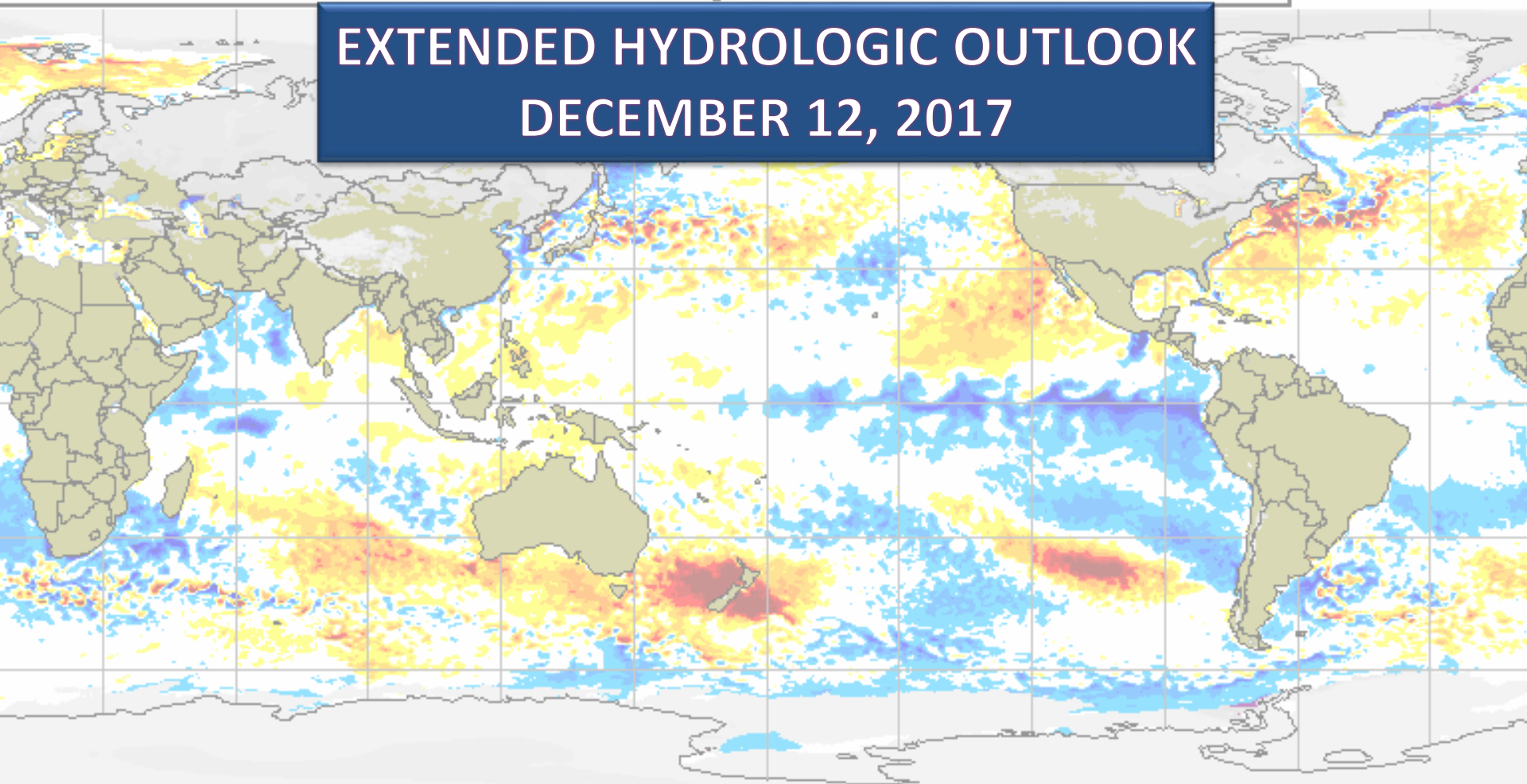


EXTENDED HYDROLOGIC OUTLOOK DECEMBER 12, 2017



Sea surface temperature anomaly / Anomalie de la température de la mer (°C)



Snow depth / Épaisseur de la neige (cm)



Uncovered sea ice
Glace marine à découvrir
Climatologie 1995-2009 Climatologie



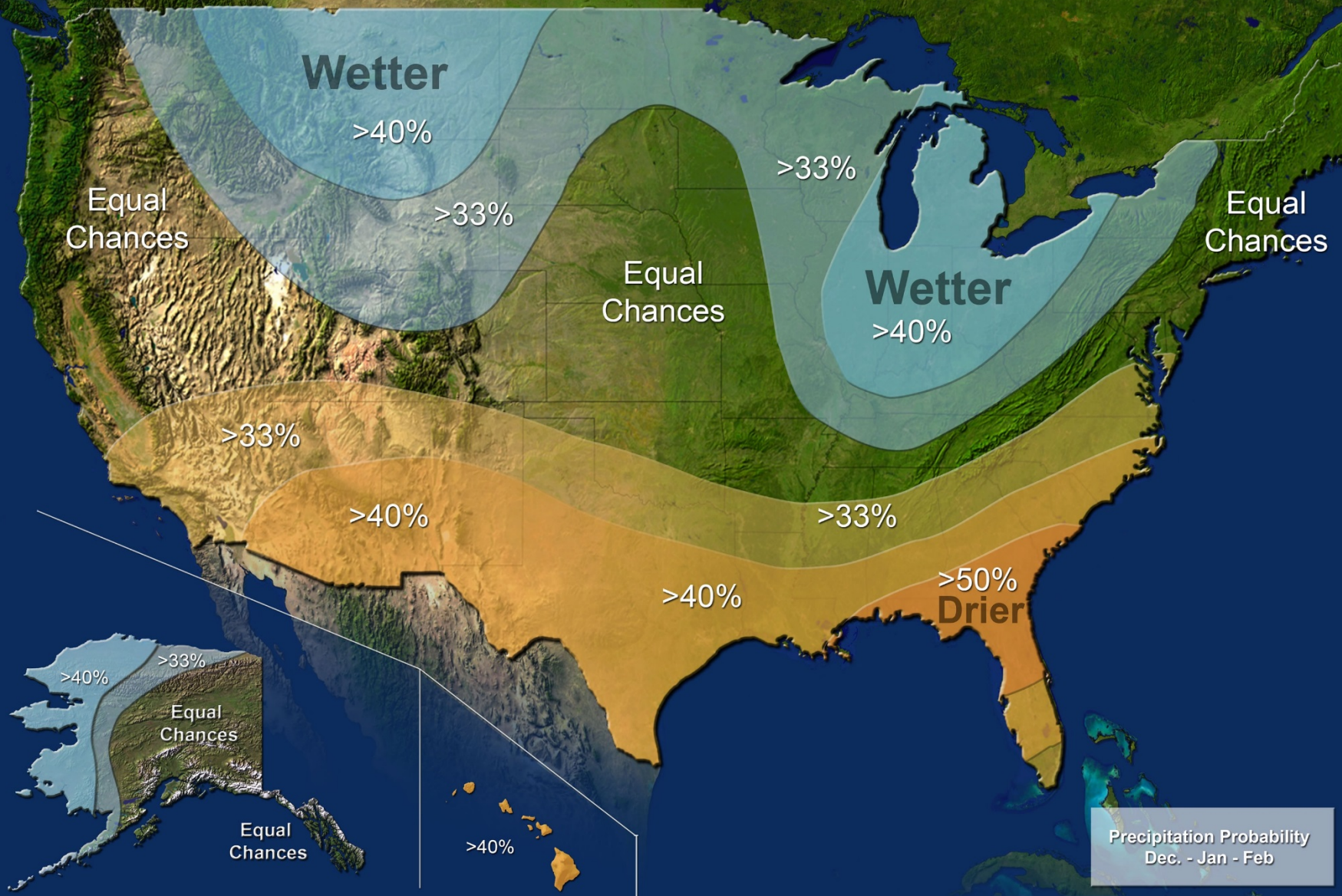
CMC Environnement Canada
CMC Environment Canada

Summary

- The Climate Prediction Center (CPC) is forecasting 40-50% chance of below normal rainfall for areas including and north of Lake Okeechobee and 33-40% chances of below normal rainfall for areas south of Lake Okeechobee for December through February.
- La Niña conditions are present and are predicted to continue (~65%-75%) at least through 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.

