

2019-2020 EARTH NETWORKS WINTER OUTLOOK

PRESENTED BY SENIOR METEOROLOGIST CHAD MERRILL

2019-2020

WINTER OUTLOOK METEOROLOGICAL TEAM



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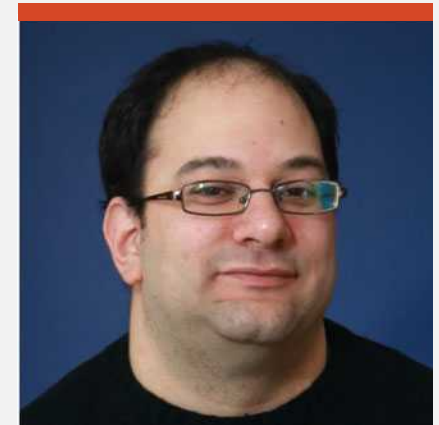
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2019-2020 WINTER OUTLOOK



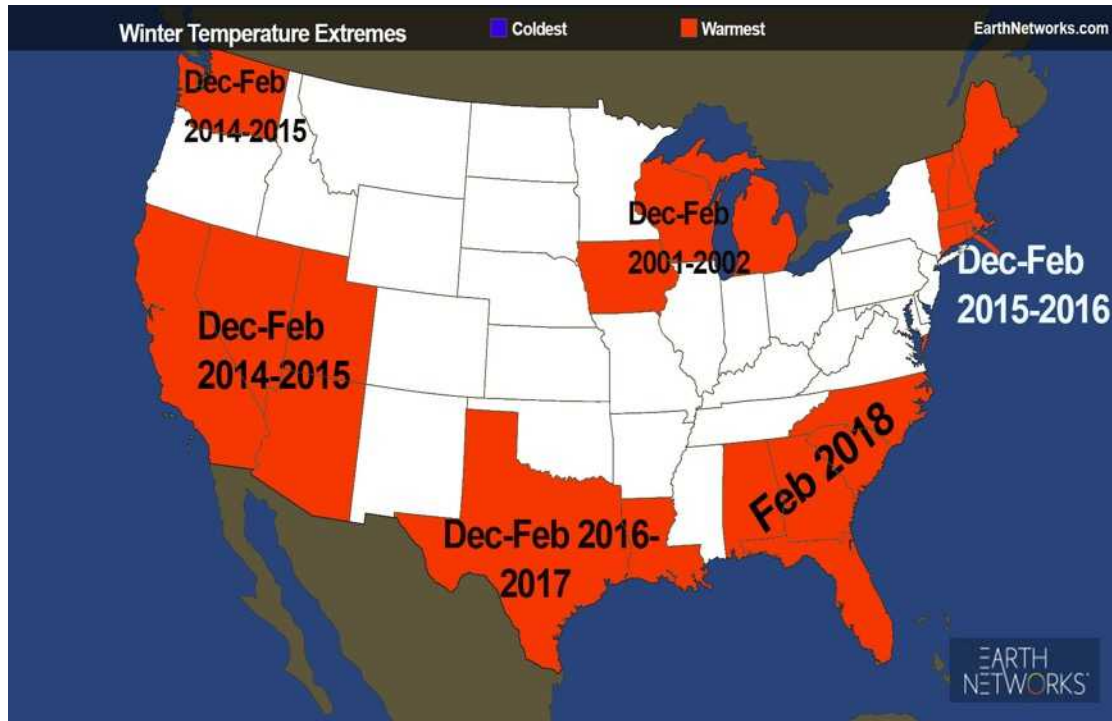
Meteorological Winter is defined as the three coldest months of the year:

December, January and February.

The Winter Outlook covers the expected temperature and precipitation trends in the Lower 48.



RECENT NOTEWORTHY WINTER TRENDS

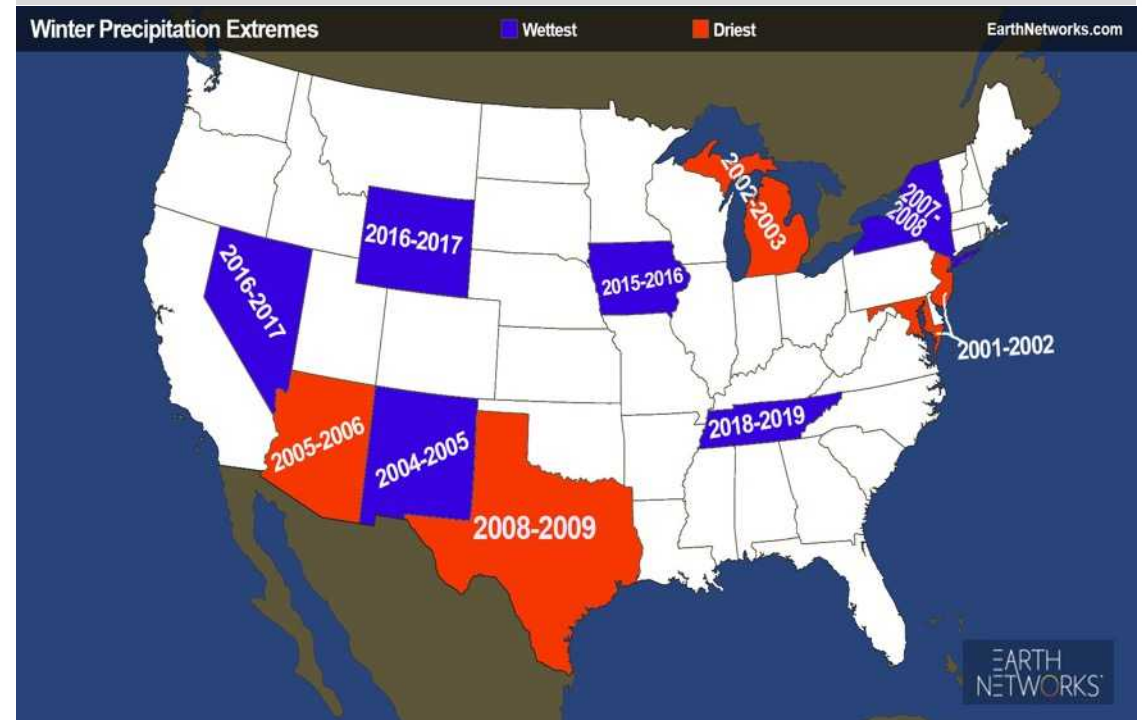


Record warmth noted in the last two decades across the South, East Coast and Great Lakes.

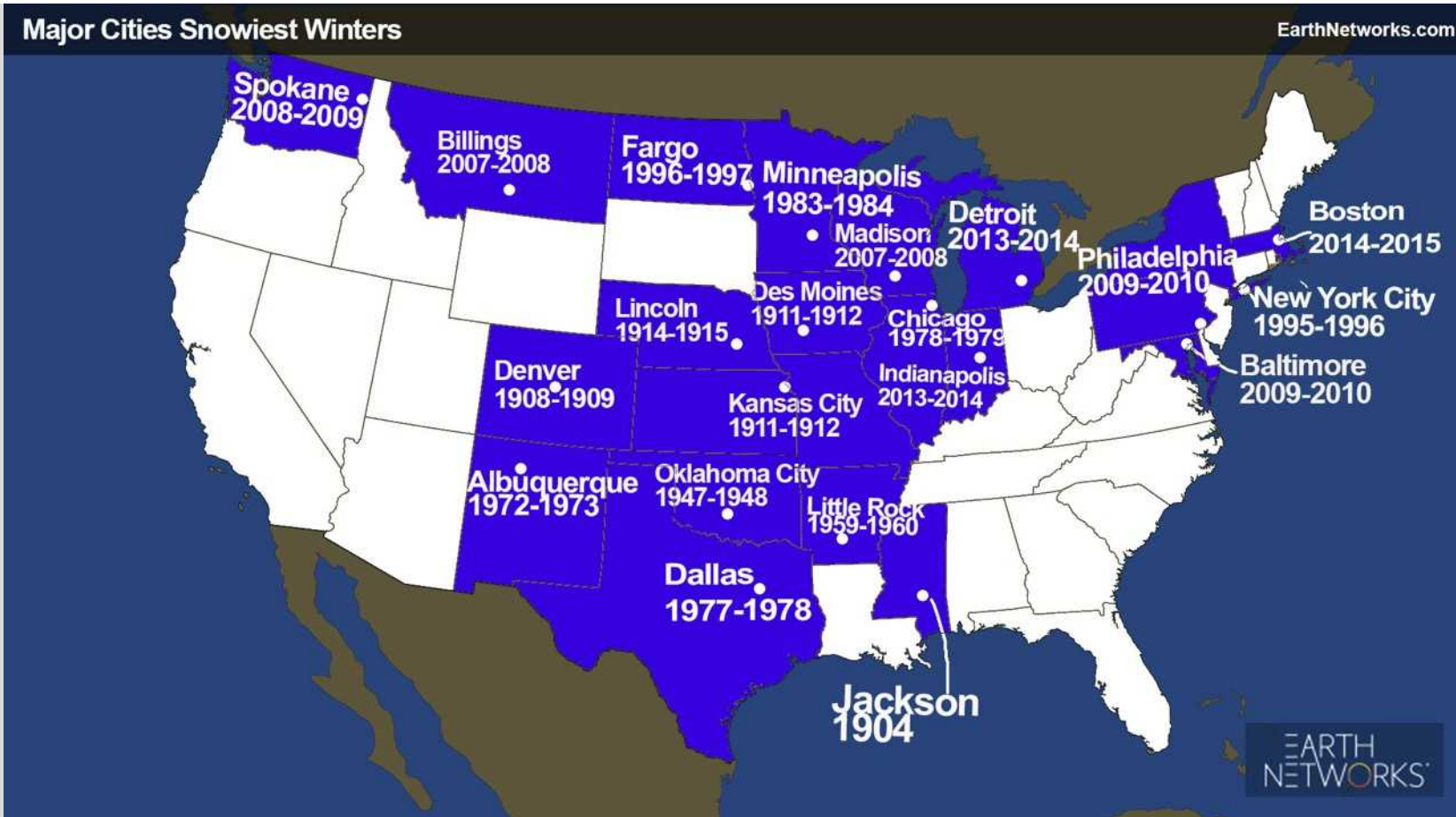
NO Record cold winters noted in the last two decades.

Record wettest winters noted in the last two decades across the Great Basin, central Rockies, Midwest and Tennessee Valley.

Record dry winters noted in parts of the South and Great Lakes. No major trend to note with precipitation extremes in the last two decades.



RECORD SNOWY WINTERS: WHEN HAVE THEY OCCURRED?



Northern tier & Mid-Atlantic snowiest winters: Mostly in the last 30 years.

Central and southern Plains snowiest winters: Mostly in the last 40 years.

