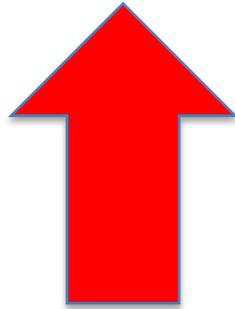


El Niño-Southern Oscillation (ENSO) Update

NOAA Eastern Region Climate Services

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



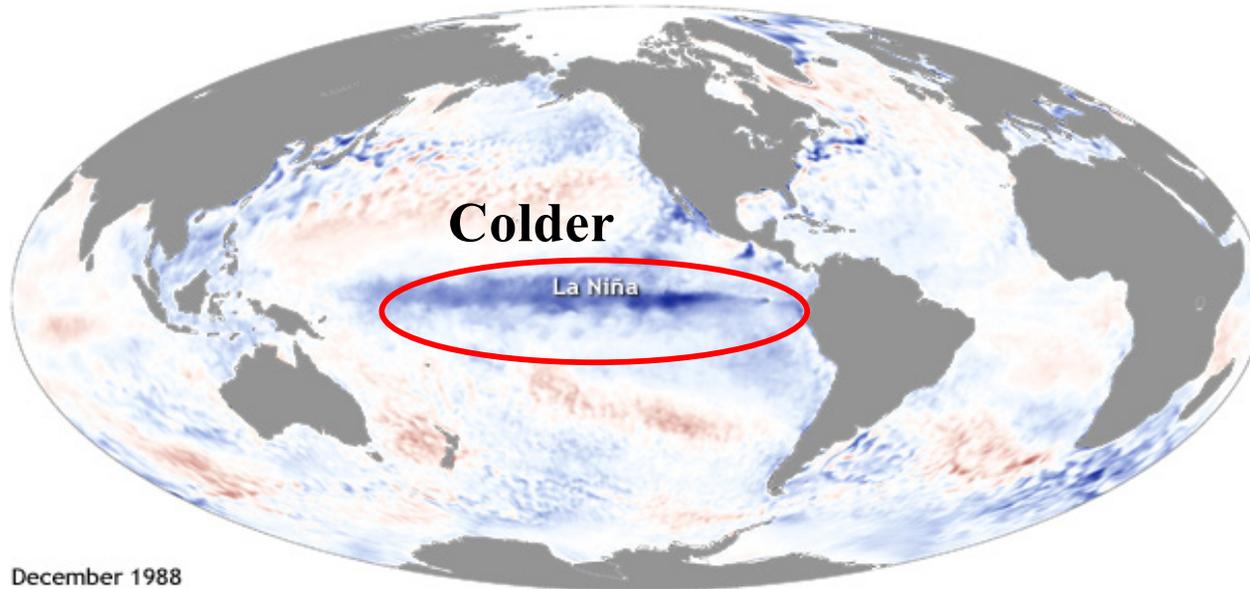
We are in an El Niño Watch!

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

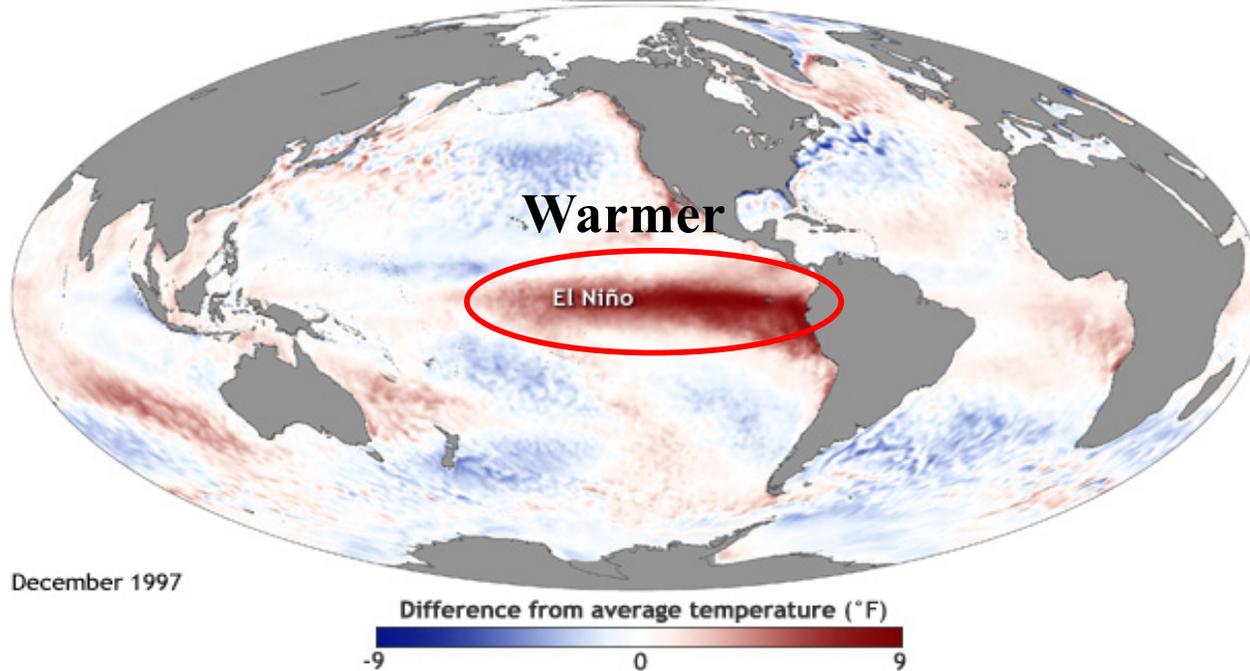
For the Eastern region, El Niño can increase rainfall/snowfall closer to the coast. For regions more inland (western NY, PA, Ohio valley) it can decrease rainfall/snowfall.

