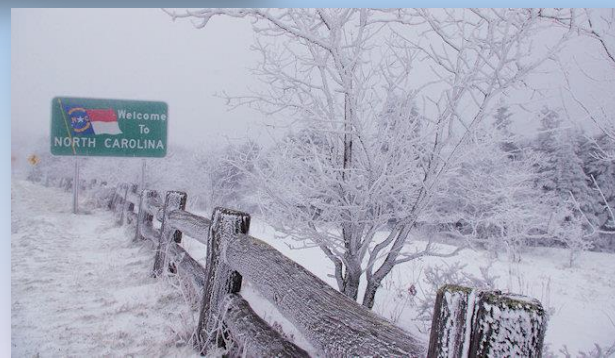




Winter Weather Impacts and Outlook



Steve Pfaff (NWS ILM) and **Nick Petro** (NWS RAH)

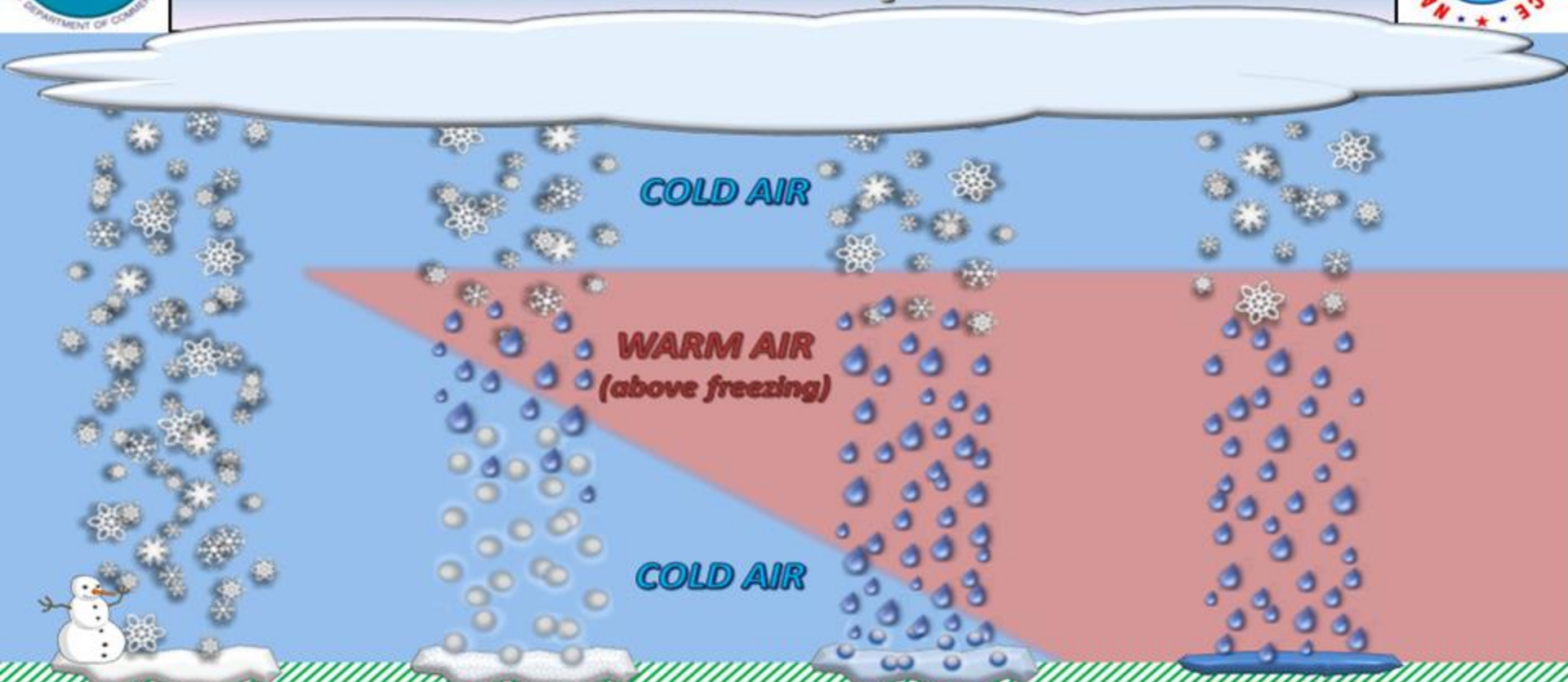


As forecasters, decision makers, and planners we want to avoid.....





Winter Precipitation



SNOW

SLEET

FREEZING RAIN

RAIN

No melting has occurred.

Snow melts and refreezes before reaching the surface.

Snow melts and refreezes on contact with the surface.

Snow melts and does not refreeze.



Winter Weather Type & Impact Matrix

Sleet

Fz Rain

Snow

Cold ground impacts

Sleet will pack making plowing difficult

Huge potential for sheets of ice, especially on bridges and elevated roadways

Snow will stick quickly on all surfaces

Warm ground impacts

Sleet will turn into slush making plowing possible

Elevated roads (esp higher elev.) impacted otherwise roads clear

Elevated roads affected otherwise accumulations on grassy surfaces and fields

Tree impacts

Sleet bounces off trees & branches thus very little, if any, impacts

Droplets stick and freeze on contact. If 1/4" or more accretes expect significant tree damage

Heavy snow results in significant tree damage. Lighter snow (arctic air-mass) will result in minor tree damage

Power impacts

Isolated power outages (sleet bounces off power lines)

Potential for major/long duration outages

Isolated to widespread outages depending on the amount and weight of snow

Overall Expectation

1 to 3 day inconvenience

1 to 3 week disaster

Minimal issues to 1 week inconvenience



Winter Weather Type & Impacts

Sleet

Cold ground impacts

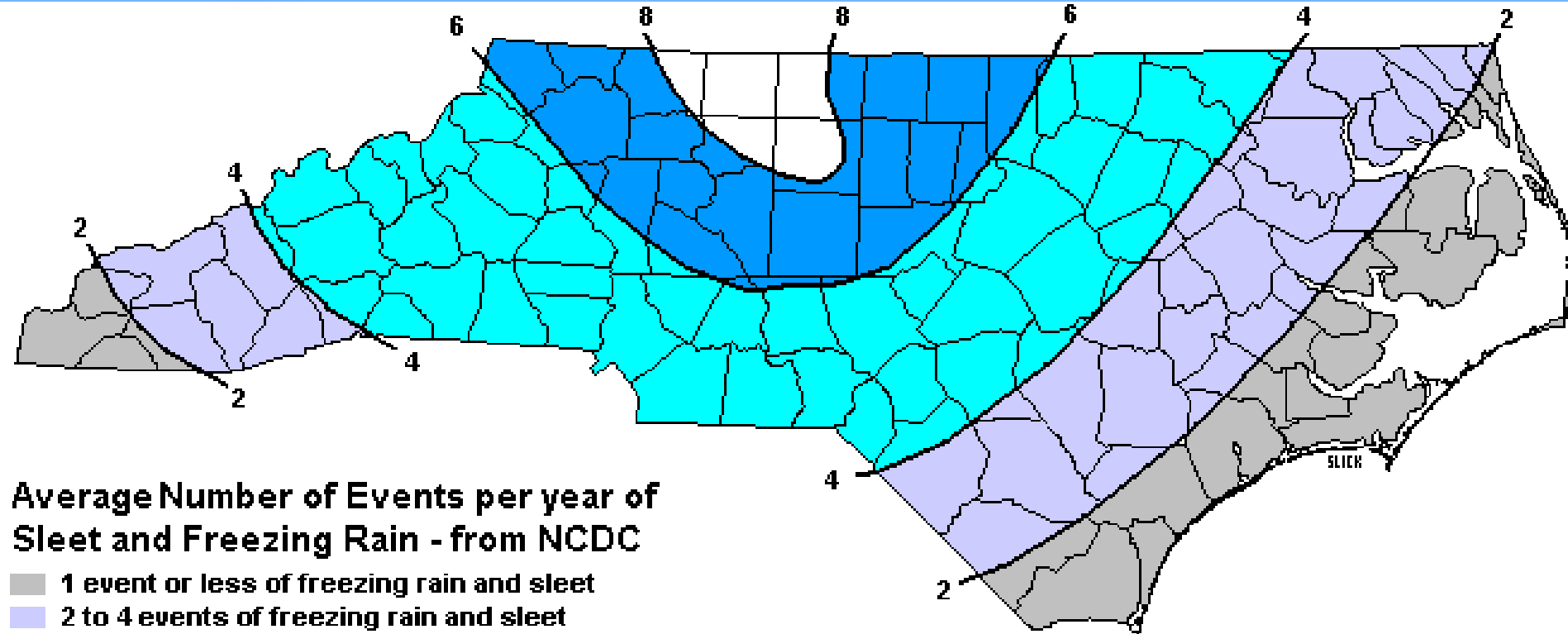
Sleet will pack making plowing difficult



College Rd near Kings Grant (video courtesy of Tim Armstrong – NWS Wilmington)



Freezing Rain/Sleet Climatology Events Per Year



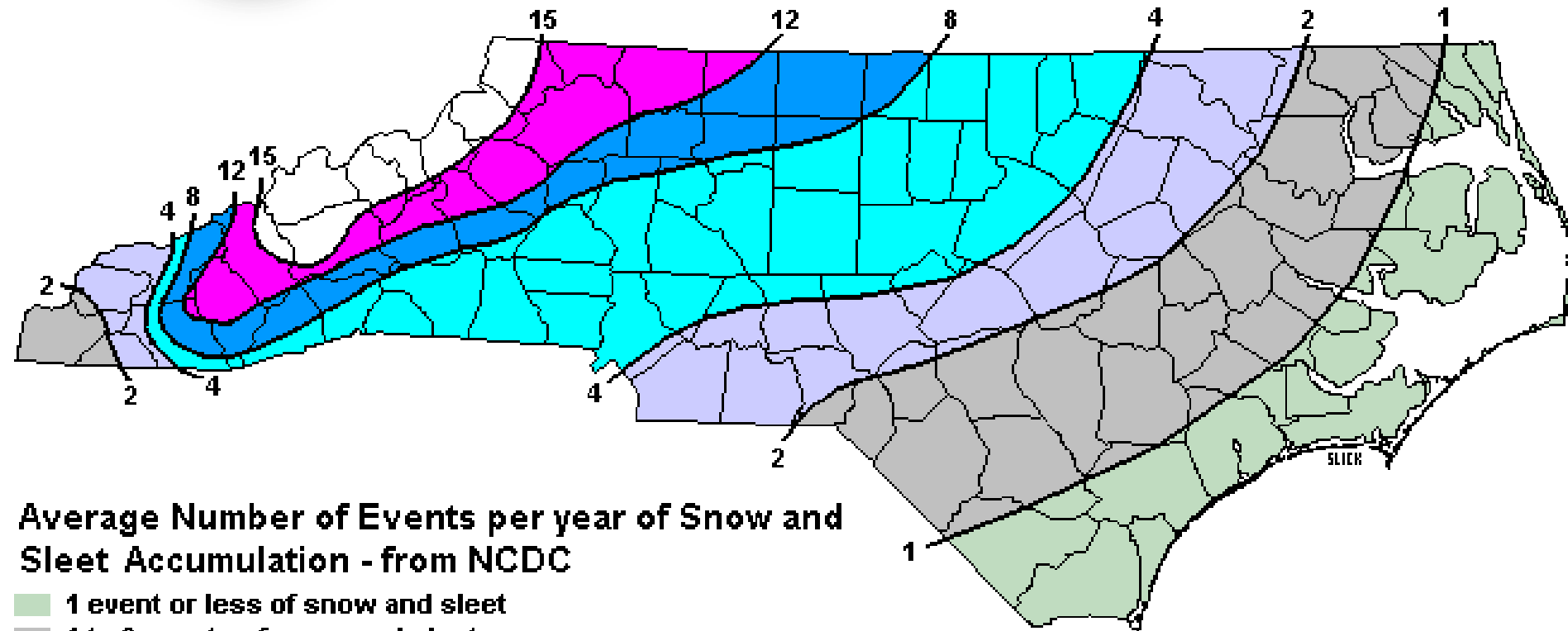
Average Number of Events per year of Sleet and Freezing Rain - from NCDC

