Marine Climatological Summaries Scheme (MCSS)

Introduction

The Marine Climatological Summaries Scheme (MCSS) was first proposed at the third session of WMO Commission on Marine Meteorology (the forerunner to JCOMM, the Joint IOC/WMO Commission for Oceanography and Marine Meteorology) in 1960, and eventually adopted at the fourth congress in 1963. The objective was to establish a joint effort of all maritime nations in the preparation and publication of climatological statistics and charts for the oceans. Eight countries (responsible members), each with a specific ocean area of responsibility (**Figure 1**), were designated to process the data in prescribed forms and regularly publish climatological summaries. However, in 1981, this routine publication ceased and climatological summaries are now only published by responsible members on an optional basis.

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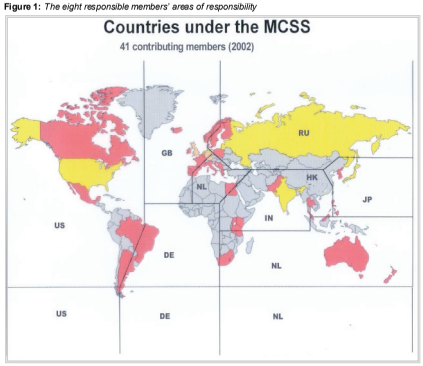
Figure 1: *The eight responsible members' areas of responsibility*



Global Collecting Centre

To improve the flow and quality control of global data, in 1993, the eleventh session of JCOMM established two Global Collecting Centre (GCCs), UK and Germany.

Contributing members receive data from their voluntary observing fleet (VOF) and once a quarter send these to both GCCs. The GCCs work in parallel to ensure the data are processed to a minimum quality control standard (see attached) and at the end of each quarter the combined dataset is distributed to all Responsible Members (**Figure 2**). All responsible members now receive the full global dataset. However, on request they are obliged to produce marine summaries for their area of responsibility only (**Figure 1**) and may do so at the cost of processing (**Figure 5**).

Orders for marine climatological summaries or observational data should be addressed directly to the responsible member.

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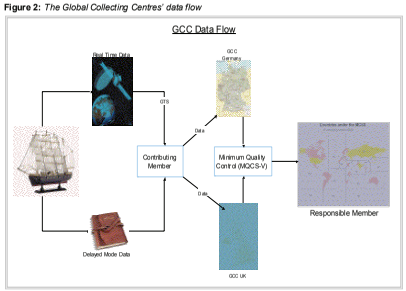
All data are in the IMMT-3 (International Marine Meteorological Tape) format and are processed to MQCS-V (minimum quality control standard – version 5). The decode for both the IMMT format and MQCS-V are attached.

Figure 2: *The Global Collecting Centres' data flow*



Climatological summaries

For each area of responsibility, monthly, annual and decadal summaries may be produced.

The summaries are presented in either chart or tabular form (chart preferred) and should include the elements shown in **Table 1**. An example of a climatological summary is shown in **Figure 4**, where each group of data represents a fixed unit area, usually of about 5°x5° squares (but this can be as large as about 5°x10° for data-sparse areas and as small as 1°x1° for some coastal locations). The summary will provide up to three pieces of information, and for the air temperature example shown, mean, standard deviation and number of obs are displayed.

The annual mean for a selected area, presented in chart form, will only be calculated if there are at least 10 observations, whereas in the case of tabular summaries and decadal summaries, the mean will only be calculated if there are at least 40 observations. In **Figure 3**, the distribution of observations received by the GCCs in 2004 is shown, which indicates the amounts of data available for areas throughout the world.

Figure 3: *2004 GCC Annual Report — area distribution of observations*

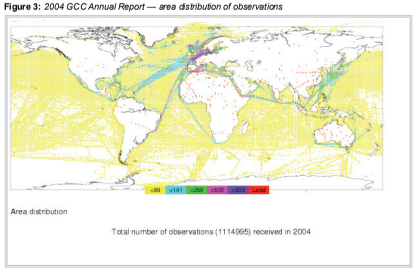
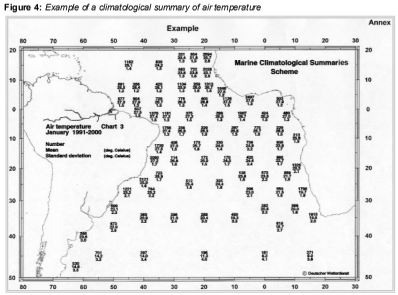


Figure 4: *Example of a climatological summary of air temperature*



Requests for summaries

Requests for summaries can be made directly to any of the responsible member countries. However, the cost of processing is sometimes charged. For further information/requests, contact one of the responsible members below:

Germany	gcc@dwd.de, www.dwd.de
Hong Kong	hkpmo@hko.gov.hk, www.hko.gov.hk
India	sivanair@hotmail.com, www.imd.gov.in
Japan	tyoshida@met.kishou.go.jp, www.jma.go.jp
Russia	kem@meteo.ru, www.meteo.ru
The Netherlands	koek@knmi.nl, www.knmi.nl
UK	gcc@metoffice.gov.uk, www.metoffice.gov.uk
USA	david.p.bowman@noaa.gov, www.noaa.gov

The countries that provide summaries free of charge are listed in **Figure 5**.

