

The role of the WMO Operational Global Producing Centres (GPCs) for Subseasonal and Longer Time Scale Predictions

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**On behalf of the
WMO CBS/CCL Expert Team on Operational Predictions from Subseasonal to Longer Time Scales
(ET-OPSLS)**



Talk Content

- **Expert Team** on Operational Predictions from Subseasonal to Longer Time Scales (ET-OPSL)
- **Global Producing Centres** of Long-range Forecasts (GPCs)
- **Lead Centres** for Long Range Forecasts: purpose and functions, websites
 - Lead Centres for Long-range Forecast Multi-Model Ensembles (LC-LRFMME)
 - Lead Centres for the Standard Verification System for Long-range Forecasts
- **Current product examples**
- **GPCs and RCC's requests for new products**
- **Next steps**

Role of the WMO Expert Team on Operational Predictions from Subseasonal to Longer Time Scales (ET-OPSLS)

- **Work** with the international operational centres producing global long-range forecasts to:
 - promote coordination, adherence to standards and ease of access to long-range (seasonal) forecasts
 - ET meets every 2 years to review :
 - Status of GPCs designation compliance
 - WMO standards and manual (GDPFS)
 - Lead centres reports (LC-LRFMME & LC-SVSLRF)
 - GPC's operational model status
 - Permission access levels for data and products
 - Review request from RCCs for new products

Role of the WMO Expert Team on Operational Predictions from Subseasonal to Longer Time Scales (ET-OPSL)

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- **Interact** with RCCs and RCOFs to maximize the use of GPCs long range forecasts
 - Through joint GPCs-RCCs-RCOF workshops
 - Ex: 1st WMO Operational Climate Prediction Workshop (last week)
 - Through Scoping Workshops (ex: GSCU, and this week on Polar RCC!)

Global Producing Centres of Long-range Forecasts (GPCs)

- **GPCs are WMO designated Centres**
 - based on well-defined standards, aiding the consistency and usability of long-range forecasts
 - fixed forecast production cycles (once a month)
 - standard sets of mandatory and recommended forecast products
 - WMO-defined verification standards
 - Hindcast verifications follow well-defined performance scores
- **Make forecast products available through**
 - GPC own websites (with or without password protection)
 - Web site of the Lead Centre for Multi-Model Ensembles LRF

Global Producing Centres of Long-range Forecasts (GPCs)

GPCs		Countries
Montreal		Canada
Washington		USA
Moscow		Russia
Exeter		UK
Seoul		Korea
Tokyo		Japan
Melbourne		Australia
Toulouse		France
ECMWF		Europe
Beijing		China
Pretoria		South Africa
CPTEC		Brazil

* Bold = members of the Arctic Council

WMO disclaimer

WMO Lead Centres for LRF

- **LC for Multi-Model Ensemble Long-Range Forecasts**

Rational:

- MME forecasts more reliable than individual GPC forecast in average
- Need for a centralized forecast access to individual GPCs and MME forecasts

Functions:

- Collect forecast data from GPCs
- Generate a set of Lead Centre (LC) products
- Provide Web pages to satisfy requirements for regional display (for example, for RCCs and RCOF coordinators);
- Redistribute digital forecast data for those GPC's that allow it
- Maintain an archive of the real-time GPC and MME forecasts.
- Maintain a repository of documentation for the system configuration of all GPC LRF systems

WMO Lead Centres for LRF

- LC for Multi-Model Ensemble Long-Range Forecasts

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

Home About us News Data & Plot Related Sites WMO Lead Centre for SVSLRF

Introduction Deterministic MME Probabilistic MME References

Latest Forecast data

ECMWF 2014 MAM, Moscow 2014 MAM, Exeter 2014 MAM, Toulouse 2014 MAM, Pretoria 2014 MAM, Beijing 2014 MAM, Seoul 2014 MAM, Tokyo 2014 FMA, Melbourne 2014 MAM, Montreal 2014 MAM, Washington 2014 MAM, CPTC 2014 MAM

