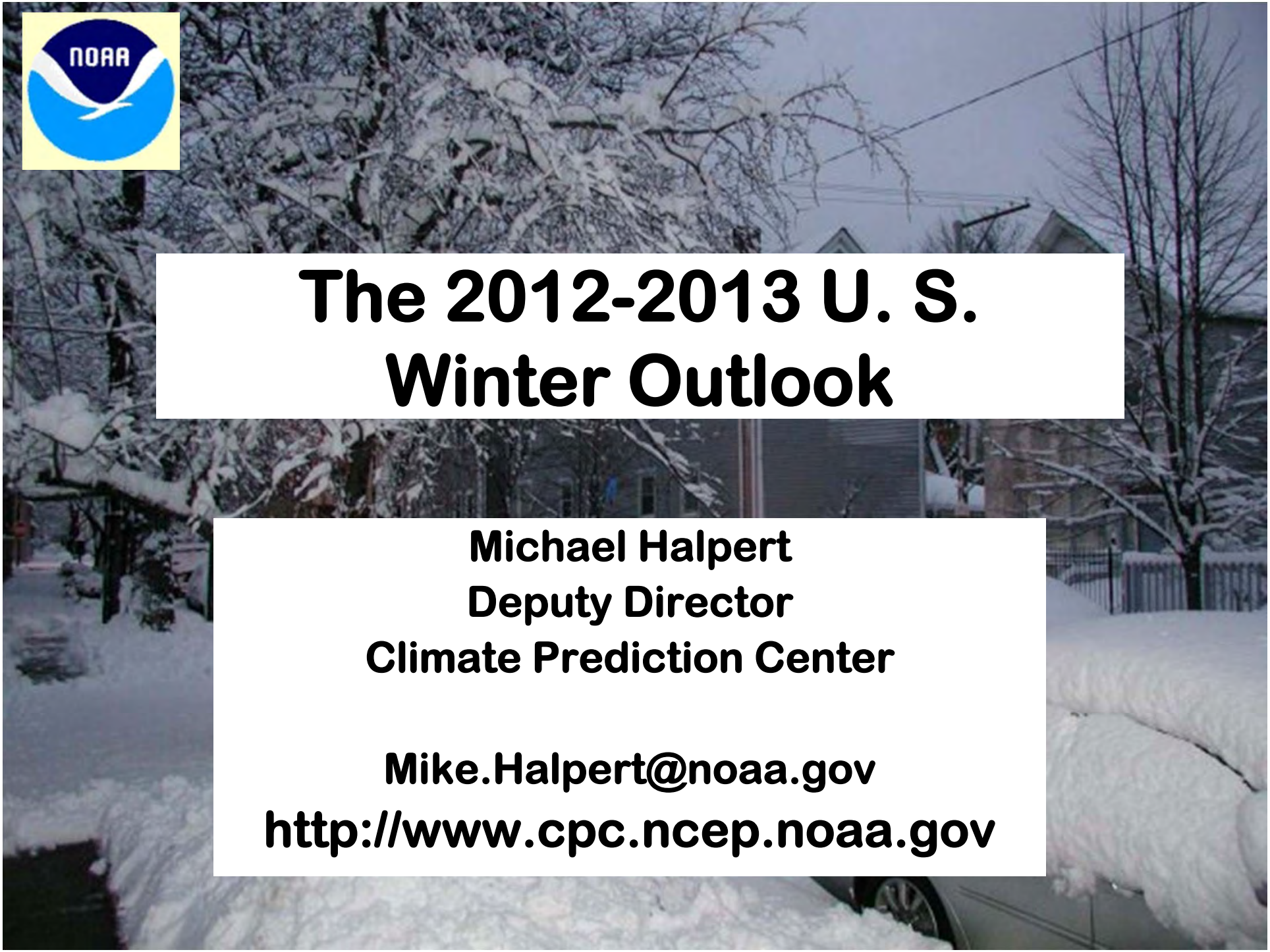
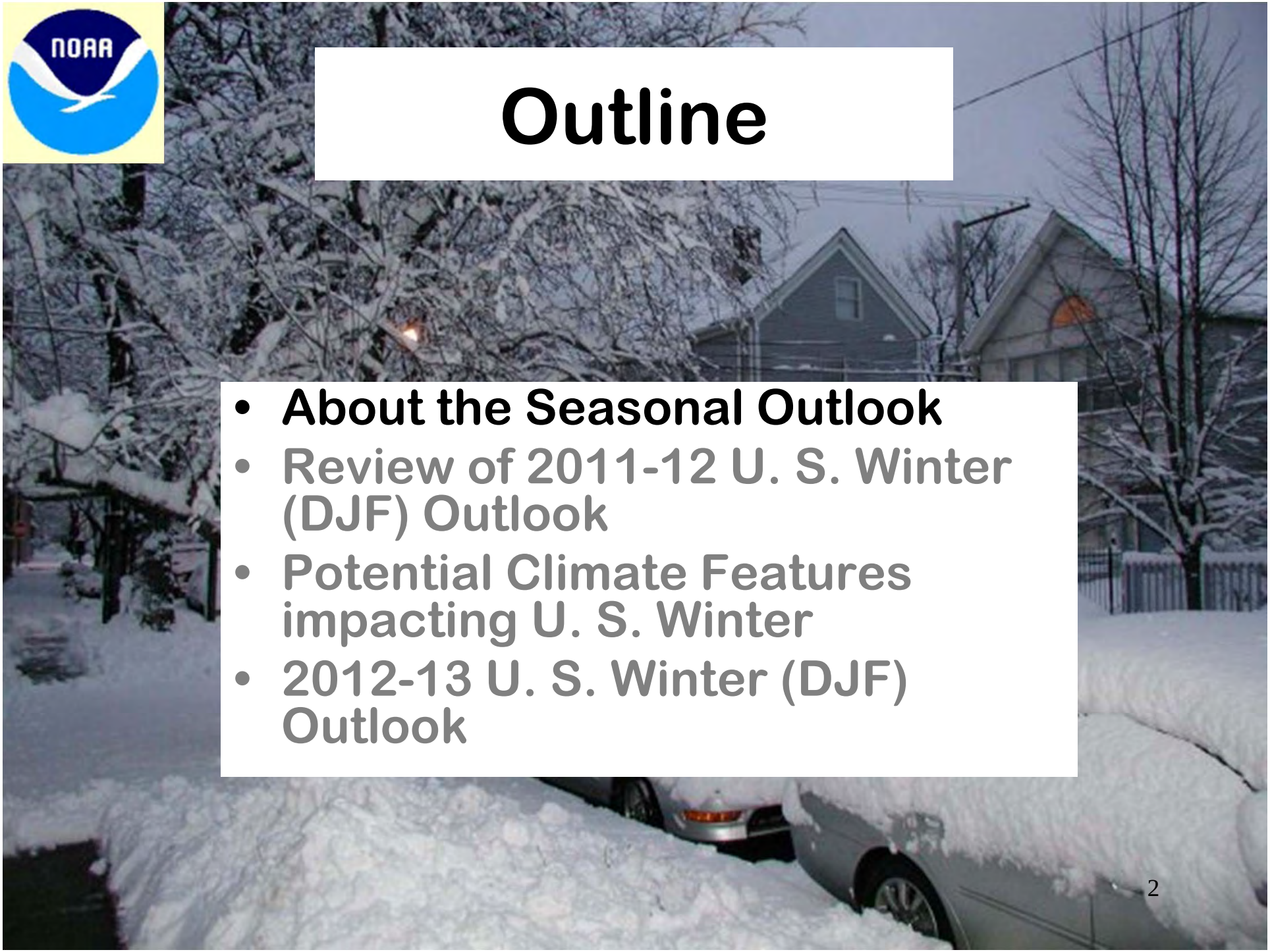


The 2012-2013 U. S. Winter Outlook

Michael Halpert
Deputy Director
Climate Prediction Center

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



Outline

- **About the Seasonal Outlook**
- Review of 2011-12 U. S. Winter (DJF) Outlook
- Potential Climate Features impacting U. S. Winter
- 2012-13 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.

