



# 2021 Updated Winter Weather Outlook

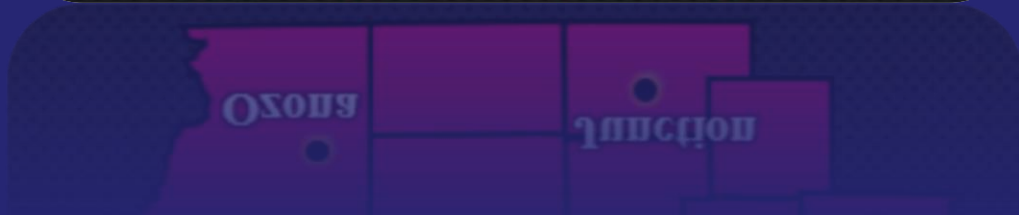
January 21, 2021  
by Hector Guerrero



# Winter Outlook Topics



- La Nina Status
- Local Climatology
- Winter Outlook
- Winter Impacts
- Summary
- Monitor

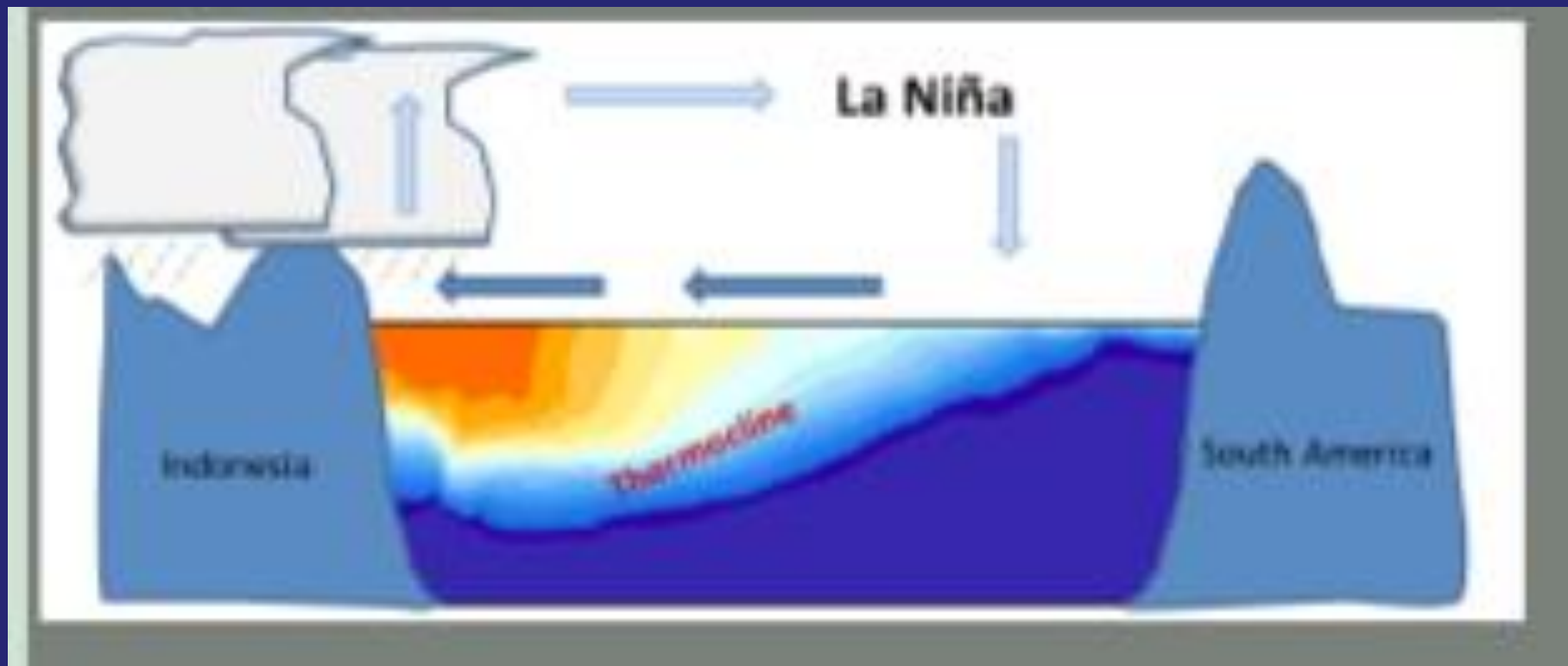




# La Nina/Southern Oscillation (ENSO)

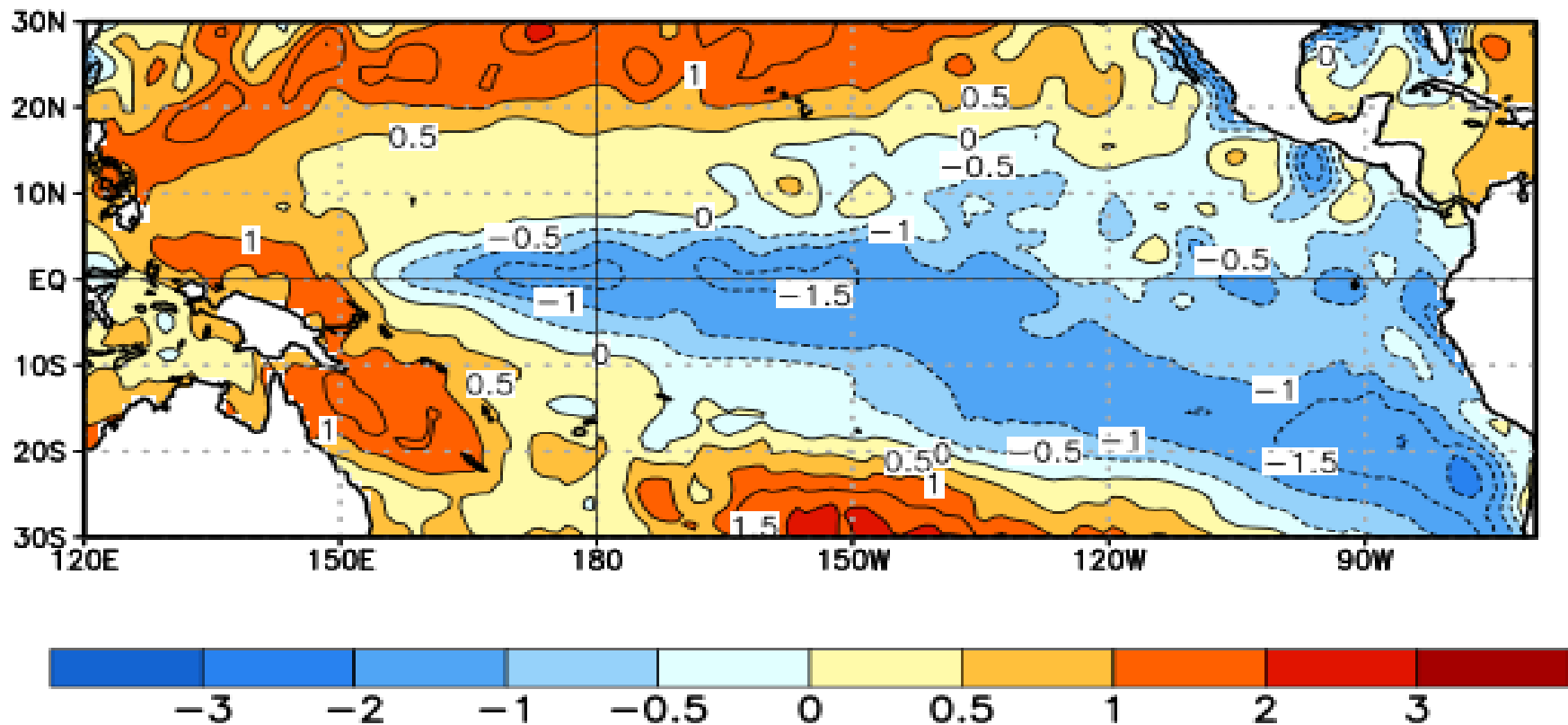


Can impact Texas weather during the late fall, winter, and early spring season (A cooling of the waters along the equator)



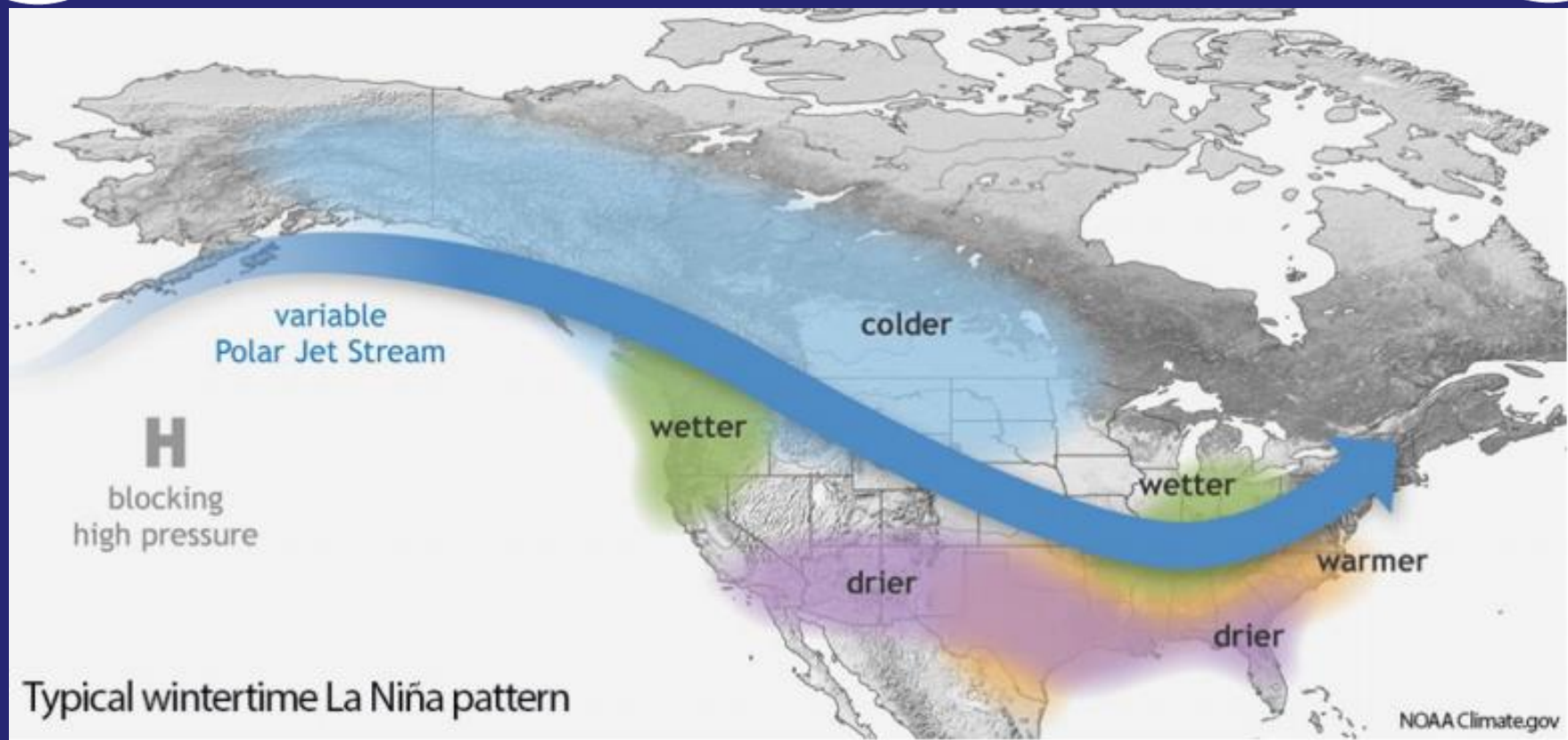
# SST Departures ( $^{\circ}\text{C}$ ) in the Tropical Pacific During the Last Four Weeks

Average SST Anomalies  
20 DEC 2020 — 16 JAN 2021





# La Nina Weather Pattern



- Weak (-0.5-0.9c), Moderate (-1.0-1.4c) or Strong (1.5 to 1.9c) and Very Strong ( > 2.0c )



# West Central Texas La Nina Status



- La Nina is still at moderate strength
- An intense wavy upper level jet stream that brought several storm systems into the area continues
