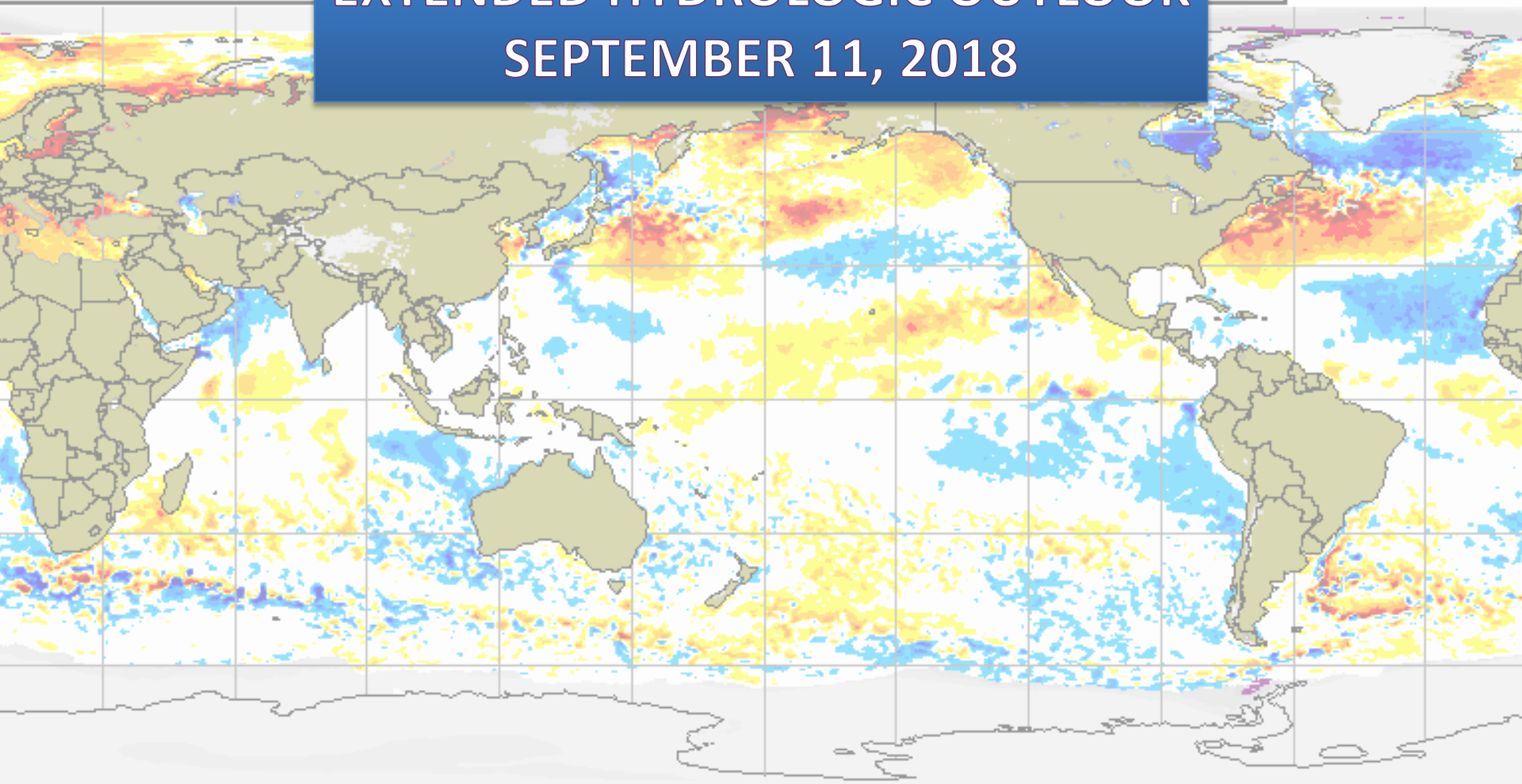
EXTENDED HYDROLOGIC OUTLOOK
SEPTEMBER 11, 2018



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

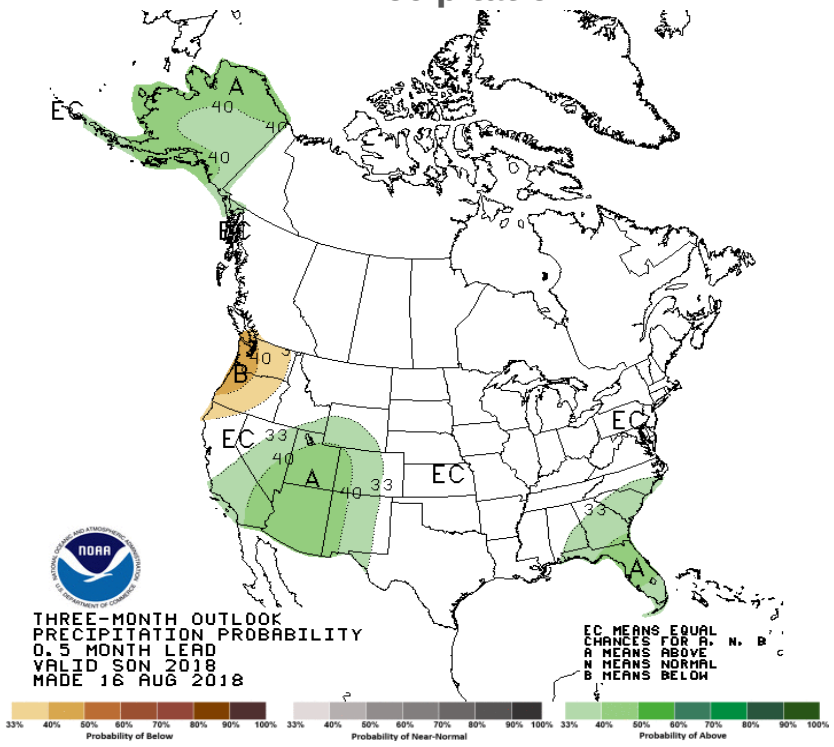
- The Climate Prediction Center (CPC) is forecasting above normal rainfall for September through November.
- ENSO-neutral conditions are present. There is ~60% chance of El Niño in the fall 2018 (September-November), increasing to ~70% during winter 2018-19. El Niño increases the chances of a wetter-than-normal dry season.
- Monitoring Atlantic Multidecadal Oscillation (AMO) index for switch to negative (cold) phase, this has the potential to contribute to drier-than-normal wet seasons.

