

Global Collecting Centres for Marine Climatological Data

Annual Report 2007

Germany

Deutscher Wetterdienst
GCC

P.O.-Box 30 11 90
D-20304 Hamburg
Germany

email: gcc@dwd.de

website: www.dwd.de/gcc

United Kingdom

Met Office
GCC

S9 Saughton House
Broomhouse Drive
Edinburgh, EH11 3XQ
Scotland, UK

email: gcc@metoffice.gov.uk

website: www.metoffice.gov.uk/research/interproj/gcc/

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1. Introduction

1.1 Origin of the GCCs

In 1963, the WMO Commission for Marine Meteorology (CMM) established the Marine Climatological Summaries Scheme (MCSS). Their objective was to develop and maintain a joint effort of all maritime nations in the collection of marine data and production of climatological statistics. To achieve this, eight responsible members (RMs) were appointed; Germany, Hong Kong, India, Japan, Russia, The Netherlands, UK and USA. Each of the eight RMs were assigned a specific area of responsibility (see Appendix A). Any queries/data requests regarding these areas should be directed to the appropriate RM.

In 1993, the WMO CMM agreed there was a need to improve the flow and quality control of global marine data. As a result, two Global Collecting Centres (GCCs) were established; one based at the DWD Germany and the other at the Met Office UK. The GCCs are a collecting, processing and distribution point for all marine Voluntary Observing Fleet (VOF) data (see marine data-flow diagram in Appendix C).

It is the responsibility of each Contributing Member (CM) to collect data from their voluntary observing ships, apply a minimum quality control and regularly submit these to both GCCs. The GCCs ensure these data meet the Minimum Quality Control Standards (MQCS) and, four times a year (at the end of March, June, September and December), re-distribute the data to the eight RMs. It is important that the GCCs work in close co-operation and apply identical procedures. This ensures that, even in the event of failure of one of the centres, the data-flow can continue unaffected.

For further details of the GCCs work see websites above.

1.2 Introduction to GCC 2007

This 2007 report marks the 14th year of GCC operation. The GCC report highlights the activities, new developments and future plans over the past year. Section 2 details Voluntary Observing Ship data received throughout 2007. This includes the amount of data received, problems encountered and also details the quality of these data. The distribution of all data is described in section 3. Future development within the GCCs and the report summary is reported in section 4 & 5. At the end of the report section 6 provides information on contributions to JCOMM's VOSclim project, detailing volumes and quality of data received from VOSclim registered ships.

2. Voluntary Observing Fleet (VOF)

2.1 VOF Data Contributions 2007

In 2007 the total number of observations received by the GCCs was 1,101,880 (see Table I). This is a 15% increase on 2006 collections. The contributions came from 17 countries which is a slight increase on previous figures, however, it still represents less than half of the 41 total CMs. A detailed analysis in Table II displays all CMs and their contributions since the GCCs began. Many of the countries submitting data in 2007 did so only once or twice throughout the year. The GCCs would ask that CMs send their observations more regularly, preferably on a quarterly basis.

The majority of data received by the GCCs are done so by email and anonymous FTP transfer. They arrive in IMMT format with most submissions in 2007 received in the preferred IMMT-3

(5% IMMT-1, 4% IMMT-2, 91% IMMT-3). On occasion a CM may submit a data file of varying length (three times in 2007) and this can be problematic for the GCCs as it hinders processing. Due to this, submissions are requested to be in one IMMT format only.

The volume of data received over the past fourteen years varies significantly and is observed in blue in figure 1. A notably smoother variation can be seen as when considering only unique (non-duplicate) data in purple. This displays that in some years there have been significantly large submissions of duplicated data, however, since 2003 this has been less evident with duplicates making up a very small percentage of the total. For some CMs this is still an issue that should be addressed and by checking the data prior to submission these problems could be dealt with before the GCCs receive the data. [N.B. The version III consolidated MQC-software, which allows the separation of duplicates, is available free of charge to all CMs through the GCCs.]

Data was received each month by the GCCs during 2007 (figure 2), with a significant peak in contributions during August when one country made a large submission. The distribution of observing periods within 2007 spans almost two decades (figure 3 & 5). It can be seen that data has been received from as far back as 1988, but 54% of observations were from 2006 and 2007 alone. Figure 4 displays the number of ships sending data for each year reported with, predictably, most ships sending observations for 2006 and 2007. The GCCs appreciate prompt submission of data, however, old data is still important and represents a valuable addition to the global database.

There is a continuing problem with an increased number of ships reporting under the anonymous/masked callsign of 'SHIP' or similar. This is often done because of security concerns, however this should not be an issue in non-real-time data. When callsigns are masked it is not possible for GCCs and RMs to fully quality control these data; comparisons with real-time, verifying positions and identifying duplicates can prove extremely difficult. Please ensure masked callsigns are converted back to true IDs prior to submission and the GCCs are informed of the real-time callsign for comparison. Where possible, the GCCs would ask CMs to submit their delayed mode only when it is no longer sensitive and not requiring masking.

2.2 VOF Data Processing

To ensure that data meets the JCOMM agreed Minimum Quality Control Standards (latest version MQCS-V), they are processed through a series of GCC programs. Processing draws attention to invalid dates & positions, out-of-range values and invalid coding (i.e. '/' instead of blank) etc. At the final stage of processing, elements are given flags related to their quality and these are compared to flags set by the CM.

During processing there are some instances where simple errors within the date, time, position or identifier (elements 2-8, 42) are noted. Although simple, errors of this sort can be detrimental to the validity of the whole observation, but these can normally be corrected after consultation with the CM. Checking of data by the CM before submission would save time and help alleviate this problem. On occasion, however, some errors are not corrected and these data are then rejected from the dataset to a 'dregs' file. Occurrences of this sort are mostly due to duplicated data, 134 observations (0.01%) received in 2007 fell into this category.

Correct positioning is an issue to be considered, with on-land observations still being reported. The areal distribution map in figure 6 shows the main shipping lanes between continents with much data concentrated at the coasts. The locations of observations on-land are highlighted in red. There were 1,632 (0.15%) observations reported on-land which is a significant increase on 2006 (194) and 2005 (327).

2.2.1 VOF Data Processing – Detailed Analysis

A detailed analysis of GCC 2007 processing identified further issues in the reporting of observations. Some data are still submitted with FM13 coding of "/" or "-" instead of a blank as required by IMMT. The use of invalid coding increased in 2007 to 0.04% of occasions (2006: 0.01%).

In the reporting & coding for precipitation, it is interesting to see that for all VOSclim ships the correct coding for inclusion of precipitation, iR = 3 or 4, is used. However, 2% (2006: 10%) of VOS ships leave the whole group blank. This coding is incorrect even if the element has not been recorded. The GCCs suggest that a change in the compilation of observations at source would be the best way to deal with this type of problem.

The MQC software compares flags already set on the data by CMs to those the MQCS-V would set. This showed that in 2007 the percentage of observations without any flags set was the same as 2006, 1.8%. Further analysis identifies 7,091 (0.03%) occasions where flags conflicting with MQCS-V required resetting to a level of 6 or 7 (see extract from GCC 1994 report in Appendix B for details). This is much less than in 2006 (0.44%) indicating the previous year's rise to be anomalous.

There is evidence to show that the percentage of elements reported blank has varied frequently over past years (figure 7a). The most commonly reported blank elements were still precipitation, swell direction and height of lowest cloud. It was observed in 2006 that there had been a reduction in reported blanks for all elements (excluding precipitation) and in some cases a decrease of 10-20%. However, results for 2007 show that for most elements the number of reported blanks has increased again to similar values as 2005 with the exception of sea surface temperature. This element has previously been reported blank on less than 20% of occasions, however, in 2007 it was reported blank on 30%. Figure 7b displays that there are considerably less reported blank elements (excluding precipitation) from VOSclim ships compared to VOF, with clouds, visibility, pressure tendency and present weather being reported more than double than for VOF.

Throughout the year detailed two-way correspondence was conducted with some CMs on the improvement of data quality and resolving of problems.

3. Dispatch of Data

During the year, four data collectives are dispatched via FTP server to RMs, one at the end of each quarter. The collectives are checked by MQCS-V, meaning the quarterly dispatched data are in IMMT-3 format, even though they were contributed in other versions by the CMs. The original format is coded in element 65 (IMMT version).

The dispatched data comprises of three files; the 'good' file holding all reports which passed the MQC successfully, the 'dregs' containing data which were rejected due to errors in organisational information and the third 'msgs' or 'warn' file holding information on the 'dregs' observations and other problems arising within the file. It is the responsibility of each RM to decide how to proceed with these data, either omitting or correcting the 'dregs'.

It has been noted that occasionally CMs have resubmitted data within later datasets. These duplicates cannot be rejected by the GCCs if they are submitted during different quarters and are therefore only noticed by the RMs during further processing. Please can CMs refrain from re-submitting data, however, if it is necessary then please make GCCs aware of this to allow replacement within the database.

RMs not only receive data for their area of responsibility but they all now also receive the full global dataset quarterly. Requests for data/summaries can be made directly to any of the RMs, however, the cost of processing is sometimes charged.

