

WORLD METEOROLOGICAL ORGANIZATION

**INTERGOVERNMENTAL OCEANOGRAPHIC
COMMISSION (OF UNESCO)**

JOINT WMO / IOC TECHNICAL COMMISSION FOR
OCEANOGRAPHY AND MARINE METEOROLOGY
(JCOMM)

SOT-V/Doc. III-3.5
(XX.XX.2009)

SHIP OBSERVATIONS TEAM

ITEM III-3.5

FIFTH SESSION

GENEVA, SWITZERLAND, 18-22 MAY 2009

Original: ENGLISH

REVIEW OF THE MARINE CLIMATOLOGICAL SUMMARIES SCHEME (MCSS)

*(Submitted by Scott Woodruff, Chairperson, ETMC;
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Martin Rutherford, Chairperson, TT-MOCS)*

Summary and purpose of the document

This document provides a general review of the current status and future plans, emerging from the Data Management Program Area (DMPA) and its Expert Team on Marine Climatology (ETMC), for the Marine Climatological Summaries Scheme (MCSS). These plans include the work undertaken by two new task teams: the cross-cutting Task Team on Delayed-Mode Voluntary Observing Ship Data (TT-DMVOS), and ETMC's Task Team on Marine-meteorological and Oceanographic Climatological Summaries (TT-MOCS).

ACTION PROPOSED

The Team will review the information contained in this report, and comment and make decisions or recommendations as appropriate. See part A for the details of recommended actions.

- Appendices:** A. TT-DMVOS: Status and Additional Information
B. TT-MOCS: Status and Additional Information

- A - DRAFT TEXT FOR INCLUSION IN THE FINAL REPORT

III-3.5.1 Mr Scott Woodruff, Chairperson of the JCOMM Expert Team on Marine Climatology (ETMC) reported on the recent developments with regard to the Marine Climatological Summaries Scheme (MCSS). The Task Team on Delayed-mode VOS data (TT-DMVOS), started functioning as of April 2007 and includes crosscutting membership from both OPA and DMPA, representing a new active area of collaboration. This TT is focusing primarily, on modernizing the management and quality control of the delayed-mode VOS data, while at the same time exploring possible connections with the management of real-time (GTS) data, and other ship-based data, e.g., Shipboard Automated Meteorological and Oceanographic System (SAMOS) and Global Ocean Surface Underway Data (GOSUD). Links are also planned to the JCOMM Pilot Project for WIGOS and the International Comprehensive Ocean-Atmosphere Data Set (ICOADS; <http://icoads.noaa.gov/>).

III.3.5.2 The meeting noted that the ETMC Task Team on Marine-meteorological and Oceanographic Climatological Summaries (TT-MOCS) was at an earlier stage of development and without a permanent Chair, but offered the potential for organizational links to the WMO Commission on Climatology (CCI) including the joint CCI/CLIVAR/JCOMM Expert Team on Climate Change Detection and Indices (ETCCDI). This TT has discussed options for modernizing the content, format and dissemination methods for MCSS data and products to include satellite data, geographical information systems (GIS) compatibility and internet-based web services respectively.

III.3.5.3 A joint TT-DMVOS/TT-MOCS planning meeting was held 10 May 2008 in Gdynia, Poland. For TT-DMVOS, a number of detailed new proposals were developed for enhancing the delayed-mode and real-time data flows, including the roles of Global Collecting Centres (GCCs) (see Appendix A for additional information). For TT-MOCS, it was agreed that the limited near-term focus would be on climatologies, and some work has been done since then to engage relevant science partners particularly on wind climatologies (see Appendix B for additional information).

III.3.5.4 To help knit together the eventual flow of data and products between the two TTs (and ultimately to users), the ICOADS already produces year-month and monthly long-term climatological summaries (in standardized netCDF format), which are proposed to feed into the JCOMM Pilot Project for WIGOS. Another upcoming development likely to strongly influence the roles and work plans of both the TTs will be the OceanObs'09 meeting (Sept. 2009, Venice; <http://www.oceanobs09.net/>).

III.3.5.5 The meeting made the following recommendations:

- (i) That SOT continues to take an active role in the TT-DMVOS activities, and engage with TT-MOCS in the future as appropriate.
- (ii) To endorse recommendations, planned for JCOMM-III (from ETMC/TT-DMVOS/GCCs) for relatively minor revisions to the International Maritime Meteorological Tape format (IMMT-IV) and Minimum Quality Control Standards (MQCS-VI), with implementation of the new versions proposed for data collected as from 1 January 2011 (**action, Secretariat, SOT-VI**).

