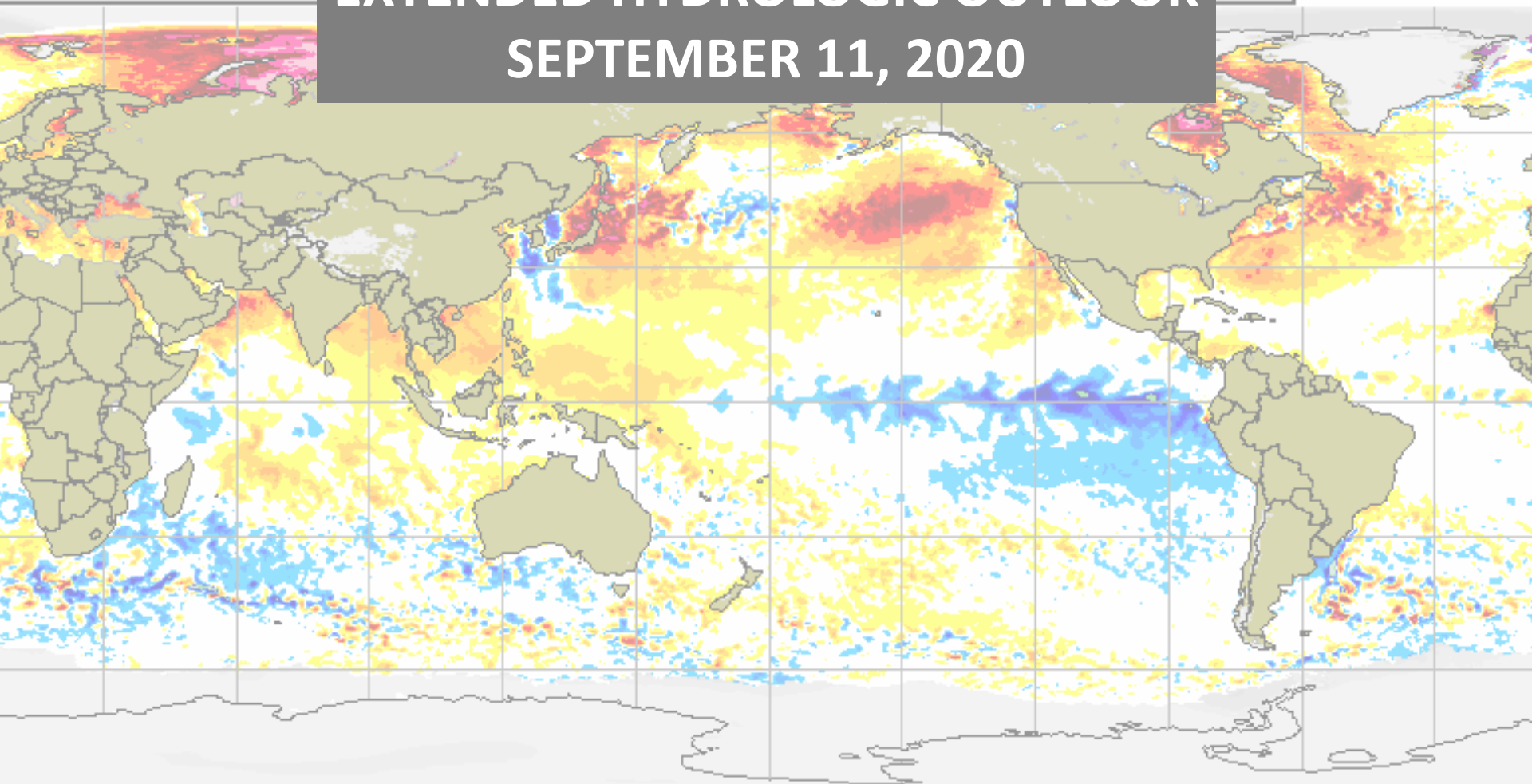


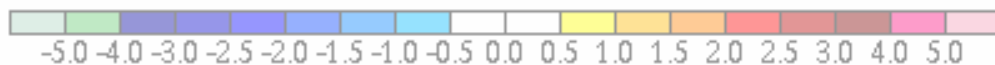
Global sea surface anomaly
18 Sep 2020

EXTENDED HYDROLOGIC OUTLOOK

SEPTEMBER 11, 2020



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

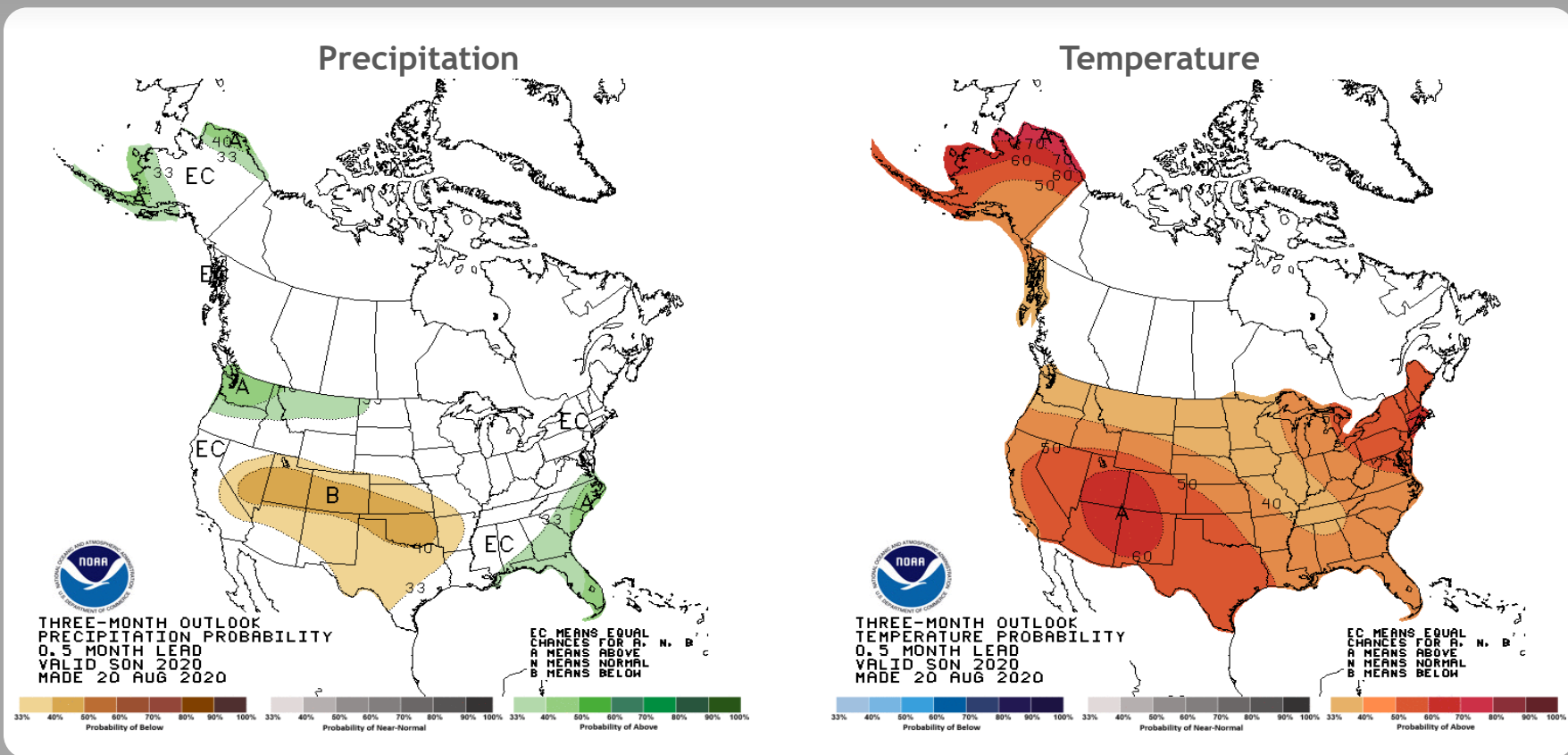
Summary

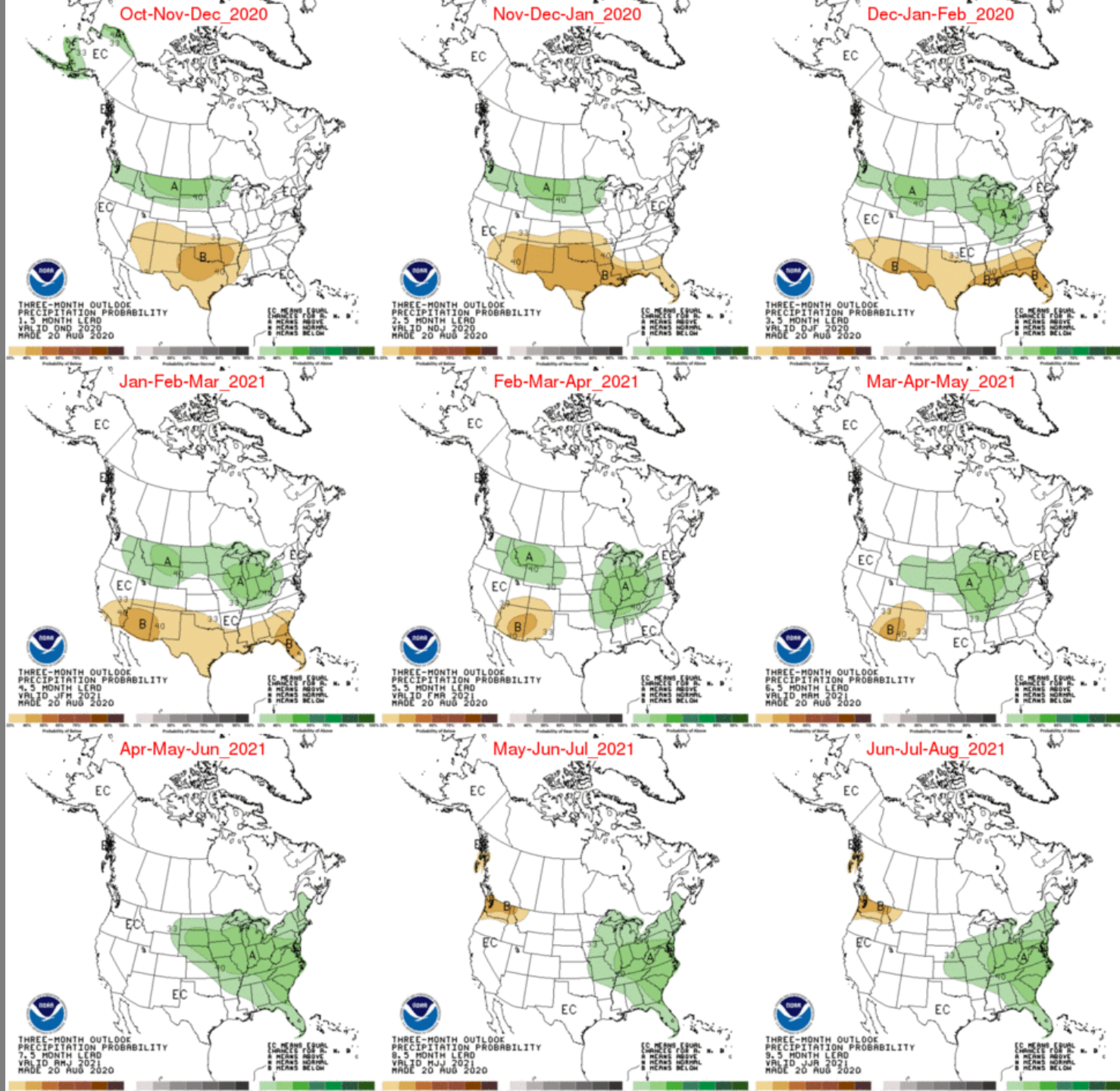
- The Climate Prediction Center (CPC) is forecasting above normal rainfall from September through November.
- La Niña conditions are present and are likely to continue through winter (~75% chance).
- El Niño increases the chances of a wetter-than-normal dry season and decreased tropical activity, La Niña increases the chances of a drier-than-normal dry season and increased tropical activity (both have most influence November through March).
- Monitoring Atlantic Multidecadal Oscillation (AMO) which is currently in the warm phase:
 - Average annual inflow to Lake Okeechobee is nearly 50% greater during the warm phase compared to the cold phase

