ANNUAL REPORT FOR 2003

DBCP Technical Document No. 25

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION (OF UNESCO)

WORLD METEOROLOGICAL ORGANIZATION

DATA BUOY COOPERATION PANEL

ANNUAL REPORT FOR 2003

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N O T E

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FOREWORD

I am pleased to present this seventeenth Annual Report for the Data Buoy Co-operation Panel, covering the Panel's activities during 2003.

The efforts of the Panel members have been once again very significant in producing another successful year for the Panel. The work of the Panel is summarised in this Annual Report, and various key areas of the Panel's work, are highlighted to provide an overview of the Panel's achievements during the year. In particular, I would like to emphasise that under the guidance of the Panel, that the amount of quality buoy data available in a timely manner to the meteorological/oceanographic communities has continued to increase annually. The user communities now have routine access to essentially all the useful data, and can be assured that the data are quality controlled to the appropriate standards.

In my chairman's capacity, I had discussions with the Chairman of the Observations Coordination Group, in preparation for the JCOMM MAN-II meeting. It was noted that the major challenge for the DBCP is to investigate methods to facilitate an increase in buoy numbers the present numbers to approx. 1250 drifters. In order to achieve this goal, it was suggested that as an initial step, the DBCP should consider a more structured interaction between requirement-setting and implementing panels. While the OOSDP, OOPC, OceanObs99, & Ocean.US/Airlie House Report present the conceptual requirements for observations, there is a general interface issue between the OOPC and JCOMM with regard to observational requirements. In coming years, it is hoped that a more formal interaction will evolve, and possibly enable a more coherent strategy to be developed for implementation groups, such as the Panel.

As in previous years, I would like to note that the Panel's Action Groups have been quite busy during the year and have been crucial in advancing the work of the Panel into all of the world's ocean basins. These groups are very active in the intersessional periods and play a key role in the success of the DBCP as a whole. I would also 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 Brazil, and also the organiser of the Technical Workshop, Mr Eric Meindl from NDBC.

In closing, I would like to highlight the decision of the Panel to create a new vice chair position for Asia, in recognition of the growing number of countries in Asia that were now actively involved in ocean data buoy programmes and the work of the panel. At this point, I would also like to note that both myself and the vice chair for North America (Eric Meindl) are retiring from our respective positions.

From a personal perspective, I would like to express my appreciation to all those people that have helped me over the eight years of my chairmanship. I feel that the Panel has made many advances over those years, and I feel proud to have been associated with the Panel during this time. I wish the Panel, and it's office bearers, every success in the future.

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

Seventeen 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 1400, of which roughly one-half report data onto the GTS. The Internet double access (1 Mbits + 2 Mbits) increased the reliability of the main communication link used to distribute processed data to users and to retrieve data sets from receiving stations.

The significant impact of the Argos data delay was happened by the Polar-orbiting Operational Environmental Satellite (POES) reception in Lannion site, because of the limited capability to recover “blind” orbit data. This situation is not likely to change until the launch of NOAA-18 (2004) which will have a full suite of operational, digital recorders.

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. There were some development for the quality control of real-time data and its report, such as buoy monitoring statistics of BOM, and a new tool at JCOMMOPS for PMOCs.

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 309,000 BUOY reports per month and received reports from an average of 837 buoys per month, an increase of 36,000 reports from last year.

5. Technical Developments

The development for the code of BUFR report was continued during the intersessional period, cooperated with CBS Expert Team on Data Representation and Codes. BUFR encoding capability was finally implemented operationally at Service Argos in early July 2003. The Evaluation Sub-group analyzed technical issues regarding the spikes of the data in the Southern Ocean under certain high sea state conditions, and recommended a DBCP-M2-TEST format for the test and comments.

6. Communications System Status

The Argos system has continued to provide a reliable service for recovery and processing of buoy data in real or quasi real-time. Various system enhancements were

undertaken during the year and future developments are planned for the next few years. A ARGOS two-way instrument, allowing user to send message to their platforms equipped of an Argos receiver, was also reviewed at the DBCP session. Unfortunately, first satellite carrying Argos downlink capability failed in late 2003 so that capability won't be available before 2005.

7. Administrative Matters

The Panel has eight 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); and the North Pacific Data Buoy Advisory Panel (NPDBAP).

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 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 2003: 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 2004 to 31 May 2005), a total budget of US$169,262 is planned to be allocated as follows:

	US$
Technical coordinator (salary, travel, logistic support)	126,000
Travel of Chairman, Vice-chairmen & JTA chairman	15,000
JTA chairman (contract)	8,000
Publications	6,000
CLS/equipment	10,000
WMO Costs	1,500
Contingencies	2,762
TOTAL	**169,262**

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 programmes relatifs aux observations de la Commission technique mixte OMM/COI d'océanologie et de météorologie maritime (JCOMM).

1. Programmes actuels et programmes prévus

Dix-sept 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, 1.400 bouées de mesure environ ont transmis des données, dont à peu près la moitié sur le SMT. Le double accès Internet (1 Mbits + 2 Mbits) a augmenté la fiabilité du principal lien de communication utilisé pour diffuser les données traitées auprès des utilisateurs et pour récupérer les ensembles de données auprès des stations de réception.

L'important retentissement du retard des données Argos tient à la réception des signaux des satellites environnementaux opérationnels en orbite polaire (POES - Polar-orbiting Operational Environmental Satellites) au site de Lannion, qui a une capacité limitée de récupération des données "d'orbites aveugles". Cette situation n'évoluera probablement pas avant le lancement de NOAA-18 (en 2004) qui sera équipé d'un ensemble complet d'enregistreurs numériques opérationnels.

3. Qualité des données

La qualité des données relatives à la pression atmosphérique et à la température de surface 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 une confiance accrue en la qualité des données mesurées par des bouées. Un certain nombre d'innovations ont été introduites pour le contrôle de la qualité des données en temps réel et de leur transmission, comme par exemple les statistiques sur la surveillance des bouées du BOM et un nouvel outil à la disposition des PMOC (centres météorologiques ou océanographiques principaux) au JCOMMOPS.

4. Archivage des données

Le Service des données sur le milieu marin (SDMM), basé au Canada, fait depuis 1986 office 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 309.000 messages BUOY par mois provenant de 837 bouées (en moyenne mensuelle), soit 36.000 messages de plus que l'an passé.

5. Evolution technique

La mise au point du code des messages BUFR s'est poursuivie depuis la dernière session en coopération avec l'Equipe d'experts de la CSB sur la représentation des données et les codes. La capacité de codage BUFR est finalement opérationnelle à Service Argos

depuis juillet 2003. Le Sous-Groupe chargé de l'évaluation a analysé les questions techniques concernant les pics de données dans l'océan Austral dans certaines conditions de haute mer et a recommandé un format DBCP-M2-TEST pour les essais et observations.

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. Diverses améliorations lui ont été apportées durant l'année écoulée et d'autres sont prévues dans les prochaines années. Un instrument Argos bidirectionnel, permettant aux utilisateurs d'envoyer des messages à leurs plates-formes équipées d'un récepteur Argos a également été examiné lors de la session du DBCP. Malheureusement, le premier satellite transportant le dispositif Argos capable d'établir la liaison descendante est tombé en panne fin 2003 si bien que cette possibilité ne sera pas disponible avant 2005.

7. Questions administratives

Le Groupe de coopération compte huit 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) ; le Groupe de mise en oeuvre de bouées dans les océans tropicaux (TIP) ; et le Groupe consultatif pour les programmes de bouées de mesure dans le Pacifique Nord (NPDBAP).

Le Coordonnateur technique du Groupe de coordination, M. Etienne Charpentier, continue d'être employé comme expert par la Commission océanographique au titre d'un fonds de dépôt 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 2003, 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 2004 - 31 mai 2005), il est prévu d'allouer au Groupe de coopération un budget total de 169.262 dollars des Etats-Unis réparti comme suit :

	Dollars des Etats-Unis
Coordonnateur technique (rémunération, frais de voyage et soutien logistique)	126.000
Frais de voyage du Président, des Vice-Présidents et du Président du JTA	15.000
Président du JTA (contrat)	8.000
Publications	6.000
CLS/équipement	10.000
Frais de l'OMM	1.500
Dépenses imprévues	2.762
TOTAL	**169.262**

RESUMEN

Introducción

El Grupo de Cooperación sobre Boyas a la Deriva fue creado en 1985 por la Resolución 10 de la OMM (EC-XXXVII) y por la Resolución EC-XIX.7 de la COI. En 1993, los órganos rectores de la OMM y de la COI decidieron cambiar el nombre del grupo por el de Panel de Cooperación sobre Boyas de Acopio de Datos (DBCP) y modificar ligeramente su mandato, para que se ocupe también de la coordinación internacional que exijan los programas de boyas fijas en apoyo a los principales programas de la OMM y de la COI (Resolución 9 de la OMM (EC-XLV) y Resolución XVII-6 de la COI). El Panel forma parte ahora del Área de programa de observaciones de la Comisión Técnica Mixta OMM-COI sobre Oceanografía y Meteorología Marina (JCOMM).

1. Programas actuales y previstos

Diecisiete países, siete grupos de acción y dos centros de gestión de datos han presentado informes sobre las actividades que llevan a cabo en materia de recopilación de datos procedentes de boyas.

2. Flujo de datos

El número medio de boyas que transmiten datos fue de aproximadamente 1.400, de las que más o menos la mitad transmiten los datos por el SMT. Gracias al doble acceso Internet (1 Mbit + 2 Mbit), la principal vía de comunicación utilizada para proporcionar al usuario datos procesados y obtener series de datos procedentes de las estaciones receptoras ganó en fiabilidad.

Las notables repercusiones del retraso en los datos de Argos se debieron a la insuficiente capacidad para captar datos de órbitas “ciegas” que tiene la estación receptora del “Satélite operacional con órbita polar de estudio del medio ambiente” (POES) de Lannion. Esta situación no tiene visos de cambiar hasta el lanzamiento del NOAA-18 (2004), que contará con un equipo completo y funcional de grabadoras digitales.

3. Calidad de los datos

La calidad de los datos relativos a la presión atmosférica y a la temperatura de la superficie del mar fue excelente. Este resultado probablemente se puede atribuir a la aplicación de las directrices de control de calidad del Panel de Cooperación a los datos transmitidos por el SMT y al hecho de que los especialistas en predicciones meteorológicas numéricas confíen más en la calidad de los datos procedentes de boyas. Hubo algunos avances en cuanto al control de calidad de los datos en tiempo real y su notificación, por ejemplo las estadísticas de control de boyas de la BoM y el nuevo dispositivo del JCOMMOPS para los principales centros meteorológicos u oceanográficos.

4. Archivos de datos

Desde 1986, el Servicio de Datos sobre el Medio Marino (MEDS) de Canadá asume las funciones de Centro Nacional Responsable de los Datos Oceanográficos en nombre de la COI y de la OMM. Durante el último periodo entre reuniones, el MEDS ha archivado aproximadamente 309.000 informes BUOY al mes y ha recibido informes de un promedio de 837 boyas al mes, lo cual supone un aumento de 36.000 informes con respecto al año pasado.

5. Adelantos técnicos

Durante el periodo entre reuniones prosiguió la elaboración de la clave para informes en BUFR, en colaboración con el Grupo de Expertos sobre Representación de Datos y Claves de la CSB. Finalmente, a primeros de julio de 2003 quedó instalado y en funcionamiento en el Servicio Argos el dispositivo para codificar en clave BUFR. El

Subgrupo de Evaluación analizó aspectos técnicos relativos a los valores máximos que muestran los datos del Océano Austral cuando en alta mar reinan ciertas condiciones, y recomendó un formato DBCP-M2-TEST para efectuar pruebas y comentarios.

6. Situación del sistema de comunicación

El sistema Argos ha seguido facilitando servicios fiables para la recuperación y el procesamiento, en tiempo real o casi real, de los datos procedentes de boyas. Durante el año transcurrido se introdujeron varias mejoras en el sistema y se han previsto nuevos perfeccionamientos durante los próximos años. En la reunión del DBCP se examinó también un instrumento ARGOS bidireccional que permite al usuario enviar mensajes a sus plataformas dotadas de un receptor Argos. Lamentablemente, el primer satélite equipado con instrumental de enlace con Argos falló a finales de 2003, por lo que habrá que esperar al menos hasta 2005 para disponer de esa función.

7. Cuestiones administrativas

El Panel de Cooperación cuenta con ocho 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 Boyas a la Deriva (GDP), el Equipo de Ejecución de la Red de Boyas Fijas en Mares Tropicales (TIP) y el Grupo consultivo sobre datos procedentes de boyas en el Pacífico Norte (NPDBAP).

El coordinador técnico del Panel de Cooperación, Sr. Etienne Charpentier, siguió trabajando para la COI de la UNESCO, como experto financiado con cargo a fondos fiduciarios en la sede del servicio CLS/Argos en Toulouse (Francia). Además, desde enero de 1999 está desempeñando las funciones de coordinador técnico del Programa de Buques que Colaboran Ocasionalmente (SOOP).

Catorce países facilitaron voluntariamente apoyo financiero al Panel de Cooperación y/o al SOOP en 2003, a saber: Alemania, Australia, Canadá, Estados Unidos de América, Francia, Grecia, Irlanda, Islandia, Japón, Noruega, Nueva Zelandia, Países Bajos, Sudáfrica y Reino Unido.

Para el próximo ejercicio financiero del Panel de Cooperación (es decir, del 1º de junio de 2004 al 31 de mayo de 2005), se ha previsto un presupuesto total de 169.262 dólares estadounidenses distribuidos de la forma siguiente:

	dólares estadounidenses
Coordinador técnico (sueldo, viajes y apoyo logístico)	126.000
Viajes del Presidente, los vicepresidentes y el Presidente del JTA	15.000
Presidente del JTA (contrato)	8.000
Publicaciones	6.000
Equipo/CLS	10.000
Costos para la OMM	1.500
Imprevistos	2.762
TOTAL	**169.262**

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 основных программ ВМО и МОК (резолюция МОК XVII-6 и резолюция ВМО 9 (EC-XLV)). В настоящее время эта группа действует в рамках программной области «Наблюдения» 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 семнадцать стран, семь групп действий и два центра управления данными.

2. Поток данных

Данные поступают в среднем примерно с 1 400 буев, около половины которых направляют сводки данных в ГСТ. Обеспечение двойного доступа в Интернет (1 Мбит/с + 2 Мбит/с) увеличило надежность основных каналов связи, использующихся для распространения обработанных данных среди пользователей и получения данных с принимающих станций.

Задержка в получении данных Арго, имевшая значительные последствия, возникла на станции Ланнион, принимающей данные с полярноорбитального спутника оперативного наблюдения за окружающей средой (ПОЕС), в результате ограниченной способности сбора «блокированных» орбитальных данных. Эта ситуация, по-видимому, не изменится до запуска НОАА-18 (2004 г.), который будет оснащен полным набором устройств для записи оперативных цифровых данных.

3. Качество данных

Обеспечивалось прекрасное качество данных об атмосферном давлении и о температуре поверхности моря. Такой результат, вероятнее всего, достигнут благодаря соблюдению руководящих принципов контроля качества ГСБД для данных ГСТ, а также росту доверия к качеству данных с буев со стороны сообщества специалистов по прогнозированию погоды на основе цифровых данных. Наблюдался некоторый прогресс в том, что касается качества контроля и передачи данных в реальном режиме времени, например, статистика мониторинга буев метеорологической службы и новые технические средства ОКОММОРС, используемые для основных метеорологических и океанографических центров.

4. Архивация данных

Служба данных по морской среде (МЕДС) Канады выступает в качестве ОНЦОД для дрейфующих буев от имени МОК и ВМО с 1986 г. В течение последнего межсессионного периода МЕДС архивировала в среднем 309 000 сводок BUOY в месяц и получала сводки в среднем от 837 буев в месяц, что составляет увеличение на 36 000 сводок по сравнению с прошлым годом.

5. Технические мероприятия

В течение межсессионного периода продолжалась разработка кода предоставления данных BUFR в сотрудничестве с Группой экспертов КБС по форме представления данных и кодированию. Возможности кодирования в формате BUFR

были окончательно реализованы для оперативных целей службы Аргос в начале июля 2003 г. Подгруппа по оценке проанализировала технические аспекты, касающиеся пиковых значений данных по Южному океану при некоторых параметрах состояния открытого моря и рекомендовала формат DBCP-M2-TEST для соответствующих испытаний и представления замечаний.

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 рассматривался также вопрос об инструментах Аргос двустороннего действия, предоставляющих пользователям возможность направлять сообщения на свои платформы, оборудованные приемным устройством системы АРГОС. К сожалению в конце 2003 г. прекратил действовать спутник, оборудованный системой нисходящей линии связи Аргос, и соответствующие возможности появятся не ранее к 2005 г.

7. Административные вопросы

В группе имеются восемь 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); Группа по использованию заякоренных буев в тропических районах (ТИП) и Консультативная группа экспертов для данных с буев в северной части Тихого океана (КГДБСТО).

Технический координатор группы экспертов – г-н Этьенн Шарпентье, по-прежнему оказывает услуги в качестве эксперта ЮНЕСКО/МОК и размещается в КЛС/Службе Аргос в Тулузе (Франция), а его должность финансируется за счет целевого фонда. Кроме того, с января 1999 г. он дополнительно выполняет функции технического координатора Программы использования попутных судов (СООП).

В оказании финансовой поддержки этой группе и/или СООП на добровольной основе участвовали в 2003 г. четырнадцать стран: Австралия, Германия, Греция, Ирландия, Исландия, Канада, Франция, Нидерланды, Новая Зеландия, Норвегия, Соединенное Королевство, США, Южная Африка и Япония.

Общий бюджет группы экспертов на следующий финансовый год (1 июня 2004 г. – 31 мая 2005 г.) в сумме 169 262 долл. США планируется распределить следующим образом:

	долл. США
Технический координатор (заработная плата, поездки, материально-техническое снабжение)	126 000
Поездки председателя/заместителей председателя и председателя КТС	15 000
Председатель КТС (контракт)	8 000
Публикации	6 000
КЛС/Оборудование	10 000
Расходы ВМО	1 500
Непредвиденные расходы	2 762
ИТОГО	**169 262**

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 August 2003, data from a total of 1436 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 19 countries. The table below summarizes the evolution of the numbers of buoys in the last 10 years.

Year	Operational drifting buoys	On GTS	% on GTS
August 1993	1269	548	43.2%
September 1994	1246	587	47.1%
September 1995	1429	631	44.2 %
September 1996	1180	638	54.1%
September 1997	1159	581	50.1%
August 1998	1230	543	44.1%
July 1999	1270	728	57.3%
July 2000	1385	807	58.3%
July 2001	1338	763	57.0%
July 2002	919	459	49.9%
August 2003	1436	752	52.3%

Table 1 : Status of drifting buoys reporting onto GTS

A detailed breakdown by countries of "active" drifting buoys and those reporting onto the GTS is given for August 2003 in Annex IV, whereas Annex V shows the number of buoy data onto the GTS per country and sensor for August 2003.

Météo-France provided with Data Availability Index Maps on a monthly basis since February 1994 (see examples of these maps in Annex III). The maps are useful to identify the data sparse ocean area for each kind of geo-physical variable and therefore to assist the various data buoy programmes in adjusting deployment strategies. The maps show clearly the impact of the TAO array ATLAS moored buoys (wind), of DBCP regional action groups such as the ISABP (air pressure), or of specific national programmes such as MSNZ (air pressure).

2.2 Data reception

Each of the five Argos processing centers—in Toulouse, Largo, Melbourne, Tokyo, and Lima—operated without a major hitch in 2003. The two global processing centers in Toulouse and Largo continue to process data sets from all receiving stations, handling over 500 data sets per day. The regional processing centers in Melbourne, Tokyo, and Lima only process data sets from stations covering their region. Supplementary data providing global coverage are supplied by the Toulouse center or by the Largos center if necessary.

The Internet was the main communication link used to distribute processed data to users and to retrieve data sets from receiving stations. The Toulouse center has a double access (1

Mbits + 2 Mbits) which improve the reliability of our communication facilities. The same methodology is planned to apply to the Largo center in 2003.

Figure 1 shows STIP (Stored TIROS Information Processing) data set arrival times at the Toulouse and Largo processing centers. Ideally, one data set should be received every 100 minutes.

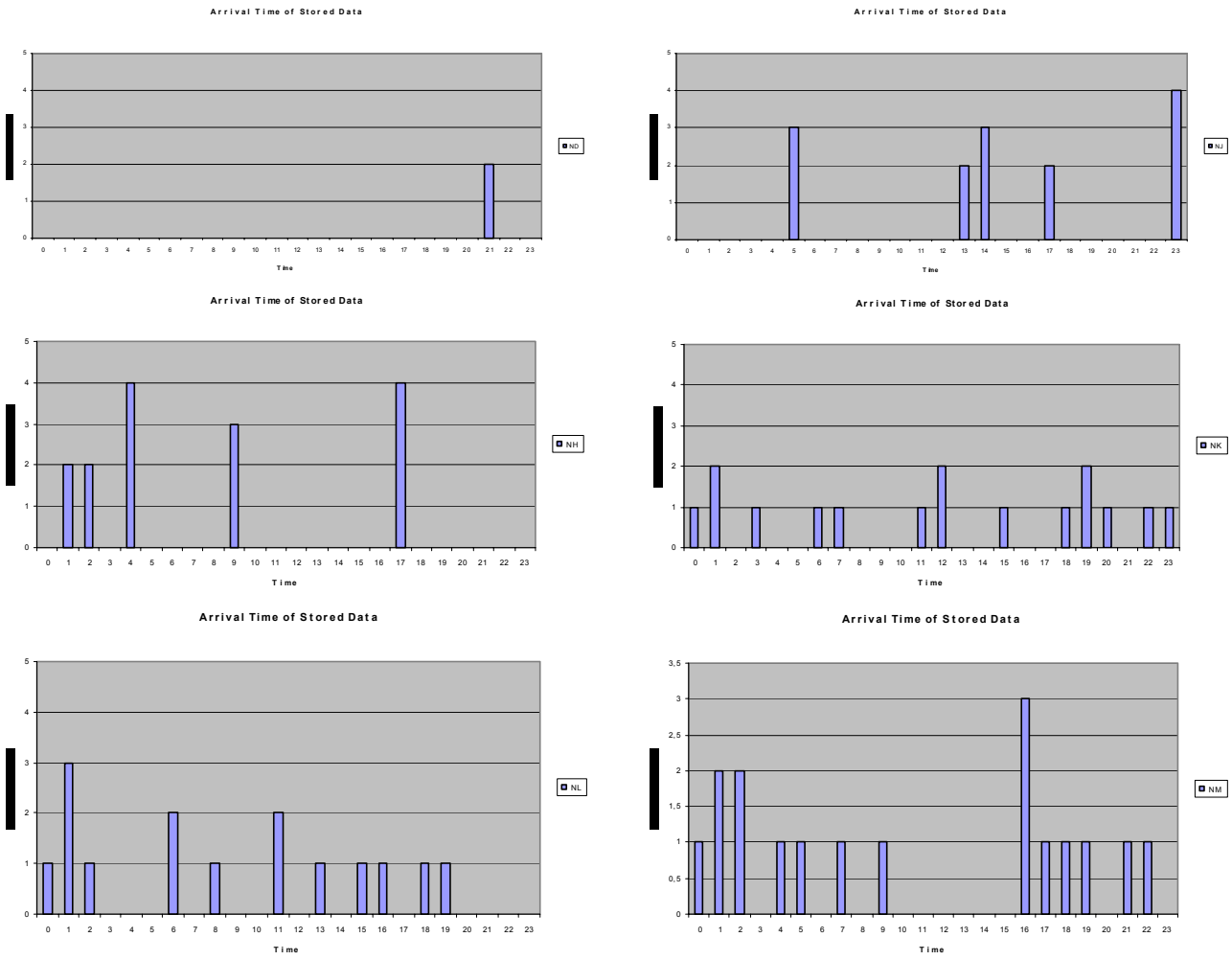

Figure 1

Table 2 shows the throughput time for delivery of results for stored data from NOAA-17, NOAA-16 and NOAA-15. 29% of the data are available within two hours while 64% of the data are available within three hours.

Satellite Delivery	NOAA-15, NOAA-16 & NOAA-17
1 h	13 %
2 h	29 %
3 h	64 %
4 h	87 %
5 h	92 %
> 5 h	100 %

Table 2: Stored data availability for satellites NOAA-15, NOAA-16 and NOAA-17

Table 3 shows the throughput time for delivery of results for stored data from NOAA-11 and NOAA-14, the two backup satellites.

Satellite Delivery	NOAA-11 & NOAA-14
1 h	01 %
2 h	12 %
3 h	32 %
4 h	56 %
5 h	66 %
> 5 h	100 %

Table 3: Stored data availability for satellites NOAA-11 and NOAA-14

Only 32 % of the data are available within three hours as opposed to 64% for the satellites NOAA-17, NOAA-16 and NOAA-15. This delay is due to the NOAA data set delivery times.

Table 4 below shows the throughput time for delivery of results for real-time data from NOAA-17, NOAA-16, NOAA-15, NOAA-14 and NOAA-12 and acquired by the 33 HRPT receiving stations. 86 % of these real-time data are available within 30 minutes. (Note that about 2/3 of the Argos data are now available in near real time.)

Satellite Delivery	NOAA-12, NOAA-14 NOAA-15 & NOAA-16
10’	4 %
15’	20 %
20’	49 %
30’	87 %
45’	97 %
60’	98 %
>60’	100 %

Table 10: Real-time data availability

The throughput time for delivery of results for real-time data includes three main delays:

- the satellite pass duration, because we have to wait for the end of the pass to transfer and process the data set;
- the time taken to transfer the data set to the global processing centers. Most transfers go over the Internet. The transfer rate is getting better and better.

- the time taken to process the data set by the global processing centers, which is not significant (less than 30 seconds).

The chairman of the Data Buoy Cooperation Panel (DBCP) sent a letter to the U.S Argos Operations Committee (OPSCOM), outlining the significant impact of the Argos data delay caused by the Polar-orbiting Operational Environmental Satellite (POES) “blind” orbits. CLS and Météo France investigated the Lannion site and confirmed that Lannion retains a limited capability to recover “blind” orbit data and is restricted to smaller data sets (Stored TIROS Information Processor [STIP]) at 2 of 3 download frequencies (1698 MHz and 1707 MHz), however, not on a 7 day, 24 hour basis. A consolidated requirement for POES “blind” orbit data was presented to NOAA/NESDIS management for decision and was approved for implementation at the Barrow site. Barrow is installing communication and equipment upgrades to become fully operational by early 2004. The “blind” orbit data requirement is subject to POES operational priorities and the availability of satellite recorder time. Currently there is limited recorder time on the operational satellites (NOAA-16 and 17) due to recorder failures and other higher priority missions. Therefore there is not sufficient recorder time for any "blind orbit" downloads anywhere (Lannion or Barrow) until some of the higher priority requirements are discontinued or the larger data sets [Local Area Coverage (LAC) or Global Area Coverage (GAC)] can be partially downloaded, thereby making available some recorder time to playback the "blind” orbit data. This situation is not likely to change until the launch of NOAA-18 (2004) which will have a full suite of operational, digital recorders.

Argos downlink capability: unfortunately, the Midori-II (ADEOS-II) satellite which was launched in December 2002, and carrying an Argos equipment including downlink capability failed in late October 2003. Such capability won't be available before launch of METOP-I which is now planned in 2005.

3. DATA QUALITY

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

During the period July 2002 to June 2003, 54 quality information messages were issued by PMOCs through the mailing list. Participating PMOCs included MSC, MSNZ, IMO, JMA, SAWS, NCEP, ECMWF, Météo France, BOM, and UKMO, the last four providing buoy monitoring statistics. The decrease in the number of messages compared to last year (119) is not alarming but most probably reflects increased confidence of NWP centres in the quality of the data. BOM began production of buoy monitoring statistics based on output from the BOM NWP model.

The DBCP technical coordinator developed a new tool at JCOMMOPS for PMOCs to report quality information regarding specific buoys via a web page. This tool is complementary to the buoy-qc mailing list. Quality information reports posted onto the web page are directly stored in the JCOMMOPS database and forwarded to the PGCs. This tool can potentially be used for VOS data, as required by OCG-1 and SOT-2, provided that the list if VOS ships is also uploaded into the database (using WMO-No. 47).

Various tools, including web based, are now available to monitor the quality of the data produced by Member States and JCOMMOPS which provide information on the quality of buoy data. These include detailed monitoring reports (e.g. UKMO semestrial) and miscellaneous web products (e.g. Météo France). Details can be found on the DBCP web site in the quality control section.

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

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 Codes

Following DBCP-17 recommendations, developments started in January 2002 and progress was reported at the 18th DBCP session. Developments continued during the last intersessional period and work was completed in April 2003. Extensive tests had been conducted between April and June 2003 with active participation from the Czech Hydrometeorological Institute (CHMI), ECMWF, Deutscher Wetterdienst (DWD), Météo France, Service Argos, JCRI, and the Technical Coordinator. Test BUFR reports and their decoded content can be downloaded from the JCOMMOPS ftp site at ftp://ftp/jcommops.org/gts/test/bufr/.

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

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

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

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

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

The version of the code tables indicated in the BUFR report is 11, i.e. the version number for the descriptors which are awaiting validation and which are described as such on the WMO web page listed above. Note that the current version of BUFR tables is 9 at this point. Similarly, the template which is used is the one that was agreed upon at the last meeting of the CBS Expert Team on Data Representation and Codes, Arusha, 17-21 February 2003.

The CBS Expert Team on Data Representation and Codes met in Arusha, 17-21 February 2003 and basically adopted the proposed modifications of the templete that would be used for GTS distribution of buoy data in BUFR (see final report of the meeting at

http://www.wmo.ch/web/www/DPS/reports/ET-DRC-Arusha-2003.doc). The adopted template is given in Annex VII. Small changes might still be required to this template so the panel asked the technical coordinator to coordinate this with panel members and to liaise with the CBS ET/DRC.

5.2 SVPB Evaluation Sub-group

During the intersessional period, the DBCP Evaluation Sub-group detected a data problem in the Southern Ocean under certain high sea state conditions. Some of the atmospheric pressure values being reported by some drifters showed spikes, which prompted their removal from GTS distribution. Sug-group noted that this pressure spiking problem was not new; the global drifter community at times in the past had experienced similar spiking problems. Since accurate pressure data were required by marine forecasters, some solution should be sought to retain good pressure values being reported by questionable buoys, while removing spiky data from GTS distribution.

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

6. COMMUNICATION SYSTEM STATUS

6.1 Argos system

6.1.1 Space segment

There are three satellites for the basic service, NOAA-15 (K), which has been operating nominally since December 1st, 1998, NOAA-16 (L), launched on March 20, 2001, and, ADEOS-2 (MIDORI-2) which was added on May 5th 2003, but failed October 25th 2003.

NOAA-17 (M), NOAA-14 (J) and NOAA-12 (D) are used as secondary satellites. Global and Regional datasets they collect are delivered according to the “multi-satellite” service characteristics.

NOAA-11 (H) is providing global datasets which are also delivered through the “multi-satellite” service. NOAA-11 is no longer delivering real-time data through the HRPT downlink since October 2001.

From Satellite status	Oct 99	Sep 2000	Mar 01	July 02	May 03	July 03
Commissioning		NOAA-16		NOAA-17	ADEOS-2	
Basic service	NOAA-15 NOAA-14	NOAA-15 NOAA-14	NOAA-16 NOAA-15	NOAA-16 NOAA-15	NOAA-16 NOAA-15	NOAA-16 NOAA-15 ADEOS-2
Multi-satellite service (additional satellites)	NOAA-11 NOAA-12	NOAA-11 NOAA-12	NOAA-14 NOAA-11 NOAA-12	NOAA-14 NOAA-11 NOAA-17 NOAA-12	NOAA-14 NOAA-11 NOAA-17 NOAA-12	NOAA-14 NOAA-11 NOAA-17 NOAA-12
Decommissioned	NOAA-9 NOAA-10	NOAA-9 NOAA-10	NOAA-9 NOAA-10	NOAA-9 NOAA-10	NOAA-9 NOAA-10	NOAA-9 NOAA-10

Table 5

6.1.2 Ground receiving stations

The two global stations able to acquire the STIP telemetry are still the Fairbanks and Wallops Island stations. The Lannion global station, which could also acquire the STIP telemetry in some conditions, is no more used since the year 2000. Despite all our efforts to convince NOAA, it seems to be difficult to restart the STIP downloads over Lannion.

The two global stations of Fairbanks and Wallops deliver the STIP telemetry from the satellites NOAA-11, NOAA-12, NOAA-14, NOAA-15, NOAA-16 and NOAA-17. As regards NOAA-12, only two orbits per day are delivered by NOAA/NESDIS. The STIP telemetry from NOAA-11 – the only type of telemetry available for this satellite – is delivered by group of three or four orbits.

Figure 3 shows the satellite orbit plans in July 2003.

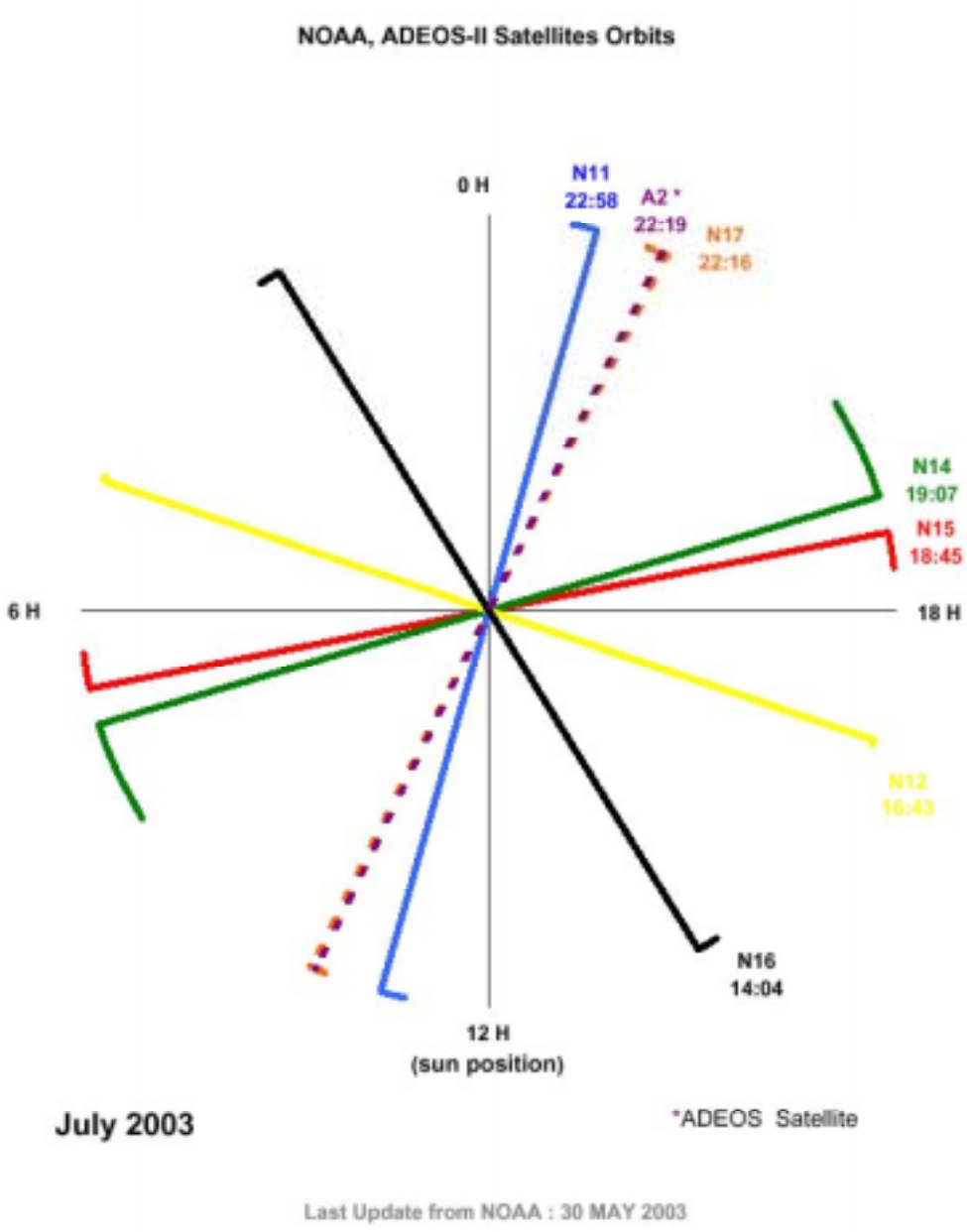

Figure 3

CLS and Service Argos Inc. pursued their efforts in 2002 to increase the number of receiving stations able to provide TIP data sets from the NOAA satellites. Five new stations joined the Argos network during the year. They are in Hatoyama (Japan, NASDA), Oslo (Norway, NMI), Las Palmas (Canaries Island, CLS), Singapore (Singapore, SMM) and Santiago (Chile, Meteo Chile). There are currently 33 stations delivering TIP data sets to CLS and Service Argos (Annex VIII). Most of them process data from NOAA-16, NOAA-17, NOAA-15, NOAA-14 and NOAA-12, so we are able to maintain good throughput times for delivery of results.

For the year 2003, Argos had some projects for antennas located in Greece, Chile and Fidji.

6.1.3 ARGOS ENHANCEMENT

The purpose of the Argos 2001 project is to upgrade the entire Argos processing system. This ambitious project is vital for the long-term continuity of the Argos system and to better serve users. 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. Our objective is to give users more versatility if they require it. Consequently we will be expected to offer them quick and efficient support.

Phase II : Improvement and development of value-added services.

Phase III : Redesign of the Argos processing system.

Phase I began end 1998 and is finished. The user management application is operational. The User Office application is operational since end of 2000. The problems of performance in the new data distribution system have been solved. The opening of the website to the users has been made in May 2003.

Phase II is being persued. Requirement specifications were reviewed and approved in January 2002. Software specifications have been finished in July 2002, and the development have commenced in December 2002. The end of the development is scheduled at end of 2003.

Phase III is started and being persued. Requirement specifications are being reviewed in July 2003. The development will commence in the fourth quarter 2003.

Argos Next: ADEOS-II satellite was successfully launched by NASDA, which is the first satellite that carries on a ARGOS two-way instrument (named ARGOS-NEXT) allowing users to send messages to their platforms equipped of an Argos receiver (called PMT- Platform Messaging Transceiver) via a specific Argos downlink.

The ARGOS/ADEOS-II DCS (ARGOS-NEXT) equipment was switched on January 29th, 2003 at 00:40 UTC and on-orbit check out tests as following were successfully completed. The ARGOS/ADEOS-II DCS (uplink) was declared operational early May, 2003.

- DRUs activation and HK verification,
- Uplink functioning and performance check out,
- Downlink functioning and performance check out,
- On board software validation.

As explained in paragraph 2.2, the Midori-II satellite failed in late October 2003.

7. ADMINISTRATIVE MATTERS

7.1 Action groups

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

7.1.1 EUROPEAN GROUP ON OCEAN STATIONS (EGOS)

EGOS was formally 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, National Institute of Ocean Technology (DoD/NIOT)
South Africa	South African Weather Bureau
USA	Global Drifter Center of NOAA/AOML, Navoceano*

The full report by IBPIO is reproduced in Annex II.

7.1.6 GLOBAL DRIFTER PROGRAMME (GDP)

The GDP was established in 1996 as the follow-up 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.

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.

7.1.8 NORTH PACIFIC DATA BUOY ADVISORY PANEL (NPDBAP)

By the request of the Data Buoy Cooperation Panel (DBCP), Canada was invited to explore the possibility of facilitating the formation of a DBCP Action Group for the North Pacific Ocean, similar to other successful groups which have been formed for other major ocean areas. The main objective of the group would be to increase the amount of operational meteorological and oceanographic data available in the North Pacific Ocean. The NPDBAP was officially accepted as an entity reporting to the DBCP and PICES at the DBCP-18 meeting held in October, 2002.

The following members and observers are participating in the Panel:

Bessmertnaya, Natasha	PICES	PICES Intern
Charpentier, Etienne	DBCP	Data Buoy Cooperation Panel (DBCP)
Cook, Yvonne	Observer	Meteorological Service of Canada (MSC)
Couture, Estelle	Member	Marine Env. Data Service, Canada (MEDS)
Freeland, Howard	Observer/Presenter	Department of Fisheries and Oceans (DFO)
Horton, Elizabeth	Member	Naval Oceanographic Office, USA (NAVO)
Lange, Owen	Observer/Presenter	Meteorological Service of Canada (MSC)
Mackas, Dave	Observer/Presenter	Department of Fisheries and Oceans (DFO)
McKinnell, Skip	PICES	Asst. Exec. Secretary, PICES
McLaren,Ron	Technical Coord.	Meteorological Service of Canada (MSC)
Moersdorf, Paul	Member	National Data Buoy Centre, USA (NDBC)
O'Donnell, Brian	Co-chair	Meteorological Service of Canada (MSC)
Watson, Dave	Observer	Meteorological Service of Canada (MSC)

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

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

7.1.9 BLACK SEA BUOY PROGRAM

The Black Sea Buoy Program (BSBP) was de-facto created in 1999 by international cooperation of countries and organizations, which have the scientific and applied interests in this region. Despite the fact that there wasn't the international official agreement to create the BSBP this body had been actually working under the cover of international BS GOOS programme and international project "Black Sea – 2001/2005". The last one was created by participants (listed below), who provided financial, technical and organizational support for BSBP.

The following organizations and institutes, participating in the programme:

USA	Department of Oceanography, Naval Postgraduate School, Naval Oceanographic Office (NAVOCEANO)
Italy	Istituto Nazionale di Oceanografia e di Geofisica Sperimentale
Ukraine	Oceanolog. Center / Marine Hydrophys. Institute (MHI) National Acad. of Science
Russia	P.P.Shirshov Institute of Oceanology Russian Academy of Science
Turkey	Institute of Marine Sciences / Middle East Technical University

The programme is open to any organizations and institutes 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 service such as communications, storage, deployments, data quality control and distribution, data archiving, data analysis and coordination.

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:

- 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;

- Eighteenth session (Trois Ilets, Martinique, France, October 2002): Australia, Bahamas, Brazil, Canada, France, India, Italy, Japan, Republic of Korea, Netherlands, New Zealand, South Africa, Ukraine, United Kingdom, USA.

- Nineteenth session (Angra dos Reis, Brazil, October 2003): Australia, Bahamas, Brazil, Canada, France, India, Italy, Japan, Republic of Korea, Malaysia, Netherlands, New Zealand, Peru, 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 IX.

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 JCOMM Ship-of-Opportunity Programme (SOOP).

7.4 Finances

Overall management of the panel's finances has continued to be undertaken by WMO during 2003, while IOC has arranged contracts for the employment of the technical coordinator as well as for his logistic support. Annex X contains financial statements as follows:

(a) Finalized IOC Statement of Account for the period 1 June 2002 to 31 May 2003;

(b) Final WMO Statement of Account as at 31 August 2003.

For the financial year 2004-2005, 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	15,000
JTA chairman (contract)	8,000
Publications	6,000
CLS/equipment	10,000
WMO Costs	1,500
Contingencies	2,762
TOTAL	**169,262**
B. Income achieved/required	
Contributions	165,550
Carry-over to next binnium	3,762
TOTAL	**169,262**

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: **ARGENTINE**

Year: 2003

CURRENT PROGRAMMES

A. Agency or programme: Instituto Nacional de Investigacion y Desarrollo Pesquero (INIDEP) - ISABP

Number and type of buoys:
(a) deployed during year: 4 drifters (SVP)
(b) operational at 31 August:
(c) reporting on GTS at 31 August:

Purpose of programme:
(a) operational
(b) met/ocean research

Main deployment areas: SW Atlantic

B. Agency or programme: Servicio de Hidrografia Naval (SHN) - ISABP

Number and type of buoys:
(a) deployed during year: 4 drifters (SVP)
(b) operational at 31 August: 4
(c) reporting on GTS at 31 August: 4

Purpose of programme:
(a) operational
(b) met/ocean research

Main deployment areas: SW Atlantic

PLANNED PROGRAMMES

A. Agency or programme: Instituto Nacional de Investigacion y Desarrollo Pesquero (INIDEP) - ISABP

Number and type of buoys planned for deployment in next 12 months: 4 drifters (SVP)

Purpose of programme:
(a) operational
(b) met/ocean research

Main deployment areas: SW Atlantic

B. Agency or programme: Servicio de Hidrografla Naval (SHN) - ISABP

Number and type of buoys planned for deployment in next 12 months: 4 drifters (SVP)

Purpose of programme: (a) operational
(b) met/ocean research

Main deployment areas: SW Atlantic

Country: **Australia**

Year: 2002/2003 (covering the period: 1 July 2002 – 30 June 2003)

CURRENT PROGRAMMES

A. Agency or programme: Commonwealth Bureau of Meteorology

Number and type of buoys:
(a) deployed during year:
2 x FGGE, 2 x FGGE-W, 15 SVP-B.

