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
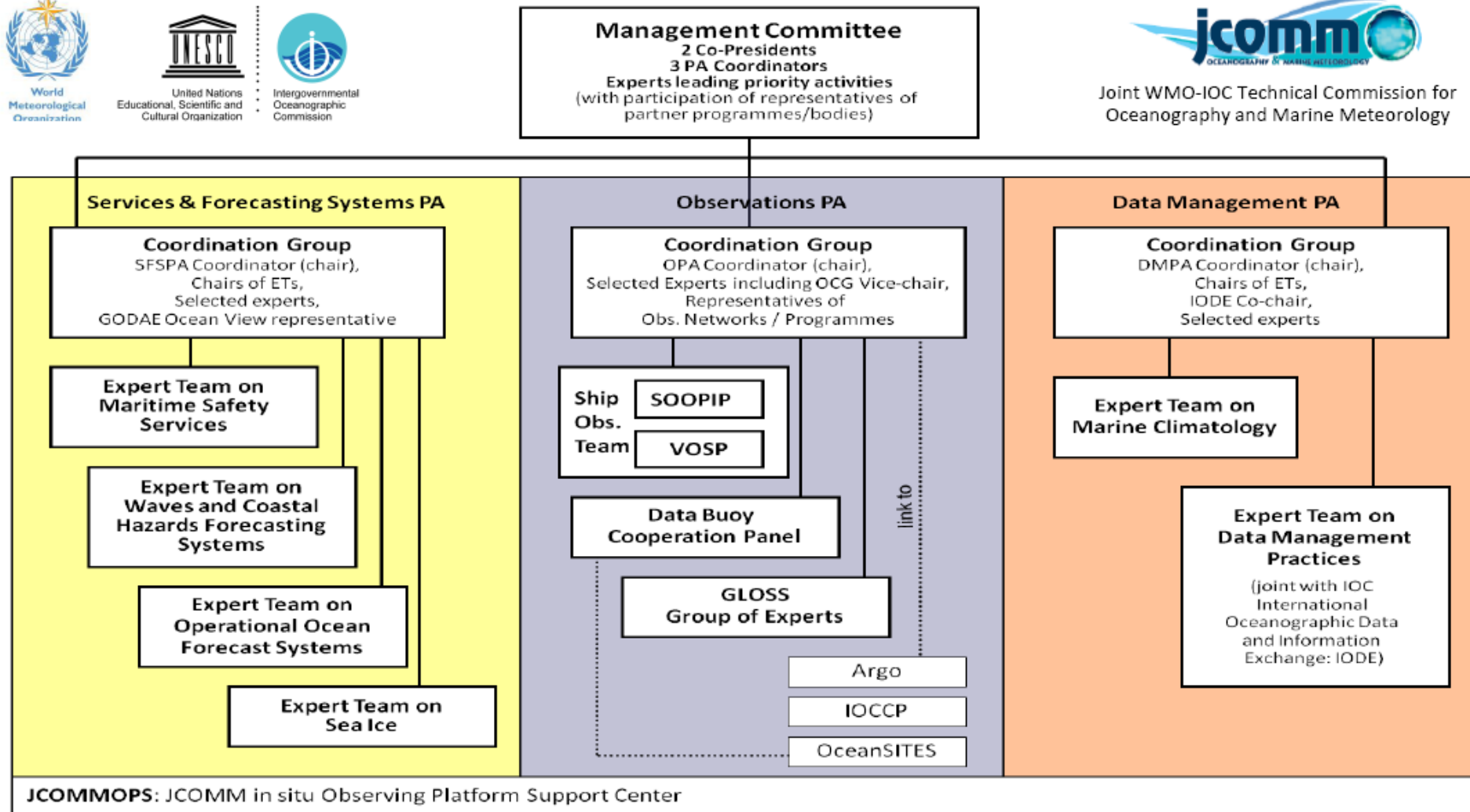- Implementation of the MCDS

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JCOMM Strategy

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)

Weather • Climate • Water

Cross-cutting activities

- Capacity Development

- Joint CCl/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)

WMO; Cg-17-Doc-2.5(8) (2015)

