

GLOBAL COLLECTING CENTRES FOR MARINE CLIMATOLOGICAL DATA

ANNUAL REPORT - 2003

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Introduction

GCCs started their operation in 1994 according to Rec. 11, CMM-XI and Resol. 10, EC-XLV 1993, as a result of the revised MCSS. This had the goal of simplifying, improving the quality and accelerating the data flow within the scheme. The contributions by members should be made quarterly. It is the responsibility of each GCC to check if the minimum control procedures have been applied and then to dispatch a copy of all the quality controlled data, collected from Contributing Members, to the remaining Responsible Members, also on a quarterly basis. The GCCs are expected to work in close co-operation, applying identical principles and being able to continue the total dataflow in the scheme, even in the case of possible failure of one of them. This 2003 report marks the 10th year of operation.

Data Contributions 2003

In 2003, the total amount of data collected was about 1,1 million observations (**Table 1**). The contributions came from 17 countries, which represents less than one third of all potential Contributing Members.

A history of the volume of data supplied the last 10 years is shown in **Fig. 1**. The numbers sometimes differ significantly from year to year, due to the fact that big data volumes are delayed and provided in the following year.

This behaviour becomes more evident looking at the figures considering non-duplicate data only (**Fig. 2**), though the numbers in 2003 do not differ much from those numbers of the unique observations in 2002.

Three countries sent data from recruited VOSclim ships to the GCCs, but only one country contributed observations with the additional variables. Some ships added the VOSclim messages at the end of their observations, although they are not a recruited VOSclim ship.

The distribution of observing periods within the 2003 contributions shows data originating from as early as 1988, this can be seen in **Fig.3** and **Fig.4**. About 68% of data were not older than 2001 and 56% less than 2 years old. The percentage of old data is small, but though delayed, represents a valuable addition to the global database. The number of data sets received per month still varied greatly as shown in **Fig.5**. The majority of countries contributed on a quarterly basis, with just a few contributing annually.

The areal distribution (**Fig.6**) reflects, as always, the main shipping lanes between continents, with data concentrated near the coasts. There were still erroneous data with land positions, this should be considered by the Contributing Members, although numbers showed a slight improvement.

¹ <http://www.dwd.de/en/FundE/Klima/KLIS/int/GCC/GCC.htm>

Data Processing

1. The received data were in IMMT format (2/3 IMMT-1, but 1/3 already in IMMT-2 format). Some contributors still continued the mistaken practice of coding "/" or "-" for "missing data" (as in FM13) rather than the blank required by IMMT.
2. As before, the GCCs corrected, where possible, simple errors in organizational data (elements 2-8, 42: date/time, position and identifier) normally after consultation with contributors. Correct values of these data are essential for any successful archival and retrieval. Correct positioning still seems to be an issue to be considered by the Contributing Members.
3. Subsequent processing checked the data consistency by applying the WMO Minimum Quality Control (MQC) standards. Flags were set by the GCC MQC procedure where a quality control query was raised, especially when the original data were without any flag information. The proportion of data sets that required this action decreased slightly to about 4% (2002: 5%). The existing flags in the remaining reports were checked and corrected where necessary as described in the 1994 report.
4. Most data were exchanged by e-mail. If appropriate the transfer was also achieved by anonymous ftp. Floppy disk is of course accepted, or any transfer medium bilaterally agreed between contributor and GCCs.

Errors

The general error rate increased to 0.3% in 2003 (occasions where flagging by national quality control was inconsistent with GCC MQC control). No particular type of error dominated. Duplicate data from one source still occurred and had to be rejected due to bilateral consultation.

Some records with uncorrectable errors had to be rejected, in particular those having an invalid date or time or distance inconsistency. Rejected data were placed to a "dregs" datafile which accompanies the collective of good data, dispatched quarterly to the Responsible Members. GCCs found these to be about 0.1% in 2003 which mostly came from duplicate data.

There was also some evidence of rarely reported elements (**Fig. 7**), though for most of the parameters there was no significant change or improvement, and it seems more as if the percentage of missing elements is rising.

Detailed bilateral correspondence was conducted with 11 countries on the improvement of data quality and resolving of problems.

Dispatch of Data

During the reporting period four data collectives were dispatched to Responsible Members at the end of each quarter and the selected VOSclim data were provided as subset to the DAC (Data Acquisition Center) in Asheville/USA. (**Fig. 8**)

The dispatched data comprised of three files, as usual; the first holding all those reports which passed MQC successfully, the second those which were rejected because of errors in organizational information and the third holding information on rejected observations. It is up to each Responsible Member to decide how to proceed with these data, either ignoring or correcting the "dregs".

Developments

The VOSclim Project started its operational phase. The GCCs therefore had to conform to the IMMT-2 format, which allows for additional parameters, introduced through this project and

adopted by JCOMM-I, June 2001. Although there are presently no minimum quality criteria for these parameters the GCCs are able to process the VOSCLIM data as part of the general processing line.

GCCs continued working on the MQC criteria, developing some small revisions and additional updates to be proposed to the ETMC at its next session in 2004. There will also be MQC criteria proposed for the VOSCLIM additional parameters for discussion at ETMC.

This year the first revision of the MQC-program was sent to the 19 countries who have requested the software, there were some minor changes made, and now include a check for invalid characters in the VOSCLIM additional fields columns. The next update, with the checking for the VOSCLIM additional elements, will be made in the near future.

