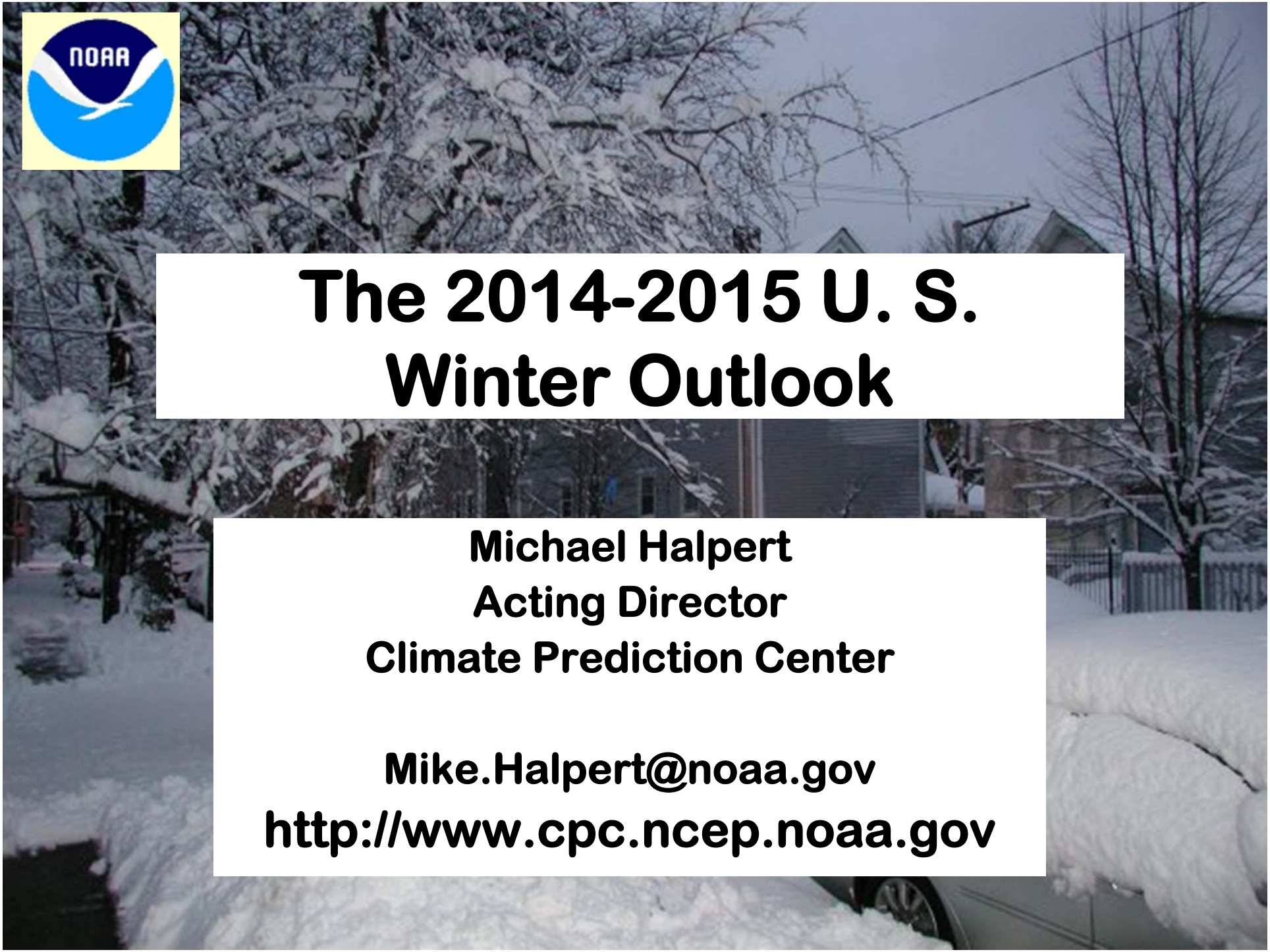
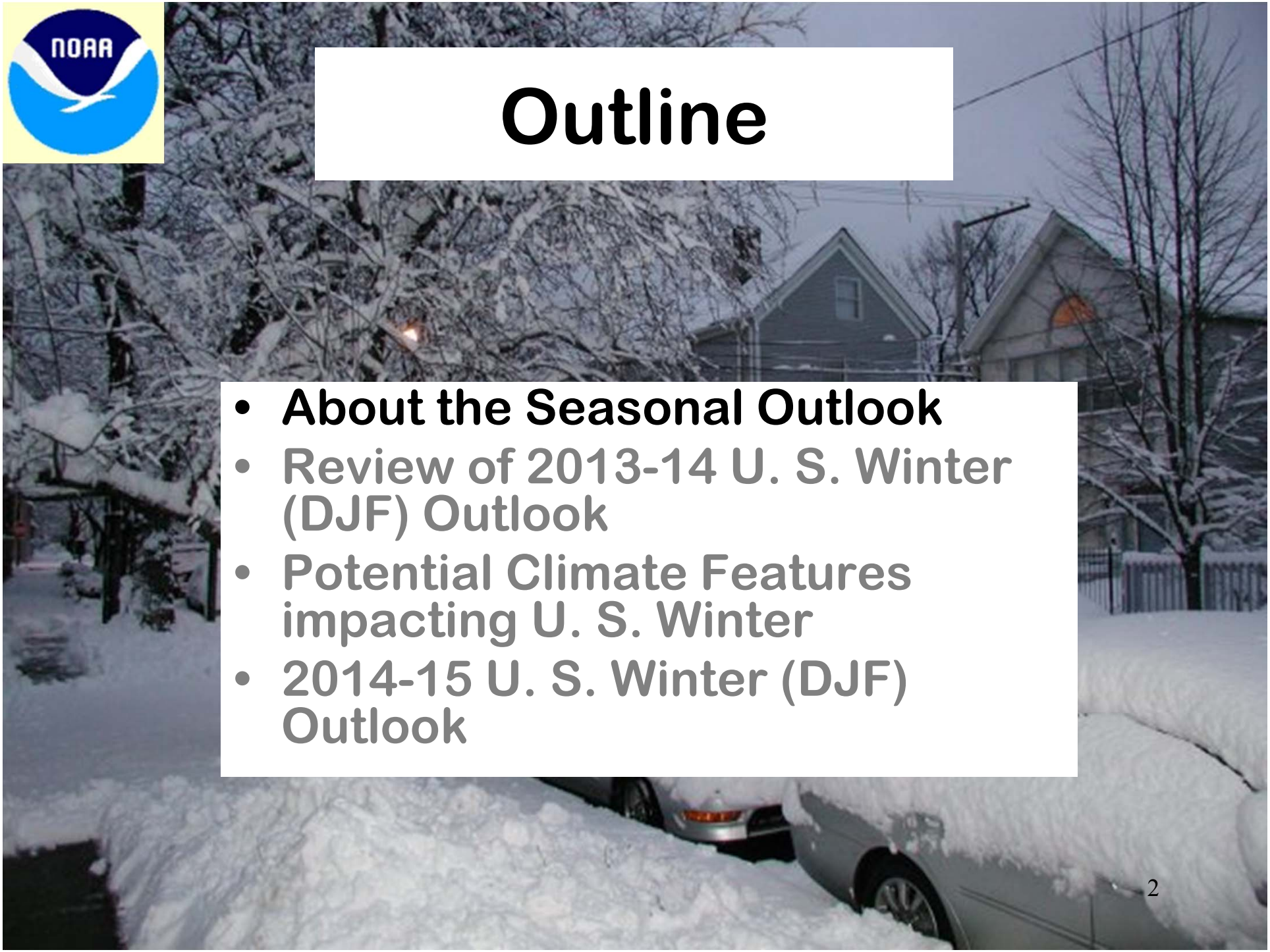


The 2014-2015 U. S. Winter Outlook

Michael Halpert
Acting Director
Climate Prediction Center

Mike.Halpert@noaa.gov
http://www.cpc.ncep.noaa.gov



Outline

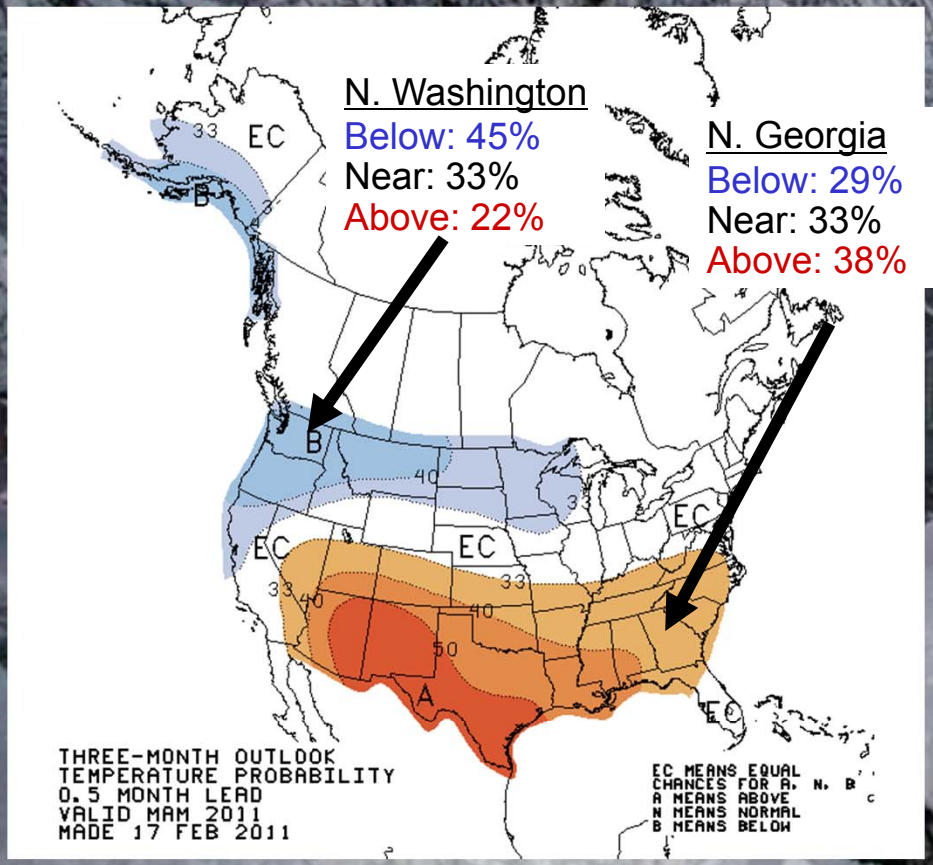
- **About the Seasonal Outlook**
- Review of 2013-14 U. S. Winter (DJF) Outlook
- Potential Climate Features impacting U. S. Winter
- 2014-15 U. S. Winter (DJF) Outlook

Outlook Categories and Probabilities

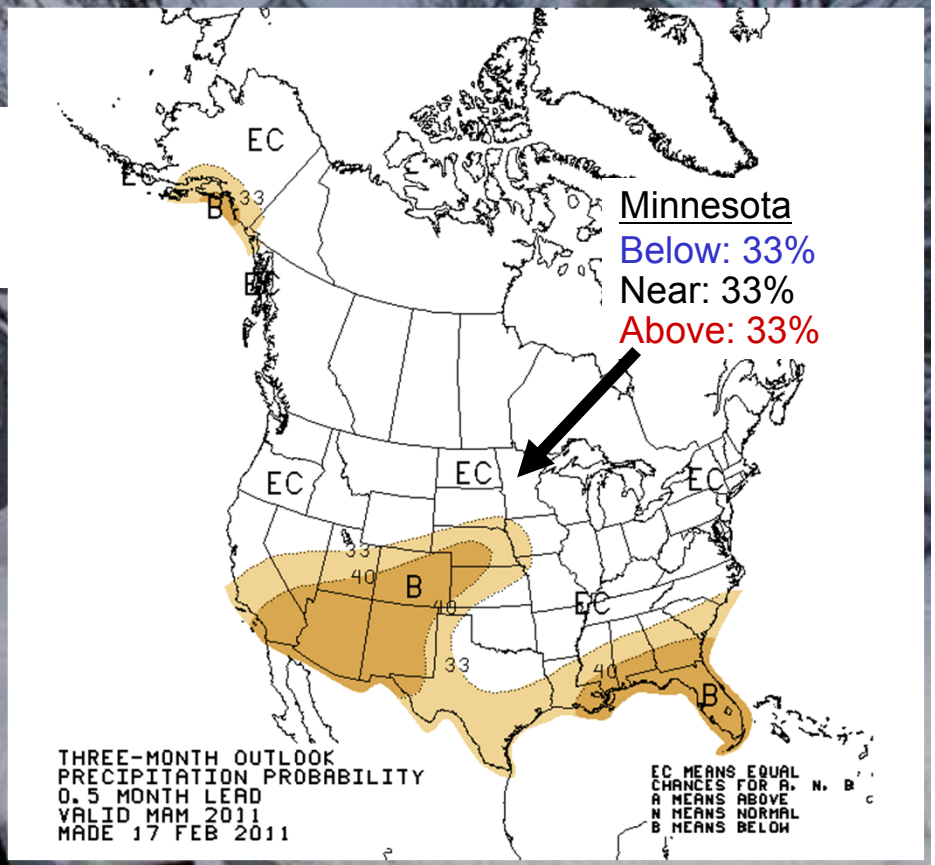
- Seasonal outlooks are prepared for average temperature and total accumulated precipitation category
- Three categories are used (terciles). These are BELOW-,NEAR- and ABOVE-normal (median), for temperature (precipitation).
- Regions where the likelihoods of the three categories are the same (33.33…% 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