4. Developments

2nd Session of ETMC: The ETMC met in March 2007 and discussed issues affecting the GCCs. The principles of the newly proposed IMMT-4 and MQCS-VI were agreed. In the revised IMMT-4, if the record originated from an electronic logbook with embedded MQCS, the coding number "4" for the source of observation (element 40) is reserved only for this. The MQCS-VI will raise the upper limit of SLL (maximum height of deck cargo above summer load line) to allow for increasing ship size and cargo deck height. The IMMT-4 will also separate element 91 (s_Lhh) into two elements 91 (s_L) and 92 (hh) and remove the QC indicator for the sign (s_L) of element 92. Due to these adjustments the element numbers from characters 146 to 155 will be affected and increased by 1. Although these were agreed they are yet to be finalised and accepted.

TT-DMVOS: The Data Management Cooperation Group had previously agreed that maintaining the delayed-mode VOS data flow utilising the International Maritime Meteorological Tape (IMMT) format was important, but also that management of the MCSS needed to be modernised. As recommended, a new Task Team on Delayed-Mode Voluntary Observing Ship data (TT-DMVOS) was officially established at ETMC. The Team will be tasked amongst other things to manage the GCCs, establish requirements for the IMMT format and the MQCS, investigate the reconciliation of the IMMT and the International Maritime Meteorological Archive (IMMA) formats, revise relevant WMO technical publications as needed, and establish a web site to share relevant information. A task list was agreed by the members during August 2007 and work has commenced. For details of the TT-DMVOS refer to the JCOMM website:

http://www.jcomm.info/index.php?option=com_oe&task=viewGroupRecord&groupID=158

A TT-DMVOS meeting is planned for during CLIMAR-III, Poland, May 2008.

GCC Meeting: In July 2007 both GCCs met in Hamburg to discuss the further development of the MCSS and to coordinate the most important tasks of the TT-DMVOS working plan.

Callsign Masking: This issue has been discussed by many countries during 2007. The GCCs have agreed all CMs should only submit their IMMT files with the real (un-masked) callsign once the data is no longer sensitive and can be released. There is no set timescale on which these delayed mode data must be contributed. However, the RMs have a separate issue because they may store the delayed mode data in the same database as the real-time data (which contain masked callsigns). These issues will be discussed further at the TT-DMVOS meeting planned in connection with CLIMAR-III in Poland.

MQCforCM Software: GCC MQCforCM version III is still available and can be obtained by contacting the GCCs. This software includes changes to checks according to MQCS-V, checking present weather codes from automatic stations, checking of VOSclim additional elements, the addition of new flags in the IMMT-3 format and also the choice to separate duplicate records. All countries that had the previous version of MQCforCM were sent the update.

Data Questionnaire: In December 2007 the GCCs sent a Marine Climatological Data Questionnaire to all marine meteorological services throughout the world (see Appendix D for copy of questionnaire). The purpose of the questionnaire was to seek information on whether each country ran a Voluntary Observing Ship Fleet and if they are currently contributing their observations to the MCSS or, if not, if they required help in doing so. The aim is to encourage all countries to contribute their data and to increase the amount for

checked observations within the archives. The result of this questionnaire will revise the numbers of CMs within the scheme which can be seen in Table II of the Annual Report.

5. Summary

To summarise, the GCCs continue to receive data from a number of CMs regularly and overall the quality of the data is encouraging with reduced dregs, reduced changes to suspect flags and an increased number of observations in IMMT-3 format. However, there could potentially be many more observations received by the GCCs each year, therefore, countries having trouble submitting data should contact the GCCs to make them aware of their difficulties and take action in working toward addressing these issues.

There are still delays between our received and controlled data in the archives of the RMs and those only collected and flagged data in other real-time international datasets. We would like to encourage all countries to submit their observations, and if their ships do not record in a logbook they should submit their MQCS checked GTS data. This will give RMs the opportunity to check data with higher quality control for their archives and further processes.

There are some points from the report that need consideration from CMs.

- Observations should be submitted regularly on a quarterly basis.
- Convert masked callsigns (i.e. 'SHIP') back to original prior to submission.
- Data files should be sent in one IMMT format only – IMMT-3 preferably.
- By applying MQCS to data prior to submission CMs can identify and rectify any significant problems, in particular, issues within date, time and position.
- With improved compilation of observations, the presence of '/' and incorrect/missing flags could be addressed before submission.
- Any CM that has not yet received the updated 'MQCforCMs' (version 3) can do so by contacting the GCCs.

There is increasing demand from areas in climate research, marine forecasting, satellite calibration, climate modeling and maritime industries for marine data. Therefore, it is hoped CMs will appreciate the importance of their submissions and the value they add to the global marine database.

The GCCs would like to thank the CMs for their data that was submitted and for their co-operation during 2007. As always, all members are invited to provide further feedback which may benefit the whole system and integrity of the marine database.

6. VOSClim Data 2007

6.1 VOSClim Project

The VOSClim Project is an ongoing pilot within JCOMM's Voluntary Observing Ships' Scheme. It aims to provide a high-quality subset of marine meteorological data with detailed information on how the data have been obtained. These data are available in delayed mode and are of great value to both operational marine forecasting and global climate studies.

The IMMT-2 format, which allowed delayed mode submission of VOSClim elements (element 87-93), came into effect in January 2003. The more recent IMMT-3 format, which allows flags to be set on these additional elements (element 94-101), was formally accepted at the second session of JCOMM in September 2005.

For further details and information, refer to the VOSClim project website <http://www.ncdc.noaa.gov/oa/climate/vosclim/vosclim.html>

In 2007 New Zealand joined the project and is now contributing observations from their VOSClim ship. There are currently ten CMs in total with recruited VOSClim ships and 251 active ships worldwide.

6.2 VOSClim Contributions

In 2007 VOSClim submissions were received from nine of the ten CMs. The GCCs received 66,915 observations from VOSClim ships (Table III, IV & V), contributing to 6% of the total submissions. (2006: 9%, 2005 and 2004: 4%, 2003: 1%) (see figure 8). The distribution of data was larger than in previous years with data received from 2001 to 2007 (figure 9). Figure 10 shows the number of ships sending data for each year reported with, predictably, most ships sending observations for 2006 and 2007. However, the number of observations containing additional VOSClim elements was considerably less than the total submitted at 44,725. Nevertheless it is encouraging to see the number of observations remains high and are being submitted regularly from most of the CMs in the project.

There are still a considerable number of observations received from non-VOSClim ships containing the additional elements (see Table V). CMs are asked to encourage ships already reporting these elements (and other vessels) to join the VOSClim project.

The GCCs understand there can be software issues involved when initially processing VOSClim data which can delay submission to the GCCs. Any CMs having such problems are encouraged to make GCCs aware of this, because advice may be available to help.

As mentioned in section 2.1 the masking of ship callsigns is becoming a considerable international problem and it also has serious implications to the VOSClim project. The UK Met Office's Real Time Monitoring Centre commitment for VOSClim is unable to be properly fulfilled as VOSClim ships reporting under a masked callsign cannot be effectively identified. As a consequence, their VOSClim data will not be sent to the Data Assembly Centre (DAC) at the National Climatic Data Center and monitored. The GCCs would ask CMs, where possible, to ensure masked callsigns are converted back to true IDs prior to submission to the GCCs.

6.3 VOSClim Data Processing & Analysis

As with the VOF contributions, observations are processed through a series of programs to ensure it passes the MQCS. VOSClim data still proves to be of a higher standard compared with VOF. Only 4 observations (0.01%) in 2007 were rejected into the 'dregs' file and all

observations had corresponding flags reported to the common weather elements, but only 29% to the attached VOSClim elements.

The area distribution map in figure 12 shows that VOSClim ships prefer the main shipping lanes between continents, but are also spread ocean wide. There were 38 (0.06%) observations reported on-land by VOSClim ships in 2007 which is significantly lower than VOF. However, there were still observations where the common weather flags were inconsistent with the MQCS-V and were subsequently reset. This occurred on 0.08% of occasions which is a little more than for VOF ships. On 1,218 occasions, however, the VOSClim flags were inconsistent with MQCS-V in particular for the SLL flag, occurring 1,116 times (1.67%).

It has been seen that reporting of SLL is an issue for the MQCS. 4.5% of VOSClim data was reported with SLL greater than the MQCS limit of 32m. This may be due to ships and their deck cargo height growing larger and so the MQCS-V limits must be adapted to the new generation of ships. The proposed MQCS-VI will allow for a higher limit of SLL.

In figure 7b it can be seen that all elements (excluding precipitation) were reported blank on significantly less occasions than for VOF. In particular for clouds, visibility, present weather and pressure tendency. Figure 11 displays the slight reduction in reported blank VOSClim elements and flags compared to 2006.

The GCCs are aware that some CMs are having problems sending VOSClim data in the newer formats. On occasion data has been submitted to the GCCs from VOSClim ships without inclusion of extra elements and then at a later date, these have been re-submitted with the VOSClim elements added. The GCCs would ask CMs to please hold submission until full observations can be sent, else RMs receive a great deal of duplicated data.

6.4 Dispatch of Data

VOSClim data is dispatched to RMs as part of the quarterly exchange and in addition to this all observations received from VOSClim ships are dispatched quarterly to the Data Assembly Center in the USA. For details of the number of observations sent refer to Table III and figure 8.