Summary

Most contributors are applying MQC or other kinds of advanced quality control before sending their data to the GCCs. Best results can be achieved if data are corrected, instead of being flagged as "doubtful" or "erroneous". This can be done most competently by the Contributing Members themselves. A good preventive tool may be the results of the quality monitoring activities by WMO and UK, or the use of an automatic system which provides immediate minimum quality checks just after the composition of an observation. Avoiding errors at the origin appears to be the best strategy for the improvement of quality.

Two tools are available: 1. Electronic journal software can be ordered from WMO or KNMI, The Netherlands. 2. A consolidated MQC-software is offered by GCCs.

Members are encouraged to improve the steadiness of their contributions where applicable and to realize the quarterly cycle of the data flow to enable the archives to respond to the needs of the climatological user community for timely and complete marine climate data.

GCCs invite all members to provide further feedback, as well as data, for the benefit of the whole system and the integrity of the marine database.

Abbreviations

CMM	Commission for Marine Climatology
DAC	Data Acquisition Center (NCDC, NOAA –VOSCLIM Project Data Centre)
EC	Executive Council of WMO
ETMC	Expert Team on Marine Climatology (JCOMM)
FM 13-X SHIP	Code Form (numbering system of code forms) (FM also Form of Message)
GCC	Global Collecting Centre (MCSS / JCOMM)
IMMT	International Maritime Meteorological Tape
JCOMM	Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology
KNMI	Koninklijk Nederlands Meteorologisch Instituut
MCSS	Marine Climatological Summaries Scheme (JCOMM)
MQC	Minimum Quality Control (WMO Standard)
UK	United Kingdom
VOS	Voluntary Observing Ship
VOSCLIM	VOS Climate (Subset for High Quality Data - Project)
WMO	World Meteorological Organization

Country Name	ISO Alpha-2 code	Number of observations
Argentina	AR	436
Australia	AU	46190
France	FR	16269
Germany	DE	450384
Hong Kong, China	HK	2011
Israel	IL	9523
India	IN	12084
Japan	JP	70063
Malaysia	MY	6711
Netherlands	NL	134889
Norway	NO	30263
Poland	PL	2603
Russian Federation	RU	104938
Singapore	SG	1706
South Africa	ZA	2202
United Kingdom	GB	88874
United States	US	99372
Total 2003		1078518