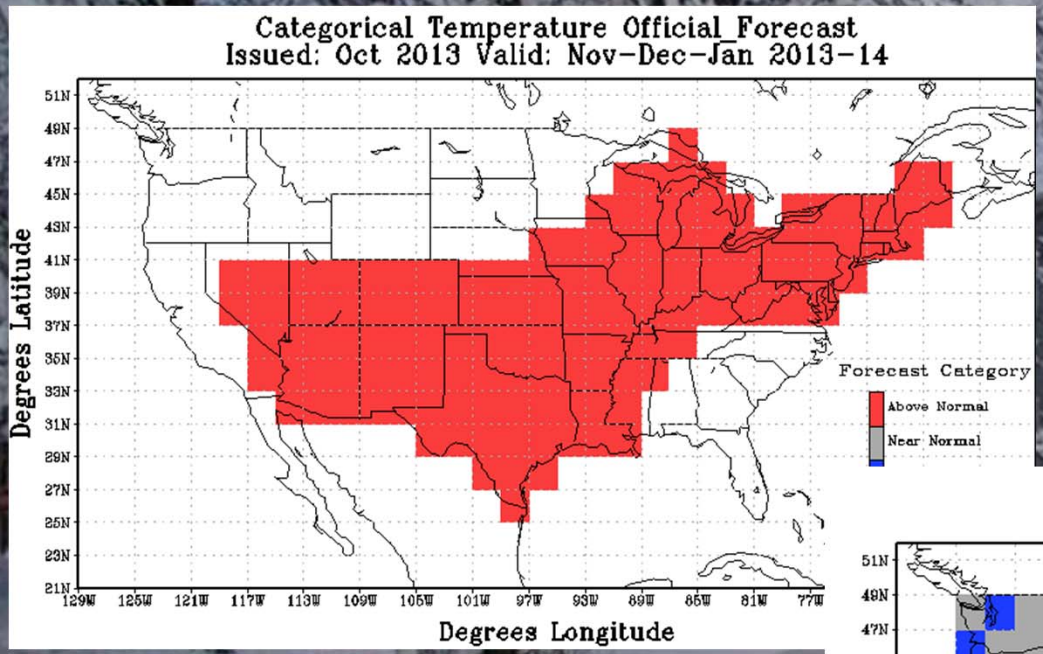


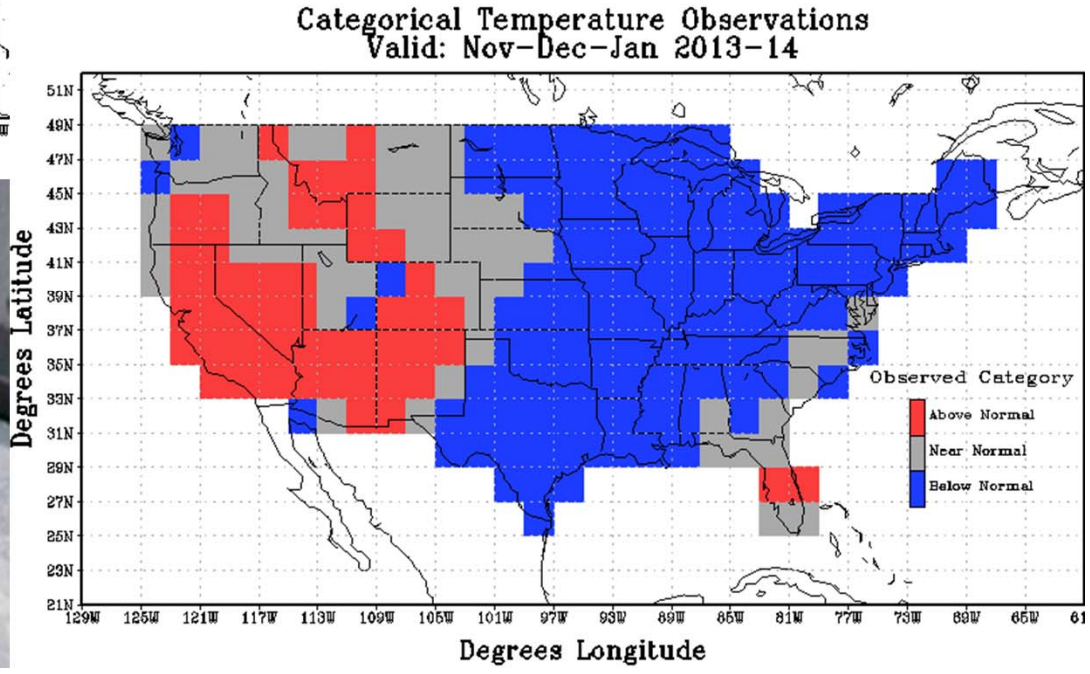
Precipitation



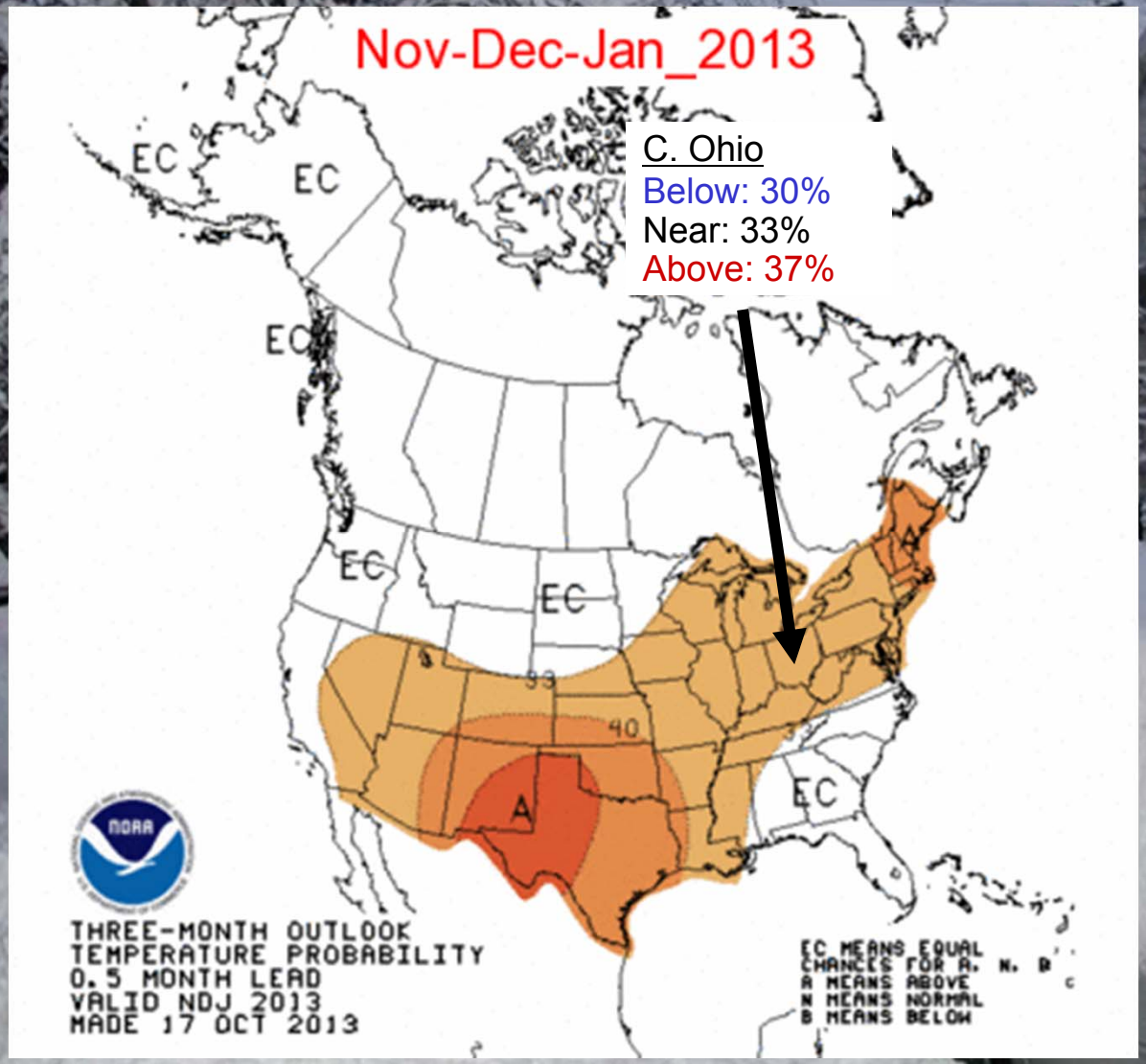
The U.S. Government's Amazingly Wrong Forecast for This Winter

It predicted "above-normal" temperatures. Oops.