III.3.5.6 The meeting decided on the following action items (deadlines to be agreed at the meeting):

- (i) Action 1: Investigate appropriate archiving format(s) at the GCCs taking into account the IMMT format and the modernized International Maritime Meteorological Archive (IMMA) format (offering greater flexibility and direct compatibility with ICOADS) (**action, TT-DMVOS, GCCs, TBD**).
- (ii) Action 2: SOT members invited to discuss the proposed new TT-DMVOS data flow and provide feedback to TT-DMVOS via the GCCs (Appendix A) (**action, SOT, TBD**).

- (iii) Action 3: SOT invited to provide views on the proposed development of a Higher-level QC (HQC) standard, and modernized climatological summary products to replace the outdated Marine Climatological Summaries (MCS). Also suggest how products will be served to users, e.g., through RMs, ICOADS, and the WIGOS Pilot Project; including the role of Geographical Information Systems (GIS) (**action; SOT, TT-DMVOS, TT-MOCS; TBD**).
- (iv) Action 4: Discuss the desirability of new names to replace the data flow and MCS components of the outdated "MCSS" terminology (**action; SOT, TT-DMVOS, TT-MOCS; TBD**).

- B - BACKGROUND INFORMATION

1. The Marine Climatological Summaries Scheme (MCSS), established in 1963 (Resolution 35, Cg-IV), is responsible for the international exchange, quality control and archival of delayed-mode marine climatological data, in support of global climate studies and the provision of a range of marine climatological services.
 2. ETMC and DMCG proposed, with the subsequent endorsement of SOT-IV in 2007, a separation of the management of the two different functions of the MCSS into: (i) delayed-mode VOS data handling, and (ii) the preparation of (tabular/graphical) Marine Climatological Summaries (MCS).
 3. For purposes of modernizing both functions, two task teams were formed: the Task Team on Delayed-mode VOS data (TT-DMVOS), and the Task Team on Marine-meteorological and Oceanographic Climatological Summaries (TT-MOCS) (see Appendices A and B, respectively, for further information).
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APPENDIX A

TT-DMVOS STATUS AND ADDITIONAL INFORMATION

The current Terms of Reference and Membership of the crosscutting Task Team on Delayed-Mode VOS Data (TT-DMVOS) are available at

http://www.jcomm.info/index.php?option=com_content&task=view&id=67&Itemid=0

1. Objectives and Timescales

1.1 In August 2007, TT-DMVOS agreed a 3-year working plan (see Annex) with the main objective of improving the overall data flow. To do this, several areas were identified for improvement:

- The GCCs are to become more proactive in data collection and providing assistance if required.
- In cooperation with the TT-MOCS, plan and implement a Higher-level Quality Control (HQC) standard, intended to provide more detailed data quality feedback than the current MQC, and considering potential linkages with modernized Marine Climatological Summaries (MCS).
- In cooperation with the TT-MOCS, to consider suitable mechanisms for serving and archival of data and modernized MCS products, including eventual interoperability with WIS/WIGOS.
- Consider the flow, in real-time data, and whether it should be quality controlled and archived in a similar way to delayed-mode data.
- Make modernized MCSS information more easily available eventually with a joint GCC website for publishing reports/format/standards, etc.
- Improve data availability for the VOSClim project by regularly providing the full global dataset to VOSClim Data Assembly Centre (DAC).
- Working closely with TT-MOCS to develop useful end products suitable for modern user requirements.

The work is planned for completion in 2010.

2. Progress

2.1 There has been good progress made with the Task Team's working plan to date. There has been meetings and many discussions, which have proved fruitful. The GCCs had a joint meeting in July 2007, in Hamburg, Germany, to generate the working plan document and to initiate tasks. There was also a joint meeting including available members from both TT-DMVOS and TT-MOCS 10 May 2008 in Gdynia, Poland but most collaborations and discussions have taken place by regular e-mails.

