WMO DATA COLLECTION AND ARCHIVAL OF VOS OBSERVATIONS

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The international agreement concerning a formalized recording of weather observations from the seas in ships' logbooks was made at the Maritime Conference held in Brussels in 1853.

Traditional logbooks were only episodically digitized and exchanged through bilateral agreements.

The digitalization and exchange of digitized meteorological journals were not formalized until 1960.

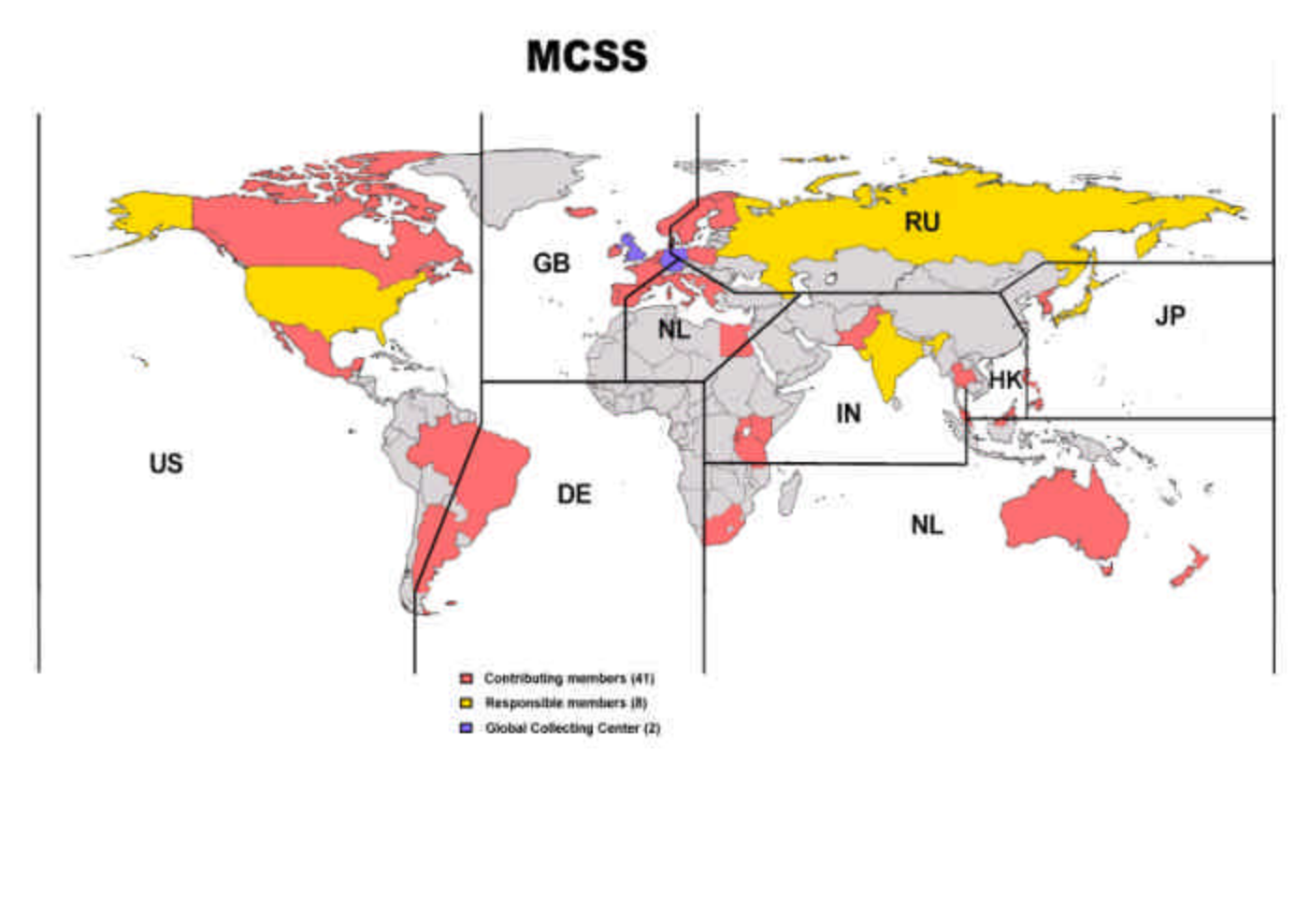
The Commission for Marine Meteorology on its third session in 1960 made several recommendations (Rec. 22-27, CMM-III), which formalized preparation of the marine section of the World Climatic Atlas and created the basements of nowadays existing Marine Climatological Summary Scheme.

The Fourth World Meteorological Congress in 1963 finally decided on regular publication of marine climatological summaries and designated the 1st January 1964 as the start of an agreed procedure (Res. 35, Cg-IV).

By this recommendation for the purpose of preparing the marine climatological summaries and of collecting data with a view to the eventual preparation of a marine characteristics, the world ocean and the seas were divided into several areas of responsibility and several countries volunteered to act as Responsible Members, e.g. being responsible for collecting digitized marine meteorological data from the area of their responsibility, for preparation of marine climatological summary and for supporting society in high quality climatological information.

There are 8 active Responsible Members:

Germany,
Hong-Kong/China
India,
Japan,
The Netherlands,
Russia,
United Kingdom
USA



Congress decided that all Responsible Members should prepare annual climatological summaries for their areas of responsibility and in those areas for a number of selected representative sub-areas, as well as for the fixed ship stations within them. Annual summaries should be prepared for particular years of decade 1961-70, 10 years summaries should be prepared systematically starting with the period 1961-70.

The scope and layout of summaries has been defined as well as its form of publication.

All Members (Contributing Members) operating fixed ship stations, selected, supplementary and auxiliary ship stations should ensure that all available observations from mentioned above stations would be digitized in accordance with the layout of the International Meteorological Punch-Card (nowadays called the International Marine Meteorological Tape), sorted half-yearly and dispatched to the Responsible Members according to their area of responsibility.

The above system developed with time. Several important changes have been introduced taking into account changing boundary conditions, e.g. technological progress etc.

Considering increasing importance of the global marine data collection in support of global climate monitoring, research and prediction, the need to improve the timeless and efficiency in data collection and archival, the need to ensure uniform Minimum Quality Control Standard (MQCS) and finally to improve an appropriate backup of data collection and exchange procedure as well as to ensure continuous global availability of marine data the eleventh session of CMM recommended several changes with MCSS.

The main ones are as follows:

- Two of the RMs (Germany and UK) will act as Global Collecting Centers (GCC) for marine climatological data since 1st January 1994,

- Minimum quality control to be applied by the Contributing Members,

- All digitized marine climatological data will be send by CM directly to each of GCCs on a quarterly basis,

- GCCs to ensure that Minimum Quality Control has been applied,

- GCCs maximize data availability by bilateral exchange between themselves,

- GCCs deliver complete (global) data set updates to all Responsible Members on a quarterly basis

Two Global Collecting Centres were installed as focal points to:

1. receive (in parallel) all VOS data from CMs
2. ensure, that MQC has been applied to all data
3. maximize data availability by bilateral exchange between themselves
4. deliver complete (global) data set updates to all Responsible Members on a quarterly basis
5. undertake any neccesary correspondence with both, Contributing Members and Responsible Members in acting in parallel concerning all aspects of :
   - data collecting
   - software
   - results of MQC control
   - error management
   - data despatch
   - task sharing

Dr. Volker Wagner, GCC Hamburg, Germany

The accuracy of data is of primary importance for MCSS and scientific research. It is important that marine climatological data are quality controlled before they will be exchanged. To ensure quality of marine climatological database Contributing Members should apply MQCS before dispatching data to GCCs.

