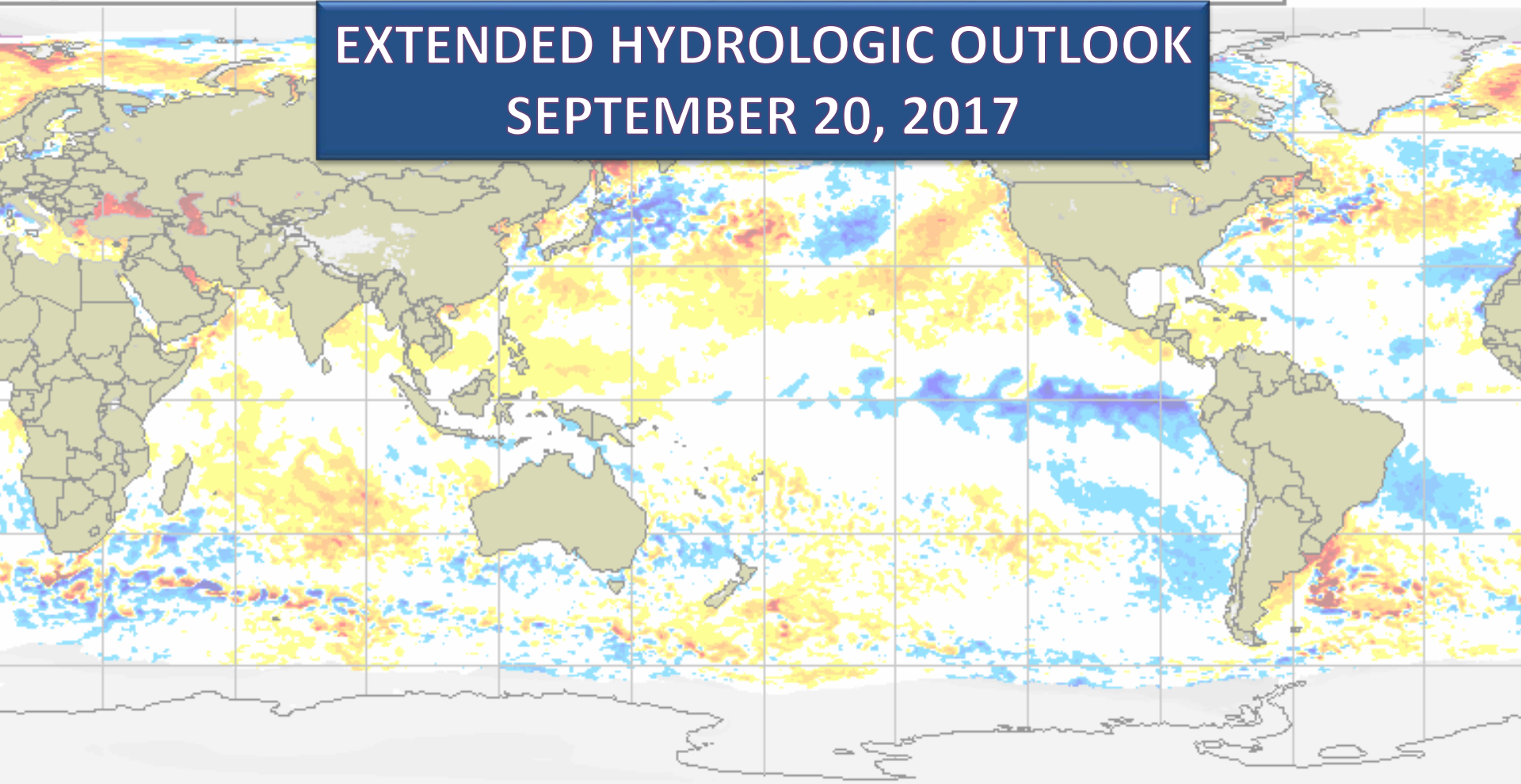
Global sea surface anomaly and snow cover
20 Sep 2017

Anomalie de la température de la mer et épaisseur de la neige
20 Sep 2017 /operational

EXTENDED HYDROLOGIC OUTLOOK
SEPTEMBER 20, 2017



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

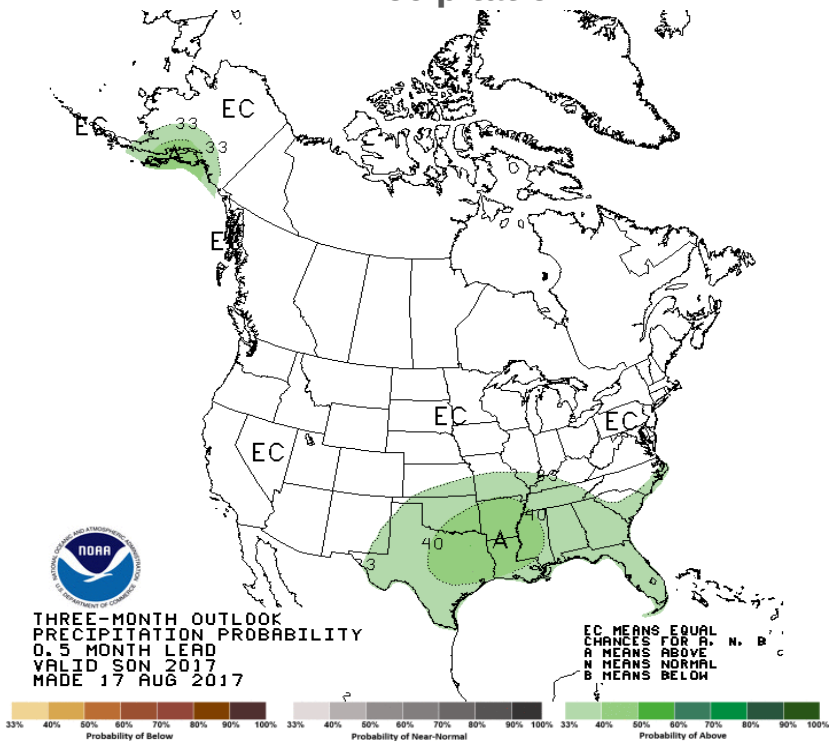
- The Climate Prediction Center (CPC) is forecasting 33-40% chance of above normal rainfall for September through November.
- ENSO-neutral conditions are present. There is an increasing chance(~55%-60%) of La Niña during the fall and winter 2017-18.
- Monitoring Atlantic Multidecadal Oscillation (AMO) index for switch to negative (cold) phase, this has the potential to contribute to drier-than-normal wet seasons.
- National Hurricane Center favors an above-normal hurricane season (5-9 hurricanes), with 60% probability (30% probability of a near-normal season). Colorado State University's Tropical Meteorology Project anticipates an above-average hurricane season (8 hurricanes).