November 2013 – January 2014



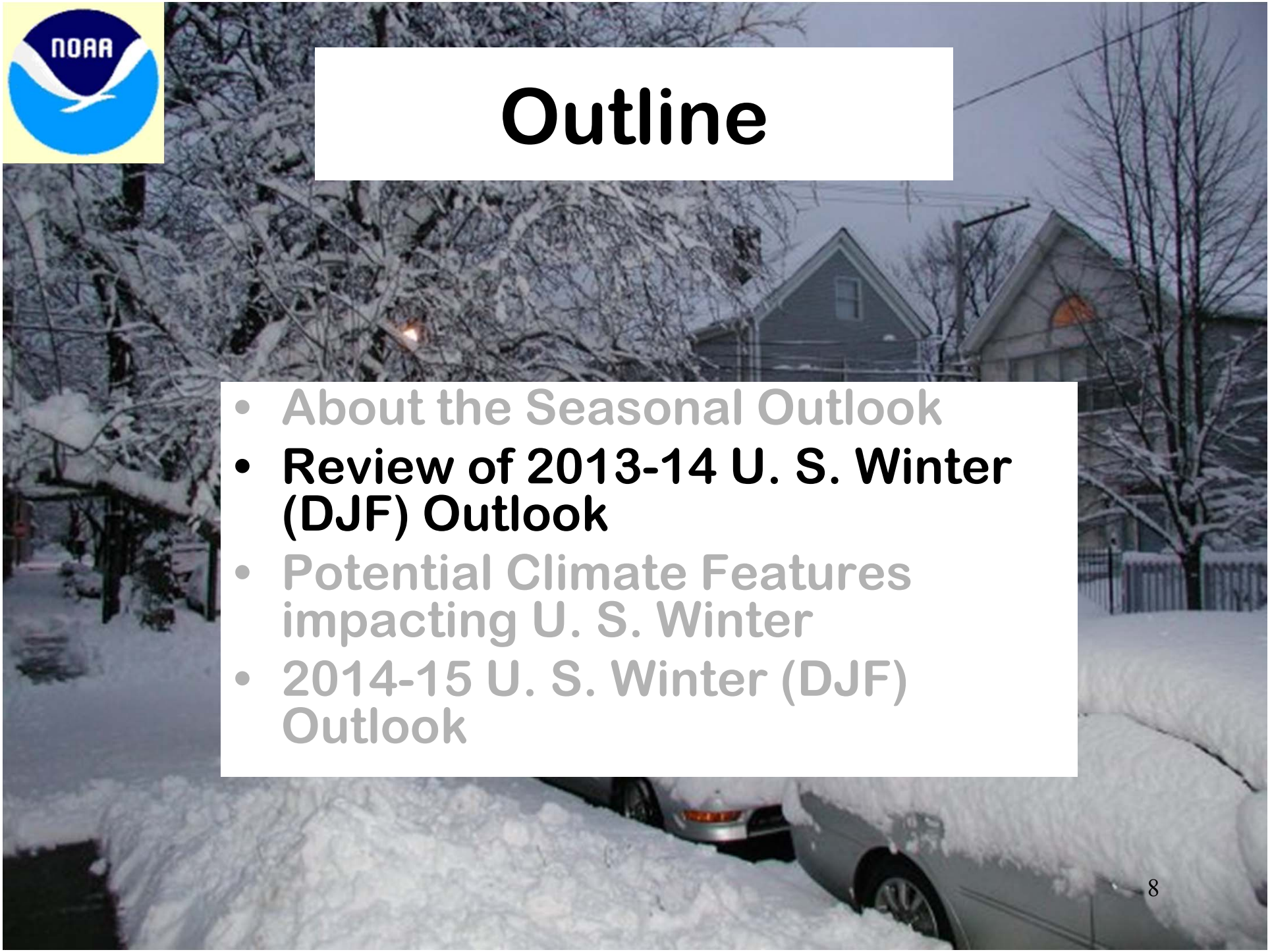
About the Seasonal Outlook

- 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 16

  Final Winter Outlook: November 21

- 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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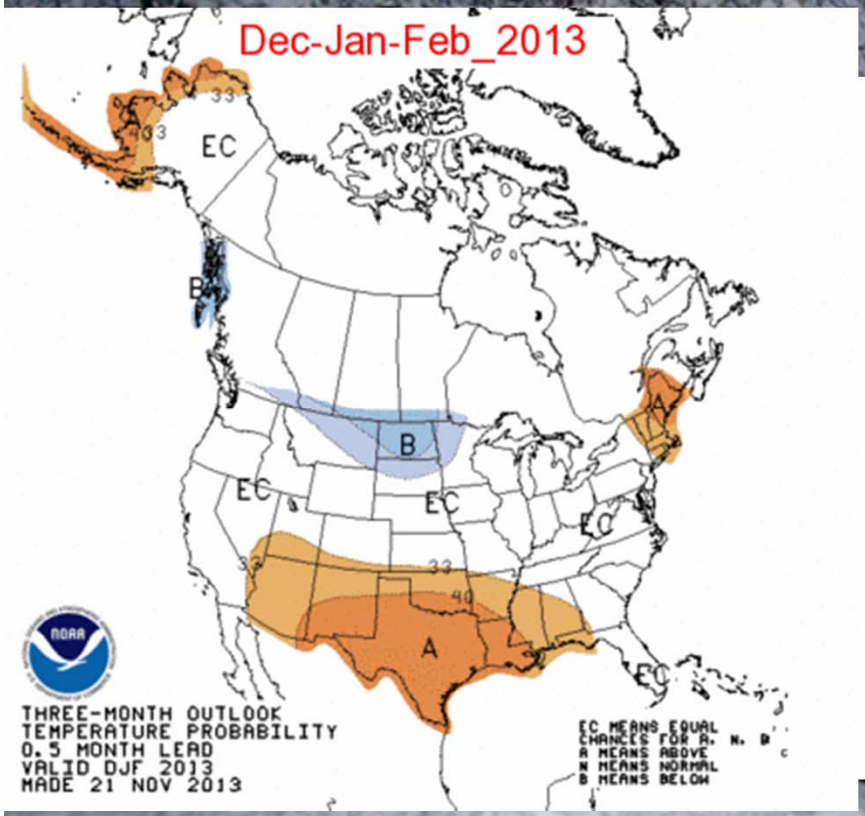
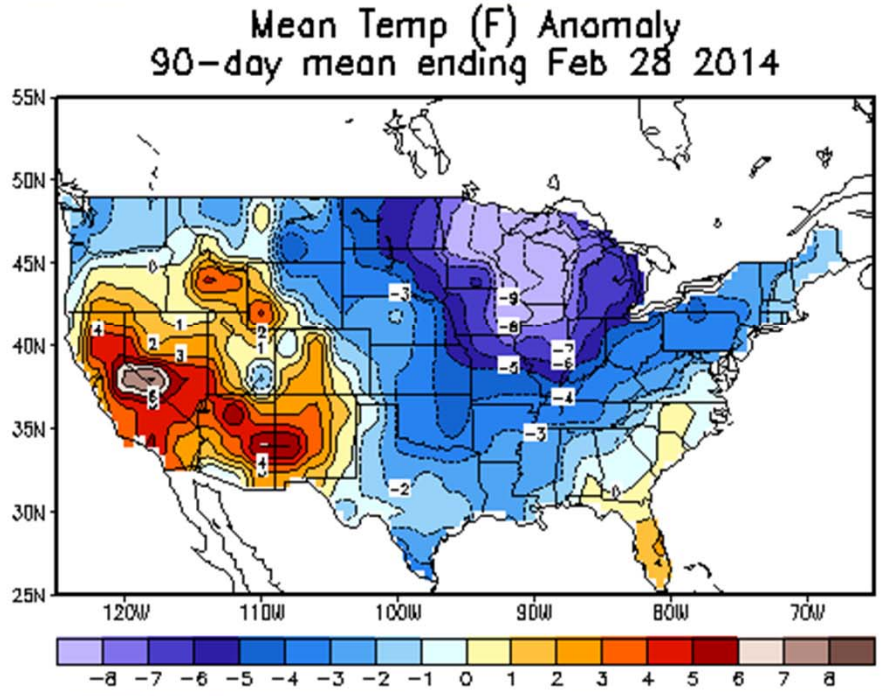
Winter 2013-14 Outlook Rationale (from Oct. 2013)

- ENSO-neutral conditions across the Pacific have prevailed for over a year.
- ENSO-neutral is favored through NH 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 generally small over country; precipitation trends resemble La Niña.
- Forecast consistent with trends and most model forecasts, but confidence is low.

Dec 2013 – Feb 2014 Temperature

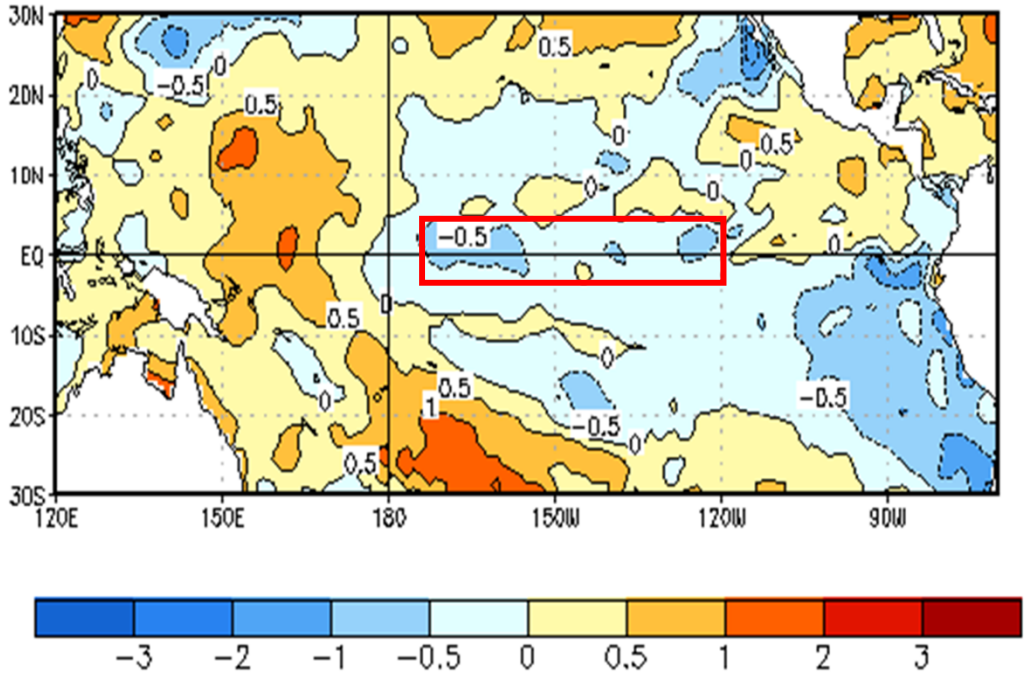


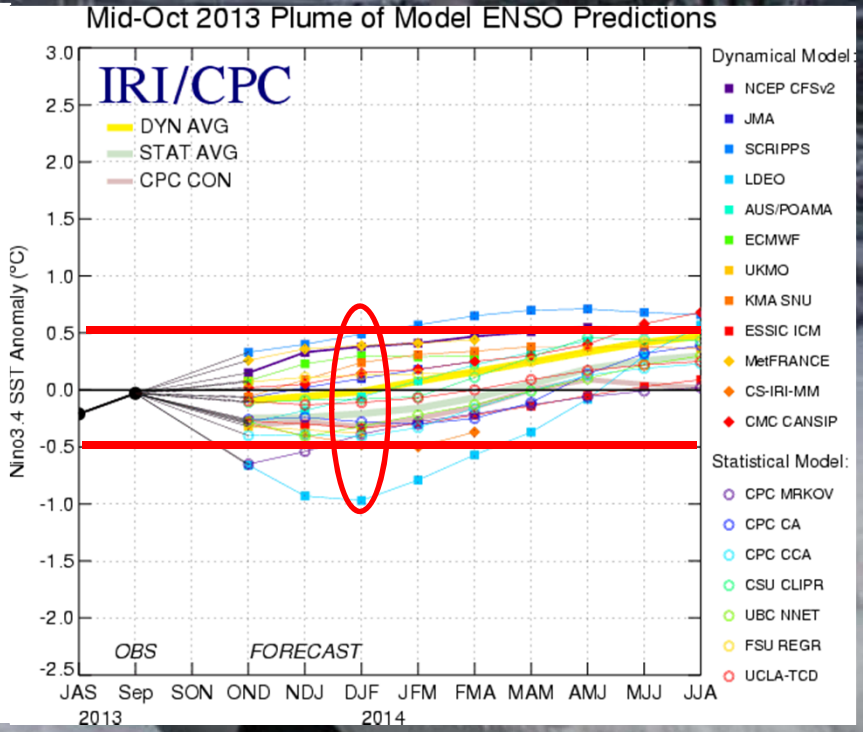


Heidke = 5.1, Coverage = 34%

Current ENSO Status (Oct. 2013)

SST Departures (°C)





