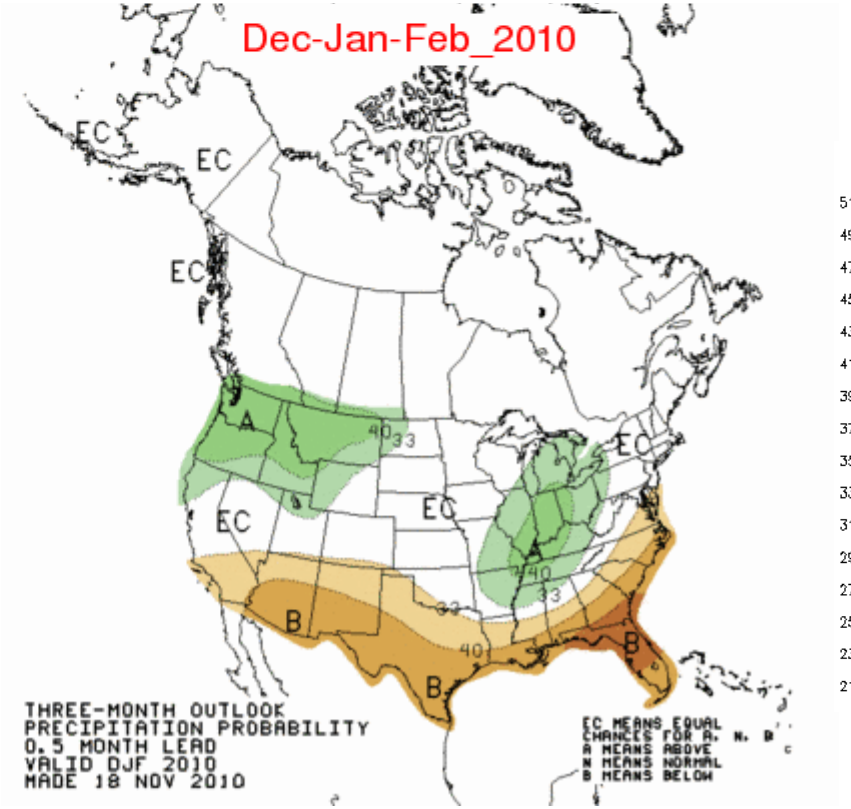
U.S. Seasonal Outlooks 2010-11 What went right, wrong, and a look at DJF 2011-12

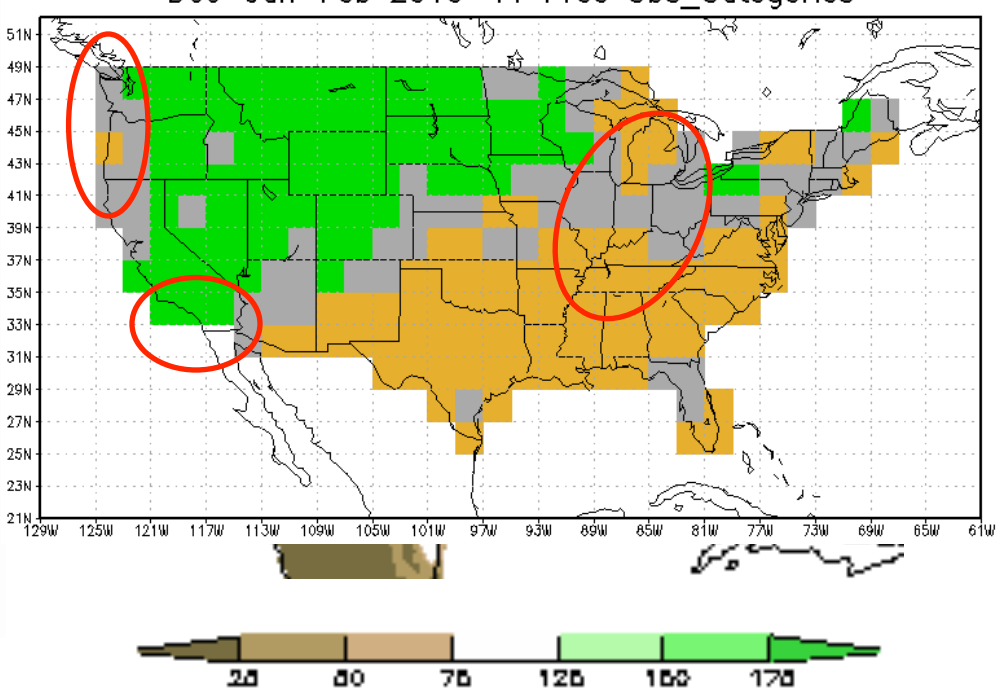
Mike Halpert

Thanks to: Michelle L'Heureux, Arun Kumar, Mingyue Chen, Wanqiu Wang, Emily Riddle