2.2 To enable the GCCs to become more proactive in the data collection process the actual participation of Contributing Members (CMs) required verification. A questionnaire was sent to 39 NMHSs yielding 31 responses. The results confirmed a total of 26 participating CMs, which is considerably less than 41 as previously believed. During 2008, 10 out of the 26 CMs did not actively contribute any data to the MCSS so it is planned for 2009 that the GCCs will approach those 10 CMs to provide assistance with contributing to the scheme. This should help increase data flow and ultimately increase data stored within the archives.

2.3 There were past issues with not all VOSClim data being submitted to the DAC. This had been because the list of VOSClim recruited ships was not always updated promptly and hence data from those ships was not being identified. To alleviate this problem the responsibility of selecting the VOSClim data from the quarterly exchange dataset has been shifted from the GCCs to the DAC. Since July 2008, the complete quarterly dataset containing VOSClim data has been dispatched to the DAC,

which now takes ownership of calculating VOSclim observations and statistics.

2.4 During the joint TT-DMVOS/TT-MOCS meeting in 2008, there was extensive discussion about a variety of proposals for the future data flow. Before any action was taken to design a new data flow structure it was important to solicit feedback from all TT-DMVOS members and the eight Responsible Members (RMs). The GCCs distributed a questionnaire to the RMs during summer 2008 and received all responses by August. The results highlighted many different views across RMs but with the general responses showing keenness for the data flow to be modernized, and for RMs still to be involved in the new data flow in some way.

2.5 Considering issues brought up during discussions and the results from the RM questionnaire, a proposed future data flow has now been developed (Fig. 1). This data flow is still largely preliminary, and seen as a goal to work towards (and be refined) over the coming years.

2.6 The light-green boxes (1, 2, and 4 in Fig. 1) indicate that those components already essentially exist in the current systems. In contrast, the other boxes of varying colours are proposed new or modified aspects to the data flow.

2.7 One important change from the current data flow is that an additional GCC (or possible dual/modified role by one of the existing GCCs) should be responsible for Global Telecommunication System (GTS) data collection/storage, and the possible later ingest of GTS buoy data. In addition to offering the possibility to eventually, construct an optimal combined real-time/delayed-mode data mixture, the GCCs could provide a secure environment for data processing, which may help in dealing with the callsign masking issue. With collection of both datastreams (real-time and delayed-mode), the GCCs could potentially identify “masked” data and convert to the real callsign (to allow WMO Pub. 47 metadata linkage, another potential GCC role). As the current GCCs operate within a secure framework (e.g., Ministry of Defence for the Met Office), the details of callsign masking are more likely to be granted.

2.8 A related potential development that would likely, need to be handled in a secure environment is proposed access to contemporary and/or historical “ship particulars” from Lloyd’s commercial organizations, which is an ongoing subject of discussion with the International Maritime Organization (IMO). Selected ship particulars, similar to WMO Pub. 47 metadata, would ultimately be of interest to scientific or other users (including IMO), probably via ICOADS (which currently forms the main context of discussions).

2.9 Boxes 4a (NWP) and 4b (SAT) represent real-time monitoring—similar to that currently being carried out at the UK Met Office. We emphasize that details of any new GCC structures have not yet been agreed to, nor any new resource requirements at the respective host institutions (DWD and Met Office).

3. Work Planned for 2009

3.1 The GCCs met 16-18 March 2009, in Hamburg, Germany, to discuss further progress with outstanding tasks on the 3-year work plan. The proposed work for 2009 (with progress and future plans suggested to be presented at JCOMM-III in November 2009):

- Building on JCOMM/DMPA (2008) and in close cooperation with TT-MOCS, begin development of an HQC standard, through discussion of the feasibility and desirability of these proposed new features:
 - (i) intercomparison checks to add to ones currently included in the MQC.
 - (ii) utilizing modernized/specialized climatologies; e.g., a common climatology for comparison with sea/air temperature and present weather.
 - (iii) utilizing track-checking.
 - (iv) investigate the possibility of GCC real-time monitoring comparisons.

- (v) investigate the possibility of model/NWP comparisons.
 - (vi) investigate the possibility of satellite comparisons.
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- Finalize the data and product flow and functions (Fig. 1) for proposal at JCOMM-III.
 - The GCCs are to work together in the development of WIS DCPCs within respective centres.
 - The GCCs are to investigate ways to contribute data to WIGOS Pilot Project for JCOMM.
 - Investigate ways to establish a joint GCC email address and joint GCC website, anticipating proposed establishment of a single “virtual” delayed-mode GCC (see Fig. 1).

