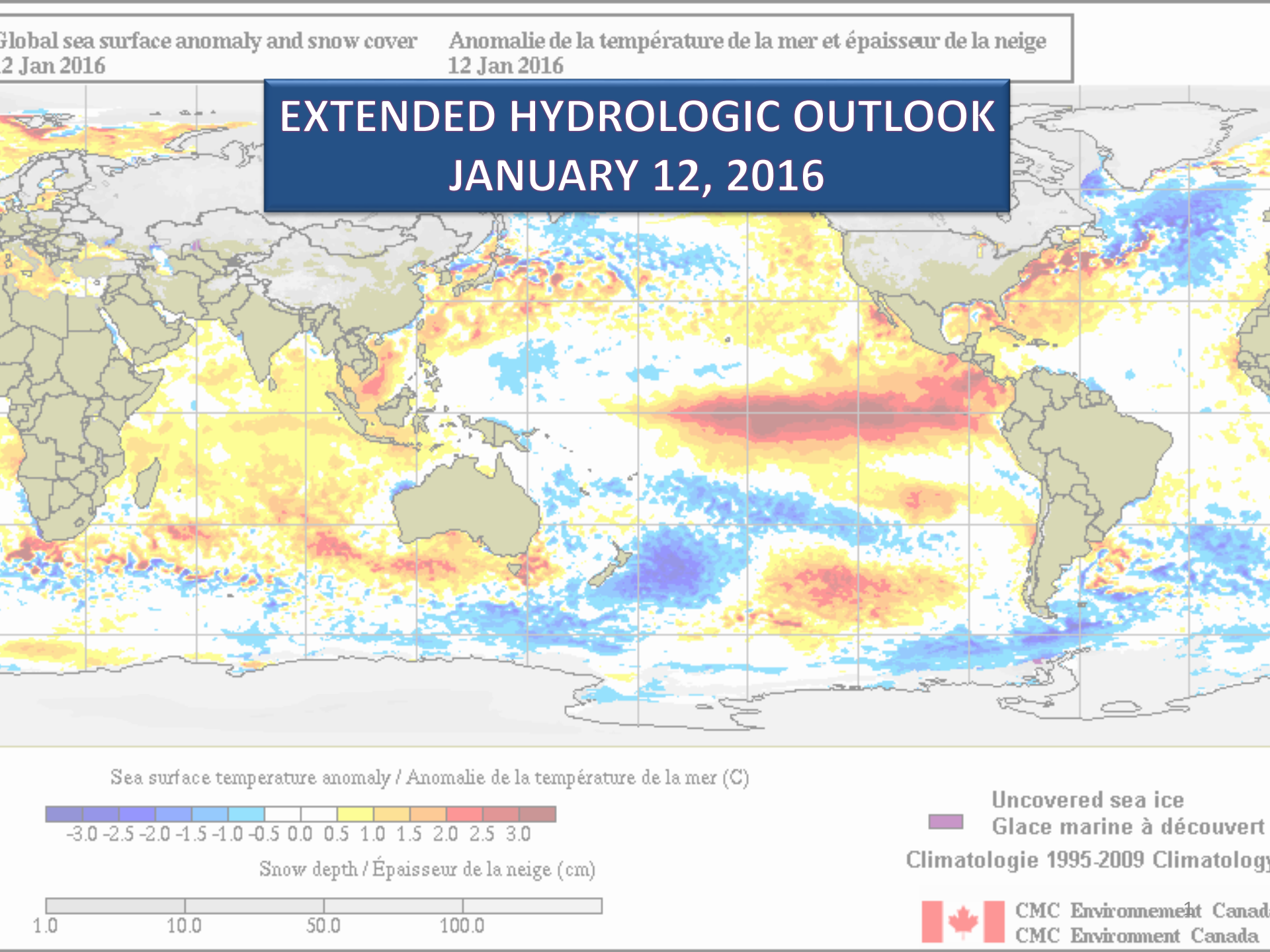
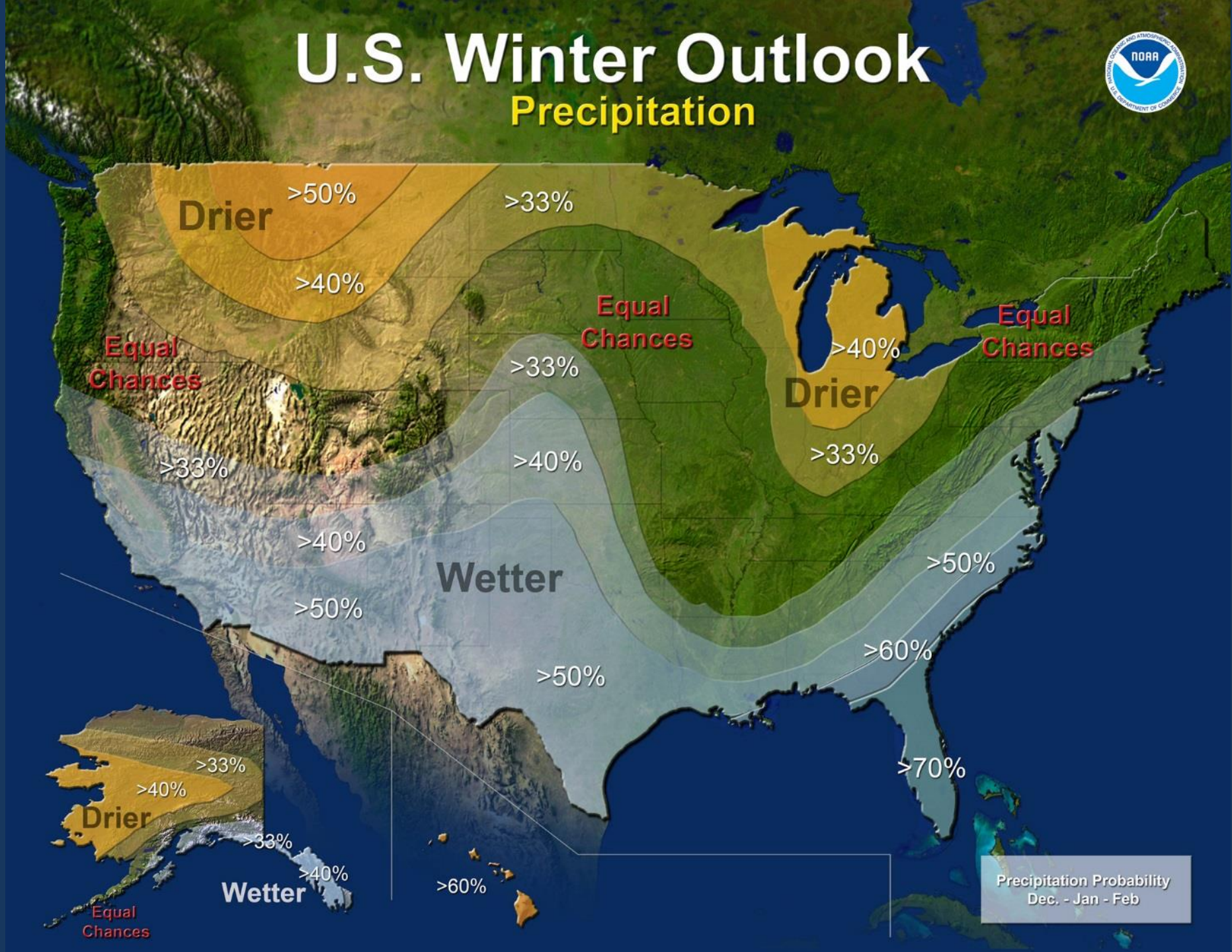

Global sea surface anomaly and snow cover
12 Jan 2016
Anomalie de la température de la mer et épaisseur de la neige
12 Jan 2016
EXTENDED HYDROLOGIC OUTLOOK
JANUARY 12, 2016
Sea surface temperature anomaly / Anomalie de la température de la mer (C)
-3.0 -2.5 -2.0 -1.5 -1.0 -0.5 0.0 0.5 1.0 1.5 2.0 2.5 3.0
Snow depth / Épaisseur de la neige (cm)
1.0 10.0 50.0 100.0
Uncovered sea ice
Glace marine à découvert
Climatologie 1995-2009 Climatology
CMC Environnement Canada
CMC Environment Canada

Summary

- The Climate Prediction Center (CPC) is forecasting above-normal rainfall for January through March. NOAA is forecasting a 70% likelihood of being in the wettest tercile through winter 2016.
- Strong El Niño conditions are present. A strong El Niño is likely to persist through winter 2016 and to weaken through spring 2016. There are increased chances of above normal rainfall for the 2015-2016 dry season.
- The strong positive phase of the Pacific Decadal Oscillation increases the potential for above normal rainfall in the winter and a greater number of El Niño events for multi-year periods.
- Watching Atlantic Multidecadal Oscillation (AMO) index for potential switch to negative (cold) phase, this has the potential to contribute to a drier than normal 2016 wet season.


U.S. Winter Outlook
Precipitation
Drier
>50%
>33%
>40%
Equal Chances
Equal Chances
>33%
Drier
>40%
Equal Chances
>33%
>40%
>40%
Wetter
>50%
>50%
>60%
>50%
>70%
>33%
>40%
Drier
>33%
>40%
Wetter
Equal Chances
>60%
Precipitation Probability
Dec. - Jan - Feb

National Weather Service Melbourne

DRY SEASON FORECAST | Dec 2015

The Forecast

November – December - January

ENSO State	Temperature	Precipitation	Storminess
STRONG EL NINO	**WELL ABOVE NORMAL**	WELL ABOVE NORMAL	WELL ABOVE NORMAL
WEAK EL NINO	ABOVE NORMAL	**ABOVE NORMAL**	**ABOVE NORMAL**
NEUTRAL	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL
WEAK LA NINA	BELOW NORMAL	BELOW NORMAL	BELOW NORMAL
STRONG LA NINA	WELL BELOW NORMAL	WELL BELOW NORMAL	WELL BELOW NORMAL

February – March - April

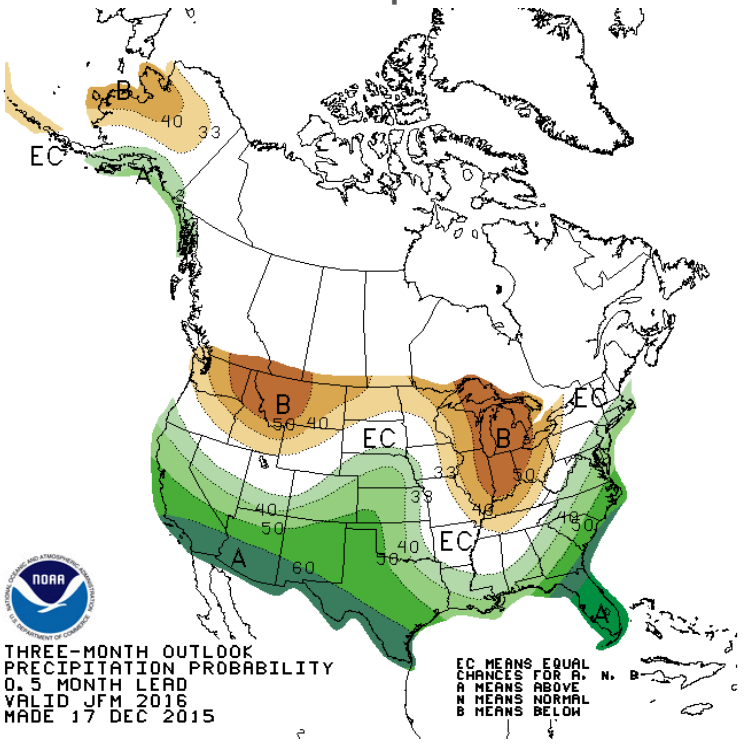
ENSO State	Temperature	Precipitation	Storminess
STRONG EL NINO	WELL ABOVE NORMAL	**WELL ABOVE NORMAL**	**WELL ABOVE NORMAL**
WEAK EL NINO	ABOVE NORMAL	ABOVE NORMAL	ABOVE NORMAL
NEUTRAL	NEAR NORMAL	NEAR NORMAL	NEAR NORMAL
WEAK LA NINA	**BELOW NORMAL**	BELOW NORMAL	BELOW NORMAL
STRONG LA NINA	WELL BELOW NORMAL	WELL BELOW NORMAL	WELL BELOW NORMAL

