WORLD METEOROLOGICAL ORGANIZATION

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION (of UNESCO)

DATA BUOY COOPERATION PANEL
THIRTEENTH SESSION

St. Denis, La Réunion, France, 13-17 October 1997

FINAL REPORT

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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 associated with the thirteenth session of the Data Buoy Cooperation Panel (DBCP) was opened at 0930 hours on Monday 13 October 1997 in the conference room of Météo France, St. Denis, La Réunion, by the chairman of the DBCP, Mr G. Brough. He welcomed all participants to the session and to the workshop, noting that the large participation was testimony to the importance with which the work of the panel was now regarded, as well as the ever-increasing interest in this work and in the applications of buoy data in both meteorology and oceanography. He also noted that the new format for combining the workshop with the regular panel session appeared particularly appropriate. The chairman expressed his sincere thanks, on behalf of all participants, to Météo France, and in particular to Mr Alain Soulan and his staff in La Réunion for hosting the session and workshop and for providing such excellent facilities and support and warm hospitality.

1.1.2 The Interregional Director of Météo France in La Réunion, Mr A. Soulan, welcomed participants on behalf of Météo France. He stressed the importance of the work of the panel and of buoy data generally to operational meteorology and particularly to forecasting in the Indian Ocean region. He reiterated that the meetings and participants had the full support of Météo France throughout the two weeks, and wished everyone a very enjoyable stay in La Réunion.

1.1.3 On behalf of the Secretary-General of WMO and the Executive Secretary IOC, the representative of the WMO Secretariat also welcomed participants to the workshop and DBCP session, and in doing so expressed the sincere thanks of both organizations to Météo France and to Mr Soulan and his staff for their excellent support for the meetings, for the panel and for the work of WMO and IOC in general.

1.1.4 The list of participants in the workshop is included in the proceedings, which are published as a DBCP Technical Document.

1.2 Opening of the DBCP session

1.2.1 The formal meeting component of the thirteenth session of the DBCP was opened at 1430 hours on Tuesday 14 October 1997 in the conference room of Météo France, St. Denis, La Réunion, again by the chairman of the panel, Mr G. Brough.

1.2.2 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 The panel agreed the hours of work and other arrangements necessary for the conduct of the session. The documentation was introduced by the Secretariats.

B. IMPLEMENTATION COMPONENT

2. IMPLEMENTATION REPORTS

2.1 Report by the technical coordinator

2.1.1 Mr. Etienne Charpentier reported on his activities as technical coordinator of the DBCP (TC/DBCP) during the last intersessional period. He was employed by IOC and located at CLS, Service Argos. He nominally spent every Tuesday at Météo France working on case studies.

2.1.2 Besides attending DBCP-12 and JTA-16 sessions, Henley on Thames, in October 1996, the technical coordinator spent one week in mission in USA visiting the US Naval Oceanographic Office, the NOAA National Data Buoy Center, Mississippi (NDBC), the NOAA Global Drifter Center (GDC), Miami, Woods Hole Oceanographic Institute (WHOI), Massachusetts, and the NOAA National Ocean Service (NOS), Silver Spring. He visited WHOI in conjunction with the vice-chairman of the DBCP, Mr. Bill Woodward, to study feasibility of distributing PALACE sub surface float drifter data onto the GTS. The TC/DBCP represented the panel at the IABP and IBPIO action group meetings, respectively held in Saint Petersburg, 3-5 June 1997, and Perth, 21-23 July 1997.

2.1.3 Compared to the previous intersessional period, he spent more time on user assistance issues and at Météo France, and less time on monitoring, quality control (because of QC guidelines automation), and in missions. At Météo France, he developed tools for case studies. All needed tools are available now.

2.1.4 A substantial amount of time was spent working on the DBCP Web Server, and on the Argos GTS sub-system. With support from Météo France, NOAA/NWS, USA, and MEDS, Canada, the TC/DBCP implemented so called "data-flow control" tools on the DBCP Web Server. Tools are useful for users with no GTS access who are interested to know whether their buoys are reporting on GTS. However, tools presently suffer from poor performances because of computer power limitations. NOAA/AOML plans to replace the DBCP Web. Server machine with a more powerful one. The Technical Co-ordinator worked with CLS, Service Argos, in implementing remote GTS Technical file access within the Argos GTS sub system. This facility is now operational and works via electronic mail.

2.1.5 Quality control guidelines have been partly automated, updated accordingly, and information circulated among the various actors. The report on DBCP views on BUFR is finalised according to discussions within the dedicated DBCP sub-group. The report, which was reviewed by the panel at the present session, will be submitted to CBS in 1998 for implementation of the proposed changes in 1999.

2.1.6 The full report of the technical coordinator is given in Annex III, which also includes the list of normal tasks undertaken by him during any intersessional period and which are not detailed above. The panel expressed its appreciation to the technical coordinator for the work accomplished on its behalf during the past intersessional period, as well as in previous years. Discussion on various issues raised is recorded under appropriate agenda items.

2.2 Reports by the action groups and related programmes

2.2.1 The panel noted written reports by the European Group on Ocean Stations (EGOS), the International Arctic Buoy Programme (IABP), the International Programme for Antarctic Buoys (IPAB), the International South Atlantic Buoy Programme (ISABP) and the International Buoy Programme for the Indian Ocean (IBPIO). These reports would be published in the Annual Report of the panel as usual, together with the report from the Global Drifter Programme.

2.2.2 The following paragraphs contain the main highlights of the reports by the action groups of the panel.

The European Group on Ocean Stations

2.2.3 Mr D W Jones, vice-chairman of the EGOS Management Committee, gave an oral presentation on EGOS activities and on the status of moored and drifting buoys in the North Atlantic. He introduced the EGOS summary report for the year and noted that the operational EGOS programme had been particularly successful in 1997 with a significant increase in the number of drifting buoys deployed. This was in part as a result of several members contributing extra buoys to the multi-national FASTEX experiment, the field phase of which was carried out in January and February.

2.2.4 Mr Jones was particularly pleased to inform the session that France formally joined the group during the year, and was already providing valuable extra buoys to the programme, plus the expertise and services of the Centre de Météorologie Marine, in Brest. Consequently the total number of buoys operational in EGOS at the end of August 1997 was 38 drifting and 7 moored.

2.2.5 Maintaining a high data availability rate with minimum time delay between time of observation and insertion onto the GTS remains a high priority for the group, and in this respect the impact provided by the two Local User Terminals in Oslo and Sondre Stromfjord was emphasised

2.2.6 A major concern of the group expressed at its June meeting, held at SMHI in Norkoping, Sweden, was the unacceptably high number of buoys of the SVP-B design that failed on or shortly after deployment. In this respect Mr Jones reported that he was pleased that the panel had at this meeting agreed to investigate this matter further with the manufacturers during the next intersessional period.

International Arctic Buoy Programme (IABP)

2.2.7 Mr. Charpentier reported on behalf of the IABP. The 7th annual session of the IABP was held in St. Petersburg, 3-6 June 1997. The IABP remains active with 24 organizations spanning 10 countries and one international organization participating. The number of buoys operating on ice in the Arctic basin in August 1997 was 28. A buoy position map and status sheet, updated monthly, is available from the IABP web site at **http:// iabp.apl.washington.edu/**. The Programme decided to include fixed stations on islands and coastal stations in its activities and updated its operating principles accordingly. Drifting buoys deployed include CALIB buoys (Air Pressure only, 1 year life time), and ICEX buoys (air pressure and air temperature, 3 years life time) which are air deployed plus other types of buoys such as IOEB (JAMSTEC/WHOI), and ZENO buoys. Additional buoys will be deployed in September 1997 in the northern Beaufort Sea as part of the SHEBA programme (Surface Heat Budget of the Arctic Ocean).

2.2.8 Besides basic measurements such as air pressure and air temperature, it is planned to measure additional variables such as ice temperature and internal stress. Very accurate positions using GPS are used for studying convergence and divergence within ice fields and rotation of ice floats.

2.2.9 IABP is organizing a mini-conference in conjunction with its 8th session. The conference "The Arctic Buoy Programme: Scientific Achievements from the first 20 years" will be held in Seattle, 3-4 August 1998. A workshop on "Operational Sea Ice Charts of the Arctic" will also be held in conjunction with the conference, 5-7 August 1998.

2.2.10 IABP has requested the DBCP to cosponsor the conference. The DBCP discussed the issue and decided to cosponsor the conference with IABP, under the understanding that no financial support could be provided. The panel may offer limited secretariat support if required, plus participation from panel members and/or the technical coordinator.

The International Programme for Antarctic Buoys (IPAB)

2.2.11 A report from the International Programme for Antarctic Buoys (IPAB) was tabled during the session. It was clear from the report that the IPAB is doing well and that their activities in 1998 will continue at a level similar to that of the last few years.

The International South Atlantic Buoy Programme (ISABP)

2.2.12 The fourth Programme Committee meeting of the ISABP was held in Port-of-Spain, Trinidad, during the week of 8 September 1997. The meeting was both enjoyable and productive. Participants pooled resources during the meeting and came to the conclusion that the programme was strong and progressive. The web site for the ISABP is:

http://www.dbcp.nos.noaa.gov/isabp.html

2.2.13 A list of tasks and responsibilities to be performed by individuals and groups of participants during the intersessional period was drawn up. This list plus other accomplishments and problems encountered during the intersessional period will form the basis of the fifth Programme Committee meeting scheduled for August 1998 in Buenos Aires. The panel supported the proposal by ISABP-IV to investigate the possibilities for the installation of an Argos LUT in South America, and requested its chairman to make a formal request to the following JTA meeting for this proposal to be adopted as an Argos development project.

The International Buoy Programme for the Indian Ocean (IBPIO)

2.2.14 The second meeting of the IBPIO was held in Perth, Australia, from the 21st to the 23rd of July 1997. Five organisations have formally joined the programme during the intersessional period:

Bureau of Meteorology - Australia
Global Drifter Centre of NOAA/AOML
Météo-France
National Institute of Oceanography (NIO), India
South African Weather Bureau (SAWB).

2.2.15 More than sixty drifting buoys have been deployed during the 96-97 intersessional period. For the next intersessional period, about 80 drifting buoys should be deployed.

2.2.16 At the last meeting, the Programme Committee was asked to prepare a plan for improved monitoring of cyclone activity before the 97/98 tropical cyclone season.

2.2.17 Besides a quarterly newsletter, IBPIO information is available on the World Wide Web at: **http://www.shom.fr/meteo/ibpio**

The Global Drifter Programme (GDP)

2.2.18 The GDP Operating Principles and the Program Coordinator's Terms of Reference have been drafted, and they may be obtained at the GDP world wide web site at:

http://www.aoml.noaa.gov/phod/dac/gdc.

2.2.19 During the period 01 October 1996 to 01 October 1997, drifter deployments conducted solely for the Global Drifter Program were severely restricted by Argos data processing budget limits. Data processing costs incurred from previous drifter deployments exceeded the allotted 125 PTT-year GDP JTA commitment, consequently drifters were deployed only under special circumstances. Since drifter purchases exceeded deployments, the GDC has acquired a sizable inventory of drifters. Only recently has the GDP PTT usage rate reached a sustainable 125 PTT-year level.

2.2.20 During the course of the year, there were four conditions under which deployments were permitted:

(i) prior GDP commitments,
(ii) cooperative deployments where Argos fees are funded by others,
(iii) Equatorial Pacific deployments to monitor the 1997 ENSO event, and
(iv) drifters already placed aboard VOS ships.

2.3 National reports

2.3.1 The panel noted the written reports by Australia, Canada, France, Iceland, Japan, the Netherlands, New Zealand, South Africa, Thailand and the USA. It requested that those be reproduced in its annual report, together with other such reports that may be delivered to the IOC Secretariat in due time (viz before 30 November 1997) and those of the action groups of the panel.

2.3.2 In addition to these written reports, the session was informed of the following national activities:

(a) The project RAYO, operated by the Spanish Harbours Authority (EPPE/CEDEX), which includes six operational buoys, to be augmented to nine, moored offshore at 20-30 miles from the coastline. The panel invited the participation of Spain in EGOS, with a view to assisting in the quality control of these data and their insertion onto the GTS;

(b) The work in Brazil to develop and implement both drifting and moored buoy projects in a national buoy programme, including the PIRATA project, jointly with France and USA, undertaken within the context of the Brazil pilot GOOS project.

3. REQUIREMENTS

3.1 World Weather Watch (WWW)

3.1.1 The panel noted that the requirements for data from the air-sea interface in support of the World Weather Watch continued to be expressed clearly in the WWW component of the WMO Long-Term Plan, and that these had not changed substantially in recent years. The panel was also informed of actions underway within the World Intellectual Property Organization, which might eventually lead to an international treaty on data bases, with potential implications for the international exchange of and access to meteorological and oceanographic data. Both WMO and IOC were watching these actions carefully, and interacting in the process where possible, to ensure that the interests and concerns of both operational and research meteorology and oceanography were properly taken into account, and that any eventual treaty was, to the extent possible, compatible with both the principles and practice relating to the exchange of data and products as expressed in WMO Congress Resolution 40 (CG-XII).

3.2 World Climate Research Programme (WCRP)

3.2.1 The panel reviewed the elements of the CLIVAR programme as presented in a draft Initial Implementation Plan, so far as it involved the use of data buoys. It was noted that buoy data would make a significant contribution to most of the fundamental fields that need to be observed and especially sea surface temperature, surface wind, surface and subsurface currents and upper ocean temperature.

3.2.2 The Panel agreed that these requirements would need to be addressed in formulating the DBCP implementation strategy, further discussed under agenda item 4.

3.3 Global Ocean Observing System (GOOS)/Global Climate Observing System (GCOS)

3.3.1 The meeting reviewed recent and planned activities in relevant aspects of GOOS/GCOS.

3.3.2 It was noted that, as a first step in the progressive implementation of GOOS and GCOS, on the basis of specific requirements as they become known, and in preparation for a Global Ocean Data Assimilation Experiment (GODAE), an implementation strategy for the physical oceanography elements of GOOS/GCOS (in particular for climate and services) is being drafted. This strategy will identify specific actions required of existing implementation bodies such as the DBCP, as well as requirements for which no existing body has responsibility, and provide an action plan to ensure as complete an implementation as possible. A meeting to elaborate and agree this strategy is to take place in Sydney, Australia in March 1998, involving representatives of all existing implementation bodies as well as GOOS/GCOS planning mechanisms.

3.3.3 The panel agreed that it should be fully represented at the Implementation Strategy Workshop in Sydney in March 1998 and that it should contribute to this implementation as required and within the competence of the panel as expressed in its Terms of Reference, which reflect the fundamental aims of the panel. In addition the panel agreed to participate in an overall global coordination mechanism for ocean observations in support of GOOS/GCOS, when such a mechanism is established. It requested the chairman and vice-chairmen to continue to liaise with the Secretariats and GOOS/GCOS officers on this issue, to establish an appropriate DBCP input to this coordination mechanism.

3.3.4 The panel noted with appreciation the establishment by the USA of a national GOOS centre within AOML/NOAA in Miami. This centre will begin by coordinating NOAA GOOS activities related to climate, including buoy and SOOP programmes.

4. IMPLEMENTATION STRATEGIES

4.1 The panel recalled that at DBCP-XII it had recognized the need to develop a comprehensive implementation strategy for itself and its action groups, in support of the requirements of both global programmes and also national/regional projects, and had requested the vice-chairmen to address this issue. It further recalled that such an implementation strategy would be essential input to the development of a comprehensive GOOS/GCOS implementation strategy, as discussed under the previous agenda item.

4.2 In this context, it reviewed with interest a draft implementation strategy prepared by Mr David Meldrum. It expressed its appreciation to Mr Meldrum for this draft, which it considered to be a very valuable and comprehensive first draft of what was ultimately required. The following general and specific comments were offered at the meeting, to be addressed in the second draft:

(i) the strategy needed to stress the importance of optimizing deployments in the light of limited available resources;

(ii) a climatology of drifter tracks would be very valuable as a tool for future reseeding of networks, and panel members should be encouraged to develop such a tool;

(iii) the web server should be used to provide updated information on deployment opportunities;

(iv) better contacts were required among action groups, to allow cross-fertilization of deployments;

(v) GTS data flow monitoring should be included;

(vi) the strategy should be expanded to cover also moored buoy networks, stressing their importance, requirements and complementarity to drifters, with the title adjusted accordingly;

(vii) references to buoy hardware should be more comprehensive;

(viii) the value of meteorological/oceanographic coordination to optimise deployments should be emphasised, as well as the role of the DBCP as a link between observing network managers and data users;

(ix) section 7 should be divided, to show separately summary and action items;

(x) the action items should underline the direct participation of action group members in GOOS/GCOS; the lead role of the DBCP in providing buoy data for GODAE; and the value of the action groups adopting mechanisms to identify primary applications of buoy data in their regions and subsequently monitoring the use of the data in these applications;

(xi) the strategy should clearly show its relationship to the panel's terms of reference.

4.3 The panel agreed that the second draft of the strategy, to include these and other comments received from members up to mid-November 1997, should be finalized by end of December 1997, for further distribution to members and also for submission to the planned Implementation Strategy Workshop in March 1998. The final draft of the strategy should be prepared for adoption at DBCP-XIV. The panel accepted the offer of AOML to assist Mr Meldrum and the Secretariats to prepare this second draft.

5. SCIENTIFIC AND TECHNICAL WORKSHOP

5.1 Following the pattern established over recent DBCP sessions, the Scientific and Technical Workshop has become an integral part of the annual meeting. Fourteen papers were presented to the 1997 workshop, covering three main areas of interest: technical developments, meteorological applications and oceanographic science and applications.

5.2 The various topics included some exciting developments in low-cost drifter instrumentation and many examples of the use of buoy data in scientific programmes and meteorological applications.

5.3 The panel noted that the SVP - barometer (SVP-B) drifter was now deployed in large numbers but that reliability had been rather uneven between production batches from the various manufacturers; hence the panel requested the technical co-ordinator to liaise with the SVP-B manufacturers to investigate the correlation between manufacturing methods and product development and the operational record for the various deployments, to try to identify factors that will lead to improved reliability and consistency of performance in the future.

5.4 In closing the workshop, the chairman noted that it had proved to be very successful and had stimulated frank and open discussion leading to several avenues for future progress. It was agreed that the proceedings should be published as a DBCP technical document (with a deadline for submission of the full paper texts to the WMO Secretariat of end November 1997), and that a similar workshop should be organized with DBCP-XIV, with similar structure. The panel accepted the kind offer of Mr Eric Meindl to undertake this organization. It further agreed that, where possible, the following aspects should also be emphasised: scientific and operational applications of buoy data; moored buoy technology and data applications.

6. DATA AND INFORMATION EXCHANGE

6.1 Reports by buoy data management centres

The IGOSS Specialized Oceanographic Centre for Drifting Buoys (SOC-DB)

6.1.1 Mr F. Gérard introduced briefly the report of the SOC-DB operated by Météo-France. He drew the attention of the panel to the already important number of WAVEOB data circulating onto the GTS. The panel thanked Météo-France for the quality of the work performed by the SOC.

The IODE Responsible Nnational Oceanographic Data Centre for Drifting Buoys (RNODC-DB)

6.1.2 The Marine Environmental Data Service of Canada (MEDS) presented the report of the RNODC-DB. During the last 19 months being reported, the average number of messages was 130,918 per month. 93.9% of those messages were from drifting buoys, and 44.1% were considered useful (not duplicates). There was a constant gap between the number of buoys from

which MEDS received data and buoys actually in the Argos system. The average gap was 1,411 buoys, based on information provided by the TC/DBCP. The relatively low percentage of useful data was a reflection of the way the processing of the data from the GTS was being performed. Position received automatically a flag of 3 (data not useful) when the same message was reported by an Argos centre and an LUT centre (LUT got the level 3 rating). Messages were also flagged as not useful when an "old" position was being reported on any satellite pass. At the end of December 1996, MEDS archives contained a total of 10,934,456 messages and was growing at a greater rate than in the past. MEDS would continue to answer requests for drifting buoy data and also produce a monthly map of the buoy tracks. These maps are routinely distributed by mail and also made available on the MEDS web site.

6.2 Information exchange

DBCP Web Server:

6.2.1 The DBCP is operating a World Wide Web Internet server since February 1995. The server home page is physically implemented at the NOAA National Ocean Service (NOS) under the responsibility of the NOAA Atlantic Oceanographic and Meteorological Laboratories (AOML). At its twelfth session, the panel requested the technical coordinator to investigate the feasibility of various improvements, in conjunction with NOS, and to report at DBCP-XIII.

6.2.2 Among realised improvements there are:

- the look of the server pages has been re-designed (by Darren Wright, NOAA/AOML);
- links have been added to other servers like the IBPIO home page developed by Pierre Blouch (Météo France), and the ISABP home page developed by Eugene Burger (SAWB);
- the page describing the DBCP and its objectives has been re-written;
- a global Implementation menu item added;
- links to Action Group servers status maps added;
- list of buoy manufacturers substantially updated;
- several documents have been edited in HTML format in order to improve their readability;
- a table summarising the Low Earth Orbit (LEO) systems potentially useful for drifting buoys has been added.

6.2.3 Developments are still underway, especially regarding so called "data-flow control" facilities: presently, GTS buoy data received at Météo France and MEDS are copied to the DBCP server on a daily basis. The list of received GTS BUOY reports, statistics, including delay histogram by GTS bulletin header or individual buoy can be obtained easily by someone accessing the DBCP server via a dedicated web page (see Annex IV for the related web page and for an example of output). The tools are useful for someone authorising GTS distribution of his buoy data but who has no access to the GTS. Using the tools, he can easily check whether a buoy is reporting on GTS. The tools can also be useful to make comparisons between what has actually been received, at Météo France, MEDS, and the National Weather Service. Delays (i.e. reception time minus observation time) can also be obtained and compared. The panel thanked AOML, MEDS and Météo France for their assistance in this work.

6.2.4 These tools could not be considered operational so far because in practice, access times are unacceptable for high WMO numbers or large amount of requested information. However the system is available in test mode for someone patient (**http://dbcp.nos.noaa.gov/dataflow.html**) and daily files can be downloaded via ftp by anyone (files are kept for two weeks on the server). AOML offered to replace the present computer with a more powerful one. The panel thanked AOML for its commitment to operate the DBCP web server.

6.2.5 A few other improvements are being proposed which the panel was invited to consider. Possible improvements could be implemented on the server provided that the needs are well recognised and the resources are available for development. It is not necessary that additional menu items are implemented on AOML computers: any agency with full Internet access can propose and implement on its own computers such additional products (as is presently done by the Centre de Météorologie Marine and the Icelandic Meteorological Office for Quality Control menu items).

6.2.6 The panel encouraged its members to:

(i) provide the TC/DBCP with yearly national reports in electronic form for inclusion in the DBCP server;

(ii) add products related to global implementation issues and deployment strategies. For example, it is being proposed that deployment opportunities should be available on the web on a country or regional Action Group basis. Presently only USA provides a product via the DBCP server (under "Global Implementation" menu item). The panel therefore encouraged its members to provide the DBCP/TC with similar products in electronic form for inclusion in the DBCP server.

DBCP Brochure

6.2.7 At its twelfth session, the DBCP considered the possibility of publishing a brochure for publicising its work and the action groups. The brochure had to be mainly oriented towards the use of data buoys and appear as an A4 three-folding leaflet, possibly encompassing smaller leaflets relating to the action groups. Unfortunately, under the pressure of work and other priorities, the TC/DBCP, chairman, vice-chairmen, and Secretariats could not spend sufficient time on the issue to present substantial material to the session. The panel decided to tentatively produce the brochure for DBCP-XIV under the following provisional schedule:

(i) drafting of text, compilation of illustrations and preparation of draft layout by TC/DBCP, chairman, vice-chairmen, and Secretariats; deadline mid-1998;

(ii) preparation of draft brochure by WMO graphics artist (DBCP funding), for approval by DBCP-XIV;

(iii) publication of the brochure by a panel Member State as a contribution in kind, late 1998. The panel accepted with appreciation the kind offer of Canada to investigate undertaking the printing of the brochure, and requested the Secrtariats and the chairman to confirm this offer with Canada at an appropriate time.

Set of transparencies

6.2.8 The TC presented the DBCP set of transparencies which had been prepared by himself and the WMO Secretariat. This set can be made available on request for making presentations while representing the panel at various meetings or occasions. Copies of the set were already distributed to the chairman, the vice-chairmen and the WMO Secretariat.

7. TECHNICAL ISSUES

7.1 Quality control

7.1.1 The technical coordinator reported on the DBCP quality control guidelines. At its 12th session, the DBCP decided to partly automate the guidelines and to reduced the delay for informing the Principal GTS Co-ordinator (PGC) of a buoy when a problem is reported by a Principal Meteorological or Oceanographic Center (PMOC) responsible for buoy data quality control. Hence such reports are automatically and almost immediately forwarded by Argos computers to the PGCs. QC guidelines have been updated accordingly and circulated among principal actors.

7.1.2 12 PMOCs are now participating in the guidelines and 23 individuals are registered on the **BUOY-QC@VEDUR.IS** mailing list.

7.1.3 For a total of 1450 buoys that reported onto the GTS during the period 1 August 1996 to 31 July 1997, following 332 status change proposals from PMOCs related to 305 buoys, 171 buoys had their status changed (i.e. 11.8%): 193 buoys or buoy sensors were removed from GTS distribution, no buoy sensors were re-calibrated, and no action has been taken for 30 buoys or buoy sensors (e.g. PI denied to change the buoy status because he believed the buoy data were good although one or more PMOC commented on the quality of the data). 50% of the proposed status changes have been implemented within 4 days, while 80% within 3 weeks.

7.1.4 Activity was a little lower than for the previous year and fewer buoys had their status changed (171 this year versus 210 last year). It can be assumed that monitoring centres (PMOCs) rely increasingly on buoy data and are more confident in the quality of the data.

7.1.5 After steadily decreasing from about 3 hPa in 1987 to about 1.7 hPa in 1997, mean RMS of ECMWF first guess field minus observation for air pressure data seems stabilised.