6.5 Summary

In summary, 2007 saw nine out of the ten CMs making regular submissions from VOSClim ships. It is also encouraging to see that data quality generally proves to be better than for VOF and that the number of reported blanks VOSClim elements and flags are decreasing.

There is still one CM yet to contribute their VOSClim ship submissions to the GCCs. The GCCs would like to provide help to the CM with making these submissions so please make contact.

There are some points from the report that need consideration from CMs.

- All VOSClim ship data submissions should include additional VOSClim elements.
- CMs with data not yet submitted from VOSClim ships are encouraged to be sent at their earliest convenience or contact GCCs if having trouble.
- Convert masked callsigns (i.e. 'SHIP') back to original prior to submission.
- Please do not split observations to enable submissions to be made possible. If CMs experience problems in exchanging the newer IMMT formats, wait until it is possible to do so before sending observations.
- For non-VOSClim ships reporting VOSClim additional elements, please take action to join the project.

The GCCs would like to thank the CMs for their VOSclim data that has been submitted in 2007 and the continual co-operation. As you are in no doubt aware, the data from the project is extremely important for climate change studies and research.



GCC Meeting, July 2007 in Hamburg

From left to right: R. Zöllner (GCC DE), E. Gowland (GCC UK), W. Gloeden (GZS), H. Otten-Balaccanu (GZS), Ch. Lefebvre (GZS), N. Scott (GCC UK), H. Haar (GCC DE).

Abbreviations

CM	Contributing Member
CMM	Commission for Marine Meteorology
DAC	Data Assembly Center
DWD	Deutscher Wetterdienst
ETMC	Expert Team on Marine Climatology
GCC	Global Collecting Centre (MCSS / JCOMM)
GZS	Marine Meteorological Archive, DWD
IMMA	International Maritime Meteorological Archive
IMMT	International Maritime Meteorological Tape
JCOMM	Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology
MCSS	Marine Climatological Summaries Scheme
MQC	Minimum Quality Control (WMO Standard)
MQCS-V	Minimum Quality Control Standards (Version 5, July 2004)
RM	Responsible Member
SLL	maximum height of deck cargo above summer load line (IMMT-2 & IMMT-3 element 90)
TT-DMVOS	Task Team on Delayed Mode VOS Data
UK	United Kingdom
VOF	Voluntary Observing Fleet
VOS	Voluntary Observing Ship
VOSclim	VOS Climate (Subset for High Quality Data - Project)
WMO	World Meteorological Organization

Table I: GCC Observations 2007

Country Name	1st Q	2nd Q	3rd Q	4th Q	Total
Argentina	69	241	34		344
Australia			314728	15641	330369
France			107764		107764
Germany	146647	86992	27949	42842	304430
Hong Kong, China	355	391	1285	937	2968
India		3578		1218	4796
Israel			7585		7585
Japan	5358	5742	6797	7658	25555
Malaysia		2830	1658	837	5325
Netherlands	14365	14911	23826		53102
New Zealand				11218	11218
Norway				12611	12611
Poland		609		424	1033
Russian Federation	12169	12105	12043	12022	48339
South Africa	288	1220			1508
United Kingdom	7674	11491	21944	9321	50430
USA			118631	15872	134503
17 Countries	186925	140110	644244	130601	1101880

Table II: Number of Contributions by CMs per Quarter (1994 - 2007)

ISO Alpha-2 code	status	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	Number of years with contributions					
AR	CM								1		1 2	1 1 1	1 1 1 1	1 1 1	1 1 1	6					
AU	CM							3		1	1	1	1		1 1	6					
BE	CM															0					
BR	CM		1		1	1 1 1	1 1									4					
CA	CM															0					
HR	CM				1	1	1	1	1 1							5					
DK	CM							3 2		1			2 2			4					
EG	CM															0					
FI	CM															0					
FR	CM	1		1 1	1	1 1	1		6 3		1		2 1 1 1	2 1	1	11					
DE	GCC/RM	1 4 2 4	3 3 4 3	2 4 2 1		1 18 3 2	1 4 2	1 2 1 2	1 1 1 2	1 1	2 1 3 1 6	10 1 2 5	3 5 3 1	5 3 3 3	4 4 2 2	14					
GR	CM															0					
HK	RM	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1	2 1 1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	14					
IS	CM															0					
IN	RM	1	2 1	1		1 1 1 1	1 1	2 1 1	1 2 1 1	1 1 1 1	1 1 1 1	1 1 1 1	2 1		2 1	3 2	14				
IE	CM				1	1	1	1 2			2						4				
IL	CM			2		1	1	1	1	1	1	1	1	1	1		13				
IT	CM																0				
JP	RM		(6)	1 1	1 2	1 1	1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	2 2 1 1	1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 2	14				
KE	CM																0				
KR	CM							1									1				
MY	CM	1			1	1	1	1	2	1	1 1	2 1	1 1		2 1 1	1 1 1	12				
MX	CM																0				
NL	RM	1		2	2	1		2 2	2 1 1	1 1 1 1		1		1 3	1 1	3 1	1 1 1	1 1 1	12		
NC	CM	1		1 1 1 1	1 1	1 1 1	1		1										6		
NZ	CM															1		1	2		
NO	CM		5 4	2 2 2	2	6 3 3 6	3 3	9 3	3 6	1 3 3 3	3 3	3 3 3	3		21	3		3	14		
PK	CM																		0		
PH	CM																		0		
PL	CM	1		2 1	1	1 1 1 1	1	2	1 2	1 1 1 1	2 1		1 1	1 1	1 1	1 1	1	1 1	14		
PT	CM																		0		
RU	RM			2 1	1	4 2		3 6 1 1	1 1 1 1 5	2 2 2 2	2 2 2 2	2 2 2 2	2 2 2 2	2 2 2 2	2 2 2 2	1 1 1 1	1 1 1 1	13			
SG	CM			1 1	1 1		1 1 1					1 1	1		2				8		
ZA	CM							4 1 1	1 2 5 2 2 1	2 3 2	4 4 2 4	2 5 4 2	4 4 3 2	3 3	3 2 4			9			
ES	CM																		0		
SE	CM				1														1		
TH	CM																		0		
UG	CM																		0		
TZ	CM																		0		
GB	GCC/RM	3 1 1 1	1 1 1 1	1	1 1 1	1 2	1 1 1 1	1 1 1 1	1		3	3 2	5 1			16 2 2	1 1 1 1	12			
US	RM	2 2 1	1		6 1 2		3 1 1	1 1	1 3		3 2 4 2 2						1 1	10			
			13		15		18		17		17		14		17		16		16		17

Table III:**Observations from VOSclim Ships / Observations with VOSclim Elements 2007**

Country Name	1st Q		2nd Q		3rd Q		4th Q		Total	
	Australia					23494	15305	3937	3214	27431
France					9512	0			9512	0
Germany	2145	2001	2246	2186	1452	1409	4521	4363	10364	9959
India			1464	214			309	251	1773	465
Japan							3026	3026	3026	3026
Netherlands	1582	1519			3672	3409			5254	4928
New Zealand							455	342	455	342
United Kingdom			2558	2133	3362	2596	2982	2757	8902	7486
USA					198	0			198	0
9 Countries	3727	3520	6268	4533	41690	22719	15230	13953	66915	44725

Table IV:**Observations from VOSclim Ships / Observations with VOSclim Elements (03 - 07)**

Country Name	2003		2004		2005		2006		2007	
	Australia	2078	0	3397	0	3928	0	0	0	27431
Canada	0	0	0	0	0	0	0	0	0	0
France	0	0	30637	0	17619	0	18567	0	9512	0
Germany	5675	5166	5345	5176	6474	6377	9552	8771	10364	9959
India	1332	0	3077	0	4269	0	2679	792	1773	465
Japan	0	0	818	0	4439	0	0	0	3026	3026
Netherlands	215	0	603	0	2161	1899	2011	1117	5254	4928
New Zealand	0	0	0	0	0	0	0	0	455	342
United Kingdom	0	0	1017	0	0	0	51204	42779	8902	7486
USA	278	0	0	0	0	0	0	0	198	0
	9578	5166	44894	5176	38890	8276	84013	53459	66915	44725

Table V:**Total Observations from VOSclim Ships / Number of Observations with VOSclim Elements from VOSclim-Ships / Number of Observations with VOSclim Elements from not listed ships 2007**

Country Name	1st Q			2nd Q			3rd Q			4th Q			Total		
	Australia							23494	15305	2477	3937	3214	0	27431	18519
France							9512	0	0				9512	0	0
Germany	2145	2001	0	2246	2186	2176	1452	1409	0	4521	4363	3932	10364	9959	6108
India				1464	214	40				309	251	31	1773	465	71
Japan										3026	3026	629	3026	3026	629
Netherlands	1582	1519	1468				3672	3409	1565				5254	4928	3033
New Zealand										455	342	0	455	342	0
United Kingdom				2558	2133	963	3362	2596	687	2982	2757	303	8902	7486	1953
USA							198	0					198	0	0
9 Countries	3727	3520	1468	6268	4533	3179	41690	22719	4729	15230	13953	4895	66915	44725	14271

