El Niño-Southern Oscillation (ENSO) Update
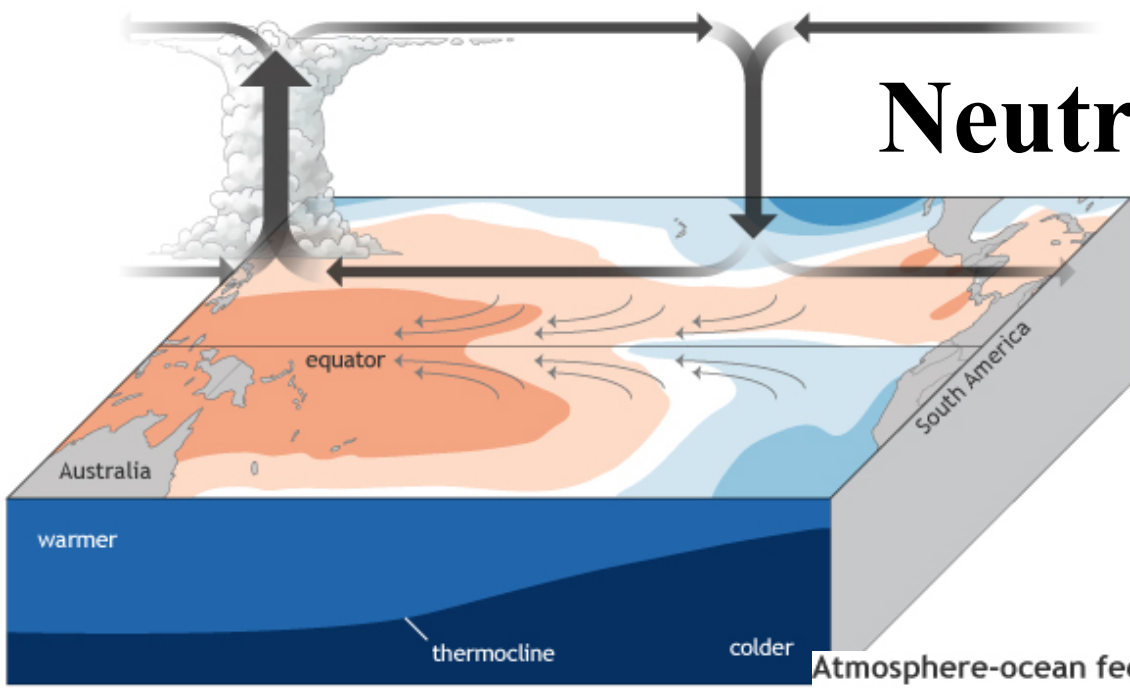# + Seasonal Outlooks

NOAA Eastern Region Climate Services

Michelle L'Heureux
Climate Prediction Center / NCEP/ NWS
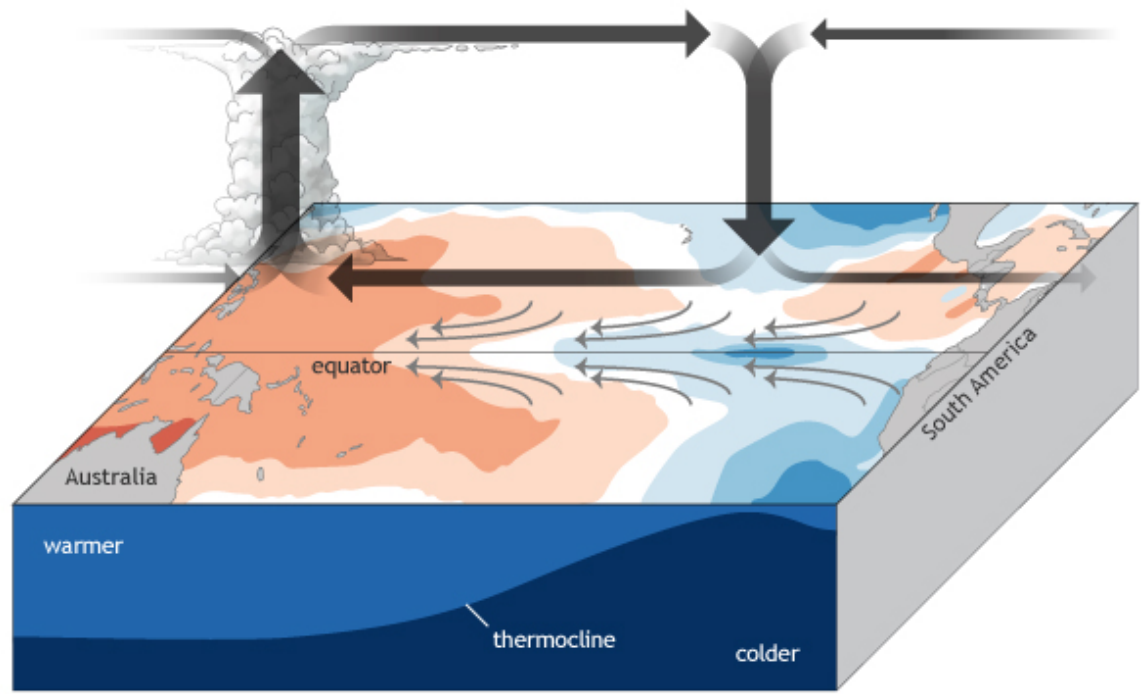19 November 2020

La Niña Advisory

La Niña is likely to continue through the Northern Hemisphere winter 2020-21 (~95% chance during January-March) and into spring 2021 (~65% chance during March-May).

