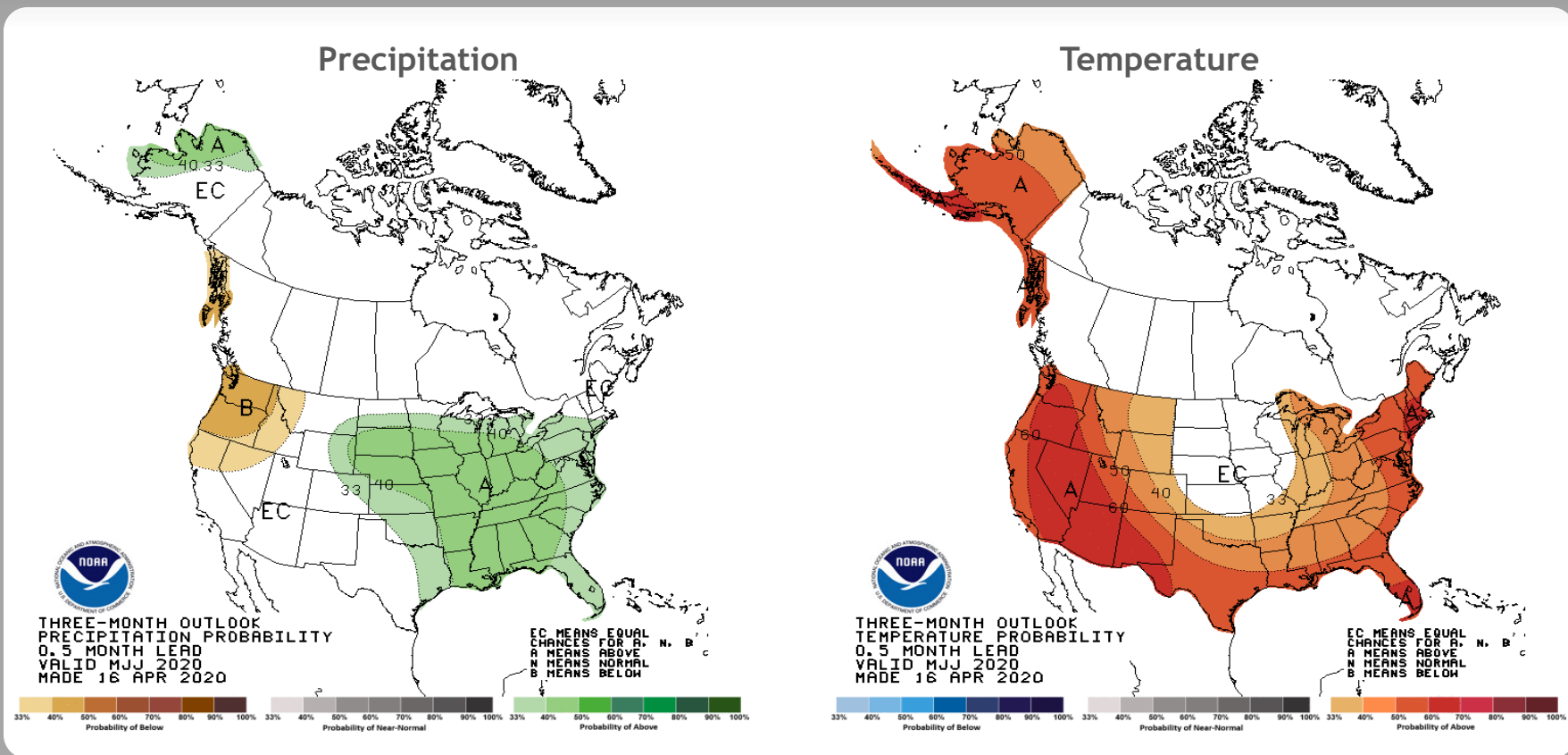EXTENDED HYDROLOGIC OUTLOOK
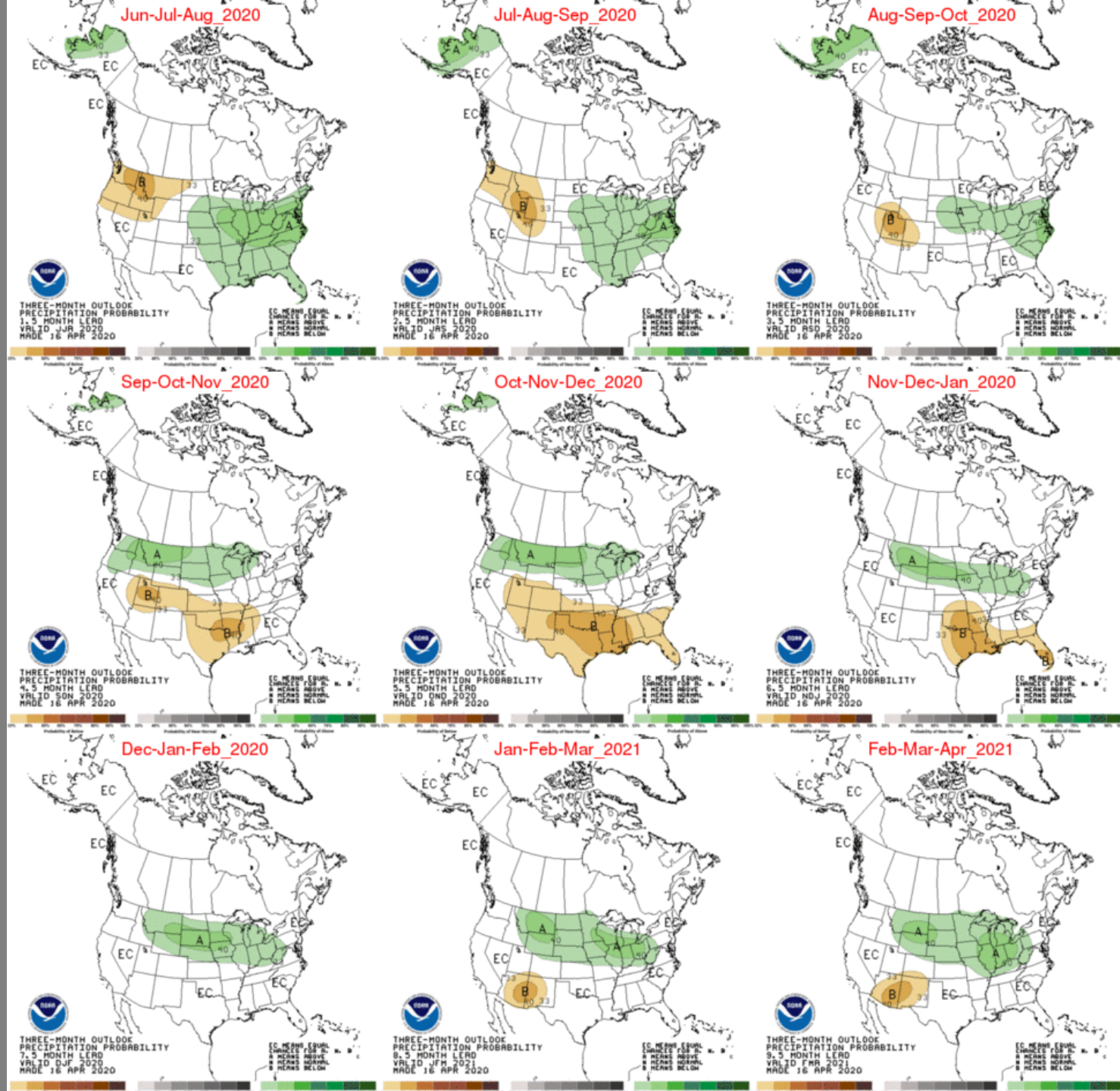MAY 12, 2020
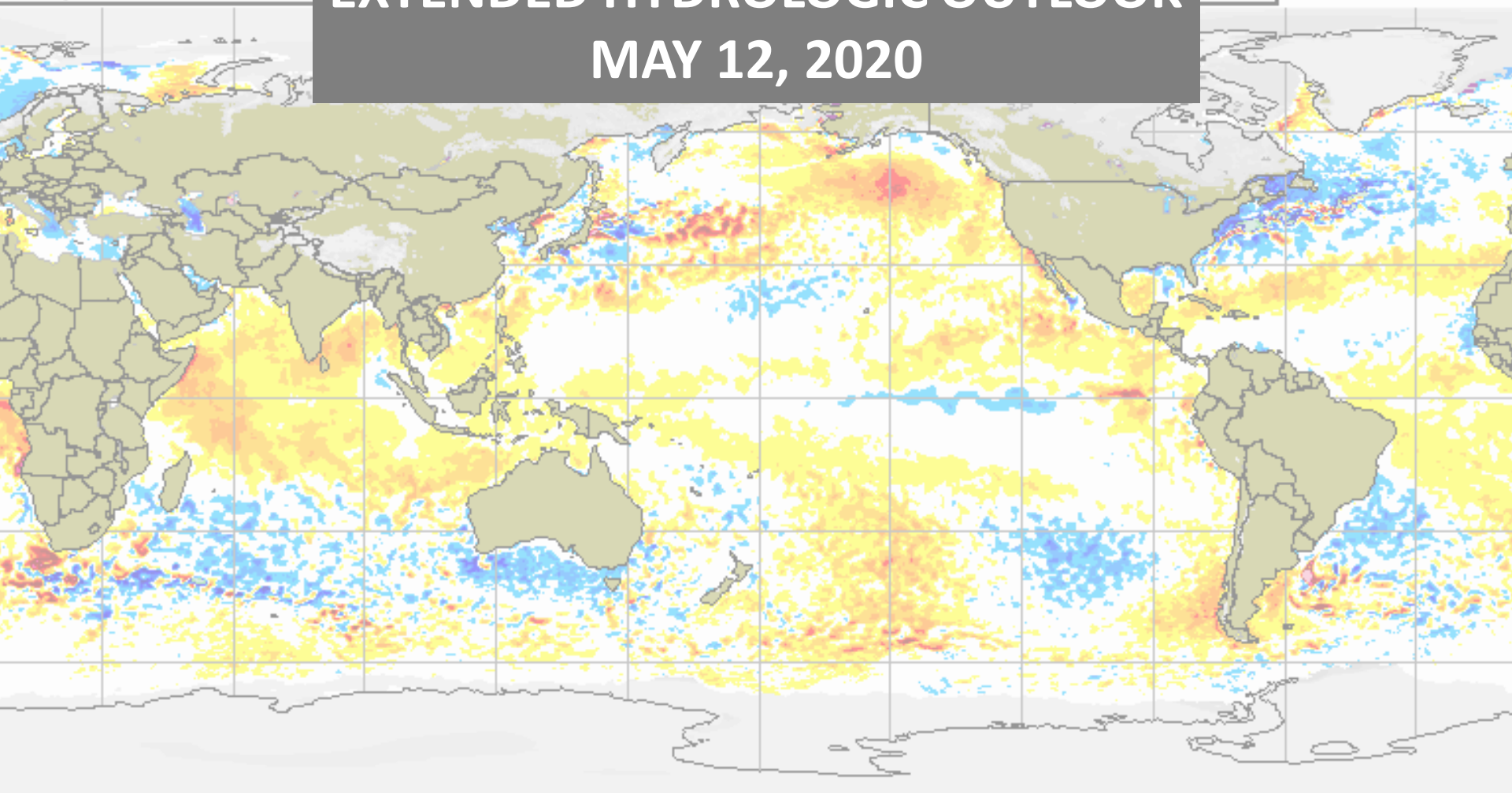
Summary