U. S. Seasonal Outlooks

September-November 2020

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

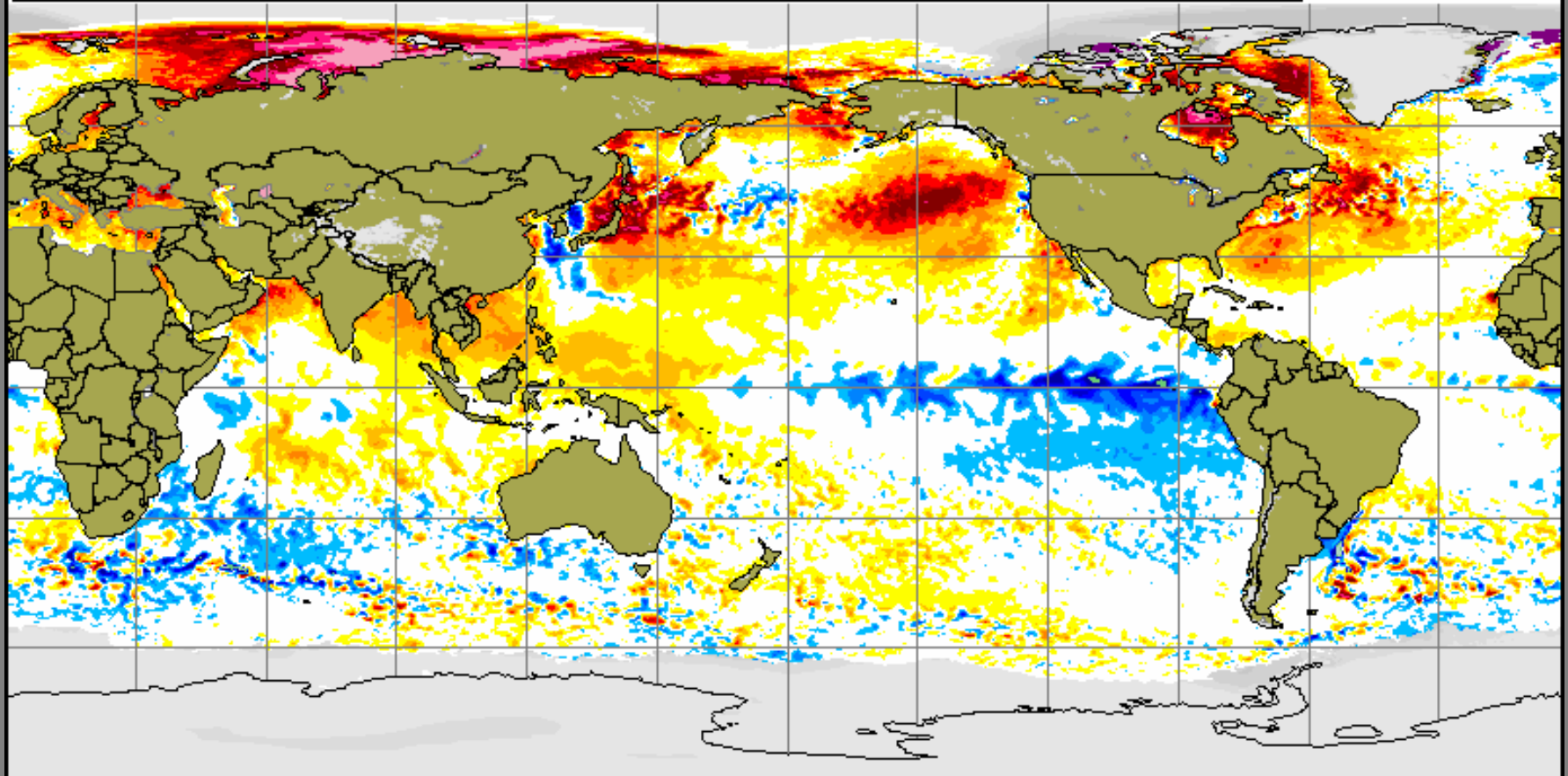
Pacific Decadal Oscillation (PDO)

Increases variations of south Florida dry season rainfall

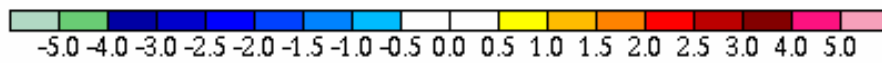
Current Global Sea Surface Temperature Anomalies

Global sea surface anomaly and snow cover
08 Sep 2020

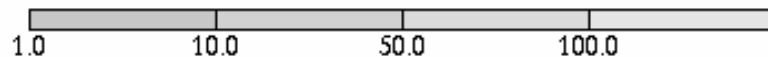
Anomalie de la température de la mer et épaisseur de la neige
08 Sep 2020



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



Snow depth / Épaisseur de la neige (cm)

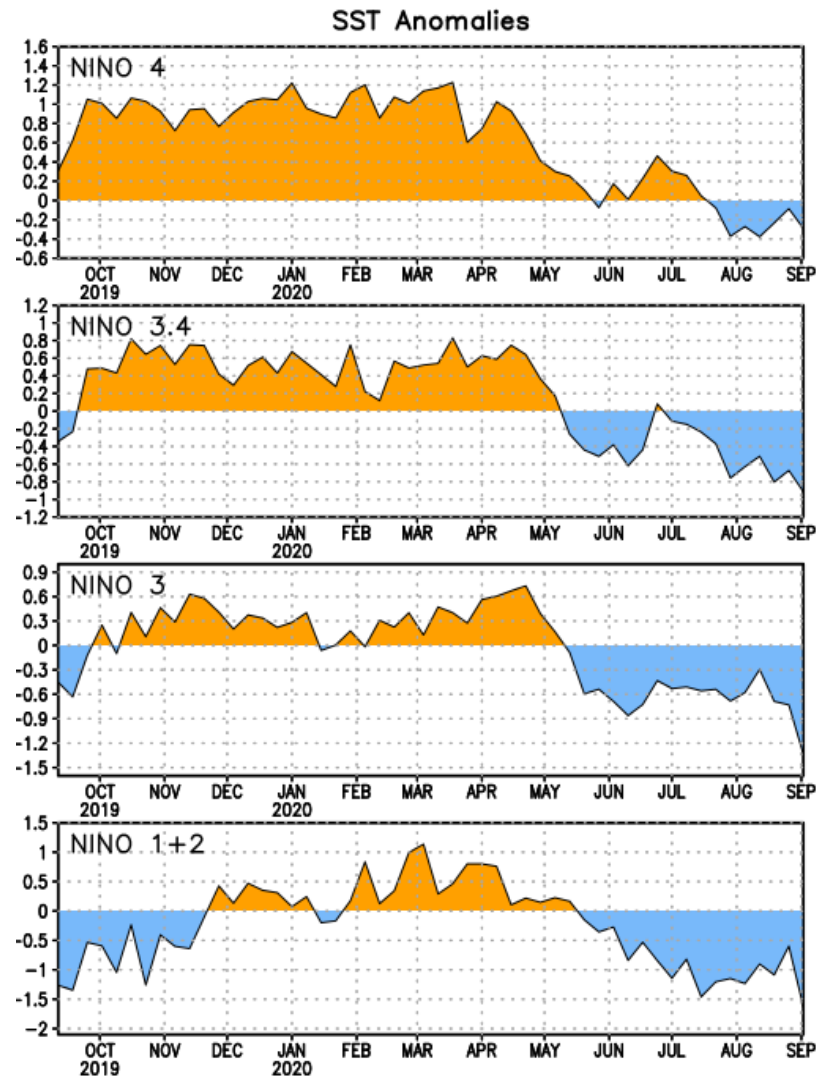
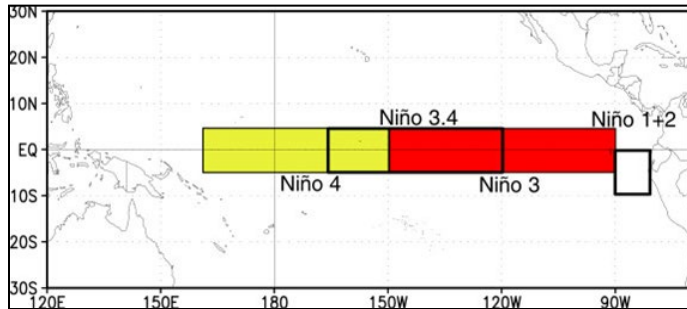


Uncovered sea ice
Glace marine à découvert
Climatologie 1995-2009 Climatologie

Niño Region SST Departures (°C) Recent Evolution

The latest weekly SST departures are:

Niño 4	-0.3°C
Niño 3.4	-0.9°C
Niño 3	-1.3°C
Niño 1+2	-1.6°C



Weekly Heat Content Evolution in the Equatorial Pacific

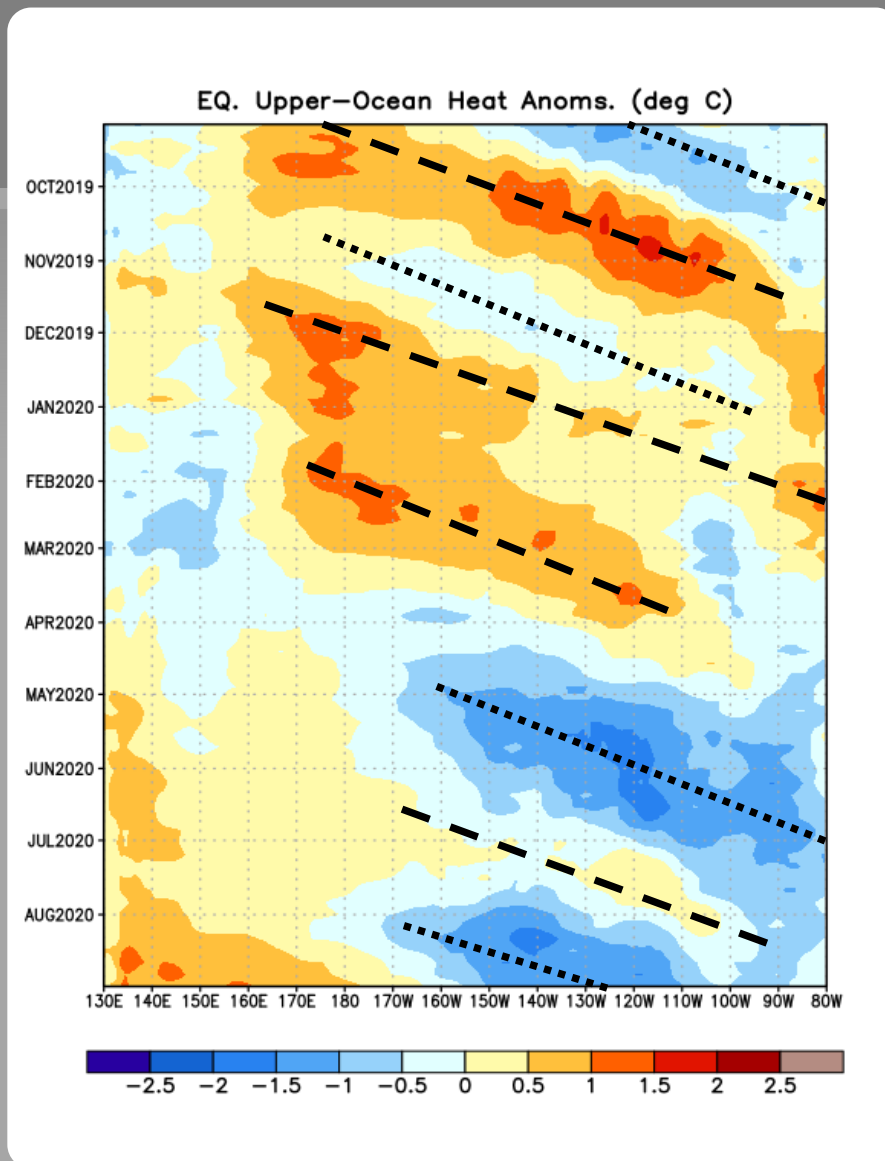
Significant equatorial oceanic Kelvin wave activity (dashed and dotted lines) has been present throughout the period shown.

From December 2019 to February 2020, downwelling Kelvin waves (dashed line) resulted in above-average subsurface temperatures across the central and east-central equatorial Pacific.

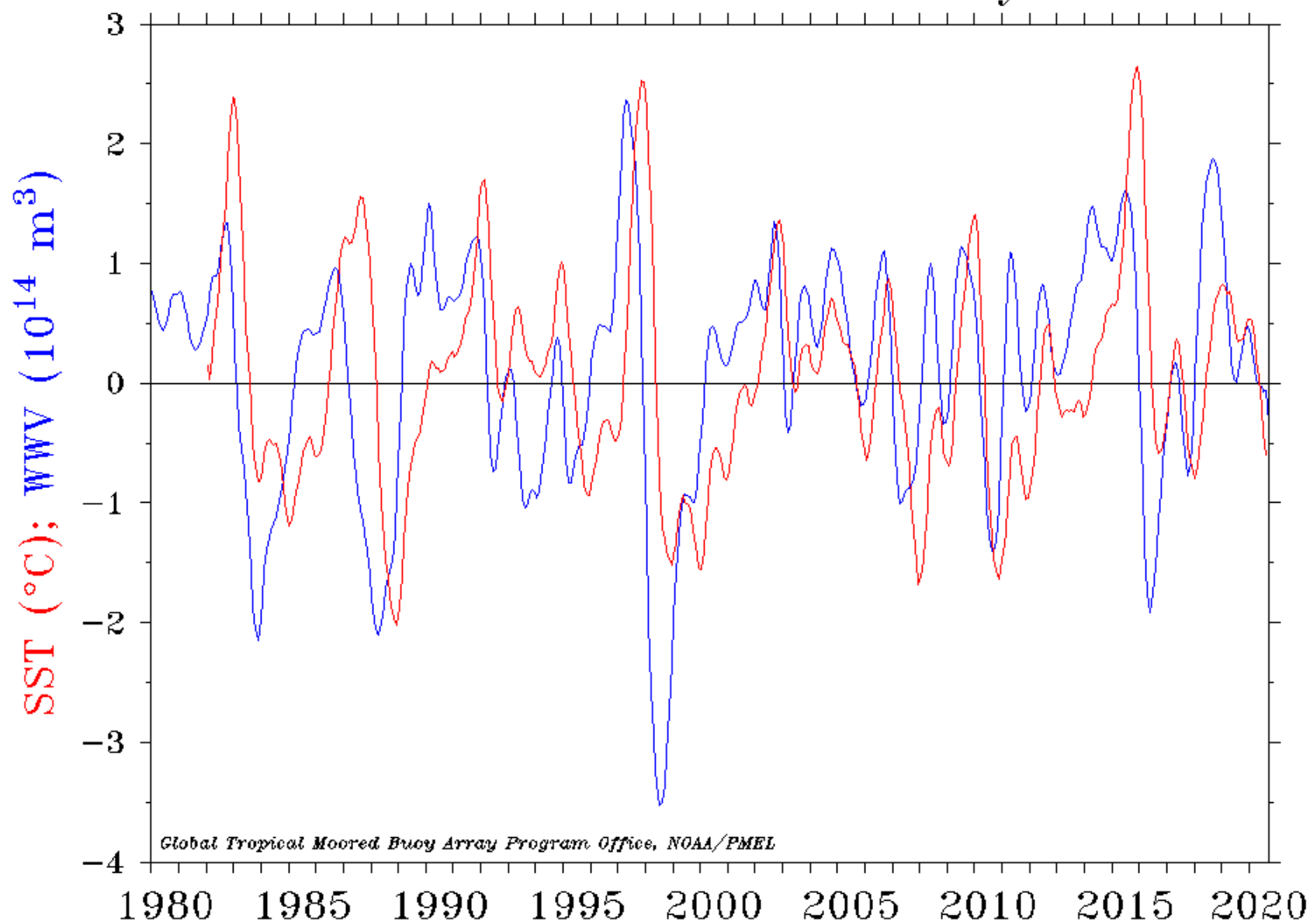
From April-June 2020, negative subsurface temperature anomalies expanded eastward in association with an upwelling Kelvin wave.

During July-August 2020, negative anomalies strengthened in the east-central Pacific Ocean.

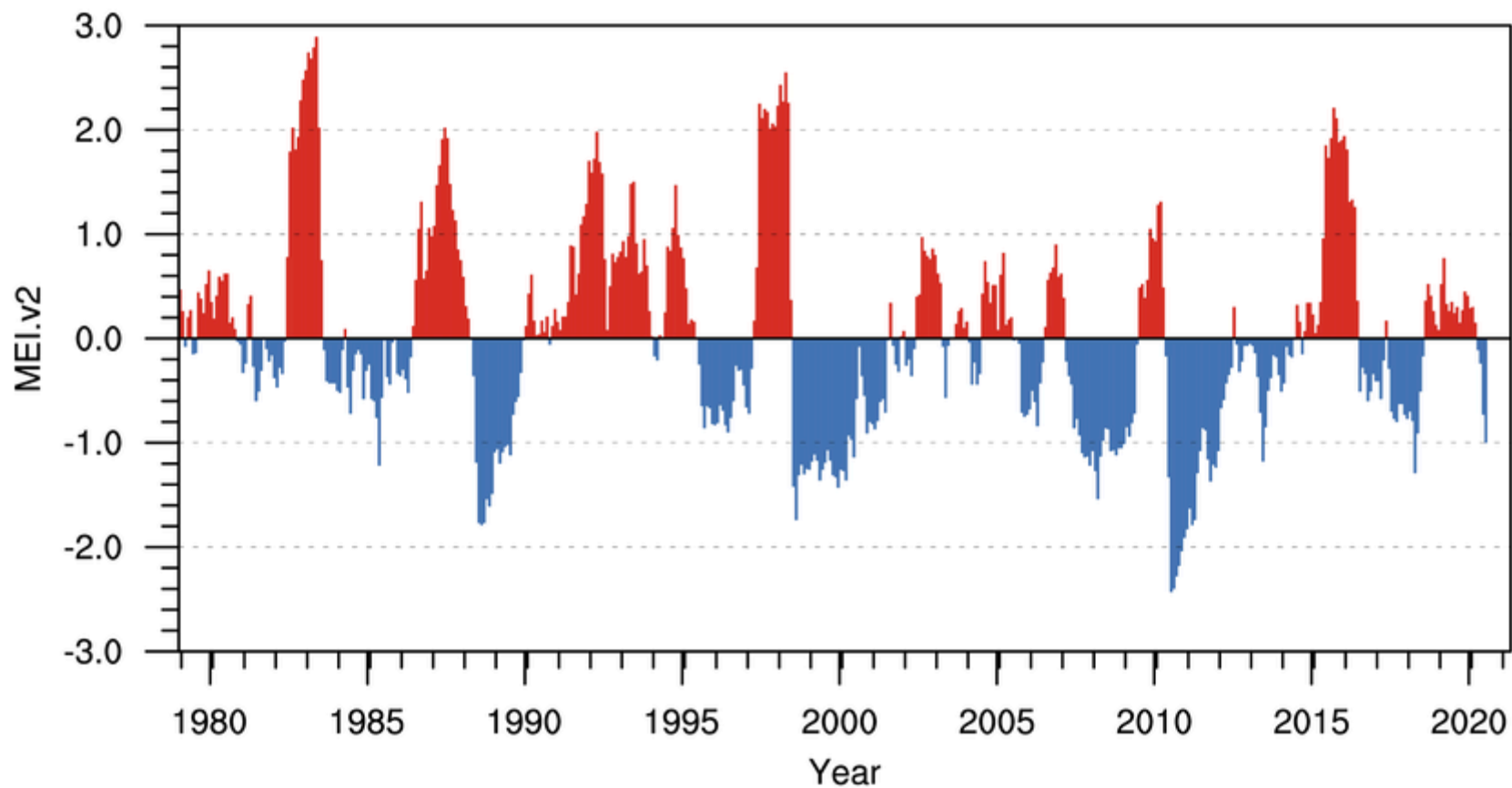
Equatorial oceanic Kelvin waves have alternating warm and cold phases. The warm phase is indicated by dashed lines. Downwelling and warming occur in the leading portion of a Kelvin wave, and up-welling and cooling occur in the trailing portion.