U.S. Winter Outlook

Precipitation

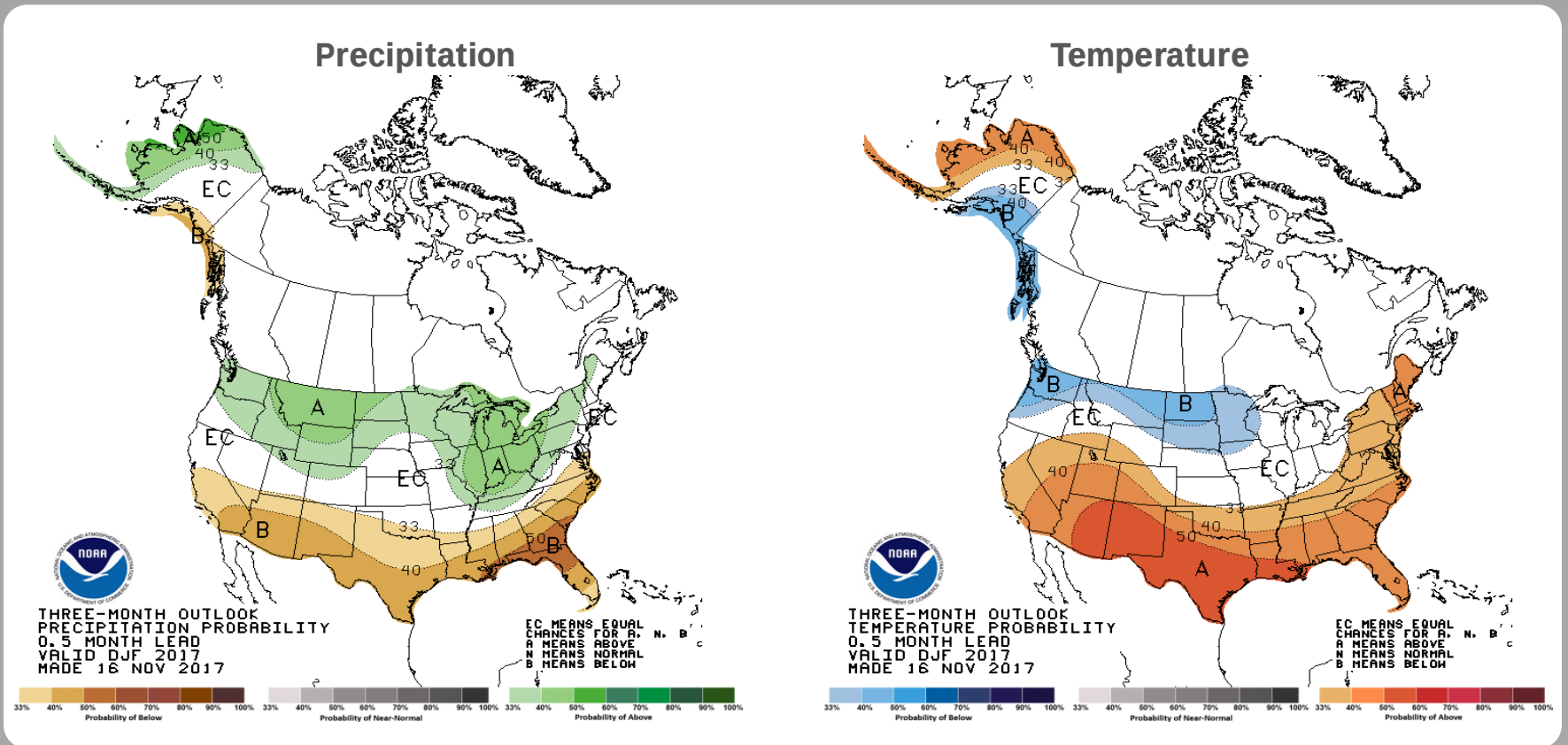


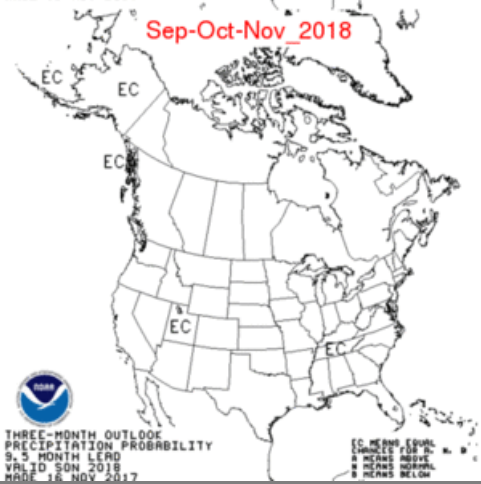
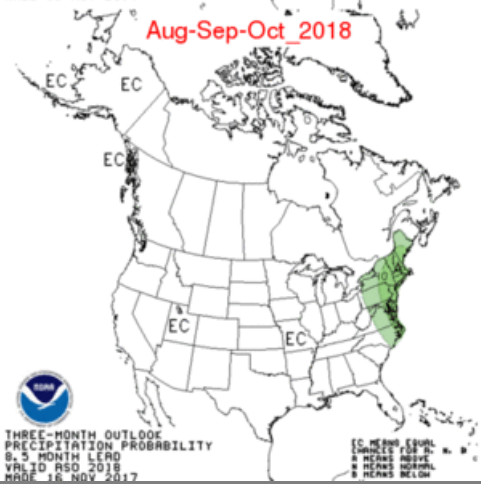
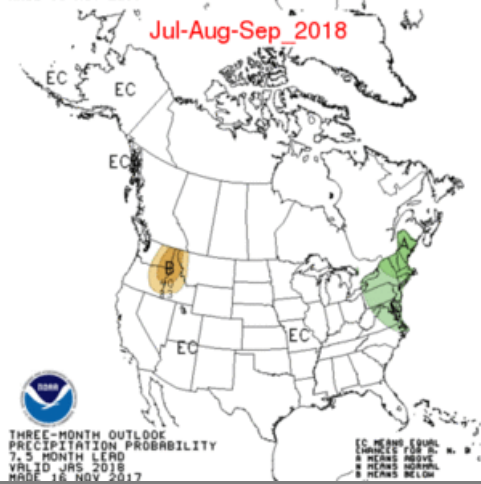
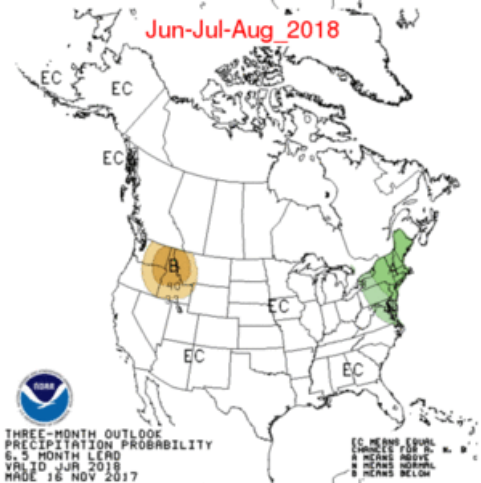
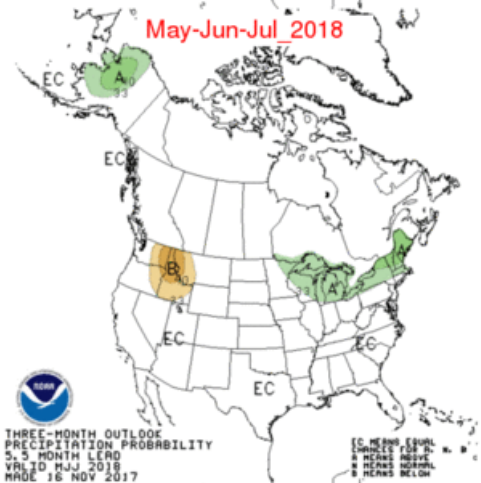
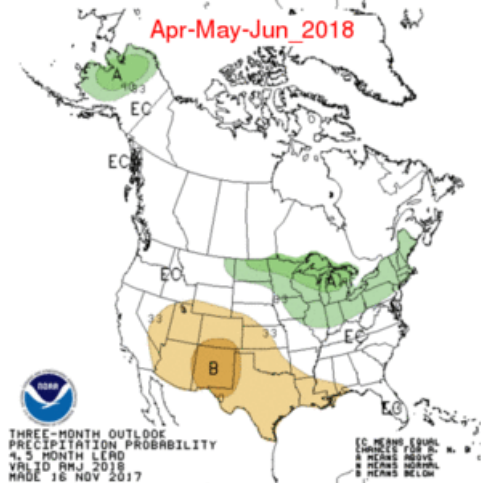
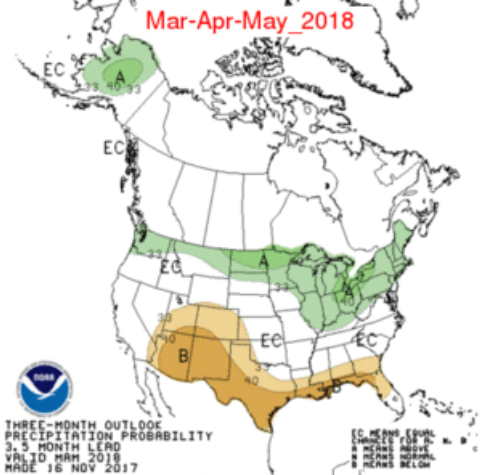
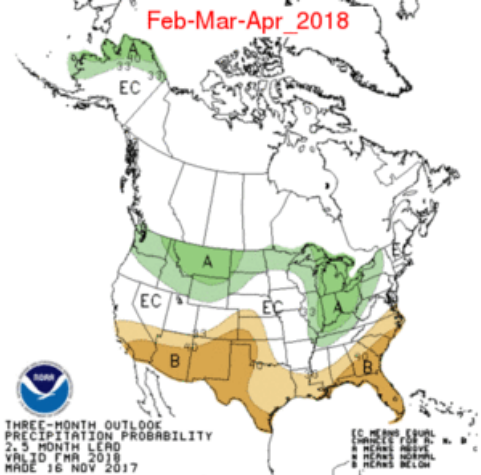
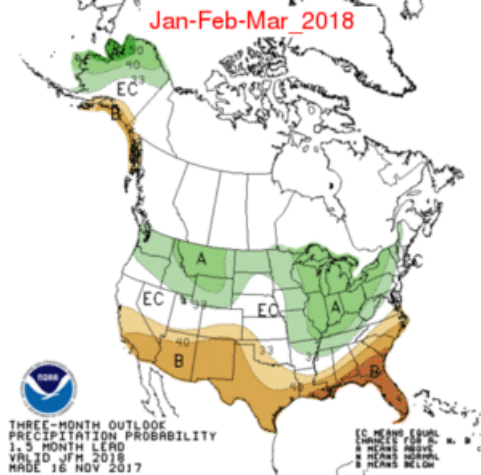
Precipitation Probability
Dec. - Jan - Feb