Figure 1: Contributed and Distributed Observations 1994 - 2007

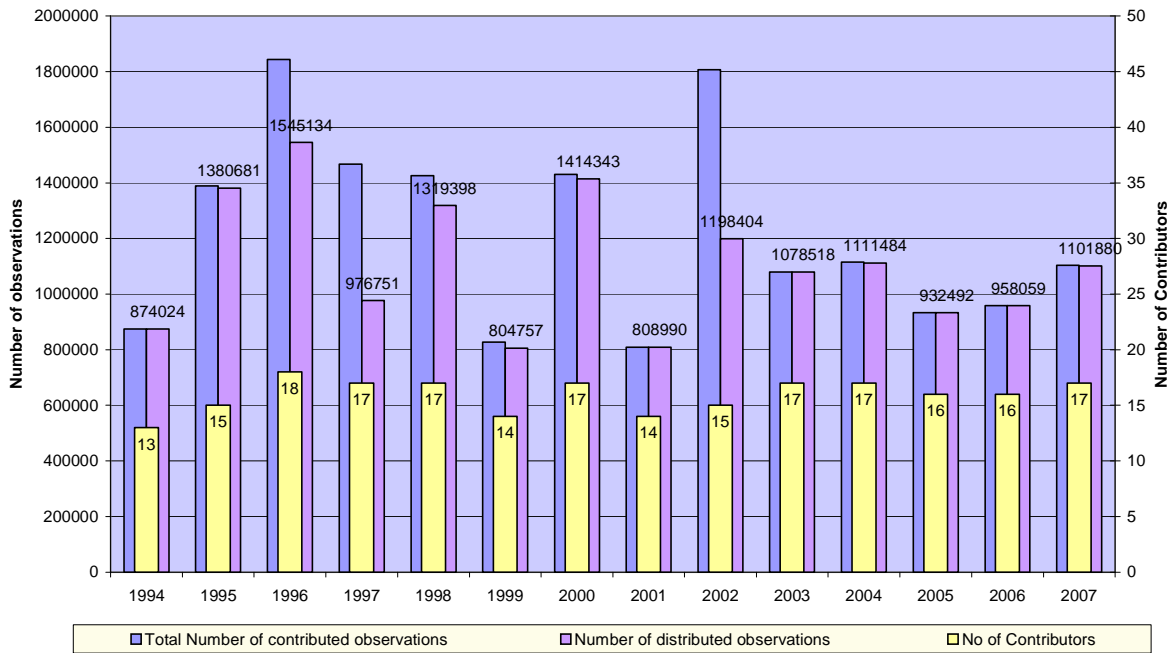


Figure 2: Number of Observations Received each Month 2007

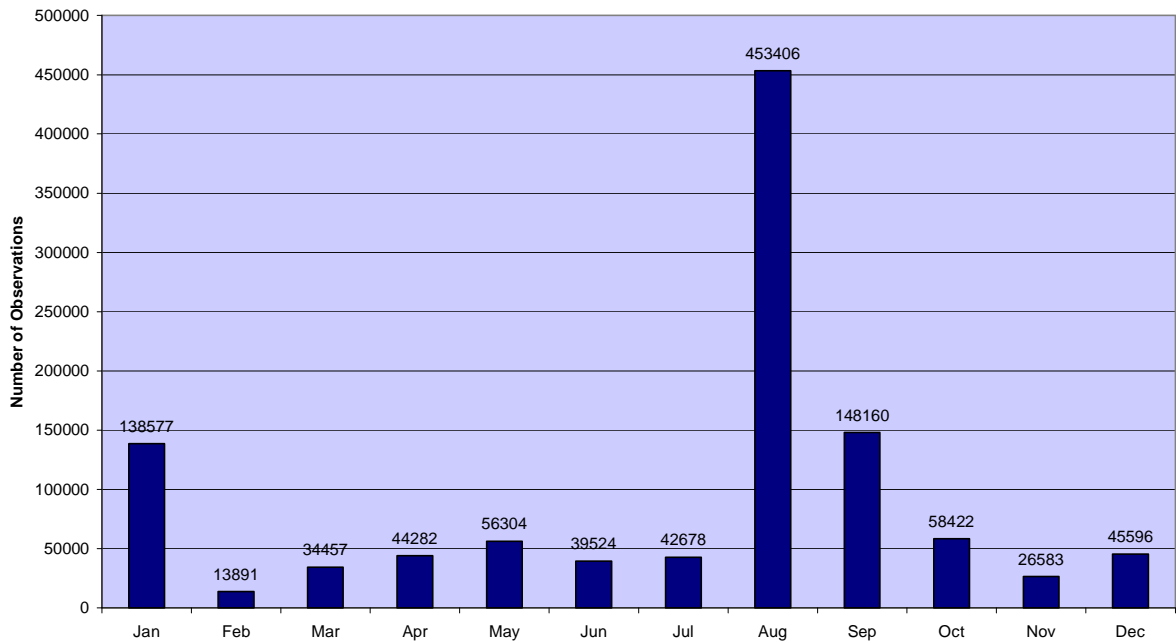


Figure 3: Distribution of Data Received in 2007