SST Departures (°C) February 2014

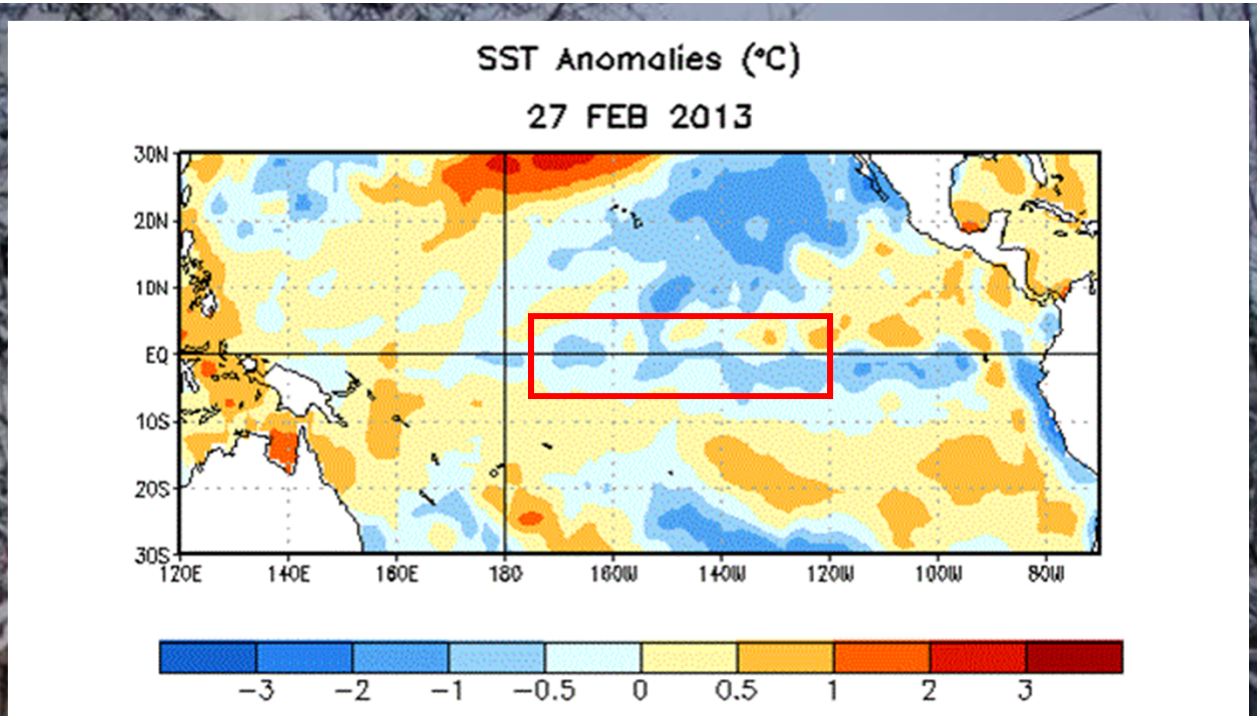
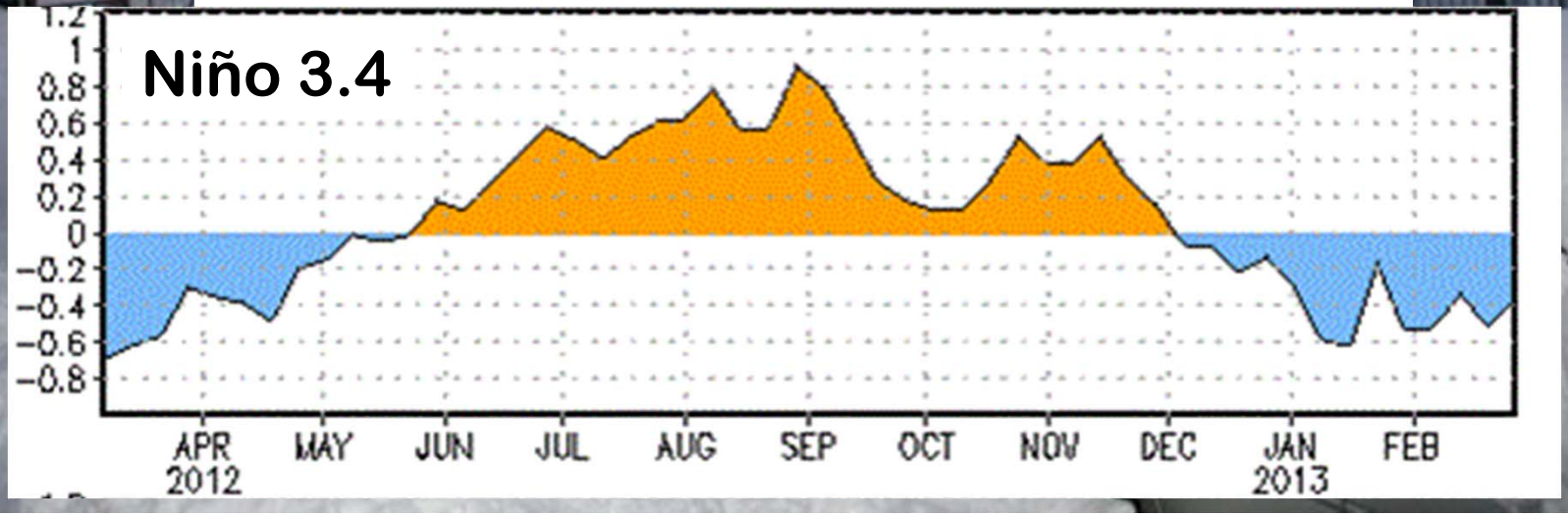
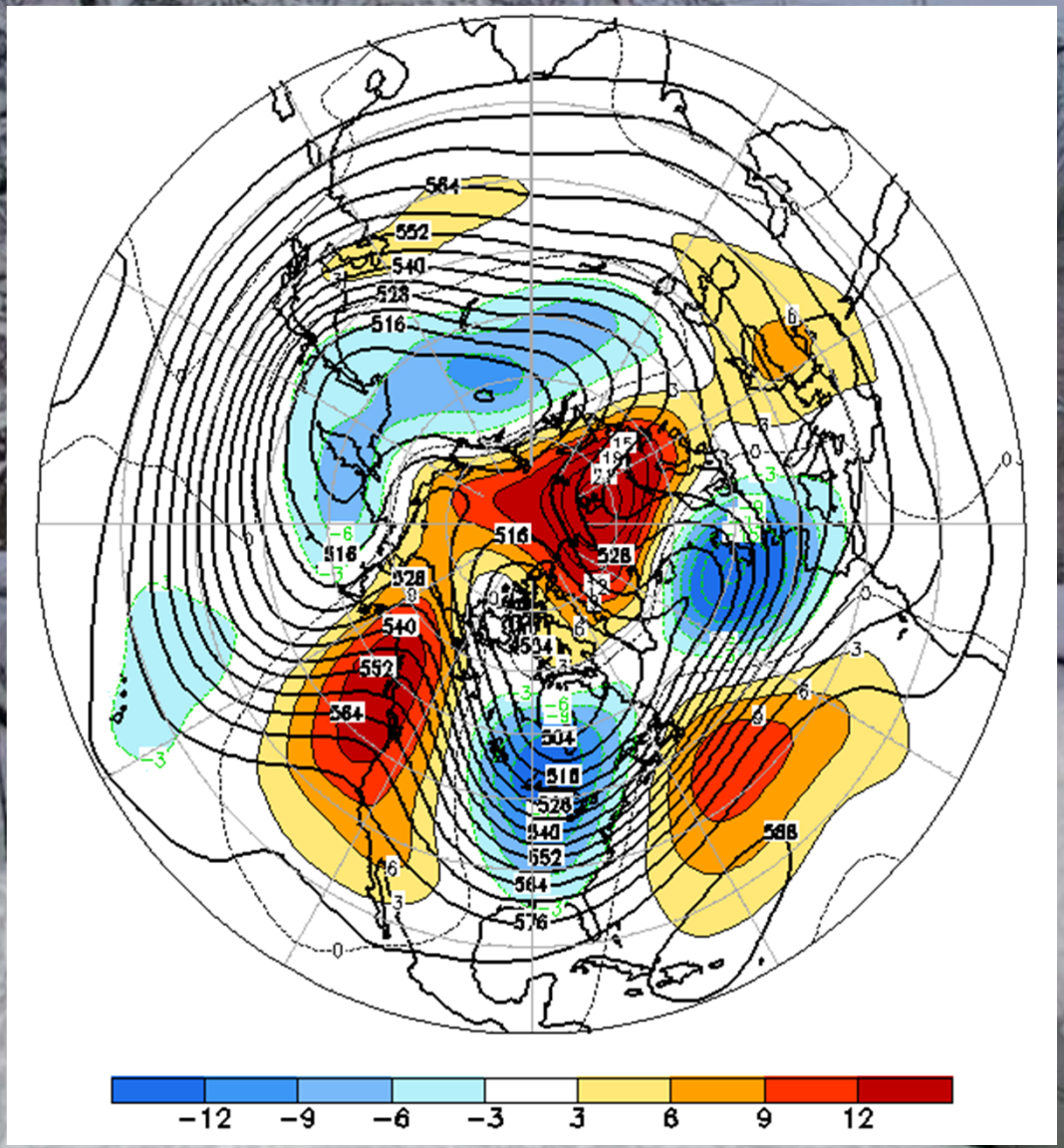
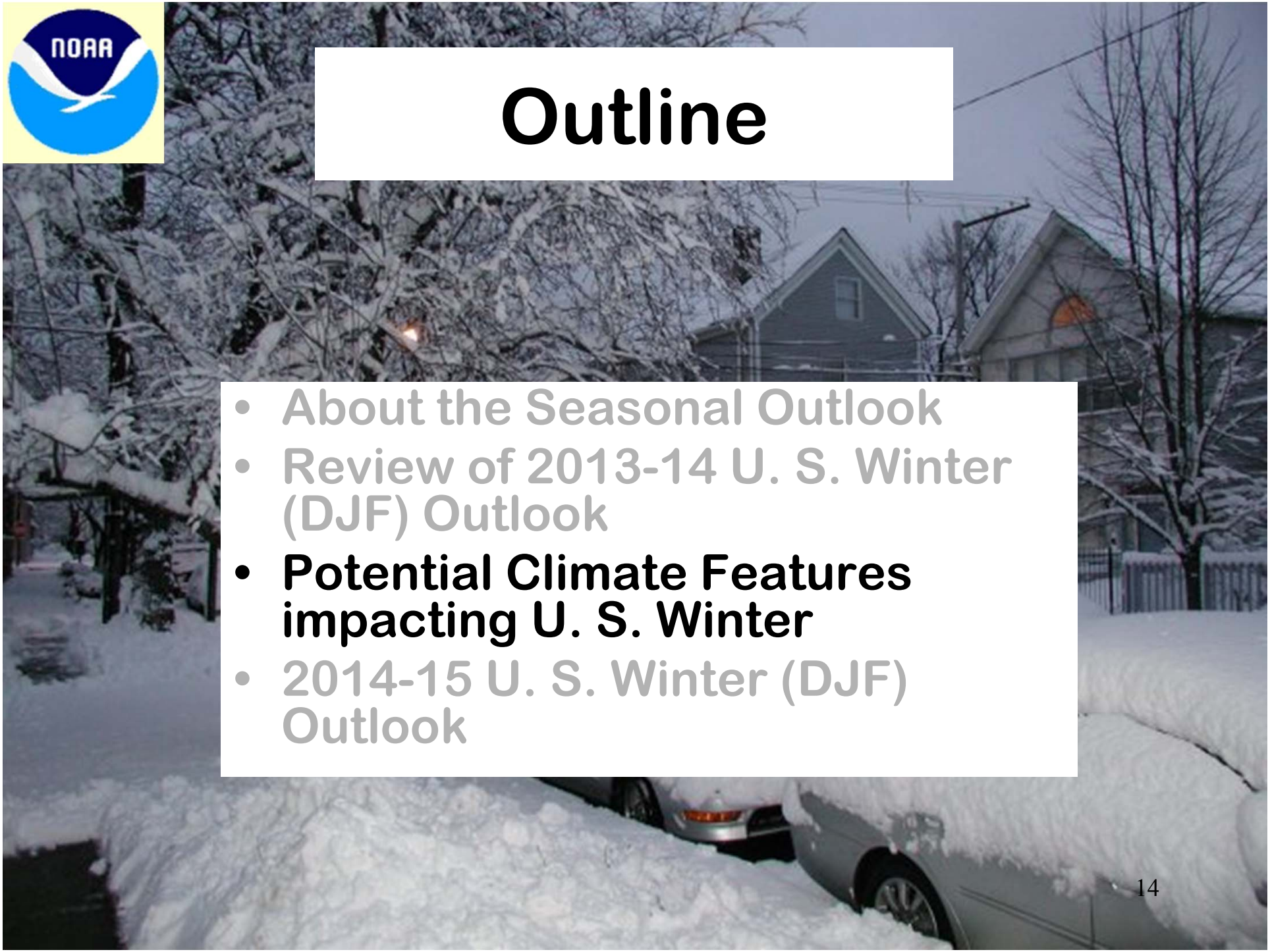


Figure 1. Average sea surface temperature (SST) anomalies (°C) for the week centered on 27 February 2013. Anomalies are computed with respect to the 1981-2010 base period weekly means.



January 2014
500-hPa Heights/Anomalies





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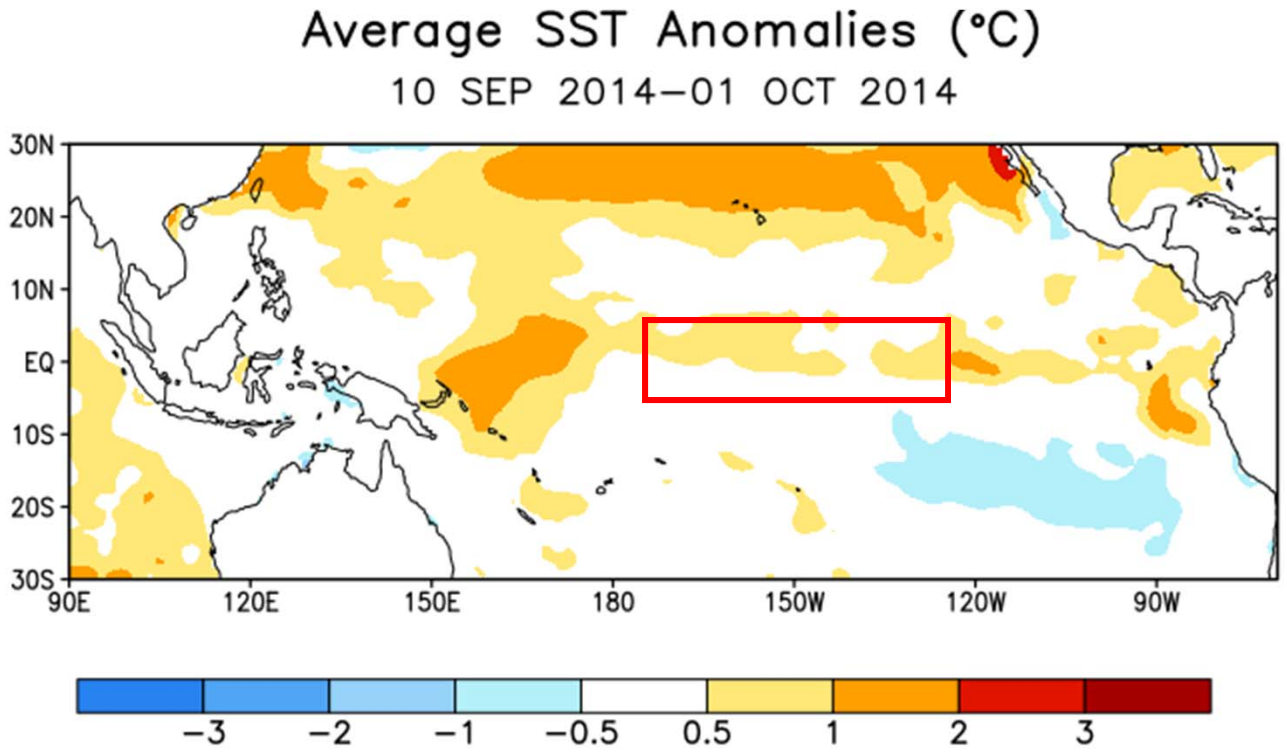
The chance of El Niño is at 60-65% during the Northern Hemisphere fall and winter.



Pacific Niño 3.4 SST Outlook

Most models favor El Niño (greater than or equal to +0.5ºC) to develop during October-December 2014 and persist through Northern Hemisphere winter 2014-15.