- 1 event or less of freezing rain and sleet
- 2 to 4 events of freezing rain and sleet
- 4 to 6 events of freezing rain and sleet
- 6 to 8 events of freezing rain and sleet
- 8 events or more of freezing rain and sleet

Graphic - Jonathan Blaes
NWS Raleigh, NC
www.erh.noaa.gov/rah



Snow/Sleet Climatology Events Per Year



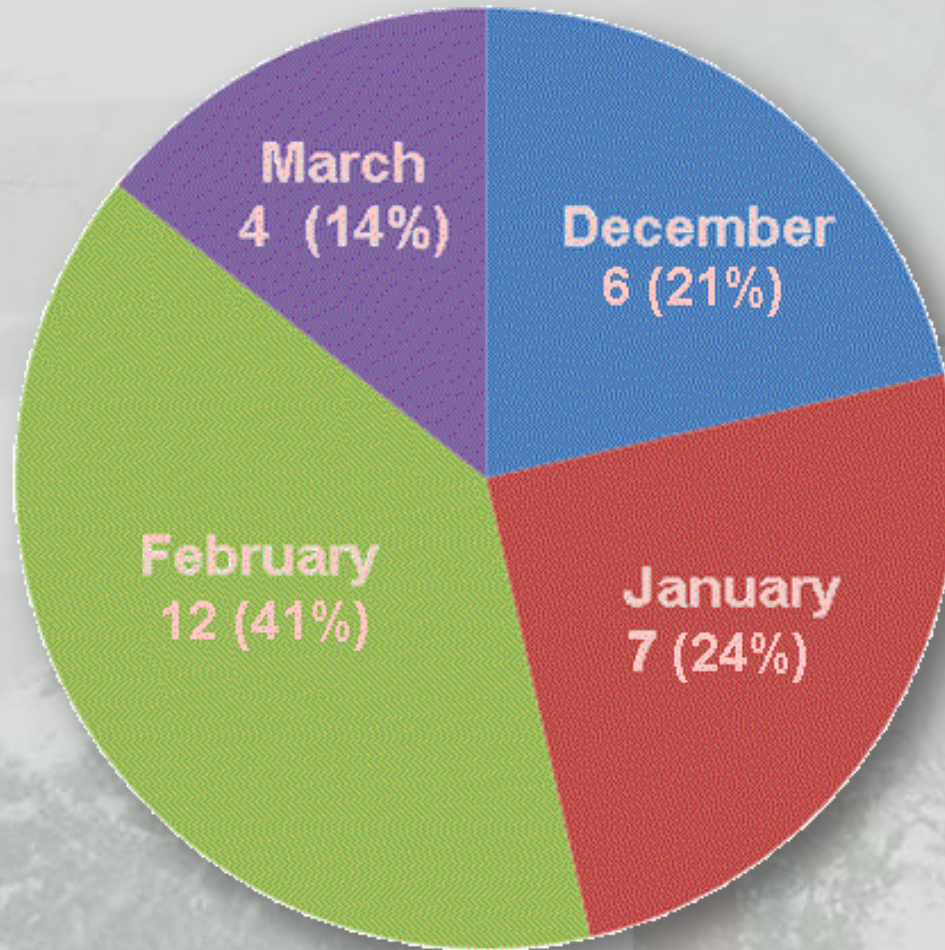
Average Number of Events per year of Snow and Sleet Accumulation - from NCDC

- 1 event or less of snow and sleet
- 1 to 2 events of snow and sleet
- 2 to 4 events of snow and sleet
- 4 to 8 events of snow and sleet
- 8 to 12 events of snow and sleet
- 12 to 15 events of snow and sleet
- 15 events or more of snow and sleet

Graphic - Jonathan Blaes
NWS Raleigh, NC
www.erh.noaa.gov/rah



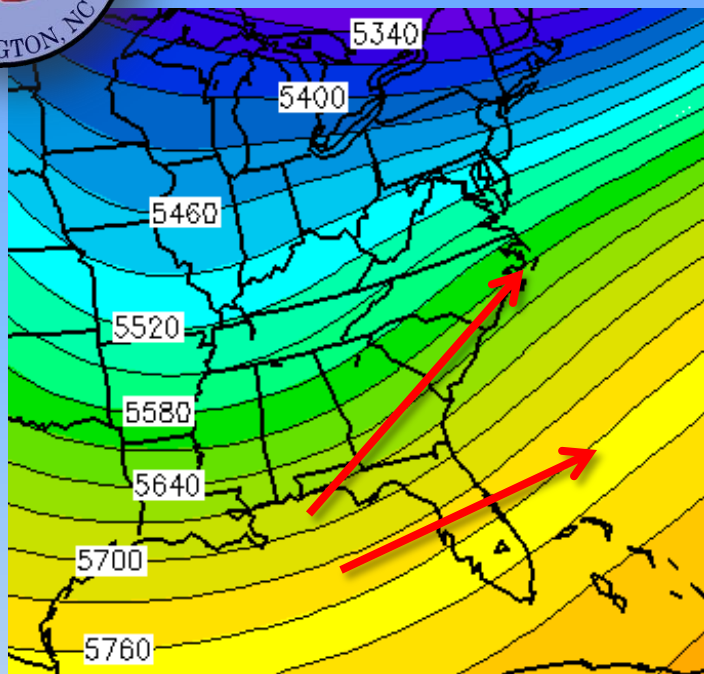
Three inch or larger snowfall events in Wilmington by Month: 1871-2012



29 total events

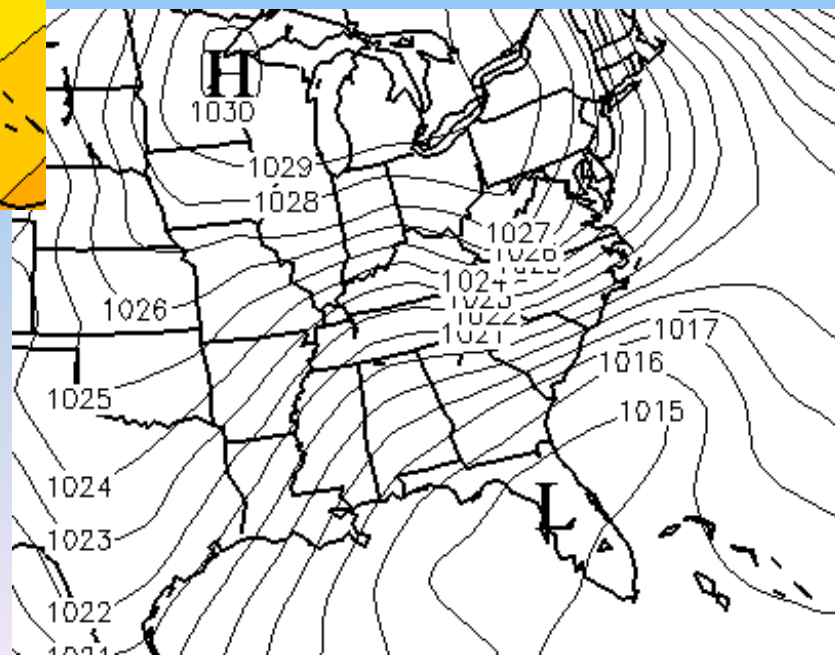


Composite Snowfall Pattern



Mean 500 mb pattern at onset of snow in eastern NC.

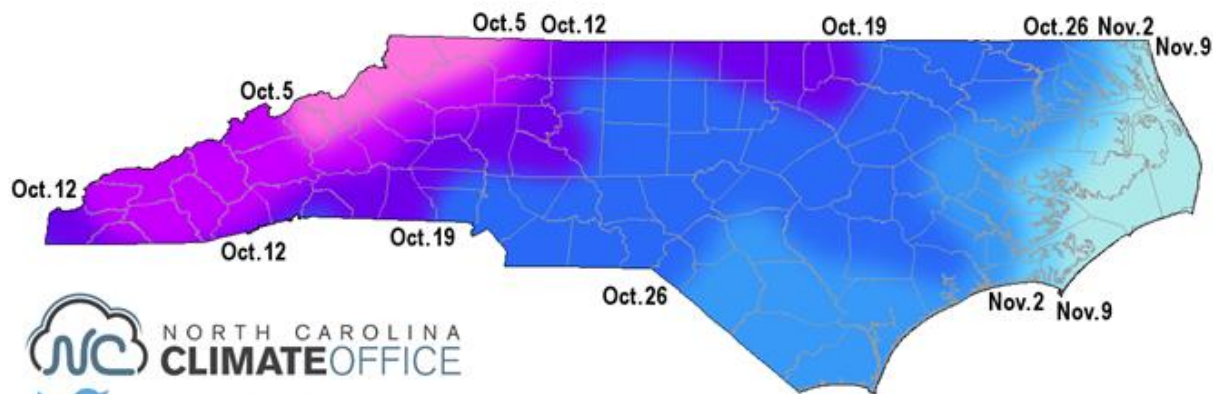
Mean surface pattern at onset of snow in eastern NC.