- **The Climate Prediction Center (CPC) is forecasting <u>above normal rainfall from May through July</u>.**

- **ENSO-neutral is favored for the summer 2020 (~60% chance), remaining the most likely outcome through autumn. <u>El Niño</u> increases the chances of a <u>wetter-than-normal dry season</u>, <u>La Niña</u> increases the chances of a <u>drier-than-normal dry season</u> (both have most influence November through March).**

- **Monitoring Atlantic Multidecadal Oscillation (AMO) which is <u>currently in the warm phase</u>:**

  - **Average annual inflow to Lake Okeechobee is nearly 50% greater during the warm phase compared to the cold phase**

U. S. Seasonal Outlooks

May-July 2020

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

Prepared by: Climate Prediction Center/NCEP

Jun-Jul-Aug_2020   Jul-Aug-Sep_2020   Aug-Sep-Oct_2020

Sep-Oct-Nov_2020   Oct-Nov-Dec_2020   Nov-Dec-Jan_2020

Dec-Jan-Feb_2020   Jan-Feb-Mar_2021   Feb-Mar-Apr_2021

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
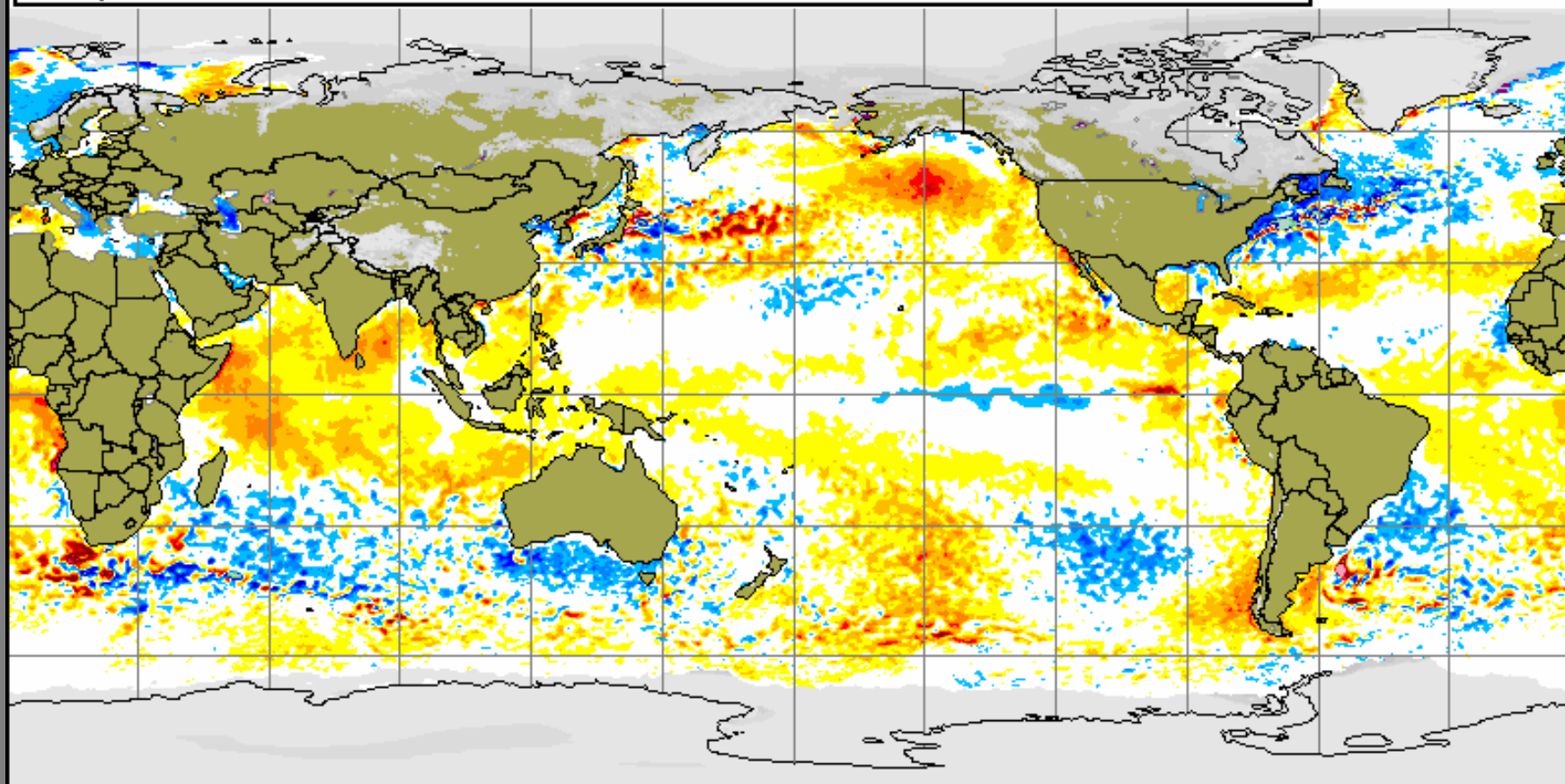
Pacific Decadal Oscillation (PDO)

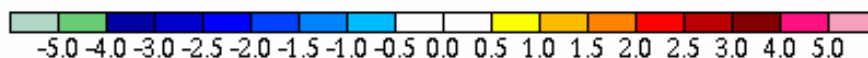Increases variations of south Florida dry season rainfall

Current Global Sea Surface Temperature Anomalies
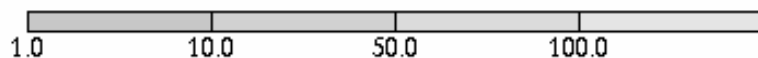

Global sea surface anomaly and snow cover
12 May 2020

Anomalie de la température de la mer et épaisseur de la neige
12 Mai 2020

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

-5.0 -4.0 -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 4.0 5.0

Snow depth / Épaisseur de la neige (cm)