U. S. Seasonal Outlooks

December 2017- February 2018

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





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

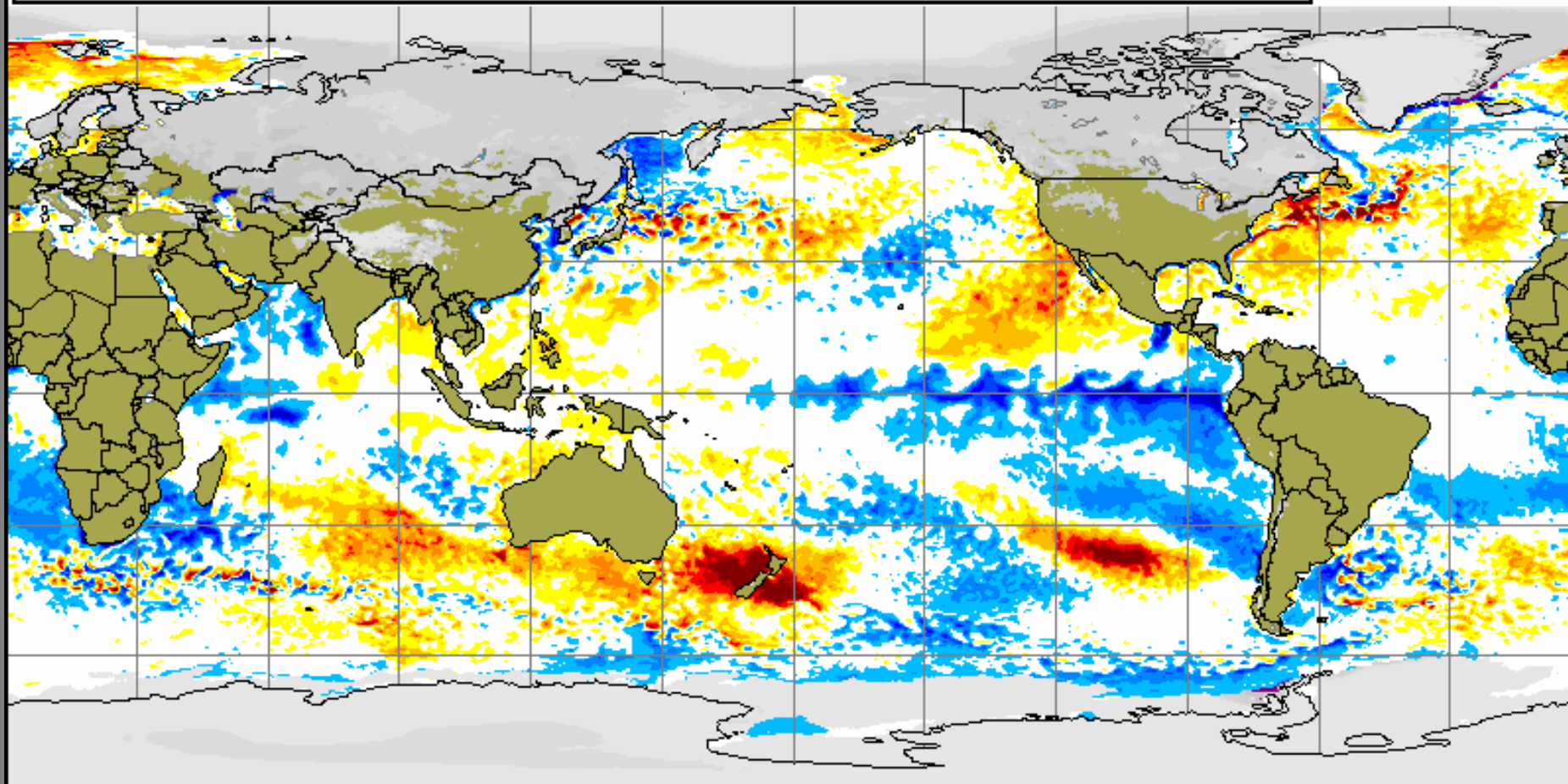
Pacific Decadal Oscillation (PDO)

Increases variations of south Florida dry season rainfall

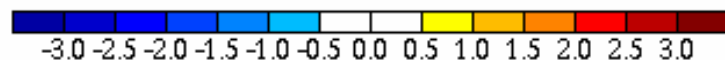
Current Global Sea Surface Temperature Anomalies

Global sea surface anomaly and snow cover
12 Dec 2017

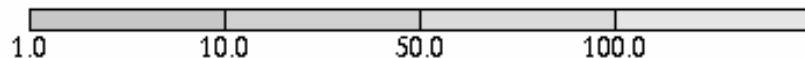
Anomalie de la température de la mer et épaisseur de la neige
12 Dec 2017 /operational



Sea surface temperature anomaly / Anomalie de la température de la mer (°C)



Snow depth / Épaisseur de la neige (cm)



Uncovered sea ice

Glace marine à découvert

Climatologie 1995-2009 Climatology



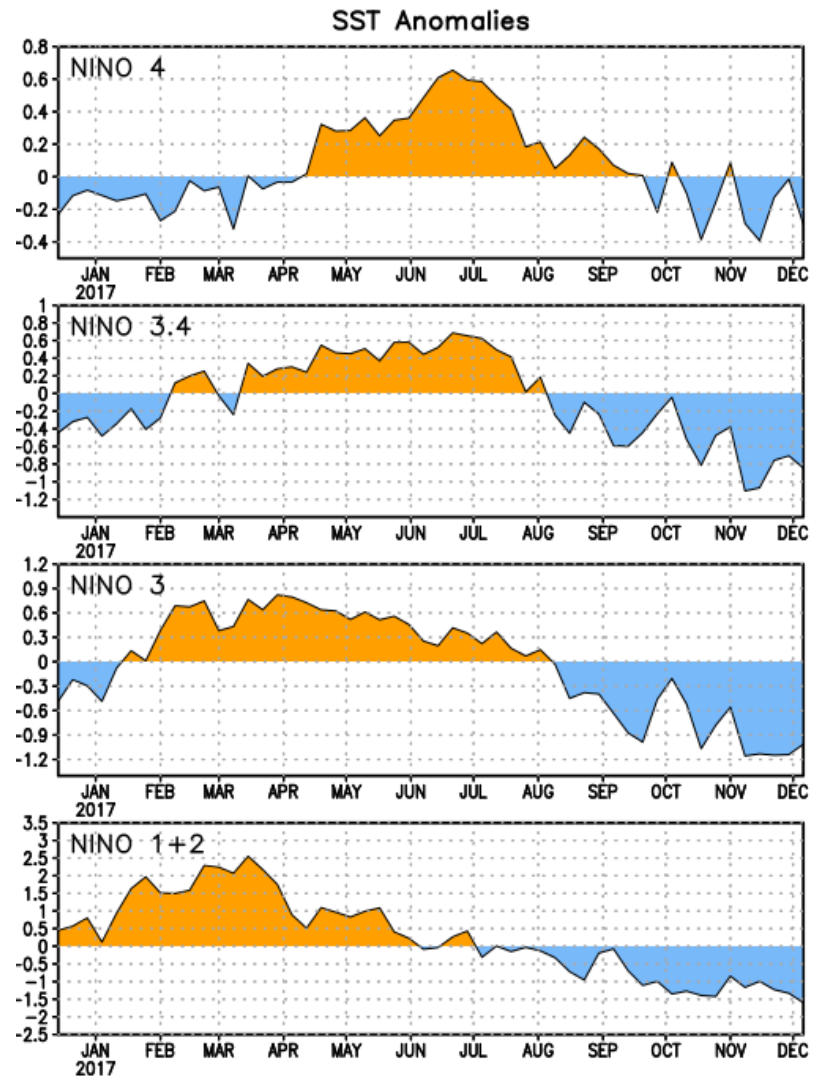
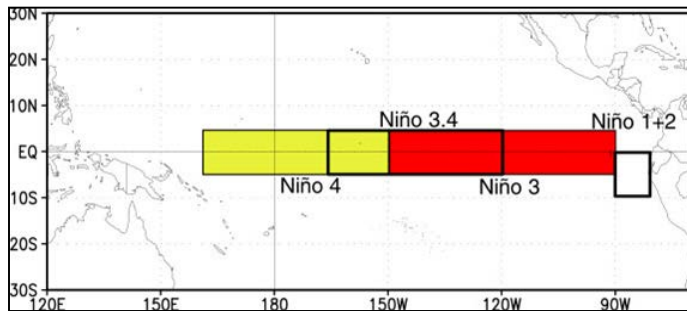
CMC Environnement Canada

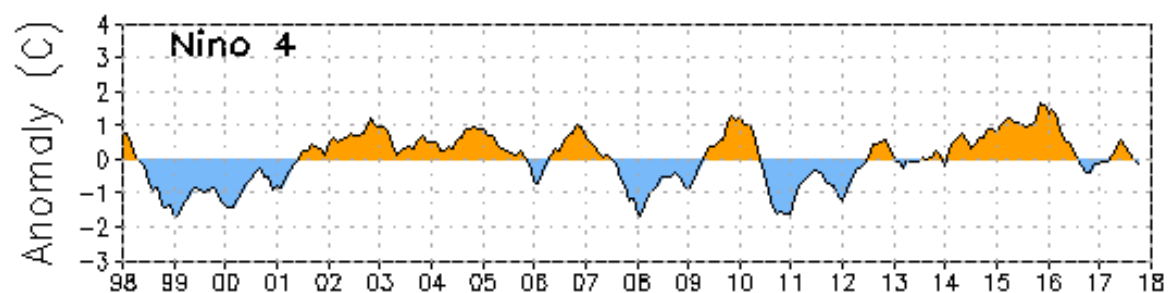
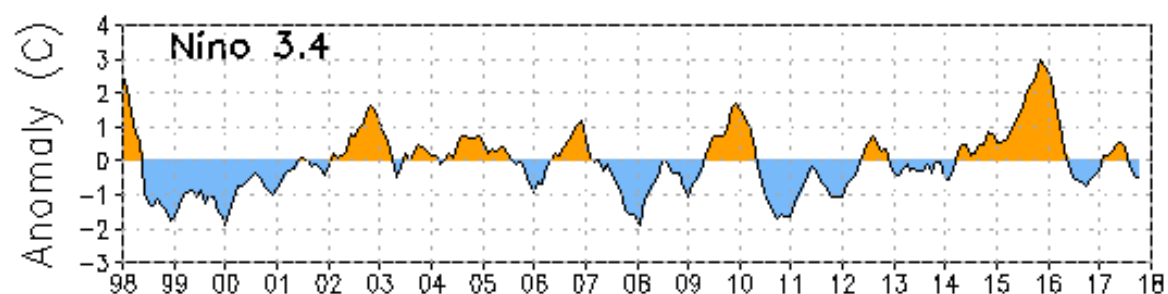
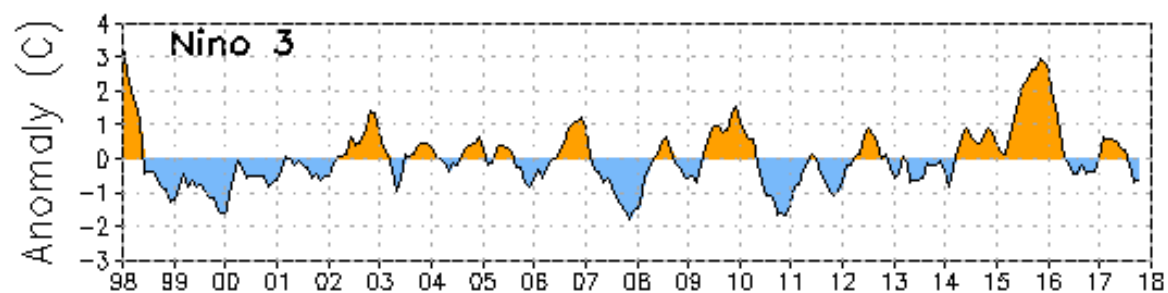
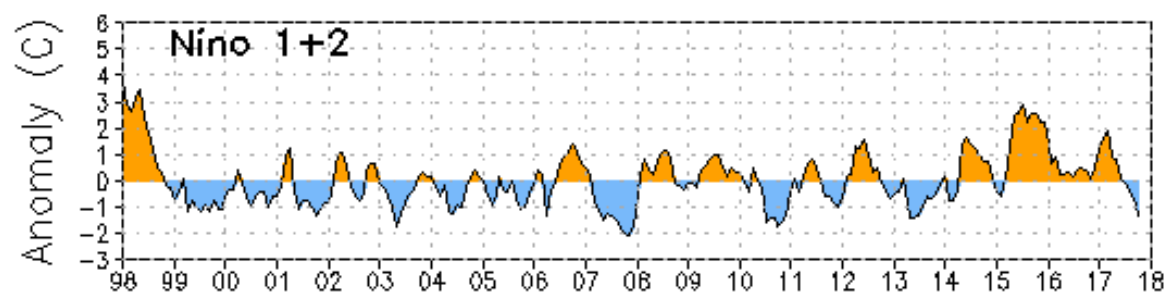
CMC Environnement Canada