Table 1

Figure 1
Yearly Contributions 1994 - 2003

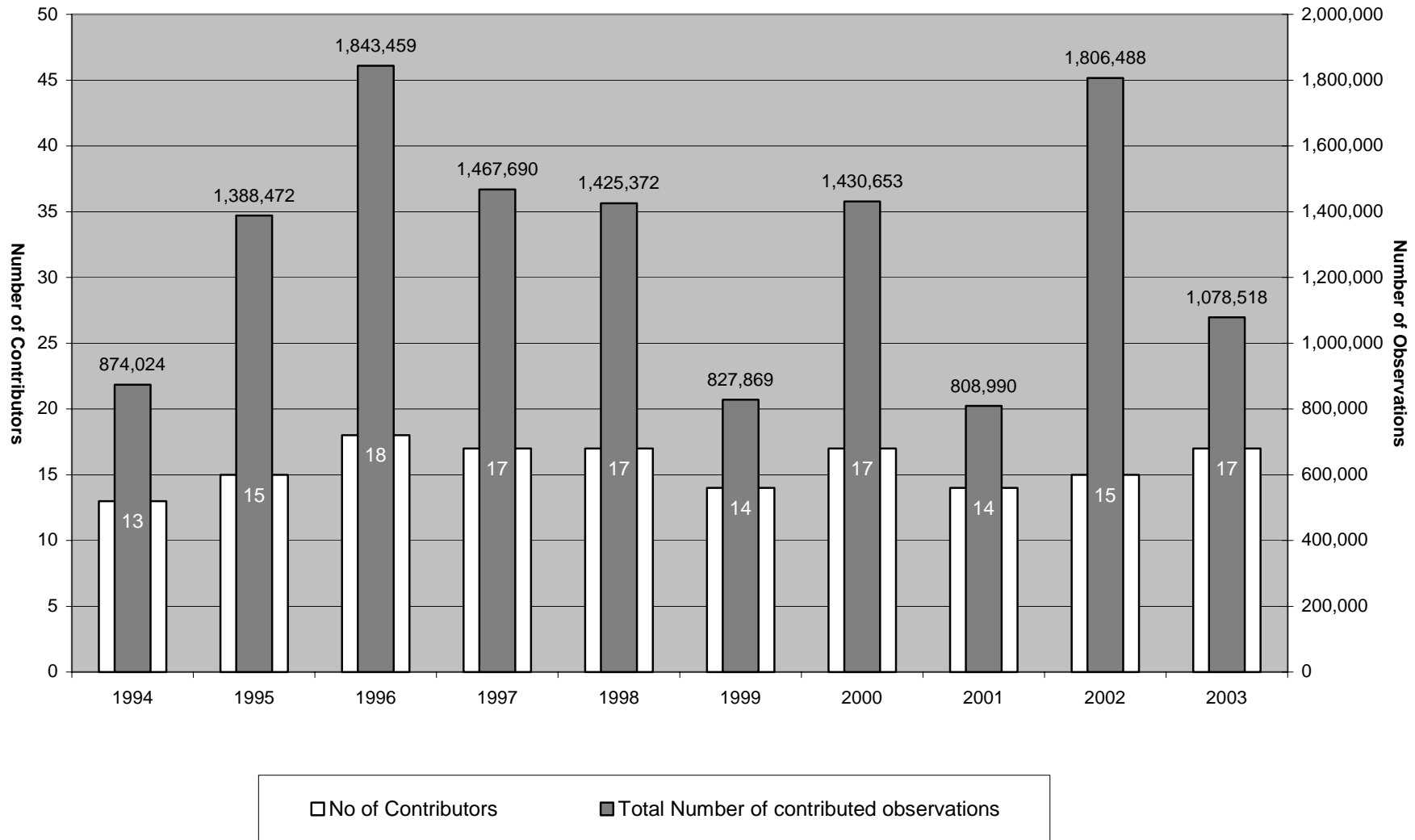