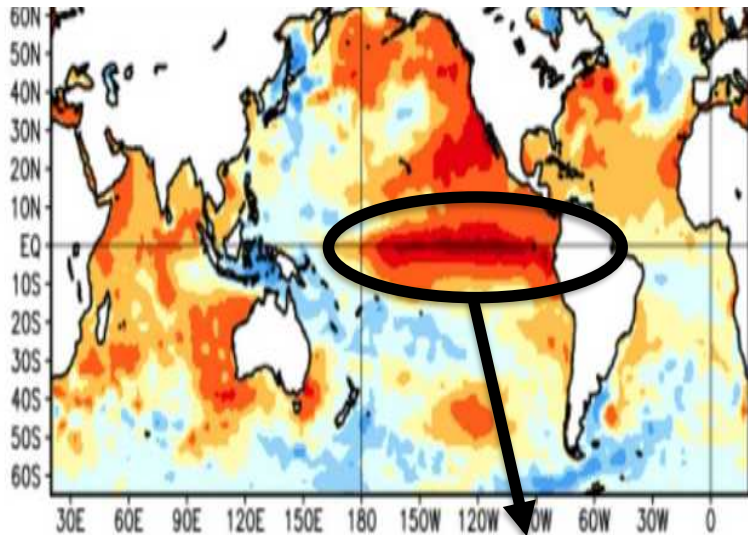
LET'S DIVE INTO THE 2019-2020 WINTER OUTLOOK



WHAT IS ENSO? (EL NIÑO SOUTHERN OSCILLATION)

El Niño

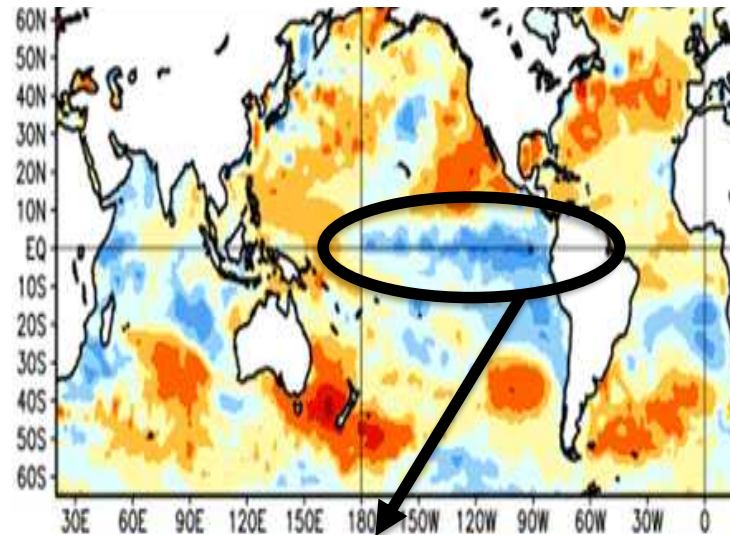
Sea Surface Temperature Anomalies



Above Average

La Niña

Sea Surface Temperature Anomalies

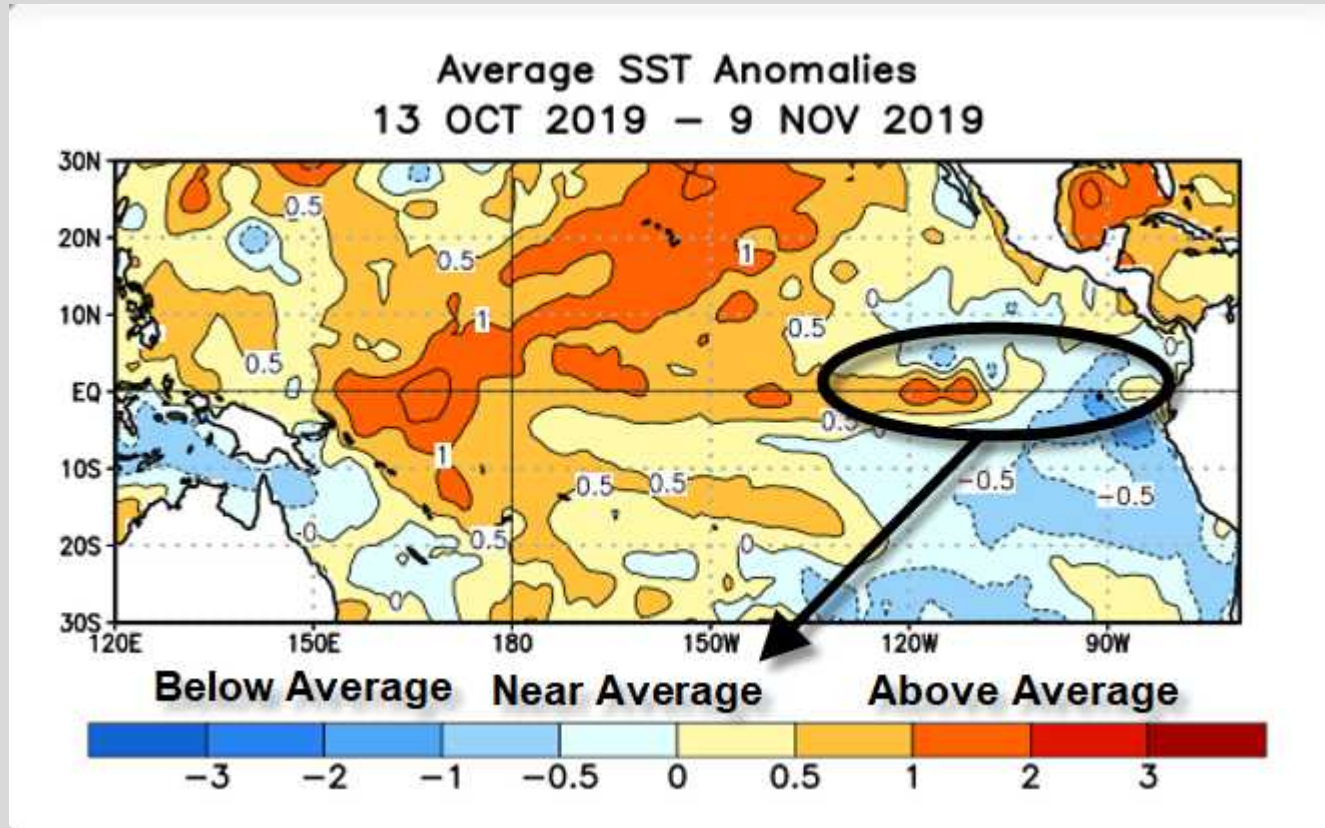


Below Average

ENSO is a periodic, cyclical warming or cooling of the equatorial Pacific Ocean

WHICH PHASE OF ENSO IS EXPECTED THIS WINTER?

Neutral: Neither El Niño or La Niña



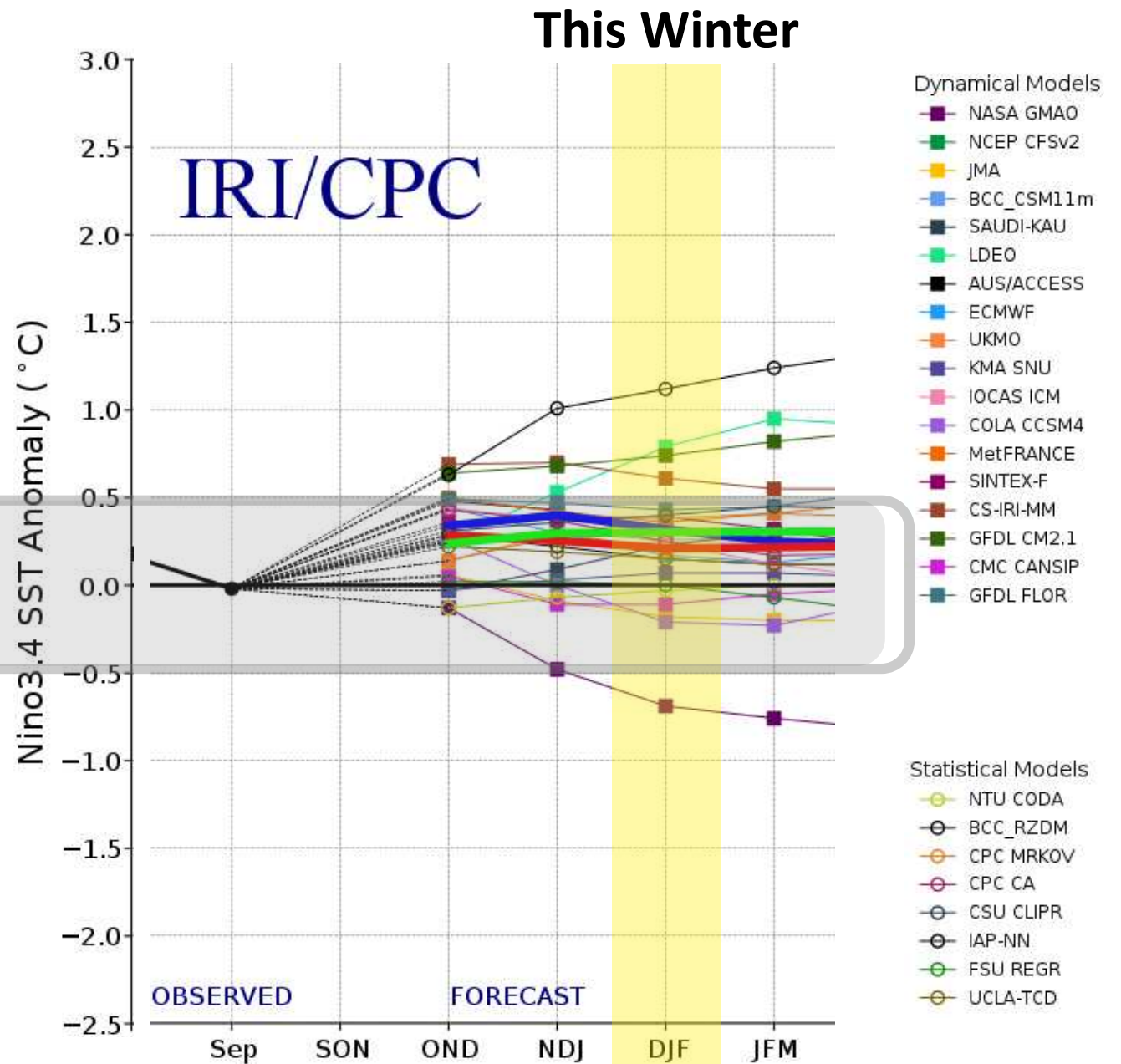
The equatorial Pacific sea surface temperatures are NEAR average.

