Global Producing Centres for Long-Range Forecasts

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Plan of talk

- **Introductory background information**
- **WMO infrastructure for seasonal and inter-annual prediction**
- **Designation process of Global Producing Centres for Long-Range Forecasts (GPCLRFs) and minimum required products delivered**
- **WMO LC-LRFMME and LC-SVSLRF functions/activities**
- **Final remarks**

Developers meeting on the GFCS-relevant climate data, products and tools for implementation of the Climate Services Information System
Geneva, Switzerland, 6-8 December 2016

Background

- In recent years WMO (through CBS and CCl) designated centres responsible for generating and delivering long-range forecasts and other climate information
- The infrastructure is part of the Global Data-Processing and Forecast System (GDPFS)
- It is also the core for the Climate Service Information System (CSIS) of the Global Framework for Climate Services (GFCS)
- The designated centres and their roles and responsibilities are defined in the Manual on the GDPFS (WMO-No. 485)

WMO infrastructure for seasonal and inter-annual prediction

- GFCS three-tier structure: global, regional and national
  For long-range forecasting:

Global domain:

- 12 Global Producing Centres for Long-Range Forecasts (GPCs), 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 GPC forecasts, displaying the forecast information, generating multi-model products, and more recently generating verification information for GPCs delegating score computation to the LC
- A Lead Centre for Standardised Verification of Long-Range Forecasts (LC-SVSLRF), responsible for providing documentation on verification scores, software and datasets for long-range forecast verification

Regional domain:

- Regional Climate Centres (RCCs) and RCC Networks covering WMO RAs and Polar Regions are either fully desig. or in demons. phase

National domain:

- National Met. and Hydrol. Serv. (NMHSs) play central role at national level, including coord. National Climate Outlook Forums (NCOFs)

Designation of Global Producing Centres of LRF

- WMO process to designate centres making global seasonal forecasts as WMO Global Producing Centres (GPCs) of Long Range Forecasts (LRF) started in 2006
- GPCs follow commonly defined standards – aiding consistency and usability of output:
  - a fixed forecast production cycle
  - a standard set of forecast products
  - WMO-defined verification standards for retrospective forecasts (set of measures described in the WMO Standard Verification System for Long-Range Forecasts – SVSLRF)

Currently designated GPCs

Links to 12 designated GPCs: **Target audience: NMHSs, RCCs and RCOFs**

http://www.wmo.int/pages/prog/wcp/wcasp/gpc/gpc.php

Minimum required products delivered by GPCLRFs

- Predictions for averages, accumulations, or frequencies over 1-month periods or longer (typically anomalies in 3-month-averaged quantities is the standard format for seasonal forecasts, and forecasts are usually expressed probabilistically)
- Lead time: between 0 and 4 months
- Issue frequency: monthly or at least quarterly
- Delivery: graphical images on GPCLRF website and/or digital data for download
- Variables: 2m temperature, precipitation, Sea Surface Temperature (SST), Mean Sea-Level Pressure (MSLP), 500hPa height, 850hPa temperature
- Long-term forecast skill assessments, using measures defined by the SVSLRF

WMO Lead Centre for Long-Range Forecast Multi-Model Ensemble

Target audience:
NMHSs, RCCs and RCOFs

Jointly operated by Korean Meteorological Administration (KMA) and NOAA NCEP Climate Prediction Centre (CPC)

LC-LRFMME operational activities on LRF in support of WMO members

- Collection of retrospective and real-time forecasts from GPCs
- Production of real time forecast products from the collected GPCs
- More recently, production of verification products from the collected GPCs retrospective forecasts for GPCs that delegate score computation to the LC
- Production of multi-model ensemble (MME) forecast products from the collected GPCs
- More recently, production of verification products for the MME forecast products from the collected GPCs
- Dissemination of all forecast and verification products listed above in the LC-LRFMME web site for NMHSs, RCCs and RCOFs
- Dissemination of retrospective forecast data from GPCs that allows this practice for RCCs, NMHSs and RCOFs
- Production of forecast and verification products for the Global Seasonal Climate Update (GSCU)
- More recently, development of pilot sub-seasonal forecast products

