the panel, its members and activities, over many years, which would be greatly missed in the future. He also paid a special tribute to the local organizers of the session, Alaor dall'Antonia and Janice Trotte, as well as to all the support staff from INMET, DHN, and the Portogalo Suite Hotel, for their outstanding support, which had contributed substantially to the success of the meeting as well as to the enjoyment of participants.

15.3 The nineteenth session of the Data Buoy Cooperation Panel closed at 1200 hours on Friday, 24 October 2003.

Annex I

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Annex II

AGENDA

A. ORGANIZATIONAL COMPONENT

1. ORGANIZATION OF THE SESSION

1.1 OPENING OF THE SCIENTIFIC AND TECHNICAL WORKSHOP
1.2 OPENING OF THE SESSION
1.3 ADOPTION OF THE AGENDA
1.4 WORKING ARRANGEMENTS

B. IMPLEMENTATION COMPONENT

2. IMPLEMENTATION REPORTS

2.1 TECHNICAL COORDINATOR
2.2 ACTION GROUPS AND RELATED PROGRAMMES
2.3 NATIONAL REPORTS
2.4 ARGO SCIENCE TEAM AND ARGO INFORMATION CENTRE
2.5 DBCP EVALUATION GROUP

3. NEW ACTION GROUPS

4. REVIEW OF THE DBCP IMPLEMENTATION STRATEGY

5. JCOMM ACTIVITIES RELEVANT TO THE DBCP

6. SCIENTIFIC AND TECHNICAL WORKSHOP

7. DATA AND INFORMATION EXCHANGE

7.1 REPORTS BY BUOY DATA MANAGEMENT CENTRES
7.2 INFORMATION EXCHANGE

8. TECHNICAL ISSUES

8.1 QUALITY CONTROL
8.2 CODES
8.3 ARGOS SYSTEM
8.4 NEW COMMUNICATION TECHNIQUES AND FACILITIES
8.5 JCOMMOPS
8.6 OTHER TECHNICAL ISSUES
    8.6.1 Deployment opportunities
    8.6.2 GTS delays and the reactivation of Lannion
    8.6.3 Vandalism
    8.6.4 Buoy deployment notification scheme
    8.6.5 Others

C. ADMINISTRATIVE COMPONENT

9. REPORTS

9.1 CHAIRMAN AND VICE-CHAIRMEN
9.2 SECRETARIATS

10. FINANCIAL AND ADMINISTRATIVE MATTERS

10.1 FINANCIAL SITUATION
10.2 CONTRACTS
10.3 FUTURE COMMITMENTS
10.4 REVIEW OF THE duties OF THE TECHNICAL COORDINATOR

D. CONCLUDING COMPONENT

11. RECOMMENDATIONS TO THE ARGOS JTA

12. WORKPLAN

13. ELECTION OF THE CHAIRMAN AND THE VICE-CHAIRMEN OF THE PANEL

14. DATE AND PLACE OF THE NEXT SESSION

15. CLOSURE OF THE SESSION

Annex III

REPORT BY THE TECHNICAL COORDINATOR

1. Introduction

This report covers the period 1 September 2002 to 31 August 2003. During this period the Technical Coordinator (TC) of the Data Buoy Cooperation Panel (DBCP) was based in Toulouse at CLS, Service Argos, and was employed by the United Nations Educational, Scientific and Cultural Organisation (UNESCO). The time spent on TC DBCP tasks could be estimated as following:

Topic	days	% tot. TC
JCOMM		
Mission (JCOMM), effective meeting time (50% of I-GOSS-6)	2.5	1.0
Missions (JCOMM), travel time on working days	0.0	0.0
JCOMMOPS database development, tuning & data loading	8.0	3.1
JCOMMOPS web products (dynamic pages, e.g. DBCP daily map, statis	9.0	3.5
JCOMMOPS web (re-design static web site)	2.0	0.8
Integrating QC guidelines within JCOMM (prepare/discuss proposal)	0.5	0.2
Deployment opportunities	1.0	0.4
SOOP (excluding travel time)	71.0	27.3
Missions (SOOP), effective meeting time (Brest workshop, BOM, SOT-	8.5	3.3
Missions (SOOP), travel time on working days	0.0	0.0
Argo (coord. training, supervision, team work, misc. support)	5.0	1.9
Missions (Argo), effective meeting time (50% of I-GOOS-6)	2.5	1.0
Missions (Argo), travel time on working days	0.0	0.0
Missions (DBCP), effective meeting time	14.5	5.6
Missions (DBCP), travel time on working days	4.0	1.5
Missions, preparation (DBCP only)	20.0	7.7
User assistance (e.g. assist GTS, e.g. TRITON salinity+currents)	27.0	10.4
TC Vacation, holidays	30.0	11.5
GTS (BUFR (mainly), BUOY, bulletin headers)	24.0	9.2
Miscellaneous DBCP	5.0	1.9
Requests for GTS	4.0	1.5
Action Groups	4.0	1.5
GTS Sub-System (monitoring, concepts for future)	3.0	1.2
Misc. Techn. (e.g. formats, hourly data)	2.0	0.8
Monitoring, Quality Control Guideleines (& new QC relay web page)	2.0	0.8
Misc. Administrative	2.0	0.8
Publications	1.0	0.4
TC monthly report, stats., regular reports	1.5	0.6
Buoy deployment notification scheme	1.5	0.6
DBCP evaluation group (e.g. definitions)	1.0	0.4
DBCP web server & technical forum	1.0	0.4
TC Tools	1.0	0.4
Southern Hemisphere SVPBs	0.5	0.2
DB Quarterly report	0.5	0.2
Delays (i.e. impact of loss of Lannion STIP)	0.5	0.2
Vandalism	0.0	0.0
Total (52 weeks)	**260.0**	**100.0**

During the period, I also worked for SOOPIP part time (30.6%) and spent some time on Argo (2.9%) and JCOMM&JCOMMOPS (9%). Work spent on JCOMM was directly related to DBCP and SOOP activities. Work spent on Argo basically included training of the Argo Coordinator, supervision, team work to develop JCOMMOPS, miscellaneous support, and presenting Argo at the GSC-6 meeting. During the period CLS provided some staff support for routine tasks on DBCP related issues (user assistance, insertion of data on GTS, monthly reports, system monitoring).

The following paragraphs describe in detail the various activities of the TC DBCP during the period. Paragraph 2 highlights recent DBCP activities. Paragraph 3 describes specific non regular tasks undertaken by the TC DBCP during the considered period while paragraph 4 describes regular tasks normally undertaken during any intersessional period.

2. DBCP highlights (As of August 2003)

2.1 Present status of buoy programmes

See graphics in Appendix B:

- Graph-1: Drifting Buoys reporting via Argos and those on GTS by country.
- Graph-2: Moored buoys in the high seas (plus US and Canadian buoys and buoys reporting via Argos) and those on GTS by country.

These graphs are also available at http://w3.jcommops.org/cgi-bin/WebObjects/PTFcountry. Dynamic monthly map is available from JCOMMOPS at http://w3.jcommops.org/WebSite/DBCP/.

Among the drifting and moored buoys which are reporting on GTS in BUOY and SHIP format, the following variables are being measured (valid for drifting and moored buoy data received from GTS at Météo France during the period 1 August to 31 August 2003):

Table 1: Drifting Buoys and Moored Buoys in the high seas (including US and Canadian moorings) reporting on GTS in August 2003

Variable	Drifting Buoys	Moorings	Remark
Any variable	752	211	
AT	48	191	
P	313	151	
U	0	108	
SST	701	202	
Tend	284	123	
Waves		136	
Wind	46	184	
Sub/T	5	69	TAO, PIRATA, TRITON.

2.2 18th DBCP session, Martinique, 14-18 October 2002.

18th session of the DBCP was held in Martinique, 14-18 October 2002. More than 50 people attended the DBCP workshop and 18 presentations were made at the Scientific and Technical workshop. The newly established DBCP-PICES North Pacific Data Buoy Advisory Panel (NPDBAP) was accepted as a new DBCP Action Group. Elizabeth Horton reported on the SVPB evaluation sub-group (submergence and drogue drop issue fixed, WOTAN wind speed algorithms refined).

DBCP implementation strategy was reviewed and commitments in the Southern Ocean discussed (about 90 barometer buoys committed in the region for 2002/2003). Following results from impact studies, the Panel encouraged buoy operators, in conjunction with manufacturers and Service Argos to distribute as much hourly data on GTS as possible.

The Panel discussed information exchange and technical issues (QC, GTS codes, Argos system, new communication techniques, GTS distribution of buoy data collected through commercial satellite systems, delays), and particularly, the Panel:

- Agreed that publishing DBCP publications on CD-Roms was cost effective and as useful as in a paper form. Panel therefore agreed that this should be considered as the preferred approach.
- Invited centres interested in participating in tests for BUFR code implementation (at Service Argos) to contact the Technical Coordinator (operational implementation of BUFR within the Argos GTS sub-system is planned for early 2003).
- Noted with concern the potential impact of the planned transmission of stored and real-time Argos data via the HRD-X band frequency versus LRD L-band frequency as this would involve expensive change in equipment for the LUT network.
- Ask for reinstatement of the Lannion downloading station for global Argos data (action DBCP chairman, OPSCOM).
- Recommended that Service Argos develops a dedicated application to relay onto the GTS properly formatted buoy observations collected via other satellite systems (action JTA, OPSCOM)
- Thanked NDBC for its offer to develop an application capable of reading already formatted BUOY bulletins from an FTP site and to insert them onto the GTS (NDBC would also develop portable BUOY encoding software).
- Asked the Secretariats to write to relevant NMS requesting them to take action regarding publicizing existence and value of ocean data buoys among fishermen and other marine users (action to be also discussed with IHO).

2.3 Global Implementation

2.3.1 JCOMM

Time spent on integrated JCOMM issues was mainly related to JCOMMOPS development and operations. I also attended the 6th meeting of the IOC-WMO-UNEP Committee for GOOS, Paris, 10-14 March 2003 where I made a presentation on Argo and JCOMMOPS.

2.3.1.1 JCOMMOPS.

Development of JCOMMOPS in conjunction with Argo Coordinator continued. Database was optimized and tuned. TC DBCP database (Paradox) was moved to JCOMMOPS database. New tools to routinely upload specific data in the database were developed, including for the GDP deployment log, and Canadian moorings. JCOMMOPS web site was re-designed, and new dynamic application made available, including:

- DBCP real-time dynamic status map (http://w3.jcommops.org/WebSite/DBCP_RT). This map is updated on a daily basis based upon GTS data provided by Météo France to JCOMMOPS. JCOMOOPS negotiated access to daily GTS files with Météo France.
- DBCP status by country (http://w3.jcommops.org/cgi-bin/WebObjects/PTFcountry)
- Application to relay quality information from PMOCs to PGCs via a dedicated web page (http://w3.jcommops.org/cgi-bin/WebObjects/QCRelay).
- Histograms showing difference between buoy data distributed on GTS and first guess field (http://w3.jcommops.org/cgi-bin/WebObjects/Histogram)
- Time series regarding the quality of buoy data (http://w3.jcommops.org/cgi-bin/WebObjects/StatsSeries.woa/wa/progDirect?prog=DBCP)
- Monthly JCOMMOPS GTS status available online on a routine basis , including high resolution status maps (ftp://ftp.jcommops.org/gts/Maps, ftp://ftp.jcommops.org/DBCP/Maps/)
- Monthly GTS statistics based upon input from NOAA/AOML (Gary soneira), (http://w3.jcommops.org/cgi-bin/WebObjects/GTSReport)

See DBCP session preparatory document dealing with JCOMMOPS for details.

2.3.2 Deployment opportunities

As part of JCOMMOPS activities, DBCP, SOOP, and Argo Technical Coordinators are routinely collecting information on deployment opportunities. Such information is made available via the

JCOMMOPS web site at http://www.jcommops.org/depl_opport/depl_opport.html. Information is useful for buoy operators, and especially new ones, to make contacts in specific countries in order to seek new deployment opportunities. It can also be interesting for buoy operators willing to deploy buoys in ocean area where there are not used to do so to quickly identify available opportunities and make appropriate contacts.

During the period July to September 2003, a student, Mathieu Lopes, is also developing specific web tools for deployment opportunities at JCOMMOPS. These tools should permit to query the database for specific deployment opportunities. See preparatory document related to this issue for details.

2.3.3 Southern Hemisphere barometers

A Southern Ocean Buoy Programme (SOBP) is now part of the DBCP Implementation Strategy.

112 drifting buoys were reporting from area South of 40S in August 2003.
Main players are:

- The Bureau of Meteorology, Australia
- The Antarctic Division, Australia
- The South African Weather Service
- The Meteorological Service, New Zealand
- Météo France
- INPE, Brazil
- The Alfred Wegener Institute, Germany,
- JAMSTEC, Japan
- The Meteorological Office, UK
- Navoceano, USA
- NOAA/AOML, USA

In the period September 2002 to August 2003 we had the following deployments:

Country	Buoys purchased SO	Additional upgrades SO	Total
Australia	7	8	15
France	0	7	7
New Zealand	4	6	10
South Africa	0	20	20
USA	32	0	32
Total	43	41	84

Proposed commitments for the period September 2003 to August 2004 are:

Country	Buoys purchased SO	Additional upgrades SO	Total
Australia	5	10	15
France	0	5	5
New Zealand	5	5	10
South Africa	0	24	24
USA*	37	0	37
Total	47	44	91

*: USA plans to deploy 37 SVPBs in the region 40S-55S, i.e. 15 in the SA, 15 in the PO, and 7 in the IO.

AOML also offers to upgrade standard drifters (SST only) with barometers for about $US 1000 per unit (see http://dbcp.nos.noaa.gov/dbcp/svpb_upgrade.html)

2.3.4 DBCP Action Groups

2.3.4.1 EGOS

European Group on Ocean Stations (EGOS)

Area of interest: North Atlantic Ocean: EGOS area of interest covers the sea area from the European coastline out to 50 °W, between 30°and 65°N, including adjacent seas, such as the Baltic and Mediterranean Seas.
Chairman: Evelyn Murphy, Irish Met. Service
Technical Secretary: Ann Hageberg, Christian Michelsen Institute, Norway
Technical Coordinator: Pierre Blouch (deployment coordination and GTS matters), Meteo France

Web site: http://www.meteo.shom.fr/egos/
Status: Network of 51 drifting buoys in May 2003, including 37 SVPBs, and 4 SVPBWs. In addition, 17 moorings are part of the EGOS programme.
Meetings: Twice a year (December and June).

At the last EGOS meeting in Madrid, Jun 2003, the Technical Coordinator of the DBCP informed the meeting that in case EGOS was merged into EUCOS then the DBCP would have to re-consider what body, if any, would play the role of DBCP Action Group for the area of interest previously covered by EGOS.

EUCOS as a whole does not probably fit in the definition of a DBCP Action Group (DBCP-10) as the buoy programme is not a significant element of its responsibilities. Consequently, EUCOS would have to establish a body under its responsibility that would be dedicated to the implementation of the buoy programme. An advisory group within EUCOS could well play that role. EUCOS would have to agree with the conditions above and ask its advisory group or dedicated body to apply as DBCP Action Group for the agreed upon region of interest.

The integration which is taking place in EUCOS is consistent to a large extend with the JCOMM integration process. On the other hand, one concern that the DBCP might have in its role of JCOMM body dedicated to the implementation of buoy programmes is regarding the coordination of collection of oceanographic data from buoys. This was the role of EGOS to a certain extend. This might not be the role of EUCOS as EUCOS is dedicated to Numerical Weather Prediction and operational oceanography is not part of its activities. Although oceanographic data might still continued to be collected nationally, the need for coordination of such measurements should be stressed and EUCOS is invited to take such requirements into account as well or to propose a mechanism by which it body dedicated to buoy deployments would do it. It should be noted, however, that not making oceanographic measurements would not prevent EUCOS body dedicated to buoy deployments to become an Action Group of the DBCP.

2.3.4.2 IABP

International Arctic Buoy Programme (IABP)

Chairman: Tim Goos, Meteorological Services Canada
Coordinator: Ignatius Rigor, University of Washington
Web site: http://iabp.apl.washington.edu/
Area of Interest: Central Arctic Ocean and its marginal seas, excepting Exclusive Economic Zones where agreements of the Coastal States have not been obtained.
Status: 13th IABP meeting was held in Tromsø, Norway, June 2003. 32 IABP buoys were operational in the Arctic basin in June 2003. The key re-seeding of the buoy array across the Arctic Basin occurred annually, courtesy of the Naval Oceanographic Office (NAVOCEANO) under the WHITE TRIDENT exercise.
Next IABP meeting: IABP-14, Geneva, mid 2004.

