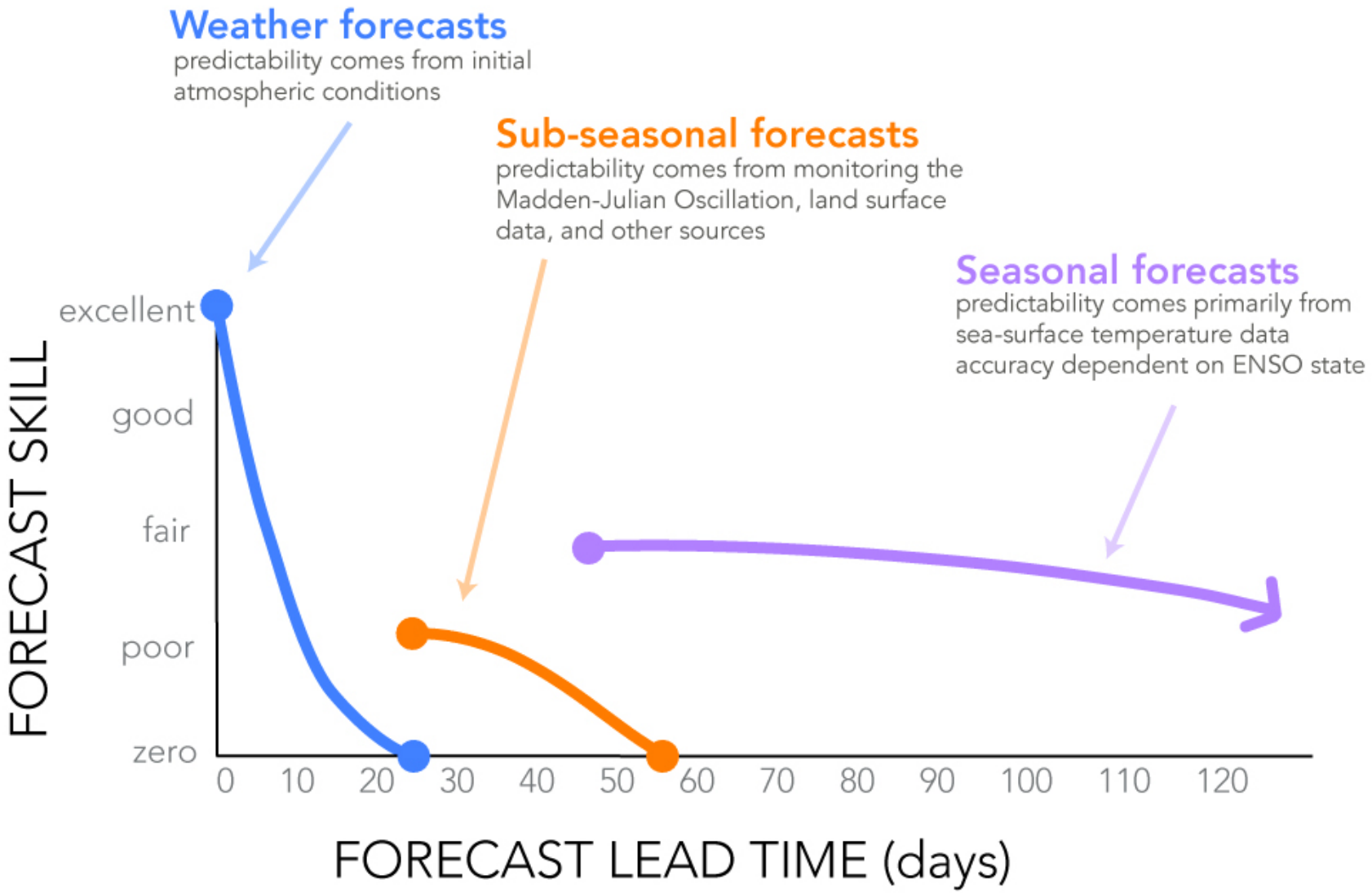
# Forecast Skill Scores and Examples from Recent Winters

Jon Rutz (jonathan.rutz@noaa.gov)

National Weather Service – Western Region HQ
Science and Technology Division

# CPC Precipitation Outlook DJF 2015-2016



# CPC Precipitation Outlook DJF 2015-2016

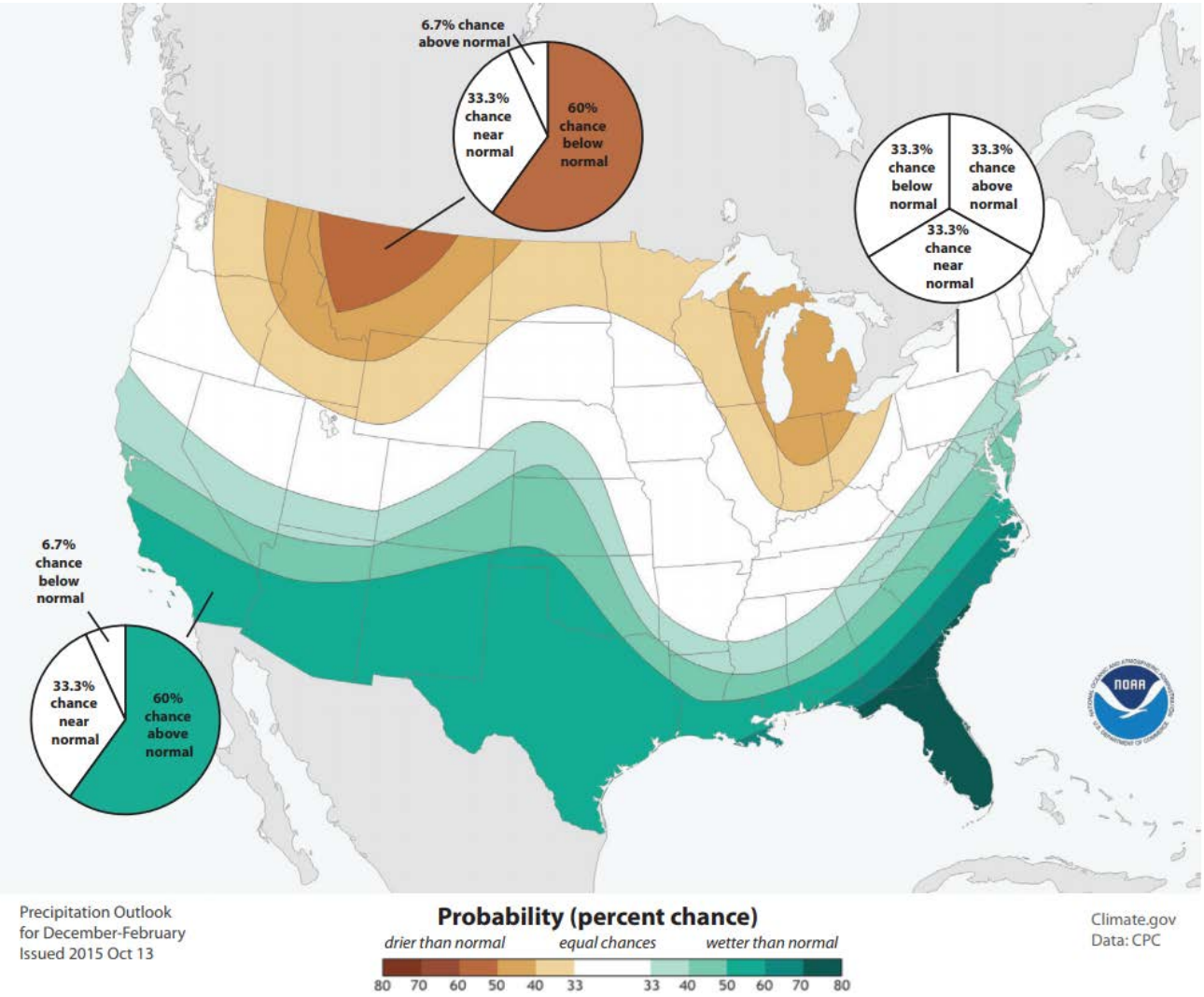
**What it does say**

The probability that precipitation will be above, near, or below the median (*not mean*) value.

These three classes (above, near, and below) are defined by separating the climatological (1981–2010) distribution into thirds, so that each has a 33.3% probability of occurrence.

**What it does not say**

How far above or below the median precipitation the outcome will be.

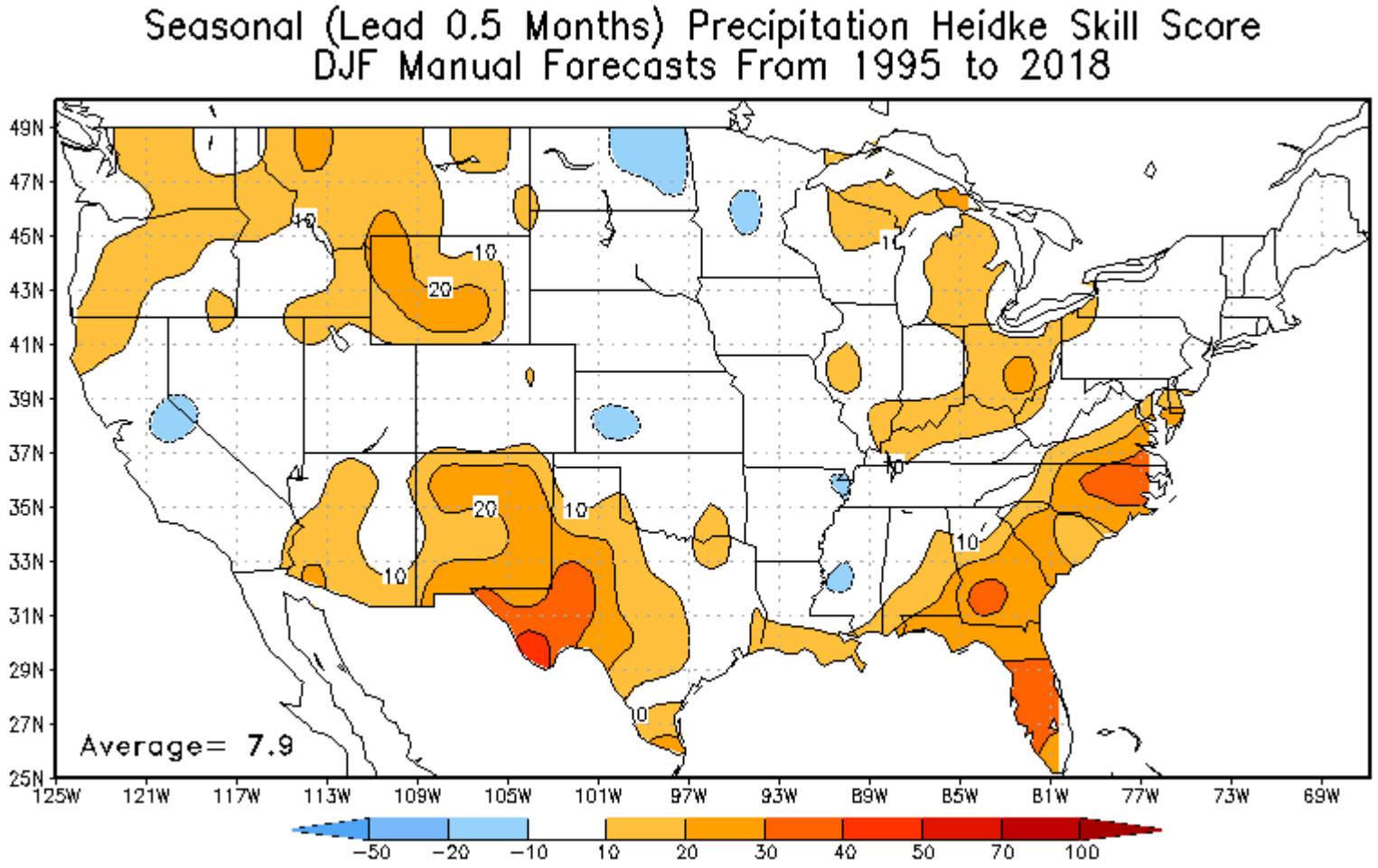



Description: http://www.cpc.ncep.noaa.gov/products/predictions/long_range/tools.html