U. S. Seasonal Outlooks

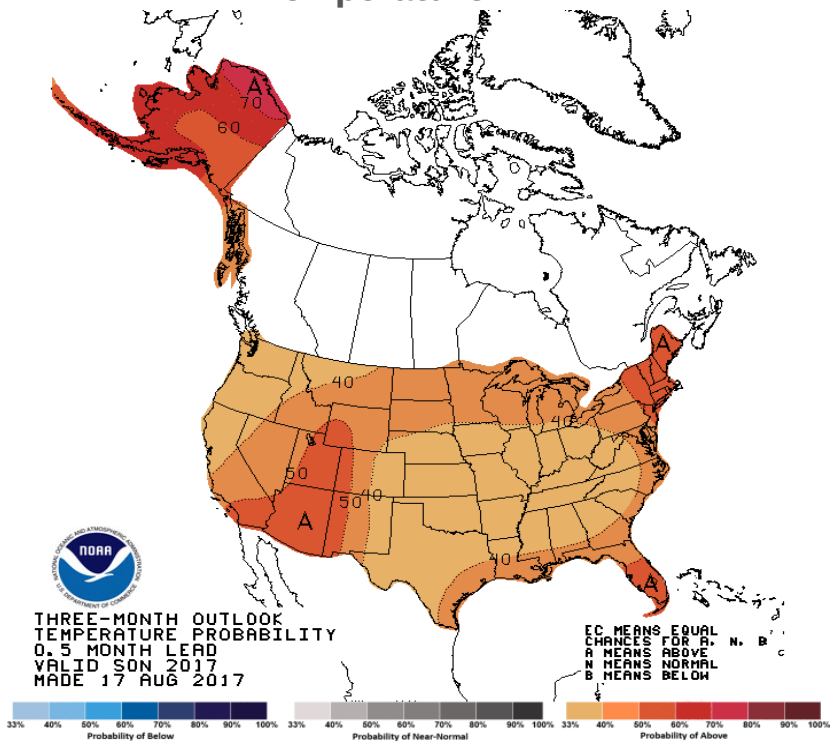
September - November 2017

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

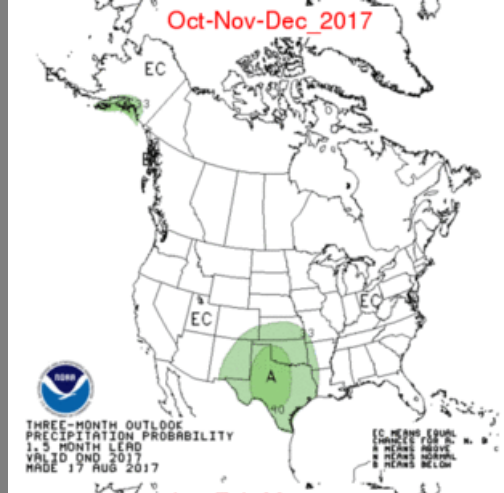
Precipitation

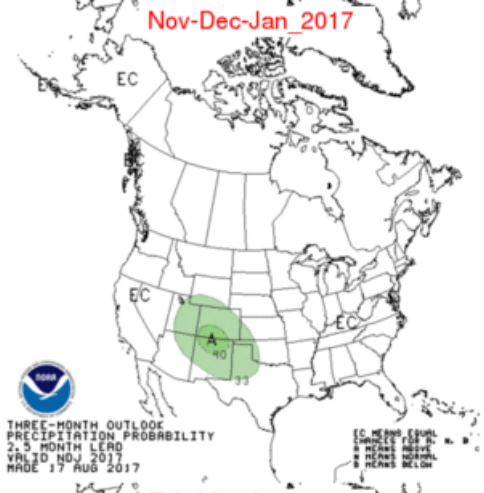


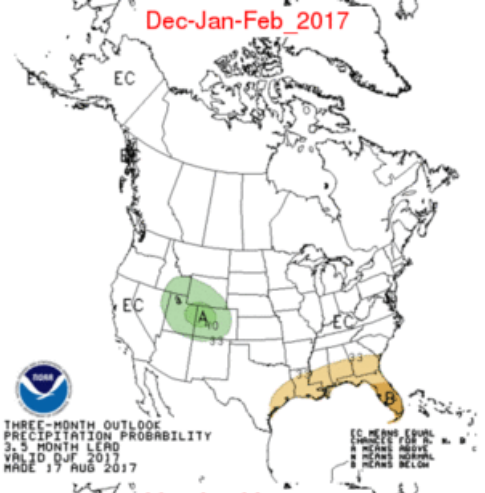
Temperature

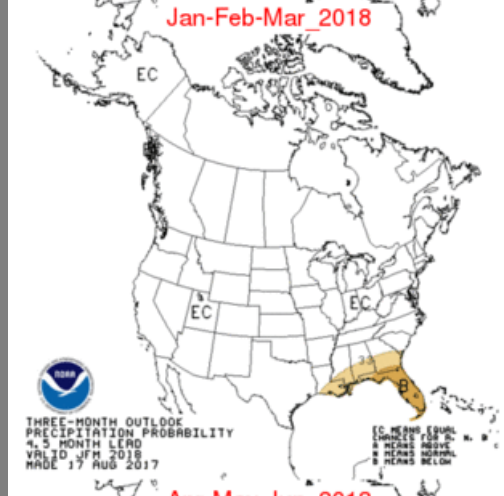


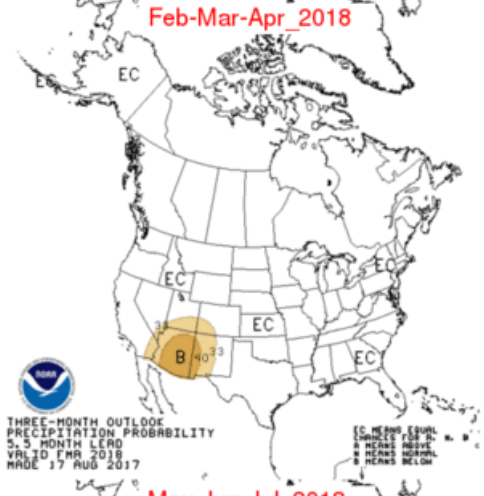
Prepared by: Climate Prediction Center / NCEP

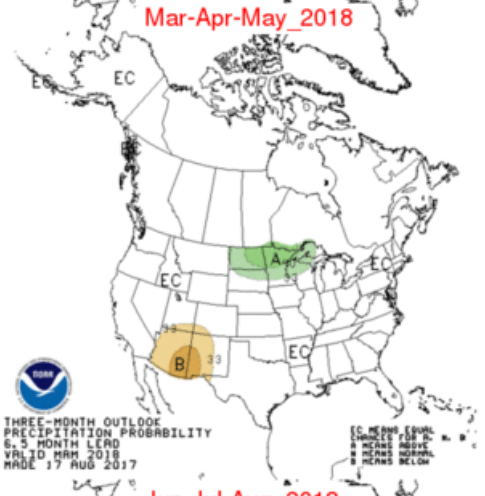


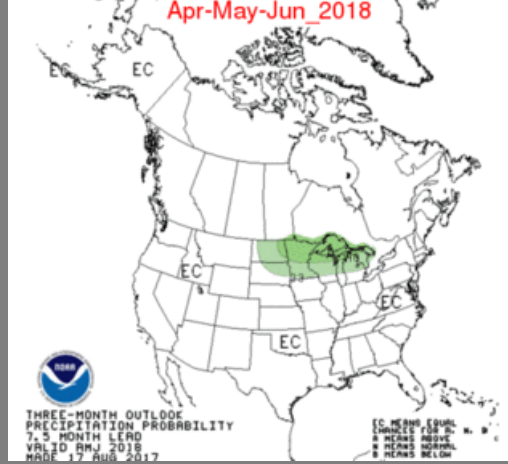


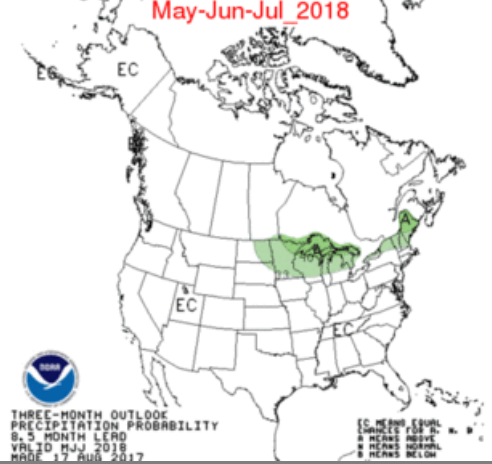


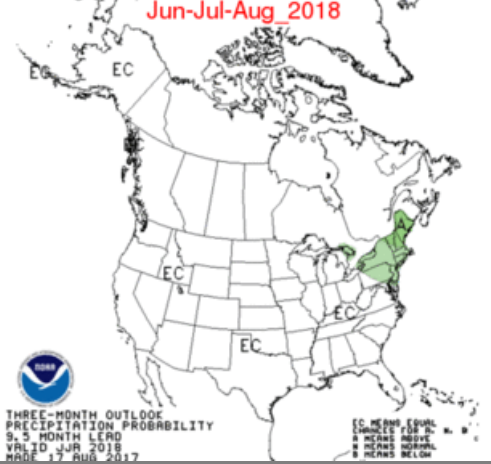












Prepared by: Climate Prediction Center / NCEP

Teleconnections to South Florida

Climate anomalies being related to each other at large distances:

El Niño Southern Oscillation (ENSO)

- South Florida dry season (November through May) rainfall is positively correlated with El Niño which has a frequency that ranges between 3 to 7 years while rainfall is negatively correlated with La Niña November through March with a potential increase in tropical rainfall during La Niña

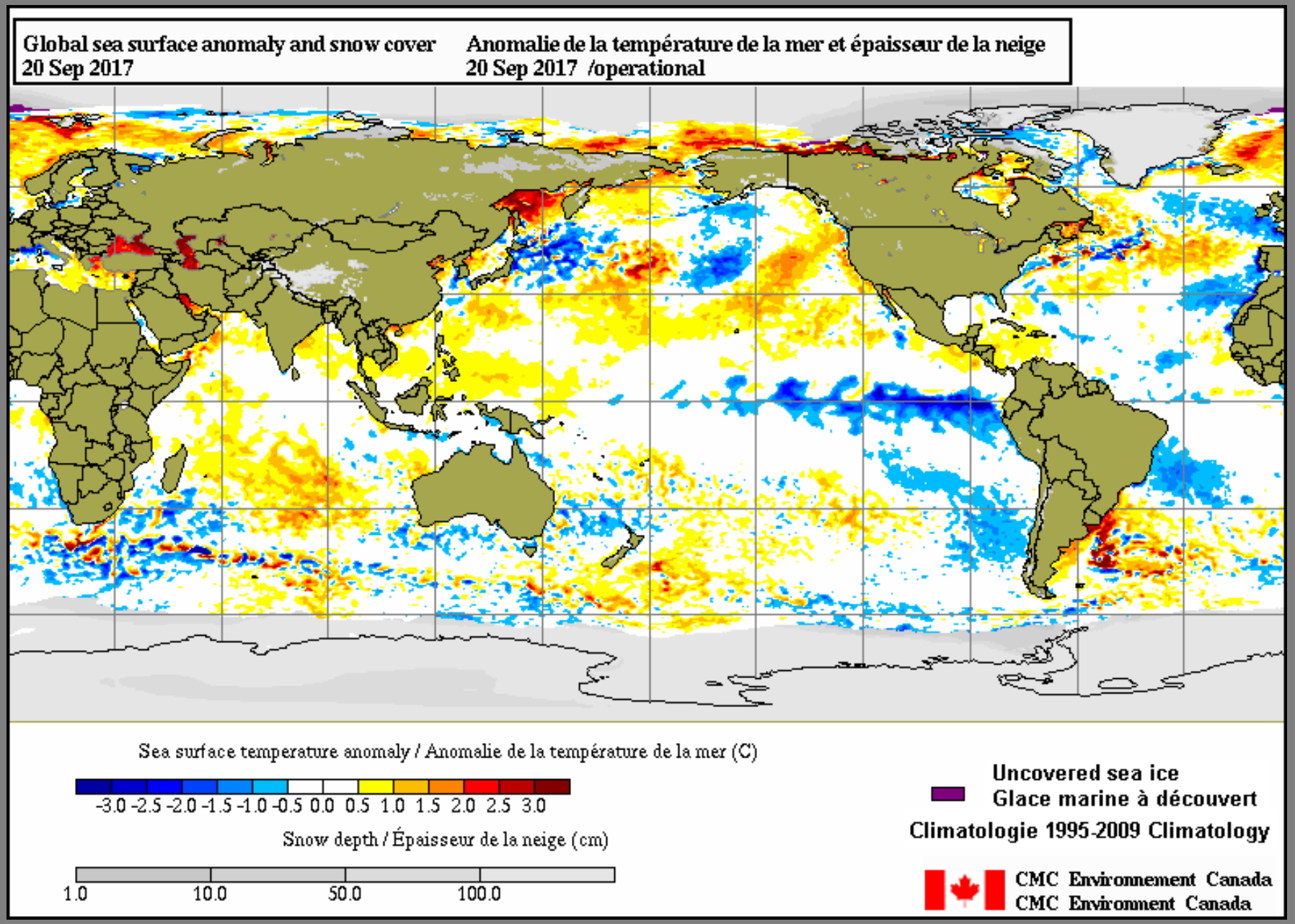
Atlantic Multidecadal Oscillation (AMO)

- Average annual inflow to Lake Okeechobee is nearly 50% greater during the warm phase compared to the cold phase of the AMO, easterly flow toward south Florida affected by phase