Weather • Climate • Water

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

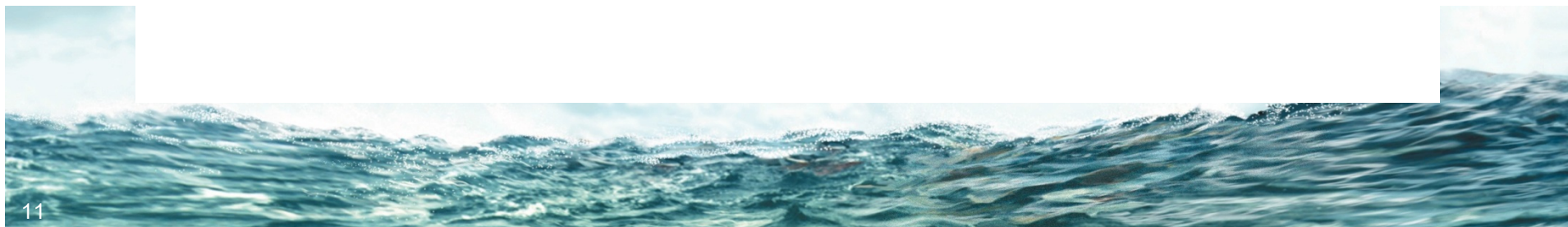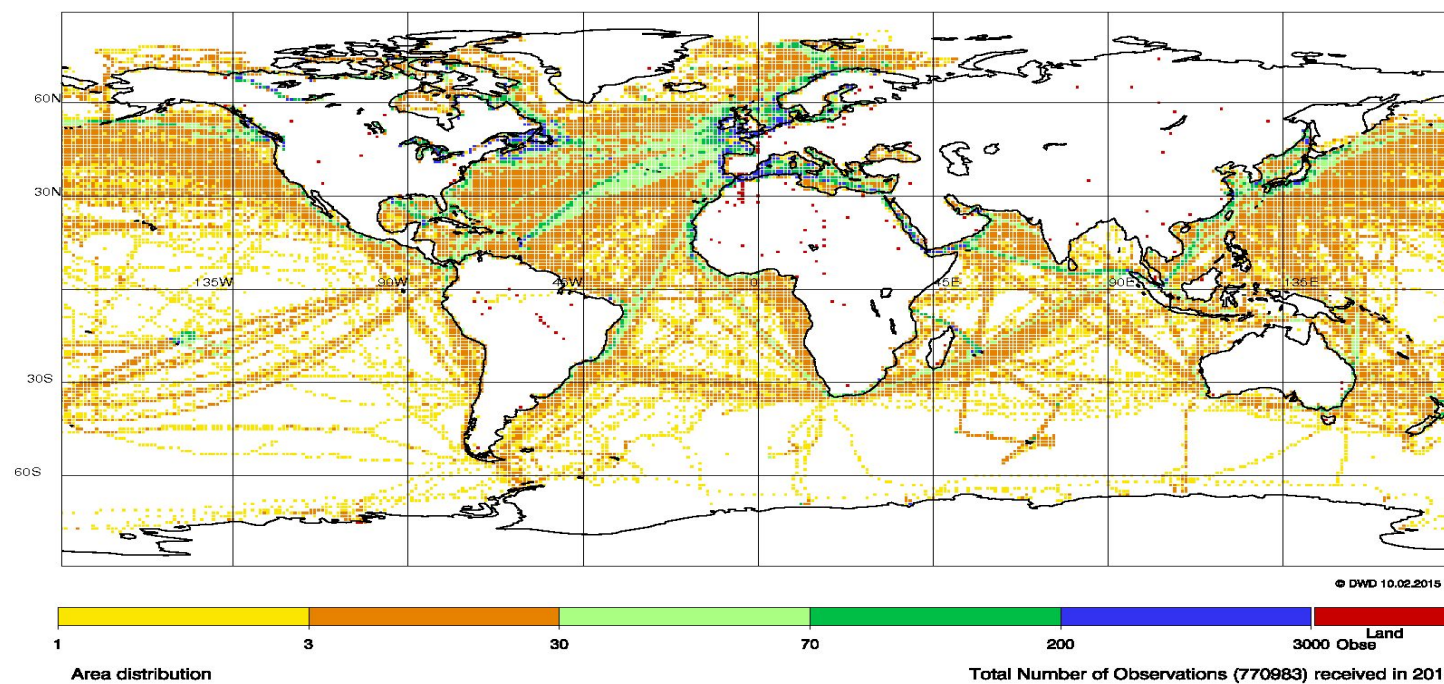- The new VOS model vision was good – something similar could be applied across JCOMM