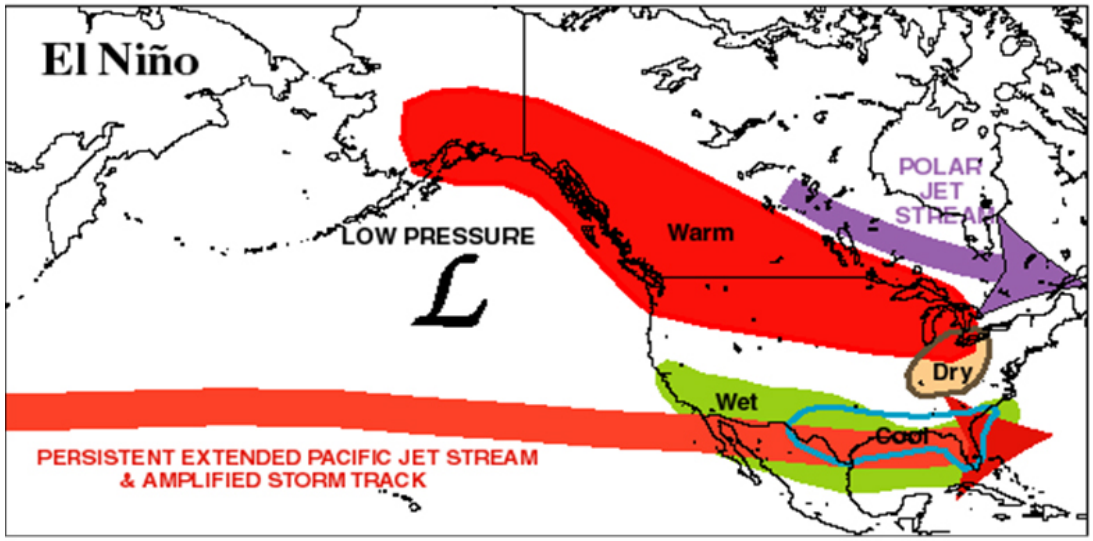
# Skill Score Basics

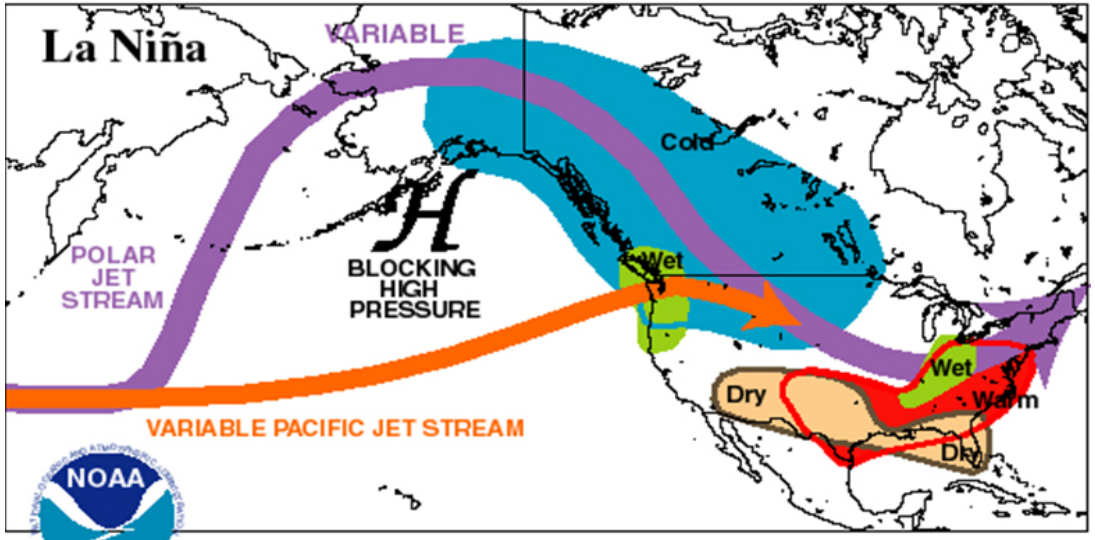
- Many ways to verify weather/seasonal forecasts
- Heidke Skill Score (HSS) and Brier Skill Score (BSS) both measure value added, and are popular with meteorologists
- HSS perhaps more intuitive
  - Measures improvement over climatology
- BSS also useful, particularly for measuring the skill of probabilistic forecasts

# CPC Precipitation Outlook DJF 2015-2016



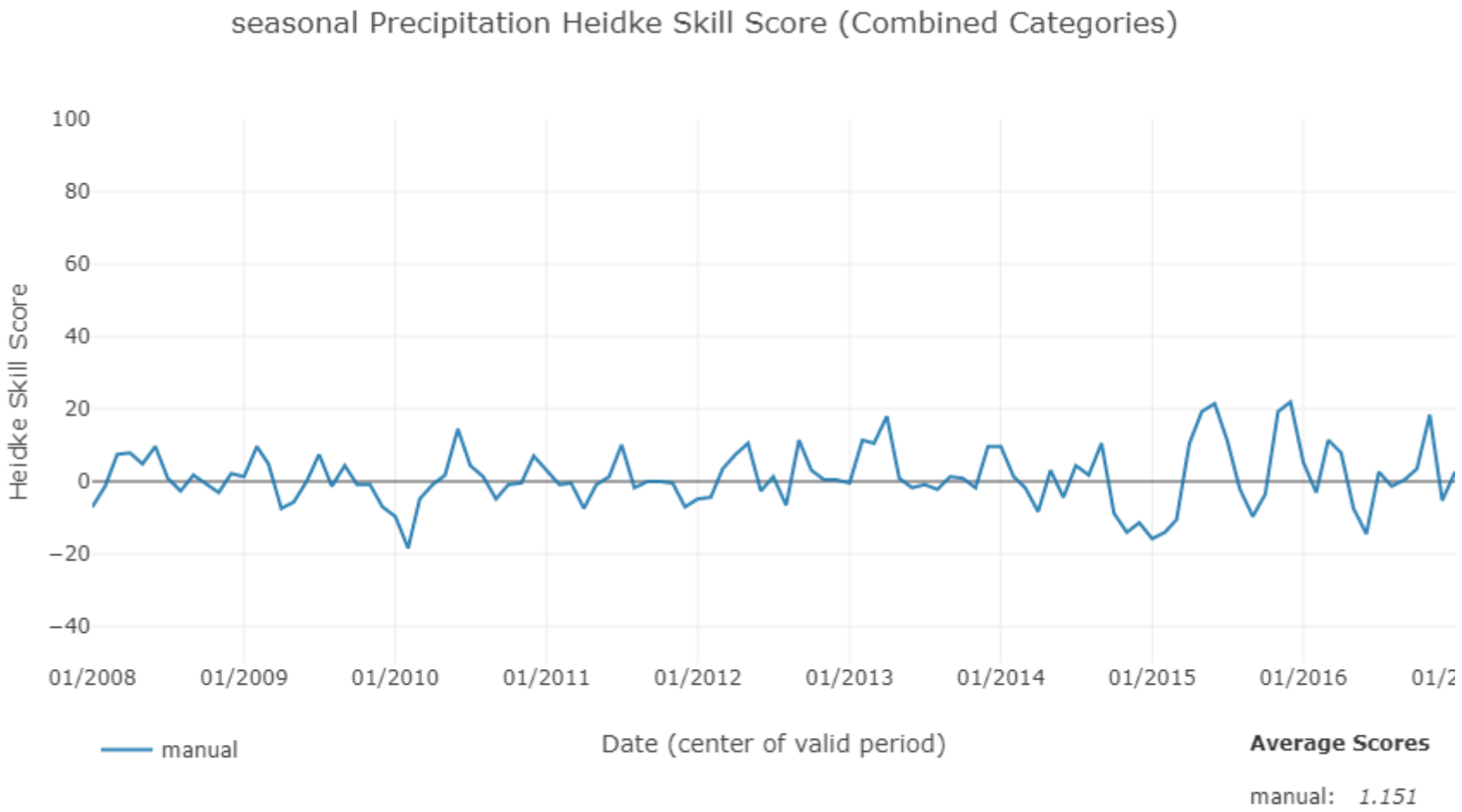
# CPC Precipitation Outlook DJF 2015-2016