U. S. Seasonal Outlooks

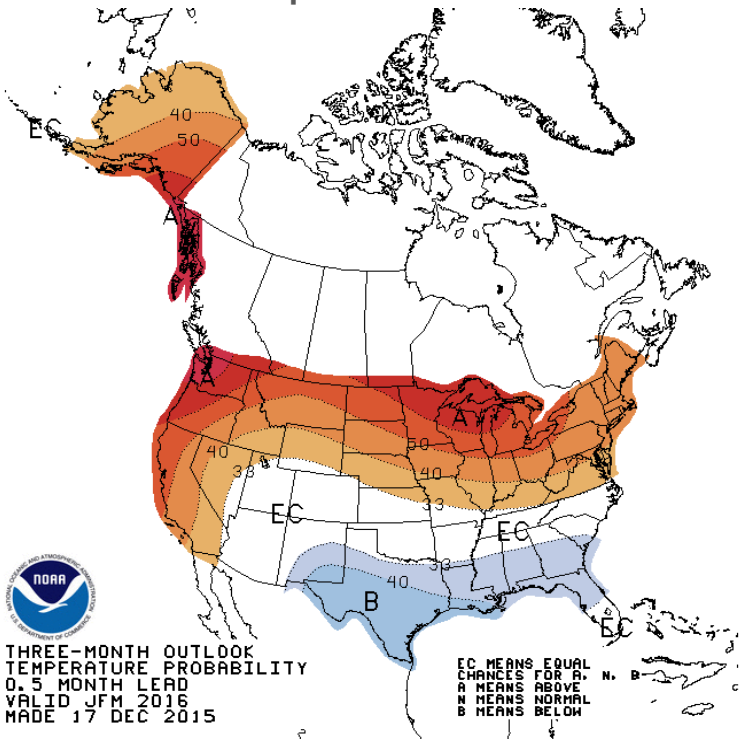
January- March 2016

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

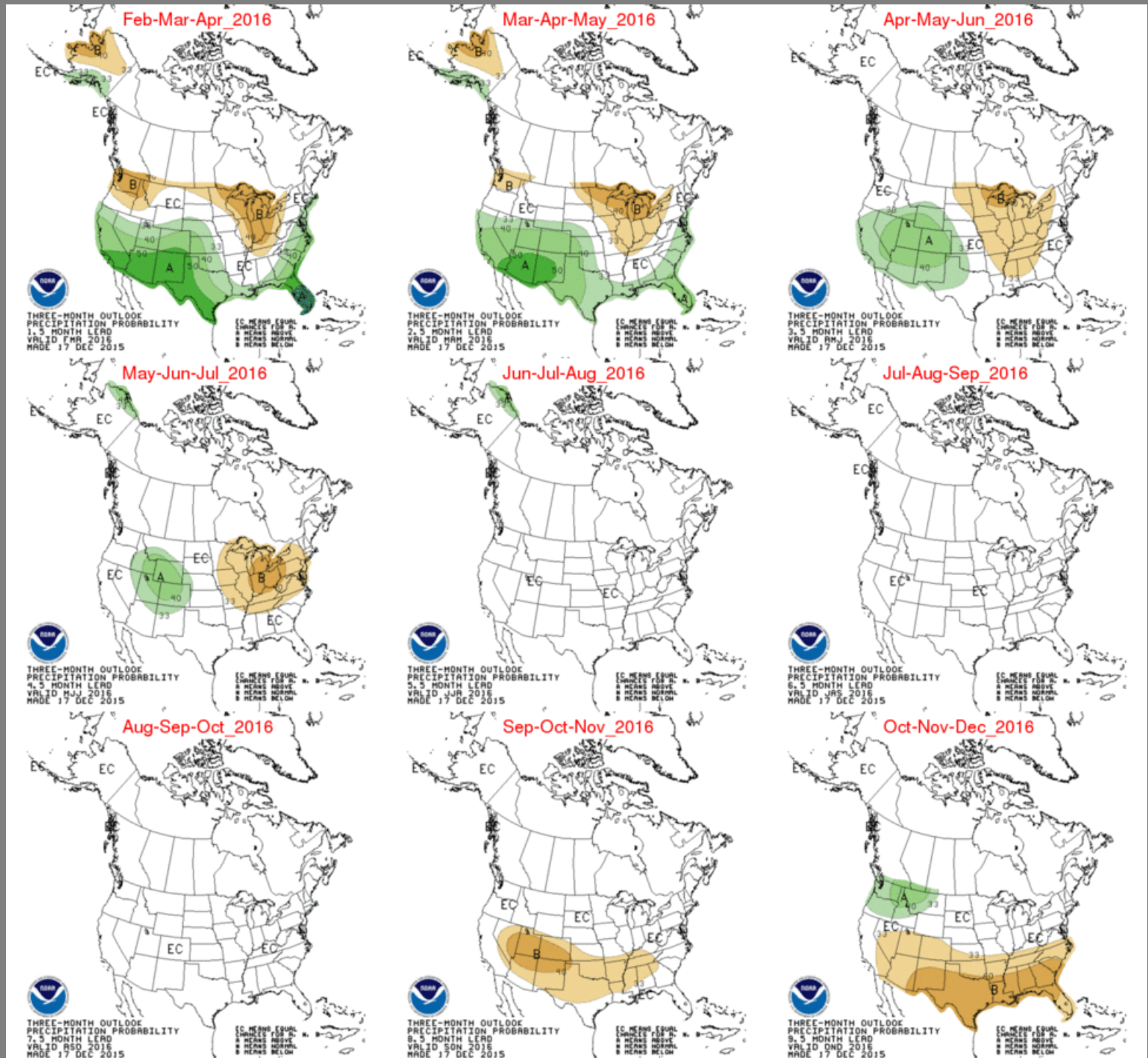
Precipitation



Temperature

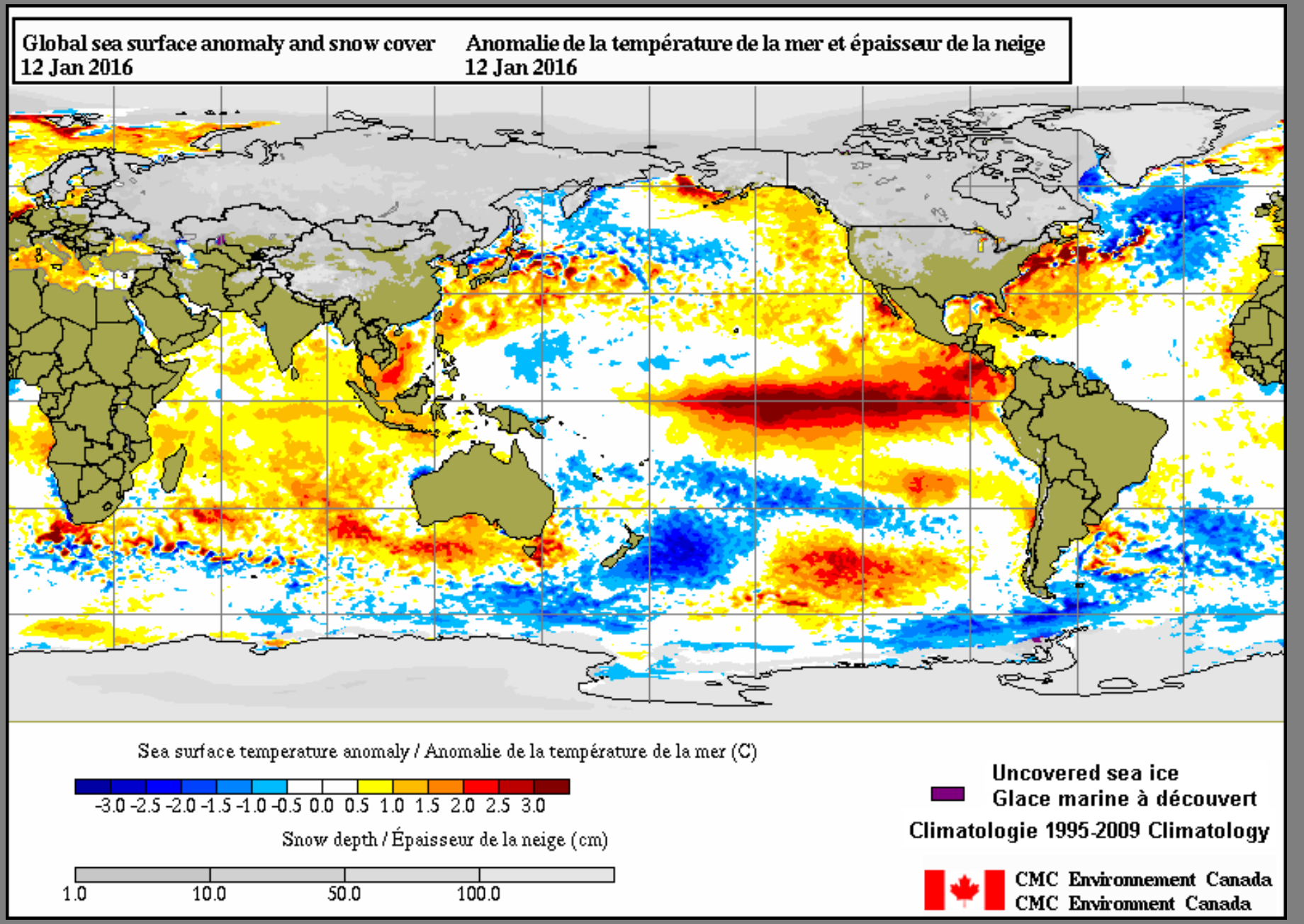


Prepared by: Climate Prediction Center / NCEP



Prepared by: Climate Prediction Center / NCEP

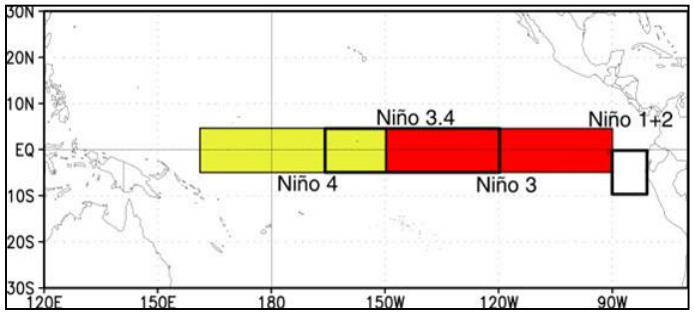
Current Global Sea Surface Temperature Anomalies