7.1.6 RMS is now in the order of 3 m/s for wind speed data (ECMWF sources), and around 0.6 Celsius for SST data (CMM sources).

7.1.7 MEDS and the Icelandic Meteorological Office are archiving buoy-qc messages. MEDS inserts these in its metadata base and will make them available on its web site. The panel thanked PMOCs, MEDS and IMO for their committments in operating the QC guidelines.

7.2 Codes

BUFR

7.2.1 At its eleventh session, the DBCP decided to establish a sub-group for studying and making recommendations regarding requirements for GTS distribution of buoy data, including in BUFR. The sub-group included David Gilhousen (NDBC), Pierre Blouch (Météo France), and Etienne Charpentier (TC DBCP). The sub-group also discussed the issue with Cliff Dey (NCEP), Bob Keeley (MEDS), Madeleine Céron (Météo France), and Joel Martellet (WMO). At its twelfth session, the panel reviewed the requirements expressed by the group and agreed that these should reflect formal DBCP views on the matter and should eventually be submitted to the CBS Working Group on Data Management. It decided to maintain the DBCP WG for amending the document according to (i) details expressed by panel members at the session, and (ii) amendments possibly expressed by panel members by 31 December 1996. Important amendments regarding location quality were proposed after that date and incorporated. The final version of the report of the sub-group was reviewed by the panel at the present session. The panel decided to go along with the sub-group recommendations and to submit the report to CBS in 1998 for implementation of proposed changes in 1999. The document will therefore be formally submitted to CBS by the

DBCP chairman via the chairman of the CBS Working Group on Data Management, Mr. K. Kashiwagi (Japan Meteorological Agency) as soon as possible after the DBCP session.

BUOY

7.2.2 Regarding the BUOY code, at its twelfth session the panel recommended to change the interpretation practice of the Q1 indicator of Section 0 to reflect current usage and availability of the Argos Location Index. It suggested an implementation date as of 1 January 1997. For practical reasons and simplicity, another indicator Qa was proposed and this will be implemented on 5 November 1997.

7.3 Argos System

7.3.1 At its 15th session in Pretoria, October 1995, the Argos Joint Tariff Agreement (JTA) requested the Technical Co-ordinator (TC) of the Data Buoy Co-operation Panel (DBCP) to compile a list of Argos user requirements. A survey had been conducted, and the TC reported at the 12th DBCP and 16th JTA sessions. JTA decided to include most of the requested requirements within the Argos development programme according to a priority list. Some of the requirements have been implemented in the Argos system, others are still being developed or planned.

7.3.2 Implemented requirements are:

- On-line access tothe Argos data bank has been increased from 4 days to 10 days.
- GTS users can now access technical files of existing platforms declared within the GTS sub system in read and/or write mode. Access is realised through Email. Instructions are available via: **http://www.argosinc.com/gts.**
- LUTs have been implemented and connected in La Réunion and Capetown and will substantially decrease delays, basically for GTS users.

7.3.3 Developments underway are:

- Data flow control: GTS reports are sent back to Argos making it possible to monitor the data flow.
- On-line Argos documentation. Information will be available via the Web.
- Data sharing facilities. GTS sub-system will be capable of processing and disseminating data directly to users, including to shared ftp sites.

7.3.4 Developments planned are:

- Access to Argos data using CD-ROMs.
- Compressed Argos DS files.
- Remote access to Argos technical files.
- Remote access to ADS technical files.
- Argos enhancements (Argos 2 and 3 generations).

7.3.5 Considering requirements expressed by the users and discussion during the session, the panel decided that providing Argos users with data on CD-ROM was a top priority. It urged Service Argos to undertake a survey among its users by 30 November 1997 with the view to obtaining their comments on possible technical solutions for using CD-ROMs. It also urged Service Argos to propose and implement a technical solution as soon as possible after that date.

7.3.6 Policy issue:

- Access to the other GPC. Certain users have been asking Service Argos for a while to have direct access to the other Argos Global Processing Centre (e.g. to Toulouse for an American user or to Landover for a German user) for accessing data processed there and for which access has been authorised by the owner of the platforms. Present solution involves having these platforms processed through so called "dual processing" (the PTT is being processed at both GPCs) but this is considered as too expensive by the users (extra 15% in Argos fees). In fact, presently users from different countries but having their Argos data processed via the same Global Processing Centre can share their data free of charge by asking Service Argos to place one as "User on copy" to the other's programme. By doing so a user can use his own password to access the other's data. This is not technically possible for users having their data processed via different Global Processing Centres unless the shared programme is placed in so called "Dual Processing". Why should one pay for sharing the data between an American and a French programme while it is free between a British and a French? Specific developments could be undertaken to offer direct access to the other GPC without having to place a programme in dual processing. However, having a fair pricing policy for the dual processing would be a more simple solution if impact on Argos revenues is acceptable. This would involve no technical development. The panel further recommended to the JTA to discuss the issue and to consider changing dual processing pricing policy accordingly.

7.3.7 Developments cancelled are:

- Access to Argos data using DAT tapes. This has been abandoned because CD-ROMs are better suited.

7.4 New action groups

7.4.1 The panel noted with pleasure that, as foreshadowed at DBCP-XII, the Global Drifter Programme was formally established during the intersessional period and was now an action group of the panel. It further noted and welcomed the strong possibility that the TAO Implementaton Panel might wish to become associated with the DBCP as an action group. It requested Mr W. Woodward to continue to liaise with the TIP on this issue, and suggested that the technical coordinator might usefully attend the next TIP session, at ECMWF in Reading in November 1997. The panel further authorised the chairman to formally approve on its behalf any application by the TIP during the coming intersessional period to become an action group.

7.4.2 No further proposals were received at the session for the establishment of new action groups at the present time.

7.5 New communications techniques and facilities

7.5.1 At the Scientific and Technical Workshop which immediately preceded the formal panel session, a brief presentation was made by Mr Michel Taillade-Carrière of CLS/Service Argos on future developments within the Argos system. The panel noted with approval that CLS/Service Argos were continuing their efforts to increase the number of Local User Terminals (LUTs) feeding real-time data to the GTS via the global processing centres at Toulouse and Landover, and urged CLS/Service Argos to continue to make every effort to improve LUT coverage in critical areas such as the south Atlantic and Pacific oceans. Further developments that were reported to the panel included the imminent launch (February 1998) of NOAA-K, carrying the improved Argos-2 on board equipment. Argos-2 is expected to fly on subsequent NOAA launches, for the next several years at least. Similar equipment, further enhanced by the addition of a two-way communication capability, is scheduled for launch in 1999 on board the

Japanese satellite ADEOS-2. Planning has also started for the next phase of Argos equipment (Argos-3), taking into account the results of a detailed user survey.

7.5.2 As regards other potential satellite communication techniques, in which the panel has a strong and continuing interest, a paper (see Annex ...) was presented by Mr D Meldrum detailing the current status and future development plans of a number of systems. Because of the commercial forces which are driving the implementation of the new systems, many will focus primarily on land masses and centres of population. These systems will not in general be useful for global ocean monitoring. Furthermore, while the technology to implement the new services does currently exist, delays are inevitable due to problems with spectrum allocation, licensing (in each country where the service will be offered), company financing, and availability of launch vehicles. It seems unlikely that many of the planned systems will overcome all of these hurdles.

7.5.3 The panel noted that a number of systems, including Orbcomm, Inmarsat D+, ICO and SAFIR, were worthy of detailed investigation, by virtue of both their technical capabilities and their operational status, and requested panel members to grasp any opportunity to undertake trials of these systems and report back to the panel at its next session. In particular, the panel expressed great interest in the results of trials of Orbcomm-equipped drifters, to be co-ordinated by Mr Mark Bushnell of NOAA/AOML. The panel also invited Mr Frank Grooters of KNMI to investigate the possibility of trials of Inmarsat D+ through the Netherlands service provider, Station 12. Finally under this item, the panel once again asked Mr D Meldrum to inform them of new developments in the communications field at its next session. The report of Mr Meldrum is in Annex V and will also be published in the annual report for 1997.

7.6 Other technical issues

7.6.1 Under this agenda item, and following on the presentation by Mr W.Woodward on USA GOOS activities, the panel discussed the importance of undertaking and analysing comprehensive monitoring of buoy data flow on the GTS, as well as of buoy data usage by major applications, with a view to identifying reasons for missing data and also the value of buoy data, with specified time, space and accuracy scales, to particular users. It agreed that a separate item on this subject should be included in the agenda for DBCP-XIV, and that input for this should include as a minimum the results of the WMO GTS monitoring (relating to BUOY reports), any other similar monitoring undertaken nationally or by action groups, and also analyses of adat usage by action groups.

8. TECHNICAL WORKPLAN

8.1 The preparation of a DBCP implementation and technical workplan is dealt with as a part of the general workplan development under agenda item 13.

C. ADMINISTRATIVE COMPONENT

9. REPORTS

9.1 Chairman and vice-chairmen

Report by the chairman

9.1.1 The chairman noted that progress had been made on most items in the intersessional work plan and that action was 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 Secretariats of WMO and IOC in advancing the work plan. The Chairman recalled that during the WMO Commission for Marine Meteorology's (CMM) discussions at its 12th session in Cuba in March 1997 on the Commission's future structure, the reporting arrangements for the DBCP were mentioned. The main proposal impacting on the DBCP was the possible joint sponsorship of CMM by IOC and WMO. The proposal would then see the DBCP reporting to this restructured body. While it would appear that any changes to CMM are some distance off, it would be desirable for members to monitor these developments with respect to their impact on the DBCP.

9.1.2 The Chairman highlighted the continuing production of technical documents in the DBCP series - covering the Annual Report for 1996 and the technical presentations made at the twelfth session. He noted that he had not been very successful in establishing evaluation trials for the alternative communication systems, viz Orbcomm and SAFIR. In particular, Orbcomm have not responded to numerous faxes and e-mails. On the other hand SAFIR had been in contact, however their initial contacts were heavily orientated to offering some form of commercial arrangement. In the end SAFIR offered to supply equipment for evaluation by the Australian Bureau of Meteorology, however at the time of writing no equipment had been delivered.

9.1.3 The Chairman reported that he had represented panel interests at one international meeting during the intersessional period. This meeting was the second programme meeting of the International Buoy Programme for the Indian Ocean (IBPIO) from 21-23 July held in Perth, Australia. The meeting was very successful and will be reported on under another agenda item. He noted that the DBCP had been requested by the Chairman of the IABP to cosponsor a conference on the Arctic Buoy Program in Seattle in July/August 1998. This offer has been accepted on the Panel's behalf, with the proviso that there are no financial costs associated with the sponsorship.

9.1.4 The Chairman expressed his appreciation for the assistance of the two vice-chairmen during the intersessional period, particularly with respect to representing the panel at various international meetings.

Report by Mr William E Woodward

9.1.5 During the intersessional period Mr Woodward engaged in several activities on behalf of the DBCP, as follows:

- *PALACE floats*. Efforts were made in conjunction with the technical co-ordinator to develop and implement a mechanism for inserting data from PALACE floats on to the GTS.

- *ISABP-4*. Mr Woodward presented an initiative to routinely monitor and document South Atlantic buoy data usage by participating countries.

- *GTS transmission delays*. A joint project was implemented with Service Argos Inc to investigate the sources of large time differences between buoy observation time and the receipt of the observation at the national centres.

Report by Mr David Meldrum

9.1.6 During the intersessional period, the main DBCP activities in which Mr Meldrum was involved were as follows:

- *Technical Workshop at DBCP-XII, Henley-on-Thames.* Written and graphical material was gathered in from as many speakers as were able to co-operate (19 out of the 23 who spoke at the session). This was then given light editorial revision before submission to the WMO in camera-ready format. The proceedings have been published as No 10 in the DBCP Technical Document Series.

- *DBCP Implementation Plan.* An outline plan was drafted as the basis for discussion at DBCP-XIII. This document attempts to capture the spirit of the Global Implementation Programme document and discussion at DBCP-XII and recasts it in a slightly different form, using the existing Ship of Opportunity plan as a model.

- *Mobile Satellite Systems.* A watch was kept on developments within this area which might benefit data buoy operators, and an updated status document produced as an information paper for the panel.

9.1.7 The panel thanked most sincerely the chairman and both vice-chairmen for the considerable and valuable work which they had undertaken on its behalf during the intersessional period.

9.2 Secretariats

9.2.1 The representative of the WMO Secretariat reported to the session that WMO had continued to support the work of the panel in a variety of ways, including managing the overall panel budget, interacting with a variety of other programmes and bodies on behalf of the panel, maintaining various data bases including the list of DBCP focal points and the buoy ID register for GTS data distribution, and supporting the panel's action groups as required.

9.2.2 The representative of the IOC Secretariat reported that the IOC Assembly, at its nineteenth session (Paris, 2-17 July 1997), commended the panel for its numerous and valuable achievements so far. It further once more urged as many Member States as possible to contribute to the panel's fund, even with small amounts, on the grounds that, whereas only a handful of countries were contributing to the fund, all countries benefited from the global effect of obtaining and exchanging more and better data from the world ocean. The major activity of the IOC Secretariat in support of the panel had continued to be concerned with the management of the employment and missions of the technical coordinator, recruited since June 1993 as a "*UNESCO funds-in-trust expert*" (see agenda item 10 for more details).

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 1996 - 31 May 1997;
(ii) interim WMO account 1 January 1996 - 31 August 1997;
(iii) provisional WMO statement of estimated income and expenditure to 31 May 1998.

These statements are reproduced in Annex VI. The panel accepted and approved the various statements, as appropriate.

10.2 Contracts

10.2.1 The panel reviewed and approved the terms of the IOC/UNESCO employment contract for the technical coordinator, as well as the contract between IOC/UNESCO and CLS/Service Argos for his logistic support.

10.3 Future committments

10.3.1 The panel recalled the agreement made with Mr Charpentier at the end of 1996, that he would be willing to remain as technical coordinator, located in Toulouse and employed by IOC/UNESCO, until at least 31 May 1999. It therefore decided to conntinue the existing arrangements for the next financial period, 1 June 1998 to 31 May 1999, subject to the availability of funds. With regard to future years, beyond 1999, and bearing in mind the long lead-time required to recruit a new technical coordinator, the panel noted the agreement by Mr Charpentier to inform the chairman and the Secretariats, by the beginning of December 1997, whether or not he may wish to continue as technical coordinator beyond 31 May 1999. In the event of a decision to continue on the part of Mr Charpentier, it was agreed by the panel that it would retain him as technical coordinator, subject to the availablity of funds.

10.3.2 The panel recognized that all panel Member States were continuing to experience severe financial constraints, and that this situation was likely to continue for some considerable time. At the same time, it agreed that the technical coordinator position was essential to the evident success of the panel, and that every effort should be made to maintain a budget sufficient to support the coordinator and other essential panel activities, while exercising maximum possible financial restraint.

10.3.3 In this context, the panel reviewed expenditure estimates for 1998/99, and agreed on these estimates as given in Annex VII, where they are shown in comparison with actual expenditures for 1994/95 and estimates for 1996/97. The panel then addressed the contributions necessary from Member States to cover these expenditure requirements. On the basis of provisional committments made at the meeting or otherwise, the panel drew up the table of provisional contributions for 1998/99, which is also given in Annex VII. It expressed its appreciation to all contributing Member States for their continuing support for the panel, and requested the Secretariats, as in past years, to ensure that invoices for these contributions were issued as soon as possible, and in any case before the end of 1997. It also urged the Secretariats and panel members to continue efforts to recruit new contributors to the trust fund, no matter how small their contributions might be.

10.3.4 Finally on this agenda item, the panel recalled its discussions at DBCP-XII on a proposal that the technical coordinator might work for part of his time on Argos development projects, in exchange for which CLS would take over certain routine monitoring and related activities of the coordinator. In this context, it noted with interest a formal proposal to this effect which had recently been sent by the Director-General of CLS/Service Argos to the chairman of the panel. This proposal is given in Annex VIII. During the ensuing discussion a number of concerns were raised with the proposal, relating to issues such as potential inequalities in the exchange, supervisory and oversight responsibilities, accountability, training of Argos personnel, and ultimate value to the panel. Overall, however, it was recognized that such work for the panel would indeed directly benefit buoy operators, and help to ensure that future Argos developments were in line with panel requirements. The panel therefore agreed to the proposal, with the provisos that:

(a) it would be initially for a one year trial period only, to be reviewed at DBCP-XIV, and that the two week opt-out clause be retained, as noted in the proposal;

(b) full training of Argos staff in the routine tasks be undertaken, but that user contact on monitoring issues continue to be through the technical coordinator;

(c) the technical coordinator bi-monthly reports to the chairman clearly show the developing division of tasks with CLS staff;

(d) the technical coordinator should continue to remain under the direct supervision of the panel chairman and Secretariats in all his activities.

11. PUBLICATIONS

11.1 Annual report

11.1.1 The panel agreed to retain the previous table of contents for the 1997 DBCP Annual Report. It further agreed that the "Technical Developments" part of the report would be made up of a presentation of the new SVP-B + wind (SVP-BW) drifter, to be prepared by Mr Jean Rolland from Météo-France. All the required inputs, including that of Mr Rolland, should reach the IOC Secretariat (attention Mr Yves Tréglos) by 30 November at the latest, in order that the report be ready for transmission to WMO and printing by early February 1998.

11.2 Technical Publications

11.2.1 The panel considered it should up-date the construction manual for the SVP-B, since several changes had been introduced since the initial publication of the manual. Similarly, it agreed to begin the preparation of a construction manual for the SVP-BW. Given the likely rapid evolution in the techniques used to construct and instrument these devices, it agreed to establish and maintain, through the joint efforts of Mr Mark Bushnell and of the technical co-ordinator, a web site entry dedicated to these publications, in order that interested people could easily download and print, if they so wished, the relevant information.

11.3 Brochure

11.3.1 The panel recalled it had already dealt with this question under agenda item 6.2.7.

12 ARGOS JTA

12.1 Operation of ALIP

12.1.1 The panel was informed of the status of implementation of the Interim Argos Large International Programme (IALIP). A summary of this status is given in Annex IX. Although considerable efforts had been expended by the ALIP coordinator and Argos to try to make IALIP a success it was noted that few users were satisfied with the present ALIP formulation and that the aim of encouraging increased deployments of 100% duty cycle platforms in large programmes had not been met. Some users, however, with relatively small programmes, had been able to make significant increases in buoy deployments at little extra cost.

12.2 DBCP position on JTA.

12.2.1 The panel noted that users of real-time meteorological and oceanographic data placed a very high value on buoy data and that requirements were not satisfied in many regions; hence it requested the chairman to reiterate to the JTA the recommendations formulated at the panel's last session:

(i) **Operational meteorological and oceanographic requirements are such that buoys should report full-time rather than on a one-third duty cycle. The DBCP therefore recommends as a top priority that a new tariff structure be arranged which will encourage full-time data collection with a minimal impact on data collection costs.**

(ii) **The DBCP encourages the GDP to co-ordinate efforts to create common data formats and platform standards, to gain benefits available from economies of scale. The DBCP recommends to the JTA to consider the provision of favourable tariffs for programmes that have both large numbers of platforms as well as common objectives for well-defined ocean-atmosphere missions, and operate over a long period to provide real-time data for GTS distribution.**

12.2.2 The panel further requested its chairman to convey to the JTA that any new arrangements for the future should not disadvantage buoy operators who had participated in the IALIP under the 1997 tariff agreement and have expressed plans to continue in 1998.

13. WORKPLAN

13.1 As in previous years, the panel reviewed and revised its operating procedures and workplan for the coming intersessional period. In line with its revised agenda and its present approach to implementation issues, the workplan is divided into two components, *Implementation and Technical* and *Administrative*. These workplans are given in Annex X.

14. ELECTIONS

14.1 The panel re-elected Mr Graeme Brough as its chairman, to hold office until the end of the next session. It further re-elected Messrs David Meldrum and William Woodward as vice-chairmen.

15. DATE AND PLACE OF THE NEXT SESSION

15.1 The panel noted with appreciation the provisional offer of AOML/NOAA/USA to hold the 1998 session in Miami, USA. It accepted this offer, and requested the chairman and Secretariats to finalize the situation as soon as possible, with the fall-back arrangements being to have the session at WMO headquarters in Geneva. Subject to agreement by the seventeenth meeting on the Argos Joint Tariff Agreement, it decided that the dates for the fourteenth session would be 12-16 October 1998. The panel reiterated its decision under item 5 that, as was now the custom, a scientific and technical workshop would take place during the first 1.5 days of the session, with the exact format and times to be determined by the organizer, Mr Eric Meindl, in consultation with the chairman and Secretariats.

16. CLOSURE OF THE SESSION

16.1 In closing the session, the chairman thanked all panel members for their continuing support for its work and that of the actions groups during the intersessional period, and in particular for their contributions to what had been another very successful panel session. He concluded by once more offering his sincere appreciation, on behalf of all participants, to Météo France La Réunion for hosting the session and to the Inter-regional Director, Mr Alain Soulan, to Mr Virgile Pesey, and to all the other staff for their highly efficient and generous support and hospitality.

16.2 The thirteenth session of the Data Buoy Cooperation Panel closed at 1200 hours on Friday 17 October 1997.

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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 DBCP session
   1.3 Adoption of the agenda
   1.4 Working arrangements

B. IMPLEMENTATION COMPONENT

2. IMPLEMENTATION REPORTS

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   2.2 Reports by the action groups and related programmes
   2.3 National reports

3. REQUIREMENTS

   3.1 World Weather Watch (WWW)
   3.2 World Climate Research Programme (WCRP)
   3.3 Global Ocean Observing System (GOOS) / Global Climate Observing System (GCOS)

4. IMPLEMENTATION STRATEGIES

5. SCIENTIFIC AND TECHNICAL WORKSHOP

6. DATA AND INFORMATION EXCHANGE

   6.1 Reports by buoy data management centres
   6.2 Information exchange

7. TECHNICAL ISSUES

- 7.1 Quality control
- 7.2 Codes
- 7.3 Argos system
- 7.4 New action groups
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8. TECHNICAL WORKPLAN

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- 9.1 Chairman and vice-chairmen
- 9.2 Secretariats

10. FINANCIAL AND ADMINISTRATIVE MATTERS

- 10.1 Financial situation
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- 11.1 Annual report
- 11.2 Technical publications
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12. ARGOS JTA

- 12.1 Operation of ALIP
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15. DATE AND PLACE OF THE NEXT SESSION

16. CLOSURE OF THE SESSION

Report of the technical coordinator

Discussion

1. Introduction

This report covers the period 1 October 1996 to 30 September 1997. During this period the Technical Co-ordinator (TC) of the Data Buoy Co-operation 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 the TC DBCP spent on his tasks could be estimated as following:

Topic	days	%
User assistance	50	19.2
Vacation, holidays	39	15.0
Météo France (data flow control, impact studies)	31	11.9
Missions, Travel	23	8.8
Preparation of missions (incl. DBCP sessions and travel time)	20	7.7
DBCP web server (incl. data-flow control, mission excluded)	20	7.7
GTS Sub-System (user requirements, incl. Techn. file access)	15	5.8
Monitoring, Quality Control Guideleines	10	3.8
TC monthly report, stats., regular letters (e.g. WMO list)	10	3.8
Code matters (BUFR, BUOY, SHIP)	5	1.9
Miscellaneous DBCP	5	1.9
Requests for GTS	5	1.9
Action Groups	4	1.5
CLS Argos 2001 project	4	1.5
CLS Argos Web. group	4	1.5
Argos monthly report	3	1.2
DB Quarterly report	3	1.2
Publications (e.g. articles in Argos bull...)	2	0.8
TC Tools	2	0.8
Office move	2	0.8
Misc. Administrative	2	0.8
Combined Oceano-Meteo drifting buoys	1	0.4
Total (52 weeks)	**260**	**100.0**

Compared to the previous intersessional period, I spent more time on User assistance and at Météo France, and less on monitoring, QC (automation), and in missions. I am tentatively spending one day a week at Météo France (normally on Tuesdays).

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

2. Specific tasks undertaken during the intersessional period

2.1. Missions, Visits, Meetings

Dates indicated are affective meeting dates, i.e. not including travel time.

2.1.1. 21-22 October 1996, Henley, UK, DBCP Technical Workshop.

2.1.2. 22-25 October 1996, Henley, UK, 12th session of the DBCP.

2.1.3. 28-30 October 1996, Henley, UK, 16th session of the JTA.

2.1.4. Vacation: 24 December 96 - 17 January 97.

2.1.5. US Mission:

2.1.5.1. 3 February 97, Stennis Space Center, Mississippi : US Naval Oceanographic Office.

2.1.5.2. 4 February 97, Stennis space Center, Mississippi: National Data Buoy Center.

2.1.5.3. 5-7 February 97, Miami: Atlantic Oceanographic and Meteorological Laboratories. I visited the Global Drifter Center, and met with Mark Bushnell, Mayra Pazos, and Claude Jodoin.

2.1.5.4. 10-11 February 97, Woods Hole, Massachusetts: Woods Hole Oceanographic Institute. I visited WHOI in conjunction with Bill Woodward and Gary Soneira of NOAA/NOS basically for discussing the issue of inserting PALACE float data on GTS.

2.1.5.5. 12 February 97, Silver Spring, Maryland: NOAA National Ocean Service.

2.1.6. 3-5 June 1997, Saint Petersburg, Russia, 7th meeting of the International Arctic Buoy Programme (IABP)

2.1.7. 23 June-18 July, Vacation

2.1.8. 21-23 July 1997, Perth, Australia, 2nd programme meeting of the International Buoy Programme for the Indian Ocean (IBPIO)

2.1.9. 25 July 1997, Melbourne, Australia, Bureau of Meteorology.

2.2. GTS

2.2.1. GTS sub system

The specific work of the Technical Co-ordinator concerning the Argos GTS Sub-System is mostly related to the following topics:

- Data flow control. GTS buoy data received at Météo France are now being sent back to Service Argos in Toulouse for data flow control. Thanks to these data, feed back information is now available for the Argos Users' Guidance Office to control that data supposedly distributed on GTS are effectively being received. It is also possible to control directly at the source that the overall system is working correctly.

