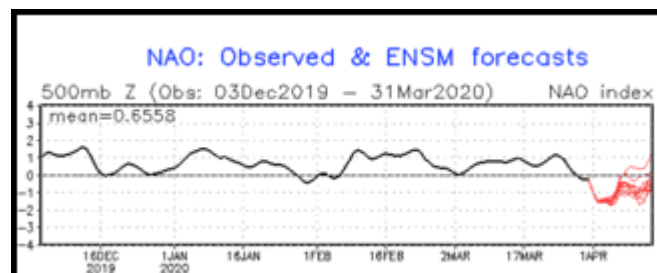


## Climate Discussion for April 2020

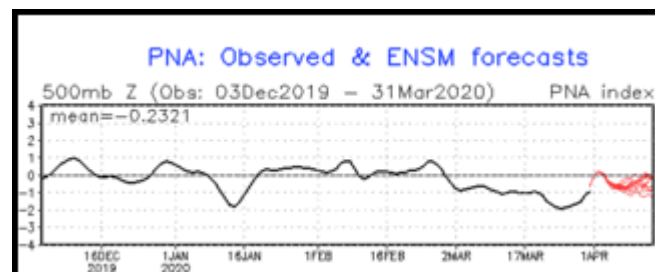
Dr. Justin Schulte

Valid: March 31, 2020

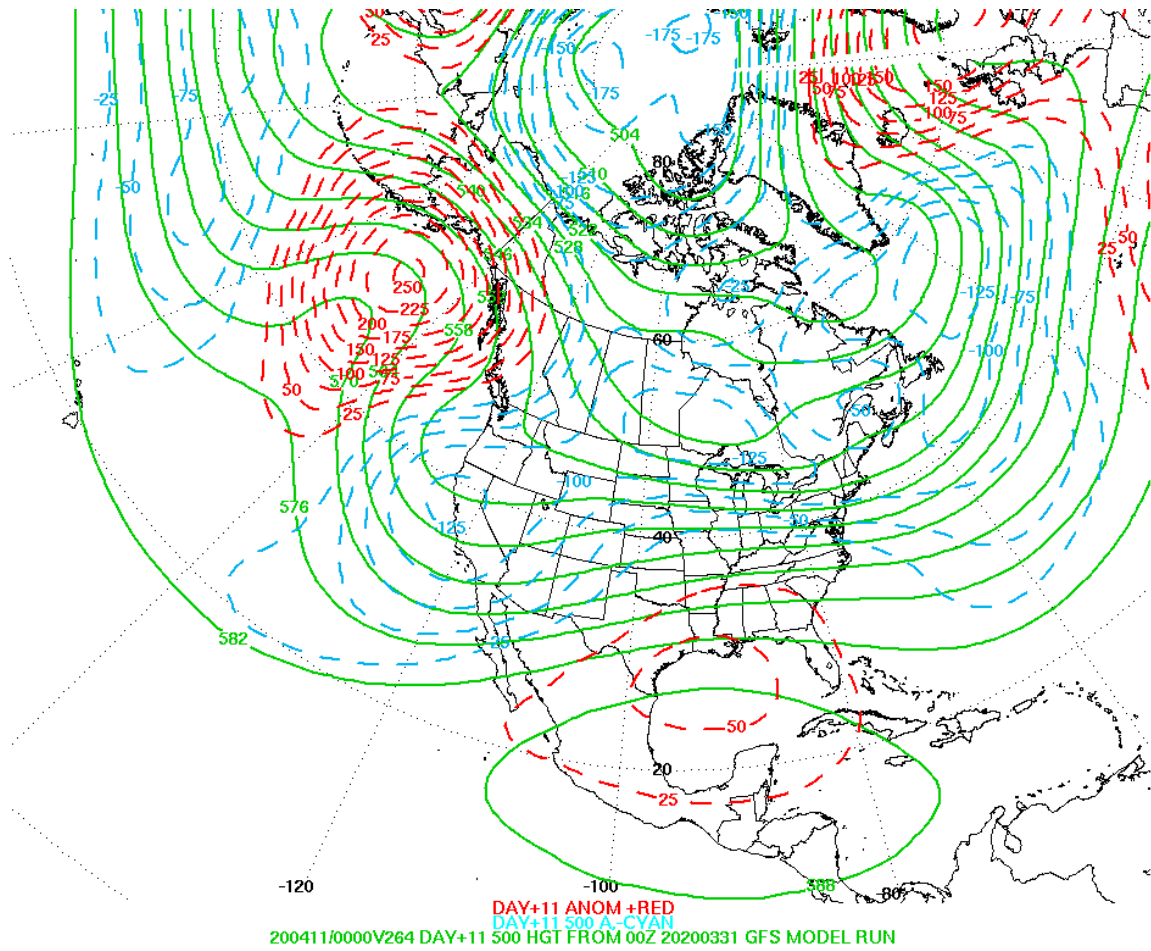
Current forecasts suggest that the NAO (**Figure 1**) will be in a strong negative phase in the beginning of April before weakening in mid-April. As such, I expect cooler-than-normal conditions to prevail across the western United States in the beginning April. However, for the Northeast, I do not expect the negative NAO regime to contribute to any cold weather, as there is no relationship between temperature and the NAO index. In terms of precipitation, NAO impacts will be negligible. The likelihood for warmer-than-normal conditions across the Southeast United States will be enhanced by a negative PNA pattern that is forecast to occur during the first half of April (**Figure 2**). The negative PNA phase will also weakly favor drier-than-normal conditions along the East Coast United States.



