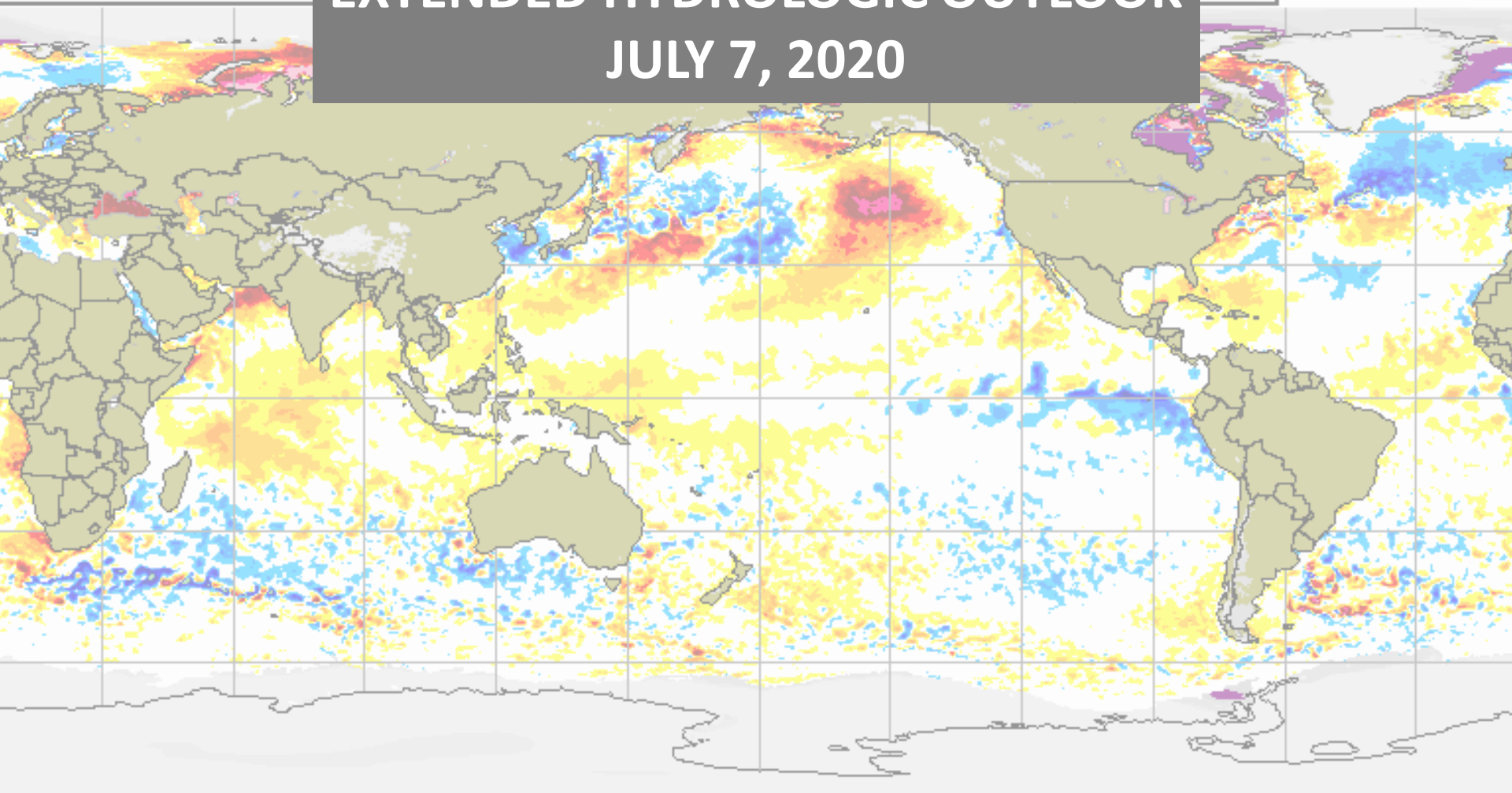


EXTENDED HYDROLOGIC OUTLOOK

JULY 7, 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



CMC Environnement Canada
CMC Environment Canada

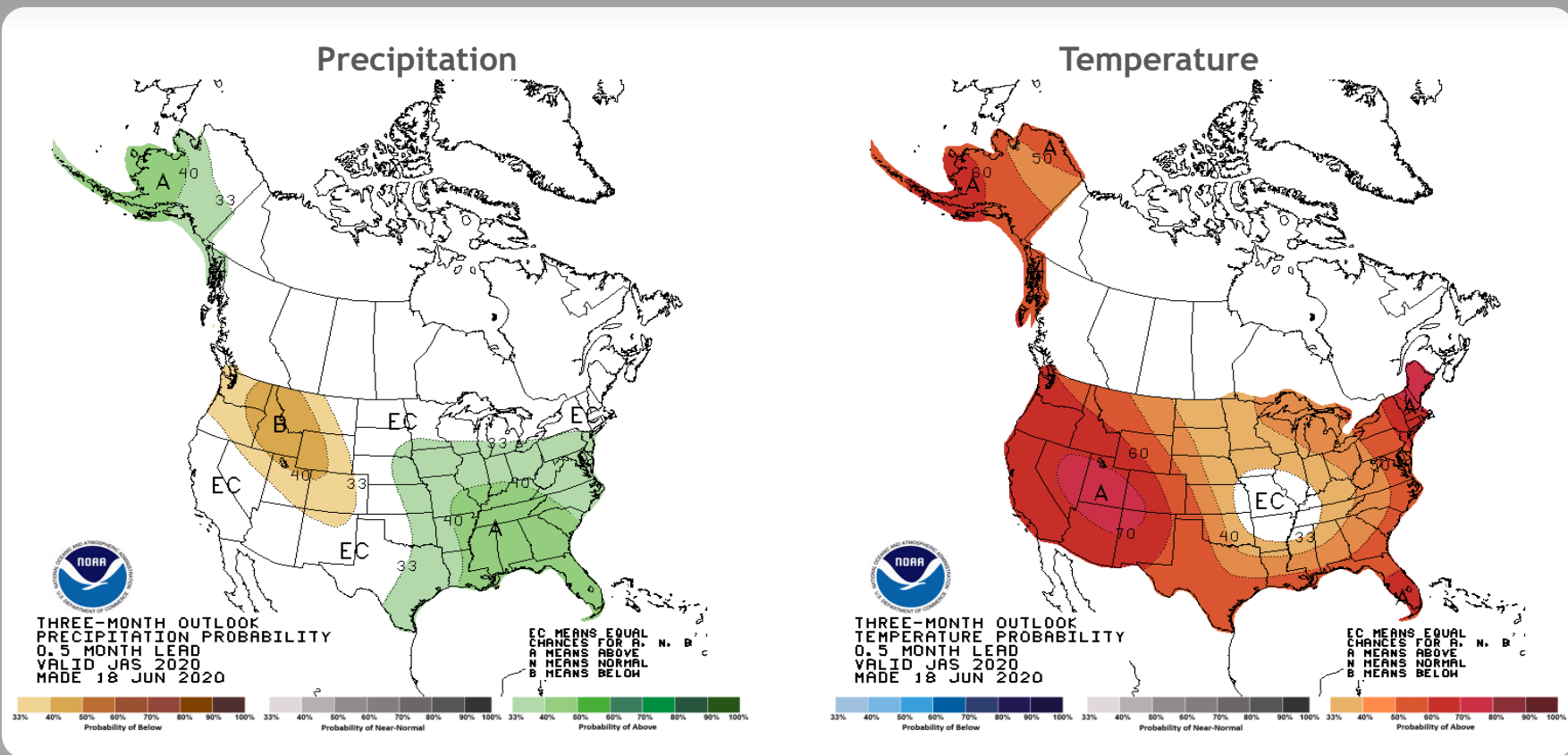
Summary

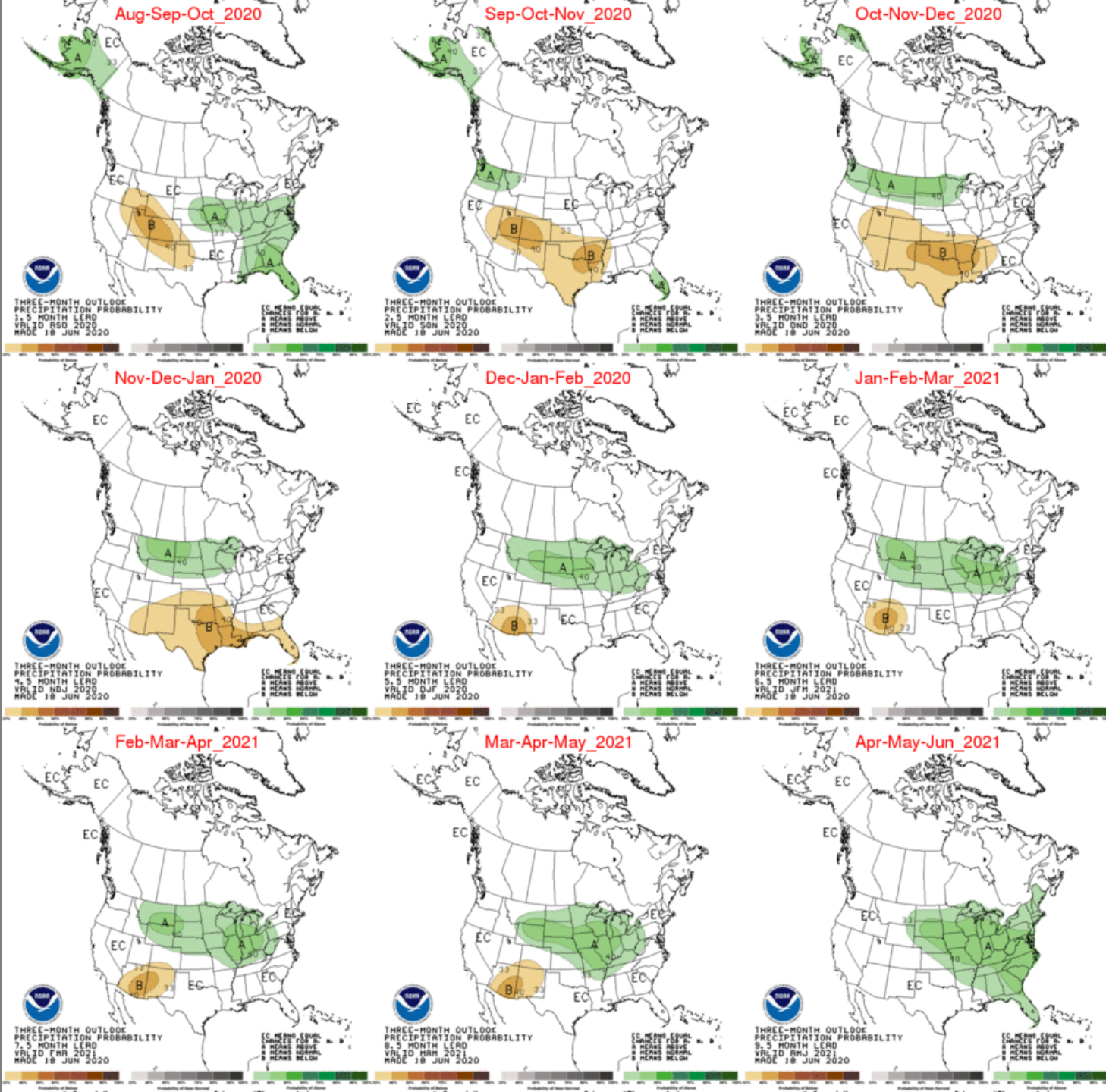
- The Climate Prediction Center (CPC) is forecasting above normal rainfall from July through September.
- ENSO-neutral conditions are present. There is a ~60% chance of ENSO-neutral during summer 2020, with roughly