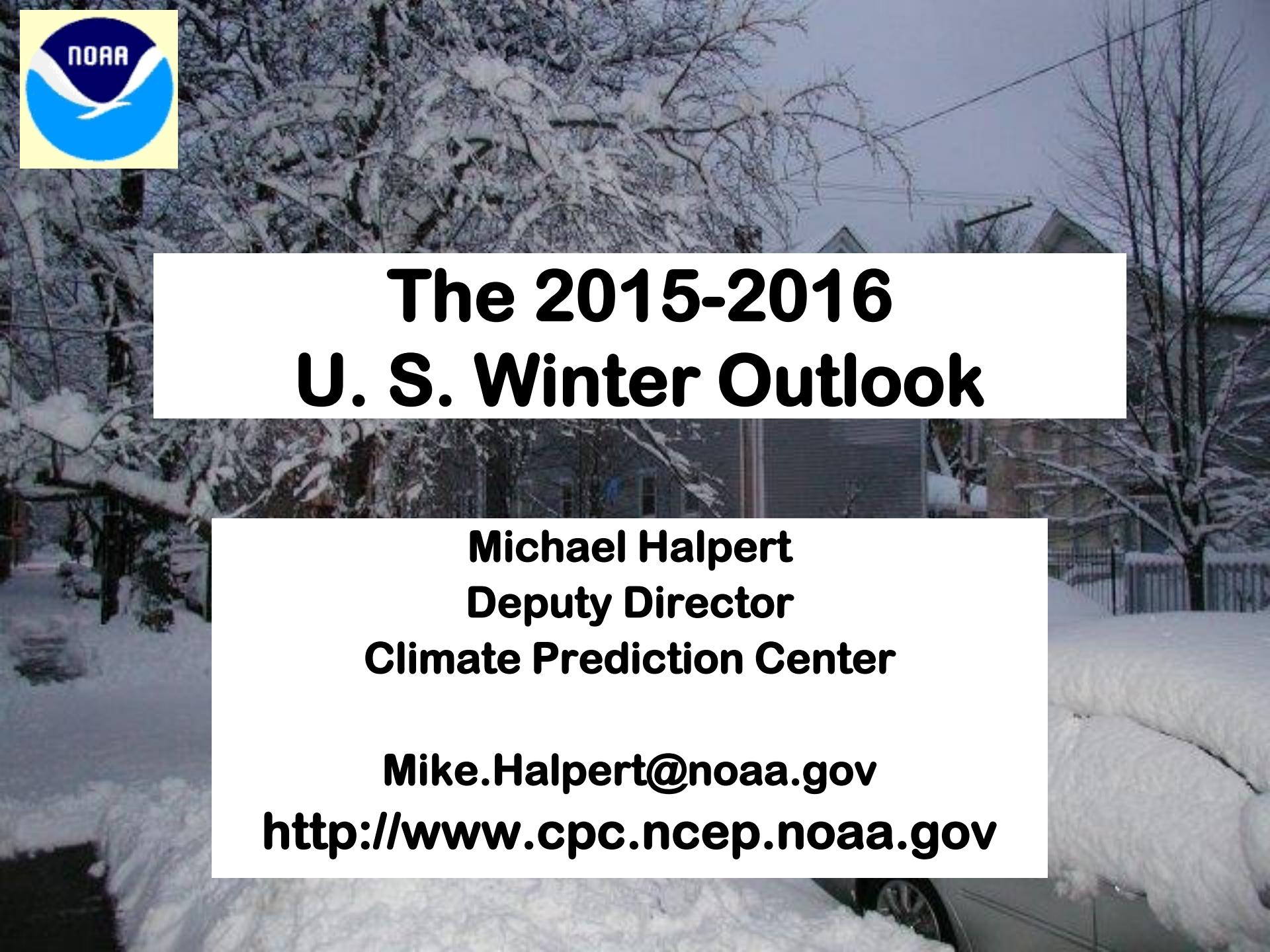

The 2015-2016 U. S. Winter Outlook

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Climate Prediction Center

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Outline

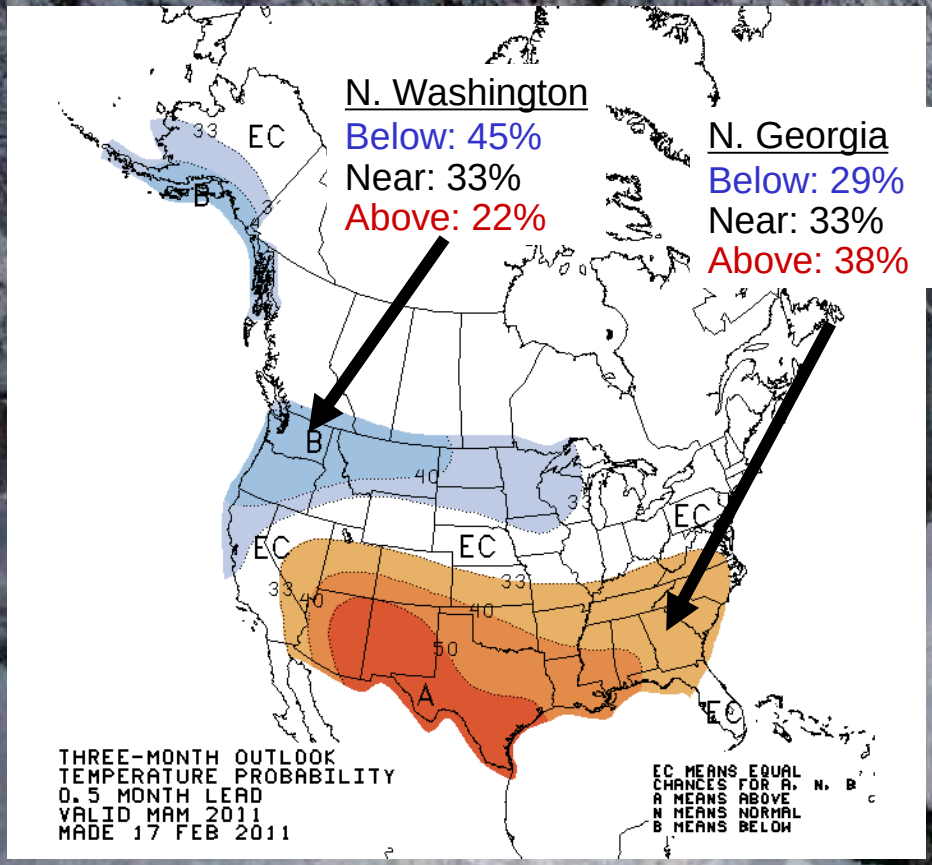
- **About the Seasonal Outlook**
- Review of 2014-15 U. S. Winter (DJF) Outlook
- Potential Climate Features impacting U. S. Winter
- 2015-16 U. S. Winter (DJF) Outlook

Outlook Categories and Probabilities

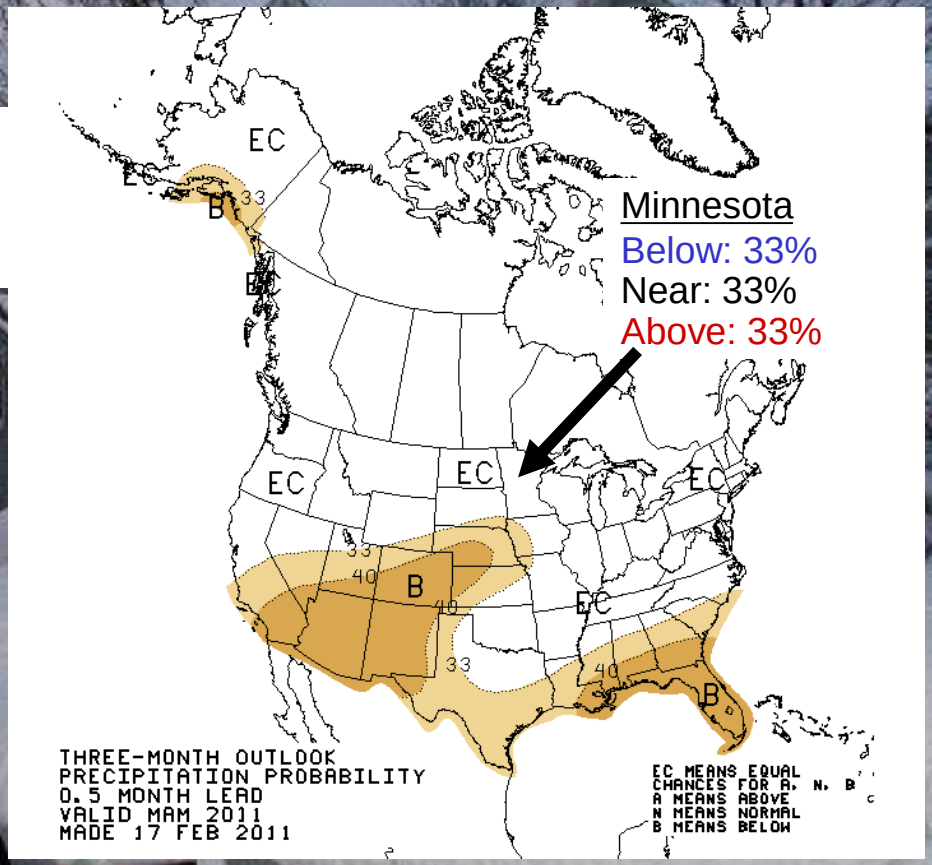
- Seasonal outlooks are prepared for average temperature and total accumulated precipitation category
- Three categories are used (terciles). These are BELOW-,NEAR- and ABOVE-normal (median), for temperature (precipitation).
- Regions where the likelihoods of the three categories are the same (33.33…% each) are designated as “EC”, for equal chances.
- In non-EC regions the labels on the contours give the total probability of the dominant category.

U. S. Seasonal Outlooks Interpretation

Temperature



Precipitation



About the Seasonal Outlook

- Each month, near mid-month CPC prepares a set of 13 outlooks for 3-month "seasons" (any set of 3 adjacent months) for lead times ranging from ½ month, 1 ½ months, 2 ½ months, 3 ½ months, …, 12 ½ months.

  Next Outlook: October 15

  Final Winter Outlook: November 19

- The outlook for each successive/prior lead time overlaps the prior/successive one by 2 months. This overlap makes for a smooth variation from one map to the next.