The reason for such procedure is the possibility to verify with original logbooks and to introduce corrections to data instead of simply flagging as wrong. GCCs can only mark wrong or suspicious data by flags. Requirements of VOSClim Project caused changes in MQCS, and the latest version (MQCS v.4) has been accepted by JCOMM-I (Rec.9, JCOMM-1, Appendix C)

RM prepares summaries in both tabular and graphical form (charts). They include air and sea temperature, dew-point temperature, visibility, weather, wind direction and speed, atmospheric pressure, clouds and waves. The necessary minimum number of observations is specified before mean can be calculated.

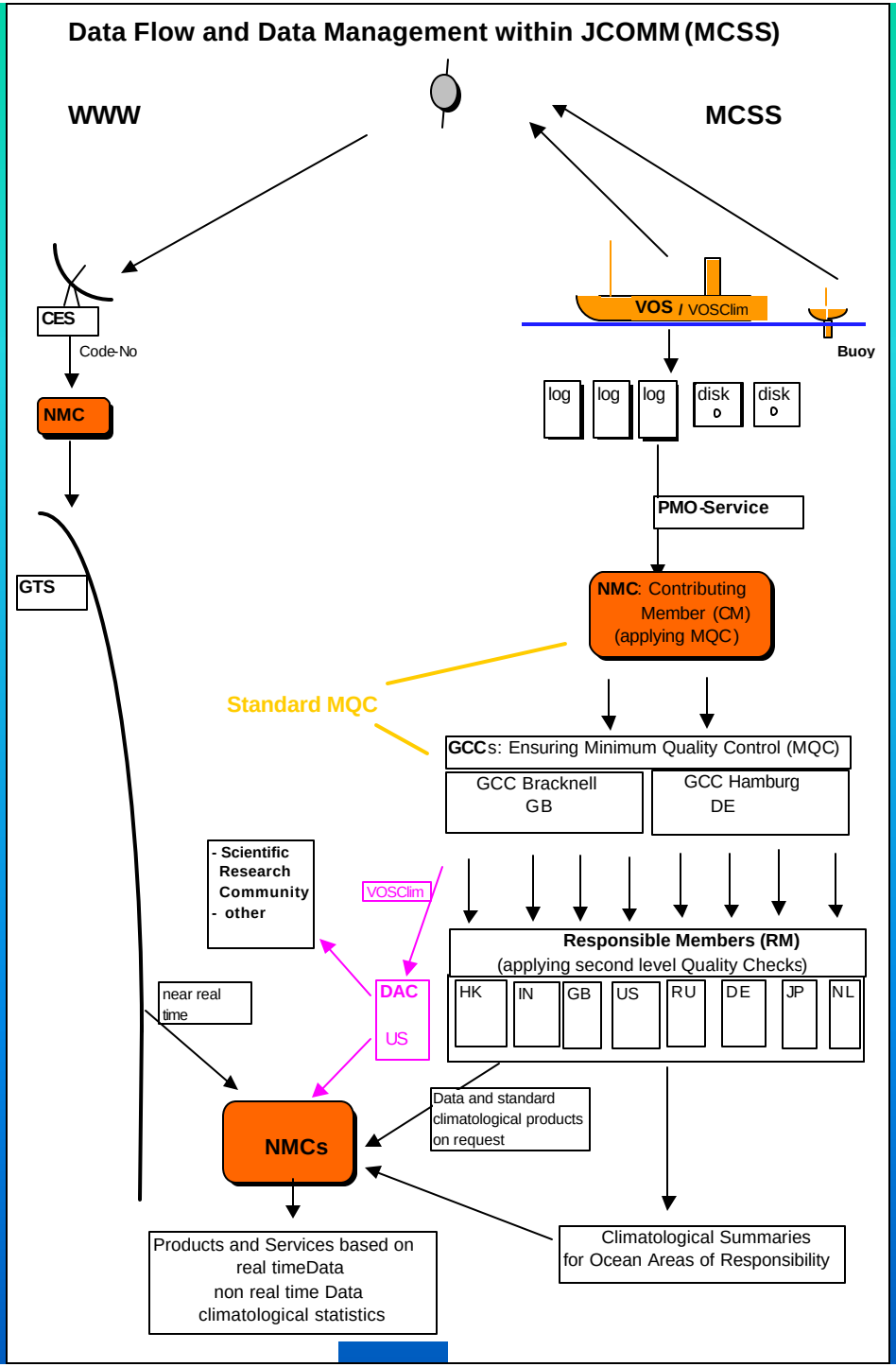
The routine publication of annual summaries was stopped in 1981, but they are still available on request and could be published by RM if they wish.

Decadal climatological summaries are prepared for each decade 1961-70, 1971-80, 1981-90, and 1991-2000

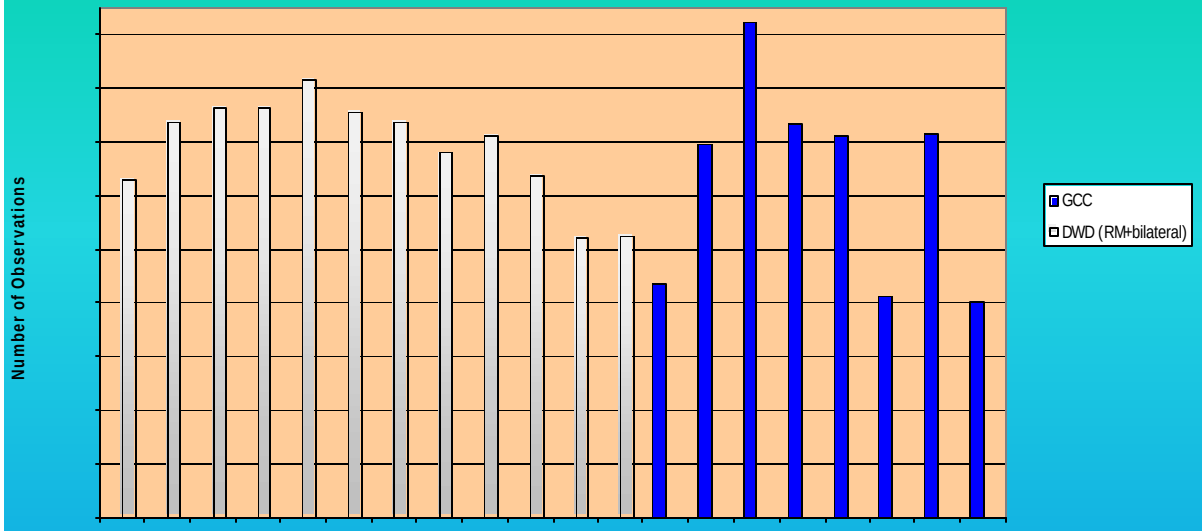
The Marine Climatological Summery Charts for representative areas are prepared for using Mercator projection (for polar region stereographic projection is recommended). For each element data are plotted for unit areas in form of 3 columns block that contains: mean value, standard deviation and number of observations made in given unit area. Unit areas as far as possible should have uniform size. Usually for most parts of ocean there are 5° x 5° squares, however in data-sparse regions areas are large as 5° x 10°. In the vicinity of coasts or in semi-enclosed seas 2° x 2° or 1° x 1° squares are appropriate.