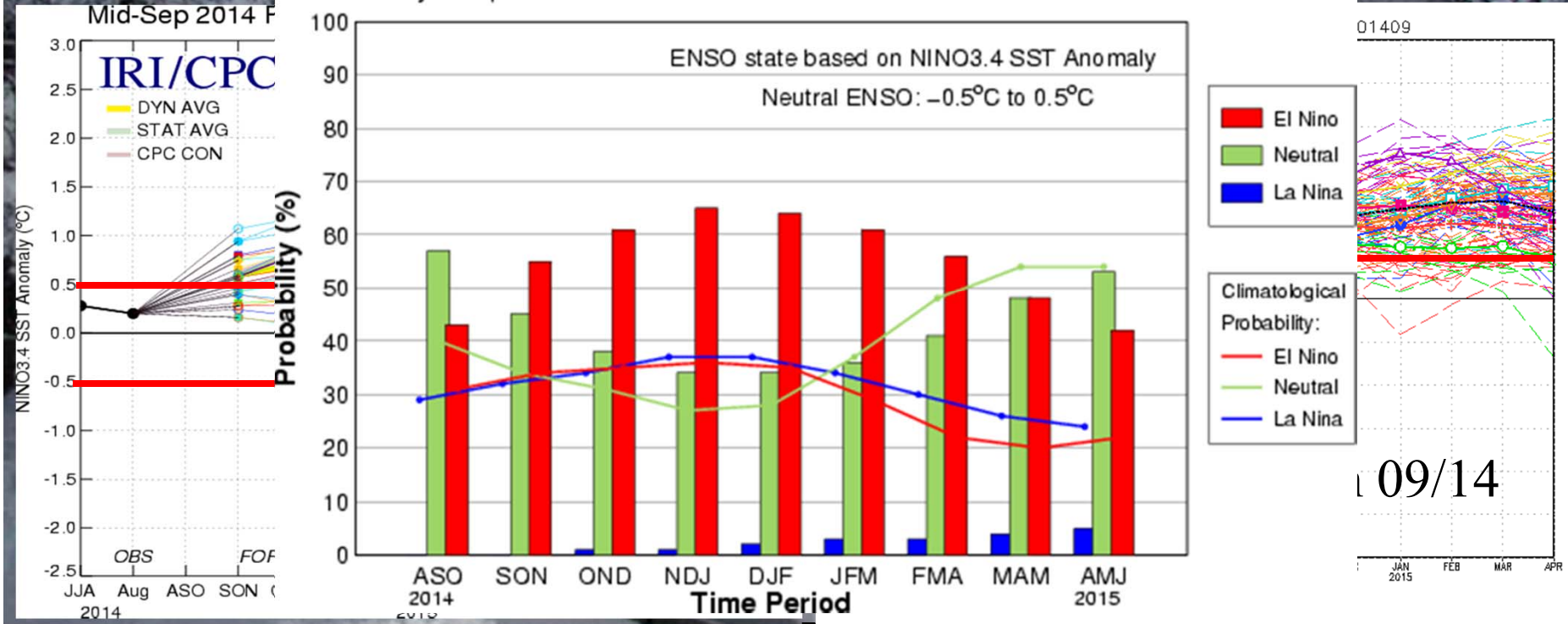
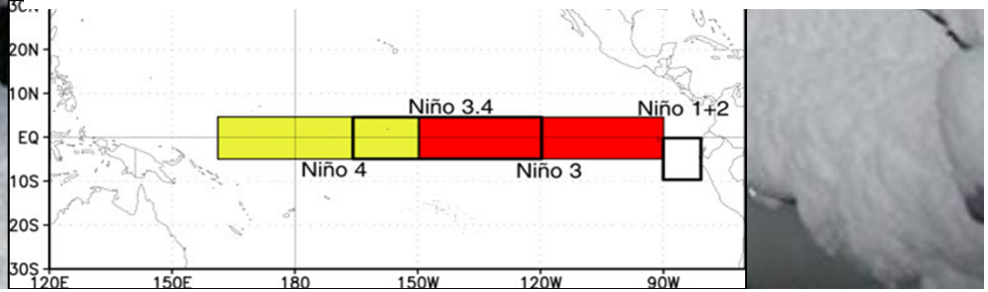
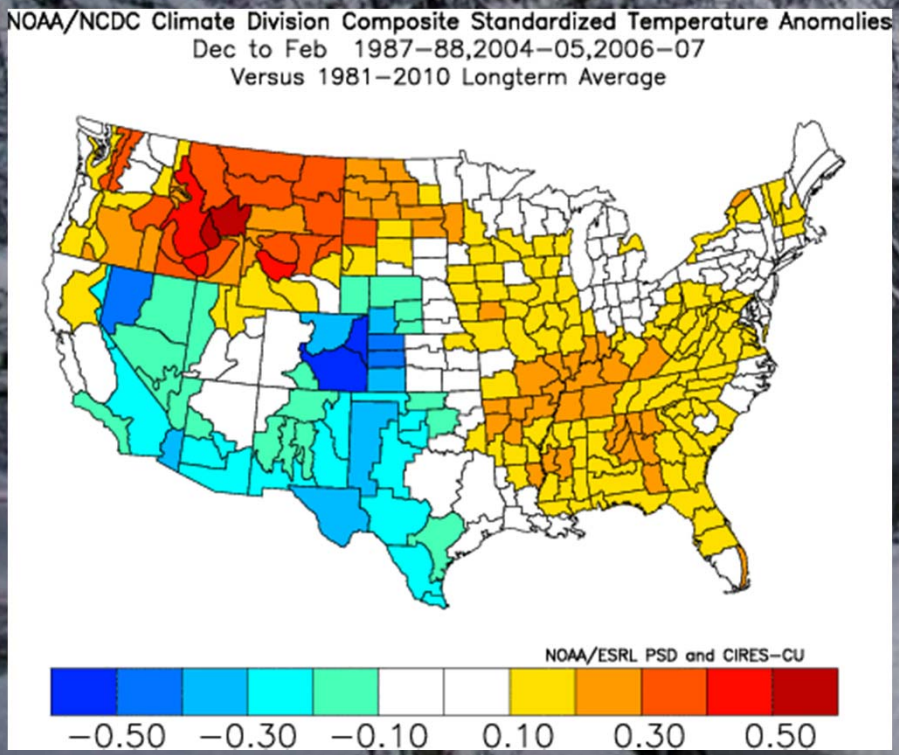
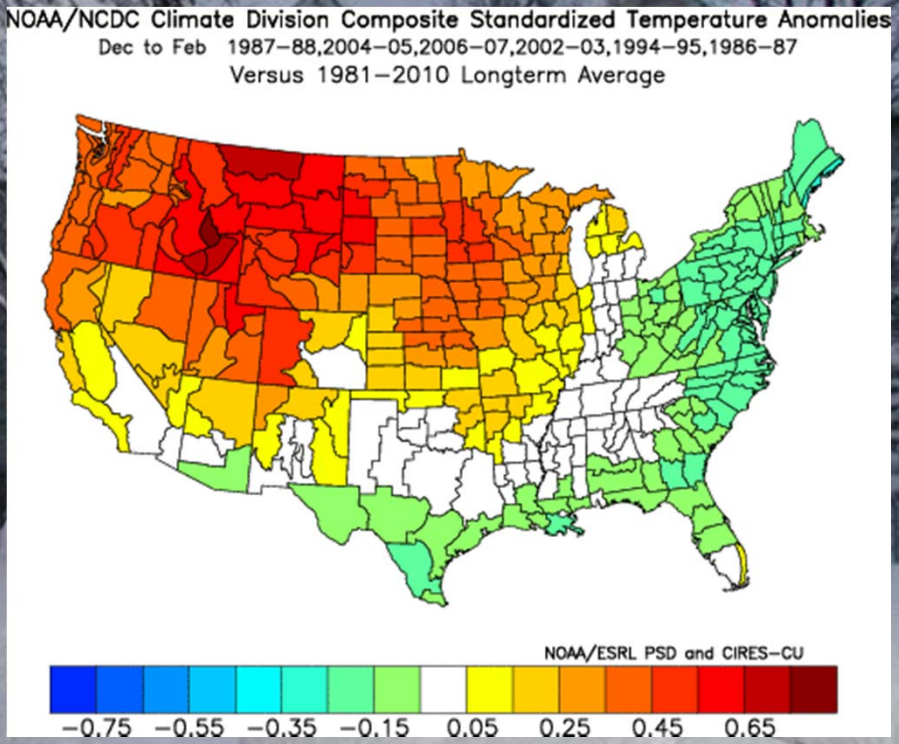


Figure provided by the International Research Institute (IRI) for Climate and Society (updated 16 September 2014).

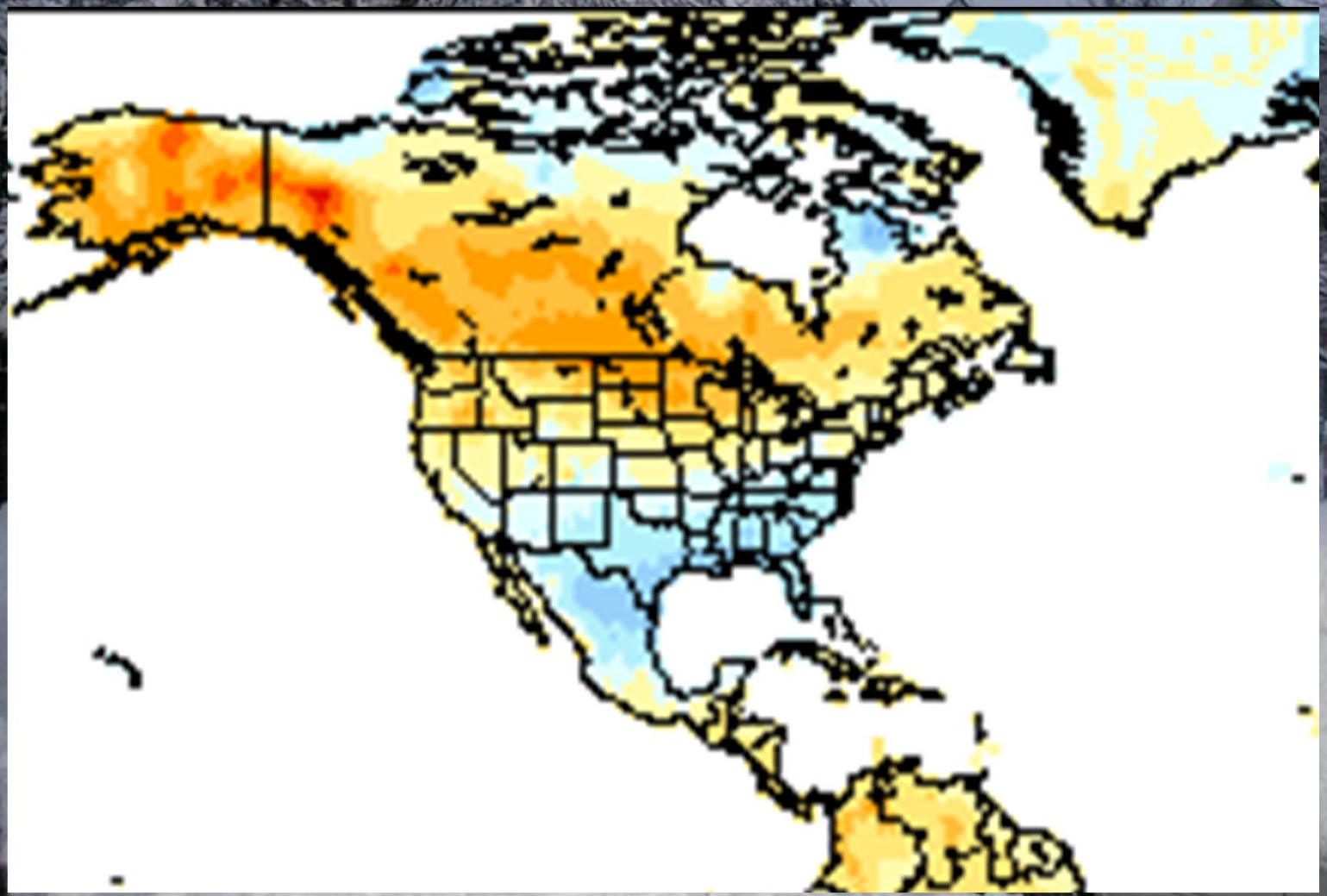


Standardized anomalies for weak El Nino events since 1980 (left) & weak and moderate El Nino events (right), 1981-2010 climatology





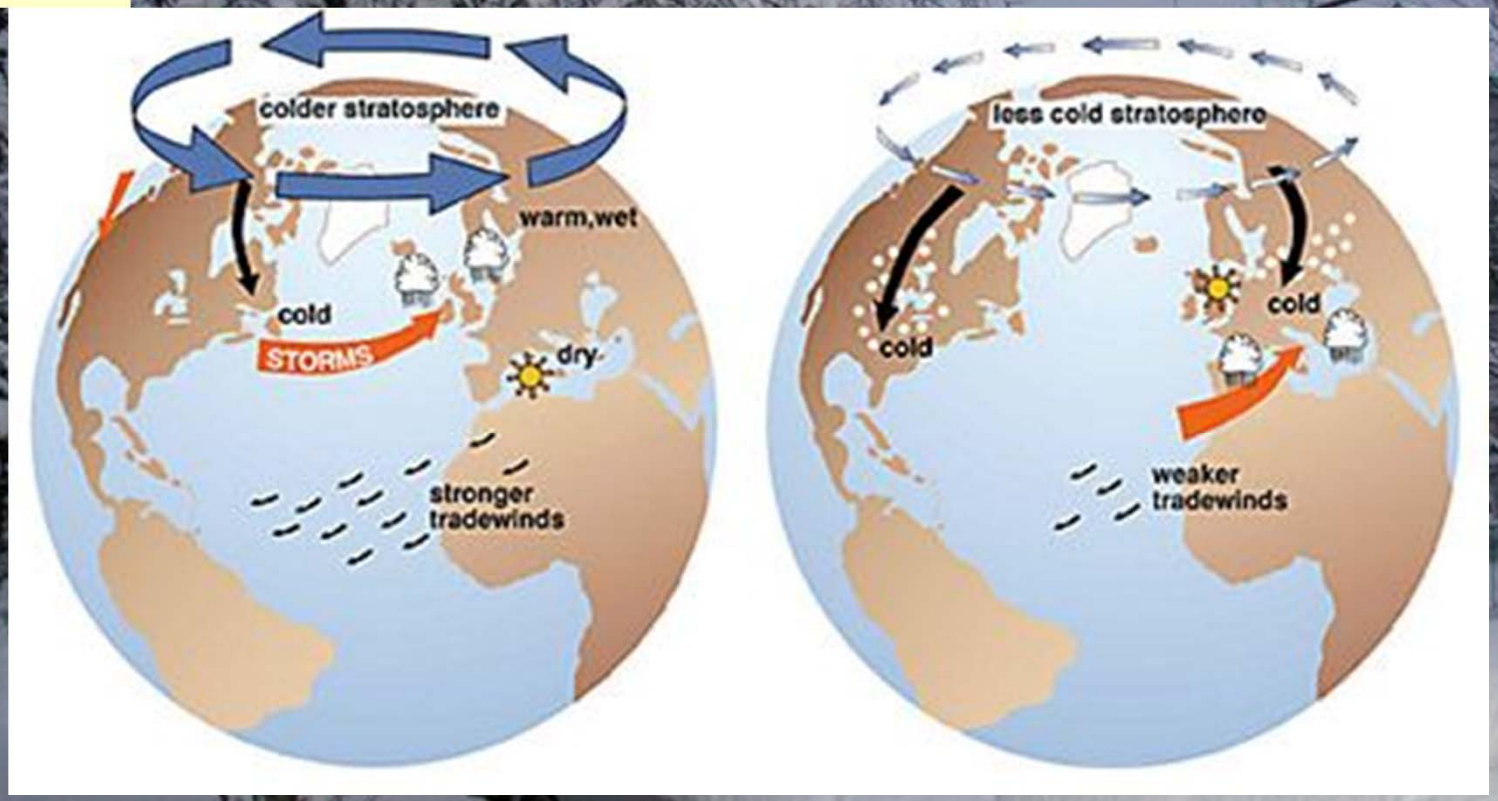
Linear regression of DJF 1948-2010 to Nino 3.4 1981-2010 climatology



