



World Meteorological Organization

Weather • Climate • Water

Priority Activities of the WMO Commission for Hydrology

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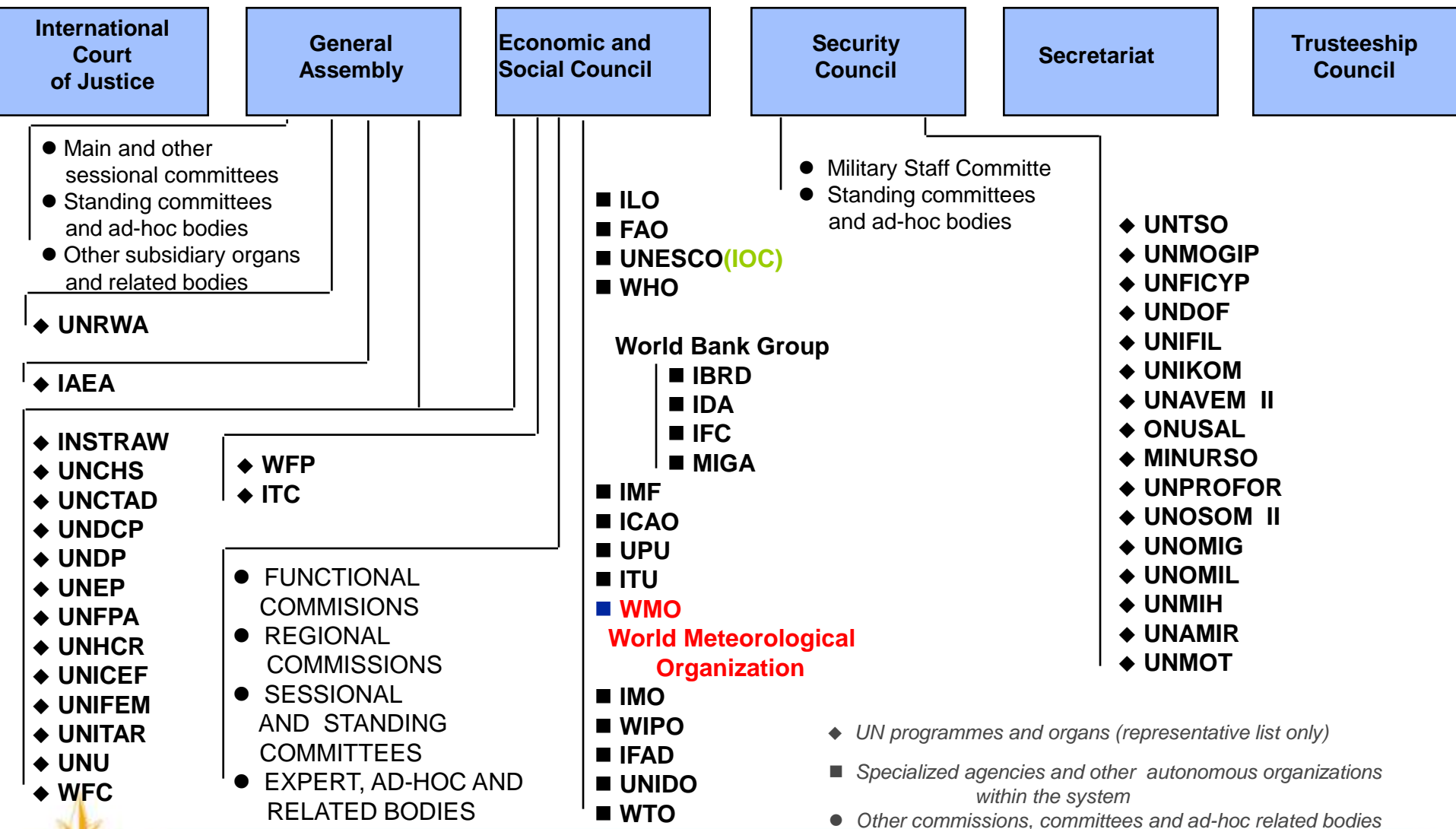
Bureau of Hydrology of the Ministry of Water Resources of China
Vice President, WMO Commission for Hydrology

Contents

-  **Introduction of WMO programmes and WMO-CHy**
 - Current activities of CHy in Water, Climate and Risk Management**
 - Suggestions on the future direction**



WMO in The United Nations System



WMO's long-term development goal

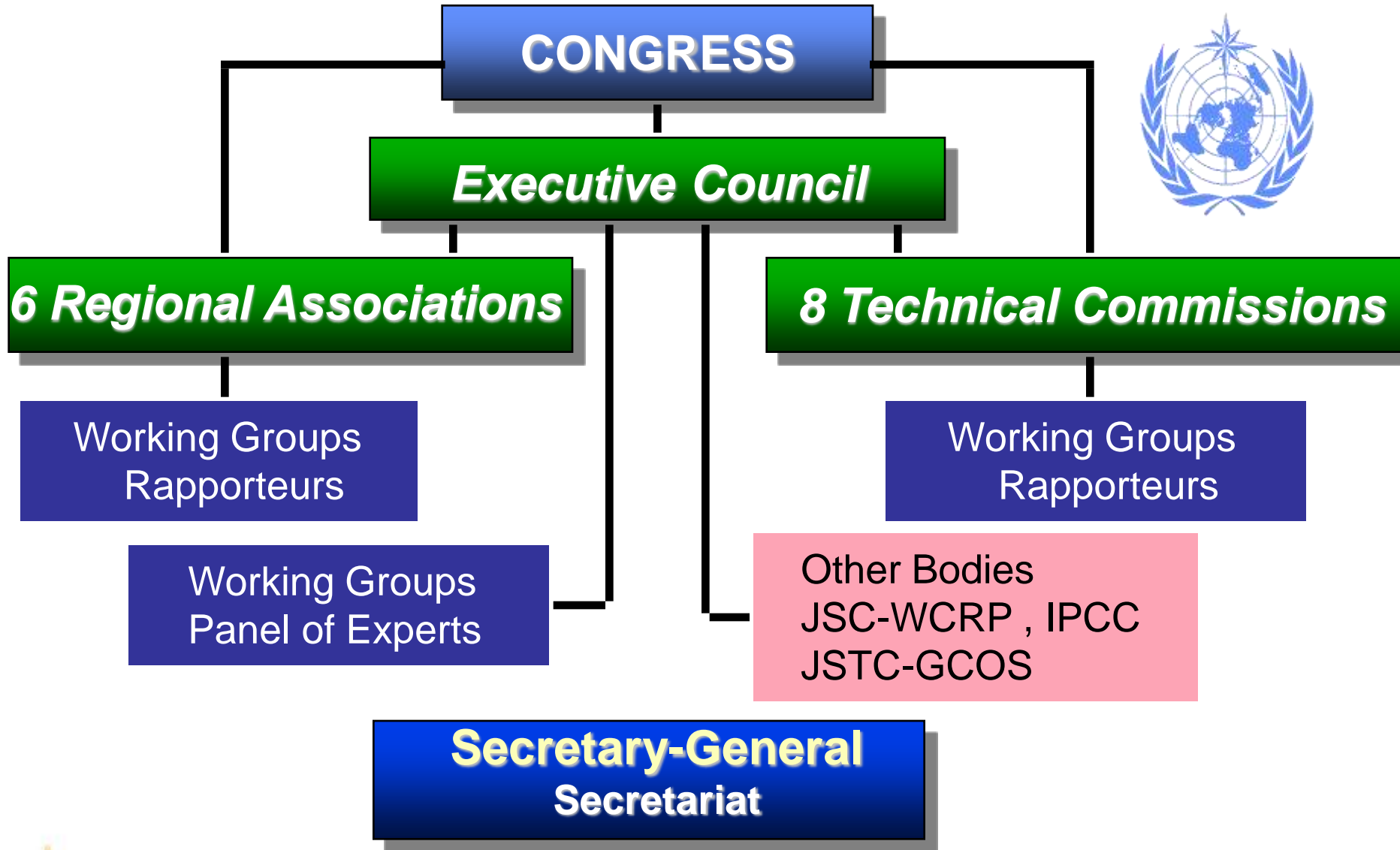
To provide world leadership in expertise and international co-operation in

