

Second WMO Operational Climate Prediction Workshop: summary and outcomes

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WMO OMM

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Outline

- **Introduction to Operational Climate Prediction**
- **Second Operational Climate Prediction workshop (OCP-2): goals and expected outcomes**
- **Research-Operations linkages: WGSIP, S2S and ET-OPSLS**
- **Potential mechanisms for accelerating R2O and O2R value cycle: building on existing platforms at regional scale**
- **Key conclusions and recommendations**



Operational Climate Prediction

The facets of Operational Climate Predictions (OCP):

- 1) Operational infrastructure for long-range forecast (LRF) referring to:
 - Global Producing Centers for LRF, Lead Center (LC) for LRF Multi-Model Ensemble, LC for Standardized Verification System, GPC and LC for Annual to Decadal Climate Prediction,
 - The technical regulations to facilitate exchange of meteorological analysis and forecast products are governed by the Commission for Basic Systems (CBS) and its Global Data Processing and Forecast System (GDPFS) Manual
- 2) Delivery of Climate Services: conformed by the Global Framework for Climate Services (GFCS) and the Climate Services Information System (CSIS)
- 3) Research to support further advances, including two working groups: one on sub-seasonal to Interdecadal Prediction (WGSIP) and the other one on Sub-seasonal to Seasonal Project (S2S) a joint initiative by WCRP and WWRP

WMO Operational climate prediction workshop

- Under the leadership of the CCI and CBS WMO initiated a workshop series on **Operational Climate Prediction (OCP)**, to serve as a platform for **operational, services and research communities** to share experiences, to review the progress in the operational practices and scientific studies.
- The first Workshop in this series (OCP-1) - in Pune, India, 9-11 November 2015, **OCP-2 was held on 30 May-1 June, in Barcelona, Spain**
- **Goal:** to bring representatives of these three communities together to advance communication and coordination and to have a better understanding of the gaps, needs and factors that will enable better coordination and collaboration among three facets of “operational climate prediction” towards improved climate services provision



Second WMO Operational climate prediction workshop

Expected outcomes:

- Strengthened collaboration and feedback mechanisms between the operational and research communities
- Articulation of research needs to improve operational climate prediction in terms of enhanced skill and an expanded range of forecast products
- Identification of mechanisms for bringing research results into operational climate prediction
- Propose ways for enhanced delivery of forecast information cascading from global to regional and national scale (e.g., to Regional Climate Centres, Regional and National Climate Outlook Forums),
- Identifying good practices for developing climate outlooks and their delivery;
- Initiate **development of a guidance document on OCP**, and conceive pilot demonstration projects to put “good practices” in action; and
- Summarizing the outcomes in a position paper



Second WMO Operational climate prediction workshop

Participation in the workshop by invitation,

- Around 50 participants including the members of the CBS/CCI Inter-Programme Expert Team on Operational Prediction from Sub-seasonal to the Longer-time Scales (IPET-OPSLS).
- The target audience included experts from various operational climate prediction centres, including those established under WMO umbrella (GPCLRF, LC, RCC), other international centres, such as APEC Climate Centre (APCC), International Research Institute for Climate and Society (IRI), Copernicus Climate Change Services (C3S), from research community, including WCRP/WGSIP, WWRP/S2S

Next Workshop planned to be open to all interested relevant experts – open call will be issued

Potential mechanisms to transition R2O and O2R

- The co-chairs of the WGSIP and Expert Team on Operational Predictions from Sub-Seasonal to Long Time-Scales (ET-OPSLs) have agreed **to form a joint task group to close the gap between research and operations.**
- One of the recommendations was **to develop a framework within the community, where research is operationalized through a bidirectional approach i.e. top-down driven by operational needs or bottom up driven by innovative push of research.**
- Most participants felt that the **value cycle would be more easily enhanced if it was driven by operational needs, as needs of the community can already be harvested from, have been often expressed but have been largely untapped from the Regional Climate Outlook Forums (RCOFs).**
- While there had been progress since the earlier days in consulting users and factoring in their needs in directing research and developing products, much more could be done to address some of the basic, persistent scientific questions raised at RCOFs by tapping on established linkages between the operations and research communities. A specific, **first-step recommended action would be the co-authorship of journal publications highlighting issues raised at RCOFs.**



Potential mechanisms to transition R2O and O2R

- Another recommendation was **to create a closely-knit joint community between operations and research to develop solutions cooperatively**, which will help to contextualise the research outcomes and aid the design and provision of end-products for the services community.
- The **joint community** will also be a **useful channel to facilitate feedback and improvements between the two groups**. It was acknowledged however that for such activities to sustain, substantial resources (including financial) need to be invested, and proper success indicators need to be developed to robustly assess initiatives.
- Activities within this **joint community** can also be **better promoted and strengthened by sharing model data and adopting data standards**. These in turn can promote regional-specific research, which the region can undertake, before operational centres decide to invest resources to operationalize the products.
- The **visibility and effectiveness of such platforms could be enhanced further by actively and professionally publicising its activities**. Given that the market demanding climate services is developing rapidly, there is a need to tap on these developments, and the recommendations can help to advance the community forward in this regard.



