EXPERT TEAM ON MARINE CLIMATOLOGY
First Session

Gdynia, Poland, 7-10 July 2004

FINAL REPORT

JCOMM Meeting Report No. 32

WORLD METEOROLOGICAL ORGANIZATION

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION (OF UNESCO)

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N O T E

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C O N T E N T S

GENERAL SUMMARY OF THE WORK OF THE SESSION

1. ORGANIZATION OF THE SESSION (agenda item 1)

1.1 Opening (agenda item 1.1)

1.1.1 The first session of the Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM) Expert Team on Marine Climatology (ETMC) was opened at 0930 hours on Wednesday, 7 July 2004, in a conference room at the University of Gdańsk, Institute of Oceanography under the chairmanship of Dr Miroslaw Mietus. Dr Mietus welcomed participants to the session and introduced Professor Dr Jan Zielinski, the Director of the Institute of Meteorology and Water Management (IMWM, Polish Meteorological and Hydrological Service), Permanent Representative of Poland with WMO; Professor Kazimierz Rozdzynski, President of the Scientific Council of the IMWM; and Ms Barbara Cygan, Director of the Marine Branch Office of the IMWM. Dr Mietus then called on Professor Dr Zielinski, to address the session.

1.1.2 Professor Zielinski welcomed participants to the session, to Gdynia in general and to the IMWM in particular. In the first part of his welcoming address he made references to the history of Gdynia, a city founded in 1926 and constructed on the basis of Poles' dreams of the sea, and the Polish window to the world. He mentioned that the year 2004 marked the 85th anniversary of the Polish Meteorological and Hydrological Service(IMWM). IMWM has been providing the government and the public with vital information on the actual state of the atmosphere and hydrosphere and preparing weather forecasts as well as warnings of dangerous natural phenomena. Professor Zielinski stressed the importance of World Weather Watch (WWW), Global Climate Observing System (GCOS) and Global Ocean Observing System (GOOS) and underlined that Poland always supplied these activities with results of observations from the surface network, upper air sounding network including ozone probing, sea level gauge system and VOS system. Data transmitted on a real-time basis as well as taken from a national archive were used successfully within the World Climate Research Programme (WCRP), the International Geosphere-Biosphere Programme (IGBP) and other programmes. He mentioned also that for nearly 45 years IMWM has been actively participating in many international programmes concerning interactions between the atmosphere and ocean. More than 700.000 SHIP reports have been collected by IMWM, controlled according to the rules of the former Commission for Marine Meteorology (CMM) and distributed according to area of responsibility. He stressed that since the establishment of JCOMM, IMWM has actively participated in work of several groups and expert teams of this very important international body. Professor Zielinski referred also to the Regional Association VI (RA VI-Europe) Project on the Climate of the Baltic Sea Basin, coordinated by IMWM and successfully completed in 1998. As the General Director of the IMWM and the Permanent Representative of Poland with WMO he wished a successful discussion at this meeting in a friendly atmosphere. He hoped that fruitful discussion at this meeting will contribute to progress in the field of marine climatology.

1.1.3 On behalf of the Secretary-General of WMO, Mr Michel Jarraud, and the Executive Secretary IOC, Dr Patricio Bernal, the Secretariat representative also welcomed participants to the first session of the ETMC. In doing so, she expressed the very sincere appreciation of both Organizations to the Government of Poland, to the Institute of Meteorology and Water Management and its Director Dr Jan Zielinski, and especially to the local organizer and the chairman of the Team, Dr Miroslaw Mietus, and his staff for the excellent facilities provided as well as for the tremendous organizational effort already put into preparations for the meeting. She noted that although this session is called the first session of the Expert Team on Marine Climatology, activities undertaken by the Team, including the implementation of the Marine Climatological Summaries Scheme (MCSS) have a long history and that the year 2004 marked the tenth anniversary of the establishment of the two Global Collecting Centres. She noted that activities under MCSS had been changing and that one of the main purposes of this meeting would be to review and consider the future of the MCSS including the structure/activities of GCCs and Responsible Members. She assured participants of the full support of the Secretariat, both during

the meeting and throughout the implementation of the work programme of the Team. She concluded by wishing all participants a very successful meeting and an enjoyable stay in Gdynia.

1.1.4 The list of participants in the meeting is given in ***Annex I***.

1.2 Adoption of the agenda (agenda item 1.2)

1.2.1 The Team adopted its agenda for the session on the basis of the provisional agenda with some modification, so that the future of the Marine Climatological Summaries Scheme including operations/structures of the Global Collecting Centres (GCCs) and Responsible Members (RMs) would be discussed all together. The final agenda for the session is given in ***Annex II***.

1.3 Working arrangements (agenda item 1.3)

1.3.1 Under this agenda item the Team agreed its hours of work and other arrangements necessary for the session. The list of session documents was introduced by the Secretariat, as well as a session timetable.

2. REVIEW OF THE ACTIVITIES OF JCOMM DATA MANAGEMENT PROGRAMME AREA

2.1 Report of the chairman of the Team

2.1.1 The Team noted with appreciation the report of the chairman of the ETMC. The report was prepared taking into account the chronology and working plan of the ET. Firstly, Dr Mietus mentioned that although some members of the Expert Team had been replaced due to national reasons, the work plan of the Team had been smoothly implemented in principal. The chairman referred to the VOSClim Project and the first and second sessions of the JCOMM Ship Observations Team (SOT) (Goa, India, February-March 2002) (London, July 2003) where some topics relevant to this Team were discussed, including real-time and delayed mode data transmission, the extended layout of data record for VOSClim ships, metadata, particularly WMO-No. 47, and the ship's inspection form.

2.1.2 Dr Mietus mentioned that based on JCOMM-I recommendations as well as some from the above-mentioned meetings, a draft version of the working plan of the Expert Team on Marine Climatology was prepared and persons in charge were assigned in early spring 2002. The draft version of the working plan was presented by the chairman of the Expert Team during the First Session of the Data Management Coordination Group (DMCG) (Paris, May 2002). DMCG pointed out that there is a lack of a "route map" for users looking for data and assistance, while at the same time the group agreed that MCSS is a developed system of marine meteorological data management with a distributed structure. Taking into account discussions at the above-mentioned meetings as well as the recommendations of the DMCG-I, the final version of the working plan of the Expert Team on Marine Climatology was circulated by e-mail to all members on 2 August 2002.

2.1.3 Dr Mietus referred to the Workshop on Advances in the Use of Historical Marine Climate Data which was held in Boulder, USA, January-February 2002, where inter alia the technical aspects related to data archeology, rescue, digitization, management on global scale, the significant value of metadata etc. were discussed. He pointed out that the Workshop stressed the importance of international cooperation particularly within JCOMM and the Expert Team on Marine Climatology e.g. on the new International Marine Meteorological Archive (IMMA) format, metadata, the history of CMM decisions concerning VOS and MCSS, bilateral data exchange within GCCs etc. Several recommendations were made by this Workshop, one of which was to adjust the wind force data back to about 1854 using an improved equivalence scale (most likely the implementation should produce a separate field, so that the present WMO 1100-based values can still be archived and made available). Taking into account the above recommendation, an external expert, Dr Ralf Lindau (Germany), was invited to be responsible for the realization of this task. Dr Lindau gave a talk on this general subject at the Second JCOMM Workshop on Advances in

Marine Climatology (CLIMAR-II) (Brussels, November 2003). As presented in Brussels, a wind correction according to the recommended method (using individual pressure differences) was completed for the North Atlantic.

2.1.4 Dr Mietus informed the Team that in association with a seminar to celebrate the 150th anniversary of the Brussels Maritime Conference, the Second JCOMM Workshop on Advances in Marine Climatology (CLIMAR-II) successfully took place in Brussels. Details of this workshop were presented under agenda item 7.1 at this session.

2.1.5 Dr Mietus stressed that cooperation with the JCOMM Expert Team on Data Management Practice (ETDMP) was an important issue for ETMC. The GCCs were originally represented by Dr Volker Wagner (GCC Germany) at ETDMP, and after his retirement by Ms Elanor Gowland (GCC United Kingdom). Mr Yoshida is a member of both ETMC and ETDMP.

2.1.6 Dr Mietus mentioned with appreciation that several members of the ETMC regularly reported on progress achieved in the implementation of the Expert Team on Marine Climatology working plan. Based on these reports, annual reports on Expert Team activities were prepared and sent to the Data Management Programme Area Coodinator, Professor Lin Shaohua (China). While a number of tasks had been satisfactorily conducted by Team members, Dr Mietus noted with regret that he had not received responses/contributions from all the Team members, thus all tasks had not been fully implemented.

2.1.7 The Team noted the close collaboration between the ETMC and VOSClim Project. Under this agenda item, Ms Sarah North (United Kingdom) project leader of the VOS Climate (VOSClim) Project, presented the objectives, current status, and data management system of the Project. The project has entered into its implementation phase and data, metadata and quality monitoring results are available through the project Web site. The Team noted that the VOSClim project is a good example of an E2EDM system and that the GCCs contributed to the data management system.

2.2 Report of the Secretariat

2.2.1 The meeting recalled that JCOMM was formally established in 1999 and that its first session (JCOMM-I) took place in Akureyri, Iceland, in June 2001. Bearing in mind that the best way to activate and motivate the main JCOMM subsidiary bodies is to have them meet early in the intersessional period, to prepare work strategies, address priority issues identified by JCOMM-I and allocate specific tasks, a work programme was prepared which allowed for the Management Committee and all PA Coordination Groups to meet in the first half of 2002. In addition to these meetings, the programme included other subsidiary bodies and related meetings, in particular those of a regular nature (e.g. the present session of the Expert Team on Marine Climatology) or planned prior to JCOMM-I, as well as some training events directly under JCOMM.

2.2.2 The Team noted with interest that the Future WMO Information System (FWIS), which was an overarching approach to meet information exchange requirements of all WMO Programmes, was being developed by the Commission for Basic Systems and that the Inter-Commission Coordination Group on FWIS had been established at the WMO EC-LVI (June 2004). The Team noted that although the implementation of FWIS would not be pursued within a short period, the Team would need to keep this development in mind when the Team would consider the future of the Marine Climatological Summaries Scheme.

2.3 Report on the first session of the Expert Team on Data Management Practices

2.3.1 Ms Elanor Gowland (United Kingdom) reported on the discussion at the first session of the Expert Team on Data Management Practices (ETDMP-I) and major activities of the ETDMP. ETDMP-I concentrated on the requirements for end-to-end data management, current data management systems, accompanying metadata, cooperation with other programmes and setting up pilot projects. Specifications for E2EDM were presented for GCOS, GOOS Coastal

Ocean Observations Panel (COOP) and Marine Meteorological Services (MMS), along with their requirements for satellite and sea ice data. This information along with the current data management practices for oceanography and marine meteorology were taken on board, and discussed in relation to two pilot projects (PP2 – Data assembly, quality control and quality assurance; PP3 – End-to-end Data Management (E2EDM) prototype). The common themes were: elements and frequency of collection; timeliness, quality and availability of data; storage of data and associated metadata. There currently exists a number of metadata management systems. These different models have a number of cross-cutting issues, but have been developed for particular purposes, and thus hold varying types of data to differing standards. This discussion formed the basis for one of the pilot projects (PP1 – Metadata management). Some details of the discussion at ETDMP-I and those of three pilot projects are in ***Annex III***. Marine meteorological data have been requested by ETDMP from ETMC. The Met Office, UK was requested to provide such information and to inform ETDMP if there is any problem by 23 July 2004.

3. DATA QUALITY AND EXCHANGE

3.1 Review of the IMMT and MQCS

3.1.1 The Team recalled that the current Minimum Quality Control Standards (MQCS-IV) did not extend to the additional elements introduced for the VOSClim project. Mr Reinhard Zöllner (Germany) presented a detailed proposal on a revision of the International Maritime Meteorological Tape (IMMT) format and Minimum Quality Control Standard (MQCS) in accordance with the needs of the project. The Team was informed that the basic part of this proposal on the revision had already been agreed at the fourth session of the VOSClim project and the second session of the Ship Observations Team (SOT-II) (London, July 2003).

3.1.2 The Team reviewed the proposal and agreed with the revision, after some small modifications, as in ***Annexes IV and V***. It was thus agreed that a proposal to revise the Manual on Marine Meteorological Services (WMO-No. 558) and the Guide to Marine Meteorological Services (WMO-No. 471) should be submitted to JCOMM-II for its consideration. GCC Germany and the Secretariat will prepare a draft recommendation to be submitted to JCOMM-II. **(Action: GCC Germany and Secretariat)**

3.1.3 The Team noted that in some cases, observations categorized as either erroneous or doubtful under the current MQCS are confirmed by the observers as the correct value and that the specification for quality control Indicators may need some modification. The Team agreed that Mr Martin Stam (Netherlands) would check the procedures and criteria used by electronic logbook such as TurboWin, SEAS and OBSJMA and would report to the Team with a proposal by October 2004, if any modification to specification for quality control Indicators is considered to be needed. **(Action: Mr Martin Stam)**

3.2 Review of BUFR template for ship data

3.2.1 Mr Scott Woodruff (USA) presented a limited review of the BUFR template for ship (and buoy) data. This review was based on a translation into the International Marine Meteorological Archive (IMMA) format of marine BUFR data from NOAA's National Centers for Environmental Prediction (NCEP). That translation was compared with a parallel translation into IMMA of the corresponding original GTS messages (attached in NCEP BUFR). The comparison revealed that differences still existed between BUFR and the original GTS data. The source and significance of each field difference has not been systematically determined, but it appears that BUFR is not yet successfully retaining all the original details and precision of the originally reported GTS data (e.g., apparently no codes in BUFR for variable wind direction). The attachment by NCEP of the original GTS message was extremely valuable, and, to ensure complete presentation of the original data, is suggested for consideration for the BUFR templates.

3.2.2 The Team noted the significance of this issue and requested the Secretariat to inform the Commission for Basic Systems (CBS) of findings by this general review. The team expressed its appreciation to Mr Scott Woodruff for his efforts on this issue and accepted his offer to continue this work if so requested by CBS. **(Action: Mr Scott Woodruff)** The Team agreed that retaining the original BUFR message should be important for the future interpretation/comparison of BUFR data.

3.3 Review on electronic logbooks

3.3.1 The Team recalled that Members operating VOS had been encouraged to use electronic logbooks. Mr Takashi Yoshida (Japan) reviewed the development and the current status of OBSJMA for Windows. The software was distributed to about 850 VOS via Japanese shipping company in September 2002. At least 45 VOSs have used it and about 10,000 observations were compiled into IMMT-2 electronic logs in 2003. Mr Martin Stam (Netherlands) presented the structure of TurboWin; a systematic procedure for update of TurboWin has already been established. A brief summary of Mr Stam's report is in ***Annex VI***. The Team also noted that it was essential that amendments on codes and formats be accommodated in the electronic logbooks. The Team noted with appreciation that both software packages are available on web sites, which should accelerate the wider use of electronic logbooks. The Team noted with interest that an Ocean Wave Atlas is also available on the TurboWin web site.

