INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION (OF UNESCO)

WORLD METEOROLOGICAL ORGANIZATION

DATA BUOY COOPERATION PANEL

ANNUAL REPORT FOR 1997

INTERNATIONAL YEAR OF THE OCEAN 98

DBCP Technical Document No. 11

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NOTE

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariats of the Intergovernmental Oceanographic Commission (of UNESCO), and the World Meteorological Organization concerning the legal status of any country, territory, city or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

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FOREWORD

I am pleased to present this 1997 Annual Report for the Data Buoy Co-operation Panel.

The Panel has had another successful year, with a considerable amount of work being undertaken. The five action groups have operated very well, with the new Indian Ocean action group now in its first full year of operation. During the intersessional period another action group covering the Global Drifter Programme was formed.

I would like to thank all those people who have participated in the work of the Panel and contributed to this eleventh annual report.

Graeme Brough
Chairman, DBCP

7. Administrative matters

The Panel now has six action groups: 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); the International Buoy Programme for the Indian Ocean (IBPIO); and the Global Drifter Programme (GDP).

Twelve countries contributing on a voluntary basis to the financial support of the Panel in 1997 were: Australia, Canada, France, Greece, Iceland, Ireland, Netherlands, New Zealand, Norway, South Africa, United Kingdom and USA.

The Panel's technical coordinator, Mr Etienne Charpentier, has continued to be employed by UNESCO/IOC as a **fund-in-trust** expert and located with CLS/Service Argos in Toulouse, France.

For the Panel's next financial year (1 June 1998 to 31 May 1999), a total budget of US$136,850 - is planned to be allocated as follows:

	US$
Technical coordinator (salary, travel, logistic support)	120,000
Travel of Chairman and Vice-chairmen	8,550
Experts	2,000
Publications	6,000
WMO Costs	300
TOTAL	136,850

SUMMARY

Introduction

The Drifting Buoy Co-operation Panel (DBCP) was established in 1985 by WMO Resolution 10 (EC-XXXVII) and IOC Resolution EC-XIX.7. In 1993 the governing bodies of IOC and WMO agreed to change the name of the panel to the Data Buoy Co-operation Panel (DBCP) and to slightly modify its terms of reference, so that the panel might also provide any international co-ordination required for moored buoy programmes supporting major WMO and IOC programmes (IOC Resolution XVII-6 and WMO Resolution 9 (EC-XLV)).

1. Current and planned programmes

Eleven countries, six action groups and two data management centres submitted reports on their data buoy activities. A new action group, the Global Drifter Programme (GDP) was established during the intersessional period.

2. Real-time data flow

The data from buoys available in real-time on the GTS decreased slightly over the past year, in September 1997 581 buoys (50.1% of the total operational buoys) were reporting on the GTS. The total number of active buoys essentially remained unchanged, with a slight decrease of 1.8% compared to the same period last year; the number of buoys reporting via the GTS was also very similar to the previous year - a minor decrease by 4.0%.

3. Data Quality

The Panel's QC methods continue to be extremely effective in ensuring data quality is maintained at the highest level. The quality control system that operates in near real-time via an Internet mailing list is widely used and has been most successful . Twelve Principal Meteorological or Oceanographic Centres (PMOCs) responsible for Quality Control of GTS buoy data are now participating in this system.

4. Data archival

The Marine Environmental Data Service (MEDS) in Canada has acted as the RNODC for drifting buoys on behalf of the IOC and WMO since 1986. The number of messages MEDS archived per month increased from approx 121,000 in 1996 to approx 131,000 during 1997. The IGOSS Specialised Oceanographic Centre (SOC) for Drifting Buoys operated by Meteo France collects and archives buoy reports daily. The French SOC produces a range of products including monthly global maps of the distribution of ship and drifter reports of wind, pressure, air temperature and sea surface temperature.

5. Technical Developments

The success of the SVP barometer drifter has continued during the past year, and investigations have now begun into developing a wind speed measuring capability for the SVP.

The technical coordinator further enhanced the features of the DBCP's World Wide Web Internet server located at the NOAA/NOS headquarters in Washington DC. The server is proving to be extremely popular and is a valuable source of Buoy information.

6. Communications system status

The Argos system has continued to provide a reliable service for recovery and processing of drifting buoy real-time data. Various future developments of the system were discussed at the meeting. Discussions were also held on emerging alternative communications systems utilising Low Earth Orbiting (LEO) satellites.

RESUME

Introduction

Le Groupe de coopération pour la mise en oeuvre des programmes de bouées dérivantes (DBCP) a été créé en 1985 en vertu de la Résolution 10 (EC-XXXVII) de l'OMM et de la Résolution EC-XIX.7 de la COI. En 1993, les organes directeurs de la COI et de l'OMM ont décidé de le rebaptiser Groupe de coopération pour les programmes de bouées de mesure (DBCP) et d'en modifier légèrement le mandat, afin qu'il puisse également assurer la coordination internationale requise pour les programmes de bouées ancrées qui servent d'appui aux grands programmes de l'OMM et de la COI (Résolution XVII-6 de la COI et Résolution 9 (EC-XLV) de l'OMM).

1. Programmes actuels et programmes prévus

Onze pays, six groupes d'action et deux centres de gestion des données ont présenté des rapports sur leurs activités concernant les bouées de mesure. Un nouveau groupe d'action, le Programme mondial sur les dériveurs (GDP), a été créé pendant l'intersession.

2. Acheminement des données en temps réel

Le nombre de données en provenance de bouées disponibles en temps réel sur le SMT a légèrement diminué au cours de l'année passée. En septembre 1997, les bouées transmettant des messages sur le SMT étaient au nombre de 581 (50,1 % de l'ensemble des bouées en service). Le nombre total de bouées communiquant des messages n'a pratiquement pas changé, avec une légère diminution de 1,8 %, par rapport à la période correspondante de l'année précédente ; le nombre de bouées communiquant des messages via le SMT était aussi très proche de celui de l'année précédente, faisant apparaître une baisse minime de 4 %.

3. Qualité des données

Les méthodes de contrôle de la qualité appliquées par le Groupe de coopération continuent d'être extrêmement efficaces et de garantir le niveau de qualité le plus élevé. Le système de contrôle de la qualité en temps quasi réel par courrier électronique via l'Internet est largement utilisé et se révèle très efficace. Douze centres météorologiques ou océanographiques principaux responsables du contrôle de la qualité des données communiquées par des bouées sur le SMT participent désormais à l'exploitation de ce système.

4. Archivage des données

Le Marine Environnemental Data Service (MEDS), au Canada, exerce les fonctions de Centre national des données océanographiques "responsable" en ce qui concerne les bouées dérivantes pour le compte de la COI et de l'OMM depuis 1986. Le nombre de messages MEDS archivés par mois est passé d'environ 121.000 en 1996 à environ 131.000 en 1997. Le Centre océanographique spécialisé (SOC) du SMISO pour les bouées dérivantes exploité par Météo-France recueille et archive quotidiennement des messages d'observation en provenance de bouées. Le SOC français produit toute une gamme de produits, notamment des cartes mondiales mensuelles de la répartition des navires et des messages d'observation du vent, de la pression, de la température de l'air et de la température de la mer en surface en provenance de bouées dérivantes.

5. Progrès techniques

Le succès des bouées dérivantes SVP équipées de baromètres s'est maintenu tout au long de l'année écoulée et on a commencé à étudier la mise au point d'un système de mesure de la vitesse du vent pour le Programme SVP.

Le coordonnateur technique a encore amélioré les caractéristiques du serveur World Wide Web du DBCP, situé au siège de la NOAA/NOS à Washington. Ce serveur se révèle extrêmement utile et constitue une précieuse source d'information sur les bouées.

6. Etat du système de communication

Le système Argos a continué d'assurer un service fiable de récupération et de traitement des données fournies en temps réel par des bouées dérivantes. Les participants à la réunion ont examiné plusieurs

possibilités d'évolution future du système. Ils ont aussi discuté des nouveaux systèmes de communication utilisant les satellites sur orbite à basse altitude.

7. Questions administratives

Le Groupe de coopération compte désormais six groupes d'action : le Groupe européen pour les stations océaniques (EGOS) ; le Programme international de bouées de l'Arctique (IABP) ; le Programme international de bouées de l'Antarctique (IPAB) ; le Programme international de bouées de l'Atlantique Sud (ISABP) ; le Programme international de bouées pour l'océan Indien (PIBOI) et le Programme mondial sur les dériveurs (GDP).

Les douze pays ayant fourni une contribution financière volontaire au Groupe de coopération en 1997 sont les suivants : Afrique du Sud, Australie, Canada, Etats-Unis d'Amérique, France, Grèce, Irlande, Islande, Norvège, Nouvelle-Zélande, Pays-Bas et Royaume-Uni.

Le coordonnateur technique du Groupe de coopération, M. Etienne Charpentier, a continué de travailler pour le compte de l'UNESCO/COI, en tant qu'expert dont les activités sont financées par un **fonds d'affectation spéciale**, au CLS/Service Argos à Toulouse, France.

Pour le prochain exercice financier du Groupe de coopération (1er juin 1998 au 31 mai 1999), il est prévu un budget total de 136.850 dollars des Etats-Unis, répartis comme suit :

	(en dollars des Etats-Unis)
Coordonnateur technique (rémunération, voyage, appui logistique)	120.000
Voyage du président/vice-président	8.550
Experts	2.000
Publications	6.000
Frais OMM	300
TOTAL	136.850

RESUMEN

Introducción

El Grupo de cooperación sobre boyas a la deriva (GCBD) fue establecido en 1985 por la Resolución 10 de la OMM (EC-XXXVII) y la Resolución EC-XIX.7 de la COI. Los órganos rectores de la COI y la OMM decidieron en 1993 cambiar el nombre del grupo, denominándolo en adelante Grupo de Cooperación sobre Boyas de Acopio de Datos (GCBD), y modificar ligeramente sus atribuciones, para que además pudiera facilitar la coordinación internacional que exigieran los programas de boyas fondeadas en apoyo de los principales programas de la OMM y la COI (Resolución XVII-6 de la COI y Resolución 9 de la OMM (EC-XLV)).

1. Programas actuales y previstos

Once países, seis grupos de acción y dos centros de gestión de datos presentaron informes sobre sus actividades sobre el acopio de datos procedentes de boyas. Durante el periodo entre reuniones se creó un nuevo grupo de acción denominado Programa Mundial de Derivadores (GDP).

2. Flujo de datos en tiempo real

Durante el año pasado, disminuyó ligeramente el número de datos procedentes de boyas y disponibles en tiempo real por el Sistema Mundial de Telecomunicación (SMT), y en septiembre de 1997 transmitían sus datos por SMT 581 boyas (el 50,1% de las boyas en funcionamiento). El número de boyas en funcionamiento apenas varió, con una ligera disminución del 1,8% en comparación con el mismo periodo del año anterior; el número de boyas que transmiten datos a través del SMT fue también muy similar al del año anterior, con una ligera disminución del 4,0%.

3. Calidad de los datos

El Grupo que se ocupa de los métodos de control de calidad continúa siendo sumamente eficaz en velar por que la calidad de los datos se mantenga al nivel más elevado posible. El sistema de control de calidad, que funciona casi en tiempo real a través de una lista de direcciones de Internet, es un sistema muy generalizado y está teniendo mucho éxito. En él participan actualmente 12 centros principales meteorológicos u oceanográficos (PMOC) responsables del control de calidad de los datos recopilados por boyas y transmitidos por el SMT.

4. Datos de archivo

Desde 1986, el Servicio de datos sobre el medio ambiente marino (MEDS) del Canadá ha actuado de Centro nacional responsable de la concentración de los datos oceanográficos (RNODC) respecto de las boyas a la deriva, en nombre de la COI y la OMM. El número de mensajes archivados mensualmente por el MEDS aumentó, pasando de aproximadamente 121.000 en 1996 a unos 131.000 en 1997. El Centro Oceanográfico Especializado (SOC) del Sistema Global Integrado de Servicios Oceánicos (IGOSS) para las boyas a la deriva, que corre a cargo de "Météo France", recopila y archiva diariamente todos los informes transmitidos por boyas. El SOC francés elabora diversos productos, tales como mapas mensuales de la distribución en el mundo de informes procedentes de buques y de boyas a la deriva que facilitan datos sobre el viento, la presión y la temperatura del aire y de la superficie del mar.

5. Evolución técnica

Ha continuado durante el último año el éxito de los barómetros a la deriva del Programa de medida de la velocidad de las corrientes en superficie (SVP) y se han iniciado investigaciones para dotar al SVP de capacidad anemométrica.

El coordinador técnico puso de relieve las características del servidor del World Wide Web de Internet del DBCP, ubicado en la sede de la NOAA/NOS en Washington DC. El servidor tiene mucho éxito y constituye una valiosa fuente de información sobre los datos procedentes de boyas.

6. Situación en que se encuentra el sistema de comunicaciones

El sistema Argos ha seguido proporcionando un servicio fiable de la recuperación y proceso de datos en tiempo real procedentes de las boyas a la deriva. En la reunión se analizaron diferentes perspectivas del sistema y asimismo diversos sistemas de comunicaciones alternativos que están apareciendo y utilizan satélites en órbita baja (LEO).

7. Cuestiones administrativas

El Grupo cuenta ahora con seis grupos de acción, a saber: el Grupo europeo para las estaciones oceánicas (EGOS); el Grupo internacional de boyas del Artico (PIBA); el Programa internacional de boyas en el Antártico (PIBAn); el Programa internacional de boyas del Atlántico sur (PIBAS), el Programa internacional de boyas para el Océano Indico (PIBOI) y el Programa Mundial de Derivadores (GDP).

Los 12 países que en 1997 facilitaron apoyo financiero voluntario al Grupo de expertos son los siguientes: Australia, Canadá, Estados Unidos de América, Francia, Grecia, Irlanda, Islandia, Nueva Zelandia, Noruega, Países Bajos, Reino Unido y Sudáfrica.

El coordinador técnico del Grupo, Sr. Etienne Charpentier, continúa trabajando para la UNESCO/COI como experto remunerado con cargo a un **fondo fiduciario**, destacado en el CLS del Servicio Argos de Toulouse (Francia).

El presupuesto total del próximo ejercicio financiero (del 1° de junio de 1998 al 31 de mayo de 1999) del Grupo asciende a 136.850 dólares, desglosados de la manera siguiente:

	$
Coordinador técnico (sueldo, viajes, apoyo logístico)	120.000
Viajes del Presidente y los Vicepresidentes	8.550
Expertos	2.000
Publicaciones	6.000
Gastos de la OMM	300
TOTAL	136.850

РЕЗЮМЕ

Введение

В 1985 г. в соответствии с резолюцией 10 (EC-XXXVII) ВМО и резолюцией EC-XIX.7 МОК была создана Группа сотрудничества по дрейфующим буям (ДБКП). В 1993 г. руководящие органы МОК и ВМО решили переименовать ее в Группу сотрудничества по буям для сбора данных ДБКП, а также незначительно изменить круг ее обязанностей, с тем чтобы группа могла также обеспечивать любую международную координацию, необходимую для программ по заякоренным буям, поддерживающих основные программы ВМО и МОК (резолюция XVII-6 МОК и резолюция 9 (EC-XLV) ВМО).

1. Текущие и планируемые программы

Одиннадцать стран, шесть групп действий и два центра управления данными представили отчеты о своей деятельности в отношении буев для сбора данных. В течение межсессионного периода была создана Группа действий для Глобальной программы по дрейфующим платформам (ГДП).

2. Поток данных в реальном масштабе времени

За истекший год объем данных с буев в реальном масштабе времени в ГСТ несколько сократился; в сентябре 1997 г. по ГСТ передавались сводки с 581 буя (50,1% от общего количества оперативных буев). В сравнении с тем же периодом предыдущего года общее число действующих буев существенно не изменилось, сократившись лишь на 1,8%, а количество буев, передающих данные через ГСТ, также было почти тем же, что и в предшествующем году при незначительном сокращении на уровне 4,0%.

3. Качество данных

Применяемые группой методы контроля качества (КК) по-прежнему чрезвычайно эффективны в обеспечении поддержания качества данных на самом высоком уровне. Система контроля качества, которая функционирует через список адресатов Интернет в близком к реальному масштабе времени, широко и весьма успешно используется. В настоящее время в данной системе участвуют двенадцать основных метеорологических или океанографических центров (ПМОК), ответственных за контроль качества данных с буев в ГСТ.

4. Архивация данных

С 1986 г. Служба данных о морской среде (МЕДС) в Канаде выступает от имени МОК и ВМО в качестве Ответственного национального центра океанографических данных (ОНЦОД) по дрейфующим буям. Приблизительное количество сообщений, ежемесячно помещаемых МЕДС в архив, увеличилось с 121 000 в 1996 г. до 131 000 в 1997 г. Специализированный океанографический центр ОГСОС (СОЦ) по дрейфующим буям, действующий в рамках Метеофранс, ежедневно собирает и помещает в архив сводки с буев. СОЦ во Франции производит ряд видов продукции, включая ежемесячные глобальные карты распределения сводок, поступающих с судов и дрейфующих платформ, с данными о ветре, давлении, температуре воздуха и температуре поверхности моря.

5. Техническое развитие

В истекший год с успехом продолжалось применение барометрического дрейфующего буя СВП, и ныне начаты исследования с целью расширения возможностей измерения скорости ветра в рамках СВП.

Технический координатор значительно расширил характеристики сервера ДБКП в World Wide Web Интернет, который располагается в штаб-квартире НОАА/НОС в Вашингтоне, О.К. Сервер пользуется огромной популярностью и является ценным источником информации с буев.

6. Состояние системы связи

Система Аргос продолжала предоставлять надежное обслуживание, обеспечивая сбор и обработку данных с дрейфующих буев в реальном масштабе времени. На совещании были обсуждены различные вопросы будущего развития системы. Рассматривались также появляющиеся альтернативные системы связи с использованием спутников с низкой околоземной орбитой (НОО).

7. Административные вопросы

В настоящее время в Группе имеется шесть групп действий: европейская группа по океаническим станциям (ЕГОС); Группа по Международной программе по арктическим буям (ИАПБ); Группа по Международной программе по антарктическим буям (ИПАБ); Группа по Международной программе по буям для Южной атлантики (ИСАБП); Группа по Международной программе по буям для Индийского океана (ИБПИО) и Группа по Глобальной программе по дрейфующим платформам (ГДП).

В 1997 г. на добровольной основе вносили свой вклад в финансовую поддержку Группы следующие двенадцать стран: Австралия, Канада, Франция, Греция, Исландия, Ирландия, Нидерланды, Новая Зеландия, Норвегия, Южная Африка, Соединенное Королевство и США.

Технический координатор Группы г-н Этьен Шарпантье продолжал состоять в штате ЮНЕСКО/МОК в качестве эксперта, **финансируемого из целевого фонда**, а его рабочее место находилось в КЛС/Службе Аргос в Тулузе, Франция.

В следующем финансовом году (1 июня 1998 г. - 31 мая 1999 г.) планируется распределить общий бюджет Группы в сумме 136 850 долл. США следующим образом:

	долл. США
Технический координатор (заработная плата, путевые расходы, материальное обеспечение)	120 000
Путевые расходы председателя и заместителей председателя	8 550
Эксперты	2 000
Публикации	6 000
Расходы ВМО	300
ИТОГО	136 850

REPORT

1 CURRENT AND PLANNED PROGRAMMES

Reports on national and international data buoy programmes are attached as Annexes I and II and reports on data management centres as Annex III.

2 REAL-TIME DATA FLOW

2.1 Number of buoys reporting over the Global Telecommunication System (GTS)

During November 1997, data from a total of 1590 buoys were collected and processed at the Argos Global Processing Centres in Toulouse, France, and Landover, Maryland, USA, for distribution in real time and delayed mode to the respective Principal Investigators. These buoys were operated by 17 countries. (A detailed breakdown by organizations and countries is given for the month of December 1997 in Annex IV).

Some 38.5% (612) of the 1590 buoys transmitted there data over the GTS in real- or quasi real-time. At the same time, in 1996, the total number of buoys was 1180 and 44% of them (631) were transmitting data over the GTS. (The number and location of BUOY reports received in Toulouse during October 1997 is given in Annex V).

The data availability index maps produced on a monthly basis by Météo-France since February 1994 (see examples of these maps in Annex III) allow to identify data sparse areas for each kind of geophysical variables. The index is indeed representative of how the requirements (such as of WWW, WCRP or GOOS-GCOS) are met: an index of 100 means that an average of eight observations of the variable concerned per day per five hundred km area has been received during the month. Maps are produced for air pressure, air temperature, sea surface temperature and wind. The index takes into account the observations transmitted in SHIP and BUOY code forms and another figure gives the percentage of BUOY reports from the total of SHIP plus BUOY reports received.

2.2 Data reception

The Argos Global Processing Centres (GPCs) in Toulouse and Landover both receive real-time and delayed-mode data from the ground stations in Fairbanks, Alaska, Wallop Island, Virginia, and Lannion, France.

Roughly 60% of Argos platforms are within the real-time coverage of Fairbanks, Wallop Island and Lannion. For these platforms, an average of 95% of the reports are made available to users within less than one hour (see Figure 1). For the other 40% of the transmitters, 80% of the data are delivered within three hours (see Figure 2).

3 DATA QUALITY

One of the principal aims of the panel is to encourage operators of data buoys and users of buoy data to improve the quality of data at source and through the processing chain. The statistics gathered through the year show that the improvement in quality of air pressure data disseminated over the GTS noted the last two years has been maintained and the mean RMS differences of the data compared with ECMWF analyses have stabilized at around 1.2 hPa (see Annex VI).

Such a result is likely attributable, at least in part, to the implementation of the quality control guidelines for GTS data. These guidelines were adopted by the panel at its seventh session (Toulouse, October 1991). They are based on an electronic distribution list maintained through Internet, where principal meteorological or oceanographic centres responsible for GTS buoy data quality control deposit status change proposals. The quality control guidelines for GTS data were last updated and approved by the panel at its twelfth session (Henley-on-Thames, October 1996). These updated guidelines are given in Annex VII.

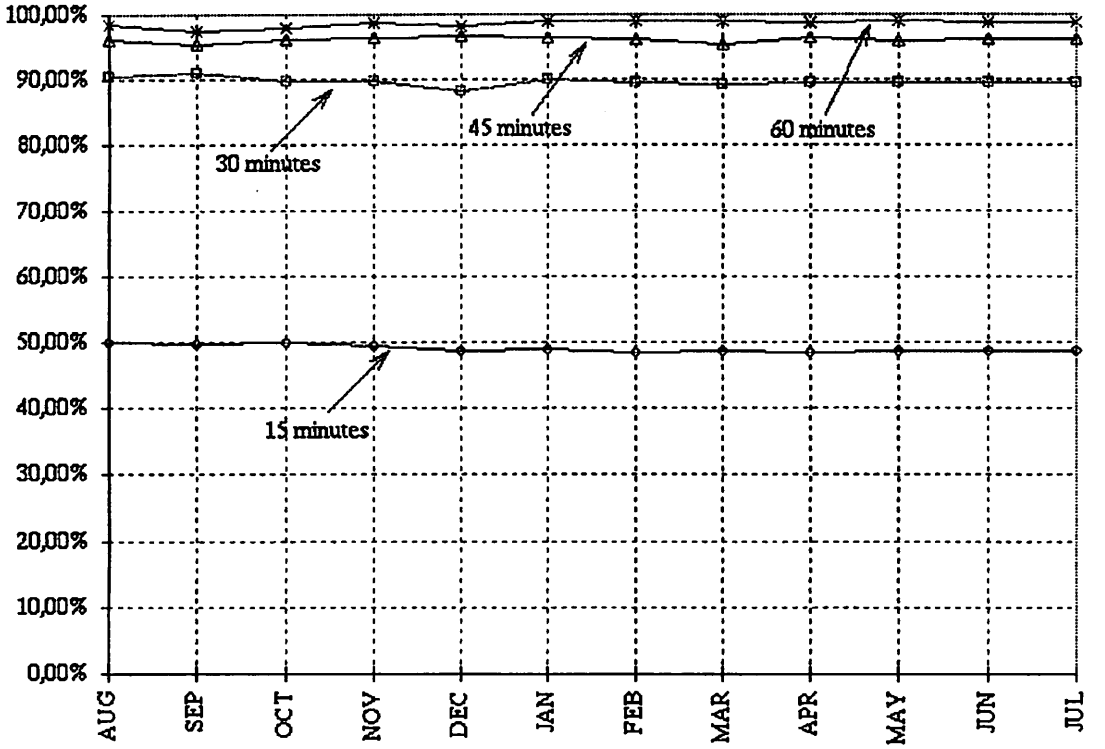

Figure 1 - Real-time coverage

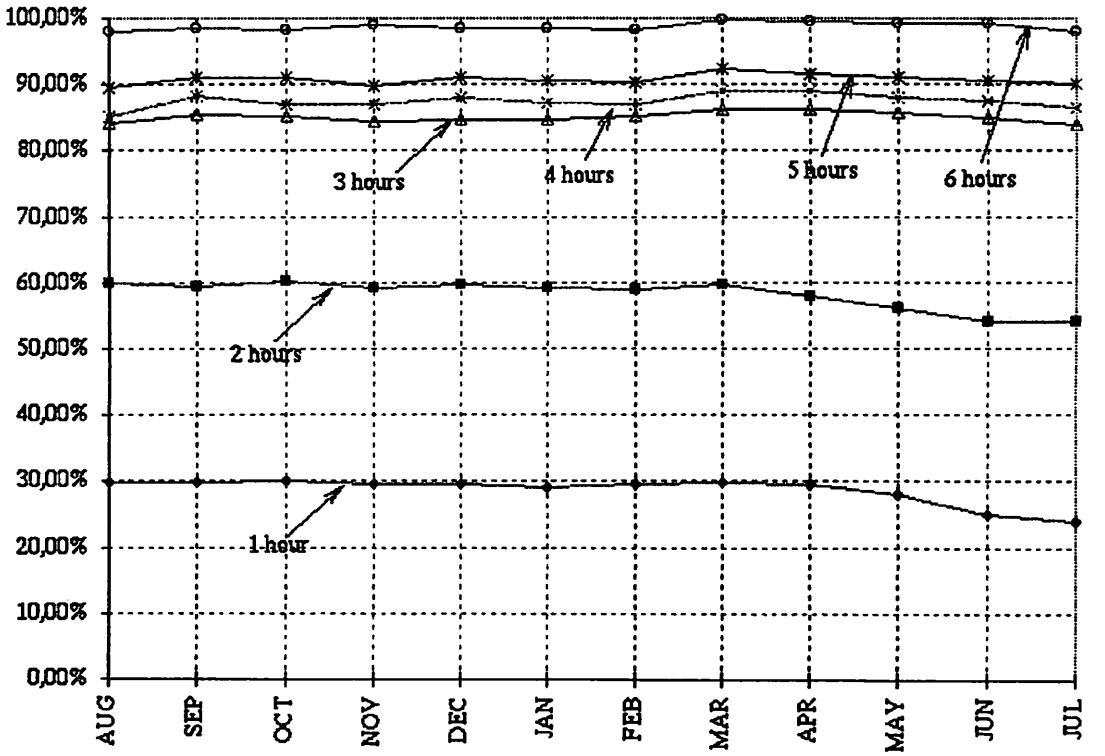

Figure 2 - Global coverage

The panel had also established a World Wide Web server dedicated to the DBCP. The server is maintained at the NOAA National Ocean Service (NOS) since February 1995. It has been substantially upgraded during the intersessional period with the assistance of Météo-France, the Canadian Marine Environmental Data Service (MEDS) and the technical co-ordinator.

4 DATA ARCHIVAL

The Marine Environmental Data Service (MEDS) in Canada became the Responsible National Oceanographic Data Centre (RNODC) for drifting buoy data on behalf of IOC and WMO in January 1986. The full report of MEDS is given in Annex III, pages 2 to 12. In addition, Annex VIII contains the drifting buoy track charts prepared by MEDS for the months of June through September 1997.

5 TECHNICAL DEVELOPMENTS

5.1 Combined meteorological/oceanographic drifting buoy

Since its third session, the panel has been increasingly involved in efforts to persuade meteorologists and oceanographers to collaborate on combined meteorological/oceanographic drifting buoys. The Global Drifter Centre (GDC), previously at the Scripps Institution of Oceanogrphy (SIO), La Jolla (CA), and now at the NOAA Atlantic Oceanographic and Meteorological Laboratory (AOML), Miami (FL), was responsible for the development of a low-cost Lagrangian drifter equipped with a barometer port (Surface Velocity Programme Barometer (SVP-B) drifter) and worked in collaboration with the panel to that end. The SVP-B drifter has become an established and largely reliable technology. and the panel is continuously urging oceanographers and meteorologists to co-operate in the use of the platform whenever possible, to the benefit of all programme requirements. A list of current SVP-B manufacturers is given in Annex IX for information.

5.2 Lifetime of drifting buoys

As during previous years, the technical co-ordinator made a study of the lifetime of drifting buoys based on that of their air-pressure sensor. The histogram reproduced in Annex X shows the results of this study.

5.3 SVP-B with wind sensor (SVP-BW) drifter

A presentation by MMr Jean Rolland and Pierre Blouch (Météo-France) and Dr Mark Bushnel (NOAA/AOML) of the new SVP-BW drifter in given in Annex XI.

6 COMMUNICATION SYSTEM STATUS

6.1 Argos system

6.1.1 SPACE SEGMENT

Two satellites are operational: NOAA-12 (D) and NOAA-14 (J) since 14 May 1991 and 30 December 1994, respectively. Since the failure of NOAA-9 (F) by mid-August 1995, NOAA-11 (H) has been the third satellite. Up to July 1997, only platforms within the coverage of the Lannion and Australian stations could have their data collected and located by the third satellite. Since then, NOAA has been again distributing global data from the third satellite. It is therefore now possible to locate and distribute data from all platforms through the third satellite, with subscription to the multi-satellite service.

6.1.2 GROUND SEGMENT

The three global receiving ground stations of Fairbanks, Wallops Island and Lannion are fully operational and give complete satisfaction. They provide the Argos system with global coverage and the data are processed by the French and US Global Processing Centres (GPCs). Those stations also receive data in near-real time from platforms in their regional coverage areas. In addition, regional stations are operational in Melbourne, Casey, Darwin, Perth and Wellington (the data are processed in Melbourne; some

of them are sent to the French GPC fir quality control and forwarding over the GTS); and in Hawaii (the data are relayed to the US GPC for processing). Two additional stations are being installed in Cape Town and La Réunion.

The Argos Global Processing Centres in Toulouse and Landover were operational over 99.9% of the time and the GTS sub-sytem remains fully operational.

6.1.3 ARGOS ENHANCEMENT

At the GPCs, all the old Vax computers have now been replaced by new-generation 64-bit DEC Alpha computers and the software has been updated accordingly. The Australian centre was upgraded in 1996 and is now connected to the receiving station at the New Zealand Meteorological Office in Wellington. Preparation is in progress for the launch in February 1998 of NOAA-K which will carry the first model in the Argos-2 series.

Other improvements required by the buoy user community have been implemented or are under study, such as: the "increase" in the size of the Argos on-line data base (9, instead of 4, days plus the current day, since 1 April 1997); the on-line access to the GTS technical files (an experimental system is being tested); software to give an overview of the information sent onto the GTS (not to the data themselves); etc.

7 ADMINISTRATIVE MATTERS

7.1 Action groups

[*See at beginning of Annex II the guidelines for the action groups of the panel.*]

7.1.1 EUROPEAN GROUP ON OCEAN STATIONS (EGOS)

EGOS was formally establishedon 1 December 1988 and was *de facto* an action group of the panel as the successor to COST-43. EGOS now has the following membership:

Denmark	Danish Meteorological Institute
Germany	Deutscher Wetterdiesnt
France	Météo-France
Iceland	Icelandic Meteorological Office
Ireland	Irish Meteorological Service
Netherlands	Royal Netherlands Meteorological Institute
Norway	Norwegian Meteorological Institute
Sweden	Swedish Meteorological and Hydrological Institute
United Kingdom	United Kingdom Meteorological Institute

The full report by EGOS is reproduced in Annex II.

7.1.2 INTERNATIONAL ARCTIC BUOY PROGRAMME (IABP)

IABP was formally established on 18 September 1991 and became officially an action group of the panel at the seventh session of the DBCP (Toulouse, October 1991). The following organizations are participating in IABP:

Canada	Environment Canada, Canadian Coast Guard, Institute of Ocean Sciences, Marine Environmental Data Service
China	Institute of Oceanology of the China Academy of Sciences
Finland	Arctic Centre of the University of Lapland
France / USA	Service Argos
Germany	Alfred-Wegener Institute for Polar and Marine Research
Japan	Japan Marine Science and Technology Centre
Norway	

Russian Federation	Chr. Milchelsen Rearch AS, Nansen Envioronmental and Remote Sensing Centre, Norsk Polarinstitutt, Norwegian Meteorological Institute
United Kingdom	Arctic and Antarctic Research Institute, Russian Federal Service of Hydrometeorology and Environmental Monitoring
USA	Scott Polar Research Institute, United Kiongdom Meteorological Office
	National Ice Center (representing the National Aeronautics and Space Administration, the Nationa Science Foundation, the National Oceanic and Atmospheric Administration, the Office of Naval Research and the US Coast Guard), Pacific Marine Environmental Laboratory (of NOAA), Polar Science Center of the Applied Physics Laboratory of the University of Washington, Woods Hole Oceanographic Institution, Naval Oceanographic Office, Naval Meteorology and Oceanography
International organizations	Command
	World Climate Research Programme of WMO, IOC and ICSU

The full report by the IABP is reproduced in Annex II.

7.1.3 INTERNATIONAL PROGRAMME FOR ANTARCTIC BUOYS (IPAB)

The IPAB was established in 1994 and became an action group of the panel in October 1994. The following organizations are participating in IABP:

Australia	Antarctic Co-operation Research Center, Australian Antarctic Division
Canada	Marine Environmental Data Service
Finland	Finnish Institute of Marine Research
France/USA	CLS/Service Argos
Germany	Alfred Wegener Institute for Polar and Marine Research
Italy	National Programme for Antarctic Research
Japan	Hydrological Department of the Maritime Safety Agency, National Institute of Polar Research
Russian Federation	Arctic and Antarctic Research Institute
South Africa	South African Weather Bureau
United Kingdom	Scott Polar Research Institute
USA	National Ice Center (see above under IABP), Polar Science Center, World Data Center A for Glaciology

The full report by the IPAB is reproduced in Annex II

7.1.4 INTERNATIONAL SOUTH ATLANTIC BUOY PROGRAMME (ISABP)

The ISABP was established in 1994 and became an action group of the panel in November 1994. The following organizations are participating in the ISABP:

Argentina	Servicio Meteoroligico, Servicio de Hidrografia Naval
Brazil	Diretoria de Hidrografia e Navegacao
Canada	Marine Environmental Data Service
France/USA	CLS/Service Argos
Namibia	The Meteorological Service
South Africa	South African Weather Bureau, Sea Fisheries Research Institute
United Kingdom	United Kingdom Meteorological Office
USA	Atlantic Ocean Meteorological and Oceanographic Laboratory, National Data Buoy Center

The full report by the ISABP is reproduced in Annex II.

7.1.5 INTERNATIONAL BUOY PROGRAMME FOR THE INDIAN OCEAN (IBPIO)

The IBPIO was established in 1996 and became an action group of the panel in October 1996. The following organizations are participating in the IPBIO:

Australia	Australian Bureau of Meteorology
France	Météo-France
France/USA	CLS/Service Argos
India	National Institute of Oceanography
South Africa	South African Weather Bureau
USA	Global Drifter Center of NOAA

Some other institutes expressed their willingness to participate:

India	India Meteorological Department
Indonesia	Faculty of Fisheries
Mauritius	Mauritius Meterorological Service
South Africa	University of Cape Town
USA	Navoceano

The full report by IBPIO is reproduced in Annex II.

7.1.6 GLOBAL DRIFTER PROGRAMME (GDP)

The GDP was established in 1996 as the follow-up of the Surface Velocity Programme (SVP) of TOGA and WOCE and became an action group of the Panel in 1997. The Global Drifter Center (GDC) is hosted by the NOAA Atlantic Oceanographic and Meteorological Laboratory (AOML) in Miami, FL. The full report of the GDP is reproduced in Annex II.

7.2 Membership

7.2.1 IOC MEMBER STATES AND WMO MEMBERS DIRECTLY INVOLVED IN THE PANEL'S ACIVITIES

The following countries were represented at the recent sessions of the panel:

- Ninth session (Athens, Greece, October 1993): Australia, Canada, France, Greece, Iceland, Netherlands, United Kingdom, USA
- Tenth session (La Jolla, CA, USA, November 1994): Australia, Brazil, Canada, China, France, Greece, Iceland,Netherlands, South Africa, United Kingdom, USA
- Eleventh session (Pretoria, South Africa, October 1995): Argentina, Australia, Brazil, France, Iceland, Netherlands, New Zealand, South Africa, Ukraine, United Kingdom, USA
- Twelfth session (Saint-Denis, La Réunion, France, October 1997): Australia, Brazil, Canada, France, Iceland, Netherlands, New Zealand, South Africa, Spain, United Kingdom, USA.

7.2.2 NATIONAL FOCAL POINTS

The present list of national focal points for the DBCP is attached as Annex XII.

7.3 Technical co-ordinator

The panel's technical co-ordinator continues to be Mr. Etienne Charpentier (France). Since 1 June 1993, he has been employed by UNESCO/IOC as a *fund-in-trust expert* and located at Collecte-Localisation-Satellite (CLS)/Service Argos in Toulouse, France.

7.4 Finances

Overall management of the panel's finances has continued to be undertaken by WMO during 1997, while IOC has arranged contracts for the employment of the technical co-ordinator as well as for his logistic support. Annex XIII contains financial statements as follows:

(a) Finalized IOC Statement of Account for the period 1 June 1996 to 31 May 1997;

(b) Interim WMO Statement of Account as at 30 November 1997.

For the financial year 1998-1999, the panel agreed the following draft budget, to which contributions will be made by twelve countries (Australia, Canada, France, Greece, Iceland, Ireland, Netherlands, New Zealand, Norway, South Africa, United Kingdom, USA):

A. Expenditures	US$
Technical coordinator (salary, travel, logistic support)	120,000
Travel of Chairman and Vice-chairmen	8,550
Experts	2,000
Publications	6,000
WMO Costs	300
TOTAL	136,850
B. Income	
Contributions	128,850
Carry-over 1997-1998	8,000
TOTAL	136,850

(**Note**: Official UN exchange rate in September 1997: USD 1 = FFR 6.07)

ANNEX I

NATIONAL REPORTS ON DATA BUOY ACTIVITIES

The following pages contain national reports on data buoy activities submitted by the following countries:

AUSTRALIAN BUREAU OF METEOROLOGY DRIFTING BUOY PROGRAM

Report to Data Buoy Co-operation Panel
DBCP13 October 1997

1. Deployment Report for the 1996/97 Intersessionary Period

The Bureau completed eleven drifter deployments to maintain its array in the Southern and Indian Oceans during the intersessionary period. These comprised seven Metocean Data Systems TOGA type drifters, and four TURO Technology barometer drifters. Three TOGA drifters were fitted with wind speed and direction (WSD) sensors, and all were fitted with weighted line drogues. An additional four barometer drifters were also deployed on behalf of the GDC/AOML. A total of ten Bureau drifters are currently reporting on the GTS. Table 1 lists deployment dates and locations.

Notes on these deployments are as follows:

i. Two WSD TOGA drifters 53534 and 53549 were deployed to the north west of the Australian continent in the Indian Ocean. Buoy 53534 failed after six months, believed to have resulted from water entry. This buoy was an older model manufactured prior to the introduction of an improved sealing process. Buoy 53549 ran aground within 3 months after being caught in a strong easterly current to the north west of Australia.

ii. Stationary WSD TOGA drifter 52623 in the Gulf of Carpentaria was replaced with a new drifter 52624 at the same location, after continuous unattended operation for almost two years and having survived several cyclones.

iii. The pressure sensor of TURO barometer drifter 56536 was found to be in error soon after deployment, cause is unknown.

iv. Two deployments were made enroute from Antarctica to Heard Island from the RV Aurora Australis. This voyage also provided an opportunity to replace the Argos DCPs at Spit Bay and Atlas Cove. Both DCPs use drifting buoy technology, measuring barometric pressure and air temperature only, and are reporting on the GTS. It is expected both DCPs will report for up to five years.

v. The GDC/AOML drifters operate on a 6 hours-on and 18 hours-off duty cycle. Their current operational status is not known.

2. 1997/98 Deployment Plan

The ability of the Bureau to deploy new drifting buoys and maintain its array is determined by annual funding allocations for buoy procurements and Argos communications. Argos funding is usually the main limiting factor, and current funding will allow about ten new deployments, sufficient to maintain the existing array. Table 2 lists the proposed dates and locations for new deployments which, as in previous years, will be a mix of TOGA type drifters and SVP barometer drifters.

Actual deployment locations will depend on the availability of ships of opportunity in the deployment areas.

3. Technical Developments

The Bureau's main areas of interest in new technical developments relate to alternative communications such as the Orbcom or Safir satellite systems, and to the feasibility of SVP barometer drifters carrying wind speed and direction sensors.

i. Discussions have been held with Safir officials to investigate the feasibility of performing an Australian trial, but no agreements have been made so far.

ii. An operational trial of the Orbcom system is planned for early 1998 with a TOGA drifter equipped with transmitters for both Argos and Orbcom.

iii. Operational trials of two WOTAN barometer drifters are planned for 1998.

Attachment 1

Table 1 - Deployments Completed in 1996/97

WMO	Argos	TYPE	OWNER	DATE	LAT	LONG	SHIP
56529	4873	SVP-B	BoM	21/09/96	19.00 S	109.00 E	MV ENCOUNTER BAY
56530	4871	SVP-B	BoM	18/11/96	32.00 S	100.00 E	MSC NURIA
56531	4872	SVP-B	BoM	19/11/96	30.00 S	90.00 E	MSC NURIA
53549	2951	TOGA/WSD	BoM	21/11/96	13.06 S	120.96 E	HMAS GEELONG
56532	2949	TOGA	BoM	05/12/96	41.90 S	109.96 E	RV SHIRASE
56533	2948	TOGA	BoM	06/12/96	47.10 S	110.00 E	RV SHIRASE
56534	2944	TOGA/WSD	BoM	19/02/97	17.36 S	109.16 E	MV AUST. VENTURE
74538	2938	TOGA	BoM	16/03/97	60.99 S	73.98 E	MV AURORA AUSTRALIS
56535	2939	TOGA	BoM	17/03/97	54.99 S	74.09 E	RV AURORA AUSTRALIS
56536	4876	SVP-B	BoM	04/04/97	49.92 S	88.47 E	RV RIG SEISMIC
52624	2942	TOGA/WSD	BoM	20/08/97	13.00 S	139.00 E	HMAS IPSWICH *
56911	------	SVP-B	AOML	07/12/96	52.26 S	110.06 E	RV SHIRASE
56905	------	SVP-B	AOML	08/12/96	57.53 S	108.23 E	RV SHIRASE
-------	------	SVP-B	AOML	12/12/96	51.15 S	130.05 E	MV AURORA AUSTRALIS
56924	------	SVP-B	AOML	13/12/96	55.00 S	120.05 E	MV AURORA AUSTRALIS

Table 2 - Deployment Plan for 1997/98

No	TYPE	DATE	LAT	LONG	SHIP
1	TOGA/WSD	Sep 97	14 S	139 E	HMAS IPSWICH (* completed)
2	SVP-B	Oct 97	14 S	120 E	HMAS DUBBO
3	TOGA/WSD	Oct 97	19 S	109 E	MV BOTANY BAY
4	TOGA	Nov 97	45 S	85 E	TBA
5	SVP-B	Dec 97	43 S	110 E	RV SHIRASE
6	TOGA	Dec 97	47 S	110 E	RV SHIRASE
7	TOGA	Dec 97	58 S	100 E	RV SHIRASE
8	SVP-B	Jan 97	19 S	109 E	TBA
9	TOGA	Feb 98	32 S	100 E	TBA
10	TOGA	Feb 98	30 S	90 E	TBA

Canada

YEAR: 1997 (Sept. 1/96 - Aug. 31/97)

CURRENT PROGRAMS:

A **AGENCY OR PROGRAM: CANADA** - Pacific and Yukon Region - North East Pacific Ocean

Number and type of buoys:

a) Deployed during year:	3 Standard Metocean drifters 10 WOCE drifters (provided by the Global Drifter Centre NOAA/AOML)
b) Operational (31/08/97):	3 moored Six Metre NOMAD buoys 13 moored Three Metre Discus buoys 4 Standard drifters WOCE drifters will be included in NOAA/AOML report
c) Reporting on GTS (31/08/97):	16 moored buoys 4 standard drifters
Main deployment area:	North Eastern Pacific Ocean

B **AGENCY OR PROGRAM: CANADA** - Prairie and Northern Region

Number and type of buoys:

a) Deployed during year:	● 3 moored buoys, open water season, lakes ● 4 drifters, Arctic Basin ice, (combination of air-deployed via parachuting onto ice and surface deployed via landing on ice) Two additional buoys were air-deployed on Arctic Basin ice but failed on deployment.-
b) Operational (31/08/97):	● all 3 moored buoys ● 3 of the 4 drifters
c) Reporting on GTS (31/08/97):	● all 3 moored buoys ● 3 drifters
Main deployment area:	● Great Slave Lake open water season: one 3-metre buoy deployed (annually) July, retrieved (annually) October ● Lake Winnipeg open water season: two buoys (WD buoy South Basin and Hexoid buoy North Basin) deployed (annually) in June, retrieved (annually) in October ● eastern / southeastern Arctic Basin ice: 2 to 5 drifters

C **AGENCY OR PROGRAM: CANADA** - Canadian Ice Services

Number and type of buoys:

a) Deployed during year:	2 Metocean Standard CALIB in NWRN Baffin Bay 1 Metocean Lithium with Pressure CALIB in Beaufort Sea 4 Metocean Standard CALIB in Gulf of St.-Lawrence 1 Metocean Standard CALIB in Davis Strait (on iceberg)
b) Operational (31/08/97):	1 Metocean Standard CALIB in Davis Strait (on iceberg)

c) Reporting on GTS (31/08/97): 1 Metocean Standard CALIB in Davis Strait (on iceberg)

Main deployment area: Arctic waters - Beaufort Sea and Baffin Bay.
Gulf St.-Lawrence.

