

Global Collecting Centre

Annual Report 2012



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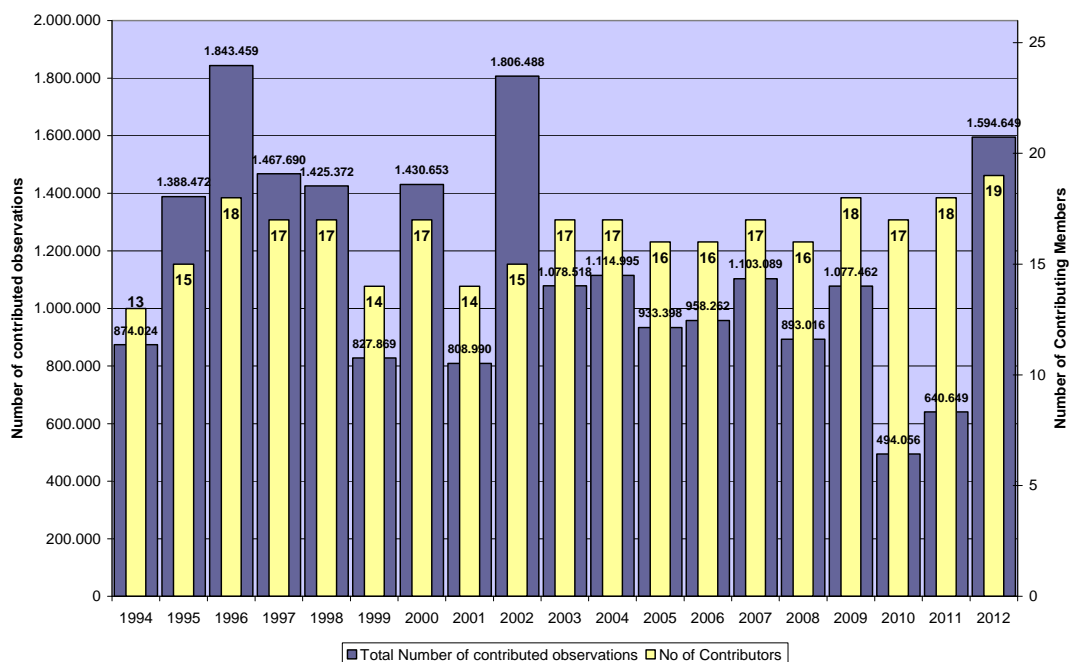
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Background

The two Global Collecting Centres (GCCs) for JCOMM's Marine Climatological Summaries Scheme (MCSS) were set up in 1993 to improve data flow and quality of delayed-mode Voluntary Observing Ship (VOS) data. Data is received regularly by the GCCs (figure 1 & appendix A) from the MCSS Contributing Members (CMs) (appendix B). This is then quality ensured to the Minimum Quality Control Standard (MQCS-7) and, once 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 & WMO Guide 471.

2012 marks the 19th year of GCC operation.

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



VOS Data Volumes 2012

- 1,594,649 observations were received and processed by the GCCs during 2012.
- 19 CMs contributed data out of a total of 26 registered Members/Member States.
- 1394 VOS ships made observations in 2012.
- Date of contributed data ranged: from 1996 to 2012.
- 59% of data were observed in 2011 & 2012 and 80% during the last three years.
- 53% of the received observations used IMMT-3 format and 47% the IMMT-4 format which was adopted in 2010. There were still 2459 (0.15%) observations received in IMMT-1 format and 124 in IMMT-2 format.

Figure 2: Number of observations by CMs for each quarter of 2012.

Country Name	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total
Argentina					0
Australia					0
Brazil					0
Canada	137.397	263.293			400.690
Croatia					0
France	201.515	35.768	34.051	58.792	330.126
Germany	55.200	44.133	82.356	101.930	283.619
Greece		530			530
Hong Kong, China	451	453	495	634	2.033
India		440	180	595	1.215
Ireland	784		433	308	1.525
Israel		865	3.467		4.332
Japan	5.346	5.633	2.668	2.431	16.078
Kenya					0
Malaysia	1.191			26	1.217
Netherlands	20.399	7.556	12.904	9.018	49.877
New Zealand	2.844	2.326		1.951	7.121
Nigeria					0
Norway	269.405	16.588		12.151	298.144
Poland				538	538
Russian Federation	10.040	10.037	10.003	10.020	40.100
Singapore				427	427
South Africa		648			648
Sweden					0
United Kingdom	84.366	22.617	18.670	29.241	154.894
USA	511	410	614		1.535
19 of 26 Contributing Countries	789.449	411.297	165.841	228.062	1.594.649