Niño Region SST Departures (°C) Recent Evolution

The latest weekly SST departures are:

Niño 4	-0.3°C
Niño 3.4	-0.8°C
Niño 3	-1.0°C
Niño 1+2	-1.6°C





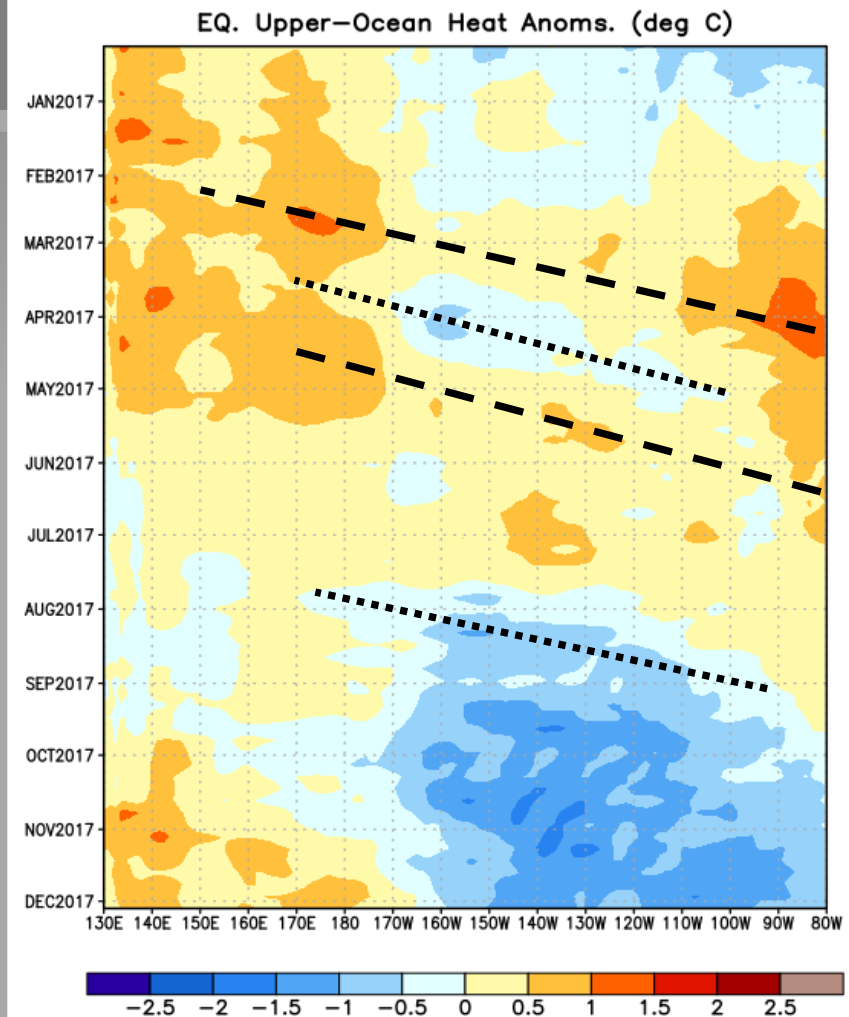
Data updated through October 2017

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 temperature variability in the central Pacific.

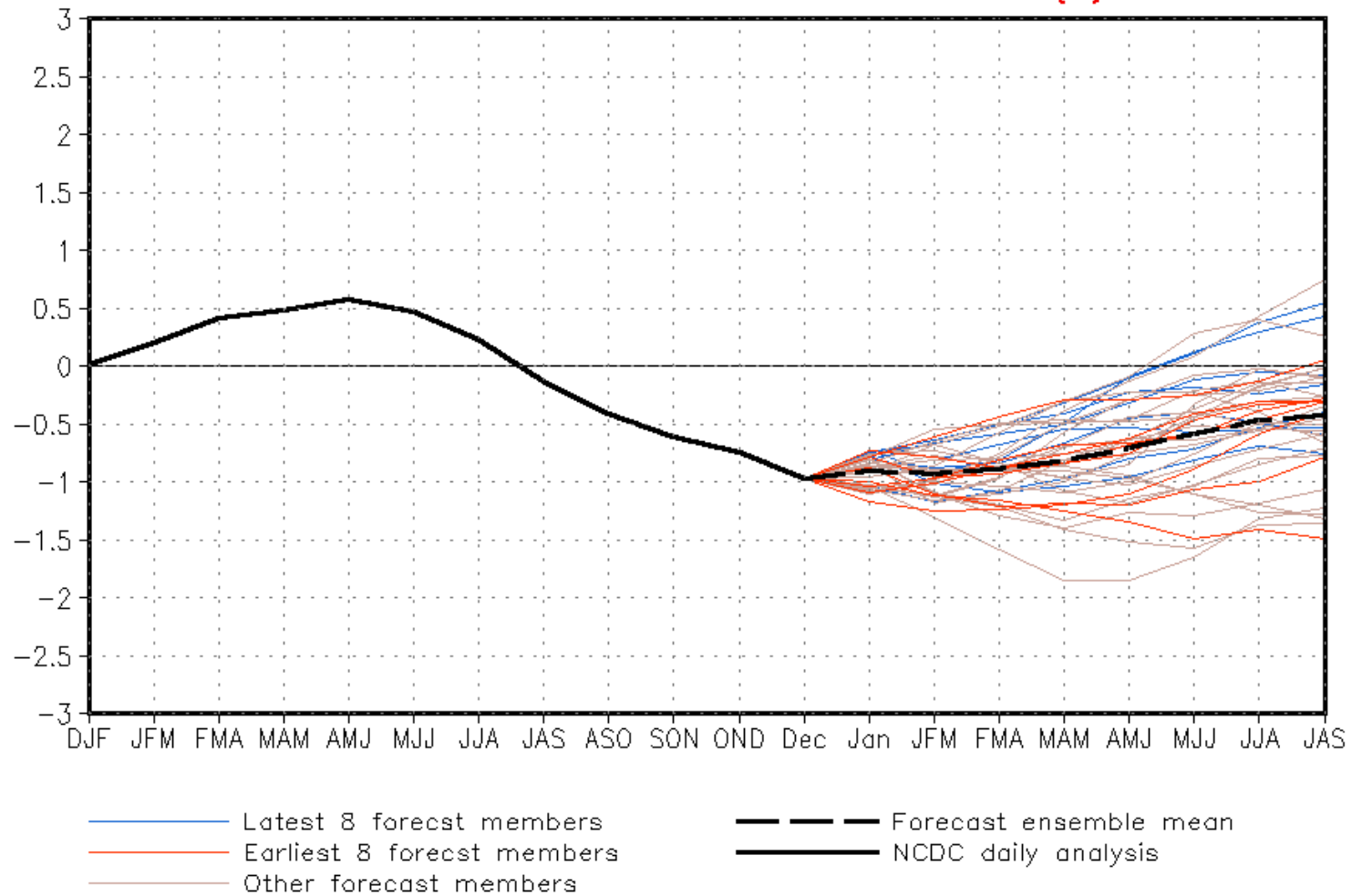
During August 2017, an upwelling Kelvin wave resulted in below-average sub-surface temperatures across the east-central and eastern equatorial Pacific. Since September 2017, negative sub-surface anomalies have persisted in those regions.

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.