Reference:

JCOMM/DMPA, 2008: Common Issues of Quality Control of Surface Marine Data (Draft, 7 March 2008; Chairs of ETMC, DMCG, SAMOS, GOSUD, et al.). DMCG-III/Doc 5.3 rev1 for JCOMM Data Management Coordination Group, Third Session Oostende, Belgium, 26-28 March 2008 [http://www.jcomm.info/index.php?option=com_oe&task=viewDocumentRecord&docID=1838].

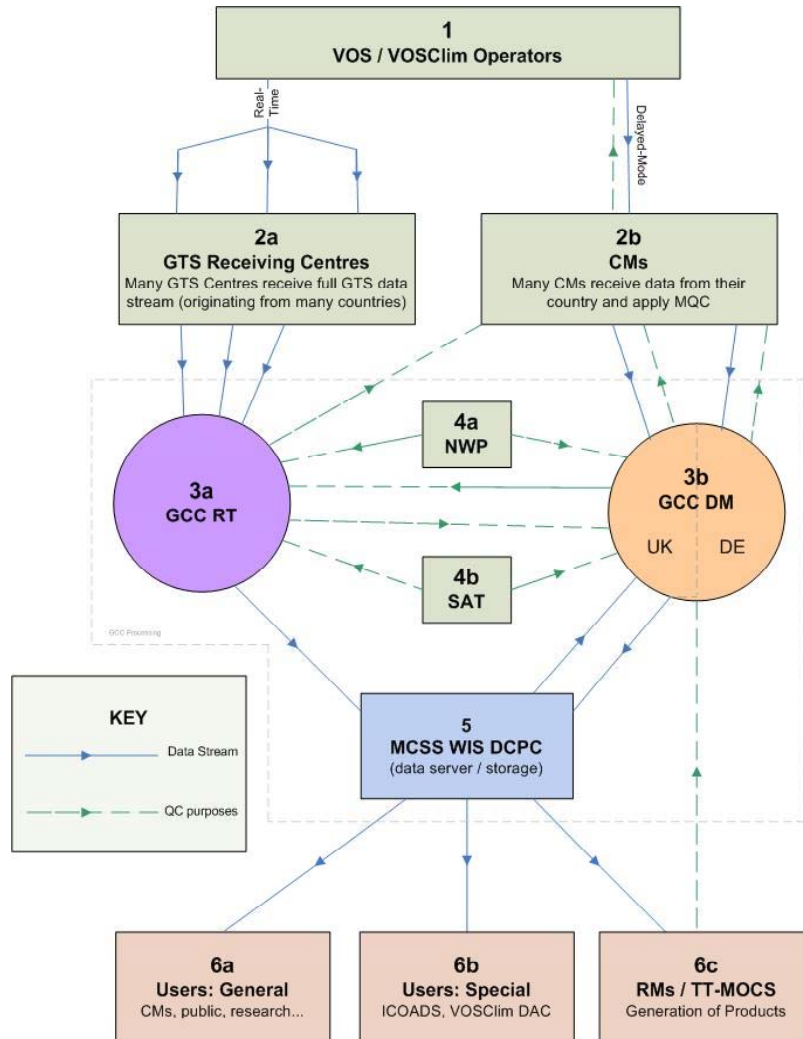


Figure 1: Proposed Flow of Modernized MCSS Data and Products, and Organizational (including GCCs, TT-MOCS) and Project (including ICOADS, VOSclim, and WIGOS Pilot for JCOMM) Roles

Detailed description of Figure 1:

Notes by box number:

1. **VOS/VOSCLIM Operators:** actual ships making the observations, with observers ordinarily sending data in both real-time (GTS) and delayed mode (paper or electronic logbooks).

2a. **GTS Receiving Centres:** Major GTS centres (e.g., across RMs) receiving all VOS and buoy data (FM 13, FM 18, or BUFR) from the GTS/WIS. Their role is to forward all relevant marine data that comes to them regularly (e.g. daily, or initially monthly) on a regular schedule to GCC RT. The forwarding formats are anticipated to be primarily FM 13, FM 18, or BUFR (additional marine codes).