First Frost and Freeze

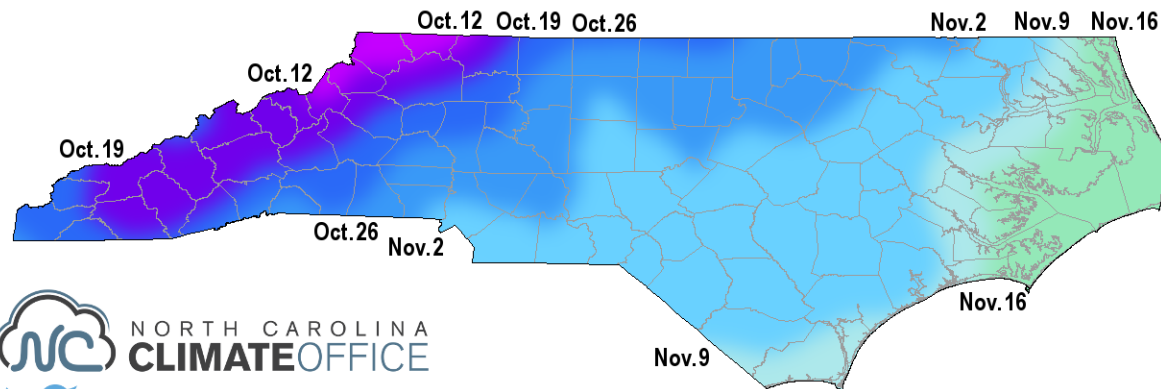
Average First Frost Dates (1981-2010)

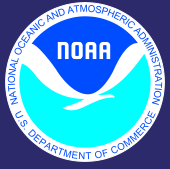
First day with minimum temperatures $\leq 36^{\circ}\text{F}$



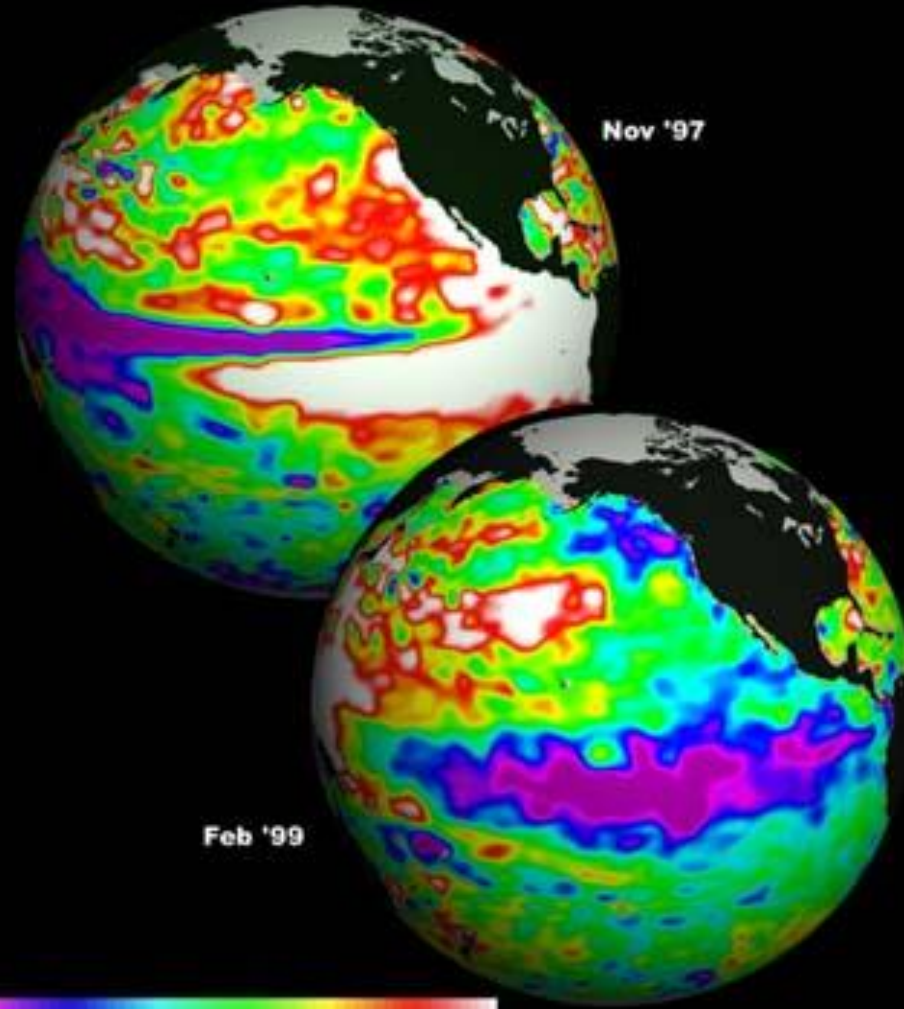
Average First Freeze Dates (1981-2010)