3.3.2 The Team was informed that SOT-I had suggested that, instead of the reduced (10m) wind, the original wind data should be reported and that this suggestion had been endorsed by the Management Committee at its second session (MAN-II) (Paris, February 2003). The recommendation will be sent to JCOMM-II for its consideration. Recalling that only the VOS using TurboWin (version 2.1.2 onwards) had been reporting the reduced (10m) wind, the Team noted with satisfaction that TurboWin had been revised to report non-reduced wind for ships. It endorsed the recommendation at SOT-II that a revised version should be used so that non-reduced wind would be widely reported as soon as possible pending adoption of the recommendation by JCOMM-II. **(Action: VOSClim participants)**

3.3.3 The Team noted with appreciation to KNMI that the Turbo software series has been widely used in the world and greatly facilitated data collection. It was suggested that on-line submission from VOS through electronic logbooks should be considered for the future, when the Internet access is readily available on ships. **(Action: developers of electronic logbooks)**

3.4 Review of the Marine Climatological Summaries Scheme

3.4.1 Report of the Global Collecting Centres

3.4.1.1 The Team was presented with a report on the Global Collecting Centres by Ms Elanor Gowland (United Kingdom). She reported on the current status of data collection/exchange and noted problems such as long delays in data submission. The GCCs have been making efforts to ensure that Minimum Quality Control Standards (MQCS) have been applied to the data and following up on any problematic data contributions, bilaterally with the concerned Contributing Member. The Team expressed its appreciation to GCC UK and GCC Germany for their efforts to assure the quality of delayed mode VOS observations. The Team noted with satisfaction and appreciation that the GCCs had developed MQCS software, which has been distributed to 19 Contributing Members. The Team encouraged all CMs to use the MQCS software as appropriate. **(Action: CMs)**

3.4.2 Report of Responsible Members

3.4.2.1. The Team was presented with reports from the Responsible Members attending this session (Germany; Hong Kong, China; India, Japan, Netherlands, United Kingdom, USA), which are available in ***Annex VII***. A report from Russia (Responsible Member) was not received. In addition, the Team was presented with a report by Argentina, a contributing member. The Team

noted that some RMs were actively preparing summaries and some RMs are providing observational data upon request. The Netherlands, United Kingdom and USA noted that they had no requirements currently for summaries.

3.4.2.2. The Team recalled that the GCCs were not global data archival centres, but focal points for delayed-mode data. At the moment, users are requested to contact the relevant Responsible Member(s) to obtain marine meteorological data collected under the MCSS. It agreed that there was a lack of a "route map" for users looking for data and assistance, although MCSS is a developed system of marine meteorological data management with a distributed structure. The GCC web site should include such information. **(Action: GCC Germany)** The current basic duties of GCCs and RMs are described in ***Annex VIII***.

3.4.3 Requirements of and assistance for users

3.4.3.1 The Team recalled that the preparation of climatological summaries was currently an optional activity to be conducted by RMs, with details of the summaries defined in the Manual on Marine Meteorological Services (WMO-No. 558). It agreed that a survey should be conducted to better understand actual requirements for such summaries and that Ms Gowland and Mr Zollner together with Dr Mietus would prepare a questionnaire by 30 October 2004. **(Action: Ms Gowland, Mr Zöllner, Dr Mietus)** The questionnaire will refer to the currently available summaries. For this purpose, the Team requested Germany to make available their recent decadal summaries on the GCC Germany web site. **(Action: GCC Germany)** The Team encouraged the GCC UK to establish a similar web site **(Action: GCC UK).** The questionnaire will be distributed to Responsible Members (members of the ETMC) and Contributing Members (members of ETMC and VOS focal points) through the Secretariat. RMs and CMs will distribute the questionnaire to their relevant national/regional contacts. **(Action: Secretariat, RMs and CMs)** The completed questionnaires will be sent to Dr Mietus for his analysis. **(Action: Dr Mietus)** The results of the survey will be circulated to members of this Team for their further consideration on the future of the climatological summaries and MCSS. Such discussion should continue by correspondence until the next session of ETMC, where the final proposal on the future activities/implementation of the MCSS should be prepared. **(Action: ETMC members)**

3.4.3.2 The Team noted with regret that the MCSS, and data/summaries prepared under the scheme, was not well known by potential users (e.g., marine and hydrographic organizations, researchers). The Team agreed that the GCC web site(s) should be more publicized. The site should be linked to other relevant web sites including the JCOMM web site, ICOADS web site, and the web site of historical marine ship codes (see agenda item 4.2) **(Action: GCC Germany)**

4. Data archival

4.1 Development of the International Marine Meteorological Archive (IMMA) format

4.1.1 The Team recalled that the CMM Subgroup on Marine Climatology (SGMC) had been addressing the development of a standardized code format required for the exchange of historical ship data digitized from national logbooks. It also recalled that JCOMM-I had recognized that such data were especially significant for data sparse time periods such as the duration of the two world wars, the 19th Century and earlier data. The Subgroup had agreed that such a format would need to be flexible, expandable and simple enough to meet unanticipated requirements and characteristics of such data, as well as to simplify practical implementation by Members/Member States.

4.1.2 Mr Scott Woodruff presented a summary of the development of the International Marine Meteorological Archive (IMMA) format. The format is operational for the International Comprehensive Ocean-Atmosphere Data Set (ICOADS), for the Climatological Database for the World's Ocean 1750-1854 (CLIWOC), and helping to meet requirements of the VOSClim project. The format is similar to IMMT in using a simple ASCII representation, but more flexible and

extensible through the definition of "attachments" tailored to the requirements of different marine data types (e.g., historical or contemporary).

4.1.3 The Team expressed its appreciation to Mr Woodruff for his efforts to develop this format. It noted that more "attachments " for the IMMA format would be developed e.g. in accordance with the planned future update of IMMT. The Team noted that further clarifications in the units and configurations of some fields need to be added to the proposed IMMA format. The Team agreed that the accordance between the proposed IMMA format and the latest version of IMMT should be further carefully examined. It thus agreed that GCC UK and GCC Germany would discuss with Mr Woodruff on this issue and that Mr Woodruff would prepare a revised version by December 2004. **(Action: Mr Woodruff)** The Team agreed that the revised format should be publicized for wider usage in the near future through a JCOMM Technical Report, while continuing its evolution and development (e.g. finalization of an attachment for earlier ship data). This Technical Report will be made available on the WMO web site, the same as other JCOMM Technical Reports. At the same time, the Team further agreed that the report would be also made available on the ICOADS web site (http://www.cdc.noaa/gov/coads) **(Action: Secretariat, Mr Woodruff)**.

4.2.1 History of the marine ship code

4.2.1 The Team recalled that JCOMM-I had noted and supported the efforts by the CMM SGMC to verify the availability of documentation relating to the history of the marine ship codes, as well as the feasibility of making such documentation available on the web. This documentation would be extremely valuable in particular to the correct interpretation of observational data contained in the archives, which were clearly sensitive to the codes and formats used for their exchange.

4.2.2 Mr. Yoshida reported the progress of the task to trace the change of marine ship codes and formats and to look into the feasibility of making the information available on the Web. Results of the study on the history of codes and formats change had been made available on the following web site with references to relevant WMO documents:

http://goos.kishou.go.jp/ws/ETMC/code_task/

The team noted the progress with satisfaction and agreed the future work plan to finalize this task by 1) making all final reports of CMM and Commission for Synoptic Meteorology (CSM)/CBS sessions available on the web site, 2) updating the web site, 3) looking for past editions and supplements to the Manual on Codes and making them available on the web site, and 4) expanding this task to other marine codes such as FM 18 DRIFTER/BUOY, FM 62 TRACKOB, FM 63 BATHY, FM 64 TESAC and FM 65 WAVEOB.

4.2.3 It was noted that a number of marine related archival documents had been passed from the Met Office, UK, to Dr Elizabeth Kent (Southampton Oceanography Centre). The Team requested Mr Yoshida to contact Dr Kent to expand the search for older versions of the Manual on Codes. **(Action: Mr Yoshida)** It also agreed that all Team members should look for the older versions of the Manual on Codes in the archives of each country and inform Mr Yoshida if missing versions are found. **(Action: members of ETMC)** The Team expressed its sincere appreciation to Mr Yoshida for his efforts to accomplish this complicated task.

4.3 Archival of wave and storm surge data

4.3.1 The Team recalled that the eighth session of the Subgroup on Marine Climatology (SGMC-VIII) (Asheville, April 2000) discussed archival of wave spectra data (FM 65-IX WAVEOB) and agreed that Mr Joe Elms (USA), SGMC chair, would conduct a questionnaire survey. The Team noted with appreciation the summary results prepared by Mr Elms (***Annex IX***). This information was being forwarded to the JCOMM Expert Team on Wind Waves and Storm Surges (ETWS).

4.3.2 The Team recalled that JCOMM-I requested the ETMC to investigate the possibility to re-establish a global wave metadata archive centre. Upon the request by the ETMC chair, Mr Chris Hall (UK, formerly member of ETMC) contacted Dr Lesley Rickards (British Ocean Data Centre), who was responsible in the past (mid 80's) for the global wave metadata archive, namely the "catalogue of instrumentally measured Wave Data". The information was passed to the Secretariat and Mr Val Swail, the chair of the ETWS; and it was agreed that ETWS would take responsibility on this issue.

4.3.3 The Team noted that the ETWS was preparing two-year-updates of catalogues of operational wind wave and storm surge models and products; an updated inventory of hindcast wind wave climatologies, and measured wind wave and storm surge data bases. The Team agreed with appreciation that tasks related to wave and storm surge data should be handed over to the ETWS.

5. WMO SHIP CATALOGUE (WMO-No. 47)

5.1 Current status of WMO-No. 47

5.1.1 The Team was informed the WMO Secretariat had developed and now implemented an electronic database containing the information in WMO-No. 47, based on the format agreed at JCOMM-I. The periodical updating of the country files was done and the latest quarterly file (31 March 2004) of ships metadata of all VOS in the new format is now available on the web site: http://www.wmo.ch/web/www/ois/pub47/pub47-home.htm. The backlog of quarterly files (31 March 1999 to 31 March 2004) of ships' metadata for all VOS is also available on the WMO FTP server ftp://www.wmo.ch/wmo-ddbs to both operational and research users.

5.1.2 The Team noted with satisfaction that the quarterly data were now available to the public. The Team encouraged VOS operators to submit ship metadata in the current format to the WMO Secretariat on a quarterly basis as agreed by the former CMM Subgroup on VOS (currently the VOS Panel under the JCOMM Ship Observations Team).

5.1.3 The Team noted with concern that a number of Members were still using older formats for the submission of ship metadata to the WMO Secretariat. The Team encouraged VOS operators to use the latest format.

5.2 Revisions proposed to WMO-No. 47 by the Ship Observations Team

5.2.1 The third and fourth sessions of the VOSClim Project (Southampton, January 2002) (London, July 2003) and the second session of the Ship Observations Team (London, July 2003) recognized the need for further amendments to WMO-No. 47, and a Task Team on Metadata for WMO-No. 47 was established under the chairmanship of Mr Graeme Ball (Australia). Ms Sarah North (United Kingdom), a member of the Task Team, presented proposals from that Team. The proposal document comprises eight parts for separate consideration by the ETMC. Broadly, the parts may be summarized as follows:

1. Proposal to streamline the process of approving coding changes to Pub47.
2. Proposal to define the requirements for inclusion in Pub47.
3. Proposal for the development of a dedicated ASAP metadata database.
4. Proposals to modify the content of existing tables and to improve the documentation, including the revision of code descriptions. These changes will not affect the existing format of Pub47.
5. Proposals to modify field definitions or, if the modifications are not supported, to delete fields. The modifications will not affect the existing format of Pub47, but the deletions will affect the format.
6. Proposals to add and delete fields. These changes will affect the existing format of Pub47.

7. Proposed new delimited format for transmitting Pub47.
8. Proposal to develop an XML standard for the future exchange of Pub47 metadata.

5.2.2 The Team agreed that the SOT (VOS Panel) had the appropriate expertise to make proposals on revisions of WMO-No. 47 and that the SOT should assume the responsibility to the future revisions involving this Team as appropriate. With regard to a need for a dedicated ASAP metadata database, the Team suggested that the SOT should be the more appropriate body to consider this issue. The Team agreed that the ETMC could assist it if so requested by the SOT and the ASAP panel.

5.2.3 With regard to the collection of metadata for off shore platforms, the Team recognized that application of the metadata requirements was complicated by the fact that such platforms could be either fixed or mobile. As a compromise the Team generally agreed that, on a temporary basis, mobile offshore units should be a subject to the Pub 47 metadata requirements, whilst fixed platforms should be the subject of ODAS metadata requirements.

5.2.4 In principle, the Team agreed with code changes proposed by the Task Team, but some comments on codes were given. The Team expressed its concern that the change of the order of fields could affect the operational use of the publication. It suggested that the Task Team should make a final proposal, taking comments at this meeting into consideration, to be presented at SOT-III. The proposal will be submitted to JCOMM-II for its consideration with a view to approval. **(Action: TT on WMO-No. 47 to submit a final proposal to SOT-III)**

5.2.5 The Team recommended that the Task Team should start liaising with the WMO Secretariat regarding the feasibility of the revision of the database developed and maintained by the WMO Secretariat. With regard to possible development of an XML standard for the future exchange of Pub47 metadata, the Team considered that it would be premature to proceed along this line for all VOS operators. The Team suggested that development of an XML standard should be considered for use by the VOSClim project on a trial basis.

5.3 Old versions of WMO-No. 47

5.3.1 The Team was informed that old versions of WMO-No. 47, previously available only in paper forms covering 1955-1972, were being imaged and digitized under the Climate Database Modernization Program (CDMP) of NOAA. Mr Scott Woodruff presented the status of this project. Imaging has been completed, and PDF files are now available from the ICOADS web site. The WMO Secretariat received a copy of PDF files, which are in its archive. Digitizing into machine readable form should be completed by 2005. At that stage, the entire publication (which was initiated in 1955) should be readily available to all the users.

5.3.2 The Team noted with appreciation that all the information in past versions of WMO-No. 47 (1955 to the present) would be available electronically. The Team noted that it would be worth double-checking if the metadata digitized at the Southampton Oceanography Centre (SOC) covering 1973-1997 included all the same information as the corresponding hard copy publications. With regard to older data, the Team suggested that ship classification lists (e.g., lists from Lloyds Register) might provide some more information to supplement older versions of WMO-No. 47.

6. REVIEW OF CONTRIBUTIONS AND REQUIREMENTS OF THE WORLD CLIMATE PROGRAMME AND OTHER CLIMATE RELATED PROGRAMMES

6.1 Climate change detection monitoring and indices

6.1.1 The Team was informed that Mr Val Swail, Chair of the JCOMM ETWS and a former member of the SGMC, was invited to participate in the first Team meeting of the CCl/CLIVAR Expert Team on Climate Change Monitoring Detection and Indices (ETCCMDI) (Norwich, United Kingdom, November 2003). ETCCMDI considered that marine climate indices fell within the

preview of JCOMM and encouraged JCOMM to work on their development. The Team was informed that the second session of the JCOMM Services Coordination Group (Toulouse, May 2004) was informed of this discussion and that the Group noted that the Task Team on JCOMM Ocean Product Development, which was established at SCG-II, should take this issue into consideration.

6.1.2 The Team noted that, while some summaries prepared by RMs could potentially provide some useful indices, the development of useful climate indices might need different aspects of expertise than are available from this Expert Team. The Team recognized the importance of development of such indices and encouraged the Task Team on JCOMM Ocean Product Development to consider this issue.