Pacific Decadal Oscillation (PDO)

- Increases variations of south Florida dry season rainfall

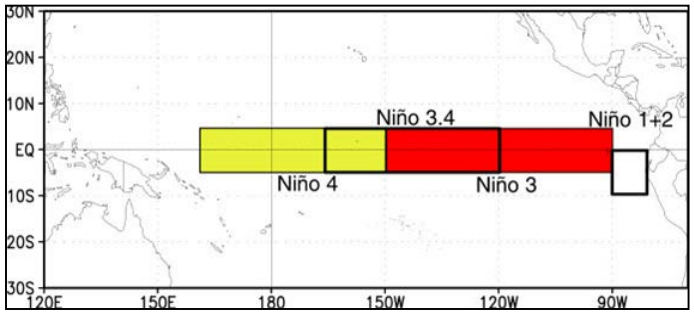
Current Global Sea Surface Temperature Anomalies

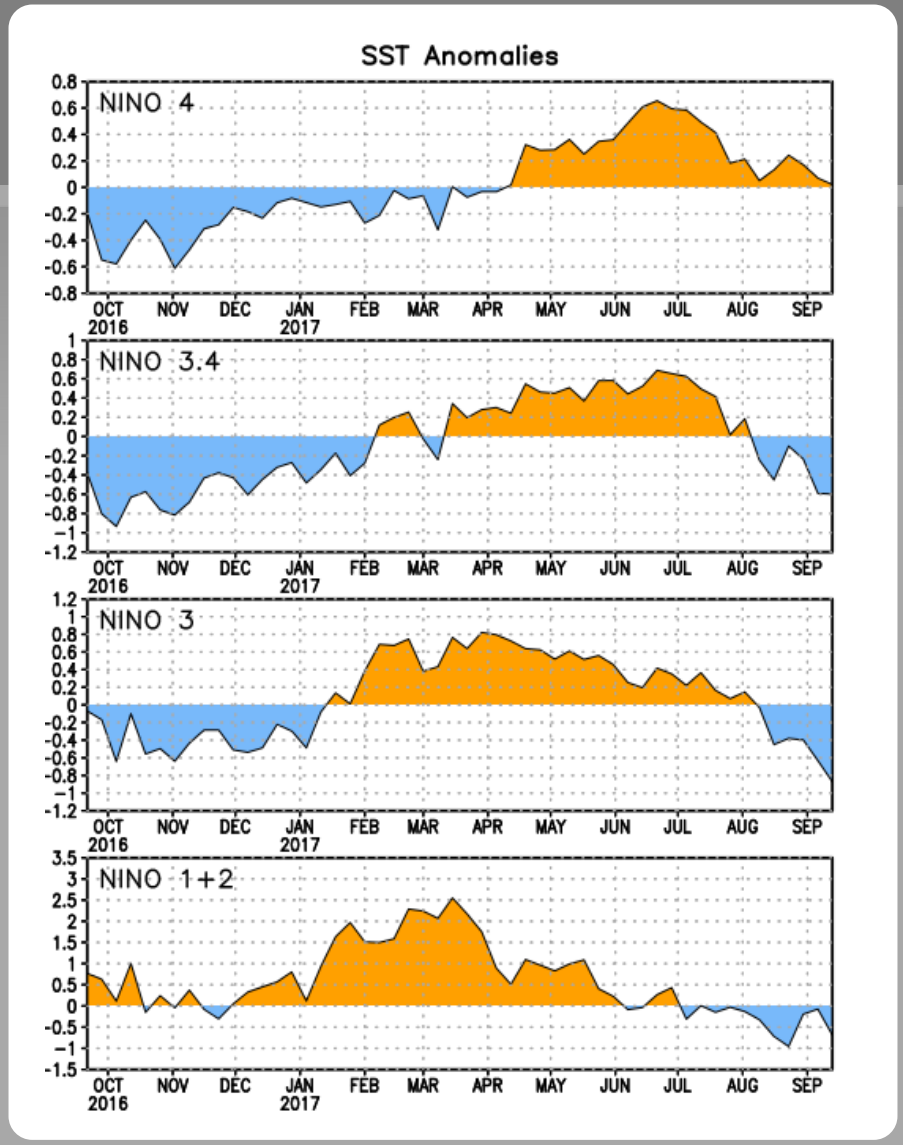


Niño Region SST Departures (ºC) Recent Evolution

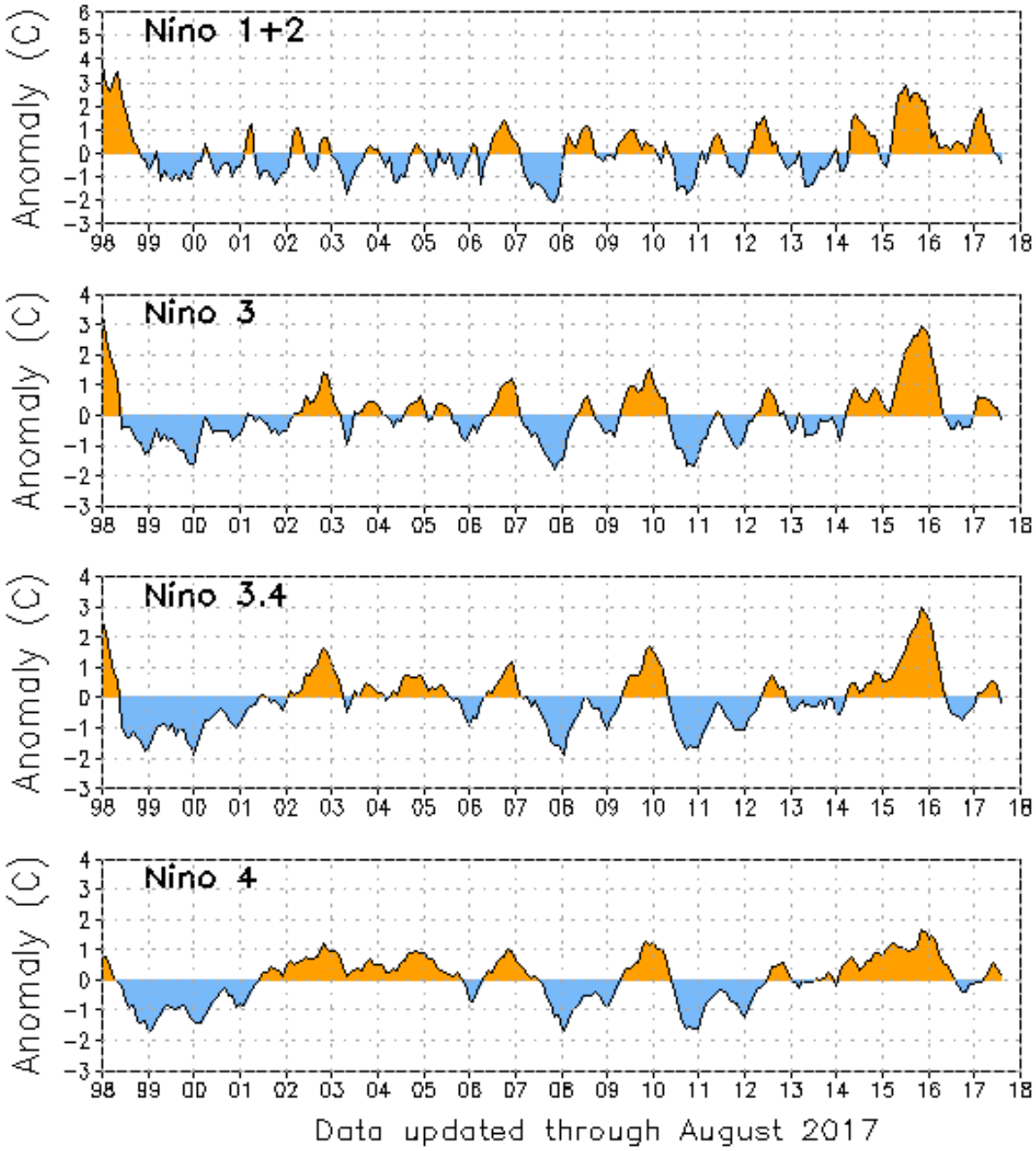
The latest weekly SST departures are:

Niño 4	0.0ºC
Niño 3.4	-0.6ºC
Niño 3	-0.9ºC
Niño 1+2	-0.7ºC





Prepared by: Climate Prediction Center / NCEP

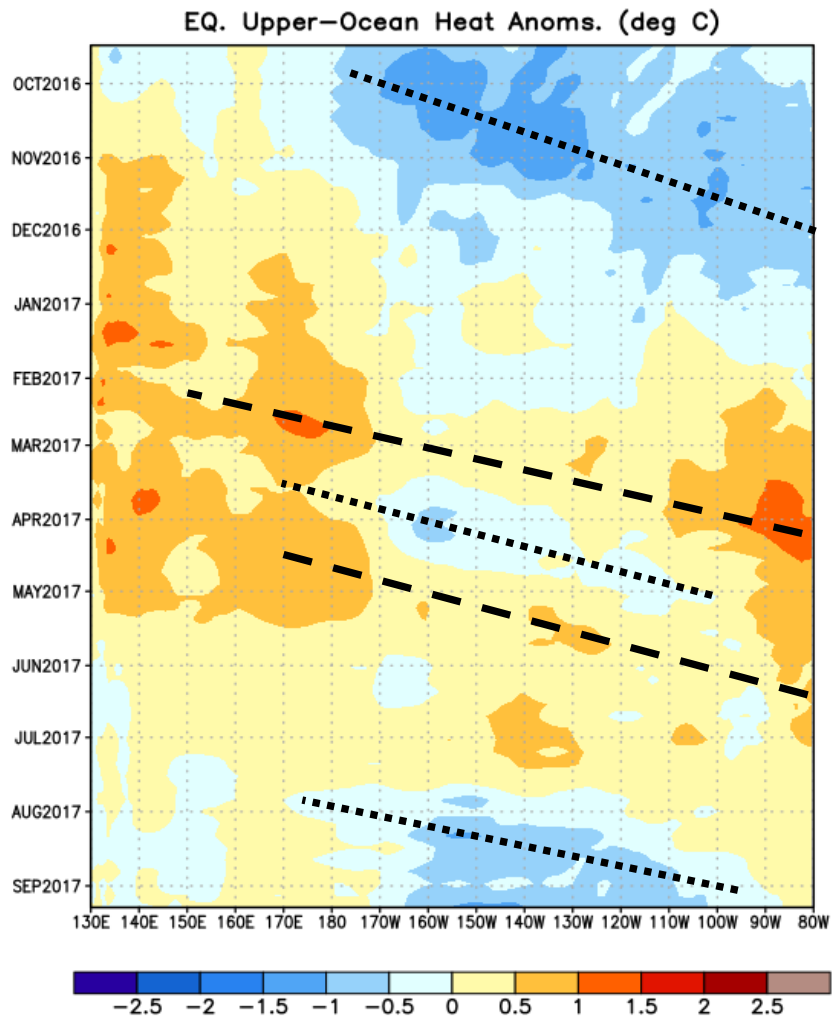

Nino 1+2
Nino 3
Nino 3.4
Nino 4
Anomaly (C)
98 99 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18
Data updated through August 2017

Weekly Heat Content Evolution in the Equatorial Pacific

From February 2017 through May 2017, positive subsurface temperature anomalies persisted in the western and eastern Pacific Ocean, with oceanic Kelvin waves resulting in anomalous temperature variability in the central Pacific.

