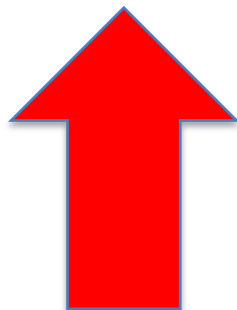
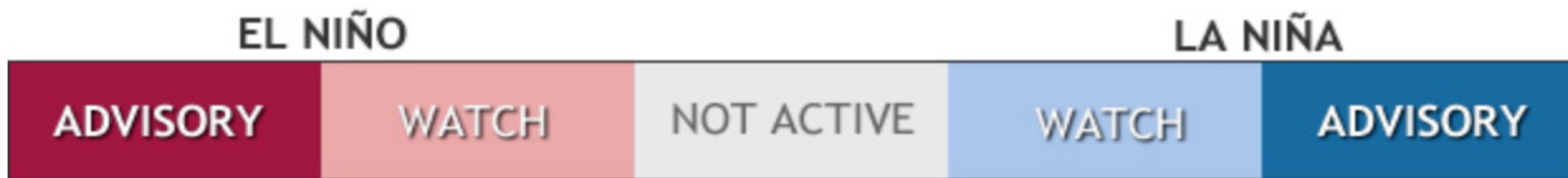


# **El Niño-Southern Oscillation (ENSO) Update**

**NOAA Eastern Region Climate Services**

**Michelle L'Heureux  
Climate Prediction Center / NCEP/ NOAA  
29 November 2018**



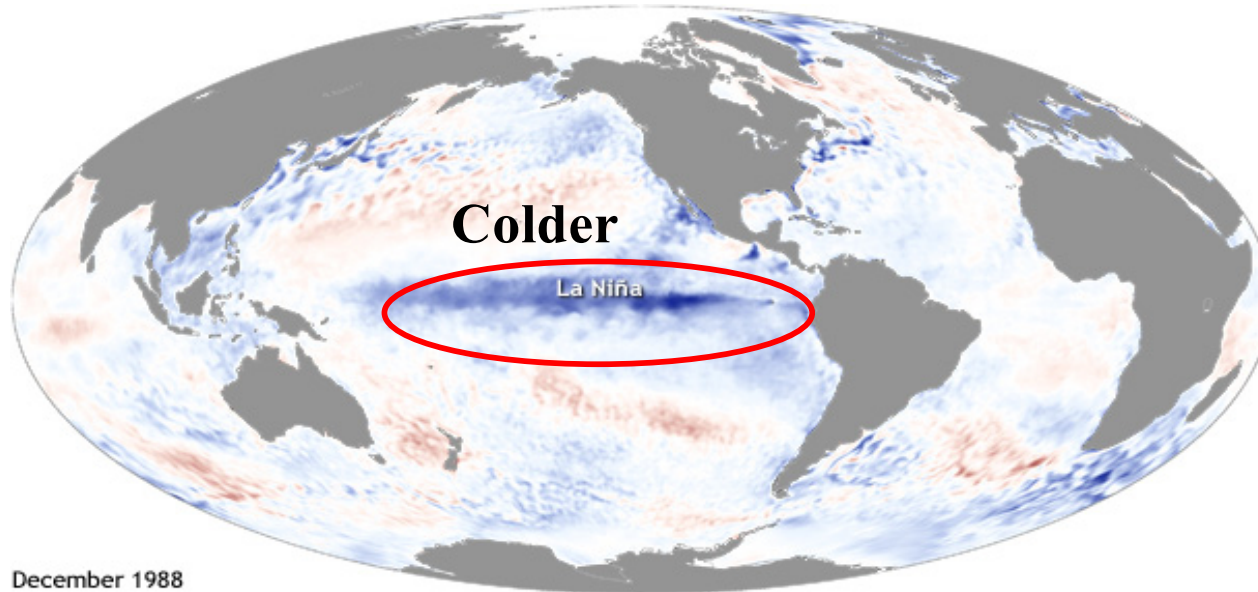
## **We are in an El Niño Watch!**

El Niño is expected to form and continue through the Northern Hemisphere winter 2018-19 (~80% chance) and into spring (55-60% chance).

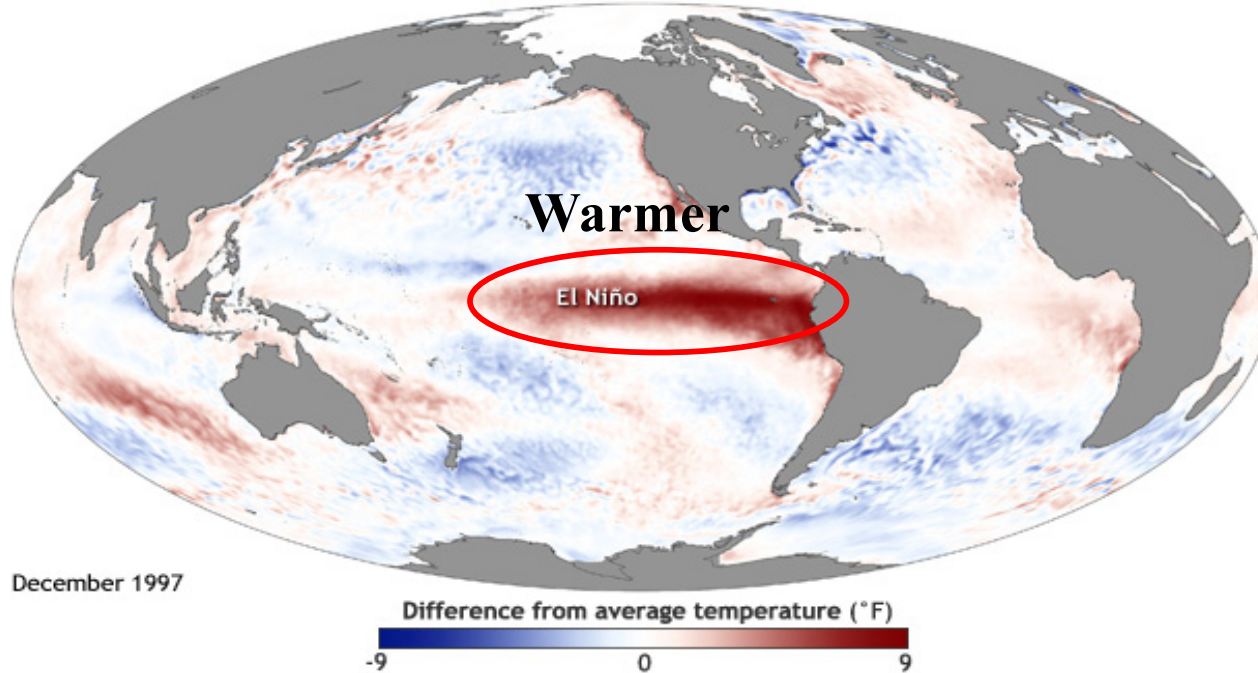
For the Eastern region, El Niño can increase rainfall/snowfall closer to the coast. For regions more inland (western NY, PA, Ohio valley) it can decrease rainfall/snowfall.

