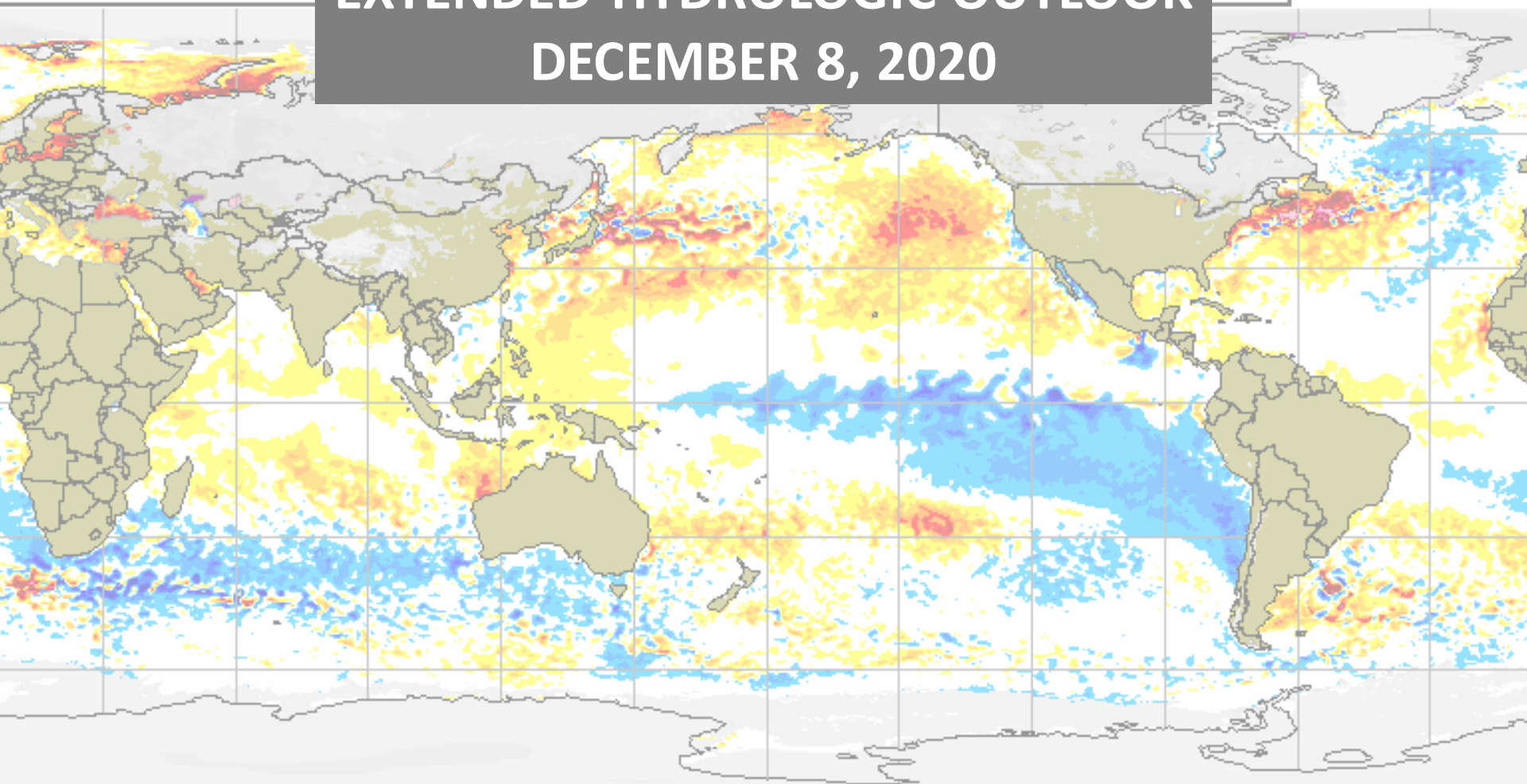


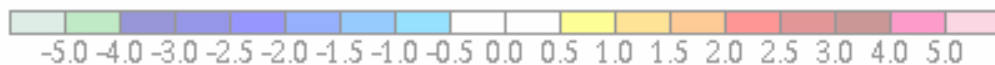
Global sea surface anomaly
8 Dec 2020

EXTENDED HYDROLOGIC OUTLOOK

DECEMBER 8, 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

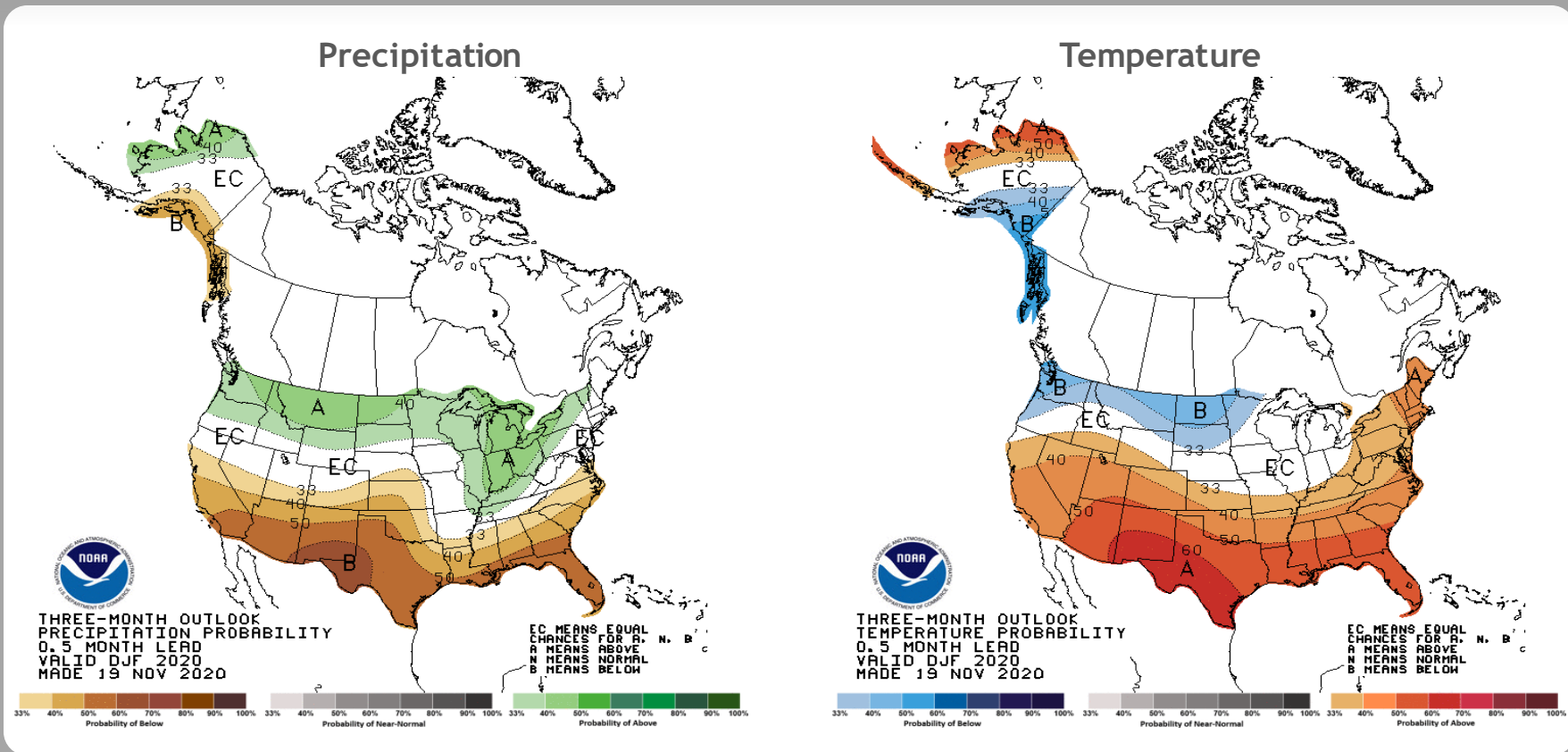
Summary

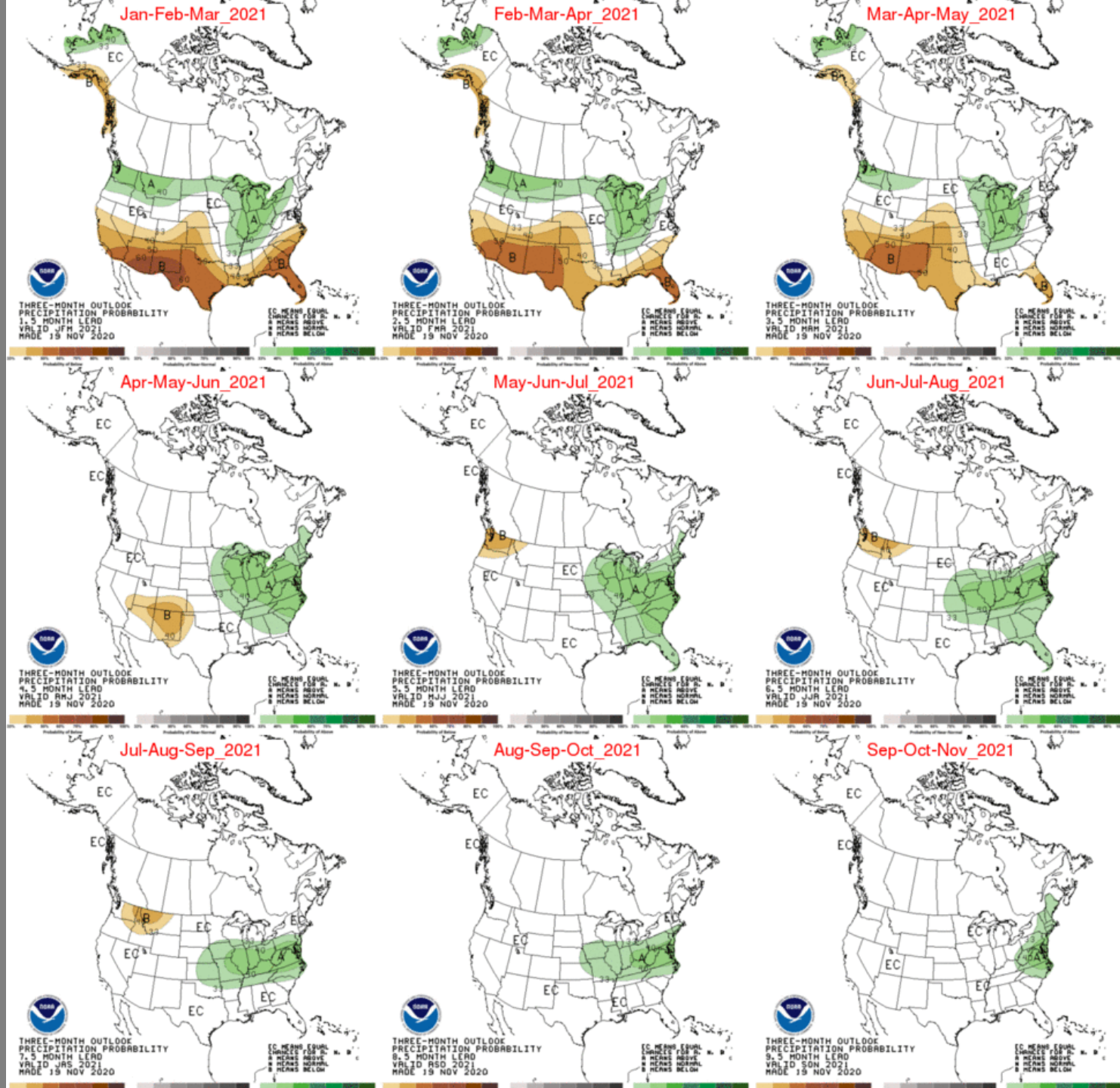
- The Climate Prediction Center (CPC) is forecasting below normal rainfall from December through February.
- La Niña is likely to continue through winter 2020-21 (~95% chance during January-March) and into spring 2021 (~65% chance during March-May).
- El Niño increases the chances of a wetter-than-normal 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