During August 2017, an upwelling Kelvin wave resulted in below-average subsurface temperatures across the east-central and eastern equatorial Pacific.

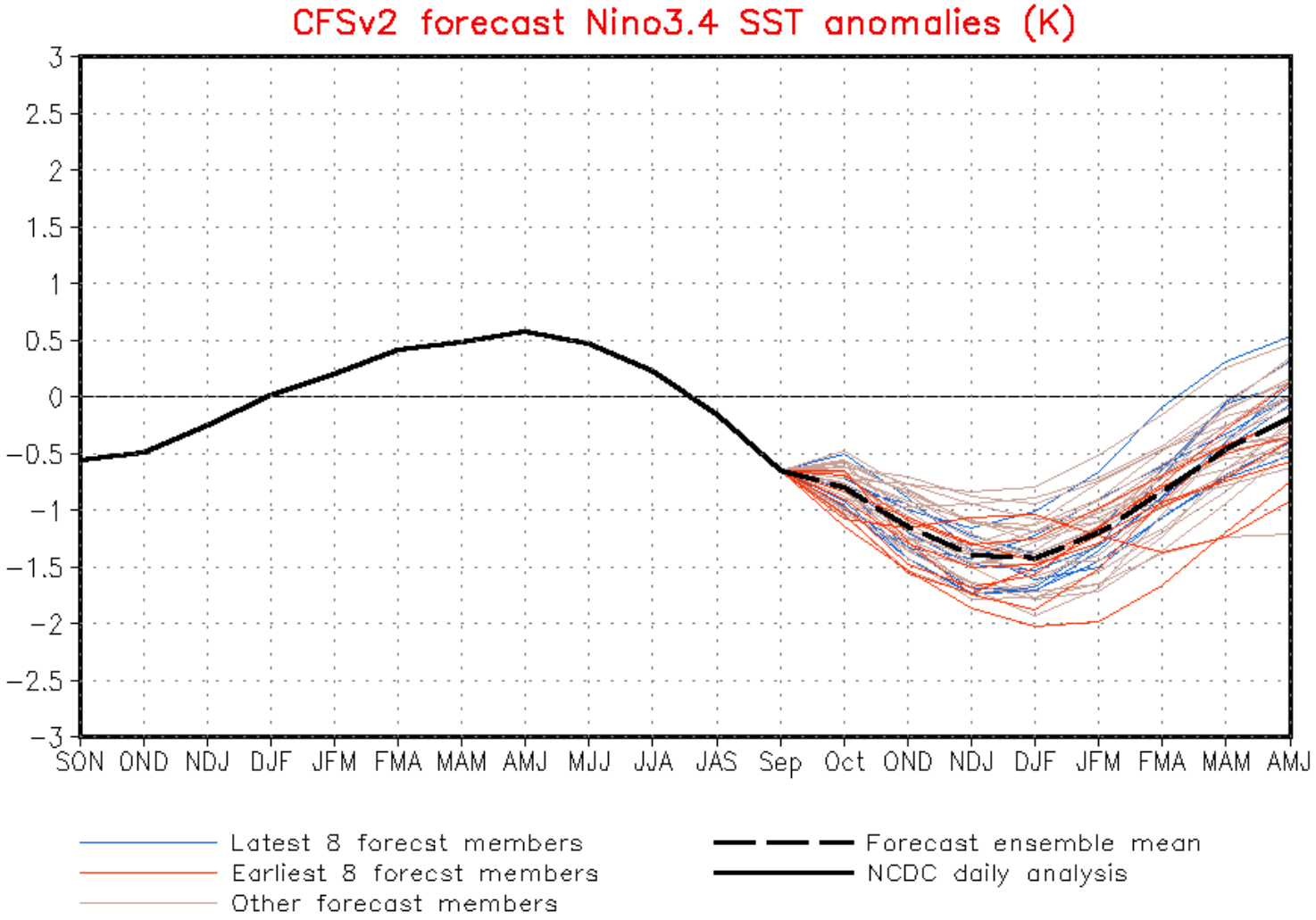
Negative subsurface anomalies have persisted in the east-central Pacific Ocean.



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.

NWS/NCEP/CPC

Last update: Tue Sep 19 2017
Initial conditions: 9Sep2017–18Sep2017



IRI/CPC Pacific Niño 3.4 SST Model Outlook

Most models and the multi-model averages predict ENSO-Neutral through the remainder of the year and into early 2018.

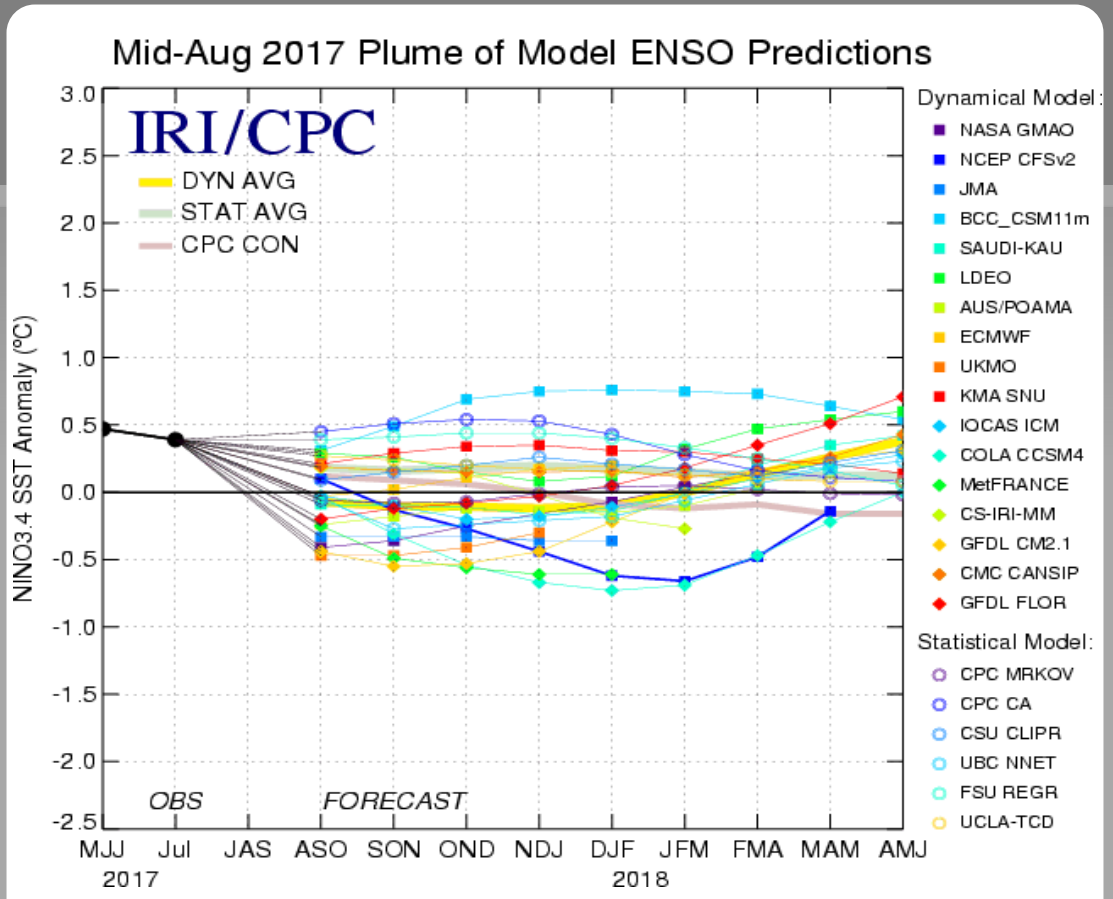


Figure provided by the International Research Institute (IRI) for Climate and Society (updated 18 August 2017).

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 ºC 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.