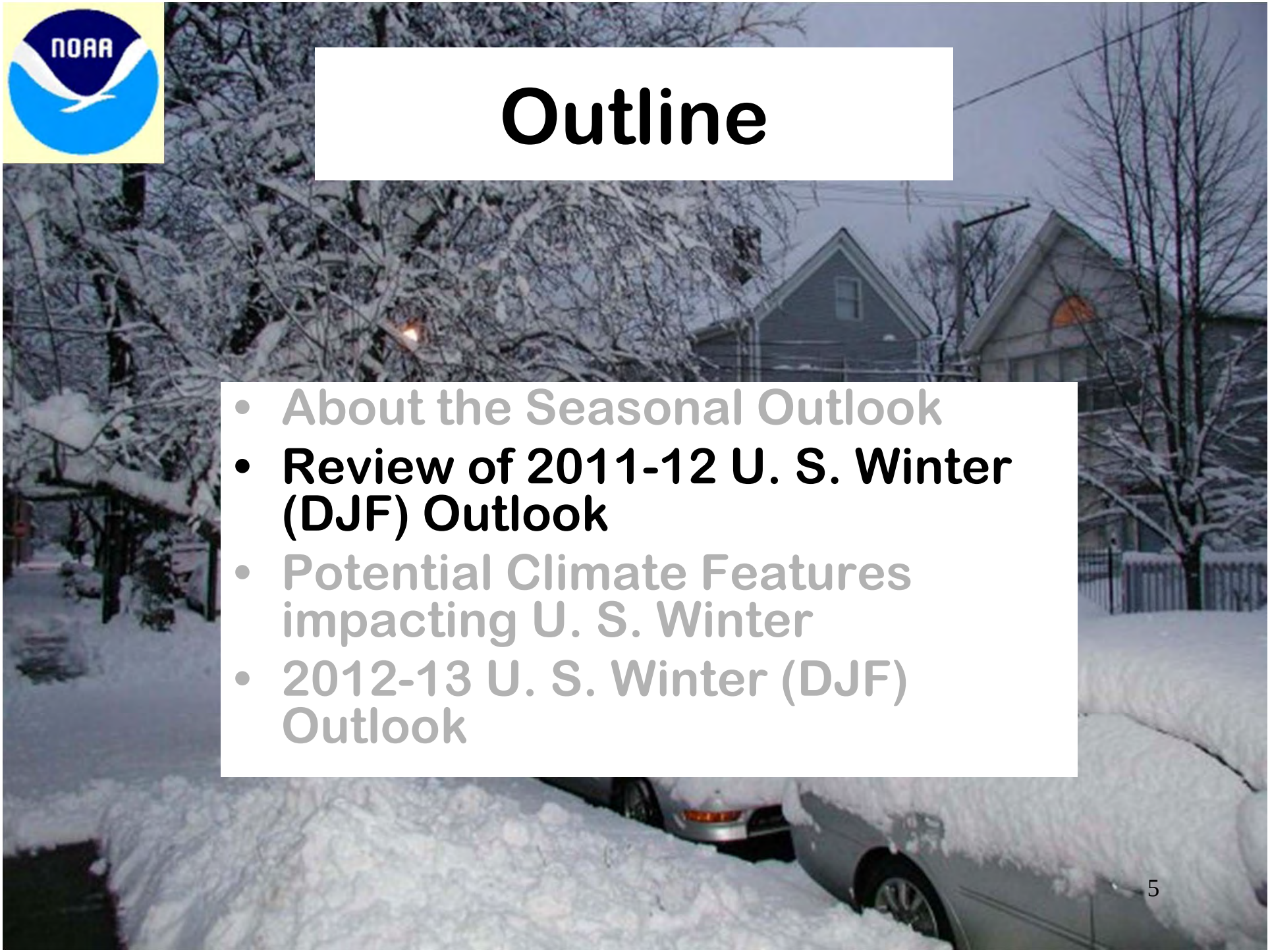
About the Seasonal Outlook

- 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 18

  Final Winter Outlook: November 15

- 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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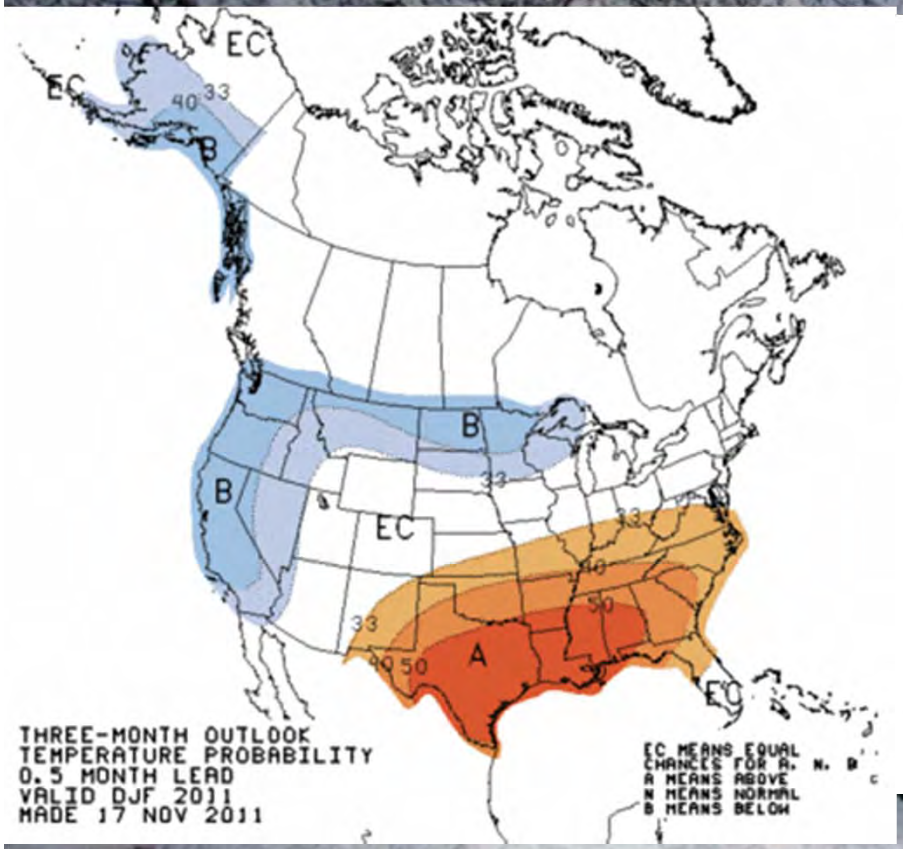
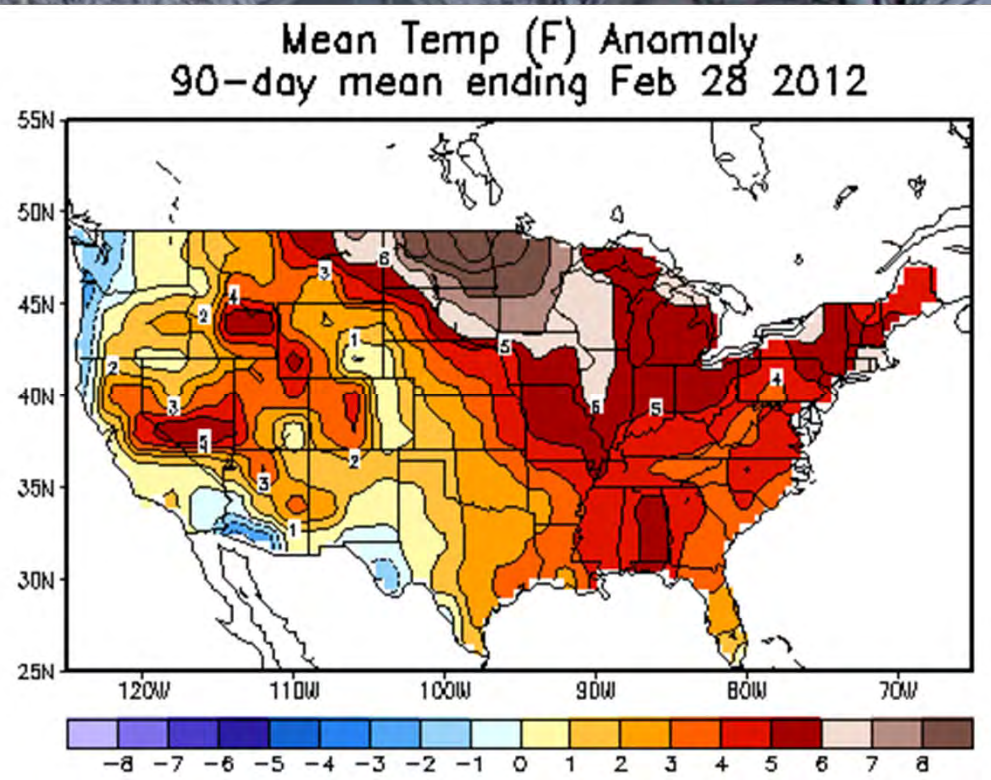
Winter 2011-12 Outlook Rationale (from Oct. 2011)

- 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.

Dec 2011 – Feb 2012 Temperature

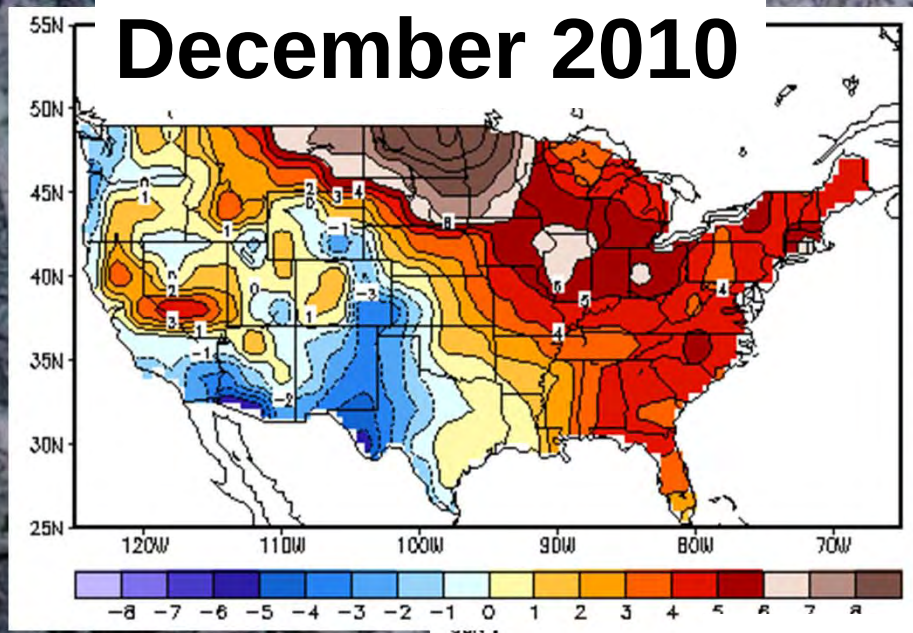




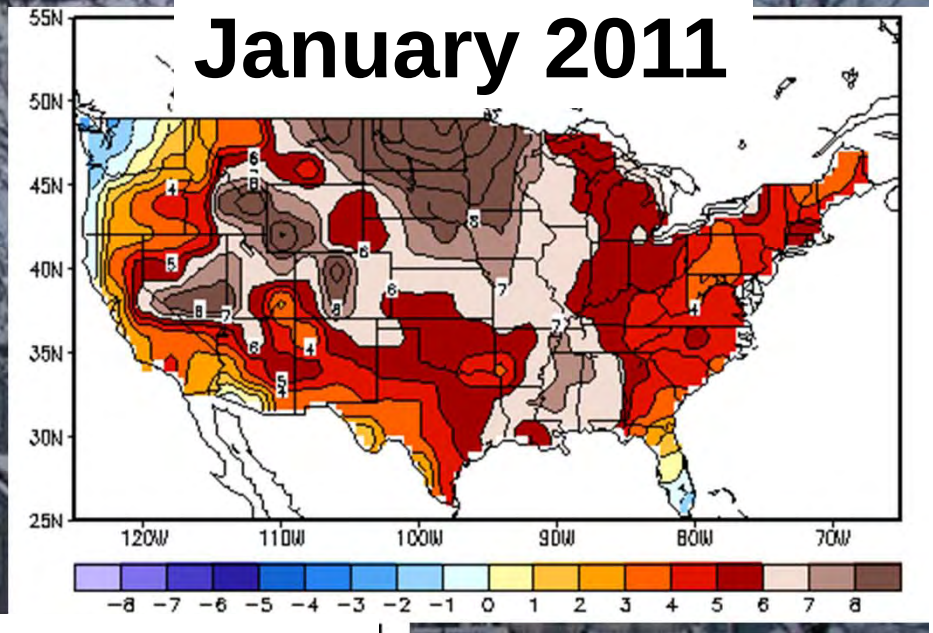
Heidke = 23.5, Coverage = 62%

Monthly Temperature Anomalies (°F)