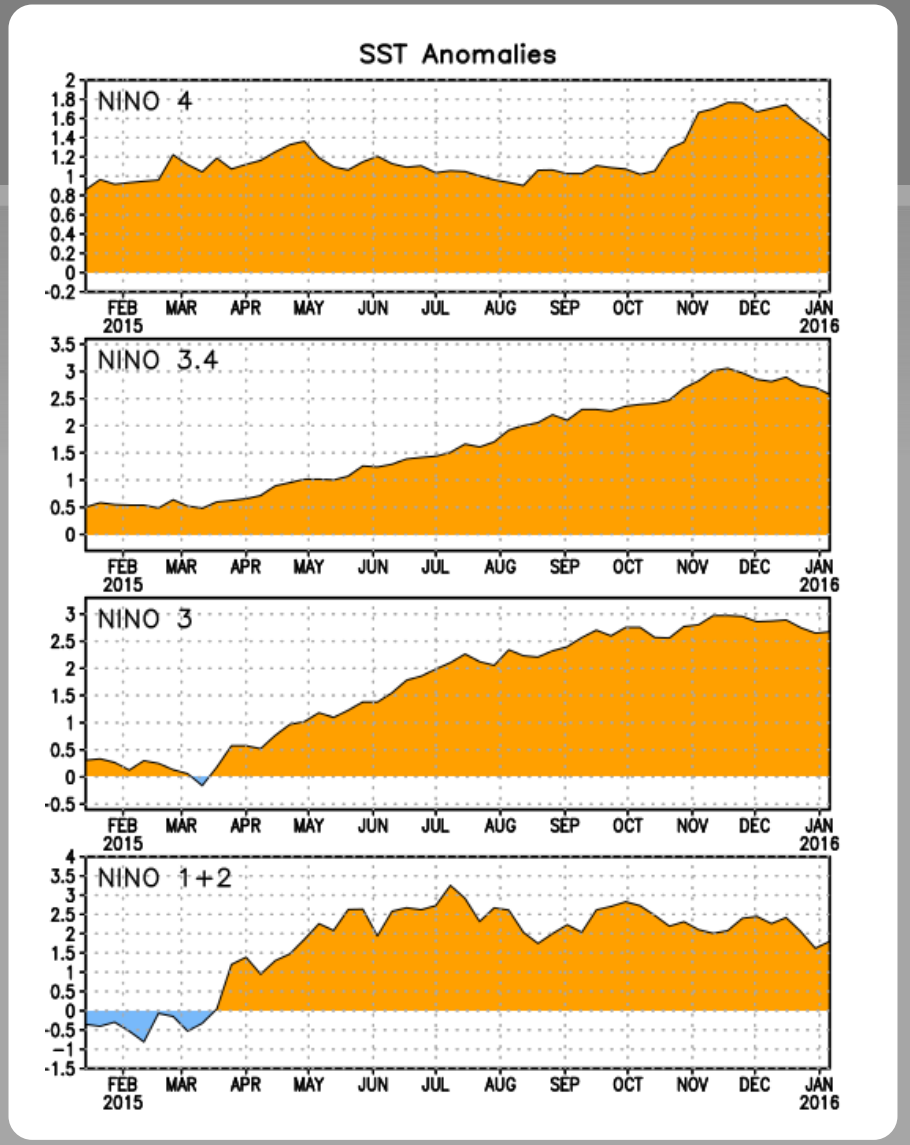


Niño Region SST Departures (ºC) Recent Evolution

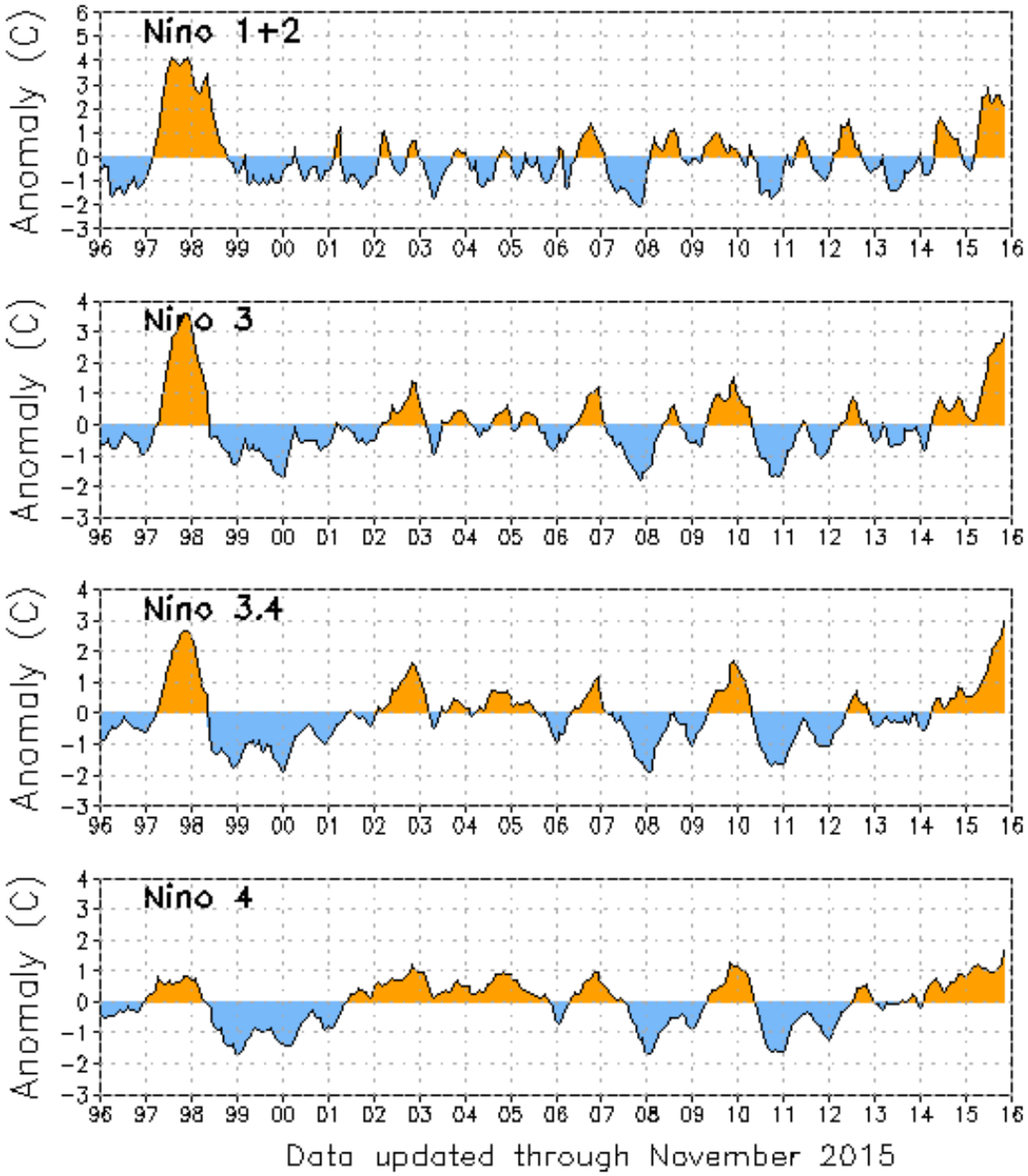
The latest weekly SST departures are:

Niño 4	1.4ºC
Niño 3.4	2.6ºC
Niño 3	2.7ºC
Niño 1+2	1.8ºC





Prepared by: Climate Prediction Center / NCEP

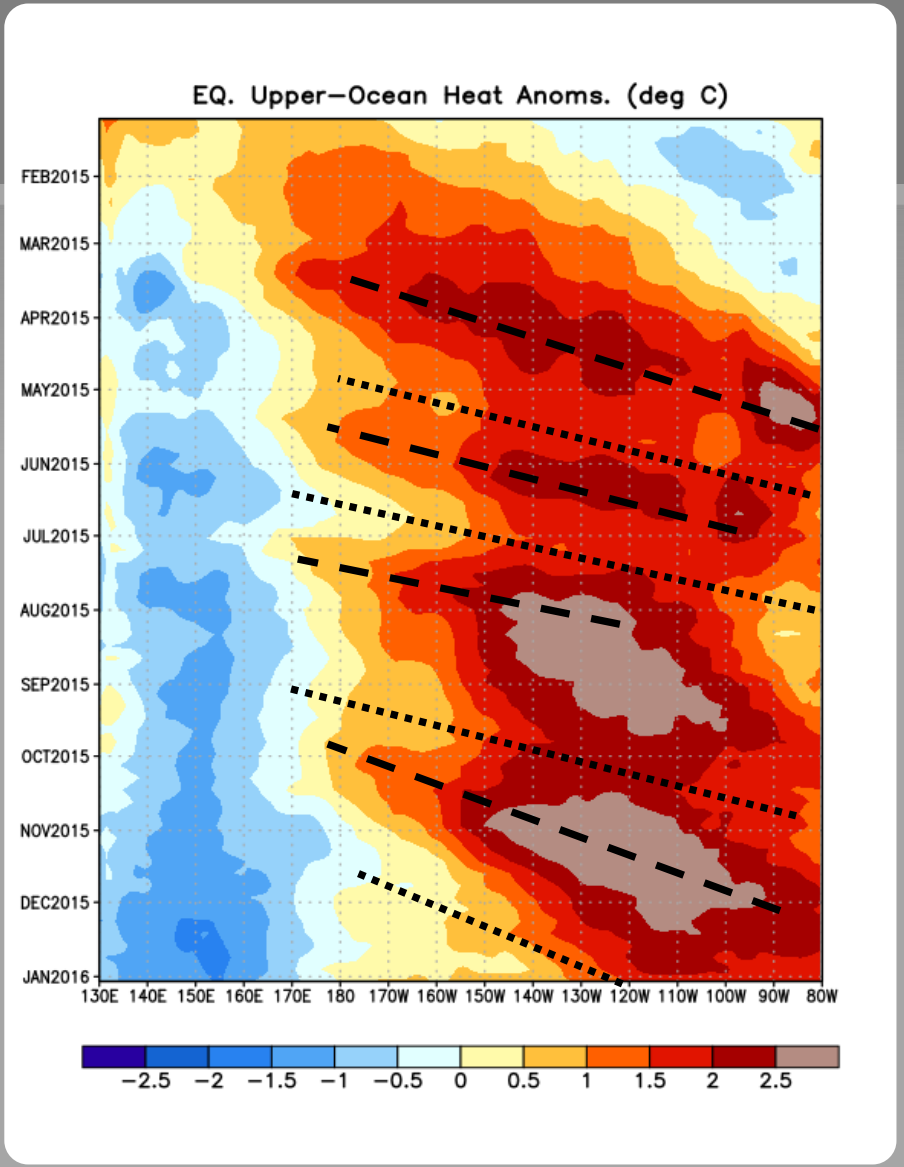

Nino 1+2
Nino 3
Nino 3.4
Nino 4
Anomaly (C)
96 97 98 99 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16
Data updated through November 2015

Weekly Heat Content Evolution in the Equatorial Pacific

Downwelling phases of a Kelvin wave were observed in March-April, mid-May to late June, July-August, and October to November.

During August and September, positive subsurface temperature anomalies slowly shifted eastward.