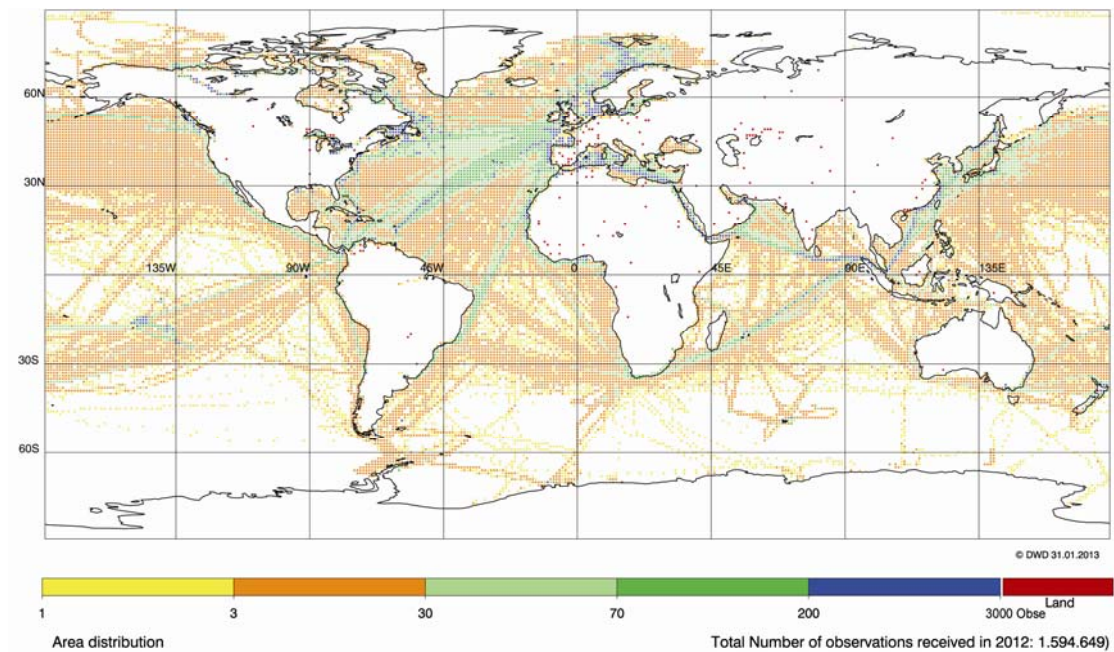
CMs without any contribution in 2012 are marked in red

VOS Data Quality 2012

- The majority of observations were again of good quality. For example the most reported elements like wind direction and speed, air pressure and air temperature were flagged in over 98 % with a 1, which means 'element appears correct'.
- There were 419 observations (0.03%) with on land positions. These are plotted as red dots in Figure 3.
- Quarterly analysis of the exchanged datasets identified 215 observations (0.01%) that were rejected by the MQCS. Analysis of the yearly dataset highlighted that the number of observations rejected increased noticeably to 4469. These observations failed MQC but were included at quarterly exchange. However, these still only accounts for 0.28% of total observations received.

- Before the quarterly data exchanges over 100,000 previously submitted duplicate observations were identified and deleted.
- Many observations containing erroneous positions or observations from ships that were not recruited by the CM were selected and, after consultation with the appropriate CM, were deleted.

Figure 3: Distribution of observations received in 2012



VOSClm Class Data 2012

- 779,400 observations were received and processed from VOSClm registered ships by the GCCs during 2012.
- This makes up 49% of data received by the GCCs from the VOS fleet in 2012 which is the largest number of received VOSClm observations since collection began in 2003.
- 8 of the 10 CMs with registered VOSClm ships submitted observations (Figure 4) in 2012.
- In 2012, the GCCs received data from over 330 listed VOSClm ships.
- 362,273 of VOSClm observations (46%) contained the VOSClm defined additional elements.
- 77,962 observations from non-VOSClm registered ships were received with VOSClm defined additional elements.
- This increase in the number of VOSClm observations is likely due to VOSClm now being a 'VOS class' (IMMT element 41, Observation Platform).