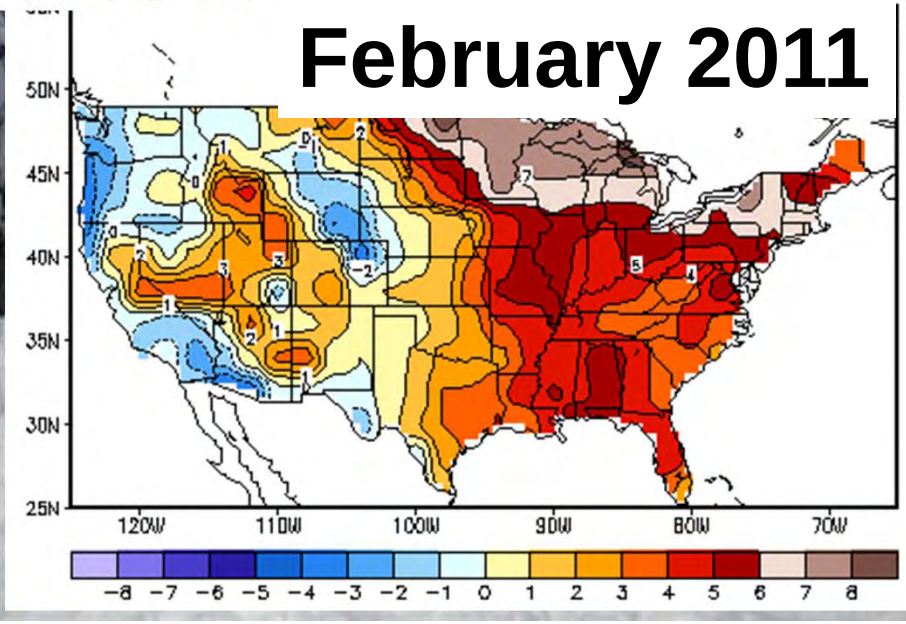
December 2010



January 2011

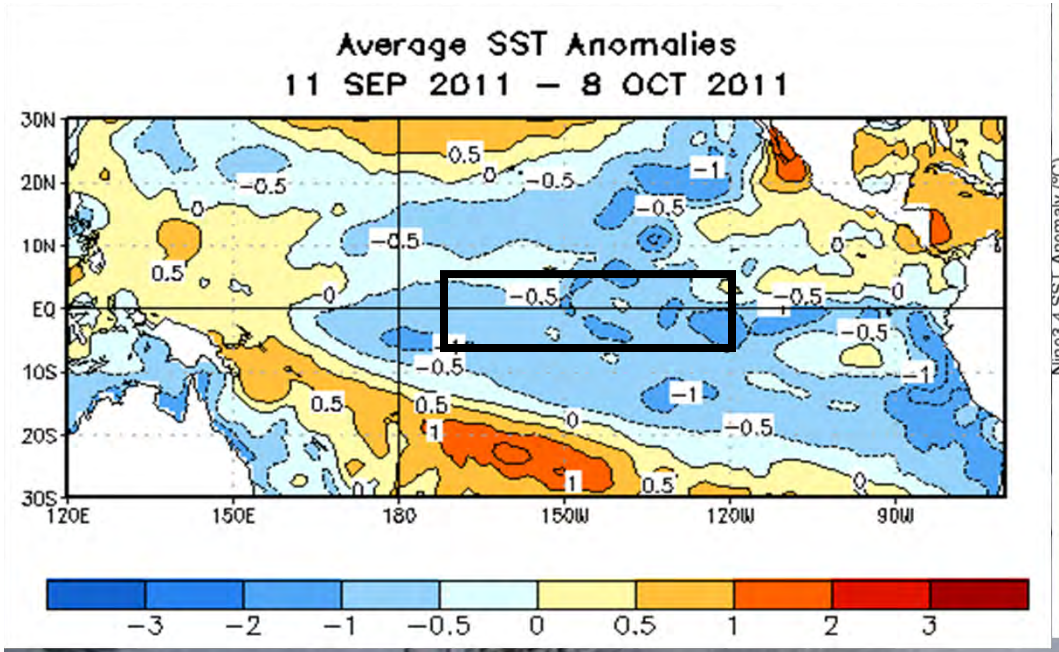


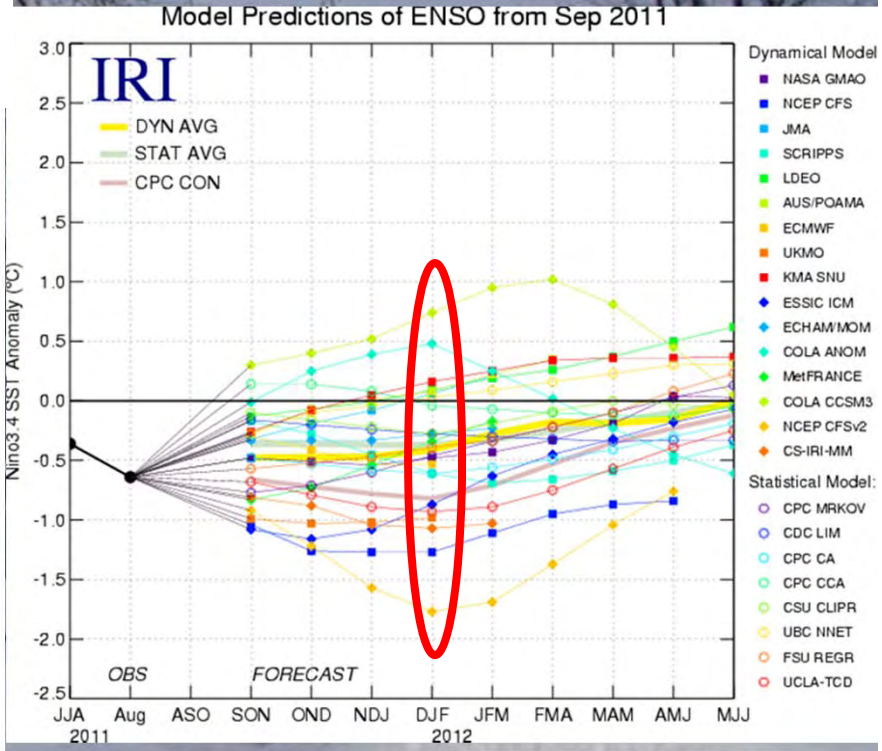
February 2011



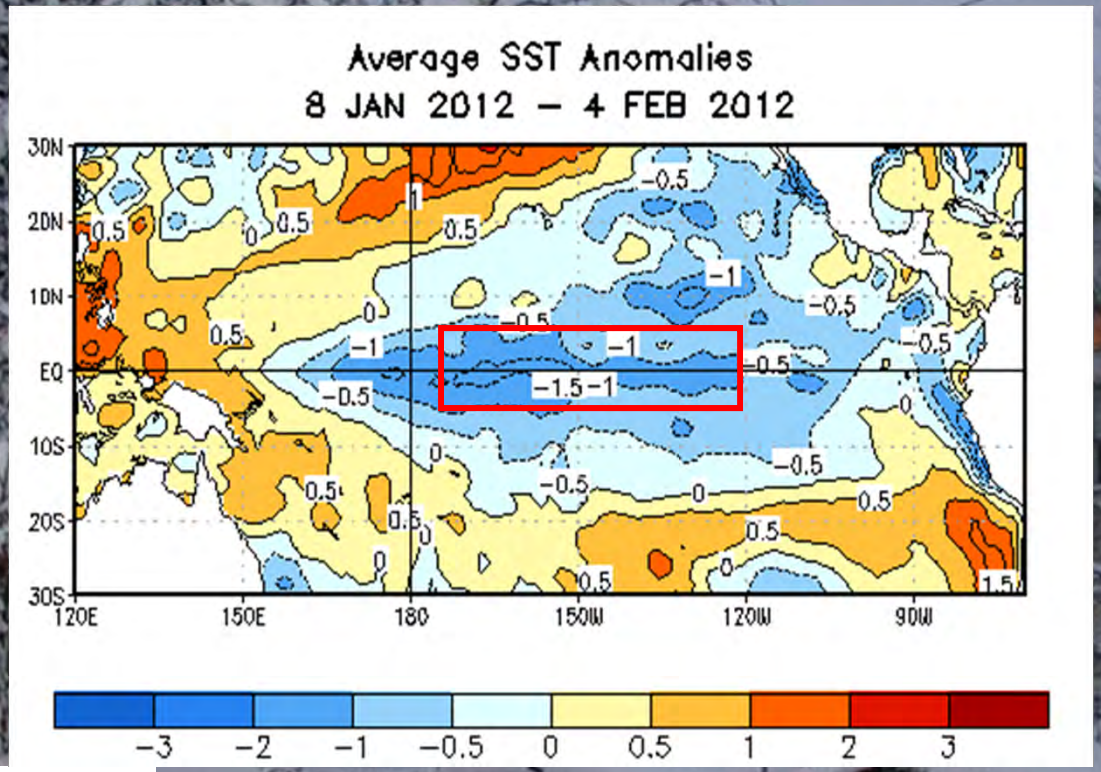
Current ENSO Status

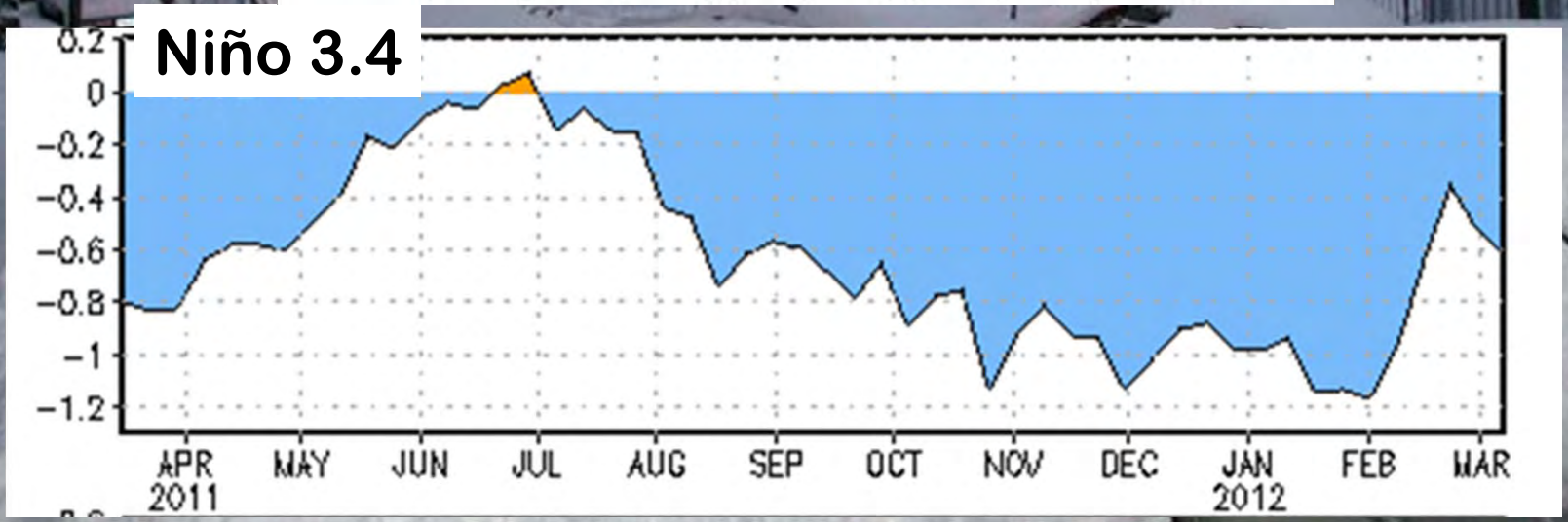
SST Departures (°C)



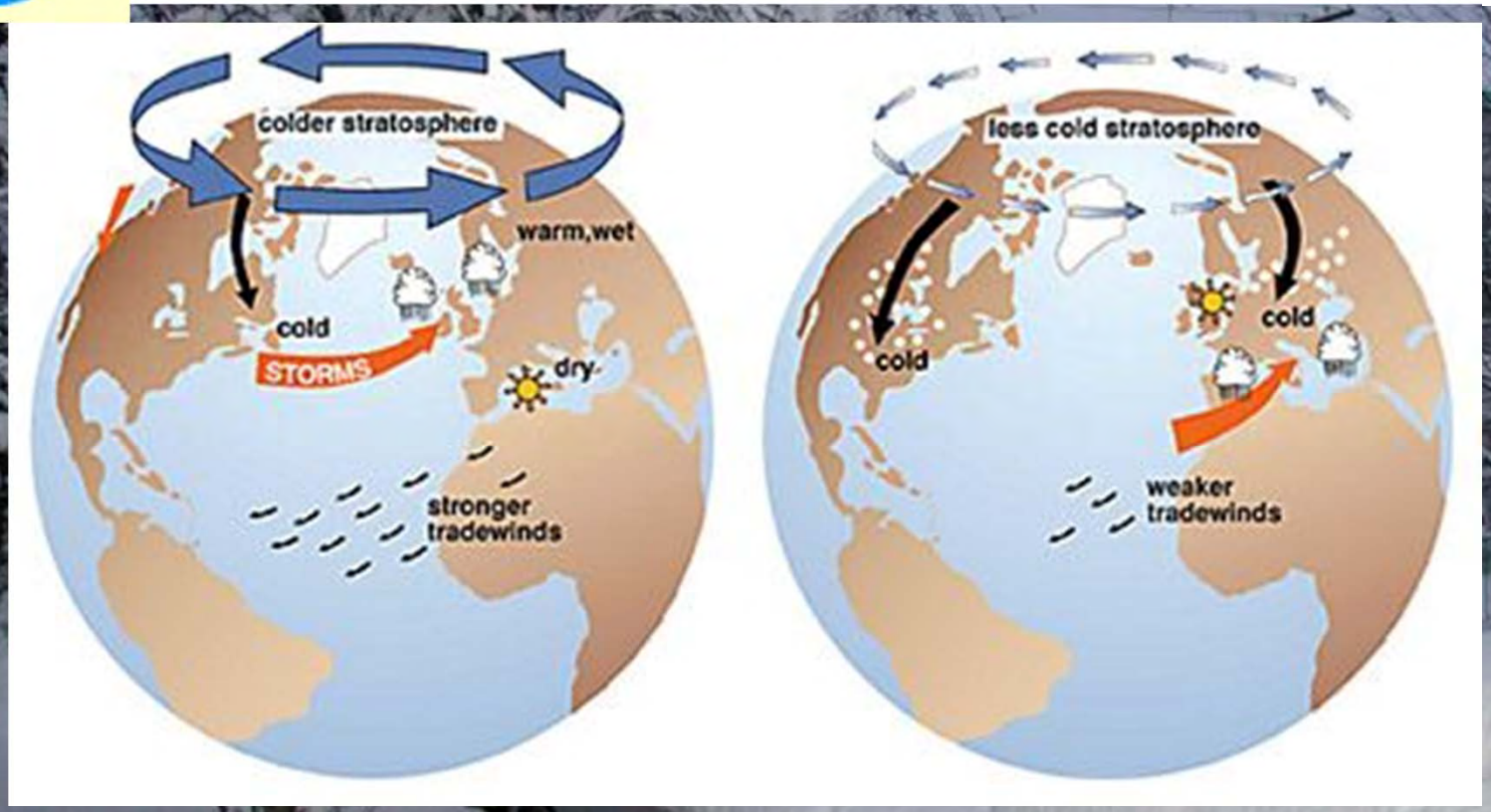


SST Departures (°C) February 2012



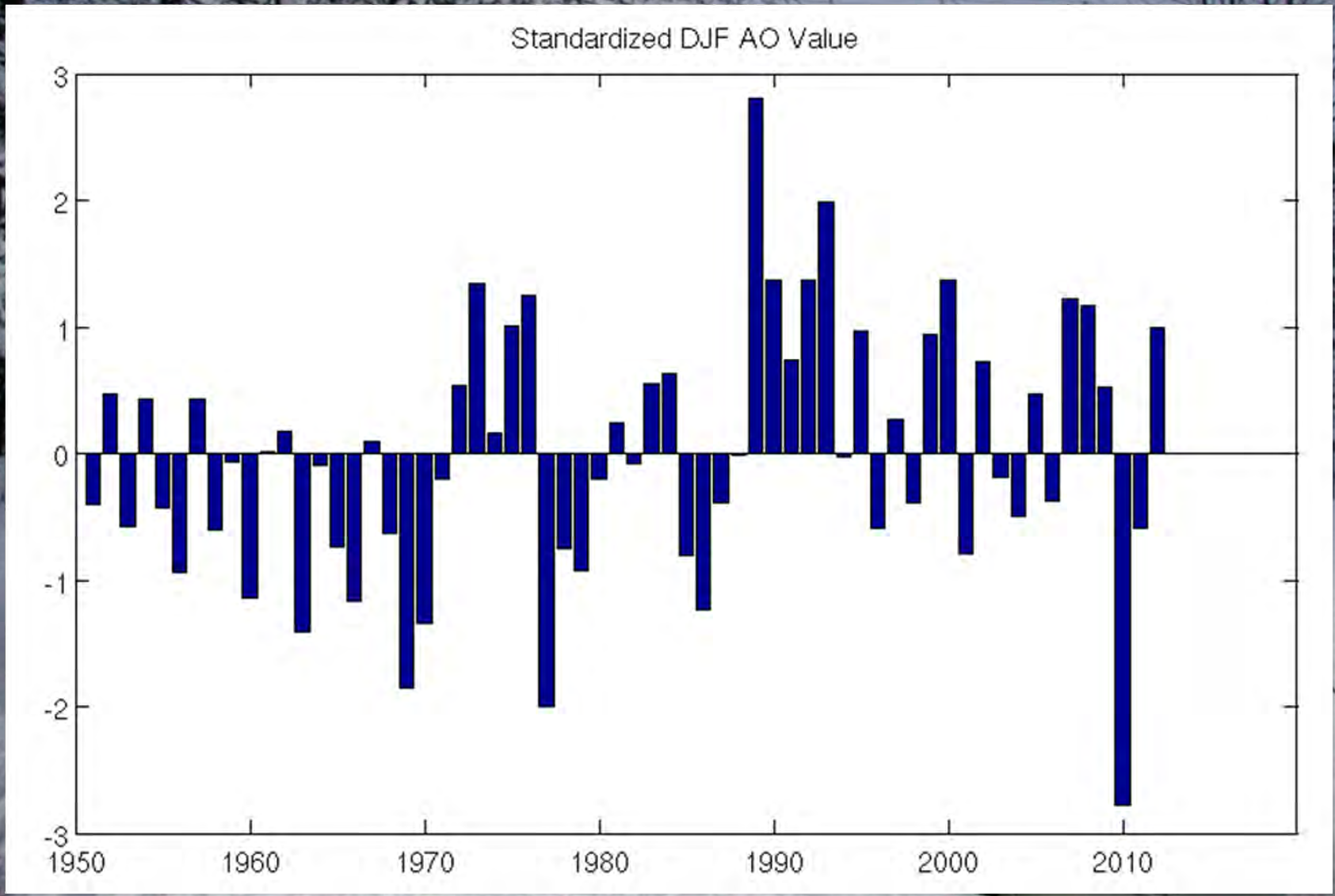


Arctic Oscillation (AO)