CFSv2 forecast Nino3.4 SST anomalies (K)



IRI/CPC Pacific Niño

3.4 SST Model Outlook

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

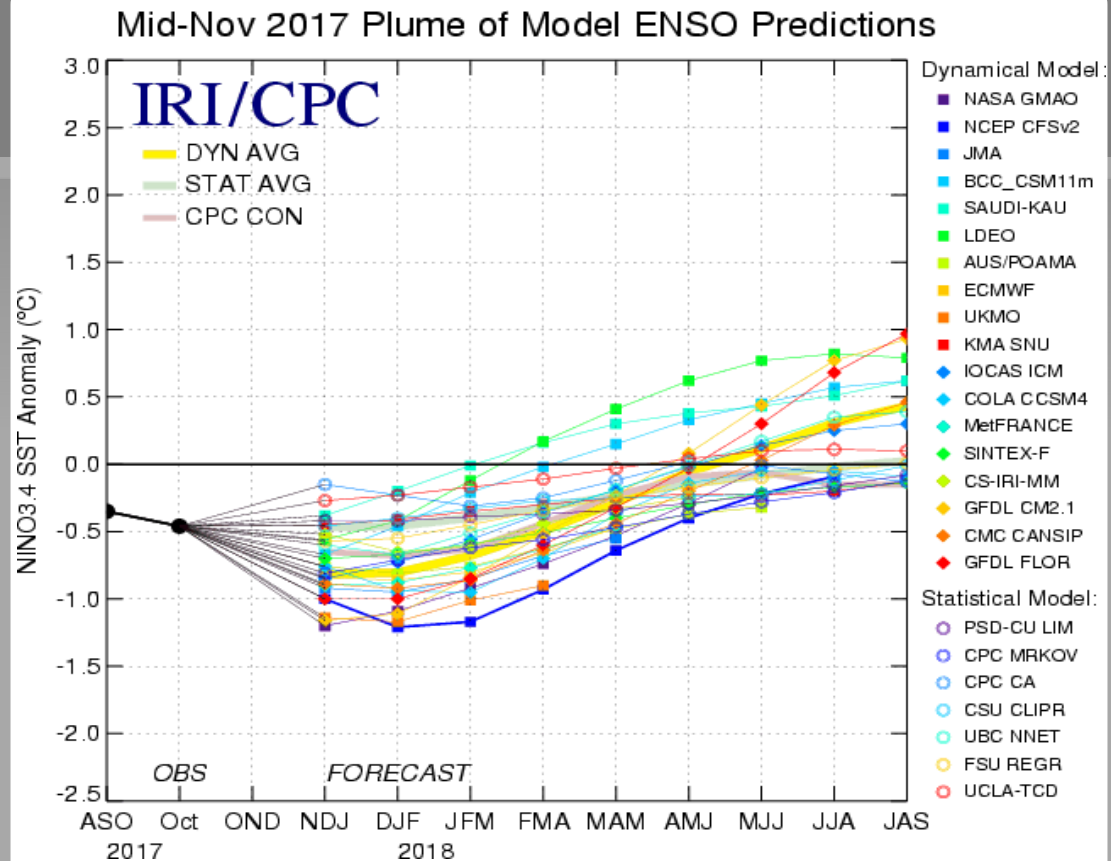


Figure provided by the International Research Institute (IRI) for Climate and Society (updated 17 November 2017).

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.

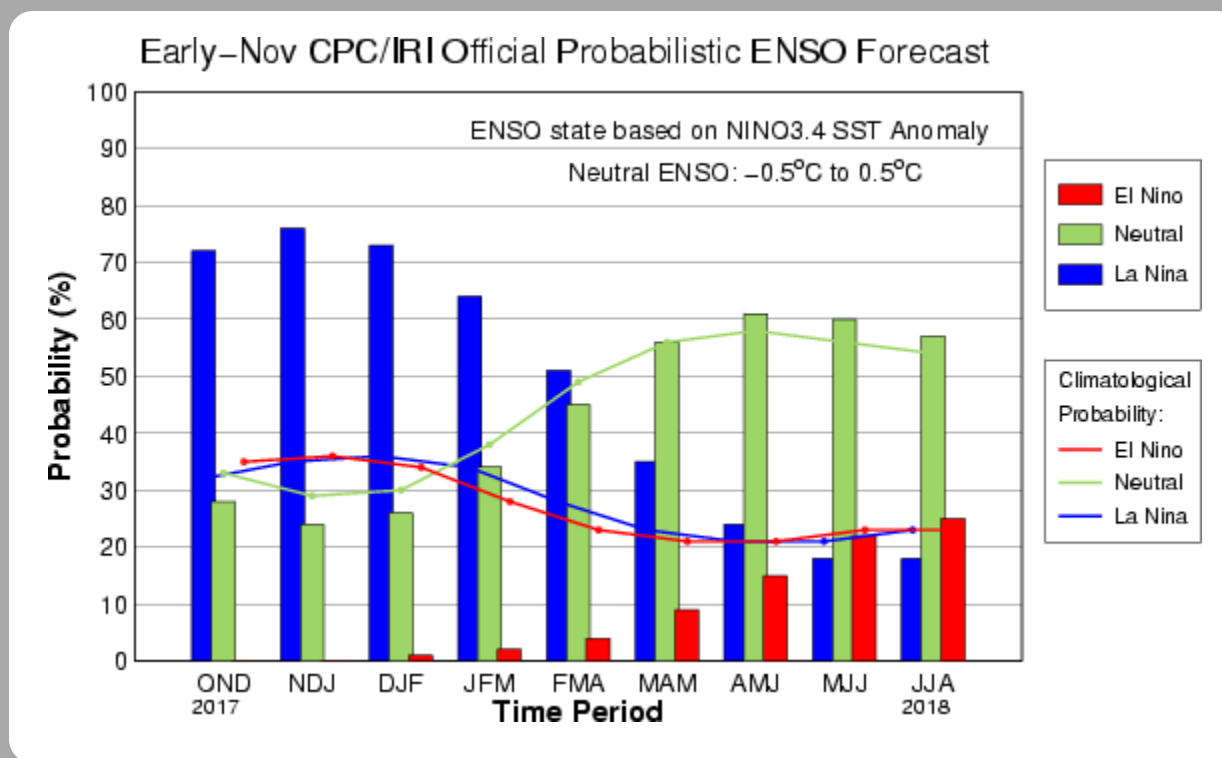
The ONI is one measure of the El Niño-Southern Oscillation, and other indices can confirm whether features consistent with a coupled ocean-atmosphere phenomenon accompanied these periods. The complete table going back to DJF 1950 can be found [here](#).

