

# Weather and Disaster risk reduction Services

## WDS Department



**WMO OMM**

World Meteorological Organization  
Organisation météorologique mondiale

Director : Dr. Xu Tang

Group PR Familiarization Visit  
25 September 2019

# WDS Mission

- WDS mission is to effectively coordinate Members' activities in **advancing weather related applications and services** contributing to safety, resilience, socio-economic benefits and sustainable development through development of state-of-the art methods, techniques, standards and guidance.

# Aeronautical Meteorology Division



**WMO OMM**

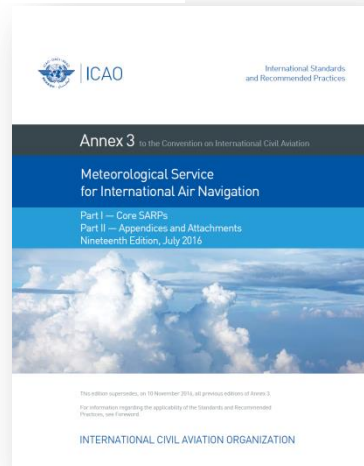
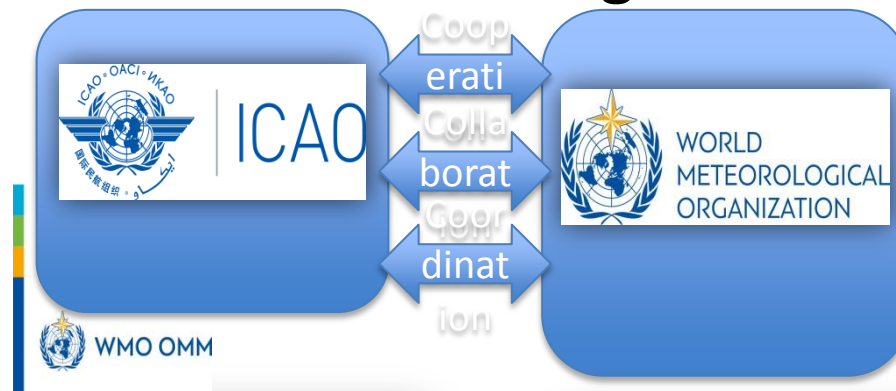
World Meteorological Organization  
Organisation météorologique mondiale

Greg Brock  
Helena Campos Benitez

Greg Brock  
Acting Chief, AEM Division

# WMO's role in aeronautical meteorology

- Objective: To contribute to the safety, regularity and efficiency of international air navigation



supporting technical  
guidance material and other  
resources

# WMO Member responsibilities

- World area forecast centres (WAFC)
- Volcanic ash advisory centres (VAAC)
- Tropical cyclone advisory centres (TCAC)
- Meteorological watch offices (MWO)
- Aerodrome meteorological offices (AMO)<sub>AL</sub>
- Aeronautical meteorological stations (AMS)

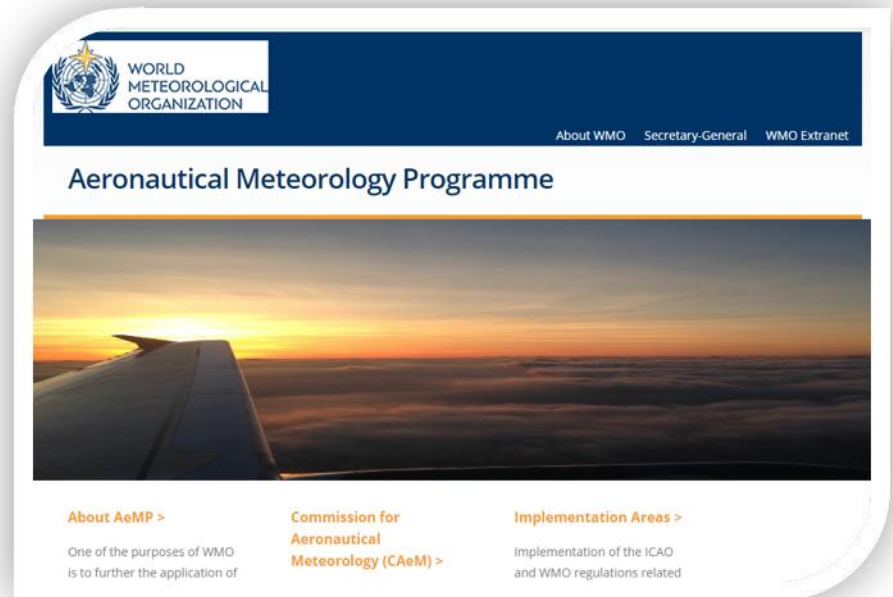
GLOBAL  
SUB-REGIONAL  
REGIONAL  
NATIONAL

All operated by NMHSs or other Aeronautical Meteorological Service Providers (AMSPs) of WMO Members



# WMO Aeronautical Meteorology Programme (AeMP)

- One of the major WMO application programmes
- Find out more on the web...
- Administered by a very small team:
  - Acting Chief (1 FTE)
  - Senior Secretary (0.5 FTE)



[www.wmo.int/aemp/](http://www.wmo.int/aemp/)