equal chances (~40-50%) of La Niña or ENSO-neutral during the autumn and winter 2020-21.
- 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

July-September 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

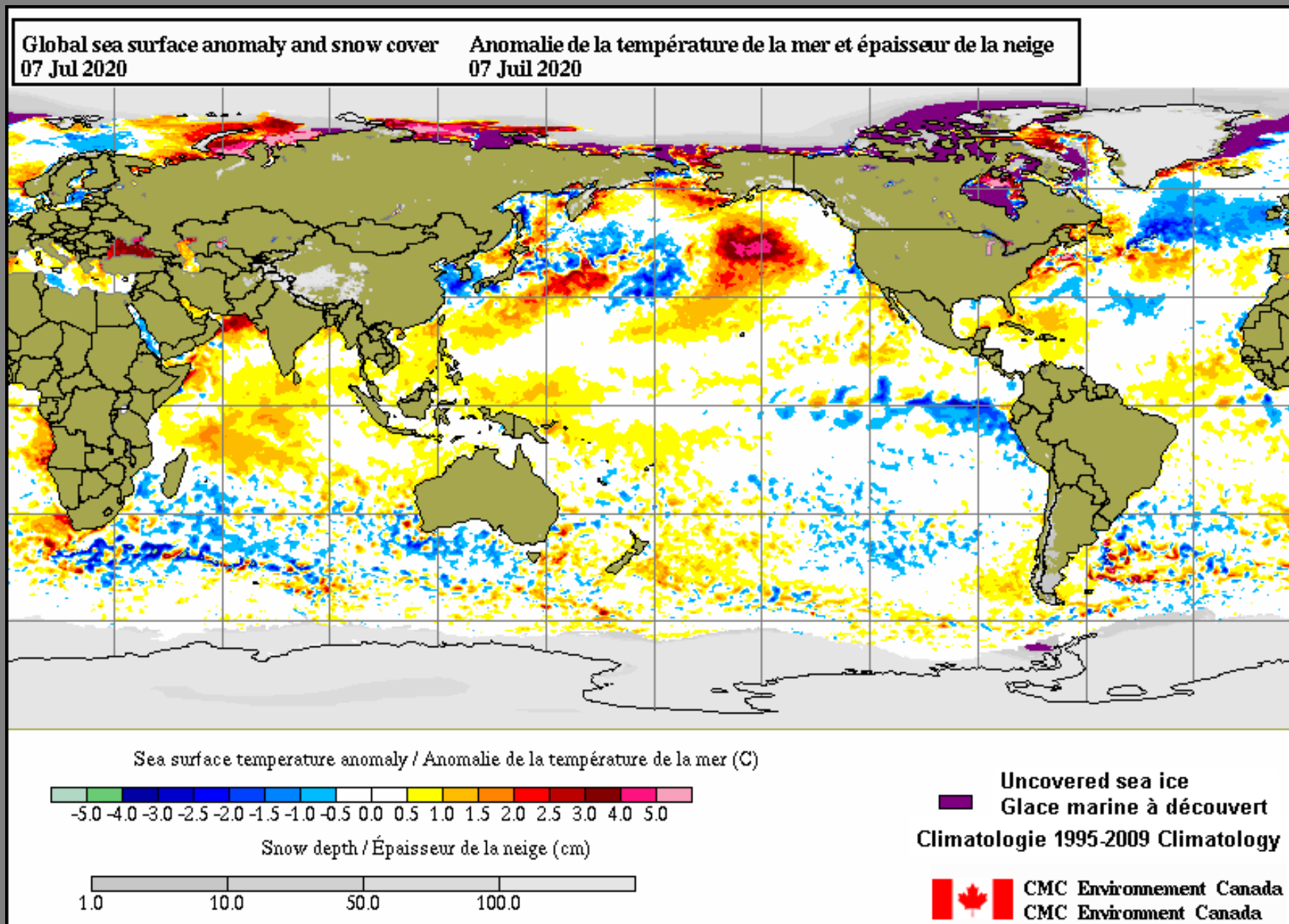
Atlantic Multidecadal Oscillation (AMO)

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

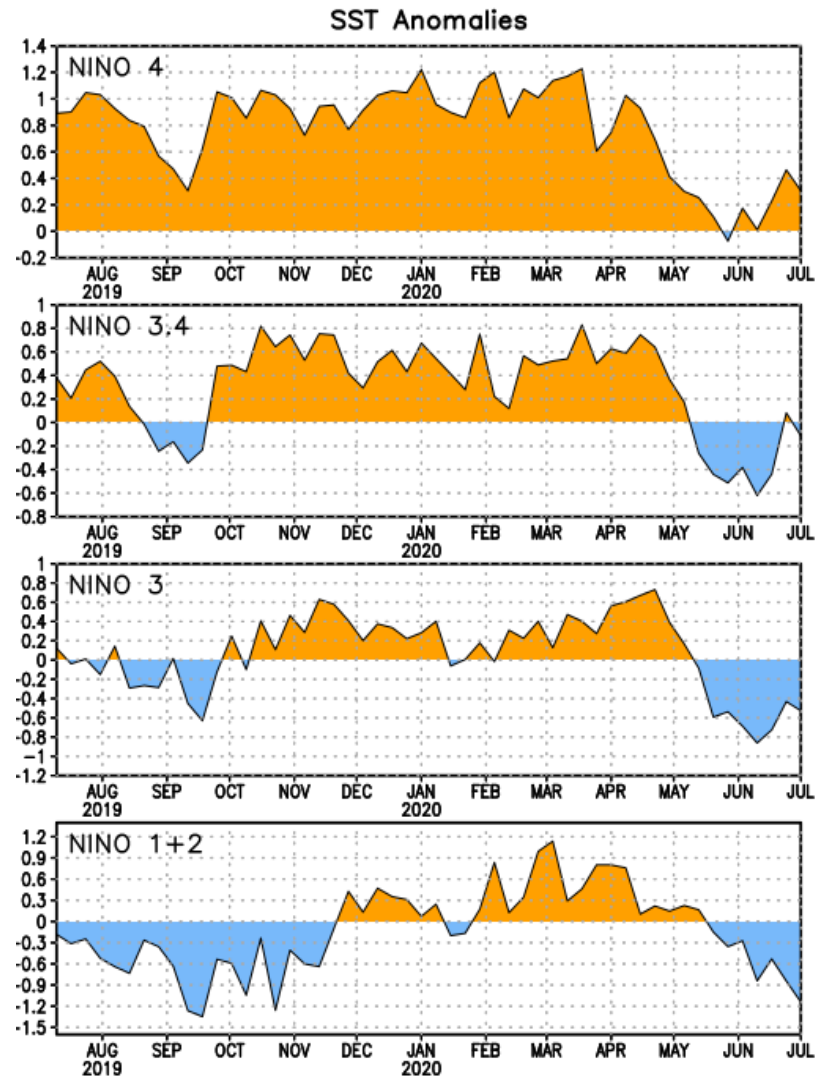
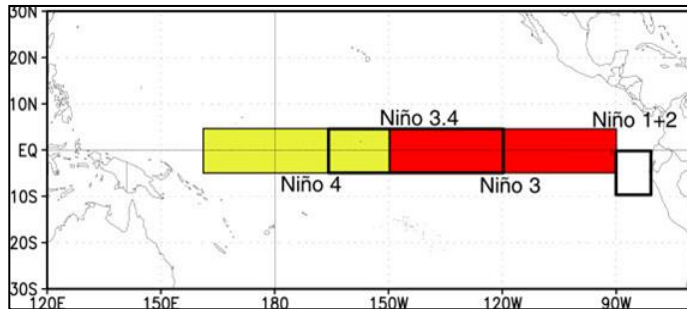
Current Global Sea Surface Temperature Anomalies