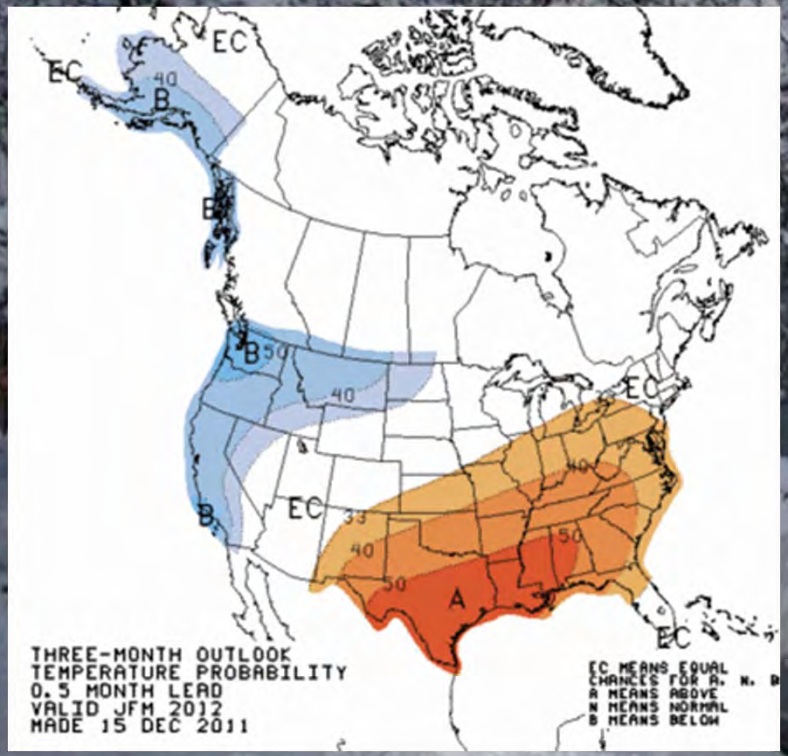


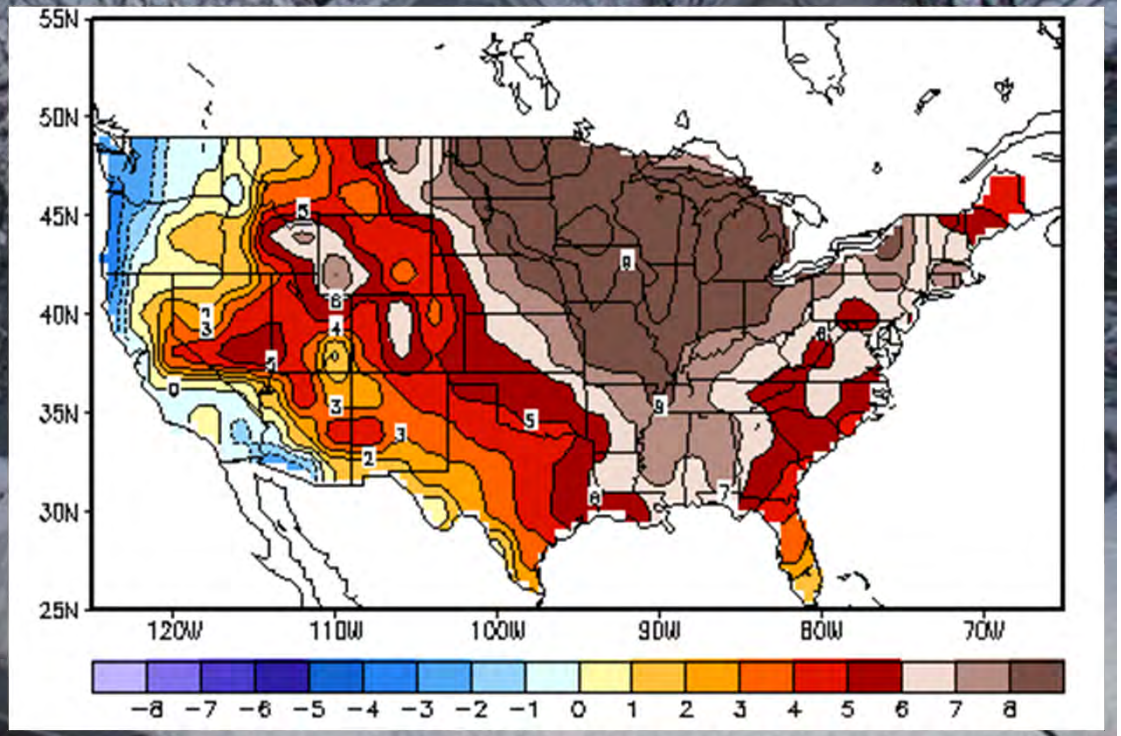
Positive Arctic Oscillation (left) and negative Arctic Oscillation (right).
Source: J. Wallace, University of Washington

NH Winter Arctic Oscillation (AO)