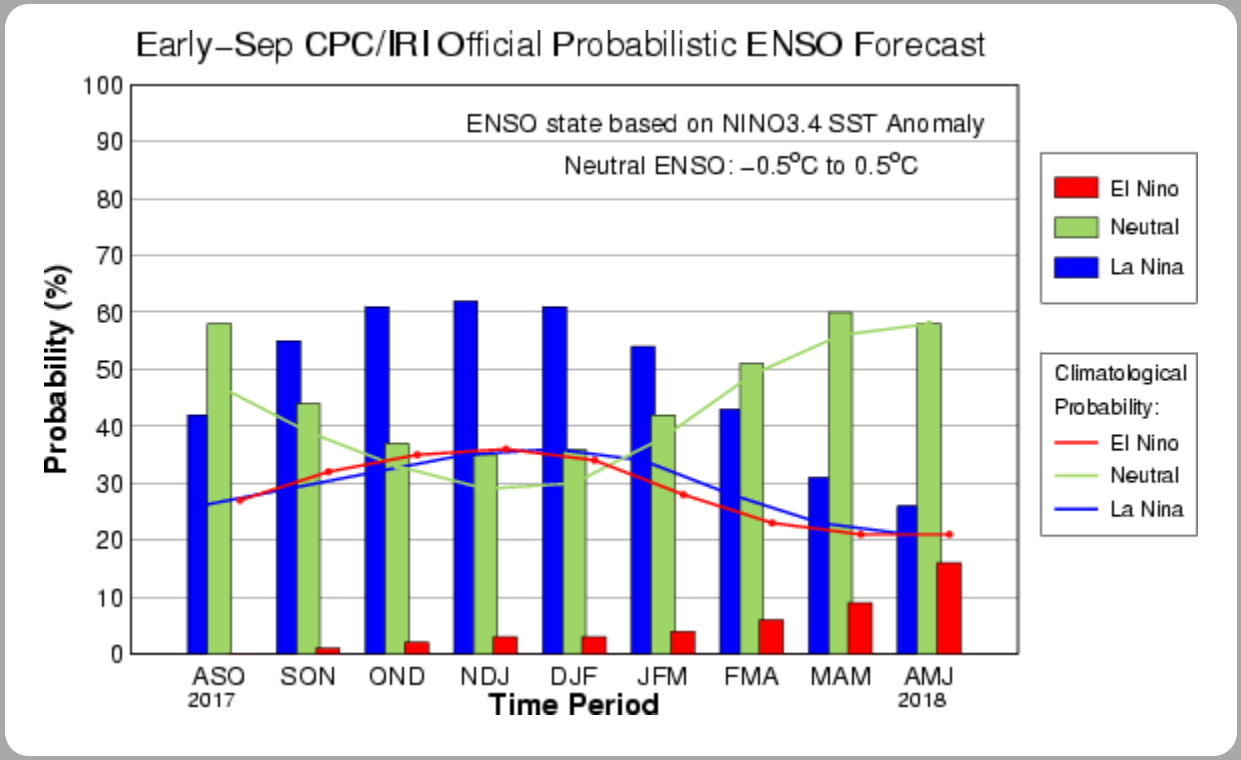
The ONI is one measure of the El Niño-Southern Oscillation, and other indices can confirm whether features consistent with a coupled ocean-atmosphere phenomenon accompanied these periods. The complete table going back to DJF 1950 can be found here.

Year	DJF	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ
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	-0.8	-0.8	-0.8	-0.7
2017	-0.4	-0.1	0.2	0.4	0.4	0.2	-0.1					

CPC/IRI Probabilistic ENSO Outlook

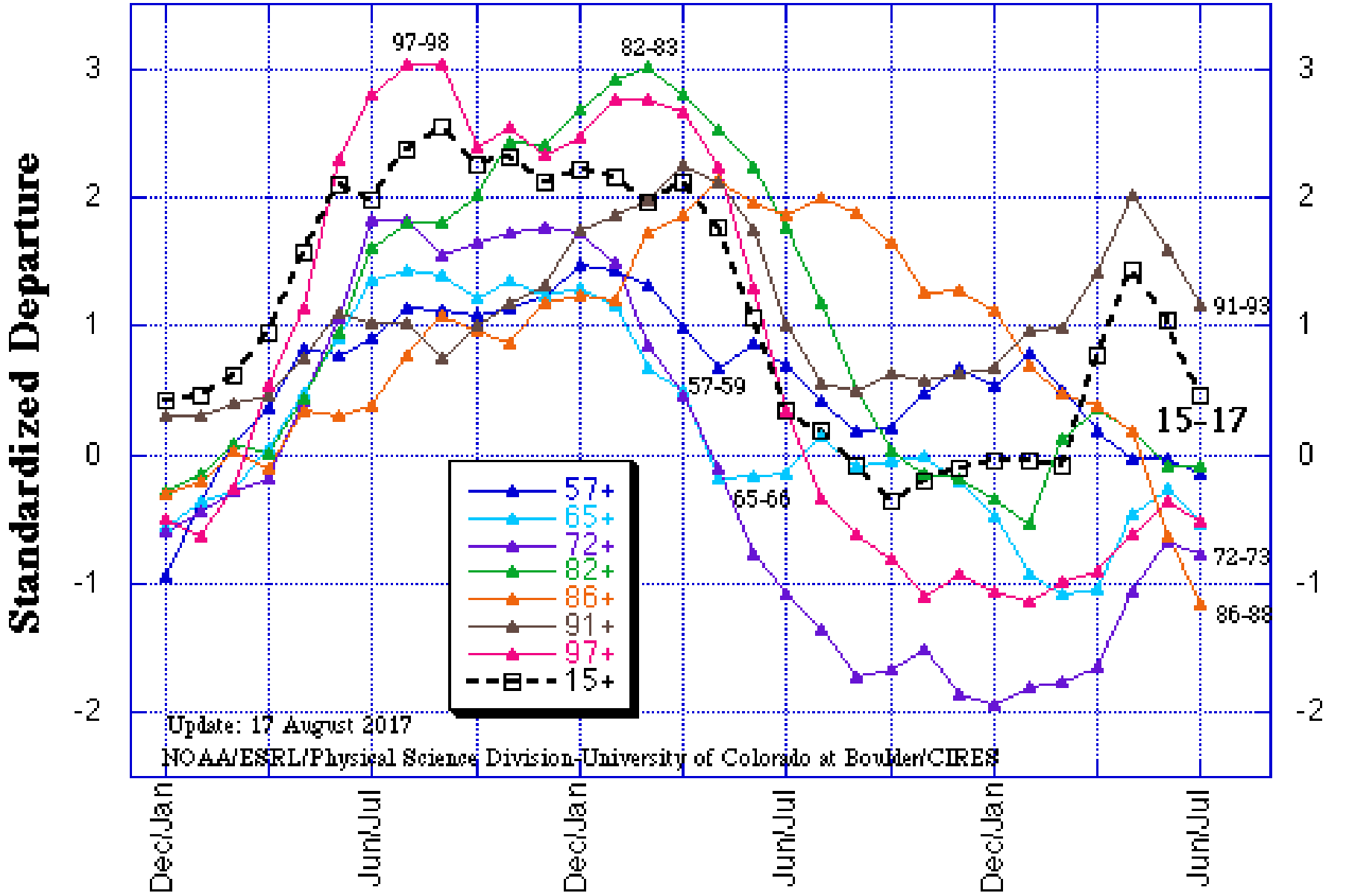
Updated: 14 September 2017

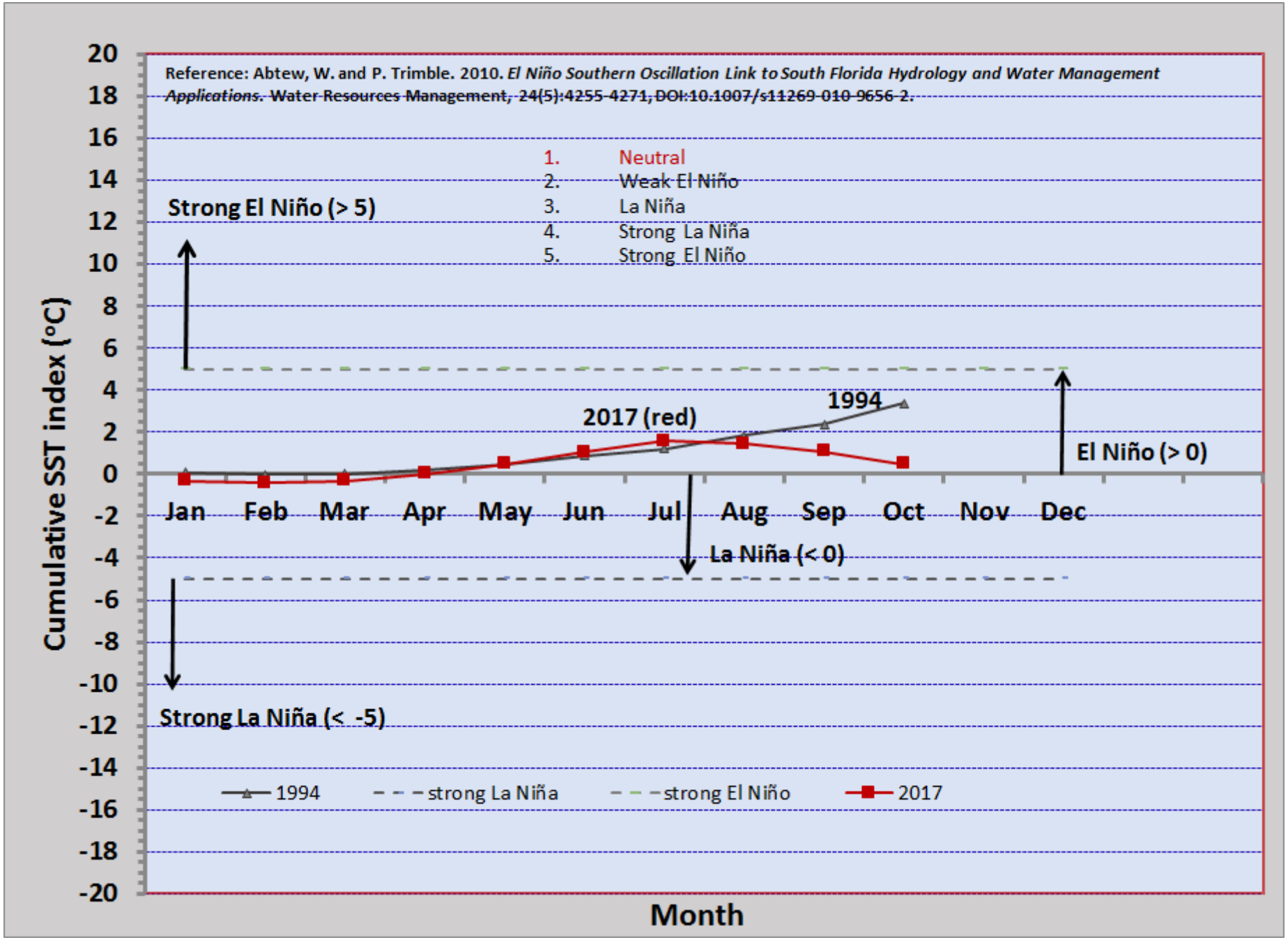
La Niña is favored (~55%-60%) during the Northern Hemisphere fall and winter 2017-18.