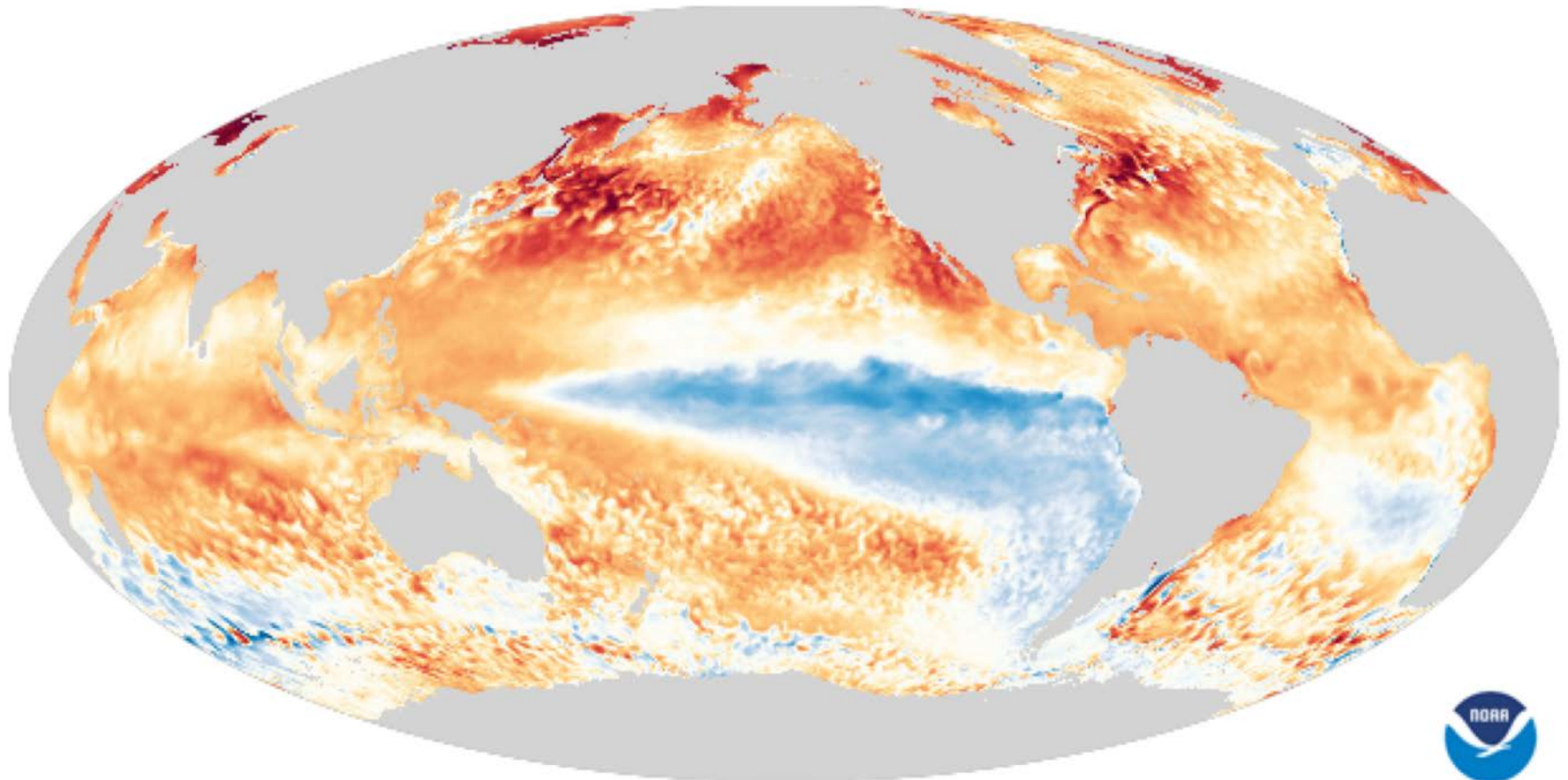Atmosphere-ocean feedbacks during El Niño-Southern Oscillation
Neutral

Neutral

La Niña

Atmosphere-ocean feedbacks during El Niño-Southern Oscillation
La Niña

https://www.climate.gov/news-features/blogs/enso/rise-el-niño-and-la-niña

NOAA Climate.gov

Sea surface temperatures (SST) anomalies during October

October 2020
Compared to 1981-2010

Difference from average temperature (°F)

0

Blue shading is Below-Average SST

Yellow-Red shading is Above-Average SST

NOAA NNVL
Data: NCEI

Below-average SSTs across the equatorial Pacific Ocean, which indicate La Niña

Looking back to 1950, How Strong is it?

**Monthly ERSSTv5 Nino3.4 index (October Ranks back to 1950)**

Roughly 1 in 10 years have a La Niña as strong as this one.

But La Niña is not just monthly SSTs.

Subsurface temperature anomalies on the Equator (Pacific Ocean)

EQ. Subsurface Temperature Anomalies (deg C)

