ANNUAL REPORT FOR 2001

DBCP Technical Document No. 20

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DATA BUOY COOPERATION PANEL

ANNUAL REPORT FOR 2001

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N O T E

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TABLE OF CONTENTS

FOREWORD

I am pleased to present this fifteenth Annual Report for the Data Buoy Cooperation Panel, covering the Panel's activities during 2001.

The Panel's year has once again been very busy, and has involved a considerable amount of effort from panel members. There have been a number of challenges during the year, and amongst other things, we have had to continue to operate under a mantle of either globally declining, or at best level, budgets. Nonetheless, the panel has continued to gradually grow since its inception in 1985, and it has been most gratifying to learn that the panel's work has been recognized in a number of areas as being very successful in the WMO/IOC context. In this regard, I would like to thank all the individual members who have collectively contributed their time and intellect to making the panel pre-eminent in the field of surface observations.

With the first meeting of the new Joint Commission for Oceanography and Marine Meteorology (JCOMM) during the year, the DBCP now forms the major component of the new Data Buoy Observations Team. In future, the panel will report to the Observations Coordination Group (OCG), rather than directly to the respective WMO/IOC Executive Councils. The DBCP will be represented on the OCG by its chairman, and will thus be directly involved in establishing future procedures and policies in this important area.

Once again I would like to formally record my appreciation for the extremely valuable work that has been undertaken by the panel's Action Groups. These groups are very active in the intersessional periods and play a key role in the success of the DBCP as a whole. I note with pleasure the attendance of three new member countries at this year's panel meeting, namely Italy, Korea, and Japan. I am pleased to welcome them and encourage others that may be thinking about joining the panel, to seriously consider doing so.

In closing, I would like to thank all those people who have participated in the activities of the Panel, and whose work is essential for the continuing success of the Panel. In particular, I would like to thank the people associated with arranging this year's annual meeting in my home country of Australia, and also the organizer of the Technical Workshop, Mr Ron McLaren from Canada.

Graeme Brough
Chairman, DBCP

SUMMARY

Introduction

The Drifting Buoy Cooperation Panel 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 Cooperation Panel (DBCP) and to slightly modify its terms of reference, so that the panel might also provide any international coordination required for moored buoy programmes supporting major WMO and IOC programmes (IOC Resolution XVII-6 and WMO Resolution 9 (EC-XLV)). The panel is now part of the Observations Programme Area of the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM).

1. Current and Planned Programmes

Eleven countries, seven action groups and two data management centres submitted reports on their data buoy activities

2. Data Flow

The mean number of reporting data buoys was around 1500, of which roughly a half report data onto the GTS. Some 69% of the "global" data sets were delivered to users within 3 hours, and some 87% of the "regional" data sets were available within 30 minutes.

3. Data Quality

The quality of air pressure and sea surface temperature data was excellent. Such a result is most likely attributable to the implementation of the DBCP quality control guidelines for GTS data and to an increased confidence in the quality of the buoy data on the part of the numerical weather prediction community.

4. Data Archival

The Marine Environmental Data Service (MEDS) in Canada has acted as the RNODC for drifting buoys on behalf of IOC and WMO since 1986. During the last intersessional period, MEDS has archived an average of 232, 000 BUOY reports per month and received reports from an average of 860 buoys per month, an increase of 38,000 reports and 11 buoys from last year respectively.

5. Technical Developments

During the intersessional period, the Evaluation Sub-group continued to analyze technical issues regarding the performance of the Surface Velocity Programme (SVP) drifters equipped with measuring devices. It also undertook other studies that led the panel to extend its terms of reference and rename it "*DBCP Evaluation Group*".

6. Communications System Status

The Argos system has continued to provide a reliable service for recovery and processing of data buoy in real or quasi real-time. Various system enhancements were undertaken during the year and future developments are planned for the next few years. Alternative communications systems utilizing Low Earth Orbiting (LEO) satellites were also reviewed at the DBCP session.

7. Administrative Matters

The Panel has seven 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); the Global Drifter Programme (GDP); and the Tropical Moored Buoys Implementation Panel (TIP). The establishment of a new action group for the North Pacific Ocean is envisaged.

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. He is in addition discharging the tasks of technical coordinator for the the Ship-of-Opportunity Programme (SOOP) since January 1999

Fourteen countries contributed on a voluntary basis to the financial support of the Panel and/or SOOP in 2001: Australia, Canada, France, Germany, Greece, Iceland, Ireland, Japan, Netherlands, New Zealand, Norway, South Africa, United Kingdom and USA.

For the Panel's next financial year (1 June 2002 to 31 May 2003), a total budget of US$163,150 is planned to be allocated as follows:

	US$
Technical coordinator (salary, travel, logistic support)	126,000
Travel of Chairman, Vice-chairmen & JTA chairman	19,000
JTA chairman (contract)	7,000
Publications	10,000
WMO Costs	50
Contingencies	1,100
TOTAL	**163,150**

RESUME

Introduction

Le Groupe de coopération pour la mise en oeuvre des programmes de bouées dérivantes 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 sur lesquels reposent les grands programmes de l'OMM et de la COI (résolution XVII-6 de l'Assemblée de la COI et résolution 9 (EC-XLV) de l'OMM). Il fait désormais partie du domaine de programme relatif aux observations de la Commission technique mixte OMM-COI d'océanologie et de météorologie maritime.

1. ***Programmes actuels et programmes prévus***

Onze pays, sept groupes d'action et deux centres de gestion des données ont rendu compte de leurs activités relatives aux bouées de mesure.

2. ***Acheminement des données***

En moyenne, 1.500 bouées de mesure environ ont transmis des données, dont la moitié *grosso modo* sur le SMT. A peu près 69 % des séries de données "mondiales" ont été fournies aux utilisateurs dans un délai de trois heures et 87 % des séries de données "régionales" dans un délai de 30 minutes.

3. ***Qualité des données***

La qualité des données relatives à la pression atmosphérique et à la température superficielle de la mer était excellente. Un tel résultat tient très certainement à l'application des directives de contrôle de la qualité du DBCP pour les données transmises sur le SMT et suscite chez les spécialistes de la prévision météorologique numérique une confiance accrue en la qualité des données mesurées par des bouées.

4. ***Archivage des données***

Le Service des données sur le milieu marin (SDMM), basé au Canada, fait office depuis 1986 de Centre national de données océanographiques responsable (CNDOR) pour le compte de la COI et de l'OMM. Depuis la dernière session, le SDMM a archivé en moyenne 232.000 messages BUOY par mois provenant d'environ 860 bouées, soit 38.000 messages et 11 bouées de plus que l'an passé.

5. ***Evolution technique***

Depuis la dernière session, le Sous-Groupe de l'évaluation continue d'analyser les questions d'ordre technique concernant les performances des bouées dérivantes du Programme sur la vitesse superficielle (SVP) qui sont équipées d'appareils de mesure. Il a également entrepris d'autres études, si bien que le Groupe de coopération a décidé d'élargir son mandat et de le rebaptiser "*Groupe d'évaluation du DBCP*".

6. ***Etat du système de télécommunications***

Le système Argos continue d'assurer, avec toute la fiabilité voulue, la récupération et le traitement en temps réel ou quasi réel des données fournies par les bouées. Quelques améliorations ont été apportées au système durant l'année écoulée et d'autres sont prévues dans les prochaines années. Il a également été question de nouveaux systèmes de télécommunications faisant appel à des satellites sur orbite basse lors de la session du DBCP.

7. Questions administratives

Le Groupe de coopération compte aujourd'hui sept groupes d'action : le Groupe européen sur les stations océaniques (EGOS), le Programme international de bouées dans l'Arctique (IABP), le Programme international de bouées dans l'Antarctique (IPAB), le Programme international de bouées dans l'Atlantique Sud (ISABP), le Programme international de bouées pour l'océan Indien (IBPIO), le Programme mondial de bouées dérivantes (GDP) et le Groupe de mise en oeuvre de bouées dans les océans tropicaux (TIP). La création d'un nouveau groupe d'action pour le Pacifique Nord est envisagée.

Le coordonnateur technique du Groupe de coopération, M. Etienne Charpentier, est employé comme expert par la Commission océanographique intergouvernementale de l'UNESCO au titre d'un fonds d'affectation spécial et reste basé à Toulouse (France), dans les locaux de CLS/Service Argos. Il exerce en outre depuis janvier 1999 les fonctions de coordonnateur technique du Programme de navires occasionnels (SOOP).

En 2001, les 14 pays ci-après ont fourni une contribution financière volontaire au Groupe de coopération et/ou au SOOP : Afrique du Sud, Allemagne, Australie, Canada, Etats-Unis d'Amérique, France, Grèce, Irlande, Islande, Japon, Norvège, Nouvelle-Zélande, Pays-Bas et Royaume-Uni.

Pour le prochain exercice financier (1er juin 2002 – 31 mai 2003), il est prévu d'allouer au Groupe de coopération un budget de 163.150 dollars des Etats-Unis répartis comme suit :

	$
Coordonnateur technique (rémunération, frais de voyage et soutien logistique)	126.000
Frais de voyage du président, des vice-présidents et du président du JTA (Accord tarifaire collectif concernant le système Argos)	19.000
Président du JTA	7.000
Publications	10.000
Frais de l'OMM	50
Dépenses imprévues	1.100
TOTAL	**163.150**

RESUMEN

Introducción

El Panel de Cooperación sobre Boyas a la Deriva fue establecido en 1985 en virtud de la Resolución 10 de la OMM (EC-XXXVII) y de la Resolución EC-XIX.7 de la COI. En 1993, los órganos rectores de la COI y de la OMM decidieron cambiar el nombre del Panel, que pasó a ser el Panel de Cooperación sobre Boyas de Acopio de Datos (DBCP), y modificar ligeramente su mandato de modo que también pudiera facilitar la coordinación internacional que exigieran los programas de boyas fondeadas en apoyo de los principales programas de la OMM y de la COI (Resolución XVII-6 de la COI y Resolución 9 de la OMM (EC-XLV)). Actualmente el Panel forma parte del área programática Observaciones de la Comisión Técnica Mixta OMM-COI sobre Oceanografía y Meteorología Marina (JCOMM).

1. Programas actuales y previstos

Once países, siete grupos de acción y dos centros de gestión de datos presentaron informes sobre sus actividades de acopio de datos de boyas.

2. Flujos de datos

La cantidad media de boyas que transmiten datos fue de aproximadamente 1.500, de las cuales cerca de la mitad transmiten datos por el SMT. Un 69% de los conjuntos de datos “mundiales” fue transmitido a los usuarios en un plazo de tres horas, y un 87% de los conjuntos de datos “regionales” estuvo disponible en 30 minutos.

3. Calidad de los datos

La calidad de los datos relativos a la presión atmosférica y la temperatura de la superficie del mar fue excelente. Este resultado se puede atribuir probablemente a la aplicación de las directrices del DBCP en materia de control de calidad a los datos transmitidos por el SMT y suscita en los especialistas en predicciones meteorológicas informatizadas una mayor confianza en la calidad de los datos procedentes de boyas.

4. Archivos de datos

Desde 1986 el Servicio de Datos sobre el Medio Marino (MEDS) de Canadá cumple la función de Centro Nacional Responsable de Datos Oceanográficos (RNODC) en nombre de la COI y de la OMM respecto de las boyas a la deriva. En el periodo transcurrido entre reuniones, el MEDS ha archivado un promedio mensual de 232.000 mensajes procedentes de boyas y recibido informes de un promedio de 860 boyas por mes, lo que representa un aumento de 38.000 mensajes y 11 boyas respecto del año anterior, respectivamente.

5. Adelantos técnicos

Desde la última reunión el Subgrupo de Evaluación siguió analizando los aspectos técnicos del rendimiento de los derivadores del Programa sobre la Velocidad Superficial (SVP) equipados con dispositivos de medición. Emprendió asimismo otros estudios que lo indujeron a ampliar su mandato y adoptar la nueva denominación de “*Grupo de Evaluación del DBCP”*.

6. Situación del sistema de comunicaciones

El sistema Argos siguió proporcionando un servicio fiable de recuperación y tratamiento de datos procedentes de boyas en tiempo real o casi real. Durante el año se realizaron varias mejoras del sistema y se prevén nuevos adelantos para los años venideros. En la reunión del DBCP se examinaron asimismo otros sistemas de comunicaciones mediante satélites en órbita terrestre baja.

7. Cuestiones administrativas

El Panel cuenta con siete grupos de acción: el Grupo Europeo sobre Estaciones Oceánicas (EGOS); el Programa Internacional de Boyas en el Ártico (IABP); el Programa Internacional de Boyas en el Antártico (PIBA); el Programa Internacional de Boyas en el Atlántico Sur (ISABP); el Programa Internacional de Boyas para el Océano Índico (IBPIO); el Programa Mundial de Derivadores (GDP) y el Equipo de Ejecución de la Red para la Observación Océano-Atmósfera en los Mares Tropicales (TIP). Se prevé establecer un nuevo grupo de acción para el Océano Pacífico Septentrional.

El Sr. Etienne Charpentier, Coordinador Técnico del Panel, sigue trabajando para la COI de la UNESCO como experto adscrito al CLS/Servicio Argos en Toulouse (Francia). Además, desde enero de 1999 desempeña las tareas de coordinador técnico del Programa de Buques que Colaboran Ocasionalmente (SOOP).

Catorce países facilitaron voluntariamente apoyo financiero al Panel y/o al SOOP en 2001: Alemania, Australia, Canadá, Estados Unidos de América, Francia, Grecia, Irlanda, Islandia, Japón, Nueva Zelandia, Noruega, Países Bajos, Reino Unido y Sudáfrica.

Para el próximo ejercicio financiero del Panel (1º de junio de 2002 a 31 de mayo de 2003), se prevé un presupuesto total de 163.150 dólares estadounidenses, distribuido como sigue:

	dólares estadounidenses
Coordinador Técnico (salario, viajes, apoyo logístico)	126.000
Viajes del Presidente, los Vicepresidentes y el Presidente del JTA	19.000
Presidente del JTA (contrato)	7.000
Publicaciones	10.000
Costos para la OMM	50
Imprevistos	1.100
TOTAL	**163.150**

РЕЗЮМЕ

Введение

Группа сотрудничества по дрейфующим буям была учреждена в 1985 г. резолюцией ВМО 10 (EC-XXXVII) и резолюцией МОК EC-XIX-7. В 1993 г. руководящие органы МОК и ВМО решили переименовать ее в Группу сотрудничества по буям для сбора данных (ДБКП) и несколько изменить ее круг ведения, с тем чтобы она могла также обеспечивать международную координацию, которая требуется для программ по заякоренным буям, используемым для поддержки крупных программ ВМО и МОК (резолюция МОК XVII-6 и резолюция ВМО 9 (EC-XLV)). В настоящее время Группа действует в рамках Программной области наблюдений Объединенной технической комиссии ВМО-МОК по океанографии и морской метеорологии (ОКОММ).

1. Текущие и планируемые программы

Доклады о своих мероприятиях по использованию буев для сбора данных представили
11 стран, семь групп действий и два центра управления данными.

2. Поток данных

Данные поступают в среднем примерно с 1 500 буев, около половины из которых передают данные в ГСТ. Почти 69% «глобальных» наборов данных предоставлялись пользователям в течение трех часов с момента их получения, а доступ к примерно 78% «региональных» наборов данных обеспечивался в течение 30 минут.

3. Качество данных

Обеспечивалось прекрасное качество данных об атмосферном давлении и о температуре поверхности моря. Такой результат, вероятнее всего, обусловливается соблюдением руководящих принципов контроля качества ДБКП для данных ГСТ, а также ростом доверия к качеству данных с буев со стороны сообщества специалистов по цифровому прогнозированию погоды.

4. Архивация данных

Служба данных по морской среде (МЕДС) в Канаде с 1986 г. действует в качестве ОНЦОД для дрейфующих буев от имени МОК и ВМО. В последний межсессионный период МЕДС в среднем архивировала 232 000 сообщений с буев в месяц и в среднем ежемесячно получала сообщения с 860 буев, что составило прирост соответственно на 38 000 сообщений и на 11 буев по сравнению с предыдущим годом.

5. Технические мероприятия

В межсессионный период Подгруппа по оценке продолжала анализировать технические аспекты функционирования дрейфующих платформ, снабженных измерительной аппаратурой, в рамках Программы по измерению скорости на поверхности (СВП). Она также проводила другие исследования, которые побудили Группу расширить круг ведения этой подгруппы и переименовать ее в «Группу по оценке ДБКП».

6. Состояние системы связи

Система Аргос продолжает предоставлять надежные услуги по восстановлению и обработке данных с буев в реальном или близком к реальному режиме времени. В

течение года в систему были внесены различные усовершенствования, и в предстоящие несколько лет планируется ее дальнейшее развитие. На сессии ДБКП также рассматривался вопрос об альтернативных системах связи с использованием низкоорбитальных спутников (НОС).

7. Административные вопросы

В Группе имеется семь групп действий: Европейская группа по океанским станциям (ЕГОС); Международная программа по арктическим буям (МПАРБ); Международная программа по антарктическим буям (МПАБ); Международная программа по буям для Южной Атлантики (МПБЮА); Международная программа по буям для Индийского океана (МПБИО); Глобальная программа по дрейфующим платформам (ГПДП); и Группа по использованию заякоренных буев в тропических районах (ТИП). Предусматривается учредить новую группу действий для северной части Тихого океана.

Технический координатор группы г-н Этьен Шарпантье по-прежнему размещается в КЛС/Службе Аргос в Тулузе (Франция) и продолжает оказывать услуги в качестве эксперта ЮНЕСКО/МОК, должность которого финансируется за счет целевого фонда. Кроме того, с января 1999 г. он выполняет функции технического координатора Программы использования попутных судов (СООП).

В 2001 г. в оказании финансовой поддержки Группе и/или СООП на добровольной основе участвовали следующие 14 стран: Австралия, Германия, Греция, Ирландия, Исландия, Канада, Нидерланды, Новая Зеландия, Норвегия, Соединенное Королевство, США, Франция, Южная Африка и Япония.

Общий бюджет Группы на следующий финансовый год (1 июня 2002 г. – 31 мая 2003 г.) в сумме 163 150 долл. планируется распределить следующим образом:

	Долл. США
Технический координатор (заработная плата, поездки, материально-техническое снабжение)	126 000
Поездки председателя, заместителей председателя и председателя КТС	19 000
Председатель КТС (контракт)	7 000
Публикации	10 000
Расходы ВМО	50
Непредвиденные расходы	1 100
ИТОГО	**163 150**

REPORT

1. CURRENT AND PLANNED PROGRAMMES

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

2. DATA FLOW

2.1 Numbers of reporting buoys

During October 2001, data from a total of 1546 buoys were collected and processed at the Argos Global Processing Centres in Toulouse, France, and Largo, 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 countries of "active" drifting buoys and those reporting onto the Global Telecommunication System (GTS) is given for the first half of July 2001 in Annex IV, whereas Annex V shows the number of buoy data onto the GTS per country and sensor for the end of July 2001.

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 the identification of data sparse areas for each kind of geophysical variable. The index is 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 Largo receive:

(i) the global data sets (i.e. data stored during a 101 minute orbit of the operational satellites, also called STIP [*Stored TIROS Information Processing*] data sets) from the global receiving stations in the USA (Fairbanks and Wallop Island) (see paragraph 6.1.2 regarding the French Lannion station). Tables 1 and 2 show the throughput times (i.e. the time taken to make available the data for end users) for delivery of results for STIP data from NOAA-15 and NOAA-16 on the one hand, and NOAA-11 and NOAA-14 on the other:

Satellite Delivery	NOAA-15 & NOAA-16
1 h	18 %
2 h	39 %
3 h	69 %
4 h	76 %
5 h	84 %
> 5 h	100 %

Table 1: Stored data availability for satellites NOAA-15 and NOAA-16

(some 40% of the data are available within 2 hours and 65% within 3 hours, as last year.)

Satellite Delivery	NOAA-11 & NOAA-14
1 h	3 %
2 h	13 %
3 h	22 %
4 h	44 %
5 h	47 %
> 5 h	100 %

Table 2: Stored data availability for satellites NOAA-11 and NOAA-14

(only some 25% of the data are available within three hours as opposed to 65% for the two operational satellites. This delay is due to NOAA-11 data set delivery times)

(ii) a number of regional data sets (i.e. those data received by global or regional stations when an operational satellite is in view of both the station and one or more Platform Transmitter Terminal (PTT)) from regional receiving stations (see Annex VIII). Table 3 shows the throughput times for delivery of results for real-time data from the 4 satellites:

Satellite Delivery	NOAA-12, NOAA-14, NOAA-15 & NOAA-16
10’	5 %
15’	25 %
20’	50 %
30’	87 %
45’	97 %
60’	99 %
>60’	100 %

Table 3: Real-time data availability

(87% of these real-time data are available within 30 minutes)

In addition, three regional processing centres are in operations in Melbourne, Tokyo and Lima.

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 quality of air pressure data (including SVPB), and sea surface temperature, from drifting boys is excellent. Mean RMS (Obs-FG) field for air pressure using the ECMWF model continues to slowly decrease due to (i) better numerical models, (ii) more surface air pressure reports, and (iii) better quality buoy pressure reports. RMS now varies between 1 hPa and 1.2 hPa. (see Annex VI). 57% of the RMS values are now lower than 1hPa and another 39% between 1 and 2 hPa. For SST, 83% of the data are within 1 Celsius, and 95% within 2 Celsius (see Annex VI). Mean RMS using the NOAA/NCEP model is in the order of 1 Celsius.

Such a result is attributable to the implementation of the DBCP quality control guidelines for GTS data, which worked efficiency during the period, as well as to an increased confidence in the quality of the buoy data on the part of the meteorological centres. Overall activity under the QC guidelines decreased substantially during the intersessional period, especially during the period December 2000 to March 2001. Since April 2001, activity seems to be stabilized at a level of about

10 QC messages a month. 71 buoys had their status changed this year, versus 71 in 2000, 62 in 1999 and 132 in 1998. It is clear, from the result of a query undertook by the technical coordinator regarding the afore-mentioned decrease of activity under the QC guidelines, that monitoring centres and the numerical weather prediction community rely increasingly on buoy data and are more and more confident in the quality of the data: improvements in NWP and assimilation techniques have indeed demonstrated that this quality is very good.

The quality control status information as graphics is available through the DBCP Web Server and the Quality Control Guidelines are also detailed on the web site. The server is maintained at the NOAA National Ocean Service since February 1995 at the URL:

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

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.

5. TECHNICAL DEVELOPMENTS

5.1 Lifetime of drifting buoys

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

5.2 SVPB Evaluation Sub-group

During the intersessional period, the DBCP Evaluation Sub-group continued to analyse technical issues regarding the SVP drifters equipped with measuring devices. In particular, a study conducted by Météo-France found that: (i) the total number of SVP-B drifters has decreased since 1996; (ii) performance is independent of deployment method; (iii) early failures have decreased since 1998; (iv) that average life expectancy is about 350 days; and (v) the SVP-B system is valuable for collecting air pressure data, yet there is still some room for improvement. Difficulties reported included early barometer failures and a serious drogue detachment problem (which has since been corrected by the manufacturer). The Subgroup urged that manufacturers focus on their quality assurance programmes to prevent serious data losses.

The Subgroup was also led to study the question of Argos message recommended formats and a suggestion was made that some terms used to report drifter status be clearly defined (e.g. “buoy failure”), as these terms may be different for meteorologists and oceanographers. As a result of those considerations, the panel decided to extend the terms of references of the sub-group and renamed it as “DBCP Evaluation Group”.

6. COMMUNICATION SYSTEM STATUS

Argos system

6.1.1 SPACE SEGMENT

NOAA-16 (L), launched on September 21, 2000, replaced NOAA-14 (J) as one of the two NOAA operational satellites on March 20, 2001. The other operational satellite NOAA-15 (K) has been operating nominally since December 1st, 1998. The launch of NOAA-17 (M) is scheduled for March 2002. NOAA-14 (J) and NOAA-12 (D) are used as secondary satellites. Global and

Regional datasets they collect are delivered according the “multi-satellite” service characteristics.NOAA-11 (H) is providing global datasets which are also delivered through the “multi-satellite”. NOAA-11 is no longer delivering real-time data since October 2001. Table 4 describes the present status of the space segment.

From Satellite status	May 98	Dec 98	Oct 99	Sep 2000	Mar 01
Under test	NOAA-15			NOAA-16	
Operational	NOAA-14 NOAA-12	NOAA-15 NOAA-14	NOAA-15 NOAA-14	NOAA-15 NOAA-14	NOAA-16 NOAA-15
Back-up Third satellite	NOAA-11 NOAA-10	NOAA-11 NOAA-12 NOAA-10	NOAA-11 NOAA-12	NOAA-11 NOAA-12	NOAA-14 NOAA-11 NOAA-12
Decommisioned	NOAA-9	NOAA-9	NOAA-9 NOAA-10	NOAA-9 NOAA-10	NOAA-9 NOAA-10

Table 4

6.1.2 GROUND SEGMENT

In 2000, the delivery of stored data sets to Lannion station was stopped. Even though previously this station only received two data sets per day from each satellite (corresponding to two “blind” orbits), it nevertheless was helpful to the fast data deliver to users. The two global receiving ground stations of Fairbanks and Wallops Island 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). An important and positive development was the resumption in stored data reception from the NOAA-12 (D) satellite: beforehand, two orbits only were received daily. From July 27, 2000, all orbits began to be received again via the Wallops and Fairbanks stations.

Those stations also receive data in near-real-time from platforms in their regional coverage areas. In addition, there are currently 28 stations delivering near-real-time data sets to CLS and Service Argos Inc. Three new stations joined the Argos network during the year: they are in Cayenne, Hawaii and Toulouse . The latter, which is running alongside the existing station at CLS, is primarily dedicated to studies, testing and other activities not compatible with operational requirements. Annex VIII shows the network and the regional coverage areas for near-real time data collection.

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

6.1.3 ARGOS ENHANCEMENT

Work goes on in 2000 towards improving Argos System performance under two main projects: the Argos 2001 project and Argo Next. Preparation for the former included upgrading the computer system architecture (see Annex IX).

Argos 2001: This project is scheduled in three phases:

Phase I: development and implementation of a new user interface allowing users to access data and view and update technical files via a Web server. The System Use Agreements database will also be implemented during this phase. Data will be stored and managed by a database

management system designed to be responsive to users' needs. Argos objective is to give users more versatility if they require.
Phase II: Improvement and development of value-added services.
Phase III: Redesign of the Argos processing system.

Phase I began end 1998 and is being pursued. The user management application is operational. The User Office application is operational since end of 2000. The Web interface will be opened to beta testing users in September and for all users at the end of the year. The SUA web interface for NOAA and CNES will be operational in September.

Phase II is started. The operating interface specifications are completed. The specifications for value-added services will be completed for September. This phase is scheduled to be completed by the end of next year.

Argos Next: The downlink messaging capabilities provided by the ADEOS II/Argos DCS equipment will require the addition of two new components to the current Argos ground segment:

(i) A Downlink Message Management Center (DMMC) located at CLS premises in Toulouse, France. The DMMC's role is to centralize, validate, and schedule downlink message requests from users before transmitting downlink messages to the satellite (via a Master Beacon). DMMC development was completed by the end of the second quarter of 2000. DMMC acceptance tests took place during the third quarter of 2000. (Note: a symmetrical DMMC will be installed at SAI Largo after ARGOS 2001 phase I development is completed).

(ii) *A network of four master beacons located at strategic points around the globe, acting as the link between satellites and the DMMC. The four locations foreseen for these beacons are: Toulouse, Hatoyama, Fairbanks, and Spitsberg (TBC). After completing the development of the prototype, the first two master beacons were installed in Toulouse (France) and Hatoyama (Japan) respectively in September and December 2000. The Fairbanks Master Beacon installation was scheduled for October 2001.*

7. ADMINISTRATIVE MATTERS

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 established on 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	Danmarks Meteorologiske Institutt
France	Météo-France
Iceland	Veðurstofa Íslands
Ireland	Met Éireann
Federal Republic of Germany	Deutscher Wetterdienst
The Netherlands	Koninklijk Nederlands Meteorologisch Instituut
Norway	Det Norske Meteorologiske Institutt (DNMI)
Sweden	Sveriges Meteorologiska och Hydrologiska Institut
United Kingdom	The Met. Office

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	Meteorological Service of Environment Canada (assisted by Polar Continental Shelf Project, Canadian Coast Guard, Canadian Forces and Institute of Ocean Sciences), Marine Environmental Data Service
France / USA	Service Argos
Germany	Alfred-Wegener Institute for Polar and Marine Research
Japan	Japan Marine Science and Technology Centre
Japan/USA	International Arctic Research Center
Norway	Christian Milchelsen Research, Norsk Polarinstitutt, Norwegian Meteorological Institute
Russian Federation	Arctic and Antarctic Research Institute, Russian Federal Service of Hydrometeorology and Environmental Monitoring
United Kingdom	United Kingdom Meteorological Office
USA	National Ice Centre (representing the National Aeronautics and Space Administration, the Nation Science Foundation, the National Oceanic and Atmospheric Administration and the Office of Naval Research), Pacific Marine Environmental Laboratory (of NOAA), Polar Science Centre of the Applied Physics Laboratory of the University of Washington, Woods Hole Oceanographic Institution, Naval Oceanographic Office, Naval Meteorology and Oceanography Command
International Organizations	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 IPAB:

Australia	Australian Antarctic Division, Tasmania and Antarctica Regional Office of the Australian Bureau of Meteorology
Finland	Finnish Institute of Marine Research, University of Helsinki
France / USA	CLS/Service Argos
Germany	Alfred Wegener Institute for Polar and Marine Research, Institute für Meteorologic und Klimaforschung Universität Karlruhe
Italy	Programma Nazionale di Ricerche in Antartide
South Africa	South African Weather Bureau
United Kingdom	British Antarctic Survey, Scott Polar Research Institute, United Kingdom Meteorological Office
USA	National Ice Centre (see above under IABP), Geophysical Institute of the University of Alaska, World Data Centre 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, National Meteorological Institute, National Space Research Institute
Canada	Marine Environmental Data Service
France / USA	CLS/Service Argos
Namibia	The Meteorological Service
South Africa	South African Weather Service, Marine and Coastal Management
Ukraine	Marine Hydrophysical Institute of National Academy of Science
United Kingdom	The Met Office
USA	Atlantic Oceanographic and Meteorological Laboratory, National Data Buoy Center, Naval Meteorology and Oceanography (COMNAVMETOCCOM)
International Organizations	Caribbean Meteorological Organization

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
India	National Institute of Oceanography1
South Africa	South African Weather Bureau
USA	Global Drifter Center of NOAA/AOML*

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 to 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.

7.1.7 TROPICAL MOORED BUOYS IMPLEMENTATION PANEL (TIP)

The Tropical Moored Buoys Implementation Panel (TIP) became an Action Group of the Data Buoy Cooperation Panel (DBCP) during 1999 (under then the name of TAO Implementation Panel). Its annual report is reproduced in Annex II.

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[1] Provides support, but not yet formal member.

7.1.8 NORTHEAST PACIFIC COOPERATIVE PROGRAMME (NPCP)

The NPCP was developed by the United States and Canada to prepare accurate forecasts for the coastal areas of the Northeast Pacific. Although the Northeast Pacific is apparently well served by the USA and Canadian moored buoys, and Voluntary Observing Ships, large expanses of ocean still exist where little meteorological information is available to forecasters.

In this context, the possible establishment of an action group for the North Pacific Ocean was envisaged. Over the past year, meetings were held with PICES (the North Pacific Marine Science Organization) towards the establishment of a subgroup (called an Advisory Panel) to their Physical Oceanography and Climate Committee (POC). PICES accepted the concept of this new group and the panel endorsed the proposal to establish a North Pacific action group, with participation from the PICES Advisory Panel. Canada will work with the Secretariats to organize a preparatory meeting for such a group in the first half of 2002. DBCP members with interests in this ocean basin are encouraged to join this new action group.

7.2 Membership

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

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

- Thirteenth session (Saint-Denis, La Réunion, France, October 1997): Australia, Brazil, Canada, France, Iceland, Netherlands, New Zealand, South Africa, Spain, United Kingdom, USA;

- Fourteenth session (Marathon, Florida, USA, October 1998): Australia, Brazil, Canada, France, Iceland, India, Netherlands, New Zealand, South Africa, United Kingdom, USA;

- Fifteenth session (Wellington, New Zealand, October 1999): Australia, Brazil, Canada, France, Iceland, India, Netherlands, New Zealand, South Africa, Thailand, Ukraine, United Kingdom, USA;

- Sixteenth session (Victoria, BC, Canada, October 2000): Australia, Brazil, Canada, France, India, Japan, Netherlands, New Zealand, South Africa, Ukraine, United Kingdom, USA;

- Seventeenth session (Perth, Australia, October 2001): Australia, Brazil, Canada, France, India, Italy, Japan, Netherlands, New Zealand, Republic of Korea, South Africa, Ukraine, United Kingdom, USA.

7.2.2 NATIONAL FOCAL POINTS

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

7.3 Technical coordinator

The panel's technical coordinator 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. Since 1 January 1999, he is also discharging the functions of technical coordinator of the Ship-of-Opportunity Programme (SOOP).

7.4 Finances

Overall management of the panel's finances has continued to be undertaken by WMO during 2001, while IOC has arranged contracts for the employment of the technical coordinator as well as for his logistic support. Annex XI contains financial statements as follows:

(a) Finalized IOC Statement of Account for the period 1 June 2000 to 31 May 2001;

(b) Final WMO Statement of Account as at 31 December 2001 (for the years 2000-2001).

For the financial year 2002-2003, the panel agreed the following draft budget (which encompasses the expenditures and contributions relating to SOOP):

A. Expenditures	**US$**
Technical coordinator (salary, travel, logistic support)	126,000
Travel of Chairman, Vice-chairmen & JTA chairman	19,000
JTA chairman (contract)	7,000
Publications	10,000
WMO Costs	50
Contingencies	1,100
TOTAL	**163,150**

B. Income achieved/required	
Contributions	162,650
DBCP ties	500
Carry-over 2000-2001	0
TOTAL	**163,150**

The following fourteen countries are contributing to the DBCP-SOOP funding: Australia, Canada, France, Germany, Greece, Iceland, Ireland, Japan, Netherlands, New Zealand, Norway, South Africa, United Kingdom and USA. Some countries may indicate that their contributions are earmarked for DBCP only or for SOOP only.

ANNEX I

NATIONAL REPORTS ON DATA BUOY ACTIVITIES

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

Country: **Australia**

Year: **2000/2001 (July 2000 – June 2001)**

CURRENT PROGRAMMES

A. **Agency or programme**: Bureau of Meteorology

Number and type of buoys:

(b) 9 drogued FGGE (2 with wind measuring capabilities) were deployed between 1 July 2000 – 30 June 2001
(b) 9 buoys were operational at 31 August
(c) 9 buoys were reporting on GTS at 31 August

Purpose of programme: support for the Bureau's operational forecasting and warning services

Main deployment areas: Southern and Indian Oceans

B. **Agency or programme:** Global Drifter Program

Number and type of buoys:

(a) 9 SVP-B buoys were deployed between 1 July 2000 – 30 June 2001.
(c) 8 buoys were operational at 31 August.
(d) 8 buoys were reporting on GTS at 31 August.
(e)

Purpose of programme: support for the Bureau's operational forecasting and warning services and oceanographic research

Main deployment areas: Southern and Indian Oceans

PLANNED PROGRAMMES

A. **Agency or programme:** Bureau of Meteorology

Number and type of buoys planned for deployment between 1 July 2001 – 30 June 2002:

6 FGGE
4 FGGE-W (to be deployed as 'moored' buoys)
1 SVP-B
2 SVP-BW

Purpose of programme: support for the Bureau's operational forecasting and warning services

Main deployment areas: Southern and Indian Oceans

B. **Agency or programme:** Global Drifter Program

Number and type of buoys planned for deployment between 1 July 2001 – 30 June 2002:

6 SVP
14 SVP-B (6 SVP-B buoys to be deployed with the assistance of Météo France from La Reunion, and 2 SVP-B buoys to be deployed with the assistance of the South African Weather Service from Cape Town)

Purpose of programme: support for the Bureau's operational forecasting and warning services and oceanographic research

Main deployment areas: Indian Ocean

TECHNICAL DEVELOPMENTS

Buoy design:

The Bureau has successfully moored FGGE-W buoys in the relatively benign waters of the Gulf of Carpentaria over the past several Tropical Cyclone seasons, with only minor modifications to the drogue. The Bureau is proposing to moor two FGGE-W buoys in the exposed waters along the southern coast of Australia using a modified mooring system.