27 countries still run a VOS fleet and are willing to contribute data to the MCSS

Legend:
- Contributing members
- Responsible members
- Global Collecting Centre
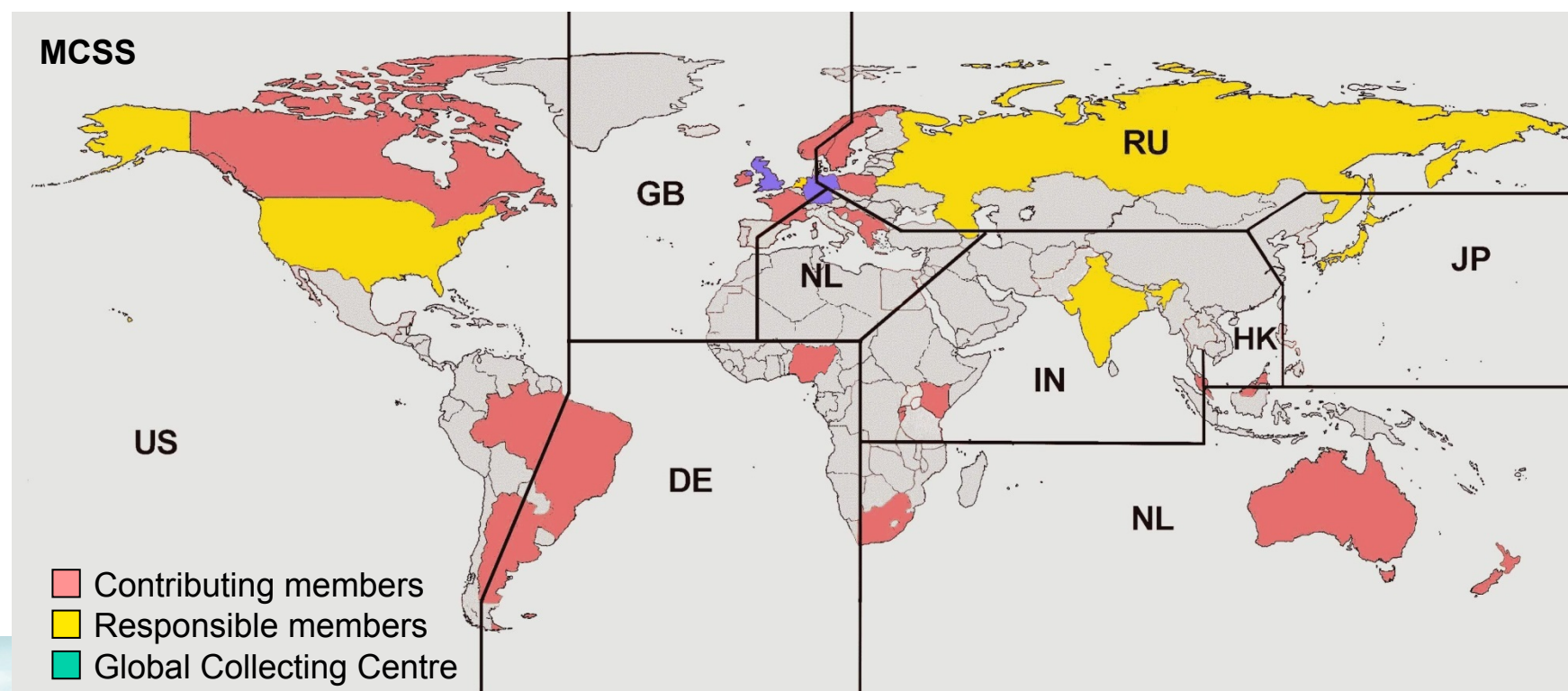
23 of the 27 countries have contributed in the last 3 years!