December 2010-February 2011 Precipitation

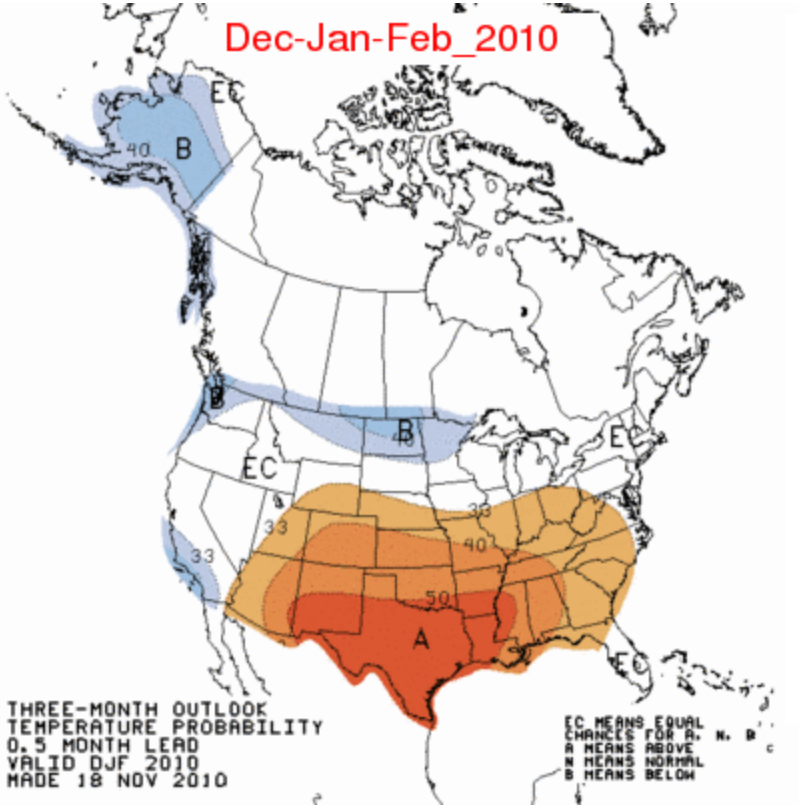


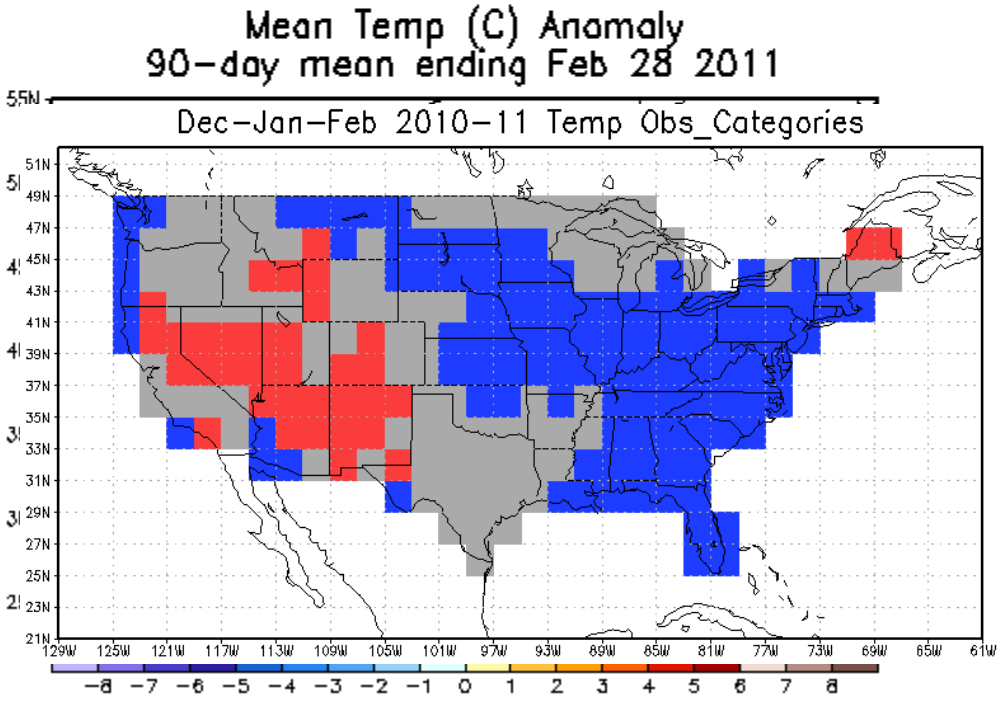
90 day % of Normal
DJF 2010-11



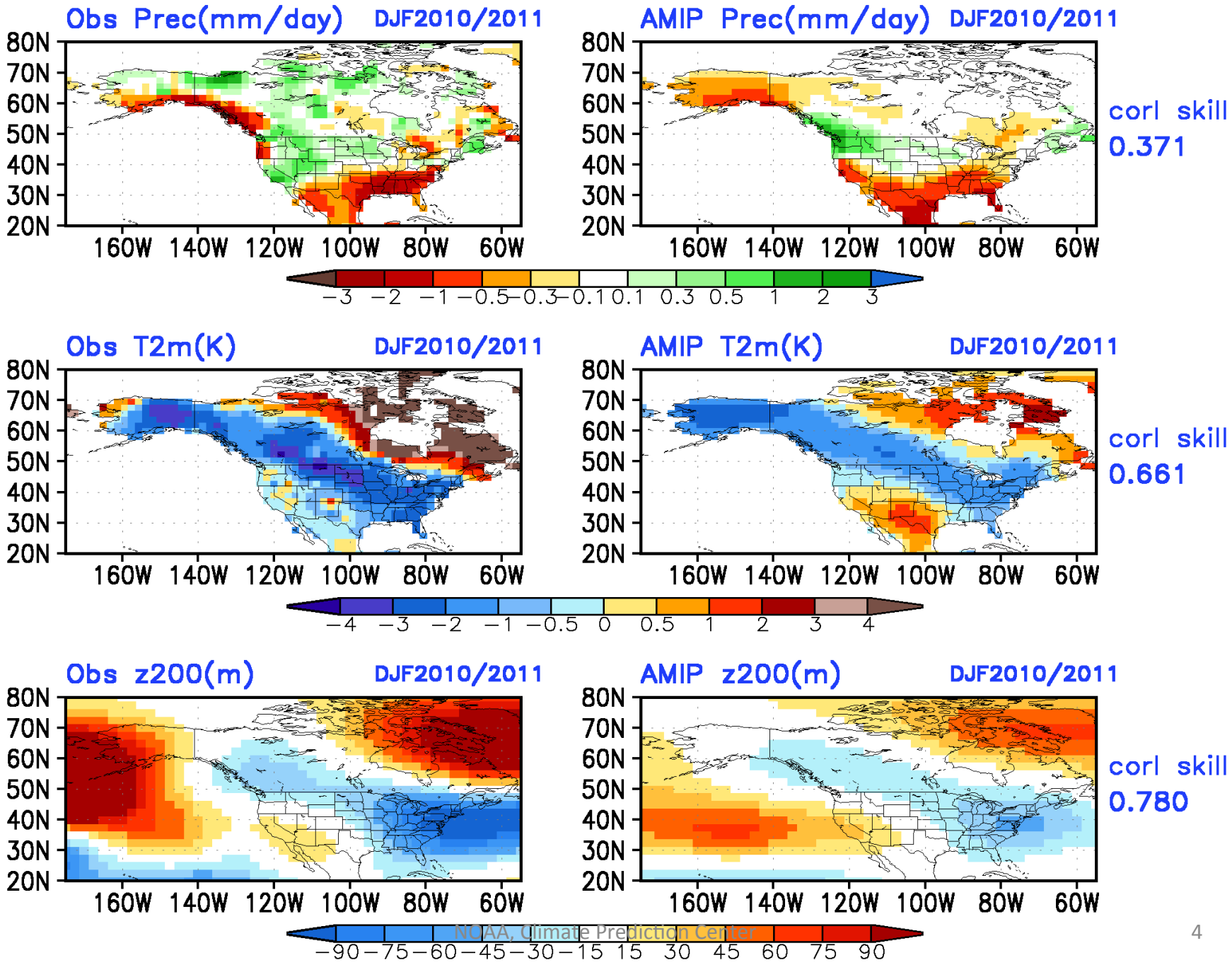
Heidke = 41.4, Coverage = 57%

Dec 2010 – Feb 2011 Temperature



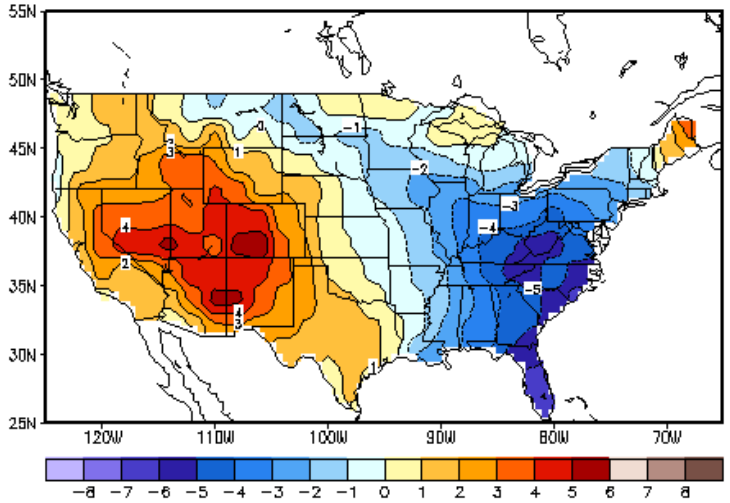


Heidke = -16.8, Coverage = 56%

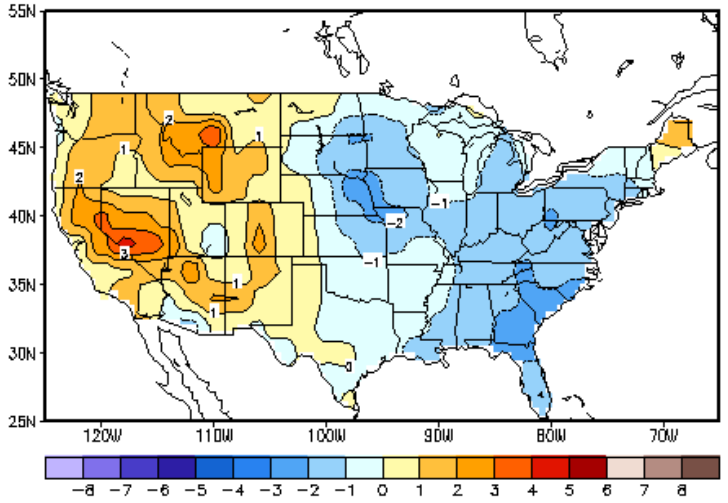

Obs Prec(mm/day) DJF2010/2011
AMIP Prec(mm/day) DJF2010/2011
80N
70N
60N
50N
40N
30N
20N
160W 140W 120W 100W 80W 60W
−3 −2 −1 −0.5 −0.3 −0.1 0.1 0.3 0.5 1 2 3
corl skill
0.371
Obs T2m(K) DJF2010/2011
AMIP T2m(K) DJF2010/2011
−4 −3 −2 −1 −0.5 0 0.5 1 2 3 4
corl skill
0.661
Obs z200(m) DJF2010/2011
AMIP z200(m) DJF2010/2011
−90 −75 −60 −45 −30 −15 15 30 45 60 75 90
corl skill
0.780

Monthly Temperature Anomalies (°C)