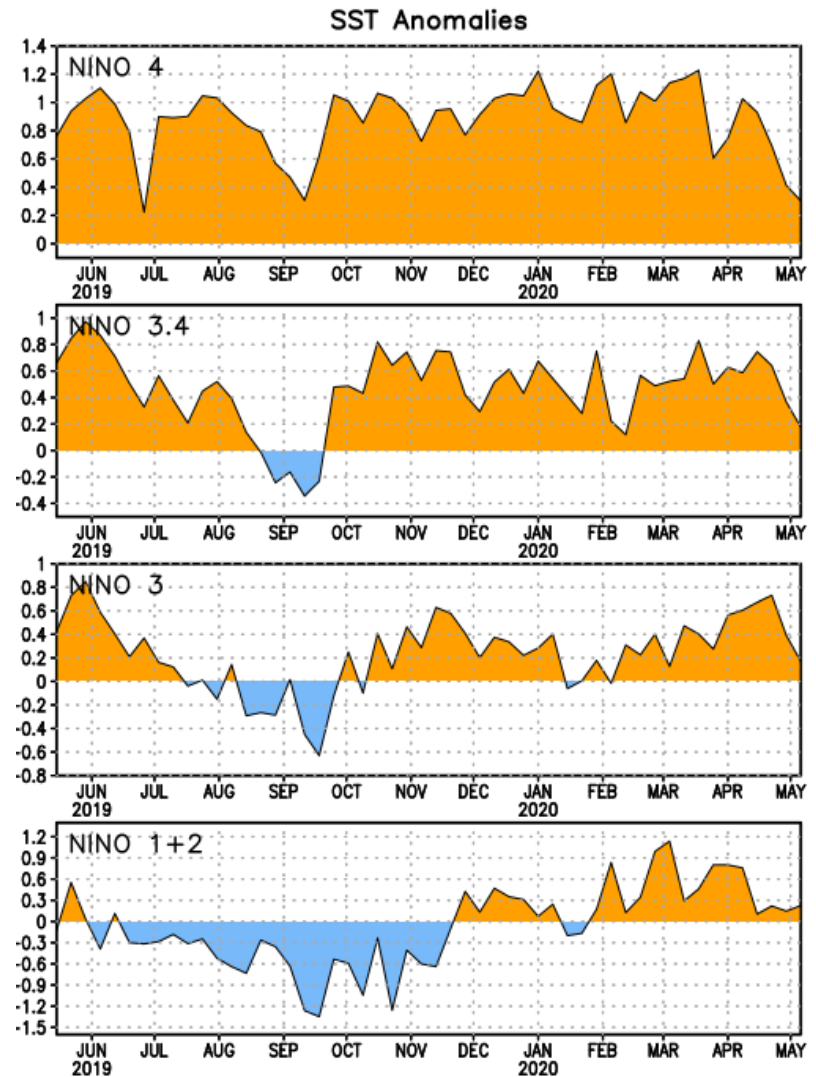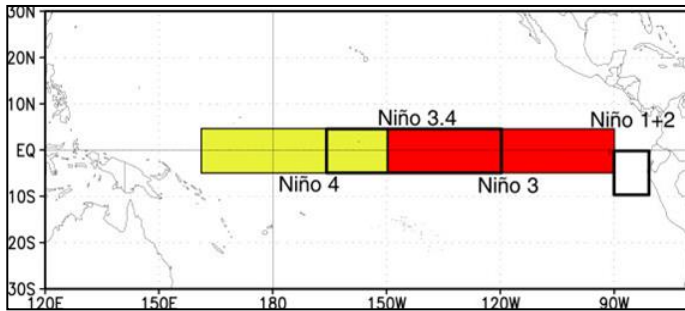1.0   10.0   50.0   100.0

Uncovered sea ice
Glace marine à découvert

Climatologie 1995-2009 Climatology

CMC Environnement Canada
CMC Environment Canada

Niño Region SST Departures (ºC) Recent Evolution

The latest weekly SST departures are:

|	
Niño 4	0.3ºC
Niño 3.4	0.2ºC
Niño 3	0.2ºC
Niño 1+2	0.2ºC

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.
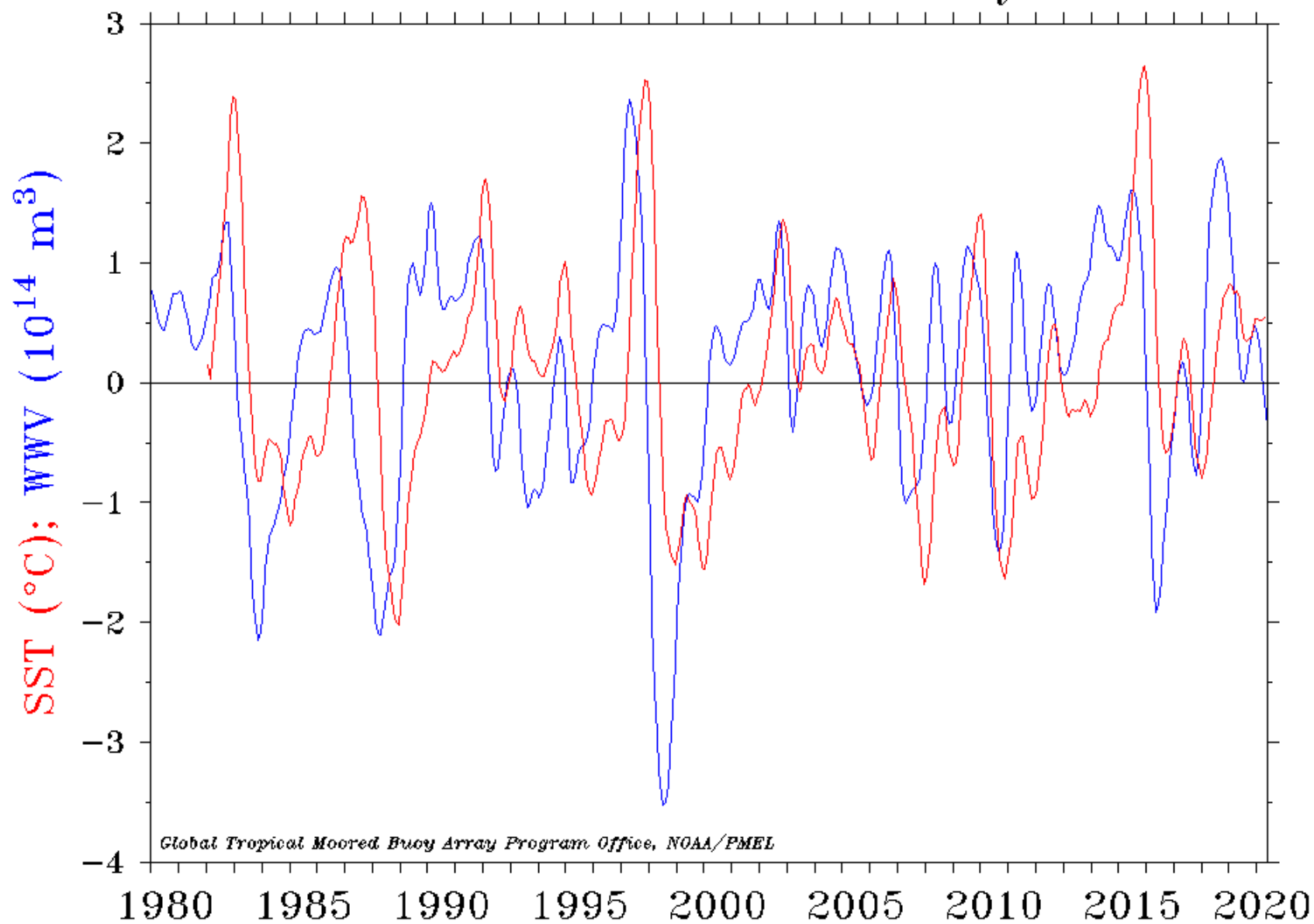
During December 2019 and January 2020, a downwelling Kelvin wave (dashed line) resulted in above-average subsurface temperatures across the central and east-central equatorial Pacific.

Since late March 2020, negative subsurface temperature anomalies have 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. Down-welling and warming occur in the leading portion of a Kelvin wave, and up-welling and cooling occur in the trailing portion.

EQ. Upper-Ocean Heat Anoms. (deg C)
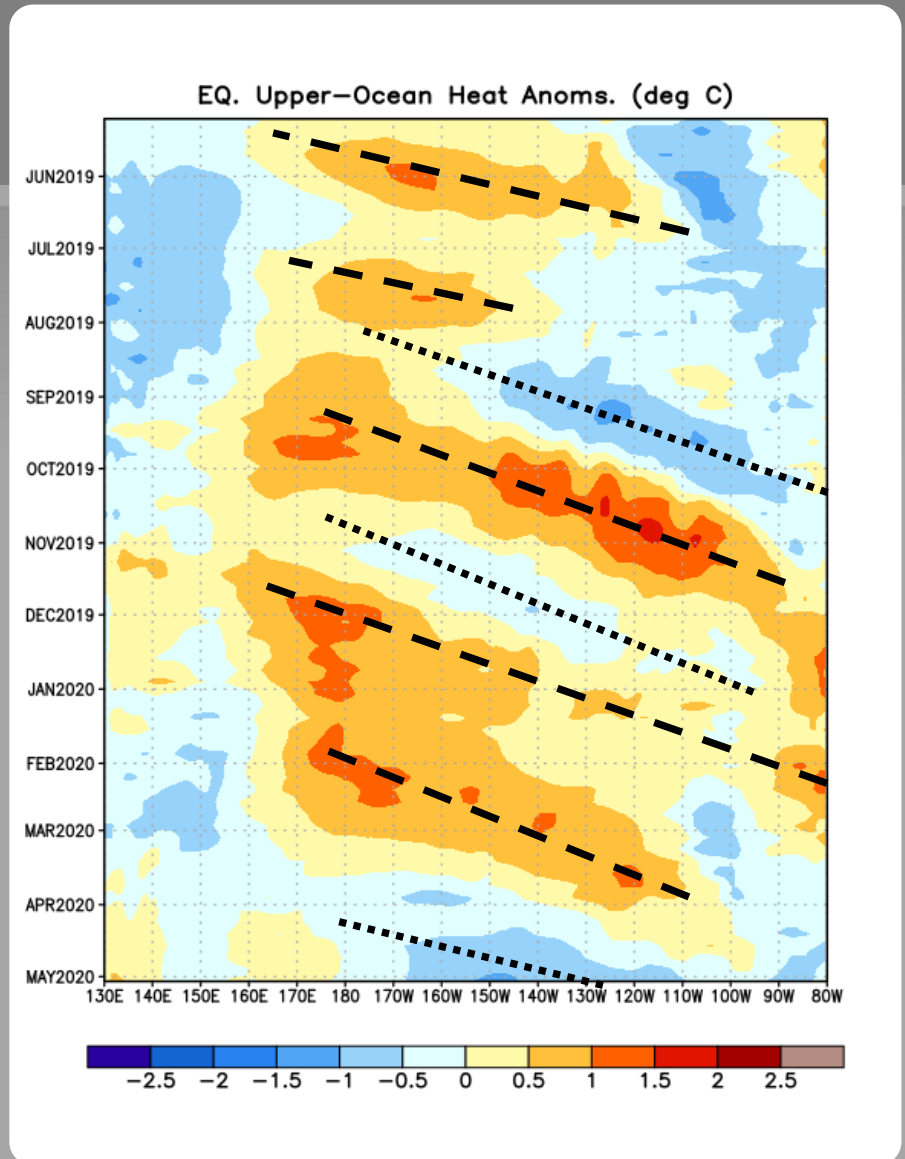
Warm Water Volume (5°N–5°S, 120°E–80°W) and NINO 3.4 SST Anomaly