NORTH ATLANTIC OSCILLATION/ ARCTIC OSCILLATION

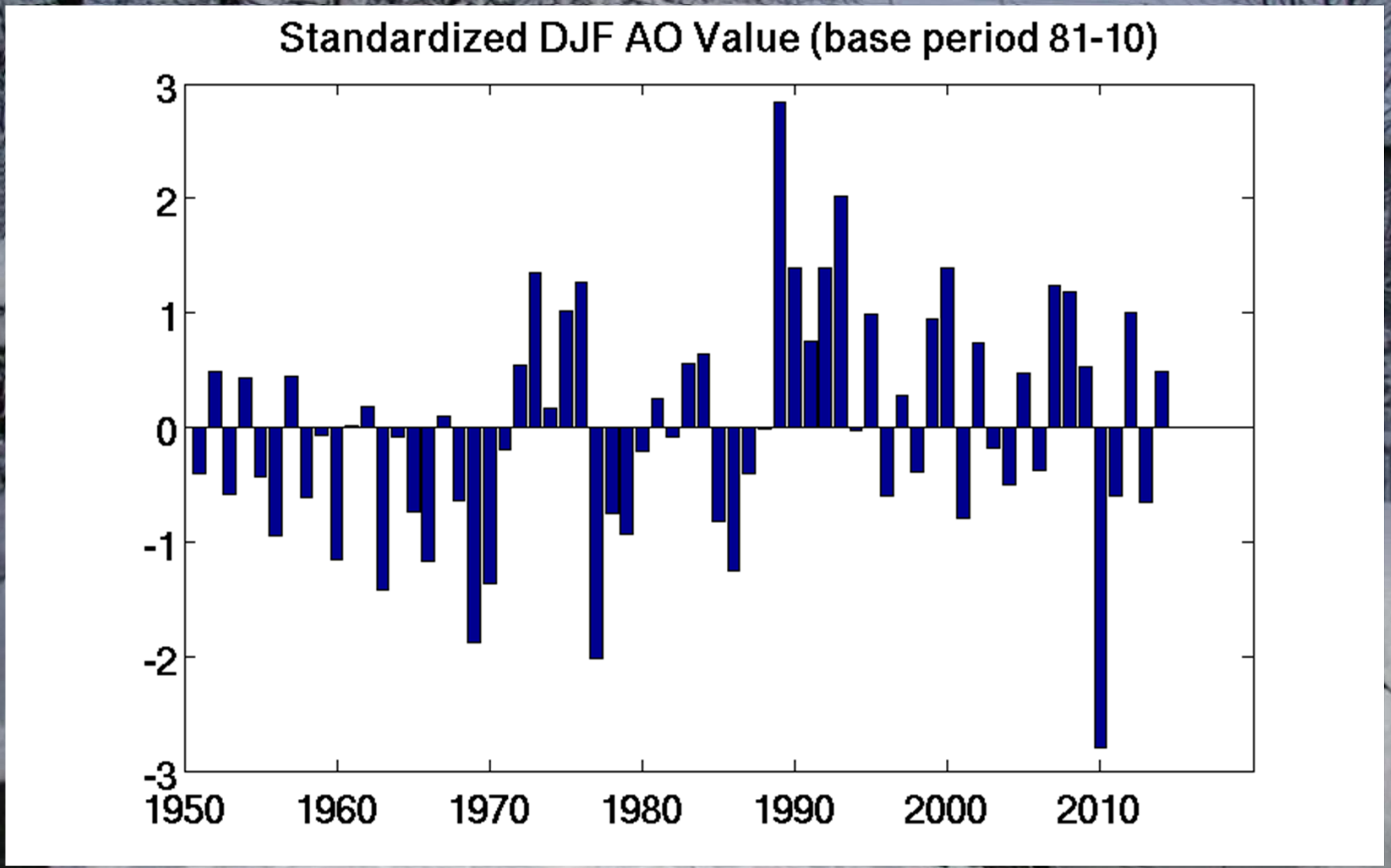
- A major source of intraseasonal variability over the U. S., Atlantic and Europe during winter.
- Modulates the circulation pattern over the high latitudes thereby regulating the number and intensity of significant weather events affecting the U.S., such as cold air outbreaks.
- Currently there is no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

Arctic Oscillation (AO)

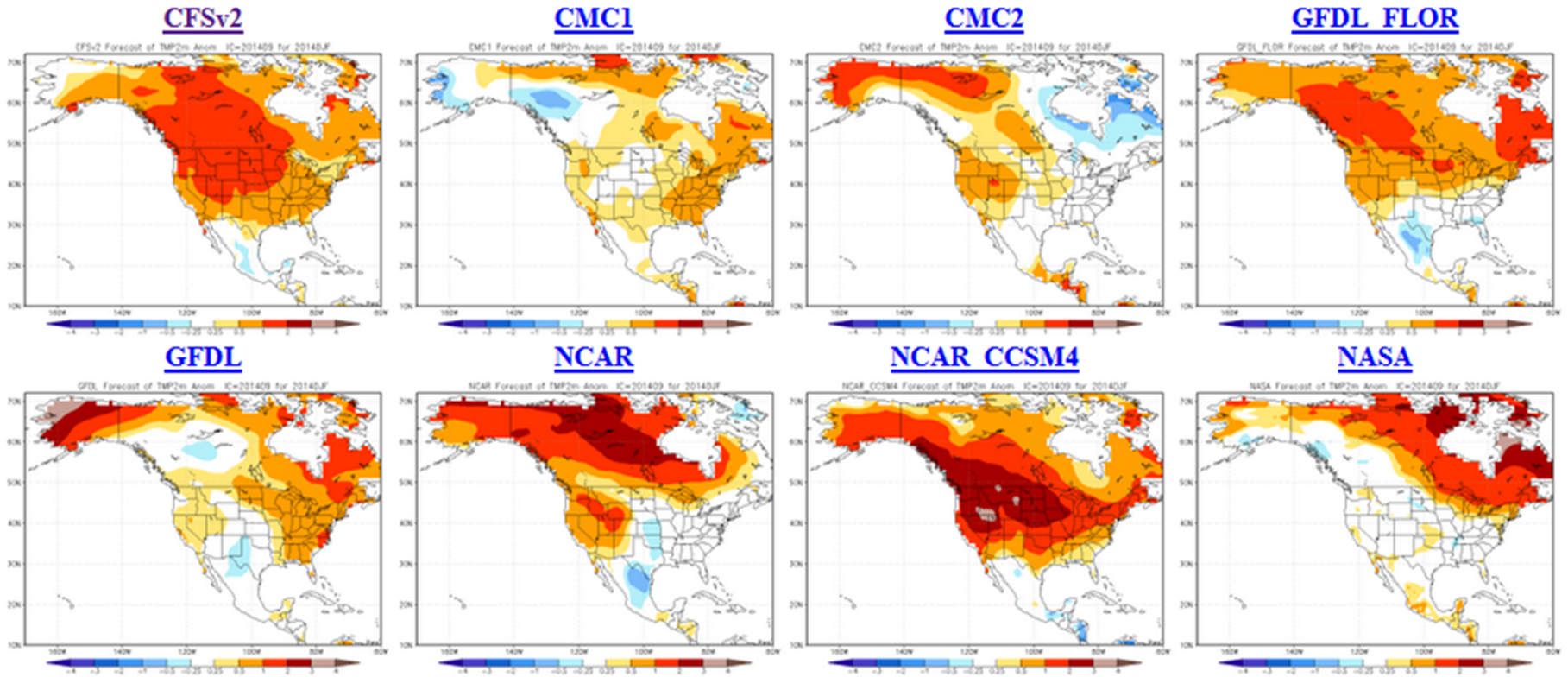


Positive Arctic Oscillation (left) and negative Arctic Oscillation (right).
Source: J. Wallace, University of Washington

NH Winter Arctic Oscillation (AO)