Niño Region SST Departures (°C) Recent Evolution

The latest weekly SST departures are:

Niño 4	0.3°C
Niño 3.4	-0.1°C
Niño 3	-0.5°C
Niño 1+2	-1.1°C



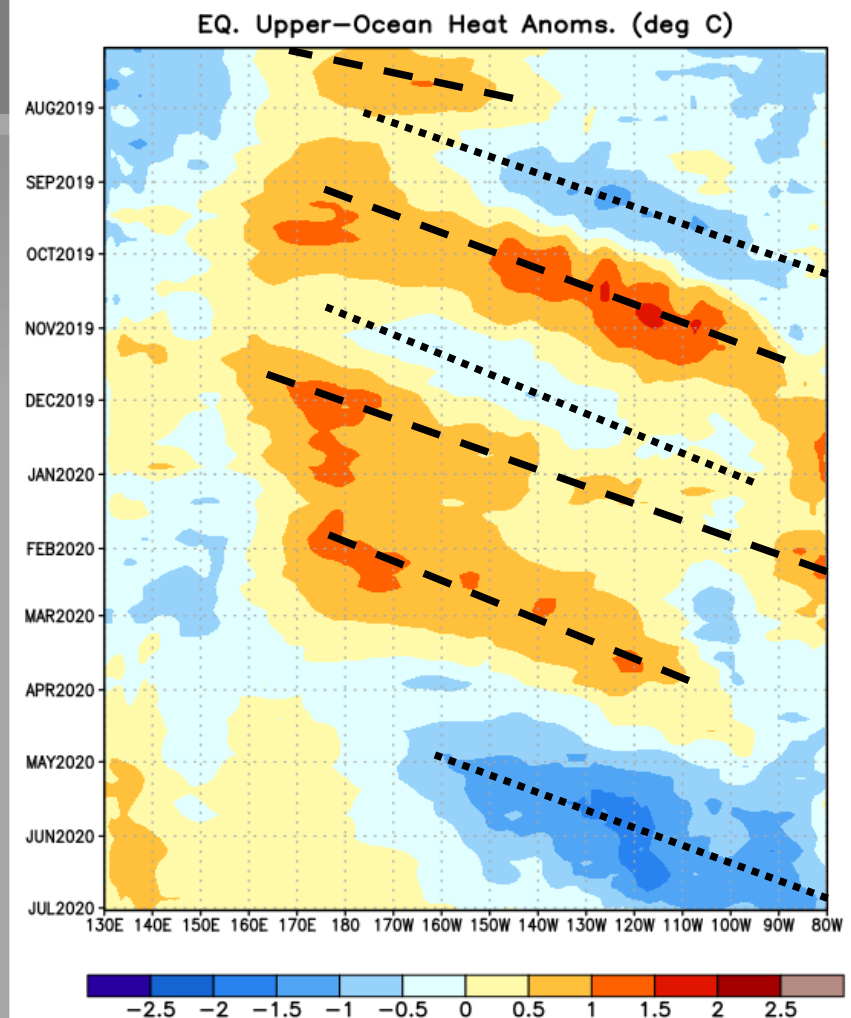
Weekly Heat Content Evolution in the Equatorial Pacific

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

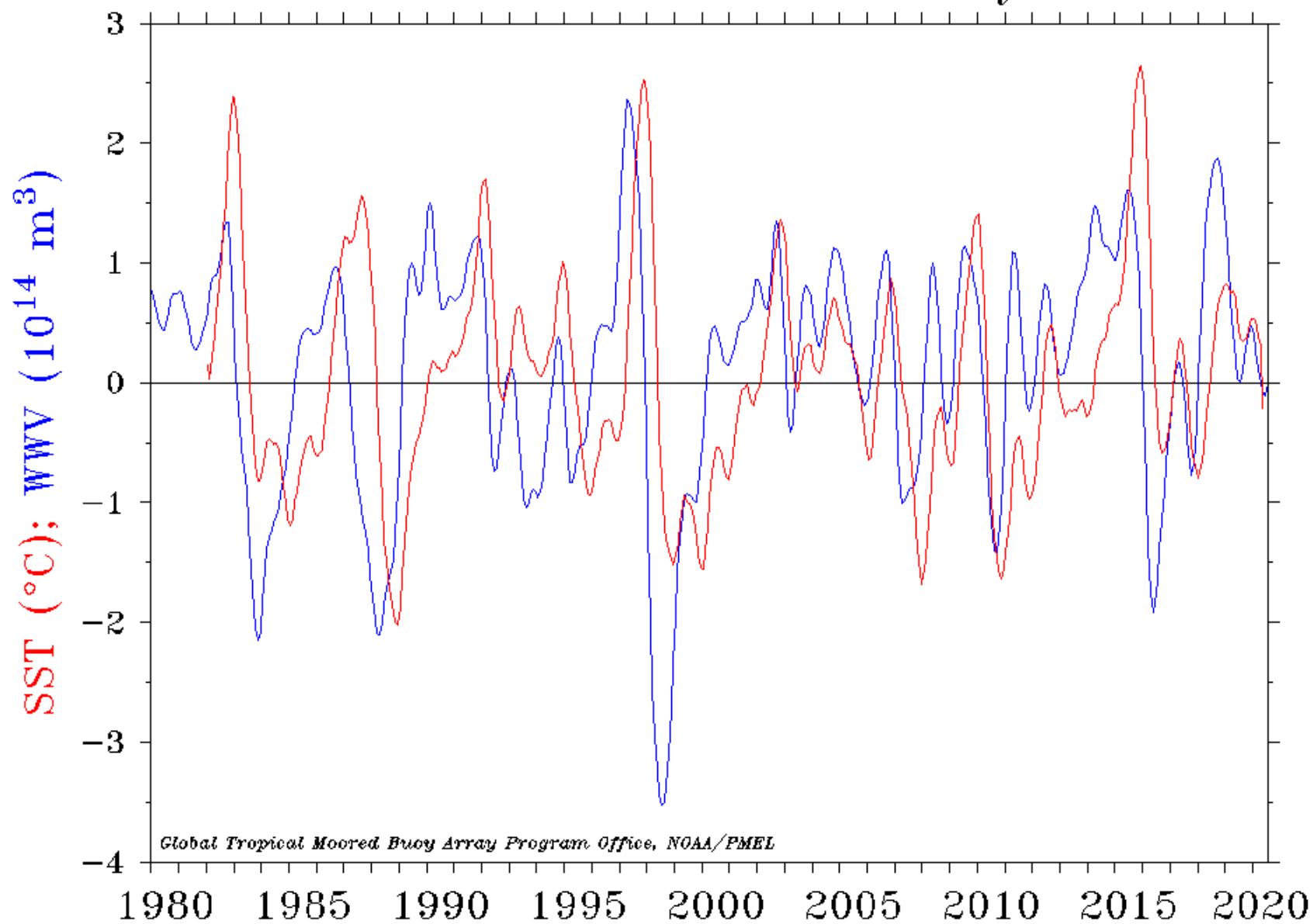
From December 2019 to February 2020, downwelling Kelvin waves (dashed line) resulted in above-average subsurface temperatures across the central and east-central equatorial Pacific.