D **AGENCY OR PROGRAM: CANADA** - Atlantic region

Number and type of buoys:

a) Deployed during year: No new deployments

b) Operational (31/08/97): five 6 meter NOMADS

c) Reporting on GTS (31/08/97): all

Main deployment area: North West Atlantic

E **AGENCY OR PROGRAM: CANADA** - Ontario region

Number and type of buoys:

a) Deployed during year: 5 three metre buoys
2 twelve metre buoy

b) Operational (31/08/97): 7 buoys

c) Reporting on GTS (31/08/97): all

Main deployment area:

F **AGENCY OR PROGRAM: CANADA** - Québec region

Number and type of buoys:

a) Deployed during year: 1 moored 3-meter discus buoy

b) Operational (31/08/97): 1 buoy

c) Reporting on GTS (31/08/97): 1

Main deployment area: Gulf of St. Lawrence

PLANNED PROGRAMS:

A **AGENCY OR PROGRAM: CANADA** - Pacific and Yukon Region - North East Pacific Ocean

Number and type of buoys planned for deployment in next 12 months:

Purpose of programme :

a) Operational: 0 Moored buoys
4 Standard wind speed and direction drifters

b) Developmental: 1 Six Metre NOMAD moored buoy - (Continuation of Severe Wave Study) to be deployed near the Hibernia Oil Platform Oct/97.
1 Three Metre discus buoy - (Optical sensors for Biological monitoring).

C) Met/Ocean research: As above.

Main deployment area: Drifting buoys will be deployed in the NE Pacific Ocean.
Optical sensor buoy will be deployed in a coastal location in Georgia Strait.
Severe Wave Study NOMAD buoy will be deployed in the Western Atlantic Ocean near the Hibernia Oil Platform, October/97.

B. **AGENCY OR PROGRAM: CANADA** - Prairie and Northern Region

Number and type of buoys planned for deployment in next 12 months:

1. **Moored buoys:**

Purpose of programme: To support operational marine forecasting program.

a) Operational: 3 buoys

b) Developmental: nil

c) Met/Ocean research: nil.

Main deployment area: Great Slave Lake (3-metre buoy)
Lake Winnipeg (moored WD drifter buoy and hexoid buoy)

2. **Drifting buoys on Arctic Basin ice**

Purpose of programme: To actively participate in the International Arctic Buoy Programme (IABP). Our focus is ensuring that there is real-time meteorological data from the southeastern Arctic Ocean / the Beaufort section of the Arctic Basin and that the data is available on GTS.

a) Operational: From 2 to 4 buoys depending on 'holes' in the buoy array across the southeastern Arctic Ocean / the Beaufort and deployment opportunities. The deployments will be comprised of:
- air-drops of CALIB buoys and
- landing on ice operating a Twin Otter from Eureka or Tuktoyaktuk to deploy in-house assembled buoys and buoys on behalf of the U.S. National Ice Centre.

b) Developmental: Experiment with the assembly of buoys in house including making combination battery / solar panel power supplies

c) Met/Ocean research: nil

Main deployment area: Arctic Basin ice east of 141W and south of about 83N

C **AGENCY OR PROGRAM: CANADA** - Canadian Ice Services

a) Operational: 2 Metocean Standard CALIB.
2 Metocean Lithium Battery CALIB
1 Metocean Lithium Battery with Pressure sensor CALIB
Up to 4 Ice Beacon

b) Developmental: Nil.

c) Met/Ocean research: Possibly 1 Standard CALIB to be used by the North Open Water project.

Main deployment area: Eastern Arctic and Gulf/Nfld. waters

D **AGENCY OR PROGRAM: CANADA** - Atlantic region

Number and type of buoys planned for deployment in next 12 months:

Purpose of programme :

a) Operational: Nomad Grand Banks of Newfoundland

b) Developmental: one

c) Met/Ocean research: none

Main deployment area:

E **AGENCY OR PROGRAM: CANADA** - Ontario region

Number and type of buoys planned for deployment in next 12 months:

Purpose of programme :

a) Operational: Two 12 Metre Buoys and five 3 Metre Buoys

b) Developmental: Light Weight Coastal Buoy

c) Met/Ocean research: One 12 metre buoy is equipped with a chemistry laboratory on board with several on going experiments (mass spec). The buoy is powered by two diesel (6kw) engines and solar power.

Main deployment area:
1. Develop a lightweight meteorological buoy that can work in coastal conditions and can be handled by smaller ships.
2. Experiments to examine the air-lake exchange of gaseous pesticides, of CO, water vapour, momentum and heat fluxes and a biological study of the isotope fixation during primary productivity involving phytoplankton.

F **AGENCY OR PROGRAM: CANADA** - Quebec region

Number and type of buoys planned for deployment in next 12 months:

Purpose of programme :

a) Operational: none

b) Developmental: none

c) Met/Ocean research: none

Main deployment area:

TECHNICAL DEVELOPMENTS:

A **Moored Buoy Systems : CANADA** - Pacific and Yukon Region - North East Pacific

a) Buoy design: 3 solar powered buoys deployed June/97 using Siemens high output solar panels.
Improvements to wind mast design to simplify exchange of anemometers at sea.

b) Instrumentation: Global Positioning Systems on all moored buoys.
Award of contract to AXYS Environmental Systems for the supply of Watchman 100 buoy payloads for all Canadian moored buoys.
Three new Watchman 100 payloads installed and deployed June/97.
Ultrasonic anemometer on test.

B 1) **Moored Buoy Systems : CANADA** - Prairie and Northern Region

a) Buoy design: nil

b) Instrumentation: **Great Slave Lake and Lake Winnipeg North Basin buoys:**
air pressure, air temperature, water surface temperature, wind speed and direction, and wave height sensors/ data.
Lake Winnipeg South Basin buoy:
meteorological but no wave sensor /data.

B 2) **Drifting Buoy system : CANADA** - Prairie and Northern Region

a) Buoy design: Continue to try various buoy components and in-house assembly of components in pursuit of cost effective buoy packages that will:
- provide the basics of reliable and accurate pressure and temperature readings through continuous real time operation in the Arctic Basin environment and
- have a power system that will last 2 or 3 years

b) Instrumentation:
- air-deployed CALIBs: air pressure sensor/ data
- surface-deployed buoys (in house and those deployed on behalf of US National Ice Centre): air pressure and air temperature sensors/ data

c) Others : 1) Buoy data is used operationally to provide air pressure and air temperature data to assist in real time analysis and forecasting across the Canadian sector of the Arctic Ocean by the Arctic Weather Centre, Canadian Meteorological Centre and other international forecast offices such as the UK Met Office. The data is also used operationally by Canadian Ice Service to provide general ice motion data.

The data contributes to the overall Arctic Basin data set which is used to provide data on ice motion, surface pressure pattern, and air temperatures across the Arctic Ocean for both the operational and research communities.

C **Drifting Buoy system : CANADA** - Canadian Ice Services

a) Beacon design Using mostly Lithium Batteries for northern beacons.

b) Instrumentation: Pressure and temperature sensors on 1 CALIB in NW Baffin Bay (temperature may be unreliable due to proximity of sensor to the ice surface).

D **a) Moored Buoy Systems : CANADA - ATLANTIC REGION**

a) Buoy design:

b) Instrumentation: Watchman 100 Payloads to be installed in 3 Nomads

D **b) Drifting Buoy system : CANADA - ATLANTIC REGION**

a) Buoy design: No drifters

b) Instrumentation:

c) Others :

E **Moored Buoy Systems : CANADA - Ontario Region**

a) Buoy design: Presently developing a small lightweight buoy that can be used in the coastal or lakes environment that can be serviced using smaller vessels than are presently used with the 12 and 3 metre buoys.

b) Instrumentation: All buoys in the Buoy Program are being upgraded with the new Buoy Payload (WATCHMAN 100).

F **Moored Buoy Systems : CANADA** - Quebec region

a) Buoy design: 3D

b) Instrumentation: Various

PUBLICATIONS:

A CANADA - Pacific and Yukon Region - North East Pacific

Monthly WMO Moored and Drifting Buoy Status Reports
On line Moored Buoy buoy Status Reports at: http://www.pwc.bc.doe.ca/~ftp/wbs/bplatstat.html
Annual ODAS Buoy Service Reports - Pacific and Yukon Region (Internal distribution)

B CANADA - Prairie and Northern Region
none

C CANADA - Canadian Ice Services

First internal CIS report delivered on November 20th, 1996.

D CANADA - Atlantic Region
none

E CANADA - Ontario Region
none

F CANADA - Quebec region
none

SPECIAL COMMENTS:

A CANADA - Pacific and Yukon Region - North East Pacific

a) Quality of buoy data: Good

b) Communication: Good. Over 91% of all possible moored buoy data delivered to users

c) Buoy Lifetimes: Moored buoys - up to 3 years between battery changes.
New solar buoys should increase service interval for battery replacement to 5 years.
Drifting buoys - Over 2 years

d) Other. Nil

B CANADA - Prairie and Northern Region

a) Quality of buoy data:

b) Communication: Prairie and Northern Region, Environment Canada, continue to operate a Local Users Terminal at their Edmonton facility. Canadian and some U.S. National Ice Centre buoy data is accessed, processed and input to GTS directly from Edmonton.

c) Buoy Lifetimes:
- air-deployed CALIBs with lithium batteries have an expected life of about 1 year
- surface deployed buoys have an expected life of about 2 years

Summer melt of ice and the breakup of ice throughout the year factor into buoy lifetimes!

d) Other: Ice in the southern Beaufort is vulnerable to melt and breakup and also to moving quickly out of the region. Hence our use of air-deployable CALIBs which provide position and pressure but not temperature data. For surface deployments we target ice which we believe to be within but on the outer edge of the Beaufort gyre.

C CANADA - Canadian Ice Services

a) Quality of buoy data: Good and reliable.

b) Communication: Good and reliable.

c) Buoy Lifetimes: 3-4 months for Standard, up to 1 year for Lithium batteries.

d) Other: Nil.

D CANADA - Atlantic Region

a) Quality of buoy data: 1 AIR TEMP U/S

b) Communication: 1 BUOY ON ARGOS BACKUP

c) Buoy Lifetimes:

d) Other:

E CANADA - Ontario Region

a) **Quality of buoy data:**

b) **Communication:**

c) **Buoy Lifetimes**:

d) **Other:**

D **CANADA** - Quebec Region

a) **Quality of buoy data:** 90%

b) **Communication:** goes

c) **Buoy Lifetimes**:

d) **Other:** position Aargos

CONTACT POINTS

A **CANADA** - Pacific and Yukon Region - North East Pacific

Environment Canada
Atmospheric Environment Branch
Suite 700-1200 W. 73rd Ave.
Vancouver, B.C.
V6P 6H9
attn : Ron McLaren

phone : 604-664-9188
fax : 604-664-9195
Email: ron.mclaren@ec.gc.ca

B **CANADA** - Prairie and Northern Region

Arctic Weather Centre
Environment Canada
Twin Atria Bldg - Room 200
4999 - 98 Avenue
Edmonton, AB
T6B 2X3
Canada
attn : Edward Hudson

phone: 403 951-8878
fax 403 951-8872
E-Mail : edward.hudson@ec.gc.ca

C **CANADA** - Canadian Ice Services

Environment Canada
373 Sussex dr. 3rd floor, Block E
Ottawa, Ontario.
K1A 0H3
attn. : Luc Desjardins

Phone : 613-996-1617
fax : 613-947-9160
Email : Luc.Desjardins@ec.gc.ca

D **CANADA - Atlantic Region**

Environment Canada
1496 Bedford Highway
Bedford, N.S.
B4A 1E5
attn : Mike McNeil

Phone : 902-426-9225
fax : 902 426-1595.
Email: Mike.McNeil@ec.gc.ca

E **CANADA - Ontario Region**

Environment Canada
100 Eastport blvd
PMO office
Hamilton, Ont
L8H 7S4
attn : Ron Fordyce

phone : 905-312-0900/0933
fax : 905-312-0730
Email : ron.fordyce@ec.gc.ca

F **CANADA - Québec Region**

Environment Canada
100 Alexis Nihon
PMO office
St Laurent, Québec
H4M 2N8
attn : Denis Blanchard

phone : 514-283-4078
fax : 514-283-4325
Email : D.Blanchard@EC.GC.CA

G **CANADA - Marine Program**

National Marine Focal Point
Environment Canada
373 Sussex dr. 3rd floor, Block E
Ottawa, Ontario.
K1A 0H3
attn. : Normand Michaud

Phone : 613-947-3754
fax : 613-996-4218
Email : Normand.Michaud@ec.gc.ca

Country: **FRANCE**

Year: **1 September 1996 - 31 August 1997**

CURRENT PROGRAMMES

A. MÉTÉO-FRANCE

Number and type of buoys :

(a) 26 drifting buoys (most of them drogued) + one directional waverider were deployed in last 12 months. Drifting buoys are :
- 2 Marisonde B (air pressure + barometric tendancy + SST),
- 6 Marisonde G (as B + wind + air temperature),
- 1 Marisonde GT (as G + subsurface temperature) and
- 17 SVP barometer drifters (including 3 with wind measurement capabilities and 3 with salinity) ;

(b) 20 buoys[1] were operational at 31 August ;

(c) 20 buoys[1] were reporting on GTS at 31 August.

Purposes of programme :

(a) to provide oceanographical and meteorological observations in real time to Weather Forecast Centres (SIMBAD network, EGOS programme, French West Indies, IBPIO programme...) ;

(c) to improve present materials (tests of new buoys, new sensors (compasses and barometers)). To validate wind and bathythermal measurements.

Main deployment area:

North Atlantic (Off France, Spain and Portugal - West Indies).
Indian Ocean.

B. LODYC (ESOPE-2, DIFAMED, CARIOCA programme)

Number and type of buoys:

(a) 5 prototypes of CARIOCA (moored and drifting), and 2 Marisonde GT buoys were deployed in last 12 months.

(b) 2 CARIOCA buoys were operational at 31 August;

(c) None was reporting on GTS at 31 August.

Purpose of programme:

(b) Research programmes ((ESOPE-2, DIFAMED)

(c) To develope a buoy able to measure CO_2 concentrations at the ocean-atmosphere interface (Programme CARIOCA - see Technical developments). Such buoys will be used in the frame of GOOS.

Deployment area:

Greenland Sea, North and Tropical Atlantic, Mediterranean Sea.

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[1] Including the UK/French moored buoy " Brittany " and three DATAWELL waveriders in French West Indies.

C. **STNMTE** (Service Technique de la Navigation Maritime et des Transmissions)

Number and type of buoys:

(a) STNMTE operates a Network of 6 omnidirectional wave moored buoys (DATAWELL) and one directional (DATAWELL).
(b) 7 buoys were operational at 31 August;
(c) none was reporting on GTS.

Purpose of programme:

(a) Operational - to maintain a long duration wave measurement network along the French coasts and centralize the French wave data.

Main deployment area:

French coasts.

D. **ORSTOM** (PICOLO programme)

Number and type of buoys:

(a) 10 SVP drifters were deployed in last 12 months ;
(b) 7 drifters were operational at 31 August ;
(c) 7 drifters were reporting on GTS at 31 August.

Purpose of programme:

(b) research.

Deployment area:

Tropical Atlantic Ocean.

PLANNED PROGRAMMES (next 12 months)

A. **MÉTÉO-FRANCE**

Number and type of buoys :

About 25 buoys will be deployed in next 12 months :
- 20 CEIS Marisonde buoys and/or SVP-Barometer drifters for operational purposes,
- 4 other drifting buoys for technical tests ;
- one moored buoy in the Biscay Bay (off France),

Météo-France will continue to operate the Brittany moored buoy in co-operation with the UK Met-Office off France and 3 waveriders in West Indies.

Purposes of programme:

(a) to provide oceanographical and meteorological observations in real time to Weather Forecast Centres (EGOS programme, West Indies, Indian Ocean, French Polynesia...) ;
(c) to test and validate new equipments.

Main deployment areas:

North Atlantic, Indian and Central Pacific Oceans.

B. **ORSTOM** (French participation to **PIRATA** programme - cooperation with Météo-France, CNES, IFREMER...)

Number and type of buoys :
Two Atlas buoys will be moored in next 12 months.

Purposes of programme:
(a) to provide oceanographical and meteorological observations in real time to Weather Forecast Centres ;
(b) to describe and understand the evolution of SST, upper ocean thermal structure and air-sea fluxes of momentum, heat and fresh water in the Tropical Atlantic.

Main deployment areas:
Tropical Atlantic Ocean.

C. **LODYC** (ESOPE, DIFAMED, CARIOCA)

Number and type of buoys :
7 CARIOCA buoys will be deployed in next 12 months.

Purposes of programme:
(b) research.

Main deployment areas:
Tropical Pacific Ocean, Atlantic Ocean, Greenland Sea.

D. **PRECOCE** (SHOM, Météo-France)

Number and type of buoys :
25 Marisonde GT buoys will be deployed in next 12 months.

Purposes of programme:
(b) research.

Main deployment areas:
Atlantic Ocean.

TECHNICAL DEVELOPMENTS

(b) Instrumentation

(i) Meteo-France continues to participate in the evaluation of SVP pressure drifters developed by the Global Drifter Center (USA). Fourteen drifters were deployed in the last 12 months. In parallel to the use of drifters, Meteo-France continuously surveys the performances of air pressure measurement for almost of the drifters of that kind deployed over the World Ocean.

(ii) Meteo-France is participating in the evaluation of the WOTAN technique (Wind

Observation Through Ambient Noise) applied to SVP drifters. One prototype, built by Metocean, was successfully tested off France, during the 96-97' winter. Eight new buoys were ordered to be deployed in next months.

(iii) The project of CO_2 concentrations measurements (inside the water and the atmosphere) from drifting buoys is managed by LODYC is continuing. Five prototypes of this buoy called CARIOCA (CARbon Interface OCéan Atmosphère) were deployed in last 12 months (2 moored and one drifting). It is planned to deploy 7 new drifters in the 12 next months.

PUBLICATIONS (programme plans, technical developments, QC reports...)

Météo-France - Centre de Météorologie Marine, Monthly statistics on buoys data transmitted on GTS in BUOY and SHIP codes (Air pressure, SST, wind speed and direction, air temperature).

Blouch P., 1996. The quality control of buoy data transmitted on the GTS and its use in evaluating the SVP-B drifter. *DBCP Technical Workshop - Henley-on-Thames.*

SPECIAL COMMENTS

(a) Buoy QC

The Centre de Meteorologie Marine of Meteo-France continues to operate quality control procedures on drifting buoys data. Warning messages are sent to the *buoy-qc@vedur.is* mailing list of Internet when a problem appears (e.g. bad location detected) or when a modification seems needed (i.e. to recalibrate or to remove a sensor from GTS). Statistics on comparisons with analysis fields are set up for each buoy and each LUT (when several are used for transmitting the data of a buoy). Monthly statistics are sent to the *buoy-qc@vedur.is* mailing list too. French monthly statistics and those provided by other centres are available on Internet through anonymous ftp in the */meteo/qc-stats* directory of host *ftp.shom.fr*. They are also available on the World Wide Web thanks to an application software which allows to get those of a particular buoy or a list of buoys. The http address is *http://www.shom.fr/meteo/rechstat*.

(d) Other

Like in 1996, Meteo-France funded 10 barometers to be added to SVP drifters. These will be deployed in the Indian Ocean by the end of 1997. The action will be renewed in 1998.

Country: ICELAND

Year: 1997 - 1998

CURRENT PROGRAMMES

A.	**Agency or programme:**	Marine Research Institute 1119 Scripps Institution of Oceanography	
	Number and type of buoys:	(a)	deployed during year: 40 Clear Water and Technocean drifters
		(b)	operational at 31 August:
		(c)	reporting on GTS at 31 August:
	Purpose of programme:	met/ocean research	
	Main deployment areas:	coastal waters South and West of Iceland; deep water South of Iceland in the Icelandic basin	
B.	**Agency or programme:**	The Icelandic Meteorological Office	

The Icelandic Meteorological Office is a participant in EGOS. It operates a deployment centre in Reykjavik and provides a semi-regular near-real-time data quality control of EGOS drifting buoys. Considerable statistical work is also carried out. A majority of EGOS drifting buoys are deployed from Icelandic ships en-route from Reykjavik to the USA. Pre-deployment tests of all buoys to be deployed are performed.

PLANNED PROGRAMMES

A.	**Agency or programme:**	Marine Research Institute 1119 Scripps Institution of Oceanography
	Number and type of buoys planned for deployment in next 12 months: 20 Clear Water and Technocean drifters	
	Purpose of programme:	met/ocean research
	Main deployment areas:	

SPECIAL COMMENTS (if any)

(a)	Quality of buoy data:	OK
(b)	Communications:	OK
(c)	Buoy lifetimes:	A few months up to one year. Failures mainly due to drift-ice
(d)	Others:	

Country: JAPAN

Year: 1997

CURRENT PROGRAMME

A. Maritime Safety Agency

Number and type of buoys:

(a) deployed during year: 24 surface drifters with holey sock drogues and SST sensors

(b) operational at 31 August: 15

(c) reporting on GTS at 31 August: None

Purpose of programme: ocean research (ocean circulation)

Main deployment areas: North Pacific, Indian and Antarctic Oceans

B. Japan Meteorological Agency

Number and type of buoys:

(a) deployed during year: 3 moored buoys with 11 maritime meteorological and oceanographic sensors

(b) operational at 31 August: 3

(c) reporting on GTS at 31 August: 3

Purpose of programme: operational meteorological and oceanographic observation

Main deployment areas: seas around Japan

C. Japan Marine Science and Technology Center

Number and type of buoys:

(a) deployed during year:	(Type 1)	1 drifter (Ice-Ocean Environmental Buoy)
	(Type 2)	3 subsurface current meter moorings
	(Type 3)	2 subsurface ADCP moorings
	(Type 4)	5 acoustic tomography moorings (200 Hz type)
	(Type 5)	1 subsurface current meter mooring
	(Type 6)	7 subsurface ADCP moorings
(b) operational at 31 August:	(Type 1)	1
	(Type 2)	0
	(Type 3)	0
	(Type 4)	5

(Type 5)	1
(Type 6)	7

(c) reporting on GTS at 31 August: None

Purpose of programme:		
	(Type 1)	met/sea-ice/ocean research
	(Type 2)	ocean research
	(Type 3)	ocean research
	(Type 4)	ocean research/engineering test
	(Type 5)	ocean research
	(Type 6)	ocean research

Main deployment area:		
	(Type 1)	Arctic Ocean (Beaufort Gyre)
	(Type 2)	Arctic Ocean (1), Bering Sea (2)
	(Type 3)	Arctic Ocean (Beaufort Gyre)
	(Type 4)	Kuroshio Extension region
	(Type 5)	south of Japan (Izu Ridge)
	(Type 6)	western tropical Pacific

D. University of Tokyo

Number and type of buoys:
(a) deployed during year: 6 compact surface drifters with drogues

(b) operational at 31 August: None

(c) reporting on GTS at 31 August: None

Purpose of programme: ocean research (Kuroshio warm water)

Main deployment areas: Kuroshio Extension region

E. Tokai University

Number and type of buoys:
(a) deployed during year: None

(b) operational at 31 August: 3 surface drifters with SST sensors, without drogues

(c) reporting on GTS at 31 August: None

Purpose of programme: research on ocean environment

Main deployment areas: North Pacific

F. National Space Development Agency of Japan

Number and type of buoys:
(a) deployed during year: 1 moored buoy

(b) operational at 31 August: None

(c) reporting on GTS at 31 August: None

Purpose of programme: ocean and atmosphere research (calibration and validation for ADEOS satellite)

Main deployment areas: Yamato bank (in the Japan Sea)

PLANNED PROGRAMME

A. Maritime Safety Agency

Number and type of buoys planned
for deployment in next 12 months: 32 surface drifters with holey sock drogues and SST sensors

Purpose of programme: ocean research (ocean circulation)

Main deployment areas: North Pacific, Indian and Antarctic Oceans

B. Japan Meteorological Agency

Number and type of buoys planned
for deployment in next 12 months: 3 moored buoys with 11 maritime meteorological and oceanographic sensors. All the buoys are continuously operated.

Purpose of programme: operational meteorological and oceanographic observation

Main deployment areas: seas around Japan

C. Japan Marine Science and Technology Center

Number and type of buoys planned
for deployment in next 12 months:

(Type 1)	1 drifter (Ice-Ocean Environmental Buoy)
(Type 3)	1 subsurface ADCP mooring
(Type 5)	1 subsurface current meter mooring
(Type 6)	7 subsurface ADCP moorings
(Type 7)	5 acoustic tomography moorings (400 Hz type)
(Type 8)	4 meteorological and subsurface oceanographic surface moorings (TRITON buoys)

Purpose of programme:

(Type 1)	met/sea-ice/ocean research
(Type 3)	ocean research
(Type 5)	ocean research
(Type 6)	ocean research
(Type 7)	ocean research

	(Type 8)	met/ocean research
Main deployment area:	(Type 1)	Arctic Ocean (Beaufort Gyre)
	(Type 3)	Arctic Ocean (Beaufort Gyre)
	(Type 5)	south of Japan (Izu Ridge)
	(Type 6)	western tropical Pacific
	(Type 7)	south of Japan
	(Type 8)	western tropical Pacific

D. University of Tokyo

Number and types of buoys planned
for deployment in next 12 months: 6 compact surface drifters with drogues

Purpose of programme: ocean research (Kuroshio warm water)

Main deployment areas: Kuroshio Extension region

E. Tokai University

Number and types of buoys planned
for deployment in next 12 months: 4 surface drifters with holey sock drogues and SST sensors

Purpose of programme: research on ocean environment

Main deployment areas: North Pacific

THE NETHERLANDS

Year: 1997

CURRENT PROGRAMMES

A **Agency or programme** Royal Netherlands Meteorological Institute (KNMI)

Number and type of buoys

deployed during year	3 (CS)
operational at 31 August	3
reporting on GTS at 31 August	3

Purpose of programme: Participating in the EGOS drifting buoy programme for operational meteorology and oceanography

Main deploymant areas: North Atlantic

B **Agency or programme** Netherlands Institute for Sea Research (NIOZ)

Number and type of bouys

deployed during year	5
operational at 31 August	5
reporting on GTS at 31 August	5

Purpose of programme: Study of the North-East Atlantic surface circulation under the terms of the WOCE Hydrographic programme. For that reason the inflow of warm and saline Atlantic water into the Norwegian Sea was monitored from 1989 to 1994. From 1995 onwards the research has been shifted towards the monitoring of the eastern boundary current in the Bay of Biscay which is assumed to contribute considerably to the northward flow of saline water in the North-East Atlantic Ocean.

Main deployment areas: North Atlantic

PLANNED PROGRAMMES

A **Agency or programme** KNMI

Number and type of buoys planned for development in next 12 months: 2

Purpose of programme: EGOS

Main deployment areas: North Atlantic

B **Agency or Programme** NIOZ

Number and type of buoys planned for deployment in next 12 months: 5

Purpose of programme Study of surface circulation

Main deployment areas North Atlantic

TECHNICAL DEVELOPMENTS

Buoy design

Instrumentation 1 buoy in test situation with GPS receiver

Others

PUBLICATIONS *(on programme plans, technical developments, QC reports etc)*

Stastistics of buoy data from buoys within EGOS programme are published in quarterly reports (UKMO) and monthly statistics (Météo-France)

Otto L. And H.M. van Aken (1996) -Surface circulation in the northeeast Atlantic as observed with drifters. Deep-Sea Research I, 43, 467-499

SPECIAL COMMENTS *(if any)*

Quality of buoy data see under Publications

Communications all buoys are tracked by Argos System

Buoy lifetimes see relevant EGOS documents

Others

Country NEW ZEALAND
Year 1997

CURRENT PROGRAMMES
A. Agency : Meteorological Service of New Zealand Ltd (MSNZ)

Number and type of buoys:
(a) deployed during the year : 5 Drifters - 4 FGGE, 1 WSD
(b) operational at 31 August : 5 Drifters
(c) reporting on GTS as at 31 August : 5 Drifters

Purpose of programme: Real-time buoy data for weather forecasting

Main deployment areas: Tasman Sea

PLANNED PROGRAMMES
A. Agency : Meteorological Service of New Zealand Ltd (MSNZ)

Number and type of buoys planned for deployment in next 12 months: 5 drifters, or as many as required to maximise contracted PTT time.

Purpose of programme: Real-time buoy data for weather forecasting

Main deployment areas: Tasman Sea

PUBLICATIONS
Nil

SPECIAL COMMENTS

A. Quality of buoy data: see recovered buoys below

B. Communications: All buoys are tracked by the Argos system.

C. Buoy Lifetimes: Buoys deployed in recent years have achieved very good lifetimes. MSNZ buoys are deployed in the Tasman Sea, where the prevailing westerly currents eventually carry buoys back towards New Zealand making recovery of buoys possible. MSNZ has achieved about an 80% recovery rate and has been able to recycle buoys. Over the last eight years 20 buoys have been recycled over 39 deployments, whilst maintaining an operational network of 7 buoys. Of the five MSNZ buoys operational as at 31 August 1997, two are on their first deployment, two buoys are on their second deployment , and one buoy is on its third deployment. The high number of recoveries shortens individual buoy lifetimes. In MSNZ's case it is more representative to look at cumulative lifetimes achieved by buoys over several deployments. Lifetime is counted until barometer failure, transmission failure or recovery. The Average Cumulative Lifetime of the five operational buoys to 31 August 1997 is 26.4 months. In the case of one buoy #6439, its cumulative service over three deployments is 80 months.

D. Other: RECOVERED BUOYS

In the twelve months to 1 September 1997 MSNZ successfully recovered three buoys (#22189, #7176 and #22187). All three buoys were still fully operational and providing good data until recovery. One buoy was recovered after beaching in Northland, NZ, after ten months at sea. Another buoy was found at sea after nineteen months by a research vessel and brought in, and the third buoy was recovered after twelve months by a fishing boat off Fraser Island, Queensland, Australia.

The sensors of all recovered buoys are calibrated and compared with pre-deployment calibrations to find out how they performed during their time at sea. Particular attention is paid to sensors flagged as defective during

operational data monitoring. Pressure Sensors : Post recovery calibrations on the three buoys showed their barometers (Paroscientific) were still within ± 0.2 hPa over the pressure range 900 to 1050 hPa. Temperature Sensors : The air and sea temperature sensors on the three buoys were checked and found to be satisfactory. Wind Sensors : Only one of the three recovered buoys was a WSD buoy. The wind speed and direction output on this buoy had locked up one month after deployment and was still locked up when recovered. Post recovery examination confirmed an eeprom failure on the wind board.

Buoy #22189 was refurbished with new batteries and drogue, and all sensors were calibrated before redeployment in March 1997. Five months after deployment the data from all sensors locked up, due to a suspected onboard processor problem. The other two buoys are suitable for refurbishment and will be redeployed as required in the Tasman Sea.

SOUTH AFRICAN WEATHER BUREAU: PRESENT ACTIVITIES AND FUTURE PLANS

South Africa started the year (inter-sessional period Oct 1996 - Sept 1997) with 8 drifters operational in the South Atlantic. During November 1996 a consignment of 25 drifters was received from the manufacturer METOCEAN. As it turned out, these drifters were mainly used to maintain the existing network of drifters in the South Atlantic.

1996			1997								
OCT	NOV	DEC	JAN	FEB	MARCH	APR	MAY	JUN	JUL	AUG	SEPT
-	-	-	5	3	-	5	8	3	1	-	-

DEPLOYMENT TEMPO OF THE CONSIGNMENT OF 25 DRIFTERS

The deployment of drifters during the months January, February and April took place during routine voyages to Antarctica, Gough- and Marion Islands. The remainder was deployed by ships of opportunity enroute from Cape Town to Buenos Aires or St Helena and Ascension.

All 25 drifters received during November 1996, of which the first 5 was deployed during January 1997, are still operating. Our good record of no fatalities during or immediately after deployment was therefore maintained. The same success rate applies to deployments undertook on behalf of other agencies. (However we must admit there is a great deal of luck in a record such as this.) The pressure sensors on a previous batch of METOCEAN drifters turned out somewhat disappointing and we are therefore monitoring the present batch closely. Until now however we are satisfied with the results.

Previously the SAWB did not invest in duty cycle drifters because we use buoy-data first and foremostly for operational forecasting. Like most other agencies however budget cuts forced us to look at all the possible ways of saving and it was decided to include 6 duty cycle drifters in the consignment of 25. The results however proved that our initial consideration i.e. that we will receive inadequate data from these drifters were correct. We therefore proved to ourselves that duty cycle drifters, in the latitude of our area of interest, is not a proposition and we will rather buy less drifters than to investing in more duty cycle drifters.

FUTURE PLANS

Regarding the forthcoming inter-sessional period we have already taken delivery of 11 out of a consignment of 23 drifters ordered from the manufacturer METOCEAN. This 11 drifters plus another 6 full-on drifters will be deployed during October in a pattern shown on plot 1. The remainder of the consignment i.e. 12 drifters is expected in November. Five of these will be deployed during the routine Antarctica voyage in the positions shown on plot 2. The remainder of the consignment is earmarked for periodic maintenance of the network.

The work that was done by METOCEAN to add wind speed and direction to the SVP-B drifter was followed closely during the inter-sessional period. After taking note of the tests done by METEO-France on these drifters we decided to buy 3 SVP-B-WSD drifters. We intend deploying these 3 drifters south west of the country in order to better evaluate the results and for easy retrieval should it become necessary.

The South Africa Weather Bureau drifter programme was seriously hampered during this inter-sessional period by a shortage of knowledgeable people. Transformation and right sizing was and is still accepted policy us. The result was that many of our experienced colleagues opted for the severance packages offered. These vacancies were filled with affirmative action appointments resulting in extensive training programmes. Unfortunately we are not out of the woods yet and presently the SAWB buoy programme still revolves around one or two persons.

Country: **THAILAND**

Year: **1997**

CURRENT PROGRAMMES

A. **Agency or programme:** **Thai Meteorological Department**

Number and type of buoys:
(a) deployed during year: 7 buoys and moored buoys which has co-operated with National Research Copuncil of Thailand (NRCT)
(b) operational at 31 August: no
(c) reporting on GTS at 31 August: no

Purpose of programme:
(a) operational: Monitoring of marine status
Know the weather current status
Service of shipping and fisheries
(b) met/ocean research: Apply to wave height forecasting
Know the topography in the Gulf of Thailand

Main deployment areas: Gulf of Thailand and Andaman Sea

PLANNED PROGRAMMES

A. **Agency or programme:** **Thai Meteorological Department**

Number and type of buoys planned for deployment in next 12 months: no programme

Purpose of programme:

Main deployment areas:

SPECIAL COMMENTS (if any): no comments

UK NATIONAL REPORT - 1997

CURRENT PROGRAMMES

Institute: Meteorological Office
Programme: EGOS
Number & type of buoys:
a) deployed during year: 29 drifters (22 TOGA style + 7 SVP-B), 13 moored
b) operational at 31 August: 24 drifters + 13 moored
c) reporting on GTS at 31 August: 24 drifters + 13 moored
Note: One of the moored buoys is a joint project between the UK Meteorological Office and Météo-France. Eight buoys were also deployed in support of FASTEX.
Purpose of programme: Operational meteorology, oceanography and climate research
Main deployment areas: North Atlantic and North Sea

Institute: Meteorological Office
Programme: IABP
Number & type of buoys:
a) deployed during year: 1 ice buoy (air-dropped)
b) operational at 31 August: 1
c) reporting on GTS at 31 August: 1
Purpose of programme: Operational meteorology, oceanography and climate research
Main deployment areas: Arctic Ocean

Institute: Meteorological Office
Programme: ISABP
Number & type of buoys:
a) deployed during year: 1 TOGA WSD drifter
b) operational at 31 August: 1
c) reporting on GTS at 31 August: 1
Purpose of programme: Operational meteorology and oceanography
Main deployment areas: South Atlantic Ocean

Institute: Dunstaffnage Marine Laboratory
Programme: LOIS Shelf Edge Study
Number & type of buoys:
a) deployed during year: 6 SVP-type drifters
b) operational at 31 August:
c) reporting on GTS at 31 August:
Purpose of programme: Physical oceanography
Main deployment areas: Shelf edge west of Scotland

Institute: Dunstaffnage Marine Laboratory and Defence Evaluation and Research Agency
Programme: Adaptive sampling drifters
Number & type of buoys:
a) deployed during year: 7 (2 ASDs + 5 conventional sonobuoy size drifters)
b) operational at 31 August:
c) reporting on GTS at 31 August:
Purpose of programme: Physical oceanography
Main deployment areas: Coastal seas

Institute: Centre for Environment, Fisheries and Aquaculture Science
Programme: Circulation studies
Number & type of buoys:
a) deployed during year: 25 drogued drifters

b) operational at 31 August: 2
c) reporting on GTS at 31 August:
Purpose of programme: Oceanographic research
Main deployment areas: UK continental shelf

Institute: University College of North Wales
Programme: Caribbean circulation study
Number & type of buoys:
a) deployed during year: 3 drifters
b) operational at 31 August:
c) reporting on GTS at 31 August:
Purpose of programme: Oceanographic research
Main deployment areas: Caribbean

Institute: University of Cambridge, Scott Polar Research Institute
Programme: Sea ice dynamics
Number & type of buoys:
a) deployed during year: 3 GPS drifters
b) operational at 31 August:
c) reporting on GTS at 31 August:
Purpose of programme: Sea ice and oceanographic research
Main deployment areas: Nordic seas

PLANNED PROGRAMMES

Institute: Meteorological Office
Programme: EGOS
Number & type of buoys planned for deployment in next 12 months: 20+ drifters (including 5+ SVP-B drifters), 13 moored
Purpose of programme: Operational met/ocean and climate research
Main deployment areas: North Atlantic, seas around the British Isles, including the North Sea
Note: One of the moored buoys is a joint project between the UK Meteorological Office and Météo-France.

Institute: Meteorological Office
Programme: IABP
Number & type of buoys planned for deployment in next 12 months: 1 ice drifter
Purpose of programme: Operational met/ocean and climate research
Main deployment areas: Arctic Ocean

Institute: Meteorological Office
Programme: IPAB
Number & type of buoys planned for deployment in next 12 months: 2 PTT-yr contribution to IPAB
Purpose of programme: Met/ocean research
Main deployment areas: Antarctic

Institute: Meteorological Office
Programme: ISABP
Number & type of buoys planned for deployment in next 12 months: 1 TOGA-style WSD drifter
Purpose of programme: Met/ocean research
Main deployment areas: South Atlantic

Institute: Dunstaffnage Marine Laboratory
Programme: Developments in buoy technology
Number & type of buoys planned for deployment in next 12 months: 2 enhanced SVP drifters, including DGPS, advanced processing and new communication technologies

Purpose of programme: Met/ocean research
Main deployment areas: North Atlantic

Institute: **Centre for Environment, Fisheries and Aquaculture Science**
Programme: Circulation studies
Number & type of buoys planned for deployment in next 12 months: 25 drogued drifters
Purpose of programme: Oceanographic research
Main deployment areas: UK continental shelf

Institute: University of Cambridge, Scott Polar Research Institute
Programme: Sea ice dynamics
Number & type of buoys planned for deployment in next 12 months: 3 GPS drifters
Purpose of programme: Oceanographic and sea ice research
Main deployment areas: Seas around Antarctica

Institute: University College of North Wales
Programme: Circulation studies
Number & type of buoys planned for deployment in next 12 months: 7 drogued drifters
Purpose of programme: Oceanographic research
Main deployment areas: Iberian peninsula

TECHNICAL DEVELOPMENTS

Installation of Gill temperature screens on TOGA-style drifters to improve temperature sensor exposure. Addition of intermediate observations (synoptic hour + 1.5) to asynoptic and synoptic values (Meteorological Office).

Trials of alternative satellite communications systems (Meteorological Office and Dunstaffnage Marine Laboratory).

Use of GPS and DGPS ice drifters for fine-scale studies of ice dynamics (Scott Polar Research Institute and Dunstaffnage Marine Laboratory).

Development of adaptive sampling drifters incorporating on board intelligence and GPS (Dunstaffnage Marine Laboratory and Defence Evaluation and Research Agency).

UNITED STATES OF AMERICA

In support of marine weather forecasts, ocean, coastal and climate studies, and other scientific studies, the United States had a total of 3655 Argos platforms for the 12 month period ending September 1997. Of this total, 2393 were drifting buoys, 1141 of which reported on the GTS. 56 of the drifting buoys were air deployed in the Atlantic and Pacific Oceans by the U.S. Navy for scientific and operational ocean and marine weather applications. The United States also maintains a network of 125 moored data buoys located in waters around the continental United States, Alaska, Hawaii, Guam and the tropical Pacific. All of the moored buoys are reported on GTS. Of the moored buoys, 65 transmitted through Argos and 60 transmitted through GOES. The United States agencies which sponsor the programs supporting these data buoys include the National Science Foundation, the National Oceanic and Atmospheric Administration, the Department of Transportation, the Department of Defense, the Department of the Interior, and numerous state institutions.

For 1998, as shown in the accompanying tables, about 1930 drifting buoys are planned for deployment. The distribution of these buoys by ocean basin is: 647 - Pacific; 736 - Atlantic; 157 - Indian; 47 - Arctic; 300 - Gulf of Mexico; 18 - Great Lakes; and 31 at coastal locations to be determined. In addition, over 215 moored buoys are slated for deployment as follows: 134 - Pacific; 30 - Atlantic; 4 - Great Lakes; and 47 in coastal waters.

A. NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

1. National Data Buoy Center

Purpose: To provide operational meteorological and oceanographic data.

Location and No.: (a) Drifters:
Emergency Response - 9
(b) Moorings:
Coastal U.S. - 43

2. Pacific Marine Environmental Laboratory

Purpose: To study biological and physical processes which cause variability of recruitment to commercially valuable fish and tsunami observations.

Location and No.: (a) Drifters:
Pacific - 17
(b) Moorings:
Arctic - 6

3. Great Lakes Environmental Research Laboratory

Purpose: Surface wave and current measurements in the Great Lakes.

Location and No.: (a) Drifters:
Great Lakes - 14
(b) Moorings:
Great Lakes - 4

4. Office of Global Programs
(Funding for NOAA Laboratories, and various Institutions.)

Purpose: To provide meteorological and oceanographic observations for the monitoring and prediction of climate change and circulation studies.

Location and No.: (a) Drifters:
Atlantic - 38
Pacific - 340
Indian - 40
(b) Moorings:
Pacific - 100

5. **National Environmental Satellite and Data Information Service (Includes the Navy/NOAA Joint Ice Center)**

Purpose: To provide meteorological and oceanographic observations for Arctic analysis and forecasting and ocean optical properties.

Location and No.: (a) Drifters:
Arctic - 17
(b) Moorings:
Coastal - 1

6. **National Weather Service**

Purpose: To provide meteorological observations for weather analysis and forecasting.

Location and No.: (a) Drifters:
Pacific - 47

7. **National Marine Fisheries Service**

Purpose: To study biological and physical processes for fish and marine mammal research.

Location and No.: (a) Drifters:
Pacific - 1

8. **National Ocean Service**

Purpose: Oil spill response

Location and No.: (a) Drifters:
Coastal - 3

9. **Coastal Ocean Program**

Purpose: To study marine ecological systems for GLOBEC.

Location and No.: (a) Drifters:
Pacific - 10

B. **U.S. COAST GUARD**

Purpose: To collect current and sea surface temperature data for ice berg movement and deterioration and search and rescue operations.

Location and No.: (a) Drifters:
Atlantic - 50

C. **NATIONAL SCIENCE FOUNDATION (Funding for several Universities and Institutions)**

Purpose: To provide meteorological and oceanographic observations for the WOCE Surface Velocity Program, circulation studies, and biological and chemical oceanography programs.