- **Weather,**
- **Climate,**
- **Water,**
- **and related environmental issues,**

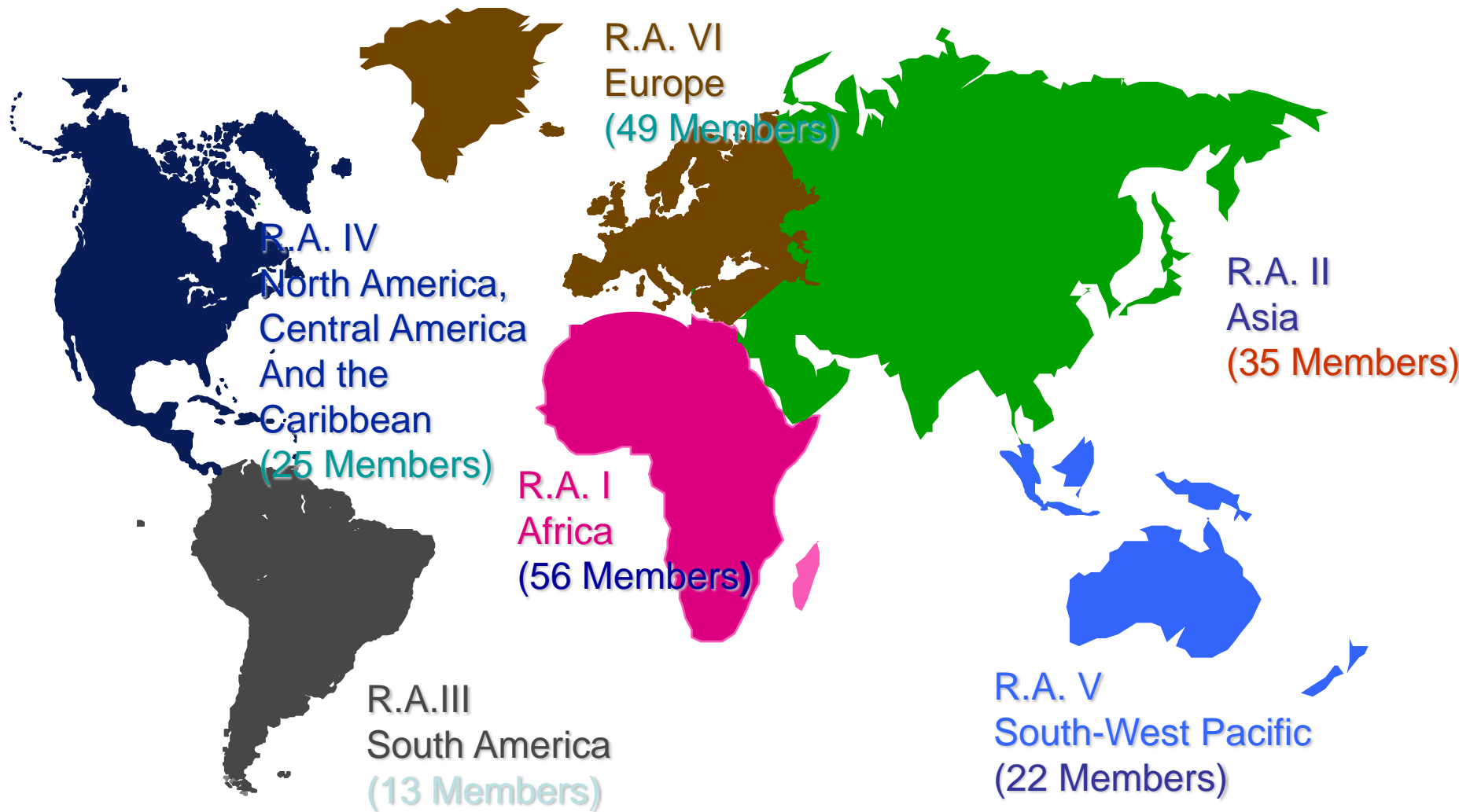
--contribute to the safety and well being of people throughout the world and to the economic benefit of all nations



WMO



WMO Regional Associations



WMO Programmes

World Weather Watch (WWW) Programme

WMO Space Programme

Natural Disaster Prevention and Mitigation Programme

**World
Climate
Programme**

**Atmospheric
Research
and
Environment
Programme**

**Applications
of
Meteorology
Programme**

**Hydrology
and
Water
Resources
Programme**

**Education and Training Programme
Technical Cooperation Programme
Regional Programme**



Hydrology and Water Resources Programme

Long-term objective:

promote application of hydrology and to further close cooperation between Meteorological and Hydrological Services.



Purposes:

- **assessment of** the quantity and quality of **water resources**,
- **mitigation of water-related hazards** like floods and droughts, efforts to facilitate horizontal cooperation
- **transfer of technologies** to strengthen the capacities of the hydrological services across the world.