2.3.4.3 ISABP

International South Atlantic Buoy Programme (ISABP)

Chairman: Alaor Moacyr Dall'Antonia Jr., MHS, Brazil
Vice-Chairman: Ariel Troisi, Argentina
Coordinator: Louis Vermaak, SAWB, South Africa
Web site: http://www.dbcp.noaa.gov/dbcp/isabp/
Area of Interest: South Atlantic Ocean north of 55S plus Tropical Atlantic Ocean.

Status: Last meeting was held in Cape Town, 29-31 July 2002. 142 drifters had been deployed in the South Atlantic during the intersessional period, including 41 SVPBs, 12 SVPBWs, and 89 standard drifters. Most of these buoys were deployed South of 20S or North of the Equator in the tropics by USA, South Africa, and Brazil. Data sparse area remains along the West coast of Africa, and off the East coast of Argentina.

Next ISABP meeting: 2004, exact date and place to be decided.

2.3.4.4 IBPIO

International Buoy Programme for the Indian Ocean (IBPIO)

Chairman: Graeme Ball, BOM, Australia
Vice-Chairman: K. Premkumar, India
Coordinator: Pierre Blouch, Météo France
Web site: http://www.shom.fr/meteo/ibpio
Status: Last meeting was held in Cape Town, 29-31 July 2002. IBPIO maintains a network of about 100 drifting buoys in the Indian Ocean. The 12 NIOT moorings also provide valuable data as well as the two JAMSTEC TRITON buoys. Lack of data is observed in the South Tropical region where drifters tend to escape rapidly.
Next IBPIO meeting: IBPIO-7, 2004, date and place yet to be defined (La Reunion meeting which was due in September 2003 was cancelled).

2.3.4.5 IPAB

WCRP International Programme for Antarctic Buoys (IPAB)

Chairman: Enrico Zambianchi, Istituto Universitario Navale, Italy
Coordinator: Peter Wadhams, SPRI, UK
Web site: http://www.antcrc.utas.edu.au/antcrc/buoys/buoys.html
Status: Last meeting (IPAB-III) was held in Fairbanks, Alaska, 26-28 June 2000.
The IPAB was launched in 1995 for a period of 5 years, to coordinate drifter deployments in the Antarctic sea ice zone, to optimize buoy distribution and create a central data archive. It was resolved to continue the programme indefinitely, and as of September 2000, 14 participants had reconfirmed their commitment to the IPAB Action Group.

In May 2003, 36 drifting buoys were reporting on GTS in BUOY code from the Antarctic region (i.e. South of 55S). 19 of these buoys were reporting air pressure.
Next meeting: IPAB-4, Bremerhaven, Germany, 5-6 september 2003.

2.3.4.6 GDP

Global Drifter Programme (GDP)

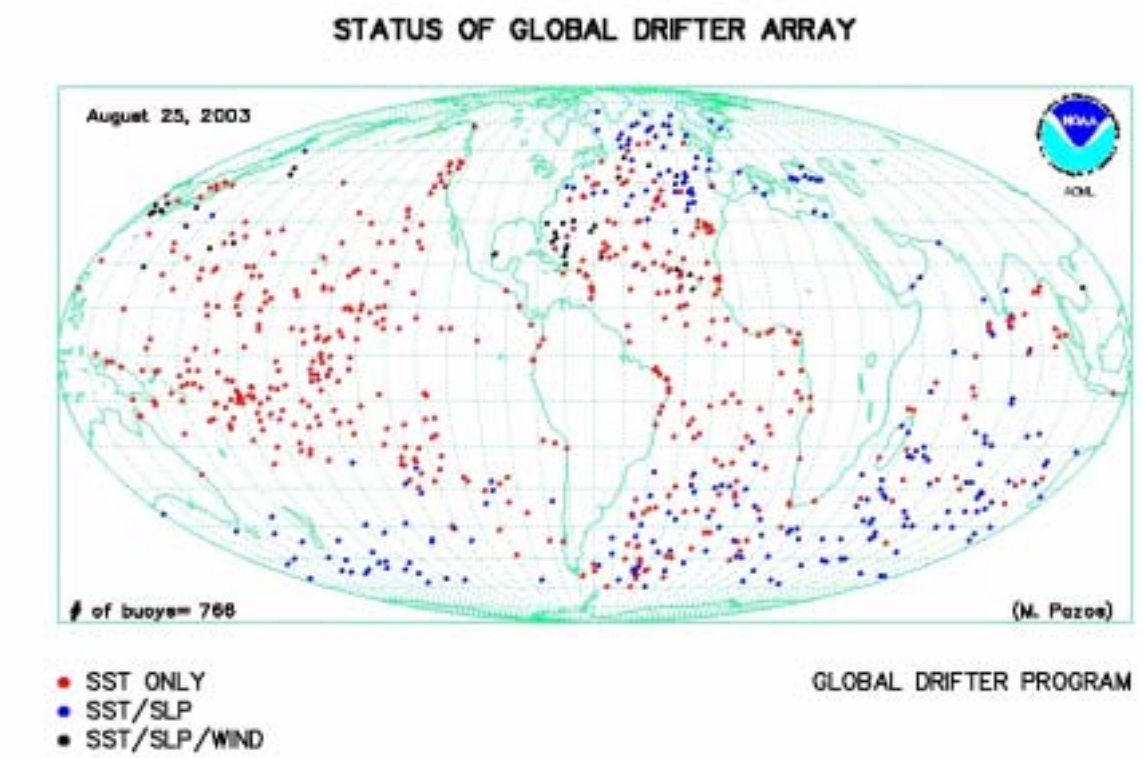
Chairman: Pierre Poulain, OGS, Italy
Manager, GDC: Craig Engler, AOML, USA
Web site: http://www.aoml.noaa.gov/phod/dac/gdp.html
Status: The Global Drifter Center (GDC, http://www.aoml.noaa.gov/phod/dac/gdc.html) has now been fully integrated into NOAA's Global Ocean Observing System (GOOS) Center in Miami, Florida. GDP deploys about 420 drifters per year in the world oceans, including 200 into the tropical Pacific, 90 into the tropical Atlantic, 50 into the tropical Indian and more than 12 into the southern ocean.

The GDC supports the upgrading of SVPs to SVPBs by any country which desires to do so and it is working closely with those countries in coordinating the shipping and deployment of those upgraded drifters.

The GDC and its related Data Assembly Center (DAC) provides products through the following web site: http://www.aoml.noaa.gov/phod/dac

The GDC encourages other drifter programs to contribute their data to the DAC if those data are collected by the SVP WOCE type drifter with drogues set between 10 and 15 meters.

In August 2003, 766 Lagrangian drifters were operational in the GDP.



2.3.4.7 TIP

Tropical Moored Buoy Implementation Panel (TIP)

Chairman: Mike McPhaden, PMEL, USA
Coordinator: Paul Freitag, PMEL, USA
Status: The TAO/TRITON Array includes about 70 moorings in the Equatorial Pacific Ocean. PIRATA (Pilot Research Moored Array in the Tropical Atlantic) which includes 12 moorings is now in a consolidation phase, 2001-2006 intended to demonstrate utility of the data for climate forecasting and operational oceanography. Possible southeast and SouthWest extension of PIRATA in cooperation with Brazil and South Africa is under review.

2.3.4.8 DBCP-PICES NPDBAP

DBCP-PICES North Pacific Data Buoy Advisory Panel (NPDBAP)

Co-Chairmen: NE Pacific: Brian O'Donnell, MSC, Canada
NW Pacific: To be proposed by PICES
Coordinator: Ron McLaren, MSC, Canada
Area of Interest: North Pacific Ocean and marginal seas generally north of 30°N.
Status: This is a new Action Group of the DBCP. First meeting was held in Victoria, Canada, 5-7 June 2002. The NPDBAP aims an operational network of about 120 buoys North of 30N in the Pacific Ocean. In May 2003, 57 drifting buoys were reporting on GTS from the region.
New web site at: http://npdbap.noaa.gov/

Next meeting: Might be held prior to, or in conjunction with PICES-12, Seoul, Korea, 10-18 October 2003.

2.4 Information exchange

2.4.1 DBCP Web server (http://www.dbcp.noaa.gov/dbcp/)

The DBCP web server is routinely updated by the Technical Coordinator to reflect DBCP current activities. Information is also being provided via the JCOMMOPS web site (see paragraph and preparatory documents on information exchange and JCOMMOPS for details).

2.4.2 DBCP Internet technical forum

DBCP Internet Technical forum (http://forum.jcommops.org/) is not really being used by buoy operators but on the other hand does not require substantial efforts to maintain. It is anyhow available in case buoy operators want to upload information, ask questions, and exchange information with others. See preparatory document on information exchange for details.

2.4.3 DBCP mailing lists

No new mailing list was added during the intersessional period. Mailing lists are routinely being used by the Technical Coordinator and a few buoy operators to exchange information with the buoy community. See preparatory document on information exchange for details.

2.4.4 New DBCP publications:

The DBCP recently published the following documents within its Technical Document series:

- No. 23: DBCP Annual report for 2003;
- No. 22: Research, applications and developments involving data buoys, DBCP Workshop, Martinique, October 2002**.**

The WOCE Surface Velocity Programme Barometer Drifter Construction Manual (No. 4, revision 1.2, 12/2002) was also slightly updated.

2.5.1 GTS

2.5.1.1 GTS codes

BUOY: Latest version of BUOY format (FM-18-XII) was implemented at Service Argos in March 2002.

BUFR: Developments of BUFR code were completed in April 2003. Tests were conducted with key players during the period April to June 2003. Operational implemented of GTS distribution of buoy data from Service Argos was realized on 1 July 2003 (FRGPC, Toulouse, and 3 July 2003 (USGPC, Largo).

Much time was spent by the TC DBCP on the issue to (i) discuss needed BUFR descriptors and BUOY template with CBS Expert Team on Data Representation and Codes, (ii) discuss technical details with the company contracted by CLS to do the developments, (iii) load BUFR tables into the Argos GTS sub-system database, (iv) update specifications document, (v) train CLS staff on BUFR, and (vi) comprehensively test the new system.

CBS Expert Team on data representation & codes which met in Arusha in February 2003 proposed a new template for the encoding buoy data in BUFR. This is the template which is now being used by Service Argos. See DBCP session preparatory document dealing with code matters for details.

2.5.1.2 GTS bulletin headers

Complete list of GTS bulletin headers used for GTS distribution of buoy data from Service Argos is given in Annex A.

2.5.1.3 GTS distribution of buoy data

Identify buoy data which are not distributed on GTS and encourage buoy operators to authorize GTS distribution of the data when this is feasible. Provide technical assistance to buoy operators in this regard.

2.5.1.4 Hourly data

I checked the GTS sub-system database for buoys which did not report the hourly data on GTS. When such buoys were identified, I suggested that the hourly data should be distributed as was recommended by the Panel at its 18th session.

2.5.1.5 GTS Delays

Loss of Argos STIP data from Lannion, France: As discussed at the last Panel session, DBCP Chairman sent a letter to NOAA/NESDIS in order to raise DBCP concerns about the issue and to ask for reinstatement of Lannion as an Argos Global receiving station. NOAA/NESDIS and CLS/Service Argos might report further on the issue at the DBCP meeting.

2.5.1.6 Argos & Argos GTS sub-system

Most of the work in this regard was related to the implementation of the BUFR code for GTS distribution of buoy data (see paragraph and specific preparatory document for details).

I assisted Service Argos in adding Buoy type and drogue type in the list of fields which the PGCs can automatically access via email from the GTS sub-system. I also assisted Service Argos in permitting data processing and GTS distribution of salinity and sub-surface current data from the TRITON moorings.

I participated in the discussions of the CLS, Service Argos team to define what sensor data processing will be required in the future to eventually replace the GTS sub-system.

I laised with Service Argos regarding the issue of re-instating Lannion ground receiving station.

2.5.1.7 GTS distribution of buoy data from satellite systems with no GTS data processing capability.

Solutions proposed by NDBC and CLS were advertised as needed.

2.5.2 Quality Control

2.5.2.1 QC guidelines.

To facilitate reporting of systematic errors by PMOCs for buoys reporting onto the GTS, as an alternative to the buoy-qc@vedur.is mailing list a new web based JCOMMOPS tool was developed by the TC DBCP and implemented. After the PMOC logs in, quality information report can be easily entered through a web form (http://w3.jcommops.org/cgi-bin/WebObjects/QCRelay), submitted, and then automatically delivered to the PGC (i.e. usually the buoy operator).

2.5.2.2 Buoy monitoring statistics

BOM is developing software in order to produce buoy monitoring statistics using BOM NWP model.

A comprehensive report describing algorithms and remaining discrepancies among statistics produced by UKMO, NCEP, Météo France, and ECMWF is available via the DBCP web site at http://www.dbcp.noaa.gov/dbcp/monstats.html .

2.5.3 Impact studies regarding data buoys:

List of impact studies regarding data buoys is available through the DBCP web site (http://www.dbcp.noaa.gov/dbcp/impact.html). Anybody with information on past, present or future studies which are not listed in the web page is invited to submit details to the Technical Coordinator.

2.5.4 Metadata/Manufacturer's spec. sheet.

Discussion is underway regarding establishment of a **global buoy deployment notification mechanism** as a scheme to collect metadata for data users, DBCP evaluation group, archiving centres and JCOMMOPS. This discussion is linked to previous discussions on metadata and manufacturer's specification sheet (the Panel agreed that the manufacturers were in the best position to provide the metadata through a specification sheet). EGOS participation in this regard, especially by Anne Hageberg was therefore very helpful. Scheme was also discussed between Graeme Ball and the Technical Coordinator of the DBCP. A two step approach is proposed, i.e. (i) by the buoy manufacturer upon buoy purchase, and (ii) by the buoy operator upon deployment. Sarah North, UKMO, Pierre Blouch, Météo France, and Elizabeth Horton, Navoceano, supported the proposal. A reply from Steve Cook, GDP requested not to duplicate work already done by them in this regard and to avoid having the manufacturers to fill in more than one specification sheet. This latter request can easily be taken into account through specific mechanisms put in place to exchange metadata between GDP or EGOS and JCOMMOPS. See specific preparatory document regarding this issue for details.

2.6 DBCP evaluation group.

The DBCP evaluation group presently includes the following people: Elizabeth Horton, Navoceano (Chairperson), Pierre Blouch, Météo France, Sarah North, UKMO, Graeme Brough, BOM, Peter Niiler, SIO, Etienne Charpentier, DBCP, Tony Chedrawy, Metocean, Jeff Wingenroth, Technocean, Gary Williams, Clearwater Instrumentation, Sergey Mothyzev, MARLIN, Louis Vermaak, SAWB,

Ron McLaren, Environment Canada, Julie Fletcher, MSNZ, New Zealand, and Satheesh Shenoi, NIO, India. Any other person interested in participating in the evaluation group should contact Elizabeth Horton. A mailing list is used by the group to communicate (dbcpeval@jcommops.org). Mailing list maintained by the TC DBCP so individuals interested to appear on the mailing list should contact the TC DBCP.

Main discussion in the group was related to the SVPB despiking algorithm which didn't seem to always provide reliable pressure observations in certain regions (e.g. SO) because of specific submergence conditions. The Group also discussed and proposed the establishment of an extension to the DBCP-M2 format in order to conduct dedicated tests and investigate the problem further.

See report by the chair of the evaluation group for details concerning its activities during the intersessional period.

