Extended-range/Monthly Predictions

WGSIP, Trieste

Sub-seasonal to Seasonal Prediction: Met Office, Exeter (1 to 3 December 2010)

- **Purpose**
  - ***Review of the current capabilities in sub seasonal to seasonal prediction and the identification of high-priority problems which if addressed successfully would lead to improvements in predictions***

Sub-seasonal to Seasonal Prediction: Met Office, Exeter (1 to 3 December 2010)

- **Recommendations**
  - ***Sponsorship of a few international research activities***
  - ***The establishment of collaboration and co-ordination between operational centres undertaking sub-seasonal prediction***
  - ***Facilitating the wide-spread research use of the data collected for the CHFP (and its associate projects), TIGGE and YOTC for research***
  - ***The establishment of a series of regular Workshops on sub-seasonal prediction***

- **Operational centers making extended-range/monthly forecasts**
  - ***ECMWF***
  - ***JMA***
  - ***NCEP***
  - ***Environment Canada***
  - ***Bureau of Meteorology (Australia)***
  - ***UKMET (?)***

Operational Prediction Systems

- Medium-range weather predictions (~10-15 days)
- Monthly or extended-range predictions (~30-45 days)
- Seasonal predictions (~12 months)
- Decadal predictions (~10-15 years)

Weather vs. Monthly/Seasonal Predictions

- For monthly/seasonal prediction biases could be as large as the signal one seeks to predict, and hence, anomalies cannot be computed from the observed climatology
- And therefore, one needs to have a set of hindcasts to calibrate real-time predictions
- Need for hindcasts creates some difficult practical issues (e.g., consistency of initial conditions; standardization across centers ; data exchange; etc.)
- For weather predictions atmospheric initial conditions are very important, but we don't quite know the same for long-range predictions (and importance of initial conditions for various components, e.g., land, ocean, atmosphere,..., may also differ. Implications!)

Status of Forecast System Standardization

- **Weather predictions**
  - ***Good standardization across different operational centers***
  - ***Forecasts run at a fix cycle (00Z; 06Z;…18Z)***
  - ***Data exchange procedures are in place***
  - ***Coordinated efforts (e.g., TIGGE; GIFS)***

Status of Forecast System Standardization

- **Seasonal predictions**
  - ***Not adequate standardization across different operational centers***
  - ***Seasonal forecast systems are run on a daily, weekly, or a monthly basis***
  - ***Out of ten GPCs for LRF, currently it is a mix of 1-tier and 2-tier prediction systems (but all have hindcasts)***
  - ***Some data exchange (mostly real-time forecast anomalies) are in place via the efforts of the WMO LC-LRFMME***
  - ***Some coordination via LC-LRFMME, CHFP etc.***

Status of Forecast System Standardization

- **Monthly predictions**
  - ***Probably not adequate level of standardization across different operational centers***
  - ***Monthly forecasts run on a daily or weekly basis***
  - ***Mix of coupled, or atmospheric alone, prediction systems***
  - ***No data exchange efforts (?)***
  - ***So…how to organize this???***

Global Producing Centers (GPCs) and Extended-Range Forecasts

Global Producing Centers for Long-Range Forecasts (LRF)

- **Global Producing Centers (GPCs) for LRF are**
  - ***WMO recognized centers (for LRF)***
  - ***Recognition is mandated based on meeting a minimum set of functional requirements (listed in the GDPFS manual)***
    - Have fixed production cycles and time of issuance;
    - Provide a limited set of mandatory products;
    - Provide verifications as per the WMO SVSLRF;
    - Provide up-to-date information on methodology used by the GPC;
    - Make products accessible through the GPC website and/or disseminated through the GTS and/or the Internet

The 12 WMO-designated GPCs

GPC name	Centre	System Configuration (ensemble size of forecast)	Resolution (atmosphere)	Hindcast period used
Beijing	Beijing Climate Centre	Coupled (48)	T63/L16	1983-2004
CPTEC	Centre for Weather Forecasts and Climate Studies	2-tier (15)	T62/L28	1979-2001
ECMWF	European Centre for Medium Range Weather Forecasts	Coupled (41)	T159/L62	1981-2005
Exeter	Met Office Hadley Centre	Coupled (42)	1.25° x1.85° /L38	1989-2002
Melbourne	Australian Bureau of Meteorology	Coupled (30)	T47/L17	1980-2006
Montreal	Meteorological Service of Canada	2-tier (40)	T32/T63/T95/2.0° x2 .0° (4- model combination)	1969-2004
Seoul	Korean Meteorological Agency	2-tier (20)	T106/L21	1979-2007
Tokyo	Japan Meteorological Agency	Coupled (51)	T95/L40	1979-2008
Toulouse	Météo-France	Coupled (41)	T63/L91	1979-2007
Washington	National Centres for Environmental Prediction	Coupled (40)	T62/L64	1981-2004
Moscow	Hydromet Centre of Russia	2-tier (10)	1.1° x1.4° /L28	1979-2003
Pretoria	South African Weather Service	2-tier (6)	T42/L19	1983-2001