Hydrology and Water Resources Programme

3 mutually supporting components:

- **Basic Systems in Hydrology**
- **Forecasting and Applications in Hydrology**
- **Capacity-building in Hydrology and Water Resources Management**



WMO Technical Commissions

Basic Commissions

- Commission for Basic Systems (CBS)
- Commission for Instruments and Methods of Observations (CIMO)
- Commission for Hydrology (CHy)
- Commission for Atmospheric Sciences (CAS)

Applications Commissions

- Commission for Aeronautical Meteorology (CAeM)
- Commission for Agricultural Meteorology (CAgM)
- Joint WMO/IOC technical Commission for Oceanography and Marine Meteorology (JCOMM)
- Commission for Climatology (CCI)



Commission for Hydrology (CHy)

Mission:

■ To design and execute the water related activities of WMO, including promoting the exchange of technology and capacity building. In particular, CHy provides guidance to WMO Member countries and the WMO Secretariat for the implementation of HWRP.

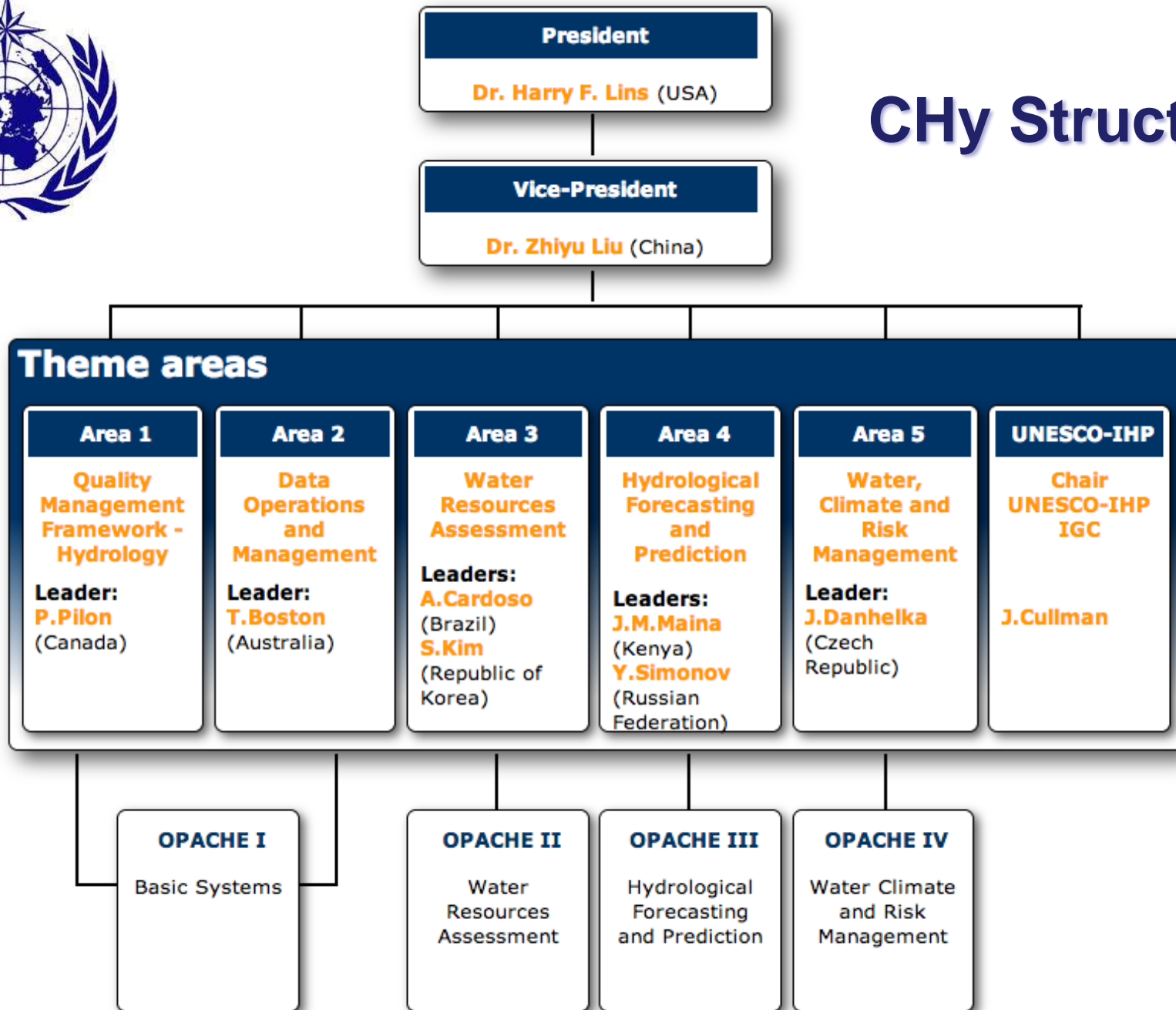
■ The CHy organizes activities under the framework of the HWRP according to the Thematic Areas and specific topics, in order to align its work plan with the WMO Strategy Plan and Operational Plan.



Website: <http://www.wmo.int/pages/prog/hwrp/chy/index.php>



CHy Structure



Contents

- Introduction of WMO programmes and WMO-CHy

-  **Current activities of CHy in Water, Climate and Risk Management**

- **Suggestions on the future direction**



CHy's Activities in Water, Climate and Risk Management

- **Flood Management**
 - Flood Forecasting Initiative (FFI)
 - Global Flash Flood Guidance System
 - Coastal Inundation Forecasting Demonstration Project
 - Projects – Zambezi FF&EWS
 - Associated Programme on Flood Management (with the GWP) - Integrated Flood Management
 - International Flood Initiative (with UNESCO)
- **Drought Management**
 - Integrated Drought Management Programme (IDMP) (with GWP)
- **Extended hydrological prediction**
- **Contribution to the GFCS**



Global Flash Flood Guidance Program

- The implementation of Flash Flood Guidance systems globally is a program to provide a **tool** for National Meteorological and Hydrologic Services to develop flash flood warnings.
- Addresses the need to provide early warnings for flash floods in the development of **regional or country-wide** approaches to flash flood issues.
- The global program is a partnership between the Agency for International Development/Office of Foreign Disaster Assistance, the World Meteorological Organization, the Hydrologic Research Center, and the National Oceanic and Atmospheric Administration – **MoU in place**