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

SPECIAL COMMENTS

Communications:

Between 0000 UTC 26 August 2001 and 1800 UTC 3 September 2001, NMOC Melbourne received 93312 individual BUOY messages. The delay between the time of observation and reception over the GTS was calculated for each message.

Almost 80% of the messages were received within 4 hours of the observation time, increasing to almost 90% within 6 hours. A small number of messages were delayed beyond 24 hours.

NATIONAL REPORT FOR CANADA

YEAR: 2000/2001 (Sept. 1/00 - Aug. 31/01)

CURRENT PROGRAMS:

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

Number and type of buoys:

a) Deployed during year:
- 2 TOGA WSD drifters
- 2 SVP/B drifters

b) Operational (31/08/01):
- 3 moored six meter NOMAD buoys
- 13 moored three meter Discus buoys
- 1 Developmental three metre Discus buoy
- ? drifters

c) Reporting on GTS (31/08/01):
- 16 moored buoys
- ????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:
- 4 moored buoys deployed inland lake's spring/summer 2001 (seasonal: deployed May into July, retrieved late September or October)
- 1 moored buoy deployed Hudson Bay summer 2001 (seasonal: deployed July or August, retrieved late September or October)
- 6 drifting buoys deployed Arctic Basin as a Participant of the International Arctic Buoy Programme (IABP)

b) Operational (31/08/01):
- 4 inland lakes moored buoys
- 1 Hudson Bay moored buoy
- 4 Arctic Basin drifting buoys

c) Reporting on GTS (31/08/01):
- all 5 inland lake / Hudson Bay moored buoys
- 4 of the Arctic Basin drifting buoys

Main deployment area:
- Great Slave Lake
- Lake Winnipeg
- Hudson Bay vicinity Churchill
- Arctic Basin west of the Canadian Arctic Islands

*** seasonal only (~~May - October)**

C AGENCY OR PROGRAM: CANADA - Canadian Ice Service

Number and type of buoys:

a) **Deployed during year:**
- 6 CALIB, 2 having pressure sensor

b) Operational (31/08/01):
- None

c) Reporting on GTS (31/08/01):
- None

Main deployment area:
- West Baffin bay: to track southward motion of old ice.
- Beaufort Sea: to add to the IABP network.
- ????Labrador Coast: to validate sea ice and iceberg models.

D AGENCY OR PROGRAM: CANADA - Atlantic Region

Number and type of buoys:

a) Deployed during year:
- One six metre NOMAD

b) Operational (31/08/01):
- Eight 6 meter NOMAD buoys
- One DATAWELL

c) Reporting on GTS (31/08/01):
- 8 six metre NOMADS

Main deployment area:
- North West Atlantic

E AGENCY OR PROGRAM: CANADA - Ontario Region

Number and type of buoys:

a) Deployed during year:
- 5 three meter buoys
- 2 twelve meter buoys
- 6 lightweight WatchKeeper buoys

b) Operational (31/08/01):
- 13 buoys

c) Reporting on GTS (31/08/01):
- all

Main deployment area:
- Great Lakes
- Large Lakes and bodies of water other than the Great Lakes

F AGENCY OR PROGRAM: CANADA - Quebec Region

Number and type of buoys:

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

b) Operational (31/08/01):
- 1 buoy

c) Reporting on GTS (31/08/01):
- 1

Main deployment area:
- Gulf of St. Lawrence

G AGENCY OR PROGRAM: CANADA - Fisheries and Oceans (BIO)

Purposes of the 2001 program:

Extensive programs continued on the ice fields of the Labrador Shelf and Gulf of St. Lawrence using beacons measuring drift, pressure, stress, convergence/divergence and wind profiles. Data were provided to the Canadian Ice Centre for forecasting and to the Canadian Coast Guard to support ice breaking. GPS beacons were used to empirically indicate and validate models of transport and dispersal pathways for salmon aquaculture sites in the Bay of Fundy. Beacons were used to measure drift on the Scotian Shelf for an investigation of possible ballast water discharge sites

Number and type of buoys:

a) Deployed during year:	·	17 GPS surface beacons
	·	6 Argos surface drifters
b) Operational (31/08/01):	·	6
c) Reporting on GTS (31/08/01):	·	?
Main deployment area:	·	Labrador Shelf, Gulf of St. Lawrence,
	·	Bay of Fundy and Scotian Shelf

PLANNED PROGRAMS:

Purpose of programme and number and type of buoys planned for deployment in next 12 months:

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

a) Operational:	·	0 additional moored buoys planned for deployment
	·	3 TOGA WSD drifters.
	·	10 SVP/B drifters.
	·	3 SVP/BW wind speed and direction drifters.
b) Developmental:	·	1 updated developmental buoy to replace an earlier generation of optical sensor 3 metre discus buoy.
c) Met/Ocean research:	·	As above.
Deployment area:	·	Drifting buoys will be deployed in the North East Pacific Ocean along approximately 160 degrees west between 43 to 52 degrees north.

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

a) Operational:	·	Inland lakes: 3 to 5 buoys
	·	Hudson Bay: may not deploy 2002
	·	IABP: 3 to 5 buoys depending on "holes" in the buoy array and deployment opportunities
b) Developmental:	·	IABP**:** experiment with the assembly of buoys in house including making combination battery / solar panel power supplies
c) Met/Ocean research:	·	IABP: endeavouring to have oceanographic temperature/salinity profiles done at sites where buoys are deployed via Twin Otter landing on ice.
Deployment area:	·	Hudson Bay
	·	Great Slave Lake
	·	Lake Winnipeg
	·	Arctic Basin adjacent to Canada

C AGENCY OR PROGRAM: CANADA - Canadian Ice Service

a) Operational:	·	? Lithium Battery with air Pressure sensor CALIB to be deployed in Eastern Arctic to support Environment Canada data acquisition program. · 1 CALIB to be deployed on request to support operations.
b) Developmental:	·	N/A
c) Met/Ocean research:	·	4 Ice beacons with GPS for the research project called: "Improved Routing Methodologies in the St Lawrence System" · 4-6 CALIBs for model verification off Labrador coast.
Deployment area:	·	Eastern Arctic. Gulf of St-Lawrence and Newfoundland/Labrador waters.

D AGENCY OR PROGRAM: CANADA - Atlantic Region

a) Operational:	·	One 3 meter disc buoy (DND Project)
b) Developmental:	·	None
c) Met/Ocean research:	·	N/A
Deployment area:	·	North West Atlantic

E AGENCY OR PROGRAM: CANADA - Ontario Region

a) Operational:	·	0
b) Developmental:	·	N/A
c) Met/Ocean research:	·	One 12 meter buoy is equipped with a chemistry laboratory on board with several on going experiments (mass spectrometer). The buoy is powered by two diesel (6kw) engines and solar power.
Deployment area:	·	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. · 12 meter buoy Lake Ontario

F AGENCY OR PROGRAM: CANADA - Quebec Region

a) Operational:	·	N/A
b) Developmental:	·	N/A
c) Met/Ocean research:	·	Current meter to be installed in co-ordination with DFO Maurice Lamontagne Institute
Deployment area:	·	N/A

G AGENCY OR PROGRAM: CANADA - Fisheries and Oceans (BIO)

Purpose of program

- To provide data to the Canadian Ice Centre for forecasting and to the Canadian Coast Guard to support ice breaking.
- To validate models of transport pathways for salmon aquaculture sites in the Bay of Fundy.

- To investigate possible offshore sites for ballast water discharge.

a) Operational: · N/A

b) Developmental: · N/A

c) Met/Ocean research:
- Extensive programs will continue on the pack ice of the Labrador Shelf and Gulf of St. Lawrence using beacons for measuring drift, pressure, stress, convergence/divergence and wind profiles to validate and provide inputs to operational ice forecasting models.
- GPS beacons will be used to empirically indicate and validate models of transport pathways for salmon aquaculture sites in the Bay of Fundy.
- Beacons will be used to measure drift on the Scotian Shelf for an investigation of possible ballast water discharge sites.

Deployment area: · Gulf of St Lawrence, Labrador Shelf, Bay of Fundy, Scotian Shelf

TECHNICAL DEVELOPMENTS:

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

a) **Buoy design:**
- No significant changes over past year.
- Improvements to wind mast design to simplify exchange of anemometers at sea completed.

b) **Instrumentation**:
- Ultrasonic anemometer continues on test at an operational buoy station and on the developmental buoy.
- Installation of transmitter reset circuits to begin on test buoy fall/01.
- Installation of backup ARGOS transmitters to be installed over next 3 years.
- Optical sensors for biological monitoring installed on 2 buoys.
- High Accuracy Water Temperature system (HATS) to be tested on developmental buoy.
- High Data Rate GOES transmitter to be tested on developmental buoy.

B **Moored Buoys and drifting buoys: CANADA - Prairie and Northern Region**

a) **Buoy design**: · Nil

b) **Instrumentation:** · Nil

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

a) **Beacon design**
- Using Lithium batteries for northern beacon deployments.
- Using Alkaline batteries for southern beacon deployments.

b) **Instrumentation:** · Atmospheric Pressure and temperature sensors on 1 CALIB in North-western Baffin Bay (temperature sensor data is available on raw data only). Temperature data not included on GTS due to unreliability of data when beacon is insulated by increasing snow cover during fall / winter months.

D **Moored Buoy Systems : CANADA - Atlantic Region**

a) **Buoy design:** · 11 NOMADS now have shortened fwd mast.

· 11 NOMADS now have reinforced 50 watt solar panels and are
· configured for solar power operation.

b) **Instrumentation**: · Watchman 100 Payloads installed in 11 Nomads
· 'Blipper Radar Detectors' installed on 6 buoys

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

a) **Buoy design:** · NIL

b) **Instrumentation**: · All buoys in the Buoy Program are being upgraded with the new Buoy Payload (Watchman 100).
· All buoys have Global Positioning System installed.
· Rain gauge has been added to the 12 metre in Lake Ontario

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

a) **Buoy design:** · 3 Metre Discus

b) **Instrumentation**: · Watchman 100

G **AGENCY OR PROGRAM: CANADA - Fisheries and Oceans (BIO)**

a) **Buoy design:** · N/A

b) **Instrumentation**: · N/A

PUBLICATIONS:

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

- Monthly WMO Moored and Drifting Buoy Status Reports for all Canadian Buoys.
- On line Moored Buoy Status Reports at: **http://sebulba.pyr.ec.gc.ca/~wbs/**
- Buoy data available at: **http://weatheroffice.ec.gc.ca/**
- Annual ODAS Buoy Service Reports - Pacific and Yukon Region (Internal distribution)

B **CANADA - Prairie and Northern Region**

Inland lakes
- None

IABP
- International Arctic Buoy Programme Data Reports published by the Applied Physics Laboratory, University of Washington,
- Data is also available from the IABP web site **http://iabp.apl.washington.edu.**

C **CANADA - Canadian Ice Service**

- None.

D **CANADA - Atlantic Region**

- None

E **CANADA - Ontario Region**

- None

F **CANADA - Quebec Region**

- None

G AGENCY OR PROGRAM: CANADA - Fisheries and Oceans (BIO)

- None

SPECIAL COMMENTS:

A CANADA - Pacific and Yukon Region - North East Pacific

a) **Quality of buoy data:**
- Good

b) **Communication:**
- Good. Over 93% of all possible moored buoy data delivered to users

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

d) **Other.**
- Nil

B CANADA - Prairie and Northern Region

a) Quality of buoy data:
- Inland lakes: Good and reliable.
- IABP: Good and reliable. Unreliable data is not put on GTS.

b) Communication:
- Inland Lakes and Hudson Bay - via GOES satellite
- Arctic Basin: from polar orbiting NOAA series weather satellites and processed in-house / put onto GTS at Meteorological Service of Canada's Local users terminal in Edmonton or via Service Argos.

c) Buoy Lifetimes:
- Inland lakes and Hudson Bay: seasonal moored buoys have up to 3 years between battery changes.
- IABP: about 2 years; summer ice melt and break-up of ice though the year factor into buoy survival.

d) Other.
- Nil

C CANADA - Canadian Ice Service

a) **Quality of buoy data:**
- Good and reliable.

b)

c) **Communication:**
- Good and reliable.

d) **Buoy Lifetimes:**
- 3-4 months for Alkaline batteries, up to 1 year for Lithium batteries.

e) **Other:**
- All NFLD coast CALIB deployments provided good results.
- Gulf experiment cancelled due to lack of ice in early February.
- Will be conducted this coming winter (ice permitting).

D CANADA - Atlantic Region

a) **Quality of buoy data:**
- Good

b) **Communication:**
- 80% of transmitters operating

c) **Buoy Lifetimes**:
- N/A

d) **Other:** · N/A

E **CANADA - Ontario Region**

a) **Quality of buoy data:** · Excellent this season - recent modifications to overcome lightning problems seem to be working.

b) **Communication:** · 95 % plus

c) **Buoy Lifetimes**: · The three meter buoys are deployed and retrieved annually with the battery system being replaced every 5 years. The 12 meter buoys are year round platforms, with the power system being replaced every 5 years. The lightweight buoys will follow the same cycle as the three meter buoys.

d) **Other:** · N/A

F **CANADA - Quebec Region**

a) **Quality of buoy data:** · 90%

b)

c) **Communication:** · GOES

d) **Buoy Lifetimes**: · N/A

e) **Other:** · Position by ARGOS beacon

G **AGENCY OR PROGRAM: CANADA - Fisheries and Oceans (BIO)**

a) **Quality of buoy data:** · N/A

b) **Communication:** · N/A

c) **Buoy Lifetimes**: · N/A

d) **Other:** · N/A

CONTACT POINTS

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

Environment Canada
Meteorological Service of Canada
Atmospheric Monitoring Division
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

Meteorological Service of Canada
Twin Atria Bldg - Room 200
4999 - 98 Avenue
Edmonton, AB
T6B 2X3
Canada
Attn : Edward Hudson

phone: 780 951-8878 fax: 780 951-8872 E-Mail : edward.hudson@ec.gc.ca

C **CANADA - Canadian Ice Service**

Environment Canada
Meteorological Service of 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
Meteorological Service of Canada
45 Alderney Dr.
Dartmouth NS
Attn : Mike McNeil

Office:
Phone : 902-426-9225 Fax : 902 426-1595 Email: Mike.McNeil@ec.gc.ca
Work Shop:
Phone : 902-426-6616, fax: 426-6404 Cell: 902-483-1625

E **CANADA - Ontario Region**

Environment Canada
Meteorological Service of 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 - Quebec Region**

Environment Canada
Meteorological Service of Canada
100 Alexis Nihon
PMO office
St Laurent, Quebec
H4M 2N8
Attn : Richard Dupuis

phone : 514-283-1635 fax : 514-496-1867 Email : Richard.Dupuis@ec.gc.ca

G **CANADA - Fisheries and Oceans (BIO)**

Department of Fisheries and Oceans
Coastal Ocean Sciences
P.O. Box 1006
Dartmouth, N.S.
B2Y 4A2
Attn : Dr. Donald Lawrence

Phone : 902-426-2431 Fax : 902 426-6927
Email : lawrenced@mar.dfo-mpo.gc.ca

H **CANADA - Environment Canada National Marine Program**

National Marine Services Manager
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 2000 - 31 August 2001**

This report concerns surface buoys only. Programmes using profilers (ARGO floats) are not described here.

PROGRAMMES

A. MÉTÉO-FRANCE

Number and type of buoys :

(a) 34 drifting buoys (most of them drogued) were deployed in last 12 months :

(b) 13 SVP barometer drifters (including 2 with wind measurement capabilities and 5 with salinity) ;

- 21 Marisonde GT (wind FGGE type fitted with a thermistor string) into the POMME [1] experiment (Multidisciplinary Programme on Mesoscale Oceanography) ;

In addition, 5 moored buoys were moored or replaced ;

(b) 30 buoys[2] were operational at 31 August 2001 ;

(c) 30 buoys[1] were reporting on GTS at 31 August 2001.

Purposes of programme :

(b) Operational : to provide Weather Forecast Centres with oceanographic and meteorological observations in real time (EGOS programme, French West Indies, IBPIO programme...) ;

(c) Reasearch : to provide scientists with in-situ observations close to the air-sea interface (Marisondes GT - POMME experiment) ;

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

Main deployment areas :

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

Plans for the next 12 months :

Meteo-France will continue to operate drifting buoys in the Atlantic and Indian oceans through its contribution to the DBCP regional action groups EGOS and IBPIO. The co-operation with the Global Drifter Center of NOAA and Navoceano will be pursued. Meteo-France will continue to operate three ocean weather stations (two in West Indies and one in the Mediterranean Sea) and a new station will be implemented in the Mediterranean Sea. The co-operation with the UK Meteorological Office to maintain the Brittany and Gascogne moored buoys will continue. The three waverider stations located in West Indies will be also maintained.

B. LODYC (DYFAMED, CARIOCA, IMCORP programmes)

Number and type of buoys :

(a) 3 CARIOCA buoy and 1 prototype of Carbon buoy were deployed in last 12 months ;

(b) Four buoys were operational at 31 August ;

(c) Four buoys were reporting on GTS at 31 August.

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[1] http://www.ipsl.jussieu.fr/POMME/site_gi_frame.html

[2] Including two DATAWELL waveriders in French West Indies and the two UK/French moored buoys.

Purposes of programmes :

(a) Research : to understand, quantify and monitor the CO2 fluxes exchanged at the air-sea interface ;

(b) Technical : to develop a buoy able to measure CO_2 concentrations at the ocean-atmosphere interface (Programme CARIOCA) and another one to measure the distribution of carbon compounds at the same interface (Programme IMCORP). Such buoys will be used in the frame of GOOS.

Deployment areas :

North and Tropical Atlantic ;
Western Mediterranean Sea ;
Southern Indian Ocean.

Plans :

Five new buoys will be deployed in the next 12 months in the Southern Seas.

C. CETMEF (Centre d'Etudes Techniques Maritimes Et Fluviales)

Number and type of buoys :

(a) CETMEF operates a network of 13 omnidirectional wave moored buoys and two directional (DATAWELL). In addition, CETMEF implemented wave measurement systems on two Aid-to-Navigation moored buoys ;

(b) 17 buoys were operational at 31 August ;

(c) One was reporting on GTS at 31 August.

Purpose of programme :

(a) Operational : to maintain a long duration wave measurement network along the coast of the French mother and overseas territories coasts and to centralize the French wave data.

Deployment area :

French coasts and La Reunion Island.

Plans for the next 12 months :

The network will be maintained. CETMEF plan to complete it with four new directional wave buoys : two Datawell waveriders and two Triaxys. Developments are in progress at Meteo-France to report the CETMEF wave data onto the GTS in real time (WAVEOB code).

D. IRD (ex ORSTOM) - French participation to PIRATA programme co-operation with Meteo-France and CNRS)

Number and type of buoys :

(a) Two Atlas buoys were operational at 31 August ;

(b) Two Atlas buoys were reporting on GTS at 31 August.

Purposes of programme :

The PIRATA programme is an extension of the TAO array in the Tropical Atlantic. Contributions are from Brazil, France and USA.

(a) Operational : to provide oceanographical and meteorological observations in real time to Weather Forecast Centres ;

(b) Research : 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.

Deployment area :

Tropical Atlantic Ocean

Plans for the next 12 months :

IRD will continue to maintain four stations after replacing two buoys which ceased to operate in 2001. Detailed information is available on *http://www.ifremer.fr/orstom/pirata/pirataus.html*

E. IFREMER (MAREL programme)

Number and type of buoys :

(a) Three buoys were operational at 31 August ;
(b) None was reporting on GTS at 31 August.

Purposes of programme :

To provide coastal environmental data in order to study and monitor the direct or indirect effects of human activities on marine environment ;

Deployment area :

French coasts

Plans for the next 12 months :

Ifremer will continue to maintain three buoys in next 12 months : two in the Bay of Seine, one in the Bay of Brest.

F. SHOM (Hydrographic and Oceanographic Service of the Navy)

Number and type of buoys :

(a) 34 Surdrift buoys (lagrangian drifters drogued at 400m depth) and 12 CMOD XAN-3 drifters were deployed in last 12 months ;
(b) Ten buoys were operational at 31 August ;
(c) Six was reporting on GTS at 31 August.

Purposes of programme :

To get oceanic data (current and temperature in depth) that could be introduced in real time into prediction models for defence applications.

Deployment area :

North Atlantic

Plans for the next 12 months :

10 Surdrift buoys will be deployed in the next 12 months ;
Data will be reported on the GTS for some of them.

TECHNICAL DEVELOPMENTS

(b) Instrumentation

(i) Meteo-France continues to participate in the evaluation of SVP pressure drifters developed by the Global Drifter Center (USA). 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. Three new SVP-BW

drifters reporting sound energy spectra will be deployed by Meteo-France over the next 12 months.

(iii) Meteo-France also evaluates SVP-B drifters fitted with conductivity sensors in co-operation with LODYC (France). Five buoys were tested during the 12 past months, off France and Iceland. Four new drifters will be tested in 12 next months.

(iv) The project of CO_2 concentration measurements from drifting buoys, managed by LODYC is continuing. Five buoys, called CARIOCA (CARbon Interface OCéan Atmosphère) and one Carbon buoy will be deployed in next 12 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).

Servain, J., Busalacchi, A. J., McPhaden, M. J., Moura, A. D., Reverdin, G., Vianna, M., and Zebiak, S.E., 1998a : A pilot research moored array in the tropical Atlantic (PIRATA). *The Bulletin of the American Meteorological Society*., Vol. 79, No. 10, 2019-2031.

SPECIAL COMMENTS

(a) Buoy QC

(i) 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.

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

(b) Other

For the sixth consecutive year, Meteo-France funded 10 barometers to be added to SVP drifters. These will be deployed in the Indian Ocean in November 2001. The action will be renewed in 2002 if possible.

Country: Iceland

Year 2001:

Current Programs:

A. Programme number 00588: Icelandic Met Office
Number and type of buoys deployed: The Met Office provides 1 PTT year for use in EGOS drifting buoy programme and this PTT is managed by the EGOS Secretariat in Bergen.

B. Programme number : 01119 Marine Reserch Institute.
Number and type of buoys deployed: No activety

Planned programmes.

a) The Icelandic Met Office will as before provide one PTT year for use within the EGOS buoy programme in the North Atlantic
b) The Marine Research Ibnstitute: No activety.

Reports and publications:

Recent developments in oceanographic research
in Icelandic waters. Steingrímur Jónsson og Héðinn Valdimarsson, 2001.
Submitted to Quaternary Science Reviews.

On the influence of freshwater runoff to Héraðsflói on currents
and environmental conditions. Héðinn Valdimarsson,
Steingrímur Jónsson, Gerða Geirsdóttir, Jóhannes Briem,Jón
Ólafsson,Magnús Danielsen og Sólveig Ólafsdóttir,
Marine Research Institute 2001.

Country : INDIA

Year : 1st September '2000 to 31st August 2001

I. MOORED BUOYS

CURRENT PROGRAMMES

A. Agency or Programme : National Data Buoy Programme (Moored Buoys)
National Institute of Ocean Technology
Department of Ocean Development
Government of India

Number and type of buoys : (a) deployed during the year :12 Moored buoys
(b) operational at 31 August : 7 Moored buoys

(c) reporting on GTS at 31 August : 7 Moored buoys

Purpose of programme (a) Opertional : √
(b) met/ocean research : √
(c) developmental : √

PLANNED PROGRAMMES

A. Agency or Programme: **National Institute of Ocean Technology**,
Department of Ocean Development

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

Purpose of programme: (a) operational : √

(b) met/ocean research : √

(c) developmental : √

Main deployment areas : Bay of Bengal, Arabian sea, Indian Ocean

TECHNICAL DEVELOPMENTS

(a) Buoy design : On going

(b) Instrumentation : Nil

(c) Others : Satellite communication (in the advanced development)

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

(b) Completion report on the implementation of NDBP with respect to the bilateral co-operation between Govt. of India and Govt. of Norway has been made.

(c) A technical report on 'Laboratory calibration and field testing of Minitracka Chlorophyll and UV Aquatracka Hydrocarbon Sensors' has been made.

SPECIAL COMMENTS (if any)

(a) Quality of buoy data : Good

(b) Communications : Good

(c) Buoy lifetime : Unable to decide, as frequent damages to data buoys due to acts of vandalism.

(d) Others : Nil

II. DRIFTING BUOYS

A. Agency or programme: National Institute of Oceanography
Dona Paula, Goa, INDIA - 403 004

Purpose of programme: Operational, research and technical improvements

Numbers and types of platforms:
(a) deployed current year: SVP-B -10 Nos.
FGGE - 1 No

(b) planned next year: SVP-B - 12 Nos.
SVP-BW - 2 Nos.
FGGE - 1 No

Estimated number of PTT years (a) current year 10 PTT years
(b) next year 10 PTT years

Publications:

Saji P.K., Shenoi S.C., Almeida A. and Rao G (2000) Inertial currents in the Indian Ocean derived from satellite traced surface drifters; Oceanologica Acta, 23, 635-640.

Country: JAPAN

Year: 2001

CURRENT PROGRAMMES

A. Japan Meteorological Agency (JMA)

Number and type of buoys:
(a) deployed during year:
(Type 1) 18 drifting buoys with 4 maritime meteorological and oceanographic sensors
(Type 2) 6 PALACE
(b) operational at 31 August:
(Type 1) 7
(Type 2) 11
(c) reporting on GTS at 31 August:
(Type 1) 7
(Type 2) 11
Purpose of programme:
(Type 1) operational meteorological and oceanographic observation
(Type 2) oceanographic research and operational observation
Main deployment areas:
(Type 1) seas around Japan
(Type 2) the western North Pacific

B. Meteorological Research Institute, JMA

Number and type of buoys:
(a) deployed during year: 6 isopycnal APEX floats
(b) operational at 31 August: 21 (10 PALACE, 5 APEX and 6 isopycnal APEX)
(c) reporting on GTS at 31 August: 21 (10 PALACE, 5 APEX and 6 isopycnal APEX)
Purpose of programme: oceanographic research (subarctic intermediate circulation)
Main deployment areas: Oyashio-Kuroshio mixed water region (seas east of Japan)

C. Japan Coast Guard

Number and type of buoys
(a) deployed during year: 32 surface drifters with holey sock drogues and SST sensors
(b) operational at 31 August: 31
(c) reporting on GTS at 31 August: 26
Purpose of programme: operational observation
Main deployment areas: the North Pacific and the Antarctic Oceans

D. Japan Marine Science and Technology Center

Number and type of buoys:
(a) deployed during year:
(Type 1) 2 meteorological and subsurface oceanographic drifters(J-CAD)
(Type 2) 11 meteorological and subsurface oceanographic surface moorings (TRITON buoys)
(Type 3) 18 profiling floats with CTD sensor (ARGO floats)
(b) operational at 31 August:
(Type 1) 2
(Type 2) 11
(Type 3) 20

(c) reporting on GTS at 31 August

(Type 1)	2
(Type 2)	10
(Type 3)	20

Purpose of programme:

(Type 1)	meteorological and oceanographic research
(Type 2)	meteorological and oceanographic research and ENSO monitoring
(Type 3)	oceanographic research

Main deployment areas:

(Type 1)	the Arctic Ocean
(Type 2)	the western tropical Pacific
(Type 3)	the western tropical Pacific

E. Ocean Research Institute, University of Tokyo

Number and type of buoys:

(a) deployed during year:

(Type 1)	None (ALACE)
(Type 2)	None (PALACE)

(b) operational at 31 August:

(Type 1)	1
(Type 2)	4

(c) reporting on GTS at 31 August:

(Type 1)	None
(Type 2)	2

Purpose of programme:

(Type 1 and 2)	oceanographic research

Main deployment areas:

(Type 1)	the Japan Sea
(Type 2)	the Japan Sea and western North Pacific

F. Tokai University

Number and type of buoys:

(a) deployed during year:	None
(b) operational at 31 August:	1 surface drifter with holey sock drogue and SST sensor
(c) reporting on GTS at 31 August:	None
Purpose of programme:	oceanographic research
Main deployment areas:	the North Pacific

G. Central Research Institute of Electric Power Industry

Number and type of buoys:

(a) deployed during year:	6 ALACE
(b) operational at 31 August:	21 (1 ALACE, 20 PALACE)
(c) reporting on GTS at 31 August:	None
Purpose of programme:	observation of sub-surface circulation
Main deployment areas:	the western North Pacific

PLANNED PROGRAMMES

A. Japan Meteorological Agency

Number and type of buoys planned for deployment in next 12 months:	
(Type 1)	12 drifting buoys with 4 maritime meteorological and oceanographic sensors
Purpose of programme:	
(Type 1)	operational meteorological and oceanographic observation
Main deployment areas:	
(Type 1)	seas around Japan

C. Japan Coast Guard

Number and type of buoys planned for deployment in next 12 months:	11 surface drifters with holey sock drogues and SST sensors
Purpose of programme:	operational observation
Main deployment areas:	the North Pacific and the Antarctic Oceans

D. Japan Marine Science and Technology Center

Number and type of buoys planned for deployment in next 12 months:	
(Type 1)	2 meteorological and subsurface oceanographic drifter (J-CAD)
(Type 2)	16 meteorological and subsurface oceanographic surface moorings (TRITON buoys)
(Type 3)	80 profiling floats with CTD sensor (ARGO floats)
Purpose of programme:	
(Type 1)	meteorological and oceanographic research
(Type 2)	meteorological and oceanographic research and ENSO monitoring
(Type 3)	oceanographic research
Main deployment areas:	
(Type 1)	the Arctic Ocean
(Type 2)	the western tropical Pacific (14 buoys), the eastern Indian Ocean (2 buoys)
(Type 3)	the western North Pacific, the eastern Indian Ocean

F. Tokai University

Number and type of buoys planned for deployment in next 12 months:	2 surface drifters with holey sock drogues and SST sensors
Purpose of programme:	oceanographic research
Main deployment areas:	the North Pacific

SPECIAL COMMENTS

A. Japan Meteorological Agency

Type 1 buoys operated by the Japan Meteorological Agency

(b) Communications: ORBCOMM (bent-pipe mode)
- Purpose: Data collection. Transmission of commands for changing the operation mode.
- Available commands: 6

- Change the threshold of starting the hourly observation.
- Keep hourly observation regardless of the wave height.
- Change to 3-hourly observation.
- Inform of the operation situation (the latest data, voltage of batteries).
- Terminate operation.
- Sink (unscrew two bolts on top and bottom plate of the hull).
- Observation interval: 3-hourly (1-hourly when waves are higher than thresholds set beforehand or when commanded manually).
- Data collection interval: Immediately after each observation.
- Timeliness and reliability: Almost all (about 99%) data were received within 15 minutes after it had observed.

D. Japan Marine Science and Technology Center

Type 1 buoys (J-CAD) operated by the Japan Marine Science and Technology Center

(b) Communications: ORBCOMM (globalgram mode)

- Purpose: Data collection. Transmission of commands for changing the operation mode.
- Observation interval: Hourly. The observation data are stored till completion of transmission.
- Data collection interval: Each time when the transmitter catches a satellite.
- Timeliness: The monthly rates of data which received immediately after observation were from 20% to 90%. Delay time were between 0.2 hours to 10 hours, while the mean delay was about 6.2 hours.
- Reliability: 90% of all observation data were receivable with

Country : Republic of Korea

Year : 1st September 2000 to 31st August 2001

CURRENT PROGRAMMES

A. Agency or Programme : National Data Buoy Programme (Moored Buoys)
Korea Meteorological Administration(KMA)
Division of Observation
Purpose of Programme: (a) Operational: Meteorology and oceanography
(b) Met/ocean research : verification of forecast model
Number and type of buoys: Four 3m DISCUS buoys and one 6m NOMAD buoy
Main deployment areas : Korean peninsula coastal and offshore areas

B. Agency or Programme : Meteorological Research Institute(METRI)/KMA
Marine meteorology & Earthquake research Lab.
Purpose of Programme: (a) Operational: Meteorology and oceanography
(b) Met/ocean research : verification of forecast model
Number and type of buoys: Four 3m DISCUS buoys
Main deployment areas : Korean peninsula coastal area

PLANNED PROGRAMMES

A. Agency or Programme : National Data Buoy Programme (Moored Buoys)
Korea Meteorological Administration(KMA)
Division of Observation
Purpose of Programme: (a) Operational: Meteorology and oceanography
(b) Met/ocean research : verification of forecast model
Number and type of buoys: 6m NOMAD buoy
Main deployment areas : Korean peninsula offshore areas

B. Agency or Programme : Meteorological Research Institute(METRI)/KMA
Marine meteorology & Earthquake research Lab.
Purpose of Programme: (a) Operation: Meteorology and oceanography
(b) Met/ocean research : verification of forecast model
Number and type of buoys: Drift buoys
Main deployment areas : Korean peninsula coastal area and East China Sea

C. Agency or Programme : METRI/KMA ARGO Programme
Meteorological Research Institute(METRI)/KMA
Marine meteorology & Earthquake research Lab.
Purpose of Programme: (a) Met/ocean research : Climate resarch
Number and type of buoys: Argo floats
Main deployment areas : East sea/Japan sea and North Pacific Ocean

D. Agency or Programme : KORDI ARGO Programme
Korea Ocean Development and Research Institute
Purpose of Programme: (a) Met/ocean research : Climate resarch
Number and type of buoys: Argo floats
Main deployment areas : East sea/Japan sea and North Pacific Ocean

THE NETHERLANDS

Year: 2001

CURRENT PROGRAMMES

A	**Agency or programme**	Royal Netherlands Meteorological Institute
	Number and type of buoys	(a) deployed during year 3 SVP-B (b) operational at 31 August 3 (c) reporting on GTS at 31 August 3
	Purpose of programme	Participating in the EGOS drifting buoy programme for operational meteorology and oceanography
	Main deployment areas	North Atlantic

PLANNED PROGRAMMES

A	**Agency or programme**	KNMI
	Number and type of buoys planned for deployment in next 12 months: 3 SVP-B	
	Purpose of programme	EGOS
	Main deployment areas	North Atlantic

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

1. Statistics of buoy data from buoys within EGOS programme are published in quarterly reports (UKMO) and monthly statistics (Météo-France); Monthly Report by the Technical Secretariat of EGOS.

SPECIAL COMMENTS *(if any)*

(a)	Quality of buoy data	see under Publications
(b)	Communications	all buoys are tracked by Argos System
(c)	Buoy lifetimes	see relevant EGOS documents
(d)	Others	

Country **NEW ZEALAND**
Year **2001**

CURRENT PROGRAMMES
A. Agency : **Meteorological Service of New Zealand Ltd**

Number and type of buoys:
(a) deployed during the year : 4 FGGE Drifters
(b) operational at 31 August : 6 Drifters
(c) reporting on GTS as at 31 August : 6 Drifters

Purpose of programme: Real-time buoy data for Weather Forecasting

Main deployment areas: Tasman Sea

B. Agency : **Meteorological Service of New Zealand Ltd for Global Drifter Centre in support of Southern Ocean Buoy Programme**

Number and type of buoys:
(a) deployed during the year : 2 SVPB (Technocean)
(b) operational at 31 August : 2 SVPB
(c) reporting on GTS as at 31 August : 2 SVPB

Purpose of programme: Weather Forecasting & Oceanographic Research

Main deployment areas: Southern Pacific Ocean

PLANNED PROGRAMMES
A. Agency : **Meteorological Service of New Zealand Ltd**

Number and type of buoys planned for deployment in next 12 months: 4 drifters – a mix of FGGE and SVPB types

Purpose of programme: Real-time buoy data for Weather Forecasting

Main deployment areas: Tasman Sea

B. Agency : **Meteorological Service of New Zealand Ltd for Global Drifter Centre in support of Southern Ocean Buoy Programme**

Number and type of buoys planned for deployment in next 12 months: 6 SVPB drifters

Purpose of programme: Weather Forecasting & Oceanographic Research

Main deployment areas: Southern Pacific Ocean

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**:
MetService still uses FGGE type buoys in its operational buoy programme. These buoys have given long service, with buoys being recycled through several deployments. MetService has an active Buoy

Recovery policy. Buoy positions are monitored as they near the NZ coast and where possible buoys are recovered just before, or after beaching. This has resulted in many buoys being recovered, refurbished and redeployed, with some buoys being deployed three or four times. All buoys are deployed in the Tasman Sea, where the prevailing westerly currents eventually carry buoys back towards New Zealand, enabling around 80% of buoys to be recovered.
Since 1988 (14 years) MetService has recycled 26 buoys through 54 deployments, whilst maintaining an operational network of 7 buoys. Of the six buoys operational on 1 October 2001, four buoys are on their first deployment and two are on their third deployment. The average lifetime from deployment until beaching for buoys deployed in the Tasman Sea is about eighteen months. To better assess the total lifetime per buoy it is more representative to look at the Cumulative Lifetime achieved by buoys over several deployments. Lifetime is counted until barometer failure, transmission failure or recovery. The Average Cumulative Lifetime of the twenty six buoys, including the six operational buoys at 1 October 2001 is 35.5 months. Looking at individual buoys, #8585 is on its third deployment and is still operational after 68 months of cumulative service and #22187 is six months into its third deployment with a cumulative lifetime of 36 months.

