Priority Activities of the WMO Commission for Hydrology

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Contents

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

CONGRESS

Executive Council

6 Regional Associations
- Working Groups
- Rapporteurs
- Working Groups
  Panel of Experts

8 Technical Commissions
- Working Groups
- Rapporteurs
- Other Bodies
  JSC-WCRP, IPCC
  JSTC-GCOS

Secretary-General
Secretariat
WMO Regional Associations

- R.A. I: Africa (56 Members)
- R.A. III: South America (13 Members)
- R.A. IV: North America, Central America, and the Caribbean (25 Members)
- R.A. V: South-West Pacific (22 Members)
- R.A. VI: Europe (49 Members)
- R.A. II: Asia (35 Members)
## WMO Programmes

### World Weather Watch (WWW) Programme

- **WMO Space Programme**
- **Natural Disaster Prevention and Mitigation Programme**

#### Regional 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
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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
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 thro
- 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.

Get Help

- Assistance for Flood Management Policy, Law and Strategy
- Capacity Building for Integrated Flood Management
- Rapid Guidance on Technical Tools and Advisory Material

Help Yourself

Tools and Publications
Education
Database Reference Centre
Questions and Answers

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

**HelpDesk Support Base**
institutes specialized in various disciplines relevant for IFM

Mail to floodmanagement@wmo.int
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

Basic Climate Services Cat 1
Essential Climate Services Cat 2
Full Climate Services Cat 3
Advanced Climate Service Cat 4

Climate Observations
Climate Data Management
Interaction with users
Seasonal Climate Outlooks
Climate Monitoring
Specialised climate products
Decadal Climate Prediction
Long-term Climate Projections
Customized climate products
Climate Application Tools
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

Short Range
- hours
- days
- weeks

Long Range
- months
- seasons
- years
- decades

Forecast Requirements

Flash flood warning
Flash flood guidance

Medium - Long-range

flood forecasting guidance
Reservoir inflow forecast

Water supply volume forecast

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)
Contents

• **Introduction of WMO programmes and WMO-CHy**

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• **Suggestions on the future direction**
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.
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?

- Climate data
- Seasonal predictions
- Climate outlooks
- Scenarios of possible regional impacts from climate change over the next 10 to 50 years
- Training for climate service providers
- Training of climate service users
- Climate research
- Other
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 cooperation 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)

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.
**Long Range Forecast**

- Monthly (BCC-AGCM2.0)
- Seasonal (BCC-CGCM1.0)

**Data Download**

- precipitation anomaly percentage
  - Rain (EM&ML)
  - surface temperature anomaly
  - Temp (EM&ML)
  - Nino3.4
  - 500hPa Height
  - 850hPa Temperature
  - 200hPa Wind
  - 850hPa Wind

**Forecast Parameters**

- Period of Prediction Year: 2014
- Month: Nov
- Region: East Asia
- Element: precipitation anomaly percentage
- Lead Time: 3 Month
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.
Thank you for your attention!

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