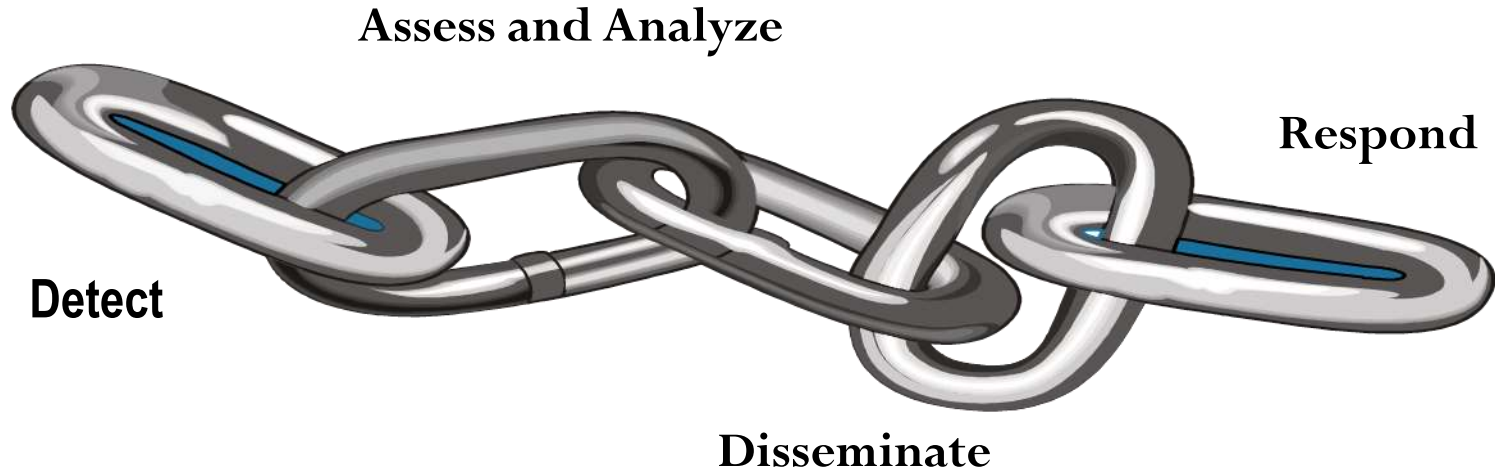
HYDROLOGIC RESEARCH
CENTER

A Nonprofit Research Corporation



Global Flash Flood Guidance Program

Implement an end-to-end flash flood early warning system to improve response by federal, state, and local governments, international organizations, NGOs, the private sector, and the public to occurrences of flash floods.



Global Flash Flood Guidance Program

FFG System Benefits

- Addresses all flash flood prone basins over the area of interest
- Early awareness of impending local flash flood threats for all potentially vulnerable areas
 - Provide rapid assessments of the **occurrence** (not the magnitude) of a flash flood
 - Only analyzing the occurrence allows for more rapid mobilization, reduces uncertainty and complexity
- **System designed to provide a balance between quality (accuracy) and value (timely)**



APFM – Associated Programme on Flood Management



Joint Initiative between World Meteorological Organization and Global Water Partnership



Founded in 2001

Contributors Switzerland, USAID, Germany, Italy, Japan



Mission

“to support countries in the **integrated management of floods** within the overall framework of Integrated Water Resources Management.”

APFM activities



Compilation of guidance materials and advisory tools

Field Demonstration Projects

Strategic Advice on flood management through



Developing training and advocacy materials

Capacity building

Building a network of institutions supporting multi-disciplinary approach in flood management

Contributing programme to the **Global Framework for Climate Services**

Mission

“to support countries in the **integrated management of floods** within the overall framework of Integrated Water Resources Management.”

Integrated Flood Management HelpDesk

A facility to provide guidance on flood-related issues to countries that seek to adopt the IFM concept.



**No Disaster Assistance or
Flood Emergency Response Functions !!!**





Integrated Flood Management HelpDesk

Beneficiaries

Government agencies on various levels, CBOs, RBOs, Voluntary Organizations, Bi- and Multilateral Organizations, Universities



Request for assistance, preparation of project proposal, supervision of technical implementation



Mail to floodmanagement@wmo.int

Technical input

HelpDesk Support Base

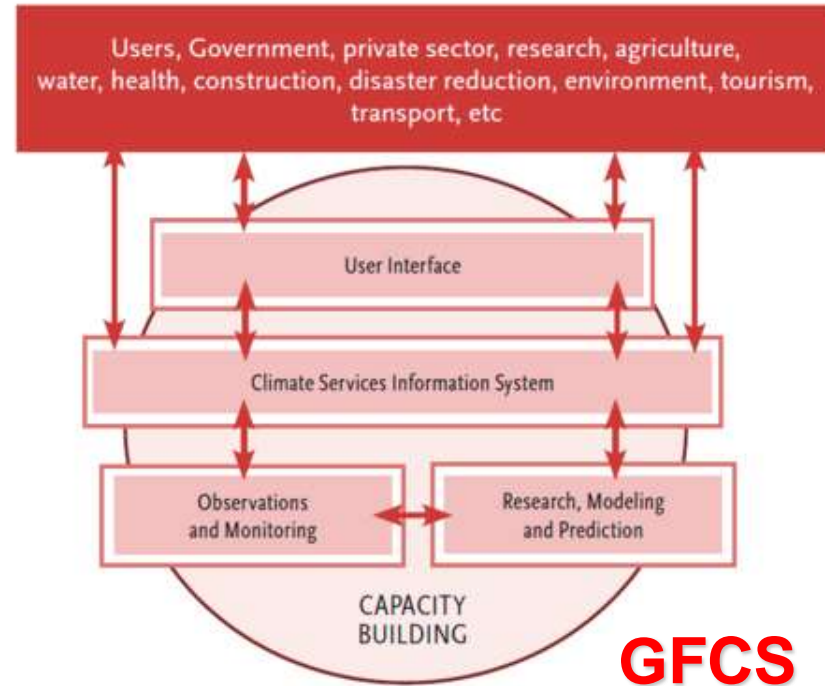
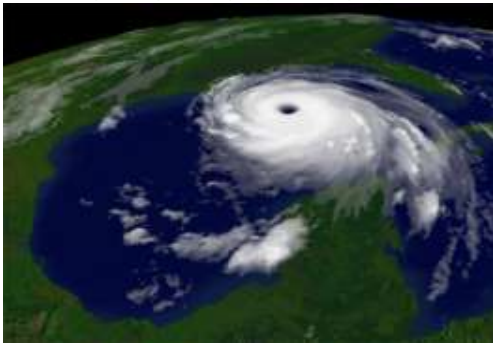
institutes specialized in various disciplines relevant for IFM



Global Framework for Climate Services

WMO high priority areas (2012-2015)

- ✓ **Global Framework for Climate Services**
- ✓ **Capacity building**
- ✓ **WIGOS/WIS**
- ✓ **Disaster Risk Reduction**
- ✓ **Aeronautical meteorology**



Primary goal of GFCS

- GFCS's primary goal is to ensure the greater availability of access to, and use of **climate services** for all countries and a wide range of users, of whom the water is one of its top priority.
- **Climate data and information** collected on various timescales and at national, regional and local levels, are essential to develop operational water resources management strategies, including flood and drought preparedness and response.