Location and No.: (a) Drifters/Floats:
Atlantic - 282
Pacific - 16

Indian - 51
(b) Moorings:
Atlantic - 16
Pacific - 6

D. DEPARTMENT OF DEFENSE

1. Naval Oceanographic Office

Purpose: Collection of real-time data for operational analysis and forecasting.
Location and No.: (a) Drifters:
Atlantic - 81
Pacific - 114
Indian - 66

2. Office of Naval Research

Purpose: Physical oceanography studies.
Location and No.: (a) Drifters:
Atlantic - 115
Pacific - 50
(b) Moorings:
Atlantic - 7
Pacific - 8

3. Naval Research Laboratory

Purpose: Real-time meteorological/oceanographic data collection.
Location and No.: (a) Drifters:
Atlantic/Mediterranean - 40
Pacific - 30
Arctic - 30

4. Navy Postgraduate School

Purpose: Study the surface currents of the Mediterranean Sea
Location and No.: (a) Drifters:
Mediterranean - 20

E. DEPARTMENT OF AGRICULTURE, FOREST SERVICE

Purpose: To track the movement of log rafts in channels and ocean areas.
Location and No.: (a) Drifters:
Coastal - 4

F. DEPARTMENT OF INTERIOR, MINERALS MANAGEMENT SERVICE

Purpose: To study circulation patterns in the continental shelf areas.
Location and No.: (a) Drifters:
Pacific - 13
Gulf of Mexico - 300
(b) Moorings:
Pacific - 14

G. NON-PROFIT INSTITUTIONS/ORGANIZATIONS

1. Rosensteil School of Marine and Atmospheric Studies

Purpose: Determine the recruitment pathways of fish and lobster larvae in the

offshore circulation and wind driven routes in the Straits of Florida.
Location and No.: (a) Drifters:
Straits of Florida - 12

2. **Scripps Institution of Oceanography**
Purpose: Shallow water oceanographic studies.
Location and No.: (a) Moorings:
Coastal - 3

3. **Woods Hole Oceanographic Institution**
Purpose: Physical oceanography along New England Coast
Location and No.: (a) Drifters:
Atlantic - 10

4. **University of California, Santa Barbara**
Purpose: Physical oceanography near Bermuda
Location and No.: (a) Moorings:
Atlantic - 5

5. **Prince William Sound Science Center**
Purpose: Physical oceanography and ecosystem assessment of Prince William Sound
Location and No.: (a) Drifters:
Coastal - 9

6. **University of Delaware**
Purpose: Recruitment in buoyancy-driven coastal systems
Location and No.: (a) Drifters:
Coastal - 4

7. **University of Maine**
Purpose: Physical oceanography in the South China Sea
Location and No.: (a) Drifters:
Pacific - 5

8. **Lake Pontchartrain Basin Foundation**
Purpose: Distribution of certain indicator organisms and enteric pathogens in Lake Pontchartrain
Location and No.: (a) Drifters:
Coastal - 2

ANNEX II

REPORTS FROM THE DBCP ACTION GROUPS

At its tenth session (La Jolla, November 1994), the Panel adopted the following guidelines regarding its action groups:

1. An action group of the DBCP is an independent self-funded body that maintains, as a significant element of its responsibilities, an observational buoy programme providing meteorological and oceanographic data for real-time and/or research purposes in support of the World Weather Watch, the World Climate Research Programme, the Global Climate Observing System, the Global Ocean Observing System and other relevant WMO and IOC programmes.

2. Action groups of the DBCP shall support the aims and objectives of the DBCP as set out in the terms of reference of the DBCP in particular with respect to:

(a) provision of good quality and timely data to users;

(b) insertion of real-time (or near real-time) data into the GTS;

(c) exchange of information on data buoy activities and development and transfer of appropriate technology.

3. An action group may be regional or national in nature provided that its programme benefits a regional or international community.

4. To be adopted as an action group of the DBCP the terms of reference or operating principles of the body or programme shall be submitted to a session of the DBCP for formal approval. Once approved these shall be lodged with the Secretariats of WMO and IOC.

5. On its part the DBCP shall support the activities of its adopted action groups and especially through the assistance of the officers of the DBCP, its technical co-ordinator and the Secretariats of WMO and IOC as far as resources allow.

6. Action groups of the DBCP shall submit annual reports of their activities to the chairman of the DBCP.

The Panel has at present six action groups, the reports of which follow:

EGOS, THE EUROPEAN GROUP ON OCEAN STATIONS
Preliminary report for 1997

Prepared by: Lars G. Golmen
EGOS Technical secretary
(lars.golmen@niva.no)

INTRODUCTION

The European Group on Ocean Stations (EGOS), an Action Group of the DBCP, was formally established on December 1, 1988. The main objective of the group is to maintain a network of operational stations (moored and drifting buoys) for observation of meteorological and oceanographic data from the North Atlantic on near real-time basis.

The project is managed by the EGOS Management Committee, composed of one representative from each of the nine participating states. The costs of the operation of the group are borne by the participants. Financial contributions to a common fund are made on a voluntary basis.

MEMBERSHIP OF EGOS

In 1997 the members of EGOS were:

• Denmark	Danish Meteorological Institute
• France	Metéo-France
• Germany	German Weather Service
• Iceland	The Icelandic Meteorological Office
• Ireland	Irish Meteorological Service
• The Netherlands	Royal Netherlands Meteorological Institute
• Norway	The Norwegian Meteorological Institute
• Sweden	Swedish Meteorological and Hydrological Institute
• United Kingdom	United Kingdom Meteorological Office

France became a full member in 1997. This was agreed upon at the meeting of the Management Committee in December, 1996. At the winter meetings in Paris, December 2-3, 1997, Spain was represented by observers from 2 institutions: Servicio de Observacion, Madrid, and Puerto del Estado, Madrid. Spain may become a member of EGOS in 1998.

FINANCIAL MATTERS

The EGOS Common Fund is based on voluntary contributions, mainly to cover the service of the Technical Secretariat. WMO handles the EGOS Common Fund on behalf of the EGOS Management Committee. On behalf of the EGOS Management Committee WMO established a contract with the Christian Michelsen Research A/S (CMR) in Bergen, for the continued service of the EGOS Technical Secretariat for 1996. The contract sum was GBP 23.406. During its meeting in December 1997 the Management Committee agreed that the calls for voluntary contributions to the Common Fund for 1998 should remain the same as for 1997.

On June 25, 1997, the Chairman of the Management Committee made an invitation to Christian Michelsen Research AS to continue its service of the Technical Secretariat in 1998 on similar terms and conditions as before. The German Weather Service indirectly contributed to the common fund through a contract with CMR, valued GBP 12.310 with the purpose to support the work at the Technical Secretariat. In 1997 a process was initiated to re-formulate the text of the annual Contract between WMO and CMR for the Technical Secretariat. The present year-to-year arrangement did not provide the necessary long-term security for continuous operation neither for EGOS nor for CMR, and a new text for the Contract was accepted at the December meeting of the Management Committee.

THE TECHNICAL SECRETARIAT

The Technical Secretariat in 1997 continued its functions according to the Terms of Reference and the instructions given by the Management Committee and on the basis of the contract between WMO and CMR. The Technical Secretary, Mr Lars Golmen, is an oceanographer working at the Regional office in Bergen of the Norwegian Institute for Water Research (NIVA). He has continued to run the task as Technical Secretary of EGOS on an anual basis as a regular project in 1997, in parallel with other projects for NIVA. The contract with CMR for 1997 was valued 180,000 NOK (GBP ca 15,000), corresponding to ca 1/6 of the full year working time.

Activities at the Secretariat had increased significantly in 1997, as the number of buoys deployed had almost doubled, and also that the EGOS membership had increased. This put an extra burden particularly on the Technical Secretary that was even more accentuated in the summer of 1997 due to personnel vacancies at CMR. Discussions have continued on the possibilities of sharing work task between CMR and EGOS member institutes such as CMM. Task sharing has already taken place on an informal basis.

In 1997 the Management Committee has specifically instructed the Technical Secretary to:

1. Complete a Draft Annual Report for 1997 for review at the December meeting and a final version by January 31, 1998.
2. To prepare a report on EGOS for the meetings of the DBCP and CGC in 2nd half of 1997.
3. To produce an updated draft version of the EGOS Brochure to be discussed at the December meeting.
4. To prepare an overview of his work for EGOS in terms of tasks and man-hours spent, to be presented at the December meetings.

The status of the operating buoys has been closely monitored in close co-operation with Mr. Flosi H. Sigurdsson in Iceland and Mr. Pierre Blouch at CMM in Brest.
Other routine actions have included:

To co-ordinate information to CLS Argos and the LUT operators whenever
- a new buoy is deployed, for insertion on GTS,
- an operating buoy has failed or run ashore, for removal from GTS,
- the status of a buoy or one of its sensors has changed.

To co-ordinate information to respective owners of buoys whenever
- a new buoy is deployed
- an operational buoy has failed or its operative status has changed
- a buoy has run ashore
- a buoy has been reported recovered by e.g. local fishermen.

To update the database at CMR on the history and status of each EGOS buoy.

To maintain the list of WMO numbers and PTT numbers relevant to EGOS.

The following EGOS reports or documents were completed during 1997:

- The EGOS Annual report for 1996. A draft version was revised by the Management Committee during the winter meeting in December, 1996, and subsequently amended and issued as Techn. Doc. No. 148.

- The reports on the EGOS meetings in Geneva in December 1996, and in June, 1997. The draft versions had been reviewed and reissued as Techn. Docs. No. 150, 151, 161 and 162 respectively.

- Draft reports from the winter meetings in Paris in December 1997, issued as Technical Documents No. (167, 168) for review and approval at the 1998 summer meetings.

- Reports on EGOS for the DBCP and CGC in 1997.

- Monthly reports on the status of the EGOS programme during 1997. These reports describe the operational status of the programme, the performance of the buoys and the data quality based on statistics provided by the UK Meteorological Office and on drift track maps provided by the Danish Met. Office.

- A manuscript on EGOS for the 1st EuroGOOS conference in the Hague in October 1996 was reviewed and accepted in May, 1997, for printing in the Proceedings of the conference.

- A draft version of a report on life histories for all EGOS buoys deployed in the year 1995.

In June, 1997, CMR signalled that they wanted to take over the work of the Technical Secretary in 1998. This initiated several activities prior to the December meetings in Paris. The Chairman and Vice-Chairman of EGOS visited Bergen in early November to discuss the matter and discussions continued at the December meeting of the Management Committee. It was then agreed that Mr. Lothe from CMR will take over from 1 January, 1998.

MEETINGS IN 1997

The Management Committee met twice during the reporting period:

- The summer meeting was held on June 4-5, 1997, at SMHI, Norrköping, Sweden. A report on the conclusions and recommendations of the meeting is in EGOS Techn. Doc. No. 161.

- The winter meeting was held at the IOC headquarters in Paris, December 2-3, 1997. At this meeting the Management committee elected Mr. Wynn Jones from the UKMO as Chairman, and elected Mr Wil van Dijk from KNMI as Vice-Chairman. Iceland offered to host the 1998 summer meetings of EGOS, on 18 and 19 June in Reykjavik. A report on the conclusions and recommendations of the December meeting will be prepared.

The Technical Subgroup met twice during the reporting period, in combination with the Management Committee meetings (see above):

- In Norrköping, Sweden June 4-5, 1997. The Technical Subgroup Committee then unanimously re-elected Mr. Volker Wagner as Chairman.. The recommendations from the meeting are contained in EGOS Technical Doc. No. 162.

- At the IOC headquarters in Paris on December 2-3, 1997. At this meeting the Technical Subgroup Committee unanimously elected Mr. Pierre Blouch from CMM in Brest as Chairman, to hold office until the end of the next session of the Technical Subgroup. The recommendations from the meeting will be issued as EGOS Technical Doc. No. 168 (Draft).

LIAISON WITH INTERNATIONAL ORGANISATIONS

In 1997 EGOS maintained a close co-operation with international organisations working in the same field.

WMO and IOC

WMO manages the EGOS Common Fund and financial matters on behalf of the EGOS Management Committee.

WMO and IOC were represented at the EGOS meetings in June and December 1997 by Mr. Yves Tréglos, Assistant Secretary of the IOC.

DBCP

Mr. Yves Tréglos, Assistant Secretary of the IOC, represented DBCP on the summer meetings of EGOS in Sweden. The Technical Co-ordinator of the DBCP, Mr. Etienne Charpentier, attended the December meetings in Paris.

The day-to-day control for the EGOS drifting buoys at the Technical Secretariat was maintained and supported by the Technical Co-ordinator of the DBCP. The mail distribution list for data quality control

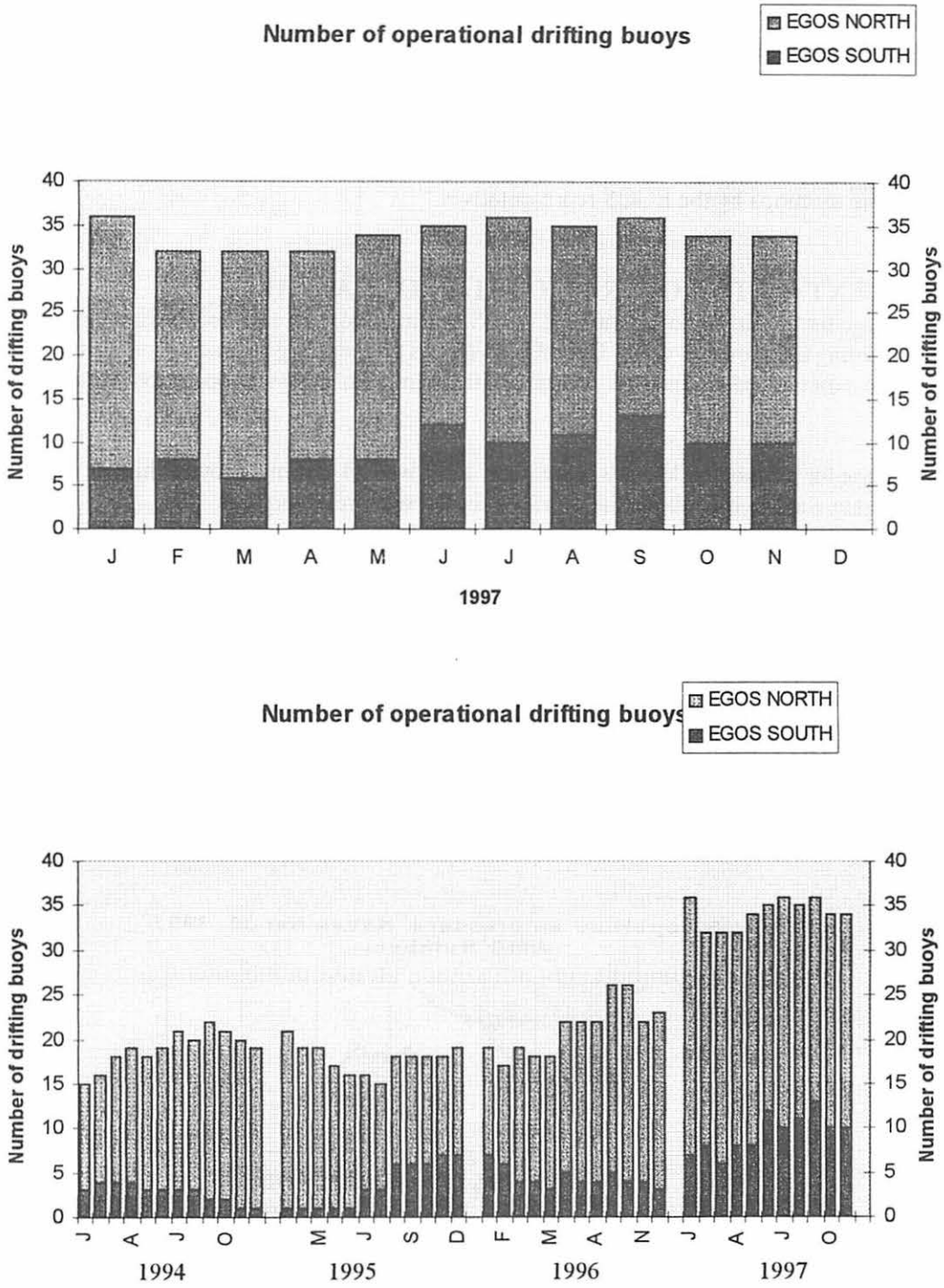


Fig. 1. Number of operational drifting buoys in EGOS at the end of each month, for the years 1994-1997.

'BUOY-QC@VEDUR.IS' was more than ever actively used for communication and information exchange. The DBCP Internet server address for GTS buoy dataflow control: **http://dbcp.nos.noaa.gov/dataflow.html**, had frequently been used by the Technical Secretary to inspect if a certain buoy was transmitting or not on GTS, and also active sensors. The service provides overview (not true data or positions) for the previous 7 days.

Mr. Wynn Jones represented EGOS at the DBCP-XII meeting in La Reunion in October 1997. Mr. Flosi H. Sigurdsson represented EGOS at the CGC meeting in Oslo, in August, 1997. Brief reports on EGOS were presented at these meetings by the EGOS representatives.

DEVELOPMENT OF THE OPERATIONAL PROGRAMME

The annual average for the number of operational EGOS drifting buoys in each month has shown a slow but steady increase during the previous years. Operational means transmitting at least air pressure. The drifting buoy programme experienced an unusual increase in the number of buoys in operation in early 1997, as is shown in Fig. 1.

The annual average for the months January-November, 1997 was 34 drifting buoys, while in 1996 it was 21 buoys which again was slightly above the averages for the two previous years.

As at January 1st, 1997, a total of 23 drifting buoys were operating in the EGOS, 20 in EGOS North and 3 in EGOS South area.

At the end of January the number of drifting buoys in operation had increased to 36, and at June 1st, the number of buoys was 34, with 8 of these in EGOS South. The high increase in the number of buoys in January was mainly due to the FASTEX experiment. Also the fact that France then began contributing buoys to the Programme is reflected in the increased number.

As at November 30, 1997, a total of 34 drifting buoys were operating; 24 in EGOS North and 10 in EGOS South. See map in Fig. 2.

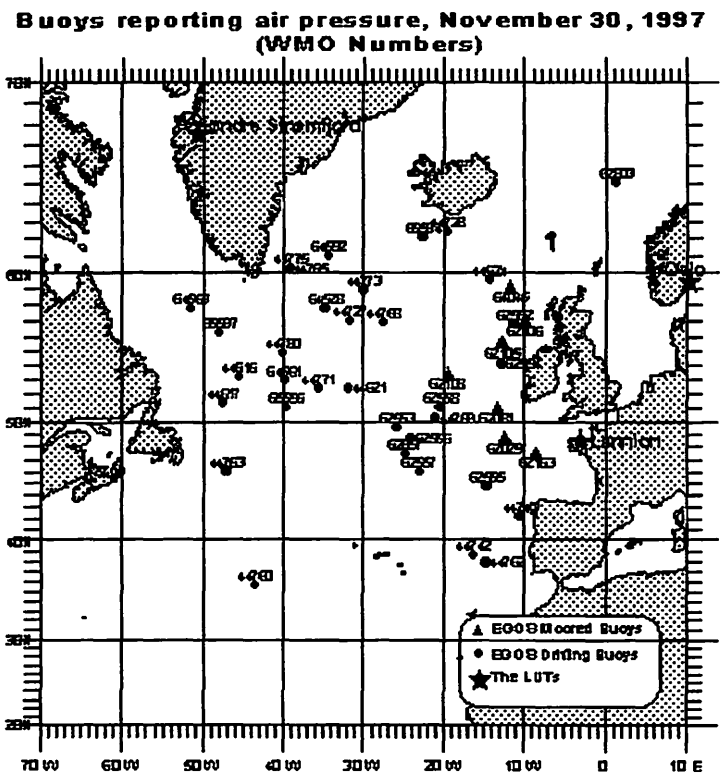


Fig. 2. Distribution of EGOS buoys at November 30, 1997.

A total number of 44 drifting buoys were deployed in EGOS up until November, 1997. The corresponding number for the whole 1996 was 22. The deployments were either Conmar C/S buoys (6), Metocean FGGE type buoys 19 and SVP-B type buoys 19. Three of the SVP-B buoys had an additional salinity sensor. Ten of the Metocean buoys had wind sensors. Two of the Conmar buoys had a GPS receiver.

32 EGOS-buoys had ceased to operate in 1997, up until November 30. This includes buoys that completely failed to transmit due to technical failure or battery exhaustion, buoys with air pressure sensor failure and buoys that ran ashore. As many as 14 buoys had run ashore or had been picked up by ships.

3 of the buoys that stopped transmitting in 1997 had been deployed in 1995, and 14 deployed in 1996. The remaining 16 had been deployed in 1997.

The average lifetime for the drifting buoys that ceased to operate in 1997 until November 30 was 248 days, in comparison to 336 days for 1996 which was the highest average since EGOS was established.

The decline in the average lifetime in 1997 may be a combination of many buoys running aground, and the fact that many of the SVP-B drifters had very short lifetimes. In fact, the average lifetime for the ten SVP-Bs that failed in 1997 was 132 days, in comparison to 300 days for the other types of buoys. I.e. the SVP-Bs lasted significantly shorter than the other buoys. The failure of only 1 SVP-B can be attributed to running aground, in comparison to 13 for the other types. Most of the SVP-Bs deployed later in the year seemed to survive for 7-8 months. The reasons for the many failures of SVP-B drifters are subject to further investigations.

CONTRIBUTION TO THE EGOS DRIFTING BUOYS

The contributions of drifting buoys to the EGOS programme in 1997, until 30 November, were as follows, including buoys that were ready for deployment:

Country	No. of oper. buoys 01.01. 1997	New or re-furbished buoys 1997	No. deployed in 1997 (Jan-Nov)
Germany	2	3	3
Ireland	1	2	1
The Netherlands	2	2	1
Norway	1	1	1
UK	17	18	16
Sum:	23	26	22

DATA RECEPTION, DISSEMINATION AND QUALITY CONTROL

The data from the buoys in the EGOS North are received by CLS-Argos in Toulouse and by the LUTs in Oslo and Søndre Strømfjord which are operated by the Norwegian and Danish Met. services, respectively. Data are further disseminated from these centra on the GTS on a near real-time basis.

The EGOS south region (south of 50°N) can only be adequately served by CLS-Argos in Toulouse, and the data are therefore disseminated on the GTS mainly by the Meteorological Service in Toulouse (LFPW).

Studies have been carried out at the Icelandic Meteorological Office on the mean number of useful reports from the EGOS North drifting buoys received in Reykjavik per day via LFPW (Toulouse), ENMI (Oslo) and BGSF (Søndre Strømfjord). These investigations include studies on the effect of data reception from three LUTs, on the data recovery rate and on the data reception via the GTS as a function of the hour of the day, with "cut-off" times of 90 and 210 minutes respectively.

During selected months in 1997 data reception based on all three LUTs together varied between 14-22 messages per day for each buoy in EGOS North. In EGOS South the data reception was less satisfactory. It is further concluded that the timeliness of the data and the average reception rate are similar to that for the previous years.

The data quality control for the EGOS buoys is based on the quasi-real-time control carried out at the Meteorological Office in Iceland and on the weekly and monthly statistics produced by the UK Meteorological Office, and on the quarterly reports on drifting buoys in the North Atlantic made by the UK Met Office.

EGOS MOORED BUOYS

On January 1, 1997, United Kingdom operated a network of 6 moored buoys in the Atlantic west of the British Isles (K1-K5 and RARH). The UK also has established a moored buoy station at about 47.3°, 9°W (the 'Brittany' buoy), in co-operation with the Météo-France. All these seven buoys are part of EGOS.

The International Arctic Buoy Programme (IABP)

This report highlights activities - and upcoming activities - of the International Arctic Buoy Programme that have occurred since the report filed August 1996 for the 12th session of the Data Buoy Cooperation Panel. The IABP continues to maintain a homepage that provides IABP participant listing, monthly maps of the IABP buoys in place and their status, buoy diagrams, IABP images and plots to browse and borrow, IABP data animations, pointers to ice charts and more - ***http://iabp.apl.washington.edu***

INTERNATIONAL ARCTIC BUOY PROGRAMME (IABP) SEVENTH ANNUAL MEETING AND BUOY DESIGN WORKSHOP, ST PETERSBURG, RUSSIAN FEDERATION, JUNE 1997

Members of the International Arctic Buoy Programme met 2 June for a one day buoy designers workshop and 3-6 June, 1997, in St Petersburg, Russian Federation for the seventh annual business meeting of the program. The meetings were hosted by the Arctic and Antarctic Research Institute.

BUOY DESIGN WORKSHOP HIGHLIGHTS

New model AARI buoy - The Arctic and Antarctic Research Institute (AARI) has developed a buoy for air-deployment. The new model AARI air-deployable Argos-system ice buoy is designed to provide air pressure and air temperature data. The buoy is battery powered to operate for a year.

At present, Canada uses CALIB buoys (air pressure only, 1 year life) for air-deployment while other participants use ICEX buoys (air pressure and air temperature, 3 year life) for air-deployment.

IABP 7 MEETING HIGHLIGHTS

'Drifting' becomes 'data' - In recognition that IABP data sets have grown from beyond only drifting buoys on ice to include fixed buoys on islands and coastal stations, the IABP operating principles were amended to *'data buoys'* in place of *'drifting buoys'*.

Data flow control facilities / tools available on the web - The DBCP is implementing data flow control facilities accessible via the web so that users with no GTS access can check whether their platforms are reporting on GTS. The DBCP is also implementing tools on the web that should be useful for deployment strategies.

GCOS (Global Climate Observing System) - The IABP looks to contact between the coordinator of the IABP and the GOOS (Global Ocean Observing System) Project Office, and the European GOOS Office.

UPCOMING EVENTS

The Arctic Buoy Program: Scientific Achievements from the first 20 years: A mini-conference sponsored by the IABP and the Data Buoy Co-operation Panel will be held 3-4 August 1998, Seattle, Washington.

Operational Sea Ice Charts of the Arctic: A workshop sponsored by the Arctic Climate System Study of the World Climate Research Programme will be held 5-7 August 1998, Seattle, Washington

See ***http:iabp.apl.washington.edu/*** or ***http:npolar.no:80/acsys*** for details.

COMMITMENT

The IABP is committed to working closely with the Global Groups who are working on the impacts of oceans on climate change to ensure that the Arctic Ocean data is part of the broader global ocean analysis. Atmospheric pressure and 2 meter air temperature remain the principal geophysical variables monitored by IABP buoys. This basic data is made available in real time on the global transmission system. Technology exists for the long term measurement of several additional variables, for example, ice temperature and internal stress. Participants Woods Hole Oceanography Institution, for example, in partnership with the Japan Marine Science and Technology Center has a buoy in place (IOEB Ice-Ocean Environmental Buoy) which provides data both above ice and below ice. Above ice, it provides air temperature, atmospheric pressure and wind speed and direction. Below ice, it has a compliment of oceanographic instruments ranging from sonar to CTD measuring devices. The web site ***http:ioeb.whoi.edu*** outlines the history of the IOEB buoy and the 1996 and 1997 refurbishments of the buoy. Per Figure 1, the IOEB buoy - Argos Ids 10667 and 10668 - resided northwest of Banks Island 21 August 1997. Another set of buoys with oceanographic strings are the Metocean buoys deployed August 1996 by scientists of the Alfred Wegener Institute for Polar and Marine Research. Per Figure 1, these buoys lay on the European site of the pole 21 August 1997.

PARTICPANTS

Twenty-four organizations spanning 10 countries and 1 international organization are participants in the International Arctic Buoy Programme. The participants remain a mix of operational agencies, meteorological and oceanographic institutes, research agencies and non-government organizations that are interested in the Arctic Ocean and who contribute actively to the program. IABP participants continue to seek partners within their respective countries and internationally who are willing to supply additional buoys or sensors for existing buoys so that the IABP can grow.

CURRENT BUOY ARRAY / DEPLOYMENTS / COOPERATION

Per Figure 1, the buoy array across the Arctic Basin as of 21 August 1997 was comprised of 28 buoys including a total of 6 buoys deployed in 1997 - airdrop of a CALIB buoy by the Canadian Forces May 1997, surface deployment of a U.S. Coastal Climate Zeno buoy by Environment Canada via Twin Otter landing on ice and air deployment of four ICEX-AIR buoys by the U.S. Naval Meteorology and Oceanography Command. The buoys were funded by U.S. National Ice Service and the Japan Marine Science and Technology Center.

MORE (1997) DEPLOYMENTS TO COME

Ongoing Process - Deployments to replenish the buoy array across the Arctic Basin are ongoing. Buoys fail due to battery power coming to an end - buoys are powered to last from a year or so (CALIB air-deployed buoys) to up to 3 years (ICEX air-deployed buoys and the Coastal Climate ZENO surface-deployed buoys), other buoys exit the Arctic Basin for the North Atlantic, and some buoys fall through the ice while others get crushed as ice rafts and ridges. The number of operational buoys is usually at a peak late summer and at a minimum during the spring.

ICEX Buoys to the Laptev - ICEX buoys will be air-deployed on the ice of Laptev Sea late August or September by the Norwegien Air Force.

Buoys to the Beaufort - As part of the SHEBA (Surface Heat Budget of the Arctic Ocean) - ***http://sheba.apl.washington.edu*** - experiment field data gathering stage, several buoys, both sensored and position only buoys, will be deployed September 1997 in the northern Beaufort Sea.

IMPROVEMENTS IN POSITION ACCURACY AND DATA AVAILABILITY

Position accuracy available from Service Argos has improved in the past few years. Since mid June 1994, position accuracy within 100 metres has been available making accurate ice motion calculations possible. In addition, the availability of GPS integrated into Argos transmitters has allowed the very accurate position readings required for studying convergence and divergence within ice fields and the rotation of large floes. Most of the buoys presently in place rely on Service Argos calculated positions for ice motion and the cruder local user terminal calculated positions for real-time meteorological use. Since mid-June 1994, Service Argos has offered 3-satellite service thereby providing an increase of data capacity and the number of daily locations.

RECENT IABP PUBLICATIONS

International Arctic Buoy Program Data Report 1 January 1996 - 31 December 1996; Ignatius G. Rigor and Andreas Heiberg; Applied Physics Laboratory, University of Washington

International Arctic Buoy Program Data Report 1 January 1995 - 31 December 1995; Ignatius G. Rigor and Andreas Heiberg; Applied Physics Laboratory, University of Washington

Monthly Ice Motion and Atmospheric Pressure in the Arctic Basin, 1979 - 1993; Ignatius G. Rigor and Roger L. Colony; Applied Physics Laboratory, University of Washington.

PAPERS MAKING USE OF IABP DATA

Recent and soon to be released papers that make use of IABP buoy data include:

Recent Decrease in Sea Level Pressure in the Central Arctic; John E. Walsh, William L. Chapman, and Timothy L. Shy; American Meteorological Society, Journal of Climate, Vol. 9, February 1996, 480-486.

Sea Ice Production in the Laptev Sea; Rigor, I. and R. Colony; in press: Science of the Total Environment.

Potential Shortcuts for Transport of Contaminants from the Kara Sea; Pfirman, S.L, J.W. Kogeler, and I. Rigor; in press: Science of the Total Environment.

Reconstructing the Origin and Trajectory of Drifting Arctic Sea Ice; Pfirman, S.L., R. Colony, D. Numberg, H. Eicken, and I. Rigor; in press: Journal of Geophysical Research.

Properties of the Arctic 2-Meter Air Temperature for 1979; Martin, S. and Munoz, E.; in press: Journal of Climate.

Statistics of Surface Air Temperature Observations in the Arctic Basin; Rigor, I. and E. A. Muroz; in preparation.

Transport of 137 Cs and 239,240 Pu by Ice Rafted Debris in the Arctic Ocean; Landa, E., E. Reimnitz, D. Beals, J. Pochkowski, and I. Rigor; in preparation.

Recent observations of a spring-summer surface warming over the Arctic Ocean; Martin, S., Munoz, E., and R. Drucker; GRL (submitted).

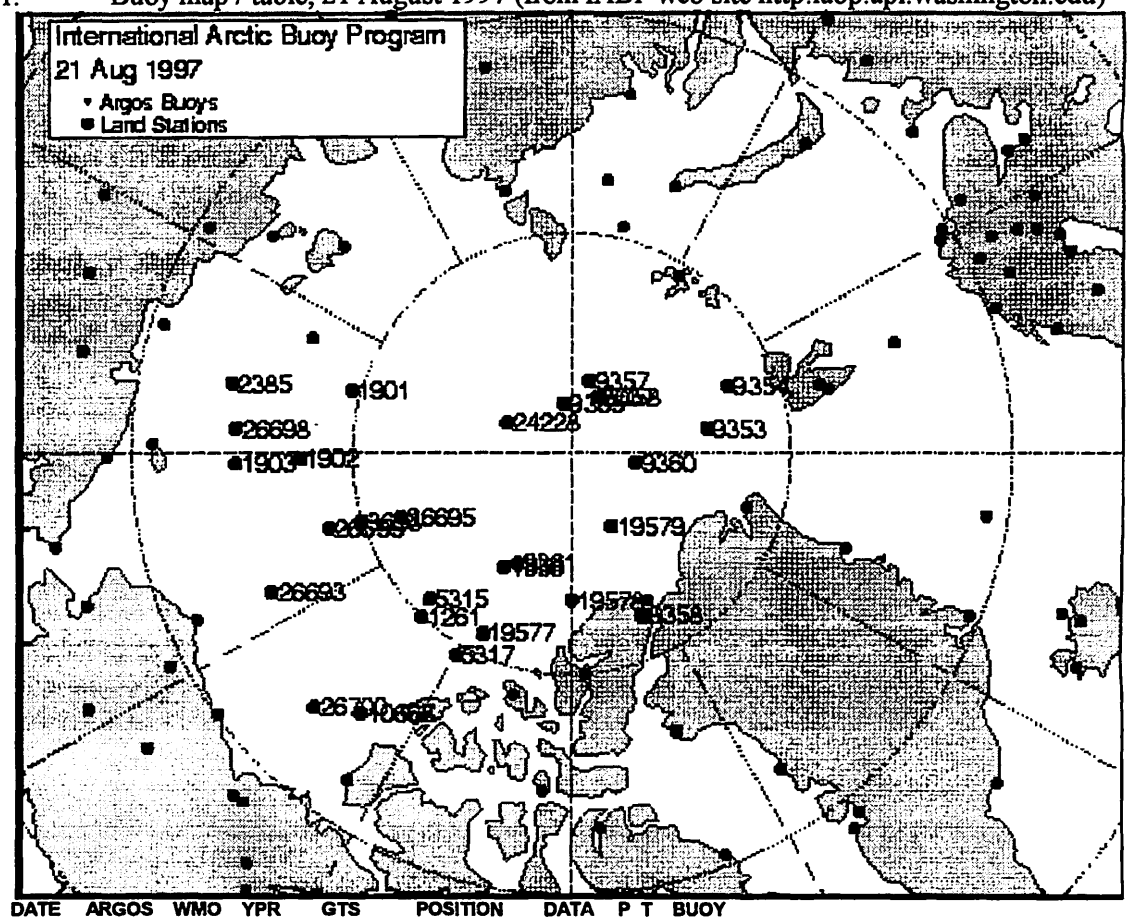
Brian O'Donnell
Chairman, IABP
Environment Canada
200 - 1200 West 73rd Avenue
Vancouver, B.C.

V6P 6H9
Canada

Roger Colony
Coordinator, IABP
ACSYS International Project Office
Post Office 5072 Majorstua
N-0301 Oslo

Norway

Figure 1. Buoy map / table, 21 August 1997 (from IABP web site http:iabp.apl.washington.edu)



DATE DEPLOYED	ARGOS ID	WMO ID	YPR NUMBER	GTS HEADER	POSITION LAT	LONG	DATA BYTES	P	T	BUOY DESCRIPTION
Aug 96	1261	48102	484	SSVX01-LFPW	79.962	-132.758	16	Y	Y	ICEX-AIR
Aug 96	1556	48111	314	SSVX01-LFPW	84.063	-120.909	16	Y	Y	ICEX-AIR
Aug 97	1901	25521	557	SSVX12-KARS	79.584	163.940	21	Y	Y	ICEX-AIR
Aug 97	1902	25522	557	SSVX12-KARS	77.632	-178.850	21	Y	Y	ICEX-AIR
Aug 97	1903	25523	557	SSVX12-KARS	74.722	-178.320	21	Y	Y	ICEX-AIR
Aug 97	2385	25549	1053	SSVX12-KARS	74.228	168.326	17	Y		ICEX-AIR
Aug 95	3693	48092	314	SSVX01-LFPW	79.970	-162.319	16	Y	Y	ICEX-AIR
May 97	5315	48525	627	SSVX02-CWEG	80.794	-134.563	4	Y	Y	CALIB Buoy
Oct 96	5317	48523	627	SSVX02-CWEG	79.493	-119.758	4	Y		CALIB Buoy
Aug 96	8057	63664	919	SSVX01-LFPW	87.181	64.755	32	Y	Y	Metocean
Aug 96	8058	63665	919	SSVX01-LFPW	87.074	62.205	32	Y	Y	Metocean
Aug 96	9353	63666	919	SSVX07-LFPW	83.701	10.524	12		Y	AARI
Aug 96	9354	25569	919	SSVX07-LFPW	82.229	23.232	12		Y	AARI
Aug 96	9357	63663	919	SSVX07-LFPW	86.601	75.227	22	Y	Y	Metocean
Aug 96	9358	63661	919	SSVX07-LFPW	81.997	-65.854	22	Y	Y	Metocean
Aug 95	9360	63662	919	SSVX07-LFPW	86.983	-7.581	16	Y	Y	ICEX-AIR
Aug 95	9361	25571	919	SSVX07-LFPW	84.485	-115.966	20	Y	Y	ICEX-AIR
Aug 96	9365	25570	919	SSVX07-LFPW	87.696	97.807	25	Y	Y	ICEX
May 92	10667	48531	1016	SSVX02-CWEG	74.846	-129.122	32	Y	Y	IOEB
May 92	10668	48531	1016	SSVX02-CWEG	74.846	-129.122	32			IOEB
Aug 96	19577	47601	1053	SSVX12-KARS	80.938	-116.139	16	Y	Y	ICEX-AIR
Aug 96	19578	47602	1053	SSVX12-KARS	83.391	-89.544	16	Y	Y	ICEX-AIR
Aug 96	19579	48518	1053	SSVX12-KARS	86.232	-60.086	16	Y	Y	ICEX-AIR
Jul 96	24228	9053			86.781	154.398	32	Y	Y	Seimac
Mar 96	26693	48578	1053	SSVX02-CWEG	74.983	-155.371	32	Y	Y	Zeno Ice Buoy
Sep 96	26695	25548	1053	SSVX02-CWEG	81.747	-159.767	32	Y	Y	ICEX-AIR
Jul 96	26698	48572	1053	SSVX02-CWEG	74.675	175.726	32		Y	Zeno Ice Buoy
Jul 96	26699	48573	1053	SSVX02-CWEG	78.459	-163.007	32			Zeno Ice Buoy
Apr 97	26700	48579	1053	SSVX02-CWEG	73.611	-135.503	32	Y	Y	Zeno Ice Buoy

Buoys deployed to 21 August 1997 are in bold.

International Programme for Antarctic Buoys

1. Introduction

The WCRP/International Programme for Antarctic Buoys (IPAB) was formally established, following a one year pilot phase, at a meeting in Helsinki, Finland in June 1994. IPAB builds upon co-operation among agencies and institutions with Antarctic and Southern Ocean interests to develop and maintain an optimum observational network for near-surface meteorological and oceanographic data within the Antarctic sea-ice zone, using drifter buoys and other appropriate data collection systems. The operational area of the Programme is south of 55 degrees South latitude, and includes that region of the Southern Ocean and Antarctic marginal seas within the maximum seasonal sea-ice extent.

IPAB has a strong research component, and is endorsed as a self-sustaining project of the WMO/ICSU/IOC World Climate Research Programme. It reports to the JSC for WCRP through the Arctic Climate System Study (ACSYS). IPAB is also an Action Group of the WMO/IOC Data Buoy Co-operation Panel.

The Programme is proposed as a long-term on-going one. After a five year initial phase, begun in 1994, subsequent development will be as agreed by the Participants.

2. Objective of the Programme

The objective of the WCRP International Programme for Antarctic Buoys is to establish and maintain a network of drifting buoys in the Antarctic sea-ice zone in order to:

(i) support research in the region related to global climate processes and to global change, and, in particular, to meet research data requirements specified by the WCRP and relevant SCAR programmes;

(ii) provide real-time operational meteorological data meeting the quality requirements of the WMO/World Weather Watch (WWW) programme;

(iii) establish a basis for on-going monitoring of atmospheric and oceanic climate in the Antarctic sea-ice zone, in particular contributing to the aims of GCOS;

3. Participants

At August 1997, 16 organisations, representing 11 countries, had subscribed to IPAB by submitting letters of intent to participate in the programme.

Participant's contributions to the Programme include not only data buoy activities, but can also take the form of data acquisition and processing charges, monetary contribution, logistic support for deployment, data communication services, data archiving, and scientific or technical advice.

4. Management

The First Session of the International Programme for Antarctic Buoys (IPAB) was held at the Scott Polar Research Institute, Cambridge, UK, 1-3 August 1996. This meeting was attended by 24 scientists, representing 10 countries and 3 international organisations. The report of this meeting has been published as WCRP Informal Report No. 4/1997, and copies can be obtained from WCRP, c/o WMO, Geneva.

IPAB is managed by an Executive Committee, whose members are:

Chairman	Dr. Christoph Kottmeier, Germany
Vice-Chairman	Mr. David Crane, United Kingdom
Member	Mr. Piet le Roux, South Africa
Member	Dr. Andrea Pellegrini, Italy

Dr. Ian Allison, Australia, is Co-ordinator of the Programme.

The second session of IPAB will be held in 1998, possibly in conjunction with the 20th anniversary meeting of the International Arctic Buoy Programme (IABP) in Seattle, USA, in August.

5 Data reception and dissemination

Most IPAB data buoys report through System Argos. Data form the programme is archived in two streams. An operational data archive includes all basic data from the Programme transmitted in real-time on the GTS. Participants are urged to ensure that, as far as possible, all platforms deployed for the Programme are issued with an WMO ID number, and that data are inserted to the GTS. A uniform, quality-controlled research data base for ice motion, and surface meteorology and oceanography is also maintained as required by the Antarctic research community. The Programme Co-ordinator is responsible for maintenance of this data set and, since February 1995, the Programme has been a registered user with CLS Argos. All original data from those platforms nominated by the registered owners are copied direct to the co-ordinating office each month from Service Argos, and form the basis of the IPAB Research Data Base at the Antarctic CRC in Hobart, Australia. This includes data from all sensors, and from non-synoptic reporting times.

A report entitled 'Wind and Ice Motion Statistics in the Weddell Sea: A compilation based on data from drifting buoys, vessels, and operational weather analyses' was produced with contributions from Dr C. Kottmeier and many IPAB participants. This work was published as WMO/TD-No. 797, January 1997.

6. Buoy deployments and activities

During 1995 and 1996 there was a considerable increase in buoy activities in the Antarctic sea ice zone by Participants. In 1995, there were a total of 19 buoys operating in Antarctic ice, and reporting via the GTS, plus an additional 11 deployments of buoys that provided data to the IPAB data base, but not to the GTS. Most buoy activity occurred in August, as part of an Australian sea ice process study, and typically over the whole year there were 9 to 14 buoys operating each month. During 1996 a total of 21 drifters were operating, and all but 3 of these reported via the GTS. Typically there were 10 to 14 buoys reporting each month, with greater activity in March and April.

Activities during 1997 have been considerably reduced, with only six new IPAB deployments during the year, and since June 1997 there have only been 4-5 IPAB buoys operating and reporting via the GTS. The following Tables and Figure show, for 1997, details of the numbers of IPAB buoys operating each month; buoy deployment locations and characteristics (including manufacturer, model, and sensors); and summary drift tracks.

Most activity has been concentrated in the Weddell Sea and in the Indian Ocean sector, with major data gaps in other areas, and particularly off the coast of West Antarctica. The relatively short life of many of the buoys within the region of interest continues to be a problem to maintaining an optimum array. Short life in the sea ice zone has been partly a result of the high failure rate of some buoys (some manufacturers' products are more susceptible to this). But more importantly, since there is a generally northward divergent component to the pack ice drift in the Antarctic, many buoys deployed at high southern latitude eventually move north of the ice edge and out of the main region of interest. Some buoys are designed specifically for ice deployment and do not survive in open water for a long time, and sometimes it is difficult to directly determine whether the buoy is operating within the ice edge or not.

6. Outlook

Buoy activity in 1998 is expected to continue at a background level similar to the last few years. In addition there is possibility of increased deployments (yet to be confirmed) associated with a joint US/Australian winter-time field study of an East Antarctic coastal polynya, and a US sea-ice research cruise to the Ross Sea in May.