December 2020-February 2021

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

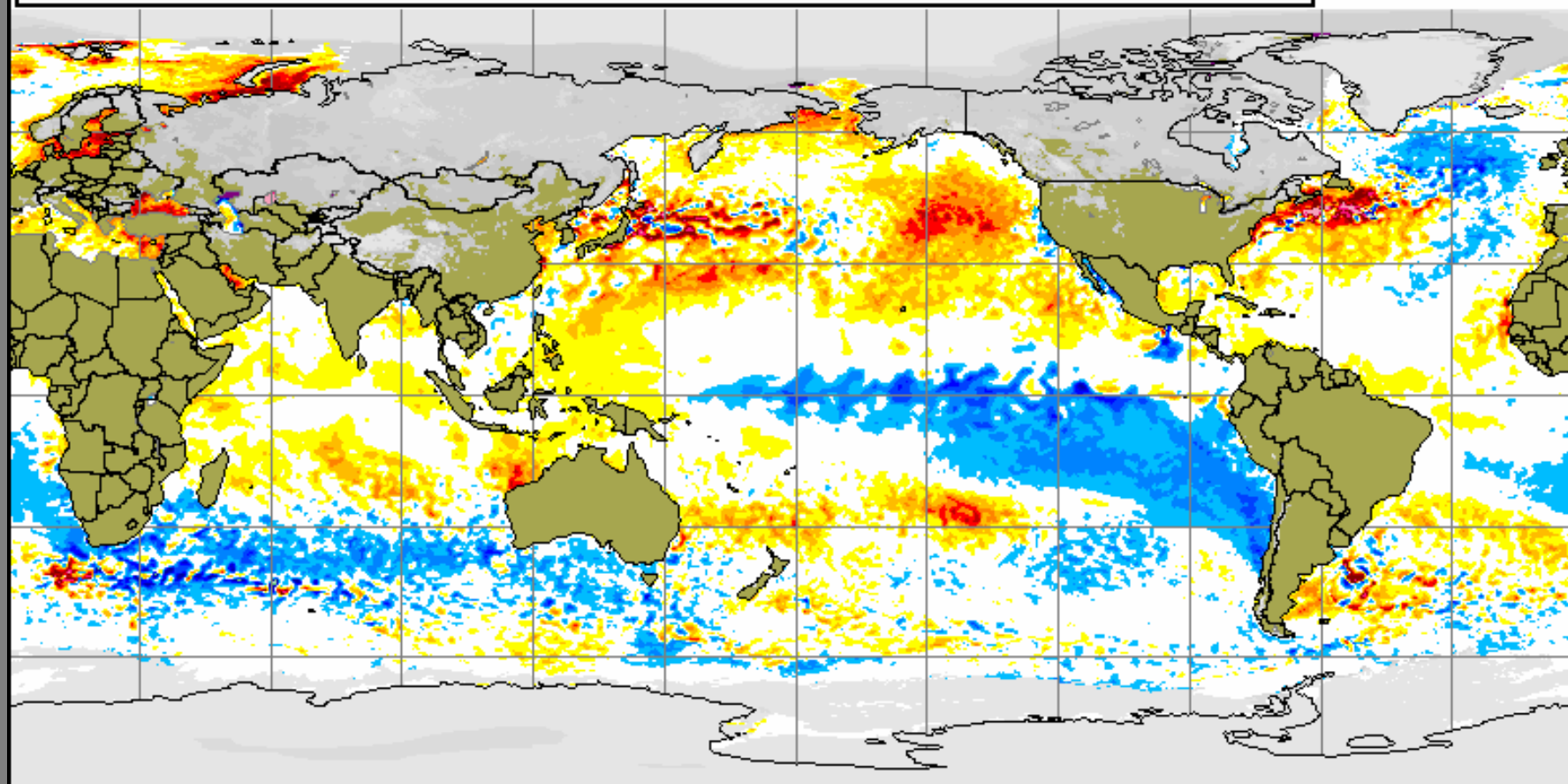
Pacific Decadal Oscillation (PDO)

Increases variations of south Florida dry season rainfall

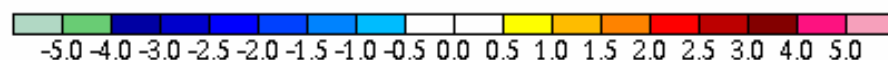
Current Global Sea Surface Temperature Anomalies

Global sea surface anomaly and snow cover
08 Dec 2020

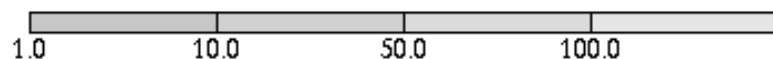
Anomalie de la température de la mer et épaisseur de la neige
08 Dec 2020



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

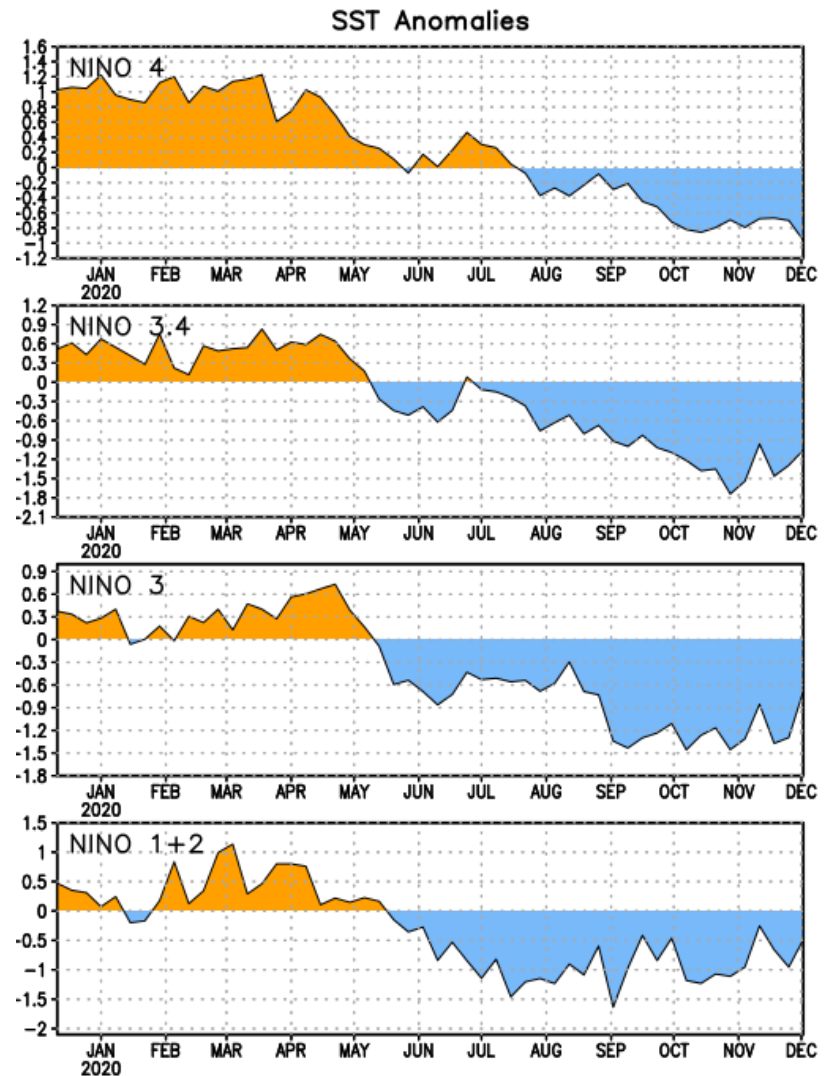
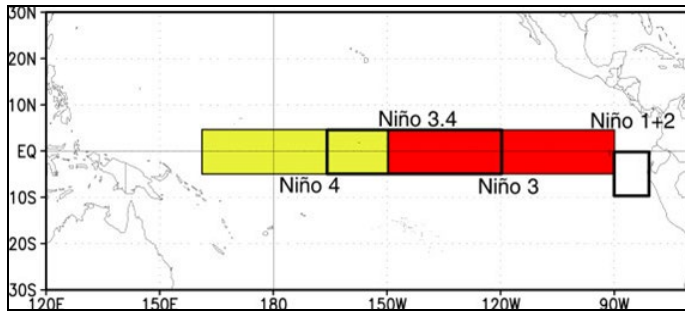