- I wrote specific monitoring tools (e.g. a WHY command to understand why a platform is not reporting on GTS).

- Technical file access. I worked on a new system which permits Argos users to automatically access their GTS Technical Files via Email. Read and Write access, including security, is possible. The system has successfully been tested in June 97 by Pierre Blouch (Météo France) and implemented in August.

- Regarding data sharing facilities, I have been working on the issue of using the GTS sub-system to process, encode and disseminate the data to other destinations than the GTS. This new facility is still being tested.

- I assisted CLS in making possible to process the JAMSTEC moored buoys via the GTS sub system. The Argos message format is complicated and uses multiplexing.

- I am working with CLS on improving automatic updates between the two Argos centres for the GTS sub-system.

- CLS sub-contracted Digital Equipment for upgrading the GTS sub-system data base and access screens to deal with some of the above requirements plus other ones:

  - ✓ Security issues regarding remote technical file access;
  - ✓ Possibility to disseminate data to other destinations than the GTS;
  - ✓ New requirements directly expressed by users (encoding times in BCD (BOM), binary permutation (Navy), 2nd compensating sensor (BOM));
  - ✓ TRITON JAMSTEC moored buoys and make their distribution on GTS possible.

  I have been testing these modifications.

Refer to DBCP session agenda item number 7.3 (Argos) for details.

2.2.2. Buoy monitoring statistics:

ECMWF monitoring statistics of October 96 contained errors. I alerted Antonio Garcia at ECMWF who then rapidly corrected the problem. Statistics have been re-computed and re-sent over the BUOY-QC mailing list.

ECMWF departed a little bit from the standard format for exchanging the buoy monitoring statistics, leading to problems for some users decoding the data. I convinced ECMWF to come back to the standard format.

NCO used to mark as buoys SHIP reports with identification numbers other than Ship's call signs. This has been corrected.

2.2.3. BUFR

As decided at DBCP-12, I collected comments from DBCP members regarding the report from the working group on "encoding buoy data in BUFR". The sub group comprises David Gilhousen (NDBC), Pierre Blouch (Météo France), Etienne Charpentier (TC DBCP), plus Bob Keeley (MEDS), Cliff Dey (NCEP), and Madeleine Céron (Météo France). Comments have been included in a new version. However, other important aspects regarding buoy location class have been debated with the sub-group after the due date. Those aspects have been included in the final version of the report. It is attached with

the DBCP preparatory document dealing with code matters and will be submitted to CBS in 1998 for implementation of proposed changes in 1999.

Refer to DBCP session agenda item number 7.2 (Code matters) for details.

2.2.4. BUOY code

Per discussions at DBCP-12, a new field "Q_a" has been added in group 6 of section 0 and group 2 of section 4 of BUOY reports. Implementation is due for the 5 November 1997. This is to deal with Argos location class information which could not be encoded in BUOY reports. I liaised with Joel Martellet (WMO) in that regard. Refer to DBCP session agenda item number 7.2 (Code matters) for details.

2.2.5. SHIP reports containing drifting buoy data!

We found out that erroneous SHIP reports (BBXX) actually containing buoy data and formatted as in BUOY reports have been distributed on GTS under specific GTS bulletin headers (e.g. SMVD01 KWBC, SMVF01, SIVF30, SNVA01, SIVF30 ...). For some reason, Tinker AFB is getting these buoy observations from a weather intercept site on Ascension Island. Apparently, someone is re-transmitting the BUOY reports out on HF radio. The intercept at Ascension is picking them up off radio, and probably under bad weather conditions over the area, the signal isn't strong enough and the first part of the observation is garbled (e.g. no ZZYY). An attempt is then made to salvage the data. When this is done, the buoy data looks like ship data, so the BBXX is attached to the front of the message hence becoming a SHIP report! Al Mongeon (NWS) said the only way to stop these messages from being received at Tinker would be to shut off all incoming messages from Ascension, which they don't want to do, so it looks like the problem may appear again in the future.

2.3. User assistance

TC DBCP user assistance is an issue which grows with DBCP popularity and maybe with the number of connections to the DBCP web. Server (2145 connections from 695 different sites during the period March-August 1997). I am spending an increasing amount of time in assisting in the insertion of buoy data on GTS, answering question, solving problems, or providing users with information. I listed a few typical examples below:

- I assisted the Météo France in inserting a few buoys on GTS.
- I worked on the issue of distributing BOM ship-board PTT data on GTS via the Argos GTS sub-system.
- I did orbitography simulations for drawing orbital delay histograms at South Sandwich Island for the SAWB.
- CLS office in Melbourne contacted me for solving GTS distribution problems with Australian buoys.
- I assisted Woods Hole Oceanographic Institute to find solutions for inserting PALACE float sub-surface temperature profiles on GTS (via MEDS, then NOAA, then possibly Argos in the future if QC can be automated).
- I assisted EGOS in fixing a problem with checksum computation of one of their buoys (Argos 3039, simulating checksum computation and bit errors).

- I monitored MSNZ buoys on behalf of Julie Fletcher while she was in vacation (21 May-23 June).

- Upon request, I added a few names in the DBCP list of drifting buoy manufacturers which is available via the Web.

- I indicated adequate contacts to people interested in obtaining buoy data.

Etc...

2.4. Quality Control guidelines

As decided at DBCP-12, QC Guidelines have been partly automated. PMOC messages are automatically redirected to the PGC when he can be automatically identified and has an Email address.

I updated the QC Guidelines accordingly and circulated the new version among all the actors. The new QC guidelines are now also available in html format via the DBCP server.

Refer to DBCP session agenda item number 7.1 (Quality Control) for details.

2.5. DBCP World wide Web Server

The specific work of the Technical Co-ordinator concerning the DBCP web. Server is mostly related to the following topics:

- Updating the DBCP server and re-writing a number of pages.

- I spent substantial amount of time in writing specific tools for data flow control and discussing with Météo France, MEDS, and NOAA/NWS in order to obtain GTS sample files on a routine daily basis at the Web. Site (NOAA/NOS). With those tools, users can check via the Web. whether their buoy data are being received from the GTS (http://dbcp.nos.noaa.gov/dataflow.html).

- Thinking of possible future improvements.

Refer to DBCP session agenda item number 6.2 (information exchange) for details.

2.6. Global and regional actions

2.6.1. Global implementation

I informed DBCP action Groups of the DBCP-12 decision not to create a DBCP Global Implementation Programme.

I updated the DBCP server to reflect DBCP trend towards Global Implementation.

I reviewed David Meldrum's document on Implementation Strategies and provided the WMO Secretariat with comments.

2.6.2. Global Drifter Program (GDP)

I visited the Global Drifter Center (GDC) in February 1997 (see paragraph 2.1.5.3).

According to Pierre Blouch, it is likely that software problem on transmitters manufactured by CLEARWATER is the cause of many early failures of SVPBs. A peak of failures at about 120 days after deployment has been noticed. Mark Bushnell has been alerted by Pierre Blouch on this.

Early deployment failures have been observed for SVPB type buoys. For recent deployments, about 30% of the buoys did not provide reliable pressure reports after 20 days at sea. The Global Drifter Centre in conjunction with the buoy manufacturers are investigating the problem. A water leak with the SVPB barometer port has been discovered and corrected. Although this might not be the only cause of early deployment failures, better air pressure data series are now expected in the future.

SVPBs using WOTAN technique to measure wind speed (Wind Observation Through Ambient Noise) have been tested and deployed at sea by the Centre de Météorologie Marine, Brest, France. Wind direction is obtained thanks to a profiled wind vane. Comparisons with nearby moored buoys and model output give good correlation and shows that measurements are accurate enough to be used in weather forecast data assimilation.

See also paragraph 2.9.

2.6.3. DBCP Action Groups

I prepared DBCP reports for the DBCP Action Group meetings (either for myself or officers representing the DBCP): EGOS, IABP, IBPIO, ISABP. I also prepared the DBCP report for CGC-8 meeting, Oslo, Norway, 27-19 August 1997.

- IABP meeting, 3-6 June 97 in St. Petersburg. I attended the meeting and represented the Panel.
- EGOS meeting, 4-5 June 97 in Stockholm. The DBCP was represented by Yves Tréglos.
- IBPIO meeting, 21-23 July 97 in Perth. I attended the meeting and represented the Panel.
- ISABP meeting, near 9-11 Sept. 97 in Trinidad. The DBCP was represented by Bill Woodward.

2.7. DBCP

I prepared series of transparencies for DBCP-13.

I worked with Peter Dexter on preparing DBCP series of transparencies useful to DBCP officers in mission on behalf of the Panel.

I finalised the text of my presentation at DBCP-12 Technical Workshop and submitted it to David Meldrum.

2.8. Argos

Per DBCP-12 recommendations, and JTA-16 decisions, I worked in conjunction with CLS, Service Argos, in implementing or finding future solution to some of the requirements included in the Argos development programme:

- Increase the size of the Argos data base (extended to 9 days);
- Remote GTS technical file access (Email solution implemented);
- Data flow control facilities (underway);
- Data sharing facilities (underway);
- On-line Argos documentation (underway);
- Improved delays (new LUTs connected).

Through the so called "Argos 2001 project", CLS, Service Argos, is in the process of rethinking its data processing system in a 3-4 years perspective. I have been invited, as representative of buoy users, at a few meetings with CLS. The initial goal is to define all existing and potential requirements for all Argos users in the context of a system operating after 2001 hence including Argos-2 and Argos-3 capabilities.

I have been participating in a CLS "Web. Group" which role is to offer World Wide Web services to Argos users (I am particularly involved in Technical File and data access in this regard).

Per recent correspondence between Peter Niiler and Michel Cazenave, NESDIS initiated a "drifting buoy community meeting" conference at the end of July in Washington apparently to define new system use policy with Argos.

CLS, Service Argos moved to another building. I basically spent two working days to pack/unpack my files. I also changed my Email address at about the same time (my new address is charpentier@cls.cnes.fr).

Refer to DBCP session agenda item number 7.3 (Argos) for details.

2.9. Other Systems

Mark Bushnell at the Global Drifter Center is in the process if testing 2-4 ORBCOMM buoys manufactured by Seimac. 2 buoys would be deployed in local coverage area while the two other buoys would be deployed in the Southern Hemisphere to test the store and forward capability.

Bureau of Meteorology, Australia, obtained transmitters from SAFIR for test purposes. Although the BOM contacted Orbcomm as well, Orbcomm did not respond positively so far.

2.10. Météo France

At its eleventh session, the Panel discussed the issue of the Technical Co-ordinator of the DBCP working part time at Météo France for the DBCP. It agreed that this would be in the best interest of the DBCP, of WMO and IOC, and of all Member States, in particular in facilitating monitoring and simulation studies by the Technical Co-ordinator using data in the Météo France data banks. In February 1996, Météo France offered the TC DBCP an office with full computer access. The NOAA National Ocean Service offered a Personal Computer for realising this access (90 MHz Pentium PC). I received the PC in mid March 1996 and since then am basically spending every Tuesday at Météo France (i.e. about 20% of my time) except of course while I am in mission or vacation, or when my regular TC DBCP workload is too heavy (e.g. user assistance, preparation of DBCP session).

At Météo France, I have basically been working on two issues, (i) sensitivity/case studies, and (ii) data flow control issues.

2.10.1. Sensitivity/case studies

I prepared tools for conducting case studies efficiently and rapidly (considering that I spend about only 1 day a week at Météo France). I wrote programmes for preparing script files to submit to the Cray for basically:

- Running adjoint model for sensibility studies. "Cost" function is the averaged 48 hours forecasted surface pressure over an area of interest (e.g. a storm). Adjoint model basically produces fields describing how sensitive this cost function is to the initial values of historical variables of the model. For drifting buoys, we are mostly interested in how the cost function is sensitive to surface pressure (analysis). In order to spare computer time and memory resources, resolution of the model used (T63/19L/C1) is not as precise as the operational Arpège model of Météo France (T149/27L/C3.5): spectral truncature (which is related to the model resolution) is T63 instead of T149, 19 levels are used instead of 27 and no stretching is used for the grid (C=1 instead of 3.5).

- Running model initially in T63/19L/C1 mode for computing the 48 hour forecast for comparison with the operational forecast to make sure that the lower resolution model used gives similar results at least in the area of interest.
- Drawing verification analysis for final validation.
- Plotting buoys providing pressure observations in found sensitive areas.
- Re-building an analysis by removing these "sensitive" buoys.
- Re-running 48 hour forecast (initially in T63/19L/C1 and later in T149/27L/C1).
- Comparing the two forecasts with and without "sensitive" buoys.

All the above tools are now available.

I initially worked on the UKMO case of 29 September 1995 (Impact of Drifting Buoy Observations on an NWP forecast - the case of the 29th September 1995 - by Grant, Graham, Bader, March 96). This later case showed a positive impact of two specific buoys on UKMO weather forecast South West of England. Sensitivity study I conducted at Météo France showed that these two buoys were located in a sensitive area (i.e. forecasted mean sea level pressure over South West England is very sensitive to sea level pressure in an area where the two buoys are reporting from). The impact study I then conducted at Météo France showed that removing the two buoys from the analysis deteriorated the forecast South West of England hence validating the methodology I used.

I have then been working on some 10 FASTEX cases but could not find any where removing the buoy data had a negative impact upon the quality of the weather forecast. This could be due to the following causes:

- Conditions in altitude are predominant.
- First guess field in the North Atlantic is good and the buoy observations are very close to it hence having minor impact on the analysis.
- Presence of other surface observations (e.g. ships) does not permit to modify analysis substantially by removing buoy observations.
- Quality of forecast produced (both with and without the buoy data) was not always good enough because of I used a low model resolution (63 spectral truncature versus 149 for the operational model).

To avoid those sorts of problems the following approaches can be tentatively realised:

- Selecting cases where conditions in altitude are not a priori predominant. Météo France is running the adjoin model on a routine basis based on a cost function using average surface pressure over France. These products can be useful to select those situations but limits us to meteorological events over France.
- Identifying drifting buoys producing good quality data and showing higher deviations from the first guess field in certain meteorological situations. It can be expected that these buoys during these situations may have a greater impact on the analysis.
- Removing ship reports as well from the data assimilation scheme while running the impact study. Impact of surface air pressure reports is aimed as opposed to impact of air pressure reports from drifting buoys. At least if such an impact can be proven, it would mean that buoys can have a positive impact in areas where no ship reports are available.
- Studying areas where the first guess field is not as good as in the North Atlantic. South Atlantic, Indian Ocean, Southern Ocean can be studied in that regard.
- Running the impact study using a higher resolution (e.g. T119 or T149). The adjoin model would still use a lower resolution because of a lack of computer resources (T63).

I will work on these issues during the next intersessional period, hopefully to be in a position to show positive results at the next DBCP session.

2.10.2. Data-flow control

In the context of GTS data flow control, I wrote specific programmes for accessing and formatting GTS buoy data received at Météo France. I discussed the issue with Météo France who agreed to integrate these tools in the Météo France operational system so that feed back information is being sent daily to the DBCP server and to Service Argos in Toulouse (and then from Toulouse to Landover). To avoid confidentiality problems, data do not include location nor sensor data. WMO number, GTS bulletin header, date/time of observation, reception delay, and sensor status (i.e. on/off GTS flags) is included. This system has been operationally implemented on the 24 March 1997.

3. Regular or normal tasks

3.1 Monitoring

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

3.1.1. Quality Control Guidelines

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

3.1.1.2. To contact the PGCs: The QC guidelines have been automated, so status change proposals are automatically being forwarded to the Principal GTS Co-ordinator (PGC) when the latter can be automatically identified and has an Email address. In the contrary, 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 deposits a denial message on the bulletin board.

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

3.1.1.4. Feed back. Possibly to deposit feed back information on the bulletin board on behalf of Service Argos for sensors actually recalibrated.

3.1.2. 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...

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

3.2. User assistance

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

3.2.1. 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.

3.2.2. 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.

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

3.2.4. Secretariats: Upon request, I provid WMO or IOC secretariats with graphs and documentation.

3.2.5. Buoy manufacturers. Buoy manufacturers regularly contact me to be included in the DBCP list of drifting buoy manufacturers. I may also discuss technical issues with them.

3.2.6. Individual users contact me to obtain information of drifting buoys and seek information on how to obtain buoy data. I would redirect them to adequate institutions in that case (e.g. RNODC/DB).

3.2.7. Acting as a Principal GTS Co-ordinator (PGC) upon request (e.g. the regular PGC is in vacation).

3.2.8. 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...).

3.2.9. Investigate various data loss problems.

3.3. Drifting Buoy Quarterly Report

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

3.4. Global Telecommunication System (GTS)

3.4.1. Status for drifting buoys reporting onto the GTS:

- In July 1991, 718 drifting buoys were operational, 264 of these reporting on GTS (i.e. 36.8%).
- In July 1992, 1162 drifting buoys were operational, 474 of these reporting on GTS (i.e. 40.8%).
- In early August 1993, 1269 drifting buoys were operational, 548 of these reporting on GTS (i.e. 43.2%).
- In early September 1994, 1246 drifting buoys were operational, 587 of these reporting on GTS (i.e. 47.1%).
- In early September 1995, 1429 drifting buoys were operational, 631 of these reporting on GTS (i.e. 44.2 %).
- In early September 1996, 1180 drifting buoys were operational, 638 of these reporting on GTS (i.e. 54.1%).
- In September 1997, 1159 drifting buoys were operational, 581 of these reporting on GTS (i.e. 50.1%).

⇨ Although the number of drifting buoys reached a maximum in 1995, the total number of buoys on GTS continued to increase to reach a maximum of 638 in September 1996. In September 1997, the number of buoys and those on GTS decreased a little bit compared to the previous year.

See also figure 2 (distribution of active buoys by country), figure 5 (evolution of the number of buoy GTS air pressure reports since 1987), and figure 6 (evolution of mean RMS (Obs.-FG) for GTS air pressure data since 1987.

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. A set of these maps valid for August 1997 is shown in figure 1. The maps show clearly the impact of the TAO array ATLAS moored buoys (wind) or of DBCP regional action groups such as the ISABP (air pressure).

3.4.2. GTS bulletin headers:

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

See Table 1 for a complete list of GTS bulletin headers used to date.

3.4.3. 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 DBCP session agenda item number 7.1 (Quality Control of buoy data) for details.

3.4.4. Non-standard wind sensor heights:

I keep up to date the list of drifting buoys making wing measurements and reporting on GTS using the BUOY code. The list includes the WMO and Argos ID numbers, the height of the anemometers and whether or not a correction to 10 meters is applied.

3.4.5. Non-standard air pressure measurements for stations in altitude.

A few land stations reporting via Argos continue to report on GTS in BUOY code instead of SYNOP. I am therefore keeping up to date the list of such stations. This list includes the WMO, and Argos ID numbers, the Position and Altitude of the stations and whether or not Air Pressure is reduced to sea level.

3.4.6. 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.

3.5. Argos GTS Sub-System

The regular work of the Technical Co-ordinator 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 DBCP session agenda item number 7.3 (Argos) for details.

3.6. DBCP World Wide Web Internet server

The regular work of the Technical Co-ordinator concerning the newly established DBCP World Wide Web (W3) server 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 DBCP session agenda item number 6.2 (Information exchange) for details.

3.7. TC statistics and graphs.

3.7.1. 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 figure 2 (distribution of active buoys by country) and figure 5 (evolution of the number of buoy air pressure data distributed on GTS since 1987).

3.7.2. 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. The graph is included in the TC monthly report. See figure 3. See also figure 6 (evolution of mean RMS (Obs. - FG) for GTS air pressure data since 1987.

3.7.3. 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. See figure 4.

3.8. Action Groups, Regional actions.

3.8.1) Action Groups. I liaise with DBCP Action Group co-ordinators 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.

3.8.5) COSNA

I prepared the DBCP report for presentation by Flosi Sigurdsson at the 8th session of the Co-ordinating Group for COSNA (CGC).

3.9. Miscellaneous

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

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

3.9.3. TC DBCP files. I updated my files on a PC, using a data base management system (Paradox) and getting the data from Argos files and various status reports.

3.9.4. WMO/Argos number cross reference list and PGC list. I issued, on a monthly basis, the WMO/Argos number cross reference list, and sent it via the BUOY-QC mailing list to various Meteorological Centres and interested individuals. The is list no more distributed by regular mail. The list also includes the WMO numbers managed by the Oslo and Edmonton Local User Terminals (LUT) and indicates for each WMO number, the Argos number, the drifting buoy owner, and the dates the WMO numbers have been introduced and removed from the system (Argos or LUT). Attached to it is also included the list of Principal GTS Co-ordinators (PGC) designated by Principal Investigators for asking Service Argos to implement status changes on buoys reporting onto the GTS.

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

3.9.6. List of buoy user requirements. I am keeping this list up to date according to comments or information from buoy users.

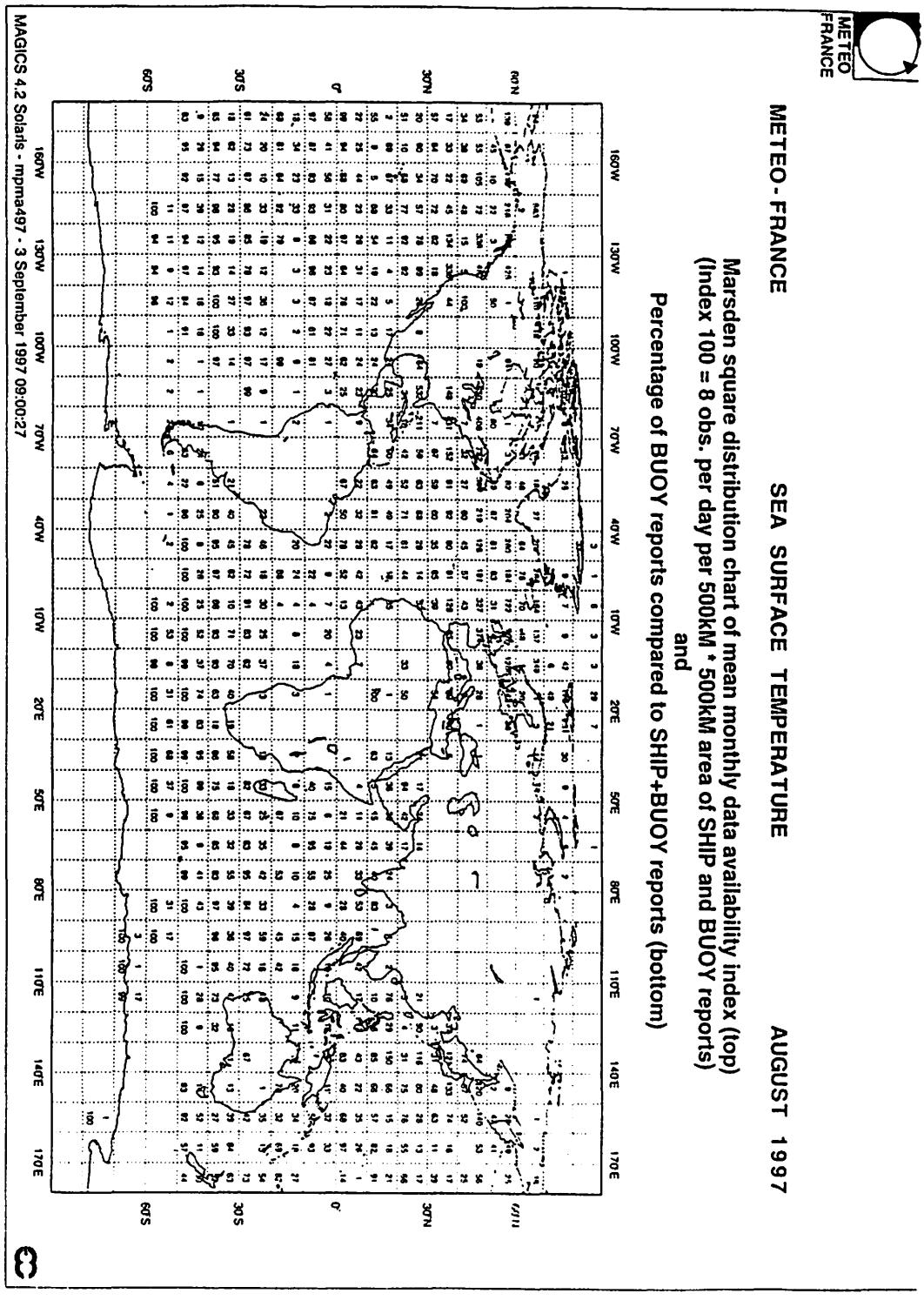
3.9.7. Documentation, assistance. I provided users with documentation or status reports concerning specific programs or experiments; I answered specific questions regarding the Argos System.

