WMO REGIONAL CLIMATE CENTRES (RCCs) AND REGIONAL CLIMATE OUTLOOK FORUMS (RCOFS): Overview and African Context

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Purpose of RCCs

• Support development and delivery of effective climate services for the benefit of all WMO Members through:
  – Regional cooperation and prioritization for capacity development;
  – Regional coordination of operational implementation of the progress made in WMO’s climate data, monitoring, prediction and research initiatives;
  – A regional mechanism for interpretation and interface to NMHSs of global climate information;
  – Serve as key regional entities within the Climate Services Information System (CSIS) pillar of the Global Framework for Climate Services (GFCS).
WMO RCCs and the GDPFS (1/2)

WMO’s Global Data Processing and Forecasting System (GDPFS) is organised as a three-level system of World Meteorological Centres (WMCs), Regional Specialised Meteorological Centres (RSMCs) and National Meteorological Centres (NMCs) which carry out a variety of GDPFS functions at global, regional and national levels.

WMO Regional Climate Centres are RSMCs by definition and, therefore, part of the GDPFS and, hence, shall follow respective standard practices and procedures.
WMO RCCs and the GDPFS (2/2)

- WMO RCCs are part of WMO’s baseline infrastructure, practices and procedures of which shall be followed or implemented by Members.
- This explains the importance of WMO RCCs from a technical point of view as well as the formalities attached to its establishment and operations.
- Whilst CBS has the overall coordinating responsibility for running the GDPFS, close CCI-CBS interaction is required and realised for climate-related GDPFS aspects (e.g., CCI/CBS Expert Team on RCCs; CBS/CCI Expert Team on Operational Prediction on Sub-seasonal to Longer-time Scales)
WMO RCC: Definitions

• WMO-RCC
  – A multifunctional centre that fulfils all the required functions of an RCC for the entire region, or for a sub-region to be defined by the regional association

• WMO RCC-Network
  – A group of centres performing climate-related activities that collectively fulfil all the required functions of an RCC

• WMO RCC-Network Node
  – a centre in a designated WMO RCC-Network
  – a node will perform, for the region or sub-region defined by the regional association, one or several of the mandatory RCC activities (e.g. long-range forecasting (LRF), climate monitoring, climate data services, training).
Flexibility built into RCC concept in GDPFS

- WMO RCCs or WMO RCC-Networks might be established, by request of the Members of the Regional Associations concerned, for climate-sensitive areas whose boundaries extend beyond or are outside those of a single Regional Association.
- In order for a centre or a group of centres in a cooperative effort to be designated as an RCC or RCC-Network, it shall perform the minimum set of functions, criteria and products defined in the Manual on GDPFS.
- Additional requirements for RCC functions may vary in detail from Region to Region. A list of highly recommended, but not mandatory, functions is also given.
- An RCC is not necessarily an NMHS, but a non-NMHS candidate for RCC designation must be nominated by the Permanent Representative of the Member concerned.
More on the RCC concept

• Who can use the title?
  – Only centres or groups of centres designated by WMO will carry the title ‘WMO RCC’ or ‘WMO RCC-Network’ respectively.

• Recipients of RCC products and services (RCC Users):
  – NMHSs (RCCs are complementary to and supportive of NMHSs, who will deliver all national-scale products and warnings)
  – other RCCs and
  – international institutions recognized by the Regional Association.

• Guidance for RCCs and RCC-Networks:
  – Guidance published by the Commission for Climatology on technical, climate-related matters
  – Functions and criteria identified in the Manual on the GDPFS
Mandatory Functions for RCC Designation (1/2)

• Operational Activities for LRF*:
  – Interpret and assess relevant LRF products from GPCs, distribute relevant information to RCC Users; and provide feedback to GPCs
  – Generate regional and sub-regional tailored products, relevant to RCC User needs, including seasonal outlooks etc.;
  – Perform verification of RCC quantitative LRF products, including the necessary exchange of basic forecasts and hindcast data;
  – Generate ‘consensus’ statement on regional or sub-regional forecasts;
  – Provide on-line access to RCC products/services to RCC Users;
  – Assess use of RCC products and services through feedback from RCC Users.