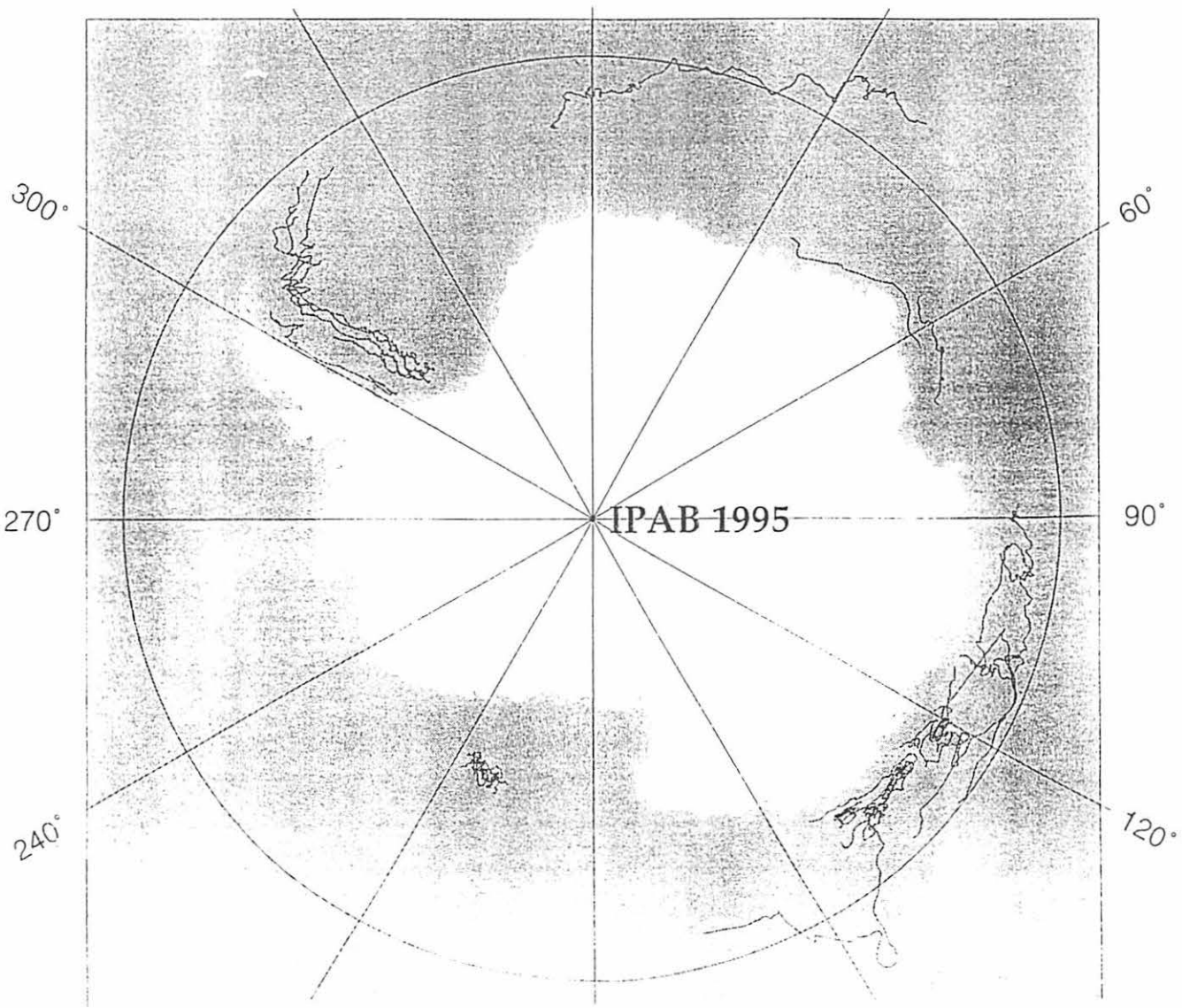
Ian Allison, IPAB Co-ordinator

IPAB buoys 1995

IPAB	PTT	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
AWI63	8060	x	x	x	x	x	x	x	x				
AWI66	8064	x	x	x	x	x	x	x	x	x	x	x	x
AWI67	14954	x	x	x	x	x	x						
AWI68	14955	x	x	x	x	x	x	x	x	x	x	x	x
AWI69	14956	x	x	x	x	x	x	x	x	x	x	x	x
AWI70	14957	x	x	x	x	x	x	x	x	x	x	x	x
AWI71	14958	x	x	x									
AWI72	14959	x	x	x									
SPI16	23008	x	x	x	x	x	x	x	x	x	x	x	
CRC03	23380		x	x	x	x	x	x					
CRC05	6550												x
AAD15	4475			x	x	x							
AAD16	6983			x	x	x	x	x	x	x			
AAD17	6984			x	x	x							
AAD18	4471				x	x	x	x	x	x	x	x	x
AAD19	4473				x	x	x	x			x	x	x
AAD20	4474				x	x	x	x	x				
AAD21	24663							x	x				
AAD22	24773								x				
AAD23	24774								x				
AAD24	24775								x				
AAD25	24776								x				
AAD26	24771								x				
AAD27	24772								x				
AAD28	24770								x				
AAD29	24777								x				
AAD30	24777								x				
AAD31	24774								x				
AAD32	24665								x	x	x	x	x
AAD33	24664								x	x	x	x	x
Buoys reporting		9	10	13	14	14	12	12	22	9	9	9	9

IPAB buoys 1995

IPAB	PTT	Deployment			Buoy type	GTS	Drogue	Deployed	Pair	Tair	Tss	Wind	Other
		time	Lat	Lon									
AWI63	8060	.07.94	-67.9	354.9	MO	71545	n	on ice	y	y			GPS
AWI66	8064	.02.95	-75.9	313.8	Def. Sys. Inc.	71557	n	on ice	y				
AWI67	14954	.02.95	-75.2	308.8	MO	71547	n	on ice	y	y			GPS
AWI68	14955	.02.95	-74.6	312.2	MO	71548	n	on ice	y	y			GPS
AWI69	14956	.02.95	-76.0	310.6	MO	71549	n	on ice	y	y			GPS
AWI70	14957	.02.95	-74.7	302.7	MO	71550	n	on ice	y	y			GPS
AWI71	14958	.02.95	-73.9	300.0	MO	71553	n	on ice	y	y			GPS
AWI72	14959	.02.95	-73.8	302.6	MO	71555	n	on ice	y	y			GPS
SPI16	23008	.10.94	-70.1	204.3	MO	n	n	on ice	y	y	y	y	y
CRC03	23380	.02.95	-62.4	90.1	Turo T-701	74531	y	ow	y	y	y		
CRC05	6550	.12.95	-62.0	79.6	Turo T-701	74537	y	ow	y	y	y		
AAD15	4475	.03.95	-66.0	70.0	Turo T-AN-301	74532	y	ow in ice	y	y	y		
AAD16	6983	.03.95	-65.9	145.2	Turo T-AN-302	73510	y	ow in ice	y	y	y		
AAD17	6984	.03.95	-66.0	62.0	Turo T-AN-302	73533	y	ow in ice	y	y	y		
AAD18	4471	.04.95	-64.6	110.9	CMI	73507	n	on ice	y	y	y		
AAD19	4473	.04.95	-64.6	120.0	CMI	73508	n	on ice	y	y	y		
AAD20	4474	.04.95	-65.2	127.8	CMI	73509	n	on ice	y	y	y		
AAD21	24663	.08.95	-64.6	140.3	MO Ice TOGA	74534	n	on ice	y	y	y		
AAD22	24773	.08.95	-64.7	141.7	AAD/Telonics	n	n	on ice					GPS
AAD23	24774	.08.95	-65.0	141.5	AAD/Telonics	n	n	on ice			y		GPS
AAD24	24775	.08.95	-65.1	141.3	AAD/Telonics	n	n	on ice		y	y	y	GPS
AAD25	24776	.08.95	-65.1	141.4	AAD/Telonics	n	n	on ice					GPS
AAD26	24771	.08.95	-65.1	141.3	AAD/Telonics	n	n	on ice					GPS
AAD27	24772	.08.95	-65.0	141.6	AAD/Telonics	n	n	on ice					GPS
AAD28	24770	.08.95	-65.0	141.8	AAD/Telonics	n	n	on ice		y	y	y	GPS
AAD29	24777	.08.95	-64.9	141.3	AAD/Telonics	n	n	on ice					GPS
AAD30	24777	.08.95	-64.7	139.5	AAD/Telonics	n	n	on ice					GPS
AAD31	24774	.08.95	-65.1	139.7	AAD/Telonics	n	n	on ice			y		GPS
AAD32	24665	.08.95	-64.6	141.2	MO Ice TOGA	74535	n	on ice	y	y	y		
AAD33	24664	.08.95	-64.5	141.0	MO Ice TOGA	74536	n	on ice	y	y	y		

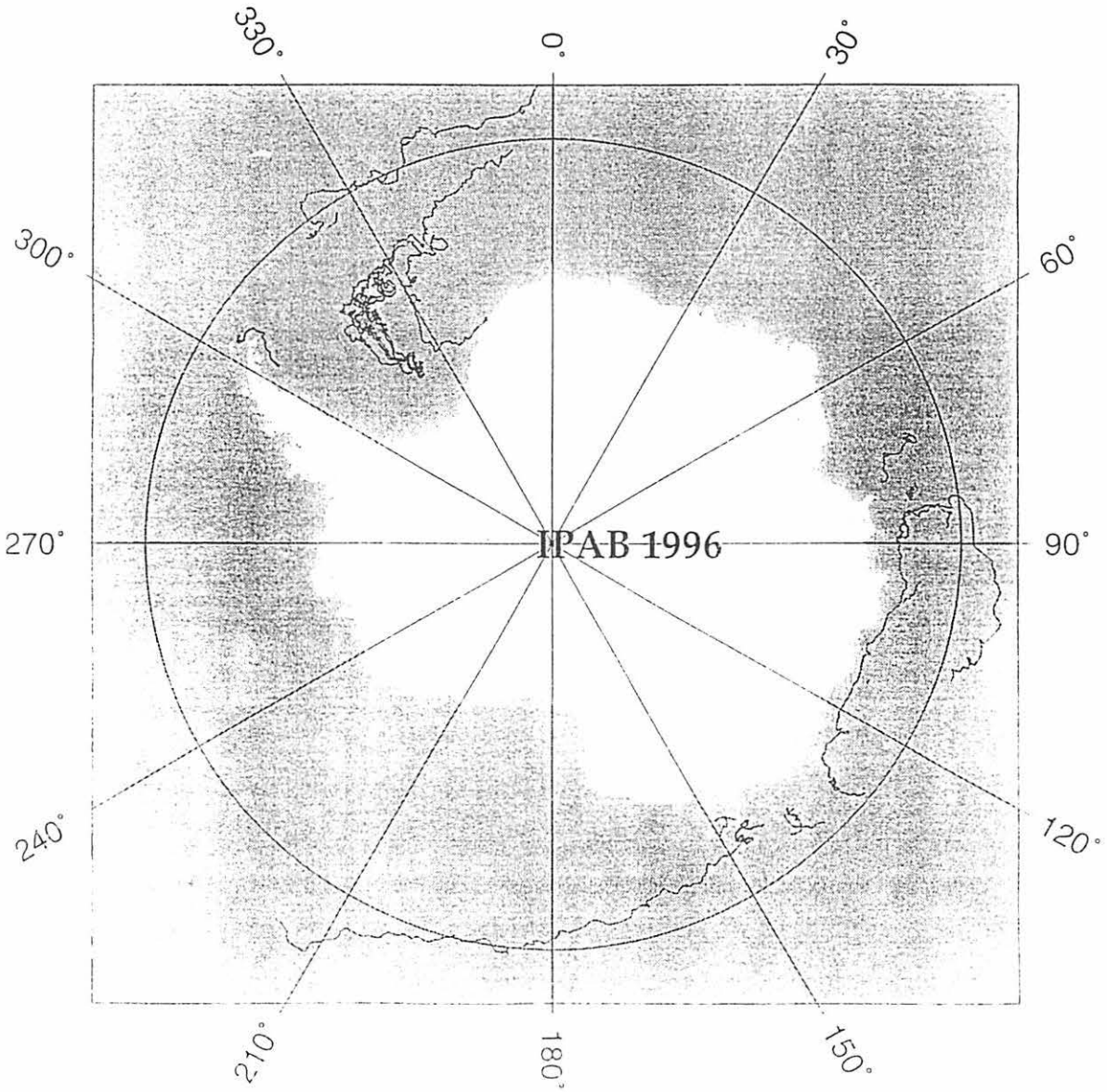


IPAB buoys 1996

IPAB	PTT	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
AWI68	14955	x											
AWI69	14956	x	x	x	x	x	x	x	(x)				
AWI70	14957	x	x	x	x	x							
CRC05	6550	x	x	x	x	x							
AAD18	4471	x	x	x	x	x	x	x	x	x	x	x	x
AAD19	4473	x											
AAD32	24665	x											
AAD33	24664	x	x	x	x	x	x	x	x	x	x	x	x
AAD34	24669			x	x	x							
AAD35	24673			x	x								
AAD36	24672				x	x	x						
AAD37	24674				x	x	x						
AAD38	24670				x	x							
AAD39	24671				x	x							
FIN04	25161	x	x	x	x	x	x	x	x	x	x		
FIN05	25933	x	x	x	x	x	x	x	x	x	x	x	x
FIN06	25932	x	x	x	x	x	x	x	x	x	x	x	x
FIN07	10855	x	x	x	x	x	x	x	x	x	x		
FIN08	10856	x	x	x	x	x	x	x	x	x	x	x	x
FIN09	5895		x	x	x	x	x	x	x	x	x	x	x
FIN10	10858		x	x	x	x	x	x	x	x	x	x	x
Buoys reporting		13	12	14	18	17	12	10	10	9	9	7	7

IPAB buoys 1996

IPAB	PTT	Deployment			Buoy type	GTS	Drogue	Deployed	Pair	Tair	Tss	Wind	Other
		Time	Lat	Lon									
AWI68	14955	.02.95	-74.6	312.2	MO	71548	n	on ice	y	y			GPS
AWI69	14956	.02.95	-76.0	310.6	MO	71549	n	on ice	y	y			GPS
AWI70	14957	.02.95	-74.7	302.7	MO	71550	n	on ice	y	y			GPS
CRC05	6550	.12.95	-62.5	79.7	Turo T-701	74537	y	ow	y	y	y		
AAD18	4471	.04.95	-64.6	110.9	CMI	73507	n	on ice	y	y	y		
AAD19	4473	.04.95	-64.6	120.0	CMI	73508	n	on ice	y	y	y		
AAD32	24665	.08.95	-64.6	141.2	MO Ice TOGA	74535	n	on ice	y	y	y		
AAD33	24664	.08.95	-64.5	141.0	MO Ice TOGA	74536	n	on ice	y	y	y		
AAD34	24669	.03.96	-65.7	150.0	Turo T-AN302	-	y	ow in ice	y	y	y		
AAD35	24673	.03.96	-65.7	149.9	Turo T-AN302	-	y	ow in ice	y	y	y		
AAD36	24672	.04.96	-65.2	79.3	Turo T-AN302	-	y	on new ice	y	y	y		
AAD37	24674	.04.96	-64.5	132.4	Turo T-AN302	-	y	ow in ice	y	y	y		
AAD38	24670	.04.96	-63.7	99.9	Turo T-AN302	-	y	ow in ice	y	y	y		
AAD39	24671	.04.96	-64.4	114.4	Turo T-AN302	-	y	on new ice	y	y	y		
FIN04	25161	.01.96	-73.7	323.1	MO T-916	71558	n	on ice	y	y		y	Atm
FIN05	25933	.01.96	-73.5	321.8	Technocean	71560	n	on ice	y	y		y	Atm.
FIN06	25932	.01.96	-73.9	321.5	Technocean	71559	n	on ice	y	y		y	Atm.
FIN07	10855	.01.96	-73.9	324	CMI	-	n	on ice					
FIN08	10856	.01.96	-73.9	324.0	CMI	-	n	on ice					
FIN09	5895	.02.96	-73.4	322.0	Pol.Res.Lab. MET	71591	n	on ice	y	y		y	Atm.
FIN10	10858	.04.96	-72.5	343.5	CMI	-	n	on ice					



International Programme for Antarctic Buoys - 1997 Activities

Abbreviations used in the following Tables:

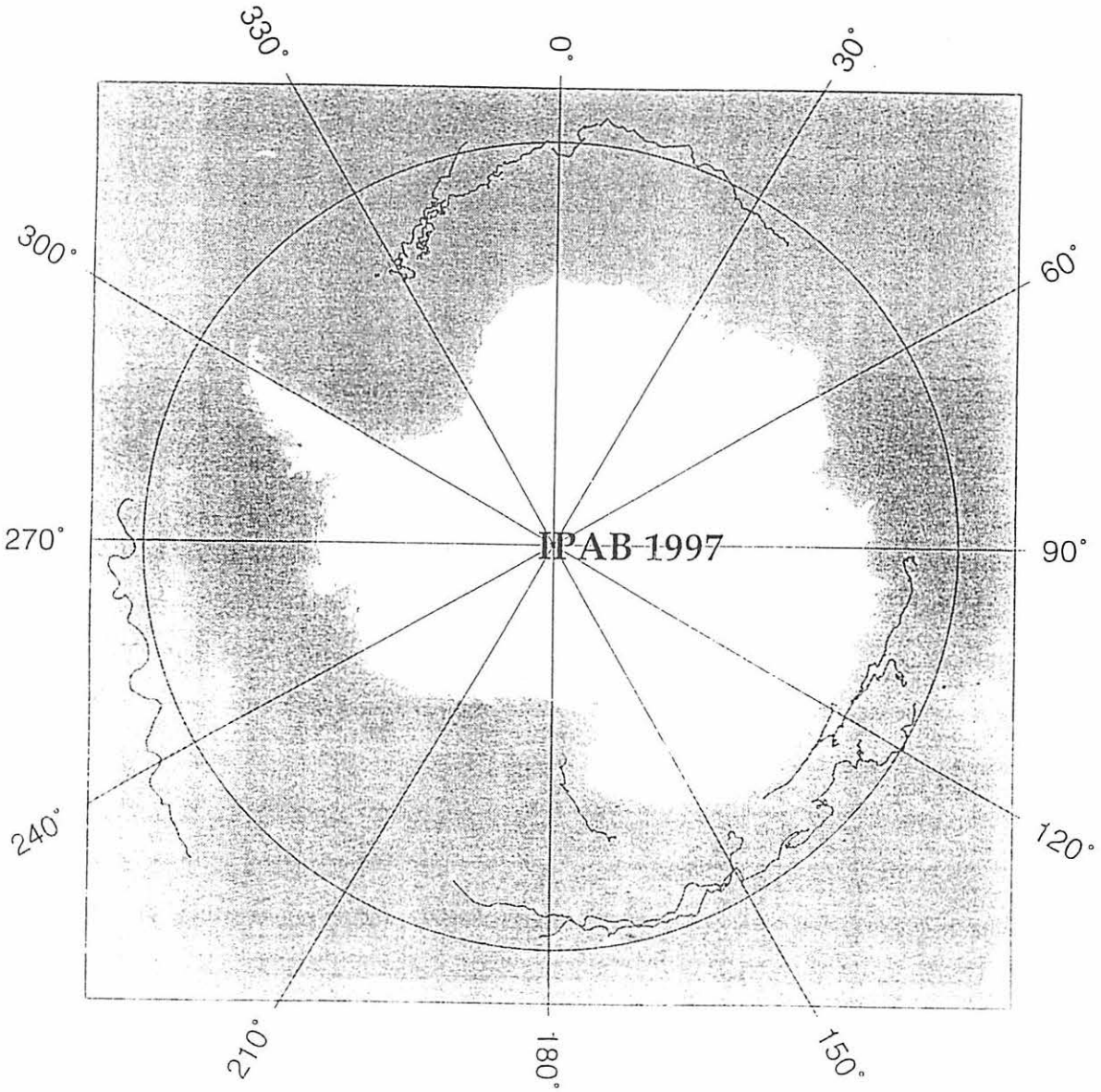
Sensors	Tair	Air temperature
	Tss	Sea surface temperature
	Pair	Air pressure
Agencies	AAD	Australian Antarctic Division
	Finn	Finnish Institute of Marine Research & Dept. of Geophysics, Univ. of Helsinki
Buoy Type	MO	MetOcean
	Pol.Res.Lab.	Polar Research Laboratory
	CMI	Christian Michelsen Research AS

IPAB buoys 1997

IPAB	PTT	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
AAD18	4471	x	x	x	x	x	x	x	x				
AAD33	24664	x	x	x	x	x							
AAD40	24668				x	x	x	x	x				
AAD41	18648				x	x							
AAD42	18647				x	x	x	x	x				
AAD43	18649				x	x	x	x	x				
AAD44	24667				x								
AAD45	24666				x	x	x	x					
FIN04	25161	x	x	x	x	x							
FIN05	25933	x											
FIN06	25932	x											
FIN07	10855	x											
FIN08	10856	x	x	x	x	x							
FIN09	5895	x	x	x									
FIN10	10858	x	x	x	x	x							
Buoys reporting		9	6	6	11	10	5	5	4				

IPAB buoys 1997

IPAB	PTT	Deployment			Buoy type	GTS	Drogue	Deployed	Pair	Tair	Tss	Wind	Other
		Time	Lat	Lon									
AAD18	4471	.04.95	-64.6	110.9	CMI	73507	n	on ice	y	y	y		
AAD33	24664	.08.95	-64.5	141.0	MO Ice TOGA	74534	n	on ice	y	y	y		
AAD40	24668	.04.97	-64.9	117.3	MO	73501	n	on ice	y	y	y		
AAD41	18648	.04.97	-65.2	128.2	MO	73504	n	on ice	y	y	y		
AAD42	18647	.04.97	-65.2	140.0	MO	73503	n	on ice	y	y	y		
AAD43	18649	.04.97	-64.3	148.8	MO	73502	n	on ice	y	y	y		
AAD44	24667	.04.97	-75.6	176.2	MO	72503	n	on ice	y	y	y		
AAD45	24666	.04.97	-74.0	176.1	MO	72502	n	on ice	y	y	y		
FIN04	25161	.01.96	-73.7	323.1	MO T-916	71558	n	on ice	y	y		y	Atm.
FIN05	25933	.01.96	-73.5	321.8	Technocean	71560	n	on ice	y	y		y	Atm.
FIN06	25932	.01.96	-73.9	321.5	Technocean	71559	n	on ice	y	y		y	Atm.
FIN07	10855	.01.96	-73.9	324.0	CMI	-	n	on ice					
FIN08	10856	.01.96	-73.9	324.0	CMI	-	n	on ice					
FIN09	5895	.02.96	-73.4	323.6	Pol.Res.Lab. MET	71591	n	on ice	y	y		y	Atm.
FIN10	10858	.04.96	-72.5	343.5	CMI	-	n	on ice					



A participation driven action group of the Data Buoy Co-operation Panel

INTERNATIONAL SOUTH ATLANTIC BUOY PROGRAMME

The Fourth Programme Committee Meeting of the International South Atlantic Buoy Programme was held in Port of Spain, Trinidad during the week of 8 September 1997. The meeting was hosted by Mr Steve Pollonais, Director of Trinidad Meteorological Services and was, thanks to the kind favour of Dr Arun Wagh, Director of Marine Affairs, convened on the premises of the Institute of Marine Affairs in a beautiful setting on Chaguaramas Pensinsula. The meeting was productive and very enjoyable. Our host spoiled us with his kind hospitality. The people of Trinidad are very friendly and obviously contented with life on their beautiful tropical island. During our stay we picked up a saying of the Trinidad people. They say "*God, if I should die take me to heaven if you can, but if that is not possible, I am quite happy to remain here in Trinidad*".

The meeting lasted five days. The first two days were devoted to workshops and the rest of the time in meeting, reporting, discussing, learning, planning and generally fostering our common goal to increase the drifting buoy data from the South Atlantic Ocean. The ideas of the participants were focussed, their contributions very good and the subsequent discussions open, enthusiastic and spontaneous. The end result was that we all left the meeting with a sense of achievement, as well as with a list of 21 tasks to be performed by individuals during the inter-sessional period. One of the items on this list are for discussion during this DBCP meeting. Next year when the ISABP meets in Buenos Aires the meeting will revisit this list. The tasks and responsibilities carried out according to the list plus other accomplishments during the inter-sessional period will form the basis of the agenda for that meeting.

The Fourth Programme Committee Meeting was intentionally convened in Trinidad because of the data sparseness in the area. By holding two days of workshop sessions we hoped to involve the islands in the Caribbean Sea in our programme. The attendance, however, was disappointing and the workshops did not accomplish as much as we would have liked to. The important fact is that we know why the attendance was down and we know what to do to prevent a recurrence. In our discussion after the workshop we were unanimous about the value of the workshop from a participation canvas point of view. Our Fifth Programming Meeting in Buenos Aires next year will therefore again be preceded by a two day workshop.

Mr Bert Berridge, First Vice President of the WMO and Co-ordinating Director of the Caribbean Meteorological Organization, attended some of the Fourth Meeting discussions. Participants were impressed with his vast experience of the area, his dedication to meteorology and his no nonsense attitude. To us it was obvious that Bert could promote our programme in the Caribbean Sea. Bert, from his point of view, after getting to know us and listening to our deliberations said "I can see you are not a talk shop". Being impressed with the ISABP and the achievements of its participants he, on our request, agreed to henceforth be our vocal supporter and to promote the ISABP amongst the Caribbean Meteorological Services, at CMO and WMO levels and in particular with the Commission of Marine Meteorology.

We, the participants to the ISABP, consider our programme strong, versatile and progressive. During the meeting we pooled resources thus proving the premise that the ISABP is participation driven.

The pooling of resources showed that:

- Apart from the existing good network of drifting buoys in the Atlantic we presently have about 70 SVP drifters in stores ready for deployment.

- We have an approved air-deployment flight, much along the lines of what was done last year, in the southern area of the South Atlantic.

- There is a ship deployment voyage into the South Atlantic to deploy 15 SVP drifters during November.

- We will be deploying five drifters between Antarctica, South Sandwich Islands and Cape Town during January.

- Through the shipping lines, with whom we have very good relations, deploy opportunities exist on a regular basis between Cape Town, Brazil and Argentina.

- Javier Valladares is the Commanding Officer of the RV ARA PUERTO DESEADO frigate in the Argentinean Navy. He is also a committee member of the ISABP. Our programme therefore has an open door with the Argentinean Navy. For the first six months of the inter-sessional period Javier offered the following voyages as deploy opportunities.

    * 1 - 20 October; Oceanographic Cruise in Brazilian Basin
    * 2 - 20 December; Antarctic cruise
    * 26 December - 7 March; Antarctic cruise
    * 15 - 25 March Oceanographic Cruise in Drake Passage

- We have the co-operation of the RMS St Helena to deploy drifters in the central South Atlantic between Cape Town, St Helena, Ascension and southwards towards Tristan da Cunha.

- We are committed to work closely with PIRATA, GOOS and TEMA.

- We are committed to work closely with the Caribbean Community Ocean Sciences Network (CCOSNET) which is a network of Common Wealth Caribbean Institutes engaged in Marine sciences. The ISABP decided to donate 2 SVP-drifters to CCOSNET in order to stimulate their programme while making buoy data available in a data sparse area.

- Two LUT's, one on Gough Island in the South Atlantic and one in Cape Town South Africa, will be operational during November 1997. These facilities will speed up the data availability to all users especially those in South America and Southern Africa.

- Storage facilities are available in all participating countries.

- Mr Bert Berridge will be promoting our programme in the Caribbean Sea area and also at WMO, CMO and CMM.

- Our ISABP brochure has been translated and is now available in English, Spanish and Portuguese. More than 300 copies are available and we have a distribution plan in place to disseminate these brochures.

On the proverbial downside the ISABP are seriously concerned about:

- Budget cuts which we all have to endure from time to time. Some of our participating countries also have to cope with an inflation rate tending toward double figures.

- The ARGOS processing costs which after more than a decade of negotiations, still remain very high.

We know for a fact that the decreasing budgets and high data processing costs are having a negative effect on our programmes. We foresee that this negative effect will get worse unless savings are brought about. Our meeting also noted the fact that we have reached the stage where we have more drifters sitting in stores waiting for deployment, than buoy years to pay for the data processing.

As the Chairman of the ISABP I have a mandate to raise this concern with the DBCP. We feel strongly that the DBCP should during this session look into ways and means of reducing user costs.

REPORT BY THE INTERNATIONAL BUOY PROGRAMME FOR THE INDIAN OCEAN

1. INTRODUCTION

The International Buoy Programme for the Indian Ocean was formally established at a meeting in La Reunion, in 1996. The primary objective of the IBPIO is to establish and maintain a network of platforms in the Indian Ocean to provide meteorological and oceanographic data for both real time and research purposes. This task includes support to the World Weather Watch Programme (WWW), the Global Climate Observing System (GCOS), the World Climate Research Programme (WCRP), the Global Ocean Observing System (GOOS), tropical cyclone forecast and monitoring, as well as to the research activities of participating institutions.

The programme is self-sustaining, supported by voluntary contributions from participants in the form of equipment, services (such as communications, deployment, storage, archiving, co-ordination...).

2. ANNUAL MEETING

The second meeting of the IBPIO was held in Perth, Australia, from the 21st to the 23rd of July 1997. The meeting was hosted by the Regional Forecasting Centre of the Australian Bureau of Meteorology. The report of this meeting will be soon available near the Chairman or the Programme Co-ordinator of the IBPIO.

Five organisations have formally joined the programme during the first intersessional period:

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

The participants re-appointed Mr. Graham Jones, BoM, as chairman and Dr. Gangadhara Rao, NIO, as vice-chairman. Mr. Pierre Blouch was re-appointed as programme co-ordinator. Messrs. Warren Krug (GDC), Piet Le Roux (SAWB) and Phil Parker (BoM) were appointed as members of the Programme Committee.

3. OPERATIONAL PROGRAMME

3.1 Buoy deployments

More than sixty drifting buoys have been deployed during the 96-97 intersessional period. Three quarters of them were equipped with a barometer, but unfortunately, because of system failures, only half of the buoys operating by the end of June 1997 reported air pressure. Because of these deployments, the number of operating buoys remained stable.

For the next intersessional period, about 80 drifting buoys should be deployed. Some of them will be deployed by air thanks to Navoceano. Contributions will come from:

- Bureau of Meteorology, Australia :	8 buoys - some with wind sensors
- Global Drifter Centre :	20 SVP + 25 SVP-B[1]
- Meteo-France :	7 buoys - some with wind sensors
- National Institute of Oceanography :	15 SVP-B's including a few with wind sensors
- South African Weather Bureau :	3 to 5 SVP-B's for cyclone monitoring

[1] Including 10 drifters equipped with barometers funded by Meteo-France

Most of the deployments are carried out by research vessels and ships of opportunity plying in the Indian Ocean from many harbours such as Perth (Australia), Goa (India), Durban and Cape Town (South Africa) and La Reunion. Some ship voyages to remote islands are useful too, for deployments in the southern latitudes: Heard I. from Australia; Amsterdam I., Kerguelen and Crozet Is. from La Reunion and Marion Is. from South Africa.

Some buoys, owned by SAWB, will migrate from the South Atlantic Ocean, westerly driven to the Indian Ocean. This flux is more or less compensated by the escape of other buoys to the South of Australia.

Owner	SST only	Air Pressure	Wind
Atlantic Oceano. and Met. Laboratories	54	19	-
Australian Bureau of Meteorology	1	6	-
Météo-France	-	2	1
National Data Buoy Center (USA)	-	1	-
National Institute of Oceanography	-	6	-
Navoceano	-	2	-
South African Weather Bureau	-	8	-
Total	**55**	**44**	**1**

Table 1. Operating drifting buoys by the end of August 1997

3.2 Data recovery

The data are recovered through the Argos system and sent on the GTS through the processing centers of Toulouse and Landover. Two new local stations (for regional acquisition) will be soon operational in La Reunion and Capetown. The first one will be operated by Meteo-France, the second one by SAWB. Both will report their data to CLS/Argos in Toulouse who will process and relay them on the GTS as done for the data through the global coverage. The use of these two stations should reduce the reception delays.

IBPIO buoys drifting in the East of the Indian Ocean, already benefit of the receiving station operated by BoM in Perth.

3. PLANS

At the last meeting, participants identified the areas in which a lack of data exists: Gulf of Bengal, tropical area south of the Equator and south of 40°S. If we except the Arabian Sea, the two first regions represent exactly the cyclone areas of the Indian Ocean. The Programme Committee was asked to prepare a plan for improved monitoring of cyclone activity before the 1997/98 tropical cyclone season, in consultation with meteorological centres in the region.

4. INFORMATION ON THE IBPIO

Besides a quarterly newsletter, IBPIO information is available on the World Wide Web at *http://www.shom.fr/meteo/ibpio*. The pages, regularly updated, give a description of the programme, its objectives and management, listings of participants and buoys status, monthly buoys trajectories and links to related subjects such as DBCP data quality control information.

A promotional leaflet on the IBPIO should be soon available.

Pierre Blouch,
IBPIO Programme Co-ordinator

Global Drifter Program Implementation Report

GDP Formation

The GDP is a successor of the WOCE/TOGA Surface Velocity Program (SVP). It was accepted in principle as a WMO/DBCP Action Group at the 12th DBCP meeting, and it's formation has been completed during the 1997 intercessional period. The GDP steering committee members are:

Mark Swenson	NOAA/AOML, USA	Chairman
Dong Kyu Lee	Pusan National University, Republic of Korea	Vice-Chairman
Mark Bushnell	NOAA/AOML, USA	Program Coordinator
Peter Niiler	Scripps Institute of Oceanography, USA	
Gilles Reverdin	France	

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.

FY 97 Status

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.

During the course of the year, there were four conditions under which deployments were permitted;
1) prior GDP commitments,
2) cooperative deployments where Argos fees are funded by others,
3) Equatorial Pacific deployments to monitor the 1997 ENSO event, and
4) drifters already placed aboard VOS ships.

Deployments meeting one of these four conditions are next described in detail.

Prior GDP commitments include;

a)Iceland - 1997 is the third year of a three year agreement with Iceland, in which the GDC provided 20 SVP drifters and Iceland matched that contribution. In the past, the 20 GDC drifters were deployed in the early half of the year, followed by the 20 Iceland drifters. To accommodate the GDP predicament, in 1997 Iceland funded the Argos fees for the 20 GDC drifters. When the 20 Iceland drifters are deployed, they will be funded by the GDP within the 125 PTT-year limitation.

b) NAVOCEANO - The long lead time required for NAVOCEANO air deployments, coupled with the fact that in this instance a special effort (and opportunity) had been arranged, forced GDP participation. A C-141aircraft was used to deploy 18 SVPB drifters in the remote area 40-55S 025W-010E.

There were also prior commitments to investigators in Korea and Taiwan, and several deployments were made in the marginal seas of East Asia.

Cooperative deployments with Argos fees funded by others were pleasantly abundant, and the GDP owes thanks to the many participants. Specifically; South Africa accepted 26 SVPB drifters and has deployed 10 of them in cooperation with Woods Hole Oceanographic Institution investigators. The U.S. Naval Oceanographic Office accepted the Argos fees for 26 drifters deployed in the Indian Ocean and the tropical Atlantic Ocean. The United Kingdom Meteorological Office has accepted 3 drifters deployed from the

Falkland Islands.

A total of 432 drifter deployment reports were received, as follows;

SVP	228	standard drifter
SVPB	155	barometer
SVPBW	29	wind
SVPS	16	salinity
SVPBS	3	barometer & salinity
SVPBG	1	barometer & GPS

Of the 432 drifters deployed, only 159 were fully funded by NOAA's Office of Global Programs.

FY97 Accomplishments

A cooperative arrangement between the GDC, NAVOCEANO, and MeteoFrance lead to the deployment of 12 wind drifters in the tropical Atlantic. Data from these was successfully used by the U.S. National Weather Service and NOAA's National Hurricane Center to assist in the forecast of tropical storms. A barometer drifter fitted with a GPS was manufactured by Metocean and deployed in the Caribbean Sea for evaluation. Such devices can be operated in Argos data-only service, reducing the Argos fees by a factor of 2. A purchase order for four SVP drifters using Orbcomm transceivers has been issued to Seimac, with delivery expected in late October 1997. A NOAA Small Business Innovative Research (SBIR) topic has been published and will be used to solicitate proposal for barometer drifters fitted with Orbcomm tranceivers. A proposal has been submitted to NOAA's High Performance Computing and Communications for the evaluation of several new Low Earth Orbiting Satellite Systems.

FY97 Problems
A batch of Technocean drifters were found to have transmitters fabricated using unstable crystals. The faulty drifters were returned for repair. A problem in the barometer port of Clearwater drifters was identified, and kits with replacement parts and instructions were shipped to effect repairs. Investigation continues in the failure of some Clearwater drifters, which quit transmitting after 120 days.

FY98 Plans

A cooperative long term deployment arrangement at the ESTOC time series station located near the Canary Islands is planned. Other agreements with the Monterey Bay Aquarium Research Institute and the Hydrographic Office of Brazil are pending. Phase II of a U.S. NWS program located off the U.S. west coast will start in December 1997, with five wind/wave drifters and 33 SVPB drifters deployed to support that project. A cooperative agreement with NAVOCEANO will result in the air deployment of 10 SVP drifters in the Sea of Japan. Additional air deployments by NAVOCEANO are scheduled as follows;

December 1997, Indian Ocean, 10 SVPB drifters with barometers funded by MeteoFrance
January 1998, NE Pacific, 10 NWS SVPB drifters
January 1998, Eq Pacific, 2 SVP drifters
January 1998, SE Pacific, 20 SVPB drifters
March 1998, SW Atlantic, 12 SVPB drifters

ANNEX III

REPORTS FROM DATA MANAGEMENT CENTRES

The following pages contains the reports by the:

RESPONSIBLE NATIONAL OCEANOGRAPHIC DATA CENTRE

for Drifting Buoys

Marine Environmental Data Service (MEDS) Report

13th Session of the Data Buoy Co-operation Panel

La Réunion Island (France)

October 1997

REPORT OF THE WMO/IOC RESPONSIBLE NATIONAL OCEANOGRAPHIC CENTRE FOR DRIFTING BUOYS

Introduction

The Marine Environmental Data Service (MEDS) in Canada became a Responsible National Oceanographic Data Centre (RNODC) for Drifting Buoy Data on behalf of the Intergovernmental Oceanographic Commission (IOC) and the World Meteorological Organization (WMO) in January 1986. The purpose of this report is to describe the activities of the RNODC-MEDS in acquiring and making drifting buoy data available to the scientific community during the last nineteen months (January 96 - July 97).

Data Flow

Table 1 shows various statistics derived for this 19-month period of activity. The first column of the table gives the month and year, the second column provides the number of messages received by MEDS for this particular month-year while the third column provides the ratio in percentage of messages with the quality flags equal to 1 for position and date/time. A quality flag of 1 means that no errors were found either in the date/time stamp of the message nor in the observed data themselves. The next two columns provide the statistics on the buoys themselves; columns 4 shows first the number of buoys reporting on the GTS and for which MEDS is receiving the data while column 5 gives the number of operational drifting buoys according to the Technical Coordinator DBCP. The last column of this table gives the ratio expressed in percentage of the number of buoys for which MEDS is receiving data during each particular month.

Figure 1 is an illustration of the level of activities performed by MEDS during this same 19-month period. For each month, it displays the number of messages received, the number of messages received with both quality flags equal to 1 (position and date/time) and the number of messages received from drifting buoys only (the difference is received from fixed platforms). The total number of messages received, processed and archived by MEDS each month for this time period is 2,487,439 with an average of 130,918 messages per month.

Figure 2 illustrates, over the same 19-month time period, the number of buoys for which MEDS is receiving data via the GTS route over the number of physical drifting buoys that transmitted at least once during that month. The second number is provided by the Technical Coordinator of the DBCP (TC DBCP). Although both curves have a positive upward slope, the mean gap (1,411 buoys) remains more or less constant between both curves. On the average, MEDS is receiving data from 36% (see Figure 3) of all the buoys (drifting and fixed platforms). As this percentage is too small by

approximately 5%, it must be pointed out though that the number of physical buoys provided by the DBCP TC includes all drifting buoys which have transmitted during that particular month. Therefore, this number includes operational buoys, buoys with no localization computed, backup buoys, inactive buoys and buoys near their death. It must also be pointed out that the upward rapid trend seen in the TC DBCP curve since April 1997 is not reflected in MEDS curve, therefore the number of buoys for which MEDS is receiving data is decreasing since April.

With regard to the number of messages received by MEDS, this number is inflated by two different sources. Multiple messages are reported on the GTS as they are processed by an ARGOS centre (KARS or LFPW) and a LUT centre (EDMO, OSLO or BGSF). In this case, MEDS keeps both messages. It may be picked up by a single LUT, but having different parameters (channels) echoed back by the satellite. In this case, a message is not a duplicate message if it has different parameters. Otherwise, MEDS keeps the best (most complete) message. Inflation is also caused by multiple messages on the same satellite pass. Identical messages are deleted during processing when the information is exactly the same within some tolerance limits (35-minute window on time and smaller than 15 km in space, 5 knots in speed) where reported positions are not old positions. If the information from multiple messages is outside these tolerance limits, then duplicate messages are being kept.

Figure 3 provides quantitative ratios that describes the situation with regard to drifting buoys. The first ratio is the number of messages received from drifting buoys as a percentage of the total number of messages received from all buoys (drifting + fixed platforms). This ratio is very high and is on the average 93.9%. This means that drifting buoys still dominate over fixed platforms. The second ratio describes the quality of the messages being sent daily on the GTS. The percentage of good quality messages (position and date/time flags set to 1) has decreased in the last part of the period (44.1%) after having stayed around the 50% mark for the first four months. The last ratio, being called here the buoy ratio, is the comparison of the number of buoys from which MEDS is receiving data over the the number of physical platforms floating in the oceans. This number was already discussed in the above paragraph and is on the average around 36%.

With regard to the ratio describing the quality of the messages received, it must be pointed out that this ratio was higher by approximately 15% a few years ago. The decrease of the ratio is not caused by poor data being reported but is a reflection of the processing of the drifting buoy messages received on the GTS. Positions received an automatic flag of 3 (suspicious) when the same message is reported by an ARGOS Centre and a LUT centre (LUT gets the level 3 rating). Messages are also flagged as suspicious (QC=3) when an old position is being reported on any satellite

pass.

Finally, Figure 4 describes the number of messages per buoy per day of operation. This number is fairly constant over the 19-month period as there are on the average 5.5 messages per buoy per day of operation. Figure 6 illustrates the same information but as a cumulative curve year after year. It reflects the usual shape for any growth as a second order degree curve.

Historical Data Acquisition

Since the FGGE program and since January 1986 when MEDS became the RNODC for Drifting Buoys Data, the archive has grown constantly as shown in Figures 5 and 6. At the end of December 1996, it contained a total of 10,934,456 messages. More than 64.4% of these messages have a quality flag equal to 1 (good quality on position and date/time) and 73.5% of these messages are originating from a drifting buoy as opposed to a fixed platform. Sub-surface data are available from these buoys since 1987 and the archive now contains a total of 146,692 messages with sub-surface information.

Development

Most of the resources for development were spent this year in the production of a CD-Rom for WOCE/Surface Velocity Program (WOCE/SVP). This CD must be completed by the end of this year to be ready for distribution next May during the WOCE Conference in Halifax, Canada.

MEDS has also participated in the GTS Buoy Data Flow Control with the Technical Coordinator, DBCP. This InterNet homepage lists buoy reports received on the GTS by Météo-France, NOSS/NWS (USA) and MEDS (Canada). Information for one week is kept on line on this web page.

Services

MEDS issues an annual report summarizing the data received and processed during the previous year and showing the locations of the buoys. The 1994 annual report is now ready for printing. It will be available for distribution before the end of the year. 1995 and 1996 reports are scheduled to be printed and distributed before the end of this fiscal year (March 98). Every month, global maps are issued displaying the location of the buoys reporting over the GTS. In addition, MEDS also delivers data for a user specified area, time and range of buoys in GF-3 format (also available now as a CSV data file) on various computer media (such as computer magnetic tape, computer diskette and Exabyte cartrige). Displays of buoy tracks are also available for any ocean area and time frame. The MEDS Monthly DRIBU track chart is also now published on MEDS WWW. Two years of world maps are available on MEDS Web page

(http://www.meds.dfo.ca/Meds/e_rec_db.html).