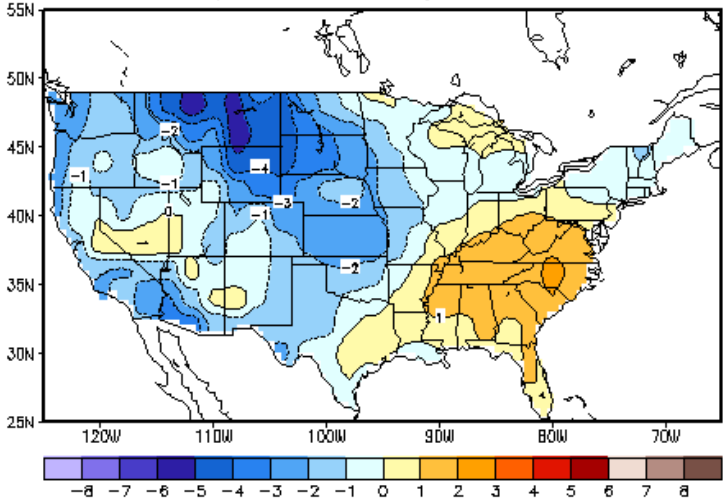
December 2010



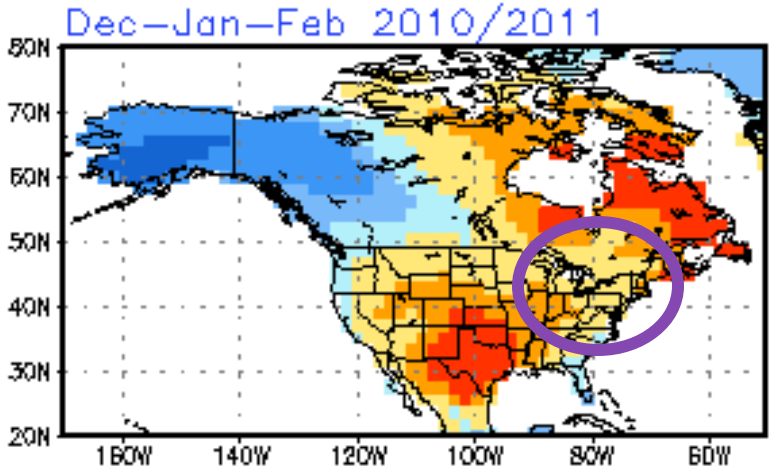
January 2011



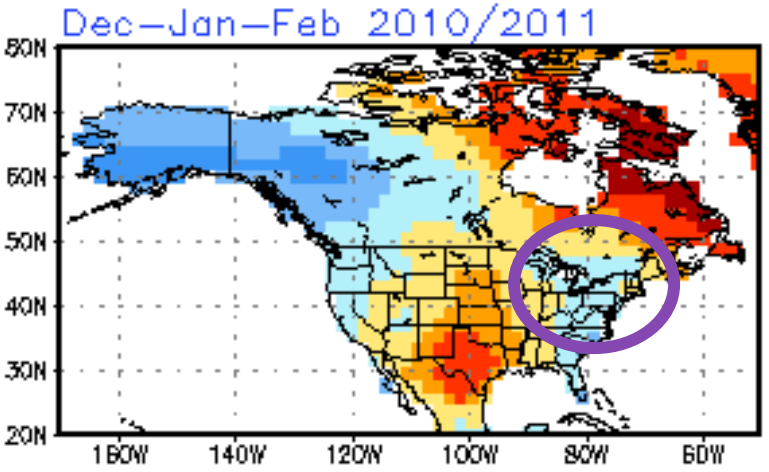
February 2011



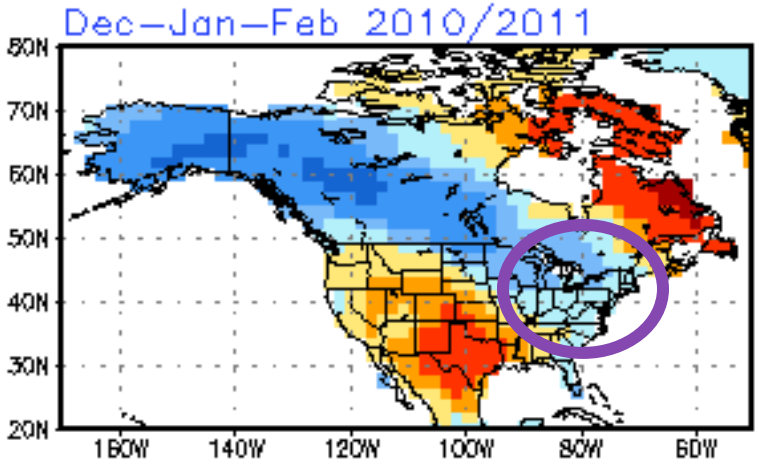
CFSv1 Forecasts for DJF 2010-11



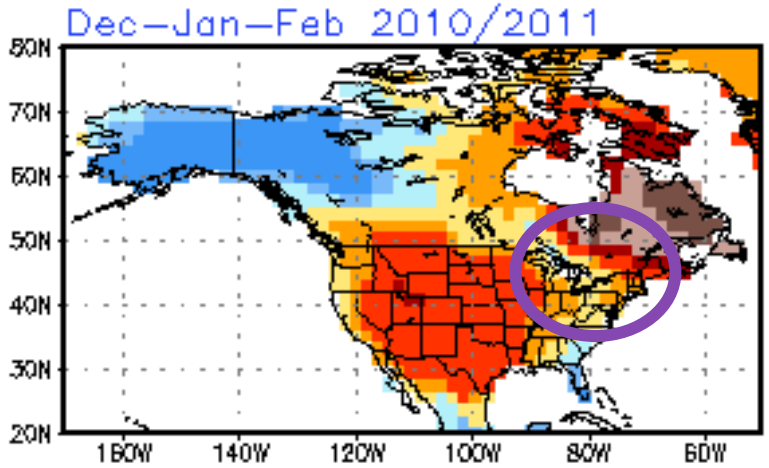
mid-September



mid-October

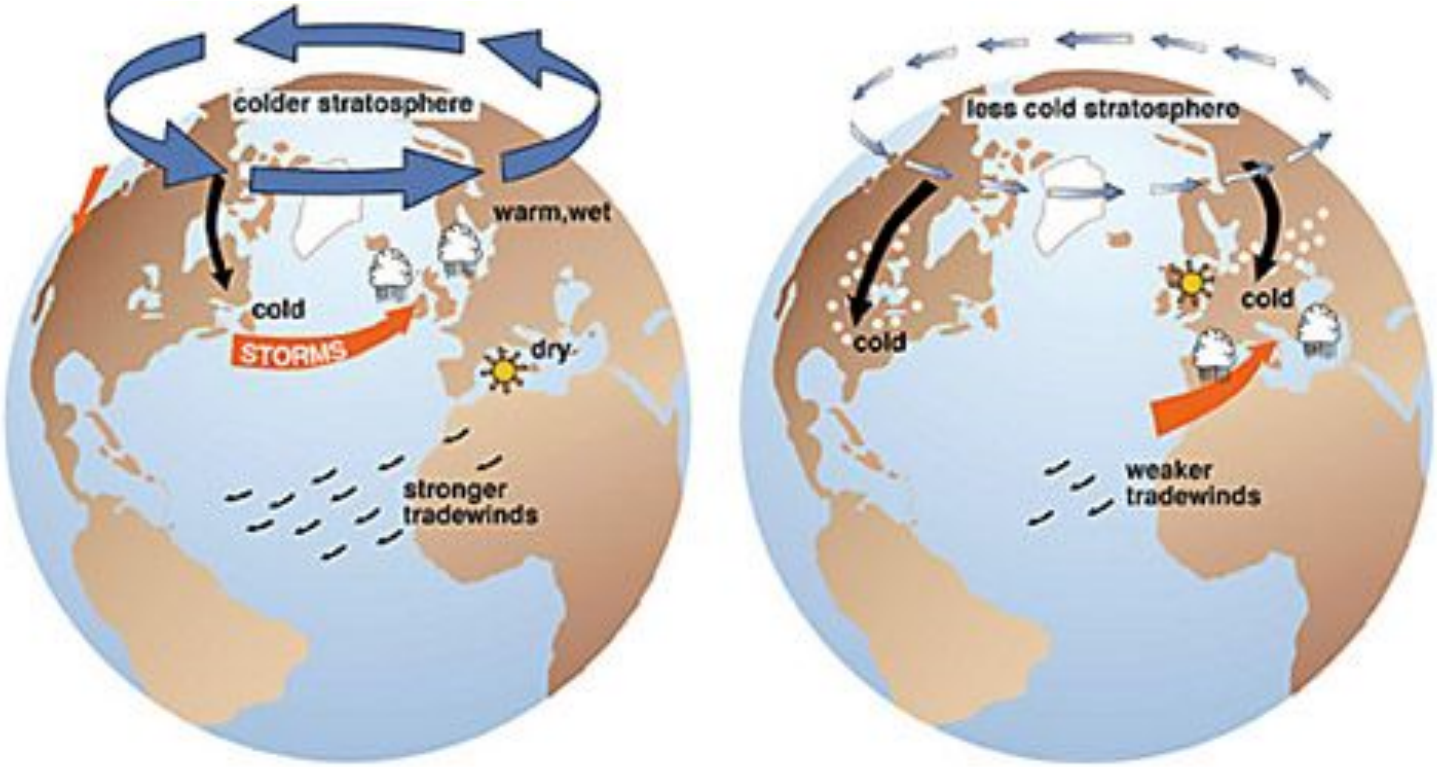


mid-November



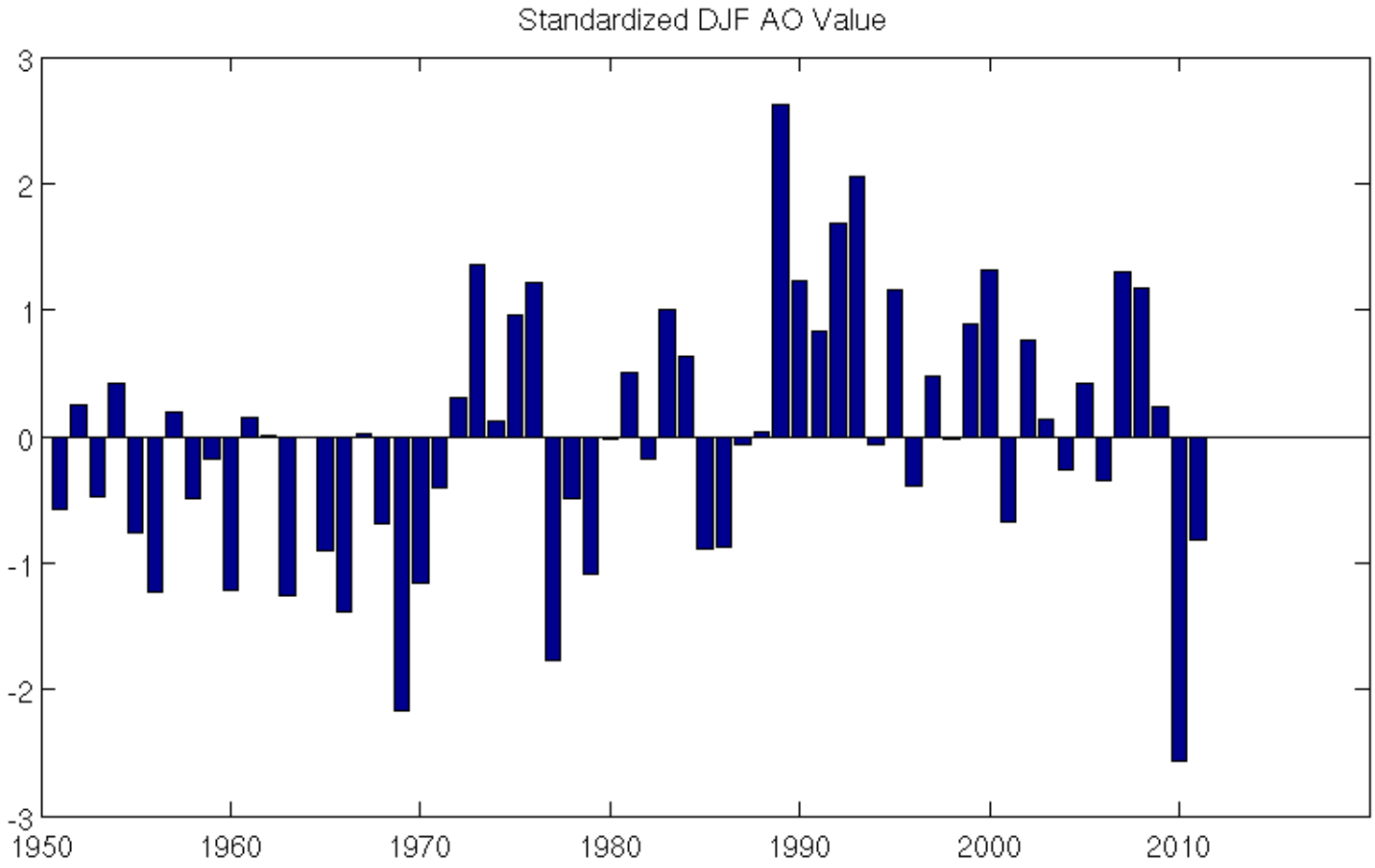
mid-December

Arctic Oscillation (AO)

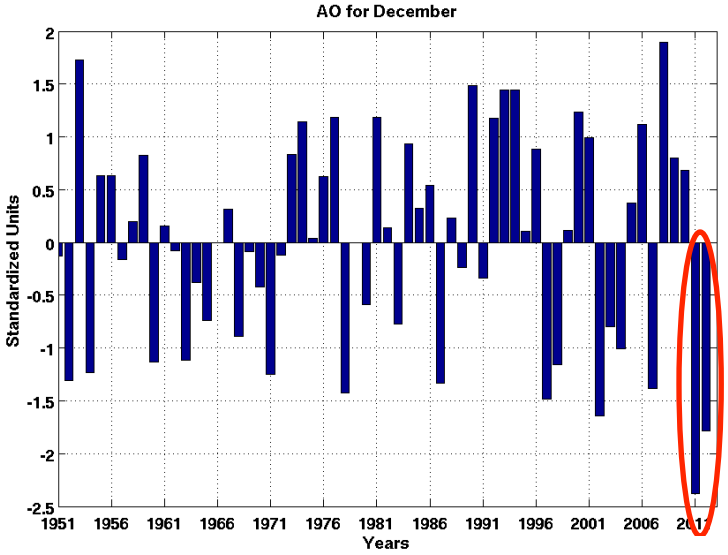


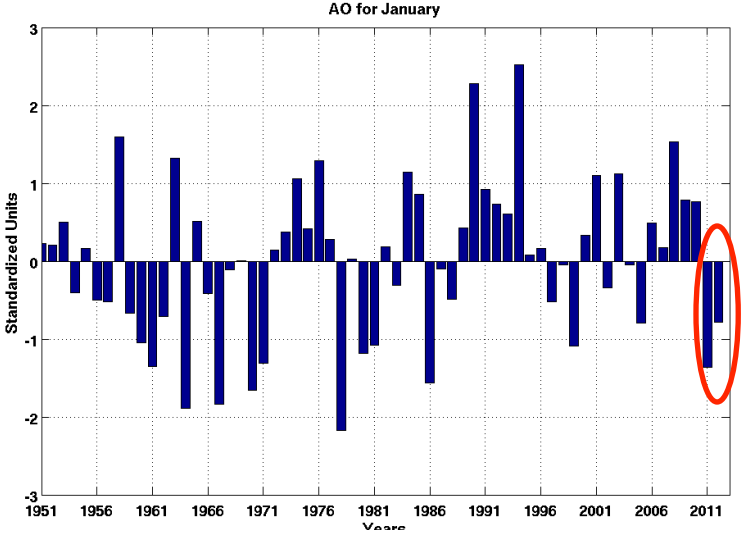
Positive Arctic Oscillation (left) and negative Arctic Oscillation (right).
Source: J. Wallace, University of Washington

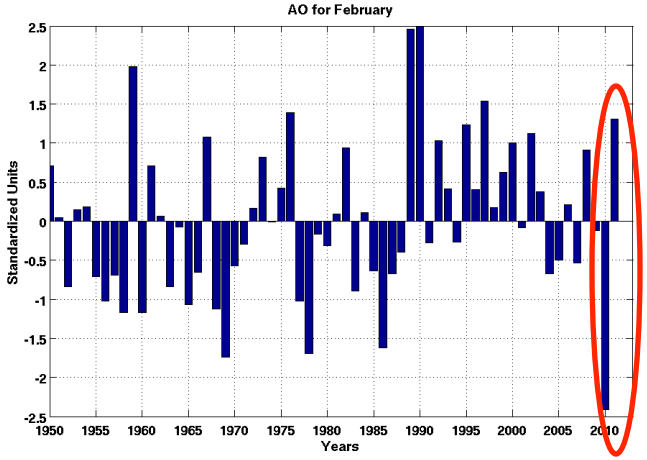
NH Winter Arctic Oscillation (AO)

