Implementing the New JCOMM Marine Climate Data System (MCDS)

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Outline

- Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology
- JCOMM Climate Data Management System
- MCDS Vision and Goals
- Achievements so far
- Data Flow
- MCDS Impacts
- Implementation of the MCDS
Structure of the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM)
JCOMM Activities

Observations (OPA)

- Coordination of implementation of ocean observing systems addressing the GCOS Implementation Plan requirements.
- One coordination group, and series of panels to deal with data buoys (DBCP, OceanSITES), ship-based observations (SOT, VOS, SOOP, ASAP), sea-level (GLOSS), profiling floats (Argo)

Data Management (DMPA)

- Coordination of marine meteorological and oceanographic data management in close relationship with the IOC of UNESCO International Oceanographic Data and Information Exchange (IODE)
- **Marine Climatology (ETMC)**
- Data Management Practices (ETDMP), jointly with the IODE
- Table Driven Codes (including migration)

Services and Forecasting Systems (SFSPA)

- Coordination of marine services activities in WMO & IOC frameworks, including Maritime Safety Services, Coastal Hazards Forecasting Systems (e.g. Coastal Inundation Forecasting Demonstration Project), Operational Ocean Forecasting Systems, Sea-Ice services, Marine Environmental Emergency Responses

WMO; Cg-17-Doc-2.5(8) (2015)
Cross-cutting activities

- Capacity Development
- Joint CCI/CLIVAR/JCOMM Expert Team on Climate Change Detection and Indices (ETCCDI)
- Joint CAgM-JCOMM Task Team on Weather, Climate and Fisheries
- Migration to Table Driven Codes (TT-TDC)
- Integration of Marine Meteorological and Oceanographic Services within WIS (TT-MOWIS) to improve the interoperability with WIS of the near real-time and delayed mode data sets of ocean observations, as well as of analysis and forecasting products
- Satellite data requirements (TT-SAT)
JCOMM Intersessional Priorities (2012-2017)

- Weather and Ocean Forecasting;
- Disaster and Risk Reduction (DRR);
- Global Framework for Climate Services (GFCS) implementation;
- WMO Integrated Global Observing System (WIGOS) and WMO Information System (WIS) implementation;
- Capacity Development (CD).
Data Management Programme Area (DMPA) activities

- Marine Climatological Summaries Scheme (MCSS) and development of the Marine Climate Data System (MCDS) contributing to GFCS
- Congress approved the first WMO-IOC Centre for Marine Meteorological and Oceanographic Climate (CMOC) data in Tianjin, China.
- CMOCs are key for integration of ocean climate data from various sources, higher level quality control, bias correction, and with regard to data rescue
- Collaboration with the International Oceanographic Data and Information Exchange of the IOC of UNESCO on the Ocean Data Portal (ODP) and Ocean Data Standards and Best Practices (ODSBP)
Pre-MCDS

- MCSS (Marine Climate Summaries Scheme) modernisation was underway by TT-DMVOS & TT-MOCS (VOS Data only)

- Need to join up climate data management across JCOMM

- The new VOS model vision was good – something similar could be applied across JCOMM
27 countries still run a VOS fleet and are willing to contribute data to the MCSS.

23 of the 27 countries have contributed in the last 3 years!
Distribution of Observations 2014
Existing JCOMM Climate Data Management System

Non-standardised
High complexity
Not well documented
Not well understood
Not well linked
MCDS Data Flow

Data Sources
RT DM

RT-DAC(s)  DM-DAC(s)

GDAC(s)

CMOC-China  CMOC a  CMOC b

CMOC c

JCOMM User Interface

MCSS Data Flow

Ship / PMO

CMs

RM s

Two GCCs

8 National Archives

Data stream

QC feedback

MARCDAT-4 2016
MCDS Vision and Goals

• Standardised data management structure across JCOMM
• Well documented and well defined processes (formats, standards, procedures, etc)
• Reduced complexity
• Improved timescales for data availability
• Standardized high quality control (HQCS)
• Capitalising on synergies among existing systems
MCDS Vision and Goals