Latest PMME plot View all Latest Individual Forecast plot View all

Notice / News

- Check! System Requirements
- All GPCs(12) for MAM 2014 are uploaded 2014.02.19
- All GPCs(12) for FMA 2014 are uploaded 2014.01.22
- All GPCs(12) for JFM 2014 are uploaded 2013.12.20
- All GPCs(12) for DJF 2013 are uploaded 2013.11.22
- All GPCs(12) for NDJ 2013 are uploaded 2013.10.25

WMO Global Producing Centres

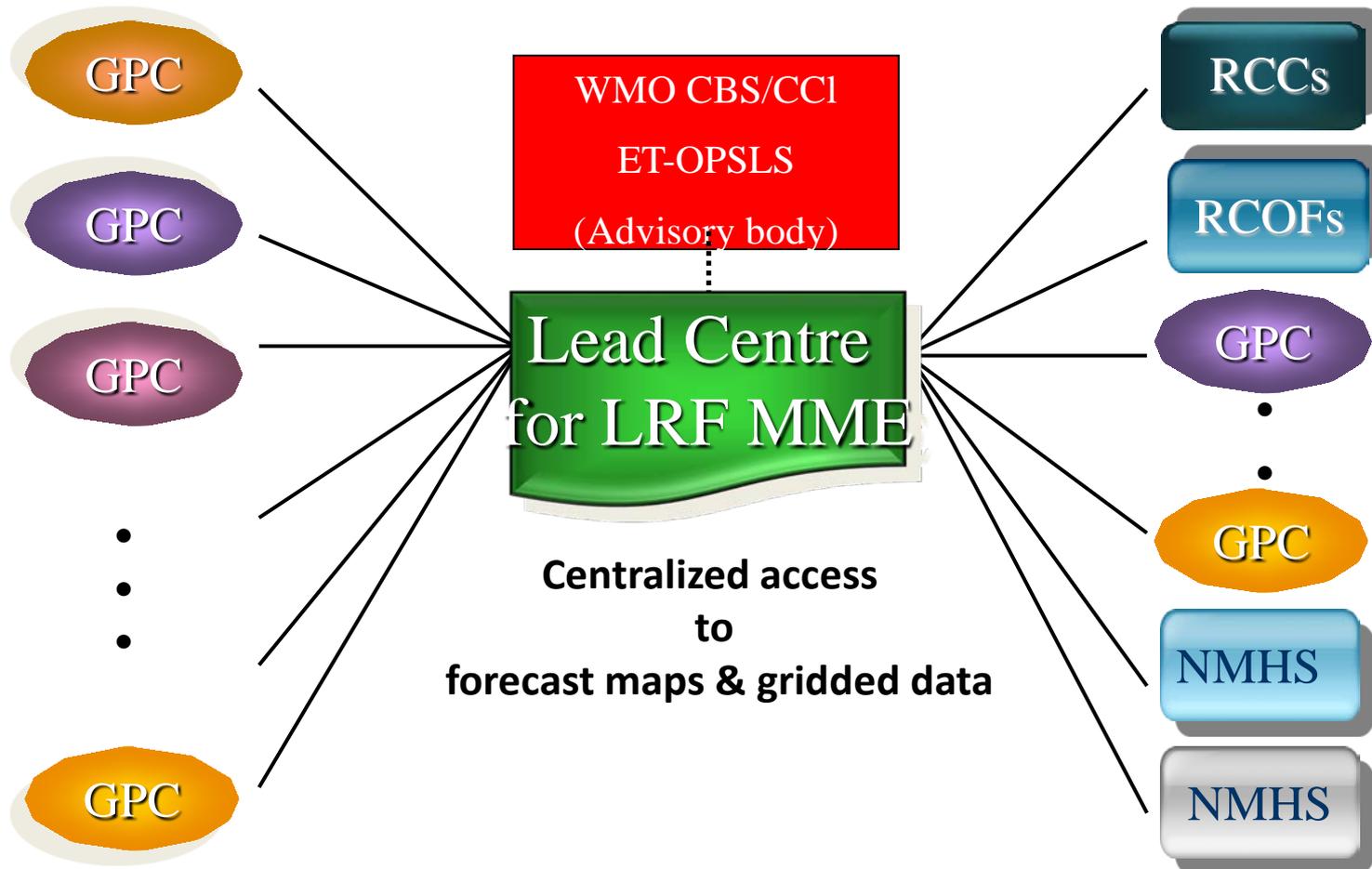
Canada Montreal	BCC Beijing	ECMWF	Moscow
Seoul	Tokyo	Toulouse	Washington
Exeter	PCMA Melbourne	Pretoria	CPTC