# Data Processing and Forecasting System Division



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Abdoulaye Harou, C/DPFS

Eunha Lim

Ata Hussain

Pascale Gomez

# DPFS division objectives

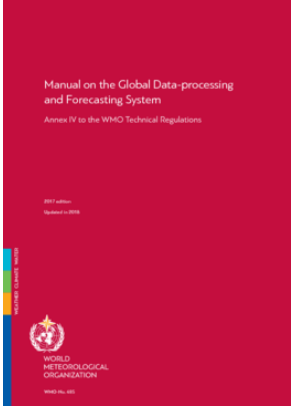
- **Support the Commission for Basic Systems (CBS) in**
  - Management of the the seamless Earth System data-processing and forecasting system (GDPFS)
  - Supporting the development, implementation and operation of the WMO Emergency Response Activities (ERA)
  - Maintaining close liaison and reporting to international bodies and programmes, Members and other stakeholders (e.g., Internal Atomic Energy Agency (IAEA), Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), International Civil Aviation Organization (ICAO))
- **Contribute to capacity development projects in support to Members**





# DPFS division Activities

- **GDPFS Management**
  - Initiation of pilot projects for S/GDPFS
  - Coordination with centres
  - WMCs / RSMCs workshops
  - Development of audit mechanism
- **Development / maintenance of regulatory and guidance material ( Manual and Guide on GDPFS (WMO-No. 484 +305, guidelines etc.)**
- **Regional project management ( former SWFDP) including training workshops etc ...**
- **Support various country projects**



# Marine Meteorology & Ocean Affairs (MMO) Division



**WMO OMM**

World Meteorological Organization

Organisation météorologique mondiale

Sarah Grimes  
Irene Sanz Zoydo,  
Tero Jokilehto  
Zichao Wang  
Helena Campos Benitez

# MMO : Key Objectives

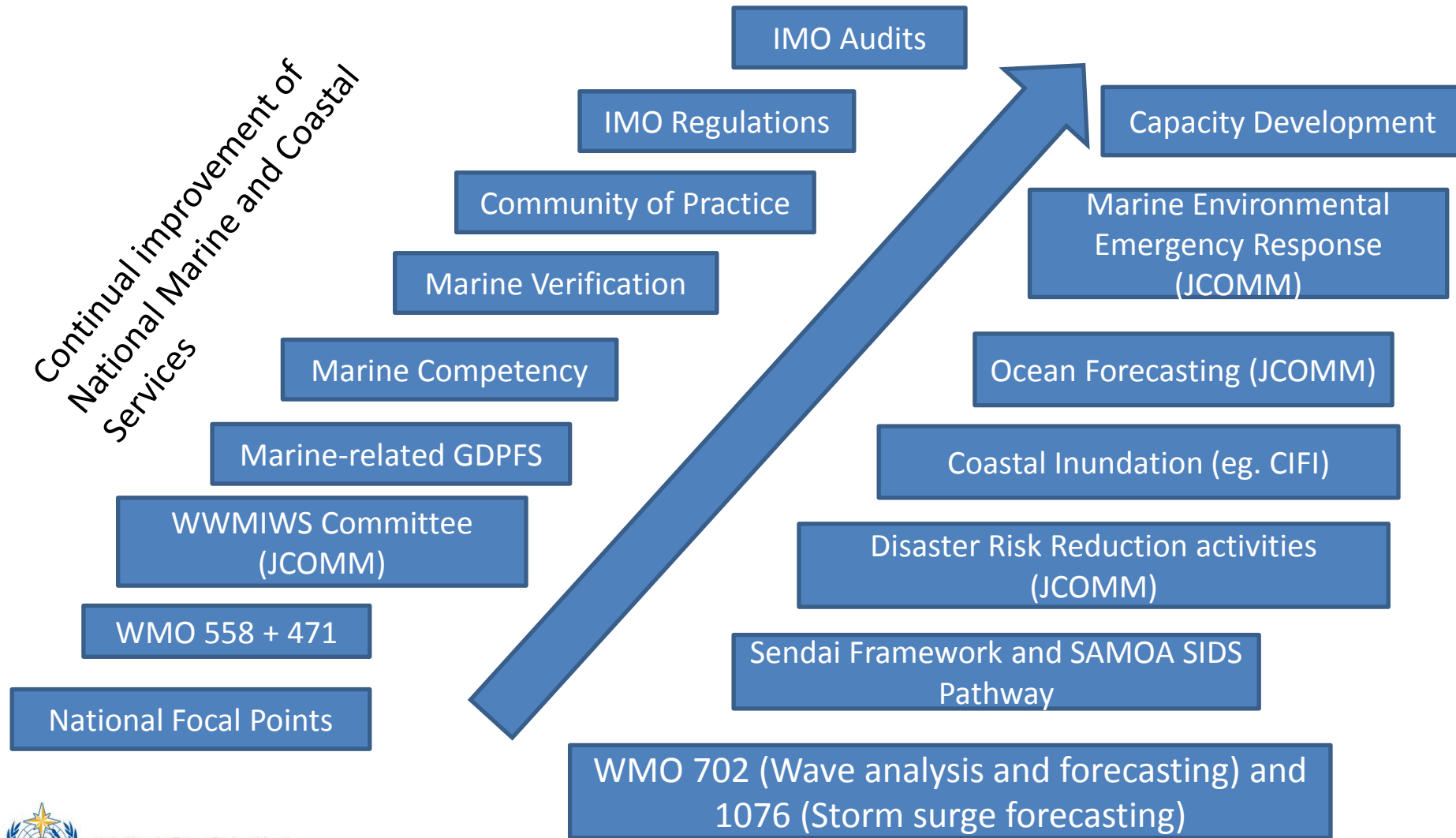
Support WMO Members through assistance for:



- Safety of life & property at sea and in coastal areas (including lakes & inland waters)
  - Fulfil SOLAS Convention by ensuring up-to-date MSI delivery
  - Polar regions (eg Polar Code)
- Contribute to prevention and control of marine pollution, sustainable development of marine and coastal environments
- Reduce risk of disaster impacts, in marine/coastal areas
- Support climate research; detection and prediction of climate variability related to the ocean
- Coordinate marine matters at WMO, whilst maintaining partnerships (eg IOC, IMO, IHO) and communicating with Members



# Enhancing Marine and Coastal Services



# Multi-Hazard Early Warning Services Division

**Weather and Disaster Risk Reduction Services Department (WDS)**



**WMO OMM**

World Meteorological Organization

Organisation météorologique mondiale

Cyrille Honoré  
Jochen Luther  
James Douris  
Geunhye Kim  
Anita Blavo

# MHEWS Division objectives

- **Supporting Members in improving their national MHEWS and DRM activities** ( institutional and technical components) in support the safety of their people and communities
- **Promoting regional and global cooperation and good practices,** Contributing to a variety of development projects
- **Providing guidance material and advice to Members**
- **Coordinating WMO enhanced support to humanitarian action**
- **Supporting the WMO visibility in the global DRR Agendas and establishing relevant partnerships that in turn benefit to Members**



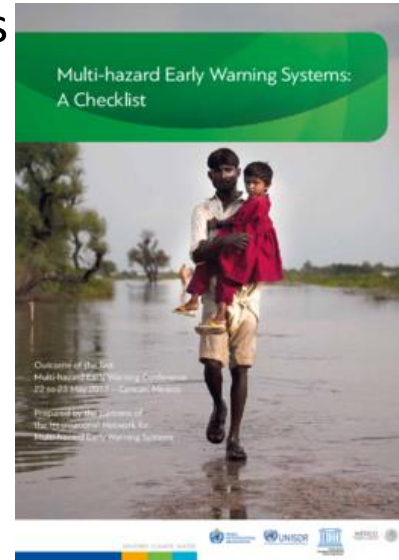
# MHEWS Division Activities

## Supporting the WMO visibility in the global DRR Agendas

- Preparation and participation in various Conferences and events
- Aligning with the Sendai Framework for DRR,
- Support to the International Network for MHEWS

## Development of the GMAS Framework concept and implementation,

- leveraging other WMO supportive frameworks such as GDPFS,
- Promoting and supporting integration of multiple hazard and partners
- To enhance Members NMHSs visibility and profile



## Hazard cataloguing and contribution to Loss & Damage reports :

- As a contribution to IBFWS, SFDRR reporting, UNFCCC etc

## Developing a WMO Coordination Mechanism to support UN and Humanitarian action

## Supporting Members to strengthen their early warning services:

- Support to a variety of projects funded by CREWS, AFD/GCF
- Guidance material , advisory services

# Service Delivery Division (SDD)



**WMO OMM**

World Meteorological Organization  
Organisation météorologique mondiale

Miriam Andrioli, C/SDD  
Samuel Muchemi  
Catherine Bezzola

Greg Brock  
Acting Chief, AEM Division

# SDD-PWSP Objectives

- Strengthen the capabilities of WMO Members to meet the needs of the community through the provision of comprehensive weather and related environmental services with particular emphasis on public safety and welfare;
- Foster a better understanding by the public of the capabilities of NMHSs and how best to use their services.

# SDD Activities

- Supports the development and maintenance of WMO Strategy on service Delivery and guidance material
- Promotes Impact Based Forecast and Warning services through guidance material (WMO-1150) and training workshops
- Facilitates NMHSs' development/enhancement of multiple channels of communication (traditional /social media) including media training, and guidelines (WMO-1086)
- Fosters the use of Common Alerting Protocol and maintain the WMO Register for Alerting Authorities
- Tackles emerging areas such as urban, land transport and wild fires related services



# Tropical Cyclones Programme Division

Weather and Disaster Risk Reduction Services Department (WDS)



**WMO OMM**

World Meteorological Organization

Organisation météorologique mondiale

Taoyong Peng C/TCP

Anne-Claire Fontan

Catherine Bihute

# Tropical Cyclone Programme (TCP) Division

- **TCP Mission:** to assist and support its Members to:
  - Provide reliable and improved forecasts of
    - tropical cyclone tracks and intensities, and
    - related forecasts of strong winds, heavy rainfall, and storm surges,
    - covering all tropical cyclone-prone areas;
  - Through multi-hazard early warning systems
- TCP activities implemented mainly through two levels:
  - **Regional coordination** through the five regional tropical cyclone bodies (RA I and RA V TCCommittees, RA IV Hurricane Committee, Panel on Tropical Cyclones, Typhoon Committee), their RSMC-Tropical Cyclone Centers and Members, and the regional TC Operational Plans
  - **Global Coordination** through the RSMCs/TCWCs Technical Coordination Meetings, for capacity development, transfer of technology and scientific knowledge to Members, etc



# Tropical Cyclone Programme

## Priority Areas

### Continuing working towards

- Strengthened and harmonized regional and national coordination mechanisms for TC forecasting and warnings, governed by the regional tropical cyclone Operational Plans in all ocean basins prone to tropical cyclones;
- Establishing or enhancing regional and national tropical cyclone forecasting and early warning systems through regional and national centres;
- Developing TC forecasters competencies and skills by providing various training opportunities, training materials and optimal planning training events, etc., especially for those from SIDS and LDCs.