Figure 4: VOSClim class observations submitted by CMs for each quarter of 2012

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 2012														
Country Name	1st Quarter			2nd Quarter			3rd Quarter			4th Quarter			Total	
Australia	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Canada	137.133	0	0	263.115	0	0	0	0	0	0	0	0	400.248	0
France	148.032	148.032	52.357	31.750	31.750	1.824	32.195	32.195	1.856	50.924	50.924	7.868	262.901	262.901
Germany	5.617	5.556	0	3.123	2.928	0	13.392	12.365	152	24.730	21.293	215	46.862	42.142
India	0	0	0	71	0	0	31	0	0	136	0	0	238	0
Japan	0	0	0	3.061	3.061	0	0	0	0	0	0	0	3.061	3.061
Netherlands	4.461	1.732	291	2.296	1.707	505	5.239	4.161	627	4.711	4.379	628	16.707	11.979
New Zealand	644	643	6	404	0	0	0	0	0	257	257	0	1.305	900
United Kingdom	14.838	12.821	4.214	8.018	7.403	6.539	9.307	8.531	78	15.915	12.535	802	48.078	41.290
USA	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8 of 10 Countries	310.725	168.784	56.868	311.838	46.849	8.868	60.164	57.252	2.713	96.673	89.388	9.513	779.400	362.273
													77.962	

CMs without any contribution in 2012 are marked in red

Recent Developments

Formats & Standards

The latest version of the IMMT & MQCS format and standard (IMMT-5 and MQCS-7) were adopted at JCOMM-4 in May 2012 and were in effect from 1st June 2012. These versions include only minor updates of wording and QC limits.

The MQC-software for CMs was updated to MQCS-7. The 5th version is available at http://www.wmo.int/pages/prog/amp/mmop/mqc_soft.html.

The different lists of registered VOSClim ships (administered by ESURFMAR/France and NOAA/USA) were updated and assimilated at the request of the GCCs to ensure they were in agreement. In the newly adopted IMMT formats 4 and 5 it is a requirement to indicate that a ship is a registered VOSClim ship using element 41 'Observation platform'.

Meetings and Activities

In May 2012 at JCOMM-4 in Yeosu, Republic of Korea, the new JCOMM task team on Marine Climate Data System (TT-MCDS), which combines the work and tasks of the TT-DMVOS & the TT-MOCS, was adopted. Also the vision of the MCDS-Strategy with the Initial Implementation Plan was discussed and approved. The new data flow structure of MCDS proposes that all data types across JCOMM should be gathered for better access to marine meteorological and oceanographic climatological data (met-ocean climate data). The update of the Manual on and the Guide to Marine Meteorological Services (WMO No. 558, and 471 respectively) were agreed as well as the formats and standards.

The two GCCs met in Hamburg in September 2012 to discuss the new HQCS and prepare for the ETMC meeting in Ostend, Belgium in November.

At ETMC-4 in November 2012 in Ostend, Belgium, the data-flow diagram for the MCDS was reviewed and a new version, which better highlights the role of the IODE was agreed upon. At the meeting the potential contributions and roles of the various actors and stakeholders in the MCDS, concerning foreseen Data Acquisition Centres (DACs), Global Data Assembly Centres (GDACs), and Centres for Marine Meteorological and Oceanographic Climate Data (CMOCs) were clarified. During the coming years the MCDS data-flow shall replace the MCSS which will mean that CMs will then act as DACs and the GCCs as GDACs, which will process delayed mode data as well as real time data. It will be no longer necessary for the RMs to archive the data as CMOCs will check, archive and provide all observations for all areas worldwide. The goal is to have only one standardised quality checked dataset, mirrored at two or more places.

High number of submitted data

During 2012 the GCCs received a much larger volume of data than in the two years previous. This fluctuation in contributions results from a variety of CM issues including software, staff and technical problems. The increase in the volume of data can mainly be accounted for by Canada, France, Norway and the UK all processing large backlogs and contributing the data in 2012. Additionally data was received from Singapore again after a number of years without any submissions. Unfortunately a quarter of the listed CMs still did not contribute any data during 2012. (Appendix A)

Interoperable MCSS data

Both GCCs have been identified as DCPCs for the WIS and are able to provide nearly 17.9 million MQCS-checked and flagged observations received by the GCCs during 1996 to 2012. Additionally all contributed original records are saved and available.