- Improved JCOMM Data Management linkages
- Enhanced integration of WMO-IOC data, metadata and products
- Improved availability of climate data and products (GFCS)
- Interoperable with WIS and ODP
- ‘Internationalised’ data storage
- International mirroring for improved access and security
MCDS Vision: Progress so far

• Apr 2011, Hobart – SOT-6: The concept and very first vision of MCDS was born

• Nov/Dec 2011, Hamburg: Workshop for a new MCDS

• May 2012, Yeosu – JCOMM-IV: The Commission adopted the new MCDS

• Nov 2012, Oostende – ETMC-IV / TT-MCDS: Participation of IODE members, review the JCOMM-IV decisions

• Mar 2013, Ensenada - IODE –XXII: MCDS Vision approved

• Summer 2014: Update of the MCDS Implementation Plan at CLIMAR-4 by members of ETMC and the Task Team of MCDS (TT-MCDS)
MCDS
Marine Climate Data System

- **Goal**: to develop a standardized international data management system across JCOMM
- Modernization of the MCSS
- Add and make interoperable new sources of marine-meteorological and oceanographic data incl. historical data
- State of the art data management techniques
- Collection, rescue, quality control, formatting, archiving, exchange and access for all marine data and metadata
• Receive data/metadata from single platform type (e.g. buoy, ship)
• Both in near real-time and delayed mode
• Apply Minimum Quality Control (MQC)
• Forward data to the GDACs in agreed formats
GDACs
Global Data Assembly Centres

- Combine all data streams
- Establish a unique complete dataset
- Perform agreed quality checks including High Quality Control (HQC)
- Forward the original and quality controlled data and metadata with flags to the CMOCs
- Ensure that delayed-mode and real-time data streams are compared and linked
- Feedback to DACs
HQCS
High Quality Control Standard

• Developed by DWD
• Integrated land-sea-mask, accuracy of 0.01°
• Climatology check based on background fields using the ERA-Interim-Reanalysis 1981-2010
• Time-Sequence check, inconsistency check
• Spatial check
• Implementation of all MQC rules, capability to run as an MQC-only version
• Handling of data with high temporal resolution
• Documentation of the code
CMOCs
WMO-IOC Centres for Marine-Meteorological and Oceanographic Climate Data

• Scope: many observational platforms
• Act as a network of data centres
• Collect data and metadata from GDACs and other sources
• Undertake data/metadata rescue
• Common formatting (e.g. netcdf), bias adj.
• Make integrated climate datasets and products available to the user interface
• Ensure storage of data and metadata with defined standards
CMOC in Tianjin, China

- was successfully evaluated against the CMOC evaluation criteria proposed by the ETMC and Data Management Coordination Group (DMCG); a resolution establishing CMOC/China was adopted by WMO and IOC
- 2014-2016: the integration of global drifting buoy observations and metadata, in cooperation with NOAA/AOML and GDACs, etc.
- will also have a focus on historical metadata and data rescue in the Asian-Pacific region
- capacity building activities
Impacts

- MCSS to be discontinued
- Changes to role names and some tasks/ responsibilities
- CMs migrate to DACs
- GCCs and VOSClim DAC migrate to GDACs
- RMs – possible other roles within MCDS
Implementing the MCDS Vision

- Begin implementation phase of the new JCOMM MCDS
- Formalise and coordinate the activities of existing data management systems within JCOMM, and address gaps
- Send invitations to candidate centres
- Submit proposals for CMOC-ICOADS and CMOC-WOD
- Rewrite relevant sections of WMO Publ. No. 471 and 558

- Prepare adoption of the new MCDS at JCOMM-V in 2017

- **2020: Dedicated WMO-IOC Marine Climate Data System operational**
Thank you!