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Long-range forecasting and the Global Framework for Climate Services

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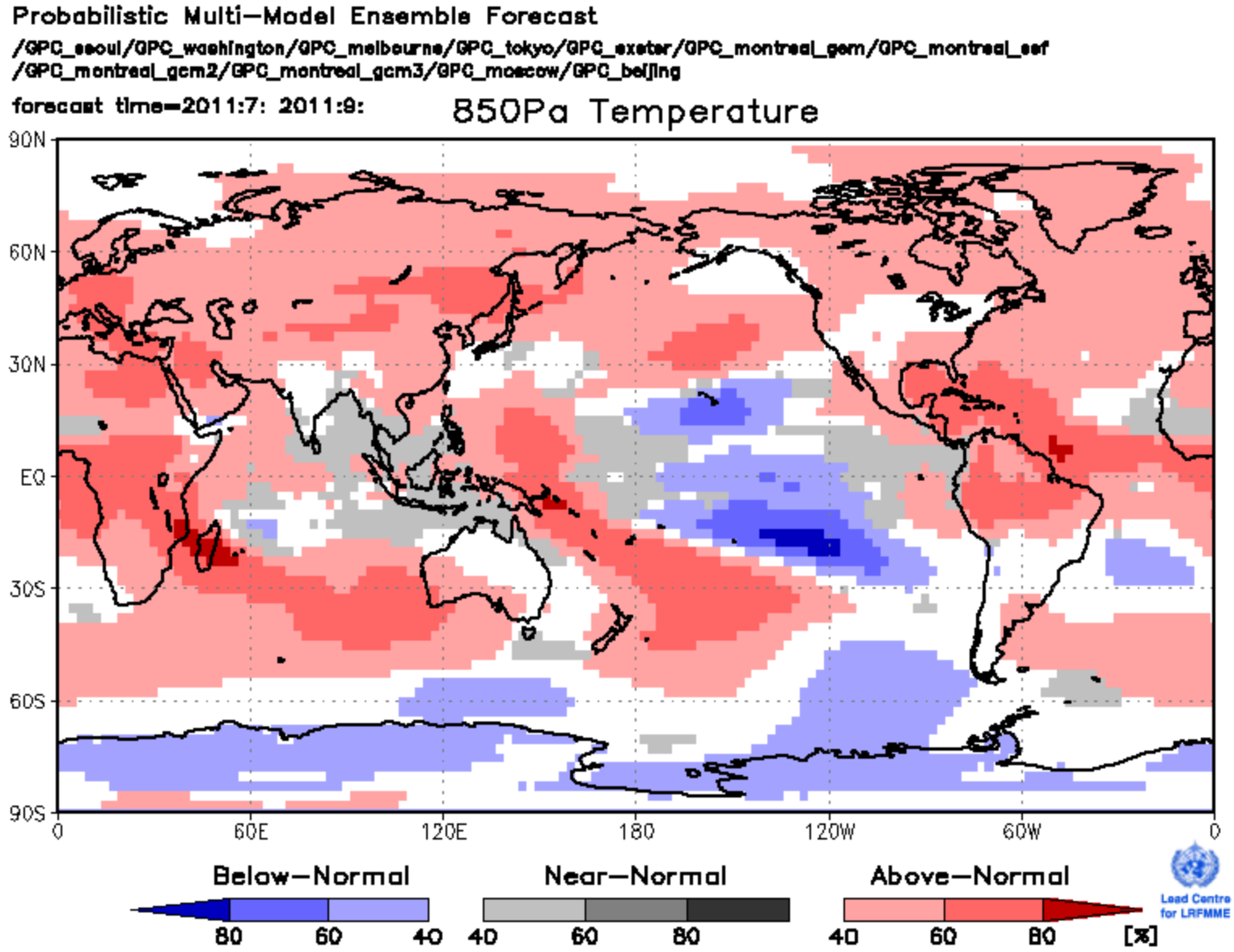
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30N
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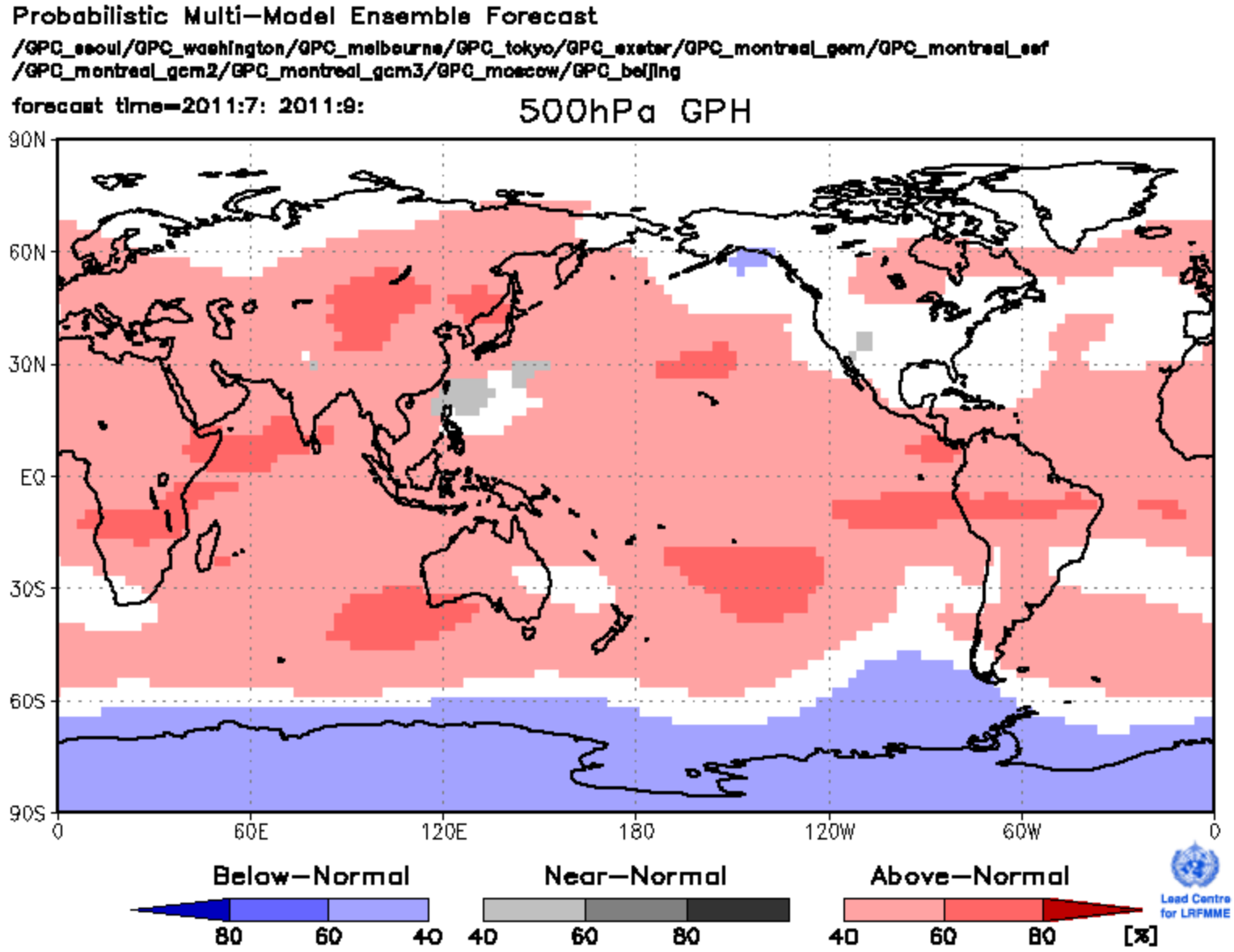
Lead Centre for LRFMME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Lead Centre
for LRFMME

- **Global Seasonal Climate Update (GSCU)**
  - ***Similar to WMO El Nino/La Nina update***
  - ***Seasonal outlook guidance for surface temperature & precipitation***
  - ***Use data from GPCs collected at the KMA***

- **SI Predictions/Predictability**
  - ***Connections between CHFP and Operational predictions (GPCs, LRFMME)***