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

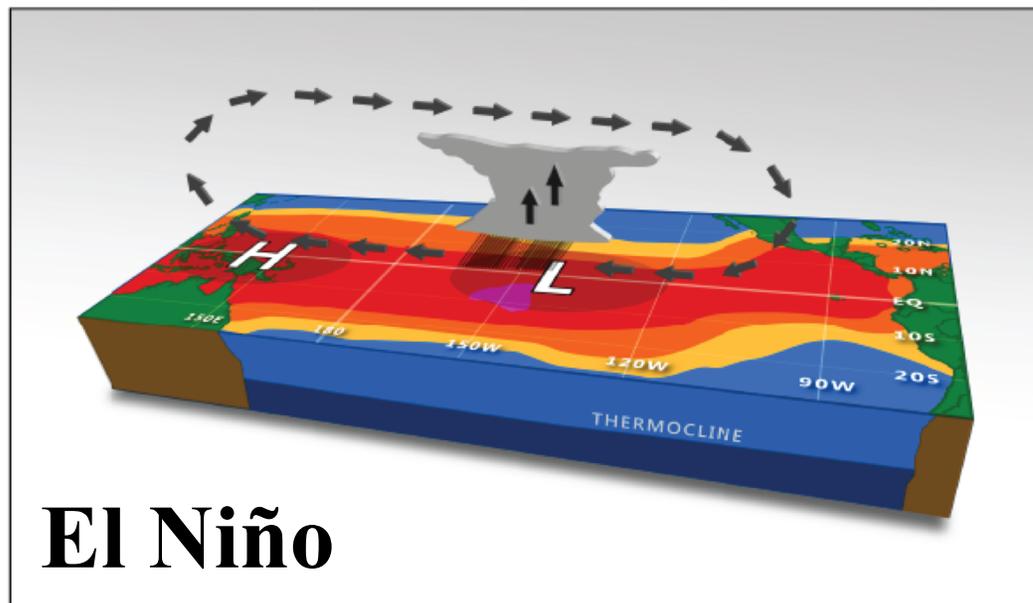
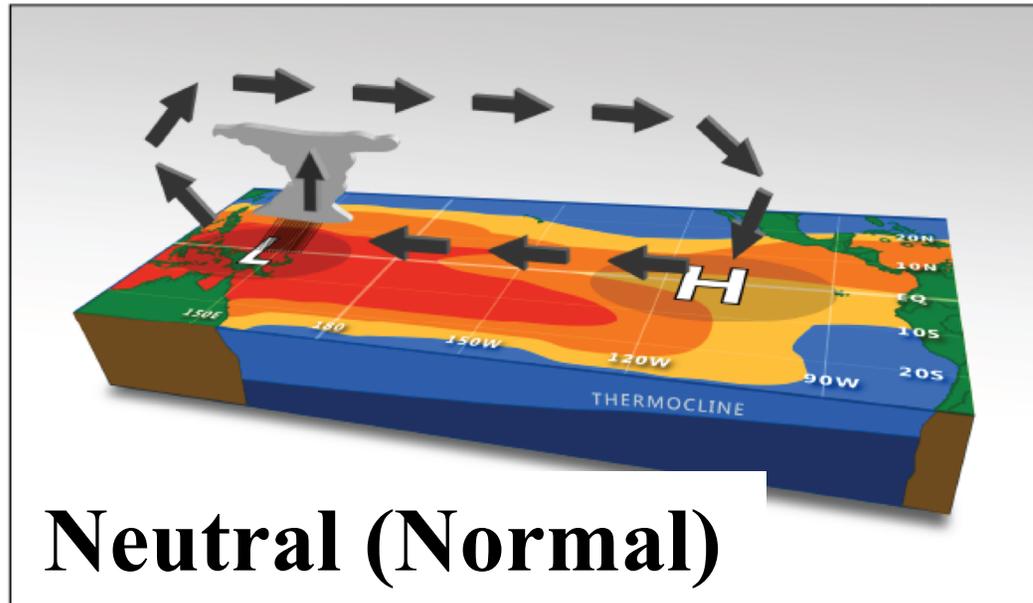
La Niña



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:

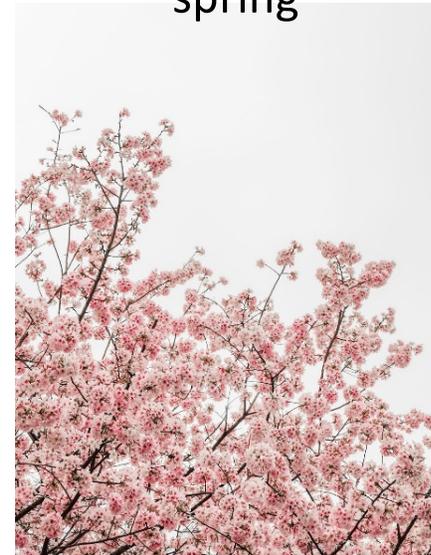
- Hurricanes
- Tropics

Strongest in winter



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

Dissipate/weaken in spring

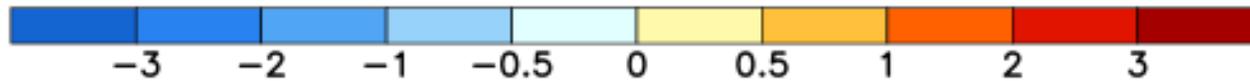
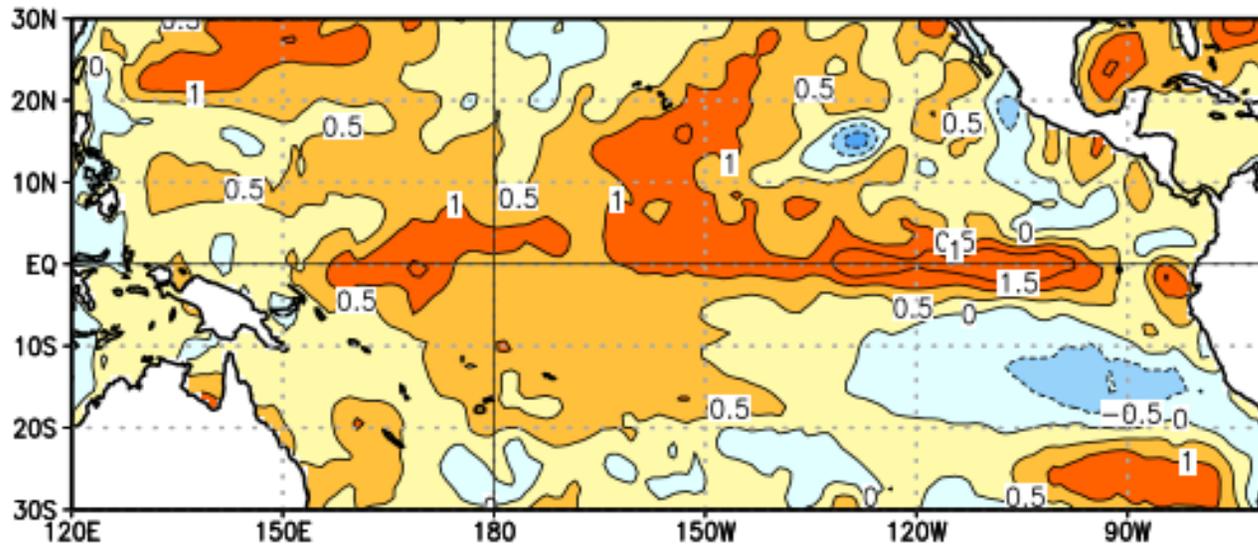


U.S. Impacts during winter into spring:

