WORLD METEOROLOGICAL ORGANIZATION

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION (OF UNESCO)

JOINT WMO/IOC TECHNICAL COMMISSION FOR OCEANOGRAPHY AND MARINE METEOROLOGY (JCOMM)
EXPERT TEAM ON MARINE CLIMATOLOGY

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SECOND SESSION

ITEM 3.5.2

GENEVA, SWITZERLAND, 26 TO 27 MARCH 2007

Original: ENGLISH

DATA QUALITY AND EXCHANGE

Report of the Responsible Members

(Submitted by the Responsible Members (RMs))

Summary and purpose of document

This document contains reports by the following respective Responsible Members (Germany, Hong Kong, China, India, Japan, the Netherlands, the Russian Federation, the United Kingdom and the USA).

ACTION PROPOSED

The Expert Team on Marine Climatology is invited to:

(a) Review the operation/activities of the Responsible Members;

(b) Identify any deficiencies and consider possible further improvements of the data exchange system;

(c) Consider future activities of Responsible Members under the MCSS, and make suggestions and/or recommendations, as appropriate.

Appendices: A. Area of Responsibility and Responsible Members under the Marine Climatological Summaries Scheme

B. Reports by Responsible Members (Germany; Hong Kong, China; India; Japan; Netherlands; Russian Federation; UK; and USA)

DISCUSSION

Introduction

1. The Marine Climatological Summaries Scheme (MCSS) is defined in the *Manual on Marine Meteorological Services* (WMO-No. 58). International agreement regarding the MCSS are based on Resolution 35 (Cg-IV), Recommendation 36 (68-CMM), Recommendation 6 (CMM-VI), Recommendation 15 (CMM-VII), Recommendation 35 (79-CMM), Recommendation 6 (CMM-VIII), Recommendation 12 (CMM-X) and Recommendation 11 (CMM-XI).

2. According to the principles of the MCSS, the oceans and seas are divided into eight areas of responsibility for the purpose of preparing the marine climatological summaries, with a view to continued international cooperation regarding the collection, archiving and exchange of marine data. Members having assumed responsibility for the respective area are shown in Appendix A.

3. Full text for the MCSS and Marine Climatology from the *Manual on Marine Meteorological Services* (WMO-No. 558) and *Guide to Marine Meteorological Services* (WMO-No. 471) are available in Doc 7.2 to this meeting.

4. Reports from Responsible Members (RMs) are provided in detail in Appendix B to this document.

Action proposed

5. The Expert Team on Marine Climatology (ETMC) is invited to review the operation/activities of the Global Collecting Centres, identify any deficiencies, and consider possible further improvements of the data exchange system. The ETMC is also invited to consider future activities of Responsible Members under the MCSS and make suggestions and/or recommendations, as appropriate.

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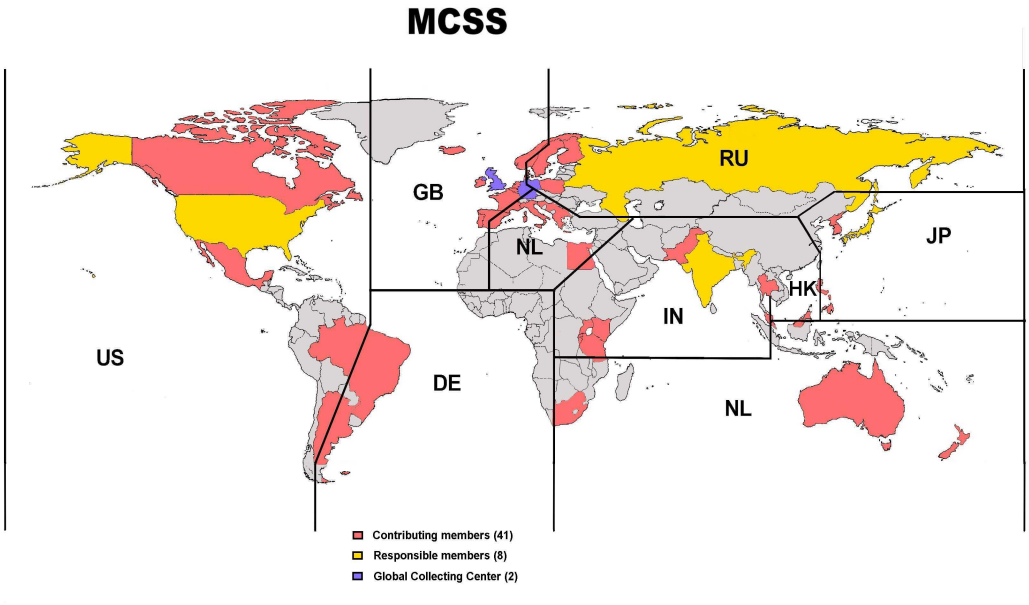
Appendices: 2