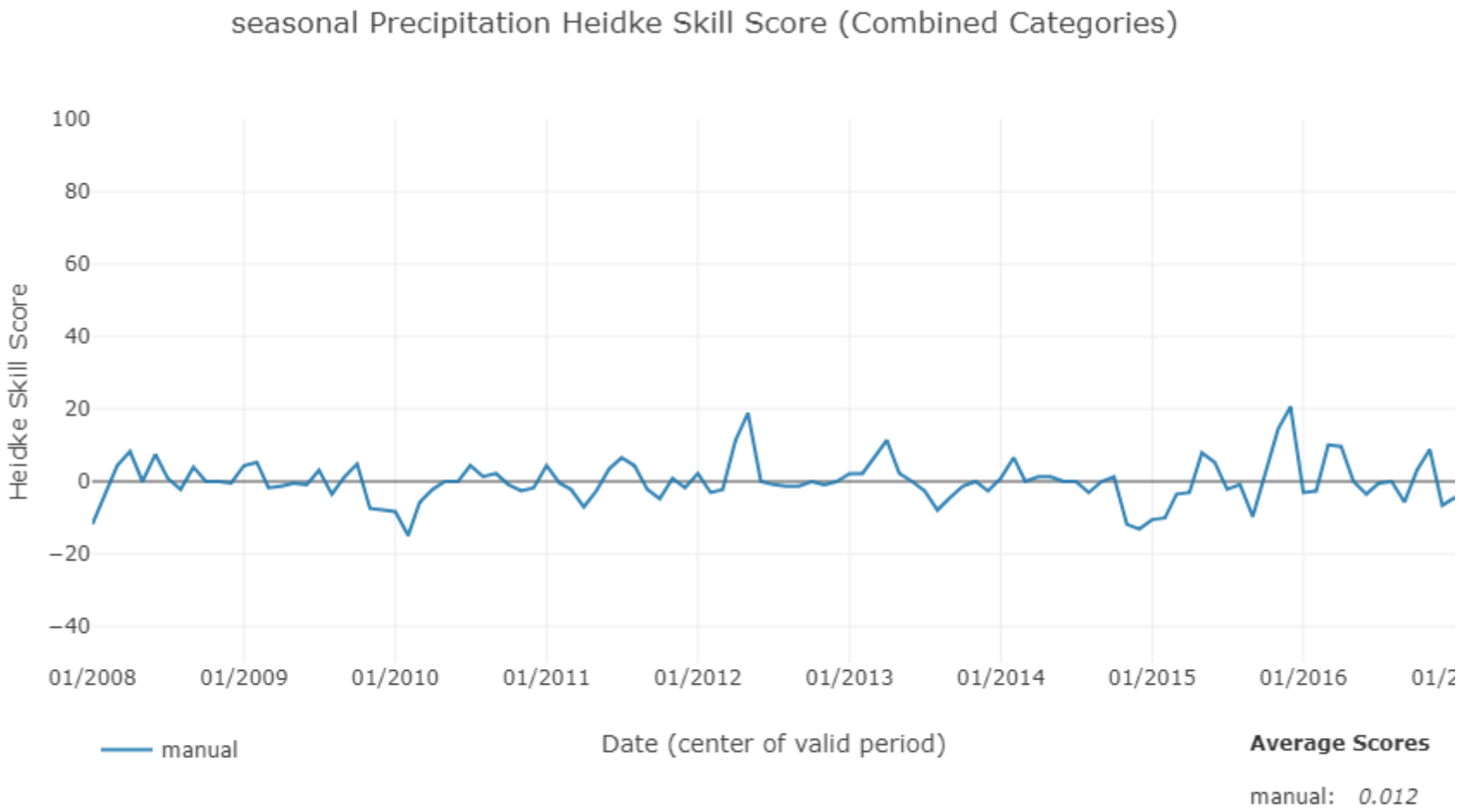




Climate Prediction Center/NCEP/NWS

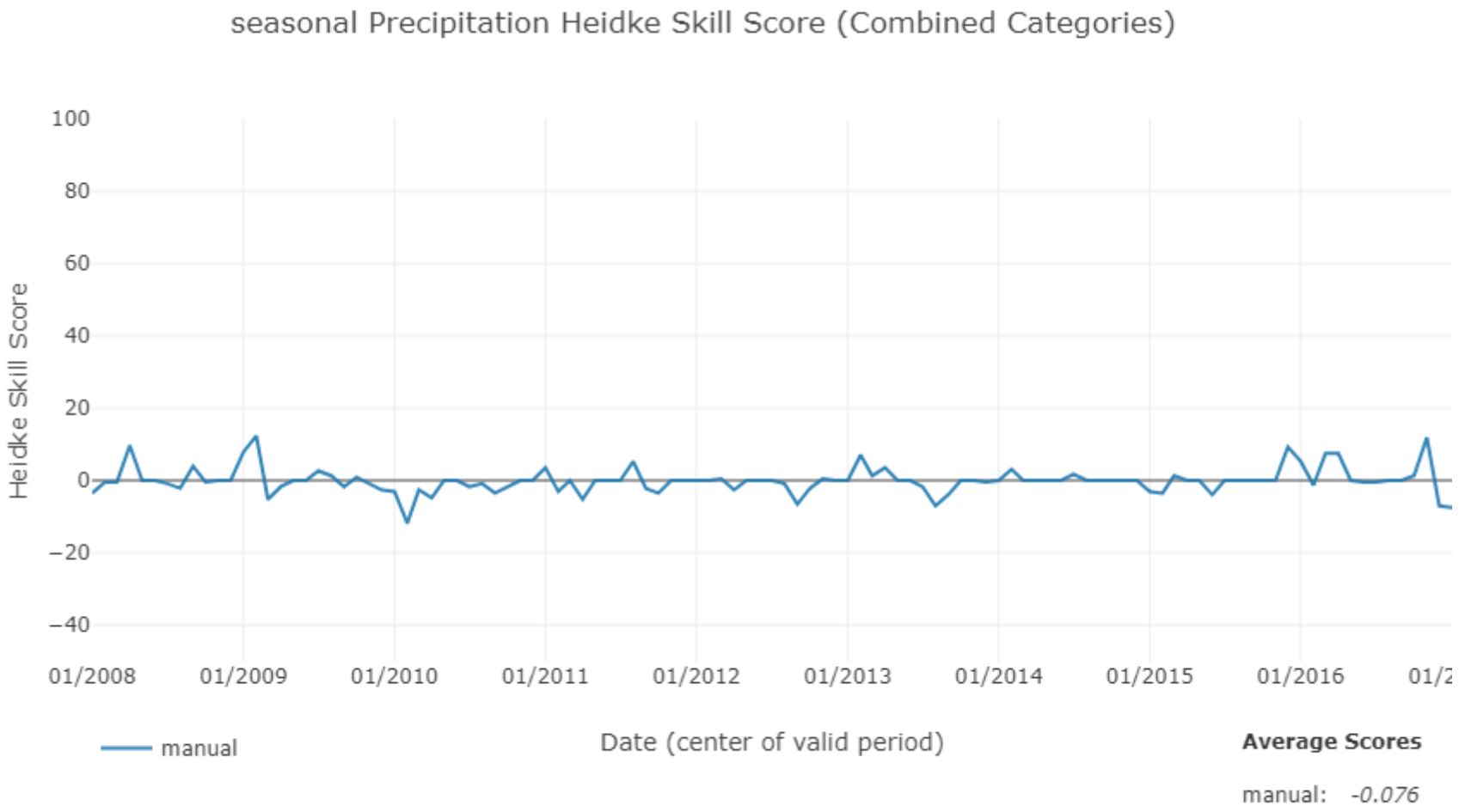
# Precipitation (0.5-Month Forecast, CONUS)



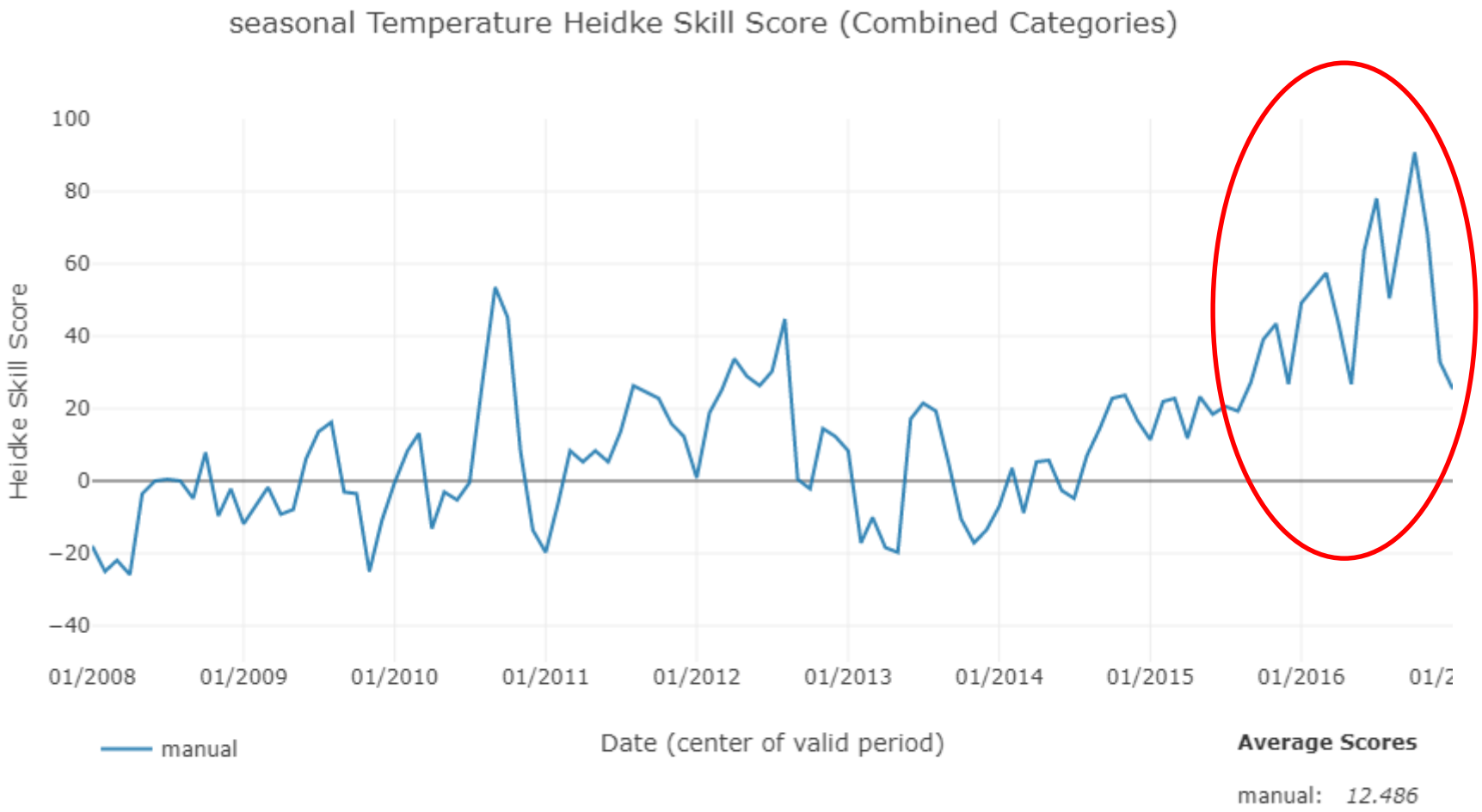
# Precipitation (3.5-Month Forecast, CONUS)



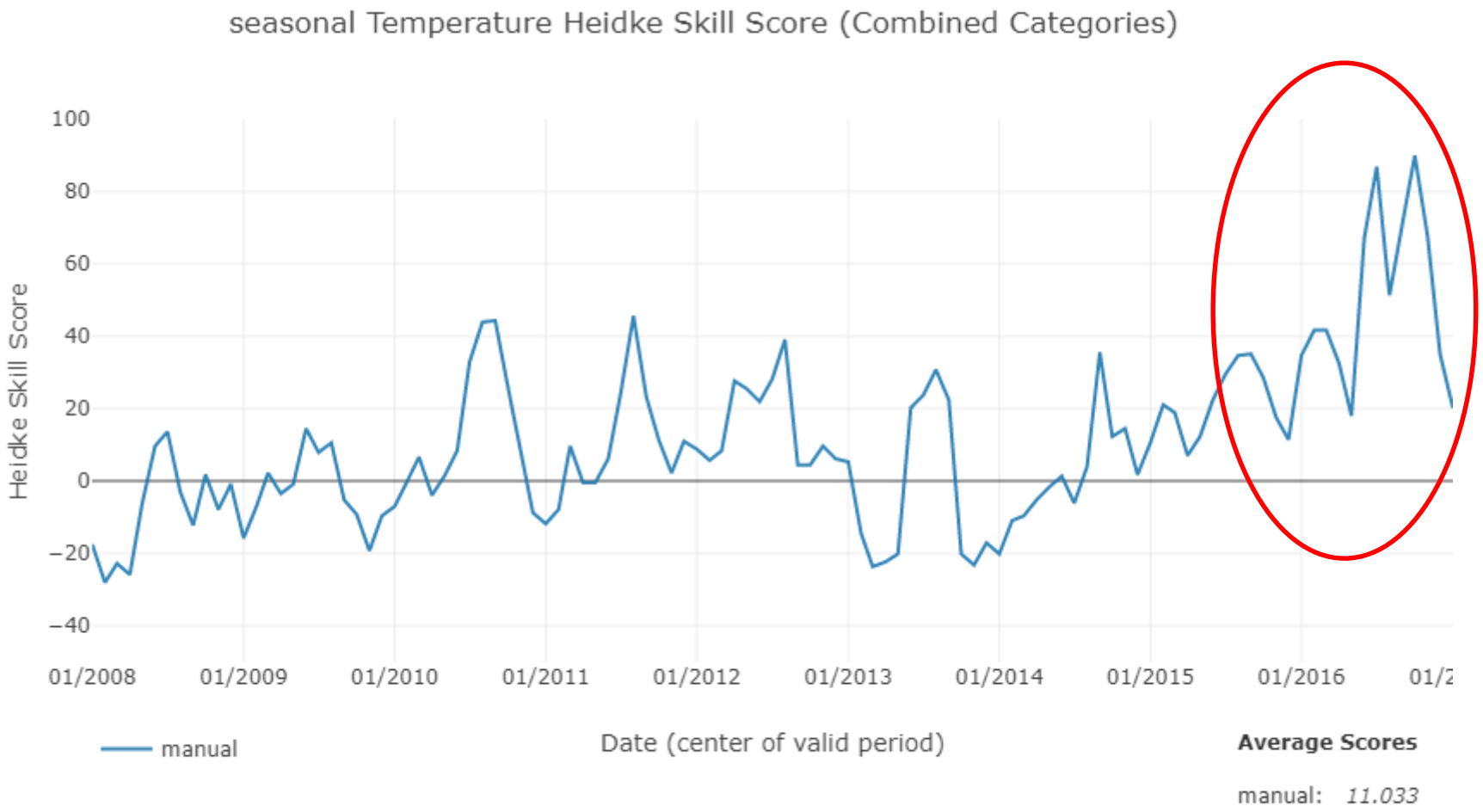
# Precipitation (6.5-Month Forecast, CONUS)



