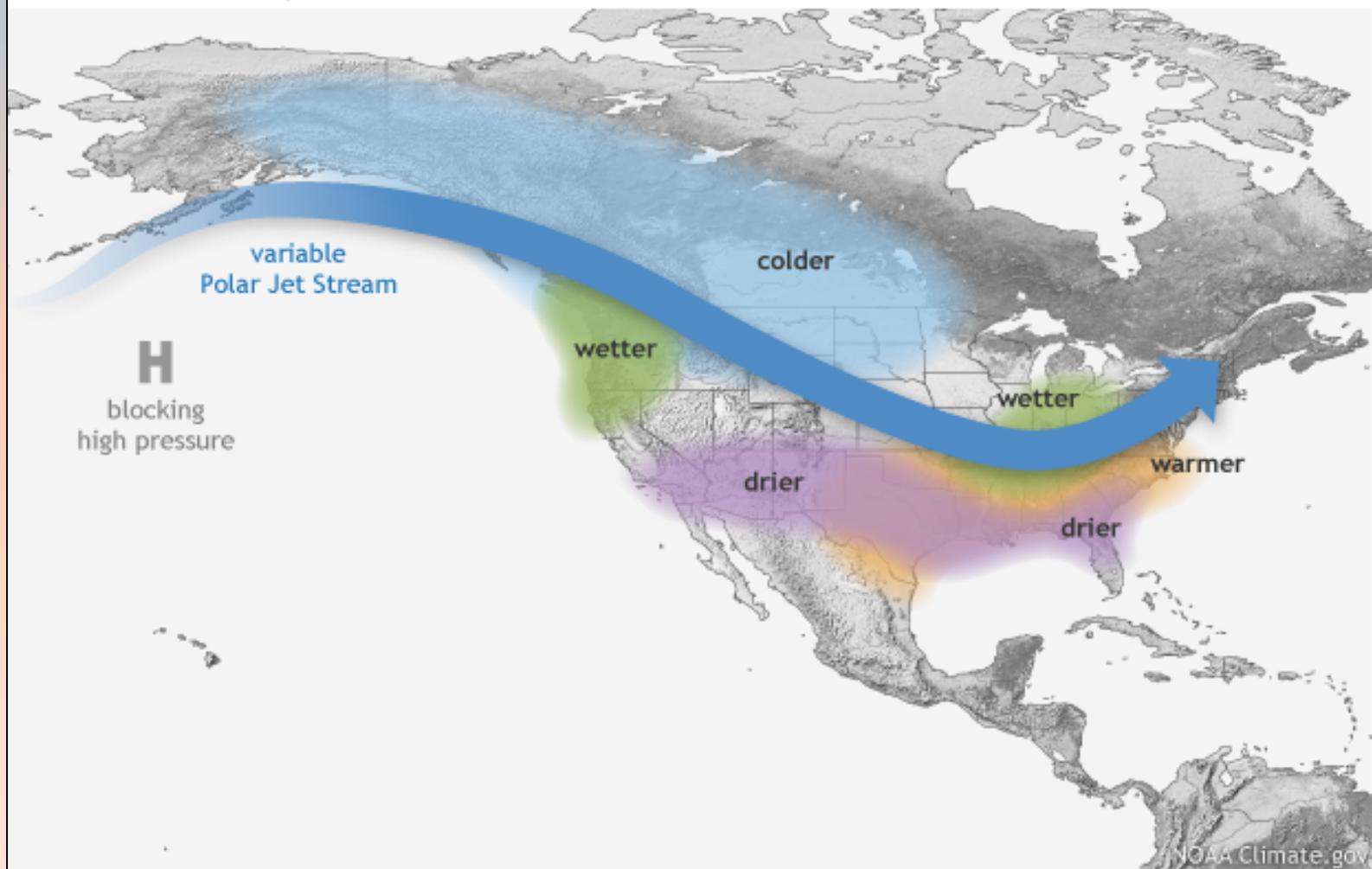# Climate and Drought Outlooks

Wintertime La Niña pattern

Summary

ENSO Alert System Status: **La Niña Advisory**

La Niña conditions are present.*

Equatorial sea surface temperatures (SSTs) are below average across the central and eastern Pacific Ocean.

La Niña is likely (exceeding ~80%) through the Northern Hemisphere winter 2017-18, with a transition to ENSO-neutral most likely during the mid-to-late spring.*

CPC's ENSO Diagnostics Discussion:
http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/index.shtml

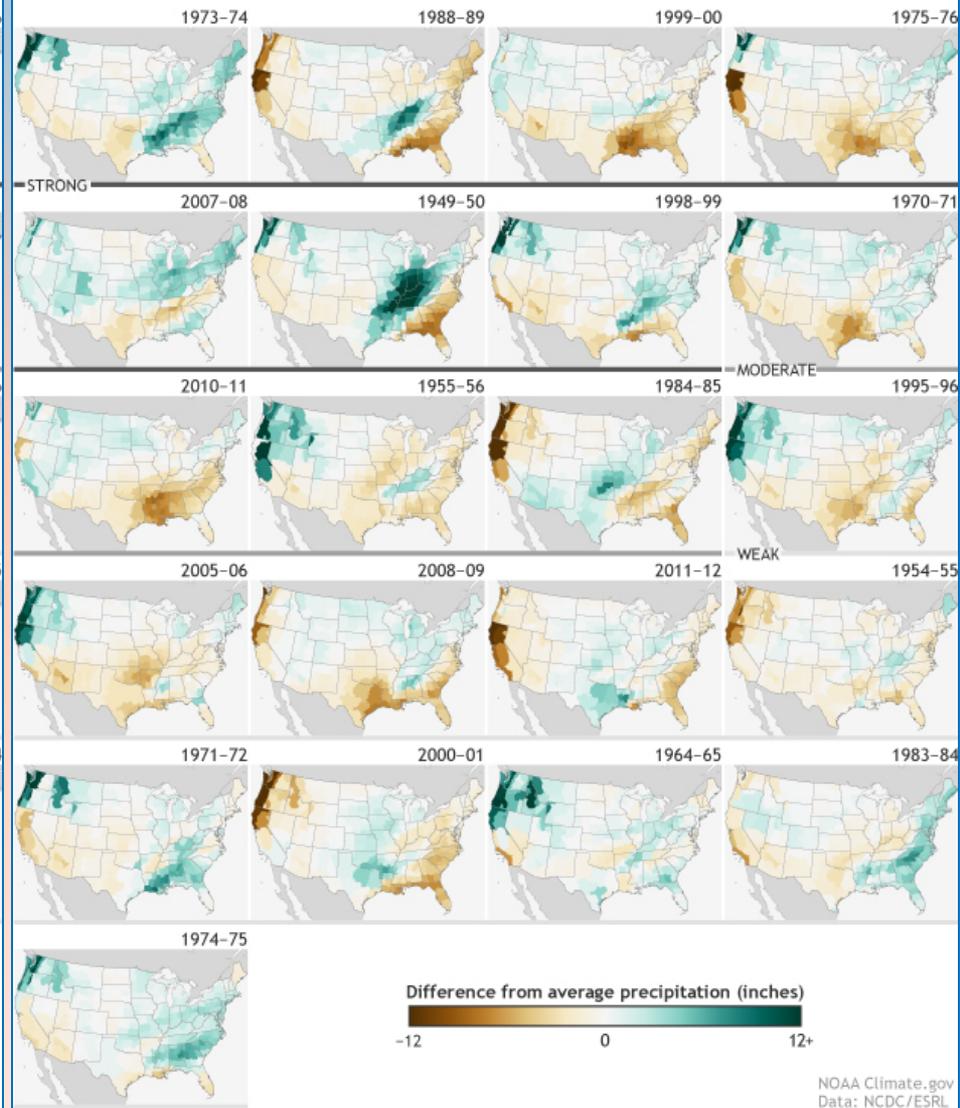**ENSO Blog:** http://www.climate.gov/news-features/department/enso-blog

 * Note: These statements are updated once a month (2nd Thursday of each month) in association with the ENSO Diagnostics Discussion, which can be found by clicking here.

Not All La Niñas are the Same!