- Much of West Central Texas has been blessed with above normal rainfall and snowfall from late December into January
- The drought has improved



# West Central Texas El Nino Status



- Temps were above normal in December and below normal January 1-20
- The Arctic Oscillation remains negative
- 22 La Ninas since 1950 and 11 were moderate to strong





# 2020 La Nina Winter Climatology



**Photo courtesy of Sheriff Tim Sanders,  
Sterling County SO**





# December 2020

## Average Snow, Rainfall and Temperatures

- Abilene Rain 1.82 in. (+0.59 in.)
- Abilene Snow 2.60 in.
- Abilene 48.3 deg or +3 degrees
- San Angelo 1.06 in. (+0.21 in.)
- San Angelo Snow 1.7 inches
- San Angelo 48.5 deg or +1.8 degrees



# January 1-20, 2021

## Average Snow, Rainfall and Temperatures

- Abilene Rain 1.12 in. (+0.52 in.) DJ 2.94 in.
- Abilene Snow 7.9 in. & 8.7 in. for season
- Abilene 43.4 deg or -1.0 degrees
- San Angelo 0.96 in. (+0.41 in.) DJ 2.02 in.
- San Angelo Snow 5.5 in. & 5.8 in. for season
- San Angelo 43.4 deg or -2.6 degrees