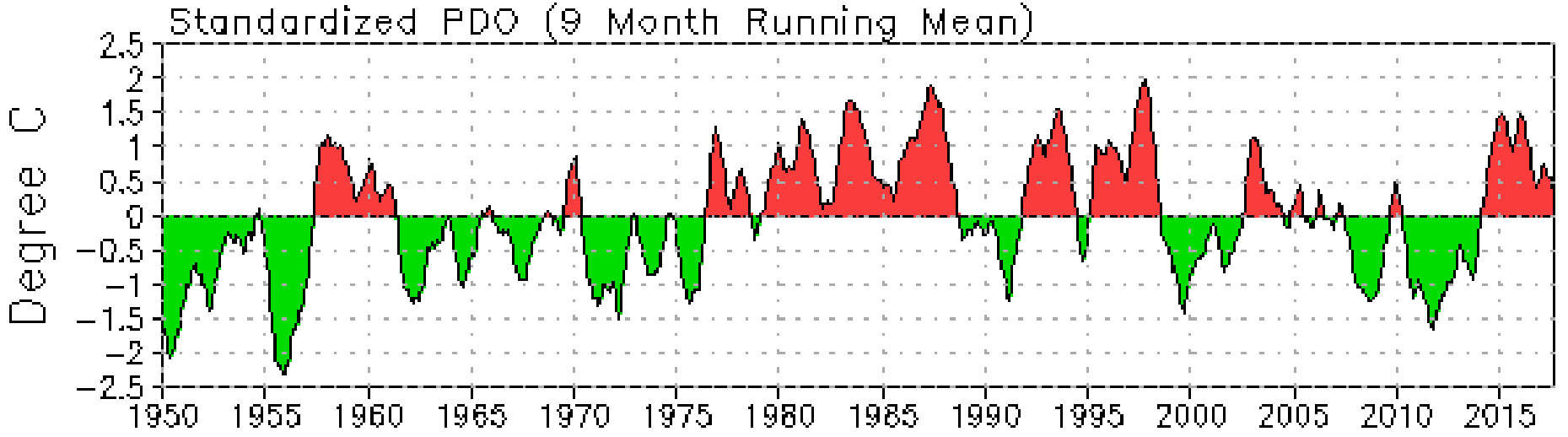
Prepared by: Climate Prediction Center / IRI

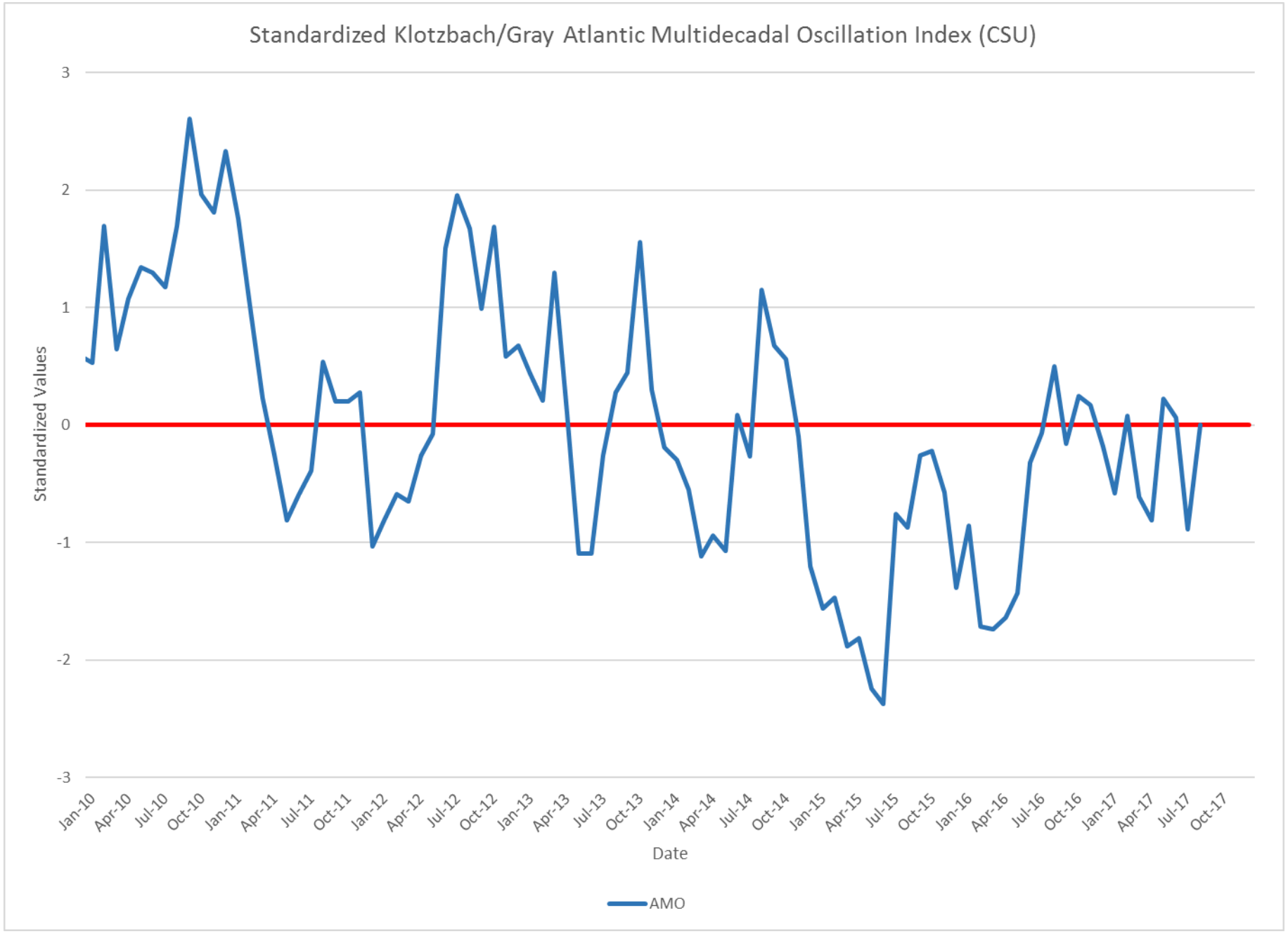
Multivariate ENSO Index (MEI) for the seven strongest El Niño events since 1950 vs. 2015-17





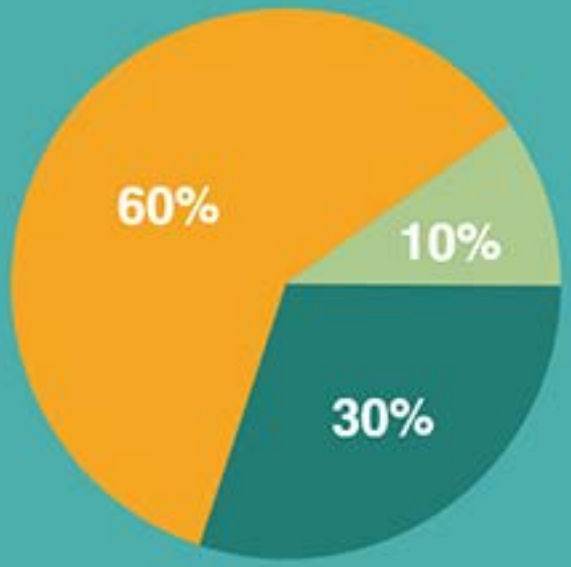
Source: Wossenu Abtew (SFWMD)


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


Standardized Klotzbach/Gray Atlantic Multidecadal Oscillation Index (CSU)
3
2
1
0
-1
-2
-3
Standardized Values
Jan-10
Apr-10
Jul-10
Oct-10
Jan-11
Apr-11
Jul-11
Oct-11
Jan-12
Apr-12
Jul-12
Oct-12
Jan-13
Apr-13
Jul-13
Oct-13
Jan-14
Apr-14
Jul-14
Oct-14
Jan-15
Apr-15
Jul-15
Oct-15
Jan-16
Apr-16
Jul-16
Oct-16
Jan-17
Apr-17
Jul-17
Oct-17
Date
AMO

2017 Atlantic Hurricane Season Outlook

AUGUST 9 UPDATE



Above-normal | Near-normal | Below-normal season

Season probability

Named storms
14-19

Hurricanes
5-9

Major Hurricanes
2-5

Be prepared: Visit hurricanes.gov and follow @NWS and @NHC_Atlantic on Twitter.