* Both dynamical and statistical, within the range of 1 month to 2 year timescale, based on regional needs
Mandatory Functions for RCC Designation (2/2)

- **Operational Activities for Climate Monitoring:**
  - Perform climate diagnostics including analysis of climate variability and extremes, at regional and sub-regional scales;
  - Establish an historical reference climatology for the region and/or sub-regions;
  - Implement a regional Climate Watch.

- **Operational Data Services, to support operational LRF and climate monitoring:**
  - Develop regional climate datasets, gridded where applicable;
  - Provide climate database and archiving services, at the request of NMHSs;

- **Training in the use of operational RCC products and services**
  - Provide information on methodologies and product specifications for mandatory RCC products, and provide guidance on their use
  - Coordinate training for RCC Users in interpretation and use of mandatory RCC products.
‘Highly Recommended’ Functions for RCCs

• Climate prediction and projection
  – Use of model simulations, downscaling of scenarios, adaptation strategies, verification

• Non-operational data services
  – WIS; DARE; metadata; assist Members in archiving, datasets, QM, QA/QC; homogenization; DBM;

• Coordination functions
  – Collaboration; assist members with user liaison, media, public awareness strategies

• Training and capacity building
  – Promote technical, assist in professional, capacity building

• Research and development
  – CV and CC, regional models, proxy data, economic value of climate information
Key Elements of the Designation Process of a WMO RCC or RCC-Network

• RA considers Member requirements and agrees on an implementation plan
  – RA invites expressions of interest from Members/potential RCC applicants
  – The interested Member/org contacts P/RA re intent
  – P/RA considers criteria for designation, regional capabilities and needs; interacts with relevant experts in the Region as well as CCI and CBS

• The RCC candidate conducts a demonstration phase
  – On successful completion of demonstration phase (1-2 years), P/RA initiates formal designation process through WMO SG, CCI and CBS

• CCI and CBS evaluate the performance during demonstration phase against designation criteria

• Upon CBS recommendation, and its approval by WMO EC or Congress, the GDPFS Manual will be amended to include the designated RCC, and the Member/org informed.
RCC Establishment Status in Africa

- Designation Criteria approved by WMO EC (June 2009)
- 6 potential RCCs identified by RA I:
  - Eastern Africa (RCC-IGAD)
  - Southern Africa (RCC-SADC)
  - Central Africa (RCC-ECCAS)
  - Western Africa (RCC-Network-ECOWAS)
  - Northern Africa (RCC-Network-North-Africa)
  - RCC-Africa-ACMAD,
- ACMAD was designated as RCC-Africa in 2015,
- Demonstration phase completed for two (RCC-IGAD at ICPAC and RCC-Network-North-Africa coordinated by Morocco) and designation process initiated.
RCC Issues for consideration: Africa

- Need for review of the current status of RCC implementation;
- Designation process to be completed for RCC-IGAD and RCC-Network North Africa;
- Determining approaches to accelerate the implementation of the remaining RCC proposals;
- Promoting the use of RCC products by NMHSs: training, guidance material, access to RCC products (common gateway?), data exchange, NMHS feedback to RCCs, etc.;
- GPC linkages;
- Determining the working mechanisms for oversight of RCC implementation
- Role of RCCs in fast-tracking GFCS implementation at the national level
Regional Climate Outlook Forums (RCOFs) (1/2)