There is increasing interest in global marine climatological data due to global warming and intensification of investigations concerning the role of ocean in global processes. Intensification of efforts to digitize results of marine meteorological observations made before 1960 is highly recommended by the marine climatological research community, whereas the accompanying metadata become an important issue. Many of these historical data (and contemporary as well) have been compiled into global collections such as the Comprehensive Ocean-Atmosphere Data Set (COADS). However digitalization of historical logbooks meets several problems, as it is a laborious process, requiring a bulk of resources in time, staff and budgets

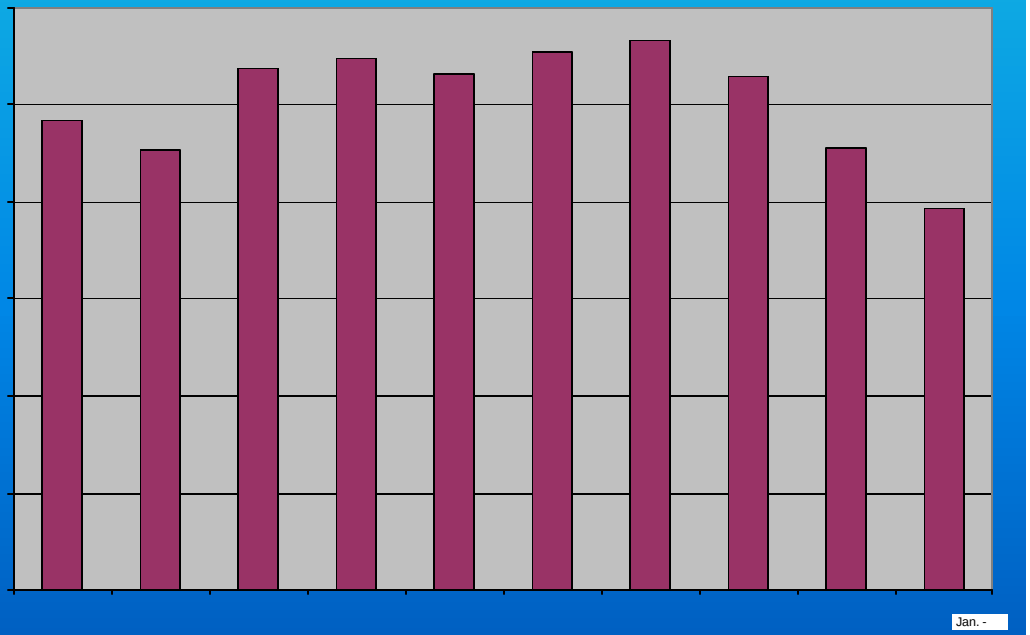
Data Flow and Data Management within JCOMM (MCSS)