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

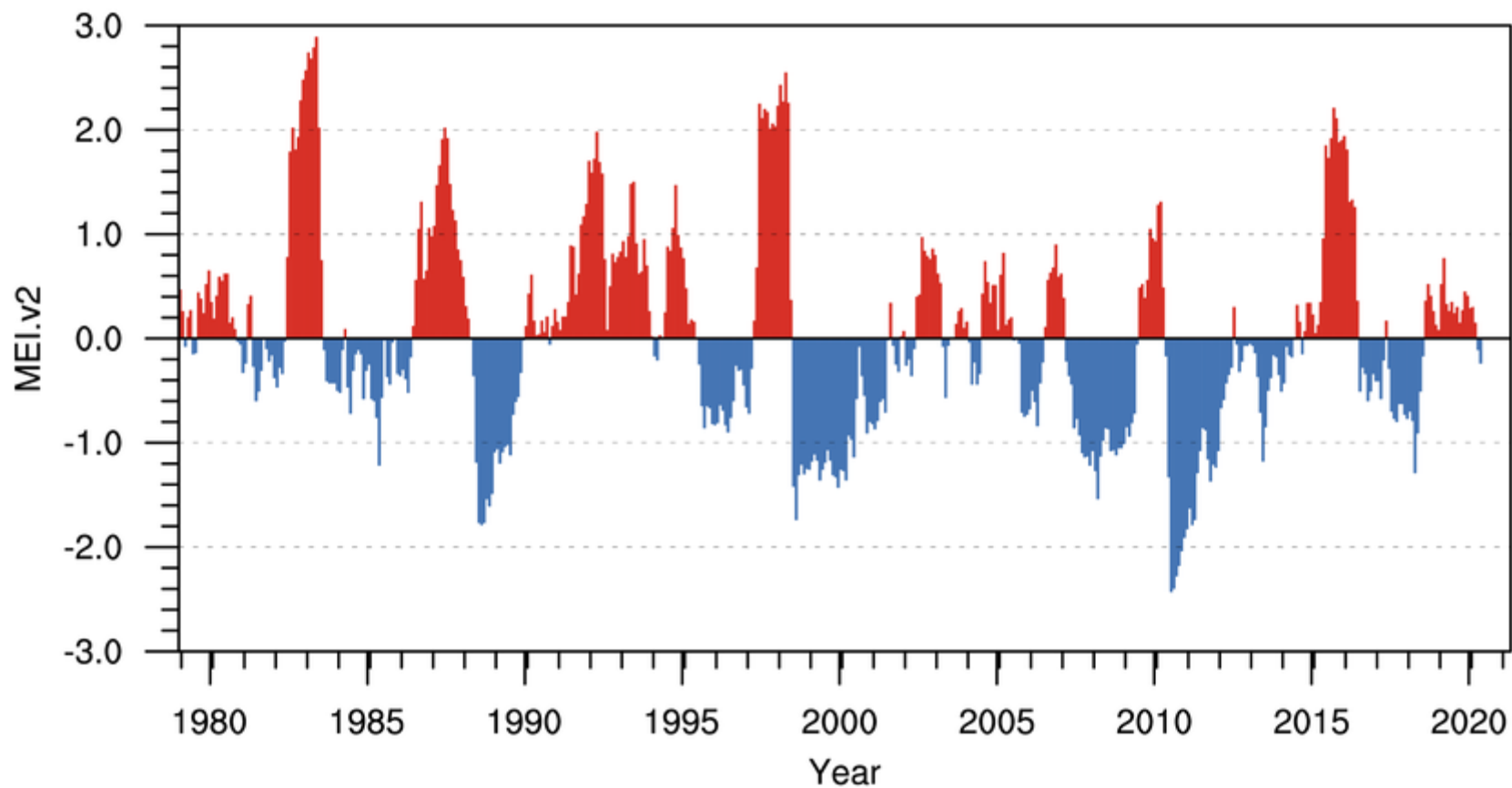
Equatorial oceanic Kelvin waves have alternating warm and cold phases. The warm phase is indicated by dashed lines. Downwelling and warming occur in the leading portion of a Kelvin wave, and up-welling and cooling occur in the trailing portion.



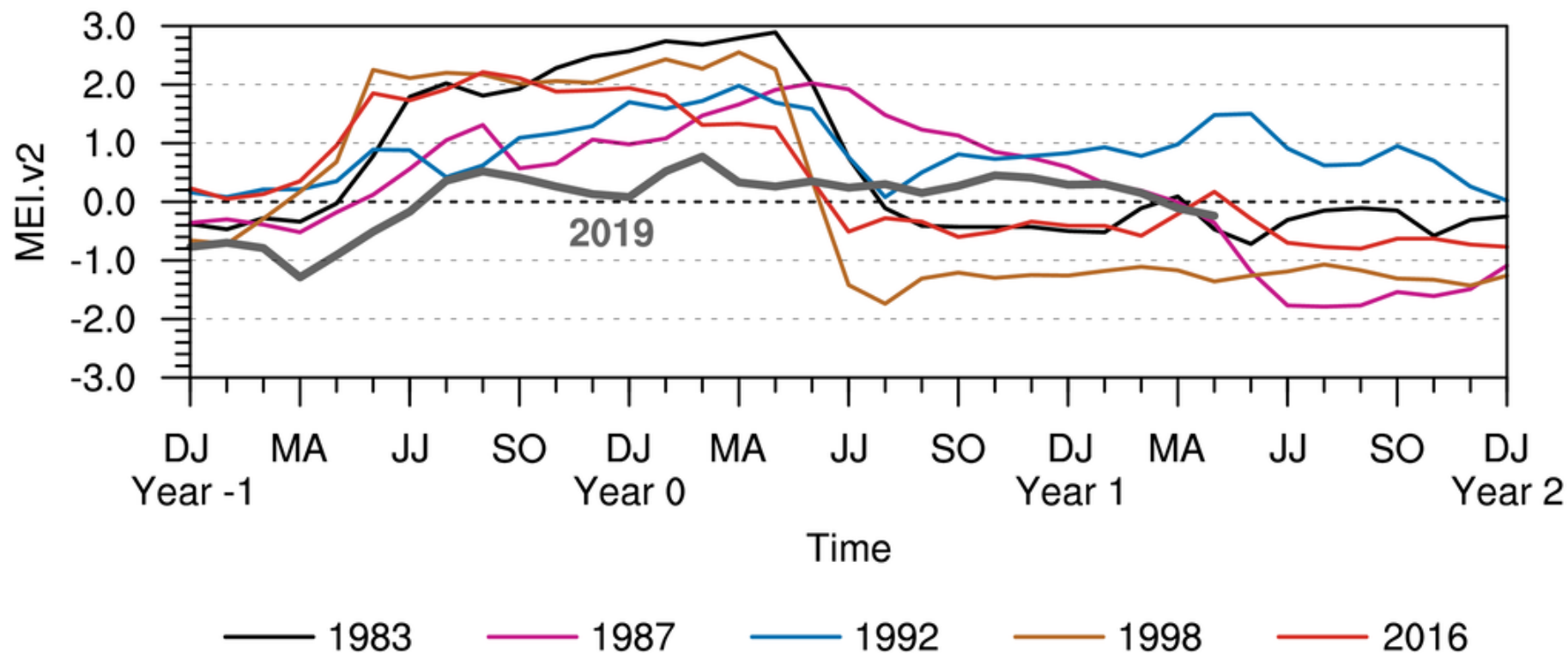
Warm Water Volume (5°N–5°S, 120°E–80°W) and NINO 3.4 SST Anomaly