WMO Lead Centre for Standardised Verification of Long-Range Forecasts

World Meteorological Organization
Lead Centre for the
Long Range Forecast Verification System

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DISCLAIMER

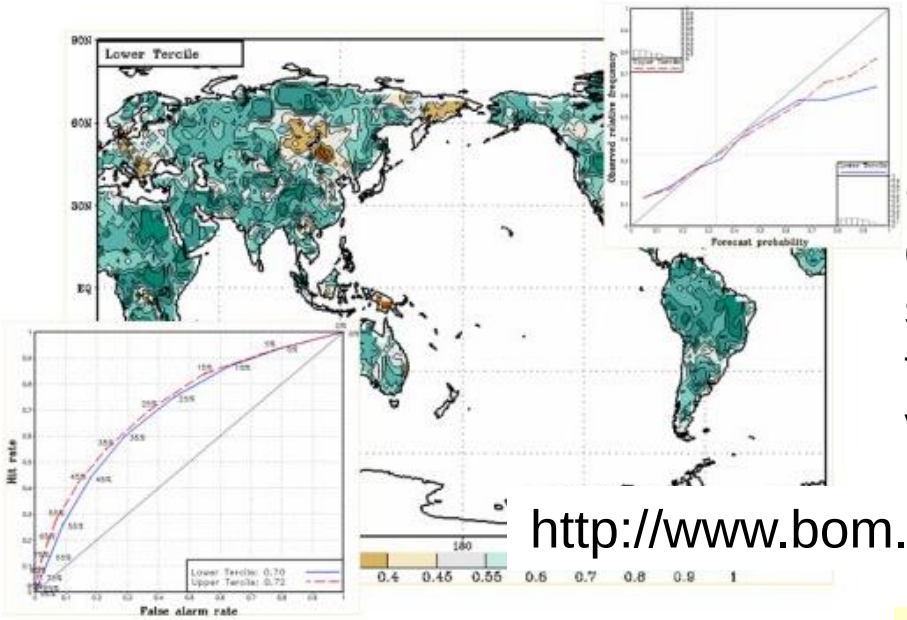
DOCUMENTATION

Participating Met. Agencies.
Lead Centre role.
Documentation and software.
Verifying datasets.
Submitting data.
Glossary.

USERS GUIDE

Variables to be assessed.
Levels of assessment.
Diagnostic measures.
What the Lead Centre provides.
How to submit results.
Format for submitting results.
Model system details.

VERIFICATION MAPS



The Lead Centre provides access to verification datasets, verifying software, documentation of the system, broad technical support, access to the final verification data as well as graphing and display of results.

The WMO Lead Centre for the SVS-LRF is jointly managed by the Australian Bureau of Meteorology and the Meteorological Service of Canada.

Current seasonal forecasts from Global Producing Centre (GPC) models will become available via the Lead Centre for Long-Range Forecast Multi-Model Ensemble Prediction.

- Provide documentation on verification scores, software and datasets for long-range forecast verification

http://www.bom.gov.au/wmo/lrfvs/

Target audience: GPCs, NMHSs, RCCs and RCOFs

Jointly managed by the Australian Bureau of Meteorology (BOM) and the Meteorological Service of Canada

Final remarks

• Data and products generated by GPCs and disseminated either directly by GPCs or via the WMO LC-LRFMME are well structured and managed under guidance of joint CBS/CCl ET-OPSLS

• Target audience: NMHSs, RCCs, RCOFs

• Currently available datasets and products disseminated via the LC-LRFMME can be integrated in the climate services toolkit

• Under development sub-seasonal forecast products could be integrated in the climate services toolkit at a later stage

• Existing WMO global LRF infrastructure is well organized for facilitating climate services development and delivery, including developments relevant to GFCS priority areas

• Various challenges still need to be addressed: e.g. data format, tailoring/downscaling, interpretation/communication, delivery timeliness of products and services, managing model changes and impacts on users procedures

Thank you all for your attention!