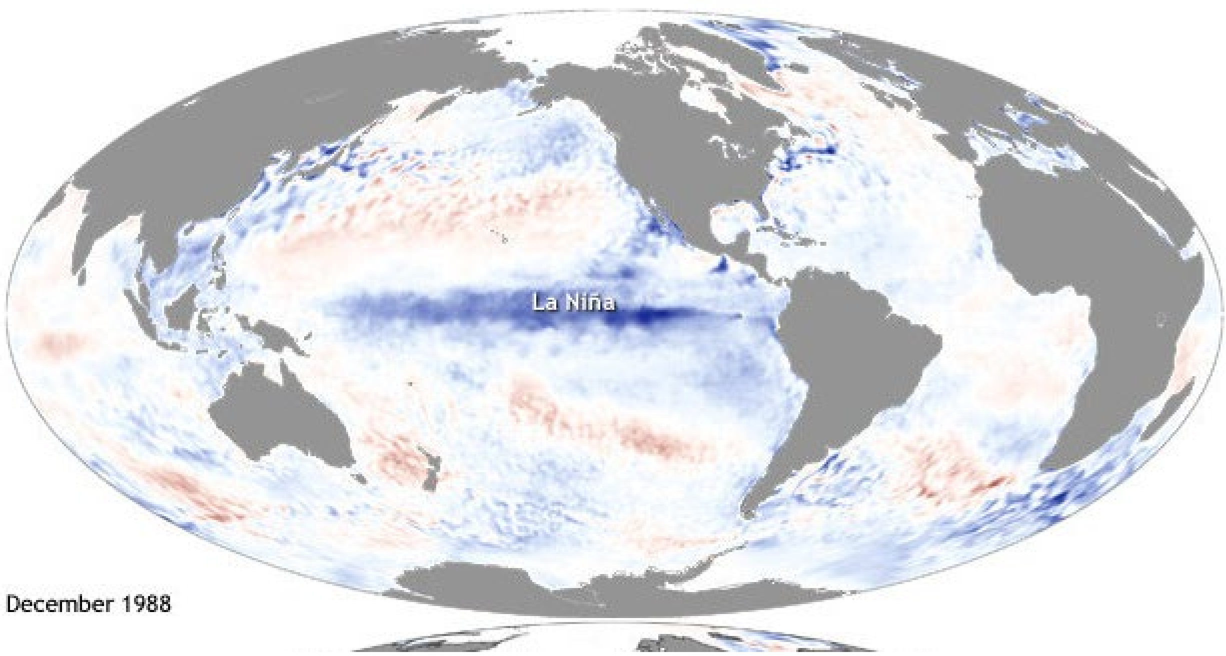
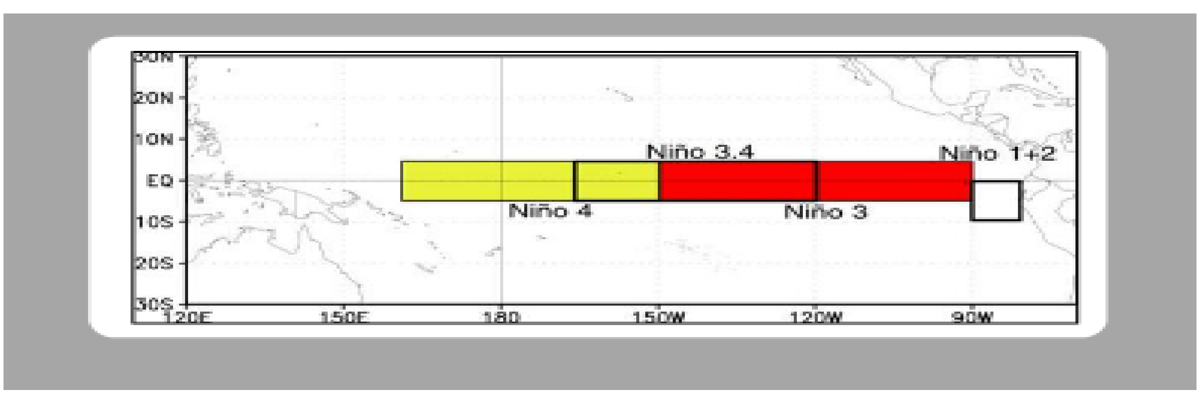
Bi-monthly Educational Topic #2 for CCGCD
by Texas Hill Country Weather Services, LLC
January 27, 2025

Within the first bi-monthly educational topic dated January 12, 2025, we learned that La Niña is the cool phase of sea surface temperatures (SSTs) of the El Nino-Southern Oscillation (ENSO) located within the tropical zone of the Pacific Ocean. La Niña occurs on average every few years, it causes and maintains our droughts, NOAA tracks and forecasts its evolution, entities like CCGCD make their water conservation decisions based on expected impacts from La Niña, and we are currently under the influence of La Niña as it is expected to impact us through early Spring 2025.