2b. **CMs:** The Contributing Members (currently numbering 26) are responsible for:

- a) collecting DM VOS data from their recruited vessels
- b) applying MQC to these data
- c) forwarding MQC data to GCC DM
- d) investigating problems identified and reported by GCC DM or GCC RT
- e) informing VOS or VOSCLIM (and/or Port Meteorological Officers) about identified problems

3a. **GCC Real-Time (RT):** The RT GCC is responsible for:

- a) assembling all of the real-time data from the GTS Receiving Centres (2a)
- b) resolving duplications within and among the GTS datastreams
- c) identifying data that are unique among datastreams, to assist GTS monitoring activities
- d) applying real-time QC (RQC; proposed for development)
- e) comparing observations with co-located model NWP results to identify possible problems (or linking as appropriate to existing monitoring efforts such as UK Met Office)
- f) comparing with available satellite products to identify possible VOS data problems
- g) notifying respective CM of possible problems
- h) forwarding the data (both original and quality controlled) to the Server (5) on an appropriate timescale (in IMMA/IMMT or other suitable format)

3b. **GCC Delayed Mode (DM):** The DM GCC is responsible for [Note: partly representative of current GCC processing at the GCCs in Germany and UK, including (a)-(b) and (e)]:

- a) assembling the delayed mode data received from CM
- b) ensuring MQC is applied to the delayed mode data
- c) comparing real-time and delayed mode data via Server (5)
- d) identifying and flagging/linking of duplicates of real-time and delayed mode data
- e) notifying the respective CM of any systematic data problems identified, and resolving issues where possible
- f) applying the proposed HQC standard, e.g. track checking
- g) forwarding the dataset to the Server (5), as soon as possible (in IMMA/IMMT or other suitable format)

4a. **NWP:** One or more NWP centres producing analysis and forecasts with GTS data that can provide model fields to compare to real-time and delayed-mode data. These fields are provided regularly (preferably daily or longer periods as appropriate).

4b. **Satellite:** One or more satellite centres with fields of variables that are also found in GTS data. These fields are delivered regularly (preferably daily or longer periods as appropriate).

5. **MCSS WIS DCPC (data server / storage):** Being a Data Collection or Production Centre (DCPC) involves being part of WMO Information System (WIS) and providing both data and discovery metadata. The server contains (or links to) separate or integrated database(s) (real-time and delayed-mode, original and quality controlled). The WIS will hold all discovery metadata for data within the

server/storage point. Software recommended by WIGOS will be used.

The MCSS WIS DCPC is responsible for:

- a. providing appropriate access to the discovery metadata and data (ICOADS and other users) via the WIS;
- b. providing a data-bank to hold the data

6a. **Users - General:** General users (CMs, research, public) may access the Server (5).

6b. **Users - Special (ICOADS & VOSClm DAC):** special users have access to the Server (5), may feedback to GCCs, and interconnect separately with the WIGOS Pilot Project as appropriate.

6c. **RMs / TT-MOCS:** Use data from server to produce modernized products (climatologies, etc.).

ANNEX: TASK TEAM ON DELAYED MODE VOS DATA (TT-DMVOS)
WORK PLAN FOR 2007–2010 (Note: Completed or substantially completed items are listed in grey)

Task No.	Task	Detail	who	when	Status
1	Mutual links on GCCs homepages	• Each of the current GCC websites should create an active link to the other.	GCCs	By end October 2007	Completed
2	Create a unique homepage and email address for the GCCs and investigate ways of making GCC information available, plus, in due course explore the possibility of making data freely available	• A single website is to be developed for the GCCs, to provide access to information regarding data, data-flow, current developments and the Annual report. It should also be investigated how to make data available to users via the site, and monitor the use.	GCCs, supported by TT members	Start investigation ASAP; Seek clarification with WMO by end June 2009;	Discussed at March 2009 Hamburg GCC meeting; First step: Both existing GCC websites will have the same appearance.
3	GCCs to take a more active role in the collection of data	• GCCs to contact CMs to encourage dataflow to the GCCs. Where possible, the GCCs should provide advice/support in getting non-submitting countries to set up a system to allow their data to be contributed.	GCCs	During 2009	Questionnaire results highlighted the CM membership to be 26. GCCs to approach 10 CMs in 2009 to help with contributing data
4	Review and suggest changes to the function of the RMs	• Co-Chairs TT-DMVOS to initiate discussion among the members of the Task Team concerning the future roles of RMs.	GCCs, members of TT-DMVOS	Start investigations / discussions ASAP. Decide RM roles for discussion at JCOMM-III November 2009	GCCs distributed a questionnaire to the 8 RMs. Results now are available with information of activities within MCSS. Provisional future data-flow is currently being discussed and established. Slight changes to the Data Flow Diagram concerning the possible future roles of RMs
5	Develop a Higher-level Quality Control (HQC) standard	• To agree on an appropriate HQC and decide how flags should be set (with input from TT-MOCS). Software to be developed in-line with these decisions and thoroughly tested by both GCCs.	GCCs, TT-DMVOS, TT-MOCS, and external experts as appropriate	Prepare a paper for discussion at JCOMM-III. First version of HQC standard by	Discussions continued March 2009, Hamburg GCC meeting; basic decisions concerning the treatment of