U. S. Seasonal Outlooks

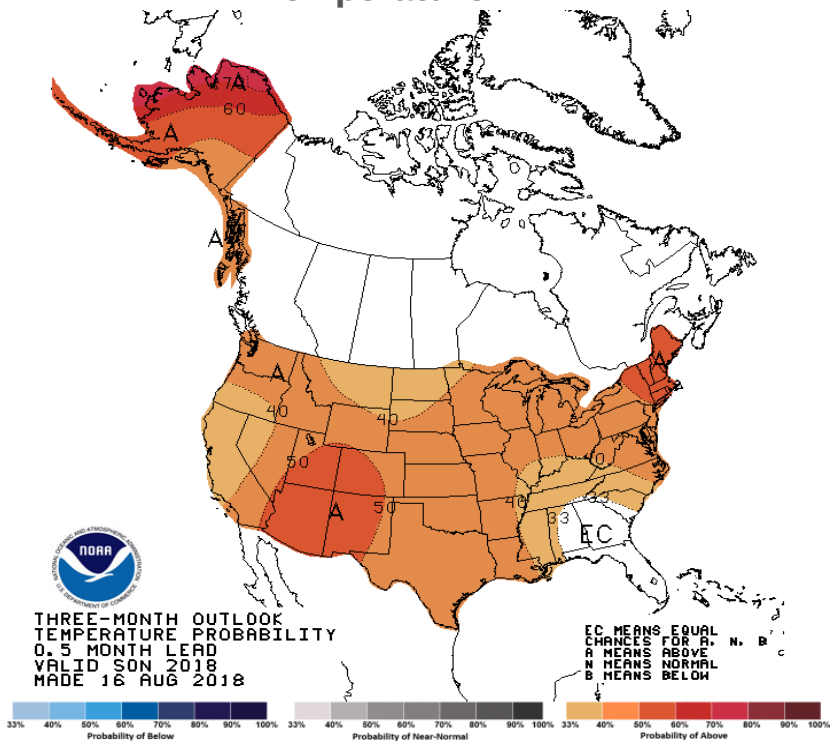
September - November 2018

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

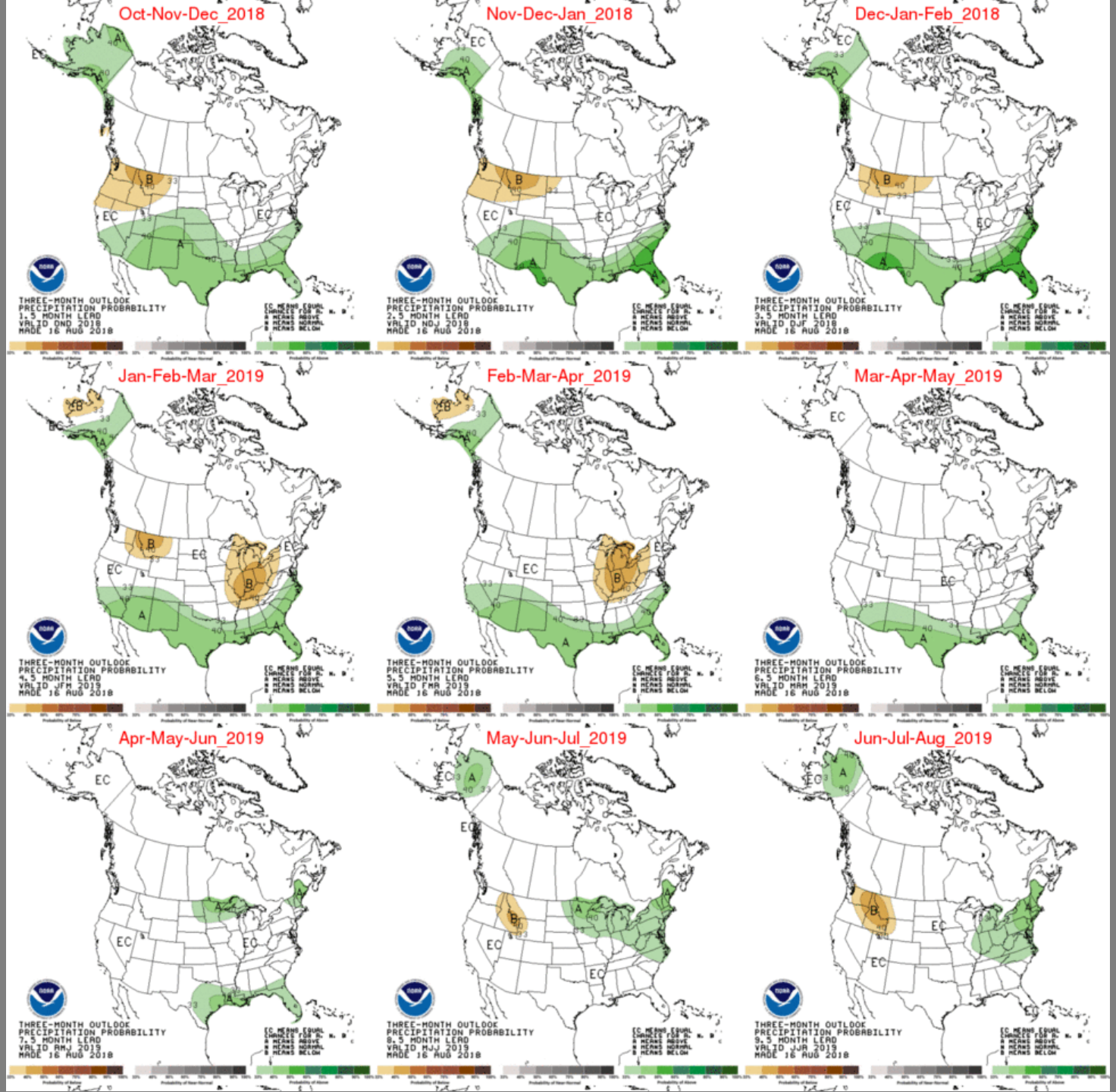
Precipitation



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

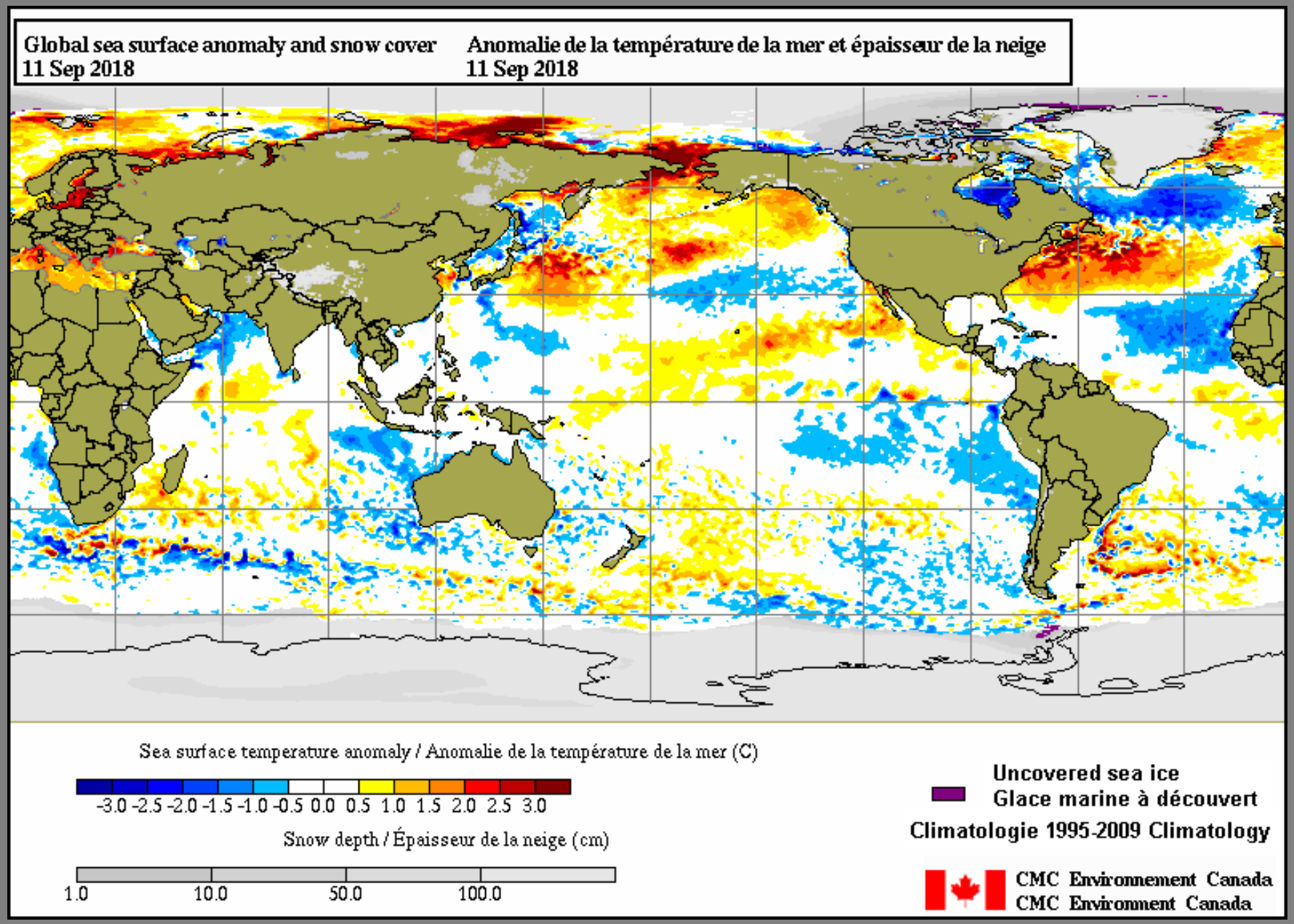
Atlantic Multidecadal Oscillation (AMO)

- 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

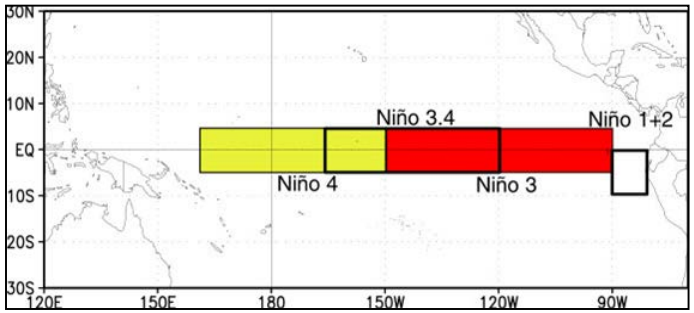
Current Global Sea Surface Temperature Anomalies