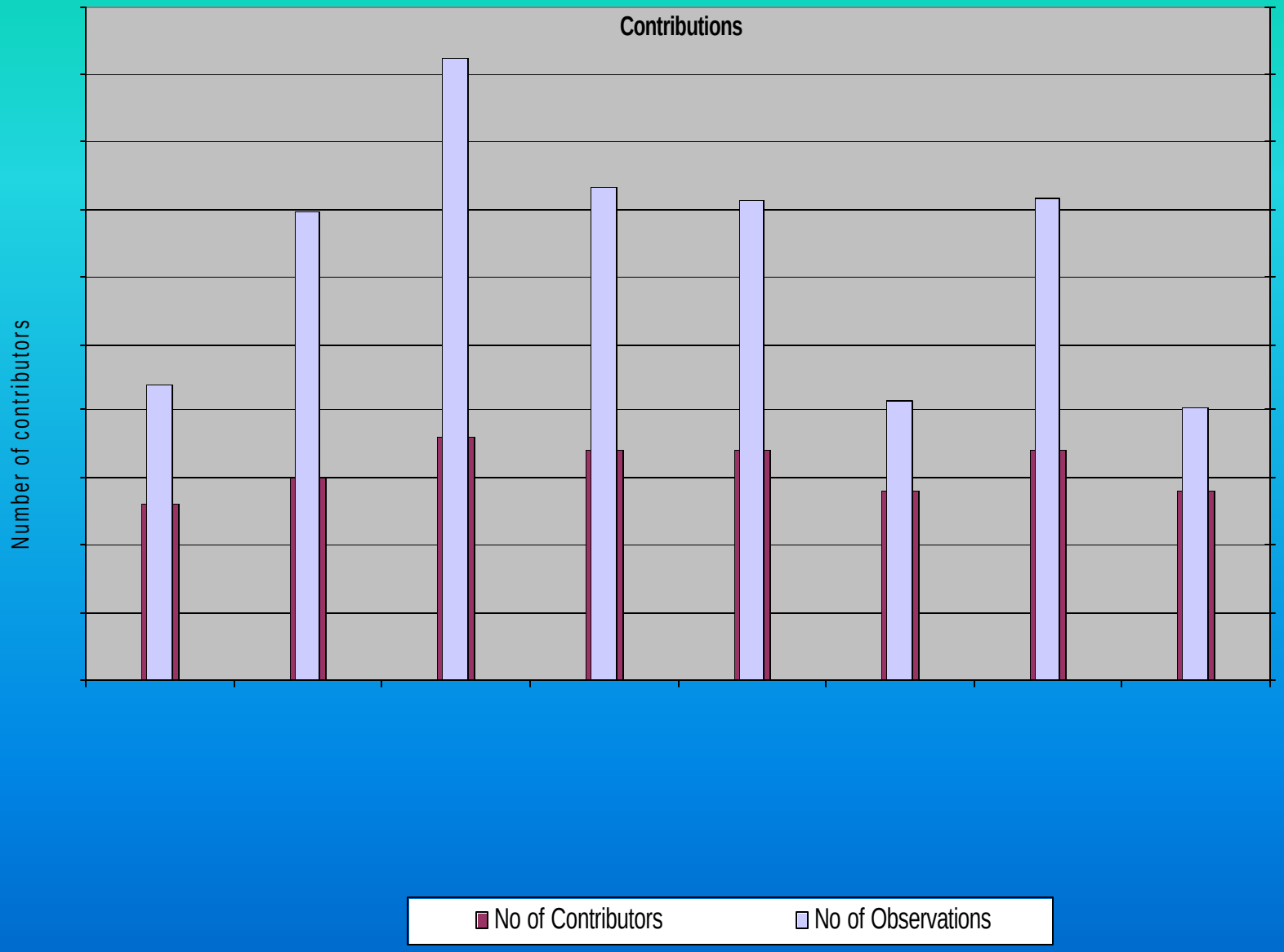


Data volumes in the international exchange since



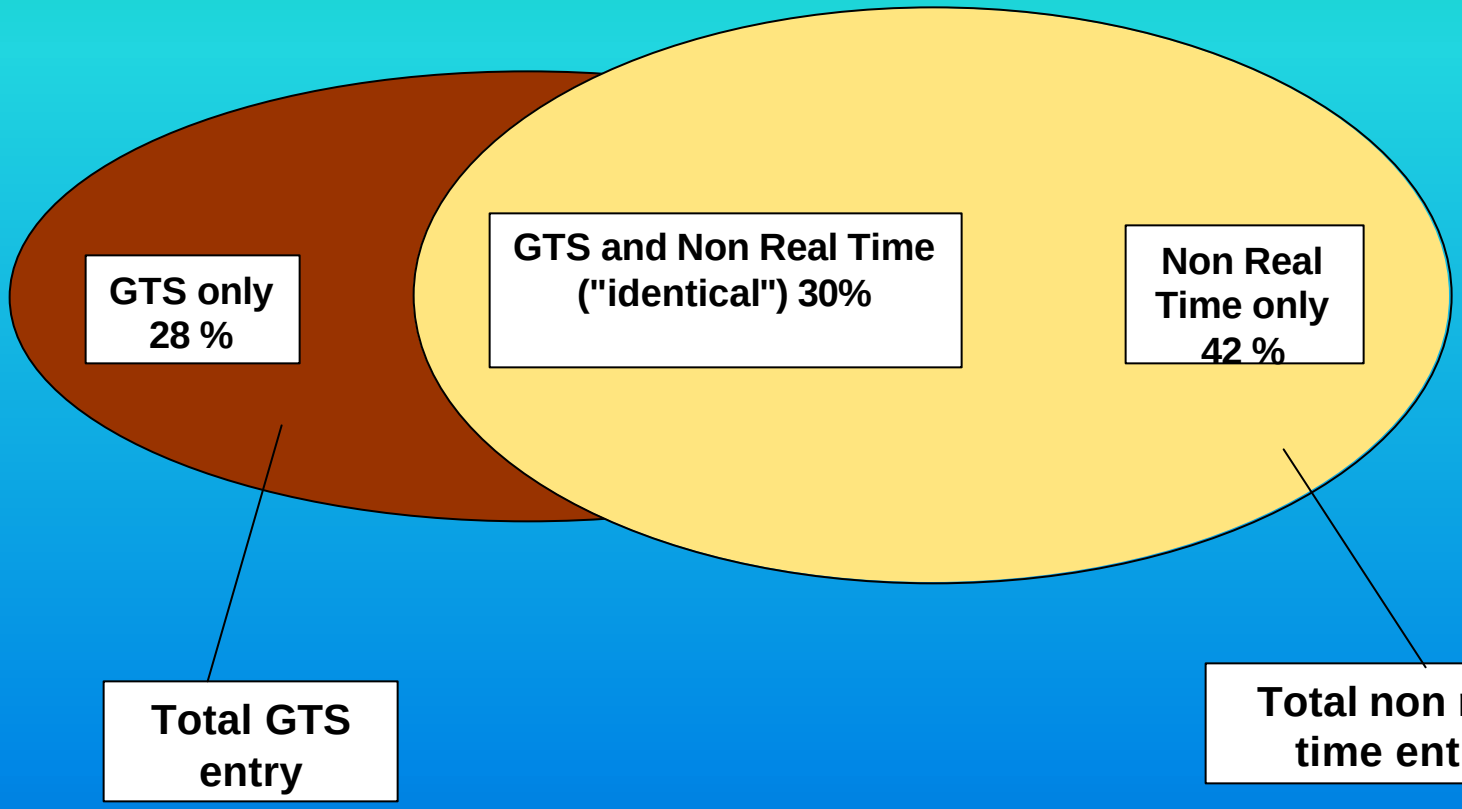
Number of Observations on GTS




Contributions
Number of contributors
Number of observations
No of Contributors
No of Observations

Number of Countries with Number of Years of Contributing to MCSS (-)									
No of years with contribution (period -)									
No of countries									
VOS Potential (WMO ,)	**%**	**%**							
	MCSS members contributed every year								
	MCSS members contributed at least time within the last years								
	MCSS members never contributed within the last years								

Proportion of GTS only, Non Real Time only and both (1982 - 2002)



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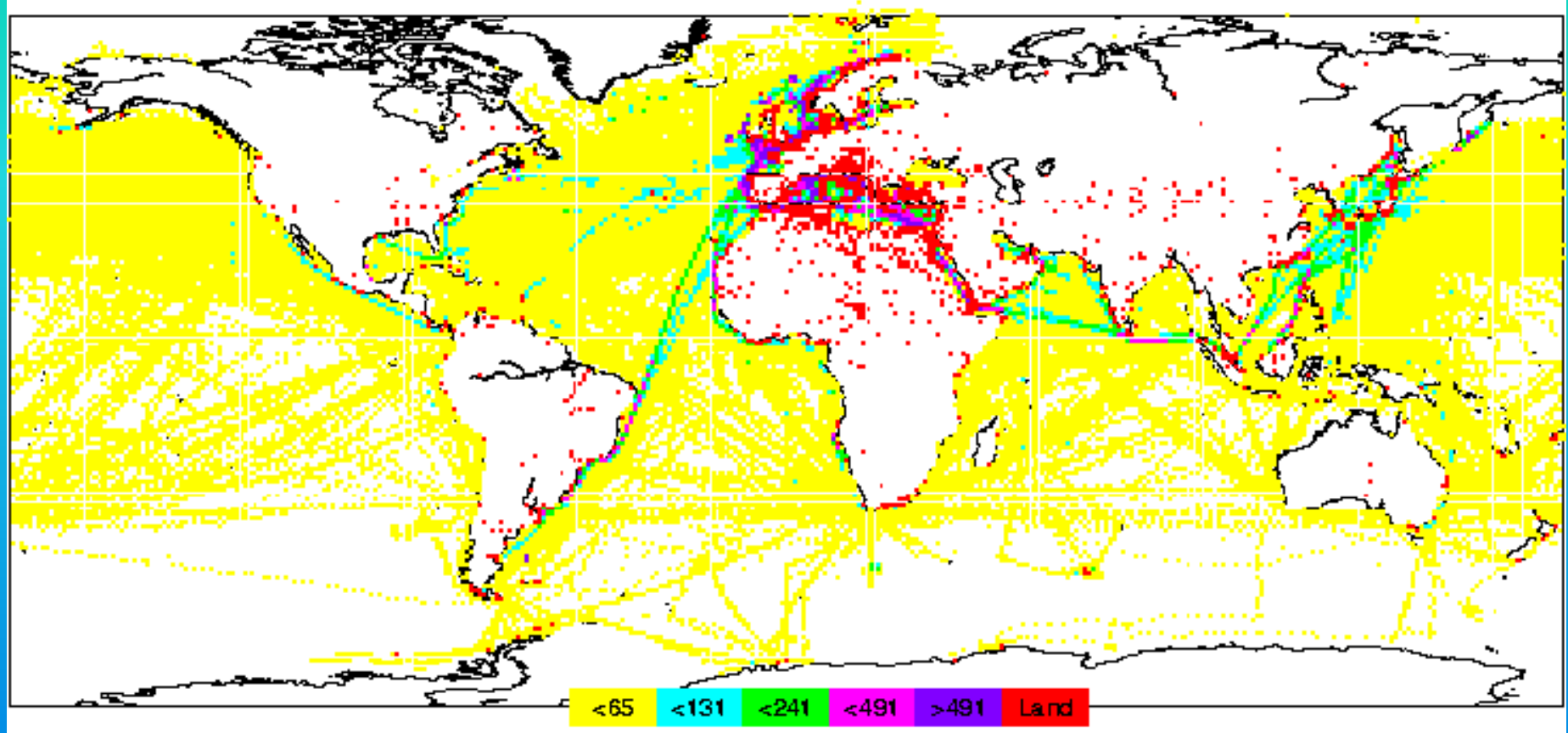


Area distribution

Total number of observations (808990) received in 2001

Figure 5

VOSClim – subset of ca. 200 selected ships making extendent obs.