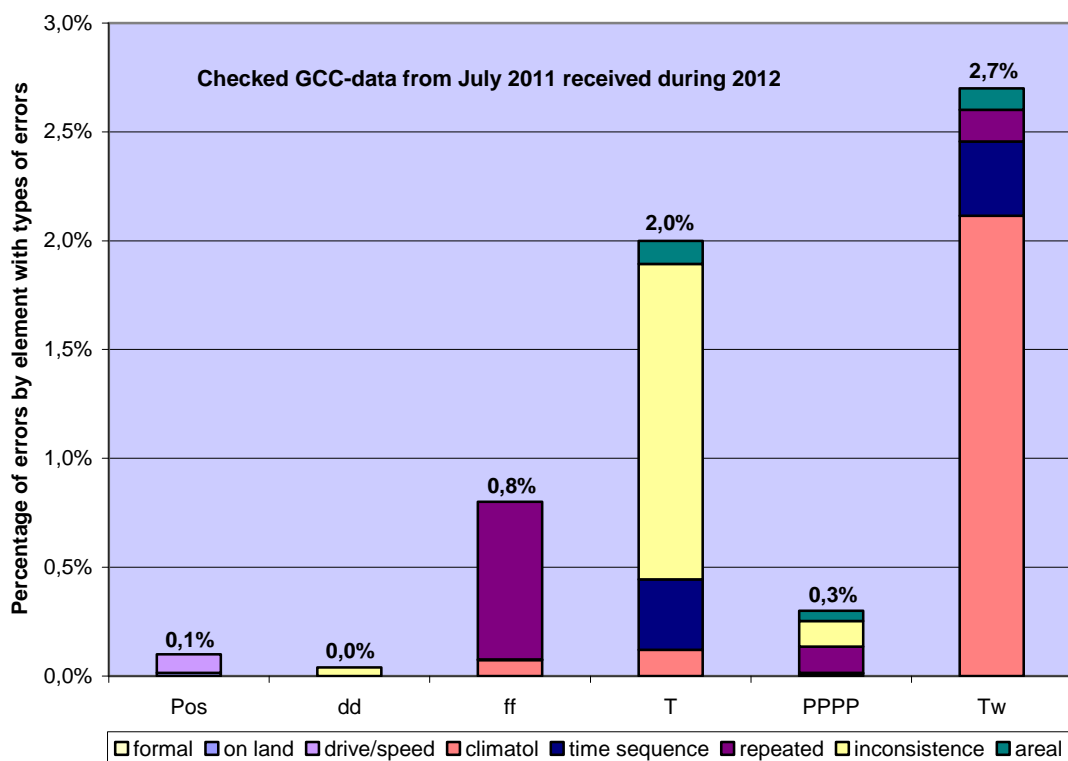
Interoperable MCSS datasets can be searched and accessed from the German WMO Information System's (WIS) GISC http://gisc.dwd.de/GISC_DWD/toSimpleSearch.do In addition since early 2012 MCSS data were also available from the IODE Ocean Data Portal <http://www.oceandataportal.org/>

Higher Quality Control Standard

DWD continues to make progress in the development of a new standardised Higher Quality Control Standard (HQCS). The goal is a uniform checking of all types of VOS observations, easy handling, documented steps and graphic demonstration of erroneous values and simple ways of correction. A revised and improved land-sea mask will soon be made available and climatological checking with ERA-Interim-data have led to satisfying results. The UK GCC and the International Comprehensive Ocean-Atmosphere Data Set (ICOADS) team will test the first version of the HQCS during 2013.

As an example of the new HQCS observations received in 2012 from July 2011 were tested and the output has been displayed in Figure 5 below.

Figure 5: Percentage of the type's errors detected by the new HQC



The graph shows the percentage of error type detected by the new HQC.

The software checks are performed in the following order:

- **formal** errors, checks of invalid characters and defined limits
- **on-land positions**
- **drive and speed**, comparisons of course of the ship
- **climate checks**, against ERA Interim extremes
- **time sequence**, checks of changes against limits
- **repeated** (stuck) values
- **inconsistency**, checks of internal consistency of the record
- **areal**, comparisons of near-neighbouring values

The output figure is based on 62.298 observations received by the GCCs during 2012 from July 2011 for the parameters of position, wind direction and speed, air temperature, air pressure and sea surface temperature. All parameters are quality flagged separately.