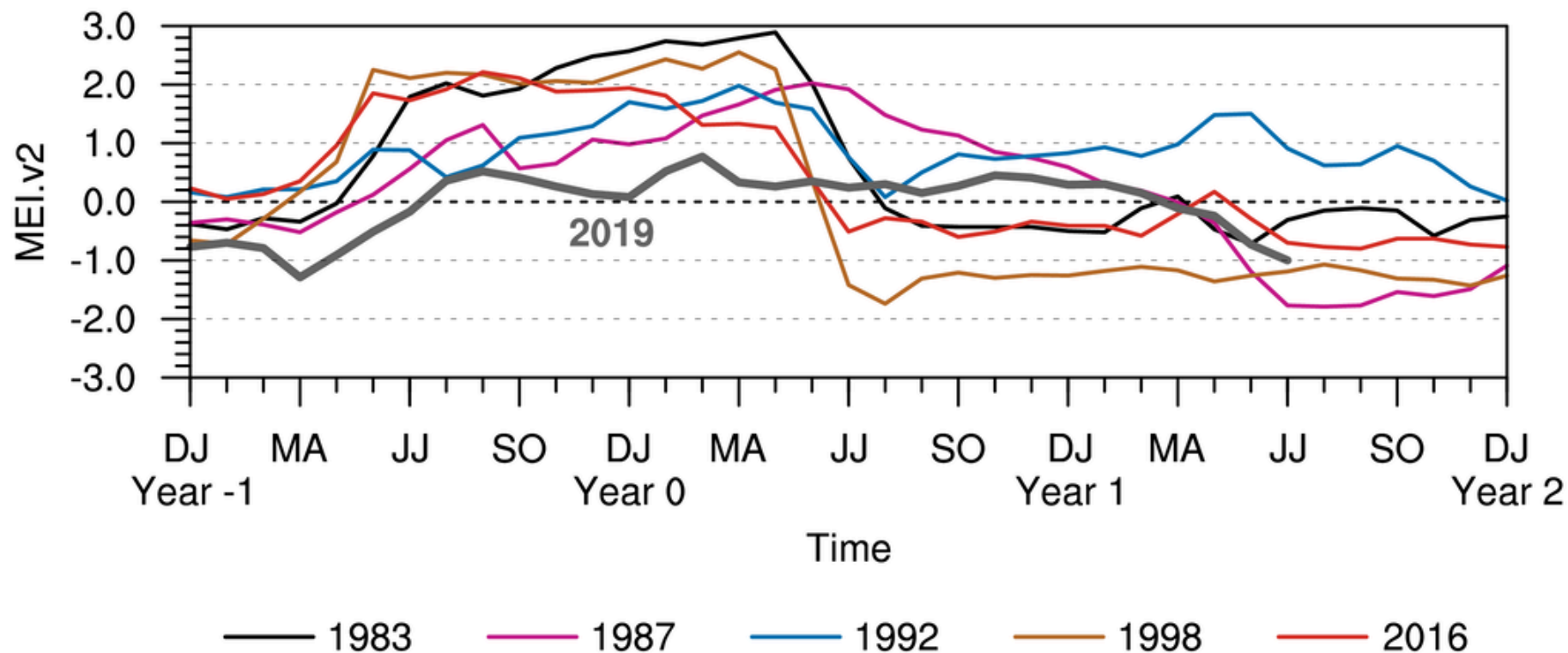
Warm Water Volume (5°N–5°S, 120°E–80°W) and NINO 3.4 SST Anomaly