### Working towards

- Developing impact-based tropical cyclone forecasting and warning products;
- Establishing a WMO tropical cyclone forecasting competencies and
- Supporting the development or establishment of comprehensive regional and national protocols on tropical cyclone DRR.

# THANK YOU/ MERCI

Weather and Disaster Risk Reduction Services Department (WDS)



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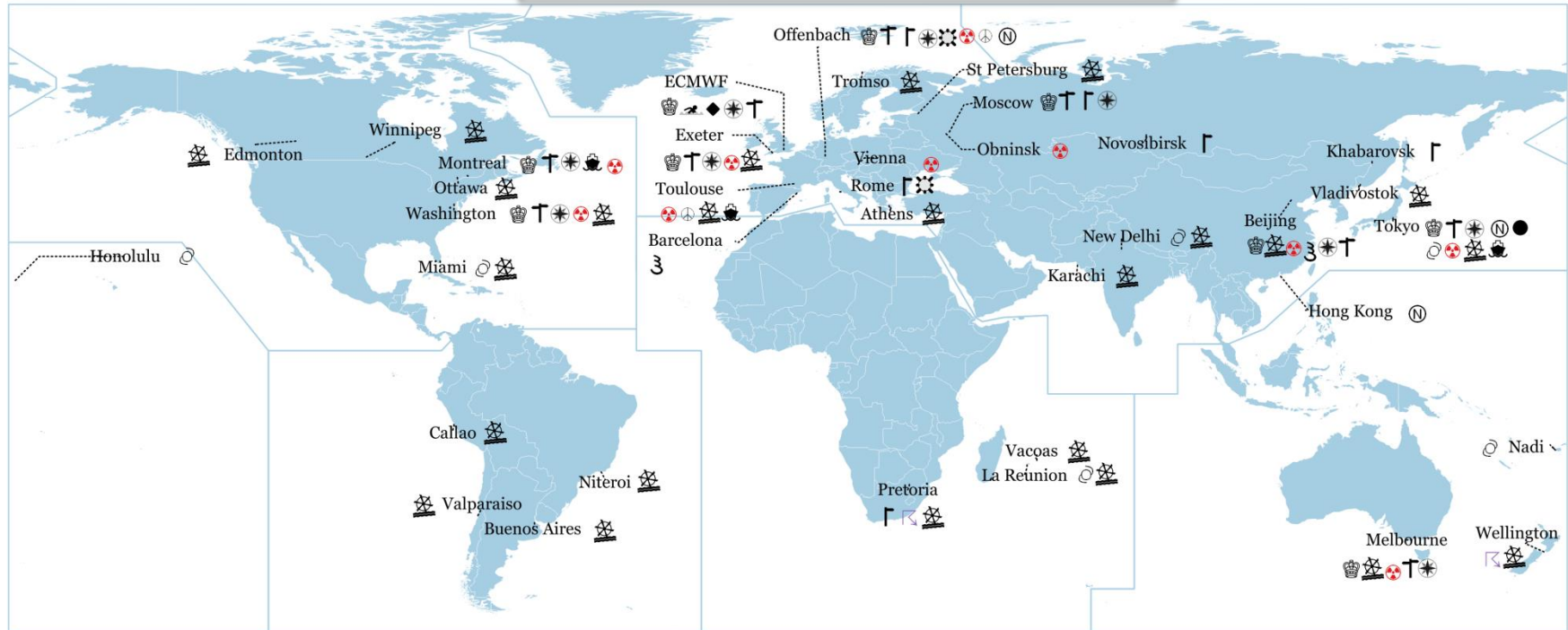
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# The GDPFS Today

## WMO Designated Global Data-processing and Forecasting System Centres

- Nowcasting and Weather Forecasting (upto 30 days)

Updated on 26 September 2018



### Legend

- |                                                                      |                                               |                                            |
|----------------------------------------------------------------------|-----------------------------------------------|--------------------------------------------|
| 👑 World Meteorological Centres (WMCs)* (9)                           | 🌊 RSMCs TC (6)                                | 🕒 RSMCs Nowcasting (3)                     |
| 🚢 RSMCs(NRT***) Lead Centre for Coordination of Wave Forecast (1)    | 🌊 RSMCs Marine Meteorological Services (24)   | 🌪️ RSMCs Limited Area Ensemble NWP (2)     |
| ● RSMCs(NRT***) Lead Centre for Coordination of EPS Verification (1) | ☢️ RSMCs Nuclear Emergency Response** (10)    | 🌐 RSMCs Global Ensemble NWP (9)            |
| ♦️ RSMCs(NRT***) Lead Centre for Coordination of DNV (1)             | ☮️ RSMCs Non-Nuclear Emergency Response** (2) | 📏 RSMCs Limited Area Deterministic NWP (6) |
| 🌊 RSMCs Numerical Ocean Wave Prediction (3)                          | 3 RSMCs Sand Dust (2)                         | 📏 RSMCs Global Deterministic NWP (9)       |
| 🌪️ RSMCs Severe Weather Forecasting (2)                              |                                               |                                            |

\* World Meteorological Centres are also Global Producing Centres for a) Deterministic Numerical Weather Prediction, b) Ensemble Numerical Weather Prediction, and c) Long-Range Forecasts.

\*\* RSMC for nuclear and non-nuclear emergency response have Atmospheric Transport and Dispersion Modelling (ATDM) capabilities.