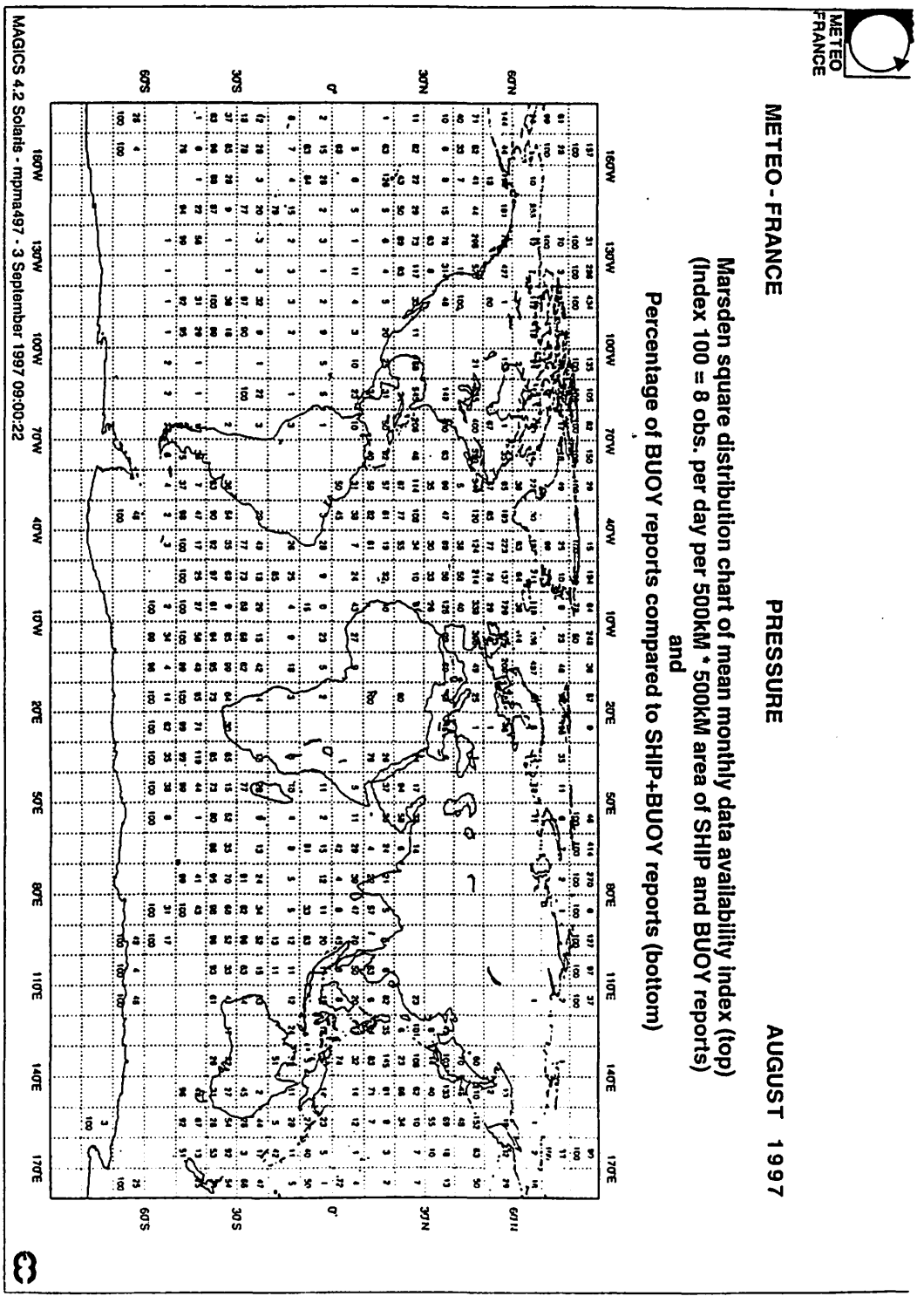
3.9.8. TC DBCP missions. I prepared the various missions or meetings I had to attend.

3.9.9. Preparation of the DBCP session. I prepared specific documents and the TC report for the DBCP XIII session:

- Report of the Technical Co-ordinator;
- Report on drifting buoy data Quality Control;
- Report on Argos developments (user requirements);
- Code matters (BUFR, BUOY);
- Information exchange.

Figure 1. Météo France August 1997 data availability Index maps by geophysical variable for SHIP and BUOY GTS reports (Air Pressure, Air Temperature, Sea Surface Temperature, Wind)

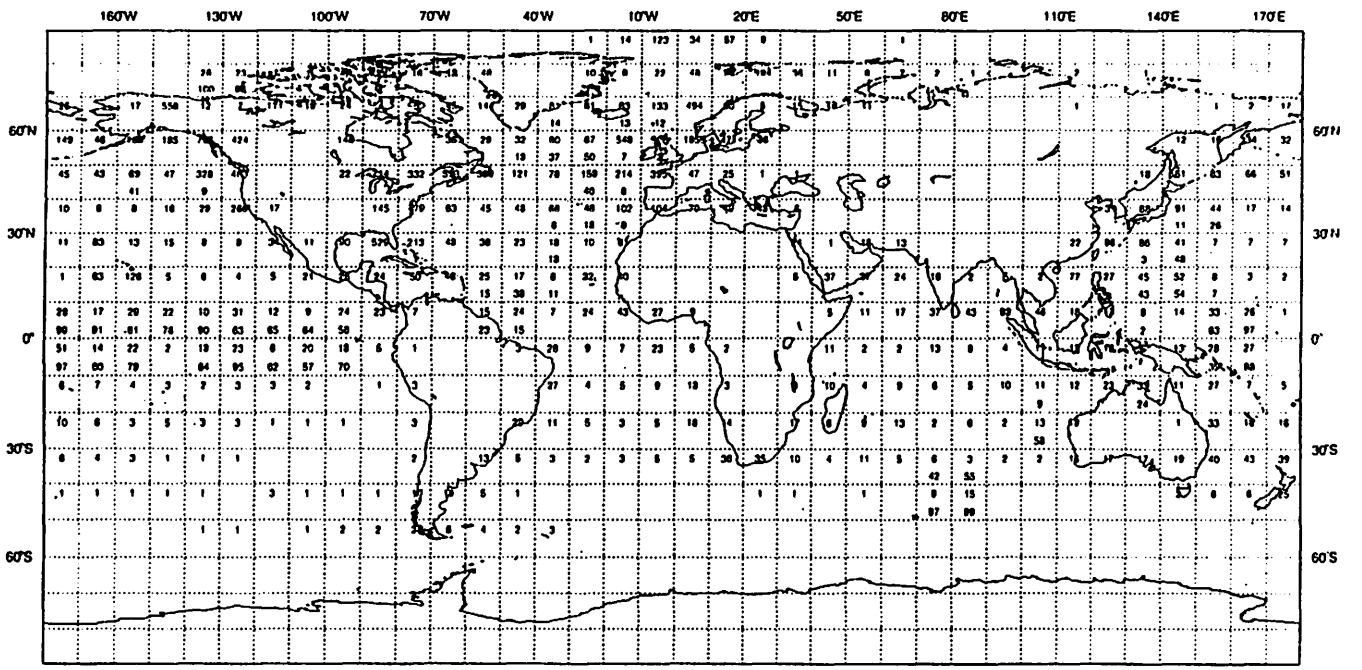



METEO FRANCE
METEO-FRANCE
PRESSURE
AUGUST 1997
Marsden square distribution chart of mean monthly data availability index (top)
(Index 100 = 8 obs. per day per 500kM * 500kM area of SHIP and BUOY reports)
and
Percentage of BUOY reports compared to SHIP+BUOY reports (bottom)
MAGICS 4.2 Solaris - mpma497 - 3 September 1997 09:00:22

METEO FRANCE

METEO-FRANCE **WIND** **AUGUST 1997**

Marsden square distribution chart of mean monthly data availability index (top)
(Index 100 = 8 obs. per day per 500kM * 500kM area of SHIP and BUOY reports)
and
Percentage of BUOY reports compared to SHIP+BUOY reports (bottom)

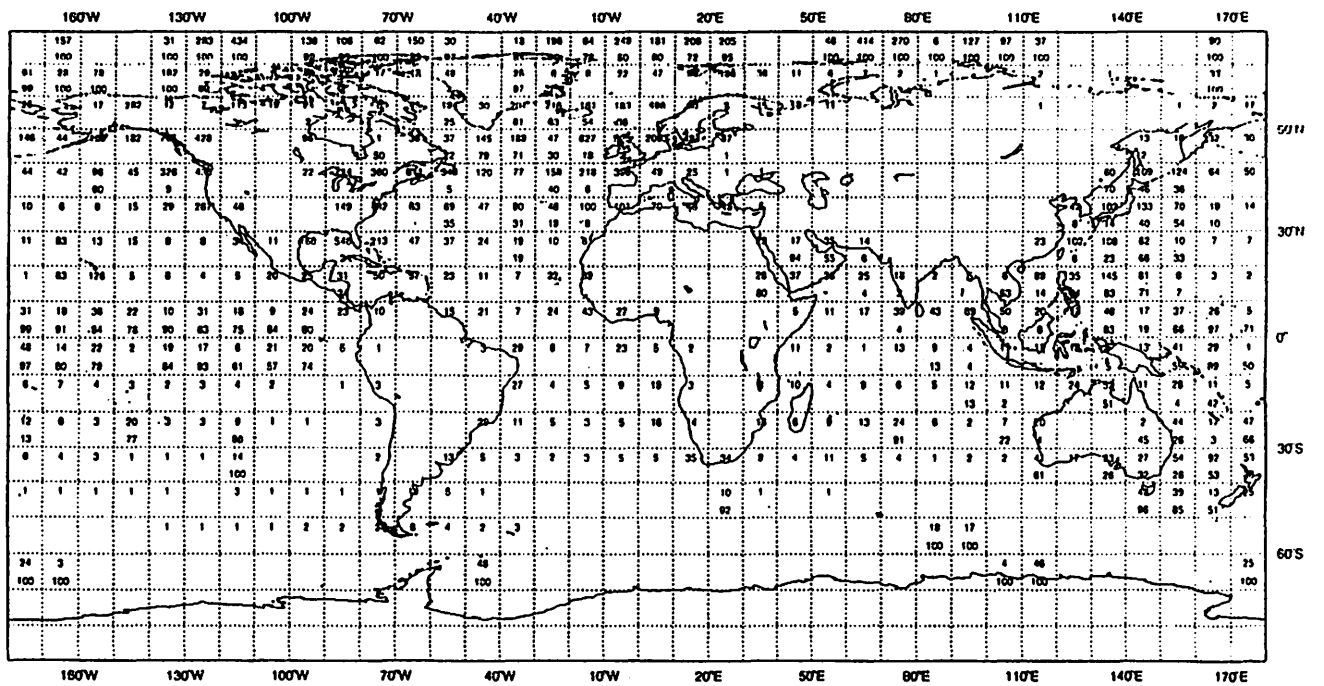


MAGICS 4.2 Solaris - mpma497 - 3 September 1997 09:00:32

METEO FRANCE

METEO-FRANCE **TEMPERATURE** **AUGUST 1997**

Marsden square distribution chart of mean monthly data availability index (top)
(Index 100 = 8 obs. per day per 500kM * 500kM area of SHIP and BUOY reports)
and
Percentage of BUOY reports compared to SHIP+BUOY reports (bottom)



MAGICS 4.2 Solaris - mpma497 - 3 September 1997 09:00:38

Table 1. List of GTS bulletin headers being used for drifting buoy data.

$T_1T_2A_1A_2$ii	Approximate region of deployment or Programme
USGPC (Service Argos Inc., Landover, USA):	
SSVX04 KARS	North Atlantic Ocean;
SSVX06 KARS	Northern Hemisphere;
SSVX10 KARS	Southern Hemisphere;
SSVX12 KARS	Arctic Ocean;
SSVX14 KARS	Antarctic area;
SSVX16 KARS	Specific experiments. Buoys from various ocean area;
SSVX18 KARS	NWS GLDB drifters for NE Pacific Ocean ;
SSVX40 KARS	ATLAS moored buoys in the Equatorial Pacific Ocean;
SSVX96 KARS	Specific experiment conducted by the NDBC.
QC by NDBC (Mississippi, USA) based on data from the USGPC:	
SSVX02 KWBC	Southern Hemisphere;
SSVX08 KWBC	Northern Hemisphere.
NIC (Washington-DC, USA) based on data received from the USGPC:	
SSVX18 KWBC	Arctic Ocean.
FRGPC, (CLS, Service Argos, Toulouse, France):	
SSVX01 LFPW	North Atlantic Ocean;
SSVX03 LFPW	Southern Hemisphere;
SSVX05 LFPW	Northern Hemisphere;
SSVX07 LFPW	Arctic Ocean;
SSVX09 LFPW	Antarctic area;

Oslo LUT (NMI, Oslo, Norway):

SSVX01 ENMI	North Atlantic Ocean (for the EGOS Programme);

Sondre Stromfjord LUT (DMI, Greenland):

SSVX01 BGSF	North Atlantic Ocean (for the EGOS programme);

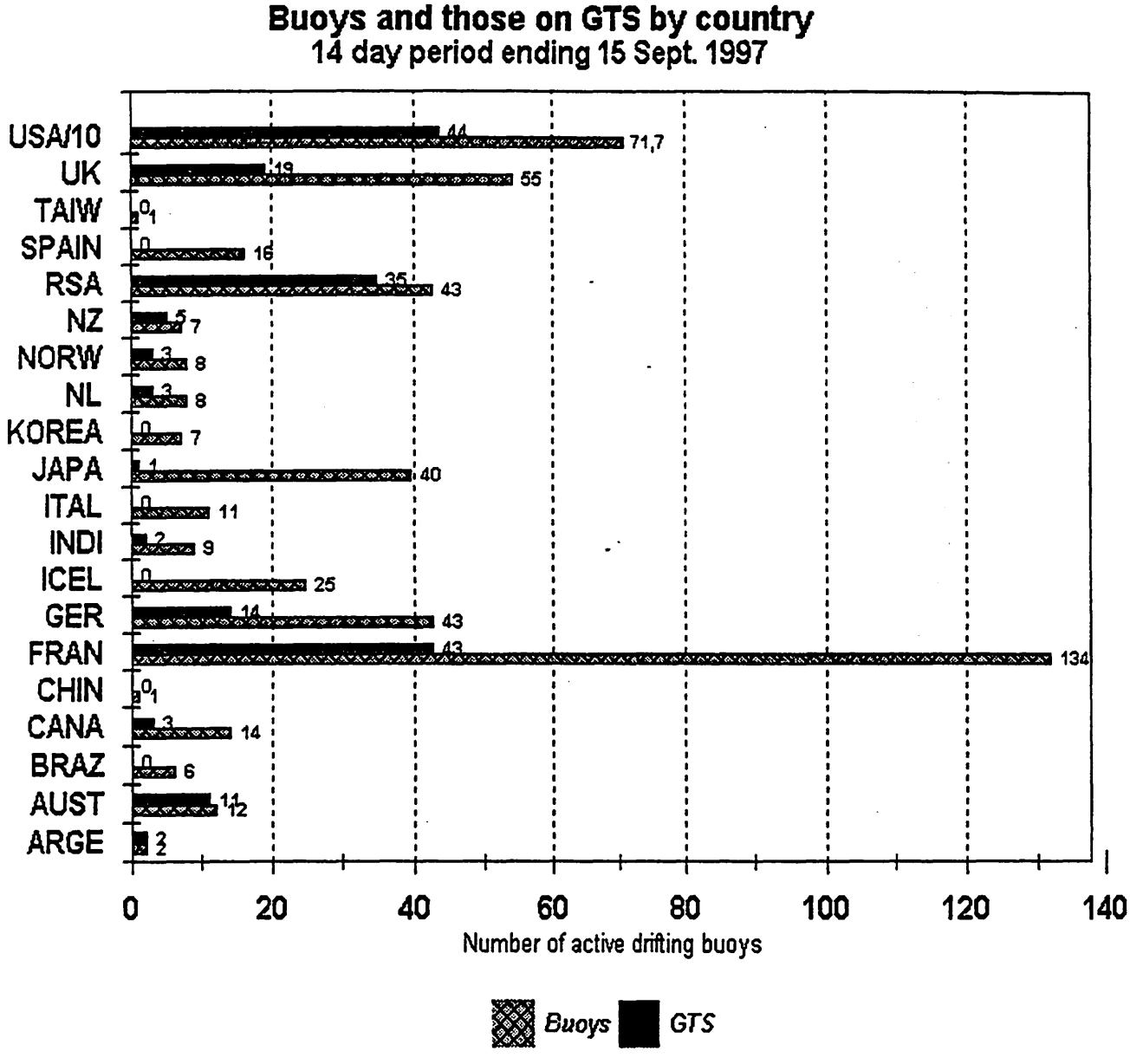
Halifax LUT (Environment Canada):

SSVX01 CWHX	North-West Atlantic Ocean.

Edmonton LUT (Environment Canada):

SSVX02 CWEG	Arctic Ocean;
SSVX03 CWEG	Hudson Bay;
SSVX04 CWEG	North-East Pacific Ocean.

Figure 2. Distribution of GTS and non-GTS platforms by country:



Total:1159 buoys, 581 on GTS (i.e. 50.1%)

Figure 3. Distribution of RMS (Obs. - First Guess Field. for Air Pressure data:

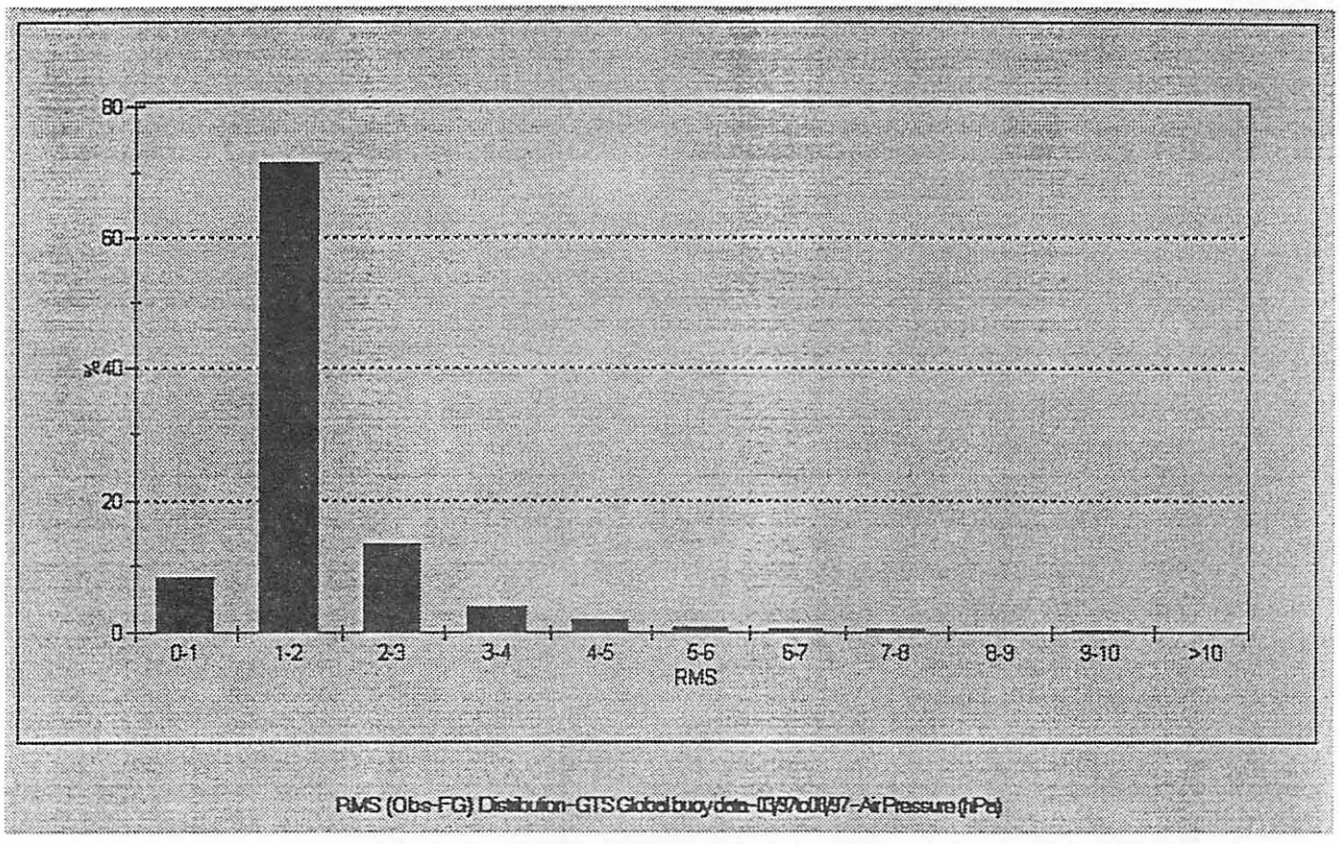


Figure 4. Distribution of the Life Time of the Air Pressure sensor:

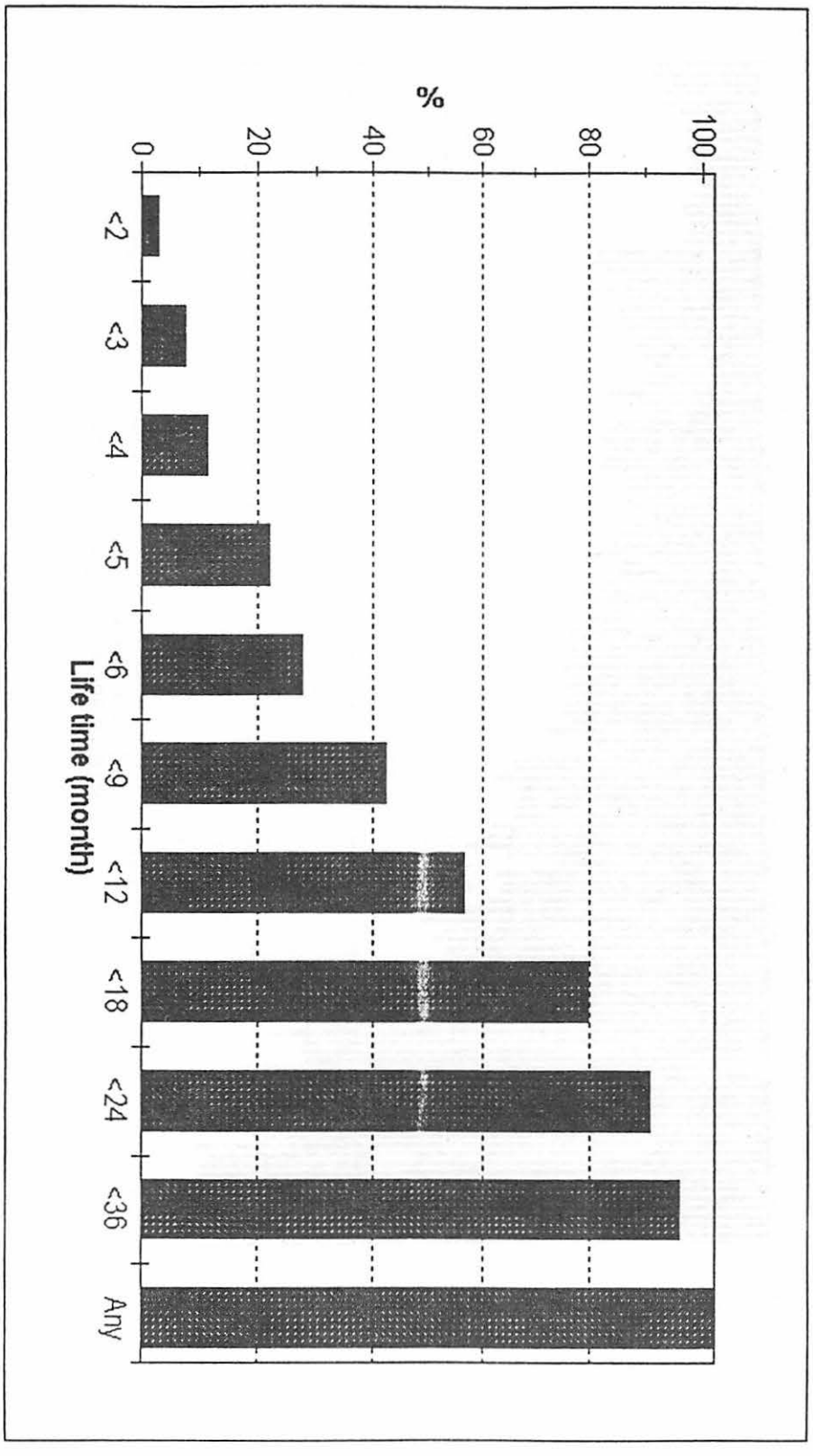


Figure 5. Evolution of the number of air pressure GTS reports by month since 1987 (from ECMWF statistics)