Figure 2

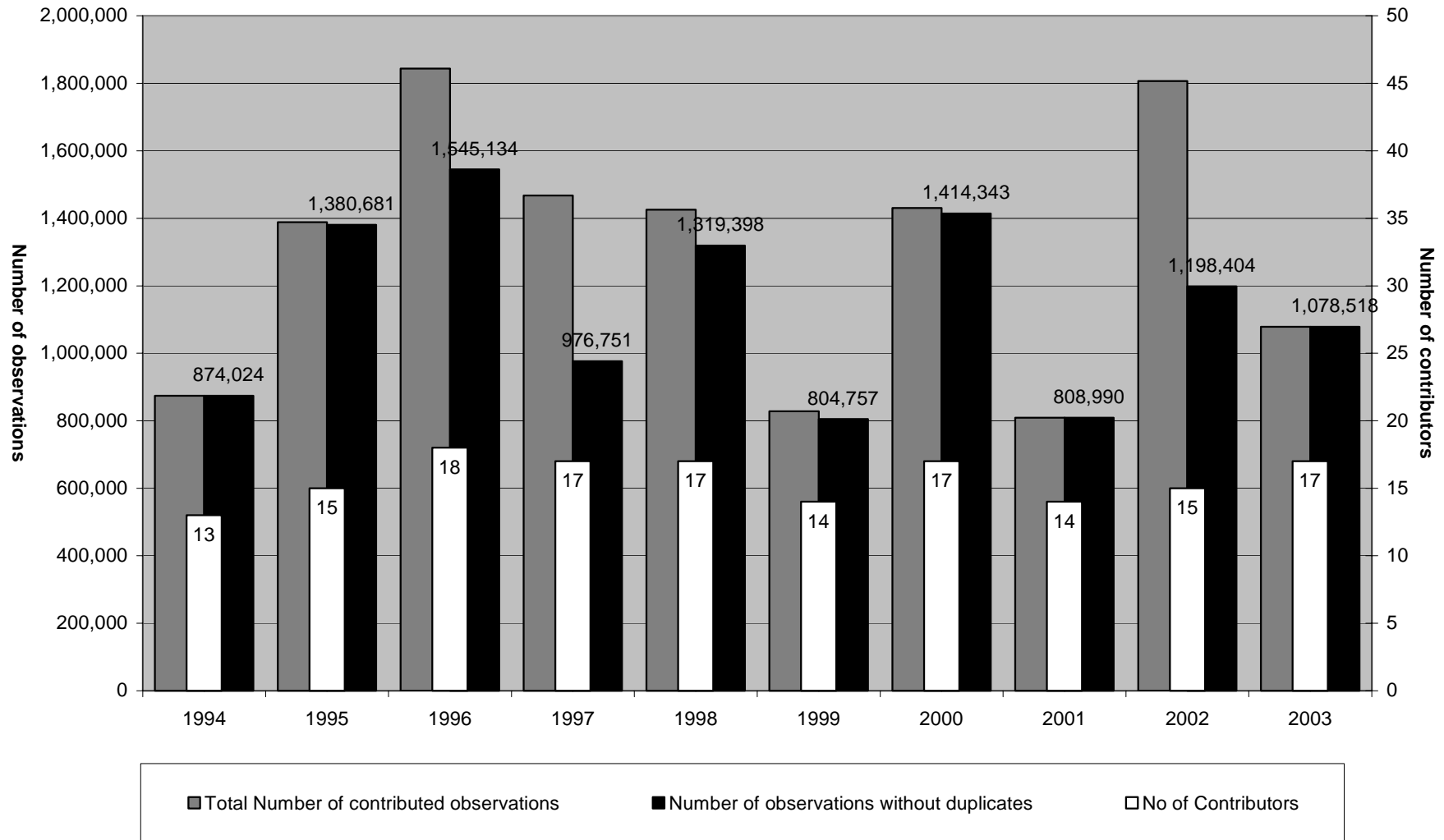
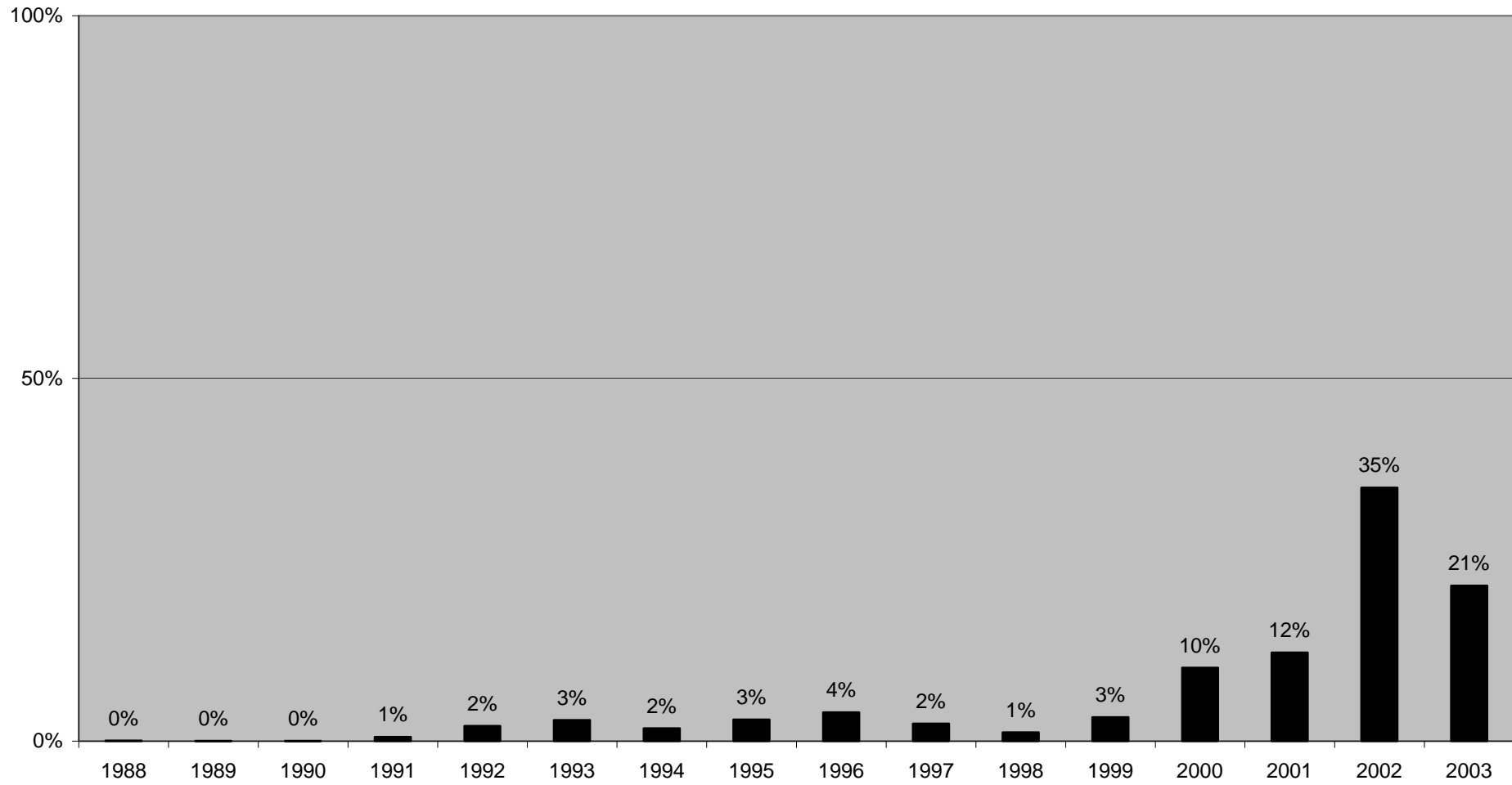