MOST MODEL FORECASTS SHOW A NEUTRAL PHASE OF ENSO THIS WINTER

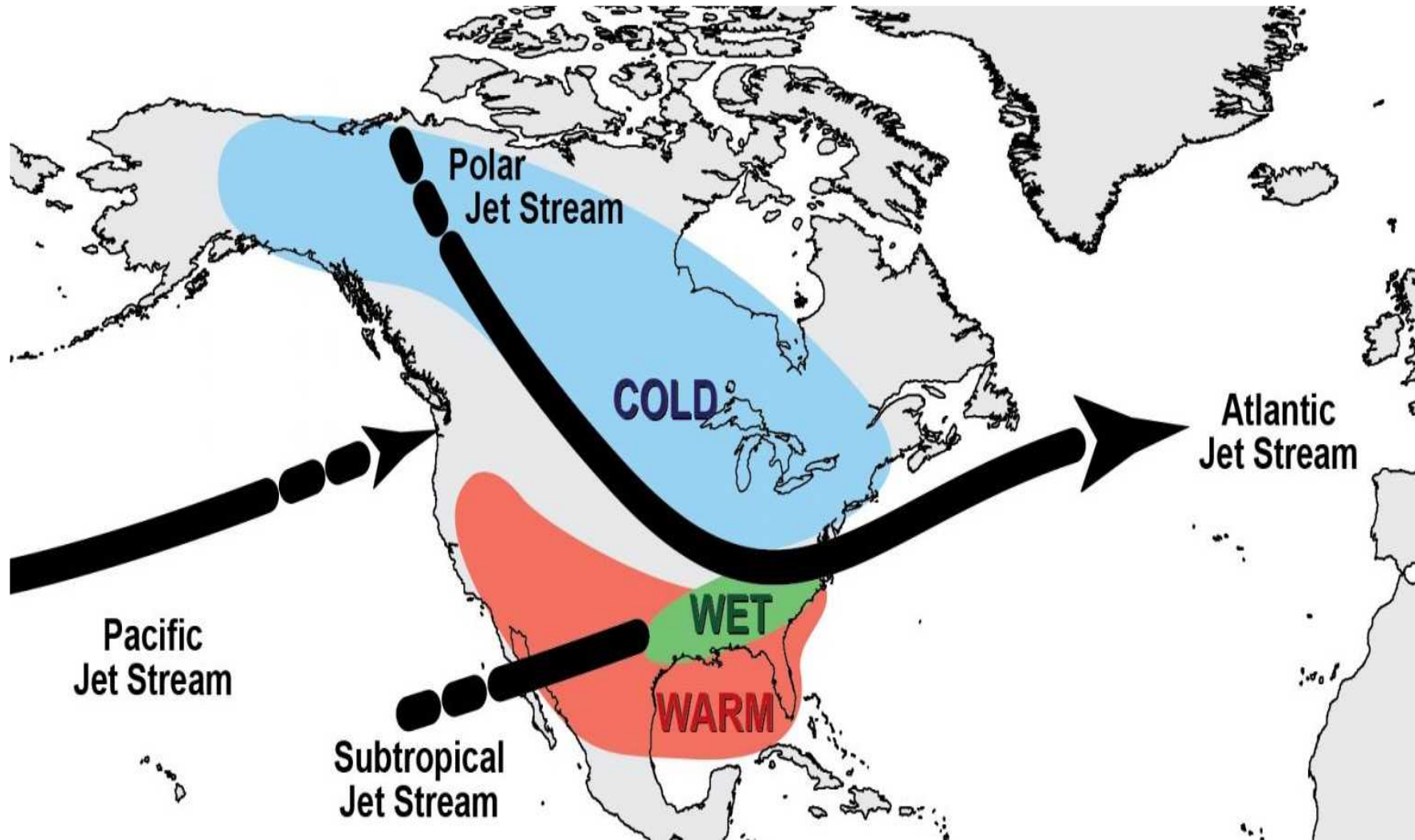
El Nino

Neutral Zone

La Nina



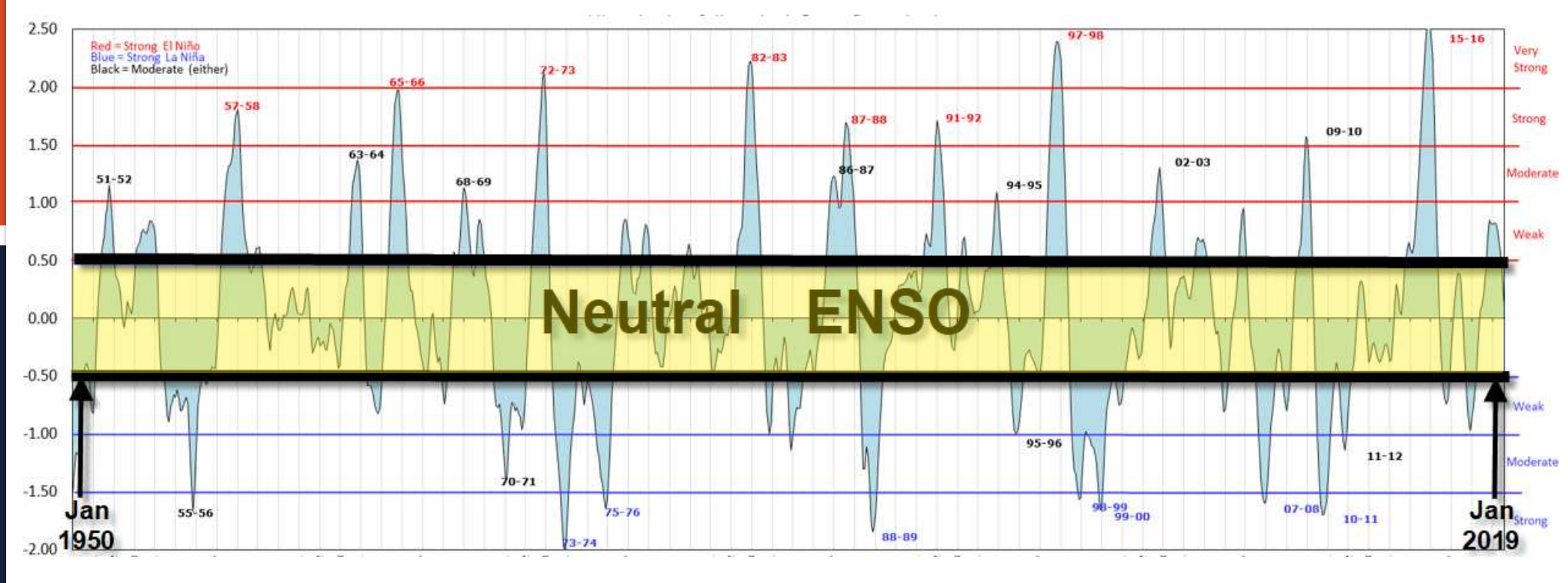
TYPICAL ENSO-NEUTRAL WINTERTIME U.S. PATTERN



- Cold noted from the northern Plains to the Mid-Atlantic/Northeast
- Warm from the Carolinas to the interior West
- Wet signal across the Deep South and Gulf Coast to the Carolinas

HOW COMMON ARE NEUTRAL ENSO WINTERS?

30% of all winters since 1950 have been in the Neutral Phase



WHAT FACTORS DETERMINE AN ANALOG YEAR?



Identifying years with similar Equatorial Pacific Sea Surface Temperature Anomalies leading into the winter season.



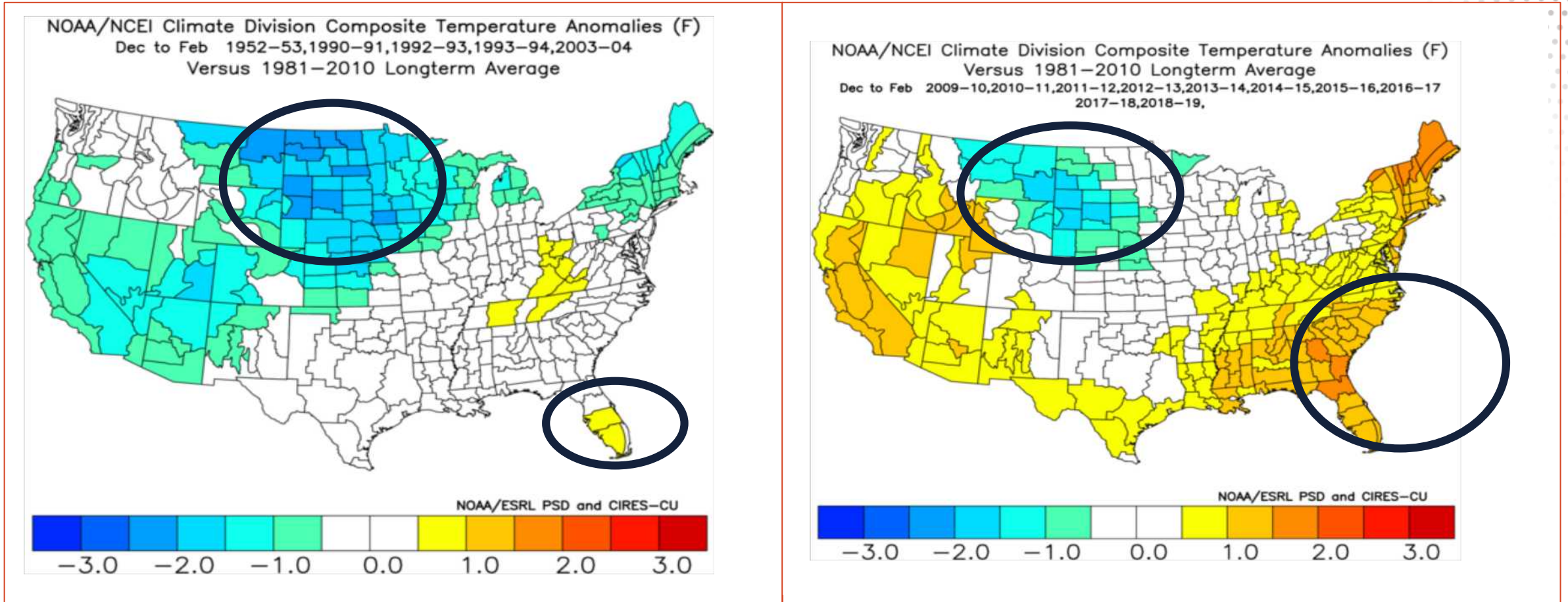
Identifying winters that saw similar Equatorial Pacific Sea Surface Temperature Anomalies to what we expect this winter.



Which years have the *closest* match to the conditions leading up to the winter season and what we expect going through the winter season?