Winter (December-February) temperature during strong, moderate, and weak La Niñas since 1950
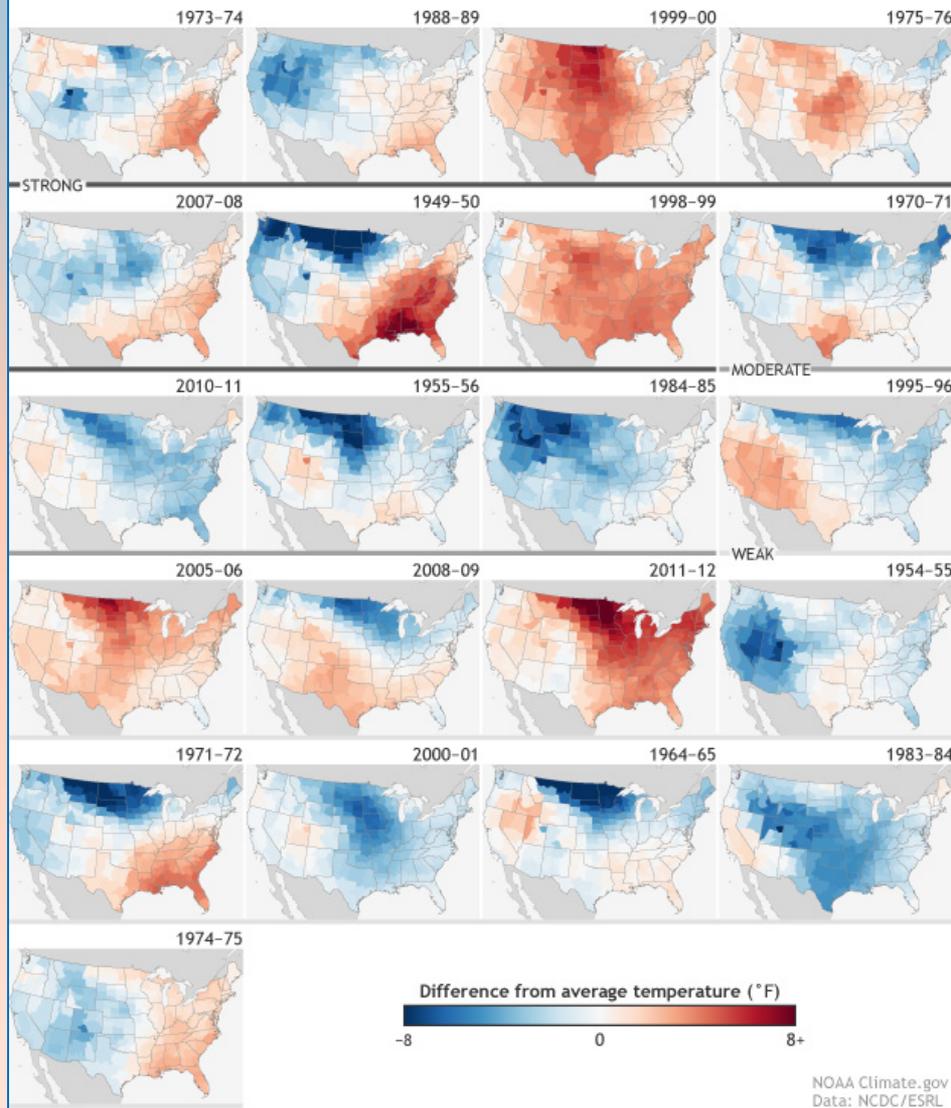
Winter (December-February) precipitation during strong, moderate, and weak La Niñas since 1950

Difference from average temperature (°F)

Difference from average precipitation (inches)
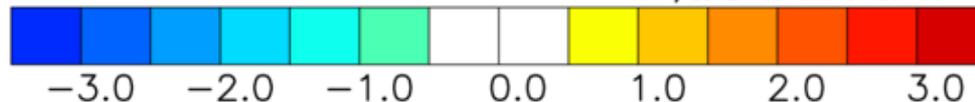
NOAA Climate.gov
Data: NCDC/ESRL

Temperature anomalies during La Niña Episodes
21 Member Composite

NOAA/NCEI Climate Division Composite Temperature Anomalies (F)
Versus 1981–2010 Longterm Average
Dec to Feb 1973–74,1988–89,1999–00,1975–76,2007–08,1949–50,1998–99,1970–71
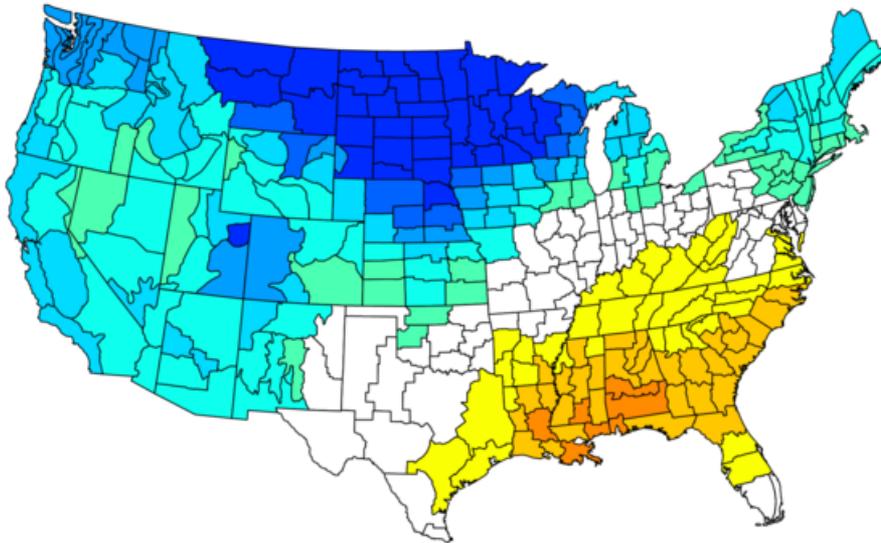2010–11,1955–56,1984–85,1995–96,2005–06,2008–09,2011–12,1954–55,1971–72,2000–01,1964–
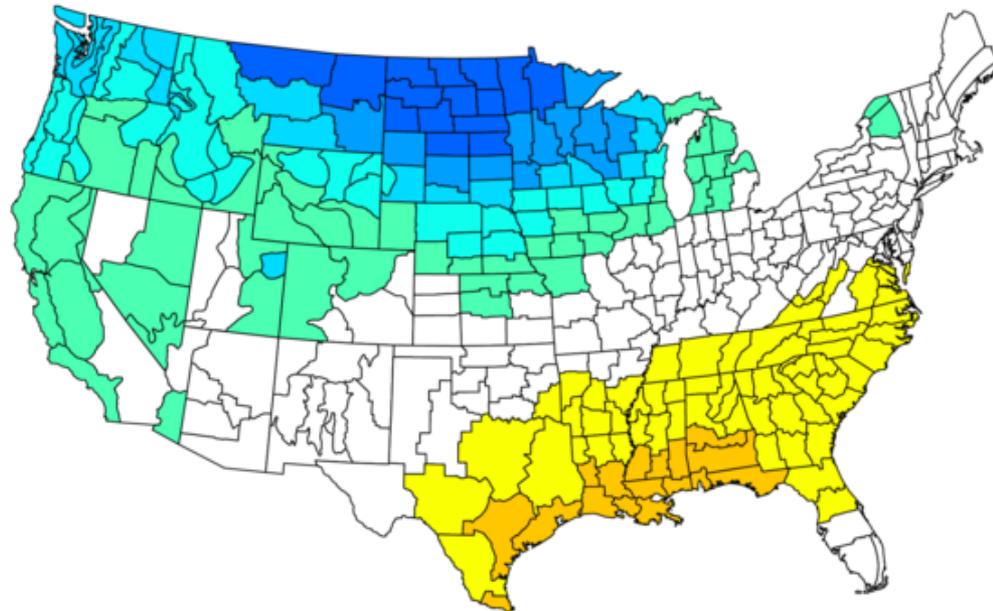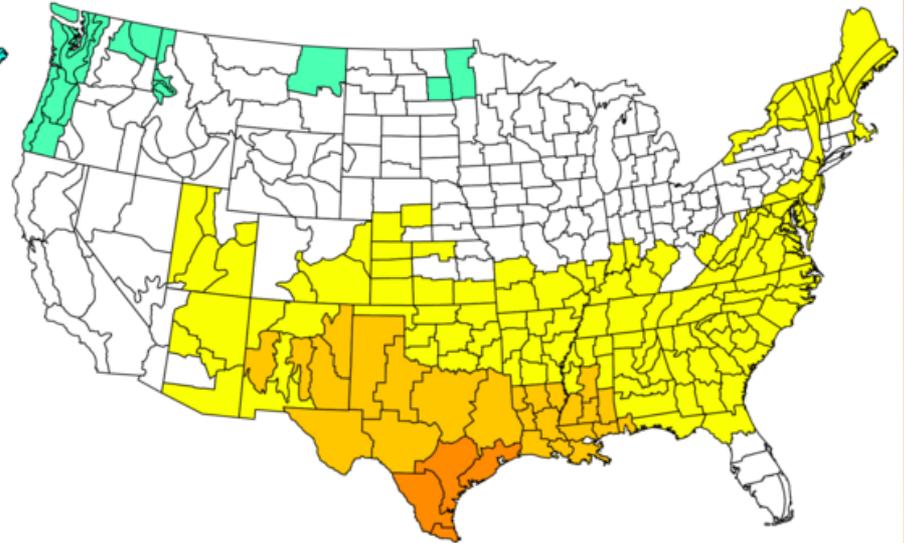
NOAA/ESRL PSD and CIRES–CU