CMC Environnement Canada
CMC Environnement Canada

Niño Region SST Departures (°C) Recent Evolution

The latest weekly SST departures are:

Niño 4	-1.0°C
Niño 3.4	-1.1°C
Niño 3	-0.7°C
Niño 1+2	-0.5°C



Weekly Heat Content Evolution in the Equatorial Pacific

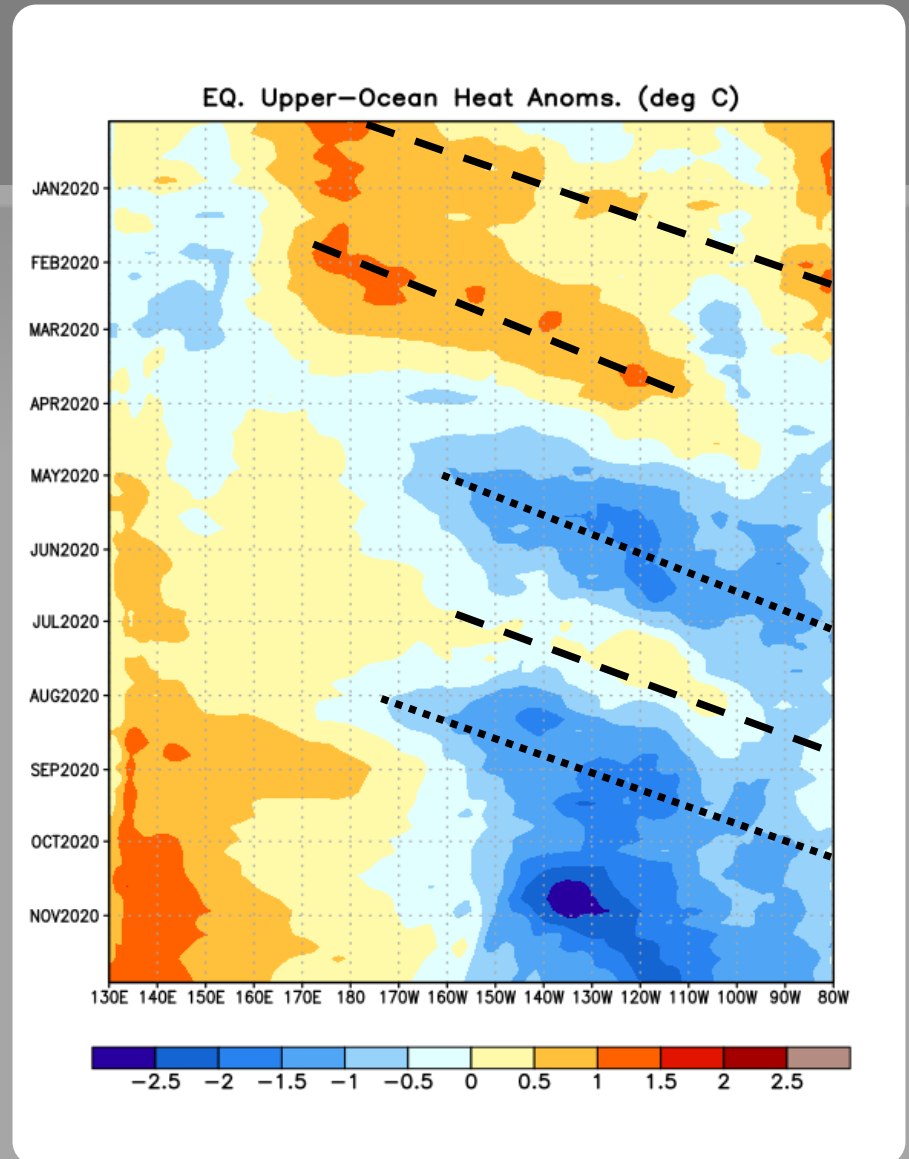
Significant equatorial oceanic Kelvin wave activity (dashed and dotted lines) has been present throughout the period shown.

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.

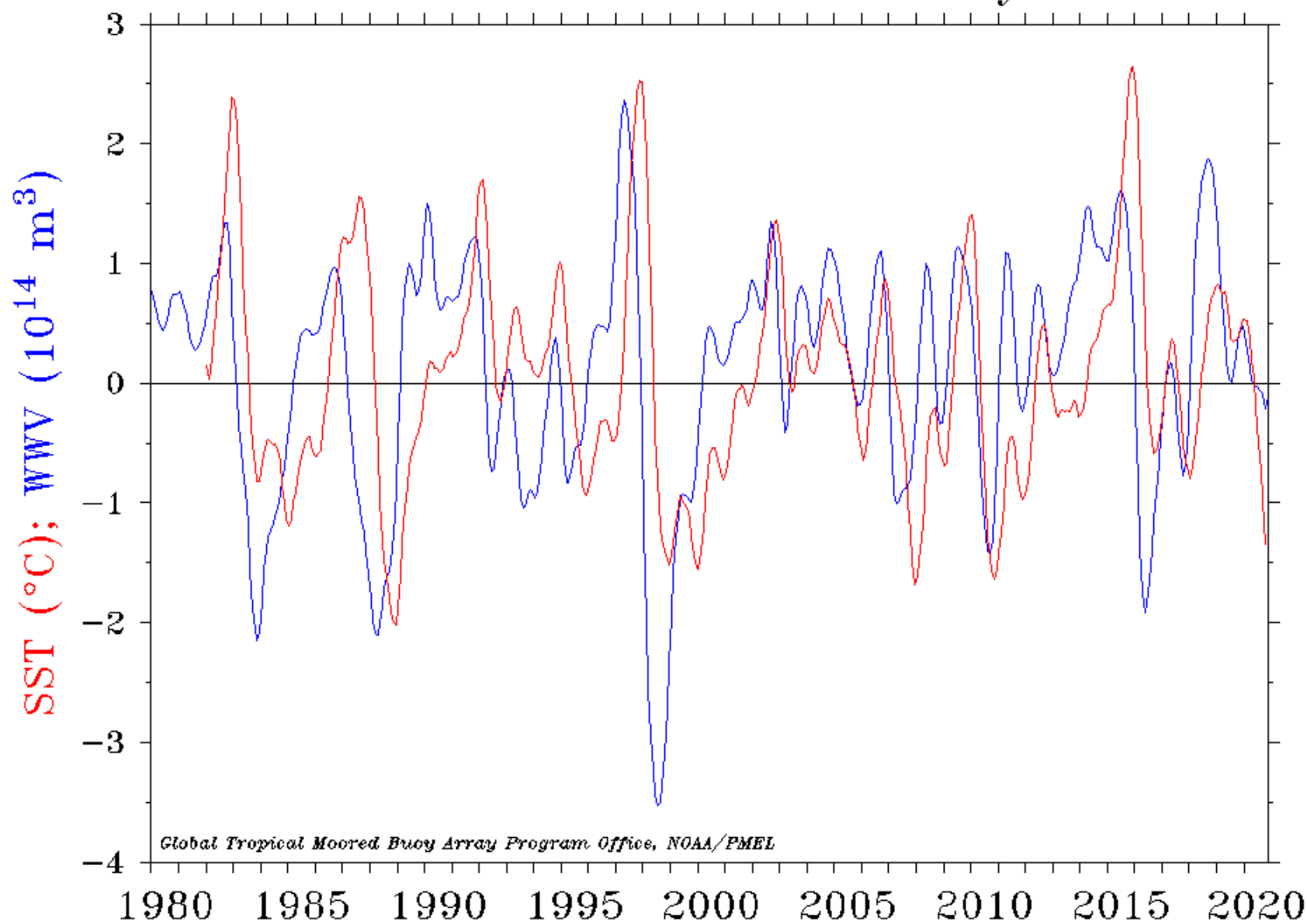
During April-June and August-September 2020, negative subsurface temperature anomalies were associated with upwelling Kelvin waves.

Since August 2020, negative anomalies have persisted in the eastern half of the Pacific Ocean.

