



## FIRST WMO WORKSHOP ON OPERATIONAL CLIMATE PREDICTION

9-11 November 2015, Pune, India  
Concept Note



### Purpose

The goal of the workshop is to facilitate increased interaction between and among the various operational climate prediction centres and the associated research communities, leading to better collective capability to meet the climate information needs of decision-makers. The operational prediction centres and research communities include Global Producing Centres of Long-Range Forecasts (GPCLRFs), Regional Climate Centres (RCCs), Regional Climate Outlook Forums (RCOFs), National Meteorological and Hydrological Services (NMHSs), the World Climate Research Programme (WCRP) Working Group on Seasonal to Interannual Prediction (WGSIP), the World Weather Research Programme as well as other institutions engaged in real-time climate prediction. The workshop is also envisaged to be the first in a series of periodic workshops to ensure sustained and regular interactions between the concerned communities.

The mandatory functions of GPCLRFs and associated Lead Centres involve provision of long-range forecast information with global coverage and associated verification information. The mandatory functions of RCCs cover long-range forecasting, climate monitoring, data services and training for the region of responsibility. The research community strives to maximize prediction capabilities by conducting experimentation into climate variability and predictability, paying special attention to assessing and improving prediction skills. The workshop will identify gaps and priorities to further strengthen cooperation and to enhance exchange of forecast data from GPCLRFs, methods, tools and scientific knowledge between GPCLRFs, RCCs, RCOFs and WGSIP, and to develop a plan of action to realize improved operational practice, including in support of NMHSs. The workshop will cover operational prediction on sub-seasonal to longer time-scales in the context of contributing to the Climate Services Information System (CSIS) pillar of the Global Framework for Climate Services (GFCS). The workshop will also help consolidate the contributions from the WMO Technical Commissions, particularly the Commission for Basic Systems (CBS), Commission for Climatology (CCI) and the Commission for Atmospheric Sciences (CAS).

### Objectives

The objectives of the workshop are to (a) communicate developmental efforts in operational climate prediction with a major focus on sub-seasonal and seasonal forecasting, (b) identify research needs, (c) share operational status, potential impediments and best practices in the uptake of data produced by GPCLRFs by RCCs, RCOFs, NMHSs and by the research community, and d) develop a framework for best-practice guidance document for generating regional climate outlooks from the diverse sources of prediction information available..

In addition to the above, the workshop will address incorporation of recent research advances when developing new operational forecast products. The workshop also intends to consider the emerging possibilities for decadal prediction and the associated operational requirements.

### Benefits

It is expected that the workshop will facilitate improved implementation and functioning of the CSIS pillar of the GFCS through improved long-range forecasting services to WMO Members, in support of the five GFCS priority sectors: agriculture, health, water, energy and

disaster risk reduction (DRR). This will follow through enhancing the relevance and strengthening the delivery of long-range forecast information cascading from GPCLRFs and by guiding research towards operational priorities, allowing RCCs to make more effective use of global-scale information in preparation of guidance for the region, including for use at RCOFs and by NMHSs. Benefits will also include strengthening of feedback mechanisms to GPCs, RCCs and WCRP/WGSIP to support continual service improvement. The initial steps to be taken by the workshop to examine sub-seasonal and decadal aspects are expected to lay a more comprehensive roadmap to operational climate prediction.

## **Background**

In recent years WMO CBS and CCI have significantly strengthened their cooperation in the establishment of designated centres with responsibility for generating and delivering long-range forecasts and other climate information. The infrastructure forms part of the Global Data-Processing and Forecast System (GDPFS). It also forms the operational core of the GFCS in terms of the CSIS pillar. The designated centres and their roles and responsibilities are defined in the Manual on the GDPFS (WMO-No. 485). One of the fundamental principles of GFCS implementation is to have a three-tier operational structure; global, regional and national. From the viewpoint of long-range forecasting, this structure would include the following entities:

### *Global domain:*

- 12 GPCLRFs, responsible for producing and disseminating long-range forecasts and associated verification with global coverage;
- A Lead Centre (LC) for Long-Range Forecast Multi-Model Ensembles (LC-LRFMME), responsible for collecting GPCLRF products, displaying the forecast information in standard formats, and generating multi-model products;
- A Lead Centre for Standardised Verification of Long-Range Forecasts (LC-SVSLRF), responsible for collecting verification information from the GPCs and displaying it in standardised formats.