# La Nina Avg. DJF Temperature

DJF AVG Temperature	Abilene (Deg)	San Angelo (Deg)
Normal Temp	46.3	47.8
22 La Ninas	46.9	48.8
11 Weak La Ninas	46.3	48.1
11 Moderate to Strong La Ninas	47.5	49.6



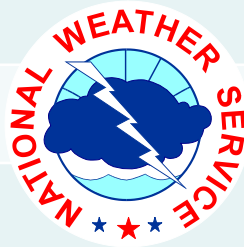
All La Ninas since 1950 and Normal Rainfall Period 1981-2010



# La Nina Avg. Dec-Feb (DJF) Rainfall



AVG DJF Rainfall	Abilene (In.)	San Angelo (In.)
30 Yr Normal Rainfall	3.61	3.13
22 La Ninas	2.56	2.08
11 Weak La Ninas	2.81	2.52
11 Moderate to Strong La Ninas	2.30	1.65



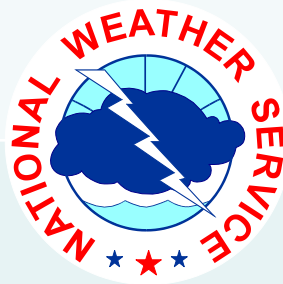
All La Ninas since 1950 and Normal Rainfall Period 1981-2010



# La Nina Avg. DJF Snow



AVG DJF SNOW	Abilene (In.)	San Angelo (In.)
Normal Snow	3.4	1.8
22 La Ninas	2.8	1.1
11 Weak La Ninas	3.2	1.0
11 Moderate and Strong La Ninas	2.6	1.3