APPENDIX A

AREA OF RESPONSIBILITY AND RESPONSIBLE MEMBERS UNDER THE MARINE CLIMATOLOGICAL SUMMARIES SCHEME

Eight Responsible Members:

Germany
Hong Kong, China
India
Japan
Netherlands
Russian Federation
United Kingdom
United State



APPENDIX B

REPORTS BY RESPONSIBLE MEMBERS (GERMANY; HONG KONG, CHINA; INDIA; JAPAN; NETHERLANDS; USA)

REPORT OF RESPONSIBLE MEMBER - GERMANY

1. Data management

• The German Meteorological Service, Deutscher Wetterdienst, hosts one of the two Global Collecting Centres (GCCs) within the Marine Climatological Summaries Scheme, the MCSS, and at the same time acts as Responsible Member for the South Atlantic Area.

• After the MQC check and exchange of the globally collected ship observations between the two GCCs, the completed data sets are forwarded to the Responsible Members on a quarterly basis. Detailed information regarding these activities is contained in the "Annual Report for 2006 of the Global Collecting Centres (GCCs)".

• The New versions of the MQCS and IMMT have been elaborated by the GCC United Kingdom in co-operation with the GCC Germany and will be submitted for discussion at the upcoming ETMC-II Session.

• Reports from ships of the German VOS fleet and fixed stations in 2006:

418 Selected Ships	-	121,716	Obs.
2 Supplementary Ships		282	Obs.
25 Auxiliary Ships	-	18,492	Obs.
7 Automated Stations	-	25,909	Obs.
18 Fixed Sea Stations	-	95,315	Obs.
Total		**261,714**	**Obs**.

• The total number of data sets received from the Area of Responsibility of RM Germany in the year 2006 amounts to about 110,000. There are also older reports contained in this number, which were generated in the years before, but delivered to the GCCs in 2006. Fig.1 provides an overview of the distribution.

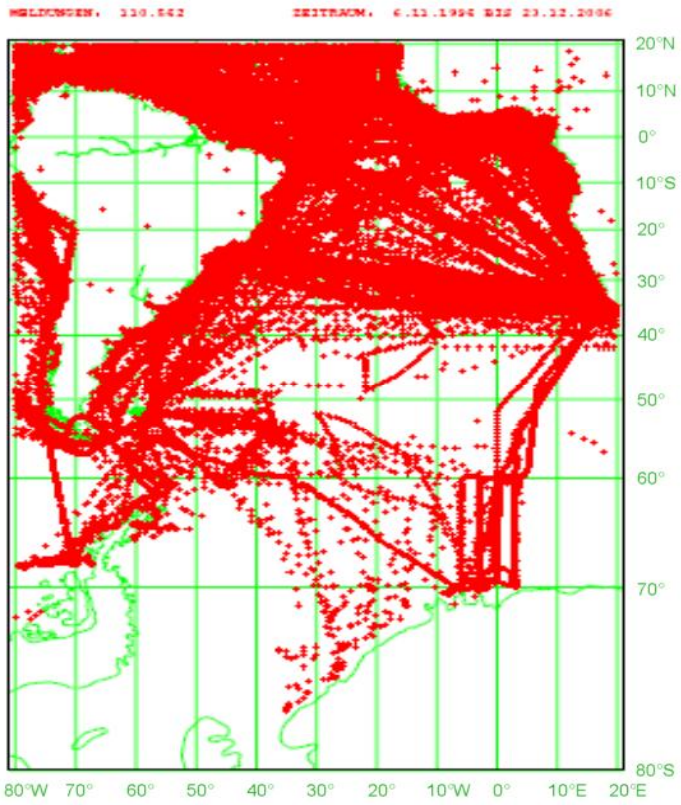


Fig.1 Distribution of observations received by RM Germany from the area South Atlantic during 2006 (from the period of 6 November 1996 to 23 December 2006)