# The El Niño-Southern Oscillation (or “ENSO”)

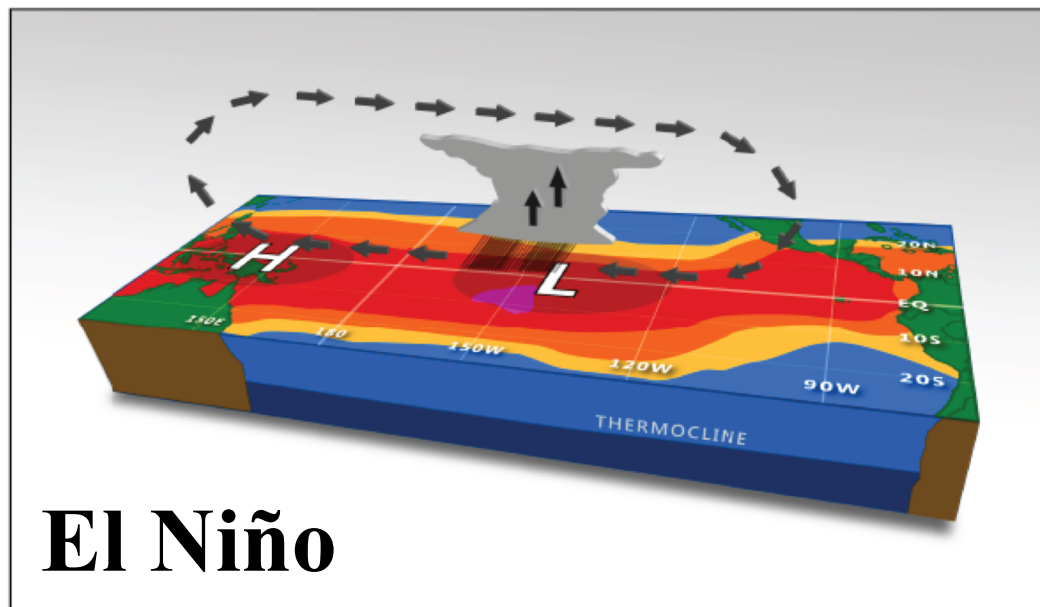
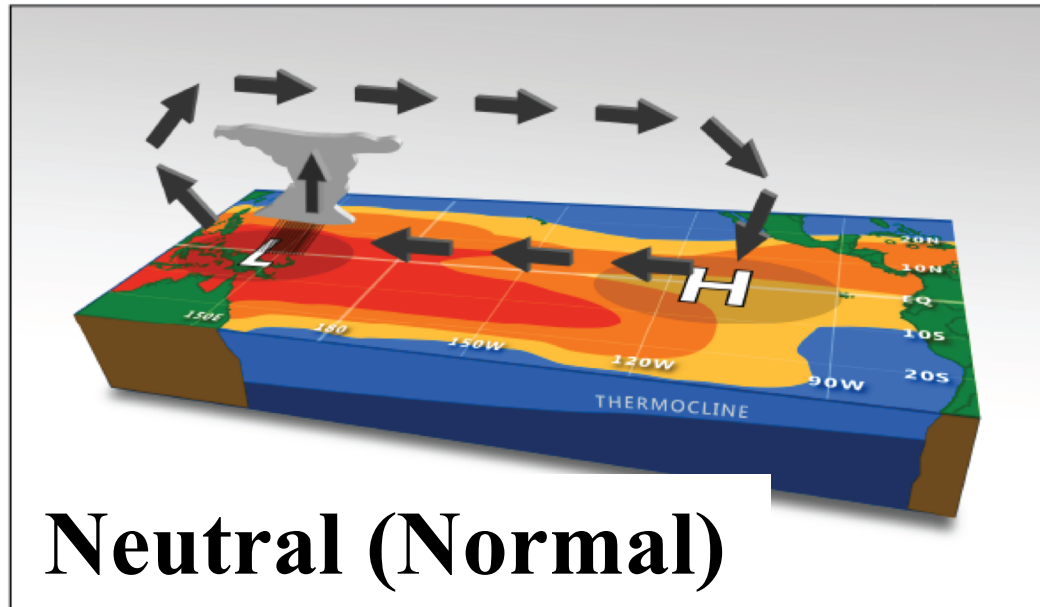
**La Niña**



**El Niño**



**ENSO is “coupled” meaning that the atmosphere and ocean in the tropical Pacific reinforce each other.**



# El Niño (and La Niña) Life Cycle

Typically last 9-12 months. Occur every 3-5 years or so.

Develop mid-to-late summer or fall



Photo courtesy <https://www.countryliving.com>

Summer/ fall impacts:

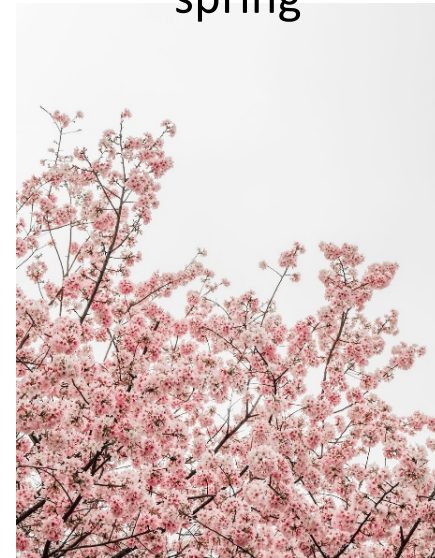
- Hurricanes
- Tropics

Strongest in winter



<https://unsplash.com/search/photos/>

Dissipate/weaken in spring

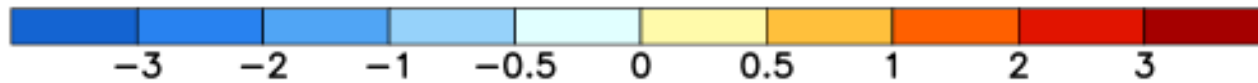
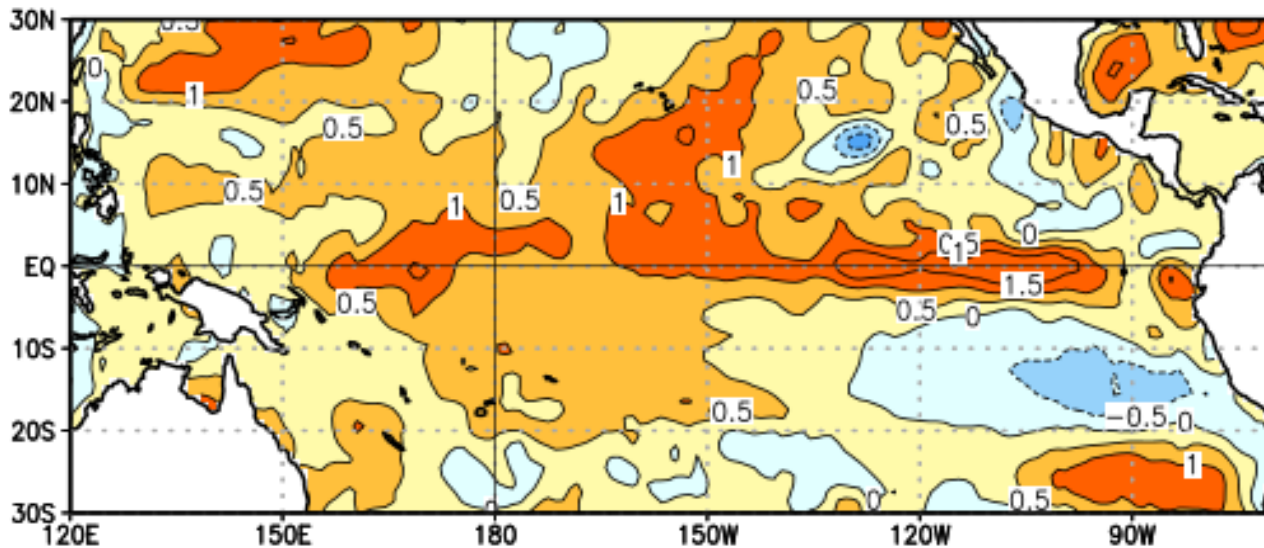