Multivariate ENSO Index Version 2

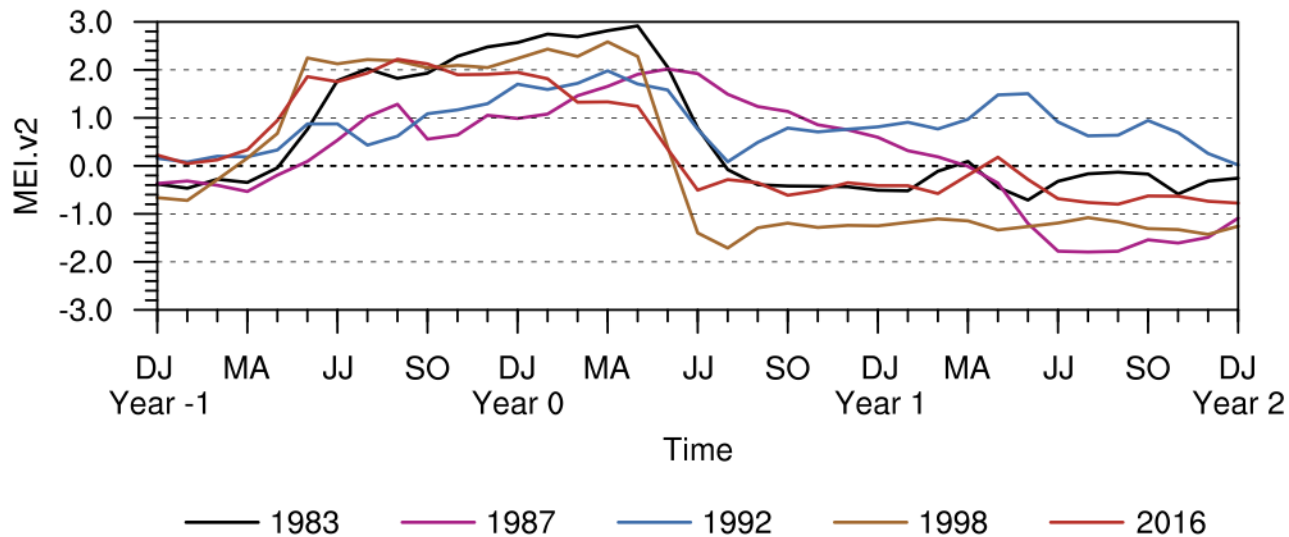


MEI.v2 Evolution of Current ENSO Event in Historical Context

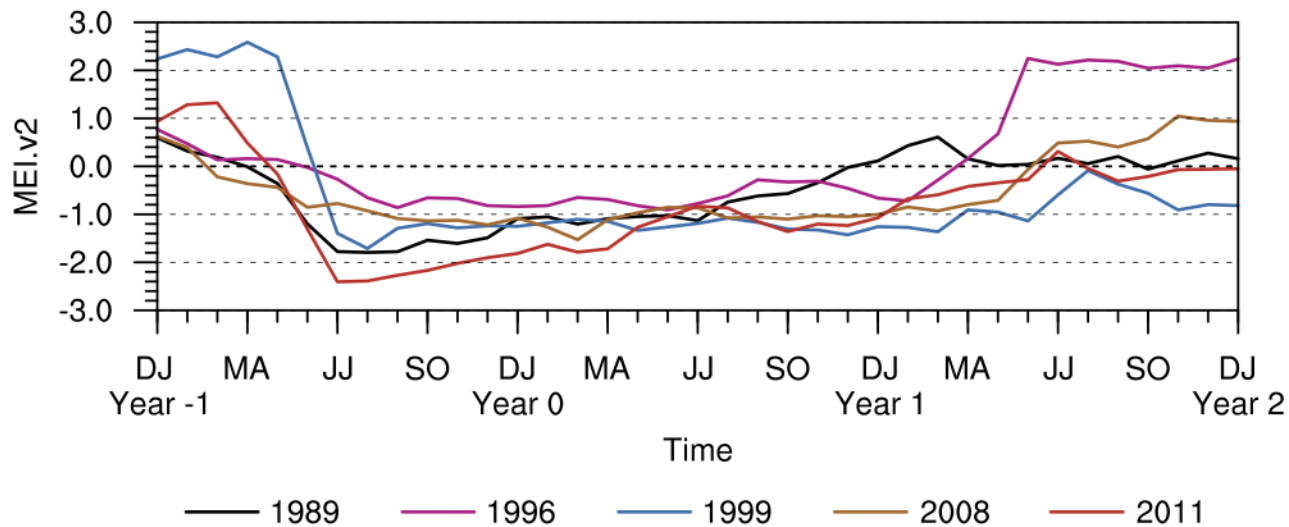


MEI.v2 Evolution of Historical ENSO Events

(a) El Niño

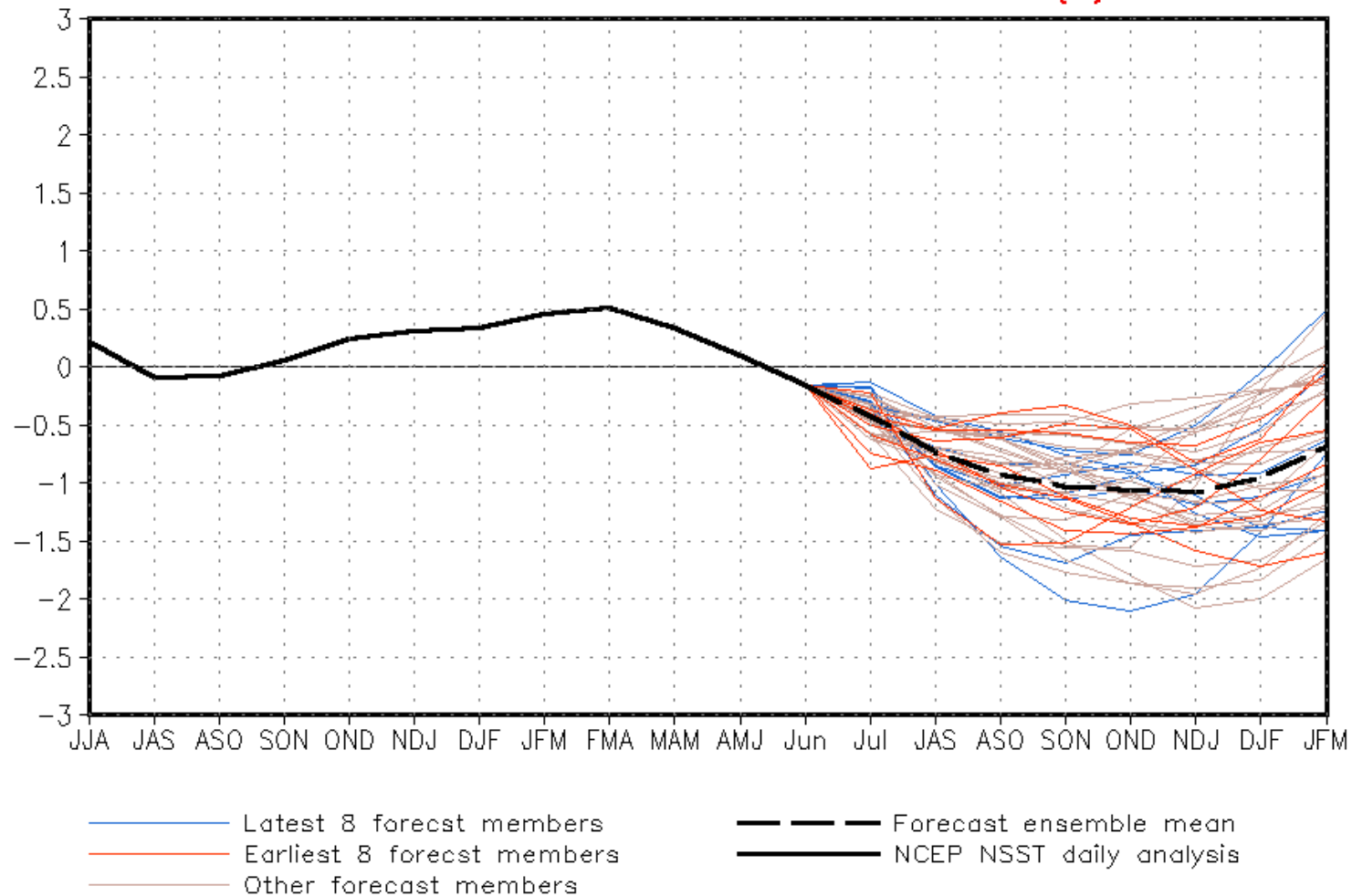


(b) La Niña





CFSv2 forecast Nino3.4 SST anomalies (K)



— Latest 8 forecast members
— Earliest 8 forecast members
— Other forecast members
— Forecast ensemble mean
— NCEP NSST daily analysis

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

IRI/CPC Pacific Niño

3.4 SST Model Outlook

Most models predict either ENSO-neutral or La Niña during the remainder of 2020.

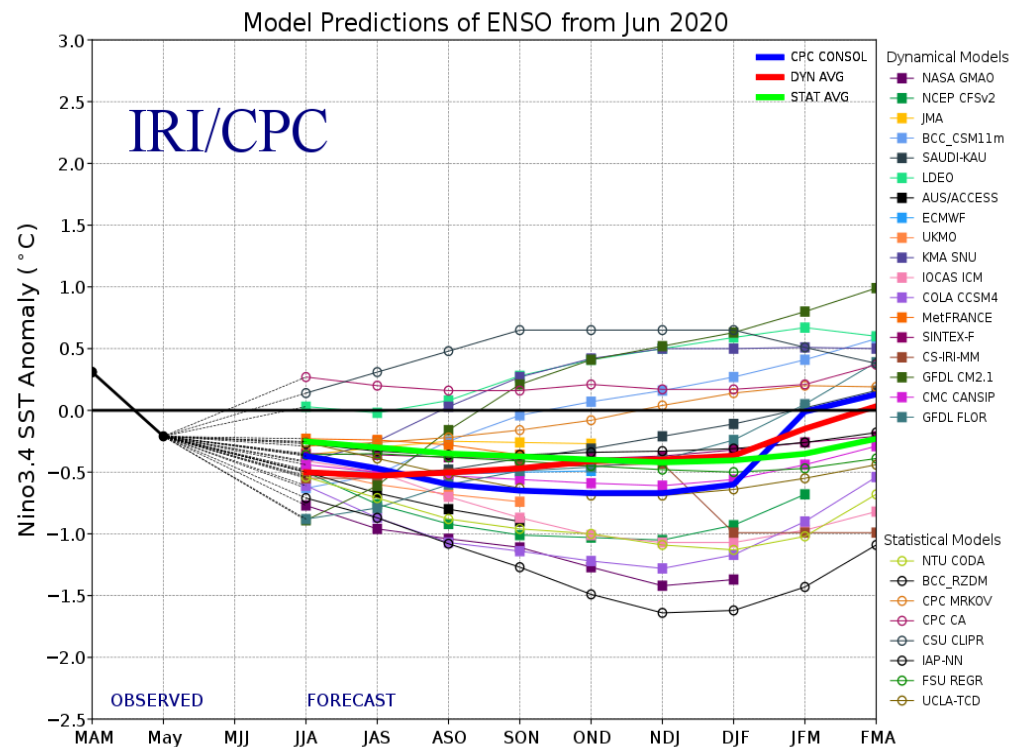


Figure provided by the International Research Institute (IRI) for Climate and Society (updated 19 June 2020).

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.