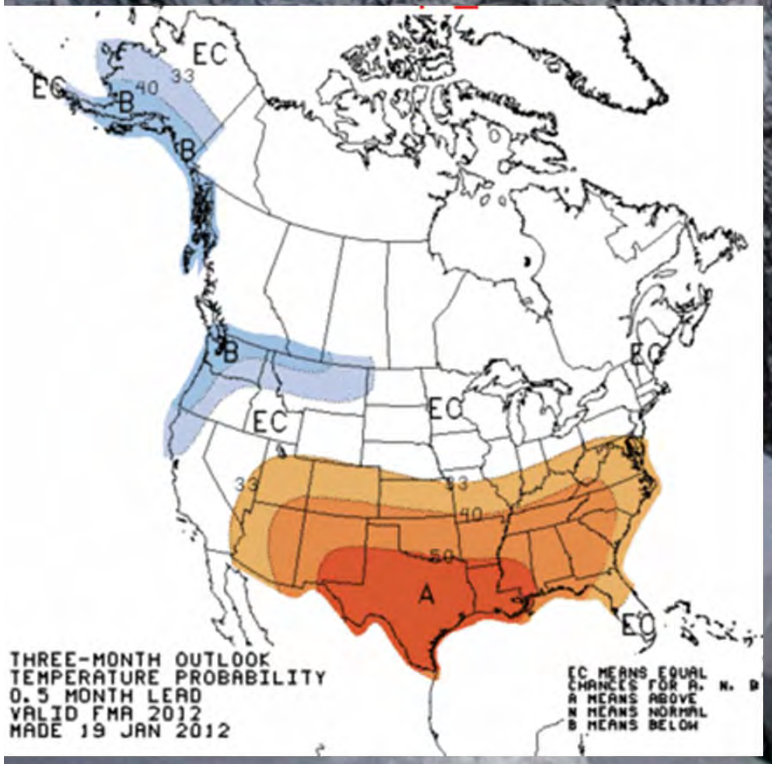
Review
January – March 2012

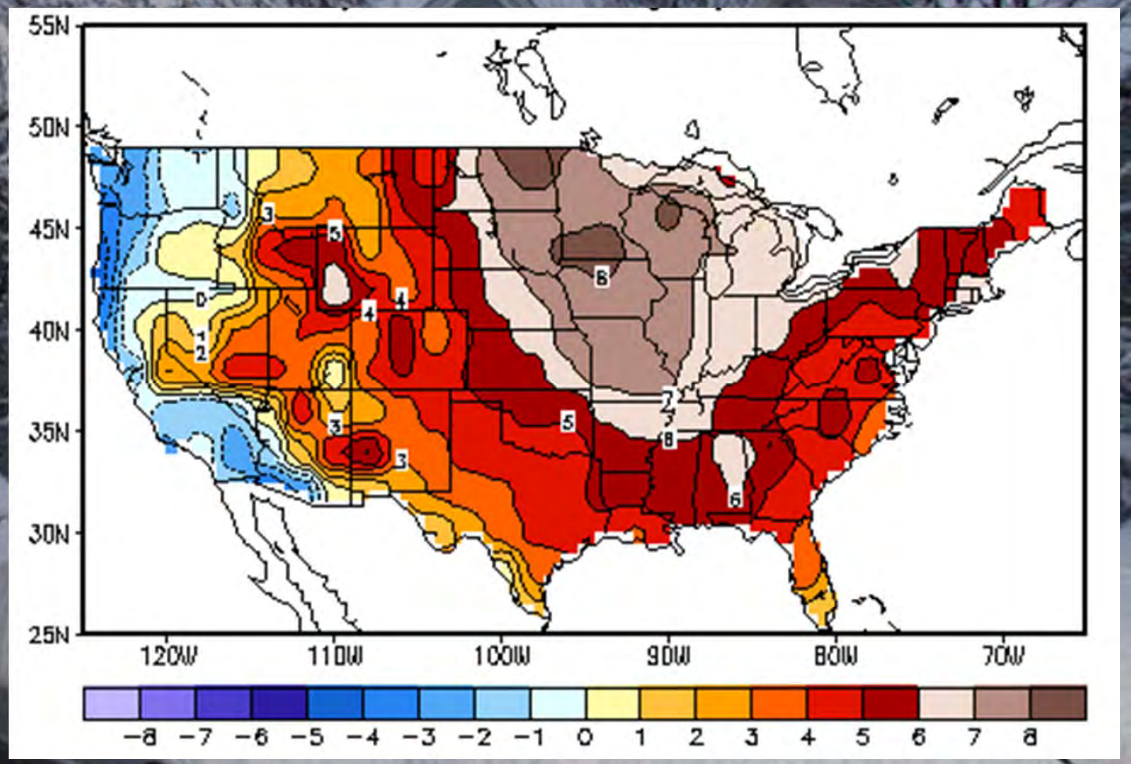




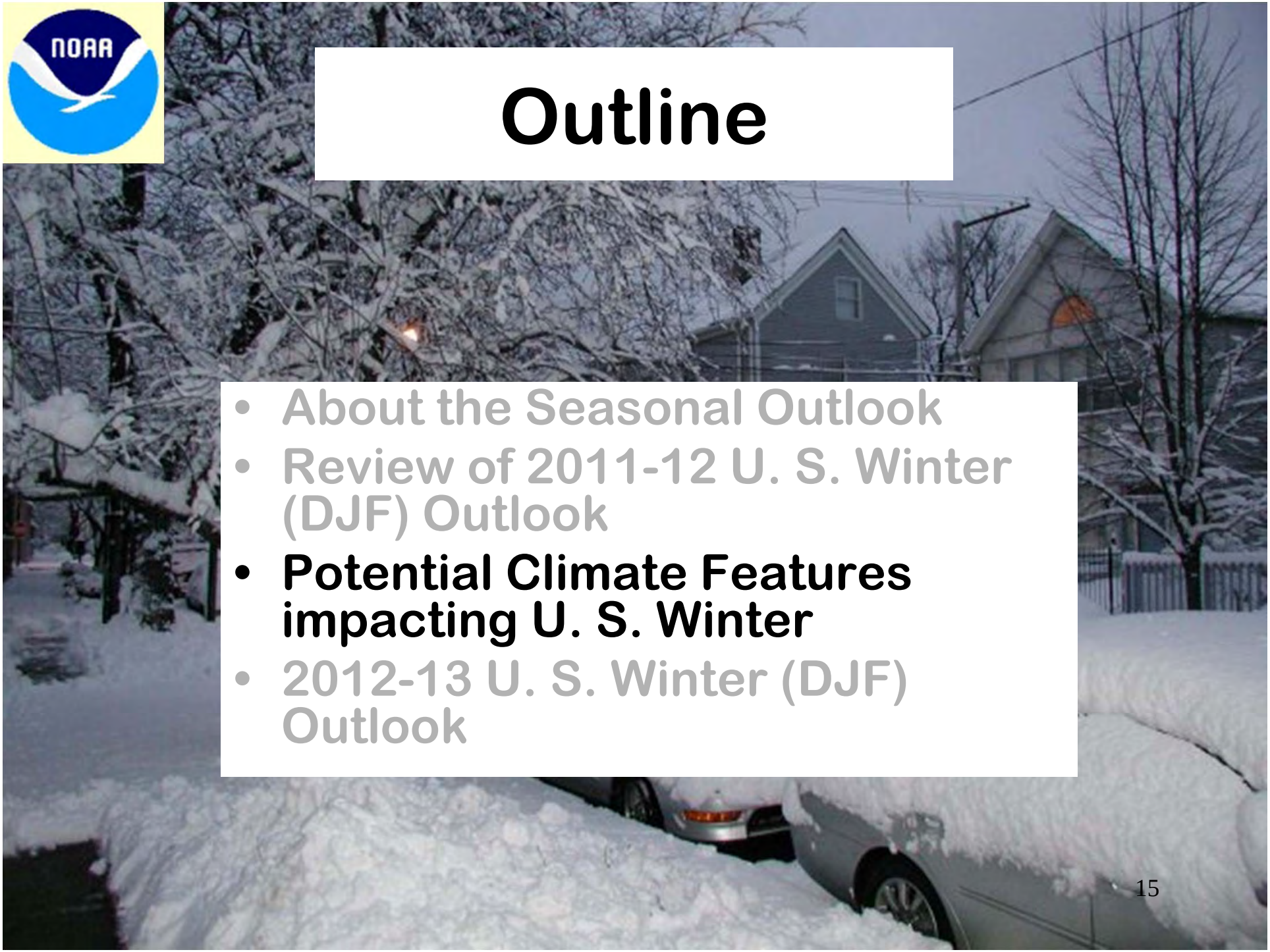
Heidke = 55, Coverage = 63%

Review
February - April 2011





Heidke = 76, Coverage = 54%



Outline

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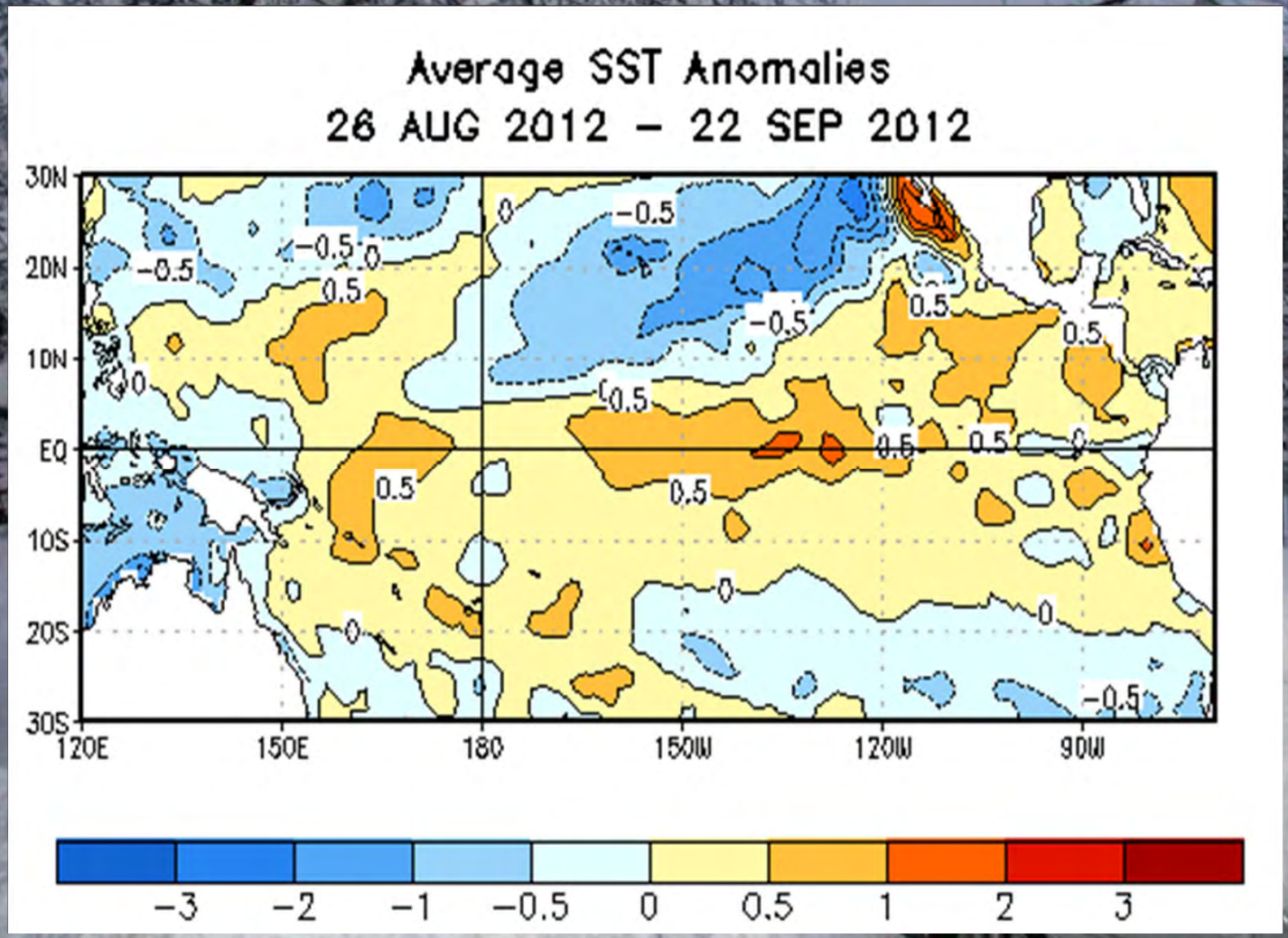
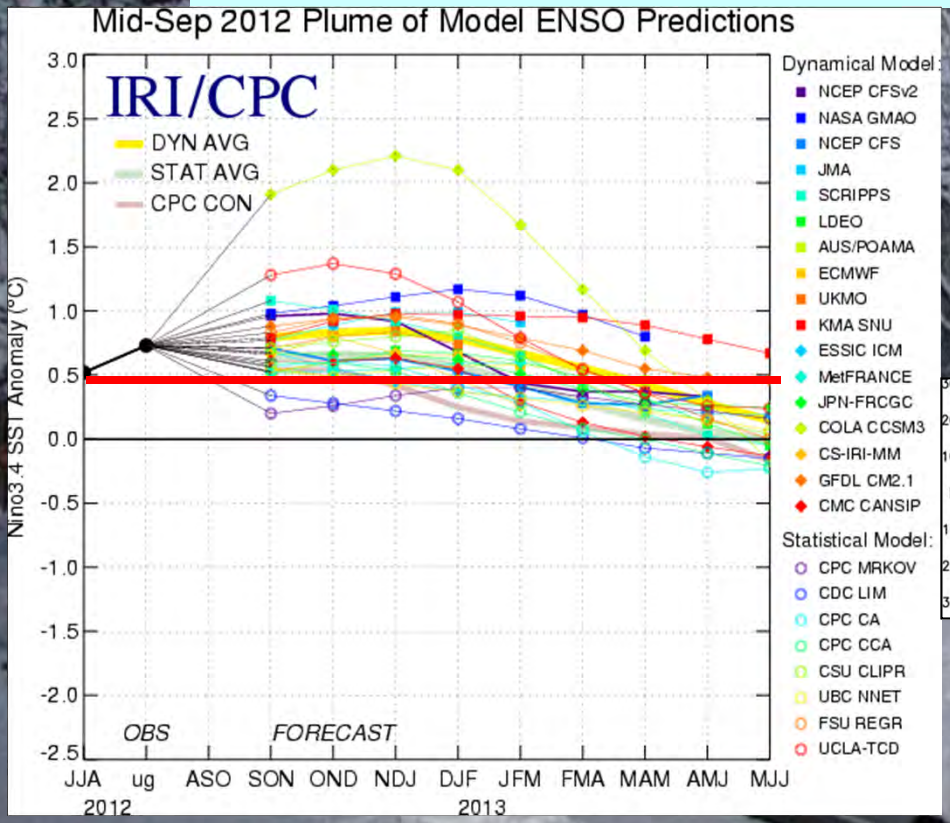
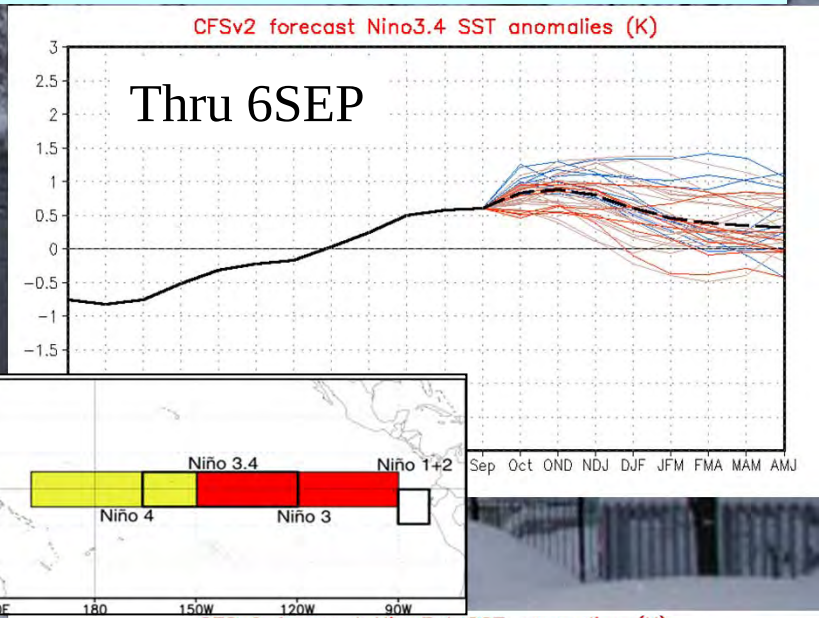
Borderline ENSO-neutral/ weak El Niño conditions are expected to continue into Northern Hemisphere winter 2012-13, possibly strengthening during the next few months.



Pacific Niño 3.4 SST Outlook

• Nearly all of the models predict El Niño during the Northern Hemisphere fall, with most models predicting El Niño to continue into December-February 2012-13.





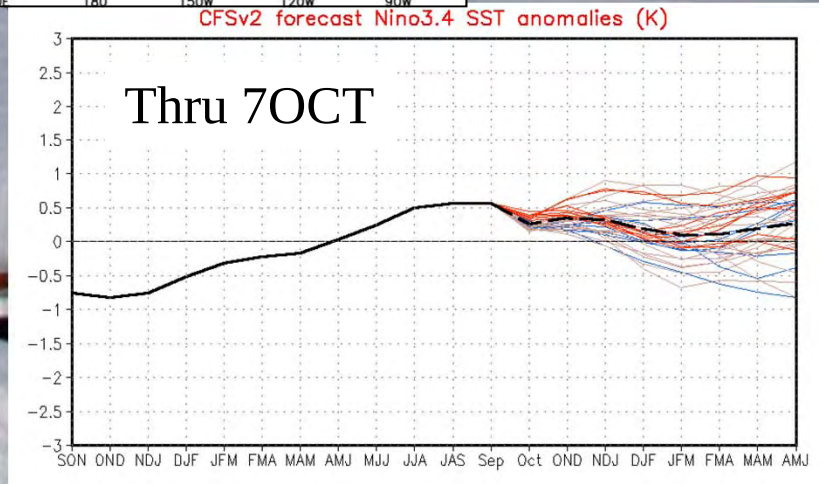
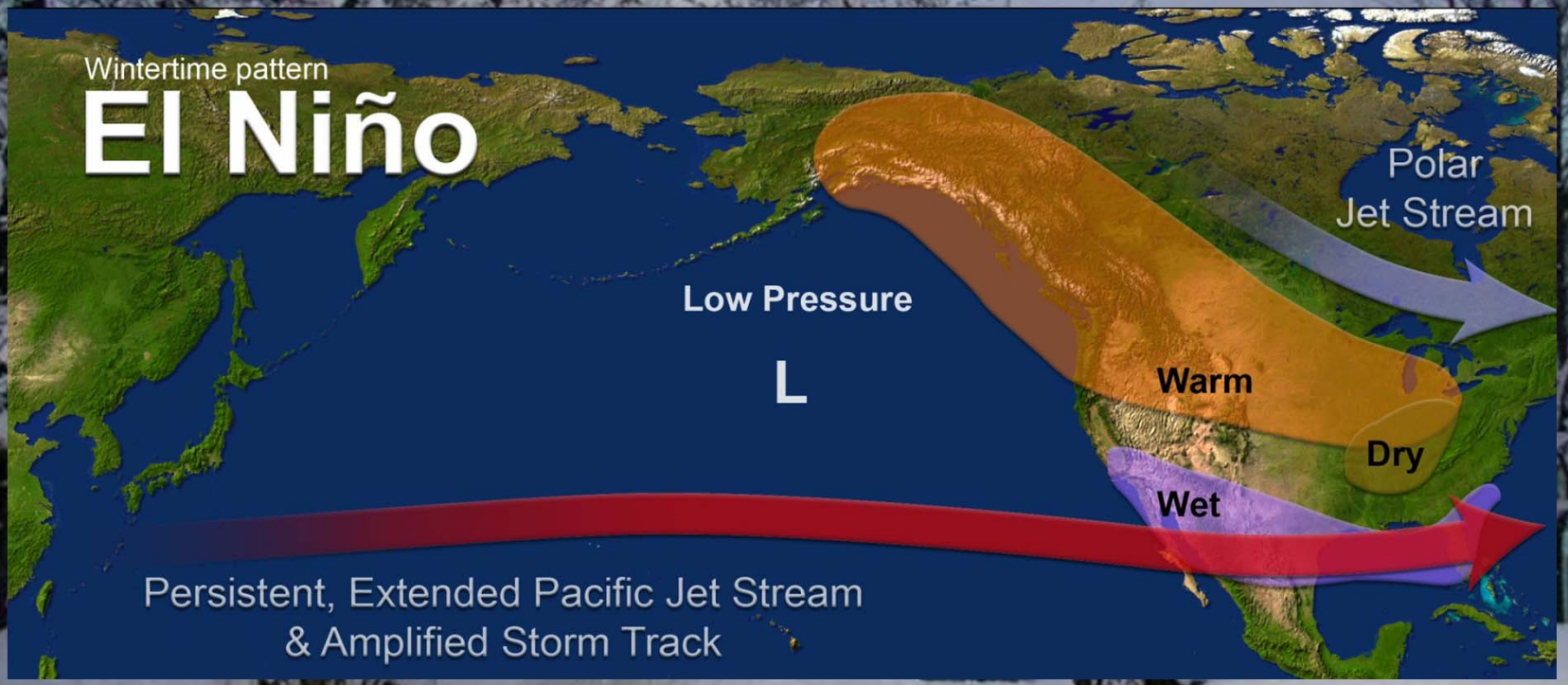


Figure provided by the International Research Institute (IRI) for Climate and Society (updated 18 September 2012).