U.S. Impacts during winter into spring:

- Jet streams,
- Storm tracks/ storm location
- Temperature
- Rain, snowfall, snowpack
- Drought formation/ intensification/ relief

# Sea surface temperatures (SST) anomalies over the last Month

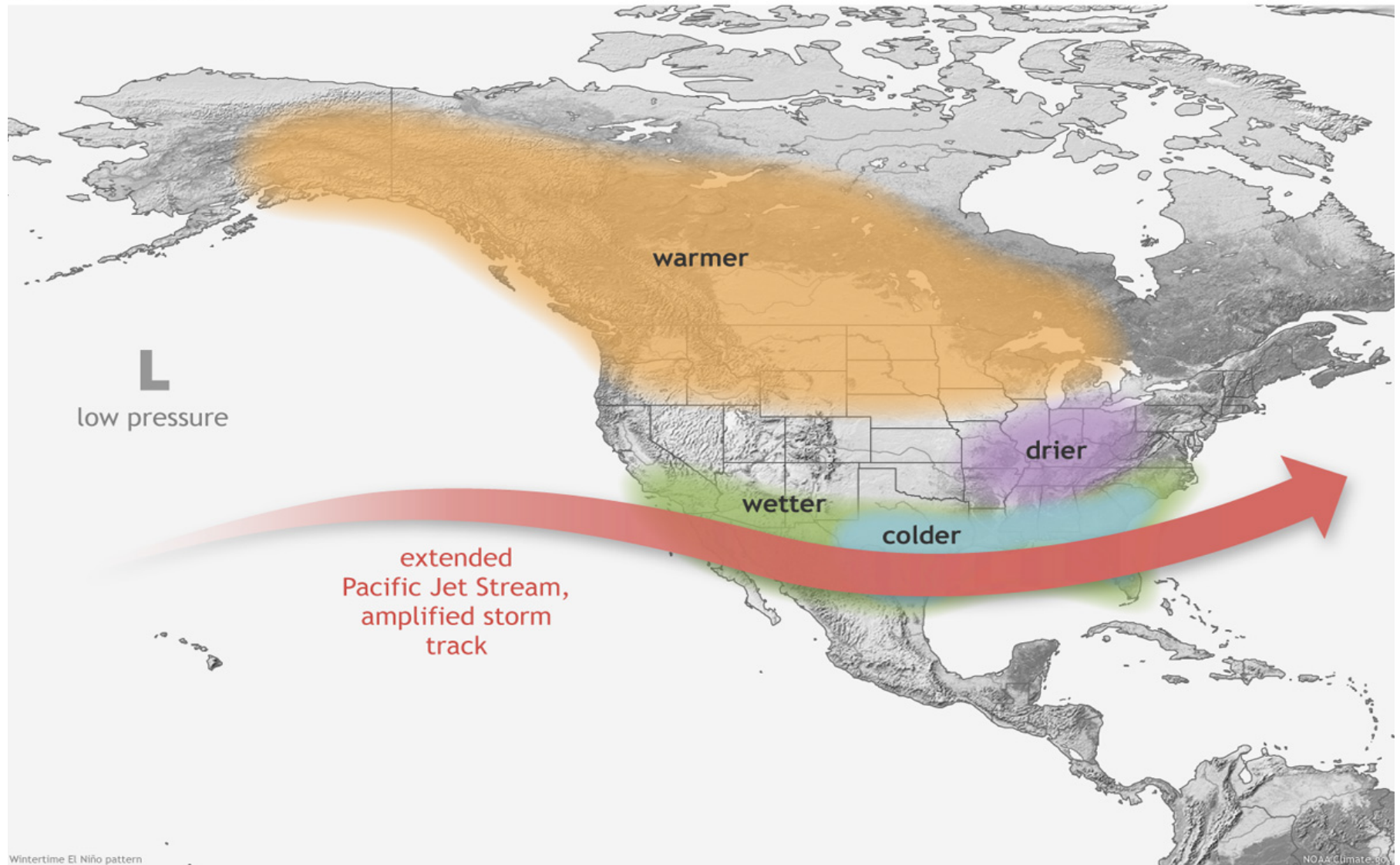
Average SST Anomalies  
28 OCT 2018 – 24 NOV 2018



Blue shading is Below-Average SST

Yellow-Red shading is Above-Average SST

## TYPICAL EL NIÑO WINTERS



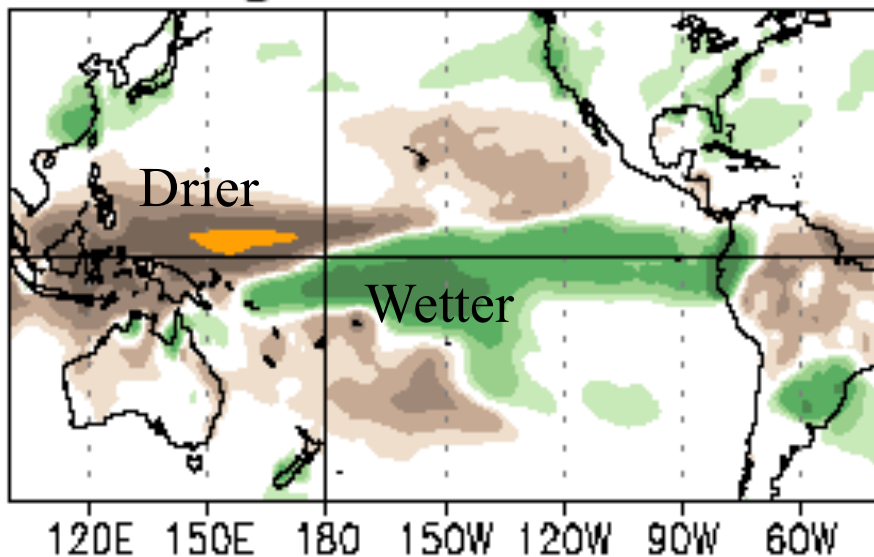
Keep in mind this pattern is not the case for EVERY El Niño winter. It will vary considerably from El Niño event to El Niño event, which is why related impacts are expressed as **PROBABILITIES (% Chance Of)**.