(b) operational at 31 August: 25

(c) reporting on GTS at 31 August: 25

Purpose of programme: To support the BoM's operational forecasting and warning service.

Main deployment areas: Southern and Indian Oceans.

B. Agency or programme: Global Drifter Program

Number and type of buoys:
(a) deployed during year:
8 x SVP-B (barometer upgrades by BoM), 4 x SVP.

(b) operational at 31 August: 25

(c) reporting on GTS at 31 August: 25

Purpose of programme: To support the Global Drifter Program in the Indian Ocean, and the BoM's operational forecasting and warning service.

Main deployment areas: Indian Ocean

PLANNED PROGRAMMES

A. Agency or programme: Commonwealth Bureau of Meteorology

Number and type of buoys planned for deployment in next 12 months:
1 x FGGE, 3 x FGGE-W, 12 x SVP-B

Purpose of programme: To support the BoM's operational forecasting and warning service.

Main deployment areas: Southern and Indian Oceans

B. Agency or programme: Global Drifter Program

Number and type of buoys planned for deployment in next 12 months:
8 x SVP-B (BoM sponsored barometer upgrades). These are located at La Reunion, and will be deployed with the assistance of Meteo France and Ifremer. The BoM could also assist with the cooperative deployment of up to another eight SVP-B and SVP for AOML/GDC.

Purpose of programme: To support the Global Drifter Program in the Indian Ocean, and the BoM's operational forecasting and warning service.

Main deployment areas: Southern and Indian Oceans

SPECIAL COMMENTS (if any)

BoM FGGE buoy 56535 (PTT 2939) was deployed near Heard Island on 17 March 1997 and failed on 17 May 2003, a total of 2252 days of reliable operation. The buoy circumnavigated the Southern Hemisphere before beaching on Rodriguez Island on 20 September 2002.

Country: **BRAZIL**

Year: 2003

CURRENT PROGRAMMES

A. **Agency or programme**: Programa Nacional de Bóias (PNBOIA)

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

(b) operational at 31 August: 3, 1 moored and 2 drifters

(c) reporting on GTS at 31 August: 3

Purpose of programme: (a) operational: Forecast

(b) met/ocean research: In Universities

(c) developmental:

Main deployment areas: South Atlantic

B. **Agency or programme:** PNBOIA
(as above, repeat as often as necessary)

PLANNED PROGRAMMES

A. **Agency or programme:** PNBOIA

Number and type of buoys planned for deployment in next 12 months: 1 moored and 5 drifters

Purpose of programme: (a) operational: Forecast

(b) met/ocean research: In Universities

(c) developmental:

Main deployment areas:

B. **Agency or programme:** PNBOIA
(as above, repeat as often as necessary)

TECHNICAL DEVELOPMENTS

(a) Buoy design: none

(b) Instrumentation: none

(c) Others: none

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

http://www.dhn.mar.mil.br/

http://www.dsr.inpe.br/pnboia/pnboia.html

SPECIAL COMMENTS (if any)

(a) Quality of buoy data: none

(b) Communications: none

(c) Buoy lifetimes: none

(d) Others: Due to severe budgetary constrains in Brazil, the PNBOIA reduced the number of planned deployments.

Country: **CANADA**

YEAR: 2002/2003 (Sept. 1/02 - Aug. 31/03)

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 • 14 SVP/B drifters in support of North Pacific Data Buoy Panel • 6 SVP/B Deployed by VOS
b) Operational (31/08/03):	• 3 moored six meter NOMAD buoys • 13 moored three meter Discus buoys • 1 developmental three meter Discus buoy • 25 drifters
c) Reporting on GTS (31/08/03):	• 16 moored buoys • 25 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:	• 2 moored buoys deployed in Great Slave Lake July 2003 (seasonal: deployed July, retrieved late September) • 3 moored buoys deployed in Lake Winnipeg June 2003 (seasonal: deployed May or June, retrieved late September or October) • 1 moored buoy deployed southwestern Hudson Bay August 2003 (seasonal: deployed July or August, retrieved late September or October) • 2 drifting buoys deployed on ice Arctic Basin April 2003 via Twin otter landing on ice. Done for U.S. IABP agencies by MSC as a Participant of the International Arctic Buoy Programme (IABP) • 1 drifting buoy provided for IABP August 2003 air deployment as done by U.S. Naval Oceanographic Office.
b) Operational (31/08/03):	• 5 inland lakes moored buoys • 1 Hudson Bay moored buoy • 3 Arctic Basin on ice drifting buoys
c) Reporting on GTS (31/08/03):	• 5 inland lakes moored buoys • 1 Hudson Bay moored buoy • 3 Arctic Basin drifting buoys
Main deployment areas:	• Great Slave Lake (seasonal) • Lake Winnipeg (seasonal) • Hudson Bay (near Churchill) • Arctic Basin west of the Canadian Arctic Islands

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

Number and type of buoys:

a) Deployed during year:	• 13 CALIBs, 1 having pressure sensor
b) Operational (31/08/03):	• None
c) Reporting on GTS (31/08/03):	• None
Main deployment area:	• 1- West Baffin Bay: to monitor southern motion of old ice. • 8- Gulf St-Lawrence: to validate sea ice drift model. • 2- Labrador Coast: to validate sea ice drift model. • 2- East Newfoundland/Labrador water: to validate iceberg drift model.

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

Number and type of buoys:

a) Deployed during year:	• One 3-Meter Discus • One – TRYAXIS Waverider
b) Operational (31/08/03):	• Nine 6 meter moored NOMAD buoys • One 3- Meter Discus buoy
c) Reporting on GTS (31/08/03):	• Four six metre NOMADS • One 3-Meter Discus
Main deployment area:	• North West Atlantic • Northumberland Strait

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

a) Deployed during year:	• 5 three meter buoys • 2 twelve meter buoys • 6 lightweight WatchKeeper buoys • 2 Watchkeepers deployed in Lake Ontario for research purposes. 45159 / 45160.
b) Operational (31/08/03):	• 15 buoys
c) Reporting on GTS (31/08/03):	• all
Main deployment area:	• Great Lakes • Large Lakes and bodies of water other than the Great Lakes. Two research buoys participating in the High Resolution Wind Project for the western basin of Lake Ontario.

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

Number and type of buoys:

a) Deployed during year:	• 1 moored 3-meter discus buoy
b) Operational (31/08/03):	• 1 buoy
c) Reporting on GTS (31/08/03):	• 1
Main deployment area:	• Gulf of St. Lawrence

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

Purposes of the 2003 program:

Programs will continue on the pack ice of the Labrador Shelf and Gulf of St. Lawrence using beacons measuring drift, pressure, stress, convergence/divergence and wind profiles to validate and provide inputs to operational ice forecasting models. Data will be provided to the Canadian Ice Centre for forecasting and to the Canadian Coast Guard to support icebreaking. GPS beacons will be used to empirically indicate and validate models of transport pathways for salmon aquaculture sites in the Bay of Fundy, and to improve Search-and-Rescue efficiency. Directional wave rider buoy data will provide input to high resolution coupled atmosphere-ocean-wave model to predict the impact of climate change on the frequency and intensity of storms which can affect activities in the Atlantic Canada offshore.

Number and type of buoys:

a) Deployed during year:	• 10 GPS surface beacons • 6 Argos surface drifters • 1 Directional Wave Rider (May-November)
c) Operational (31/08/03):	• 8
c) Reporting on GTS (31/08/03):	• 0
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 • 1 TOGA WSD drifter. • 6-12 SVP/B drifters in Support of North Pacific Data Buoy Advisory Panel. (NPDBAP) • 2 SVP/BW wind speed and direction drifters. • Up to 10 Barometer upgrades in co-operation with Global Drifter Program and NPDBAP.
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 between 160 & 170 degrees west and 41 to 52 degrees north.

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

a) Operational:	• Great Slave Lake: 1 to 2 buoys • Lake Winnipeg: 3 buoys • Hudson Bay: 1 buoy • IABP Arctic Basin: 3 to 5 buoys depending on "holes" in buoy array, deployment opportunities, partnerships with other IABP participants
b) Developmental:	• Nil
c) Met/Ocean research:	• IABP: endeavor to have oceanographic temperature/salinity profiles done at sites where buoys are deployed via Twin Otter landing on ice.
Deployment area:	• Great Slave Lake, Lake Winnipeg, Hudson Bay • Arctic Basin west of the Canadian Arctic Islands

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

a)	• 1 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)	• Nil
c)	• 4-6 CALIBs for model verification off Labrador coast. • 2 CALIBs to be deployed on iceberg for model verification. • 9 CALIPs to be used for CASES project.

Deployment area:	• Eastern & Western Arctic. Newfoundland & Labrador waters.

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

a) Operational:	• Seasonable Deployment and retrieval of Discus and TRYAXIS • Buoys in support of the New Brunswick Sea Level Rise Project. • Deployment of two Wotan drifting buoys
b) Developmental:	• None
c) Met/Ocean research:	• Nil
Deployment area:	• North West Atlantic

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

a) Operational:	• Nil
b) Developmental:	• Nil
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. • One 12 Metre buoy is to be used as a testing / standards platform.
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:	• Nil
b) Developmental:	• Nil
c) Met/Ocean research:	• Nil
Deployment area:	• Nil

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 provide wave data for high resolution coupled atmosphere-ocean-wave model.

a) Operational:	• Nil
b) Developmental:	• Nil
c) Met/Ocean research:	• 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. • Directional Wave Rider deployed May-Nov., Lunenburg Bay Project (with Dalhousie University and Environment Canada).
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:**	• Installation of inerting systems in NOMAD buoys to displace explosive gasses if present. • Miscellaneous tower modifications to improve strength and servicing capabilities.
b) **Instrumentation**:	• Ultrasonic anemometer continues on test at three operational buoy stations. • Installation of backup ARGOS transmitters on operational buoy stations. Program to be completed by 2005. • Optical sensors for biological monitoring installed on the developmental buoy and one operational buoy station. • High Accuracy Water Temperature system (HATS) on test at the developmental buoy and one operational buoy station. • High Data Rate GOES transmitter operating at 300 baud on test at the developmental buoy and HDR's installed and operating at 100 baud at eleven operational buoy stations. Program to be completed by 2005.

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

a) **Buoy design**:	• Assemble buoys in house for on ice deployment
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 northwest 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:**	• Modification of rail design of buoys to include a safety slider rail • Modification and testing of a self locking mechanism for after mast raising and lowering.
b) **Instrumentation**:	• Nil.

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

a) **Buoy design:**	• Locking mechanisms to be installed on 3 Metre hatch dogs. • 12 Metre Buoy 45135 has safety ladder installed. • Bird deterrence wires installed. • Safety working hooks installed on all Watchkeeper buoys. • External grounding (tower to mooring) cables installed on all WATCHKEEPER buoys.
b) **Instrumentation**:	• All buoyshave High Data Rate transmitters installed.

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

a) **Buoy design:**	• Nil
b) **Instrumentation**:	• Nil

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

a) **Buoy design:**	• Nil
b) **Instrumentation** :	• Nil

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)
- North Pacific Data Buoy Advisory Panel web page: **http://npdbap.noaa.gov/**

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,
- Annual Meteorological Service of Canada Participant Report for IABP available on IABP web site **http://iabp.apl.washington.edu** as part of the annual IABP meeting report.

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 91% of all possible moored buoy data delivered to users.
c) **Buoy Lifetimes:**	• Moored buoys - 4 years • Drifting buoys - Over 1-2 years
d) **Other.**	• Nil

B CANADA - **Prairie and Northern Region**

a) Quality of buoy data:	• Inland lakes: Good. • IABP: Good. Unreliable data is not put on GTS.
b) Communication:	• Inland Lakes and Hudson Bay - via GOES satellite • Arctic Basin: data acquired from polar orbiting NOAA series weather satellites and processed/ put onto GTS either in-house at Meteorological Service of Canada's Local users terminal in Edmonton **or** by Service Argos.
c) Buoy Lifetimes:	• Inland lakes and Hudson Bay: seasonal moored buoys have up to 3 years between battery changes. • On ice IABP: generally 2 to 3 years as long ice on which resides survives.
d) Other.	• Nil

C CANADA - **Canadian Ice Service**

a) **Quality of buoy data:**	• Good and reliable. Encountered problem with 3 CALIBs; 2 did not send any signal after deployment (one of them also had GPS antenna). The third one malfunctioned while being tested at Metocean's shop in Halifax just prior to shipment.
b) **Communication:**	• Good and reliable.
c) **Buoy Lifetimes:**	• Up to 4 months for Alkaline batteries, up to 1 year for Lithium batteries.
d) **Other:**	• Most LAB coast CALIB deployments provided good results. • Gulf experiment done in 2 different missions. • 2 beacons dropped on icebergs; both targets were hit…but one iceberg remained grounded and never provided any drift track data.

D CANADA - **Atlantic Region**

a) **Quality of buoy data:**	• Good
b) **Communication:**	• GOES transmitters being updated
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:**	• New Watchkeeper grounding is working well.

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 201 – 401 Burrard Street
Vancouver, B.C.
V6C 3S5
Attn : Ron McLaren

phone : 604-664-9188 fax : 604-713-9541 Email: ron.mclaren@ec.gc.ca

B CANADA **- Prairie and Northern Region**

Prairie Aviation and 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 Email:
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: Randy Sheppard

Office: Phone: 902-426-6703 Fax: 902 426-1595 Email:
Randy.Sheppard@ec.gc.ca
Work Shop: Phone: 902-426-6616, Fax: 902 426-6404 Cell: 902-456-6927

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
phone : 514-283-1644 fax : 514-496-1867 Email : erich.gola@ec.gc.ca

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

Department of Fisheries and Oceans
Ocean Circulation
P.O. Box 1006
Dartmouth, N.S.
B2Y 4A2
Attn : Robert J. Anderson

Phone : 902-426-3584 Fax : 902 426-7827
Email : andersonr@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: **CHILE**

Year: 2003

CURRENT PROGRAMMES

A. Agency or programme: Environmental Studies Section
Department of Oceanography
SERVICIO HIDROGRAFICO Y OCEANOGRAFICO
DE LA ARMADA DE CHILE (SHOA)

Number and type of buoys: 1 TRIAXYS BUOY (directional wave measurements)

(a) deployed during year: April, 1999

(b) operational at 31 August: YES

(c) reporting on GTS at 31 August: NO

Purpose of programme: to measure ocean surface waves, winds and other oceanographic parameters with a coastal buoy along the Chilean coast. In extreme situations, the buoy can run out of the deployment area, making it necessary to use the ARGOS system to track and follow the position of the buoy in the open ocean.

(a) operational: YES

(b) met/ocean research: YES

(c) developmetal: NO

Main deployment areas: Valparaiso. Latitude 33° 02' S Longitude 71° 38' W

PLANNED PROGRAMMES

A. Agency or programme: Environmental Studies Section
Department of Oceanpgraphy,
SERVICIO HIDROGRAFICO Y OCEANPGRAFICO
DE LA ARMADA DE CHILE (SHOA)

Number and type of buoys planned for deployment in next 12 months:
1 Watchkeeper Monitoring Buoy at Valparaiso on Jan/Feb 2004

Purpose of programme: to measure ocean surface waves, winds and other oceanographic parameters with a coastal buoy along the Chilean coast. In extreme situations, the buoy can run out of the deployment area, making it necessary to

use the ARGOS system to track and follow the position of the buoy in the open ocean.

(a) operational: YES

(b) met/ocean research: YES

(c) developmetal: NO

Main deployment areas: at Valparaiso area. The Triaxy buoy will be placed at another site along the Chilean coast

TECHNICAL DEVELOPMENT

(a) Buoy Design:
(b) Instrumentation:
(c) Others: Improve and re-design of the mooring line, obtain a better protection against fishermen and others

TECHNICAL DEVELOPMENT

Periodic data reports for different institutions in Chile

SPECIAL COMMENT

(a) Quality of Buoy data:

Good quality of the data. The time series of different parameters (Hs, Tpeak, Direction, etc.) show the natural behavior of the wave field in the bay with a good agreement with independent measurements

(b) Communications:

Almost an 80% of the data is received in real time in our facilities. The fraction lost during the operational functioning is recovered later during the periodic maintenance.

(c) Buoy lifetimes:

It is expected a lifetime over 10 years. Since the buoy is build with resistant and low cost components, the maintenance is very easy and we obtain good results replacing or repairing them.

Country: **ECUADOR**

Year: 2003

CURRENT PROGRAMMES

A. Agency or programme: INSTITUTO OCEANOGRAFICO DE LA ARMADA

Number and type of buoys: (a) deployed during year: September 2002 (2 buoys)

(b) operational at 31 August: NO

(c) reporting on GTS at 31 August:

Purpose of programme: (a) operational:

(b) met/ocean research: Monitoring and Diffusion for early alert about anomalous oceanic events in Ecuadorian seas by the use of automated coastal and oceanic sensors, that let us to make correlation analysis and determine their influence on productive and social activities on the region.

(c) developmental:

Main deployment areas: The firth buoy is in the 2° 00.12' S and 84° 00.4' W and the second buoy 1° 37.78' S and 88° 55.73' W

B. Agency or programme:

INSTITUTO OCEANOGRAFICO DE LA ARMADA

Country: **FRANCE**

Year: **1 September 2002 - 31 August 2003**

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

PROGRAMMES

A. METEO-FRANCE

Number and type of buoys :

(a) 24 drifting buoys owned by Meteo-France were deployed in last 12 months :
- -18 SVP-B barometer drifters ;
- -2 SVP-BW drifters (wind measurements thanks to the WOTAN acoustic method)
- -2 SVP-BS drifters (salinity measurements)
- -2 Marisonde NG (FGGE type buoys with 300 m long thermistor chain

In addition, Meteo-France operates 4 moored buoy stations (plus two others in co-operation with UKMO), three omni-directional waveriders and two automated stations put aboard aid-to-navigation buoys ;

(b) 29 buoys were operational at 31 August 2003 ;

(c) 29 buoys were reporting on GTS at 31 August 2003.

Purposes of programme :

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

(b) Research : to provide scientists with in-situ observations close to the air-sea interface ;

(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 four ocean weather stations (two in West Indies and two 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 and the two automated stations put aboard aid-to-navigation buoys will be also maintained.

Other Meteo-France activities in the frame of the DBCP are described further (see paragraphs on technical developments and special comments).

B. LODYC (CARIOCA programme)

Number and type of buoys :

(a) 2 CARIOCA-II buoys were deployed south of Tasmania in last 12 months ;
(b) One was operational at 31 August ;
(c) One was reporting on GTS at 31 August.

Purposes of programmes :

(a) Research : to understand, quantify and monitor the CO2 fluxes exchanged at the air-sea interface ;
(c) Technical : to develop a buoy able to measure CO_2 concentrations at the ocean-atmosphere interface and to measure the distribution of carbon compounds at the ocean surface. Such buoys will be used in the frame of GOOS.

Web site : *http://www.lodyc.jussieu.fr/carioca/home.html*

Deployment areas :

Tropical Atlantic ;
Southern Ocean.

Plans :

Two new buoys will be deployed in the next 12 months in the Southern Ocean (Pacific sector).

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

C1. Wave measurement network

Number and type of buoys :

(a) CETMEF operates a network of 11 scalar buoys and 4 directional buoys (DATAWELL). In addition, CETMEF implemented wave measurement systems on two Aid-to-Navigation moored buoys. CETMEF also manage the real-time data for two directional Triaxys wave buoys owned by two French universities (Bordeaux and Pau) ;
(b) 15 buoys were operational at 31 August ;
(c) 8 were 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 plans to complete it with one new directional wave buoy. Real time data are available on the Internet at *http://www.cetmef.equipement.gouv.fr/donnees/candhis/* and on the GTS thanks to Meteo-France.

C2. MAREL network

Number and type of buoys :

(a) CETMEF operates a network of two MAREL buoys
(b) One buoy were operational at 31 August ;
(c) 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 ;
Web site : *http://www.ifremer.fr/marel/en/index.html*

Deployment area :

Bay of Seine

Plans for the next 12 months :

CETMEF will continue to maintain two buoys in next 12 months. One buoy will be moored back within a few weeks.

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

Number and type of buoys :

(a) IRD operates a network of 5 Atlas buoys in the tropical Atlantic in co-operation with NOAA/PMEL ;
(b) 5 Atlas buoys were operational at 31 August ;
(c) 5 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 oceanographic and meteorological observations in real time to Weather Forecast Centres as well as to ocean global circulation modes (e.g. MERCATOR);
(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.

Web site : *http://www.brest.ird.fr/pirata/piratafr.html*

Deployment area :

Tropical Atlantic Ocean

Plans for the next 12 months :

IRD will continue to maintain five stations. The next servicing cruise is planned in February 2004..

E. IUEM (European Institute for Marine Studies, UBO) :

Number and type of buoys :

(a) The MAREL-Iroise project results from a IUEM-IFREMER-INSU collaboration ; the buoy is operational since July 2000; a PCO2 sensor

adapted from the CARIOCA system is implemented on the buoy since March 2003

(b) The buoy was operational at 31 August

(c) It was not reporting on GTS at 31 August.

Purposes of programme :

The main aim of the IUEM observatory is to describe and understand the relative impact of climatic and anthropogenic strains on the coastal ecosystem "Bay of Brest-Iroise Sea"

Web site : *http://www.ifremer.fr/mareliroise*

Deployment area :

French coast

Plans for the next 12 months :

IUEM will continue to maintain the MAREL Iroise buoy and qualify the PCO2 sensor.

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

Number and type of buoys :

(a) 15 Surdrift buoys (lagrangian drifters drogued between 15 m and 75 m depth) were deployed in last 12 months ;

(b) Zero buoy was operational at 31 August ;

(c) None 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 :

50 Surdrift buoys will be deployed in the next 12 months ;

Data will be reported on the GTS for some of them.

TECHNICAL DEVELOPMENTS

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. Two SVP-BW drifters reporting sound energy spectra were deployed in the vicinity of moored buoys in last 12 months. Wind data from the moored buoys have been used to check and improve the wind speed algorithm implemented in the drifters.

(iii) The evaluation of new SVP-B drifters fitted with a conductivity sensor is going on (co-operation between Meteo-France and LODYC). Two buoys, ordered to Metocean, were tested in the next 12 months.

(iv) The project of CO_2 concentration measurements from drifting buoys, managed by LODYC is continuing (see *http://www.lodyc.jussieu.fr/carioca/home.html*).

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

Blouch, P., Rolland, J., Evaluation of the WOTAN technique on two SVP-BW drifters deployed near moored buoys, Presentation at the 2002' DBCP Workshop, Trois Ilets, Martinique, DBCP technical document n°22, 2003.

Gonzalez Davila, M., Santana-Casiano, J.M., Merlivat.,L., and E.V.Dafner .,Fluxes of CO2 between the atmosphere and ocean during POMME Project in the North-East Atlantic Ocean, submitted to *Deep Sea Research*, in review, 2003.

Memery L., Levy M., Verant S., and L. Merlivat, The relevant time scales in estimating the air-sea CO2 exchange in a mid latitude region, *Deep Sea Research II*, 49, 2067-2092, 2002.

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).

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.meteo.shom.fr/qctools*) to help buoy operators to check their buoys : monthly statistics carried out by 4 meteorological centers for individual buoys ; plots of data and differences with model outputs ; blacklists of buoys reporting dubious air pressure values or being perhaps ashore can be seen.

(b) Buoy data

(i) The Centre de Meteorologie Marine of Meteo-France report the wave data collected by CETMEF in real time onto the GTS. Developments are in progress to built FM-65 WAVEOB reports containing wave spectra in addition to the present FM-18 BUOY reports which contain wave height and period only.

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

(c) Other activities

For the eighth consecutive year, Meteo-France funded 10 barometers to be added to SVP drifters deployed in the Tropical Indian Ocean, each year in November. Five other upgrades were funded in 2003 . These drifters are devoted to the Southern Ocean, south of 40°S in the Indian Ocean, as a principle. These actions will be renewed in 2004 .

Country : **India**

Year: 1st September 2002 to 31st August 2003

CURRENT PROGRAMMES

A. Agency or programme: National Data Buoy Programme
National Institute of Ocean Technology
Department of Ocean Development, Government of India

Number and type of buoys: (a) deployed during year: 08

(b) operational at 31 August: 13

(c) reporting on GTS at 31 August: 10

Purpose of programme: (a) operational: √

(b) met/ocean research: √

(c) developmental: √

Main deployment areas: Bay of Bengal and Arabian Sea

PLANNED PROGRAMMES

A. Agency or programme: National Data Buoy Programme
National Institute of Ocean Technology
Department of Ocean Development, Government of India

Number and type of buoys planned for deployment in next 12 months: To up keep buoy network to 20

Purpose of programme: (a) operational: √

(b) met/ocean research: √

(c) developmental: √

Main deployment areas: Bay of Bengal and Arabian Sea

TECHNICAL DEVELOPMENTS

(a) Buoy design: New design emerging

(b) Instrumentation: Integration of FSI current meter with the Data acquisition system for real-time data out flow

(c) Others: Established INSAT satellite data communication

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

1. K. Premkumar, OCT-2002: Real Time Data Communication Through Indian Satellites For Buoys Operating In Indian Ocean Region And The Expansion Of Indian Moored Buoy Network, Proceedings of DBCP 2002.

2. K. Premkumar, DEC-2002: Ocean Observing System (OOS) - Insitu Platforms In India**,** Proceedings of ICONS 2002. International Conference on Sonar – Sensors and Systems at NPOL, Cochin, India.

SPECIAL COMMENTS (if any)

(a) Quality of buoy data: Good

(b) Communications: Good

(c) Buoy lifetimes: Unable to decide, as frequent damages to data buoys due to act of vandalism. However the mechanical system can be of 5 years, Electronic system can be for 3 years.

(d) Others: Nil

Country: **Ireland**

Year: September 2002 – August 2003

CURRENT PROGRAMMES

A. Agency or programme: Met Éireann

Number and type of buoys: (a) deployed during year: 3 drifters

(b) operational at 31 August: 4 drifters (ConMar (GPS))

(c) reporting on GTS at 31 August: 4 drifters (ConMar (GPS))

Purpose of programme: (a) operational: Participating in EGOS programme for operational meteorology and oceanography to improve forecasting and safety at sea.

(b) met/ocean research:

(c) developmental:

Main deployment areas: North Atlantic

B. Agency or programme:

Programme: Irish Marine Data Buoy Network

Agencies: The Marine Institute, Met Éireann , Department of the Marine and Natural Resources and the UK Met Office.

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

(b) operational at 31 August: 4 moored buoys

(c) reporting on GTS at 31 August: 4 moored buoys

Purpose of programme: (a) operational: to provide meteorological and oceanographic observations in real-time to Met Éireann and the Marine Institute for forecasting and climatological purposes to improve safety at sea. The buoys are part of the EGOS programme and are the same in type as the UK Met Office K Series Buoys.

(b) met/ocean research:

(c) developmental:

Main deployment areas: North East Atlantic and Irish Coastal Waters

PLANNED PROGRAMMES

A. Agency or programme: The Marine Institute, Met Éireann , Department of the Marine and the UK Met Office. – **final buoy in the Irish Marine Data Buoy Network**

Number and type of buoys planned for deployment in next 12 months:
1 moored buoy with meteorological and oceanographic (salinity, temperature and currents at depth etc.)sensors and the continuation of the 4 moored buoys already deployed.

Purpose of programme: (a) operational: operational meteorology and oceanography

(b) met/ocean research: climate research

(c) developmental: instrument development and testing.

Main deployment areas: North east Atlantic and Irish Coastal areas.

B. Agency or programme: Met Éireann

Number and type of buoys planned for deployment in next 12 months:
Continued ARGOS support for the 4 Irish drifting buoys until they fail or drift ashore.

Purpose of programme: (a) operational: Contribution to the EGOS programme for operational meteorology and oceanography.

(b) met/ocean research:

(c) developmental:

Main deployment areas: North Atlantic.

TECHNICAL DEVELOPMENTS

(a) Buoy design:

(b) Instrumentation: Irish Marine Weather Buoy Network (www.marine.ie/databuoy)

The Irish Marine Weather Buoy Network was set up in 2000 as a collaboration between the Irish Department of Communications, Marine and Natural Resources, Marine Institute, Met

Eireann and the UK Met Office. To date the project has seen the deployments of four moored buoys and the fifth will be deployed during Autumn 2004 in the waters surrounding Ireland.

In December 2001 Amergen International Oceanographic Services Ltd was awarded a contract for the development of a new Data Acquisition System. The reason for the development of a new acquisition system was to enhance the capability of the system to record and transmit a subset of other marine parameters in near real time. It is planned that initially these parameters will be temperature and salinity (SBE 16+) and water current speed and directions (ADCP). It was also decided to change the location of the DAS on the buoy for ease of servicing. The new DAS will be housed in the lattice structure of the buoy instead of inside the hull.

Progress to Date
The system will be undergoing land trials starting the last week of February 2004 for approximately three weeks. Once these are completed it will then undergo sea trials for a three to four month period.

(c) Others:

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

Statistics of EGOS buoy data are published in the Monthly Report by the Technical Secretary of EGOS, also in the quarterly reports of the UK Met Office and the monthly statistics by Meteo France and ECMWF.

SPECIAL COMMENTS (if any)

(a) Quality of buoy data: Good, see EGOS publications

(b) Communications: Good, using ARGOS for the drifting buoys and METEOSAT for the moored buoys.

(c) Buoy lifetimes:

(d) Others:

Country: **JAPAN**

Year: 2003

CURRENT PROGRAMMES

A. Japan Meteorological Agency (JMA)

Number and type of buoys:
(a) deployed during year:
(Type 1) 14 drifting buoys with 4 maritime meteorological and oceanographic sensors
(Type 2) None
(b) operational at 31 August:
(Type 1) 3
(Type 2) 2 profiling floats
(c) reporting on GTS at 31 August:
(Type 1) 3
(Type 2) 2
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: None
(b) operational at 31 August: 17 profiling floats
(c) reporting on GTS at 31 August: 17
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: 7 surface drifters with holey sock drogue and SST sensors
(b) operational at 31 August: 6
(c) reporting on GTS at 31 August: 6
Purpose of programme: operational observation
Main deployment areas: the Japan Sea, the western 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) 18 meteorological and subsurface oceanographic surface moorings (TRITON buoys)

(Type 3) 115 profiling floats
(b) operational at 31 August:
(Type 1) 4
(Type 2) 17
(Type 3) 148
(c) reporting on GTS at 31 August
(Type 1) 4
(Type 2) 15
(Type 3) 148
Purpose of programme:
(Type 1) meteorological and oceanographic research
(Type 2) meteorological and oceanographic research and ENSO monitoring
(Type 3) oceanographic research (Argo project)
Main deployment areas:
(Type 1) the Arctic Ocean
(Type 2) the western tropical Pacific and the eastern Indian Ocean
(Type 3) the North Pacific, the South Pacific, the eastern Indian Ocean and the Southern Ocean

E. Ocean Research Institute, University of Tokyo

Number and type of buoys:
(a) deployed during year:
(Type 1) None
(Type 2) None
(b) operational at 31 August:
(Type 1) 1 float (ALACE)
(Type 2) 2 profiling floats (PALACE)
(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 and 2) the North Pacific

F. Tohoku University

Number and type of buoys:
(a) deployed during year: 1 profiling float
(b) operational at 31 August: 2 profiling floats
(c) reporting on GTS at 31 August: 2
Purpose of programme: oceanographic research
Main deployment areas: the North Pacific (boundary area between subtropical and subarctic regions)

G. National Institute of Polar Research

Number and type of buoys:
(a) deployed during year: 3 profiling floats
(b) operational at 31 August: 1 profiling float
(c) reporting on GTS at 31 August: 1
Purpose of programme: oceanographic research
Main deployment areas: the Indian sector of the Southern Ocean

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
- (Type 2) 2 profiling floats

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

C. Japan Coast Guard

Number and type of buoys planned for deployment in next 12 months: 7 surface drifters with holey sock drogue and SST sensors

Purpose of programme: operational observation

Main deployment areas: the Japan Sea, the western 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) 1 meteorological and subsurface oceanographic drifter (J-CAD)
- (Type 2) 18 meteorological and subsurface oceanographic surface moorings (TRITON buoys)
- (Type 3) 100 profiling floats

Purpose of programme:
- (Type 1) meteorological and oceanographic research
- (Type 2) meteorological and oceanographic research and ENSO monitoring
- (Type 3) oceanographic research (Argo project)

Main deployment areas:
- (Type 1) the Arctic Ocean
- (Type 2) the western tropical Pacific (16 buoys) and the eastern Indian Ocean (2 buoys)
- (Type 3) the North Pacific, the South Pacific, the Indian Ocean and the Southern Ocean

G. National Institute of Polar Research

Number and type of buoys planned for deployment in next 12 months: 3 profiling floats

Purpose of programme: oceanographic research

Main deployment areas: the Indian sector of the Southern Ocean

H. Tokai University

Number and type of buoys planned for deployment in next 12 months: 5 surface drifters (2 drifters with holy sock drogue)

Purpose of programme:	Kuroshio current and drift ice research
Main deployment areas:	the North Pacific and the Sea of Okhotsk

Country: **Republic of KOREA**

Year: 2003

CURRENT PROGRAMMES

Status of moored buoys

The Korea Meteorological Administration (KMA) has operated a total of five ocean data buoys on the adjacent seas of the Korean Peninsula since 1996. One of them is a 6-m NOMAD buoy; it is 70 km off the eastern coast of Korea, and the ocean depth is about 1,500 m. The other buoys are a 3-m DISCUS type. The five buoys have been registered in the Ocean Data Acquisition System (ODAS) already. All data observed by buoys are the distributed in real-time to WMO member countries via the GTS (Global Telecommunication System) for the meteorological telecommunication networks. Table 1 gives some details on the data buoys.

Table 1. Details of the five KMA buoys

Classification	Dukjukdo	Chilbaldo	Keomundo	Keojedo	Donghae
Date of installation	July 5 1996	July 6 1996	May 16 1997	May 18 1998	May 7 2001
Type	3m Discus				6m Nomad
WMO ID	22101	22102	22103	22104	22105
Latitude Longitude	37°14′N 126°01′E	34°48′N 125°42′E	34°00′N 127°30′E	34°46′N 128°54′E	37°32′N 130°00′E
Distance from main island/land	15km west of Dukjukdo	2km northwest of Chilbaldo	14km east of Keomundo	16km east of Keojedo	70km east of Donghae
Oceanic depth (m)	30	33	80	84	1,518
Geographical position	Central Yellow Sea	Southern Yellow Sea	Western South Sea	Eastern South Sea	Central East/Japan Sea
Telecommunication	VHF	VHF	Inmarsat C	Orbcomm	Orbcomm
Manufacturer	Coastal (USA)	Coastal (USA)	Axys (Canada)	Axys (Canada)	Metocean (USA)

Status of Argo floats

1) Status of Argo floats (2002 activities)

In 2002, twenty-five Argo floats equipped with APEX-CTD were deployed by the Meteorological Research Institute (METRI) of the Korea Meteorological Administration (KMA), and the Korea Ocean Research & Development Institute (KORDI) of the Ministry of Maritime Affairs & Fisheries (MOMAF); eleven floats in the East/Japan Sea, ten floats in the Northwest Pacific, and four floats in the Antarctic Ocean were launched.

2) Deployment of Argo floats (2003 activities)

Thirty-three floats were planned for deployment in 2003 by METRI and KORDI.

METRI has deployed five floats in the East/Japan Sea in September using the R/V of KMA. These floats are set to park at a depth of 800 dbar and have a 7-day cycle. At the same month, METRI deployed ten floats in the Northwest Pacific with a 2000 dbar parking depth and a 10-day cycle.

In August 2003, KORDI deployed two Provor floats in the East/Japan Sea using the R/V Haeyang-2000 of the National Oceanographic Research Institute (NORI) of Korea. KORDI plans to deploy six floats in the East/Japan Sea in October 2003, set to park at a depth of 700 dbar and have a 10-day cycle. KORDI has a plan to deploy ten additional floats in the Antarctic Ocean.

Table 2 gives the details of the Korean Argo floats.

Year	Organization	Number of deployed Argo floats in each area			Total
		East/Japan Sea	Northwest Pacific Ocean	Antarctic Ocean & others	
2002	KMA	5	10	-	25
	MOMAF	6	-	4	
2003	KMA	5	10	-	33
	MOMAF	8	-	10	
2004 (plan)	KMA	5	10	-	30
	MOMAF	5	-	10	

PLANNED PROGRAMS

Thirty floats will be deployed in the East Sea, the Pacific Ocean, and the Antarctic Ocean by KMA and MOMAF in 2004.

Country: **MALAYSIA**

Year: 2003

A. Agency or programme: Environmental Monitoring System

Numbers and types of platforms: (a) deployed current year: 2002 - 4 BUOY
2003 – 6 STATION

(b) operational at 31 August: 8

(c) Reporting on GTS at 31 August: NIL

Purpose of programme: (a) operational:

(b) met/ocean research: 10

(c) developmental:

Main deployment areas: South China sea and Malacca Strait

B. Agency or programme: Hydrographic department, Royal Malaysian Navy for Environmental Monitoring System

PLANNED PROGRAMMES

A. Agency or programme:

Numbers and types of buoys planned for deployment in next 12 months:

Purpose of programme: (a) operational:

(b) met/ocean research: 10

(c) developmental:

Main deployment areas: South China sea and Malacca Strait

B. Agency or programme: Hydrographic department, Royal Malaysian Navy for Environmental Monitoring System

TECHNICAL DEVELOPMENT

(a) Buoy design: WNI Weathernews

(b) Instrumentation: Wind Speed and direction, barometric pressure, air temperature, humidity, rain gauge, tides, current, waves, ctd and sea temperature.

(c) Others: Real time monitoring software

PUBLICATION

The full system is still in warranty period and undergo final test and calibration before being accepted by the Hydrographic Department royal Malaysian Navy.

SPECIAL COMMENTS

(a) Quality of buoy data: GOOD

(b) Communications: FAIR

(c) Buoy lifetimes: 5-10 years

(d) others: Mooring arrangement due to bad weather at South China Sea.

Country: **The Netherlands**

Year: 2003

A. Agency or programme: Royal Netherlands Meteorological Institute (KNMI)

Purpose of programme: EGOS Drifting Buoy Programme (0436)

Numbers and types of platforms: (a) deployed current year: 4 SVP-B drifters

(b) planned next year: 3 (4) SVP-B drifters

Estimated number of PTT-years: (a) current year: 3

(b) next year: 2.6

B. Agency or programme: Institute for Marine and Atmospheric Research (IMAU)

Purpose of programme: Land ice change and sea level change monitoring(1238)

As a contribution to the European Project on Ice Coring in Antarctica (EPICA) the IMAU has placed at one time a maximum of eight Automatic Weather Stations (AWS) in Dronning Maud Land, Antarctica. These AWSs were installed on a transsect ranging from the coast to the plateau Amundsenisen, along the Swedish research stations Wasa and Svea. The goal of this project is to extend the knowledge of the climatological conditions of this particular part of Antarctica and to obtain a better understanding of the surface energy and mass balance of the Antarctic ice sheet. Therefore surface and subsurface (bore holes up to 100 meters) temperatures, relative humidity, wind speed and direction, snow height, air pressure, short and long wave incoming and outgoing radiation is measured. Together with GPS positioning the data are transmitted as two hour averaged values through the ARGOS system. Four stations will be closed at the end of 2002. One of these stations might be reinstalled at the Norwegian basis Trol in 2003.

Numbers and types of platforms: (a) deployed current year: 4 Telonics PTTs

(b) planned next year: 4 Telonics PTTs

Estimated number of PTT-years: (a) current year: 3.6

(b) next year: 2.6

C **Agency or programme** ALTERRA, Dept. of Aquatic Ecology

Purpose of programme: Seals feeding I (1877)

The harbour seal population in the Dutch Wadden Sea has increased exponentially over the past 10 years. Mainly because of the difficulty of obtaining information, very little is known about the diet of these animals, let alone the potential effect this population growth has on the (commercial) fish stocks. This project, which is commissioned by the Ministry of Agriculture, nature management and fisheries of the Netherlands, is designed to obtain data on possible feeding locations of the seals and on the fish species present in these seas.

To achieve this, 8 harbour seals will be equipped with satellite tags to determine their location and dive data. Four animals are released during autumn and winter 2002 and four during spring and summer 2003. Concurrently, fish will be sampled in the areas where seals are located and assumed to feed (based on the diving data). This will yield a first insight in possible dietary preference, and mostly in preferred feeding locations. In addition to this, several ways to directly the diet of the seals will be explored.

Number and types of platforms: (a) deployed current year: 4 Telonics ST-16 PTTs
(b) planned next year: 10 Telonics ST-16 PTTs

Estimated number of PTT-years: (a) current year: 0
(b) next year: 0.6

D **Agency or programme:** Royal Netherlands Academy of Arts and Science (NIOO), Netherlands Institute of Ecology

Purpose of programme: Fluxes of Carbon and Nitrogen in Antarctic Terrestrial Ecosystems FATE (<number>)

Study of the relative importance of the various sources of carbon and nitrogen, the extent of the decomposition process, the rate of transport of matter into and through the terrestrial ecosystem and the water use efficiency. Argos will be used to transmit status information of the equipment.

Numbers and types of platforms: (a) deployed current year: 0

(b) planned next year: 1 SEIMAC tx

Estimated number of PTT-years: (a) current year: 0

(b) next year: 0.8

Country: **NEW ZEALAND**

Year **2003**

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

Number and type of buoys:
(a) deployed during the year : 3 Drifting Buoys (1 FGGE, 2SVPB)
(b) operational at 31 August : 8 Drifters
(c) reporting on GTS as at 31 August : 8 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 (SOBP)**

Number and type of buoys:
(a) deployed during the year : 6 SVPB (Technocean)
(b) operational at 31 August : 6 SVPB
(c) reporting on GTS as at 31 August : 4 with pressure data, 2 SST data only

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: 3 SVPB buoys

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 (SOBP)**

Number and type of buoys planned for deployment in next 12 months: 10 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 NZ now uses a mix of FGGE and SVPB type buoys in its operational programme. As at 1 October 2003 the first two SVPB buoys to be deployed in to the programme have been operational for 6 and 15 months respectively. The latter buoy is on its second deployment, having been recovered after 10 months operation.

Prior to 2002 MetService used only FGGE type buoys and 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 prevailing westerly currents carry them back towards New Zealand, enabling around 80% of buoys to be recovered.

Since 1988 (16 years) MetService has recycled 27 FGGE buoys through 59 deployments, whilst maintaining an operational network of 7 buoys. Of the six FGGE buoys operational on 1 October 2003, two buoys are on their first deployment and four are on their second deployment. FGGE buoys deployed in the Tasman Sea last about eighteen months on average before beaching on the New Zealand coast. Because so many NZ FGGE buoys are recovered and redeployed it is more representative to look at the Cumulative Lifetime of buoys over several deployments, to best assess their operational lifetime. Lifetime is counted until barometer failure, transmission failure or recovery. The Average Cumulative Lifetime of the twenty seven FGGE buoys, including the six operational buoys at 1 October 2003 is 39.1 months. Looking at individual buoys, #21583 is still operational after 21 months on its second deployment with a cumulative service of 32 months and #21587 is 17 months into its second deployment with a cumulative total of 38 months.

D. **Recovered Buoys:**
In the twelve months to 1 October 2003, three MetService buoys (#7176, #22187 and #21719) were recovered.

Buoy 7176, FGGE style, was found on a North Cape beach in October 2002. This buoy had been deployed for the sixth time in August 2001, but failed two weeks later after a suspected lightning strike. The finder was allowed to keep this buoy as it was unlikely to be of any further use.

FGGE Buoy 22187 was recovered by the local Coastguard near Yeppoon, Queensland, Australia in January 2003. This buoy had been deployed for the third time in April 2001 and still was fully operational when it beached. Thanks to the co-operation of staff from the Bureau of Meteorology, Australia and a trans Tasman VOS ship the buoy was returned to NZ. Initial tests made after the buoy returned showed the air and sea temperatures, and the barometer output to be within specification. This buoy will be refurbished, re-calibrated and redeployed in the future.