3. Specific TC DBCP non regular tasks undertaken during the intersessional period

1. September 2002

1. Add new layers to DBCP dynamic map (JCOMMOPS)
2. JCOMMOPS library (quick access, query, to publications referenced at JCOMMOPS)
3. Prepare slides for DBCP session
4. Write BUOY encoder (for POSEIDON moored buoy project)
5. Using WMO documentation, prepare BUFR tables in electronic form
6. Training on WebObjects by Mathieu Belbeoch (WebObjects is used to write dynamic web pages)
7. SOOP Indicators' issue, prepare a web application to draw 2D graphics (e.g. latitude versus time)
8. SOOP Semestrial survey (collect/import data from SOOP participants)

2. October 2002

1. Prepare DBCP session, manage preparatory documents on DBCP web (new application at JCOMMOPS to manage library and make it accessible via the web)
2. SOOP Semestrial survey (collect/import data from SOOP participants, work on dedicated tools)
3. Moving some of the TCDBCP tools on Paradox Database onto the JCOMMOPS database
4. Metadata specification sheet for manufacturers (coordination with EGOS Technical Secretary)
5. Work on BUFR tables for the Argos GTS sub-system
6. 14-18 October: DBCP-18 session, Martinique
7. 21-23 October: JTA-22 session, Martinique
8. 24 Oct. – 1 November: Vacation

3. November 2002

1. Peruvian buoys vandalized. All buoys now ashore for repair and installation of anti-vandalism devices.
2. Work on SEAS data submitted by USA for the SOOP semestrial survey
3. Finalize and implement tools for SOOP semestrial survey and SOOP indicators: web products and maps. Produce and issue SOOP semestrial survey, January-June 2002.
4. Negotiate daily access to GTS data with Météo France for JCOMMOPS. Prepare tools to import data into JCOMMOPS database.
5. 21-22 November: Visit of Graeme Ball to discuss JCOMMOPS and SOT coordination (task team)
6. Standard dynamic and static high resolution JCOMMOPS status maps for SOOP, DBCP, Argo. Investigate feasibility for GLOSS and VOS.
7. Hourly buoy data on GTS. Check technical files of buoys to make sure that the hourly data are distributed on GTS.
8. Need for comparisons of life-time between standard SST drifters and SVPBs.
9. Prepare EGOS December meeting

4. December 2002

1. 3-4 December: EGOS meeting, Geneva.
2. Metadata issue, investigate status with JCOMM/SG Marine Climatology
3. Organize JCOMMOPS database to optimize disk space (table-spaces, partitioning)
4. TRITON buoys current data on GTS

5. Small update of Barometer Drifter design manual to take into account information provided by Vaisala (AIR SB-2A not available any more)
6. Check with Rob Basset on Lannion and planned transmission of stored and real-time Argos data via HRD versus LRD
7. Work on tools to provide information on buoy monitoring statistics via JCOMMOPS web. Such tools could then be used for VOS provided that such statistics are uploaded in database.
8. Re-design DBCP monthly status by country based upon JCOMMOPS database: Develop web dynamic tool to provide monthly statistics on DBCP activity (http://w3.jcommops.org/cgi-bin/WebObjects/PTFcountry).
9. Make software modification to permit certain GTS technical file information to be available to users via email (e.g. buoy type, drogue type as requested by P. Blouch).
10. Produce maps for GLOSS which are compatible with JCOMMOPS design (list of GLOSS stations included in JCOMMOPS database, dynamic map also proposed)
11. 23-31 December: Vacation

5. January 2003

1. 2-6 January: Vacation
2. Discussions with CLS regarding future of the Argos GTS sub-system following letter written by myself to Michel Cazenave and Christophe Vassal..
3. Update SOOP database with historical call-signs
4. Move production of SOOP monthly BATHY report from Paradox database to JCOMMOPS database
5. Work on BUFR tables and templates for Argos GTS sub-system, upload the tables in the sub-system database.
6. Discuss with development team and suggest a few changes for the development of the BUFR code within the Argos GTS sub-system.
7. Update specifications document on BUFR for the Argos GTS sub-system to take into account changes agreed upon since developments began
8. Tools to update JCOMMOPS database (e.g. list of Canadian buoys)
9. Coordinate with DBCP and SOOP, and prepare documents on required BUFR changes for the meeting of the ET/DRC
10. TRITON buoys to distribute salinity data on GTS
11. 28-29 January: Instrumentation Workshop, Brest. Meetings with Coriolis, IRD, and SISMER.

6. February 2003

1. 10-11 February: Visit of Phil Parker and Peter Dexter at JCOMMOPS. Discussions regarding planned JCOMM workshop on products and services.
2. Finalize SOOP monthly BATHY report via web (http://w3.jcommops.org/cgi-bin/WebObjects/GTSReport)
3. Start working on a dynamic application to display histograms via the web (e.g. RMS (obs.-FG) for drifting buoy air pressure using ECMWF monitoring statistics)
4. Tools to upload ship's information into the JCOMMOPS database (call signs, ship names, etc. e.g. from WMO Pub. 47).
5. Prepare I-GOOS-6 meeting and presentation on Argo, AIC, and JCOMMOPS
6. Ask SOOP operators for input for SOOP semestrial survey, July-December 2002. Start processing received inputs.
7. Develop and finalize new JCOMMOPS application to relay quality information from PMOCs to PGCs via dedicated web page (http://w3.jcommops.org/cgi-bin/WebObjects/QCRelay)).

7. March 2003

1. 3-7 March: Visit to BOM, Australia. Discuss DBCP and SOOP coordination as well as SOT coordination (task team on SOT coordination).

2. 10-14 March: Attend 6th session of GOOS Steering Committee, Paris. Make a presentation on Argo and JCOMMOPS.
3. Configure new portable PC under Windows XP; implement and configure needed software & tools
4. Follow up from CBS ET/DRC meeting, Arusha, February 2002.
5. Development team contracted by CLS to develop BUFR code within Argos GTS sub-system nearly completed the work. Start working on validating/testing the new software.
6. Proposal for a new buoy deployment notification scheme.
7. Continue processing inputs from SOOP operators for the semestrial survey, July-December 2002.
8. Participate in CLS/Service Argos team to discuss sensor data processing issues and concepts for future Argos developments, including future re-development of the Argos GTS sub-system.
9. Monthly JCOMMOPS GTS status available online on a routine basis.

8. April 2003

1. Reshape JCOMMOPS web site. Reorganize layout and menu. Dedicated page for JCOMMOPS status maps and other status information.
2. Finalize SOOP semestrial survey, analyze results for all lines and issue draft. Ask SOOPIP for comments.
3. Continue testing BUFR encoding application at Service Argos; exchange test BUFR reports with Météo-France and other potential users.
4. Buoy metadata issue and deployment notification. Impact for GDP and EGOS and adjustments needed.
5. Continue participation in CLS/Service Argos team to discuss sensor data processing issues and concepts.
6. Move JCOMMOPS office to the building across the street with Mathieu Belbéoch
7. Article on JCOMMOPS in ATMOSPHERIQUES magazine of Météo France.
8. Start writing reports by TC/SOOP for SOT-2 meeting.

9. May 2003

9. Attend EGOS meeting, Madrid, 27-28 May 2003.
10. Visit of Boram Lee, IOC, at JCOMMOPS, 19 May 2003.
11. Prepare reports by TC/SOOP for SOT-2 meeting.
12. Prepare DBCP reports for EGOS and IABP meetings.
13. Extensive tests of new GTS sub-system with BUFR encoding capability. Provide meteorological centres with test BUFR reports and discuss required changes. Check/update/validate BUFR tables and templates in the system.

10. June 2003

1. Attend IABP meeting, 4-5 June 2003, Tromso, Norway.
2. 10-11 June 2002, visit of Steve Piotrovicz at JCOMMOPS
3. 11-18 June: Vacation
4. Problems to fix with JCOMMOPS database
5. Application to upload GDP deployment log into JCOMMOPS database
6. 30 June, student Mathieu Lopes arrives at JCOMMOPS for working 3 months on deployment opportunities.
7. Start writing reports by TC/DBCP for DBCP-19 session.

11. July 2003

1. 30 July-1 August, SOT-2 meeting, London
2. Prepare presentations for SOT-2 meeting
3. Investigate buoy deployments in the Southern Ocean for next year

4. 1 July: operational implementation of BUFR code encoding capability within Argos GTS sub-system in Toulouse. Prepare database to allow for buoy data to be properly encoded in both BUOY and BUFR formats.
5. 3 July: operational implementation of BUFR in Largo.
6. BUFR monitoring, assist CLS in fixing problems
7. Provide feed-back on BUFR to data centres asking questions
8. New JCOMMOPS server available (but not operational). Database installed on new server. This was an opportunity to tune the database extensively.
9. Reports by TC/DBCP for DBCP-19 session.

12. August 2003

1. 4-22 August, Vacation.
2. JCOMMOPS web tool to draw time series (initially for DBCP)
3. Discussion with DBCP evaluation group on SVPB despiking algorithm
4. Work on portable BUFR decoder (java)
5. Correct SOOP semestrial survey according to feed-back from SOOP operators
6. Ask input for SOOP semestrial survey (Jan-June 2003)
7. Reports by TC/DBCP for DBCP-19 session.

4. Regular or normal tasks

4.1 Monitoring

Below are detailed the different monitoring activities that the TC DBCP undertook during this intersessional period:

4.1.1 Quality Control Guidelines

4.1.1.1 Reading QC messages

To read the QC messages from the BUOY-QC Internet mailing list as posted by the Principal Meteorological or Oceanographic Centres responsible for GTS buoy data quality control (PMOC). For rationalization purposes, all the proposals are stored and archived in a data base.

4.1.1.2 Contacting PGCs

To contact the PGCs: The QC guidelines have been automated, so most of the time status change proposals are automatically forwarded to the Principal GTS Coordinator (PGC) provided that he has an email address. In case the PGC has no email address, the TC DBCP contacts the PGC directly, and suggests him to implement the proposed change. The PGC should normally contact Service Argos and/or Local User Terminal (LUT) operators and request implementation of the proposed change. In case the PGC disagrees, the TC DBCP immediately sends a denial message on the mailing list.

4.1.1.3 Checking Argos files

To check Argos files and/or GTS data in order to ascertain whether suggested modifications have actually been implemented or not.

4.1.1.4 Feed back.

For sensors actually recalibrated, and on behalf of Service Argos, possibly provide feed back information onto the mailing list.

4.1.2 Specific problems.

To resolve specific problems related to GTS for given buoys, such as looking carefully at the data and the transfer functions. For example, I could be investigating why no or only a few messages are received at Meteorological Centres...

4.1.3 TC DBCP files.

To update TC files: list of the operational platforms and programs (on GTS or not), new programs, WMO numbers, monitoring statistics...

4.2 User assistance

As usual, I answered specific questions and resolved specific problems as needed or requested by users.

4.2.1 Principal Investigators (PI) or buoy programme managers:

PIs regularly request the TC DBCP to look at specific problems regarding their buoy data or request assistance for GTS distribution of the data. For example, I could be studying in detail Argos message formats and sensor transfer functions or I could obtain WMO numbers on their behalf. I could also simulate satellite orbits in order to estimate orbital delays.

4.2.2 Local User Terminals (LUT):

From time to time, LUT operators ask me to provide them with the transfer functions used with specific platforms so that they can also report to the GTS via their LUT.

4.2.3 Meteorological Centres

Meteorological Centres may contact me when they need information on given platforms drifting in an area of interest.

4.2.4 Secretariats:

Upon request, I provided WMO or IOC secretariats with graphs and documentation.

4.2.5 Buoy manufacturers.

Buoy manufacturers regularly contact me to be included in the DBCP list of drifting buoy manufacturers (http://www.dbcp.noaa.gov/dbcp/1lobm.html). I may also discuss technical issues with them.

4.2.6 Individual users

Individual users contact me to obtain buoy information and/or seek information on how to obtain buoy data. I usually redirect them to adequate institution(s) (e.g. RNODC/DB).

4.2.7 Acting as a Principal GTS Coordinator

e.g. When the regular PGC is in vacation, I can replace hem/her and act as a PGC.

4.2.8 Focal point.

Directly or through the BUOY-QC Internet mailing list, I am acting as a focal point between the Meteorological Centres and the Principal Investigators when a specific action is required for a buoy reporting onto the GTS (e.g. remove the data from the GTS, recalibrate a sensor...).

4.2.9 Investigate various data loss problems.

4.3 Drifting Buoy Quarterly Report

The Drifting Buoy Quarterly Report was issued , and distributed widely by CLS, Service Argos.

4.4 Global Telecommunication System (GTS)

4.4.1 Status for drifting buoys reporting onto the GTS:

Year	Operational drifting buoys	On GTS	% on GTS
July 1991	718	264	36.8%
July 1992	1162	474	40.8%
August 1993	1269	548	43.2%
September 1994	1246	587	47.1%
September 1995	1429	631	44.2 %
September 1996	1180	638	54.1%
September 1997	1159	581	50.1%
August 1998	1230	543	44.1%
July 1999	1270	728	57.3%
July 2000	1385	807	58.3%
July 2001	1338	763	57%
July 2002	919	459	49.9%
August 2003	1436	752	52.3%

See also graphs, tables, and maps in Appendix B
Météo-France provided me with Data Availability Index Maps on a monthly basis. The maps are useful to identify the data sparse ocean area for each kind of geo-physical variable and therefore to assist the various data buoy programmes in adjusting deployment strategies. The maps show clearly the impact of the TAO array ATLAS moored buoys (wind), of DBCP regional action groups such as the ISABP (air pressure), or of specific national programmes such as MSNZ (air pressure).

4.4.2 GTS bulletin headers:

All Local User Terminal sources comply with WMO regulations regarding GTS bulletin headers.

See Annex A for a complete list of GTS bulletin headers used to date.

4.4.3 Quality Control.

The work of the TC DBCP concerning Buoy data Quality Control was related to the following topics:

Actually monitor the Internet Mailing List, and contact PGCs accordingly when those cannot be reached automatically.
Act as a PGC upon request.

Refer to related DBCP session agenda item (Quality Control of buoy data) for details.

4.4.4 New buoys on GTS

I am regularly contacting buoy programme managers of new programmes in order (i) to convince them to authorise GTS distribution of their buoy data, and (ii) to offer assistance for that purpose. Programme managers who spontaneously authorise GTS distribution of their buoy data, may regularly contact me for assistance.

The new GTS sub-system permits to process the data provided that adequate information is precisely implemented in the system. I am therefore studying in details technical files of buoys with complicated Argos message formats. In some instances I obtain WMO numbers from National Focal Points or WMO secretariat on behalf of the programme managers.

4.5 Argos GTS Sub-System

The regular work of the Technical Coordinator concerning the Argos GTS Sub-System is mostly related to the following topics:

- Monitor the system and look for possible problems.
- Make sure the problems are corrected.
- Training of the Argos Users' Guidance Office and work in conjunction with it regarding complex problems.
- Refer to related DBCP session agenda item (Argos) for details.

4.6 DBCP World Wide Web Internet server

The regular work of the Technical Coordinator concerning the DBCP web site is mostly related to the following topics:

- Keep regular files on the Web. Server up to date (transfer files).
- Tentatively keep links to other servers up to date.
- Refer to related DBCP session agenda item (Information exchange) for details.

4.7 TC statistics and graphs.

4.7.1 Active drifting buoys.

Using Argos files and data provided by LUT operators, I computed on a monthly basis, by country and by organisation, graphs showing the distribution of active GTS and non-GTS drifting buoys. It is particularly useful to see the evolution of the total number of drifting buoys deployed by the various countries involved, and the percentage of these reporting to the GTS. See graph-1 in Annex B (distribution of active drifting buoys by country), graph-2 (distribution of active moored buoys in the high seas by country), and graph-3 (Evolution of number of air pressure observations distributed on GTS per month (from ECMWF monitoring statistics)).

4.7.2 Quality of air pressure.

I Computed on a monthly basis, the graph showing the distribution of the RMS (of Observation minus First Guess Field) of Air Pressure data according to ECMWF monthly monitoring statistics. This graph, which uses 6 months of data, gives a good estimate of the quality of the drifting buoy Air Pressure data. See graph-4 in Annex B (evolution of mean RMS (Obs.-First guess) per month for global GTS air pressure data (from ECMWF monitoring statistics)), and graph-5 (histogram of distribution of RMS (Obs. - First Guess).

4.7.3 Air pressure from drifting buoy life time.

I Computed the graphs showing the distribution of life times of Air Pressure measurements, using the ECMWF monitoring statistics.

4.8 Action Groups, Regional actions.

4.8.1 Action Groups.

I liaise with DBCP Action Group coordinators and reply questions from them, prepare DBCP reports for AG meetings (to be presented by the DBCP representative at the meeting), and possibly attend those meetings on behalf of the DBCP.

4.9 Miscellaneous

4.9.1 Drifting Buoy Quarterly Report.

I checked the Quarterly Report on Drifting Buoy and gave approval before CLS could send it to WMO and IOC.