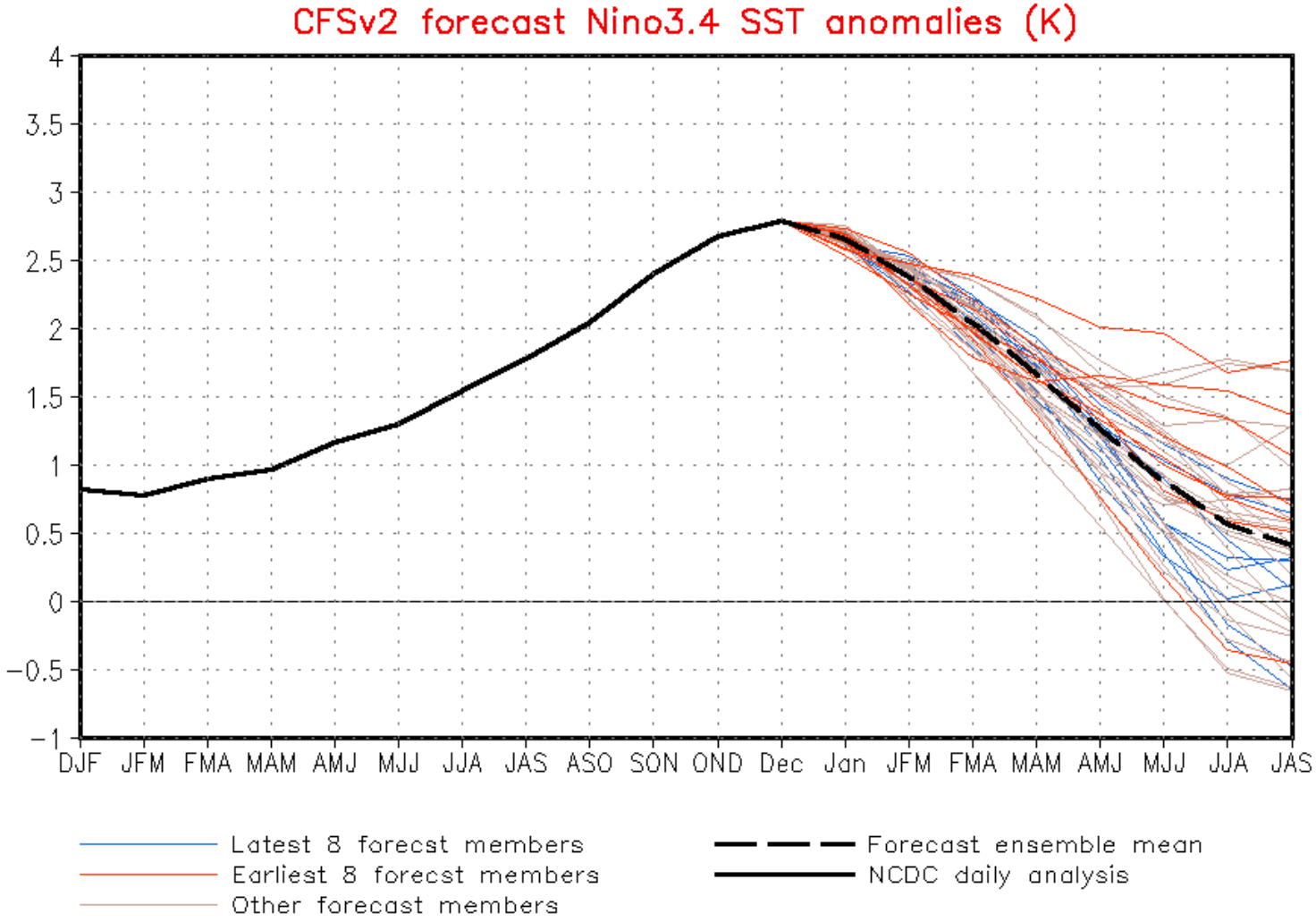
The upwelling phase of a Kelvin wave is evident in the eastern Pacific.



Oceanic Kelvin waves have alternating warm and cold phases. The warm phase is indicated by dashed lines. Down-welling and warming occur in the leading portion of a Kelvin wave, and up-welling and cooling occur in the trailing portion.

NWS/NCEP/CPC

Last update: Tue Jan 12 2016
Initial conditions: 1Jan2016–10Jan2016



IRI/CPC Pacific Niño 3.4 SST Model Outlook

Most models indicate that Niño 3.4 will remain strongly positive into early 2016.

Positive anomalies are predicted to weaken into the Northern Hemisphere Spring 2016.

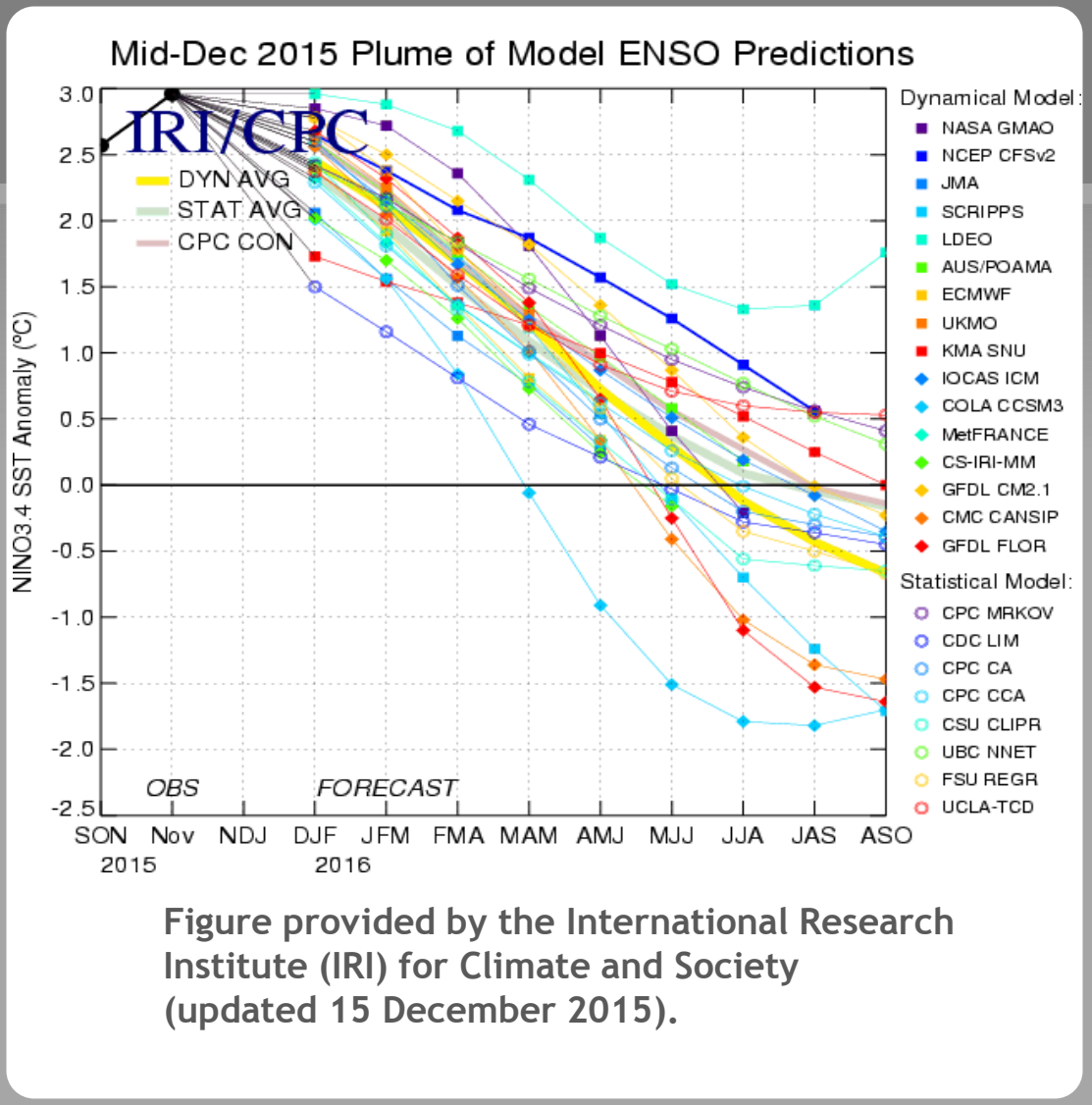


Figure provided by the International Research Institute (IRI) for Climate and Society (updated 15 December 2015).

Prepared by: Climate Prediction Center / NCEP

Historical El Niño and La Niña Episodes Based on the ONI computed using ERSST.v4

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.v4 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.

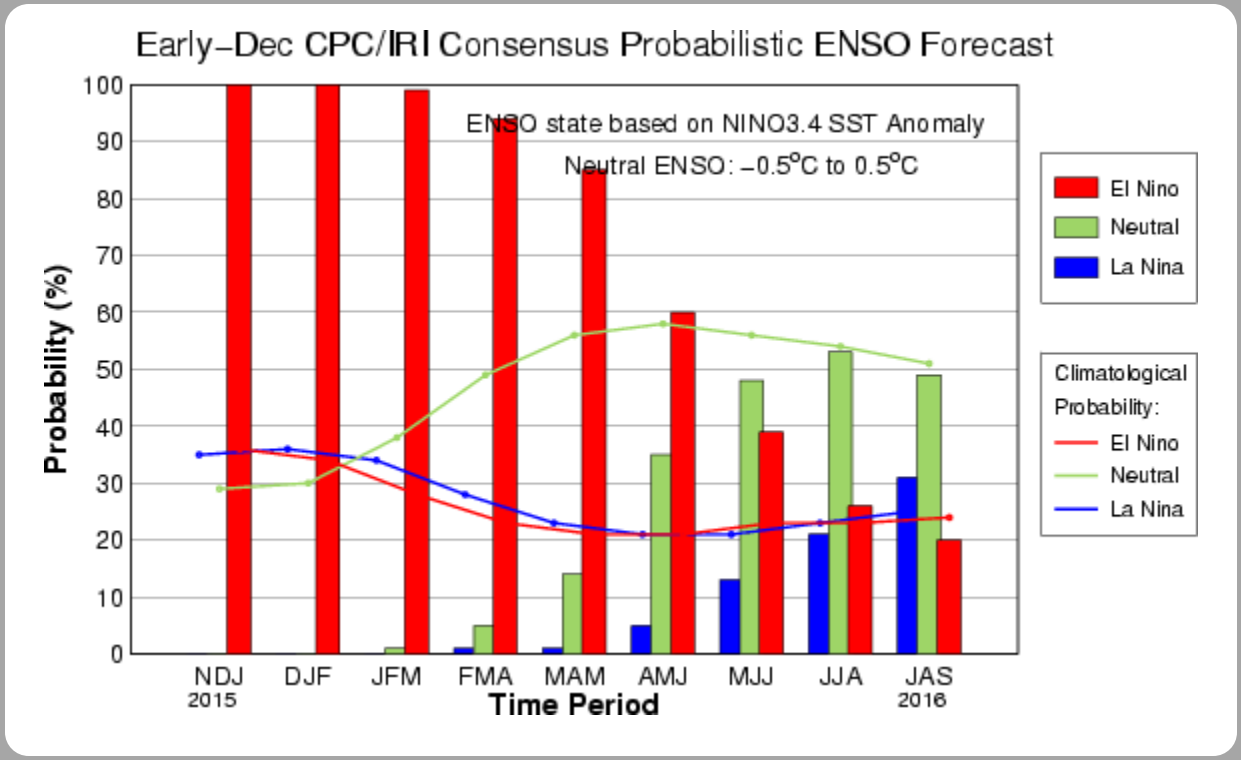
Year	DJF	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ
2003	0.9	0.6	0.4	0.0	-0.2	-0.1	0.1	0.2	0.3	0.4	0.4	0.4
2004	0.3	0.2	0.1	0.1	0.2	0.3	0.5	0.7	0.7	0.7	0.7	0.7
2005	0.6	0.6	0.5	0.5	0.4	0.2	0.1	0.0	0.0	-0.1	-0.4	-0.7
2006	-0.7	-0.6	-0.4	-0.2	0.0	0.1	0.2	0.3	0.5	0.8	0.9	1.0
2007	0.7	0.3	0.0	-0.1	-0.2	-0.2	-0.3	-0.6	-0.8	-1.1	-1.2	-1.3
2008	-1.4	-1.3	-1.1	-0.9	-0.7	-0.5	-0.3	-0.2	-0.2	-0.3	-0.5	-0.7
2009	-0.8	-0.7	-0.4	-0.1	0.2	0.4	0.5	0.6	0.7	1.0	1.2	1.3
2010	1.3	1.1	0.8	0.5	0.0	-0.4	-0.8	-1.1	-1.3	-1.4	-1.3	-1.4
2011	-1.3	-1.1	-0.8	-0.6	-0.3	-0.2	-0.3	-0.5	-0.7	-0.9	-0.9	-0.8
2012	-0.7	-0.6	-0.5	-0.4	-0.3	-0.1	0.1	0.3	0.4	0.4	0.2	-0.2
2013	-0.4	-0.5	-0.3	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3
2014	-0.5	-0.6	-0.4	-0.2	0.0	0.2	0.3	0.3	0.3	0.4	0.6	0.6
2015	0.5	0.4	0.5	0.7	0.9	1.0	1.2	1.5	1.8	2.0	2.3	