Temperature anomalies during La Niña Episodes

NOAA/NCEI Climate Division Composite Temperature Anomalies (F)
Versus 1981−2010 Longterm Average
Dec to Feb 1949−50,1954−55,1955−56,1964−65,1970−71,1971−72,1973−74,1974−75
1975−76,1983−84,

NOAA/NCEI Climate Division Composite Temperature Anomalies (F)
Versus 1981−2010 Longterm Average
Dec to Feb 1988−89,1995−96,1998−99,1999−00,2000−01,2005−06,2007−08,2008−09
2010−11,2011−12,

NOAA/ESRL PSD and CIRES−CU

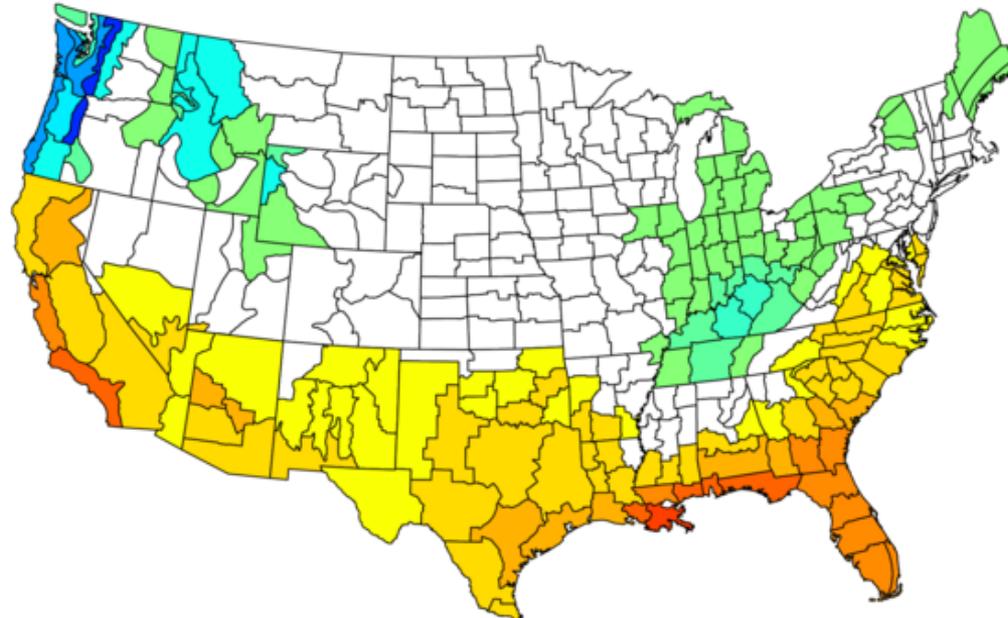NOAA/ESRL PSD and CIRES−CU

Episodes prior to 1985

Episodes after 1985
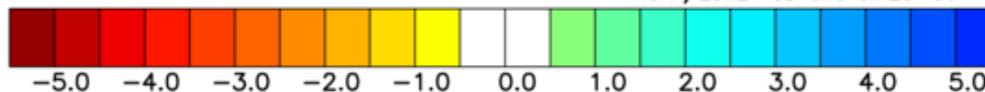
Precipitation anomalies during La Niña Episodes
21 Member Composite

NOAA/NCEI Climate Division Composite Precipitation Anomalies (in)
Versus 1981–2010 Longterm Average
Dec to Feb 1973–74,1988–89,1999–00,1975–76,2007–08,1949–50,1998–99,1970–71
2010–11,1955–56,1984–85,1995–96,2005–06,2008–09,2011–12,1954–55,1971–72,2000–01,1964–
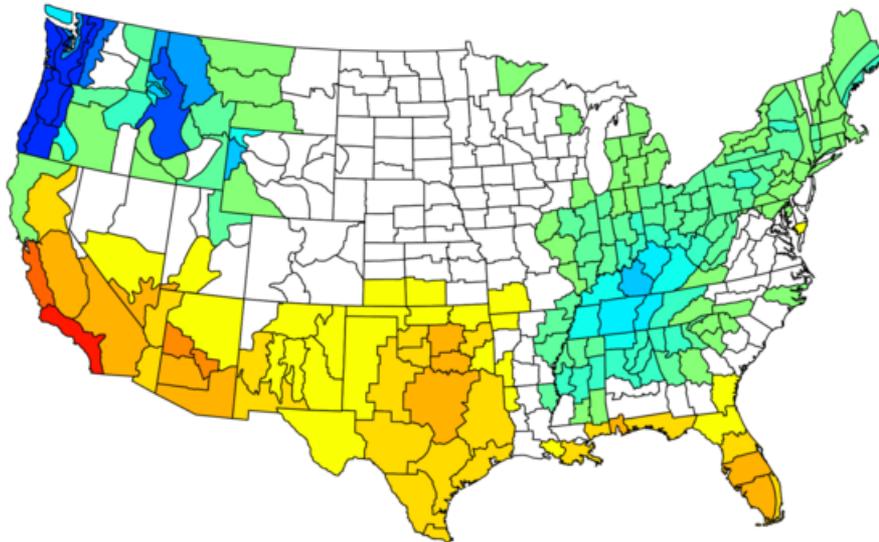
NOAA/ESRL PSD and CIRES–CU

Precipitation anomalies during La Niña Episodes

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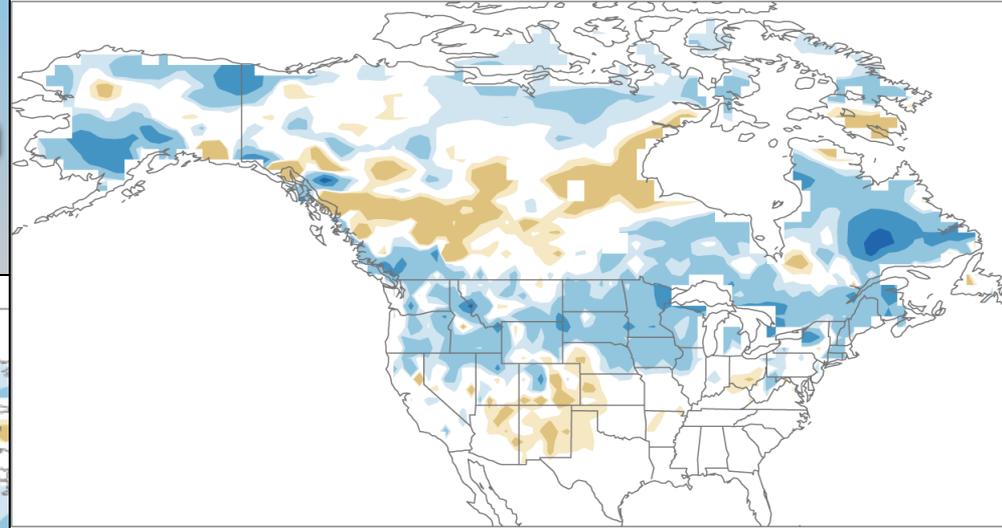−5.0 −4.0 −3.0 −2.0 −1.0 0.0 1.0 2.0 3.0 4.0 5.0
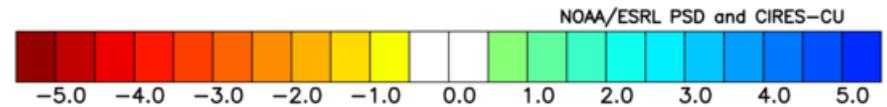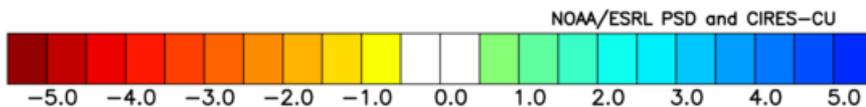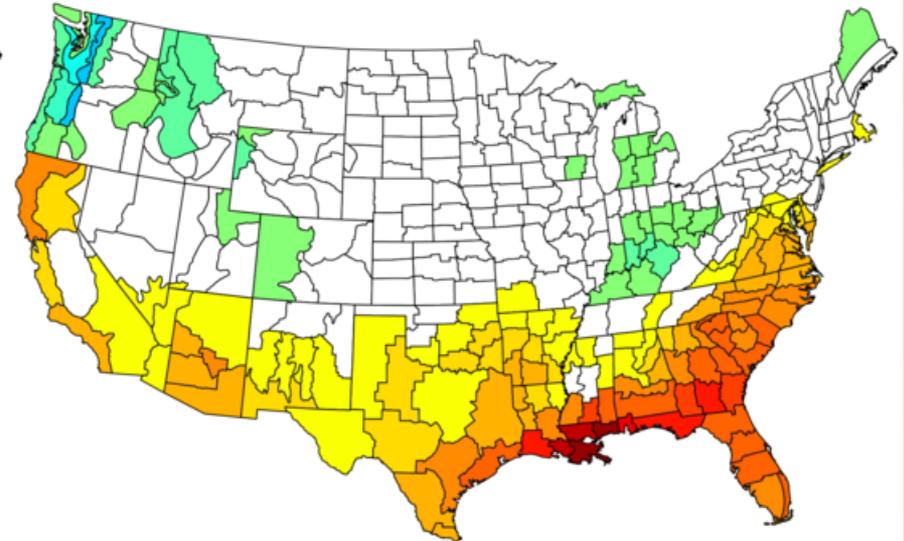
Episodes prior to 1985