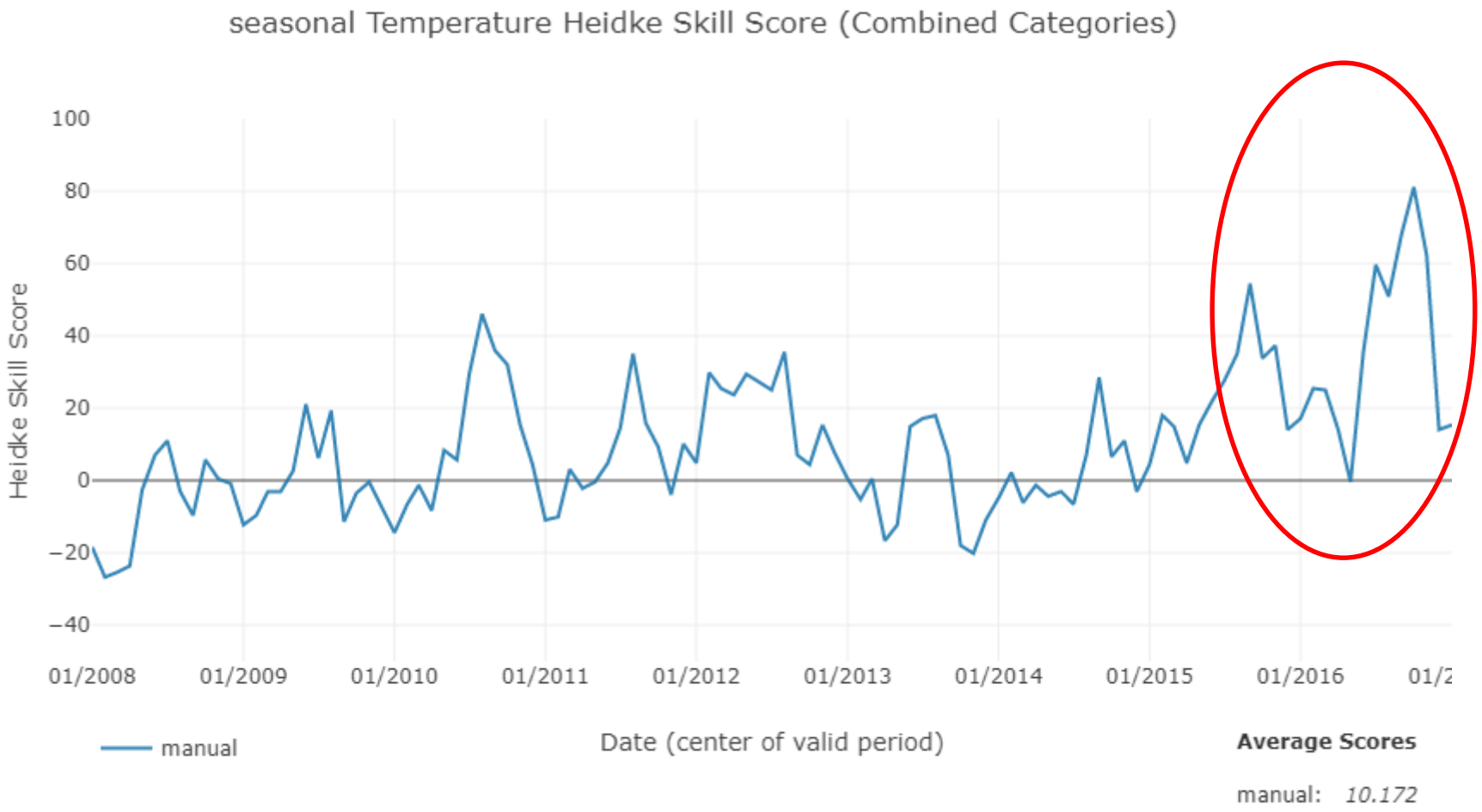
# Temperature (0.5-Month Forecast, CONUS)



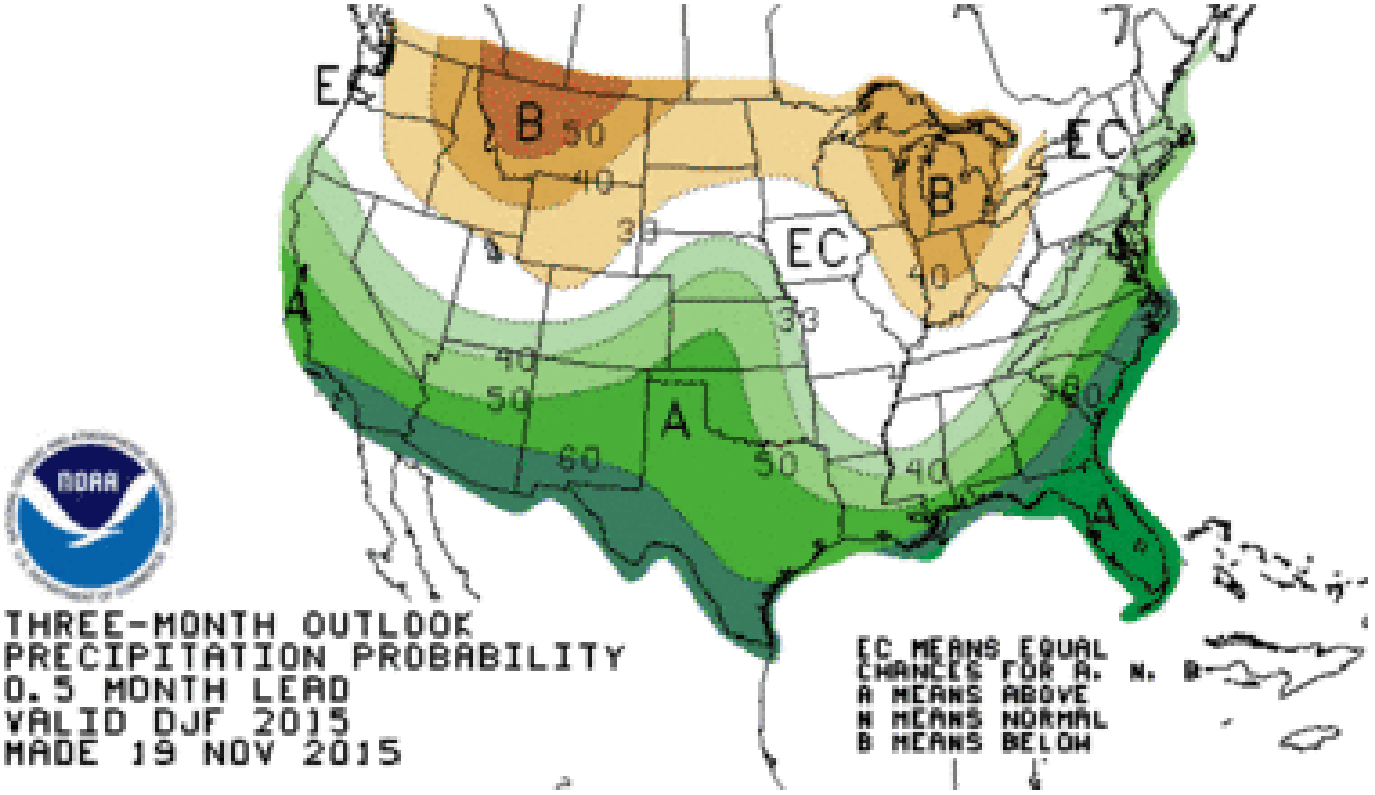
# Temperature (3.5-Month Forecast, CONUS)



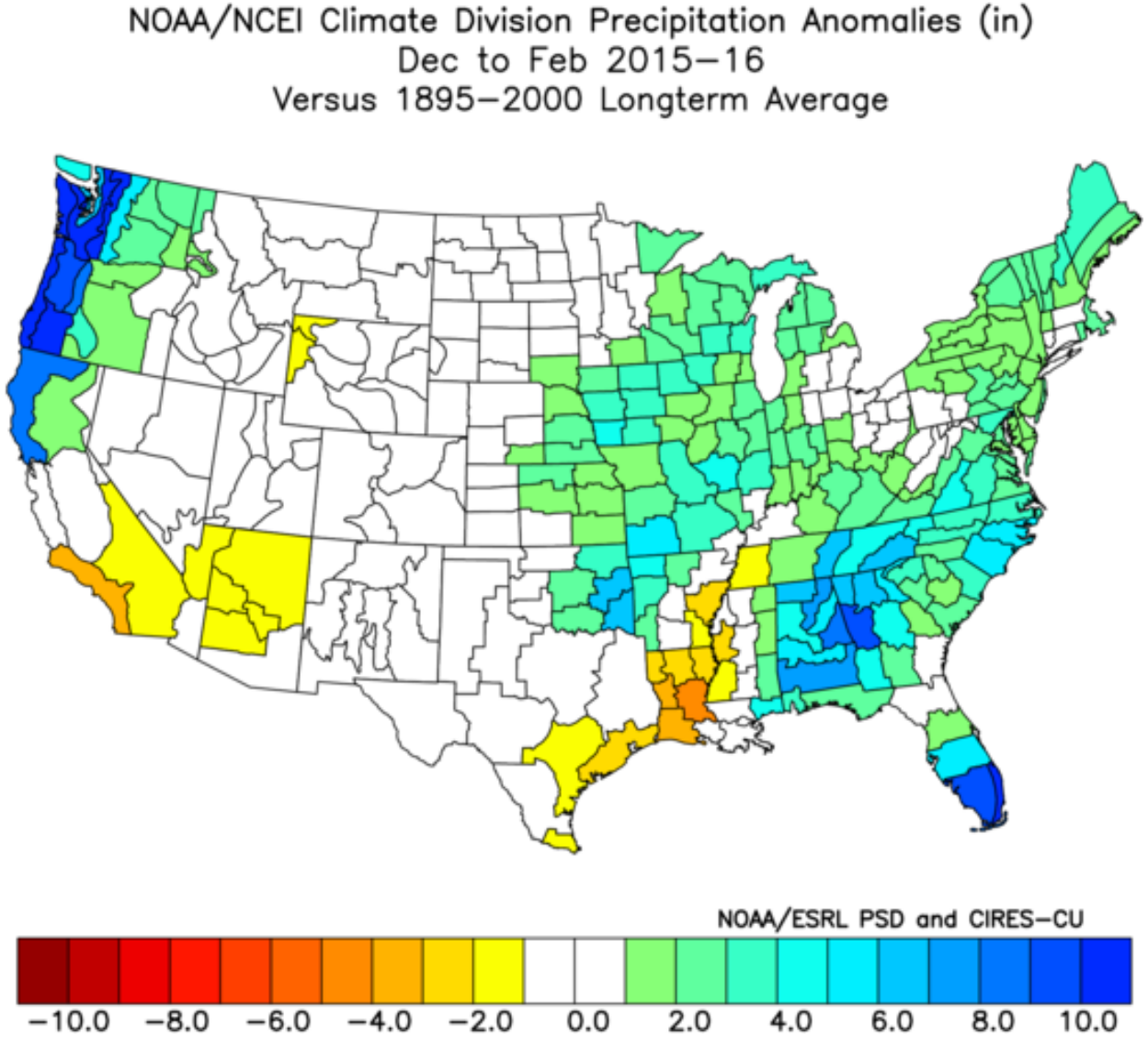
# Temperature (6.5-Month Forecast, CONUS)