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today : 66 total : 86862

WMO Lead Centres for LRF

- LC for Multi-Model Ensemble Long-Range Forecasts



WMO Lead Centres for LRF

- **LC for Multi-Model Ensemble Long-Range Forecasts**

Mandatory products

- 2m surface temperature
- Precipitation

Recommended products

- Mean Sea Level Pressure
- 500 hPa geo. Height
- Temperature @ 850 hpa
- Sea Surface Temperature

These mandatory and recommended products are available from GPCs as well from the LRF MME web site

Digital products

- Both forecast and hindcast of monthly mean anomalies of the GPC's ensemble mean for lead 1~3, following the month of submissions

Graphical products

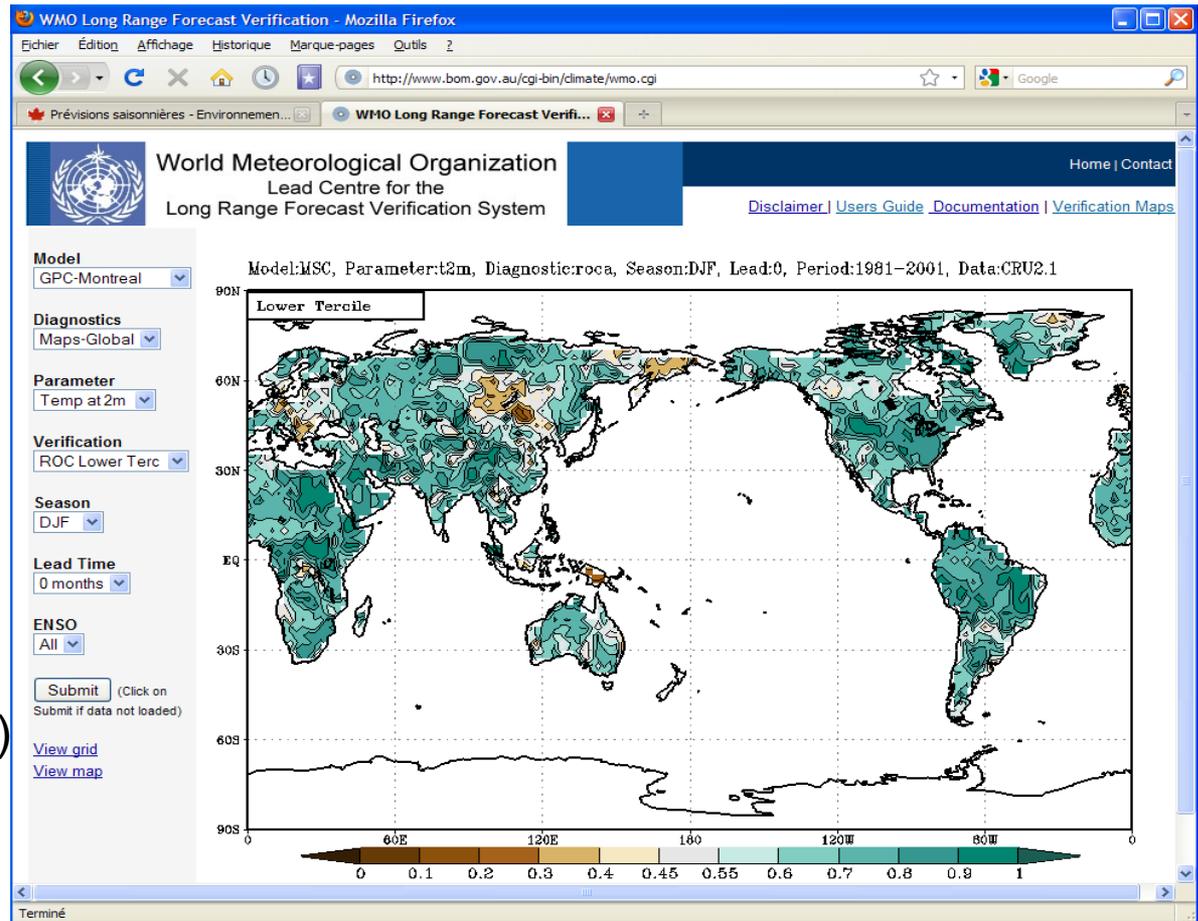
- Individual forecast
- Deterministic Multi-model Ensemble
- Probabilistic Multi-model Ensemble
- Agreement maps (consensus amongst GPCs forecasts)