Buoy 21719 was the first SVPB type buoy to be deployed under the NZ National programme. This buoy was deployed in the southwestern Tasman Sea in April 2002. The buoy performed well, sending good data on GTS until it was picked up by a fishing vessel close to the NZ coast in February 2003. Post recovery barometer comparisons over the range 920 to 1050hPa showed the buoy pressure to be within 0.2hPa, unchanged from the pre-deployment calibration results. SST was good. The buoy was redeployed in May 2003 with original batteries (still more than 3/4 life left) and with a new small drogue supplied free of charge by Technocean. The original drogue had been lost after the cable separated at the carrot close to the buoy hull.

Country: **SOUTH AFRICA**

Year: 2003

CURRENT PROGRAMMES

A. Agency or programme: **South African Weather Service**

Number and type of buoys:
(a) deployed during year: Total 43
17 Indian Ocean
26 South Atlantic
36 SVPB and 7 SVP
(b) operational at 31 August:54
(c) reporting on GTS at 31 August: 54

Purpose of programme:
(a) operational: Operational – Weather Forecasting
(b) met/ocean research: Meteorology
(c) developmental:

Main deployment areas: South Atlantic Ocean and Indian Ocean

B. Agency or programme: Scripps Institute Oceanography/Benefit Program

Number and type of buoys
(a) deployed during year: Total 6 SVP
(b) operational at 31 August: 3
(c) reporting on GTS at 31 August: 3

Purpose of programme:
(a) operational:
(b) met/ocean research: Oceanography research
Surface water circulation
(c) developmental

Main deployment areas: South Atlantic Ocean – coastal waters.

PLANNED PROGRAMMES

A. Agency or programme: South African Weather Service

Number and type of buoys planned for deployment in next 12 months: Total 48
39 SVPB, 9 SVP

Purpose of programme:	(a)	operational:	Operational - Weather Forecasting
	(b)	met/ocean research:	Meteorology
	(c)	developmental:	
Main deployment areas:		South Atlantic Ocean and Indian Ocean	

B. Agency or programme: Scripps Institute Oceanography/Benefit Program

Number and type of buoys planned for deployment in next 12 months: Total 6 SVP

Purpose of programme:	(a)	operational:	
	(b)	met/ocean research:	Oceanography research Surface water circulation
	(c)	development:	
Main deployment areas:		South Atlantic Ocean – coastal waters,	

TECHNICAL DEVELOPMENTS

(a) Buoy design: Metocean/Technocean

(b) Instrumentation: SVPB/SVP

(c) Others:

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

South African Weather Service programme statistics and plans are published on the ISABP web page,
While the monthly reports of the programme is distributed to specific users.

Numerical model managers are sending monthly QC reports to the program manager.

SPECIAL COMMENTS (if any)

(a) Quality of buoy data: Buoy data generally good. The Weather Service deployed 26 drifters in the South Atlantic Ocean with no failures on deployment.. However spikes are experienced on the pressure data, resulting in that the pressure data was removed from the GTS.

(b) Communications: South African Weather Service drifter data is distributed on the GTS
by Argos – Toulouse. The Weather Service also operates a LUT on
Gough and Marion Island. Negotiations is till been conducted to improve the communications to the Islands so that the TIP data can be send directly to Toulouse.

(c) Buoy lifetimes: Weather Service SVPB drifters average lifetime 480 days. There is
8 drifters still transmitting after 700 days.

Country: **United Kingdom**

Year: 2003

Organisation	Type of programme	Platforms deployed in 2003	Location	Active at 31 Aug / on GTS at 31 Aug	Platforms planned for 2004	Location
British Antarctic Survey	Biological oceanography research	22 GPS/Argos drifters	S Georgia / Scotia Sea	24/0		
Centre for Environment Fisheries and Aquaculture	Fisheries and oceanographic research	18	UK waters	3/0	18	UK waters
Met Office	Moored buoy network	9	UK waters	9/9	11	UK waters
	Drifting buoy network	26 SVP-B and SVP-BW drifters	N Atlantic (EUCOS,EGOS) , Arctic (IABP), S Atlantic (ISABP)	32/26	34 SVP-B drifters	N Atlantic (EUCOS, EGOS), Southern Ocean (SOBP)
	Argo float programme	23 Argo floats (18Apex, 5 Provor)	N Atlantic, Arctic, Indian Ocean, Southern Ocean	54/47	40 Argo floats	N Atlantic, Arctic, Indian Ocean, Southern Ocean
Plymouth Marine Laboratory	Tracer patch monitoring	0			1 GPS/Argos drifter	Mediterranean
Scottish Association for Marine Science	Mooring monitoring	2	Arabian Sea	2/0	2	Arabian Sea
	Polar oceanographic research	4 Iridium ice buoys	Arctic Ocean	0/0	5-10 ice buoys (with SPRI and BAS)	Polar seas
	Polar oceanographic research	1 Argo float	Greenland Sea	1/1	1 float	Greenland Sea
University of Southampton	Float programme	0		2/2	0	
	Oceanographi c research	4 (2 moored, 1 drifting sediment trap, 1 AUV)		3/0	2	

Technical Developments

A Deep Ocean Monitoring System (DOMS) has been deployed on the Met Office K4 moored buoy as part of a project that aims to enhance the use of Met Office moored buoy network to include physical, chemical and biological oceanographic measurements in addition to standard meteorological measurements. Parameters measured include conductivity, chlorophyll, fluorescence, phytoplankton numbers and nutrient concentrations. Further work is scheduled to include the use of moored buoys as data relays for seabed-mounted profiler packages being developed at the Scottish Association for Marine Science.

The Met Office is also collaborating with the Irish Marine Institute (IMI) on work to enhance the technical capabilities of a standard open ocean moored buoy by the incorporation of new sensors and the exploitation of new technologies.

The Scottish Association for Marine Science and the British Antarctic Survey are collaborating in the development of a new series of ice buoys that will feature the use of the Iridium satellite communications system in addition to new sensors and processing methodologies.

Publications

Brown, J, Carillo, L, Fernand, L, Horsburgh, K J, Hill, A E, and Young, E F, 2003. Observations of the physical structure and seasonal jet-like structure of the Celtic Sea and St George's Channel of the Irish Sea. Continental Shelf Research, 23, pp 533-561.

Meredith, M P, Watkins, J L, Murphy, E J, Cunningham, N, Wood, A G, Korb, R, Whitehouse, M J, Thorpe, S E and Vivier, F, in press. An anticyclonic circulation above the Northwest Georgia Rise, Southern Ocean. Geophysical Research Letters.

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Weston, K, Jickells, T D, Fernand, L and Parker, E R, in press. Nitrogen cycling in the southern North Sea: consequences for total nitrogen. Estuarine, Coastal and Shelf Science.

Young, E F, Brown, J, Aldridge, J N, Horsburgh, K J and Fernand, L, in press. Development and application of a three-dimensional baroclinic model to the study of the seasonal circulation in the Celtic Sea. Continental Shelf Research.

Country: **United States of America**

Year: 2003

The major contributors to U.S. *in-situ* observations in 2003 have been the National Oceanic and Atmospheric Administration (NOAA), Ocean. US, and the U. S. Naval Oceanographic Office. In all, these groups operated nearly 150 moorings, more than 400 drifting buoys, and over 300 profiling floats. Nearly all were considered operational or research with data reported data via the Global Telecommunications System (GTS). Growth in the number of observing systems, particularly in the number of drifting buoys, is expected in 2004. The number of moored buoys around Alaska and off the coast of southern California will continue to increase.

CURRENT PROGRAMMES

A. Agency or programme: NOAA NWS/NDBC Moored Buoys (Met./ocean)

Number and type of buoys: (a) deployed during year: 79

(b) operational at 31 August: 79

(c) reporting on GTS at 31 August: 79

Purpose of programme: (a) operational: 79

(b) met/ocean research:

(c) developmental:

Main deployment areas: Atlantic and Pacific Oceans and coastal zone of U.S., including Bering Sea, Gulf of Mexico, and Great Lakes

B. Agency or programme: NOAA NWS/NDBC Drifting Buoys

Number and type of buoys: (a) deployed during year: 4

(b) operational at 31 August: 3

(c) reporting on GTS at 31 August: 3

Purpose of programme: (a) operational: 4

(b) met/ocean research:

(c) developmental:

Main deployment areas: Bering Sea, Pacific Ocean, and Atlantic Ocean

C. Agency or programme: NOAA/NWS/NDBC Argo Floats

Number and type of buoys: (a) deployed during year: 4

(b) operational at 31 August: 4

(c) reporting on GTS at 31 August: 4

Purpose of programme: (a) operational: 4

(b) met/ocean research:

(c) developmental:

Main deployment areas: Pacific Ocean

D. Agency or programme: NOAA NWS/NDBC ADSMEX (Air-Deployed Self-Moored Expendable) Buoys

Number and type of buoys: (a) deployed during year: 2

(b) operational at 31 August: 1

(c) reporting on GTS at 31 August: 1

Purpose of programme: (a) operational:

(b) met/ocean research:

(c) developmental: 2

Main deployment areas: Pacific Ocean and Gulf of Mexico

E. Agency or programme: Argo Program

Number and type of buoys: (a) deployed during year: 205

(b) operational at 31 August: 294

(c) reporting on GTS at 31 August: 294

Purpose of programme: (a) operational: X

(b) met/ocean research: X

(c) developmental:

Main deployment areas: Global

F. Agency or programme: NOAA/PMEL/TAO

Number and type of buoys: (a) deployed during year: 58 surface toroids, 4 subsurface

(b) operational at 31 August: 53

(c) reporting on GTS at 31 August: 53

Purpose of programme: (a) operational: X

(b) met/ocean research:

(c) developmental:

Main deployment areas: Tropical Pacific

G. Agency or programme: NOAA/PMEL/PIRATA

Number and type of buoys: (a) deployed during year: 10 surface toroids, 4 subsurface

(b) operational at 31 August: 10

(c) reporting on GTS at 31 August: 10

Purpose of programme: (a) operational:

(b) met/ocean research: X

(c) developmental:

Main deployment areas: Tropical Atlantic

H. Agency or programme: Global Drifter Program (GDP), Global Ocean Observing System Center
Atlantic Oceanographic & Meteorological Laboratory (AOML/OAR/NOAA)

Number and type of buoys: (a) deployed during year: 355

(b) operational at 31 August:

(c) reporting on GTS at 31 August: 283

Purpose of programme: (a) operational: 312

(b) met/ocean research: 5 SVPWD + 38 CORC

(c) developmental: 2

Main deployment areas: Globally Tropical and Southern Oceans

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

Number and type of buoys: (a) deployed during year: 73 surface drifters total, 42 SVP-B, 31 SVP-BW, 17 Argo equivalent floats

(b) operational at 31 August: 68

(c) reporting on GTS at 31 August: 68

Purpose of programme: (a) operational: 68

(b) met/ocean research:

(c) developmental:

Main deployment areas: North Atlantic (especially the Inter-Tropical Convergence Zone), West Pacific, northern Indian Ocean and Mediterranean Sea. Small numbers of drifters in the South Atlantic, Sea of Japan

PLANNED PROGRAMMES

A. Agency or programme: NOAA NWS/NDBC Moored Buoys (Met./Ocean)

Number and type of buoys planned for deployment in next 12 months: 91

Purpose of programme: (a) operational: 91

(b) met/ocean research:

(c) developmental:

Main deployment areas: Atlantic and Pacific Oceans, and coastal zone of U.S., including Bering Sea, Gulf of Mexico, and Great Lakes.

B. Agency or programme: NOAA NWS/NDBC Drifting Buoys
Number and type of buoys planned for deployment in next 12 months: 40*

Purpose of programme: (a) operational: 40

(b) met/ocean research:

(c) developmental:

Main deployment areas: Pacific Ocean

*co-operative project with NOAA Research Global Drifter Program (GDP)

C. Agency or programme: NOAA NWS/NDBC DART Moored Buoys
Number and type of buoys planned for deployment in next 12 months: 6*

Purpose of programme: (a) operational: 6

(b) met/ocean research:

(c) developmental:

Main deployment areas: Pacific Ocean offshore

*Operated through September 2003, by NOAA Research's PMEL. Four (4) more systems will be deployed if funds are appropriated.

D. Agency or programme: Argo Program
Number and type of buoys planned for deployment in next 12 months: ~315

Purpose of programme: (a) operational: X

(b) met/ocean research: X

(c) developmental: X

Main deployment areas: Global

E. Agency or programme: NOAA/PMEL/TAO
Number and type of buoys planned for deployment in next 12 months: 55 surface toroids, 4 subsurface

Purpose of programme: (a) operational: X

(b) met/ocean research:

(c) developmental:

Main deployment areas: Tropical Atlantic

F. Agency or programme: NOAA/PMEL/PIRATA
Number and type of buoys planned for deployment in next 12 months: 10

Purpose of programme: (a) operational:

(b) met/ocean research: X

(c) developmental:

Main deployment areas: Tropical Atlantic

G. Agency or programme: GDP, Global Ocean Observing System Center
Number and type of buoys planned for deployment in next 12 months: 600

Purpose of programme: (a) operational: 450

(b) met/ocean research: 150

(c) developmental:

Main deployment areas: North Pacific; Globally Tropical and Southern Oceans

H. Agency or programme: Naval Oceanographic Office
Number and type of buoys planned for deployment in next 12 months: 600

Purpose of programme:	(a)	operational: 31 SVP-BW, 50 SVP-B, 20 Argo
	(b)	met/ocean research:
	(c)	developmental:
Main deployment areas:		North Atlantic (especially the Inter-Tropical Convergence Zone), West Pacific, northern Indian Ocean and Mediterranean Sea. Small numbers of drifters in the South Atlantic, Sea of Japan

TECHNICAL DEVELOPMENTS

(a) Buoy design: Air-Deployed, Self-Mooring Expendable (ADSMEX) buoy under test as quick-response system. ADSMEX concept is based on TOGA type drifter technology.

(b) Instrumentation:

(c) Others:

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

A'Hearn, P.N., H.P. Freitag, and M.J. McPhaden (2002): ATLAS module temperature bias due to solar heating. NOAA Tech. Memo OAR PMEL-121 (NTIS PB2003-101593), NOAA/Pacific Marine Environmental Laboratory, Seattle, WA, 24 pp.

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Cronin, M. F., S.-P. Xie, and H. Hashizume. Barometric pressure variations associated with eastern Pacific tropical instability waves. J. Climate, 16, 3050-3057, 2003.

Freitag, H.P., M.J. McPhaden, C. Meinig, and P. Plimpton, 2003: Mooring motion bias of point Doppler current meter measurements. In: *Proceedings of the IEEE Seventh Working Conference on Current Measurement Technology*, San Diego, CA, 13-15 March 2003, IEEE, Piscataway, NJ, 155-160.

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Serra, Y. and M.J. McPhaden, 2003: In situ observations of the diurnal variability in rainfall over the tropical Atlantic and Pacific Oceans. J. Climate, submitted

Serra, Y.L and M.J. McPhaden, 2003: Multiple time space comparisons of ATLAS buoy rain gauge measurements to TRMM satellite precipitation measurements. J. Appl. Meteorol., 42, 1045-1059.

Several articles in Proceedings, Oceans 2003, at: http://shop.ieee.org

Wong, A.P.S., G.C. Johnson, W.B. Owens, 2003: Delayed-mode calibration of autonomous CTD profiling float salinity data by θ-S climatology. J. Atmos. Oceanic Tecchol., 20:308-318.

SPECIAL COMMENTS (if any)

(a) Quality of buoy data: Real-time automated quality control applied to all data prior to release of NDBC's data.

NOAA/PMEL monitored daily.

(b) Communications: NDBC communications via satellite. Scheduled hourly data transmission via GOES from moored buoys. Non-scheduled data transmitted from drifters and floats, and moored buoy position fixing by POES and Service Argos.

NOAA/PMEL systems use Service Argos communications.

(c) Buoy lifetimes: NDBC planned service intervals every 2 to 3 years; discrepancy response to repair failures as needed.

NOAA/PMEL - 1 year between scheduled visits.

ANNEX II

REPORTS FROM THE DBCP ACTION GROUPS

At its tenth session (La Jolla, November 1994), the Panel adopted the following guidelinesregarding 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 coordinator 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 eight action groups, the reports of which follow:

THE EUROPEAN GROUP ON OCEAN STATIONS (EGOS)

SUMMARY OF TECH. DOC. NO. 267 INTERSESSIONAL REPORT OF THE EUROPEAN GROUP ON OCEAN STATIONS

August 1st 2002 - August 1st 2003, Issued by The EGOS Technical Secretariat

1 The organization

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 3rd and 4th 2002. At this meeting the Management committee elected Ms. Evelyn Murphy, Met Éireann, and Mr. Kjell Hegg from the Norwegian Meteorological Institute as respectively Chairwoman and Vice-Chairman. The Spanish Meteorological Institute offered to host the EGOS summer meeting in 2003. A report on the conclusions and recommendations of the December 2002 meeting is in EGOS Tech. Doc. No. 259. Representatives from the National Data Buoy Center and EUCOS attended this meeting.
- The summer meeting was hosted by the Spanish Meteorological Institute and Puertos del Estado in Madrid during May 27th and 28th 2003. A report on the conclusions and recommendations of this meeting is in EGOS Tech. Doc. No. 266, draft. Representatives from the National Data Buoy Center and EUCOS attended this meeting.

From January 1st 2003 Spain became a new member of EGOS. The ten participating countries are Denmark, France, Iceland, Ireland, Federal Republic of Germany, The Netherlands, Norway, Spain, Sweden and United Kingdom. The EGOS Common Fund is based on voluntary contributions, mainly to cover the service of the Technical Secretariat. WMO handles the EGOS Common Fund on behalf of the EGOS Management Committee. Calls for national contribution for 2002 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 2002.

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

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 Ms. Anne A. Hageberg. 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 2002, 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.

2 Activity areas of EGOS

- Inclusion of Spain (Meteorological Institute and Puertos del Estado) as a member of EGOS.
- The Spanish Meteorological Institute and Puertos del Estado are cooperating with Technical Co-ordinator to get the Spanish moorings onto GTS.
- EGOS is to be taken over by EUCOS Surface Marine Programme.
- Improvement of data transmission (timeliness and management) by connecting Søndre Strømfjord LUT to CLS ARGOS.
- Technical Co-ordinator is in contact with SVP-B manufacturers about improving the lifetime of the drogues.
- The Technical Secretary is working in collaboration with Technical Co-ordinator of DBCP to find a suitable system for storage of buoy metadata.

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 resources through improved deployment strategies has been in focus. Deployments have been carried out on shipping routes from UK, Iceland, and Norway to US or South America. Air deployments of SVP-Bs have been carried out in August 2002 and March 2003 in EGOS South. From figure 1 we see that the number of buoys in EGOS South has in the intersessional period doubled. The number of buoys deployed in EGOS North has decreased throughout the period and is now only half of what it was in May 1998. The minimum number of operational drifting buoys by the end of each month in the intersessional period was 39 and maximum was 51 and reflects as figure 1 a significant increase throughout the period. This is mainly due to the extra deployments done by EUCOS OSE (Observing System Experiments) in sensitive areas for numerical modelling.

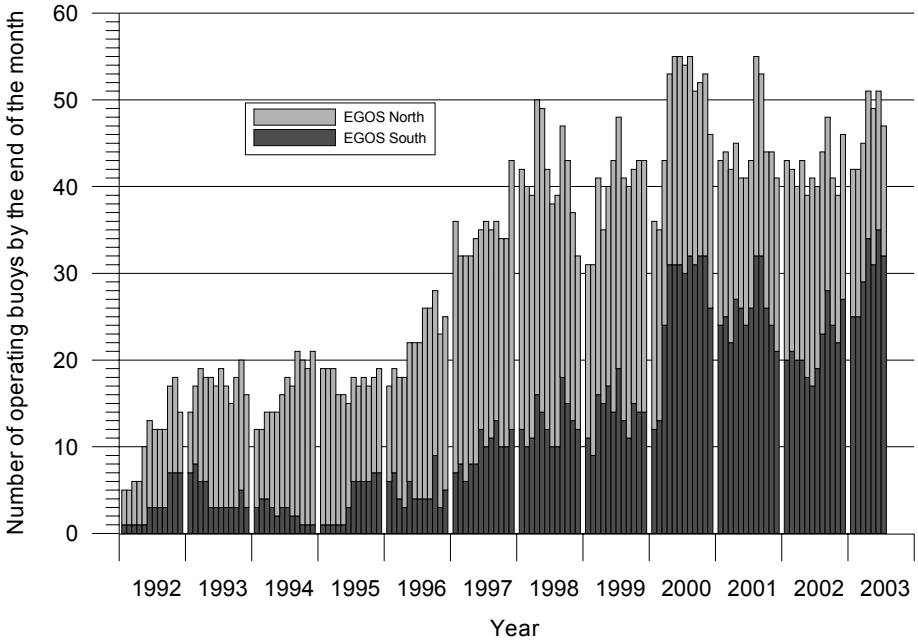

Figure 1. The number of operational EGOS drifting buoys by the end of each month 1992-Aug 2003.

As of August 1st 2003 the number of operational buoys is 47, with 15 in EGOS North and 32 in EGOS South (figure 2). The number of none-EGOS drifters is typically around ten, operating north of the southern boundary of the EGOS area of interest (30 ºN) in 2002/2003. In November there was a sudden appearance of 5 none-EGOS drifters in the Mediterranean Sea.

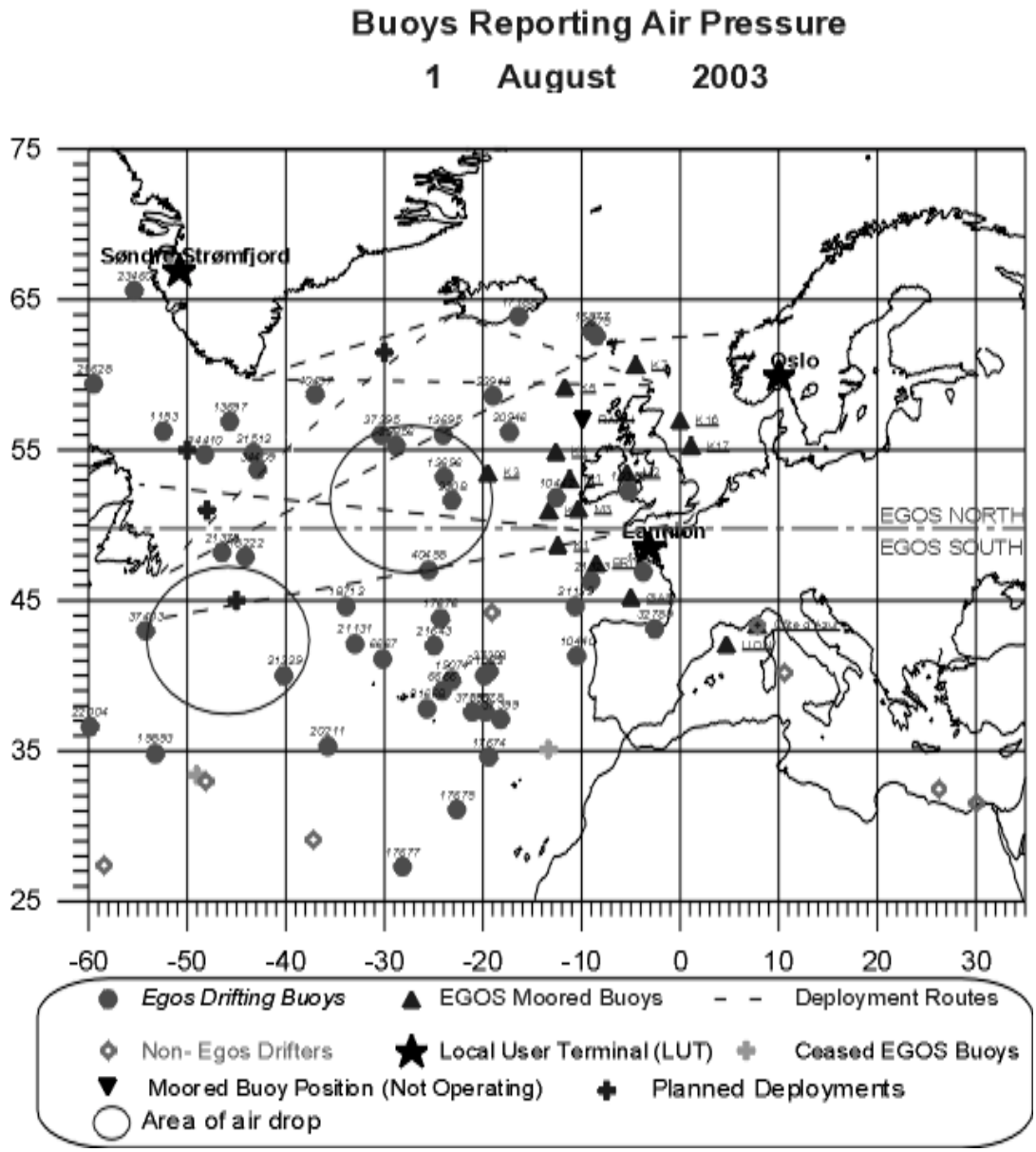

Figure 2. Distribution of EGOS buoys at August 1st 2003.

Early failures

The number of SVP-B failures was 19% in 1998, 29 % in 1999, 24 % in 2000, 4 % in 2001 and 2 % in 2002. For the year 2001 and 2002 this has improved dramatically. In the intersessional period of a total of 55 SVP-Bs deployed 8 or 15 % suffered an early failure. 4 of these early failures happened right after air deployment in early March. The weather was rough.

Drogue losses

The tendency for the SVP-B Drifters to loose the drogues has continued into 2003. This is an important issue, since the wind measurements of the SVP-B rely on an attached drogue. As of August 1st 2003 a total of 42 SVP-Bs were operating in EGOS. 12 of these, or 29 %, had lost the drogue. This is an improvement by 15 % compared to the same period last year.

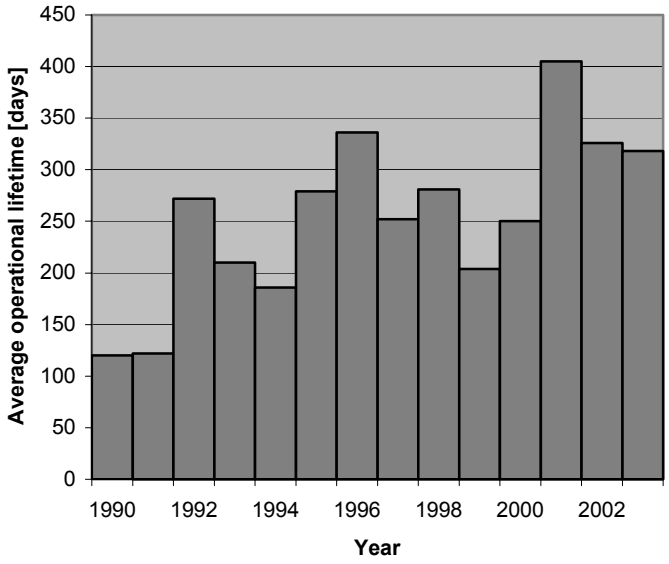

Figure 3. The average lifetime for EGOS drifting buoys 1990-Aug 2003.

4 EGOS Moored BUOYS:

In addition to the drifting buoys EGOS members also operate moored buoys under the programme. At present the number of operational EGOS moored buoys is 16. Their positions are shown in figure 2 and in table 1.

Table 1 The EGOS Moored buoys as of August 1st 2003.

Name	WMO	Position	Operatin	Data reporting to
K 1	62029	48.7 N. 12.4 W	Yes	Yes
K 2	62081	51.0 N, 13.3 W	Yes	Yes
K 3	62108	53.5 N, 19.5 W	Yes	Yes
K 4	62105	54.9 N, 12.6 W	Yes	Yes
K 5	64045	59.1 N, 11.4 W	Yes	Yes
K 7	64046	60.6 N, 4.2 W	Yes	Yes
K16	62109	57.0 N, 0.0 E	Yes	Yes
K17	62026	55.3 N, 1.1 E	Yes	Yes
RARH	62106	57.0 N, 9.9 W	No	Yes
BRIT	62163	47.5 N, 8.5 W	Yes	Yes
GAS	62001	45.2 N, 5.0 W	Yes	Yes
Côte d'Azur	61001	43.4 N, 7.8 E	Yes	Yes
LION	61002	42.1 N, 4.7 E	Yes	Yes
M1	62090	53.1 N, 11.2 W	Yes	Yes
M2	62091	53.5 N, 5.4 W	Yes	Yes
M3	62092	51.2 N, 10.5 W	Yes	Yes
M4	62093	54.67 N, 9.07	Yes	Yes
Bilbao-		43.63 N, 3.04	Yes	No
Cabo de		43.73 N, 6.17	Yes	No
Estaca de		44.06 N, 7.62	Yes	No
Villano-		43.49 N, 9.21	Yes	No
Silleiro		42.12 N, 9.40	Yes	No
Golfo de		36.48 N, 6.96	Yes	No
Alborán		36.24 N, 5.03	Yes	No
Cabo de Gata		36.57 N, 2.34	Yes	No
Cabo Begur		41.91 N, 3.65	Yes	No
Mahón		39.73 N, 4.42	Yes	No
Gran Canaria		28.19 N, 15.81	Yes	No
Tenerife		28.00 N, 16.58	Yes	No

INTERNATIONAL ARCTIC BUOY PROGRAMME (IABP)
CHAIRMAN'S AND COORDINATOR'S REPORT

for Nineteenth Session of the Data Buoy Cooperation Panel
Rio de Janerio, Brazil, 20-24 October 2003

Participants of the IABP work together to maintain a network of drifting buoys on the ice of the Arctic Basin to provide meteorological and oceanographic data for real-time operational requirements and research purposes including support to the World Climate Research Programme (WCRP) and the World Weather Watch (WWW) Programme. http://iabp.apl.washington.edu/

IABP 13th ANNUAL MEETING - Members of the International Arctic Buoy Programme met 4-6 June 2003 in Tromso, Norway. The meeting was hosted by the Norwegian Polar Institute (NPI) and the Arctic Climate System Study / Climate and Cryosphere (ACSYS / CliC).

Annual IABP meetings continue to be an opportunity for the host agency and other agencies in the area to share their work. At IABP-13, Chad Dick gave a presentation on ACSYS CliC activities. IABP-13 also facilitated a tour of the Norwegian Meteorological Service Forecast Office. IABP meeting participant Roger Colony made lunch time presentations to interested NPI staff on hydrographic chemistry data set, and another on ice concentration in the Barents. At IABP-13, the following technical presentations were given:

- Climate Research at the Norwegian Polar Institute – J-G Winther
- Evolution of the IABP and the Study of Environmental Arctic Change (SEARCH) – I. Rigor
- Sea Ice Thickness Observation System – A. Hageberg
- Failure of Sea Ice in the Beaufort Gyre to Converge – R. Colony
- Position of Extreme Atmospheric Pressure and their Link to the Arctic Climate During the Period 1898 to 1998 – T. Løyning
- Activities of the International Ice Charting Working Group – H. Tangen

IABP PARTICIPANT ACTIVITY - The annual reports of IABP Participants are available on the IABP web site: http://iabp.apl.washington.edu as part of the IABP-13 meeting report.

IABP EXECUTIVE AND COORDINATOR

Chairman:	Timothy Goos, Environment Canada, Canada	tim.goos@ec.gc.ca
Vice Chairman:	Christian Haas, Alfred Wegener Institut, Germany	chaas@awi-bremerhaven.de
Member:	Ivan Frolov, Arctic and Antarctic Research Institute, Russia	aaricoop@aari.nw.ru
Member:	Elizabeth Horon, Naval Oceanographic Office, U.S.A	hortone@navo.navy.mil
Coordinator:	Ignatius Rigor, Polar Science Centre, U.S.A	ignatius@apl.washington.edu

BUOY ARRAY - IABP Participants strive to maintain an array of at least 25 buoys evenly distributed across the Arctic Ocean providing surface air pressure and surface air temperature to GTS. Monthly buoy mappings and status sheets can be accessed on the IABP web site: http://iabp.apl.washington.edu The mappings show all buoys on the Arctic Basin known to the IABP Coordinator. This includes some buoys the data from which does not get onto the GTS and other buoys that were deployed by non IABP participants. New for 2003, the suite of monthly maps was expanded. It now includes separate maps with:

- buoys with Etopos5 bathymetry;
- buoys with NCEP ice concentration (2 September map accompanies this report);
- buoy instrumentation;

- buoys by deployment year; and
- buoys by experiment number.

Some of the buoys are oceanographic buoys while others are position-only buoys. Most are buoys that provide the basic meteorological parameters of surface air temperature and/or surface air pressure to GTS. The table shows statistics for April 2003 and September 2003. These dates represent when the arrays are typically at their minimum and maximum respectively as most of the annual deployments occur in the period April to August. The annual summer "White Trident" exercise where a total of 7 ICEX buoys provided by IABP participants are air dropped onto the ice of the Arctic Basin courtesy of the US Naval Oceanographic Command remains key to the IABP having an appropriate array of buoys on ice from the perspective of both number and placement. For the 2003 deployment, the Alfred Wegener Institute (1), Norwegian Meteorological Institute (1), Meteorological Service of Canada (1) and U.S. IABP Participants (4) provided ICEX buoys.

2003	Buoys on map and status sheet[1]	Buoys on GTS	Reporting surface air pressure and temperature	Reporting only surface air pressure	Reporting only surface air temperature
1 April	35	21	17	2	Nil
2 September	40	30	28	2	Nil

[1] Plus one land station

The data from a few IABP buoys are not routinely made available on GTS but may be available from other sources. For example, data from JCAD buoys of the Japanese Marine Science and Technology Centre, are available on their web site;
http://www.jamstec.go.jp/arctic/J-CAD_e/jcadindex_e.htm

DATA AND PUBLICATIONS - IABP data have been updated through December 2002 and are available on the web. Hardcopy of the draft 2002 IABP buoy report is available from the IABP coordinator. A PDF of the 2002 data report and reports dating back to 1995 are available from the IABP web pages. Work is underway to reproduce all the buoy reports back to 1979 in PDF format and to make these available on the web.

WORK IN PROGRESS OR COMPLETED BY PARTICIPANTS

Coordinator Ignatius Rigor - In the capacity of IABP Coordinator and as the IABP representative to the Metadata working group of the DBCP, Ignatius continues to work to ensure Metadata from the various buoys going on ice is collated. Ignatius also continues working to acquire information on buoy deployments on ice the Arctic Basin that are at present beyond the realm of the IABP. This is being done so that these buoys can be included on the monthly buoy mappings and, as appropriate, made available on GTS. Both Ignatius and IABP Chairman Timothy Goos encourage those doing such buoy deployments to join the IABP.

Meteorological Service of Canada - MSC implemented processes to quality control spurious position calculations coming from the Edmonton LUT.

FUTURE WORK BY PARTICIPANTS - IABP Participants are working on:
- roles of the IABP and IABP Participants in the International Polar Year (IPY) 2007 and how the IABP can make best use of this opportunity;

- increasing organizational commitment versus personal commitment to the IABP;
- increasing the demonstrated value of the IABP data to the operational forecast services and hence getting more support from operational agencies to replace dwindling support, in some cases from scientific agencies; and
- participation in QC of IABP data.

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REPORT OF THE INTERNATIONAL PROGRAMME FOR ANTARCTIC BUOYS (IPAB) CO-ORDINATING OFFICE

The co-ordinating office staff (Peter Wadhams and Martin Doble) transferred from the Scott Polar Research Institute at the end of 2002, relocating to the Scottish Association for Marine Science's Dunstaffnage Marine Laboratory (DML) in Scotland. The move represents an excellent opportunity to further the work of IPAB, since the co-ordinating office is now co-located with that of the National Focal Point for the Data Buoy Co-operation Panel (DBCP).

Buoy activity 2001-2003

The number of buoys operating in Antarctic waters has fluctuated considerably over the past three years. From a relatively stable inventory of around ten buoys in 2000 and 2001, numbers dropped off to leave one solitary buoy reporting to the GTS for November and December 2001, close to South Georgia. The first months of 2002 saw this rapidly redressed, however, with multiple deployments in the Weddell Sea and up to 20 buoys reporting. Numbers then fell again, reaching only six in October 2002. A mass deployment in the waters around the South Sandwich islands, north of the Antarctic Peninsula, boosted numbers to the low twenties in the first half of 2003. Figure 1, below, shows the total GTS buoy population, split into the three IPAB areas; Weddell (60°W – 20°), East Antarctica (20°E – 170°E) and the Bellingshausen, Amundsen and Ross Seas (170°E – 60°W). Iceberg drifters are not included in these numbers.

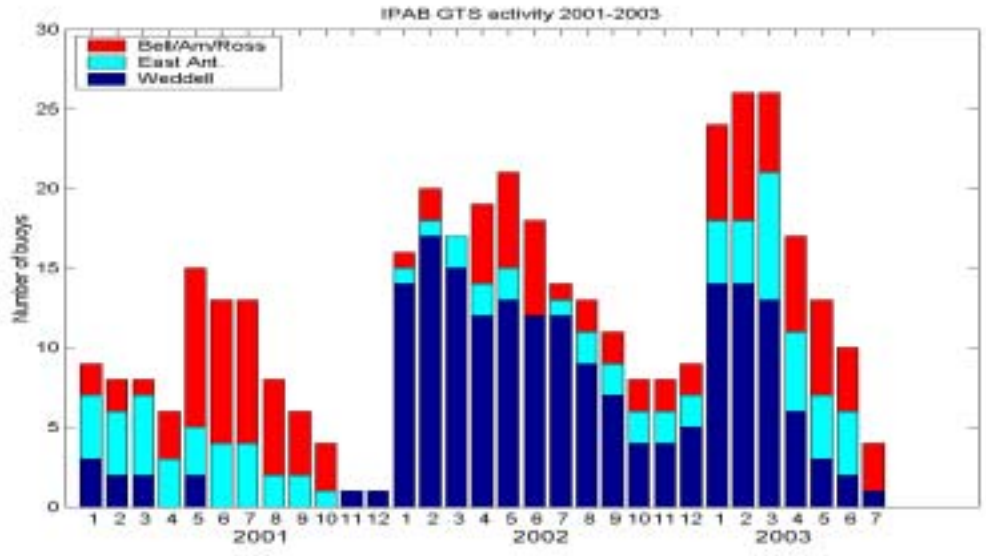


Figure 1: Buoys reporting to the GTS since 2000.

While the very cyclic nature of the number of buoys reporting is itself undesirable, even the relatively well-represented months show a worrying lack of spatial coverage. Large numbers of buoys have been deployed in small areas, leaving the remainder of the Antarctic waters almost un-instrumented. The situation is well illustrated by examining drift tracks for the best represented months (May 2001, May 2002 and March 2003),

shown in Figure 2 (a)-(c). The poorest coverage, in November 2001 is also illustrated in Figure 2 (d).

The majority of recent deployments have been performed by the WHOI SO-GLOBEC interests in the Peninsula region and have occurred exclusively in open water regions.

a) b)

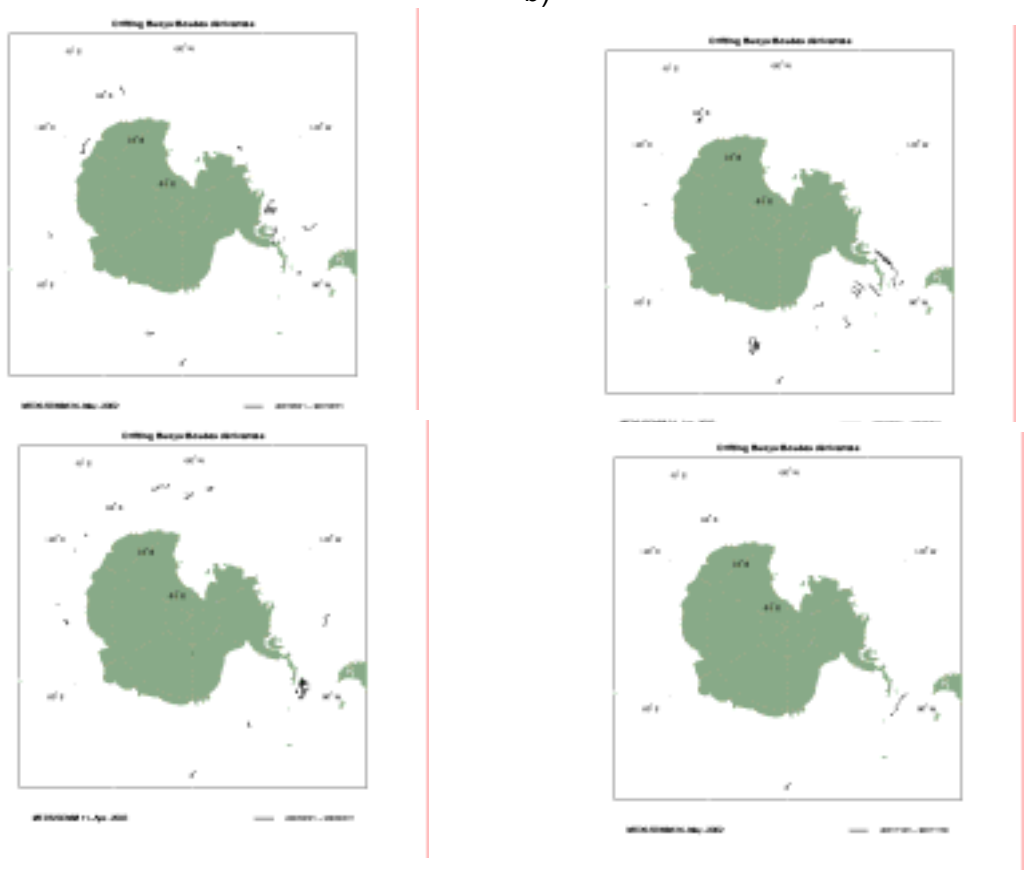


Figure 2 (a)-(d): Tracks of buoys reporting to the GTS during the 'glut months' over the past three years (a)-(c); and (d) the sole reporting buoy in November 2001. The far from ideal nature of the buoy distribution is clearly shown, with the majority of the buoys in the region of the Antarctic Peninsula and very little activity elsewhere.

Full details of each GTS buoy are given in the Annex. Iceberg drifters are tabulated separately. Non-GTS buoy activity known to the co-ordinating office is included, though only two IPAB members have provided any details of these activities to the co-ordinating office. It is suggested that members report these non-visible deployments as a matter of course to the co-ordinator, as this would greatly increase the value of the IPAB function above that currently provided by MEDS.

Website

The move to Scotland has caused some disruption to the provision of an up-to-date and useful website, since the new organisation is itself upgrading all major computer and server facilities. The laboratory has a large dedicated IT department, however, who will provide the database preparation and maintenance services for the website.

In the meantime, IPAB data provided by the Australian office has been integrated with the searchable Oracle database maintained at the British Antarctic Survey (BAS), which can be found at http://www.antarctica.ac.uk/met/metlog/cui.html. Perl scripts allow the user to select data on the basis of several fields, whether WMO ID, date, position or sensor information. Data are then output directly to screen in either text or graphical format, which can then be directly downloaded. This is seen as a significant extension to the NSIDC interface and will be incorporated in the new co-ordinator's website as time allows. The figure below shows a screen-grab of the BAS interface.

Figure 3: Searchable Oracle database for IPAB data 1995-1998.