\*\*\* NRT stands for Non-Real-Time

### DESIGNATIONS USED

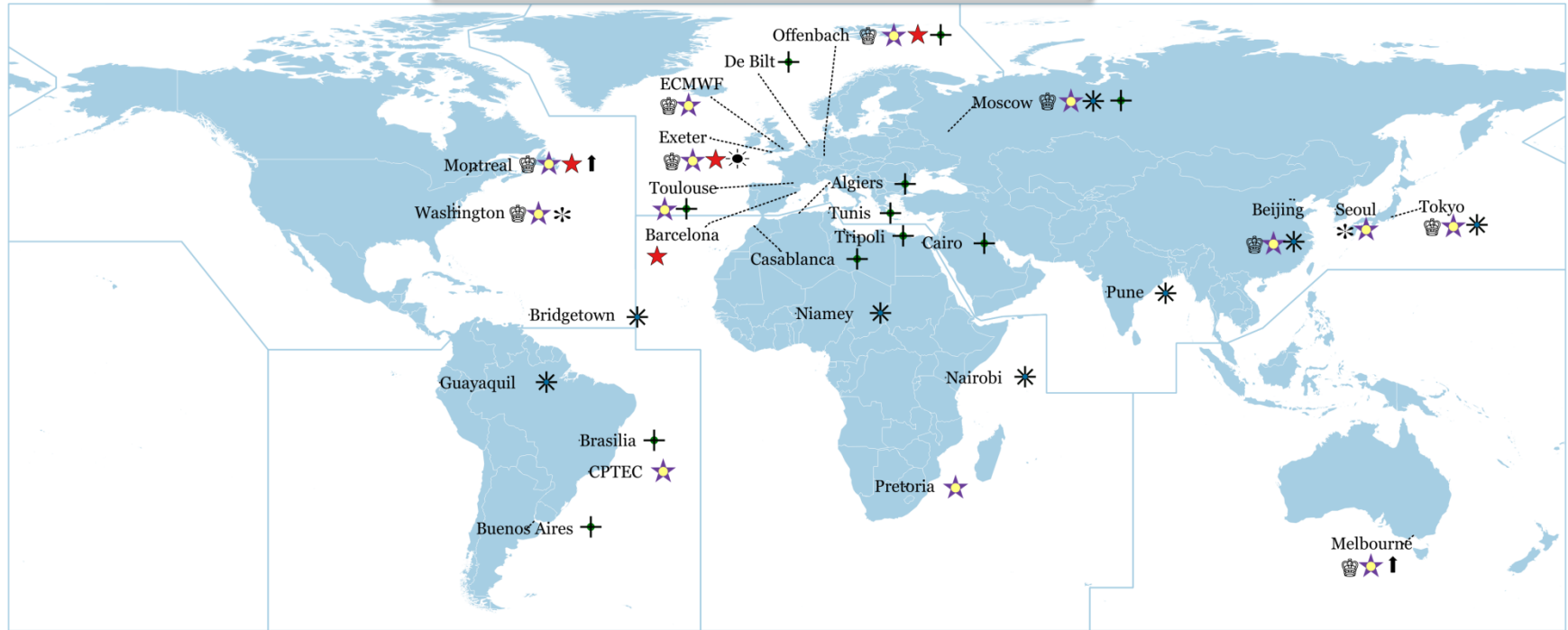
The depiction and use of boundaries, geographic names and related data shown on maps and included in lists, tables, documents, and databases on this web site are not warranted to be error free nor do they necessarily imply official endorsement or acceptance by the WMO.

# The GDPFS Today

## WMO Designated Global Data-processing and Forecasting System Centres

- Long-range and Climate Forecasting (over 30 days)

Updated on 26 September 2018



### Legend

- |                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li> World Meteorological Centres (WMCs)* (9)</li> <li> RSMCs(NRT**) Lead Centre for coordination of ADCP*** (1)</li> <li> RSMCs(NRT**) Lead Centre for coordination of LRFMME**** (2)</li> <li> RSMCs(NRT**) Lead Centre for coordination of LRF verification (2)</li> </ul> | <ul style="list-style-type: none"> <li> RCC - Networks Regional Climate Prediction and Monitoring NODEs (11)</li> <li> RCCs Regional Climate Prediction and Monitoring (8)</li> <li> GPC for ADCP*** (4)</li> <li> GPC for Long-Range Forecasting (13)</li> </ul> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

\* World Meteorological Centres are also Global Producing Centres for a) Deterministic Numerical Weather Prediction, b) Ensemble Numerical Weather Prediction, and c) Long-Range Forecasts.

\*\*NRT stands for Non-Real-Time

\*\*\*ADCP stands for Annual to Decadal Climate Prediction

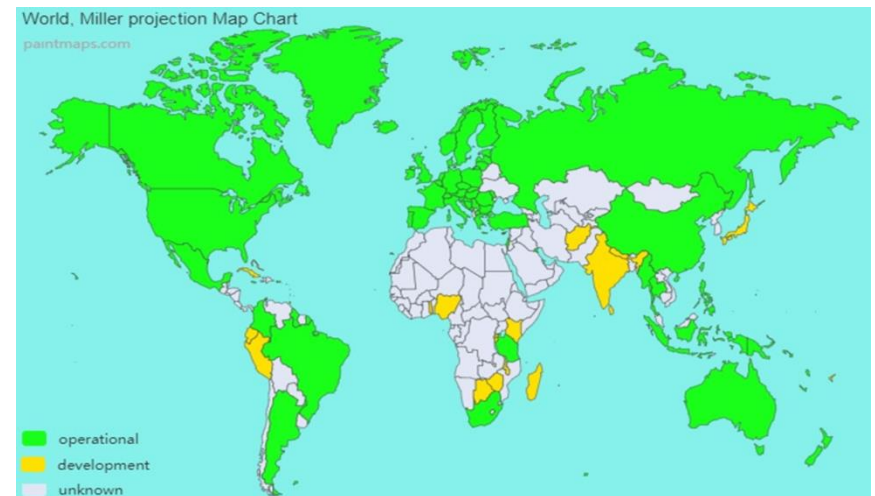
\*\*\*\*LRFMME stands for Long-Range Forecast Multi-Model Ensemble