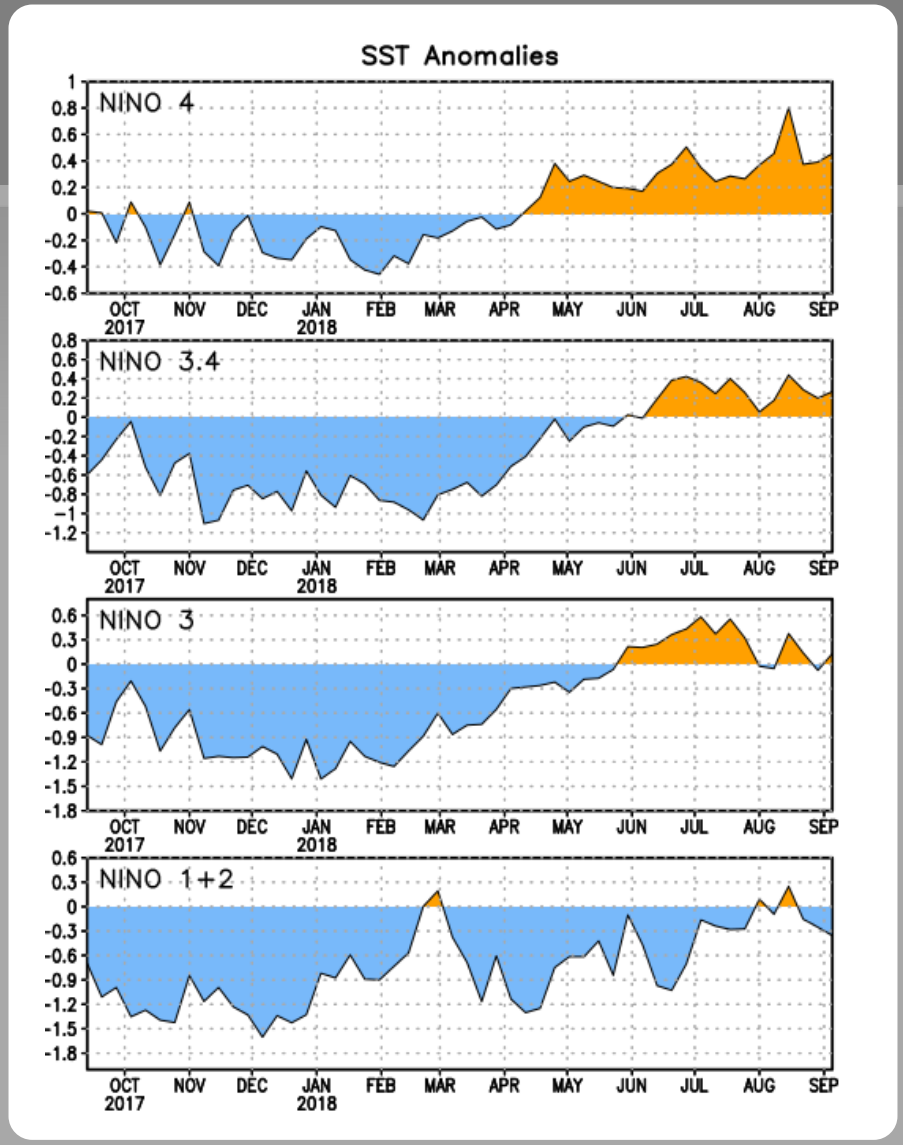


Niño Region SST Departures (ºC) Recent Evolution

The latest weekly SST departures are:

Niño 4	0.5ºC
Niño 3.4	0.3ºC
Niño 3	0.1ºC
Niño 1+2	-0.4ºC





Prepared by: Climate Prediction Center / NCEP

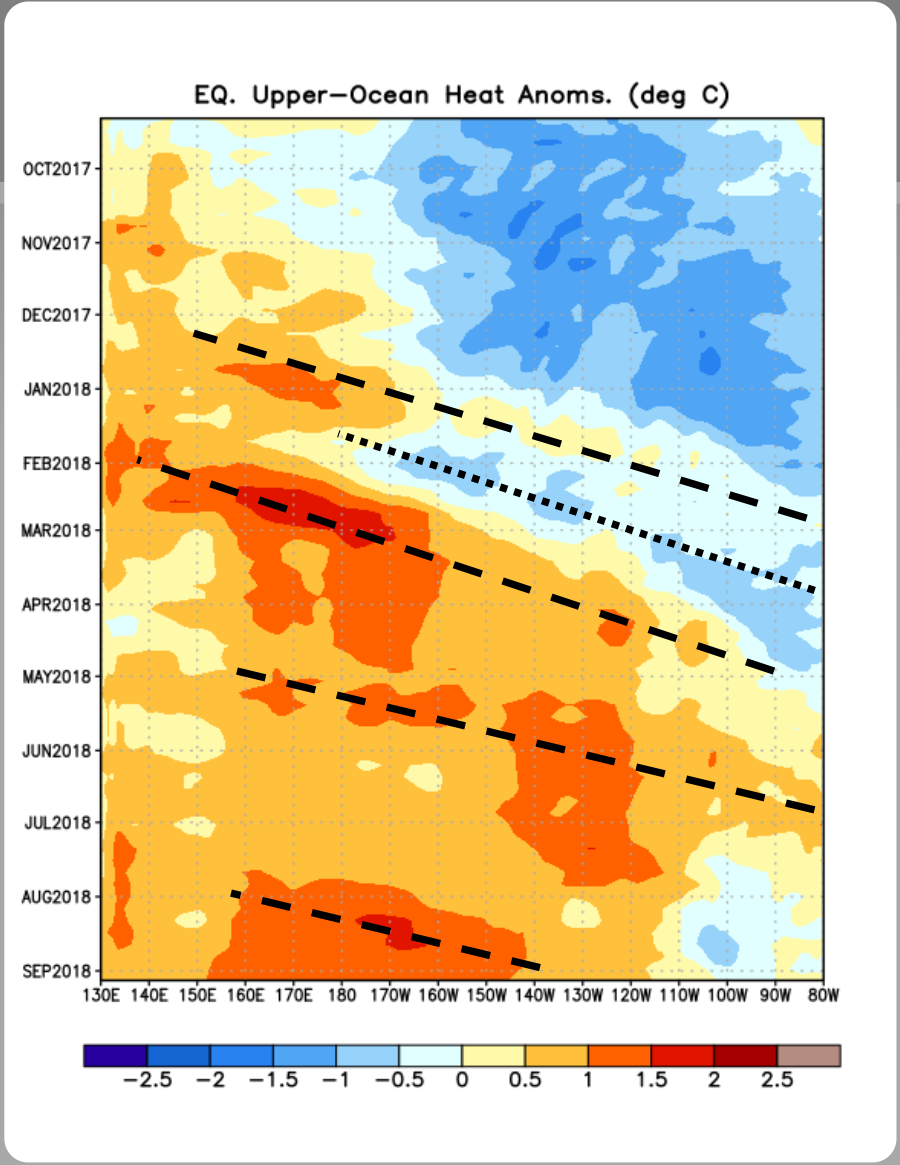
Weekly Heat Content Evolution in the Equatorial Pacific

From December 2017- May 2018, successive Kelvin waves contributed to the eastward shift of positive and negative subsurface temperature anomalies.

From early April 2018 to early July, positive subsurface temperature anomalies persisted across most of the equatorial Pacific, with the largest anomalies from mid-May to mid-July 2018 occurring between ~150°-110°W.

Since early July 2018, positive subsurface temperature anomalies have weakened in the eastern Pacific.