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

Martin Doble

Annex: IPAB buoy activities 2001-2003

Abbreviations and notes

Institutions

SAWB	South African Weather Bureau
WHOI	Woods Hole Oceanographic Institution
SIO	Scripps Oceanographic Institution
AAD	Australian Antarctic Division
ABOM	Australian Bureau of Meteorology
BAS	British Antarctic Survey
SPRI	Scott Polar Research Institute
DML	Dunstaffnage Marine Laboratory

Areas

W	Weddell Sea	60°W – 20°E
E	East Antarctica	20°E – 170°E
B	Bellingshausen, Amundsen and Ross Seas	170°E – 60°W

Sensors

P	Atmospheric pressure
Ta	Air temperature
SST	Sea surface temperature (usually hull temperature)
W	Wind speed and direction
Ti	Ice temperature
Tw	Thermistor chain temperatures
Hd	Buoy heading
SP	Wave spectrum

Drg Drogue fitted, with centre depth if known

Doubtful records (launch date apparently too old) are shown in *italics*

2001: Buoy details

IPAB No.	WMO ID	Argos PTT	Argos Prg	First deployment			Area	Buoy type	Drg	Deployed	GPS	Sensors			
				Date (m)	Lat	Lon						P	Ta	SST	Other
SAWB 01	17644	25475	243	2000			W		Y			X		X	
SAWB 02	17645	25480	243	2000			W		Y			X		X	
SAWB 03	17647	8528	243	5			W					X	X		
SIO 01	33949	14826	9325	5			W		Y					X	
SPRI 08	71513	19079	9484	4	69°21’ S	88°20’W	B	SVPB	Y	Pancake ice		X			
AWI 104	71554	09364	10919	2000			B					X	X		
WHOI A11	71571	22957	9325	5			B	SVP	15m	Open water				X	
WHOI A9	71572	22956	9325				B	SVP	15m	Open water					
WHOI A2	71572	26373	9325	5			B	SVP	15m	Open water				X	
WHOI A3	71573	22406	9325				B	SVP	15m	Open water					
WHOI A4	71573	30461	9325	5			B	SVP	15m	Open water				X	
WHOI A7	71574	22405	9325	5			B	SVP	15m	Open water				X	
WHOI A5	71580	30458	9325	5			B	SVP	15m	Open water				X	
SPRI 09	71582	19081	9484	4	69°30’ S	85°41’W	B	SVPB	Y	Pancake ice		X			
SPRI 10	71583	16187	9484	4	70°00’ S	87°00’W	B	SVPB	Y	Pancake ice		X			
AAD 74	73501	18657	1155	4/99			B					X	X	X	
AAD 75	73502	18658	1155	3/00			E					X	X	X	
AAD 53	73509	18659	1155	3/99			E		Y			X	X	X	
AAD 79	73509		1155	10											
SIO 02	73650	27540	7325	2000			E		Y					X	
SIO 03	73651	27539	7325	2000			E		Y					X	
SIO 04	73651		7325	7					Y					X	
AAD 78	74531	18651	1155	3								X	X	X	
AAD 80	74531		1155	6					Y					X	
ABOM 01	74534	04871	85	2000			E		Y			X	X	X	
BAS BB1		21384		2	70°59’ S	87°04’W	B	CALIB		Pack ice		X			

BAS BB2		21388		2	70°54' S	87°28'W	B	CALIB		Pack ice		X			
BAS BB3		21376		2	71°47' S	80°18'W	B	CALIB		Pack ice		X			
BAS BB4		21392		4	71°05' S	85°21'W	B	CALIB		Pack ice		X			
AAD 76		20138		3/00								X	X		
AAD 77		20140		3/00								X	X		
WHOI A8		26367		5			B	SVP	15m	Open water				X	
WHOI A14		26368		6			B	SVP	15m	Open water				X	
WHOI A10		26369		5			B	SVP	15m	Open water				X	
WHOI A12		26371		5			B	SVP	15m	Open water				X	
WHOI A13		26372		5			B	SVP	15m	Open water				X	
WHOI A6		30459		5			B	SVP	15m	Open water				X	
WHOI A1		30460		5			B	SVP	15m	Open water				X	

2001: Buoy lifetimes.
Numbers of messages are shown for those buoys reporting to the GTS.
Functioning non-GTS buoys are indicated by an 'X'. These are not assigned a WMO ID.

IPAB No.	WMO ID	Argos PTT	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
SAWB 01	17644	25475	691	643	390									
SAWB 02	17645	25480	664	638	53									
SAWB 03	17647	08528	2				486	478	736	623	55			
SIO 01	33949	14826					277							
SPRI 08	71513	19079			X	X	683	705	744	741	698	4		
AWI 104	71554	09364	175	185	221	222	221	181	206	206	180	124		
WHOI A11	71571	22957					244	425	514					
WHOI A9	71572	22956					239	119	13					
WHOI A2	71572	26373								149				
WHOI A3	71573	22406					236	110	16					
WHOI A4	71573	30461								160				
WHOI A7	71574	22405					239	481	333	453	11			
WHOI A5	71580	30458					19	487	130					
SPRI 09	71582	19081			X	94	338							
SPRI 10	71583	16187			X	93	735	705	743	740	340			
AAD 74	73501	18657	704	567			530	718	372					
AAD 75	73502	18658	727	659	742	713	737	711	742	742	720	52		
AAD 53	73509	18659										411	545	671
AAD 79	73509													
SIO 02	73650	27540	325	418	496	465	496	466	361					
SIO 03	73651	27539	320	408	3									
SIO 04	73651								74					
AAD 78	74531	18651			132									
AAD 80	74351							349						
ABOM 01	74534	04871	613	523	490	452	193							
BAS BB1		21384		X										
BAS BB2		21388		X	X									
BAS BB3		21376		X	X	X	X							
BAS BB4		21392				X	X							
AAD 76		20138	X	X	X	X								
AAD 77		20140	X	X	X	X	X	X	X	X	X			

WHOI A8		26367					X	X	X	X	X			
WHOI A14		26368						X	X	X	X			
WHOI A10		26369					X	X	X	X	X			
WHOI A12		26371					X	X	X	X	X			
WHOI A13		26372					X	X	X	X	X			
WHOI A6		30459			X	X	X	X	X	X	X			
WHOI A1		30460			X	X	X	X	X	X	X			
No. buoys reporting to GTS			**9**	**8**	**8**	**6**	**15**	**13**	**13**	**8**	**6**	**4**	**1**	**1**

2002 Buoy details

IPAB No.	WMO ID	Argos PTT	Argos Prg	First deployment			Area	Buoy type	Drg	Deployed	GPS	Sensors			
				Date	Lat	Lon						P	Ta	SST	Other
WHOI	15907	33840	7325	12-1-02	61°59'S	23°59'W	W	SVPB	Y			X		X	
WHOI	15910	33845	7325	20-1-02	60°00'S	40°00'W	W	SVPB	Y			X		X	
WHOI	34515	13565	7325	26-2-02	60°02'S	101°35' W	B	SVP	Y					X	
WHOI	34517	13556	7325	27-2-02	57°59'S	97°08'W	E		Y					X	
	54914			12			B		Y			X	X	X	
	56514	*02935*	*9085*	*1-5-95*	*53°54'S*	*130°51' E*	*B*	*SVPB*	*Y*			*X*	*X*	*X*	
	56517	*04879*	*9085*	*1-1-98*	*11°45'S*	*120°16' E*	*E*	*SVPB*	*Y*			*X*	*X*		
	63661			12			W						X		
	71541	08060		1			W					X	X		
	71542	09728		1, 5			W					X	X		
	71543	09781		1, 5			W					X	X		
	71544	08066		1			W					X			
	71545	08067		1			W					X			
	71546	08068		1			W					X			
AWI 104	71554	09364	10919	2-00	71°04'S	103°44' W	B	S+K	-	On ice	X	X	X		
AWI 105	71543	09781	10919	4-1-02	71°54'S	43°06'W	W	S+K	-	On ice	X	X	X		
AWI 106	71542	09728	10919	4-1-02	71°46'S	45°11'W	W	S+K	-	On ice	X	X	X		
AWI 107	71541	08060	10919	4-1-02	71°28'S	42°51'W	W	S+K	-	On ice	X	X	X		
WHOI	71566	33847	7325	7-2-02	62°30'S	00°45'W	W	SVBP	Y			X		X	
AAD 53	73509	18659	1155	10/01			W					X	X	X	

	74519	24086		1			W		Y			X		X	
	74520	24811	243	21-1-02	64°54'S	35°02'W	W	SVPB	Y			X		X	
	74535	02695		2			E		Y			X	X	X	
WHOI	74903	33846	7325	6-2-02	64°59'S	0°08'W	W	SVP	Y			X		X	
	74904	*24476*	*1325*	*18-4-96*	*47°34'S*	*125°11' W*	*B*	*SVP*	*Y*					*X*	
WHOI	74905	24477	7325	13-2-02	66°40'S	69°28'W	B	SVP	Y					X	
WHOI	74906	25119	7325	20-2-02	68°15'S	69°59'W	B	SVP	Y					X	
WHOI	74907	25181	7325	22-2-02	68°06'S	70°31'W	B	SVP	Y					X	
WHOI	74908	34225	7325	17-5-02	61°00'S	63°01'W	B	SVP	Y					X	
WHOI	74909	34226	7325	17-5-02	60°01'S	63°19'W	B	SVP	Y					X	

2002: Buoy lifetimes.
Numbers of messages are shown for those buoys reporting to the GTS (derived from MEDS).
Functioning non-GTS buoys are indicated by an 'X'

IPAB No.	WMO ID	Argos ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
WHOI	15907	33840	393	151										
WHOI	15910	33845	41	60										
WHOI	34515	13565				288				37	12	116		
WHOI	34517	13556											132	484
	54914													39
	56514	02935						124	393	492	467	502	500	489
	56517	04879	75	372	490	456	439	475	483	453	453	363	224	326
	63661													48
	71541	08060	5	219	248	225	211	185	104				1	
	71542	09728	4	222	235		199	211	214	216	12			
	71543	09781	4	221	247		207	210	212	199	56			
	71544	08066	5	217	242	220	211	221	230	212	97			
	71545	08067	5	223	245	224	221	239	245	244	235	242	237	244
	71546	08068	5	220	239	228	217	226	225	103				
AWI 104	71554	09364	17	9										
AWI 105	71543	09781	4	296	240	260	246	216	231					
AWI 106	71542	09728	4	230	236	241	238	220	223	229	223	114	9	
AWI 107	71541	08060	5	242	237	258	247	188	109	204	87	112	24	
WHOI	71566	33847		387	695	665	680	746	288					
AAD 53	73509	18659	744	670	744	40								
	74519	24086	418	670	738	709	17			94				
	74520	24811	243	409	382	707	685	467	128					
	74535	02695		10	490	467	67				73	191	370	114
WHOI	74903	33846		391	604	19	636	662	280	293				
	74904	24476				442	487	68						
WHOI	74905	24477				421	467	305						
WHOI	74906	25119				446	462	47						
WHOI	74907	25181				439	447	123						
WHOI	74908	34225					37							
WHOI	74909	34226					3							

No. buoys reporting to GTS	**16**	**19**	**16**	**19**	**21**	**18**	**14**	**13**	**11**	**8**	**9**	**10**

2003 Buoy details

IPAB No.	WMO ID	Argos PTT	Argos Prg	First deployment			Area	Buoy type	Drg	Deployed	GPS	Sensors			
				Date	Lat	Lon						P	Ta	SST	Other
WHOI	33589	34230	7325	21-12-02	59°59'S	64°47'W	W	SVP	Y	Open water				X	
WHOI	33591	39140	6325	13-2-03	61°14'S	60°00'W	W	SVP	Y	Open water				X	
WHOI	33592	39145	6325	13-2-03	60°57'S	60°32'W	W	SVP	Y	Open water				X	
WHOI	33594	39139	6325	19-2-03	60°28'S	55°38'W	W	SVP	Y	Open water				X	
WHOI	33595	39141	6325	14-2-03	60°01'S	58°34'W	W	SVP	Y	Open water				X	
WHOI	34517	13556	7325	6-11-02	60°00'S	62°13'W	W	SVP	Y	Open water				X	
WHOI	55614	34174	6325	9-3-03	60°00'S	160°00'E	B	SVPB	Y	Open water		X		X	
WHOI	55615	34190	7325	9-3-03	58°00'S	157°25'E	E	SVPB	Y	Open water		X		X	
ABOM	*56514*	*02935*	*9085*	*1-5-95*	*53°54'S*	*130°51'E*	*B*	*SVPB*	*Y*	*Open water*		*X*	*X*	*X*	
ABOM	*56517*	*04879*	*9085*	*1-1-98*	*11°45'S*	*120°15'E*	*E*	*SVPB*	*Y*	*Open water*		*X*	*X*		
MSA	56612	21563	221	2			E		Y					X	
AWI	63661	08056	919	12/02			W						X		
AWI		08064		9-3-03	70°59'S	101°15' W	B	S+K	-	On ice	X	X	X		
AWI		08068		9-3-03	70°43'S	102°06' W	B	S+K	-	On ice	X	X	X		
AWI		08069		9-3-03	70°43'S	102°06' W	B	S+K	-	On ice	X	X	X		
WHOI	71569	34228	7325	27-11-02	59°00'S	63°24'W	W	SVP	Y	Open water				X	
WHOI	71570	39096	6325	23-1-03	61°32'S	56°36'W	W	SVP	Y	Open water				X	
WHOI	71574	39133	6325	23-1-03	61°14'S	56°31'W	W	SVP	Y	Open water				X	
WHOI	71575	39110	6325	22-1-03	61°47'S	57°02'W	W	SVP	Y	Open water				X	
WHOI	71577	39119	6325	22-1-03	61°31'S	57°32'W	W	SVP	Y	Open water				X	
WHOI	71578	39111	6325	21-1-03	60°02'S	58°29'W	W	SVP	Y	Open water				X	
WHOI	71579	39112	6325	20-1-03	61°46'S	58°59'W	W	SVP	Y	Open water				X	
WHOI	71580	39132	6325	22-1-03	61°14'S	57°14'W	W	SVP	Y	Open water				X	
WHOI	71603	39130	6325	20-1-03	60°32'S	58°22'W	W	SVP	Y	Open water				X	
WHOI	71604	39131	6325	20-1-03	61°34'S	58°34'W	W	SVP	Y	Open water				X	

WHOI	71605	39097	6325	19-1-03	62°07'S	60°05'W	B	SVP	Y	Open water				X	
WHOI	71606	39113	6325	19-1-03	61°55'S	59°36'W	B	SVP	Y	Open water				X	
WHOI	71607	71607	7325	18-1-03	59°59'S	65°55'W	B	SVPB	Y	Open water		X		X	
WHOI	73651	34179	7325	8-1-03	59°03'S	63°39'W	E	SVPB	Y	Open water		X		X	
WHOI	73652	34191	7325	16-12-02	57°59'S	156°28'E	E	SVPB	Y	Open water		X		X	
ABOM	74535	02695	-	3			E		Y			X	X	X	
ABOM	74536	08035	-	1			E		Y			X	X	X	
ABOM	*74537*	*08038*	*9035*	*30-5-94*	*18°19'S*	*118°30'E*	*E*	*SVPB*	*Y*	*Open water*		*X*	*X*	*X*	

2003: Buoy lifetimes.
Numbers of messages are shown for those buoys reporting to the GTS.
Functioning non-GTS buoys are indicated by an 'X'

IPAB No.	WMO ID	Argos ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
WHOI	33589	34230	266	155										
WHOI	33591	39140		15	300	293		151	471					
WHOI	33592	39145		16	388	275								
WHOI	33594	39139				4								
WHOI	33595	39141			18									
WHOI	34517	13556	292											
WHOI	55614	34174			279	683	721	651	174					
WHOI	55615	34190			125	517								
BOM	56514	02935	476	374	469	454	575	92						
BOM	56517	04879	423	432	485	173								
MSA	56612	21563		67	101									
AWI	63661	08056	237	127										
AWI		08064			x	x	X							
AWI		08068			x	x	x	x	x	x	x	x		
AWI		08069			x	x	x	x	x	x	x	X		
WHOI	71569	34228	178	90										
WHOI	71570	39096	36	414	36									
WHOI	71574	39133	35	419	392	449	239							
WHOI	71575	39110	34	417	381	191								
WHOI	71577	39119	35	411	34									
WHOI	71578	39111	36	390	271									
WHOI	71579	39112	32	417	388	446	503	174						
WHOI	71580	39132	11	129	3									
WHOI	71603	39130	24		13									
WHOI	71604	39131	31	423	373									
WHOI	71605	39097	35	324										
WHOI	71606	39113	36	182										
WHOI	71607	71607					55							
WHOI	73651	34179	34	634	522	674	638	386						
WHOI	73652	34191	35	634	267	684	378							

BOM	74535	02695			30	453	562	212						
BOM	74536	08035	18	103	65	457	561	265						
BOM	74537	08038		233	487	453	543	271						
No. buoys reporting to GTS			**20**	**22**	**22**	**15**	**11**	**18**	**2**					

Iceberg drifters

These are separated from the main sea ice table. This is done to avoid confusion when calculating momentum transfer coefficients, since icebergs respond to a different balance of air/ocean forcing.

Table 1: AWI iceberg drifter deployments 1999-2003

Drifters with an entry in the WMO ID column are GTS (but see notes below) and carry an air pressure sensor. Others are position only; **NMR**: No matching WMO ID record, though drifter should have been on GTS; **DBL**: WMO ID was de-allocated before launch, indicating that a previous Argos PTT of the same number existed

	ARGOS-Id#	WMO ID	Deployment	Latitude	Longitude
ANT XIV/2	9803		15.01.1999	-54.7522	0.3527
	9802		15.01.1999	-55.6168	-0.92667
	9835		16.01.1999	-58.6433	0.00333
	9665		20.01.1999	-70.3752	-9.482
	9782		23.01.1999	-70.2633	-11.24343
	9834		23.01.1999	-70.4998	-11.4925
	9667		29.01.1999	-75.1204	-47.1615
	9831		30.01.1999	-75.2664	-51.59023
	8069		01.02.1999	-75.4458	-55.153
	9832		5.2.1999	-75.3245	-52.83183
	8057		1.3.1999	-70.3635	-10.226
ANT XVII/2	14956		18.1.2000	-69.1680	-4.948
	9803		18.1.2000	-69.8010	-4.758
	9835		18.1.2000	-69.7370	-6.163
	14954		20.1.2000	-70.1520	-7.931
	14959		1.2.2000	-68.4010	-10.828
	14961		1.2.2000	-68.5730	-9.633
	9802		7.2.2000	-69.7240	22.128
	14958		8.2.2000	-69.1330	16.461
	9372		16.2.2000	-66.1850	16.7

	ARGOS-Id#	WMO ID	Deployment	Latitude	Longitude
ANT XVIII/3	25719		14.12.2000	-66.2830	-4.4902
	25926		14.12.2000	-66.3630	-4.386
	25649		14.12.2000	-66.9668	-5.7828
	25887		15.12.2000	-69.6668	-6.4325
	25827		15.12.2000	-69.7825	-6.0022
	25650		17.12.2000	-69.9827	-9.4242
	25886		17.12.2000	-69.9943	-7.9763
	25718		17.12.2000	-70.3487	-7.8227
	14957		19.12.2000	-69.4800	-5.2938
	25826		21.12.2000	-68.4505	-0.8335
	25925		22.12.2000	-66.9042	-0.1872
ANT XIX/2	8067	71545	12.12.2001	-69.7100	-6.885
	9366		27.1.2001	-68.7397	0.0985
	9367		4.1.2002	-71.0048	-41.8783
	9832		7.1.2002	-68.9613	-56.182
	9665		7.1.2002	-68.6117	-55.9917
	8068	71546	9.1.2002	-68.1145	-55.792
	8057		9.1.2002	-68.0092	-56.6225
	8066	71544	10.1.2002	-67.2165	-55.246
	8061		11.1.2002	-66.8923	-52.3055
	9831		15.1.2002	-66.3443	-54.1197
ANT XX/2	9360	DBL	11.12.2002	-65.9525	-2.4815
	14959		13.12.2002	-70.3480	-8.3407
	14958		13.12.2002	-70.2268	-7.9500
	14960		14.12.2002	-70.2772	-9.6642
	14956		16.12.2002	-69.1008	0.4968
	8056	63661	18.12.2002	-66.1207	0.4132
	14955		19.12.2002	-64.8682	0.2828
	9835	NMR	23.12.2002	-64.0222	8.2837
	14954		29.12.2002	-69.1830	22.5340
	14961		29.12.2002	-69.4012	21.5782

Table 2: Summary of iceberg deployments in 2003

Argos ID	WMO ID	Deployment date	Latitude	Longitude	Length x Width x Freeboard (m)	P-Sensor
9360	DBL	11.12.2002	65° 57.15' S	2° 28.89' W	200 x 200 x 26	Yes
14959		13.12.2002	70° 20.88' S	8° 20.44' W	1600 x 750 x 40	
14958		13.12.2002	70° 13.61' S	7° 57.00' W	380 x 380 x 25	
14960		14.12.2002	70° 16.63' S	9° 39.85' W	380 x 380 x 40	
14956		16.12.2002	69° 06.05' S	0° 29.81' E	380 x 380 x 20	
8056	DBL	18.12.2002	66° 07.24' S	0° 24.79' E	180 x 180 x 10	Yes
14955		19.12.2002	64° 52.09' S	0° 16.97' E	180 x 150 x 50	
9835	NMR	23.12.2002	64° 01.33' S	8° 17.02' E	200 x 100 x 15	Yes
14954		29.12.2002	69° 10.98' S	22° 32.06' E	1000 x 300 x 30	
14961		29.12.2002	69° 24.07' S	21° 34.69' E	300 x 300 x 35	

REPORT BY THE INTERNATIONAL BUOY PROGRAMME FOR THE INDIAN OCEAN (IBPIO) - 2003

1. INTRODUCTION

The International Buoy Programme for the Indian Ocean (IBPIO) 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. More specifically, the IBPIO supports 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 the research activities of participating institutions.

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

There are presently seven organisations formally participating in the IBPIO:

- Commonwealth Bureau of Meteorology (BoM), Australia;
- Global Drifter Center of NOAA/AOML (GDC), USA;
- Météo-France;
- National Institute of Oceanography (CSIR/NIO), India;
- National Institute of Ocean Technology (DoD/NIOT), India;
- Navoceano, USA;
- South African Weather Service (SAWS).

2. PROGRAMME MEETINGS

The seventh Programme Committee meeting of the IBPIO was to be held in La Reunion in October 2003, however this meeting was cancelled when several participating organisations advised they would be unable to attend due to budget constraints or other travel restrictions. It is now envisaged that IBPIO-VII will be held in conjunction with DBCP-XX in October 2004. The sixth Programme Committee meeting of the IBPIO, as reported at DBCP-XVIII, was held in conjunction with the ninth Programme Committee meeting of the International South Atlantic Buoy Programme (ISABP) in Cape Town, South Africa, from 31 July to 2 August 2002.

3. OPERATIONAL PROGRAMME

3.1 Drifting buoys

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	68	56	1	4	2	5	**136**
1999-00	48	48	4	3	0	2	**105**
2000-01	48	27	0	5	3	0	**83**
2001-02	30	64	4	6	1	0	**105**
2002-03	20	62	1	2	2	1	**88**

Table 1. Number of drifting buoys deployed in IBPIO according to their type (period of reference: 1st Sept. to 31st Aug.)

As shown in table 1, 88 drifting buoys were deployed between September 2002 and August 2003, with 94% being Lagrangian drifters and 76% measuring air pressure (AP).

Participants in IBPIO contribute to the programme in various ways: the provision of buoys (BoM, GDC, Météo-France, Navoceano and NIO); the funding of barometer upgrades to SVP drifters provided by GDC (BoM and Météo-France); deployment arrangements (all); co-ordination (Météo-France) and data transmission (Météo-France and SAWS).

Many of the deployments in 2002/03, as in previous years, were carried out by research vessels and ships of opportunity plying the Indian Ocean from ports including: Fremantle (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 Island from Australia; Amsterdam, Kerguelen and Crozet Islands from La Reunion; and Marion Island from South Africa. 17% of the buoys were air deployed by Navoceano over the past 12 months (cf. table 2).

Year	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03
Ship	54	27	116	75	54	61	73
Air	26	16	20	30	29	44	15
% Air	33%	37%	15%	29%	35%	42%	42%
Total	**80**	**43**	**136**	**105**	**83**	**105**	**88**

Table 2. Number of drifting buoys deployed in IBPIO According to their way of deployment (period of reference: 1st Sept. to 31st Aug.)

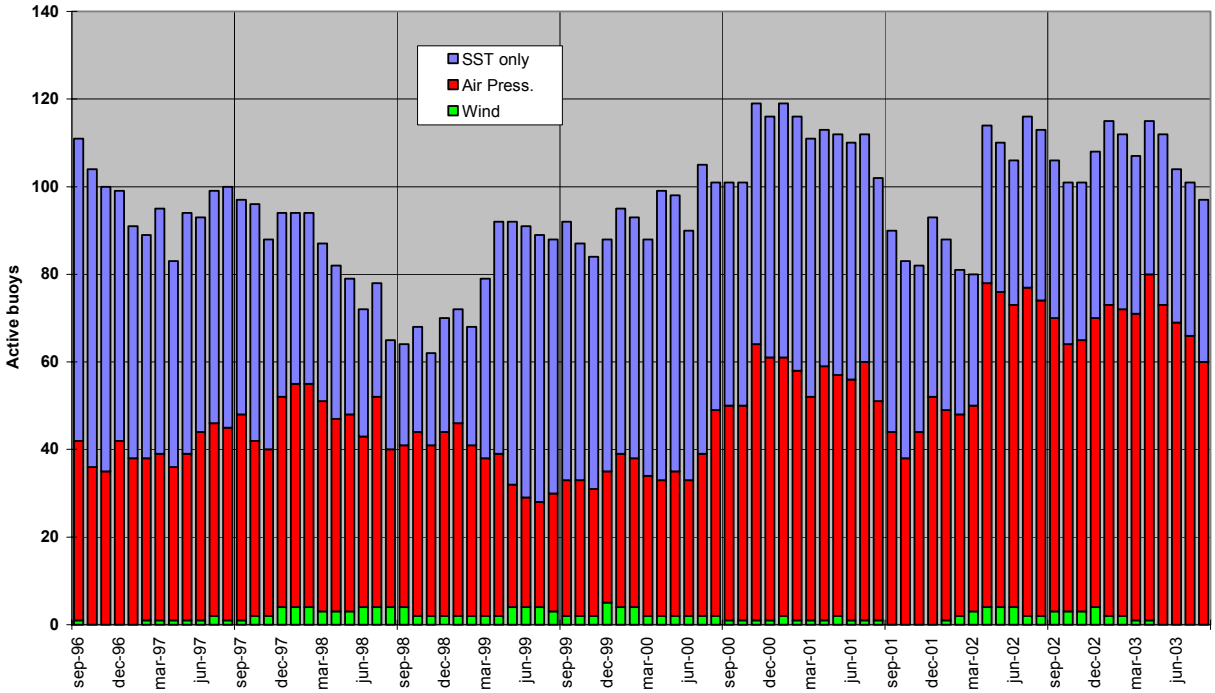


Figure 1. Number of drifting buoys operating in IBPIO according to the parameters they measure

The number of operating buoys providing AP measurements remained higher than 60 over the past 17 months. This is due to the deployment of more than 60 SVP-B drifters in each of the past two years, including 20 drifters provided by Navoceano in the Arabian Sea and the Gulf of Bengal in April 2002, plus barometer upgrades regularly funded by BoM and Météo-France.

The number of buoys measuring SST only - in addition to their position – continued to decrease, and the number of drifting buoys reporting wind measurements dropped to zero.

During the period from September 2002 to August 2003, nineteen buoys owned by SAWS or GDC migrated from the South Atlantic Ocean to the Indian Ocean. In contrast, the number of buoys that escaped to the south of Australia remained stable at seven during the same period. Most of these escaping buoys were deployed near the SE boundary of IBPIO. The Indian Ocean benefits from a natural convergence that directs the buoys coming from the South Atlantic to the middle of the South Indian Ocean.

Owner	SST only	Air Pressure	Wind
Australian Bureau of Meteorology	1	13	-
Global Drifter Center	33	34	-
Météo-France	-	4	-
National Institute of Oceanography	1	6	-
Navoceano	1	3	-
South African Weather Bureau	-	-	-
Other	1	-	-
Total	**37**	**60**	**0**

Table 2. Operating drifting buoys by the end of August 2003

All drifting buoys use the Argos system to report their data. Most are fitted with the DBCP-M1 format or, on more recent buoys, the DBCP-M2 format. These formats significantly increased 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 meteo-oceanographic moored buoys in Indian waters. Plans exist to extend the Indian Moored Buoy Programme from 12 to 20 stations in co-operation with the Indian Climate Research Programme (ICRP) and the India Meteorological Department (IMD). Data transmission is presently ensured thanks to the Inmarsat system but could use the Insat geostationary satellites in the future. 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 IBPIO participants are regularly informed about the operation of two TRITON buoys by the Japan Marine Science and Technology Center (JAMSTEC). These buoys were first deployed in the eastern tropical Indian Ocean in November 2001 (5°S – 95°E and 1.5°S – 90°E). WMO ids are 53056 and 53057 respectively. There have been no data reported from buoy 53056 since May 2003. Buoy 53057 was replaced in July 2003.

4. PLANS

IBPIO participants are constantly encouraged to increase their contributions of buoys, or to fund barometers to equip SVP drifters provided by GDC. Météo-France and BoM have funded barometer upgrades in the Indian Ocean since 1996 and 2000 respectively.

4.1 Tropical regions

Efforts are mainly aimed at filling data gaps in the tropical regions, primarily during the cyclone seasons. In the southern tropical area, the air deployment of SVP-B drifters by Navoceano, typically during November each year, is expected to continue. These buoys are provided by NOAA/GDC and routinely include 10 barometer upgrades funded by Météo-France. Further east, the BoM plans to deploy 8 drifting buoys to the northwest of Australia. NIO plans to continue to provide and deploy drifters in the Arabian Sea and in the Gulf of Bengal.

IBPIO participants are following with interest the possible development of a moored buoy array (I-MAP) in the western part of the Tropical Indian Ocean as part of the Western Indian Ocean Marine Applications Programme (WIOMAP). WIOMAP is a regional contribution to the GOOS in the Western Indian Ocean.

4.2 Southern seas

In the southern part of the Indian Ocean, the deployment of SVP-B drifters provided by GDC and upgraded by BoM (8 units per year) and Météo-France (5 units per year) should continue. These deployments will be supported by the RV Marion Dufresne during her rotations between La Reunion, Crozet, Kerguelen and Amsterdam Islands. The BoM, GDC, Météo-France and SAWS will also provide their own buoys that will be deployed from Cape Town (SA Agulhas), Fremantle (Japanese research vessel, RV Shirase), Hobart (Antarctic resupply vessels, RSV Aurora Australis and RV Southern Supporter) and La Reunion (RV Marion Dufresne).

As in previous years, the GDC remains the biggest contributor to the IBPIO. Many drifters are standard SVP which only measure SST in addition to the surface current deduced from their movement. 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 trajectories and deployment log. Buoy status tables are updated less frequently. Data availability charts will be soon replaced by observation density maps as presented on figure 3.

A promotional leaflet on the IBPIO can be obtained from the Chairman or the Programme Co-ordinator.

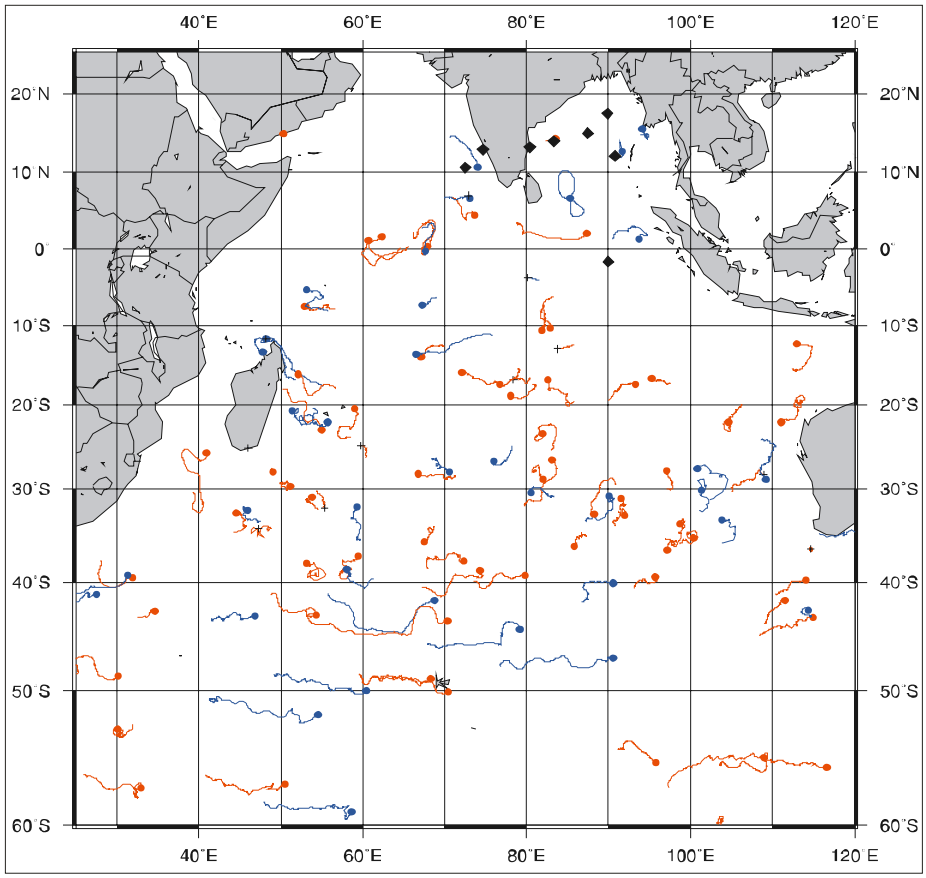


Figure 2. Buoys drifting in the Indian Ocean (August 2003)

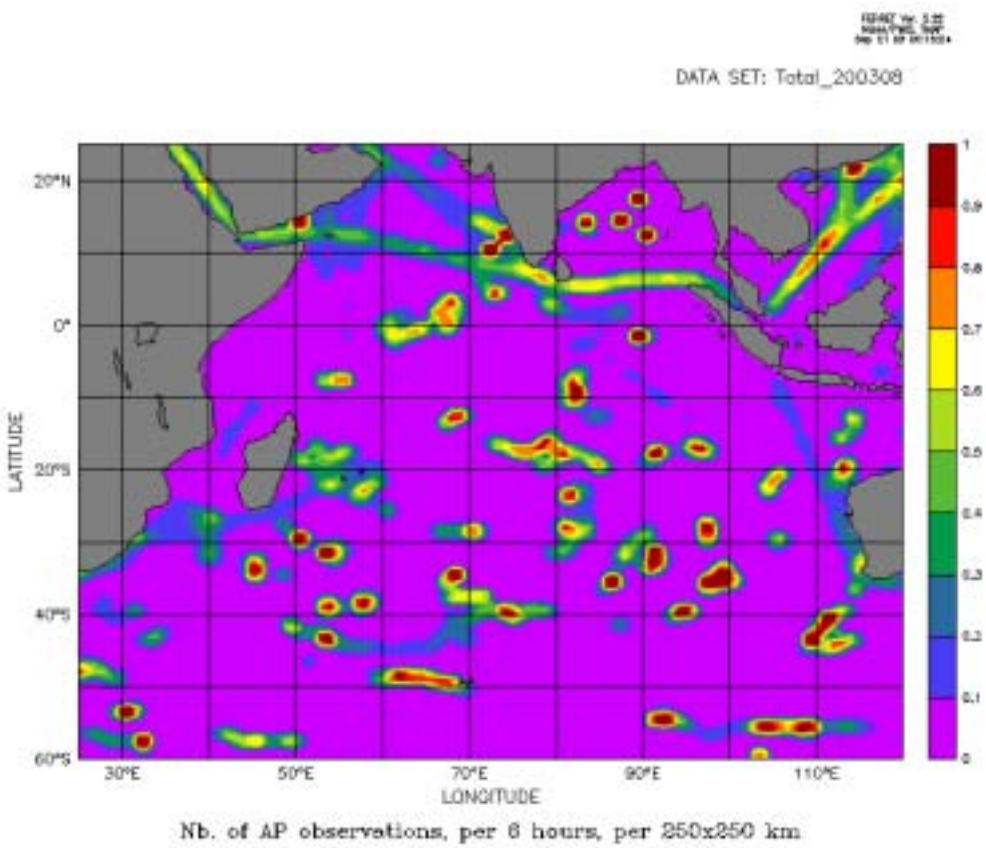


Figure 3. Density of mean sea level pressure observations in the Indian Ocean from buoys and ships for August 2003.

The unit is the mean number of observations each six hours per 250 km x 250 km square.

Note: Only one observation per platform in each six-hour period was used to compute the mean values. All mean values exceeding 1.0 were reduced to 1 in accordance with the mapping criteria.

INTERNATIONAL SOUTH ATLANTIC BUOY PROGRAMME

Report to the 19th Session of the Data Buoy Cooperation Panel

Angra dos Reis, Rio de Janeiro, Brazil, 20-24 October 2003

1. INTRODUCTION

The International South Atlantic Buoy Programme (ISABP) was established in 1993 at 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 participate in the program:

- Servico Meteorologico Nacional — Rep- Argentina
- Servico de Hidrografia Naval — Rep- 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 (Navoceano) — USA
- Caribbean Meteorological Organisation — Caribbean
- Meteo-France — France
- 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

There will be no meeting during 2003. Tentatively the ISABP X meeting will take place in Niteroi, Rio de Janeiro, Brazil towards the middle of 2004. This will be finalized during the DBCP XIX meeting.

The Programme Committee is, Alaor Moacyr Dall' Antonia, Brazil - chairman, Ariel Troisi, Argentina - vice-chairman and Louis Vermaak, South Africa - Programme Co-ordinator.

4. OPERATIONAL PROGRAMME

4.1 DATA COVERAGE IN THE ISABP AREA

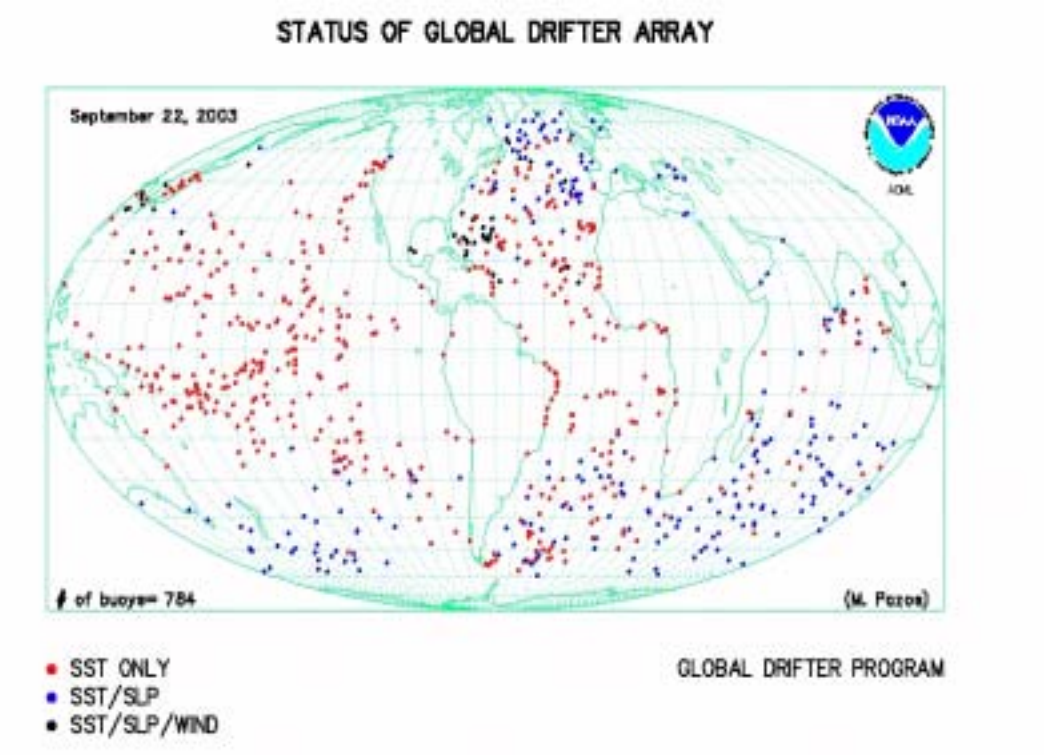


Figure 1. GLOBAL ARRAY OF DRIFTERS

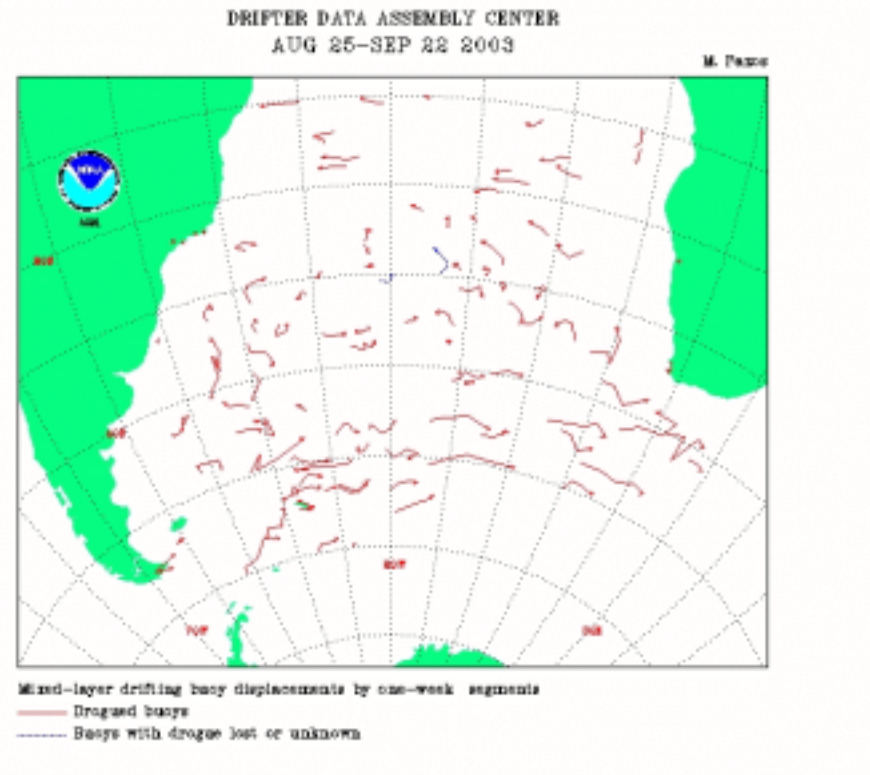


Figure 2. TRAJECTORIES IN THE SOUTH ATLANTIC OCEAN

The data coverage is good south of 20S and north of 10N with a good array of barometer drifters in the South Atlantic Ocean. There has been a increase in the array off the West Coast of Africa towards the Gulf of Guinea and also off the South

4.2 DRIFTING BUOYS

Figure 3 shows the deployments since 1997 between 1st Sept to 31st August

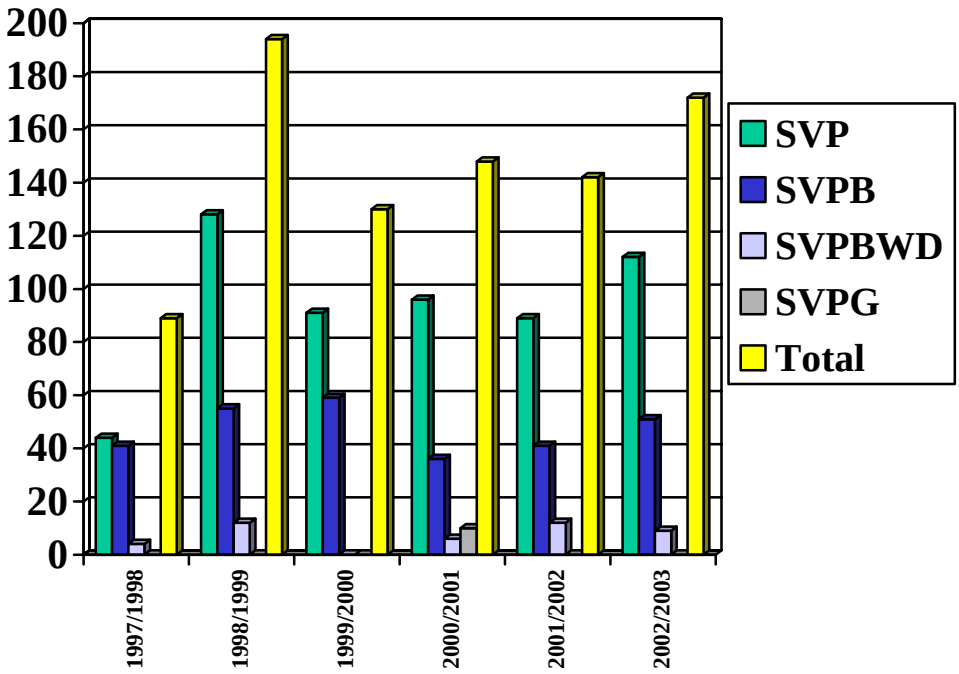


Figure 3 Number and type of drifting deployed in ISABP 1997 – 2003 (period 1st Sept to 31 Aug)

The majority of these deployments were done from research vessels, commercial vessels operating in the Tropical Atlantic, voyages between USA and South Africa, while the deployments in the Southern Oceans were done from the supply vessel that sail to Antarctica. USA Navy air deployed 10 drifters.