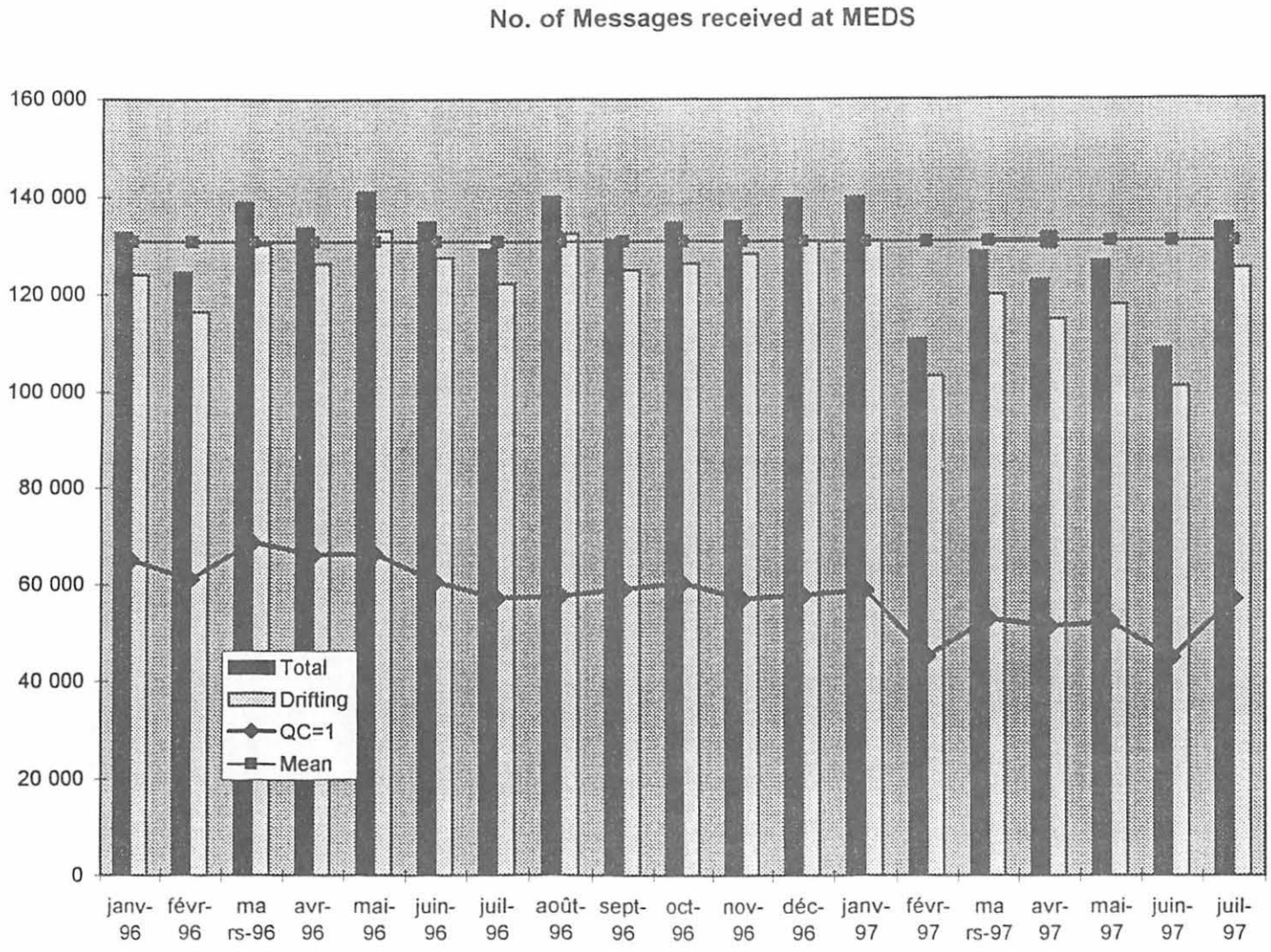
MEDS maintains an archiving system for the Drifting Buoys Bulletin Board messages (Owner Buoy QC messages) available each day through InterNet. For a particular buoy or set of buoys, all messages (if any) regarding its operational behaviour and the quality of observed data are available upon request on paper or on computer diskette.

Table 1: Monthly Statistics on Number of Buoys and Number of Messages received at MEDS from January 96 to July 97 with Evaluation of the QC and Comparison with DBCP TC Reported Number

Month/ Year	# of messages received	Ratio in % of messages QC OK	# Buoys MEDS	# of Buoys TC/DBCP	Ratio in %
Jan 96	132,708	49.1	749	2,064	36.3
Feb 96	124,589	49.0	808	2,100	38.5
Mar 96	138,919	49.6	818	2,158	37.9
Apr 96	133,772	49.5	851	2,151	39.6
May 96	141,016	47.1	835	2,237	37.3
Jun 96	134,968	44.9	881	2,265	38.9
Jul 96	129,232	44.2	861	2,141	40.2
Aug 96	140,066	41.2	814	2,193	37.1
Sep 96	131,197	45.0	878	2,166	40.5
Oct 96	134,633	44.7	846	2,173	38.9
Nov 96	134,933	42.2	797	1,984	40.2
Dec 96	139,603	41.3	800	2,079	38.5
Jan 97	139,850	42.0	806	2,118	38.1
Feb 97	110,766	40.8	750	2,050	36.9
Mar 97	126,618	40.9	758	2,316	32.7
Apr 97	122,795	41.7	685	2,197	31.2
May 97	126,727	41.0	662	2,279	29.0
Jun 97	108,681	41.2	621	2,263	27.4
Jul 97	134,366	42.3	688	2,783	24.7

Report prepared by:

Paul-André Bolduc
Marine Environmental Data Service
Ottawa, Canada
October 1997.


No. of Messages received at MEDS
160 000
140 000
120 000
100 000
80 000
60 000
40 000
20 000
0
Total
Drifting
QC=1
Mean
janv-96
févr-96
mars-96
avr-96
mai-96
juin-96
juil-96
août-96
sept-96
oct-96
nov-96
déc-96
janv-97
févr-97
mars-97
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mai-97
juin-97
juil-97

Figure 2

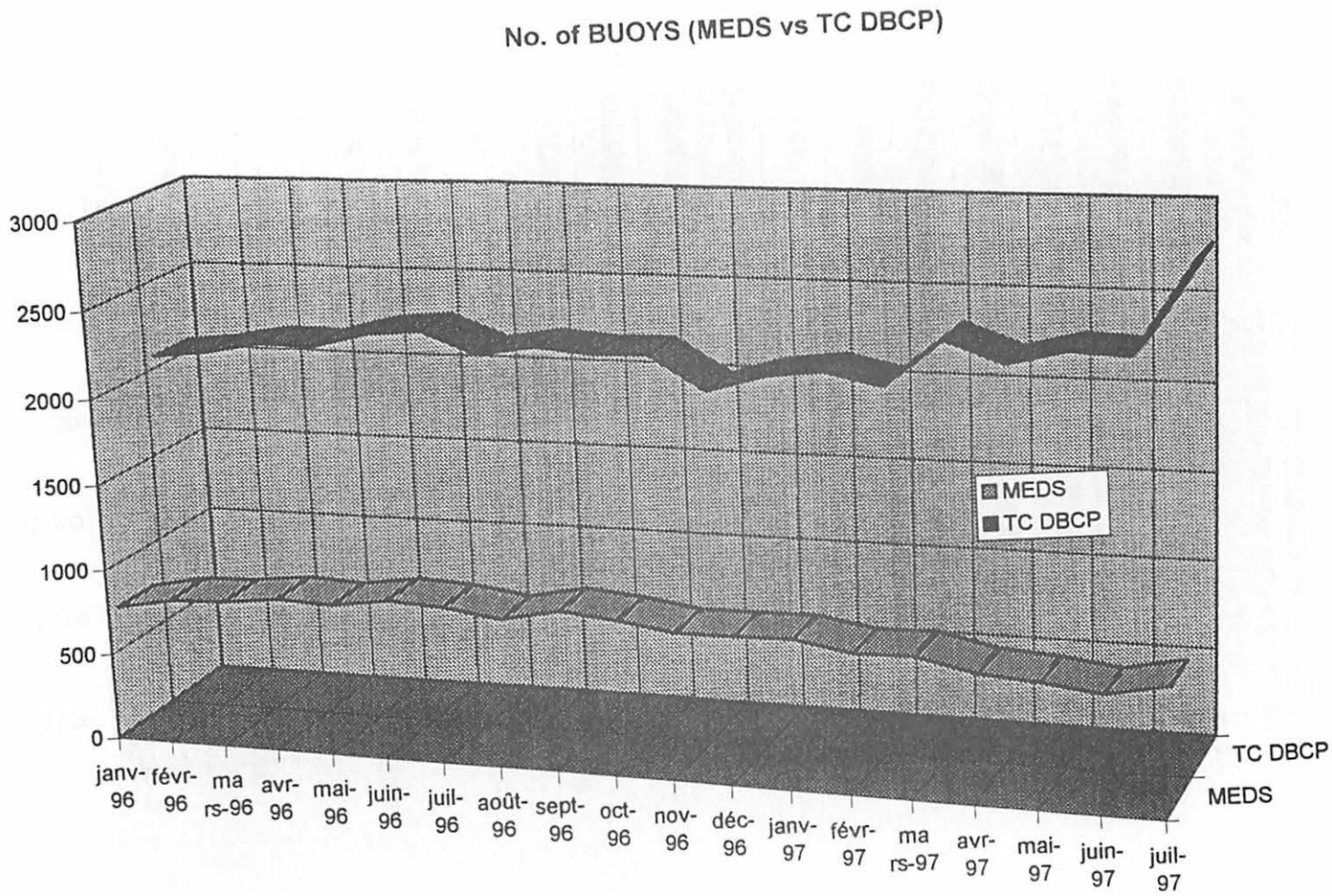

No. of BUOYS (MEDS vs TC DBCP)
3000
2500
2000
1500
1000
500
0
MEDS
TC DBCP
janv-96
févr-96
mars-96
avr-96
mai-96
juin-96
juil-96
août-96
sept-96
oct-96
nov-96
déc-96
janv-97
févr-97
mars-97
avr-97
mai-97
juin-97
juil-97
TC DBCP
MEDS

Figure 3

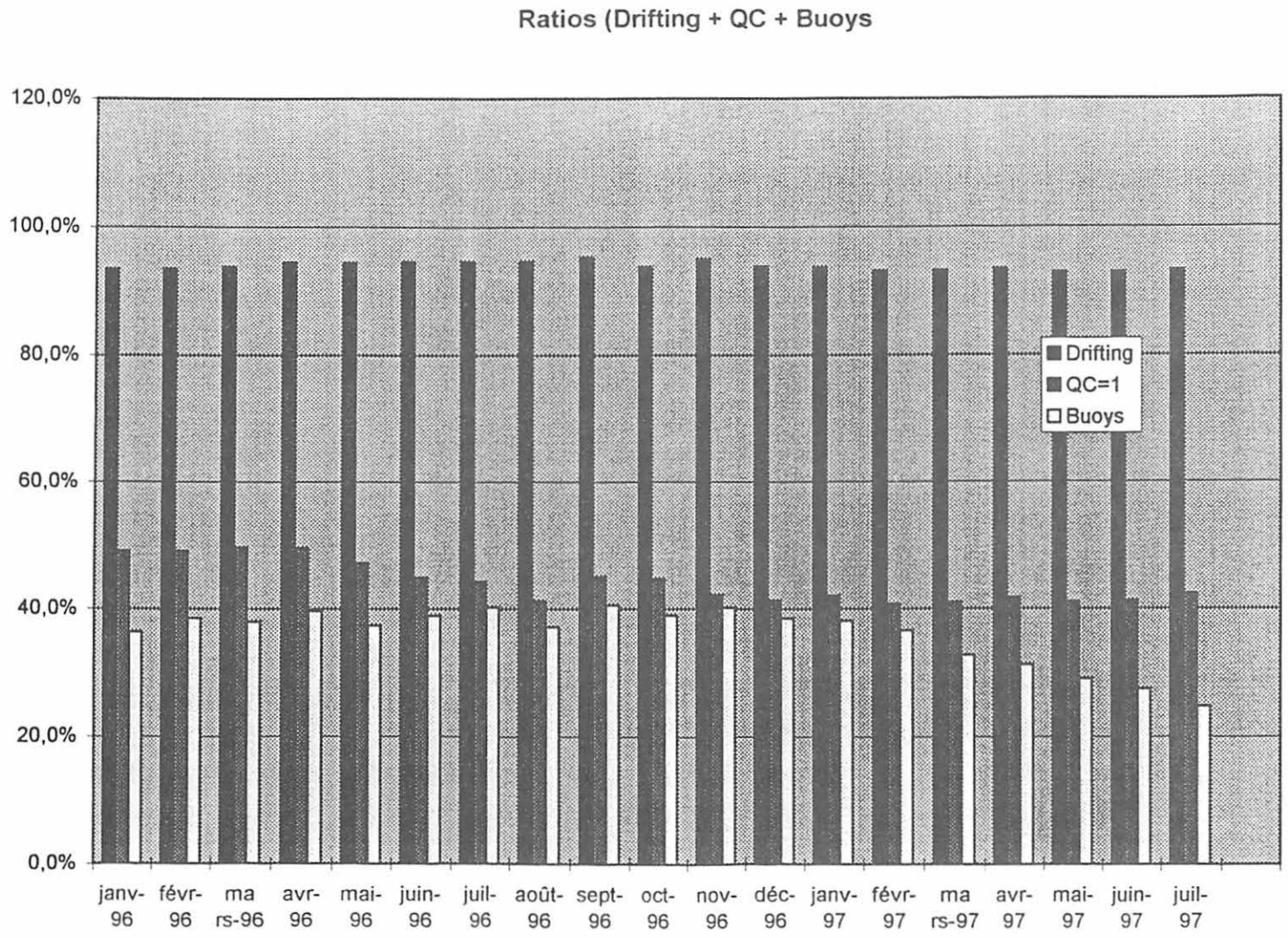

Ratios (Drifting + QC + Buoys
120,0%
100,0%
80,0%
60,0%
40,0%
20,0%
0,0%
Drifting
QC=1
Buoys
janv-96
févr-96
mars-96
avr-96
mai-96
juin-96
juil-96
août-96
sept-96
oct-96
nov-96
déc-96
janv-97
févr-97
mars-97
avr-97
mai-97
juin-97
juil-97

Figure 4

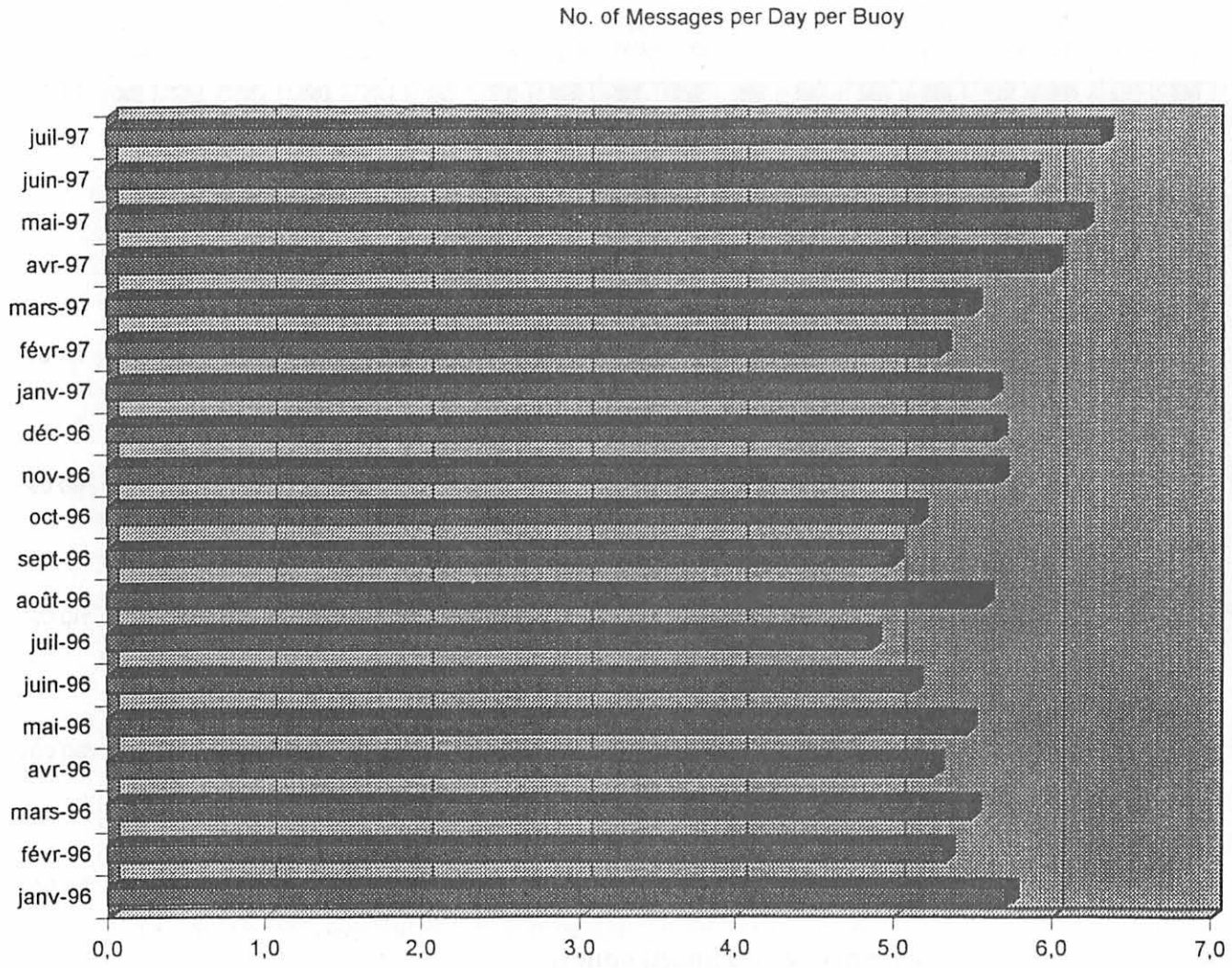

No. of Messages per Day per Buoy
juil-97
juin-97
mai-97
avr-97
mars-97
févr-97
janv-97
déc-96
nov-96
oct-96
sept-96
août-96
juil-96
juin-96
mai-96
avr-96
mars-96
févr-96
janv-96
0,0
1,0
2,0
3,0
4,0
5,0
6,0
7,0

Figure 5

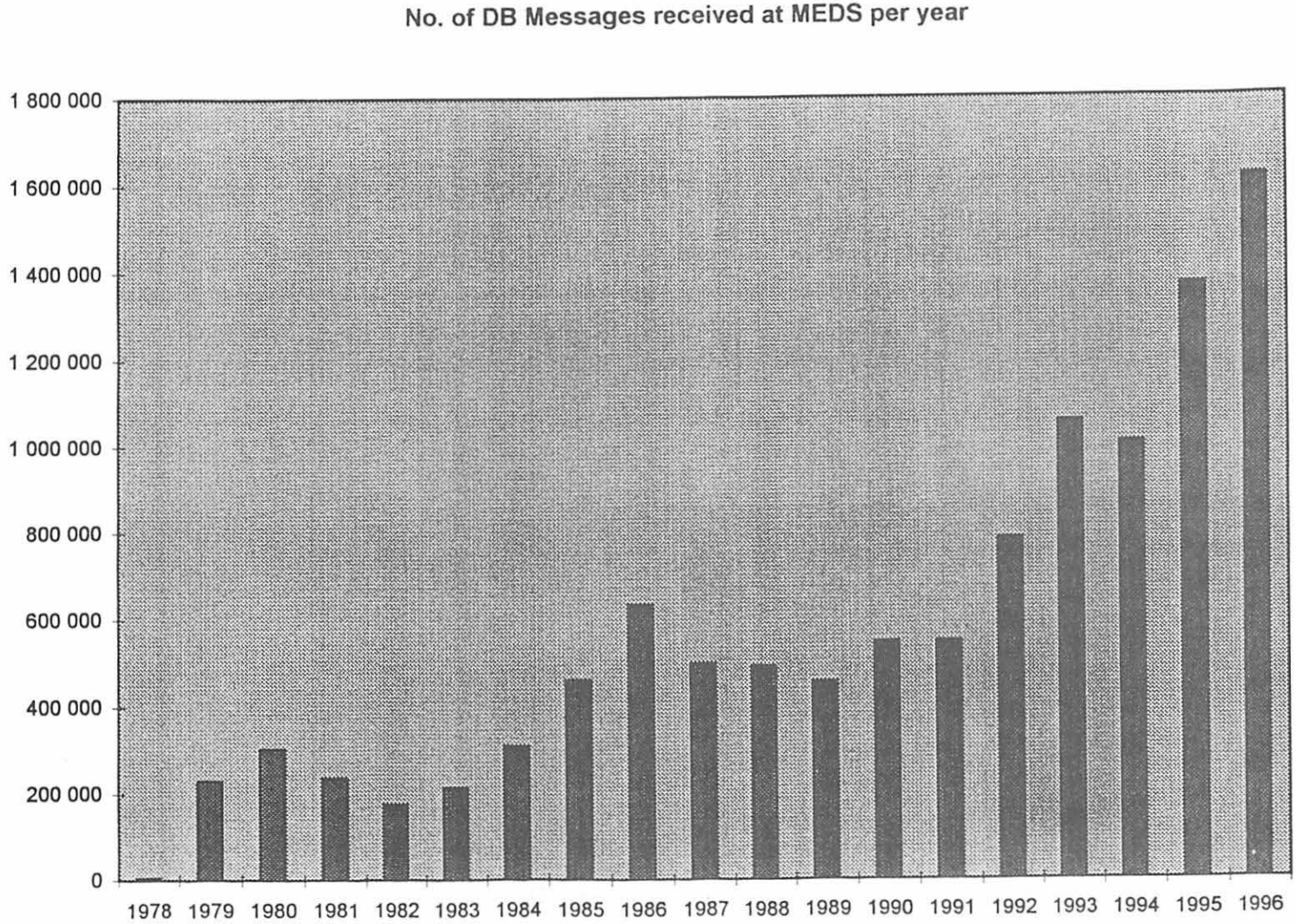
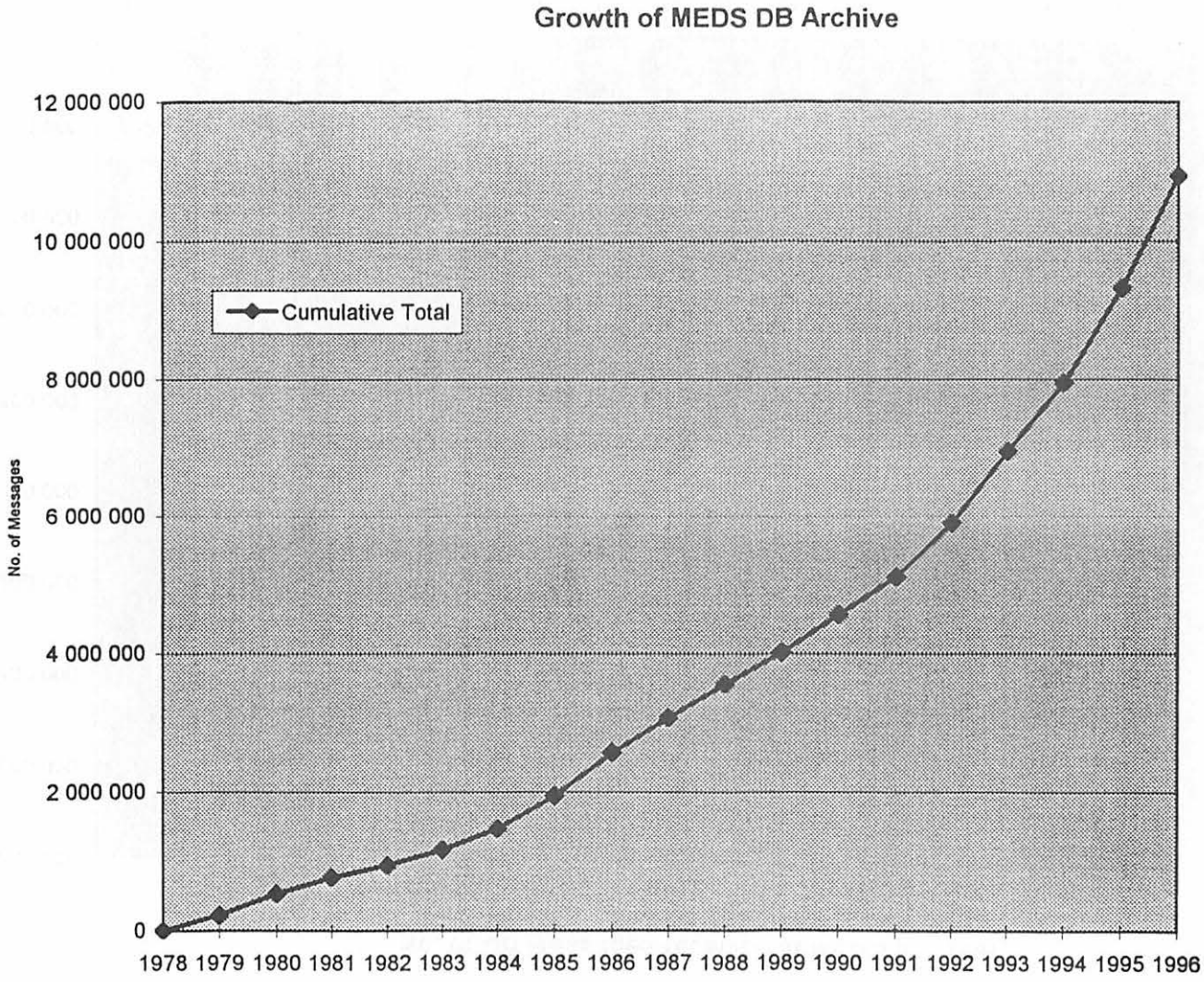

No. of DB Messages received at MEDS per year
1 800 000
1 600 000
1 400 000
1 200 000
1 000 000
800 000
600 000
400 000
200 000
0
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996

Figure 6


Growth of MEDS DB Archive
12 000 000
10 000 000
8 000 000
6 000 000
4 000 000
2 000 000
0
No. of Messages
Cumulative Total
1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996

SOC for Drifting Buoy Report

1996-1997

A daily collection and archiving of buoy reports from the world ocean is performed by the French Meteorological service.

As usual the french SOC produces monthly graphic products for buoys, moored buoys, drifting buoys, ships.

Figures 1, 2, 3, 4, show the time evolution of reports for wind (direction and speed) and for pressure respectively for all buoys, moored buoys, drifting buoys and ships since the 1st of January 1996.

Figure 5 shows the time evolution of waveobs reports since the 1st of January 1997.

Each month mapping position plot charts and Marsden square distribution are produced for Buoys and Ships and are sent to 70 users in the world. Figures 6, 7, 8, 9 show products for June 1997.

Each month Marsden square distribution chart of mean monthly data availability (top) and Percentage of Buoy reports compared to Ship + Buoy reports (bottom) for wind, pressure, air temperature, sea surface temperature are produce, Figures 10, 11, 12, 13 show products for June 1997.

French SOC Representative
Joël POITEVIN

email : joël.poitevin@meteo.fr

Time evolution of BUOY reports for wind and pressure

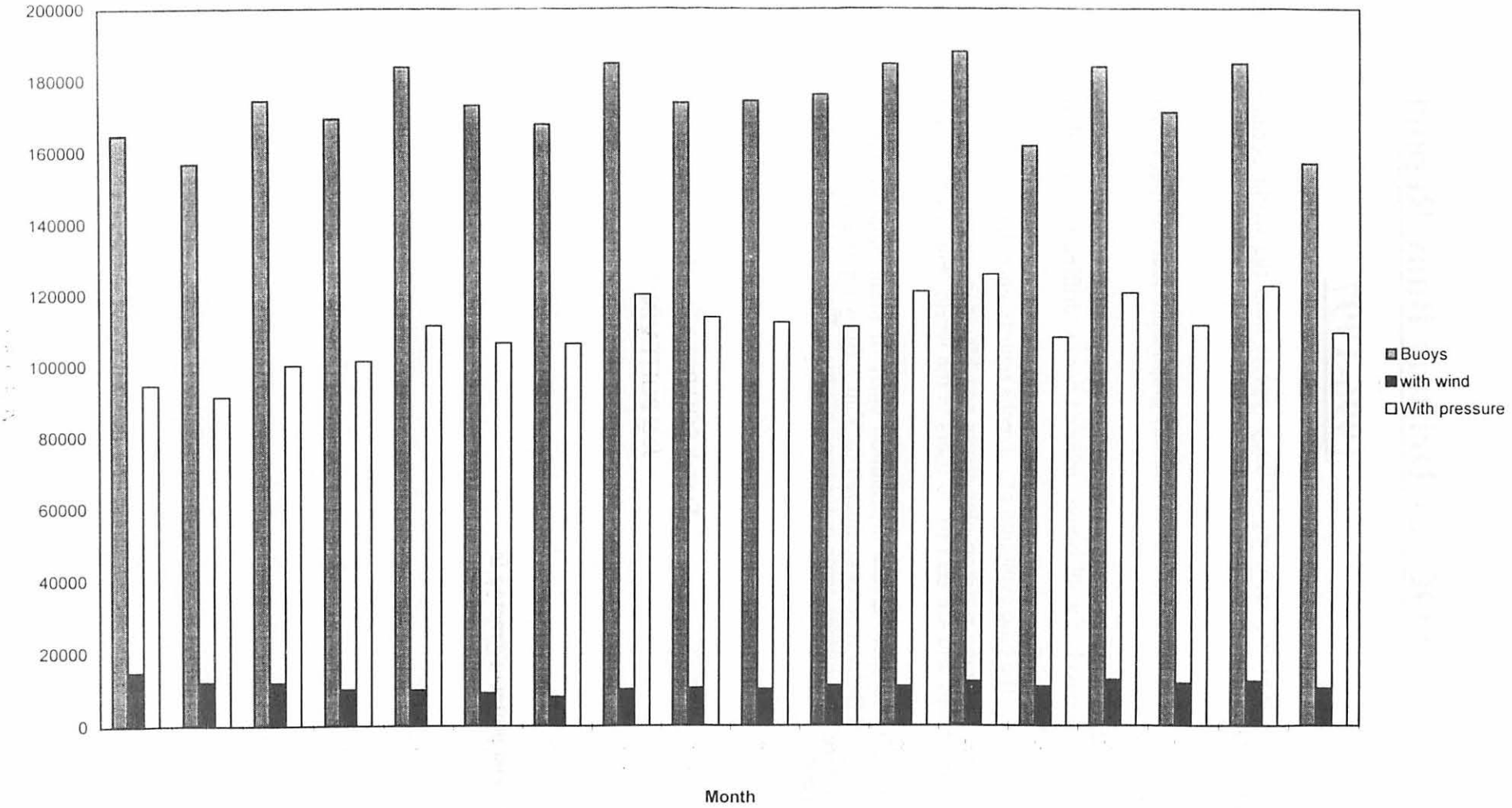


Figure 1

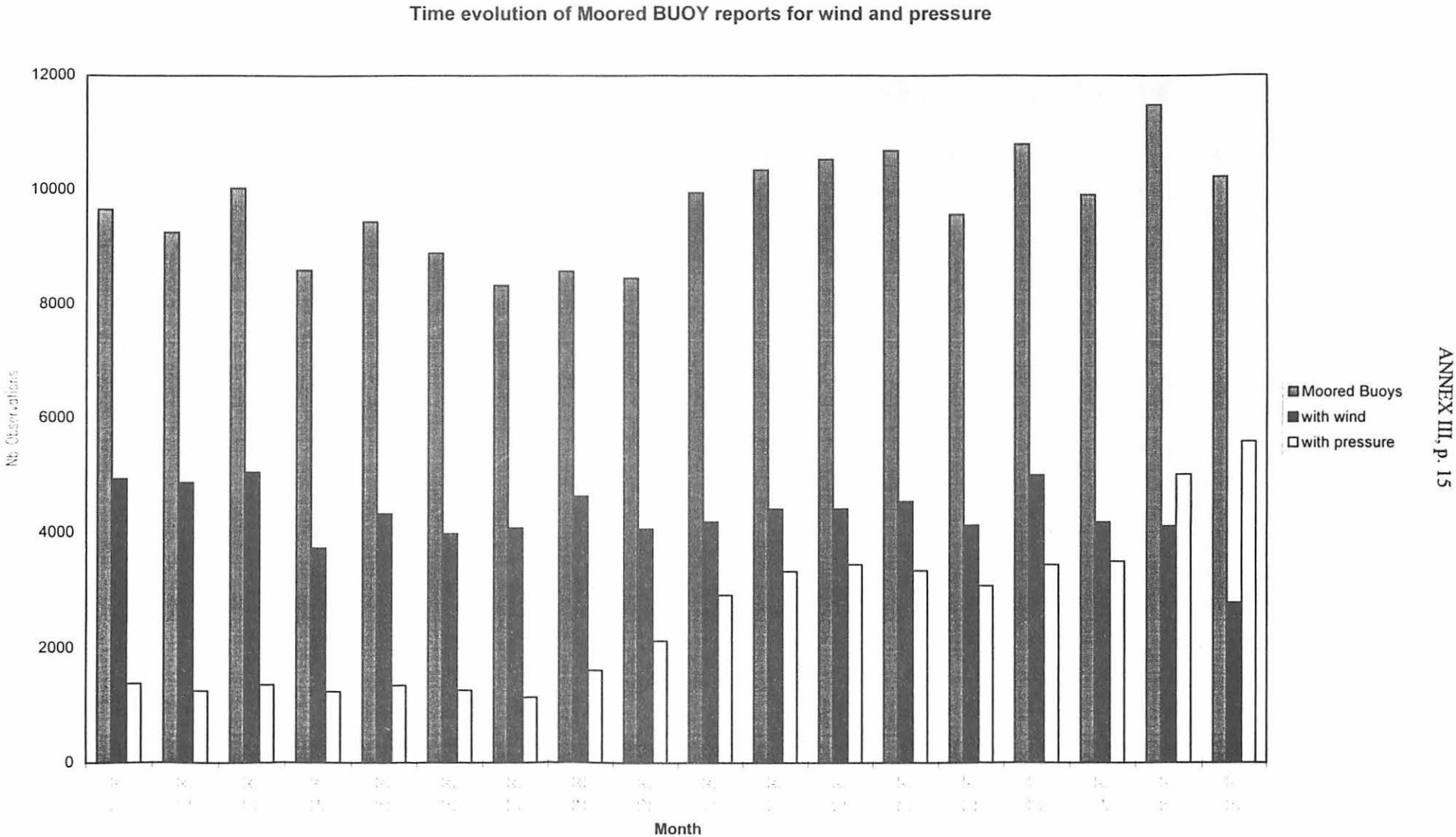

Time evolution of Moored BUOY reports for wind and pressure
12000
10000
8000
6000
4000
2000
0
Nb Observations
Month
Moored Buoys
with wind
with pressure

Figure 2

Time evolution of Drifting BUOY reports for wind and pressure

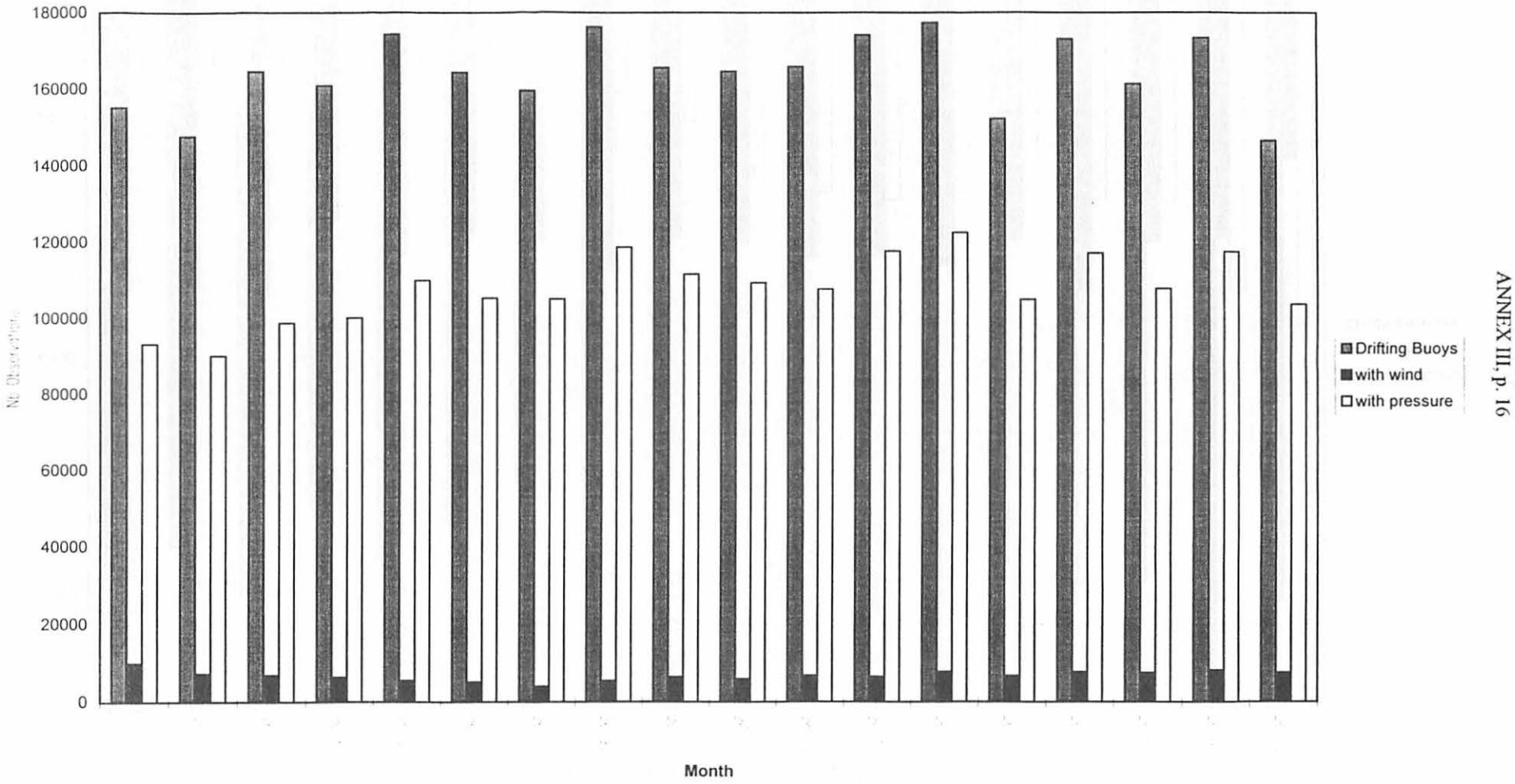


Figure 3

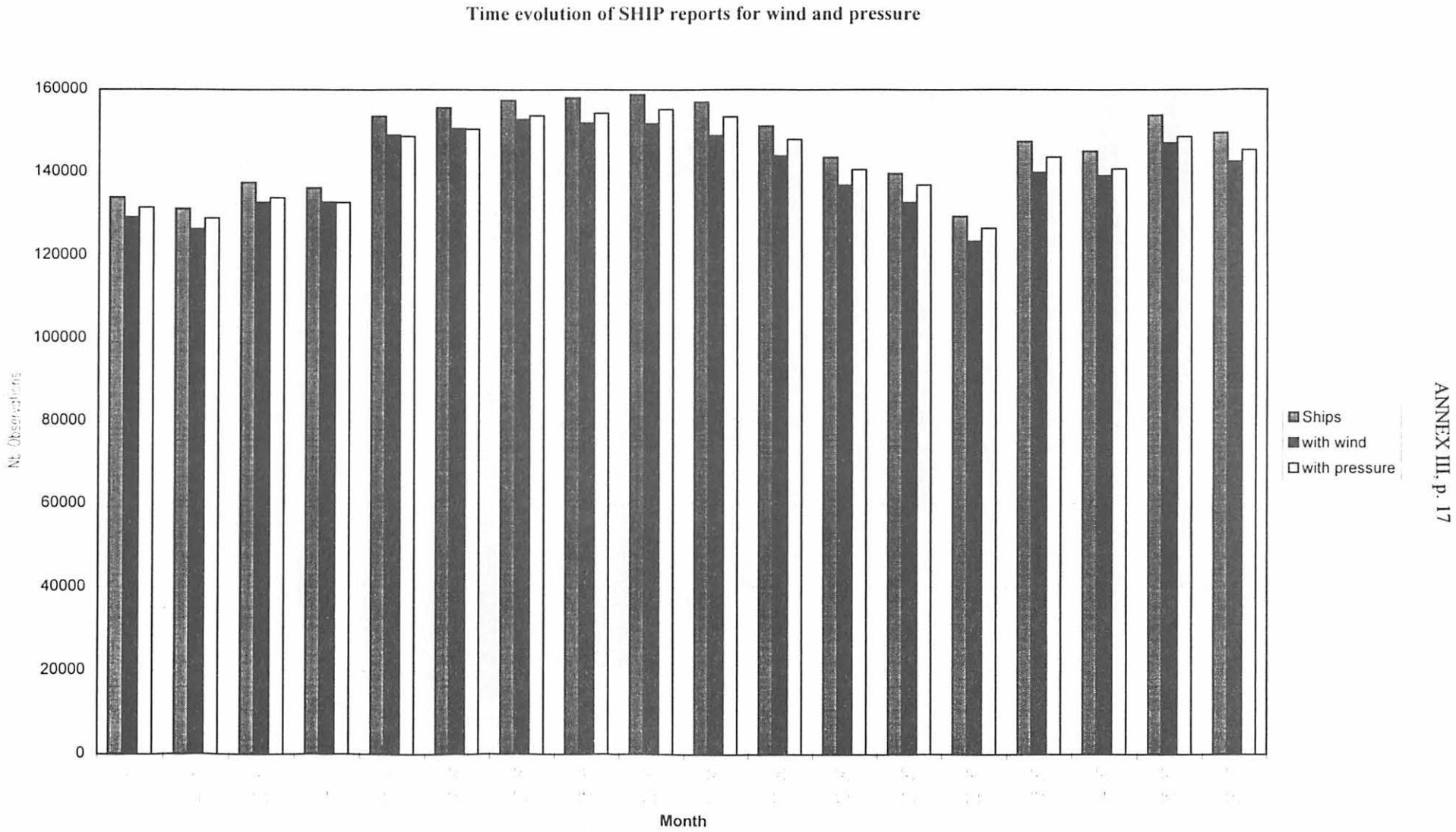

Time evolution of SHIP reports for wind and pressure
160000
140000
120000
100000
80000
60000
40000
20000
0
Nb Observations
Month
Ships
with wind
with pressure

Figure 4

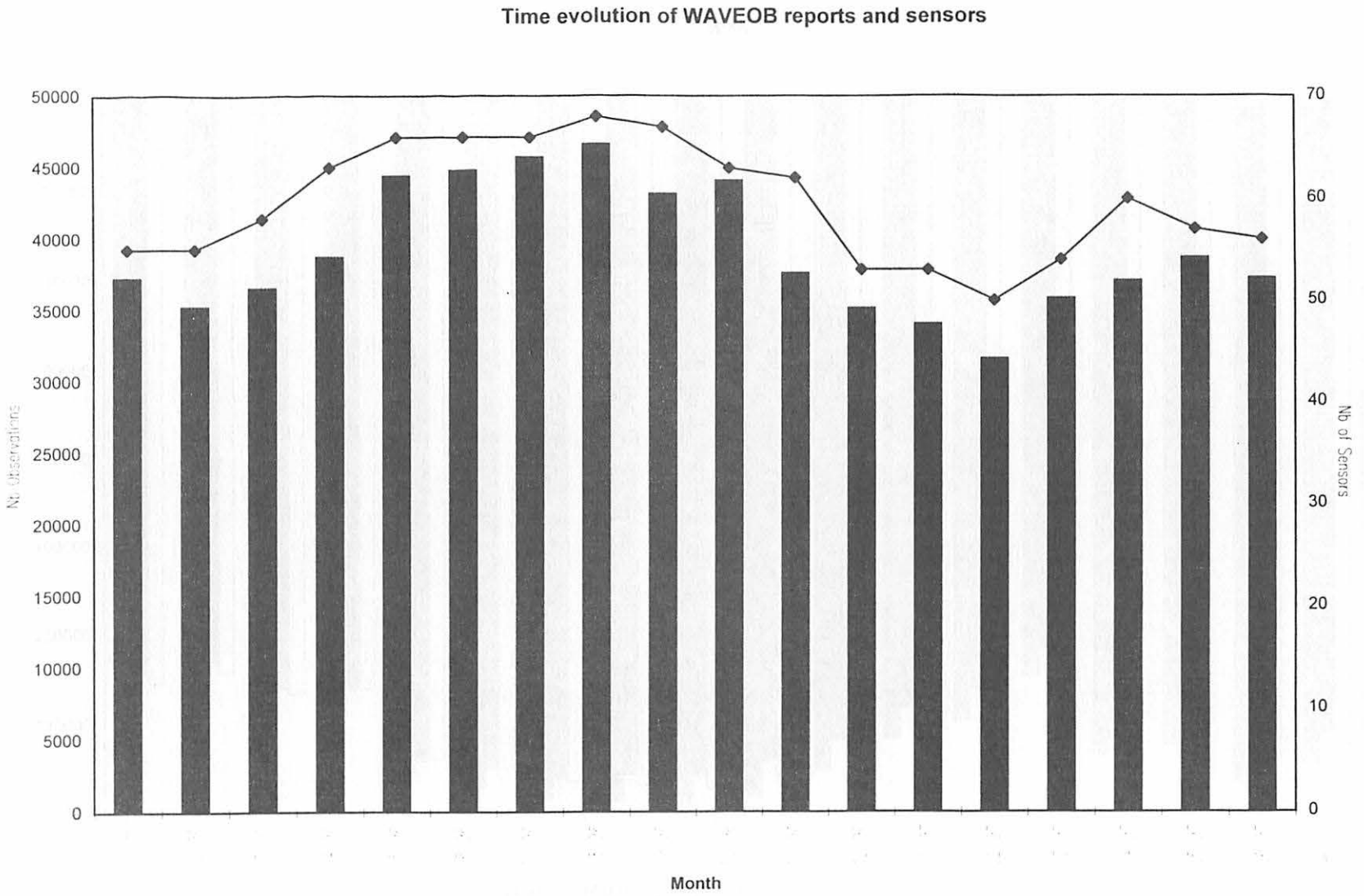

Time evolution of WAVEOB reports and sensors
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
70
60
50
40
30
20
10
0
Nb of Sensors
Waveob
Sensors
Month