First day with minimum temperatures $\leq 32^{\circ}\text{F}$





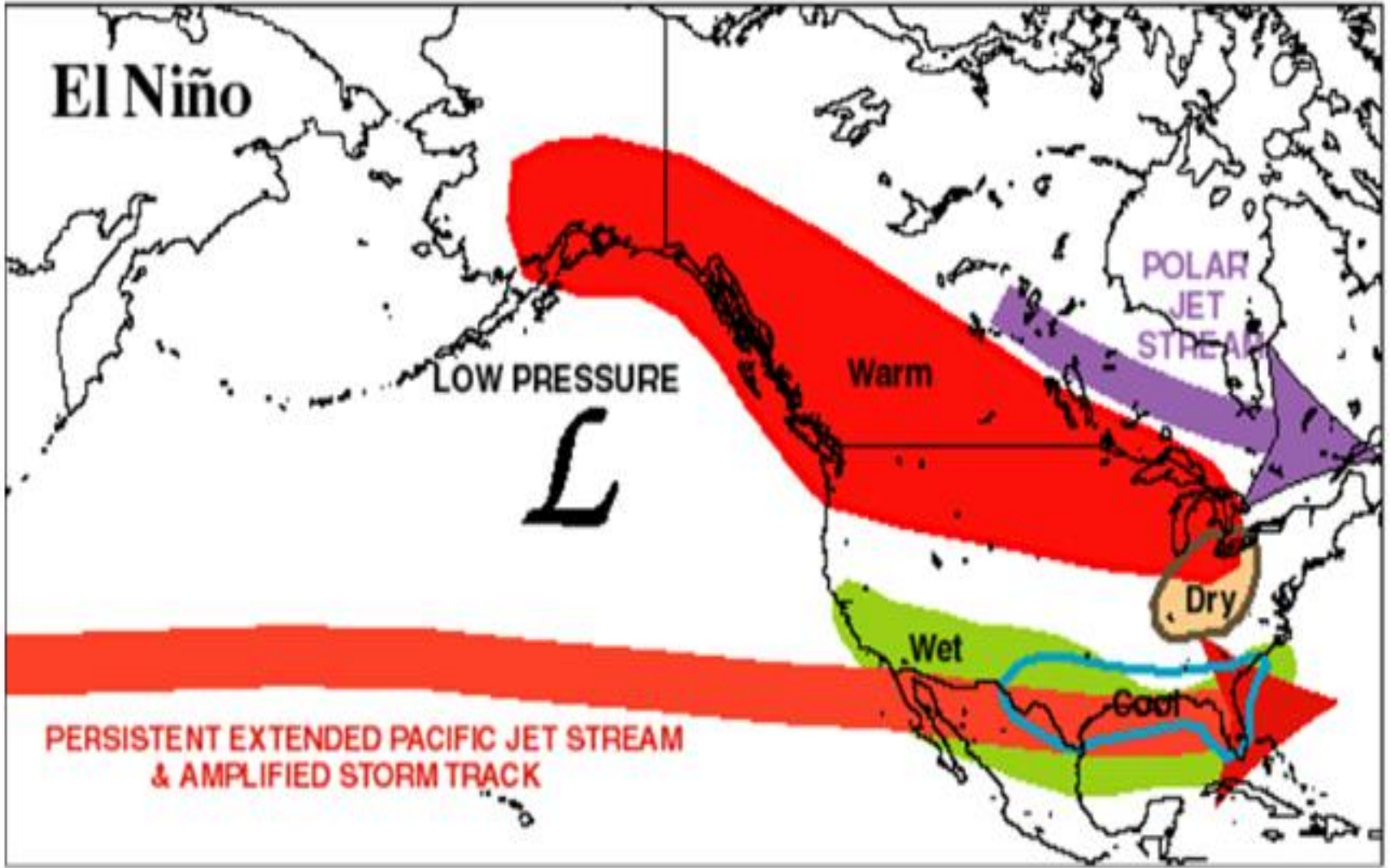
El Niño / La Niña

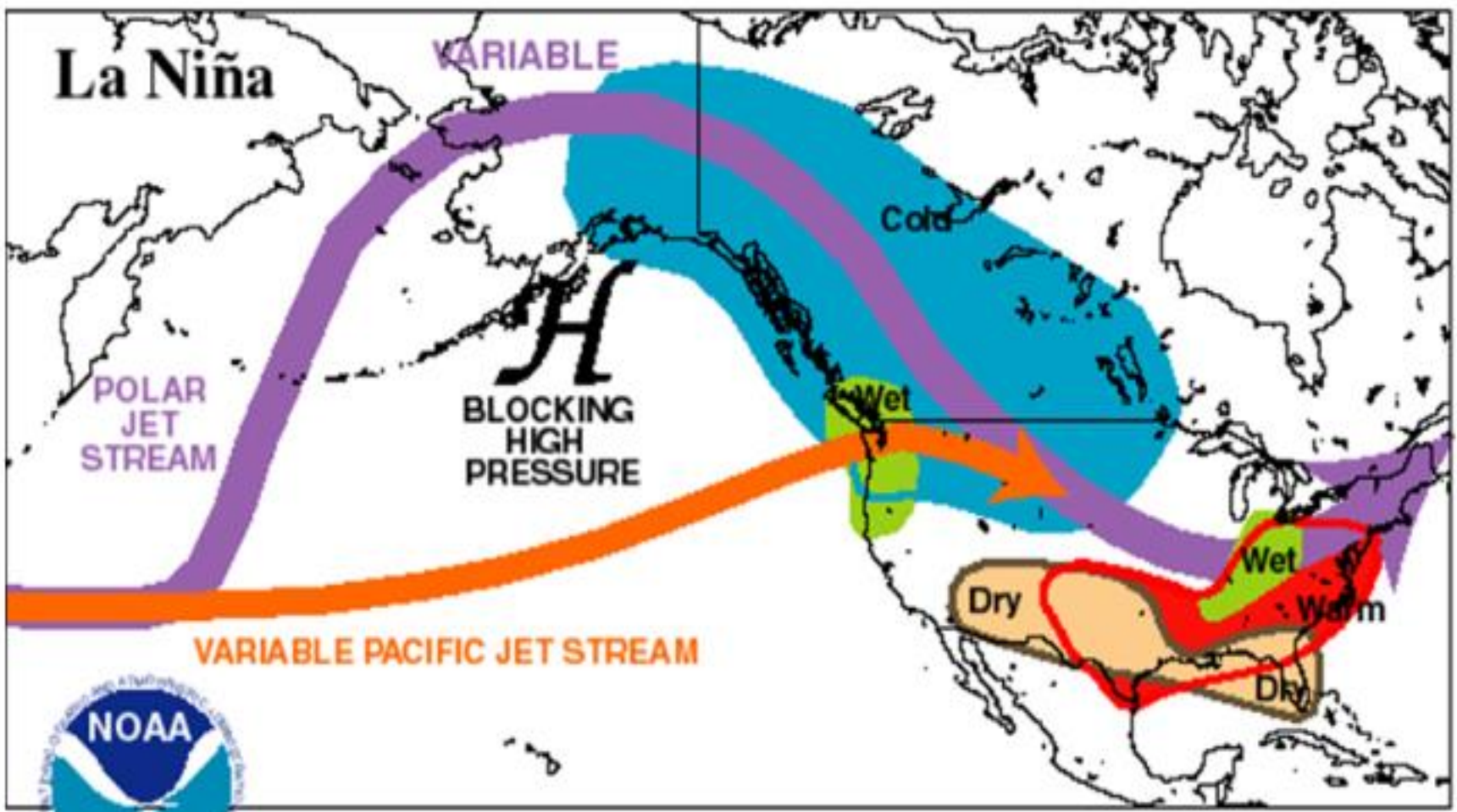


Nov '97

Feb '99



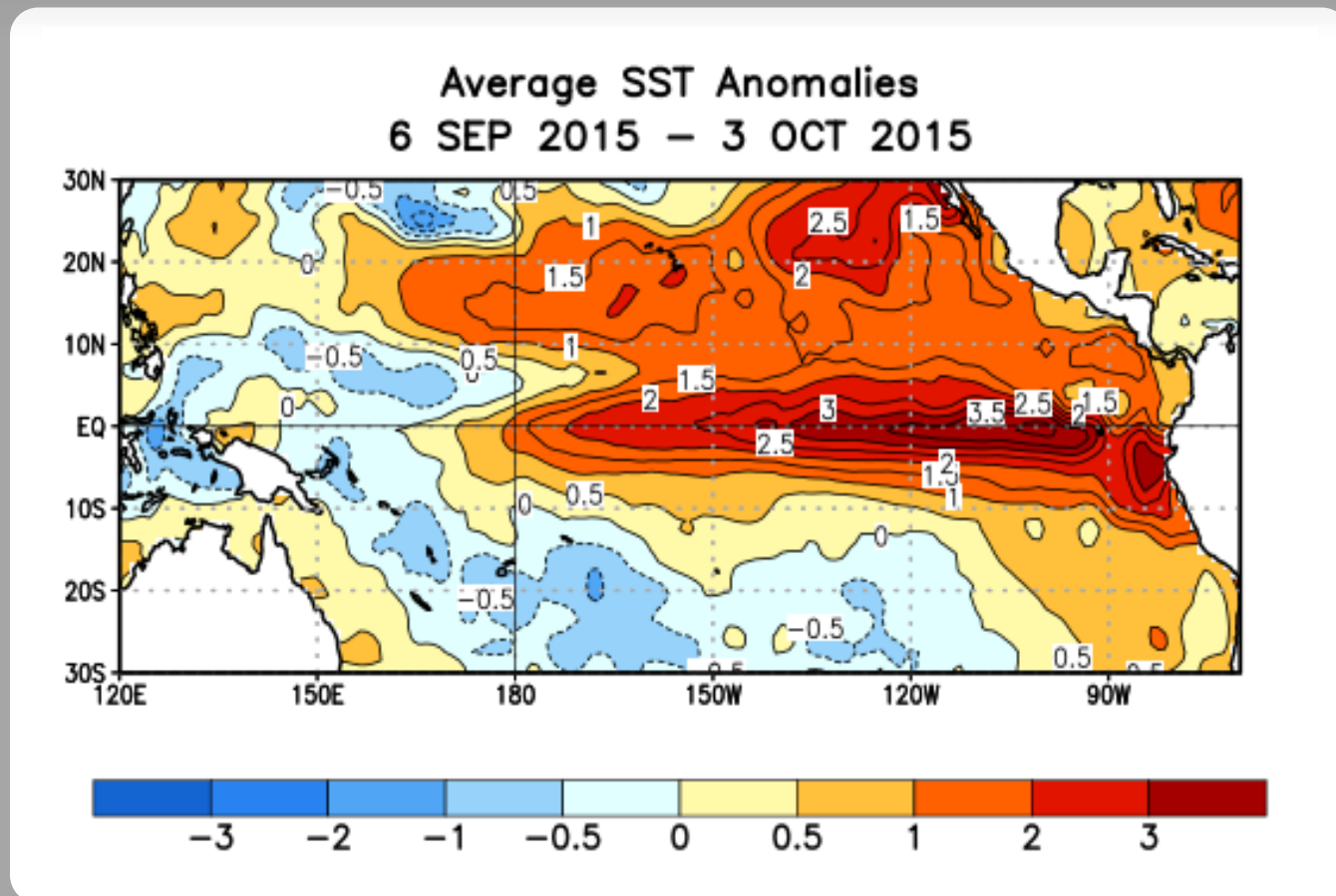




Climate Prediction Center/NCEP/NWS

SST Departures (°C) in the Tropical Pacific During the Last Four Weeks

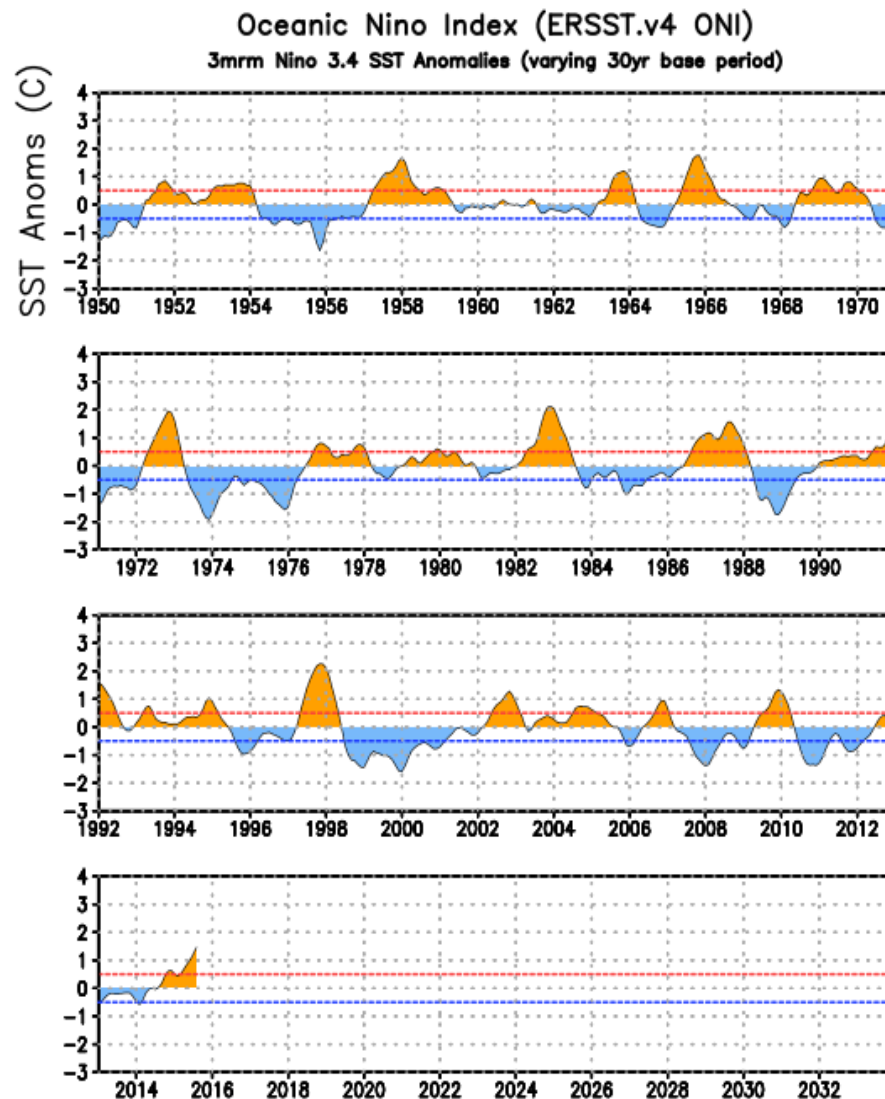
During the last four weeks, tropical SSTs were above average across the central and eastern Pacific, with the largest anomalies in the eastern Pacific.



ONI (°C): Evolution since 1950

The most recent ONI value (July - September 2015) is 1.5°C.

El Niño ↑
Neutral
La Niña ↓



IRI/CPC Pacific Niño

3.4 SST Model Outlook

Most models indicate that Niño 3.4 will be above +1.5°C (a “strong” El Niño) during late 2015 into early 2016.

Positive anomalies are predicted to weaken through the Northern Hemisphere Spring 2016.