D. **Recovered Buoys:**
In the twelve months to 1 October 2001, three buoys (#7176, #21583 and #22188) have been recovered.

Buoy 7176 was recovered from its fifth deployment off Mackay, Queensland in December 2000. The buoy was still operational, transmitting good pressure and sea temperature data. Twelve months after the June 1999 deployment, a fishing boat took the buoy on board in mid ocean. MetService requested the ship to return the buoy to the sea but the air temperature sensor was damaged during this time. After recovery the buoy was refurbished with new batteries, drogue and a new temperature housing and sensor, and the buoy was redeployed for the sixth time in August 2001. Unfortunately after only two weeks a suspected lightning strike reduced all sensor data to base values.

Buoy 21583 was recovered by a fishing vessel west of Auckland in January 2001. This buoy had been deployed in May 1999, but failed prematurely after eleven months. Post recovery calibrations of the pressure and temperature sensors revealed they were almost identical to the pre-deployment calibrations. Because of problems with ‘locked up’ data during the operational period and the premature failure the electronics were returned to Metocean for investigation.

Buoy 22188 was on its second deployment when found east of Mackay, Queensland by a fisherman in April 2001. The buoy had been deployed in February 1999, and although it was still transmitting when recovered, the pressure data had been removed from GTS in June 2000 when sensor output went to top of range. This buoy will either have a new barometer or barometer card fitted, or will be used as spares to refurbish another buoy.

MetService would like to acknowledge the excellent co-operation received from the Bureau of Meteorology offices in Mackay, Brisbane and Sydney in getting the above buoys repatriated to New Zealand.

Country: South Africa

SOUTH AFRICAN WEATHER SERVICE: PRESENT ACTIVITIES AND FUTURE PLANS

South Africa started the year (inter-sessional period August 2000 - July 2001) with 21 drifters operational. The South African Weather Service SA(WS) drifter programme are maintained mainly to supply data for operational forecasting, but also to support the maintenance of drifters in the Indian Ocean for the Tropical Cyclone monitoring. The deployments are done in data sparse areas, but also where these positions compliment deployments by other agencies. The majority of deployments done are a mixture of SA(WS) and AOML drifters. This inter-sessional period we also deployed drifters on behalf of the Bureau of Meteorology - Australia (BOM) and NOAA/Scripps.

2000					2001						
Aug	**Sept**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**March**	**April**	**May**	**Jun**	**Jul**
6	9	3	3	7	6	2	nil	2	3	nil	nil

DEPLOYMENT TEMPO OF 41 DRIFTERS

The majority of the above deployments were done from the SA Agulhas on its relief voyages to Gough and Marion Island as well as to Antarctica, while 15 of these deployments were done from ships of opportunity in the Tropical Indian Ocean - Nedlloyd Columbo and Safmarine Vaal and Oranje.

The Port Meteorological Officer in Cape Town and Durban also gave assistance to other organisations with the storage and the placing of drifters on board vessels for deployment in the Atlantic and Indian oceans. 15 drifters were deployed in the Indian ocean from Durban on behalf of AOML and 16 drifters in the Atlantic from Cape Town on behalf of NOAA and Scripps, 2 Drifters on behalf of BOM.

The South African Weather Service had a number of failures with the 10 SVPB drifters that were deployed in the South Atlantic Ocean during September and December 2000. One was never deployed after it was noticed that the pressure got stuck on one value. This drifter was returned to the manufacturer for investigation. One drifter failed soon after deployment while 3 other drifters pressure values became unstable between 90 and 200 days and was removed from the GTS.

The anchored drifter on Tristan da Cunha Island is operating well. The SA(WS) also attempted to re-install the AWS on Southern Thule Island at the beginning of January 2001. The AWS worked fine for approximately 3 months and suddenly stopped transmitting. It was clear that the mast was severely damaged in a storm. Due to the difficult terrain and weather conditions it remains a challenge to erect a AWS on the Island as a 10 m mast can not be properly stabilized on the Island.

Although the Weather Service experience some failures with the latest 10 SVPB drifters, they continue to have, in general, a good life span from the drifters averaging at 450 days. 4 drifters are still operating on average between 1300 and 1400 days. 3 are moving around the sub-tropical high pressure belt in the South Atlantic ocean, while the other drifter has moved well into the Indian Ocean.

The LUT's on Gough and Marion Islands are still operational and are transmitting processed buoy data to South Africa. Due to present bandwidth limitations the raw data can not be send to Argos for processing and distribution on the GTS.

FUTURE PLANS

SA(WS) has ordered 10 SVPB drifters with additional 8 upgrades of SVP drifters from AOML. These drifters will mainly be used to maintain the existing network of drifters in the South Atlantic. AOML has also commited to send an additional 8 SVPB and 5 SVP drifters. These drifters will be deployed during the routine voyages to Gough Island in September 2001 and Antarctica in December 2001 and January 2002. During these voyages it is planned to replace the drifter on Tristan da Cunha, while the present drifter on the Island, which is still operational will be deployed in the ocean. During the voyage to Antarctica in December the damaged AWS on Southern Thule will be removed, while a drifter will be anchored in the Island.

13 SVP drifters will also be deployed from Durban in the Indian Ocean, to monitor the Tropical Cyclone season. 6 Drifters will be deployed by August and the remaining by October 2001.

SA(WS) also committed to support and deploy drifters in the South Atlantic for the ARGO program. The SA(WS) will continue, as in the past, provide support by means of the Port Meteorological Officer in Cape Town and Durban.

The SA(WS) will continue to find solutions for the communications with Gough and Marion Island, so that the buoy data can be send directly to Toulouse for processing. Various options are investigated.

DATA BUOY COOPERATION PANEL
UK NATIONAL REPORT - 2001

Institute: **The Met Office**

Programmes: Moored buoys (programme 0309)
Drifting buoys - EGOS, IABP, ISABP, IPAB (programmes 0484, 9484)
ARGO floats

	Moored Buoys	**Drifters**	**ARGO Floats**
Total deployed during 2001	12***	34*	13† (expect 25+ by end 2001)
Total operational at 31/8/2001	11**** open ocean buoys	27**	12 (1 failure)
Total reporting on GTS 31/8/2001	11	22 (fully reporting) 5 (partially reporting)	12
Status	Operational	Operational	Operational
Total planned for 2002	Redeployments only	~15 new deployments	~50 new deployments

Notes

* includes 1 Arctic (White Trident) Ice buoy and 1 South Atlantic buoy;
excludes 3 additional SVP-B drifters deployed by NERC.

** 2 additional drifting buoys were deployed in September 2001 and a further 3 are planned for deployment in October.

*** includes new deployments of joint operated Irish buoys M1 and M2 buoys and redeployments of existing open ocean buoys.

**** includes joint operated buoys - Irish M1 and M2 buoys and French Brittany and Gascogne buoys;
K3 and K7 were not operational at 31/8/2001;
excludes 3 inshore buoys.

† float deployments include: 5 in Irminger Sea (Jan), 3 in north-east Atlantic (May), 5 in south-west Indian Ocean (July/Aug). Other floats expected to be deployed in 2001 include 5 in Arabian Sea, 2 in Norwegian Sea, 5+ in Irminger Sea (this to be made up from 5 NERC research (non-UK Argo) and 5 MARTEC (UK Argo) floats).

Estimated number of PTT-years:
a) current year: 62
b) next year: 71

Institute: **CEFAS**

Programme: 0526

Total buoys deployed during 2001: 27
Total buoys operational at 31 August: 10
Total buoys on GTS at 31 August: 0
Status of programme: Ocean Research
Main deployment areas: Central North Sea, West Coast of Ireland
Total buoys planned for 2002: 20
Status of programme: Ocean Research
Main deployment areas: Eastern Central North Sea

Technical developments: Use of SERPE-IESM GPS drifters

Publications:

Brown, J., Fernand, L., Horsburgh, K.J., Hill, A.E. and Read, J.W., 2001. Paralytic shellfish poisoning on the east coast of the UK in relation to seasonal density-driven circulation. Journal of Plankton Research, 23,105-116.

Horsburgh, K.J., Hill, A.E., Brown, J., Fernand, L., Garvine, R.W. and Angelico, M.M.P., 2000. Seasonal Evolution of the cold pool gyre in the western Irish Sea. Progress in Oceanography, 46, 1 - 58.

Posters:

Brown, J., Fernand, L., Carrillo, L., Horsburgh, K.J., Hill, A.E., Read, J.W., Medler, K.J., Nolan, G.D. and Norris, S.W. 2000. Observations of the seasonal jet-like circulation of the Celtic Sea & St. George's Channel. UK Marine Science 2000. University of East Anglia.

Brown, J. Fernand, L., Hill, A.E., Horsburgh, K.J., Garvine, R.W. and Angelico, M.M.P., 2000. Circulation of the western Irish Sea. Irish Sea Forum, Douglas, Isle of Man.

Parker, R., L. Fernand, J. Brown, S. Malcolm, D. Mills, D. Sivyer, E. Tinton, K. Medler, J. Read, T. Jickells and K. Weston. Transport and fate of UK nutrient input to the southern North Sea. UK Marine Science 2000. University of East Anglia.

Institute: **British Antarctic Survey**

Programme: 2264
Total buoys deployed during 2001: 4
Total buoys operational at 31 August: 0
Total buoys on GTS at 31 August: 0
Status of programme: Sea ice research
Main deployment areas: Bellingshausen Sea
Total buoys planned for 2002: 0

Programme: Antarctic krill transport
Total buoys deployed during 2001: 0
Total buoys operational at 31 August: 0
Total buoys on GTS at 31 August: 0
Status of programme: Research
Main deployment areas: Scotia Sea
Total buoys planned for 2002: 20

Institute: **Proudman Oceanographic Laboratory**

Programme: 1347
Total buoys deployed during 2001: 1
Total buoys operational at 31 August: 0
Total buoys on GTS at 31 August: 0
Status of programme: Ocean research
Main deployment areas: Southern Ocean
Total buoys planned for 2002: 0

Institute: **Plymouth Marine Laboratory**

Programme: 1966

Total buoys deployed during 2001: 1
Total buoys operational at 31 August: 0
Total buoys on GTS at 31 August: 0
Status of programme: Ocean research
Main deployment areas: Southern Ocean
Total buoys planned for 2002: 1

Institute: **Scottish Association for Marine Science**
Scott Polar Research Institute

Programme: 9484 (Met Office)
Total buoys deployed during 2001: 3
Total buoys operational at 31 August: 2
Total buoys on GTS at 31 August: 1
Status of programme: Sea ice research
Main deployment areas: Bellingshausen Sea
Total buoys planned for 2002: 0

Institute: **Southampton Oceanography Centre**

Programme: 1644
Total buoys deployed during 2001: 3
Total buoys operational at 31 August: 3
Total buoys on GTS at 31 August: 3
Status of programme: Ocean research
Main deployment areas: Northern seas
Total buoys planned for 2002: 5

Publications:

Bacon, S, Centurioni, L.R., Gould J.W, 2000, The evaluation of salinity measurements from PALACE floats, J. Atm. Oc. Techn.. 18, 1258.

Country: United States of America (USA)

Year: 2001

CURRENT PROGRAMMES

A. Agency or programme: National Data Buoy Center (NDBC) (NWS/NOAA) Marine Observing Net.

Number and type of buoys:
(a) deployed during year: 2 moored buoys
(b) operational at 31 August: 69 moored buoys
(c) reporting on GTS at 31 August: 69 moored buoys

Purpose of programme:
(a) operational: 67 moored buoys
(b) met/ocean research: 0
(c) developmental: 2 moored buoys

Main deployment areas: Pacific and Atlantic Oceans- coastal and offshore; Gulf of Mexico; Great Lakes

B. Agency or programme: TAO Project, Pacific Marine Environmental Labs (PMEL) (OAR/NOAA)

Number and type of buoys:
(a) deployed during year: 0
(b) operational at 31 August: 58 surface moorings; 4 Sub-surface moorings.
(c) reporting on GTS at 31 August: 58 surface moorings

Purpose of programme:
(a) operational: 58
(b) met/ocean research: 62
(c) developmental: 0

Main deployment area: Tropical Pacific Ocean

C. Agency or programme: PIRATA Project (PMEL/OAR/NOAA)

Number and type of buoys:
(a) deployed during year: 0

operational at 31 August: 10 surface moorings
reporting on GTS at 31 August: 10

Purpose of programme:
(a) operational: 10
.1 met/ocean research: 10
.2 developmental: 0

Main deployment area: Tropical Atlantic Ocean

D. Agency or programme: NOAA Atlantic Oceanographic and Meteorological Laboratories (AOML)

2001 Plans - Plans for the deployment of 419 Drifters in the period between October 2000 and September 2001.

	Tropical Oceans	Planned/Deployed
∃		Tropical Pacific 205 / 119 ENSO + 107 CORC
∃		Tropical Atlantic 78 / 50 (6 old SVP upgraded with Barometers by NOAA/SIO)
∃	Tropical Indian	50 / 35 (10 SVP upgraded with Barometers by Meteo-France)

10 WOCE BP/WSD (Tropical Atlantic) drifters have been deployed in the Hurricane formation Region

	Southern Oceans	Planned/Deployed
∃	Pacific	35 / 28 (13 SVP upgraded with Barometers by NOAA/SIO, 1 SVP upgraded by New Zealand Met Service)
∃	Atlantic	20 / 32 (8 SVP upgraded with Barometers by NOAA/SIO)
∃	Indian	22 / 21 (7 SVP upgraded with Barometers by Australian Bureau of Meteorology)

E. Agency or programme: Naval Oceanographic Office (NAVO)

Number and type of buoys: (a) deployed during year:101 (SVP-B, SVP-W-S, XAN, floats)

(b) operational at 31 Aug: 59 drifters, 9 floats

Purpose of programme: Operational, real-time in situ environmental data distributed on GTS

Main deployment areas: Northern Hemisphere for drifters

PLANNED PROGRAMMES (2002)

A. Agency or programme: NDBC (NWS/NOAA) Marine Observing Network

Number and type of buoys planned for deployment in next 12 months: 4 moored buoys

Purpose of programme: (a) operational: 73 moored buoys

(b) met/ocean research: 0

(c) developmental: 3 moored buoys

Main deployment areas: Pacific and Atlantic Oceans - coastal and offshore; Gulf of Mexico; Great Lakes

B. Agency or programme: NDBC Drifting Buoy Augmentation

Number and type of buoys planned for deployment in next 12 months: 4 TOGA drifters (50% chance)

Purpose of programme: (a) operational: (4) supplementing moored buoys

Main deployment areas: North Pacific Ocean

C. Agency or programme: TAO Project (PMEL/OAR/NOAA)

Number and type of buoys planned for deployment in next 12 months: 0

Purpose of programme: (a) operational: 58

(b) met/ocean research: 58 surface moorings, 4 sub-surface moorings (Pacific)

(c) developmental: 0

Main deployment area: Tropical Pacific Ocean

D. Agency or programme: PIRATA (PMEL/OAR/NOAA)

Number and type of buoys planned for deployment in next 12 months: 0

Purpose of programme: (a) operational: 10

(b) met/ocean research: 10

(c) developmental: 0

Main deployment area: Tropical Atlantic Ocean

E. Agency or programme: GDP (AOML/OAR/NOAA)
Plans are for the deployment of 446 Drifters in the period between October 2001 and September 2002.

Tropical Oceans	# of Drifters
∃	Tropical Pacific 223 (100 CORC)
∃	Tropical Atlantic 79
∃	Tropical Indian 54 (10 SVP upgraded with Barometers by Meteo-France)

10 WOCE BP/WSD (Tropical Atlantic) drifters will be deployed in the Hurricane formation region during the 2002 Hurricane Season.

Southern Oceans	# of Drifters
∃	Pacific 44 (20 SVP upgraded with Barometers by NOAA/SIO, 6 SVP upgraded with Barometers by New Zealand Met Service).
∃	Atlantic 22 (10 SVP upgraded with Barometers by NOAA/SIO, 8 SVP upgraded with Barometers by South African Weather Service)
∃	Indian 24 (10 SVP upgraded with Barometers by NOAA/SIO/10 SVP upgraded with Barometers by Australian Bureau of Meteorology).

F. Agency or Programme: NAVO

Number and type of buoys: 120 surface drifters (SVP-B, SVP-WS), 20 floats

Purpose of programme: operational, real-time in situ environmental data

Main deployment areas: global

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 DBC 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 seven action groups, the reports of which follow:

ACTION GROUPS page

INTERSESSIONAL REPORT OF THE EUROPEAN GROUP ON OCEAN STATIONS,
August 10 2000 - August 10 2001
Issued by The EGOS Technical Secretariat

1 THE ORGANISATION

Management and funding

The Management Committee met twice in the intersessional period:

- The winter meeting was held at the WMO headquarters in Geneva on December 5-6, 2000. At this meeting the Management committee elected Dr Volker Wagner, Deutscher Wetterdienst and Mr. Wil C.M. van Dijk as respectively Chairman and Vice-Chairman. Met Éireann offered to host the summer meeting of EGOS in 2001. A report on the conclusions and recommendations of the December 2000 meeting is in EGOS Tech. Doc. No. 224.
- The summer meeting was hosted by Met Éireann in Dublin Ireland, during June 5 and 6 2001. A report on the conclusions and recommendations of this meeting is in EGOS Tech. Doc. No. 232, draft. Representatives of the US Naval Oceanographic Office, Environment Canada and the National Data Buoy Center attended this meeting.

There have been no changes the number of members in EGOS. The nine participating countries are Denmark, France, Iceland, Ireland, Federal Republic of Germany, The Netherlands, Norway, Sweden and United Kingdom. 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.
Calls for national contributions for 2001 were issued by WMO.

On behalf of the EGOS Management Committee WMO established a contract with Christian Michelsen Research A/S (CMR) in Bergen, for the continued service of the EGOS Technical Secretariat for 2001.

During its meeting in December 2000 the Management Committee agreed that the calls for voluntary contributions to the Common Fund for year 2001 should be unchanged relative to 2000.

Deutscher Wetterdienst contributes to the work of EGOS through a bilateral contract with CMR.

2 TECHNICAL SECRETARIAT AND CO-ORDINATION

Technical Secretariat

The contract for the Technical Secretariat is a contract between WMO and CMR, and all main secretariat functions lie with Christian Michelsen Research, Norway, represented by Mr. Torleif Lothe.

All reports published later than December 1999 are available on pdf format on Internet at www.cmr.no/conmar/egos. Some older reports are also available. All reports except drafts are open.

Technical Co-ordinator

The Technical Co-ordinator is in charge of the technical and operational activities of contributors to EGOS programmes. He or she will be appointed by the committee from Parties to the programme, normally on an annual basis. At the meeting in December 2000, the Management Committee re-appointed Mr. Pierre Blouch, Météo-France as Technical Co-ordinator of EGOS.

The duties of the Technical Co-ordinator include making proposals for the deployment strategies, to co-ordinate the deployments of all available drifting buoys, and to arrange for the insertion of their data onto the GTS. The Technical Co-Ordinator shall, where appropriate, make arrangements for changes of the status of drifting buoys reporting on the GTS, with the agreement of the contributor.

The Technical Co-Ordinator also provides monthly statistics and status tables of buoy performance for inclusion in the EGOS monthly report.

3 EGOS DRIFTING BUOYS

Development of the operational programme

EGOS has continued to develop the operational programme through the intersessional period. Optimum usage of the available recourses through improved deployment strategies has been in focus. In particular, EGOS focused on the many early failures during air deployment of SVP-B Drifters. Air Deployment of SVP-Bs is now exclusively carried out in the spring in EGOS South. This has lead to an increased level of activity in EGOS South, with a corresponding decrease in EGOS North (figure 1).

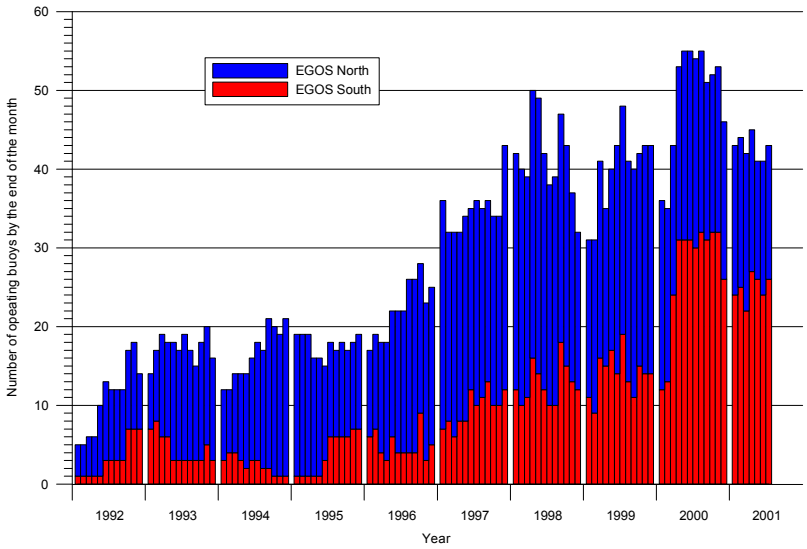


Figure 1. The number of operational EGOS drifting buoys by the end of each month 1992-July 2001.
The minimum number of operational drifting buoys by the end of each month in the intersessional period was 41, maximum was 55.

As at August 10th 2001, the number of operational buoys in EGOS was 43 with 17 in EGOS North and 26 in EGOS South (figure 2).

Very few (typically 1-2) non-EGOS drifters have operating north of the southern boundary of the EGOS area of interest (30 °N) in 2000/2001. A total number of 38 drifting buoys were deployed in EGOS in the intersessional period and 56 EGOS-buoys ceased to operate in the intersessional period.

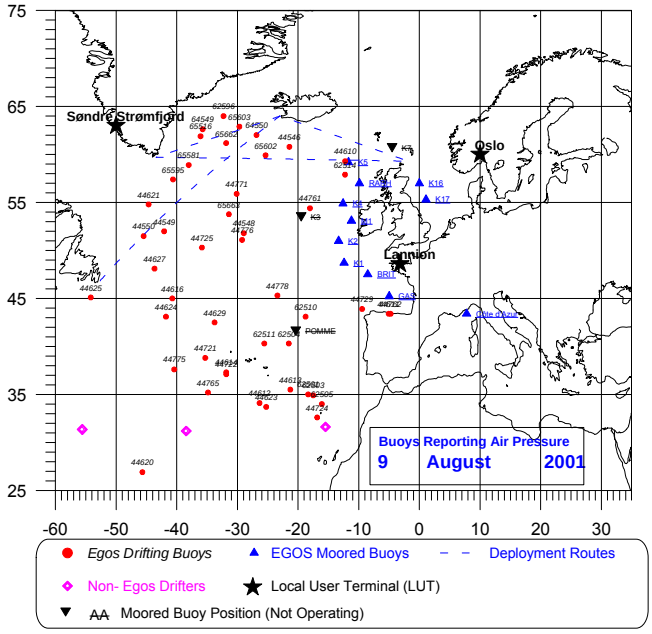


Figure 2. Distribution of EGOS buoys at August 9th, 2001.

Early failures

The number of SVP-B failures was 19% in 1998, 29 % in 1999 and 24 % in 2000. For the intersessional period this has improved dramatically. Of at total of 27 SVP-Bs deployed, only 3 suffered an early failure, or 11 %. The average lifetime for all EGOS buoys in the intersessional period was 334 days. This is compared to previous years in figure 3

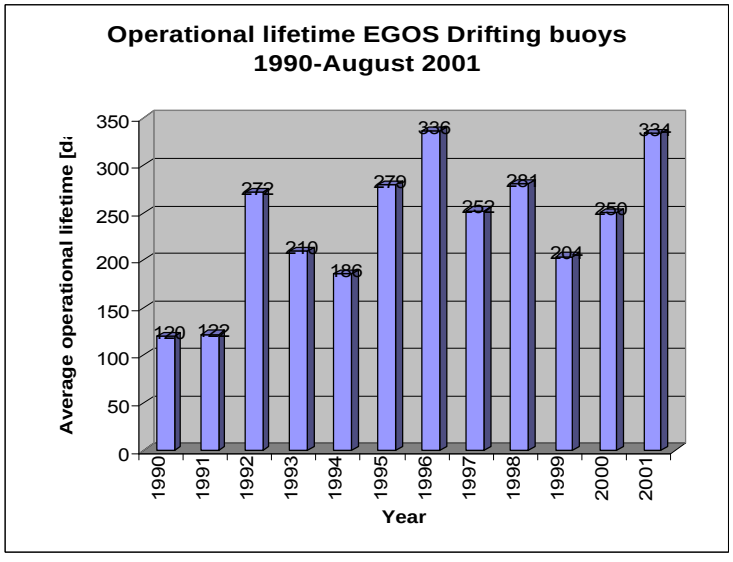


Figure 3 – The average lifetime for EGOS drifting buoys 1990-Aug 2001

Drogue losses

The tendency for the SVP-B Drifters to loose the drogues has continued into 2001. This is an important issue, since the wind measurements of the SVP-B rely on an attached drogue. As of August 10 2001, a total of 36 SVP-Bs were operating in EGOS. 14 of these or 39 % had lost the drogue.

4 EGOS MOORED BUOYS:

In addition to the drifting buoys, EGOS members operate moored buoys as a contribution to EGOS. At present the number of operational EGOS moored buoys is 12. Their positions are shown in figure 2 and in table 1.

Table 1- The EGOS Moored buoys as at August 2001.

Name	WMO No	Position
BRIT	62163	47.5 N -8.5 W
K 1	62029	48.70 N, 12.40 W
K 2	62081	51.00 N, 13.30 W
K 3	62108	Not Operating
K 4	62105	54.90N, 12.60W
RARH	62106	57.00 N, 09.90 W
K 5	64045	59.05 N, 11.47 W
K7	64046	Not operating.
K16	62109	57.00 N, 00.00 E
K17	62026	55.30N, 1.10E
Côte d'Azur	61001	43.40 N, 07.80 E
POMME	62002	Not Operating
GAS	62001	45.25 N – 5.00W
M1	62090	53.1 N - 11.2 W
M2	62091	53.5 N -5.4 W

INTERNATIONAL ARCTIC BUOY PROGRAMME (IABP)
http://IABP.apl.washington.edu
CHAIRMAN'S AND COORDINATOR'S REPORT
for the Seventeenth Session of the DATA BUOY CO-OPERATION PANEL
Perth, Australia, 22-26 October 2001
prepared 7 September 2001 by edward.hudson@ec.gc.ca

This report summarizes activities of the IABP that have occurred since the report filed September 2000 for the 16th session of the Data Buoy Co-operation Panel.

INTERNATIONAL ARCTIC BUOY PROGRAMME (IABP) ELEVENTH ANNUAL MEETING, YOKASUKA, JAPAN - Members of the International Arctic Buoy Programme met 30 May to 01 June, Yokosuka, Japan, for the eleventh annual business meeting. Host for the year 2001 meeting was the Japan Marine Science and Technology Centre (JAMSTEC). Participants were honored to be the first users of JAMTEC's International Guest House.

IABP EXECUTIVE AND COORDINATOR - The elected IABP executive and appointed coordinator:

Chairman:	Tim Goos, Environment Canada, Canada	tim.goos@ec.gc.ca
Vice Chairman:	Thor Kvinge, Christian Michelsen Research, Norway	thkvinge@online.no
Member:	Ivan Frolov, Arctic and Antarctic Research Institute, Russia	aaricoop@aari.nw.ru
Member:	Christopher O'Connors, U.S. National Ice Centre, USA	oconnorsc@natice.nooa.gov
Coordinator:	Ignatius Rigor, Polar Science Centre, U.S.A	ignatius@apl.washington.edu

BUOY ARRAY STATUS 04 SEPTEMBER - The buoy array in place 04 September 2001 per the map and sheet posted on the IABP web page - http://IABP.apl.washington.edu - showed 32 buoys on the Global Telecommunication System (GTS) 26 of which gave both surface air pressure and surface air temperature, 5 of which gave surface air pressure only, and 1 of which provided temperature only. Another buoy was added to the array mid September near the north pole. The IABP strives to maintain an array of at least 25 buoys evenly distributed across the Arctic Ocean.

DEPLOYMENTS 2001 - The following outlines some of the deployment strategies that resulted in buoys being deployed 2001.
White Trident August 2001 - The annual White Trident Deployment was conducted by the Commander, (U.S.) Naval Meteorology and Oceanographic Command. This deployment remains the key deployment strategy of the IABP. ICEX-AIR buoys for this years White Trident Exercise were provided by:

- (U. S.) National Ice Centre representing several agencies (3)
- Alfred Wegner Institute for Polar and Marine Research (1)
- Norwegian Meteorological Institute (1)
- U. K. Meteorological Office (1) and
- Meteorological Service of Environment Canada (1).

Buoys on Ice via Environment Canada - April 2001.
The photo shows one of the CES Zeno buoys deployed for US National Ice Service 23 and 24 April 2001 to the west of the Canadian Arctic Islands by Meteorological Service of Canada personnel via Twin Otter aircraft landing on ice. These deployments are an annual event and are supported by Polar Continental Shelf Project, Natural Resources, Canada.
Buoys on Ice via Icebreakers in Arctic Basin. - September 2001

The US Coast Guard icebreaker Healy and the Alfred Wegener Institute (AWI) for Polar and Marine Research vessel Polarstern were near the north pole summer 2001. An AWI buoy was deployed September as the Healy exited the area.

RECENT PUBLICATIONS

Papers

- Rigor, I.G., J.M. Wallace, and R.L. Colony, On the Response of Sea Ice to the Arctic Oscillation, J. Climate, accepted, 2001.

Buoy reports

- Rigor, I., and M. Ortmeyer, International Arctic Buoy Program 2000 Data Report, APL-- UW TM 4- 01, Applied Physics Laboratory, University of Washington, 2001.
- Rigor, I., and M. Ortmeyer, International Arctic Buoy Program 1999 Data Report, APL- UW TM 6- 00, Applied Physics Laboratory, University of Washington, 2000.
- Rigor, I., and M. Ortmeyer, International Arctic Buoy Program 1998 Data Report, APL- UW TM 3- 00, Applied Physics Laboratory, University of Washington, 2000.

CDs

- IABP CD See **http://www.meds-sdmm.dfo-mpo.gc.ca/alphapro/rnodc/IABP_CD_e.shtml**

PARTICIPANTS OF IABP - Participants of the IABP 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.

PROBLEMS WITH RESPECT TO LUT POSITION ACCURACY - A problem was noted with positions as given on GTS by Edmonton processed buoys. Investigation showed that a similar position problem exists with positions given by other LUTS such as Oslo's.

The International Programme for Antarctic Buoys

1 Introduction

Seasonal sea ice covers a large part of the Southern Hemisphere and plays an important role in the climate of the Southern Ocean, yet remains one of the least known regions of the earth 's surface. Many processes relating to sea ice remain poorly understood, due in no small part to the lack of data from this inhospitable region. The optimum method of collecting long term in-situ surface data from the ice covered seas around the Antarctic continent is by the use of autonomous stations such as satellite tracked drifting buoys.

The International Programme for Antarctic Buoys (IPAB)was formally launched in 1995 to coordinate drifter deployments in the Antarctic sea ice zone, to optimize buoy distribution over this region and to create a central archive of Antarctic buoy data. IPAB is a self-sustaining project of the WMO/ICSU/IOC World Climate Research Programme (WCRP)and an Action Group of the WMO/IOC Data Buoy Co-operation Panel. The objectives of the program are to establish and maintain a network of drifting buoys in the Antarctic sea-ice zone in order:
i) to provide a buoy network to support research in the region related to global climate processes and to global change;
ii) to provide real-time operational meteorological data meeting the quality requirements of the WMO/World Weather Watch (WWW)programme;
iii) to establish a basis for on-going monitoring of atmospheric and oceanic climate in the Antarctic sea-ice zone.
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 was initially established for a period of 5-years, and at the third biennial meeting held in June 2000 participants, with support from the World Meteorological Organisation and WCRP,resolved to continue the programme indefinitely.

2 Participants and Organisation

Unlike the drifting buoy panels operating in other oceans of the world, IPAB does not have strong support from operational meteorological agencies, and the majority of IPAB buoy deployments are made to support specific research programmes, many of which are concerned with the movement of Antarctic sea ice. Membership of IPAB thus includes individual scientists who are supported by funding agencies to deploy buoys in support of Antarctic research programs. Participating organisations and scientists were asked in 2000 to reconfirm their commitment to a continuing IPAB programme. Fourteen Participants have done so (see Appendix).

IPAB Participants meet every two years and the program is managed by an Executive Committee of 5 plus the Coordinator .The Chairman of IPAB is Dr Enrico Zambianchi (Italy) whereas the transfer of the Co-ordinating office of IPAB from the Australian Antarctic Division (former coordinator: Dr Ian Allison, Australia) to the Scott Polar Research Institute is currently underway (new coordinator: Dr Peter Wadhams, United Kingdom). The current website of the project is http://www.ipab.aq, and is presently being updated. Until the completion of its development, the old IPAB pages can be found on the Australian Antarctic Division website http://www.antcrc.utas.edu.au/antcrc/buoys/buoys.html.

3 Review of IPAB, 1995-2001

More than 140 buoys providing data to the programme were deployed south of 55 °S in the seven-year period between 1995 and 2001. Most IPAB data buoys report through System Argos and the programme encourages buoy operators to equip platforms with basic pressure and temperature sensors and to contribute real-time operational meteorological data via the Global Telecommunications

System (GTS).Other platforms include more sophisticated meteorological instrumentation while others are position only platforms (often with GPS location) used in the study of sea ice drift and deformation.
Statistics of IPAB buoy activities since 1995 are shown in Figures 1 and 2.
Figure 1(a)shows the number of new buoys deployed each year broken down into 3 regions: the Weddell Sea (20 °E to 60 °W); East Antarctica (170 °E to 20 °E); and the Bellingshausen, Amundsen and Ross Seas (60 °W to 170 °E). Figure 1(b) shows the seasonal distribution of these deployments. Almost all deployments are made onto ice floes or into newly forming ice from ships, typically vessels re-supplying Antarctic bases. In the Weddell Sea the deployments are usually made in January and February, while off East Antarctica they are made from late March to early May as the ice edge starts to advance northward from its summer minimum almost at the coast. Most early IPAB deployments were concentrated in the Weddell Sea and off the coast of East Antarctica, but there have been new initiatives in the Ross and Bellingshausen Sea region since1998.The large peak in deployments in East Antarctica in 1995 and 1999 are due to short-term position-only buoy arrays deployed as part of winter sea-ice process studies in August of those years.
Figures 2(a) and 2(b) respectively show the number of IPAB buoys reporting each year, and the seasonal distribution of active buoys. The number of platforms with meteorological sensors, and reporting via the GTS has remained fairly constant since 1995, but even at a peak, the number of active drifters falls far short of the optimum requirement. Seasonally the buoy numbers show a peak in late autumn after the new deployments, besides the above mentioned biased august maximum. Buoy numbers drop steadily after the maximum due both to instrument failures, and to northward divergence, which takes many buoys out of the region of interest to IPAB. Although many drifters have sufficient battery power to operate for 2 or more years, most drift northward out of the ice and only very few survive within the Antarctic pack for a second winter.

Synoptic data from buoys reporting in real-time on the GTS are archived by the Marine Environmental Data Service, Canada, acting as the Responsible National Oceanographic Data Centre for drifting buoy data. Up to date information on those IPAB buoys reporting via the GTS can be found on the MEDS IPAB page, with plots of position and drifter statistics, i.e. at:
http://www.meds-sdmm.dfo-mpo.gc.ca/alphapro/modc/main_anta_e.shtml
The IPAB Co-ordinating Office also maintains a separate research database of data from all buoys, including those that do not report via the GTS and those that measure location only. These data have also been transferred to the National Snow and Ice Data Center, Boulder, Colorado and are available from the NSIDC at:
http://nsidc.org/NASA/GUIDE/docs/dataset_documents/ipab_antarctic_drifting_buoy_dataset_document.gd.html

Data from the IPAB programme are used operationally by meteorological agencies and in support of a wide variety of studies of the Antarctic sea ice zone, including initialisation and validation of numerical climate modelling, and for the validation of satellite remote sensing techniques for determining sea ice motion. The data show the highly dynamic nature of Antarctic sea ice. Ice drift is on average divergent over much of the Antarctic sea ice zone, and the drift and deformation play a major role in determining the ice thickness distribution.