WMO Lead Centres for LRF

- **LC for Standard Verification System for LRF (hindcasts skill assessment)**

Selectable:

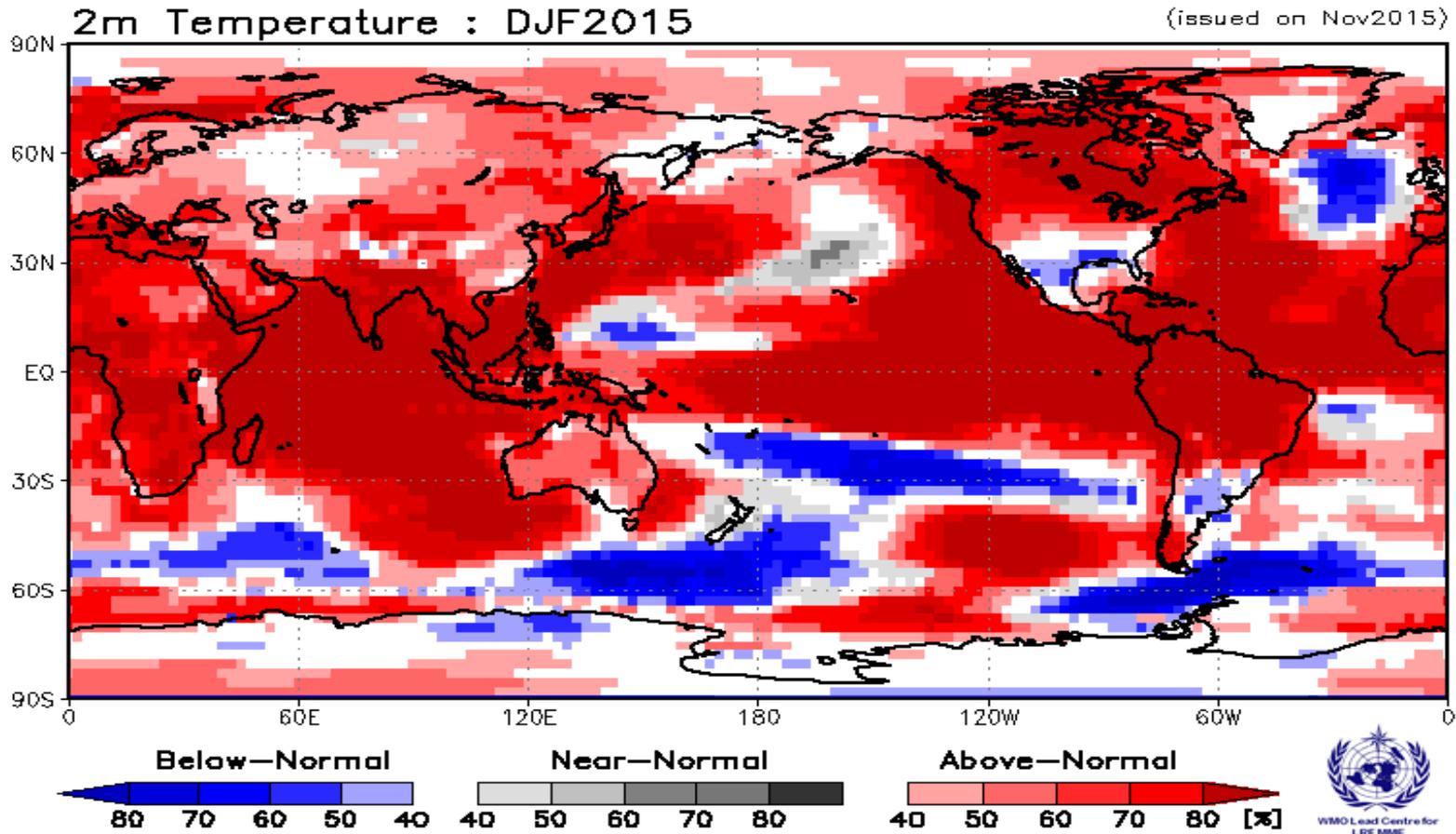
- Model – GPC
- Diagnostics
 - Maps/diagram
- Parameters
 - Temp at 2m
 - Precipitation
- Verification score
- Season
- Lead time (0,1 month)
- ENSO phase