Episodes after 1985

Average Snowfall Patterns during La Niña

Average snowfall patterns for all La Niña years
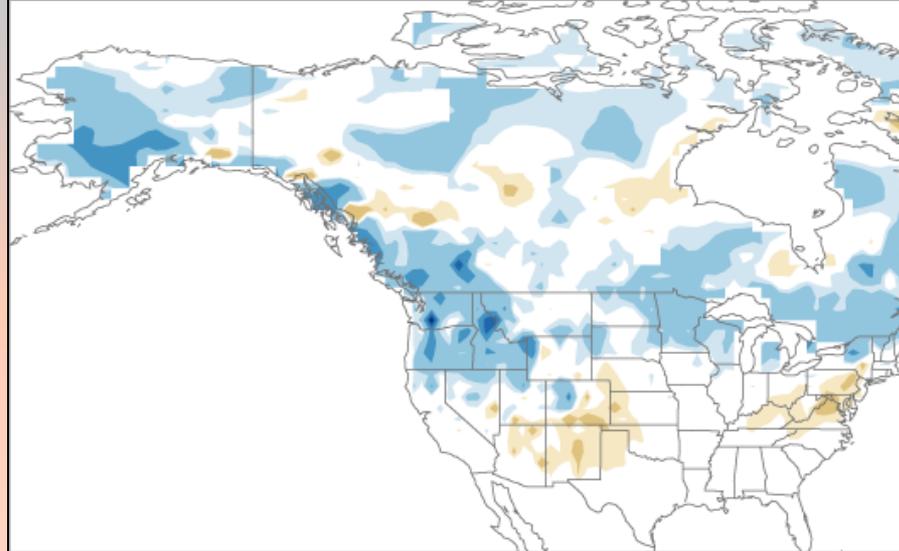
October-April
1950-51 to 2008-09

Difference from average seasonal snowfall (inches)

−4   −2   2   4   12   24   36

Average snowfall patterns for weak La Niña years

October-April
1950-51 to 2008-09

NOAA Climate.gov
Data: Rutgers GSL

Difference from average seasonal snowfall (inches)

−4   −2   2   4   12   24   36

Average snowfall patterns for strong La Niña years

October-April
1950-51 to 2008-09

NOAA Climate.gov
Data: Rutgers GSL

Difference from average seasonal snowfall (inches)

−4   −2   2   4   12   24   36
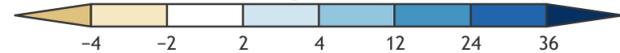
Historical El Niño and La Niña Episodes Based on the ONI computed using ERSST.v5

Recent Pacific warm (red) and cold (blue) periods based on a threshold of +/- 0.5 °C for the Oceanic Nino Index (ONI) [3 month running mean of ERSST.v5 SST anomalies in the Nino 3.4 region (5N-5S, 120-170W)]. For historical purposes, periods of below and above normal SSTs are colored in blue and red when the threshold is met for a minimum of 5 consecutive over-lapping seasons.

The ONI is one measure of the El Niño-Southern Oscillation, and other indices can confirm whether features consistent with a coupled ocean-atmosphere phenomenon accompanied these periods. The complete table going back to DJF 1950 can be found here.

Year	DJF	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ
2005	0.6	0.6	0.4	0.4	0.3	0.1	-0.1	-0.1	-0.1	-0.3	-0.6	-0.8
2006	-0.8	-0.7	-0.5	-0.3	0.0	0.0	0.1	0.3	0.5	0.7	0.9	0.9
2007	0.7	0.3	0.0	-0.2	-0.3	-0.4	-0.5	-0.8	-1.1	-1.4	-1.5	-1.6
2008	-1.6	-1.4	-1.2	-0.9	-0.8	-0.5	-0.4	-0.3	-0.3	-0.4	-0.6	-0.7
2009	-0.8	-0.7	-0.5	-0.2	0.1	0.4	0.5	0.5	0.7	1.0	1.3	1.6
2010	1.5	1.3	0.9	0.4	-0.1	-0.6	-1.0	-1.4	-1.6	-1.7	-1.7	-1.6
2011	-1.4	-1.1	-0.8	-0.6	-0.5	-0.4	-0.5	-0.7	-0.9	-1.1	-1.1	-1.0
2012	-0.8	-0.6	-0.5	-0.4	-0.2	0.1	0.3	0.3	0.3	0.2	0.0	-0.2
2013	-0.4	-0.3	-0.2	-0.2	-0.3	-0.3	-0.4	-0.4	-0.3	-0.2	-0.2	-0.3
2014	-0.4	-0.4	-0.2	0.1	0.3	0.2	0.1	0.0	0.2	0.4	0.6	0.7
2015	0.6	0.6	0.6	0.8	1.0	1.2	1.5	1.8	2.1	2.4	2.5	2.6
2016	2.5	2.2	1.7	1.0	0.5	0.0	-0.3	-0.6	-0.7	-0.7	-0.7	-0.6
2017	-0.3	-0.1	0.1	0.3	0.4	0.4	0.1	-0.2	-0.4	-0.7		

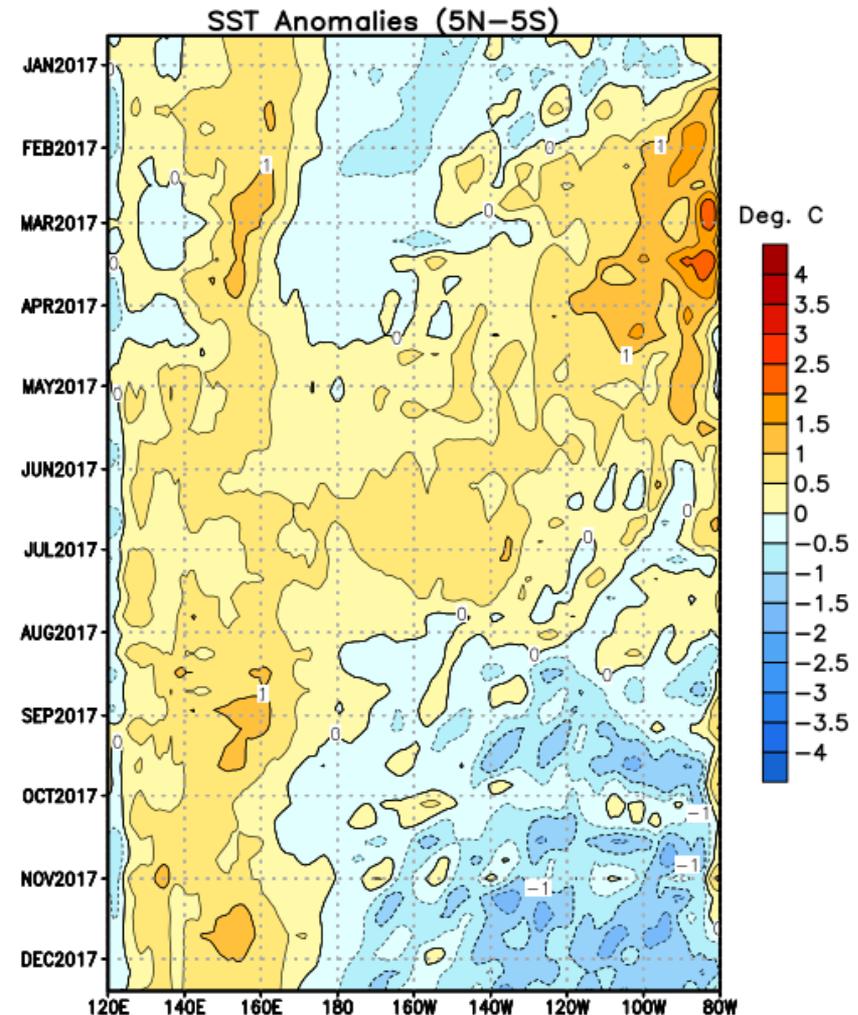# Recent Evolution of Equatorial Pacific SST Departures (°C)