7. MANUALS, GUIDES, AND OTHER TECHNICAL PUBLICATIONS

7.1 Guide to the Applications of Marine Climatology: Results of CLIMAR-II

7.1.1 The Team noted with satisfaction that the Second JCOMM Workshop on Advances in Marine Climatology (CLIMAR-II) was successfully held in Brussels, November 2003, in conjunction with a celebration of the 150th anniversary of the landmark Brussels Maritime Conference of 1853 held under the High Patronage of His Majesty King Albert II. More than 80 people from 20 Members/Member States from all the WMO Regional Associations attended. Presentations at CLIMAR-II were incorporated into a JCOMM Technical Report (JCOMM TR No. 22, 2004), and a selection of papers will be published in a special issue of the International Journal of Climatology (Royal Meteorological Society, UK). This will form an update to the Dynamic part of the Guide, which was originated at the first CLIMAR workshop (CLIMAR99) held in Vancouver, September 1999. Among the recommendations from CLIMAR-II, available in full on the workshop web site (http://www.cdc.noaa.gov/coads/climar2/recs.html) and publicized in a workshop report in the WMO Bulletin, was the recommendation to hold a CLIMAR-III in 2007.

7.1.2 The Team noted that it was important to keep checking the status of these recommendations. It was agreed that Team members should send comments on the status of the recommendations to Mr Woodruff as appropriate. **(Action: ETMC members)**

7.1.3 The Team expressed its sincere appreciation to the organizing committee for CLIMAR-II, especially to Mr Woodruff, chairman of the organizing committee for their excellent organization of the workshop. It also expressed its appreciation to Belgium for hosting the events. The Team agreed that the workshop was valuable and that similar workshops should continue to be held in the future. The Team agreed to propose to JCOMM-II that it endorse the organization a self-funded workshop, CLIMAR-III, in 2007 (**Action: Secretariat, ETMC chair**).

7.2 Review of the Manual on Marine Meteorological Services (WMO-No. 558) and the Guide to Marine Meteorological Services (WMO-No. 471)

7.2.1 The Team reviewed the Manual on Marine Meteorological Services (WMO-No. 558) and the Guide to Marine Meteorological Services (WMO-No. 471). It noted that major changes in the Manual and Guide should be made once the Team decides the future of the MCSS and roles of GCC and RMs based on the results of the questionnaire survey (see agenda item 3.4)

7.2.2 The Team agreed that no revisions should be proposed for the Manual at this stage. However, the Team agreed that sections such as "5.2.4 Fixed ship station area/ocean island station/moored buoys and fixed platforms" and "6.2.1 Reports of freak waves" should also be revised when the major changes to the Manual were proposed. **(Action: ETMC members)**

7.2.3 The Team proposed some small changes to the Guide, as shown in ***Annex X***. **(Action: ETMC chair and Secretariat)**

7.3 Guide to Climatological Practices

7.3.1 The Team recalled that the first session of JCOMM (Akureyri, June 2001) agreed with a recommendation from the former CMM Subgroup on Marine Climatology (now a JCOMM Expert Team), that JCOMM should contribute, as required, to the major revision being undertaken by the WMO Commission for Climatology (CCl) of the WMO Guide to Climatological Practices (WMO-No. 100) (see para 7.1.12 of the final report of JCOMM-I). The Team was informed that the Guide (WMO-No. 100) has been reviewed for many years and updated Part I is now on the web site:

http://www.wmo.ch/web/wcp/ccl/CClguide/app_sects3ed/appr_sec_rev_2.html

The Team further noted that Part II was now under preparation and a draft outline of the full Part II and responsible authors have already been identified for all the sections in the outline.

7.3.2 The Team reviewed the draft outline. The Team noted that text for 2.1.4 "Marine measurements" had been prepared by CCl and that the text was now being reviewed by an expert on marine observation in Canada. Considering that the Team has been updating the Guide on Applications of Marine Climatology (namely, publishing its dynamic part) by organizing a series of workshops, the Team agreed that it would not be necessary to make further input to the Guide to Climatological Practices at this stage. However, the Team noted that it would be useful if the Team could review 2.7 "Climatological Summaries", in view of the implementation of the Marine Climatological Summaries Scheme. The Team agreed that Dr Mietus would review this section, if the text of 2.7 were made available **(Action: Dr Mietus)**. The Team assured that the Team would be ready to assist the Commission for Climatology on this issue if so requested **(Action: ETMC members)**.

8. ORGANIZATIONAL MATTERS

8.1 Terms of reference (TOR) of ETMC

8.1.1 The Team noted that it would be essential to re-establish this Team at JCOMM-II especially for the purpose of the implementation of the MCSS. The Team reviewed the current terms of reference (TOR) of the Team. It agreed that major revision would not be needed, but it would be worth explicitly mentioning the collaboration with ETDMP in the TOR. At the same time, the Team stressed that GCCs and at least some of Responsible Members should be represented at the Team. **(Action: Secretariat, ETMC chair)**

9. REVIEW OF ETMC-I SESSION REPORT AND ACTION ITEMS

9.1 The meeting reviewed, revised and adopted the final report of the session, including action items. The implementation status of the work plan is in ***Annex XI***.

10. Closure of the session

10.1 In closing the meeting, the chairman, Dr Miroslaw Mietus, thanked all participants for their participation and corporation. He noted that this meeting had made an important step for the future development of the MCSS. He expressed his pleasure at having had the opportunity to host the meeting in Gdynia. He wished all participants an enjoyable stay and a safe return journey.

10.2 On behalf of all participants, the Secretariat representative expressed her thanks once again to IMWM, its Director Professor Dr Zielinski, and to Dr Mietus for hosting the meeting and for providing such impressive facilities, support and hospitality. She also expressed her appreciation to the chairman for his excellent chairing of the session and for his substantial support and work.

10.3 The first session of the JCOMM Expert Team on Marine Climatology closed at 1200 hours on Saturday, 10 July 2004.

Annex I

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Annex II

AGENDA

1. ORGANIZATION OF THE SESSION

1.1 Opening
1.2 Adoption of the agenda
1.3 Working arrangements

2. REVIEW OF THE ACTIVITIES OF JCOMM DATA MANAGEMENT PROGRAMME AREA

2.1 Report of the chairman of the Team
2.2 Report of the Secretariat
2.3 Report on the first session of the Expert Team on Data Management Practices

3. DATA QUALITY AND EXCHANGE

3.1 Review of the IMMT and MQCS
3.2 Review of BUFR template for ship data
3.3 Review on electronic logbooks
3.4 Review of the operations of the Marine Climatological Summaries Scheme
    3.4.1 Report of the Global Collecting Centres
    3.4.2 Report of Responsible Members
    3.4.3 Requirements of and assistance for users

4. DATA ARCHIVAL

4.1 Development of International Marine Meterological Archive (IMMA) format
4.2 History of the marine ship code
4.3 Archival of wave and storm surge data

5. WMO SHIP CATALOGUE (WMO-No. 47)

5.1 Current status of WMO ship catalogue (WMO-No. 47)
5.2 Revisions proposed to WMO-No. 47 by the Ship Observations Team
5.3 Old versions of WMO-No. 47

6. REVIEW OF CONTRIBUTIONS AND REQUIREMENTS OF THE WORLD CLIMATE PROGRAMME AND OTHER CLIMATE RELATED PROGRAMMES

6.1 Climate change detection monitoring and indices

7. MANUALS, GUIDES AND OTHER TECHNICAL PUBLICATIONS

7.1 Guide to the Applications of Marine Climatology: Results of CLIMAR-II
7.2 Review of the Manual on Marine Meteorological Services and Guide to Marine Meteorological Services
7.3 Guide to Climatological Practice

8. ORGANIZATIONAL MATTERS

8.1 Terms of reference of ETMC

9. REVIEW OF ETMC-I SESSION REPORT AND ACTION ITEMS

10. CLOSURE OF THE SESSION

Annex III

EXPERT TEAM ON DATA MANAGEMENT PRACTICES

By Elanor Gowland (United Kingdom)

At the first session of the Expert Team on Data Management Practices (ETDMP) we discussed the requirements of GCOS (acquisition and transmission to users on short time-scale. Argo floats used as example), COOP ([part of GOOS], interested in physical, chemical and biological variables), MMS. All (GCOS, COOP and MMS) require satellite data, with in-situ for calibration.

The existing data management for oceanographical elements are very varied. However, the MMS requirements and existing data management are for more established. The current data flow system: MCSS, was described.

The working groups set up by the ETDMP, based their pilot projects on the priorities of the OIT, as they relate very closely to the terms of reference of the ETDMP. This was tied in with the ETDMP's aim of a JCOMM E2EDM system, and the strategy to achieve this was discussed.
Pilot Project 1 – Metadata. Map the crosswalks of ODAS, MEDI and ISO19115, to determine the best metadata system for JCOMM overall.
Pilot Project 2 – Includes 2 projects in this section: First is the unique data tagging project. This will use a unique identifier tag on the original observation, to avoid duplicates due to different versions of the same observation. For example: if the data is sent in real-time over the GTS (in SHIP code), and delayed mode via IMMT format, then although a number of the observations elements are the same, they may differ slightly (due to QC) and not be recognized as the same original ob, and be stored as 2 separate obs rather than different versions of the same original. Bob Keeley is involved in the GTSPP trial, and is feeding back the results to the ETDMP. If successful, the scheme can be examined in detail and broadened to work for other types of physical, meteorological and biological data.
Second: There are a variety of QC procedures in place around the world, many for the same data type. This project is to compare the most common schemes for a chosen subset of variables. The flags will be compared, and a standard recommended enabling better use of data by a variety of customers. Takashi Yoshida is involved with this pilot project, and the MQCS-IV are included for comparison.

Pilot Project 3 - E2EDM process.
Detail of E2EDM strategy
The end-to-end data management strategy was put to the group by the Chair - Nickolay Mikhailov (of the Russian National Oceanographic Data Centre) who has written a number of papers on the topic. He laid out the objectives of such a strategy:

"(i) ensure quality, completeness and comparability of operational and delayed mode data collected from different sources, as well as of forecast, analysis and climate products generated by various organizations and groups;
(ii) to organize the full and continuous marine data and information cycle from data collection to product generation; and
(iii) to provide the timely delivery of marine data and products for scientific, forecasting, industrial and environmental needs."

Nick also stressed the new E2EDM system should not replace, but build on the current national and international data acquisition and management infrastructure. The justification for the work was given as:

"(i) the improvement of the existing data management practices for operational observed marine data, marine diagnostic and forecast information, delayed data and climate products; and the transfer and sharing of the best DM practices, experience and knowledge at mono-disciplinary and multi-disciplinary levels;
(ii) the development of the new information technology enabling the integration of various DM components and coordinated management and use of marine information resources with the full interaction between the data sources on regional / global scales; and

(iii) the development of the E2EDM scheme to meet the GCOS / COOP / MMS (as external forces) needs, and the mechanism of this integrated DM scheme adopted and implemented by all participants"

In our role as one of the MCSS data centres, the Met Office has been asked to provide historical marine meteorological data (for the last 5 – 10 years). Specifically the elements: air temperature, sea surface temperature, pressure and wave data.
We have been asked to support the data provider functions and centralized service metadata catalogue / web-portal managing during testing and demonstration stages of E2EDM prototype, and help develop the documentation. However, being a very small team, currently a team-member down, we are looking into resource issues. If the Met Office unable to participate, would anyone else be interested? A decision to ETDMP is required by end of July, so I will report back to the ETMC on the position of the Met Office by July 23rd.

Liaison with other groups: XML, FWIS and DMAC.
XML will form an integral part of both the metadata and E2EDM task. There are 2 current task groups, ICES-IOC SGXML and the EU Marine XML project. There is a website which details the work of these two groups.

The aim of FWIS is to provide a single point of contact for obtaining data, to encourage inter-disciplinary collaboration. Provide an integrated approach to meeting requirements of points above.
There are a number of similarities between FWIS and E2EDM. FWIS concentrates on the technical solutions, not the requirements. The key issues are data catalogues and technologies to support the system.

Opportunity to “internationalize” DMAC through cooperation with the ETDMP. E.g. joint work on metadata standards, joint work on semantic data model, joint development of data transport tools, joint development of data archive plan, joint pilot projects, etc.

Annex IV

DRAFT

(REVISED; JULY, 2004)

LAYOUT FOR THE INTERNATIONAL MARITIME METEOROLOGICAL TAPE (IMMT)

[VERSION IMMT-3]

Element Number	*Character Number*	*Code*	*Element*	*Coding procedure*
1	1	i_T	Format/temperature indicator	3=IMMT format with temperatures in tenths of °C 4=IMMT format with temperatures in halves of °C 5=IMMT format with temperatures in whole °C
2	2-5	AAAA	Year UTC	Four digits
3	6-7	MM	Month UTC	01 - 12 January to December
4	8-9	YY	Day UTC	01 - 31
5	10-11	GG	Time of observation	Nearest whole hour UTC, WMO specifications
6	12	Q_C	Quadrant of the globe	WMO code table 3333
7	13-15	$L_aL_aL_a$	Latitude	Tenths of degrees, WMO specifications
8	16-19	$L_OL_OL_OL_O$	Longitude	Tenths of degrees
9	20		Cloud height (h) and visibility (VV) measuring indicator	0 - h and VV estimated 1 - h measured, VV estimated 2 - h and VV measured 3 - h estimated, VV measured
10	21	h	Height of clouds	WMO code table 1600
11	22-23	VV	Visibility	WMO code table 4377
12	24	N	Cloud amount	Oktas, WMO code table 2700; show 9 where applicable
13	25-26	DD	True wind direction	Tens of degrees, WMO code table 0877; show 00 or 99 where applicable
14	27	i_W	Indicator for wind speed	WMO code table 1855
15	28-29	ff	Wind speed	Tens and units of knots or meters per second, hundreds omitted; values in excess of 99 knots are to be indicated in units of meters per second and i_W encoded accordingly; the method of estimation or measurement and the units used (knots or meters per second) are indicated in element 14
16	30	s_n	Sign of temperature	WMO code table 3845
17	31-33	TTT	Air temperature	Tenths of degrees Celsius
18	34	s_t	Sign of dew-point temperature	0 - positive or zero measured dew-point temperature 1 - negative measured dew-point temperature 2 - iced measured dew-point temperature 5 - positive or zero computed dew-point temperature 6 - negative computed dew-point temperature 7 - iced computed dew-point temperature
19	35-37	$T_dT_dT_d$	Dew-point temperature	Tenths of degrees Celsius
20	38-41	PPPP	Air pressure	Tenths of hectopascals

Element Number	*Character Number*	*Code*	*Element*	*Coding procedure*
21	42-43	ww	Present weather	WMO code table 4677 or 4680
22	44	W_1	Past weather	WMO code table 4561 or 4531
23	45	W_2	Past weather	WMO code table 4561 or 4531
24	46	N_h	Amount of lowest clouds	As reported for C_L or, if no C_L cloud is present, for C_M, in oktas; WMO code table 2700
25	47	C_L	Genus of C_L clouds	WMO code table 0513
26	48	C_M	Genus of C_M clouds	WMO code table 0515
27	49	C_H	Genus of C_H clouds	WMO code table 0509
28	50	s_n	Sign of sea-surface temperature	WMO code table 3845
29	51-53	$T_wT_wT_w$	Sea surface temperature	Tenth of degrees Celsius
30	54		Indicator for sea-surface temperature measurement	0 - Bucket thermometer 1 - Condenser inlet 2 - Trailing thermistor 3 - Hull contact sensor 4 - "Through hull" sensor 5 - Radiation thermometer 6 - Bait tanks thermometer 7 - Others
31	55		Indicator for wave measurement	Shipborne wave recorder: 0 - Wind sea and swell estimated; 1 - Wind sea and swell measured; 2 - Mixed wave measured, swell estimated; 3 - Other combinations measured and estimated Buoy: 4 - Wind sea and swell measured; 5 - Mixed wave measured, swell estimated; 6 - Other combinations measured and estimated Other measurement system: 7 - Wind sea and swell measured; 8 - Mixed wave measured, swell estimated; 9 - Other combinations measured and estimated
32	56-57	P_wP_w	Period of wind waves or of measured waves	Whole seconds; show 99 where applicable in accordance with Note (3) under specification of P_wP_w in the Manual on Codes
33	58-59	H_wH_w	Height of wind waves or of measured waves	Half-meter values. Examples: Calm or less than $^1/_4$m to be encoded 00; $3^1/_2$m to be encoded 07; 7m to be encoded 14; $11^1/_2$m to be encoded 23
34	60-61	$d_{w1}d_{w1}$	Direction of predominant swell waves	Tens of degrees, WMO code table 0877; encoded 00 or 99 where applicable. Blanks = No observation of waves attempted
35	62-63	$P_{w1}P_{w1}$	Period of predominant swell waves	Whole seconds; encoded 99 where applicable (see under element 32)
36	64-65	$H_{w1}H_{w1}$	Height of predominant swell waves	Half-meter values (see under element 33)
37	66	I_S	Ice accretion on ships	WMO code table 1751
38	67-68	E_SE_S	Thickness of ice accretion	In centimeters
39	69	R_S	Rate of ice accretion	WMO code table 3551
40	70		Source of observation	0 - Unknown 1 - Logbook (National) 2 - Telecommunication channels (National) 3 - Publications (National) 4 - Logbook (International data exchange) 5 - Telecommunication channels (International data exchange) 6 – Publications (International data exchange)