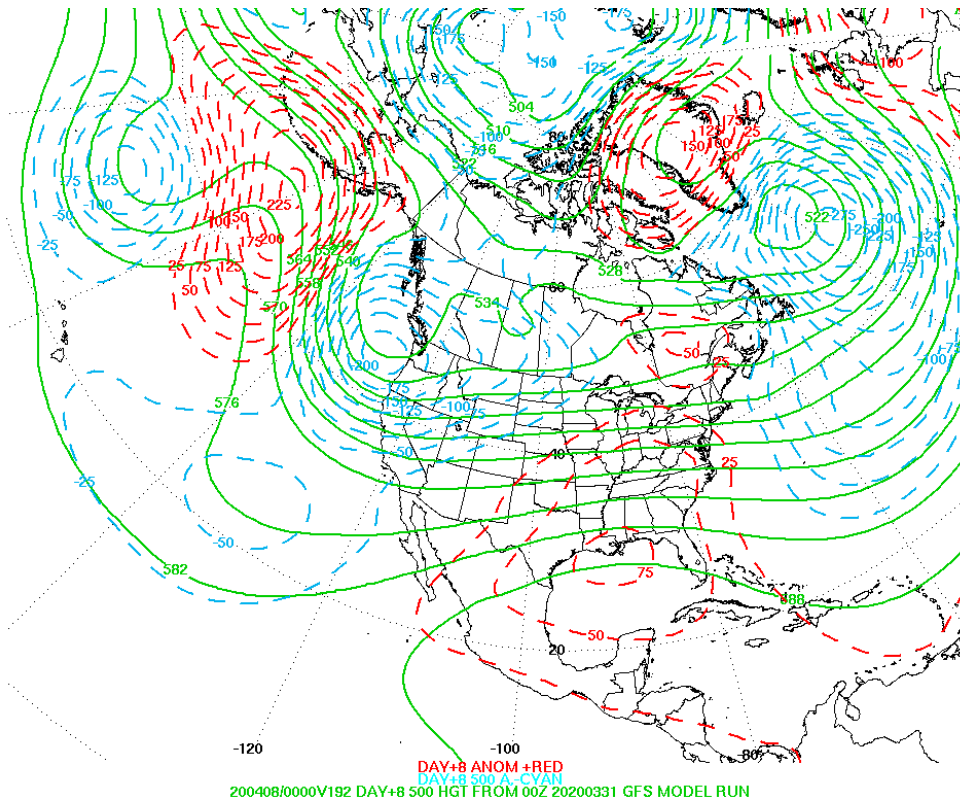
**Figure 1.** 14- day NAO ensemble forecast from the Climate Prediction Center.



**Figure 2.** 14-day PNA ensemble forecast from the Climate Prediction Center.



**Figure 3.** 11-day 500 mb GFS geopotential height forecasts obtained by applying a 7-day mean centered on the 11-th day.