During January and February 2017, above-average SSTs expanded in the eastern Pacific Ocean.

From mid April to July 2017, near-to-above average SSTs spanned most of the equatorial Pacific.

During August 2017, above-average SSTs dissipated east of the date line.

Since September 2017, SSTs have been near-to-below average across the central and eastern Pacific Ocean.
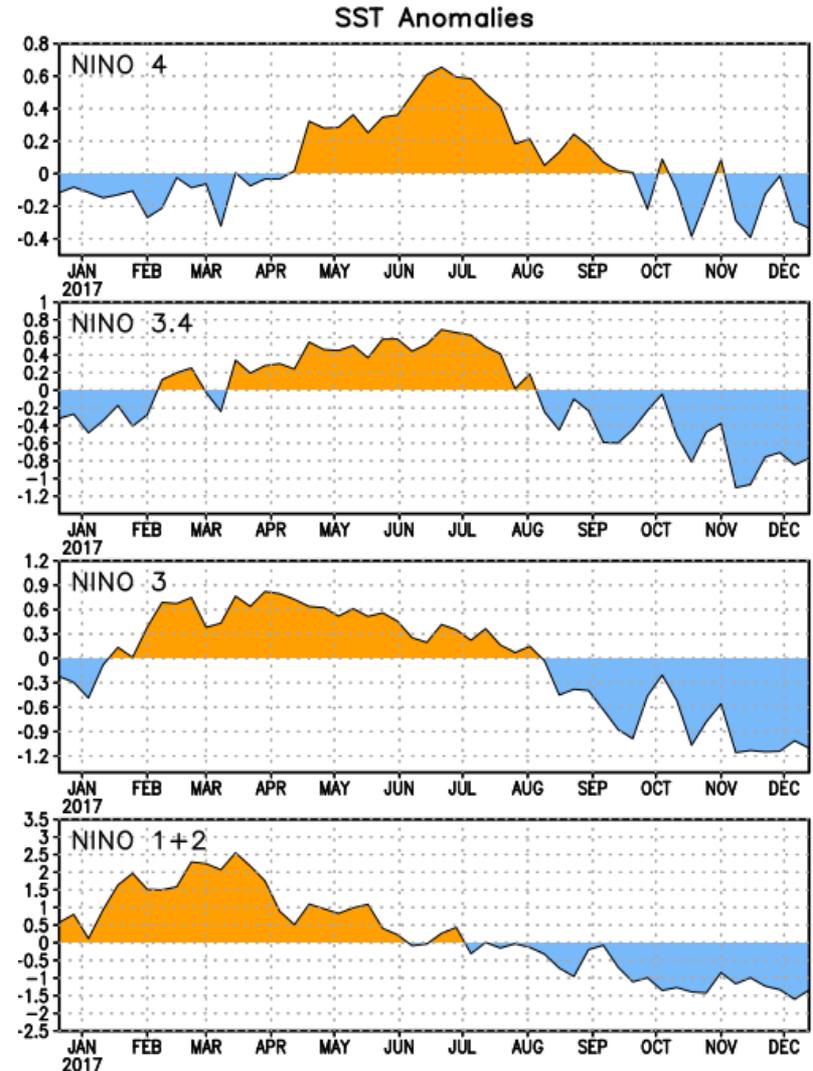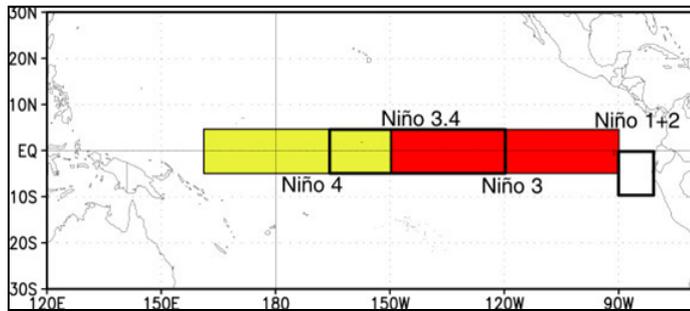
Recently, negative SST anomalies persist over the central and eastern equatorial Pacific.

SST Anomalies (5N−5S)

Niño Region SST Departures (ºC) Recent Evolution

The latest weekly SST departures are:

|	
Niño 4	-0.3ºC
Niño 3.4	-0.8ºC
Niño 3	-1.1ºC
Niño 1+2	-1.3ºC

SST Departures (ºC) in the Tropical Pacific During the Last Four Weeks

During the last four weeks, equatorial SSTs were below average across the central and eastern Pacific Ocean, and above average in the western Pacific.