OVERALL WINTER TEMPERATURE COMPARISONS

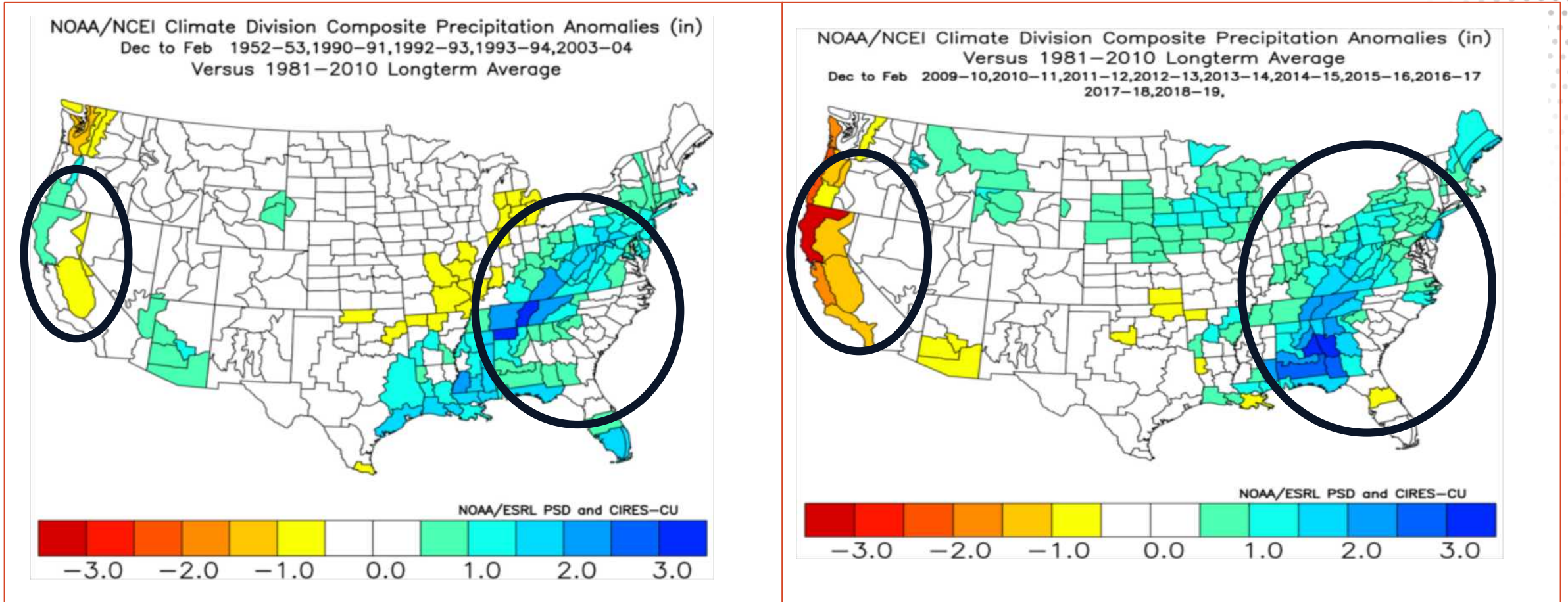
BEST MATCHED ANALOG YEARS COMPARED TO LAST 10 WINTERS



○ = Best-matched signals

OVERALL WINTER PRECIPITATION COMPARISONS

BEST MATCHED ANALOG YEARS COMPARED TO LAST 10 WINTERS



○ = Best-matched signals

WHAT WENT INTO THE FINAL PRODUCT?

FACTORS WEIGHTED

- **60%: Recent Decadal Trends** – Temperature and precipitation trends over the last 10 winters.
- **40%: Analog Years** – Best matched ENSO winters (El Nino, La Nina, Neutral)

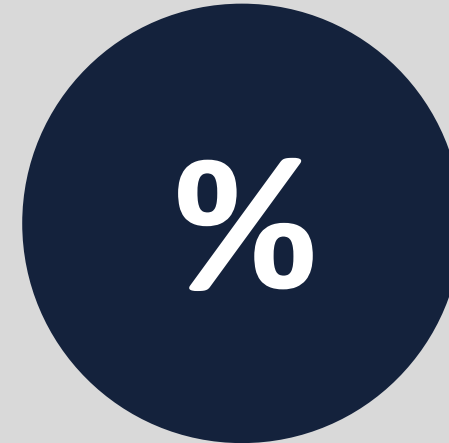


EXPLANATION OF THE FOLLOWING PROBABILITY FORECASTS

Probability of Occurrence

Above	Near	Below
40-50%	33%	26-16%
33-40%	33%	33-26%
Below	Near	Above
40-50%	33%	26-16%
33-40%	33%	33-26%
Equal Chances		
33%	33%	33%

The percentages



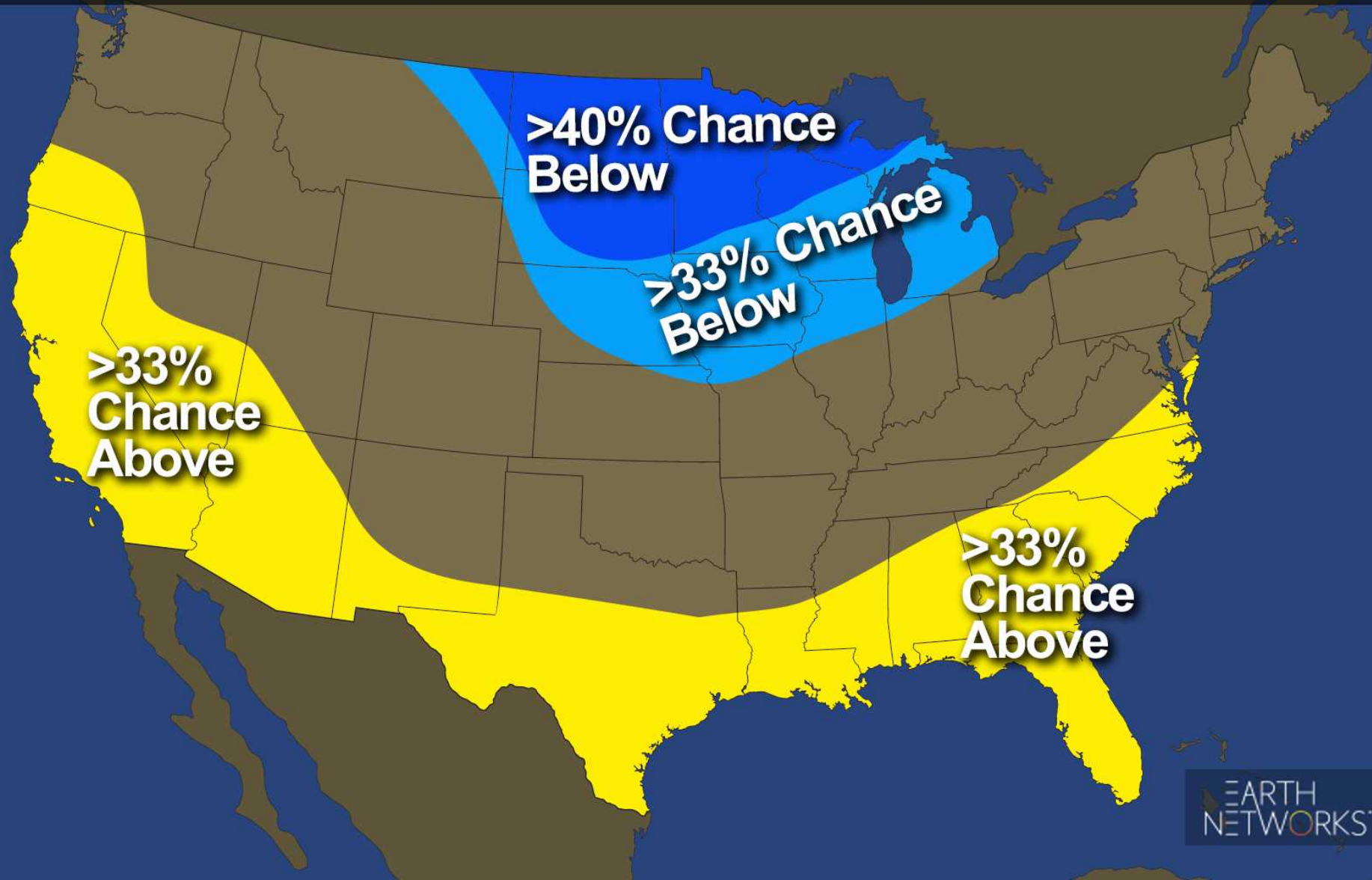
DO NOT refer to how much above or below average temperatures or precipitation will be in selected areas.