Here is a list of IPAB related papers appeared on peer-reviewed journals and books over the last 5 years; for a comprehensive list see http://www.antcrc.utas.edu.au/antcrc/special/buoys/literature.html:

Eisen, O., and C. Kottmeier, 1999.
On the importance of leads in sea ice to the energy balance and ice formation in the Weddell Sea, J Geophys. Res.., 105(C6), 14045 - 14060.

Geiger, C.A., S.F. Ackley, and W.D. Hibler III, 1998.
Sea ice drift and deformation processes in the western Weddell Sea, in Antarctic sea ice physical processes, interactions and variability, Antarct. Res. Ser., (Ed. M.O. Jeffries), 74, 141 - 160, AGU, Washington, D.C.

Geiger, C.A., and M.R. Drinkwater, 2000.
Temporal and spatial sampling of meso- to large-scale sea ice deformation in the Weddell Sea, Scaling effects in ice mechanics and dynamics, Kluwer, 12pp. (submitted).

Haas, C., 2001:
The seasonal cycle of ERS scatterometer signatures over
perennial Antarctic sea ice and associated surface ice properties and
processes. Annals of Glaciology 33, 69-73.

Harms, S., E. Fahrbach, and V.H. Strass, 2000.
Ice transport in the Weddell Sea, J. Geophys. Res. (accepted)

Heil, P., V.I. Lytle, and I. Allison, 1998.
Enhanced thermodynamic ice growth by sea ice deformation, Ann. Glaciol. , 27, 433 - 437.

Heil, P., and I. Allison, 1999.
The pattern and variability of Antarctic sea-ice drift in the Indian Ocean and Western Pacific sectors, J. Geophys. Res., Vol 104 (C7),15789 - 15802.

Heil, P., I. Allison, and V.I. Lytle, 2000.
The Impact of Deformation on the Local Sea-Ice Growth Rate and Thickness in the East Antarctic Sector, Scaling effects in ice mechanics and dynamics, Kluwer, 16pp. (submitted).

Heil, P., C.W. Fowler, J. Maslanik, W.J. Emery, and I. Allison, 2000.
A comparison of East Antarctic sea-ice motion derived using drifting buoys and remote sensing, Ann. Glaciol., 33, 6pp. (accepted).

Hibler, W.D. III, P. Heil, and V.I. Lytle, 1998.
On simulating high frequency variability in Antarctic sea-ice dynamics models, Ann. Glaciol., 27, 443 - 448.

Kwok, R., A. Schweiger, D.A. Rothrock, S. Pang, and C. Kottmeier, 1998.
Assessment of sea ice motion from sequential passive microwave observations with ERS and buoy ice motions, J. Geophys. Res., 103(C4), 8191 - 8213.

McPhee, M., J. Morison, and C. Kottmeier, 1999.
Ocean heat flux in the Central Weddell Sea during winter, J. Physical Oceanogr., 29(6), 1166 - 1179.

Padman, L., and C. Kottmeier, 2000.
High-frequency ice motion and divergence in the Weddell Sea, J. Geophys. Res., 105 (C2), 3379 - 3399.

Timmermann, R., P. Lemke, and C. Kottmeier, 1999.
Formation and maintenance of a polynya in the Weddell Sea, J. Geophys. Res., 29(6), 1251 - 1264.

Uotila, J., T. Vihma, and J. Launiainen, 2000.
Response of theWeddell Sea pack ice to wind forcing, J. Geophys. Res., 105, 1135-1151.

Vihma, T., J. Launiainen, and J. Uotila, 1996.
Weddell Sea ice drift: kinematics and wind forcing, J. Geophys. Res., 101 (C8), 18279 - 18296.

Vihma, T., J. Uotila, B. Cheng, and J. Launiainen, 2000.
Surface Heat Budget over the Weddell Sea: Buoy results and comparison with large scale models, J. Geophys. Res., submitted.

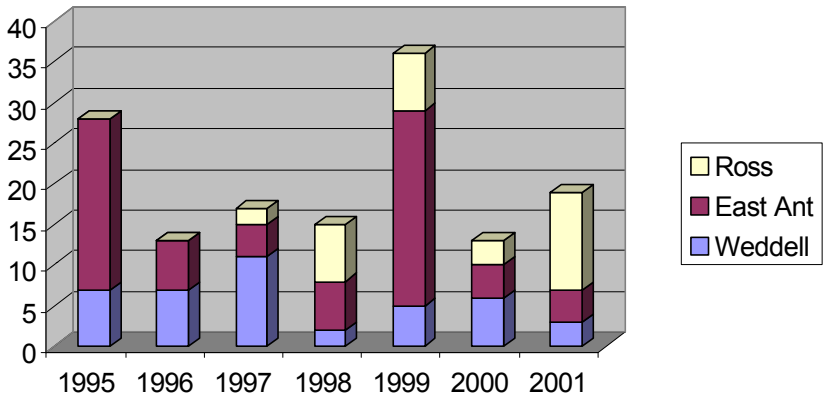


Fig. 1a – new buoy deployments per year 1995-2001

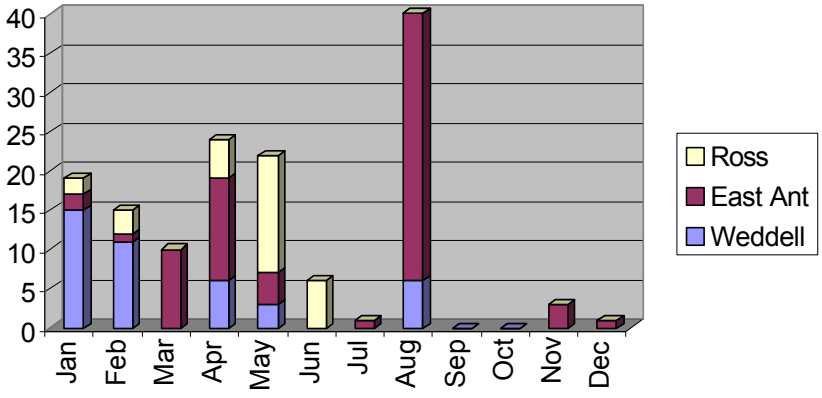


Fig. 1b – new deployments by month 1995-2001

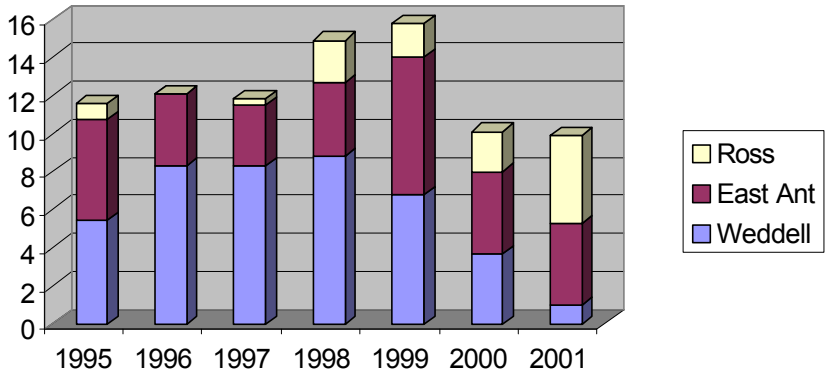


Fig. 2a – average number of active buoys per year 1995-2001

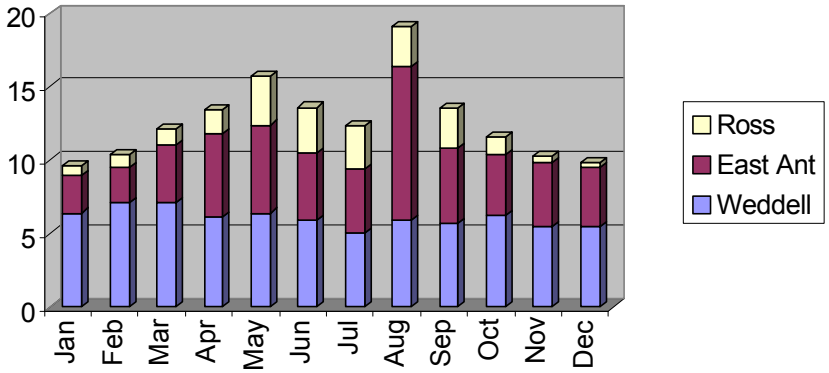


Fig. 2b – average monthly distribution of active buoys 1995-2001

4 Current activities.

After a relatively slow 2000, deployments of buoys contributing to IPAB in 2001 sum up to 19 instruments at October 2001. 3 buoys were deployed in the Weddell Sea, 4 off East Antarctica, 12 in the area between 170 E and 60 W, i.e. that of the Bellingshausen, Amundsen and Ross Seas.
At October 2001, the total number of active IPAB buoys in 2001 amounts to 25, 21 of which are equipped with an air pressure sensor, and 19 of which report their data via the GTS.
Given the current membership and/or intent status, this figures are just slightly lower than the number of contributing instruments the Programme expects for the next years.

Enrico Zambianchi
IPAB Chairman

October 2001

APPENDIX A
IPAB Participants at October 2001

Alfred Wegener Institut (Germany)
Australian Antarctic Division (Australia)
British Antarctic Survey (UK)
Finnish Institute for Marine Research (Finland)
Geophysical Institute,University of Alaska (USA)
Institut fur Meteorologie und Klimaforschung, Universitaet Karlsruhe (Germany)
National Ice Center (USA)
National Snow and Ice Data Center (USA)
Programma Nazionale di Ricerche in Antartide (Italy)
Scott Polar Research Institute (UK)
Service Argos (France)
South African Weather Bureau (South Africa)
Tasmania and Antarctica Regional Office, Australian Bureau of Meteorology (Australia)
United Kingdom Meteorological Office (UK)

REPORT OF THE INTERNATIONAL BUOY PROGRAMME FOR THE INDIAN OCEAN (IBPIO) - 2001

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, coordination...).

To date, five organizations are formally participating in the International Buoy Programme for the Indian Ocean.

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

**Note: Navoceano (USA), and the National Institute of Ocean Technology (NIOT), India, have also provided significant active support to the IBPIO, and are expected to become formal participants in the near future.

2. PROGRAMME MEETING

The fifth Programme Committee meeting of the IBPIO will be held in Perth, Australia, from the 17th to the 18th of October 2001, prior to the DBCP meeting.

3. OPERATIONAL PROGRAMME

3.1 Drifting buoys

About **75 drifting buoys** have been deployed from September 2000 to August 2001. Ninety percent of them have been lagrangian drifters and 45% have been measuring air pressure (AP).

Year	SVP	SVP-B	SVP-BW	FGGE	FGGE-W	Other	Total
1996-97	30	42	0	5	3	0	80
1997-98	1	21	2	6	7	6	43
1998-99	67	55	1	4	2	5	134
1999-00	48	49	4	3	0	2	106
2000-01	42	26	0	5	3	0	76

Table 1. Number of drifting buoys deployed in IBPIO according to their type

In practice, participants contributed to the programme in various ways during this period: provision buoys and drifters (BoM, GDC, Meteo-France, Navoceano and NIO) ; funding of barometer upgrades

to SVP drifters provided by GDC (BoM and Meteo-France) ; deployment arrangements (all) ; coordination (Meteo-France) and data transmission (Meteo-France and SAWB).

As for previous years, many deployments were carried out by research vessels and ships of opportunity plying the Indian Ocean from many ports such as Perth (Australia), Goa (India), Durban and Cape Town (South Africa) and La Reunion. Some ship voyages to remote islands were also used, 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. 38% of the buoys were deployed by air, thanks to Navoceano.

Year	1996-97	1997-98	1998-99	1999-00	2000-01
Ship	54	27	110	76	47
Air	26	16	24	30	29
% Air	33%	37%	18%	28	38
Total	80	43	134	106	76

Table 2. Number of drifting buoys deployed in IBPIO
According to their way of deployment

By the end of August 2001, **the number of operating buoys carrying out AP measurements is 58** (out of 115). This number has been stable since November 2000. It represents double that achieved in mid-1999, and is the highest since the start of IBPIO. The fact that only 34 buoys of that kind were deployed over the past 12 months shows that their mean lifetime is increasing and that there are fewer premature failures than in the past.

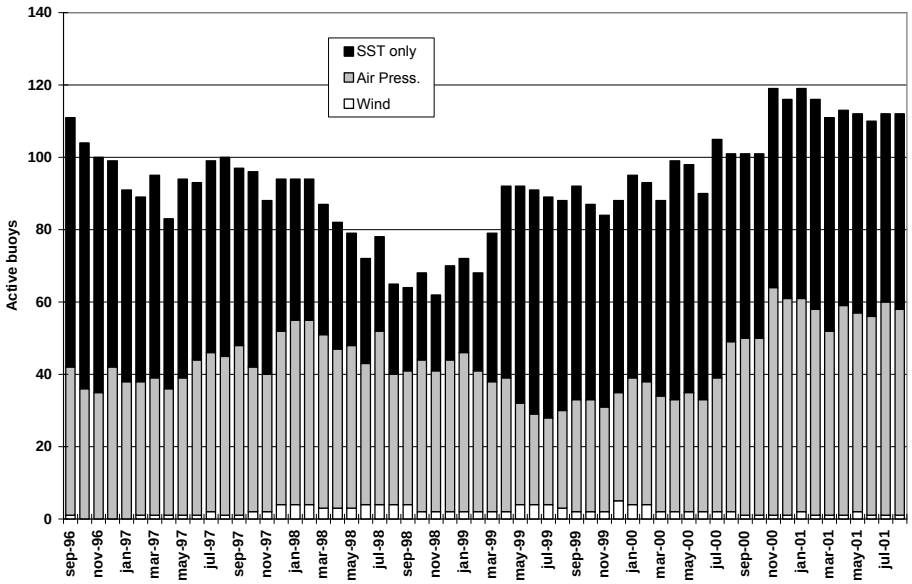


Figure 1. Number of drifting buoys operating in IBPIO
according to the parameters they measure

The number of buoys measuring SST only - in addition to their position - has been stable since April 1999 (~56 buoys in average). The number of drifting buoys measuring wind speed and wind direction in IBPIO remains marginal (less than two on average).

Some buoys, owned by SAWB and GDC, migrate from the South Atlantic Ocean, westerly driven to the Indian Ocean. This flux (10 buoys from Sept. 2000 to Aug. 2001, including 3 owned by SAWB) is

more or less compensated by the escape of other buoys to the south of Australia (5 buoys, mainly owned by BoM, during the same period).

Owner	SST only	Air Pressure	Wind
Australian Bureau of Meteorology	-	6	-
Global Drifter Center	52	29	-
Météo-France	-	2	-
National Institute of Oceanography	1	4	-
Navoceano	1	12	-
South African Weather Bureau	-	4	1
Total	**54**	**57**	**1**

Table 2. Operating drifting buoys by the end of July 2001

All drifting buoys are using the Argos system to report their data. Most of them are fitted with the DBCP-M1 format which significantly increases the availability and the timeliness of the data onto the GTS.

3.2 Moored buoys

The National Institute of Ocean Technology (NIOT), India, operates a network of 12 moored buoys in Indian waters. Seven of them were operational on August 31st, 2001. Data transmission is via the Inmarsat system. Surface meteorological parameters have been sent on the GTS in "FM 18 BUOY" code through the Indian Meteorological Department since mid-2000. Bulletin headers are SSVX01 DEMS. The number of BUOY reports transmitted for each buoy should increase in the next months. The transmission delays should also be reduced.

The IBPIO participants were informed by the Japan Marine Science and Technology Center (JAMSTEC) that two TRITON buoys should be deployed in the eastern tropical Indian Ocean in November 2001. Nominal positions are 1.5°S – 90°E and 5°S – 95°E respectively.

4. PLANS

IBPIO participants are continuously encouraged to increase their contributions of buoys, or to fund barometers to equip SVP drifters provided by GDC. For the sixth consecutive year, Meteo-France is funding 10 barometers for the Indian Ocean in 2001. This number should increase in 2002. BoM has also been funding 10 barometer upgrades per year since 2000. This action will be renewed in 2001/2002.

4.1 Tropical regions

Efforts are mainly aimed at filling data gaps in the tropical regions, mainly during the cyclone seasons. In the southern tropical area, air deployments of SVP-B drifters, done at least once a year by Navoceano in November, should continue in the next few years. These buoys are provided by NOAA/GDC, and 10 barometers are funded by Meteo-France each year. Further east, BoM plans to deploy 3 buoys with wind measurement capabilities in the northwest of Australia, for the next tropical season. NIO plans to continue to provide and deploy about 15 SVP-B drifters plus three buoys fitted with wind sensors, in the Arabian Sea and in the Gulf of Bengal.

4.2 Southern seas

In the Southern part of the Indian Ocean, the deployment of SVP-B drifters provided by Meteo-France and GDC (with barometer upgrades funded by BoM) will continue thanks to RV Marion Dufresne during her rotations between La Reunion, Crozet, Kerguelen and Amsterdam islands. Meteo-France

plans to fund 5 more SVP drifters for this region. As for 2001, some opportunities will also be found from Cape Town (RV Agulhas) and Fremantle (merchant ships, RV Shirase). BoM plans to upgrade 10 SVP drifters to be deployed in this area in the next 12 months. It also will provide 4 other buoys.

As for the previous years, GDC will be the main contributor to the IBPIO. Many drifters are standard SVP. They measure SST only in addition to the surface current deduced from their move. GDC also funds barometer upgrades to a significant number of its drifters.

5. INFORMATION ON THE IBPIO

IBPIO information is available on the World Wide Web at *http://www.shom.fr/meteo/ibpio*. The main pages give a description of the programme, its objectives and management, listings of participants and links to related subjects such as DBCP data quality control information. Some pages are updated monthly with buoy status, buoy trajectories, data availability charts, deployment log.

A promotional leaflet on the IBPIO can be obtained from the Chairman or the Programme Coordinator.

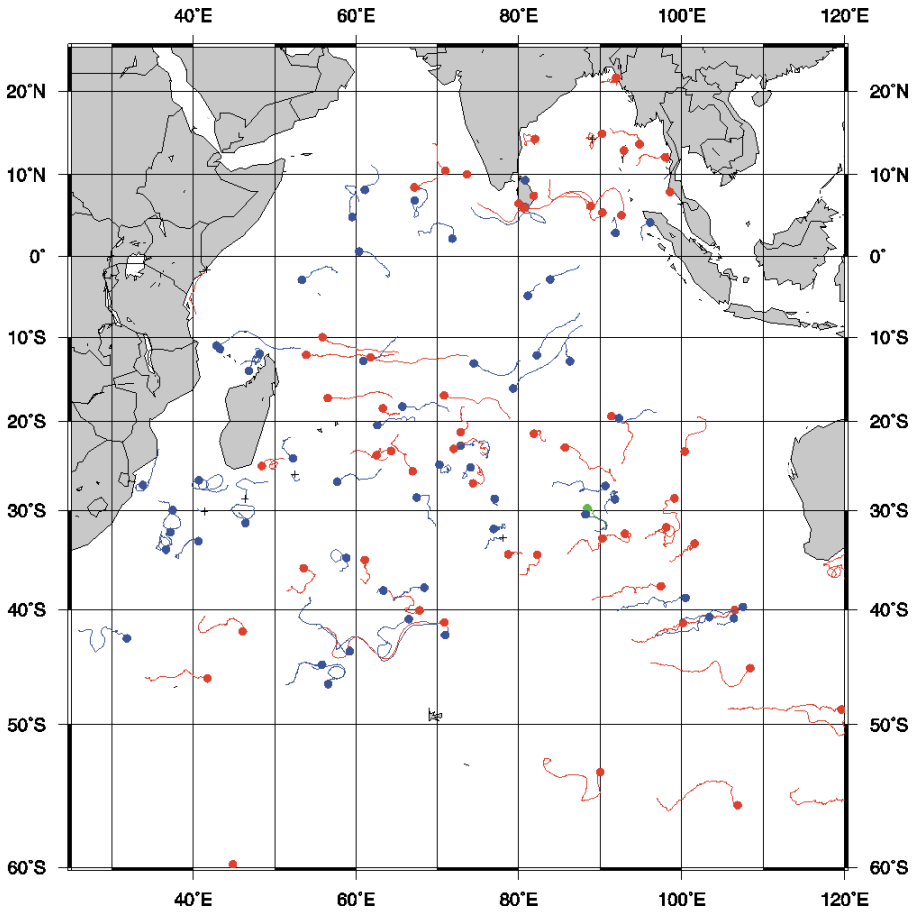


Figure 2. Buoys drifting in the Indian Ocean - August 2001

INTERNATIONAL SOUTH ATLANTIC BUOY PROGRAMME
Report to the 17th Session of the Data Buoy Cooperation Panel
Perth, Australia, 22-26 October 2001

1. INTRODUCTION

The International South Atlantic Buoy Programme (ISABP) was established in 1993at a meeting in Buenos Aires, Argentina, in order to address the problem of data sparseness in the South Atlantic Ocean. The main objective of ISABP is to establish and maintain a network of platforms in the Tropical and South Atlantic Ocean in order to provide meteorological and oceanographic data for both real-time and research purposes. The 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), as well as to the research activities of participating institutions.

2. PARTICIPANTS TO ISABP

The following are organisations or institutions who are participating in the program.

• Servicio Meteorologico Nacional	Rep. of Argentina
• Servicio de Hidrografia Naval	Rep. of Argentina
• The Met Office	United Kingdom
• Atlantic Oceanographic and Meteorological Laboratory	USA
• National Data Buoy Center	USA
• The Meteorological Service	Namibia
• Directoria de Hidrografia e Navegacao	Brazil
• South African Weather Service	South Africa
• Marine and Coastal Management	South Africa
• MEDS	Canada
• CLS/Service ARGOS	France/USA
• Instituto Nacional de Meteorologia(INMET)	Brazil
• Naval Meteorology and Oceanography (COMNAVMETOCCOM)	USA
• Caribbean Meteorological Organisation	Caribbean
• National Space Research Institute (INPE)	Brazil
• Marine Hydrophysical Institute of National Academy of Science of Ukraine	Ukraine

The programme is open to any institution interested and committed to the objectives and operating principles of the programme. It is self-sustaining and supported by voluntary contributions from participants in the form of equipment (buoys) and/or services such as communications, storage, deployments, data archiving and co- ordination.

3. ANNUAL MEETING

The eight International South Atlantic Buoy Programme meeting was held at the National Fisheries Research Institute facility in Mar del Plata, Argentina. The meeting was hosted by the Naval Hydrographic Office, Argentina. A Technical and Scientific workshop preceded the meeting during which 11 papers were presented, covering a wide spectrum of applications, including Meteorology, Oceanography, Satellite communications and buoy manufacturing. During the meeting the status of the LUT's in the South Atlantic were discussed, while the importance of Quality control was emphasized.

During the meeting Alaor Moacyr Dall' Antonia Jr from Brazil was re-elected as chairman and Javier Valladares from Argentina as vice-chairman. Louis Vermaak from South Africa was re-appointed as Programme Co-ordinator. The steering committee also proposed a joint meeting with the International Programme for the Antarctic Buoys (IPAB) in Cape Town, South Africa in 2002.

4. OPERATIONAL PROGRAMME

4.1 DATA COVERAGE IN THE ISABP AREA

The data coverage in the ISABP area are good at this moment but are constantly coming under threat. In the mid Atlantic there are still big gaps. The Programme Committee, thanked the participants who have put effort into maintaining the network, by either deploying buoys or deploy buoys on behalf of other organizations. It is however of concern that the array of buoys providing pressure data is gradually decreasing.

In the area south of 20S there are still a good array of SVP and SVPB in this area. The large gap that existed east of Argentina in the previous period has been addressed. A gap are also visible south of 50S but it remains a challenge to any institution to deploy drifters that far south due to the danger of pack ice.

In the area between 20S and 10N large gaps exist in the area. The PIRATA array exist near the equator. It remains a challenge to deploy more drifters over the eastern parts of the Tropical Atlantic Ocean.In the area 10N to 20N there are a good array of SVP and some SVP-B drifters in the area, with a gap from the West Coast of African to 20W. The Programme Committee thanked GDP for the deployments in this area with special consideration to the hurricane season.

4.2 DRIFTING BUOY DEPLOYMENTS

The Global Drifter Center deployed or arranged the deployment of a total 148 drifters during the inter-session period. This consists of 119 SVP, 10 SVP-G (GPS), 17 SVP-B and 2 SVP-BWD drifters. All these deployments were done from ships of opportunity.

In the Tropical Atlantic region north of 10S, GDC deployed 105 SVP drifters, 10 SVP-G, 6 SVP-B and SVP-BWD drifters. The US Naval Oceanographic Office air deployed 6 SVP-BWD and 12 SVP drifters.

The rest of the SVP drifters were deployed further south by ships of opportunity , for example the SA Agulhas, Nolizwe and Falklands/Malvines.

The South African Weather Service deployed in total 41 drifters in the inter-session period of which 26 is in the South Atlantic. 10 SVP-B and 16 SVP drifters. These were done from the SA Agulhas. The Weather Service experienced some failures with the SVP-B drifters.

Brazil deployed 9 drifters and 2 fixed buoys. They also recovered one drifter. They also experienced some difficulties. One of the moored buoys sensors was damaged during a storm. They continue to have problems with fishermen tampering with the drifters.

4.3 FIXED STATIONS

There are fixed stations on virtually all Island stations in the ISABP area, with a few problems at some of the stations.

- The SA Weather Service reported that the installation of the AWS on Southern Thule was not successful and will be replaced by a anchored SVP-B.
- The anchored SVP-B drifter on Tristan da Cunha is operating well.
- Brazil's program is already involved in the installation of two Automatic Weather Stations. One of those will be used as a reference station for the moored buoys.
- All other stations are operating well and good data is being received.

4.4 DATA RECEPTION AND DISSEMINATION

The South African Weather Service is operating two LUT"S on Gough and Marion Islands and are operating well. Unfortunately only South Africa is receiving the processed data due to bandwidth

limitations. The Weather Service will continue to find a solution for the problem. This will enable the Weather Service to send the raw data from the Islands directly to ARGOS to be processed and distributed on the GTS.

The hardware/software for a LUT was installed on the Falkland/Malvines early in 1999, but due to technical problems with communications the LUT is still not operational. The UK Met Office is presently installing the necessary internet connections so that the data can be send by e-mail to Argos, via Bracknell. The UK Met Office is optimistic that the system could be operational by the end of this year.

After a successful agreement between Argos and Argentina data is now also being disseminated from the LUT in Argentina.

All data is recovered through the Argos system and sent on the GTS via the processing centres of Toulouse and Landover,

4.5 DATA QUALITY CONTROL

Buoy program owners are encouraged to develop methods to do quality control on data from their platforms. Any anomalies must be corrected as soon as possible as incorrect data not only effects local weather forecasting but also the numerical models. There are various QC tools available on the internet for example, DBCP, MEDS and Meteo-France.

5. INFORMATION ON THE ISABP

ISABP information is available at: http://dbcp.nos.noaa.gov/dbcp/isabp/.
The pages, regularly updated, give a description of the programme, its objectives and management, listing of participants and meeting reports.

6. CONCERNS AND RECOMMENDATIONS

All participants continue to be concerned by the gradual decrease in barometer drifters in the South Atlantic. Programs were encouraged to make more use of the offer from the USA to upgrade NOAA drifters. Participants are also concerned about the high processing costs, which limit their participation in the program.

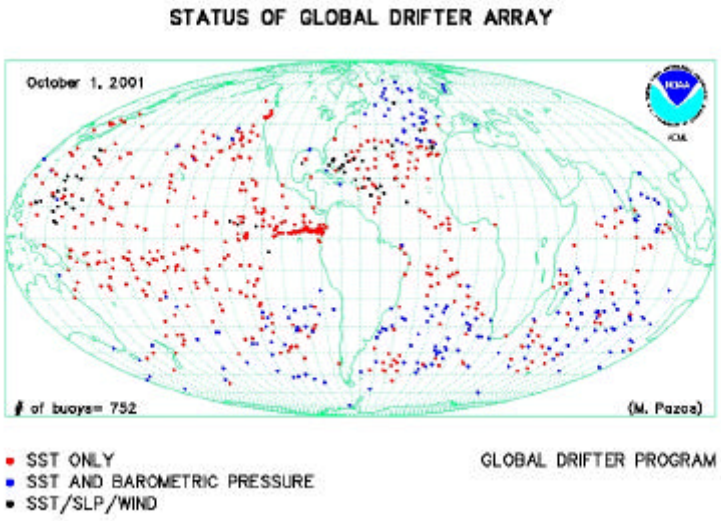
Participants were encourage to continue canvassing participation from other countries in the South Atlantic region.

Report on NOAA's contribution to Global Drifter Program in 2001

(By Craig Engler, NOAA/AOML/GOOS Center)

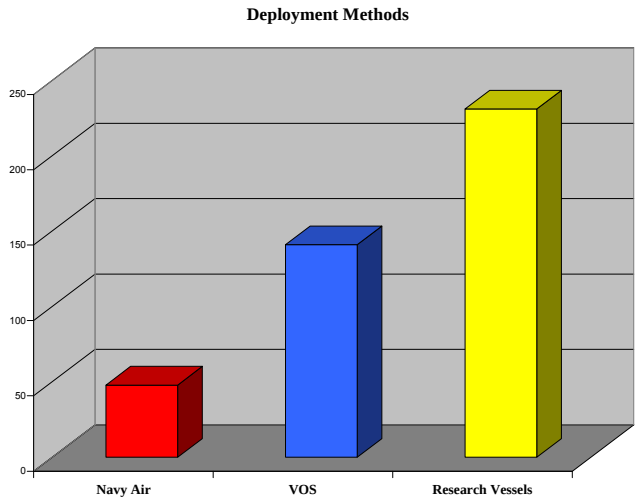
1. INTRODUCTION

The **Global Drifter Program (GDP)** is a branch of NOAA's Global Ocean Observing System (GOOS) Center located at the Atlantic Oceanographic and Meteorological Laboratory (AOML) in Miami, Florida. The objective of the GDP is to maintain a global array of ARGOS tracked Lagrangian or Surface Velocity Program (SVP) Drifters to meet the need for an accurate and globally distributed set of in-situ sea-surface temperature (SST) and surface velocity observations. The GOOS Center attempts to maintain a distribution of Drifters within a five degree by five degree array. The data from the drifter array supports short-term (seasonal-to-interannual) climate predictions as well as climate research and monitoring.



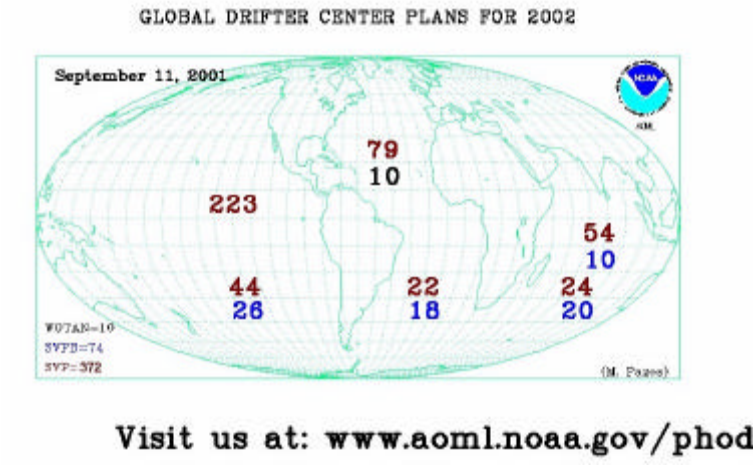
2. OPERATIONAL PROGRAM

A total of 402 buoys were deployed between October 2000 and September 2001. 39 of the SVP buoys had been upgraded with a barometer sensor. The Australian Bureau of Meteorology, Meteo-France, New Zealand Met Service and NOAA/SIO funded the barometer upgrades. Ten were specialized BP/WSD buoys that report Barometric Pressure, Wind Speed and Wind direction in addition Sea Surface Temperature and position. This information is transmitted on the GTS to support hurricane forecasting. Naval Aircraft, Research Vessel, and Voluntary Observation Ships were utilized to deploy the drift buoys.



3. PLANS

Plans are to deploy 446 drifters between October 2001 and September 2002. A number of SVP buoys are being upgraded with barometers. Ten SVP buoys will be upgraded with Barometers by Meteo-France, 40 by NOAA/SIO, ten by the Australian Bureau of Meteorology, eight by the South African Weather Service and ten by the New Zealand Met Service. Additionally, ten Barometer and Wind Speed/Direction (BP/WSD) Drifters will be deployed in the Hurricane formation region of the tropical Atlantic Ocean. Efforts will continue to deploy Drifters in data sparse regions of the world by working with the other organizations within the DBCP.



4. INFORMATION ON THE GDP AND BAROMETER UPGRADE OPPORTUNITY

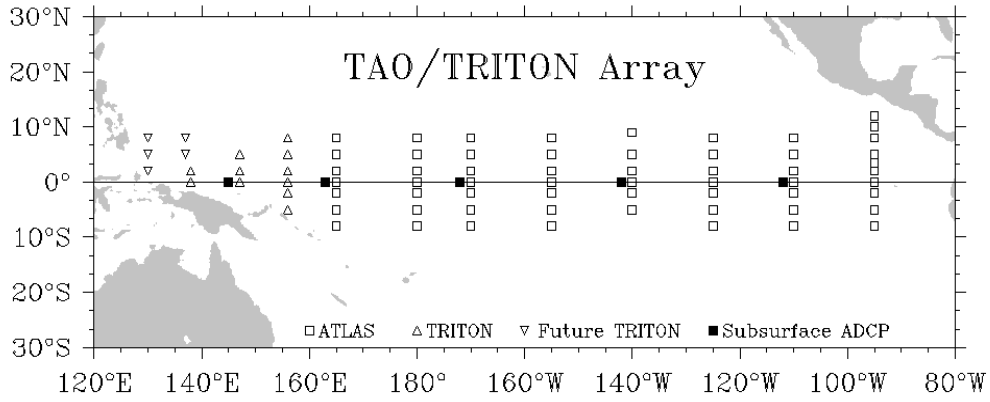
GDP information is available on the World Wide Web at http://www.aoml.noaa.gov/phod/dac/. The GDP also provides an opportunity for Meteorological agencies to add Barometers to SVP drifters deployed in the Southern Ocean. More information can be found on the DBCP website under SVPB Upgrade Opportunity link http://dbcp.nos.noaa.gov/dbcp/.

Tropical Moored Buoy Implementation Panel (TIP)
Report to the 17th Session of the Data Buoy Cooperation Panel
Perth, Australia, 22-26 October 2001

The TAO/TRITON (Tropical Atmosphere Ocean/Triangle Trans-Ocean Buoy Network) moored buoy array is a central component of the ENSO Observing System, deployed specifically for research and forecasting of El Nino and La Nina. The present composition of TAO/TRITON consists of 55 ATLAS moorings maintained by PMEL (Pacific Marine Environmental Laboratory), 10 TRITON moorings maintained by JAMSTEC (Japan Marine Science and Technology Center), and 5 subsurface ADCP (Acoustic Doppler Profiler) moorings (4 maintained by PMEL and 1 by JAMSTEC). Two additional sites of the TAO/TRITON array at 8EN and 5EN, 137EE will be occupied by TRITON moorings in October 2001.

In addition to the core moorings of the area, there are several moorings deployed or planned as enhancements. Among those presently deployed are 3 ATLAS moorings along 95EW (at 12EN, 10EN and 3.5EN) for the Eastern Pacific Investigation of Climate Processes (EPIC) and a TRITON mooring at 0E 138E. TRITON moorings will be deployed along 130°E in October 2001 (2°N) and in 2002 (5°N, and 8°N). Two TRITON moorings will also be deployed in the Indian Ocean in October 2001.

Conversion of all PMEL moorings from standard ATLAS to Next Generation ATLAS technology will be completed by December 2001. Next Generation ATLAS moorings provide higher



temporal resolution (10-min sample rates) for both surface measurements (wind speed and direction, air temperature, relative humidity and sea surface temperature) and subsurface temperatures. In addition, they provide the option of enhanced surface (rainfall, short and long wave radiation, barometric pressure) and subsurface (salinity, currents) measurements. At present, salinity and rainfall sensors are deployed on 28 ATLAS moorings, short wave radiation sensors on 17 moorings, current meters on 14 moorings, barometric pressure on 13 moorings and long wave radiation on 10 moorings.