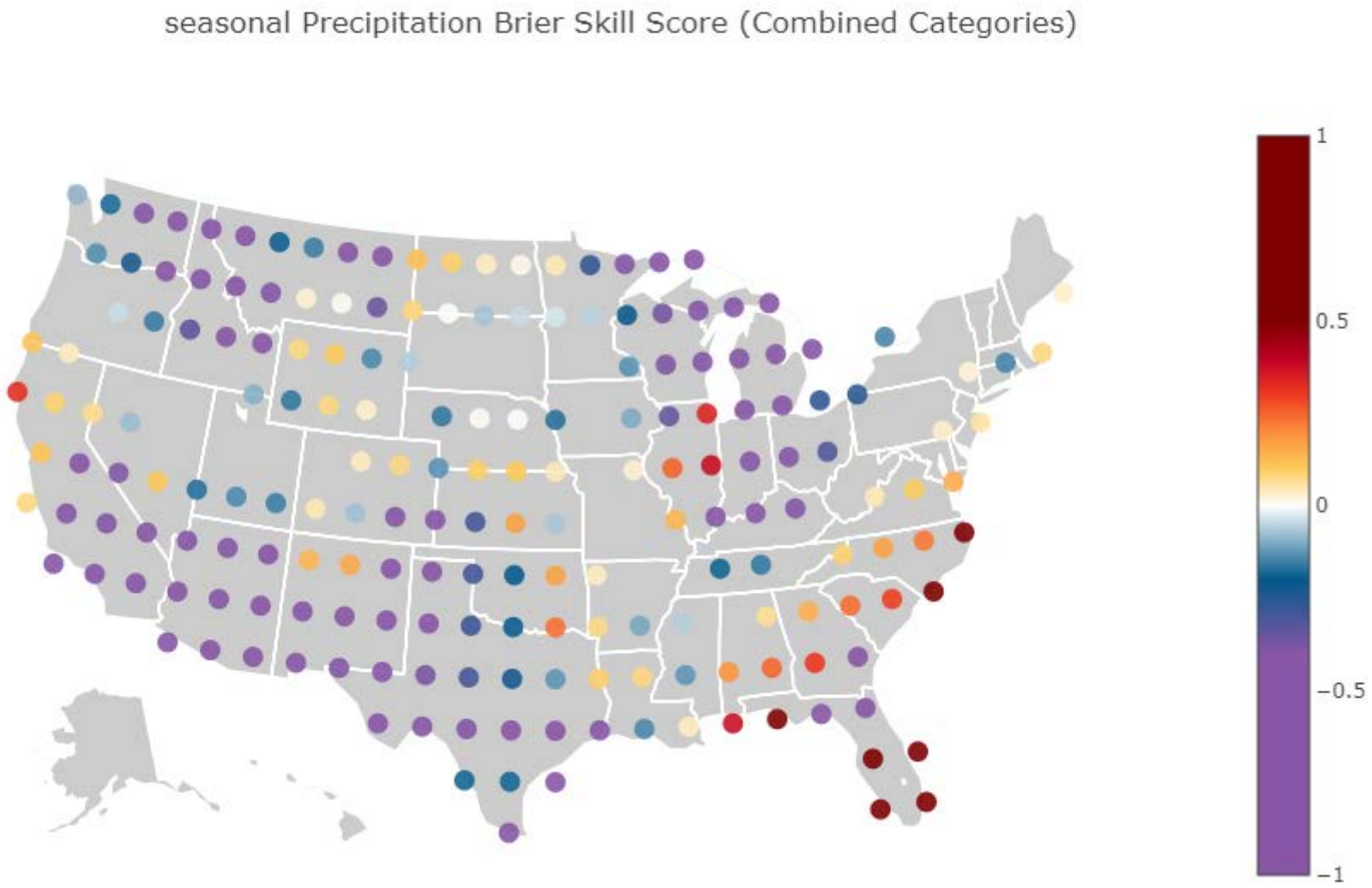
# Seasonal Precipitation Forecast 2015/16