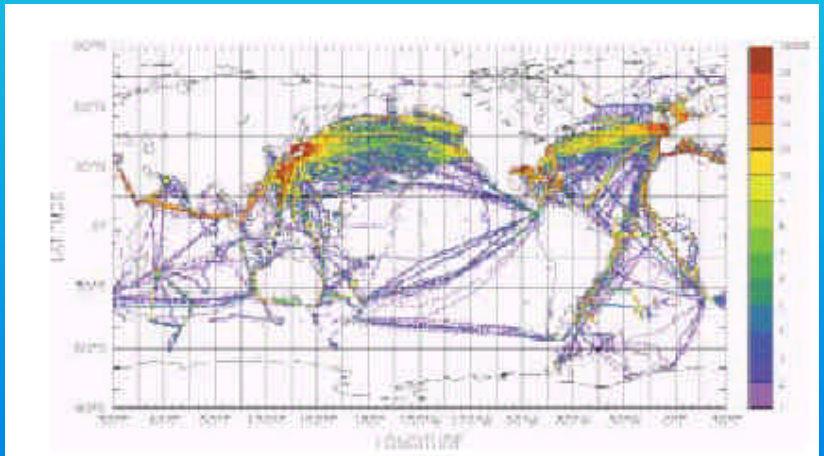


Figure 2: Projected global coverage of ships taking part in the VOS Climate Project [drawn from raw reports from the Global Telecommunication System (GTS) using data from November 1999 to October 2000), downloaded from http://www.cdc.noaa.gov/coads/ncep_obs/]

The Marine Observer, April 2001

Deutscher Wetterdienst (MCSS)

Summaries for the South Atlantic Ocean (20° N - 50° S), 1971 - 1980

(Responsible Member: Germany)

Parameters:

SST

Air temperature

Dewpoint

Air pressure

Wind (DD,FF)