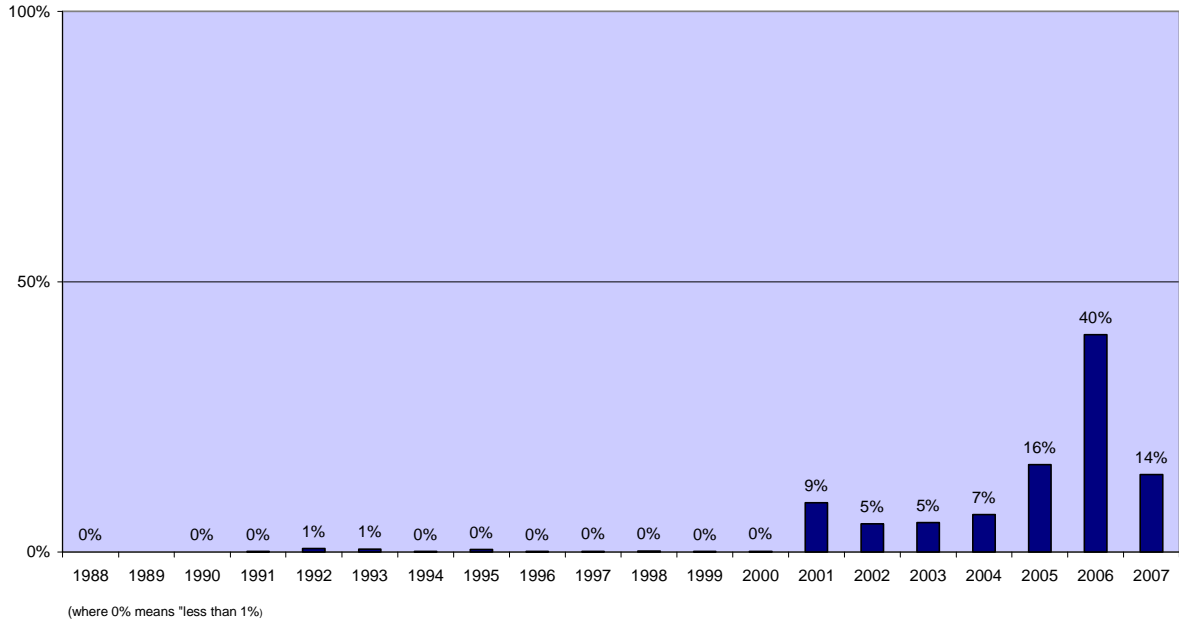


Figure 4: Number of Ships contributing in 2007

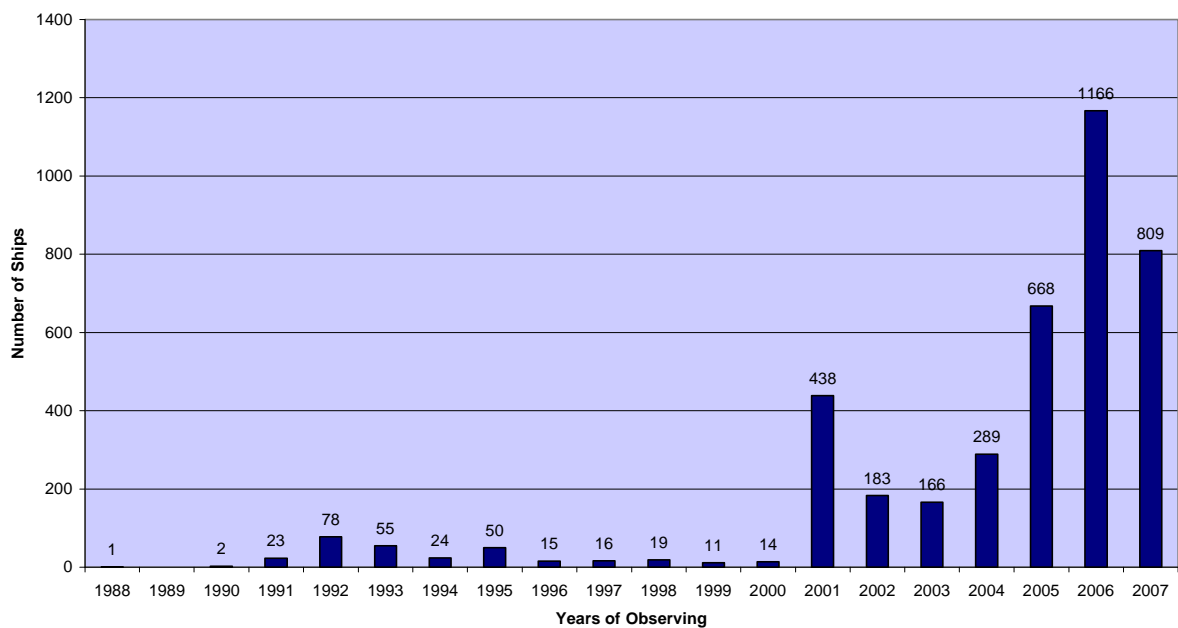
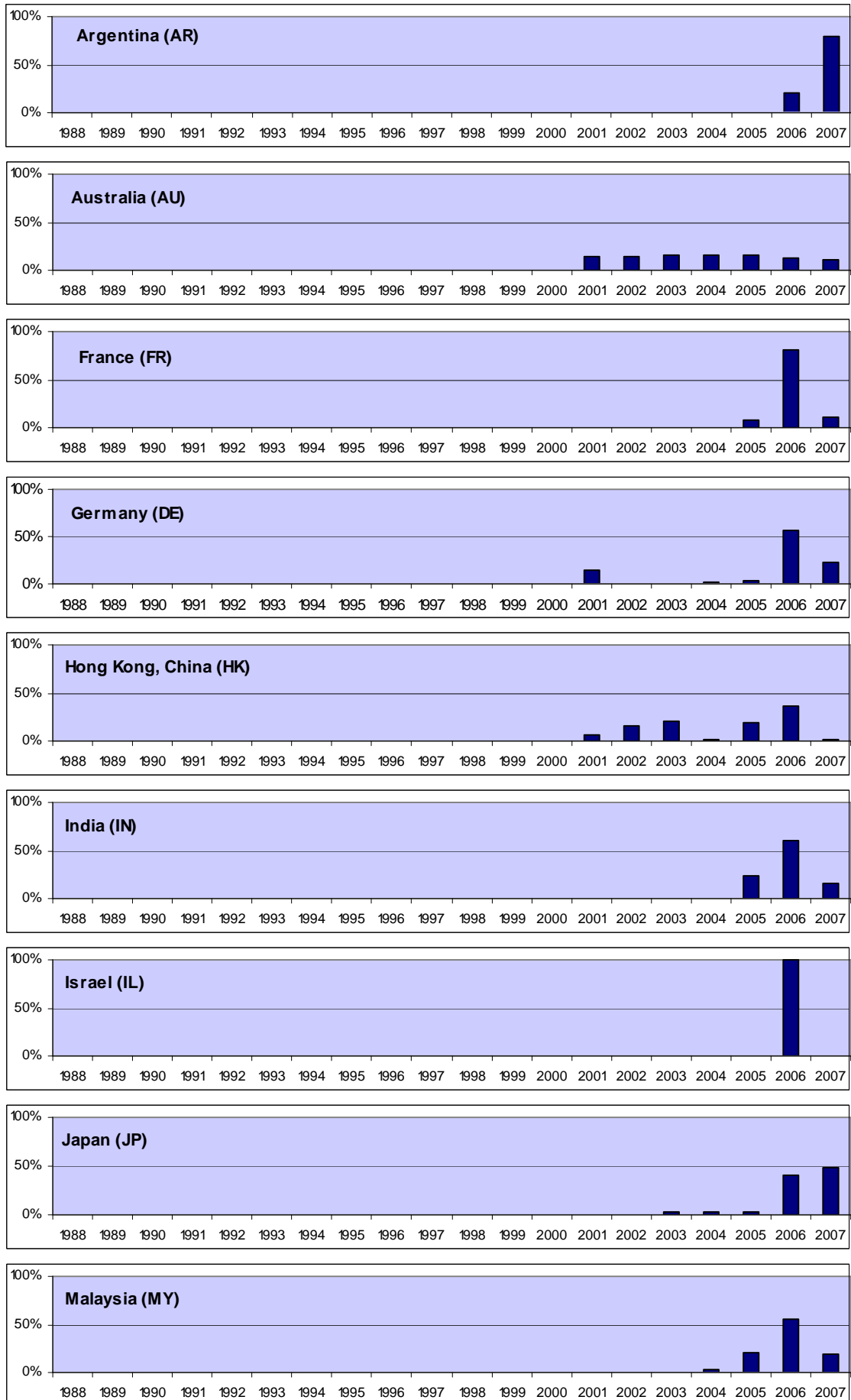
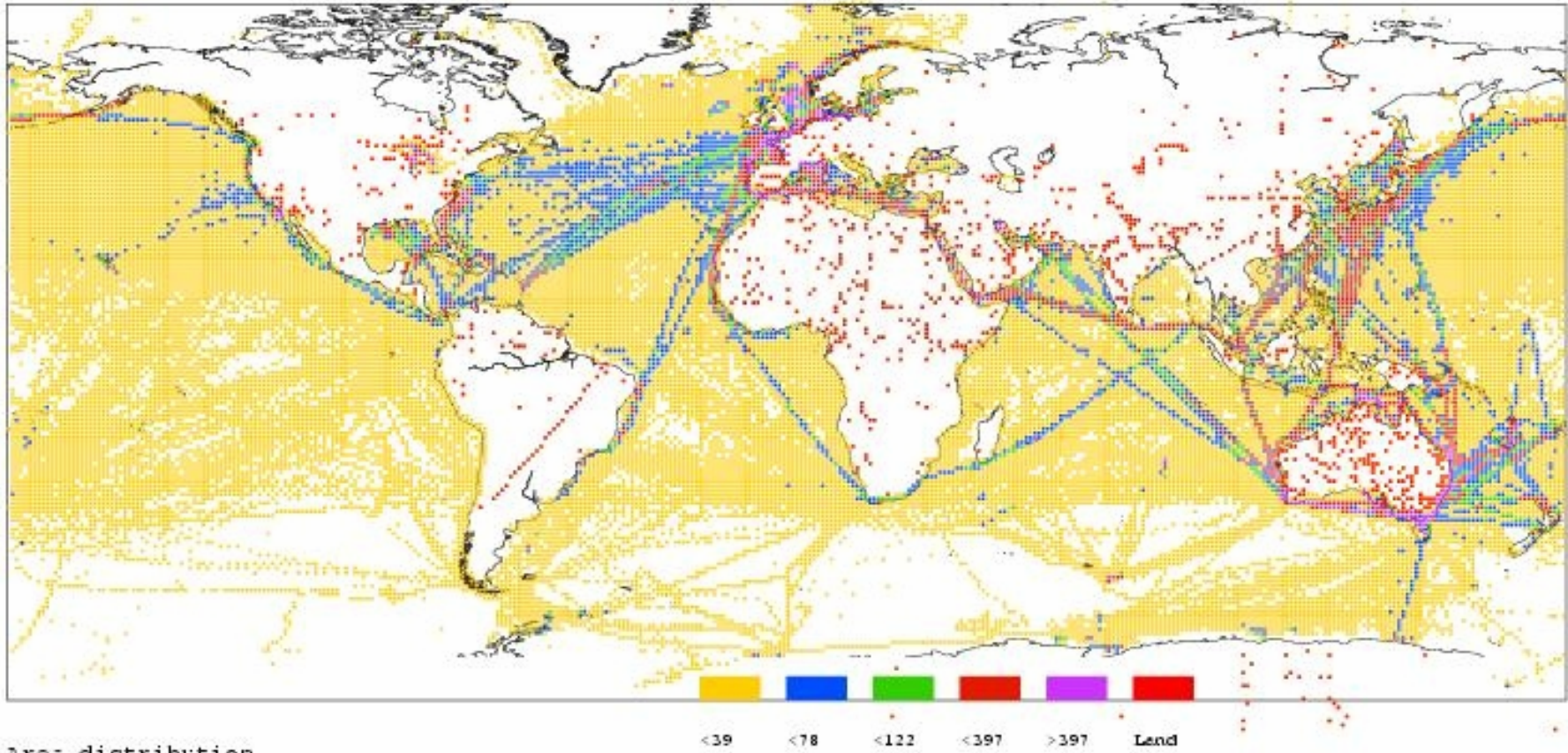