# Why El Niño Affects Our Winter Weather

## Affects Tropical Rainfall Patterns

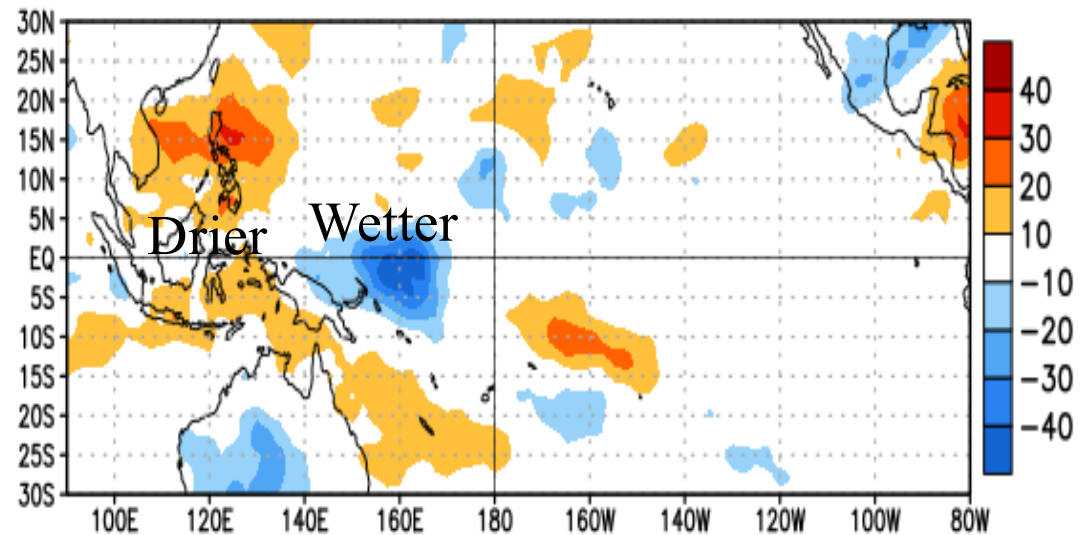
El Niño and La Niña alter the normal patterns of tropical rainfall/ convection from Indonesia to South America—a distance of about ½ way around the globe. Tropical convection then impacts the jet streams.