Pentad centered on 09 NOV 2020

Surface of Ocean

300 meters below surface

Yellow-Red shading is Above-Average Temperatures

Blue shading is Below-Average Temperatures
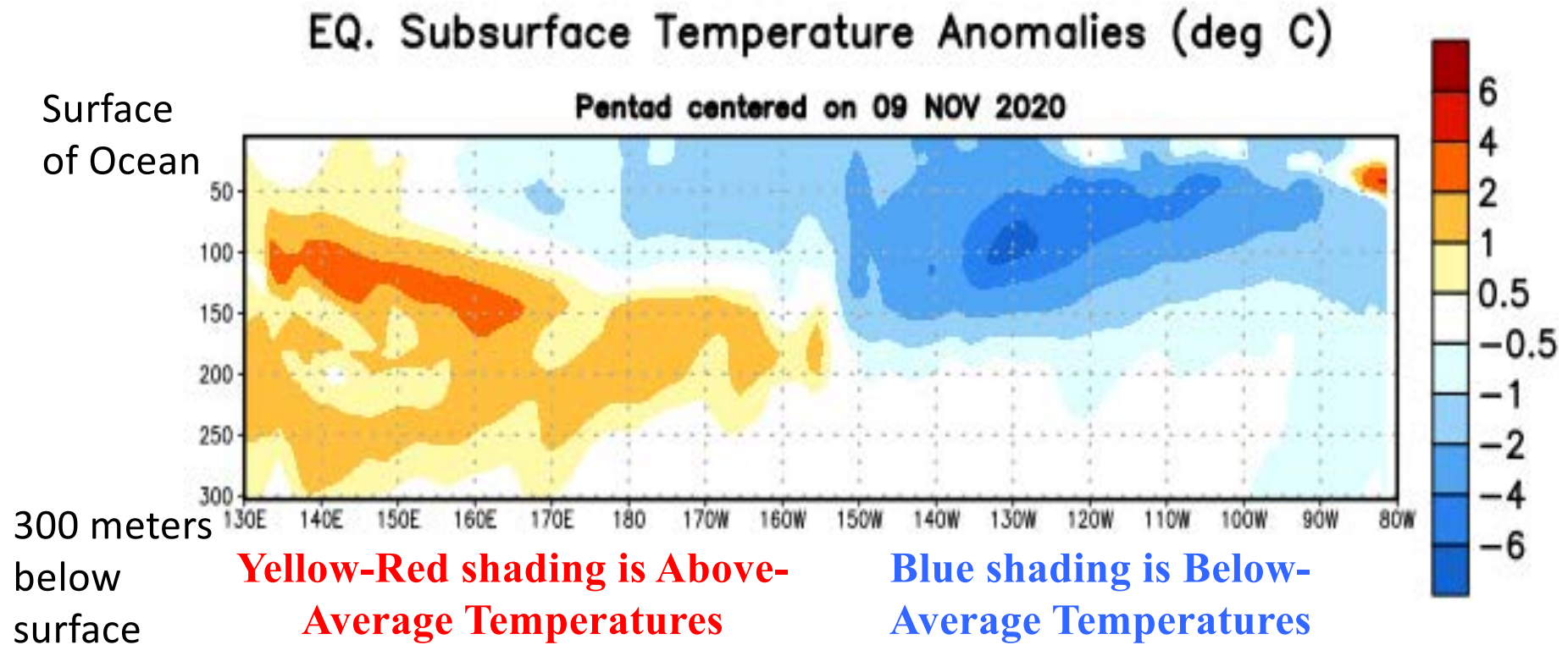
Cloudiness/Rainfall (Outgoing Longwave Radiation) anomalies during October
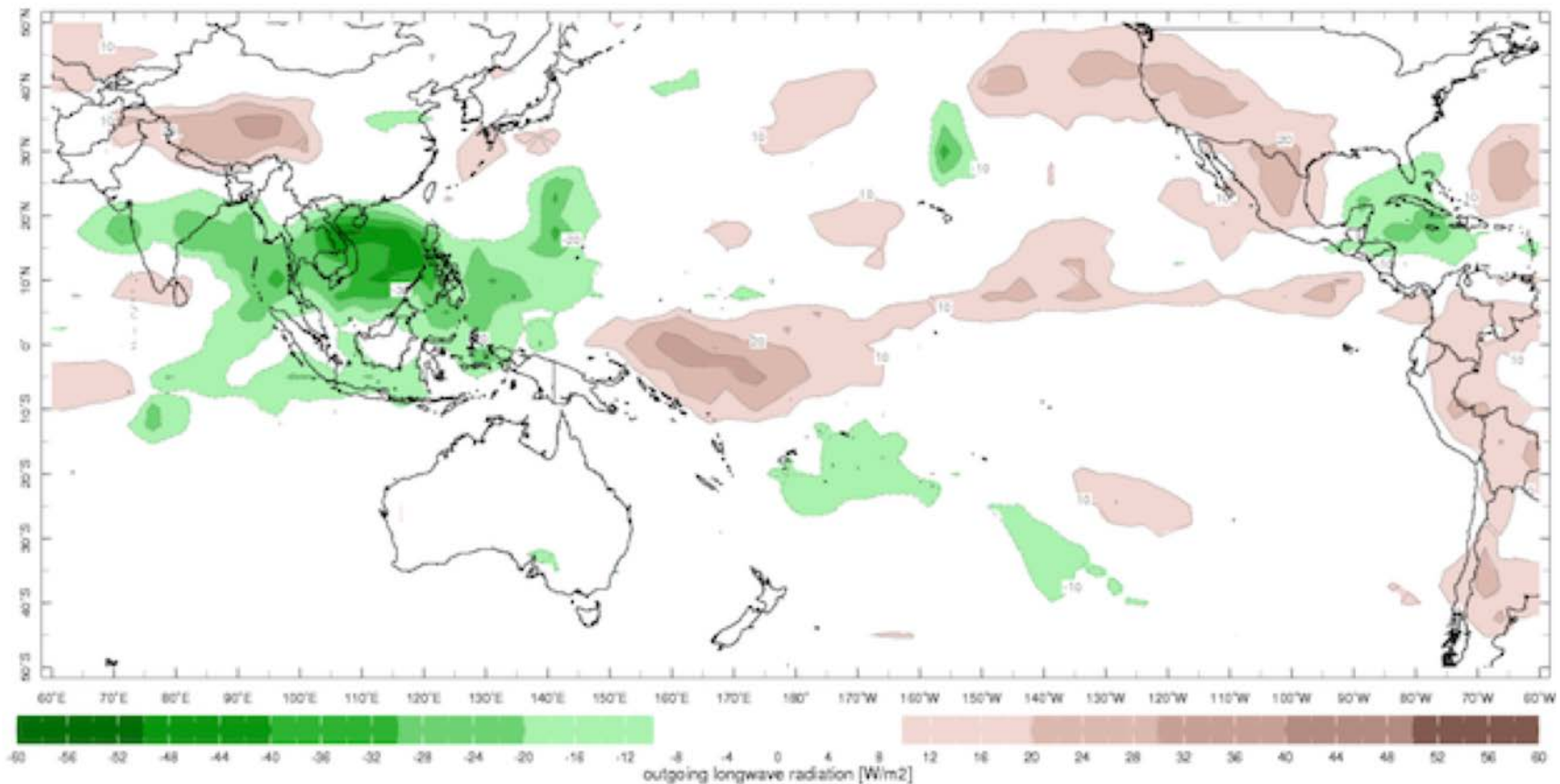
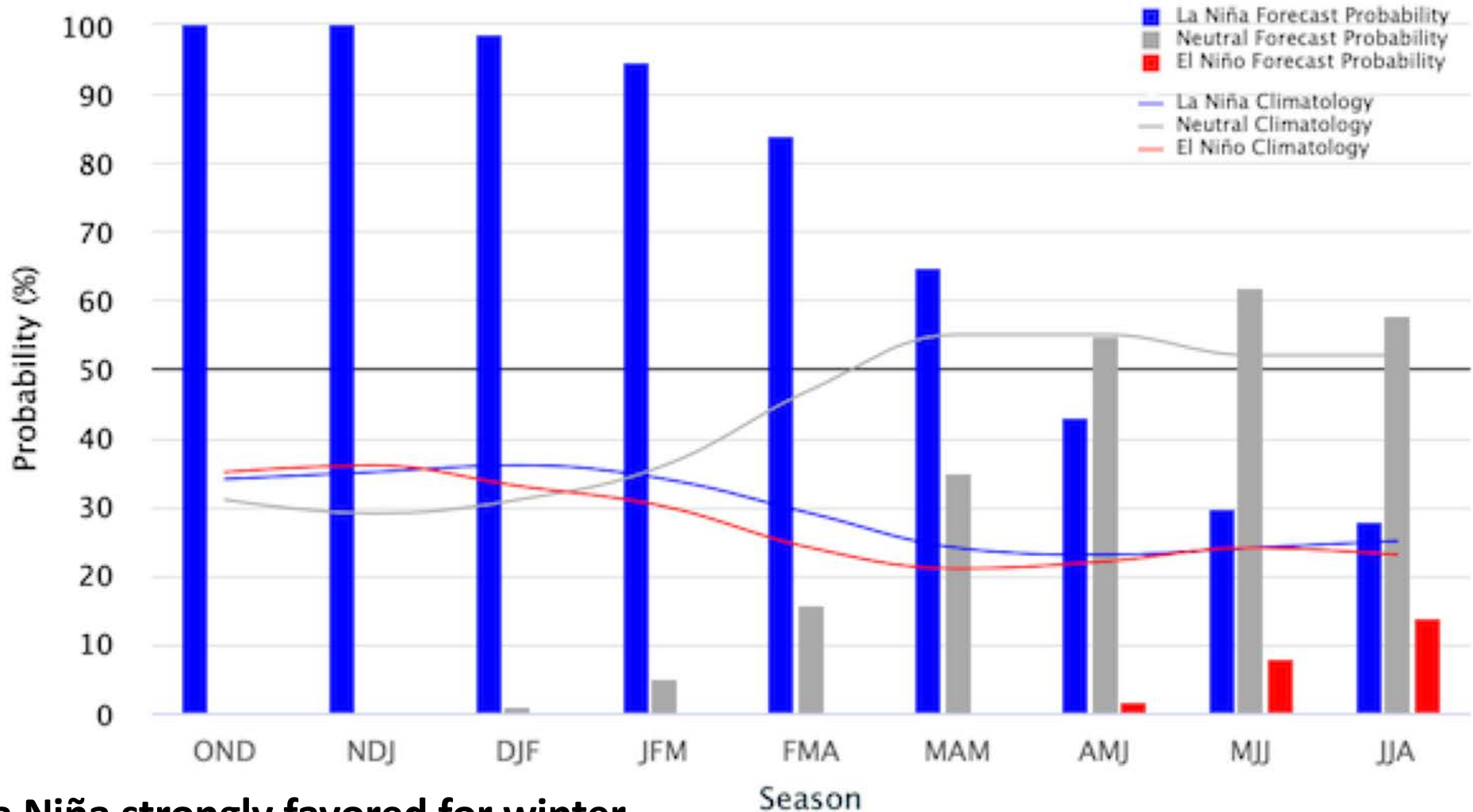During La Niña, drier than average conditions persist near the Date Line (on equator) and wetter than average conditions are evident over Indonesia.