Average SST Anomalies
19 NOV 2017 − 16 DEC 2017
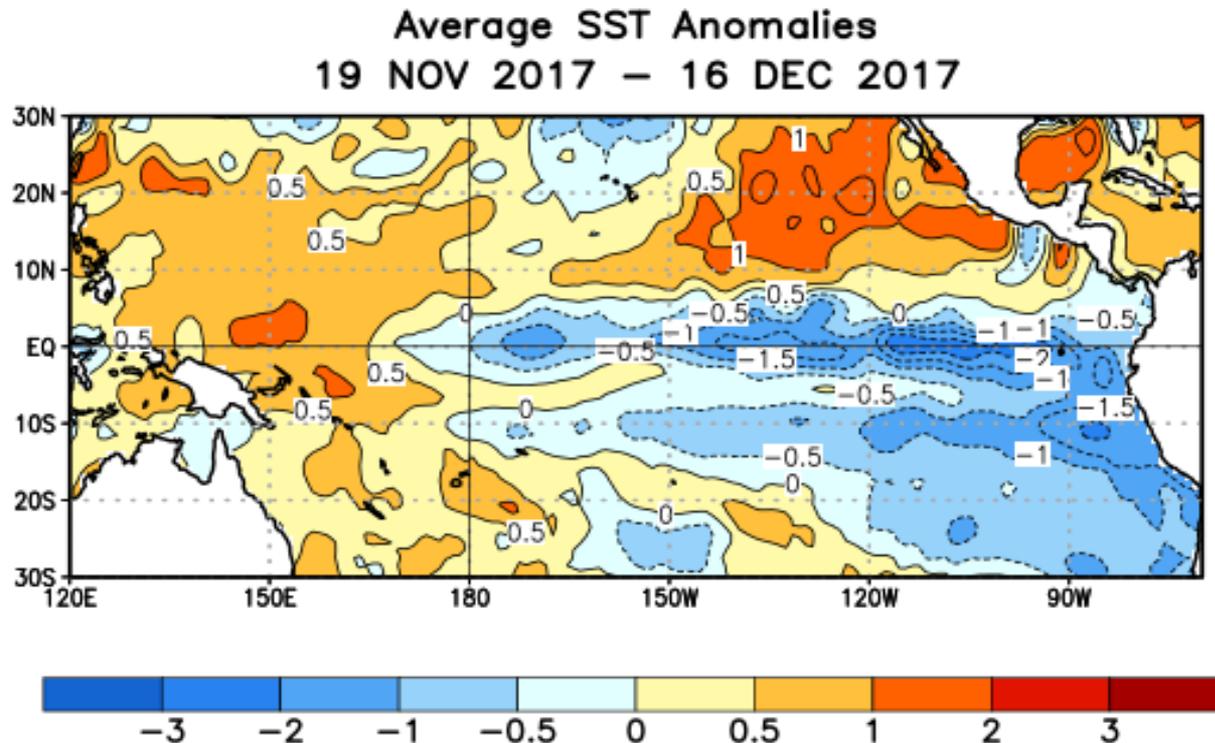
Central and Eastern Pacific Upper-Ocean (0-300 m) Weekly Average Temperature Anomalies
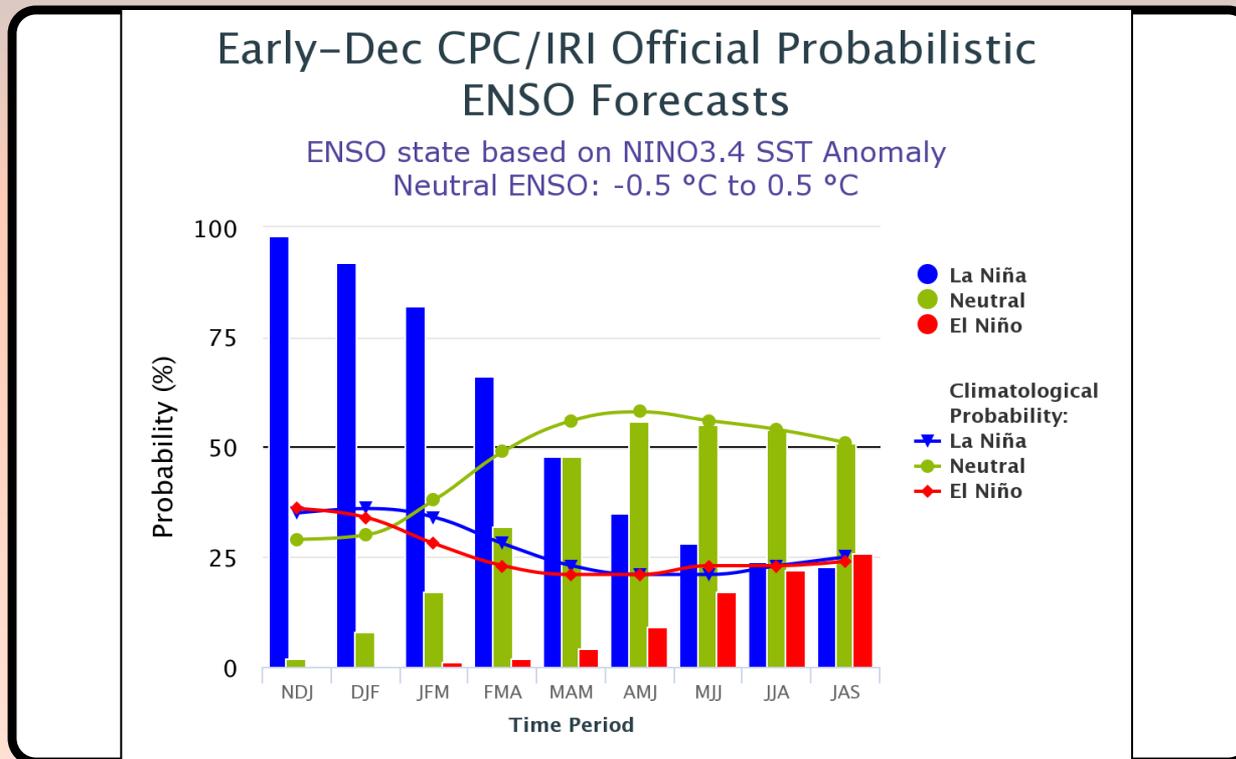
Negative subsurface temperature anomalies were present through December 2016. Positive anomalies with large fluctuations in amplitude were present from mid-January through mid-July 2017. From mid-July to late October 2017, anomalies decreased and became negative. Since early November, large negative anomalies have persisted.

EQ. Upper-Ocean Heat Anoms. (deg C) for 180-100W
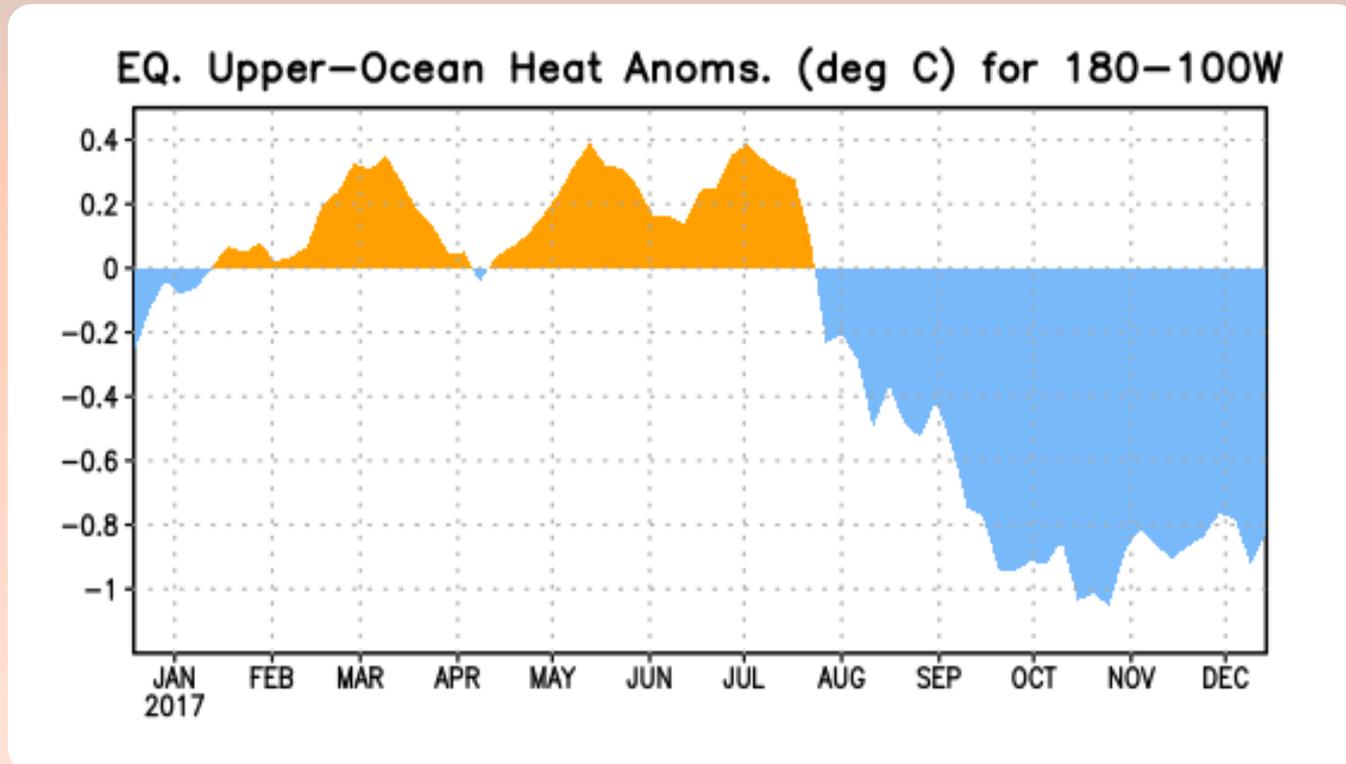
CPC/IRI Probabilistic ENSO Outlook

Updated: 14 December 2017

La Niña is likely (exceeding ~80%) through the Northern Hemisphere winter 2017-18, with a transition to ENSO-neutral most likely during the mid-to-late spring.