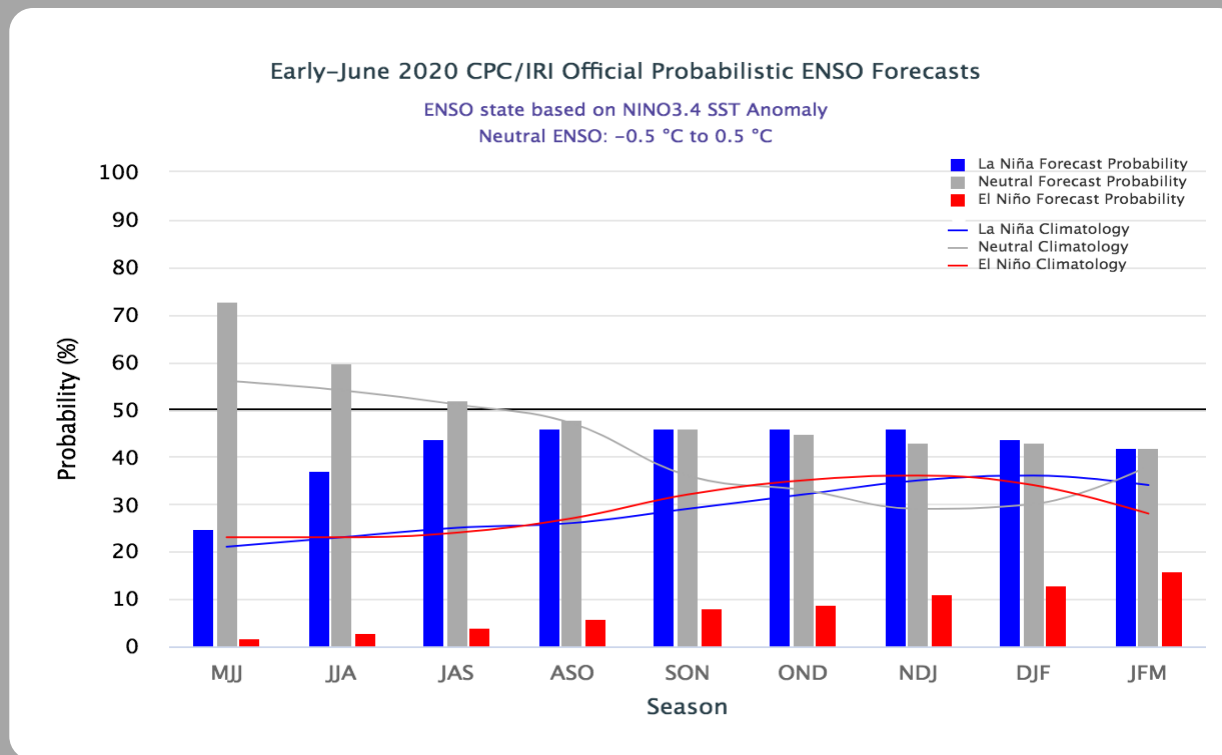
The ONI is one measure of the El Niño-Southern Oscillation, and other indices can confirm whether features consistent with a coupled ocean-atmosphere phenomenon accompanied these periods. The complete table going back to DJF 1950 can be found [here](#).

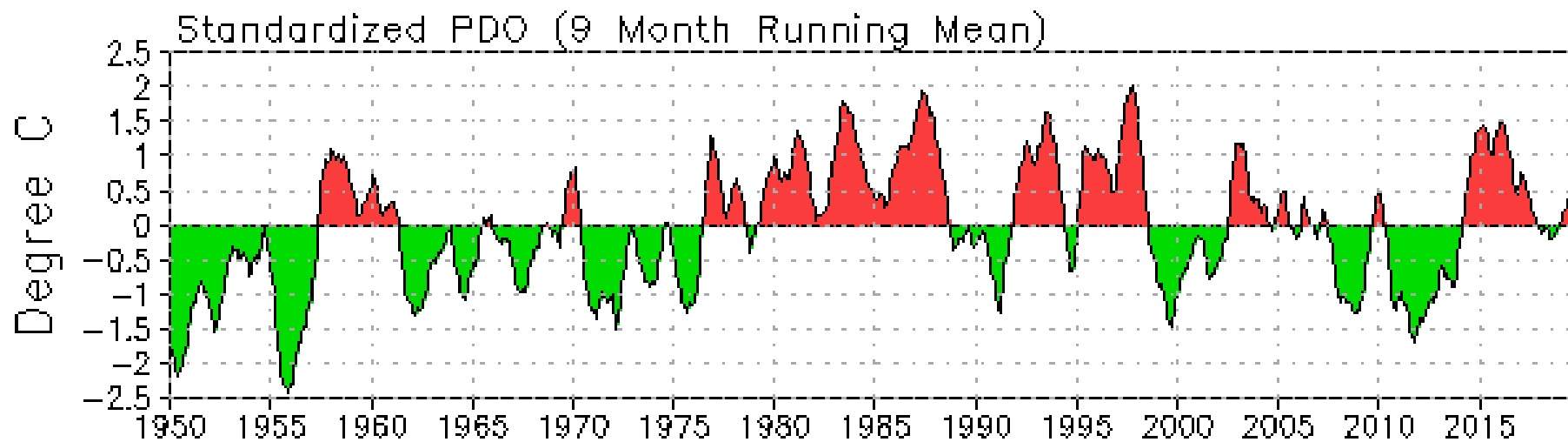
Year	DJF	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ
2008	-1.6	-1.4	-1.2	-0.9	-0.8	-0.5	-0.4	-0.3	-0.3	-0.4	-0.6	-0.7
2009	-0.8	-0.7	-0.5	-0.2	0.1	0.4	0.5	0.5	0.7	1.0	1.3	1.6
2010	1.5	1.3	0.9	0.4	-0.1	-0.6	-1.0	-1.4	-1.6	-1.7	-1.7	-1.6
2011	-1.4	-1.1	-0.8	-0.6	-0.5	-0.4	-0.5	-0.7	-0.9	-1.1	-1.1	-1.0
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							

CPC/IRI Probabilistic ENSO Outlook

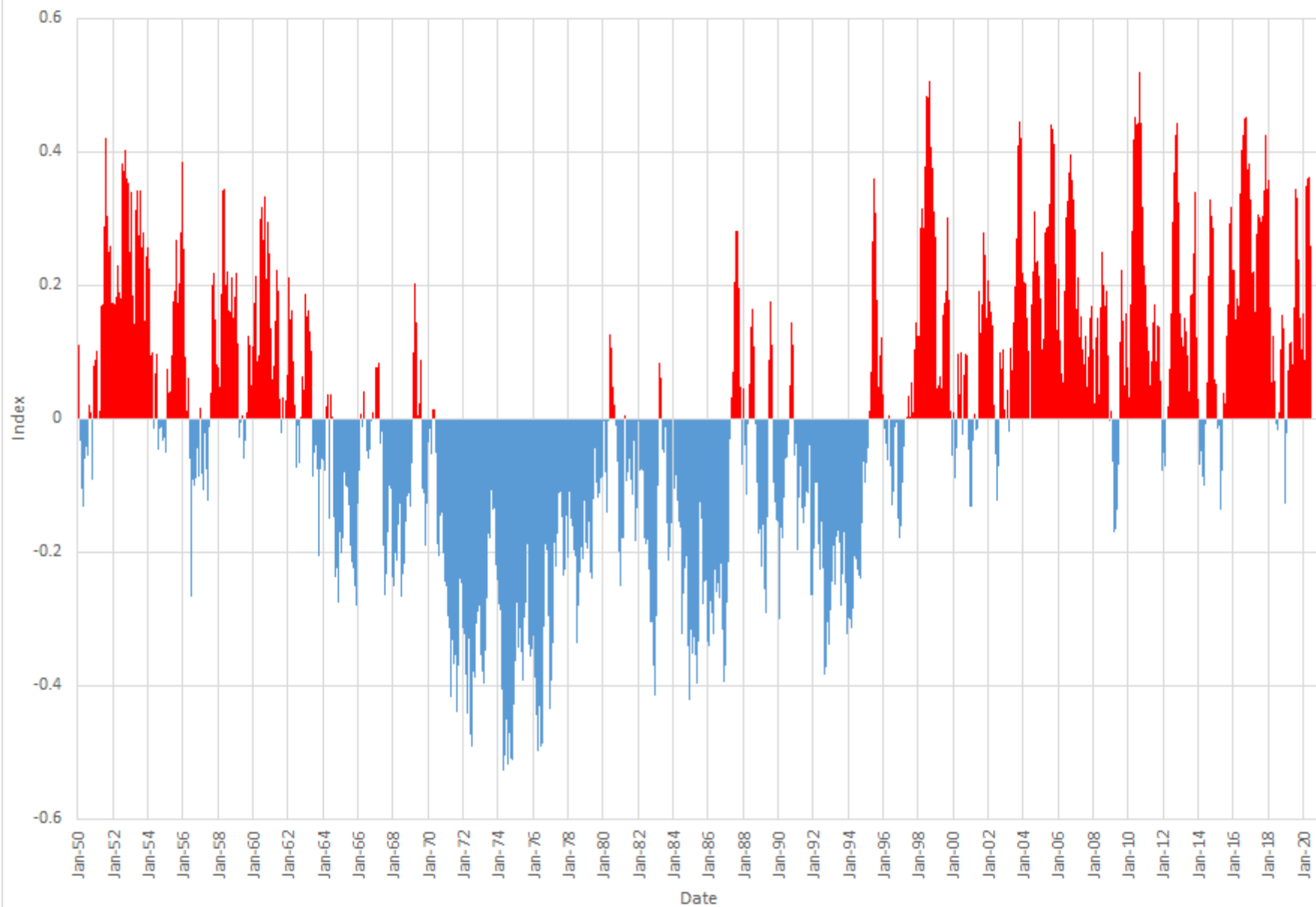
Updated: 11 June 2020

ENSO-neutral is most likely to continue through the Northern Hemisphere summer 2020, with roughly equal chances of ENSO-neutral or La Niña beginning in August-October 2020.