### DESIGNATIONS USED

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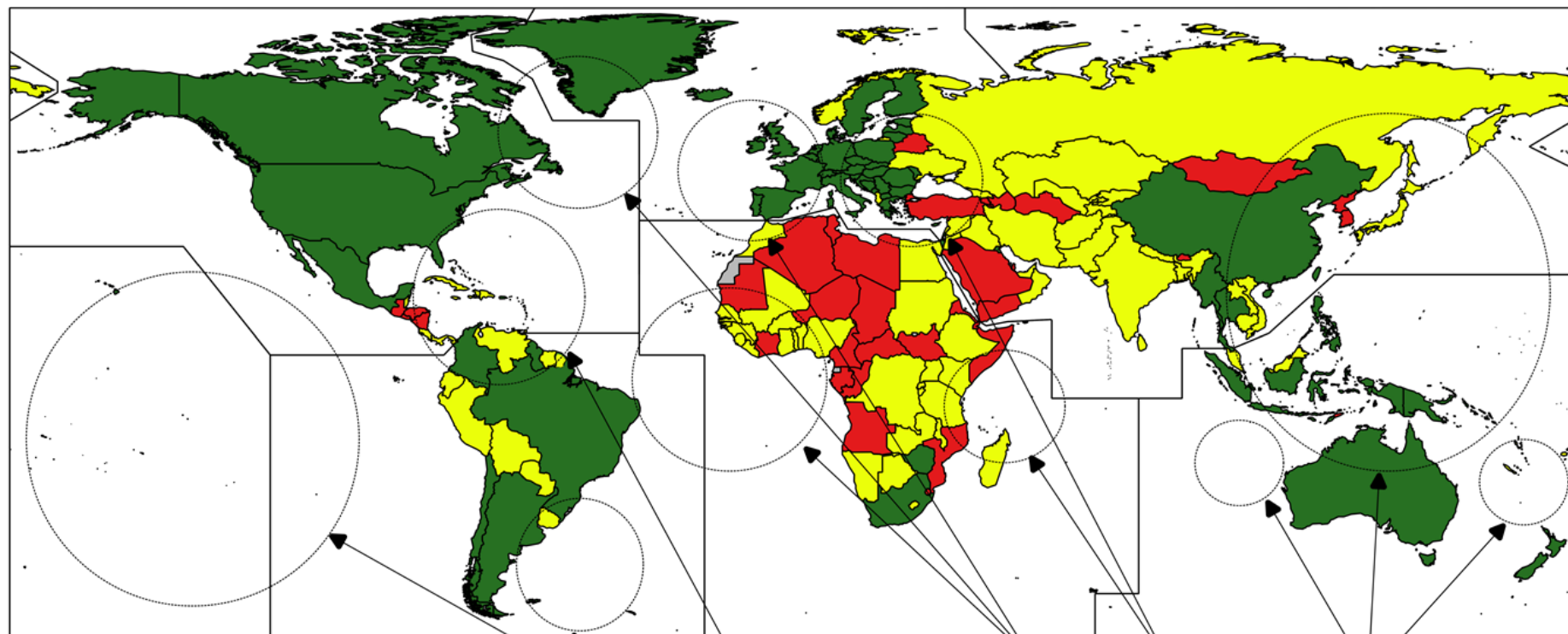
# Current state of CAP Implementation by Members

- Mapping CAP implementation region by region;
  - 75% of the world by population has at least one national CAP feed in operation or in development





# Implementation Of The Common Alerting Protocol (CAP)



## Legend

- Have Implemented Operational CAP System
- CAP Implementation Process Initiated
- Status Unknown
- Not WMO Member

American Samoa (U.S.)  
 Samoa Tonga  
 Niue  
 Falkland Islands (U.K., Claimed by Argentina)  
 Tokelau (New Zealand)  
 Wallis and Futuna Islands (France)  
 Pitcairn Islands  
 French Polynesia Kiribati  
 Cook Islands (New Zealand)  
 Falklands/Malvinas

Anguilla (U.K.) Puerto Rico (U.S.)  
 Virgin Islands (U.S.)  
 Aruba (Netherlands) Antigua and Barbuda  
 Barbados Bahamas Bonaire (Netherlands)  
 Curaçao Dominica Dominica Republic  
 Jamaica Montserrat Saba (Netherlands)  
 Saint Lucia Sint Eustatius (Netherlands)  
 Sint Maarten (Netherlands) French Guiana  
 Cayman Islands (U.K.) British Caribbean Territories  
 Guadeloupe (France) Curacao and Sint Maarten  
 Martinique (France) Haiti Virgin Islands (U.K.)  
 Saint Barthélemy (France) Trinidad and Tobago

Republic of Cabo Verde  
 Greenland (Denmark)  
 Faroe Islands (Denmark)  
 Sao Tome and Principe

Maldives  
 Comoros Mauritius  
 Palestine  
 Gibraltar (U.K.)  
 Kosovo  
 Mayotte (France)  
 Reunion Island (France)  
 Saint Pierre and Miquelon (France)  
 Seychelles  
 Vatican City State (Holy See)