4.9.2 Argos monthly status report.

I checked the Argos monthly status report to WMO which was prepared by CLS, Service Argos.

4.9.3 TC DBCP files.

Updating files and databases (PC, JCOMMOPS database). Data come from various sources, including Argos files and database, files regularly submitted by buoy operators or Action Group Coordinators.

4.9.4 WMO/Argos number cross reference list and PGC list.

Monthly list of active buoy WMO numbers is available via JCOMMOPS through (i) a dynamic web page which permits to query the JCOMMOPS database (http://w3.jcommops.org/cgi-bin/WebObjects/WMO_Telecom), and (ii) a file updated daily which can be downloaded from the JCOMMOPS ftp site.(ftp://ftp.jcommops.org/JCOMMOPS/GTS/wmo/wmo_list.txt).

The database includes WMO numbers for buoys transmitting on GTS via Argos, and Local User Terminals (LUT). For each WMO number, one can obtain the Argos or platform number, the drifting buoy owner, and the dates the WMO numbers have been introduced and removed from the system (Argos or LUT).

4.9.5 TC DBCP bimonthly report.

I provided the Chairman of the DBCP as well as the WMO and IOC Secretariats with my bimonthly report.

4.9.6 List of buoy user requirements.

I am keeping this list up to date according to comments or information from buoy users.

4.9.7 Documentation, assistance.

I provided users with documentation or status reports concerning specific programs or experiments; I answered specific questions regarding the Argos System.

4.9.8 TC DBCP missions.

I prepared the various missions or meetings I had to attend.

4.9.9 Preparation of the DBCP session.

I prepared specific documents and the TC report for the DBCP annual session:

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Appendices: 2

GTS bulletin headers being used for GTS distrib. of buoy data in BUOY code

- Table 1: Data distributed from the US Argos Global Processing Centre, Largo, USA

Bulletin header (BUOY)	Bulletin header (BUFR)	Deployment area	Remark
SSVX02 KARS	IOZX02 KARS	GDP	New
SSVX04 KARS	IOZX04 KARS	North Atlantic and EGOS	Same
SSVX06 KARS	IOZX06 KARS	Northern Hemisphere	Same
SSVX08 KARS	IOZX08 KARS	TAO, PIRATA	Was SSVX40 for TAO
SSVX10 KARS	IOZX10 KARS	Southern Hemisphere and ISABP	Same
SSVX12 KARS	IOZX12 KARS	Arctic, Antarctic, sea ice	Arctic, Antarctic merged
SSVX14 KARS	IOZX14 KARS	Indian Ocean and IBPIO	New
SSVX16 KARS	IOZX16 KARS	Navoceano	Same
SSVX18 KARS	IOZX18 KARS	Pacific Ocean	New
SSVX20 KARS	IOZX20 KARS	Navoceano	Same
SSVX22 KARS	IOZX22 KARS	Mediterranean sea	New
SSVX42 KARS	IOZX42 KARS	NOAA/NDBC, Southern Hemisphere	Was SSVX02
SSVX44 KARS	IOZX44 KARS	NE Pacific Ocean (USA, and Canada)	Was SSVX18
SSVX48 KARS	IOZX48 KARS	NOAA/NDBC, Northern Hemisphere	Was SSVX08
SSVX96 KARS	IOZX96 KARS	NDBC	Same

- Table 2: Data distributed from the French Argos Global Processing Centre, Toulouse, France

Bulletin header (BUOY)	Bulletin header (BUFR)	Deployment area	Remark
SSVX01 LFPW	IOZX01 LFPW	North Atlantic and EGOS	Same
SSVX03 LFPW	IOZX03 LFPW	Southern Hemisphere and ISABP	Same
SSVX05 LFPW	IOZX05 LFPW	Northern Hemisphere	Same
SSVX07 LFPW	IOZX07 LFPW	Arctic, Antarctic, and sea ice	Arctic, Antarctic merged
SSVX09 LFPW	IOZX09 LFPW	Indian Ocean and IBPIO	New
SSVX11 LFPW	IOZX11 LFPW	TRITON	New
SSVX13 LFPW	IOZX13 LFPW	GDP	New
SSVX15 LFPW	IOZX15 LFPW	Pacific	New
SSVX21 LFPW	IOZX21 LFPW	Mediterranean Sea	New
SSVX39	IOZX39 LFPW	French West Indies	Was SSVX19

LFPW			

Backup procedure:

Backup procedure in case one of the two Argos global processing centres fails does not change. If one centre fails, the other centre processes all the data, i.e. the data it normally processed plus the data the other centre normally processes. Hence, when an Argos centre is in backup mode, it will generate bulletins with even and odd numbers (in normal mode, only even numbers are used by Largo, and odd numbers by Toulouse). In other words:

- In case the French Argos Global Processing Center in Toulouse fails, the US Argos Processing Center in Largo is switched to backup mode. In that case, GTS bulletins normally distributed from Toulouse under TTAAii LFPW bulletin headers are distributed from Largo under TTAAii KARS bulletin headers (e.g. SSVX01 LFPW becomes SSVX01 KARS and is sent out from Largo).

- In case the US Argos Global Processing Center in Largo fails, the French Argos Processing Center in Toulouse is switched to backup mode. In that case, GTS bulletins normally distributed from Largo under TTAAii KARS bulletin headers are distributed from Toulouse under TTAAii LFPW bulletin headers (e.g. SSVX04 KARS becomes SSVX04 LFPW and is sent out from Toulouse).

Remark concerning GDP:

Since GDP drifters deployed world-wide may also participate in a DBCP regional action groups (e.g. ISABP if deployed in the South Atlantic), we have to agree on a policy on what GTS bulletin header to choose. Considering that GDP header was created basically for tracking Lagrangian drifters, it sounds reasonable to recommend to have all Lagrangian drifters participating in GDP report under GDP bulletin header and not under the other DBCP Action Group it is participating in. For example, a Lagrangian drifter participating in both GDP and ISABP (South Atlantic) and which data are distributed from the French Argos Global Processing Center would report under SSVX13 LFPW (i.e. GDP) bulletin header, and not under SSVX03 LFPW (i.e. Southern Hemisphere).

- Table 3: Data routed from the National Data Buoy Center (NDBC), Mississippi, USA, based on data received from Service Argos Inc. (SAI), Landover MD, USA

Bulletin header	Deployment area
SSVX42 KWBC	NOAA/NDBC, Southern Hemisphere
SSVX48 KWBC	NOAA/NDBC, Northern Hemisphere

- Table 4: Data routed from the National Ice Center (NIC), Washington DC, USA, based on data received from Service Argos Inc. (SAI), Landover MD, USA

Bulletin header	Deployment area
SSVX18 KWBC	Arctic Ocean, data Quality Controlled at NCEP

- Table 5: Data routed from Edmonton Local User Terminal (LUT)

Bulletin header	Deployment area

SSVX02 CWEG	Arctic Ocean
SSVX03 CWEG	Hudson Bay
SSVX04 CWEG	NorthEast Pacific Ocean

- Table 6: Data routed from Halifax Local User Terminal (LUT)

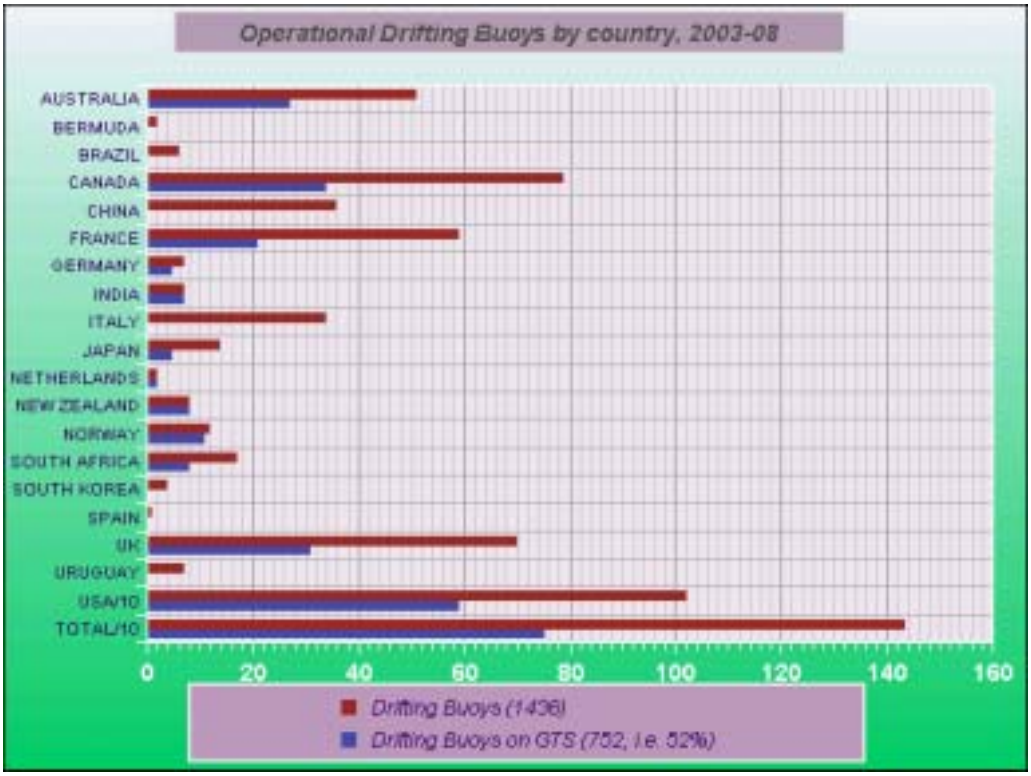
Bulletin header	Deployment area
SSVX01 CWHX	NorthWest Atlantic Ocean

- Table 7: Data routed from the Sondre Stromfjord Local User Terminal (LUT)

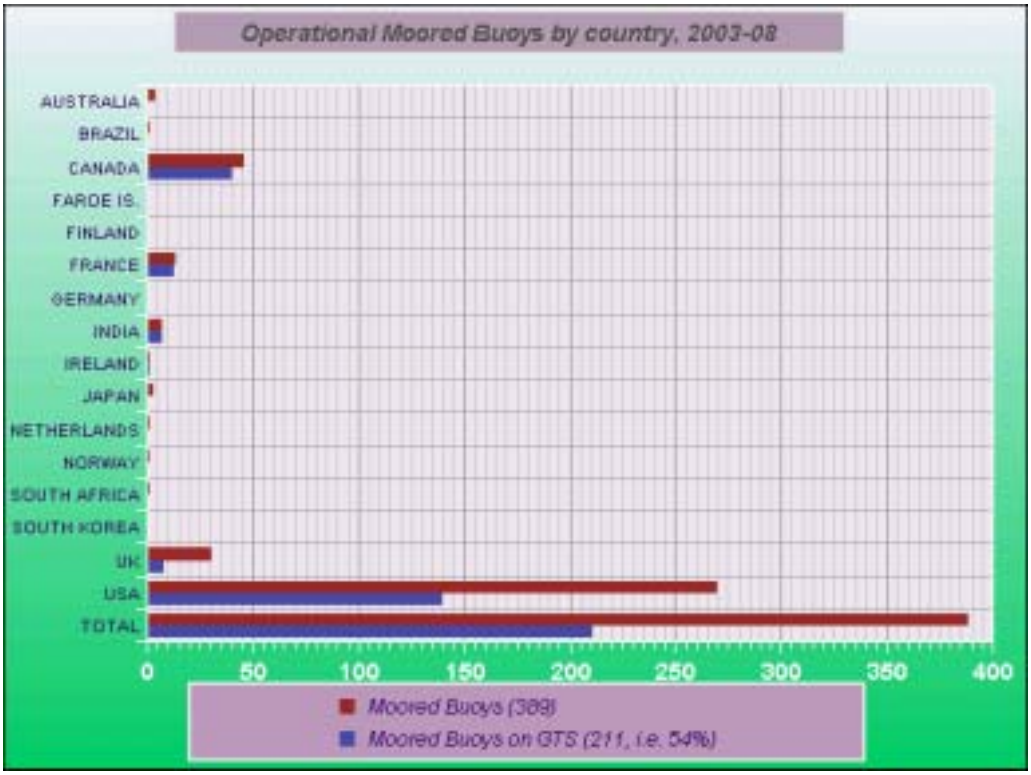
Bulletin header	Deployment area
SSVX01 BGSF	North Atlantic Ocean (EGOS)

Graphs

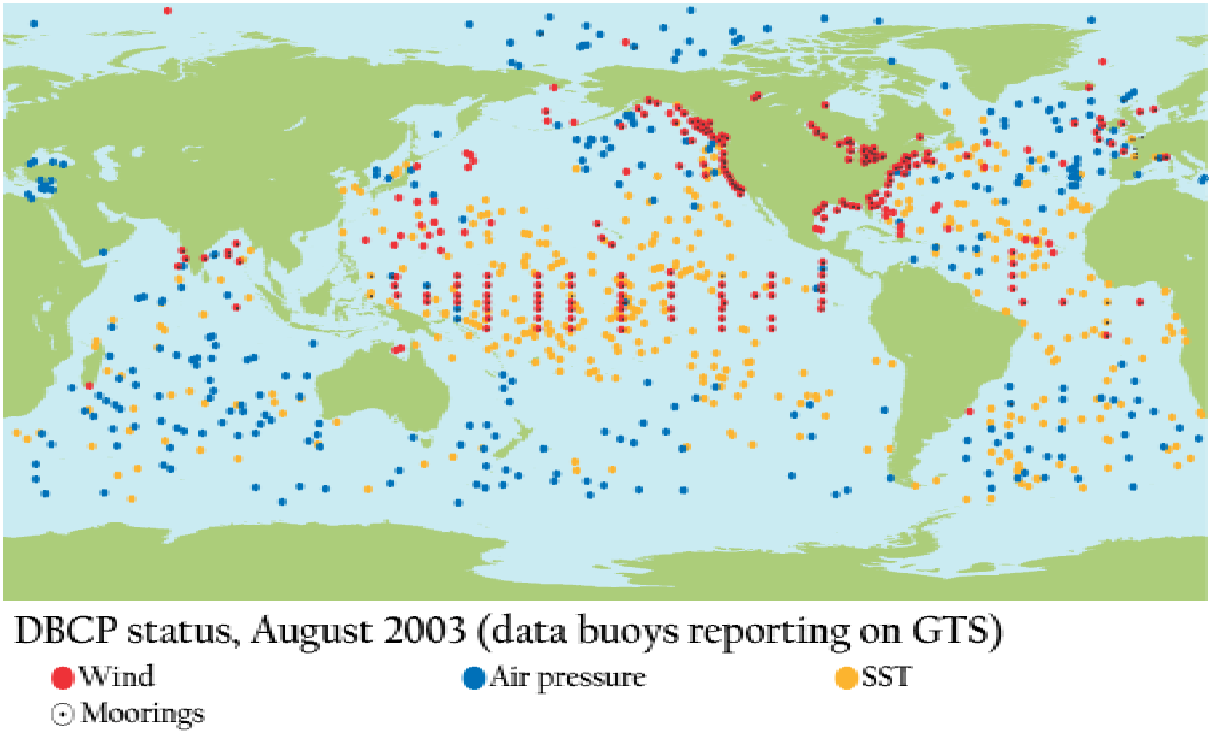
Graph-1: Drifting Buoys and those on GTS by country:



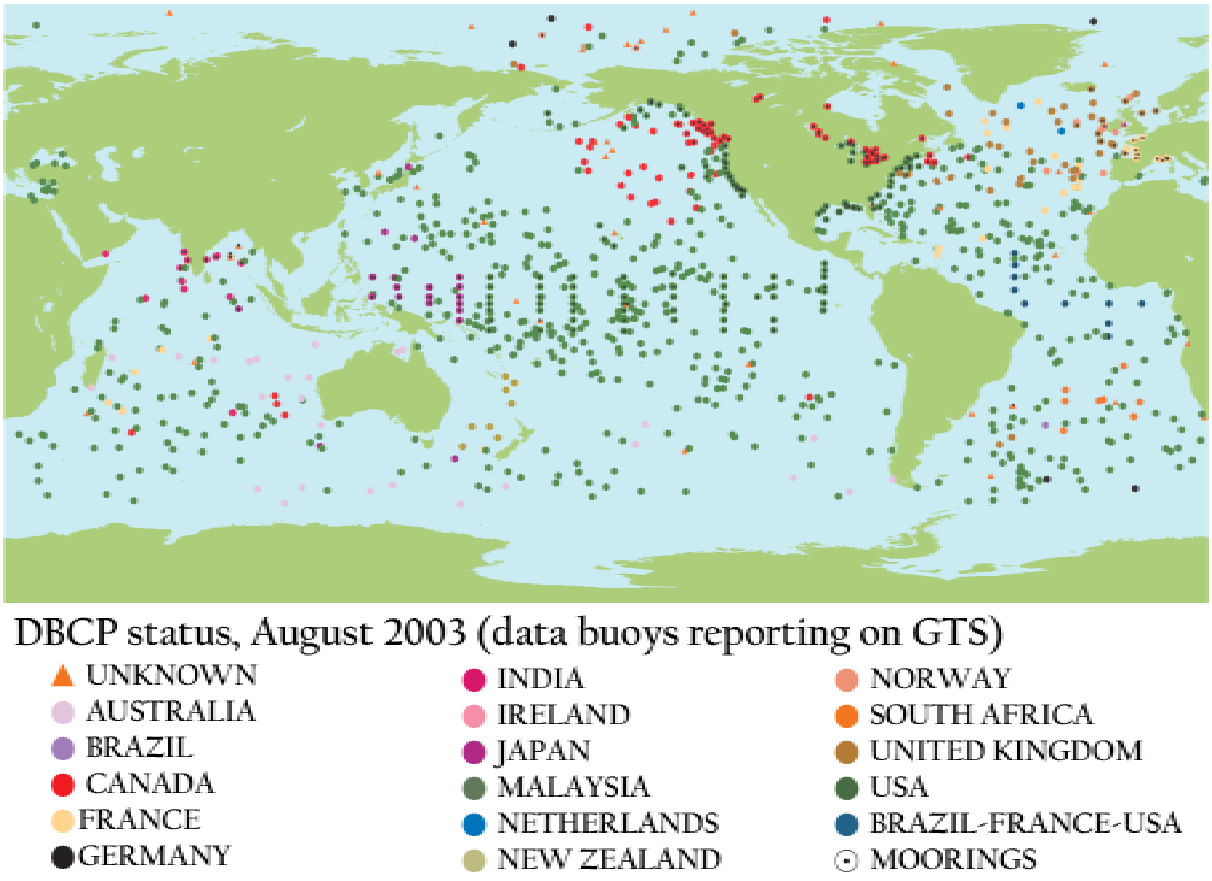
Graph-2: Moored Buoys in the high seas (plus US and Canadian buoys and moorings reporting via Argos) and those on GTS by country:



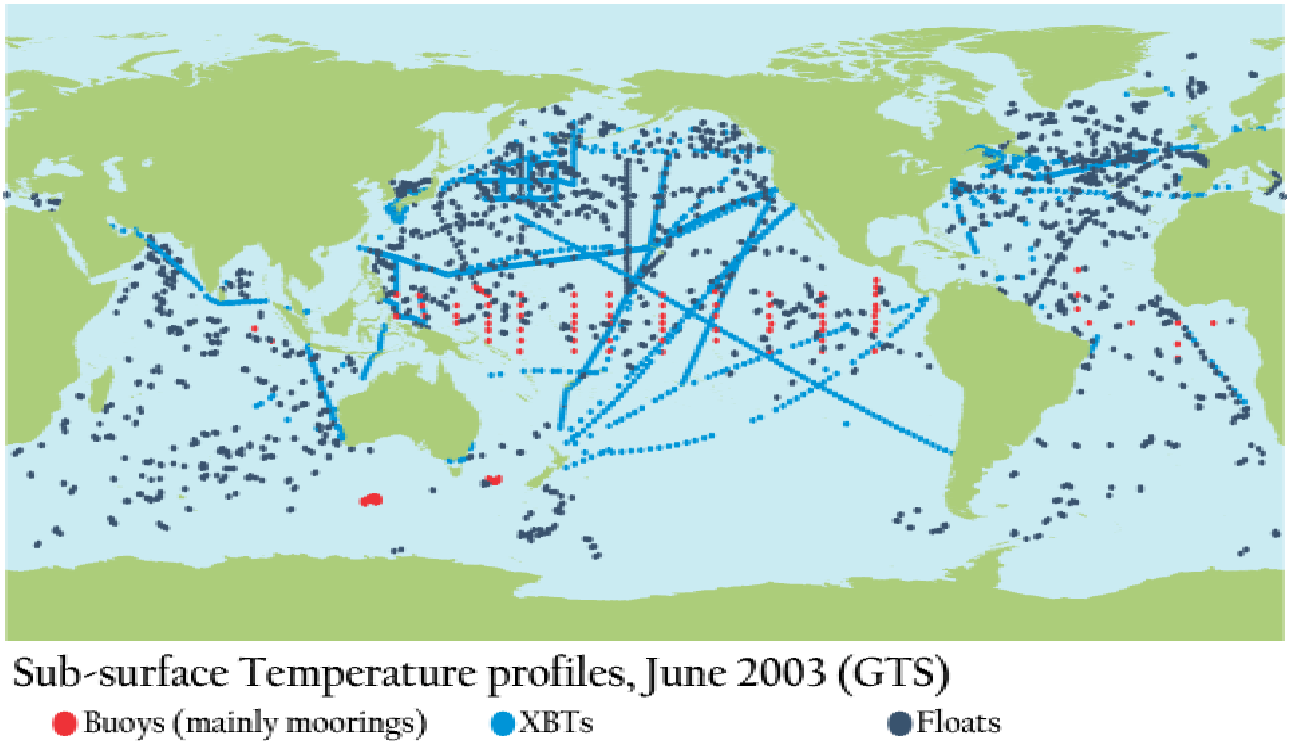
Map 1: **Drifting and Moored** buoys reporting SST, Air Pressure, or Wind on GTS in August 2003:



Map 2: Buoys reporting on GTS in August 2003 **by country**:

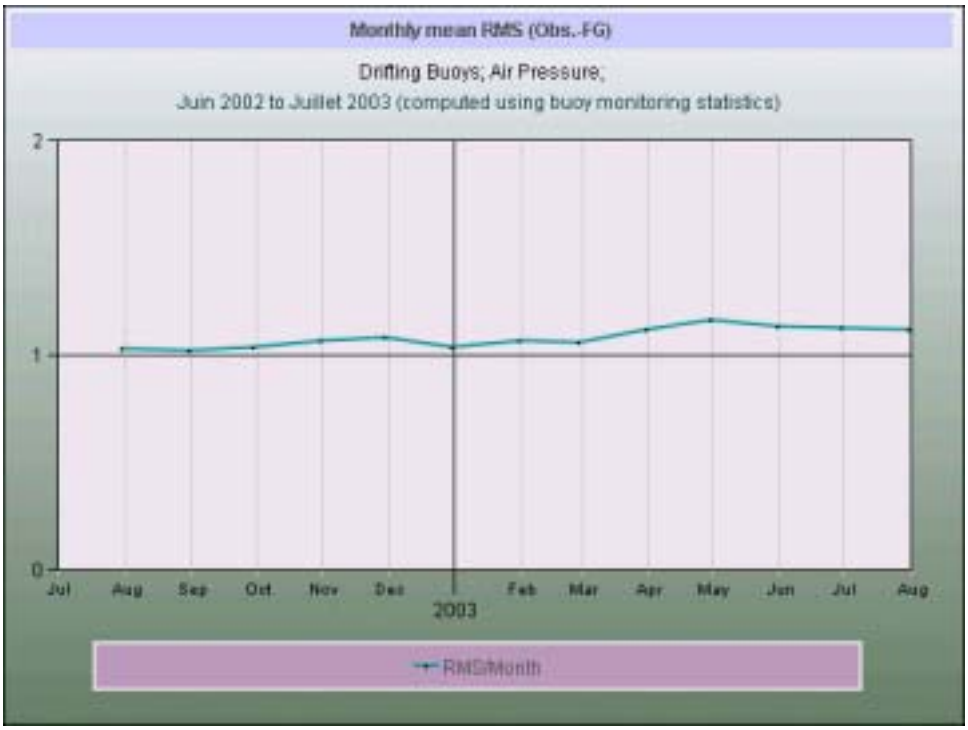


Map 3: Ocean platforms reporting **Sub-surface Temperature** on GTS in June 2003

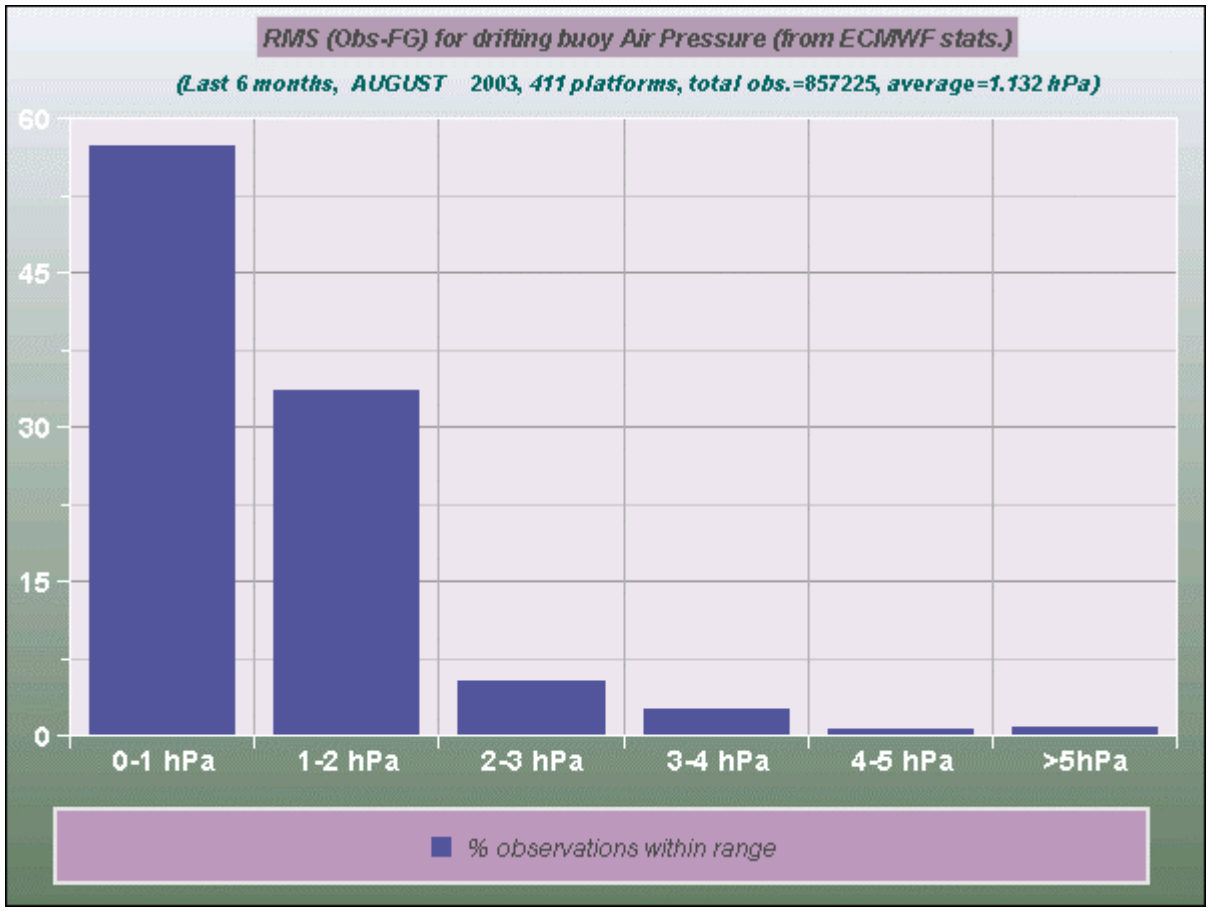


Graph 3: Evolution of number of air pressure observations distributed on GTS per month for the period June 2002-July 2003 (from ECMWF monitoring statistics)

Graph 4: Evolution of mean RMS (Obs.-First guess) per month for the period June 2002 to July 2003 for global GTS air pressure data (from ECMWF monitoring statistics)



Graph5: Histogram of distribution of RMS (Obs. - First Guess) for the period 03/2002 to 08/2003.



Annex IV

ACTION GROUP REPORT SUMMARIES

The European Group on Ocean Stations (EGOS)

The European Group on Ocean Stations (EGOS) met twice in the intersession period in Geneva (December 2002) and Madrid (May 2003) respectively. From 1st of January 2003 Spain became a new member of EGOS. The ten participating countries are now Denmark, France, Iceland, Ireland, Federal Republic of Germany, The Netherlands, Norway, Spain, Sweden and United Kingdom. The EGOS Common Fund is based on voluntary contributions, mainly to cover the service of the Technical Secretariat for which WMO contracted Christian Michelsen Research A/S in Bergen (Norway) on behalf of the Egos Management Committee. The Fund is managed by WMO.

Main activities in the period 1st August 2002-1st August 2003 were, among others, the inclusion of Spain, to get the Spanish moored buoys onto the GTS, connecting Søndre Strømfjord LUT to CLS ARGOS, assessment of the lifetime of SVP-B drogues, find a suitable system for storage of buoy metadata and start activities for EGOS to be included in the EUCOS Surface Marine Programme.

During the intersession period 64 new drifters were deployed in the EGOS area (coast of Europe to 50W and 65N to 30N, including the Baltic and Mediterranean Seas). On 1st of August 2003 47 buoys were still in operation, 15 in EGOS North (north of 50N) and 32 in EGOS South. In the same period 57 drifters ceased operation. The average lifetime of all drifters was 312 days. For SVP-B type buoys the average lifetime was 299 days, for FGGE type buoys 345 days. The 312 days is a decrease compared to 2002 (347 days) mainly caused by early failures during deployments in spring 2003 after air deployment at rough weather conditions.

The tendency for SVP-B drifters to loose the drogues has continued into 2003. This is an important issue, since the wind measurements of these buoys rely on an attached drogue. As of 1st August 2003 a total of 42 SVP-Bs were operating in EGOS, 12 of these (29%) had lost the drogue. This is an improvement by 15% compared to the same period last year.
The lifetime of drifters with a drogue attached decreased however to an average of 92 days (2001/2002-period: 195 days) but the average lifetime for buoys without drogue increased to 503 days (2001/2002 period: 385 days). The average lifetime for buoys with drogue was again effected by the rough weather in early March 2003.

28 Moored buoys were in EGOS of which 16 were operational, e.g. data on the GTS.

Discussions between EGOS and EUCOS (EUMETNET Composite Observing System) have started in order to agree on a MoU for the transfer of EGOS into the EUCOS Surface Marine Programme. It is foreseen that the transfer will take place in the second half of 2005. One of the issues to be discussed is the relation between the EUCOS Surface Marine Programme and the DBCP.

More information (monthly reports, quarterly reports, other technical documents) can be found at www.cmr.no/conmar/egos.

The International Arctic Buoy Programme (IABP)

The 13th annual meeting of the IABP was held in Tromso, Norway, 4~6 June 2003. The meeting was hosted by the Norwegian Polar Institute (NPI) and the Arctic Climate System Study / Climate and Cryosphere (ACSYS / CliC).

Chad Dick of ACSYS/CliC gave a presentation of the group's work and discussed potential cooperation with IABP. NPI organized an informative tour of the Norwegian Meteorological Service Forecast Office in Tromso, which provided the opportunity for liason and training exchange between the Met Service and IABP members, and in particular, Environment Canada. Presentations were given during lunch to interested NPI staff, and a technical workshop was given.

IABP strives to maintain an array of 25 buoys evenly distributed across the Arctic Ocean. IABP Participant Reports are available on the website (http://iabp.apl.washington.edu) as part of the IABP-13 meeting report. New for this year, the suite of monthly maps were expanded to include topography, buoys reporting ice concentration, buoys by instrumentation, deployment year and experiment numbers.

The TC for IABP is working on the DBCP Metadata, and is also working to ensure that all Arctic deployment are recorded in the IABP database. For the future, IABP is working on it's role in the International Polar Year (JPY) 2007, increasing organizational Commitment to IABP, demonstrating the usefulness of IABP data to the operational forecast services with the goal of stabilizing funding, and finally to participate in QC of IABP data.