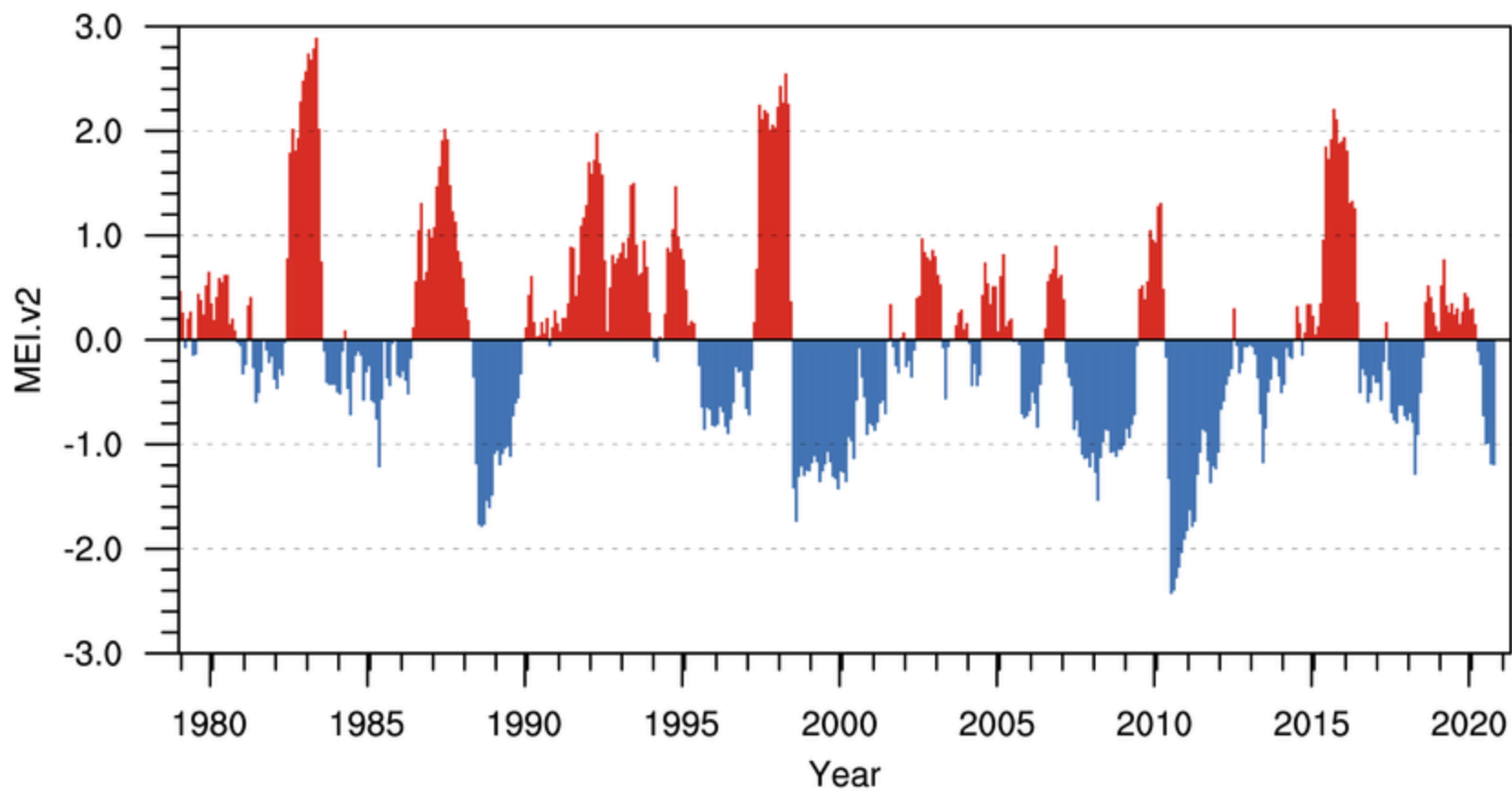
Equatorial oceanic Kelvin waves have alternating warm and cold phases. The warm phase is indicated by dashed lines. Downwelling and warming occur in the leading portion of a Kelvin wave, and up-welling and cooling occur in the trailing portion.



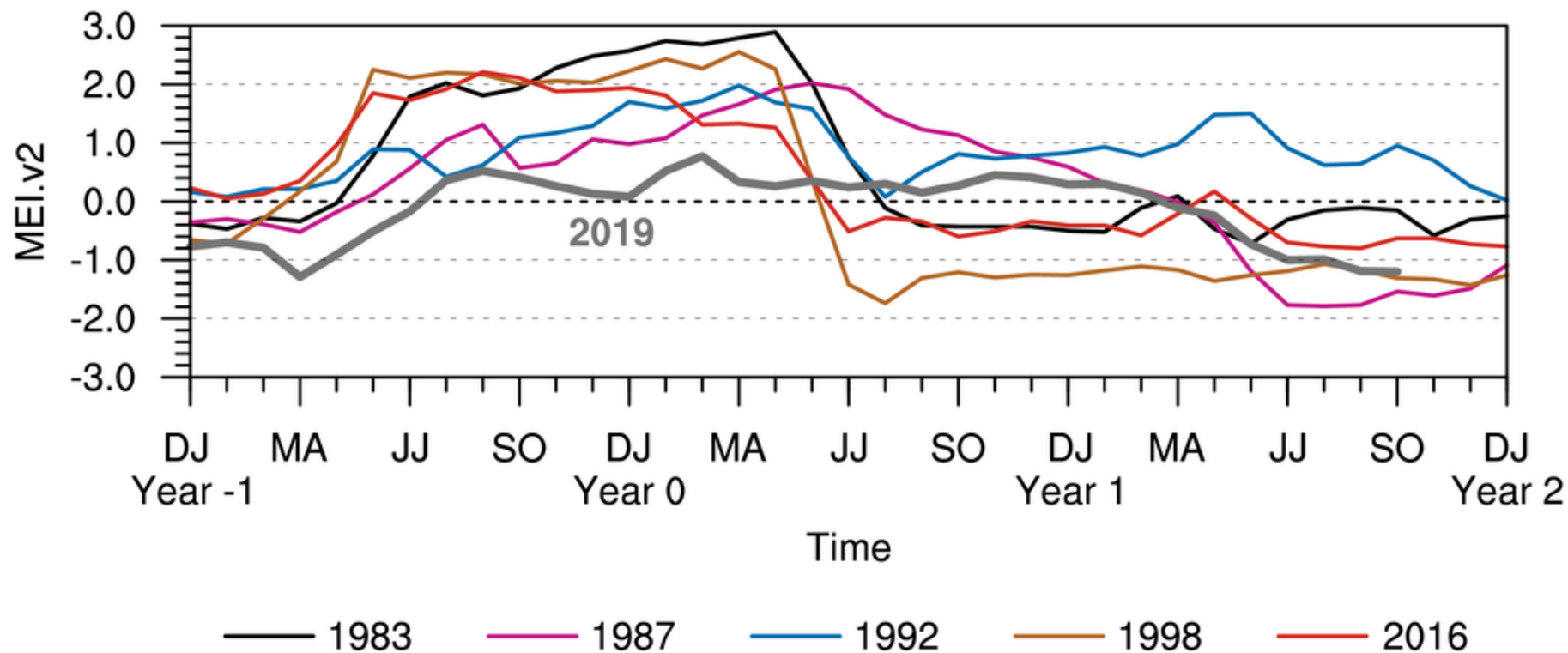
Warm Water Volume (5°N–5°S, 120°E–80°W) and NINO 3.4 SST Anomaly