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

Sea surface temperatures (SST) anomalies over the last Month

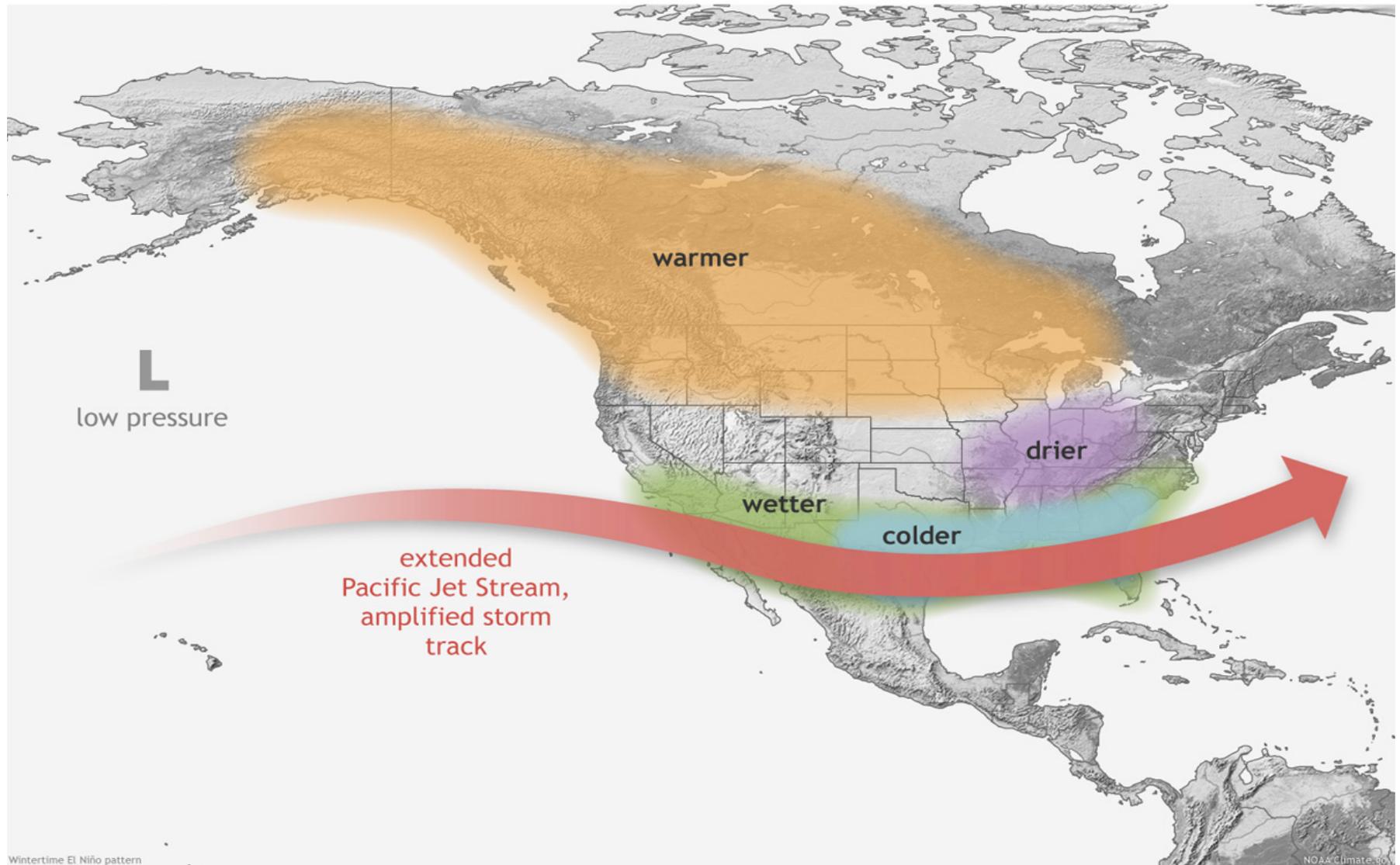
Average SST Anomalies
28 OCT 2018 – 24 NOV 2018



Blue shading is Below-Average SST

Yellow-Red shading is Above-Average SST

TYPICAL EL NIÑO WINTERS



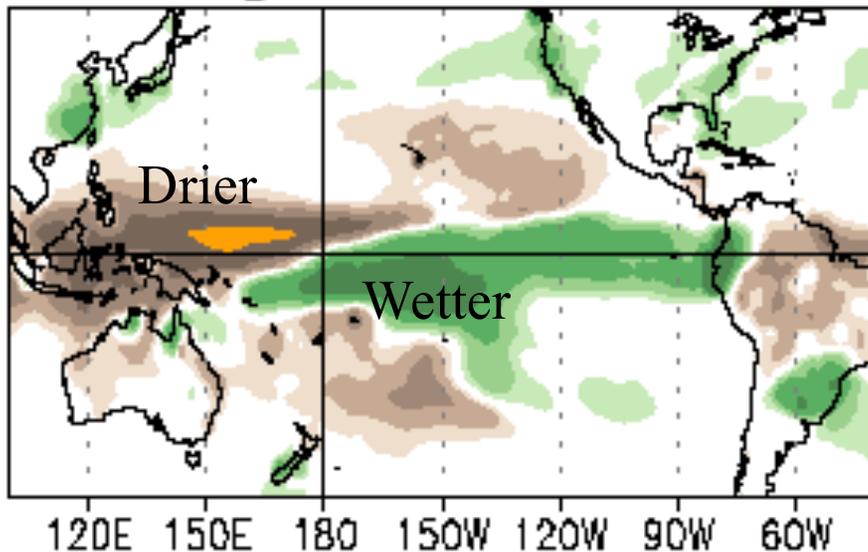
Keep in mind this pattern is not the case for EVERY El Niño winter. It will vary considerably from El Niño event to El Niño event, which is why related impacts are expressed as **PROBABILITIES (% Chance Of)**.