EARTH NETWORKS 2019-2020 WINTER TEMPERATURE OUTLOOK

Winter Outlook - Temperature Probability

December 2019- February 2020

EarthNetworks.com

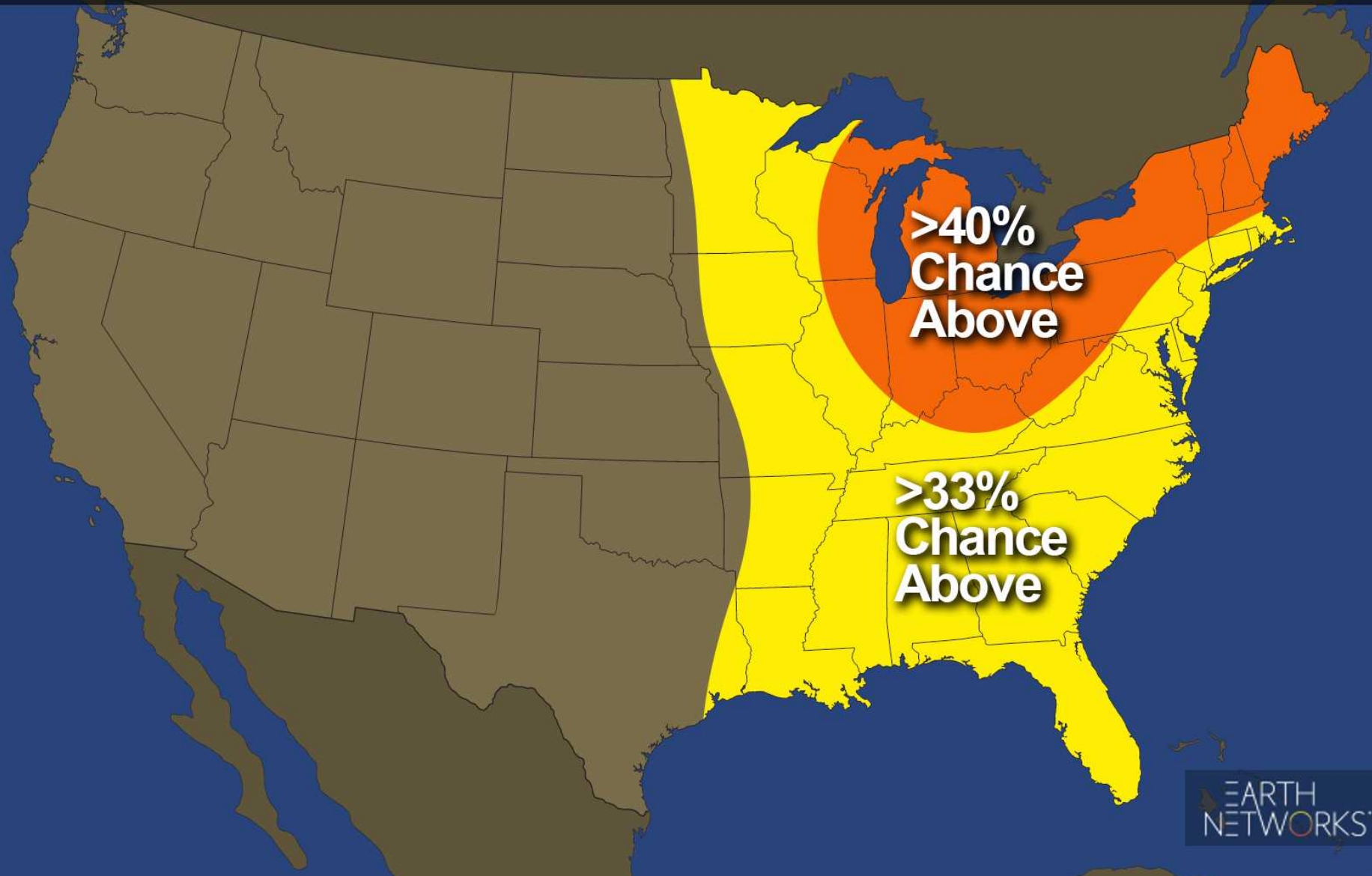


EARTH NETWORKS 2019 OUTLOOK DECEMBER TEMPERATURE

Winter Outlook - Temperature Probability

December 2019

EarthNetworks.com

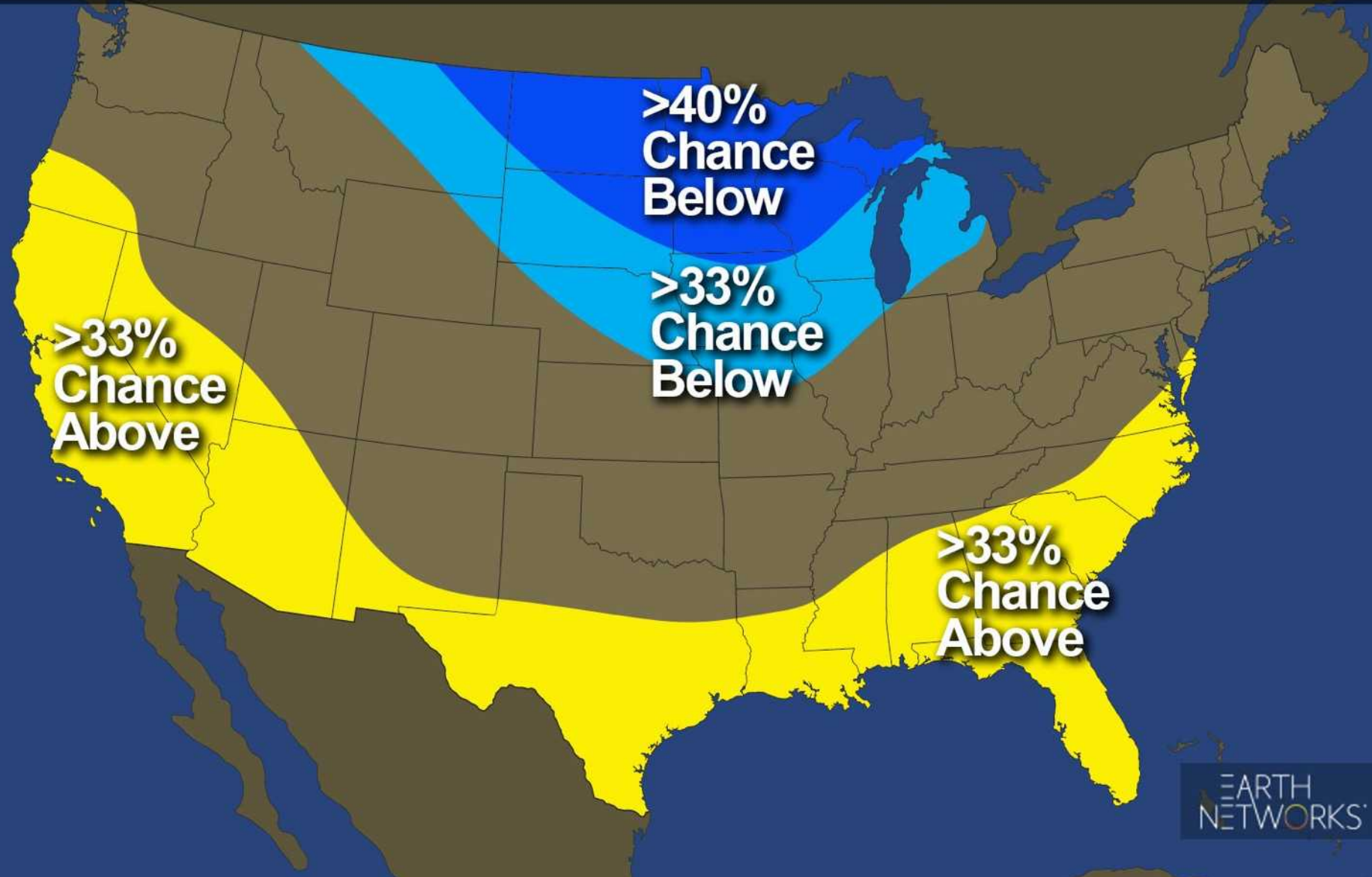


EARTH NETWORKS 2020 OUTLOOK JANUARY TEMPERATURE

Winter Outlook - Temperature Probability

January 2020

EarthNetworks.com

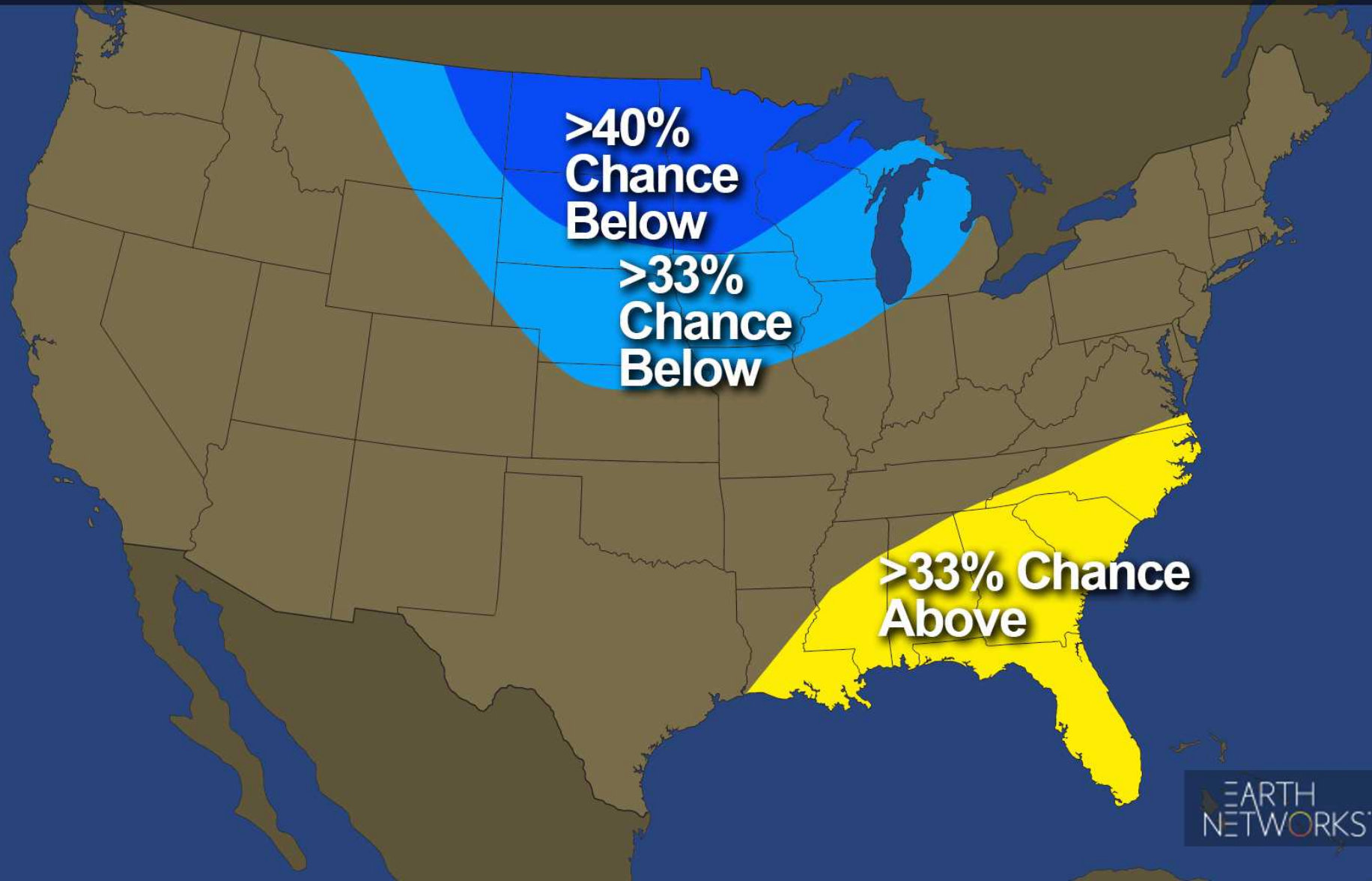


EARTH NETWORKS 2020 OUTLOOK FEBRUARY TEMPERATURE

Winter Outlook - Temperature Probability

February 2020

EarthNetworks.com

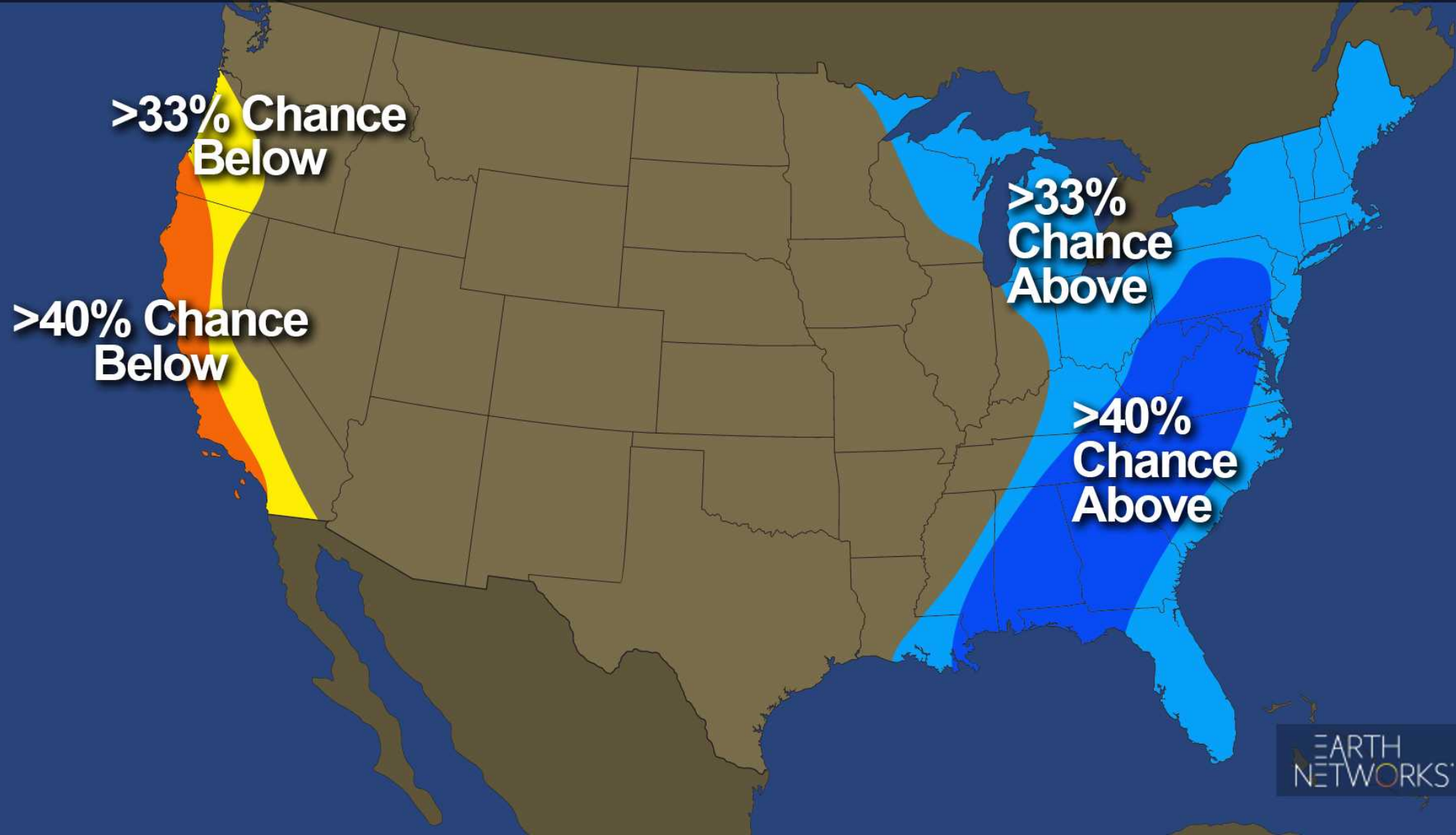


EARTH NETWORKS 2019-2020 OUTLOOK WINTER PRECIPITATION

Winter Outlook - Precipitation Probability

December - February 2020

EarthNetworks.com