Guam (U.S.) Taiwan (China)  
 Solomon Islands  
 Hong Kong, China Fiji  
 Macao, China  
 Micronesia, Federated States of  
 New Caledonia Singapore  
 Tuvalu Vanuatu  
 Brunei Darussalam  
 Christmas Island (Australia)  
 Cocos (Keeling) Islands (Australia)  
 Northern Mariana Islands (U.S.)  
 Tibet (China) Timor-Leste





## WMO Member Questionnaire on Urban Services

### Thematic Map for WMO Members Responding Status

The URLs for the online questionnaire are contained in the official letter to the PRs. The questionnaire is available in six languages: Chinese, English, French, Russian and Spanish. If you have any questions regarding this questionnaire, please contact: **Mr Samuel Muchemi**, [smuchemi@wmo.int](mailto:smuchemi@wmo.int) with the WMO Secretariat. Thank you in advance for your cooperation on this global survey!

The official letter to the PRs.

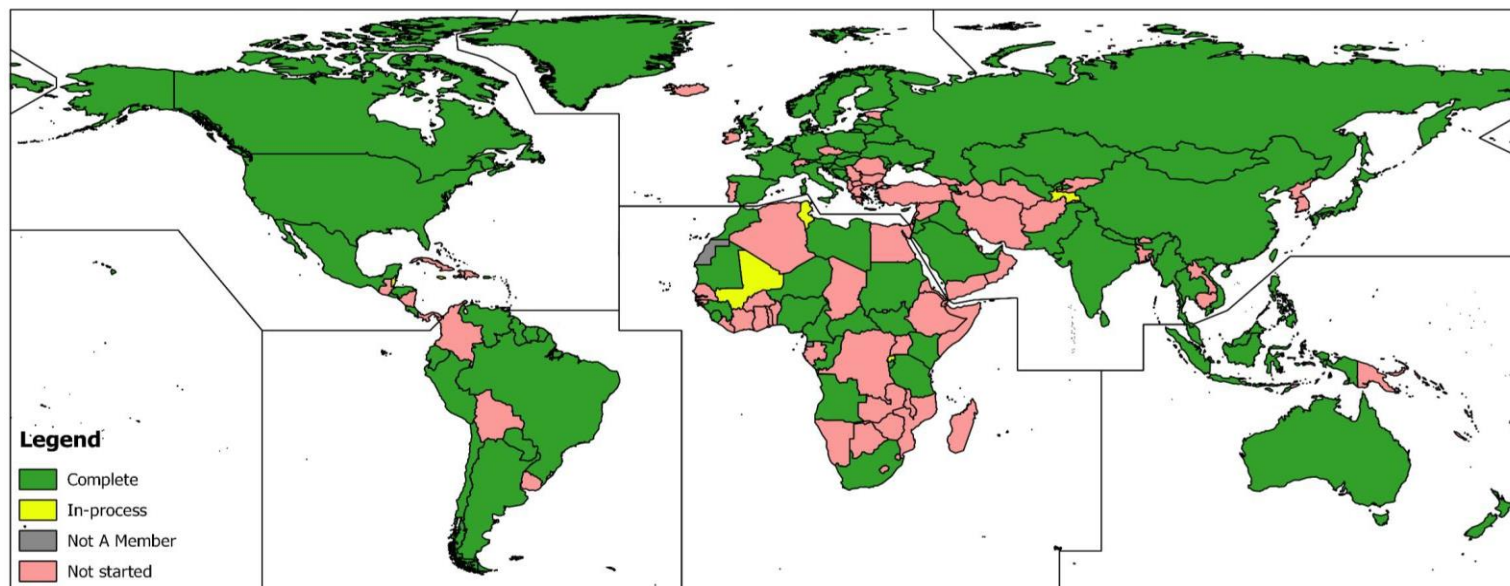
The questionnaire is available in six languages: Chinese, English, French, Russian and Spanish.

If you have any questions regarding this questionnaire, please contact:

Write to **Mrs Catherine Bezzola** ([cbezzola@wmo.int](mailto:cbezzola@wmo.int)).

Cooperation on this global survey!

**Latest Updated on 03 January 2019**



**NOTE:**

All content included on this map is for informative purposes only.

For detail, please read WMO Disclaimer at [public.wmo.int/en/disclaimer](http://public.wmo.int/en/disclaimer).

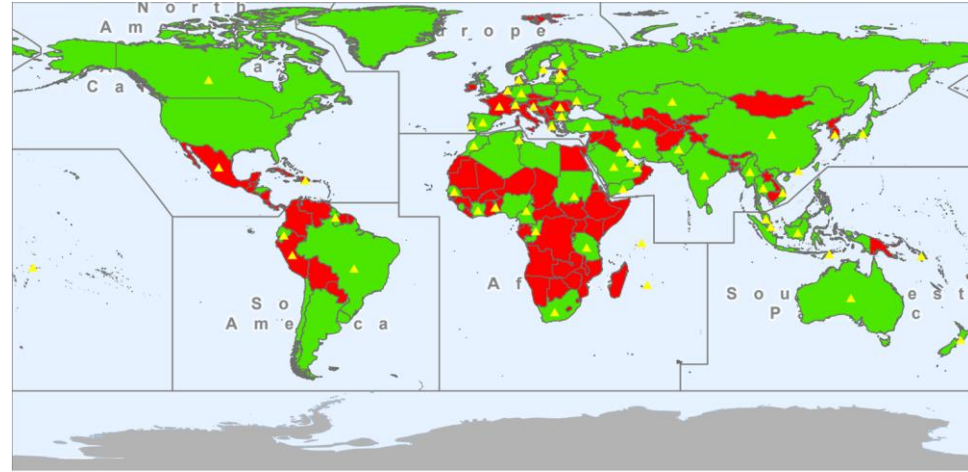
2500 0 2500 5000 7500 10000 km



**Survey:** identification of Urban Service requirements; and Collection of best practices of Members on Urban, Environmental, Health