Element Number	*Character Number*	*Code*	*Element*	*Coding procedure*
41	71		Observation platform	0 - unknown 1 - Selected ship 2 - Supplementary ship 3 - Auxiliary ship 4 - Automated station/data buoy 5 - Fixed sea station 6 - Coastal station 7 - Aircraft 8 - Satellite 9 - Others ....
42	72-78		Ship identifier	Ship's call sign or other identifier encoded as follows: 7 characters call sign Columns 72–78 6 characters call sign Columns 72–77 5 characters call sign Columns 72–76 4 characters call sign Columns 72–75 3 characters call sign Columns 72–74
43	79-80		Country which has recruited the ship	According to the two-character alphabetical codes assigned by the International Organization for Standardization (ISO)
44	81		National use	
45	82		Quality control indicator	0 - No quality control (QC) 1 - Manual QC only 2 - Automated QC only /MQC (no time-sequence checks) 3 - Automated QC only (inc. time sequence checks) 4 - Manual and automated QC (superficial; no automated time-sequence checks) 5 - Manual and automated QC (superficial; including time-sequence checks) 6 - Manual and automated QC (intensive, including automated time-sequence checks) 7 & 8 - Not used 9 - National system of QC (information to be furnished to WMO)
46	83	i_X	Weather data indicator	1 - Manual 4 - Automatic If present and past weather data included Code tables 4677 and 4561 used 7 - Automatic If present and past weather data included Code tables 4680 and 4531 used
47	84	i_R	Indicator for inclusion or omission of precipitation data	WMO code table 1819
48	85-87	RRR	Amount of precipitation which has fallen during the period preceding the time of observation, as indicated by t_R	WMO code table 3590
49	88	t_R	Duration of period of reference for amount of precipitation, ending at the time of the report	WMO code table 4019
50	89	s_W	Sign of wet-bulb temperature	0 - positive or zero measured wet-bulb temperature 1 - negative measured wet-bulb temperature 2 - iced measured wet-bulb temperature 5 - positive or zero computed wet-bulb temperature 6 - negative computed wet-bulb temperature 7 - iced computed wet-bulb temperature
51	90-92	$T_bT_bT_b$	Wet-bulb temperature	In tenths of degree Celsius, sign given by element 50
52	93	a	Characteristic of pressure tendency during the three hours preceding the time of observation	WMO code table 0200

Element Number	*Character Number*	*Code*	*Element*	*Coding procedure*
53	94-96	ppp	Amount of pressure tendency at station level during the three hours preceding the time of observation	In tenths of hectopascal
54	97	D_S	True direction of resultant displacement of the ship during the three hours preceding the time of observation	WMO code table 0700
55	98	v_S	Ship's average speed made good during the three hours preceding the time of observation	WMO code table 4451
56	99-100	$d_{w2}d_{w2}$	Direction of secondary swell waves	Tens of degrees, WMO code table 0877; encoded 00 or 99 where applicable. Blanks = No observation of waves attempted
57	101-102	$P_{w2}P_{w2}$	Period of secondary swell waves	Whole seconds; encoded 99 where applicable (see under element 32)
58	103-104	$H_{w2}H_{w2}$	Height of secondary swell waves	Half-meter values (see under element 33)
59	105	c_i	Concentration or arrangement of sea ice	WMO code table 0639
60	106	S_i	Stage of development	WMO code table 3739
61	107	b_i	Ice of land origin	WMO code table 0439
62	108	D_i	True bearing of principal ice edge	WMO code table 0739
63	109	z_i	Present ice situation and trend of conditions over the preceding three hours	WMO code table 5239
64	110		FM 13 code version	0 = previous to FM 24-V 1 = FM 24-V 2 = FM 24-VI Ext. 3 = FM 13-VII 4 = FM 13-VIII 5 = FM 13-VIII Ext. 6 = FM 13-IX 7 = FM 13-IX Ext. 8 = FM 13-X, etc.
65	111		IMMT version	0 = IMMT version just prior to version number being included 1 = IMMT-1 (in effect from Nov. 1994) 2 = IMMT-2 (in effect from Jan. 2003) 3 = IMMT-3 (in effect from Jan. 2006) 4 = IMMT-4 (next version) etc.
66	112	Q_1	Quality control indicator for (h)	0 - no quality control (QC) has been performed in this element 1 - QC has been performed; element appears to be correct 2 - QC has been performed; element appears to be inconsistent with other elements 3 - QC has been performed; element appears to be doubtful 4 - QC has been performed; element appears to be erroneous 5 - The value has been changed as a result of QC 6 - 8 Reserve 9 - The value of the element missing
67	113	Q_2	QC indicator for (VV)	- idem -
68	114	Q_3	QC indicator for (clouds: elements 12, 24–27)	- idem -
69	115	Q_4	QC indicator for (dd)	- idem -
70	116	Q_5	QC indicator for (ff)	- idem -

Element Number	*Character Number*	*Code*	*Element*	*Coding procedure*
71	117	Q_6	QC indicator for (TTT)	- idem -
72	118	Q_7	QC indicator for ($T_dT_dT_d$)	- idem -
73	119	Q_8	QC indicator for (PPPP)	- idem -
74	120	Q_9	QC indicator for (weather: elements 21–23)	- idem -
75	121	Q_{10}	QC indicator for ($T_WT_WT_W$)	- idem -
76	122	Q_{11}	QC indicator for (P_WP_W)	- idem -
77	123	Q_{12}	QC indicator for (H_WH_W)	- idem -
78	124	Q_{13}	QC indicator for (swell: elements 34–36, 56–58)	- idem -
79	125	Q_{14}	QC indicator for (i_RRRRt_R)	- idem -
80	126	Q_{15}	QC indicator for (a)	- idem -
81	127	Q_{16}	QC indicator for (ppp)	- idem -
82	128	Q_{17}	QC indicator for (D_s)	- idem -
83	129	Q_{18}	QC indicator for (v_s)	- idem -
84	130	Q_{19}	QC indicator for ($t_bt_bt_b$)	- idem -
85	131	Q_{20}	QC indicator for ships' position	- idem -
86	132	Q_{21}	Minimum quality control standards (MQCS) version identification	1 = MQCS- I (Original version, Feb. 1989) CMM-X 2 = MQCS-II (Version 2, March 1997) CMM-X11 3 = MQCS-III (Version 3, April 2000) SGMC-VIII 4 = MQCS-IV (Version 4, June 2001) JCOMM-I 5 = MQCS-V (Version 5, July 2004) ETMC-I etc.

Additional Requirements for the VOSCLIM Project

87	133-135	HDG	Ship's heading; the direction to which the bow is pointing, referenced to true North.	(000-360); e.g. 360 = North 000 = No Movement 090 = East
88	136-138	COG	Ship's ground course; the direction the vessel actually moves over the fixed earth and referenced to True North	(000-360); e.g. 360 = North 000 = No Movement 090 = East
89	139-140	SOG	Ship's ground speed; the speed the vessel actually moves over the fixed earth.	(00-99); Round to nearest whole knot
90	141-142	SLL	Maximum height in meters of deck cargo above Summer maximum load line.	(00-99); report to nearest whole meter

Element Number	*Character Number*	*Code*	*Element*	*Coding procedure*
91	143-145	$s_L$hh	Departure of reference level (Summer maximum load line) from actual sea level. Consider the difference positive when the Summer maximum load line is above the level of the sea and negative if below the water line.	Position 143 (s_L) sign position;~~,~~ 0 = positive or zero, 1 = negative Positions 144-145 (hh); (00-99) is the difference to the nearest whole meter between the Summer maximum load line and the sea level.
92	146-148	RWD	Relative wind direction in degrees off the bow	Relative wind direction; e.g. 000 = no apparent relative wind speed (calm onditions on deck). Reported direction for relative wind = 001-360 degrees in a clockwise direction off the bow of the ship. When directly on the bow, RWD = 360.
93	149-151	RWS	Relative wind speed reported in units indicated by i_W (knots or m/s)	Reported in either whole knots or whole meters per second (e.g. 010 knots or 005 m/s). Units established by i_W as indicated in Character Number 27.

Note: Since the relative wind speed can be greater than the true wind speed e.g., i_W indicates knots and ff = 98, the relative wind speed may be 101 knots; therefore, three positions must be allocated since i_W cannot be adjusted and the relative wind speed converted to meters per second as is done in element 15.

94	152	Q_{22}	Quality control indicator for (HDG)	0 - no quality control (QC) has been performed in this element 1 - QC has been performed; element appears to be correct 2 - QC has been performed; element appears to be inconsistent with other elements 3 - QC has been performed; element appears to be doubtful 4 - QC has been performed; element appears to be erroneous 5 - The value has been changed as a result of QC 6 - 8 Reserve 9 - The value of the element missing
95	153	Q_{23}	QC indicator for (COG)	- idem –
96	154	Q_{24}	QC indicator for (SOG)	- idem –
97	155	Q_{25}	QC indicator for (SLL)	- idem –
98	156	Q_{26}	QC indicator for (s_L)	- idem –
99	157	Q_{27}	QC indicator for (hh)	- idem –
100	158	Q_{28}	QC indicator for (RWD)	- idem –
101	159	Q_{29}	QC indicator for (RWS)	- idem -

Note: Most of the codes (groups of letters) in the IMMT format with the exception of those added for the VOSCLIM project are defined in the Manual on Codes (WMO Pub.No. 306) as they basically mirror the code groups used in FM 13-X Ship code. Because CBS was not persuaded to expand the FM 13-X Ship code for the VOSCLIM project the additional observed elements (selected codes) will not appear in WMO Manual on Codes (Pub. 306). Therefore an effort was made to select unique codes (groups of letters) not defined in WMO Pub. 306 for the elements added to the IMMT-2 format version modified for the VOSCLIM project. This was deliberately done to try and prevent a difference in meaning for a given code group (identical symbolic letters) in Pub. 306 versus that in IMMT. Presumably none of the Character Code formats will be altered in the future by CBS.

Annex V

DRAFT (revised July 2004)

MINIMUM QUALITY CONTROL STANDARDS
MQCS-V (Version 5~~, June 2004~~)

NOTE See specification for quality control Indicators Q_1 to Q_{29} at the end of this appendix
Δ = space (ASCII 32)

Element	Error	Action
1	$i_T \neq$ 3 – 5, Δ	Correct manually otherwise = Δ
2	AAAA ≠ valid year	Correct manually otherwise reject
3	MM ≠ 01 - 12	Correct manually otherwise reject
4	YY ≠ valid day of month	Correct manually otherwise reject
5	GG ≠ 00 - 23	Correct manually otherwise reject
6	Q ≠ 1, 3, 5, 7	Correct manually and Q_{20} = 5, otherwise Q_{20} = 4
	Q = Δ	Q_{20} = 2
7	$L_aL_aL_a$ ≠ 000-900	Correct manually and Q_{20} = 5, otherwise Q_{20} = 4
	$L_aL_aL_a$ = ΔΔΔ	Q_{20} = 2
8	$L_oL_oL_oL_o \neq$ 0000-1800	Correct manually and Q_{20} = 5, otherwise Q_{20} = 4
	$L_oL_oL_oL_o$ = ΔΔΔΔ	Q_{20} = 2
	$L_aL_aL_a = L_oL_oL_oL_o$ = ΔΔΔ(Δ)	Correct manually otherwise reject
Time sequence checks		
	Change in latitude > 0.7o /hr	Correct manually otherwise Q20 = 3
	Change in longitude > 0.7o /hr when lat. 00-39.9	Correct manually otherwise Q20 = 3
	Change in longitude > 1.0o /hr when lat. 40-49.9	Correct manually otherwise Q20 = 3
	Change in longitude > 1.4o /hr when lat. 50-59.9	Correct manually otherwise Q20 = 3
	Change in longitude > 2.0o /hr when lat. 60-69.9	Correct manually otherwise Q20 = 3
	Change in longitude > 2.7o /hr when lat. 70-79.9	Correct manually otherwise Q20 = 3
9		No checking
10	h ≠ 0-9~~, Δ~~	Correct manually and Q_1 = 5, otherwise Q_1 = 4
	h = Δ	Q_1 = 9
11	VV ≠ 90-99~~, ΔΔ~~	Correct manually and Q_2 = 5, otherwise Q_2 = 4
	VV = ΔΔ	Q_2 = 9
12	N ≠ 0-9, Δ~~, /~~	Correct manually and Q_3 = 5, otherwise Q_3 = 4
	N < Nh	Correct manually and Q_3 = 5, otherwise Q_3 = 2
13	dd ≠ 00-36, 99	Correct manually and Q_4 = 5, otherwise Q_4 =4
	dd = ΔΔ~~, //~~	Q_4 = 9
	dd versus ff	
	dd = 00, ff ≠ 00	Correct manually and Q_4 or Q_5 = 5 otherwise $Q_4 = Q_5$ = 2
	dd ≠ 00, ff = 00	Correct manually and Q_4 or Q_5 = 5 otherwise $Q_4 = Q_5$ = 2

Element	Error	Action
14	$i_W \neq$ 0, 1, 3, 4	Correct manually, otherwise $Q_5 = Q_{29} = 4$
15	ff > 80 knots	Correct manually and $Q_5 = 5$, otherwise $Q_5 = 3$
	ff = ΔΔ, //	$Q_5 = 9$
16	$s_n \neq$ 0, 1	Correct manually, otherwise $Q_6 = 4$
17	TTT = ΔΔΔ, ///	$Q_6 = 9$
	If -25 > TTT >40 then	
	when Lat. < 45.0	
	TTT < -25	$Q_6 = 4$
	TTT > 40	$Q_6 = 3$
	when Lat. ≥ 45.0	
	TTT < -25	$Q_6 = 3$
	TTT > 40	$Q_6 = 4$