Current product examples (Winter DJF 2015)

Probabilistic Multi-Model Ensemble Forecast

/GPC_seoul/GPC_montreal_cancm3/GPC_montreal_cancm4/GPC_melbourne/GPC_optec/GPC_melbourne

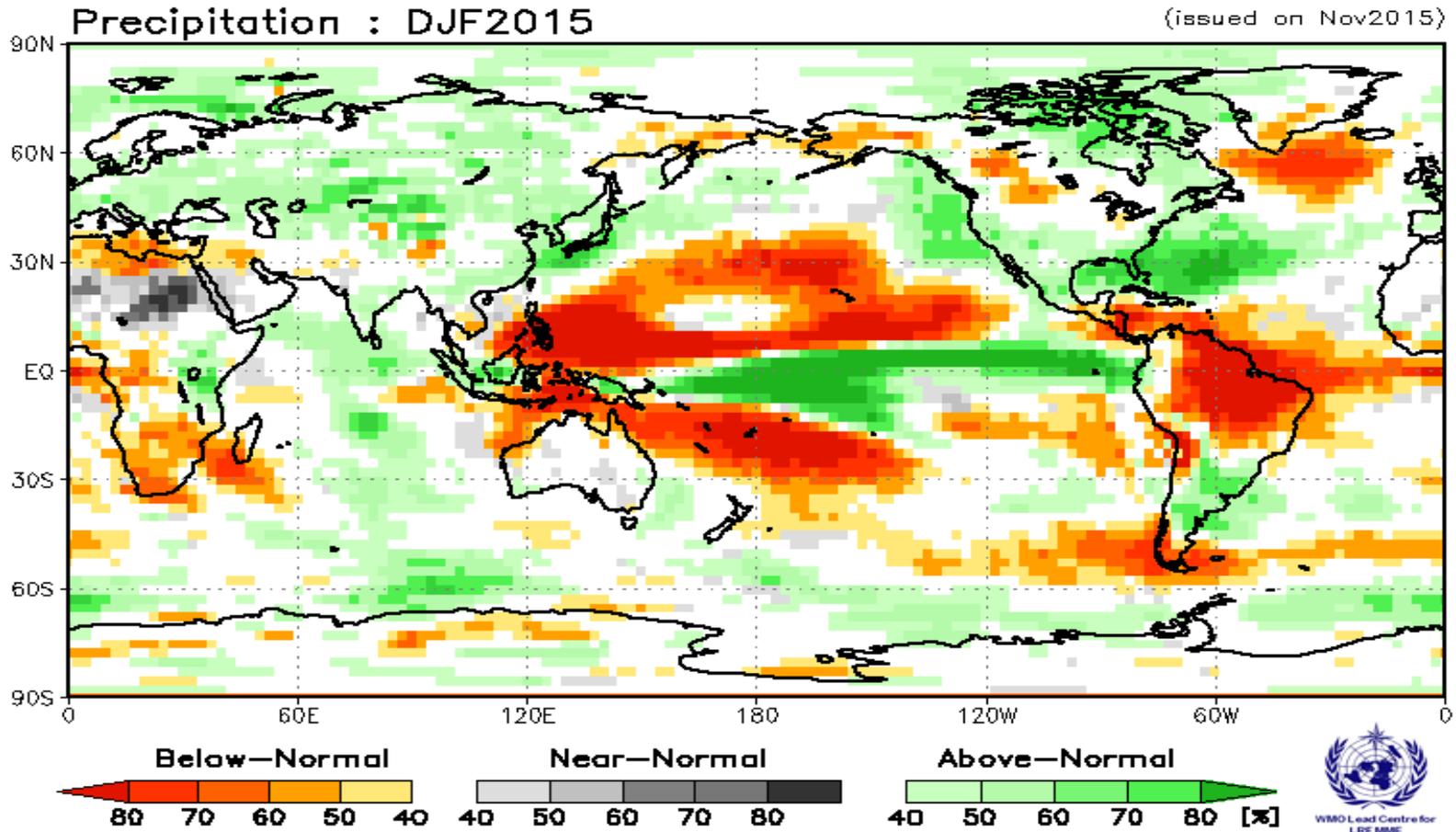


Categorical probability forecast 2-meter temperature

Current product examples (Winter DJF 2015)

Probabilistic Multi-Model Ensemble Forecast

/GPC_seoul/GPC_montreal_cancm3/GPC_montreal_cancm4/GPC_melbourne/GPC_cptec/GPC_melbourne



Categorical probability forecast of precipitation

GPCs and RCC's requests for new products