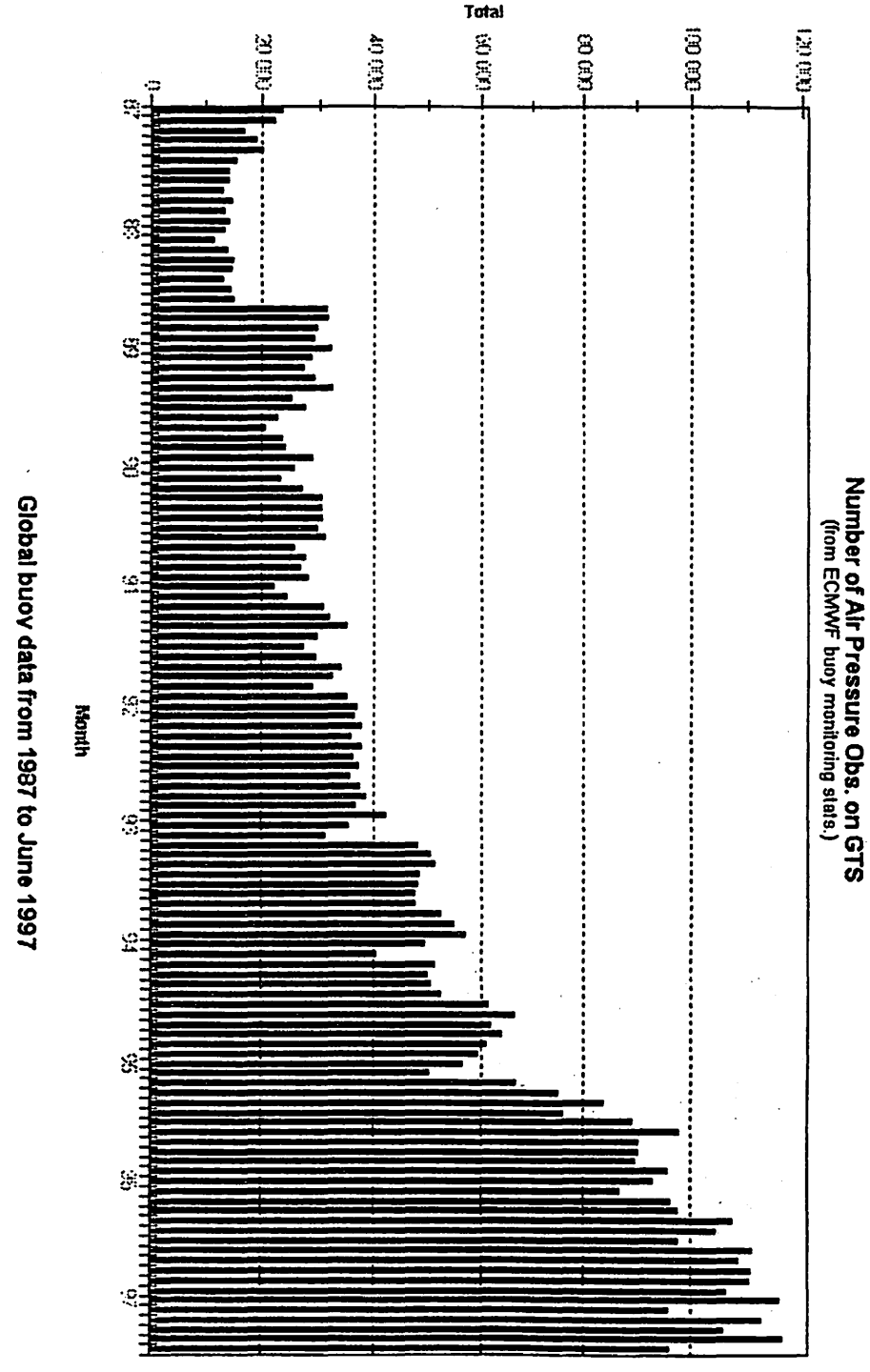
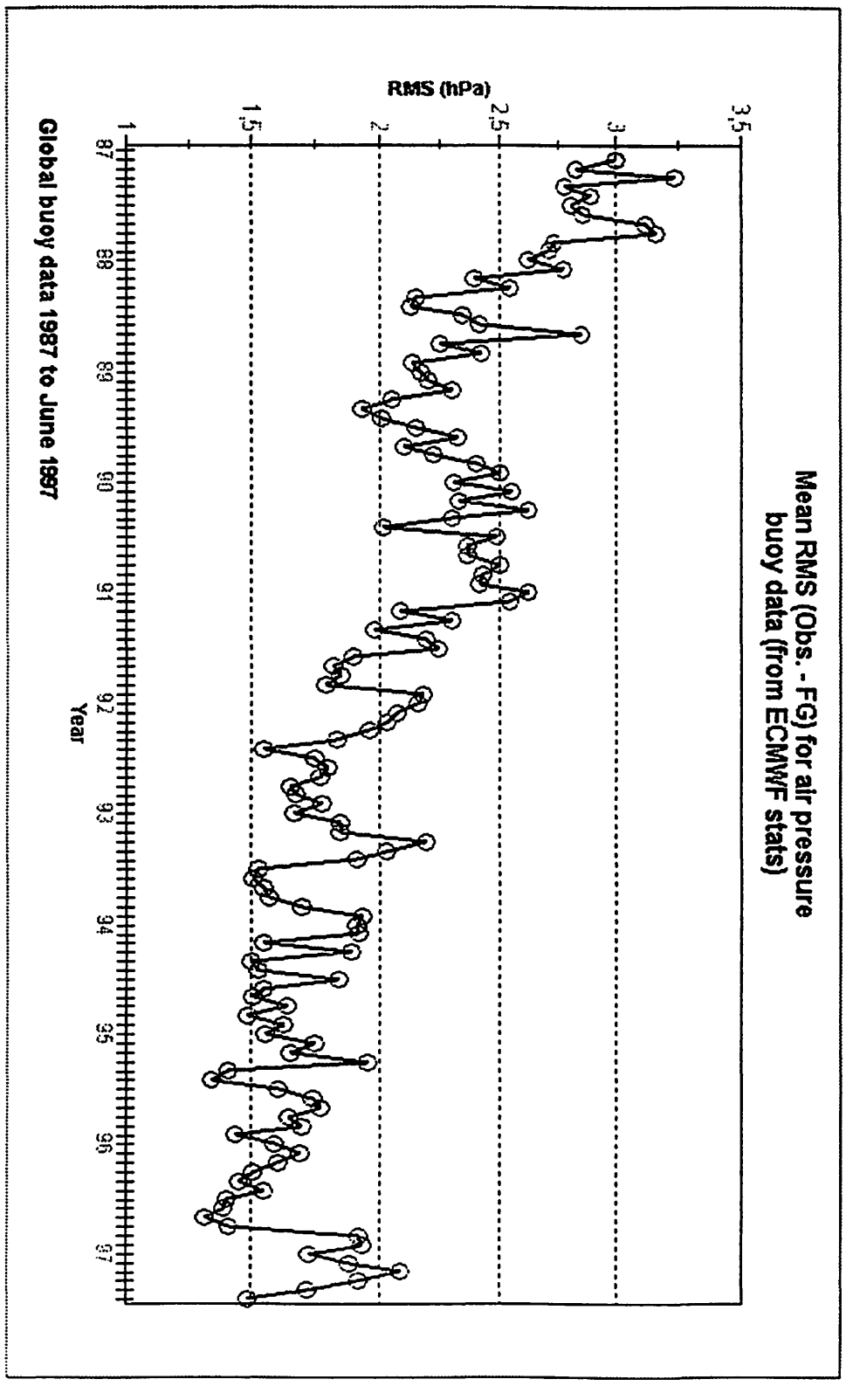


Figure 6. Evolution of mean RMS (Obs. - FG) by month for air pressure GTS data since 1987 (from ECMWF statistics)



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Discussion

1. DBCP server

1.1. Improvements realised during the last intersessional period are listed below:

-1- Look of the server pages has been re-designed by Darren Wright (AOML), particularly by adding a separate frame with the Home page menu items on every page (see annex A).

-2- Links have been added to other servers such as the new IBPIO Home Page (See Annex E, developed by the IBPIO Programme Co-ordinator, Mr. Pierre Blouch), and the ISABP Home Page (developed by the ISABP Programme Co-ordinator Mr. Eugene Burger; ISABP Home Page is also hosted by NOS on AOML computer).

-3- The page describing the DBCP has been rewritten to explain in more details what are the DBCP objectives and modes of action.

-4- Menu item "Regional Action Groups, and other Servers" has been split into two menu items:

- "Global Implementation" (second menu item after "DBCP General Information") which includes TAO, the Action Groups, including the GDP, plus a menu item for "Deployment Opportunities". A page explaining what is a DBCP Action Group as well as a global map (see annex C) showing the area of responsibility of each the Action Groups have been added.
- "Other Servers" which has been placed at the end of the Home Page menu list.

-1- Monthly status maps are linked to adequate Action Group pages when available (IABP, GDP, EGOS, IBPIO (see Annex F)) or to other global products (MEDS, GDP).

-2- Many buoy manufacturers asked to be added on the DBCP list of buoy manufacturers (see annex B). Hypertext links have been added to their servers when available.

-3- Link to a product developed by the Centre de Météorologie Marine of Météo France and providing pictures of typical buoys has been added.

-4- Several DBCP documents have been edited in HTML format for better appearance through a web viewer (QC guidelines, GTS sub-system reference guide).

-5- A table describing various data collection and location present and future systems potentially useful for drifting and/or moored buoys has been added with hypertext links to the systems servers when available.

1.2. Updates: Hypertext links have been updated to keep consistency with the other servers the DBCP server is connected with (see annex I).

1.3. Developments underway: The Technical Co-ordinator has been working substantially in developing tools for GTS data-flow control.

Presently, GTS buoy data received at Météo France and MEDS are copied to the DBCP server on a daily basis. List of received GTS BUOY reports, statistics, including delay histogram by GTS bulletin header or individual buoy can be obtained easily by someone accessing the DBCP server via a dedicated web page (see annex G for the related web. Page, and annex H for an example of output).

Tools are useful for someone authorising GTS distribution of his buoy data but who has no access to the GTS. Using the tools, he can easily check whether a buoy is reporting on GTS. Tools can also be useful to make comparisons between what has actually been received, at Météo France, MEDS, and the National Weather Service. Delays (i.e. reception time minus observation time) can also be obtained and compared.

These tools could not be considered operational so far because in practice, access times are unacceptable for high WMO numbers or large amount of requested information. However the system is available in test mode for someone patient (http://dbcp.nos.noaa.gov/dataflow.html) and daily files can be downloaded by anyone.

Samples of Météo France GTS data (i.e. location & sensor data excluded for confidentiality reasons) are available via anonymous ftp at dbcp.nos.noaa.gov on pub/dataflow directory, files are named MFRA.dat.YYYYMMDD.Z (Météo France) and MEDS.dat.YYYYMMDD.Z (MEDS): These are Unix compressed files, 1 file per day, YYYYMMDD for the date. Files are kept for about 2 week on the server.

Poor performances are due to (i) normal ASCII sequential files are used with this system, and (ii) performances of the present machine used as a DBCP server are low (disk space and central memory becomes critical for that kind of application). I understood that AOML is willing to replace the present machine with a Windows NT 200 MHz Pentium type machine. On the other hand, I succeeded in testing a new version of above "data-flow" products using database type software instead of regular ASCII sequential files. This latter version is very performant but cannot run acceptably on the present DBCP machine because it basically requires more disk space and memory. It has however been successfully tested on a more powerful machine available to me at CLS.

Since MEDS is also downloading daily files onto the server, comparisons with Météo France and MEDS are possible on a daily basis. NWS files are not available yet. I had to write dedicated programmes for processing MEDS files because data were not sorted the same way as Météo France files.

1.4. The present DBCP server

The server is accessible at any time from anywhere where Internet access is available. The Internet World Wide Web address of the server is:

http://dbcp.nos.noaa.gov/

Various kind of information can be found on the server. At the top of the home page (see Annex A), DBCP, WMO, and IOC logos appear plus two pictures of a drifting and a moored buoy. Direct links are possible to WMO and IOC home pages. A menu item to fill in a DBCP questionnaire to buoy users is also present at the top of the home page. Menu items are listed below in the same order as they appear on the home page (see annex I for detailed DBCP server tree and hypertext links):

I. General information regarding the DBCP (i.e. Logo, description of the Panel, terms of reference).

II. Global Implementation: Guidelines for DBCP Action Groups are detailed. A global map showing area of responsibilities of the different DBCP Action Groups is accessible. Direct links to the International Arctic Buoy Programme (IABP), the European Group on Ocean Stations (EGOS), the International Buoy Programme for the Indian Ocean, the Global Drifter Programme (GDP), The Tropical Atmosphere Ocean Array Programme, home pages are available. The DBCP server directly hosts home pages for the International south Atlantic Buoy Programme (prepared by Eugene Burger) and the International Programme for Antarctic Buoys. A link to the TAO array Home Page is also available under this menu item.

Recently, NOAA/AOML added US deployment opportunities maps plus contact point directly available under this menu item.

III. Quality Control information:

- ✓ Description of the Quality Control Guidelines for GTS buoy data;
- ✓ The Icelandic Meteorological Office provides tools to access the archived PMOC Quality control messages as sent onto the BUOY-QC@VEDURIS mailing list. This product is available from a menu item at the root of the DBCP server at NOS.
- ✓ The Centre de Météorologie Marine (Météo France) provides tools to access the archived buoy monitoring statistics from ECMWF, UKMO, NOAA/NMC, and Météo-France. Two menu items are available. Both products are available from menu items at the root of the DBCP server at NOS:
  - Access to the monthly files,
  - Simple Query Sheet for extracting statistics regarding a buoy, a period, etc...

I. Technical Developments (SVPB, Air Temp, Wind); Documents, pictures and graphics are available for the SVPB; Air Temp. And Wind menu items are empty for the time being.

II. Data Collection and Location Services; Description of Service Argos (basically the DBCP Guide on Argos in "text" format); Table describing alternatives to Argos is available on-line with direct links to the systems' servers when available.

III. GTS distribution of the data : Description of the Argos GTS sub-system, list of Principal GTS co-ordinators, Data Availability Index Maps, monthly status maps by Ocean Basin (seen annex F).

IV. Buoys (main types of buoys, including pictures: moored buoys and drifting buoys plus a list of buoy manufacturers (see annex B)).

V. Points of contact (National Focal Points for drifting buoy programmes, National Focal Points for logistic support, Principal GTS co-ordinators, WMO, IOC, DBCP, DBCP server).

VI. Documentation: This menu item includes the list of DBCP publications (see Annex D).

VII. Meetings of interest to the buoy community.

VIII. Other Servers: Various links to other servers potentially interesting the buoy community (i.e. WMO, IOC, WCRP, GOOS, GCOS, WOCE, CLIVAR, MEDS, SAI, NDBC, CMM, SAWB). Other servers can be added on this list if requested.

IX. Mail (Email addresses of Etienne Charpentier (TC DBCP) and Darren Wright (NOAA/AOML) for exchanging information among the users of the server).

The DBCP server should be advertised widely, especially among Principal Investigators, Buoy programme managers, and National Focal Points for buoy programmes.

1.5. Possible improvements

Besides improving performances of data-flow control tools as described in paragraph 1.3, it is planned to add new products related to global implementation issues.

Possible improvements could be implemented on the server provided that the needs are well recognised and the resources are available for the developments. It is not necessary that additional menu items are implemented on NOS computers: any agency with full Internet access can propose and implement on its own computers such additional products (as is presently done by the Centre de Météorologie Marine and the Icelandic Meteorological Office for Quality Control menu items).

The following products could be added:

a- National yearly reports provided by the NFP in electronic form

c- Products related to Global Implementation issues and deployment strategies. For example, it is being proposed that deployment opportunities should be available on the web on a country or regional Action Group basis. Presently only USA provides a product via the DBCP server (under "Global Implementation" menu item).

2. DBCP Brochure

At its twelfth session, the DBCP considered the possibility of publishing a brochure for publicising its work and the action groups. The Brochure had to be mainly oriented towards the use of data buoys and appear as a A4 three-folding leaflet, possibly encompassing smaller leaflets relating to the action groups. Unfortunately, under the pressure of work and other priorities, the TC/DBCP, chairman, vice-chairmen, and Secretariats, could not spend sufficient time on the issue to come up at the DBCP session with substantial materials. The Panel may consider tentatively producing the brochure for DBCP-XIV under a similar schedule as proposed at DBCP-XII, i.e.

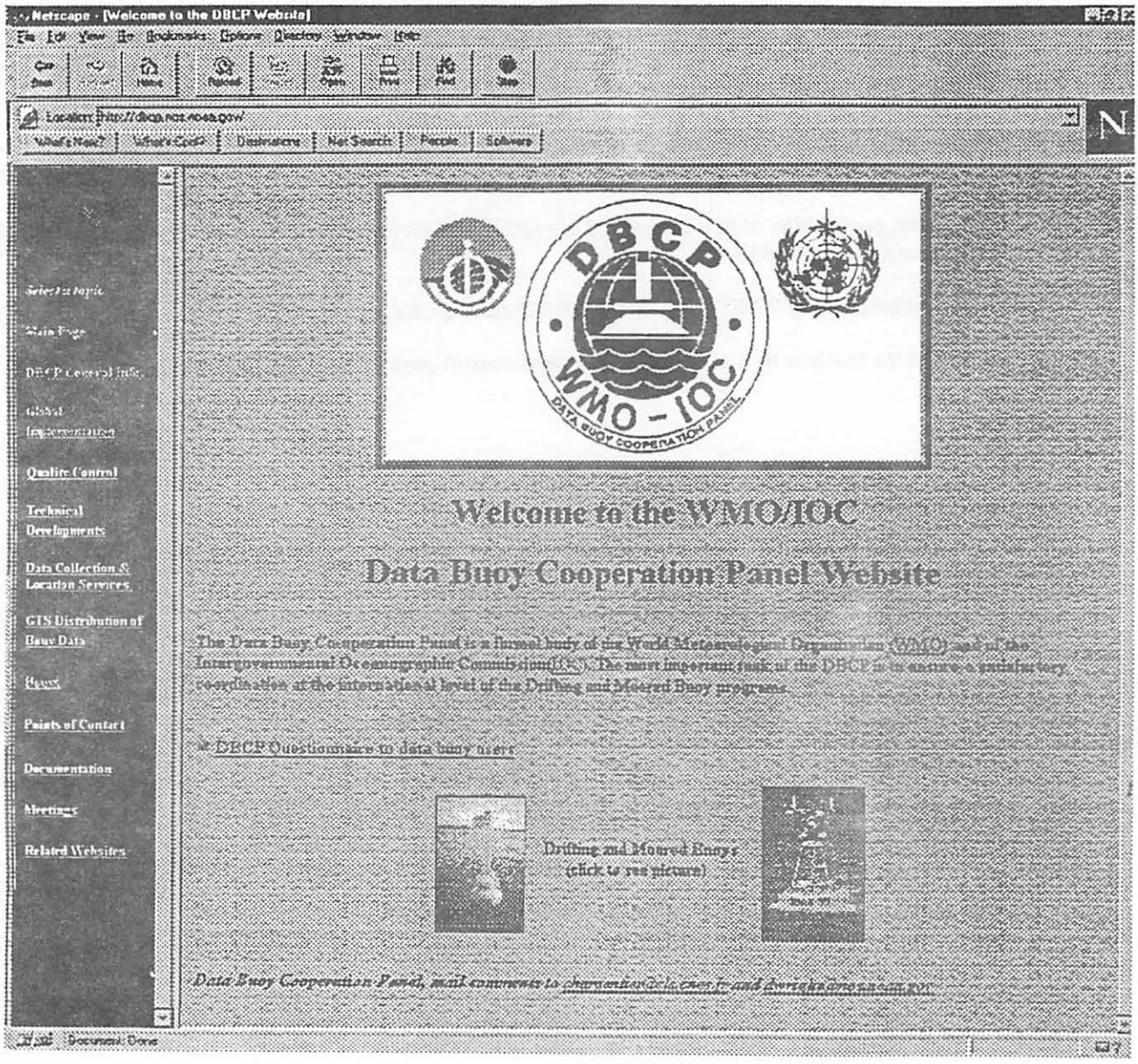
(i) drafting of text, compilation of illustrations and preparation of draft layout by TC/DBCP, chairman, vice-chairmen, and Secretariats; deadline mid-1998;

(ii) preparation of brochure by WMO graphics artist (DBCP funding), for approval by DBCP-XIV;

(iii) publication of the brochure by a panel Member State as a contribution in kind, late 1998.

Appendices: 9

DBCP SERVER HOME PAGE



DBCP LIST OF DRIFTING BUOY MANUFACTURERS

Note : Manufacturer's name is underlined when a link to its web. server is available.

List of Buoy manufacturers

Note: This is not a comprehensive list. Any manufacturer willing to be listed here must submit a request to the Technical Co-ordinator of the DBCP (charpentier@cls.cnes.fr) and will be added shortly at no fee.

The manufacturers are listed by alphabetic order.

Axys Environmental Systems

P.O. Box 2219 2045 Mills Road
Sidney, BC V8L 3S8
CANADA
Tel: (+1) 250 656 0881
Fax: (+1) 250 656 4511
Contact: Mark Blaseckie, Email: blasecki@islandnet.com

CEIS TM

L/CD Department
Le Sirius - Bat C
239 route de Saint-Simon
31100 Toulouse
France
Tel: (+33) 5 61 44 39 31
Fax: (+33) 5 61 41 01 30
Email: 101644.515@Compuserve.com
Contact: Thierry Portes

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Russian Federation

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Bergen
Norway
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Fax: (+47) 5 57 40 01
Contact: Torleif Lothe

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Wellesley Hills, MA 02181
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Fax: (+1) 617 239 3314
Contact: Gary Williams

Coastal Environmental Systems

1000 First Ave. South, Suite 200
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Tel: (+1) 206 682 6048
Fax: (+1) 206 682 5658
Email: kpouncy@coastal.org
Contact: Mr. Pat Kelly

CTA Space Systems (CTASS)

1521 Westbranch Drive
McLean, VA 22102-3201
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Fax: (+1) 703 883 2655
Contact: James J. Katsos, Director special Programs, George S. Sebestyen, President
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Fax: (+61) 02 731 749

MORS Environnement

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29200 Brest
France
Tel: (+33) 2 98 05 67 00
Fax: (+33) 2 98 45 70 71

Nereides

4, avenue des Indes
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France
Tel: (+33) 1 69 07 20 48
Fax: (+33) 1 69 07 19 14
Contact: Mr Becq

Oceanor

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Contact: Svein Erling Hansen, Manager Seawatch Europe
Tel: (+47) 7 52 50 50
Fax: (+47) 7 52 50 33

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Fax: (+1) 808-832-5577
e-mail o.amtsberg@worldnet.att.net
compuserve 76761,1653
Contact: Mr. Fritz M. Amtsberg.

ORCA Instrumentation

5, rue Pierre Rivoalon
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Tel: (+33) 2 98 05 29 05
Fax: (+33) 2 98 05 52 41
Contact: Jean-Michel Coudeville

ROBWI

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Emyr Roberts B. Sc., Ph. D.
Bryn Derwen Isaf
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United Kingdom
Tel: (+44) 01248 600 200

Seimac Limited

271 Brownlow Av.
Dartmouth, Nova Scotia
Canada B3B 1W6
Tel: (+1) 902 468 3007
Fax: (+1) 902 468 3009
Contact: Mr. Paul Hill
Email: phill@seimac.com

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Zone Indutrielle des 5 chemins
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Fax: (+33) 2 97 65 00 20
Email: contact@serpe-iesm.com
Web (francais/french): http://www.serpe-iesm.com/secu.htm
Web (english) : http://www.serpe-iesm.com/eng/secu.htm

Technocean Associates

4422 SE 9th Av.
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Fax: (+1) 813 574 5613
Contact: Hank White

Toyocom

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Hobart
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Australia

Tel: (+61) 3 6236 9511
Fax: (+61) 3 6236 9506
Email: turo@turo.com.au

Urethane Products Corporation

17007 South Broadway
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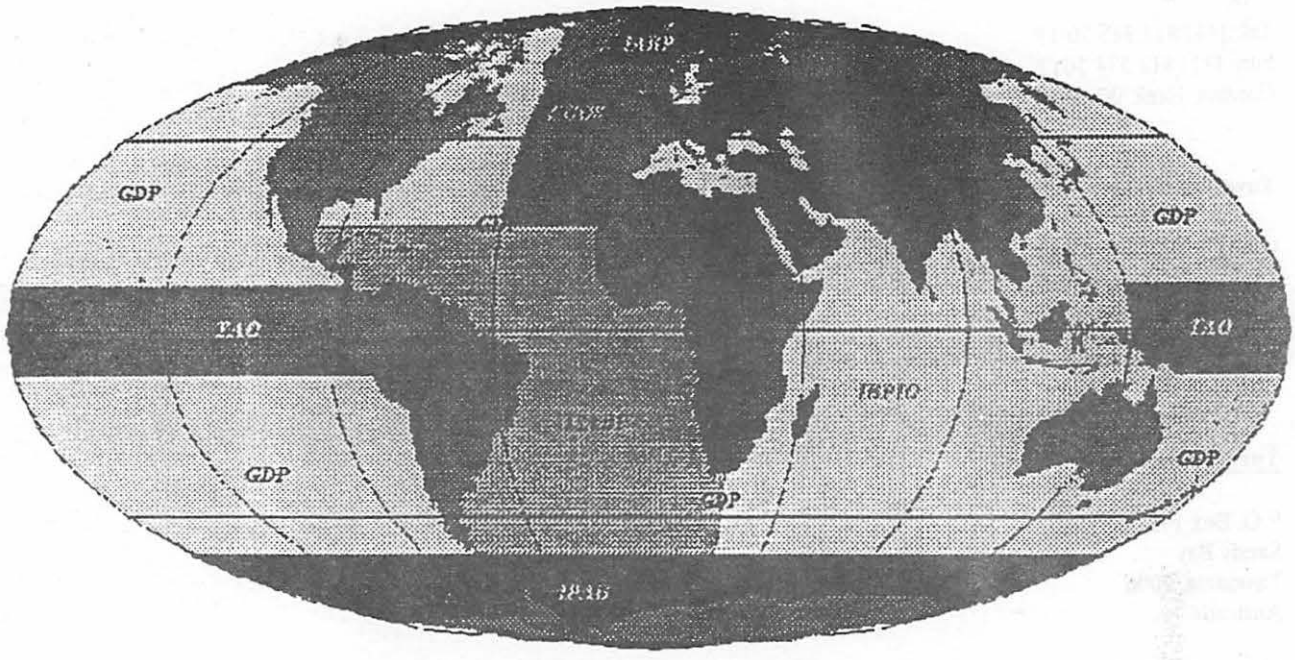
Fax: (+1) 310 532-9884
e-mail: jthermos@urethaneproducts.com
Contact: Jerry Thermos

DBCP ACTION GROUPS' AREA OF RESPONSIBILITY

Note: the map appears in colour on the web.