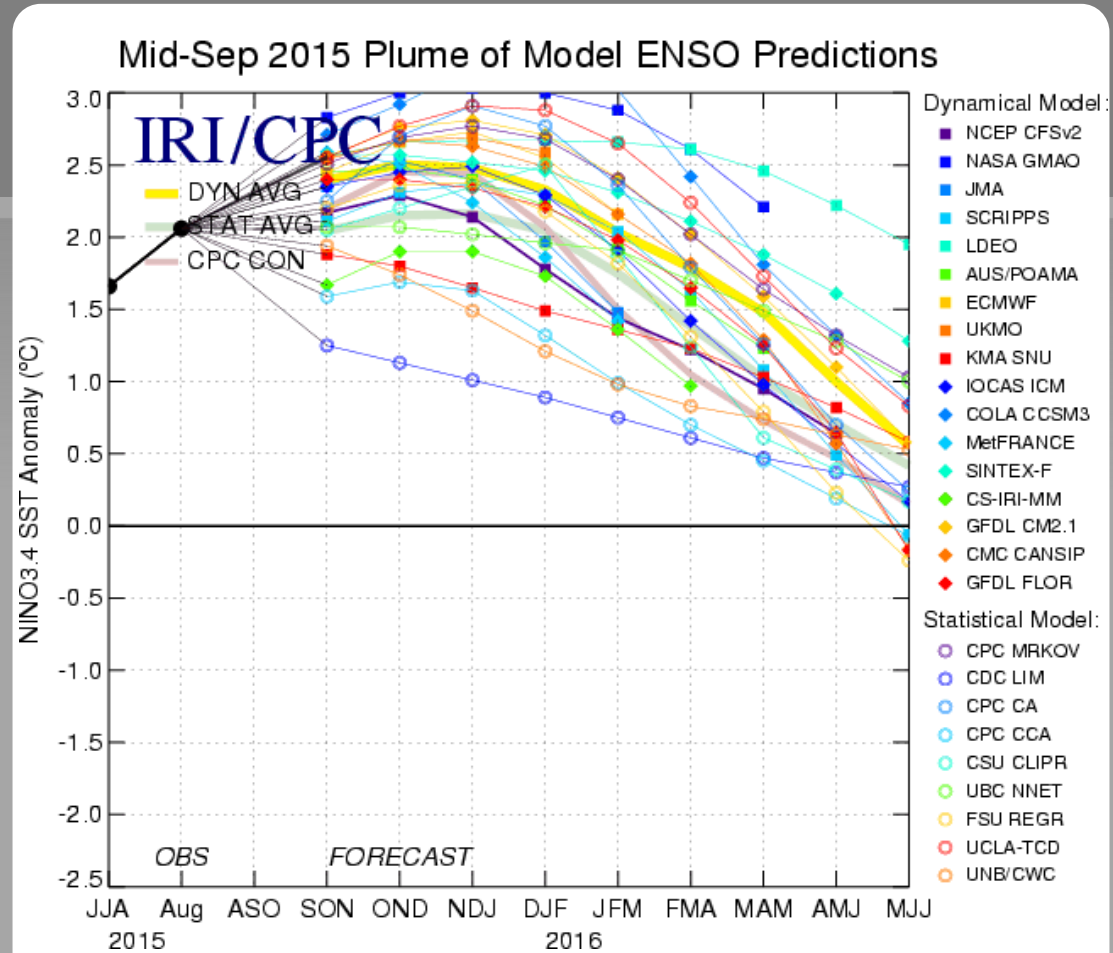


Figure provided by the International Research Institute (IRI) for Climate and Society (updated 15 September 2015).

Summary

ENSO Alert System Status: El Niño Advisory

El Niño conditions are present.*

Positive equatorial sea surface temperature (SST) anomalies continue across most of the Pacific Ocean.

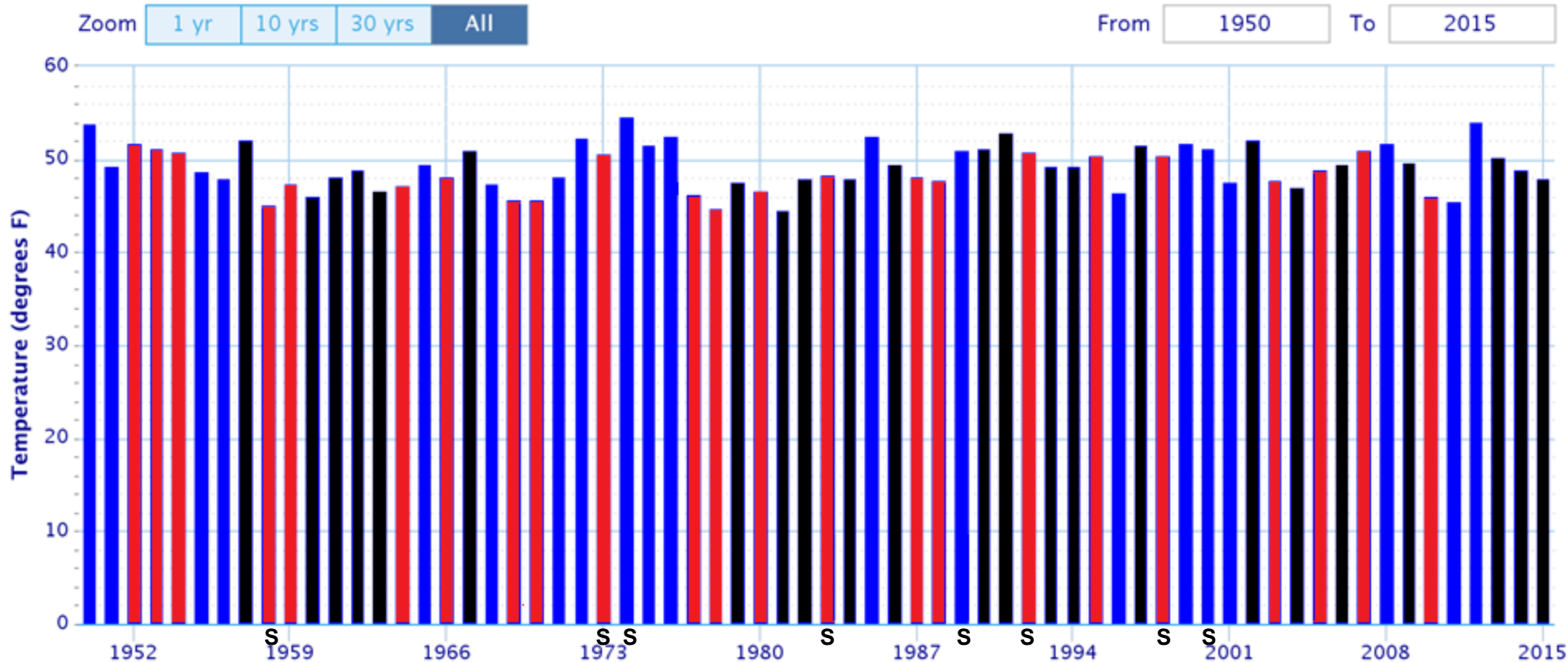
There is an approximately 95% chance that El Niño will continue through Northern Hemisphere winter 2015-16, gradually weakening through spring 2016.*

* Note: These statements are updated once a month (2nd Thursday of each month) in association with the ENSO Diagnostics Discussion, which can be found by clicking [here](#).

ENSO's Impact on Wilmington's Temp

Mean Avg Temperature Dec 1 to Mar 31 – Wilmington Area, NC (ThreadEx)

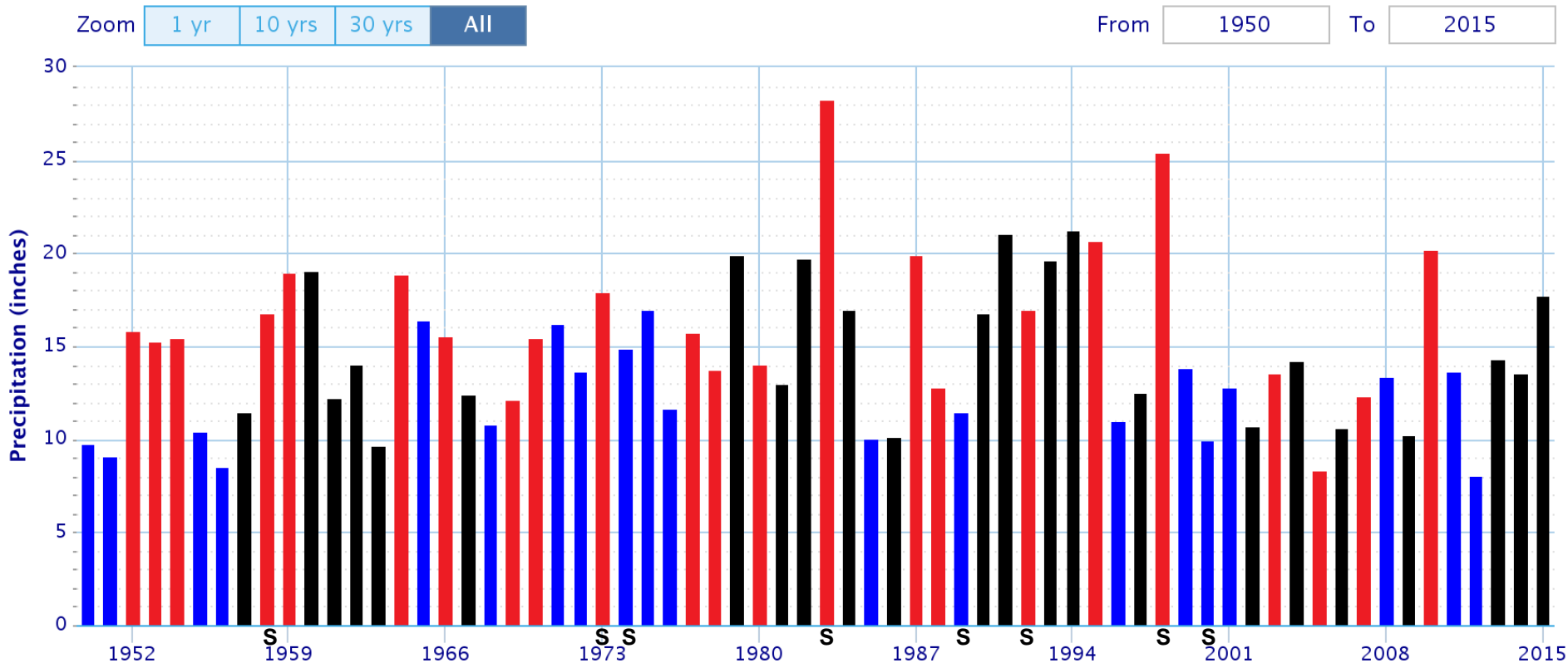
Use navigation tools above and below chart to change displayed range



ENSO's Impact on Wilmington's Precip

Total Precipitation Dec 1 to Mar 31 – Wilmington Area, NC (ThreadEx)

