

Global Collecting Centre

Annual Report 2015



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Summary

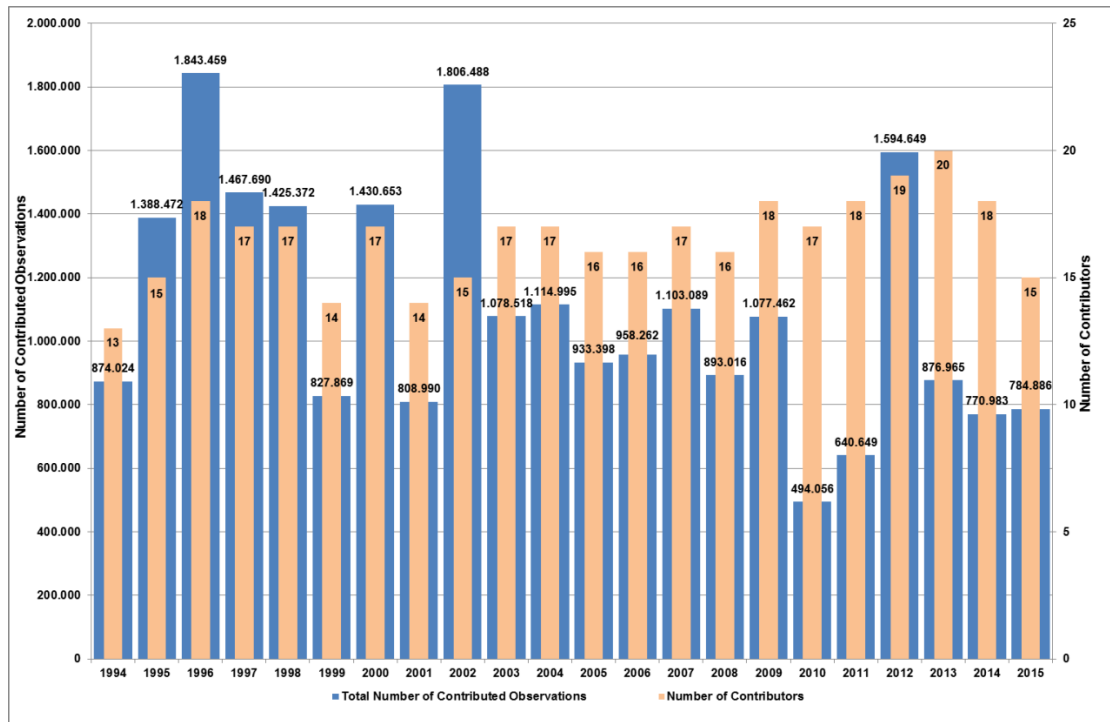
2015 marks the 22nd year of GCC operation, 22 years of successful and effective data management. Fifteen Contributing Members submitted data to the GCCs in 2015. The number of contributed observations increased slightly compared to the preceding year (see Figure 1), with the majority of observations made in the last two years and the oldest records dating back to 2008.

All data, original and MQC-checked, are available on the German WMO Information System (WIS) GISC http://gisc.dwd.de/GISC_DWD/toSimpleSearch.do.

Background

The two Global Collecting Centres (GCCs) for JCOMM's Marine Climatological Summaries Scheme (MCSS) were set up in 1993 to improve the data flow and quality of delayed-mode Voluntary Observing Ship (VOS) data. Data is received regularly by the GCCs (Figure 1 and Appendix A) from the MCSS Contributing Members (CMs) (Appendix B). This is then quality ensured to the Minimum Quality Control Standard (MQCS-7) and quarterly made available to Responsible Members (RMs) via FTP. For further information about the MCSS and GCCs work, terms of reference, data format and QC standards, see WMO Manual 558 and WMO Guide 471.

Figure 1: Numbers of contributed observations and active Contributing Members by year since GCCs began to operate



VOS Data Volumes 2015

- 784,886 observations were received and processed by the GCCs during 2015.
- 15 CMs contributed data out of a total of 27 registered Members/Member States (Figure 2).
- 961 Voluntary Observing Ships (VOS) made observations in 2015.
- The observation dates of the contributed data ranged from 2008 to 2015, however, 92% of the data were observed in the last two years, 2014 and 2015.
- 16% of the received observations were coded in IMMT-3 format, 67% in IMMT-4 format and 17% in the most recent IMMT-5 format.