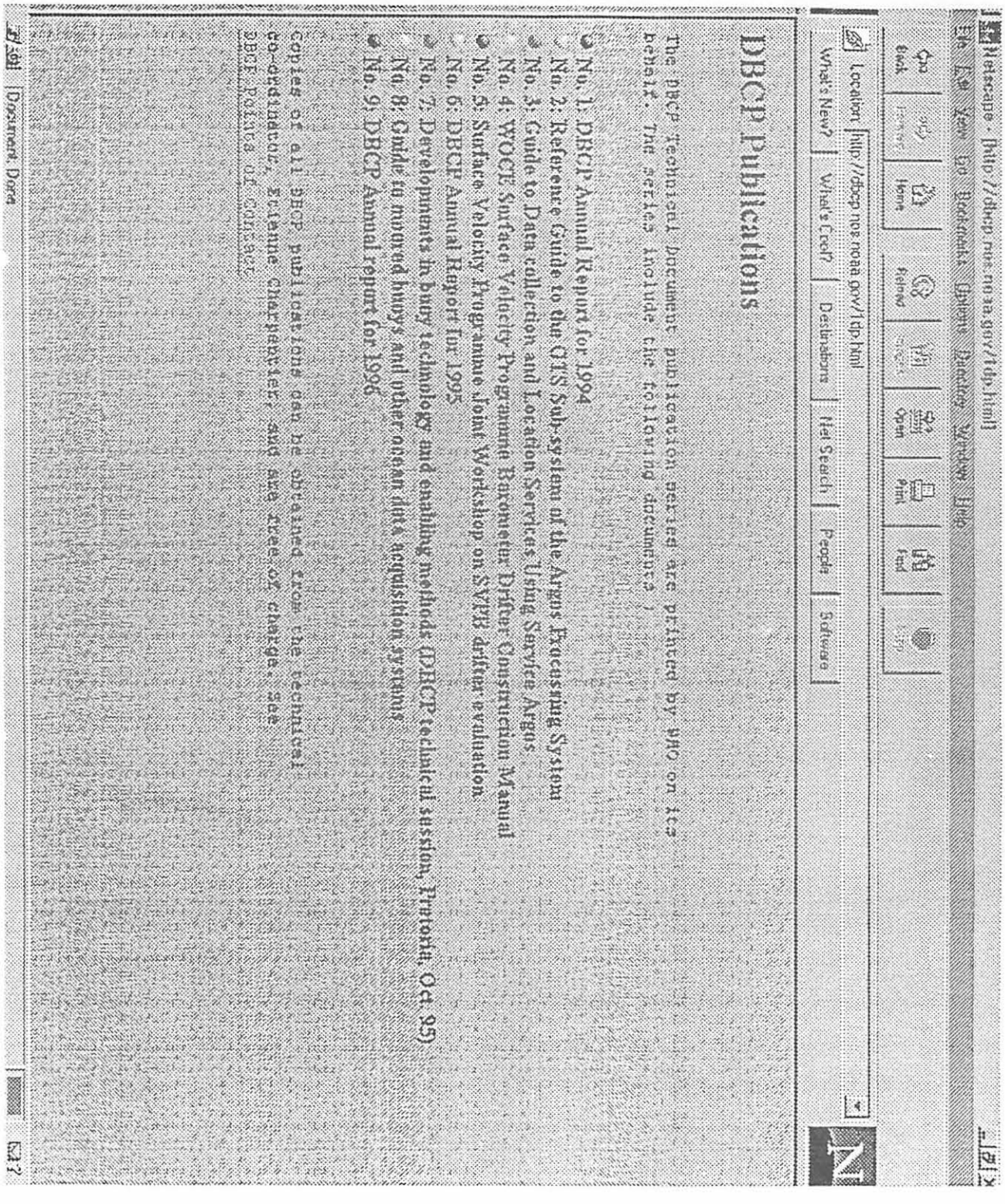
Data Buoy Co-operation Panel Action Groups



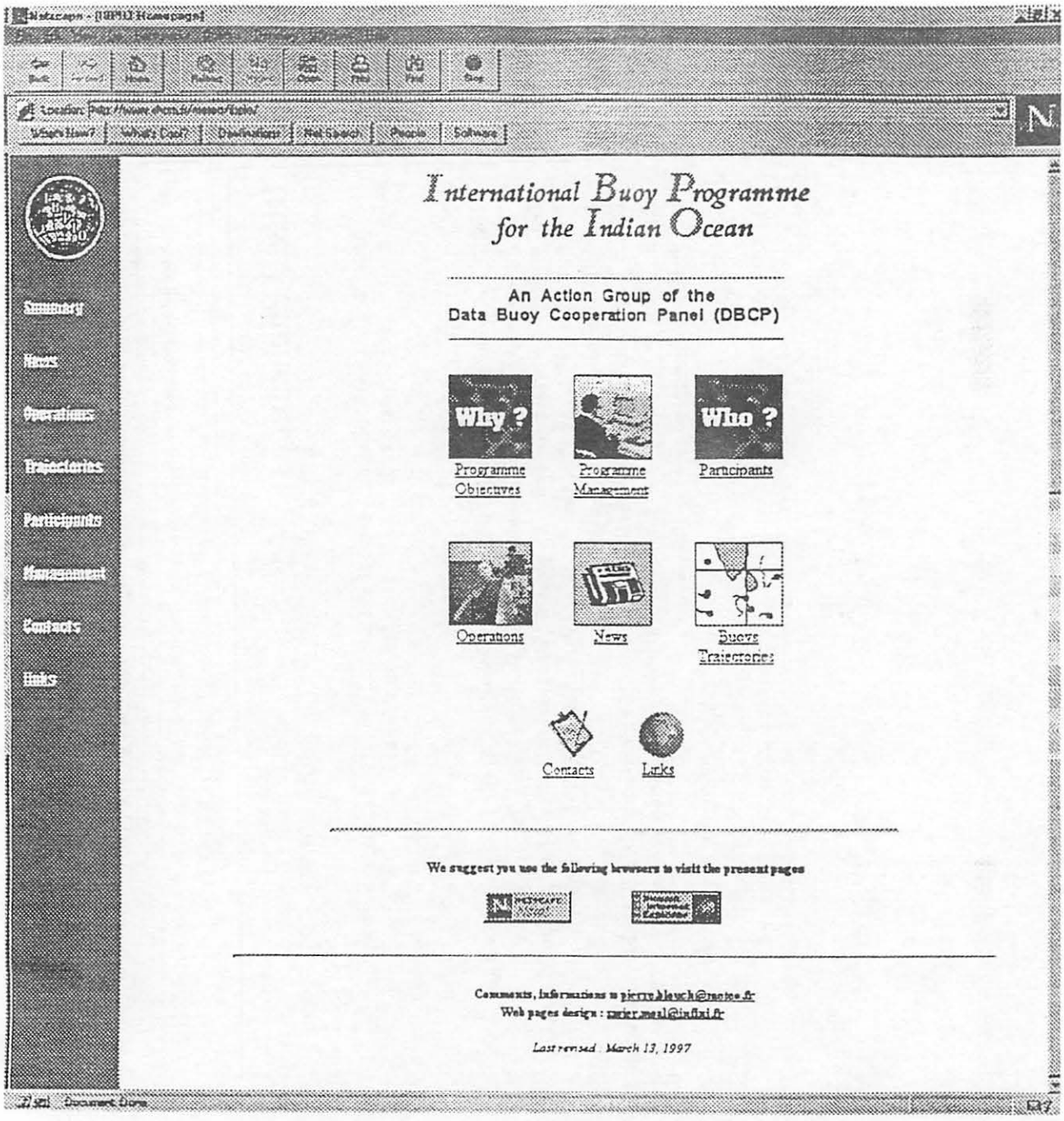
EGOS : European Group on Ocean Stations (1987)
IPAB : International Programme for Antarctic Buoys (1994)
IBPIO : International Buoy Programme for the Indian Ocean (1996)
TAO : Tropical Atmosphere Ocean Array (not a DBCP Action Group)
IABP : International Arctic Buoy Programme (1991)
ISABP : International South Atlantic Buoy Programme (1994)
GDP : Global Drifter Programme (1996)

DBCP-XIII/Doc. 5, APPENDIX D

LIST OF DBCP PUBLICATIONS

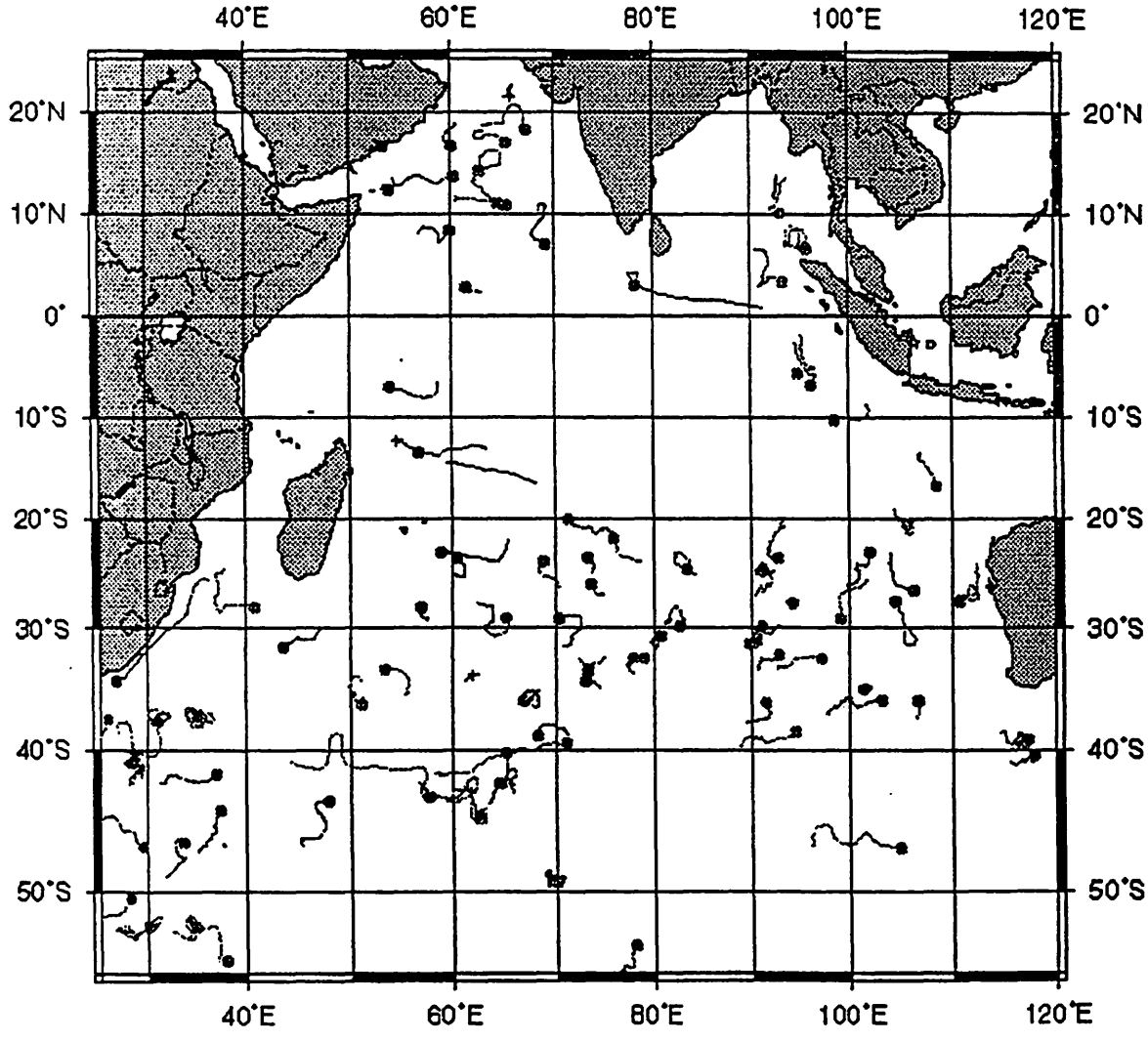


IBPIO HOME PAGE



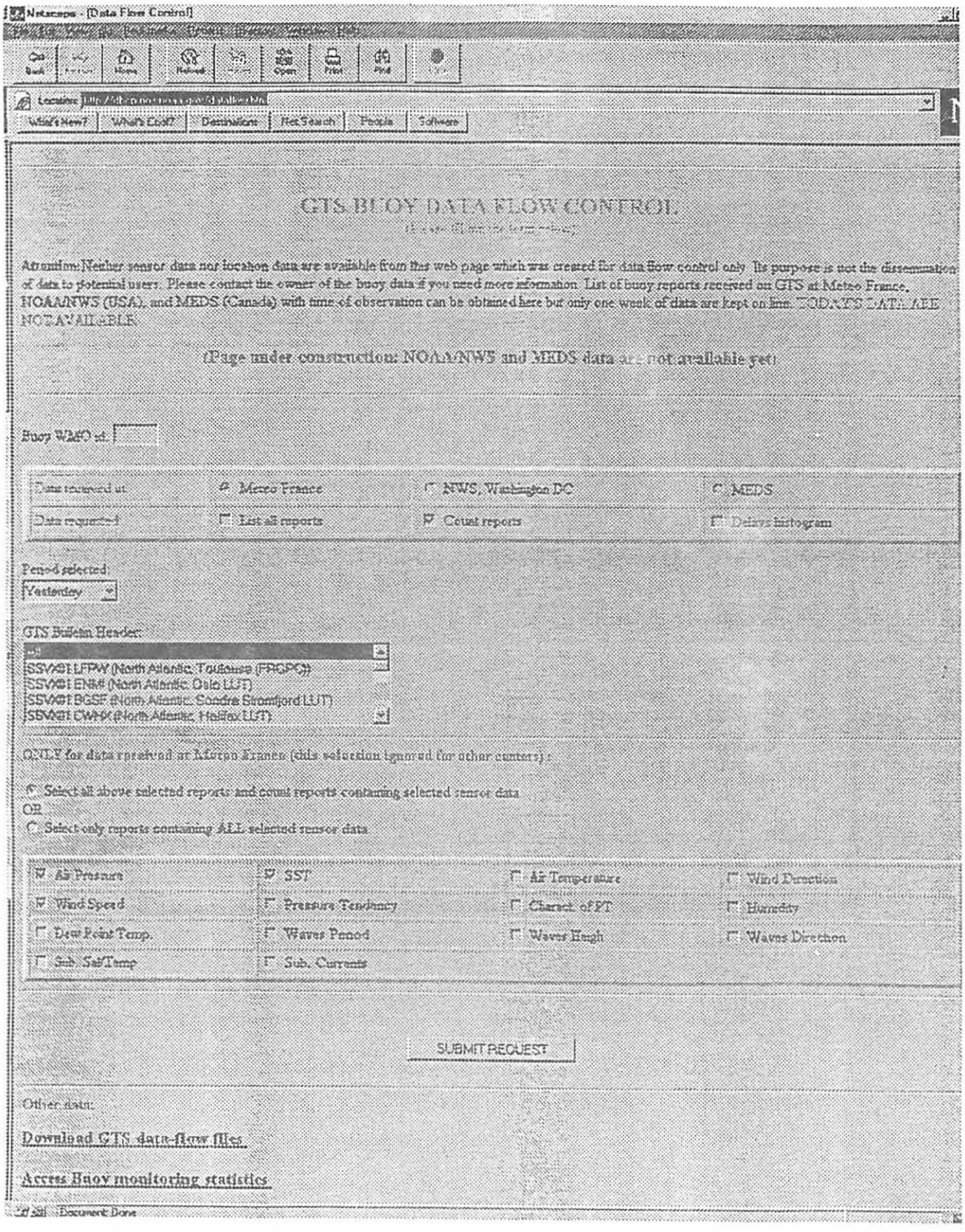
IBPIO MONTHLY STATUS MAP

Note: Following map is for June 1996. On the web, drifting buoys transmitting air pressure data on GTS appear in red, wind in green, and sea surface temperature only in blue.



DBCP-XIII/Doc. 5, APPENDIX G

DATA FLOW CONTROL WEB. PAGE



DBCP-XIII/Doc. 5, APPENDIX H

EXAMPLE OF RESULTS FROM DATA FLOW CONTROL WEB. PRODUCT.

DBCP Buoy GTS Data Flow Control

Thursday 07 August 1997

Buoy WMO number : 25571

Received at : METEO_FRANCE

Period selected : YESTERDAY

GTS bulletin header: ALL

(When presence of sensors is indicated in column sensors, they are given in the order P_SST_AT_WS_WD_PT_PTC_U_TD_PWa_HWa_DWa

WMO ,TTAAii,CCCC,ObsDate ,Time ,Delay(min)[, sensors, nb_of_sub_T_S, nb_of_sub_cur]

25571,SSVX07,LFPW,08/06/97,000000, 35,101001100000, 0, 0
25571,SSVX07,LFPW,08/06/97,001900, 16,101001100000, 0, 0
25571,SSVX07,LFPW,08/06/97,004600, 234,101001100000, 0, 0
25571,SSVX07,LFPW,08/06/97,020500, 428,001000000000, 0, 0
25571,SSVX07,LFPW,08/06/97,022900, 125,101001100000, 0, 0
25571,SSVX07,LFPW,08/06/97,030000, 74,101001100000, 0, 0
25571,SSVX07,LFPW,08/06/97,034900, 266,101001100000, 0, 0
25571,SSVX07,LFPW,08/06/97,040600, 8,101001100000, 0, 0
25571,SSVX07,LFPW,08/06/97,054500, 140,101001100000, 0, 0
25571,SSVX07,LFPW,08/06/97,060000, 228,101001100000, 0, 0
25571,SSVX07,LFPW,08/06/97,073400, 134,101001100000, 0, 0
25571,SSVX07,LFPW,08/06/97,090000, 168,101001100000, 0, 0
25571,SSVX07,LFPW,08/06/97,091300, 155,100000000000, 0, 0
25571,SSVX07,LFPW,08/06/97,103900, 137,101001100000, 0, 0
25571,SSVX07,LFPW,08/06/97,120000, 42,101001100000, 0, 0
25571,SSVX07,LFPW,08/06/97,121200, 30,101001100000, 0, 0
25571,SSVX07,LFPW,08/06/97,140500, 18,101001100000, 0, 0
25571,SSVX07,LFPW,08/06/97,142200, 142,101001100000, 0, 0
25571,SSVX07,LFPW,08/06/97,150000, 63,101001100000, 0, 0
25571,SSVX07,LFPW,08/06/97,154400, 19,101001100000, 0, 0
25571,SSVX07,LFPW,08/06/97,155100, 33,101001100000, 0, 0
25571,SSVX07,LFPW,08/06/97,172700, 121,101001100000, 0, 0
25571,SSVX07,LFPW,08/06/97,174400, 16,101001100000, 0, 0
25571,SSVX07,LFPW,08/06/97,180000, 177,101001100000, 0, 0
25571,SSVX07,LFPW,08/06/97,191000, 163,101001100000, 0, 0
25571,SSVX07,LFPW,08/06/97,204600, 11,101001100000, 0, 0
25571,SSVX07,LFPW,08/06/97,210000, 103,101001100000, 0, 0
25571,SSVX07,LFPW,08/06/97,210300, 16,100000000000, 0, 0
25571,SSVX07,LFPW,08/06/97,222500, 18,101001100000, 0, 0
25571,SSVX07,LFPW,08/06/97,224600, 121,101001100000, 0, 0

End of list of buoy reports

Number of buoy reports : 30

Number of reports with Air Pressure : 29
Number of reports with SST : 0
Number of reports with Wind speed : 0

Delay histogram by time slot (reception time - observation time)

```
                                |00% 20% 40% 60% 80% 100%
 0H <= Delay <  1H : 40.00 %    |********
 1H <= Delay <  2H : 10.00 %    |**
 2H <= Delay <  3H : 36.67 %    |*******
 3H <= Delay <  4H :  6.67 %    |*
 4H <= Delay <  5H :  3.33 %    |*
 5H <= Delay <  6H :  0.00 %    |
 6H <= Delay <  7H :  0.00 %    |
 7H <= Delay <  8H :  3.33 %    |*
 8H <= Delay <  9H :  0.00 %    |
 9H <= Delay < 10H :  0.00 %    |
10H <= Delay < 11H :  0.00 %    |
11H <= Delay < 12H :  0.00 %    |
       Delay > 12H :  0.00 %    |
                                |________________________
```

Delay histogram (% < delay)

```
                          |00% 20% 40% 60% 80% 100%
Delay <  1H : 40.00 %     |********
Delay <  2H : 50.00 %     |**********
Delay <  3H : 86.67 %     |*****************
Delay <  4H : 93.33 %     |******************
Delay <  5H : 96.67 %     |******************
Delay <  6H : 96.67 %     |******************
Delay <  7H : 96.67 %     |******************
Delay <  8H :100.00 %     |********************
Delay <  9H :100.00 %     |********************
Delay < 10H :100.00 %     |********************
Delay < 11H :100.00 %     |********************
Delay < 12H :100.00 %     |********************
                          |________________________
```

Average delay : 108 minutes

Standard Deviation delay : 144 minutes

DBCP-XIII/Doc. 5, APPENDIX I

DBCP WORLD WIDE WEB INTERNET SERVER TREE AND HYPERTEXT LINKS

Home page http://dbcp.nos.noaa.gov/

Contents:	http://dbcp.nos.noaa.gov/contents.html
Main home page:	http://dbcp.nos.noaa.gov/dbcpmain.html
DBCP, WMO, and IOC logos:	http://dbcp.nos.noaa.gov/logos.gif
WMO:	http://www.wmo.ch/
IOC:	http://www.unesco.org/ioc/
Questionnaire:	http://dbcp.nos.noaa.gov/quest.html
Drifting buoy picture	
Icon:	http://dbcp.nos.noaa.gov/fggewsml.gif
Picture:	http://dbcp.nos.noaa.gov/fggewind.gif
Moored buoy picture	
Icon:	http://dbcp.nos.noaa.gov/moorsml.gif
Picture:	http://dbcp.nos.noaa.gov/odas33.gif
Mail comments to:	charpentier@cls.cnes.fr and dwright@nos.noaa.gov
Background:	http://dbcp.nos.noaa.gov/ground.gif

1. DBCP general information:	http://dbcp.nos.noaa.gov/0dgi.html
DBCP logo:	http://dbcp.nos.noaa.gov/logocl.gif
1.1. The DBCP:	http://dbcp.nos.noaa.gov/1td.html
1.1.1. WMO:	http://www.wmo.ch/
1.1.2. IOC:	http://www.unesco.org/ioc/
1.1.3. WMO Marine Programme:	http://www.wmo.ch/web/aom/marprog/marprog.html
1.1.4. GOOS:	http://www.unesco.org/ioc/goos/goos.html
1.1.5. DBCP as a GOOS existing system:	http://www.unesco.org/ioc/goos/status.html
1.1.6. GTS:	http://www.wmo.ch/web/www/gts.html
1.1.7. Action Groups map:	http://dbcp.nos.noaa.gov/dbcp_ag.gif
1.1.8. Action Groups:	http://dbcp.nos.noaa.gov/1dag.html
1.1.9. EGOS:	http://www.shom.fr/meteo/egos/
1.1.10. IABP:	http://iabp.apl.washington.edu/
1.1.11. IPAB:	http://dbcp.nos.noaa.gov/1ipab.html
1.1.12. ISABP:	http://dbcp.nos.noaa.gov/1isabp.html
1.1.13. IBPIO:	http://www.shom.fr/meteo/ibpio/
1.1.14. GDP:	http://www.aoml.noaa.gov/phod/dac/gdp.html
1.1.15. Technical Publications:	http://dbcp.nos.noaa.gov/1dp.html
1.2. DBCP terms of reference:	http://dbcp.nos.noaa.gov/1dtor.html
1.2.1. DBCP logo:	http://dbcp.nos.noaa.gov/logocl.gif
1.3. DBCP publications:	http://dbcp.nos.noaa.gov/1dp.html
1.3.1. DBCP logo:	http://dbcp.nos.noaa.gov/logocl.gif
1.3.2. DBCP points of contact:	http://dbcp.nos.noaa.gov/1d.html

2. Global implementation: http://dbcp.nos.noaa.gov/0gi.html

DBCP logo: http://dbcp.nos.noaa.gov/logocl.gif

2.1. DBCP Regional Action Groups: http://dbcp.nos.noaa.gov/1dag.html

2.1.1. DBCP Action Groups map: http://dbcp.nos.noaa.gov/dbcp_ag.gif
2.1.2. European Group on Ocean Stations (EGOS): http://www.shom.fr/meteo/egos/
2.1.3. International Arctic Buoy Programme (IABP): http://iabp.apl.washington.edu/
2.1.4. International Programme for Antarctic Buoys (IPAB): http://dbcp.nos.noaa.gov/1ipab.html
2.1.4.1. WCRP: http://www.wmo.ch/web/wcrp/wcrp-home.html
2.1.4.2. DBCP: http://dbcp.nos.noaa.gov/
2.1.4.3. SCAR: http://www.scar.org/
2.1.5. International South Atlantic Buoy Programme (ISABP): http://dbcp.nos.noaa.gov/1isabp.html
2.1.5.1. ISABP logo: http://dbcp.nos.noaa.gov/isabp/isabplog.gif
2.1.5.2. DBCP: http://dbcp.nos.noaa.gov/
2.1.5.3. Brief overview: http://dbcp.nos.noaa.gov/isabp/2overview.html
2.1.5.4. Area of interest: http://dbcp.nos.noaa.gov/dbcp_ag.gif
2.1.5.5. Operating principles: http://dbcp.nos.noaa.gov/isabp/2referance.html
2.1.5.5.1. MEDS: http://www.meds.dfo.ca/
2.1.5.5.2. GDC data products: http://www.aoml.noaa.gov/phod/dac/dacdata.html
2.1.5.6. Participants: http://dbcp.nos.noaa.gov/isabp/2particp.html
2.1.5.6.1. Globe icon; http://dbcp.nos.noaa.gov/isabp/worldbut.gif
2.1.5.6.2. National focal points: http://dbcp.nos.noaa.gov/isabp/3focalpoint.html
2.1.5.7. How to participate: http://dbcp.nos.noaa.gov/isabp/2howtopar.html
2.1.5.7.1. Buoy picture: http://dbcp.nos.noaa.gov/isabp/3buoypc.html
2.1.5.7.1.1. http://dbcp.nos.noaa.gov/isabp/buov.gif
2.1.5.8. Information on 1997 meeting: http://dbcp.nos.noaa.gov/isabp/2nextmeet.html
2.1.5.9. ISABP-III meeting report: http://dbcp.nos.noaa.gov/isabp/2meetrep.html
2.1.5.9.1. Photo of participants: http://dbcp.nos.noaa.gov/isabp/3group.html
2.1.5.9.1.1. http://dbcp.nos.noaa.gov/isabp/isabpgroup.gif
2.1.5.10. Latest programme news: http://dbcp.nos.noaa.gov/isabp/2prognews.html
2.1.5.10.1. Under contruction icon: http://dbcp.nos.noaa.gov/isabp/spincon.gif
2.1.5.11. Contact points: http://dbcp.nos.noaa.gov/isabp/2contac.html
2.1.5.11.1. Chairman Piet Le roux: pleroux@cirrus.sawb.gov.za
2.1.5.11.1.1. Picture: http://dbcp.nos.noaa.gov/isabp/piet.gif
2.1.5.11.2. Co-ordinator Eugene Burger: burger@cirrus.sawb.gov.za
2.1.5.11.2.1. Picture: http://dbcp.nos.noaa.gov/isabp/eugene.gif
2.1.6. International Buoy Programme for the Indian Ocean (IBPIO): http://www.shom.fr/meteo/ibpio/
2.1.7. Back to Global Implementation: http://dbcp.nos.noaa.gov/0gi.html