The International Programme for Antarctic Buoys (IPAB)

The co-ordinating office staff (Peter Wadhams and Martin Doble) to the Scottish Association for Marine Science's Dunstaffnage Marine Laboratory (DML) in Scotland, which is now co-located with that of the National Focal Point for the Data Buoy Co-operation Panel (DBCP).

Buoy activity 2001-2003

The number of buoys operating in Antarctic waters has fluctuated considerably over the past three years. From a relatively stable inventory of around ten buoys in 2000 and 2001, numbers dropped off to leave one solitary buoy reporting to the GTS for November and December 2001, close to South Georgia. The first months of 2002 saw this rapidly redressed, however, with multiple deployments in the Weddell Sea and up to 20 buoys reporting. Numbers then fell again, reaching only six in October 2002. A mass deployment in the waters around the South Sandwich islands, north of the Antarctic Peninsula, boosted numbers to the low twenties in the first half of 2003. Even the relatively well-represented months show a worrying lack of spatial coverage. Large numbers of buoys have been deployed in small areas, leaving the remainder of the Antarctic waters almost un-instrumented.

The majority of recent deployments have been performed by the WHOI SO-GLOBEC interests in the Peninsula region and have occurred exclusively in open water regions. Meanwhile, it is suggested that members report these non-visible deployments as a matter of course to the co-

ordinator, as this would greatly increase the value of the IPAB function above that currently provided by MEDS.

Website

IPAB data provided by the Australian office has been integrated with the searchable Oracle database maintained at the British Antarctic Survey (BAS), which can be found at http://www.antarctica.ac.uk/met/metlog/cui.html. Perl scripts allow the user to select data on the basis of several fields, whether WMO ID, date, position or sensor information. Data are then output directly to screen in either text or graphical format, which can then be directly downloaded.

The coming year will see automated scripts running to strip IPAB-relevant data from the available data sources and thus maintain an up-to-date listing of IPAB activities at all times. It is further suggested that members will enter their relevant details onto a web-based form. These will then also be automatically incorporated into the IPAB statistics.

The International South Atlantic Buoy Programme (ISABP)

The intersessional period September 2002 to August 2003 has been very successful. In total 172 drifters were deployed compared to the 142 in 2001/2002. The 172 consisting of 112 SVP, 51 SVPB and 9 SVPWD drifters. The contributors to the deployments were GDP, Navoceano, South African Weather Service and UKMO. 162 drifters were deployed by research vessels, commercial vessels, while 10 were air deployed. In this period the deployments of SVPB drifters increased from 41 to 51.

A good array of drifters is noticeable south of 20S with a good mixture of SVPB drifters, while a good array is also well established north of 10N. Noticeable is also the increased deployments off the West Coast of Africa towards the Gulf of Guinea and also off the southeast coast of Argentina.

No programme meeting took place this year, but the tentative tenth programme meeting will take place in Niteroi, Rio de Janeiro, during June/July 2004. The Programme Committee is, Alaor Moacyr Dall' Antonia - chairman, Ariel Triosi - vice-chairman and Louis Vermaak - Programme Co-ordinator.

Future plans include the maintenance of the array in the Tropical Atlantic to ensure data during the hurricane season and the improvement in the network off the West Coast of Africa and air pressure measurements in the Southern Oceans south of 40S.

ISABP information is available on the Web site http://dbcp.noaa.gov/isabp.

The International Buoy Programme for the Indian Ocean (IBPIO)

The International Buoy Programme for the Indian Ocean (IPAB) is currently activated by 7 organizations namely Bureau of Meteorology (BOM), Australia, Global Drifter Center (GDC), US, Météo-France, National Institute of Oceanography and National Institute of Ocean Technology (NIOT) of Department of Ocean Development, India, South African Weather Service (SAWS).

The IBPIO has so far had six meetings. The 7th meeting scheduled in October 2003 at La-Réunion could not be held due to budget/travel restrictions of some participant countries. During the intersessional period, Malaysia and Mauritius have shown interest in participation for IBPIO.

Against the planned target of 100 drifting buoys deployment, 88 drifter buoys have been deployed. All drifting buoys use the Argos system to report their data and available through GTS. NIOT increased the moored buoy network to 16. The buoys surface met data is available through GTS. The Japan Marine Service and Technology center (JAMSTEC) maintains two TRITON mooring in the eastern tropical ocean.

IBPIO maintains a website at http://www.shom.fr/meteo/ibpio.

The next IBPIO meeting is planned to be held at Channai, India, prior to DBCP-XX session.

Global Drifter Program (GDP)

The Global Drifter Program (GDP) is a branch of the Global Ocean Observing System (GOOS) Center at NOAA's Atlantic Oceanographic and Meteorological Laboratory (AOML). The GDP objective is to maintain a global, 5 degree by 5 degree array of ARGOS tracked Lagrangian Drifters to meet the need for an accurate and globally dense set of in-situ observations of Sea-surface temperature (SST) and surface circulation. This data supports short-term (seasonal-to-interannual) climate predictions as well as climate research and monitoring.

Past Work

Tropical Oceans (20 S – 20 N) Current Status 2003

In the Atlantic Ocean 77 SVP drifters have been deployed as of current date. Deployments efforts have been focused on the data sparse areas of the Western Africa, Gulf of Guinea and Angola Basin. A total of 119 SVP drifter buoys were deployed in the pacific. Deployments made by Research Vessels and Voluntary Observing Ships. In the Indian Ocean 27 drift buoys have been deployed. Ten buoys were upgraded with barometers by Meteo-France and air deployed by the Naval Oceanographic Office.

Extra Tropical Oceans (40 S – 20 S) Current Status 2003

In the year 2003, 21 buoys were deployed in the Extra-tropical oceans. Deployments were made from Research vessels and Voluntary Observing Ships. Three buoys in the Indian Ocean were upgraded with barometers. Two buoys in the Atlantic Ocean were upgraded with barometers. SVP deployments in both the Atlantic and Pacific Oceans were in data sparse regions.

Southern Oceans (60 S – 40 S) Current Status 2003

In the year 2003, 68 drifting buoys were deployed in the Southern Oceans. A total of 58 buoys were upgraded with barometers by co-operative agencies. Deployments made by Research Vessel and Voluntary Observing Ships. There was an increase from the 48 barometer upgrades in 2002. Our appreciation to the many agencies and companies for their contributions to the Global Drifter Program

2004 Goals

Deployment of 712 Drifters in the period between October 2003 and September 2004. Concentration of deployments on Southern Oceans and Data Sparse regions. Deployment of 40 SVP-B buoys in the North Pacific. Continue to work with Co-Operative Agencies to upgrade Buoys with Barometers. Increase in Atlantic Ocean deployments. Continue to monitor HURRICANE PERFORMANCE STATUS

The Tropical Moored Buoys Implementation Panel (TIP)

The TAO/TRITON (Tropical Atmosphere Ocean/Triangle Trans-Ocean Buoy Network) moored buoy array is a central component of the ENSO Observing System, deployed specifically for research and forecasting of El Niño and La Niña. TAO/TRITON presently consists of 55 ATLAS moorings maintained by PMEL (Pacific Marine Environmental Laboratory), 12 TRITON moorings maintained by JAMSTEC (Japan Marine Science and Technology Center), and 5 subsurface ADCP (Acoustic Doppler Current Profiler) moorings (4 maintained by PMEL and 1 by JAMSTEC). In addition to the core moorings of the area, there are several moorings deployed by PMEL and JAMSTEC as enhancements. Most recently, TAO/TRITON data were valuable for tracking a moderate intensity El Niño in 2002-2003. Present conditions in the tropical Pacific are near normal.

PIRATA (Pilot Research Moored Array in the Tropical Atlantic) is in 5-year (2001-2006) consolidation phase, during which the array will be maintained in a 10-mooring configuration and evaluated for its utility in support of research and operational forecasting. The array is supported by the United States, France and Brazil.

TAO/TRITON data return remains good, with an overall value for real-time data availability of 86% for the time period 1 August 2002 to 31 July 2003. PIRATA data return for the same time period was 65%. Damage to moorings and sensors due to fishing activity continues to be of concern. This damage accounts for a significant amount of data loss, especially in the far western portions of the Pacific basin and in the Gulf of Guinea in the Atlantic. Additional real-time data loss due to failures in the subsurface telemetry system were caused by both fishing activity and hardware failure. As subsurface data are internally recorded, overall data return increases after moorings are recovered. Recent design modifications have reduced the occurrence of hardware failure.

At the request of NOAA headquarters, PMEL and NDBC developed two options for the transfer of the TAO portion of TAO/TRITON from PMEL to NDBC. In March 2003 the NOAA Administrator recommended against immediate transition and endorsed the development of a strategy for more systematic appraisal of transitions. In July 2003 the NOAA Executive Council asked for a new transition plan by 31 October 2003.

The establishment of an Indian Ocean Panel to guide the design and implementation of a sustained, integrated, ocean observing system in the region was endorsed by the CLIVAR Scientific Steering Group in May 2003. This Indian Ocean Panel is in the process of being established with sponsorship by CLIVAR, GOOS, and the JCOMM. The TIP will work with this new panel as well as other existing CLIVAR and IOC/WMO panels to advance the implementation of an Indian Ocean moored buoy network.

The North Pacific Data Buoy Advisory Panel (NPDBAP)

The NPDBAP was officially accepted as an entity reporting to the DBCP and PICES at the DBCP 18 meeting held in October, 2002. This is the first Annual Report as an official body of the DBCP.

During the period August 2002 to August 2003 an average of 57 drifting buoys deployed in the North Pacific Ocean (30.00N to 65.00N and 110.00E to 110.00W), reported via the Global Communications System (GTS) to the Marine Environmental Data Service (MEDS). As of August 2003, 71 buoys were reporting, 44 with barometric pressure. The total number of messages received increased from 19,165 in August 2002 to 29,841 in August 2003, the latest month for which statistics are available. Hopefully, this increase is in part, due to the efforts of the participating members of the NPDBAP.

An “ad hoc” meeting of the Panel was held during the DBCP 18 meetings held Oct. 14-18, 2002 in Martinique. During this meeting the action items from the June 2002 meeting were discussed including buoy deployment opportunities. Representatives from Canada and the United States (NDBC, US Naval Oceanographic Office and the Global Drifter Program) were in attendance.

With the kind assistance of MEDS and NDBC the NPDBAP web site is now operational and can be found at http://npdbap.noaa.gov.

Overview of Plans for 2003 - 2004

A meeting of the NPDBAP was held on October 11 2003, in conjunction with the North Pacific Marine Science Organization (PICES) Twelfth Annual Meeting. A representative of Japan and the Russian Federation were in attendance and an information session was held to discuss the work of the Panel over the past year and plans for 2003-2004. A meeting of the Panel members representing Canada and the United States (Global Drifter Program, National Data Buoy Centre and the US Naval Oceanographic Office), with observers from Korea and Japan was also held in conjunction with the DBCP meeting in Angra dos Reis – Rio de Janeiro, Brazil, October 21, 2003.

An Asian Co-chair has not yet been selected and the current North American Co-chair, Brian O’Donnell, has been assigned to a position with Climate Change and the Earth Observation System project. His future involvement with the NPDBAP will be decided over the next few months.

Approximately 87 buoys are scheduled for deployment in the North Pacific over the next year (United States – 51, Canada – 12 and Japan – 24).

Technical Coordinator : Ron McLaren, meteorological Service of Canada

Annex V

RATIONALE FOR A DBCP-M2-TEST FORMAT

Background: It was noticed recently that the quality of pressure data reported from SVPBs deployed in certain regions where sea state was rough was not particularly good. Too high pressure data were reported on GTS for a number of drifters when compared with NWP models. At the same time, these pressure reports were often associated with high submergence rate. It should however be noticed that (i) problem is not systematic as there are buoys reporting good pressure data from rough sea state regions and showing high submergence values, and (ii) when submergence is low pressure reports are usually fine. Specific sea states of unknown nature might actually cause the observed problems. It is suspected that the despiking algorithm which is being used to remove pressure readings when the buoy is submerged is not always providing expected quality results.

Further investigation is therefore needed in order to (i) understand the cause(s) of the problem, and (ii) define a new more reliable despiking algorithm.

During the discussions, Jeff Wingenroth proposed the following:

> *" Currently, a sample of 160 readings is collected. The despiking algorithm takes the median of the 10 lowest readings and filters to include ALL readings that are within 1 millibar of this "10-lowest" figure. It then calculates the median of these filtered values."*
>
> *"This algorithm was designed to eliminate false pressure data that the buoy experiences when submerged. This can be difficult in extreme high sea states. Examining the algorithm, it is apparent that if there are less than six accurate readings, then the algorithm will fail by calculating a median that does not reflect the true pressure. A method is needed to validate the 10 lowest readings so there is reasonable assurance that the algorithm performs as expected."*
>
> *"As an initial step, we propose calculating the standard deviation of the 10 lowest readings. If it falls within an acceptable range (to be determined) then the reported pressure will be the median of all the readings that are within 1 millibar of the "10-lowest" median. If it is not within range, then the last good pressure will be reported but flagged as "INVALID"."*

This was discussed further with people listed above and basically agreed upon.

I order to (i) provide some better validation for the reported pressure data meant for GTS distribution, and (ii) permit further investigations and refine the algorithm, a new format called DBCP-M2-TEST was therefore proposed. It includes:

(i) The pressure value meant for GTS distribution (BP). This pressure value was obtained using the same algorithm as before.

(ii) A Quality Indicator (QI) to validate pressure value meant for GTS distribution. QI is computed from the Standard Deviation of the 6 lowest pressure readings. For the time being, it is proposed to permit GTS distribution only if QI≥ 2.

QI	**Meaning**
0	SD is >= 2.00
1	SD is 1.00 to 1.99
2	SD is 0.50 to 0.99
3	SD is 0.00 to 0.49

(iii) The number of samples that were within 1 hPa of the 10 lowest median.

(iv) The 10 lowest air pressure readings.

The last two items relate to information included in the Argos message which is not for GTS distribution. These values are here for investigation purposes only. In other words, when it is known that a bad pressure value was distributed on GTS we'll be able to go back to these readings, understand why this particular pressure value was bad, and hopefully improve design of despiking algorithm.

Proposed DBCP-M2-TEST format

DBCP-M2 Test Format
28-bit ID's only

	Item	Bits	Pos	Min	Max	Formula/Comments
Chk1	Checksum	8	0	0	255	Checksum = modulus 256 of the sum of the next 6 bytes
Rank	Rank of observation	4	8	0	15	Rank = n
AgeB	Age of observation at the time of next block update	6	12	0	63	Age (minutes)
BP	Barometric Pressure	11	18	850	1054.7	Press(hPa) = 0.1 n + 850
SST	Sea Surface Temp.	9	29	-5	35.88	SST(°C) = 0.08 n - 5
APT	Air Pressure tendency	9	38	-25.5	25.6	APT(hPa) = 0.1 n - 25.5
Subm	Submergence Count	6	47	0	100	Percent of time submerged = 100 n / 63
VBat	Battery Voltage	3	53	6	13	Voltage = n + 6
QI	Quality Indicator	2	56	0.0	3	Quality indicator of 6 lowest baro readings. See below for details.
NS	Number of samples	8	58	0.0	160	Number of samples that were within 1 millibar of 10 lowest median
AP01	10 Lowest Air Pressure Readings	11	66	850.0	1054.7	Press(hPa) = 0.1 n + 850
AP02	10 Lowest Air Pressure Readings	11	77	850.0	1054.7	Press(hPa) = 0.1 n + 850
AP03	10 Lowest Air Pressure Readings	11	88	850.0	1054.7	Press(hPa) = 0.1 n + 850
AP04	10 Lowest Air Pressure Readings	11	99	850.0	1054.7	Press(hPa) = 0.1 n + 850
AP05	10 Lowest Air Pressure Readings	11	110	850.0	1054.7	Press(hPa) = 0.1 n + 850
AP06	10 Lowest Air Pressure Readings	11	121	850.0	1054.7	Press(hPa) = 0.1 n + 850
AP07	10 Lowest Air Pressure Readings	11	132	850.0	1054.7	Press(hPa) = 0.1 n + 850
AP08	10 Lowest Air Pressure Readings	11	143	850.0	1054.7	Press(hPa) = 0.1 n + 850
AP09	10 Lowest Air Pressure Readings	11	154	850.0	1054.7	Press(hPa) = 0.1 n + 850
AP10	10 Lowest Air Pressure Readings	11	165	850.0	1054.7	Press(hPa) = 0.1 n + 850
Chk2	Checksum 2	8	176	0	255	Checksum = modulus 256 of the sum of the previous 15 bytes
	Total Bits		184			Remaining 8 bits is for 28-bit extension

NOTE: Quality indicator divides the Standard Deviation of the six lowest barometer readings into the following ranges:
3 - SD is 0.00 to 0.49
2 - SD is 0.50 to 0.99
1 - SD is 1.00 to 1.99
0 - SD is >= 2.00

Annex VI

SUMMARY OF REPORTS BY DATA MANAGEMENT CENTRES

Responsible National Oceanographic Data Centre (RNODC) for Drifting Buoys

The Responsible National Oceanographic Data Centre for Drifting Buoys (RNODC/DB) is operated by MEDS, Canada. RNODC/DB is collecting, controlling the quality, archiving and making available to users GTS drifting buoy data as well as GDP scientific drifter data provided by GDC. The number of buoy reports received and archived by MEDS increased substantially by 12% in the last 12 months while the number of buoys remained relatively constant (now 309000 from 837 buoys). The Panel noted that this was probably due to last year's DBCP recommendation to distribute all drifting buoy hourly data on GTS.