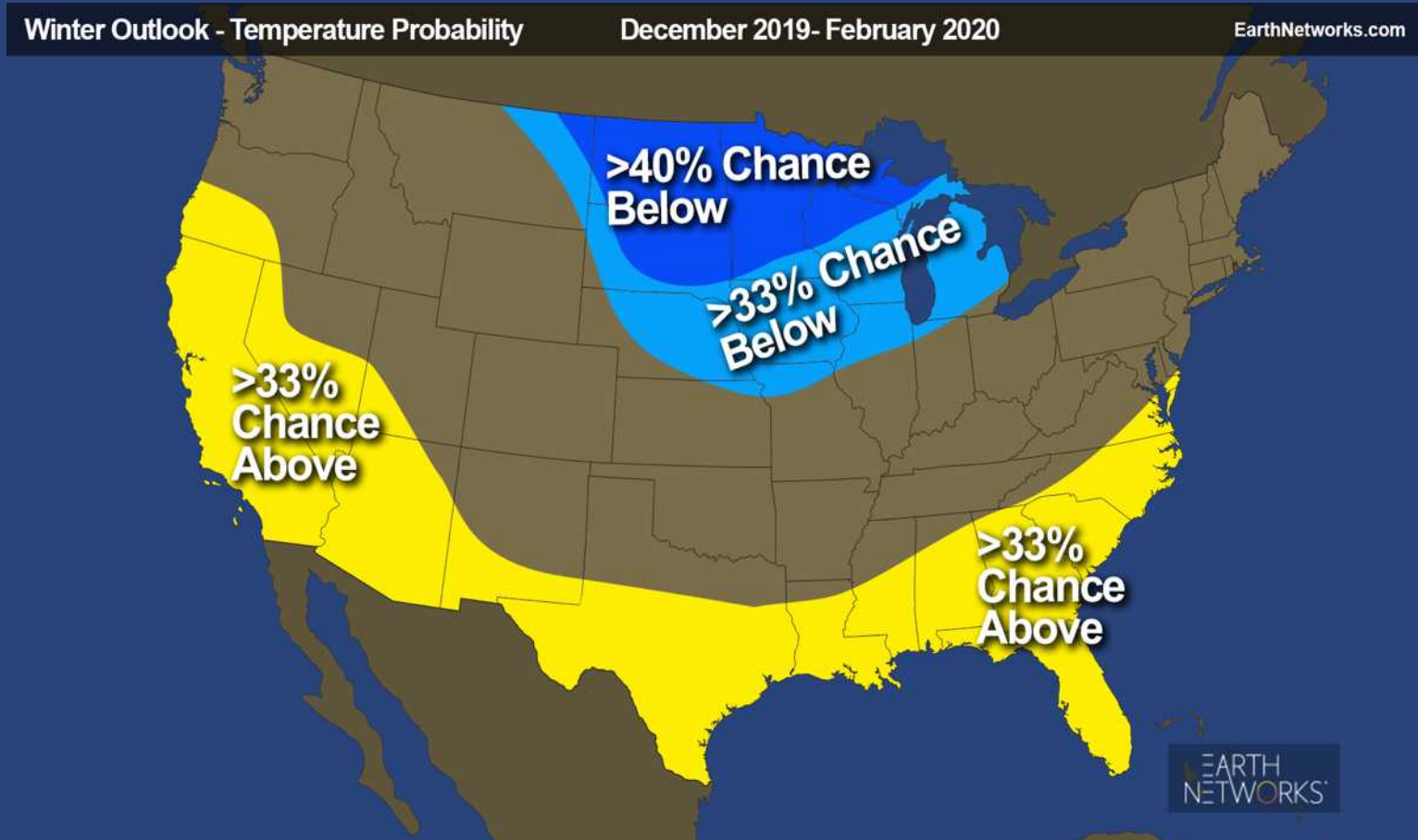
EARTH NETWORKS 2019-2020 WINTER OUTLOOK

MAJOR REGIONAL IMPACT POINTS - TEMPERATURES

Moderate signal for **COOLER than average temperatures** in the northern Plains and Upper Mississippi Valley, with a better chance for cold weather in the second half of winter.

A weak signal for **WARMER than average temperatures** across the Southern Tier into California.

EQUAL CHANCES for below, above and near average winter temperatures for the Mountain West, part of the central and southern Plains and Mid-Mississippi Valley to Northeast.



EARTH NETWORKS 2019-2020 WINTER OUTLOOK

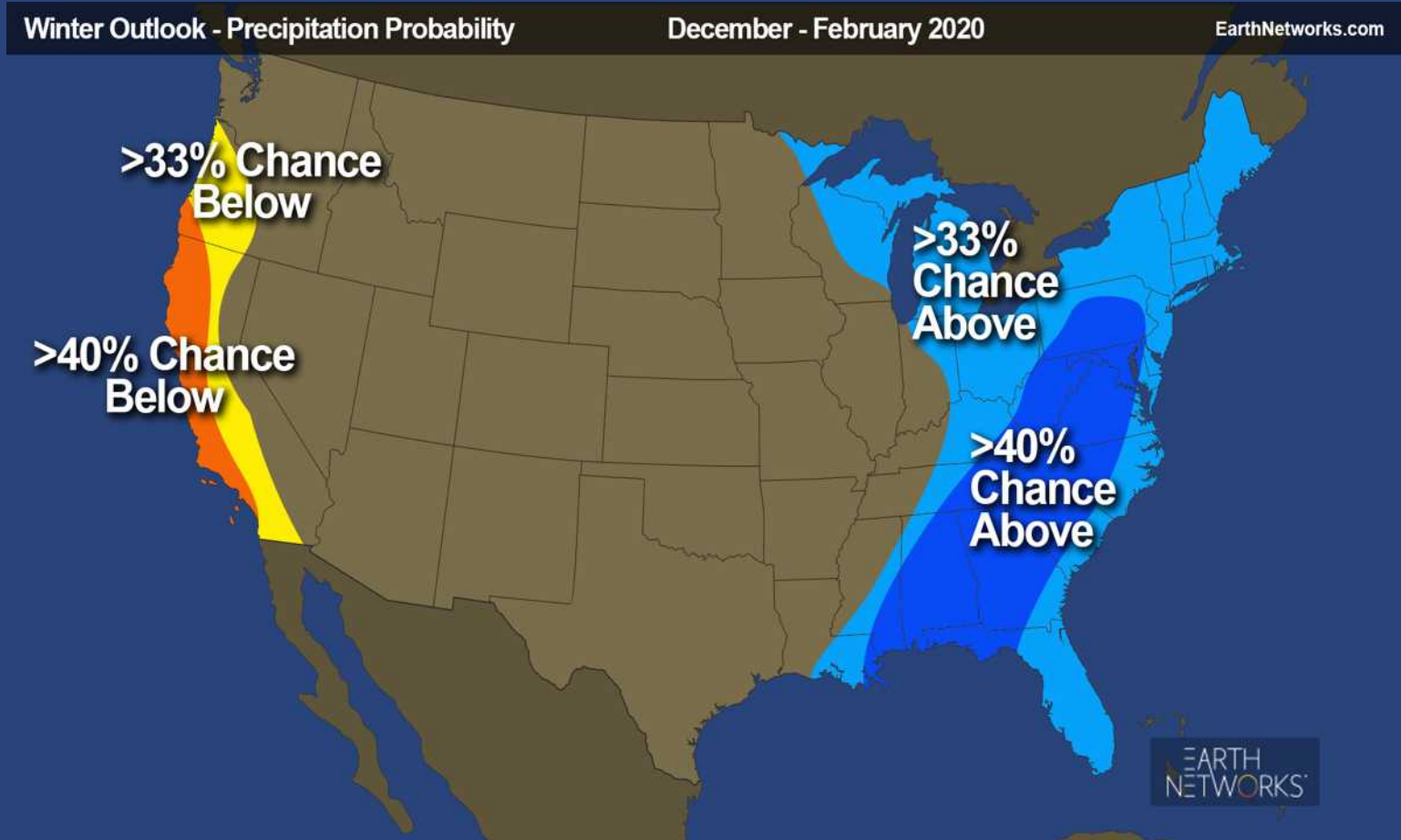
MAJOR REGIONAL IMPACT POINTS - PRECIPITATION

A moderate signal for a **WET/STORMY WINTER** from the eastern Gulf Coast into the Appalachians. This will improve drought conditions in the Southeast.