2.2. Tropical Atmosphere Ocean Array (TAO): http://www.pmel.noaa.gov/toga-tao/home.html

2.3. Global Drifter Programme (GDP)

2.3.1. Global Drifter Programme: http://www.aoml.noaa.gov/phod/dac/gdp.html
2.3.2. Global Drifter Center: http://www.aoml.noaa.gov/phod/dac/gdc.html
2.3.3. Data Acquisition Center: http://www.aoml.noaa.gov/phod/dac/dac.html
2.3.4. Global Drifter Program maps: http://www.aoml.noaa.gov/phod/dac/dacdata.html

2.4. Deployment Opportunities

2.4.1. USA: http://dbcp.nos.noaa.gov/1dousa.html
2.4.1.1. DBCP logo: http://dbcp.nos.noaa.gov/logocl.gif
2.4.1.2. Atlantic lines: http://dbcp.nos.noaa.gov/atlines.gif
2.4.1.3. Pacific lines: http://dbcp.nos.noaa.gov/paclines.gif
2.4.1.4. Indian Ocean lines: http://dbcp.nos.noaa.gov/indlines.gif
2.4.1.5. Contact point: bushnell@aoml.noaa.gov

3. Quality control: http://dbcp.nos.noaa.gov/0qc.html

DBCP logo: http://dbcp.nos.noaa.gov/logocl.gif
QC icon: http://dbcp.nos.noaa.gov/qc_icon.gif
QC graphic: http://dbcp.nos.noaa.gov/qc_guide.gif

3.1. DBCP QC Guidelines: http://dbcp.nos.noaa.gov/2qgd.html
3.1.1. QC Icon: http://dbcp.nos.noaa.gov/qc_icon.gif
3.1.2. Graphic: http://dbcp.nos.noaa.gov/qc_guide.gif

3.2. How to register on BUOY-QC Internet mailing list: http://dbcp.nos.noaa.gov/2htrobq.html

3.3. Archived QC messages: http://dbcp.nos.noaa.gov/2aqm.html
3.3.1. Product on IMO server: http://www.enrich.hi.is/buoyqc/

3.4. Archived QC monitoring statistics: http://dbcp.nos.noaa.gov/2aqs.html

3.4.1. Archived statistics by month and center (ftp): ftp://ftp.shom.fr/pub/meteo/qc-stats
3.4.2. Statistics Selection (query): http://www.shom.fr/meteo/rechstat

4. Technical developments: http://dbcp.nos.noaa.gov/0td.html

DBCP logo: http://dbcp.nos.noaa.gov/logocl.gif

4.1. SVP barometer drifter

4.1.1. The low cost barometer drifter: http://dbcp.nos.noaa.gov/2tlcbd.html
4.1.2. SVPB Argos message format: http://dbcp.nos.noaa.gov/2samf.html

4.2. Air Temperature: http://dbcp.nos.noaa.gov/1at.html
4.3. Wind: http://dbcp.nos.noaa.gov/1w.html

5. Data collection & location services: http://dbcp.nos.noaa.gov/0ladcs.html

DBCP logo: http://dbcp.nos.noaa.gov/logocl.gif

5.1. Argos

5.1.1. General description of Argos: http://dbcp.nos.noaa.gov/2gdoa.html
DBCP logo: http://dbcp.nos.noaa.gov/logocl.gif
5.1.1.1. Argos: http://dbcp.nos.noaa.gov/3a.gif
5.1.1.2. Global coverage: http://dbcp.nos.noaa.gov/3gc.gif
5.1.1.3. Argos data processing: http://dbcp.nos.noaa.gov/3adp.gif
5.1.2. DBCP Guide to Argos: http://dbcp.nos.noaa.gov/2dgta.html

5.1.3. Argos monthly status report: http://dbcp.nos.noaa.gov/2amsr.html

5.2. Alternatives to Argos: http://dbcp.nos.noaa.gov/1ata.html
5.2.1. Argos: http://www.argosinc.com/
5.2.2. EYETEL/EYESAT
5.2.3. Final Analysis (FAISAT)
5.2.4. Globalstar: http://www.globalstar.com/
5.2.5. Inmarsat-C: http://www.inmarsat.org/
5.2.6. ICO/Inmarsat-P: http://www.inmarsat.org/
5.2.7. Iridium: http://www.iridium.com/
5.2.8. IRIS
5.2.9. OCEAN-NET
5.2.10. ODISSEY
5.2.11. Orbcomm: http://www.orbcomm.net/
5.2.12. STARSYS
5.2.13. SAFIR
5.2.14. VITASAT/GEMSAT: http://www.vita.org/whovita.html

6. GTS distribution of buoy data: http://dbcp.nos.noaa.gov/0gdobd.html

6.1. Argos GTS sub-system

6.1.1. Summary: http://dbcp.nos.noaa.gov/2s.html
6.1.2. Argos GTS sub-system reference guide: http://dbcp.nos.noaa.gov/2rg.html
6.1.2.1. Argos and GTS sub system graphic: http://dbcp.nos.noaa.gov/gtsguid1.gif
6.1.2.2. Data processing graphic: http://dbcp.nos.noaa.gov/gtsguid2.gif
6.1.2.3. B1 Table: http://dbcp.nos.noaa.gov/gtsguid3.gif
6.1.2.4. B2 Table: http://dbcp.nos.noaa.gov/gtsguid4.gif
6.1.2.5. WMO areas: http://dbcp.nos.noaa.gov/gtsguid5.gif

6.2. WMO numbers

6.2.1. WMO/Argos cross reference list: http://dbcp.nos.noaa.gov/wmolist.html
6.2.2. Principal GTS Co-ordinators list: http://dbcp.nos.noaa.gov/pgclist.html

6.3. GTS bulletin headers: http://dbcp.nos.noaa.gov/1gbh.html

6.4. Status maps for buoys reporting on GTS: http://dbcp.nos.noaa.gov/1smfbrog.html
DBCP logo: http://dbcp.nos.noaa.gov/logocl.gif
6.4.1. RNODC/DB (at MEDS) global maps: http://www.meds.dfo.ca/MEDS/e_rec_db.html
6.4.2. GDP global & regional maps/products: http://www.aoml.noaa.gov/phod/dac/dacdata.html
6.4.3. North Atlantic Ocean, icon: http://dbcp.nos.noaa.gov/n_atl1.gif
6.4.3.1. Product: http://www.shom.fr/meteo/egos/egosdrif.html#traject
6.4.4. South Atlantic Ocean, icon: http://dbcp.nos.noaa.gov/s_atl1.gif
6.4.4.1. Product: http://dbcp.nos.noaa.gov/s_atl.gif
6.4.5. Arctic Ocean, icon: http://dbcp.nos.noaa.gov/arctic1.gif
6.4.5.1. Product: http://iabp.apl.washington.edu/current.gif
6.4.6. Antarctic area, icon: http://dbcp.nos.noaa.gov/antarct1.gif
6.4.6.1. Product: http://dbcp.nos.noaa.gov/antarct.gif
6.4.7. Pacific Ocean, icon: http://dbcp.nos.noaa.gov/pacific1.gif
6.4.7.1. Product: http://dbcp.nos.noaa.gov/pacific.gif
6.4.8. Indian Ocean, icon: http://dbcp.nos.noaa.gov/indian1.gif
6.4.8.1. Product: http://www.shom.fr/meteo/ibpio/traject/traject.htm

6.5. Data Availability Index Maps (DAIM) : http://dbcp.nos.noaa.gov/1daim.html
6.5.1. ftp://ftp.shom.fr/meteo/daim

7. Buoys: http://dbcp.nos.noaa.gov/0b.html

DBCP logo: http://dbcp.nos.noaa.gov/logocl.gif

7.1. Pictures of typical buoys: http://www.shom.fr/meteo/buoyinfo/

7.2. List of buoy manufacturers: http://dbcp.nos.noaa.gov/1lobm.html

7.2.1. Axys Environmental systems
7.2.2. CEIS TM http://ourworld.compuserve.com/homepages/ceistm_lcd/
7.2.3. Central Design Office of Hydrometeorological Instrument Production
7.2.4. Christian Michelsen Institute: http://www.cmr.no/
7.2.5. Clearwater Instrumentation
7.2.6. Coastal Environmental Systems: http://www.coastal.org/
7.2.7. CTA Space systems: http://www.cta-space.com/
7.2.8. Gilman Corporation
7.2.9. Instituto Nacional de Pesquidas Espaciais (INPE)
7.2.10. Metocean Data Systems, Ltd.: http://www.metocean.com/
7.2.11. Metocean Data Systems, Inc.: http://www.metocean.com/
7.2.12. Mooraker Technology, Pty.
7.2.13. MORS Environment
7.2.14. Neireides
7.2.15. OCEANOR: http://www.oceanor.no/
7.2.16. Oceantronics
7.2.17. Orca Instrumentation
7.2.18. Robwi
7.2.19. Seimac Ltd.: http://www.seimac.com/
7.2.20. SERPE IESM:
7.2.20.1. French: http://www.serpe-iesm.com/secu.htm
7.2.20.2. English: http://www.serpe-iesm.com/eng/secu.htm
7.2.21. Technocean Associates
7.2.22. Toyocom
7.2.23. TURO Technology, Pty.: http://www.ozemail.com.au/~turo/
7.2.24. Urethane Products Corporation

7.3. Types of buoys

7.3.1. Drifting buoys
7.3.1.1. FGGE type drifting buoy: http://dbcp.nos.noaa.gov/3ftdb.html
7.3.1.1.1. http://dbcp.nos.noaa.gov/3ftdb.gif
7.3.1.2. FGGE type wind buoy: http://dbcp.nos.noaa.gov/3ftwb.html
7.3.1.2.1. http://dbcp.nos.noaa.gov/3ftwb.gif
7.3.1.3. Lagrangian drifter: http://dbcp.nos.noaa.gov/3ld.html
7.3.1.3.1. Holey sock picture: http://dbcp.nos.noaa.gov/4hsp.html
7.3.1.3.1.1. http://dbcp.nos.noaa.gov/4hsp.gif
7.3.1.3.2. Lagrangian drifter: http://dbcp.nos.noaa.gov/4ld.html
7.3.1.3.2.1. http://dbcp.nos.noaa.gov/4ld.gif
7.3.1.3.3. Pacific tracks: http://dbcp.nos.noaa.gov/4pt.html
7.3.1.3.3.1. http://dbcp.nos.noaa.gov/4pt.gif
7.3.1.3.4. Barometer drifter: : http://dbcp.nos.noaa.gov/4sbd.html
7.3.1.3.4.1. http://www.aoml.noaa.gov/phod/graphics/drifterfig.gif

7.3.1.4. NDBC drifting buoy programme: http://seaboard.ndbc.noaa.gov/drift.shtml

7.3.2. Moored buoys
7.3.2.1. ATLAS buoy (TAO array) : http://dbcp.nos.noaa.gov/3ab.html
7.3.2.1.1. TAO icon: http://dbcp.nos.noaa.gov/tao.gif
7.3.2.1.2. TAO map: http://www.pmel.noaa.gov/toga-tao/gif/tao-array-huge.gif
Error! Bookmark not defined.ATLAS buoy schematic: http://www.pmel.noaa.gov/toga-tao/gif/atlas_ls.gif
7.3.2.1.3. List of WMO numbers: http://www.pmel.noaa.gov/toga-tao/wmo.html
7.3.2.1.4. TAO Project Office Home Page: http://www.pmel.noaa.gov/toga-tao/home.html
7.3.2.2. NDBC moored buoys: http://seaboard.ndbc.noaa.gov/hull.shtml

7.4. List of wind buoys reporting on GTS: http://dbcp.nos.noaa.gov/1wb.html

7.5. List of land stations reporting in BUOY code: http://dbcp.nos.noaa.gov/11sribc.html

.. Points of contact: http://dbcp.nos.noaa.gov/0poc.html

DBCP logo: http://dbcp.nos.noaa.gov/logocl.gif

8.1. National focal points for buoy programmes: http://dbcp.nos.noaa.gov/1nfpfbp.html

8.2. National focal points for logistic support: http://dbcp.nos.noaa.gov/1nfpfls.html

8.3. Principal GTS Co-ordinators: http://dbcp.nos.noaa.gov/pgclist.html

8.4. DBCP: http://dbcp.nos.noaa.gov/1d.html

8.4.1. http://dbcp.nos.noaa.gov/etienne.gif

8.5. WMO and IOC: http://dbcp.nos.noaa.gov/1wai.html

8.6. DBCP server, troubleshooting: http://dbcp.nos.noaa.gov/1dst.html

9. Documentation: http://dbcp.nos.noaa.gov/0doc.html

DBCP logo: http://dbcp.nos.noaa.gov/logocl.gif

9.1. List of DBCP publications: http://dbcp.nos.noaa.gov/1dp.html
9.1.1. DBCP logo: http://dbcp.nos.noaa.gov/logocl.gif
9.1.2. DBCP points of contact: http://dbcp.nos.noaa.gov/1d.html

9.2. DBCP directory: ftp://dbcp.nos.noaa.gov/pub/dbcp

10. Meetings: http://dbcp.nos.noaa.gov/0m.html

DBCP logo: http://dbcp.nos.noaa.gov/logocl.gif

10.1. DBCP meetings:

10.2. Other meetings

10.2.1. WMO:	http://www.wmo.ch/web/listmeet.html
10.2.2. GOOS:	http://www.unesco.org/ioc/goos/calendar.html
10.2.3. GCOS:	http://www.wmo.ch/web/gcos/meeting.html
10.2.4. WOCE:	http://www.soc.soton.ac.uk/OTHERS/woceipo/ttable.html
10.2.5. CLIVAR:	http://www.dkrz.de/clivar/latest.html

11. Other related Web. Sites: http://dbcp.nos.noaa.gov/0os.html

DBCP logo: http://dbcp.nos.noaa.gov/logocl.gif

11.1. International bodies

11.1.1. WMO:	http://www.wmo.ch/
11.1.2. IOC:	http://www.unesco.org/ioc/
11.1.3. WCRP:	http://www.wmo.ch/web/wcrp/wcrp-home.html
11.1.4. GCOS:	http://www.wmo.ch/web/gcos/gcoshome.html
11.1.5. GOOS:	http://www.unesco.org/ioc/goos/iocgoos.html
11.1.6. WOCE:	http://www.soc.soton.ac.uk/OTHERS/woceipo/ipo.html
11.1.7. CLIVAR:	http://www.dkrz.de/clivar/hp.html
11.1.8. RNODC/DB at MEDS:	http://www.meds.dfo.ca/

11.2. Other servers

11.2.1. SAI:	http://www.argosinc.com/
11.2.2. NDBC:	http://seaboard.ndbc.noaa.gov/
11.2.3. CMM of Météo France:	http://www.shom.fr/meteo/
11.2.4. SAWB:	http://cirrus.sawb.gov.za/

Miscellaneous graphics:

DBCP, WMO, and IOC logos:	http://dbcp.nos.noaa.gov/logos.gif
DBCP logo:	http://dbcp.nos.noaa.gov/logocl.gif
Drifting buoy icon:	http://dbcp.nos.noaa.gov/fggewsml.gif
Moored buoy icon:	http://dbcp.nos.noaa.gov/moorsml.gif
Pages background:	http://dbcp.nos.noaa.gov/ground.gif
New:	http://dbcp.nos.noaa.gov/icon_new.gif
Under construction:	http://dbcp.nos.noaa.gov/at_work.gif
Help button:	http://dbcp.nos.noaa.gov/help_but.gif
Info button:	http://dbcp.nos.noaa.gov/info_but.gif
Blue dot:	http://dbcp.nos.noaa.gov/blue.gif
White dot:	http://dbcp.nos.noaa.gov/white.gif
Black dot:	http://dbcp.nos.noaa.gov/black.gif
Brown dot:	http://dbcp.nos.noaa.gov/brown.gif
Cyan dot:	http://dbcp.nos.noaa.gov/cyan.gif
Red dot:	http://dbcp.nos.noaa.gov/red.gif
Green dot:	http://dbcp.nos.noaa.gov/green.gif
Grey dot:	http://dbcp.nos.noaa.gov/grey.gif
Yellow dot:	http://dbcp.nos.noaa.gov/yellow.gif
Gold dot:	http://dbcp.nos.noaa.gov/gold.gif
Orange dot:	http://dbcp.nos.noaa.gov/orange.gif
Purple dot:	http://dbcp.nos.noaa.gov/purple.gif

SUMMARY OF DEVELOPMENTS IN SATELLITE COMMUNICATION SYSTEMS

Update - October 1997

1. INTRODUCTION

Mobile satellite systems (MSS) may be classified according to orbit altitude as follows:

- GEO - geostationary earth orbit, approx altitude: 35 000 km
- MEO - mid-altitude earth orbit, approx altitude: 10 000 km
- LEO - low earth orbit, approx altitude: <1 000 km

LEOs can be further sub-divided into Big LEO and Little LEO categories. Big LEOs will offer voice, fax, telex, paging and data capability, whereas little LEOs will offer data capability only, either on a real-time direct readout ('bent pipe') basis, or as a store-and-forward service.

Since the satellite footprint decreases in size as the orbit gets lower, LEO and MEO systems require larger constellations than GEO satellites in order to achieve global coverage and avoid data delays. Less energy is, however, generally required for LEO and MEO satellite communication because of the shorter average distance between transmitter and satellite. Some higher orbit systems may offset this energy penalty by using high-gain antennas to generate 'spot beams' and so reduce the requirement of the mobile to have a complex antenna and/or high output power. A key feature of several MSS currently under development will be their inter-operability with existing public switched telephone and cellular networks, using a dual-mode handset, for example.

Because of the commercial forces which are driving the implementation of the new systems, many will primarily focus on land masses and centres of population. These systems will not in general be acceptable for global ocean monitoring. Furthermore, while the technical capabilities for these new MSS currently exist, delays are inevitable due to problems with spectrum allocation, licensing (in each country where the service will be offered), company financing, and availability of launch vehicles. It is likely that few of the planned systems will overcome all of these hurdles.

Some systems do offer significantly enhanced capabilities compared with existing methods. Potential advantages from these emerging MSS include two-way communication, more timely observations, and greater data rates and volumes. Some systems may also prove to be considerably less expensive than existing channels, although this is as yet unclear. However, dangers will exist for data buoy users of most MSS, in that they will generally be small minority users of the system, with consequent lack of influence in regard to pricing. The arrangements for data distribution are also unlikely to be tailored towards data buoy applications, in particular those that require data insertion on the GTS.

A number of systems (including Argos, ORBCOMM, STARSYS, ICO/Inmarsat, IRIS, SAFIR and OCEAN-NET) were presented to the Technical Workshop that immediately preceded DBCP XII. Full details of some of the above, in addition to a general overview of MSS by Jim Hanlon of Seimac Ltd, are given in the Proceedings of the Workshop, published as DBCP Technical Document No 10.

2. LITTLE LEOS

2.1 ARGOS

Planned enhancements to the Argos on board equipment ('Argos-2') include increased bandwidth and sensitivity, and two-way communication. Future Argos equipment will fly on the Japanese ADEOS-II and European METOPS satellites in addition to a continuing programme of launches on board NOAA satellites. The system is one of the few that offers true global coverage, and currently has no commercial requirement to recover the cost of the launch or space segment equipment. Proposed changes to the rules within the US regarding fair competition by fully commercial MSS may impact the service that CLS/Service Argos will ultimately be able to offer.

The next Argos launch, on NOAA-K, is scheduled for February 1998, and near-real-time coverage from direct readout stations continues to improve. Further enhancements to the on board equipment (Argos-3) and to the ground processing centres are at the planning stage.

2.2 ORBCOMM

This company was awarded the first FCC Little-LEO licence in late 1994. Satellites consist of discs about one metre in diameter prior to deployment of solar panels and antenna. Two satellites were launched into polar orbit during 1995, using a Pegasus rocket piggy-backed on to a Lockheed L-1011 aircraft. Both satellites suffered from initial problems, which have apparently been overcome, although only one vehicle retains a store-and-forward capability. There have also been extensive launcher problems. Conventional launch of two further satellites is planned for October 1997, with a further six scheduled for Pegasus launch by the end of the year. The company still insist that the complete constellation of 24-36 satellites will be in orbit by the end of 1998.

The system will offer both bent-pipe and store-and-forward two-way messaging capabilities, operating in the VHF (138-148 MHZ) band. Although there have been significant problems with interference close to urban areas, this is not expected to impact offshore operations, and some early trials of the system have been encouraging. More trials are planned, notably using the four Seimac drifters being procured by Mark Bushnell at AOML.

The message structure currently consists of packets transmitted at 2400 bps (scheduled to rise to 4800 bps), and coverage will be global and near-continuous when the full constellation is in place. Messages are acknowledged by the system when correctly received. The platform position is determined, if required, using propagation delay data and doppler shift, or by an on-board GPS receiver. Position accuracy without GPS is expected to be similar to that offered by Argos.

Authorised transceiver manufacturers include Panasonic, Elisra (Stellar), Torrey Science, Magellan and Scientific Atlanta. Elisra, who are featured in the AOML buoys, are the first to offer a transceiver with a fully integrated GPS engine, while Scientific Atlanta have made a chip-set available to third-party integrators.

The ground segment remains rudimentary, with the only stations being in the US. Construction of a ground station in Italy has just started, though potential European customers still face difficulties because of the lack of spectrum licensing and the presence of other in-band users. Many operational details, and the costs of using the system, which will mainly be available to users through service providers ('resellers'), are only now starting to become known.

2.3 SAFIR

This is a two-way store-and-forward communication system comprising a number of LEO satellites. One satellite has been in orbit for nearly two years, but little operational experience has been reported. A further satellite is scheduled for launch later this year.

Two types of platforms were initially offered: a microstation communicating at 300 bps, and a macrostation permitting transfer rates of 9600 bps. The microstation has since been withdrawn. Position determination is achieved by analysis of doppler shift data at the processing centre, or by inclusion of a GPS receiver. Data transfer takes place in response to a command from the satellite, and is unique in that the capability exists for transfers between platforms. For example, one platform may be incorporated within a data buoy, while the other is sited at the operator's home institute. There is no explicit limitation on message length.

2.4 STARSYS

This system is broadly similar to ORBCOMM, except that it is 'bent pipe' only, thus limiting its usefulness to coastal areas. Further work on the system, in which CLS/Service Argos have been closely involved, has been suspended because of difficulties in securing financial backing.

2.5 IRIS/LLMS

This European-led system appears to be similar to Argos, using two polar-orbiting satellites with store-and-forward capability. However, terminals are alerted by the satellite downlink signal, and two-way communications and message acknowledgement are supported. Location is by doppler and ranging, and message lengths of up to a few kilobytes are permitted. Some provision is planned for terminal-terminal communication within the satellite footprint. The first launch is scheduled for late 1997.

2.6 EYESAT

The system comprises a single microsatellite weighing 12.5 kg which operates a 9600 bps transponder service, primarily for radio amateurs. Further satellites are planned.

2.7 GEMNET

This is a 36 + 2 satellite constellation proposed by CTA Commercial systems. Their experimental satellite was the failed VITASAT launch in 1995. CTA is reported to have been taken over by Orbital Science Corporation, the parent organisation of ORBCOMM.

2.8 FINAL ANALYSIS

This will use the very recently launched FAISAT-2 (also known as VITASAT-1) for initial commercial trials. The operational status of this satellite is unclear. FA's main constellation of 26 satellites is to be deployed in four launches by AKO Polyot. The launch schedule and system technical details are unknown.

2.9 LEO ONE

This consists of a planned 48 satellite constellation offering store-and-forward two-way messaging at 9600 bps and above. No further details, except that a spectrum sharing agreement has apparently been signed.

2.10 E-SAT

Six satellites are planned, three to be launched in late 1998, with the remainder six months later. The system is aimed principally at the utility industry for remote metering.

3. BIG LEOS

3.1 IRIDIUM

This system now has 34 satellites in orbit (five launched on 26/09/97). The next launch is scheduled for November 1997, with the final launch to complete the 66-satellite constellation in the second half of 1998.

3.2 TELEDESIC

This 'Internet in the Sky' system plans to use up to 840 satellites to carry global broadband services such as video conferencing, the Internet and so on. It has just received FCC licensing for operations in the USA.

4. MEOS

4.1 ICO.

This system, formerly known as Inmarsat-P but now fully autonomous, will use a constellation of 12 MEO satellites backed by a 12-station ground segment to provide a truly global voice, fax, data and messaging service. The aim is to complement and be inter-operable with existing digital cellular telephone networks. Initial launches are planned for late 1998, with constellation completion scheduled for the year 2000. Thenceforth, two satellites will always be visible from any point on the

earth's surface. The space segment is being built by the Hughes Corporation. Data rate will be 9600 bps. Many large manufacturers are engaged in developing dual mode ICO/cellphone handsets. An ICO 'engine' is to be defined for the benefit of third-party equipment manufacturers.

5. GEOS

5.1 INMARSAT D+.

This is an extension of the Inmarsat D service using the new (spot-beam) Inmarsat Phase 3 satellites and small, low-power user terminals. The system was initially designed as a global pager or data broadcast service, with the retum path from the mobile used only as an acknowledgement. D+ permits greater flexibility, with uplink packets of up to 128 bits. The first ground station will be implemented in the Netherlands by the existing Inmarsat service provider (Station 12), and the service is expected to start within the next few months.