### Strong El Niño: Wintertime Rainfall Departures



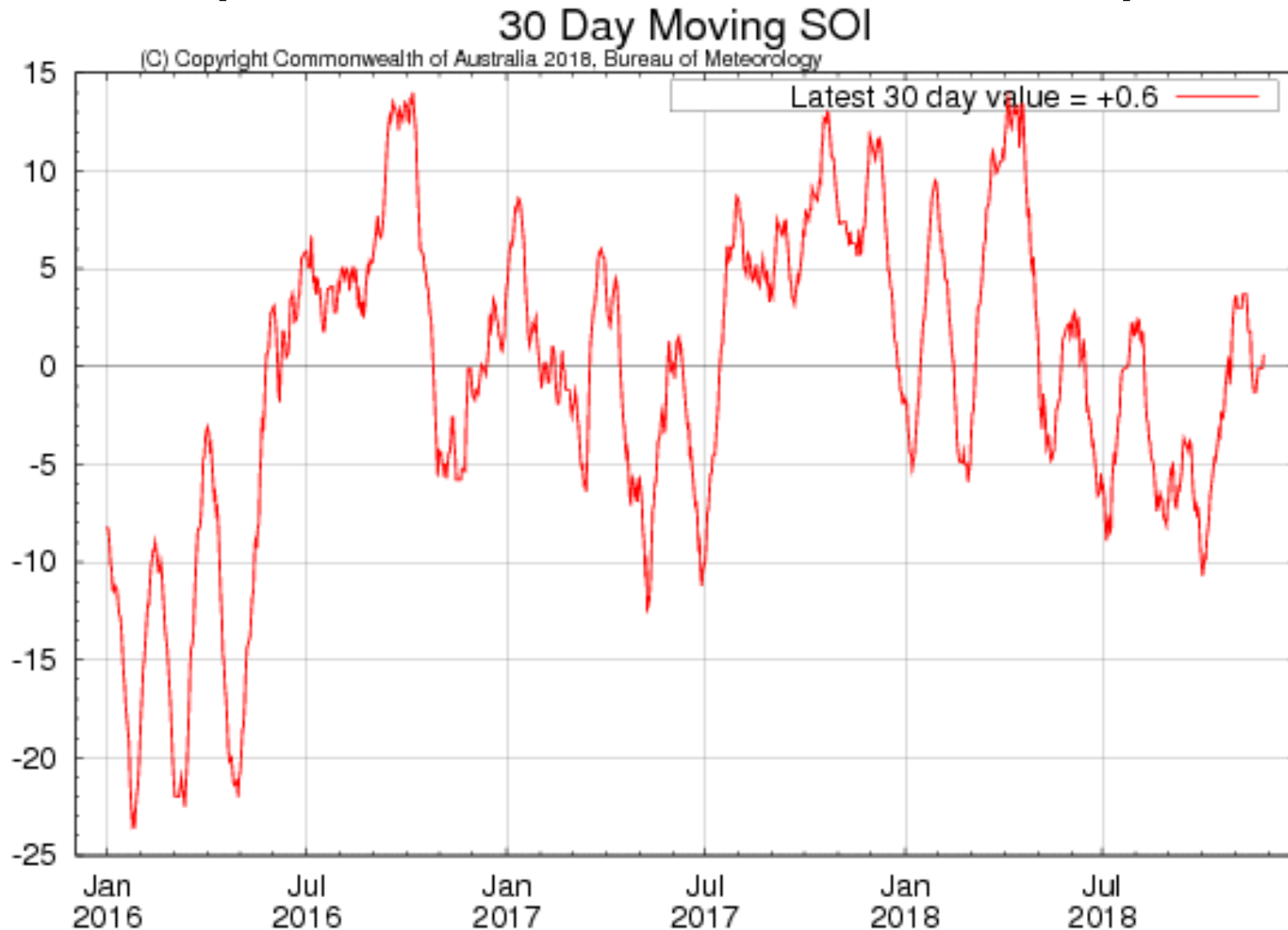
### Current 30-day Average Pattern

OLR Anomalies  
25 OCT 2018 to 19 NOV 2018

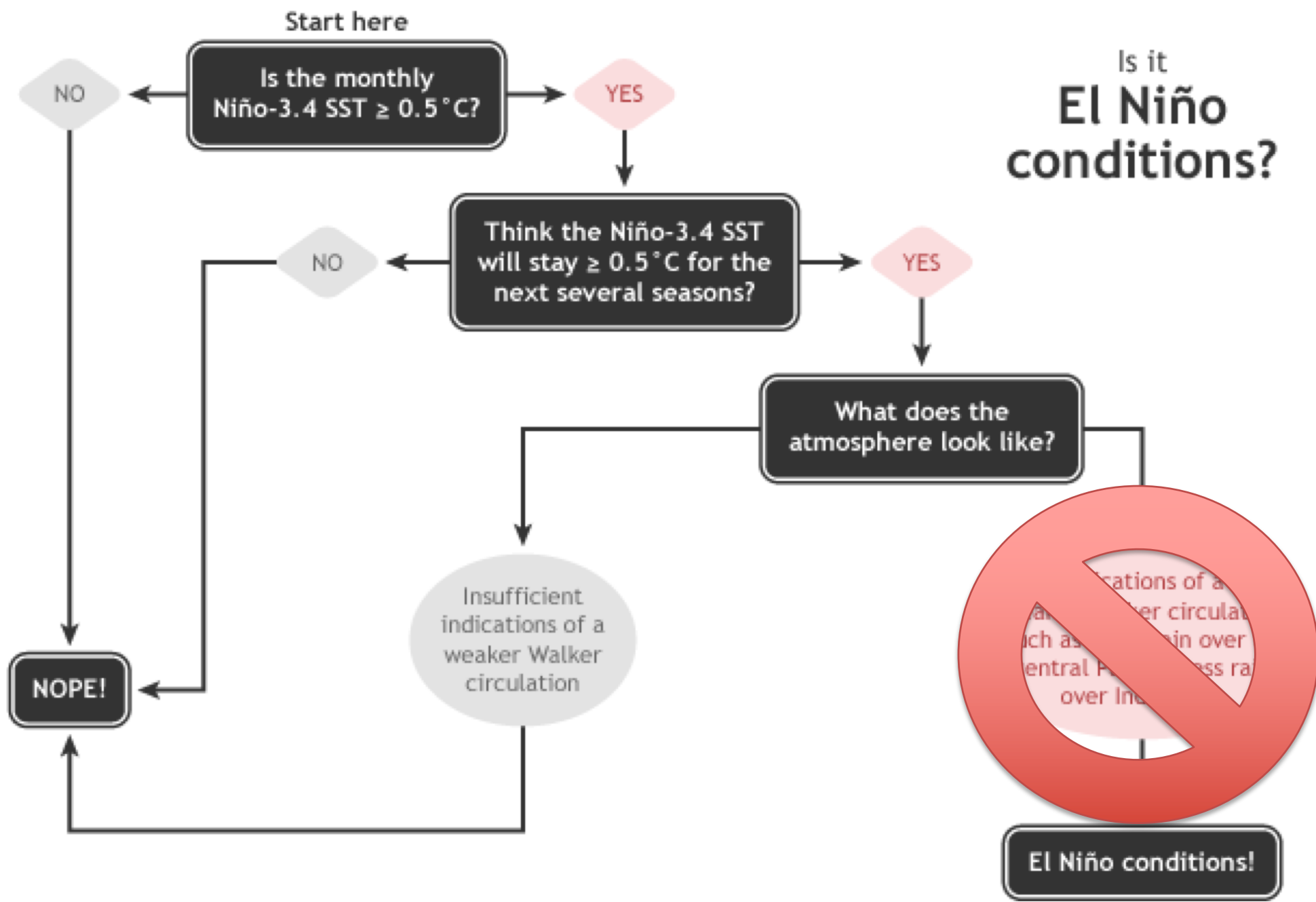




# Southern Oscillation Index (another measure of ENSO)

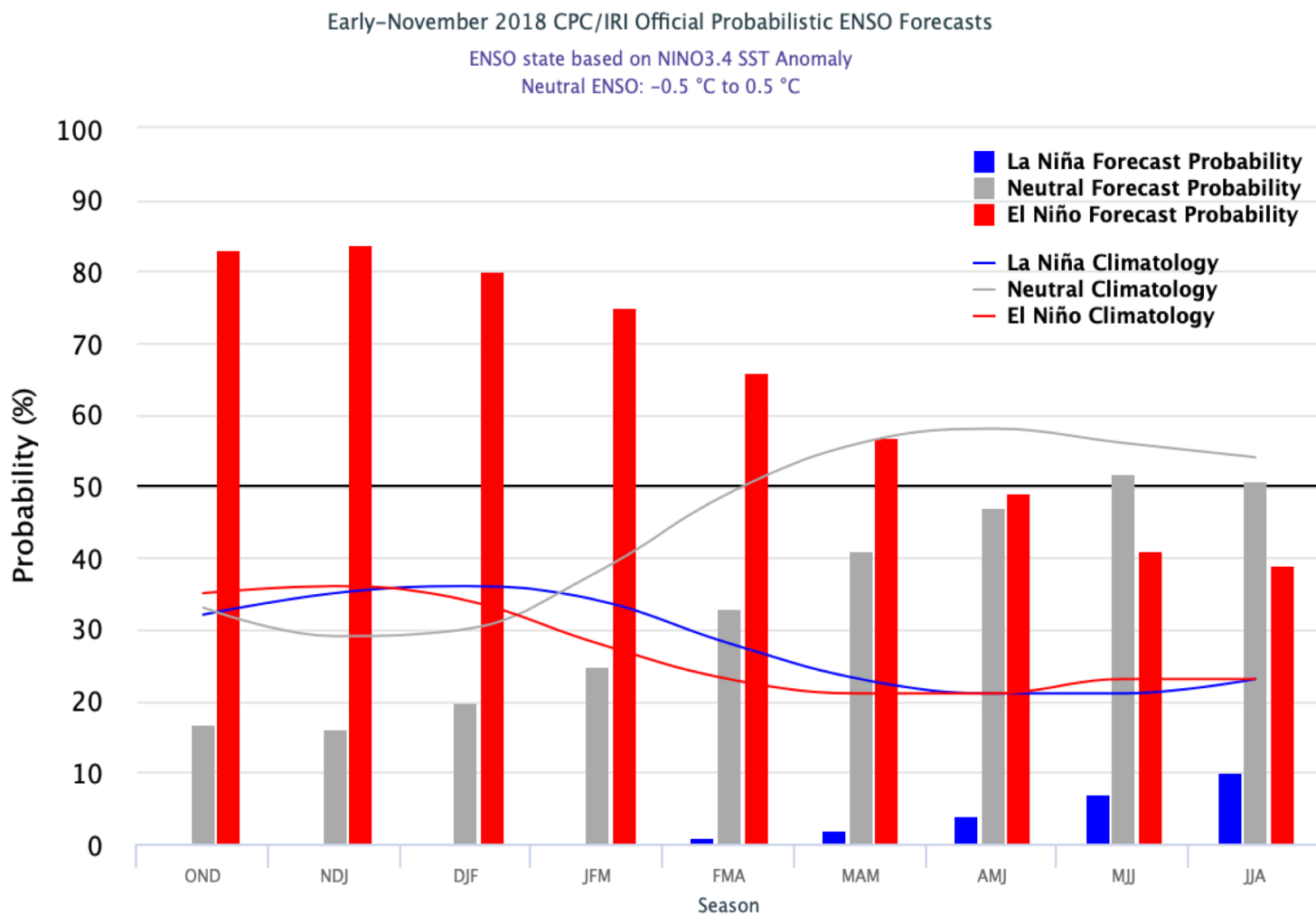


Right now the SOI is near zero, meaning consistent with “ENSO-neutral” or average conditions. Not reflecting El Niño yet.