August 9, 2017

ATLANTIC BASIN SEASONAL HURRICANE FORECAST FOR 2017

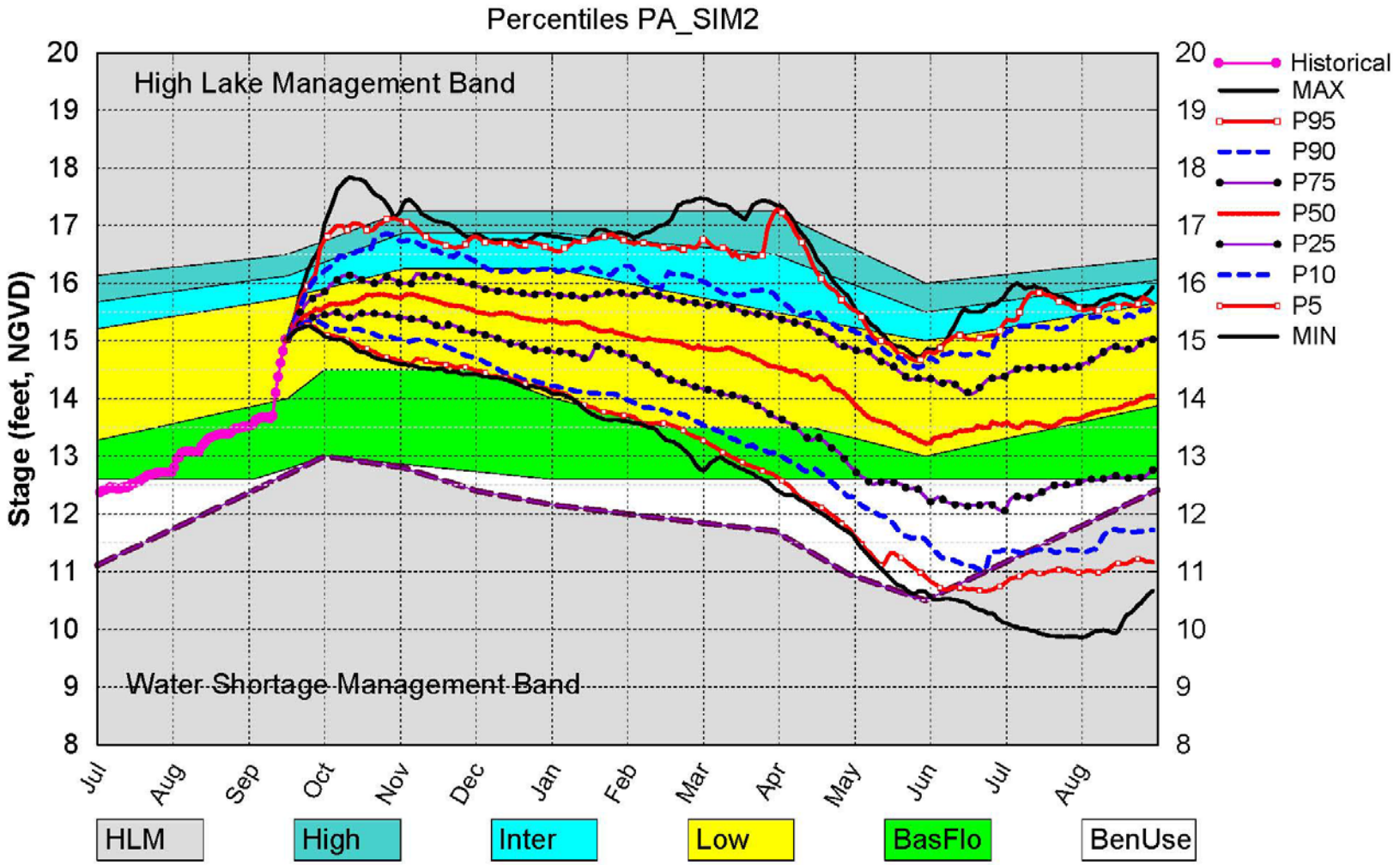
Forecast Parameter and 1981-2010 Median (in parentheses)	Issue Date 6 April 2017	Issue Date 1 June 2017	Issue Date 5 July 2017	Observed Activity Thru July 2017	Forecast Activity After 31 July	**Total Seasonal Forecast**
Named Storms (NS) (12.0)	11	14	15	5	11	**16**
Named Storm Days (NSD) (60.1)	50	60	70	6	64	**70**
Hurricanes (H) (6.5)	4	6	8	0	8	**8**
Hurricane Days (HD) (21.3)	16	25	35	0	35	**35**
Major Hurricanes (MH) (2.0)	2	2	3	0	3	**3**
Major Hurricane Days (MHD) (3.9)	4	5	7	0	7	**7**
Accumulated Cyclone Energy (ACE) (92)	75	100	135	4	131	**135**
Net Tropical Cyclone Activity (NTC) (103%)	85	110	140	11	129	**140**

From the Tropical Meteorology Project at Colorado State University (8/4/2017):
http://webcms.colostate.edu/tropical/media/sites/111/2017/08/2017-08.pdf

Dynamic Position Analysis

- Based on historical climatic conditions spanning the period 1965-2005
- Each year the model resets the initial stages for Lake Okeechobee (LOK) and the Water Conservation Areas (WCAs) to value on the 1st of the previous month and conditions the simulation using real time data during the previous month to achieve real time stage on current month's 1st for both Lake Okeechobee and the Water Conservation Areas
- Dynamic Position Analysis
  - Each 1-year simulation starts with current hydrologic conditions (e.g., 1-Jun-2017)
  - 41 1-year simulations of system response to historical rainfall conditions
  - Statistical summaries used to display projections

Lake Okeechobee SFWMM Sep 2017 Mid-Mon Dynamic Position Analysis

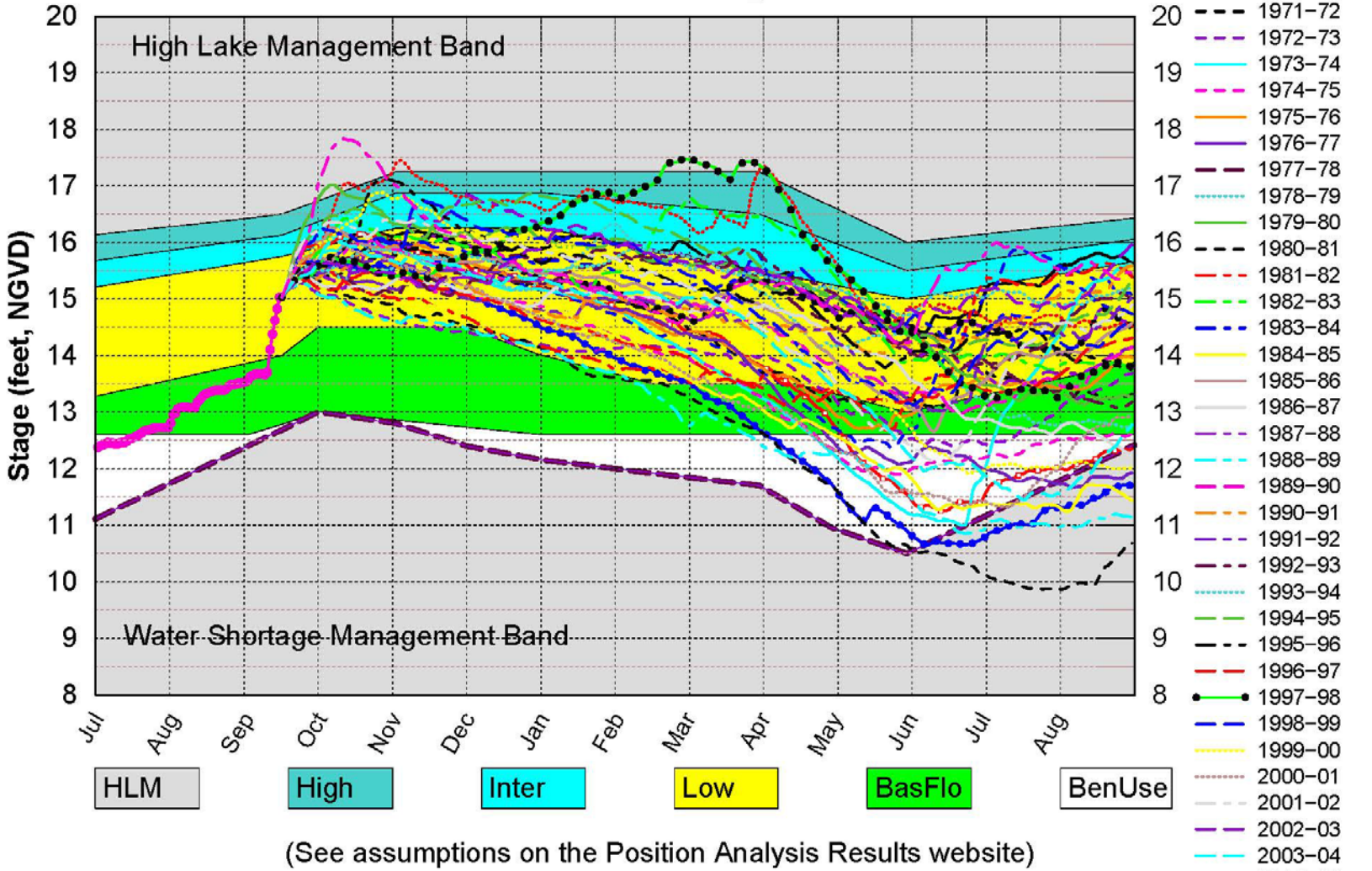


(See assumptions on the Position Analysis Results website)