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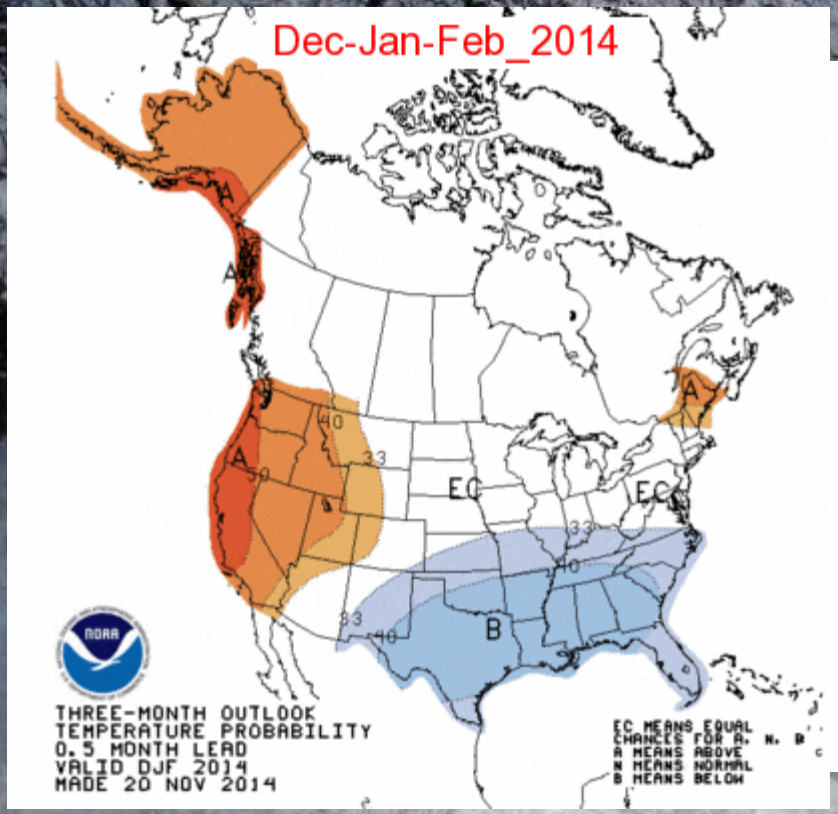
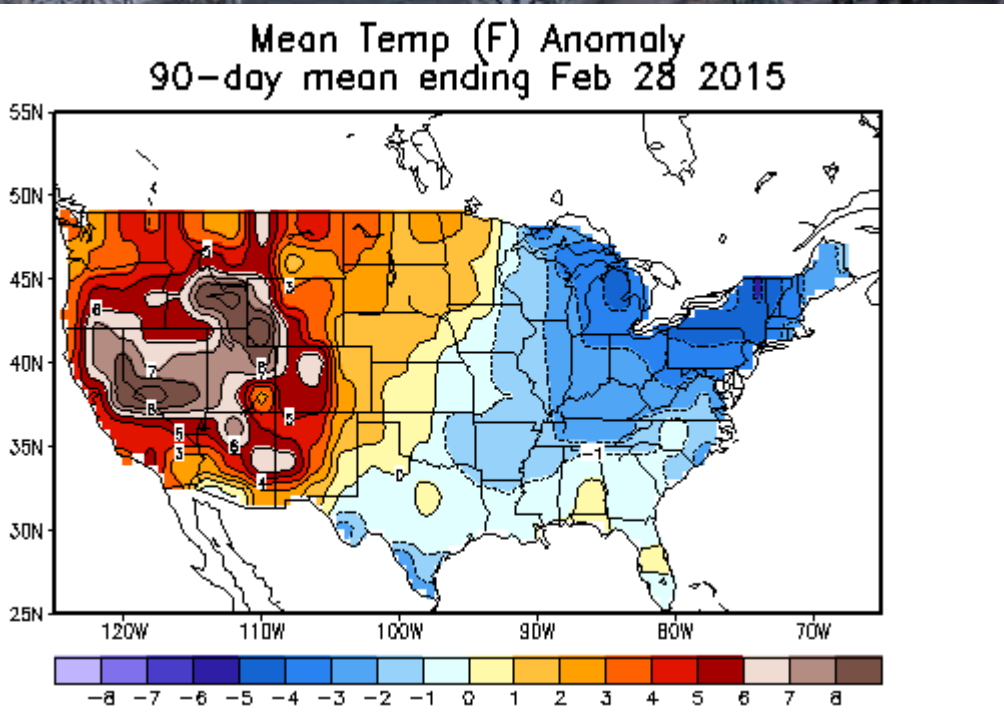
Winter 2014-15 Outlook Rationale (from Oct. 2014)

- ENSO-neutral conditions across the Pacific have prevailed for the past two years.
- However, El Nino is favored to develop and persist through NH winter (likely weak).
- 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 generally small over country; precipitation trends resemble La Niña.
- Forecast consistent with weak a El Nino, but modest probabilities.

Dec 2014 – Feb 2015 Temperature

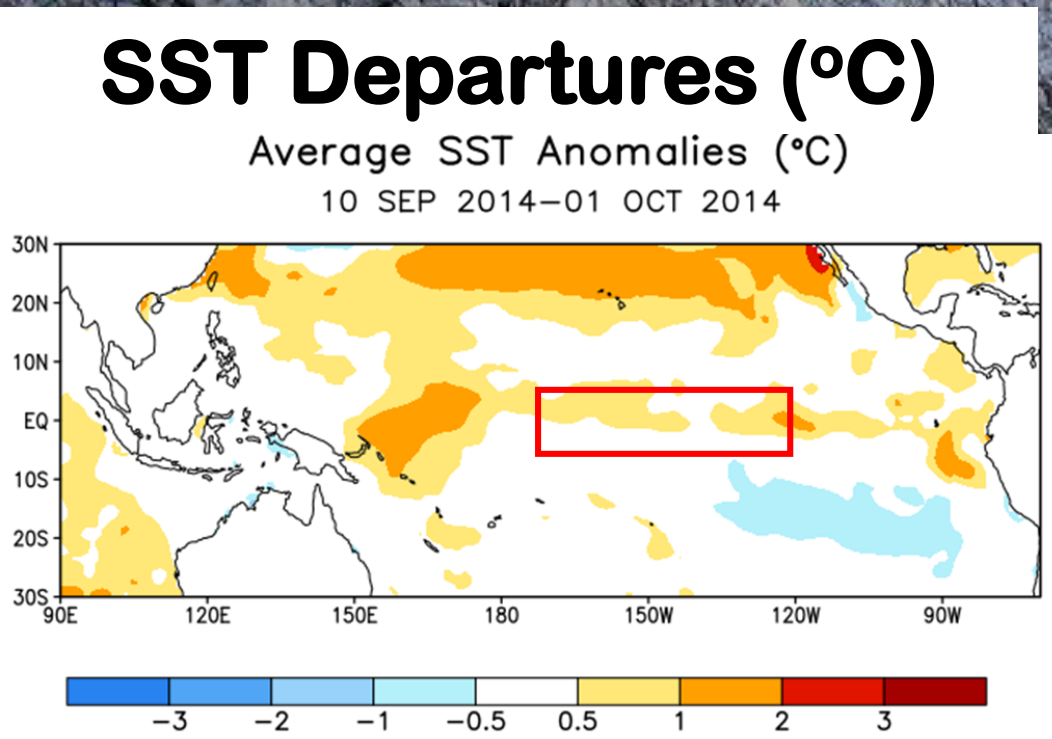


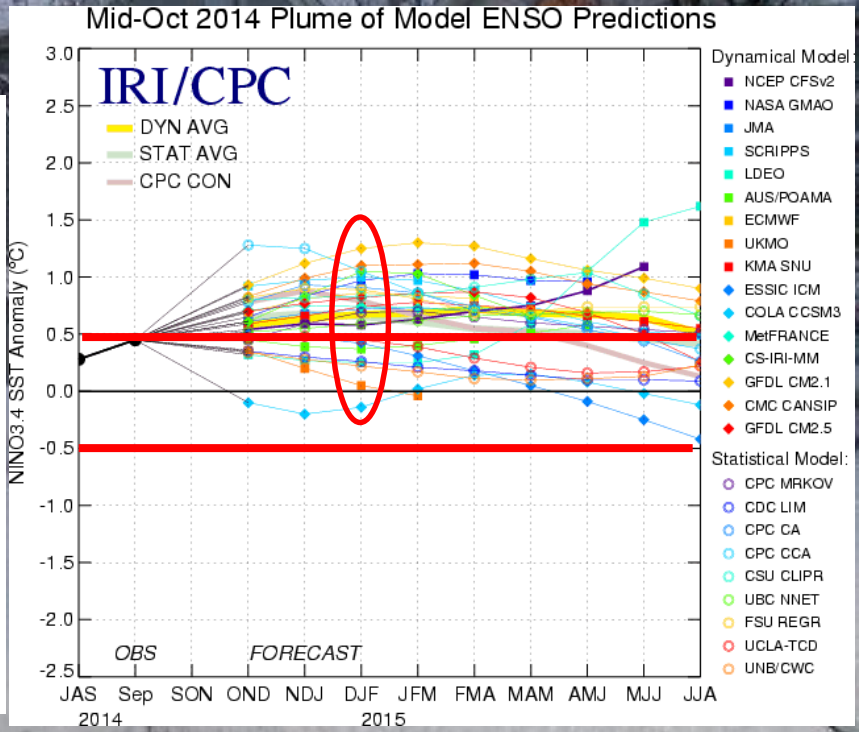


Heidke = 49.6, Coverage = 60%

Current ENSO Status (Oct. 2014)

SST Departures (°C)





SST Departures (°C) February 2015

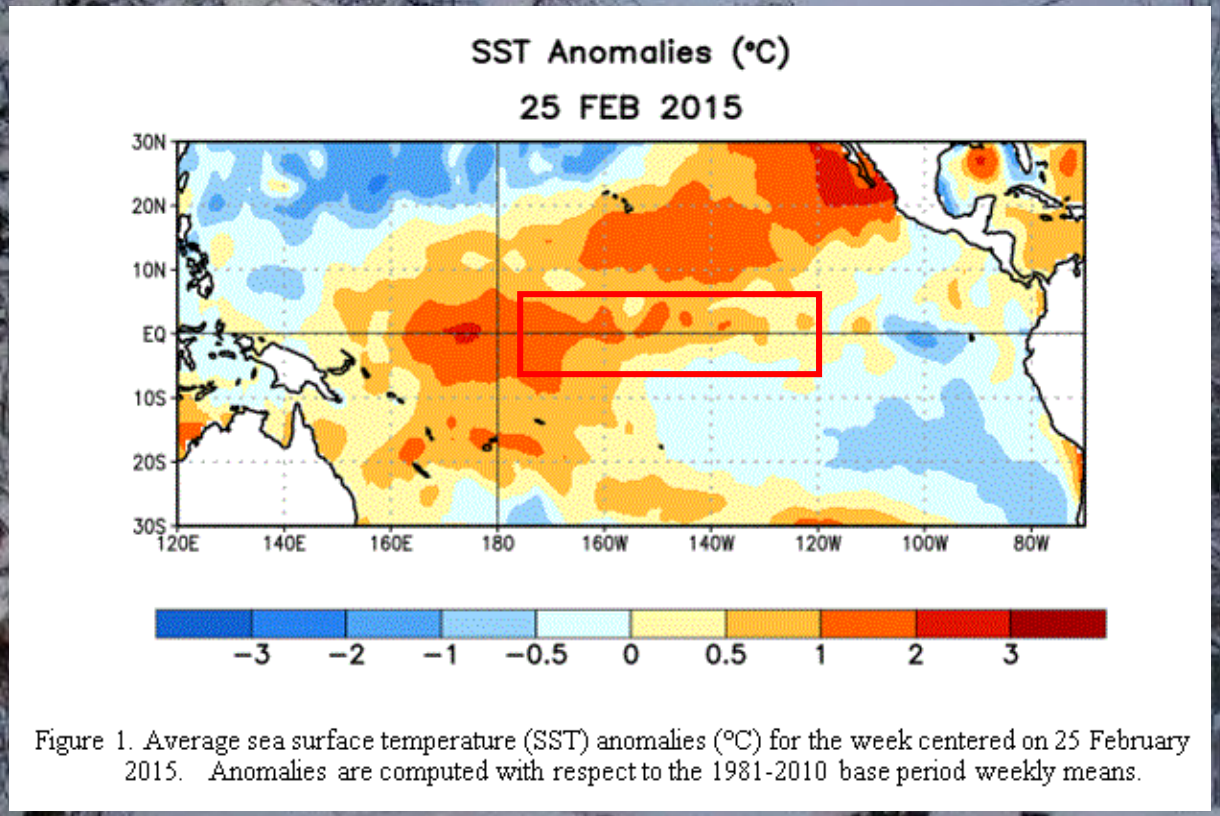
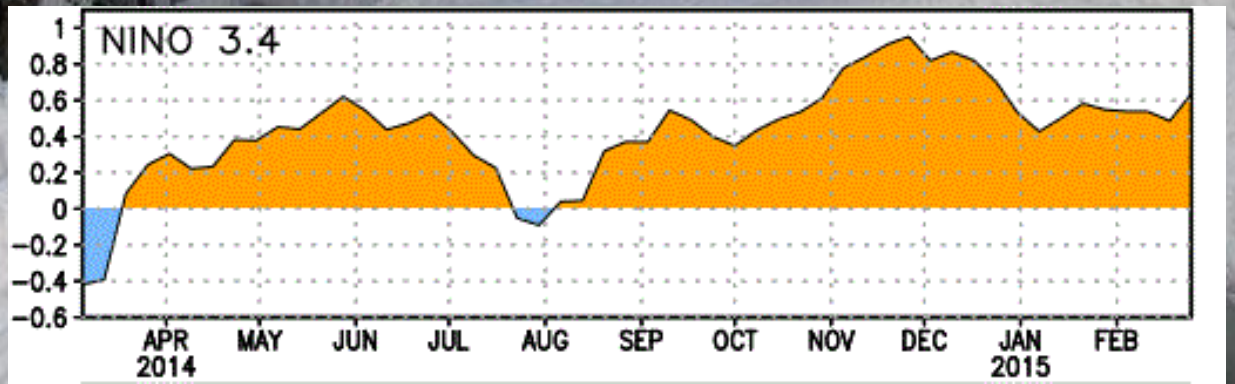
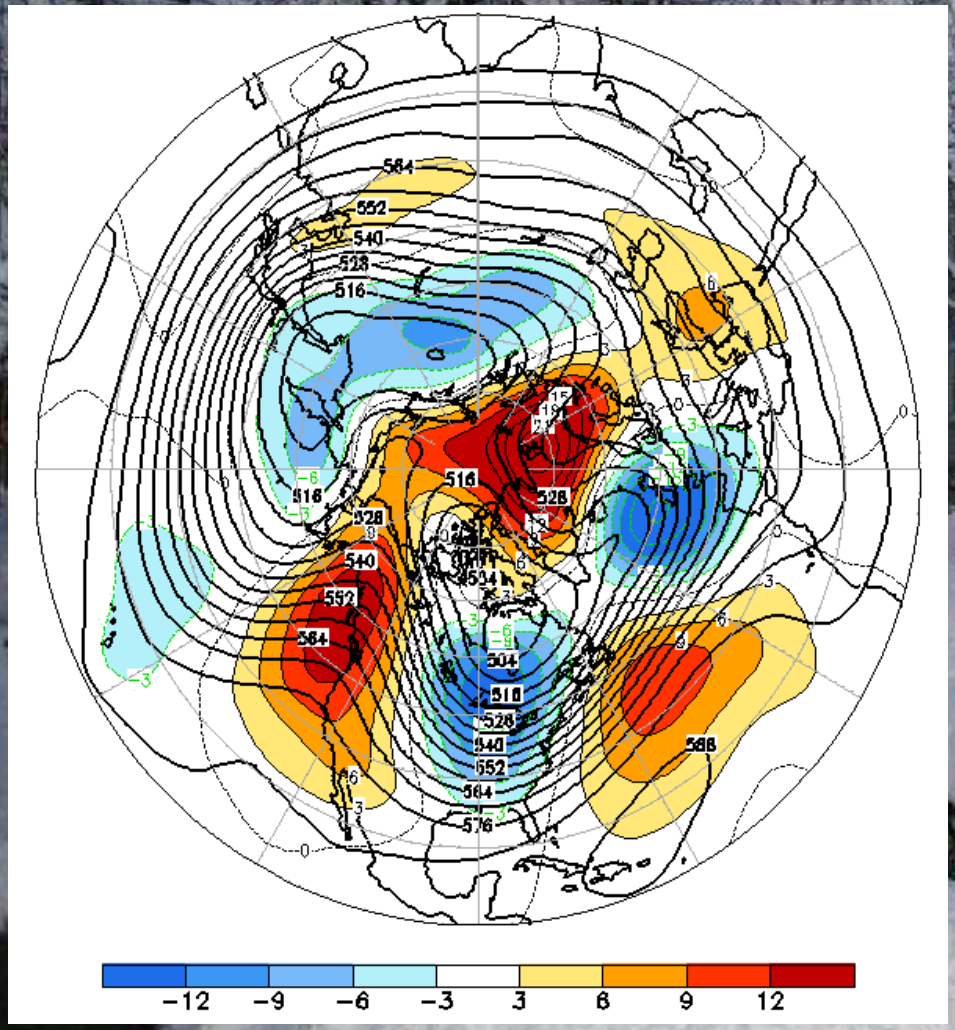