Distribution of Observations 2014

1   3   30   70   200   3000 Obs Land

© DWD 10.02.2015

Area distribution

Total Number of Observations (770983) received in 2014

Existing JCOMM Climate Data Management System

JCOMM

- ICOADS
- Argo National DACs
- RNODC/DB
- GTSPP DACs
- GOSUD GDAC
- SOC/DB
- GCCs
- NODCs
- Argo GDACs
- CMs
- OceanSITES GDACs
- RMs
- WOD
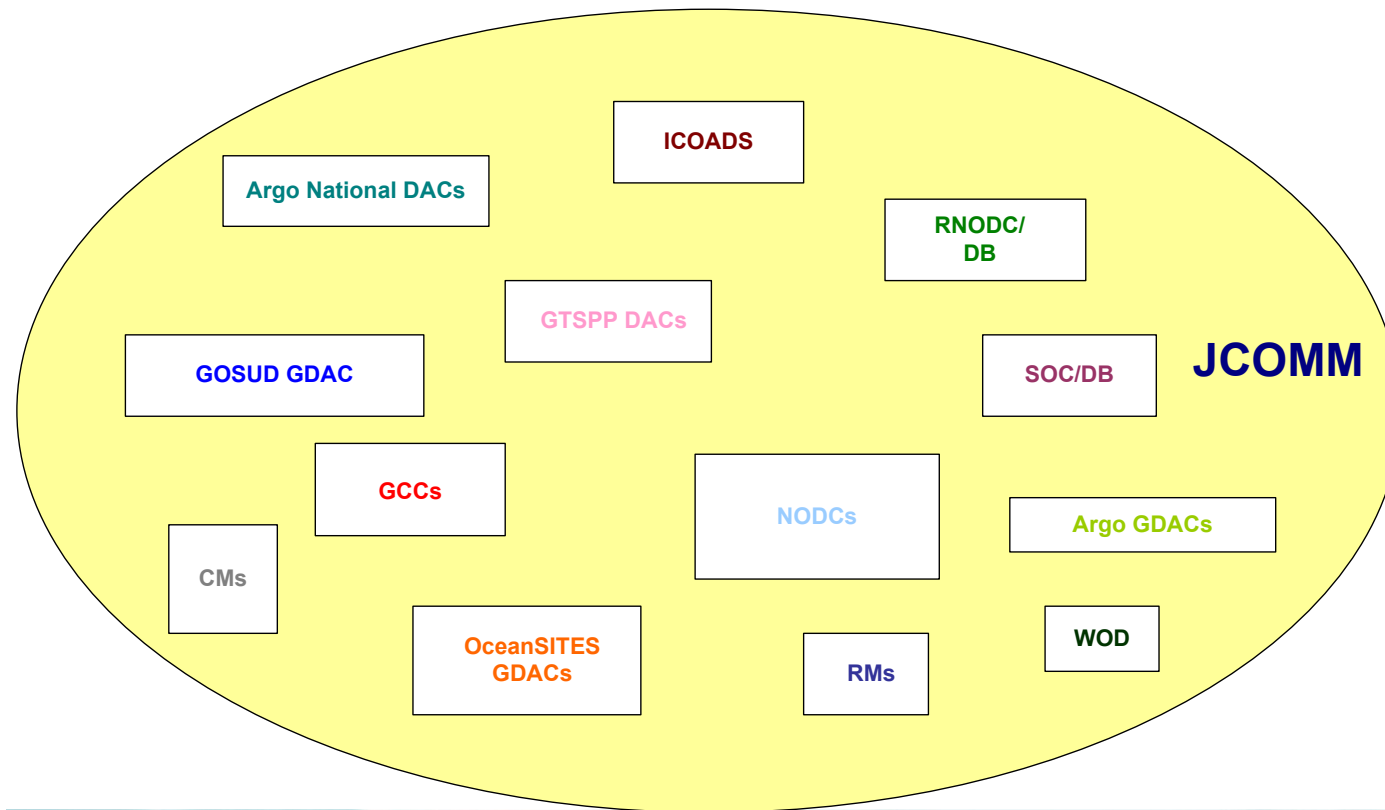
Non-standardised