It was reported that since October 2002, MEDS is providing on a monthly basis the list of buoys which reported suspicious location data during the month. Such positions can also be seen through SVG maps made available at MEDS web site.

MEDS also reported that a lot of spam messages were received from the buoy-qc@vedur.is mailing list. The Panel asked the Coordinator to work with MEDS in order to tentatively solve this problem (e.g. filtering) (Action, TC/DBCP, MEDS). On the other hand, MEDS is still in the process of reprocessing its archives in order to be consistent with the new flagging policy regarding location data. MEDS reported that a large amount of duplicate and semi-duplicate buoy messages were distributed over the GTS. It is currently working on enhancing its duplicate software to deal more effectively with this issue but suggested that it should work with the TechnicalCoordinator in order to identify what could be done directly from the source (Action, TC/DBCP, MEDS).

MEDS provided support to the IABP and NPDBAP Action Groups, including SVG map applications which can be accessed via MEDS web site. For the NPDBAP, SVG map was shown within an electronic poster at PICES meeting in October 2002. Support was also provided for the establishment of a NPDBAP web site which is now hosted by NDBC. GDC reprocessed GDP data for the period 1979 to 2000 were submitted to MEDS for archive. In addition, two annual updates for up to June 2002 were submitted to MEDS. MEDS is currently working on updating the system that handles the SVP data to deal with more data than just location and temperature. It is expected that all MEDS archives will be up to date by the end of November 2003.

For next year, MEDS is planning on (i) finishing updating of all SVP/GDP data sent from AOML and update MEDS web site, (ii) finishing reviewing its processing system, in particular the duplicate check software, and (iii) completing the work of implementing new quality flags for location data and reprocess MEDS archives to include the flags.

Specialized Oceanographic Centre (SOC) for drifting buoys

The SOC for Drifting Buoys has been run continuously during year 2002-2003. A daily collection and archiving of buoy reports from the world ocean is performed by Météo-France, the French Meteorological service. As usual the French SOC for Drifting Buoys produces monthly products for buoys, moored buoys, drifting buoys, ships. Data are delivered on request, or on a regular basis and via Internet (ftp://ftp.shom.fr/meteo/daim). Collaboration within the Coriolis project (www.coriolis.eu.org) and with JCOMMOPS are two main aspects of this SOC, beside regular exchanges with other data centres, measurements teams and agencies, and with users. Different issues have been raised and examined this year between SOC and other relevant teams, however not directly linked to Drifting Buoys.

- Figures 1, 2, 3, 4, show the time evolution of reports for wind and for pressure respectively for all BUOY reports (showing all buoys, moored buoys and Drifting Buoys) and SHIP reports, since Dec. 2001.
- Figure 5 shows the time evolution of WAVEOB reports and sensors since the Dec. 2001.

Each month, mapping position plot charts and Marsden square distribution are produced for BATHY, TESAC, SHIP, BUOY and TRACKOB.

- Figures 6a,b to 10a,b show these products for July 2003. "a" stands for mapping position plot charts, and "b" for Marsden square distribution. Figure 6: BATHY, 7: TESAC, 8: SHIP, 9: BUOY, and 10: TRACKOB.

Each month, Marsden square distribution charts of mean monthly data availability (top) and percentage of BUOY reports compared to SHIP + BUOY reports (bottom) for wind, pressure, air temperature, sea surface temperature are produced.

- Figures 11 to 14 show such products for July 2003. Figure 11: Wind, 12: Pressure, 13: Air temperature, 14: Sea surface temperature.

Meteo-France continues to operate quality control procedures on drifting buoys data. Warning messages are sent to the *buoy-qc@vedur.is* mailing list of Internet when a problem appears (e.g. bad location detected) or when a modification seems needed (i.e. to recalibrate or to remove a sensor from GTS). Statistics on comparisons with analysis fields are set up for each buoy and each LUT (when several are used for transmitting the data of a buoy). Monthly statistics are sent to the *buoy-qc@vedur.is* mailing list too.

Buoy data QC tools developed by Meteo-France are available on the Internet (*http://www.meteo.shom.fr/qctools*) to help buoy operators to check their buoys : monthly statistics carried out by 4 meteorological centers for individual buoys ; plots of data and differences with model outputs ; blacklists of buoys reporting dubious air pressure values or being perhaps ashore can be seen.

Since the 1st of January 2002, Meteo-France has been providing the Coriolis Data Centre with surface current data computed thanks to SVP drifter tracks. Coriolis contributes to the French operational oceanographic project with in-situ data. Buoy positions, get from the GTS, are interpolated every 3 hours. Surface current data are computed over 6 hours, on a weekly basis. Data are flagged with drogue presence indexes. Wind speed and wind stress data from ECMWF analysis model will be later coupled with sampled surface current data.

Annex VII

PROPOSED TEMPLATE FOR GTS DISTRIBUTION OF BUOY DATA IN BUFR (adopted as "pre-operational" by ET/DRC, Arusha, February 2003)

Descriptor	Order	Forced value	Forced missing	Name	Comment
001003	1			WMO region	
001020	2			WMO region sub-area	
001005	3			Buoy/platform identifier	
002001	4			Type of station	
002036	5			Buoy type	
002149	6			Type of data buoy	
301011	7			Date	
301012	8			Time	
008021	9	26		Time significance	Value = "26" (time of last known position)
301011	10			Date	
301012	11			Time	
008021	12		Y	Time significance	Value = "missing"
301021	13			Latitude and longitude (high accuracy)	
027004	14			Alternate latitude (high accuracy)	
028004	15			Alternate longitude (high accuracy)	
007030	16			Height of station above MSL	
001051	17			Platform Transmitter ID (CCITT IA5)	
002148	18			Data collection and/or Location system	
001012	19			Platform drift direction	
001014	20			Platform drift speed	
002040	21			Method of removing platform direction and speed from current	
033022	22			Quality of buoy satellite transmission	
033023	23			Quality of buoy location	
033027	24			Location quality class (range of radius of 66% confidence)	
022063	25			Total water depth	
302021	26			Waves	
302022	27			Wind waves	
302023	28			Swell waves	
008081	29	3		Type of equipment (observing platform)	Equipment = "platform"
025026	30			Battery voltage	
008081	31	1		Type of equipment (transmitter)	Equipment = "transmitter"
025026	32			Battery voltage	
008081	33	2		Type of equipment (receiver)	Equipment = "receiver"
025026	34			Battery voltage	
008081	35		Y	Type of equipment – value Missing = cancel	Value = "missing"
002034	36			Drogue type	
022060	37			Lagrangian drifter drogue status	
007070	38			Drogue depth	
002190	39			Lagrangian drifter submergence	
025086	40			Depth correction indicator	
002035	41			Cable length	
002168	42			Hydrostatic pressure of lower end of cable	
020031	43			Ice deposit (thickness)	
002038	44			Method of temperature and/or velocity measurement	
306004	45			Digitization, depth/salinity method, depths/salinities/temperatures	
002030	46			Method of current measurement	
306005	47			Time/duration of current measurement, depths/directions/speeds	
007031	48			Height of barometer above MSL	
008081	49	0		Type of equipment (sensor)	Equipment = "sensor"
012064	50			Instrument temperature	
302001	51			Pressure and pressure change	
008081	52		Y	Type of equipment – value missing = cancel	Value = "missing"
007032	53			Height of sensor above marine deck platform (for temp.&hum. measurement)	Here height of thermometer
007033	54			Height of sensor above water surface (for	Here height of

Descriptor	Order	Forced value	Forced missing	Name	Comment
				temp.&hum. measurement)	thermometer
012101	55			Dry-bulb temperature (scale 2)	
012103	56			Dew-point temperature (scale 2)	
013003	57			Relative humidity	
007032	58			Height of sensor above marine deck platform (for wind measurement)	Here height of anemometer
007033	59			Height of sensor above water surface (for wind measurement)	Here height of anemometer
008082	60			Artificial correction of sensor height to another value	
007033	61			Height of sensor above water surface (here height of anemometer to which it is artificially corrected)	Here height of anemometer to which it is artificially corrected
002169	62			Anemometer type	
002002	63			Type of instrumentation for wind measurement	
008021	64	2		Time significance	Value = “2” (time averaged)
004025	65			Time period in minutes	
011001	66			Wind direction	
011002	67			Wind speed	
008021	68		Y	Time significance	Value = “missing”
004025	69			Time period in minutes	
011043	70			Maximum wind gust direction	
011041	71			Maximum wind gust speed	
008082	72		Y	Artificial correction of sensor height to another value (set to missing to reset previous value)	Value = “missing”
007033	73		Y	Height of sensor above water surface (set to missing to cancel previous value)	Redefine height to previous level
007032	74			Height of sensor above marine deck platform (for precipitation measurement)	Here height of precipitations
004024	75			Time period in hours	
013011	76			Total precipitation	
007032	77		Y	Height of sensor above marine deck platform (set to missing to cancel the previous value)	Value = “missing”
008021	78	3		Time significance	Value = “3” (accumulated)
004024	79			Time period in hours	
014021	80			Global radiation, integrated over period specified	
008021	81		Y	Time significance	Value = “missing”
025028	82			Operator or manufacturer defined parameter (#1)	
025028	83			Operator or manufacturer defined parameter (#2)	
025028	84			Operator or manufacturer defined parameter (#3)	

Annex VIII

FINANCIAL STATEMENTS

Financial Statement by IOC
for the year 1 June 2002 to 31 May 2003

(all amounts in US $ unless otherwise specified)

BALANCE (from previous years)		**31,530**
FUNDS TRANSFERRED FROM WMO (relevant to the period)		
(28.05.2003)	118,000	**118,000**
TOTAL RECEIPTS		**149,530**
EXPENDITURES		
Technical Co-ordinator's employment:		**104,190**
Salary:	?	
Allowances:	?	
Relocation (yearly provision):	?	
Technical Co-ordinator's missions:		**16,954**
Victoria/Ottawa (5-12 June 2002)	2,920	
Cape Town (29 July-2 August 2002)	3,326	
Martinique (14-23 October)	2,526	
Geneva (3-4 December 2002)	910	
Brest (28-29 January 2003)	1,207	
Melbourne/Paris (3-14 March 2003)	4,566	
Madrid (27-28 May 2003)	1,499	
Contract with CLS/Service Argos		**12,200 €**
	in US $:	**13,910**
TOTAL EXPENDITURES		**135,054**
BALANCE (at 1 June 2003)		**14,476**

World Meteorological Organization

Data Buoy Co-operation Panel
Interim Statement of Account as at 31 August 2003

	US$	US$
Balance from 2001		(1,984)
Contributions Paid for Current Biennium		394,842
Total Funds Available		392,858
Obligations Incurred		
Consultants	212,545	
Travel	56,785	
Bank charges	46	
Publications of reports	516	
Postage	847	
Contribution to JCOMMOPS Data Devt	5,000	
Payment to IOC/ Logistic Support	10,000	
Support Cost	2,857	
		288,596
Balance of Fund	US $	104,262
Represented by.		
Cash at Bank		112,279
Exchange Adjustments		(4,400)
Unliquidated obligations-prior years	(3,617)	
Unliquidated obligations-current year	-	(3,617)
Accounts Payable		-
	US $	104,262

CONTRIBUTIONS	2002	2003	Total
Australia	13,500	12,500	26,000
Canada	12,015	10,000	22,015
CLS/France (for ARGOS JTA Chairman)	10,000	10,000	20,000
FAO	10,000	-	10,000
France	-	-	-
Germany	5,000	5,000	10,000
Greece	2,200	2,200	4,400
Iceland	1,500	1,500	3,000
Ireland	1,118	1,290	2,408
Japan	10,000	10,000	20,000
Netherlands	1,575	1,575	3,150
New Zealand	1,000	719	1,719
Norway	1,575	1,575	3,150
South Africa	3,000	3,000	6,000
United Kingdom	19,000	-	19,000
USA	86,000	158,000	244,000
TOTAL	177,483	217,359	394,842

Prepared on 24 Sept 2003

PROVISIONAL ESTIMATE OF INCOME AND EXPENDITURE
UNTIL 31 MAY 2004

Income	**USD**
Balance of fund from interim account	104,262
Additional contributions	10,000
Expenditure	
JTA chairman contract	7,500
JCOMMOPS logistics contribution (€12,200)	14,000
Travel of chairman/vice-chairmen/JTA chairman	3,000
Contribution to WMO for publications	6,000
Total	30,500
Anticipated balance to transfer to 2003/2004 account	83,762

Annex IX

EXPENDITURES AND INCOME FOR 2000-2005

	Actual 2000 and 2001 (2 years)	Estimated 2002 and 2003 (2 years)	Estimated 2004 (1 year)
		USD	
Expenditures			
Technical Coordinator (Salary, Travel and Logistics)	252,000	(252,000)	126,000
Travel (chair, vice-chairs and JTA chair)	16,881	(27,952)	15,000
JTA chairman	14,460	(8,000)	8,000
Publications	25,416	(6,000)	6,000
CLS/equipment	5,000	(10,000)	10,000
WMO/charges	9,679	2,857	1,500
WMO marine programme refund		18,000	
Contingencies			2,762
TOTAL	323,436	(314,809)	169,262
Income achieved/required to balance expenditures			
Contributions	281,909	(314,842)	165,550
Carry forward from previous biennium	37,798	-3,729	3,762
Carry over to next biennium	-3,729	3,762	
TOTAL	323,436	(314,809)	169,262

Annex X

TABLE OF PROVISIONAL CONTRIBUTIONS

DBCP

	2002-2003	**2003-2004**	**2004-2005**
AUSTRALIA (including one-off payment 2002)	13,500	12,500	12,500
CANADA (including one-off payment 2002)	12,015	10,000	10,000
FRANCE	Not received	(11,000) (€ 10,000)	10,000
GREECE	2,200	2,200	2,200
ICELAND	1,500	1,500	1,500
IRELAND	1,118 (IR£ 1,000)	1,290 (€ 1,270)	1,200
JAPAN	5,000	5,000	5,000
NETHERLANDS	1,575	1,575	1,575
NEW ZEALAND	1,000	1,000	1,000
NORWAY	1,575	1,575	1,575
SOUTH AFRICA	3,000	3,000	3,000
UNITED KINGDOM (including one-off payment 2002)	18,000	16,000	16,000
USA (including one-off payment 2002)	76,000	69,000	70,000
JTA (for JTA chair support)	10,000	10,000	10,000
TOTAL	**146,483**	**(145,640)**	**145,550**

SOOPIP

	2002-2003		2003-2004		2004-2005
Germany	5,000		5,000		5,000
Japan	5,000		5,000		5,000
USA	10,000		10,000		10,000
TOTAL	**20,000**		**20,000**		**20,000**

TOTAL INCOME FROM CONTRIBUTIONS

	2002-2003		2003-2004		2004-2005
TOTAL	**166,483**		**(165,640)**		**165,550**

Annex XI

DBCP IMPLEMENTATION & TECHNICAL WORKPLAN FOR THE 19th YEAR

PART A - Summary of tasks

1. Analyse programme information & other data as appropriate & in particular in accordance with DBCP global programme implementation strategy.

2. Assist in the planning & implementation, as appropriate, of the ocean data buoy component of GOOS, GCOS & CLIVAR.

3. Implement database of buoy programme information on JCOMMOPS web server.

4. Update & amend, as necessary, the DBCP World Wide Web server, including up to date information on existing & planned data telecommunication systems.