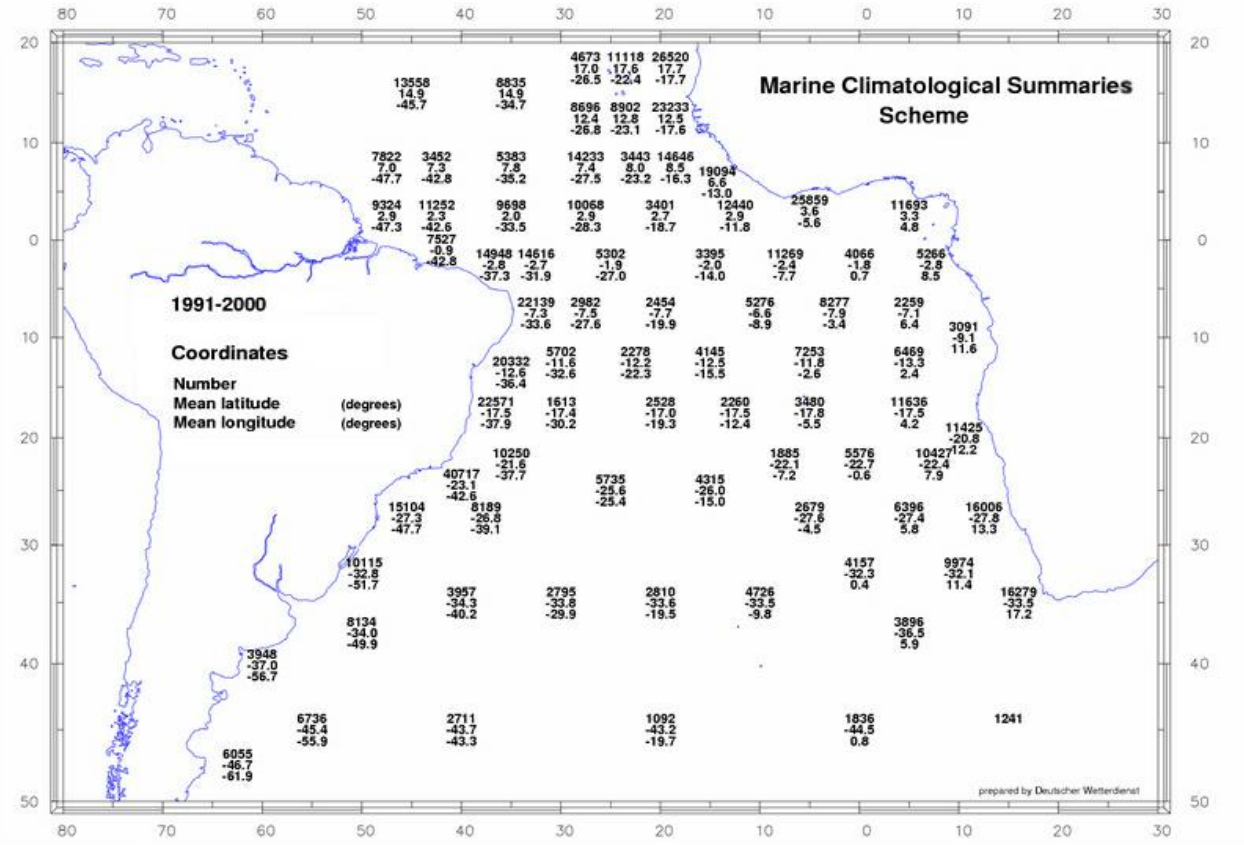
- In 2006, the German VOSClim ships contributed 9552 observations, with 8771 of them with VOSClim-Elements.

2. Preparation of Summaries

- The DWD, as Responsible Member for the South Atlantic Area, has put its Marine Climatological Summaries for the past 10 year period (from 1991 to 2000) on CD-ROM, keeping in mind that the use of these climatological statistics is far more efficient if they are made available via electronic media.

Due to the fact that a significant amount of the delayed-mode data used for the Summaries was available only some years after the end of the period under consideration, the calculations of the climatologies were carried out using such data as well. Thus, after quality check, a total of about 700,000 observations was made available for the preparation of the Summaries.

Fig. 2 Number and distribution of observations used for the preparation of the decadal Summaries 1991 – 2000 South Atlantic



3. Development of the Marine Climatological Summaries Scheme

In order to facilitate information exchange on requirements, needs concerning marine climatological data and products, and the possibilities to cope with them in the framework of the existing or an extended MCSS, it was decided at the First Session of the ETMC-I to make an inquiry. Germany took part in the development of the questionnaire.