All La Ninas since 1950 and Normal Snowfall Period 1981-2010



# 2020-21 Winter Outlook

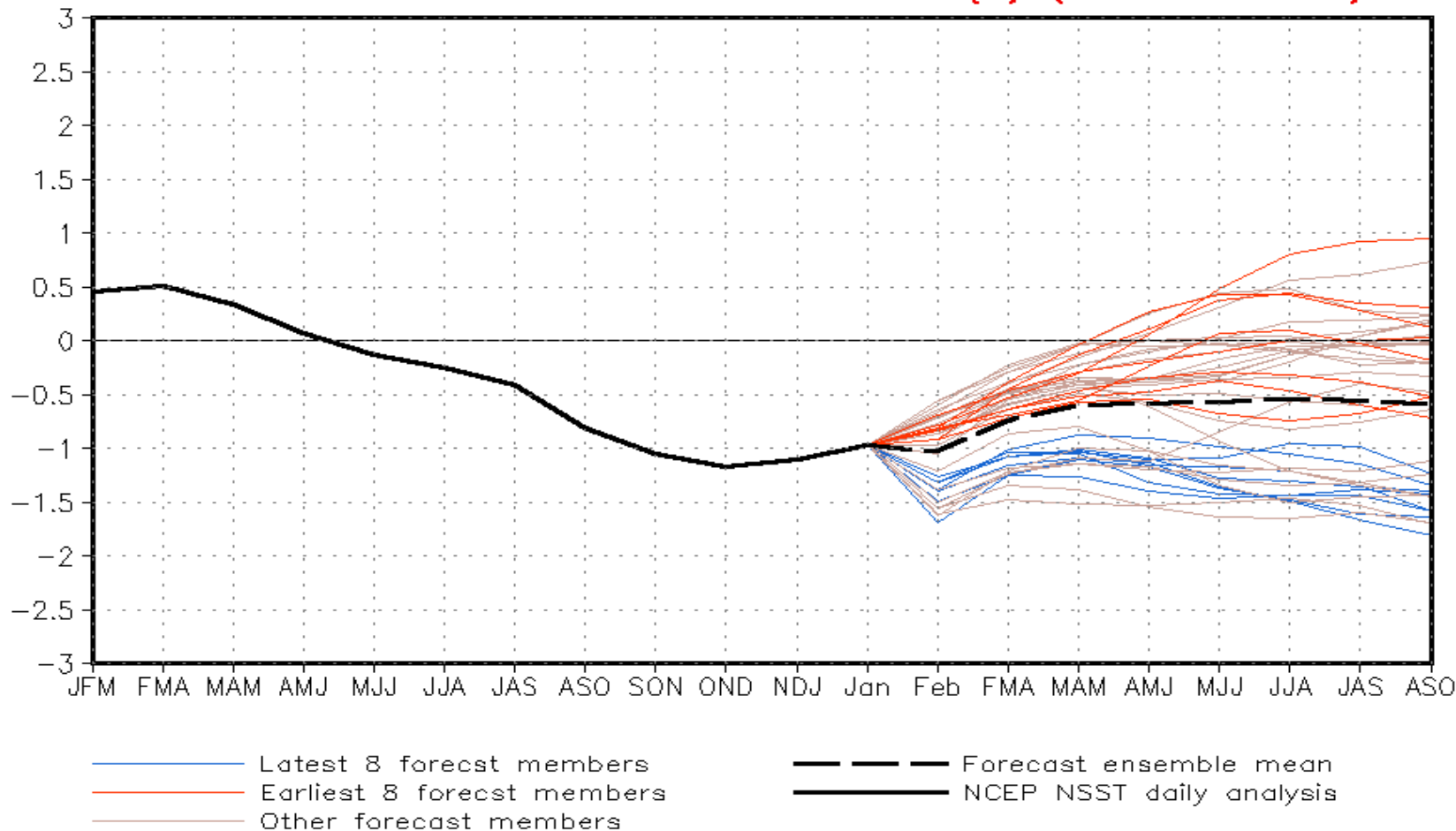




# La Nina Model Forecast of Sea Surface Temperatures



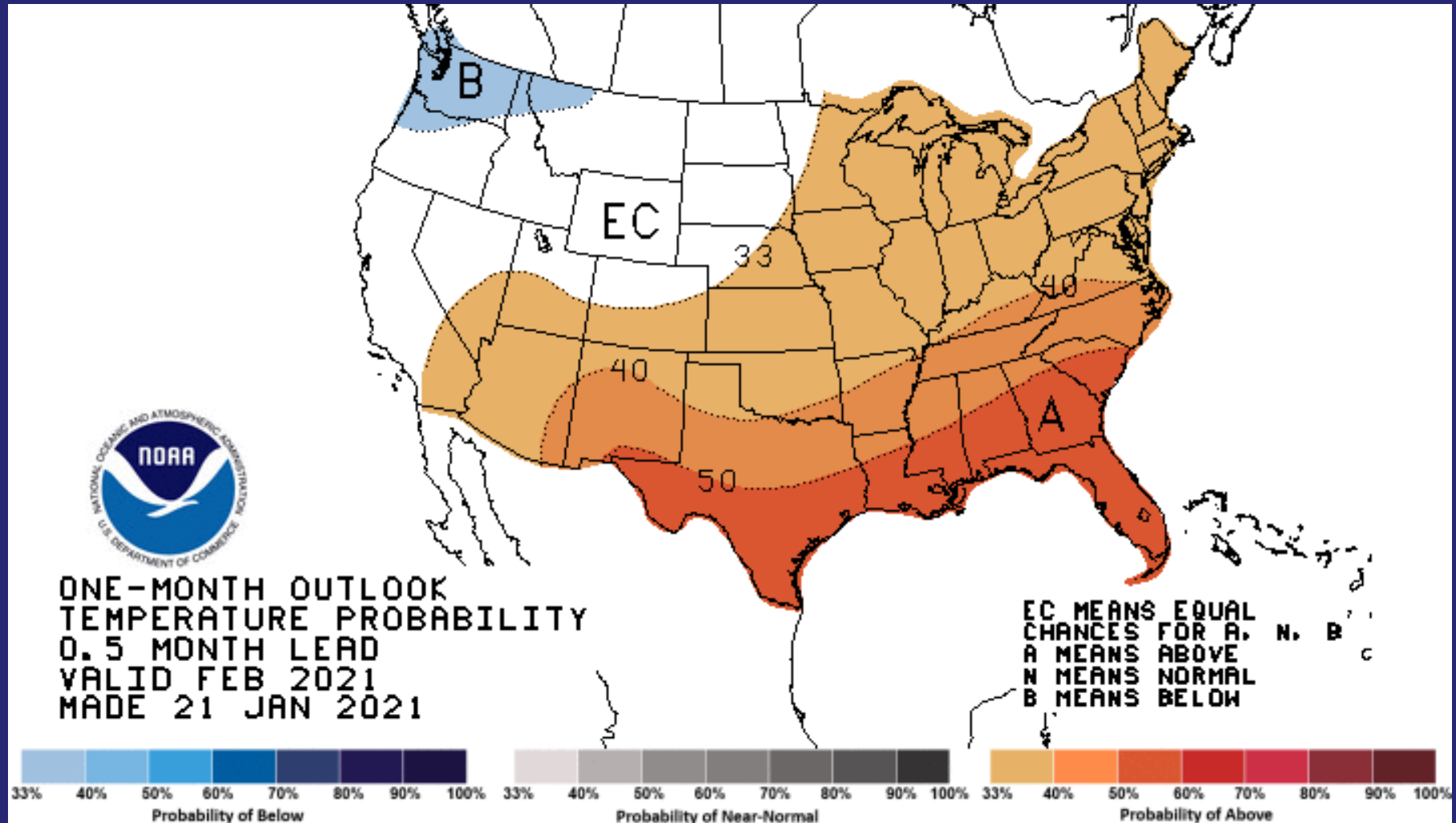
CFSv2 forecast Nino3.4 SST anomalies (K) (PDF corrected)



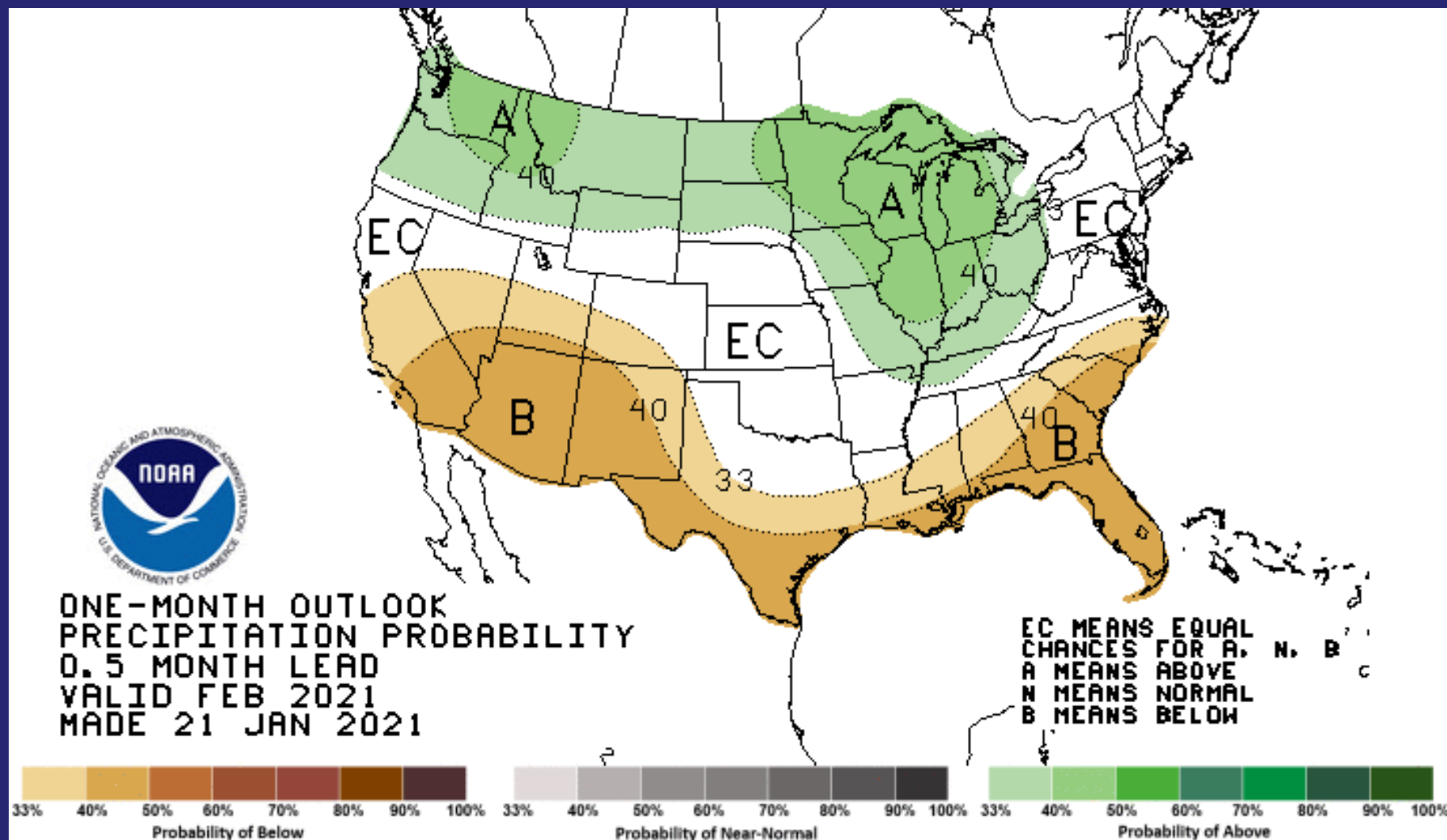
(Model bias correct base period: 1999–2010; Climatology base period: 1982–2010)