TTT versus humidity parameters

	TTT < WB (wet bulb)	Correct manually and $Q_6 = 5$, otherwise $Q_6 = Q_{19} = 2$
	TTT < DP (dew point)	Correct manually and $Q_6 = Q_7 = 5$, otherwise $Q_6 = Q_7 = 2$
18	$s_t \neq$ 0, 1, 2, 5, 6, 7	Correct manually, otherwise $Q_7 = 4$
19	DP > WB	Correct manually and $Q_7 = 5$, otherwise $Q_7 = Q_{19} = 2$
	DP > TTT	Correct manually and $Q_7 = 5$, otherwise $Q_7 = Q_6 = 2$
	WB = DP = Δ Δ Δ	$Q_7 = 9$
20	930 > PPPP > 1050 hPa	Correct manually and $Q_8 = 5$, otherwise $Q_8 = 3$
	870 > PPPP > 1070 hPa	Correct manually and $Q_8 = 5$, otherwise $Q_8 = 4$
	PPPP = Δ Δ Δ Δ	$Q_8 = 9$
21	ww = 22-24, 26, 36-39, 48, 49, 56, 57, 66-79, 83-88	Correct manually and $Q_9 = 5$, otherwise $Q_9 = 4$
	93-94	Correct manually and $Q_9 = 5$, otherwise $Q_9 = 3$
	and latitude <20°	
	if $i_X = 7$:	
	$w_a w_a$ = 24 - 25, 35, 47 - 48, 54-56, 64-68, 70-78, 85-87	Correct manually and $Q_9 = 5$, otherwise $Q_9 = 4$
	and latitude <20°	
22, 23	W_1 or W_2 = 7 and latitude <20°	Correct manually and $Q_9 = 5$, otherwise $Q_9 = 4$
	$W_1 < W_2$	Correct manually and $Q_9 = 5$, otherwise $Q_9 = 2$
	$W_1 = W_2$ = ww = ΔΔΔΔ	$Q_9 = 9$
24-27	N = 0, and $N_h C_L C_M C_H \neq$ 0000	Correct manually and $Q_3 = 5$, otherwise $Q_3 = 2$
	N = Δ, and $N_h C_L C_M C_H \neq$ ΔΔΔΔ	Correct manually and $Q_3 = 5$, otherwise $Q_3 = 2$
	N = 9, and not (Nh =9 and $C_L C_M C_H$ = ΔΔΔ)	Correct manually and $Q_3 = 5$, otherwise $Q_3 = 2$
	N= Δ, / and $N_h C_L C_M C_H$ = ΔΔΔΔ, /	$Q_3 = 9$
28	$s_n \neq$ 0, 1	Correct manually otherwise $Q_{10} = 4$
29	$T_W T_W T_W$ = ΔΔΔ, ///	$Q_{10} = 9$
	if -2.0 > $T_W T_W T_W$ > 37.0 then	
	when Lat. < 45.0	
	$T_W T_W T_W$ < -2.0	Control manually and $Q_{10} = 5$, otherwise $Q_{10} = 4$
	$T_W T_W T_W$ > 37.0	Control manually and $Q_{10} = 5$, otherwise $Q_{10} = 3$
	when Lat. ≥ 45.0	
	$T_W T_W T_W$ < -2.0	Control manually and $Q_{10} = 5$, otherwise $Q_{10} = 3$
	$T_W T_W T_W$ > 37.0	Control manually and $Q_{10} = 5$, otherwise $Q_{10} = 4$

Element	Error	Action
30	Indicator ≠ 0-7, Δ	Correct manually, otherwise Δ
31	Indicator ≠ 0-9, Δ	Correct manually, otherwise Δ
32	20 < P_WP_W < 30	Q_{11} = 3
	P_WP_W ≥ 30 and ≠ 99	Q_{11} = 4
	P_WP_W = ΔΔ, ~~//~~	Q_{11} = 9
33	35< H_WH_W < 50	Q_{12} = 3
	H_WH_W ≥ 50	Q_{12} = 4
	H_WH_W = ΔΔ~~, //~~	Q_{12} = 9
34	d_{W1} d_{W1} ≠ 00-36, 99~~, ΔΔ~~	Correct manually and Q_{13} = 5, otherwise Q_{13} = 4
	$swell_1$ = $swell_2$ = Δ	Q_{13} = 9
35	25 < $P_{W1}P_{W1}$ < 30	Q_{13} = 3
	$P_{W1}P_{W1}$ ≥ 30 and ≠ 99	Q_{13} = 4
36	35 < $H_{W1}H_{W1}$ < 50	Q_{13} = 3
	$H_{W1}H_{W1}$ ≥ 50	Q_{13} = 4
37	I_S ≠ 1-5, Δ	Correct manually, otherwise Δ
38	E_SE_S ≠ 00-99, ΔΔ	Correct manually, otherwise ΔΔ
39	R_S ≠ 0-4, Δ	Correct manually, otherwise Δ
40	Source ≠ 0-6	Correct manually, otherwise Δ
41	Platform ≠ 0-9	Correct manually, otherwise Δ
42	No call sign	Insert manually, mandatory entry
43	No country code	Insert manually
44		No Quality Control
45	Q ≠ 0-6, 9	Correct manually, otherwise Δ
46	i_X ≠ 1-7	Correct manually, otherwise Δ
47	i_R = 0-2 and RRR = 000, ~~///~~ ΔΔΔ	Correct manually, otherwise Q_{14} = 4
	i_R = 3 and RRR ≠ ~~///~~ ΔΔΔ	Correct manually, otherwise Q_{14} = 2
	i_R =4 and RRR ≠ ~~///~~ ΔΔΔ	Correct manually, otherwise Q_{14} = 2
	i_R ≠ 0- 4	Correct manually, otherwise Q_{14} = 4
48	RRR ≠ 001 - 999 and i_R = 1, 2	Correct manually and Q_{14} = 5, otherwise Q_{14} = 2
49	t_R ≠ 0-9, Δ	Correct manually and Q_{14} = 5, otherwise Q_{14} = 4
50	s_W ≠ 0, 1, 2, 5, 6, 7	Correct manually, otherwise Q_{19} = 4
51	WB < DP	Correct manually and Q_{19} = 5, otherwise Q_{19} = Q_7=2
	WB = ~~///~~ ΔΔΔ	Q_{19} = 9
	WB > TTT	Correct manually and Q_{19} = 5, otherwise Q_{19} =Q_6 = 2
52	a ≠ 0-8~~, Δ~~	Correct manually and Q_{15} = 5, otherwise Q_{15} = 4
	a = 4 and ppp ≠ 000	Correct manually and Q_{15} or Q_{16} = 5, otherwise Q_{15}=Q_{16}=2
	a =1,2,3,6,7,8 and ppp=000	Correct manually and Q_{15} or Q_{16} = 5, otherwise Q_{15}=Q_{16} = 2
	a = Δ	Q_{15} = 9
53	250 ≥ ppp > 150	Correct manually and Q_{16} = 5, otherwise Q_{16} = 3
	ppp > 250	Correct manually and Q_{16} = 5 otherwise Q_{16} = 4
	ppp = ΔΔΔ	Q_{16} = 9
54	D_s ≠ 0-9~~, Δ, /~~	Correct manually and Q_{17} = 5, otherwise Q_{17} = 4
	D_s = Δ~~, /~~	Q_{17} = 9

Element	Error	Action
55	$V_s \neq$ 0-9, ~~Δ, /~~	Correct manually and Q_{18} = 5, otherwise Q_{18} = 4
	V_s = Δ ~~, /~~	Q_{18} = 9
56	$d_{W2}d_{W2} \neq$ 00-36, 99, ΔΔ	Correct manually and Q_{13} = 5, otherwise Q_{13} = 4
57	25 < $P_{W2}P_{W2}$ < 30	Q_{13} = 3
	$P_{W2}P_{W2} \geq$ 30 and ≠ 99	Q_{13} = 4
58	35 < $H_{W2}H_{W2}$ < 50	Q_{13} = 3
	$H_{W2}H_{W2} \geq$ 50	Q_{13} = 4
59	$c_i \neq$ 0-9, Δ ~~, /~~	Correct manually, otherwise Δ
60	$S_i \neq$ 0-9, Δ ~~, /~~	Correct manually, otherwise Δ
61	$b_i \neq$ 0-9, Δ ~~, /~~	Correct manually, otherwise Δ
62	$D_i \neq$ 0-9, Δ ~~, /~~	Correct manually, otherwise Δ
63	$z_i \neq$ 0-9, Δ ~~, /~~	Correct manually, otherwise Δ
86	Minimum Quality Control Standards (MQCS) version identification	1= MQCS-I (Original version, Feb. 1989) CMM-X 2= MQCS-II (Version 2, March 1997) CMM-XII 3= MQCS-III (Version 3, April 2000) SGMC-VIII 4= MQCS-IV (Version 4, June 2001) JCOMM-I 5= MQCS-V (Version 5, July 2004) ETMC-I
87	HDG ≠ 000-360	correct manually and Q_{22} = 5, otherwise Q_{22} = 4
	HDG = ΔΔΔ ~~, ///~~	Q_{22} = 9
88	COG ≠ 000-360	correct manually and Q_{23} = 5, otherwise Q_{23} = 4
	COG = ΔΔΔ ~~, ///~~	Q_{23} = 9
89	SOG ≠ 00 - 99	correct manually and Q_{24} = 5, otherwise Q_{24} = 4
	SOG = ΔΔ ~~, //~~	Q_{24} = 9
	SOG > 33	correct manually and Q_{24} = 5, otherwise Q_{24} = 3
90	SLL ≠ 00-99	correct manually and Q_{25} = 5, otherwise Q_{25} = 4
	SLL = ΔΔ ~~, //~~	Q_{25} = 9
	SLL > 32	correct manually and Q_{25} = 5, otherwise Q_{25} = 3
91	$s_L \neq$ 0,1	correct manually and Q_{26} = 5, otherwise Q_{26} = 4
	s_L = Δ ~~, /~~	Q_{26} = 9
	hh ≠ 00 – 99	correct manually and Q_{27} = 5, otherwise Q_{27} = 4
	hh = ΔΔ ~~, //~~	Q_{27} = 9
	hh >= 13	correct manually and Q_{27} = 5, otherwise Q_{27} = 3
	hh < -01	correct manually and Q_{27} = 5, otherwise Q_{27} = 4
92	RWD ≠ 000 - 360, 999	correct manually and Q_{28} = 5, otherwise Q_{28} = 4
	RWD = ΔΔΔ ~~, ///~~	Q_{28} = 9
93	RWS ≠ 000 - 999	correct manually and Q_{29} = 5, otherwise Q_{29} = 4
	RWS = ΔΔΔ ~~, ///~~	Q_{29} = 9
	RWS > 110 kts	correct manually and Q_{29} = 5, otherwise Q_{29} = 3

Element	Error	Action
	RWD versus RWS	
	RWD = 000, RWS ≠ 000	correct manually and Q_{28} or Q_{29} = 5, otherwise $Q_{28} = Q_{29} = 2$
	RWD ≠ 000, RWS = 000	correct manually and Q_{28} or Q_{29} = 5, otherwise $Q_{28} = Q_{29} = 2$

Specifications for quality control Indicators Q_1 to Q_{29}

0	No quality control (QC) has been performed on this element
1	QC has been performed; element appears to be correct
2	QC has been performed; element appears to be inconsistent with other elements
3	QC has been performed; element appears to be doubtful
4	QC has been performed; element appears to be erroneous
5	The value has been changed as a result of QC
6	reserved for GCC
7	reserved for GCC
8	Reserve
9	The value of the element is missing

_____

Annex VI

REVIEW OF ELECTRONIC LOGBOOK TURBOWIN – SUMMARY

1 Introduction

TurboWin contains observation-checking routines, which are applied on the observations before they are transmitted and stored. TurboWin is a user-friendly system with over 200 built-in quality checks. It allows the automated compilation of observations on board ships and fixed sea stations, their downloading to disk and their subsequent transmission ashore and thence to a Meteorological Centre

2 TurboWin internals

Main modules/branches of the TurboWin programme:

- Input module. Input with a Graphical User Interface
- 'real-time mode' module for (near)real-time transmission preparations
- 'delayed mode' module for inserting data into the log books (climatological use)

3 New version (update) procedure

Main sequence of amendments of codes, formats and others accommodated in 'electronic logbook' TurboWin. Some points are repeated or updated as many times as necessary

1 Collecting of recommendations, requests, bugs, suggestions etc.
2 prepare 'item-initiation' document
3 collect additional data
4 source code changes
5 prepare directories and files document
6 prepare (pre)beta testing document
7 prepare software beta version
8 prepare what's new document
9 update quality control document if applicable
10 prepare and run install program
11 update TurboWin web site

Note

The latest TurboWin version is always available on our web site.
see: http://www.knmi.nl/onderzk/applied/turbowin/turbowin.html

Annex VII

REPORT BY RESPONSIBLE MEMBERS AND A CONTRIBUTING MEMBER

GERMANY

1. Data Management

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

- After 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 on these activities is contained in the „Annual Report for 2003 of the Global Collecting Centres (GCCs)“.

- New versions of IMMT and MQCS had to be elaborated. The main reason for the proposed changes is the extended size of the ship reports generated in the context of the VOSClim Project.

- Ship reports received from ships of the German VOS fleet in 2003:

346	Selected Ships	-	93.547	Obs.
4	Supplementary Ships	-	413	Obs.
27	Auxiliary Ships	-	14.491	Obs.
14	Ships with AWSt	-	95.665	Obs.

- The total number of data sets received from the Area of Responsibility of RM Germany in 2003 amounts to more than 83.000. There are also older reports contained in that number which were generated in the years before but delivered to the GCCs in 2003. Fig. 1 gives an overview of the distribution.

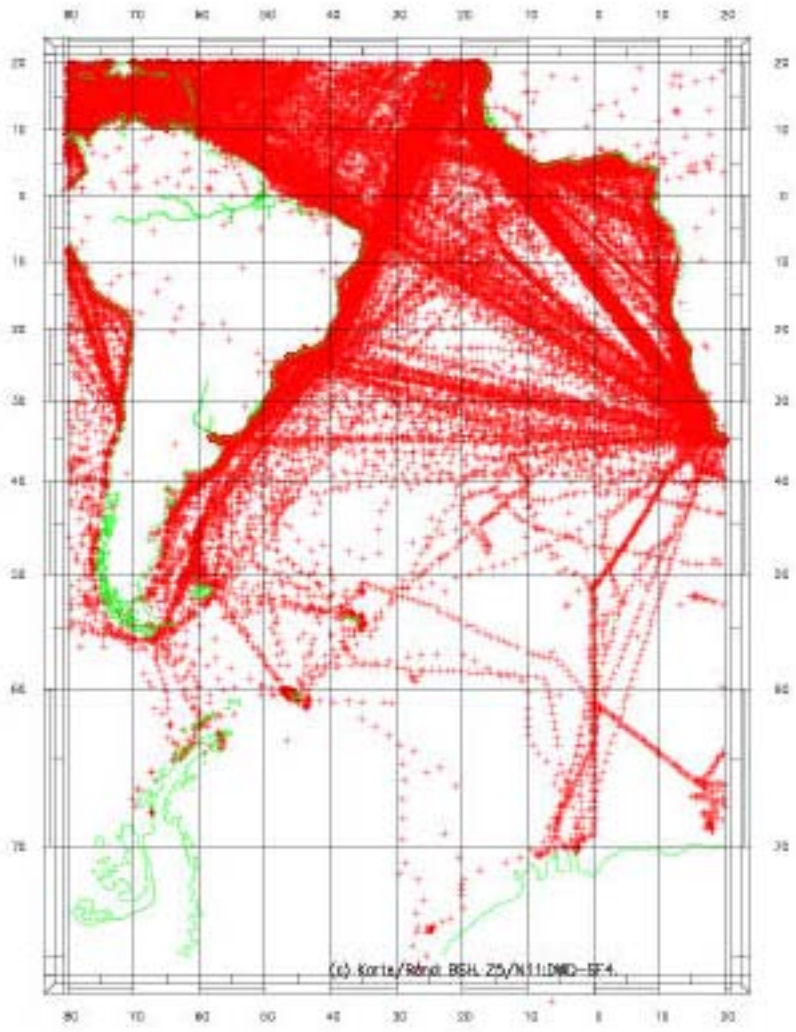


Fig. 1 Distribution of observations received by RM Germany from the area South Atlantic during 2003; Period 12 April – 17 December 2003

2. Preparation of Summaries

- DWD as Responsible Member for the South Atlantic Area is finalizing its Marine Climatological Summaries for the 10 year period 1991 - 2000.