These deployments were successful largely due to the co-operation between the USA, South Africa, Brazil, Argentinaa and UKMO. Participants contributed in provision of buoys, funding of barometer upgrades provided by GDP.

Figure 4 shows how these deployments were done since 2000.

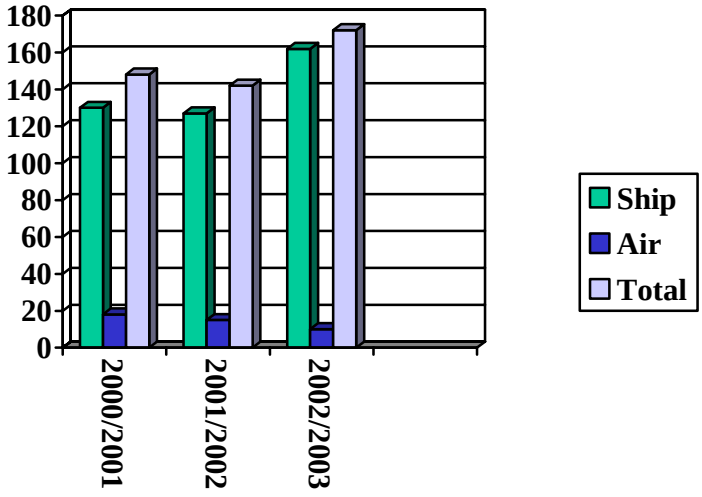


Figure 4 Number of drifting buoys deployed according to the way of deployment

4.3 FIXED STATIONS

There are fixed stations on virtually all the island stations in the ISABP area.

On Southern Thule and Tristan da Cunha the South African Weather Service has anchored drifting buoys and is providing valuable pressure data. Automatic weather stations are operated on the other fixed stations.

Meteo-France and Brazil is also involved in the maintenance of the PIRATA array in the Tropical Atlantic, while Brazil also maintains 1 moored buoy off the east coast of Brazil.

5. DATA RECEPTION AND DISSEMINATION

The South African Weather Service is operating two LUT's on Gough and Marion Islands, however software support is very crucial. Various State Departments with Telkom and the Weather Service are still negotiating to improve the communication from the Islands. The Argos LUT at Cape Town is however operating well.

According to Argos Inc there has been some progress made with the LUT on the Falklands/Malvines and we hope this will come to a conclusion.

6. DATA QUALITY CONTROL

Buoy program operators are encouraged to make use of quality control processes that are available on various web pages and to act on any anomalies as soon as possible. Incorrect data is affecting weather forecasts but also the Numerical models.

7. FUTURE PLANS

The ISABP participants are encouraged to increase their contributions of buoys, especially in the sub-Tropical region and in the Southern Oceans and to fund barometer upgrades provided by GDP. The South African Weather Service is upgrade 24 SVP drifters for deployment in the Southern Oceans and NOAA/GDP providing 15 SVPB drifters.

7.1 TROPICAL REGIONS

In the Tropical region GDP will play the major role in deploying drifters to primarily provide data in the hurricane season, while Navoceano will also assist with air deployments in this region. The majority of the deployments will be by ships of opportunity.

In the sub-Tropical region, Brazil will continue to maintain a network of drifters off the east coast and the moored buoy. GDP with assistance from The South African Weather Service will deploy some drifters from South Africa up the west coast of Africa to the Gulf of Guinea.

7.2 SOUTHERN OCEANS

The major role players in this region is GDP, Navoceano and the South African Weather Service. The South African Weather Service with GDP will continue to deploy SVPB drifters in SOBP area of interest, that is 40S. The majority of deployments will be done from the SA Agulhas on its voyage to Gough Island and Antarctica.

8. INFORMATION ON THE ISABP

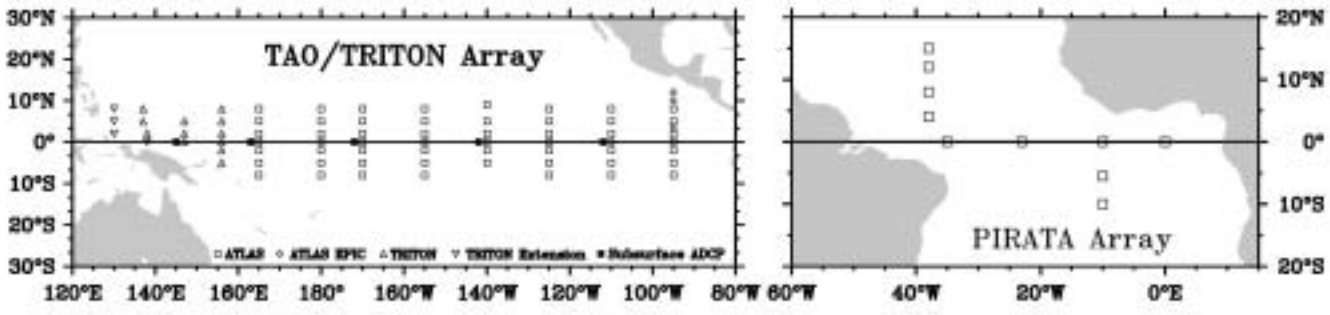
ISABP information is available at: http://dbcp.noaa.gov/isabp. The pages, regularly updated give a description of the programme, its objectives, lists of participants and meeting reports. Links to other sites can also be obtained.

TROPICAL MOORED BUOY IMPLEMENTATION PANEL (TIP)
Report to the 19th Session of the Data Buoy Cooperation Panel
Angra dos Reis, Brazil, 20-24 October 2002

The TAO/TRITON (Tropical Atmosphere Ocean/Triangle Trans-Ocean Buoy Network) moored buoy array is a central component of the ENSO Observing System, deployed specifically for research and forecasting of El Niño and La Niña. Most recently, TAO/TRITON data were valuable for tracking a moderate intensity El Niño in 2002-2003. Though not as strong as the 1997-98 El Niño, the most recent warm event had significant impacts on patterns of weather variability worldwide. At present (September 2003), conditions in the tropical Pacific were near normal.

The present composition of TAO/TRITON consists of 55 ATLAS moorings maintained by PMEL (Pacific Marine Environmental Laboratory), 12 TRITON moorings maintained by JAMSTEC (Japan Marine Science and Technology Center), and 5 subsurface ADCP (Acoustic Doppler Current Profiler) moorings (4 maintained by PMEL and 1 by JAMSTEC). In addition to the core moorings of the area, there are several moorings deployed as enhancements. Among those presently deployed are 4 TRITON moorings in the far western tropical Pacific along 130EE and 137EE, and 2 TRITON moorings in the eastern Indian Ocean. Three ATLAS moorings along 95EW (at 12EN, 10EN and 3.5EN) deployed in late 1999 for the Eastern Pacific Investigation of Climate Processes (EPIC) will be removed in October-November 2003.

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



The primary data telemetered in real time from moorings in both the TAO/TRITON and PIRATA Arrays are daily mean surface measurements (wind speed and direction, air temperature, relative humidity and sea surface temperature) and subsurface temperatures. NextGeneration ATLAS moorings provide high temporal resolution (10-min or less record interval) measurements in delayed mode and optional enhanced measurements which include precipitation, short and long wave radiation, barometric pressure, salinity, and ocean currents. At present ATLAS moorings within the TAO/TRITON Array measure salinity and rainfall at 28 sites, short wave radiation at 21 sites, currents at 10 sites, barometric pressure at 13 sites and long wave radiation at 10 sites. TRITON moorings can measure all of the above parameters, with the exception of longwave radiation. ATLAS moorings within the PIRATA array measure the primary meteorological and ocean parameters, plus precipitation, shortwave radiation and salinity sensors.

TAO/TRITON data return remains good, with an overall value for real-time data availability of 86% for the time period 1 August 2002 to 31 July 2003. 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 data return for the same time period was 65%. Moorings in the Gulf of Guinea are in an area of major fishing activity and subsequent data loss data. Other factors contributing to lower data return for

the PIRATA include the relative size of the array (1 mooring loss represents about 1.5% of TAO/TRITON vs. 10% of PIRATA) and the frequency of maintenance cruises; TAO moorings are routinely serviced on a semi-annual schedule, while PIRATA moorings are limited to annual or longer maintenance. A significant portion of data loss from moorings in both basins was due to failures of the subsurface telemetry system, which were caused by both fishing activity and hardware failure. Subsurface data are internally recorded, thus overall data return often increases after moorings are recovered. Recent design modifications have reduced the occurrence of hardware failure.

NOAA is considering the transfer of the TAO portion of TAO/TRITON from PMEL to NDBC. PMEL and NDBC developed two options which were presented to NOAA headquarters in January 2003. In March the NOAA Administrator recommended against immediate transition (Option 1) because specific operational requirements were not defined, the plan was too costly, and the transition was out of context with overall observing system development. Option 2 to develop a strategy for more systematic appraisal of transitions was endorsed. In July 2003 the NOAA Executive Council asked for a new transition plan by 31 October 2003. That plan is currently under development.

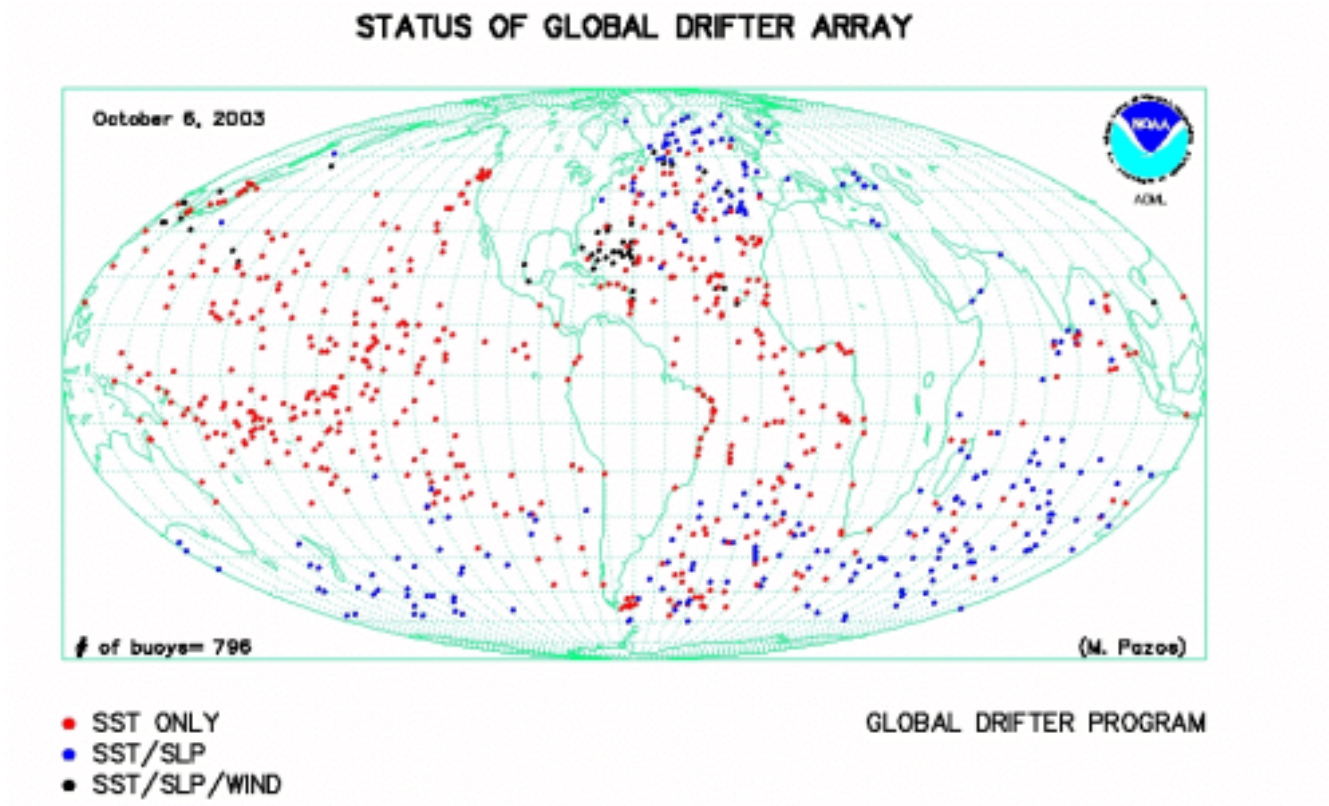
Planning for an Indian Ocean moored buoy array has progressed over the past year. At the IOGOOS meeting in Mauritius in November 2002, representatives from several nations reviewed recent scientific progress, discussed array design concepts and implementation strategies, and produced a summary document on the status of Indian Ocean moored buoy activities. An informal working group of the TIP was formed at the end of the meeting to continue the planning effort. Subsequently, the CLIVAR Asian Australian Monsoon Panel in February 2003 recommended the establishment of an Indian Ocean Panel to guide the design and implementation of a sustained, integrated, ocean observing system in the region. This recommendation was endorsed at the CLIVAR Scientific Steering Group meeting in Victoria, BC in May 2003. Thus, a new Indian Ocean Panel is in the process of being established with sponsorship by CLIVAR, GOOS, and the IOC/WMO Joint Technical Commission for Oceanography and Marine Meteorology (JCOMM). The TIP will work with this new panel (as well as other existing CLIVAR and IOC/WMO panels) to advance the implementation of a moored buoy network in the context of other observing system elements in the Indian Ocean for climate purposes.

Global Drifter Program (GDP) Report to the 19-th Session of Data Buoy Cooperation Panel

By Steve Cook/Craig Engler, NOAA/AOML/GOOS Center

Angra dos Reis, Rio de Janeiro, Brazil 20-24 October 2003

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



Past Work

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

In the Atlantic Ocean 77 SVP drifters have been deployed as of current date. Deployments efforts have been focused on the data sparse areas of the Western Africa, Gulf of Guinea and Angola Basin. A total of 130 SVP drifter buoys were deployed in the pacific. Deployments made by Research Vessels and Voluntary Observing Ships. In the Indian Ocean 27 drift buoys have been deployed. Ten buoys were upgraded with barometers by Meteo-France and air deployed by the Naval Oceanographic Office.

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

In the year 2003, 18 buoys were deployed in the Extra-tropical oceans. Deployments were made from Research Vessels and Voluntary Observing Ships. Two buoys in the Atlantic Ocean were upgraded with barometers. SVP deployments in both the Atlantic and Pacific Oceans were in data sparse regions.

Southern Oceans (60 S – 40 S) Current Status 2003
In the year 2003, 74 drifting buoys were deployed in the Southern Oceans. A total of 59 buoys were upgraded with barometers by co-operative agencies. Deployments made by Research Vessels and Voluntary Observing Ships. There was an increase from the 48 barometer upgrades in 2002. Our appreciation to the many agencies and companies for their contributions to the Global Drifter Program.

2004 Goals

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

NORTH PACIFIC DATA BUOY ADVISORY PANEL (NPDBAP)
Annual Report for 2002/2003
September 18, 2003

Summary of Activities for 2002 - 2003

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

During the period August 2002 to August 2003 an average of 57 drifting buoys deployed in the North Pacific Ocean (30.00N to 65.00N and 110.00E to 110.00W), reported via the Global Communications System (GTS) to the Marine Environmental Data Service (MEDS). Tables 1 and 2 provide information on the inventory of active buoys. As of August 2003, 71 buoys were reporting, 44 with barometric pressure which are shown in bold text in Table 1. Figures 1 to 5 show breakdowns of the number of buoys in operation and the number of messages received during the period. The total number of messages received increased from 19,165 in August 2002 to 29,841 in August 2003, the latest month for which statistics are available. Hopefully, this increase is in part, due to the efforts of the participating members of the NPDBAP. The tables and figures were compiled by MEDS and are available on the new NPDBAP web site.

Meetings

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

There was not sufficient attendance by NPDBAP members to have a meeting during the PICES 11 Annual Meeting in Qingdao, China, October 18 - 26, 2002.

Status of Workplan Action Items for 2002 - 2003

At the initial formative meeting of the Panel, held June 5 - 7, 2002, the following work plan items were identified as being actions the Panel should complete over the next year. The action taken on each item is presented.

1. Work plans for coming year (Deployments, web page, annual report).
   The Panel discussed the urgent items for the coming year, including a strategy to include all the PICES member countries in the work of the Panel. To be effective in this goal, attendance of a Panel representative at the PICES 11 Annual Meeting in Qingdao, China, Oct. 18 - 26, 2002, was recognized as being desirable. The annual DBCP meeting, will be held Oct. 14-18, 2002 in Martinique.

   Action Taken: Brian O’Donnell (North American Co-Chair, NPDBAP) and Ron McLaren (Technical Co-ordinator, NPDBAP) attended the PICES 11 Annual Meeting in Qingdao, China. Presentations were made as per the following descriptions.

2. Electronic Presentation for Poster Session at PICES 11 - Wed. Oct 23rd. 5:30-8:30 PM
   Participation in this event is seen as important to expand the participation in the work of the Panel. To achieve this goal, under the direction of the Panel Co-Chair, the Technical Coordinator of the Panel will: Design and implement an electronic poster presentation on the work of the Panel with assistance from Ms. Estelle Couture (MEDS) and Regional MSC computer support.

   Action Taken: A presentation explaining the progress to date and the objectives of the NPDBAP was created and displayed at the Electronic Poster Session at PICES 11.

There was general interest, however, there were few attendees involved in the deployment of drifting buoys so the presentation was more of academic interest than a recruitment tool.

3. PICES / CLIVAR Workshop PICES 11 - Sun. Oct. 20th.
   Attendance at this session could be of benefit to the Panel
   The Technical Coordinator of the Panel will investigate opportunities to have an NPDBAP representative attend this session.

   Action Taken: We were unable to attend this session due to our attendance at the DBCP meeting held in Martinique the previous week

4. MONITOR Workshop, PICES 11, Monitoring from Moored and Drifting Buoys, Wed. Oct 23rd.
   Attendance at this session could be of benefit to the Panel. The Technical Coordinator of the Panel will investigate opportunities to have an NPDBAP representative attend this session.

   Action Taken: A presentation was made at this session. The presentation described the work of the NPDBAP, the DBCP and provided a technical overview of drifting buoy hardware and communication processes.

5. Annual report of the work of the Panel for presentation to the DBCP and PICES/POC prior to PICES 11. The POC committee meetings will be held on Wed. Oct. 23rd at the PICES 11 Annual Meeting.
   The Technical Coordinator of the Panel will prepare a report on the activities of the Panel for submission to DBCP and PICES/POC.

   Action Taken: An annual report was prepared by Ron McLaren and submitted to the DBCP and PICES/POC prior to PICES 11.

6. Buoy deployments for 2002/2003
   The Technical Coordinator will work with MSC, NDBC and NAVO to determine the deployment locations for the 2002 air drop of SVP-B buoys.

   Action Taken:

   Canada
   The respective groups were consulted and a deployment zone between 40 to 50 degrees north and 160 to 170 degrees west was agreed to. Air deployments were completed by US Naval Oceanographic Office (NAVO) aircraft in September 2002, and May 2003, deploying 14 Canadian SVP-B Buoys (with barometers). An additional 8 Canadian buoys with barometers were deployed by Voluntary Observing Ships (VOS).

   United States
   NDBC arranged the deployment of two Surface Velocity Profilers with Barometers and Wind (SVP-B/WSD) drifting buoys in the Bering Sea in January 2003. Vessels in the U.S. National Weather Service (NWS) Voluntary Observing Ship (VOS) program performed the deployments. NDBC also arranged the deployment of a third SVP-B/WSD drifting buoy in the northern Gulf of Alaska in May 2003 near buoy station 46080 and deployed a prototype Air-Deployed Self-Moored Expendable (ADSMEX) buoy, in the northeast Gulf of Alaska (57.1 N 141.2W) in January 2003. ADSMEX technology consists of a drifting buoy hull and electronics used in the First GARP Global Experiment (FGGE) and the beginning of the Tropical Ocean Global Atmosphere (TOGA) Research Program, combined with an anchor and one-eighth inch (3.175 mm) diameter spectra line mooring system that spools out at deployment.

NAVO air deployed 3 MetOcean SVP-B drifters in the Sea of Japan in April (and 3 Argo-equivalent floats at the same locations). WMO numbers and positions follow: 21571/36 55N 130 65E 21572/38 37N 129 57E 21573/38 04N 131 06E

Japan
The Japan Meteorological Agency (JMA), Japan Coast Guard (JCG), Japan Marine Science and Technology Center (JAMSTEC), Tohoku University and National Institute of Polar Research (NIPR) deployed a total of 162 buoys (surface drifting buoy 23; profiling float 121; mooring TRITON 18) in the areas of around Japan, Japan Sea, the western North Pacific, tropical Pacific, south Pacific, Indian Ocean, Southern Ocean, Arctic Ocean and Antarctic Ocean. for oceanographic research and operational purposes. Approximately 21 of these buoys were deployed in the seas surrounding Japan and the Western North Pacific Ocean. The data are distributed on the GTS, with the header from "SSVB01 RJTD" to "SSVB19 RJTD".

7. Web Page

Paul Moersdorf offered to host the NPDBAP web site at the NDBC facilities at Stennis Space Centre. Ron McLaren with the help of Estelle Couture agreed to start building the web site.

Action Taken: The Web page was completed and can be found at: http://npdbap.noaa.gov. The web site explains the goals of the NDDBAP, Operating Principles, Membership Information and provides access to MEDS for buoy data. I would like to thank Cara Schock and Estelle Couture at MEDS, and Cheryl Demers and Steve Collins at NOAA/NDBC for their work in creating the page. I'd also like to thank Dr. Paul Moersdorf, National Data Buoy Centre, for offering to host the web site. Minor changes will be made over the next few months to include the Meteorological and Oceanographic web site links of the member countries.

The NDBC web page also displays NPDBAP drifting buoy data for the Eastern North Pacific in real time. (http://www.ndbc.noaa.gov). See Figure 6 and 7 for sample pages from the NPDBAP and NOAA web sites.

Overview of Plans for 2003 - 2004

A meeting of the NPDBAP is scheduled On October 11, 2003, in conjunction with The North Pacific Marine Science Organization (PICES) Twelfth Annual Meeting to be held October 10-18 at the Conference Hall of the Mayfield Hotel, Seoul, Korea. Initial response to the meeting announcement has not been encouraging, and it is expected that another “ad hoc” meeting of the Panel will be held in conjunction with the DBCP meeting which will be held in Angra dos Reis – Rio de Janeiro, Brazil, from October 20 to 24 , 2003.

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

Deployments and New Initiatives for 2003 - 2004

United States
In 2004 NDBC will fund barometer upgrades to 40 SVP-B drifting buoys that will be deployed for the Global Drifter Program (GDP) in the North Pacific. In addition to benefiting GDP research goals, the measurements from the buoys will be useful for better defining surface pressure fields for operational meteorological models used for North America. NAVO has plans to deploy up to 21 SVP-B drifters in the East China Sea/Yellow Sea area for next fiscal year.

Japan

JMA, JCG, JAMSTEC, Tokai University and NIPR plan to deploy in 2004 a total 148 buoys (surface drifting buoys 25; profiling floats 105; moorings TRITON 18). These buoys are scheduled to be deployed in the areas of around Japan, Japan Sea, the western North Pacific, tropical Pacific, south Pacific, Indian Ocean, Southern Ocean, Arctic Ocean, Antarctic Ocean and Okhotsk Sea for oceanographic research and operational purposes. Approximately 24 of these buoys will be deployed in the seas surrounding Japan and the Western North Pacific Ocean.

Canada
Canada will be deploying 6 to 12 SVP-B drifting buoys over the next year, by airdrop in co-operation with NAVO or by VOS vessels. Additionally, up to 10 barometer upgrades will be funded for deployment by the Global Drifter Program (GDP) in the North Pacific.

Reports for North Pacific Drifting Buoys (August 2002 – July 2003)
(30.00N to 65.00N and 110.00E to 110.00W)

Table 1. Monthly statistics of the number of drifting buoys reporting on the GTS and the number of messages archived at MEDS from these buoys

Year	Month	# Messages	# Buoys	Avr_Obs_per_buoy
2002	08	19165	53	361.60
2002	09	19897	57	349.07
2002	10	20922	57	367.05
2002	11	19448	53	366.94
2002	12	20178	52	388.04
2003	01	20015	50	400.30
2003	02	16974	52	326.42
2003	03	19733	49	402.71
2003	04	20304	52	390.46
2003	05	24101	60	401.68
2003	06	26992	65	415.26
2003	07	30324	65	466.52
2003	08	29841	71	420.30

Table 2. Buoy Inventory as of Sep. 17, 2003

Marine Environmental Data Service • Service des données sur le milieu marin

Drifting Buoy Inventory / Inventaire des bouées dérivantes

CODE	Parameter	Paramètre
SST	Sea surface temperature	Température de la surface de la mer
ATM	Atmospheric pressure at sea level	Pression atmosphérique à la surface de la mer
WSP	Wind speed	Vitesse du vent
WDI	Wind direction	Direction du vent
DRY	Air temperature	Température de l'air
ATP	Atmospheric pressure tendency	Tendance de la pression atmosphérique
DRD	Depth of drogue	Profondeur de la drogue
SCS	Surface current speed	Vitesse de la dérive
SCD	Surface current "flow toward" direction	Direction de la dérive "en direction vers"

IDENT.	TOT. OBS.	DATE FROM/DE	DATE TO/À	LATITUDE	LONGITUDE	PARAMETERS / PARAMÈTRES

IDENT.	TOT. OBS.	DATE FROM/DE TO/À	LATITUDE	LONGITUDE	PARAMETERS / PARAMÈTRES
21533	**709**	**2003/08/01-2003/08/31**	**48.91N-50.26N**	**147.55E-150.07E**	**SST ATM ATP DRD**
21535	**223**	**2003/08/03-2003/08/13**	**30.00N-30.45N**	**142.16E-142.91E**	**SST ATM WSP WDI ATP DRD**
21571	**656**	**2003/08/01-2003/08/31**	**39.55N-41.99N**	**141.58E-142.76E**	**SST ATM ATP DRD**
21572	**706**	**2003/08/01-2003/08/31**	**36.66N-38.58N**	**131.86E-135.37E**	**SST ATM ATP DRD**
21573	**471**	**2003/08/01-2003/08/22**	**38.00N-38.33N**	**131.20E-131.82E**	**SST ATM ATP DRD**
21635	**611**	**2003/08/04-2003/08/31**	**30.00N-33.56N**	**134.62E-140.06E**	**SST ATM WSP WDI ATP DRD**
21677	335	2003/08/01-2003/08/27	40.72N-41.43N	139.73E-140.79E	SST DRD
21906	92	2003/08/04-2003/08/08	40.40N-40.52N	158.10E-159.11E	SST ATM WSP WDI ATP DRD
21907	210	2003/08/04-2003/08/12	40.28N-40.69N	142.70E-144.01E	SST WSP WDI ATP DRD
21908	**830**	**2003/08/01-2003/08/31**	**43.82N-44.61N**	**156.13E-158.89E**	**SST ATM WSP WDI ATP DRD**
21909	**150**	**2003/08/01-2003/08/08**	**43.93N-44.41N**	**157.77E-159.97E**	**SST ATM WSP WDI ATP DRD**
21910	**632**	**2003/08/01-2003/08/31**	**42.20N-43.84N**	**157.05E-160.93E**	**SST ATM WSP WDI ATP DRD**
22905	414	2003/08/01-2003/08/31	39.70N-40.28N	134.68E-138.16E	SST DRD
22907	412	2003/08/01-2003/08/31	35.77N-38.06N	132.28E-137.08E	SST DRD
22908	419	2003/08/01-2003/08/31	35.99N-38.66N	133.99E-138.13E	SST DRD
22909	375	2003/08/06-2003/08/31	31.28N-33.05N	126.12E-127.21E	SST DRD
22911	383	2003/08/06-2003/08/31	33.40N-34.27N	121.76E-123.41E	SST DRD
22912	380	2003/08/06-2003/08/31	33.63N-34.75N	124.59E-125.93E	SST DRD
46508	**11**	**2003/08/20-2003/08/20**	**55.93N-55.95N**	**152.23W-152.10W**	**SST ATM ATP DRD**
46509	**16**	**2003/08/20-2003/08/21**	**55.47N-55.49N**	**152.05W-151.98W**	**SST ATM ATP DRD**
46512	**322**	**2003/08/20-2003/08/31**	**53.60N-54.09N**	**152.01W-151.26W**	**SST ATM ATP DRD**
46516	126	2003/08/01-2003/08/31	32.71N-33.64N	135.03W-132.68W	SST DRD
46518	390	2003/08/01-2003/08/31	44.33N-45.99N	129.53W-128.58W	SST DRD
46531	321	2003/08/01-2003/08/31	30.25N-31.79N	133.17W-130.65W	SST DRD
46532	227	2003/08/01-2003/08/31	32.92N-33.49N	134.73W-133.27W	SST DRD
46533	246	2003/08/03-2003/08/31	59.05N-59.07N	138.39W-138.29W	SST DRD
46551	**558**	**2003/08/01-2003/08/31**	**52.89N-53.96N**	**178.20W-174.04W**	**SST ATM**
46592	404	2003/08/01-2003/08/31	38.15N-40.51N	128.41W-124.68W	SST DRD
46593	408	2003/08/01-2003/08/31	37.16N-37.68N	129.29W-129.10W	SST DRD
46595	434	2003/08/01-2003/08/31	45.29N-46.56N	126.59W-125.37W	SST DRD
46596	431	2003/08/01-2003/08/31	44.86N-45.43N	129.83W-128.20W	SST DRD
46597	439	2003/08/01-2003/08/31	42.87N-43.49N	127.58W-125.98W	SST DRD
46599	417	2003/08/01-2003/08/31	38.98N-40.57N	129.74W-127.58W	SST DRD
46600	427	2003/08/01-2003/08/31	42.47N-42.96N	130.76W-128.14W	SST DRD
46625	425	2003/08/01-2003/08/31	39.40N-41.64N	128.85W-126.13W	SST DRD
46632	**375**	**2003/08/01-2003/08/31**	**48.48N-49.06N**	**169.69W-168.23W**	**SST ATM ATP**
46633	**576**	**2003/08/01-2003/08/31**	**51.16N-51.68N**	**147.58W-146.08W**	**SST ATM ATP**
46634	**560**	**2003/08/01-2003/08/31**	**55.81N-56.92N**	**153.44W-149.10W**	**SST ATM ATP**
46635	**651**	**2003/08/01-2003/08/31**	**44.79N-46.19N**	**129.56W-128.41W**	**SST ATM ATP**
46636	**486**	**2003/08/01-2003/08/31**	**45.32N-46.33N**	**160.54W-158.34W**	**SST ATM DRY ATP**

46637	648	2003/08/01-2003/08/31	53.02N-54.06N	140.90W-138.20W	SST					
46638	**628**	**2003/08/01-2003/08/31**	**38.12N-38.76N**	**134.78W-133.74W**	**SST**	**ATM**			**ATP**	
46639	**512**	**2003/08/01-2003/08/31**	**30.01N-31.80N**	**145.62W-144.57W**	**SST**	**ATM**			**ATP**	
46640	**475**	**2003/08/01-2003/08/31**	**48.56N-49.05N**	**165.78W-164.13W**	**SST**	**ATM**			**ATP**	
46641	583	2003/08/01-2003/08/31	36.83N-38.07N	145.37W-144.28W	SST					
46642	**298**	**2003/08/01-2003/08/15**	**51.83N-52.25N**	**131.34W-130.67W**	**SST**	**ATM**			**ATP**	
46643	**480**	**2003/08/01-2003/08/31**	**44.26N-44.91N**	**162.19W-160.37W**	**SST**	**ATM**			**ATP**	
46651	**410**	**2003/08/01-2003/08/31**	**48.68N-49.04N**	**165.43W-163.55W**	**SST**	**ATM**			**ATP**	
46652	**486**	**2003/08/01-2003/08/31**	**48.69N-49.25N**	**161.41W-159.89W**	**SST**	**ATM**			**ATP**	
46657	**573**	**2003/08/01-2003/08/31**	**53.65N-54.96N**	**157.47W-155.79W**	**SST**	**ATM**			**ATP**	
46660	**643**	**2003/08/01-2003/08/31**	**38.84N-43.95N**	**127.79W-125.49W**	**SST**	**ATM**			**ATP**	
46661	**667**	**2003/08/01-2003/08/31**	**47.44N-49.27N**	**128.82W-127.73W**	**SST**	**ATM**		**DRY**	**ATP**	
46692	**412**	**2003/08/01-2003/08/31**	**46.61N-47.08N**	**166.94W-164.94W**	**SST**	**ATM**			**ATP**	
46695	**596**	**2003/08/01-2003/08/31**	**52.20N-53.47N**	**154.56W-151.14W**	**SST**	**ATM**			**ATP**	
46698	**604**	**2003/08/01-2003/08/31**	**40.80N-41.50N**	**150.65W-148.52W**	**SST**	**ATM**			**ATP**	
46700	**620**	**2003/08/01-2003/08/31**	**47.83N-48.44N**	**137.61W-135.47W**	**SST**	**ATM**			**ATP**	
46701	**450**	**2003/08/01-2003/08/31**	**35.32N-37.11N**	**155.86W-155.38W**	**SST**	**ATM**			**ATP**	
46702	**402**	**2003/08/01-2003/08/31**	**38.94N-39.84N**	**155.88W-153.47W**	**SST**	**ATM**	**WSP**	**WDI**	**ATP**	
46705	**394**	**2003/08/01-2003/08/22**	**30.04N-32.34N**	**132.81W-130.28W**	**SST**	**ATM**			**ATP**	
46707	63	2003/08/01-2003/08/05	42.12N-42.27N	168.33W-167.92W	SST					
46707	**77**	**2003/08/25-2003/08/31**	**42.26N-42.42N**	**167.32W-166.74W**	**SST**	**ATM**			**ATP**	
46710	**391**	**2003/08/01-2003/08/31**	**39.73N-41.26N**	**167.10W-165.55W**	**SST**	**ATM**			**ATP**	
46779	**504**	**2003/08/01-2003/08/31**	**56.57N-57.15N**	**141.40W-140.52W**	**SST**	**ATM**	**WSP**	**WDI** **DRY**		
46780	**242**	**2003/08/01-2003/08/13**	**64.21N-64.52N**	**177.26W-174.96W**	**SST**	**ATM**	**WSP**	**WDI**		
46781	**358**	**2003/08/01-2003/08/31**	**54.23N-54.79N**	**178.66W-177.11W**	**SST**	**ATM**	**WSP**	**WDI**		
46784	**695**	**2003/08/01-2003/08/31**	**53.37N-54.09N**	**170.81W-169.20W**	**SST**	**ATM**	**WSP**	**WDI**	**ATP**	**DRD**
46926	134	2003/08/01-2003/08/31	31.63N-32.44N	153.18W-151.34W	SST					DRD
46981	39	2003/08/01-2003/08/05	30.00N-30.05N	126.75W-126.58W	SST					DRD
51679	89	2003/08/24-2003/08/31	30.00N-30.49N	164.50E-164.68E	SST					DRD
52517	**676**	**2003/08/01-2003/08/31**	**30.45N-31.94N**	**148.79E-149.82E**	**SST**	**ATM**			**ATP**	**DRD**
52519	**10**	**2003/08/31-2003/08/31**	**30.00N-30.02N**	**149.07E-149.14E**	**SST**	**ATM**	**WSP**	**WDI**	**ATP**	**DRD**
52619	423	2003/08/01-2003/08/31	38.69N-40.26N	171.69W-168.38W	SST					DRD

MEDS/SDMM 17/09/2003.

Figure 1. Tracks of drifting buoys for August, 2003

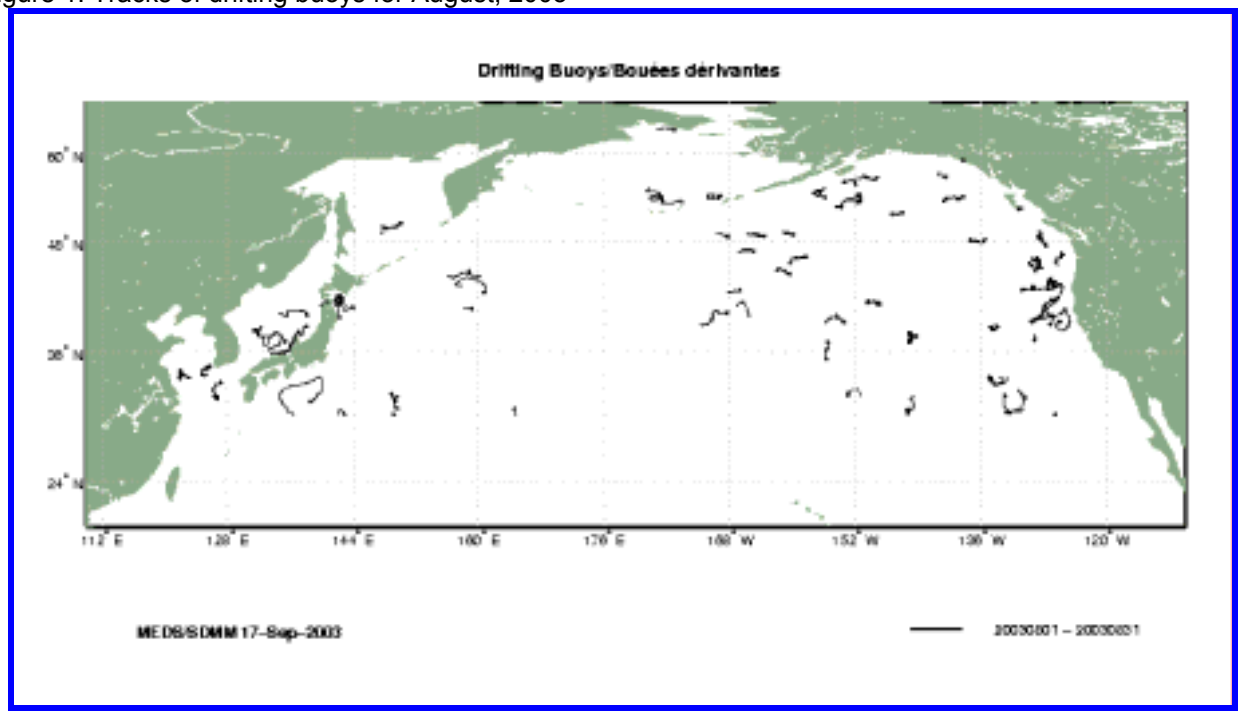


Figure 2. Number of buoys and other platforms reporting in BUOY code in 2002.

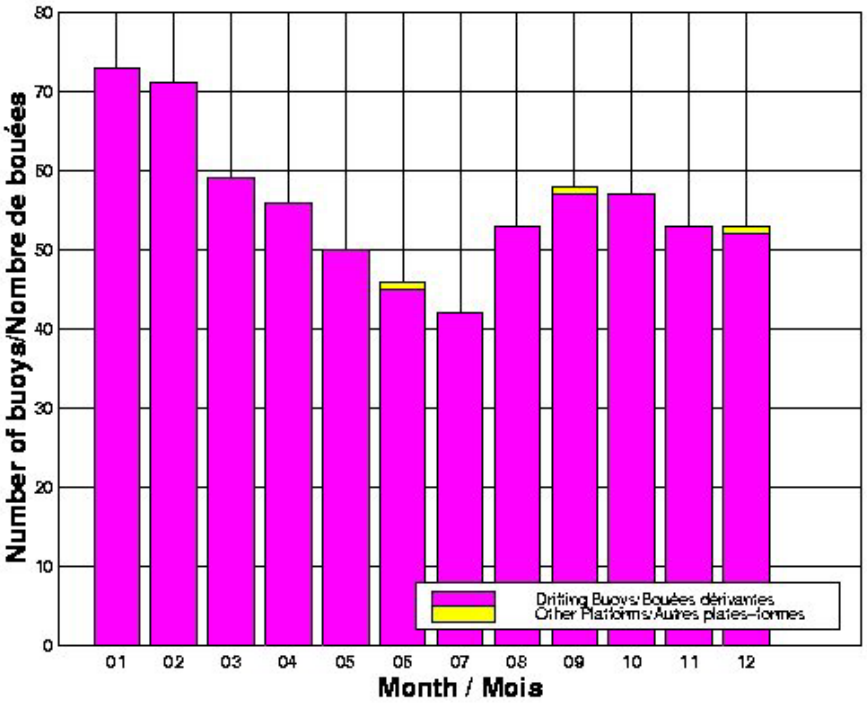
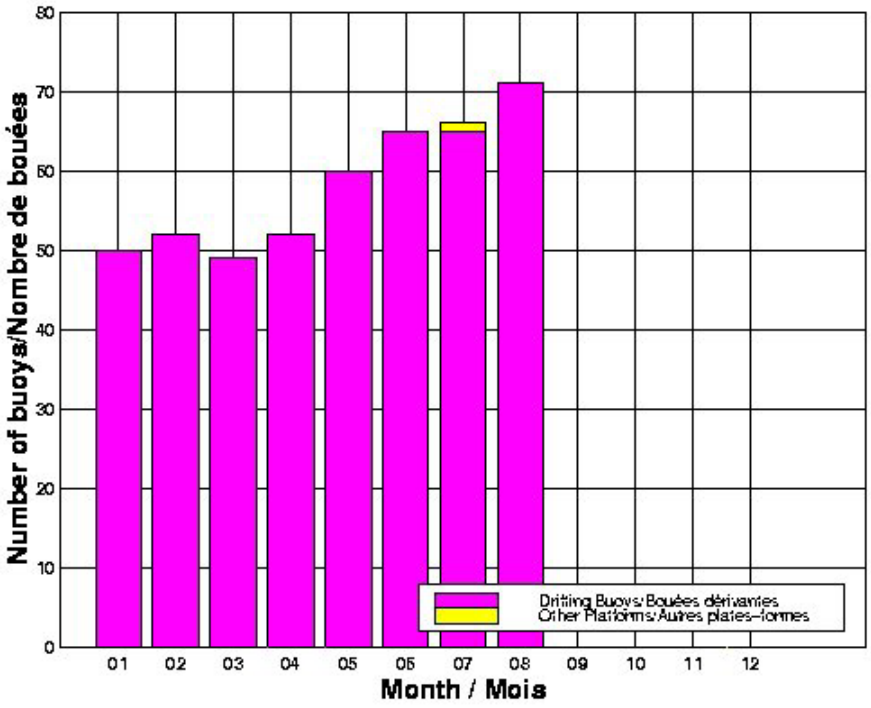
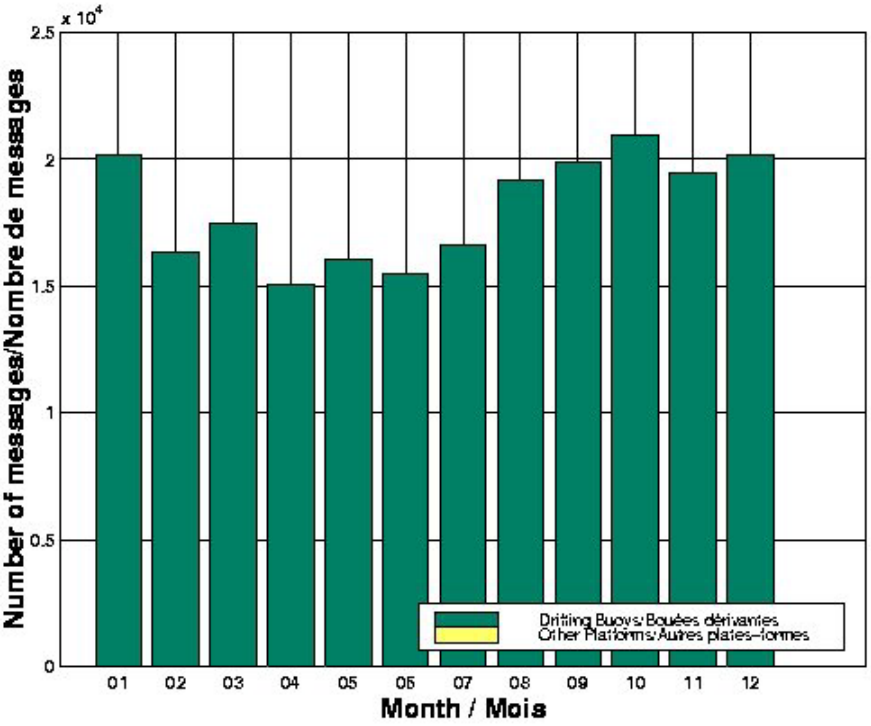


Figure 3. Number of buoys and other platforms reporting in BUOY code in 2003.