The GFCS initial priority areas

Agriculture



Water



Health

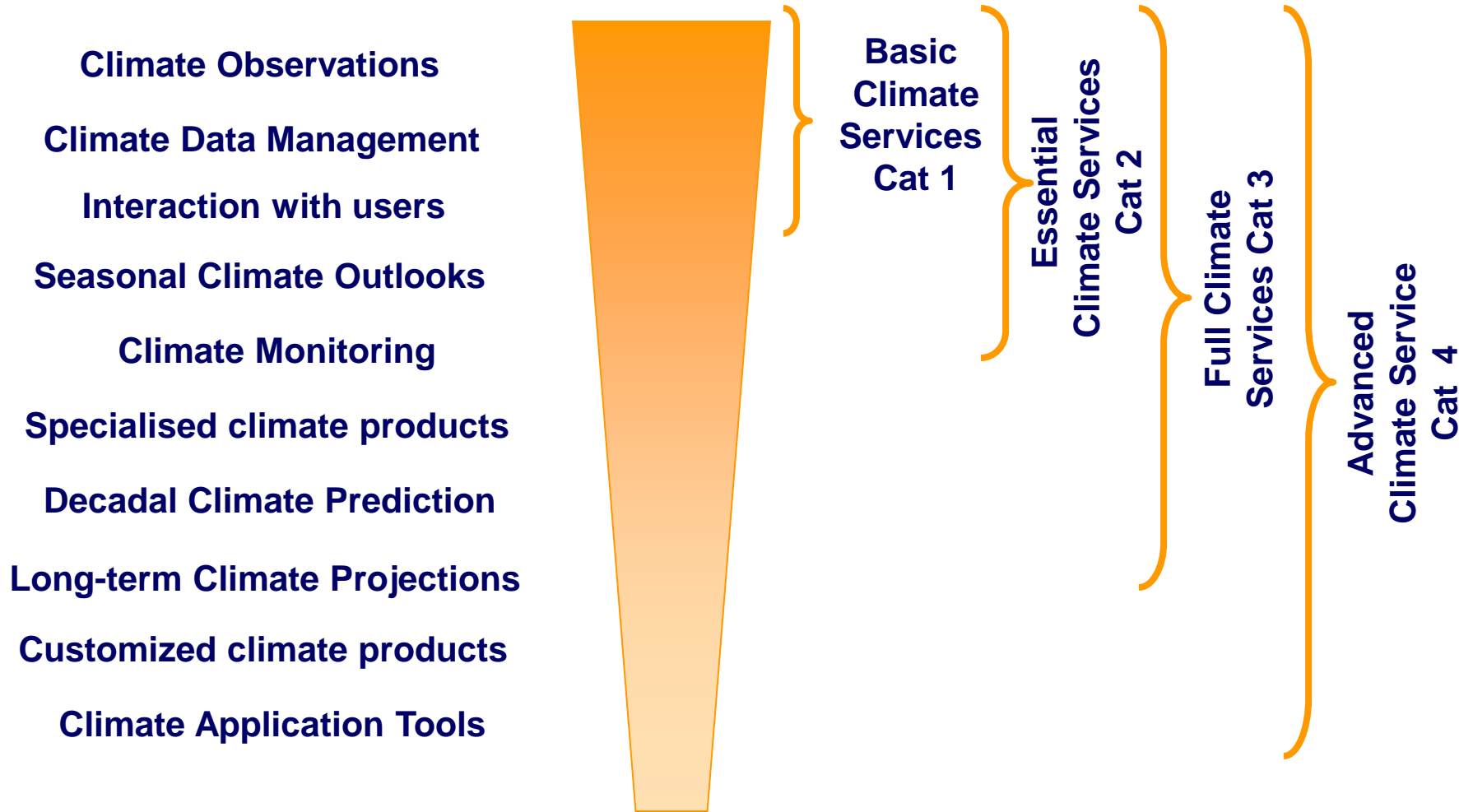


Disaster Risk
Reduction





...engagement of NMSs in climate risk management





Overview on Capacities

to provide climate services

- **Preliminary assessment (baseline)** of Members' capacity :
 - 37% (70) providing minimal to **basic services** (category 1)
 - ~30% (56) providing **essential services** (category 2)
 - ~21% (39) providing **full services** (category 3) and
 - ~13% (24) providing **advanced services** (category 4)
- **Target** for capacity after 4x4-year implementation:
 - ~ 3% (6) providing minimal to basic services (category 1)
 - ~34% (64) providing essential services (category 2)
 - ~39% (73) providing full services (category 3) and
 - ~24% (46) providing advanced services (category 4)

Contributions of HWRP and CHy to the implementation of GFCS

- **HWRP** and **CHy** can contribute to the GFCS through existing work and further development.
- **HWRP** contributes to the GFCS in an indispensable manner, in particular in relation to the **User Interface Platform**, the **observation and monitoring**, **climate services information system**, and the **capacity building**.
- **CHy's activities** undertaken in the theme area of **Water**, **Climate and Risk Management** can be considered as the direct contribution to the GFCS.



Contributions of CHy to the implementation of GFCS

CHy's contributes to the GFCS

- **strengthening quality of hydrological products and services** through the **Quality Management Framework –Hydrology**;
- **assistance in development of policies on the exchange of hydrological data**;
- **guidance** in **dynamic assessments of water resources and Extended Hydrological Prediction** by using access to improved climate services;
- **operation of a joint HelpDesk** covering both flood and drought management;
- **trainings** on the subjects of **application of climate information and products** for extended hydrological prediction and seasonal outlooks



Contributions of CHy to the implementation of GFCS

CHy's contributes to the GFCS

- CHy established a **Water and Climate Service Exchange mechanism**, which could improve climate products and services through the incorporation of hydrological observations.
- Thanks to the improvements in monthly, **seasonal climate and outlooks, hydrological services** delivery could be improved in support of water resources systems operations and seasonal planning.