Global Tropical Moored Buoy Array Program Office, NOAA/PMEL
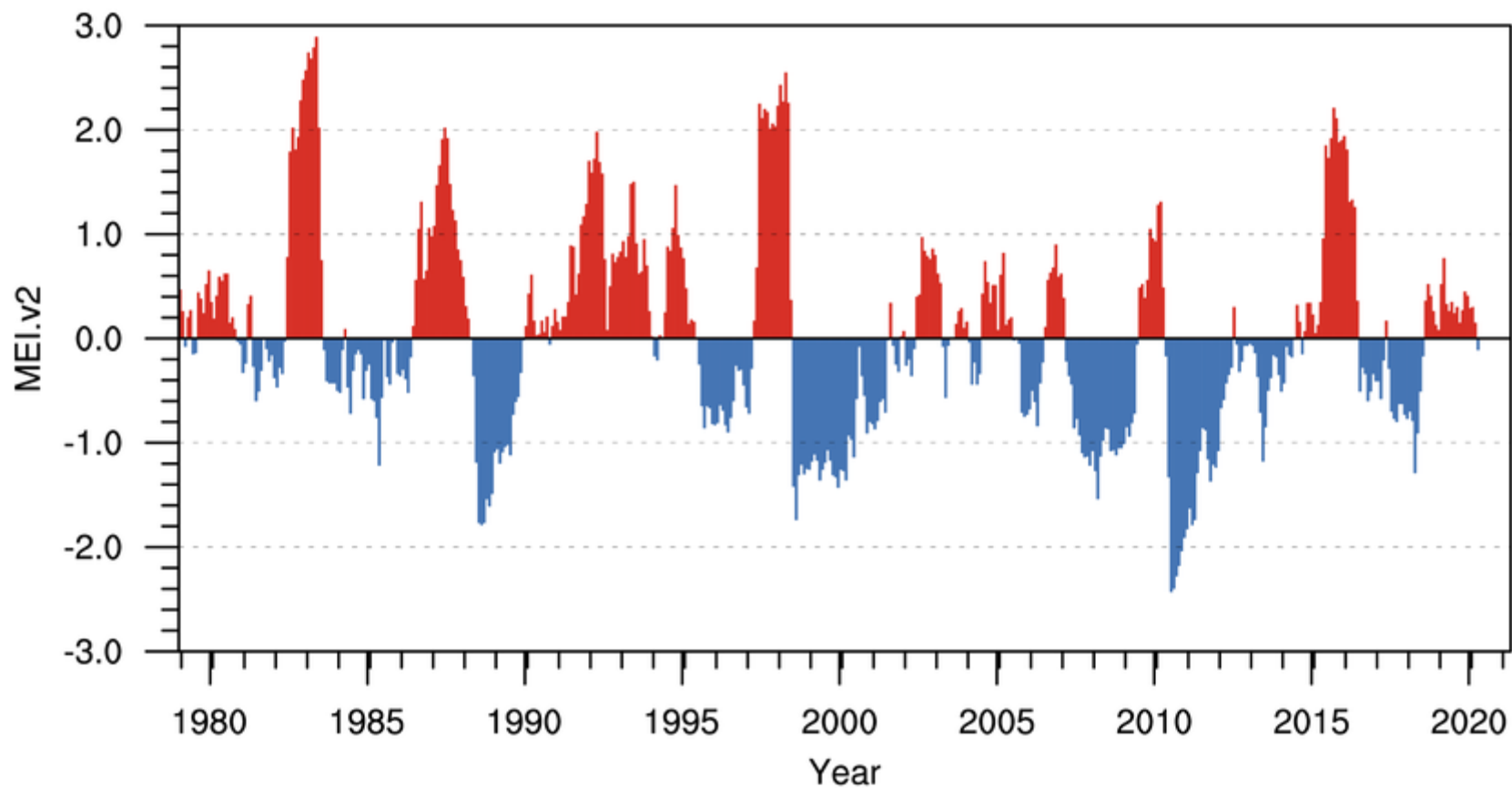
MEI.v2 Evolution of Current ENSO Event in Historical Context

2019

1983   1987   1992   1998   2016
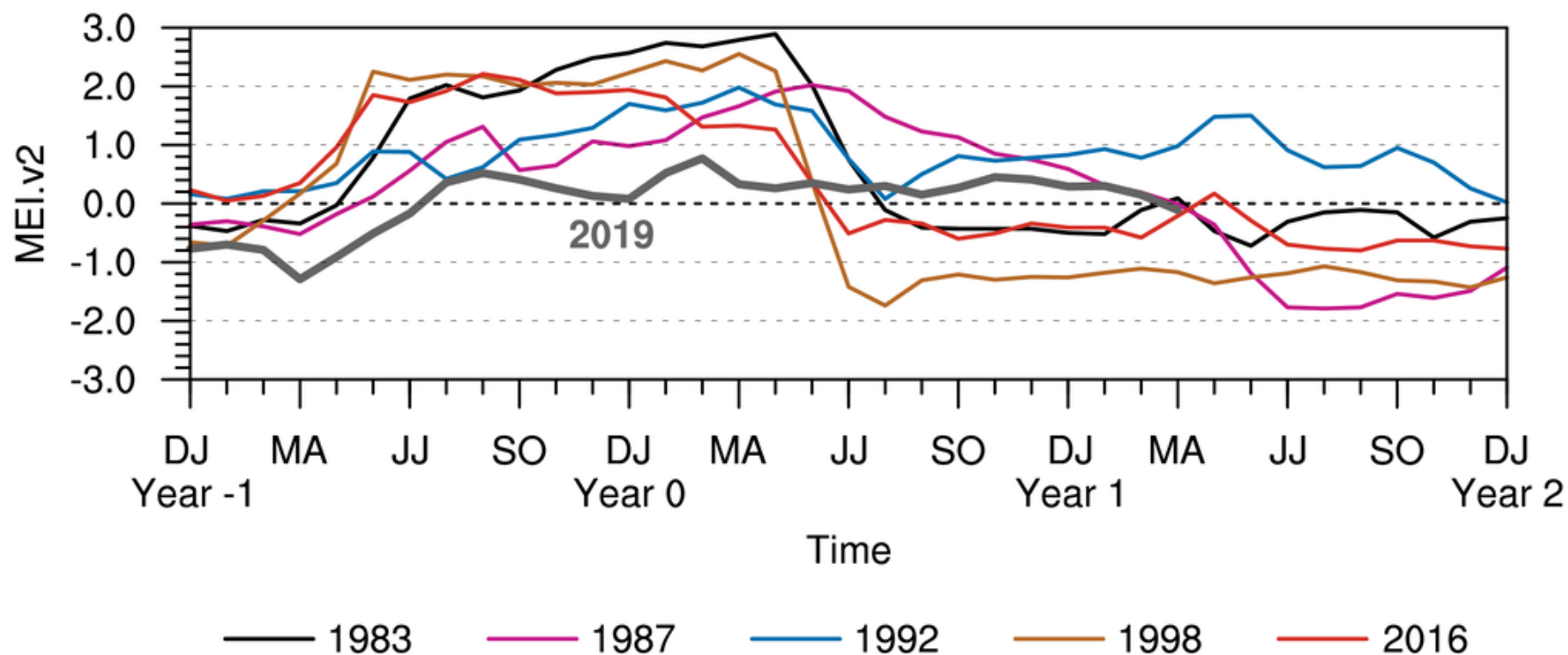
MEI.v2 Evolution of Historical ENSO Events