Figure 3
INPUT 2003



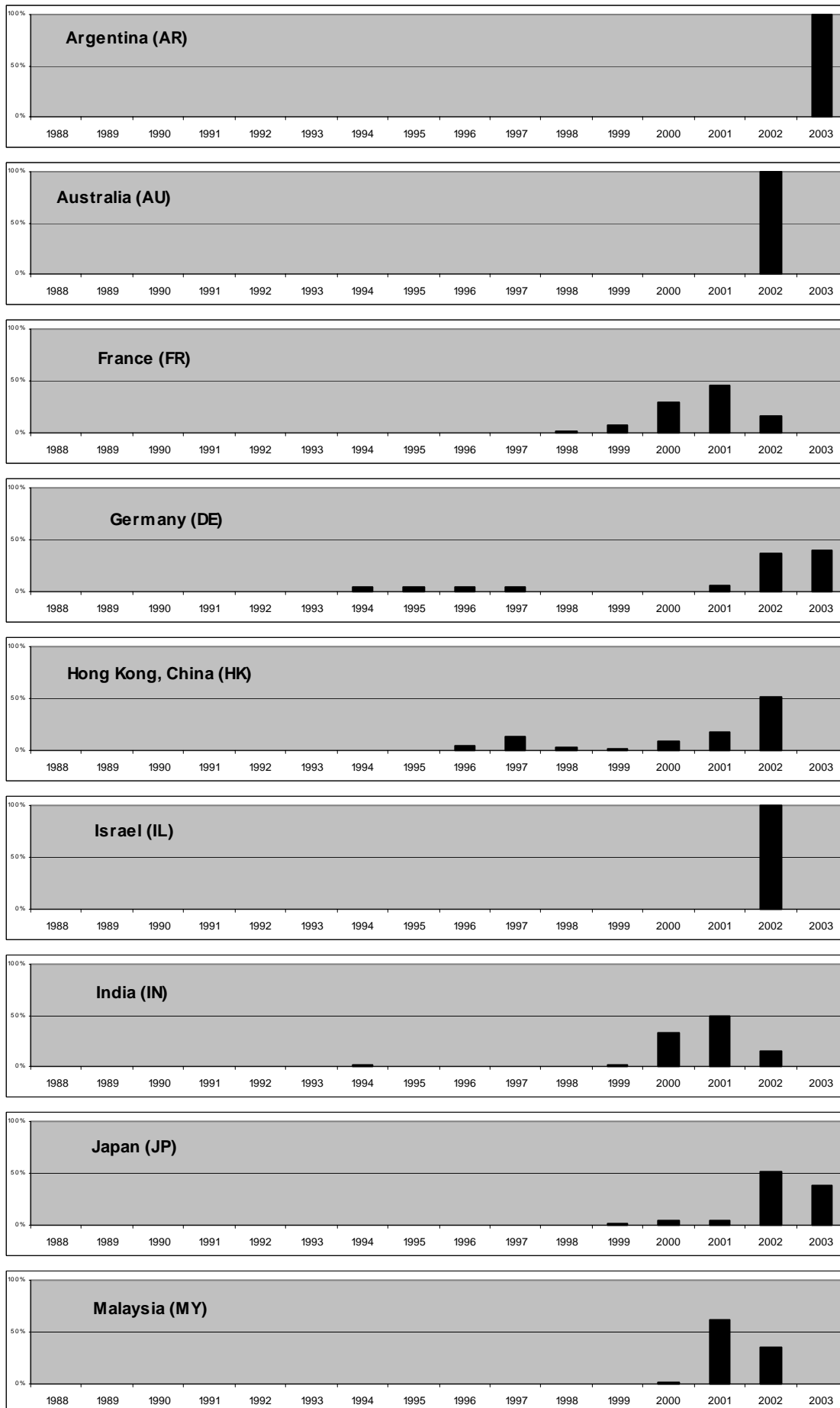


Figure 4

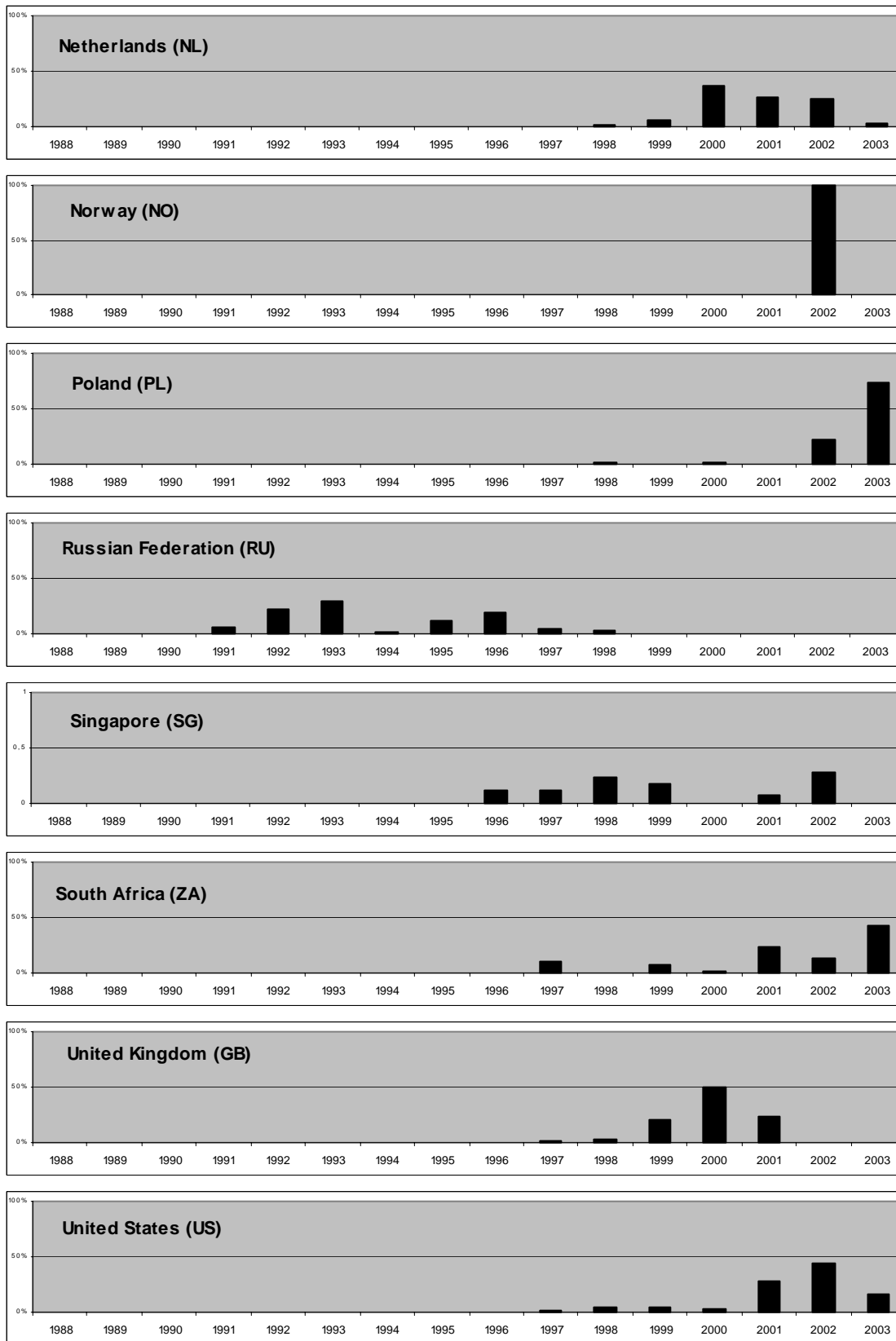


Figure 4 cont.