Current ENSO Probabilities or Chances (in %)
(updated 12 November 2020)

Early–November 2020 CPC/IRI Official Probabilistic ENSO Forecasts

ENSO state based on NINO3.4 SST Anomaly
Neutral ENSO: –0.5 °C to 0.5 °C

La Niña strongly favored for winter.
ENSO-neutral is slightly more likely starting in April-June 2021

New Probabilities for ENSO Strength!

ENSO Strengths

This table shows the forecast probability (%) of Niño-3.4 index exceeding a certain threshold (in degrees Celsius).
For negative thresholds, the table shows the probability (%) of a Niño-3.4 index value that is less than (more negative) that value.
For positive thresholds, the table shows the probability (%) of a Niño-3.4 index value that is greater than (more positive) that value.
This tool supports the official ENSO Diagnostic discussion updated on the 2nd Thursday of each month.

Target	< -1.5°C	< -1.0°C	< -0.5°C	> 0.5°C	> 1.0°C	> 1.5°C
OND	50	99	~100	~0	~0	~0
NDJ	54	94	~100	~0	~0	~0
DJF	44	86	99	~0	~0	~0
JFM	25	69	95	~0	0	~0
FMA	8	41	84	~0	~0	~0
MAM	2	19	65	~0	~0	~0
AMJ	1	9	43	2	~0	~0
MJJ	~0	6	30	8	1	~0
JJA	1	6	28	14	2	~0
	< -1.5°C	< -1.0°C	< -0.5°C	> 0.5°C	> 1.0°C	> 1.5°C

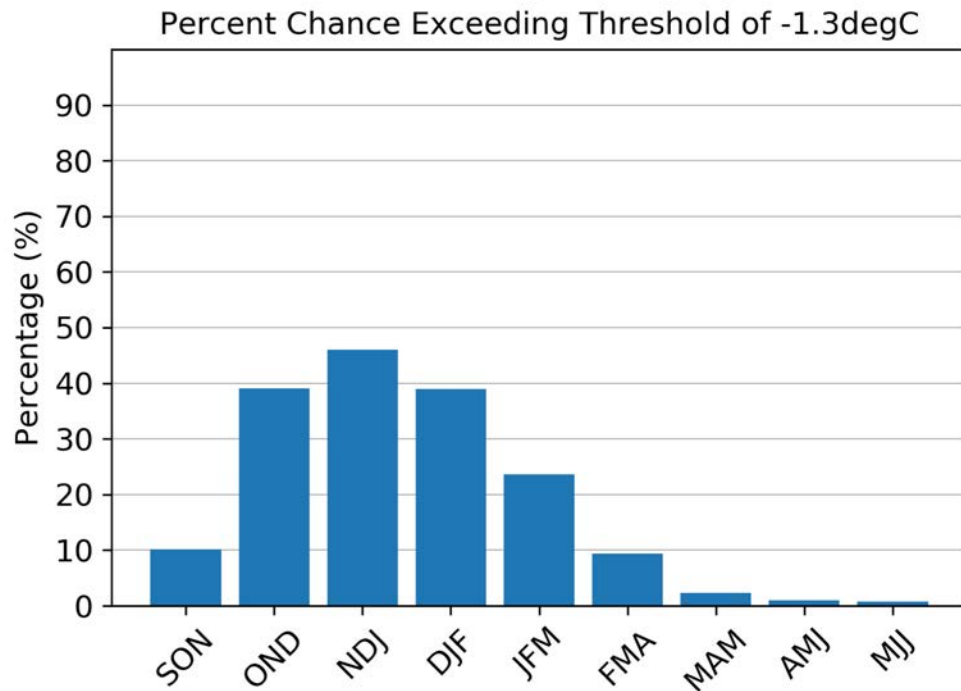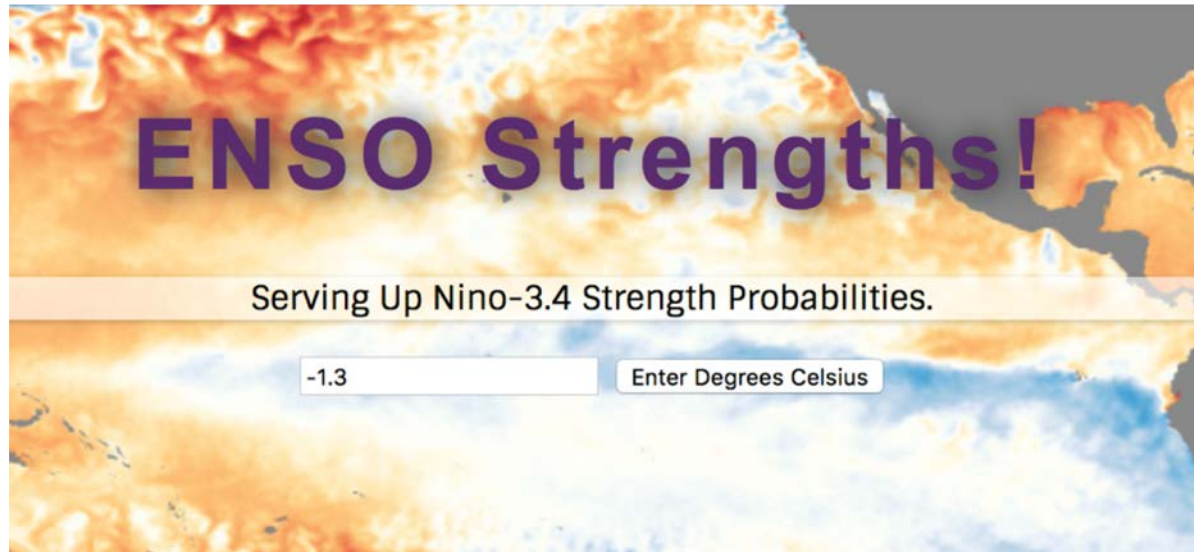**More info here:**
https://www.climate.gov/news-features/blogs/enso/enso-forecast-mash-ups-what's-best-way-combine-human-expertise-models