Early–Dec CPC/IRI Official Probabilistic ENSO Forecasts

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

IRI/CPC Pacific Niño 3.4 SST Model Outlook

The multi-model averages predict La Niña to persist into early 2018.
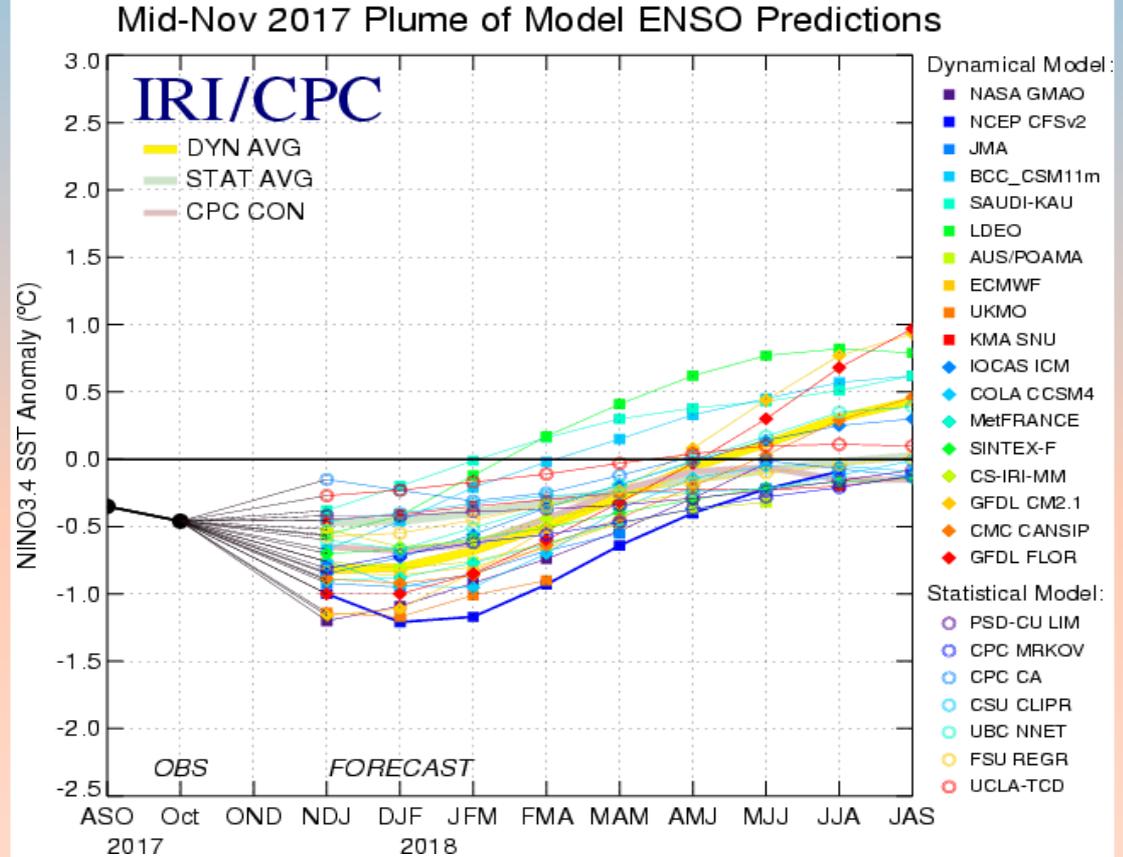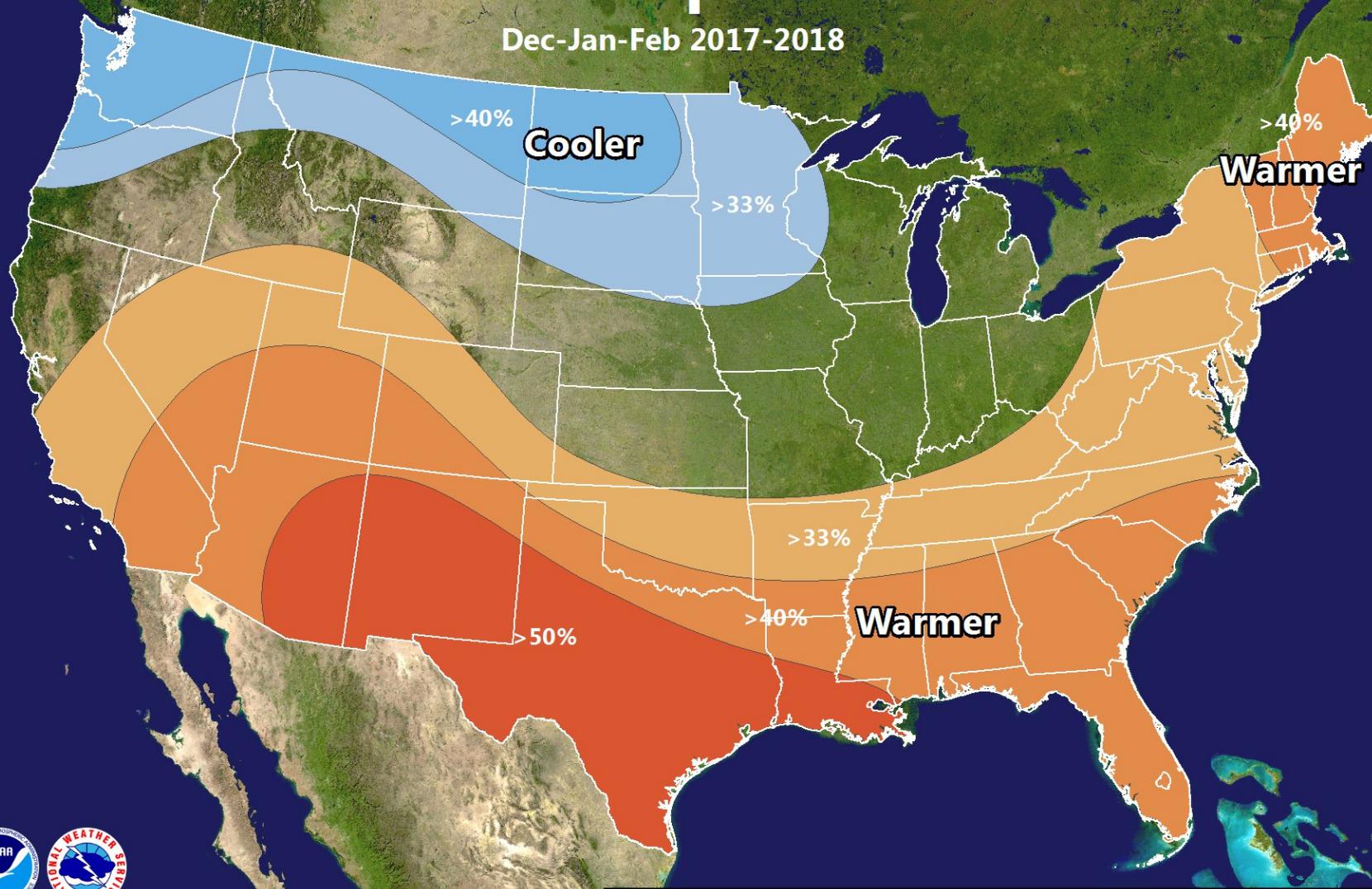

Mid-Nov 2017 Plume of Model ENSO Predictions

Figure provided by the International Research Institute (IRI) for Climate and Society (updated 17 November 2017).