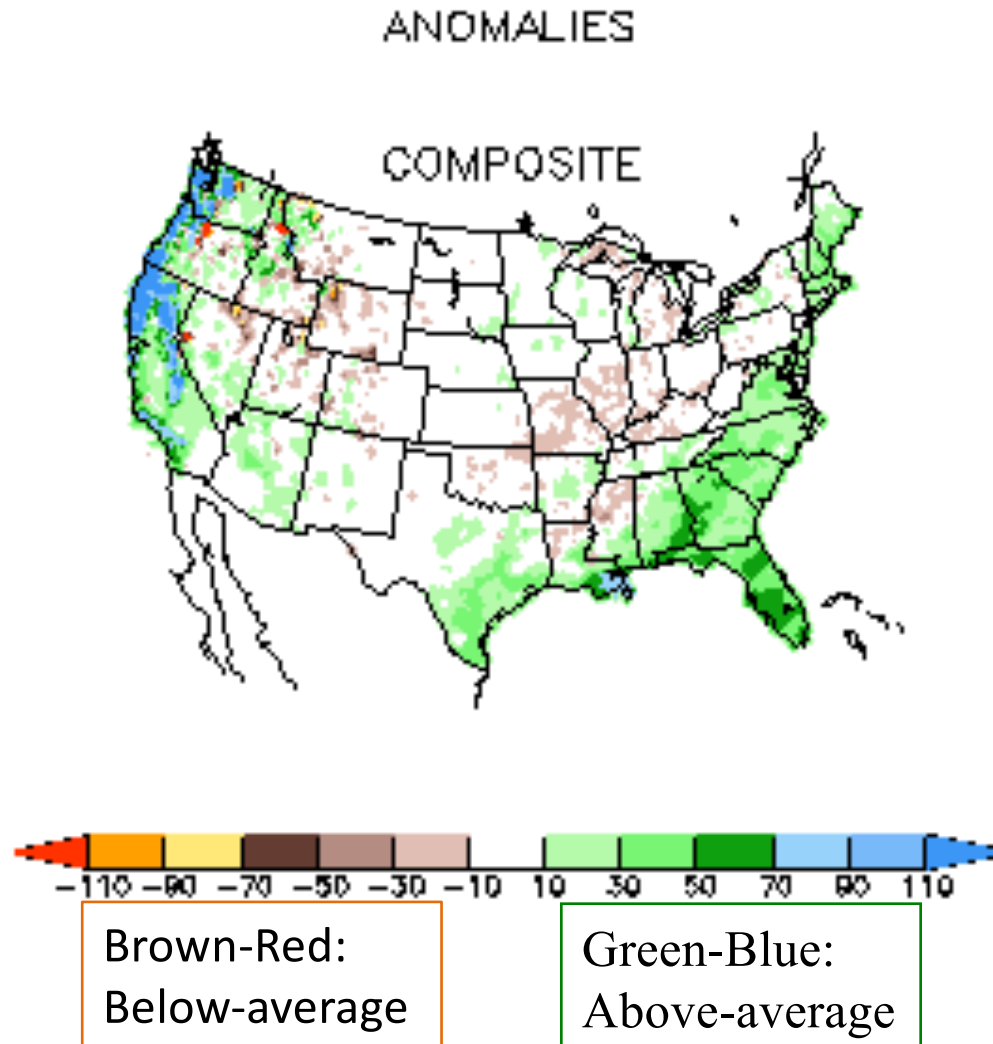


# Current ENSO Probabilities or Chances (8 November 2018)

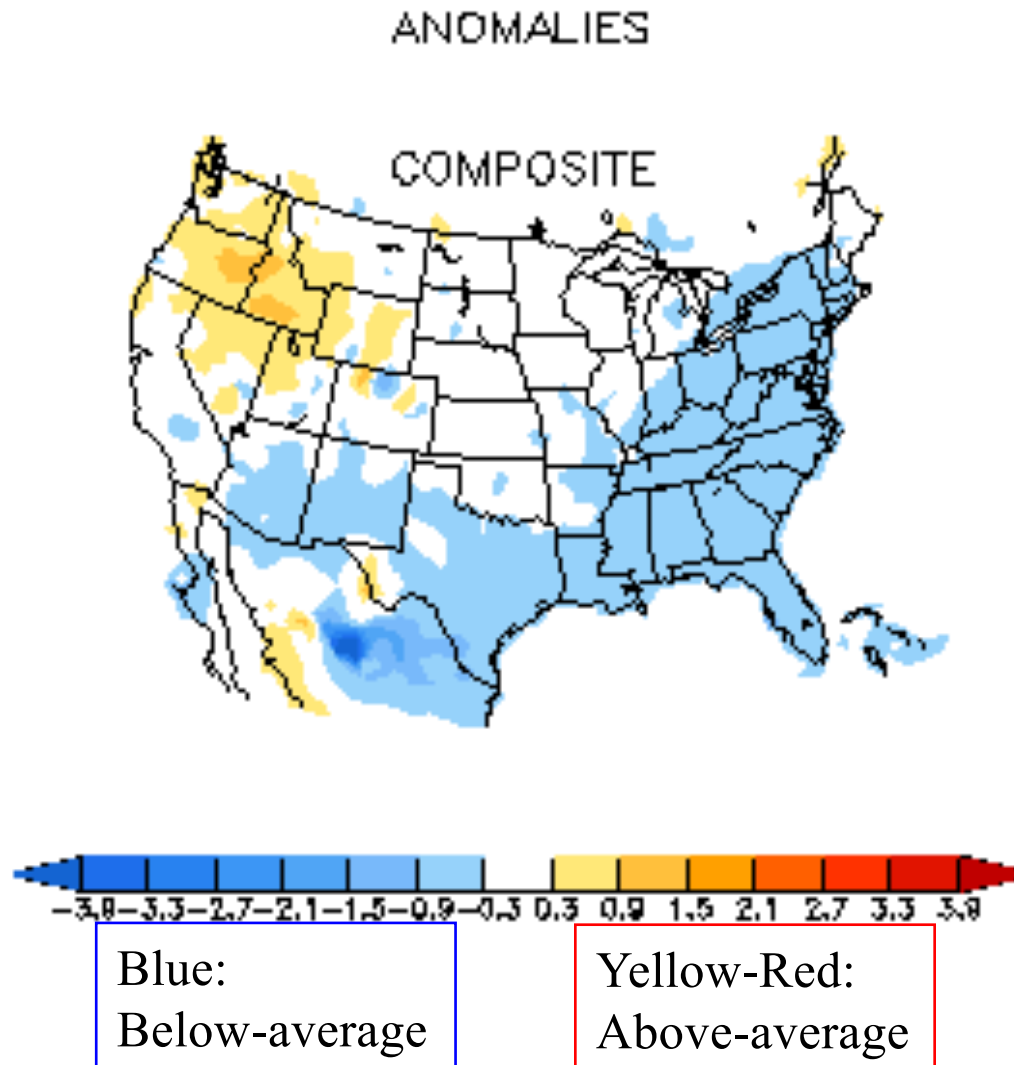
El Niño is expected to form and continue through the Northern Hemisphere winter 2018-19 (~80% chance) and into spring (55-60% chance).