Figure 5

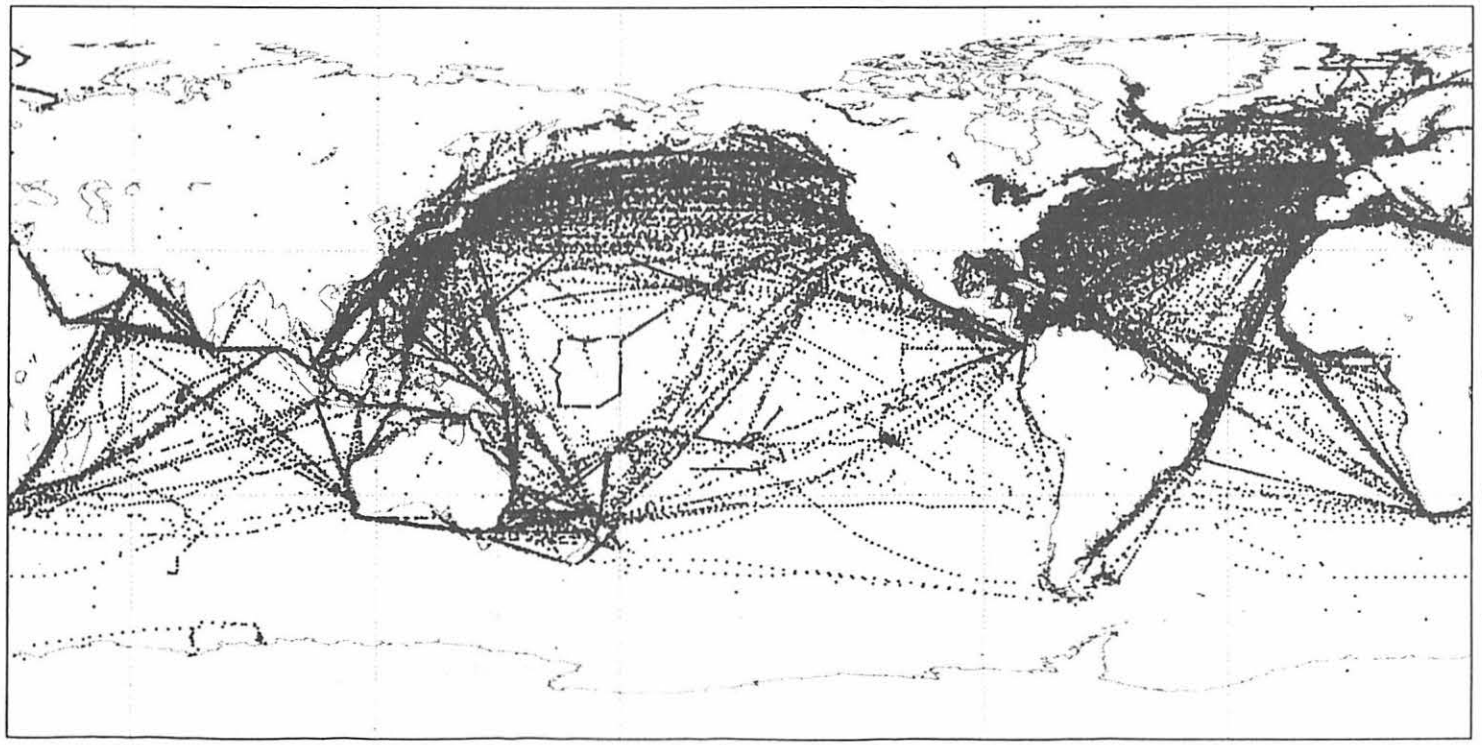
METEO FRANCE

METEO-FRANCE SMISO

Carte de pointage des observations recues en Juin 1997

Mapping position plot chart of data received during June 1997

Messages : SHIP **Total : 149589**



MAGICS 4.2 Solaris - mpma497 - 4 July 1997 10:38:04

Figure 6

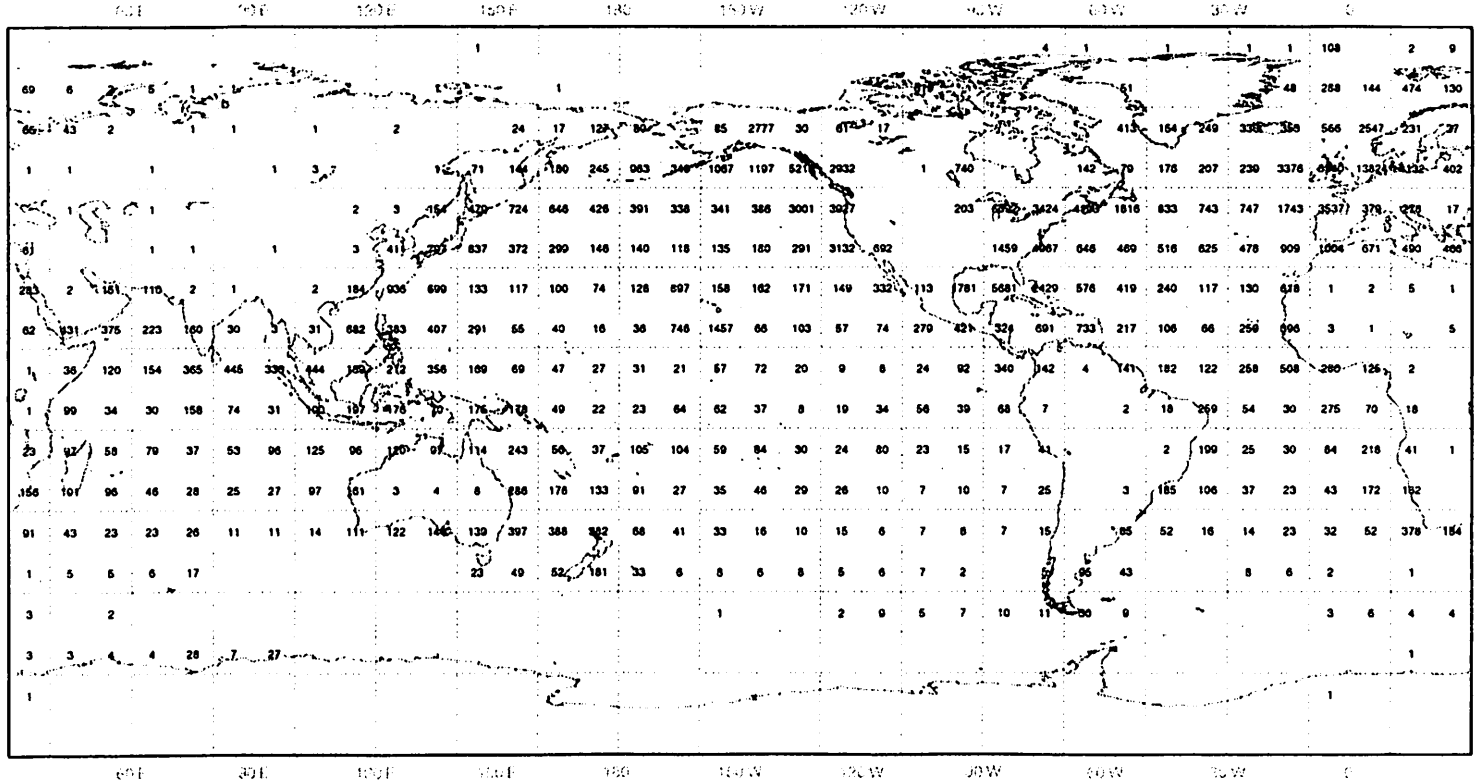
METEO FRANCE

METEO-FRANCE SMISO

Repartition par carre Marsden des observations recues en Juin 1997

Marsden square distribution chart of data received during June 1997

Messages : SHIP **Total : 149589**



MAGICS 4.2 Solaris - mpma497 - 4 July 1997 10:38:56

Figure 7

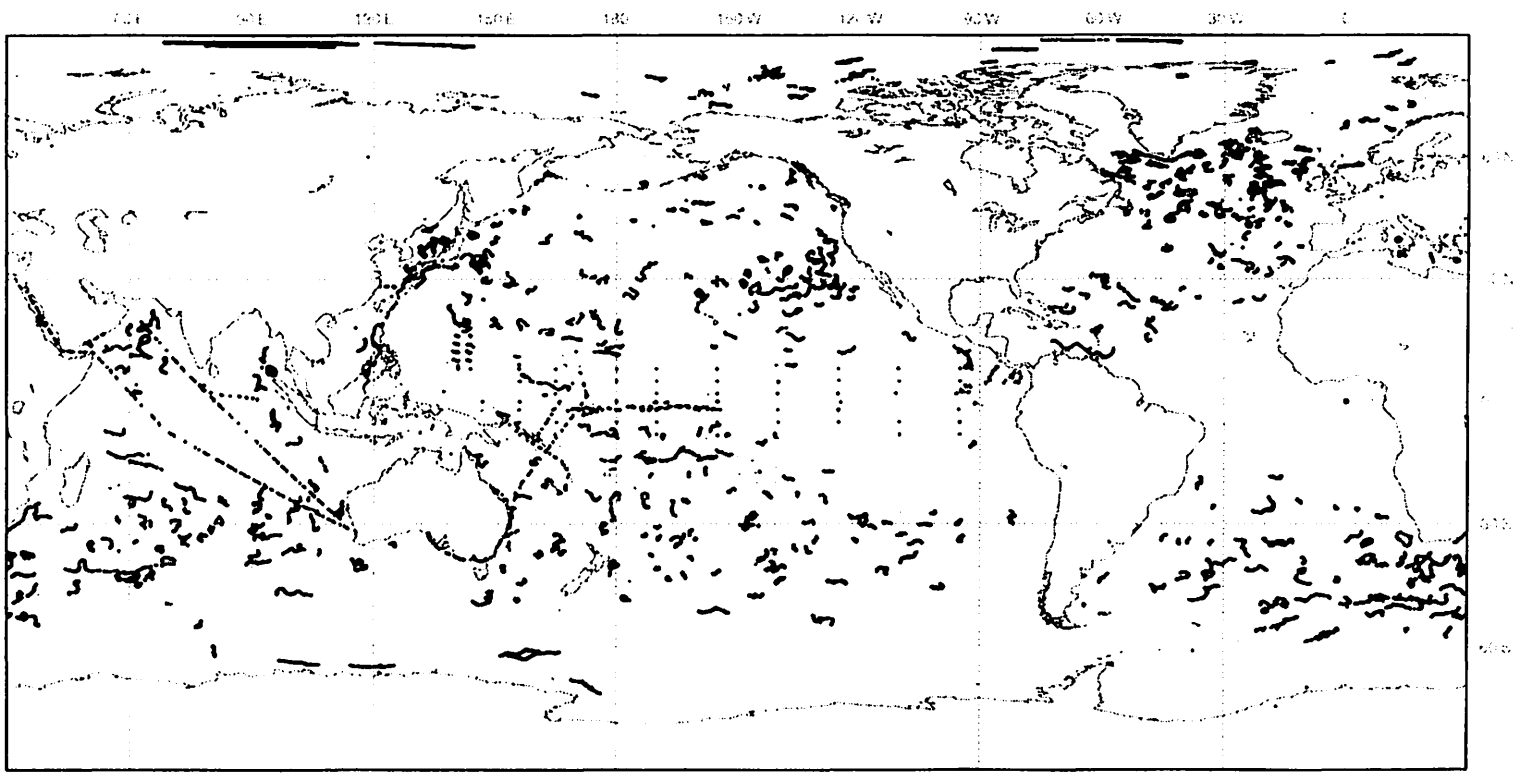
METEO FRANCE

METEO-FRANCE SMISO

Carte de pointage des observations recues en Juin 1997

Mapping position plot chart of data received during June 1997

Messages : BUOY **Total : 156856**



MAGICS 4.2 Solaris - mpma497 - 4 July 1997 10:29:22

Figure 8

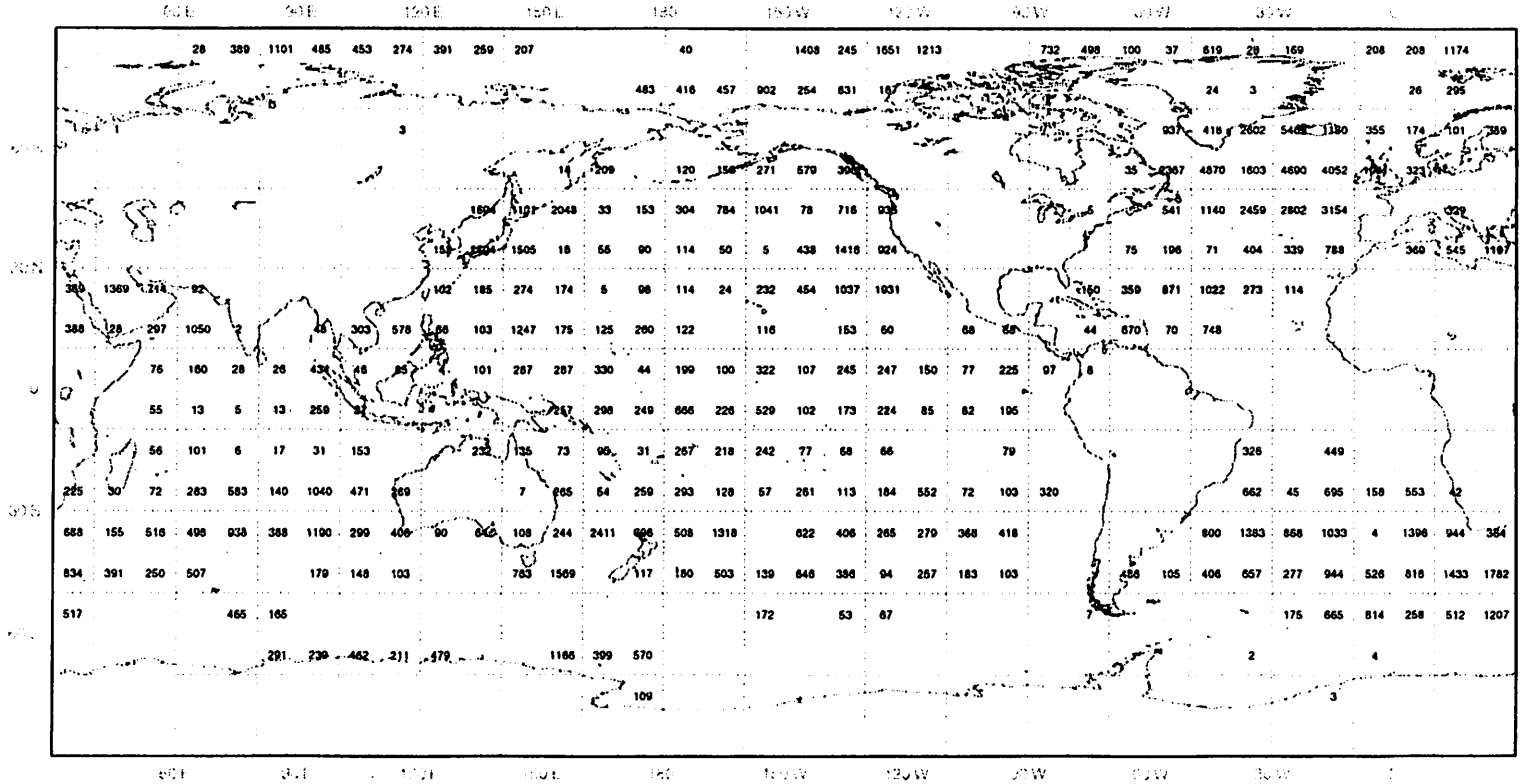
METEO FRANCE

METEO-FRANCE **SMISO**

Repartition par carre Marsden des observations recues en Juin 1997

Marsden square distribution chart of data received during June 1997

Messages : BUOY **Total : 156856**



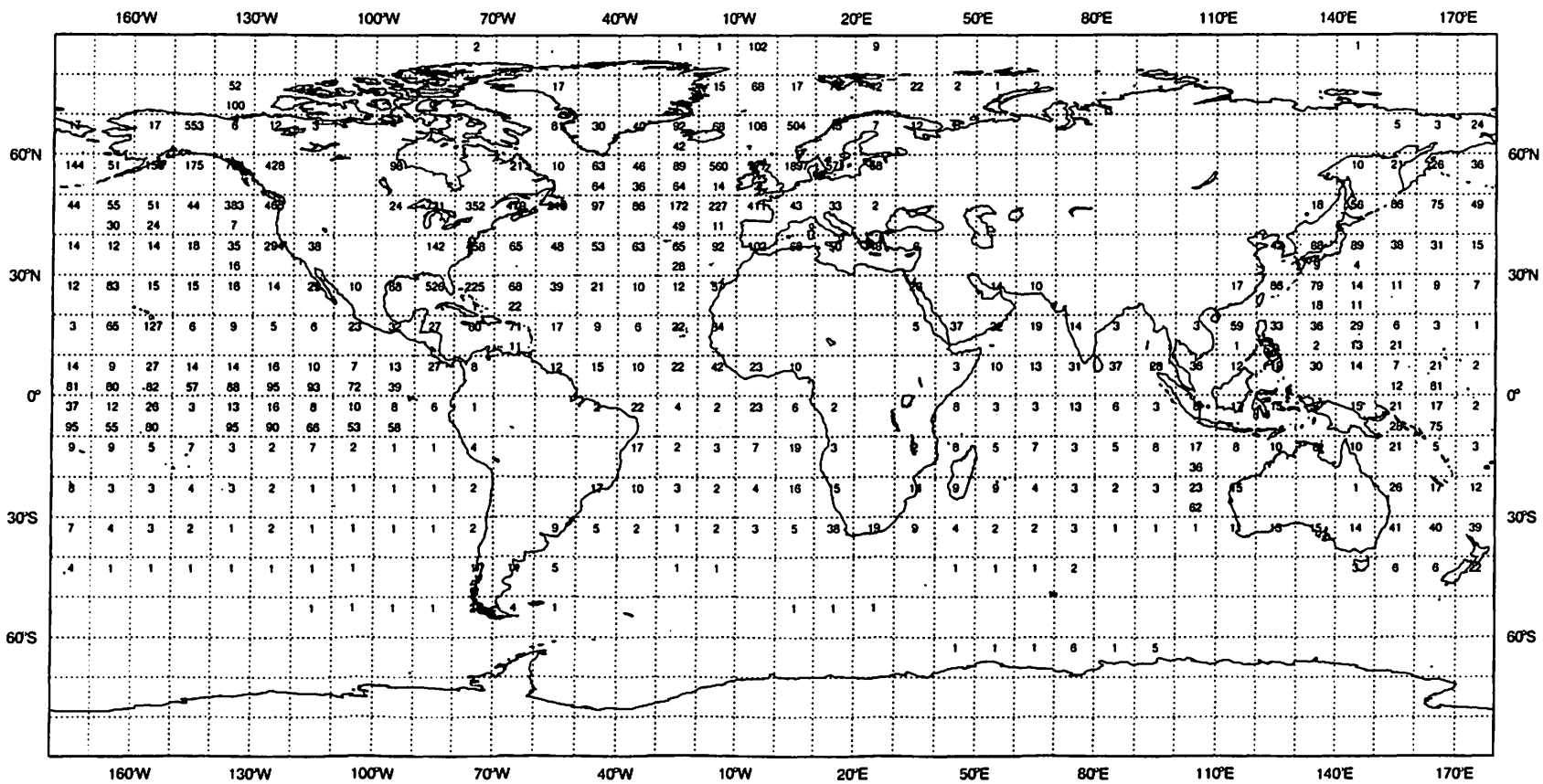
MAGICS 4.2 Solaris - mpma497 - 4 July 1997 10:30:39

Figure 9

METEO FRANCE

METEO - FRANCE **WIND** **JUNE 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)



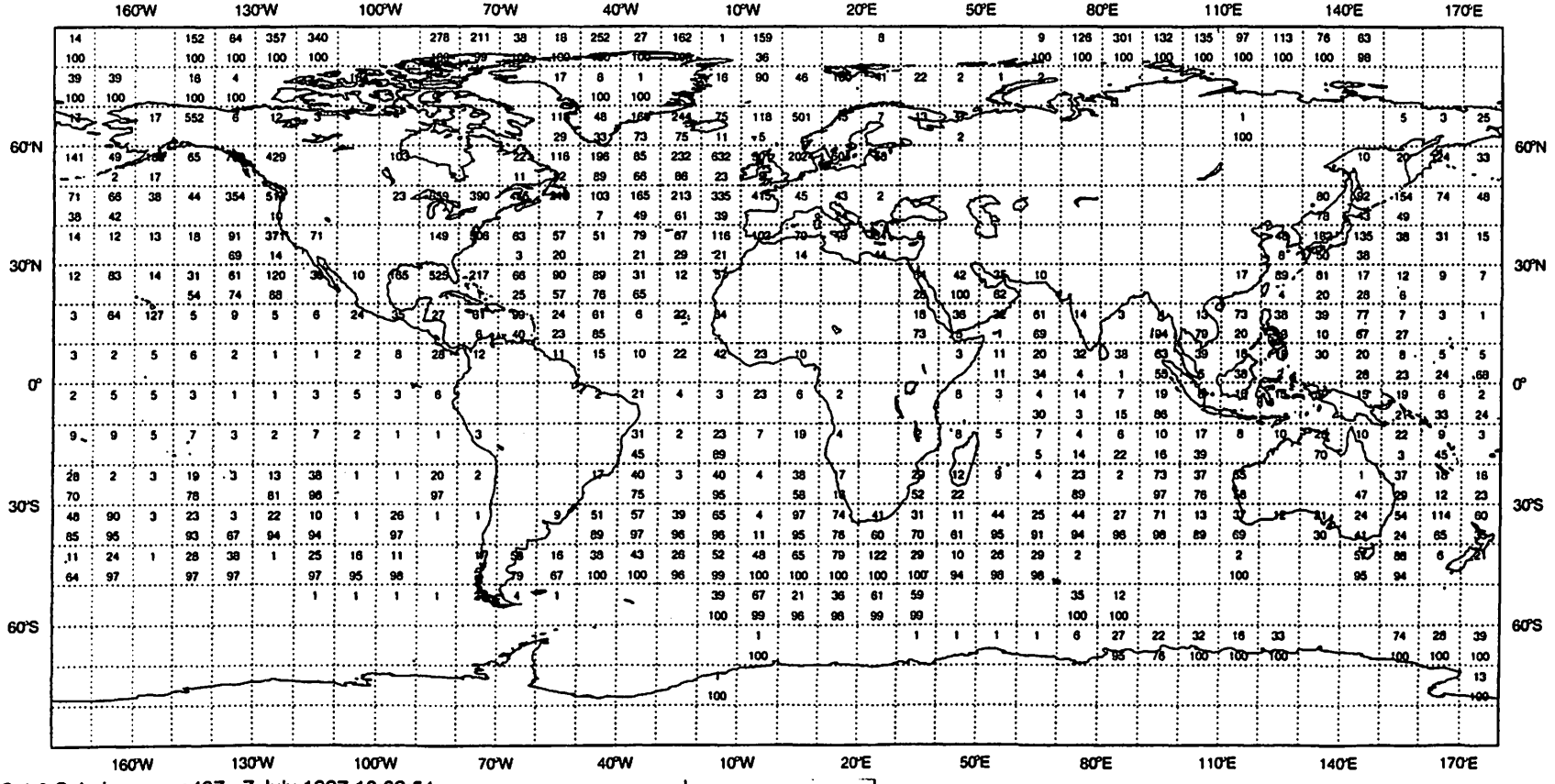
MAGICS 4.2 Solaris - mpma497 - 7 July 1997 10:03:05

Figure 10

METEO FRANCE

METEO - FRANCE **PRESSURE** **JUNE 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)



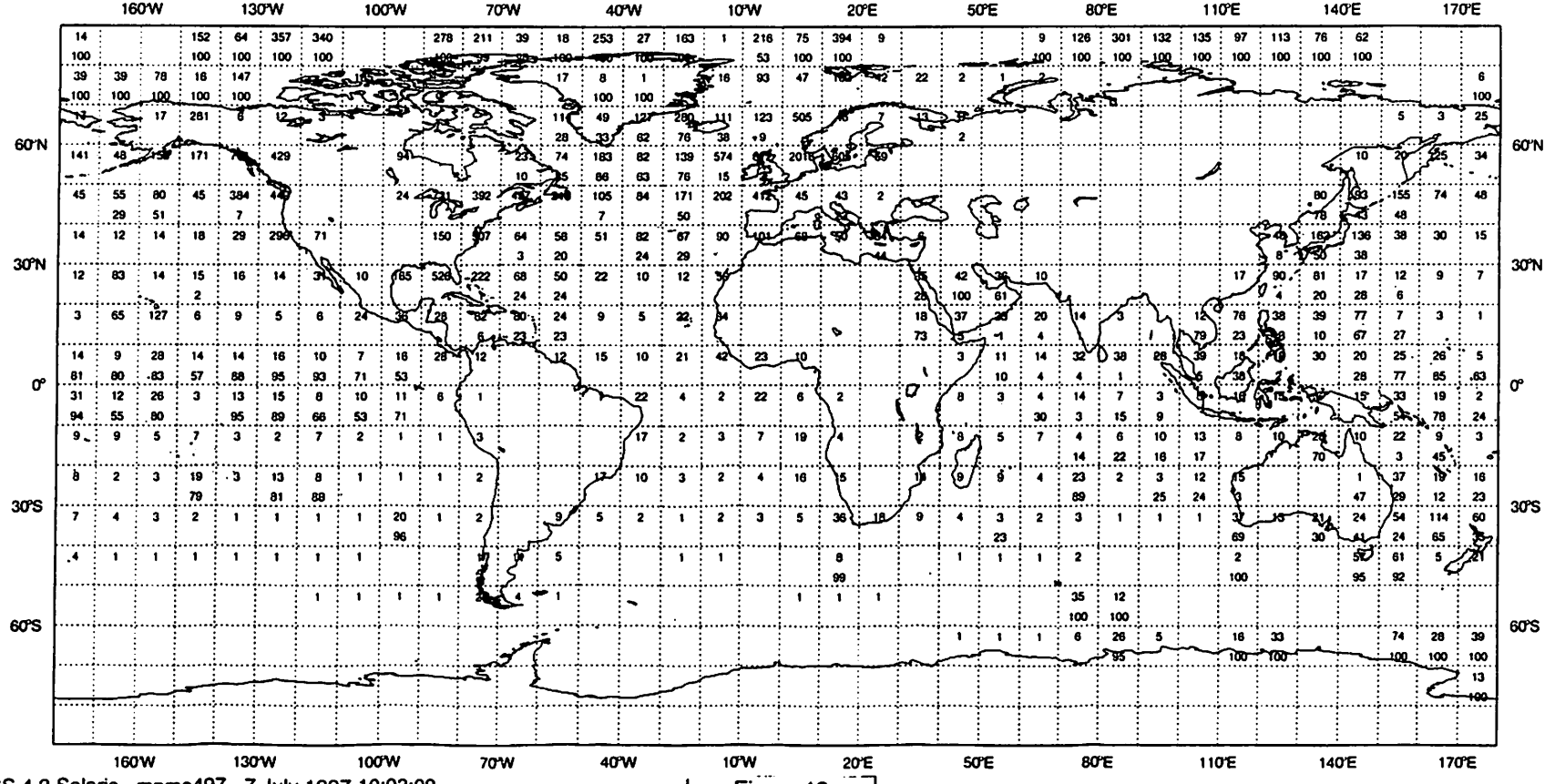
MAGICS 4.2 Solaris - mpma497 - 7 July 1997 10:02:54

Figure 11

METEO FRANCE

METEO - FRANCE **TEMPERATURE** **JUNE 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)



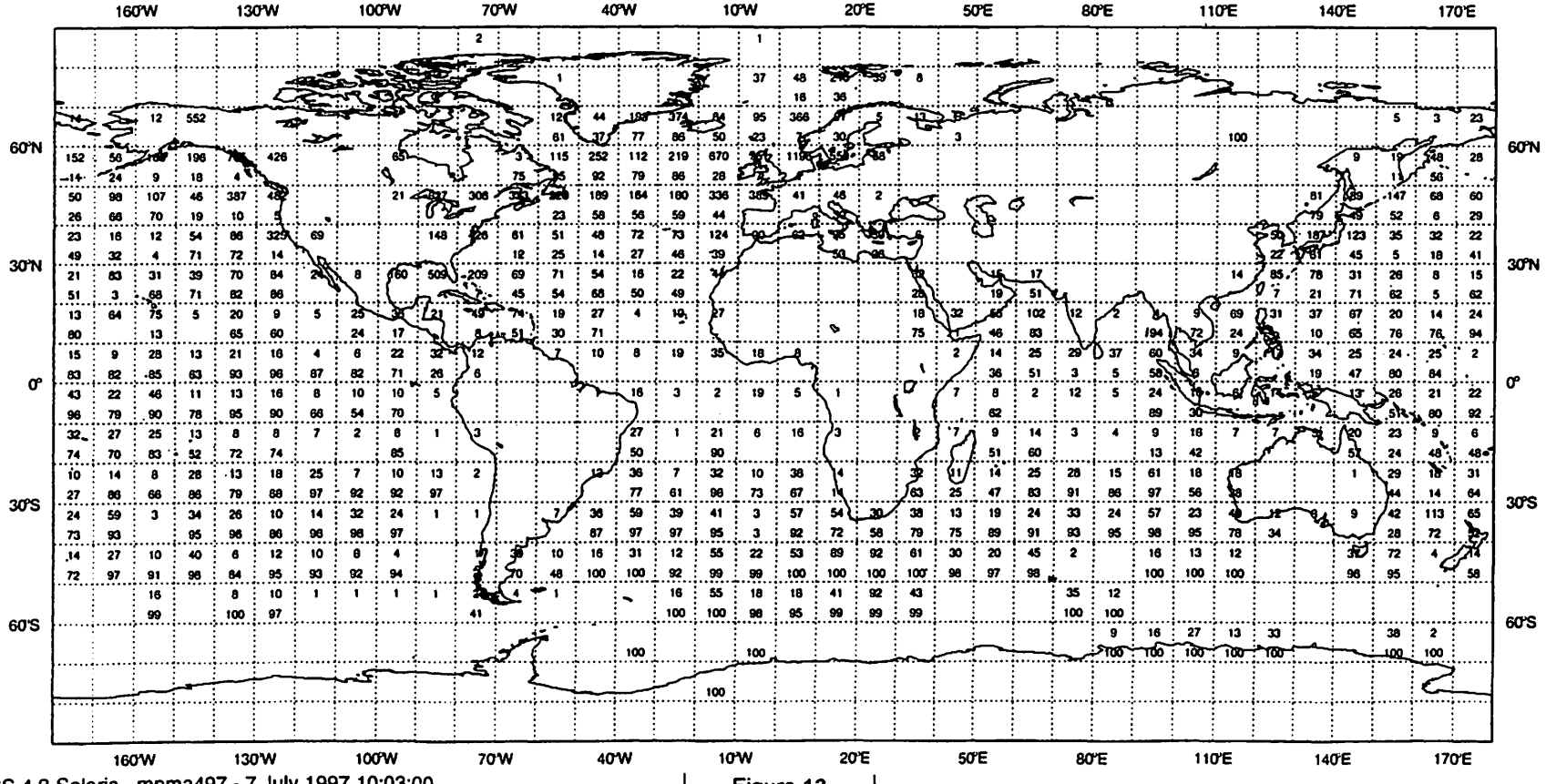
MAGICS 4.2 Solaris - mpma497 - 7 July 1997 10:03:09

Figure 12

METEO FRANCE

METEO - FRANCE **SEA SURFACE TEMPERATURE** **JUNE 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 - 7 July 1997 10:03:00

Figure 13

ANNEX IV

Programmes allowing data distribution over the GTS in December 1997

List of Argos programmes allowing data distribution on GTS, valid for December 1997 and name of the Principal GTS Coordinator (PGC, designated by the Principal Investigator) responsible for asking Service Argos to make changes on GTS platform status.

Program: 29 Experiment: IABP Owner: NPI NORW
ICE DRIFT EXPERIMENT (ICEX)
PGC:Dr. Torgny Vinje
NORWEGIAN POLAR INSTITUTE
Telephone:(+47) 2 12 36 50 Telefax:(+47) 2 12 38 54 (NPI)
Telemail :FAX: 194722959501 Country:NORW

Program: 44 Experiment: Owner: METEO_FRANCE FRAN
SEMAPHORE
PGC:Pierre Blouch
METEO FRANCE
Telephone:(+33) 98 22 44 54 Telefax:(+33) 98 05 04 73 (METEO_FRANCE)
Telemail :PIERRE.BLOUCH@METEO.FR Country:FRAN

Program: 46 Experiment: Owner: INTL_ICE_PAT USA
USCG DRIFT BUOYS
PGC:Don Murphy
US COAST GUARD, INTERNATIONAL ICE PATROL
Telephone:(203)441-2631 Telefax: (INTL_ICE_PAT)
Telemail :d.murphy/iip@cgsmtp.uscg.mil Country:USA

Program: 76 Experiment: Owner: BIO CANA
ENVIRONMENT MONITORING
PGC:Lawrence
Bedford Institute of Oceanography
Telephone:(902)426-2431 Telefax: (BIO)
Telemail :BEDFORD.INST Country:CANA

Program: 85 Experiment: Owner: ABOM AUST
AUSTRALIAN DRIFTING BUOYS
PGC:Graham Jones, Tony Baxter
AUSTRALIAN BUREAU OF METEOROLOGY
Telephone:(+61) 39669 41 67 Telefax:(+61) 39669 4168 (ABOM)
Telemail :g.jones@bom.gov.au Country:AUST

Program: 86 Experiment: Owner: ABOM AUST
AUSTRALIAN AUTOMATIC WEATHER STATIONS
PGC:Graham Jones, Tony Baxter
AUSTRALIAN BUREAU OF METEOROLOGY
Telephone:(+61) 39669 41 67 Telefax:(+61) 39669 4168 (ABOM)
Telemail :g.jones@bom.gov.au Country:AUST

Program: 88 Experiment: Owner: UN_WISC USA
ANTARCTIC AUTOMATIC WEATHER STATIONS
PGC:STEARNS; Prof. Charles R.
UNIVERSITY OF WISCONSIN
Telephone:(608)262-0780 Telefax: (UN_WISC)
Telemail :AWS@MACC.WISC.EDU chucks@ssec.wisc.edu Country:USA

Program: 129 Experiment: GDP Owner: NOAA/AOML USA
EPOCS - LUS
PGC:Mayra Pazos
ATLANTIC OCEANOGRAPHIC AND METEOROLOGICAL LABORATORY
Telephone:(+1) 305 361 44 22 Telefax:(+1) 305 361 45 82 (NOAA/AOML)
Telemail :PAZOS@AOML.NOAA.GOV Country:USA

Program: 221 Experiment: GDP Owner: MSA JAPA
KURUSHIO CURRENT
PGC:Iwao Nogushi (Director of the Ocean Surveys Division, HD)
MARITIME SAFETY AGENCY, Hydrographic Department
Telephone:03-541-3811 X605 Telefax:03 545 2885 (MSA)
Telemail :T.MORI Country:JAPA

Program: 243 Experiment: GDP Owner: SAWB AFS
SAWBEX
PGC:Piet Le Roux
SOUTH AFRICAN WEATHER BUREAU
Telephone:(+27) 12 290 2998 Telefax:(+27)122902170, 3031 (SAWB)
Telemail :pleroux@cirrus.sawb.gov.za Country:AFS

Program: 271 Experiment: GDP Owner: IFREMER FRAN
FOCAL DRIFTERS
PGC:Pierre Blouch
METEO FRANCE
Telephone:(+33) 98 22 44 54 Telefax:(+33) 98 05 04 73 (METEO_FRANCE)
Telemail :PIERRE.BLOUCH@METEO.FR Country:FRAN

Program: 282 Experiment: IABP Owner: US_NAVY USA
AIR SEA
PGC:Deborah Bird
U.S. NAVAL OCEANOGRAPHIC OFFICE
Telephone:(601)688-4242 Telefax: (US_NAVY)
Telemail :dbird@navo.hpc.mil Country:USA

Program: 314 Experiment: Owner: NMI NORW
SEANOR
PGC:Knut Bjorheim
NORWEGIAN METEOROLOGICAL INSTITUTE
Telephone:(+47) 2 60 50 90 Telefax:(+47) 2 69 25 15 (NMI)
Telemail :(19 47) 22963050 Country:NORW

Program: 323 Experiment: GDP Owner: AES CANA
PACIFIC PAPA
PGC:A. L. Lukawesky
Environment Canada
Telephone:(403) 951 8814 Telefax:(403) 468 79 50 (AES)
Telemail : Country:CANA

Program: 336 Experiment: GDP Owner: NIO INDI
COLLECTION OF METOCEAN DATA IN INDIA OCEAN
PGC:GANGADHARA RAO
NATIONAL INSTITUTE OF OCEANOGRAPHY
Telephone:6253 (PANAJI) Telefax:(+91) 832 46 12 (NIO)
Telemail :19 91 832 223 340 Country:INDI

Program: 366 Experiment: Owner: AD-DST AUST
ANTARCTIC SURFACE METEOROLOGICAL PROCESSES
PGC:MORRISSY JOHN
ANTARCTIC DIVISION - DEPARTMENT SCIENCE AND TECHNOLOGY
Telephone:(002)29-0209 Telefax:223/62616 (AD-DST)
Telemail :JOHN_MOR@ANTDIV.GOV.AU Country:AUST

Program: 395 Experiment: Owner: NOAA/NDBC USA
TROPICAL OCEAN GLOBAL ATMOSPHERE (TOGA EXPERIMENT)
PGC:Mike Burdette
National Data Buoy Center
Telephone:(+1) 601 688 28 68 Telefax:(+1) 601 494 31 53 (NOAA/NDBC)
Telemail :MBURDETTE@NDBC.NOAA.GOV Country:USA

Program: 411 Experiment: GDP Owner: IOS CANA
OCEAN SEARCH
PGC:Dr. Richard E. Thomson
INSTITUTE OF OCEAN SCIENCES
Telephone:(604)363 6514 Telefax:(604) 363 6479 (IOS)
Telemail :IOS.BC Country:CANA

Program: 428 Experiment: Owner: NMI NORW
SOBA NW
PGC:Knut Bjorheim
NORWEGIAN METEOROLOGICAL INSTITUTE
Telephone:(+47) 2 60 50 90 Telefax:(+47) 2 69 25 15 (NMI)
Telemail :(19 47) 22963050 Country:NORW

Program: 435 Experiment: Owner: METEO_FRANCE FRAN
FRENCH MET DRIFTING BUOYS
PGC:Pierre Blouch
METEO FRANCE
Telephone:(+33) 98 22 44 54 Telefax:(+33) 98 05 04 73 (METEO_FRANCE)
Telemail :PIERRE.BLOUCH@METEO.FR Country:FRAN

Program: 436 Experiment: EGOS Owner: KNMI NL
SOBA NETHERLANDS
PGC:Lars Golmen
NIVA
Telephone:(+47) 55 32 56 40 Telefax:(+47) 55 32 88 83 (NIVA)
Telemail :Lars.Golmen@Niva.no Country:NORW

Program: 466 Experiment: GDP Owner: SACLANT ITAL
EXPARGOS
PGC:STROEBEL FREDERICO
NATO SACLANT ASW RESEARCH CENTER
Telephone:0187-540111 Telefax:AX 19391875246 (SACLANT)
Telemail :FAX 1939187524600 Country:ITAL

Program: 470 Experiment: Owner: NOAA/NDBC USA
DRIFTER RAPID RESPONSE
PGC:Larry Clayton
NATIONAL DATA BUOY CENTER
Telephone:(601)688-1818 Telefax: (NOAA/NDBC)
Telemail :dscally@ndbc.noaa.gov Country:USA

Program: 476 Experiment: Owner: NZMS NZ
NEW ZEALAND DRIFTING BUOYS
PGC:Julie Fletcher
NEW ZEALAND METEOROLOGICAL SERVICE
Telephone:(+64) 4 29 732 37 Telefax:(+64) 4 29 735 68 (NZMS)
Telemail : Country:NZ

Program: 484 Experiment: EGOS Owner: UKMO UK
SOBA U.K.
PGC:Lars Golmen
NIVA
Telephone:(+47) 55 32 56 40 Telefax:(+47) 55 32 88 83 (NIVA)
Telemail :Lars.Golmen@Niva.no Country:NORW

Program: 557 Experiment: IABP Owner: UN_WASH USA
OPERATIONAL ARCTIC BUOY PROGRAM 2
PGC:Roger Colony
UNIVERSITY OF WASHINGTON
Telephone:(206)543-6613 Telefax:(206) 543 6785 (UN_WASH)
Telemail :igr@apl.washington.edu Country:USA

Program: 588 Experiment: EGOS Owner: IMO ICEL
ICELAND METEOROLOGICAL BUOYS
PGC:Lars Golmen
NIVA
Telephone:(+47) 55 32 56 40 Telefax:(+47) 55 32 88 83 (NIVA)
Telemail :Lars.Golmen@Niva.no Country:NORW

Program: 599 Experiment: Owner: US_NAVY USA
OCEANOGRAPHIC INTERACTION DRIFTER EXPERIMENT
PGC:Deborah Bird
U.S. NAVAL OCEANOGRAPHIC OFFICE
Telephone:(601)688-4242 Telefax: (US_NAVY)
Telemail :dbird@navo.hpc.mil Country:USA

Program: 600 Experiment: Owner: US_NAVY USA
REMOTE CONTROL WAVE AIR SEA DRIFTER EXP.
PGC:Deborah Bird
U.S. NAVAL OCEANOGRAPHIC OFFICE
Telephone:(601)688-4242 Telefax: (US_NAVY)
Telemail :dbird@navo.hpc.mil Country:USA

Program: 626 Experiment: Owner: AES CANA
PACIFIC C-NOMAD
PGC:A.L. Lukawesky
Environment Canada
Telephone:403.951.8814 Telefax:403 468 7950 (AES)
Telemail :lukaweskyl@edm.ab.doe.ca Country:CANA

Program: 627 Experiment: Owner: AES CANA
INTERNATIONAL ARTIC BUOY PROGRAM
PGC:A. L. Lukawesky
Environment Canada
Telephone:(403) 951 8814 Telefax:(403) 468 79 50 (AES)
Telemail : Country:CANA

Program: 633 Experiment: IABP Owner: AES CANA
ICE FLOE DRIFT
PGC:FALKINGHAM; JOHN
ATMOSPHERIC ENVIRONMENT SERVICE
Telephone:(613)996-1550 (52360 Telefax:(613) 563 84 83 (AES)
Telemail :Guy: stogaitisg@aesott.am.doe.ca 613/947-1867 Country:CANA

Program: 655 Experiment: EGOS Owner: CMI NORW
SOBA
PGC:Lars Golmen
NIVA
Telephone:(+47) 55 32 56 40 Telefax:(+47) 55 32 88 83 (NIVA)
Telemail :Lars.Golmen@Niva.no Country:NORW

Program: 687 Experiment: TOGA Owner: IFREMER FRAN
XBT. TOGA IFREMER
PGC:VOITURIEZ BRUNO
IFREMER
Telephone:1-47 23 55 28 Telefax:46 48 22 48 (IFREMER)
Telemail :46 48 22 48 Country:FRAN

Program: 693 Experiment: Owner: AES CANA
ATLANTIC AND PNR
PGC:A. L. Lukawesky
Environment Canada
Telephone:403.951.8814 Telefax:(403) 468 7950or7960 (AES)
Telemail :403.468.7950 OR 7960 Country:CANA

Program: 720 Experiment: Owner: EPSHOM FRAN
ATHENA 88
PGC:Yves Camus
EPSHOM
Telephone:98221080 P24821 Telefax:98 43 18 11 (EPSHOM)
Telemail :98 22 18 64 Country:FRAN

Program: 721 Experiment: Owner: US_NAVY USA
ARCTIC/NORTH ATLANTIC DRIFTING DATA BUOY PROGRAM
PGC:Deborah Bird
U.S. NAVAL OCEANOGRAPHIC OFFICE
Telephone:(601)688-4242 Telefax: (US_NAVY)
Telemail :dbird@navo.hpc.mil Country:USA

Program: 740 Experiment: Owner: TRCF FINL
FINNARP WEATHER PROGRAM
PGC:OLLI-PEKKA
TECHNICAL RESEARCH CENTER OF FINLAND
Telephone:358-0456-5817 Telefax: (TRCF)
Telemail : Country:FINL