Figure 5: *Countries' cost for providing summaries, analyses and services to members — status 1988*

Basis of Provision [WMO:781-Guide to the applications of Marine Climatology]
Cost of provision: Australia, Canada, Hong Kong, Iceland, India, Japan, New Zealand, Norway, United Kingdom
Free of charge: France, Germany, Italy, Kuwait, Malaysia, Mauritius, The Netherlands, Saudi Arabia, Yugoslavia
None provided: Bangladesh, Benin, Brunei, Darussalam, Chile, Colombia, Denmark, Egypt, Ethiopia, Finland, Greece, Ireland, Israel, Kenya, Korea, Morocco, Pakistan, Sao Tome, Singapore, Sudan, Thailand, Tunisia, Turkey, United Arab Emirates, Uruguay

The future of MCSS

At the JCOMM ETMC (Expert Team on Marine Climatology) meeting in Gdynia, July 2004, it was decided that a questionnaire should be produced to be circulated among WMO members involved in marine climatology. The purpose of this questionnaire was to gather various opinions on the applications, benefits, new requirements and possible modifications concerning the scheme and its output. This information can then be used to help develop and better the scheme for current and future users.

The questionnaire has now been distributed by the WMO, which is awaiting members' feedback (a copy of the questionnaire is attached).

Table 1: *Elements and characteristics to be included in climatological summaries*

Chart No.	Element	Characteristic	Accuracy	Symbol
1	Air Temp	Mean	0.1 °C	T
		Std Dev	0.1 °C	σ_T
		Number	-	N_T
2	Sea-Surface Temp	Mean	0.1 °C	T_w
		Std Dev	0.1 °C	σ_{TW}
		Number	-	N_{TW}
3	Dew-Point Temp	Mean	0.1 °C	T_d
		Std Dev	0.1 °C	σ_{Td}
		Number	-	N_{Td}
4	Air-Sea Temp	Mean	0.1 °C	$T\text{-}T_w$
		Std Dev	0.1 °C	$\sigma_{\Delta T}$
		Number	-	$N_{\Delta T}$
5	Sea-Level Pressure	Mean	0.1 hPa	P
		Std Dev	0.1 hPa	σ_p
		Number	-	N_p
6	Wind Speed	Median	0.1 m/s	f_{50}
		Std Dev	0.1 m/s	σ_f
		Steadiness of Wind	-	
7	Wind Direction	Prevailing Direction	1°	
		Number Estimated Obs	-	N_c
		Number Measured Obs	-	
8	Wind Speed / Direction	% Light Winds - ≤ 3 m/s	0.1%	
		% Strong Winds - ≥ 11 m/s	0.1%	
		Prevailing Direction of Strong Wind	1°	
9	Wind Speed / Direction	% Gales ≥ 17 m/s		
		Prevailing Direction of Gales	1°	
		-	-	
10	Wave/Swell Height	Median		H_{50}
		Std Dev	0.1 m	σ_H
		Number	-	N_H
11	Wave/Swell Height	% Waves ≤ 1.5 m	0.1%	
		% Waves ≥ 4 m	0.1%	
		% Waves ≥ 6m	0.1%	
12	Wave/Swell Period Swell Direction	% Wave Periods ≥ 6 s	1 s	
		Prevailing Swell Direction	1°	
		Number of Swell Obs	-	
13	Present Weather	% Obs with Rain or Drizzle	0.1%	
		% Obs with other Precipitation	0.1%	
		Number of Present Weather Obs	-	
14	Total Cloud Amount	% Total Cloud Amount ≤ 2 oktas	0.1%	
		% Total Cloud Amount ≤ 6 oktas	0.1%	
		Number of Total Cloud Obs	-	
15	Visibility	% Visibility < 1 km	0.1%	
		% Visibility ≥ 10 km	0.1%	
		Number of Visibility Obs	-	
16	Latitude/Longitude	Mean Latitude of Obs	0.1°	L_a
		Mean Longitude of Obs	0.1°	L_o
		Total Number of Obs	-	-
17	Latitude/Longitude	Std Dev Latitude	0.1°	$\sigma_{L,a}$
		Std Dev Longitude	0.1°	$\sigma_{L,o}$
		Total Number of Obs		-
18	Ice	Number of Icing Reports	-	
		% Potential Moderate/Severe Icing	0.1%	
		Number Obs containing Air temp & Wind	-	

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