For example, for the November-January season, there is a 54% chance of Niño-3.4 index less than -1.5°C (stronger

https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/strengths/index.php

We want to eventually roll out an interactive tool where you can write in any cut-off you want and get a probability. But we still have some IT challenges to resolve.
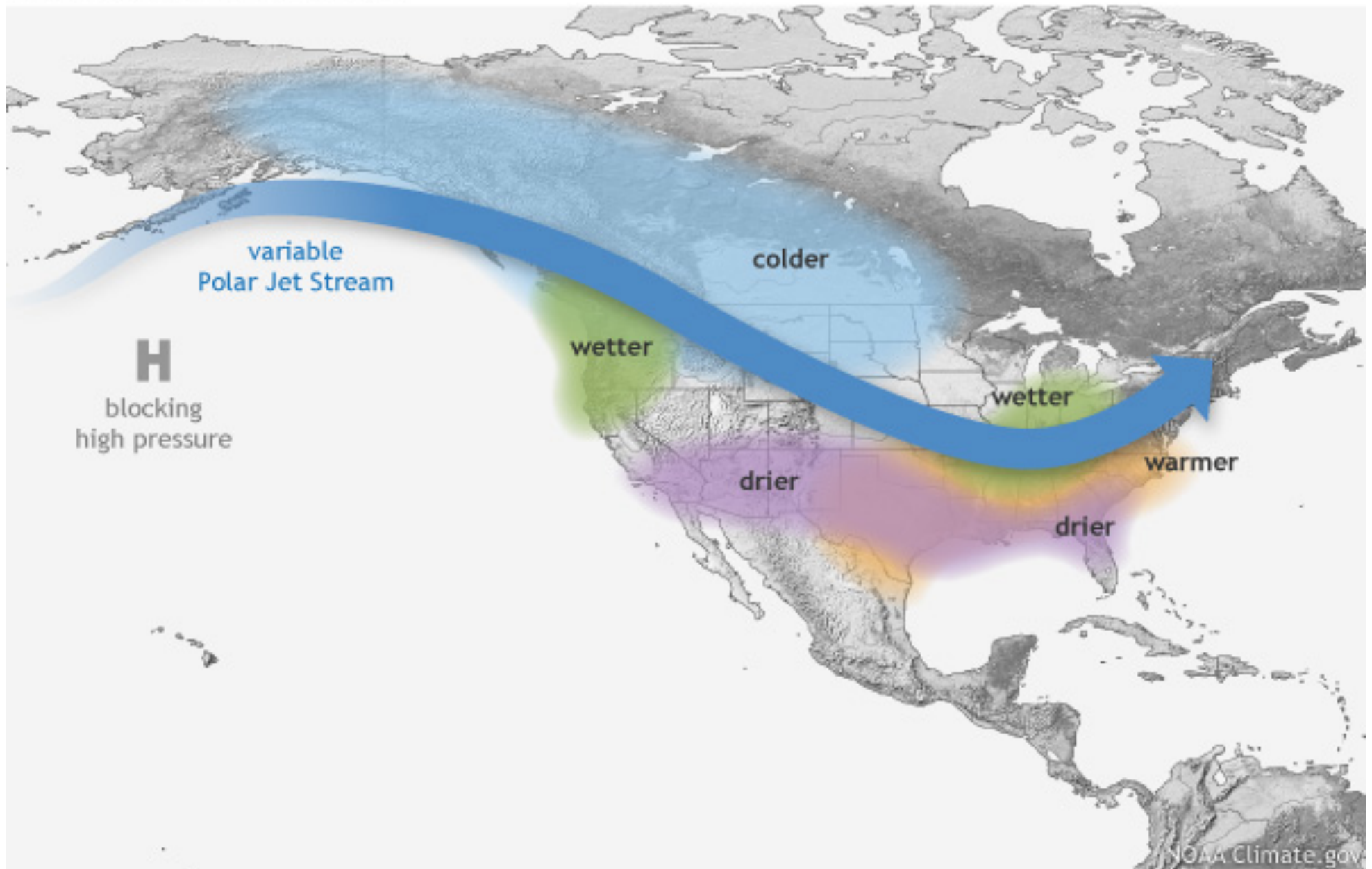

ENSO Strengths!

Serving Up Nino-3.4 Strength Probabilities.

-1.3   Enter Degrees Celsius

Percent Chance Exceeding Threshold of -1.3degC

What to Expect for
US Temperature and Precipitation

The CPC seasonal outlook
updated as of this morning!