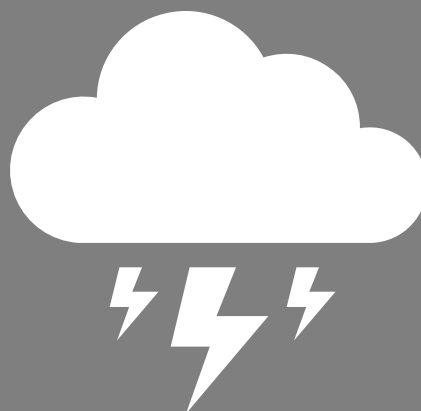




Index of the North Atlantic Temperatures from Kaplan Extended SST V2

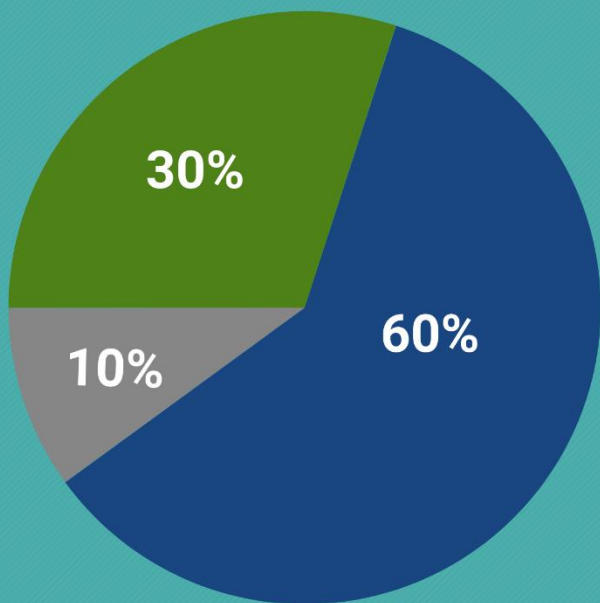


2020 Tropical Outlook





2020 Atlantic Hurricane Season Outlook



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

Season probability

Named storms

13-19

Hurricanes

6-10

Major hurricanes

3-6

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

May 2020

Source: National Hurricane Center

Colorado State University (Tropical Meteorology Project)

ATLANTIC BASIN SEASONAL HURRICANE FORECAST FOR 2020

Forecast Parameter and 1981-2010 Average (in parentheses)	Issue Date 2 April 2020	Issue Date 4 June 2020	Observed Activity Through June 2 2020	Total Seasonal Forecast (Includes Arthur, Bertha & Cristobal*)
Named Storms (NS) (12.1)	16	16	3	19
Named Storm Days (NSD) (59.4)	80	81.75	3.25	85
Hurricanes (H) (6.4)	8	9	0	9
Hurricane Days (HD) (24.2)	35	40	0	40
Major Hurricanes (MH) (2.7)	4	4	0	4
Major Hurricane Days (MHD) (6.2)	9	9	0	9
Accumulated Cyclone Energy (ACE) (106)	150	158	2	160
Net Tropical Cyclone Activity (NTC) (116%)	160	164	6	170

*Arthur, Bertha and Cristobal have formed in the Atlantic as of June 2nd.

- Anticipate above-normal activity
- Current neutral ENSO conditions may transition to weak La Niña conditions by late summer (during a La Niña, trade winds weaken over the Atlantic Ocean which supports tropical cyclone development)
- Sea surface temperatures averaged across the tropical Atlantic are somewhat above normal
- Subtropical Atlantic is much warmer than average
- CSU Atlantic Multidecadal Oscillation Index is below its long-term average

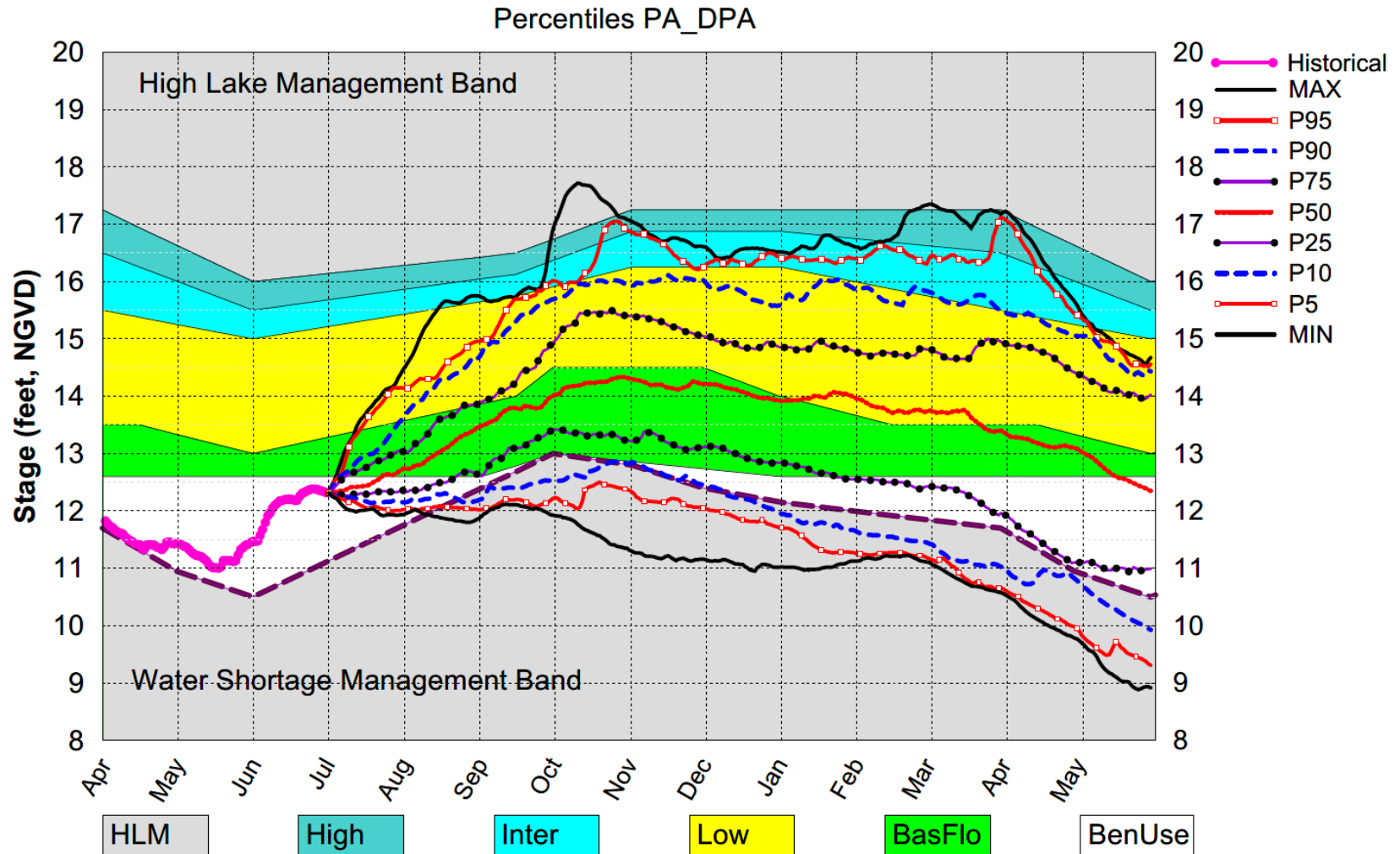
Next Update: July 7, 2020

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-July-2020)
 - 41 1-year simulations of system response to historical rainfall conditions
 - Statistical summaries used to display projections

PRELIMINARY RESULTS

Lake Okeechobee SFWMM July 2020 Position Analysis

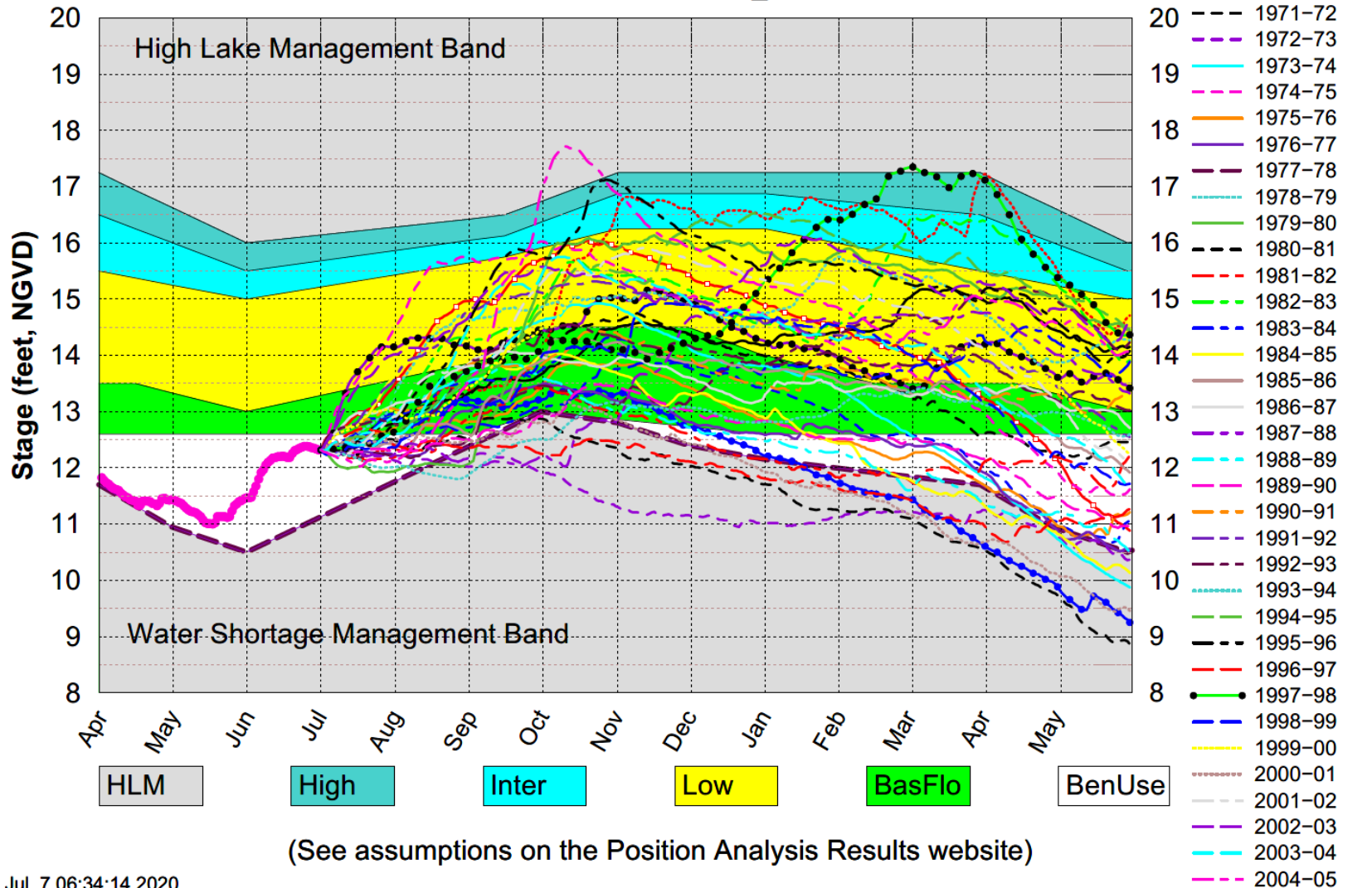


(See assumptions on the Position Analysis Results website)