2003

Figure 4. Number of GTS messages archived at MEDS from drifting buoys and other platforms reporting in BUOY Code in 2002.



2002

Figure 5. Number of GTS messages archived at MEDS from drifting buoys and other platforms reporting in BUOY Code in 2003.

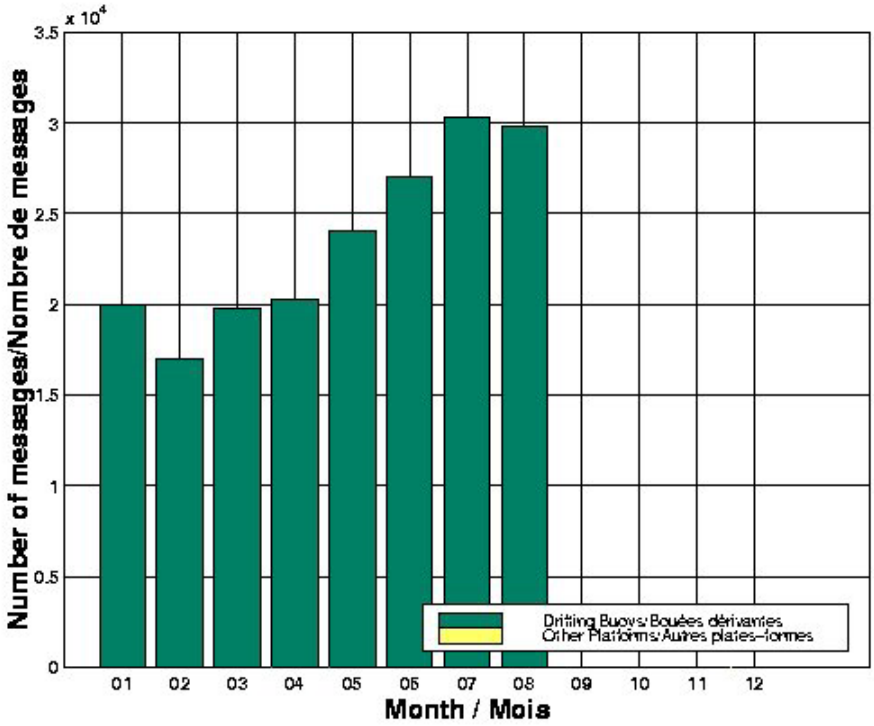
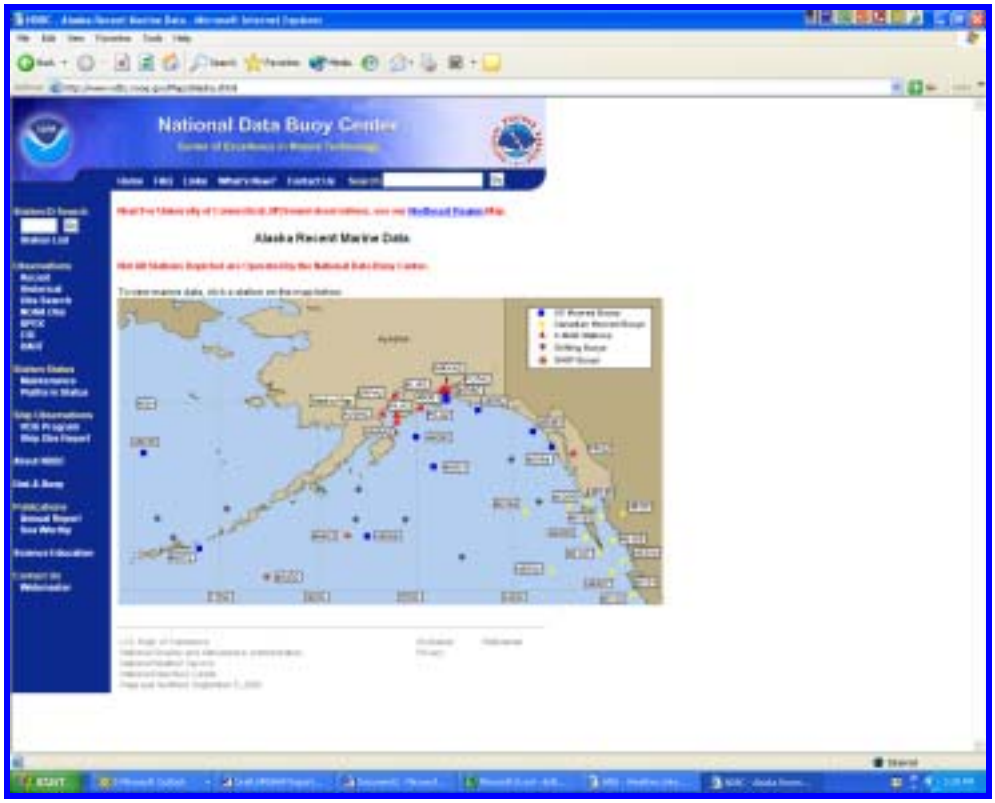


Figure 6. NPDBAP "Overview" Web Page

Figure 7. NDBC North Eastern Pacific Real Time Buoy Data page:



National Reports (Submitted as of September 10, 2003)

Canada

- As of August 31, 2003, there are 25 active Canadian drifters in the North Pacific Ocean (22 SVP-B, 2 SVP-BW and one TOGA). All buoys report sea level pressure, sea surface temperature and wind information, if so equipped. This number increased from 11 active drifters in August of 2002.

- Fourteen Canadian SVP-B buoys were air deployed by the U.S. Naval Oceanographic Office (NAVO) in September, 2002, and May, 2003, between 40 to 50 degrees north and 160 to 170 degrees west. The remainder of the buoys were deployed by Voluntary Observing Ships (VOS) in the same general deployment zone.

- The 2 SVP-BW drifters that reported winds appeared to provide good wind data, although one speed sensor failed after 5 months.

- A listing of drifting buoys in the North Pacific, trajectory maps and data summaries are available from the Marine Environmental Data Service (MEDS), a branch of Canada's federal Department of Fisheries and Oceans (DFO). As part of its role, MEDS acquires, processes, quality controls and archives real-time drifting buoy messages reporting over the Global Telecommunications System (GTS) as well as delayed mode data acquired from other sources. MEDS site: http://www.meds-sdmm.dfo-mpo.gc.ca/alphapro/rnodc/main_npac_e.shtml

- Future plans include the deployment of 6-12 SVP-B buoys over the next year and the upgrading of up to 10 SVP drifters in co-operation with the Global Drifter Program for deployment in the North Pacific.

United States

- NDBC continued to process and distributes data from four (4) profiling floats that were deployed in December 2001.

- NDBC arranged deployment of two Surface Velocity Profiler with Barometer and Wind (SVP-B/WSD) drifting buoys in the Bering Sea in January 2003. Vessels in the U.S. National Weather Service (NWS) Voluntary Observing Ship (VOS) program performed the deployments. All buoys are still returning sea surface temperature, atmospheric pressure and wind data, along with position information necessary to calculate ocean surface currents. The wind speed algorithm used on these buoys is an older version whose accuracy is known to deteriorate when wind speed exceeds approximately 17 meters per second (m/s).

- NDBC arranged deployment of a third SVP-B/WSD drifting buoy in the northern Gulf of Alaska in May 2003 near buoy station 46080. The drifter, loaded with a newer wind speed algorithm proposed by Meteo France, was deployed near the moored buoy in order to compare wind measurements. However, the drifter moved away from the moored buoy too soon to validate that the new wind algorithm provides more accurate observations at higher speeds than those obtained using the original algorithm. Comparison at low speeds was good.

- NDBC deployed a prototype, the Air-Deployed Self-Moored Expendable (ADSMEX) buoy, in the northeast Gulf of Alaska (57.1 N 141.2W) in January 2003. ADSMEX technology consists of a drifting buoy hull and electronics used in the First GARP Global Experiment (FGGE) and the beginning of the Tropical Ocean Global Atmosphere (TOGA) Research Programme, combined with an anchor and one-eighth inch (3.175 mm) diameter spectra line mooring system that spools out at deployment. In this case, the mooring is 12,000 feet (3,660 meters) long. The experiment is to determine whether the ADSMEX concept is suitable as a limited capability replacement to standard moored buoys systems. The applications might include failed moored buoys that cannot be repaired for a long time, targeted seasonal monitoring, and as a quick response monitoring system in the event of a hazardous spill.

- In 2004, NDBC is funding barometer upgrades to 40 SVP-B drifting buoys that will be deployed for the Global Drifter Program (GDP) in the North Pacific. In addition to benefiting GDP research goals, the measurements from the buoys will be useful for better defining surface pressure fields for operational meteorological models used for North America.

- NAVO air deployed 3 MetOcean SVP-B drifters in the Sea of Japan in April (and 3 Argo-equivalent floats at the same locations). WMO numbers and positions follow: 21571/36 55N 130 65E 21572/38 37N 129 57E 21573/38 04N 131 06E. NAVO has plans to deploy up to 21 SVP-B drifters in the East China Sea/Yellow Sea area for next fiscal year.

Japan

- Buoys are operated by various agencies and report SST, Air Pressure, Significant Wave Height and the Period. The data are distributed on the GTS, with the header from "SSVB01 RJTD" to "SSVB19 RJTD".

- In 2003, Japan deployed a total 162 buoys (surface drifting buoy 23; profiling float 121; mooring TRITON 18) in the areas of around Japan, Japan Sea, the western North Pacific, tropical Pacific, south Pacific, Indian Ocean, Southern Ocean, Arctic Ocean and Antarctic Ocean. for oceanographic research and operational purposes by Japan Meteorological Agency (JMA), Japan Coast Guard (JCG), Japan Marine Science and Technology Center (JAMSTEC), Tohoku University and National Institute of Polar Research (NIPR). Approximately 21 of these buoys were deployed in the seas surrounding Japan and the Western North Pacific Ocean.

- In 2004, total 148 buoys (surface drifting buoy 25; profiling float 105; mooring TRITON 18) are scheduled to be deployed in the areas of around Japan, Japan Sea, the western North Pacific, tropical Pacific, south Pacific, Indian Ocean, Southern Ocean, Arctic Ocean, Antarctic Ocean and Okhotsk Sea for oceanographic research and operational purposes by JMA, JCG, JAMSTEC, Tokai University and NIPR. Approximately 24 of these buoys will be deployed in the seas surrounding Japan and the Western North Pacific Ocean.

ANNEX III

REPORTS FROM DATA MANAGEMENT CENTRES

The following pages contain the reports by the:

METEO FRANCE

SOC for Drifting Buoys Report

2002 - 2003

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

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

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

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

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

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

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

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

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

Dr Philippe Dandin

French SOC Representative

DBCP annual report 2002-2003

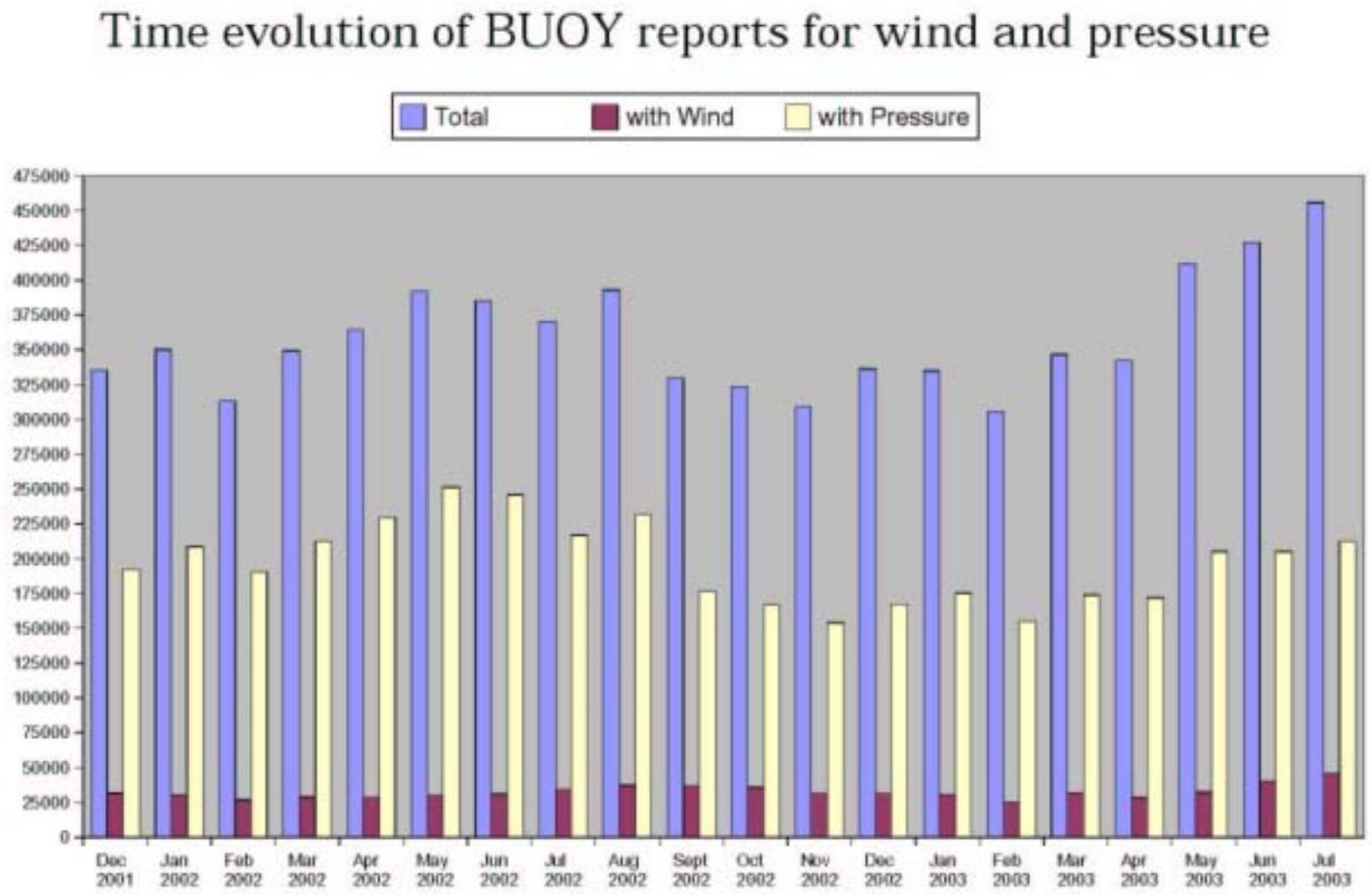


Figure 1

DBCP annual report 2002-2003

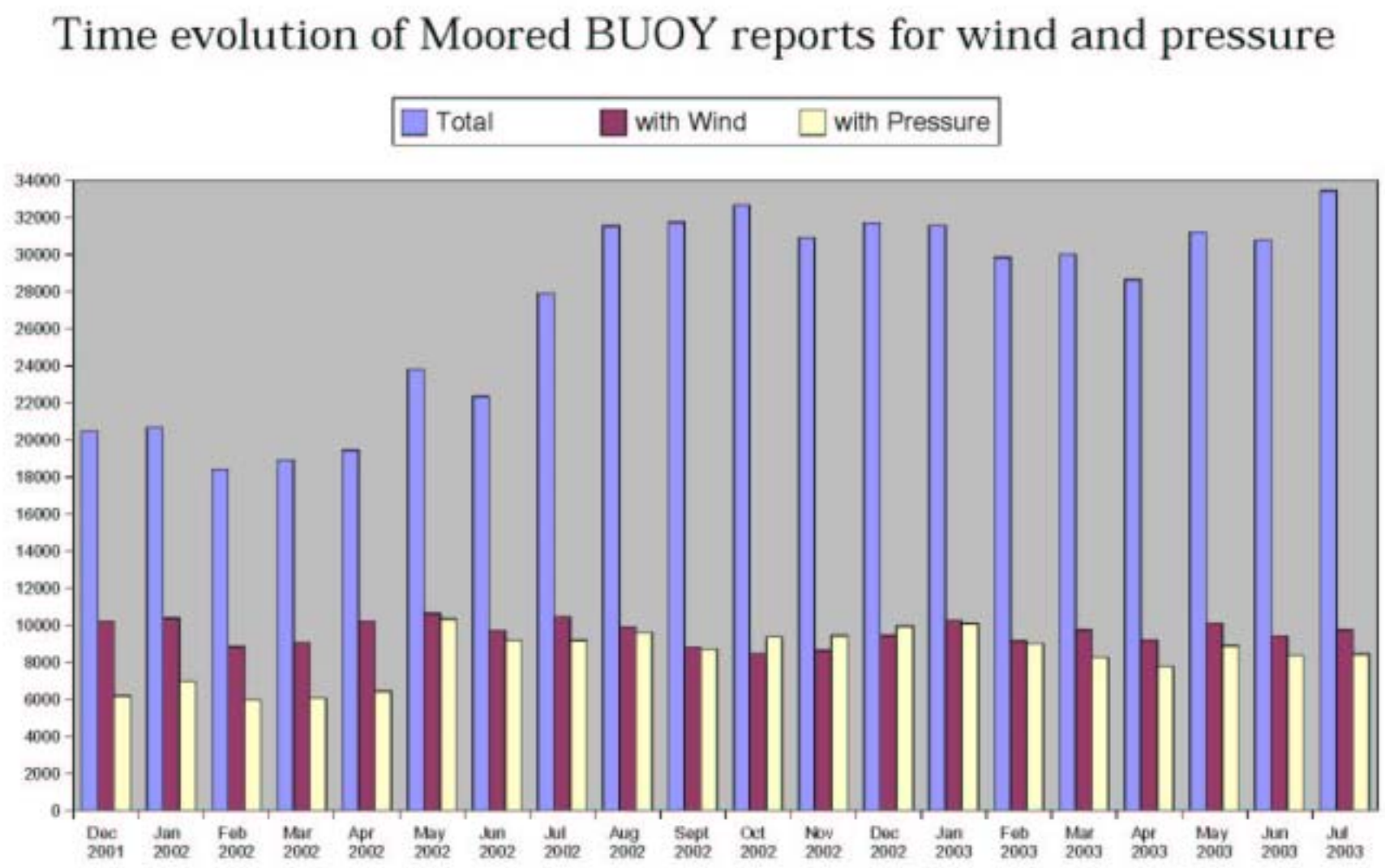


Figure 2

DBCP annual report 2002-2003

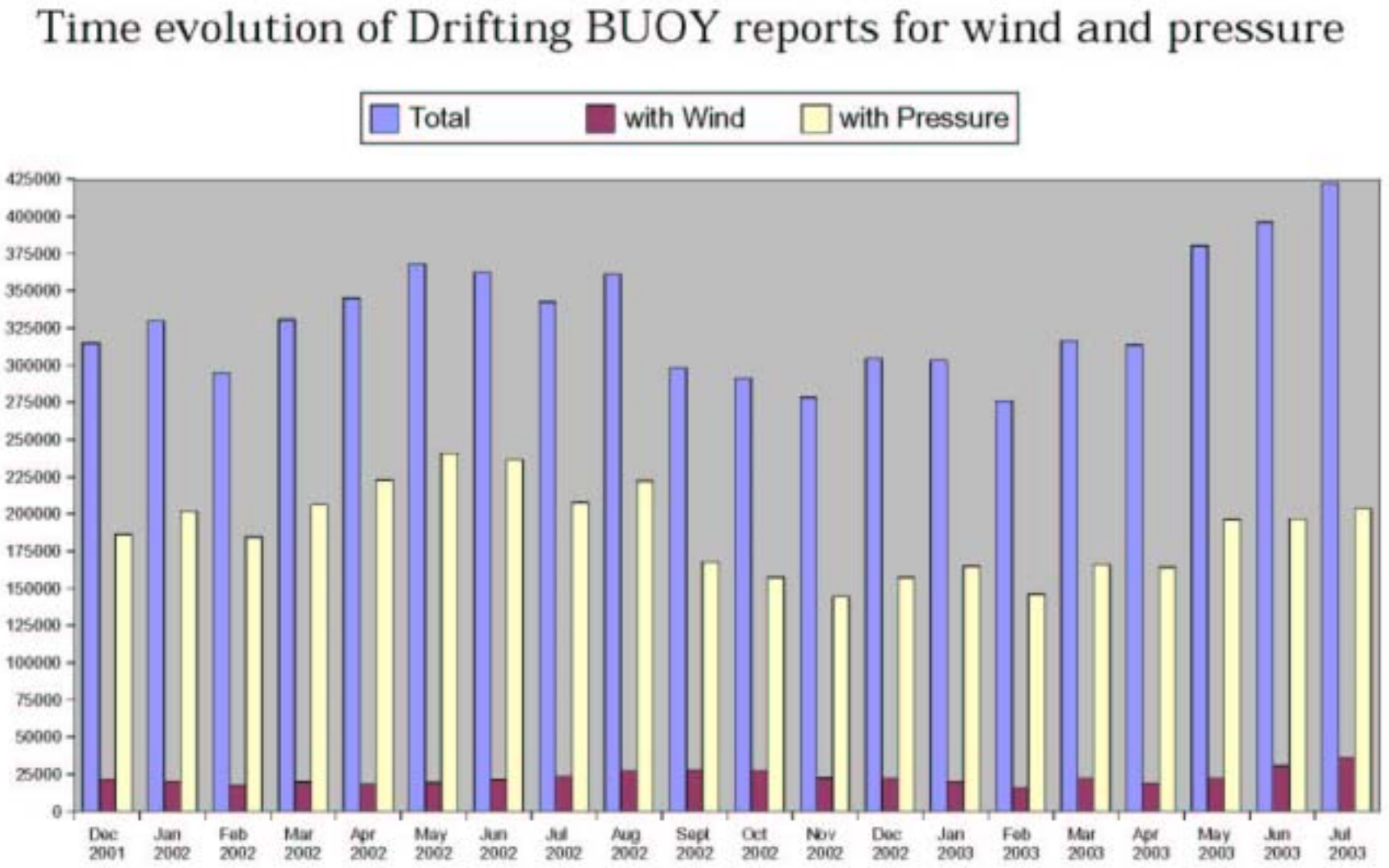


Figure 3

DBCP annual report 2002-2003

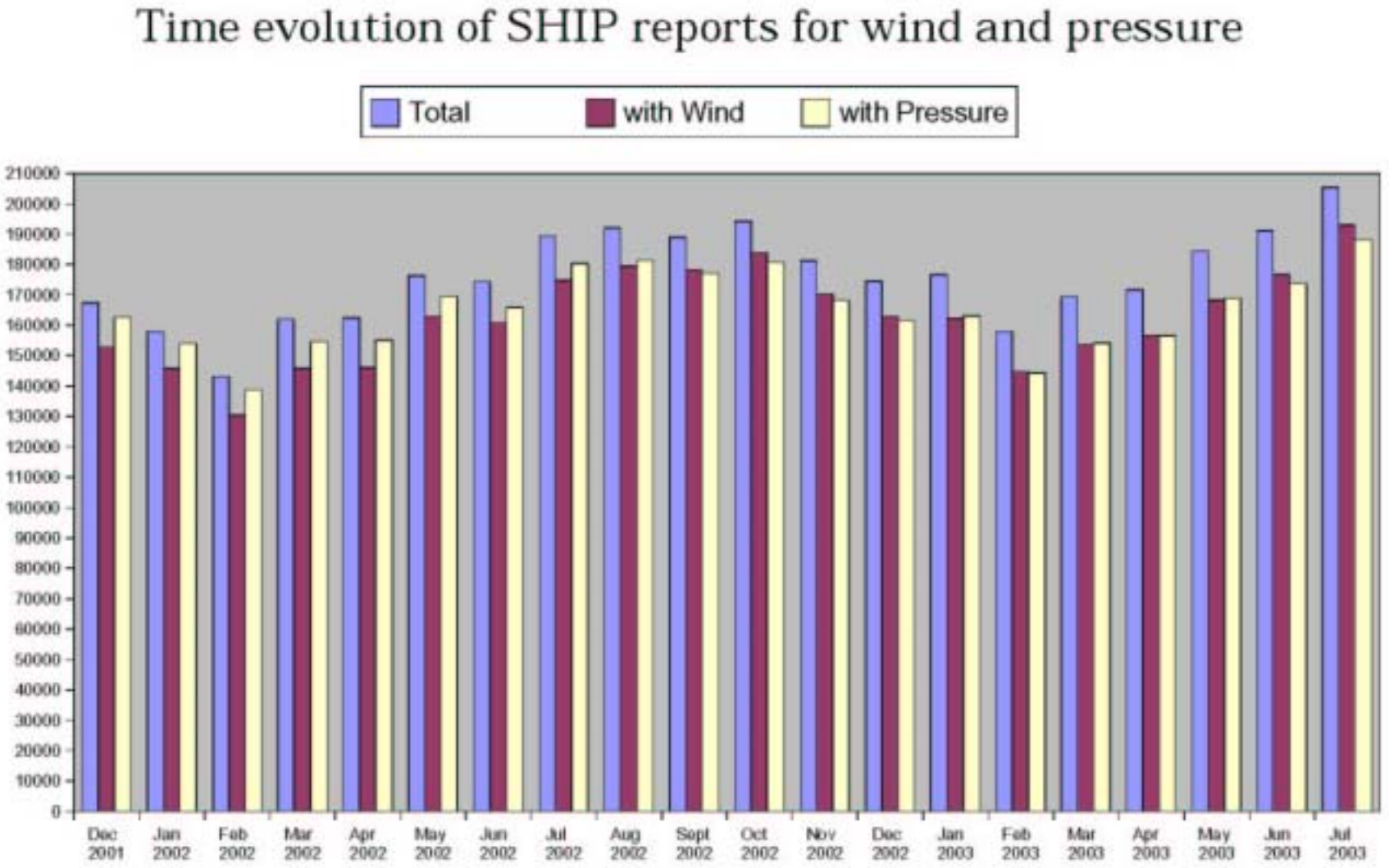


Figure 4

DBCP annual report 2002-2003

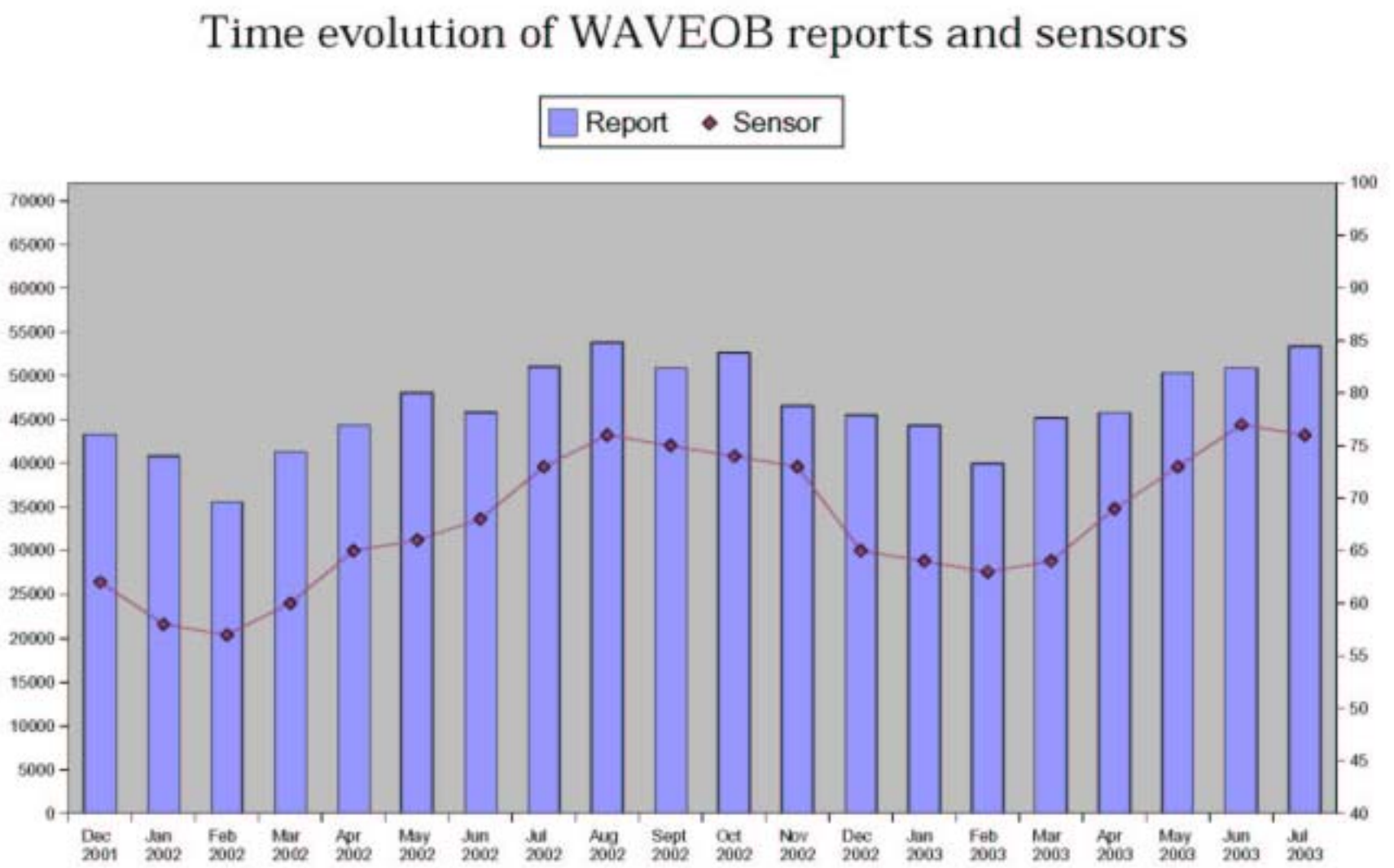


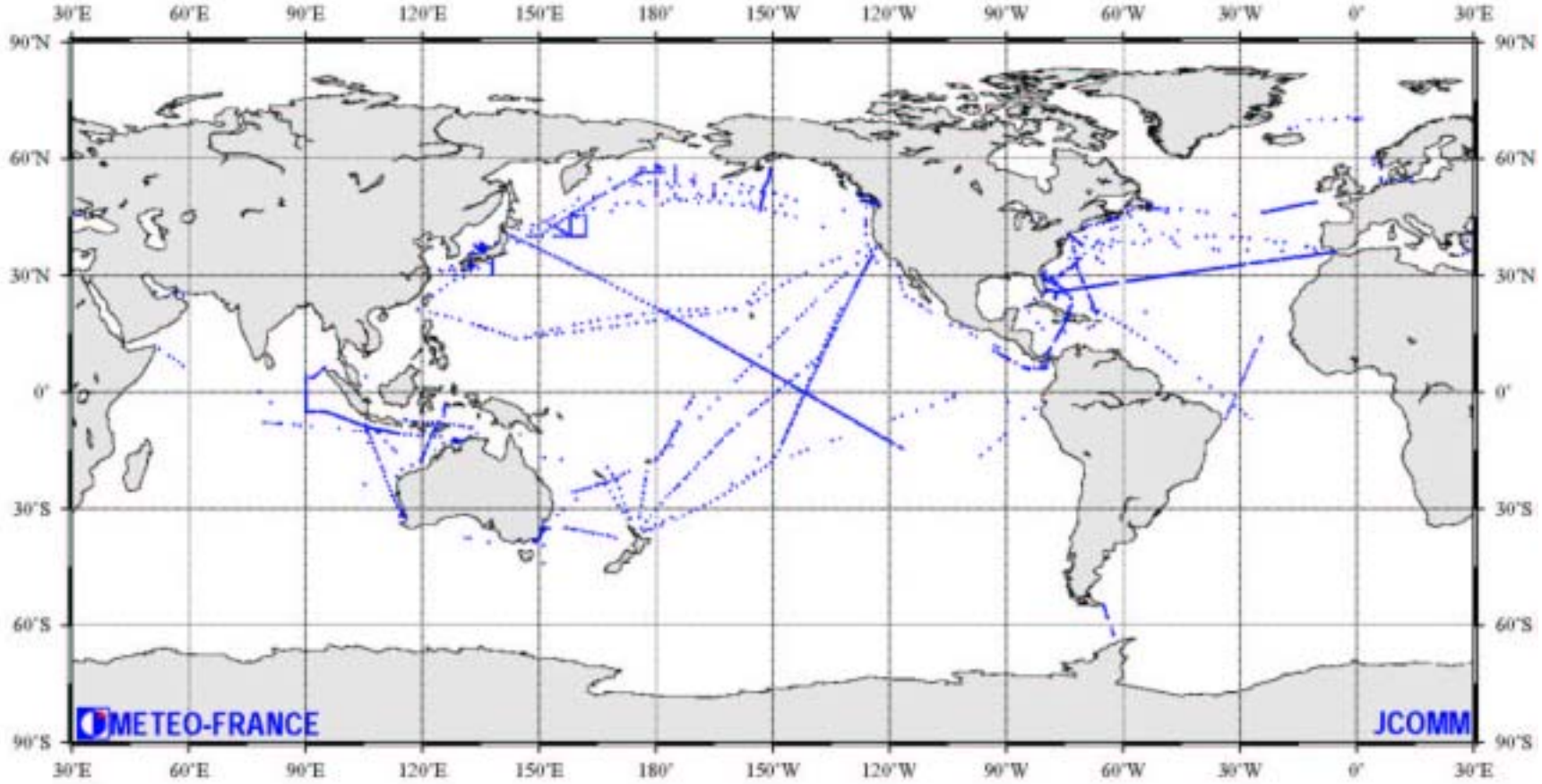
Figure 5

Carte de pointage des observations reçues en juillet 2003

Mapping position plot chart of data received during july 2003

Messages : BATHY

Total : 2684

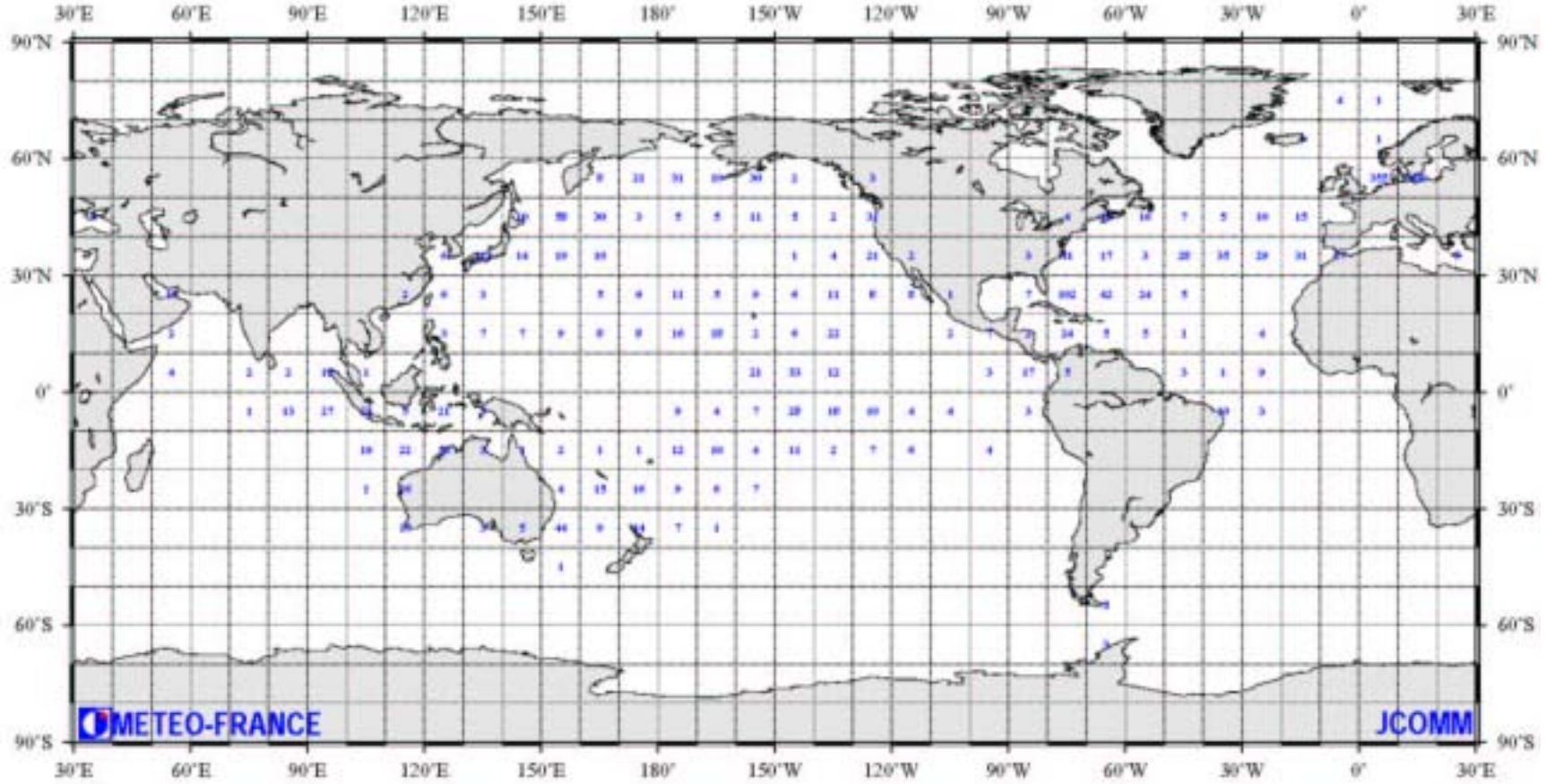


Répartition par carré Marsden des observations reçues en juillet 2003

Marsden square distribution chart of data received during july 2003

Messages : BATHY

Total : 2684

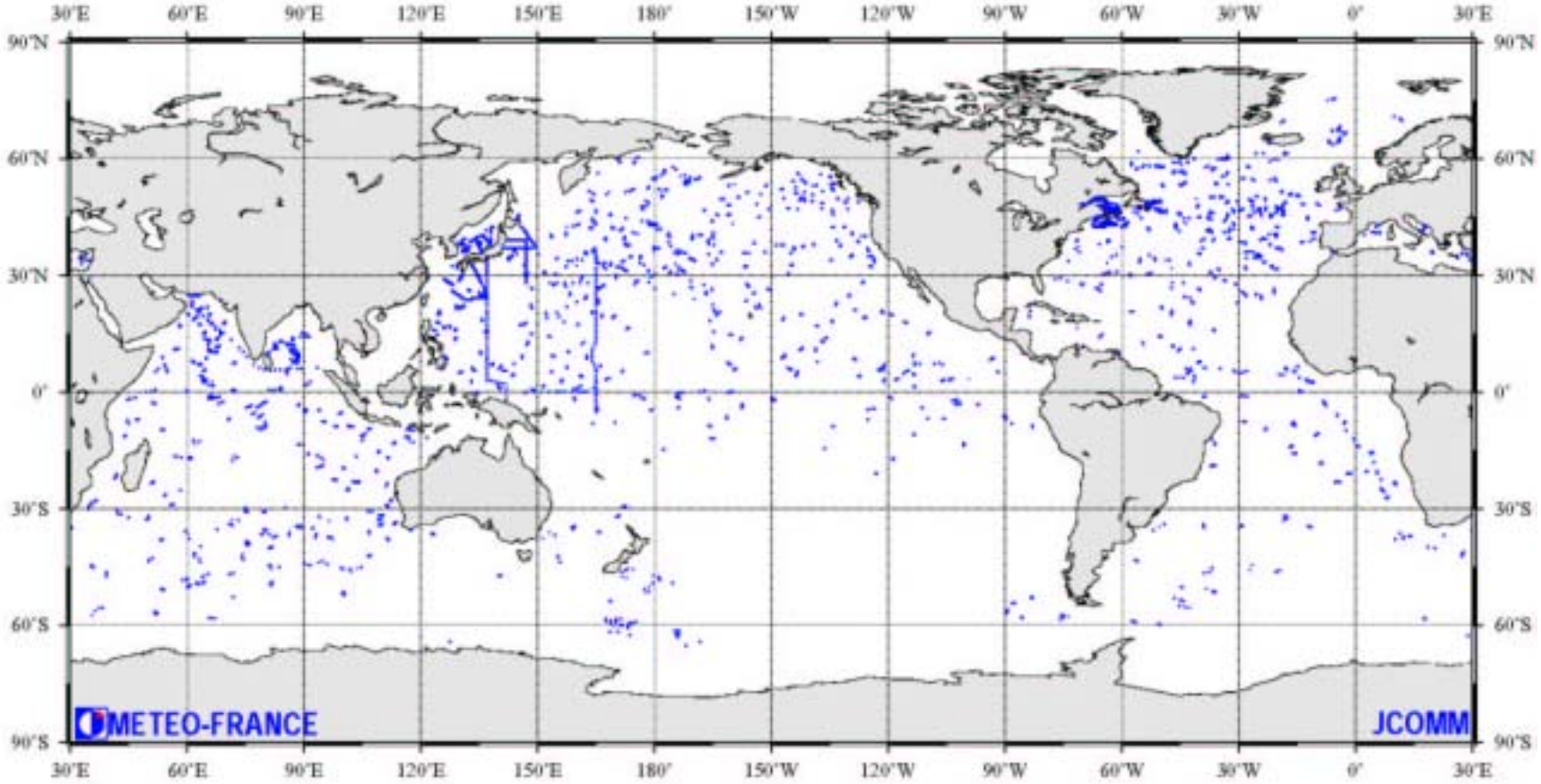


Carte de pointage des observations reçues en juillet 2003

Mapping position plot chart of data received during july 2003

Messages : TESAC

Total : 3397

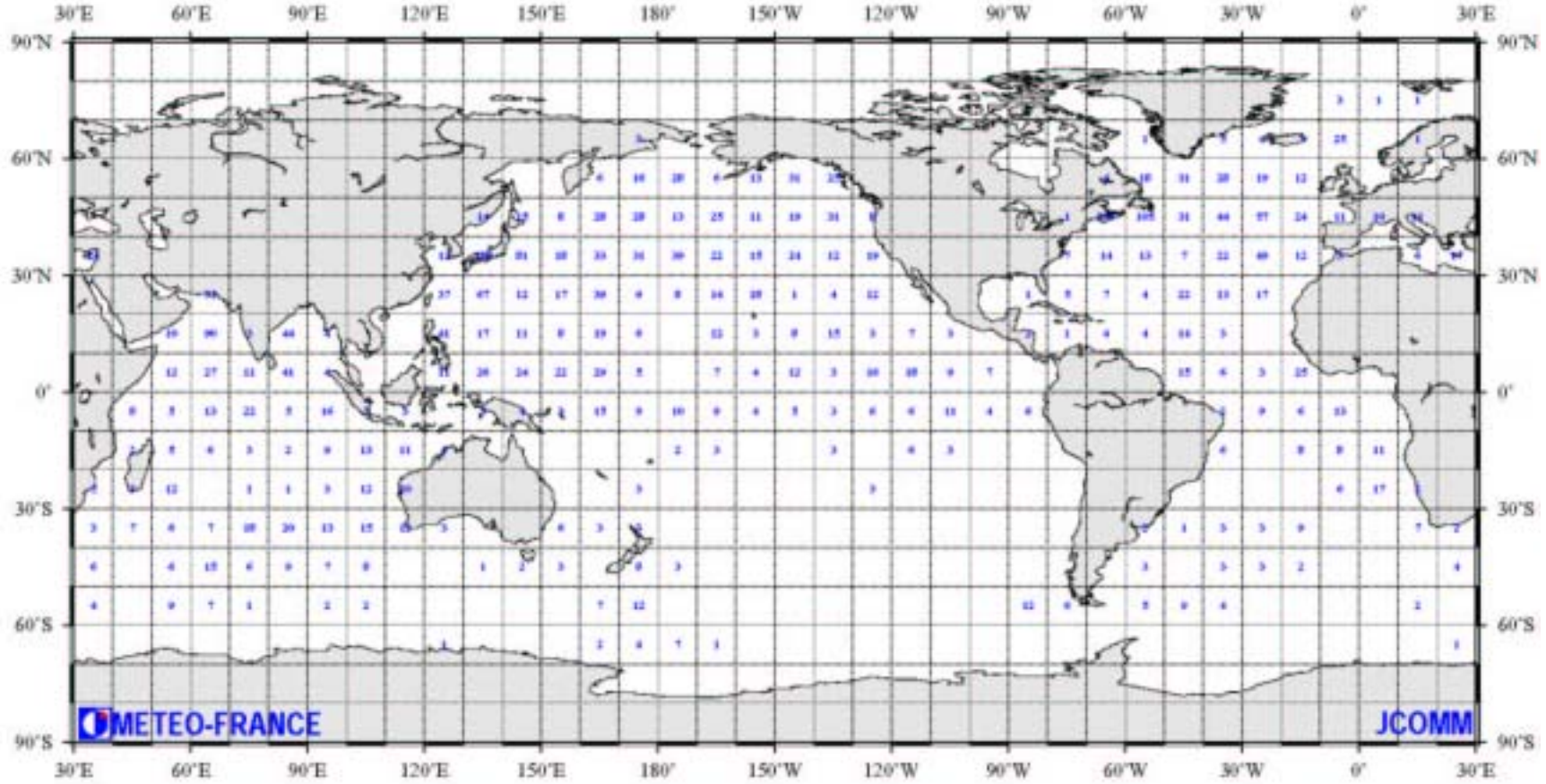


Répartition par carré Marsden des observations reçues en juillet 2003

Marsden square distribution chart of data received during july 2003

Messages : TESAC

Total : 3397

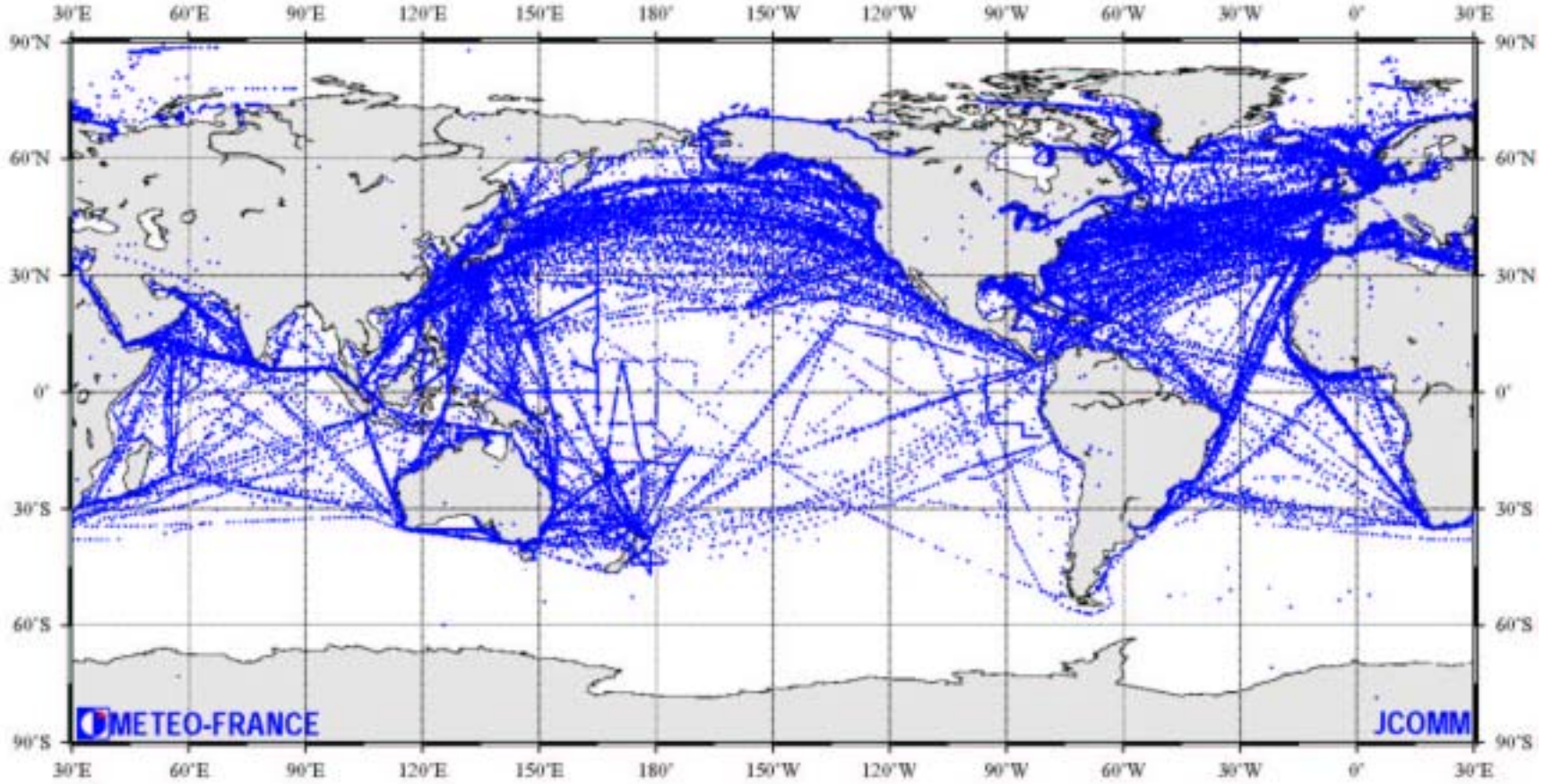


Carte de pointage des observations reçues en juillet 2003

Mapping position plot chart of data received during july 2003

Messages : SHIP

Total : 205213

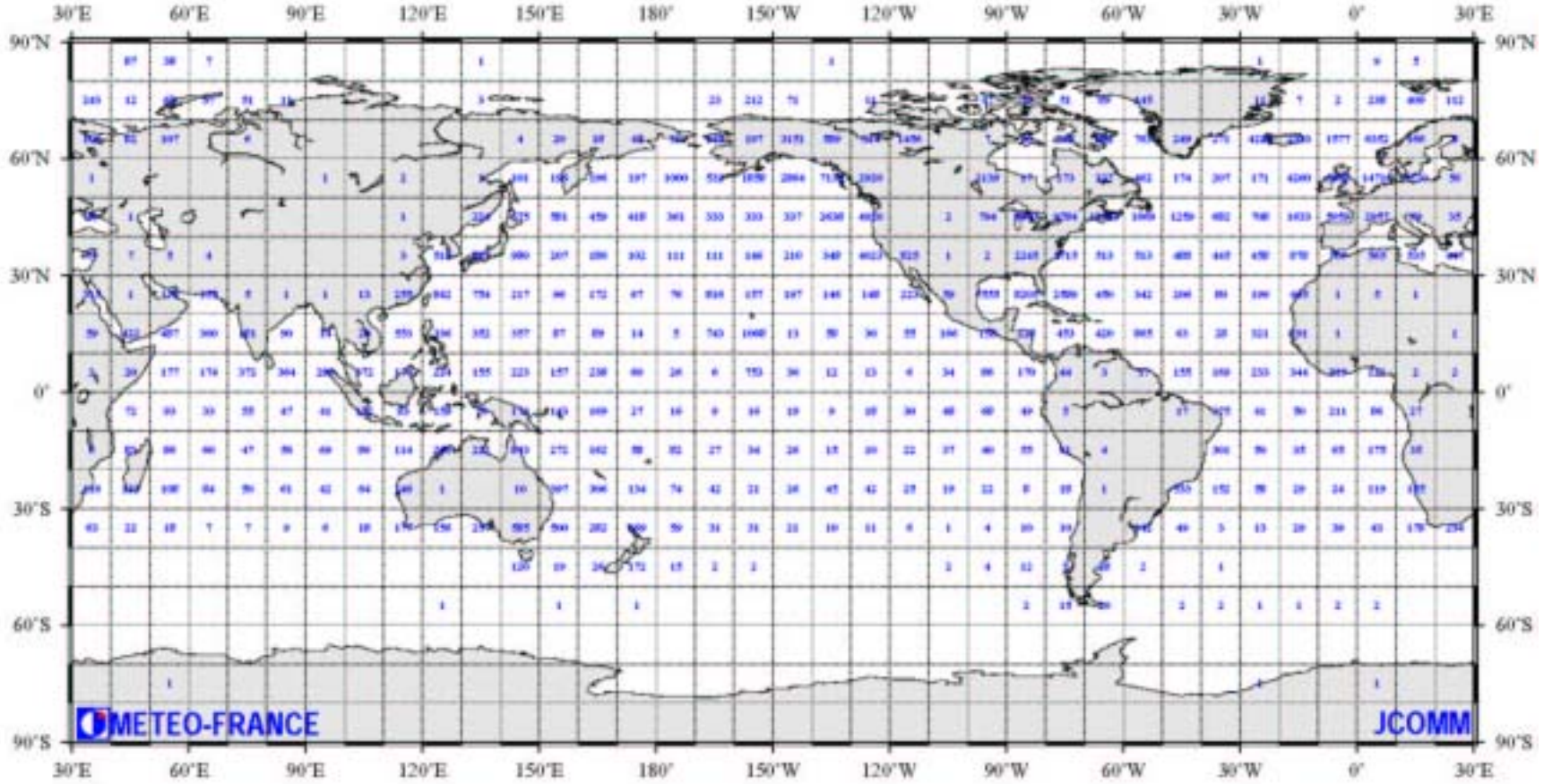


Répartition par carré Marsden des observations reçues en juillet 2003

Marsden square distribution chart of data received during july 2003

Messages : SHIP

Total : 205213

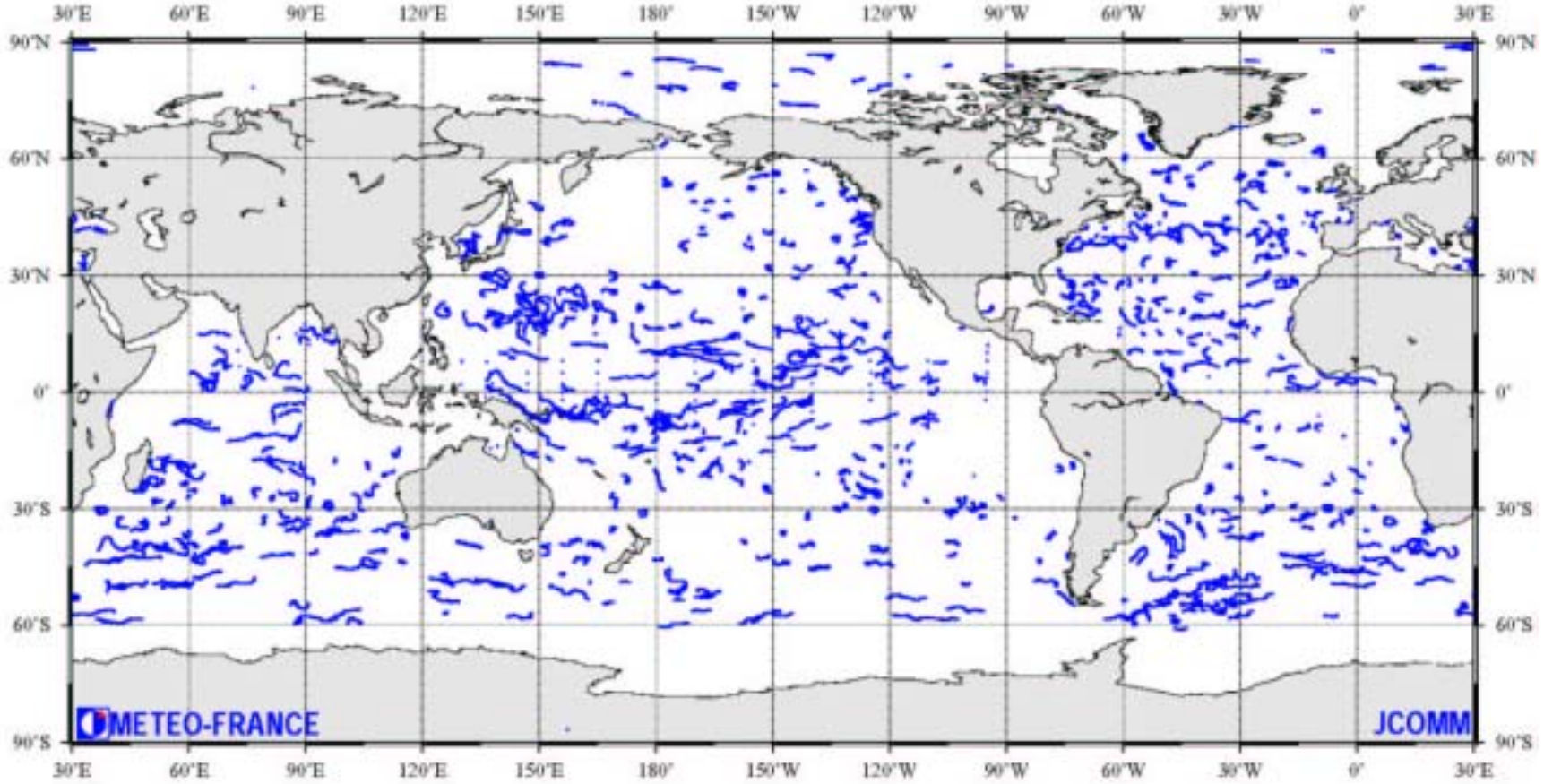


Carte de pointage des observations reçues en juillet 2003

Mapping position plot chart of data received during july 2003

Messages : BUOY

Total : 455978

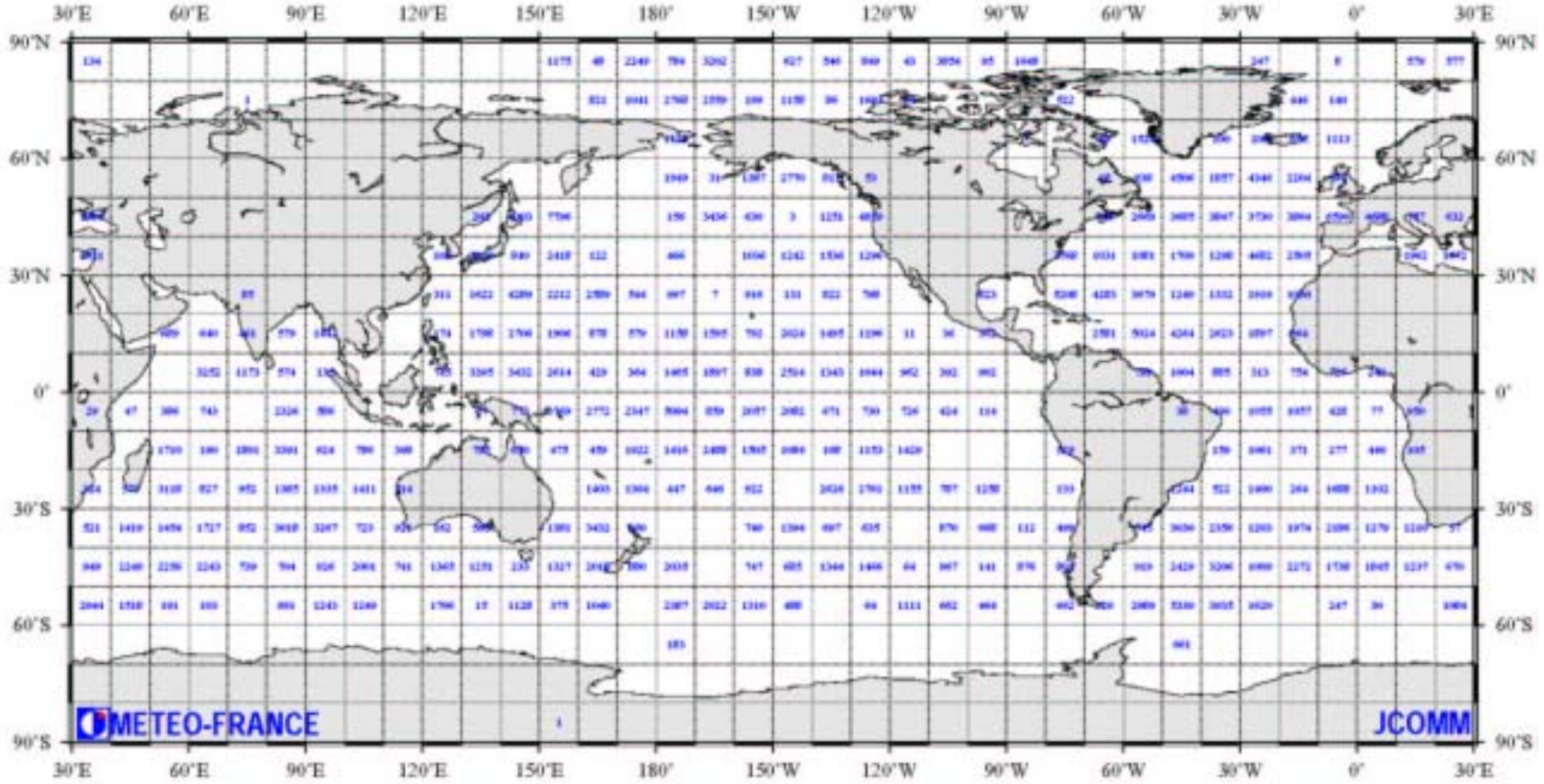


Répartition par carré Marsden des observations reçues en juillet 2003

Marsden square distribution chart of data received during july 2003

Messages : BUOY

Total : 455978

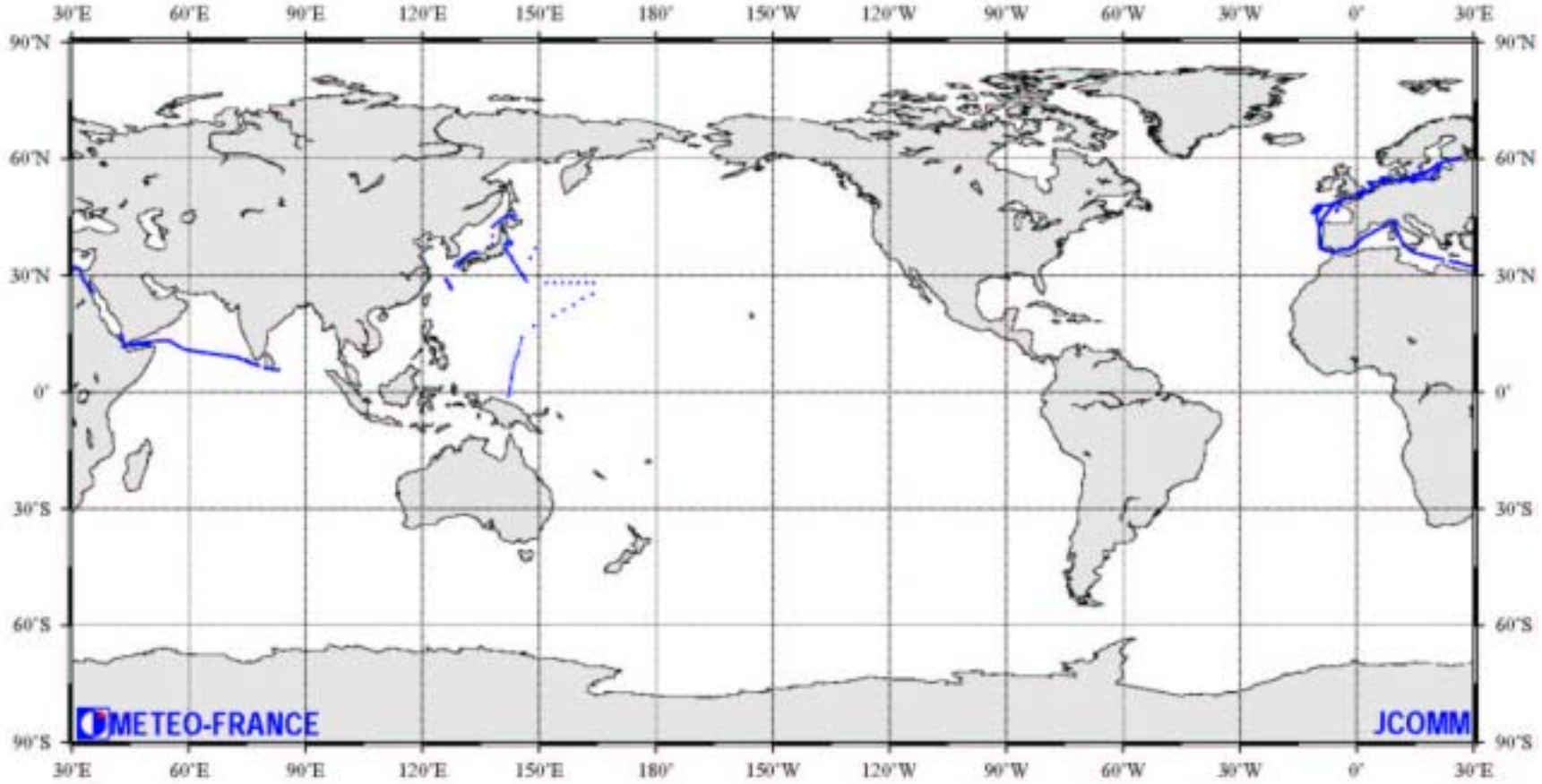


Carte de pointage des observations reçues en juillet 2003

Mapping position plot chart of data received during july 2003

Messages : TRACKOB

Total : 4822

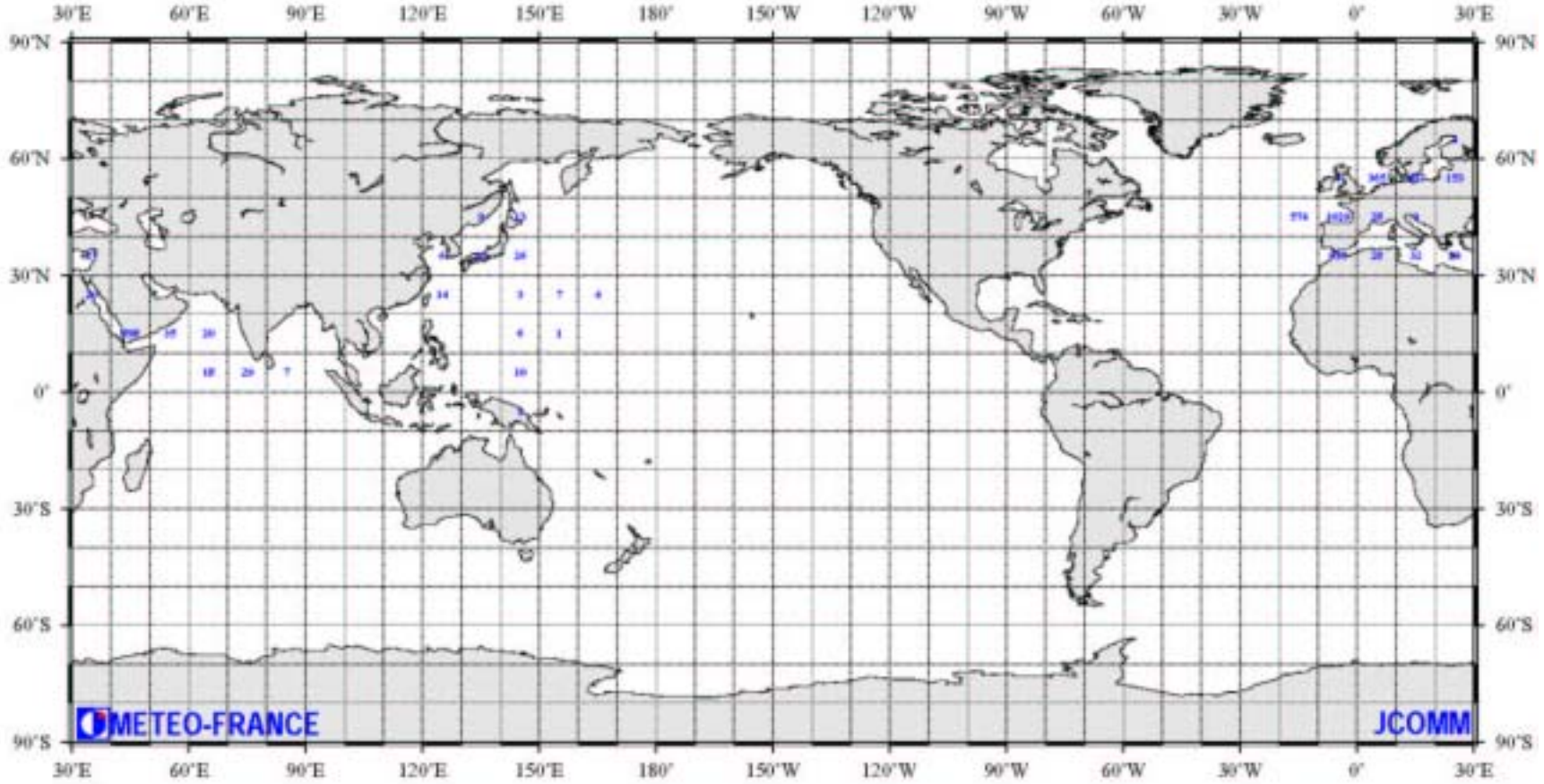


Répartition par carré Marsden des observations reçues en juillet 2003

Marsden square distribution chart of data received during july 2003

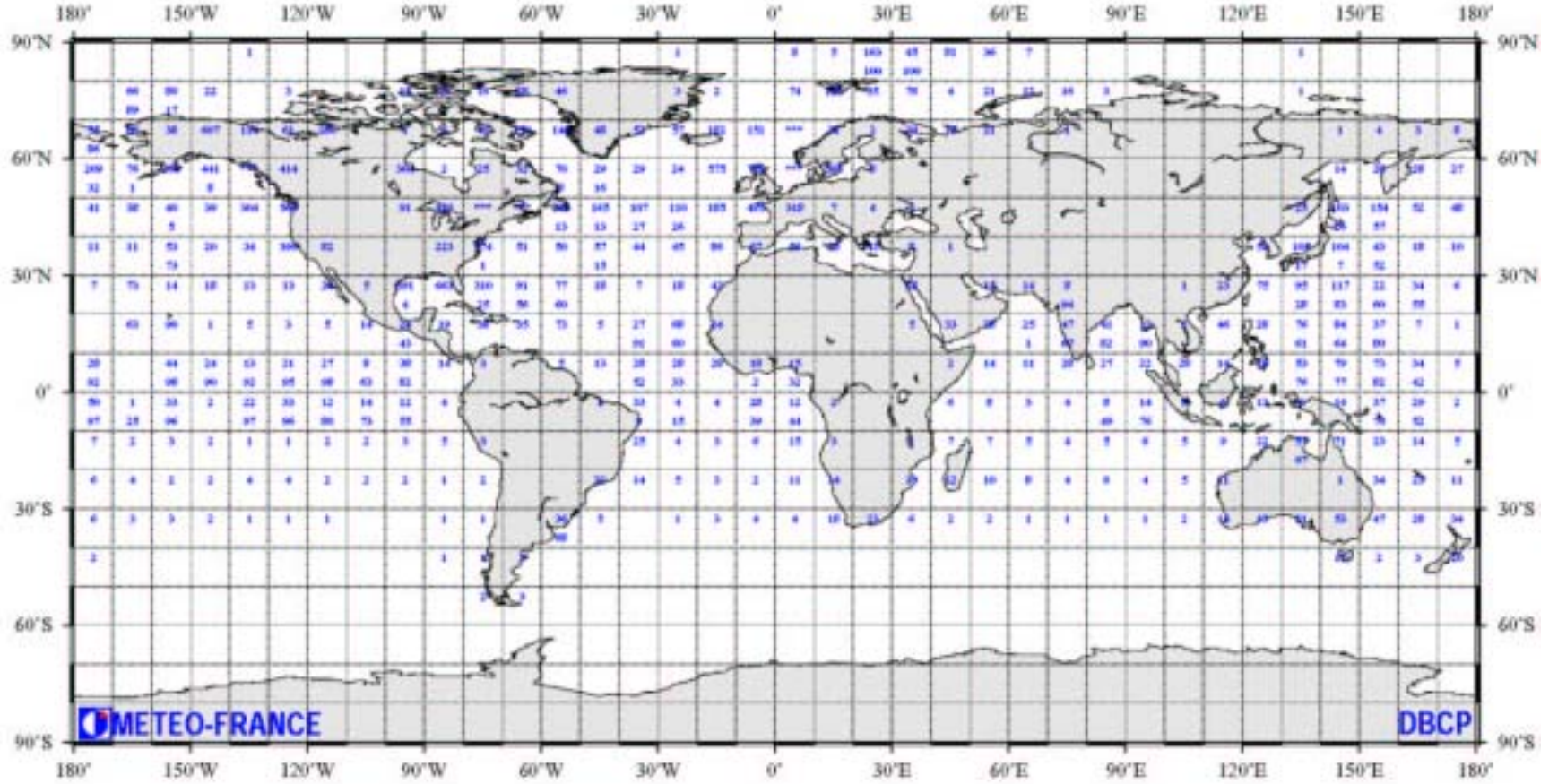
Messages : TRACKOB

Total : 4822



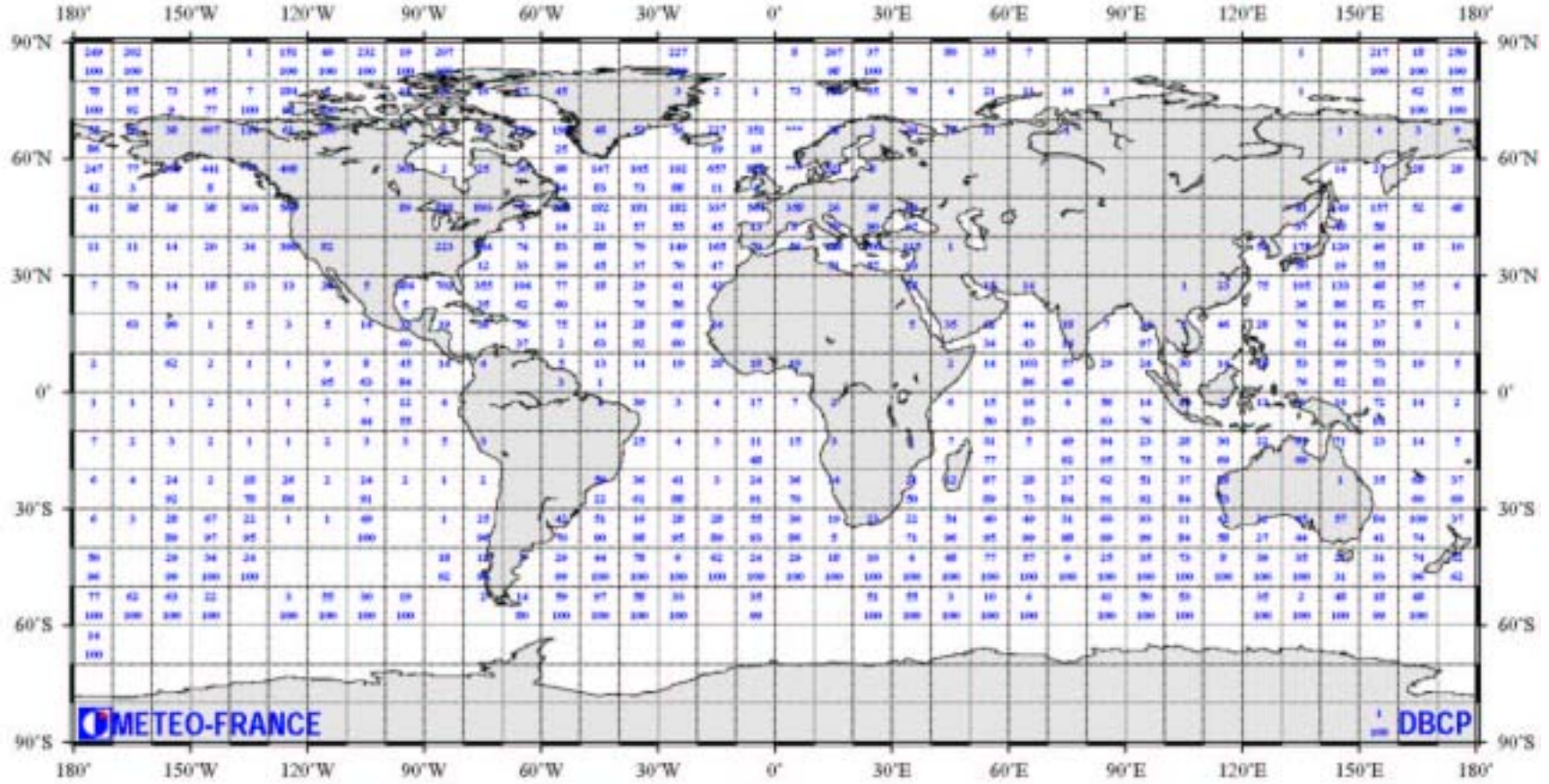
METEO-FRANCE WIND JULY 2003

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)



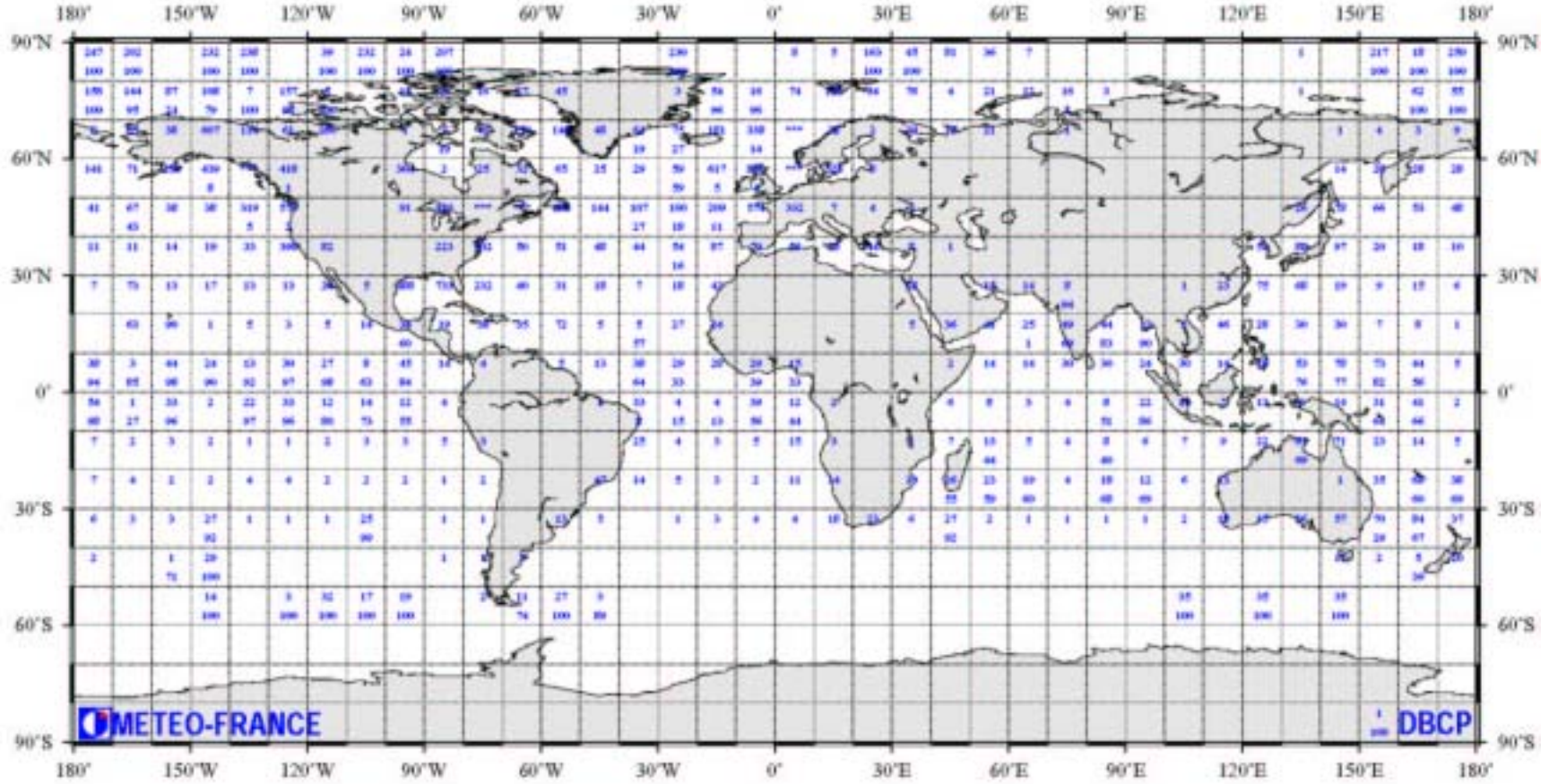
METEO-FRANCE PRESSURE JULY 2003

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)



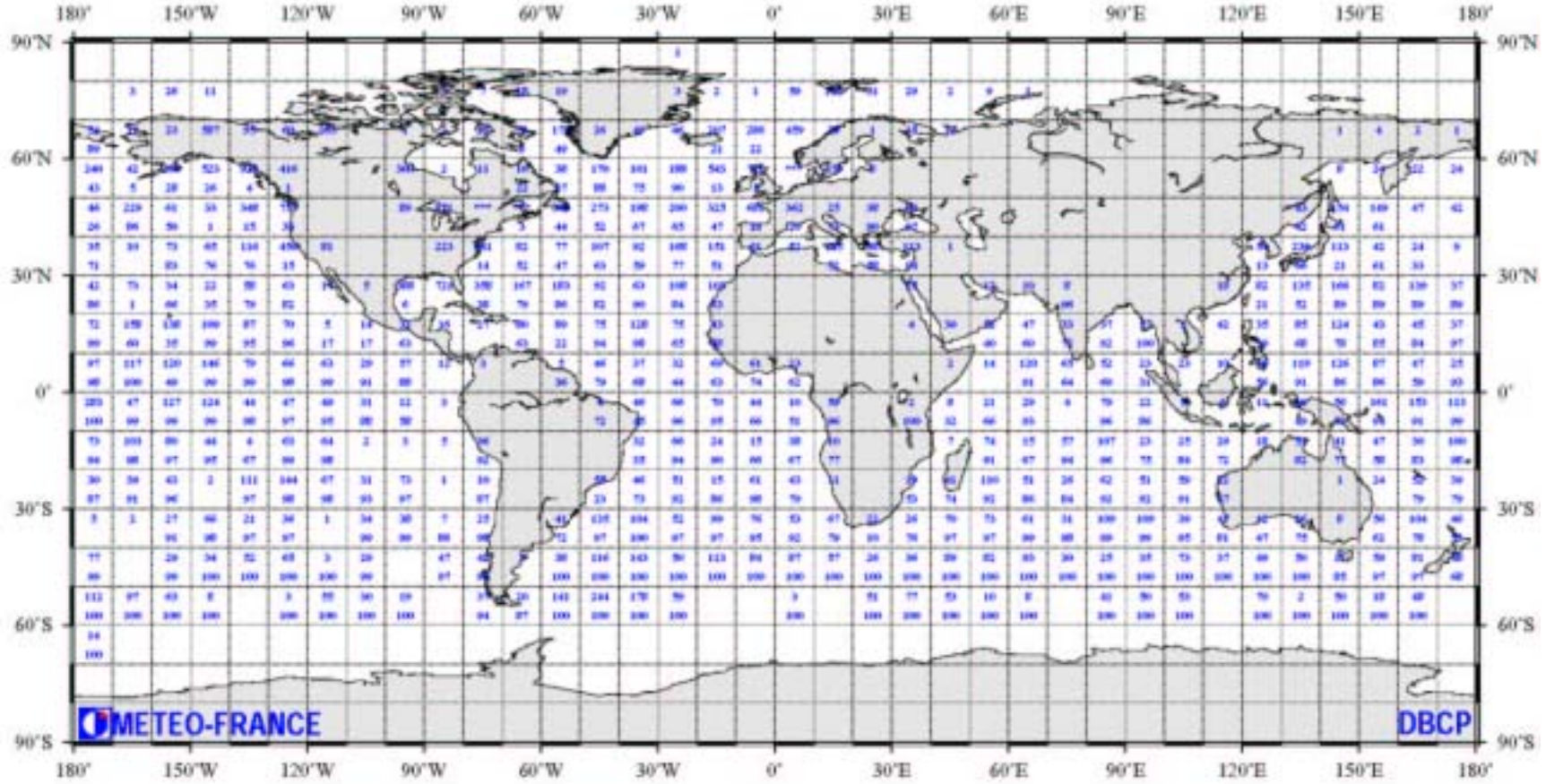
METEO-FRANCE TEMPERATURE JULY 2003

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 2003

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)



Report of the RNODC for drifting buoys

The Marine Environmental Data Service (MEDS)
(September 2002 to August 2003)

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

1. During the last intersessional period, MEDS has archived an average of 309, 000 BUOY reports per month (Figure1) and received reports from an average of 837 buoys per month (Figure 2), an increase of 36,000 reports (12%) and an increase of 19 buoys (2%) from last year respectively. Figure 3 shows the monthly average of the number of observations per day per buoy. Figure 4 shows the number of meteorological/oceanographic observations posted on the GTS and Figure 5 shows GTS data coverage.

2. Data distribution

MEDS continues to redistribute the data upon request, on a regular basis and via the web. Last year, MEDS received 47requests for drifting buoy data and provided data to 3 organizations on a daily basis. Requests came mostly from universities, government organizations and private consulting companies.

3. Update on action items from DBCP-18

   a) Participate with DBCP QC guidelines for location data (**On-going**)

      MEDS sent its first message on the BUOY-QC distribution list in October 2002. Every month, buoy locations of the previous month are displayed on SVG maps where the user “mouses over” to determine which buoys are reporting erroneous locations.

      In 1999, MEDS build an application that can search a database of all the BUOY-QC messages sent on the distribution list (Figure 6). Recently, MEDS noticed that there has been a lot of spam messages posted to this list which can be seen when doing searches and sometimes can change the look (colors, font size, etc.) of the returned pages. A simple filter program has recently been created to filter as many spam messages as possible before being added to the database, however, at this level it is impossible to filter out all the irrelevant messages. MEDS would like to cooperate with the technical coordinator of the DBCP to solve this problem.

   b) Review MEDS processing system (Work in progress)

      MEDS has noticed a large amount of duplicate and semi-duplicate buoy messages distributed over the GTS and is currently working on enhancing their duplicate software to deal more effectively with this issue

   c) Implement new location flags (Not completed)

      Implementing the new flagging policy for location data is dependent upon the review of the system. Once the system has been adequately dealt with MEDS will implement flags 0 to 4 as defined by GTSPP and subsequently re-process all of MEDS BUOY archive. (See DBCP-18 report for description of QC flags to be implemented.)

   d) Update Surface Velocity Programme (SVP) data sent from the Atlantic Oceanographic and Meteorological Laboratory (AOML) **(Work in progress)**

In 2001, the GDC reprocessed all their data (1979-2000) and forwarded it to MEDS to update their archives. MEDS has also received two annual updates to include data up to June 2002. MEDS is currently working on updating the system that handles the SVP data. The way in which MEDS deals with the position and temperature archive has been changed to include more observational data than just surface temperatures. An issue concerning reusing buoy id's has also been dealt with. As well, MEDS is creating a new archive to store the raw data. Updating the position and temperature archive with the reprocessed data is almost finished and so far the krig archive has been updated to 1999. Once completed, the annual updates will be added and the MEDS web site updated. It is expected that all MEDS archives will be up to date by the end of November 2003.

4. Participation in other action groups

a) International Arctic Buoy Programme (IABP)

The Scalable Vector Graphics (SVG) map application to view drifting buoy data and information in near real-time was completed and can be accessed from the MEDS web site. The scalable map is updated daily showing float locations and data for the current month in the area covered by the IABP.

b) North Pacific Data Buoy Advisory Panel (NPDBAP)

MEDS completed an SVG map application showing buoy locations and data which was included in an electronic poster which was displayed at the PICES meeting in China in October 2002.

As well, MEDS worked with the technical coordinator to build a web site for the NPDBAP which is hosted by NODC. The web site links to MEDS for drifting buoy data and information from the NPDBAP area. MEDS is currently working on adding a version of the SVG map application mentioned above to the NPDBAP portion of the MEDS web site.

5. Goals for 2003-2004

MEDS will focus on completing the action items described above which included:

- Finish updating all SVP/GDP data sent from AOML and update MEDS web site.
- Finish reviewing MEDS processing system, in particular the duplicate check software.
- Complete the work of implementing new quality flags for location data and reprocess MEDS archives to include the flags.