Multivariate ENSO Index Version 2

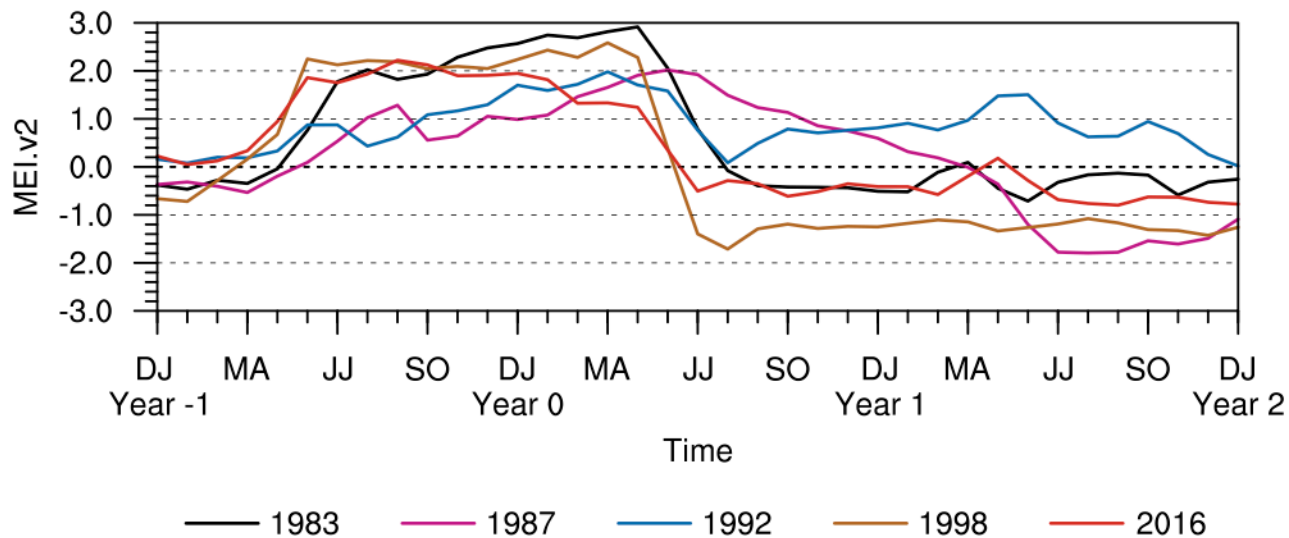


MEI.v2 Evolution of Current ENSO Event in Historical Context

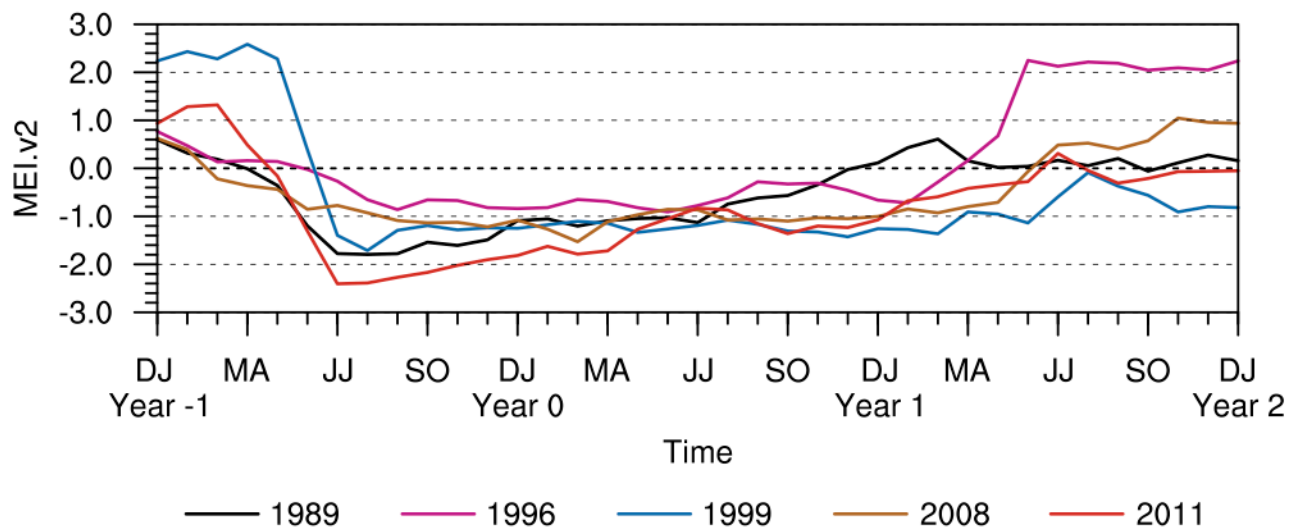


MEI.v2 Evolution of Historical ENSO Events

(a) El Niño

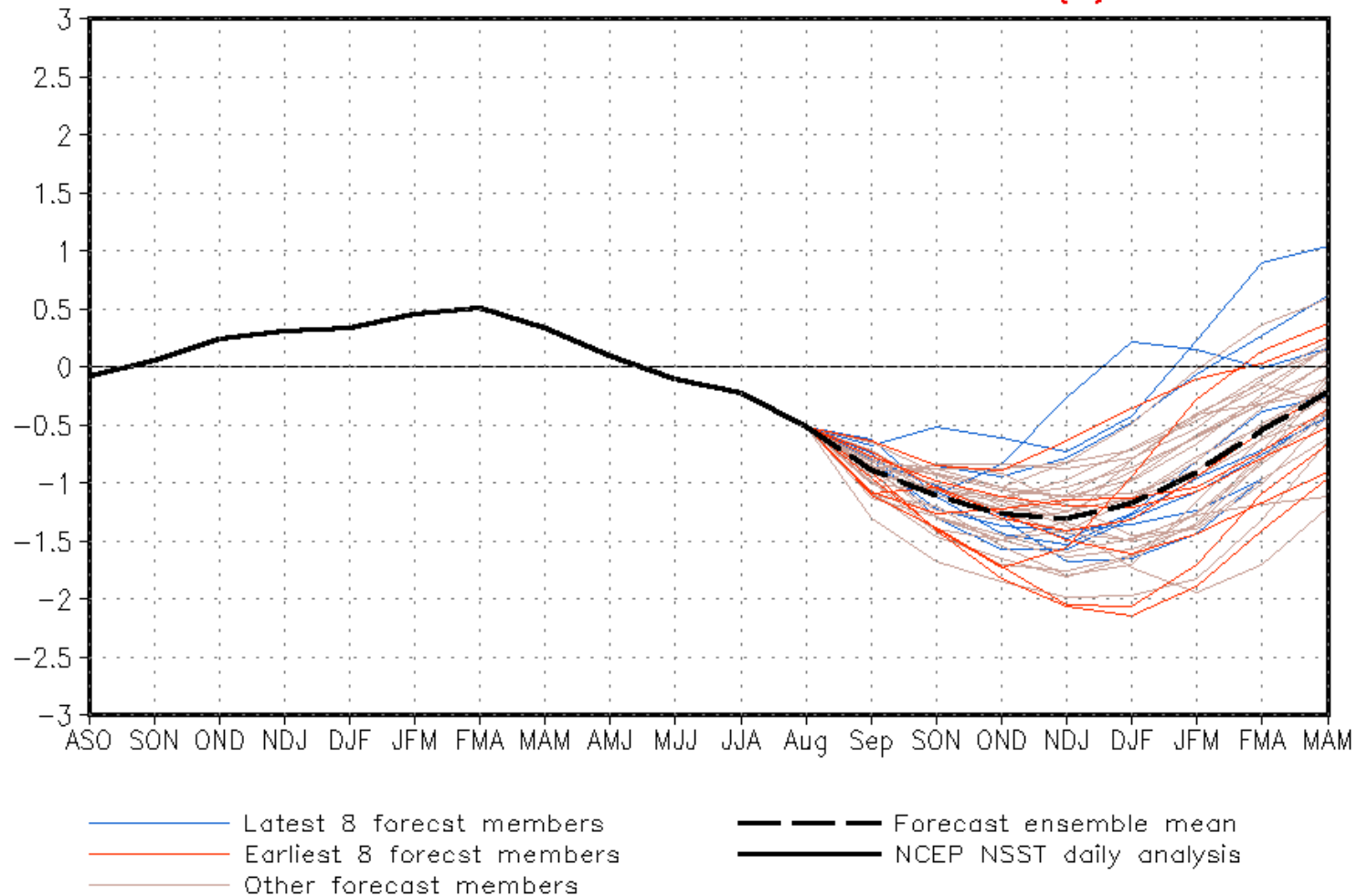


(b) La Niña





CFSv2 forecast Nino3.4 SST anomalies (K)



(Model bias correct base period: 1999–2010; Climatology base period: 1982–2010)

IRI/CPC Pacific Niño

3.4 SST Model Outlook

The averages of the models predict a borderline or weak La Niña through the Northern Hemisphere winter 2020-21.

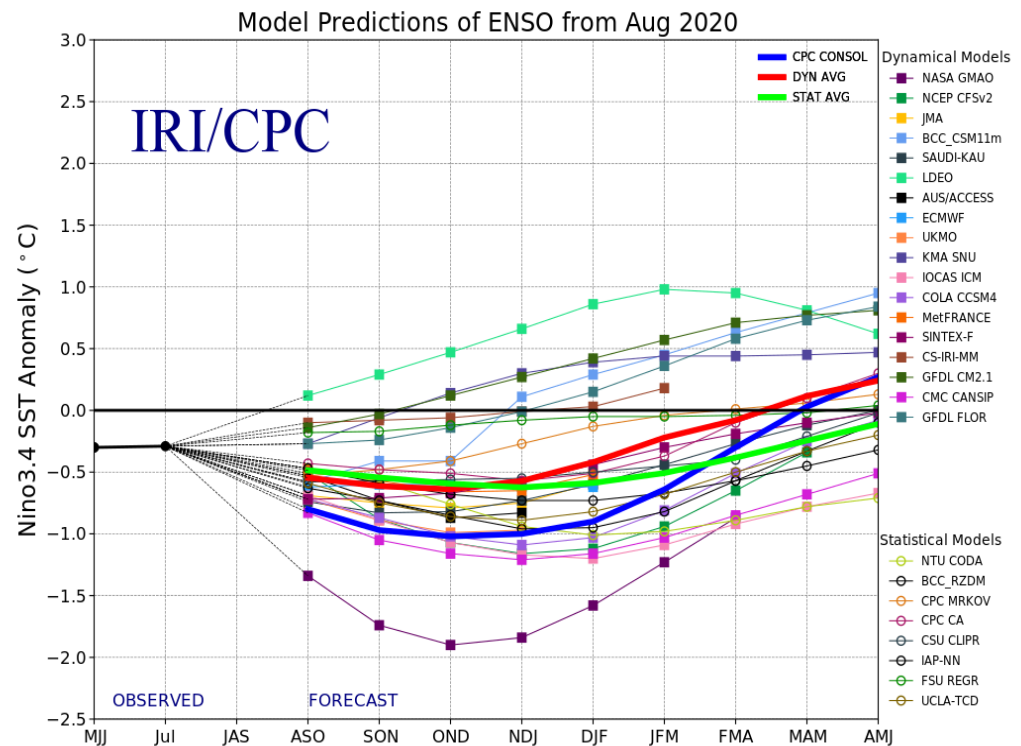


Figure provided by the International Research Institute (IRI) for Climate and Society (updated 19 August 2020).

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.

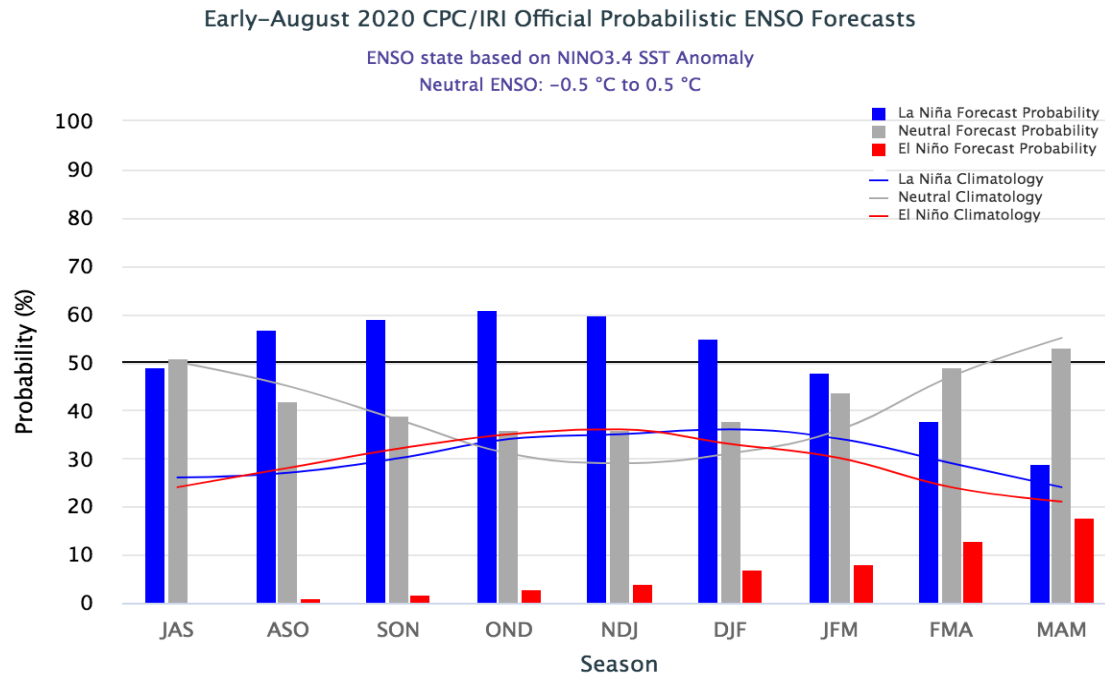
The ONI is one measure of the El Niño-Southern Oscillation, and other indices can confirm whether features consistent with a coupled ocean-atmosphere phenomenon accompanied these periods. The complete table going back to DJF 1950 can be found [here](#).

Year	DJF	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ
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	0.2	0.4	0.7	0.9	0.8
2019	0.8	0.8	0.8	0.8	0.6	0.5	0.3	0.1	0.1	0.3	0.5	0.5
2020	0.5	0.6	0.5	0.3	0.0	-0.2	-0.4					