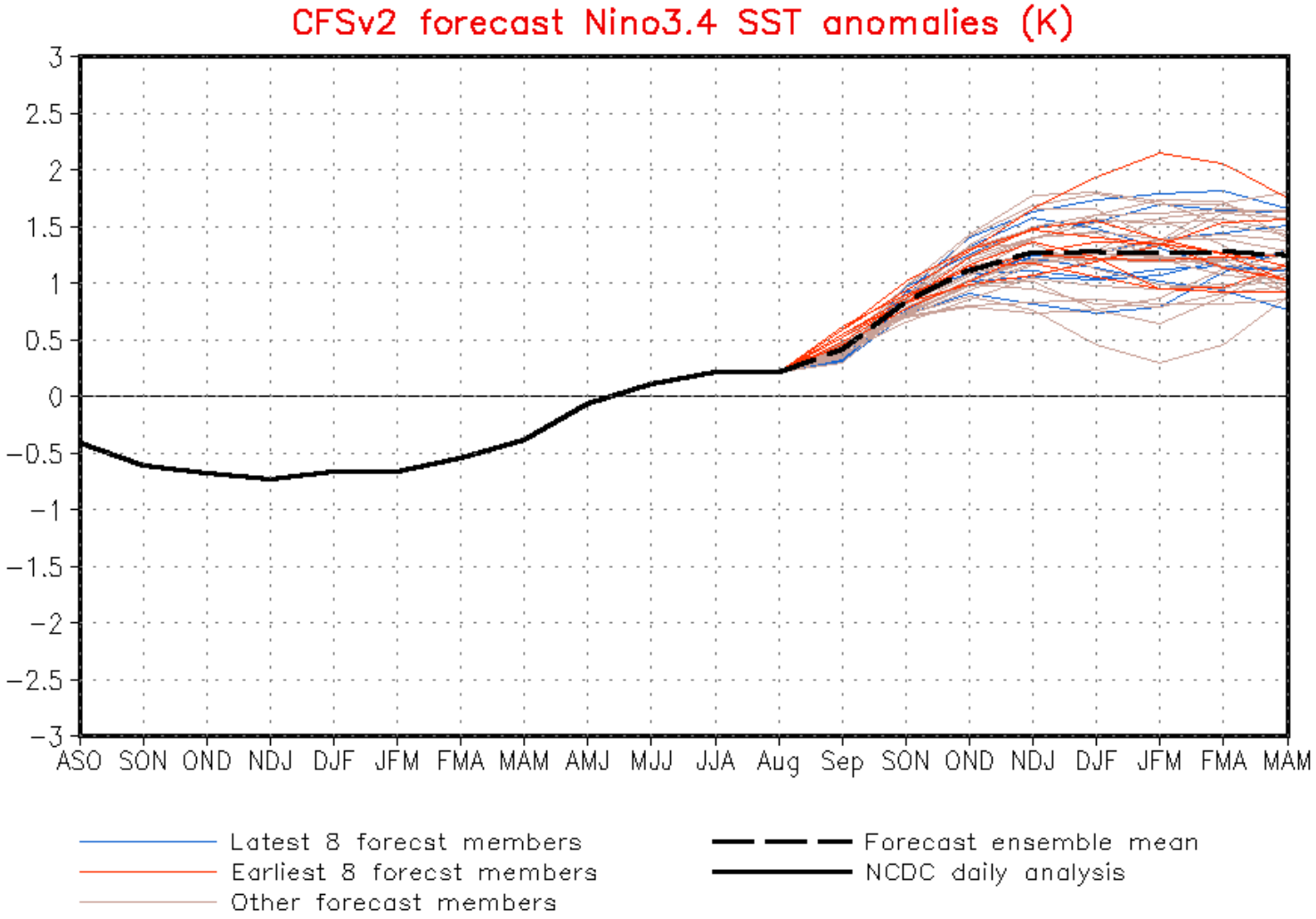
In early-mid August 2018, positive subsurface anomalies increased near the Date Line.



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.

NWS/NCEP/CPC

Last update: Mon Sep 10 2018
Initial conditions: 31Aug2018–9Sep2018



IRI/CPC Pacific Niño 3.4 SST Model Outlook

The majority of models predict El Niño to develop during September-November 2018.

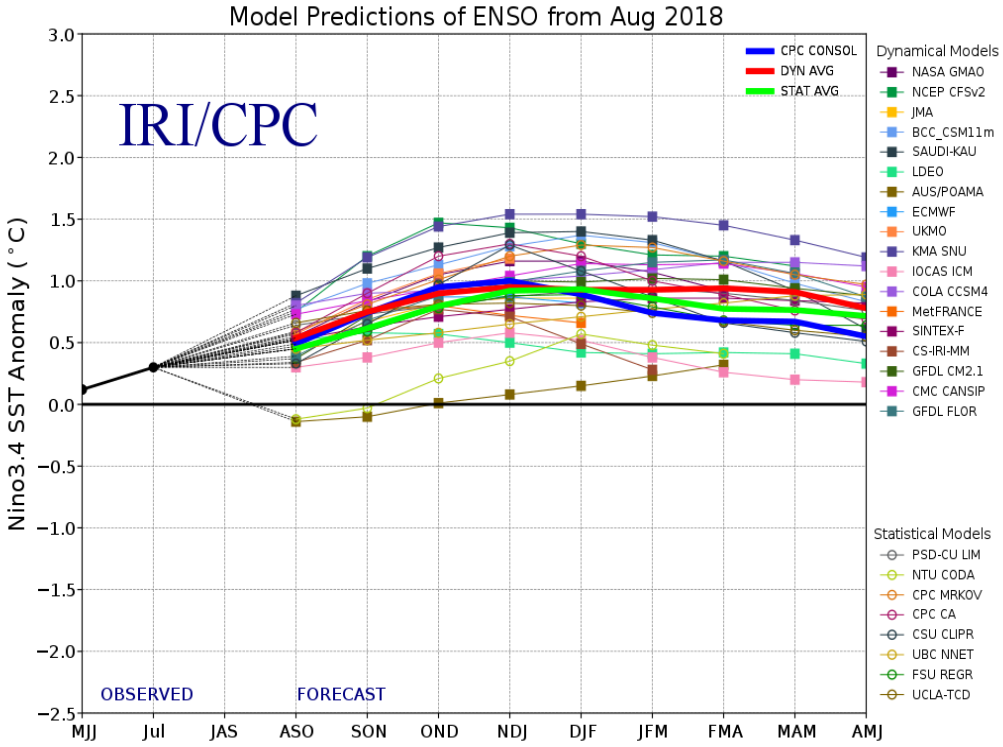


Figure provided by the International Research Institute (IRI) for Climate and Society (updated 20 August 2018).

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 ºC 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.

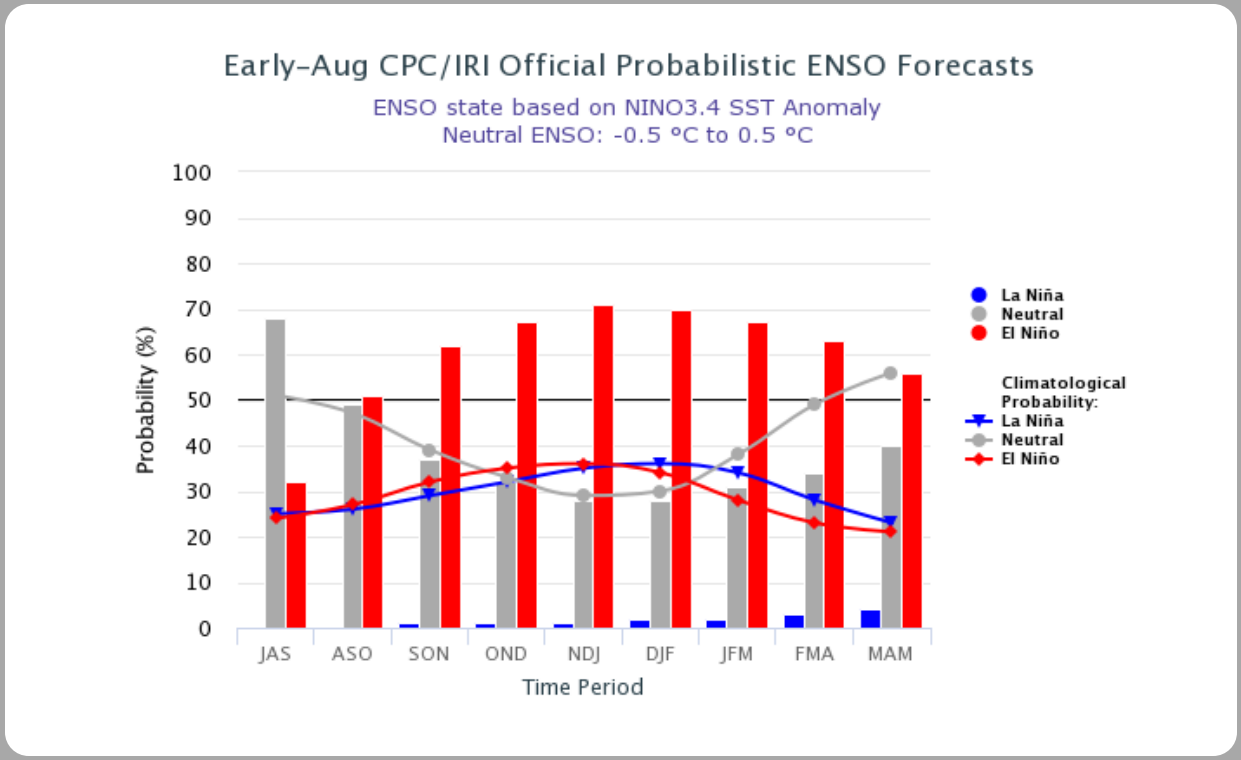
Year	DJF	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ
2006	-0.8	-0.7	-0.5	-0.3	0.0	0.0	0.1	0.3	0.5	0.7	0.9	0.9
2007	0.7	0.3	0.0	-0.2	-0.3	-0.4	-0.5	-0.8	-1.1	-1.4	-1.5	-1.6
2008	-1.6	-1.4	-1.2	-0.9	-0.8	-0.5	-0.4	-0.3	-0.3	-0.4	-0.6	-0.7
2009	-0.8	-0.7	-0.5	-0.2	0.1	0.4	0.5	0.5	0.7	1.0	1.3	1.6
2010	1.5	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	0.2	-0.1	-0.4	-0.7	-0.9	-1.0
2018	-0.9	-0.8	-0.6	-0.4	-0.1	0.1	0.1					