- GPCs have in the past fulfilled RCC's requests for new products, for example
 - Sea Surface Temperature (SST)
 - Ocean Climate Indices (Nino3.4 and others)
- In the context of a Polar RCC, the GPCs could
 - Provide maps with polar projections
 - Consider adding new products relevant to Polar regions, for example:
 - Snow related quantities (water equivalent, cover)
 - Sea ice (forecasts, verification, expected skill)

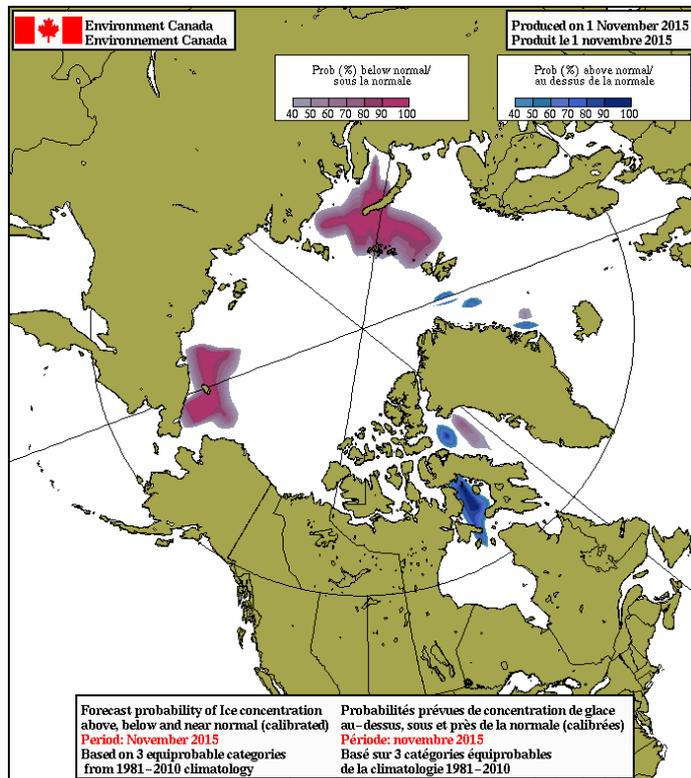
Current GPCs sea ice forecast capabilities as of Nov 2015