- As a significant amount of data arrive with a delay of several years the start of the calculations had to take that into account.

- The use of the climatological statistics is far more efficient if they are available on electronic media. DWD is no longer planning to print the 1991-2000 Summaries, but instead to publish them on CD-ROM. Preliminary examples of the contents are demonstrated during the ETMC-I meeting. Fig. 2 shows the distribution of the unit areas.

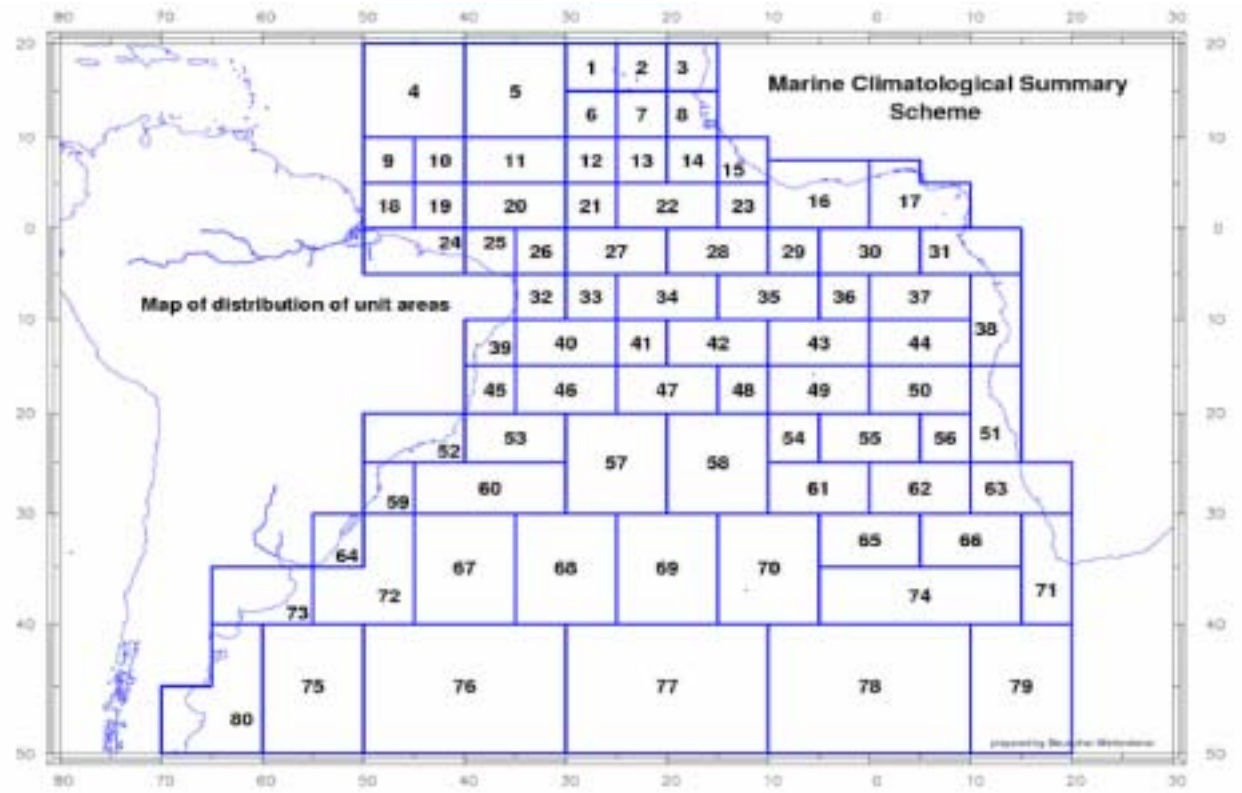


Fig. 2 Distribution of the unit areas

In fig. 3 the total number of observations per unit area available for the preparation of the decadal Summaries (South Atlantic) 1991 – 2000 and their mean latitude and longitude is shown.

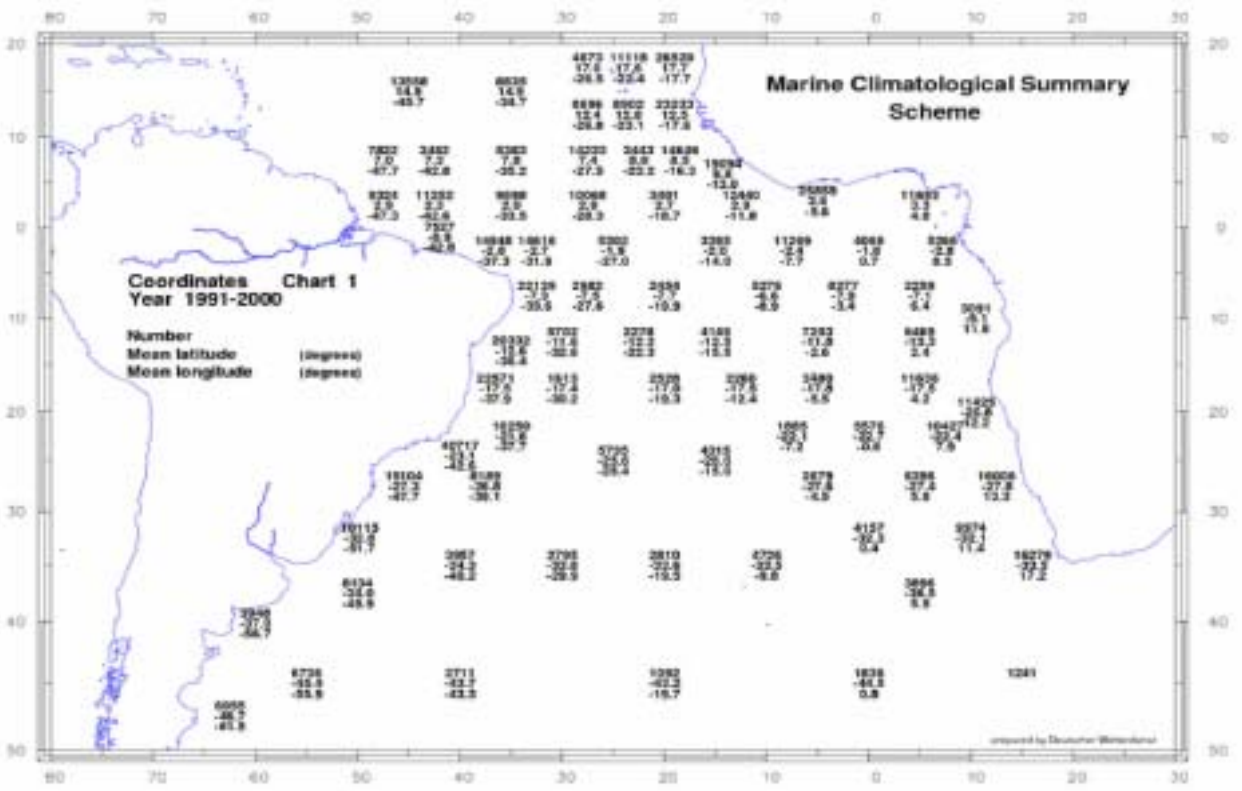


Fig. 3

HONG KONG, CHINA

Marine Climatological Summaries

1. Since the adoption of Resolution 35 (Cg-IV) of the World Meteorological Organization (WMO) in 1963, the Hong Kong Observatory (HKO) has undertaken the responsibility of collecting marine meteorological data for the area bounded by the equator and latitude 30°N, and longitudes 100°E and 120°E. Annual marine climatological summaries for this area were compiled and published for 1961 to 1990. Decadal marine climatological summaries were compiled and published for 1961-70, 1971-80, and 1981-90. The first summaries was published in 1970. The last one was published in 1995.

2. At its eighth session held in 1981, the WMO Commission for Marine Meteorology (CMM) recommended that marine climatological summaries be prepared in the form of charts instead of tables. The proposal was endorsed by the Executive Committee in 1982. Accordingly, all summaries published after 1982 were presented in chart form following the guidelines given in the Annex to Recommendation 6 of CMM-VIII. These included annual summaries 1971 to 1990 and all the decadal summaries.

3. The data used to prepare the summary charts were obtained from two sources:

   (a) weather observations recorded in the meteorological log books of the Voluntary Observing Ships (VOS) of Hong Kong, China;

   (b) weather observations made by other ships while in the area of responsibility of Hong Kong, China and sent to HKO by other WMO Members.

Data Exchange with Global Collection Centres

4. Since the establishment of Global Collection Centres (GCC) in 1994, HKO has been exchanging quality checked ship weather observations with GCC every quarter. During the past three years from 2001 to 2003, HKO received 61,322 ship weather observations from GCC and provided 8926 observations to GCC in delayed mode. Since 2003, exchange of data between HKO and GCC has been made via email.

Data Processing

5. Weather observations obtained from the meteorological log books of the VOS were scrutinized to eliminate instrumental, positional and coding errors before digitization. These data together with those received from other WMO Members were checked by an in-house quality control software application for internal consistency. All flagged data were reviewed and corrected as far as possible, and the corrected data were then injected into the data bank for further processing.

6. The International Maritime Meteorological Tape-2 (IMMT-2) format was adopted in May 2003 for ship weather observations sent to GCC. Minimum quality control software MQC version 4 distributed by GCC has been used for quality control in HKO since October 2003.

Voluntary Observing Ships

7. The status of the Voluntary Observing Ships fleet of Hong Kong, China is given below:

Category	**Number of ships at 31 Dec 2003**
Selected	41

Supplementary	5
Auxiliary	0
Others	0
Total VOS Fleet	45

Number of VOS vessels recruited in 2003	2
Number of VOS vessels decommissioned in 2003	10
Percentage of the VOS that did not report in Dec 2003 (to nearest whole percent)	44%
Total number of SHIP messages sent on the GTS in 2003	8197 (3758 messages were sent via HKO)

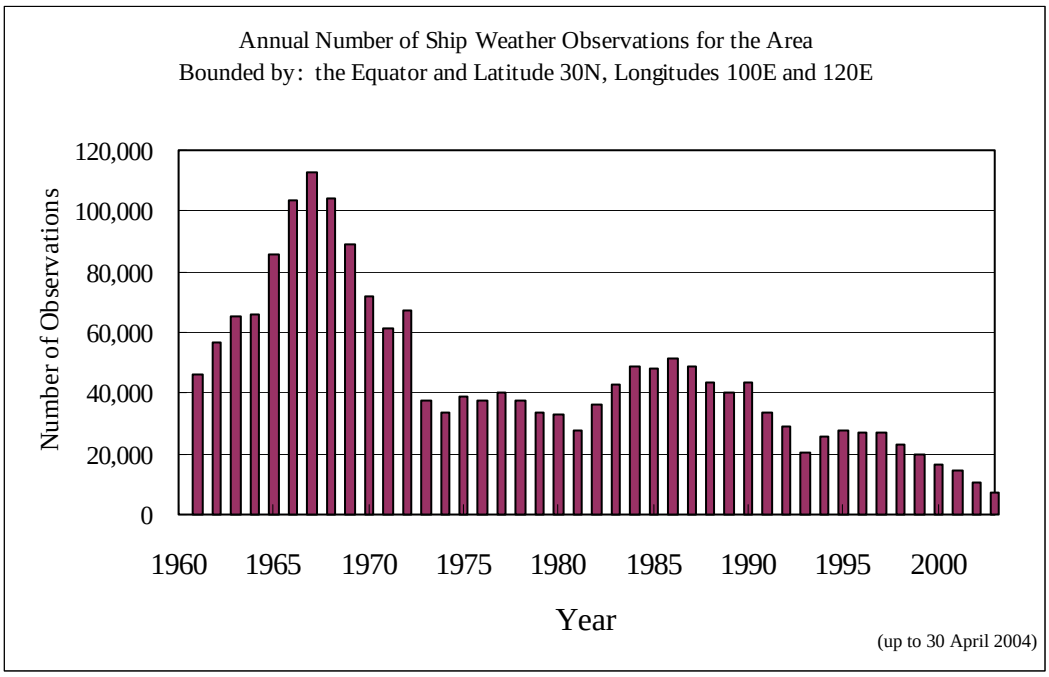
8. HKO publishes a newsletter for VOS of Hong Kong, China annually to keep the VOS fleet and shipping companies informed of the latest developments in Hong Kong marine meteorological services and to foster feedback from ships.

9. Web pages on port meteorological services including VOS information relevant to Hong Kong, China was established in 1998 under the HKO web site. These web pages provide the marine community with information on weather forecasts and warnings, codes for ship weather reports, the VOS scheme and web version of the newsletter. The URL of the web site is:

http://www.hko.gov.hk/wservice/tsheet/pms/index_e.htm

Marine Data Bank

10. HKO currently keeps a data bank of over 1.9 million ship weather observations made within the area of responsibility of Hong Kong, China. Annual distribution of these observations is given in the following figure:



Challenges

11. There is a decline in the number of serving VOS due to difficulties in recruiting new ships. The number of ship weather observations within the area of responsibility of Hong Kong, China has also decreased from about 40,000 a year in the 1980s to about 20,000 a year at the turn of the century. Efforts to recruit new VOS will not be relaxed.

JAPAN

Introduction

Japan is one of the eight Responsible Members for Marine Climatological Summary, whose responsible area is the western North Pacific and its marginal seas. The Japan Meteorological Agency (JMA) has taken charge of it since the beginning of the Marine Climatological Summary Scheme (MCSS). JMA's activities for MCSS in the recent five years are described in this report.

Collection, archiving and exchange of marine data

JMA submitted 307,000 observations to the Global Collecting Centres (GCCs) in 1999-2003. Data submission was made three times a year in the five years. Yearly numbers were 65,857, 59,313, 55,888, 56,119 and 70,065 for 1999, 2000, 2001, 2002 and 2003, respectively. Those observations were collected with paper log sheets, floppy disks and e-mails. In 2003, about 10,000 electronic records were generated by a package of PC software named "OBSJMA" developed by JMA. A new version of "OBSJMA" for windows PC has been distributed to the Japanese Voluntary Observing Ships (VOSs) in September 2002. It was found that the version had small problems on recording some elements. The problems were fixed and a modified version was distributed in May 2004 to the VOSs which have used the software.

The standard Minimum Quality Control (MQC) is applied to all observations with MQC-software provided by GCC before dispatching the data to GCCs. Duplicated records are removed before MQC.
JMA received 4,756,000 observations from GCCs in 1999-2003.

Preparing the marine climatological summaries

JMA published a 30-year climatological summary for 1971-2000 based on the marine observations exchanged within MCSS, GTS reports such as SHIP and DRIFTER/BUOY and the International Comprehensive Ocean-Atmosphere Data Set (ICOADS). The summary was distributed to related organizations in a CD-ROM in May 2003. Preparation and distribution of the decadal summaries for 1991-2000 is under consideration.

Digitization of historical log books

JMA and Japan Weather Association (JWA) carried out a project to digitize a set of historical marine observations known as the Kobe Collection for 1995-2003 with financial support of the Nippon Foundation. The project resulted in the digitized 3.1 million marine observations for 1889-1940. The final edition of data on CD-ROM (2003 edition) was distributed to related organizations in July 2003. The 5.8 million VOS observations of the Kobe Collection, including the 2.7 million observations for 1933-1960 that had been digitized in 1960-1962 and already merged into ICOADS, are now available in electronic form.