Why El Niño Affects Our Winter Weather

Affects Tropical Rainfall Patterns

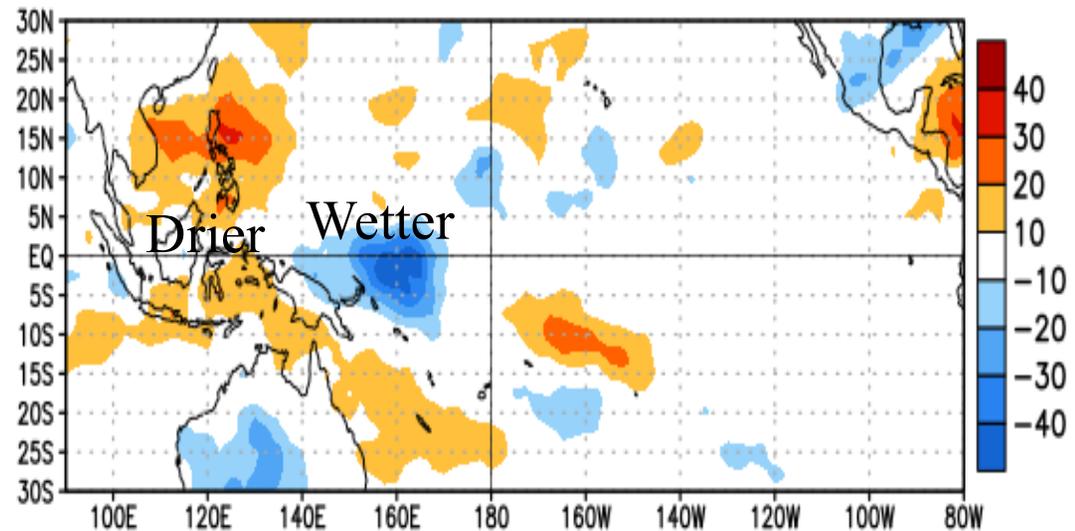
El Niño and La Niña alter the normal patterns of tropical rainfall/ convection from Indonesia to South America—a distance of about ½ way around the globe. Tropical convection then impacts the jet streams.