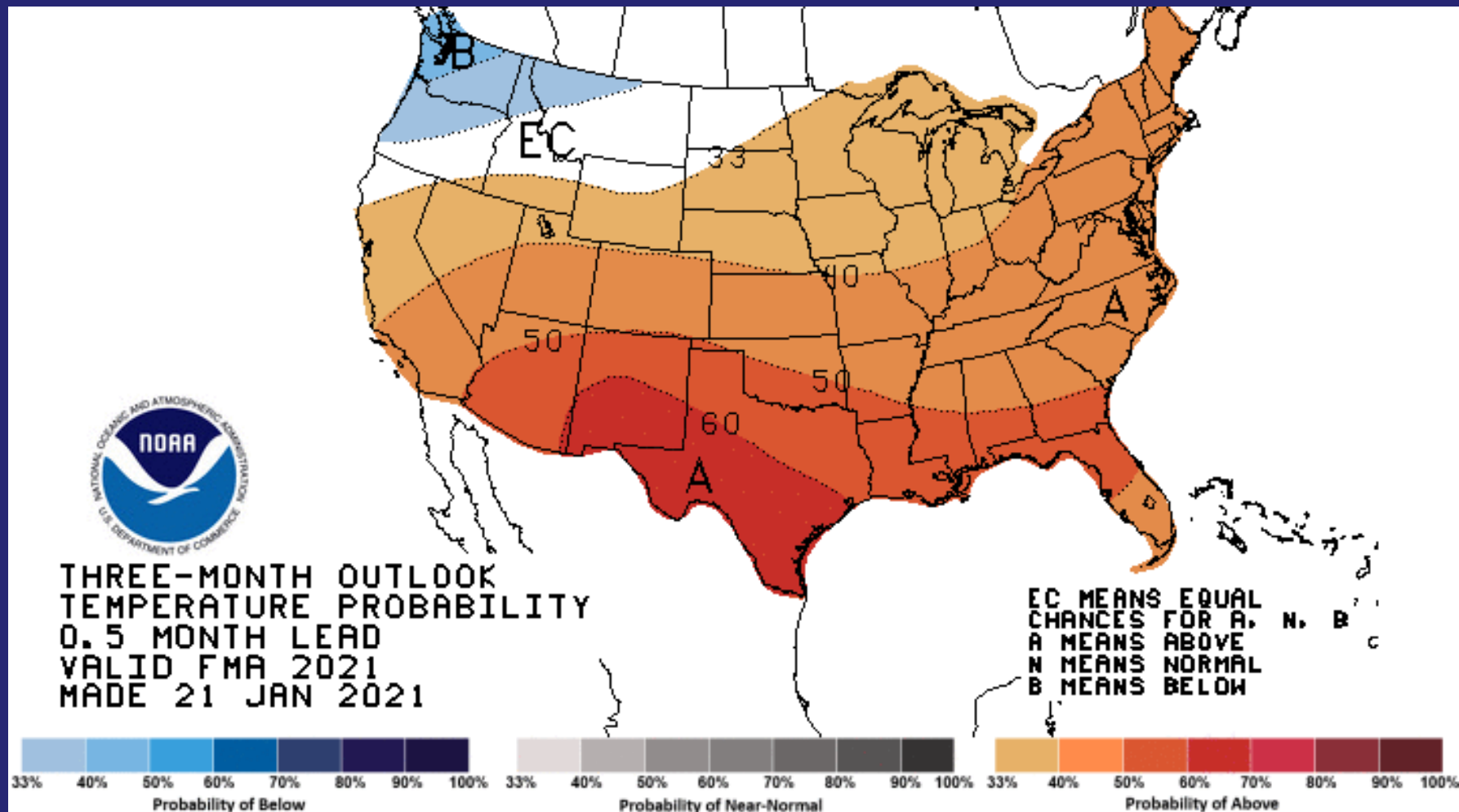
# 30 Day Temperature Outlook (Feb)



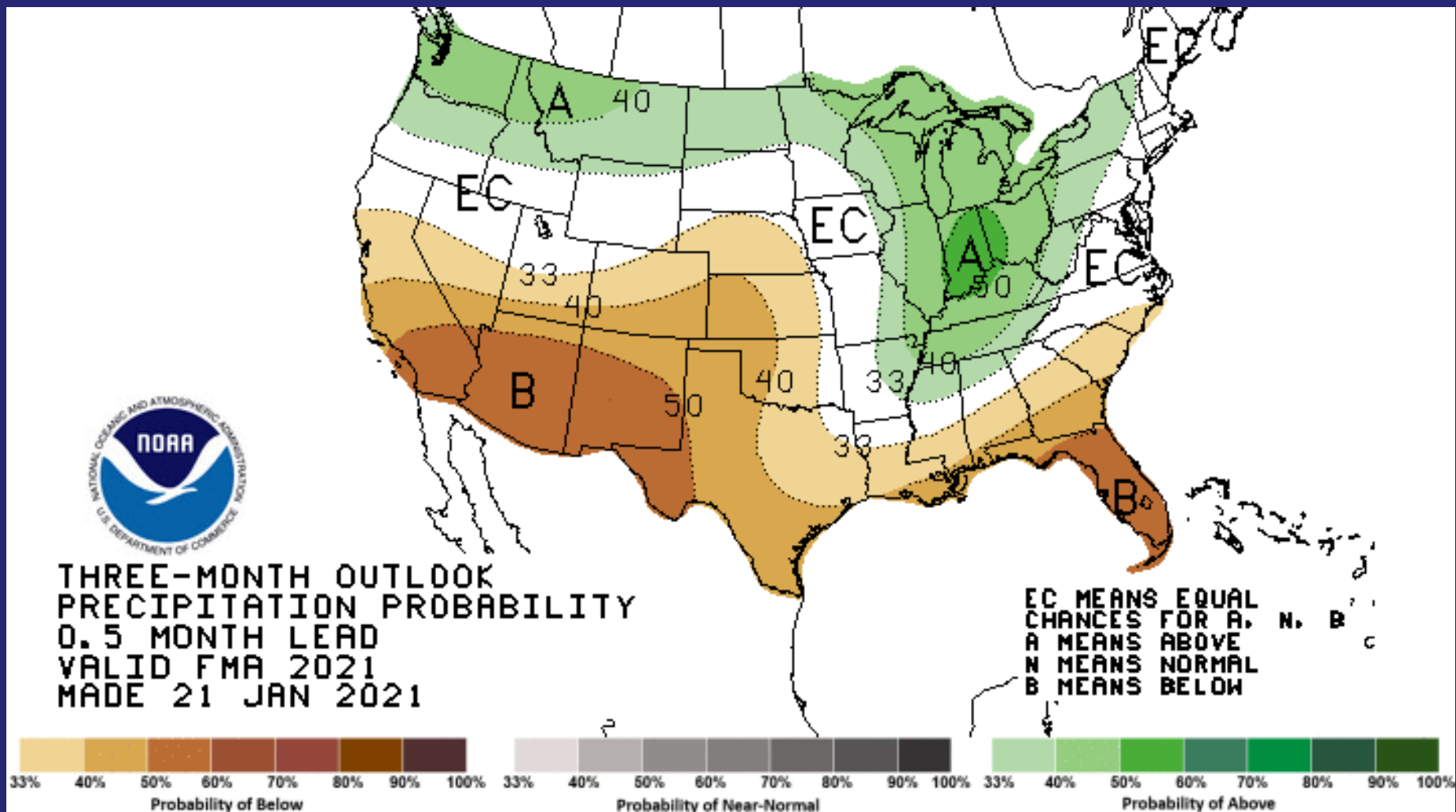
# 30 Day Precipitation Outlook (Feb)