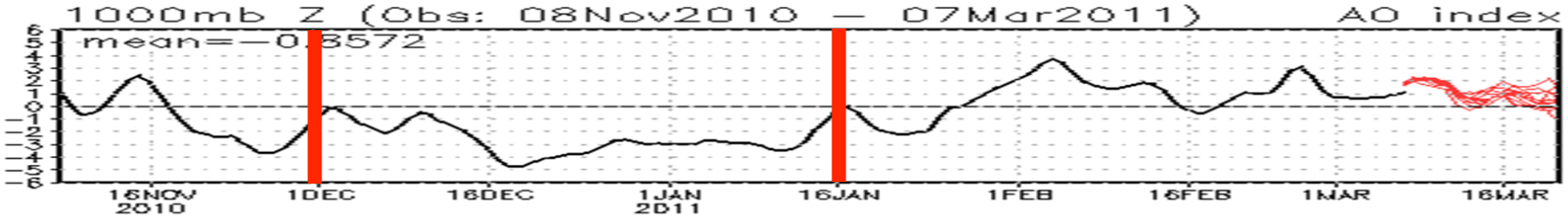


NH Winter (monthly) AO

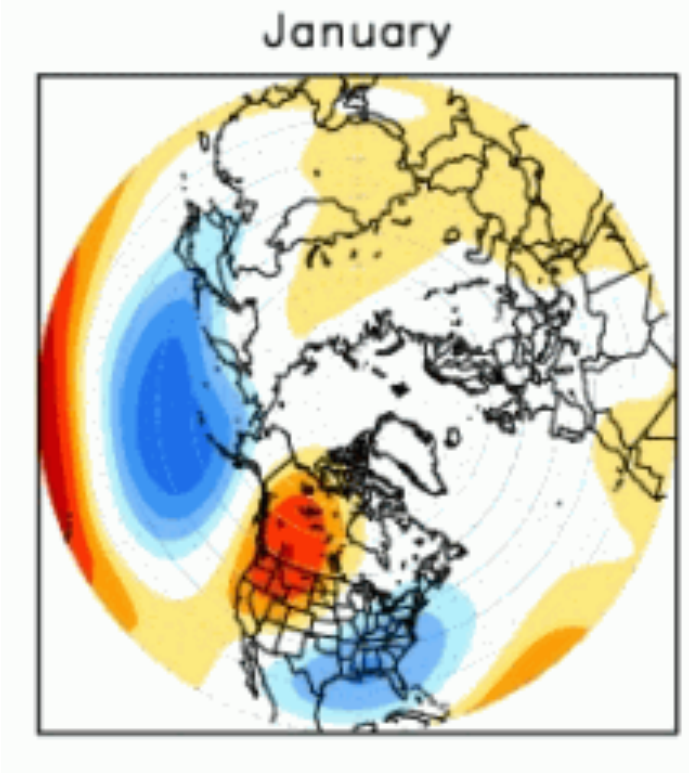


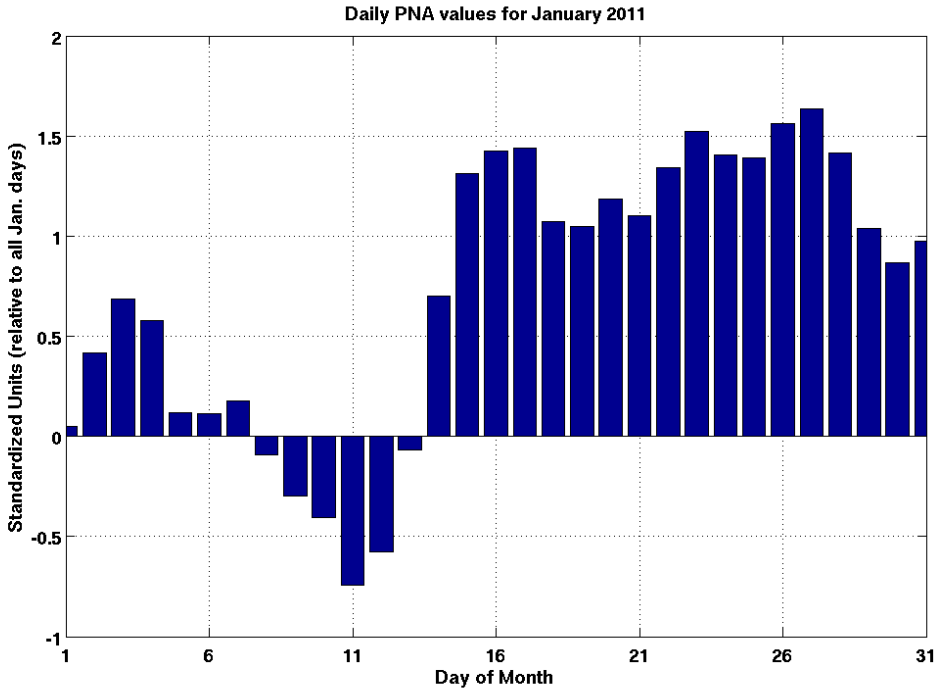




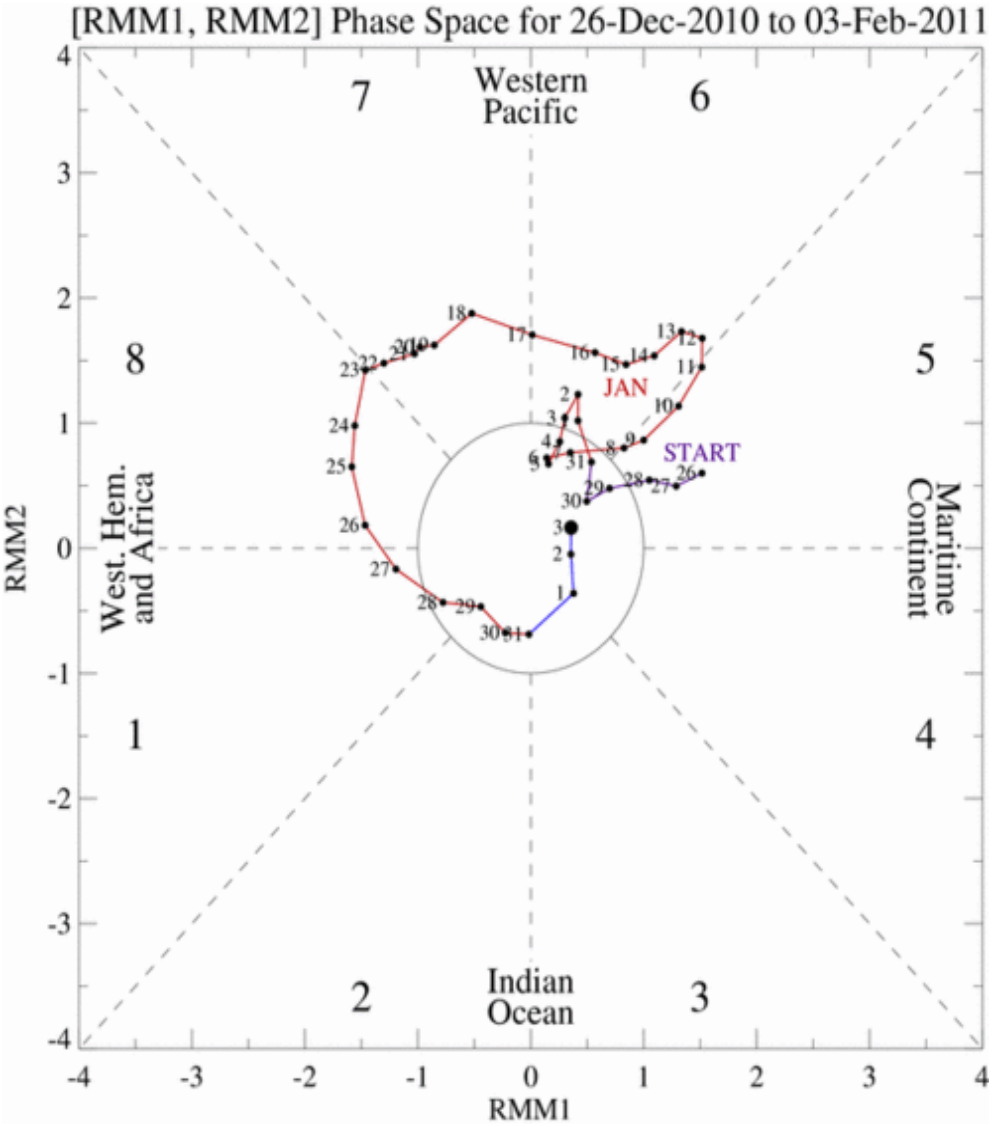


January PNA Index

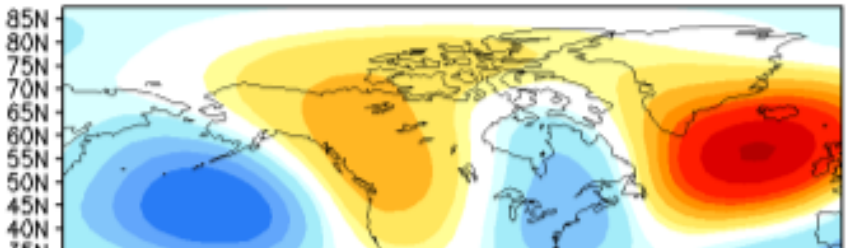




MJO Index -- Recent Evolution

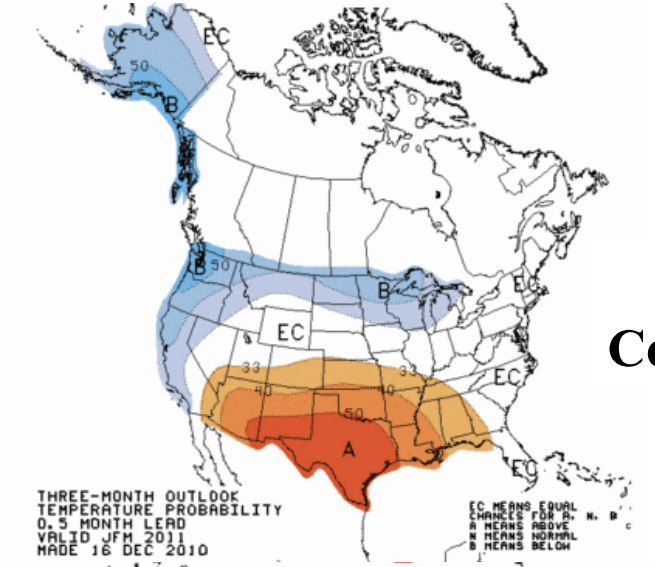


- **The axes (RMM1 and RMM2) represent daily values of the principal components from the two leading modes**
- **The triangular areas indicate the location of the enhanced phase of the MJO**
- **Counter-clockwise motion is indicative of eastward propagation. Large dot most recent observation.**
- **Distance from the origin is proportional to MJO strength**
- **Line colors distinguish different months**

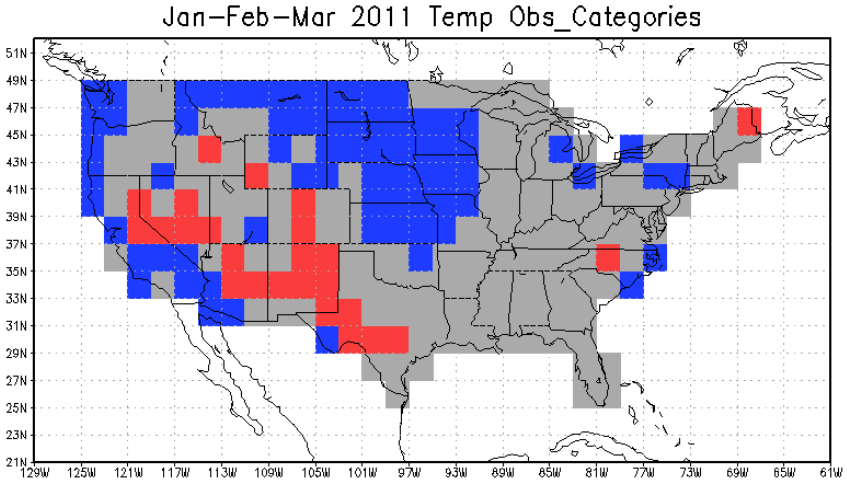


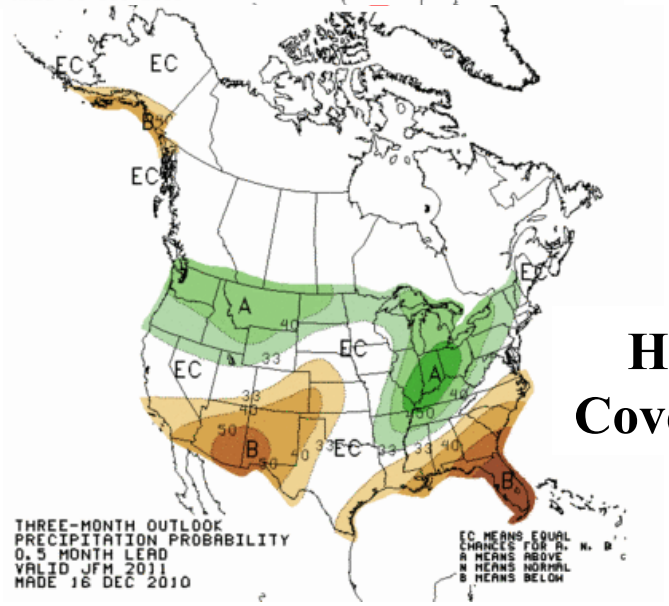
The probability of this pattern is elevated during and in the weeks after MJO phase 6-8