# Marine Service Survey 2018-Gaps & Priorities

- Member respondents: 72
- Participation rate: 47%
- More than 80% Members with NMSFP appointed have responded
- Lack of responses: Central America, Western and Central Africa and Pacific Island regions
- Main gaps: human resources, capacity building and training, funding and equipment



- Green color: countries have responded the survey
- Red color: countries have not responded the survey
- Yellow triangles: countries with NMSFP appointed

## Key projects to mitigate gaps

- ❑ Activate NMSFPs community
- ❑ Joint IMO/WMO Symposium
- ❑ Marine service training course
- ❑ Cost option for Maritime Safety Information(MSI) service delivery
- ❑ Coastal Inundation Forecasting Initiative (CIFI)/MHEWS

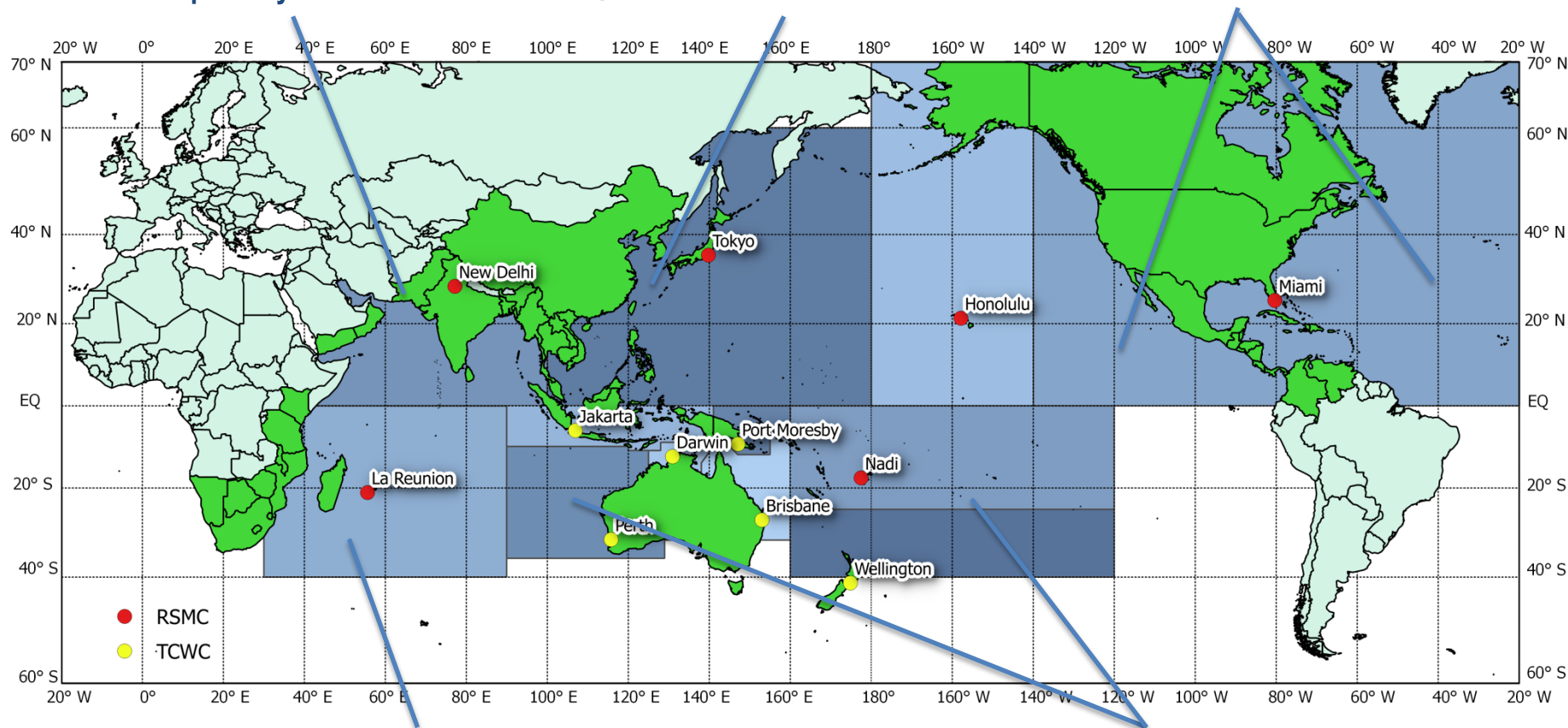
# How is the Tropical Cyclone Area organized ?

- 85 Members
- 5 Tropical Cyclone Regional Bodies
- 6 Regional Specialized Meteorological Centers (RSMCs), 6 Tropical Cyclone Warning Centers (TCWCs)

**Panel on Tropical Cyclones / 13 / 1972**

**Typhoon Committee / 14 / 1968**

**RA IV Hurricane Committee / 27 / 1977**



**RA I Tropical Cyclone Committee / 15 / 1973**

**RA V Tropical Cyclone Committee / 19 / 1985**

Name of the Regional Body / Members / Committee established in 19XX