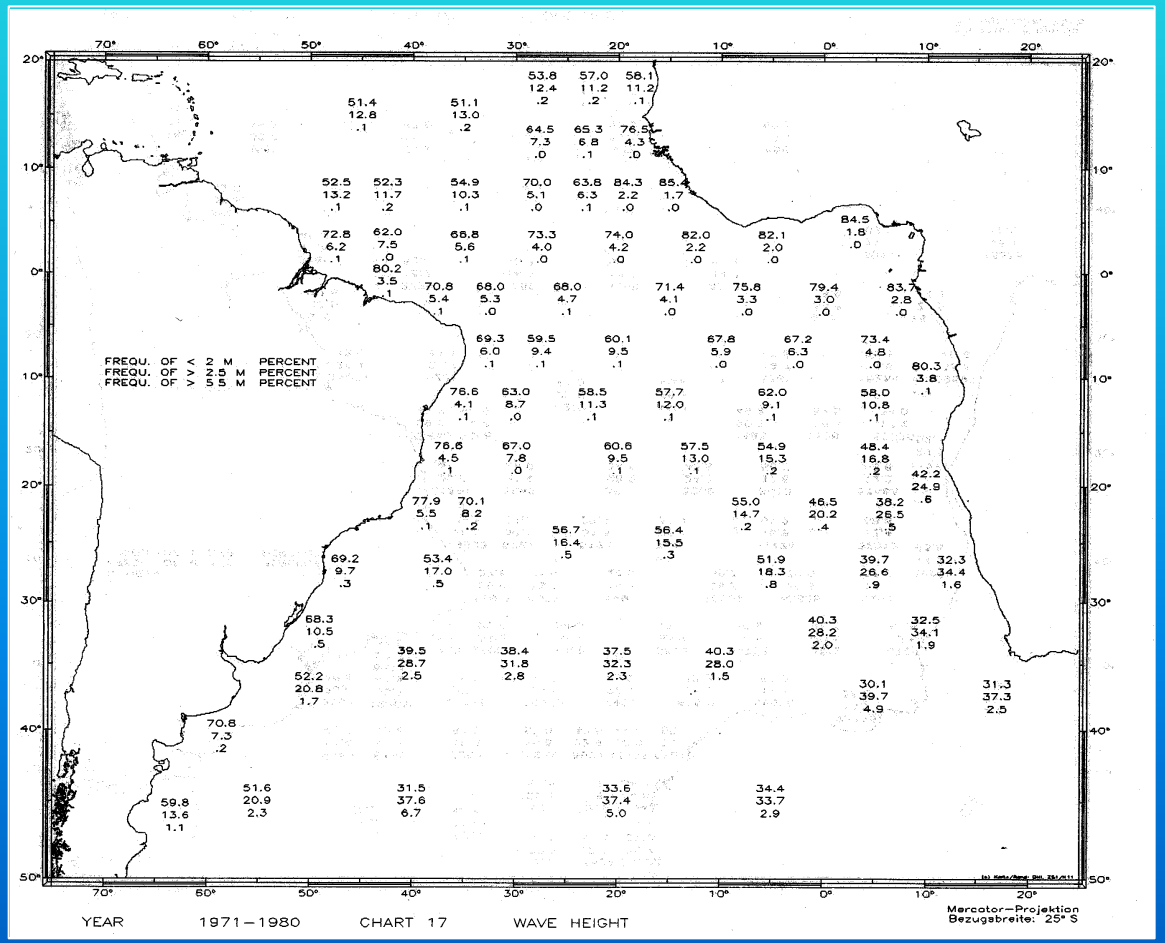
Wind wave and swell

Wave height /period

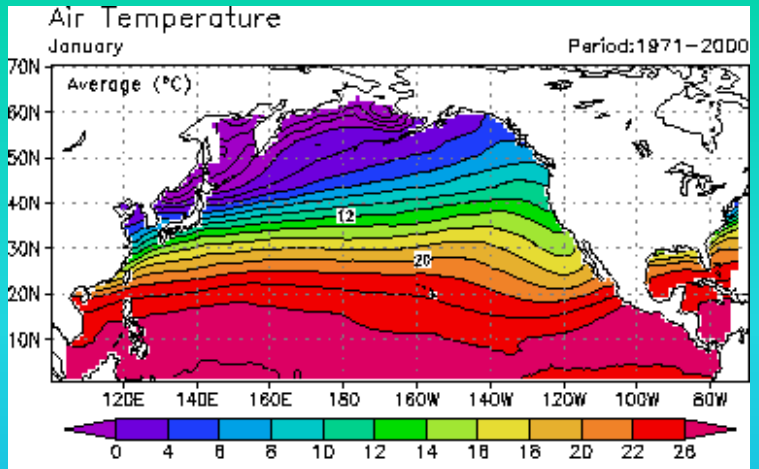
Cloudiness

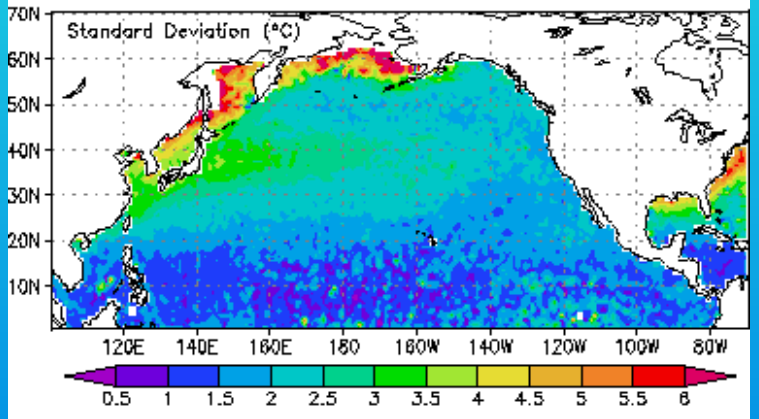
Visibility

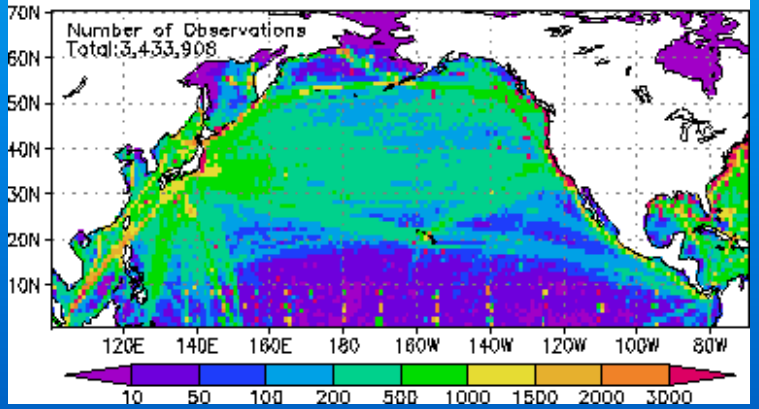
Heat fluxes

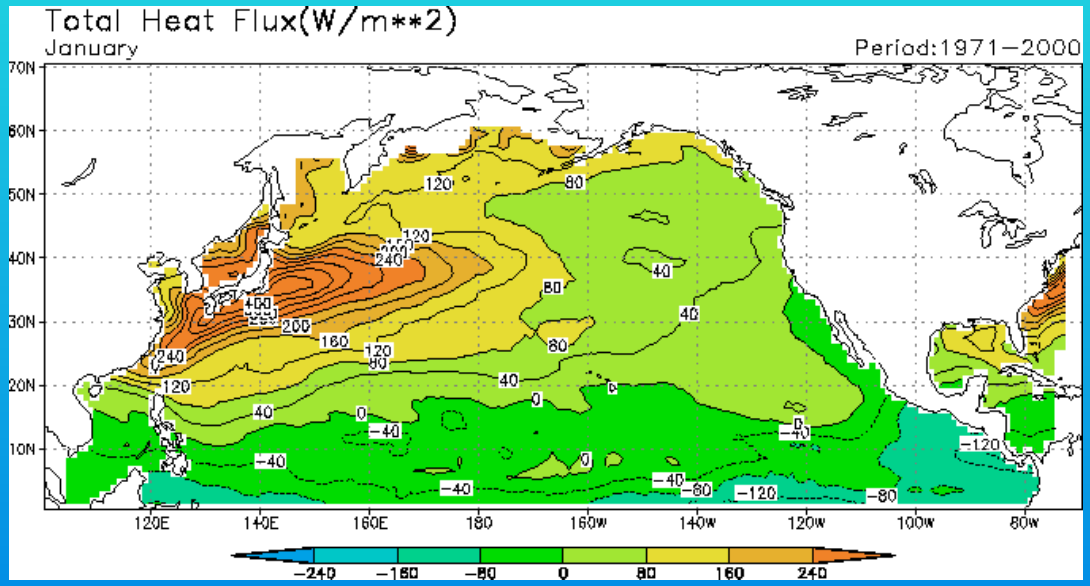


Climatological maps for North Pacific, 1971-2000, JMA









An example of realization of RM's task

Bundesamt für Seeschiffahrt und Hydrographie

Naturverhältnisse

der

Nordsee, des Kanals und der westeuropäischen Gewässer

Teil B

zum Nordsee-Handbuch
östlicher Teil (Nr. 20061)
südlicher Teil (Nr. 2007)
westlicher Teil (Nr. 2008)

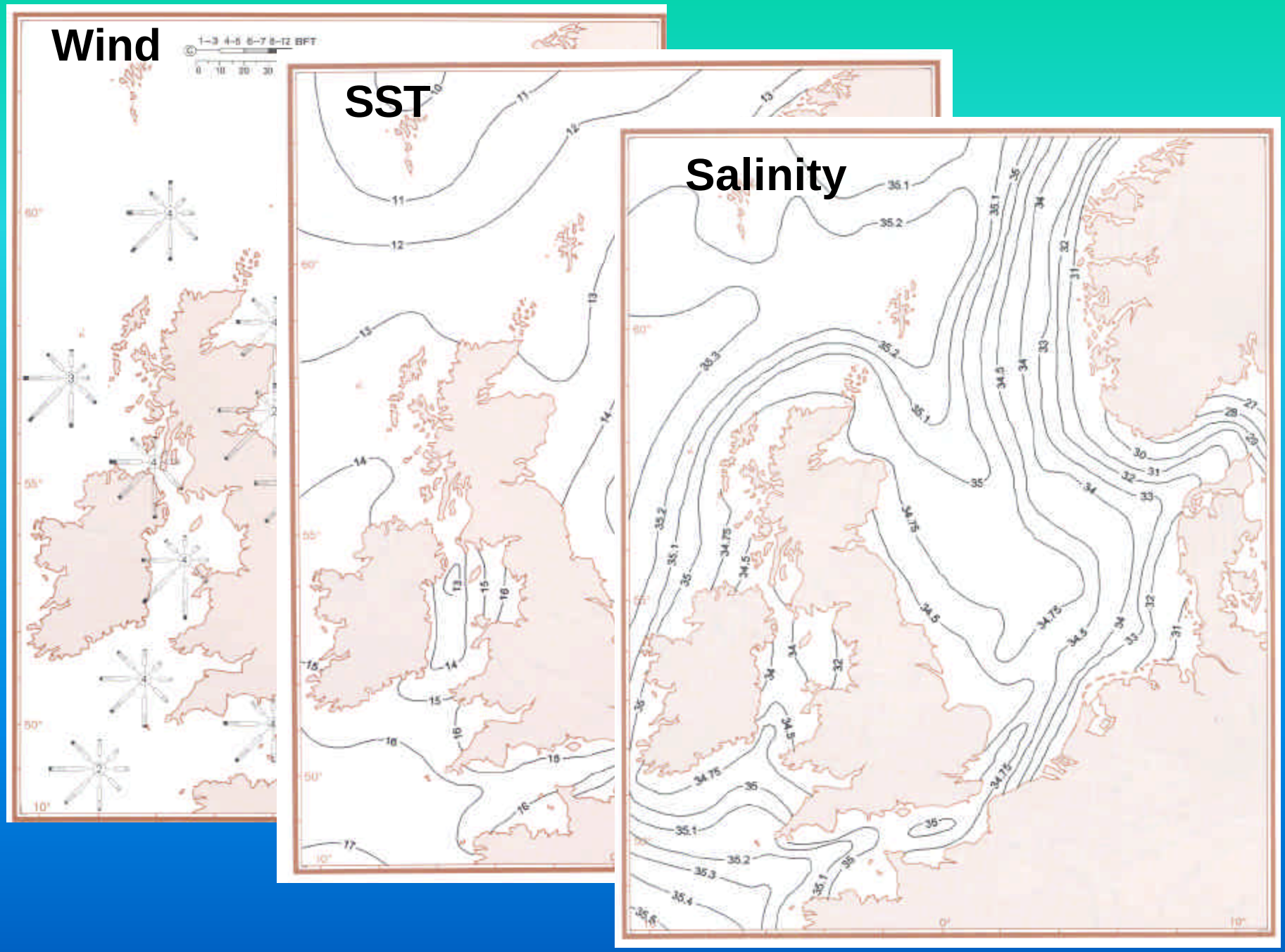
sowie

zum Handbuch
der Südküste Englands (Nr. 2017)
der Westküste Englands und Schottlands (Nr. 2019)
und zum Irland-Handbuch (Nr. 2021)

