The North American Multi-Model Ensemble (NMME)
NMME

• Very Brief Description of NMME System

• Diversity of ENSO in NMME
  – “Agnostic” view
  – Event Based: SST, Precipitation
    • Pattern Correlation
    • Lead Time

• North American Rainfall
  – 2006-07 SE US Drought
<table>
<thead>
<tr>
<th>Model</th>
<th>Hindcast Period</th>
<th>Ensemble Size</th>
<th>Lead Times</th>
<th>Arrangement of Ensemble Members</th>
<th>Contact and reference</th>
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</thead>
<tbody>
<tr>
<td>CFSv1</td>
<td>1981-2009</td>
<td>15</td>
<td>0.5-8.5 Months</td>
<td>1\textsuperscript{st} 0Z +/- 2 days, 21\textsuperscript{st} 0Z +/- 2d, 11\textsuperscript{th} 0Z +/- 2d</td>
<td>Saha (Saha et al. 2006)</td>
</tr>
<tr>
<td>CFSv2</td>
<td>1982-2010</td>
<td>24(28)</td>
<td>0.5-9.5 Months</td>
<td>4 members (0,6,12,18Z) every 5\textsuperscript{th} day</td>
<td>Saha (Saha et al. 2010)</td>
</tr>
<tr>
<td>GFDL-CM2.2</td>
<td>1982-2010</td>
<td>10</td>
<td>0.5-11.5 Months</td>
<td>All 1\textsuperscript{st} of the month 0Z</td>
<td>Rosati (Zhang et al. 2007)</td>
</tr>
<tr>
<td>IRI-ECHAM4-f\textsuperscript{l}</td>
<td>1982-2010</td>
<td>12</td>
<td>0.5-7.5 Months</td>
<td>All 1\textsuperscript{st} of the month 0Z</td>
<td>DeWitt (DeWitt 2005)</td>
</tr>
<tr>
<td>IRI-ECHAM4-a\textsuperscript{2}</td>
<td>1982-2010</td>
<td>12</td>
<td>0.5-7.5 Months</td>
<td>All 1\textsuperscript{st} of the Month 0Z</td>
<td>DeWitt (DeWitt 2005)</td>
</tr>
<tr>
<td>CCSM3.0</td>
<td>1982-2010</td>
<td>6</td>
<td>0.5-11.5 Months</td>
<td>All 1\textsuperscript{st} of the Month 0Z</td>
<td>Kirtman (Kirtman and Min 2009)</td>
</tr>
<tr>
<td>GEOS5</td>
<td>1981-2010</td>
<td>11\textsuperscript{2}</td>
<td>0.5-9.5 Months</td>
<td>1 Member every 5\textsuperscript{th} day</td>
<td>Schubert (Vernieres et al. 2011)</td>
</tr>
<tr>
<td>CMC1-CanCM3</td>
<td>1981-2010</td>
<td>10</td>
<td>0.5-11.5</td>
<td>All 1\textsuperscript{st} of the month 0Z</td>
<td>Merryfield Merryfield et al. (2013)</td>
</tr>
<tr>
<td>CMC2-CanCM4</td>
<td>1981-2010</td>
<td>10</td>
<td>0.5-11.5</td>
<td>ALL 1\textsuperscript{st} of the month 0Z</td>
<td>Merryfield Merryfield et al. (2013)</td>
</tr>
</tbody>
</table>
1.5-month Lead
1.5-month Lead

6.5-month Lead
July 1 start
DJF SST
forecast
RPSS
home tippett NMME

home tippett NMME.

Documents

outline an outline showing all sub-datasets and variables contained in this dataset

Datasets and variables

- **land mask**  home tippett NMME Lmask[ X Y l]
- **nino34**  home tippett NMME nino34[AC Normal Above Dominant Mean rpsS Below ]
- **ocean mask**  home tippett NMME Omask[ X Y l]
- **prec**  home tippett NMME prec[AC Normal Above Dominant Mean RPSS rpsS Below rain ]
- **sst**  home tippett NMME sst[AC Normal Above Dominant Mean RPSS rpsS Below ]
- **tref**  home tippett NMME tref[AC Normal Above Dominant Mean rpsS RPSS Below ]

Independent Variables (Grids)

- **lead**  grid: /L (months) ordered (1.5 months) to (10.5 months) by 1.0 N= 10 pts :grid
- **start**  grid: /S (months since 1960-01-01) ordered (0000 1 Jan 1982) to (0000 1 Dec 2010) by 1.0 N= 348 pts :grid
- **Longitude**  grid: /X (degree_east) periodic (0.0) to (1W) by 1.0 N= 360 pts :grid
- **Latitude**  grid: /Y (degree_north) ordered (90S) to (90N) by 1.0 N= 181 pts :grid
Welcome to the National Multi-Model Ensemble home!

Data and Current Forecasts

- 3-month mean spatial anomalies
- 1-month mean spatial anomalies
- Niño3.4 Plumes
- International MME
- Experimental: Probability forecasts

NMME Realtime Forecasts Archive
NMME Phase-I Hindcast Data

About the NMME

- Description of the NMME
- Phase-I Forecast Models
- CTB Activities & Documents
- Join the NMME mailing list
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Equatorial SSTA

0.5LT JFM1995
Equatorial SSTA

0.5LT JFM1998
Pattern Correlation JFM1995 (CP) – Short Lead

Pattern Correlation JFM1995 (CP) – Long Lead

Pattern Correlation JFM1998 (EP) – Short Lead

Pattern Correlation JFM1998 (EP) – Long Lead
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July 1 start
DJF prec forecast
RPSS
Jan 1 start
JJA prec forecast
RPSS
Figure 11. Observed precipitation anomaly versus NMME ensemble mean precipitation and seasonal leads. Color scale and contours range from -1 to 1 mm/day.
Figure 12. Similar to Fig. 11 but for SSTA. Color scale and contours for observed SSTA and NMME ensemble mean SSTA ranges from -3.0 to 3.0 degrees C.
2011 was quite predictable (La Nina conditions). NMME showed consistently the best skill compared to individual systems.