Prepared by: Climate Prediction Center / IRI

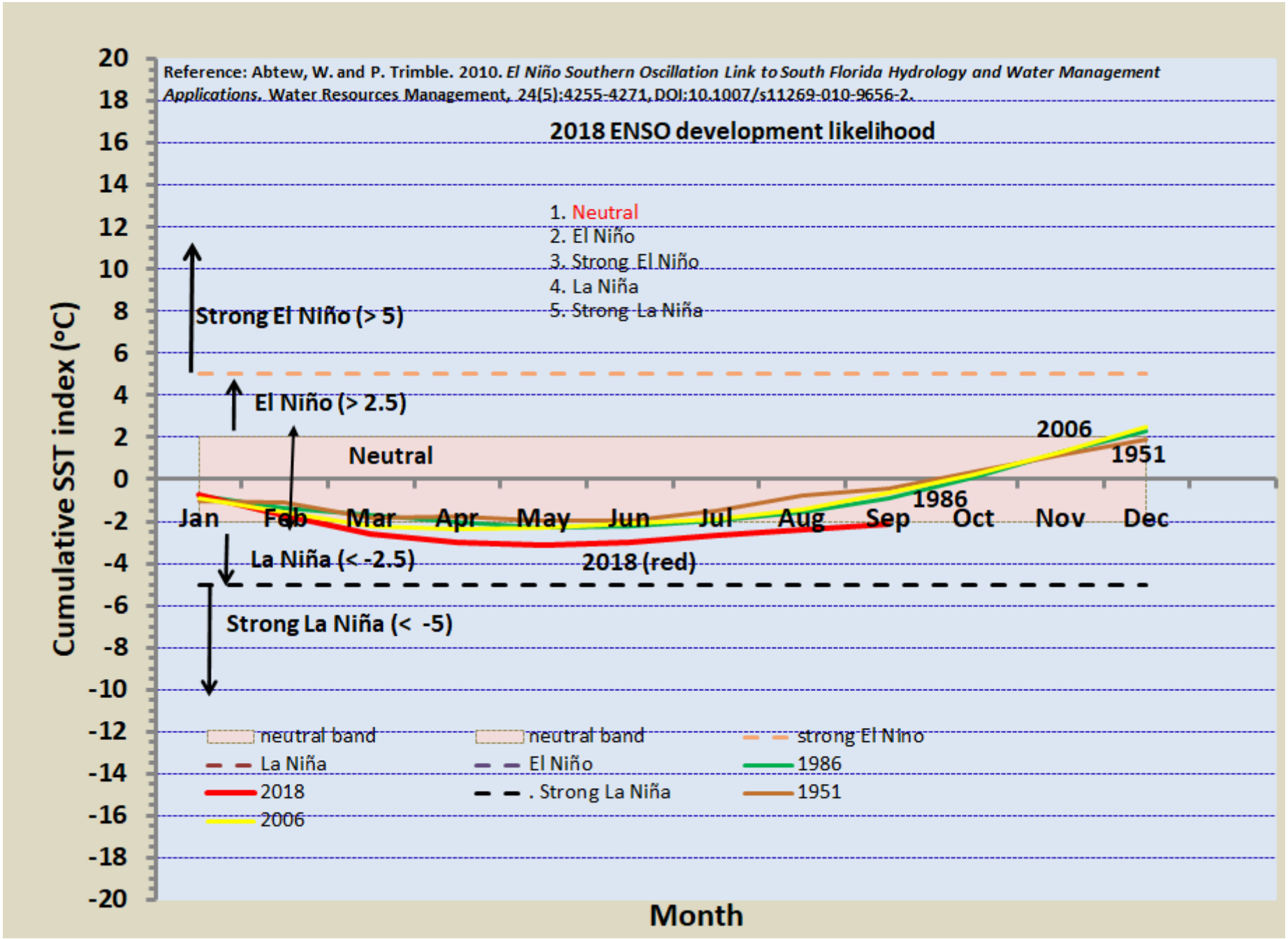
CPC/IRI Probabilistic ENSO Outlook

Updated: 9 August 2018

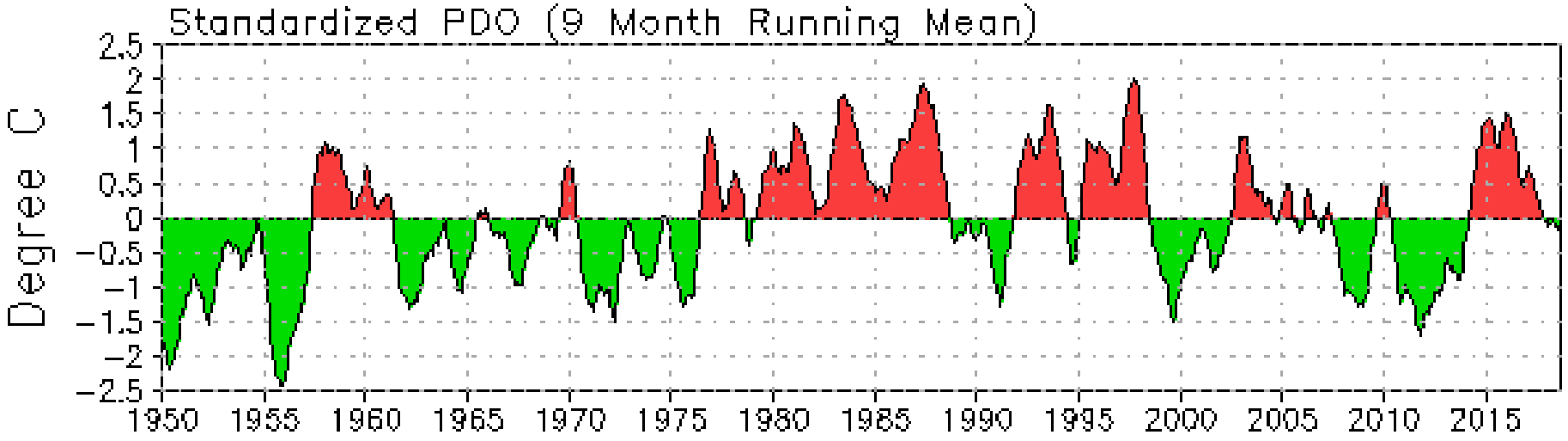
ENSO-neutral is favored through July-September 2018, with El Niño favored thereafter. Chances for El Niño are near 70% during Northern Hemisphere winter 2018-19.

