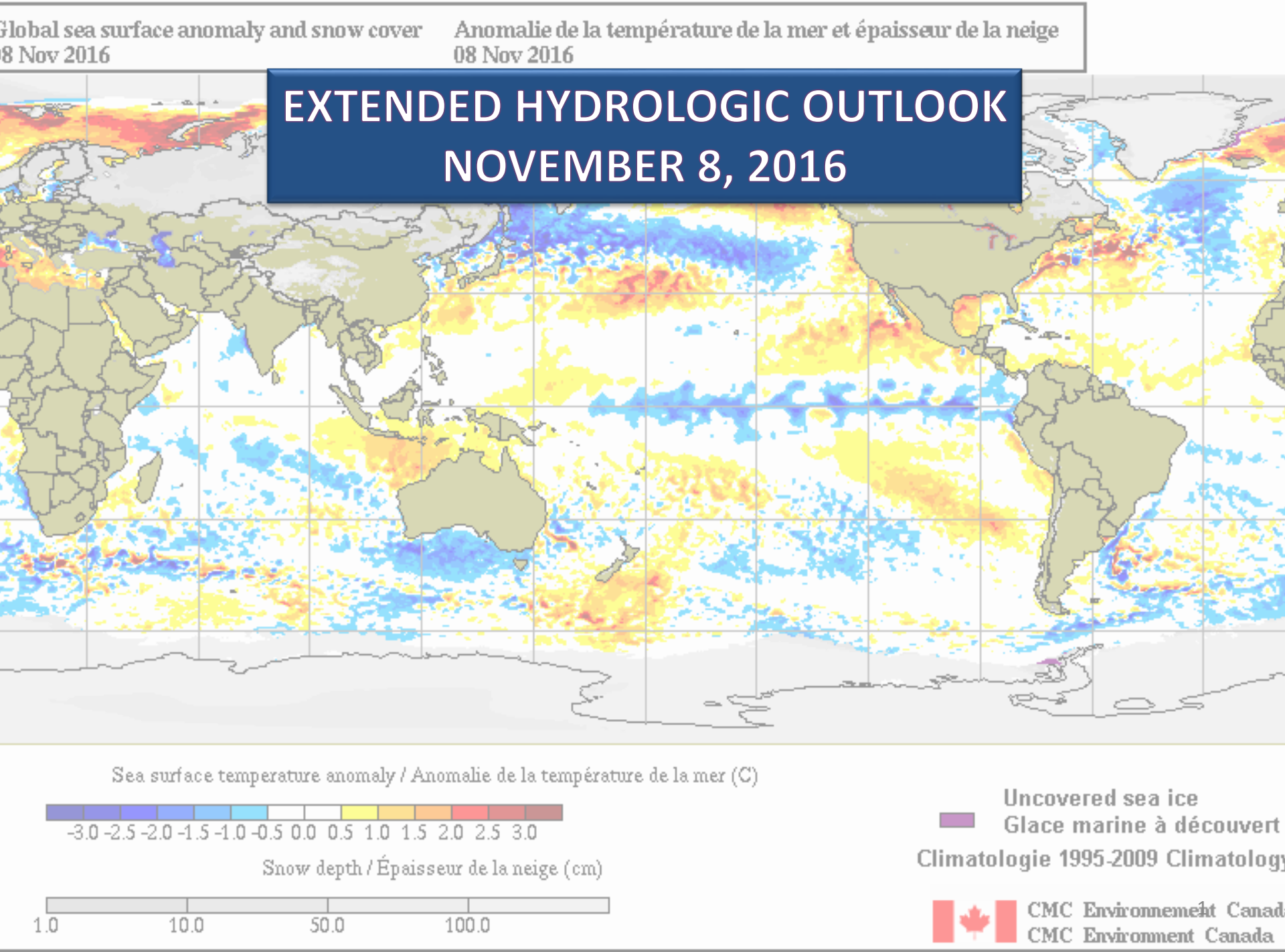
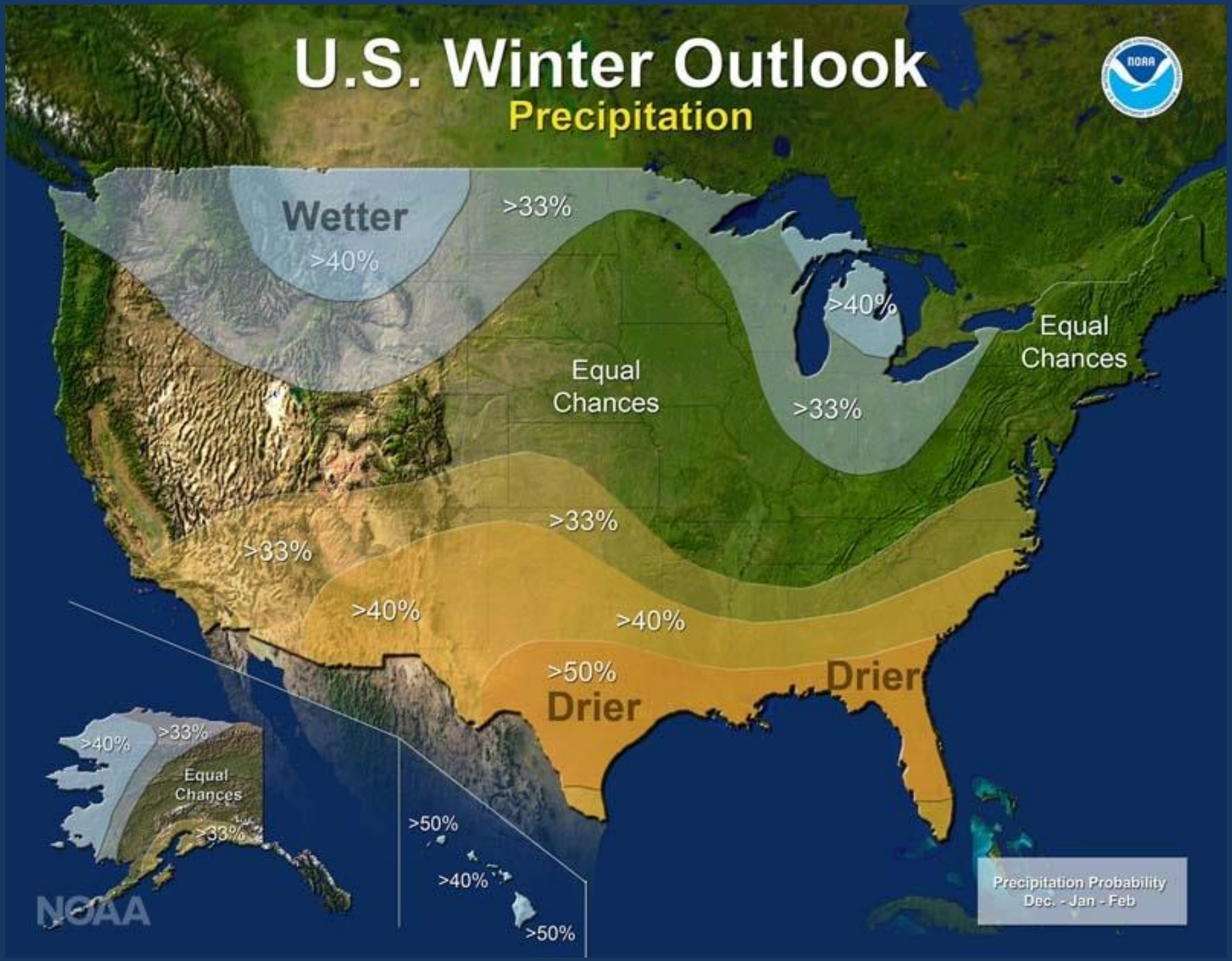
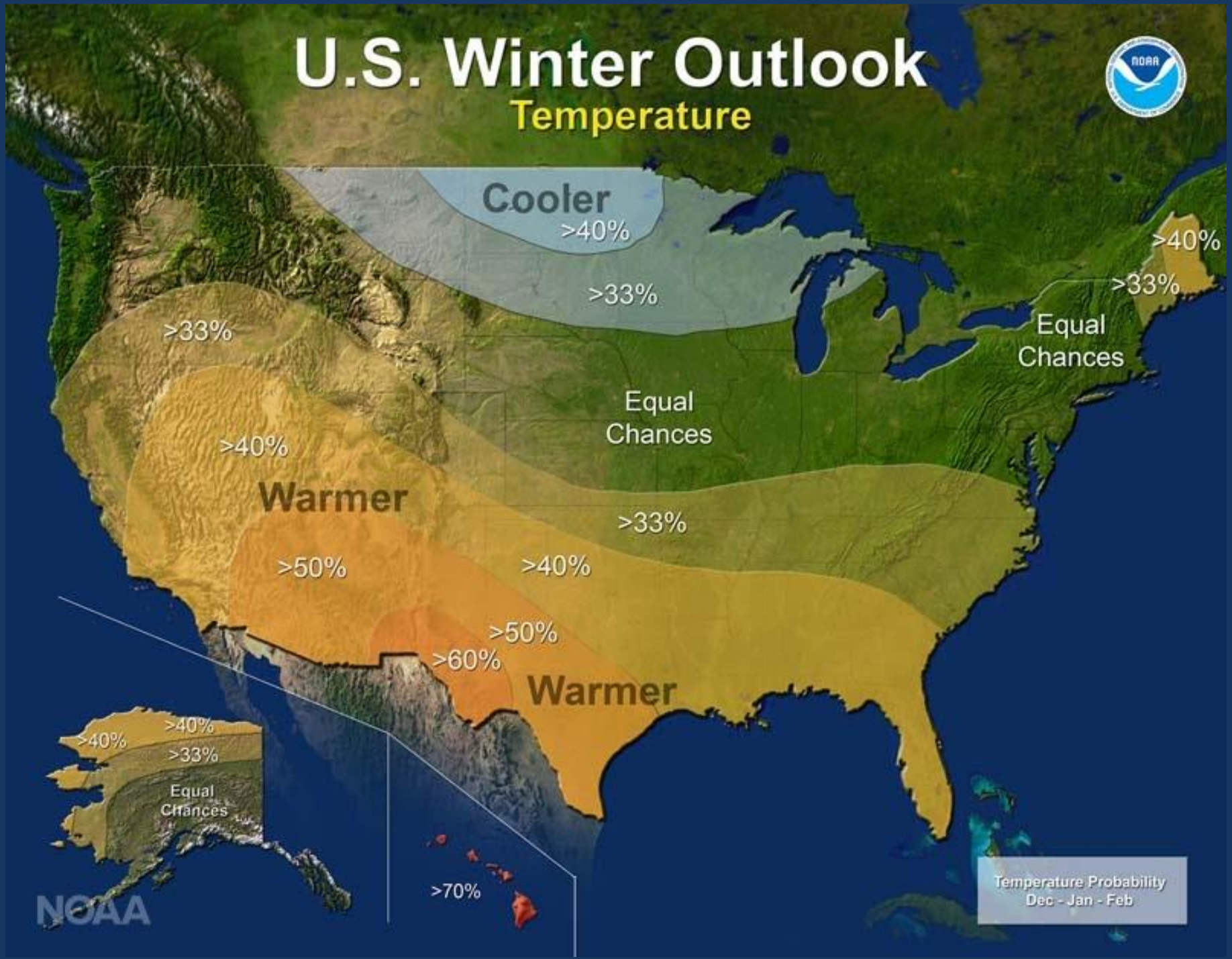
EXTENDED HYDROLOGIC OUTLOOK
NOVEMBER 8, 2016



Summary

- The Climate Prediction Center (CPC) is forecasting below normal for the Kissimmee and Lake Okeechobee areas and slightly below normal rainfall for areas south of Lake Okeechobee during November through January.
- ENSO-Neutral conditions are present. La Niña is favored to develop (~70% chance) during the fall 2016 and slightly favored to persist (~55% chance) during winter 2016-17.
- The strong positive phase of the Pacific Decadal Oscillation increases the potential for a greater number of El Niño events for multi-year periods.
- Monitoring Atlantic Multidecadal Oscillation (AMO) index for switch to negative (cold) phase, this has the potential to contribute to a drier-than-normal 2016 wet season. A good indicator of switch to the AMO cold phase will be an average to below-average hurricane season.