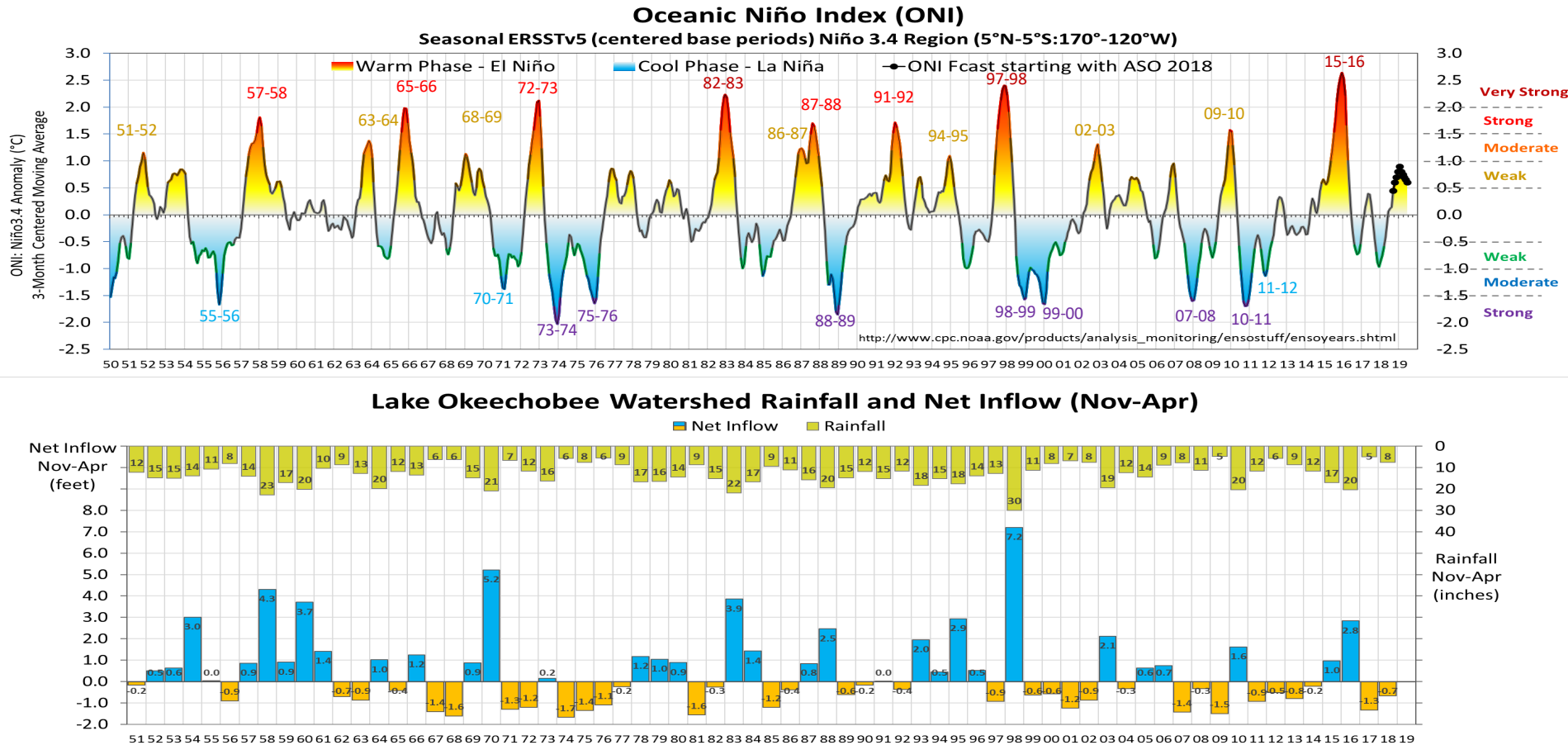
CPC/IRI Probabilistic ENSO Outlook

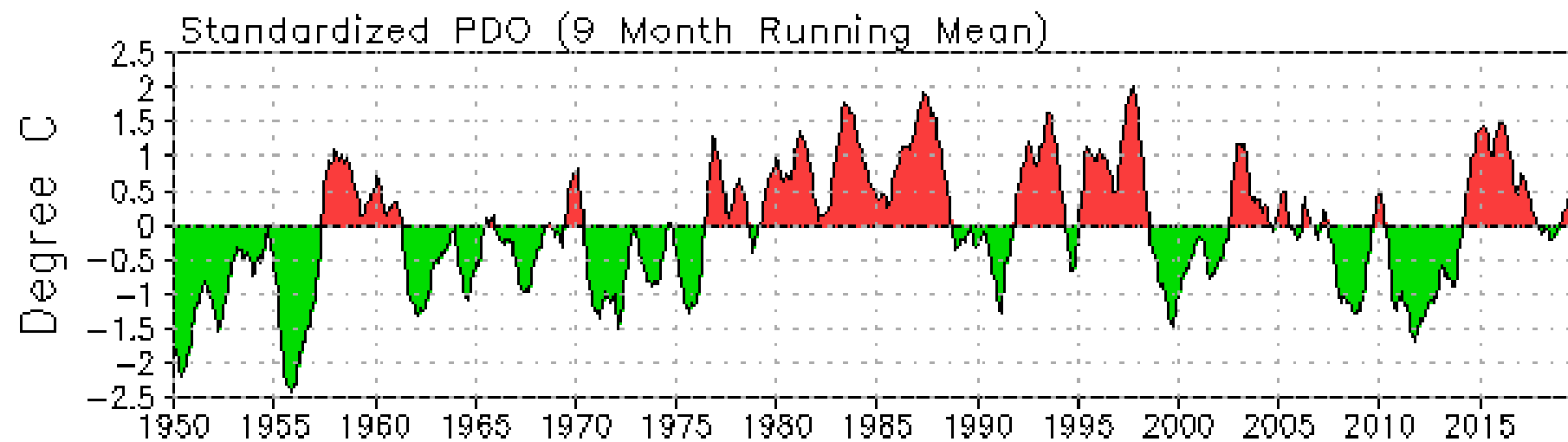
Updated: 13 August 2020

La Niña is favored (~55% chance) beginning in August-October 2020 and continuing through Northern Hemisphere winter 2020-21.

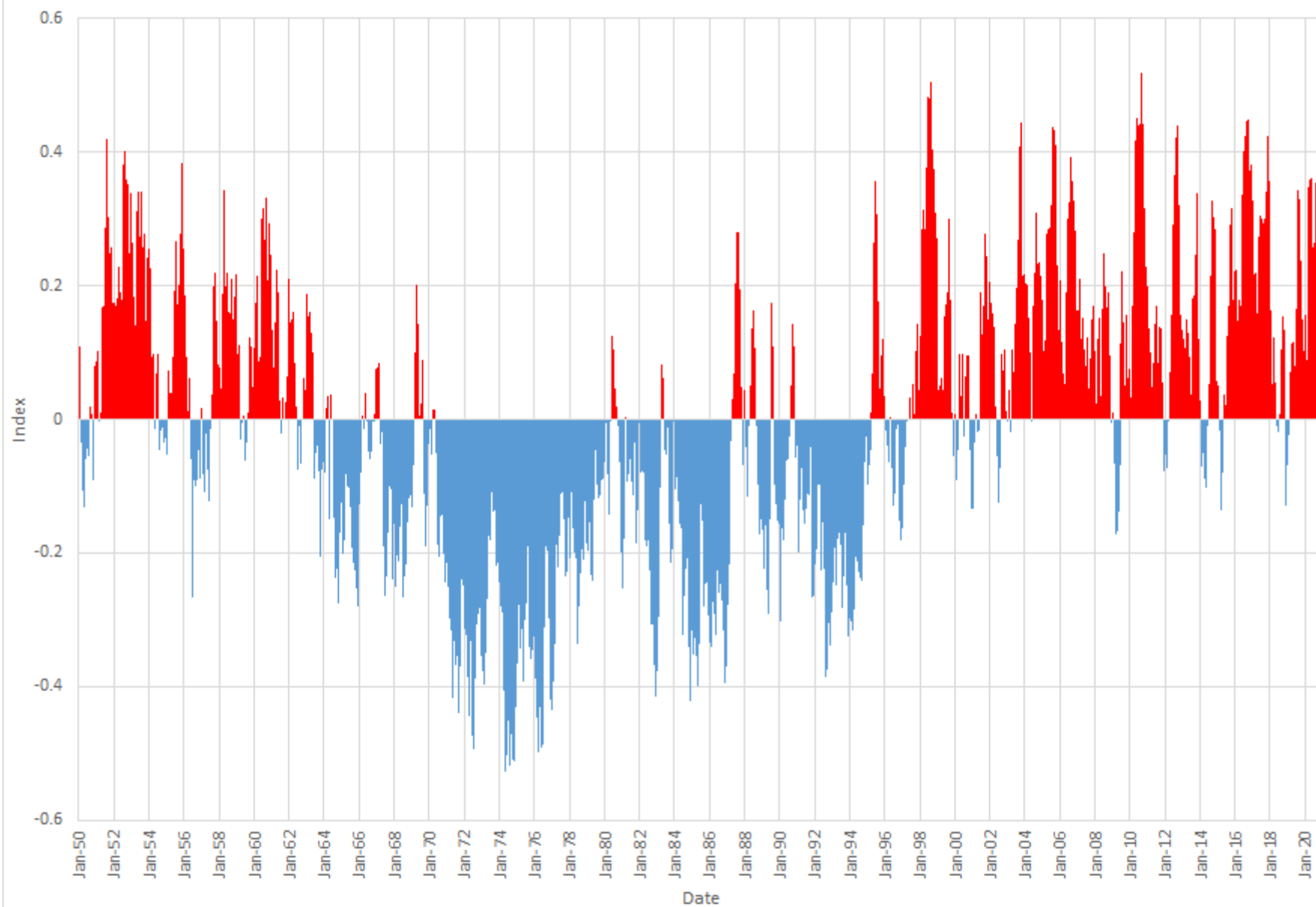


El Niño & La Niña Events (1950-2018), and Lake Okeechobee Watershed Rainfall & Net Inflow





Index of the North Atlantic Temperatures from Kaplan Extended SST V2



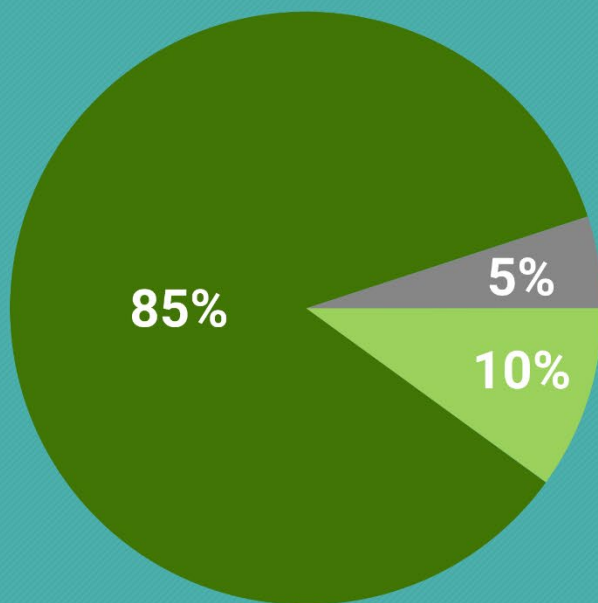
2020 Tropical Outlook





2020 Atlantic Hurricane Season Outlook

AUGUST 6 UPDATE



■ Above-normal ■ Near-normal ■ Below-normal season

Season probability

Named storms
19-25

Hurricanes
7-11

Major hurricanes
3-6

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

August 6, 2020

Source: National Hurricane Center

Colorado State University (Tropical Meteorology Project)

Forecast Parameter and 1981-2010 Average (in parentheses)	Issue Date 2 April 2020	Issue Date 4 June 2020	Issue Date 7 July 2020	Issue Date 5 August 2020	Observed Thru 4 August 2020	Remainder of Season Forecast
Named Storms (NS) (12.1)	16	19	20	24*	9	15
Named Storm Days (NSD) (59.4)	80	85	85	100	23.75	76.25
Hurricanes (H) (6.4)	8	9	9	12	2	10
Hurricane Days (HD) (24.2)	35	40	40	45	3	42
Major Hurricanes (MH) (2.7)	4	4	4	5	0	5
Major Hurricane Days (MHD) (6.2)	9	9	9	11	0	11
Accumulated Cyclone Energy (ACE) (106)	150	160	160	200	23	177
Net Tropical Cyclone Activity (NTC) (116%)	160	170	170	215	31	184