Figure 1. Average sea surface temperature (SST) anomalies (°C) for the week centered on 25 February 2015. Anomalies are computed with respect to the 1981-2010 base period weekly means.

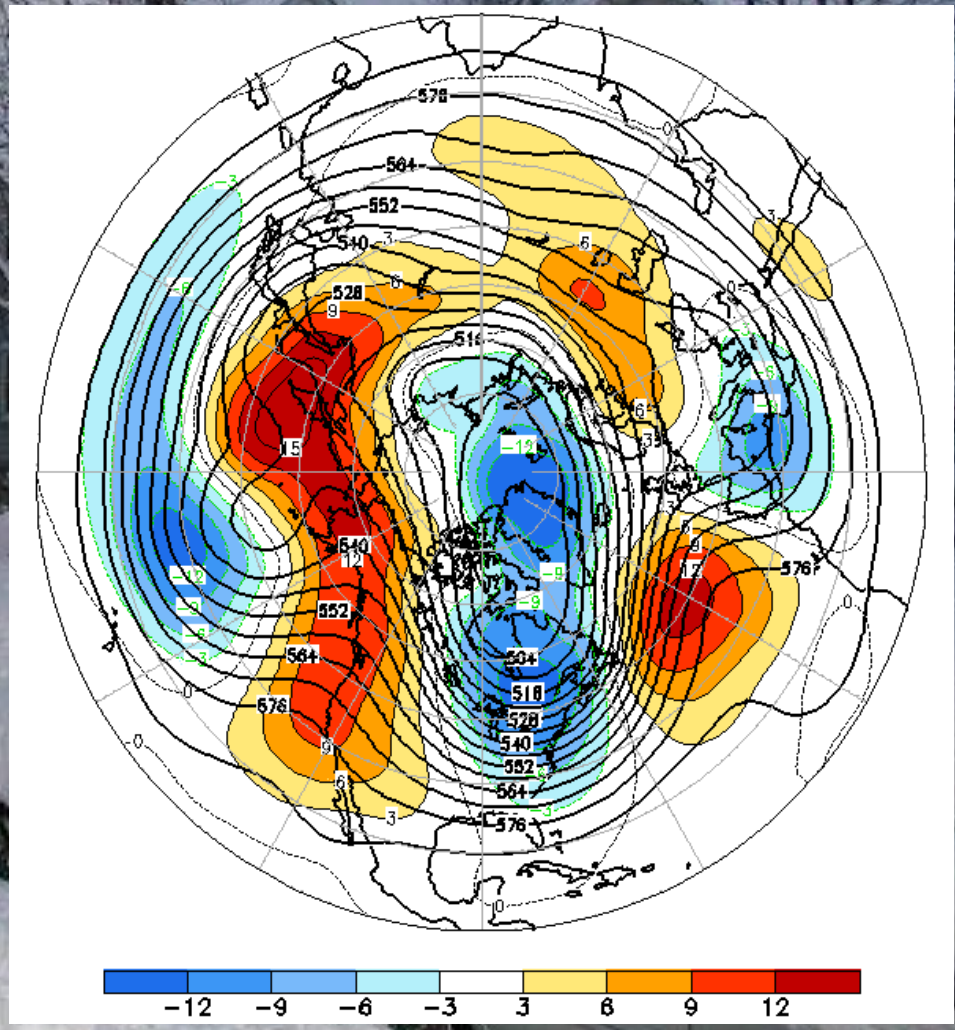
Niño 3.4



January 2014 Circulation



February 2015 Circulation



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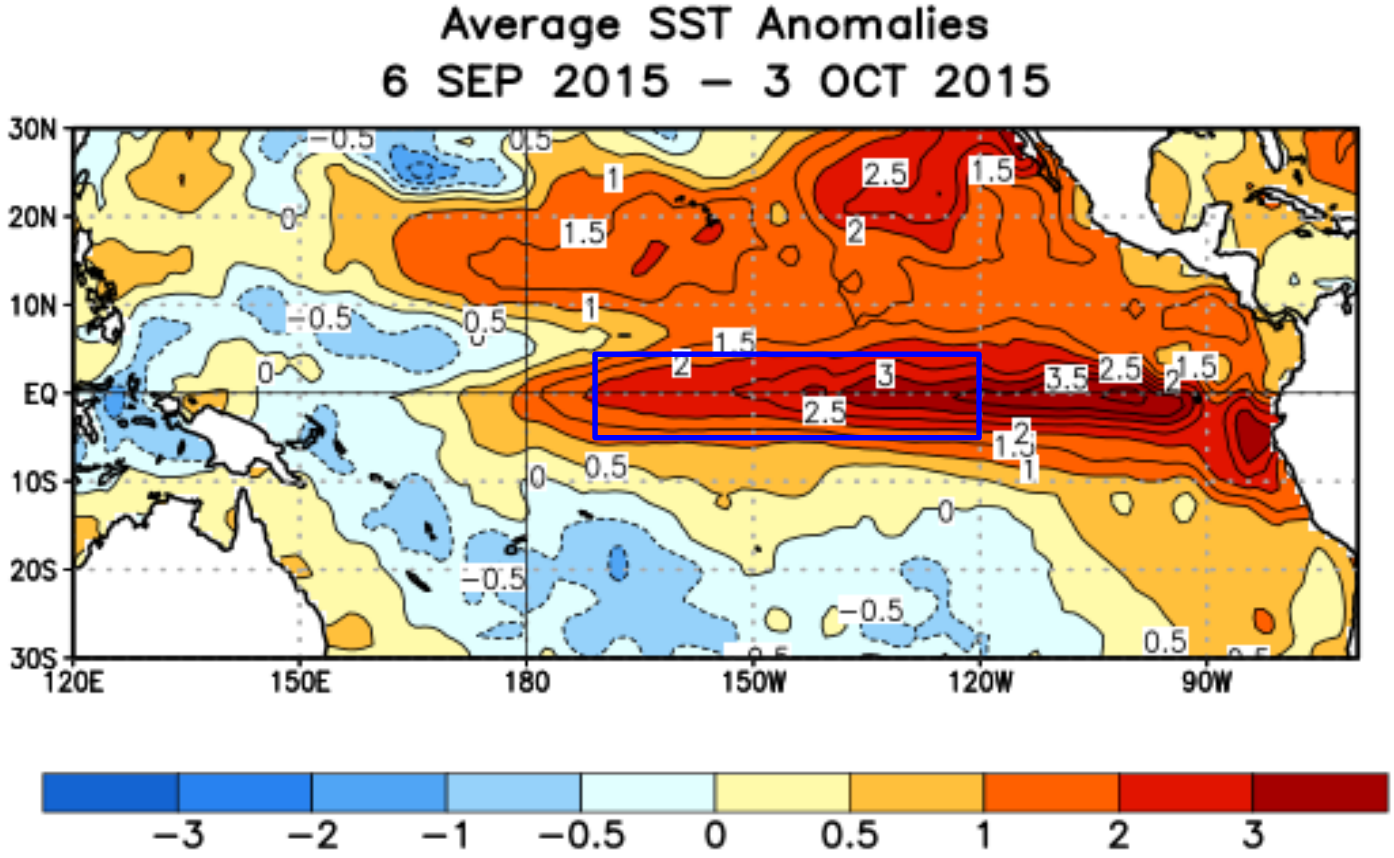
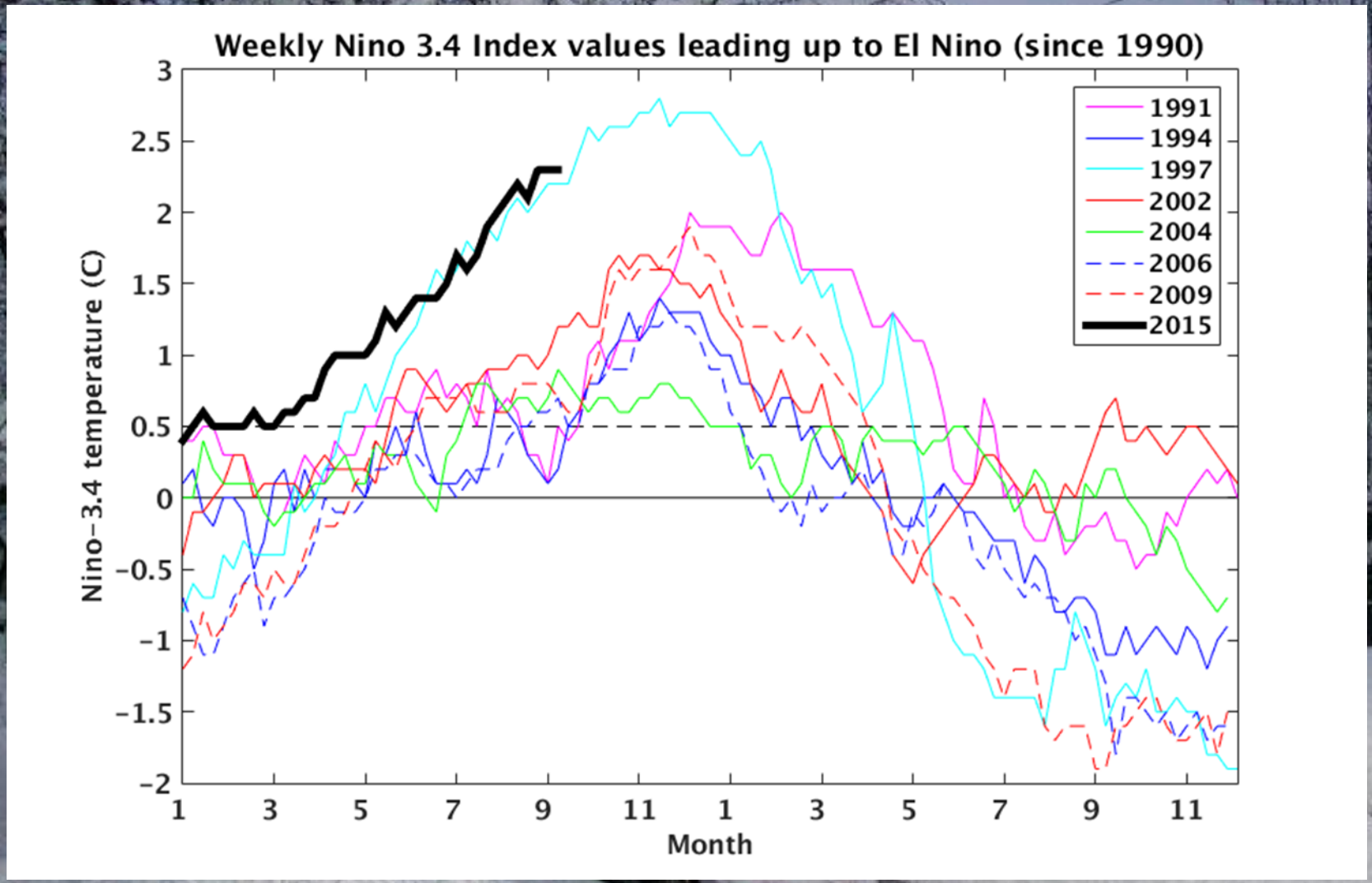
There is an approximately 95% chance that El Niño will continue through Northern Hemisphere winter 2015-16.