				end 2009	organizational data, stepwise approach to the application of available tools, e.g. advanced criteria and cross checks, common climatology, analyzed fields, satellite data etc.
6	GCCs to apply HQC standard and archive the HQC'd data (note: data flows between CMs and GCCs initially unchanged); GCCs reporting to ETMC via TT-DMVOS	<ul style="list-style-type: none"> • GCCs to routinely, apply HQC software (setting flags only) to collected data and applying standardized manual QC according to the agreed method, prior to archiving. 	GCCs	Start: after completion of Task 5, routinely apply HQC standard after JCOMM-III	
7	Discuss a simplified VOSclim data flow, i.e. routinely transmit quarterly contributions of CMs to the DAC, and document the impact this would have	<ul style="list-style-type: none"> • Discuss benefits of sending the complete global dataset to DAC in the USA, and what impact would this have. Also, consider whether they could collect this data from an FTP server. • Consideration should also be given to the frequency and method of data distribution and definition of VOSclim. Recommendation should be supplied to ETMC/SOT via annual reporting mechanism (task 15). 	TT-DMVOS, GCCs	Start: October 2007, decide by end January 2008	Since July 2008, the GCCs have sent the whole quarterly dataset to the DAC for selecting the VOSclim-ships. DAC now responsible for selecting VOSclim data and stats.
8	Review and suggest appropriate data storage structure for archival of delayed mode and real-time data. Also, consider the storage and use of additional remarks and phenomena reports.	<ul style="list-style-type: none"> • Decide on the most suitable database structure for storage of delayed mode data, taking into account the reconciliation of IMMT and IMMA formats. Consider a structure that data can be easily retrieved and which other data types may eventually be stored. • Also consider storage of platform and instrumental metadata e.g. WMO Pub. 47, and quality control feedback metadata. 	GCCs, supported by appropriate experts	Start: March 2009, depending greatly on codes but aim to complete by end 2009 (prior to archival of HQC'd data by GCCs)	To be discussed at JCOMM-III late 2009.
9	Investigate how suggested changes to MQCS-V could be implemented	<ul style="list-style-type: none"> • Changes suggested to MQCS at ETMC were tentatively agreed but formal acceptance was delayed; now pending review by SOT-V and suggested adoption by JCOMM-III. • GCC software will require upgrading to reflect the eventual adoption of MQCS-VI. 	GCCs, TT-DMVOS, Chair ETMC	April 2009	In August 2008, the ETMC agreed with the corrected limit of SLL to 40m in MQCS-V. Since October 2008, the GCCs have used the updated software. This has still to be formally accepted.