Prepared by: Climate Prediction Center / IRI

CPC/IRI Probabilistic ENSO Outlook

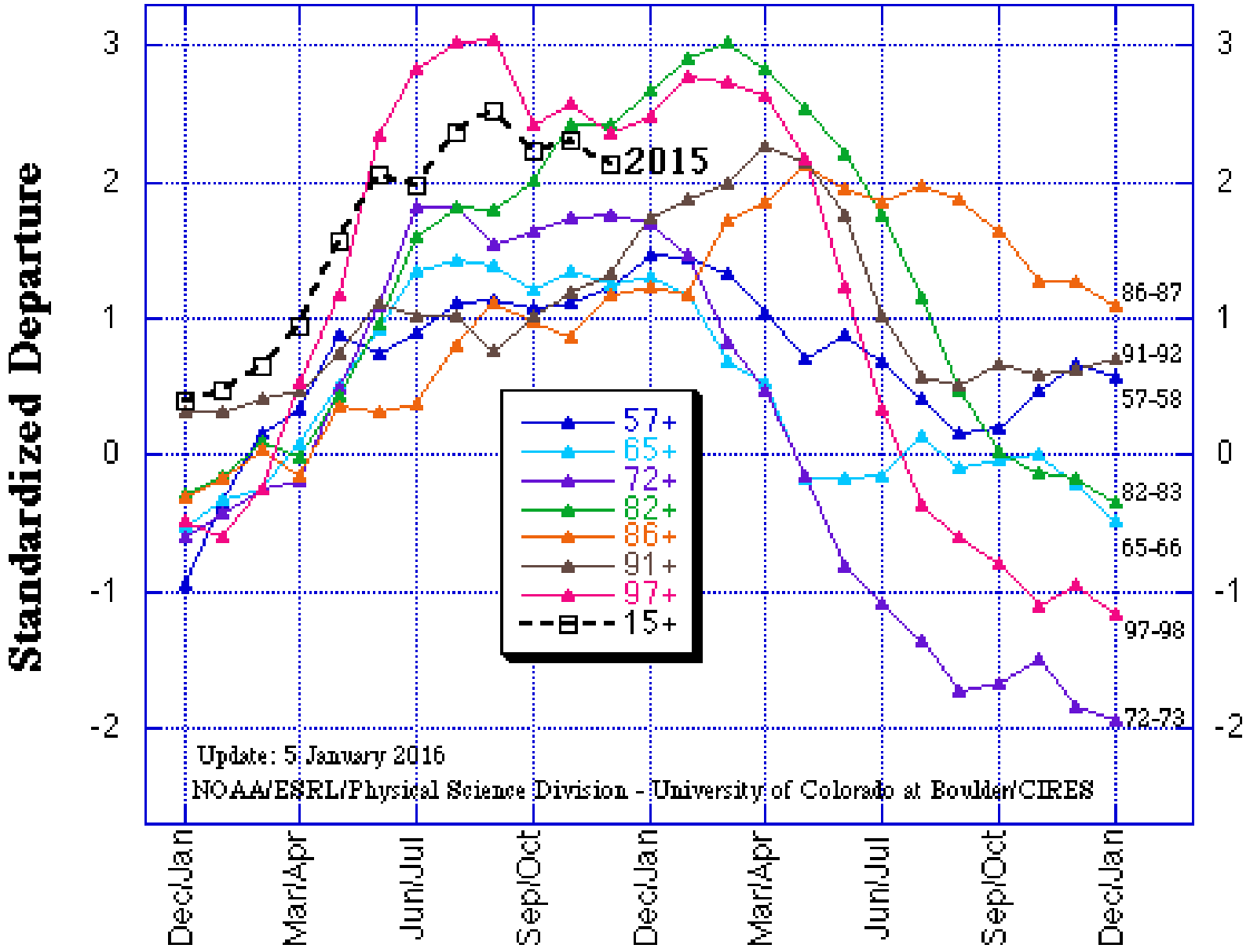
Updated: 10 December 2015

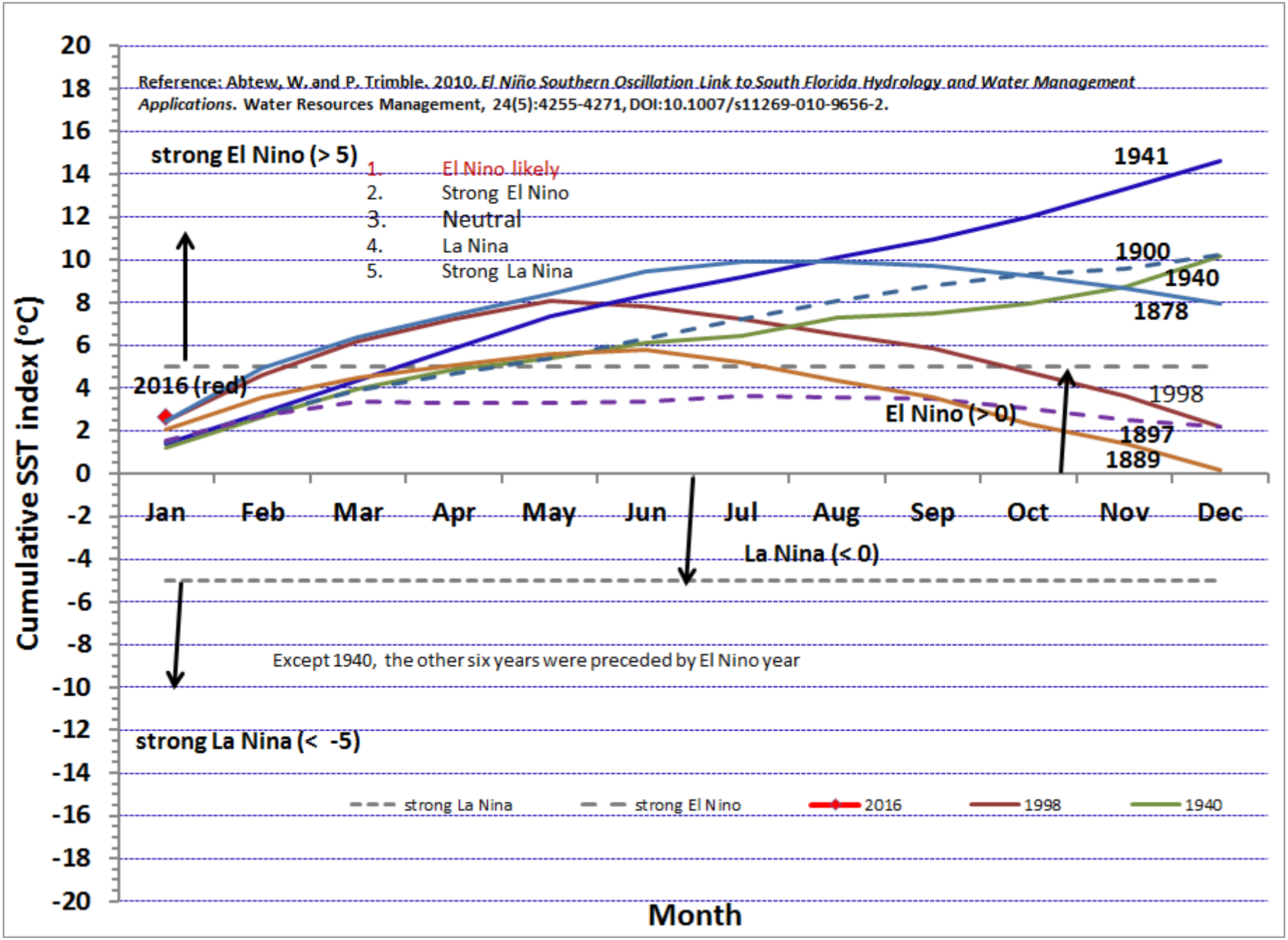
The chance of El Niño gradually decreases into the spring and ENSO-neutral is favored by May-June-July (MJJ) 2016.