January – March 2011

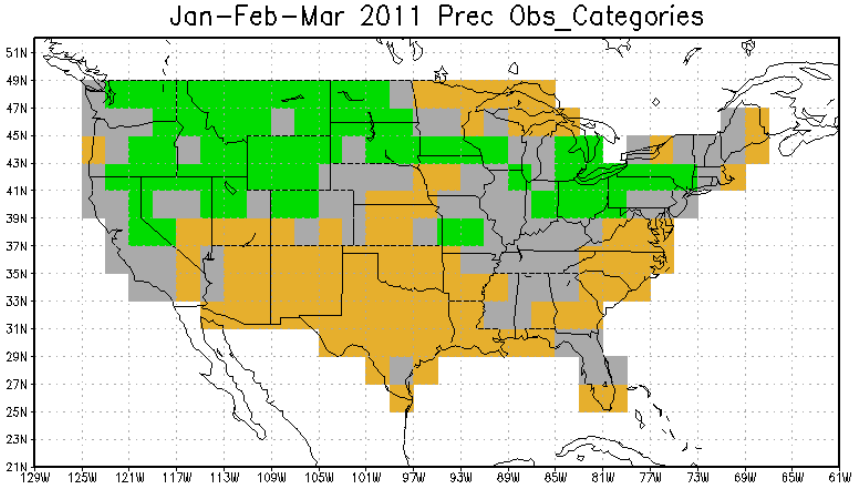


Heidke = 0
Coverage = 59%

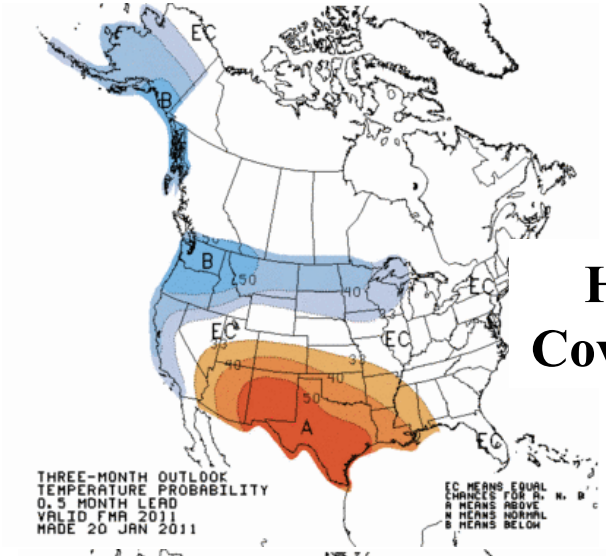




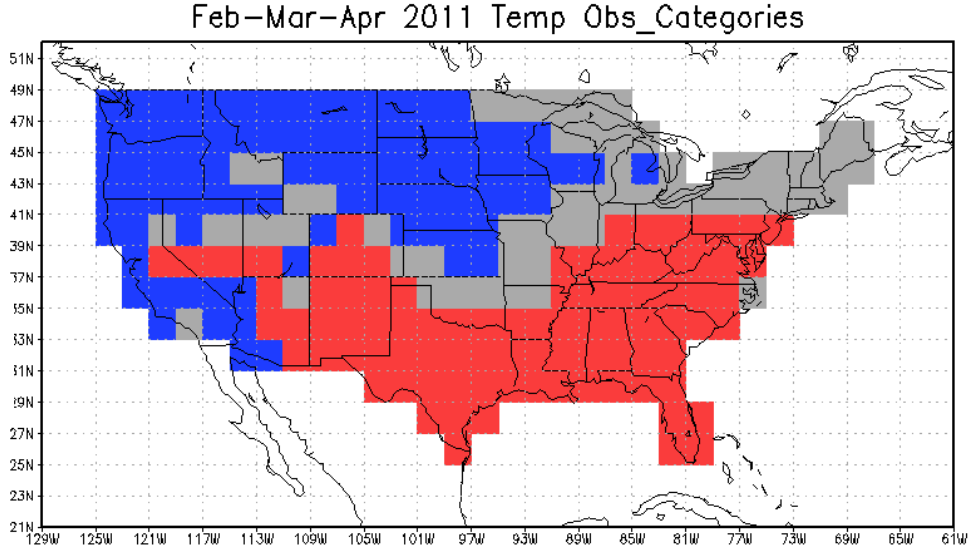
Heidke = 42
Coverage = 72%

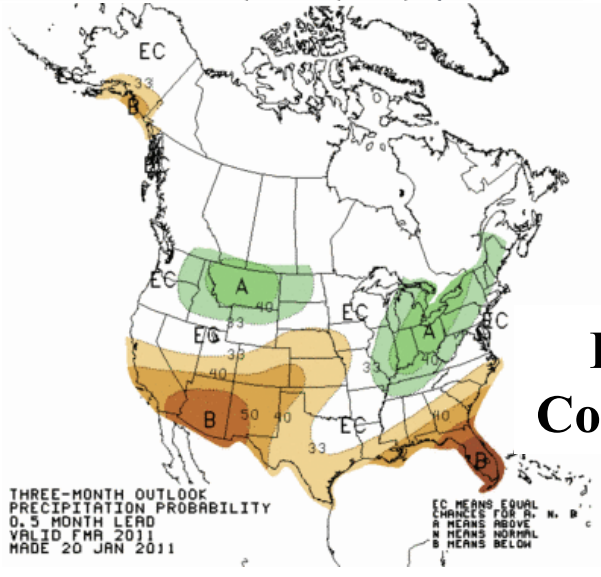


Review
February - April 2011

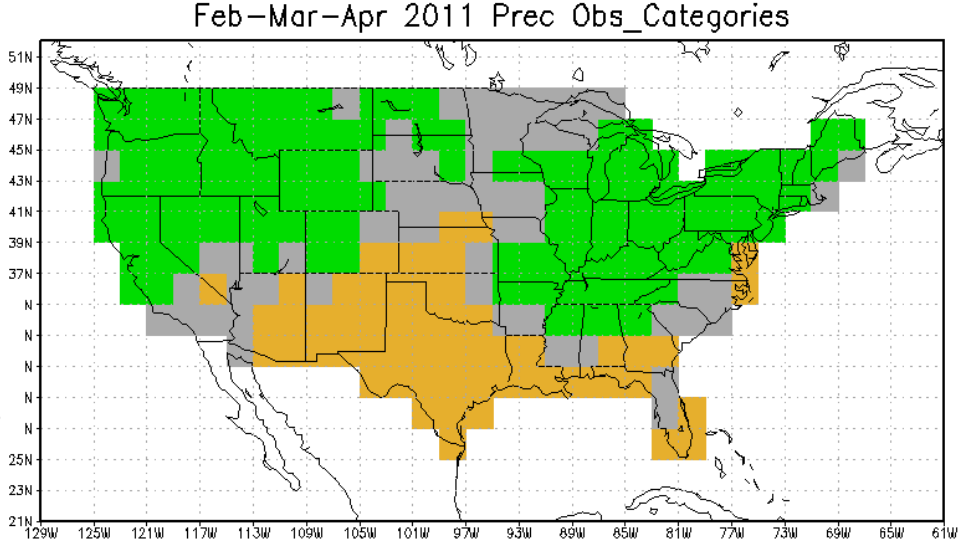


Heidke = 67
Coverage = 58%

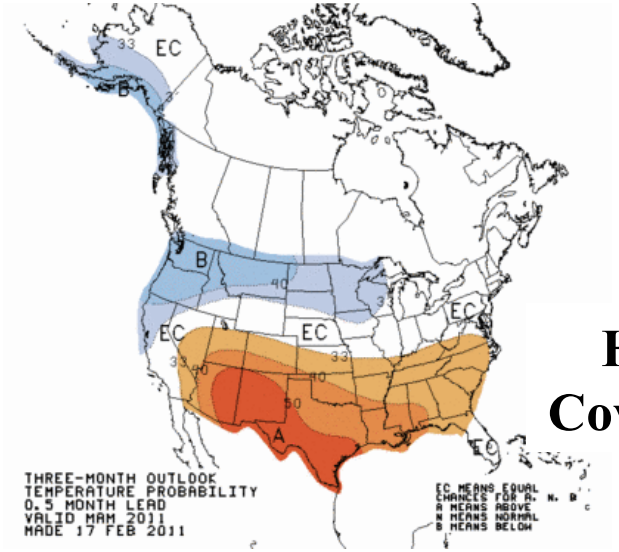




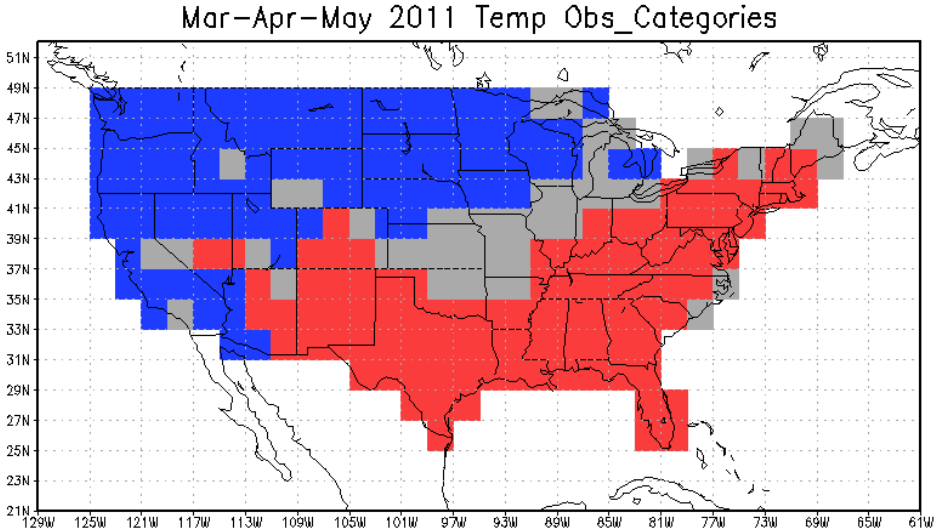
Heidke = 57
Coverage = 65%

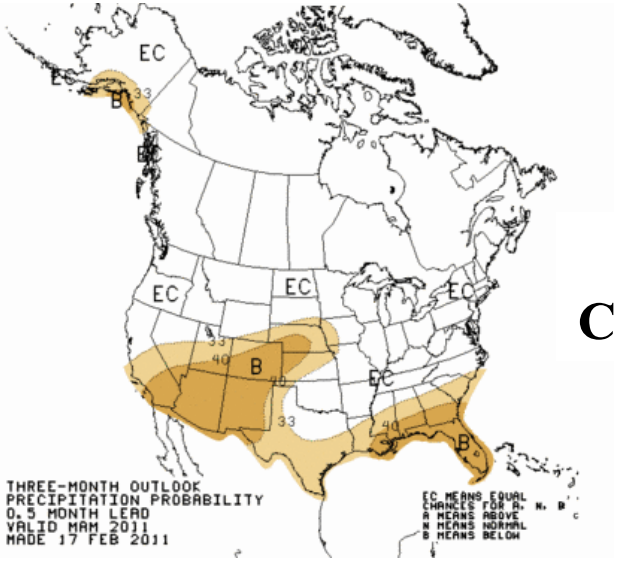


March - May 2011

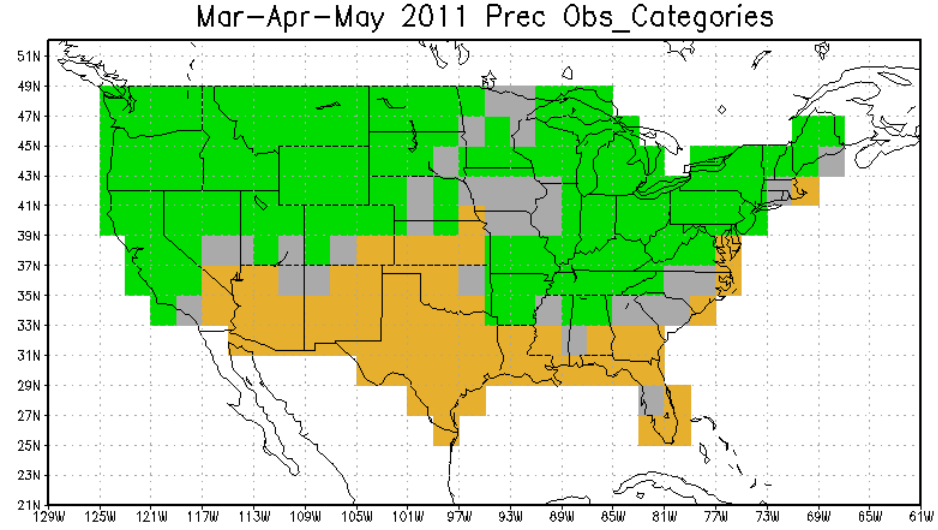


Heidke = 74
Coverage = 63%



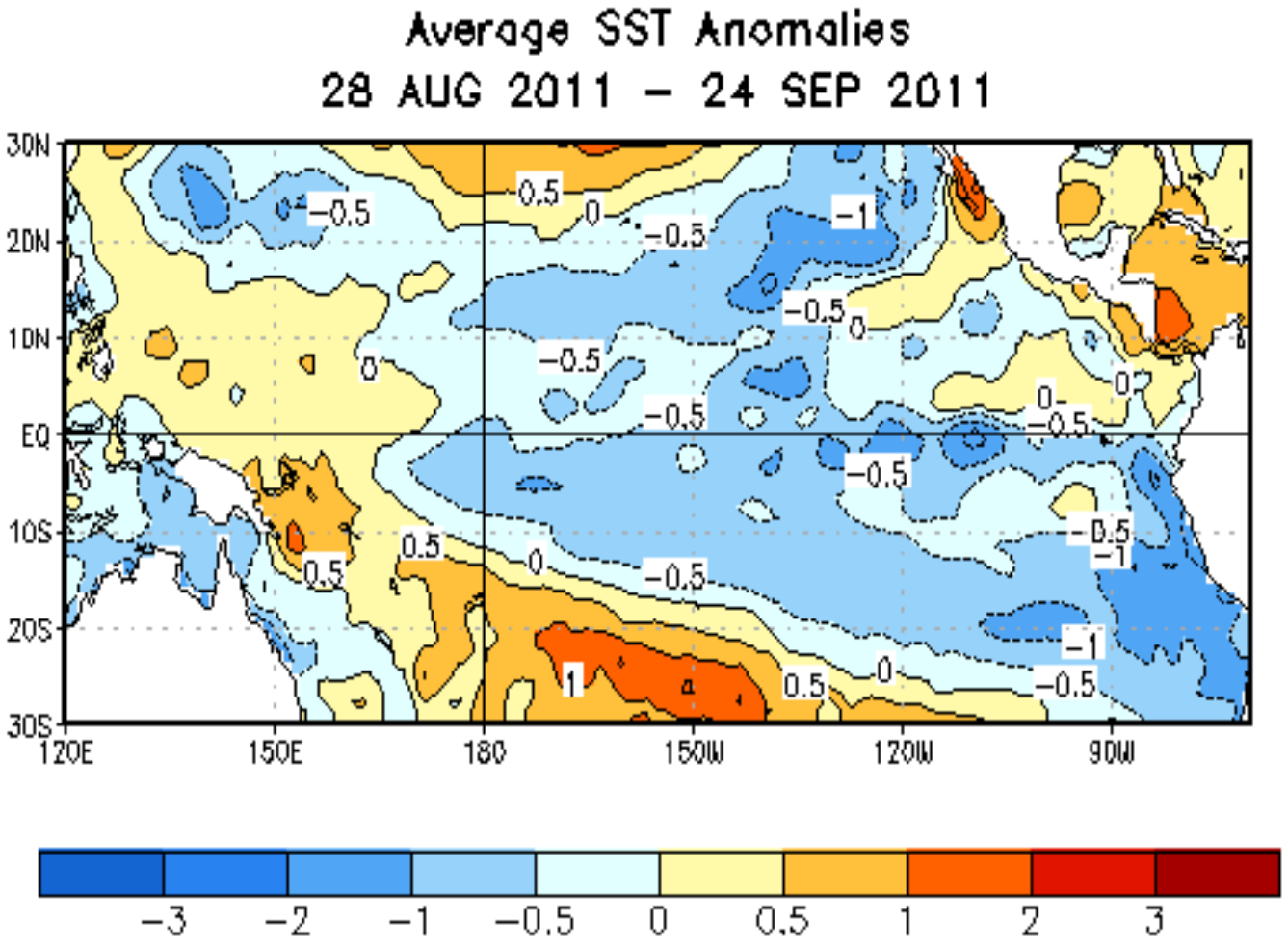


Heidke = 45
Coverage = 35%