10	Investigate ways to reconcile the IMMT and IMMA formats, and suggest improvements.	<ul style="list-style-type: none"> Compare and contrast the differences and similarities between IMMA and IMMT formats. Decide on the particular strengths of each that may be ultimately combined in a new format, with appropriate consideration to the characteristics of Table Driven Codes (e.g., BUFR). Also, investigate software for conversion of IMMA to other data formats, and vice versa. Consider particularly the idea of including unique identifiers on each observation and conversion issues concerning netCDF. 	Chair ETMC, Co-Chairs and members of the TT-DMVOS	Presentation of results by end 2009	NCDC has provided Chair ETMC with a program to convert from IMMT-III to IMMA. GCC Germany has made comparisons. GCCs to ask for conversion software and discuss further, ASAP.
11	Develop appropriate promotional material to make the system widely known in the marine community	<ul style="list-style-type: none"> Investigate and action various methods of promoting the work of the GCCs (i.e. international marine publications and a newsletter to PMOs). 	GCCs, members of TT-DMVOS	Produce new promotional material after JCOMM-III; questionnaire to TT-DMVOS members ASAP	The GCCs and the WMO listed contact persons and email-addresses from many CMs; representatives of the GCCs attend regular meetings to provide updated information
12	Investigate and implement suitable end products for use by international users	<ul style="list-style-type: none"> Liaison with TT-MOCS regarding the planned modernization of the marine climatological summaries, including investigating the types of end products users would like (i.e. charts/summaries) and possibilities for generating these routinely. 	TT-MOCS, TT-DMVOS, and GCCs	After completion of tasks 5,6 & 8 – summer 2010	
13	Develop an annual reporting mechanism between TT-DMVOS, ETMC and SOT	<ul style="list-style-type: none"> Ensure ETMC and SOT are kept informed annually of developments any problems with achieving the work plan. 	Co-Chairs TT-DMVOS in cooperation with Chairs ETMC and SOT	To start in 2008 and then continue annually	Developments reported to CLIMAR-III and SOT-V
14	Update GCCs function description within WMO manuals/guides	<ul style="list-style-type: none"> GCCs to update descriptions of MCSS dataflow, and other changes to MCSS in liaison with TT-MOCS, within the <i>Guide to</i> (WMO-No. 471) and <i>Manual on Marine Meteorological Services</i> (WMO-No. 558). 	GCCs, TT-MOCS	After new dataflow system is fully agreed and tasks 2, 4, 5, 6, 8, 9 & 13 are complete	
15	Set up TT-DMVOS meeting to chart progress	<ul style="list-style-type: none"> Align this meeting to coincide with CLIMAR-III 	TT-DMVOS	Book meeting by end November 2007, set agenda by end March 2008	Meeting occurred alongside CLIMAR-III in May 2008
16	Draft new ToR for the ETMC	<ul style="list-style-type: none"> Possible modifications to ETMC's ToR to reflect TT-DMVOS (and TT-MOCS) new roles. 	Secretariat, Chair ETMC, Chairs	by CLIMAR-III (May 2008),	Later DMPA/ETMC discussion lead to the

			TT-DMVOS & TT-MOCS	starting ASAP	conclusion that the ETMC ToR be tentatively kept unchanged for JCOMM-III
17	Draft proposal to ETMC regarding ICOADS role in modernised dataflow	<ul style="list-style-type: none"> • Draft a proposal regarding a proposed formalization of the role of ICOADS in the context of modernizing the delayed-mode data flow, and related issues, with the aim to develop a recommendation for JCOMM-III 	TT-DMVOS	In-line with the proposal at JCOMM-III	Provisional future data-flow is currently being discussed and in development stage (see Fig. 1)
18	Review GHRSSST-PP database	<ul style="list-style-type: none"> • Review the structure and content of the GHRSSST-PP database prior to operational implementation. Feedback results to ETMC. 	TT-DMVOS	Start ASAP, complete by December 2007	Yet to start