Program: 799 Experiment: Owner: ABOM AUST
PAB AUST BUREAU OF METEOROLOGY
PGC:Graham Jones, Tony Baxter
AUSTRALIAN BUREAU OF METEOROLOGY
Telephone:(+61) 39669 41 67 Telefax:(+61) 39669 4168 (ABOM)
Telemail :g.jones@bom.gov.au Country:AUST

Program: 815 Experiment: Owner: UN_HELSINKI FINL
PROJECT FI-5/89 (FINNARP 89)
PGC:LAUNIAINEN J.
UNIVERSITY OF HELSINKI
Telephone:35801912029 Telefax:358 9 331 025 (UN_HELSINKI)
Telemail :358 9 331 025 Country:FINL

Program: 864 Experiment: Owner: ABOM AUST
CSIRO MERCHANT SHIP XBT PROGRAM
PGC:MEYERS GARY
AUSTRALIAN BUREAU OF METEOROLOGY
Telephone:(002) 206 222 Telefax:(002) 240 530 (ABOM)
Telemail :(002) 240 530 Country:AUST

Program: 884 Experiment: WESTPAC Owner: NOAA/NDBC USA
WEST-PAC AMOS ARGOS PLATFORM (WAAP)
PGC:Mike Burdette
National Data Buoy Center
Telephone:(+1) 601 688 28 68 Telefax:(+1) 601 494 31 53 (NOAA/NDBC)
Telemail :MBURDETTE@NDBC.NOAA.GOV Country:USA

Program: 919 Experiment: Owner: AWI GER
SEA ICE PROCESSES IN POLAR REGIONS
PGC:Dr. C. Kottmeier
Alfred Wegener Institute for Polar and Marine Research
Telephone:(+49) 471 483 12 50 Telefax:(+49) 471 483 14 25 (AWI)
Telemail :ckottmei@awi-bremerhaven.de Country:GER

Program: 1016 **Experiment:** IABP **Owner:** JMSTC JAPA
ICE-OCEAN ENVIRONMENTAL BUOY (IOEB)
PGC:NAKANISHI; T
JAPAN MARINE SCIENCE AND TECHNOLOGY CENTER
Telephone:(0468)66-3811 Telefax:66 09 70 (JMSTC)
Telemail :FAX 66-0970 Country:JAPA

Program: 1053 **Experiment:** **Owner:** NIC USA
JOINT ICE CENTER
PGC:David Benner
National Ice Center
Telephone:(301) 763-7154 Telefax:(301) 763 4621 (NIC)
Telemail :dbenner@sar_ws.fb4.noaa.gov Country:USA

Program: 1109 **Experiment:** **Owner:** US_NAVY USA
TOWS PROGRAM - BUOY DEVELOPMENT
PGC:SELSOR; Harry D.
U.S. NAVY
Telephone:(601)688-4760 Telefax:(601) 688 4605 (US_NAVY)
Telemail :HS: hselsor@tows.nrlssc.navy.mil Country:USA

Program: 1155 **Experiment:** **Owner:** AD-DST AUST
SEA ICE DYNAMICS
PGC:MORRISSY JOHN
ANTARCTIC DIVISION - DEPARTMENT SCIENCE AND TECHNOLOGY
Telephone:(002)29-0209 Telefax:223/62616 (AD-DST)
Telemail :JOHN_MOR@ANTDIV.GOV.AU Country:AUST

Program: 1191 **Experiment:** **Owner:** JMA JAPA
MET/OCEAN RESEARCH
PGC:Hiroshi Eguchi
Japan Meteorological Agency
Telephone:+81-3-3212-8341 Telefax:+81 3 3211 3047 (JMA)
Telemail :JMA.OCEAN/Omnet Country:JAPA

Program: 1239 **Experiment:** GDP **Owner:** SHN ARGE
DRIFTING/BIANCHI/HIDROGRATIA NAVAL (LUS)
PGC:BIANCHI ALEJANDRO
Servicio De Hidrografia Naval
Telephone:541213091 Telefax:541 21 77 97 (SHN)
Telemail : Country:ARGE

Program: 1246 **Experiment:** **Owner:** NDRE SWED
OCEANOGRAPHIC MODELLING OF THE BALTIC SEA
PGC:BERGHULT LENNART
National Defence Research Establishment
Telephone:(19 46) 8 663 15 00 Telefax:(+46) 8 667 24 79 (NDRE)
Telemail :FAX : (19 46) 8 667 24 79 Country:SWED

Program: 1301 **Experiment:** **Owner:** UN_TASMANIA AUST
ANTARCTIC WEATHER ANALYSIS AROUND CASEY STATION
PGC:Mr. Bill Budd
Antarctic CRC
Telephone:61 02 207 867 Telefax:61 02 202 973 (UN_TASMANIA)
Telemail :61 02 202 973 Country:AUST

Program: 1325 **Experiment:** GDP **Owner:** SIO USA
GLOBAL DRIFTER OBSERVATIONS - LUS
PGC:Mayra Pazos
ATLANTIC OCEANOGRAPHIC AND METEOROLOGICAL LABORATORY
Telephone:(+1) 305 361 44 22 Telefax:(+1) 305 361 45 82 (NOAA/AOML)
Telemail :PAZOS@AOML.NOAA.GOV Country:USA

Program: 1326 Experiment: GDP Owner: UN_MIAMI USA
INDIAN OCEAN DRIFTER PROGRAM -- LUS
PGC:OLSON; Dr. Donald B.
UNIVERSITY OF MIAMI
Telephone:(305)361-4074 Telefax: (UN_MIAMI)
Telemail :dolson@rsmas.miami.edu Country:USA

Program: 1346 Experiment: GDP Owner: UN_HAWAII USA
CENTRAL PACIFIC DRIFTER ARRAY - LUS
PGC:FLAMENT PIERRE
University of Hawaii
Telephone:(808) 956-6418/6663 Telefax:(808) 956 92 25 (UN_HAWAII)
Telemail :PIERRE@SOEST.HAWAII.EDU Country:USA

Program: 1348 Experiment: GDP Owner: UN_OREGON USA
SEPARATION OF A CONTROL JET
PGC:BARTH; Jack A. Dr.
University of Oregon
Telephone:(503) 737-1607 Telefax:(503) 737 2064 (UN_OREGON)
Telemail :barth@oce.orst.edu spierce@oce.orst.edu Country:USA

Program: 1420 Experiment: GDP Owner: WHOI USA
GLOBEC : GEORGES BANK - LUS
PGC:Dr. Richard Limeburner
WOODS HOLE OCEANOGRAPHIC INSTITUTION
Telephone:508-548-1400X2539 Telefax:(508) 457 2181 (WHOI)
Telemail :RLIMEBURNER@WHOI.EDU Country:USA

Program: 1425 Experiment: GDP Owner: SIO USA
WOCE S.V.P. - LUS
PGC:Mayra Pazos
ATLANTIC OCEANOGRAPHIC AND METEOROLOGICAL LABORATORY
Telephone:(+1) 305 361 44 22 Telefax:(+1) 305 361 45 82 (NOAA/AOML)
Telemail :PAZOS@AOML.NOAA.GOV Country:USA

Program: 1426 Experiment: Owner: NOAA/NDBC USA
WIND SPEED AND DIRECTION EXPERIMENT
PGC:Mike Burdette
NATIONAL DATA BUOY CENTER
Telephone:(601)688-2422 Telefax:(601) 688 3153 (NOAA/NDBC)
Telemail :MBURDETTE@NDBC.NOAA.GOV Country:USA

Program: 1447 Experiment: Owner: DML UK
LOIS - SES
PGC:MR DAVID MELDRUM
NATURAL ENVIRONMENT RESEARCH COUNCIL
Telephone:44 16 31 62 244 Telefax:44 16 31 65 518 (DML)
Telemail :dtm@dml.ac.uk Country:UK

Program: 1448 Experiment: Owner: SIO USA
MINIMET DRIFTER DEVELOPMENT
PGC:Mayra Pazos
ATLANTIC OCEANOGRAPHIC AND METEOROLOGICAL LABORATORY
Telephone:(+1) 305 361 44 22 Telefax:(+1) 305 361 45 82 (NOAA/AOML)
Telemail :PAZOS@AOML.NOAA.GOV Country:USA

Program: 1450 Experiment: Owner: METEO_FRANCE FRAN
METEO ANTILLES
PGC:MR CHARLES MANDAR
METEO FRANCE
Telephone:590 82 26 26 Telefax:590 82 14 25 (METEO_FRANCE)
Telemail :FAX 590 89 60 75 Country:FRAN

Program: 1552 Experiment: Owner: COBRECAF FRAN
PECHE COBRECAF
PGC:MR NIVEZ
COBRECAF
Telephone:98 97 35 88 Telefax:98 97 73 33 (COBRECAF)
Telemail :98 97 73 33 FAX PECHE : 98 50 61 82 Country:FRAN

Program: 1556 Experiment: Owner: GDC USA
NWS DRIFTING BUOY PROGRAM (LUS)
PGC:Mark Bushnell
Global Drifter Center
Telephone:(305) 361-4353 Telefax:(305) 361 45 82 (GDC)
Telemail :MB: bushnell@aoml.noaa.gov Country:USA

Program: 1627 Experiment: Owner: NAVY_SCHOOL USA
MEDITERRANEAN SURFACE DRIFTER PROGRAM (NON LUS)
PGC:POULAIN; Pierre-Marie
Naval Postgraduate School
Telephone:408-656-3318 Telefax: (NAVY_SCHOOL)
Telemail :poulain@oc.nps.navy.mil Country:USA

Program: 1763 Experiment: Owner: JAPA
TRITON BUOYS TEST
PGC:A. SHOJI
Mitsubishi Heavy Industry Ltd. Kobe Shipyard & Machin. Work
Telephone:+81-78-672-5051 Telefax: ( )
Telemail : Country:JAPA

Program: 1810 Experiment: Owner: NACLS US
OCEANOGRAPHIC AND METEOROLOGICAL FORECAST IN BAJA CALIFORNIA
PGC:Dana POTTS
NACLS
Telephone:301-341-1814 Telefax: (NACLS)
Telemail : Country:US

Program: 5693 Experiment: Owner: AES CANA
MRM/AES EAST/MCNEIL
PGC:A. L. Lukawesky
Environment Canada
Telephone:403.951.8814 Telefax:(403) 468 7950or7960 (AES)
Telemail :403.468.7950 OR 7960 Country:CANA

Program: 6129 Experiment: GDP Owner: NOAA/AOML USA
ATLANTIC SUBDUCTION - LUS
PGC:Mayra Pazos
ATLANTIC OCEANOGRAPHIC AND METEOROLOGICAL LABORATORY
Telephone:(+1) 305 361 44 22 Telefax:(+1) 305 361 45 82 (NOAA/AOML)
Telemail :PAZOS@AOML.NOAA.GOV Country:USA

Program: 7129 Experiment: GDP Owner: NOAA/AOML USA
EXTENSION DU PR 129 - LUS
PGC:Mayra Pazos
ATLANTIC OCEANOGRAPHIC AND METEOROLOGICAL LABORATORY
Telephone:(+1) 305 361 44 22 Telefax:(+1) 305 361 45 82 (NOAA/AOML)
Telemail :PAZOS@AOML.NOAA.GOV Country:USA

Program: 7271 Experiment: Owner: IFREMER FRAN
CARIOCA
PGC:Gilles Reverdin
IFREMER
Telephone:(+33) 1 46 33 21 31 Telefax:AX: 01 44 27 71 59 (IFREMER)
Telemail :TEL MERLIVAT: 01 44 27 32 48 FAX: 01 44 27 71 59 Country:FRAN

Program: 8301 Experiment: Owner: UN_TASMANIA AUST
ANTARCTIC CRC DRIFTING BUOYS
PGC:Mr. Bill Budd
Antarctic CRC
Telephone:61 02 207 867 Telefax:61 02 202 973 (UN_TASMANIA)
Telemail :61 02 202 973 Country:AUST

Program: 8325 Experiment: Owner: SIO USA
SUB PROGRAM FOR 1325
PGC:Mayra Pazos
ATLANTIC OCEANOGRAPHIC AND METEOROLOGICAL LABORATORY
Telephone:(+1) 305 361 44 22 Telefax:(+1) 305 361 45 82 (NOAA/AOML)
Telemail :PAZOS@AOML.NOAA.GOV Country:USA

Program: 8556 Experiment: Owner: GDC USA
NWS DRIFTING BUOY PROGRAM (NON LUS)
PGC:Mark Bushnell
Global Drifter Center
Telephone:(305) 361-4353 Telefax:(305) 361 45 82 (GDC)
Telemail :MB: bushnell@aoml.noaa.gov Country:USA

Program: 9085 Experiment: GDP Owner: ABOM AUST
AUSTRALIAN DRIFTING BUOYS
PGC:Graham Jones, Tony Baxter
AUSTRALIAN BUREAU OF METEOROLOGY
Telephone:(+61) 39669 41 67 Telefax:(+61) 39669 4168 (ABOM)
Telemail :g.jones@bom.gov.au Country:AUST

Program: 9129 Experiment: GDP Owner: NOAA/AOML USA
EPOCS - EXPANSION - LUS
PGC:Mayra Pazos
ATLANTIC OCEANOGRAPHIC AND METEOROLOGICAL LABORATORY
Telephone:(+1) 305 361 44 22 Telefax:(+1) 305 361 45 82 (NOAA/AOML)
Telemail :PAZOS@AOML.NOAA.GOV Country:USA

Program: 9325 Experiment: GDP Owner: SIO USA
GLOBAL DRIFTER OBSERVATIONS (Non-LUS for PGM 1325)
PGC:Mayra Pazos
ATLANTIC OCEANOGRAPHIC AND METEOROLOGICAL LABORATORY
Telephone:(+1) 305 361 44 22 Telefax:(+1) 305 361 45 82 (NOAA/AOML)
Telemail :PAZOS@AOML.NOAA.GOV Country:USA

Program: 9435 Experiment: GDP Owner: METEO_FRANCE FRAN
FRENCH MET DRIFTING BUOYS
PGC:Pierre Blouch
METEO FRANCE
Telephone:(+33) 98 22 44 54 Telefax:(+33) 98 05 04 73 (METEO_FRANCE)
Telemail :PIERRE.BLOUCH@METEO.FR Country:FRAN

Program: 9482 Experiment: Owner: NOAA/PMEL USA
TAO ATLAS BUOYS - LUS
PGC:Linda Mangum
Pacific Marine Environmental Laboratory
Telephone:(206) 526 67 40 Telefax:(206) 526 67 44 (NOAA/PMEL)
Telemail :L.MANGUM, S.HAYES, NOAA.PMEL Country:USA

Program: 9484 Experiment: GDP Owner: UKMO UK
SOBA U.K.
PGC:A.N. Bentley
Meteorological Office
Telephone:344420242 X6219,6078 Telefax:(+44) 344 855897 (UKMO)
Telemail :FAX: (344) 855 897 Country:UK

Program: 9600 **Experiment:** **Owner:** US_NAVY USA
ATLANTIC DRIFTING DATA BUOY PROGRAM
PGC:Deborah Bird
U.S. NAVAL OCEANOGRAPHIC OFFICE
Telephone:(601)688-4242 Telefax: (US_NAVY)
Telemail :dbird@navo.hpc.mil Country:USA

Program: 9919 **Experiment:** **Owner:** AWI GER
SEA ICE PROCESS - FIXED STATIONS
PGC:Dr. C. Kottmeier
Alfred Wegener Institute for Polar and Marine Research
Telephone:(+49) 471 483 12 50 Telefax:(+49) 471 483 14 25 (AWI)
Telemail :ckottmei@awi-bremerhaven.de Country:GER

Program: 30271 **Experiment:** **Owner:** IFREMER FRAN
PICOLO
PGC:Gilles Reverdin
IFREMER
Telephone:(+33) 1 46 33 21 31 Telefax:AX: 01 44 27 71 59 (IFREMER)
Telemail :TEL MERLIVAT: 01 44 27 32 48 FAX: 01 44 27 71 59 Country:FRAN

Program: 30282 **Experiment:** **Owner:** US_NAVY USA
GLOBAL ENVIRONMENTAL DRIFTER PROGRAM
PGC:Deborah Bird
U.S. NAVAL OCEANOGRAPHIC OFFICE
Telephone:(601)688-4242 Telefax: (US_NAVY)
Telemail :dbird@navo.hpc.mil Country:USA

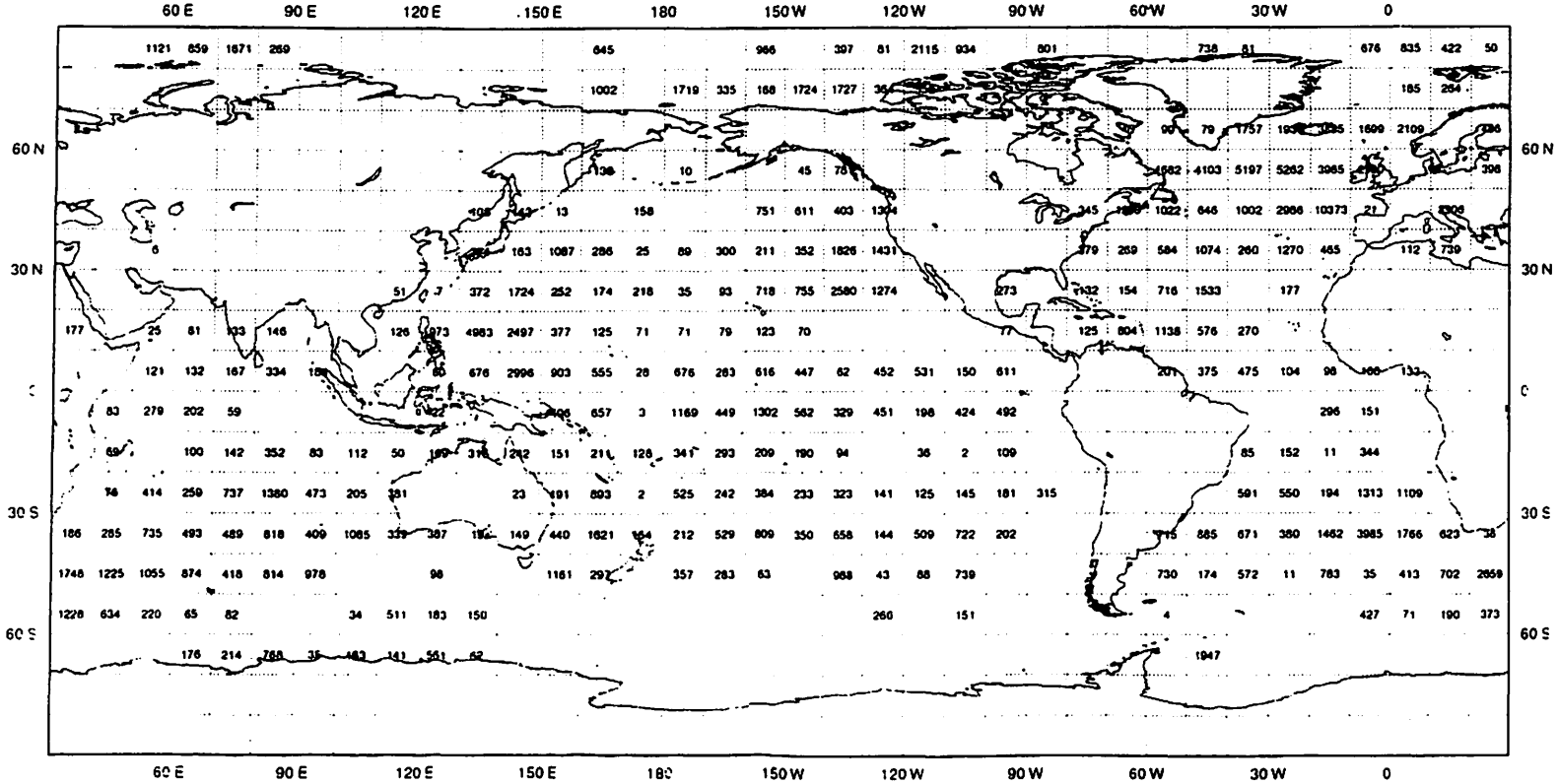
METEO FRANCE

METEO-FRANCE **SMISO**

Repartition par carre Marsden des observations recues en Octobre 1997

Marsden square distribution chart of data received during October 1997

Messages : BUOY **Total : 199708**



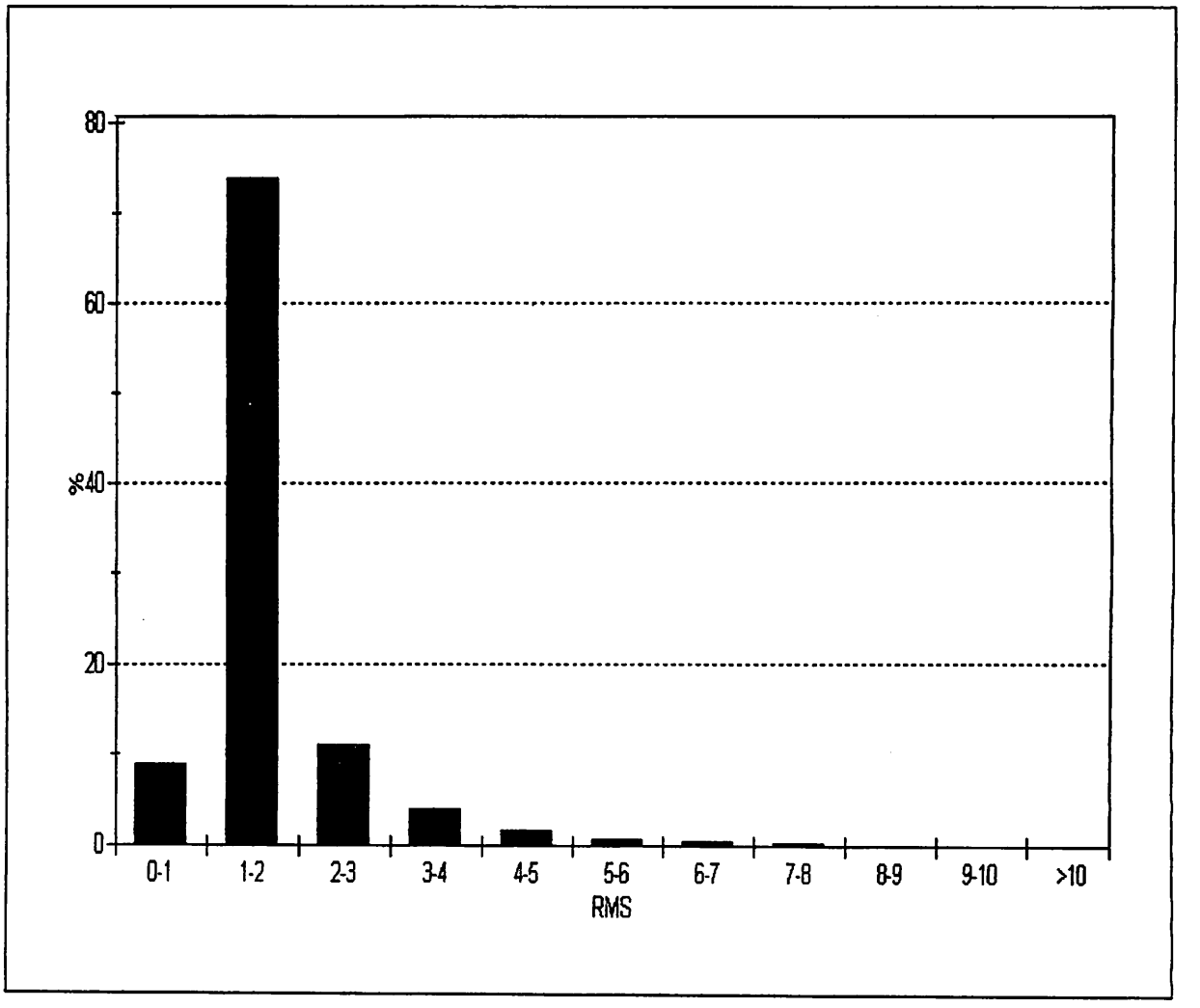
MAGICS 4.2 Solaris - mpma497 - 6 November 1997 13:30:27

ANNEX V

Number of BUOY reports received at Toulouse during October 1997

ANNEX VI

Distribution of standard deviation (RMS) for air pressure data



RMS (Obs-FG) Distribution - GTS Global buoy data - 06/97to11/97 - Air Pressure (hPa)

ANNEX VII

DATA BUOY CO-OPERATION PANEL

Quality Control Guidelines for GTS buoy data

- As of November 1996 -

At its seventh session (Toulouse, October 1991), in order to rationalise and speed up status change process of buoys reporting bad data onto the GTS, the Data Buoy Co-operation Panel decided to implement on a trial basis Quality Control Guidelines for buoy data. The guidelines worked effectively on 20 January 1992. It formally endorsed these at its following session (Paris, October 1992).

At the tenth session of CBS (Geneva, November 1992), the Guidelines were formally incorporated as part of the World Weather Watch (WWW).

The scheme is based on an Internet distribution list (i.e. mailing list) used by all actors involved in the process. Particularly, when felt necessary, and according to quality control procedures they undertake on their own, Principal Meteorological or Oceanographic Centres (PMOC) responsible for Buoy data Quality Control can make status change proposals by the mean of an Internet mailing list (BUOY-QC@VEDUR.IS). The meteorological centres are indeed in the best position to undertake Quality Control procedures. The Technical Co-ordinator of the DBCP, acting as a focal point between these centres and the owners of the buoys forwards the proposals to them. In addition, monthly buoy monitoring statistics produced by PMOCs and WMO/Argos list of identification numbers as well as the list of Principal GTS Co-ordinators are available via the mailing list.

The following PMOCs are presently participating actively in the Guidelines:

The Australian Bureau Of Meteorology (ABOM),
Environment Canada (AES),
The European Centre for Medium-Range Weather Forecasts (ECMWF),
The Icelandic Meteorological Office (IMO),
The Japan Meteorological Agency (JMA),
Météo France (CMM, Centre de Météorologie Marine),
The Meteorological Service of New Zealand, Ldt. (NZMS),
The National Data Buoy Center (NDBC of NOAA, USA),
The National Center for Environmental Protection (NCEP of NOAA, USA),
The Pacific Marine Environmental Laboratory (PMEL of NOAA, USA),
The South African Weather Bureau (SAWB),
The United Kingdom Meteorological Office (UKMO).

Full description of the Guidelines is given in annex A. Information regarding the mailing list and how to register is given in annex B

For Internet mailing list matters, you can contact Ms. Halla-Bjorg Baldursdottir of the Icelandic Meteorological Office directly:

Email: halla@vedur.is
Telephone: (+354) 560 06 00
Fax: (+354) 552 81 21.

For details regarding the DBCP QC Guidelines, you can contact Etienne Charpentier, Technical Co-ordinator of the DBCP:

Email: charpentier@atlas.cnes.fr
Telephone: (+33) 5 61 39 47 82
Fax: (+33) 5 61 75 10 14

Annex A: Quality Control Guidelines for GTS buoy data

These are principles adopted during previous DBCP sessions:

(i) Meteorological Centres are in the best position to undertake data Quality Control (DBCP VI).

(ii) Principal Investigators and Meteorological Centres share the responsibility of data Quality Control (DBCP VI).

(iii) The Technical Co-ordinator is in the best position to act as a focal point between GTS users and Principal Investigators (DBCP V, VI).

(iv) Argos is responsible for assuring that gross errors are automatically eliminated from reports distributed on GTS (DBCP VI).

In order to realise these principles, the following operating procedures or actions are proposed:

1. PGCs

Each Principal Investigator (PI) of an Argos buoy programme reporting data on GTS, designates a person responsible for making changes on PTT or sensor information present in the Argos GTS sub-system. This person is named the Programme GTS Co-ordinator (PGC). The PGC can, of course, be the PI himself but could also be a designated programme Technical Co-ordinator, as is done for the EGOS programme. If such a person does not exist as yet, for a given Argos Programme, the Technical Co-ordinator of the DBCP would contact the Principal Investigator and discuss the issue in order to find one. In a few cases, when a PI allows his platforms being distributed on GTS but does not want to be involved in the process, the Technical Co-ordinator could act as a PGC (i.e. the Technical Co-ordinator of the DBCP can directly ask Argos to make status changes).

2. PMOCs

The DBCP requests one or more Agencies or Institutions to volunteer for acting as Principal Meteorological or Oceanographic Centre responsible for deferred time GTS buoy data Quality Control (PMOC). PMOCs work on an operational basis, for given physical variables, either regionally or globally. The following centres are presently acting as PMOCs:

- The Australian Bureau Of Meteorology (BOM, Melbourne, Australia);
- Environment Canada (AES, Edmonton, Canada);
- The European Centre for Medium Range Weather Forecasts (ECMWF, Reading, United Kingdom);
- The Icelandic Meteorological Office (IMO, Reykjavik, Iceland);
- The Japan Meteorological Agency (JMA, Tokyo, Japan);
- Météo-France (the Centre de Météorologie Marine, Brest, France);
- The Meteorological Service of New Zealand, Ltd. (NZMS, Wellington ,New Zealand);
- The National Data Buoy Center (NOAA/NDBC, Stennis Space Center, Mississippi, USA);
- The National Center for Environmental Prediction (NOAA/NCEP, Camp Spring, Maryland, USA);
- The Pacific Marine Environmental Laboratory (NOAA/PMEL, Seattle, Washington, USA);
- The United Kingdom Meteorological Office (UKMO, Bracknell, UK).
- The South African Weather Bureau (SAWB, Pretoria, South Africa).

National Focal Points for Drifting Buoy Programmes are requested to designate National PMOCs, and possibly to act themselves as PMOCs.

3. **INTERNET distribution list (mailing list).**

It is proposed that the mechanism for exchanging QC information among the Guidelines Participants shall be an INTERNET distribution list. PMOCs send the proposed messages to a unique INTERNET address which name is BUOY-QC@node_path. "node_path" depends upon who actually operates the distribution list. The full INTERNET address of the Distribution List shall be circulated among the Guidelines participants.

To date the Icelandic Meteorological Office is operating the distribution list server and the Internet address is:

BUOY-QC@VEDUR.IS

The messages are then automatically forwarded to all the individual addresses from a maintained distribution list. Adding, reading, modifying, or deleting a name form the list can be done via INTERNET messages according to an agreed format.

3.1 ECMWF, NOAA/NCEP/NCO, METEO FRANCE, and UKMO monitoring statistics are delivered onto the INTERNET Distribution List.

3.2 Any suggestion for modification (i.e. recalibrate or remove sensor from GTS) or any problem noticed (e.g. bad location) on a drifting buoy reporting data on GTS should be placed on the Distribution List. Meteorological Centres are encouraged to make such suggestions.

3.3 Any feed back available on a recalibration actually implemented shall be placed on the distribution list.

4. **Operating Procedures for dealing with Potential Problems on GTS (Drifting and Moored Buoy data)**

4.1 PMOCs noticing potential problems on GTS can suggest an action via the INTERNET Distribution List. A standardised, telegraphic format is proposed (see Appendix): one message per platform or per sensor, showing the WMO number and the proposed change, directly in the "subject" line, with additional comments appearing in the text itself, using a free format if felt necessary by the PMOC (see example in Appendix).

4.2 PMOCs noticing bad location or bad sensor data episodically appearing on GTS message can copy the message on the INTERNET Distribution List, indicating from which source the message was transmitted. Although it is recommended that LUT operators access to the INTERNET Distribution List as well, if not possible, the Technical Co-ordinator of the DBCP or the responsible PGC or a designated PMOC (see paragraph 4.7.2) would keep them informed by telefax or another mean.

4.3 The Technical Co-ordinator of the DBCP can immediately (including using automated tools) contact the Principal GTS Co-ordinator (usually the person in charge of the buoy programme) and forward the PMOC message to him. It is recommended that the PGC waits for a few days before taking any action unless he/she is confident enough in the quality status of the data. Other meteorological centres may therefore have an opportunity to also comment on a particular problem. Other data users who are on the INTERNET Distribution List are encouraged to check the received messages regularly.

4.4 Then, if the PGC accepts the modification, he requests the adequate Argos centre (i.e. CLS or SAI) to make the change. In order to keep the GTS user community informed, Service Argos announces the change as soon as possible by means of the INTERNET Distribution List (a standardised message is proposed in the Appendix) and also effects the change as prescribed. It is recommended that the PGC also requests appropriate LUTs to implement the same changes.

4.5 If the PGC is not willing to go ahead with a proposed change, the Technical Co-ordinator of the DBCP deposits a standardised message on the INTERNET Distribution List (see Appendix) in order to inform PMOCs.

4.6 Local User Terminals are urged to adopt these Quality Control Operating Guidelines.

4.6.1 It is desirable that LUTs not willing to participate should distribute drifting buoy data on GTS only to local users (i.e. no global GTS distribution).

4.6.2 LUT operators participating and registered on the INTERNET Distribution List are encouraged to inform the participants back by the mean of the Distribution List each time a change is implemented, using the same format as Argos (see paragraph 4.4). If LUTs are not on the Distribution List, they would be encouraged to inform the Technical Co-ordinator of the DBCP of actual changes so that he can forward adequate messages onto the Distribution List.

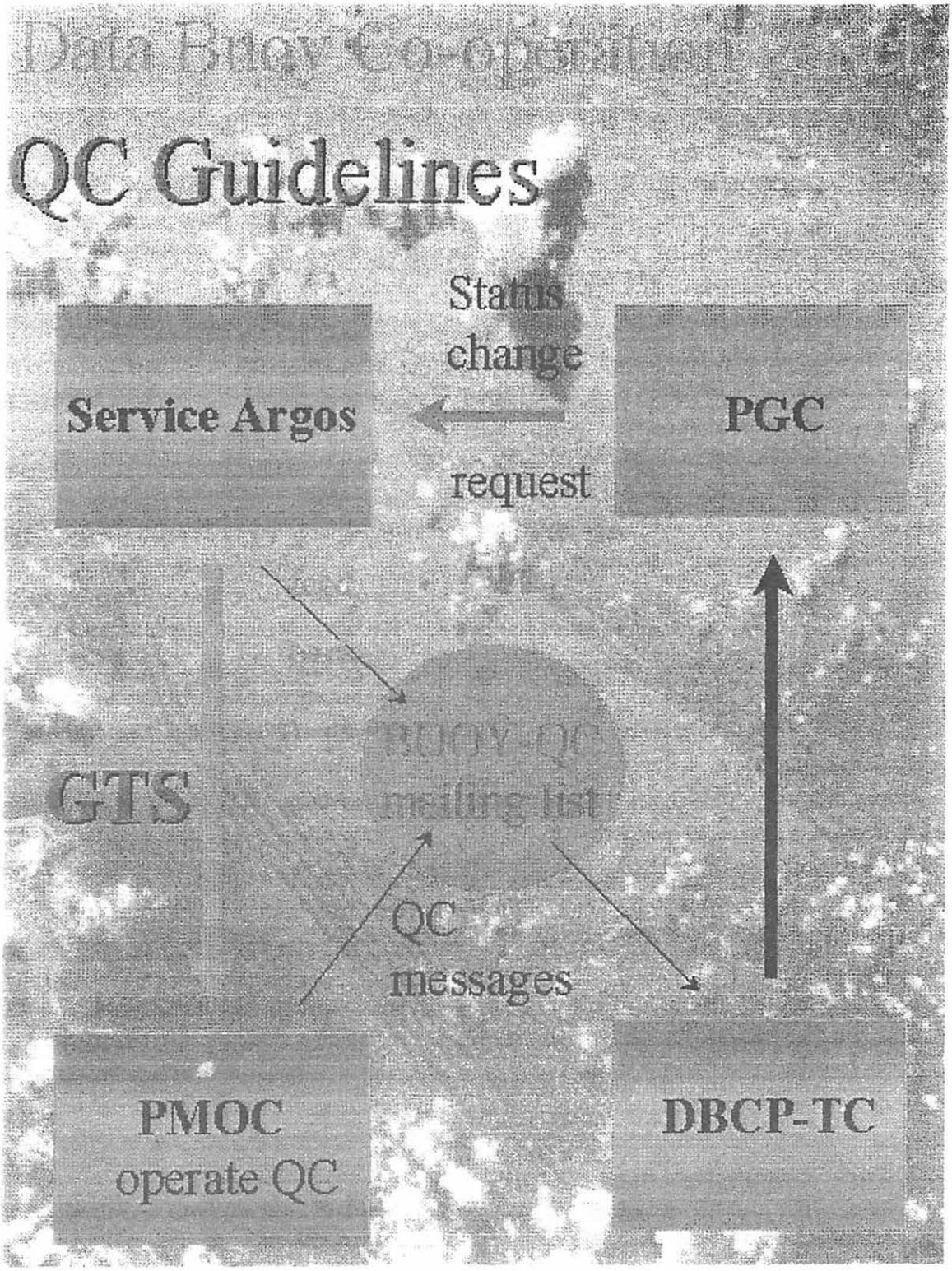
5. List of PGCs

This list is published by the Technical Co-ordinator of the DBCP on a monthly basis. It is forwarded onto the INTERNET Distribution List and sent by regular mail.

6. DBCP, WMO and IOC Secretariats

They will promote these Quality Control operating guidelines and encourage participation in this scheme.

Operating QC Guidelines for buoy data



Appendix

Standardized Format for Information Deposited on the INTERNET Distribution List

Notations:

-1- UPPERCASES in **bold** are constant field values and will appear "as shown" in the subject line; e.g. **ASK** will appear as the 3 characters 'ASK' in the subject line.

-2- Lowercases are used to designate variable data fields; If the name of the field is on 5 characters, then the field value must be coded using 5 characters (completed with spaces if necessary); e.g. ttt can be coded as '**AP** ' to indicate Air Pressure or as '**SST**' to indicate Sea Surface Temperature.

-3- The line 12345678901234567890123456789012 is just here to indicate the number of characters used (32 maxi) and their position; It has no other specific meaning.

1. **Proposals for status change** (by Meteo Centres, i.e. PMOCs):

When detecting bad data circulating on GTS, Meteorological Centres can propose changes on buoy status (remove or recalibrate sensor) via the INTERNET Distribution List. Proposals are done using a standardised telegraphic format in the subject line. Comments can be added in the body text.

Format:

```
12345678901234567890123456
hASK ttt wmo## ppp ovalue
```

Meaning:
It is proposed to remove or recalibrate one or more sensors for one given buoy.

h : One figure, **1** to **9**, to indicate the number of the request for the same buoy, for example, the first proposal would be coded **1ASK**..., and if another Meteo Centre feels necessary to comment on the same proposal, it can suggest another action and name it **2ASK**, etc...

ttt : Type of proposal:

- **RMV** : for removing sensor data from GTS
- **REC** : for recalibrating a sensor
- **CHK** : for checking data carefully; in that case, it is recommended to add in the body text of the message: (1) Example(s) of the suspicious or erroneous GTS message(s), (2) the GTS bulletin header that was used (i.e. originating centre for the bulletin), (3) a description of the problem and (4) if possible, proposed action to solve it.
- **COM** : for commenting on a particular problem. Explanation is given in the body text of the message.

wmo## : WMO number of the buoy ($A_1b_wn_bn_bn_b$) or **LIST** if more than one buoy are concerned.

It is preferable to make status change proposals for different buoys on distinct messages. However, in case the **LIST** option is used, proposals can be detailed in the body text of the message: it is recommended to state the proposal for each buoy by starting with a line encoded according to the standard format followed by the comments on a few lines included inside brackets; then the next proposal can be listed etc.. General comments can be included in free format after the last proposal.

Example for the body text in case more than one proposal are included (subject line could be 1ASK CHK LIST AP):

1ASK CHK 61412 AP
(this buoy has been transmitting erroneous data
in the last 2 week)

1ASK CHK 54814 AP
(this buoy shows strong departure of Air Pressure
from the first guess field)

...
Mr. W. Xyz., National Meteorological Service.

ppp : Physical variable (sensor) to consider:

AP	:	Air Pressure (coded as **'AP '**)
AT	:	Air Temperature (coded as **'AT '**)
SST	:	Sea Surface Temperature
WD	:	Wind Direction (codes as **'WD '**)
WS	:	Wind Speed (coded as **'WS '**)
APT	:	Air Pressure Tendency
POS	:	Position of the buoy
TZ	:	Subsurface temperatures (coded as **'TZ '**): The depths of the probes and proposed actions should be placed in the body text, not in the subject line (not enough room)
ALL	:	All buoy sensors (e.g. remove all buoy data from GTS)
Blank	:	(coded as 3 space characters, i.e. ' ') Informations are detailed in the body text.

o : Operator to use for proposed recalibration (mandatory and used only when ttt=**'REC'**):

+	:	Add the following value to the calibration function
-	:	Subtract the following value from the calibration function
*	:	Multiply the calibration function by the following value (e.g. rate for recalibrating wind speed sensor)

value: Value to use for proposed recalibration (mandatory and used only when ttt=**'REC'**); the value is coded on 5 characters and completed with space characters if necessary. It is provided using the following physical units:

Air Pressure :	Hecto Pascal
Temperatures :	Celsius degrees
Wind speed :	m/s
Wind Direction :	Degrees
Air Pressure Tendency :	Hecto Pascal
Positions :	Degree + Hundredth
Rate :	No unit

Examples:

From	Date	Subject
FLETCHER@METDP1.MET.CO.NZ	10-Oct-1994	1ASK REC 17804 AP +2.2
ARADFORD@EMAIL.METO.GOVT.UK	11-Oct-1994	1ASK RMV 62501 ALL
BLOUCH@IFREMER.FR	11-Oct-1994	2ASK REC 17804 AP +2.4
MBURDETTE@NDBC.NOAA.GOV	11-Oct-1994	1ASK CHK 44532 POS
GXB@ORVILLE.HO.BOM.GOV.AU	12-Oct-1994	1ASK REC 44704 WS *1.5

Message1: NZMS proposes to recalibrate Air Pressure sensor of buoy 17804 by adding 2.2 hPa.

Message2: UKMO proposes to remove buoy 62501 from GTS distribution. Explanations are given in the body text.

Message3: Météo F.ance comments (**2ASK**) on NZMS proposal for recalibrating air pressure sensor of buoy 17804. Météo France suggests to add +2.4 hPa instead of +2.2 hPa. Argumentation is provided in the body text.

Message4: NDBC suggests to check positions of buoy 44532. Details are given in the body text, including copy of one suspicious GTS message, the GTS bulletin header, and a description of the error.

Message5: BOM proposes to recalibrate Wind speed sensor of buoy 44704, by multiplying data by 1.5.

2. Argos or LUT answer for changes actually implemented

When a change is implemented on GTS platforms, a message is normally forwarded to the INTERNET Distribution List, by Argos or the considered LUT, no later than 24 hours after the change was implemented. All the information is encoded in the subject line, the body text is empty. The format of the subject line is as follow:

Format:

```
12345678901234567890123456789012345678
cccc ttt wmo## ppp ovalue yymmddhhmm
```

Meaning:
Argos (i.e. the French Global Processing Center of Toulouse (FRGPC) or the US Global Processing Center of Landover (USGPC)) or Local User Terminals (LUT) inform the INTERNET Distribution List each time a change is actually implemented on a buoy status.

cccc : Originating Center:
LFPW = FRGPC, Toulouse
KARS = USGPC, Landover
ENMI = Oslo LUT
BGSF = Sondre Stromfjord LUT
CWEG = Edmonton LUT

ttt, wmo##, ppp, ovalue: Same as for paragraph 1. In addition, for recalibrations, when the transfer function has been completely modified, ovalue can be coded as a question mark followed by 5 space characters,
i.e. '? ', to indicate that the change is not as simple as a +X, -X or *X transformation.

yymmddhhmm: UTC time the change was implemented: Format=Year (2 digits), Month (2 digits), Day of the month (2 digits), Hour (2 digits), and Minutes (2 digits).

Example:

```
From                    Date         Subject
GTS@GTSVAX.ARGOSINC.COM 14-Oct-1994  KARS REC 17804 AP  +2.3 9410141216
GTS@GTSVAX.ARGOSINC.COM 14-Oct-1994  KARS REC 33809 AP  ?    9410141306
```

Message6: Buoy 17804 Air Pressure sensor was recalibrated by adding +2.3 hPa. the change was implemented at 12h16 UTC the 14 October 1994. As you may notice, two proposal had been made for this buoy: NZMS proposed +2.2 hPa and Météo France proposed 2.4 hPa. The Technical Co-ordinator of the DBCP contacted both agencies and it was then decided to apply a 2.3 hPa correction.

Message7: Buoy 33809 Air Pressure sensor was recalibrated. The change was implemented at 13h06UTC the 14 October 1994. The question mark '? ' indicates that the transfer function was completely modified.

3. PGC Answer if the proposal was denied

Format:

```
12345678901234567890123456
DENI ttt wmo## ppp ovalue
```

Meaning:
The proposal was denied by the Principal GTS Co-ordinator (PGC) of the drifting buoy programme. No action was taken. Complementary information can be included in the body text.

ttt, wmo##, ppp, ovalue: same meaning as in paragraph 1. ovalue is mandatory and used only when ttt='**REC**'.