(a) El Niño

1983 — 1987 — 1992 — 1998 — 2016

(b) La Niña

1989 — 1996 — 1999 — 2008 — 2011
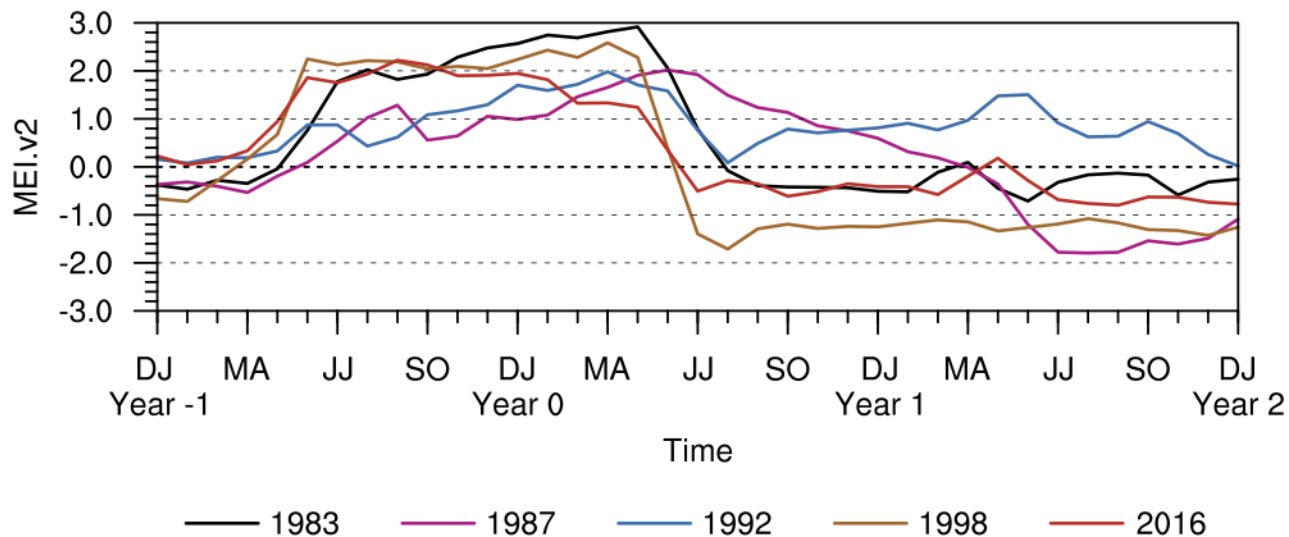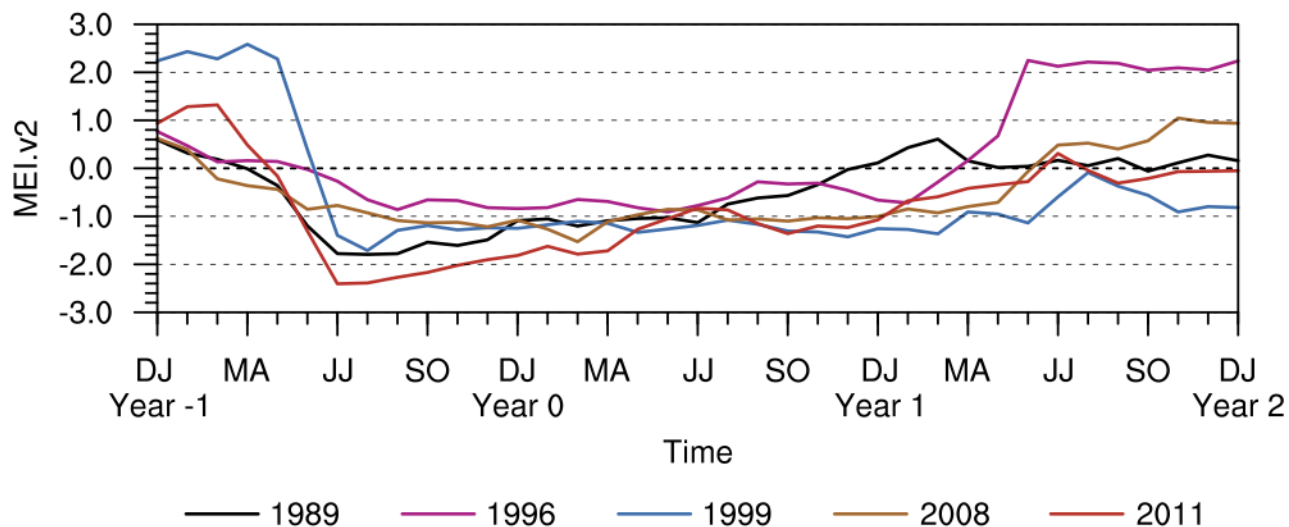
CFSv2 forecast Nino3.4 SST anomalies (K)

NWS/NCEP/CPC

Last update: Tue May 12 2020
Initial conditions: 11Apr2020–20Apr2020
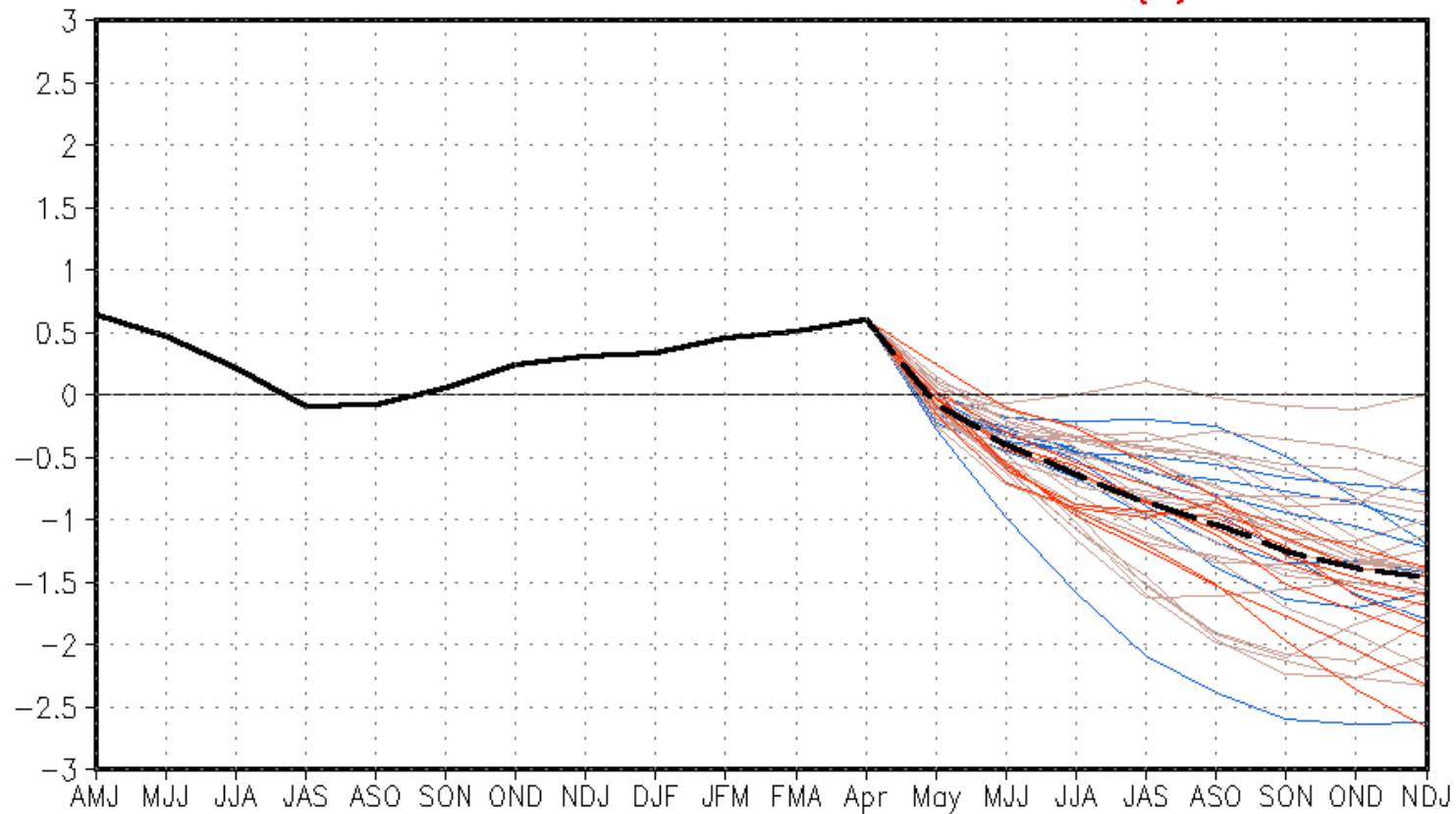
Latest 8 forecst members
Earliest 8 forecst members
Other forecast members
Forecast ensemble mean
NCEP NSST daily analysis

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

IRI/CPC Pacific Niño 3.4 SST Model Outlook

A majority of models favor ENSO-neutral through the Northern Hemisphere summer and fall 2020.