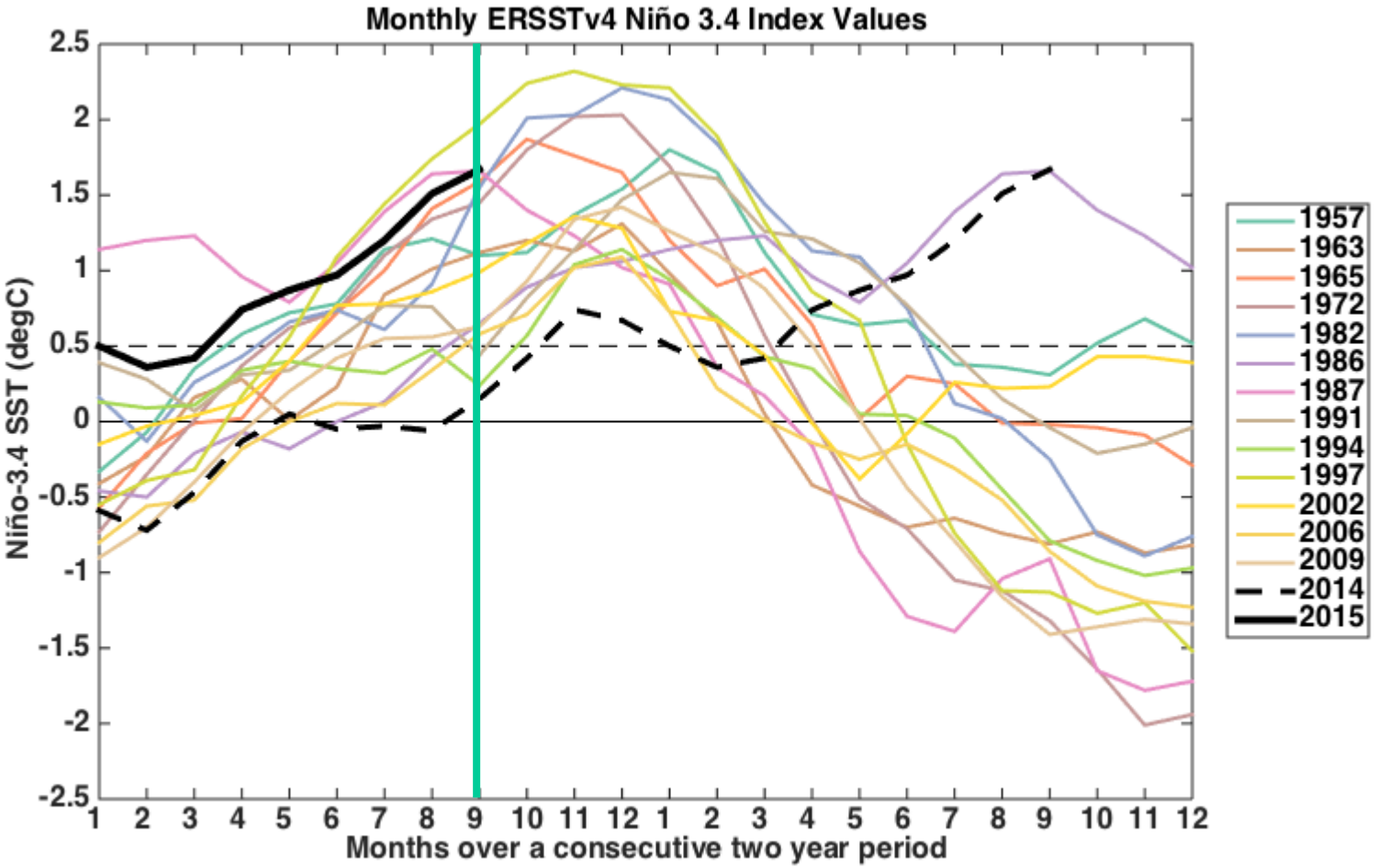


Weekly Niño 3.4 index values during El Niño events (since 1990)



Weekly OISSTv2 data going back to 1990

Monthly Niño 3.4 index values during El Niño events (since 1950)

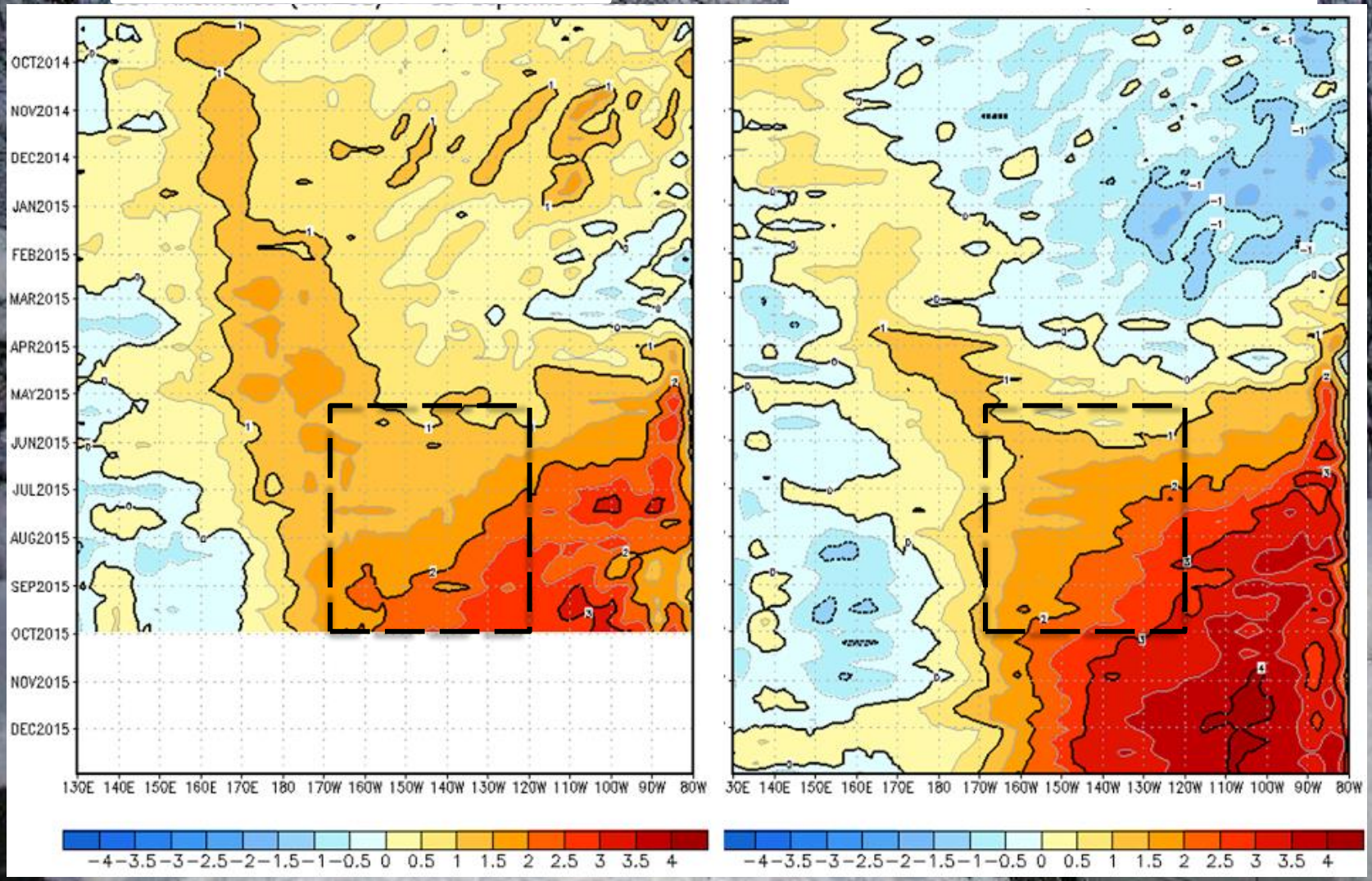


Monthly ERSST data going back to 1950

Sea Surface Temperature Anomalies (°C)