# 90 Day Temperature Outlook (Feb-April)



# 90 Day Precipitation Outlook (Feb-April)

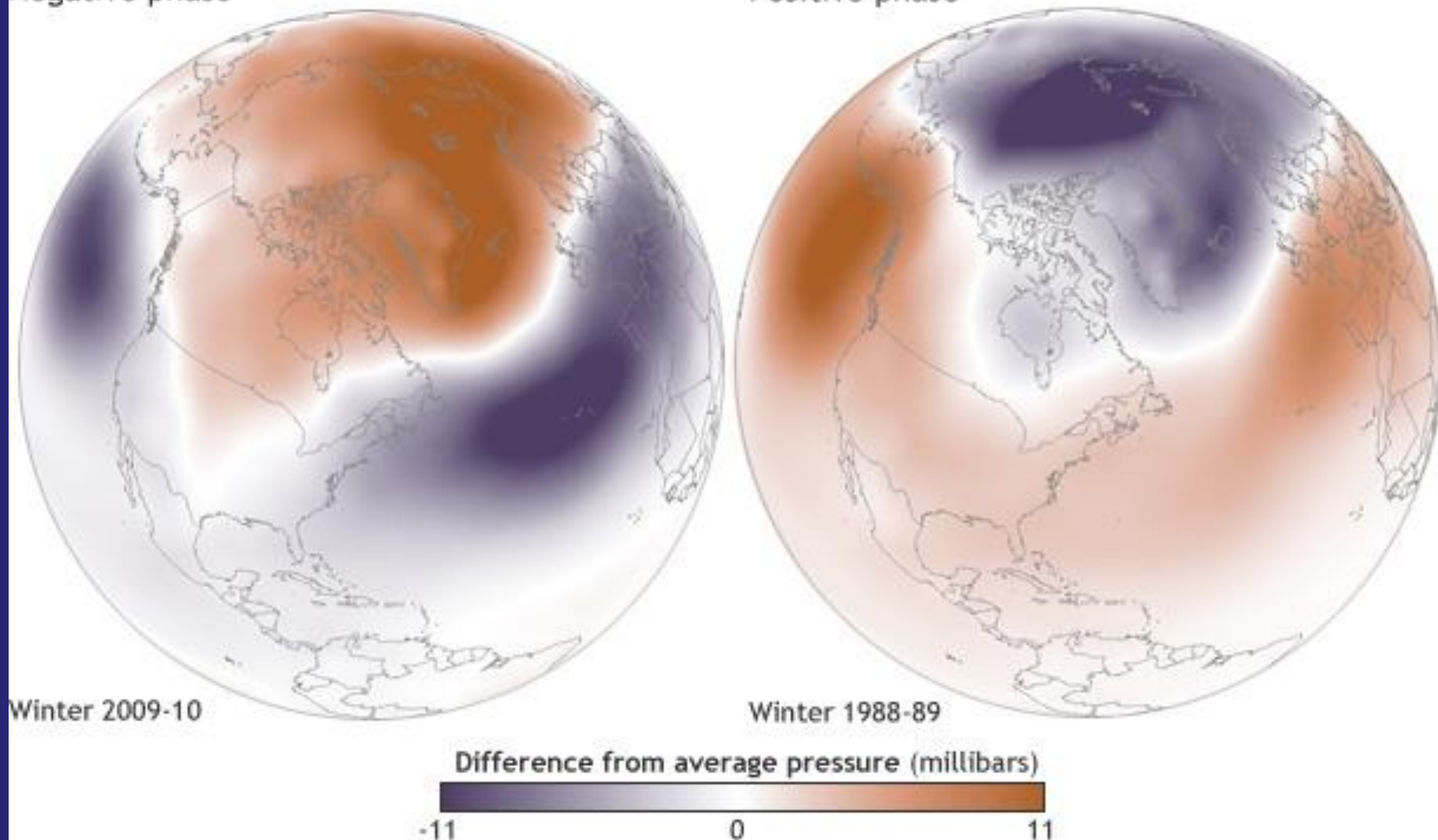




# Arctic Oscillation

Negative phase

Positive phase





# Arctic Oscillation (Positive & Negative Phases)

The positive (warmer) or negative (colder) mode of the Arctic Oscillation changes the shape of the polar vortex, as shown by these examples from the winters of 1988 to 1989 (warmer) and 2009 to 2010 (colder). Note that the color coding for atmospheric pressure is not for high or low pressure, but for higher or lower pressure than average for a given region. Credit: NOAA Climate.gov, based on NCEP Reanalysis data provided by NOAA ESRL, Physical Sciences Division