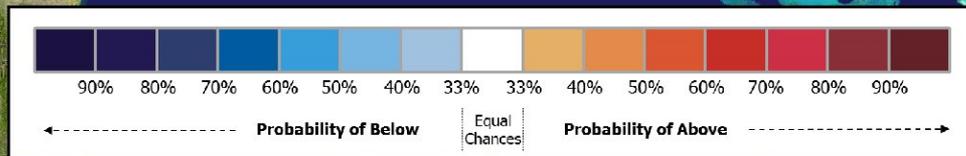# Three-Month Temperature Outlook
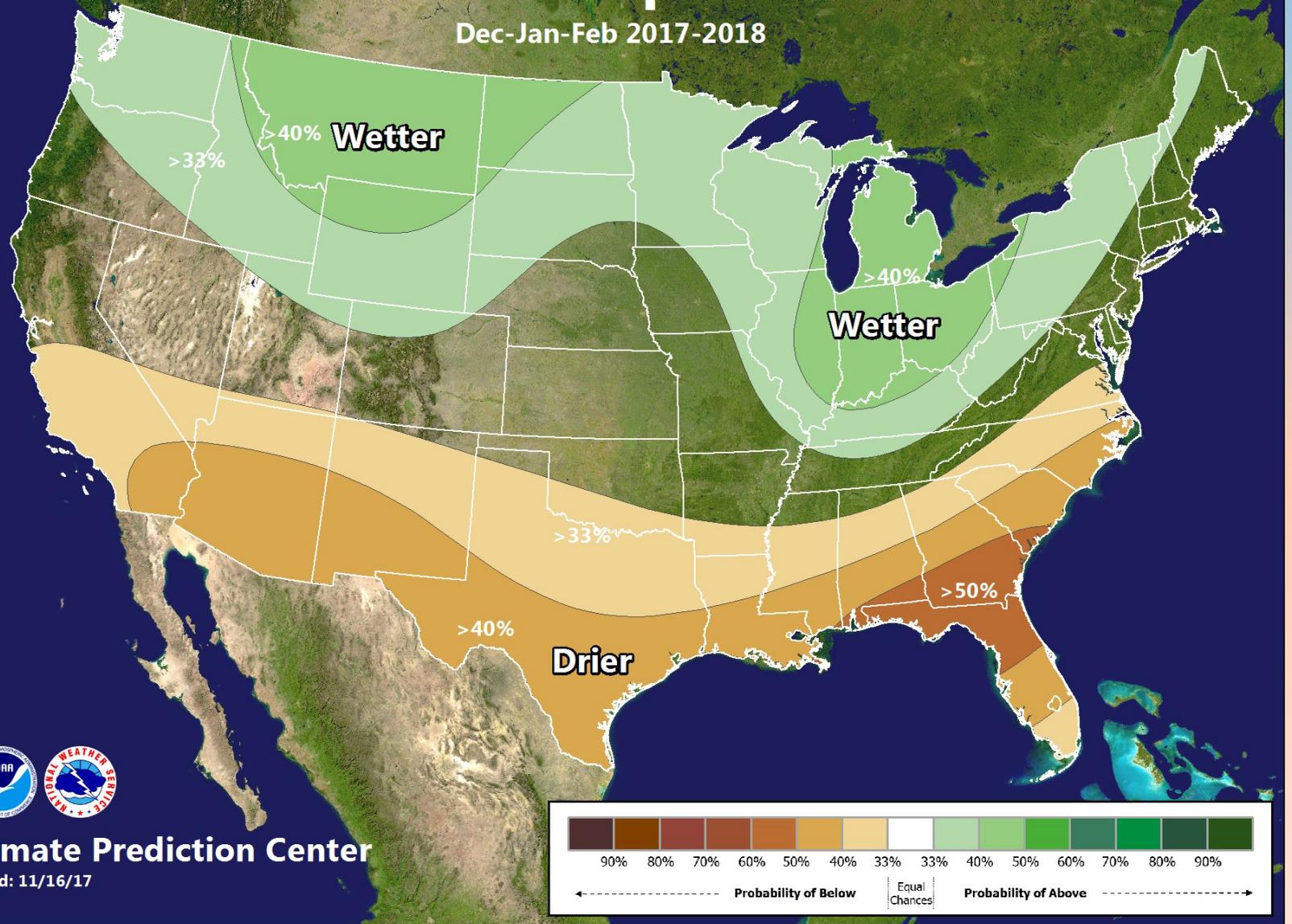
Dec-Jan-Feb 2017-2018

>40% Cooler

>33%

>40% Warmer

>33%

>50%

>40% Warmer

Climate Prediction Center

Issued: 11/16/17

90%	80%	70%	60%	50%	40%	33%	33%	40%	50%	60%	70%	80%	90%

Equal Chances
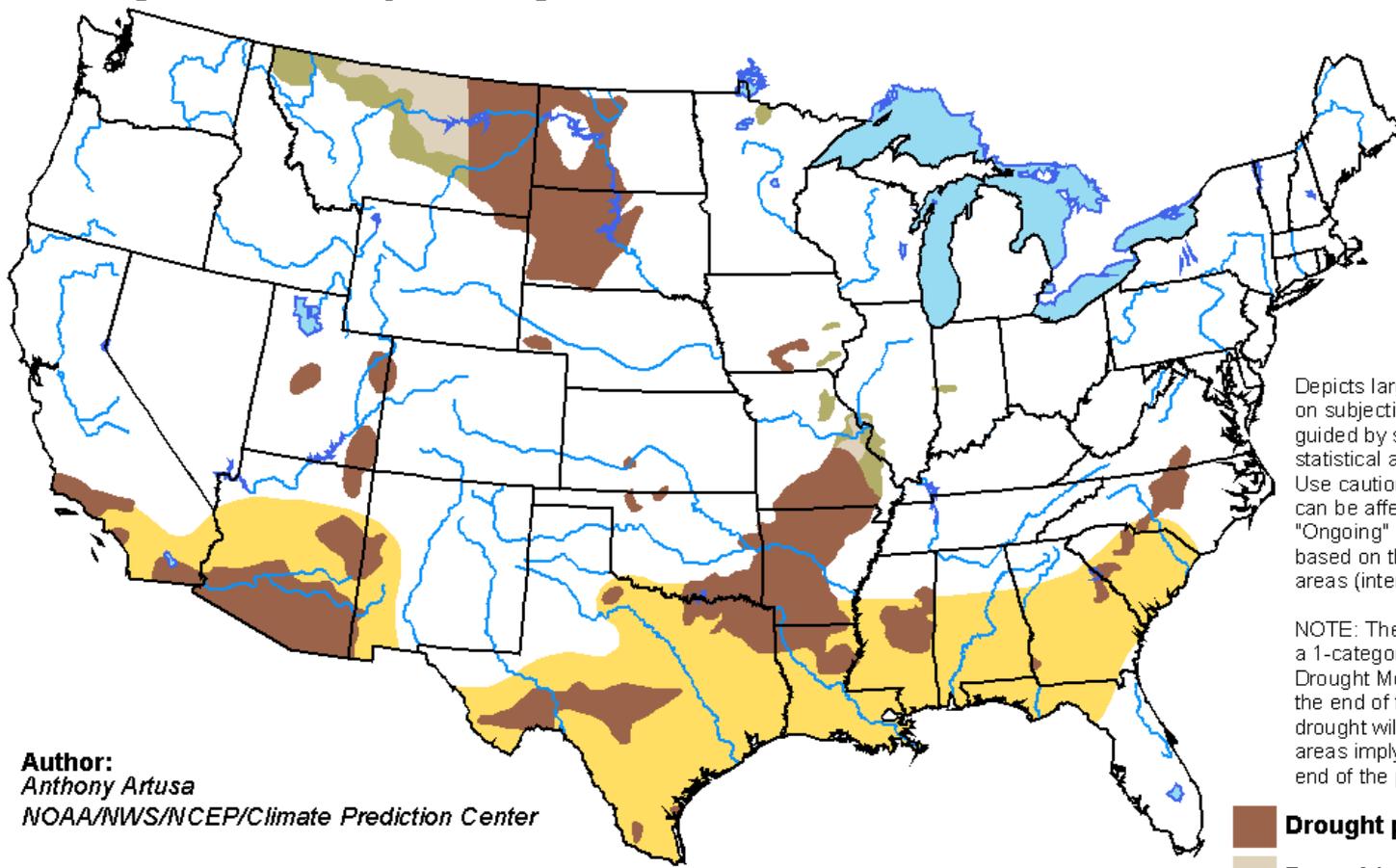
◄- - - **Probability of Below** | **Probability of Above** - - -►

The seasonal outlooks combine the effects of long-term trends, soil moisture, and, when appropriate, ENSO.

U.S. Seasonal Drought Outlook
Drought Tendency During the Valid Period

Valid for November 16 - February 28, 2018
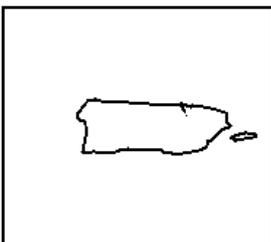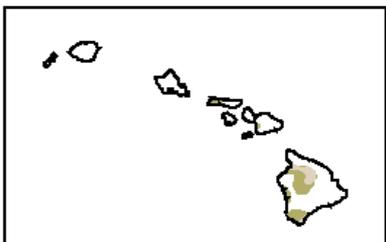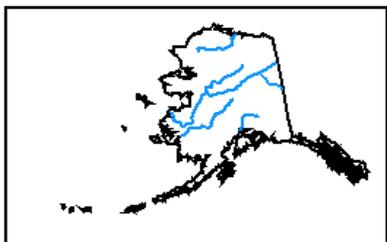**Released November 16, 2017**

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

Author:
Anthony Artusa
NOAA/NWS/NCEP/Climate Prediction Center

Drought persists
Drought remains but improves
Drought removal likely
Drought development likely

http://go.usa.gov/3eZ73

Summary

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NOAA Operational Definitions for El Niño and La Niña

El Niño: characterized by a positive ONI greater than or equal to +0.5°C.

La Niña: characterized by a negative ONI less than or equal to -0.5°C.

By historical standards, to be classified as a full-fledged El Niño or La Niña episode, these thresholds must be exceeded for a period of at least 5 consecutive overlapping 3-month seasons.

CPC considers El Niño or La Niña conditions to occur when the monthly Niño3.4 OISST departures meet or exceed +/- 0.5°C along with consistent atmospheric features. These anomalies must also be forecasted to persist for 3 consecutive months.