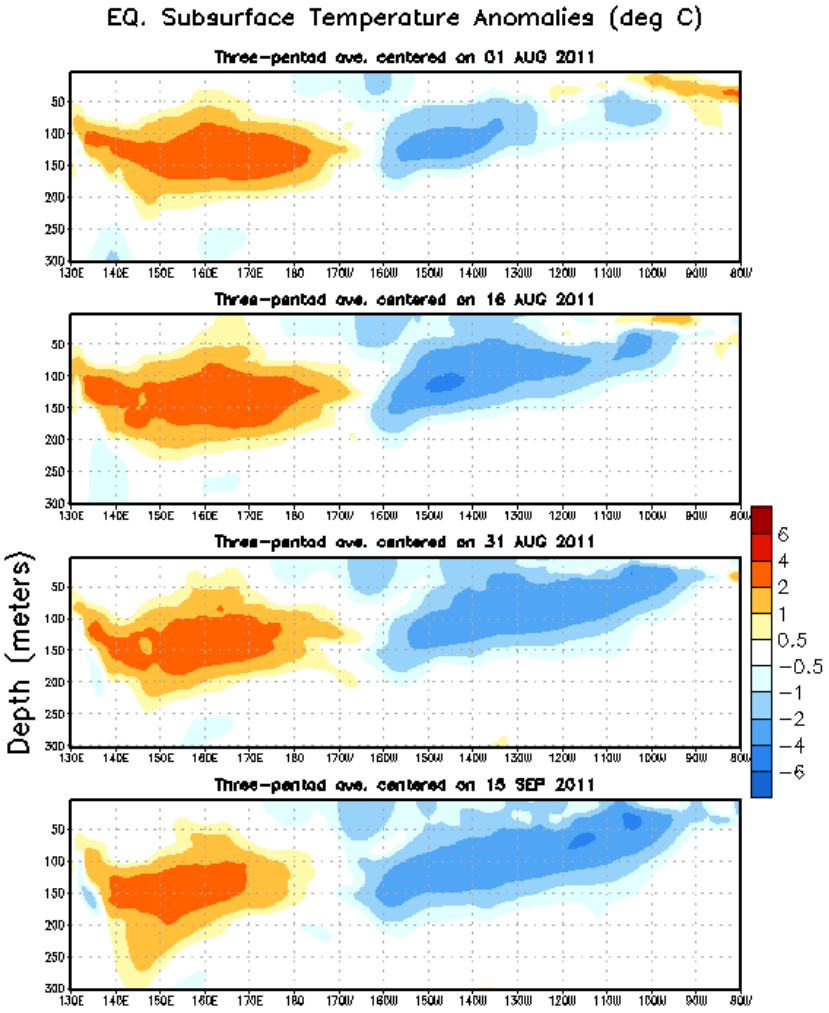


Look Ahead to Winter 2011-12

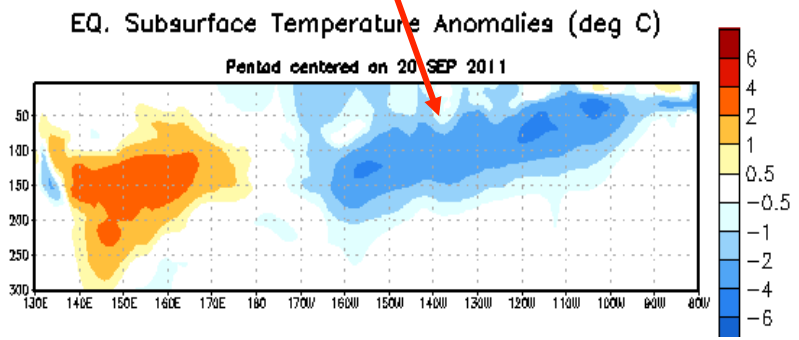
La Niña conditions have returned and are expected to gradually strengthen and continue into the Northern Hemisphere winter 2011-12.



Sub-Surface Temperature Departures (ºC) in the Equatorial Pacific



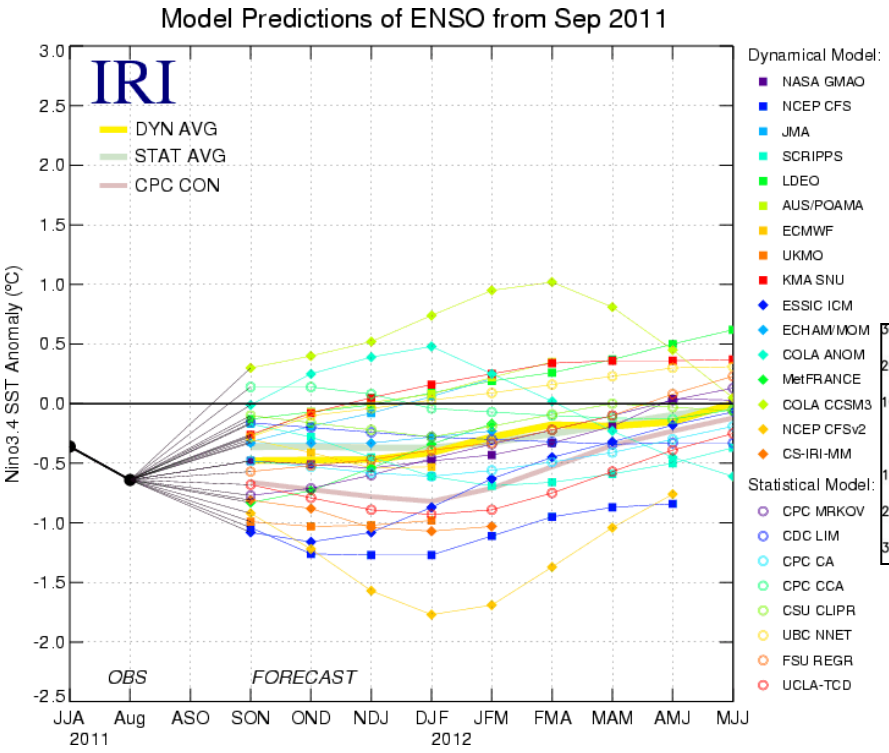
- **Since late July 2011, positive subsurface temperature anomalies (100-300m) have been observed in the western Pacific Ocean. Negative anomalies in the east-central Pacific have strengthened and expanded eastward.**
- **In the recent period, the negative subsurface anomalies continued to strengthen.**