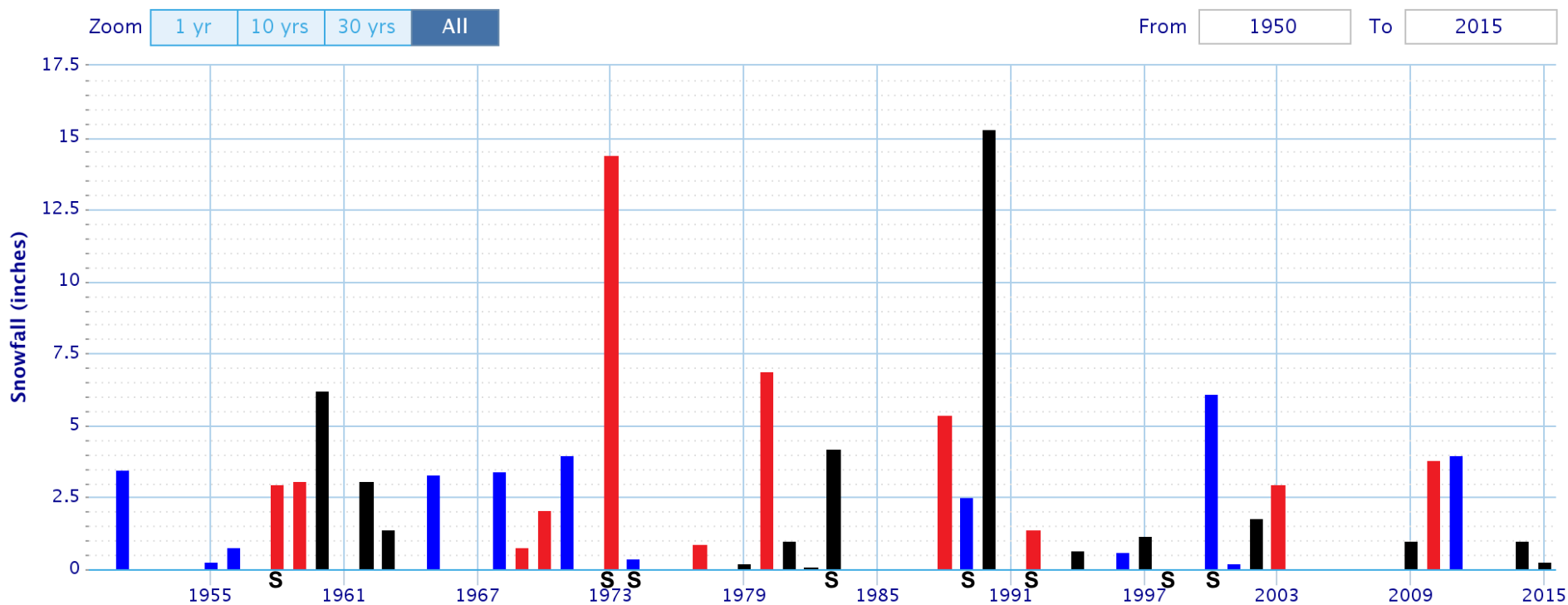
Use navigation tools above and below chart to change displayed range



ENSO's Impact on Wilmington's Snow

Total Snowfall Dec 1 to Mar 31 – Wilmington Area, NC (ThreadEx)

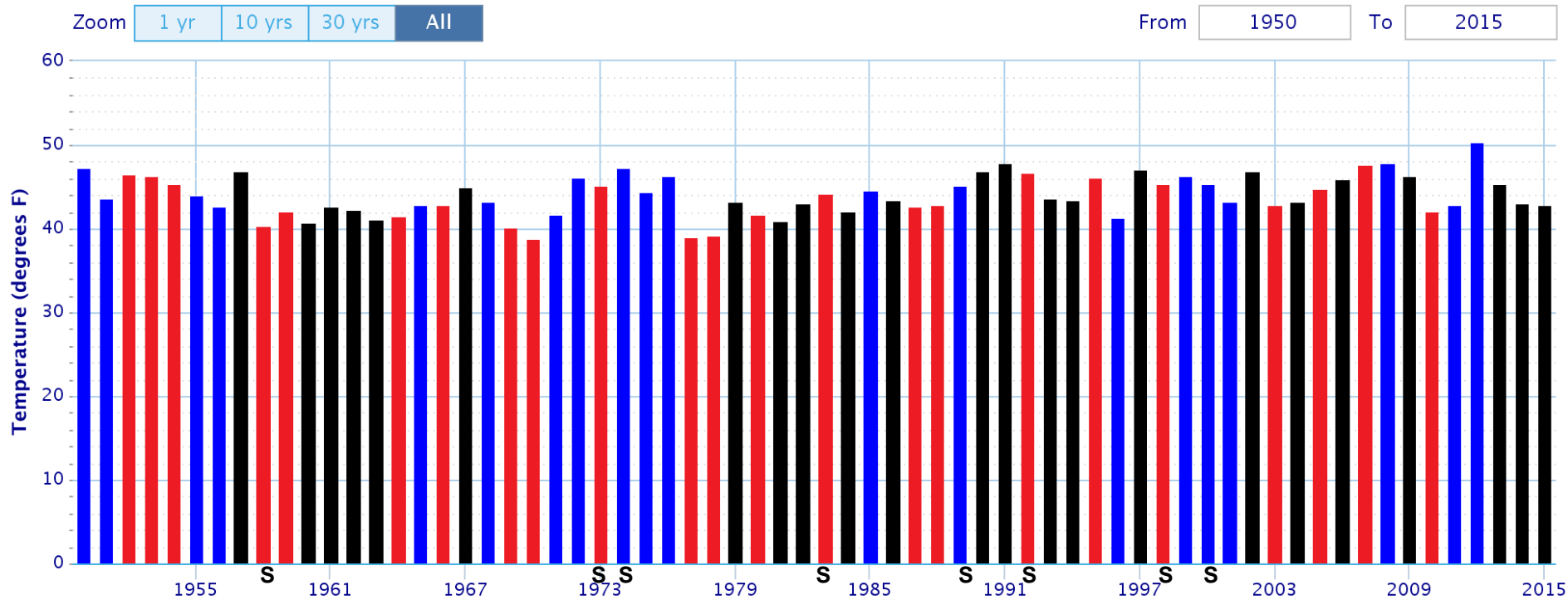
Use navigation tools above and below chart to change displayed range



ENSO's Impact on Raleigh's Temp

Mean Avg Temperature Dec 1 to Mar 31 – Raleigh Area, NC (ThreadEx)

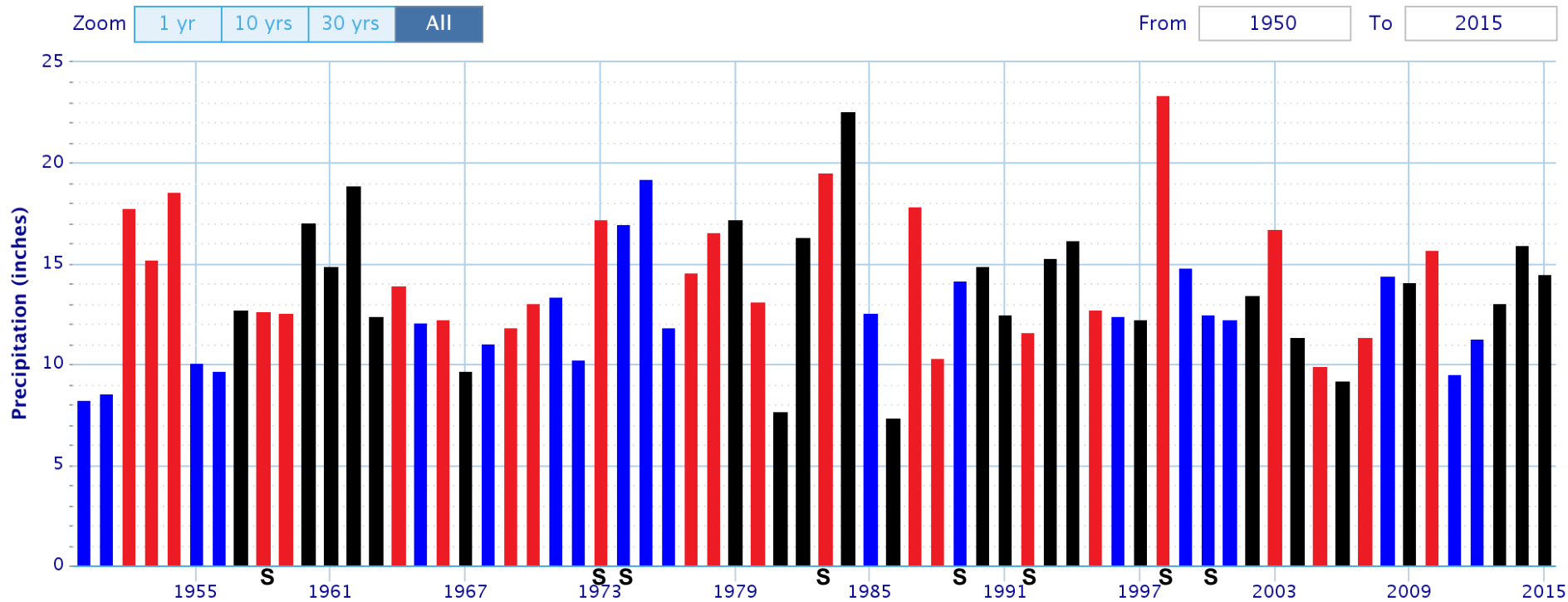
Use navigation tools above and below chart to change displayed range



ENSO's Impact on Raleigh's Precip

Total Precipitation Dec 1 to Mar 31 – Raleigh Area, NC (ThreadEx)

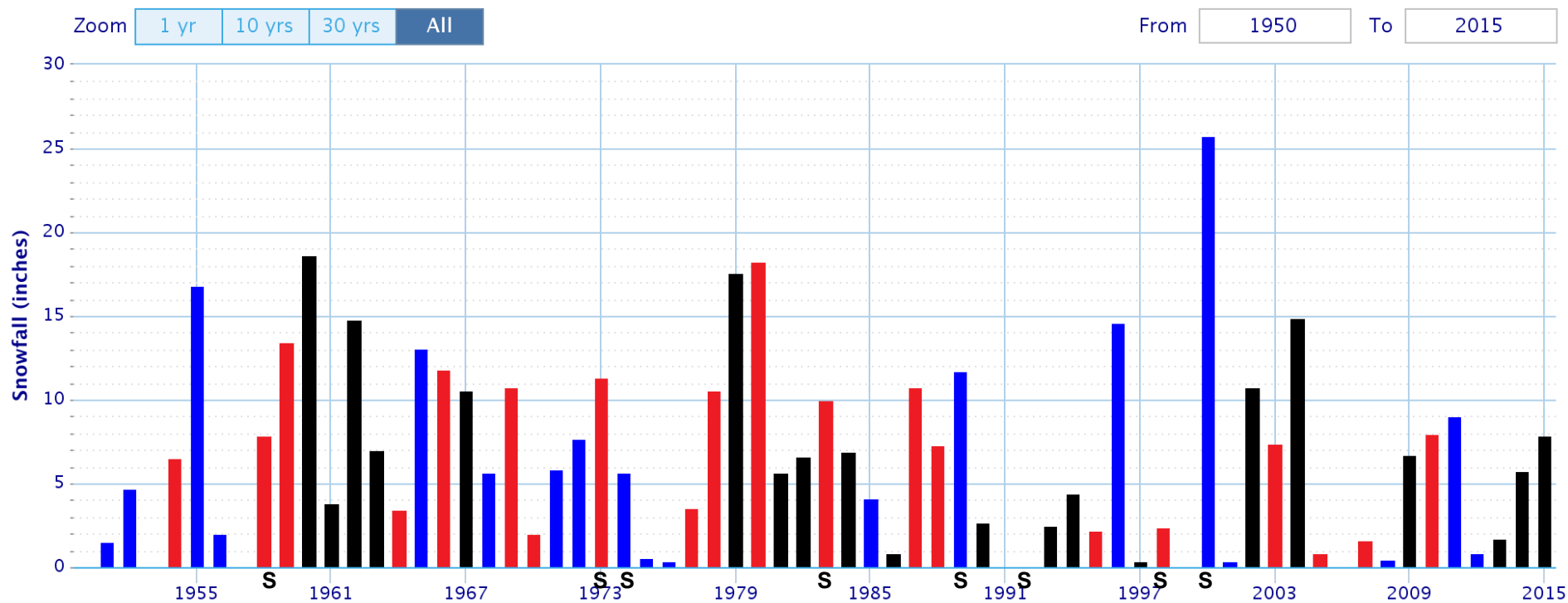
Use navigation tools above and below chart to change displayed range



