

Subseasonal forecasting activity at Environment Canada

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Current forecasting systems

- Ensemble Prediction System (EPS): upto 16 days
- Seasonal Forecasting System (SFS): up to 4 months
- Monthly Forecast: first month forecast of SFS

Ensemble Prediction System

- GEM model 400x200x28 (0.9°)
- 20 members, Kalman filter
- Perturbed physics (4 different convection schemes)
- 16 day integration

Seasonal forecasting System

- Multi-model ensemble approach GEM, GCM3, GCM2 and SEF
- 2-tier system persistent SST anomaly
- 4-month integrations
- 10 x 4 ensemble members
- 12-h lag initial conditions

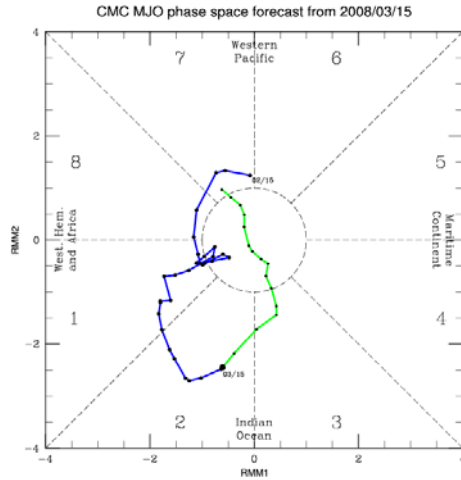
Process study

- **MJO**
- Stratosphere signal
GEMstrato (80 levels) is able to simulate downward propagation of the AO signal, agrees with the observations
- Land processes
- Data assimilation

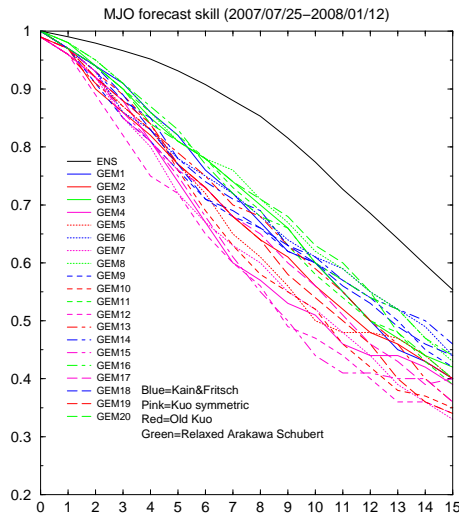
MJO forecasting in CMC ensemble prediction system

Forecast skill of the MJO index
Wheeler and Hendon (2004) defined RMM:
PC1 and PC2 of combined EOF of OLR, U200 and U850

CMC ensemble prediction system

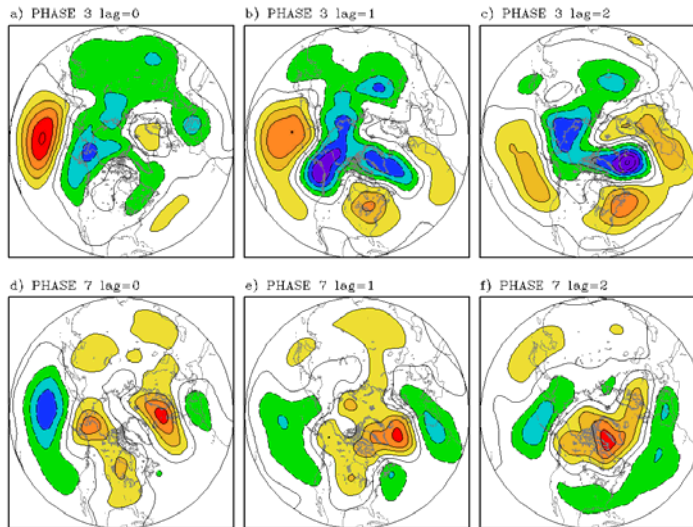


CMC ensemble prediction system



MJO influence

Z500 composites

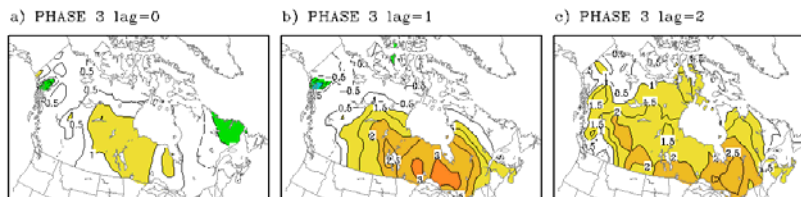


MJO and NAO

- Increase of NAO amplitude 10~15 days after the MJO-related convection anomaly reaches western Pacific
- The development of NAO is associated with a Rossby wave train

MJO impact on Canadian weather

Lagged winter SAT anomaly in Canada



Composites of pentad SAT data for 201 stations over Canada from 1979-2007
WH2004 defined MJO index

Future development

- Montreal (RPN): **CGEM**
operational model
- Victoria (CCCma): **CGCM**
for climate modeling studies
- Next generation of seasonal and monthly forecast system in Canada
- Separation of monthly forecast from SFS using EPS

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Thank you!



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Wave activity flux and 200mb streamfunction anomaly