GCC - Input 2003

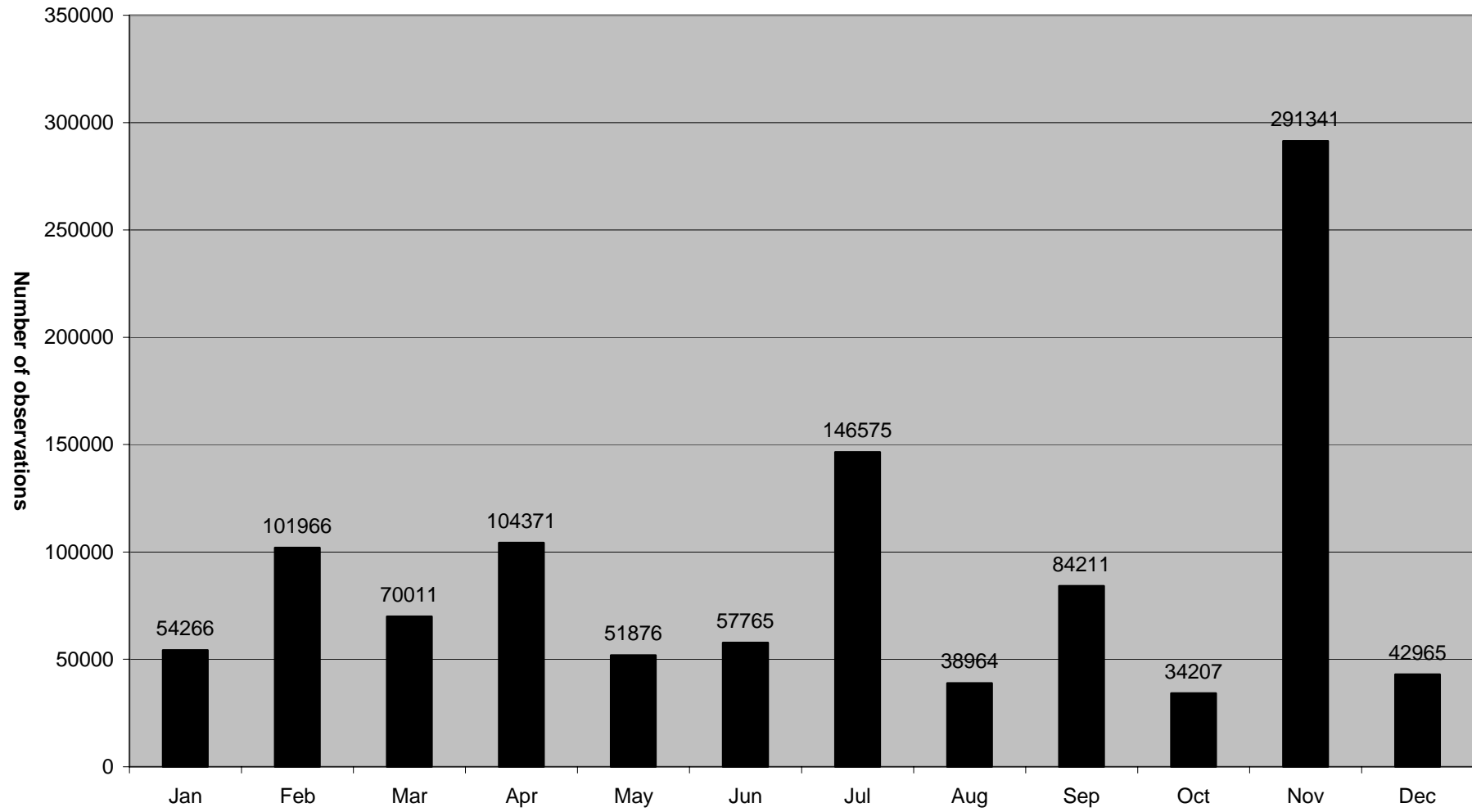
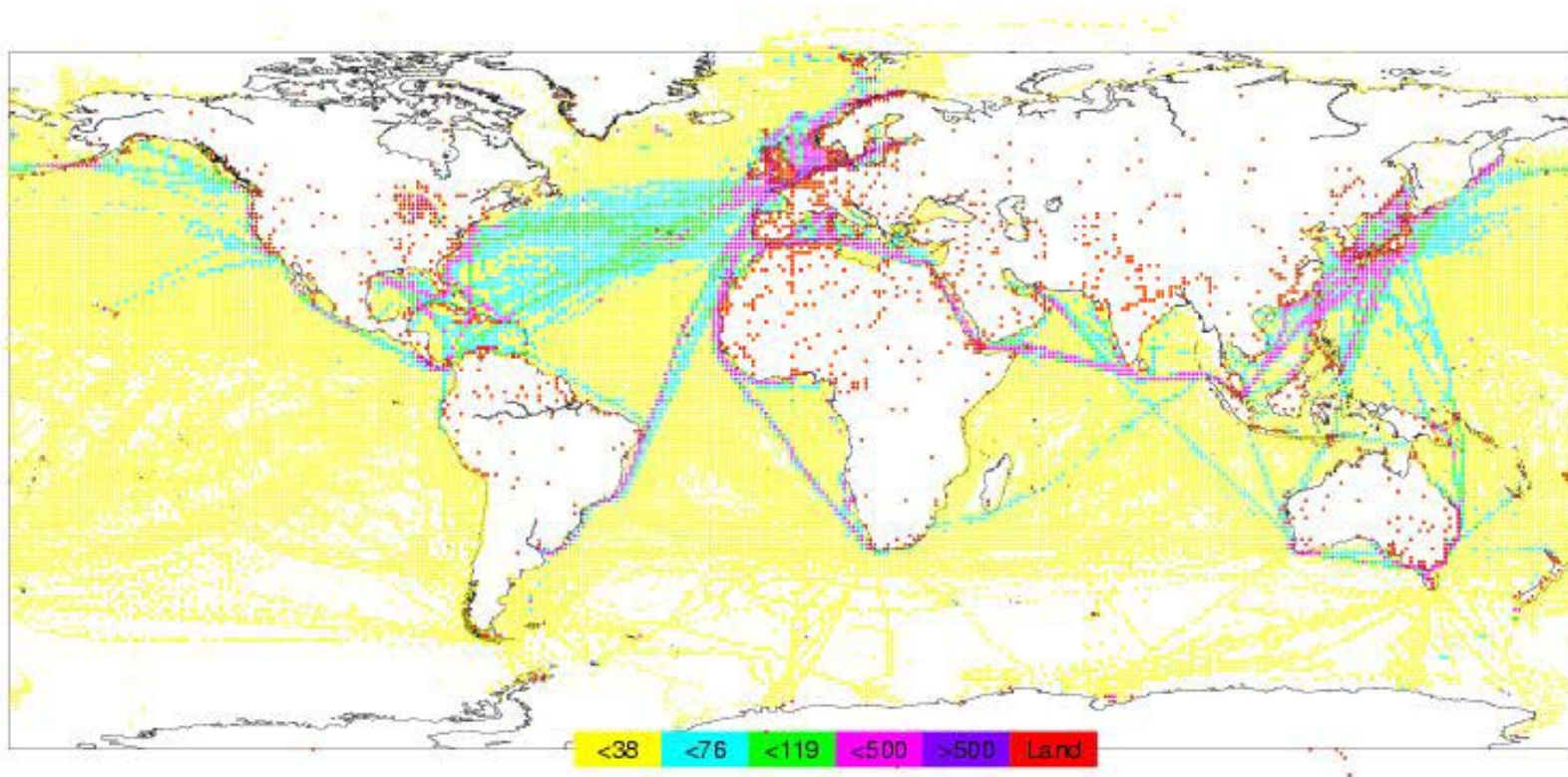