# Seasonal Precipitation Observations 2015/16

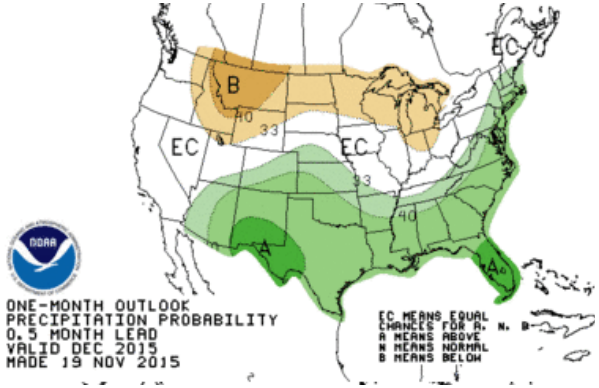


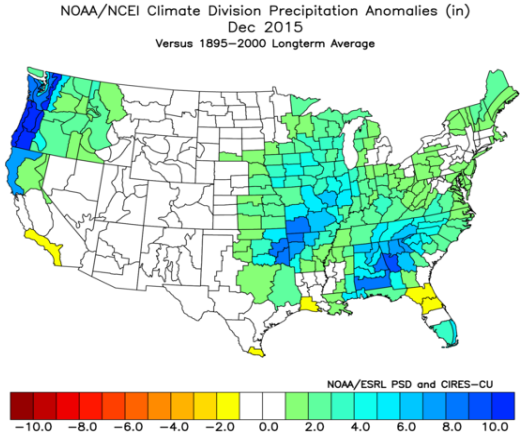
# Seasonal Precipitation Skill 2015/16



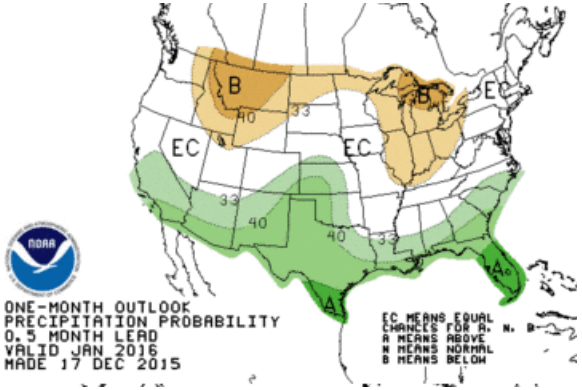
# Monthly Precipitation 2015/16

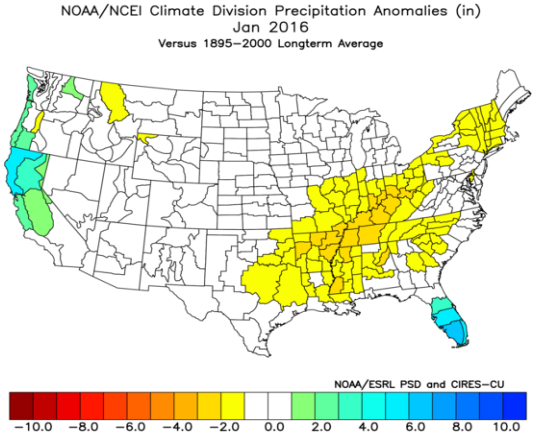
## December 2015



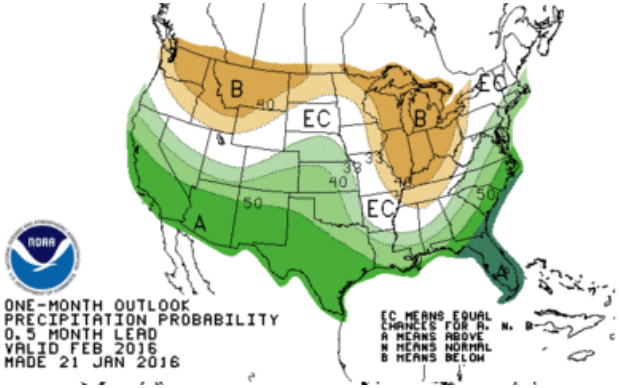



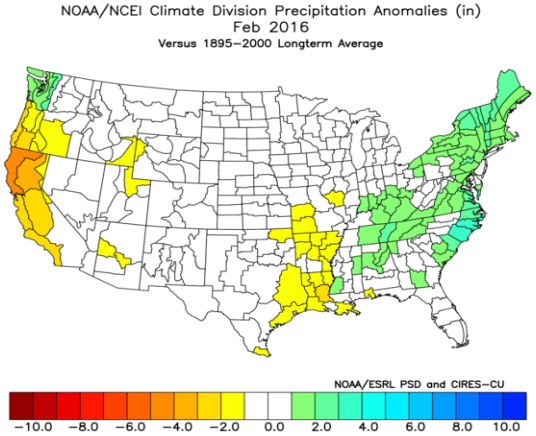

## January 2016



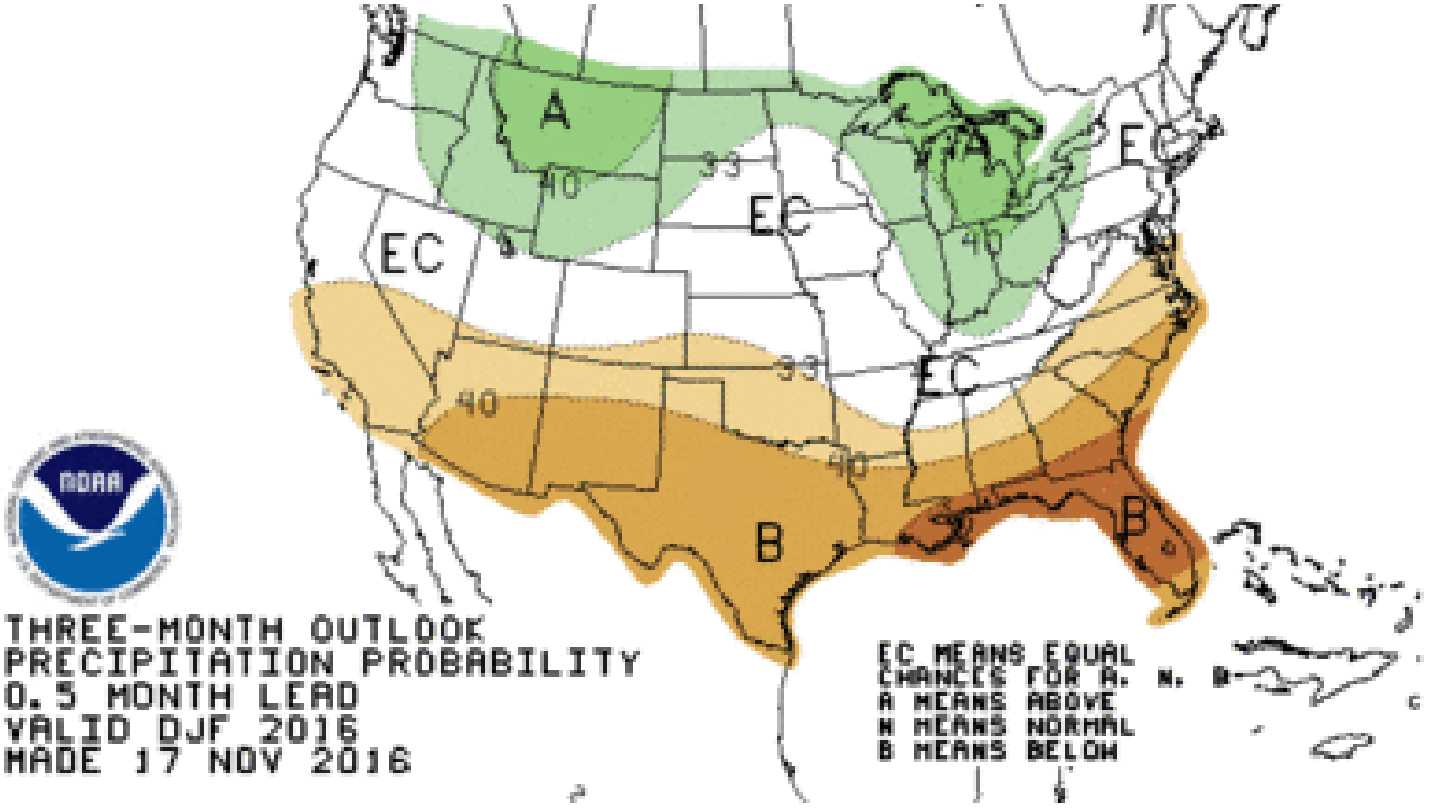




## February 2016

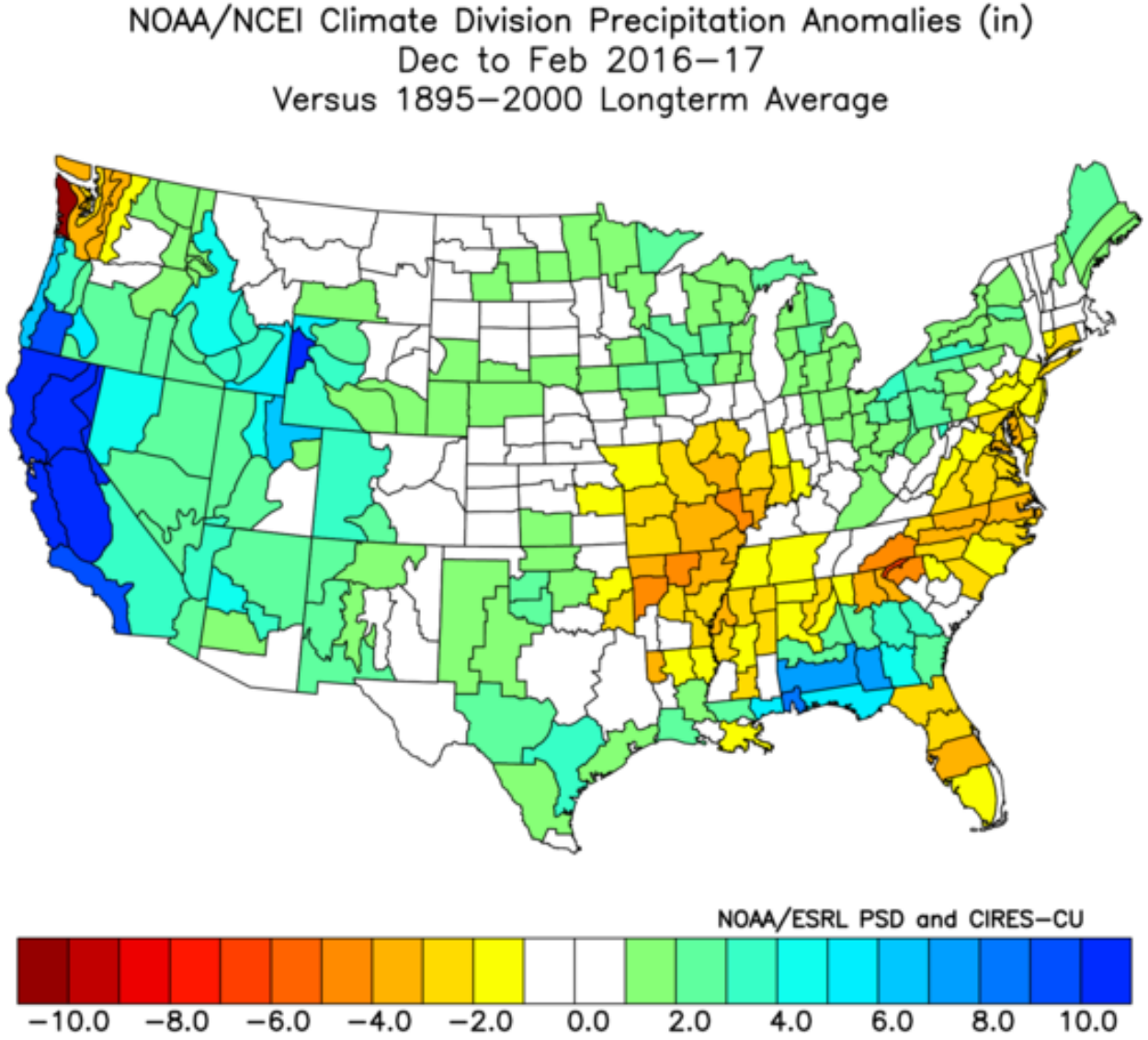


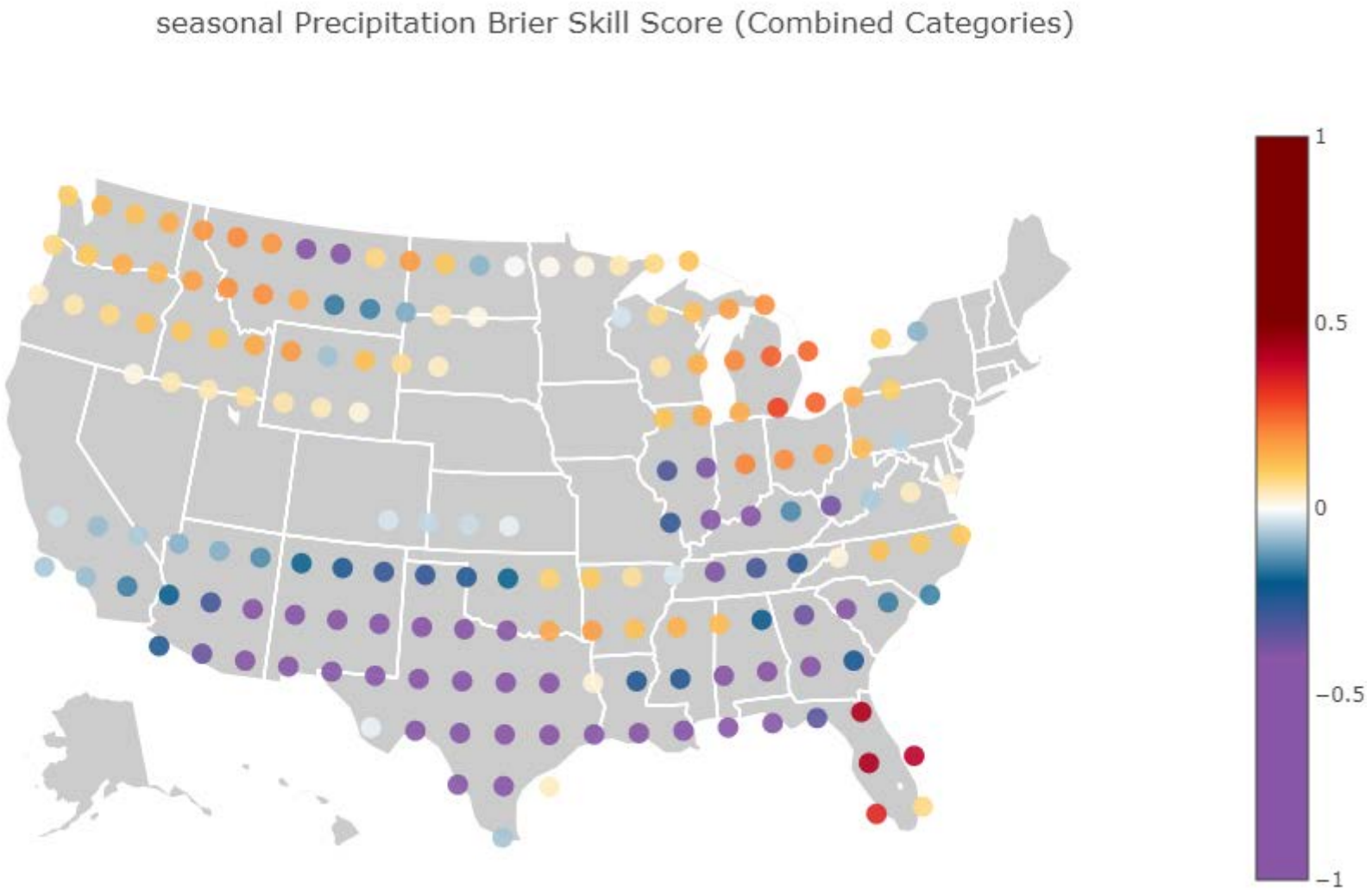
# Seasonal Precipitation Forecast 2016/17