Multivariate ENSO Index Version 2

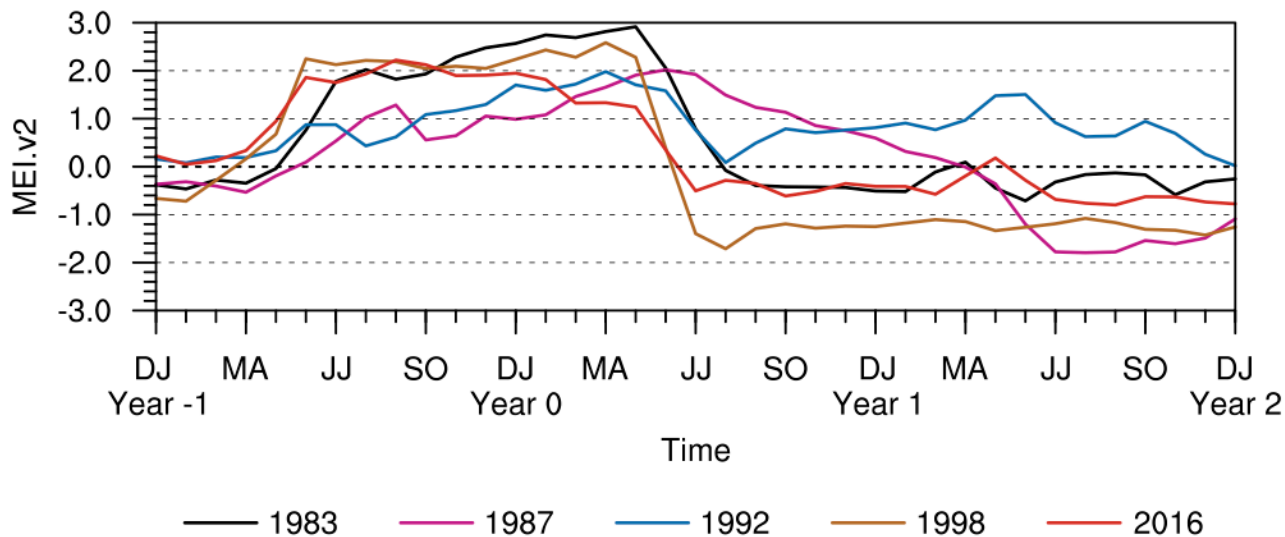


MEI.v2 Evolution of Current ENSO Event in Historical Context

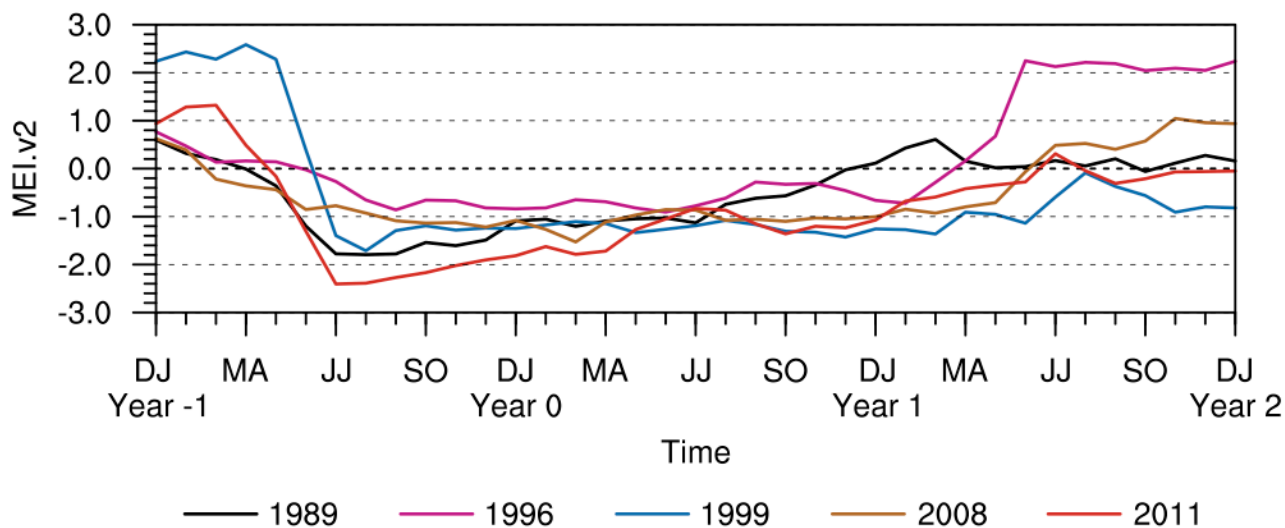


MEI.v2 Evolution of Historical ENSO Events

(a) El Niño

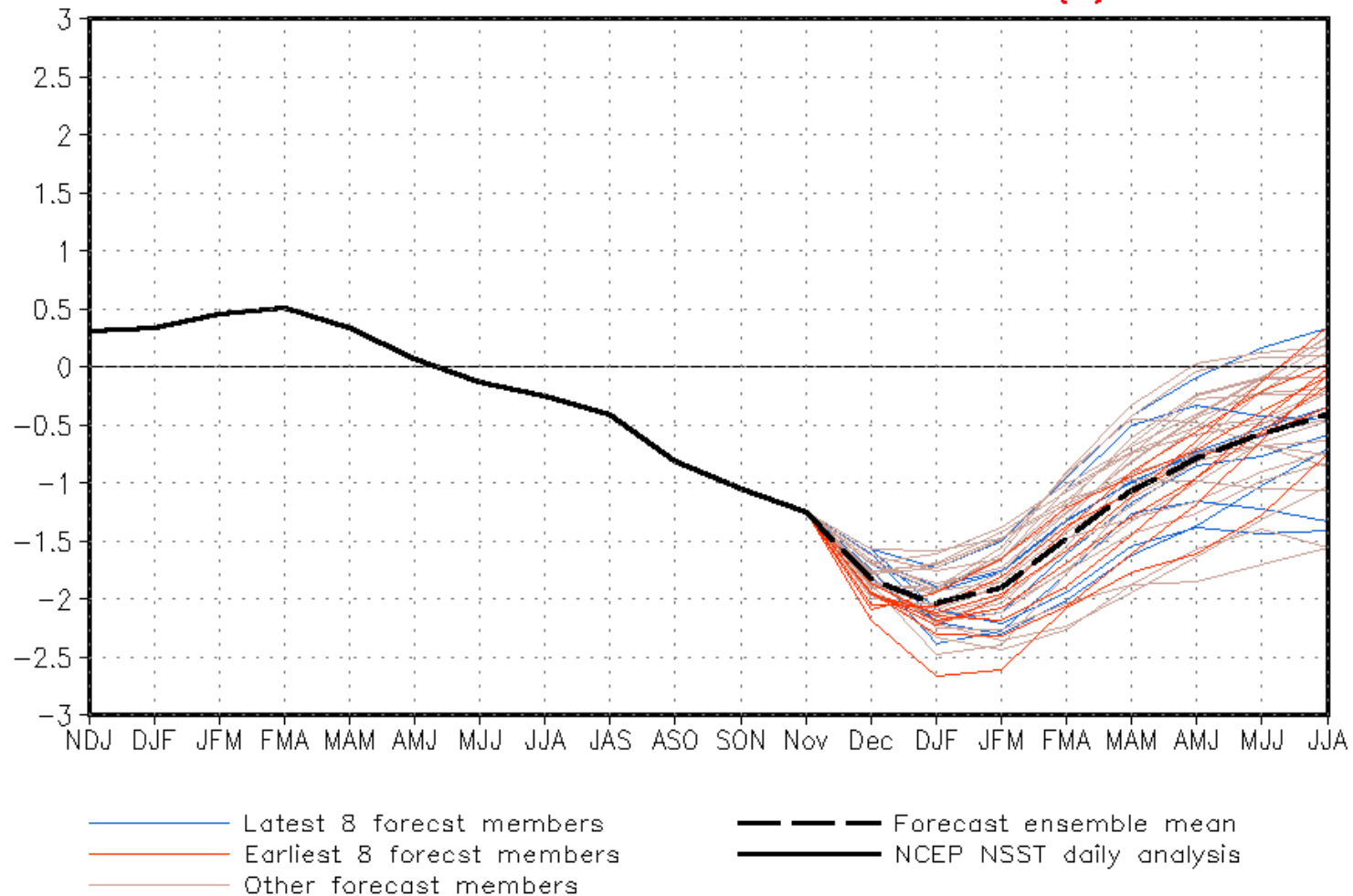


(b) La Niña





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 model averages predict La Niña to continue into the Northern Hemisphere spring 2021.

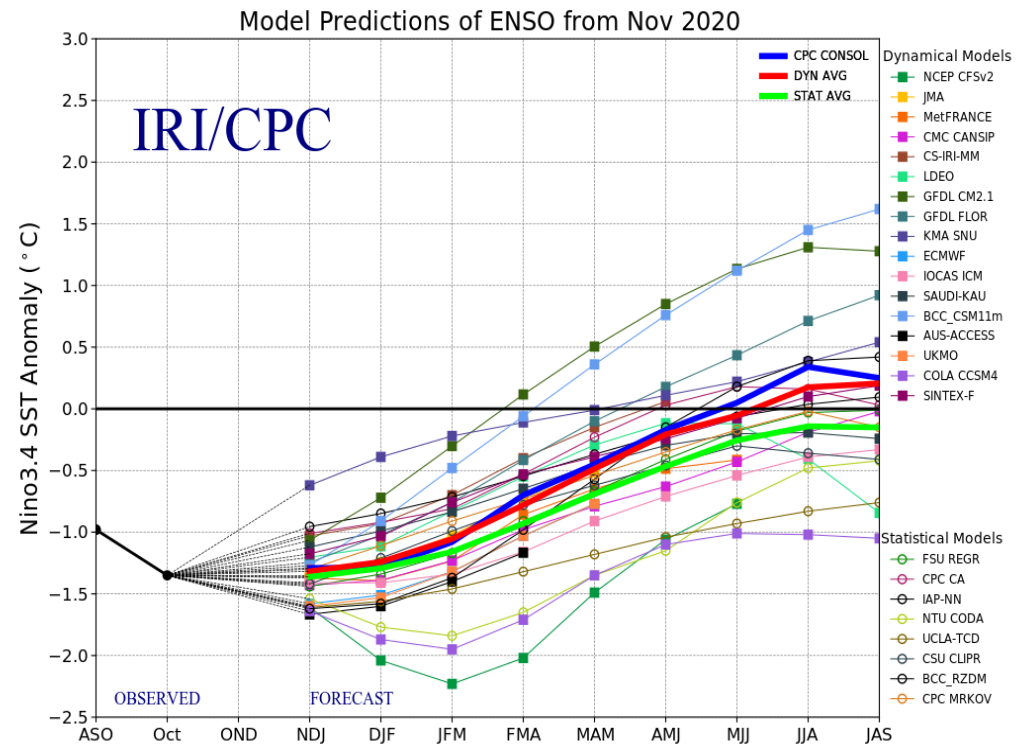


Figure provided by the International Research Institute (IRI) for Climate and Society (updated 19 November 2020).

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.