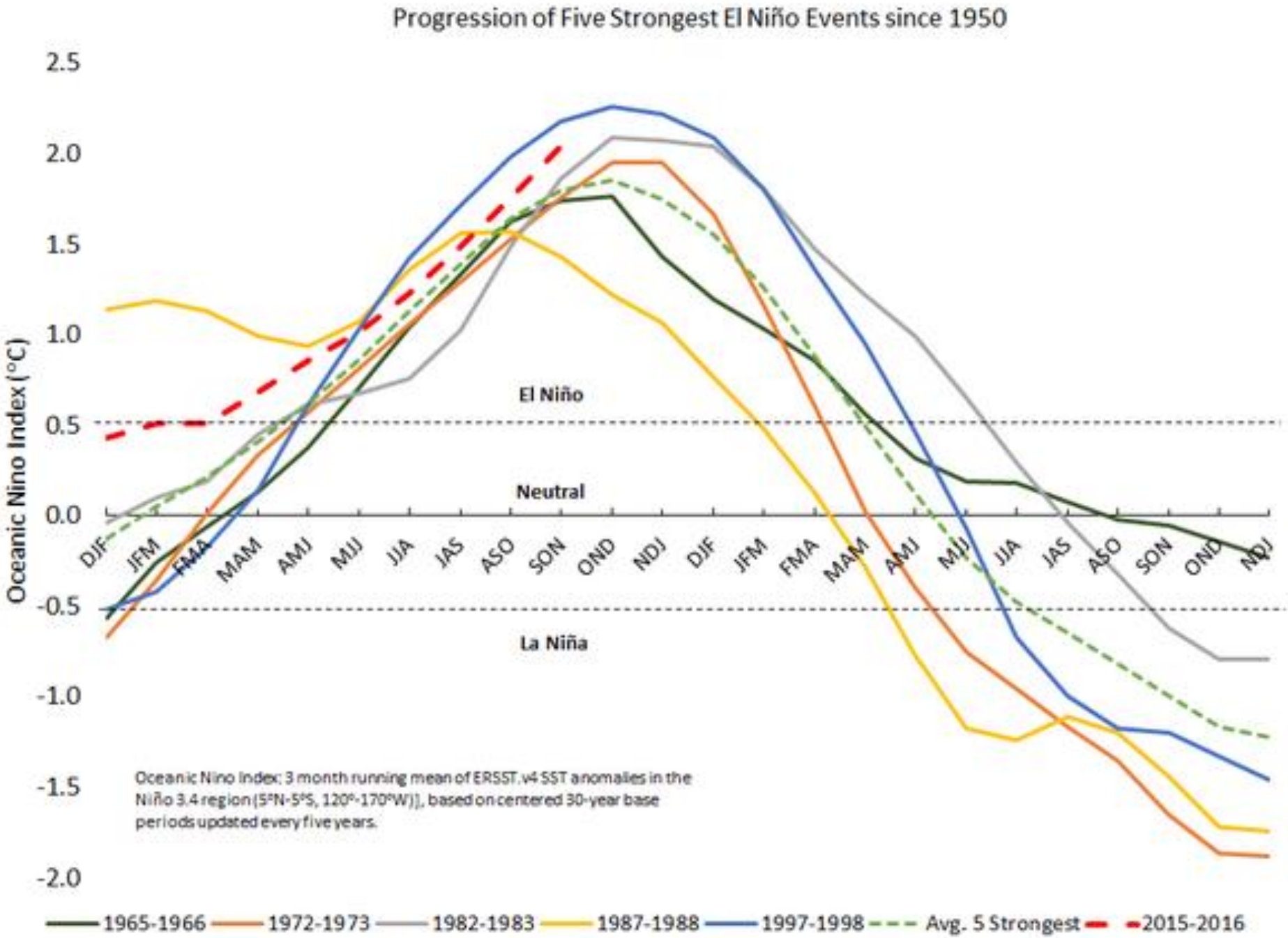
Prepared by: Climate Prediction Center / IRI

Multivariate ENSO Index (MEI) for the seven strongest El Niño events since 1950 vs. 2015

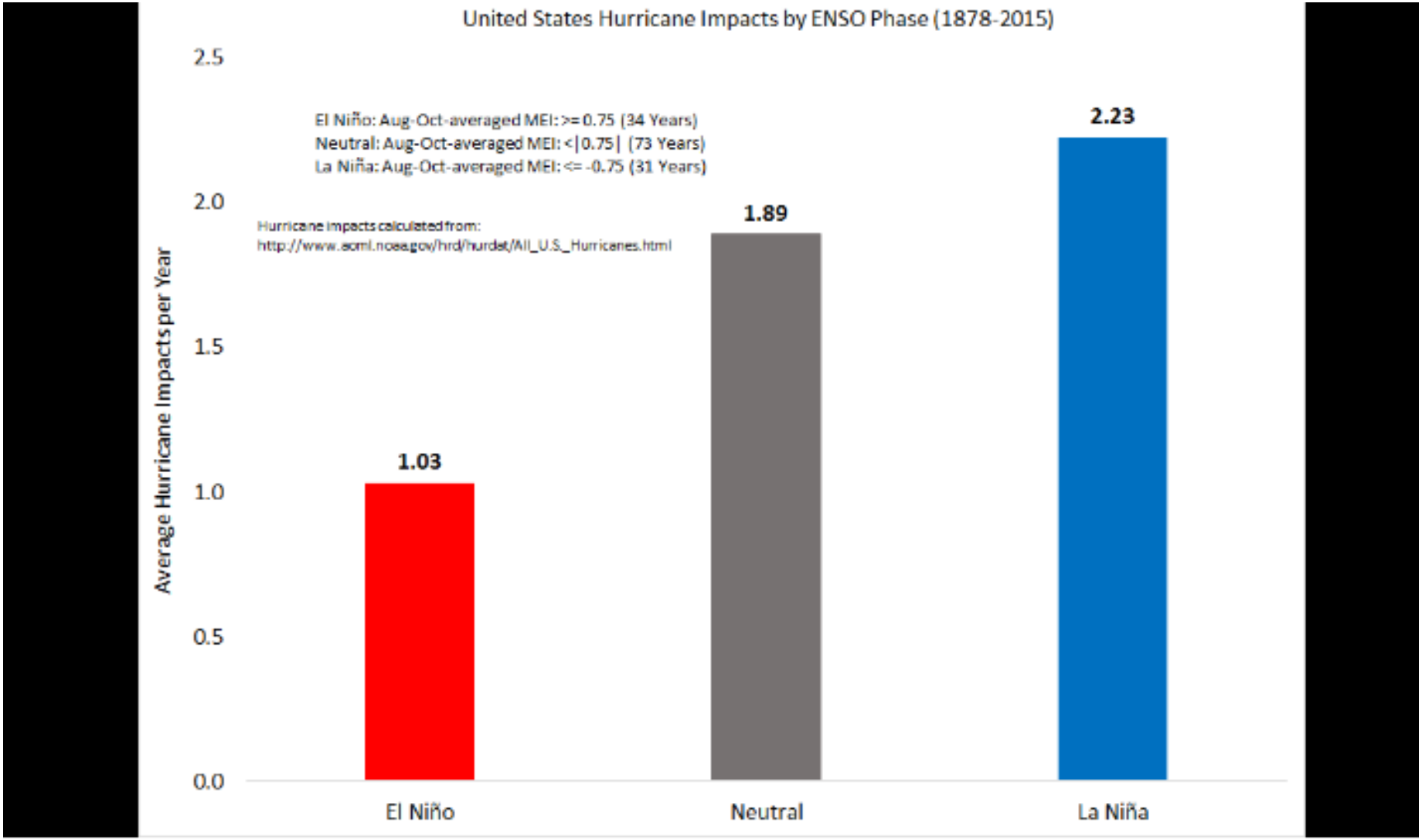




Source: Wossenu Abtew (SFWMD)



Source: Phil Klotzbach (CSU)

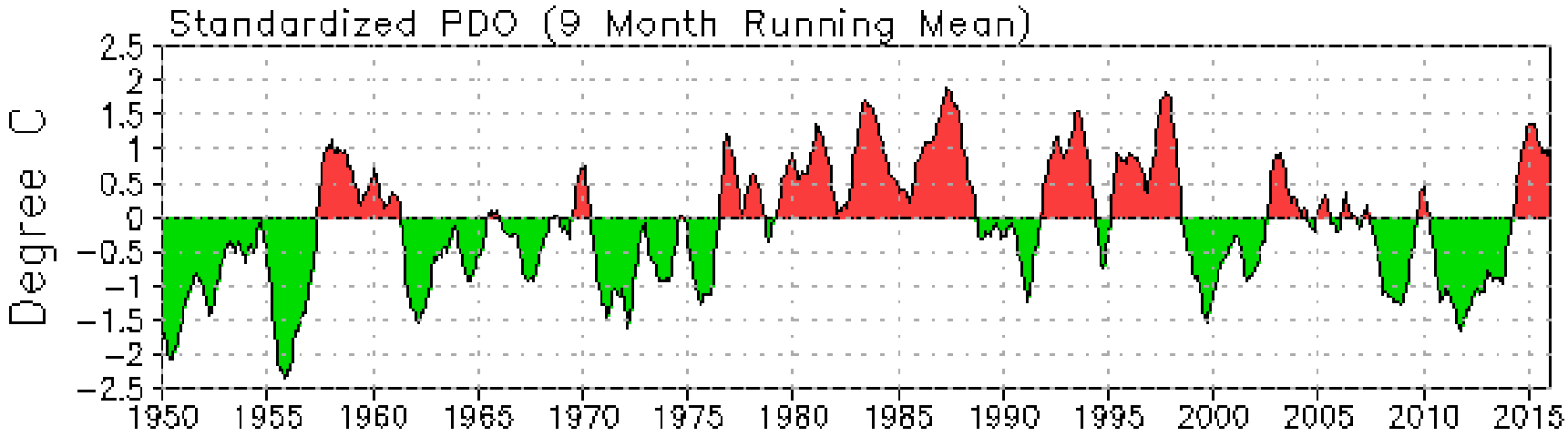


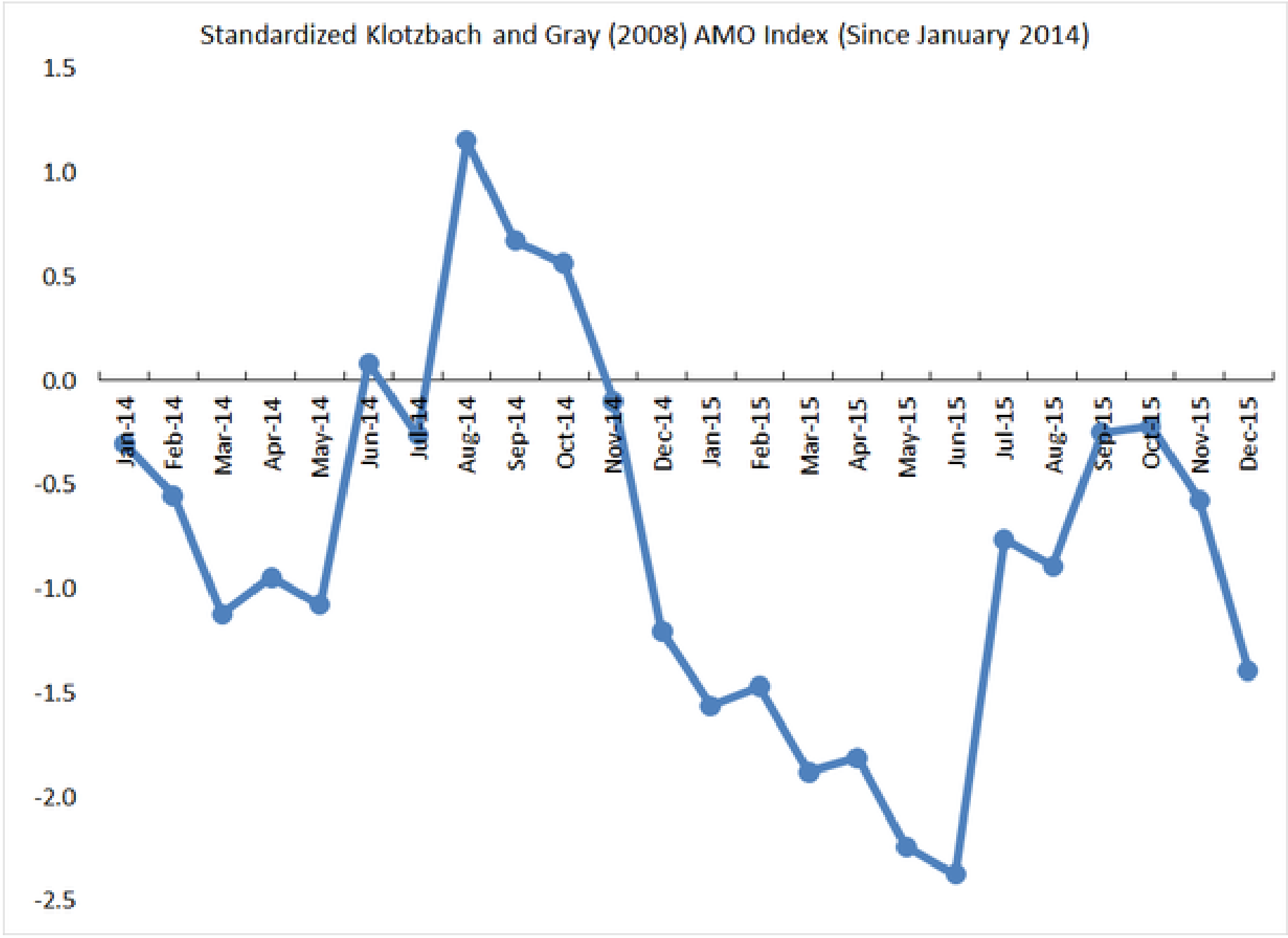
Philip Klotzbach @philklotzbach · 18 Dec 2015