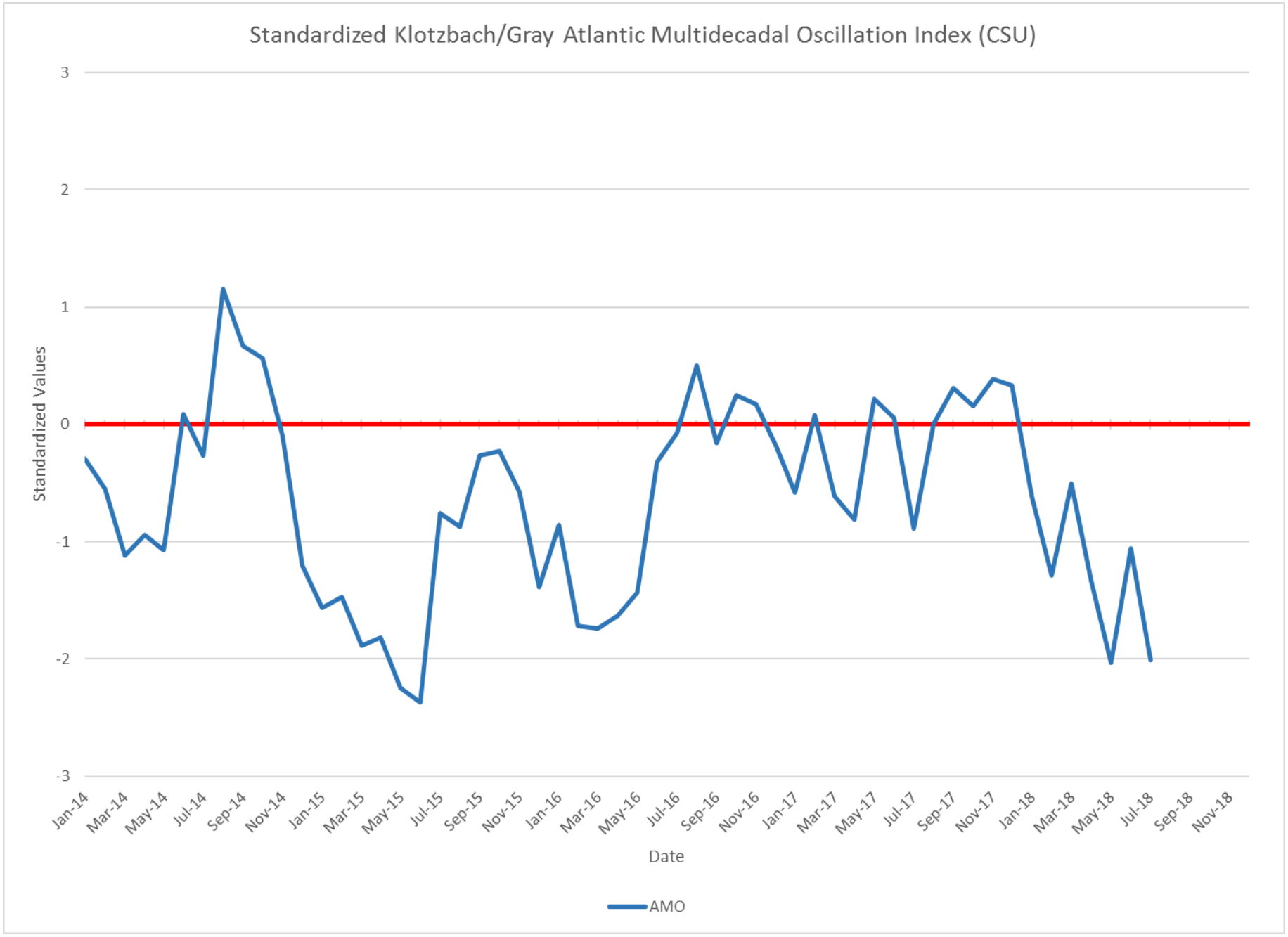


Prepared by: Climate Prediction Center / IRI



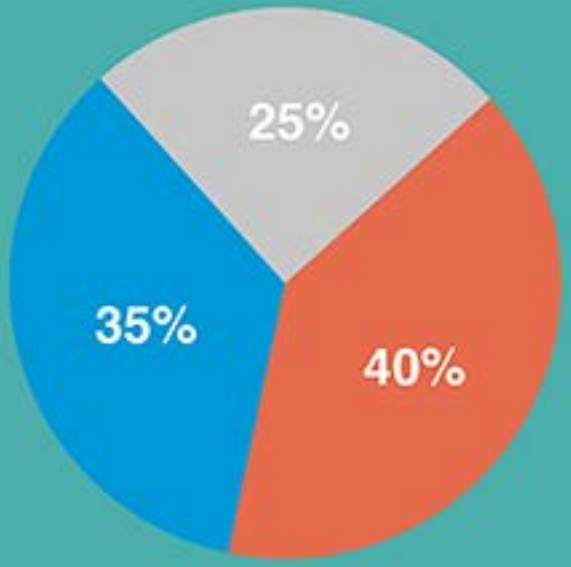
Source: Wossenu Abtew (SFWMD)


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-14
Mar-14
May-14
Jul-14
Sep-14
Nov-14
Jan-15
Mar-15
May-15
Jul-15
Sep-15
Nov-15
Jan-16
Mar-16
May-16
Jul-16
Sep-16
Nov-16
Jan-17
Mar-17
May-17
Jul-17
Sep-17
Nov-17
Jan-18
Mar-18
May-18
Jul-18
Sep-18
Nov-18
Date
AMO

2018 Tropical Outlook

2018 Atlantic Hurricane Season Outlook



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

Season probability

Named storms
10-16

Hurricanes
5-9

Major hurricanes
1-4

NOAA

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

May 24, 2018

2018 FORECAST AS OF 2 AUGUST 2018

Forecast Parameter	Statistical Forecast	Analog Forecast	Final Forecast (Including Alberto, Beryl and Chris)	1981-2010 Median
Named Storms (NS)	11.2	8.2	12	12.0
Named Storm Days (NSD)	47.3	34.6	53	60.1
Hurricanes (H)	6.2	4.0	5	6.5
Hurricane Days (HD)	16.0	10.0	15	21.3
Major Hurricanes (MH)	1.1	0.6	1	2.0
Major Hurricane Days (MHD)	1.8	0.8	2	3.9
Accumulated Cyclone Energy (ACE)	66	44	64	92
Net Tropical Cyclone Activity (NTC)	78	51	78	103

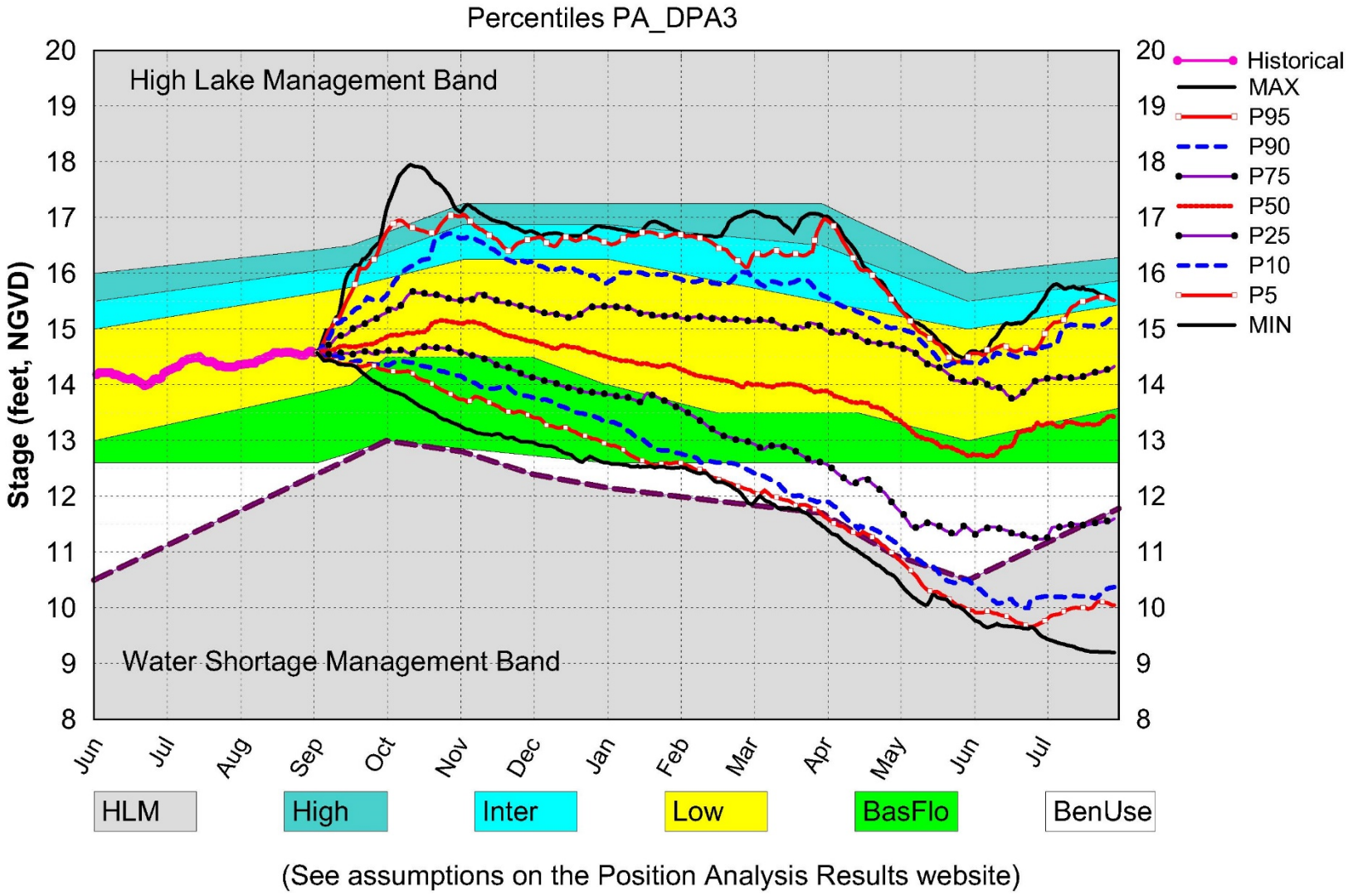
Source: Colorado State University Tropical Meteorology Project