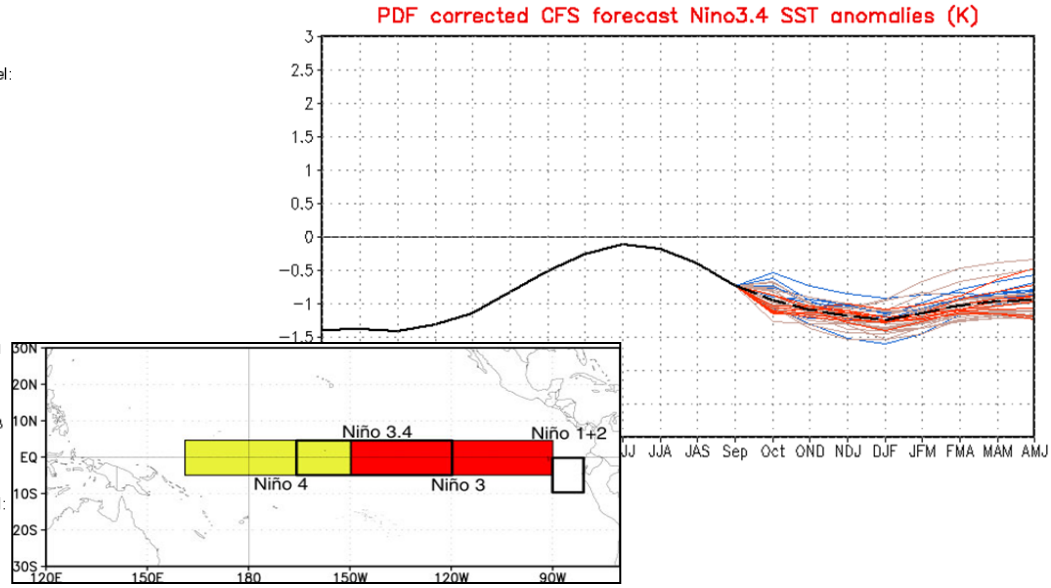


Most recent pentad analysis

Pacific Niño 3.4 SST Outlook

• An increasing number of ENSO models predict the continuation of La Niña into the Northern Hemisphere winter (Niño-3.4 SST anomalies less than -0.5°C).





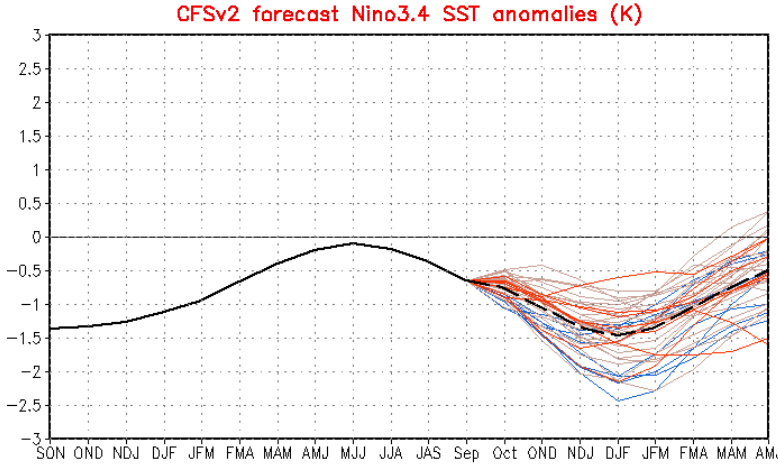
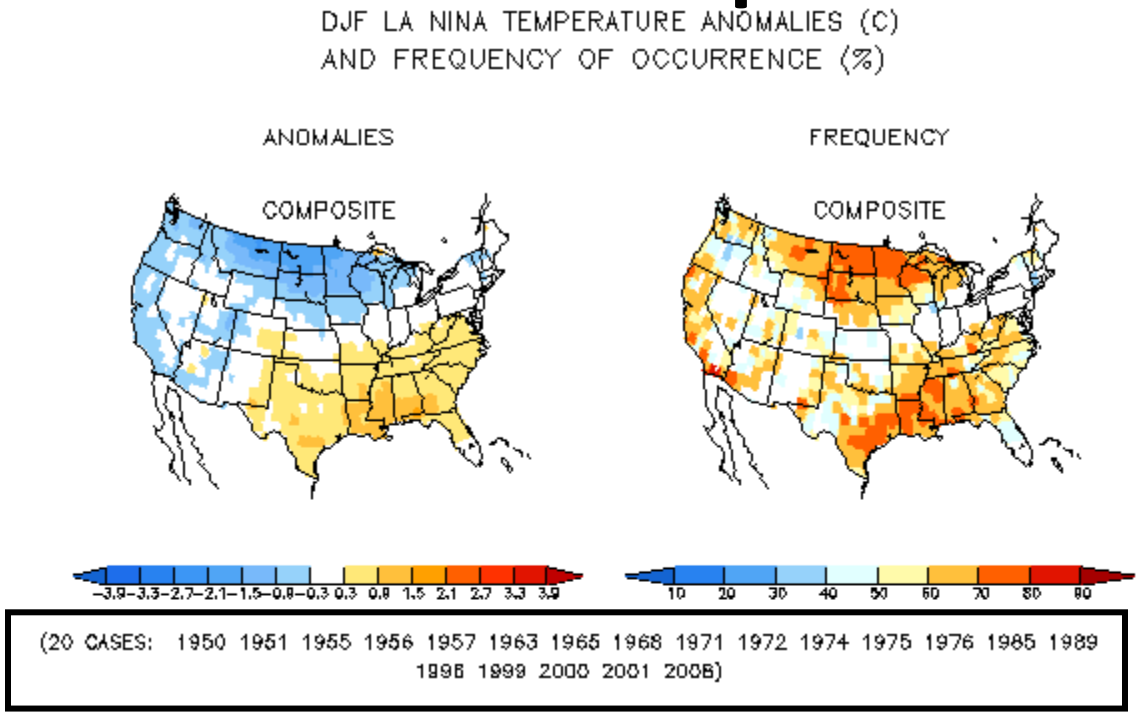
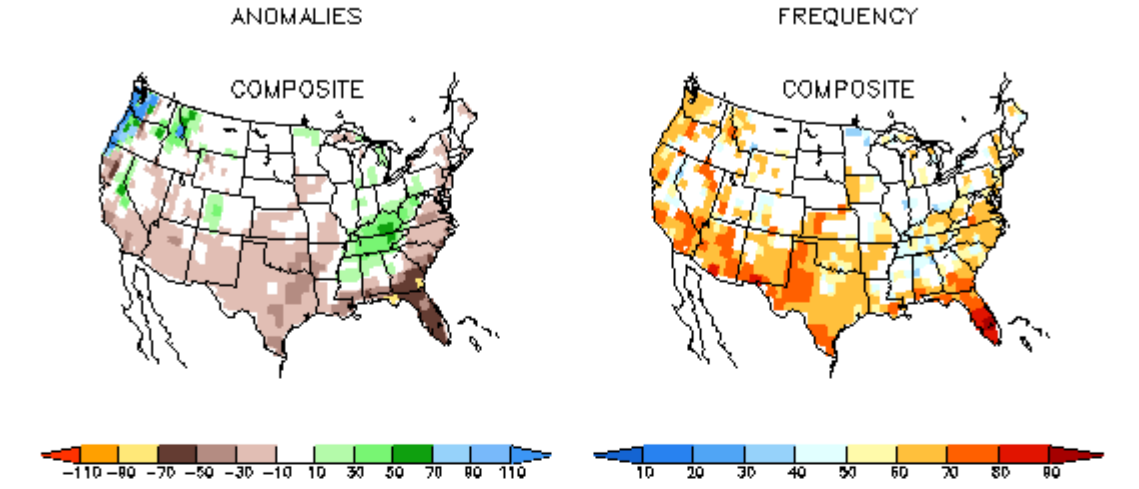


Figure provided by the International Research Institute (IRI) for Climate and Society (updated 13 September 2011).