5. Continue investigation regarding developments in communication technologies & facilities, relevant to the collection of sensor &/or location data from buoys.

6. Update & publish new versions of DBCP publications No. 3 (Argos guide) & 4 (SVPB design reference). Produce new publications: 2003 Annual Report, Workshop Proceedings (CD-Rom and web only).

7. Develop & implement cooperative buoy deployment strategies, in particular with the GDP, to provide buoy networks which serve both research & operational applications.

8. Organize scientific & technical workshop at DBCP-XX

9. Monitor & evaluate quality of pressure & wind data from SVPB & SVPBW drifters (% of gross errors increase for AP and WS, spiking problem).

10. Review DBCP-M2-TEST format.

11. Encourage other centres to act as PMOC

12. Recommend to JTA inclusion within the Argos Development Programme of BUFR compression capability for the Argos GTS sub-system.

13. Document calibration procedures

14. Provide the Technical Coordinator with deployment opportunities (maps & point of contact) for inclusion on the JCOMMOPS web server.

15. Produce table of national commitments in the Southern Ocean (by next Panel's session).

16. TC to discuss with GDP how proposed deployment notification scheme could be coupled with GDP scheme. TC to visit GDC in early 2003.

17. TC to write to EGOS to seek agreement for using EGOS metadata collection scheme for the global DBCP collection scheme.

18. Relevant panel members to routinely (e.g. monthly) provide the Technical Coordinator with the list of moored buoys they operate and which are reporting in SHIP format. This list must be provided in an electronic form in a format suitable for automatic data processing. Format to be defined with TC.

19. Enhance buoy safety through improved design (refer recommendations) and keep the Panel informed about related changes.

20. Analysis on a possible relationship between drogue lifetime and manufacturer; the study to include physical location of drogue failure.

21. Buoy operators to make sure that metadata that can be included in BUOY section 4 are routinely provided to Service Argos for actual GTS distribution.

22. Investigate flagging of GTS data in BUFR reports.

23. Update implementation strategy to take into account new programmes such as JCOMM, Argo, etc. References to findings of GOOS adequacy report and the UNFCCC/SBSTA. Panel Members to provide D. Meldrum with comments on the implementation strategy document.

24. TC to discuss with IMO, Iceland, how SPAM messages could be eliminated or filtered out from the buoy-qc mailing list.

25. Quality Information Messages posted onto the dedicated web page at JCOMMOPS to be automatically redirected to the buoy-qc mailing list.

26. TC to coordinate with Panel Members and CBS ET/DRC review of BUFR template for buoy data.

27. Panel Members to evaluate Argos two-way.

28. China to contact the Technical Coordinator to discuss details of metadata submission (i.e. medium and/or protocol and format) to the JCOMM ODAS metadata database.

29. TC and MEDS to address the issue of duplicate and semi-duplicate GTS buoy reports and suggest solutions.

30 The satellite telecommunications requirements matrix to be provided NOAA to the TC, to be made available on the DBCP web site and circulated to the Action Groups for input.

31. TC to review and update as necessary the leaflet on vandalism, and ,make this available on the DBCP web site.

DBCP IMPLEMENTATION & TECHNICAL WORKPLAN FOR THE 19th YEAR

PART B

TASK	CARRIED OUT BY*	SUPPORTED/ ASSISTED BY	REPORTED TO/ ACTION BY
1	TC	Vice-chairmen	Chairman for presentation to the panel
2	DBCP	Panel members	Panel
3	TC		Panel
4	NOAA/AOML & TC	Chairman	Panel
5	Chairman & TC	Chairman & Panel members	Panel
6	TC, Secr.	Service Argos (No. 3), SIO (No. 4), Panel Members	Panel
7	Regional action groups, GDC	Panel members, TC	Panel, GDP
8	Mr. Ken Jarrott	Secr.	Panel
9	DBCP evaluation group		Panel
10	Eval. Group		Panel
11	Panel Members	TC	Panel
12	JTA	TC, Service Argos	Panel, JTA
13	Panel Members		JCOMM sub-group on MC
14	Members		TC
15	TC	Panel Members	Panel
16	TC	GDC	Panel
17	TC		EGOS, Panel
18	Panel Members	TC	Panel
19	Manufacturers	Panel Members	Panel
20	GDC		Panel
21	Buoy operators	Service Argos	
22	TC	CBS ET/DRC	Panel
23	Chairman	Panel Members	Panel
24	TC	Iceland	Panel
25	TC		Panel
26	TC	Panel Members, CBS ET/DRC	Panel
27	Panel Members	Service Argos	Panel
28	China	TC	Panel
29	TC	MEDS, Service Argos	Panel
30	Rob Bassett, TC	AG	Panel
31	TC		Panel

DBCP ADMINISTRATIVE WORKPLAN FOR THE 19th YEAR

PART A - Summary of tasks

1. Maintain summary of requirements for buoy data to meet expressed needs of the international meteorological & oceanographic communities.

2. Maintain a catalogue of existing ongoing ocean data buoy programmes

3. Maintain a list of national contact points for the DBCP & within other relevant bodies with potential for involvement in DBCP activities.

4. Identify sources of buoy data not currently reported on the GTS & determine the reason for their non-availability.

5. If deemed necessary, make proposals for coordination activity as a result of the above actions to address items 2 to 6 in the terms of reference of the DBCP.

6. Arrange for the circulation of information on the Panel's activities, current & planned buoy programmes & related technical development/evaluations, including via distribution of existing DBCP publications to potential Argos GTS users.

7. Monitor the operation of the Argos GTS processing sub-system & arrange for modifications as necessary.

8. Continue the arrangements (including finance) to secure the services of a technical coordinator.

9. Review programme & establish working priorities of the technical coordinator.

10. Prepare annual report of the DBCP.

11. Support, as required, existing DBCP action groups (EGOS, IABP, IPAB, ISABP, IBPIO, GDP, TIP, NPDBAP), and provide assistance on request to other internationally coordinated buoy programme developments.

12. Investigate requirements for initiating new coordinated buoy deployments in other ocean areas such as the Black Sea.

13. Make every effort to recruit new contributors to the trust fund.

14. Keep up-to-date with the latest buoy technical developments.

15. Coordinate operation of DBCP QC guidelines.

16. Follow up & possibly assist in implementing requirements expressed by the buoy users within the Argos system.

17. Provide technical workshop papers to WMO Secretariat (end December) & publish proceedings (mid 2004).

18. Submit national reports & Action Group reports in electronic form to the technical coordinator for inclusion in the DBCP server.

19. Prepare & distribute revised budget estimates for 2004-2005

20. Secr. & members to identify necessary funding to allow for expansion of JCOMMOPS & AIC staffing & resources.

21. Interested Member states to make commitments to the DBCP newly established budget line of the DBCP trust fund dedicated to instrument evaluation. Chairman to write formally to WMO to establish the budget line.

22. Continue development of JCOMMOPS.

23. Make a study on the necessity, or otherwise, of having two different centres in JCOMM dealing with the same kind of data, as is the case for the RNDOC/DB and SOC/DB.

24. Review to assess the benefits and efficiency that might be achieved by extending the TOR of JCOMMOPS to include also support for VOS and ASAP.

25. IBPIO to take the lead in implementing support for an Indian Ocean Observing System as far as data buoys are concerned.

26. TC to inform chairman of his wish or otherwise to continue to work as TC/DBCP for the period 1 June 2005 to 31 May 2006.

27. Review DBCP aims, objectives, and ToR. Secretariats to include an agenda item to this effect on agenda of future meetings.

28. DBCP Members to participate at seminar to celebrate 150th anniversary of the International Marine Conference.

29. Panel Members to provide the Technical Coordinator with short articles for inclusion in JCOMMOPS News section of its web site.

30. PDF version of the DBCP brochure on DBCP web site. Panel Members to suggest revisions of the brochure.

31. Technical Coordinator to investigate conditions under which the Panel might provide input to Port Technology International. Panel Members to provide input for initial article to the TC/DBCP.

32. Panel Members to check the DBCP list of National Focal Points for logistical facilities and report discrepancies, changes, or additions to the WMO Secretariat. List to be possibly integrated as a JCOMM list.

33. Secretariats to contact IHO, IMO, FAO, international fisheries bodies such as International Tuna Commission on the issue of vandalism to provide them with the DBCP leaflet to ask them to distribute it.

34. Secretariats to send a reminder to Member States regarding the need to publicize widely value and applications of buoy data.

35. Technical Coordinator to write to EGOS to seek agreement to use future EGOS metadata collection scheme for the global DBCP scheme.

36 Secretariat to investigate upgrading the DBCP list of NFP for logistic facilities to a more general JCOMM list.

37. TC to investigate with buoy operators their possible future requirements (long term) for satellite telecommunications for buoy data.

DBCP ADMINISTRATIVE WORKPLAN FOR THE 19th YEAR

PART B

TASK	CARRIED OUT BY*	SUPPORTED/ ASSISTED BY	REPORTED TO/ ACTION BY
1	TC	Panel members & Secr.	Chairman for presentation to the panel
2	TC	Panel members & Secr.	Chairman & panel for information
3	Secr.	Panel members	Chairman & panel for information
4	TC, CLS	Panel members & Secr.	Chairman & panel for information
5	Chairman & TC	Secr. & others as appropriate	To Panel for consideration & appropriate action or for direct action by chairman
6	TC	Chairman, Secr. & CLS	Wide circulation by Secr. & CLS
7	TC	CLS	Panel & users
8	Chairman & sub-committee	Secr.	Secr.
9	Panel/chairman		Panel (at next session)
10	Chairman & Secr.	TC	Executive Councils of WMO & IOC
11	Chairman & Secr.	TC	Panel
12	Ukraine, Chairman & Secr.	EGOS, Panel members	Panel
13	Chairman	Panel members	Panel
14	Operational services, chairman, vice-chairmen & TC	Panel members	Panel
15	TC	Panel members & operational services	Panel
16	CLS	TC	Panel, meeting on JTA
17	Panel members, Secr.		Panel
18	Panel members, AG, TC		Panel
19	Secr.		Panel
20	Secr. & panel members		
21	Panel members, Chairman		WMO, Panel
22	DBCP TC & Argo TC	Panel Members, Secr., CLS	Panel
23	RNODC/DB, SOC/DB	JCOMM	Panel
24	JCOMM SOT	VOS, ASAPP, SOOP	SOT, DBCP, JCOMM
25	IBPIO	DBCP Chair, TC, Secr.	Panel
26	TC		Chairman
27	Secretariats		Panel
28	Panel Members		
29	Panel Members	JCOMMOPS	
30	Panel Members	TC	Panel
31	TC	Panel Members	Panel
32	Panel Members	WMO Secretariat	WMO Secr.
33	Secretariats		Panel
34	Secretariats		Panel
35	TC	EGOS	Panel
36	Secretariat		Panel
37	TC	Panel	Panel

Annex XII

LIST OF ACRONYMS AND OTHER ABBREVIATIONS

ADEOS	Advanced Earth Observing Satellite (Japan)
AIS	Argo Information Centre
AOML	Atlantic Oceanographic and Meteorological Laboratory (NOAA)
ARGO	Array for Real-time Geostrophic Oceanography programme
ASAP	Automated Shipboard Aerological Programme
BATHY	Bathythermograph report
BOM	Bureau of Meteorology (Australia)
BUFR	Binary Universal Form for Representation of Meteorological Data
	BUOY Report for Buoy Observations
CBS	Commission for Basic Systems (WMO)
CHMI	Czech Hydrometeorological Institute
CIMO	Commission for instruments and Methods of Observation (WMO)
CLIVAR	Climate Variability and Predictability (WCRP)
CLS	Collecte Localisation Satellites
CNES	Centre National d`ètudes spatiales (France)
COP	Conference of the Parties to the Framework Convention on Climate Change
DART	Deep-ocean Assessment and Reporting of Tsunamis
DBCP	Data Buoy Cooperation Panel (WMO-IOC)
DWD	Deutscher Wetterdienst
ECMWF	European Centre for Medium-Range Weather Forecasting
EGOS	European Group on Ocean Stations
ET	Expert Team
ET-ODRRGOS	CBS Expert Team on Observational Data Requirements and Redesign of the Global Observing System
FAO	Food and Agriculture Organization of the United Nations
FRGPC	French Argos Global Processing Centre
GAC	Global Area Coverage
GCOS	Global Climate Observing System
GDP	Global Drifter Programme
GIS	Geographic Information System
GLOSS	Global Sea-Level Observing System
GODAE	Global Ocean Data Assimilation Experiment
GOOS	Global Ocean Observing System
GTS	Global Telecommunication System (WMO)
HRPT	High Resolution Picture Transmission
IABP	International Arctic Buoy Programme
IBPIO	International Buoy Programme for the Indian Ocean
ICES	International Council for the Exploration of the Sea
IFREMER	Institut Francais de Recherche pour l`èxploitation de la Mer
IGOOS	Intergovernmental Committee for GOOS
IHO	International Hydrographic Organization
IMO	International Maritime Organization
IMO	Iceland Meteorological Office
INMET	Brazilian National Institute of Meteorology
INPE	Instituto National de Pesquisas Espaciais (Brazil)
IOC	Intergovernmental Oceanographic Commission (of UNESCO)
IODE	International Oceanographic Data and Information Exchange (IOC)
IRD	Instituit francais de recherche scientifique pour le dévelpment en coopération (ex ORSTOM)
ISABP	International South Atlantic Buoy Programme
JCL	Joint Circular Letter

JCOMM	Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology
JCOMMOPS	JCOMM Observing Platform Support Centre
JMA	Japan Meteorological Agency
JOMDB	JCOMM in situ ODAS Metadata Database
JTA	Argos Joint Tariff Agreement
LAC	Local Area Coverage
KNMI	Royal Netherlands Meteorological Institute
MEDS	Marine Environmental Data Service (Canada)
MSC	Meteorological Service of Canada
MSNZ	Meteorological Service of New Zealand
NCEP	US National Centers for Environmental Prediction
NDBC	National Data Buoy Center
NESDIS	NOAA Satellites and Information Service
NOAA	National Oceanographic and Atmospheric Administration (USA)
NPDBAP	North Pacific Data Buoy Advisory Panel
NPOESS	National Polar Orbiting Environmental Satellite (USA)
NWP	Numerical Weather Prediction
NWS	National Weather Service (NOAA)
OCG	JCOMM Observations Programme Area Coordination Group
ODAS	Ocean Data Acquisition Systems
ONR	Office of Naval Research (USA)
OOPC	Ocean Observation Panel for Climate (of GOOS, GCOS, WCRP)
OOSDP	Ocean Observing System Development Panel
OPSCOM	U.S. Argos Operations Committee
PIRATA	Pilot Research Moored Array in the Tropical Atlantic
PMEL	Pacific Marine Environmental Laboratory (USA)
PMO	Port Meteorological Officer
PMOCs	Principal Meteorological or Oceanographic Centres
PMT	Platform Messaging Transceiver
POES	Polar-orbiting Operational Environmental Satellite
QC	Quality Control
RMS	Root Mean Square
RNODC	Responsible National Oceanographic Data Centre
SAWS	South African Weather Service
SBSTA	Subsidiary Body for Scientific and Technological Advice (of the COP)
SCOR	Scientific Committee on Oceanic Research
SOBP	Southern Ocean Buoy Programme
SOC	Specialized Oceanographic Centre
SOOP	Ship-of-Opportunity Programme
SOOPIP	JCOMM Ship-of-Opportunity Programme Implementation Panel
SOT	Ship Observations Team (JCOMM)
SST	Sea Surface Temperature
STIP	Stored TIROS Information Processor
SUA	Argos System Use Agreement
SVP	Surface Velocity Programme Drifter
SVPB	Surface Velocity Programme Barometer Drifter
TAO	Tropical Atmosphere Ocean Array
TIP	TAO Implementation Panel
UKMO	United Kingdom Meteorological Office
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
URL	Universal Resource Locator
USGPC	US Argos Global Processing Center
VOS	Voluntary Observing Ship
VSOP-NA	VOS Special Observing Project-North Atlantic
WIOMAP	Western Indian Ocean Marine Applications Project

WMO	World Meteorological Organization
WOCE	World Ocean Circulation Experiment (WCRP)
XBT	Expendable Bathythermograph