Strong El Niño: Wintertime Rainfall Departures

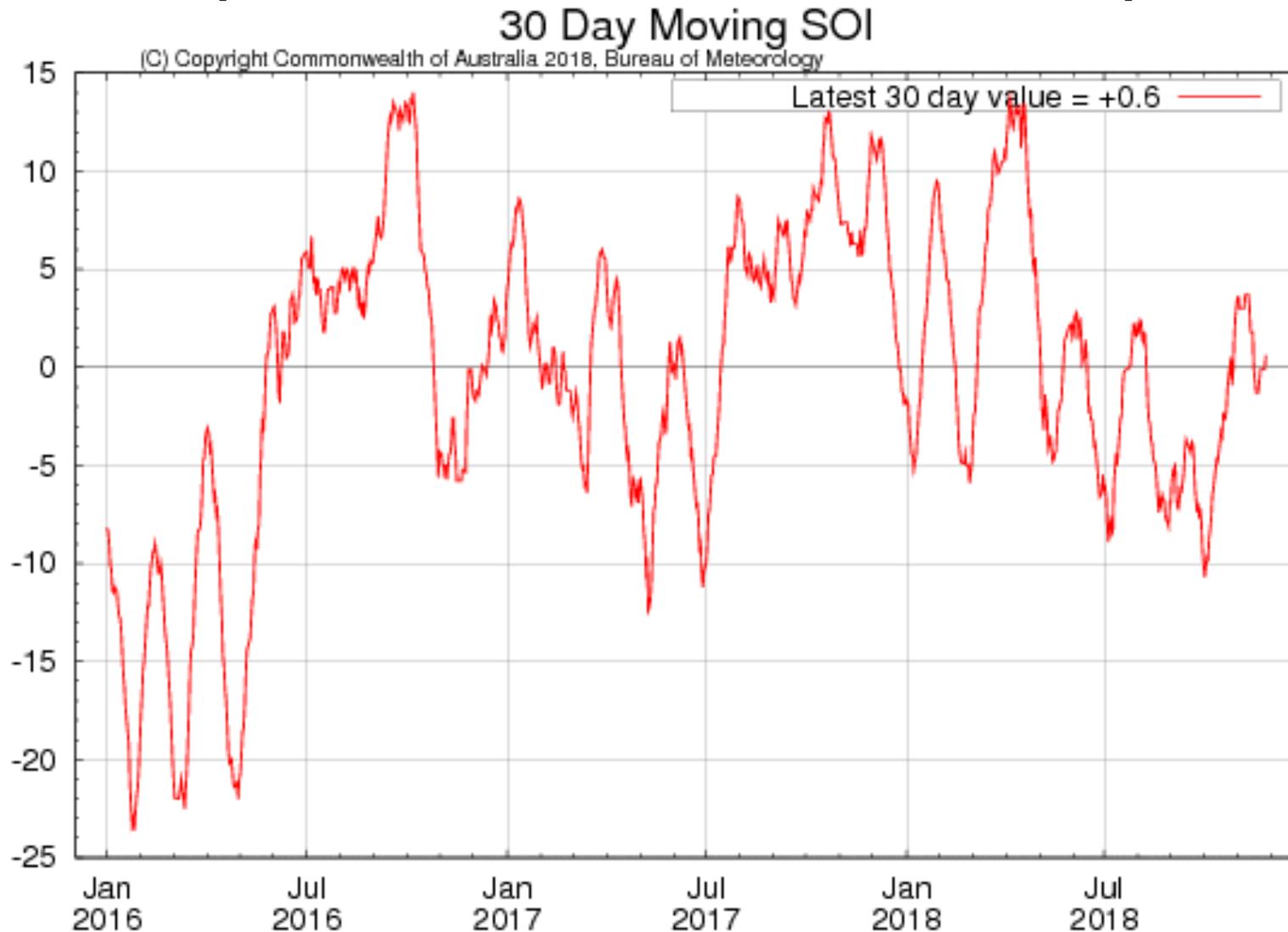


Current 30-day Average Pattern

OLR Anomalies
25 OCT 2018 to 19 NOV 2018

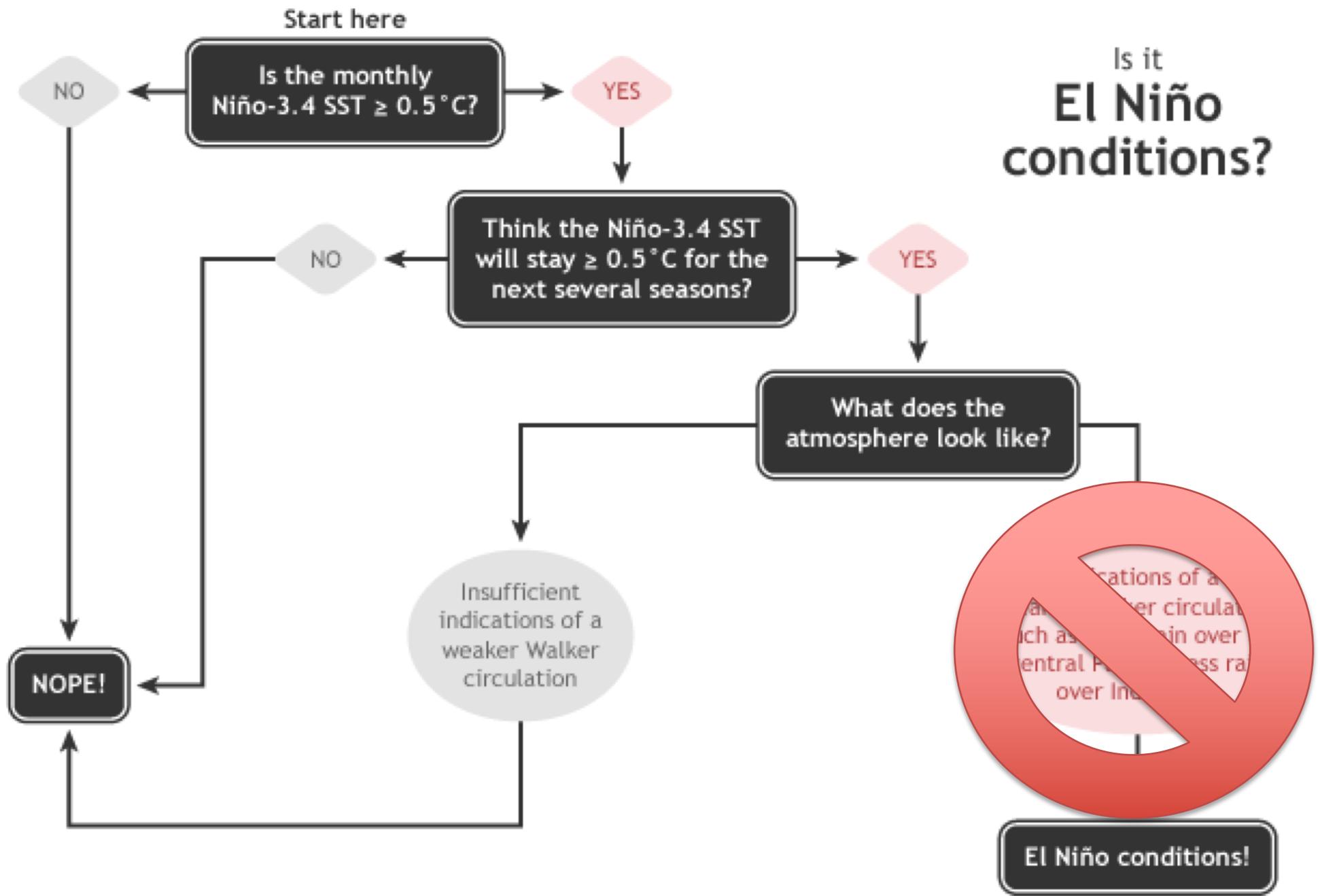


Southern Oscillation Index (another measure of ENSO)



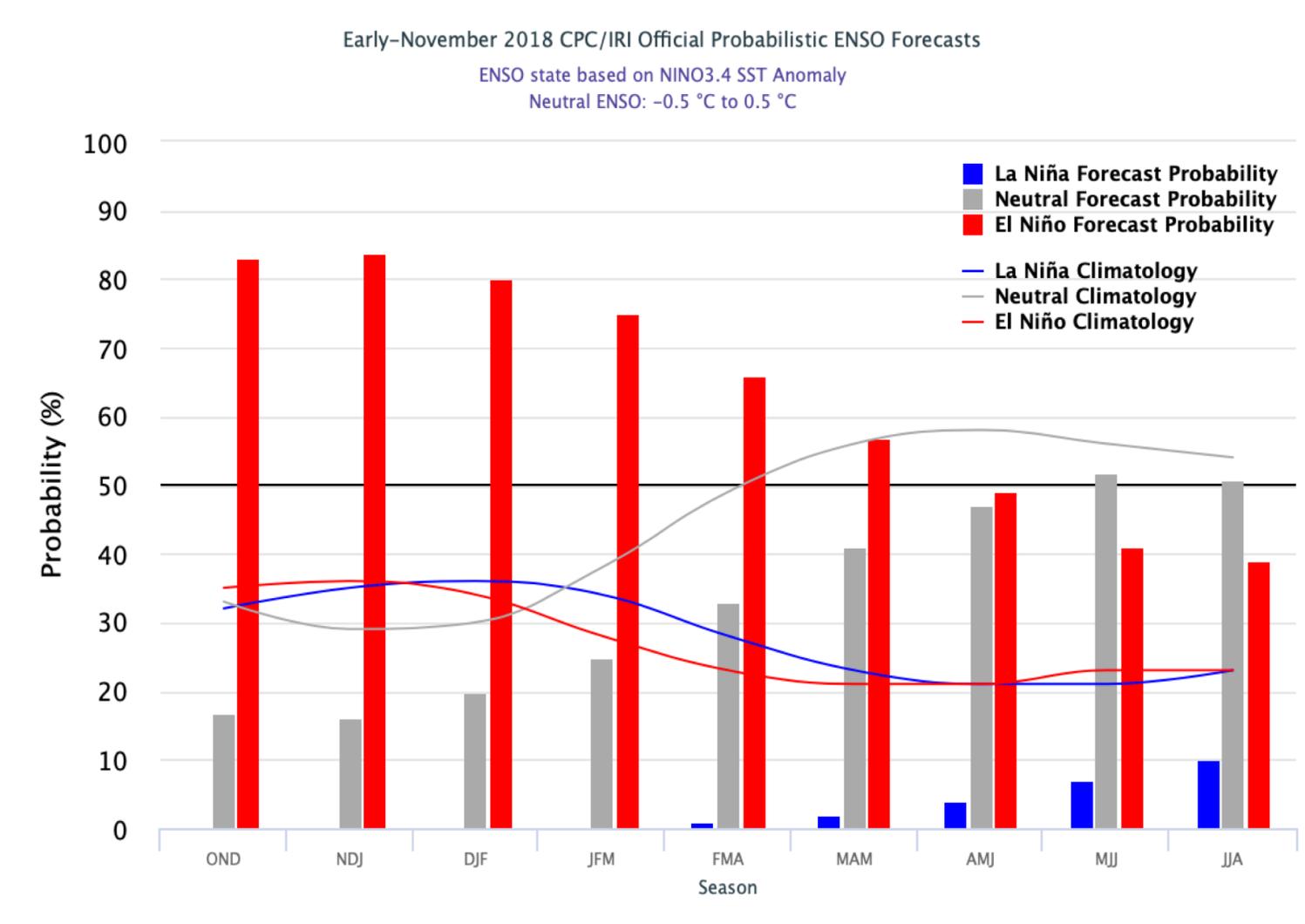
Right now the SOI is near zero, meaning consistent with “ENSO-neutral” or average conditions. Not reflecting El Niño yet.

Is it El Niño conditions?