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

Prepared by: Climate Prediction Center/NCEP

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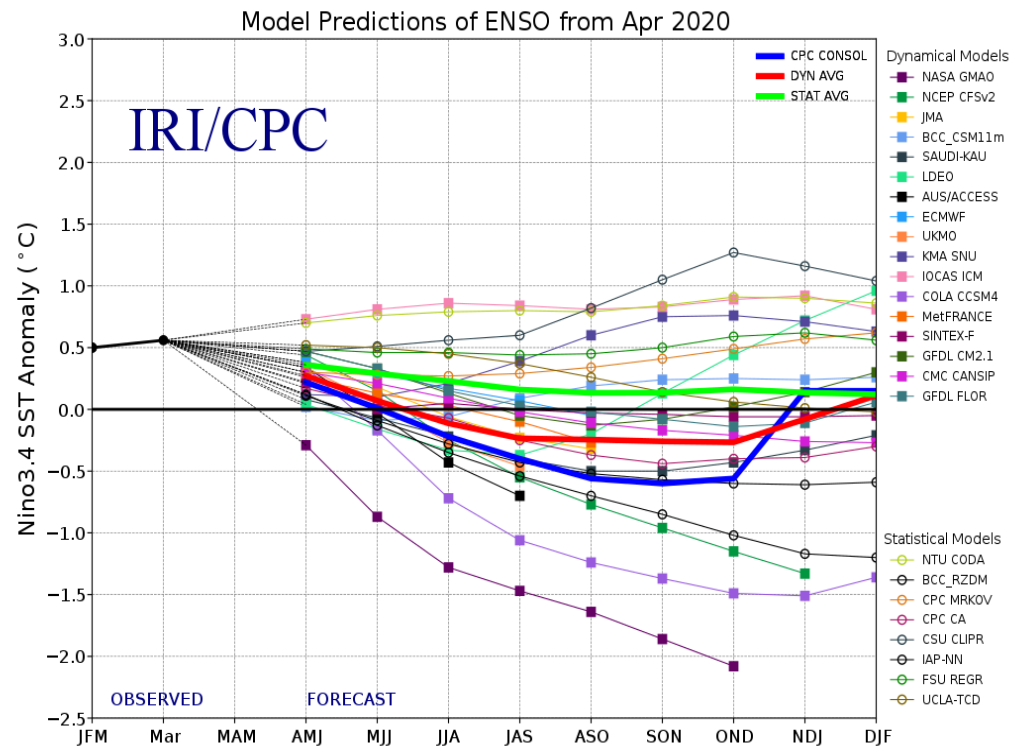-170W)]. For historical purposes, periods of below and above normal SSTs are colored in blue and red when the threshold is met for a minimum of 5 consecutive over-lapping seasons.
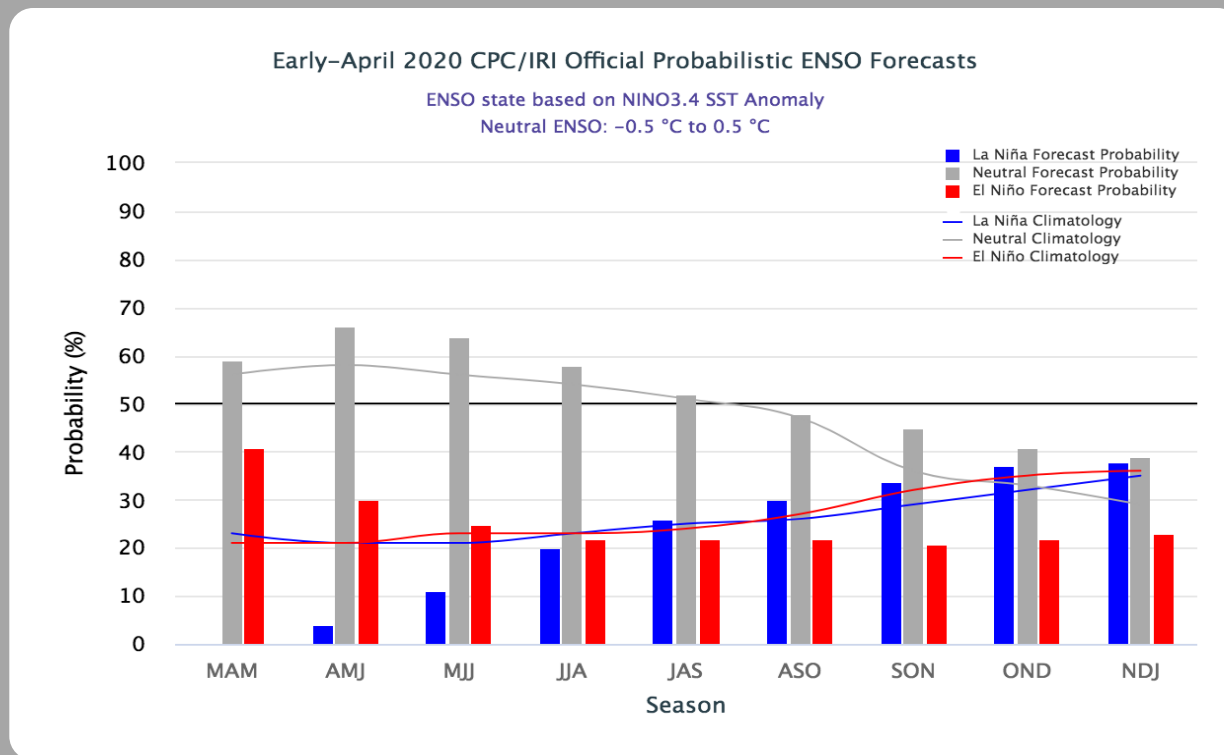
The ONI is one measure of the El Niño-Southern Oscillation, and other indices can confirm whether features consistent with a coupled ocean-atmosphere phenomenon accompanied these periods. The complete table going back to DJF 1950 can be found here.
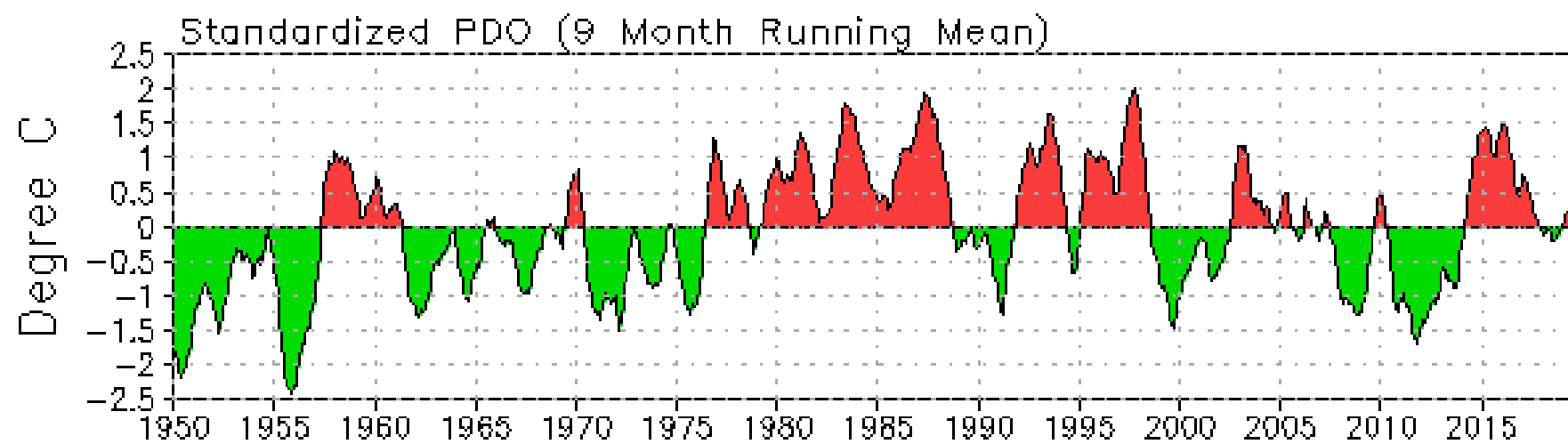
Year	DJF	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ
2008	-1.6	-1.4	-1.2	-0.9	-0.8	-0.5	-0.4	-0.3	-0.3	-0.4	-0.6	-0.7
2009	-0.8	-0.7	-0.5	-0.2	0.1	0.4	0.5	0.5	0.7	1.0	1.3	1.6
2010	1.5	1.3	0.9	0.4	-0.1	-0.6	-1.0	-1.4	-1.6	-1.7	-1.7	-1.6
2011	-1.4	-1.1	-0.8	-0.6	-0.5	-0.4	-0.5	-0.7	-0.9	-1.1	-1.1	-1.0
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									

CPC/IRI Probabilistic ENSO Outlook

Updated: 9 April 2020

ENSO-neutral is most likely to continue through the Northern Hemisphere fall 2020.

Early−April 2020 CPC/IRI Official Probabilistic ENSO Forecasts

ENSO state based on NINO3.4 SST Anomaly
Neutral ENSO: −0.5 °C to 0.5 °C

Standardized PDO (9 Month Running Mean)

Index of the North Atlantic Temperatures from Kaplan Extended SST V2
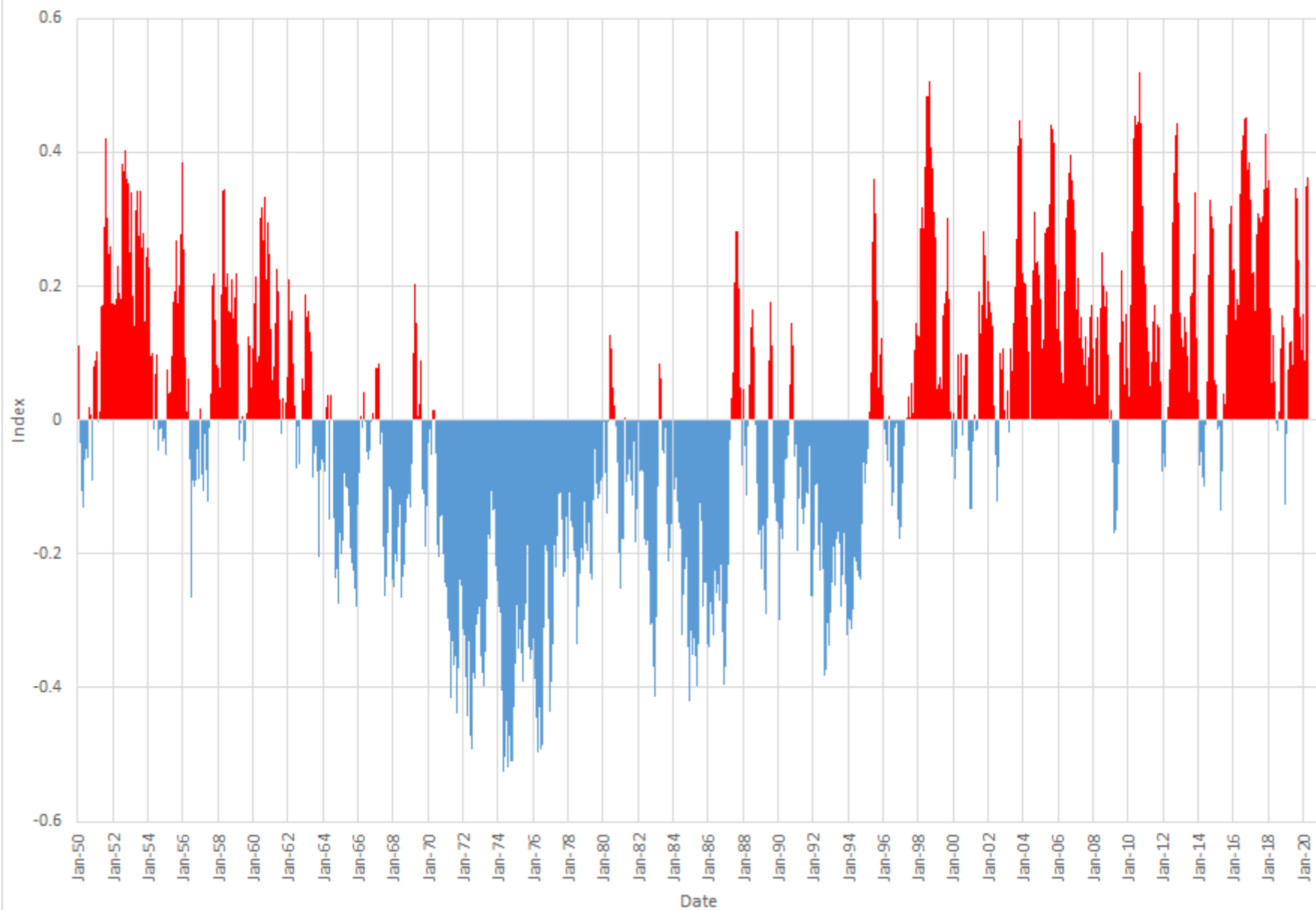
2020 CSU Tropical Outlook