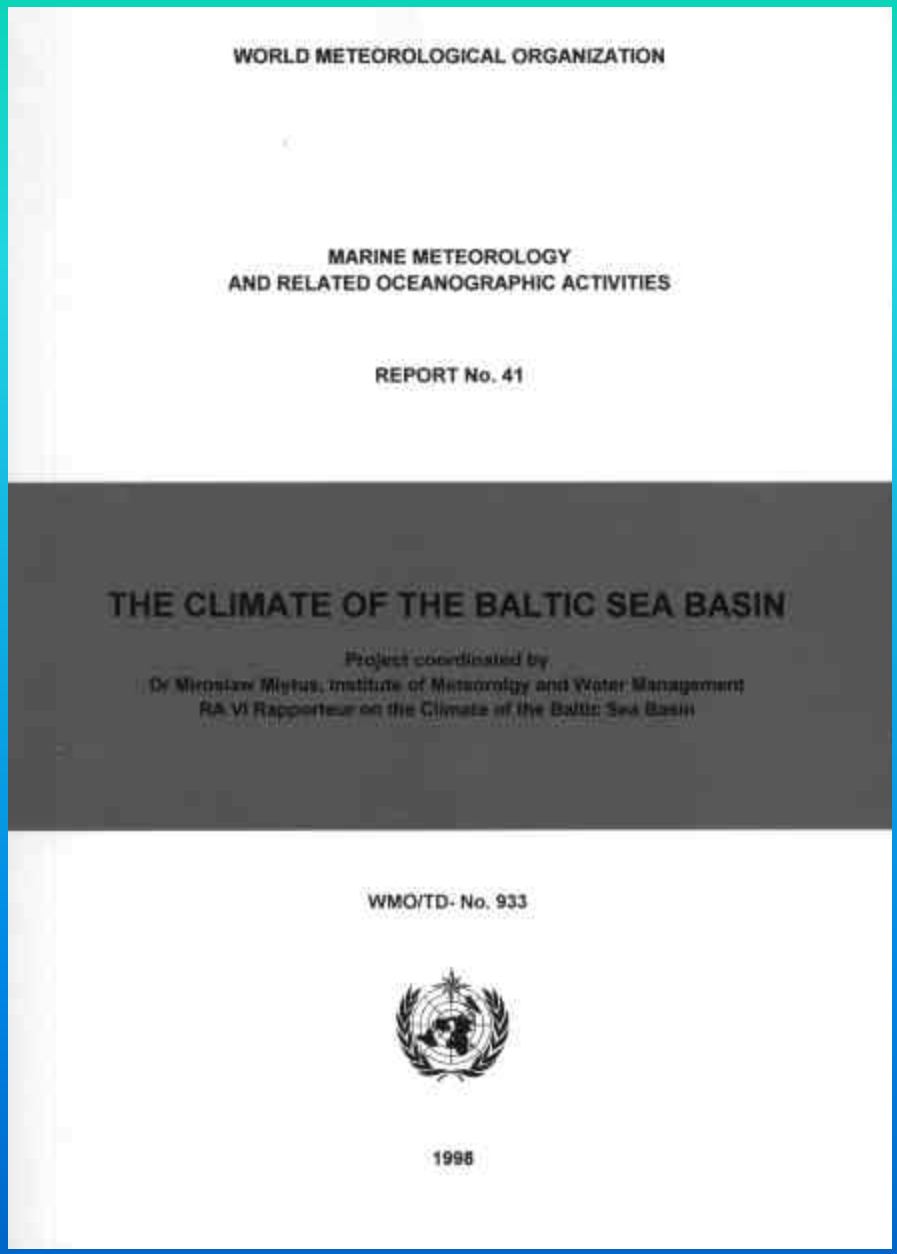
Hamburg **2003** **Rostock**

Cover page of the mandatory safety manuals on board of German ships according to SOLAS Meteorological Part

Manual on Ship's Safety (SOLAS), Meteorology, West European Area (October): Storm


Wind
SST
Salinity

The international co-operation between RM and national meteorological services



WORLD METEOROLOGICAL ORGANIZATION

MARINE METEOROLOGY
AND RELATED OCEANOGRAPHIC ACTIVITIES

REPORT No. 41

THE CLIMATE OF THE BALTIC SEA BASIN

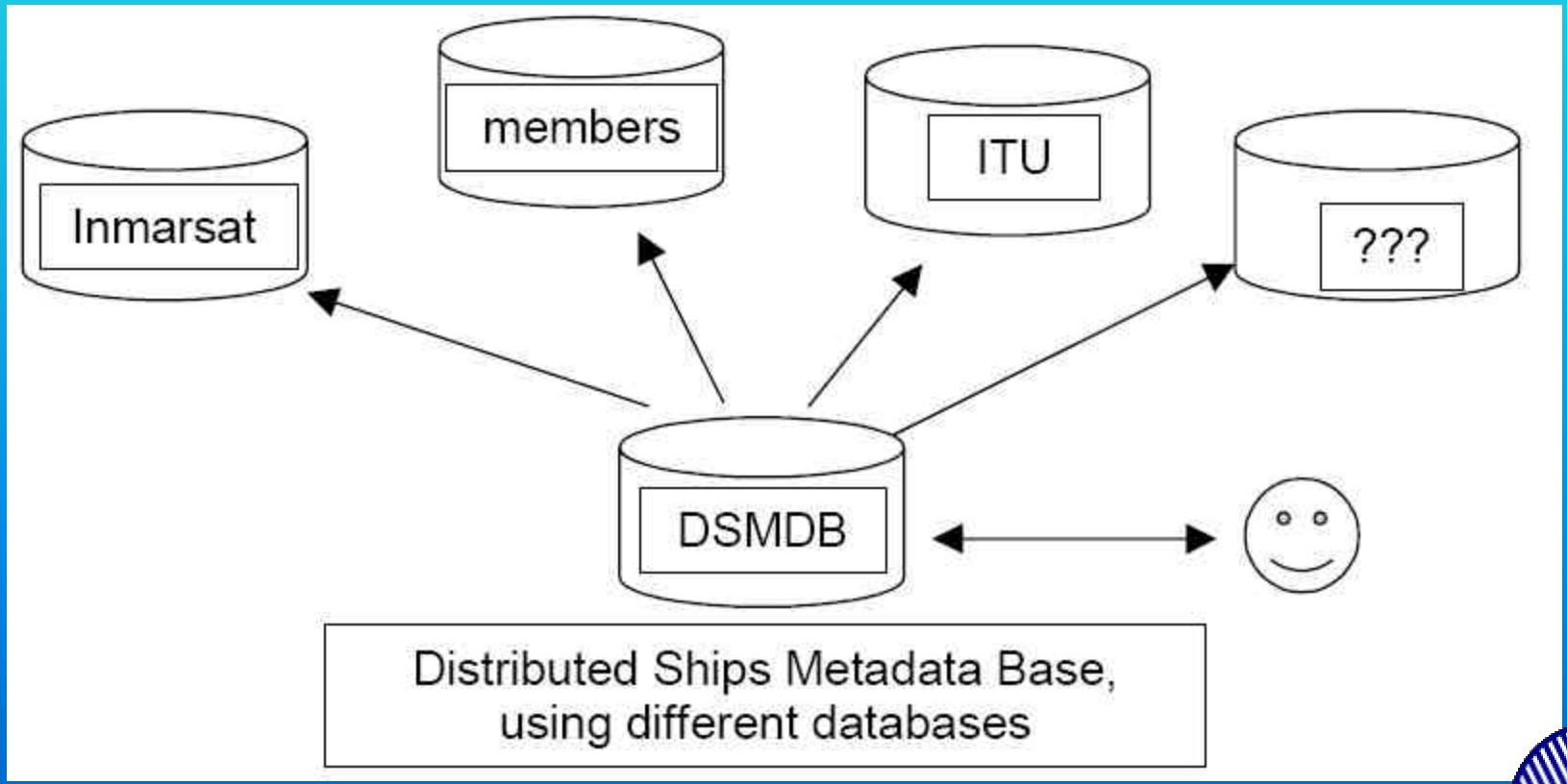
Project coordinated by
Dr Mirosław Miętus, Institute of Meteorology and Water Management
RA VI Rapporteur on the Climate of the Baltic Sea Basin