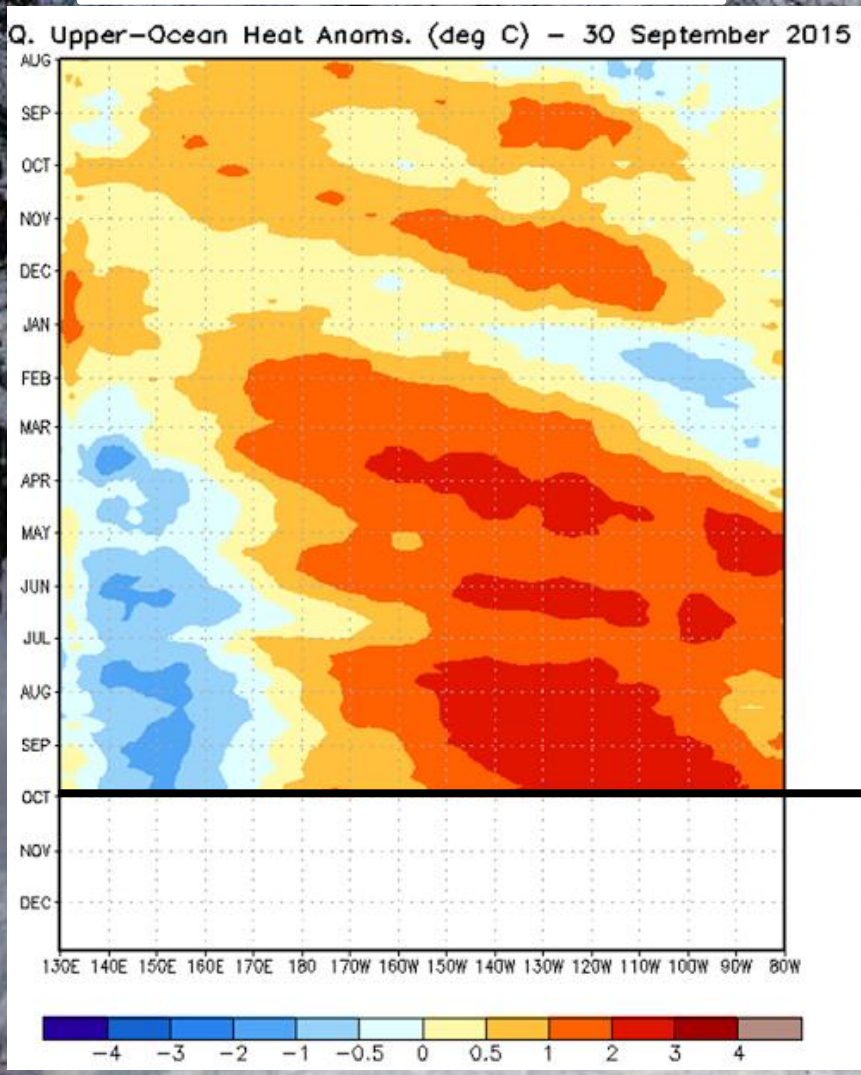
Oct 2014 – Dec 2015

Oct 1996 – Dec 1997

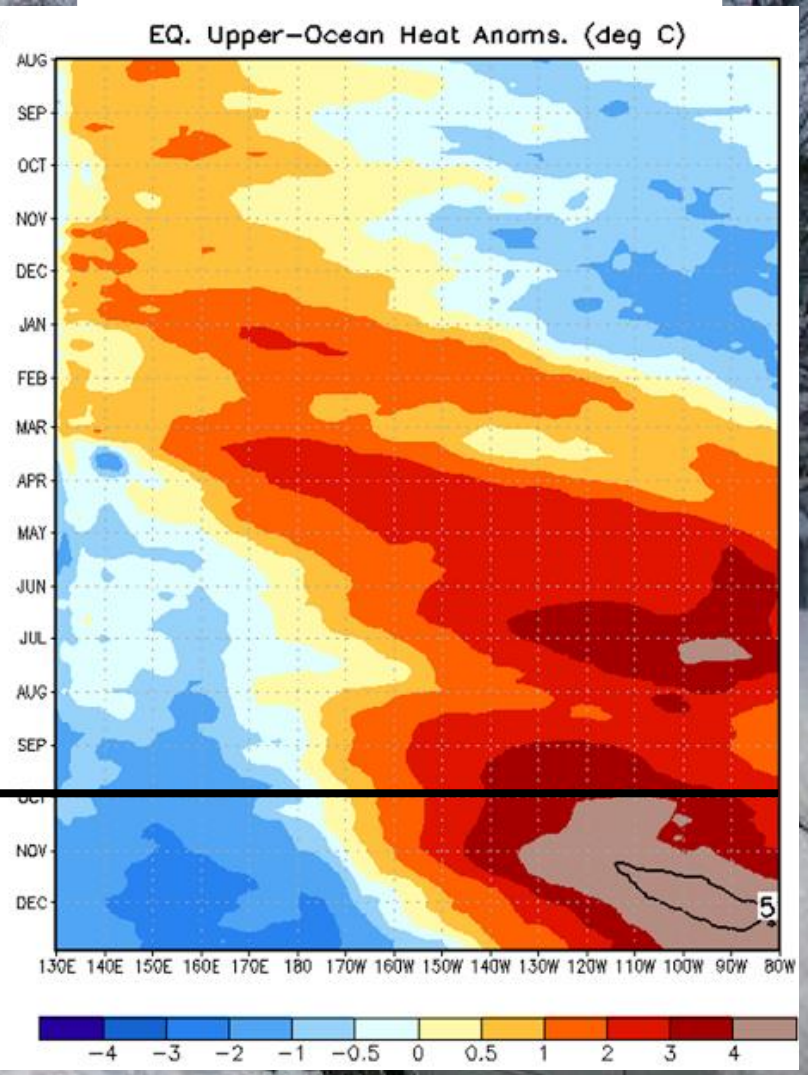


Sub-surface Anomalies (°C)

Aug 2014 – Dec 2015



Aug 1996 – Dec 1997



Pacific Niño 3.4 SST Outlook

Most models indicate that Niño 3.4 will be above +1.5ºC (a "strong" El Niño) during late 2015 into early 2016.

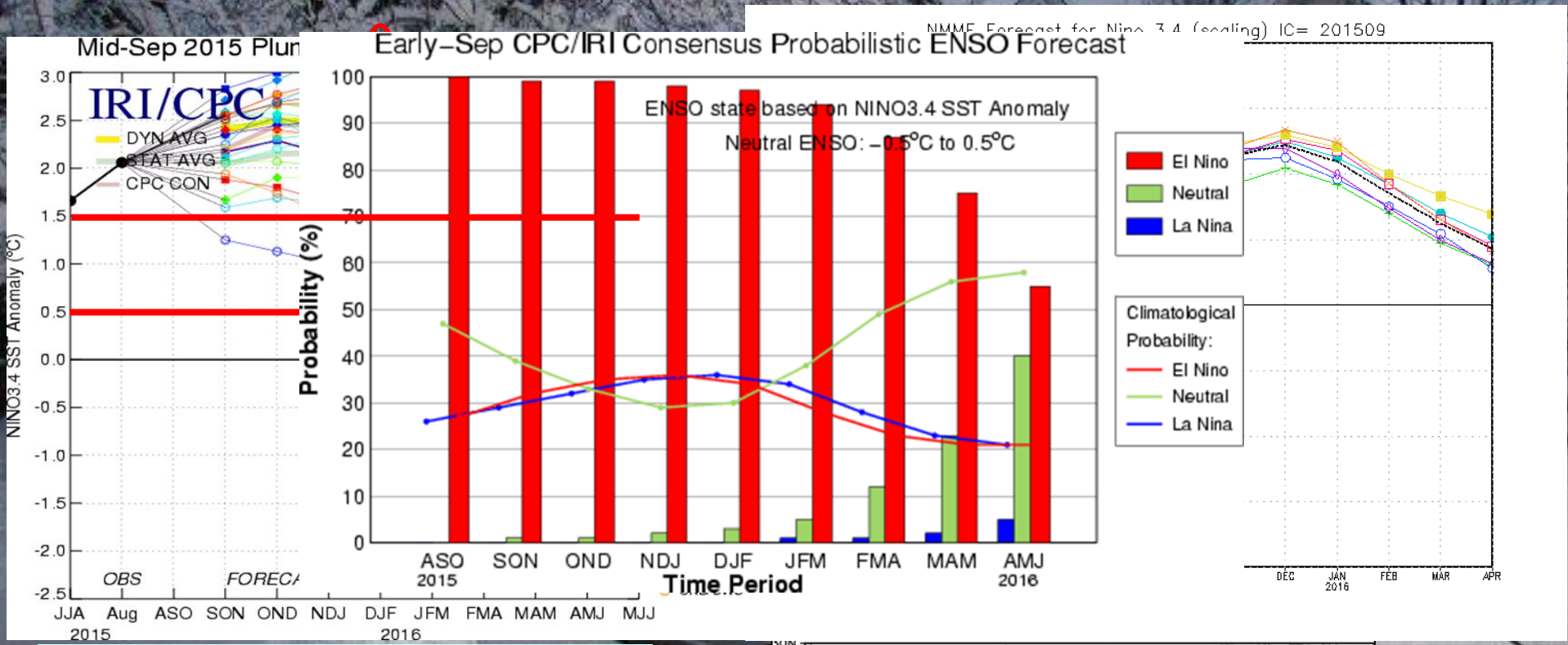
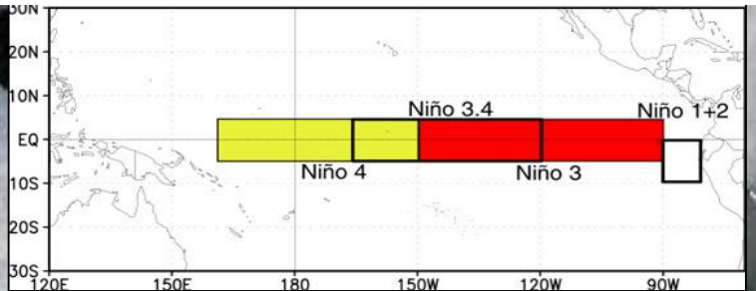
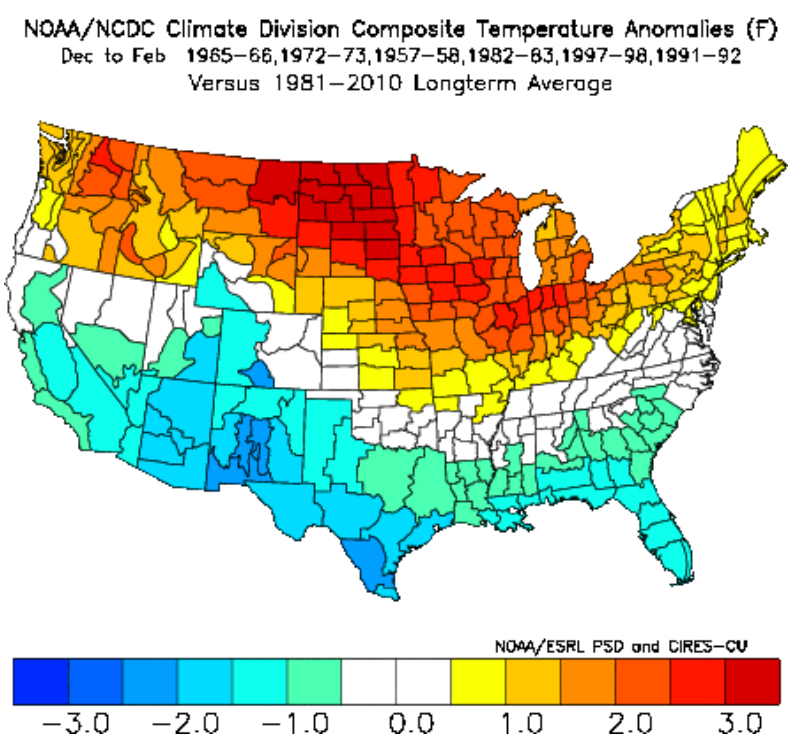
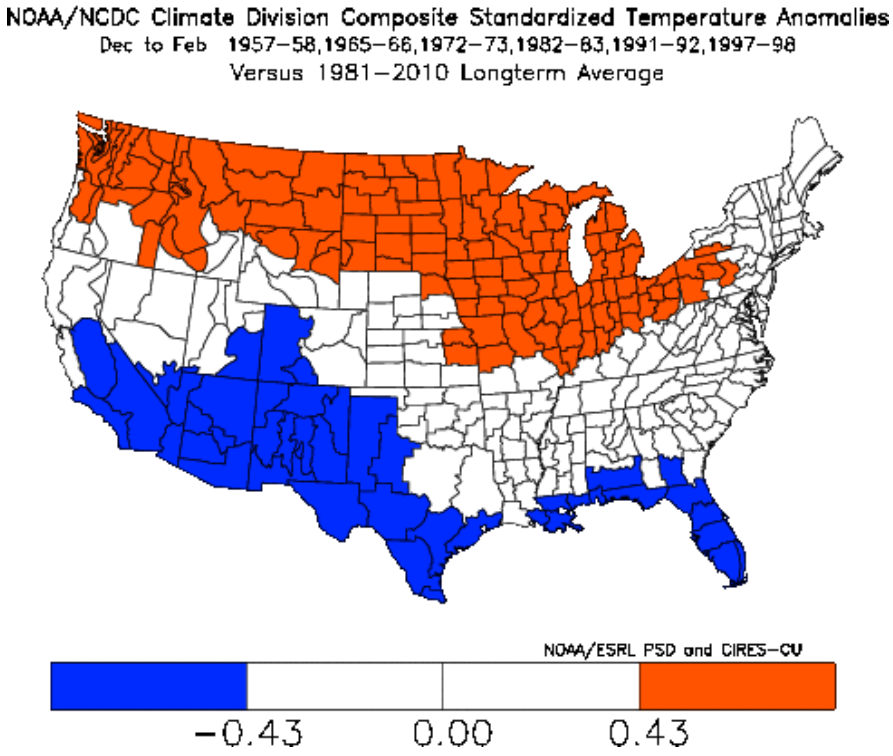


Figure provided by the International Research Institute (IRI) for Climate and Society (updated 15 September 2015).