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REPORT OF RESPONSIBLE MEMBER - HONG KONG, CHINA
FEBRUARY 2007

Area of Responsibility

1. Under the Marine Climatolgoical Summaries Scheme of the WMO, the Hong Kong Observatory (HKO) is responsible for collecting marine meteorological data for the area bounded by the Equator and latitude 30°N, and longitudes 100°E and 120°E.

Marine Climatological Summaries

2. Annual marine climatological summaries for the HKO's area of responsibility have been compiled and published from the periods of 1961 to 1990. Decadal marine climatological summaries have been compiled and published for the following years: 1961-1970, 1971-1980, and 1981-1990.

Data Exchange with Global Collection Centres

3. Delay-mode data sent to the Global Collection Centres (GCC) by the HKO in the past three years are as follows:

Number of data sent in 2004:

Year of observation					Total
≤ 2000	2001	2002	2003	2004	
233	1825	2497	1510	Nil	6065

Number of data sent in 2005:

Year of observation					Total
≤ 2001	2002	2003	2004	2005	
138	725	850	2376	2788	6877

Number of data sent in 2006:

Year of observation					Total
≤ 2002	2003	2004	2005	2006	
Nil	Nil	417	1577	695	2689

4. For the delayed-mode data observed within Hong Kong's Area of Responsibility, the number of observation reports taken in the past five years that have been digitized in the GCC archive are:

2002	2003	2004	2005	2006	Total
16980	24661	18431	16341	20586	96999

5. Data exchange frequency and data management details:

Frequency of data exchange with GCC	Quarterly
Data format	International Maritime Meteorological Tape-3 (IMMT-3) (effective 1 January 2007)
Quality control	GCC minimum quality control software MQC version 5 (effective 1 January 2007)
Frequency of submitting metadata to WMO	Quarterly
Metadata format	WMO-Pub No. 47 version 2.0, to be changed to version 3.0 starting 1 July 2007

Challenges

6. Most shipping companies are reluctant to have third party software installed on the ship computer. Only two out of the thirty-six ships in the Hong Kong VOS fleet have installed electronic logbook “Turbowin”.

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REPORT OF RESPONSIBLE MEMBER - INDIA

Introduction

India is one of eight Responsible Members (RMs) of the Marine Climatological Summaries Scheme (MCSS) with the responsibility of the Indian Ocean Area north of 15°S bounded by the longitudes of 20°E and 100°E. The India Meteorological Department carries out the responsibility.

Voluntary Observing Ships and Data Processing

As of December 2006, the status of the Voluntary Observing Ships fleet of India is was as follows:

Category	**No. of ships as of 31 December 2006**
Selected	11
Supplementary	133
Auxiliary	41
Other (specify)	Nil
Total National VOS fleet	185
Number of VOS vessels recruited in 2006	2
Number of VOS vessels de-recruited in 2006	Nil
Number of VOSClim vessels at 31 December 2006	21
Number of VOSClim vessels recruited in 2006	Nil
Number of VOSClim de-recruitments in 2006	Nil
Number of VOSClim recruitments planned for 2006	3
Target number of ships to participate in VOSClim	3

Marine weather observations from the meteorological log books of the VOS were scrutinized to eliminate instrumental, positional and coding errors, and were digitized using The International Maritime Meteorological Tape-2 (IMMT-2) format. This data, together with those received from other WMO Members were checked by an in-house quality control software application. The Minimum quality control software MQC, Version 4 (obtained from the GCC) was also used for quality control. All flagged data were reviewed and corrected as far as possible, and the corrected data were then sent to the respective GCC. A total of 8548 marine records were sent to GCC during 2006.

Marine Climatological Summaries

Annual Marine Climatological Summaries for seventeen selected areas of the Indian Area of responsibility were compiled and published for the periods of 1961 to 1970. Following the recommendation of the WMO Commission for Marine Meteorology (CMM), at its Eighth Session (1981), chart form of the decadal summary for the decade from 1971-1980 was published. As the use of electronic versions of the climatological statistics is far more efficient, recently, the Surface Marine Climatological Atlas 1961-1990 was published, along with the electronic format on CD-ROM. Currently, the preparation of marine decadal summary for 1991-2000 is in progress. About 6 lakhs marine observations from the area of responsibility of RM India are available for this purpose.