High complexity

Not well documented

Not well understood

Not well linked

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MCDS Data Flow   *MCSS Data Flow*

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Data Sources                    Ship / PMO
  RT    DM

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

      GDAC(s)                      RMs          Two
                                                GCCs

CMOC-China   CMOC a   CMOC b    8 National
        CMOC c                   Archives
```

JCOMM User Interface   ↑ Data   ⇡ QC
                              stream   feedback
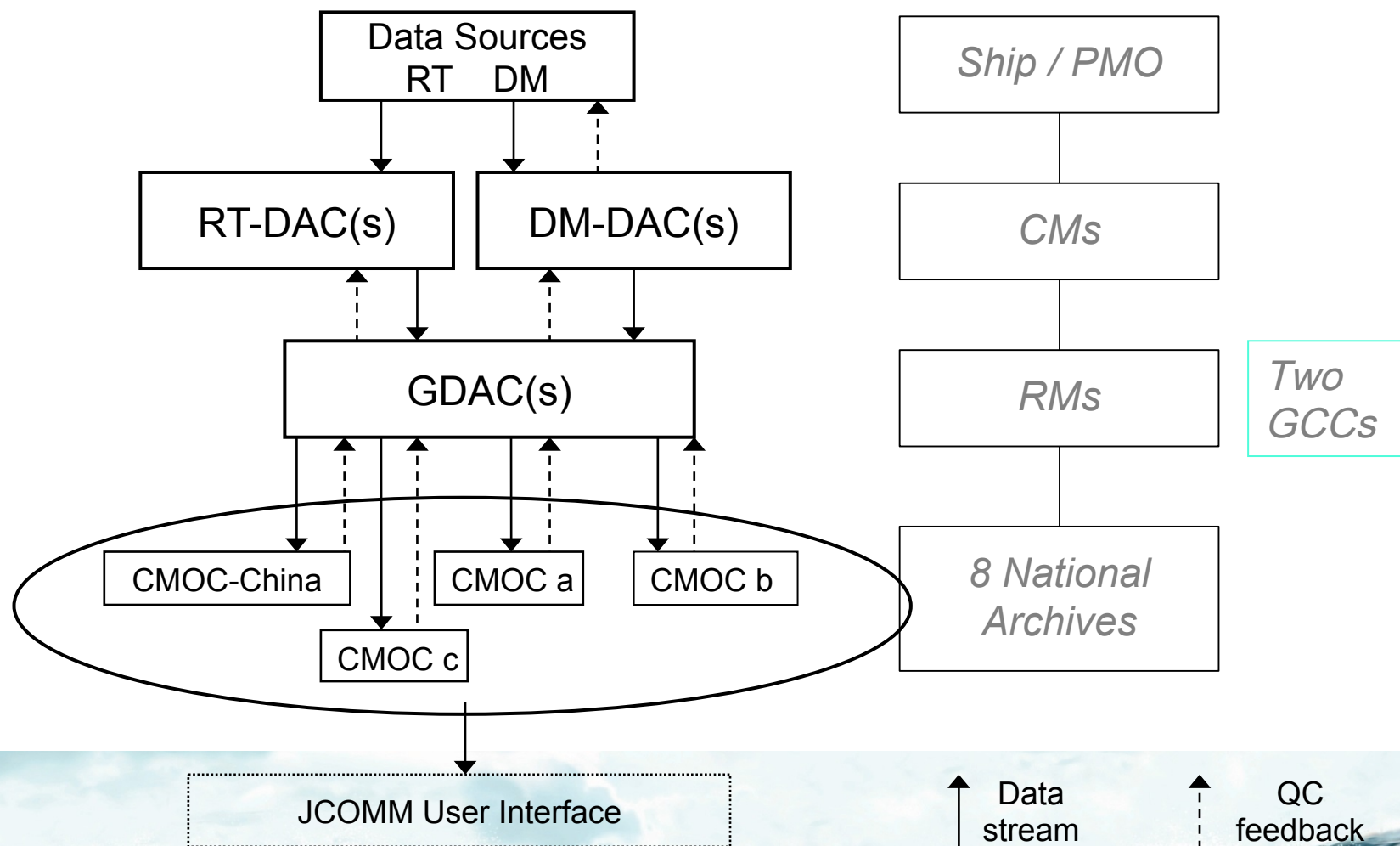