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

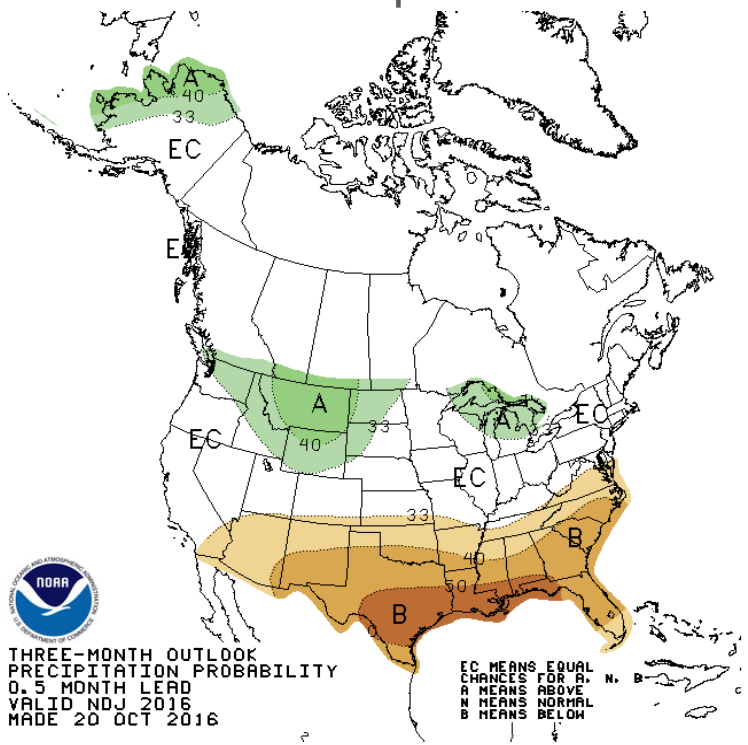

U.S. Winter Outlook
Temperature
Cooler
>40%
>33%
>33%
>40%
>33%
Equal Chances
Equal Chances
>40%
Warmer
>33%
>50%
>40%
>50%
>60%
Warmer
>40%
>40%
>33%
Equal Chances
>70%
Temperature Probability
Dec - Jan - Feb
NOAA

U. S. Seasonal Outlooks

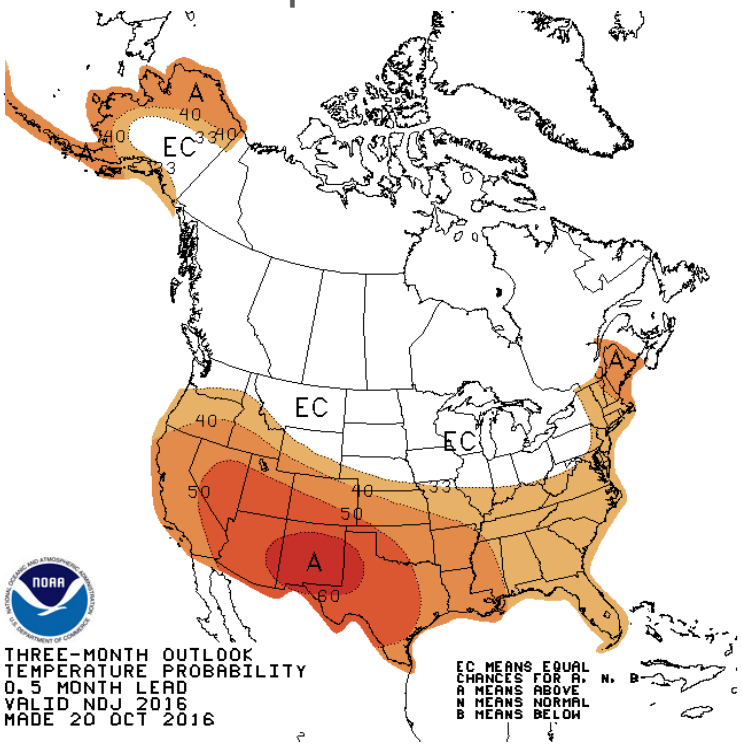
November 2016 – January 2017

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

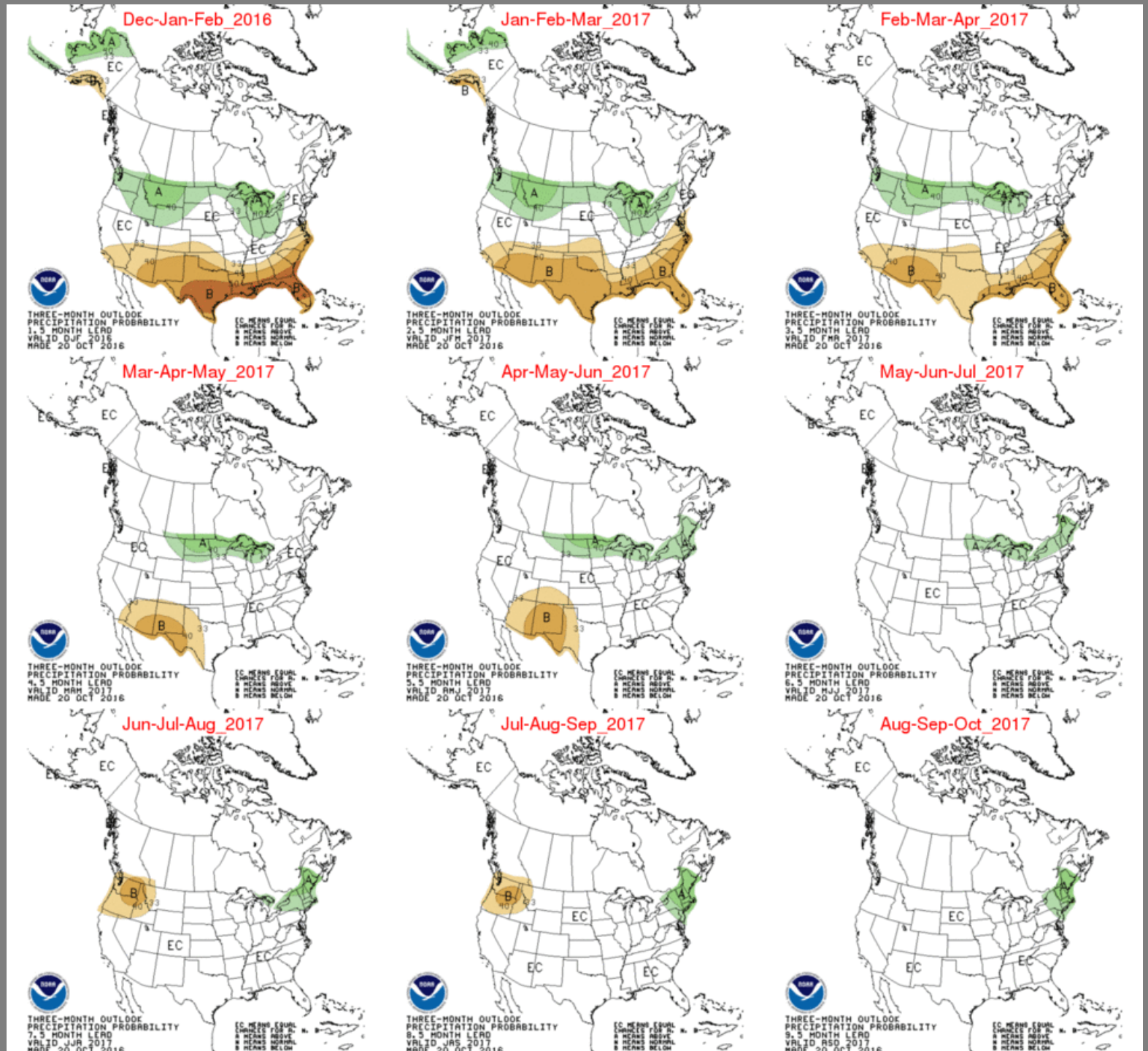
Precipitation



Temperature

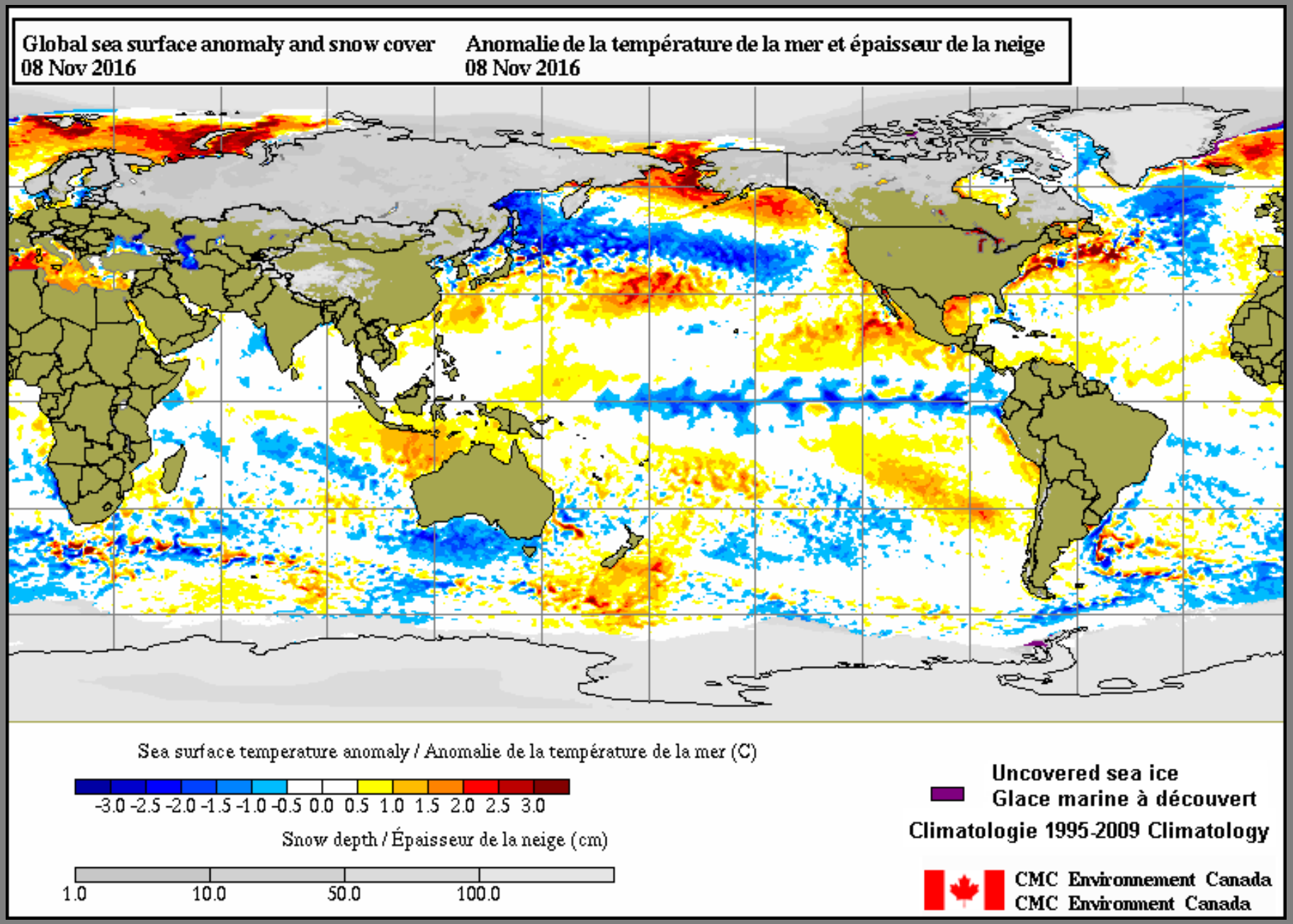


Prepared by: Climate Prediction Center / NCEP



Prepared by: Climate Prediction Center / NCEP

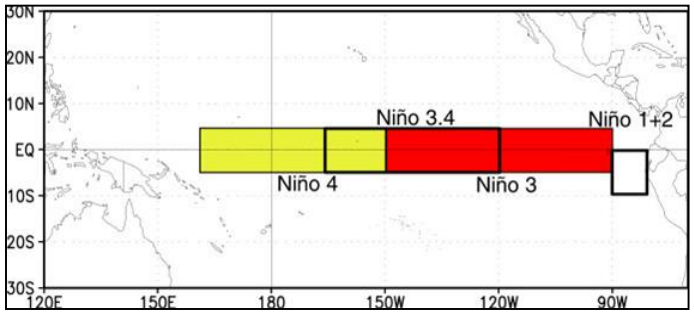
Current Global Sea Surface Temperature Anomalies