# Seasonal Precipitation Observations 2016/17

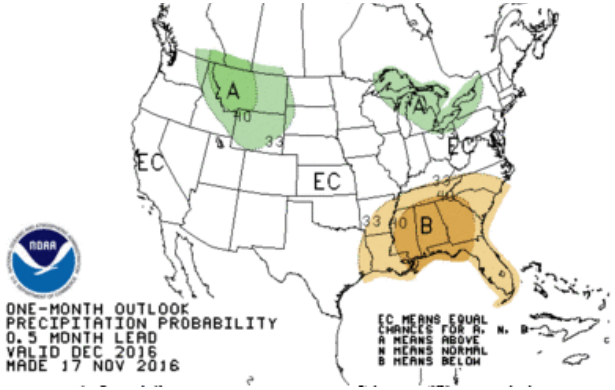


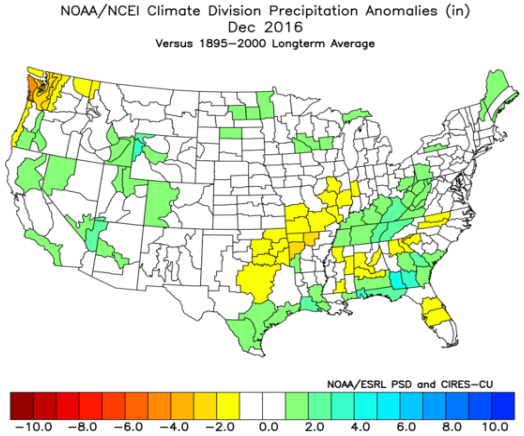
# Seasonal Precipitation Skill 2016/17



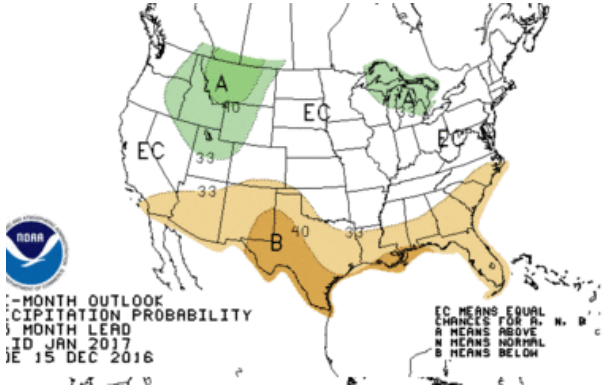
# Monthly Precipitation 2016/17

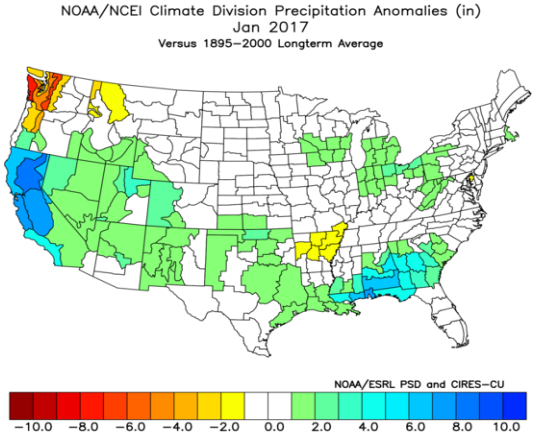
## December 2016



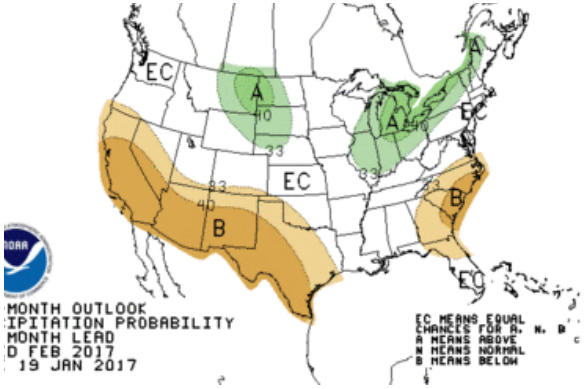



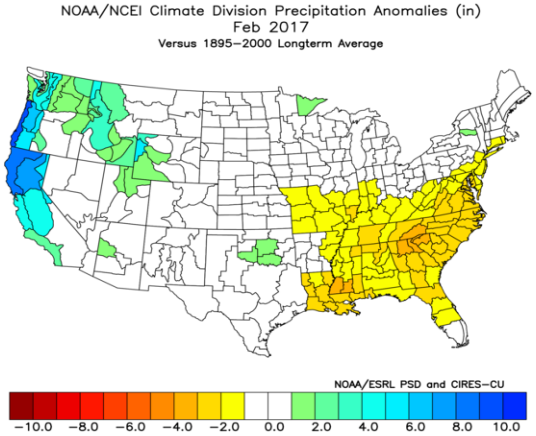

## January 2017



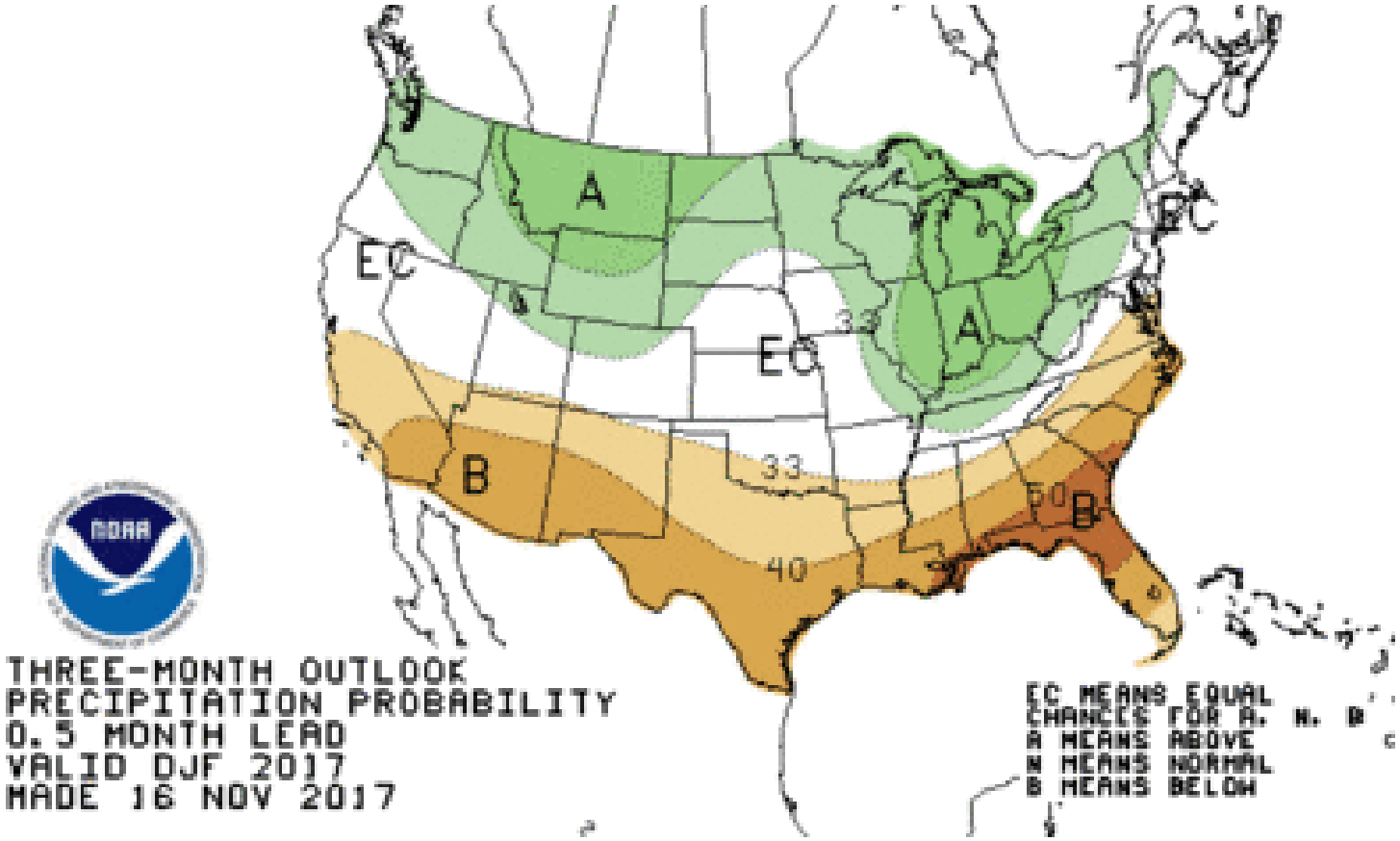




## February 2017

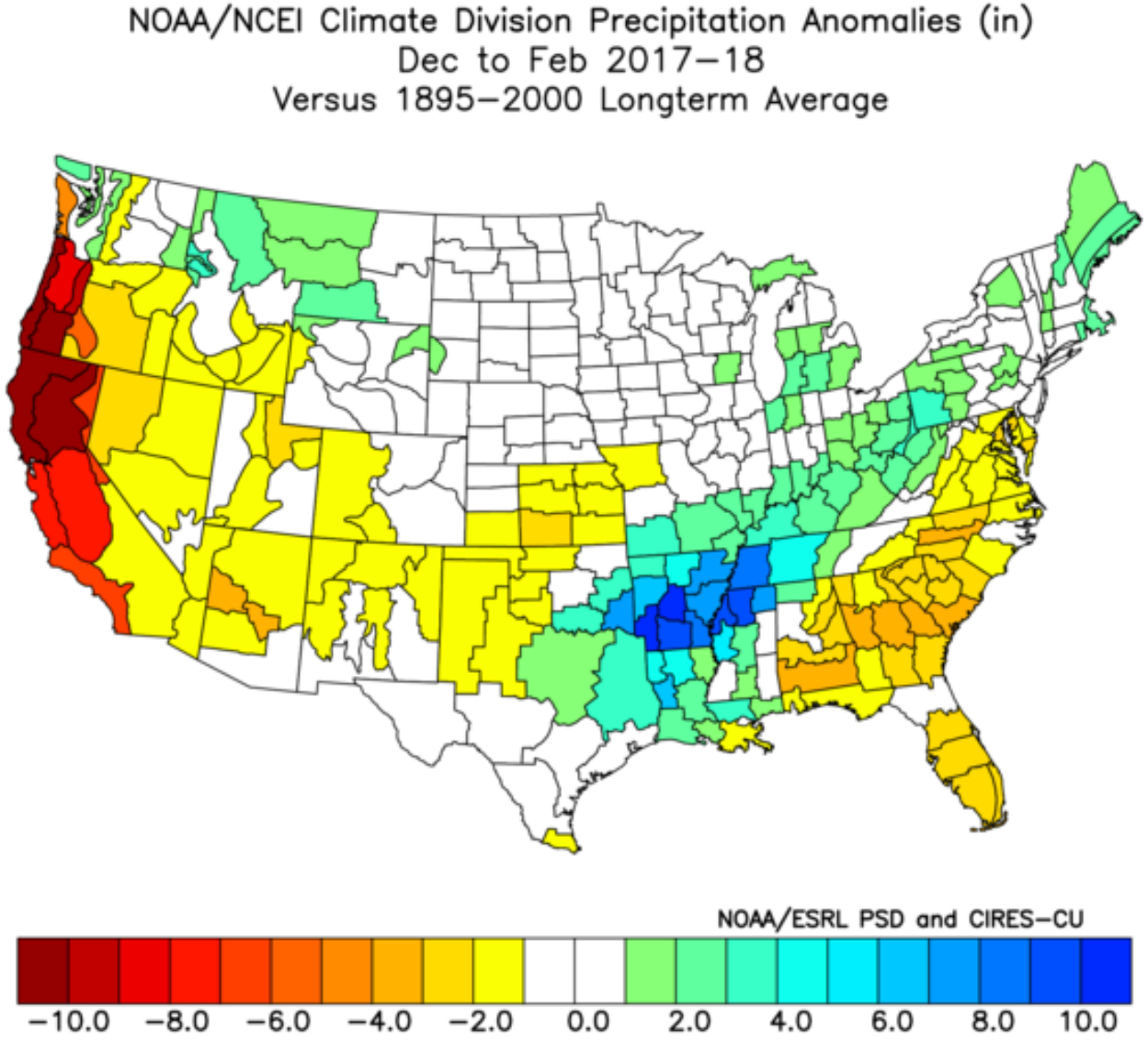


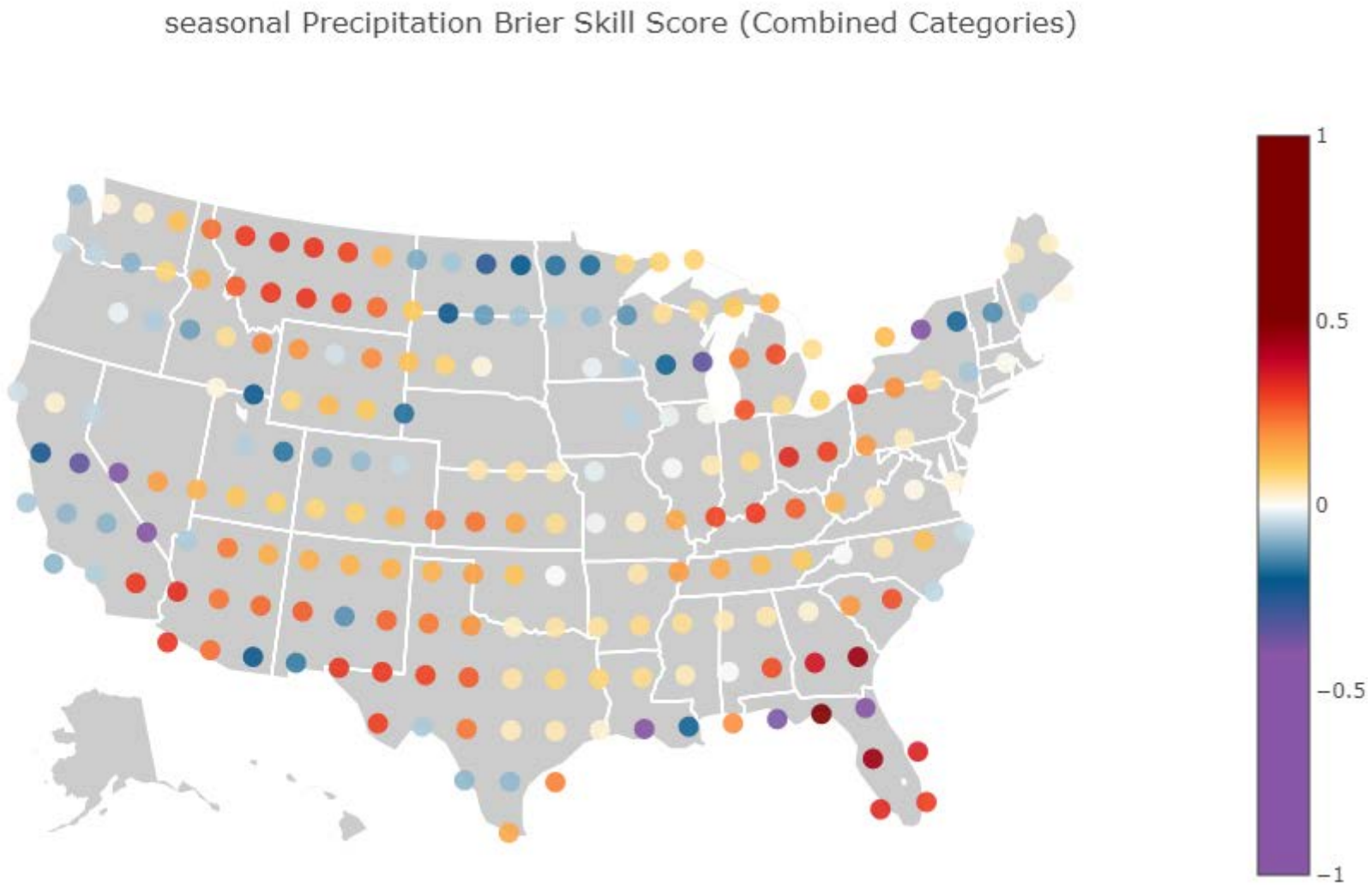
# Seasonal Precipitation Forecast 2017/18



# Seasonal Precipitation Observations 2016/17

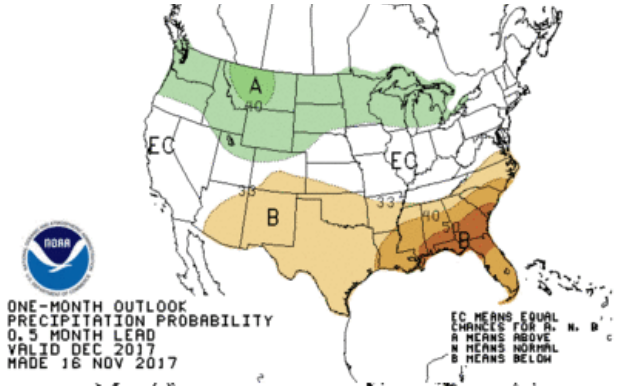


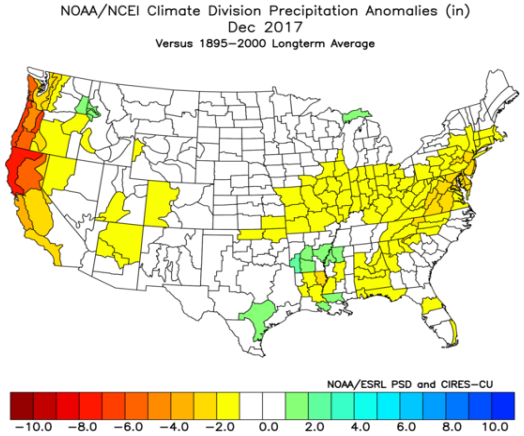
# Seasonal Precipitation Skill 2017/18



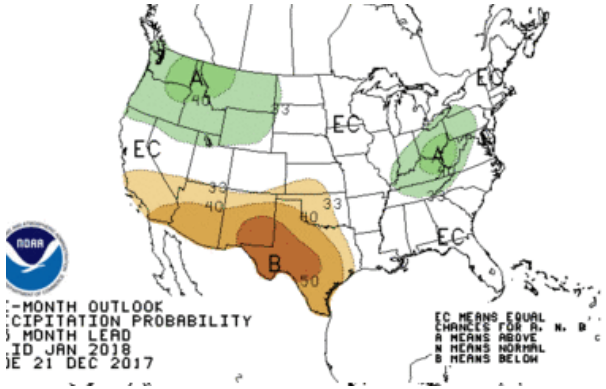