The analysis of data from a two-month long, land-based intercomparison of TAO, TRITON and WHOI-IMET surface instrumentation conducted in the summer of 2000 is continuing. Initial examination indicates that data from the three systems compare well. A detailed description of the intercomparison and analysis of the data will be published as a technical report.

TAO/TRITON data return remains good, with an overall value for real-time data availability of over 80%. Damage to moorings and sensors due to fishing activity continues to be of concern. This damage accounts for a significant amount of data loss, especially in the far eastern and far western portions of the Pacific basin.

PIRATA (Pilot Research Moored Array in the Tropical Atlantic) is beginning a 5-year (2001-2006) consolidation phase during which the pilot array will be continued in a 10-mooring configuration and evaluated for its utility in support of research and operational forecasting.

Vandalism continues to be of concern, especially in the Gulf of Guinea. PIRATA data return is lower than for TAO, mainly because of vandalism and maintenance cruises; TAO moorings are routinely serviced on a semi-annual schedule, while PIRATA moorings are limited to annual maintenance.

An International Workshop for Review of the Tropical Moored Buoy Network was conducted at PMEL on September 10-12, 2001 under sponsorship of International CLIVAR, the IOC/WMO OOPC, and the TIP. The workshop was attended by about 40 participants representing the research community and operational weather and climate forecasting communities from the United States, France, the United Kingdom, Japan, Peru, Chile, Germany, India, and South Africa. Unanimous support for the tropical moored buoy network in the Pacific and for the development of PIRATA in the Atlantic was expressed by the workshop participants. National initiatives to develop moored buoy programs in general were commended and encouraged, especially in light of emerging plans for expansion into the Indian and southeast Pacific Oceans. The scientific rationale for making these measurements as a foundation for improved understanding and prediction of seasonal to interannual climate variability was reiterated. It was also noted that these networks provide the backbone for a global ocean observing system and a framework for conducting process studies. Additional discussion points included possible adjustments in sampling strategies in terms of vertical, horizontal and temporal resolution of the measurements; enhanced capabilities for air-sea flux, salinity, currents, and CO2 measurements; and the development metrics to quantify the value of the moored time series data for climate forecasting.

In the past year, the TIP was reorganized and reconstituted as the Tropical Moored Buoy Implementation Panel. The panel is now responsible for co-ordination and implementation of moored buoy programs in all three tropical ocean regions as part of an integrated approach to observing the climate system. The new TIP, like the old, is sponsored by CLIVAR, GOOS, and GCOS, and will address both research and operational objectives; it likewise remains an action group of the DBCP. The Chair is appointed through an agreement between the sponsoring groups, and is currently Michael McPhaden of NOAA/PMEL. Attendance at TIP meetings will be open to all interested parties. However, to ensure proper co-ordination with CLIVAR research initiatives, four CLIVAR representatives have been designated (currently from Brazil, France, Japan and South Africa). A first meeting of the new TIP to discuss organizational issues was held in Seattle coincident with the moored buoy review workshop in September 2001.

ANNEX III

REPORTS FROM DATA MANAGEMENT CENTRES

The following pages contain the reports by the:

Report of the RNODC for drifting buoys
(September 2000 to August 2001)

As part of its mandate as the Responsible National Oceanographic Data Centre (RNODC) for drifting buoys, MEDS continues to capture, conduct partial quality control, archive and make available all GTS data reporting in BUOY code.

1. Data archiving

During the last intersessional period, MEDS has archived an average of 232, 000 BUOY reports per month (Figure1) and received reports from an average of 860 buoys per month (Figure 2), an increase of 38,000 reports and 11 buoys from last year respectively. Figure 3 shows the number of meteorological/oceanographic observations posted on the GTS in relation to the total number of BUOY reports and Figure 4 shows GTS data coverage.

2. Data redistribution

MEDS continues to distribute buoy data upon request and on a regular basis. Last year, 35 drifting buoy data requests were satisfied and data was provided on a regular basis to 4 organizations. Requests came mostly from universities, government organizations and private consulting companies.

In addition to providing data through custom requests, MEDS continues to post Global Drifter Center datasets, which are processed, interpolated and sent to MEDS by AOML every year. These data are easily accessible and downloadable from MEDS web site at the following address: http://www.meds-sdmm.dfo-mpo.gc.ca/meds/Prog_Int/WOCE/WOCE_SVP/SVP_e.html.

3. Quality control

a) Location
MEDS' policy regarding flagging of location data in BUOY reports was discussed at the last International Arctic Buoy Programme meeting, Yokohama, May 30 - 1 June 2001. MEDS flags as suspicious all BUOY reports where the difference between location time and observation time is greater than 30 minutes. This practice results in approximately 55% of all BUOY reports being flagged as suspicious. As a direct consequence, more than half of the data does not get included on maps and inventories produced on a monthly basis and posted on MEDS' web site. In some cases, this data does not get distributed to people who request it.

IABP expressed concern about this issue because it would expect users to see all active buoys appear on MEDS maps and inventories. The IABP and the Technical Coordinator's position on the issue was that most of BUOY reports with difference between observation time and location time exceeding 30 minutes are reliable and include valuable data for numerical weather prediction and synoptic meteorology. Consequently, the IABP asked the technical coordinator to discuss the issue in a global perspective and depending on feedback, to write a letter to MEDS asking to consider changing their flagging policy and reprocess their archive.

b) Meteorological observations
Quality control of air temperature and pressure, wind speed and direction consists of an automated range check and a visual check to look for unwanted spikes. The ranges used are as follows:

Observation	**Minimum**	**Maximum**
Air temperature	-40°C	50°C
Air pressure	905 hPa	1060 hPa
Wind speed	0 m/s	200 m/s
Wind direction	0°	360°

c) Sea surface temperature and profiles

Sea temperature is quality controlled by performing an automated range check (-2°C to 40°C) and a visual check to look for unwanted spikes. If a temperature profile is present, quality control is performed by comparing the profile to the Sid Levitus climatology.

4. Products

MEDS has partly redesigned the RNODC web site and continues to post monthly maps, inventories and statistics. These products are generated globally and by action group. This year's addition includes individual maps of currently active buoys since the time they were deployed to the present for each of the action groups. The RNODC's URL is:
http://www.meds-sdmm.dfo-mpo.gc.ca/meds/Prog_Int/RNODC/RNODC_e.html

MEDS also published a CD-ROM entitled "*International Arctic Buoy Programme and Arctic Buoy Data 1979 to 1999 – Version 1.0*", which is a compilation of 20 years of IABP research data (1979-1999). The CD was distributed to IABP and IPAB participants mainly. Anyone who wishes to acquire the CD can do so by requesting a free copy from MEDS' Request Services (services@meds-sdmm.dfo-mpo.gc.ca).

Finally, MEDS produced an animation entitled "*Sea Surface Temperature Anomalies & Drifting Buoys Tracks in the Equatorial Pacific*", which shows 20 years of SST anomalies overlaid with drifting buoy trajectories. The animation clearly shows El Niño events. The Reynolds SST dataset was downloaded from the Climate Diagnostics Center and drifting buoy data was obtained directly from MEDS' archive. The animation can be requested from Request Services or downloaded from MEDS' anonymous FTP site ftp.meds-sdmm.dfo-mpo.gc.ca/pub/drifting_buoys.avi.

5. Goals for 2001-2002

- Re-evaluate MEDS' QC system for drifting buoys.
- Change flagging policy of location data and implement these changes by modifying the QC software and reprocessing the archive.
- Investigate the possibility to actively participate in the DBCP QC guidelines for location data.
- Improve products and accessibility to data on MEDS web site

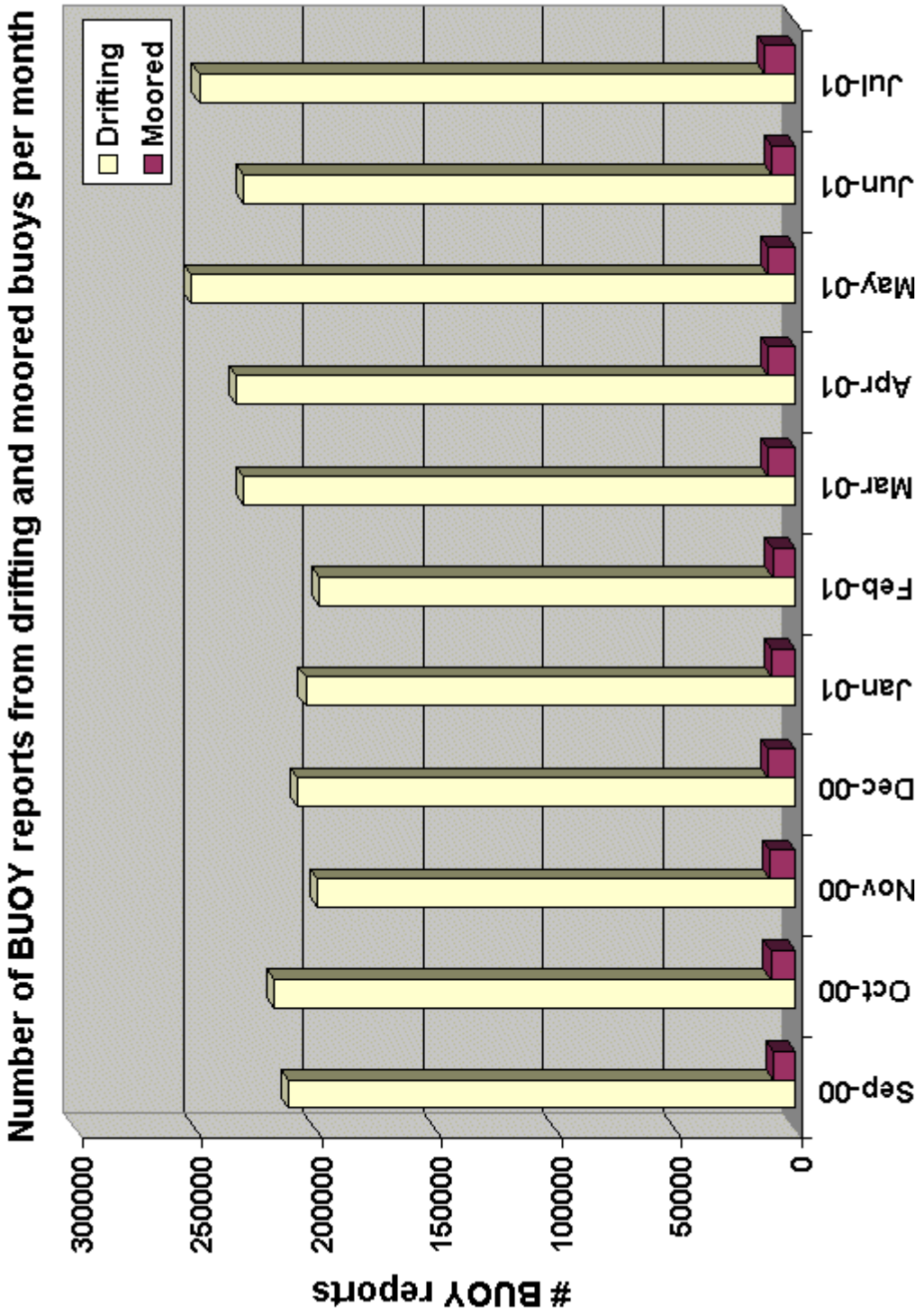

Number of BUOY reports from drifting and moored buoys per month
Drifting
Moored
BUOY reports
300000
250000
200000
150000
100000
50000
0
Sep-00
Oct-00
Nov-00
Dec-00
Jan-01
Feb-01
Mar-01
Apr-01
May-01
Jun-01
Jul-01

Figure 1

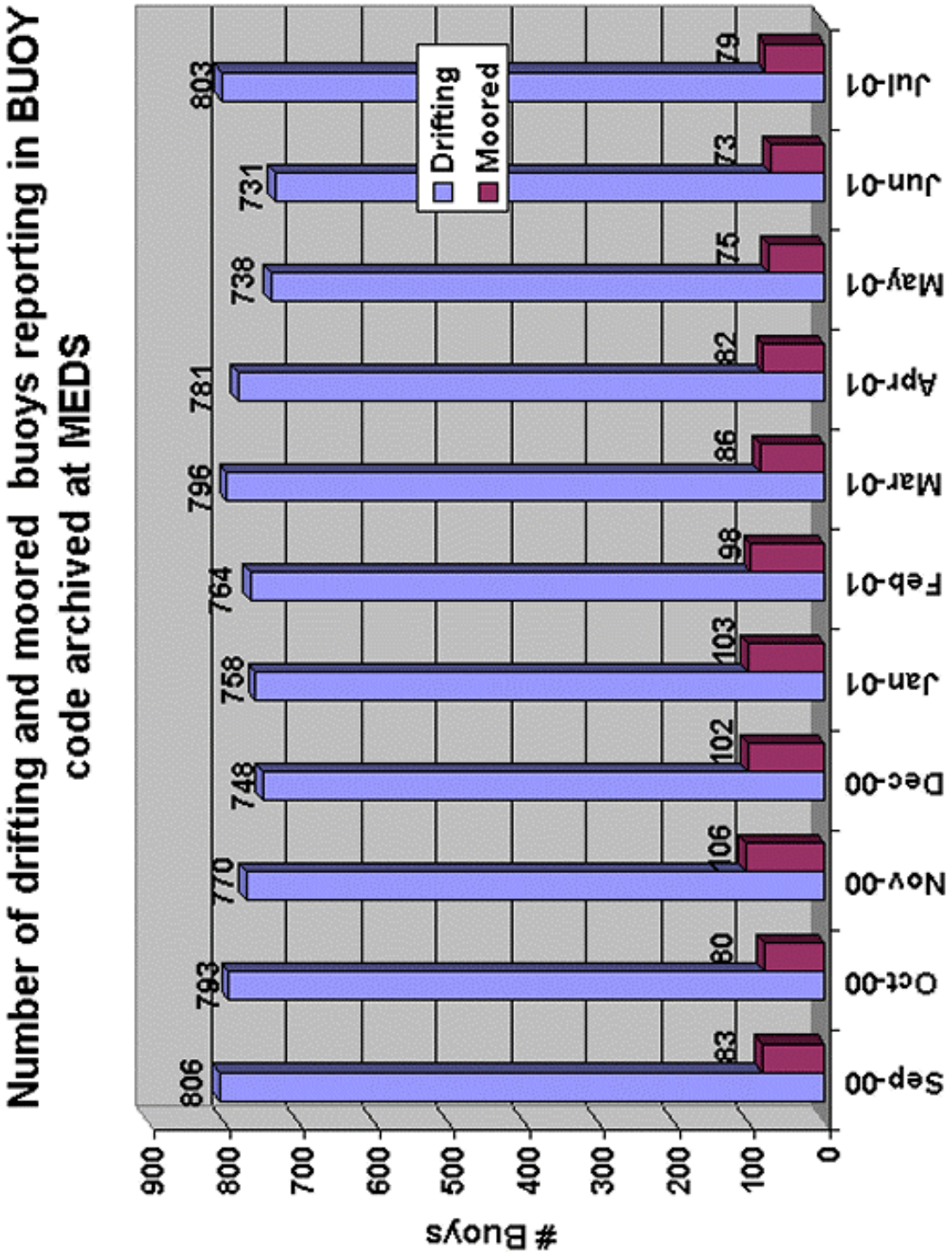
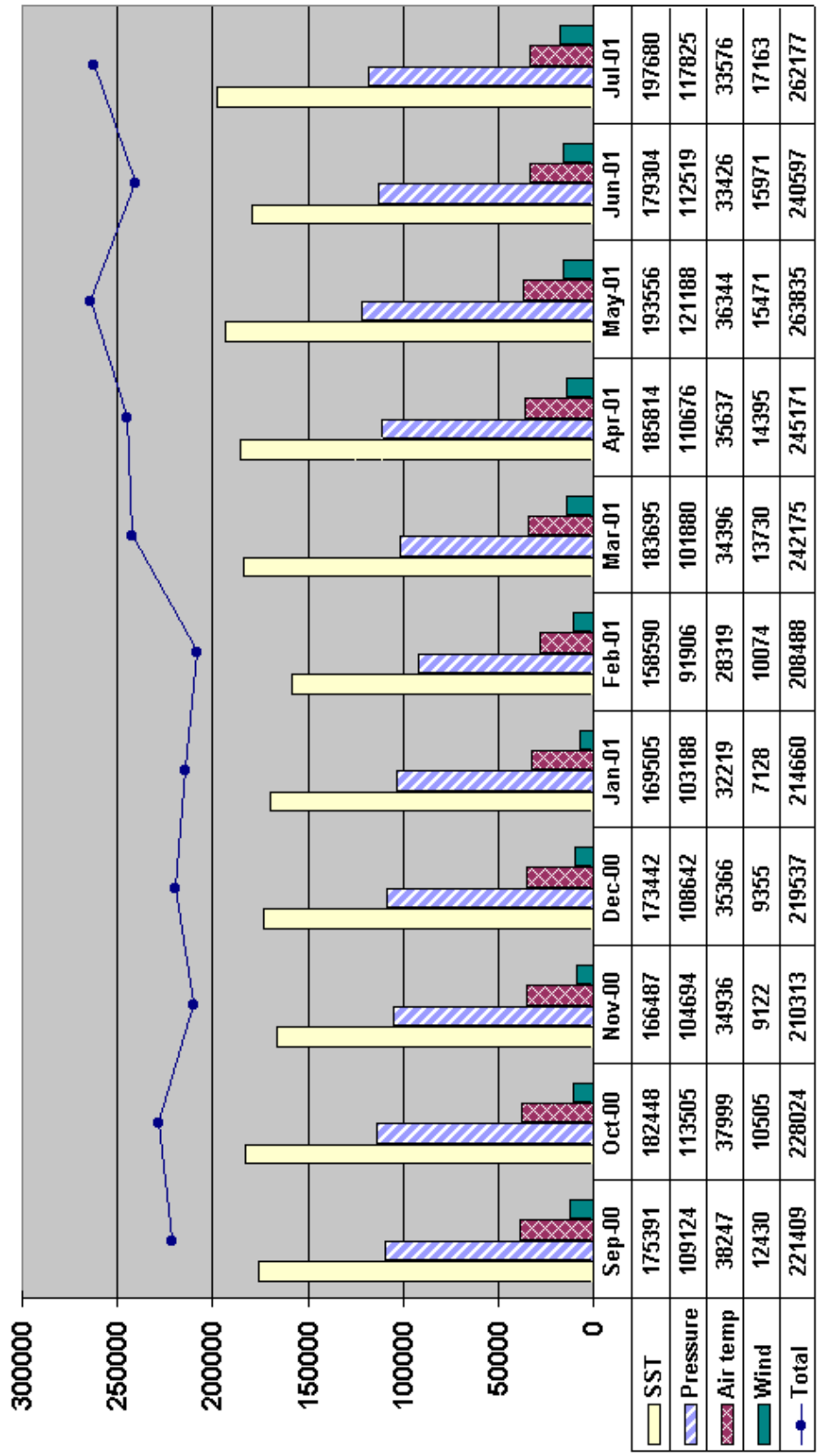

Number of drifting and moored buoys reporting in BUOY code archived at MEDS
Buoys
0
100
200
300
400
500
600
700
800
900
Drifting
Moored
806
793
770
748
758
764
796
781
738
731
803
83
80
106
102
103
98
86
82
75
73
79
Sep-00
Oct-00
Nov-00
Dec-00
Jan-01
Feb-01
Mar-01
Apr-01
May-01
Jun-01
Jul-01

Figure 2



	Sep-00	Oct-00	Nov-00	Dec-00	Jan-01	Feb-01	Mar-01	Apr-01	May-01	Jun-01	Jul-01
SST	175391	182448	166487	173442	169505	158590	183695	185814	193556	179304	197680
Pressure	109124	113505	104694	108642	103188	91906	101880	110676	121188	112519	117825
Air temp	38247	37999	34936	35366	32219	28319	34396	35637	36344	33426	33576
Wind	12430	10505	9122	9355	7128	10074	13730	14395	15471	15971	17163
Total	221409	228024	210313	219537	214660	208488	242175	245171	263835	240597	262177

Figure 3

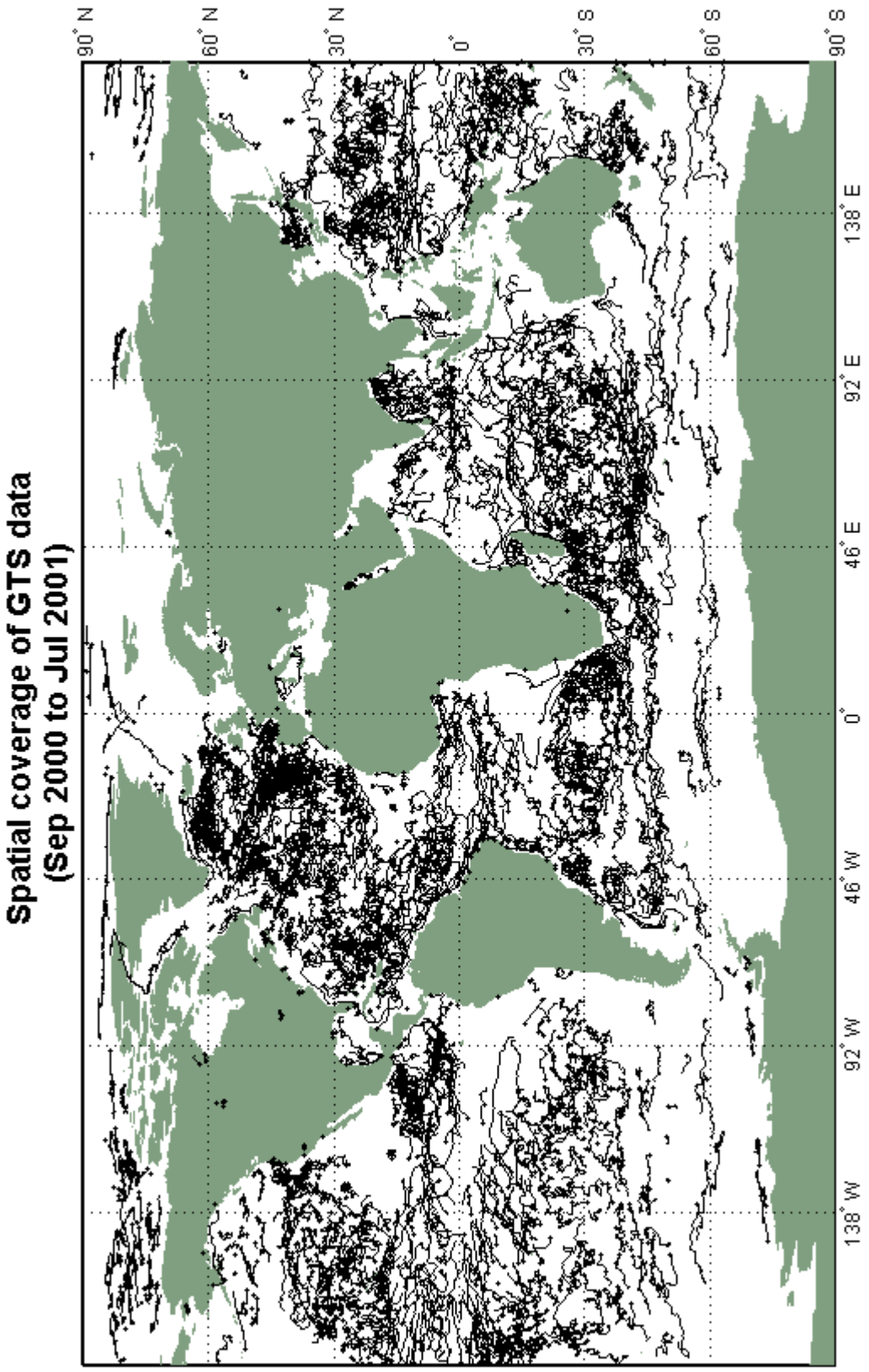

Spatial coverage of GTS data
(Sep 2000 to Jul 2001)
90° N
60° N
30° N
0°
30° S
60° S
90° S
138° W
92° W
46° W
0°
46° E
92° E
138° E

Figure 4

METEO FRANCE

SOC for Drifting Buoy Report

2000 - 2001

In 2000 and 2001, Météo-France and Ifremer have initiated the data management part of the Coriolis project. Coriolis is a collaborative effort focused on *in situ* oceanic observation. The French SOC activity should be in the near future part of this project. Besides, Météo-France SOC has increased the collaboration with JCOMMOPS, taking advantage of methods and tools used for buoys.

A daily collection and archiving of buoy reports from the world ocean is performed by Météo-France, the French Meteorological service. As usual the French SOC for Drifting Buoy produces monthly graphic products for buoys, moored buoys, drifting buoys, ships. Data are delivered on request, or on a regular basis.

- Figures 1, 2, 3, 4, show the time evolution of reports for wind and for pressure respectively for all BUOY reports (showing all buoys, moored buoys and drifting buoys) and SHIP reports, since the 1st of January 2000.
- Figure 5 shows the time evolution of WAVEOB reports and sensors since the 1st of January 2000. Notice the drastic reduction of such messages in Feb. 2001.

Each month, mapping position plot charts and Marsden square distribution are produced for BATHY, TESAC, SHIP and BUOY and are sent to 70 users in the world.

- Figures 6a,b to 9a,b show these products for July 2001. "a" stands for mapping position plot charts, and "b" for Marsden square distribution. Figure 6: BATHY, 7: TESAC, 8: SHIP, and 9: BUOY.

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

- Figures 10 to 13 show such products for July 2001. Figure 10: Wind, 11: Pressure, 12: Air temperature, 13: Sea surface temperature.