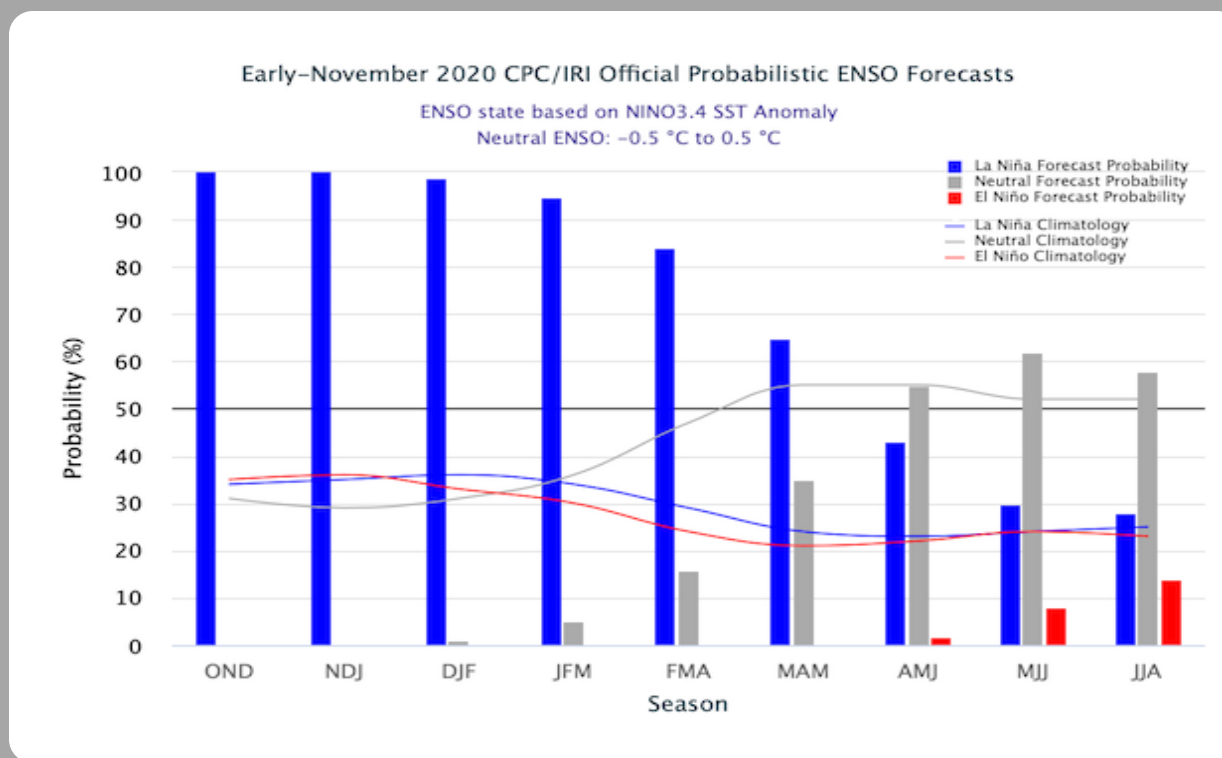
The ONI is one measure of the El Niño-Southern Oscillation, and other indices can confirm whether features consistent with a coupled ocean-atmosphere phenomenon accompanied these periods. The complete table going back to DJF 1950 can be found [here](#).

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	-0.6	-1.0	-1.2		

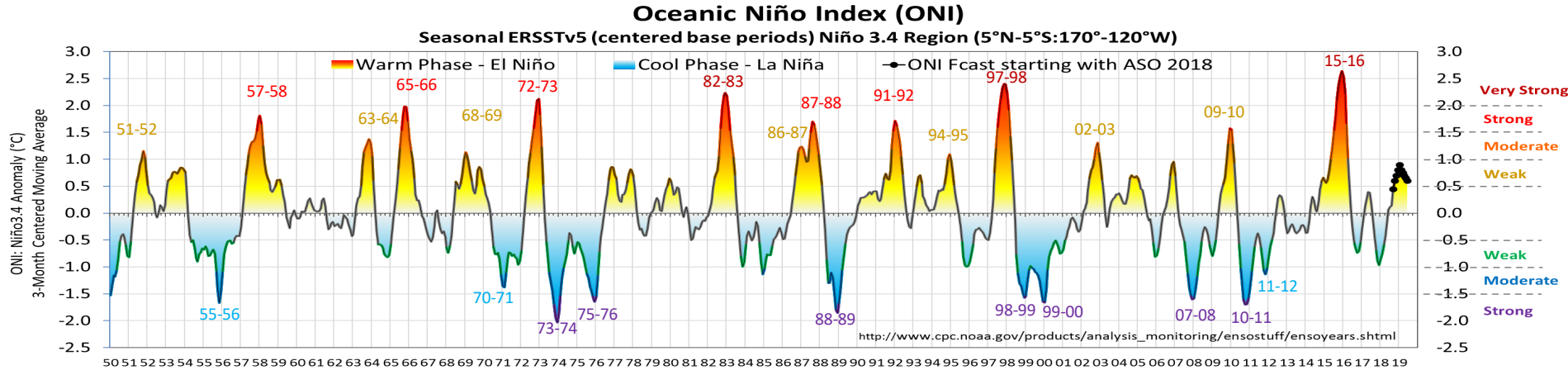
CPC/IRI Probabilistic ENSO Outlook

Updated: 12 November 2020

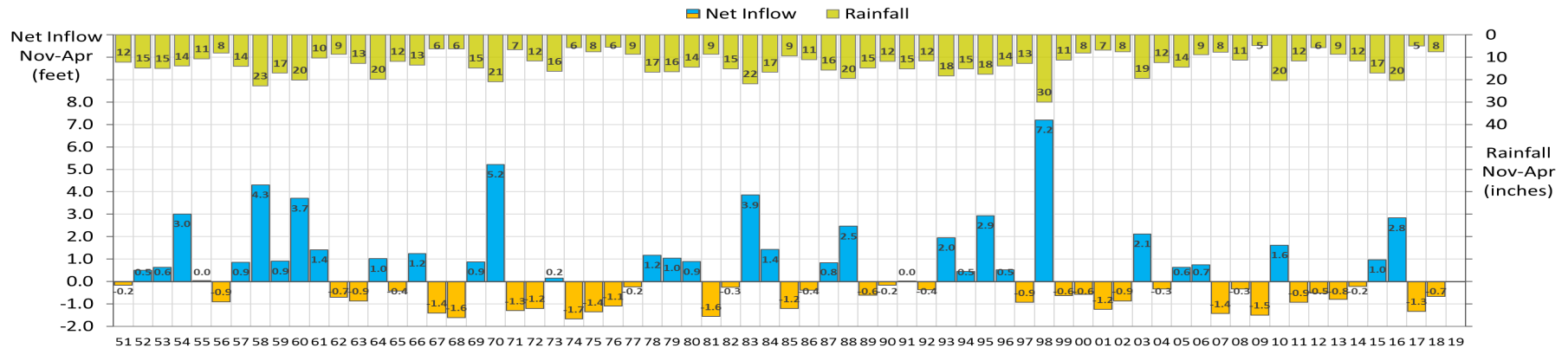
The chances of La Niña are greater than 95% through January-March 2021, with a ~65% chance of continuing through March-May 2021.

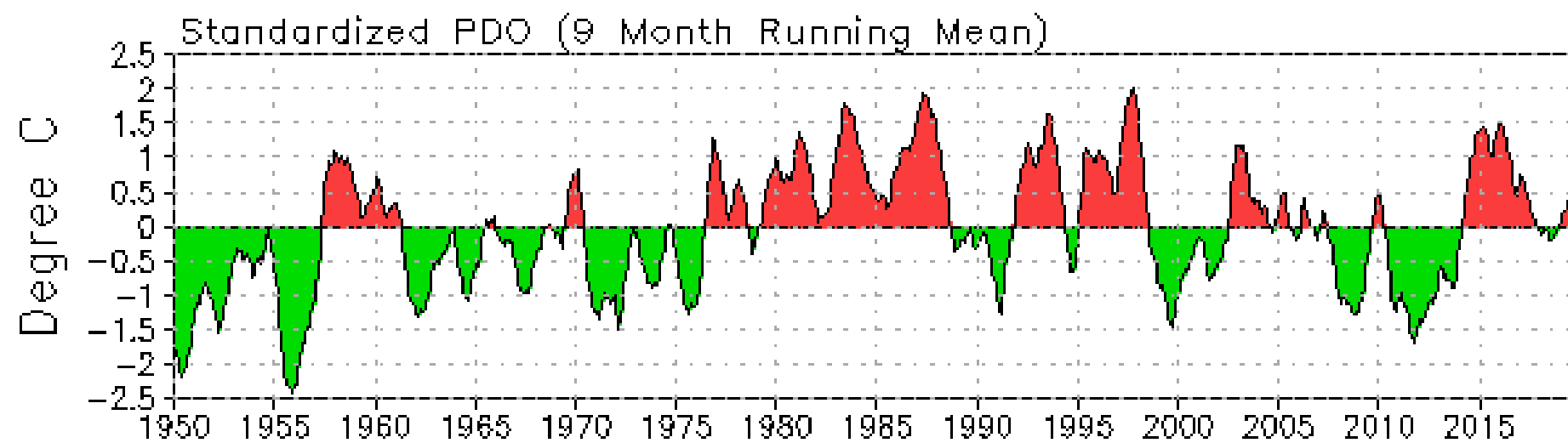


El Niño & La Niña Events (1950-2018), and Lake Okeechobee Watershed Rainfall & Net Inflow