Extended hydrological prediction



Flash flood warning

Flash flood guidance

flood forecasting guidance

Reservoir inflow forecast

Water supply volume forecast

Medium - Long-range

Forecast Requirements



Extended hydrological prediction

- **Use of climate models:**
down-scaling and ensemble schemes

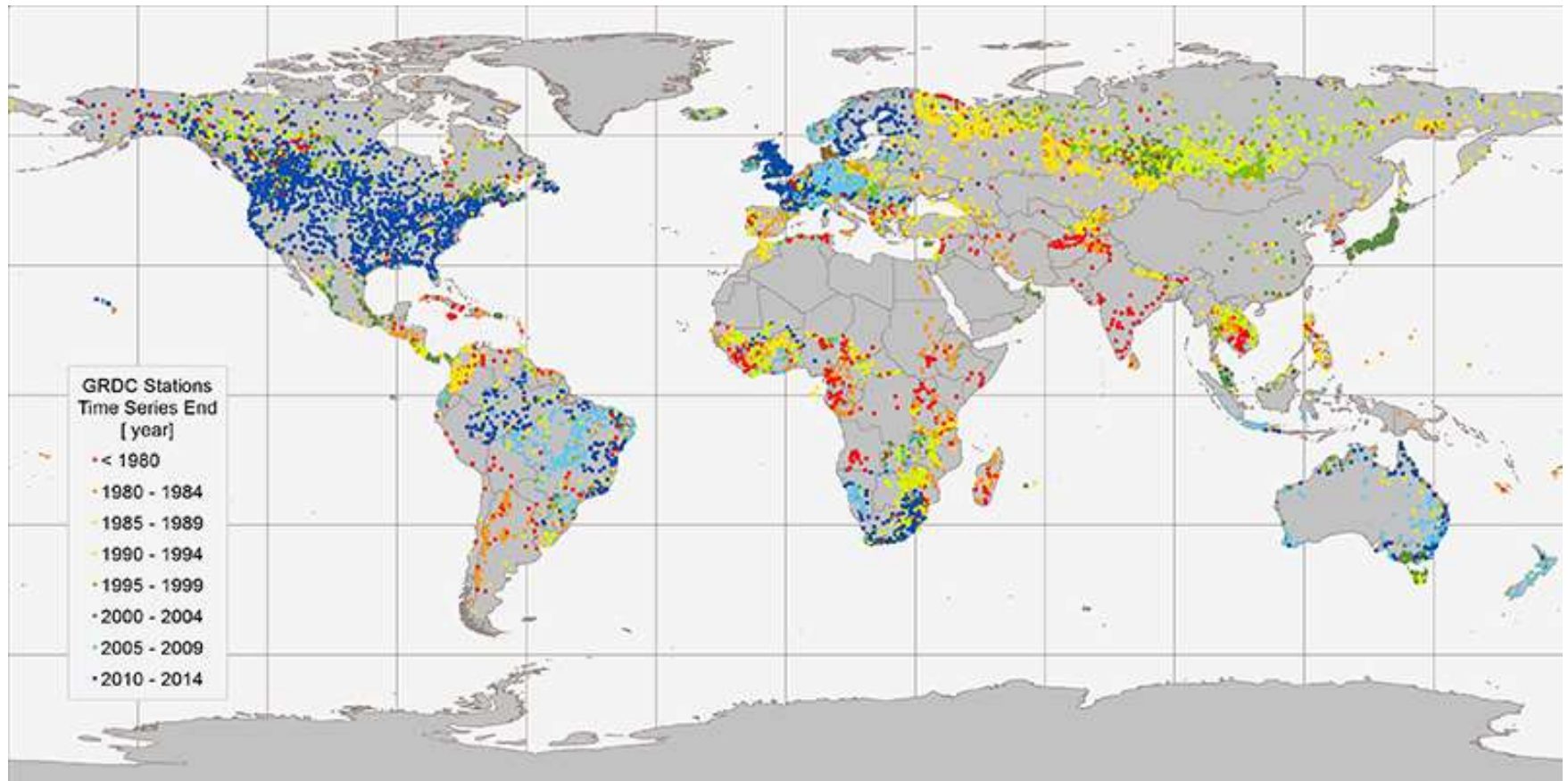
- **Traditional statistical hydrology methods:**



Commission for Hydrology (CHy)

Special Activities

World Hydrological Observing System (WHOS)



8962 stations with monthly data discharge data, including data derived from daily data (Status: 20 December 2013)

Koblenz: Global Runoff Data Centre, 2014.



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1. All observations should be used for generation of integrated and quality assured climate products

- Data availability and accessibility in many areas continues to be a significant problem

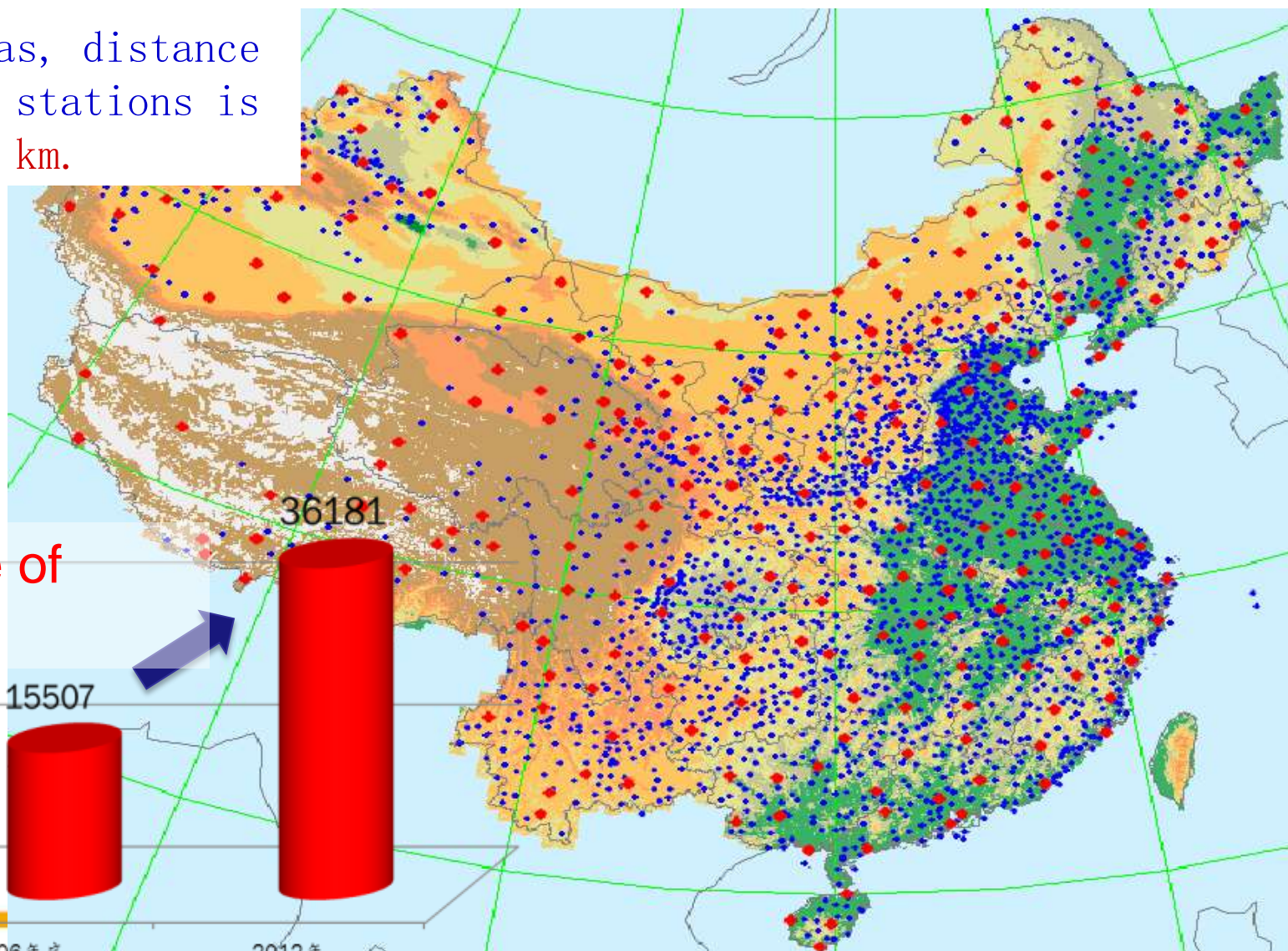
- CHy established a Water and Climate Service Exchange (**WACSE**) mechanism, which could improve climate products and services through the incorporation of hydrological observations.