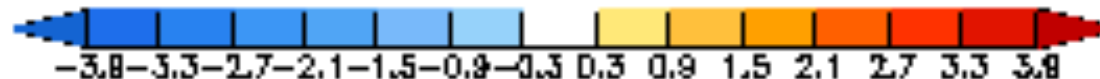
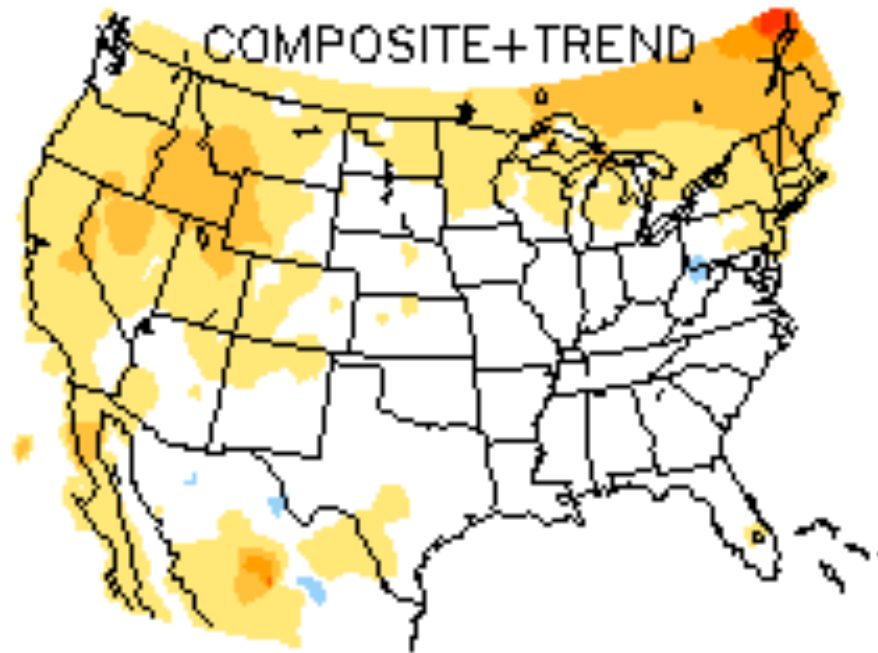
# “Typical” December-February Precipitation Anomalies associated with El Niño