# Monthly Precipitation 2016/17

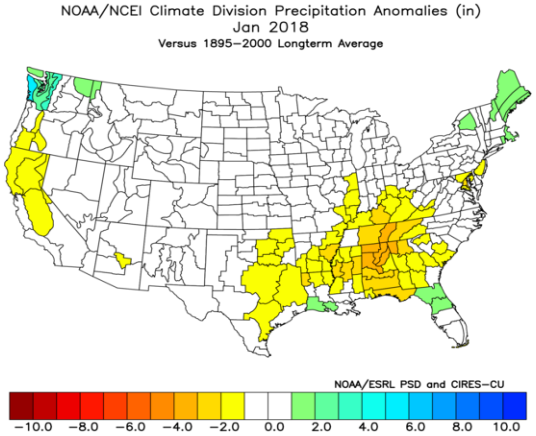
## December 2017



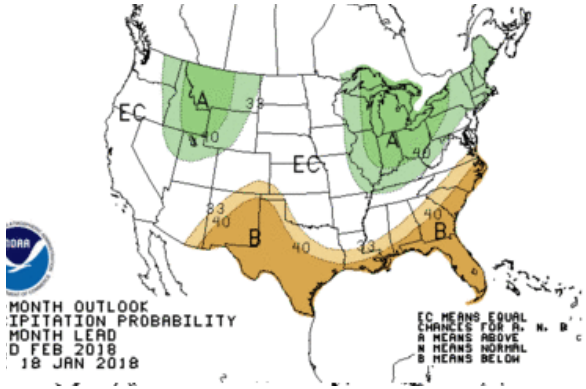



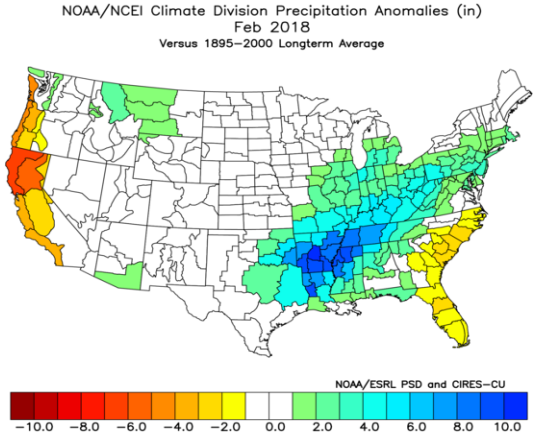

## January 2018




## February 2018

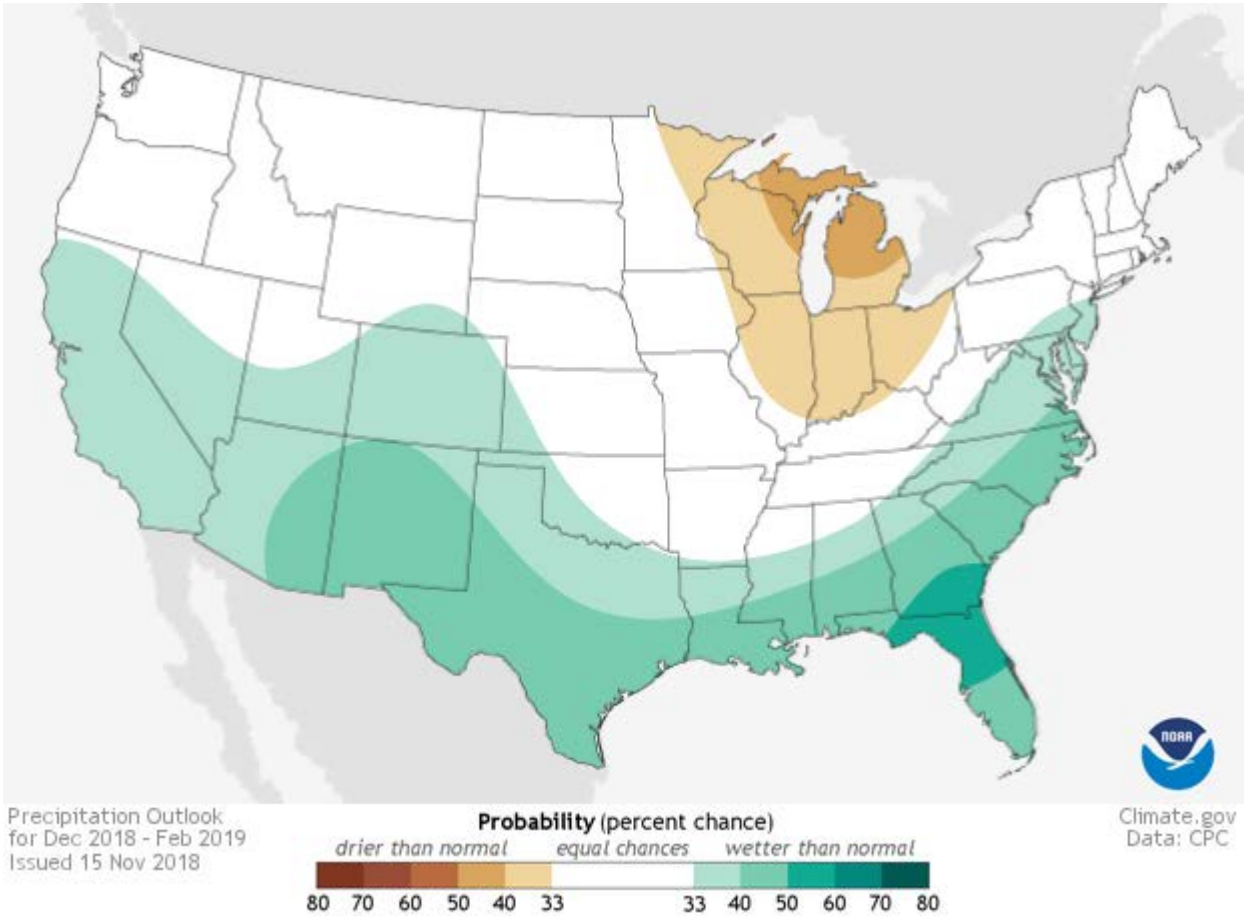


# Summary

- Seasonal temperature forecasts are improving
- Seasonal precipitation forecasts are *not* improving
- Current forecast skill for precipitation seems to rely on ENSO (El Nino / La Nina) patterns
  - The 2015/16 El Nino and 2016/17 La Nina winters did not feature good forecasts based on typical ENSO patterns
  - The 2015/16 and 2016/17 winters shook confidence in ENSO skill/reliability for S2S applications
  - The 2017/18 winter (La Nina) forecast was better

# Seasonal Precipitation Forecast 2018/19



Questions or comments?