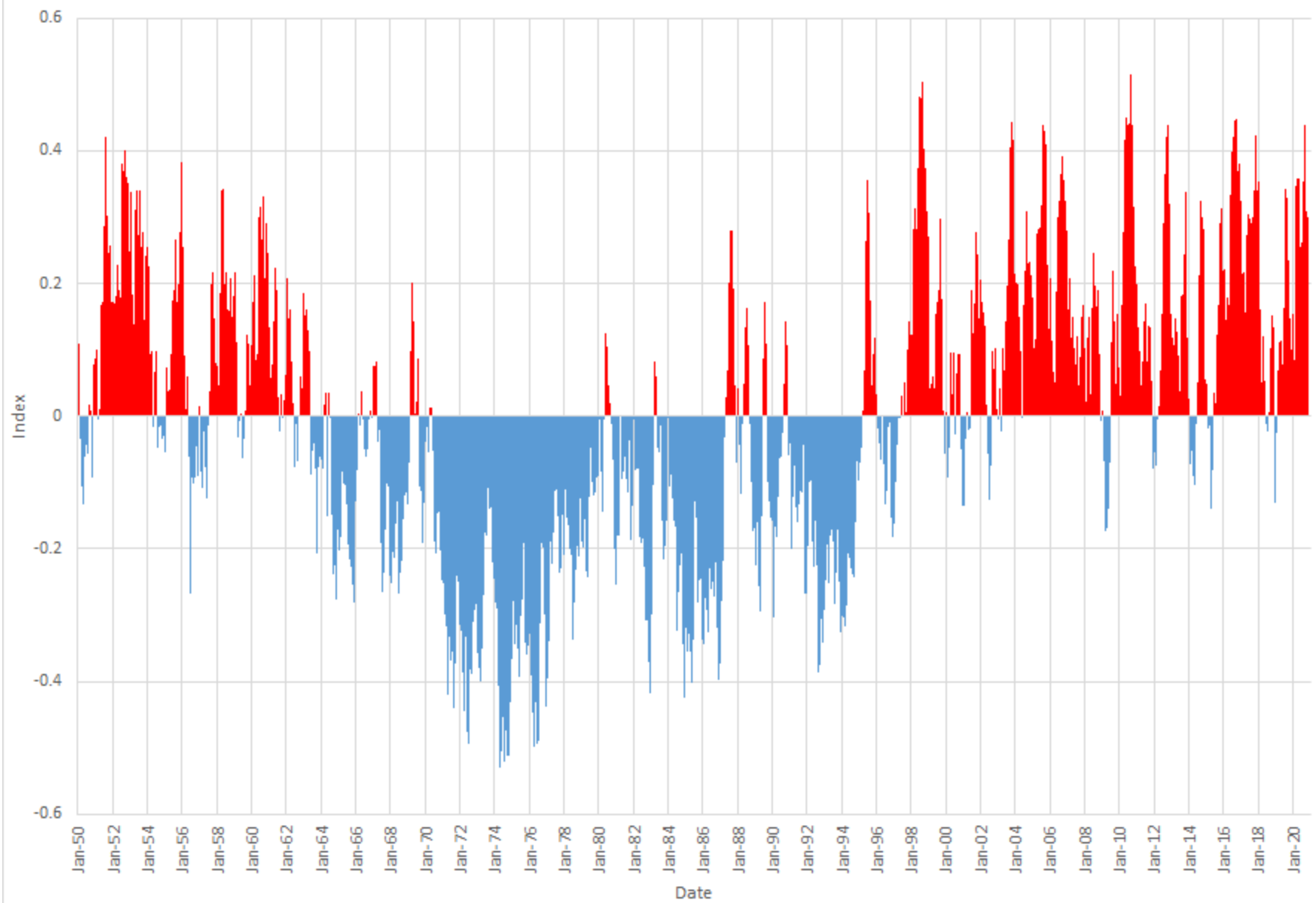


Lake Okeechobee Watershed Rainfall and Net Inflow (Nov-Apr)





Index of the North Atlantic Temperatures from Kaplan Extended SST V2

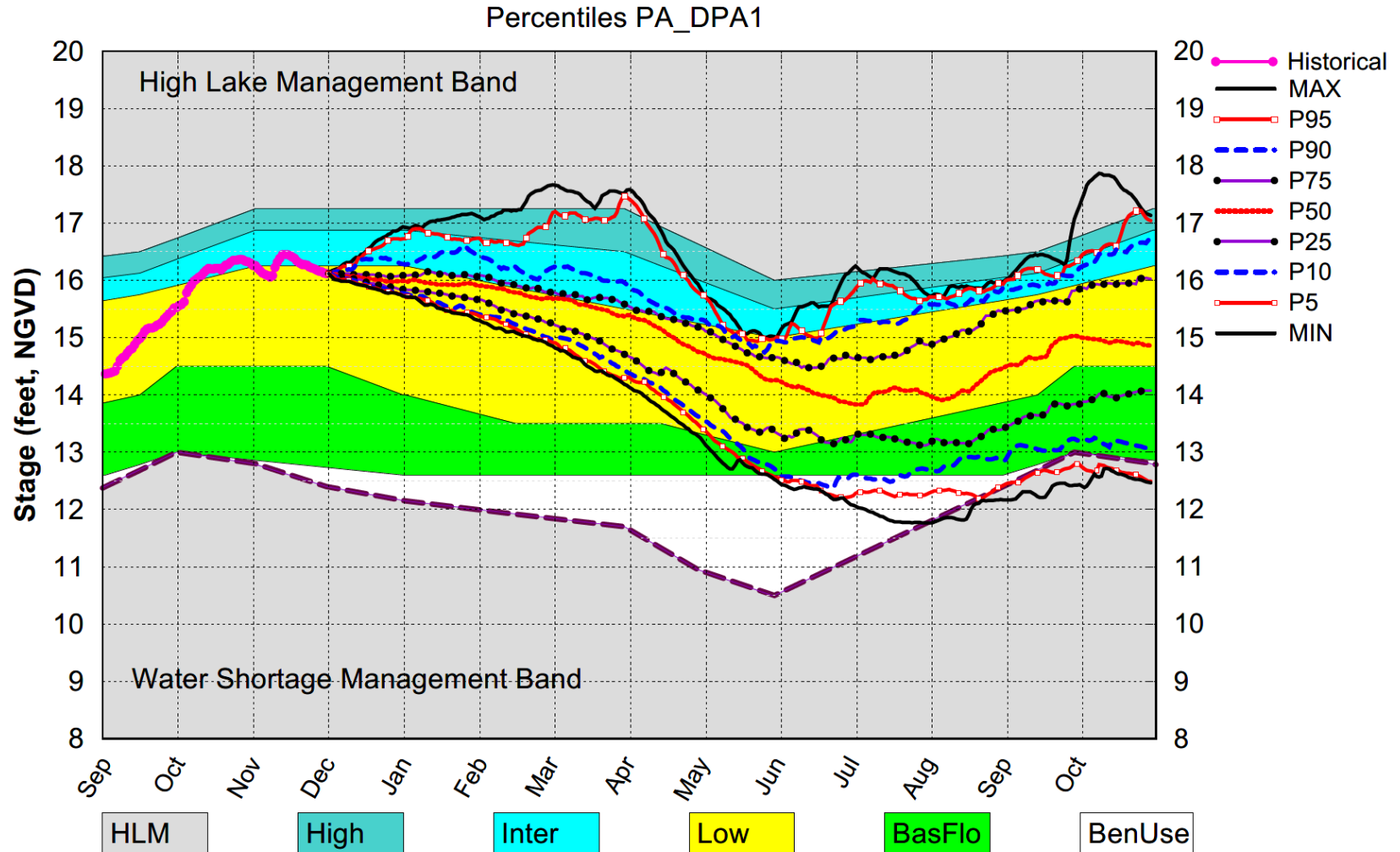


Dynamic Position Analysis

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

PRELIMINARY RESULTS

Lake Okeechobee SFWMM Dec 2020 Position Analysis

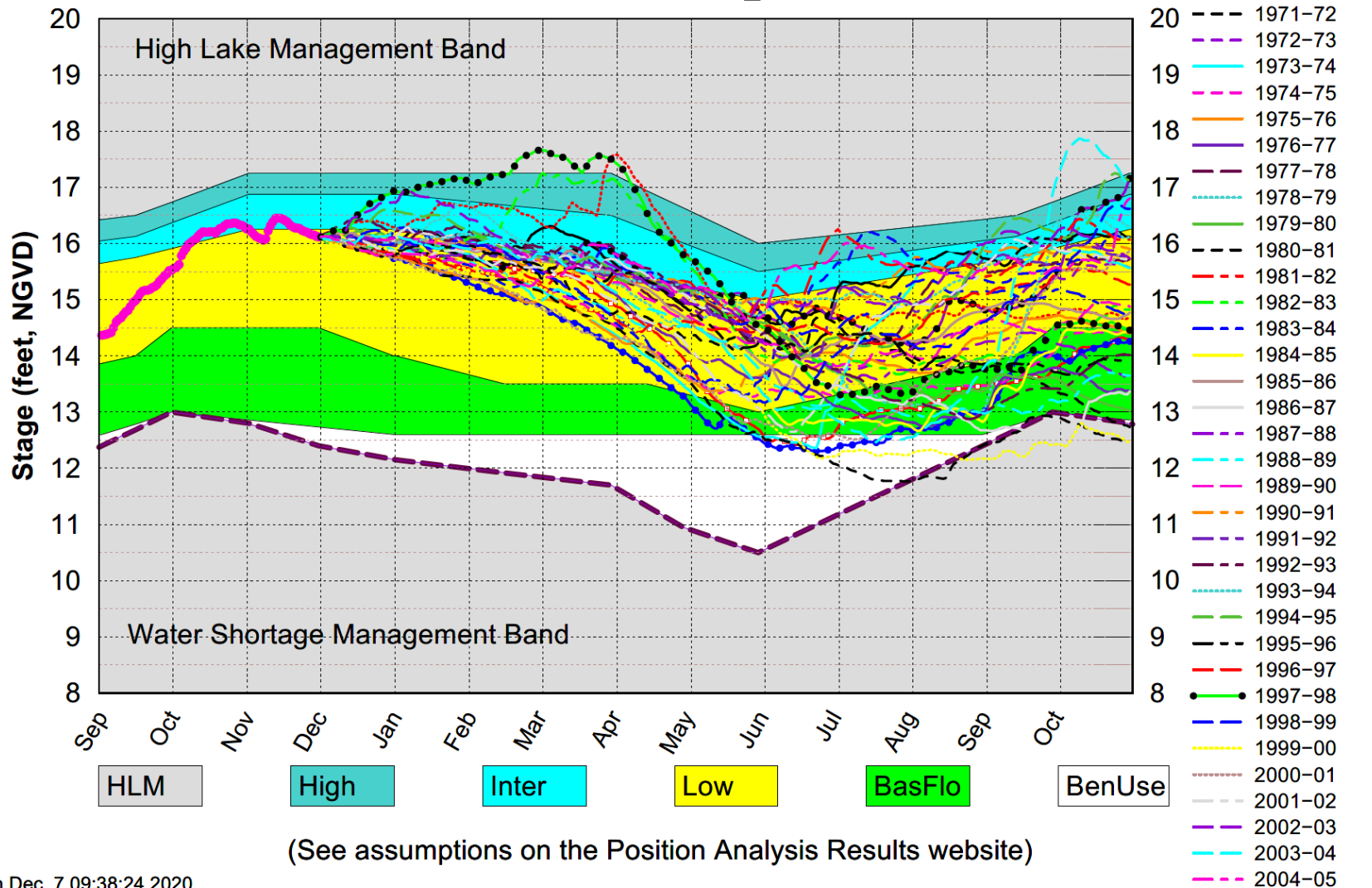


(See assumptions on the Position Analysis Results website)