APPENDIX B

TT-MOCS STATUS AND ADDITIONAL INFORMATION

1. The current Terms of Reference and Membership of the ETMC Task Team on Marine-meteorological and Oceanographic Climatological Summaries (TT-MOCS) are available at http://www.icomm.info/index.php?option=com_content&task=view&id=51&Itemid=57
2. TT-MOCS was established with one major intention to modernize and determine the future role of the (tabular/graphical) Marine Climatological Summaries (MCS), which, together with the data management function now overseen by TT-DMVOS, form a longstanding component of the MCSS. When the MCS were originally introduced they were “state of the art” climatologies, but now there is a need to reassess the current requirements for their production, or modernization. Currently it is thought only the Responsible Members (RMs) Germany, India and Hong Kong regularly produce or publish MCS products.
3. Following the ETMC-II recommendation for the establishment of TT-MOCS, an ad hoc crosscutting task team was established to draft the Terms of Reference, with membership from the ETMC, the JCOMM Service Programme Area’s Expert Teams on Sea Ice (ETSI) and Wind Waves and Storm Surges (ETWS), the WMO Commission for Climatology (CCI), and the joint CCI/CLIVAR/JCOMM Expert Team on Climate Change Detection and Indices (ETCCDI).
4. The ad hoc team completed its work by the end of 2007, and in broad terms defined the role of TT-MOCS to identify existing and potential users of, and review requirements for, marine climatological summary products and their dissemination, particularly for climate change detection, monitoring and indicators of climate trends on appropriate time scales. The TT-MOCS was also planned to consider the potential for integrated products (e.g. meteorological, oceanographic, sea-ice), and explore linkages between marine and coastal land based products; develop accordingly a list of potential products, consider production and delivery mechanisms, and their appropriate structure. It will develop metrics for the marine climatology products and their delivery (including documentation and standardization of QC, data and products usage, data adequacy for product quality). The Task Team will liaise with the TT-DMVOS for updating the overall MCSS, review its organizational structures and responsibilities, including the definition of the role and functions of the Responsible Members (RMs) concerning generation of marine climatological products, and propose changes to the *Manual on* and the *Guide to Marine Meteorological Services* (WMO Nos. 558 and 471) accordingly. Finally, the Task Team will also contribute to the development of a Higher-level Quality Control (HQC) standard proposed for international agreement.
5. Modernizing the data flow component of MCSS under TT-DMVOS has represented a more urgent initial priority for ETMC and JCOMM, and thus the TT-MOCS has progressed more slowly than TT-DMVOS. However, discussion at the 10 May 2008 joint TT/DMVOS/TT-MOCS meeting in Gdynia, Poland suggested several possible initial avenues for limited action fairly soon, including the possibility that TT-MOCS could provide tools to access data rather than explicit indices/summaries. For example, these might include making data and products available in Geographic Information System (GIS) compatible formats, and as Open GIS Consortium (OGC) and ISO compliant web services. At that meeting, it was suggested that perhaps the GCCs could produce monitoring statistics—but it would be important not to duplicate monitoring work currently carried out in various countries.
6. One suggested TT-MOCS product might be a 30-year climatology (or climatologies for different climate periods), as there are currently few of those available in digital form (ICOADS for example has some climatological fields available). TT-MOCS should consider including other data sources such as satellites. This would allow good inter-comparisons of data types. At the joint meeting, it was decided that the ToR for TT-MOCS should remain as is for now, but be monitored as work/discussions continue, and that the limited focus of TT-MOCS upcoming would be on climatologies, with ocean

winds being the highest priority.

7. In November 2008, the Interim Chair of TT-MOCS (Martin Rutherford) approached individual researchers, research groups and agencies that either had major wind data holdings or had published papers on wind climatologies. The aim was to seek support for forming a collaborative research group to take a "GHRSSST like" approach to ocean winds. Despite many statements of support for the concept, the outcome was to include ocean winds in appropriate climatology related Community White Papers being developed for OceanObs09. This would allow greater community discussion and TT-MOCS could then consider the appropriate level of participation in any resulting Project.

8. The Interim Chair also investigated publishing the existing ICOADS as a web map service to prototype the technology and allow further informed discussion by TT-MOCS members and other interested parties. This activity led, not to the expected sample, web map services but instead, to the discovery of bugs in the software package being used to publish web services directly from netCDF files. The vendor is expecting to release a software patch in April 2009, after which another attempt to deliver GIS compatible data and web map services will be made.

9. In the future, possible integration of sea ice and wind waves and storm surges climatologies appear desirable and might be possible through (i) liaison with the ETCCDI, ETSI, and ETWS, and (ii) consideration of new data management (e.g. global wave climatology atlas — ERA-40 wave atlas, <http://www.knmi.nl/waveatlas>). Development of the HQC standard has been tasked jointly to the TT-DMVOS and TT-MOCS.

10. In the broader JCOMM and WMO context, stronger links are now being considered between JCOMM and CCI, and synergies further developed. Other issues to consider with CCI include WIGOS, discovery metadata, platform/instrument metadata, extreme events, integrated products, Capacity Building, and the International Satellite Cloud Climatology Project (ISCCP).

11. Two ETMC members (Dr Elizabeth Kent and Mr Scott Woodruff; among four JCOMM representatives) participated at the second meeting of the the joint CCI/CLIVAR/JCOMM Expert Team on Climate Change Detection and Indices (ETCCDI) (2006), and at an ETCCDI progress meeting (2008).

12. While new linkages with CCI were discussed at ETMC-II, there has been little or no progress since then, in further developing those (in areas such as: impacts on land vs. marine visual observations arising from Automated Weather Systems [AWS], instrument standards/best practices, and historical data). It is anticipated, however, that TT-MOCS, once more fully tasked, will form a very useful formal point of interaction with both CCI and ETCCDI on a number of these issues.