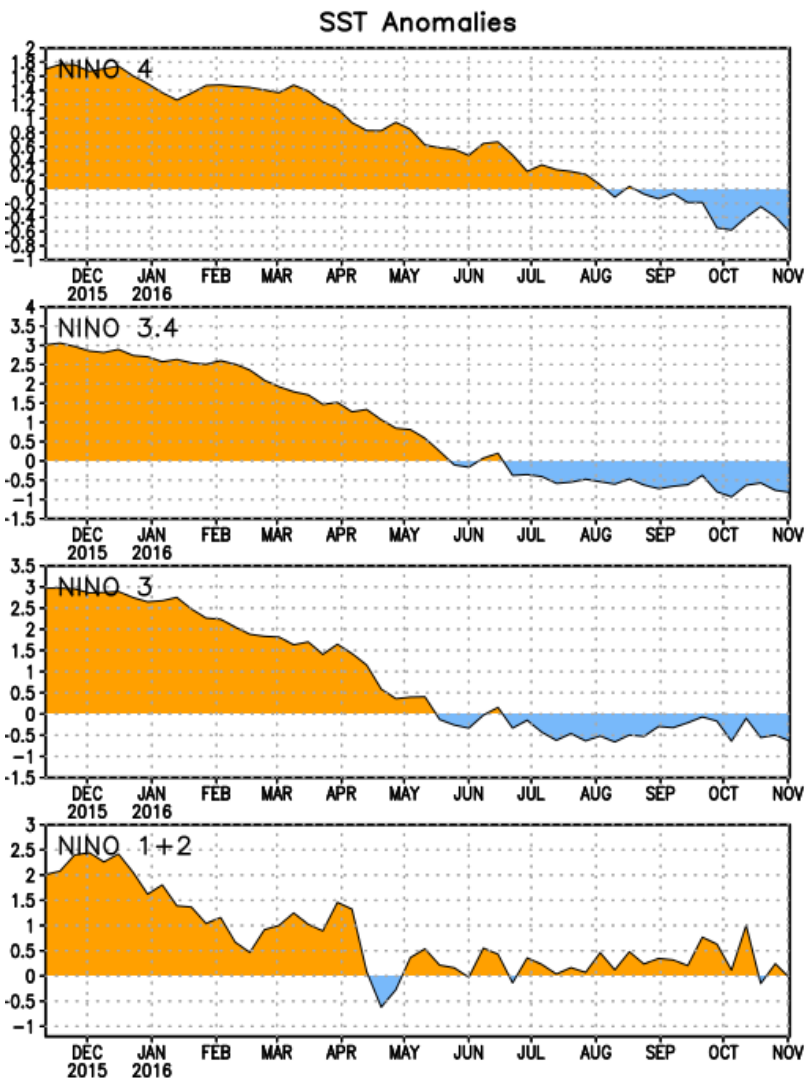


Niño Region SST Departures (ºC) Recent Evolution

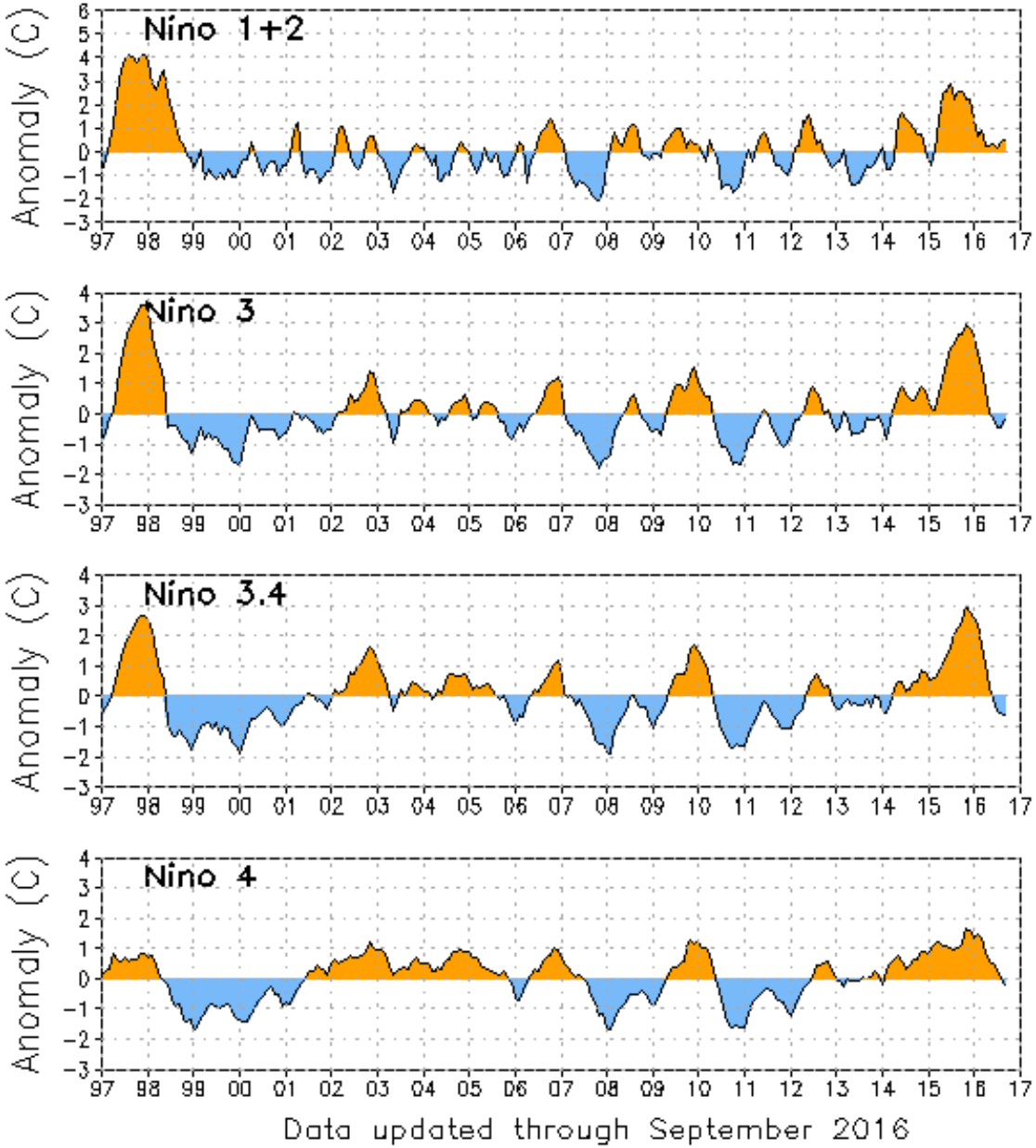
The latest weekly SST departures are:

Niño 4	-0.6ºC
Niño 3.4	-0.8ºC
Niño 3	-0.6ºC
Niño 1+2	0.0ºC





Prepared by: Climate Prediction Center / NCEP

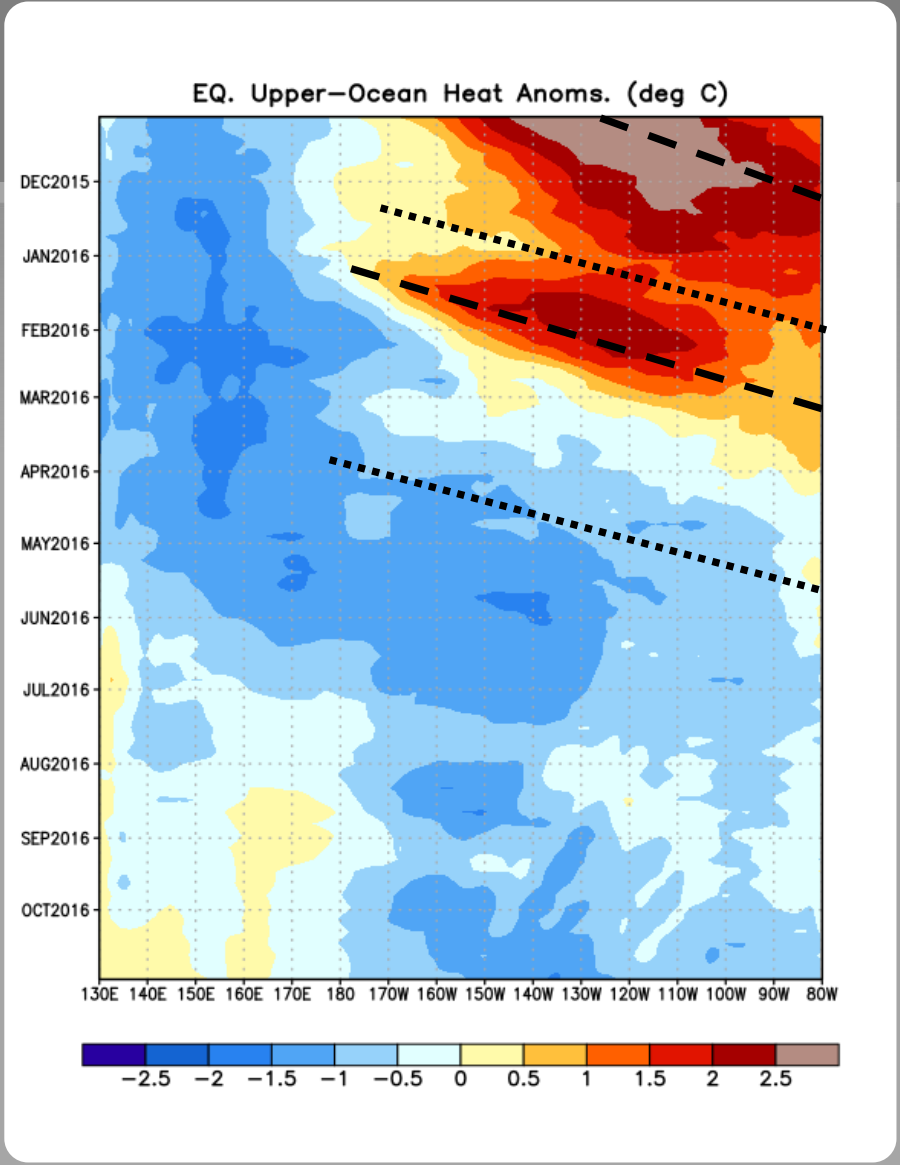

Nino 1+2
Nino 3
Nino 3.4
Nino 4
Anomaly (C)
97 98 99 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17
Data updated through September 2016

Weekly Heat Content Evolution in the Equatorial Pacific

Downwelling phases of equatorial oceanic Kelvin waves were observed October-November 2015 and January-February 2016.

Since the passage of an upwelling equatorial oceanic Kelvin wave in March 2016, below-average subsurface temperatures have continued across much of the equatorial Pacific.

Since mid- September 2016, below-average subsurface temperatures have strengthened east of the International Date Line.