• A key component of WMO Climate Information and Prediction Services (CLIPS) project activities.
• First established in October 1996 at the Workshop on Reducing Climate-Related Vulnerability in Southern Africa (Victoria Falls, Zimbabwe).
• Gained momentum as a regional response to the major 1997–1998 El Niño event.
• RCOF Concept was pioneered in Africa and spread worldwide.
• WMO and a number of national, regional and international organizations and development agencies (e.g., NOAA, IRI, Meteo France, Met Office, IGAD, SADC, USAID, AusAID, etc.) have supported their growth, stability and expansion.
Regional Climate Outlook Forums (RCOFs) (2/2)

• RCOFs provide platforms for Climate experts and climate information users to:
  – Discuss current climate status
  – Exchange views on scientific developments in climate prediction
  – Develop consensus-based regional climate outlooks that can feed into national climate outlooks produced by NMHSs
  – Engage in user-provider dialogue

• An important aspect of RCOFs is the facility to bring together experts in various fields, operational climate providers and end users of forecasts in an environment that encourages interaction and learning.
RCOF Process (1/3)

- Meetings of the regional and international climate experts to develop a consensus for the regional climate outlook, typically in a probabilistic form;
- The Forum proper, that involves both climate scientists and representatives from the user sectors, for identification of impacts and implications, and the formulation of response strategies;
- Training programmes on seasonal climate prediction to strengthen the capacity of the national and regional climate scientists;
- Outreach sessions involving sector specialists as well as media experts to develop effective communications strategies.
RCOF Process (2/3)

- Determine the critical time for development of climate prediction for the region in question;
- Assemble a group of experts:
  - Large scale prediction specialists,
  - regional and local climate applications and prediction/downscaling specialists,
  - stakeholders representative of climate-sensitive sectors;
- Review current large scale (global and regional) climate anomalies and the most recent predictions for their evolution;
- Review current climate conditions and their impacts at local, national and regional levels, and national-scale predictions;
Consensus Process in RCOFs: Mostly Subjective

Observations
- ENSO State
- Climate patterns

Assessment (conversation)

Regional, seasonal Outlook (temp, rain, flows)

Background
- Average climate
- ENSO Climatology

Forecasts
- ENSO forecasts
- Global forecasts
- Statistical forecasts

Products

Courtesy: J. Renwick
RCOF Process (3/3)

• Considering all factors, produce a climate outlook with related output (e.g. maps of temperature and precipitation anomalies) that will be applied and fine-tuned by NMHSs in the region to meet national needs;

• Discuss applications of the outlook and related climate information to climate-sensitive sectors in the region; consider practical products for development by NMHSs;

• Develop strategies to effectively communicate the information to decision-makers in all affected sectors;

• Critique the session and its results:
  – document achieved improvements to the process and any challenges encountered,
  – Establish steps required to further improve the process for subsequent sessions.
RCOFs Worldwide
Some RCOF products worldwide
Climate Change and RCOFs

- RCOFs worldwide have been set up so far with the main focus on seasonal prediction.
- However, the same RCOF mechanisms can be effectively expanded to cater to the needs of developing and disseminating regional climate change information products.
- Such initiatives are already being taken up by some RCOFs.
- Regional assessments of observed and projected climate change, including the development of downscaled climate change scenario products for impact assessments, can be included in the product portfolio of RCOFs.
WMO and RCOFs

- WMO assists developing countries hold and benefit from these forums as part of CLIPS legacy and its transition into the GFCS:
  - participant support (Country as well as GPC/international experts),
  - capacity building initiatives including some initial (limited) financial support,
  - coordination of special applications to sectors
  - Assisting with resource mobilization

- Regional institutions (e.g., WMO RCCs, ACMAD, ICPAC, CRRH, CIIFEN, DMCs, etc.) play key roles in the organization and overall implementation of these forums

- NMHSs, the regions and the users of the products must contribute to the sustainability of COFs in the regions: demonstrate utility of the forums and value of the products to those who need the information

- Research capacities at the regional level need to be enhanced, to assess the forecast skills as well as to work towards their improvement

- Media has an important role to play in RCOF process, which needs to be factored in and actively pursued

- Global review of RCOFs being planned in 2017.
Thank you

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