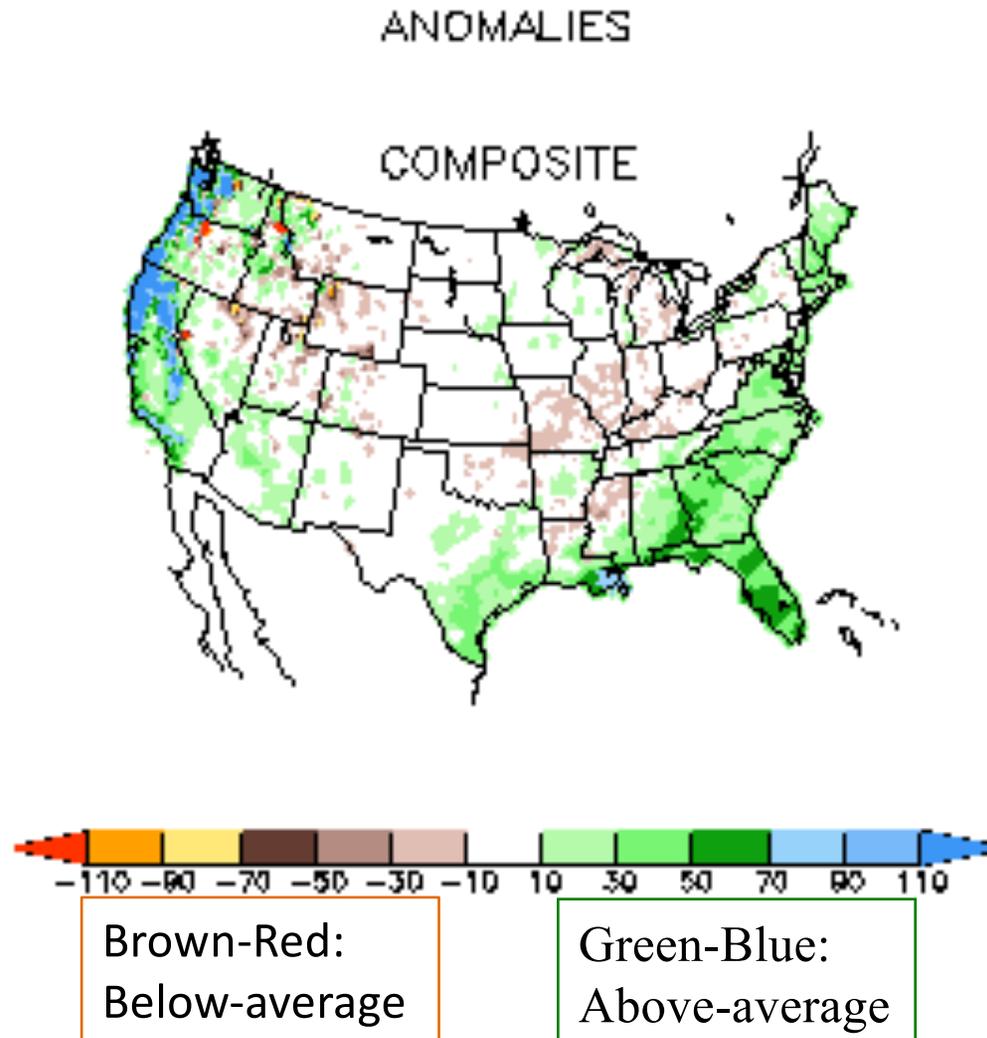


Current ENSO Probabilities or Chances (8 November 2018)

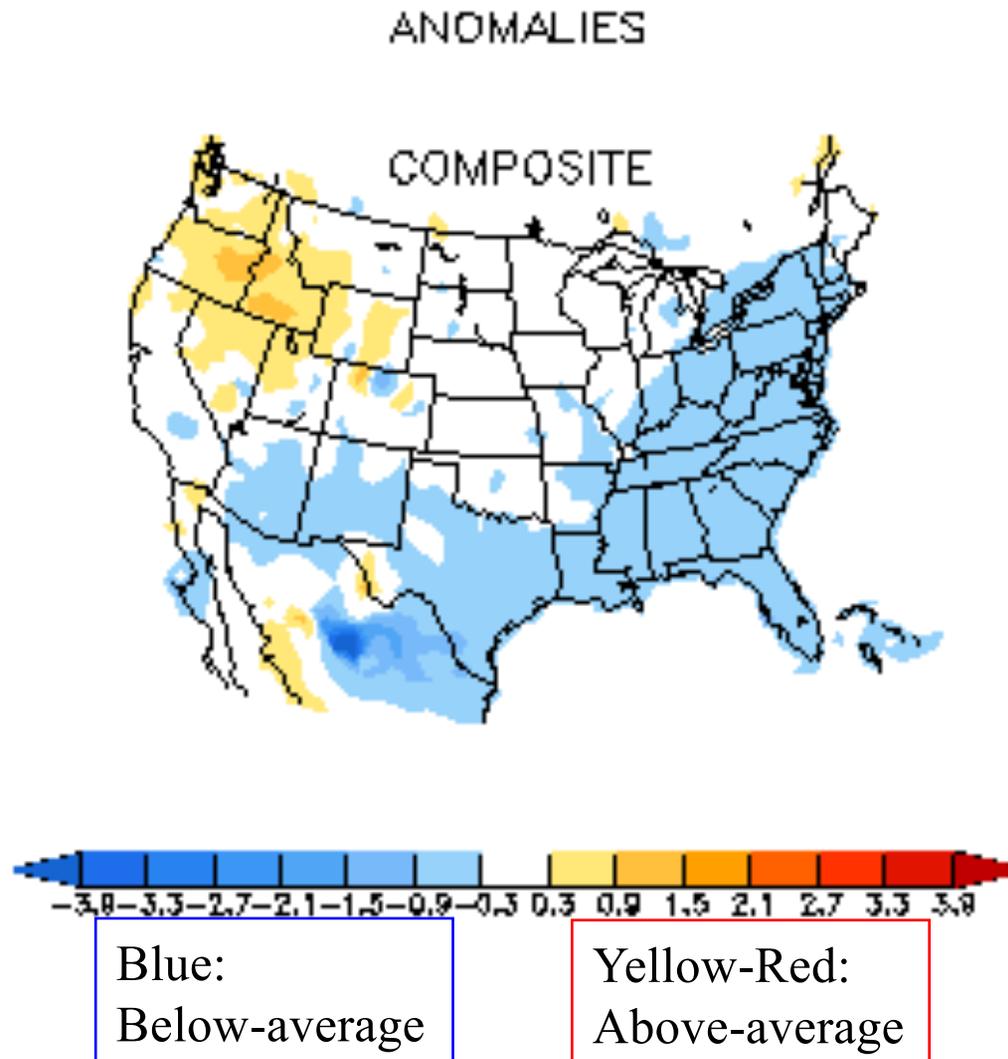
El Niño is expected to form and continue through the Northern Hemisphere winter 2018-19 (~80% chance) and into spring (55-60% chance).