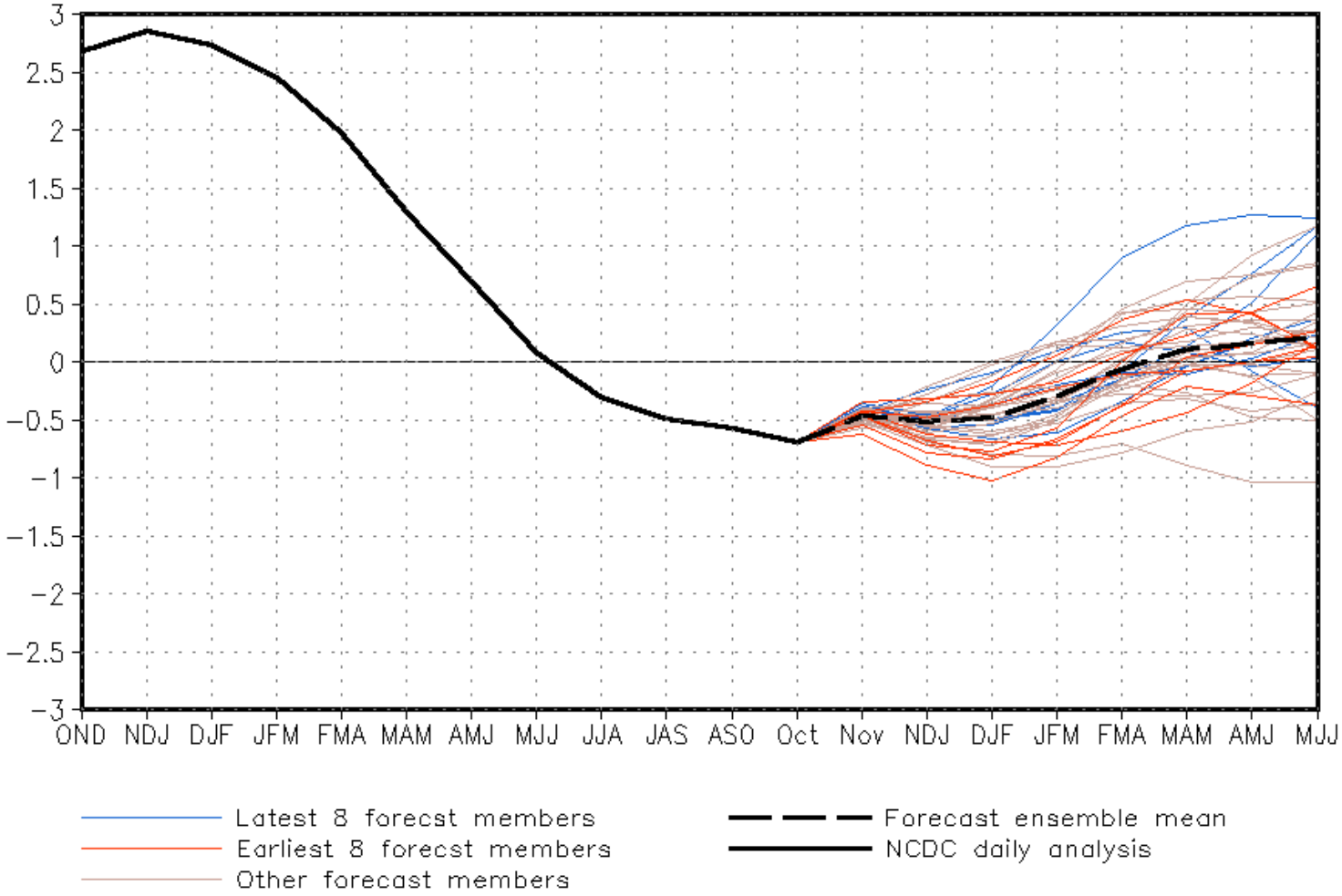
Equatorial oceanic Kelvin waves have alternating warm and cold phases. The warm phase is indicated by dashed lines. Down-welling and warming occur in the leading portion of a Kelvin wave, and up-welling and cooling occur in the trailing portion.

Prepared by: Climate Prediction Center / NCEP

NWS/NCEP/CPC

Last update: Tue Nov 8 2016
Initial conditions: 28Oct2016–6Nov2016

CFSv2 forecast Nino3.4 SST anomalies (K)



IRI/CPC Pacific Niño 3.4 SST Model Outlook

Most multi-model averages indicate weak La Niña conditions during the Northern Hemisphere fall and early winter 2016-17.

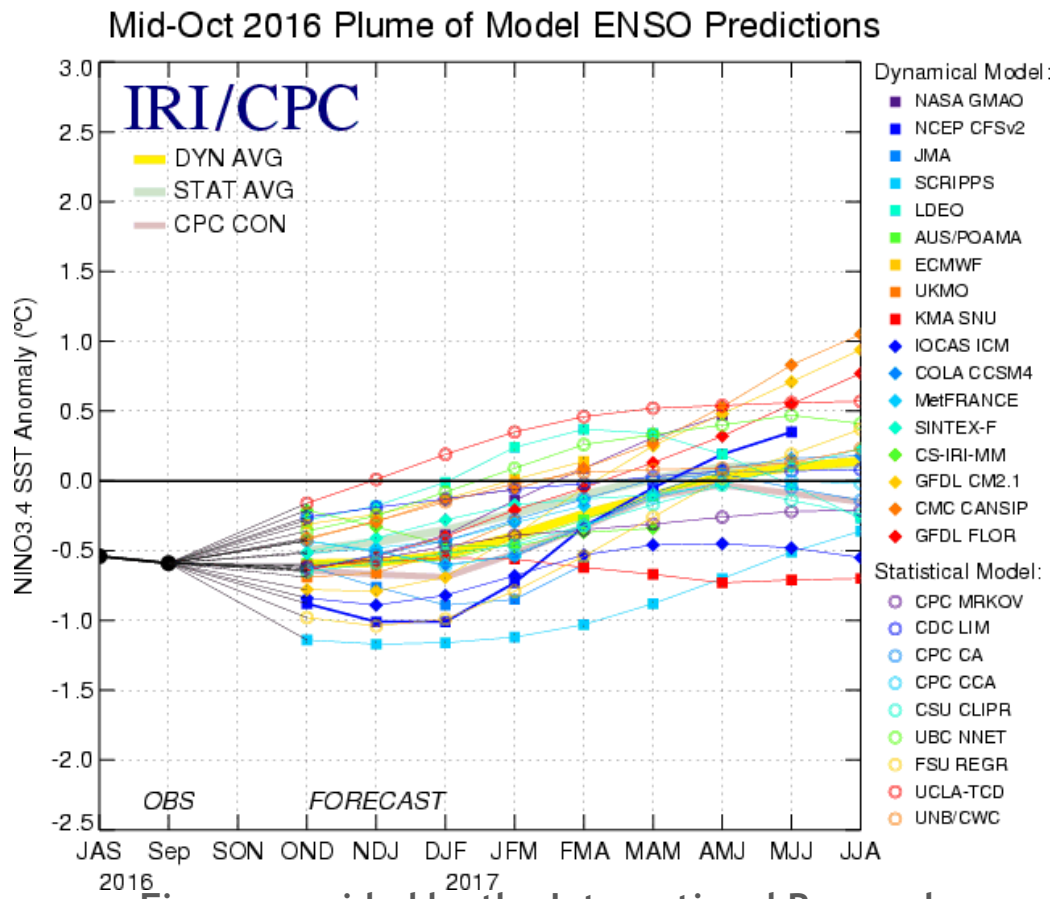


Figure provided by the International Research Institute (IRI) for Climate and Society (updated 18 October 2016).

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.

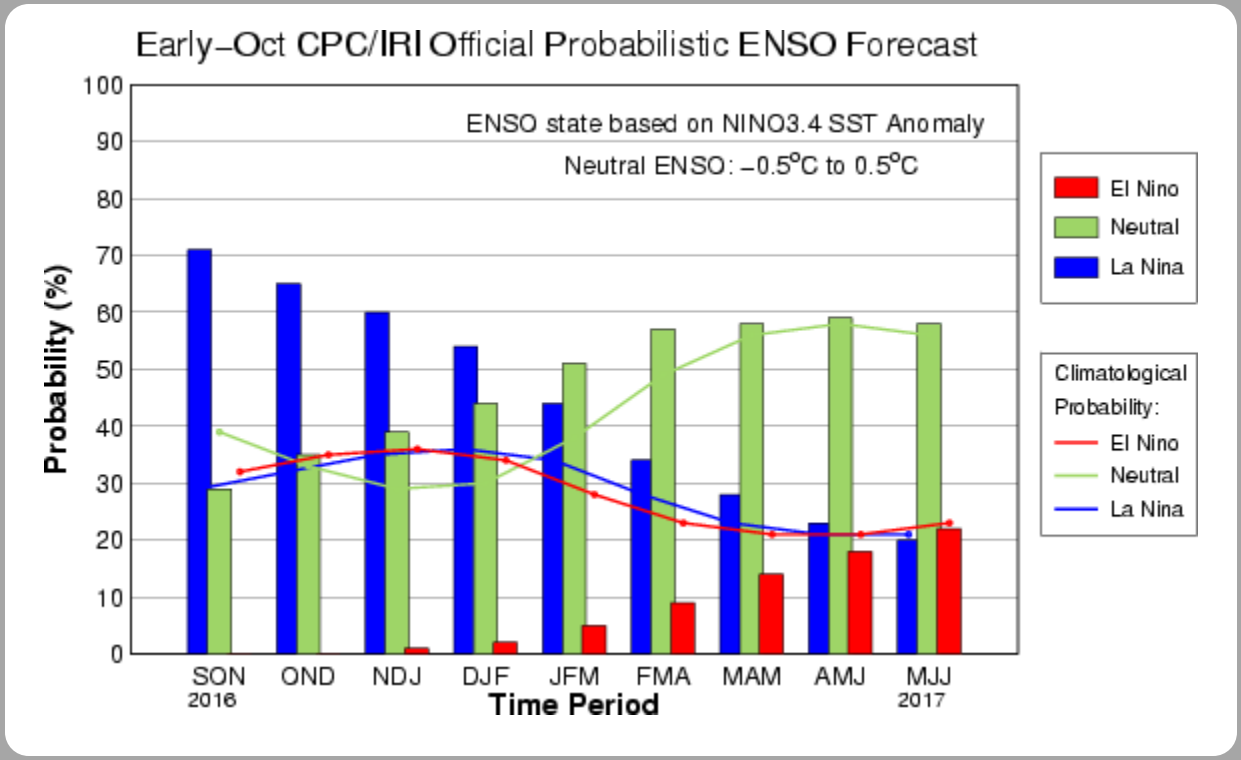
The ONI is one measure of the El Niño-Southern Oscillation, and other indices can confirm whether features consistent with a coupled ocean-atmosphere phenomenon accompanied these periods. The complete table going back to DJF 1950 can be found here.