MCDS Vision and Goals

- 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
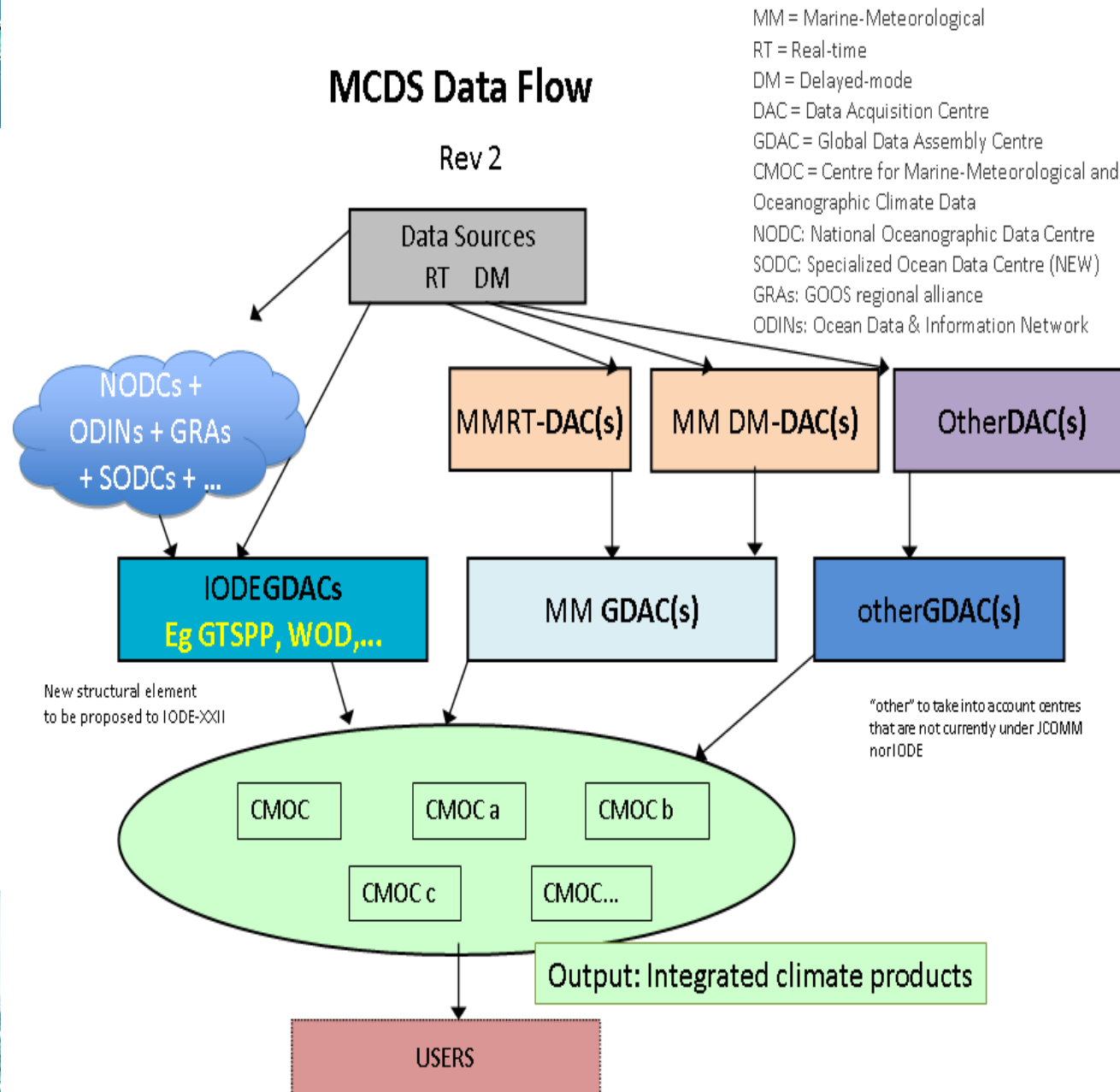
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MCDS Vision and Goals

- 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

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MCDS Data Flow

Rev 2

MM = Marine-Meteorological
RT = Real-time
DM = Delayed-mode
DAC = Data Acquisition Centre
GDAC = Global Data Assembly Centre
CMOC = Centre for Marine-Meteorological and
Oceanographic Climate Data
NODC: National Oceanographic Data Centre
SODC: Specialized Ocean Data Centre (NEW)
GRAs: GOOS regional alliance