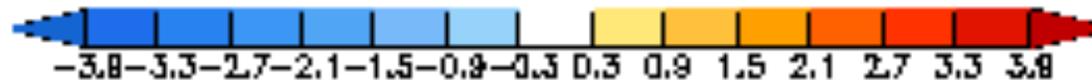
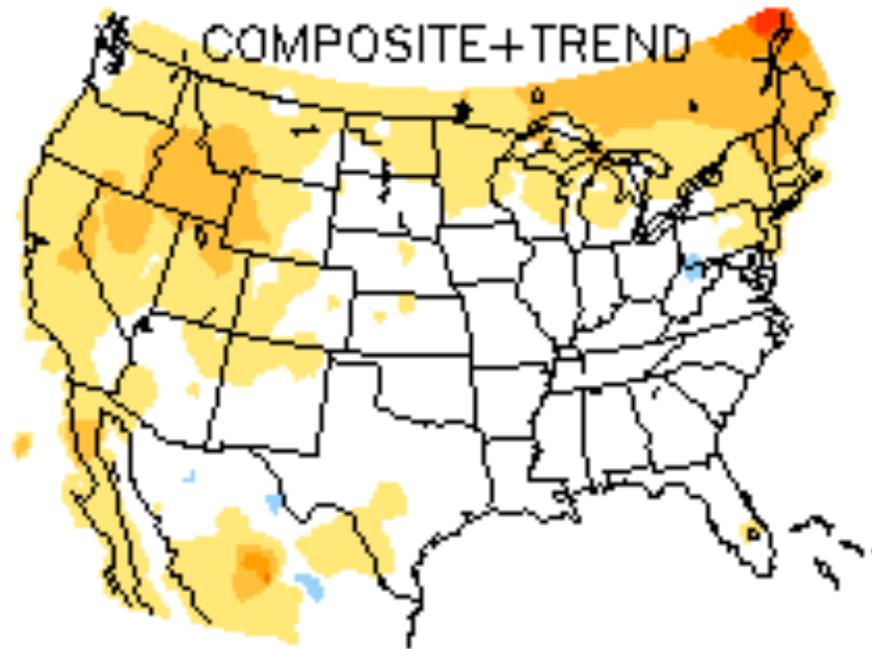
“Typical” December-February Precipitation Anomalies associated with El Niño



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



December-February Temperature Anomalies associated with El Niño + Trends

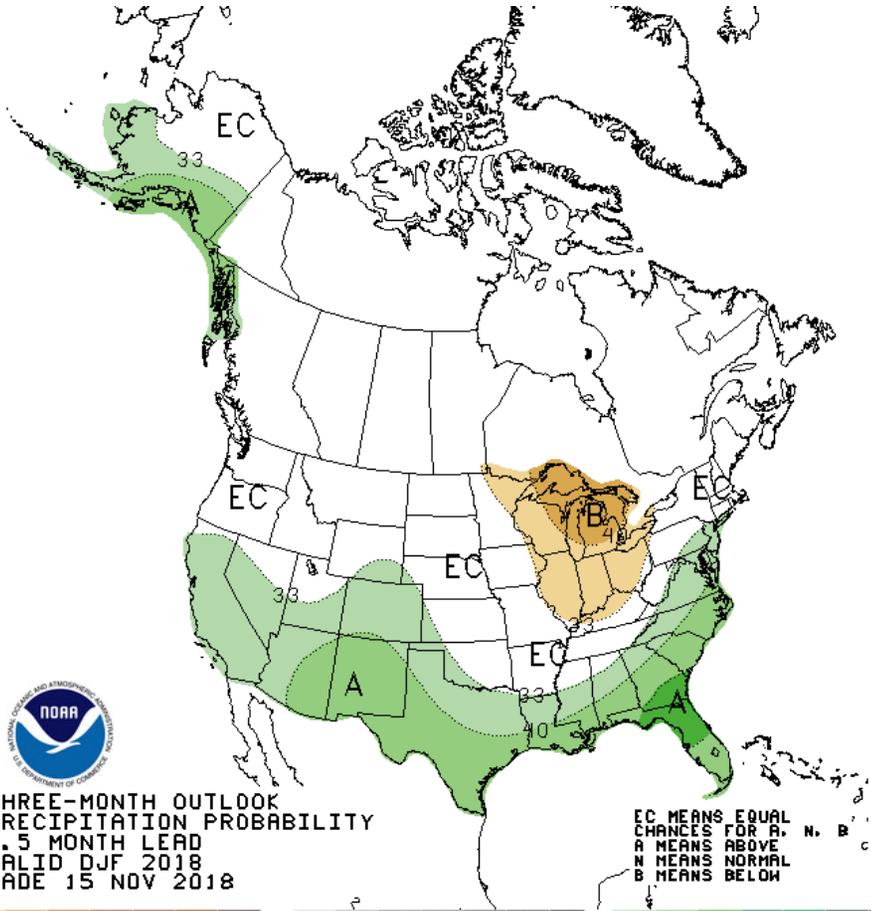


Blue:
Below-average

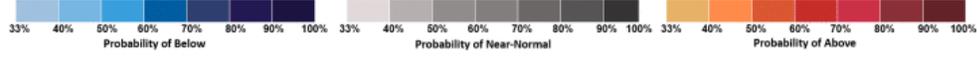
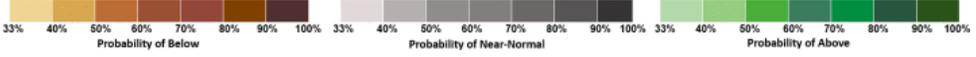
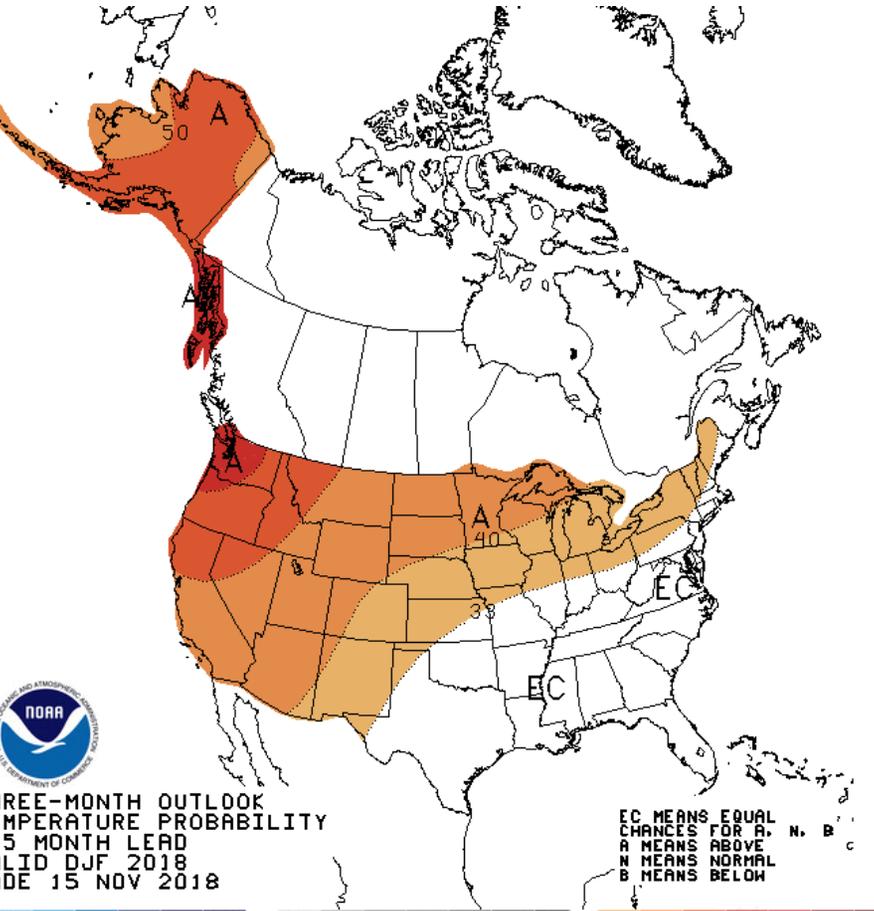
Yellow-Red:
Above-average