Recommendations

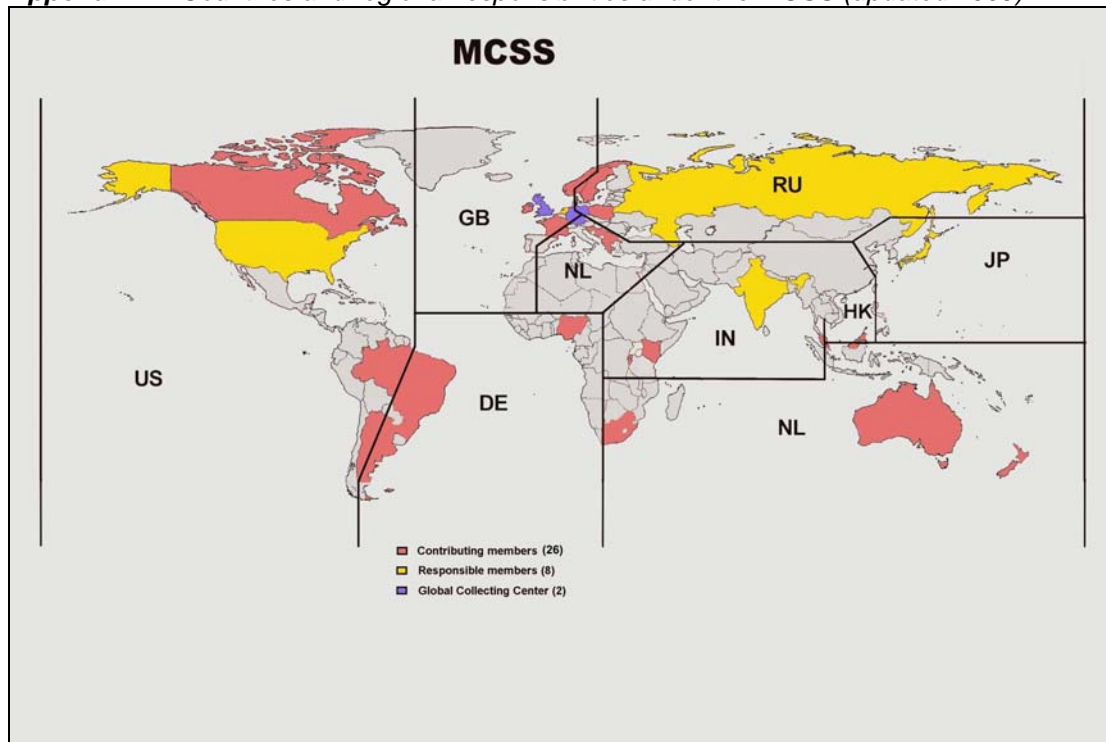
To improve data availability and quality, and in light of the recent developments, the GCCs make the following recommendations:

- CMs should submit the observations only once. But 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.
- CMs not able to submit their data because of issues e.g. with digitising or converting into the IMMT format, should contact GCCs 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 VOSClim class ships that have still not successfully submitted data to the GCCs are encouraged to do so at their earliest convenience or contact GCCs for advice.
- If possible convert all masked callsigns (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 reports etc.

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	Number of Years with Contributions 1994 - 2012
Argentina	AR								X		X	X	X	X	X	X					7
Australia	AU							X		X	X	X	X		X	X	X	X	X		10
Brazil	BR	X	X	X	X																4
Canada	CA																		X	X	2
Croatia	HR				X	X	X	X	X												5
France	FR	X	X	X	X	X			X		X	X	X	X	X	X	X		X	X	15
Germany	DE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	19
Greece	GR																	X	X		2
Hong Kong, China	HK	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	19
India	IN	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	19
Ireland	IE				X	X	X				X						X	X	X	X	8
Israel	IL		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	17
Japan	JP	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	19
Kenya	KE																				0
Malaysia	MY	X		X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	17
Netherlands	NL	X	X	X		X	X	X	X		X	X	X	X	X	X	X	X	X	X	17
New Zealand	NZ													X	X	X	X	X	X	X	7
Nigeria	NG																				0
Norway	NO	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X			X	16
Poland	PL	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	19
Russian Federation	RU		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	18
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	14
Sweden	SE			X													X	X	X		4
United Kingdom	GB	X	X	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X	17
United States	US	X	X	X	X	X	X	X		X	X				X	X	X	X	X	X	15

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



Appendix C: List of acronyms

CM	Contributing Member
CMOC	Centres for Marine Meteorological and Oceanographic Climate Data
DAC	Data Acquisition Centres
DWD	Deutscher Wetterdienst
ETMC	Expert Team on Marine Climatology
GCC	Global Collecting Centre (MCSS / JCOMM)
GDAC	Global Data Assembly Centres
GISC	Global Information System Centres (of WIS)
E-SURFMAR	EUCOS Surface Marine Programme
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 Standards
NOAA	National Oceanic and Atmospheric Administration (USA)
ODP	Ocean Data Portal
RM	Responsible Member
TT-MCDS	Task Team on Marine Climate Data System (ETMC)
TT-DMVOS	Task Team on Delayed Mode VOS Data
TT-MOCS	Task Team on Marine Meteorological and Oceanographic Climatological Summaries
UK	United Kingdom
VOS	Voluntary Observing Ship
VOSclim	VOS Climate (Subset for High Quality Data)
WIS	WMO Information System
WMO	World Meteorological Organization