Typical Pattern Changes over the North Pacific and North America

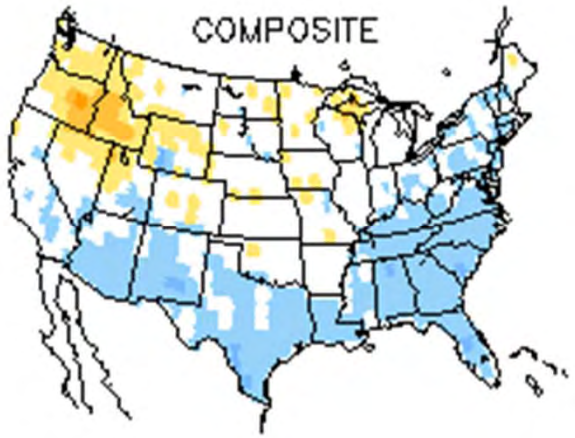


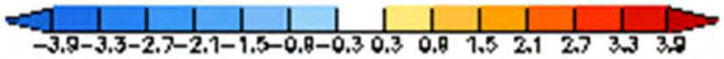
- **<u>El Niño</u>: Jet stream over North America is stronger than average and shifted equator*ward*. Flow is more zonal than average from the central Pacific eastward across the U.S.**

ENSO Composites

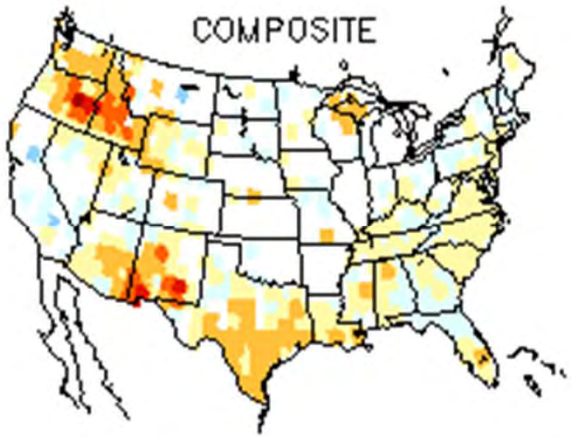
DJF EL NINO TEMPERATURE ANOMALIES (C)
AND FREQUENCY OF OCCURRENCE (%)

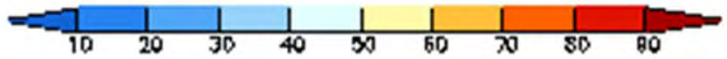
ANOMALIES





FREQUENCY



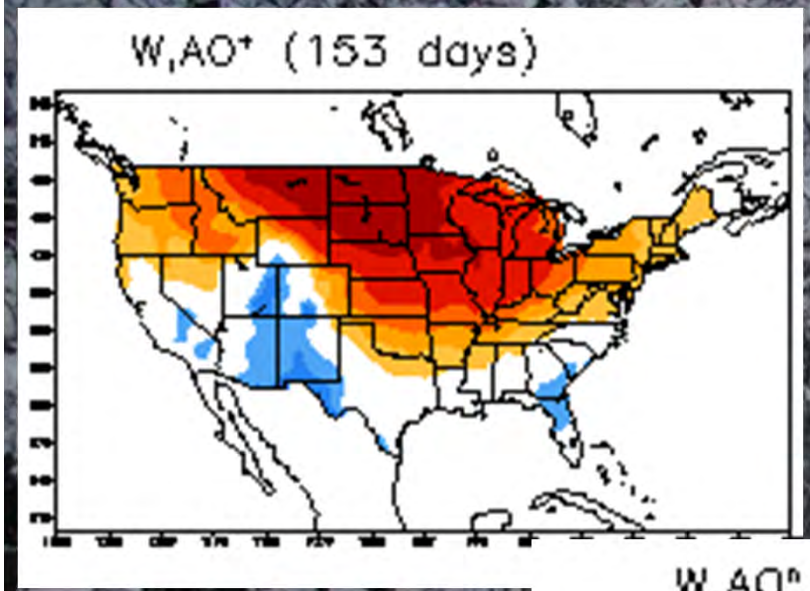


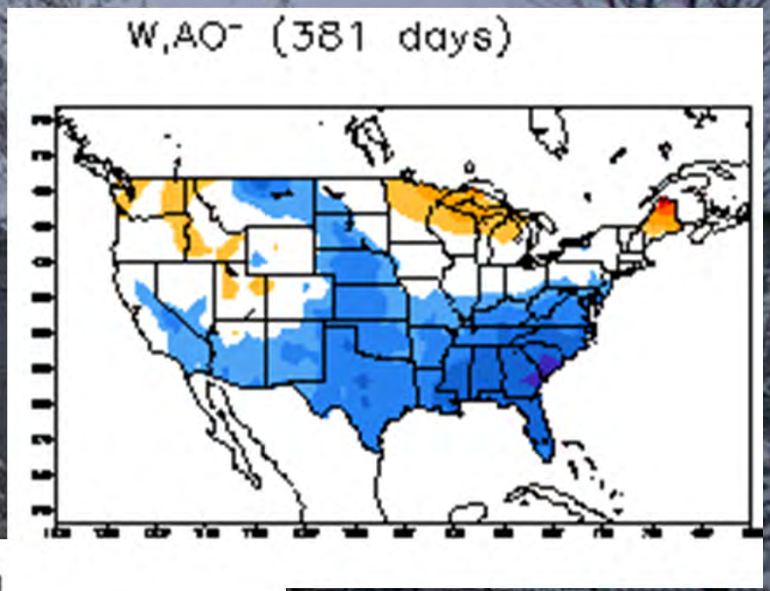
(22 CASES: 1952 1953 1954 1958 1959 1964 1966 1969 1970 1973 1977 1978 1983 1987 1988
1992 1995 1998 2003 2005 2007 2010)

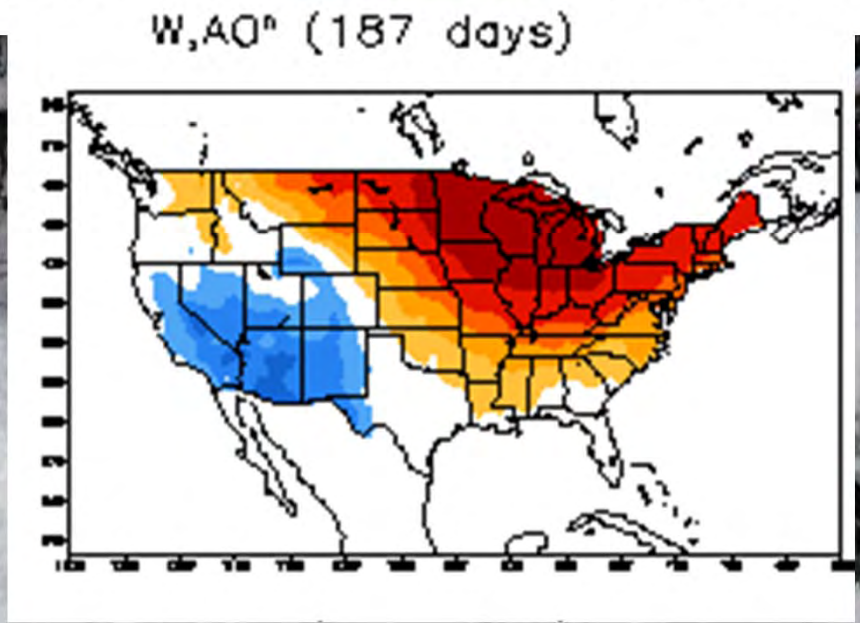
NORTH ATLANTIC OSCILLATION/ ARCTIC OSCILLATION

- 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 .