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

Precipitation Chances



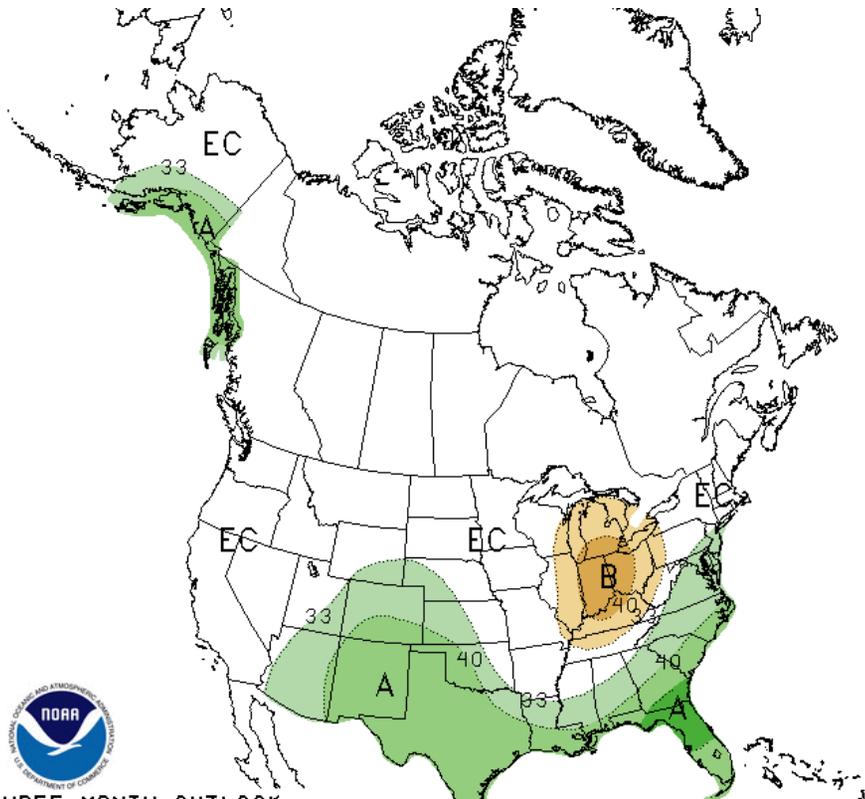
Temperature Chances



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

January-February-March (JFM) Outlook 2019

Precipitation Chances

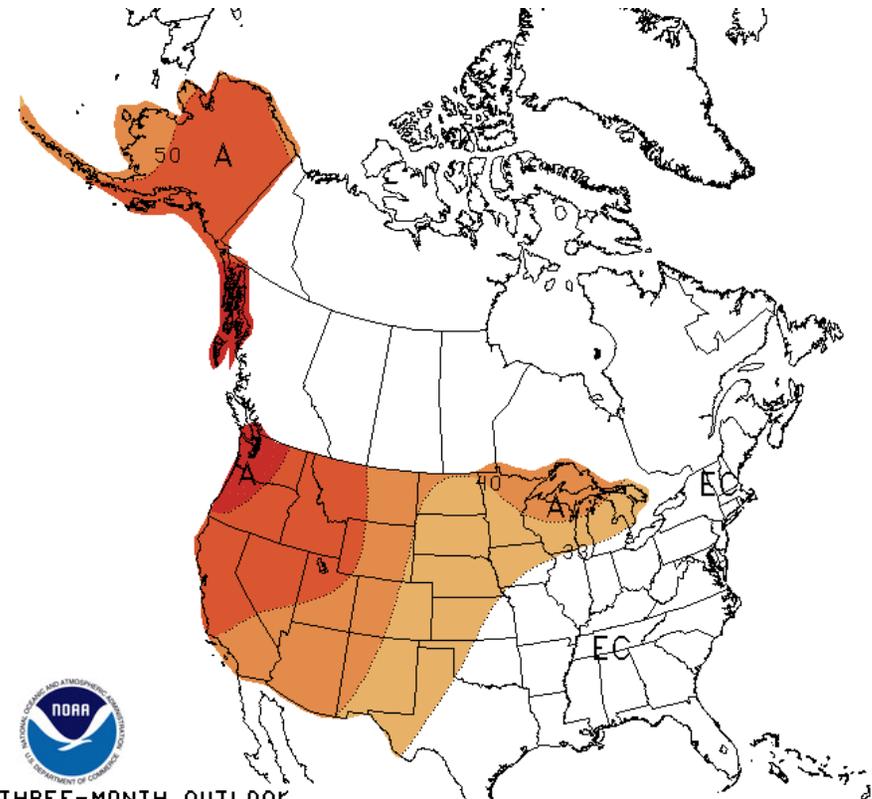


THREE-MONTH OUTLOOK
PRECIPITATION PROBABILITY
1.5 MONTH LEAD
VALID JFM 2019
MADE 15 NOV 2018

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

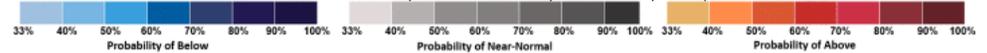


Temperature Chances



THREE-MONTH OUTLOOK
TEMPERATURE PROBABILITY
1.5 MONTH LEAD
VALID JFM 2019
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EC MEANS EQUAL
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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

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