NETHERLANDS

Since the last meeting of the predecessor of the ETMC (CMM Subgroup on Marine Climatology) in Asheville - 2000, KNMI has been working to get rid of the backlog of logbooks. These logbooks have been mounting up mainly due to lack of staff and to plans to move the existing data to a relational database (Oracle). Presently the database is being filled with all the available data and at the same time several quality checks are being carried out. This has revealed some problems that concern duplicates.

It appeared that data, received from the GCC, contained duplicates. The duplicates/originals were provided in earlier disseminations. After consulting both GCC in the United Kingdom and Germany, it appeared that no duplicate checks were carried out with the new data on data of the existing database. We are unsure if this is a correct approach.

Table I. Submitted by the Netherlands

Date	**Number of submitted observations**
December 2001	8,971
April 2003	16,826
July 2003	117,788
February 2004	26,307

UNITED KINGDOM

Introduction

The United Kingdom is one of 8 Responsible Members for the Marine Climatological Summaries Scheme (MCSS), with responsibility for the North Atlantic area. It is also one of the two Global Collecting Centres (GCC).

Data processing

The United Kingdom uses the Minimum Quality Control (MQC) software issued by the GCCs to process the data it receives from the UK Voluntary Observing Fleet (VOF).

Since 2002 we have processed 181234 UK logbook observations (Jan 02 – May 04 inclusive), and submitted 166742 to the GCC exchange (within the same period). However, these observations are global, not just for the UK area of responsibility. Also, the timescale from UK processing to submission to GCC exchange is currently experiencing a substantial time-lag (of approx. 2 years). This is due to a number of staffing / resource issues within the UK Met Office.

MCSS

The UK has had no requests for these MCSS, since taking on GCC responsibility (in 1993). Due to our resource issues we have not routinely produced the Summaries, though the Met Office would do so on request (as stated in the Manual for Marine Meteorological Services).

UNITED STATES OF AMERICA

The National Climatic Data Center (NCDC) has continued to ingest, key, quality control, archive and transfer US IMMT ship data to the Global Collection Centre. The archive and data transfer averages 8,186 observations per month, ranging from a low of 2,543 to a high of about 15,355 in the past year. Since 2000, the data have been converted and archived in the TD1129 format then converted back into IMMT format for transfer to the GCC. In 2003, NCDC began archiving US Ship data in the more inclusive ICOADS/IMMA format as well as TD1129. The official NCDC archive is now the ICOADS/IMMA format. These observations have always been available in an offline media. Since FY 2003 all VOSClim observations have been available online in the ICOADS/IMMA format with a new data access tool on the NCDC website, at http://www.ncdc.noaa.gov/vosclim.html. This web site also contains an interactive graphical browser using java tools. By FY 2005 the marine data base should be available online through NCDC's Climate Data Online (CDO) System on the NCDC web site http://hurricane.ncdc.noaa.gov/CDO/cdo.

Activities by a Contributing Member

ARGENTINA

Submitted by Cristina Rössler
Servicio Meteorológico de la Armada Argentina (SMARA)

Argentina started its contribution to the Marine Climatological Summaries Scheme in 2001. This contribution consisted of the 2239 observations of the 1950-2001 period. This Contributing Member applied the Minimum Quality Control Standard before sending data to the Global Collecting Centres. At the end of 2001, SMARA didn't receive any observation reports. Several ships have changed their usual area of activity, moved into new regions without the possibility to visit Argentina harbours. Moreover the list of VOS included in the WMO publication No. 47 was not updated. This situation continued during 2002 and the new Port Meteorological Officer for Argentina informed that other ships had been contacted to participate and that their recruitment could approximately start in late 2002. However, a few data of 2002 could be collected and sent during the following year. Argentina has been submitting data to GCCs on a quarterly basis without interruptions since January 2003. SMARA developed new advanced quality control procedures for Marine climatological data, which are now internally applied. Data are stored in the required new IMMT-2 format. Although a high percentage of data now comes through GTS, there is still a considerable amount of data coming from meteorological logbooks that require digitalisation. The following comments can be made: Communication with PMO is a very critical issue, making CM's work easier. The WMO Publication No. 47 has not been updated on regular basis, causing frustration at the CM. The related publications available through the JCOMM web have provided very valuable support to this CM in implementing their marine related activities. The WMO Publications related with the Marine meteorology activities should be sent to the Marine Meteorological Services directly to facilitate the work.

Annex VIII

RESPONSIBILITIES/ACTIVITIES OF GLOBAL COLLECTING CENTRES AND RESPONSIBLE MEMBERS

GCC

Act as a focal point between Contributing and Responsible Members – purely a point of dataset exchange, with no responsibility for archival of data.

Receive delayed-mode data from CMs electronically (e.g., by email, FTP, CD-ROM or floppy disk), in IMMT format.

Ensure current MQCS on delayed-mode data, received from CMs.

Keep inventory of datasets received from CMs (minimum: CM, date received, number of observations).

Bilateral exchange of dataset details with other GCC (i.e. CM, number of observations, years of observations, callsign list, any problems).

Feedback any problems to CMs, and agree any amendments to the dataset submitted.

Distribute quarterly data updates to RMs, in agreed format, for responsible area (or globally as agreed).

Prepare annual report to be distributed through the Secretariat to Members operating VOS and other relevant bodies.

RM

Archive data received from GCCs (at least for their responsible area). If possible, it is recommended that RM should also archive the SHIP GTS data, either as a separate dataset, or to be replaced by logbook data, received in delayed-mode from the GCCs.

Produce marine climatological summaries as appropriate.

Distribute observational data (in IMMT format) to Members on request – charge to be borne by RM, unless another exchange format agreed.

Report to the ETMC.

Annex IX

RESULTS FROM THE WMO QUESTIONNAIRE ON WAVE SPECTRA DATA (FM65-IX WAVEOB)

The questionnaire on Wave Spectra Data (Attachment 1) was sent to participating Members of which 41 responded. Attachment 2 provides the summarized responses from Countries to questions 1 through 5 on the questionnaire in the general order they were received.

Of the 41 Country responses, 16 of them either collect, generate or archive wave spectra data from moored buoys or remote platforms of some type. Of these 16 only two transmit the data over the GTS in the FM 65-IX WAVEOB code. However, when asked if they had near term plans for operating any new wave spectra sensors 15 responded that they were either proposing such plans or were planning on adding additional ones.

When asked if they would benefit from having access through a WMO World Data Centre to a historical archive of wave spectra data collected off the GTS, in the FM-IX WAVEOB Code, nearly 75% responded that it would be useful. However, most were only interested in data for their local region.

The last question was seeking to determine if Members would prefer high resolution data which they would have to request from the individual Members operating the sensors or the lower resolution data that could be obtained from the FM65-IX coded data archived at a World Data Centre. From the responses it appeared that nearly a quarter would not be interested in obtaining either. The others were near evenly split between the two options. In reviewing the responses it appeared that those most likely interested in acquiring spectral data would prefer the higher resolution data and would request it from the individual providers. In conclusion it appears that there was not much interest in setting up an official World Data Centre to archive the FM 65-IX coded messages. Again only several countries are currently encoding their data for transmission over the GTS. It also appears that a couple countries are actually archiving the FM 65-IX coded messages. Because not all Members responded to the questionnaire, there may be others that are coding their data for transmission over the GTS.

There were some significant benefits gained from the questionnaire, which will benefit the WMO Expert Team on Marine Climatology in the future. The rapporteur greatly appreciates the efforts of those Members that responded.

Attachment 1.

WORLD METEOROLOGICAL ORGANIZATION

QUESTIONNAIRE ON WAVE SPECTRA DATA (FM 65-IX WAVEOB)

A. Identification section

Member country:_____

Name of contact:_____

Mailing address:_____

Phone, fax, e-mail address:

B. Requirements for Wave Spectra Data

1. Do you collect, generate, or archive any wave spectra data from moored buoys or remote platforms such as aircraft or satellites? Please describe.

2. If you operate any wave spectra sensors do you transmit this data over the GTS in the FM 65-IX WAVEOB Code? Do you archive the data in a higher resolution format than allowed for in the FM 65-IX Code? Please describe.

Do you have any near term plans for operating any new wave spectra sensors? Please describe.

4. Would you benefit from having access through a WMO World Data Center to a historical archive of wave spectra data collected off the GTS in the FM 65-IX WAVEOB Code? Please describe.

5. If requiring wave spectra data from other than your own sensors for wider geographical coverage would you prefer to: (1) request higher resolution wave spectra data from the individual Members who operate such sensors or, (2) use the lower resolution data in the FM 65-IX Code from a single source World Data Center responsible for archiving the GTS reports? Please describe. If you also see little chance of ever requiring spectra wave data from either source please also indicate.

ATTACHMENT 2

Country	question 1
Austria	no
Belize	no
Saint Lucia	no
Canada	yes, archived MEDS
Cyprus	one waverider
Mauritius	one moored buoy
Malawi	no
Seychelles	no
New Zealand	yes, 3 non-dir; 2-dir
Bahamas	no
Denmark	no
Guyana	no
Monaco	no
Chile	yes, 17 waverider buoys
Spain	yes, usually archive only raw data
Syria	no
Slovenia	no
Peru - Meteorological & Hydrology	no
Peru - Hydrographic & Navigational	yes
Tunisia - INSTM	no
Tunisia - National Institute of Meteorology	no
Pakistan	no
Ecuador	no, wave height & period only 1992-97
Indonesia	no
Hong Kong, China	no
Greece	no
Netherlands	yes, North sea
Uruguay	no
Turkey	no
Japan	use ERS-2 data received over GTS
United Kingdom	one experimental buoy
Thailand - Geo-inf & Space Technology	wave riders report period & height only
Thailand - SE Asian Fisheries Dev Ctr	no
Thailand - Harbour Department	no
Thailand - SE Asia Start Regional Ctr	no
Thailand - Water Engineering & Mgt Pg	yes, 4 locations limited site testing
Thailand - Dpt of Marine Sc, University	no
Thailand - Fisheries Dept. Kasetsart U.	no
Qatar	no
Iceland	no
Colombia	no
Germany	yes, 3-4 buoys Ger. Bight & W Baltic
Oman	no
France	yes, 2-3 buoys W. Med, French Antilles
Kenya	receive GTS reports but do not archive
USA	yes, moored buoys & C-MAN stations
India	yes, 12 moored buoys
Belgium	yes, one location
Sweden	yes, 6 locations, some as early as 1978

ATTACHMENT 2 (CONTINUED)

Country	question 2
Austria	no
Belize	no
Saint Lucia	no
Canada	no, Transmitted over GOES
Cyprus	no
Mauritius	no
Malawi	no
Seychelles	no
New Zealand	not over GTS
Bahamas	no
Denmark	no
Guyana	no
Monaco	no
Chile	no
Spain	no, over Inmarsat-C (seawatch)
Syria	no
Slovenia	no
Peru - Meteorological & Hydrology	no
Peru - Hydrographic & Navigational	no
Tunisia - INSTM	no
Tunisia - National Institute of Meteorology	no
Pakistan	N/A
Ecuador	no
Indonesia	no reply
Hong Kong, China	no
Greece	no reply
Netherlands	no, transmitted over SeaNet
Uruguay	no reply
Turkey	do not operate any sensors
Japan	no
United Kingdom	no
Thailand - Geo-inf & Space Technology	no
Thailand - SE Asian Fisheries Dev Ctr	no reply
Thailand - Harbour Department	no reply
Thailand - SE Asia Start Regional Ctr	no
Thailand - Water Engineering & Mgt Pg	no
Thailand - Dpt of Marine Sc, University	no reply
Thailand - Fisheries Dept. Kasetsart U.	no
Qatar	NA
Iceland	no reply
Colombia	no
Germany	no, archived at comparable resol.
Oman	no
France	yes, 2 buoys soon 3
Kenya	no
USA	Yes
India	no
Belgium	no, some data available on Web
Sweden	none over the GTS and no WAVEOB

ATTACHMENT 2 (CONTINUED)

Country	question 3
Austria	no
Belize	no
Saint Lucia	no
Canada	not from MEDS
Cyprus	no
Mauritius	no
Malawi	no
Seychelles	yes, proposal
New Zealand	not on permanent basis
Bahamas	install few wave recorders by 2003
Denmark	no
Guyana	no
Monaco	no
Chile	yes, several pressure sensors near coastal
Spain	testing several & improving operational radar
Syria	yes, trying to get started
Slovenia	plans to establish one near Piran
Peru - Meteorological & Hydrology	no
Peru - Hydrographic & Navigational	no
Tunisia - INSTM	no
Tunisia - National Institute of Meteorology	no
Pakistan	possibly in the future
Ecuador	no
Indonesia	no reply
Hong Kong, China	no
Greece	no
Netherlands	no
Uruguay	no
Turkey	yes, near future
Japan	no
United Kingdom	depending on field trials
Thailand - Geo-inf & Space Technology	no
Thailand - SE Asian Fisheries Dev Ctr	yes, from ADCP sensors
Thailand - Harbour Department	no
Thailand - SE Asia Start Regional Ctr	no
Thailand - Water Engineering & Mgt Pg	no
Thailand - Dpt of Marine Sc, University	no reply
Thailand - Fisheries Dept. Kasetsart U.	no
Qatar	yes, plans to install tide gauge & wave recorder
Iceland	no
Colombia	no
Germany	no
Oman	no
France	yes, along the French Coast
Kenya	no
USA	yes, developing new dir. angular rate sensors
India	yes, plans to double the number over 2 years
Belgium	no
Sweden	recently deployed two buoys with wave sensors

ATTACHMENT 2 (CONTINUED)

Country	question 4
Austria	no
Belize	no
Saint Lucia	yes
Canada	yes
Cyprus	maybe
Mauritius	yes
Malawi	yes, inland lake
Seychelles	yes, local area
New Zealand	no
Bahamas	yes
Denmark	yes
Guyana	yes, eqautorial Atlantic
Monaco	no
Chile	yes
Spain	yes, valuable to validate wave models
Syria	yes
Slovenia	yes, Adriatic Sea
Peru - Meteorological & Hydrology	yes, coastal region
Peru - Hydrographic & Navigational	yes
Tunisia - INSTM	yes, in the Mediterranean
Tunisia - National Institute of Meteorology	no
Pakistan	might be beneficial for local area
Ecuador	maybe in the future
Indonesia	yes
Hong Kong, China	no plans
Greece	no
Netherlands	might be useful for research
Uruguay	yes
Turkey	yes
Japan	no plans
United Kingdom	yes, important for validating wave models
Thailand - Geo-inf & Space Technology	would benefit
Thailand - SE Asian Fisheries Dev Ctr	benefit in the future
Thailand - Harbour Department	yes, local studies
Thailand - SE Asia Start Regional Ctr	yes, to calibrate wave model e.g. WAM
Thailand - Water Engineering & Mgt Pg	Yes, reliable source for data
Thailand - Dpt of Marine Sc, University	yes, benefit wave forecasting system
Thailand - Fisheries Dept. Kasetsart U.	yes, useful simulation model
Qatar	Yes, information requested
Iceland	yes
Colombia	yes, in the future
Germany	unlikely
Oman	no
France	yes, validate data and model output
Kenya	yes, benefit for research
USA	yes, access to non USA data beneficial
India	yes, data for analytical studies
Belgium	no
Sweden	For the moment no

ATTACHMENT 2 (CONTINUED)