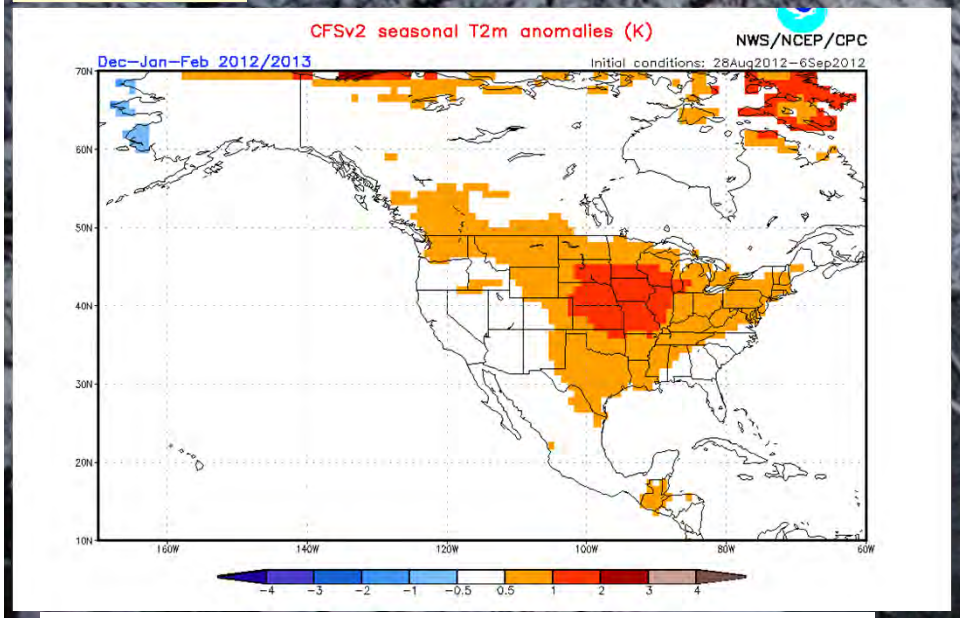
AO/La Niña Composites



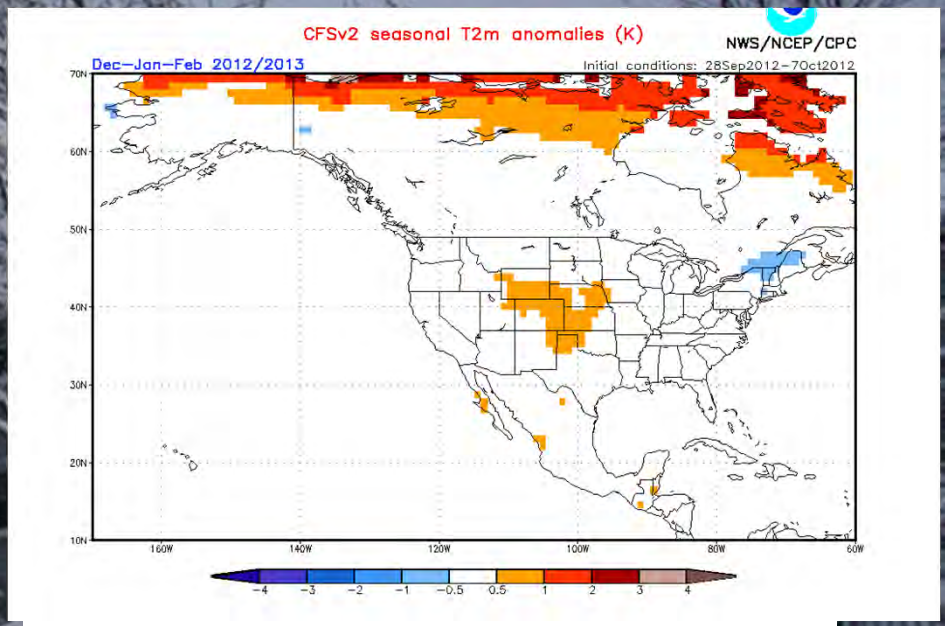




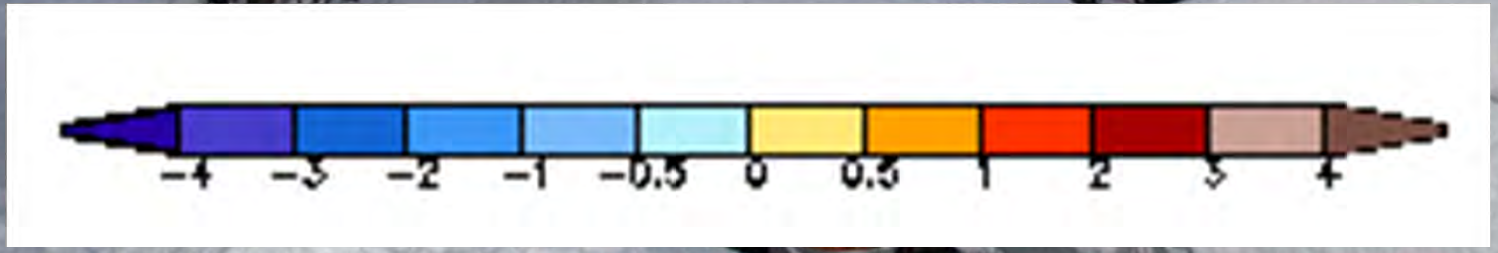
Climate Forecast System



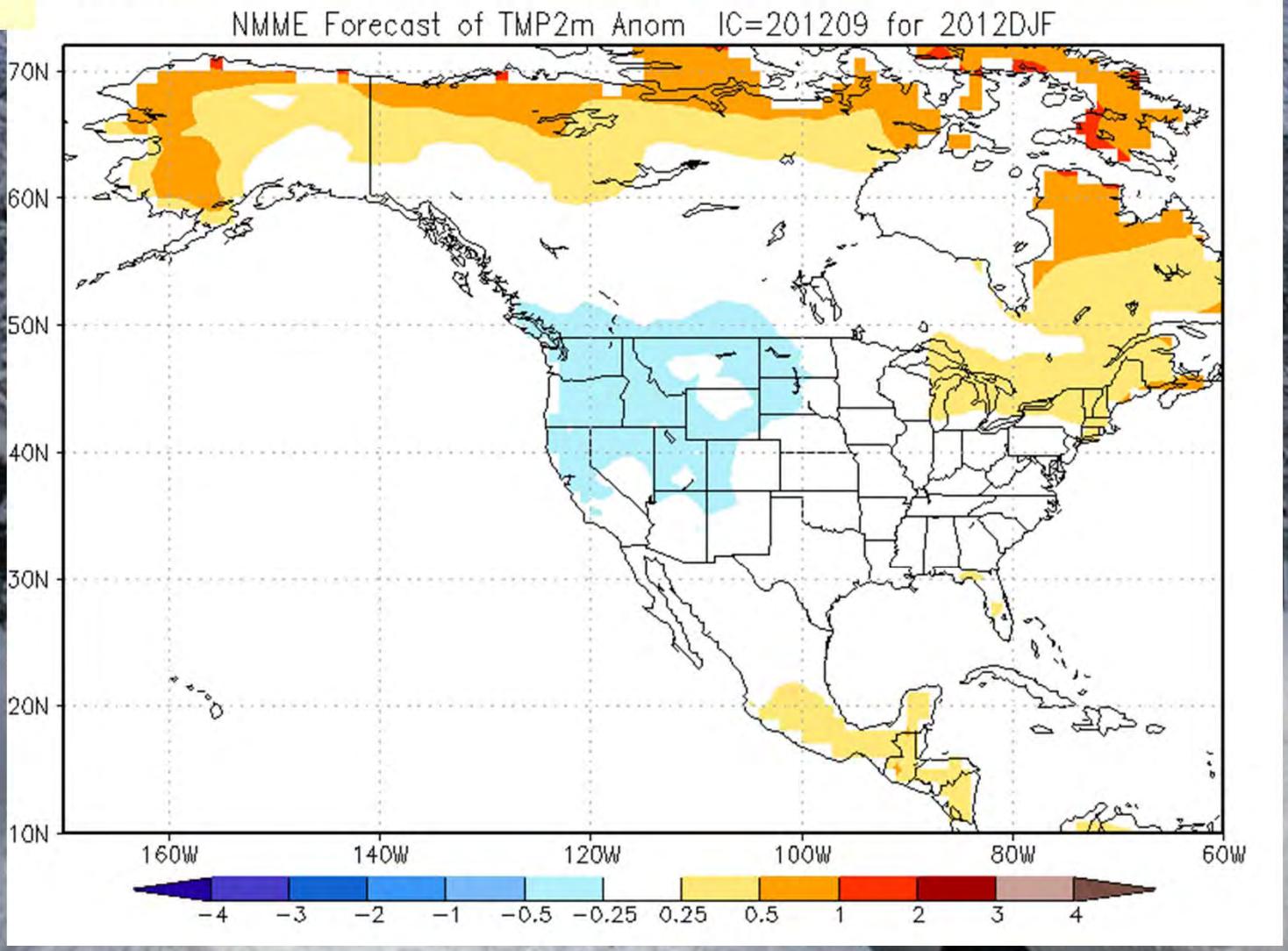
Forecast updated Sept. 6, 2012



Forecast updated Oct. 7, 2012



National Multi-Model Ensemble



Forecast updated Sep. 9, 2012

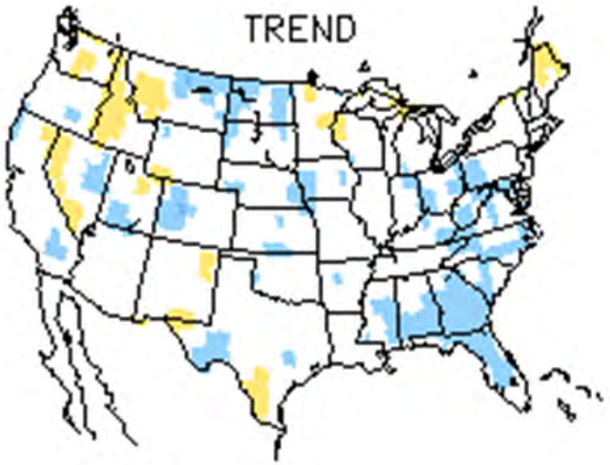
Optimal Climate Normal (OCN)

- 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.

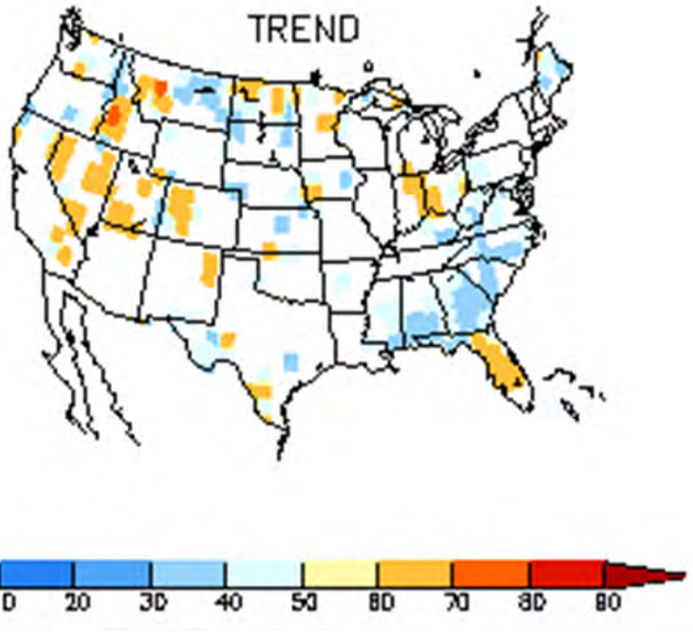
December - February OCN

2002-2011

Mean Departure

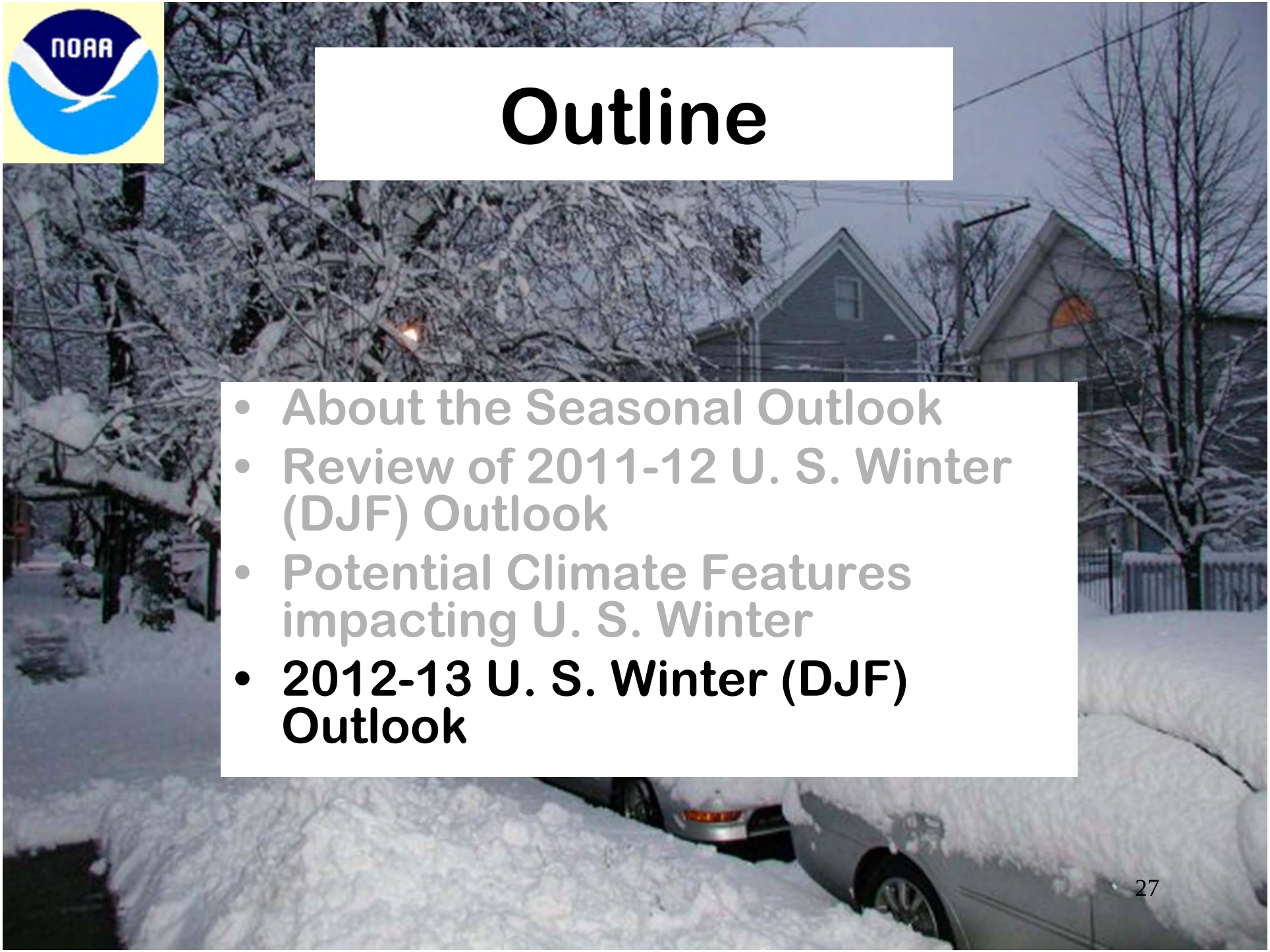


Frequency



Winter 2012-13 Outlook Rationale

- Borderline ENSO-neutral/ weak El Niño conditions have developed across the Pacific.
- El Niño conditions may strengthen during the fall.
- 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.