A moderate signal for **DRY CONDITIONS** along the West Coast into southern Oregon. This will enhance wildfire conditions in California, at least through the first month of winter.

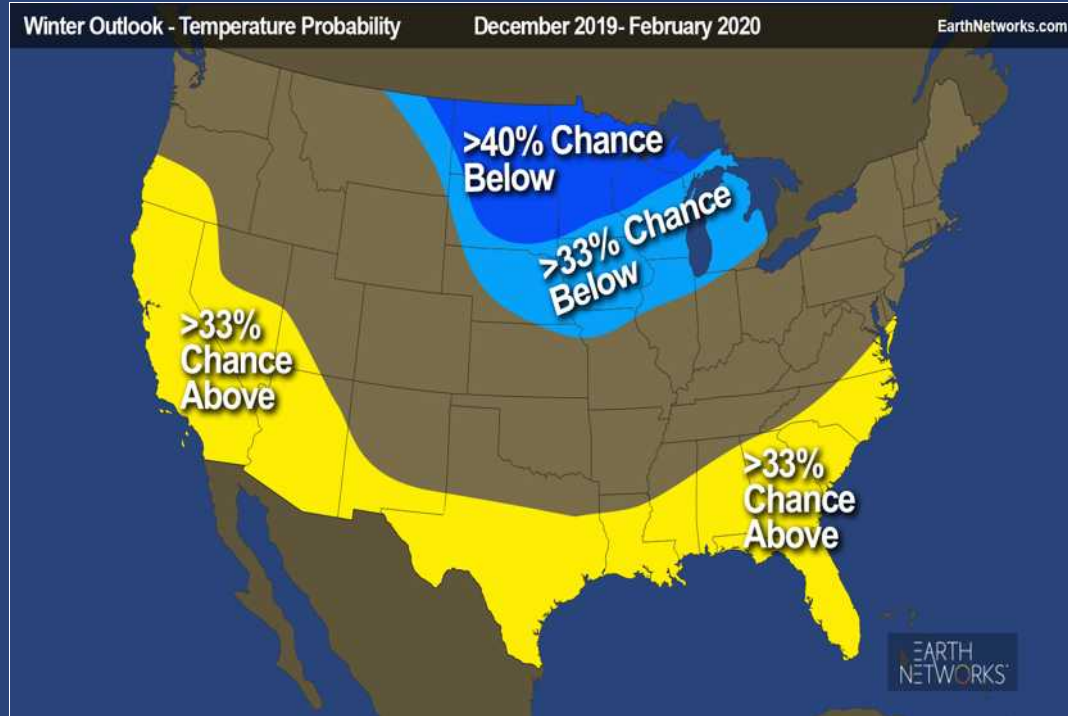
A weak signal for a **WET/STORMY WINTER** along the East Coast and for the Great Lakes.

No signals for **wet or dry conditions** from the Mountain West into the Plains.

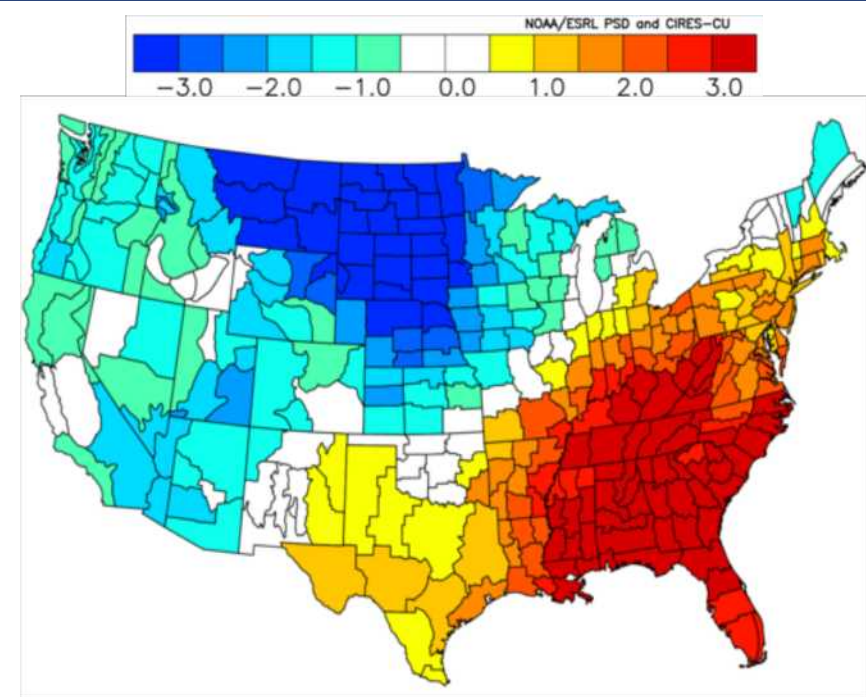


HOW WILL THIS WINTER'S TEMPERATURES COMPARE TO LAST YEAR?

THIS WINTER'S OUTLOOK



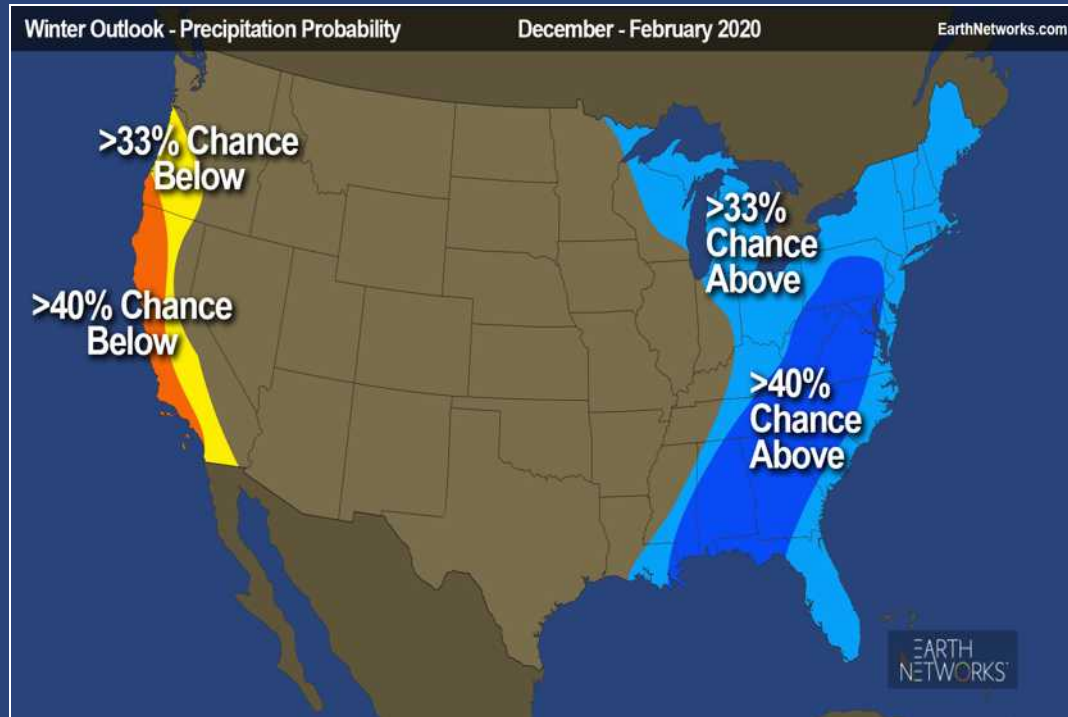
LAST WINTER'S TEMPERATURES



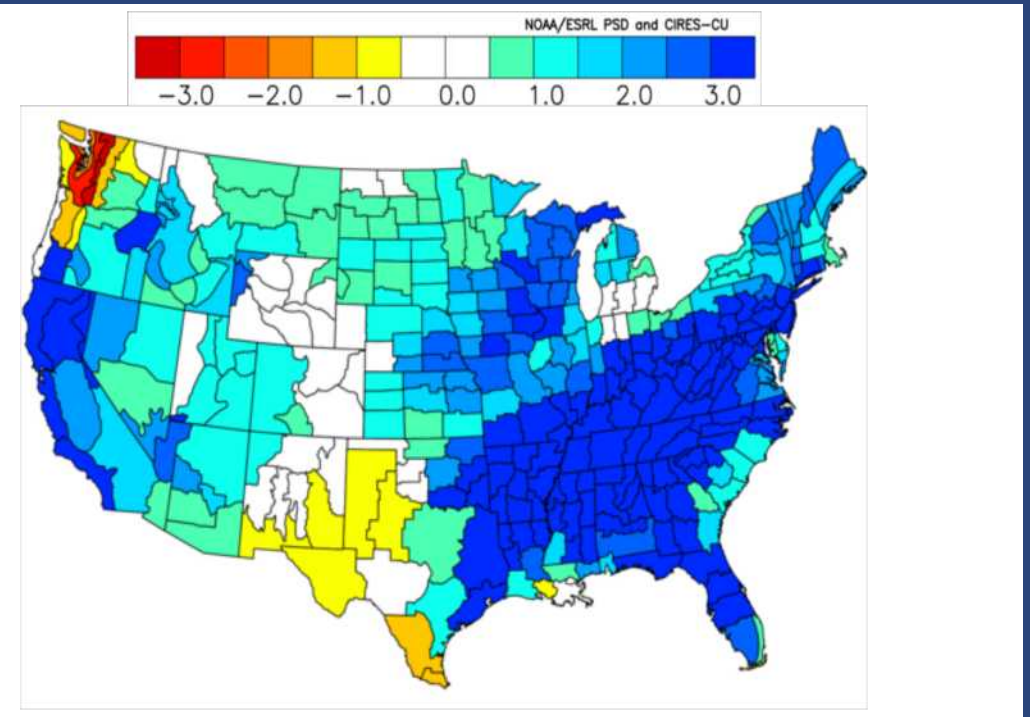
- *Similar in the northern Rockies, northern Plains and from the southern Plains to the East Coast
- *Warmer than last year along the West Coast
- *No other strong signals noted

HOW WILL THIS WINTER'S PRECIPITATION COMPARE TO LAST YEAR?

