Summer and Winter Precipitation Predictions over North America with the Eta Regional Climate Model

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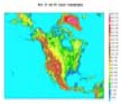
Objectives

- Examine summer and winter seasonal precipitation prediction using the Eta Regional Climate Model (Eta RCM)
- Examine the impact of predicted lateral boundary conditions and SSTs on seasonal precipitation with the Eta RCM. Focus on inter annual variability.

The Eta-based Regional Climate Model

- **Virtually exact match to the Eta model in Regional Reanalysis**
  R/R domain and grid (32-km, 45-layers, large R/R domain)
  R/R Eta model physics, e.g. Noah Version 2.3 with R/R 4 soil layers NCEP will provide as a community workstation Eta RCM
- **Developed: use very recent Eta physics**
  As implemented in operational NCEP Eta on Mid-Jul 01
- **Source of Initial land states**

1. From GR2 in runs to date (Noah 2.3, frozen soil states)
2. From NARR (finished, not presented here)



Case Chosen and Data Used

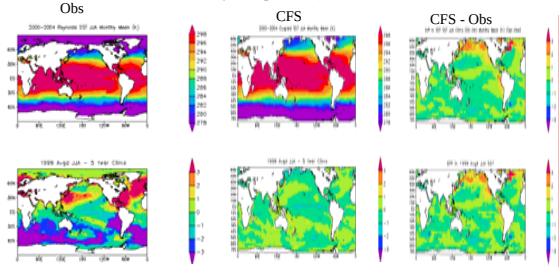
- **Executions : Seasonal Predictions**
  - Summer: 10-member ensembles from 00UTC 19-23,29, 30 April and 01, 02, 03 May. Years: 1999 to 2004
  - Winter: 7-member ensembles from 00UTC 19-23, 30, 31 Dec Years:1983, 2000-2004
- **Convection Schemes: Betts-Miller-Janjic**
- **Temporal lateral boundary conditions from CFS:**
  Used 12-hrly CFS predicted boundary conditions
- **Predicted SST from CFS (T62, L64)**
- **Daily updates of several surface boundary fields:**

1. Daily predicted 1-deg SST (CFS)
2. Satellite NDVI-based 0.15-degree monthly greenness (NESDIS)
3. Seasonal 1.0-deg snow-free albedo climatology (NASA)
4. Snow depth: USAF operational 47-km daily global snow depth

Eta RCM Summer Results

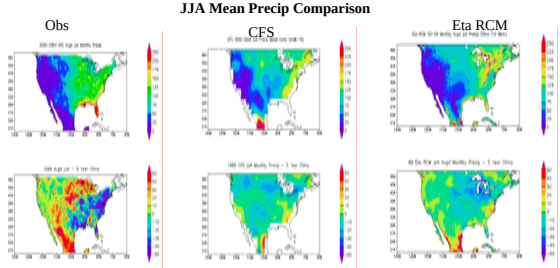
SST Climo and Anomaly Comparison (00-04 & 99) Monsoon Event

Obs CFS CFS - Obs



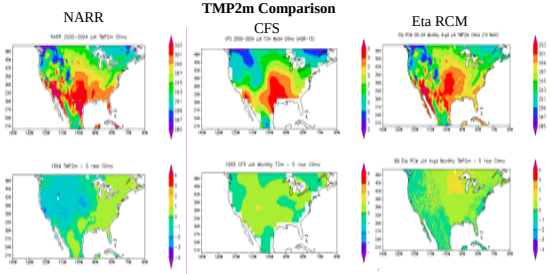
JJA Mean Precip Comparison

Obs CFS Eta RCM



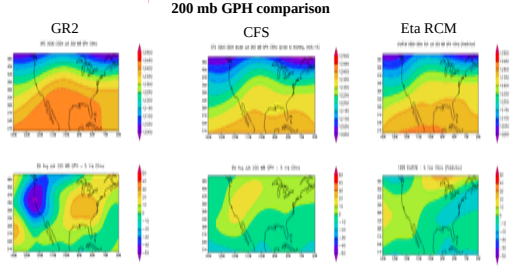
TMP2m Comparison

NARR CFS Eta RCM



200 mb GPH comparison

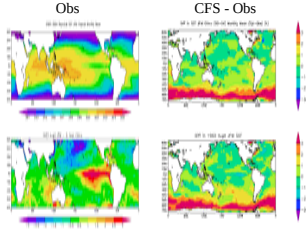
GR2 CFS Eta RCM



Eta RCM Winter Results

SST Climo and Anomaly

Obs CFS - Obs

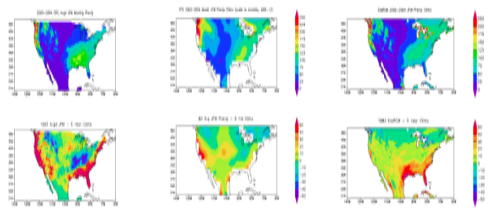


Conclusions/Future Directions

- 1983 Winter ENSO event: Eta RCM shows less skill than CFS
- 1999 Summer monsoon: Eta RCM is modestly better than CFS
- Biased Corrected SST test
- T126 test (High Res)
- Anomalies add on Climo SST test
- Domain size test

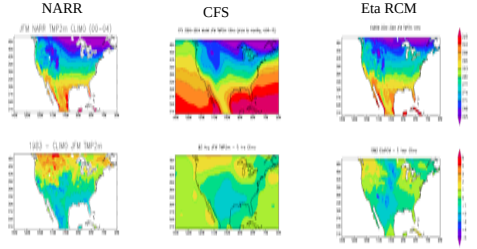
JFM Mean Precip Comparison

CPC Obs CFS Eta RCM



TMP2m Comparison

NARR CFS Eta RCM



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GR2 CFS Eta RCM