Year	DJF	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ
2004	0.3	0.3	0.2	0.1	0.2	0.3	0.5	0.6	0.7	0.7	0.6	0.7
2005	0.7	0.6	0.5	0.5	0.3	0.2	0.0	-0.1	0.0	-0.2	-0.5	-0.7
2006	-0.7	-0.6	-0.4	-0.2	0.0	0.0	0.1	0.3	0.5	0.7	0.9	0.9
2007	0.7	0.4	0.1	-0.1	-0.2	-0.3	-0.4	-0.6	-0.9	-1.1	-1.3	-1.3
2008	-1.4	-1.3	-1.1	-0.9	-0.7	-0.5	-0.4	-0.3	-0.3	-0.4	-0.6	-0.7
2009	-0.7	-0.6	-0.4	-0.1	0.2	0.4	0.5	0.5	0.6	0.9	1.1	1.3
2010	1.3	1.2	0.9	0.5	0.0	-0.4	-0.9	-1.2	-1.4	-1.5	-1.4	-1.4
2011	-1.3	-1.0	-0.7	-0.5	-0.4	-0.3	-0.3	-0.6	-0.8	-0.9	-1.0	-0.9
2012	-0.7	-0.5	-0.4	-0.4	-0.3	-0.1	0.1	0.3	0.3	0.3	0.1	-0.2
2013	-0.4	-0.4	-0.3	-0.2	-0.2	-0.2	-0.3	-0.3	-0.2	-0.3	-0.3	-0.3
2014	-0.5	-0.5	-0.4	-0.2	-0.1	0.0	-0.1	0.0	0.1	0.4	0.5	0.6
2015	0.6	0.5	0.6	0.7	0.8	1.0	1.2	1.4	1.7	2.0	2.2	2.3
2016	2.2	2.0	1.6	1.1	0.6	0.1	-0.3	-0.6	-0.7			

CPC/IRI Probabilistic ENSO Outlook

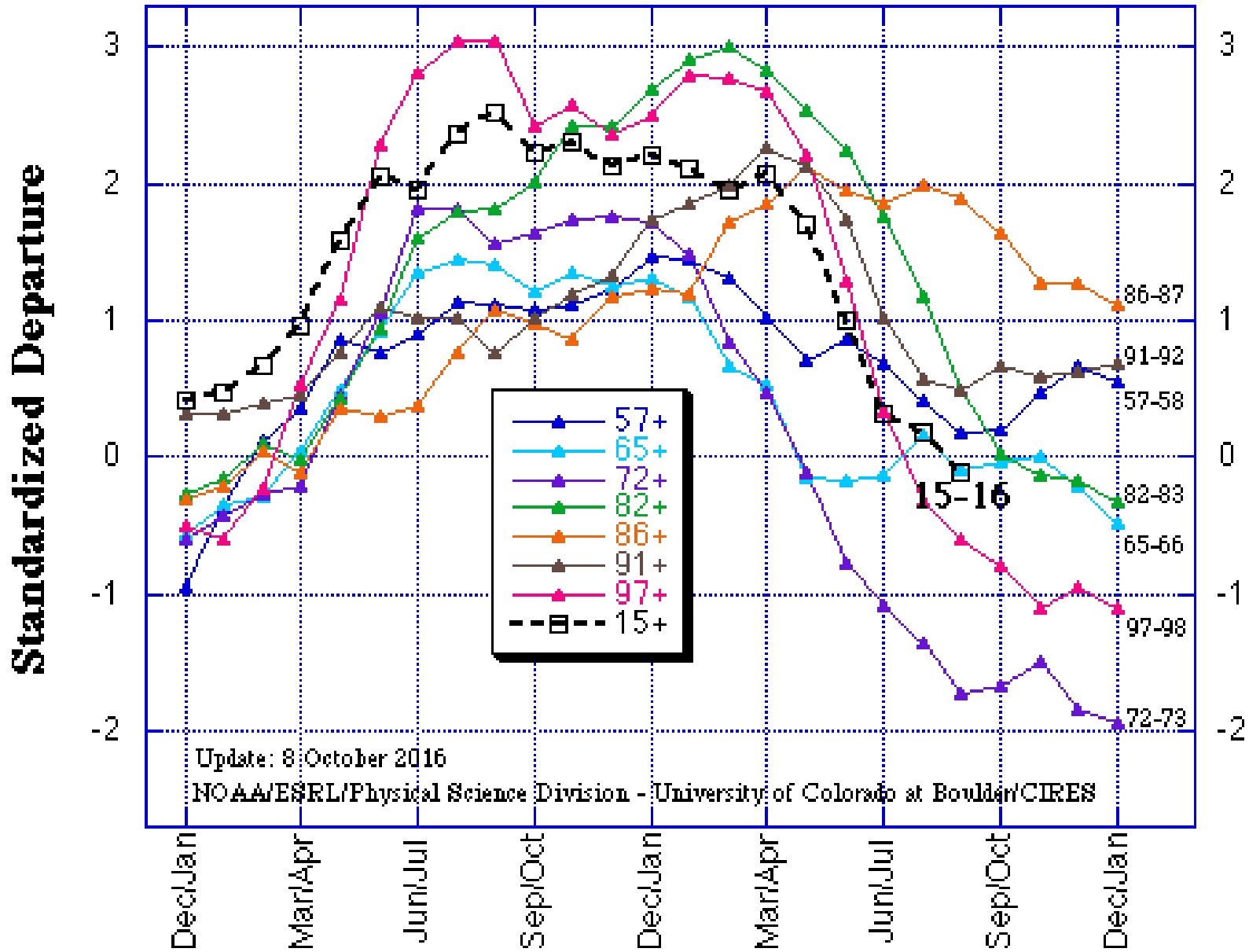
Updated: 13 October 2016

La Niña is favored to develop (~70% chance) during the Northern Hemisphere fall 2016 and slightly favored to persist (~55% chance) during winter 2016-17.

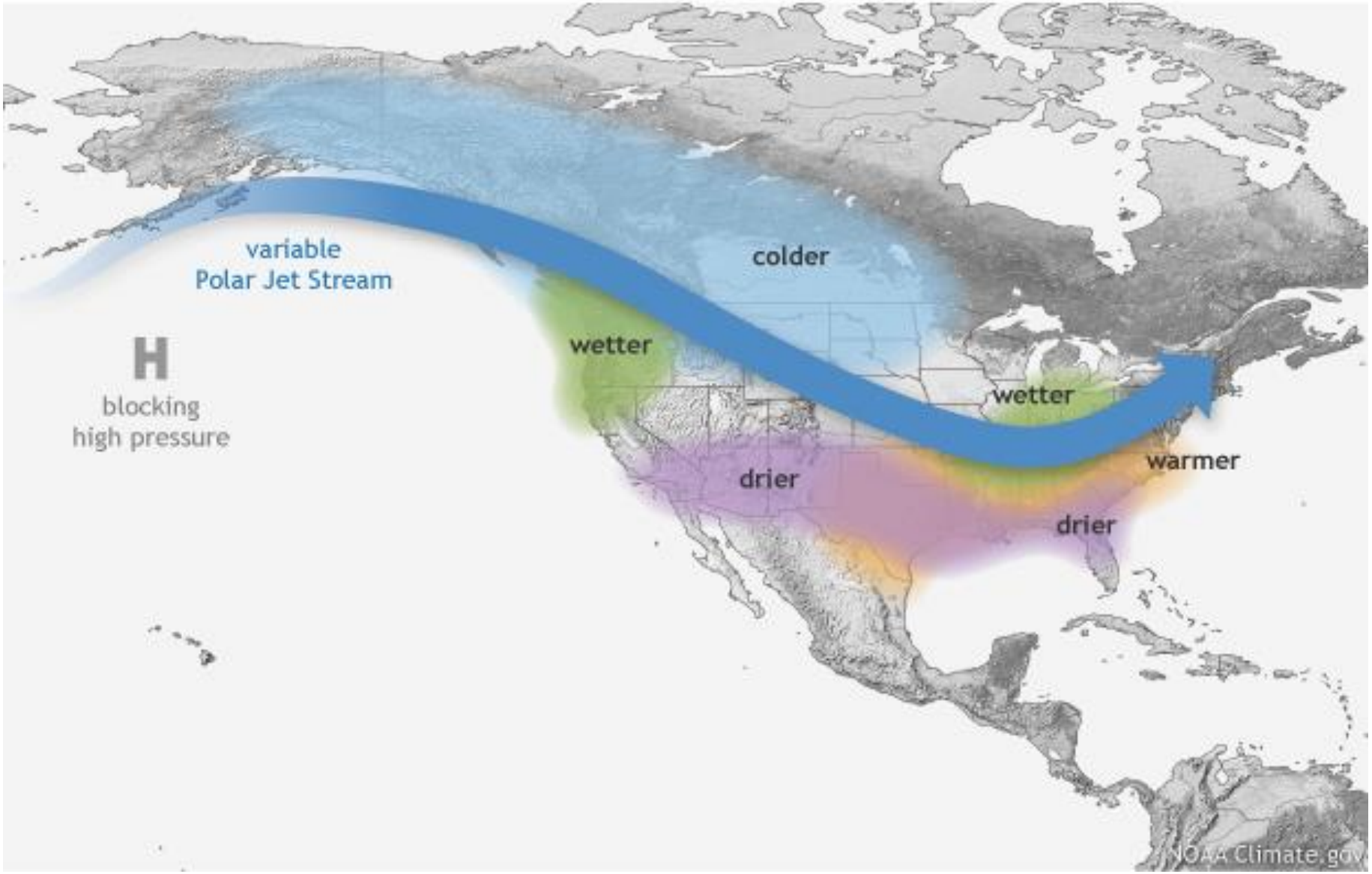


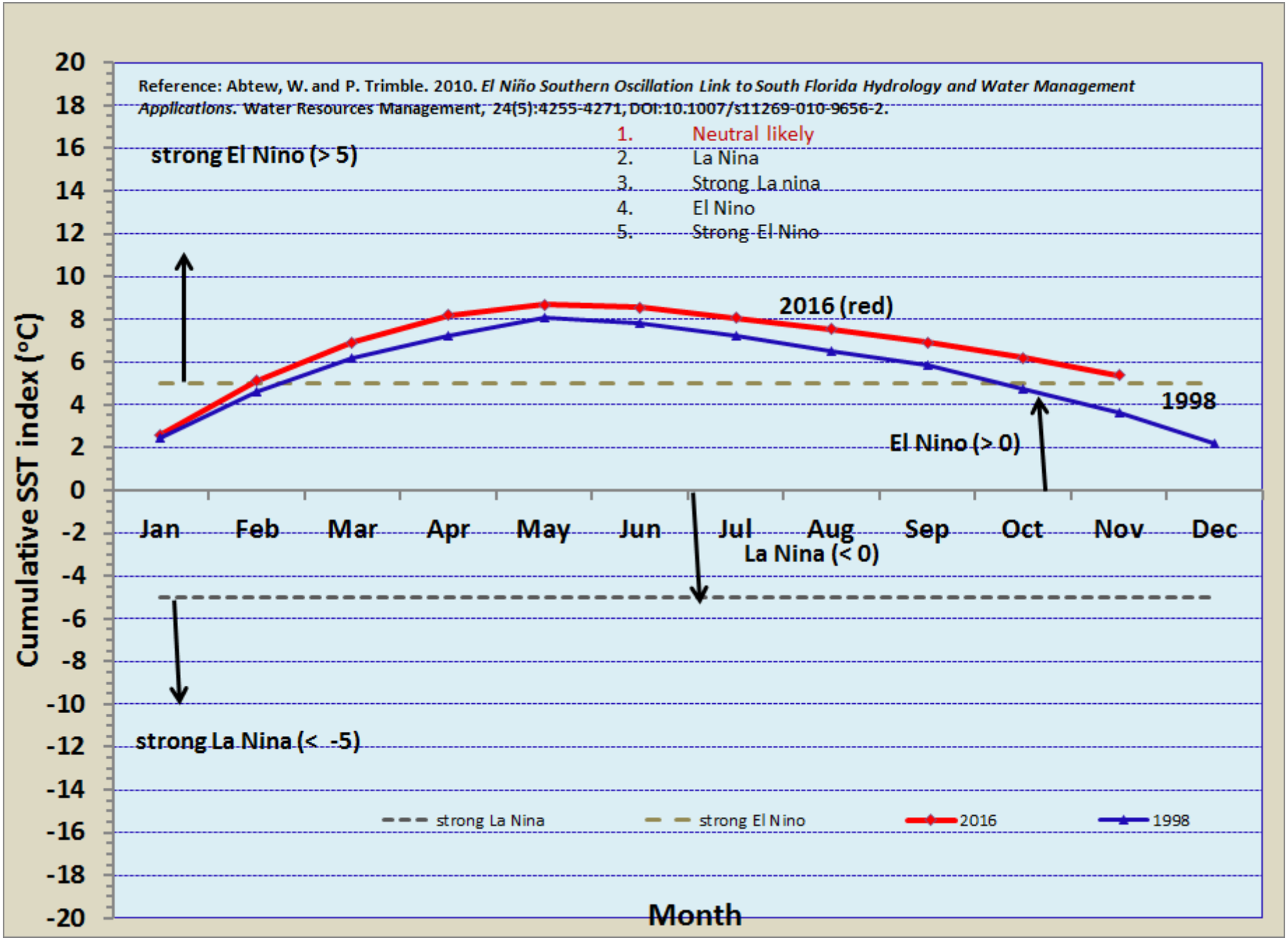
Prepared by: Climate Prediction Center / IRI