Over twice as many hurricanes impact the United States in La Nina years vs. El Nino years. #ElNino

28 16

Source: Phil Klotzbach (CSU)


Standardized PDO (9 Month Running Mean)
Degree C
2.5
2
1.5
1
0.5
0
−0.5
−1
−1.5
−2
−2.5
1950
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015


Standardized Klotzbach and Gray (2008) AMO Index (Since January 2014)
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
Jan-14
Feb-14
Mar-14
Apr-14
May-14
Jun-14
Jul-14
Aug-14
Sep-14
Oct-14
Nov-14
Dec-14
Jan-15
Feb-15
Mar-15
Apr-15
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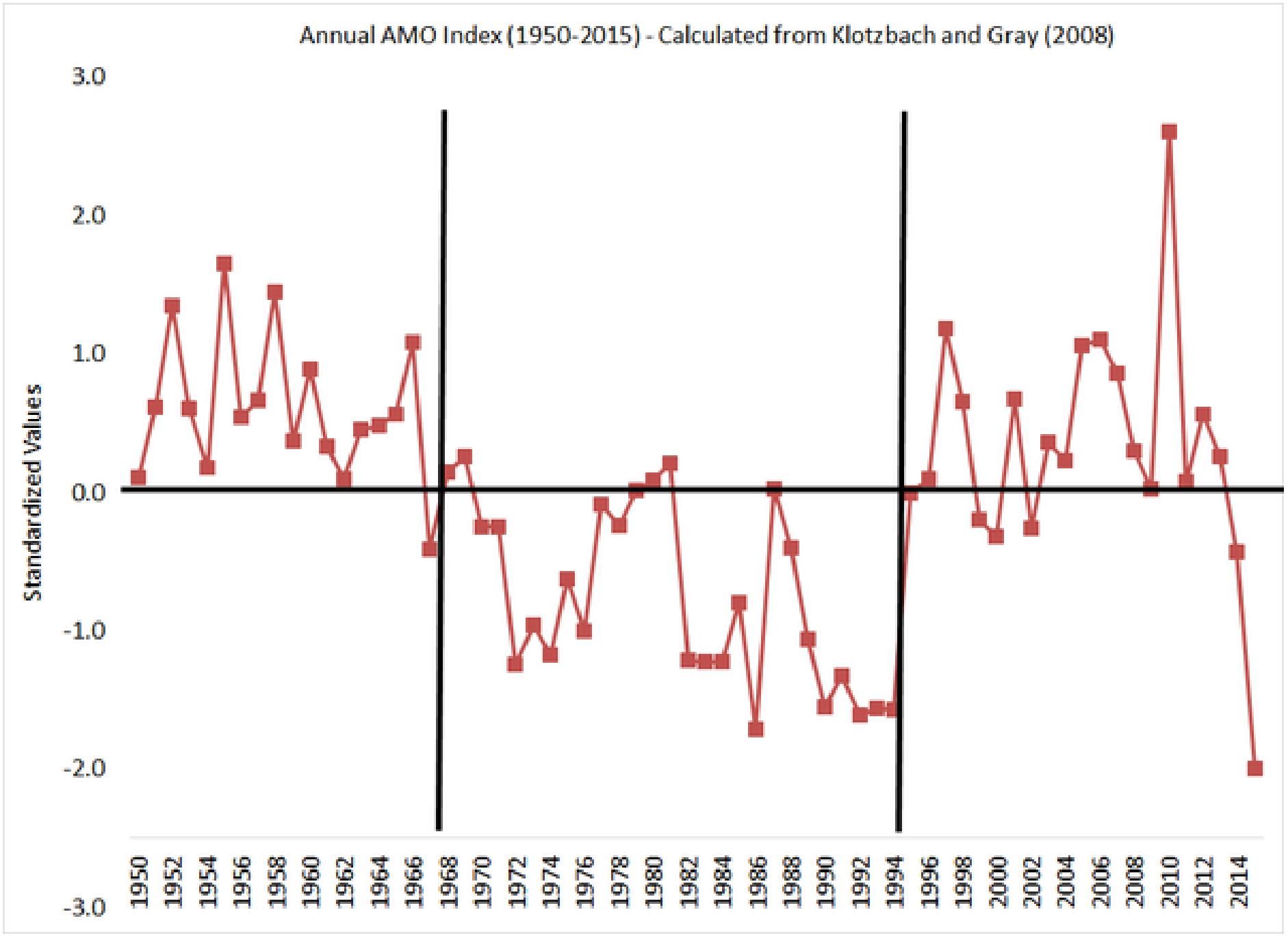
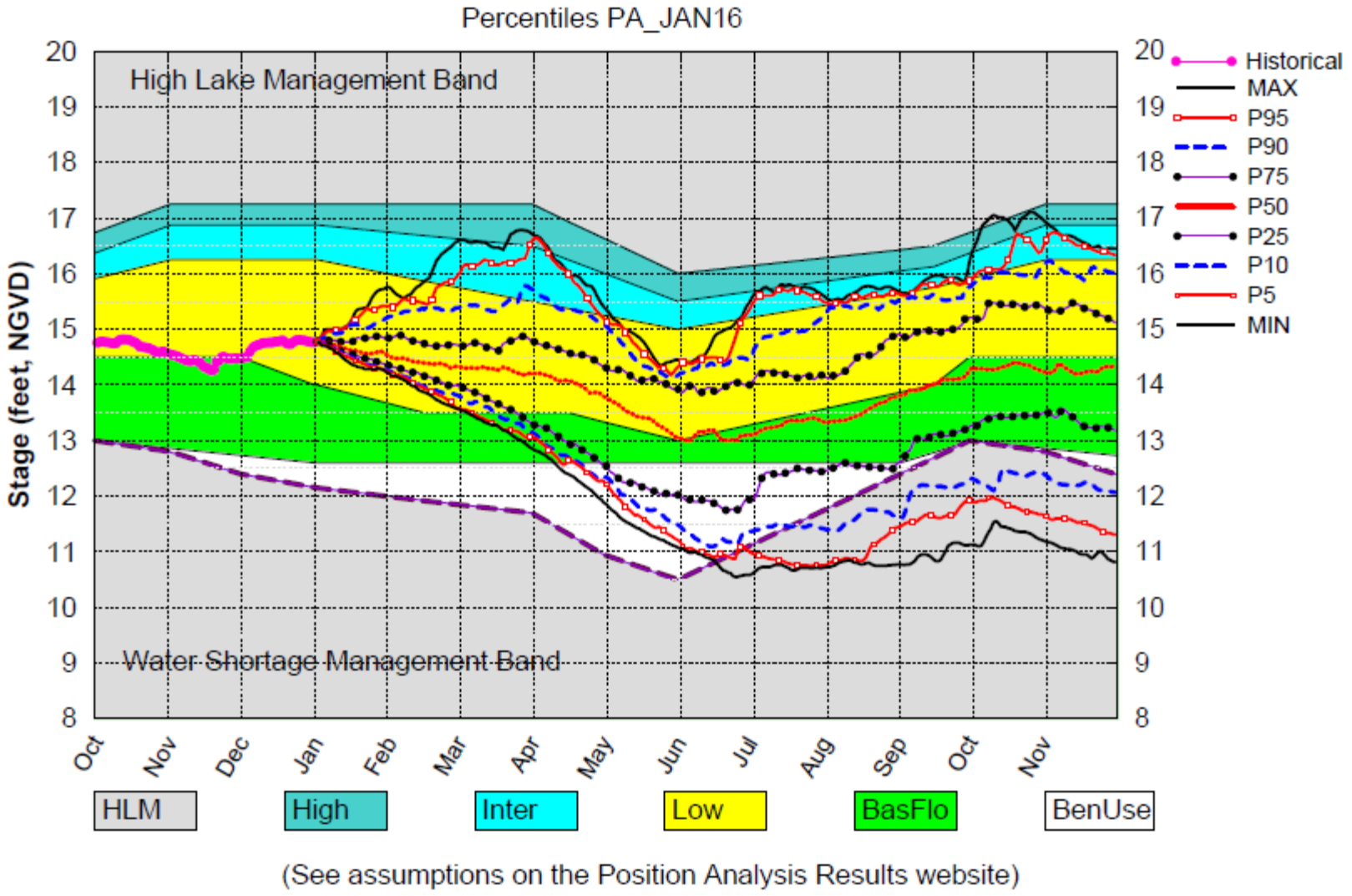
Jul-15
Aug-15
Sep-15
Oct-15
Nov-15
Dec-15