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		

CPC/IRI Probabilistic ENSO Outlook

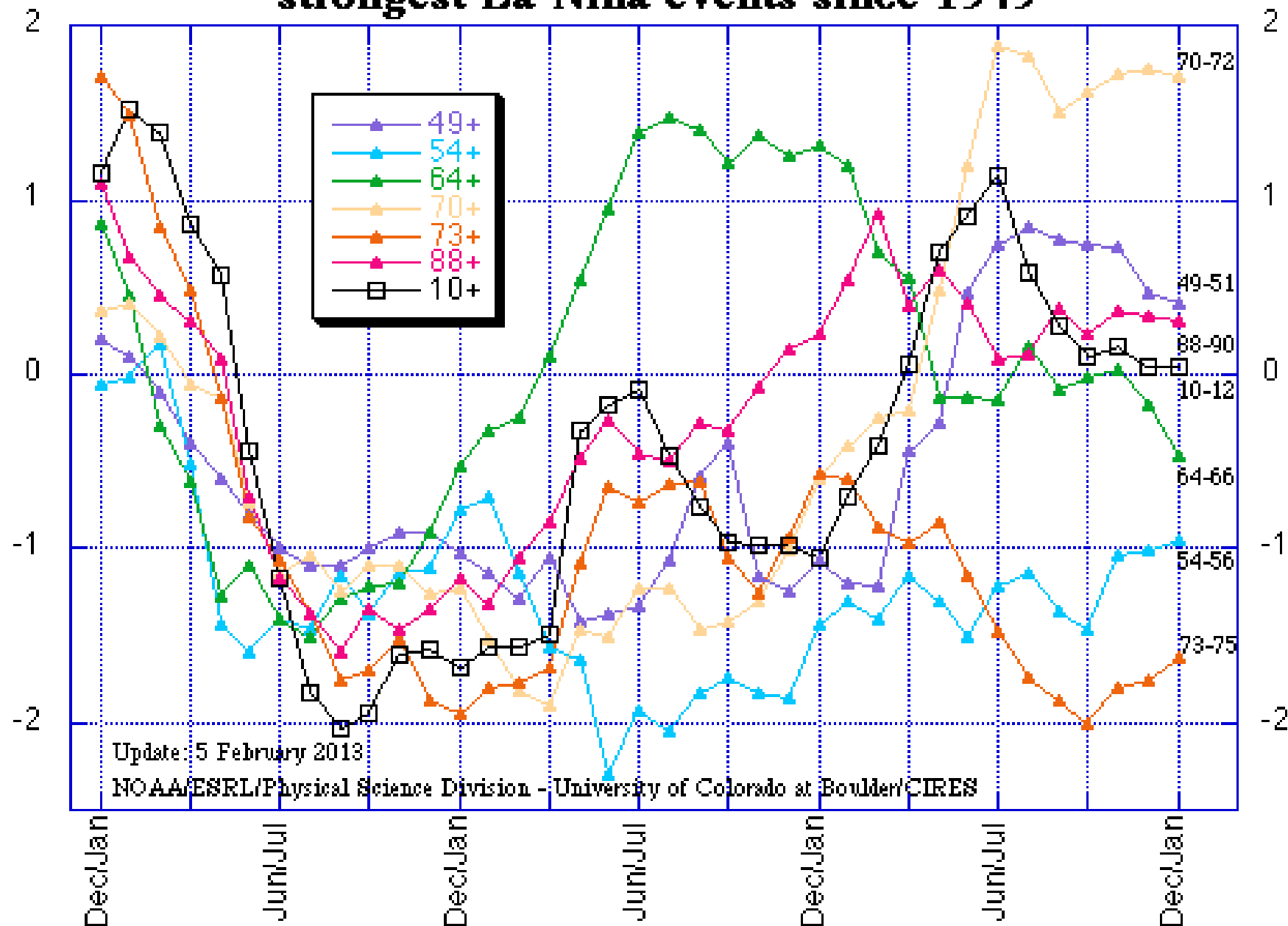
Updated: 9 November 2017

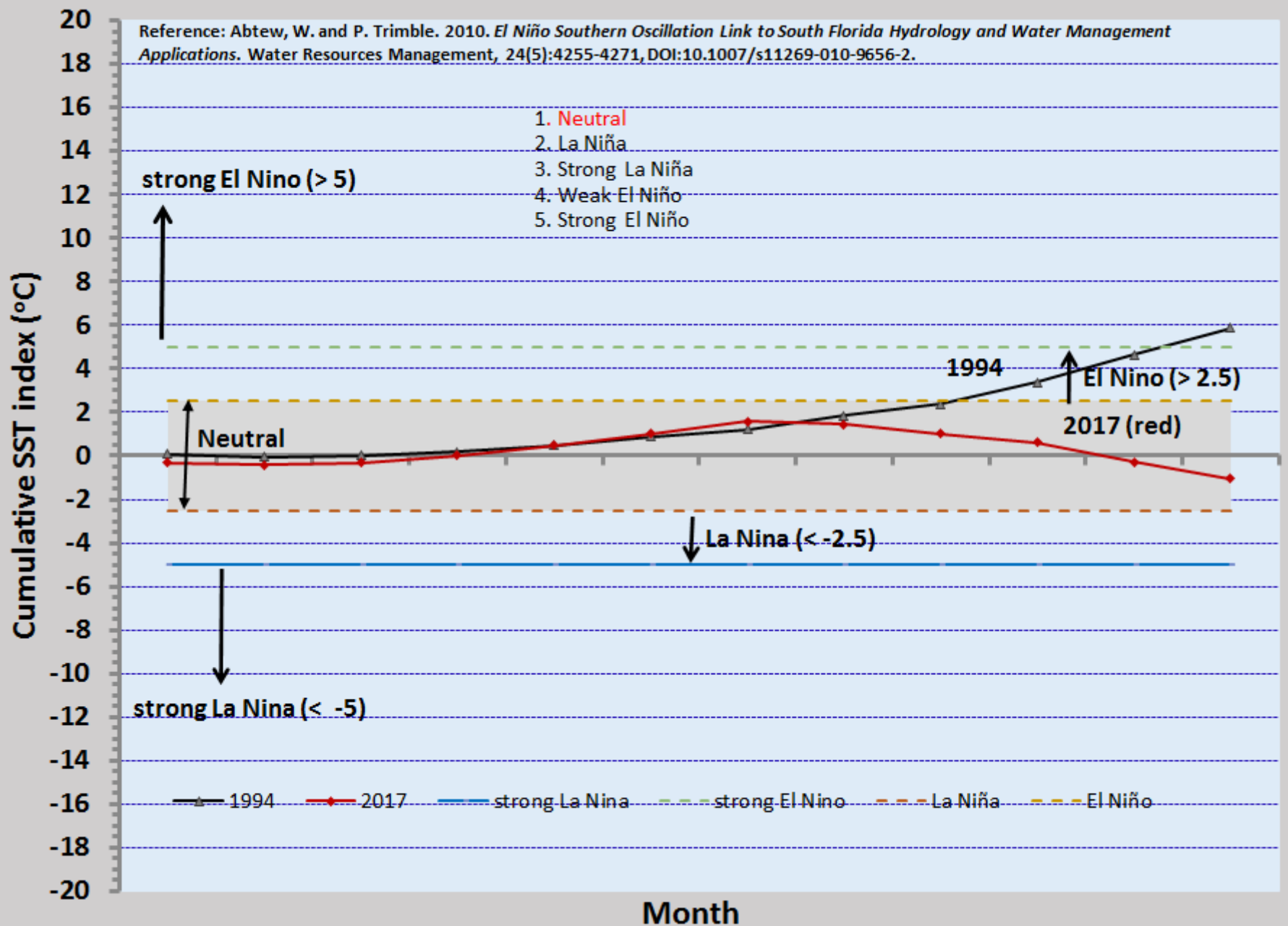
La Niña conditions are predicted to continue (~65%-75% chance) at least through the Northern Hemisphere winter 2017-18, with a 51% chance of continuation through February-April 2018.