Multivariate ENSO Index (MEI) for the seven strongest El Niño events since 1950 vs. 2015-16

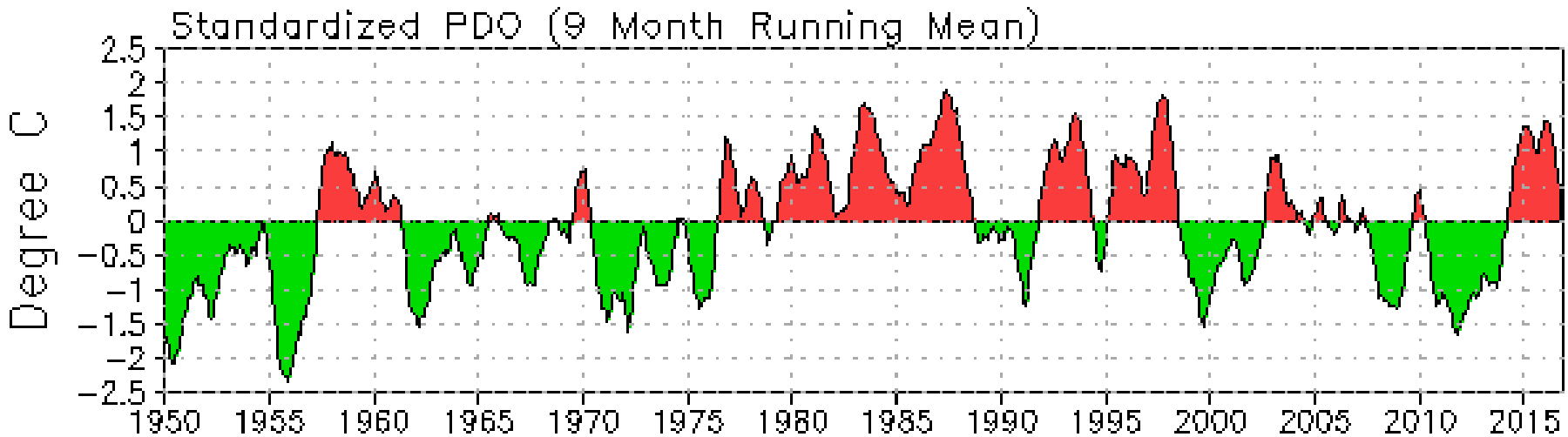


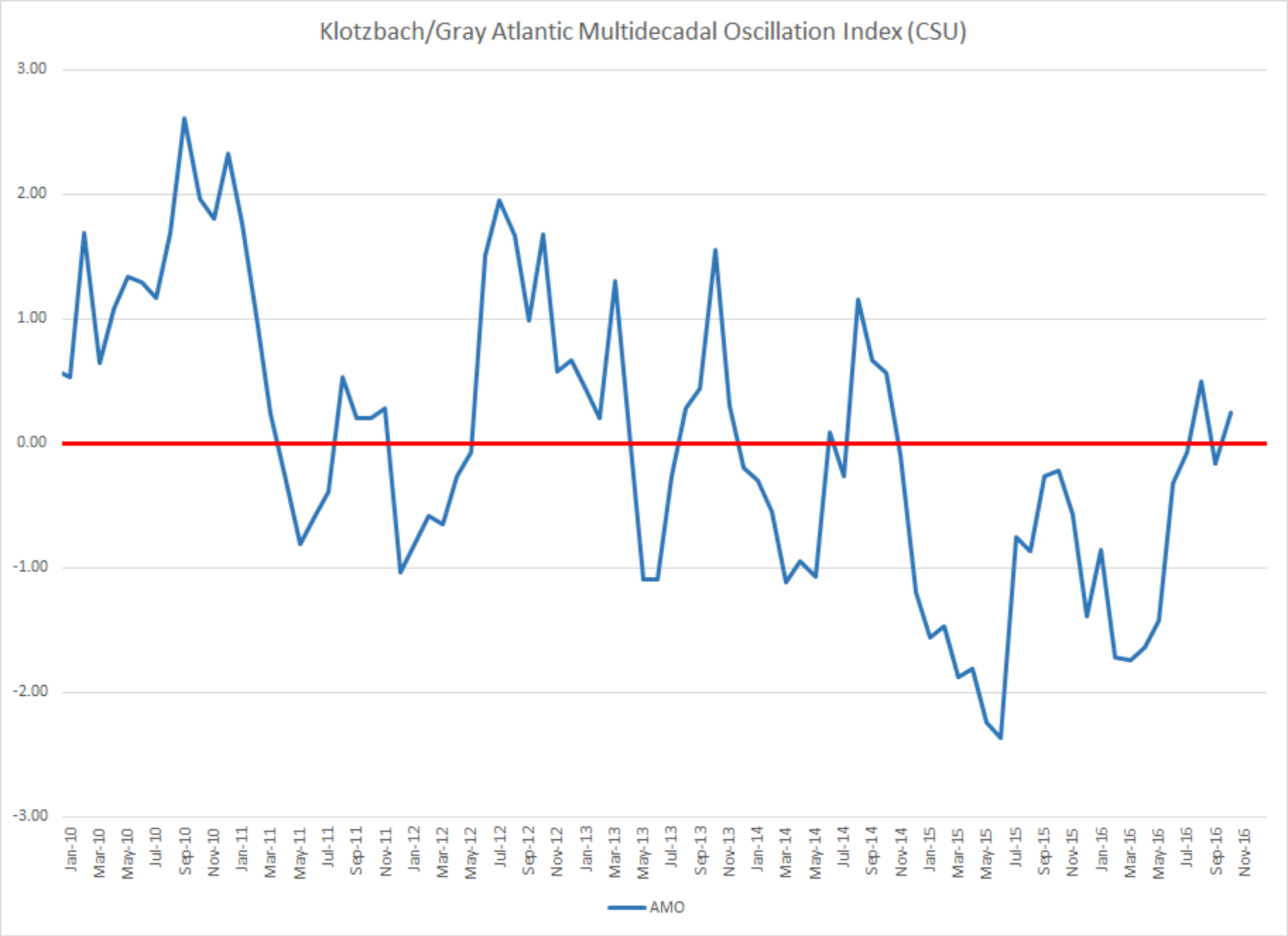
Wintertime La Niña pattern





Source: Wossenu Abtew (SFWMD)


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


Klotzbach/Gray Atlantic Multidecadal Oscillation Index (CSU)
3.00
2.00
1.00
0.00
-1.00
-2.00
-3.00
Jan-10
Mar-10
May-10
Jul-10
Sep-10
Nov-10
Jan-11
Mar-11
May-11
Jul-11
Sep-11
Nov-11
Jan-12
Mar-12
May-12
Jul-12
Sep-12
Nov-12
Jan-13
Mar-13
May-13
Jul-13
Sep-13
Nov-13
Jan-14
Mar-14
May-14
Jul-14
Sep-14
Nov-14
Jan-15
Mar-15
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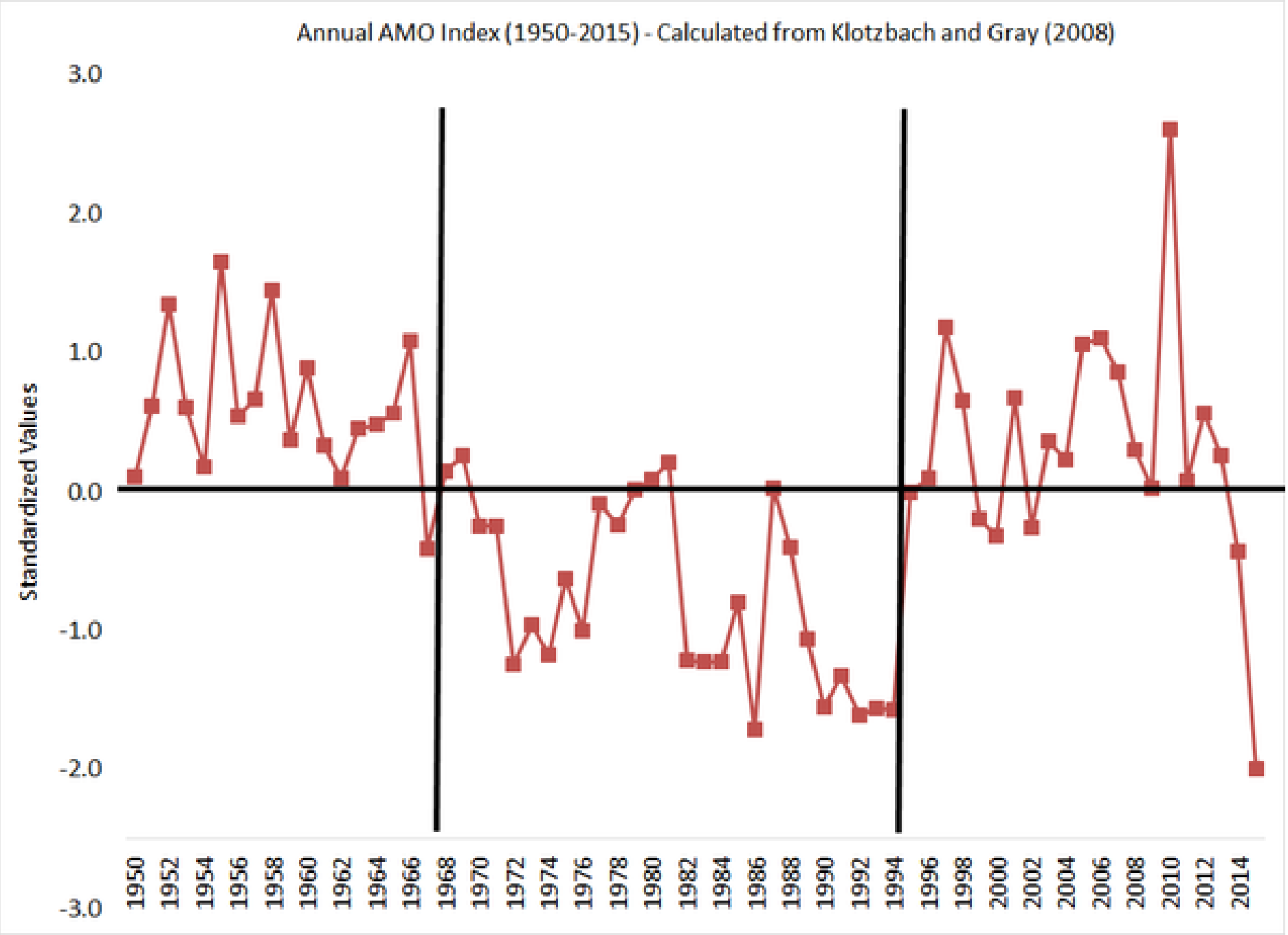
Sep-15
Nov-15
Jan-16
Mar-16
May-16
Jul-16
Sep-16
Nov-16
AMO