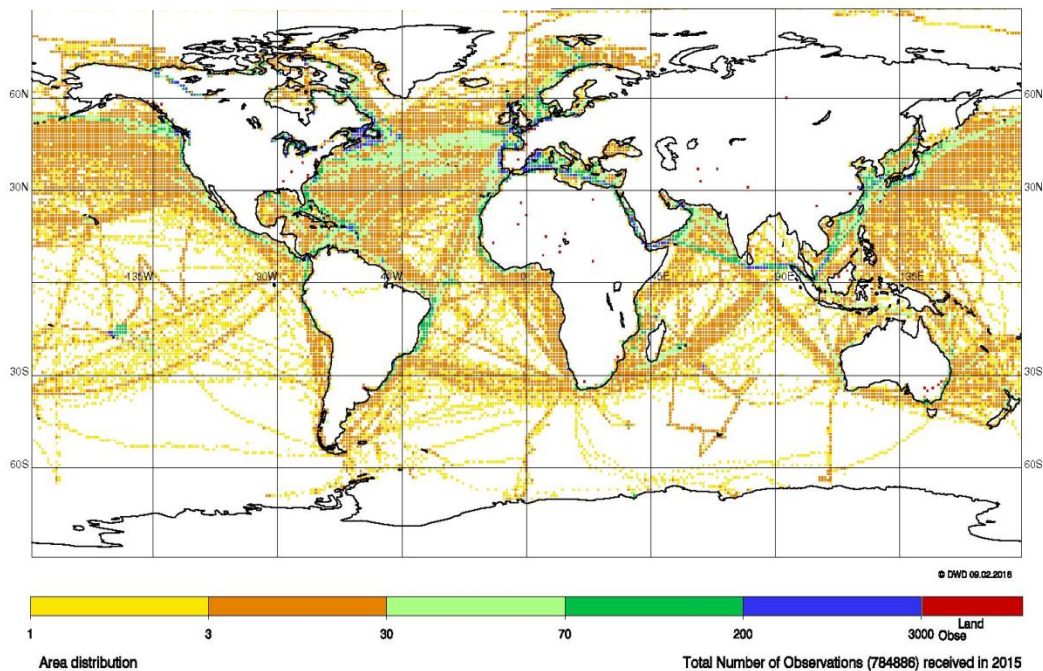
Figure 2: Number of observations by CMs for each quarter of 2015 (CMs without any contribution in 2015 are marked in red)

Number of CM Observations 2015						
Country Name	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total	
Argentina						
Australia			403	7,725	1376	9,504
Brazil						
Canada				335,737		335,737
Croatia						
France	51,796	52,270	38,907			142,973
Germany	37,328		50,559	30,543		118,430
Greece						
Hong Kong, China	486	642	543	888		2,559
India						
Ireland	360					360
Israel						
Italy						
Japan	1,749	5,065	2,968	1,041		10,823
Kenya						
Malaysia						
Netherlands	7,592		4,788	5,108		17,488
New Zealand			1,220			1,220
Nigeria						
Norway	12,397	12,723	11,459	8,908		45,487
Poland						1,402
Russian Federation	3,909	3,372	2,077	2,017		11,375
Singapore						
South Africa		1,051	332			1,383
Sweden						
United Kingdom	14,366		37,067	12,035		63,468
USA	2,553	5,398	11,885	2,841		22,677
15 of 27 Contributing Countries	132,536	80,924	505,267	66,159		784,886

VOS Data Quality 2015

- When evaluated against the MQCS, the majority of the reported elements were again found to be of good quality. Such elements were assigned a QC Flag of '1' meaning 'element appears correct'. For example, frequently reported elements such as air pressure, wind direction, wind speed and sea surface temperature were flagged with a '1' in over 98% of cases, and air temperature in 94% of cases.
- There were 152 observations (0.02%) showing on-land positions. These are plotted as red dots in Figure 3.
- The TurboWin coding problem of the previous year persists leading to a number of IMMT-4 and -5 files being submitted with erroneous relative humidity values. These data were identified and the corrected files made available on the German WMO Information System (WIS) Global Information System Centre (GISC). Until the coding problem is resolved, the GCCs will correct the data before processing and distribution.
- No previously exchanged datasets had to be corrected in 2015.
- Quarterly analysis of the exchanged datasets identified 33 duplicate observations (0.004%) that were rejected by the MQCS. Analysis of the yearly dataset highlighted that the number of observations rejected increased to 932 (0.1%). These observations failed MQC but were included at quarterly exchange.
- Before each quarterly data exchange, duplicates arising as a result of the same observations being submitted in a previous contribution were deleted. Unfortunately, duplicate observations submitted in different quarters cannot be identified. The new data quality software developed by the DWD will improve the elimination of duplicates.
- A small number of observations containing erroneous positions were identified, and after consultation with the appropriate CM, deleted.
- The RM USA (NOAA) supports the ICOADS (International Comprehensive Ocean-Atmosphere Data Set) with the quarterly MQC-checked dataset from the GCCs.