Marine Data Archival

At the present time, over 4 million marine weather observations made within the area of responsibility of RM India are in the archive of National Data Center, India Meteorological Department, Pune, India. Annual distribution of these observations for the period 1961-2006 is provided in the following figure:

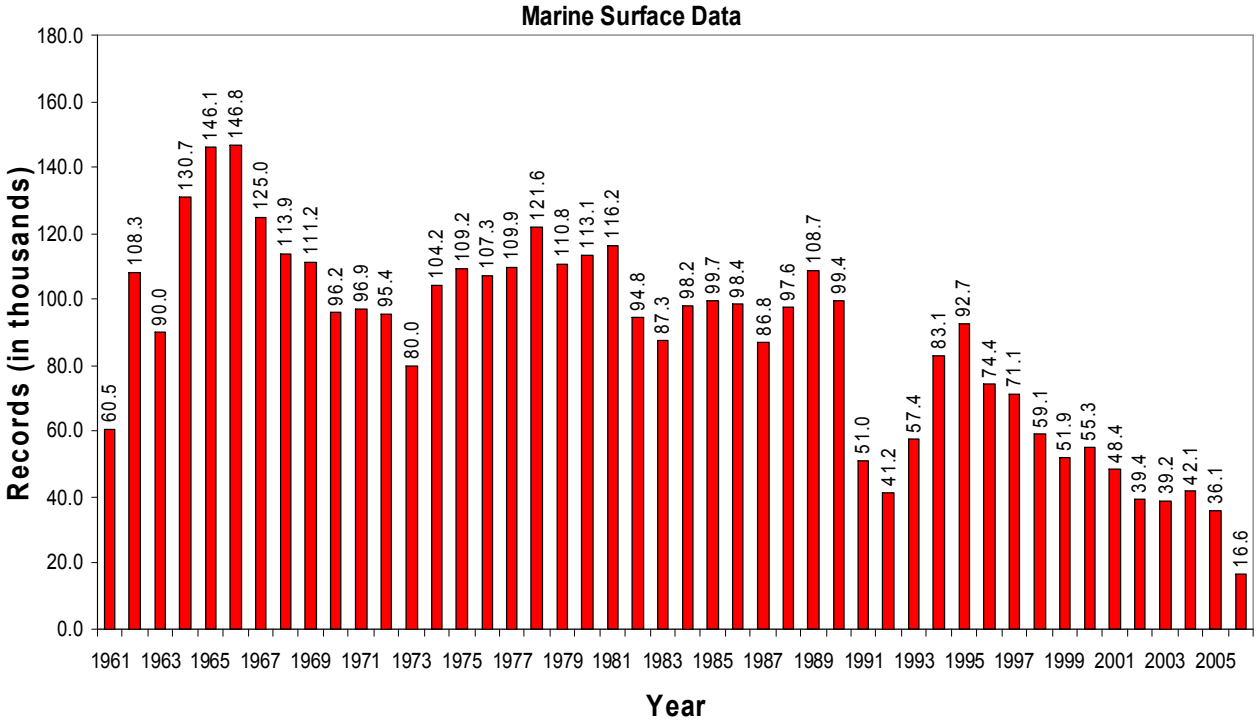

Fig. 1: Marine Surface Data available in the archives of National Data Center, India Meteorological Department, Pune for the Indian area of responsibility.

Difficulties in the analysis of old Ship Weather Observation

The RM India is planning to prepare Marine Climatological Atlas 1951-2000 for Indian area of responsibility. However, it has faced some difficulties, as the marine surface data prior to 1961 are in various formats and its metadata are not fully available. To date, these data are in the unprocessed stage and are still not integrated into the archives. World over Historical Marine Surface data have been rescued and digitized by various meteorological centers/agencies such as NOAA/NCAR, Japan Meteorological Agency (JMA), and the United Kingdom Meteorological Office (Met Office), . It would be extremely useful if these historical marine data sets are converted to a uniform format (e.g., IMMT-2) and redistributed amongst Responsible Member countries for their climatological/research work. Therefore, it is suggested that the ETMC discuss this issue in an effort to convert all relevant data in a uniform format (IMMT-2). For this process, it is suggested that one of the GCCs take up this initiative, and after reformatting sending said data to respective RMs. If accepted, India is ready to participate and support this effort.