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
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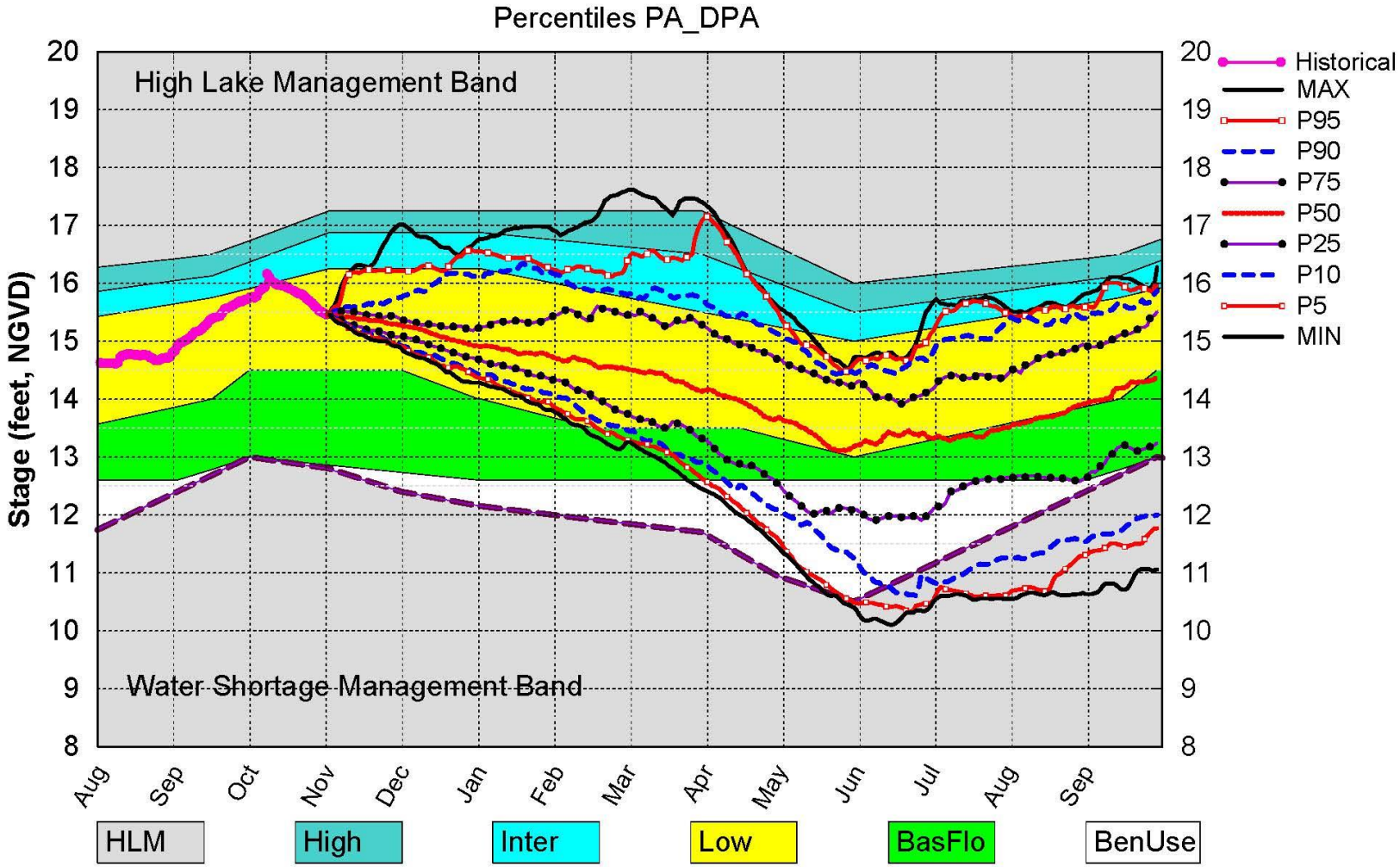
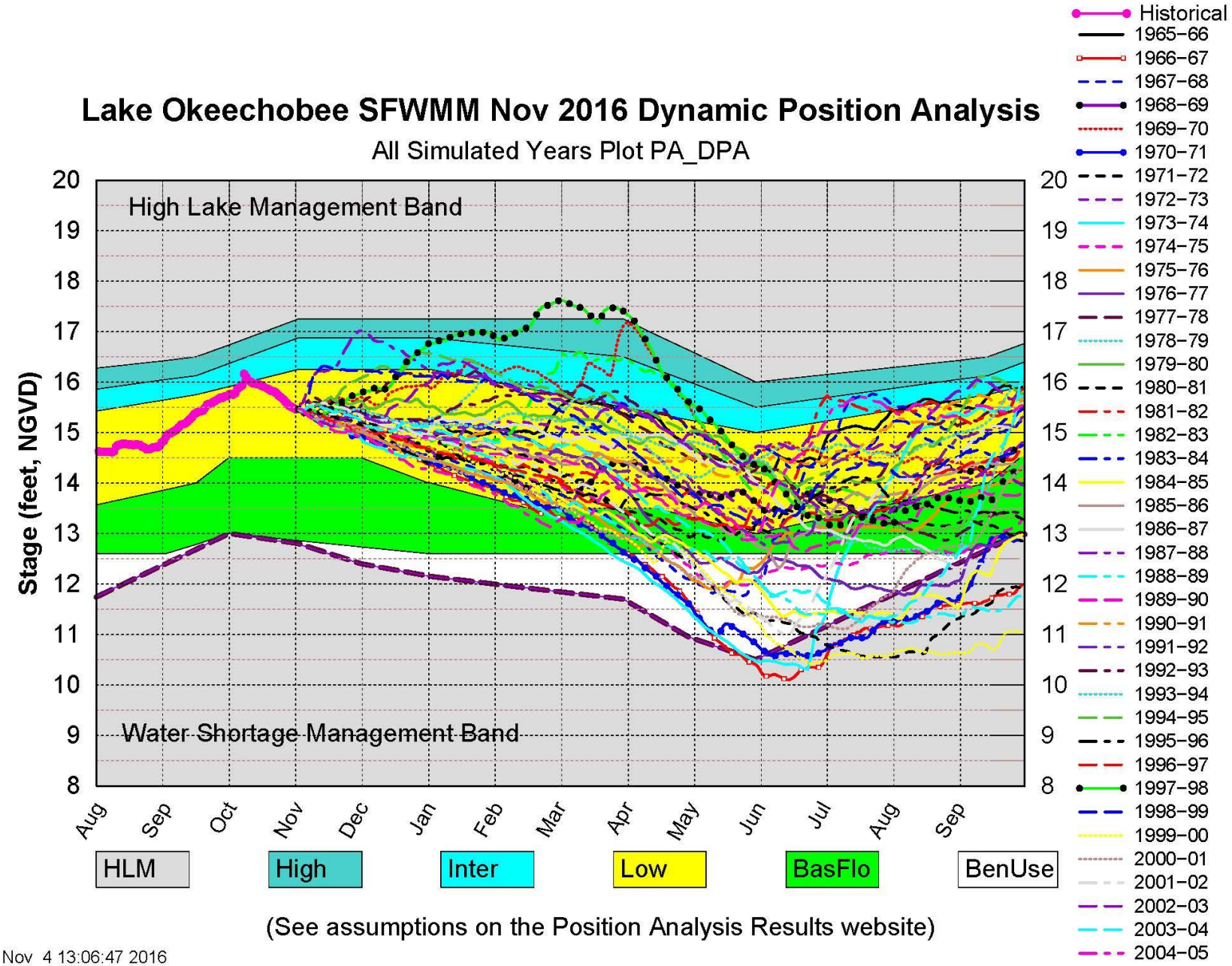
2000
2002
2004
2006
2008
2010
2012
2014

Lake Okeechobee SFWMM Nov 2016 Dynamic Position Analysis



(See assumptions on the Position Analysis Results website)

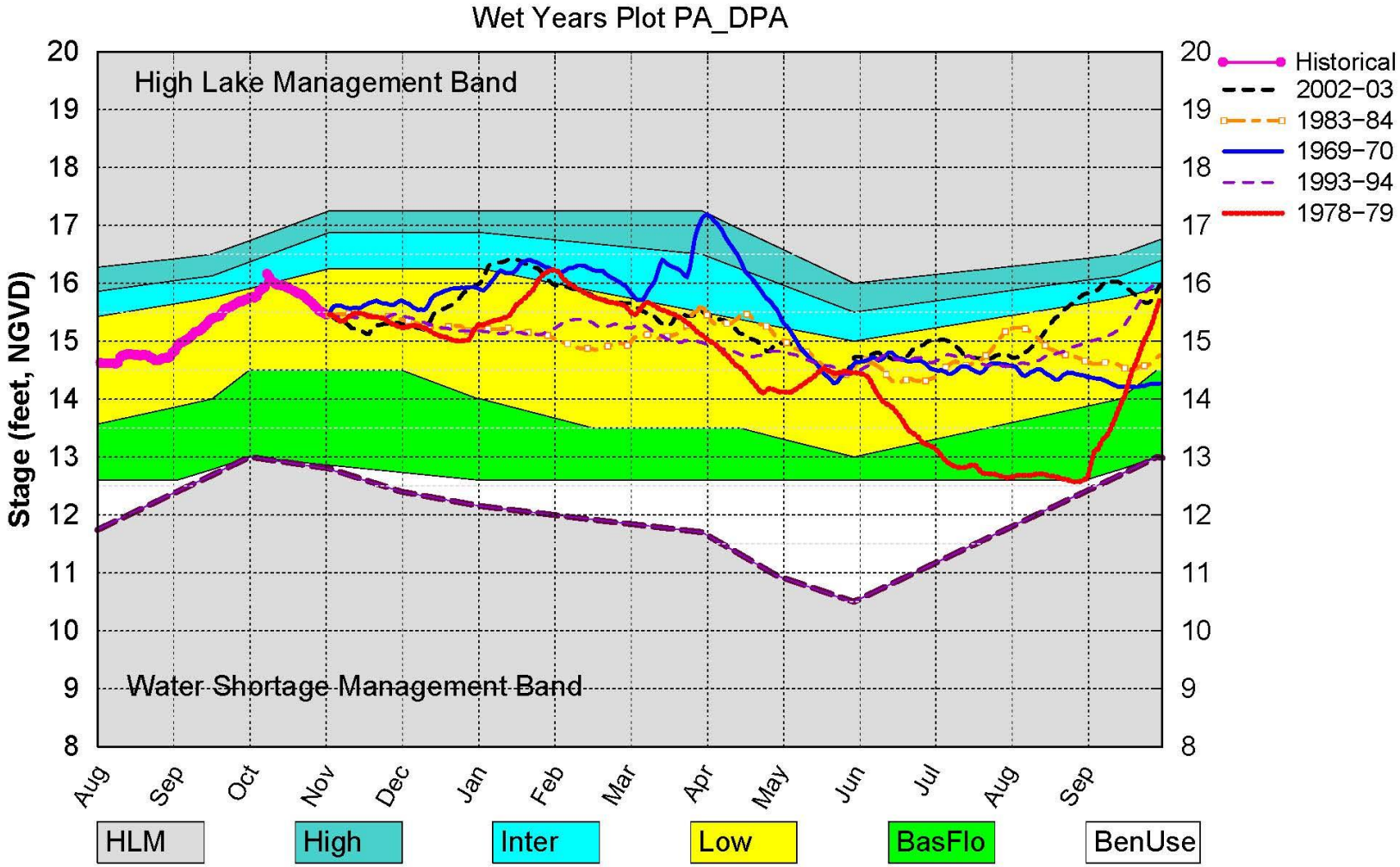
Fri Nov 4 13:05:34 2016



(See assumptions on the Position Analysis Results website)