Rapport DBCP 2000–2001

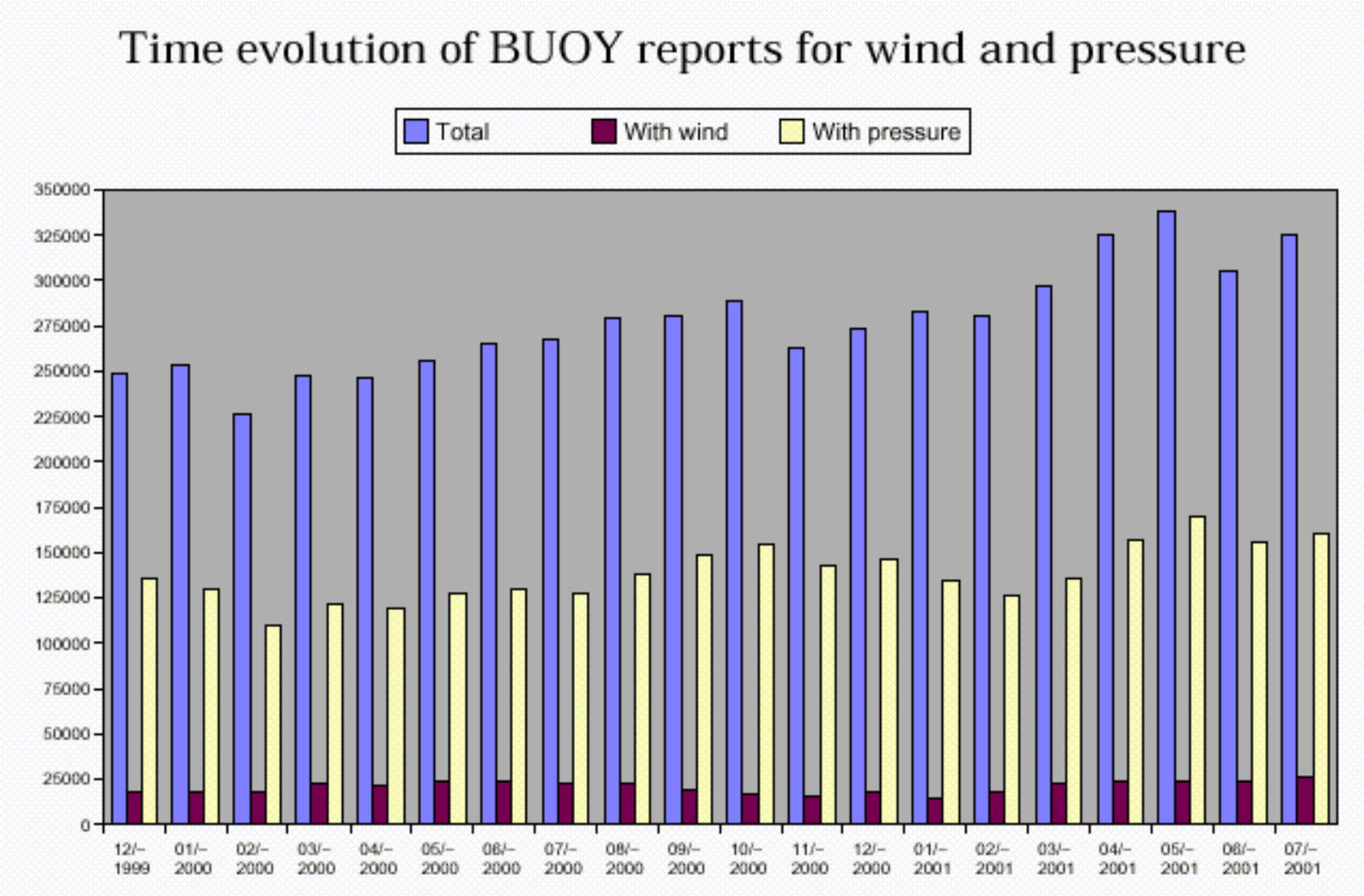


Figure 1

Rapport DBCP 2000–2001

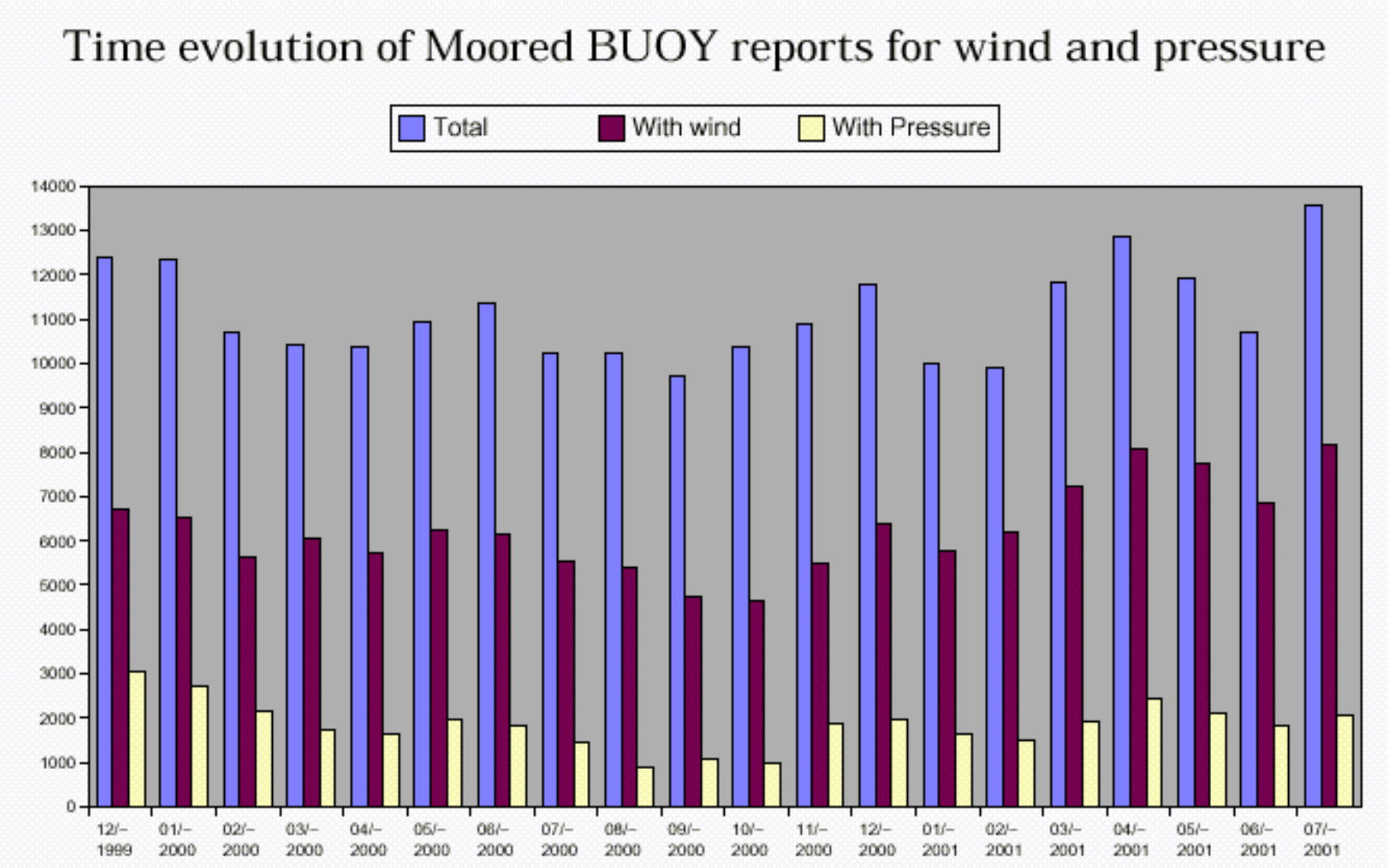


Figure 2

Rapport DBCP 2000–2001

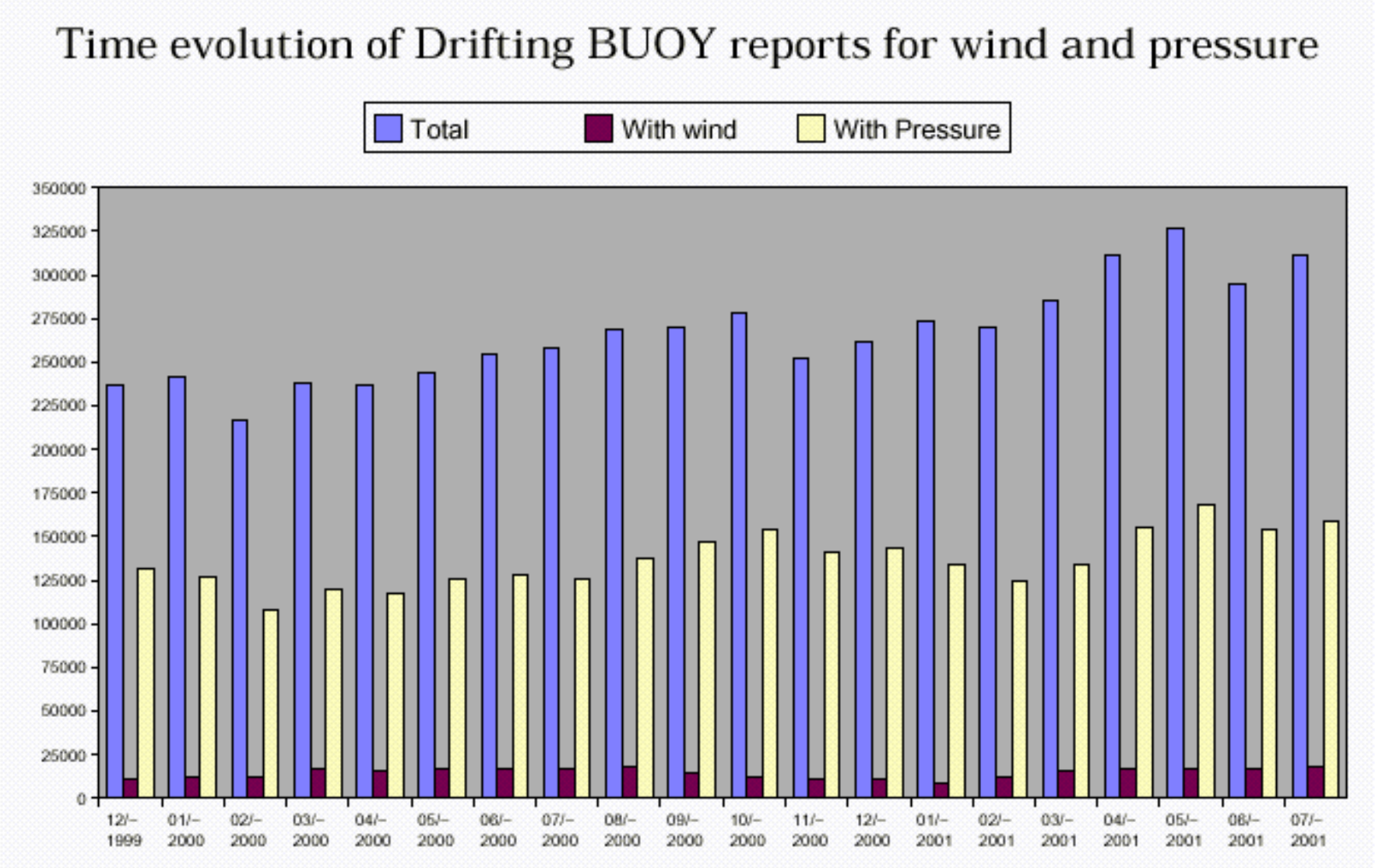


Figure 3

Rapport DBCP 2000-2001

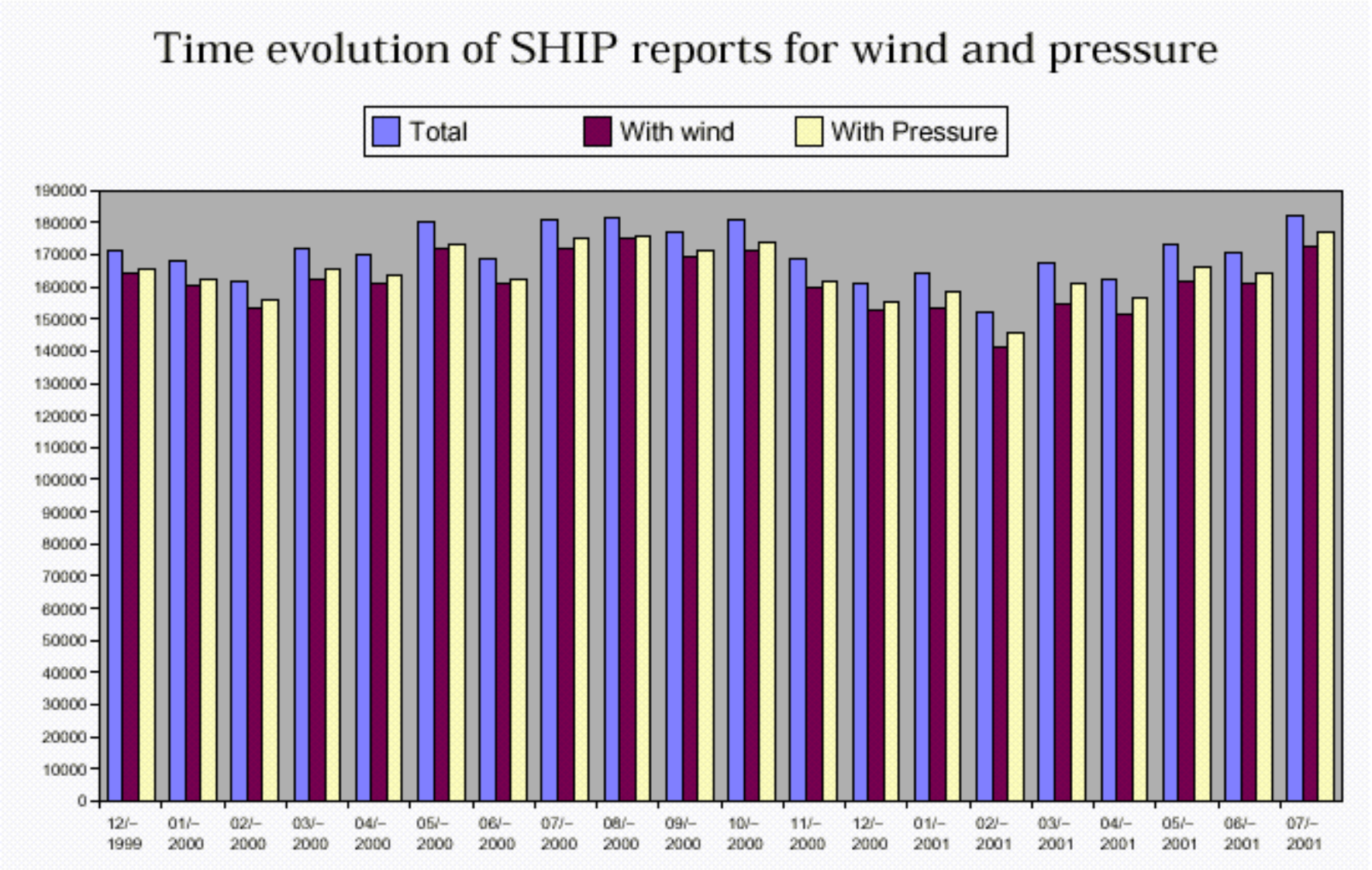


Figure 4

Rapport DBCP 2000–2001

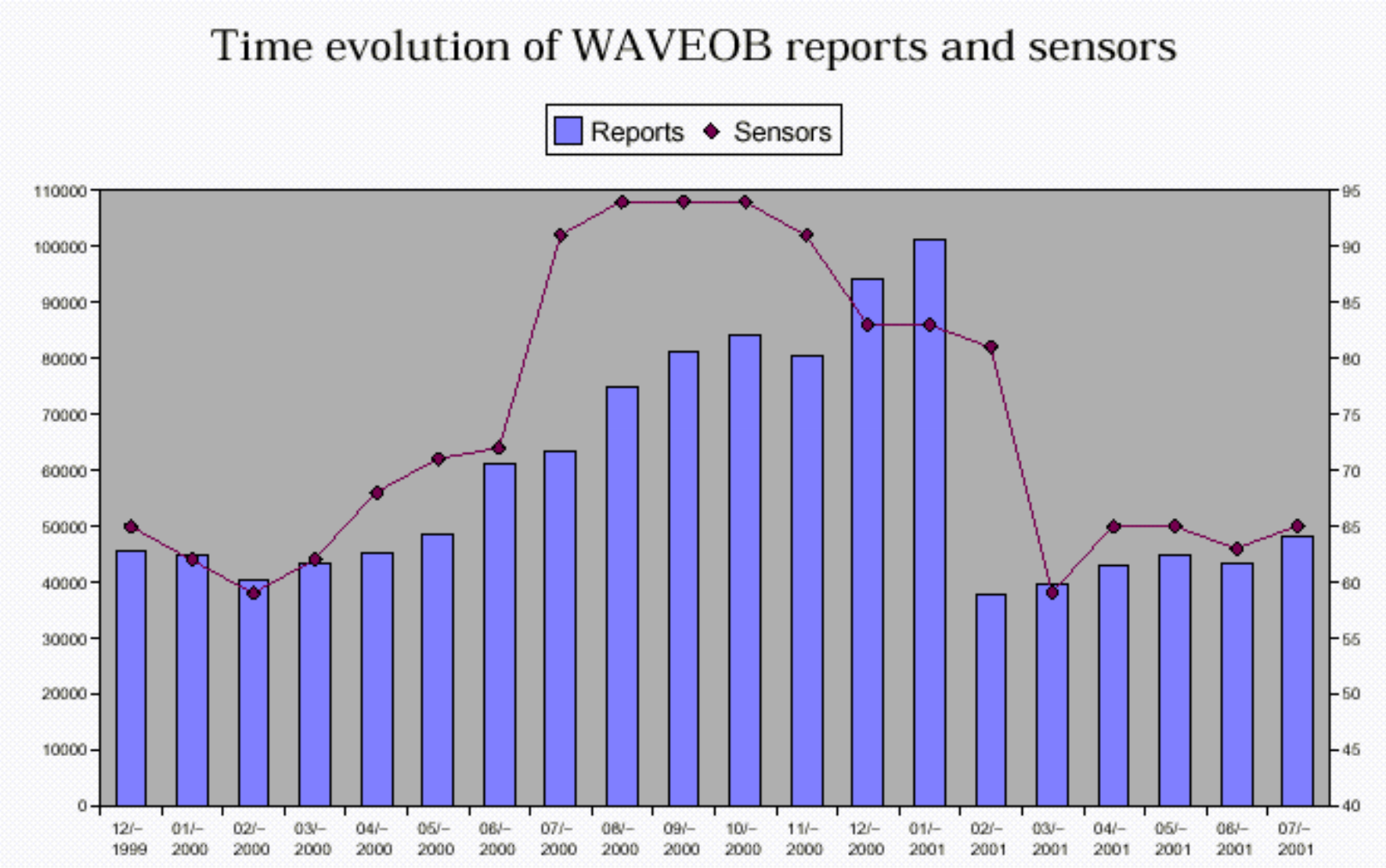


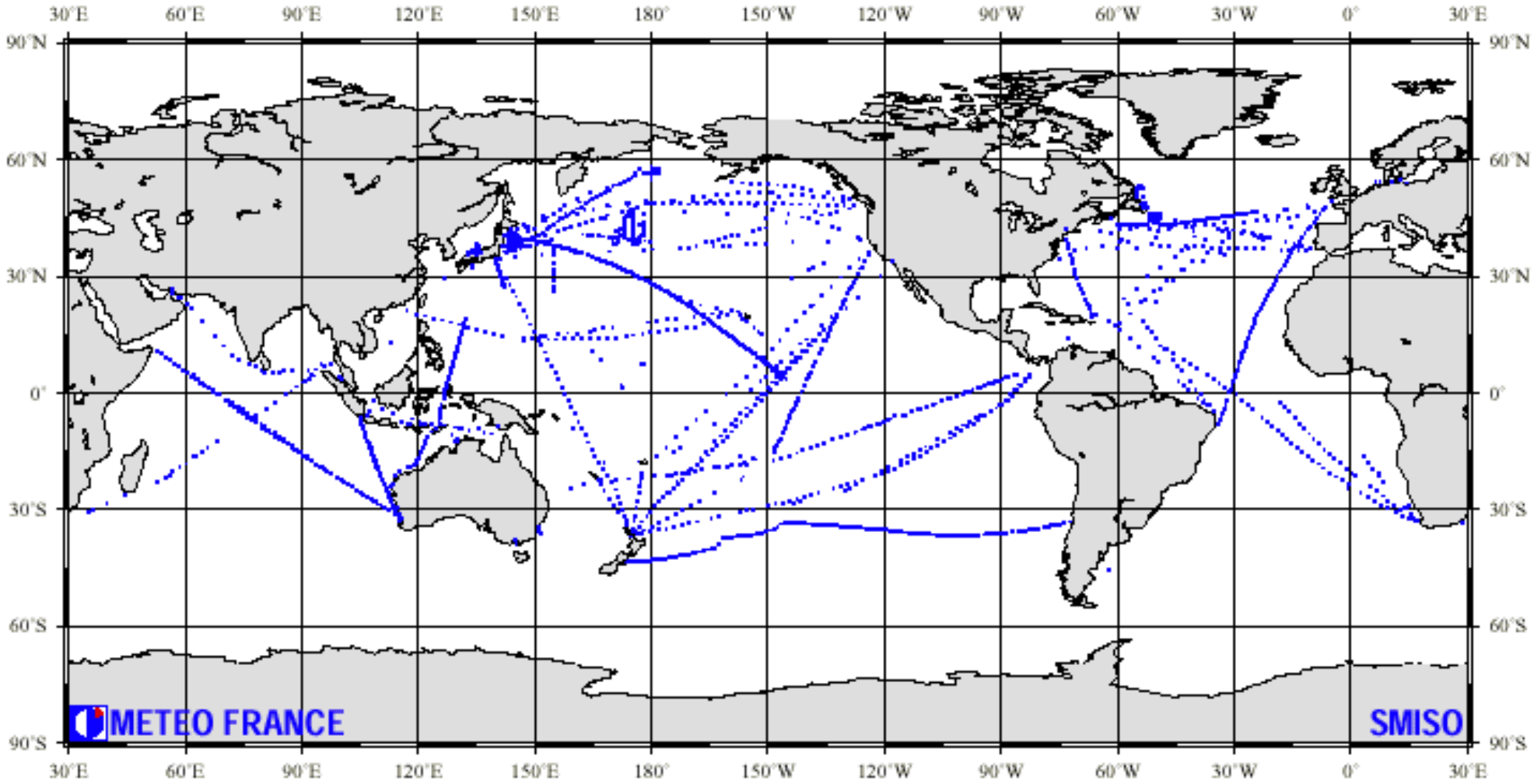
Figure 5

Carte de pointage des observations reçues en juillet 2001

Mapping position plot chart of data received during july 2001

Messages : BATHY

Total : 2562

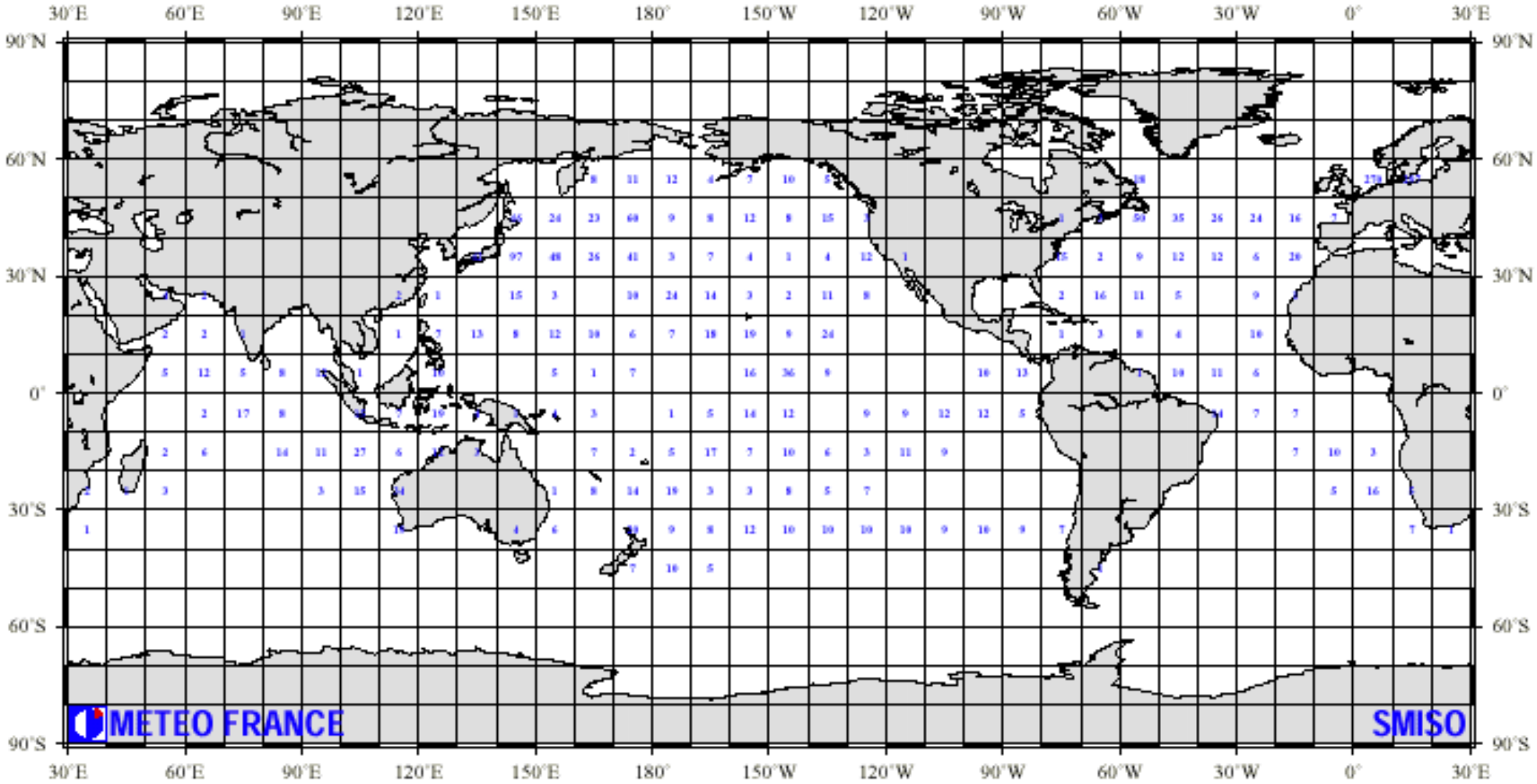


Répartition par carré Marsden des observations reçues en juillet 2001

Marsden square distribution chart of data received during july 2001

Messages : BATHY

Total : 2562

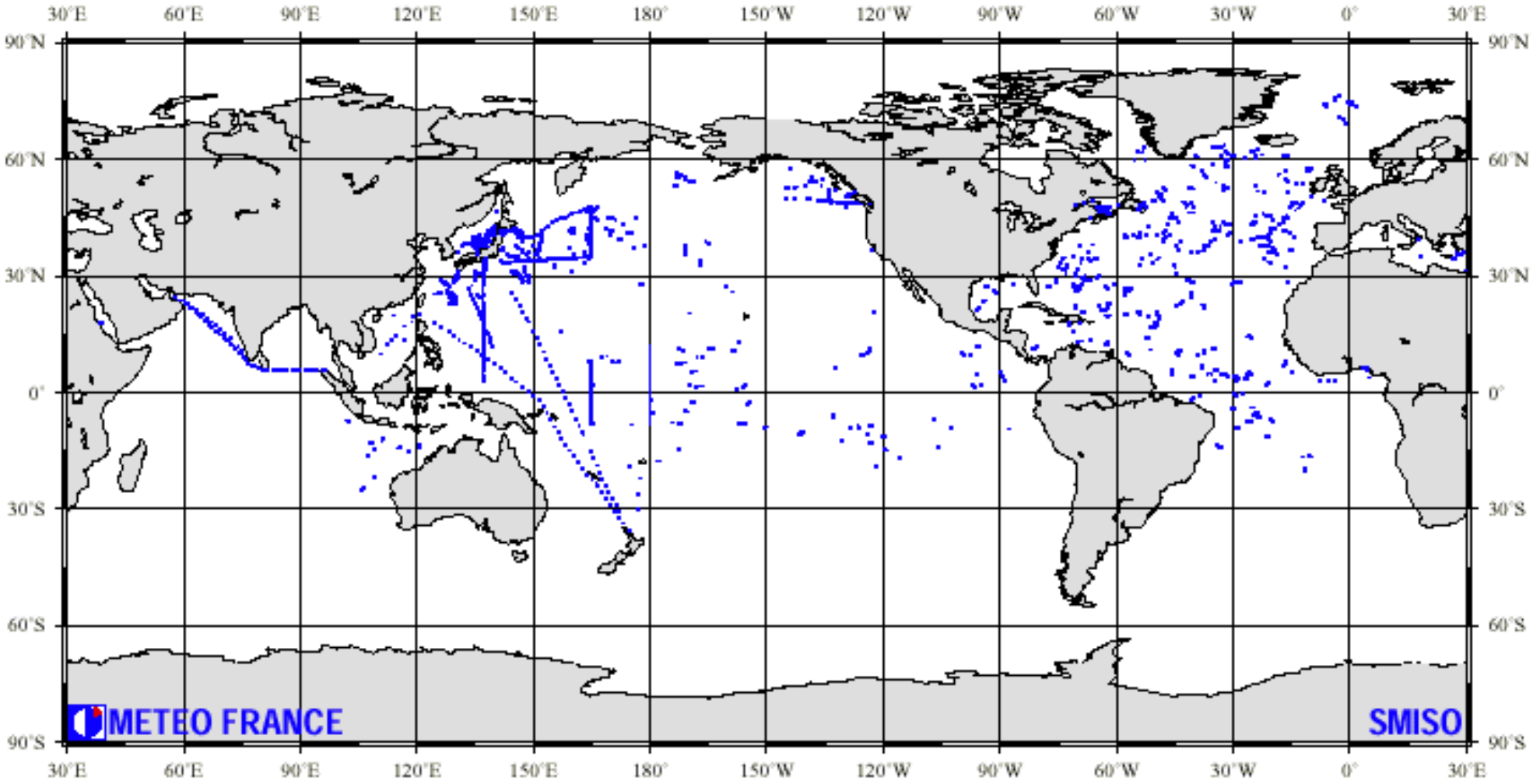


Carte de pointage des observations reçues en juillet 2001

Mapping position plot chart of data received during july 2001

Messages : TESAC

Total : 1633

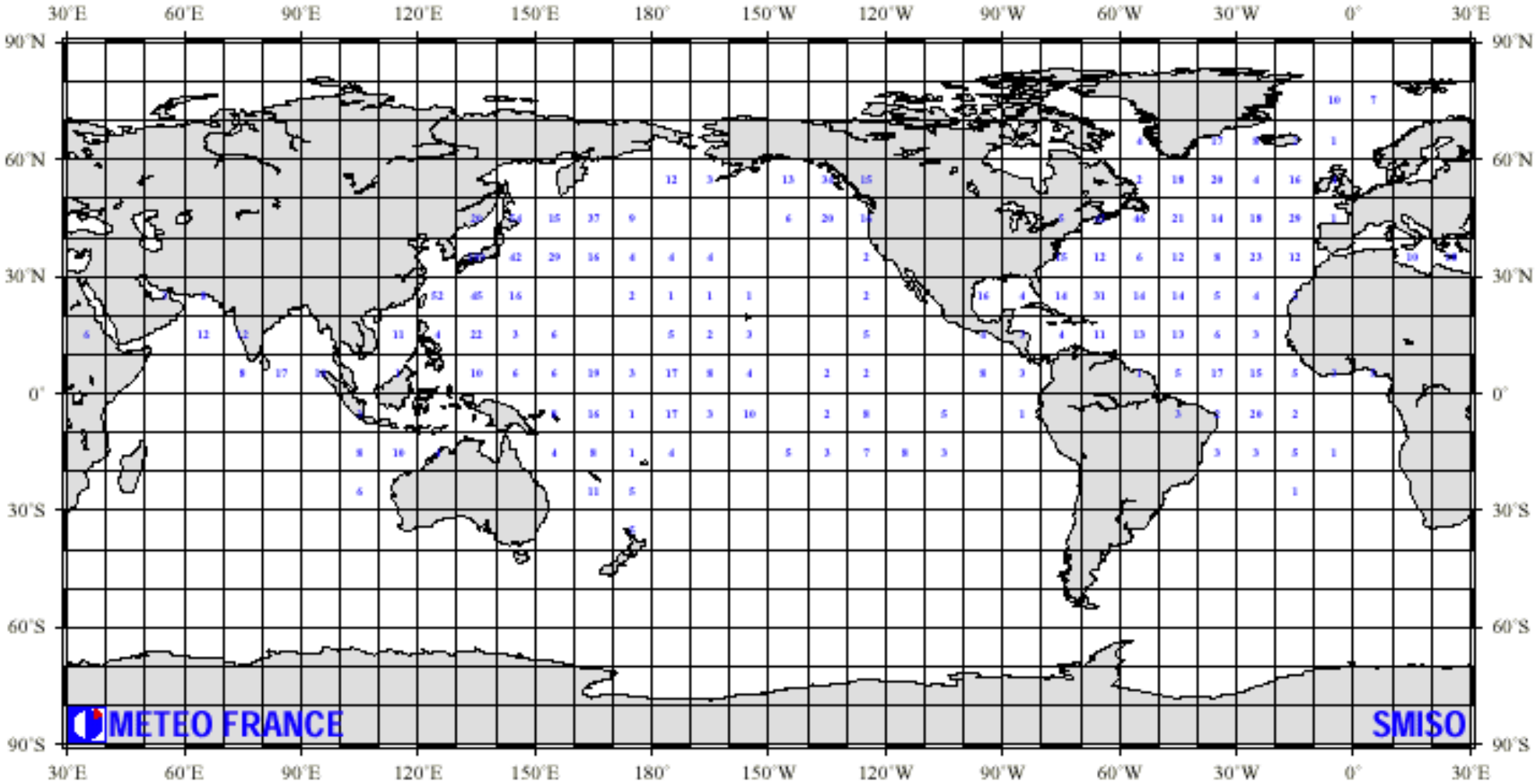


Répartition par carré Marsden des observations reçues en juillet 2001

Marsden square distribution chart of data received during july 2001

Messages : TESAC

Total : 1633

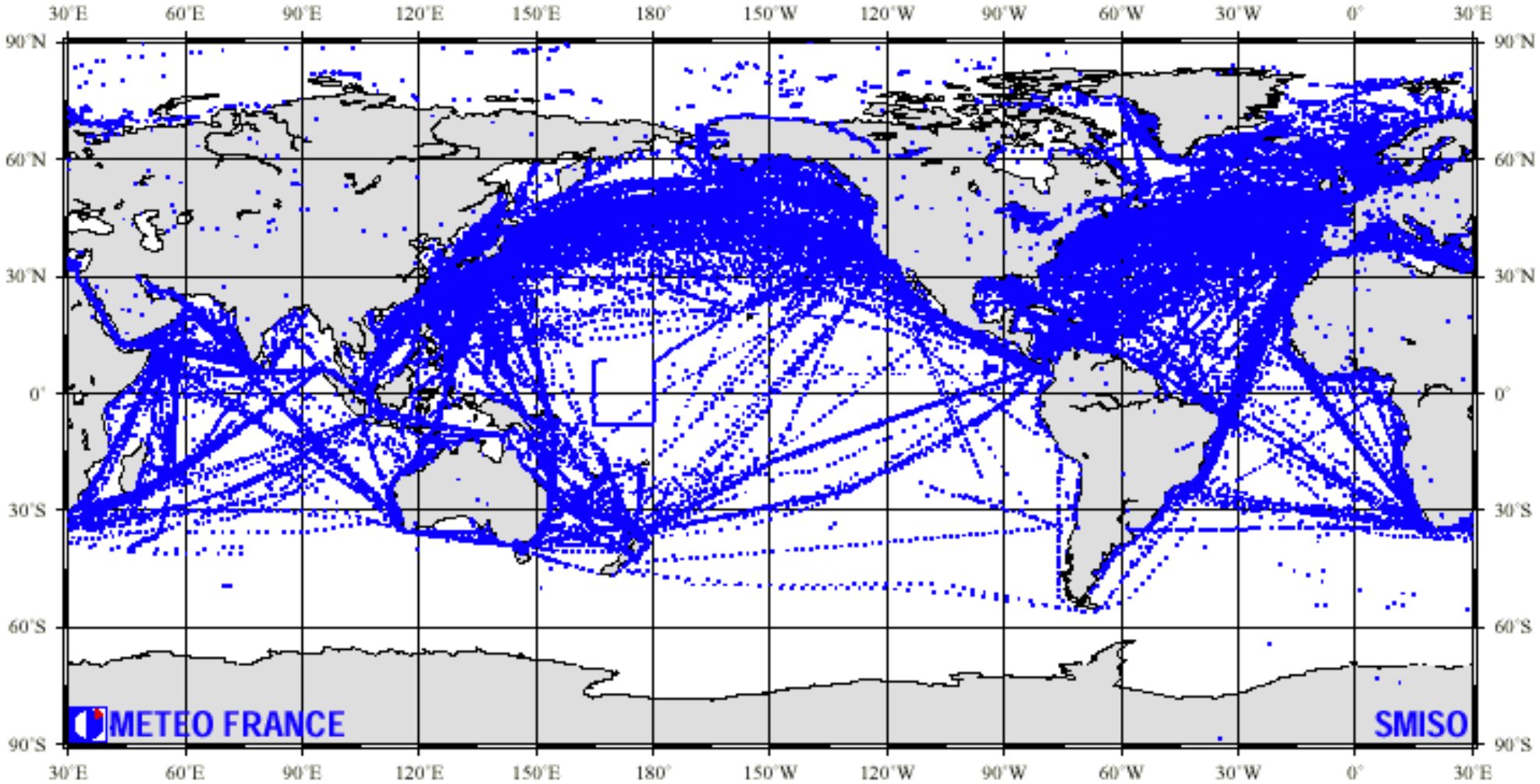


Carte de pointage des observations reçues en juillet 2001

Mapping position plot chart of data received during july 2001

Messages : SHIP

Total : 182424

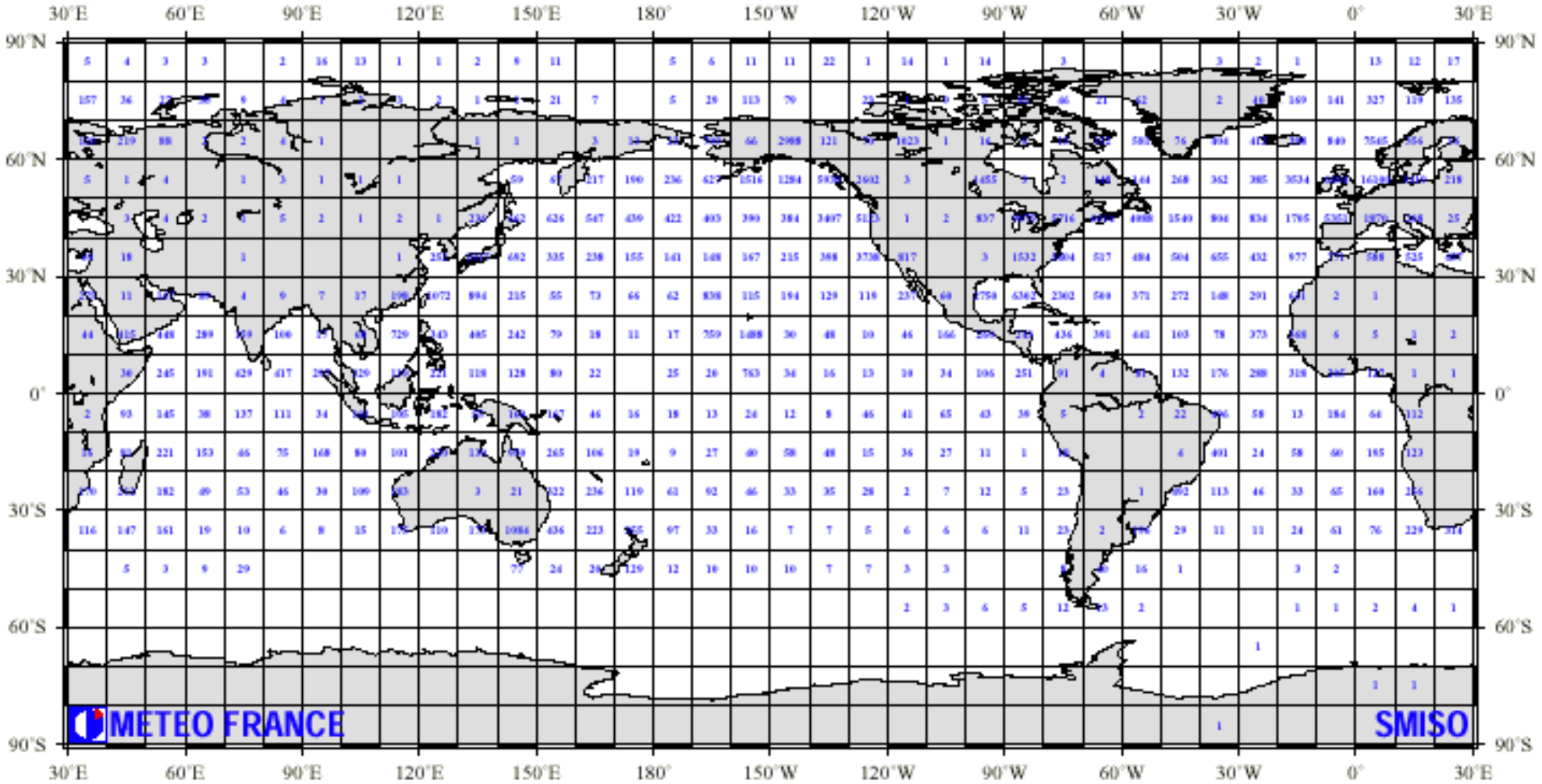


Répartition par carré Marsden des observations reçues en juillet 2001