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REPORT OF RESPONSIBLE MEMBER - JAPAN

Introduction

1. Japan is one of the eight Responsible Members (RMs) for Marine Climatological Summary Scheme (MCSS), whose responsible area is the western North Pacific and its marginal seas. The Japan Meteorological Agency (JMA) has taken charge of these areas since the inception of the MCSS. JMA's activities for the MCSS in the past three years are presented in this report.

Collection, archiving and exchange of marine data

2. The JMA accepts marine meteorological logbooks, in both paper and electronic formats from the Japanese VOSs. In the past three years (2004-2006), 101946 observations were processed and submitted to the Global Collecting Centres (GCCs) on a quarterly basis. Electronic logs accounts for approximately 30% of the total number of the logs. The IMMT-3 will be introduced in 2007 for the data observed by the VOSClim vessels (all of which are JMA's research vessels). The JMA continue to use IMMT-1 for non-VOSClim observations to ensure that these data do not meet the VOSClim requirement. The MQCS-4 is applied to the IMMT-1 data.

3. Some VOSs started to use a dummy call sign "SHIP" not only for the real-time transmission, but also for the delayed-mode logs in September 2005. From the viewpoint that the marine data with a dummy call sign are less useful for marine climatological purposes, the JMA has been keeping said data, including ship name information, and has not sent said to the GCCs for the time being. The number of those data reached 8000 by the end of 2006.

The marine climatological summaries

4. The marine climatological summaries have not been updated since the JMA published the 30-year summary for 1971-2000 in 2003. Discussion has been made on how to improve the summaries, but to date, has not reached conclusion.

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REPORT OF RESPONSIBLE MEMBER – THE NETHERLANDS

Since the First Session of the Expert Team on Marine Climatology (ETMC-I, Gdynia/Poland, 2004), the KNMI has continued to submit IMMT reports to the GCC.

Table I. Submitted by the Netherlands

Date	**Number of submitted observations**
December 2004	17,415
March 2005	24,626
April 2005	16,502
September 2005	16,510
January 2006	14,792
April 2006	11,875
September 2006	16,505
January 2007	14,365
TOTAL	**132,590**

In the MCSS, the Netherlands are the Responsible Member (RMs) for the Mediterranean, Southern Indian Ocean and the Australian Waters. However, as the KNMI collect IMMT data for the whole globe, therefore it receives the files with global observations from the GCCs each quarter. To date, there are no further activities in the field of the MCSS.

With respect to the MQC: all observations KNMI receive from our VOS fleet are made with TurboWin. This implies that the Minimum Quality Control (MQC) has been carried out properly.

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REPORT OF RESPONSIBLE MEMBER – RUSSIAN FEDERATION

This report has not been received at the time of writing this report.

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REPORT OF RESPONSIBLE MEMBER – UNITED KINGDOM

The United Kingdom Met Office maintains three roles within the Marine Climatological Summaries Scheme (MCSS). The Met Office acts as a contributing member for United Kingdom data, is one of eight Responsible Members (RMs) (taking responsibility for data within the North Atlantic Ocean) and is also one of two Global Collecting Centres (GCC) for the global marine meteorological data. The activities of the GCCs are detailed annually with the most recent 'GCC 2006 Annual Report' in the process of being published by the World Meteorological Organization (WMO).

1. Contributing Member

The UK Voluntary Observing Fleet as at end 2006 is displayed in Fig. 1.

Fig. 1: UK VOF end 2006

Category	***Number as at end 2006***
Selected Ships	378
Active Rigs	30
Ships/Rigs with TurboWin	277
VOSClim Ships	60

The United Kingdom endeavour to submit their quality controlled to the GCCs on a quarterly basis. The number of observations submitted to the GCCs during the period of 2004 to 2006 are shown in Fig.2, including a breakdown of the contributions from the VOSClim ships.

Fig. 2: Contributions to the GCCs

Year	***Total Observations***	***VOSClim Observations***	***VOSClim with extra elements***
2004	65,280	0	0
2005	0	0	0
2006	345,443	51,204	42,779

During 2004 and 2005, the United Kingdom experienced some technical/software difficulties in storing and exchanging their data, in particular for the new VOSClim additional elements. These problems were eventually overcome in 2006, which allowed the United Kingdom to submit a backlog of data to the GCCs, and now continue to contribute each quarter.

2. Responsible Member

As a Responsible Member (RM) country, the United Kingdom receives the global dataset from the GCCs at the end of each quarter.