THIS WINTER'S OUTLOOK



LAST WINTER'S PRECIPITATION



- *Similar stormy pattern expected in the East and Great Lakes
- *Much drier weather expected in California
- *No other strong signals noted

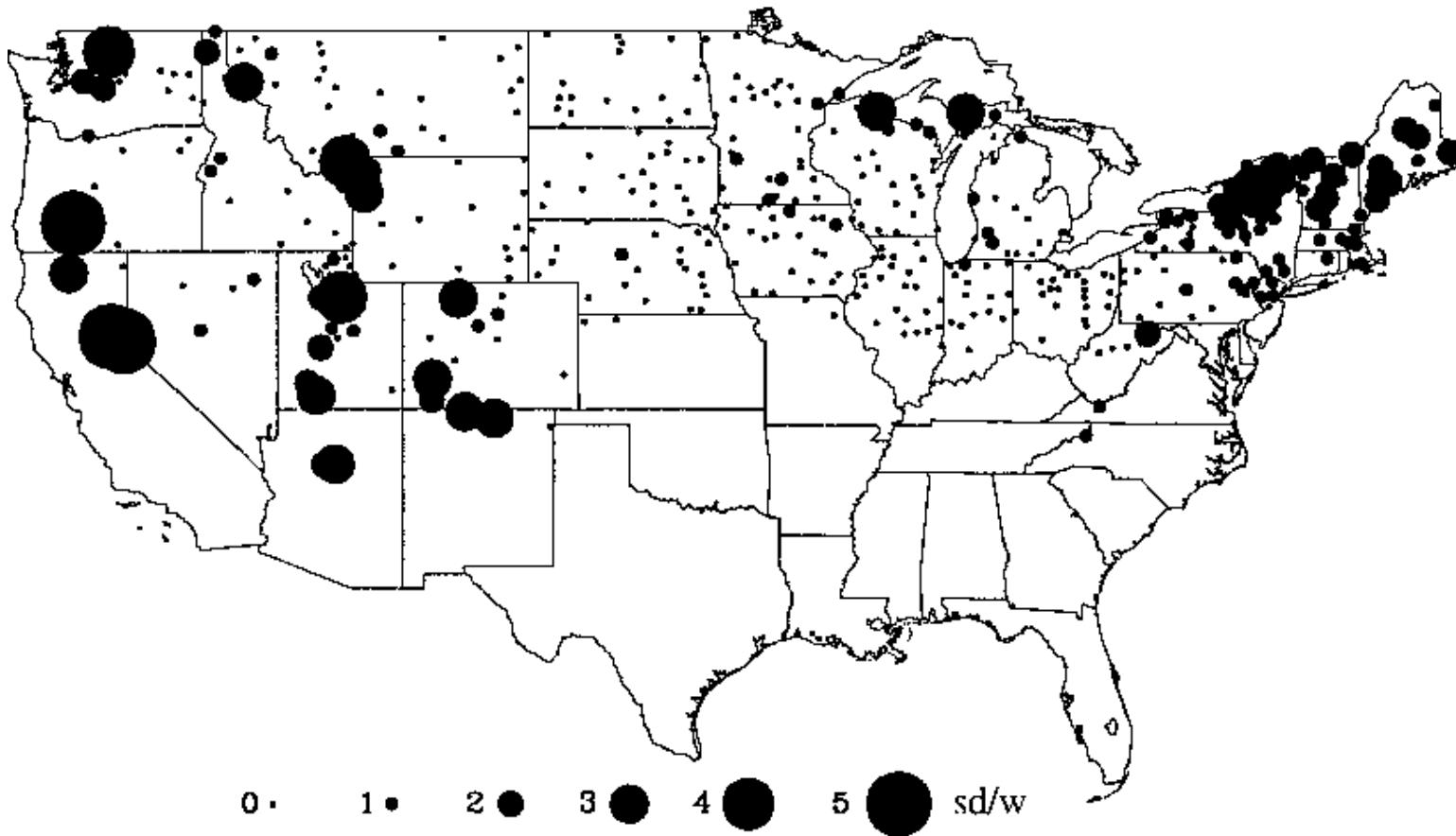
THANK YOU

QUESTIONS AND COMMENTS?

Contact us at info@earthnetworks.com or **301-250-4000**

PROBABILITY OF A MAJOR SNOWSTORM?

Average Neutral Phase Heavy Snowfalls Per Winter



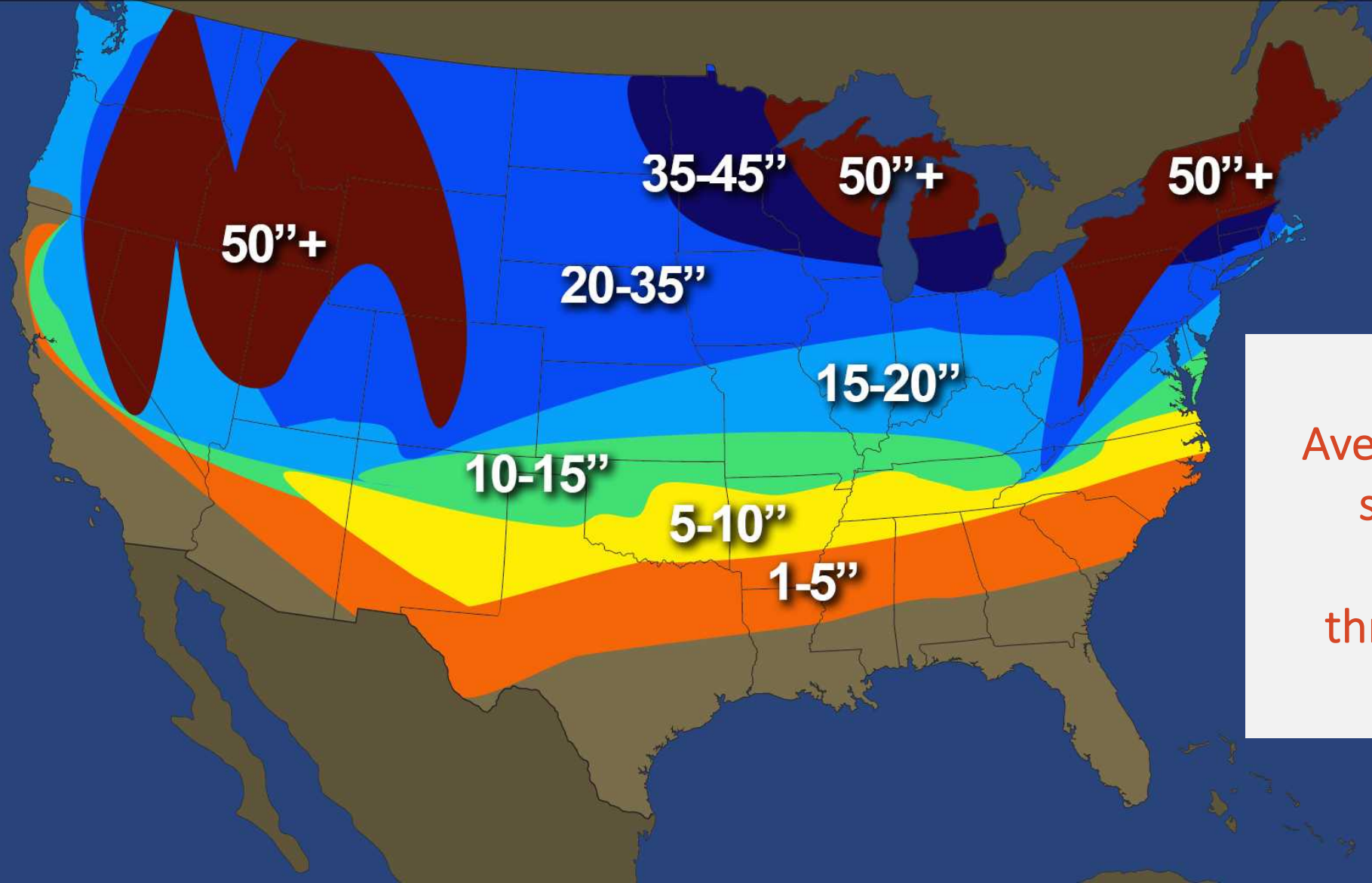
**BEST CHANCE
FOR 6-12 INCH
SNOWSTORMS IN A
NEUTRAL WINTER**

- New England, Upstate New York and Mountain West have the best chance
- There could be one or two heavy snows from the northern Plains to Upper Midwest

WHAT DOES SNOWFALL LOOK LIKE IN A NEUTRAL ENSO WINTER?

Average Snowfall For A Neutral ENSO Winter

November-March

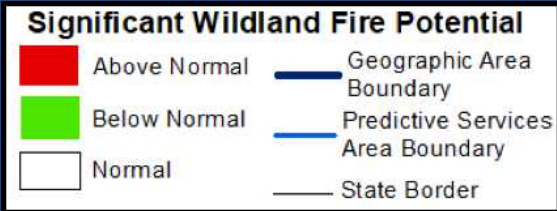
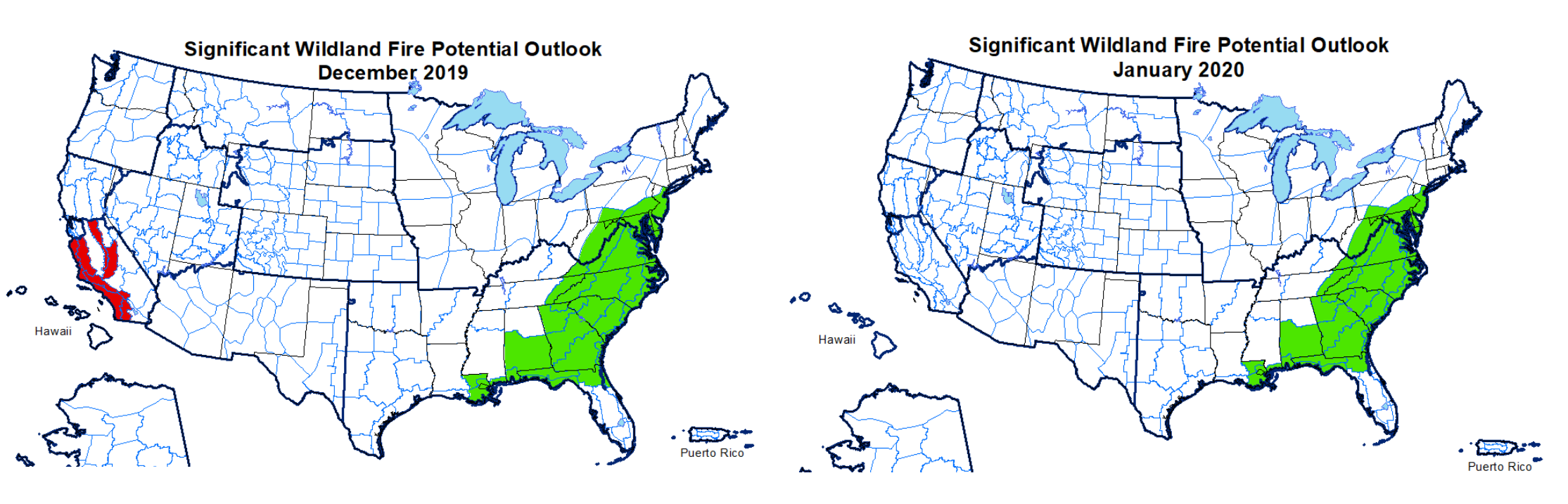


Average seasonal snowfall for November through March

WILDFIRE OUTLOOK

DECEMBER

JANUARY



WILDFIRE OUTLOOK

FEBRUARY