# Arctic Oscillation (AO)

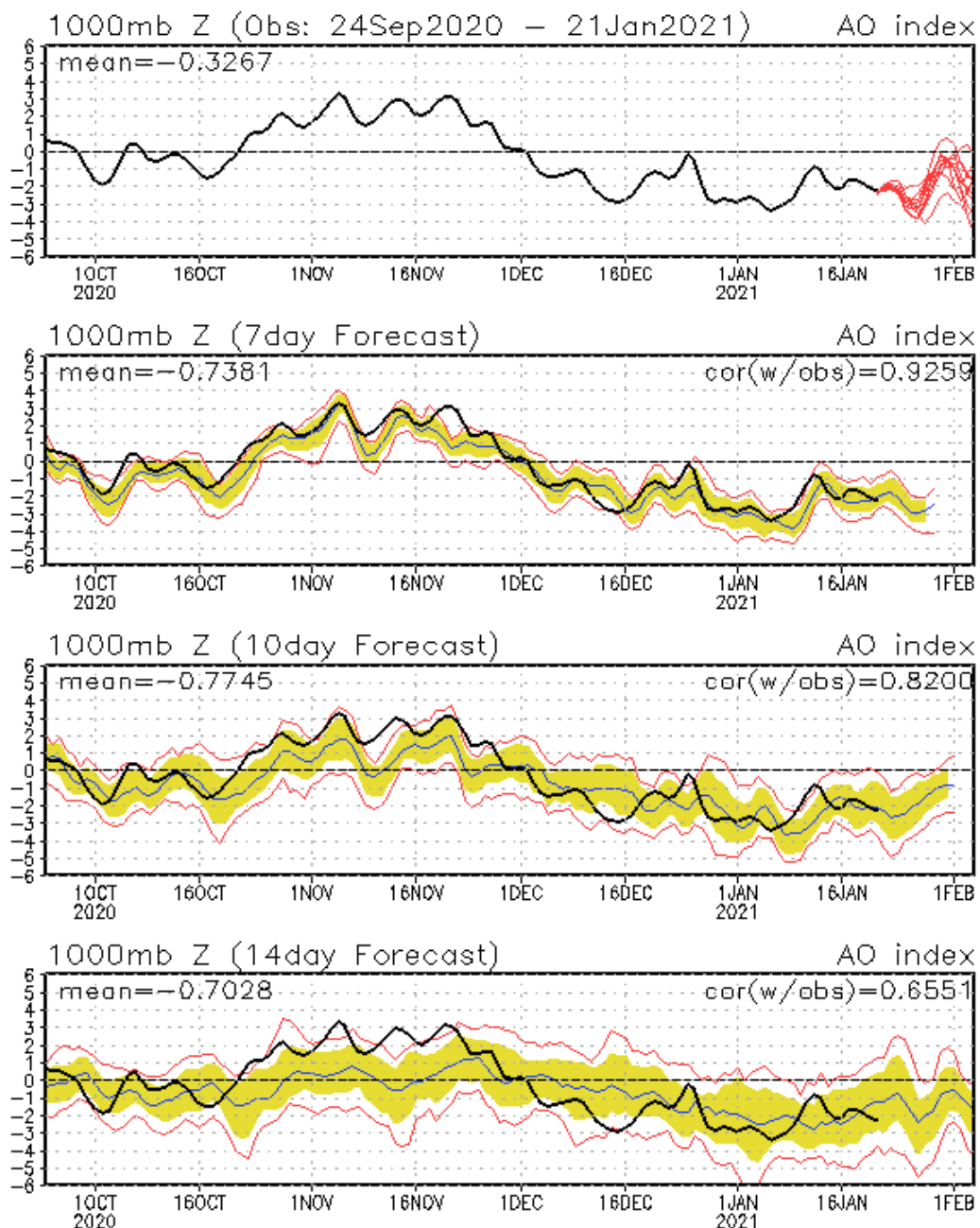


- Positive Phase means warmer
- Negative Phase means colder
- Most predictable in the fall, winter and early spring seasons about two weeks out