**Figure 4.** 8-day 500 mb GFS geopotential height forecasts obtained by applying a 5-day mean centered on the 8-th day.

The current 11-day forecast for 500-mb geopotential height anomalies (**Figure 3**) suggests that geopotential heights will be near normal across much of the eastern United States, slightly below average across the Northeast United States, and below normal across Northern Alaska. The forecast negative 500-mb geopotential height anomalies across Alaska are more intense than those across the eastern United States so that the ridge-trough dipole pattern is forecast to be in a weak positive phase, which increases the odds of warmer-than-normal conditions occurring across the eastern United States in mid-April. Without strong ridging over Alaska, it will be impossible for a strong surface anti-cyclone to develop across western Canada, which is necessary for the intrusion of cold Canadian air into the eastern United States. The 8-day geopotential height anomaly forecast (**Figure 4**) looks a lot more favorable for warmer-than-normal weather across the eastern United States. I also think there will be many dry days along East Coast because the 8-day forecast suggests that negative geopotential height anomalies will prevail over Newfoundland concurrently with positive geopotential height anomalies over the Southeast United States. This geopotential height anomaly pattern is consistent with a negative phase of the eastern Northern American sea-level pressure dipole pattern, which is associated with drier-than-normal conditions and an off-shore flow. Based on the NAO, PNA, and 500-mb geopotential height forecasts, I think the eastern and south-central United States will likely experience above-average temperature conditions for the first half of April.

For the past month, equatorial Pacific SST anomalies have been positive around the date line and near climatological elsewhere across the eastern equatorial Pacific (**Figure 5**) except along the west coast of South America. This pattern corresponds with a negative trans Nino index and a central Pacific El Nino.

This pattern does not favor colder-than-normal or warmer-than-normal conditions across the eastern United States in April. Similarly, the current SST setup does not strongly favor drier-than-normal or wetter-than-conditions across the eastern United States. Thus, I am not giving SST anomalies in the equatorial Pacific any weight in my April prediction. However, the above average SSTs along the east coast will reduce the impacts of east wind events on high temperatures. Also, the probability of a major rain event is enhanced should an active storm track establish itself along the east coast.

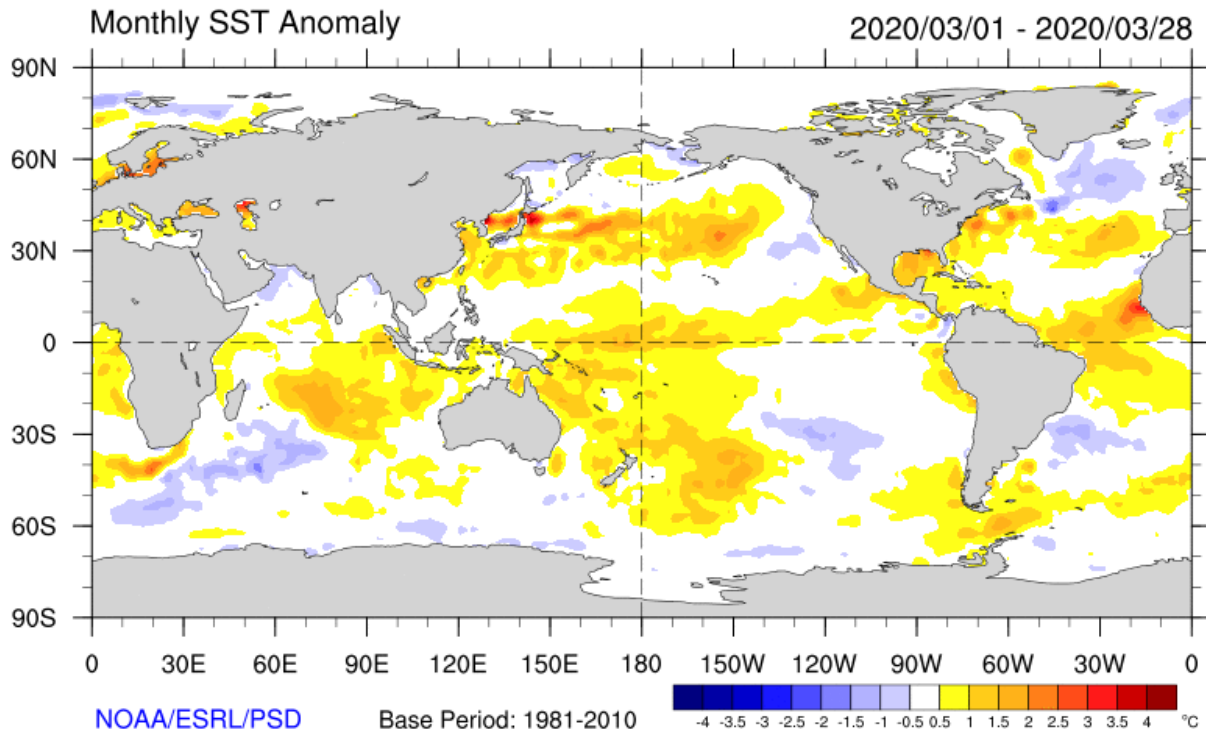


Figure 5. SST anomalies over the course of the last month.