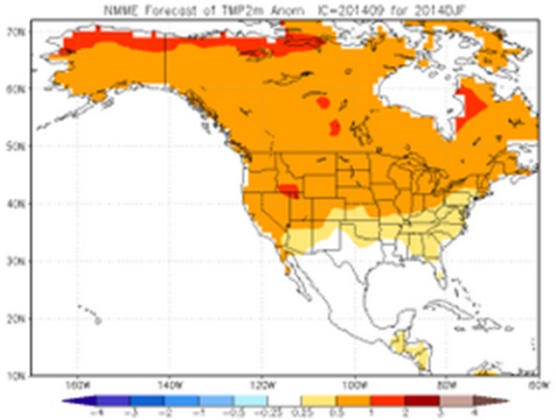


Individual NMME Model Forecasts DJF

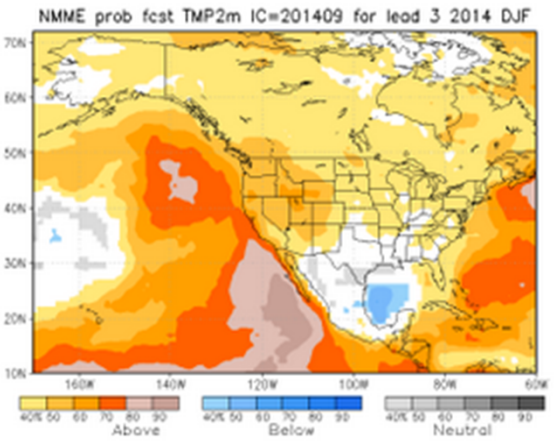


National and International Multi-Model Ensemble

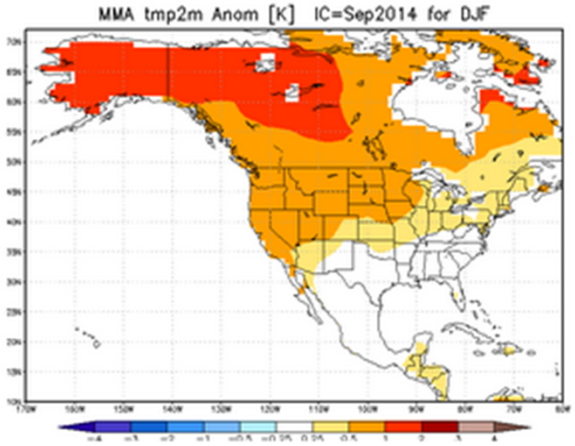
NMME



Prob fcst



IMME

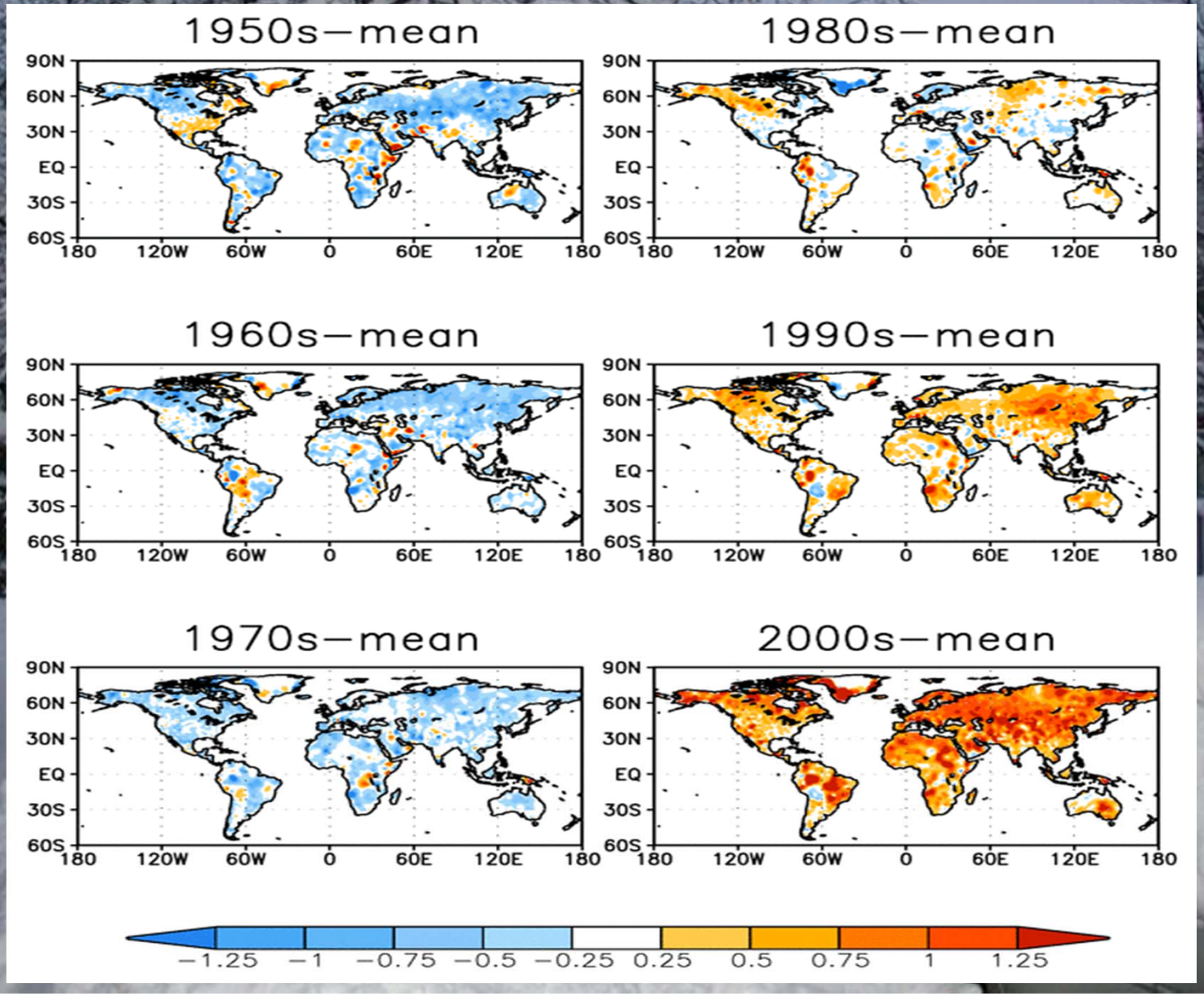


Forecast updated Sept. 9, 2014

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 10 years and the 30 year climatology.

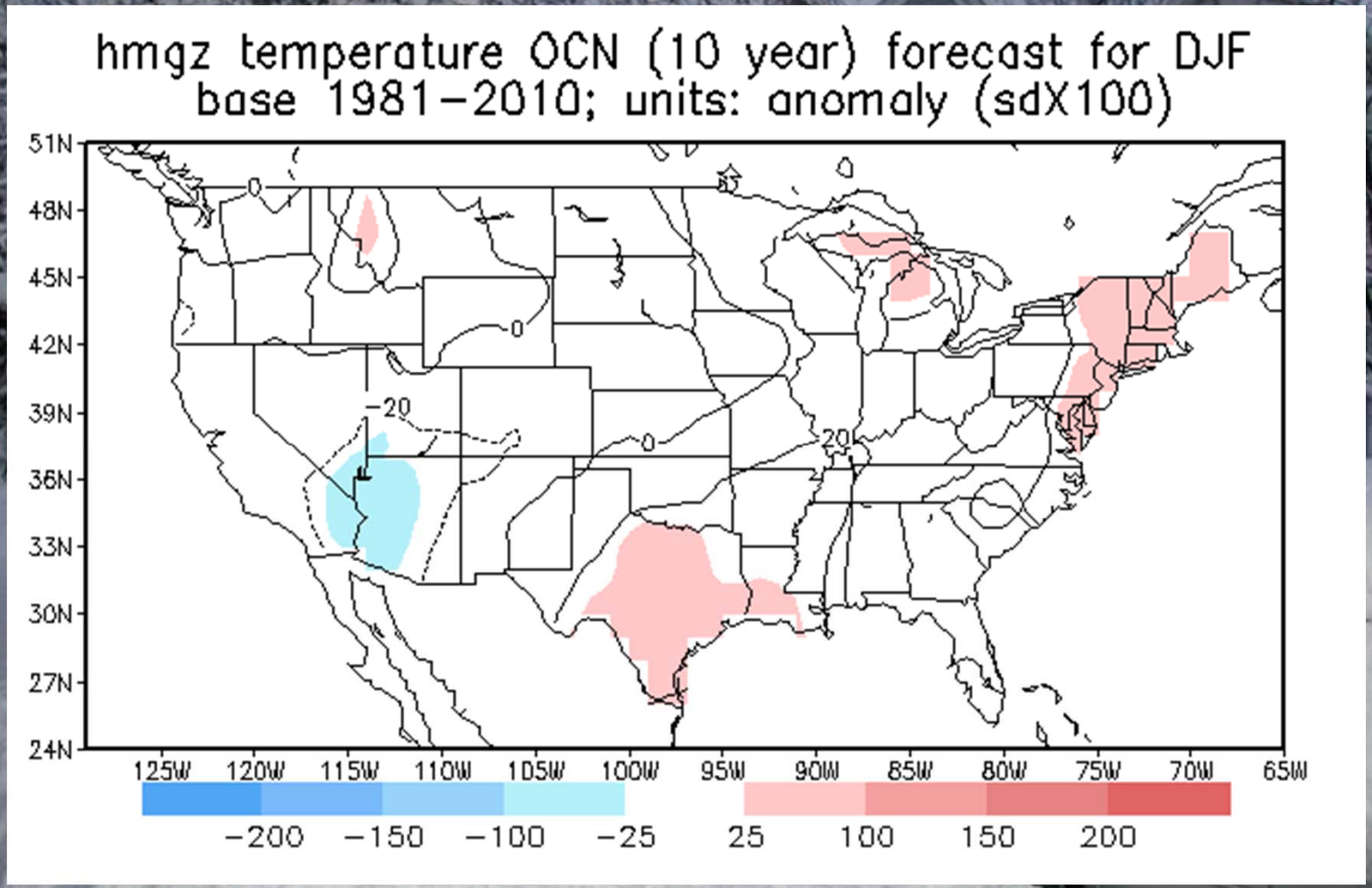
Global Land Decadal Trends



GHCN-CAMS FAN 2008

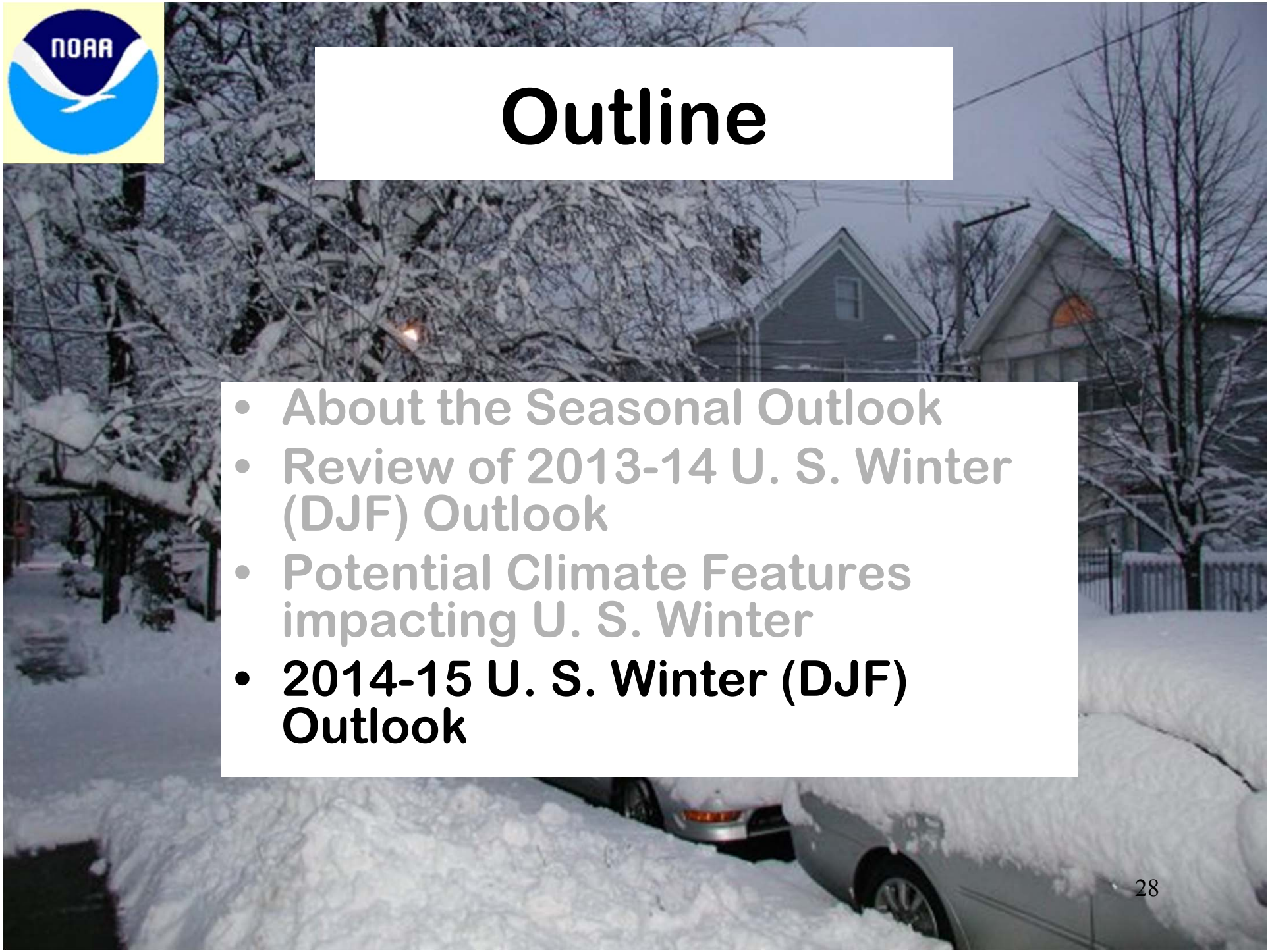
December - February OCN

1999-2013



Winter 2014-15 Outlook Rationale

- 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.



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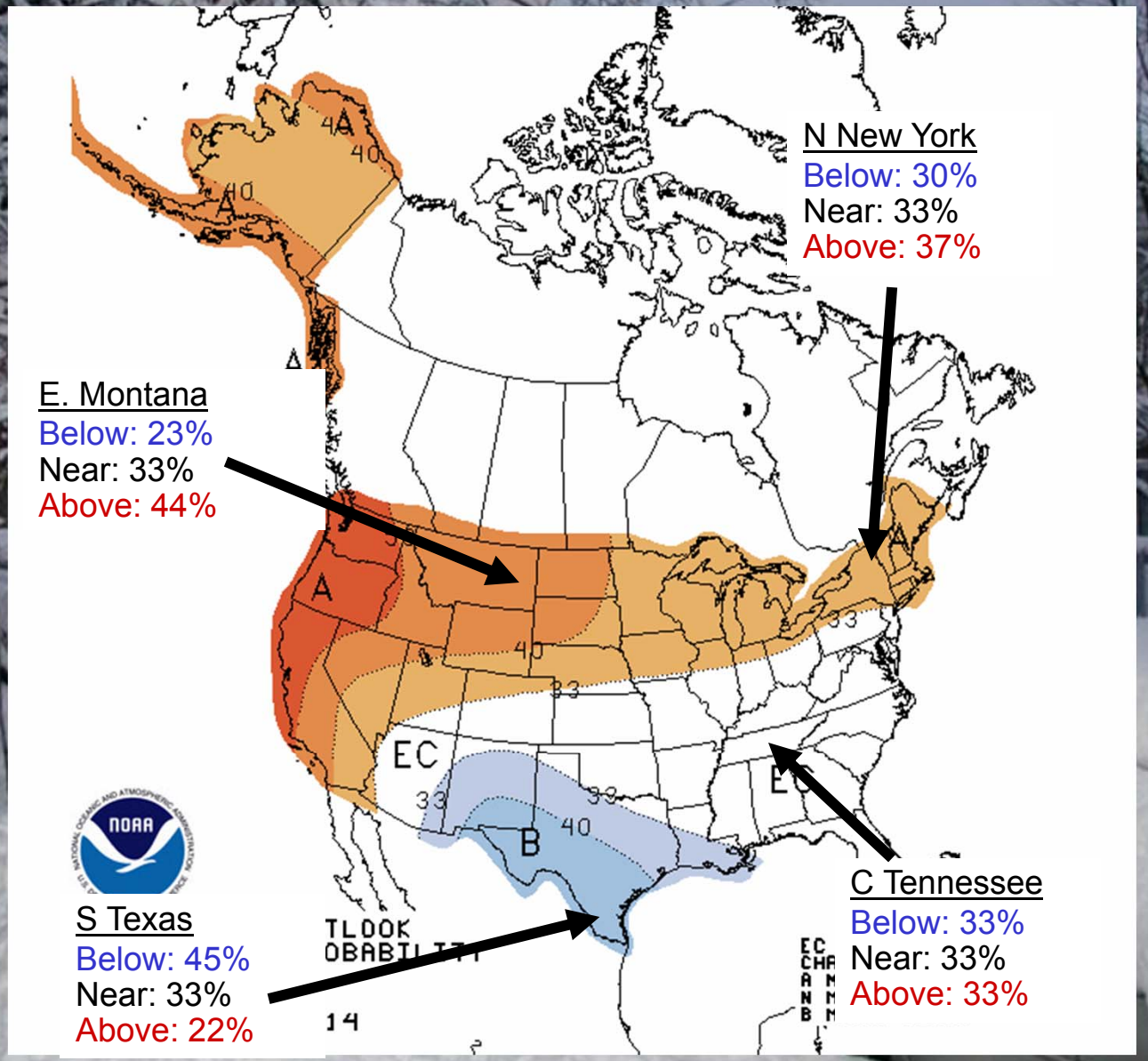
December 2014 – February 2015 Temperature Outlook