Figure 3: Distribution of observations received in 2015



VOSClim Class Data 2015

- 569,808 observations were received and processed from VOSClim registered ships during 2015.
- This represents 73% of data received by the GCCs from the VOS fleet in 2015.
- 10 of the 12 CMs with registered VOSClim ships submitted observations (Figure 4) in 2015.
- In 2015, the GCCs received data from over 341 listed VOSClim ships.
- 215,853 of the VOSClim observations (38%) contained the VOSClim defined additional elements.
- The CMs France and Japan provided 100% of VOSClim elements in the VOSClim reports.

Figure 4: VOSClim class observations submitted by CMs for each quarter of 2015
(CMs without any VOSClim contribution in 2015 are marked in red)

Total Number of Observations from VOSClim-Ships / Number of Observations with VOSClim-Elements from VOSClim-Ships /															
Number of Observations with VOSClim-Elements from not listed ships 2015															
Country Name	1st Quarter			2nd Quarter			3rd Quarter			4th Quarter			Total		
Australia	0	0	0	0	0	0	1.571	616	595	0	0	0	1.571	616	595
Canada	0	0	0	0	0	0	328.087	0	0	0	0	0	328.087	0	0
France	41.665	41.665	9.380	52.270	52.270	0	38.907	38.907	0	0	0	0	132.842	132.842	9.380
Germany	11.564	8.374	0	0	0	0	15.724	14.495	355	6.699	5.738	310	33.987	28.607	665
Hong Kong, China	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
India	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Japan	0	0	0	3.057	3.057	0	0	0	0	0	0	0	3.057	3.057	0
Netherlands	4.403	4.136	2.638	0	0	0	4.345	3.649	442	4.761	4.733	246	13.509	12.518	3.326
New Zealand	0	0	0	0	0	0	341	0	0	0	0	0	341	0	0
South Africa	0	0	0	1.045	0	0	331	0	0	0	0	0	1.376	0	0
United Kingdom	11.727	7.767	154	0	0	0	30.110	20.549	931	11.251	7.949	214	53.088	36.265	1.299
USA	207	206	324	280	280	3.296	308	307	7.121	1.155	1.155	864	1.950	1.948	11.605
10 of 12 countries	69.566	62.148	12.496	56.652	55.607	3.296	419.724	78.523	9.444	23.866	19.575	1.634	569.808	215.853	26.870

Recent Developments

Meetings and Activities

SOT

In April 2015 the Ship Observations Team (SOT) met for its 8th session in Cape Town, South Africa. Following discussions centred on the flow of delayed-mode data, the Voluntary Observing Ship (VOS) panel invited the Expert Team on Marine Climatology (ETMC) to investigate the potential for developing automated procedures to allow IMMT data to be sent directly to the CM or GCCs.

The GCCs presented updates to the group on the activities of the GCC and progress made with the Marine Climate Data System (MCDS). On recognising that many SOT members operating Automatic Weather Station (AWS) systems on ships were not submitting delayed-mode data, members were encouraged to make every effort to ensure that data are submitted to the MCSS in IMMT format, according with the WMO Technical Regulations detailed in WMO No. 558 and 471.

GCC Meeting

The two GCCs met in Hamburg, Germany, in May 2015 to discuss a number of issues relating to operations, including how to encourage countries to submit their data and how to help those with automated ships to submit delayed mode data. It was agreed that GCCs should contact CM more regularly, providing details of annual reports and presenting any highlights from future meetings.