NHC forecast anticipated to be available mid to late May

ATLANTIC BASIN SEASONAL HURRICANE FORECAST FOR 2020

| Forecast Parameter and 1981-2010 Average (in parentheses)	Issue Date 2 April 2020
Named Storms (NS) (12.1)	16
Named Storm Days (NSD) (59.4)	80
Hurricanes (H) (6.4)	8
Hurricane Days (HD) (24.2)	35
Major Hurricanes (MH) (2.7)	4
Major Hurricane Days (MHD) (6.2)	9
Accumulated Cyclone Energy (ACE) (106)	150
Net Tropical Cyclone Activity (NTC) (116%)	160

- Anticipate above-normal activity
- Current warm neutral ENSO conditions appear likely to transition to cool neutral ENSO or potentially even weak La Niña conditions by this summer/fall (El Niño tends to deter tropical cyclone development outside of the main development region near Africa)
- Sea surface temperatures averaged across the tropical Atlantic are somewhat above normal

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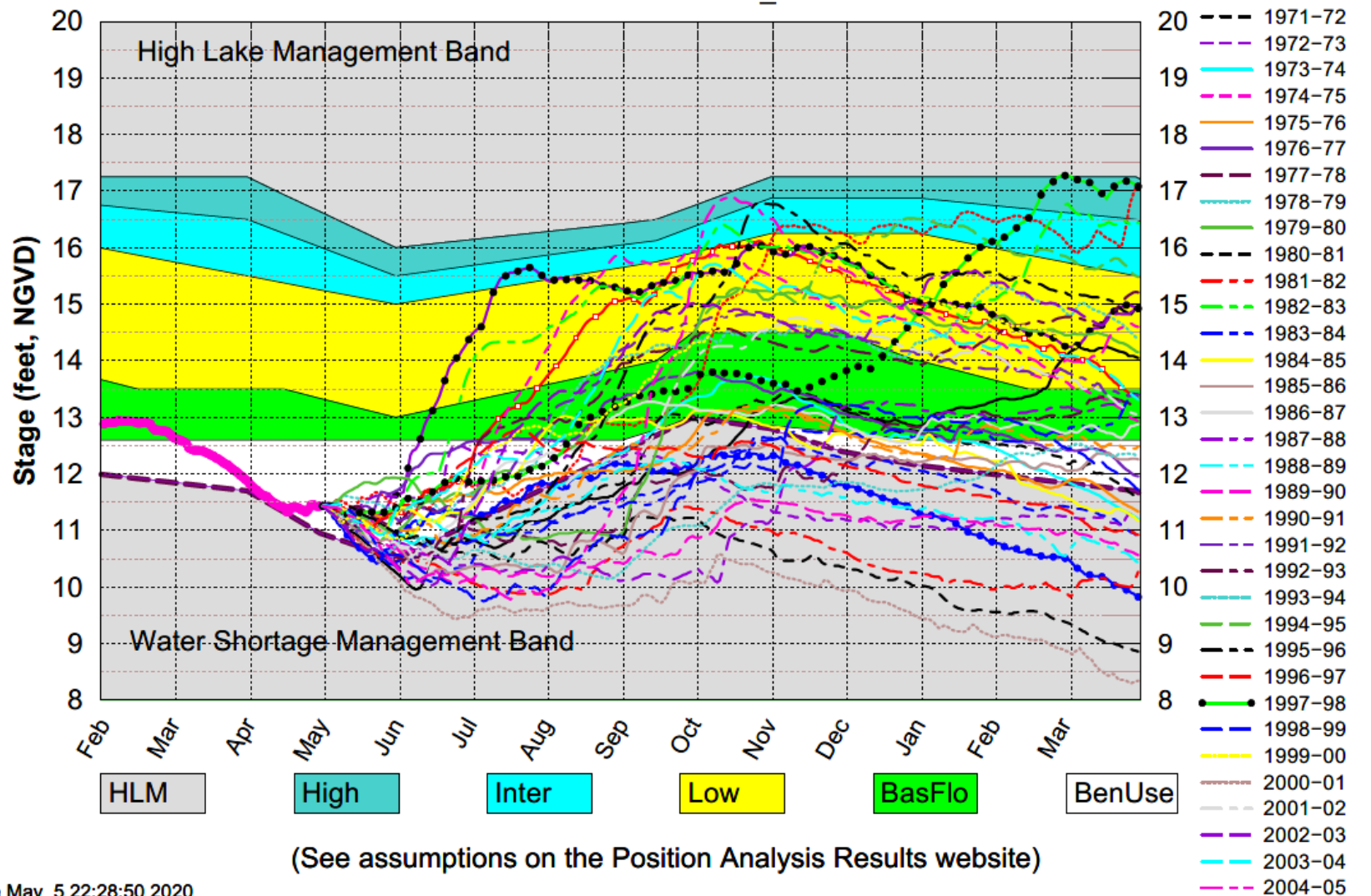   - Statistical summaries used to display projections

Lake Okeechobee SFWMM May 2020 Position Analysis
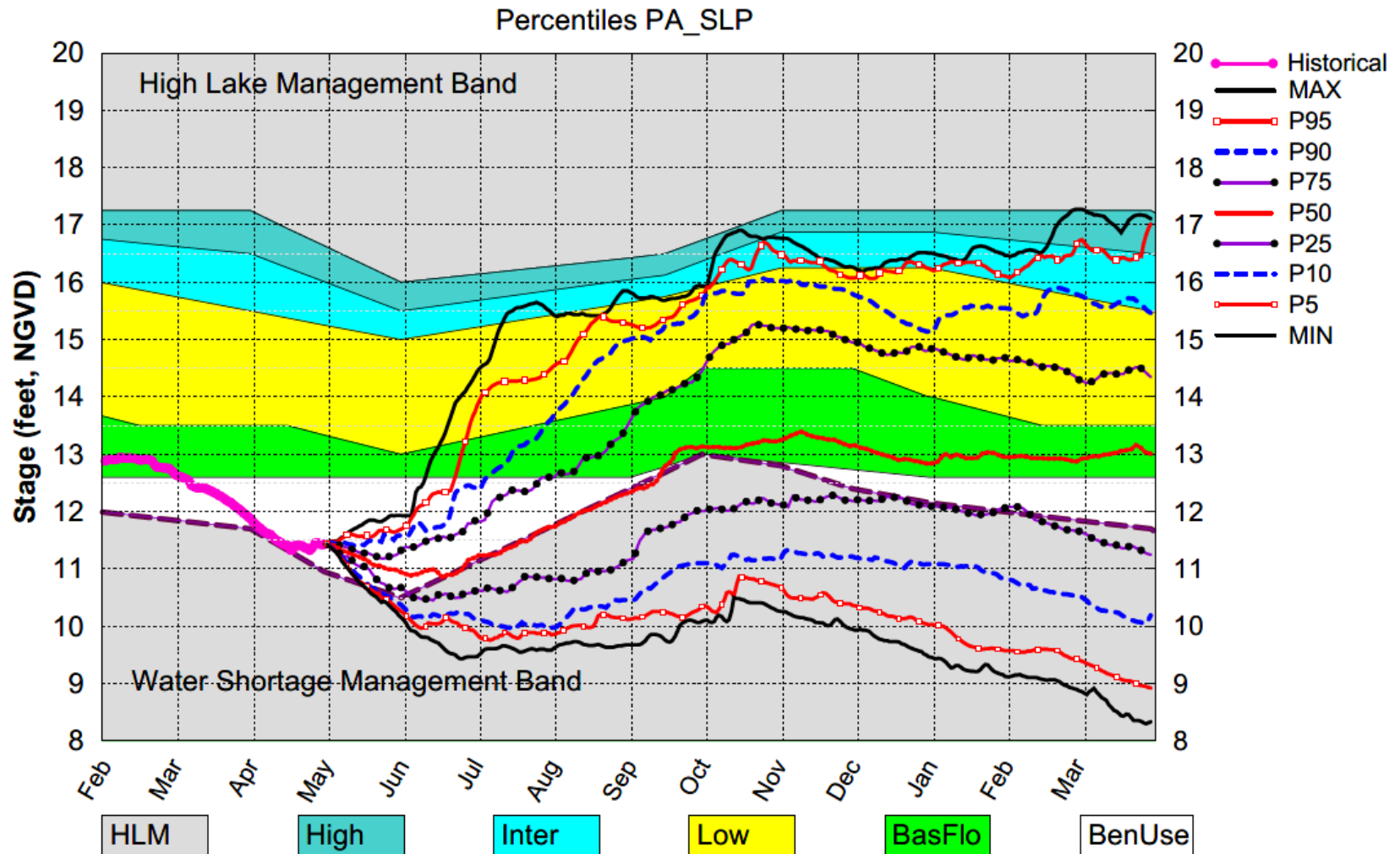
Percentiles PA_SLP