PRELIMINARY RESULTS

Lake Okeechobee SFWMM July 2020 Position Analysis

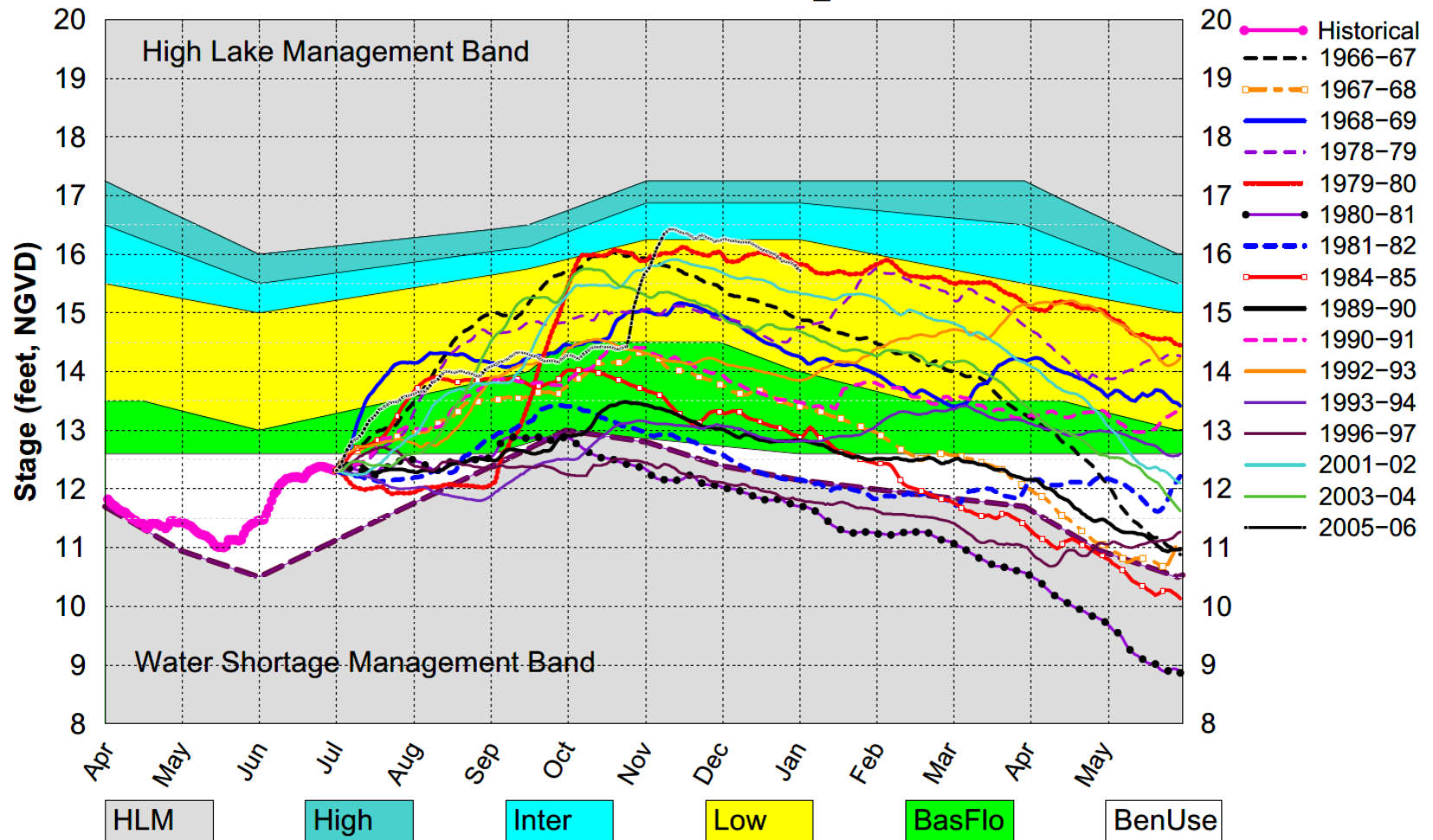
All Simulated Years Plot PA_DPA



PRELIMINARY RESULTS

Lake Okeechobee SFWMM July 2020 Position Analysis

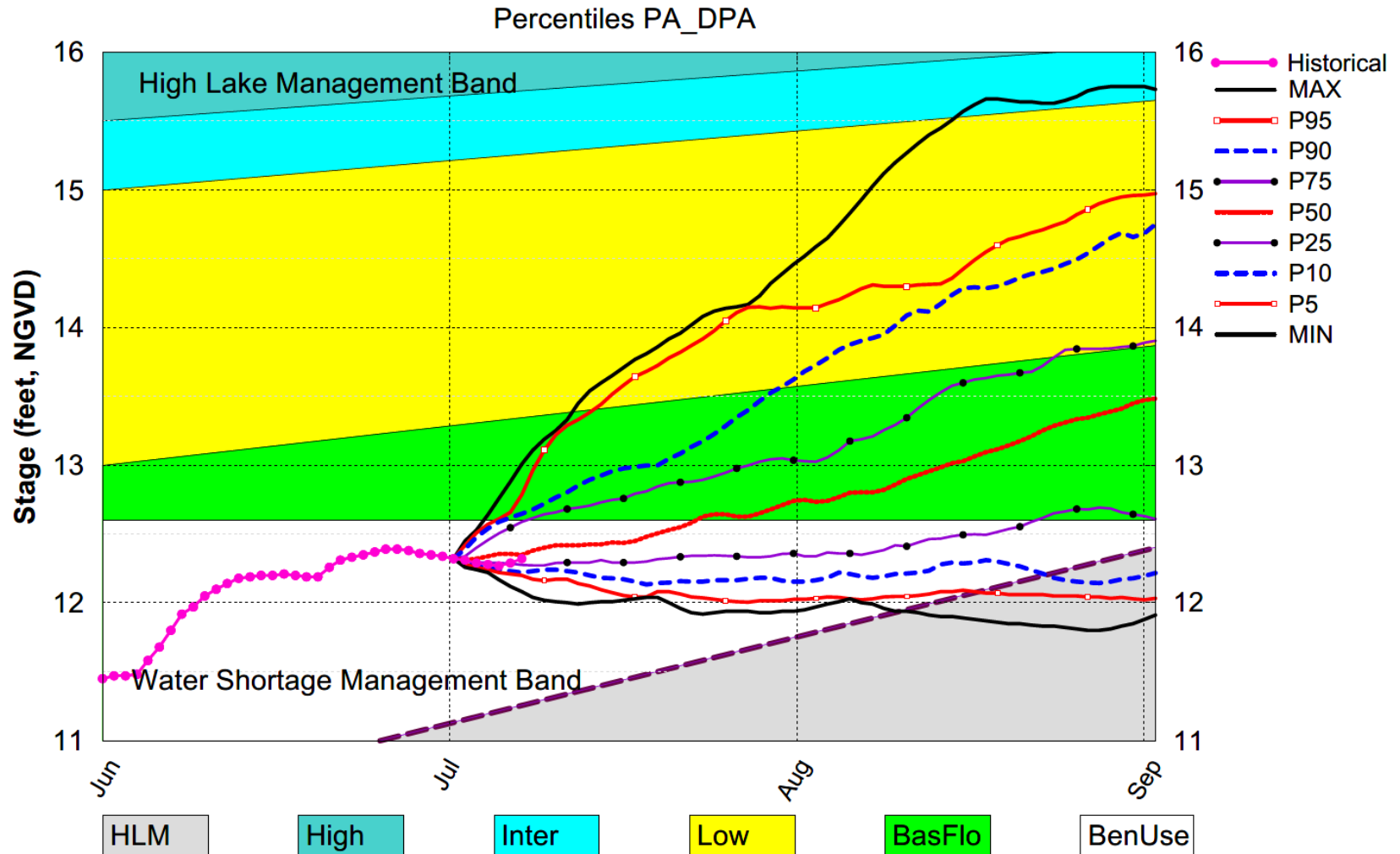
All ENSO Neutral Years Plot PA_DPA



(See assumptions on the Position Analysis Results website)

PRELIMINARY RESULTS

Lake Okeechobee SFWMM July 2020 Position Analysis



(See assumptions on the Position Analysis Results website)