Marsden square distribution chart of data received during july 2001

Messages : SHIP

Total : 182424

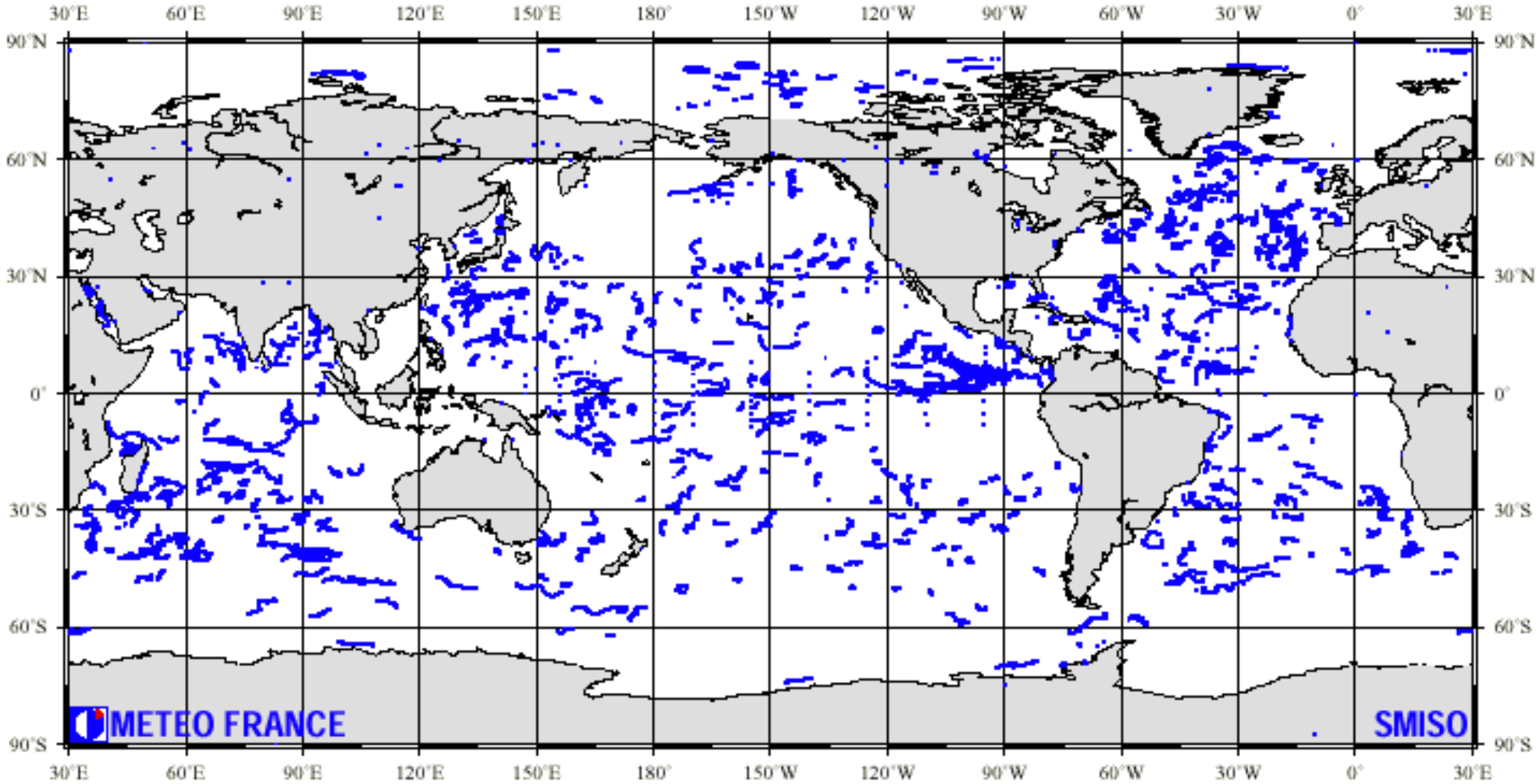


Carte de pointage des observations reçues en juillet 2001

Mapping position plot chart of data received during july 2001

Messages : BUOY

Total : 324844

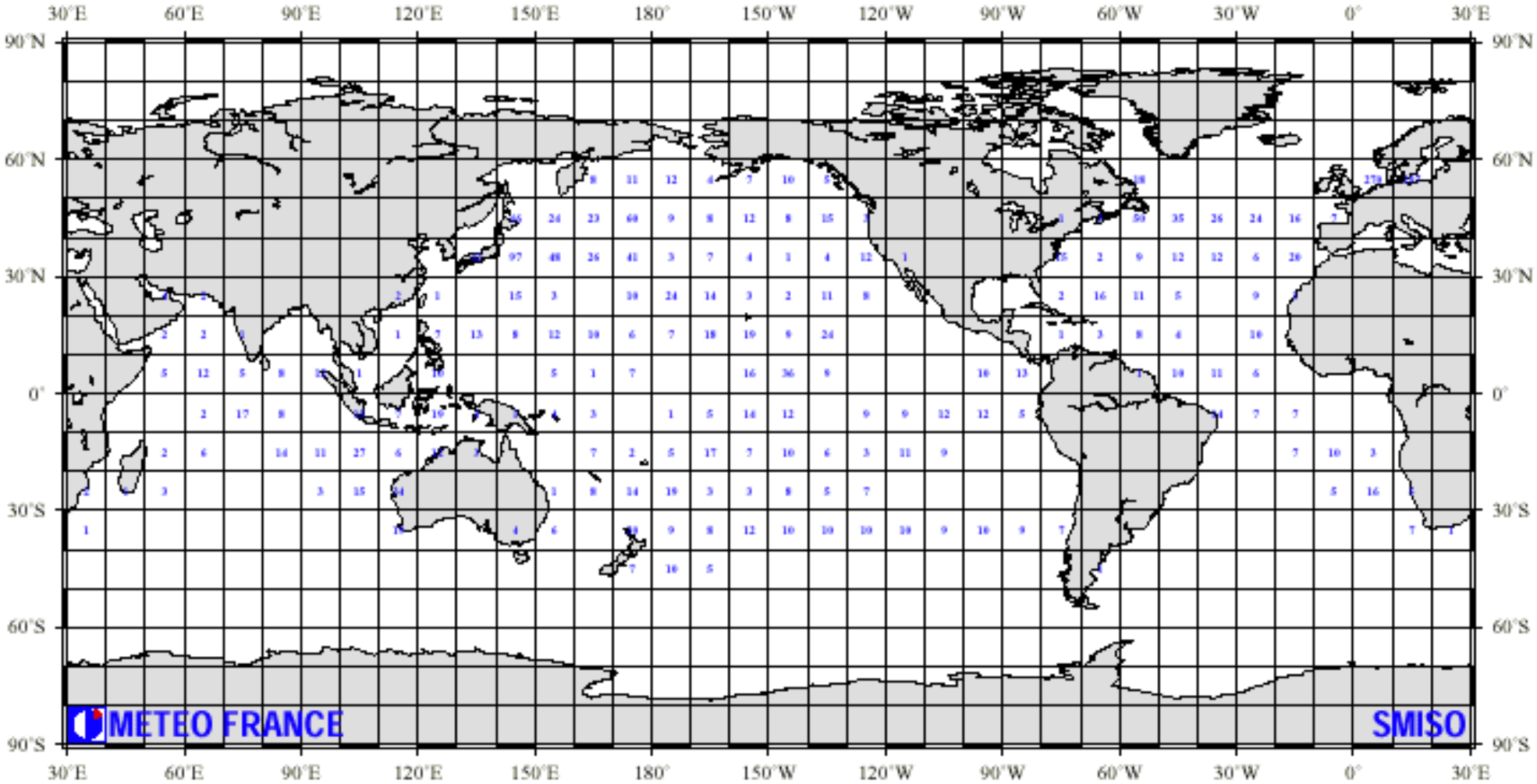


Répartition par carré Marsden des observations reçues en juillet 2001

Marsden square distribution chart of data received during july 2001

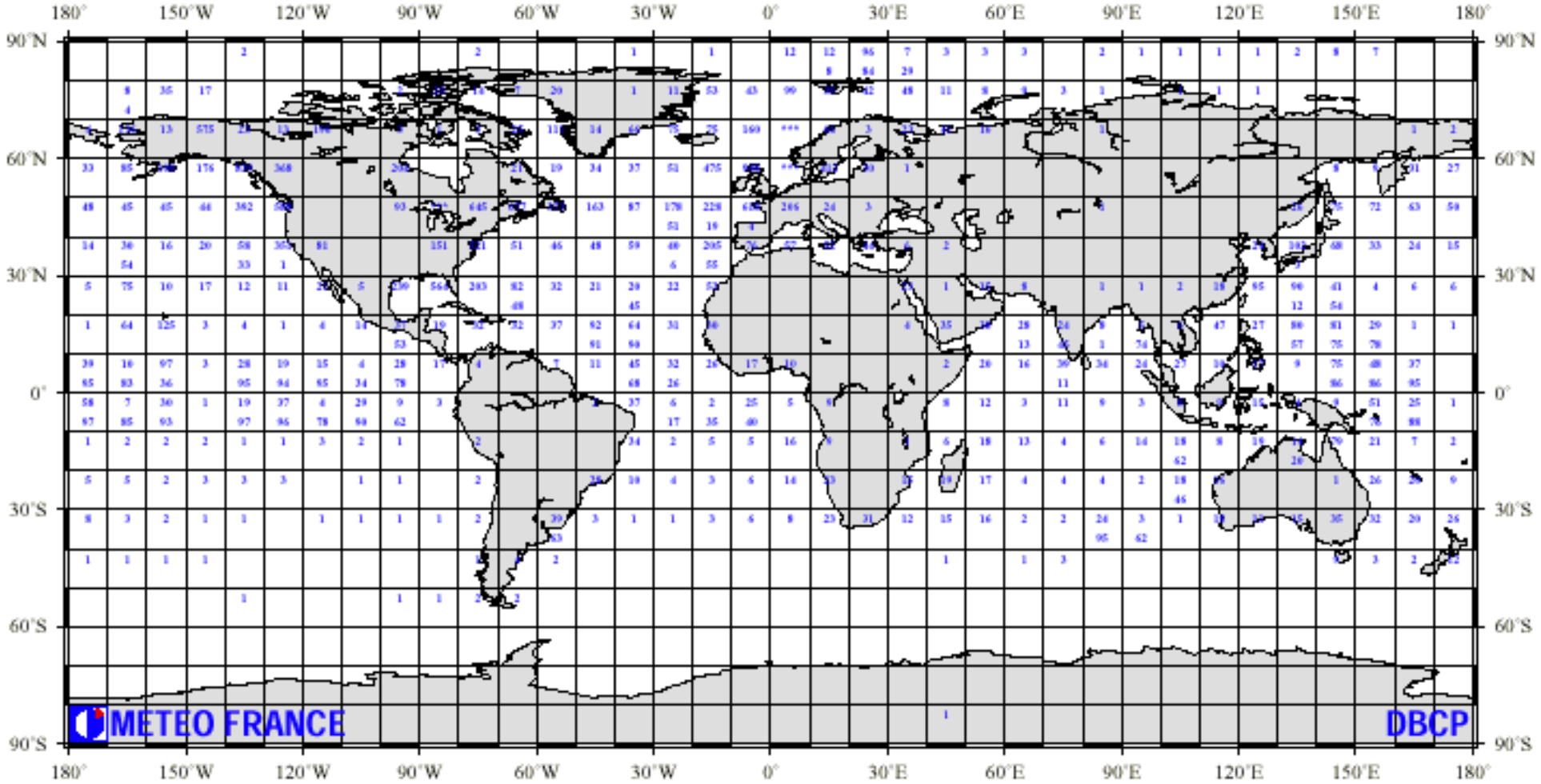
Messages : BATHY

Total : 2562



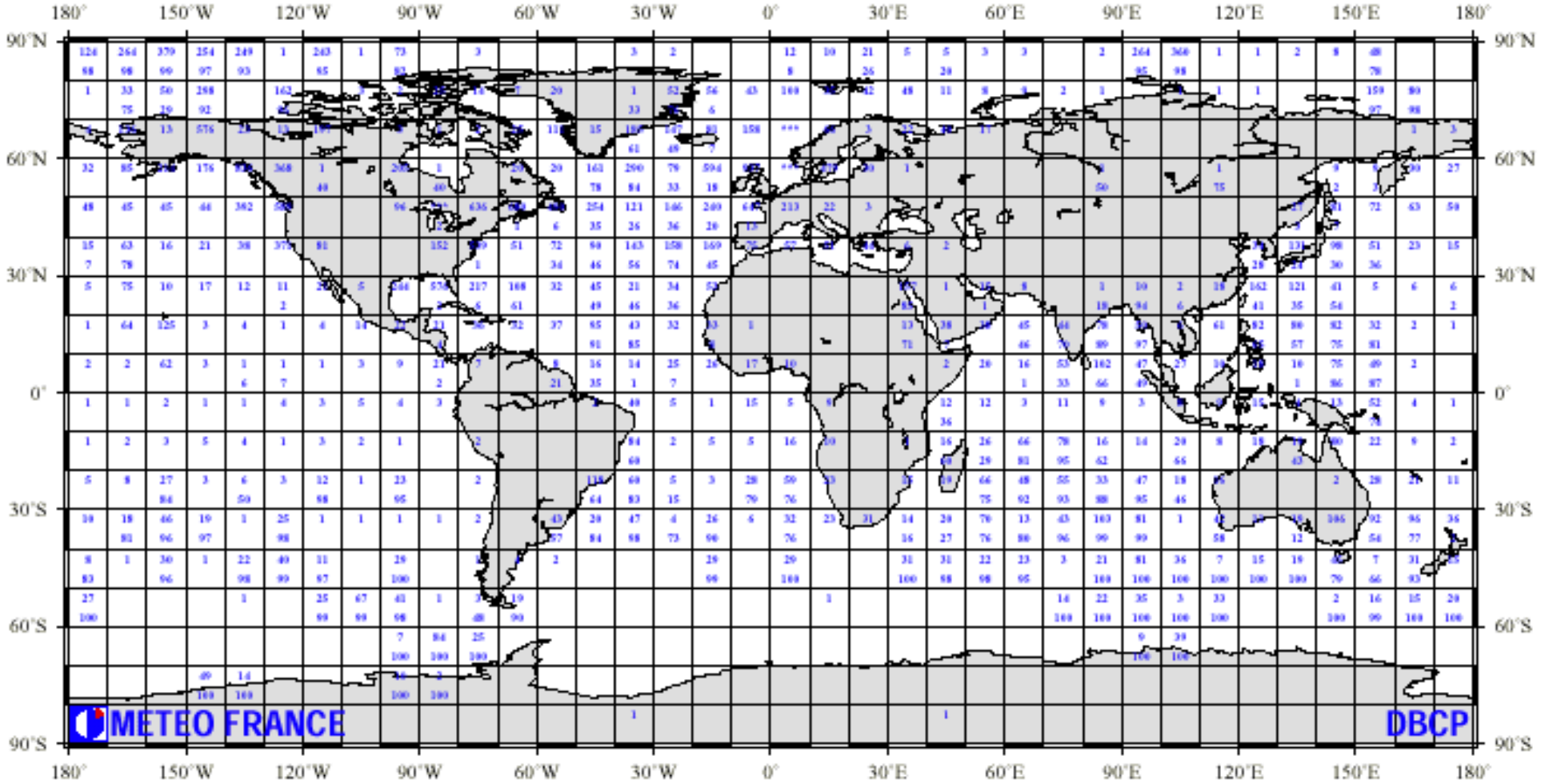
METEO-FRANCE WIND JULY 2001

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)



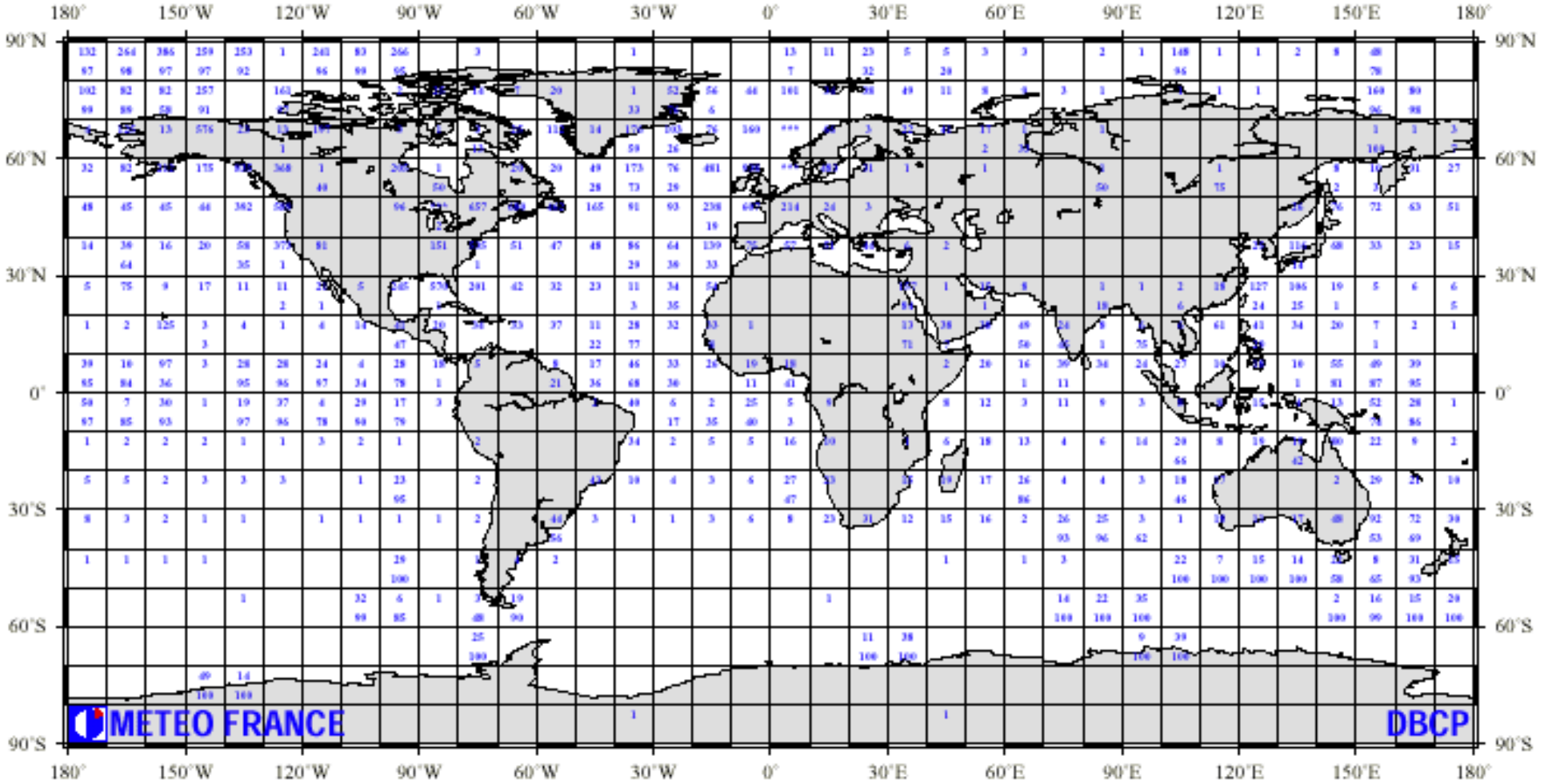
METEO-FRANCE PRESSURE JULY 2001

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)



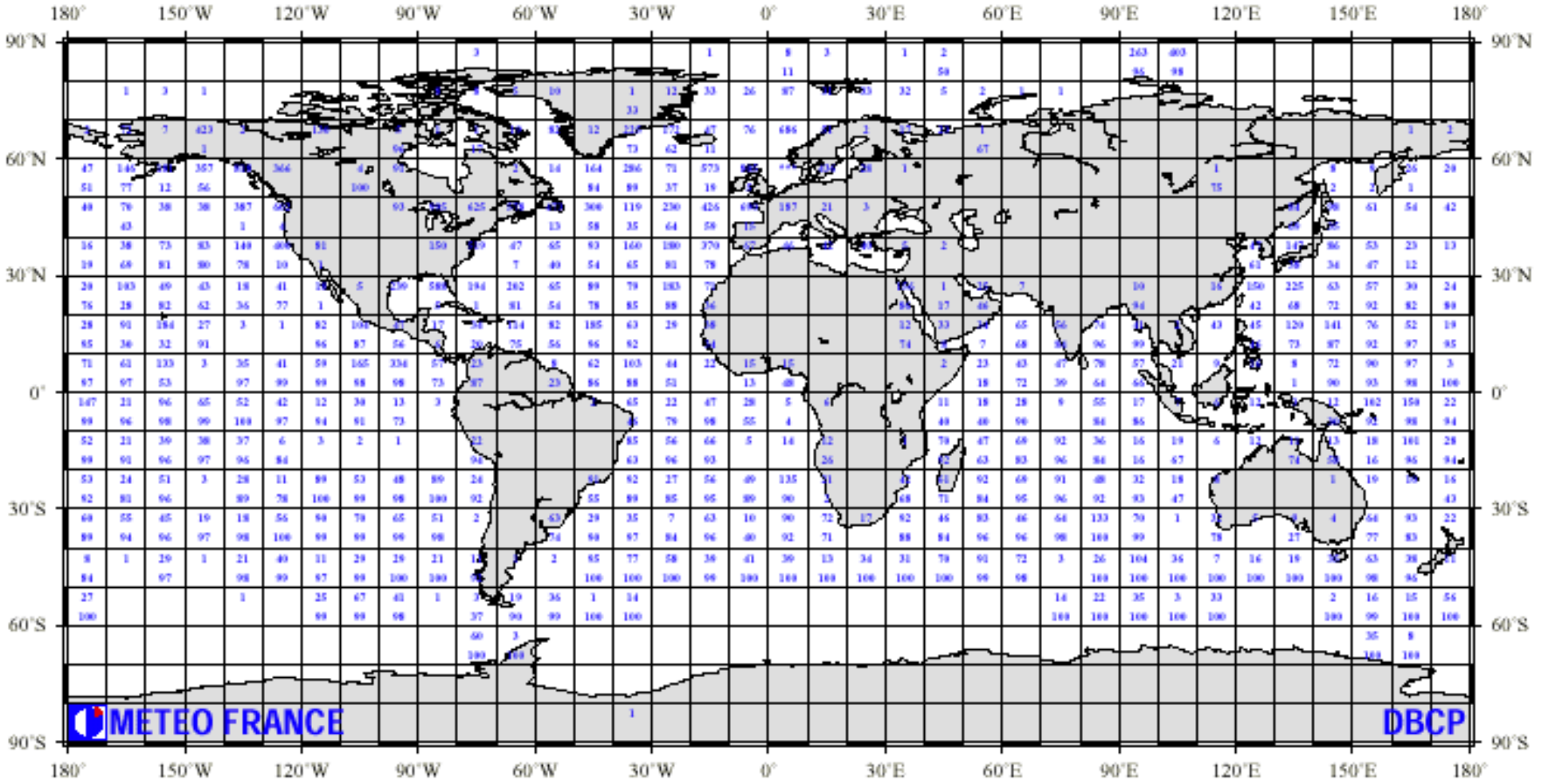
METEO-FRANCE TEMPERATURE JULY 2001

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)



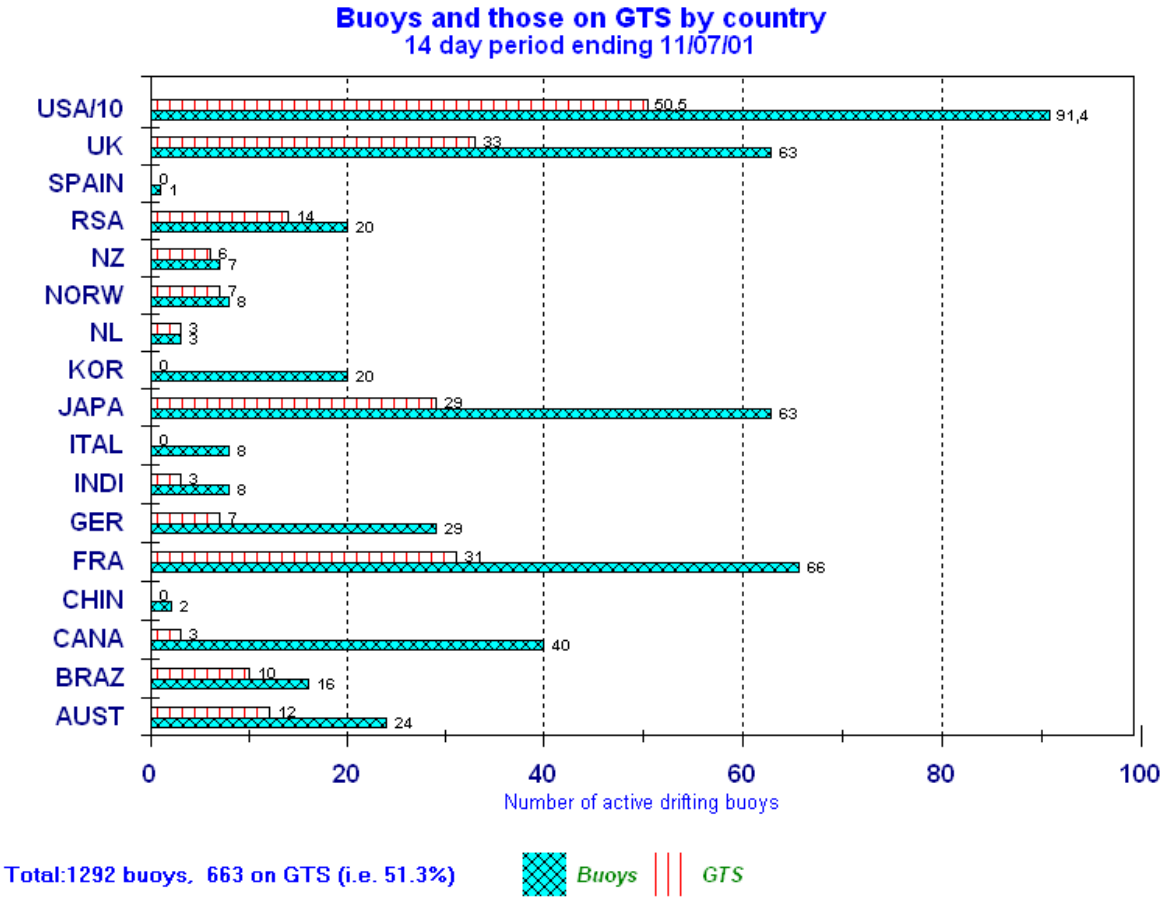
METEO-FRANCE SEA SURFACE TEMPERATURE JULY 2001

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)



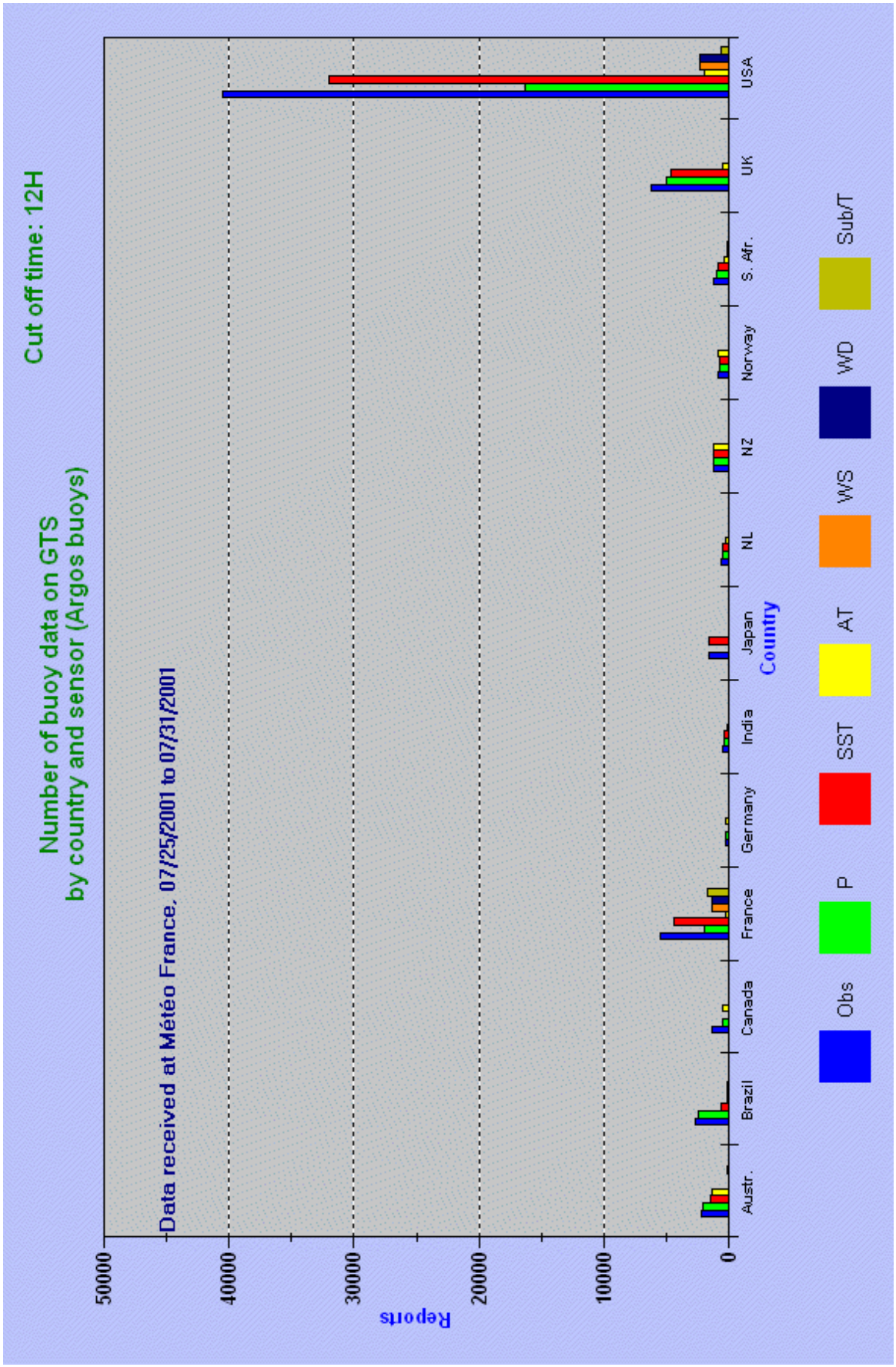
ANNEX IV

Distribution of GTS and non-GTS platforms by country



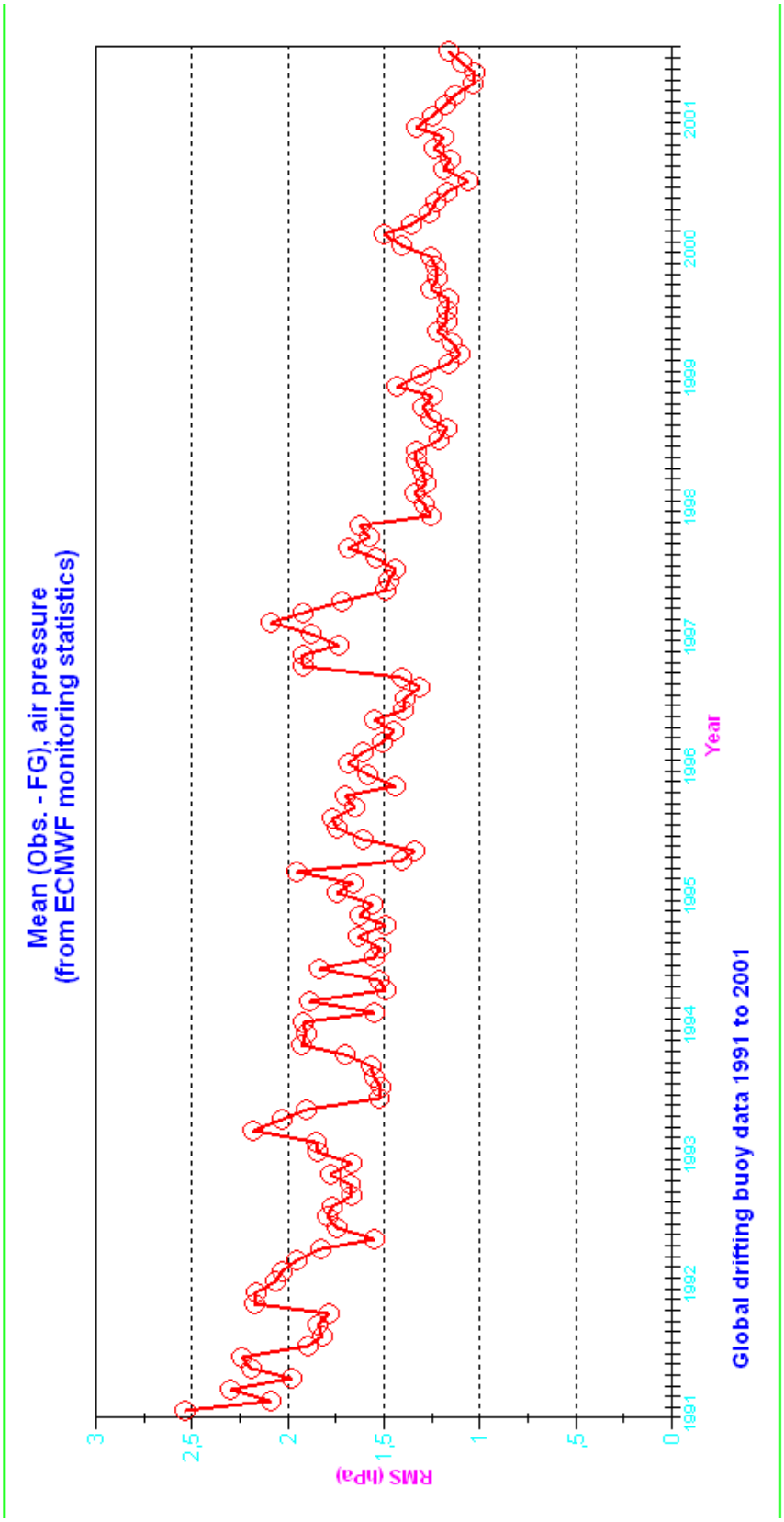
ANNEX V

Number of buoy data onto the GTS per country and sensor

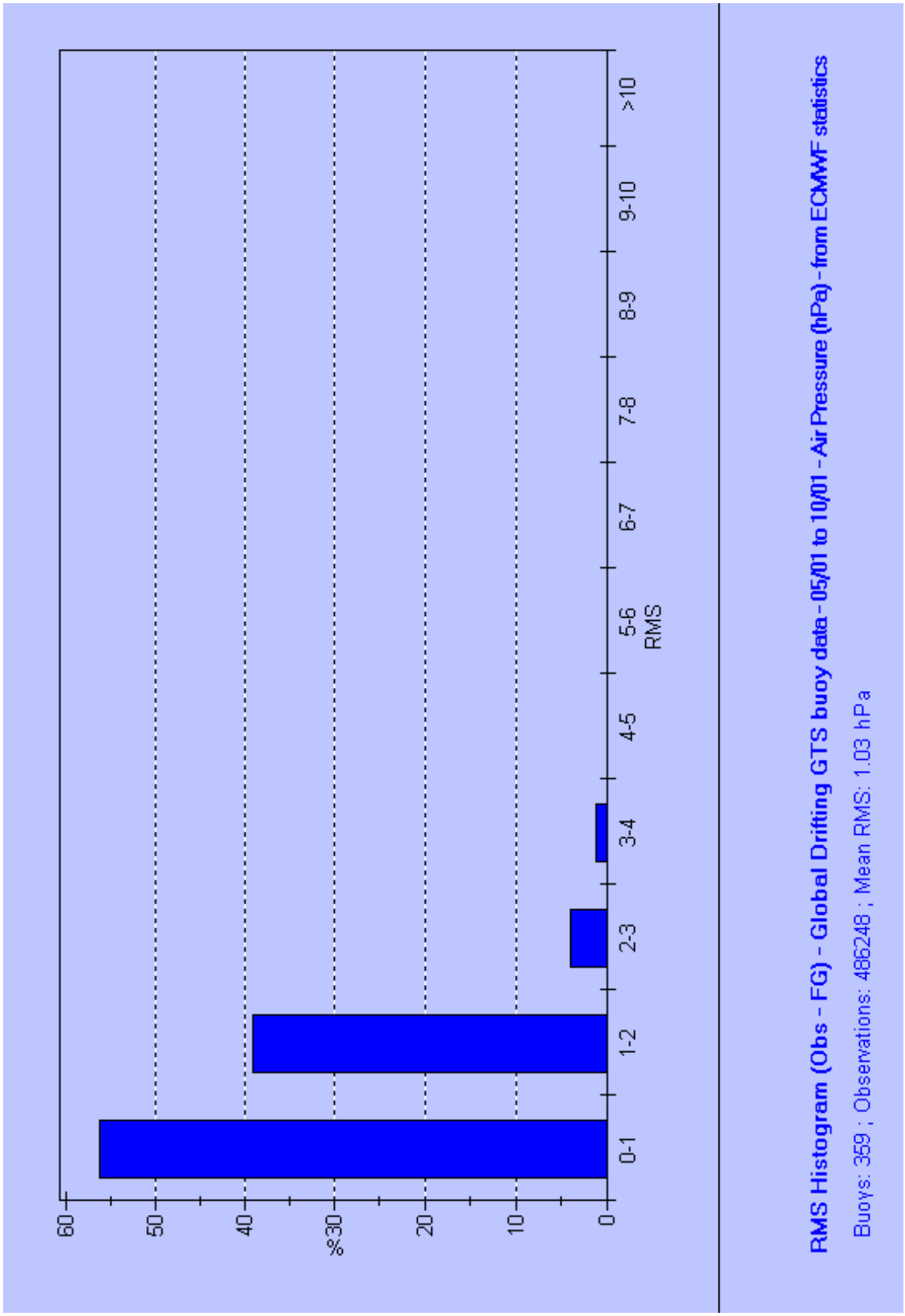


ANNEX VI

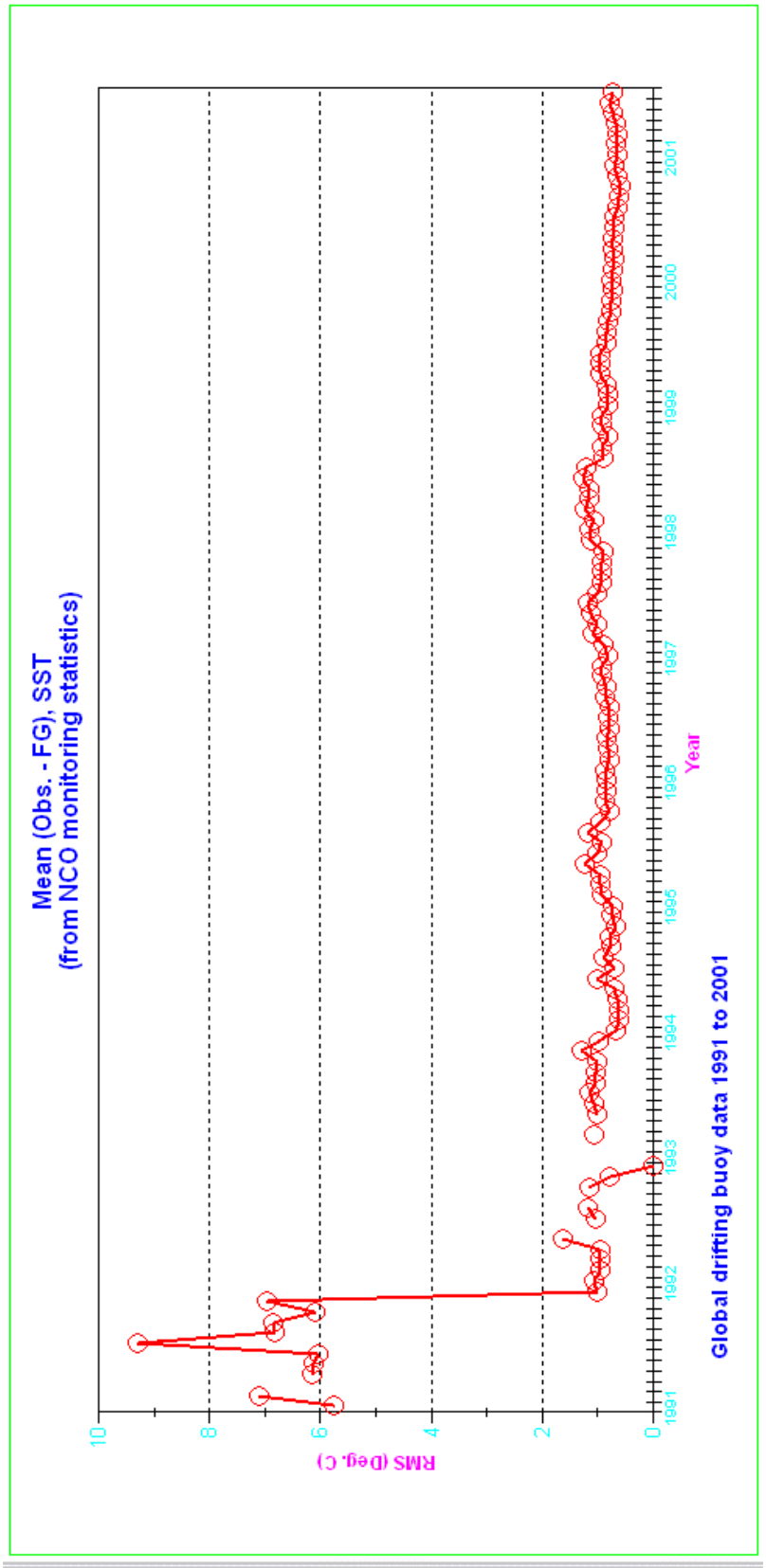
Evolution of mean RMS (Obs-FG) per month for DB air pressure data (from ECMWF statistics)