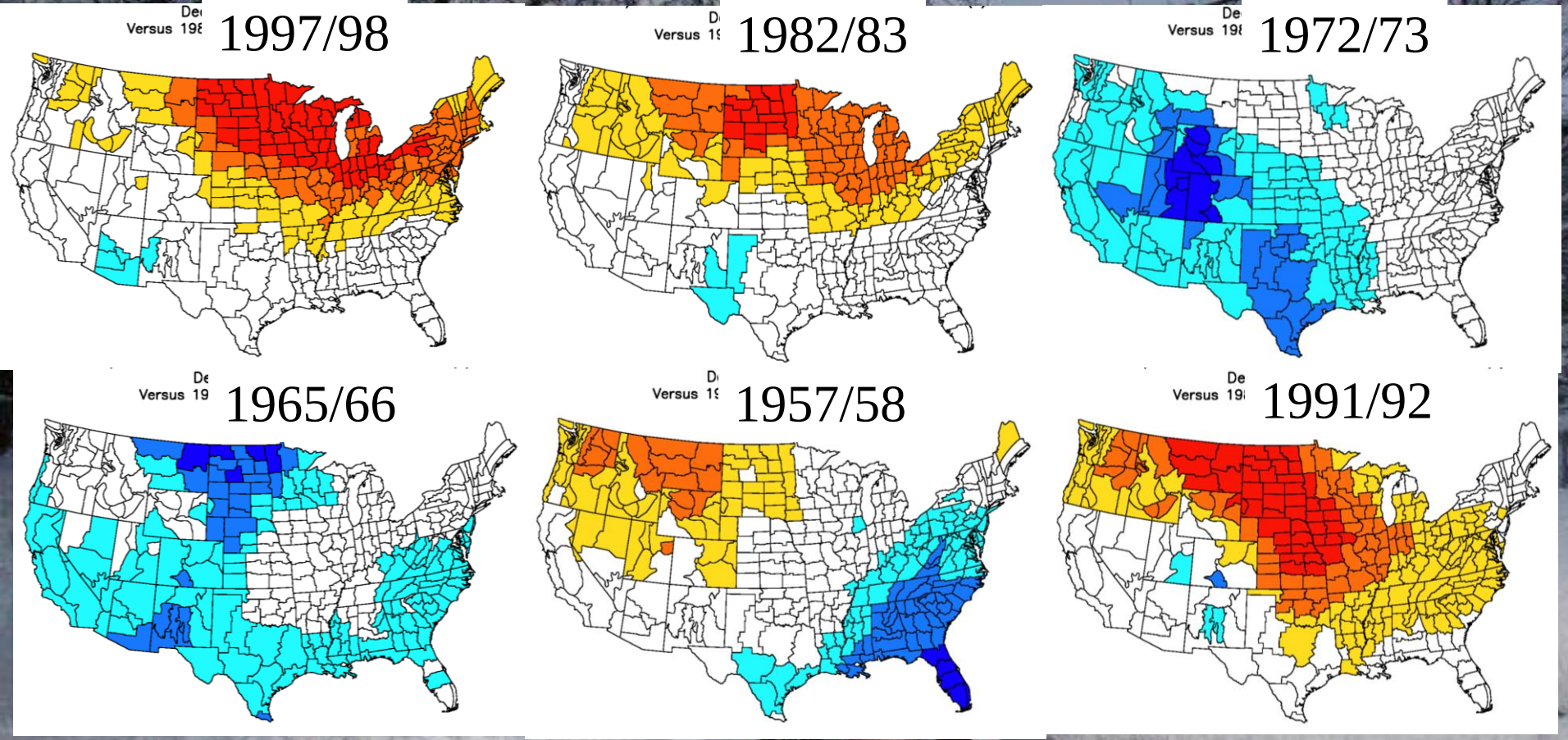


Temperature anomalies for strong El Nino events (left) & Standardized Anomalies (right), 1981-2010 climatology





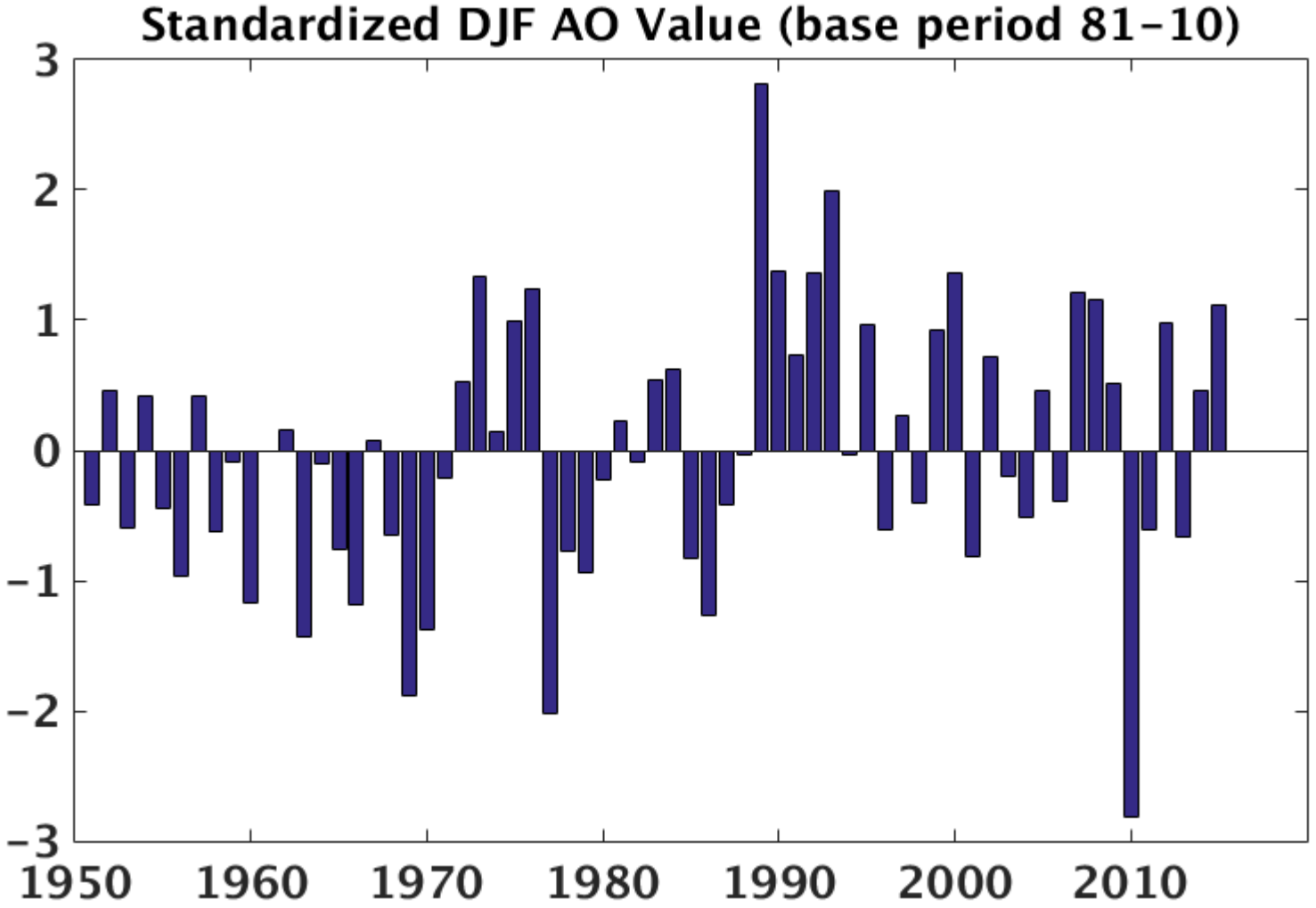
Winter Temperature Departures
6 Strongest El Niños



NORTH ATLANTIC OSCILLATION/ ARCTIC OSCILLATION

- A major source of intraseasonal variability over the U. S., Atlantic and Europe during winter.
- Modulates the circulation pattern over the high latitudes thereby regulating the number and intensity of significant weather events affecting the U.S., such as cold air outbreaks.
- Currently there is no reliable capability to forecast the seasonal phase.

NH Winter Arctic Oscillation (AO)

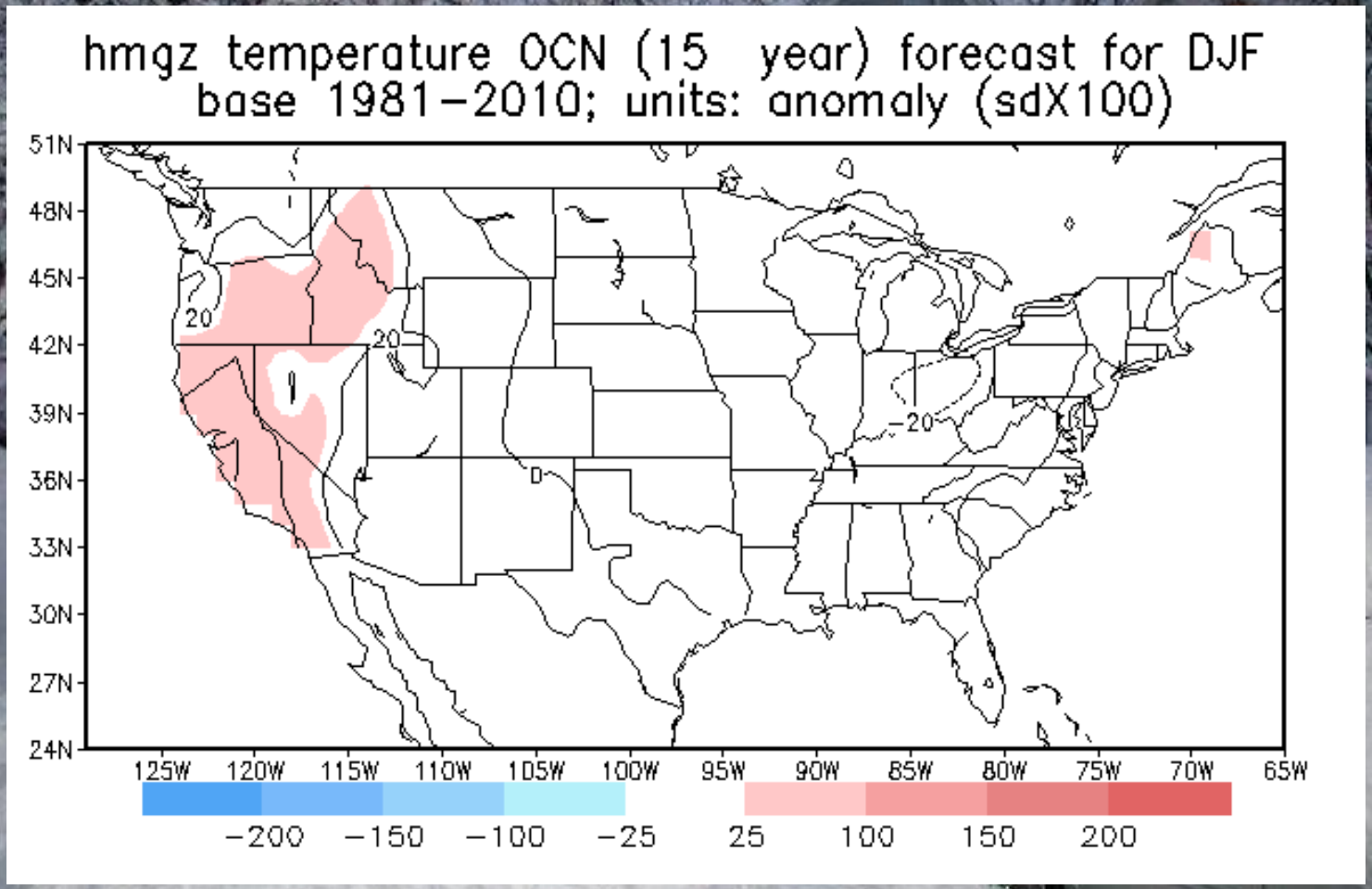


Optimal Climate Normal (OCN)