## AO: Observed & ENSM forecasts

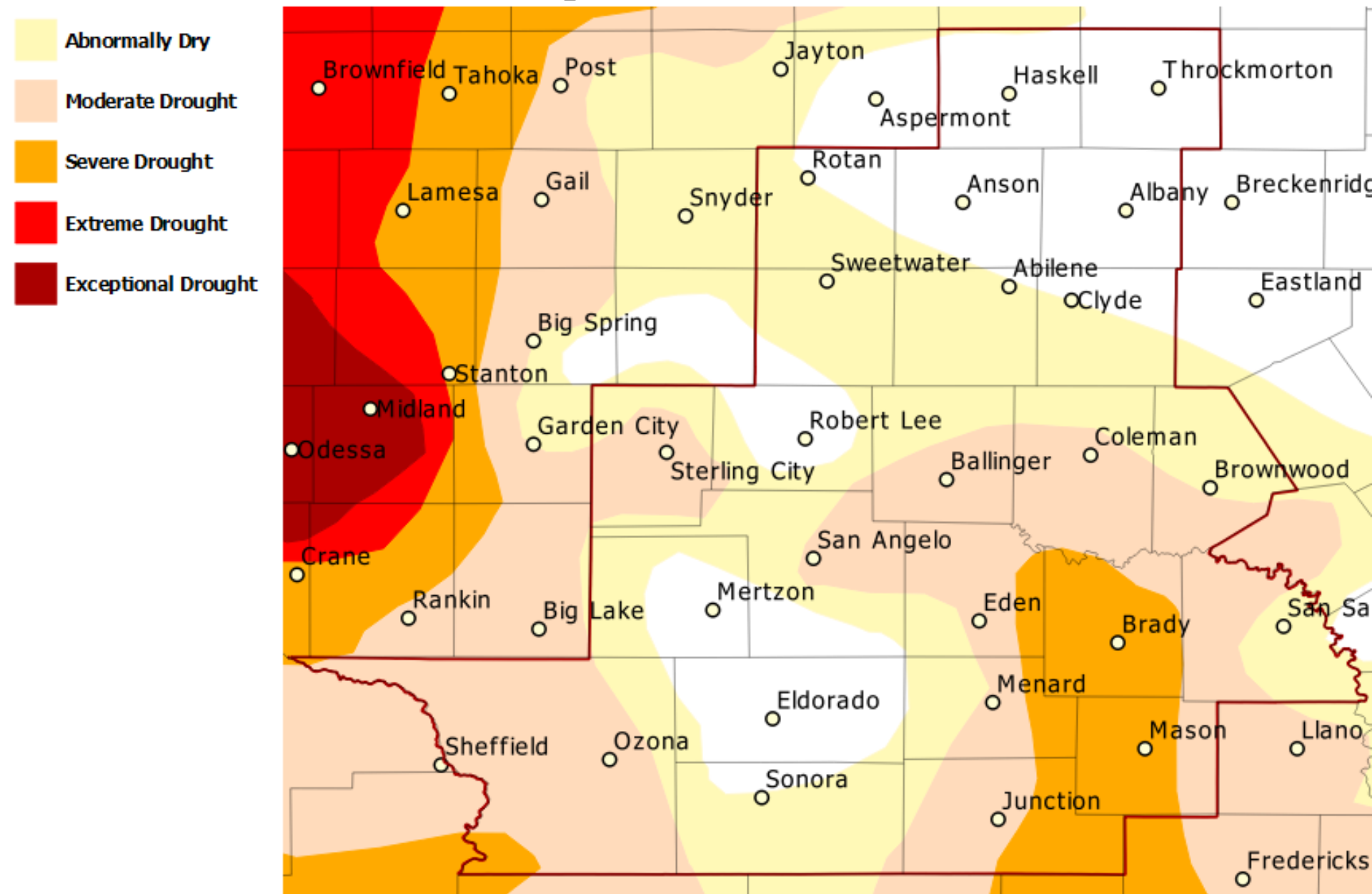




# 2020 Winter Impacts



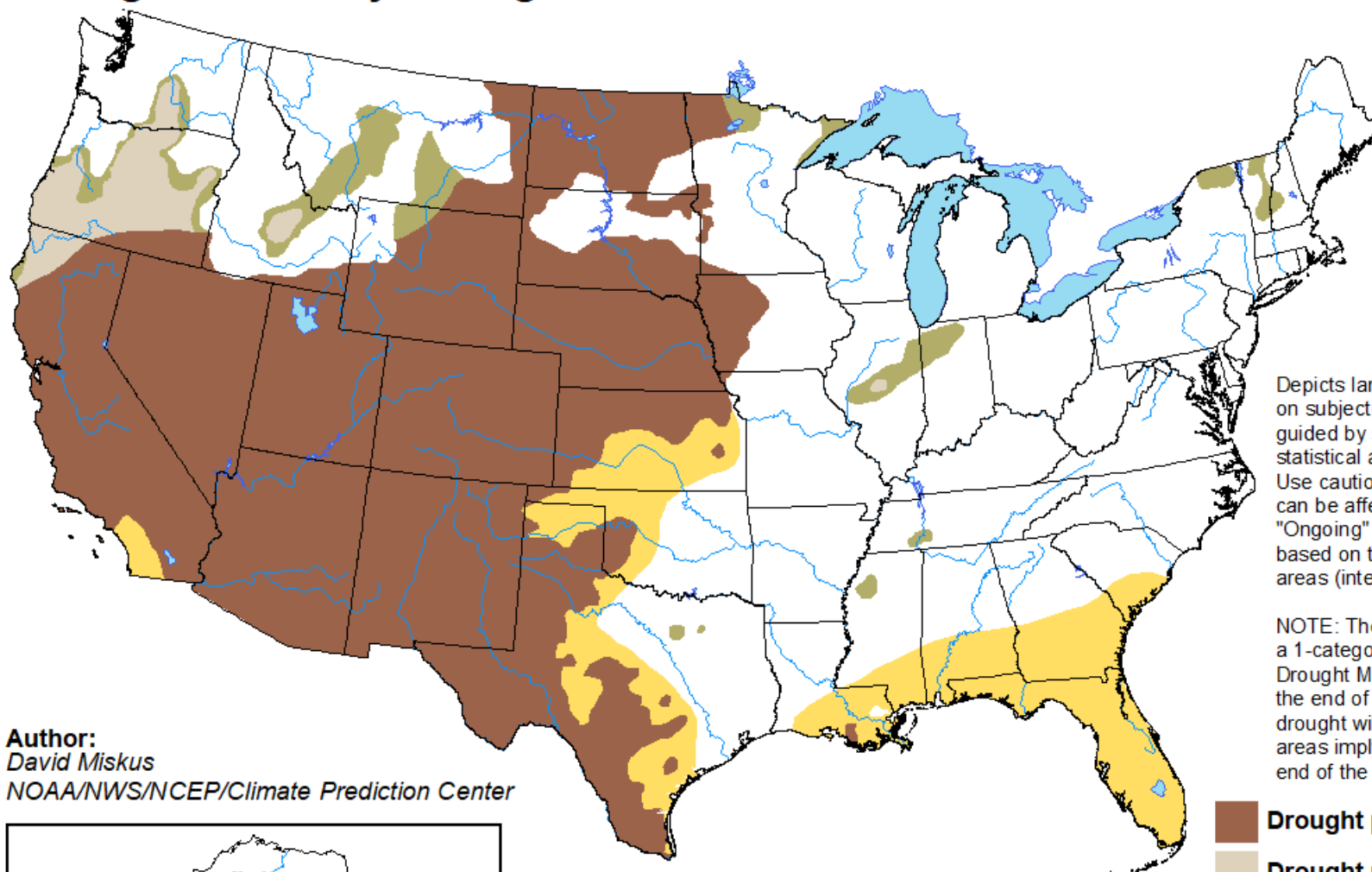
## West Texas Drought Monitor Created: Jan 19 2021



# U.S. Seasonal Drought Outlook

## Drought Tendency During the Valid Period





Valid for January 21 - April 30, 2021  
Released January 21



Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

**Author:**  
David Miskus  
NOAA/NWS/NCEP/Climate Prediction Center

-  **Drought persists**
-  **Drought remains but improves**
-  **Drought removal likely**
-  **Drought development likely**



<http://go.usa.gov/3eZ73>





# Winter Impacts

## Red Flag Warning

The NWS issues a Red Flag Warning, in conjunction with land management agencies, to alert people to an ongoing or expected critical fire weather pattern.

Critical fire weather conditions are either occurring now, or will shortly.

Be extremely careful with open flames.



[weather.gov/safety/wildfire](https://weather.gov/safety/wildfire)

**Take action.**



# Summary

Photo Courtesy of Casey Moeller, Haskell VFD



- **95% Moderate La Nina to continue through March 2021. 55% chance of going Neutral by April**
- **Chances of precipitation to continue into February with intense wavy upper level jet stream tracking across our region.**
- **Near normal precipitation along and north of I20. South of I20 could be slightly drier. Above normal temperatures through April.**
- **In 2 out of 11 moderate to strong La Ninas Winters since 1950, above normal rain and snow have occurred in West Central Texas. We may go above normal this year.**





# Summary

Photo Courtesy of Casey Moeller, Haskell VFD



- Wildfire threat continues with the potential of occasional dry wind storms.
- Have seen some improvement in the drought
- If the jet remains active in its current position, we may see a mixed bag of active weather in February.
- Arctic Oscillation should remain negative through early February, which means cold outbreaks across portions of the U.S.





# How to Monitor

- [www.weather.gov/sjt](http://www.weather.gov/sjt)
- [www.cpc.ncep.noaa.gov](http://www.cpc.ncep.noaa.gov)



# Links



Please Drive Slowly

Black Ice is difficult to see and makes roads very slippery, especially bridges and overpasses



[weather.gov/winter](http://weather.gov/winter)

[www.weather.gov](http://www.weather.gov)   [www.mobile.weather.gov](http://www.mobile.weather.gov)  
[www.drivetexas.org](http://www.drivetexas.org) or call 1-800-452-9292  
[Hector.Guerrero@noaa.gov](mailto:Hector.Guerrero@noaa.gov)