Figure 5



Area distribution

Total number of observations (1078515) received in 2003

Figure 6

Elements reported "blank"

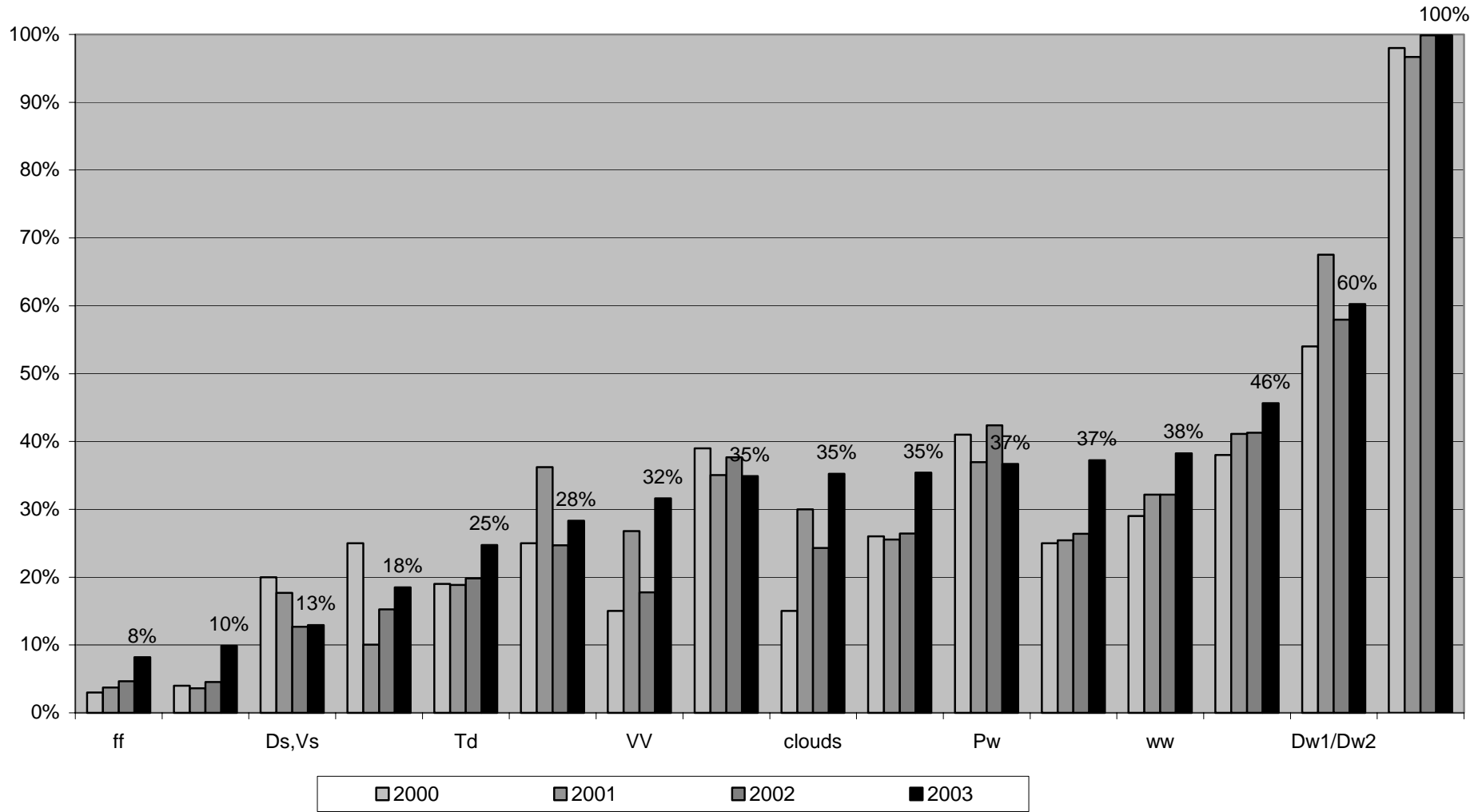


Figure 7

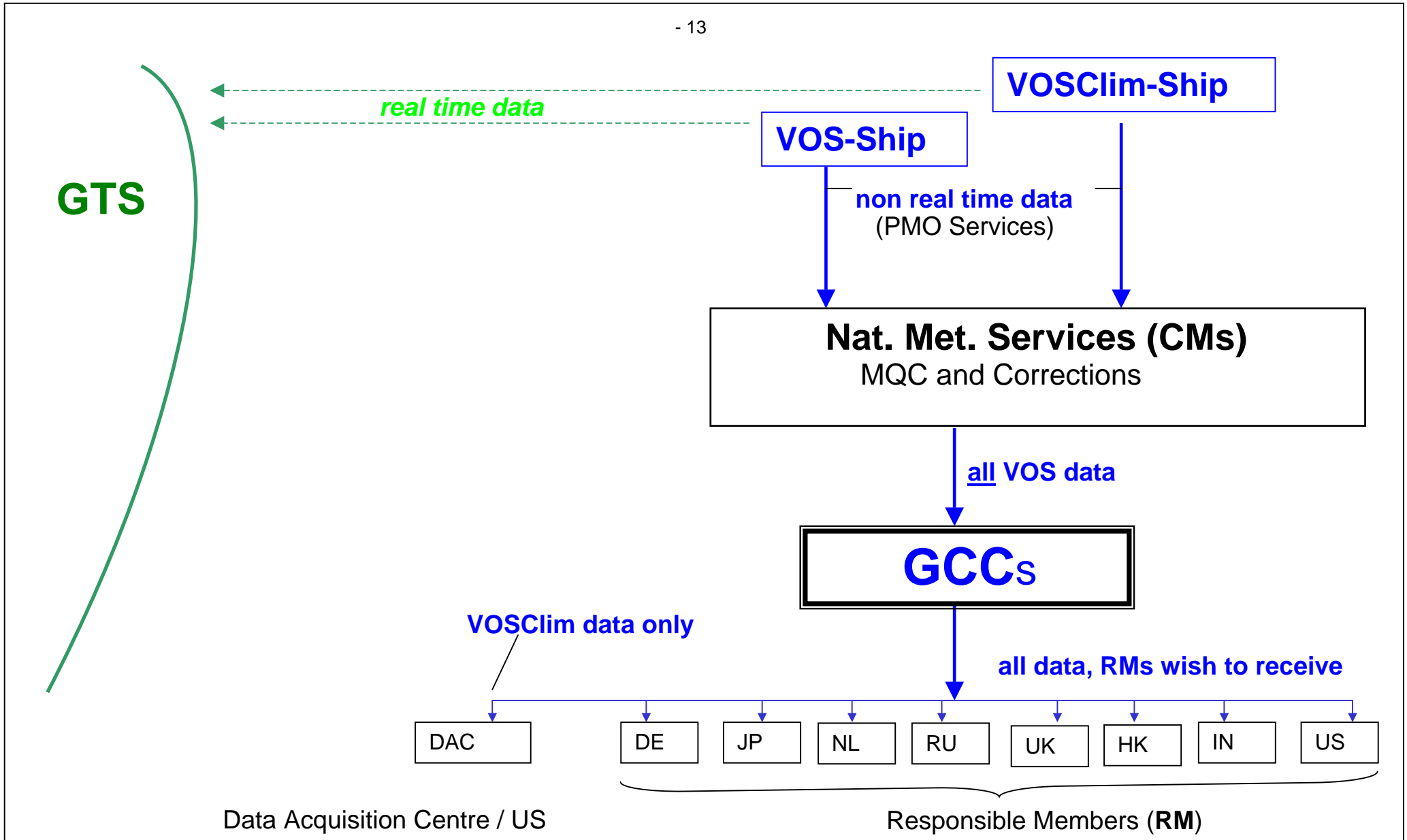


Fig. 8: Data flow (non real time) within MCSS