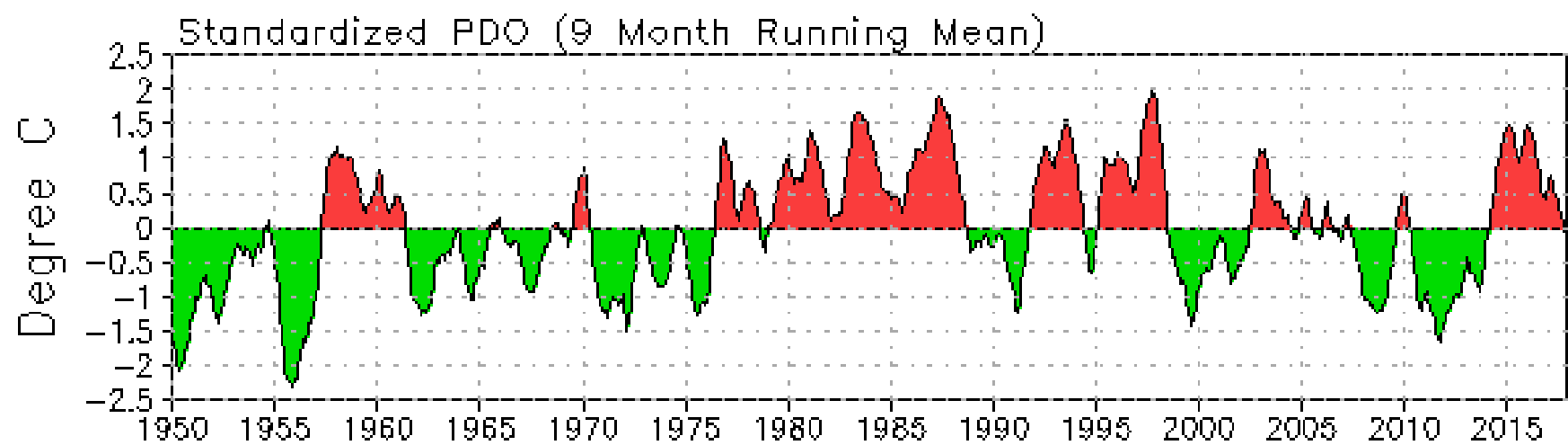


Multivariate ENSO Index (MEI) for the seven strongest La Niña events since 1949

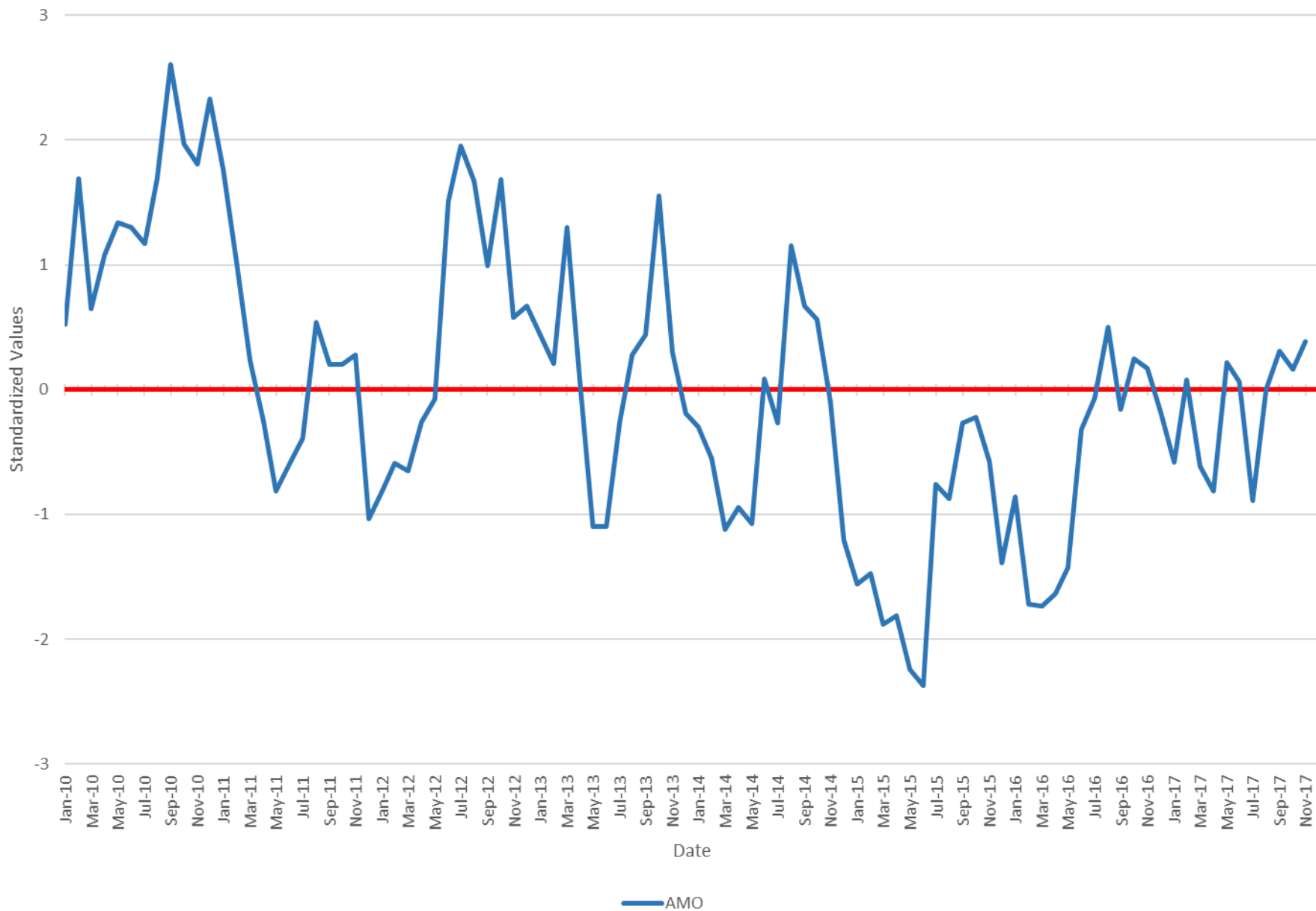
Standardized Departure







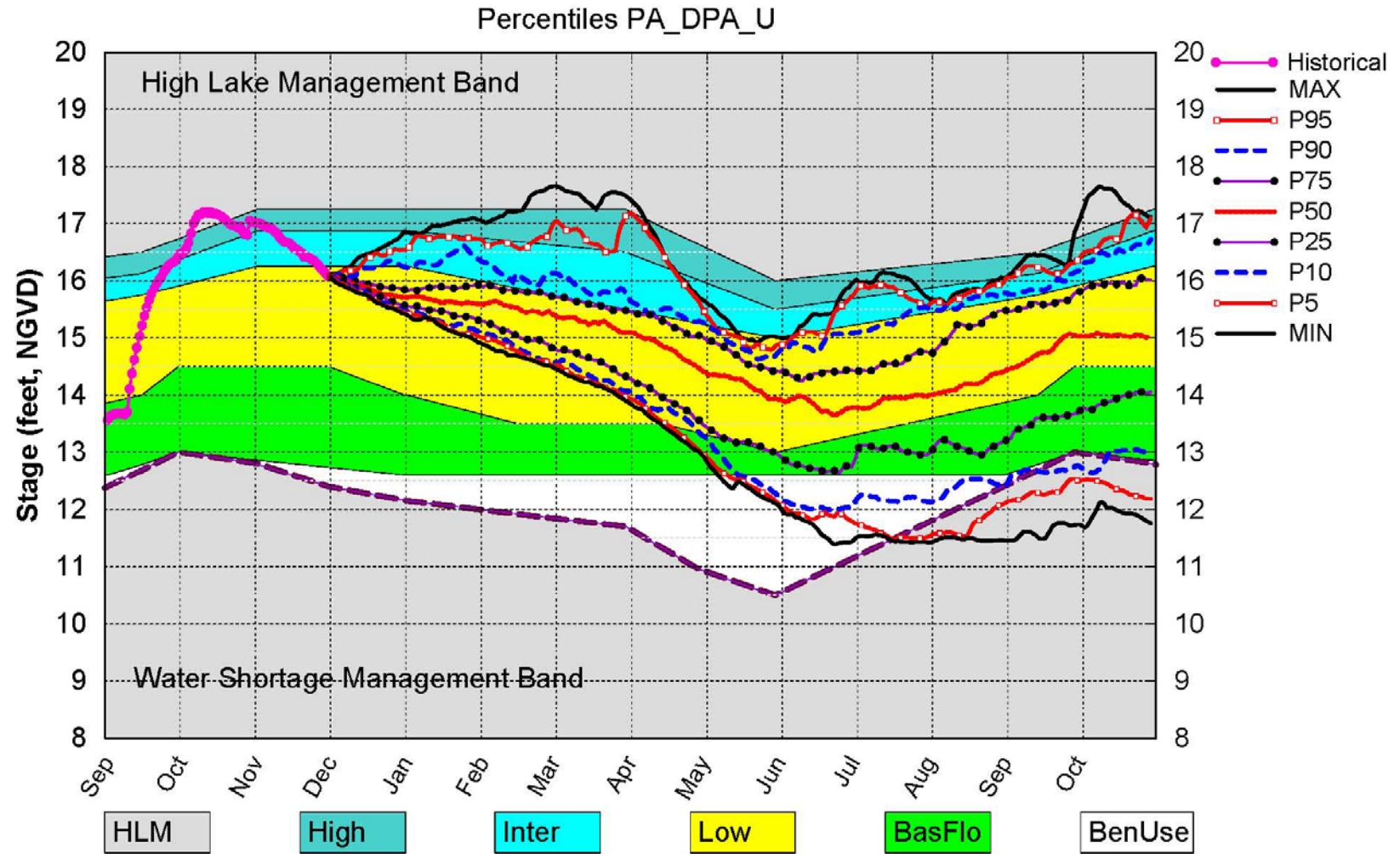
Standardized Klotzbach/Gray Atlantic Multidecadal Oscillation Index (CSU)



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-Dec-2017)
 - 41 1-year simulations of system response to historical rainfall conditions
 - Statistical summaries used to display projections

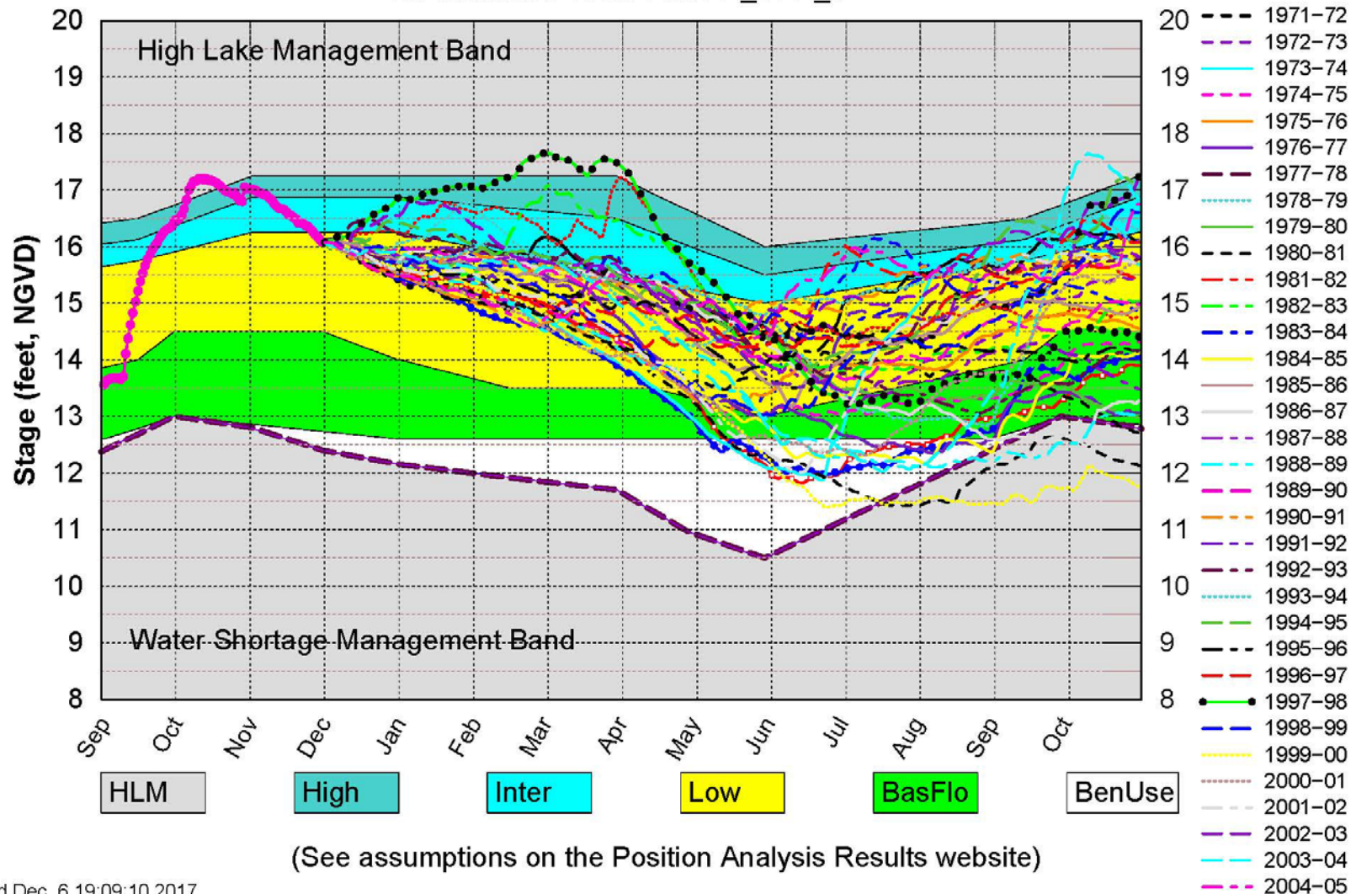
Lake Okeechobee SFWMM December 2017 Position Analysis



(See assumptions on the Position Analysis Results website)

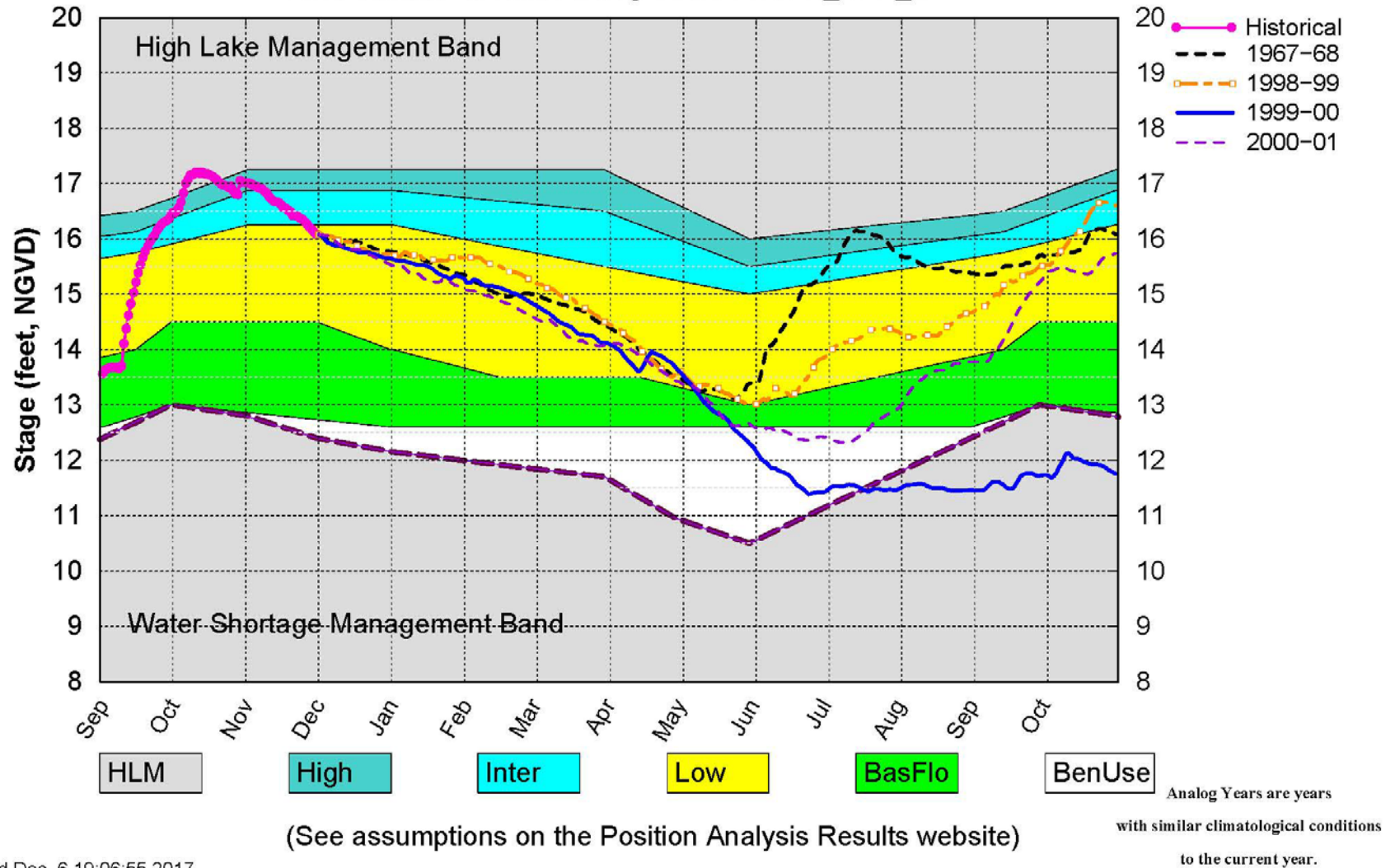
Lake Okeechobee SFWMM December 2017 Position Analysis