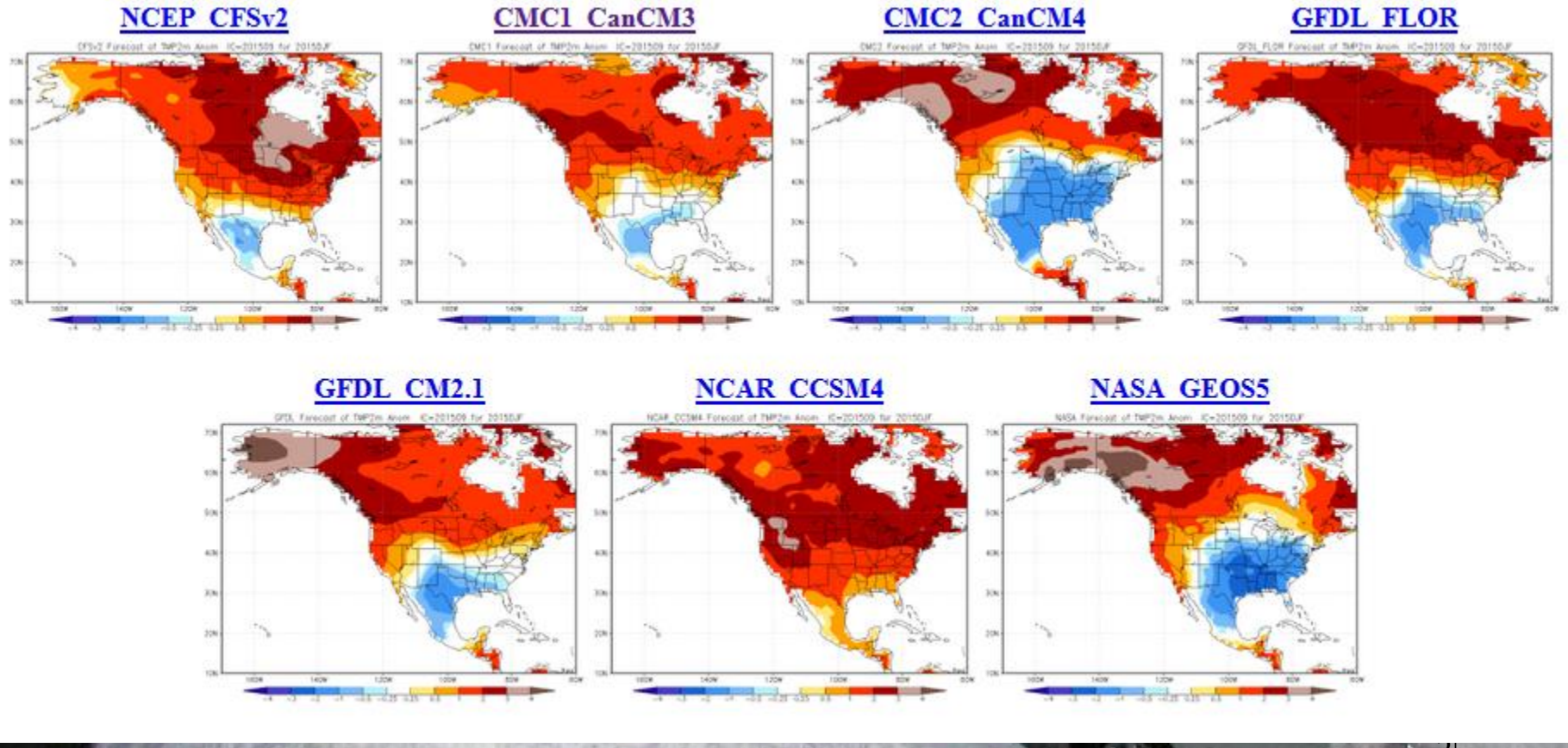
- OCN, as it is used as a tool at CPC is, quite simply, a measure of the trend. For a given station and season, the OCN forecast is the difference between the seasonal mean temperature during the last 15 years and the 30 year climatology.

December - February OCN

2001-2015

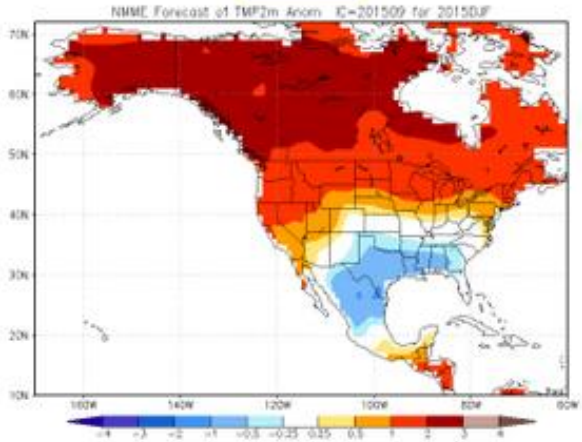


Individual NMME Model Forecasts DJF

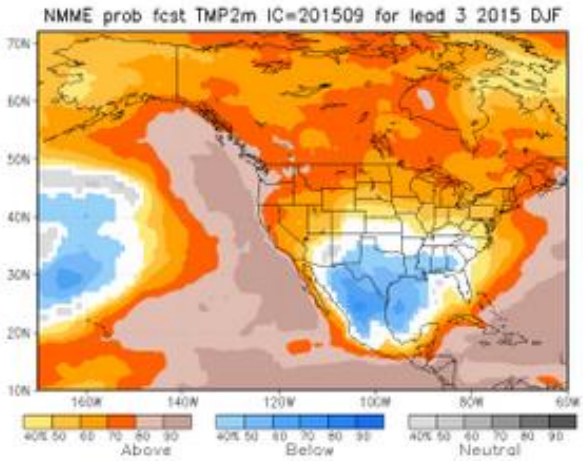


National and International Multi-Model Ensemble

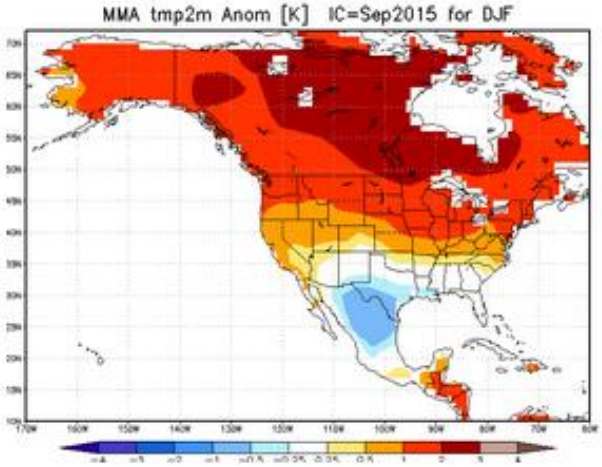
NMME



Prob fcst



IMME



Forecast updated Sept. 8, 2015

Winter 2015-16 Outlook Rationale

- El Niño conditions developed during the Spring 2015 and have become strong.
- El Niño very likely to persist into Spring 2016.
- AO has been and continues to be erratic. Large swings possible in any year (e.g. DJF 2009-10).
- JDF temperature trends relative to 1981-2010 base period are generally small over country; precipitation trends resemble La Niña.
- Forecast consistent with strong El Nino.

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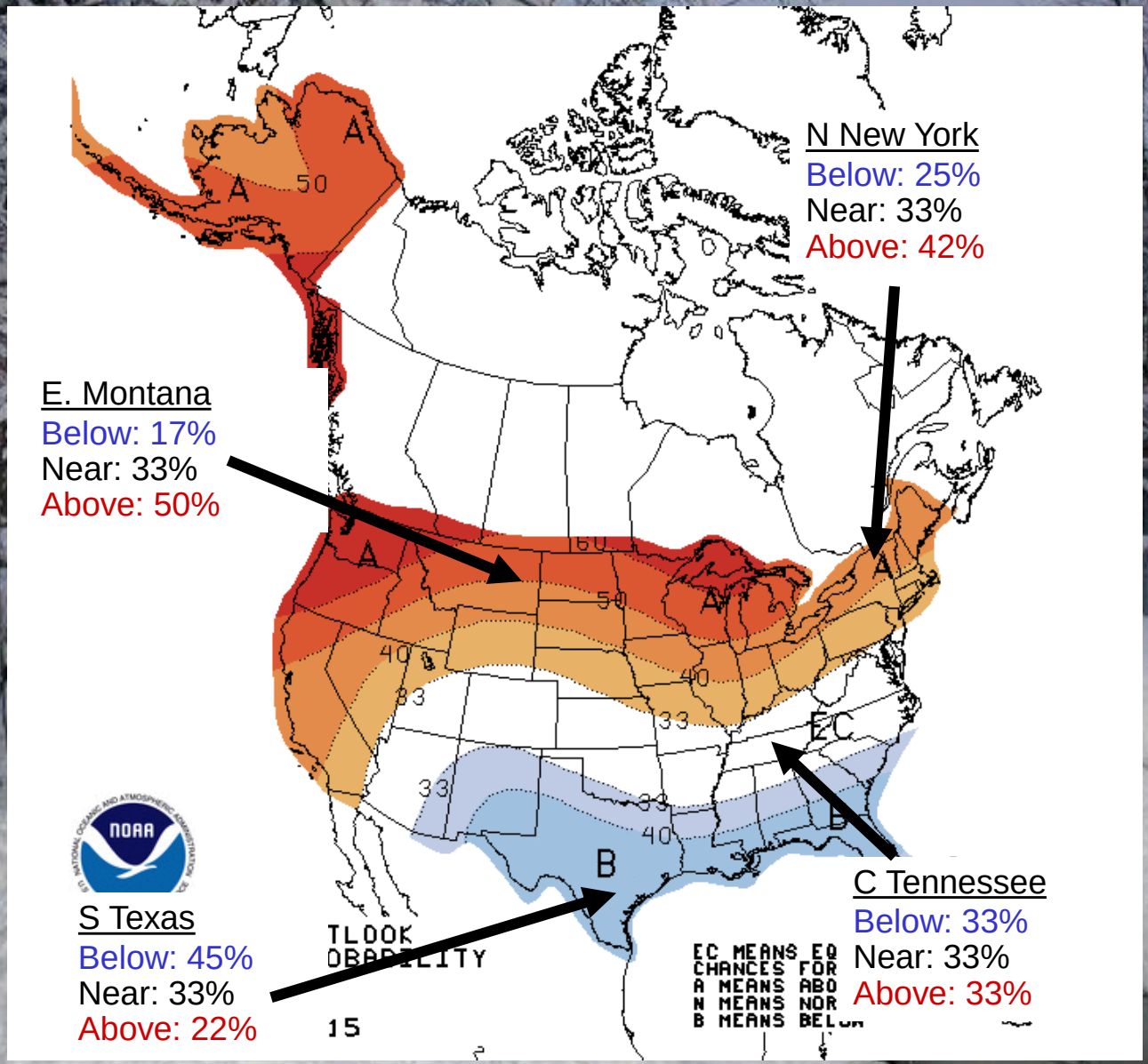
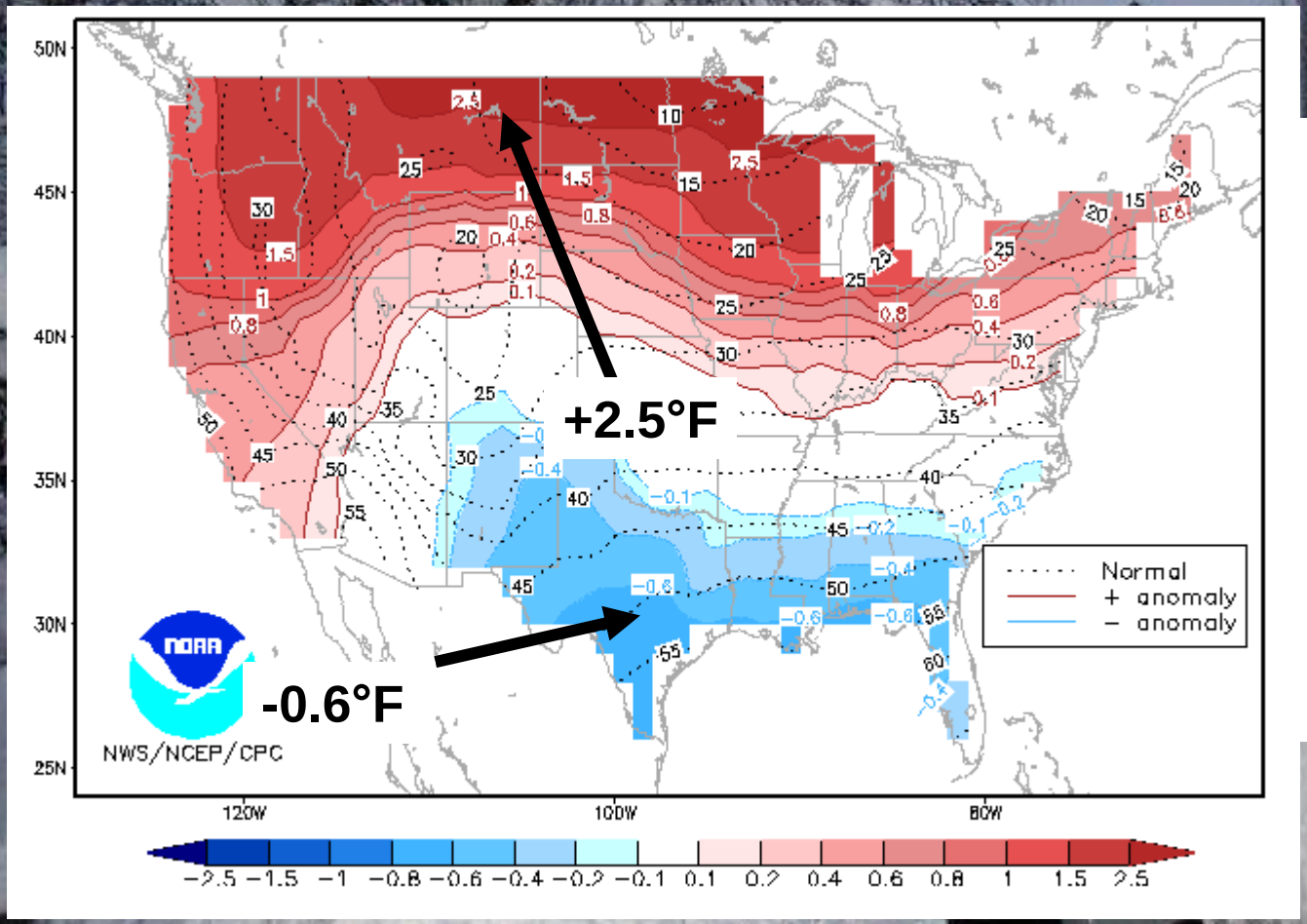
December 2015 – February 2016 Temperature Outlook