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-Sep-2018)
  - 41 1-year simulations of system response to historical rainfall conditions
  - Statistical summaries used to display projections

Preliminary Results

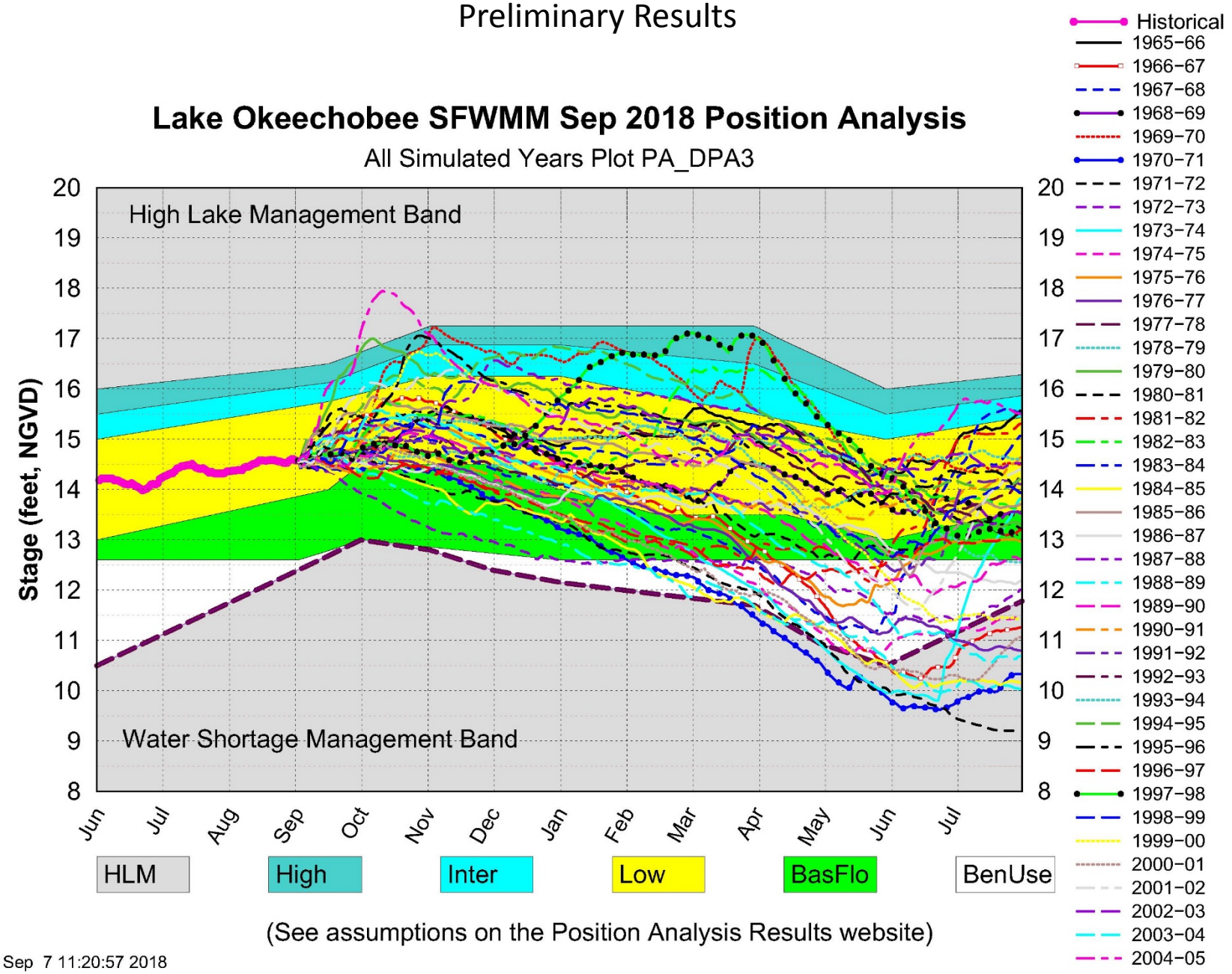
Lake Okeechobee SFWMM Sep 2018 Position Analysis



(See assumptions on the Position Analysis Results website)