All Simulated Years Plot PA_DPA_U



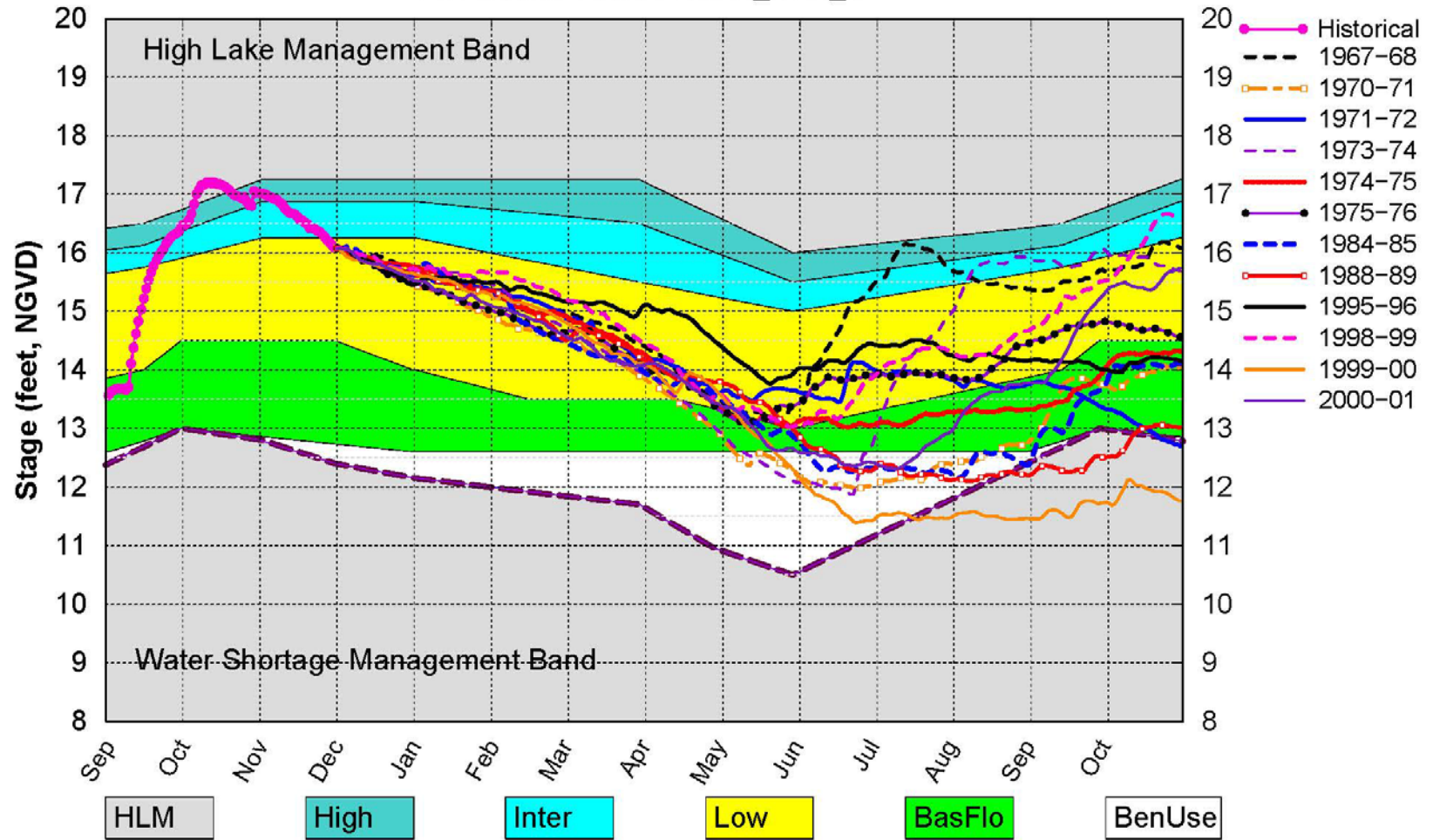
Lake Okeechobee SFWMM December 2017 Position Analysis

AMO Warm / La Nina Analog Years Plot PA_DPA_U



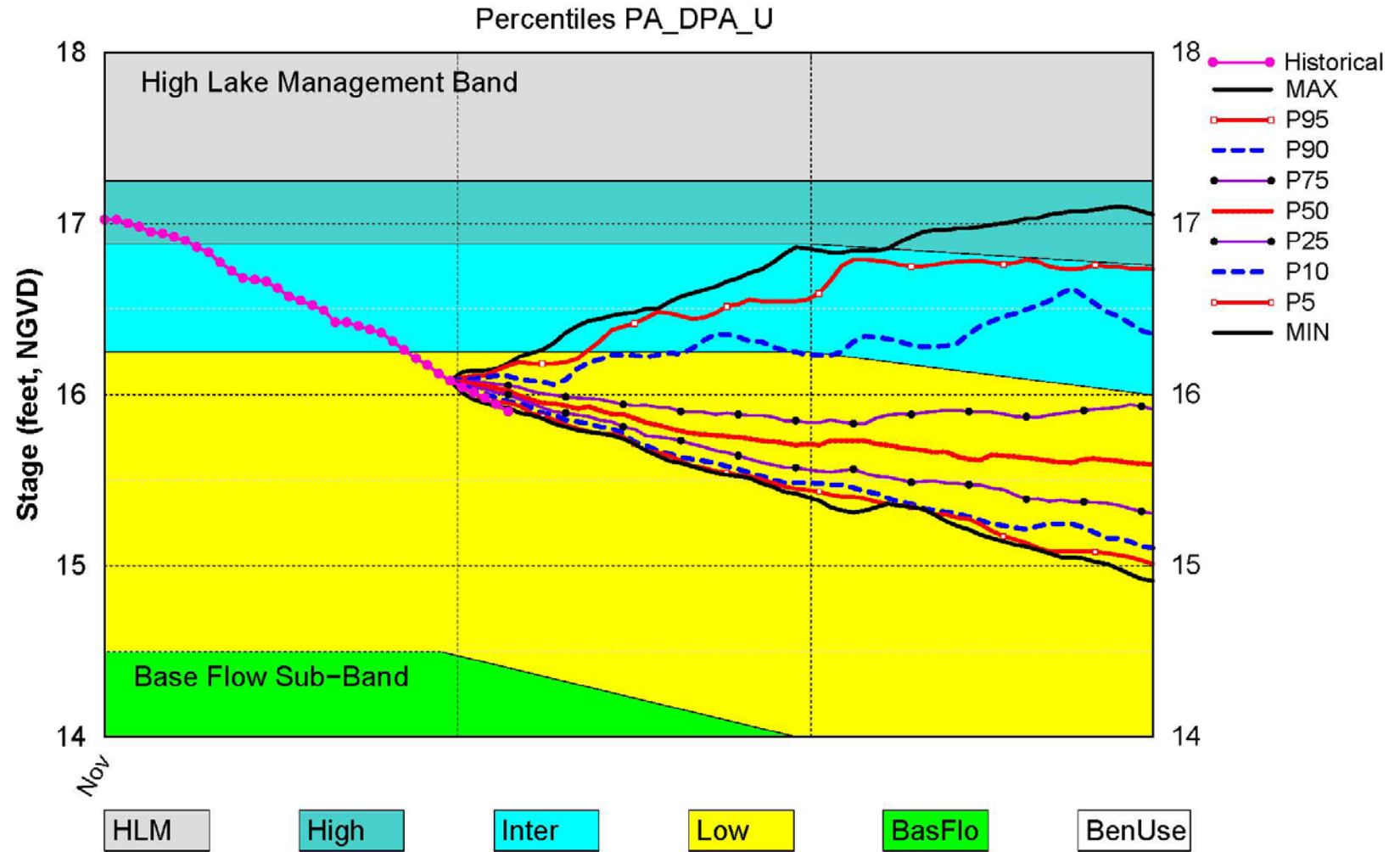
Lake Okeechobee SFWMM December 2017 Position Analysis

All La Nina Years Plot PA_DPA_U



(See assumptions on the Position Analysis Results website)

Lake Okeechobee SFWMM December 2017 Position Analysis



(See assumptions on the Position Analysis Results website)