(See assumptions on the Position Analysis Results website)
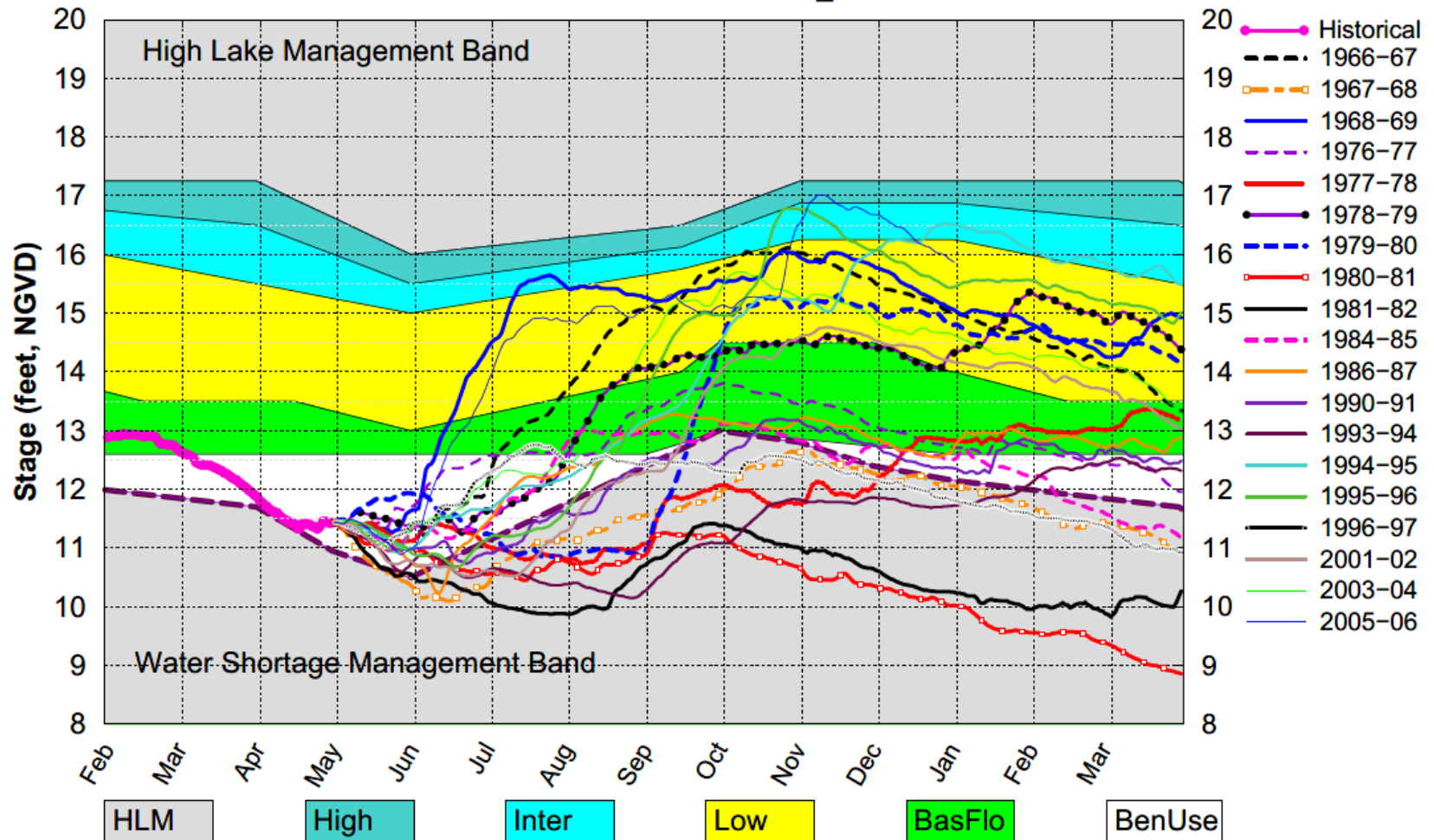
Tue May 5 22:25:45 2020

Lake Okeechobee SFWMM May 2020 Position Analysis

All Simulated Years Plot PA_SLP

Lake Okeechobee SFWMM May 2020 Position Analysis

All ENSO Neutral Years Plot PA_SLP

Legend:
- Historical
- 1966–67
- 1967–68
- 1968–69
- 1976–77
- 1977–78
- 1978–79
- 1979–80
- 1980–81
- 1981–82
- 1984–85
- 1986–87
- 1990–91
- 1993–94
- 1994–95
- 1995–96
- 1996–97
- 2001–02
- 2003–04
- 2005–06

High Lake Management Band

Water Shortage Management Band

Stage (feet, NGVD)

HLM | High | Inter | Low | BasFlo | BenUse

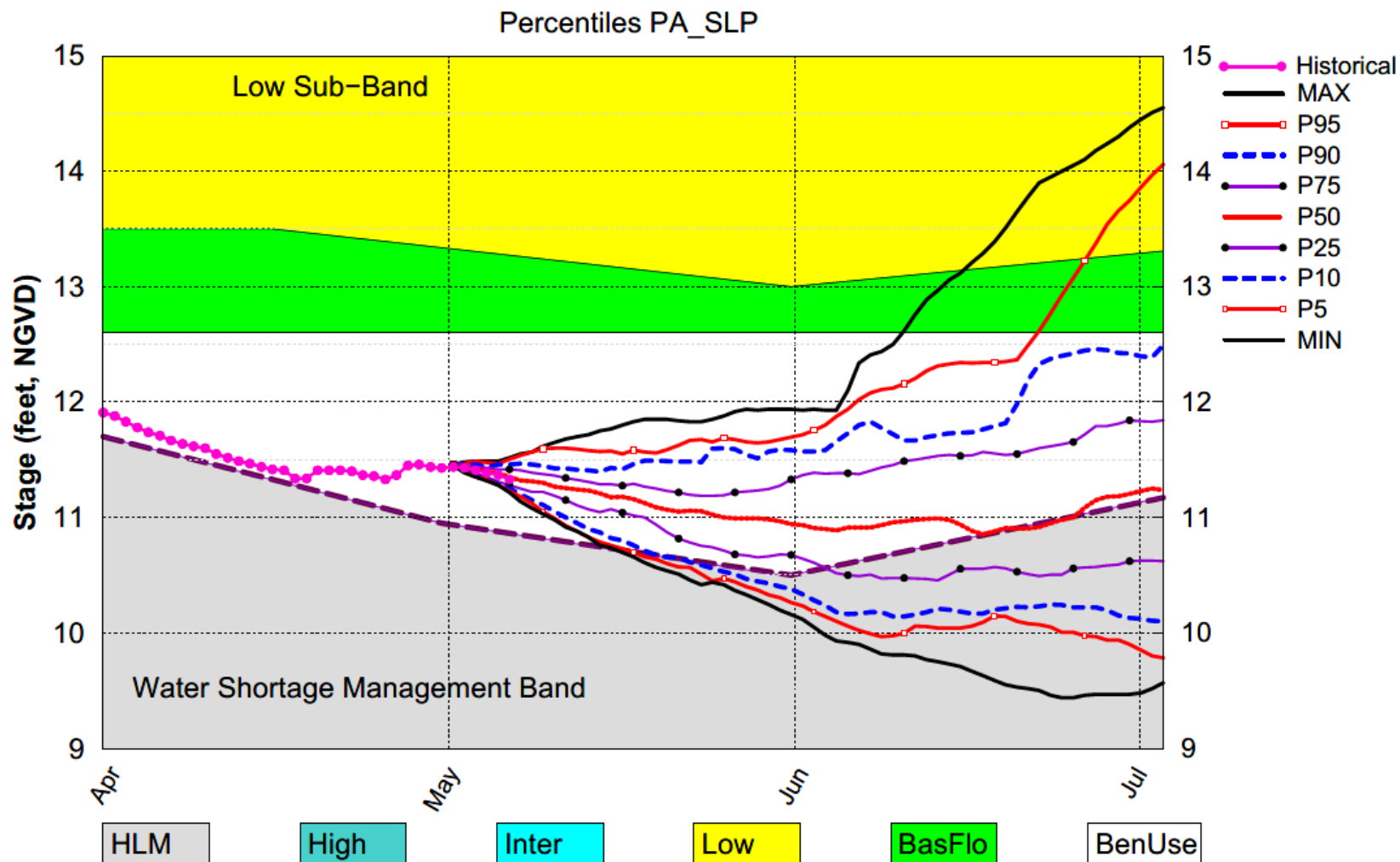**(See assumptions on the Position Analysis Results website)**

Tue May 5 22:26:21 2020

Lake Okeechobee SFWMM May 2020 Position Analysis

Percentiles PA_SLP

(See assumptions on the Position Analysis Results website)

Wed May 6 06:14:42 2020