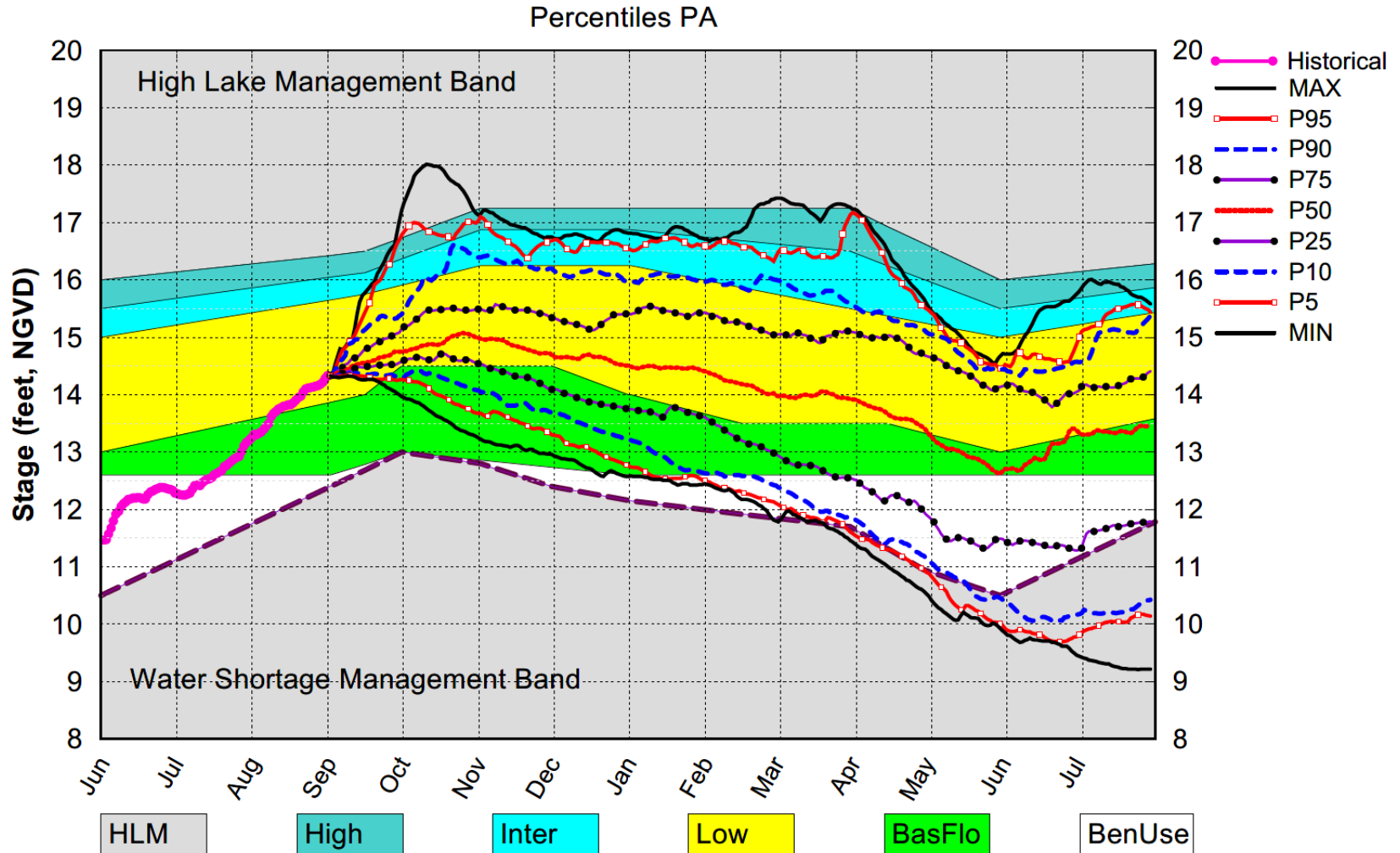
*Total forecast includes Arthur, Bertha, Cristobal, Dolly, Edouard, Fay, Gonzalo, Hanna and Isaias which have formed in the Atlantic as of August 4th.

- Extremely active season
- Sea surface temperatures averaged across the tropical Atlantic are much warmer than normal
- Vertical wind shear is well below average
- Current cool neutral ENSO conditions may transition to weak La Niña conditions by later this summer

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 the 1st or 15th of the current month for both Lake Okeechobee and the Water Conservation Areas
- **Dynamic Position Analysis**
 - Each 1-year simulation starts with current hydrologic conditions (e.g., 1-September-2020)
 - 41 1-year simulations of system response to historical rainfall conditions
 - Statistical summaries used to display projections

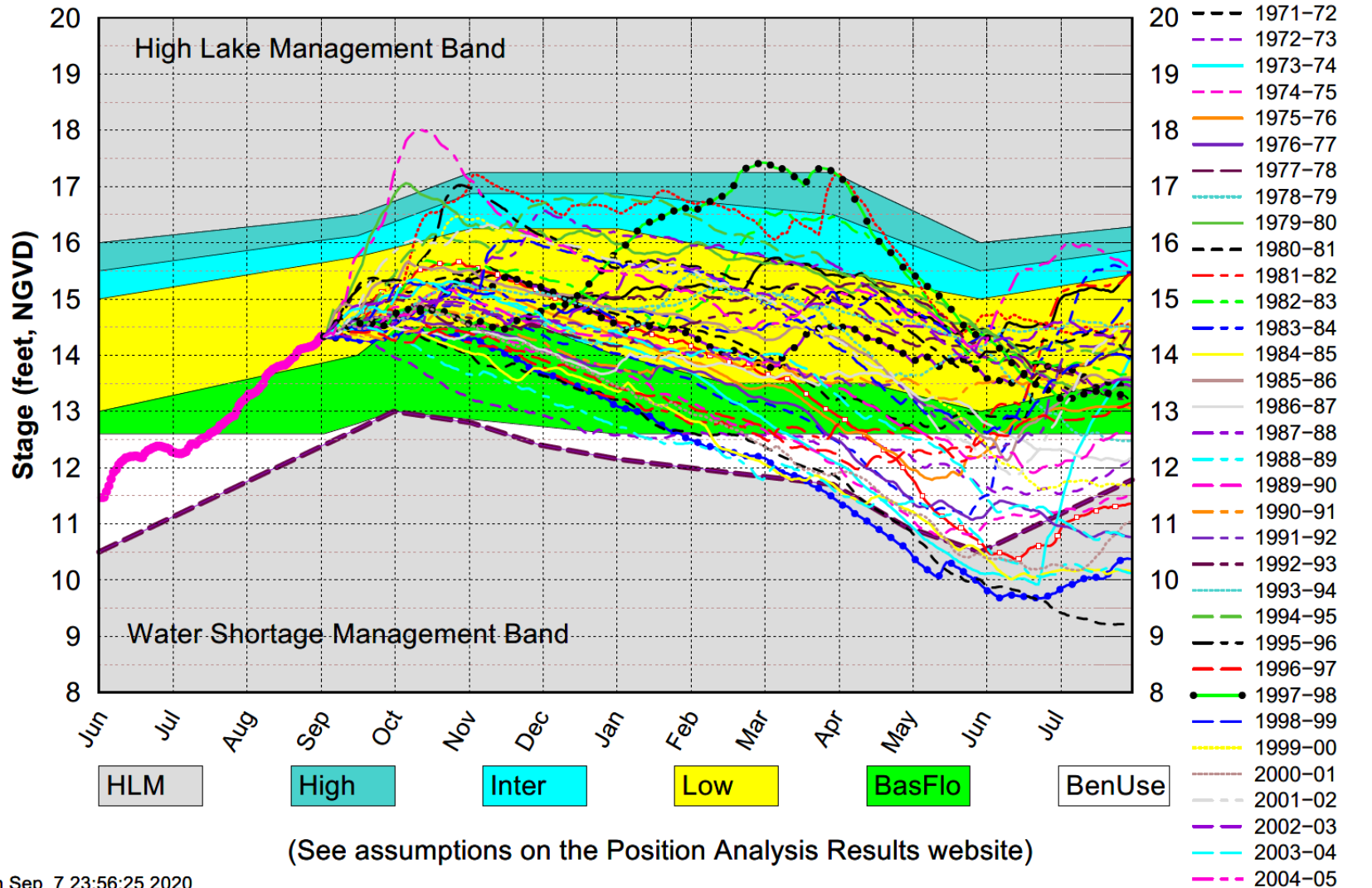
Lake Okeechobee SFWMM Sep 2020 Position Analysis



(See assumptions on the Position Analysis Results website)