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

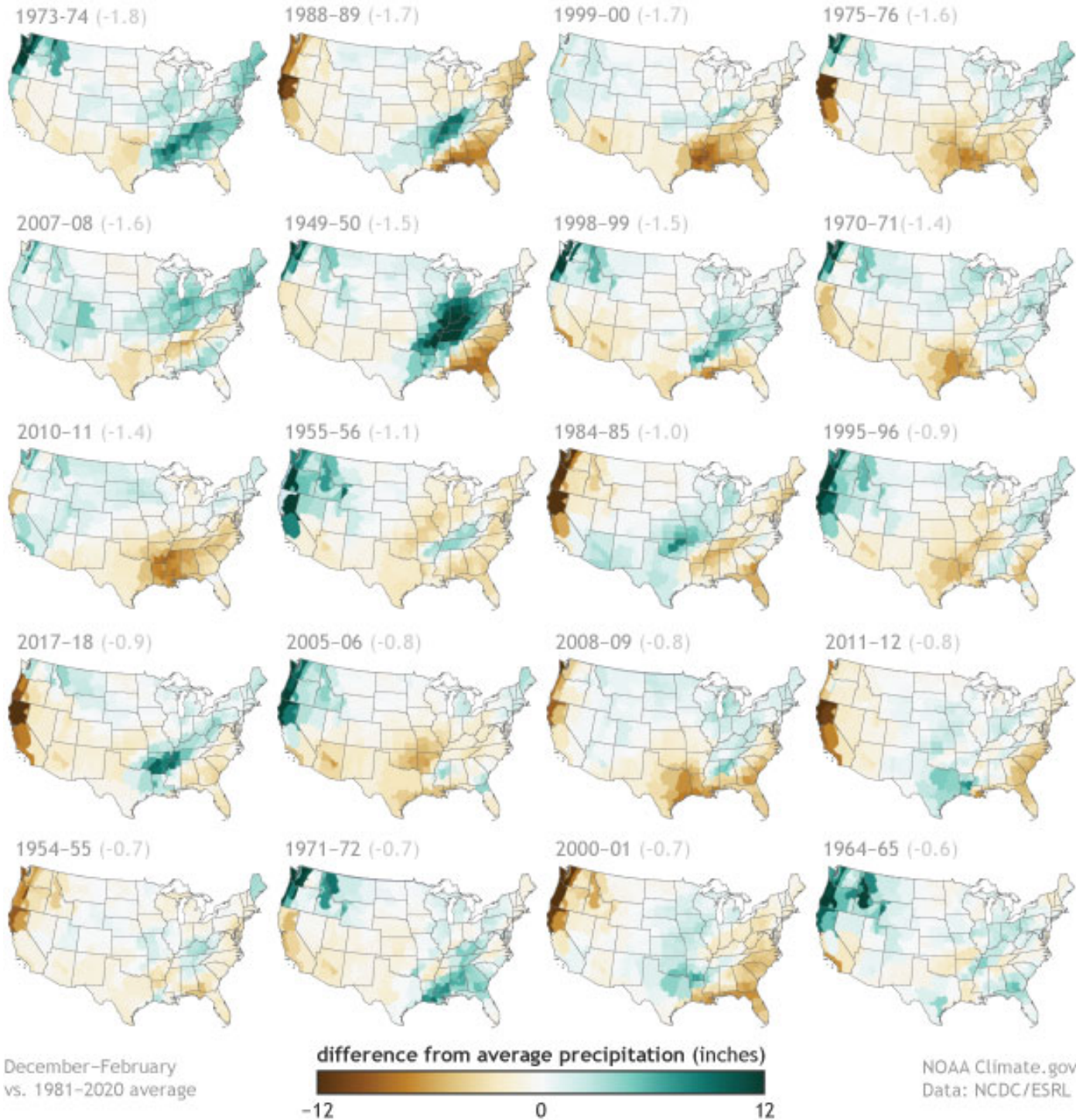# Schematic Version of La Niña Impacts

WINTER LA NIÑA PATTERN

variable Polar Jet Stream

H blocking high pressure

colder

wetter

wetter

warmer

drier

drier

NOAA Climate.gov

Temperature anomalies associated with La Niña winters
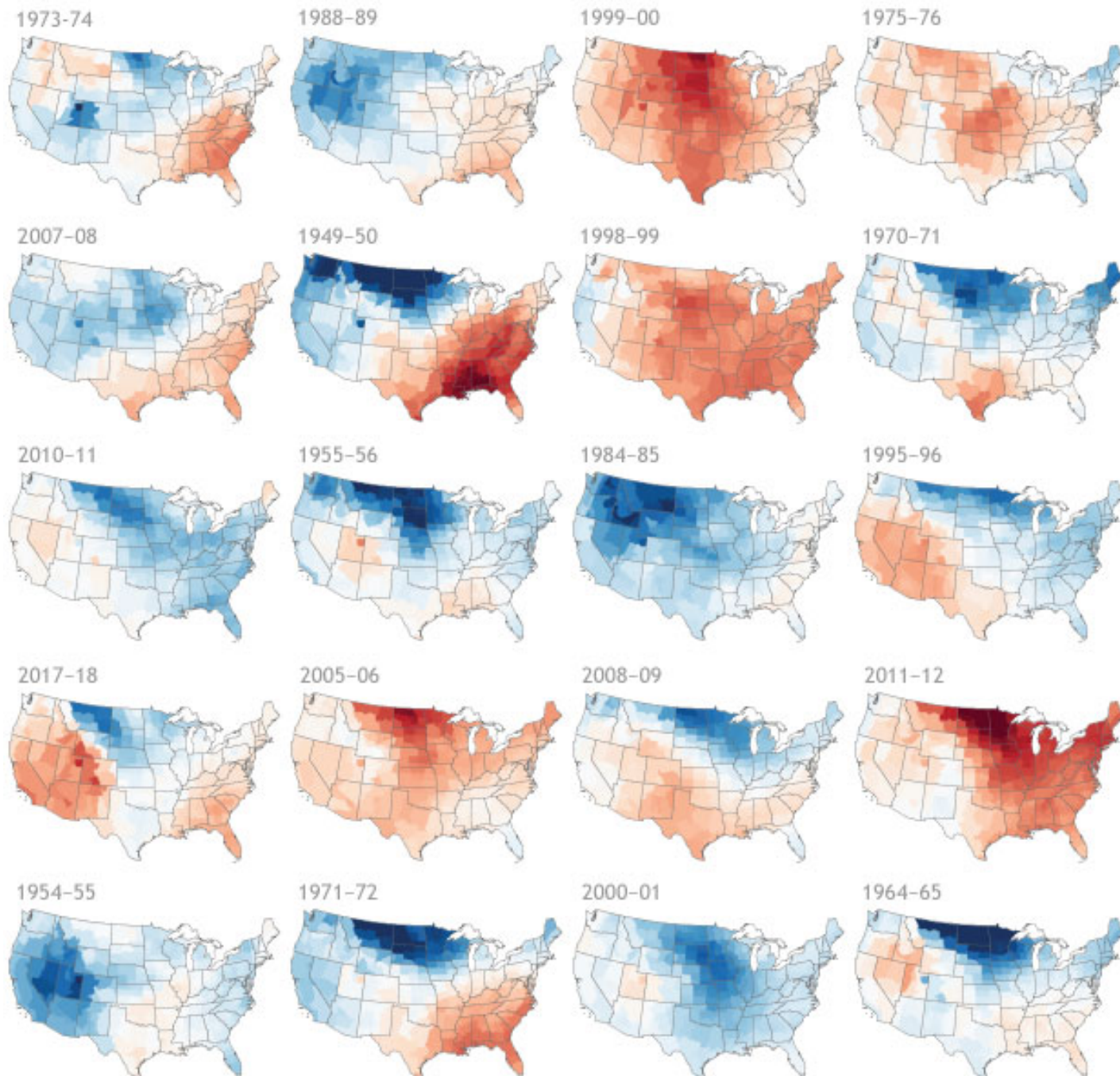
Precipitation anomalies associated with La Niña winters

December–February
vs. 1981–2020 average

difference from average precipitation (inches)