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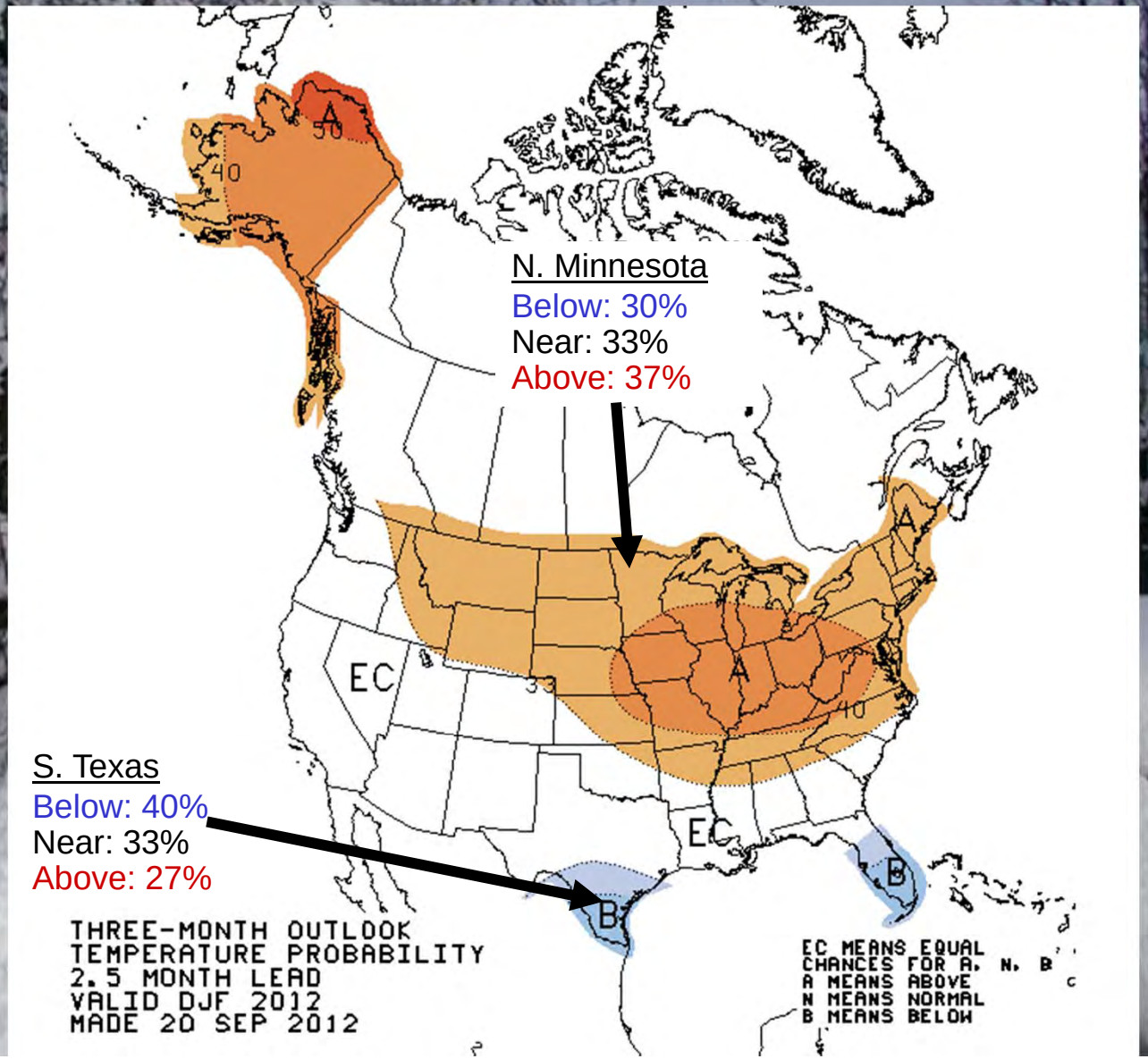
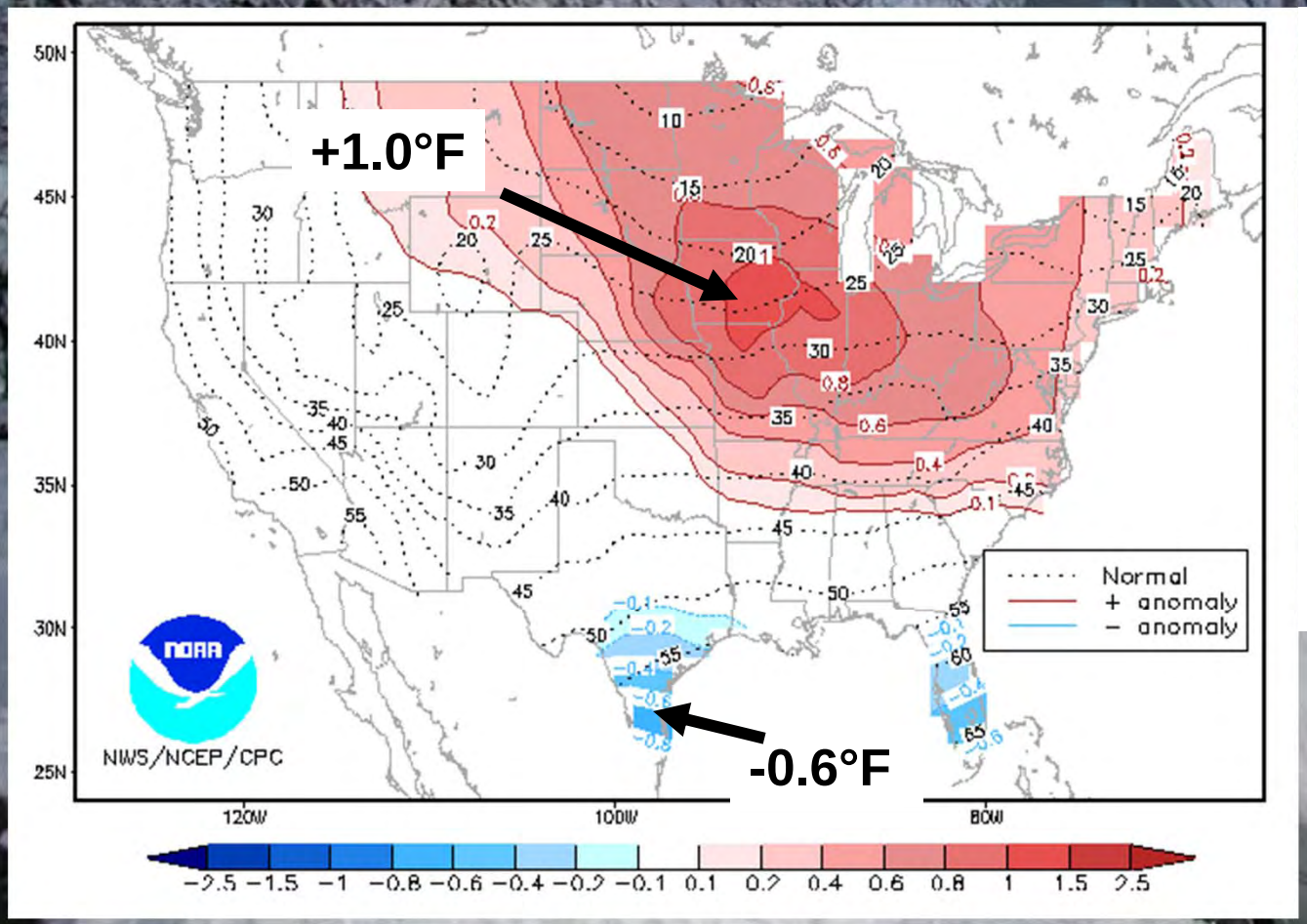
December 2012 – February 2013 Temperature Outlook



Average Departure of Mid-Value Temperature Outlook Distribution

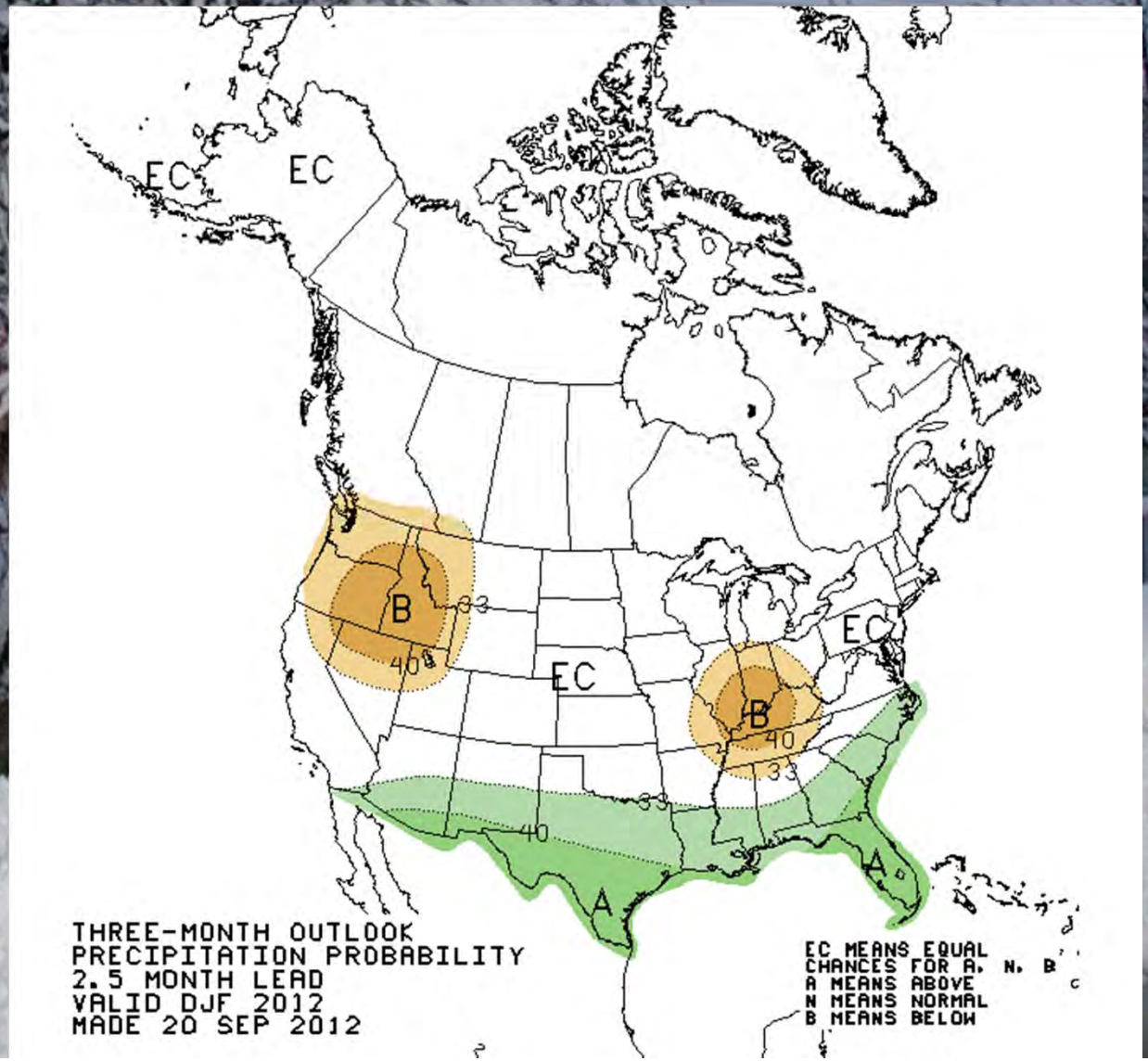


HDD Projections:

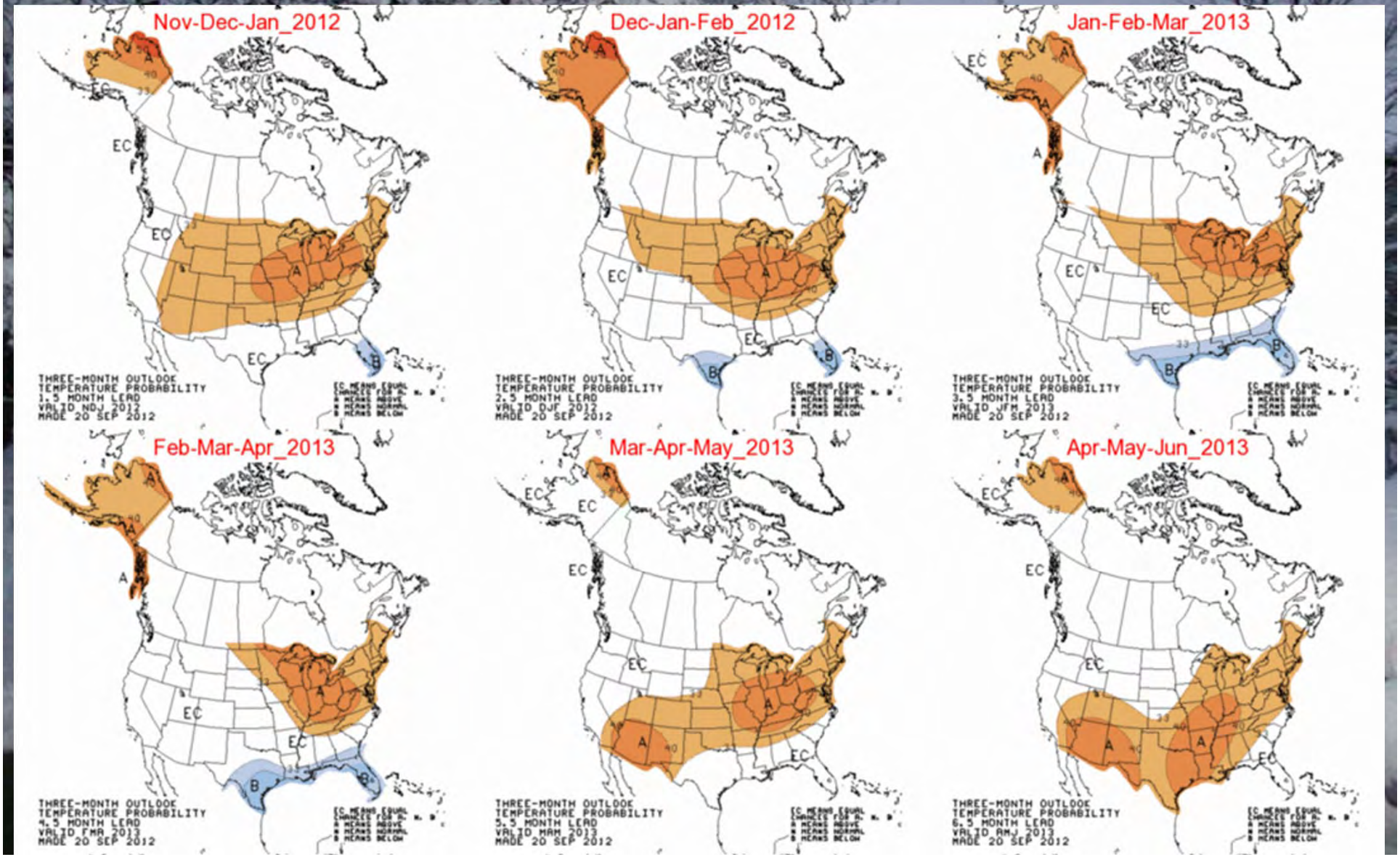
1.6% less than 1981-2010

10+% more than 2011-12

December 2012 – February 2013 Precipitation Outlook



Seasonal Temperature Outlooks
NDJ 2012 – AMJ 2013



U. S. Winter 2012-13 Outlook: Forecast Summary

Odds favor:

- Warmer than average across the northern part of the nation from the Rockies eastward and Alaska.
- Colder than average only in southern Texas and Florida
- Wetter than average across the South
- Drier than average in the Pacific NW and the Ohio Valley.