WMO/TD- No. 933

1998

Proper maintenance of the database is crucial. This depends largely on the database model.

This may be either distributed or centralized.

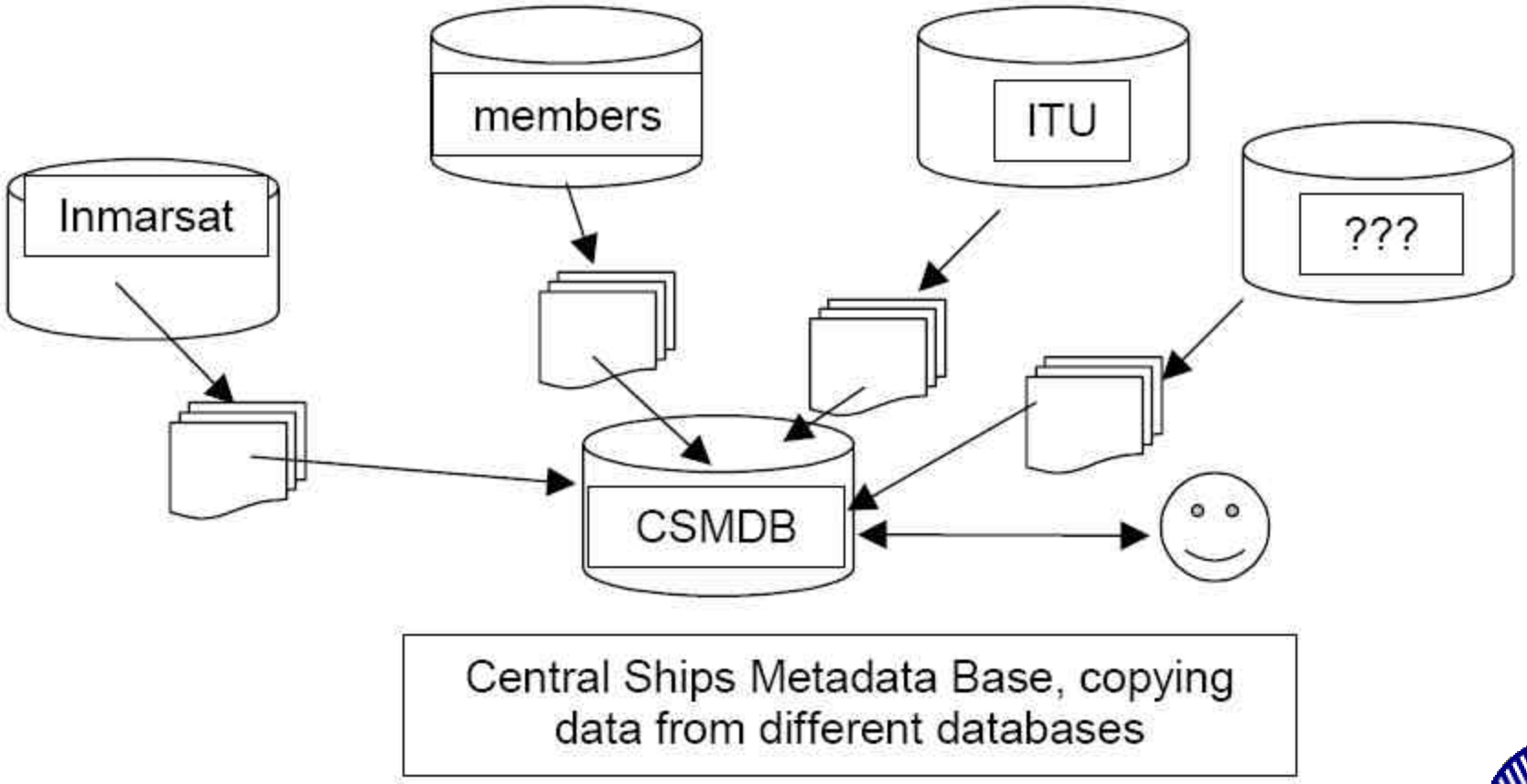


The advantage of a distributed database is that all responsibilities are there where they belong. E.g. Inmarsat keeps its own database up-to-date.

That again is also a disadvantage. If, for whatever reason, the external database is shielded from outside users, or even ceases to exist, then we have a problem.

Another problem is that information about former VOS is not available, or also will not be available anymore after a while. In other words, there should be a mechanism to keep old meta data available in the meta database (WMO-No. 47).

The centralized database has the advantage that all information is in one place and independent of the availability of other databases. The disadvantage is that the information has to be updated regularly.



METADATA OF THE MARINE SHIP CODES

Metadata are often important as the data themselves. It has been recommended that a study be conducted to verify if all the WMO Manuals on Codes (WMO-No.306) and IMMT formats documenting the history of the marine ships codes and exchange formats are available.

International code formats for data exchange and archive used by NMHSs are introduced and amended by Resolutions of EC. This is done on the basis of Recommendations by the CBS and the JCOMM (CMM), as appropriate.

SHIP codes and IMMPC/IMMT formats appear on the Manual on Codes (WMO-No.306) and on the Manual on Marine Meteorological Services (WMO-No.558), respectively.

When a revision is adopted, the revised format is introduced either by issuing a new edition of the corresponding publication or by issuing a supplement. Thus, as far as each NMHS uses the latest version of the publications with pages replaced properly, operational data exchanges are carried out smoothly using the adopted formats.

Recommendations

The future of MCSS needs:

- **continuation of VOS**
- **contribution of all members (CMs) to the scheme. It is important also to urge members (CMs) to prioritize their contributions with the goal to achieve a quarterly contribution.**

Future:

- **reducing the gap between real time and non real time as well as the individual data which are available on both time scales or on each time scale only**
- **unsolved problem of data tagging to identify the original message irrespective of time scale or quality level or changes due to quality control measures.**
- **data archiving at one place? Or distributed data base without corrupting the data base (pseudo duplicates)? Both solutions may be feasible.**
- **I-COADS as an inventory at least for all available delayed mode data?**

Special issue: Importance of Metadata (WMO 47 – type)

General:

- WMO data collection is an internationally shared issue and vitally needs national commitments

- WMO data collection highly depends on the willingness of the private section (shipping companies, nautical personnell) and therefore has to consider cost aspects (e.g. transmission costs) when continuing or changing data management practices.

Special thanks to my friend, Dr. Volker Wagner, GCC Hamburg, Germany, for his significant input!