Average Departure of Mid-Value Temperature Outlook Distribution

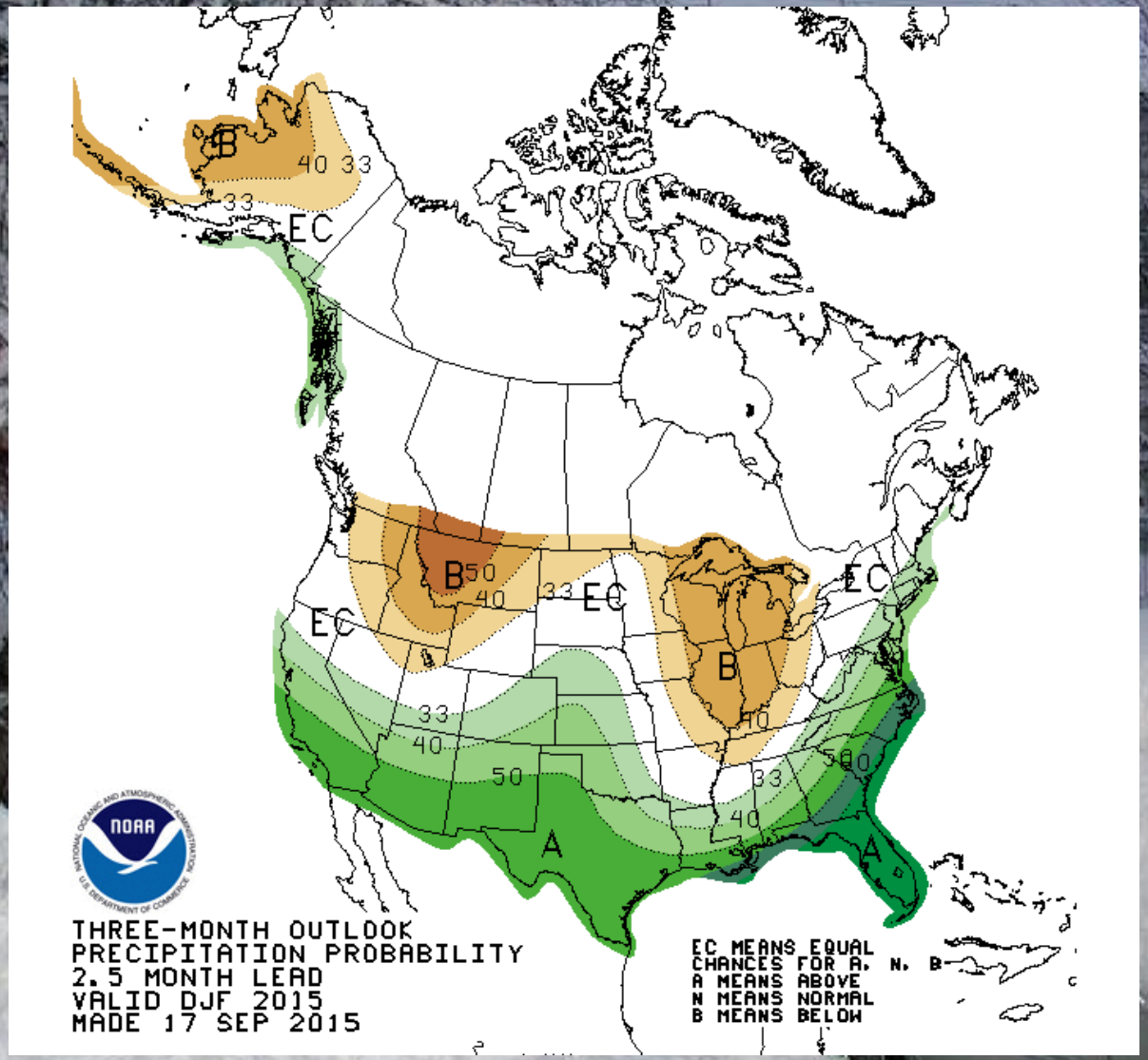


HDD Projections:

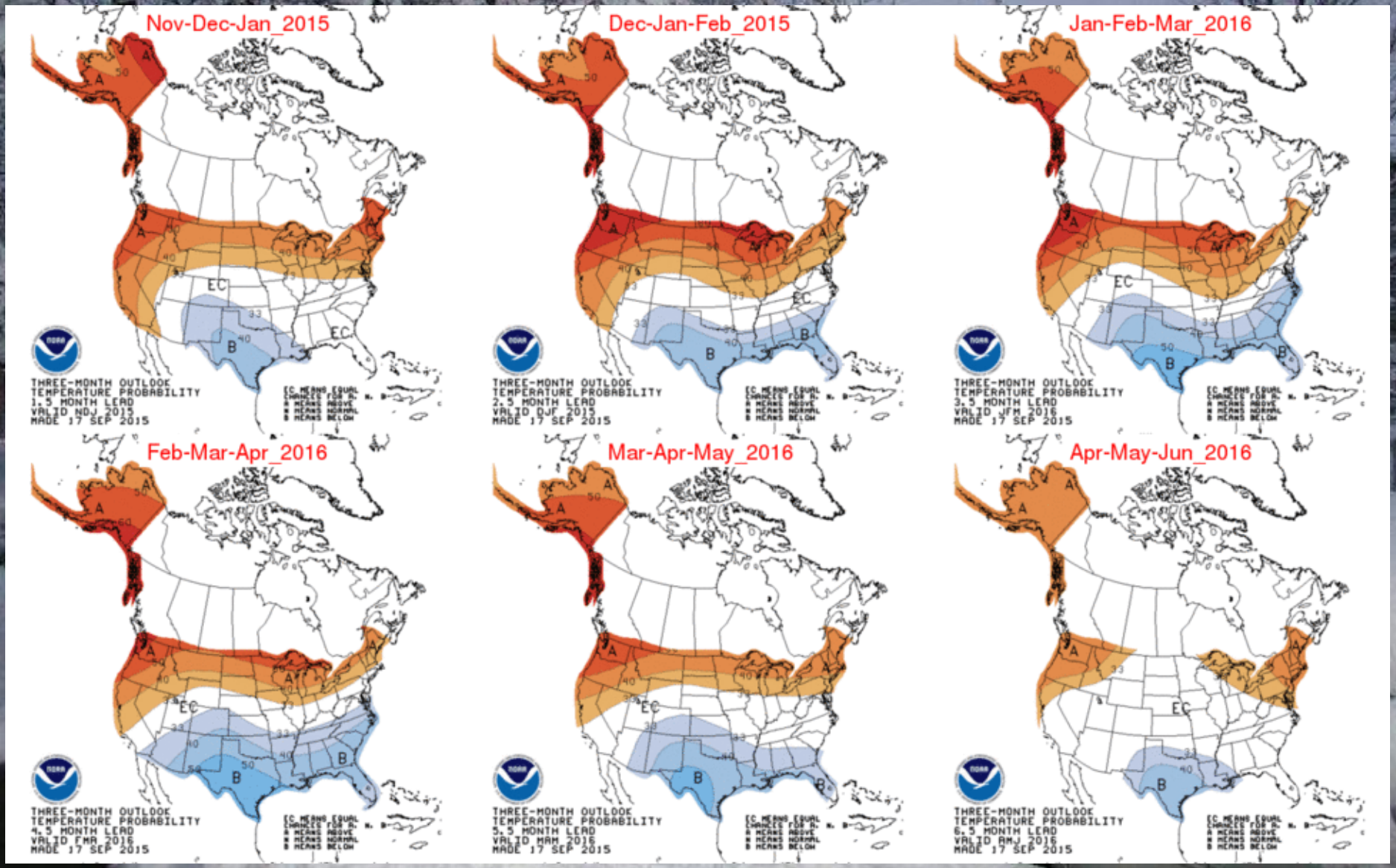
~1.6% less than 1981-2010

~6.0% less than 2014-15

December 2015 – February 2016 Precipitation Outlook



Seasonal Temperature Outlooks
NDJ 2015-16 – AMJ 2016



U. S. Winter 2015-16 Outlook: Forecast Summary

Odds favor:

- Warmer than average across the western and northern portions of the nation
- Colder than average favored for parts of Southwest and South-Central
- Drier than average in Pacific Northwest and Great Lakes
- Wetter than average favored across the Southern tier, including much of California