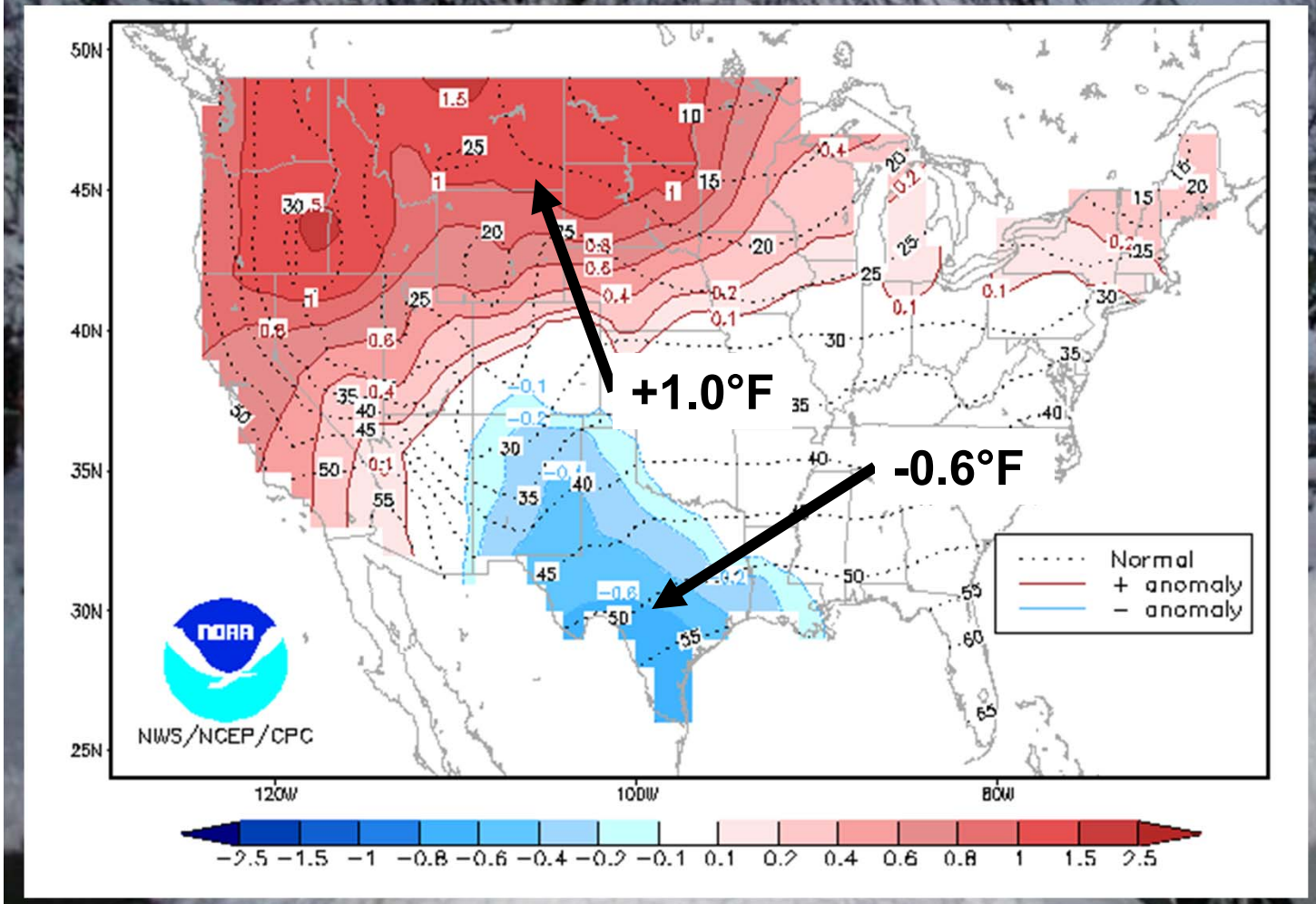
N New York
Below: 30%
Near: 33%
Above: 37%

E. Montana
Below: 23%
Near: 33%
Above: 44%

S Texas
Below: 45%
Near: 33%
Above: 22%

C Tennessee
Below: 33%
Near: 33%
Above: 33%

Average Departure of Mid-Value Temperature Outlook Distribution

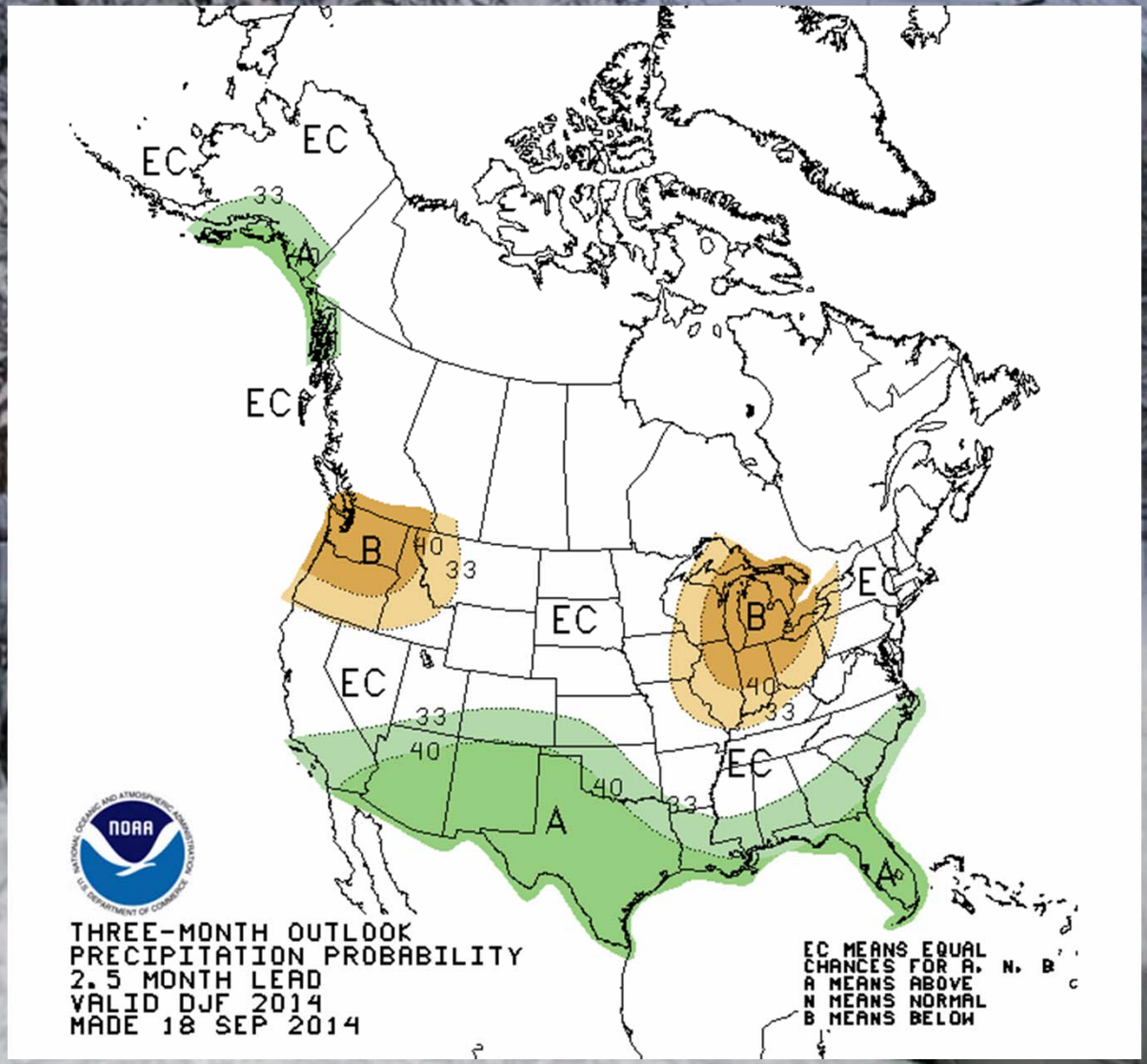


HDD Projections:

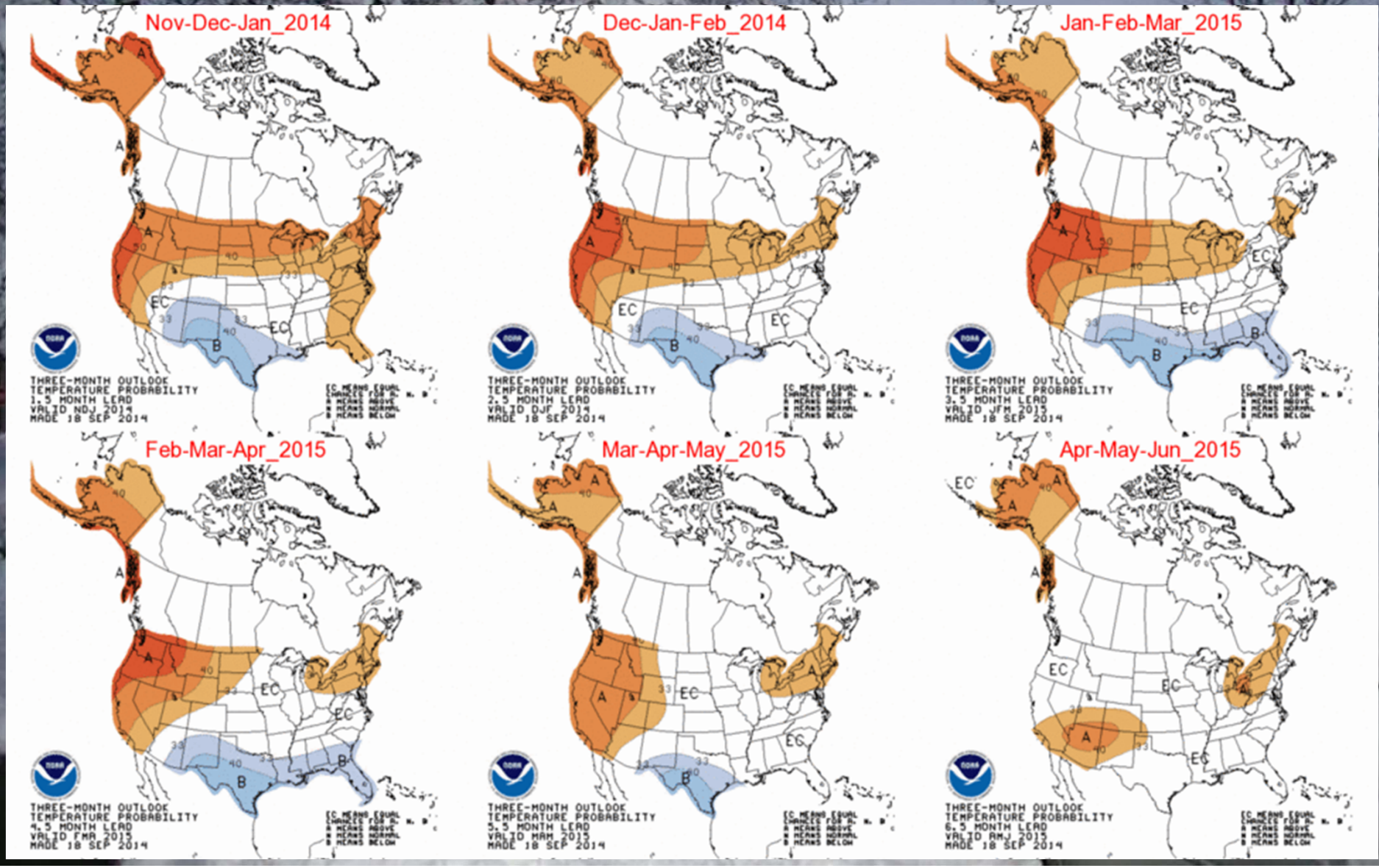
~1.0% less than 1981-2010

~8.5% less than 2013-14

December 2014 – February 2015 Precipitation Outlook



Seasonal Temperature Outlooks
NDJ 2014-15 – AMJ 2015



U. S. Winter 2014-15 Outlook: Forecast Summary

Odds favor:

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