La Niña Composite



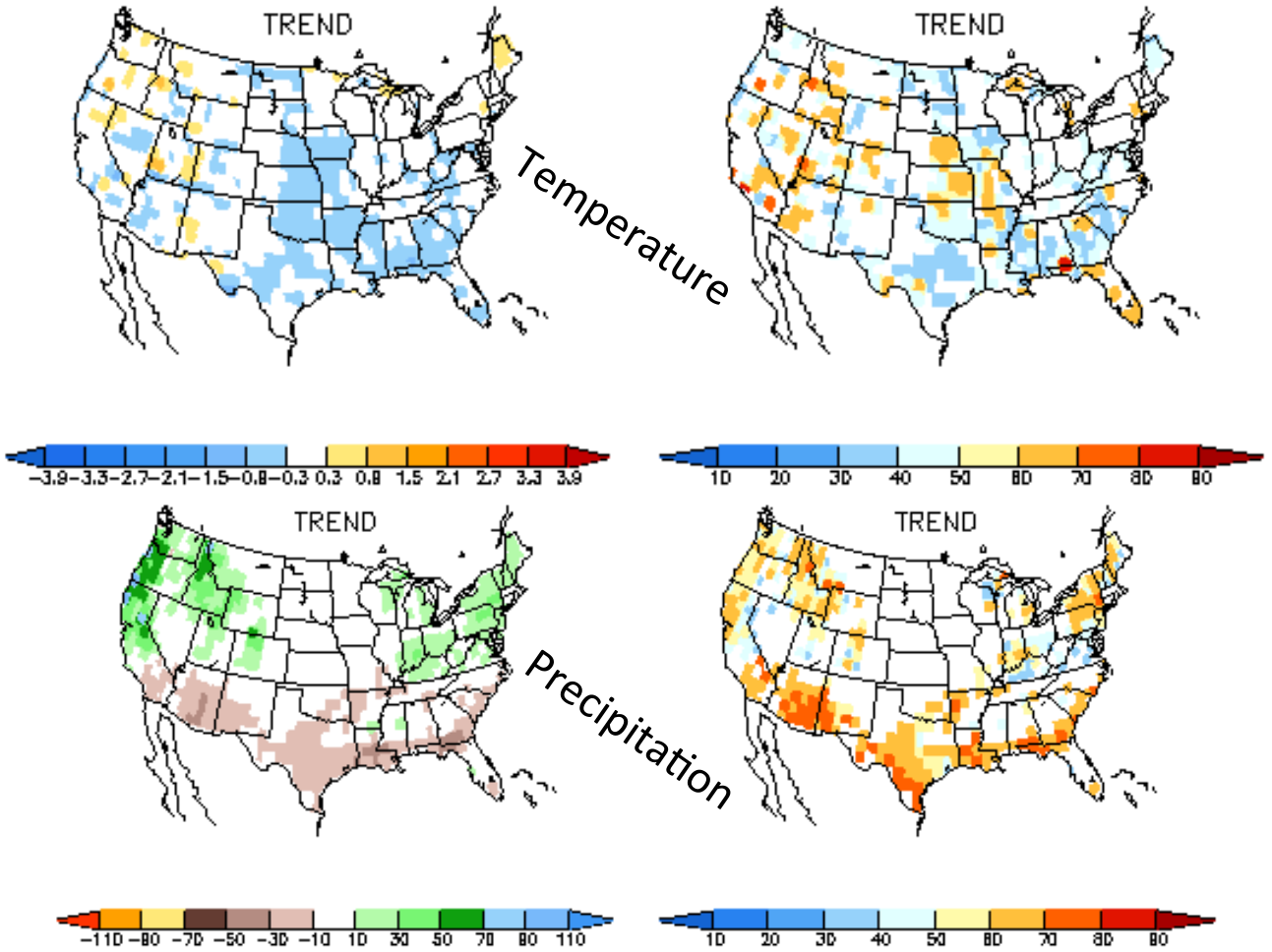


December - February OCN

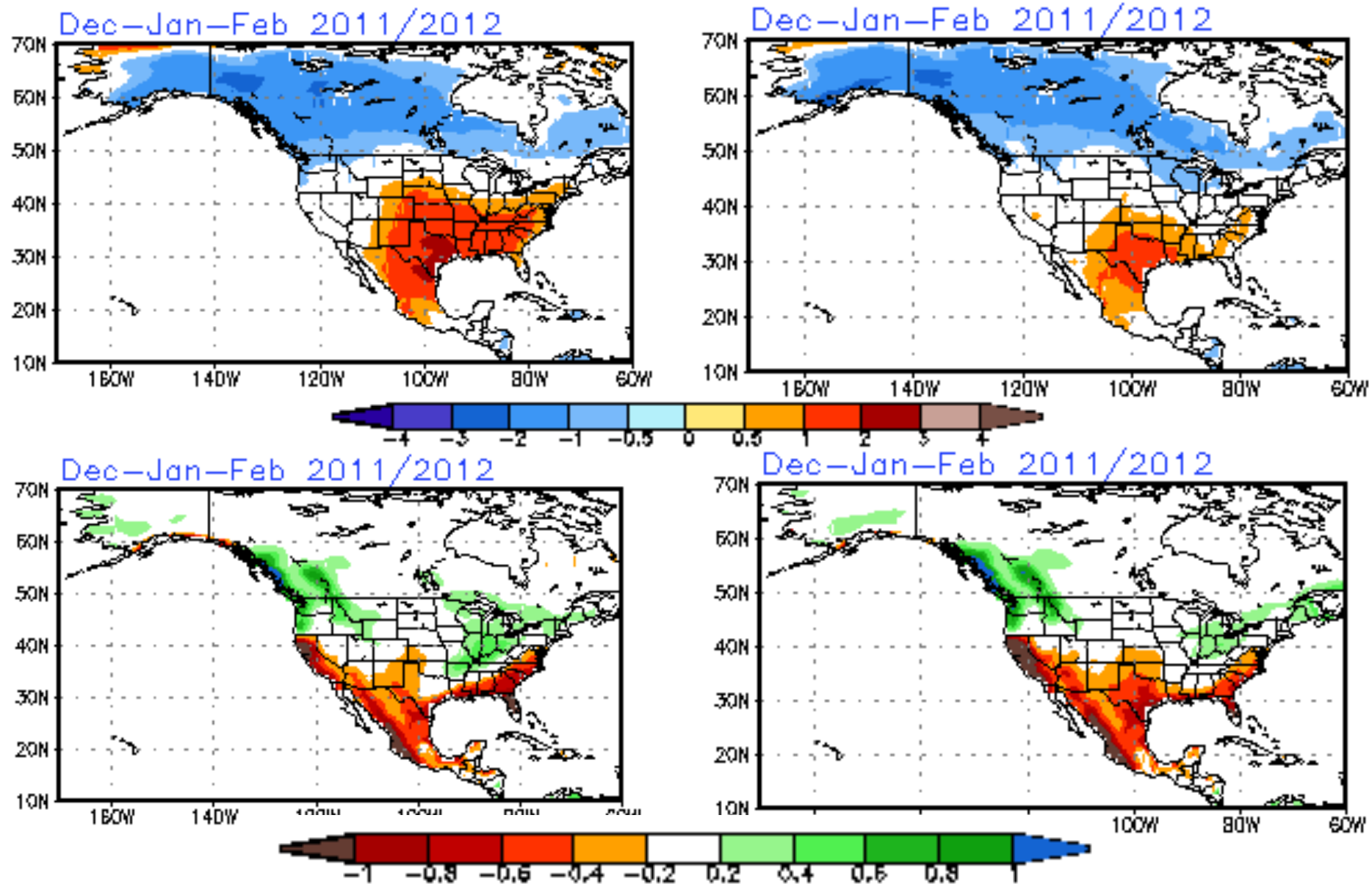
2001-2010
(relative to 1981-2010)

Mean Departure

Frequency



Climate Forecast System

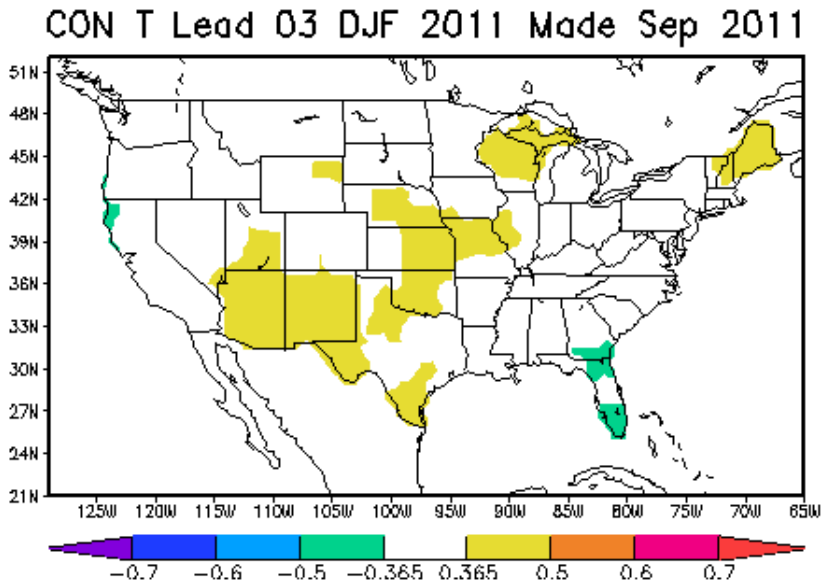


Updated Sept. 12, 2011

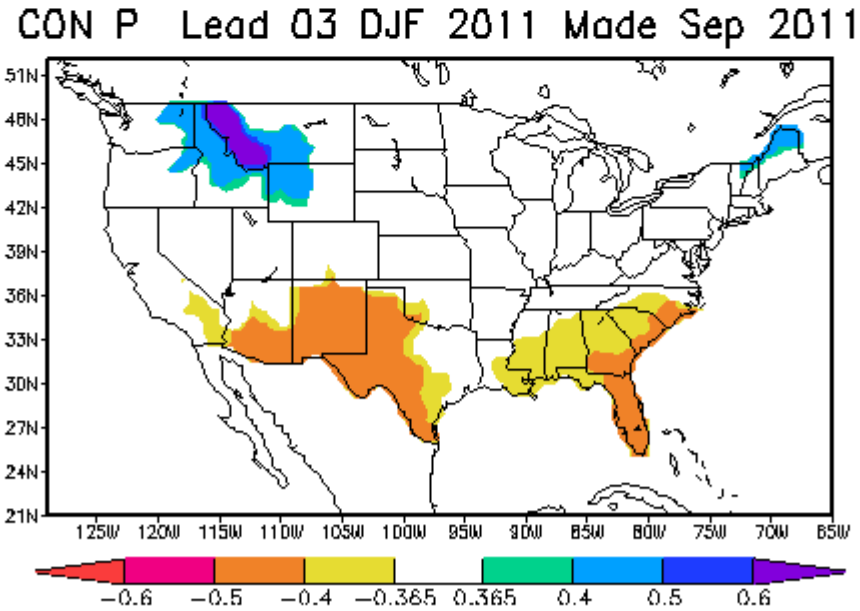
Updated Sept. 28, 2011

Consolidation Forecast

Temperature



Precipitation



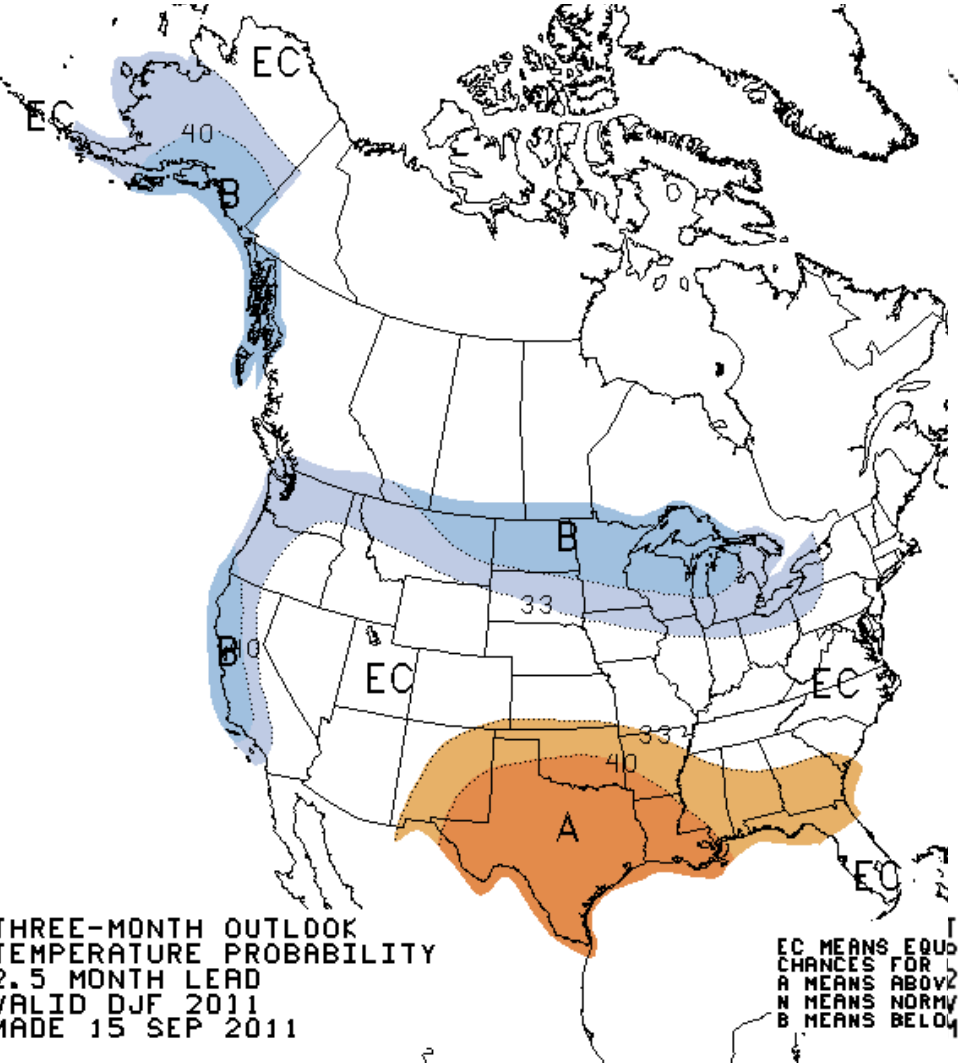
Objective skill-weighted combination of statistical tools, CFS, trend

Winter 2011-12 Outlook Rationale

- La Niña conditions have redeveloped across the Pacific.
- La Niña is expected to gradually strengthen through the fall and persist into the winter.
- AO has been and continues to be erratic. Large swings possible in any year (e.g. DJF 2010-11).
- Temperature trends relative to 1981-2010 base period are now slightly negative over large parts of country; precipitation trends resemble La Niña.
- Forecast tilted toward La Niña impacts.

December 2011 – February 2012

Temperature



Precipitation