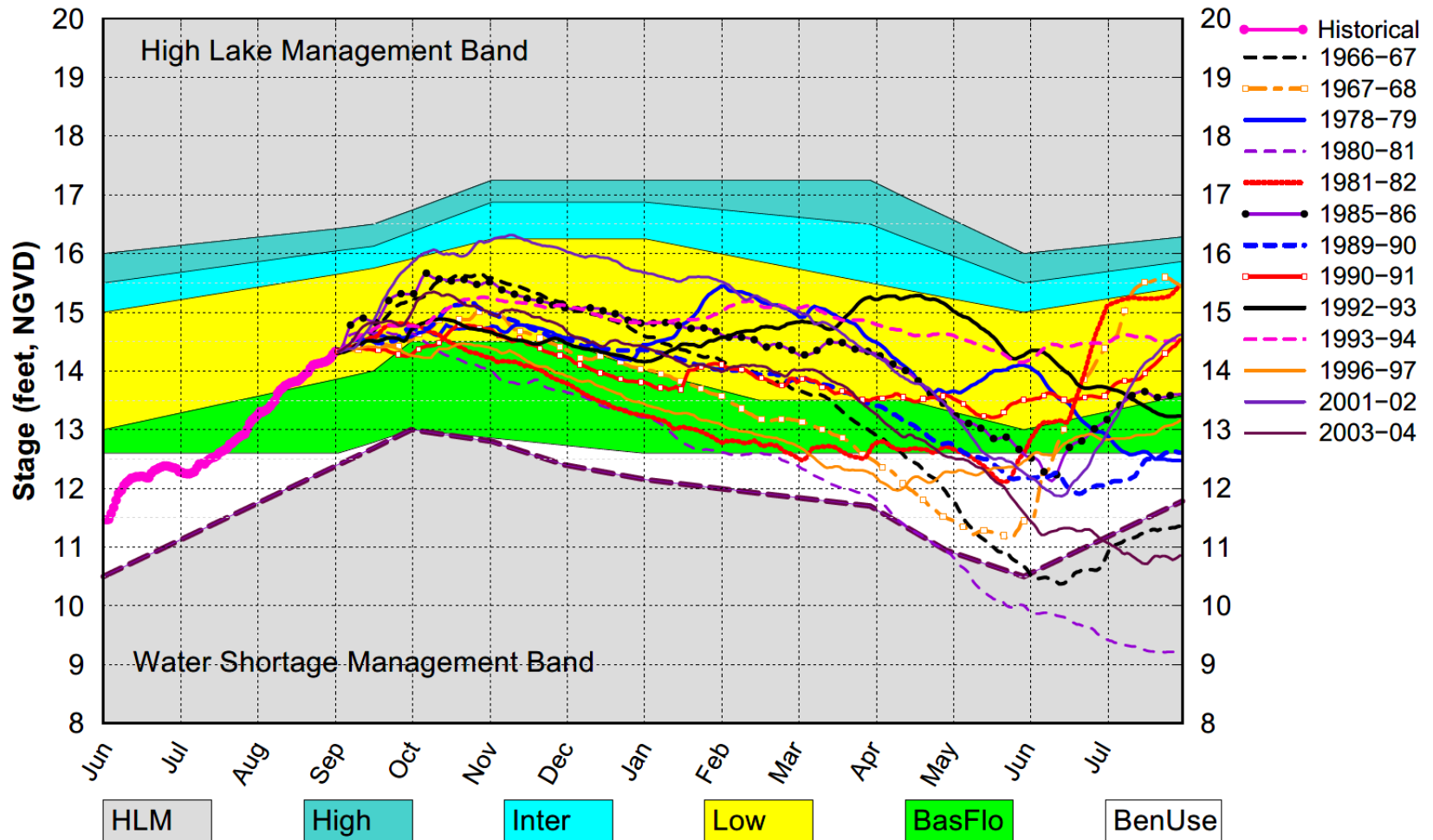
Lake Okeechobee SFWMM Sep 2020 Position Analysis

All Simulated Years Plot PA



Lake Okeechobee SFWMM Sep 2020 Position Analysis

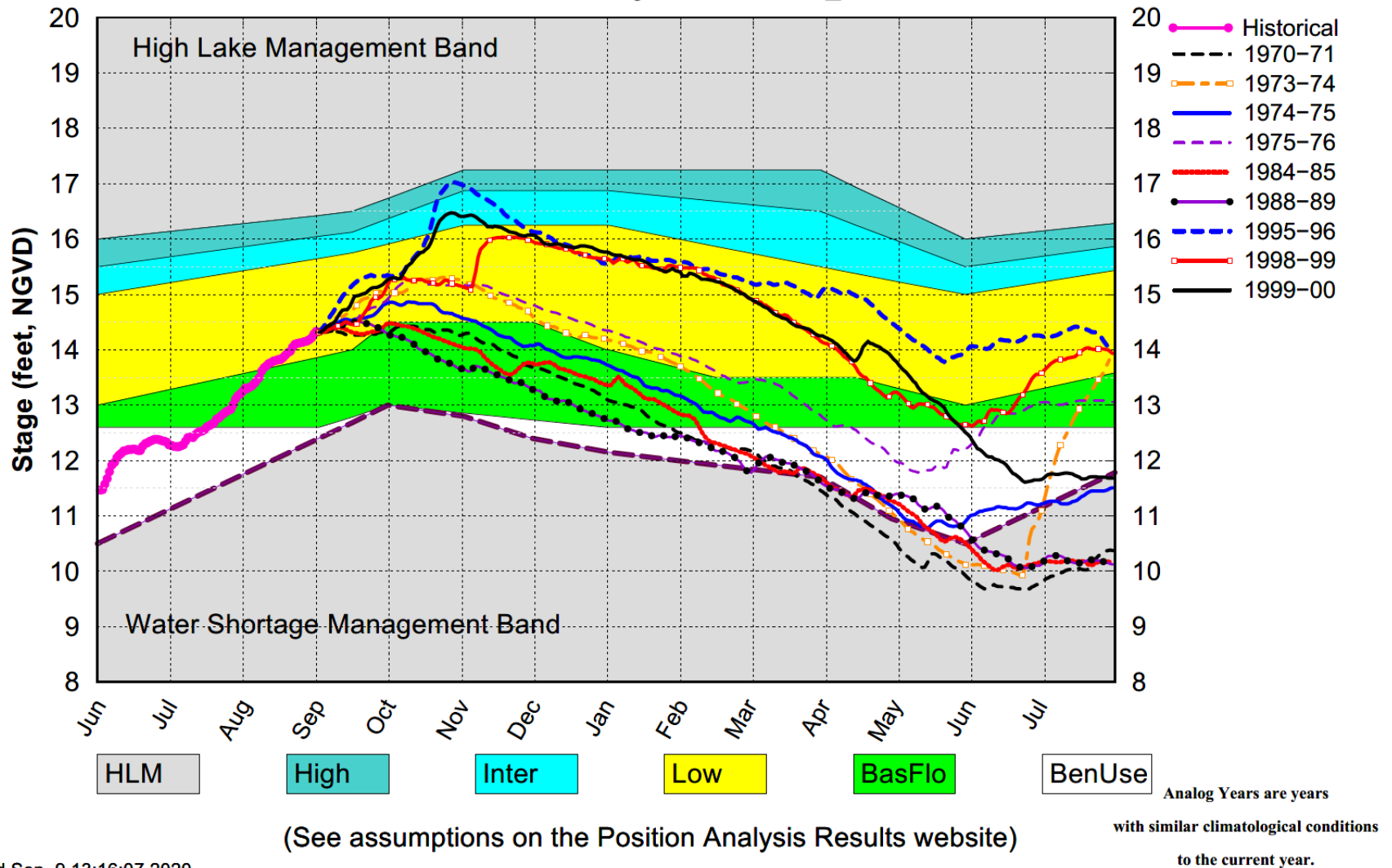
All ENSO Neutral Years Plot PA



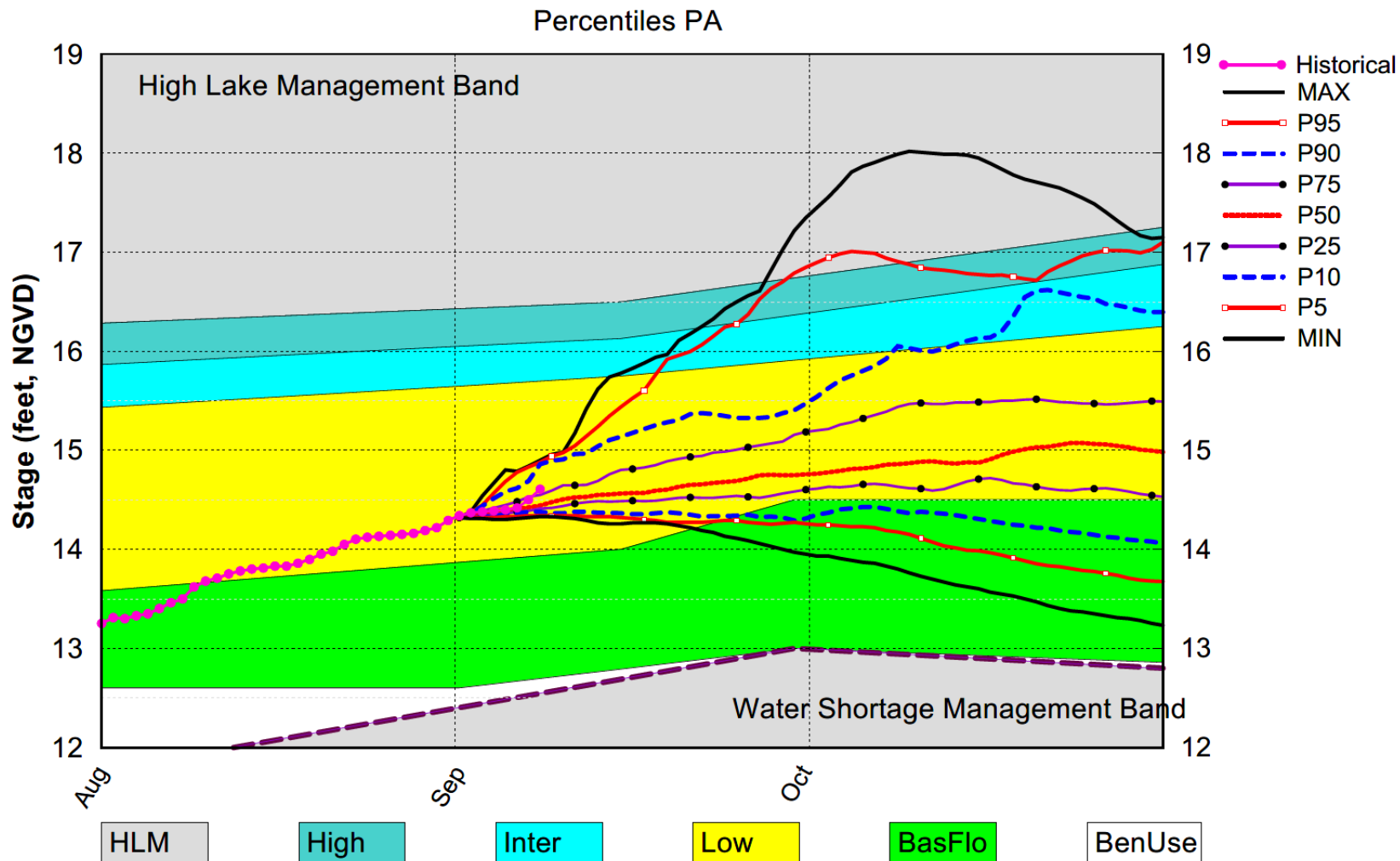
(See assumptions on the Position Analysis Results website)

Lake Okeechobee SFWMM Sep 2020 Position Analysis

AMO Warm / La Nina Analog Years Plot PA_NINA1



Lake Okeechobee SFWMM Sep 2020 Position Analysis



(See assumptions on the Position Analysis Results website)