ODINs: Ocean Data & Information Network

Data Sources
RT   DM

NODCs +
ODINs + GRAs
+ SODCs + ...

MMRT-**DAC(s)**

MM DM-**DAC(s)**

Other**DAC(s)**

IODEGDACs
Eg GTSPP, WOD,...

MM **GDAC(s)**

other**GDAC(s)**

New structural element
to be proposed to IODE-XXII

"other" to take into account centres
that are not currently under JCOMM
nor IODE

CMOC

CMOC a

CMOC b

CMOC c

CMOC...

Output: Integrated climate products

USERS

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)

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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
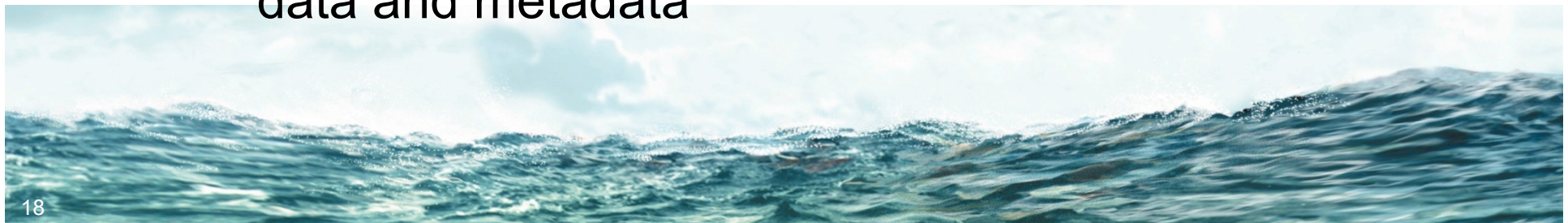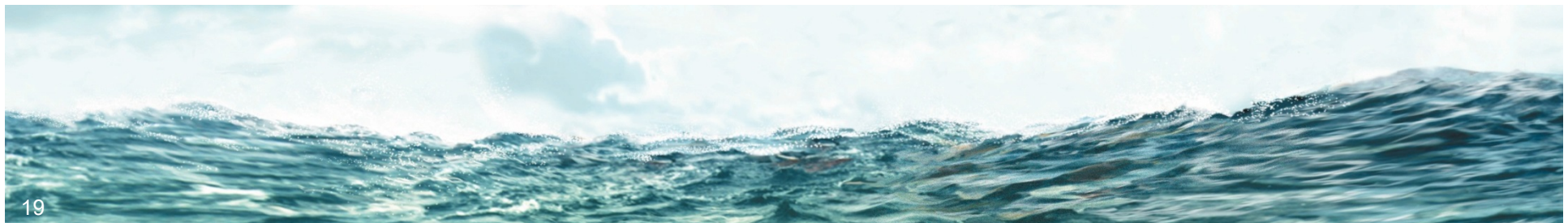