ENSO's Impact on Raleigh's Snow

Total Snowfall Dec 1 to Mar 31 – Raleigh Area, NC (ThreadEx)

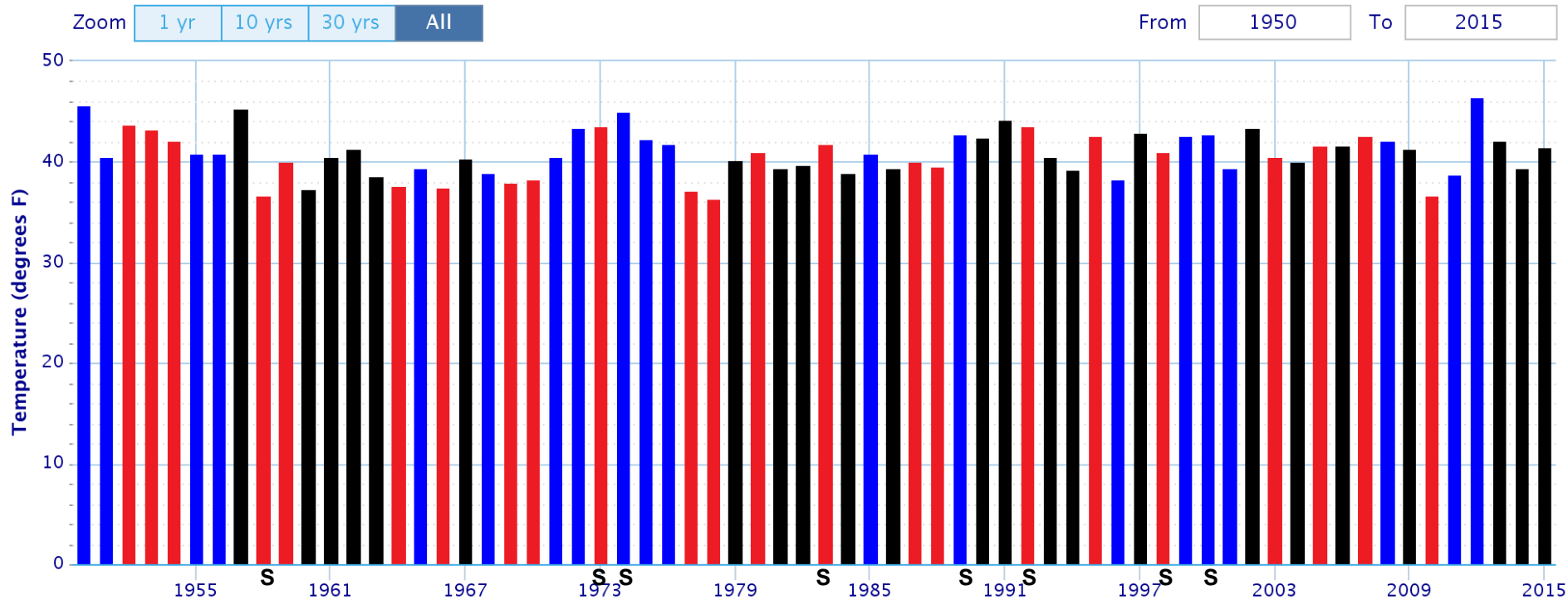
Use navigation tools above and below chart to change displayed range



ENSO's Impact on Asheville's Temp

Mean Avg Temperature Dec 1 to Mar 31 – Asheville Area, NC (ThreadEx)

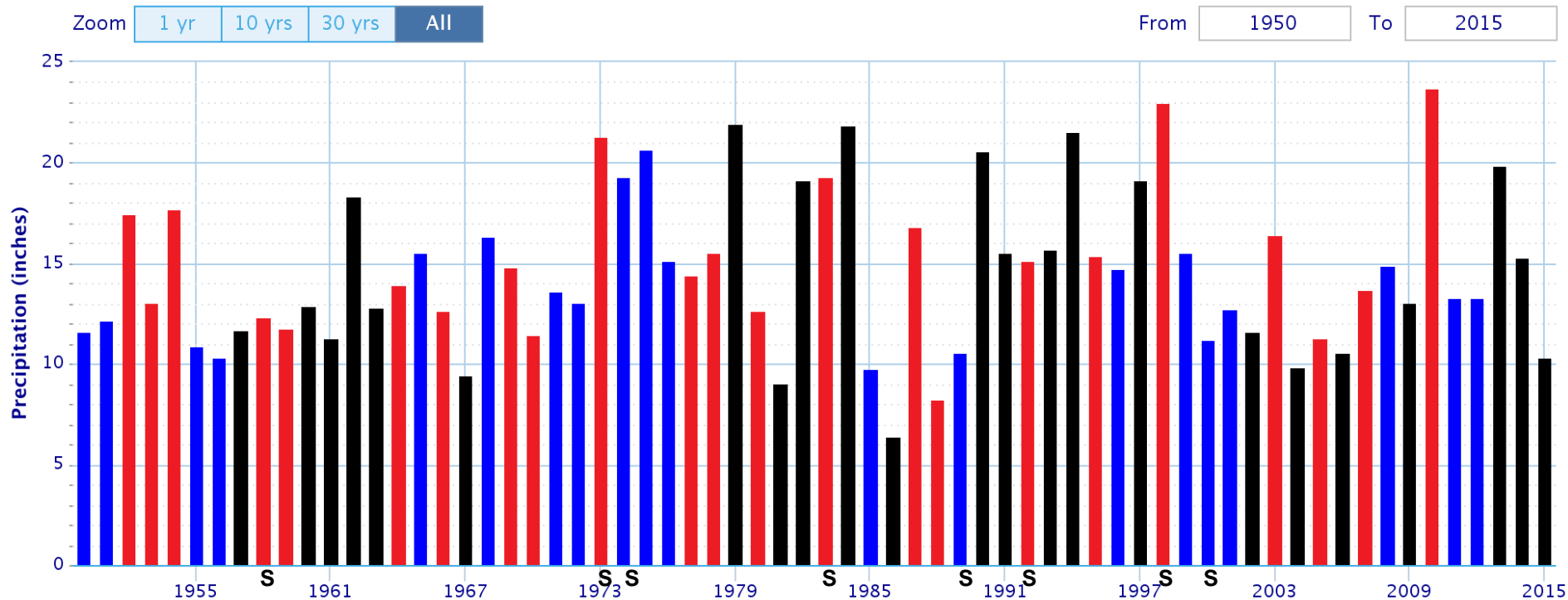
Use navigation tools above and below chart to change displayed range



ENSO's Impact on Asheville's Precip

Total Precipitation Dec 1 to Mar 31 – Asheville Area, NC (ThreadEx)

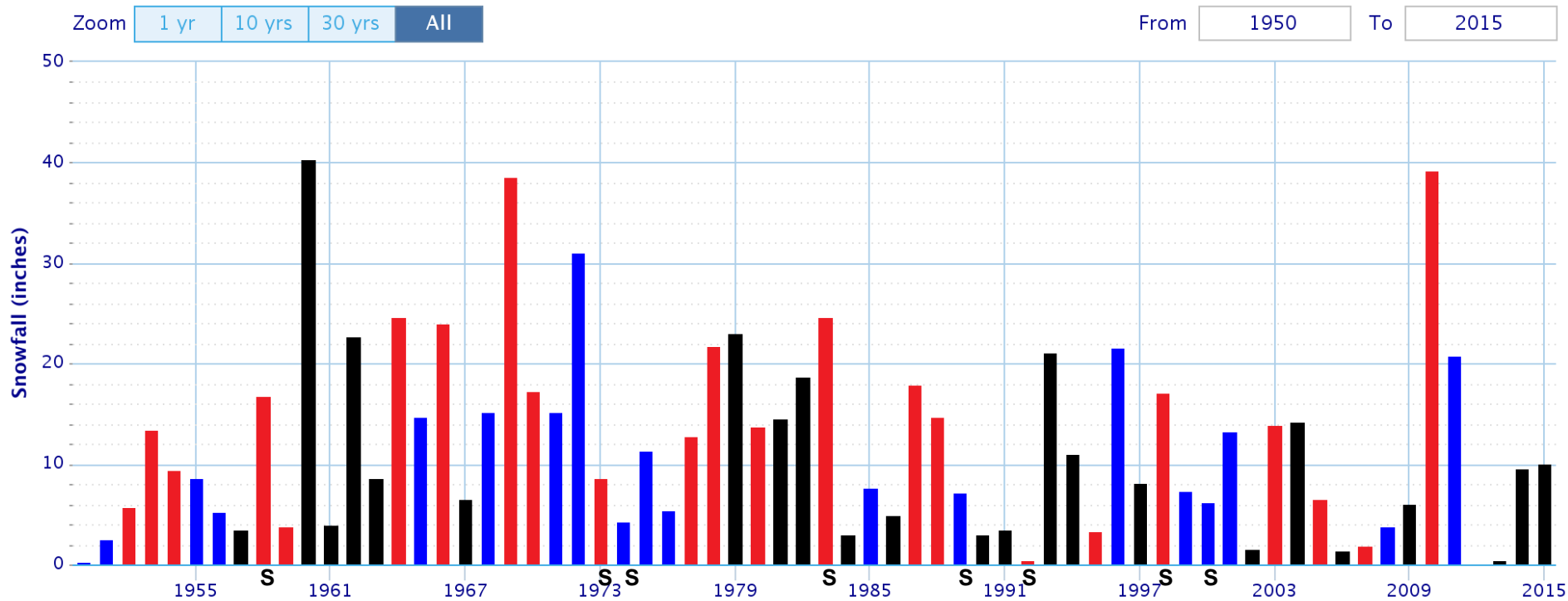
Use navigation tools above and below chart to change displayed range