Contact:
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Fisheries and Oceans – Marine Environmental Data Service (MEDS)
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Ottawa, Ontario, Canada
K1A 0E6

Phone: (613) 998-2886
Fax: (613) 993-4658
schock@meds-sdmm.dfo-mpo.gc.ca

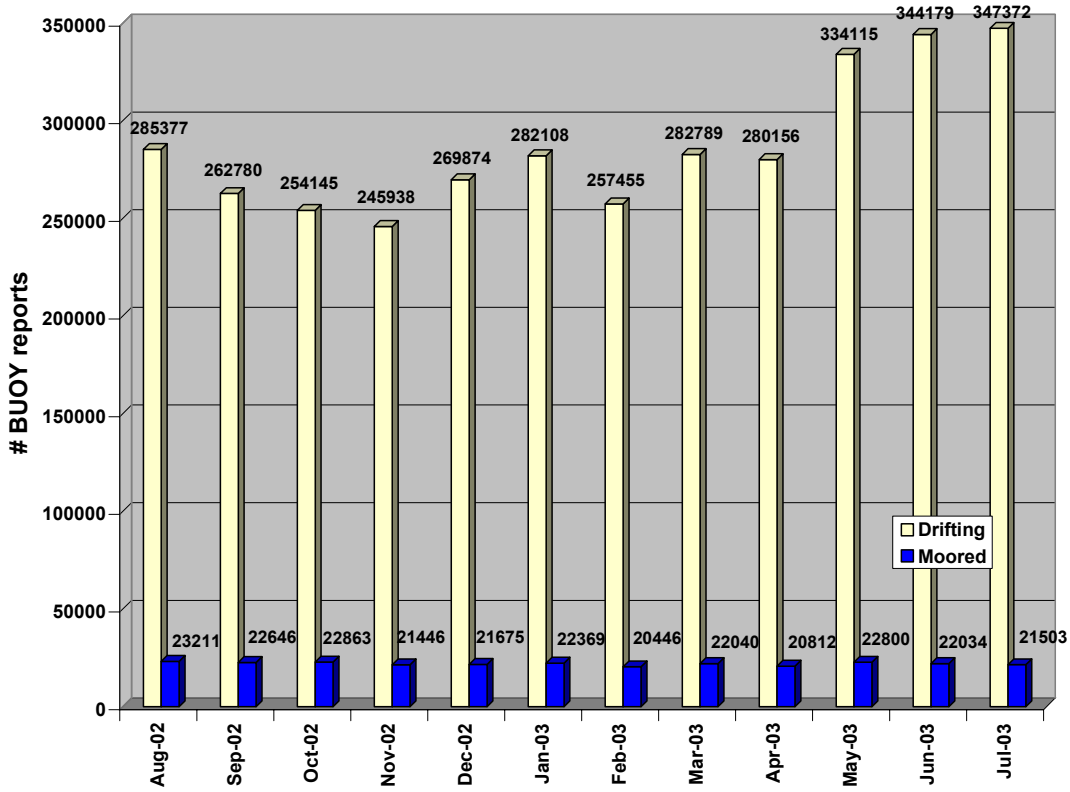

Number of BUOY reports from drifting and moored buoys per month
BUOY reports
350000
300000
250000
200000
150000
100000
50000
0
285377
262780
254145
245938
269874
282108
257455
282789
280156
334115
344179
347372
23211
22646
22863
21446
21675
22369
20446
22040
20812
22800
22034
21503
Drifting
Moored
Aug-02
Sep-02
Oct-02
Nov-02
Dec-02
Jan-03
Feb-03
Mar-03
Apr-03
May-03
Jun-03
Jul-03

Figure 1

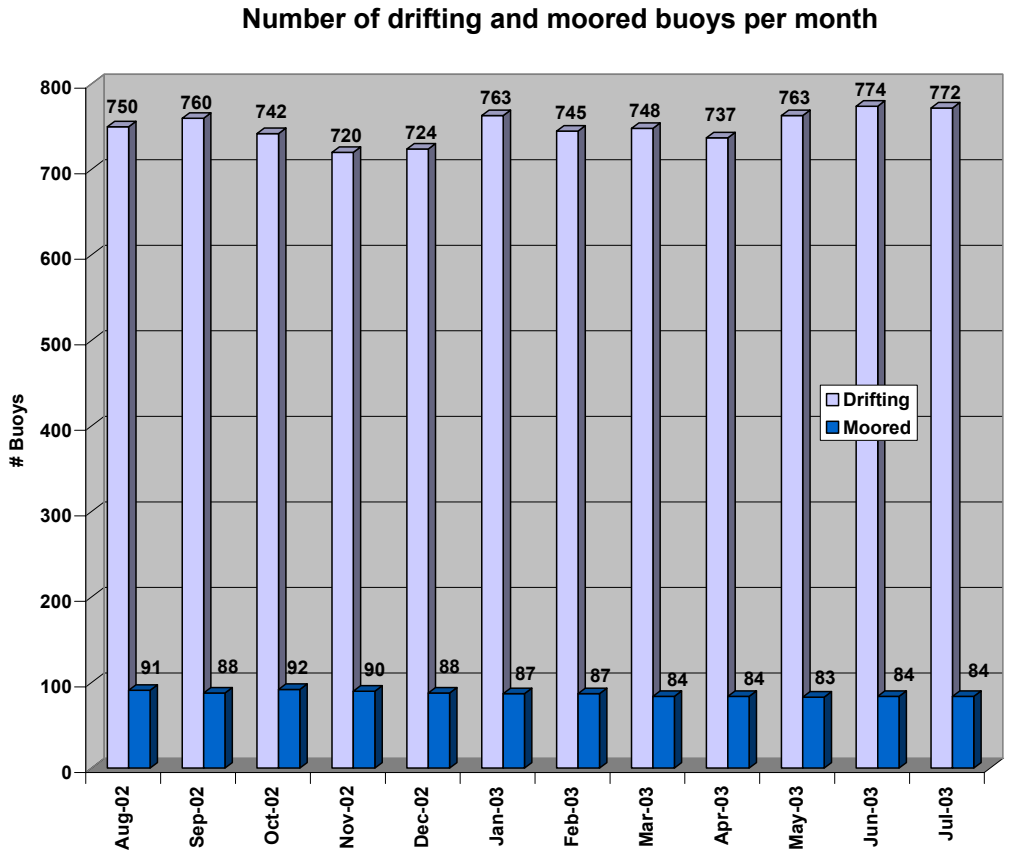

Number of drifting and moored buoys per month
Buoys
800
700
600
500
400
300
200
100
0
750
760
742
720
724
763
745
748
737
763
774
772
91
88
92
90
88
87
87
84
84
83
84
84
Drifting
Moored
Aug-02
Sep-02
Oct-02
Nov-02
Dec-02
Jan-03
Feb-03
Mar-03
Apr-03
May-03
Jun-03
Jul-03

Figure 2

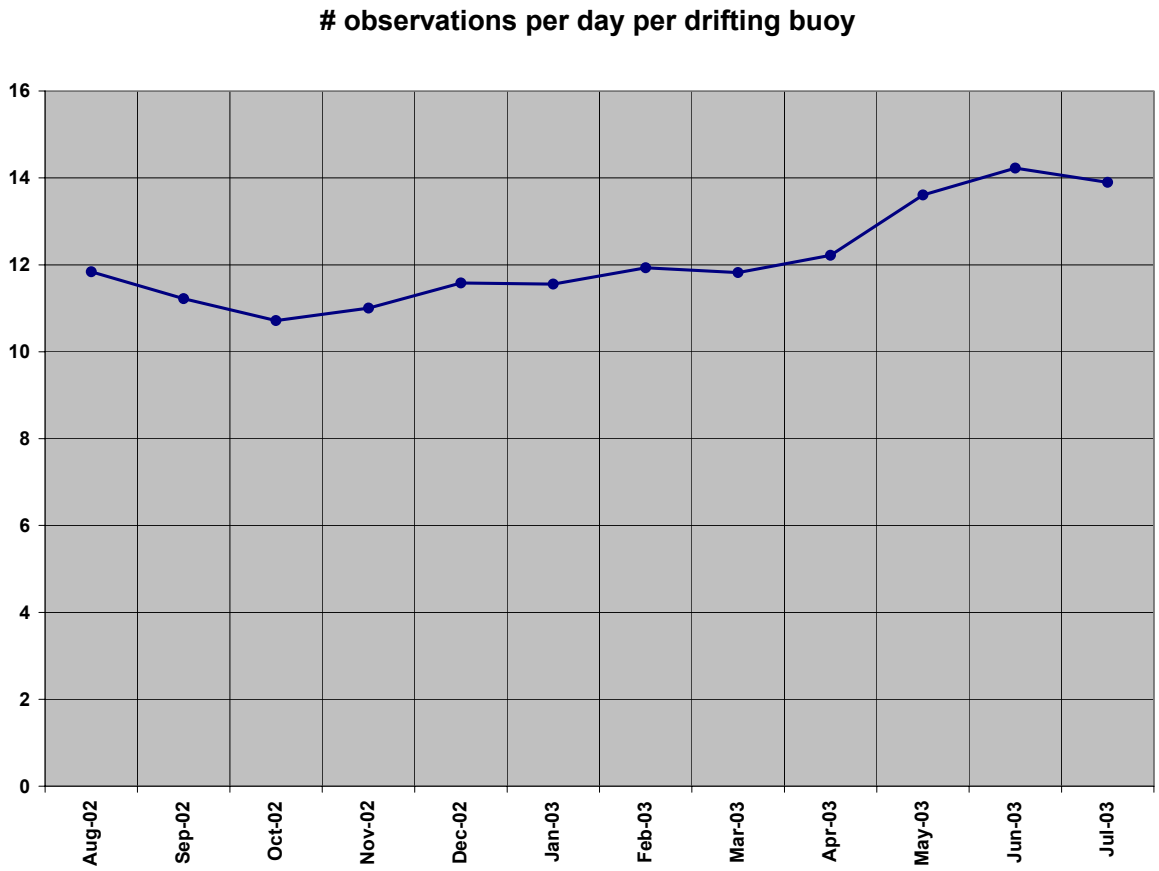
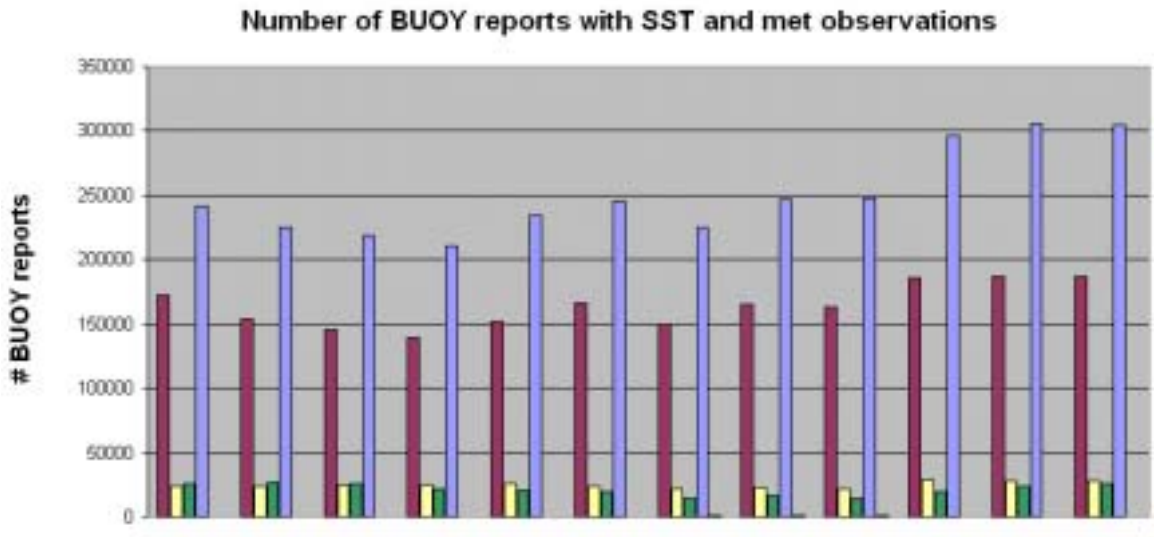


Figure 3



	Aug-02	Sep-02	Oct-02	Nov-02	Dec-02	Jan-03	Feb-03	Mar-03	Apr-03	May-03	Jun-03	Jul-03
Pressure	172621	153515	145983	138993	151790	166666	149352	165474	162753	186254	187010	186640
Air Temp	23592	24192	25281	24756	25677	24217	21348	22723	21702	28640	28260	27360
Wind	25519	26701	25884	21718	20900	19312	14951	16490	14739	20116	24027	25918
SST	241862	225216	218622	211044	233934	245244	224663	247268	247951	296342	305735	304404
Salinity	0	0	0	0	0	75	1198	1042	989	415	332	316

Figure 4

Spatial Coverage of GTS Data
(August 2002 to July 2003)

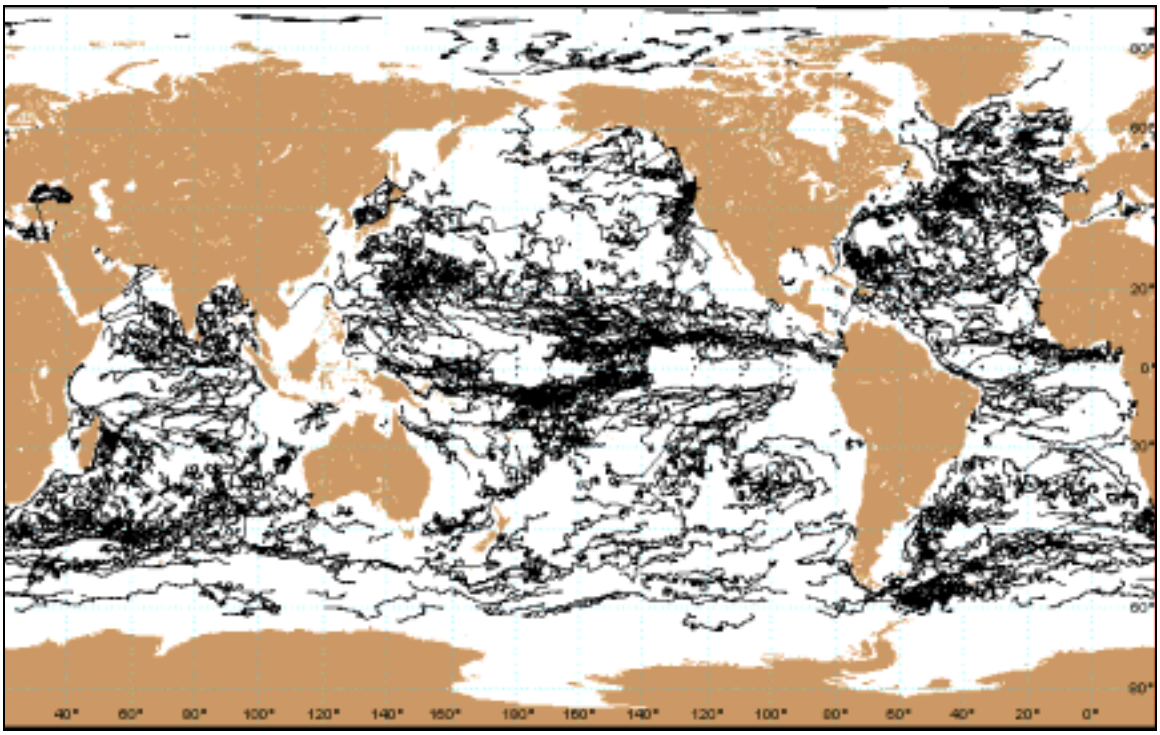


Figure 5

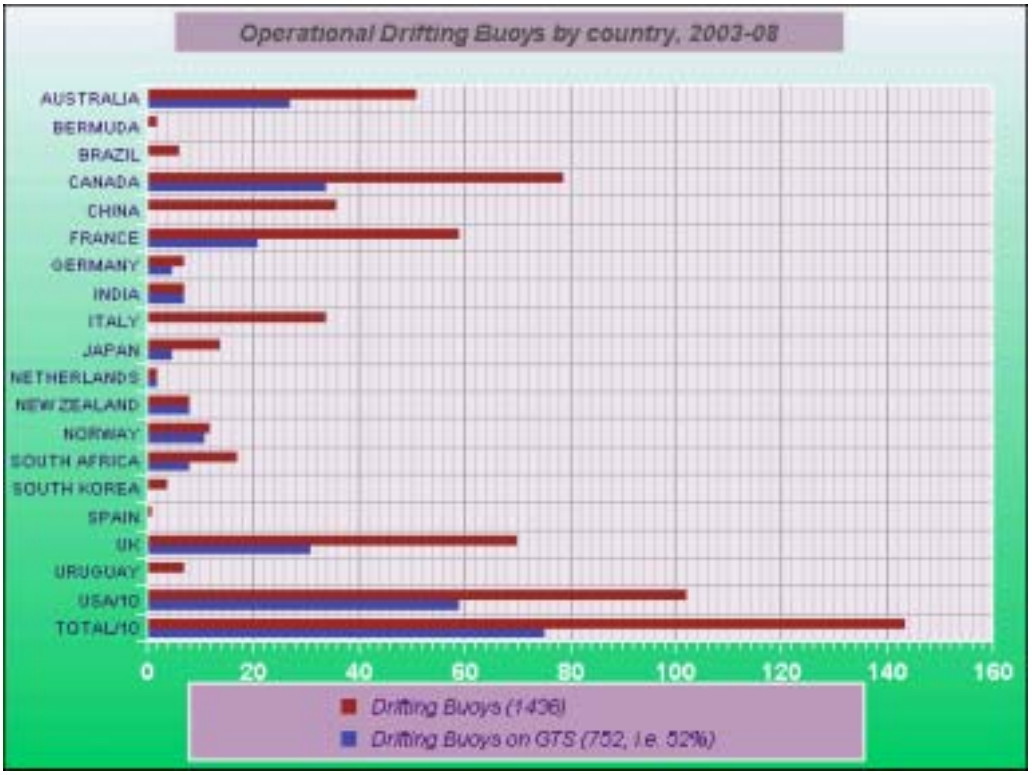

RNODC - CNRDO Buoy QC
RNODC/MEDS Buoy QC Messages Search Page
The Buoy QC Messages database was last updated on 28/8/2003 at 8:08:00 AM.
In order to search the database for specific Buoy QC Messages, please select one or more of the following parameters and click the 'Submit' button.
Search Parameters
Buoy ID: All
Date Range: Last 7 days
From: January 1, 2003
To: January 1, 2003
Keyword:
CLEAR
SUBMIT

Figure 6

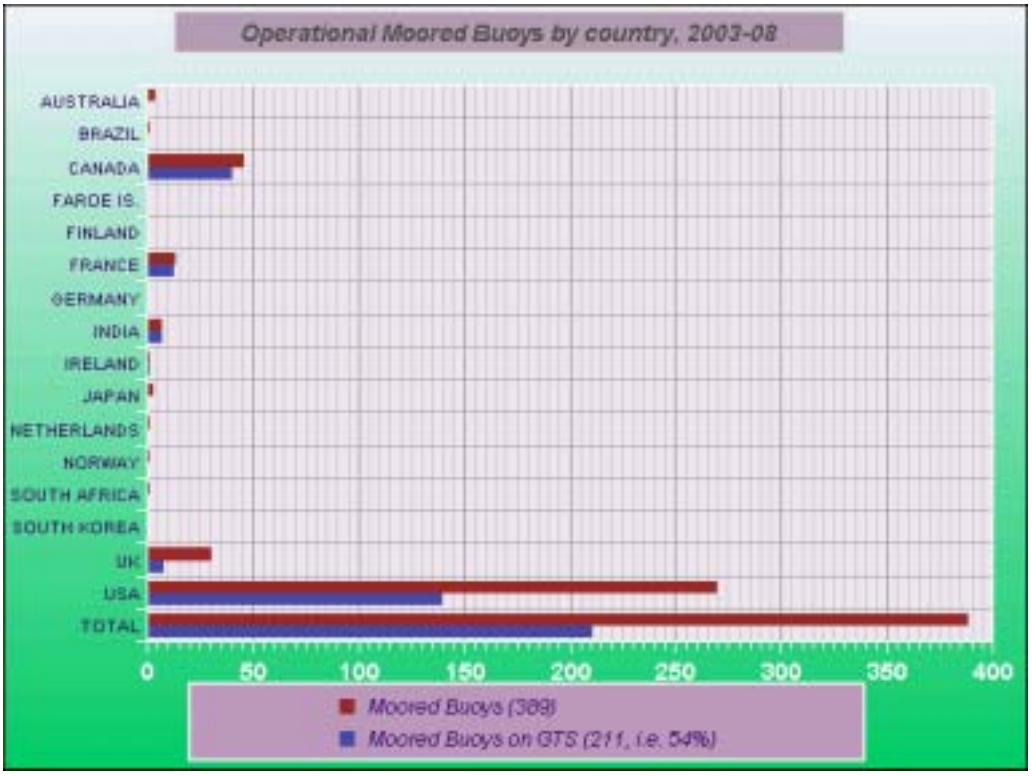
ANNEX IV

Distribution of GTS and non-GTS platforms by country

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

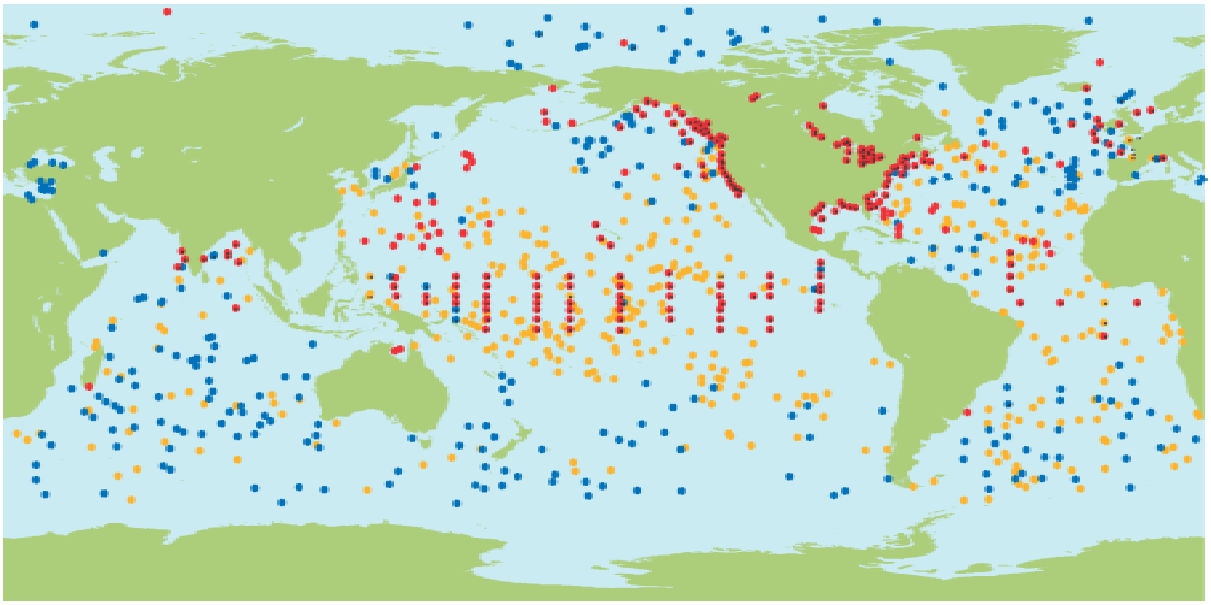


Graph-2: Moored Buoys in the high seas (plus US and Canadian buoys and moorings reporting via Argos) and those on GTS by country:



ANNEX V

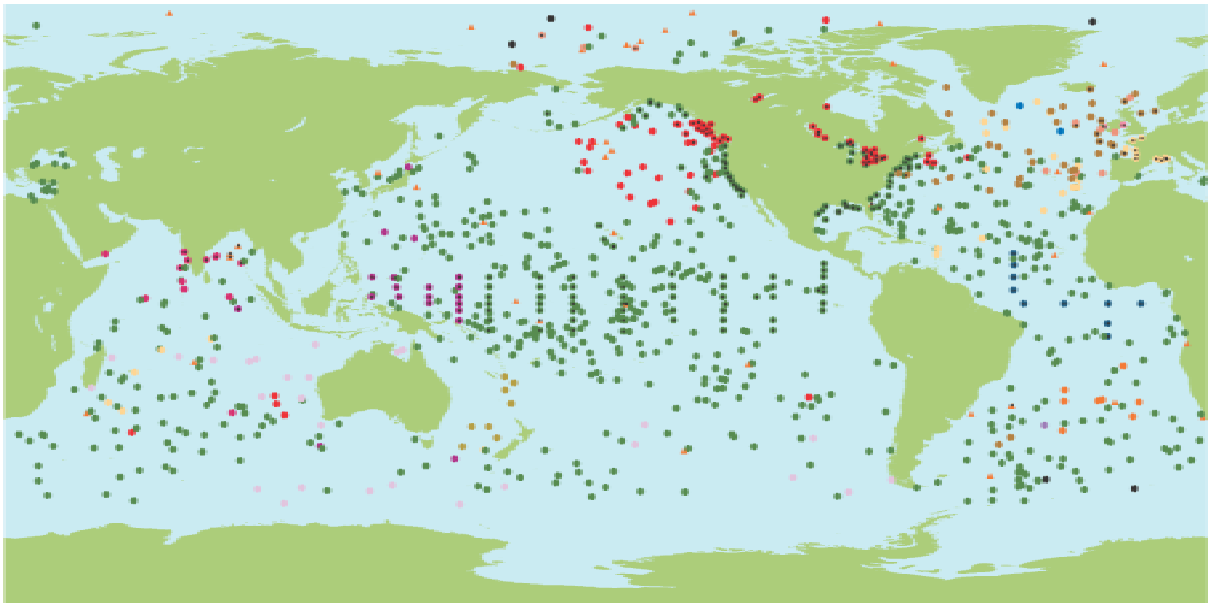
Map 1: **Drifting and Moored** buoys reporting SST, Air Pressure, or Wind on GTS in August 2003:



DBCP status, August 2003 (data buoys reporting on GTS)

Wind
Air pressure
SST
Moorings

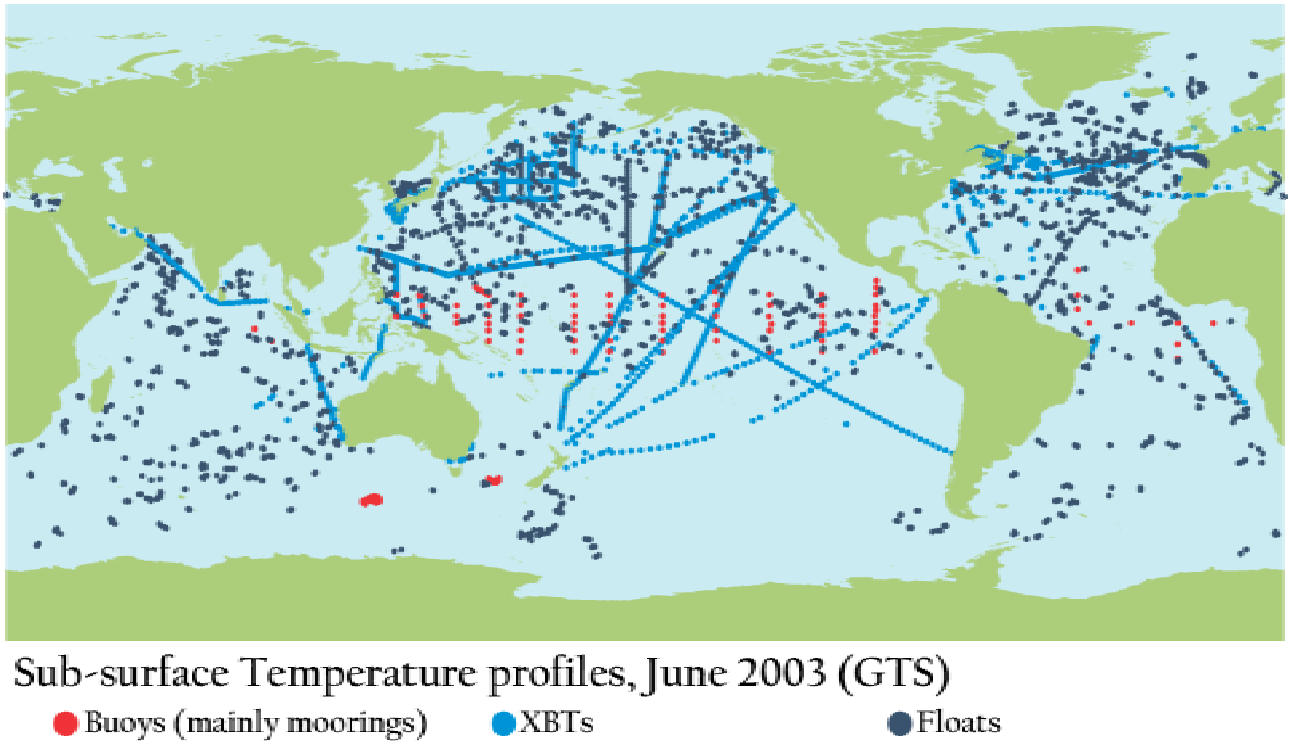
Map 2: Buoys reporting on GTS in August 2003 **by country**:



DBCP status, August 2003 (data buoys reporting on GTS)

UNKNOWN
AUSTRALIA
BRAZIL
CANADA
FRANCE
GERMANY
INDIA
IRELAND
JAPAN
MALAYSIA
NETHERLANDS
NEW ZEALAND
NORWAY
SOUTH AFRICA
UNITED KINGDOM
USA
BRAZIL-FRANCE-USA
MOORINGS

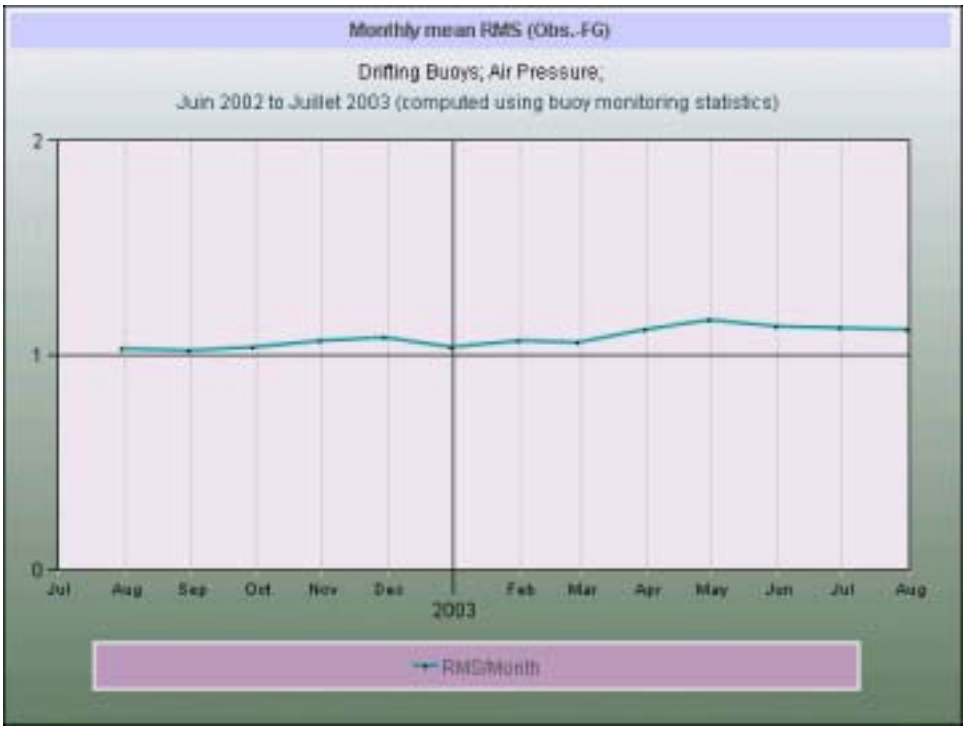
Map 3: Ocean platforms reporting **Sub-surface Temperature** on GTS in June 2003



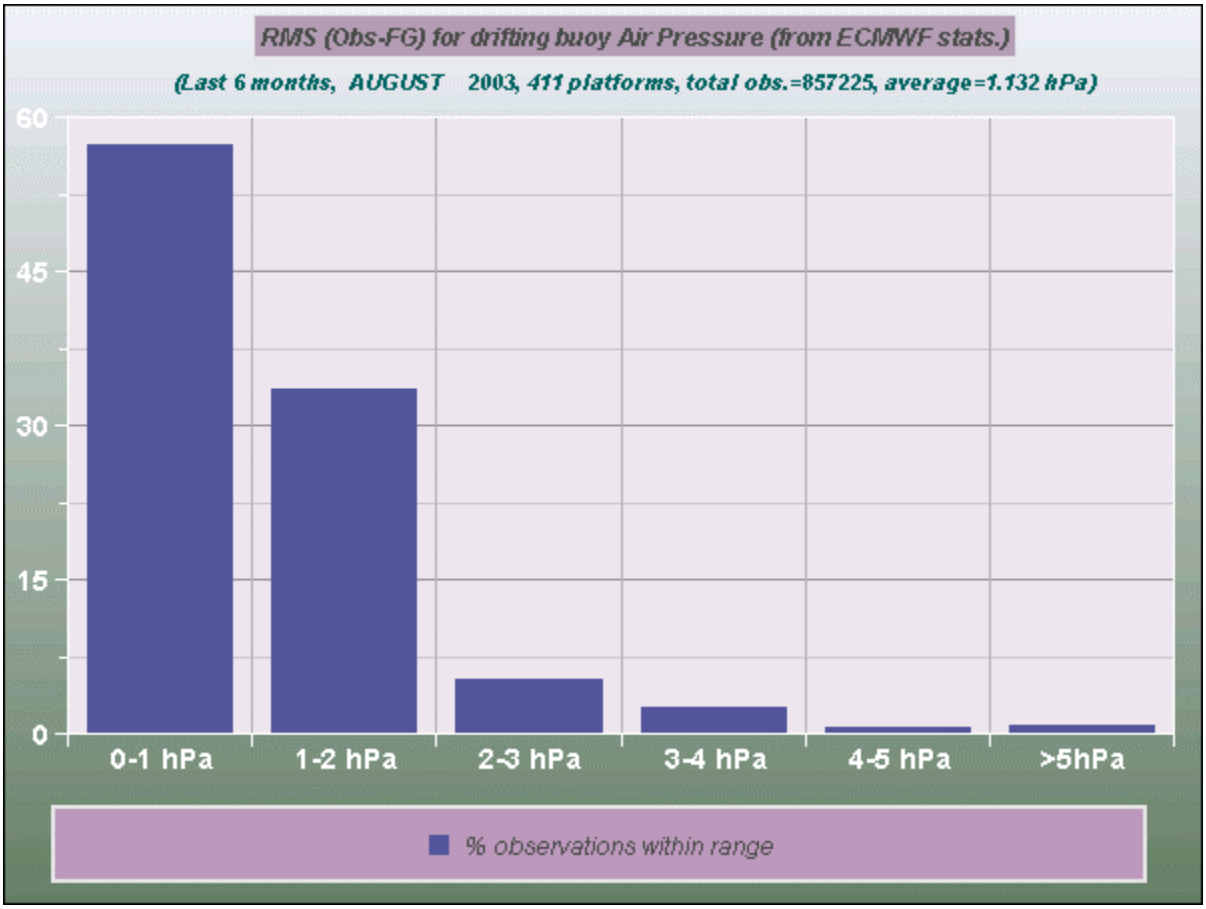
ANNEX VI

Graph 1: Evolution of number of air pressure observations distributed on GTS per month for the period June 2002-July 2003 (from ECMWF monitoring statistics)

Graph 2: Evolution of mean RMS (Obs.-First guess) per month for the period June 2002 to July 2003 for global GTS air pressure data (from ECMWF monitoring statistics)



Graph3: Histogram of distribution of RMS (Obs. - First Guess) for the period 03/2002 to 08/2003.



ANNEX VII

Proposed template for GTS distribution of buoy data in BUFR
(adopted as "pre-operational" by ET/DRC, Arusha, February 2003)

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

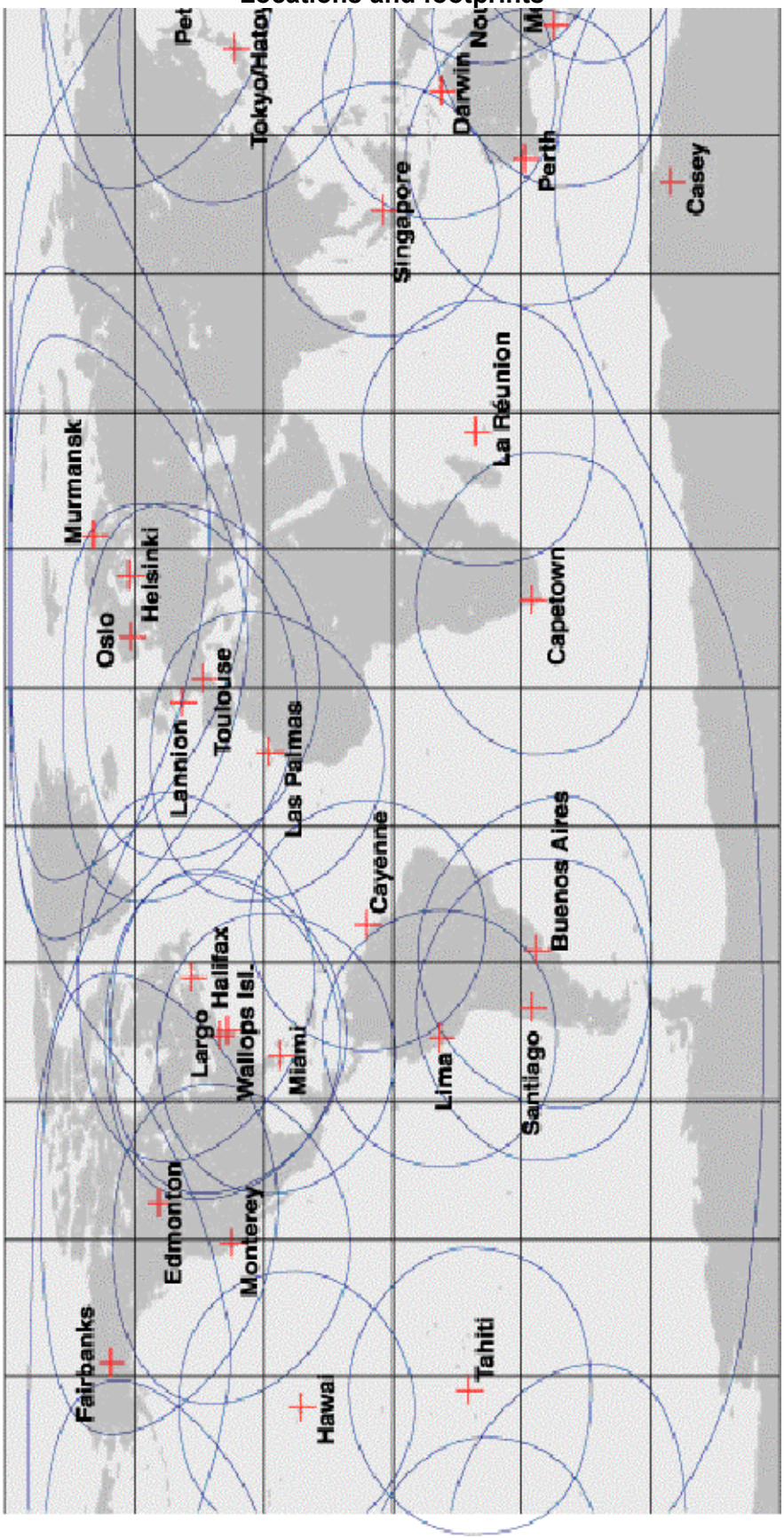
				temp.&hum. measurement)	thermometer
007033	54			Height of sensor above water surface (for temp.&hum. measurement)	Here height of thermometer
012101	55			Dry-bulb temperature (scale 2)	
012103	56			Dew-point temperature (scale 2)	
013003	57			Relative humidity	
007032	58			Height of sensor above marine deck platform (for wind measurement)	Here height of anemometer
007033	59			Height of sensor above water surface (for wind measurement)	Here height of anemometer
008082	60			Artificial correction of sensor height to another value	
007033	61			Height of sensor above water surface (here height of anemometer to which it is artificially corrected)	Here height of anemometer to which it is artificially corrected
002169	62			Anemometer type	
002002	63			Type of instrumentation for wind measurement	
008021	64	2		Time significance	Value = “2” (time averaged)
004025	65			Time period in minutes	
011001	66			Wind direction	
011002	67			Wind speed	
008021	68		Y	Time significance	Value = “missing”
004025	69			Time period in minutes	
011043	70			Maximum wind gust direction	
011041	71			Maximum wind gust speed	
008082	72		Y	Artificial correction of sensor height to another value (set to missing to reset previous value)	Value = “missing”
007033	73		Y	Height of sensor above water surface (set to missing to cancel previous value)	Redefine height to previous level
007032	74			Height of sensor above marine deck platform (for precipitation measurement)	Here height of precipitations
004024	75			Time period in hours	
013011	76			Total precipitation	
007032	77		Y	Height of sensor above marine deck platform (set to missing to cancel the previous value)	Value = “missing”
008021	78	3		Time significance	Value = “3” (accumulated)
004024	79			Time period in hours	
014021	80			Global radiation, integrated over period specified	
008021	81		Y	Time significance	Value = “missing”
025028	82			Operator or manufacturer defined parameter (#1)	
025028	83			Operator or manufacturer defined parameter (#2)	
025028	84			Operator or manufacturer defined parameter (#3)	

ANNEX VIII

List of regional receiving stations

	Antennas	Country	Operator	Possible satellites
1	Aussaguel	France	CLS	**N12, N14, N15, N16, N17**
2	Buenos Aires	Argentina	INTA	**N12, N14, N15, N16, N17**
3	Cape Town	South Africa	CLS/SAWB	**N12, N14, N15, N16, N17**
4	Casey	Australia (Antarctica)	BOM	**N12, N14, N15, N16,**
5	Cayenne	France (Guyana)	IRD	**N12, N14, N15, N16, N17**
6	Darwin	Australia	BOM	**N12, N14, N15, N16, N17**
7	Edmonton	Canada	Envir. Canada	**N12, N14, , N16, N17**
8	Gilmore	USA	NOAA/NESDIS	**N12, N14, N15, N16, N17**
9	Halifax	Canada	Can. Coast Guard	**N12, N14, N15, N16, N17**
10	Hatoyama	Japan	NASDA/EOC	**N12, N14, N15, N16,**
11	Hawaï	USA	NOAA/NWS	**N12, , N15, N16, N17**
12	Helsinki	Finland	CLS	**N12, N14, N15, N16, N17**
13	Ile de la Réunion	France (Reunion Island)	Météo France	**N12, N14, , N16,**
14	Ile de la Réunion	France (Reunion Island)	IRD	**N12, N14, N15, N16, N17**
15	Lannion	France	Météo France	**, N14, N15, N16, N17**
16	Largo	USA	SAI	**N12, N14, N15, N16, N17**
17	Las Palmas	Canaries Island	Univ. Las Palmas	**N12, N14, N15, N16**
18	Las Palmas	Canaries Island	CLS	**N12, N14, N15, N16, N17**
19	Lima	Peru	CLS perù	**N12, N14, N15, N16, N17**
20	Melbourne	Australia	BOM	**N12, N14, N15, N16, N17**
21	Miami	USA	NOAA/AOML	**N12, N14, N15, N16, N17**
22	Monterey	USA	NESDIS/NWS	**N12, , N15 , N16, N17**
23	Murmansk	Russia	Complex System	**N12, N14, N15, N16,**
24	Noumea	France (New Caledonia)	IRD	**N12, N14, , N16,**
25	Oslo	Norway	NMI	**N12, N14, N15, N16, N17**
26	Perth	Australia	BOM	**N12, N14, N15, N16, N17**
27	Petropavlosk	Russia	Rybradiov	**N12, N14, N15, N16, N17**
28	Santiago	Chile	meteo Chile	**N12, N14,N15 , ,**
29	Singapore	Singapore	SMM	**N12, N14, N15, N16, N17**
30	Tokyo	Japan	Jamstec	**N12, N14, N15, N16, N17**
31	Toulouse	France	CLS	**N12, N14, N15, N16, N17**
32	Wallops	USA	NOAA/NESDIS	**N12, N14, N15, N16, N17**
33	Wellington	New-Zeland	Met Office	**, N14, N15, N16, N17**

Argos regional receiving stations:
Locations and footprints



ANNEX IX

DBCP National Focal Points

(last updated 17 September 2003)

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ANNEX X

FINANCIAL STATEMENTS

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

(all amounts in US $ unless otherwise specified)

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

World Meteorological Organization

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

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

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

Prepared on 24 Sept 2003