Transceiver manufacturers include JRC, Calian and STK-Atlas. The JRC unit features an integral GPS receiver and combined GPS/Inmarsat antenna, and is the first to receive type approval.

The service may prove particularly attractive to national meteorological services as protocols already exist with Inmarsat service providers for the free transmission of observational data to meteorological centres for quality control and insertion on to the GTS. Inmarsat, given its assured multinational backing and established infrastructure, is also extremely unlikely to disappear.

6. FURTHER INFORMATION

Useful World-Wide Web sources of information include:

6.1 General information

http://www.ee.surrey.ac.uk/EE/CSER/UOSAT/SSHP/index.html	little LEO status, launch dates
http://www.arrl.org/fcc/wrc97/players.html	summary of little LEO competitors
http://www.newspace.com/feature/newsline/home.html	small satellite newsletter
http://www.TELE-satellit.com/tse/	satellite encyclopaedia

6.2 Specific operators

http://www.argosinc.com/
http://www.orbcomm.com/
http://www.inmarsat.org/
http://www.vita.org/
http://www.finalanalysis.com/communication_services.htm
http://www.leoone.com/overview.html
http://www.ellipso.com/system.htm
http://www.globalstar.com/index.htm
http://www.iridium.com/
http://www.ico.com/

Overview of mobile satellite systems with possible data buoy applications

System	Implementation	Orbit type	Buoy position	Message type	Terminal size	Power (watts)	Comments
ARGOS	Operational	LEO	Doppler shift	data: 32 bytes	handheld	1	various enhancements, incl 2-way messaging, are scheduled
EYESAT	Planned 1995+	Little LEO	GPS required	data: 60 bytes	handheld	5	1 satellite 1995, principally for radio amateurs
E-SAT	Planned 1998+	Little LEO	GPS required	data: TBD	TBD		6 satellites for utility metering
Final Analysis	Planned 1997+	Little LEO	GPS required	data: 128 bytes	handheld	10	26 satellites 2000+
GEMNET	Planned 1997+	Little LEO	GPS required	data: no maximum	'laptop'	10	1st satellite 1995 - launch failure 36 + 2 satellite s by ???
Globalstar	Planned 1997+	Big LEO	GPS required	voice/data: no maximum	handheld	1	48 satellites 1998+
GOES, Meteosat, GMS	Operational	GEO	GPS required	data: various options	'laptop'	10	4 satellites; directional antenna desirable
INMARSAT-C	Operational	GEO	GPS required	data: no maximum	5.5 kg	15	steered antenna not required
INMARSAT-D+	Pre-operational	GEO	GPS required	data: up to few kbytes	handheld	1	global pager using existing Inmarsat-3 satellites
ICO	Planned 1998+	MEO	GPS required	voice/data: no maximum	handheld	1	global cell-phone, inter-operable with terrestrial cellular networks
Iridium	Pre-operational	Big LEO	GPS required	voice/data: no maximum	handheld	1	34 satellites at present 66 satellites 1998

IRIS/LLMS	Planned 1997+	Little LEO	Doppler + ranging	data: up to few kbytes	handheld	1	2 satellites 1997+
LEO One	Planned	Little LEO	GPS required	TBD			48 satellite constellation, store and forward
OCEAN-NET	Planned	GEO	Moored	no maximum	large		uses moored buoys + Intelsat
Odyssey	Planned 1998+	MEO	GPS required	voice/data: no maximum	handheld	1	12 satellites 1998+
ORBCOMM	Pre-operational	Little LEO	Doppler or GPS	data: no maximum	handheld	5	2 satellites 1995 10 satellites 1997+ 36 satellites 1998+
SAFIR	Pre-operational	Little LEO	Doppler or GPS	data: no maximum	'laptop'	5	1 satellite 1995 1 satellite 1997+
Starsys	On indefinite hold	Little LEO	Doppler + ranging	data: 27 bytes multiple msgs	handheld	2	12 satellites 1998+ 24 satellites 2000+
Teledesic	Planned	Big LEO	GPS required	broadband			up to 840 satellites planned FCC licence granted

FINANCIAL STATEMENT BY IOC
FOR THE YEAR 1 JUNE 1996 TO 31 MAY 1997
(all amounts in US $ unless otherwise specified)

BALANCE (from previous year)			**$ 19 271**
FUNDS TRANSFERRED FROM WMO (relevant to the period)			
105 000	(02.05.96)		**$ 105 000**
FF 80 000	(14.08.96)		**FF 80 000**
	TOTAL RECEIPTS		**$ 124 271** **FF 80 000**
EXPENDITURES			
Technical Co-ordinator's employment:			
	- Salary:	69 141	
	- Allowances:	14 953	
	- Relocation (yearly provision):	4 072	**$ 88 166**
Technical Co-ordinator's missions:			
	- Bracknell (4-7 June 1996)	600	
	- Cambridge, UK (1-3 August)	857	
	- La Réunion (21-25 September 1996)	1 966	
	- Henley-on-Thames (21-30 October 1996)	2 320	
	- USA: Stennis Space Center, MS; Miami, FL; Woods Hole, MA; Silver Spring, MD (3-12 February 1997)	4 800	**10 543**
Contract with CLS/Service Argos:			**FF 80 000**
	TOTAL EXPENDITURES		**$ 98709** **FF 80 000**
BALANCE (at 1 June 1997)			**$ 25 562**

World Meteorological Organization

Data Buoy Co-operation Panel
Interim Account as at 31 August 1997

	US$	US$
Balance from 1995		21,349
Contributions Paid for Current Biennium		268,769
Total Funds Available		290,118
Obligations Incurred		
Technical Co-ordinator	240,939	
Experts	6,373	
Prep Mtg - Indian Ocean Buoy Prog	2,073	
Travel	7,312	
Reports	7,264	
Administration direct	1,185	
		265,146
Balance of Fund		24,972
Represented by		
Cash at Bank		28,532
Unliquidated obligations		3,560
		24,972

Contributions	Received 1996	Received 1997
Australia	25,000	
Canada	15,000	15,000
France	15,000	12,438
Greece	2,200	2,200
Iceland	1,500	1,500
Ireland	1,568	1,563
Netherlands	1,575	1,575
New Zealand	500	
Norway	3,150	
South Africa	0	3,000
UK	30,000	
USA	68,000	68,000
TOTAL	163,493	105,276

PROVISIONAL ESTIMATE OF INCOME AND EXPENDITURE
UNTIL 31 MAY 1998

Income		**USD**
Balance of fund from interim account		24,972
Expenditure		
Publications	*Existing obligations*	2,000
	New publications	5,000
Travel of chairman/vice-chairman		5,000
Experts/Support for ISABP session		4,972
Total		15,000
Anticipated balance to transfer to 1998/99 account		8,000

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EXPENDITURES AND INCOME FOR 1994-1999

	Actual 1994 and 1995 (2 years)	Estimated 1996 and 1997 (2 years)	Estimated 1998/1999 (1 year)
		USD	
Expenditures			
Technical Co-ordinator (Salary, Travel and Logistics)	226,148	240,939	120,000
Travel (chair and vice-chairs)	18,040	12,312	8,550
Experts	0	9,373	2,000
Prep meetings	5,844	2,073	0
Publications	9,032	14,264	6,000
WMO	0	1,185	300
Contingencies	-	-	
TOTAL	259,064	280,146	136,850
Income			
Contributions	271,983	269,269	128,850
Carry over	7,930	20,849	8,000
TOTAL	279,913	290,118	136,850

DRAFT TABLE OF PROVISIONAL CONTRIBUTIONS

	1996-1997	1997-1998	1998-1999
AUSTRALIA	12,500	12,500	12,500
CANADA	15,000	15,000	10,000
FRANCE	15,000 (FRF 75,000)	12,438 (FRF 75,000)	11,500 (FRF 70,000)
GREECE	2,200	2,200	2,200
ICELAND	1,500	1,500	1,500
IRELAND	1,568 (IR£ 1,000)	1,563 (IR£ 1,000)	1,500 (IR£ 1,000)
NETHERLANDS	1,575	1,575	1,575
NEW ZEALAND	500	500	500
NORWAY	1,575	1,575	1,575
SOUTH AFRICA	-	3,000	3,000
UNITED KINGDOM	15,000	15,000	15,000
USA	68,000	68,000	68,000
TOTAL	**134,418**	**134,851**	**128,850**

CLS
COLLECTE LOCALISATION SATELLITES

Annex VIII

Mr. Brough
Data Buoy Co-operation Panel (DBCP)
Bureau of Météorology
G.P.O. Box 1289K
Melbourne - Victoria 3001
Australie

Ramonville, October 3, 1997

Nos réf. :
Our ref. : MC/DL/97269

Dear Mr. Brough,

I refer to the issue that was debated at the 12th DBCP session in Henley in October 1996 regarding work that the Technical Co-ordinator of the DBCP could do on Argos development projects while some of his routine work could be performed part time by CLS under his supervision. I discussed the issue with Mr. Charpentier and prepared with him a proposal which I believe is fair and in the best interest of both parties. It is only by now that I am in a position to make important decisions regarding future Argos development projects. Please apologise for the delay in preparing this proposal. Spirit of the proposal is summarised below:

1. The Technical Co-ordinator of the DBCP will work part time (i.e. 40%) on Argos development projects. Initially these are directly related to the requirements expressed by the buoy users which were presented by the Technical Co-ordinator at DBCP-12 (see paragraph # 6.9.3 of DBCP-12 final report). Then I suggest that the TC will participate in our so called "Argos 2001 project" which goal is to re-develop the entire Argos data processing system. In this context, the TC will work under CLS supervision.

2. In exchange, CLS will provide staff support (i.e. the equivalent of a person working 40% part time) for routine tasks normally undertaken by the Technical Co-ordinator. Staff will be placed under the TC supervision. Such routine tasks include monitoring the GTS sub-system, operating QC guidelines, updating TC files, issuing the WMO/Argos cross reference and PGC lists, updating the DBCP server with regular files, producing regular status reports and graphs, and working on specific user problems possibly proposed by the TC.

I insure you that if and when this arrangement takes effect, this will have no negative impact on the DBCP work and efficiency. It may in fact increase the DBCP productivity since Mr. Charpentier will be in a position to more easily concentrate on important DBCP issues while routine tasks such as these related to DBCP quality control guidelines will be handled by CLS under his supervision.

CLS Collecte localisation satellites

8-10, rue Hermès
Parc Technologique du Canal
31526 Ramonville St-Agne, France
Tél. (33) 05 61 39 47 00
Télécopie (33) 05 61 75 10 14
Télex 531 752F

SA au capital de 15 000 000 F
RCS Toulouse B 338 034 390
SIRET 338 034 390 00017
TVA FR95 338034390
APE 742 C

Although I'm certain this should work smoothly, I propose that the arrangement can be cancelled at any time with a 2 week notice by decision of either the Chairman of the DBCP or the President of CLS, Service Argos by the way of a letter to his counterpart.

I suggest that the DBCP debates the proposal at its 13th session, possibly make amendments, and if acceptable, enforces the arrangement as of 1 November 1997 for a trial period of 12 months. The Panel will therefore re-evaluate the situation at its 14th session and may decide to continue for another period if it finds the arrangement useful.

I look forward to hear from the Panel and hope that this will lead to a fruitful co-operation between the DBCP and CLS, Service Argos.

Yours sincerely,

Hope to see you in La Rochelle

Michel Gazenave

Report of the 1997 Interim Argos Large International Program
Mark Bushnell, NOAA/AOML-Global Drifter Center

BACKGROUND

The Interim Argos Large International Program (ALIP), based primarily upon a proposal by Argos to provide cost reductions to large volume users, was accepted by the Global Drifter Program and adopted at the 16th NOAA/Argos Joint Tariff Agreement (JTA) meeting. Coordination of the ALIP was assigned to Mark Bushnell at the NOAA/AOML Global Drifter Center.

The formation of the Interim ALIP was announced to over 100 users in order to solicit participation. A total of 58 users expressed interest, and 23 chose to participate in the 1997 Interim ALIP. Nineteen expressed interest in continuing on with a 5 year ALIP.

A web site was constructed with relevant documents describing the Interim ALIP (see http://www.aoml.noaa.gov/phod/dac/alip.html for a full explanation of the Interim ALIP). A list of participants and associated Argos programs was sent to Argos. By January 1997, 49 programs representing about 1000 drifters formed the Interim ALIP.

OCTOBER 1997 STATUS REPORT

During the intersessional period Argos cooperated fully in an effort to make ALIP a success. It was recognized at the start that there were many potential problems. As these arose during the year, the agreements reached always favored the users and fostered the use of ALIP. On several occasions Argos allowed participants late entry into ALIP, and they permitted a data format change.

Regrettably, the international community was for the most part unable to respond to ALIP. Only one small program at present is actively managing PTTs to utilize the benefits of the Interim ALIP, and only a few programs are actually benefitting from ALIP. The Global Drifter Program has not positioned itself to take advantage of ALIP. During 1997 drifters continued to be built using a 1/3 duty cycle, except in small specialized instances. Program managers feared that if ALIP was not continued, the cost of deploying the constructed continuous duty cycle drifters would be prohibitively expensive. Even in the best of circumstances, the total outlay to Argos for participating programs had to increase, and few programs could afford the increase.

The three components of ALIP (not interim) are an initial basis, a growth factor, and a 5 year commitment. These components have been found to be inconsistent with existing programs;

-In 1997, the GDP struggled to reduce PTT usage to the initial basis of 125 PTT-years, as committed at the 16th JTA.

-Few programs are experiencing growth. Level funding is a success story at present.

-The word "commitment' is nebulous. No existing drifting buoy programs are truly supported on 5 year time scales, regardless of how commitment is defined.

CONCLUSIONS AND RECOMMENDATION

Very few users are satisfied with the present ALIP. All communications call for modifications, including those from the JTA Chairman, Argos, and the users. ALIP was adopted in the eleventh hour of the 16th JTA on the basis that Argos would acquire additional revenue and participants would enjoy lower cost usage. It has failed in both respects.

ALIP adds a level of confusion to a pre-existing morass of rules, and many questions remain to be answered. Furthermore, in the presence of funding instability, recent changes to the regulations regarding the use of NOAA satellites, and the genesis of new satellite communications, long term agreements should be carefully evaluated.

For these reasons, it is recommended by the Interim ALIP coordinator that a continuation into a 5 year ALIP not be pursued at this time. It is recommended that the 17th JTA explore alternative arrangements to increase Argos use with existing funding levels.

INTERIM ALIP OPERATION SUMMARY

Annualized PTT.yrs (based on Jan - May, 1997)

Note: A situation report will be sent to ALIP coordinator for Jan - August. 1997.
Jan - Sept, 1997 will be presented at the JTA meeting

1 - INTRODUCTION

The data presented in table 2 were extrapolated to annual levels for comparison against JTA commitments.
The Program Groups are categorized to show those which are best poised to take advantage of ALIP and those which need some adjustment. These categories are described at the end.

2 - TABLE 2 COLUMN HEADING DEFINITIONS

1: Group number
2: Responsible for the group
3: Country
4: Commitment for the group = total of the commitments for each program of the group
5: Annualized consumption in PTT.Yrs for platforms (based on Jan to May 97)
6: Annualized consumption in PTT.Yrs for ALIP platforms (based on Jan to May 97)
7: Percentage of consumption from ALIP platforms
8: Portion of the consumption to which the 70% discount would apply
9: Consumption after application of the discount
10: Percentage of consumption saved
11: Reasons for which the group is not ALIP qualified
A: Platform data not distributed onto the GTS
B: Platform contract processing is not in Standard
C: Location process is not needed

Category 1

All groups have significant consumption from ALIP platforms. They will benefit from the 70% ALIP discount as soon as the group consumption is higher than the group commitment.

Category 2

All groups are ALIP qualified except that they are using Limited Use Service. If they change to Full time transmission they can enter in Category 1.

Category 3

Platform data is not distributed onto the GTS. If the buoy data is qualified for GTS distribution, this change will allow the group tp enter Category 1.

Category 4

Platforms are too different from ALIP qualification to enter Category 1

1	2	3	Commit 4	Consum 5	ALIP 6	7	8	9	10	11
Category 1										
5	Fletcher	N. Zealand	7.00	7.34	7.25	99%	0.34	7.10	-3%	
22	Barth	USA	2.30	4.57	4.48	98%	2.27	2.98	-35%	
9	Allison	Australia	4.50	3.80	3.69	97%	0.00	3.80	0%	
1	Leroux	S. Africa	30.00	14.92	14.21	95%	0.00	14.92	0%	
16	Jones/Brough	Australia	4.00	5.25	4.82	92%	1.25	4.38	-17%	
17	Navoceano	USA	6.00	3.87	3.28	85%	0.00	3.87	0%	
6	Jones	UK	24.00	31.11	25.54	82%	7.11	26.13	-16%	
20	Rolland	France	20.00	16.77	13.46	80%	0.00	16.77	0%	
3	Nayak	India	12.00	4.40	3.36	76%	0.00	4.40	0%	
13	Niiler/Melville	USA	12.00	9.84	5.08	52%	0.00	9.84	0%	
15	Poulain	USA	2.88	5.23	0.93	18%	0.93	4.58	-12%	
Category 2										
18	Niiler/Hansen	USA	125.00	170.65	1.54	1%	1.54	169.57	-1%	B
14	Bushnell	USA	13.00	14.15	0.00	0%	0.00	14.15	0%	B
19	Olson/Niiler	USA	26.70	28.31	0.00	0%	0.00	28.31	0%	B
21	Flament	USA	4.20	6.15	0.00	0%	0.00	6.15	0%	B
Category 3										
7	Lee	USA	0.80	1.21	0.00	0%	0.00	1.21	0%	A
23	Price	USA	34.70	29.39	0.00	0%	0.00	29.39	0%	A
12	Abbott	USA	10.00	1.42	0.00	0%	0.00	1.42	0%	A
8	Malmerg	Iceland	5.00	4.52	0.00	0%	0.00	4.52	0%	A, B
11	Hu	Taiwan	2.00	0.50	0.00	0%	0.00	0.50	0%	A, B
Category 4										
4	Stevenson	Brazil	4.67	3.54	0.00	0%	0.00	3.54	0%	A, C
10	Paduan	USA	0.00	0.00	0.00	0%	0.00	0.00	0%	
	Total		351	367	88			358		

Table 2: ALIP summary: Annualized PTT.yrs (based on Jan - May, 1997)

3 - COMMENTS

Nearly 50 Argos programs representing more than 1000 drifting buoys are a part of ALIP. This is a significant percentage of the drifting buoys using Argos.
In reference to the ALIP Summary Table, the situation could be summarize as follows:

- Program Groups in Category 1, representing 36 % of the total commitment, have a high percentage of ALIP-qualified platforms operating. They benefit or are near to benefit from the 70% ALIP discount. The best example is Group 22, Barth (USA) which, as of the end of May, is saving 35 % on its total consumption.

- Program Groups in Category 2, representing 48 % of the total commitment, all have consumption higher than their commitment. These Groups need just to introduce full-on platforms to benefit from the 70% ALIP discount. For example, it appears that Group 18 will exceed their commitment with the network of buoys currently in the field. Thus, any additional buoys deployed in this Group should be full-on as they will be charged only 30% and provide 100% of the data (as opposed to approximately 33% for 33% of the data).
These two categories comprise 84% of the total commitment. This is a good start and second report should lead to expanded benefits from ALIP.

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Annex X

DBCP IMPLEMENTATION AND TECHNICAL WORKPLAN FOR THE 13th YEAR

PART A - Summary of tasks

1. Analyse programme information and other data as appropriate to inform the future DBCP global programme implementation strategy.

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

3. Implement data base of buoy programme information on DBCP WWW server.

4. Update and amend, as necessary, the DBCP World Wide Web server; improve performance of data flow control tools, study feasibility of adding new products for assisting DBCP action groups in refining deployment strategies.

5. Investigate new developments in communication technologies and facilities, relevant to the collection of sensor and/or location data from buoys.

6. Update the SVP-B construction manual and make it available on DBCP server.

7. Develop and implement co-operative buoy deployment strategies, in particular with the GDP, to provide buoy networks which serve both research and operational applications.

8. Organize workshop at DBCP-XIV.

9. Approach meteorological centres for conducting specific case studies of buoy data impacts during severe events and report at the next Panel workshop.

10. Submit report of DBCP WG on BUFR tables to chairman of CBS WG on Data Management.

11. Liaise with SVP-B manufacturers to investigate premature failures of some batches of buoys with a view to improve future operational reliability

12. Particpate in GOOS/GCOS implementation strategy meetng in Sydney, March 1998, and contribute to this implementation as appropriate.

13. Provide guidance on teechniques and procedures for the recovery of data buoys as may be needed for investigations or salvage purposes and make this information available on the DBCP server.

14. Liaise with ORBCOM, SAFIR and Inmarsat to request that they support pilot studies.

15. Improve consistency in monthly reporting of statistics to BUOY-QC and investigate differences in numbers reported by the different centres.

16. Implement regional projects (by Action Groups) to monitor and document the availability and use of buoy observations.

PART B

TASK	CARRIED OUT BY*	SUPPORTED/ASSISTED BY	REPORTED TO/ACTION BY	RELEVANT TOR OF THE PANEL
1	Technical co-ordinator (1, 8)	Vice-chairmen	Chairman for presentation to the panel	1, 2
2	DBCP	Panel members	Panel	7, 8
3	Technical co-ordinator (1, 2)		Panel	2, 3, 6
4	NOAA/AOML and technical co-ordinator (1, 3, 8)		Panel	7, 8
5	Vice-chairman (Meldrum) and technical co-ordinator (1, 7, 8)	Chairman and Panel members	Panel	1, 2, 6, 7
6	Technical Co-ordinator	Scripps Institution of Oceanography	Panel	7
7	Regional action groups, GDC	Panel members, Technical co-ordinator (5)	Panel, GDP	1, 2, 3
8	Eric Meindl	Secretariats	Panel	7
9	Technical co-ordinator (5, 7), WMO Secretariat, National Meteorological Services	Chairman	Panel	2, 6
10	Chairman		CBS WG on Data Management	6
11	Technical Co-ordinator		Panel	9
12	Chairman, Technical Co-ordinator		Panel	9
13	Technical Co-ordinator		Panel	1, 2, 3, 4, 6, 8
14	GDC, KNMI, BOM	Panel members as appropriate	Panel	2,7
15	Technical Coordinator and Bill Woodward (2,3,6,7)	Panel members and monitoring centres	Panel	2,6
16	Regional Action Groups		Panel	1,2,7

* When the technical co-ordinator is involved in carrying out a task, the figures in parenthesis relate to the terms of reference for the technical co-ordinator

DBCP ADMINISTRATIVE WORKPLAN FOR THE 13TH YEAR

PART A - **Summary of tasks**

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

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

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

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

5. If deemed necessary, make proposals for co-ordination 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 and planned buoy programmes and 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 and arrange for modifications as necessary.

8. Continue the arrangements (including finance) to secure the services of a technical co-ordinator.

9. Review programme and establish working priorities of the technical co-ordinator.

10. Prepare annual report of the DBCP.

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

12. Investigate requirements for initiating new co-ordinated buoy deployments in other ocean areas.

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

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

15. Co-ordinate operation of DBPC QC guidelines.

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

17. Draft a DBCP brochure.

18. Provide Secretariat with comments on DBCP Implementation Strategy (mid-November) and finalize (January 1998).

19. Provide technical workshop papers to WMO Secretariat (end November) and publish proceedings (mid 1998).

20. Submit national reports in electronic form to the technical coordinator for inclusion in the DBCP server.

21. Submit deployment opportunity information in electronic form to the technical coordinator for inclusion in the DBCP server.

PART B

TASK	CARRIED OUT BY*	SUPPORTED/ASSISTED BY	REPORTED TO/ACTION BY	RELEVANT TOR OF THE PANEL
1	Technical co-ordinator (1, 8)	Panel members and Secretariats	Chairman for presentation to the panel	1, 2
2	Technical co-ordinator (1, 3, 8)	Panel members and Secretariats	Chairman and panel for information	1, 2
3	Secretariats	Panel members	Chairman and panel for information	1, 2, 8
4	Technical co-ordinator (1, 7), CLS/Service Argos	Panel members and Secretariats	Chairman and panel for information	6
5	Chairman and technical co-ordinator (1, 3, 4, 5, 8, 9)	Secretariats and others as appropriate	To Panel for consideration and appropriate action or for direct action by chairman	1, 2, 3, 5
6	Technical co-ordinator (1, 3, 4, 5, 8, 9)	Chairman, Secretariats and CLS/Service Argos	Wide circulation by Secretariats and CLS/Service Argos	7, 8
7	Technical co-ordinator (1, 2, 3, 7) and chairman	Secretariats	Panel and users	1, 2, 6
8	Chairman and sub-committee	Secretariats	Secretariats	9
9	Panel/chairman		Panel (at next session)	9
10	Chairman and Secretariats	Technical co-ordinator (1, 7, 8)	Executive Councils of WMO and IOC	10
11	Chairman and Secretariats	Technical co-ordinator (1, 5, 8)	Panel	1
12	Chairman and Secretariats	Panel members	Panel	4
13	Chairman and technical co-ordinator (1, 4, 5, 8)	Panel members	Panel	7, 8
14	Operational services, chairman, vice-chairmen and technical co-ordinator (1, 4, 5, 8)	Panel members	Panel	1, 2, 3, 7. 8
15	Technical co-ordinator (1, 2)	Panel members and operational services	Panel	2, 3, 6
16	CLS/Service Argos	Technical co-ordinator (1, 6)	Panel, meeting on JTA	6, 7
17	DBCP	MEDS	Panel	7, 8
18	Panel members, AOML, D. Meldrum	Secretariat	Panel and GOOS Implementation Workshop	1, 2, 3, 4
19	Panel members, WMO Secretariat		Panel	7
20	Panel members, technical coordinator		Panel	7, 8
21	Panel members, technical coordinator			2, 5, 7

* When the technical coordinator is involved in carrying out a task, the figures in parenthesis relate to the terms of reference for the technical coordinator