Key recommendations: Subseasonal scale

- Working weather and climate communities to **seamless “stitching” – weather + subseasonal + seasonal** and to promote interactions between these communities -> to implement Climate Watch System
- To make **subseasonal data available to RCCs, RCOFs, NMHSs** through LC LRFMME in real time for demonstration in pilot projects;
- Start the process of **implementing subseasonal framework** similar to seasonal, including tools;
- Develop overarching **good practices to be included in the guidance document**;
- For research – develop indices and diagnostics – as an alternative to making data available

Key recommendations: Seasonal scale

- Include a chapter on interpretation and communication of seasonal forecast in the Guidance document;
- Promote use of GPC-LRF and LC LRFMME information and digital data, and also develop pathways and action plan to fill the existing gaps on the utilization of these data
- Develop and promote objective approach for consensus seasonal forecasts;
- Develop mechanisms through which research needs identified by RCCs and RCOFs can be communicated to GPCs and research community.
- Develop mechanisms whereby seasonal forecast approaches developed and proposed at regional and national level can be reviewed by research community (e.g. WGSIP) or IPET-OPSLs;

Key recommendations: Decadal scale

- Communicate the **current level of skills in terms of ECV** such as temperature, rainfall, circulation;
- **Transition more research to operations in terms of applications**, e.g. drought indices, crop etc. at decadal scale;
- Given that this is a new initiative, there is a need to make special effort **to raise awareness of this resource and help users to use** this product;
- This is a unique platform that makes research and operational communities to work together;
- **Decadal prediction is critically important to support high level policy decisions**, contributing to CSIS objectives to provide climate services for decision making and high level policy support.

<http://www.wmo.int/pages/prog/wcp/wcasp/ocp-barcelona2018.php>

Thank you

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Working Group on Seasonal to Inter-decadal Prediction

Aims: facilitate and coordinate research on sources of predictability in the climate system and the ability of dynamical models to exploit that predictability.

Explores effective ways of initialising climate predictions and methods for extracting and communicating climate prediction information.

These objectives are achieved through initiatives, e.g. **targeted community research project and enabling access to hindcasts** from different climate prediction systems.

The objectives are also facilitated by **providing platforms for scientific discussions and for coordination between different organizations dealing with research and operational** aspects (e.g. meetings, workshops, conferences).

One of the key foci of the WGSIP is to establish **closer cooperation that enhances Research-to-Operations (R2O) and Operations-to-Research (O2R) transfer** of knowledge and expertise. To this end, the co-chairs of the WGSIP and Expert Team on Operational Predictions from Sub-Seasonal to Long Time-Scales (ET-OPSLS) have agreed to **form a joint task group to close the gap between research and operations**

Sub-seasonal to seasonal prediction (S2S) project

Major Phase 1 achievement (2013-18): **establishment of the S2S database** comprising near real-time and reforecast data from 11 producing centres.

S2S collaborates closely with WMO Lead Centre for Long-range Forecast Multi-Model Ensemble (LC-LRFMME) **to build a platform for pilot exchange of subseasonal forecast model output, and conducts several S2S sub-projects**, including one on verification and products development of great importance for OCP

In the ongoing Phase 2 (2018-22) the **S2S database will be enhanced, new research activities (sub-projects) covering a wide range of targeted topics will be conducted**, and the **operational infrastructure and user application aspects** of the initiatives will be further enhanced

Sub-seasonal to seasonal prediction (S2S) project

A number of examples of application products, such as MJO index forecast, frequency of extreme temperatures, Arctic SST and SIC, tropical cyclone forecasts and joint activities between the S2S Project and WMO's operational entities and projects (e.g. Regional Climate Centres, National Meteorological and Hydrological Services, Severe Weather Forecast Demonstration Project) demonstrate good practices of existing efforts in bridging research and operations.

Researchers encouraged to share innovative and practical applications, software and data with the operational community.

In the future it is planned to improve the time resolution of models available on the S2S database (implementation details to follow).

S2S data and products are planned to be made operationally available upon the completion of Phase 2.

Potential mechanisms to accelerate R2O and O2R value cycle

the co-chairs of the WGSIP and Expert Team on Operational Predictions from Sub-Seasonal to Long Time-Scales (ET-OPSLS) have agreed to form a joint task group to close the gap between research and operations.

To promote research-operations and operations-research transition value cycle, participants made some concrete suggestions, such as:

- **to develop a framework within the community, where research is operationalized through a bidirectional approach , i.e. top-down driven by operational needs or bottom up driven by innovative push of research.**
- **value cycle would be more easily enhanced if it was driven by operational needs, as needs of the community can already be harvested from, have been often expressed but have been largely untapped from the Regional Climate Outlook Forums**

While there had been progress since the earlier days in consulting users and factoring in their needs in directing research and developing products, **much more could be done to address some of the basic, persistent scientific questions raised at RCOFs by tapping on established linkages between the operations and research communities.**

A specific, first-step recommended action would be the co-authorship of journal publications highlighting issues raised at RCOFs