Fri Sep 7 16:47:20 2018

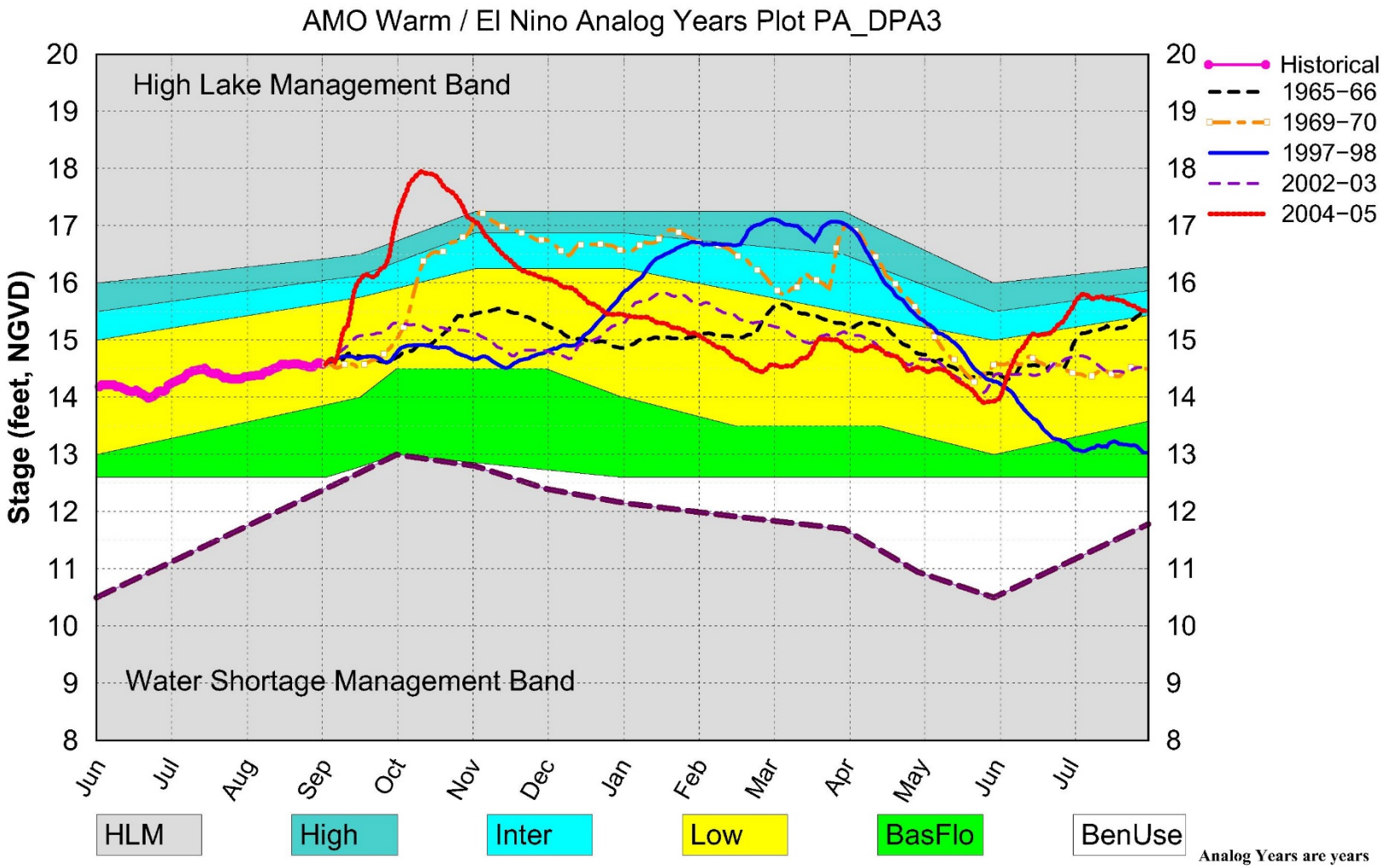
Preliminary Results



Fri Sep 7 11:20:57 2018

Preliminary Results

Lake Okeechobee SFWMM Sep 2018 Position Analysis



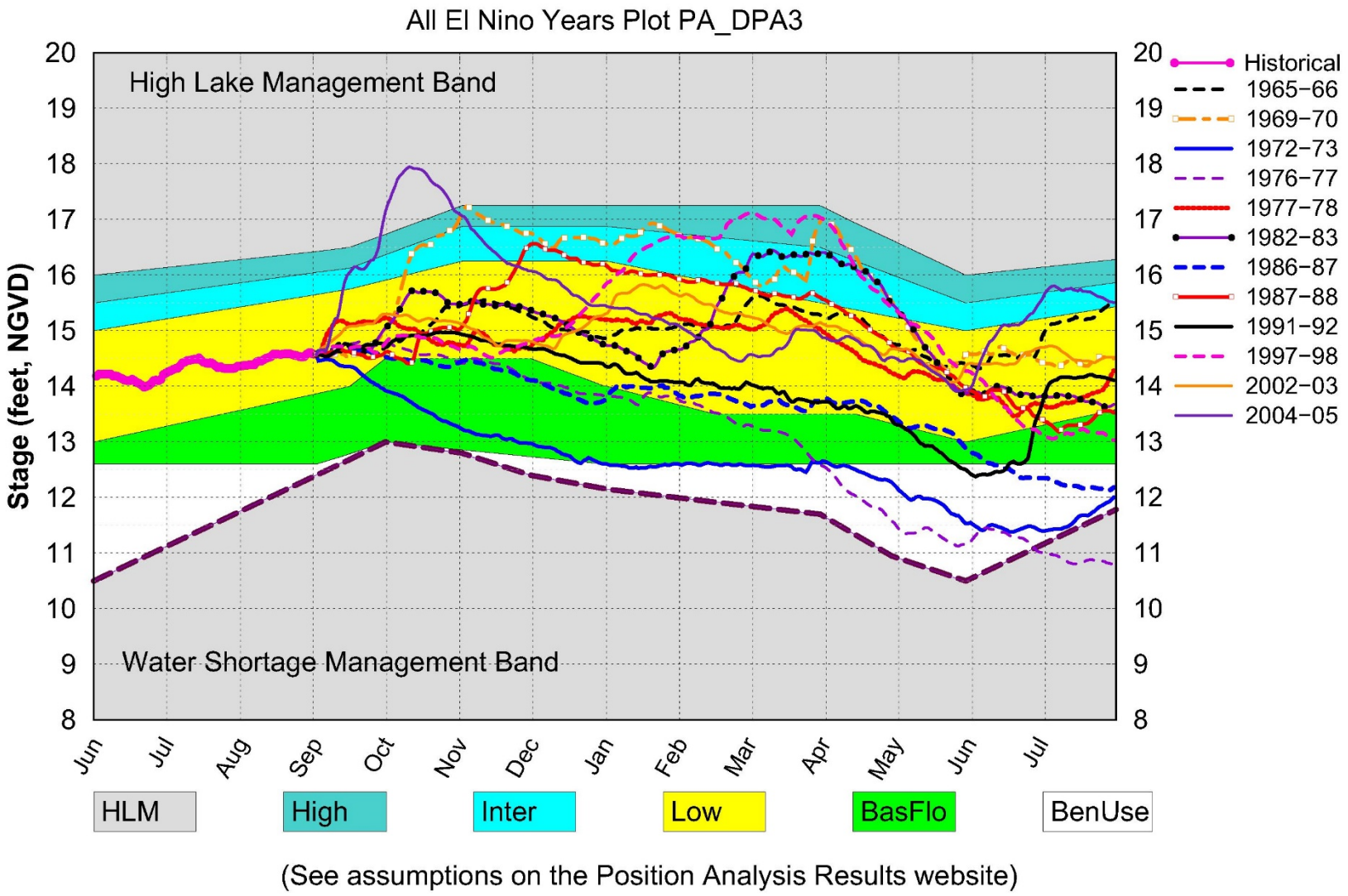
(See assumptions on the Position Analysis Results website)

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

Fri Sep 7 11:18:36 2018

Preliminary Results

Lake Okeechobee SFWMM Sep 2018 Position Analysis



(See assumptions on the Position Analysis Results website)

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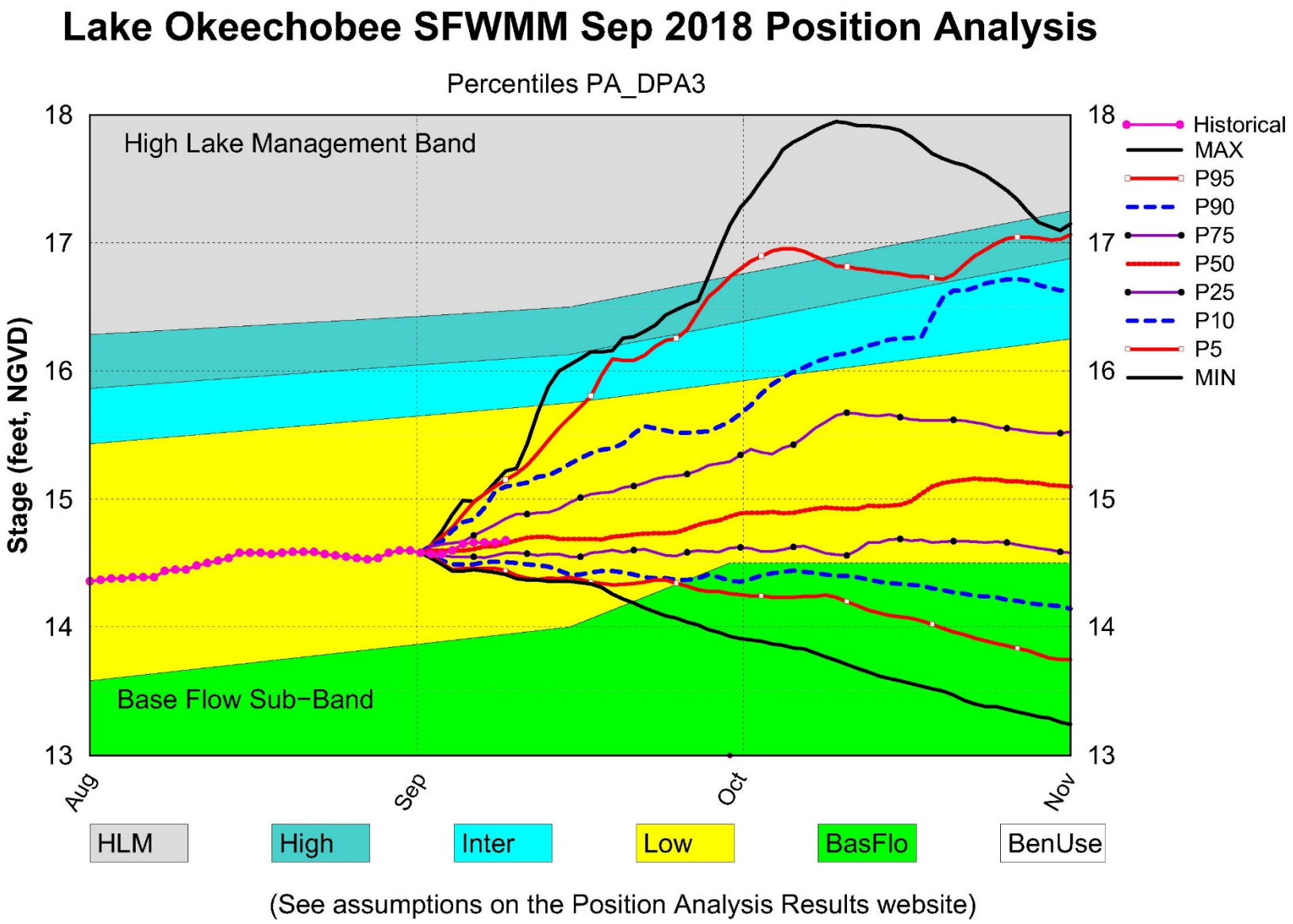
Preliminary Results



Sun Sep 9 16:16:02 2018