Country	question 5
Austria	no response
Belize	no
Saint Lucia	not sure
Canada	both
Cyprus	no response
Mauritius	high resolution, local area
Malawi	low resolution, single source
Seychelles	low resolution, single source
New Zealand	no high resolution requirement
Bahamas	option 2, data more consistent
Denmark	option 1
Guyana	option 2
Monaco	option 1, local area
Chile	option 1 S. Pacific, option 2 N. Pacific
Spain	likely option 1, depends on conditions
Syria	option 2, prefer printed data
Slovenia	option 2
Peru - Meteorological & Hydrology	both options, different purposes
Peru - Hydrographic & Navigational	option 1 near coastal, Option 2 Pacific
Tunisia - INSTM	option 2, Mediterranean
Tunisia - National Institute of Meteorology	option2, Mediterranean Sea Area
Pakistan	option 1
Ecuador	option 2
Indonesia	option 1
Hong Kong, China	no plans therefore no preference
Greece	option 2
Netherlands	option 2 might be more appropriate
Uruguay	option 2
Turkey	option 2, option 1 could be requested
Japan	option 2 from operational viewpoint
United Kingdom	both options, different purposes
Thailand - Geo-inf & Space Technology	option 1, Gulf of Thailand & Andaman sea
Thailand - SE Asian Fisheries Dev Ctr	option 1
Thailand - Harbour Department	option 1, near coastal waters, option 2 others
Thailand - SE Asia Start Regional Ctr	option 2, large geographical area
Thailand - Water Engineering & Mgt Pg	Option 2
Thailand - Dpt of Marine Sc, University	option 2, early stage
Thailand - Fisheries Dept. Kasetsart U.	no response
Qatar	option 1 Arabian Gulf, Option 2 other areas
Iceland	no reply
Colombia	interested in both options
Germany	option 2
Oman	no
France	option 2, MF archives GTS FM65-IX reports
Kenya	both options
USA	both options
India	initially option 2, may require option 1 later
Belgium	no reply
Sweden	at present time individual members

Annex X

PROPOSED REVISIONS TO THE GUIDE TO MARINE METEOROLOGICAL SERVICES

Para 3.2.4 Marine meteorological observations are recorded o-board most ships in special meteorological logbooks provided by NMSs. Members operating voluntary observations ships and/or fixed ship stations should arrange for the provision of a suitable ~~form~~ of meteorological logbook which can be in hard-copy or electronic format. Details of the layout of the hard-copy logbook are to be found in Chapter 6. Paragraph 6.8.2 of this Guide.

The observations are transferred from the hard-copy logbooks to a computer compatible medium...

Para 3.2.7 ....Any form of data exchange on computer readable media may be used, ~~such as diskette.~~

Para 3.2.9.2 ... There is space in the IMMT format for ~~20~~ quality control flags

Para 3.2.9.2 ... for this purpose. Minimum quality control software is available from GCCs upon request

Annex XI

EXPERT TEAM ON MARINE CLIMATOLOGY WORKS

(Updated progress: 10 July 2004)

1. Finalize the International maritime Meteorological Archive (IMMA) format with a view to eventual submission to the Commission for formal adoption.

   Assignment: *Mr. Scott D. Woodruff (USA), rapporteur*

Updated progress: The IMMA documentation has been updated, details have been discussed under agenda item 4.1.

2. Metadata are as important as the data themselves. It was recommended to verify if all the WMO Manuals on Codes (WMO-No 306) and IMMT formats documenting the history of the marine ship codes and exchange formats are available. This task was previously considered and reported to the 8th Session of Subgroup on Marine Climatology by Ms. Teruko Manabe (Japan), but was not finalized. Therefore JCOMM-I decided to continue the study to verify the availability of documentation relating to the history of marine ship codes.

   Assignment: *Mr. M. Kaneda (Japan), Mr Yoshida + Mr. S.D. Woodruff (USA) and Secretariat*

Updated progress: Significant progress has been made, however task still needs time and efforts, details have been discussed under agenda item 4.2.

3. Under auspices of the former Subgroup on Marine Climatology some action has been taken to compile a catalogue of global storm surge data holdings. Taking into account that substantial amounts of storm surge data are archived in a number of countries, there is some interest in a global catalogue of data holdings. There is also some interest in the eventual international exchange of these data. There is thus a need to reactivate and finalize the compilation of a catalogue of global storm surge data holdings and work closely, working closely with IODE and also with ITSU. Data Management Coordinating Group agreed that storm surge datasets should be duly included in the comparative study of existing metadata systems.

   Assignment: *Mr. A. Vorontsov (Russian Federation), Mr. J Carreno Campos (Chile) + Secretariat*

Updated progress: Any specific action has been taken by people being in charge. Due to vital interest expressed by ET on Wind Waves and Storm Surges (ETWS) and its chairman Mr. Val Swail (Canada) it was agreed with Mr Swail and with the Secretariat that this task will be transferred to ETWS. Details have been discussed under agenda item 4.3.

4. Review and assess the climatological elements of the Commission, including the operation of the MCSS, and the development of required oceanographic and marine meteorological products.

   Assignment: *Dr. Miroslaw Mietus, Dr. C. Tam (Hong Kong, China) + Secretariat*

Updated progress: Several proposals have been prepared but task still requires further efforts. Details have been discussed under agenda item 3.4.3

5. Investigate the possibility to re-establish global wave metadata archive center.

Assignment: *Action will be taken after contact with Mr. Val Swail (Canada) chairman of the ET on Wind Waves and Storm Surges + Secretariat*

Updated progress: Limited action has been taken by the ET. It was agreed with Mr. Val Swail, the chairman of ETWS that this ET will be responsible for realization of this task. Details have been discussed under agenda item 4.3.

6. Keep under review and propose procedures for the preparation and/or updating of relevant technical publications.

Assignment: *Mr. A. Lal, Ms. C. Rossler and Mr. K. Wurodu (Ghana)*

Updated progress: No action has been taken by persons being responsible, ET on its session made review of the Manual on Marine Meteorological Services (WMO-No. 558) and the Guide to Marine Meteorological Services (WMO-No. 471). Details were discussed under agenda item 7.2.

7. Provide support to CCl and assign experts to assist CCl in preparing the revised Guide to Climatological Practices.

Assignment: *Dr. Miroslaw Mietus, Secretariat and the Management Committee of CCl.*

Updated progress: Any specific action has not been taken. ET decided to support CCl in revision of some parts of prepared Guide to Climatological Practices when it will be ready. Details have been discussed under agenda item 7.3.

8. Continue with the digitization of non-electronic earlier versions of WMO-No. 47.

Assignment: *Secretariat and Mr. S.D. Woodruff (USA)*

Updated progress: Significant progress has been made, however this task still needs time and efforts. Details have been discussed under agenda items 5.1-5.3.

9. Recent version of TurboWin automatically converts wind speed to the standard level of 10m. This may affect now existing databases by causing inhomogeneity if climatological marine data will be used without information concerning version of TurboWin software (available since 1st January 2003 from IMMT-2). However information on reduction of wind speed is not automatically available from IMMT-2 records. Therefore it is essential do recognize the scale of this problem and eventually to initiate appropriate changes in used software.

Assignment: *Mr. Frits Koek (Netherlands)*

Updated progress: The action has been taken by KNMI. Details have been discussed under agenda item 3.3.

10. Keep under review IMMT format and MQCS

Assignment: *Dr. Volker Wagner (Germany), Mr Reinhard Zollner + Mr. Chris Hall (UK), Ms Gowland*

Updated progress: Several actions have been taken, significant progress has been achieved, however this task still requires time and efforts. Details have been discussed under agenda items 2.3, 3.1, 3.4.1.

11. Participate in the work of the organizing/scientific committee of the Workshop on Advances in Marine Climatology – CLIMAR-II (Brussels, late 2003).

Assignment: *D. Dehenauw (Belgium), D.E.Harrison (USA), M. Mietus (Poland), D. Parker (U.K.), V. Swail (Canada), S. Woodruff (USA), T. Manabe (Secretariat)*

Updated progress: CLIMAR-II was successfully held in Brussels in November 2003. Details have been discussed under agenda item 7.1.

12. The Workshop on Advances in the Use of Historical Marine Climate Data has been held in Boulder (USA), 29 Jan.-1 Feb. 2002. The recommendation from the Working Group on Mean sea level pressure and wind (WG3) is to adjust the wind force data back to about 1854 using an improved equivalence scale (most likely the implementation should produce a separate field, so that the present WMO 1100-based values can still be archived and made available).

Assignment: *Dr. Ralf Lindau (Germany) - external expert, S.D. Woodruff (USA)*

Updated progress: Dr. Lindau gave a talk on this general subject at CLIMAR-II. Details have been discussed under agenda item 7.1.

13. The Data Management Coordinating Group on its first meeting in Paris (22-25 May 2002) agreed that MCSS is an important and highly developed system of marine meteorological data management with a distributed structure. However, there is a lack of a so called “route map” for users looking for data and assistance. This element was considered as very important and to be implemented as soon as possible.

Assignment: *Dr. Miroslaw Mietus (rapporteur), representatives of RMs, GCCs and Secretariat*

Updated progress: The idea of “route map” has been presented. Details have been discussed under agenda item 3.4.3

Annex XII

LIST OF ACTION ITEMS

para	action	By whom	when
3.1.2	Prepare a draft recommendation on the revisionof IMMT and MQCS to be submitted to JCOMM-II	GCC Germany and Secretariat	Autumn 2004
3.1.3	Check the procedures and criteria used by electronic logbook such as TurboWin, SEAS and OBSJMA and would report to the Team with a proposal by October 2004, if any modification to specification for quality control Indicators is considered to be needed.	Martin Stam	October 2004
3.2.2	Continue the review of BUFR template for ship data, if so requested	Scott Woodruff	
3.3.3	Consider on-line submission from VOS through electronic logbooks for the future	developers of electronic logbooks	when the Internet access is readily available on ships.
3.4.1.1	Use MQC software	Contributing Members	When the tables are received
3.4.2.2	Include details information for users on the GCC Germany web site	GCC Germany	ASAP
3.4.3.1	Prepare a questionnaire for a survey to better understand actual requirements for marine climatological summaries	Gowland, Zöllner, Mietus	30 October 2004
3.4.3.1	Make their recent decadal summaries on the GCC Germany web site	GCC Germany	ASAP
3.4.3.1	Establish a GCC UK web site	GCC UK	ASAP
3.4.3.1	Distribute the questionnaire to RMs and CMs	Secretariat	as soon as the questionnaire is ready
3.4.3.1	Distribute the questionnaire to their relevant national/regional contacts	RMs and CMs	as soon as the questionnaire is received form the Secretariat
3.4.3.1	Analyse the questionnaires	Mietus	
3.4.3.1	Keep discussing the future of activities/implementation of the MCSS until ETMC-II.	ETMC members	
3.4.3.2	Link the GCC Germany web site to relevant web sites	GCC Germany	ASAP
4.3.1	Prepare the final version of IMMA	Woodruff	December 2004
4.3.1	Publish the IMMA as a JCOMM Technical Report	Secreterait	
4.2.3	Contact Dr Kent (SOC) to expand the search for older versions of the Manual on Codes	Yoshida	ASAP

para	action	By whom	when
4.2.3	Search older versions of Manual on Codes in the archives of each country and inform Mr Yoshida if missing versions are found.	ETMC members	ASAP
7.1.2	Send comments to Mr Woodruff on the recommendations made at CLIMAR-II	ETMC members	
7.1.3	Propose to JCOMM-II that it endorse the organization a self-funded workshop, CLIMAR-III, in 2007	ETMC chair, Secretariat	
7.2.3	Make revision on sections 5.2.4, 6.2.1, when major changes are made to WMO-No.558	ETMC members	
7.2.3	Propose to JCOMM-II on the revision of WMO-No.471	ETMC chair, Secretariat	
7.3.2	Review 2.7 "Climatological Summaries in the Guide to Climatological Practices, if the text of 2.7 were made available	Dr Mietus	
7.3.2	Assist the Commission for Climatology on the preparation for the Guide to Climatological Practices, if so requested	ETMC members	
8.1	Propose to JCOMM-II on the re-establishment of ETMC	ETMC chair, Secretariat	

Annex XIII

LIST OF ACCRONYMS

ASAP	Automated Shipboard Aerological Programme
ASAPP	ASAP Panel
BATHY	Report of bathythermal observation
BUOY	Report of a buoy observation
CBS	Commission for Basic Systems
CCl	Commission for Climatology (of WMO)
CDC	Climate Diagnostic Centre
CDMP	Climate Database Modernization Program
CLIMAR-II	Second JCOMM Workshop on Advances in Marine Climatology
CLIMAR99	International Workshop on Advances in Marine Climatology
CLIVAR	Climate Variability Programme
CLIWOC	Climatological Database for the World's Ocean 1750-1854
CMs	Contributing Members
CMM	Commission for Marine Meteorology
COOP	Coastal Ocean Observations Panel (of GOOS)
CREX	Character form for the Representation and Exchange of data
CSM	Commission for Synoptic Meteorology (now CBS)
DAC	Data Assembly Centre
DBCP	Data Buoy Cooperation Panel
DMCG	Data Management Coordination Group (of JCOMM)
DMPA	Data Management Programme Area (of JCOMM)
E2EDM	End-to-end Data Management
EC	Executive Council
EOF	empirical orthogonal functions
ETCCMDI	CCl/CLIVAR Expert Team on Climate Change Monitoring Detection and Indices
ETDMP	Expert Team on Data Management Practices (of JCOMM/IODE)
ETMC	Expert Team on Marine Cliamtology (of JCOMM)
FWIS	Future WMO Information System
GCCs	Gobal Collecting Centres
GCOS	Global Climate Observing System
GOOS	Global Ocean Observing System
GTS	Global Telecommunications System
ICOADS	International COADS (Comprehensive Ocean-Atmosphere Data Set)
IMMA	International Maritime Meteorological Archive
IMMPC	International Maritime Meteorological Punch-Card
IMMT	International Maritime Meteorological Tape
IMWM	Institute of Meteorology and Water Management, Poland
IOC	Intergovernmental Oceanographic Commission (of Unesco)
IODE	International Oceanographic Data and Information Exchange (IOC)
JCOMM	Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology
JMA	Japan Meteorological Agency
KNMI	Royal Netherlands Meteorological Institute
MAN	Management Committee (of JCOMM)
MCSS	Marine Climatological Summaries Scheme
MDB	Marine Data Bank
MMS	Marine meteorological services
MQCS	minimum quality control standards
NMSs	National Meteorological Services
NCDC	National Climatic Data Center, NOAA
NCEP	National Centers for Environmental Prediction, NOAA
NOAA	National Oceanic and Atmospheric Administration
OGP	Office of Global Programs, NOAA

OOPC	Ocean Observations Panel for Climate (GOOS, GCOS, WCRP)
QC	Quality control
RA	Regional Association
RM	Responsible Members (of the MCSS)
RSMCs	Regional Specialized Meteorological Centres
RTMC	Real Time Monitoring Centre
SGMC	Subgroup on Marine Climatology (of JCOMM)
SOC	Southampton Oceanography Centre
SOT	Ship Observation Team (of JCOMM)
TESAC	Temperature, salinity and current observation from a sea station
TRACKOB	Report of a marine surface observation along a ship's track
VOS	Voluntary Observing Ships
VOSClim	VOS Climate Project
VOSP	VOS panel (of SOT)
VSOP-NA	Special VOS Observing Project for the North Atlantic
WMO	World Meteorological Organization
WWW	World Weather Watch
XML	Extensible Markup Language