# “Typical” December-February Temperature Anomalies associated with El Niño



# December-February Temperature Anomalies associated with El Niño + Trends

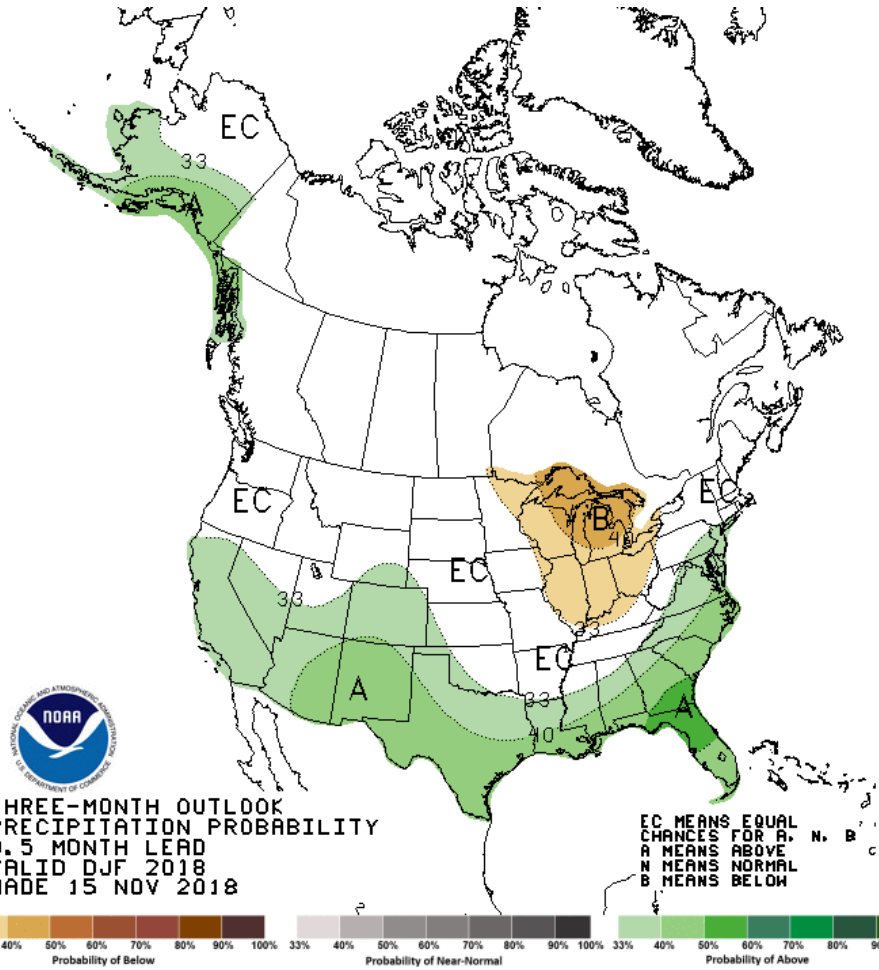


Blue:  
Below-average

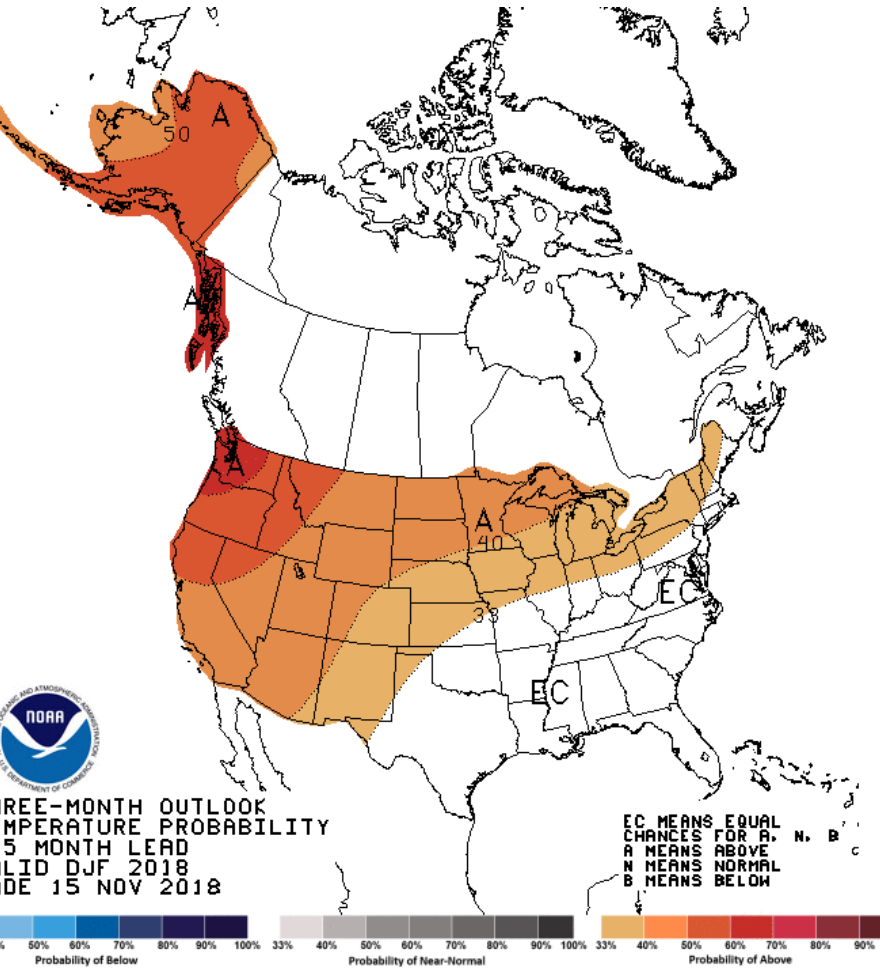
Yellow-Red:  
Above-average

# December-January-February (DJF) Outlook 2018-19

## Precipitation Chances



## Temperature Chances

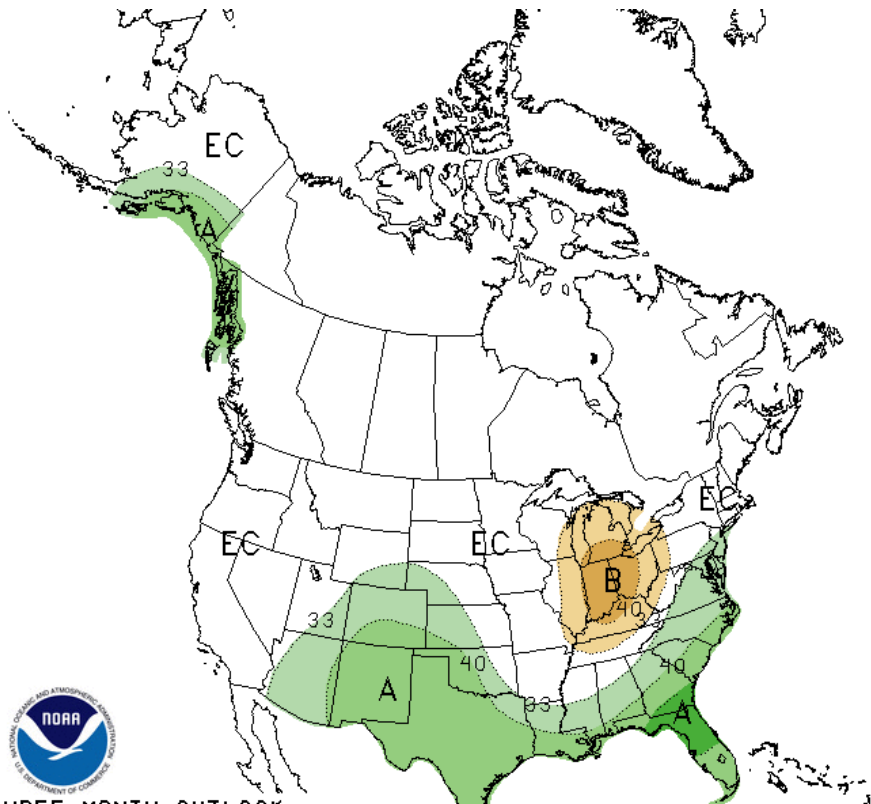


[http://www.cpc.ncep.noaa.gov/products/predictions/long\\_range/](http://www.cpc.ncep.noaa.gov/products/predictions/long_range/)

# January-February-March (JFM) Outlook 2019

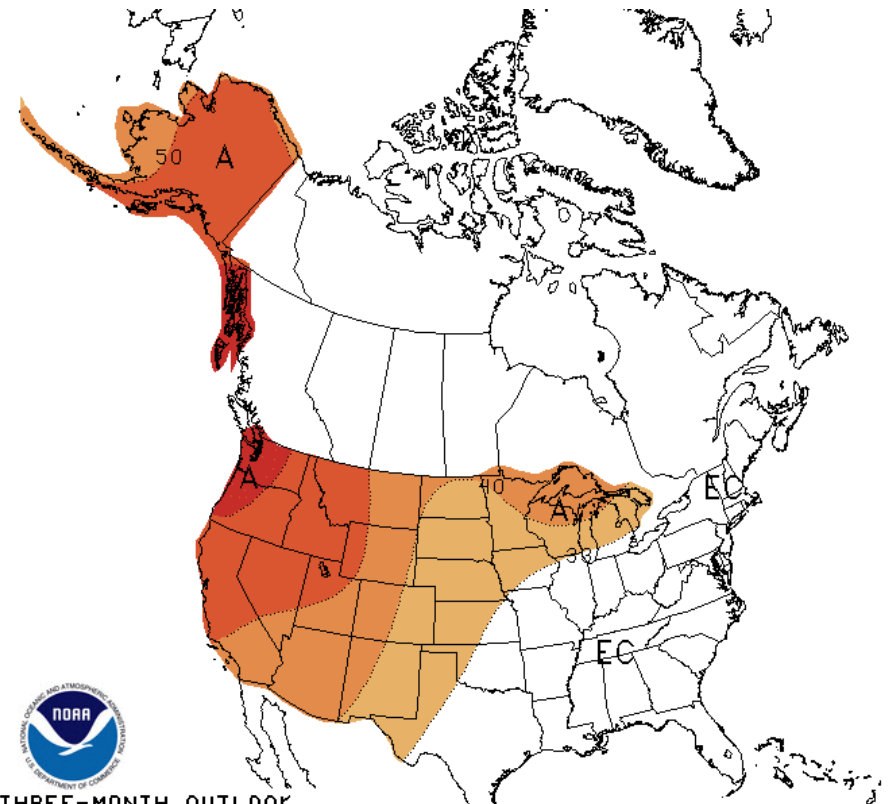
## Precipitation Chances

## Temperature Chances



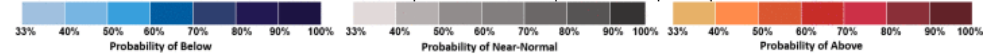
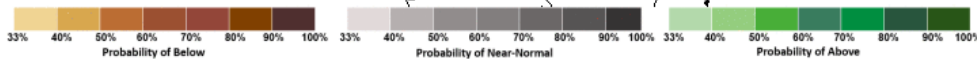
THREE-MONTH OUTLOOK  
PRECIPITATION PROBABILITY  
1.5 MONTH LEAD  
VALID JFM 2019  
MADE 15 NOV 2018

EC MEANS EQUAL  
CHANCES FOR A, N, B  
A MEANS ABOVE  
N MEANS NORMAL  
B MEANS BELOW



THREE-MONTH OUTLOOK  
TEMPERATURE PROBABILITY  
1.5 MONTH LEAD  
VALID JFM 2019  
MADE 15 NOV 2018

EC MEANS EQUAL  
CHANCES FOR A, N, B  
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[http://www.cpc.ncep.noaa.gov/products/predictions/long\\_range/](http://www.cpc.ncep.noaa.gov/products/predictions/long_range/)



# Summary

- Currently, ENSO-neutral with an El Niño Watch (conditions favorable for the development of El Niño).
- Equatorial sea surface temperatures (SSTs) are above average across most of the Pacific Ocean.
- We're still waiting on an atmospheric response consistent with El Niño.
- El Niño is expected to form and continue through the Northern Hemisphere winter 2018-19 (~80% chance) and into spring (55-60% chance).

## **ENSO Diagnostics Discussion**

[http://www.cpc.ncep.noaa.gov/products/analysis\\_monitoring/enso\\_advisory/ensodisc.html](http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.html)

**ENSO Blog** <http://www.climate.gov/news-features/department/enso-blog>