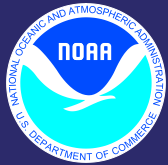


ENSO's Impact on Asheville's Snow

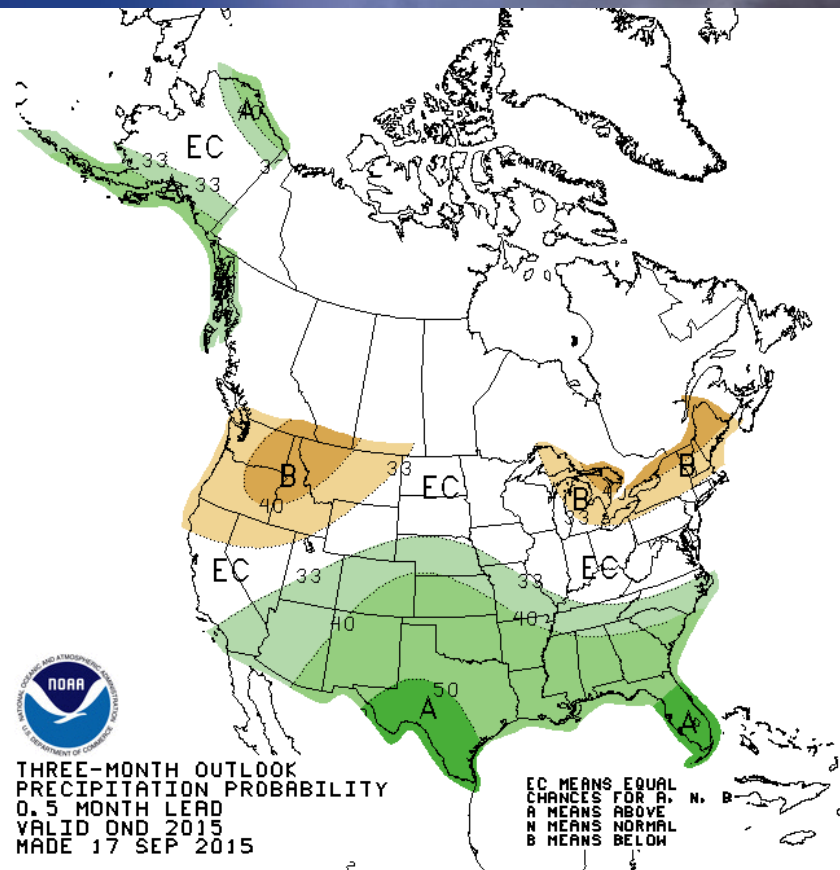
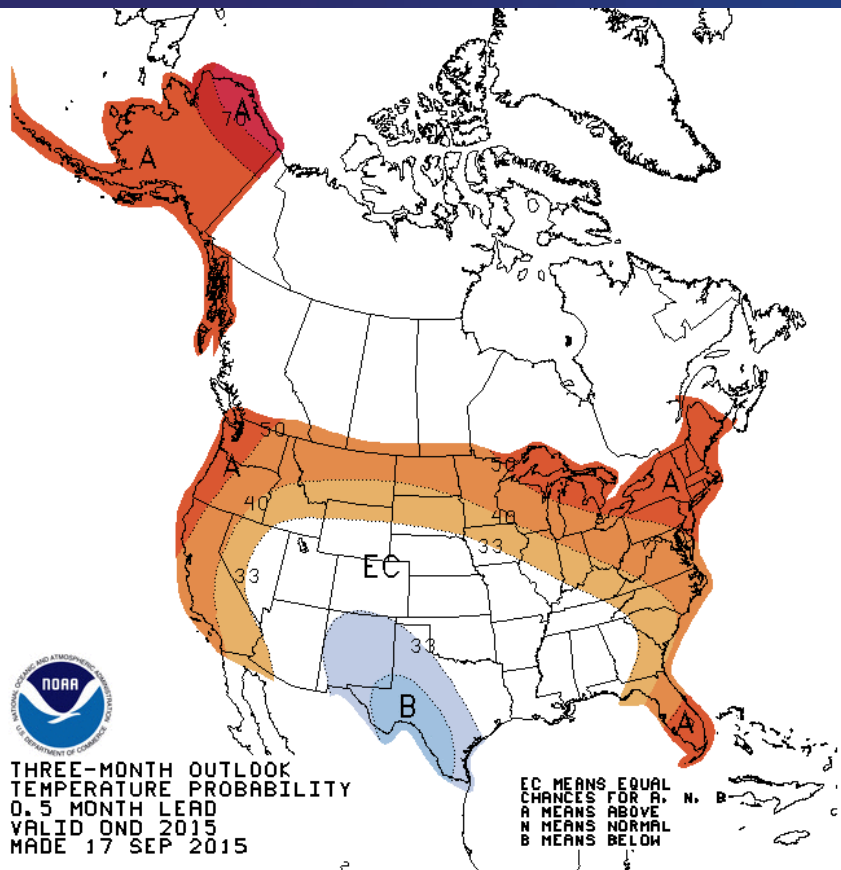
Total Snowfall Dec 1 to Mar 31 – Asheville Area, NC (ThreadEx)

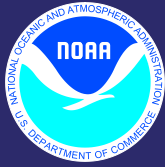
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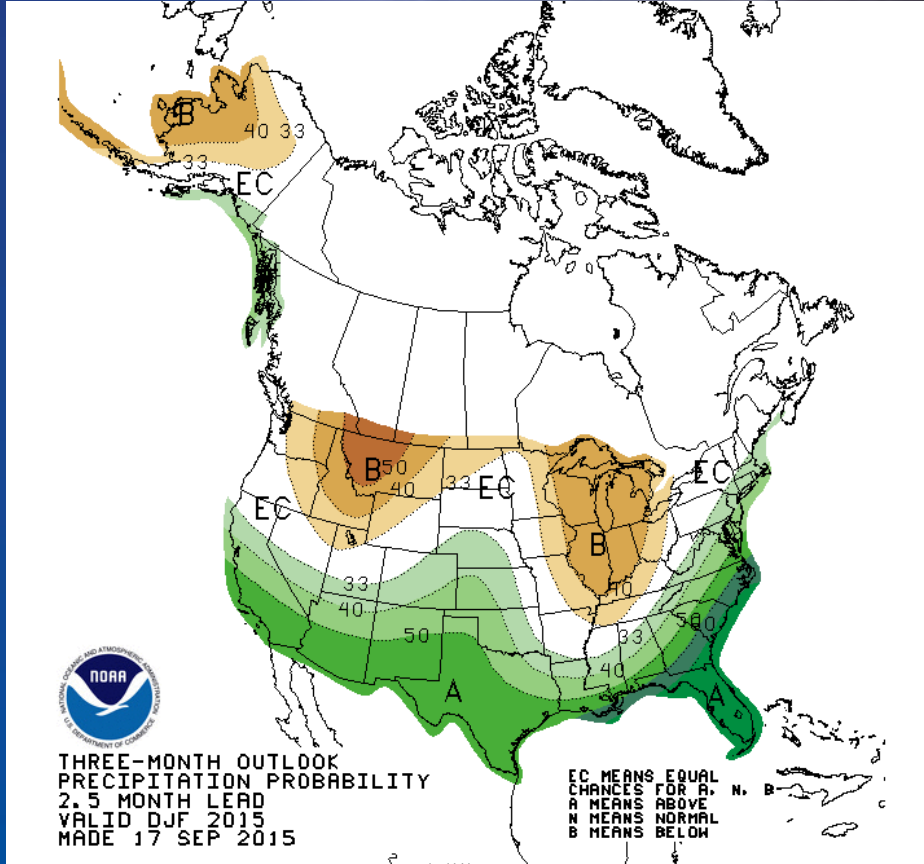
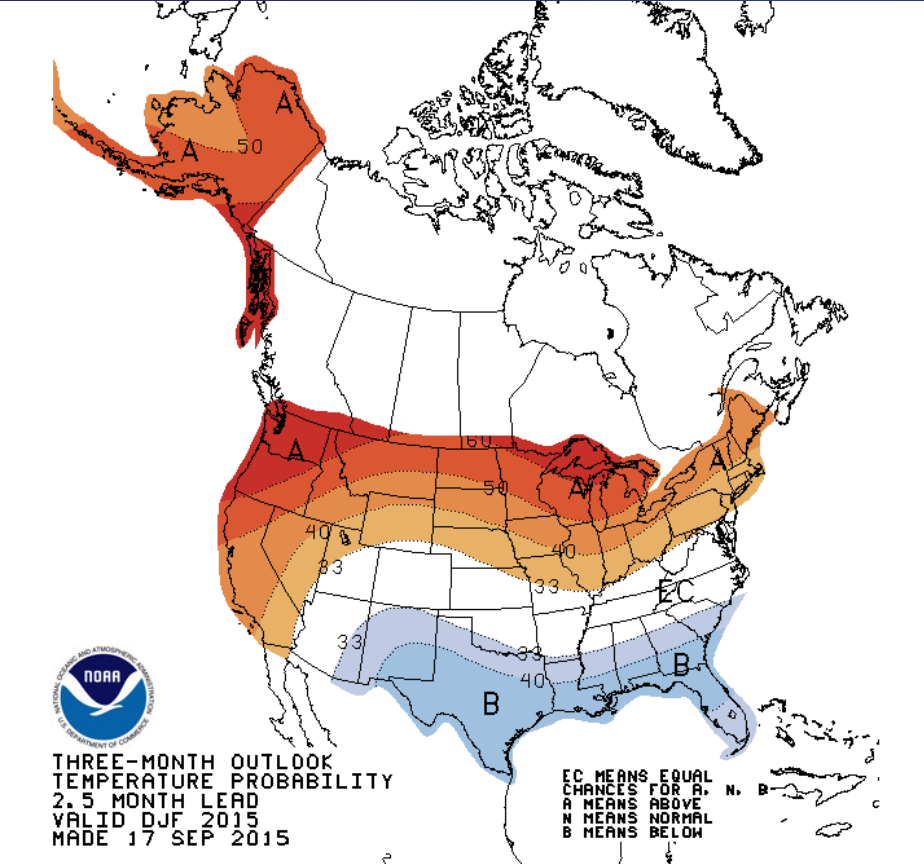


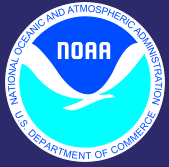
CPC October-December Outlook





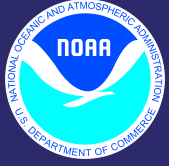
CPC December-February Outlook





Bottom Line

- ✓ **A strong El Nino is expected this winter.**
- ✓ **Above normal precip is likely, especially east of I-95.**
- ✓ **It's hard to say whether the increased precip will manifest in snow or ice. But, the opportunity will be there... it just depends on the airmass that is in place at the time of storms...and that is driven by weather and climate features beyond ENSO.**



Questions?



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 - *Steven.Pfaff@noaa.gov*