Example :

```
From                Date         Subject
BLOUCH@IFREMER.FR   15-Oct-1994  DENI RMV 62501 ALL
```

Message8: In the body text: Data were sent on GTS before deployment by mistake. The buoy is now deployed and data look good. There is therefore no need for removing data from GTS distribution.

4. Monitoring Statistics

4.1. Subject line Format:

```
12345678901234567890123456789
STAT center ppp year mm dd
```

Meaning:
The monitoring statistics are available in the body text (format is standardised and detailed in paragraph 4.2).

center: Name of the center producing the statistics, e.g.
ECMWF = European Center for Medium Range Weather Forecasts
NCO = NOAA NCEP Central Operations
CMM = Météo France, Centre de Météorologie Marine
UKMO = United Kingdom Meteorological Office

ppp: Type of physical variable concerned or **ALL** if many variables are included. Same as for paragraph 1 (i.e. **AP, AT, WD, WS, SST** ...)

year: Year concerned (e.g. **1994**)

mm: Month concerned (e.g. **08** for August)

dd: Last day of the 1-month period concerned. It is optional and used only if the 1-month period does not end on the last day of the month. For example dd=**15** if the 1-month period concerned is 16 July to 15 August.

Example :

```
From                 Date          Subject
BLOUCH@IFREMER.FR    02-Oct-1994   STAT CMM ALL 1994 09
```

Message9: The September 1994 monitoring statistics for many geo-physical variable and produced by the Centre de Météorologie Marine of Météo France are available in the body text.

4.2. DBCP standard format for exchanging buoy monitoring statistics.

Example of ECMWF statistics produced in the standard format for the month of May 1995:

```
     ALL STATISTICS ARE FOR DATA WITH GROSS ERRORS EXCLUDED

     GROSS ERROR LIMITS RELATED TO ECMWF FIRST GUESS FIELDS

     Pressure          : 15 hPa
     Temperature       : 10 Celsius
     Wind              : 25 m/s (RMS VECTOR)


Explanation of fields:

Date## :  Last day for the monthly statistics
WMO##:    WMO number of buoy or Ship's Call Sign
Sns:      Sensor Name :
          AP (Pressure), AT (Air Temp), SST (Sea Surf Temp), WS (Wind Sp),
          WD (Wind Dir), WV (Wind vector), APT (Tendency), HUM (Humidity),
          TD (Dew Point).
Orig:     GTS Origin of the data (ALL or cccc from GTS Bulletin header)
C:        GTS code (B: BUOY, S:SHIP, Y:SYNOP)
Cntr#:    Monitoring Center producing the stats (e.g. ECMWF, UKMO, OPC, CMM)
Lat##:    Last Latitude of buoy/ship during the month
Long##:   Last Longitude of buoy/ship during the month
```

```
Rcei:     Total number of obs received at the center including obs not used
Acpt:     Total number of obs accepted by the model
GE#:  Number of Gross Errors (i.e. number of (Obs-Field) exceeding limits)
Bias#:    Mean Bias (Obs-Field)
SD##:     Standard Deviation, SD = RMS (Obs-Field-Bias);
          For Wind Vectors (WV), by convention, SD = RMS(WS/Rate - Field)
RMS#:     Root Mean Square, RMS = RMS (Obs-Field);
          For Wind Vectors (WV), by convention,
          RMS=RMS(SQRT(Vec(WV-Field)**2))
Rate:     Mean (Obs/Field)
F:        Flag for Field used : A=Analysis, G=First Guess, B=Both.
```

```
Date##,        WMO##,Sns,Orig,C,Cntr#,Lat##,Long##,Rcei,Acpt,GE#,Bias#,SD##,RMS#,Rate,F

950531,15153, WD, ALL,S,ECMWF, 34.9, -62.3,   1,   1,  0, 42.5, 0.0,42.5,    ,G
950531,15153, WV, ALL,S,ECMWF, 34.9, -62.3,   1,    ,  0,     ,    , 8.6,    ,G
950531,21002, AP, ALL,S,ECMWF, 37.9, 134.5, 145, 123,  0,  0.2, 0.9, 0.9,    ,G
950531,21002, AT, ALL,S,ECMWF, 37.9, 134.5, 245, 123,  0,  0.3, 0.9, 1.0,    ,G
950531,21002, WS, ALL,S,ECMWF, 37.9, 134.5, 245, 124,  0,  0.1, 2.3, 2.3,    ,G
950531,21002, WD, ALL,S,ECMWF, 37.9, 134.5, 199, 124,  0,-10.7,31.1,32.9,    ,G
950531,21002, WV, ALL,S,ECMWF, 37.9, 134.5, 245,    ,  0,     ,    , 4.0,    ,G
.   .   .   .   .
```

5. WMO/Argos cross reference list

Format:

```
12345678901234
WMOS year mm
```

Meaning:
The WMO/Argos cross reference list sorted by WMO numbers is available in the body text.

year: Year concerned (e.g. **1994**)

mm: Month concerned (e.g. **08** for August)

Example :

```
From                          Date          Subject
CHARPENTIER@ATLAS.CNES.FR     02-Oct-1994   WMOS 1994 09
```

Message10: The September 1994 WMO/Argos cross reference list is available in the body text.

6. Principal GTS Co-ordinators (PGC) list

Format:

```
12345678901234
PGCS year mm
```

Meaning:
The list of Principal GTS Co-ordinators (PGC) sorted by Argos program number is available in the body text. The Principal GTS Co-ordinators are designated by the owners of the buoys for being responsible to request Service Argos and/or LUT operators to implement required status changes.

year: Year concerned (e.g. **1994**)

mm: Month concerned (e.g. **08** for August)

Example :

```
From                          Date          Subject
CHARPENTIER@ATLAS.CNES.FR     02-Oct-1994   PGCS 1994 09
```

Message11: The September 1994 list of Principal GTS Co-ordinators is available in the body text.

7. Information message

Format:

```
12345678901234567890123456789
INFO subject...
```

Meaning:
An information message in free format is included in the body text.

subject...: Subject of the message (free format)

Example :

```
From                          Date          Subject
CHARPENTIER@ATLAS.CNES.FR     02-Oct-1994   INFO: New on DBCP W3 server
```

Message12: This message is to indicate that new products or information are available from the DBCP World Wide Web (W3) server. Details are given in the body text.

Annex B: DBCP QC Guidelines distribution list (mailing list)

Once registered on the mailing list, you will automatically receive any message posted by anybody onto the mailing list. For posting messages onto the mailing list, just send an Email to the following address:

BUOY-QC@VEDUR.IS

To be included in the BUOY-QC@VEDUR.IS Internet mailing list you can automatically assign to it by sending a message to the following Internet address : BUOY-QC-REQUEST@VEDUR.IS

The messages in the body of your mail must comply with the syntax detailed below. You must send your commands in the body of a mail message. Subject lines in mail messages are ignored.

The following commands can be handled automatically through the -Request interface:

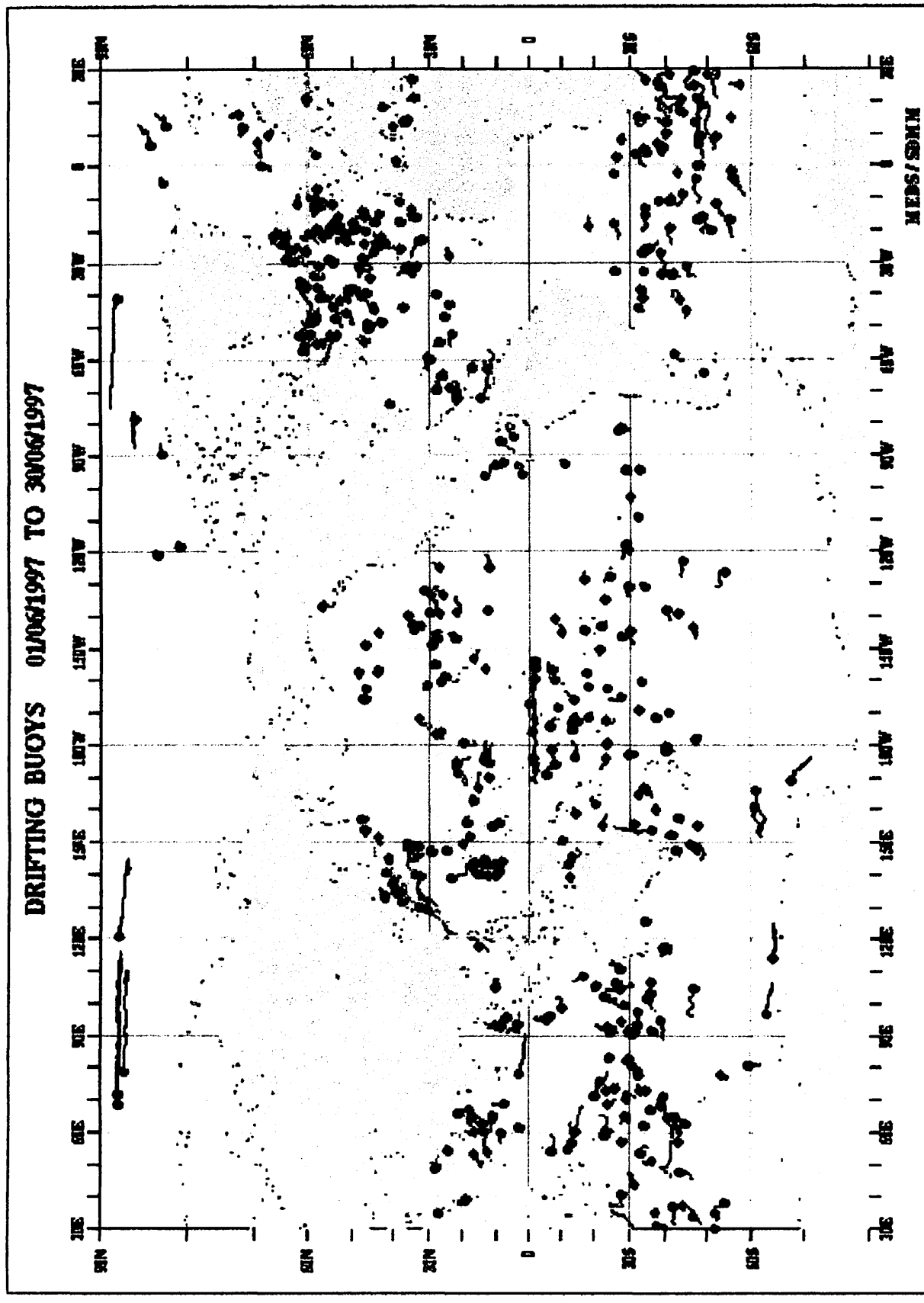
SUBSCRIBE	- to subscribe to a mailing list
SIGNOFF	- to remove yourself from a mailing list
REVIEW	- to get a list of subscribers
QUERY	- to get the status of your entry on the list
SET NOMAIL	- to remain on the list but not receive mail
SET MAIL	- to reverse the NOMAIL setting
SET CONCEAL	- to conceal yourself from REVIEW listings
SET NOCONCEAL	- to reverse the CONCEAL setting
SET NOREPRO	- to prevent the list from sending you your own postings
SET REPRO	- to reverse the NOREPRO setting
LIST	- to get a list of mailing lists available on this host
HELP	- to receive a help file

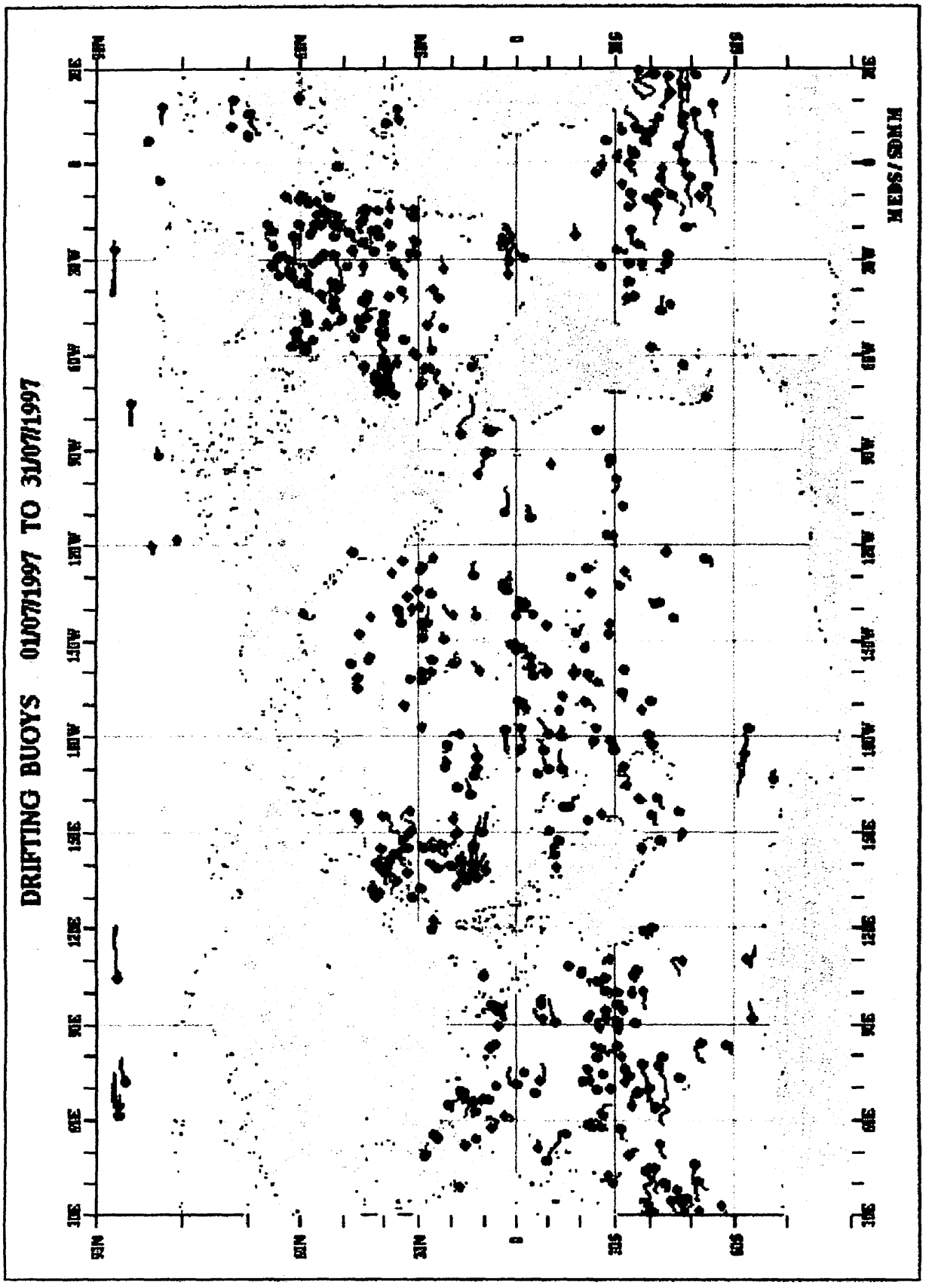
The syntax of these commands is:

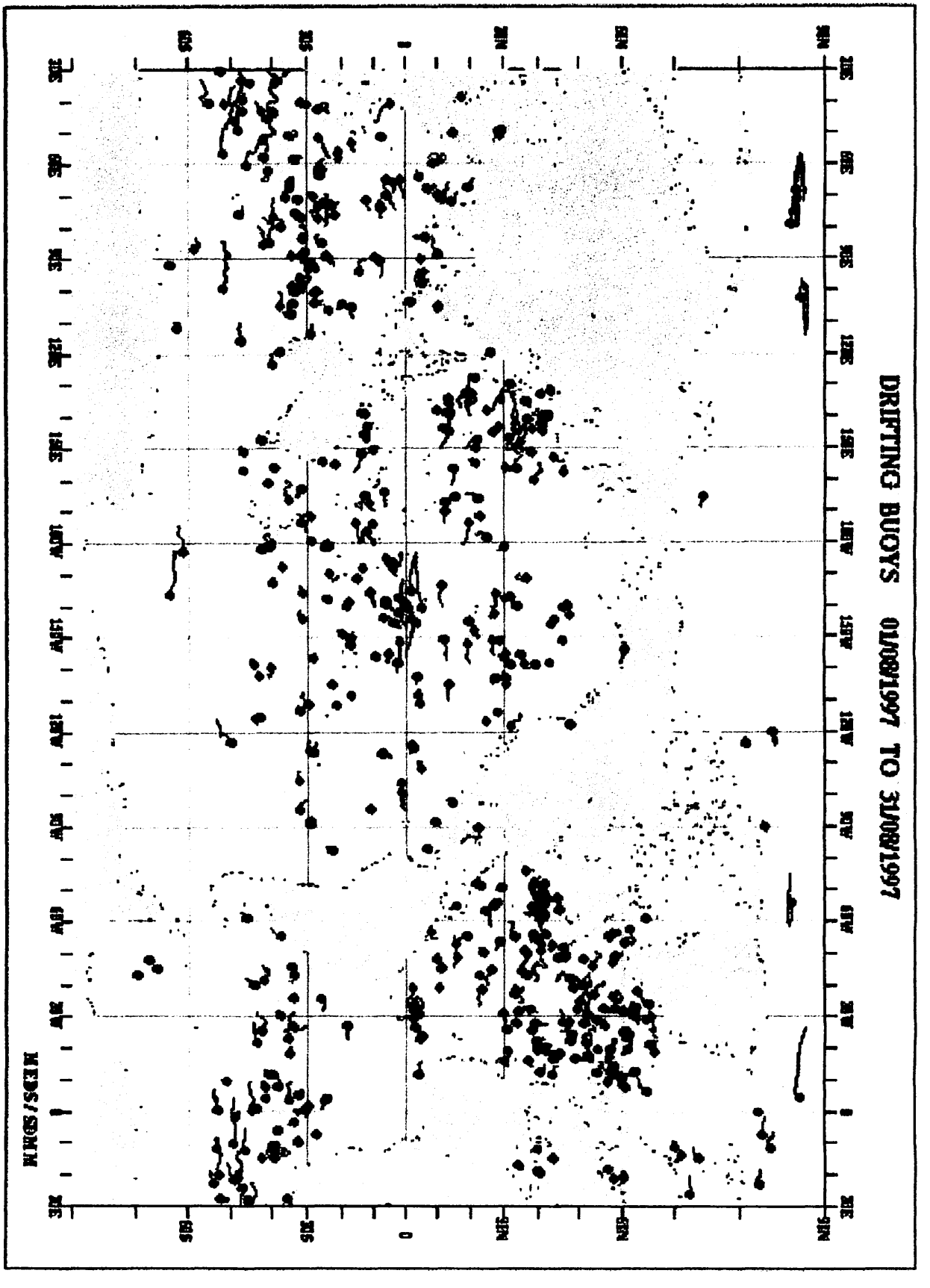
Syntax	Example
SUBSCRIBE {list-name}	SUBSCRIBE BUOY-QC
SIGNOFF {list-name}	SIGNOFF BUOY-QC
REVIEW {list-name}	REVIEW BUOY-QC
QUERY {list-name}	QUERY BUOY-QC
SET {list-name} [NO]MAIL	SET BUOY-QC NOMAIL
SET {list-name} [NO]CONCEAL	SET BUOY-QC CONCEAL
SET {list-name} [NO]REPRO	SET BUOY-QC NOREPRO
LIST	LIST
HELP	HELP

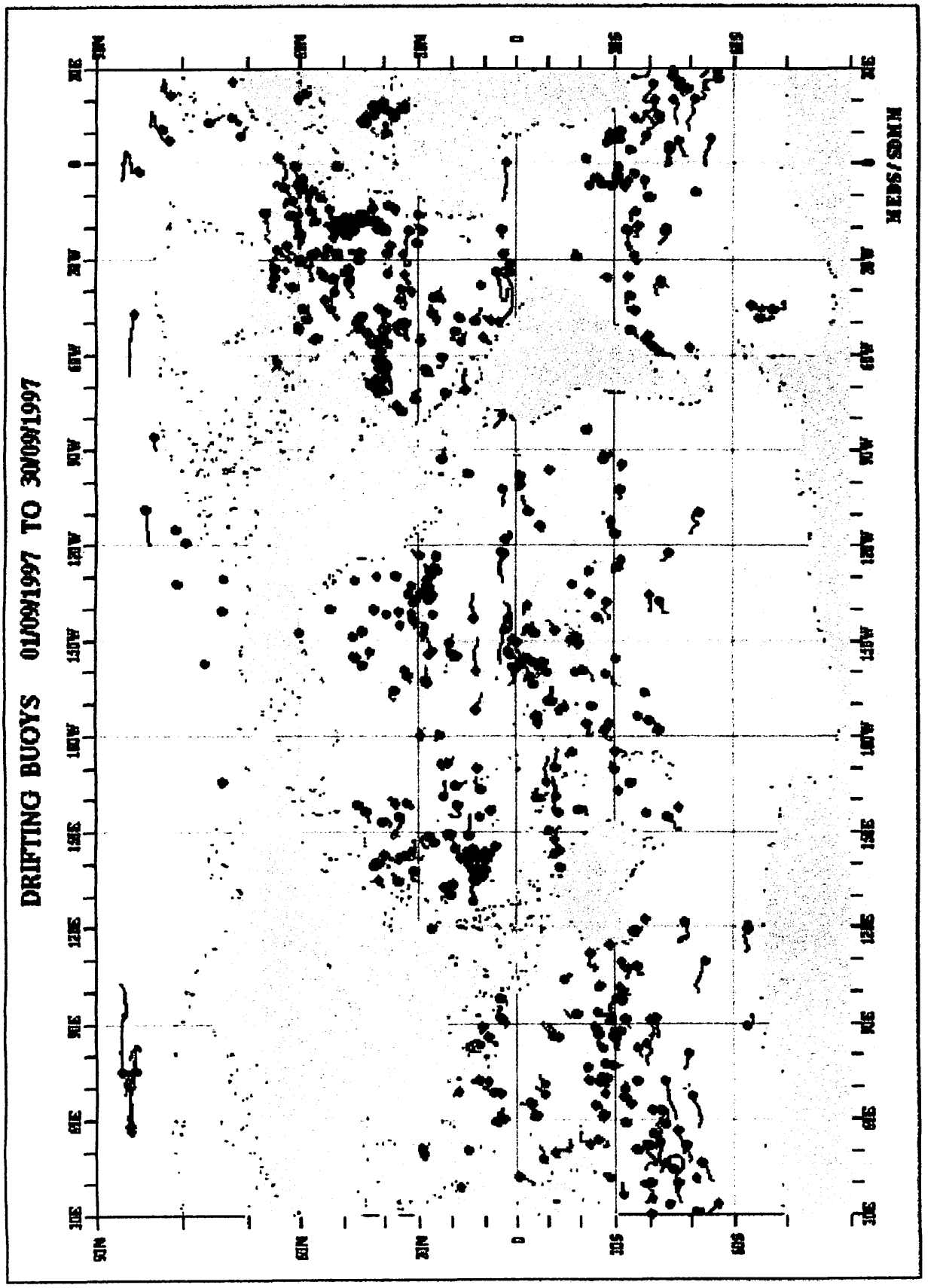
ANNEX VIII

GLOBAL DRIFTING BUOY TRACKS FOR JUNE TO SEPTEMBER 1997




DRIFTING BUOYS 01/07/1997 TO 31/07/1997
KNOTS/SEEK


DRIFTING BUOYS 01/08/1997 TO 31/08/1997
KEDS/SDMM


DRIFTING BUOYS 01/09/1997 TO 30/09/1997
NUMBER/SQUARE

ANNEX IX

Manufacturers of surface velocity programme barometer (SVP-B) drifter

Clearwater Instrumentation
49 Walnut Park, Building No. 2
Wellesley Hills, MA 02181
USA
Tel: (+1) 617 239 3305
Fax: (+1) 617 239 3314
Contact: Gary Williams

Metocean Data systems, Ltd.
PO Box 2427 D.E.P.S.
40 Fielding Avenue
Darmouth, Nova Scotia
CANADA B2W 4A5
Tel: (+1) 902 468 2505
Fax: (+1) 902 468 4442
Contact: Bernie Pelotas

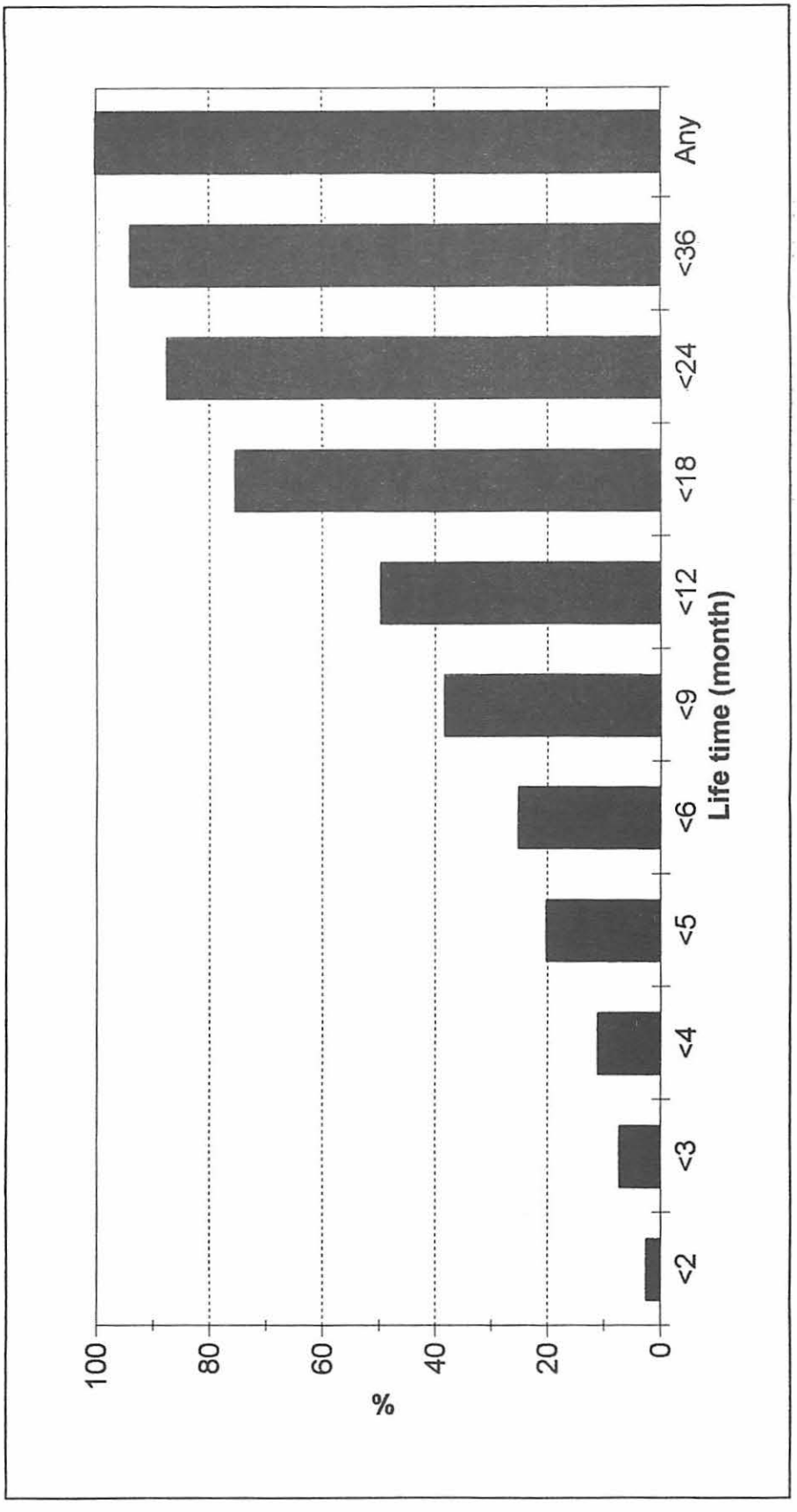
Metocean Data systems, Inc.
Building 1103, Suite 149
Stennis Space Center, MS 39529
USA
Tel: (+1) 601 688 2618
Fax: (+1) 601 688 2839
Contact: David Rankin

Technocean Associates
4422 SE 9th Avenue
Cape Coral, FL 33904
USA
Tel: (+1) 813 945 7019
Fax: (+1) 813 574 5613
Contact: Hank Wite

Turo Technology Pty. Ltd.
P.O. Box 103
Sandy Bay
Tasmania 7006
AUSTRALIA
Tel: (+61) 02 369 511
Fax: (+61) 02 369 506
Contact: Alex Papij

ANNEX X

Lifetime of drifting buoys



Life time distribution, Global Air Pressure buoy data - 11/97 (based on ECMWF stats .)

ANNEX XI

Wind measurement by Acoustic Method on SVP drifters.

Jean Rolland and Pierre Blouch - Meteo-France
Mark Bushnell- NOAA/AOML

By the end of 80's, within the framework of TOGA (Tropical Ocean and Global Atmosphere) and WOCE (World Ocean Climate Experiment), the Surface Velocity Program (SVP) Lagrangian drifter was fully developed for observation of in situ ocean currents. In the early 1990's, efforts were made to add more measurements than sea surface temperature. The idea was to have a common buoy for meteorologists and oceanographers needs. The first step was to try to measure the atmospheric pressure with SVP-B drifter; a challenging task because the SVP drifter spends a lot of time under the water. More than 500 SVPB has been deployed since 1994, and two of them have been providing good surface pressure data for more than 1000 days.

It was difficult to imagine conventional anemometers on SVP buoys. The chosen method was to make use of the Wind Observation Through Ambient Noise (WOTAN) technique using a hydrophone to sense noise levels, and a wind vane/electronic compass to sense wind direction. These drifters are commonly known now as SVP-BW drifters.

This technique has been known for a long time. Most of the noise between 500 Hz to 50 kHz is due to wind action on the ocean's surface, although a lot of acoustic sources exist under the water (ships, animals, rain, etc.) the spectral characteristics of the sounds allow to differentiate them, or to consider them as disturbing ones.

In 1990, Vagle and al, proposed an algorithm to obtain wind speed (in open oceans) from the spectral analysis of the ambient noise, based on the FASINEX (Front Air-Sea Interaction Experiment - 1986) data. The maximum wind speed during this experiment (3.5 months) was about 15 m/s. The proposed formulae has been verified successfully with instruments deployed during OCEAN STORMS experiment (1987). The comparison with classic surface measurements up to 15 m/s had an accuracy of +/- 0.5 m/s.

$$V = (10^{(SL/20)} - b) / a$$

V: wind speed at 10 m height in m/s
SL: noise level in dB relatively to $1 \mu Pa^2/Hz$
a and b: parameter dependent upon the chosen frequency for wind estimation

The SVP-BW float is derived from the SVP-B drifter, whose construction is described in detail in DBCP Technical Document N 4. It consists of a spherical surface float (40 cm diameter) with a holey-sock drogue (diameter 0.92 m, length 6.7 meters) centred at a depth of 15 m. Its weight is about 30 kg. The float is equipped with a pressure measurement system (port + sensor + signal conditioning). The hydrophone is submerged at 10 meters depth. The wind vane, which rotates the drifter under the wind influence, is fixed to the pressure port. A swivel is located at the top of the drogue to allow to the float to rotate freely under the wind's influence.

In early 1996, two prototypes, built at Scripps Institution of Oceanography by Sybrandy were deployed off California. The buoys were deployed for a short period (about one and a half hours). The noise amplitudes were stored on board the drifters, and the 10-12 kHz frequencies were used for wind estimation. In the fall of 1996 and spring 1997, 36 buoys equipped with Argos transmitters were deployed in Labrador sea. The resulting data set is presently being evaluated.

In parallel, Meteo-France tested a Metocean SVP-BW drifter off Biscay Bay for four months in late 1996 to early 1997. The algorithm (Vagle and al) used the noise level at 8 kHz. The hourly observation was done by sampling the ambient noise during a 210 second period. Metocean estimates an accuracy of +/-2m/s in the 2-15 m/s range and no indication beyond. The data was processed on board the drifter, and the wind speed estimates were transmitted via the Argos system.

The Metocean SVP-BW drifter provided reliable data until its recovery four months later. The drifter was deployed near the open ocean moored buoy Brittany (47 30'N - 8 30'W). During its four-month drift, the drifter was never further than 150 nautical miles from the Brittany buoy. After a test period of two weeks, the wind data were transmitted on the Global Transmission System (GTS). The maximum mean wind speed observed by the drifter was about 20 m/s, similar to the Brittany mooring observations. Despite wave heights of about 10-11 meters (observed in mid-February in the area), there appeared to be no significant disturbance in the wind measurements. In monthly comparisons to forecast model outputs the drifter and the moored buoy had quite similar RMS differences for wind speed and wind direction.

The recovered buoy was in a very good state when retrieved in April and sent back to Metocean for post-deployment examination.

During this experiment some problems were encountered:

1-a systematic bias of 20 degrees was seen in wind direction data after the correction for magnetic deviation was applied.

2-the wind speed classification indicator was almost constantly equal to 5 (meaning "shipping or other contamination noise present - wind speed estimate unreliable"). Despite this, the wind speed data were fully satisfactory.

3-the submergence sensor drifted from 60% to 100% by February 1997. Despite this, the flotation appeared unchanged when the buoy was recovered.

Based upon the Meteo-France success, a cooperative agreement between NOAA/AOML, NAVOCEANO and Meteo-France resulted in a large-scale air deployment in August 1997. An array of 12 SVP-BW drifters in the tropical Atlantic Ocean assisted in storm forecasts in the region. The new drifters provide the energy contained in 15 frequency bands between 0.5 and 40 kHz. The noise level at 8 kHZ is used for the data sent on the GTS. Again the results were good and in December 1997 six continued to provide good data. As Tropical Storm Ericka passed through the array in early September, building to hurricane strength, one of the drifters reported wind speeds of 68 mph. This probably provides one of the few high wind speed calibration points for WOTAN.

Given these two successes, additional SVP-BW purchases are now planned by several organizations (NAVOCEANO, NOAA/AOML, Meteo-France, UK Meteorological Office, South African Weather Bureau, and the Australian Meteorological Service)

Meteo-France has ordered 7 new SVP-BW drifters. Four out of them will be deployed before the end of 1997; two south west of Iceland for EGOS (European Group on Oceanic Stations), one in the Indian Ocean for the IBPIO (International Buoy Program in the Indian Ocean), and another one off France on the 18th western meridian.

NAVOCEANO has ordered 8 SVP-BW drifters, tentatively scheduled for deployment in the tropical Atlantic during the 1998 storm season.

NOAA/AOML has ordered 6 for deployment off the US west coast, to assist with El Nino storm development forecasts.

Taking into account the lifetime of pressure measurement, we believe that the SVP-B drifters advantageously replace the FGGE type buoys. Similarly, we can assume the SVP-BW will replace soon the FGGE type buoys which measure the wind.

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Blouch, P., J. Rolland: Promising results of the WOTAN technique to provide wind measurement on SVP-BW drifters. Technical Workshop. DBCP-XIII-1997.

ANNEX XII

NATIONAL FOCAL POINTS FOR THE DBCP

ARGENTINA

Miriam Andrioli
Chief, Maritime Division, Forecasting Department
Servicío Meteorológico Nacional
25 de mayo 658
1002 Buenos Aires
tel +541 312 4480/84 ext.232
fax +541 311 3968
email andrioli@udmeteor.mil.ar

AUSTRALIA

Dr George Cresswell
CSIRO Division of Oceanography
Hobart, Tasmania 7001
tel +612 325 228
fax +612 325 123
Email george.cresswell@ml.csiro.au

AUSTRALIA

Mr G.W. Jones
Australian Bureau of Meteorology
G.P.O. Box 1289K
Melbourne, Vic. 3001
tel +613 669 4167
fax +613 669 4168
Email g.jones@bom.gov.au

AUSTRALIA

Dr Ian Allison
Leader, Sea Ice Sub-Programme
University of Tasmania
GPO Box 252c
Hobart, Tasmania 7001
tel +61 02 207648
fax +61 02 202973
Email I.Allison@antcrc.utas.edu.au

BRAZIL

Diretoria de Hidrografia e Navegaçâo
Departamento de Serviços Oceânicos
Rua Barâo de Jaceguai, s/no.
CEP 24048 - Niterói - Rio de Janeiro
tel +55 21 7170073
fax +55 21 7187941

CANADA

Paul-André Bolduc
Chief, Policy, Planning and Special Projects Division
Marine Environmental Data Service
1202-200 Kent Street
Ottawa, Ontario K1A OE6
tel +1 613 990 0231
fax +1 613 993 4658
email bolduc@ottned.meds.dfo.ca

CANADA

Ron McLaren
Head, Marine Operations
Pacific and Yukon Region
Atmospheric Environment
700-1200 West 73rd Avenue
Vancouver, BC V6P 6H9
tel +604 664 9188
fax +604 664 9195
Email ron.mclaren@ec.gc.ca

CHILE

Lcdr Alejandro Cabezas
Head, Department of Oceanography
Servicío Hidrográfico y Oceanográfico de la Armada
Errázuriz 232, Playa Ancha
Valparaíro
tel +56 32 282697
fax +53 32 283537
Email shoa@huelen.reuna.cl

CHINA

Division of Station and Forecast
Department of Marine Monitoring and Services
State Oceanic Administration
1, Fuxingmenwai Ave.
Beijing
tel-
fax +861 853 3515

DENMARK

B. Rasmussen
Danish Meteorological Institute
100 Lyngbyvej
DK-2100 Copenhagen
tel
fax

ECUADOR

Instituto Oceanográfico de la Armada
Base Naval Sur (Avenida 25 de Julio)
Casilla No. 5940
Guayaquil
tel
fax

FRANCE

Pierre Blouch
Météo-France
Centre de météorologie marine/Brest
13, rue du Chatellier
BP 7302
F-29273 Brest Cédex
tel +33 298 221852
fax +33 298 221849
Email: pierre.blouch@meteo.fr

FRANCE

Mr F. Gérard
Ingénieur en chef de la météorologie
Chef du Département "réseau" de la
Direction générale des opérations de Météo-France
1, quai Branly
75340 PARIS Cédex 07
tel +33 1 4556 7024
fax +33 1 4556 7005
Email: francois.gerard@meteo.fr

GAMBIA

Director
Department of Water Resources
7 Marina Parade
Banjul
tel +220 228216
fax +220 225009

GERMANY

Prof. Dr Wolfgang Krauss
Institut für Meereskunde der
Universität Kiel
Düsterbrooker Weg 20
D-24105 Kiel 1
tel +49 431 597 3800
fax +49 431 565 876

GERMANY

Mr U. Liepelt
Deutscher Wetterdienst, Zentralamt
Postfach 100 465
D-63004 Offenbach
tel +49 69 8062 2832
fax +49 69 8062 2801

GREECE

Hellenic National Meteorological Service
Marine Meteorology Branch
P.O. Box 73502
GR 166 03 Hellinikon
Athens
tel +30 1 962 1116
fax 1 30 1 962 8952

ICELAND

Director
Icelandic Meteorological Office
Bústadavegi 9
150 Reykjavik
tel +354 1 600 600
fax +354 1 28121

IRELAND

Ms Evelyn Murphy
Marine Unit
Meteorological Service
Glasnevin Hill
Dublin 9
tel +353 1 842 4411
fax +353 1 375 557

JAPAN

Dr Hiroki Kondo
Director, Oceanographical Division
Climate and Marine Department
Japan Meteorological Agency
1-3-4 Otemachi, Chiyoda-ku
Tokyo 100
tel +81 3 3211 4966
fax +81 3 3211 3047

JORDAN

Dr Ahmad Abu-Hilal
Director
Marine Science Station
P.O. Box 195
Aqaba
tel +962 3 315144 and 315145
fax +962 3 313674

KENYA

Mr A.J. Mafimbo
Port Meteorologist
P.O. Box 98512
Mombasa
tel
fax

KUWAIT

Dr Abdullah Al-Salem
Manager, Hydraulics and Coastal
Engineering Department
Kuwait Institute for Scientific Research (KISR)
P.O. Box 24885
13109 Safat
tel +965 4847093
fax +965 4815192

MAURITIUS

Mr S. Ragoonaden
Marine meteorologist
Meteorological Service
St. Paul Road
Vacoas
tel +230 686 1031/32
fax +230 686 1033
telex 4722 METEO IW

NETHERLANDS

Mr A.T.F. Grooters
Royal Netherlands Meteorological Institute
Postbus 201
NL-3730 AE De Bilt
tel +31 302 206 691
fax +31 302 210 407
Email grooters@knmi.nl

NEW ZEALAND

Julie Fletcher
Meteorological Service of New Zealand Ltd.
P.O. Box 722
Wellington
tel +64 4 4700 789
fax +64 4 4700 772
Email fletcher@met.co.nz

NORWAY

Director
Det Norske Meteorologiske Institutt
P.O. Box 320, Blindern
0314-Oslo 3
tel
fax

PERU

Capitán de Corbeta
Héctor Soldi Soldi
Servicio Nacional de Meteorologia e Hidrologia
Avenida Republica de Chile 295, Apartados 1308
4862 Lima
tel
fax

REPUBLIC OF KOREA

Dong-Kyu Lee
Department of Marine Science
Pusan National University
Pusan 609-735
tel +82 51 510 2180
fax +82 51 581 2963
E-mail lee@bada.ocean.pusan.ac.kr or lee@tiwe.ucsd.edu

ROMANIA

Vasile Diaconu
Chef, Laboratoire océanographique
Institut des recherches marines
Boulevard Mamaia No. 300
8700 Constanta
tel +40 41 643288
fax +40 41 831274

RUSSIAN FEDERATION

Dr E.A. Kulikov
Committee for Hydrometeorology
12 Pavlik Morozov Street
123376 Moscow D-376
tel
fax

SAUDI ARABIA

Saleh Omar Baazim
Director of Observations and System
P.O.Box 1358, MEPA
Jeddah
tel
fax

SOUTH AFRICA

Piet Le Roux
Director, Observations and Communication
South African Weather Bureau
Private Bag X97
Pretoria 0001
tel +27 12 290 2998
fax +27 12 290 2170
Email pleroux@cirrus.sawb.gov.za

SPAIN

César Belandia
Head, Observations and Instruments
Instituto Nacional de Meteorología
Apartado 285
28070 Madrid
tel +34 1 5819651
fax +34 1 5819846
Email cesar.belandia@inm.es

Scotland / UNITED KINGDOM

D. Meldrum
Dunstaffnage Marine Laboratory
P.O. Box 3
Oban, Argyll PA34 4 AD
tel +44 1631 562244
fax +44 1631 565518
Email dtm@dml.ac.uk

UNITED ARAB EMIRATES

H.E. Mohamed Yahya Al-Suweidi
Assistant Undersecretary for Civil Aviation
Ministry of Communications
P.O. Box 900
Abu Dhabi
tel
fax

USA

Eric A. Meindl
Chief, Data System Division
National Data Buoy Center (NWS/NOAA)
Stennis Space Center, Mississippi 39576-4204
tel +1 601 688 1720
fax +1 601 688 3153
Email: emeindl@ndbc.noaa.gov

URUGUAY

Capitán de Navío (C.G.) Don Guillermo Ramis
Direccíon Nacional de Meteorología
Javier Barrios Amorín 1488
Casilla de Correo 64
11200 Montevideo
tel +5982 405177
fax +5982 497391

ANNEX XIII

FINANCIAL STATEMENTS PROVIDED BY IOC AND WMO

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 30 November 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	240 936	
Experts	6 420	
Prep Mtg - Indian Ocean Buoy Prog	2 073	
Travel	10 564	
Reports	7 264	
Administration direct	1 185	
		268 442
Balance of Fund	US $	21 676
Represented by.		
Cash at Bank		23 609
Unliquidated obligations		1 933
	US $	21 676

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		3 000
UK	30 000	
USA	68 000	68 000
TOTAL	163 493	105 276

TECHNICAL DOCUMENTS ISSUED WITHIN THE DATA BUOY COOPERATION PANEL SERIES

No.	Title	Year of issue
1	Annual Report for 1994	1995
2	Reference Guide to the GTS Sub-system of the Argos Processing System	1995
3	Guide to Data Collection and Location Services using Service Argos	1995
4	WOCE Surface Velocity Programme Barometer Drifter Construction Manual	1995
5	Surface Velocity Programme - Joint Workshop on SVP Barometer Drifter Evaluation	1996
6	Annual Report for 1995	1996
7	Developments in Buoy Technology and Enabling Methods - Technical Presentations Made at the Eleventh Session of the DBCP	1996
8	Guide to Moored Buoys and Other Ocean Data Acquisition Systems	1997
9	Annual Report for 1996	1997
10	Developments in Buoy and Communications Technologies	1997
11	Annual Report for 1997	1998

These publications can be ordered from: Etienne Charpentier, Technical Coordinator of the DBCP, CLS/Service Argos, 8-10 rue Hermès, Parc Technologique du Canal, F-31526 Ramonville Saint-Agne, France - *Internet mail:* charpentier@cls.cnes.fr - *Telefax:* +33-5 61 75 10 14 *Telephone:* +33-5 61 39 47 82