GPCs	Countries	Dynamical sea ice component?
Montreal	Canada	Yes
Washington	USA	Yes
Moscow	Russia	Next system version
Exeter	UK	Yes
Seoul	Korea	Yes
Tokyo	Japan	Yes
Melbourne	Australia	Next system version
Toulouse	France	Next system version
ECMWF	Europe	Next system version
Beijing	China	Next system version
Pretoria	South Africa	-
CPTEC	Brazil	-

Current GPCs sea ice forecast capabilities as of Nov 2015

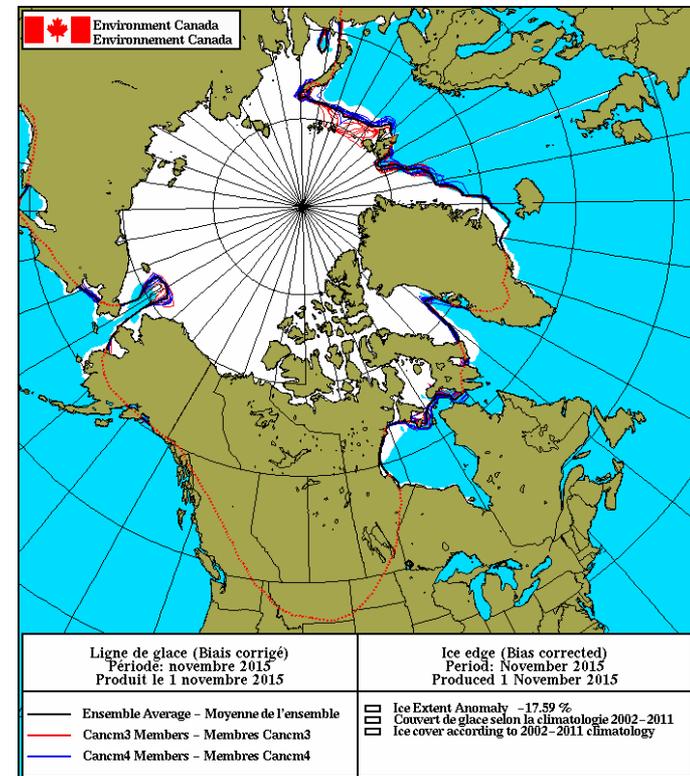
- Examples from GPC-Montreal (experimental)

Sea ice concentration (Nov 2015)



Probabilistic
2-categories (abv/blw normal)

Sea ice extent (Nov 2015)



Ensemble mean and individual
member forecasts (climato in white)

Next steps

- **Polar RCC requirements for GPCs and LCs as an outcome of this scoping workshop?**
- **ET-OPSLS will consider RCCs requests for new products**
 - Timing is good. Next ET-OPSLS meeting in April 2016
 - Some forecast products would need R&D for predictability studies and suitable packaging.
 - The degree of comfort with current sea ice forecast skill is variable amongst the GPCs
 - Some GPCs data policy might need to be amended
 - Sea ice forecast cannot be mandatory since not all GPCs have sea ice model component. Such products would be on the list of **'GPCs Recommended Products'** to produce.

THANK YOU!
&
Have a nice Winter season !



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