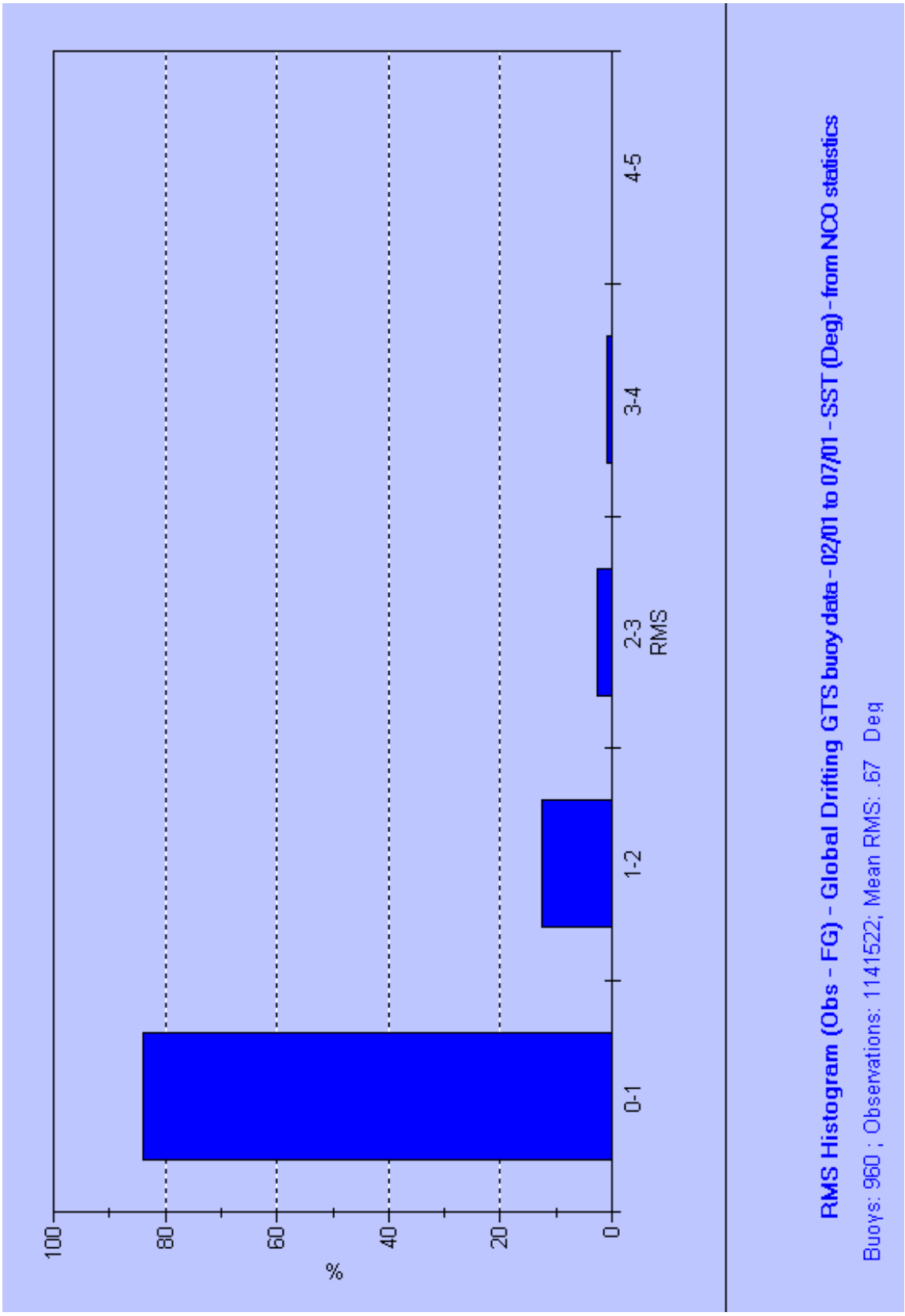
Distribution of RMS (Obs-FG) per month for DB air pressure data (from ECMWF statistics)



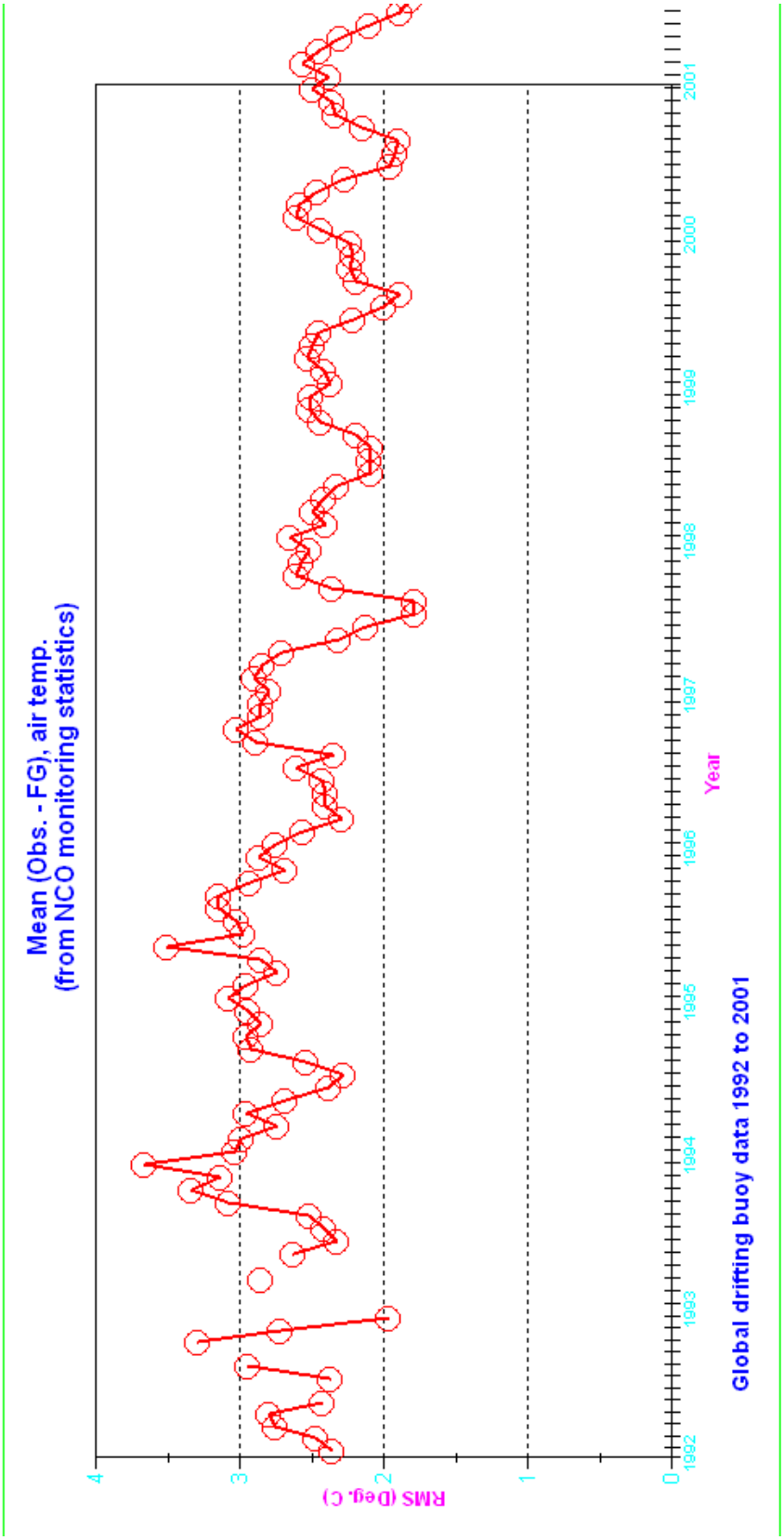
Evolution of mean RMS (Obs-FG) per month for DB SST data (from ECMWF statistics)



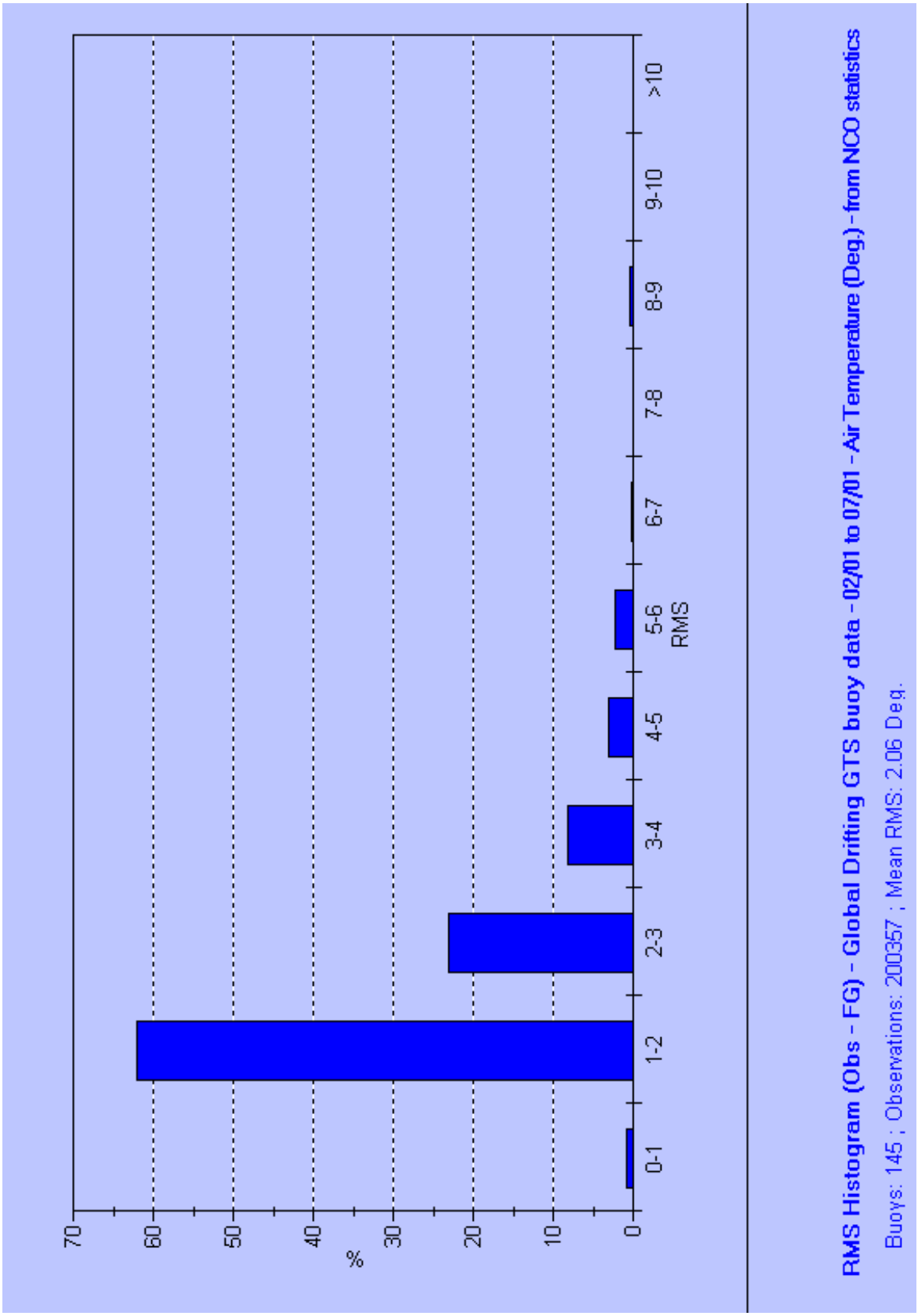
Distribution of RMS (Obs-FG) for DB SST data
(from ECMWF statistics)



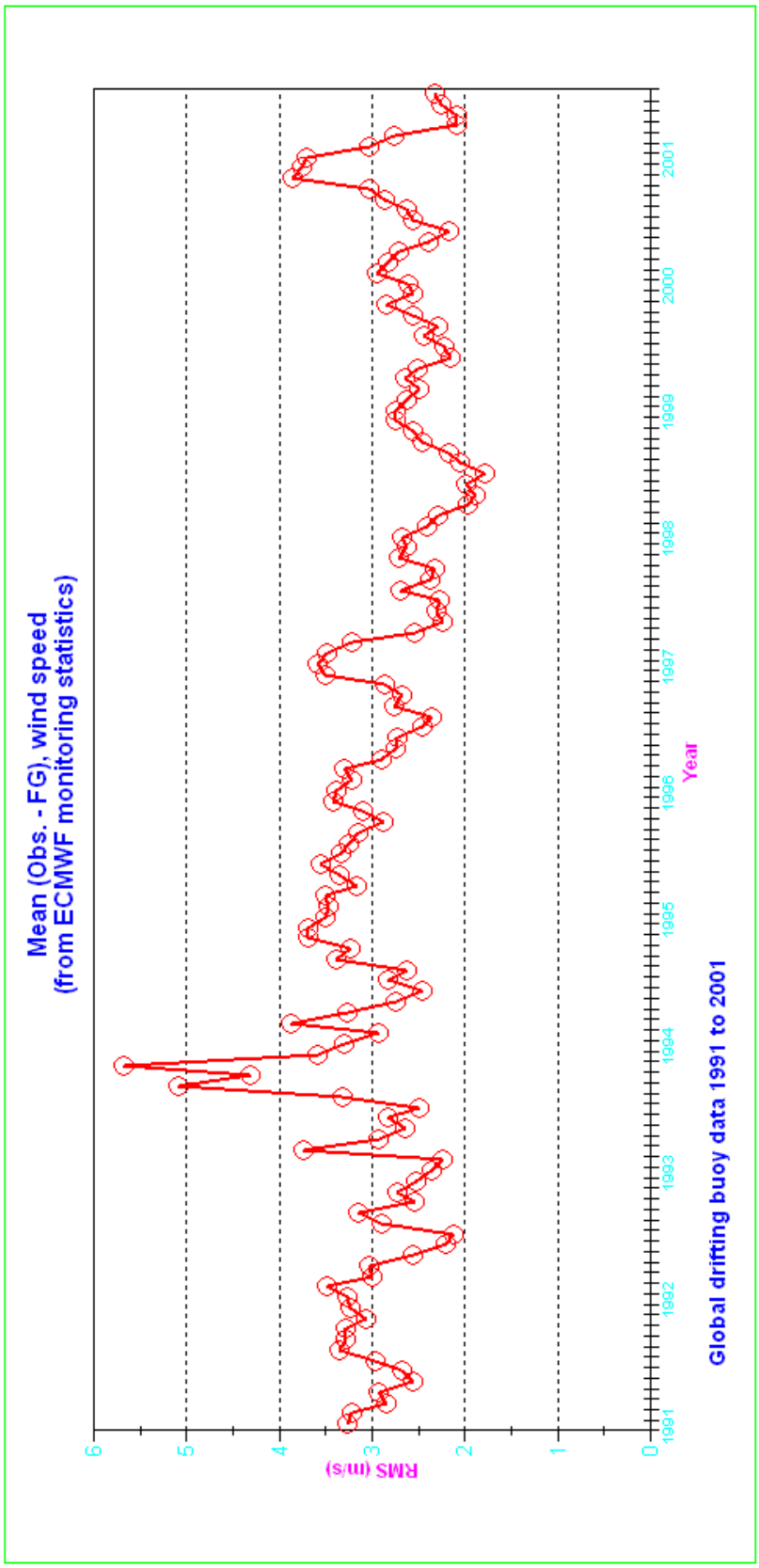
Evolution of mean RMS (Obs-FG) per month for DB air temperature data (from ECMWF statistics)



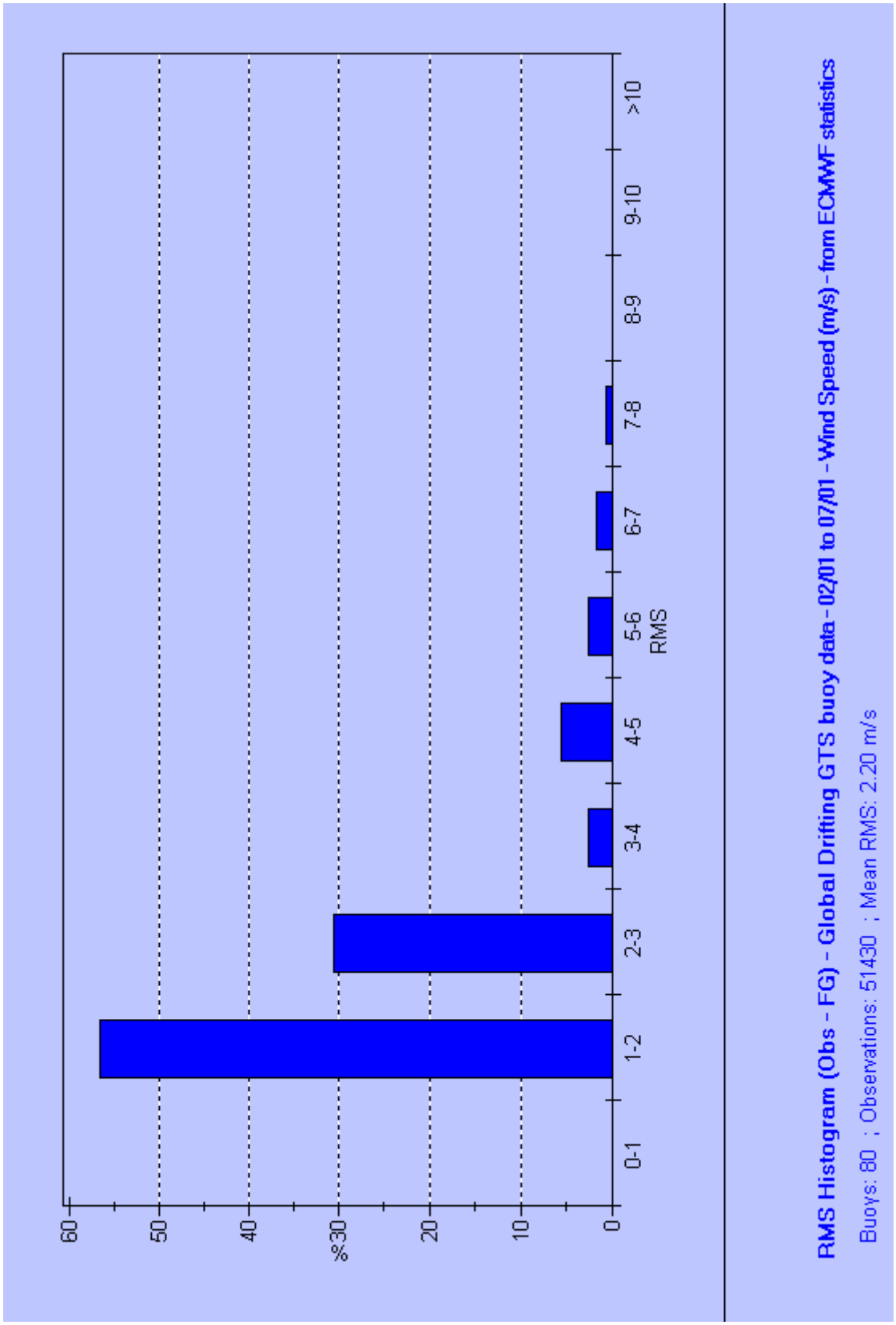
Distribution of RMS (Obs-FG) for DB air temperature data
(from ECMWF statistics)



Evolution of mean RMS (Obs-FG) per month for DB wind speed data (from ECMWF statistics)

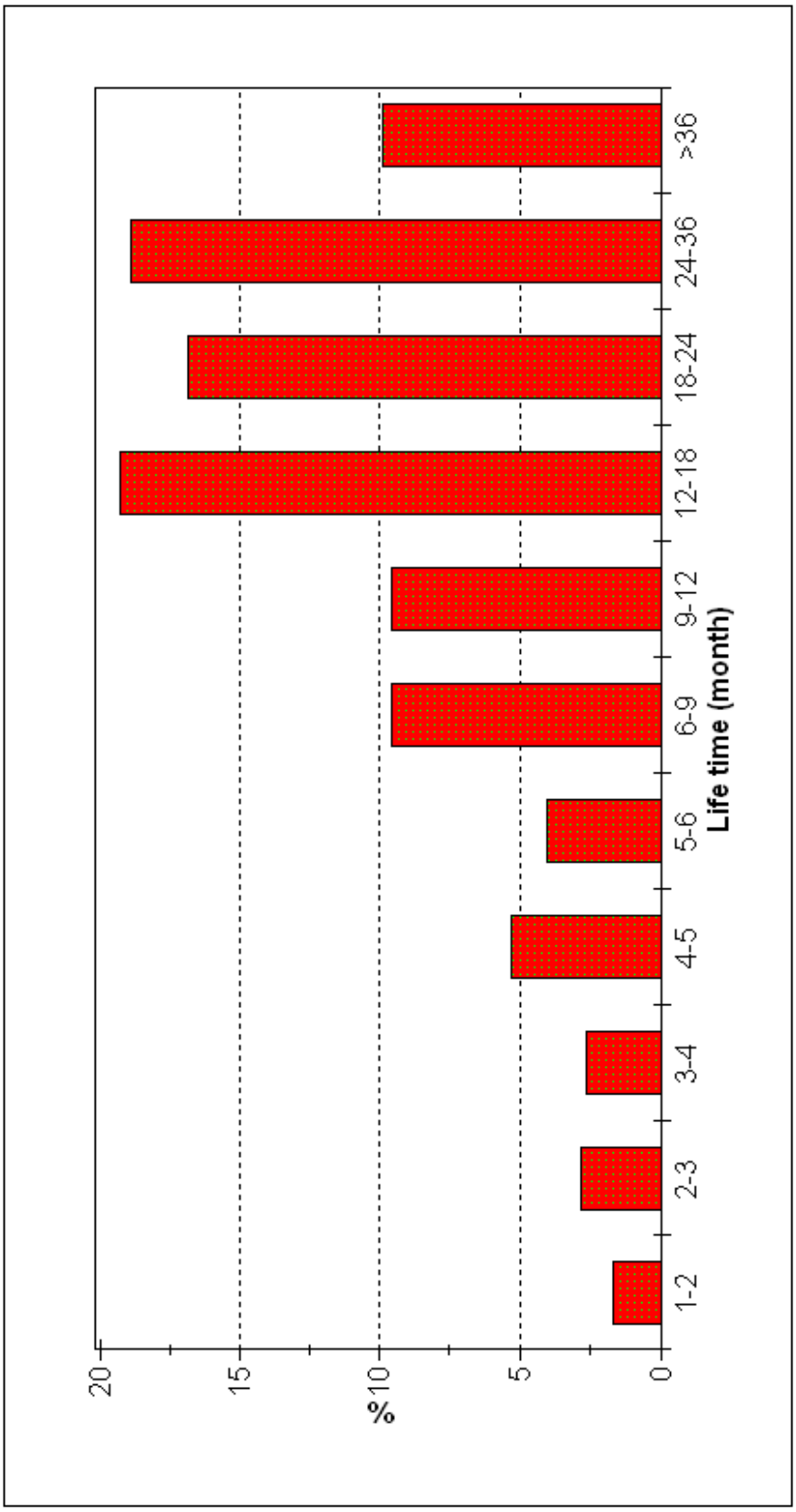


Distribution of RMS (Obs-FG) for DB wind speed data
(from ECMWF statistics)



ANNEX VII

Distribution of the life time of the air pressure sensor



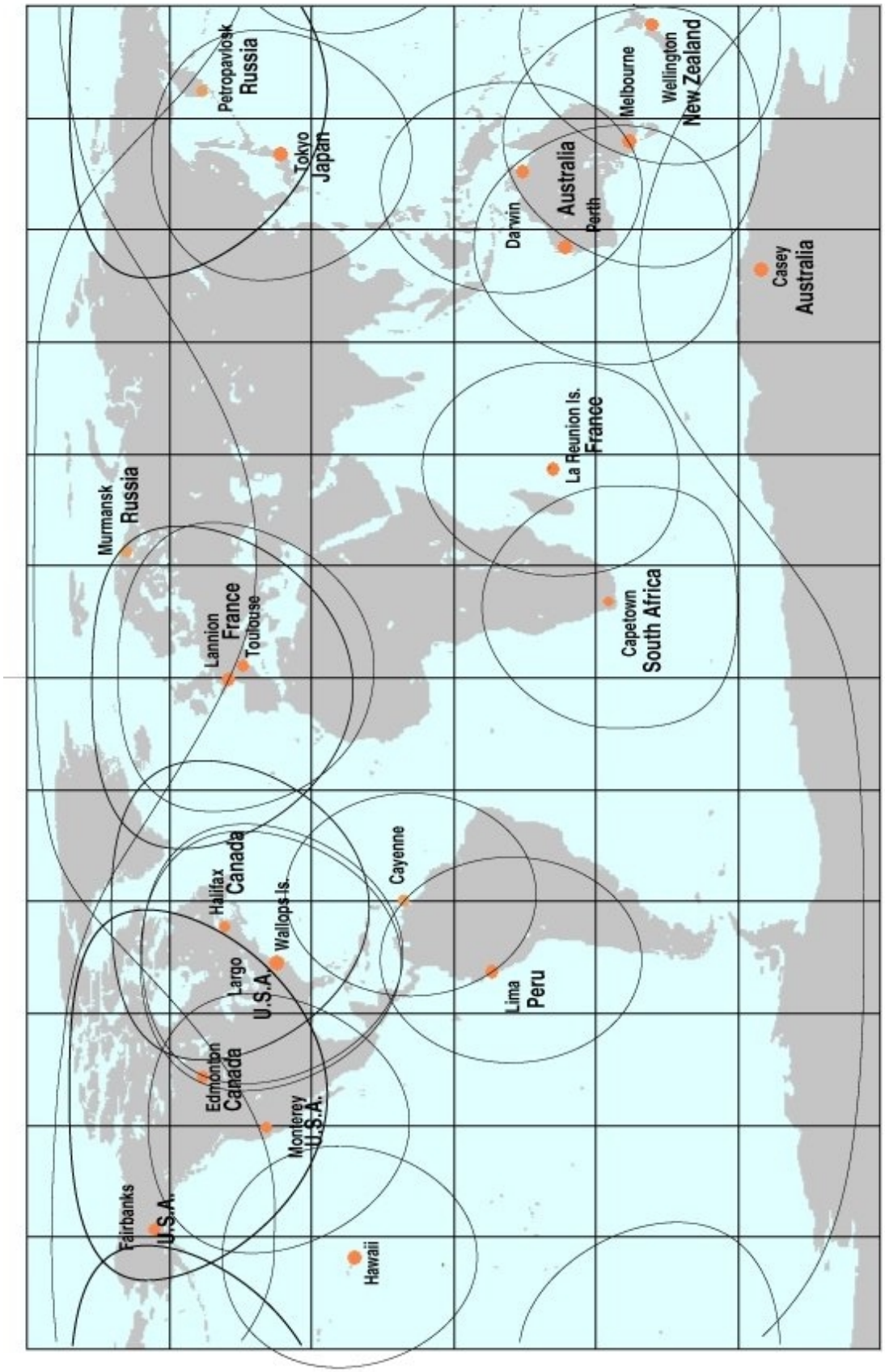
Life time distribution, Global drifting buoy Air Pressure data - 12/00 (based on ECMWFstats.)

ANNEX VIII

Argos regional receiving stations: Listing

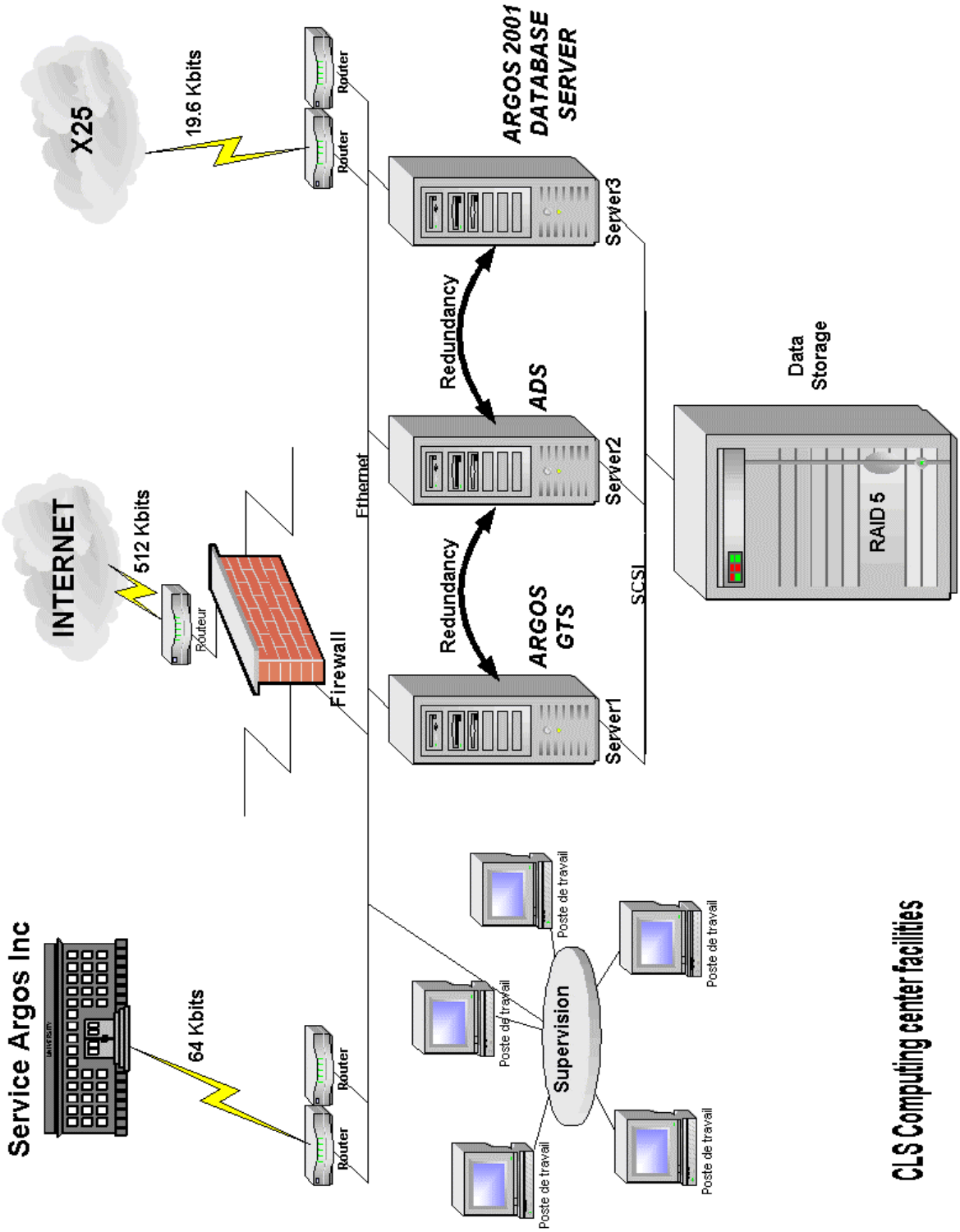
Antennas	Sigle	Country	Operator	Satellites
Buenos Aires	BA	Argentina	INTA	**N16, N15, N14, N12**
Casey	CA	Australia (Antarctica)	BOM	**N16, N15, N14, N12**
Cayenne	CY	France (Guyana)	IRD	**N16, N15, N14, N12**
Darwin	DA	Australia	BOM	**N16, N15, N14, N12**
Gilmore	GC	USA	NOAA/NESDIS	**N16, N15, N14, N12**
Halifax	HA	Canada	Can. Coast Guard	**N16, N15, N14, N12**
Ile de la Réunion	RN	France (Reunion Island)	Météo France	**N16, , N14,**
Ile de la Réunion	RE	France (Reunion Island)	IRD	**N16, N15, N14, N12**
Lannion	WE	France	Météo France	**N16, N15, N14,**
Las Palmas	LP	Canaries Island	Univ. Las Palmas	**N16, N15, N14, N12**
Melbourne	ME	Australia	BOM	**N16, N15, N14, N12**
Miami	MI	USA	NOAA/AOML	**N16, N15, N14, N12**
Hawaï	HW	USA	NOAA/NWS	**, , N14, N12**
Noumea	NO	France (New Caledonia)	IRD	**N16, , N14, N12**
Perth	PE	Australia	BOM	**N16, N15, N14, N12**
Wallops	WI	USA	NOAA/NESDIS	**N16, N15, N14, N12**
Wellington	NZ	New-Zeland	Met Office	**N16, N15, ,**
Cape Town	SA	South Africa	CLS/SAWB	**N16, N15, N14, N12**
Largo	LA	USA	SAI	**N16, N15, N14, N12**
Lima	PR	Peru	CLS perù	**N16, N15, N14, N12**
Toulouse	RV	France	CLS	**N16, N15, N14, N12**
Aussaguel	AU	France	CLS	**N16, N15, N14, N12**
Helsinki	HL	Finland	CLS	**N16, N15, N14, N12**
Murmansk	RU	Russia	Complex System	**N16, N15, N14, N12**
Petropavlosk	PT	Russia	Rybradiov	**N16, N15, N14, N12**
Tokyo	JM	Japan	Jamstec	**N16, N15, N14, N12**
Edmonton	ED	Canada	Envir. Canada	**N16, , N14, N12**
Monterey	MO	USA	NESDIS/NWS	**N16, , , N12**

Argos regional receiving stations:
Locations and footprints



ANNEX IX

Argos computer system architecture



Annex X

NATIONAL FOCAL POINTS FOR THE DBCP
(as of 5 September 2001)

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Annex XI

FINANCIAL STATEMENTS

Financial Statement by IOC
for the year 1 June 2000 to 31 May 2001

(all amounts in US $ unless otherwise specified)

BALANCE (from previous years)			**19,973**
FUNDS TRANSFERRED FROM WMO (relevant to the period)			
(15.04.2000)		118,000	**118,000**
(01.12.2000)	FF 80,000		**FF 80,000**
TOTAL RECEIPTS			**137,973**
			FF 80,000
EXPENDITURES			
Technical Co-ordinator's employment:			
Salary:		64,915	
Allowances:		22,501	
Relocation (yearly provision):		4,766	**92,182**
Technical Co-ordinator's missions:			
Paris (13-16 June 2000)		842	
Geneva (19-21 June 2000)		1,074	
Paris (10-11 July 2000)		698	
Brest (4 October 2000) [*paid for by IOC RP*]		0	
Victoria/Washington DC (16 October - 3 November 2000)		4,547	
Bergen/Tröndheim (11-12 December 2000)		1,308	
Geneva (5-7 February 2001)		1,350	
Southampton (1-2 March 2001)		1,037	
Sidney (20-22 March 2001)		1,726	
Geneva (9-10 May 2001)		1,100	
Yokohama/Tokyo (30 May - 5 June 2001)		3,450	**17,132**
Contract with CLS/Service Argos			**FF 80,000**
TOTAL EXPENDITURES			**109,314**
			FF 80,000
BALANCE (at 1 June 2001)			**28,659**

World Meteorological Organization

Data Buoy Co-operation Panel
Final Statement of Account as at 31 December 2001

	US$	US$
Balance from 1999		37,798
Contributions Paid for Current Biennium		291,909
Total Funds Available		329,707
Obligations Incurred		
Consultants	227,734	
Travel	55,281	
Bank charges	18	
Publication of Reports	12,242	
Printing Services	13,174	
ATLAS project	12,540	
Cancellation of prior years' obligations	-3,568	
		317,422
Balance of Fund	US $	12,285
Represented by.		
Cash at Bank		18,368
Unliquidated obligations		6,083
	US $	12,285

CONTRIBUTIONS	Received 2000	Received 2001	TOTAL
Australia		13,500	13,500
Canada	10,000	10,000	20,000
FAO		10,000	10,000
France	9,863	9,435	19,298
Germany	5,000	5,000	10,000
Greece	2,200	2,200	4,400
Iceland	1,500	1,500	3,000
Ireland	1,243	1,168	2,411
Japan		10,000	10,000
Netherlands	1,575	1,575	3,150
New Zealand		500	500
Norway	2,075	1,575	3,650
South Africa		3,000	3,000
United Kingdom	16,000	15,000	31,000
USA	79,000	79,000	158,000
TOTAL	128,456	163,453	291,909