Mon Sep 18 18:52:23 2017

Lake Okeechobee SFWMM Sep 2017 Mid-Mon Dynamic Position Analysis

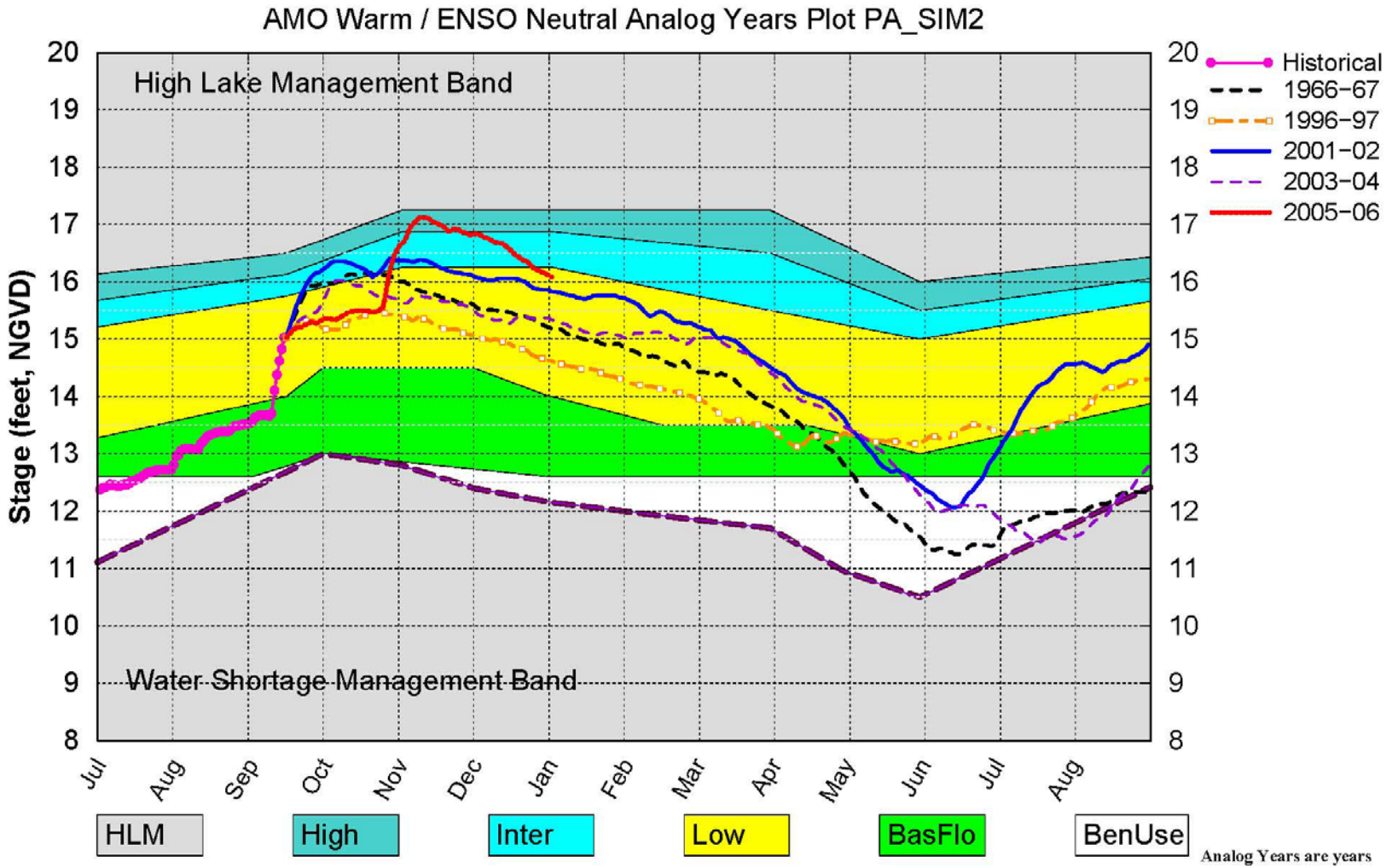
All Simulated Years Plot PA_SIM2



(See assumptions on the Position Analysis Results website)

Mon Sep 18 18:55:12 2017

Lake Okeechobee SFWMM Sep 2017 Mid-Mon Dynamic Position Analysis

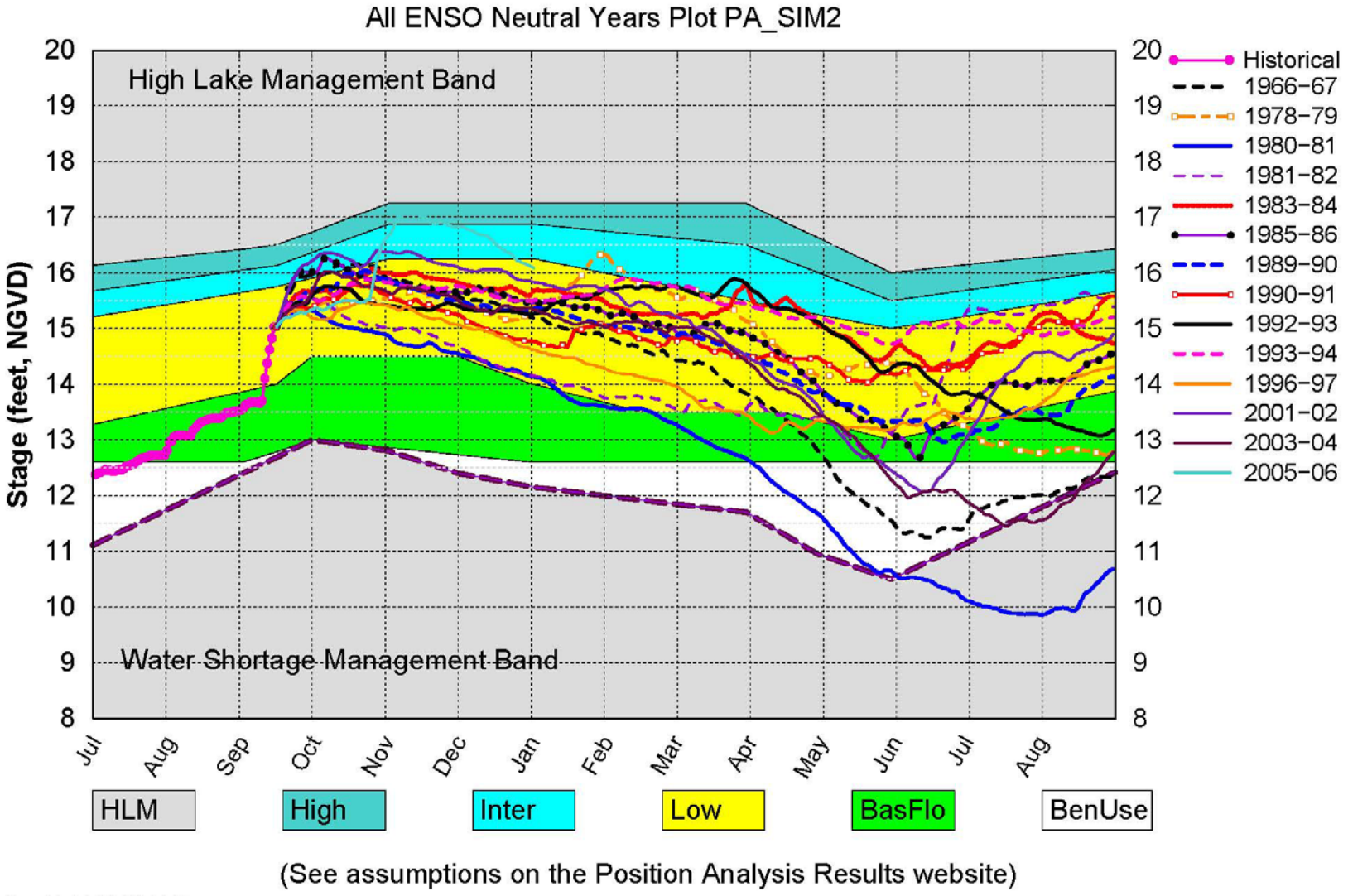


(See assumptions on the Position Analysis Results website)

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

Mon Sep 18 18:53:01 2017

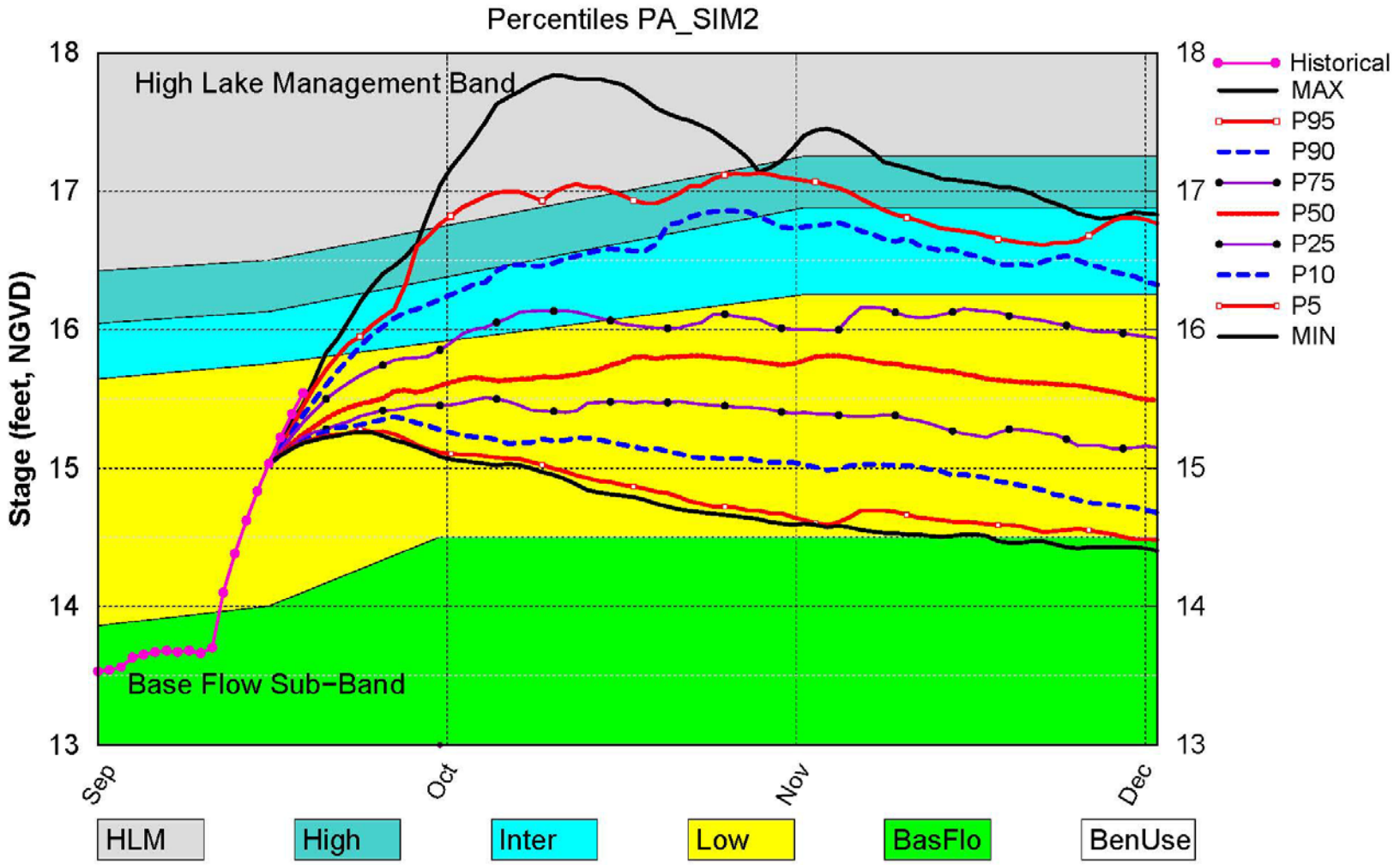
Lake Okeechobee SFWMM Sep 2017 Mid-Mon Dynamic Position Analysis



(See assumptions on the Position Analysis Results website)

Mon Sep 18 18:52:56 2017

Lake Okeechobee SFWMM Sep 2017 Mid-Mon Dynamic Position Analysis



(See assumptions on the Position Analysis Results website)

Mon Sep 18 19:04:34 2017