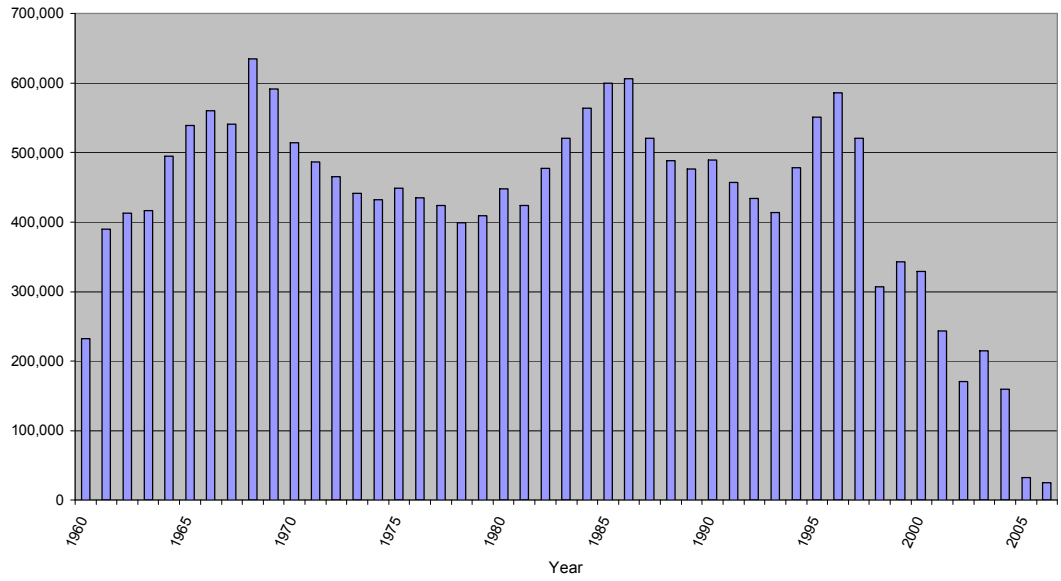
***2.1 Data Processing*:** The United Kingdom stores the global marine datasets in the Met Office relational (Oracle) database. During storage, if an observation matches the date/time/position/id as a GTS observation already stored, this process overwrites this record with the delayed-mode observation. Unfortunately, due to a shortage of staffing resources, only the United Kingdom Ships observations have been stored since April 2005.

Within 24 hours of storage, quality control software checks the data and sets quality flags (currently GCC flags are not passed to the database). Both automatic and manual quality control is performed, and if any changes are made to data two versions will be stored in the database – 1 original and 1 quality controlled.

***2.2 Climatological Summaries*:** During 2004 to 2006 there were no summary requests, and as a consequence no charts were produced.

***2.3 Data Requests*:** During 2006 the United Kingdom has received several data requests under the MCSS with requests originating from contributing members to research students. Fig. 3 shows the volumes of delayed-mode data stored in the database for the United Kingdom's area of responsibility.

Fig. 3: Obs by Year for UK Area



REPORT OF RESPONSIBLE MEMBER - USA

The Expert Team on Marine Climatology (ETMC) is invited to review the activities of NOAA's National Climatic Data Center (NCDC).

In recent years the NCDC has not provided any delayed-mode input to the Global Collecting Centers (GCC). This is largely due to a lack of resources and a shift in focus of the marine program.

The NCDC is attempting to rectify this deficiency by providing additional human resources to support the marine program to fulfill the responsibilities to the GCCs and as the Data Assembly Center for the VOSClim program. The new resource will be tasked with the oversight of the marine program with special emphasis on delayed-mode data and the recovery of historical logbook data.

A meeting comprising representatives of the NCDC (Mr Alan Hall), the United Kingdom's Global Collecting Center (GCC), and the United Kingdom Met Office was held in October of 2006 to discuss the issues. The meeting was able to identify the specific responsibilities of the NCDC and efforts have been underway to meet those responsibilities. A conversion process has been developed to convert IMMA format (NCDC archive format) to the latest IMMT-3 format. This new process will be used to convert all delayed-mode data to IMMT-3 and then passed said data on to the respective GCCs. The timeframe for this to take effect should be in the second quarter of 2007.

A new process will be developed to convert historical logbook data and Buoy data to the IMMA. At that point, these data can be converted to IMMT-3 and made available to the GCCs, if recommended.

Respectfully submitted:

NOAA's National Climatic Data Center
Alan D. Hall

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