Figure 5: Distribution of Data by Country





Total Number of Observations (1101880) received in 2007

Figure 6: Areal Distribution of Reported Positions 2007

Figure 7a: Elements reported "blank" 2003 -2007

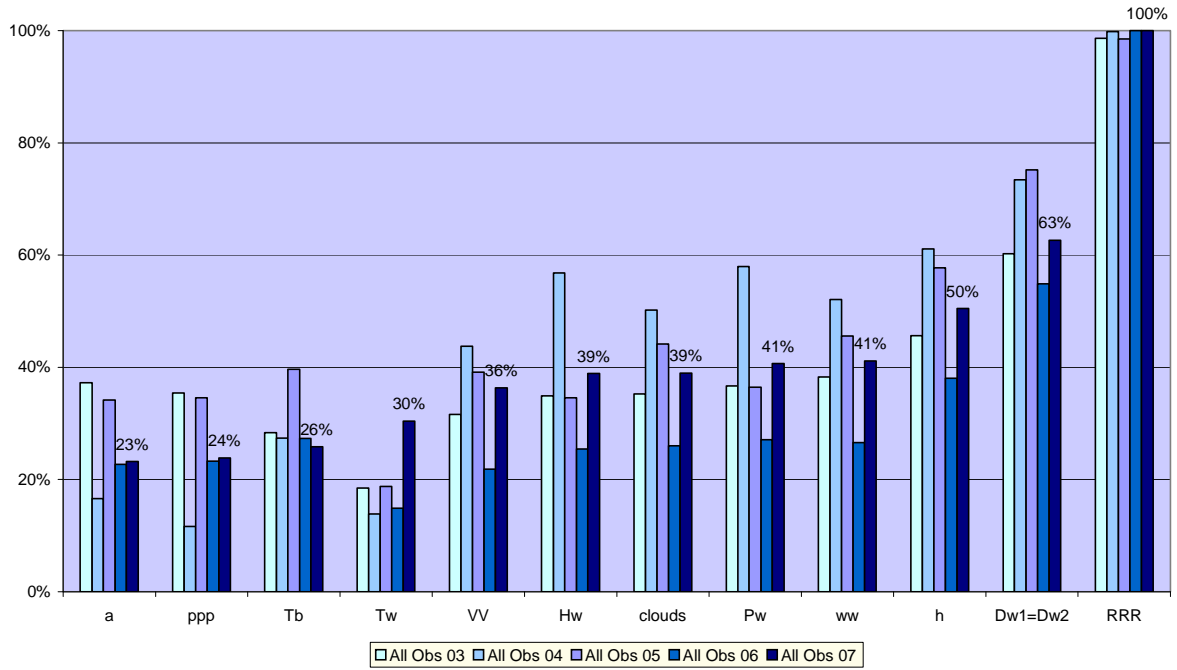


Figure 7b: Elements reported "blank" 2007

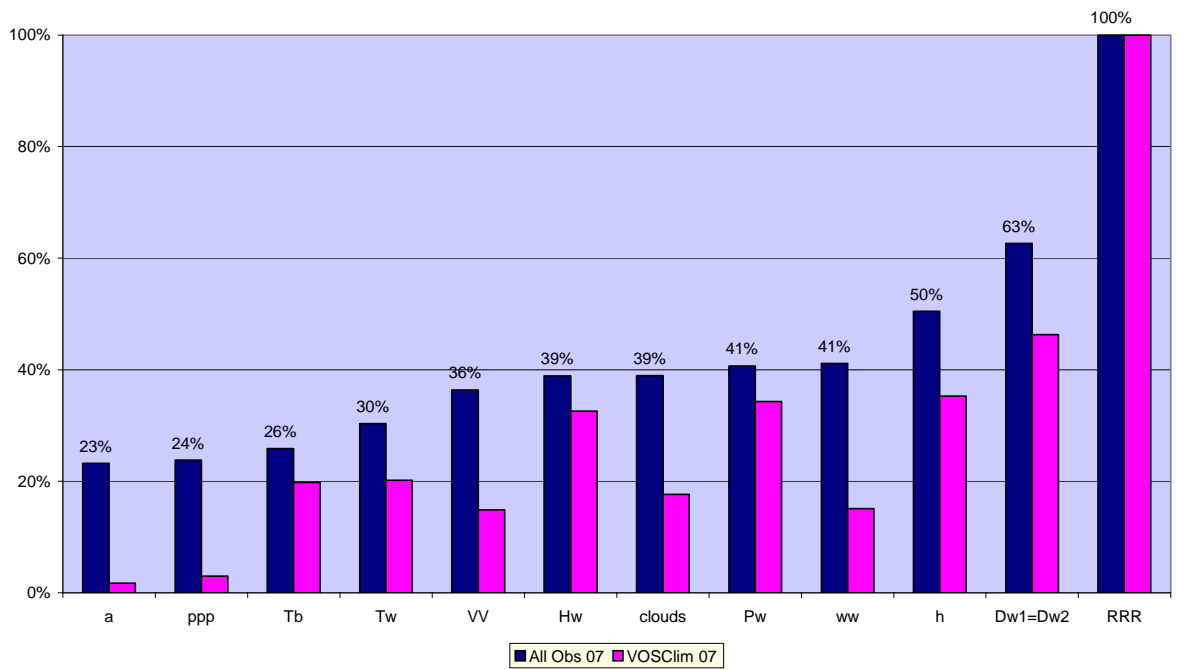