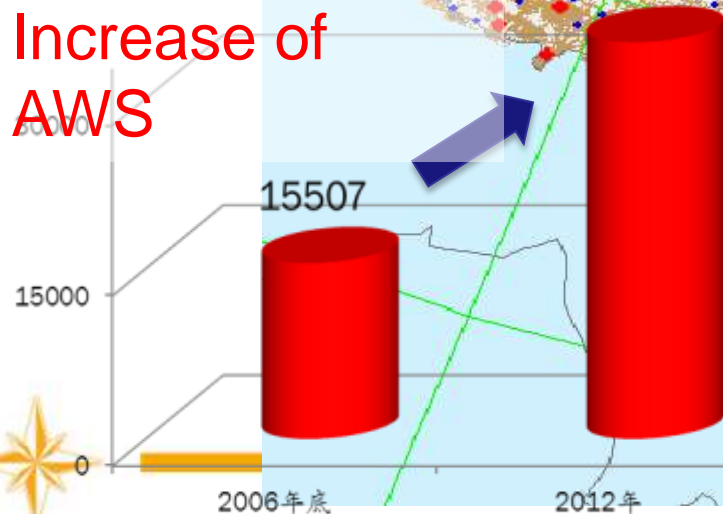
National Observing Stations (2419)

& AWS (36181)

In some areas, distance between two stations is less than 5 km.

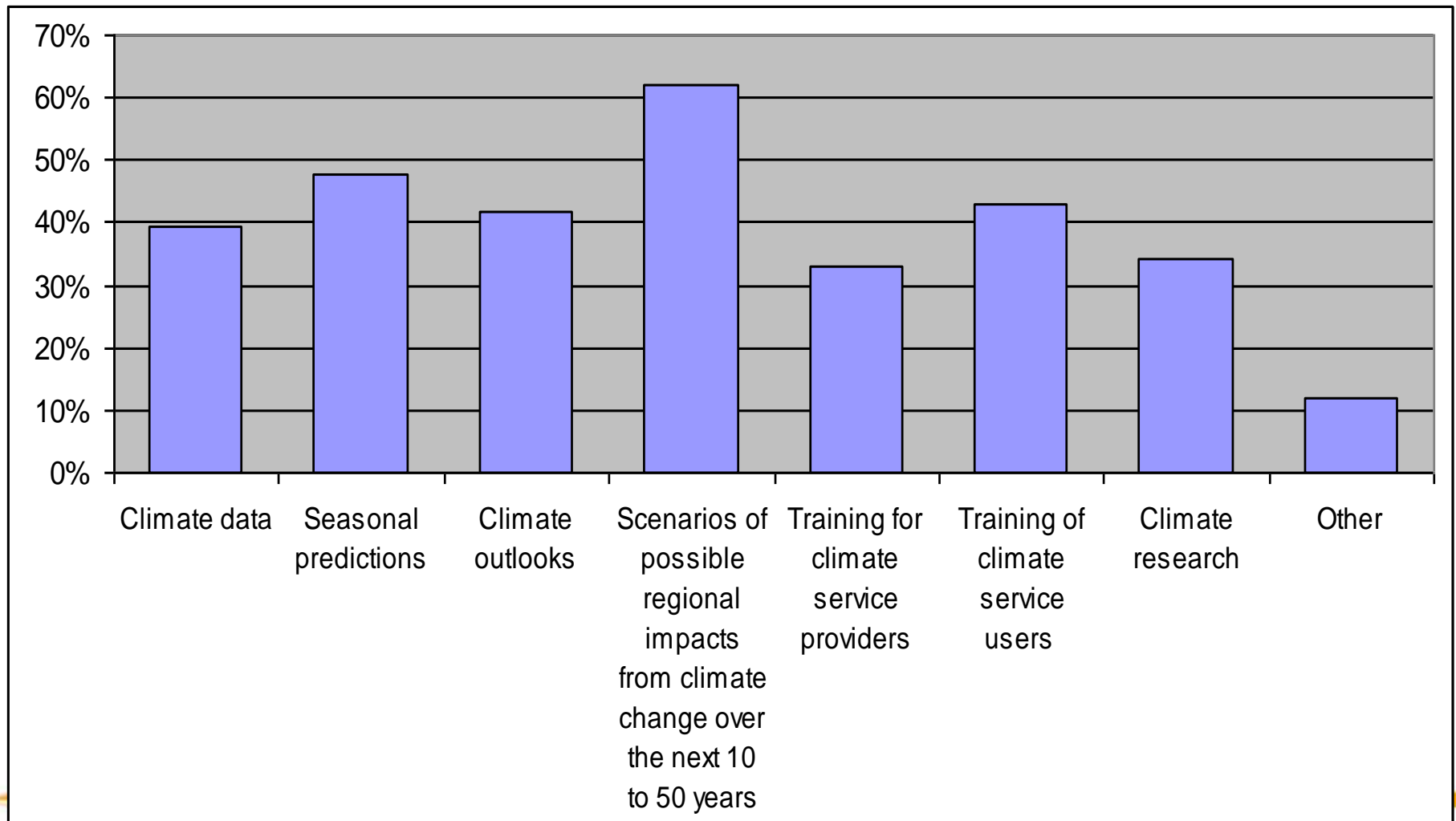


Increase of
AWS



Questionnaire:

Which climate services do you need but are currently unable to obtain ?



2. Regional Climate Centers and the Regional Climate Outlook Forums need to be looking more seriously into water issues than they currently are.