DACs
Data Acquisition Centres

- 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
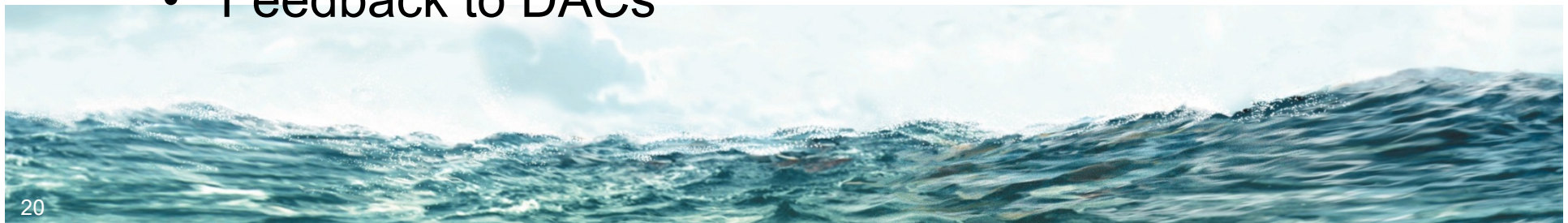
HQCS
High Quality Control Standard

- 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

- Documention of the code
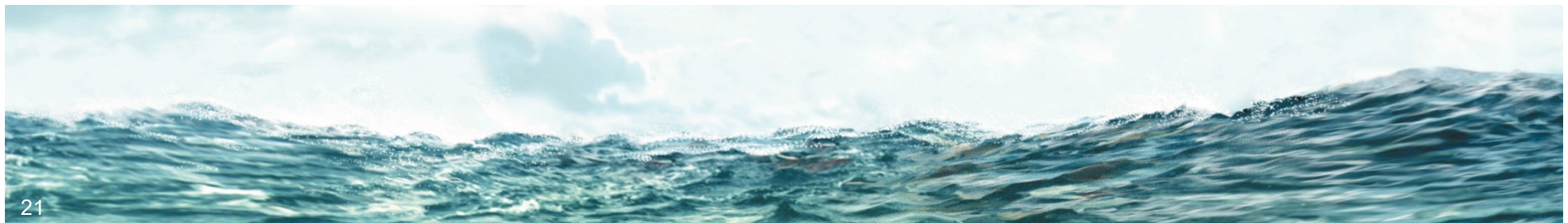
CMOCs
WMO-IOC Centres for Marine-Meteorological and Oceanographic Climate Data

- 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
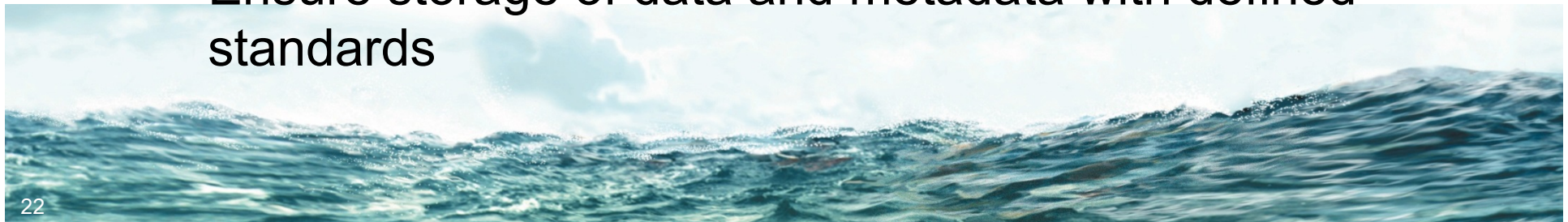
CMOC in Tianjin, China

- 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
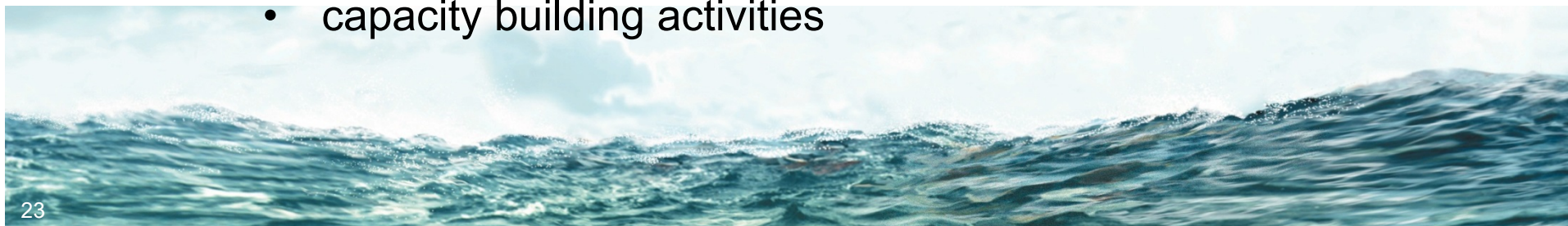
Impacts

- 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!