Figure 8: VOSCLim- Input 2003 - 2007

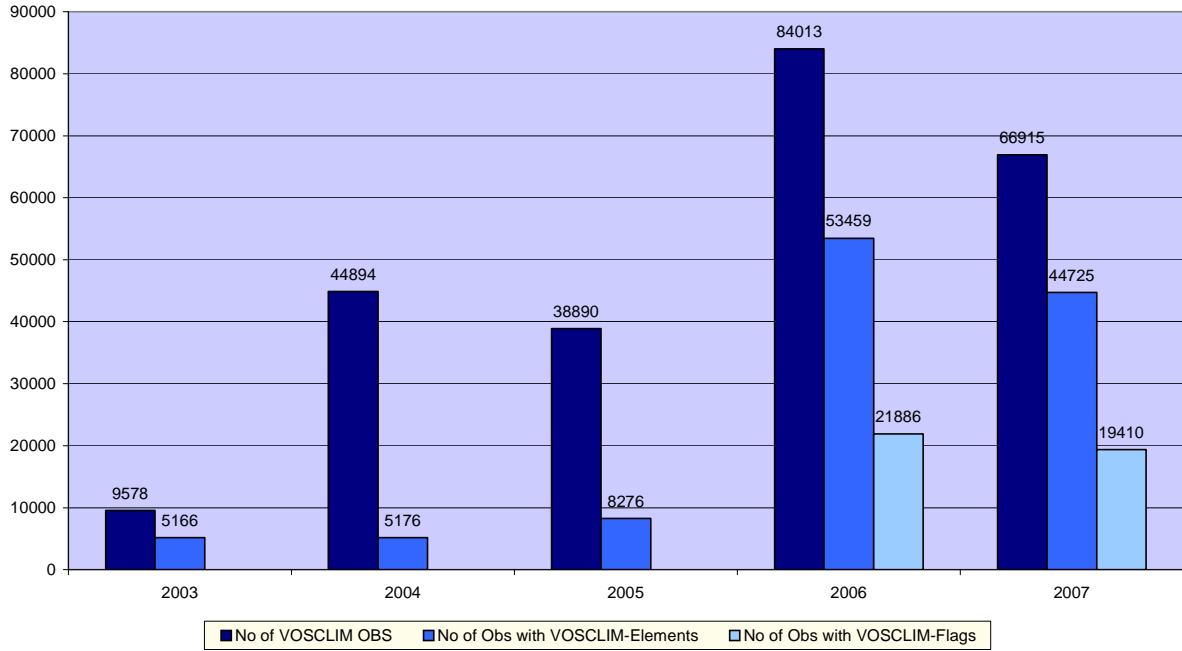


Figure 9: Distribution of VOSCLim Data Received 2007

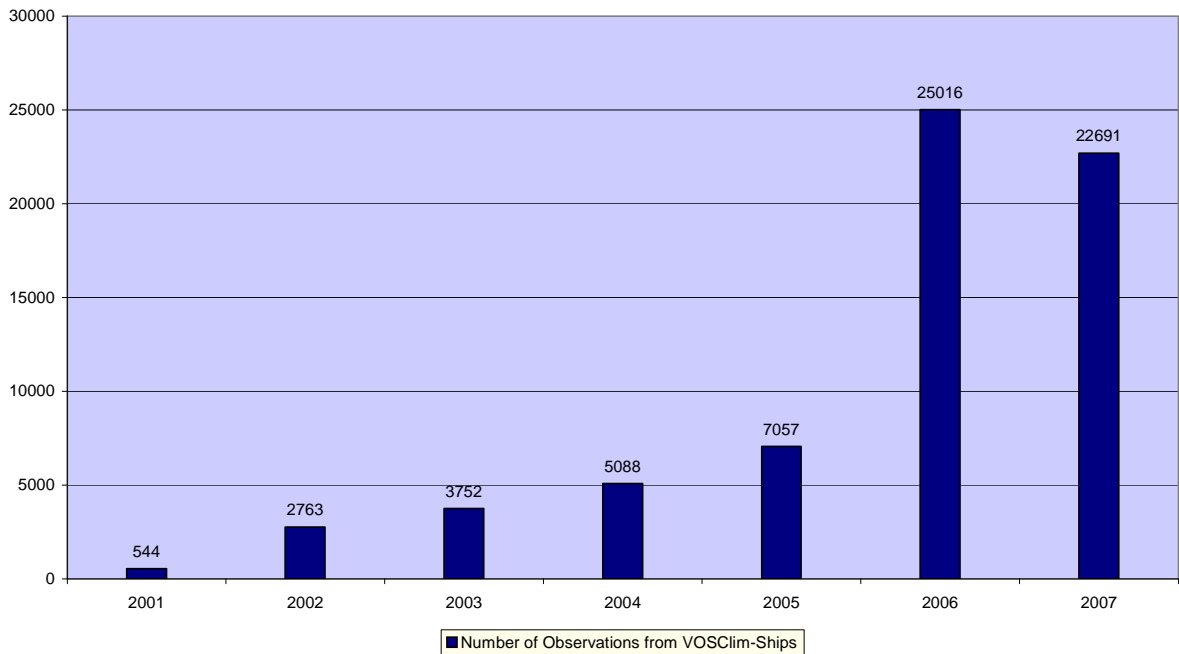


Figure 10: Number of VOSlim Ships contributing in 2007

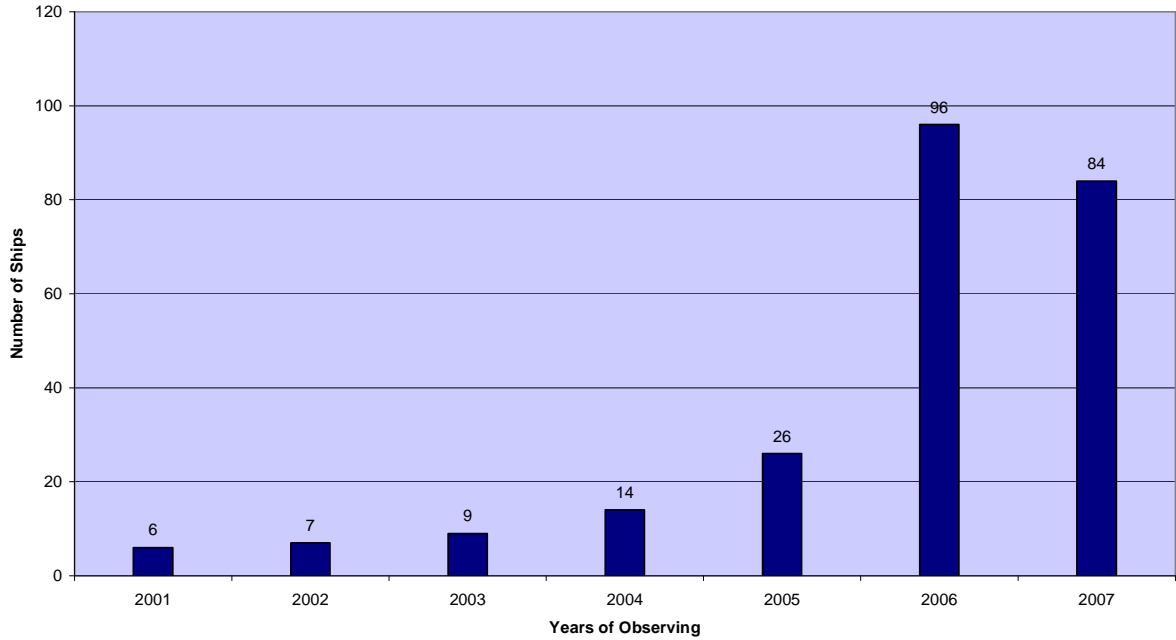
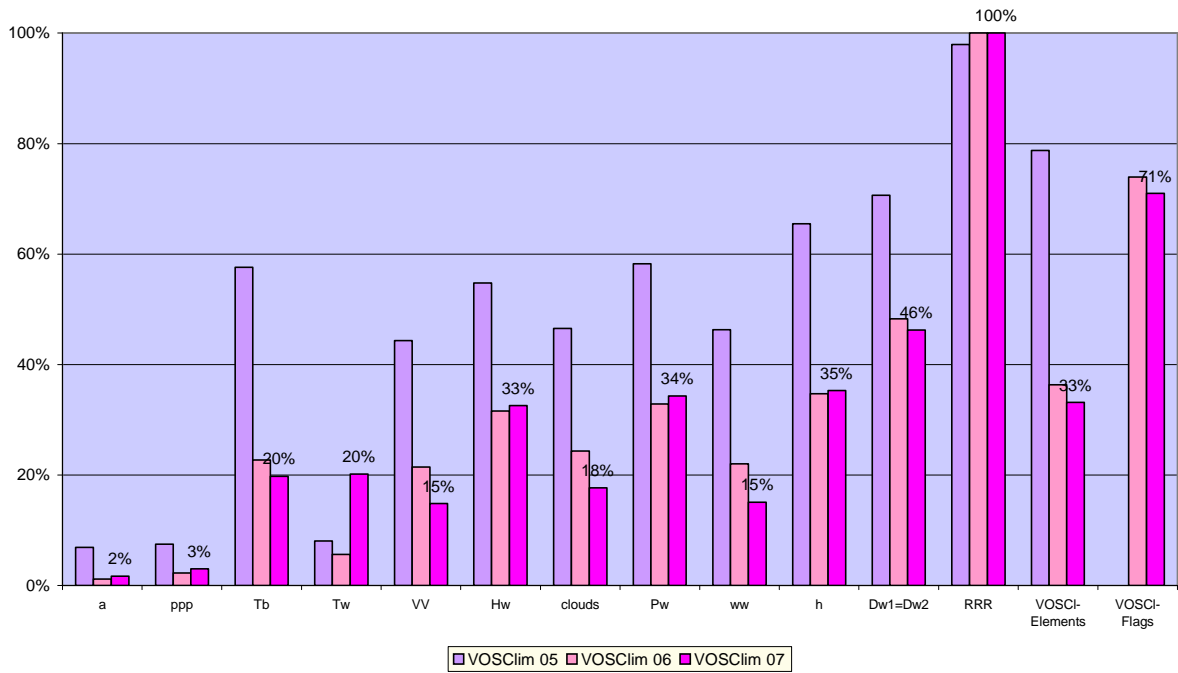
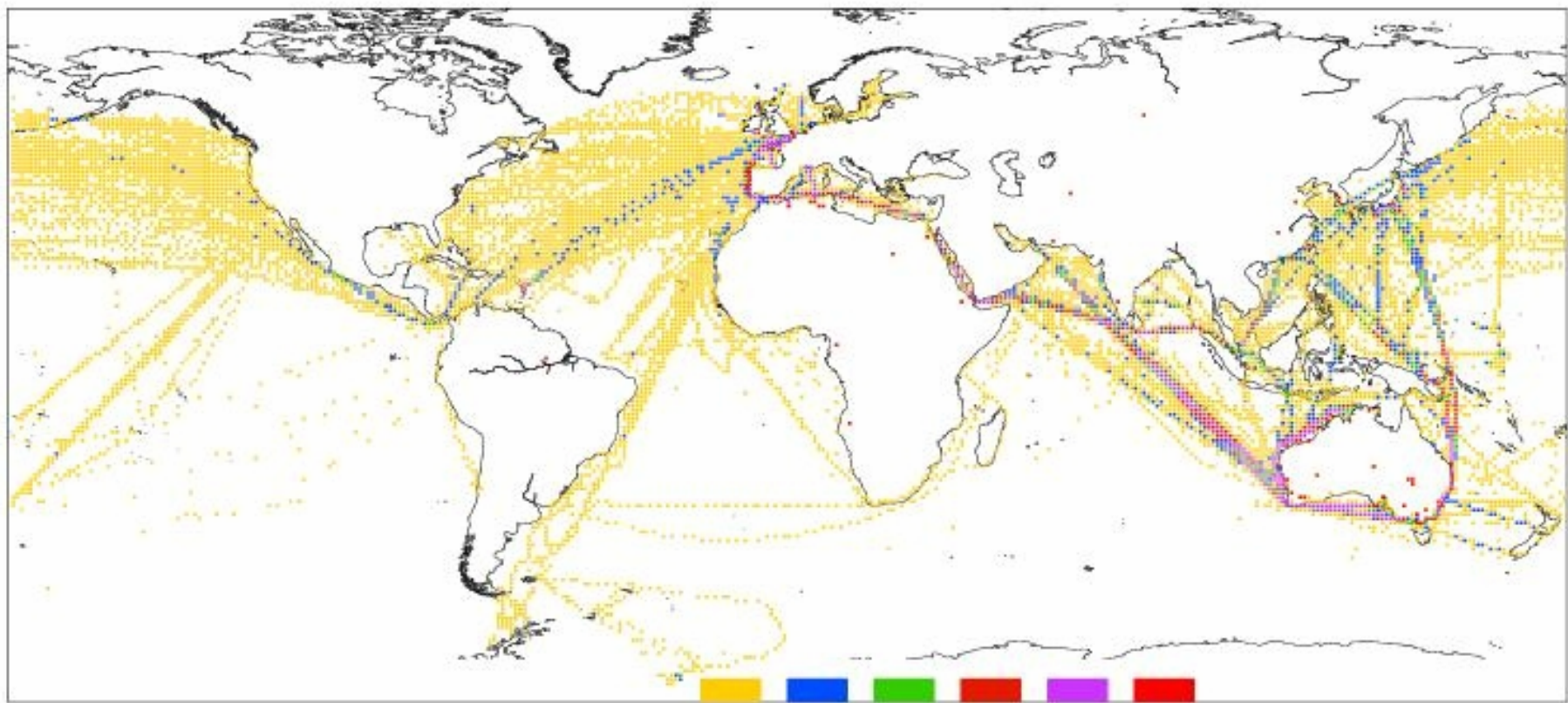