ETMC

In June 2015, the Expert Team on Marine Climatology met for its 5th sessions in Geneva, Switzerland. An important goal of the meeting was to make substantial progress towards the development of the MCDS as a replacement for the Marine Climatological Summaries Scheme (MCSS). The team discussed potential roles for the various stake holders in the MCDS, giving particular attention to how the role of a RM in the MCSS might transition under the MCDS. Terms of reference for Data Acquisition Centres (DAC) and Global Data Assembly Centres (GDAC) were proposed and a number of potential candidates for each centre identified. The team agreed that the role of the GCCs should eventually evolve as a GDAC in the framework of the MCDS.

Significant progress was made in updating sections of the WMO Guide to Marine Meteorological Services (No. 471) and Manual on Marine Meteorological Services (No. 558) relevant to marine climatology. The goal is to have final changes to these publications ready to submit to JCOMM-5 in 2017.

The team also reviewed the status of the IMMT and MQCS formats. It was again noted that with CM continually moving to automated fleets, there is a risk that data could be lost if they are not submitted to the GCC in IMMT format. The team agreed that the replacement of the MCSS with the MCDS provides an opportunity to discuss the suitability of the IMMT format moving forward, given that it was designed specifically for delayed-mode VOS observations and the MCDS encompasses multiple data types.

Assisting CM

The DWD assisted Canada and the Netherlands in preparing their contributions in 2015.

HQC Development

The newly developed high quality program Validat was tested extensively and expanded to include more features. These improvements have been included in the documentation which will be available soon.

Recommendations

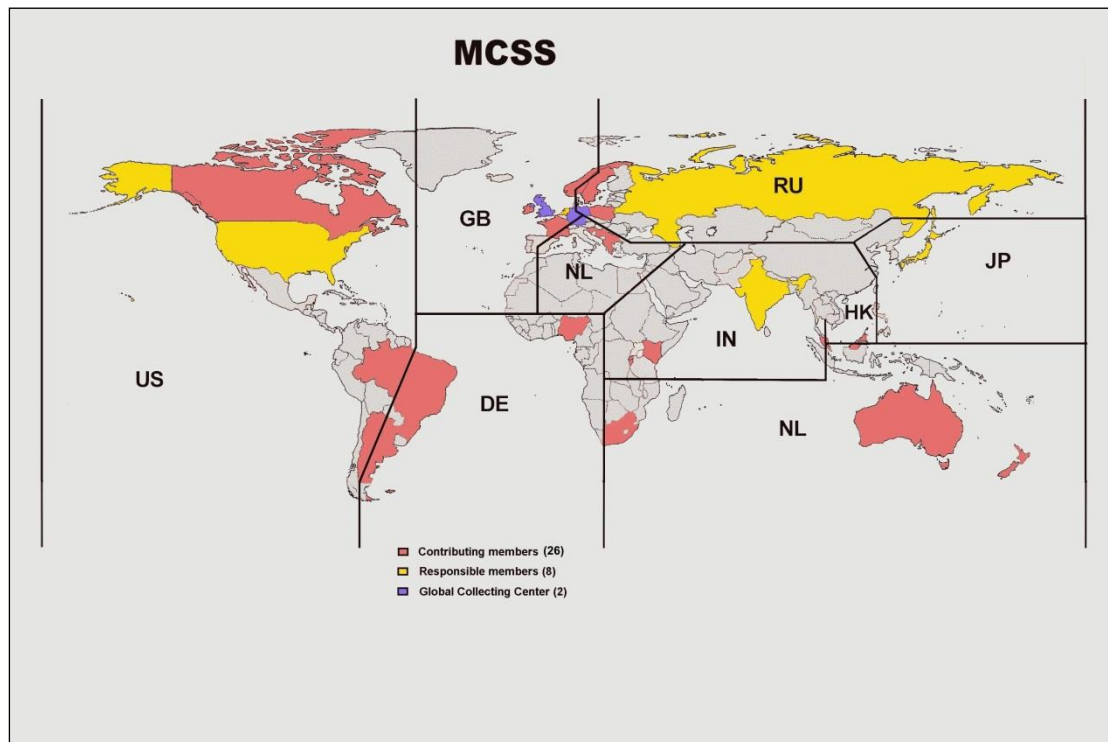
To improve data availability and quality, and in light of the recent developments, the GCCs make the following recommendations:

- CMs should submit their observations only once. If there is a requirement to resubmit data (e.g. quality improvements) then the GCCs should be made aware of this.
- CMs should submit data files in one IMMT format only – preferably now IMMT-5.
- Where problems arise that prevent a CM submitting its data e.g. when digitizing or converting into the IMMT format, GCCs should be asked for advice.
- By applying MQCS to data prior to submission, CMs can identify and solve significant problems, in particular issues within date, time and position.
- All VOSClim class ships should use the indicator for registered VOSClim ships in element 41 (observation platform), in the newly adopted formats IMMT-4 and -5, with the option set to 4.
- All VOSClim class ship observations should include the additional VOSClim elements.
- CMs with Voluntary Observing Ships reporting the additional VOSClim elements should consider listing the vessels within the VOSClim program.
- If possible, convert all masked call signs (i.e. 'SHIP') back to the original ID prior to submission.
- CMs and RMs should stay up to date with TT-MCDS developments in order to ensure they know how they might be affected in the future or how they may contribute in the present. This can be done by attending meetings or reading workshop and session reports available on the JCOMM website.
- CMs and RMs should consider if they wish to apply to be Data Acquisition Centres (DACs) and Global Data Assembly Centres (GDACs) in the future MCDS.
- Where fleets contain automated ships CMs should make every effort to ensure that delayed-mode data is submitted to the GCCs.

Appendix A: CM contribution by year since GCCs began operations in 1994

	ISO Alpha-2 code	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Number of Years with Contributions 1994 - 2015	
Argentina	AR								X					X										7	
Australia	AU							X		X	X	X	X		X	X	X	X	X			X	X	X	13
Brazil	BR	X	X	X	X																				4
Canada	CA																		X	X	X	X	X		5
Croatia	HR				X	X	X	X	X											X	X	X	X		7
France	FR	X	X	X	X	X			X		X	X	X	X	X	X	X		X	X	X	X	X	X	18
Germany	DE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	22
Greece	GR																		X	X	X				3
Hong Kong, China	HK	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	22
India	IN	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	20
Ireland	IE			X	X	X				X								X	X	X	X		X	X	10
Israel	IL		X	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X	X	X			18
Italy	IT																					X			1
Japan	JP	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	22
Kenya	KE																								0
Malaysia	MY	X		X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		19
Netherlands	NL	X	X	X		X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	20
New Zealand	NZ													X	X	X	X	X	X	X		X	X		9
Nigeria	NG																								0
Norway	NO	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X			X	X	X	X		19
Poland	PL	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	22
Russian Federation	RU		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	21
Singapore	SG		X	X	X	X					X	X	X	X						X					9
South Africa	ZA						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	17
Sweden	SE			X														X	X	X		X	X		6
United Kingdom	GB	X	X	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X	X	X	X	X	20
United States	US	X	X	X	X	X	X	X		X	X				X	X	X	X	X	X	X	X	X	X	18

Appendix B: Countries and regional responsibilities under the MCSS (updated 2009)



Appendix C: List of acronyms

APP	Ancillary Pilot Project
AWS	Automatic Weather Station
CM	Contributing Member
CMOC	Centre for Marine Meteorological and Oceanographic Climate Data
DAC	Data Acquisition Centre
DMCG	Data Management Coordination Group
DWD	Deutscher Wetterdienst
E-SURFMAR	EUCOS Surface Marine Programme
ETMC	Expert Team on Marine Climatology
FTP	File Transfer Protocol
GCC	Global Collecting Centre (MCSS / JCOMM)
GDAC	Global Data Assembly Centre
GISC	Global Information System Centre (of WIS)
HQCS	Higher Quality Control Standard
ICOADS	International Comprehensive Ocean-Atmosphere Data Set (USA)
IMMT	International Maritime Meteorological Tape Format
IOC	Intergovernmental Oceanographic Commission of UNESCO
IODE	International Oceanographic Data and Information Exchange
JCOMM	Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology
MCDS	Marine Climate Data System
MCSS	Marine Climatological Summaries Scheme
MQCS	Minimum Quality Control Standard
NCEI	National Centers for Environmental Information
NMDIS	National Marine Data and Information Service
NOAA	National Oceanic and Atmospheric Administration (USA)
ODP	Ocean Data Portal
QC	Quality Control
RM	Responsible Member
SOA	State Oceanic Administration
SOT	Ship Observations Team
TT-MCDS	Task Team on Marine Climate Data System of ETMC
UK	United Kingdom
VOS	Voluntary Observing Ship
VOSclim	VOS Climate (Subset for High Quality Data)
WIS	WMO Information System
WMO	World Meteorological Organization