Fri Nov 4 13:06:47 2016

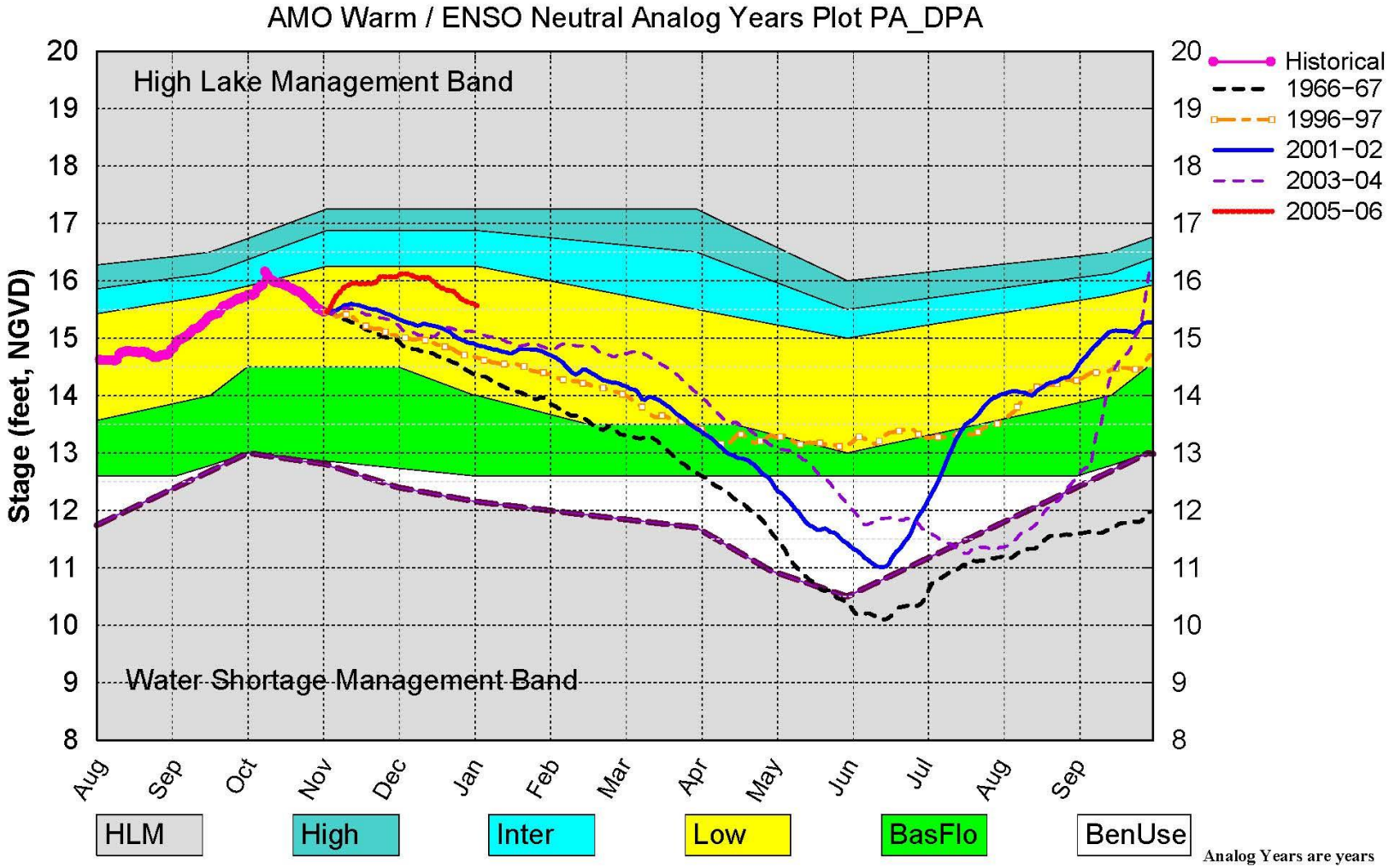
Lake Okeechobee SFWMM Nov 2016 Dynamic Position Analysis



(See assumptions on the Position Analysis Results website)

Fri Nov 4 13:05:58 2016

Lake Okeechobee SFWMM Nov 2016 Dynamic Position Analysis

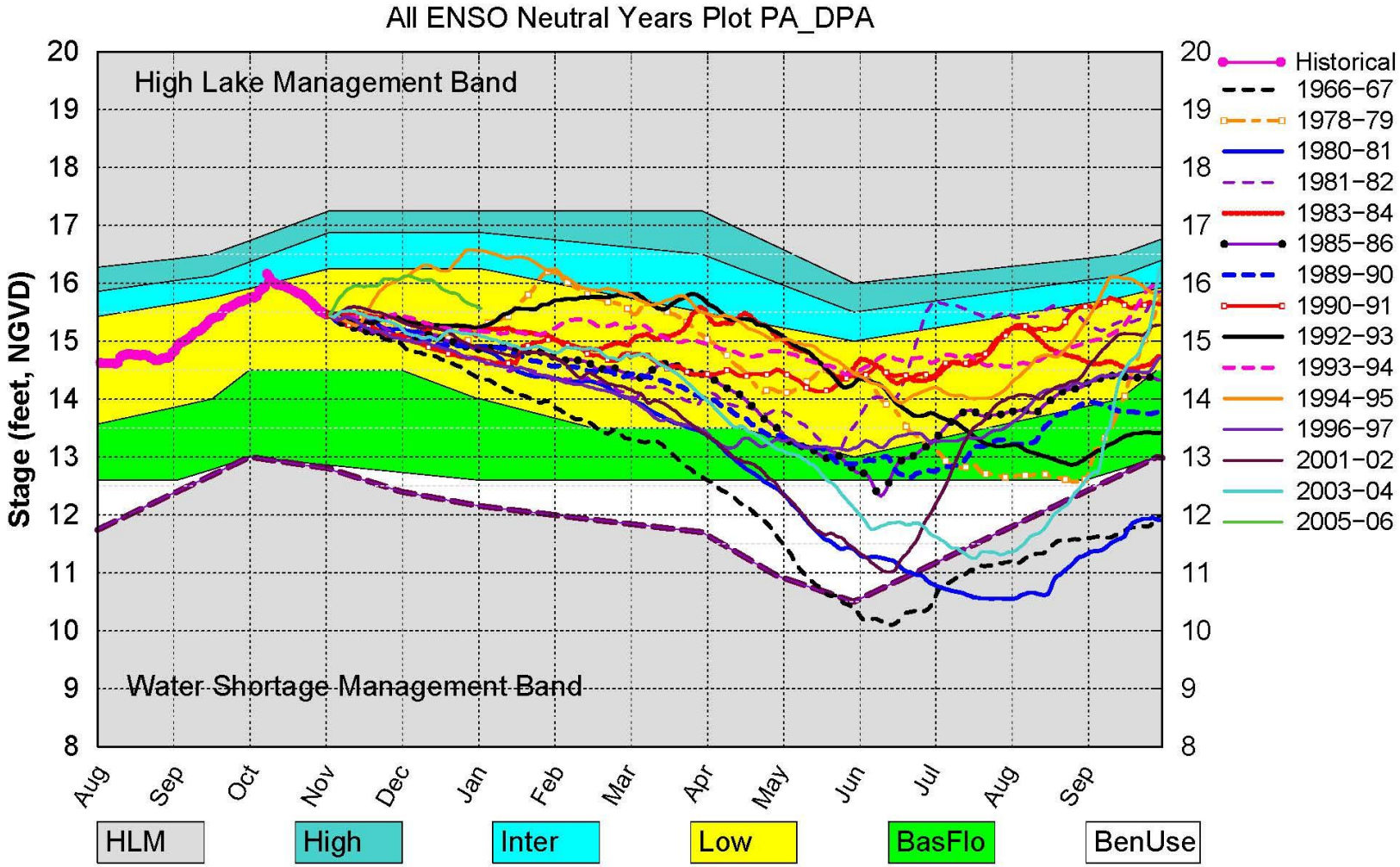


(See assumptions on the Position Analysis Results website)

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

Fri Nov 4 13:07:35 2016

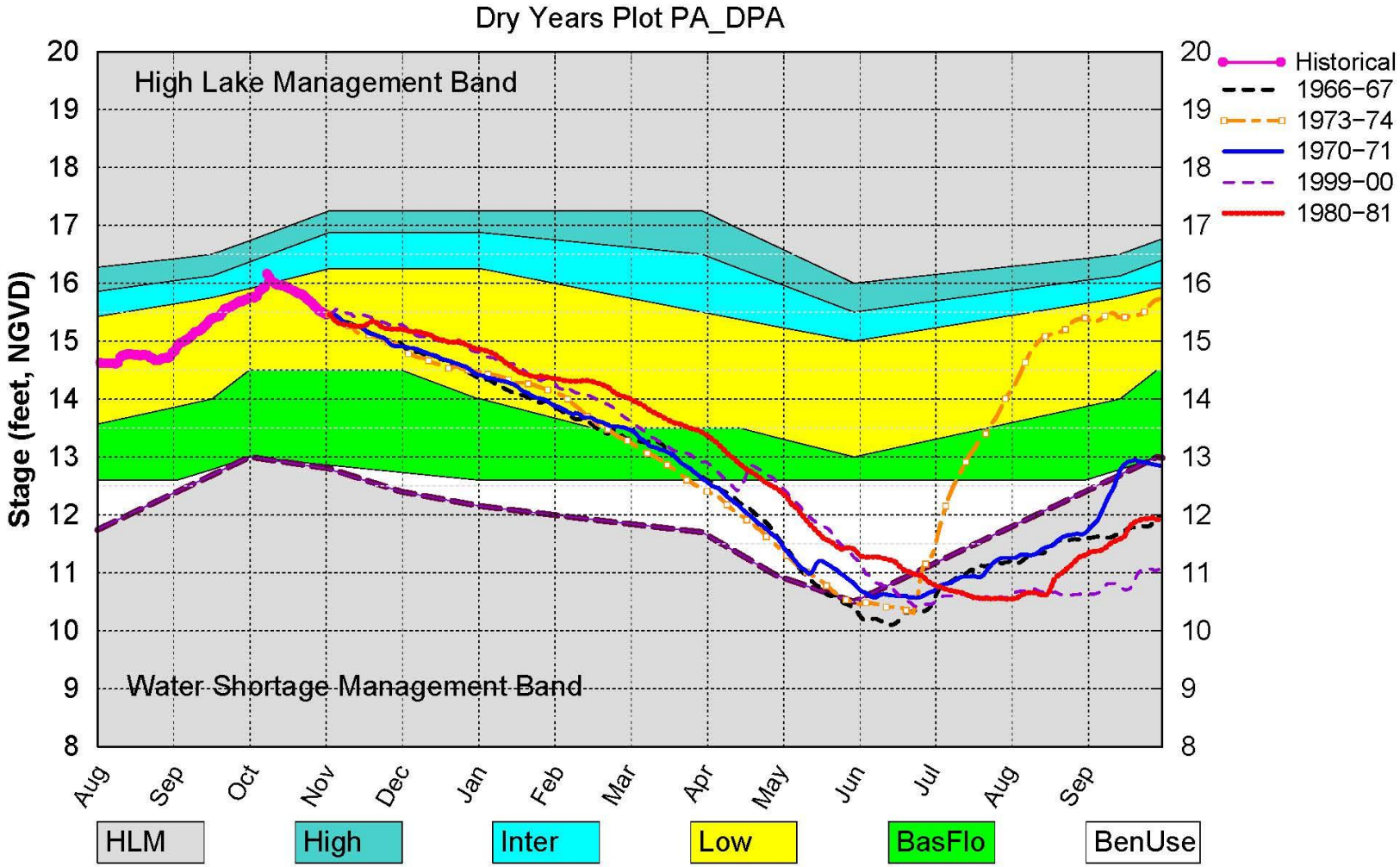
Lake Okeechobee SFWMM Nov 2016 Dynamic Position Analysis



(See assumptions on the Position Analysis Results website)

Fri Nov 4 13:06:22 2016

Lake Okeechobee SFWMM Nov 2016 Dynamic Position Analysis



(See assumptions on the Position Analysis Results website)

Fri Nov 4 13:07:07 2016