−12   0   12

NOAA Climate.gov
Data: NCDC/ESRL

December-January-February (DJF) Outlook 2020-21

Precipitation Chances

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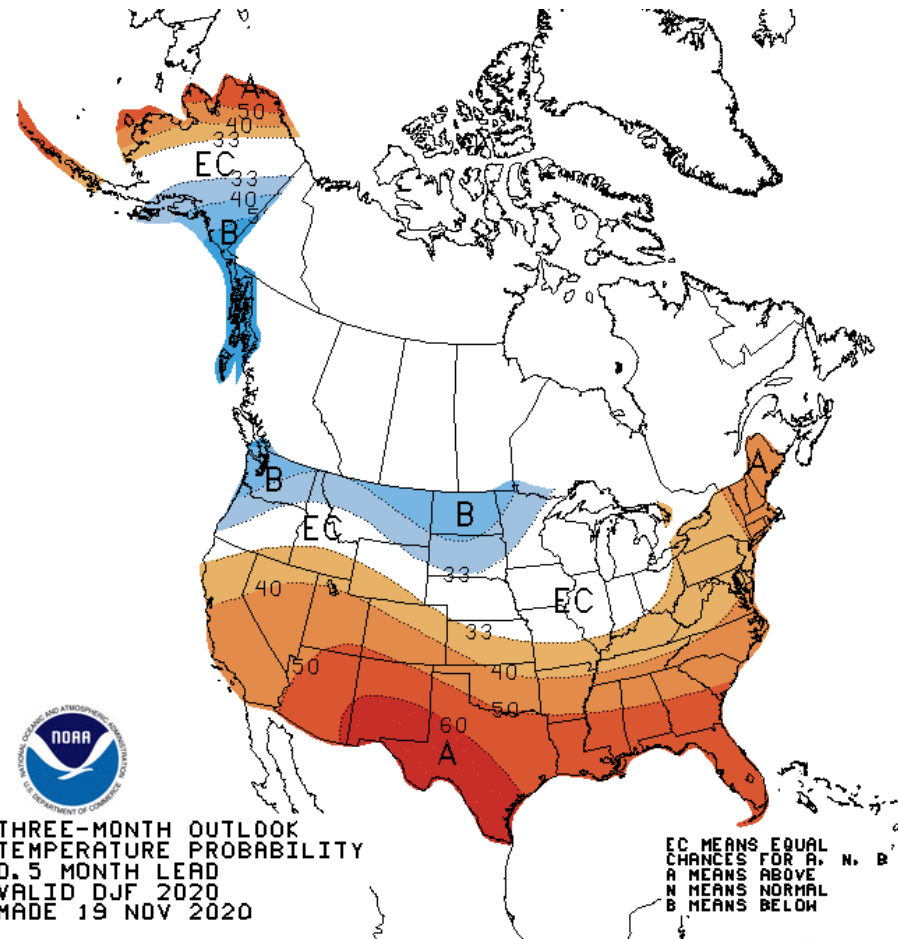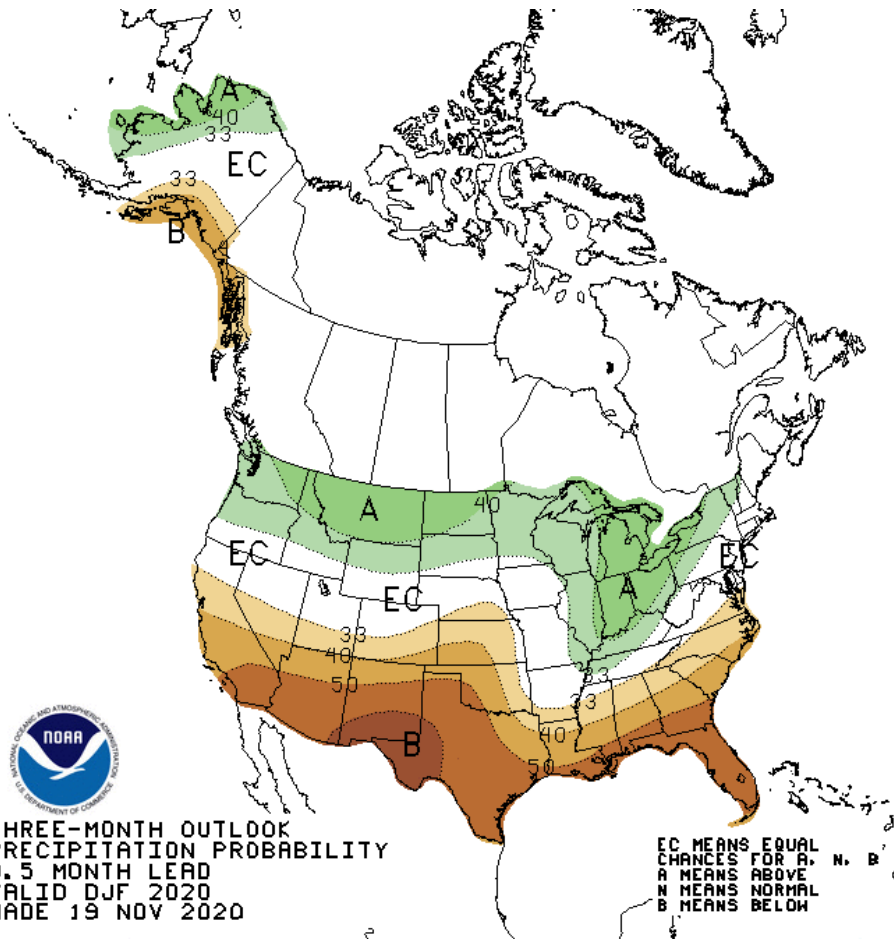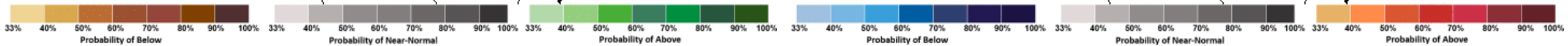
http://www.cpc.ncep.noaa.gov/products/predictions/long_range/

Dec-Feb Trend based on Optimal Climate Normals (OCN)

Recent trends in winter temperatures
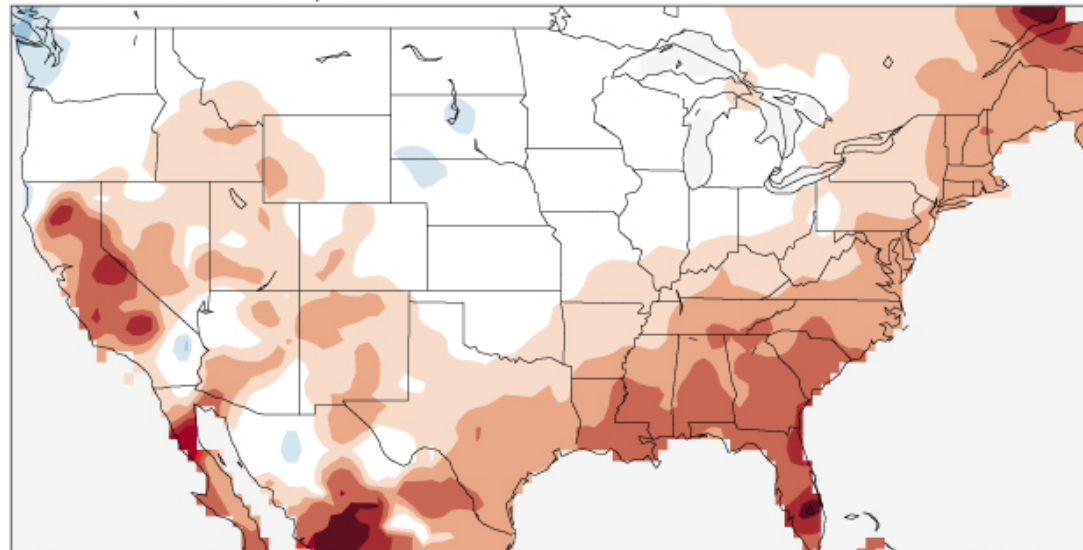
Dec-Feb 2004/5—2018/19 compared to 1981—2010
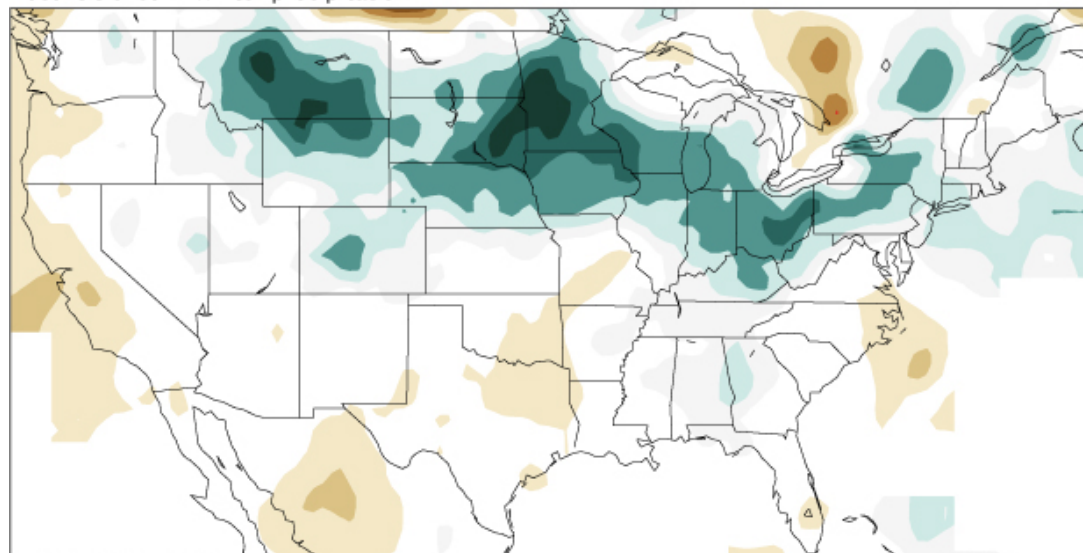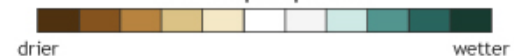
trend in temperature