Figure 11: Elements reported blank from VOSlim Ships 2005 - 2007





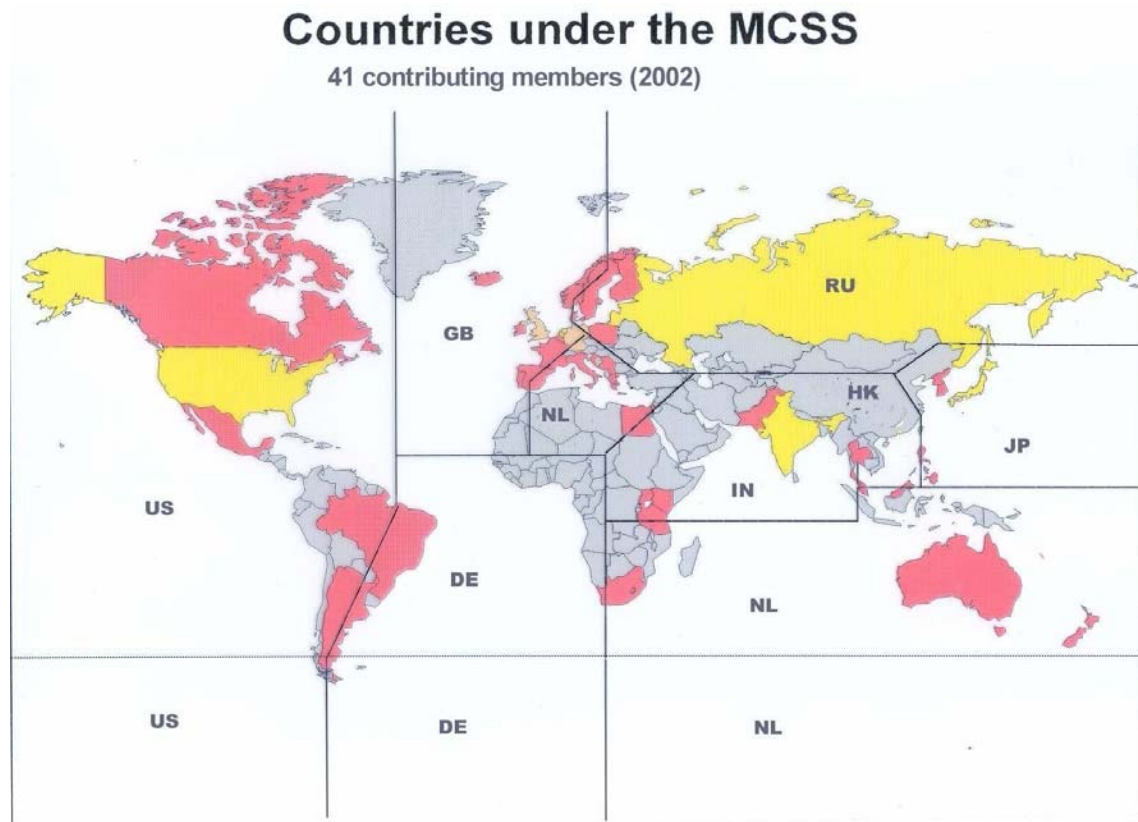
Area distribution

<9 <18 <27 <48 >48 Land

Total Number of Observations (66915) from VOSCLIM-Ships received in 2007

Figure 12: VOSCLIM Ship Areal Distribution of Reported Positions 2007

Appendix A: Responsible Member Countries



Appendix B: Extract from 1994 GCC Report

"A special problem arises if original flags claim 'correct' (flag=1) or 'value corrected by quality control' (flag=5) but the MQC check flags as erroneous or dubious. This discrepancy may be real, because MQC is not a sophisticated, high-quality check routine.

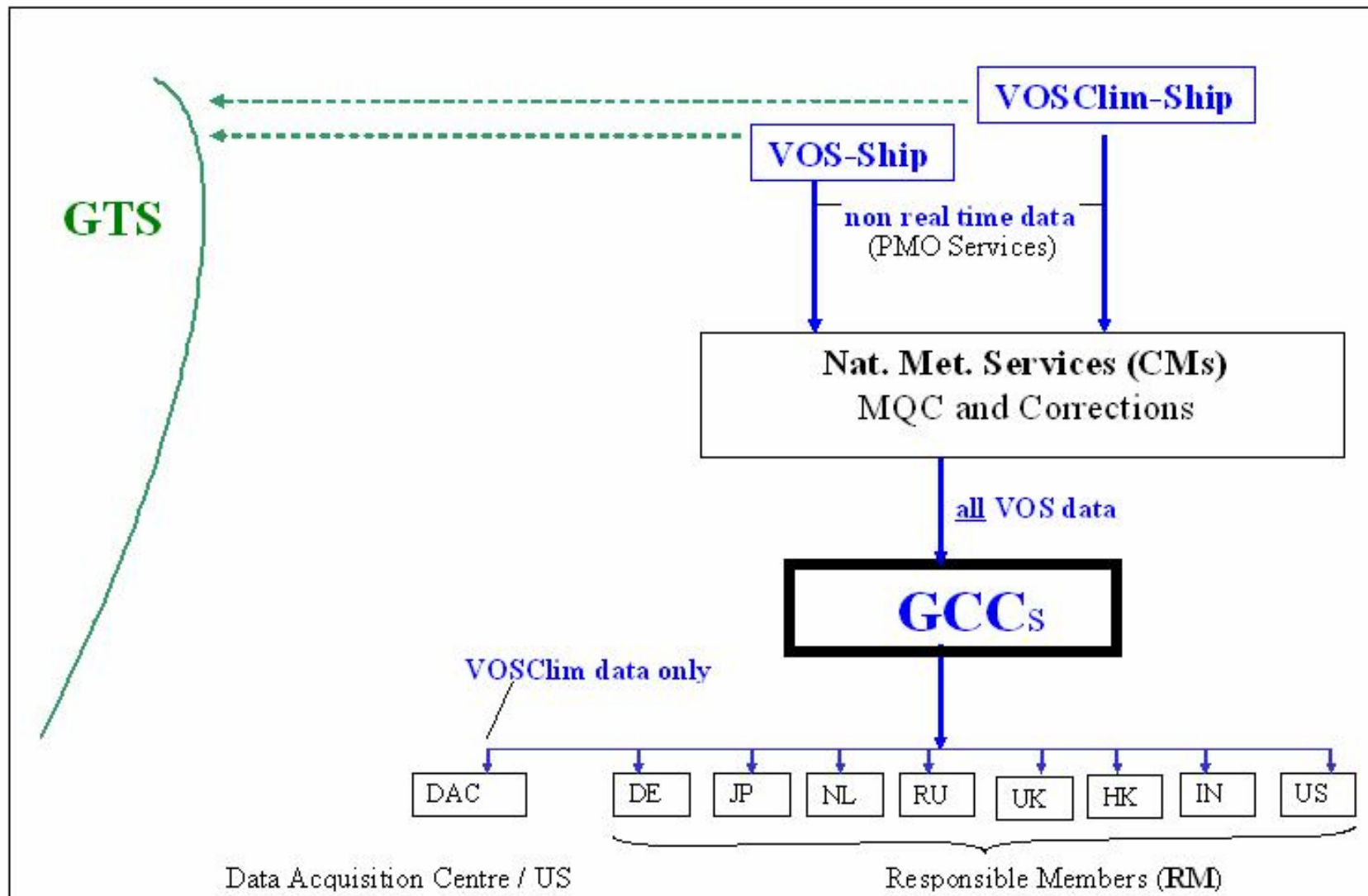
This discussion led to the view that such cases may be of interest, especially with respect to climatological extreme values, and so should be highlighted. In order to direct attention to such events the following procedure was applied by GCCs, using the available flag values of 6 and 7.

** flag is set to "6" if the original flag is set "1" (correct) and the value will be classed by MQC as inconsistent, dubious, erroneous or missing,*

** flag is set to "7" if the original flag is set "5" (amended) and the value will be classed by MQC as inconsistent, dubious, erroneous or missing.*

Otherwise, no original flag will be overwritten."

Appendix C: Marine Data-Flow



Marine Climatological Data Questionnaire

Country Name:

1. Does your country run a **Voluntary Observing Ship Fleet**? Yes/No

If **'No'**, there is no need to complete the rest of this form. Please return the form to email address below. Thank you for taking the time to do so.

If **'Yes'**, continue to Q2.

2. Do you already **regularly** submit data from this fleet via the Global Collecting Centres (GCCs) to the international archives? Yes/No

If **'Yes'**, there is no need to complete the rest of this form. Please return the form to email address below. Thank you for taking the time to do so.

If **'No'**, continue to Q3 and the rest of the questionnaire.

3. Would you like to regularly contribute your countries' **maritime meteorological observations** from this fleet and take part in the MCSS (Marine Climatological Summaries Scheme)? Yes/No

4. Are you able to **digitise the observations** of your Voluntary Observing Ships? Yes/No

5. Are you able to **transfer** the data of your Voluntary Observing ships **into the IMMT-format**? Yes/No

6. Are you able to **check the observations** to Minimum Quality Control Standards or better? Yes/No

7. Would you like any advice/help for any of these last actions? Yes/No

8. Do you require any other help? Yes/No

Thank you for taking the time to complete this questionnaire. Please return by email at your earliest convenience to gcc@dwd.de or gcc@metoffice.gov.uk.

Any Comments:
.....
.....