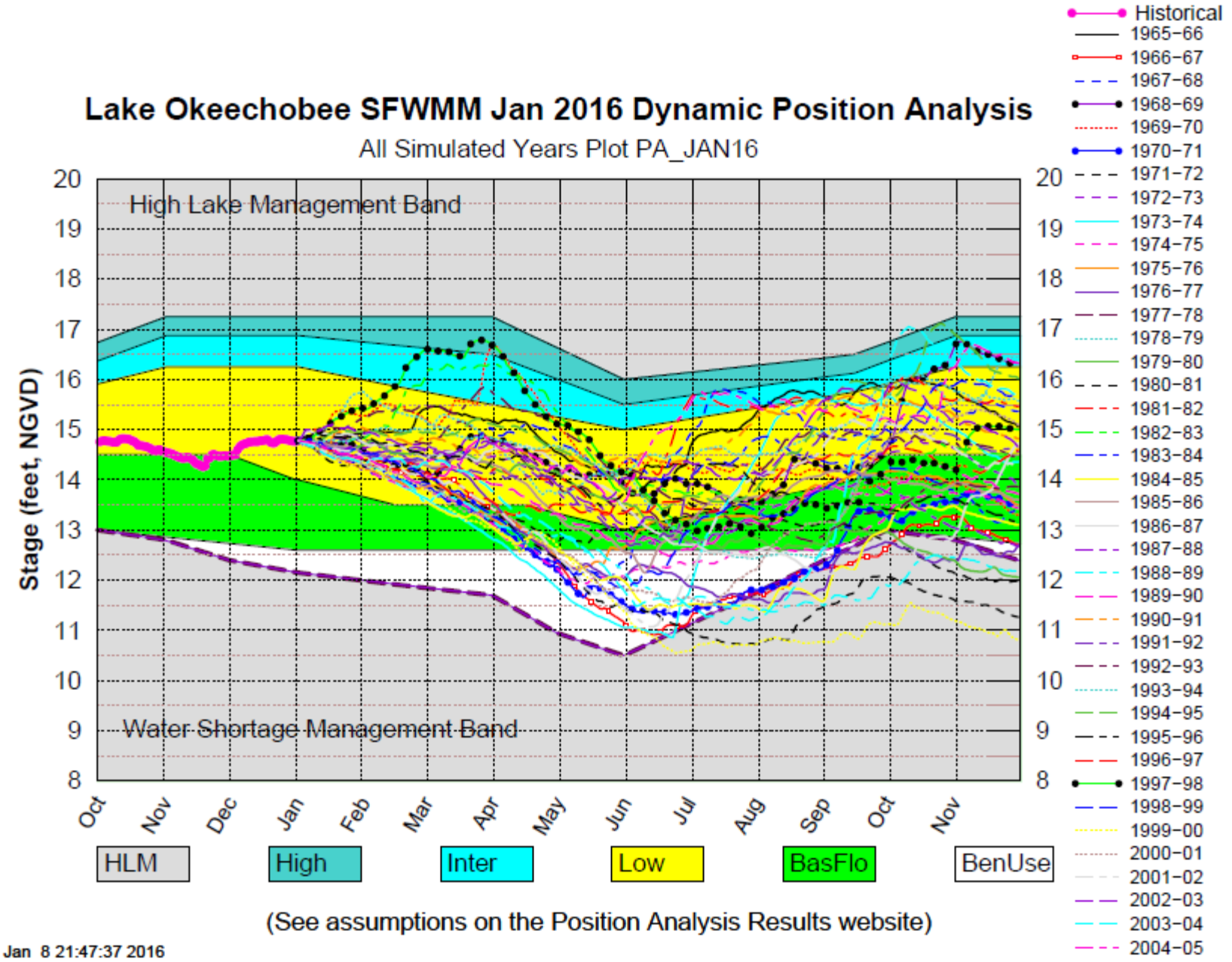

Annual AMO Index (1950-2015) - Calculated from Klotzbach and Gray (2008)
Standardized Values
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
1950
1952
1954
1956
1958
1960
1962
1964
1966
1968
1970
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014

Lake Okeechobee SFWMM Jan 2016 Dynamic Position Analysis

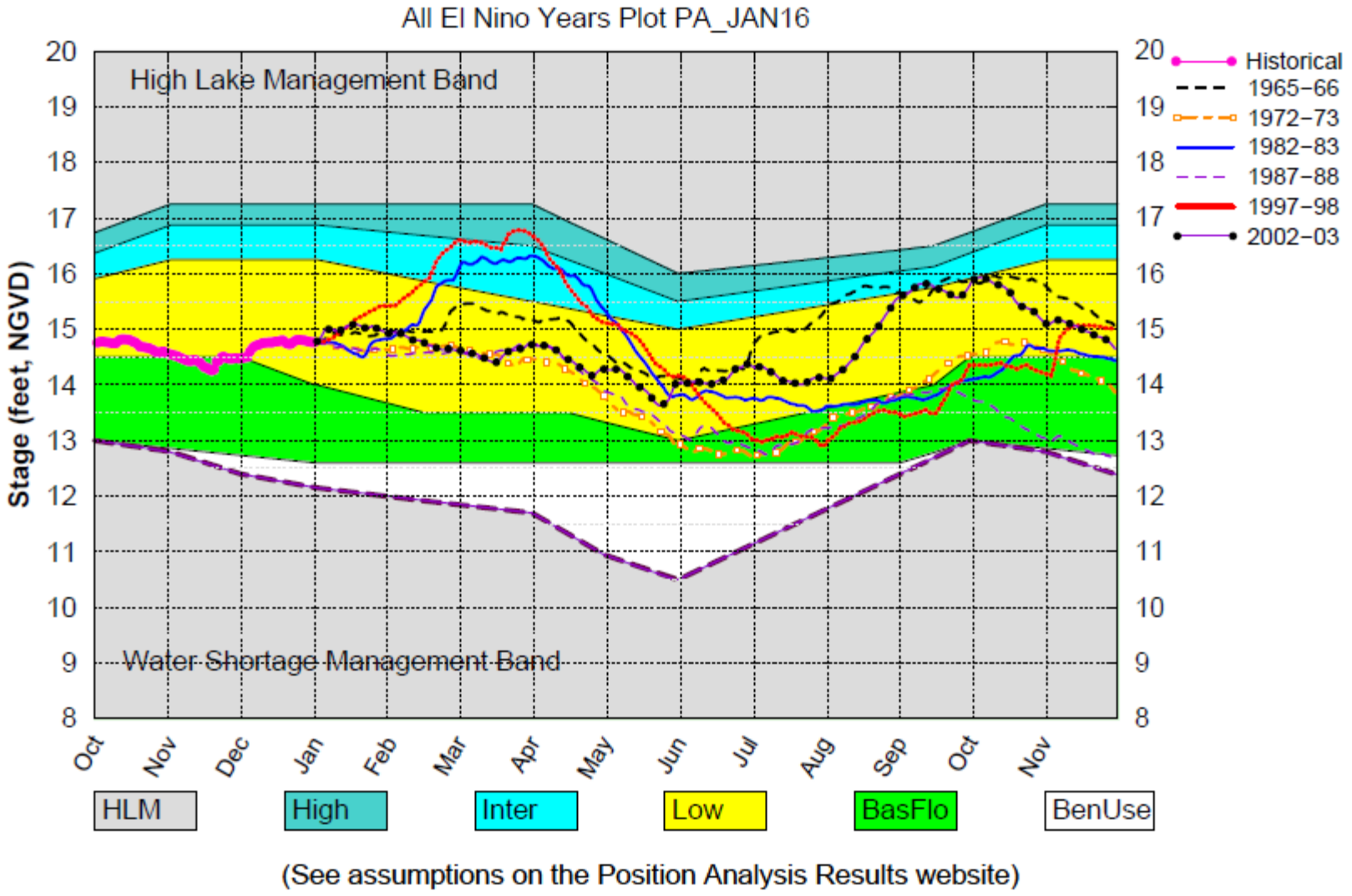


(See assumptions on the Position Analysis Results website)

Fri Jan 8 21:44:27 2016


Lake Okeechobee SFWMM Jan 2016 Dynamic Position Analysis
All Simulated Years Plot PA_JAN16
High Lake Management Band
Water Shortage Management Band
Stage (feet, NGVD)
20
19
18
17
16
15
14
13
12
11
10
9
8
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
HLM
High
Inter
Low
BasFlo
BenUse
(See assumptions on the Position Analysis Results website)
Historical
1965-66
1966-67
1967-68
1968-69
1969-70
1970-71
1971-72
1972-73
1973-74
1974-75
1975-76
1976-77
1977-78
1978-79
1979-80
1980-81
1981-82
1982-83
1983-84
1984-85
1985-86
1986-87
1987-88
1988-89
1989-90
1990-91
1991-92
1992-93
1993-94
1994-95
1995-96
1996-97
1997-98
1998-99
1999-00
2000-01
2001-02
2002-03
2003-04
2004-05
Fri Jan 8 21:47:37 2016

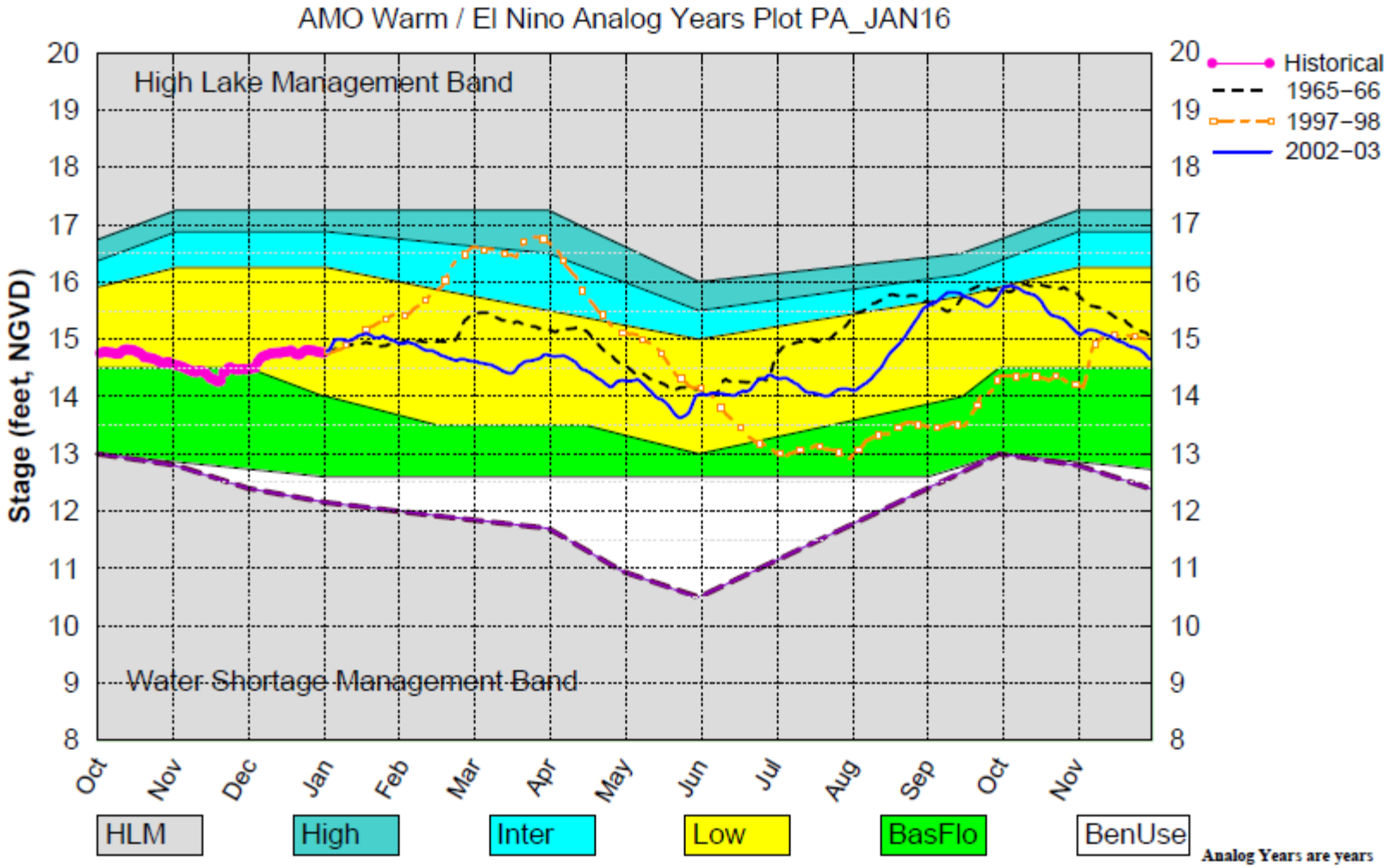
Lake Okeechobee SFWMM Jan 2016 Dynamic Position Analysis



(See assumptions on the Position Analysis Results website)

Fri Jan 8 21:45:10 2016

Lake Okeechobee SFWMM Jan 2016 Dynamic Position Analysis



(See assumptions on the Position Analysis Results website)

Analog Years are years with similar climatological conditions to the current year.

Fri Jan 8 21:45:15 2016