PRELIMINARY RESULTS

Lake Okeechobee SFWMM Dec 2020 Position Analysis

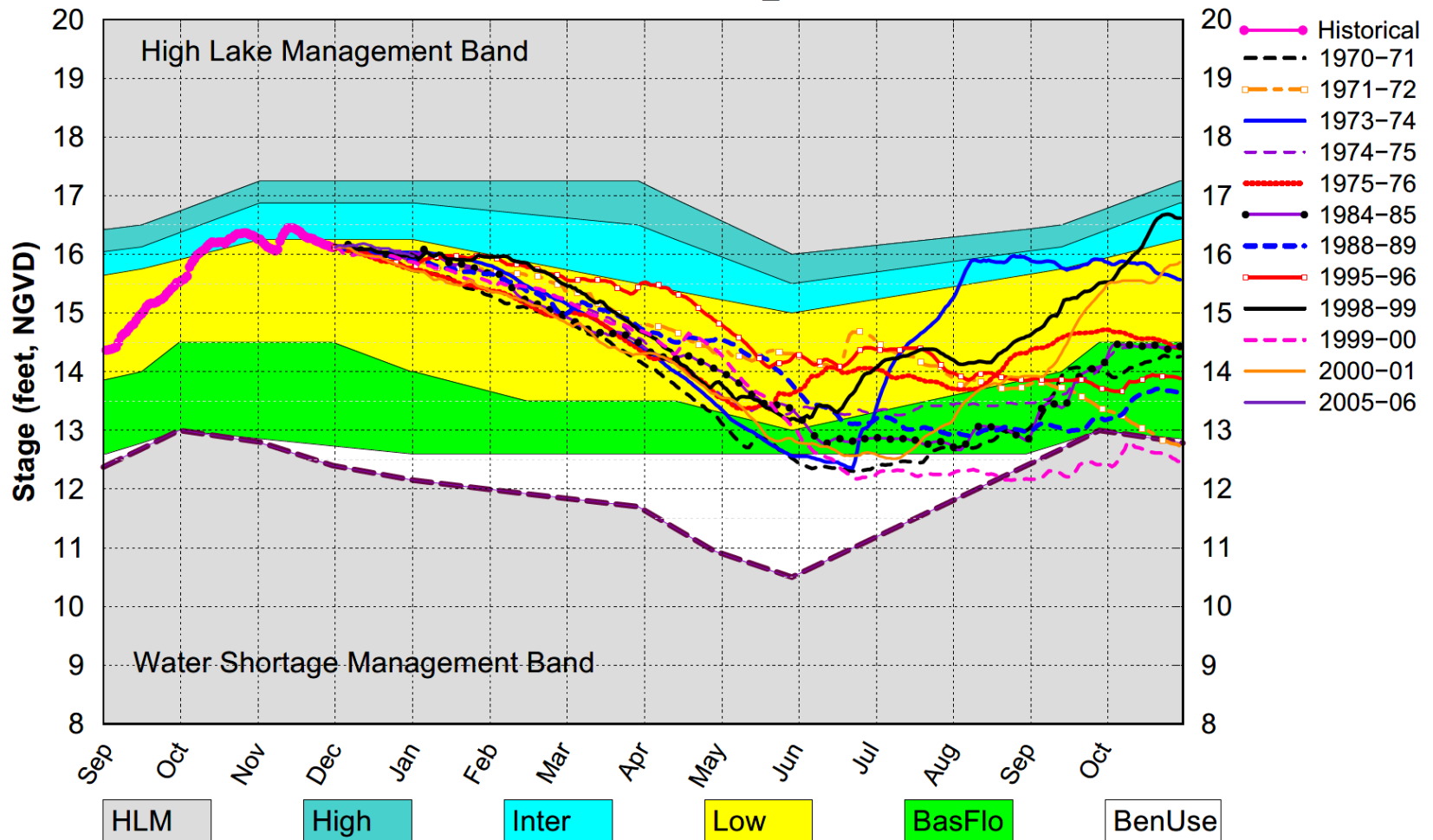
All Simulated Years Plot PA_DPA1



PRELIMINARY RESULTS

Lake Okeechobee SFWMM Dec 2020 Position Analysis

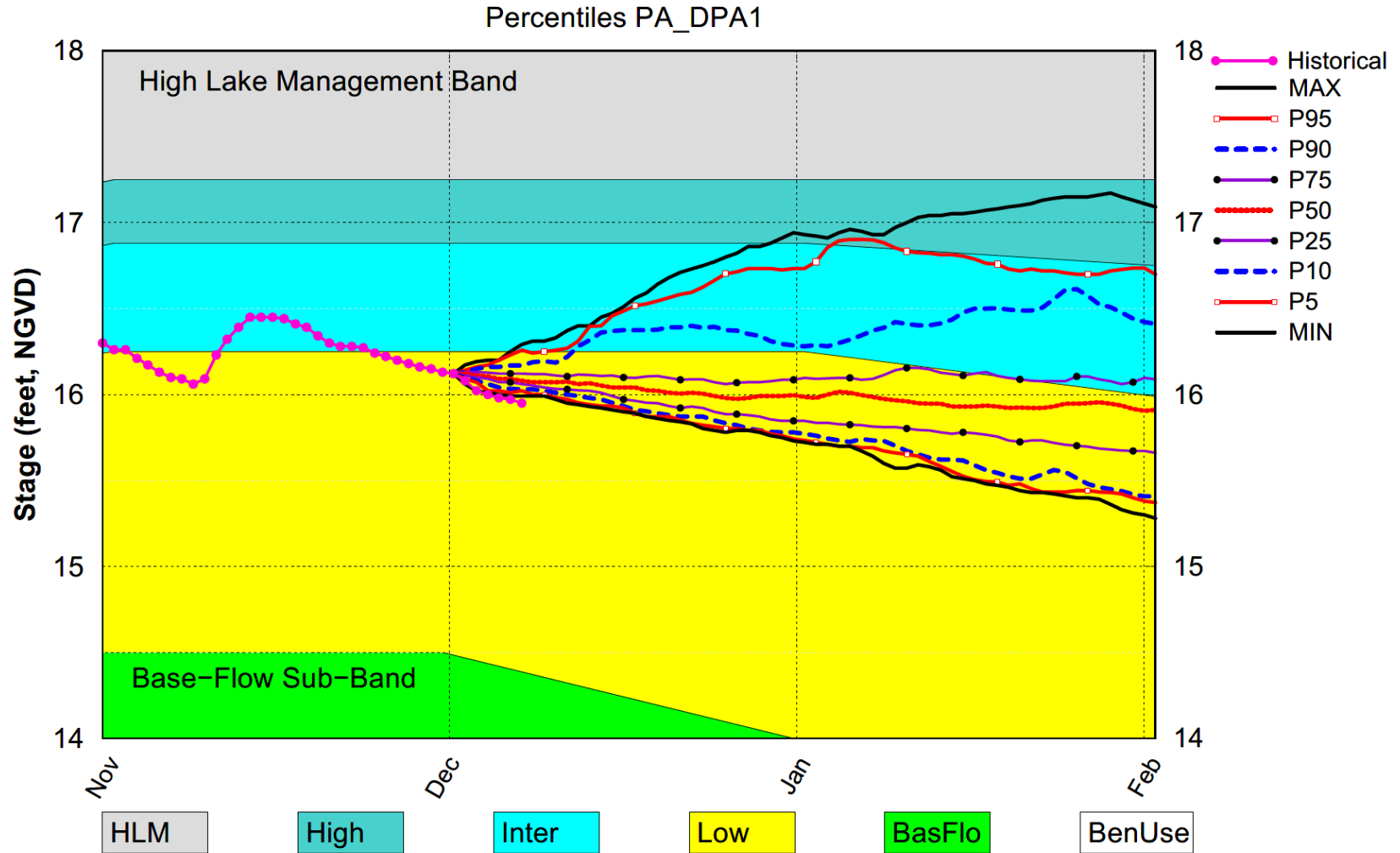
All La Nina Years Plot PA_DPA1



(See assumptions on the Position Analysis Results website)

PRELIMINARY RESULTS

Lake Okeechobee SFWMM Dec 2020 Position Analysis



(See assumptions on the Position Analysis Results website)