- We call for strengthened cooperations in the future between WMO and its Members, among WMO Members in implementation of GFCS
- It's expected for regional climate centers, regional climate outlook forums (monitoring, prediction and assessment) to play a larger role in GFCS



Regional Climate Centers (RCCs)

About RCC RAI



WMO Regional Climate Centers (RCCs) are centres of excellence that create regional products including long-range forecasts that support regional and national climate activities, and thereby strengthen the capacity of WMO Members in a given region to deliver better climate services to national users.

In RA II, the Beijing Climate Center (BCC), China, and the Tokyo Climate Center (TCC), Japan were designated as RCC Beijing and RCC Tokyo, respectively, in 2009. The North Eurasian Climate Center (NEACC), Russian Federation, was designated as a new RCC (RCC Moscow) in 2013. India began a demonstration phase in May 2013. Iran and Saudi Arabia have intention to become RCC.

RCCs really need to be looking more seriously into water issues than they currently are.





Monitoring

Long Range Forecast

Monthly (BCC-AGCM2.0)

Seasonal (BCC-CGCM1.0)

Data Download

Period of Prediction Year Month

Region

Element

Lead Time

- EastAsia**
- Northern Hemisphere
- Hemisphere of the Northeast
- Global
- Pacific India
- China

precipitation anomaly percentage

Rain(EM&ML)

surface temperature anomaly

Temp(EM&ML)

Nino3.4

海温距平

500hPa Height

850hPa Tempture

200hPa Wind

850hPa Wind

Lead 1 Month

Lead 2 Month

Lead 3 Month

Lead 4 Month

Lead 5 Month

Lead 6 Month

Lead 7 Month

Lead 8 Month

Lead 9 Month

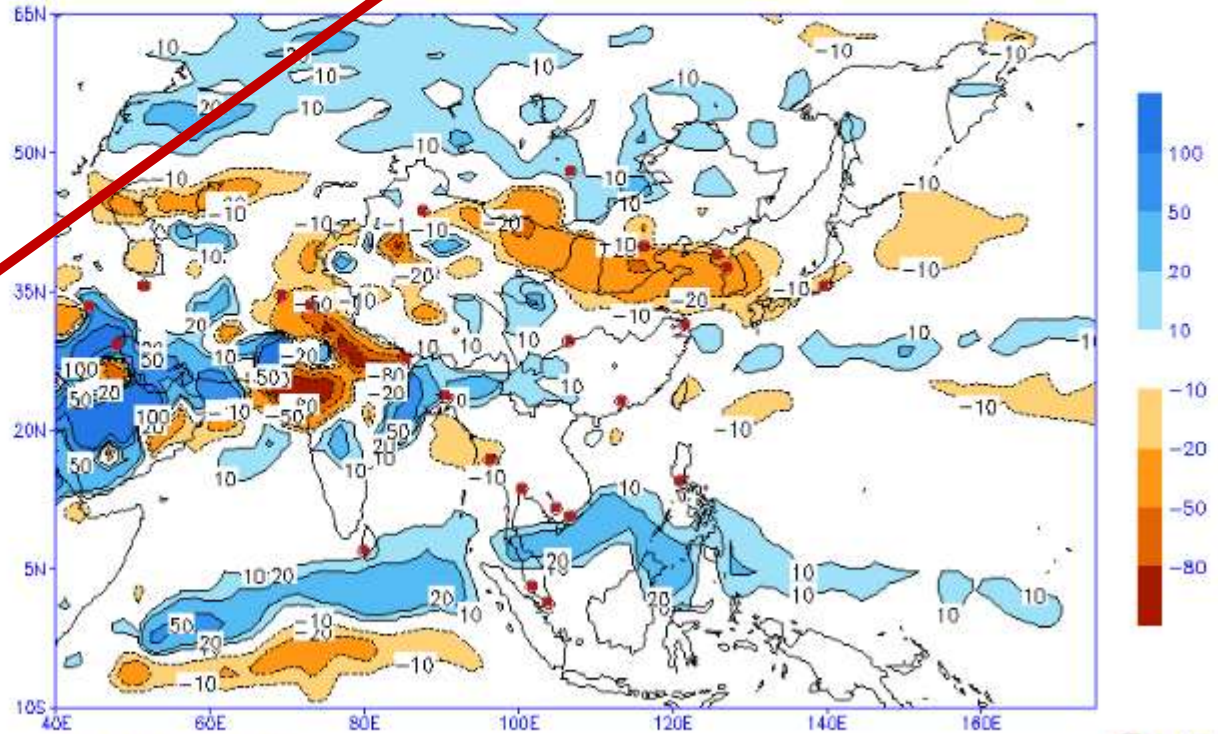
Lead 10 Month

Lead 11 Month

Lead 12 Month

NCC/BCC Seasonal Forecast
 Ensemble Mean Preci Anomaly Percentage
 Fcst Started Refer Date 2014/08/01
 Member Size=12

CGCM
 For 2014/11-2015/01
 Fcst Produced Date 2014/08/22



Regional Climate Outlook Forums (RCOFs)

- Regional Climate Outlook Forums, active in several parts of the world, routinely provide real-time regional climate outlook products.

- ◆ **Greater Horn of Africa** Climate Outlook Forum (GHACOF)
- ◆ **Southern African** Regional Climate Outlook Forum (SARCOF)
- ◆ Climate Outlook Forum for **West Africa** (PRESAO)
- ◆ **Forum on Regional Climate Monitoring, Assessment and Prediction for Regional Association II (Asia) - FOCRAII**
- ◆ **Western Coast of South America** Climate Outlook Forum (WCSACOF)
- ◆ **Southeast of South America** Climate Outlook Forum (SSACOF)
- ◆ **The Pacific Islands: The Island Climate Update**
- ◆ **Pacific Islands** online Climate Outlook Forum (PICOF)
- ◆ Climate Outlook Forum for **Central America**
- ◆ **Southeastern Europe** Climate Outlook Forum (SEECOF)
- ◆ **South Asian** Climate Outlook Forum (SASCOF)
- ◆ **Caribbean** Climate Outlook Forum (CARICOF)
- ◆ **North Eurasian** Climate Outlook Forum (NEACOF)
- ◆ **ASEAN** Climate Outlook Forum (ASEANCOF)
- ◆ **Mediterranean** Climate Outlook Forum (MedCOF)

Regional Climate Outlook Forums (RCOFs)

FOCRAII : Forum on Regional Climate Monitoring, Assessment and Prediction for Regional Association II (Asia)

FOCRAII covers all the countries in **Asia**, most of them part of the WMO Regional Association II. Beijing Climate Center (BCC) of China Meteorological Administration (CMA) has been coordinating FOCRAII activities. The latest seasonal outlook produced by FOCRAII and other related information is available at:

[FOCRAII Statement](#)



RCOFs need to be looking more seriously into water issues than they currently are.





**World
Meteorological
Organization**

Weather · Climate · Water

Thank you for your attention !

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