### *Regional domain:*

- RCCs and RCC Networks covering a majority of the WMO Regional Associations (RAs) are either fully designated or in demonstration stage, with more under active development.
- RCOFs are active in 18 sub-regions around the world, several of them coordinated by RCCs, producing consensus-based seasonal outlooks with inputs from GPCLRFs, RCCs and NMHSs.

### *National domain:*

- NMHSs play the central role in producing and disseminating operational long-range forecasts as well as user engagement at the national level, including through coordination of National Climate Outlook Forums (NCOFs).

On the research side, WCRP has established the WGSIP to investigate pressing questions to advance seasonal to interannual predictions. The research knowledge produced by WGSIP, along with the work done in collaboration with the WWRP (i.e., the Sub-Seasonal to Seasonal Prediction Project), is therefore of great relevance for improving the current operational climate model predictive capabilities at GPCLRFs and consequently helps advance the operational climate prediction capabilities of RCCs, RCOFs and NMHSs.

## **Workshop Themes**

The Workshop will cover sub-seasonal to decadal scales of climate prediction, though the dominant focus will be on sub-seasonal and seasonal. The following are the suggested workshop themes:

- Recent research advances in Sub-seasonal to Decadal Prediction and their potential for improving operational capabilities;
- Research needs of the operational community;
- Progress on addressing impediments to the usage of GPCLRF data that were identified by the Brasilia 2013 workshop;
- Global Seasonal Climate Update – a synthesis of GPCLRF products to assist RCCs, RCOFs and NMHSs
- Current status and component tools of the Climate Services Toolkit under development within the CSIS;
- Operational practices currently used for generating seasonal forecasts and a framework for developing a guidance document for recommended long-range prediction procedures.

### **Workshop format**

- Participation will be by invitation only;
- Three full days for the workshop;
- Keynote talks on major themes, including an overview of the follow-up of the Brasilia workshop;
- Sessions focused on different aspects of sub-seasonal to decadal forecasts
  - Recent research advances and ongoing efforts in Sub-seasonal to Decadal Predictions;
  - Procedures used for generating long-range forecasts at regional and national level;
- Open discussions through break-out groups to develop some key actions as an outcome of the workshop to advance operational predictions;
- Poster sessions (Each GPC, RCC, RCOF, and interested NMHSs to send a poster in ppt format that could be printed locally and displayed throughout the workshop);
- Research community engagement (WGSIP and S2S);
- One NMHS from each RA to represent national issues;
- Short meeting of ET-OPSLs.

### **Workshop participants:**

- All ET-OPSLs members (covering all GPCLRFs and Lead Centres)
- Other institutions generating real-time global LRF products;
- RCCs (designated, demonstrating as well as developing)
- RCOF technical coordinators
- NMHSs (RA I: Ivory Coast; RA II: Myanmar; RA III: Peru; RA IV: Jamaica; RA V: Philippines; and RA VI: Moldova)
- Concerned CBS/CCI leads
- WGSIP representatives (co-chairs or their nominees)
- S2S representatives (co-chairs or their nominees)
- Capacity development experts/Other LRF experts from host country
- Secretariat staff

## Draft workshop agenda

1. Opening session. Could include
  - a. Welcome and formality etc.
  - b. Background on GFCS
  - c. Background on CSIS
2. Review of Brasilia workshop
  - a. Recommendations and their status
  - b. Discuss pathways to expedite implementation of recommendations
3. Research advances and key issues of operational relevance
  - a. Summary from WGSIP (including decadal prediction aspects)
  - b. Summary from S2S Project
4. Overview talks on WMO infrastructure for long-range predictions
  - a. GPCLRFs and lead centres
  - b. RCCs
  - c. RCOFs
  - d. NMHSs
5. Overview and current status of GSCU development
6. Overview and current status of Climate Services Toolkit
7. Review of current operational practices for LRF by GPCLRFs, RCCs and NMHSs
8. Breakout groups (parallel - two at one time) to develop:
  - a. Actions and pathways for improving connections between operational and research communities (e.g., improving use of GPCs hindcast and forecast data; contrast with, and lessons learned from, other efforts, e.g., CHFP, NMME, APCC)
  - b. Requirements for Climate Services Toolkit (with a focus what components it will need to include to advance operational predictions at global, regional, and national level)
  - c. Framework for a guidance document for recommended long-range prediction practices based on the review of current long-range forecast practices
9. Plenary with summary, recommendations and action items from the breakout sessions
10. Closing