cooler — warmer

NOAA Climate.gov
Data: CPC

Recent trends in winter precipitation

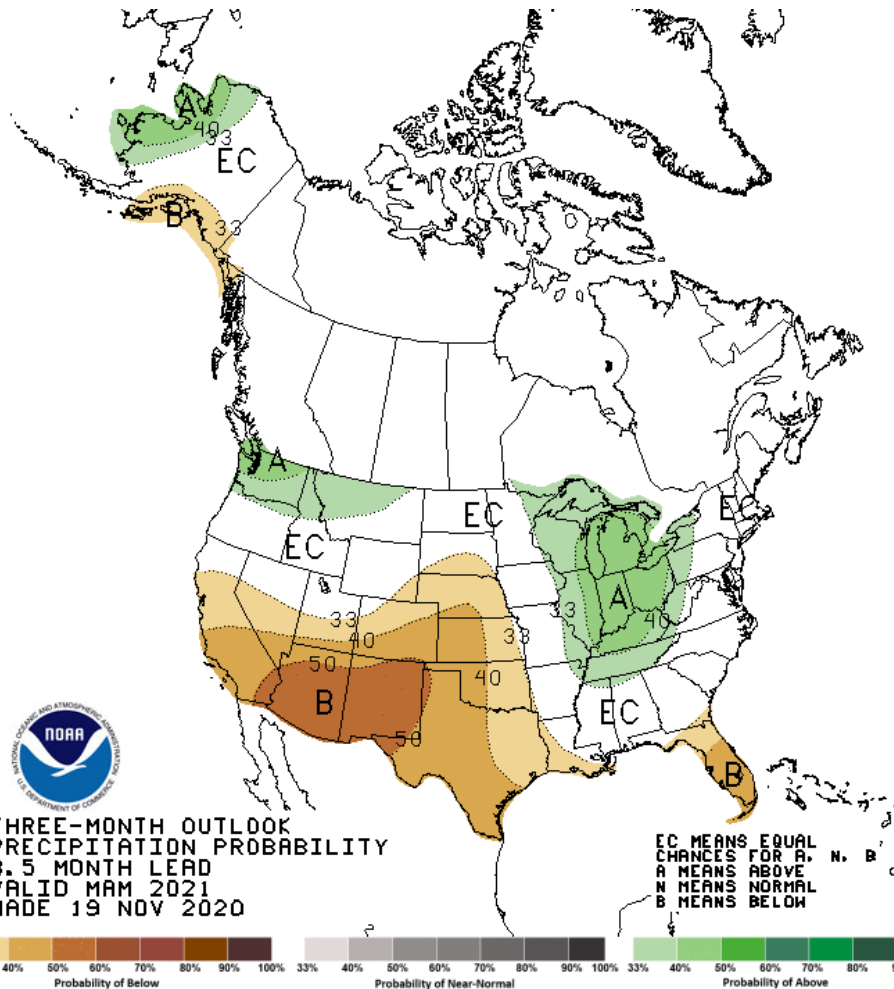Dec-Feb 2004/5—2018/19 compared to 1981—2010
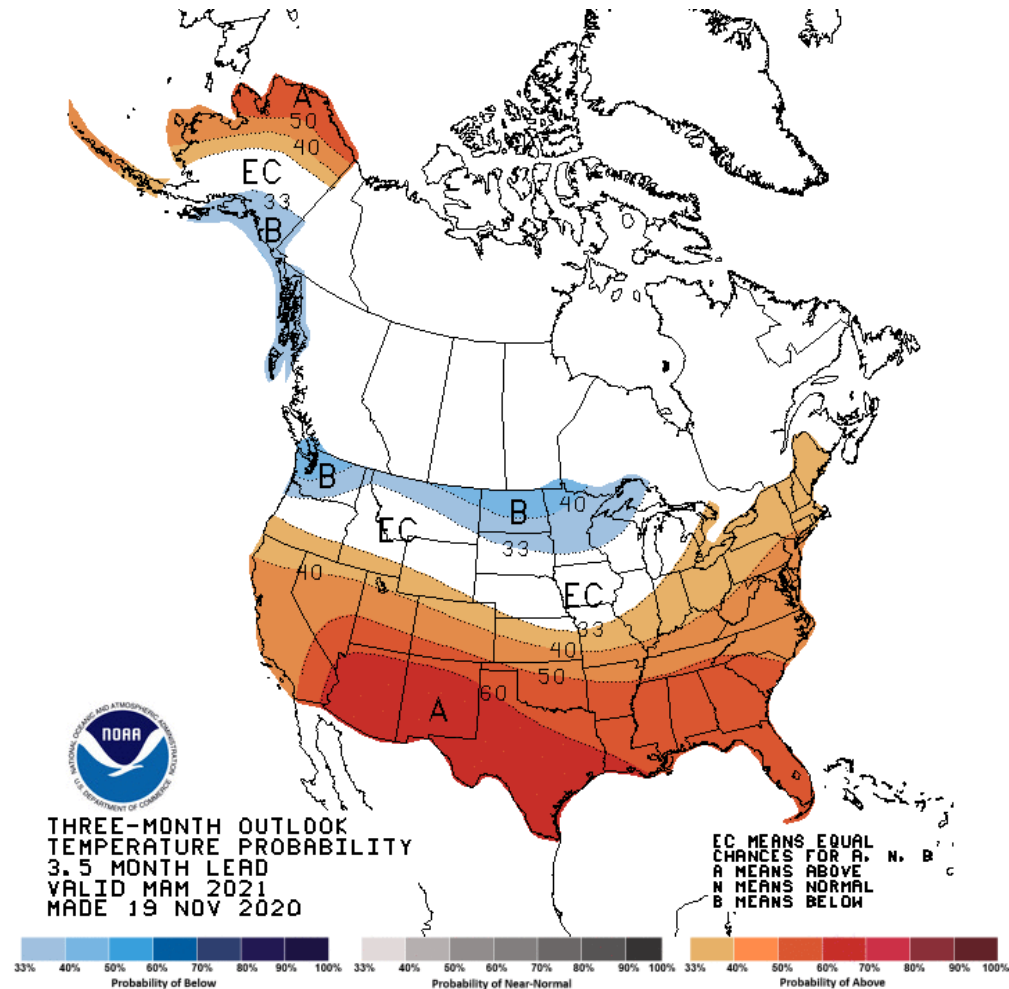
trend in precipitation

drier — wetter

NOAA Climate.gov
Data: CPC

March-April-May Outlook 2021

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

Summary

- Currently, there is a La Niña Advisory

- La Niña is likely to continue through the Northern Hemisphere winter 2020-21 (~95% chance during January-March) and into spring 2021 (~65% chance during March-May).

- Winter (Dec-Feb) seasonal prediction is informed by various climate models, but La Niña and the "Trend" (15-year average relative to 30-year climo) are prominent drivers.

ENSO Diagnostics Discussion
http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.html *[updated on 2nd Thursday of each month]*

ENSO Blog http://www.climate.gov/news-features/department/enso-blog
[updated twice a month]