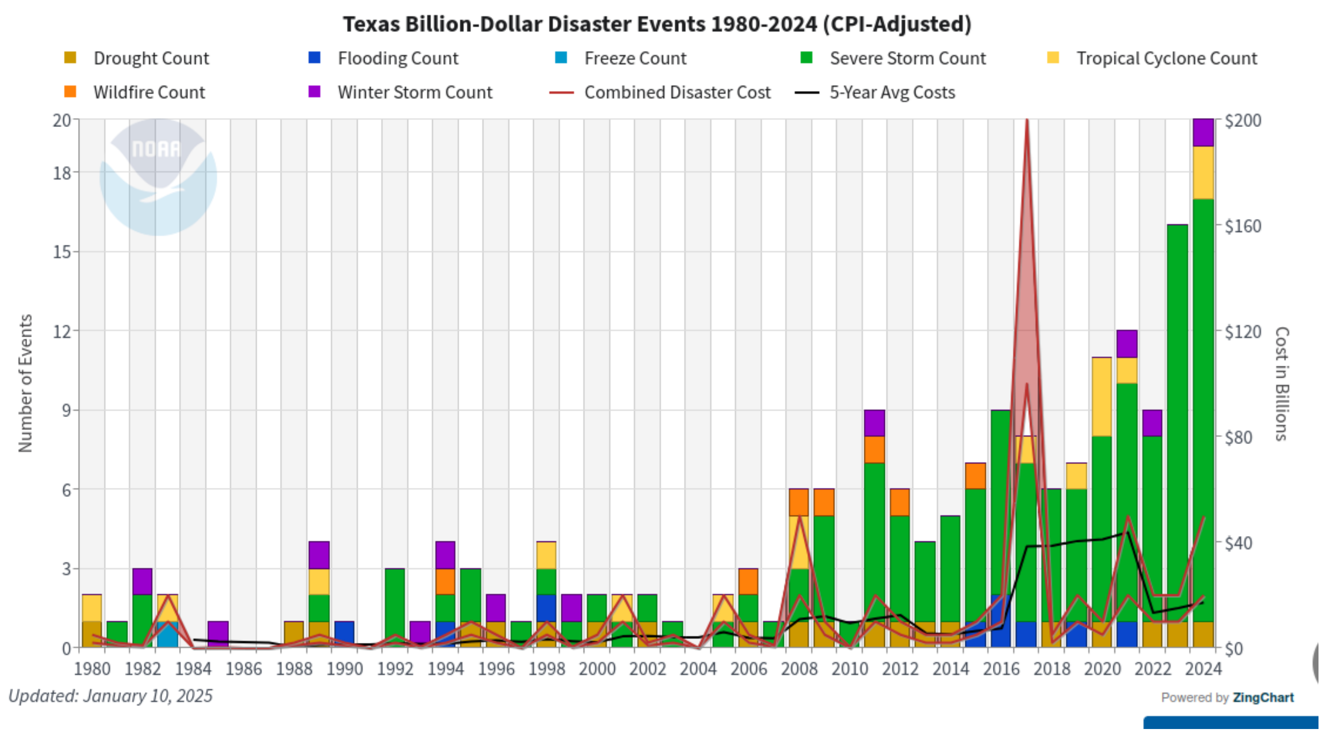
We now continue with our deep dive into the La Niña climate pattern. The image below from NOAA's Climate.gov website is an excellent representation of the spatial extent and size of the very intense December 1988 La Niña event. The distinct blue colored area in the tropical Pacific Ocean represents the cooler than average SSTs.



A La Niña occurs when three consecutive months in the ENSO 3.4 region (see image below from NOAA) have mean SSTs registering lower than 0.5° C below long-term average conditions.



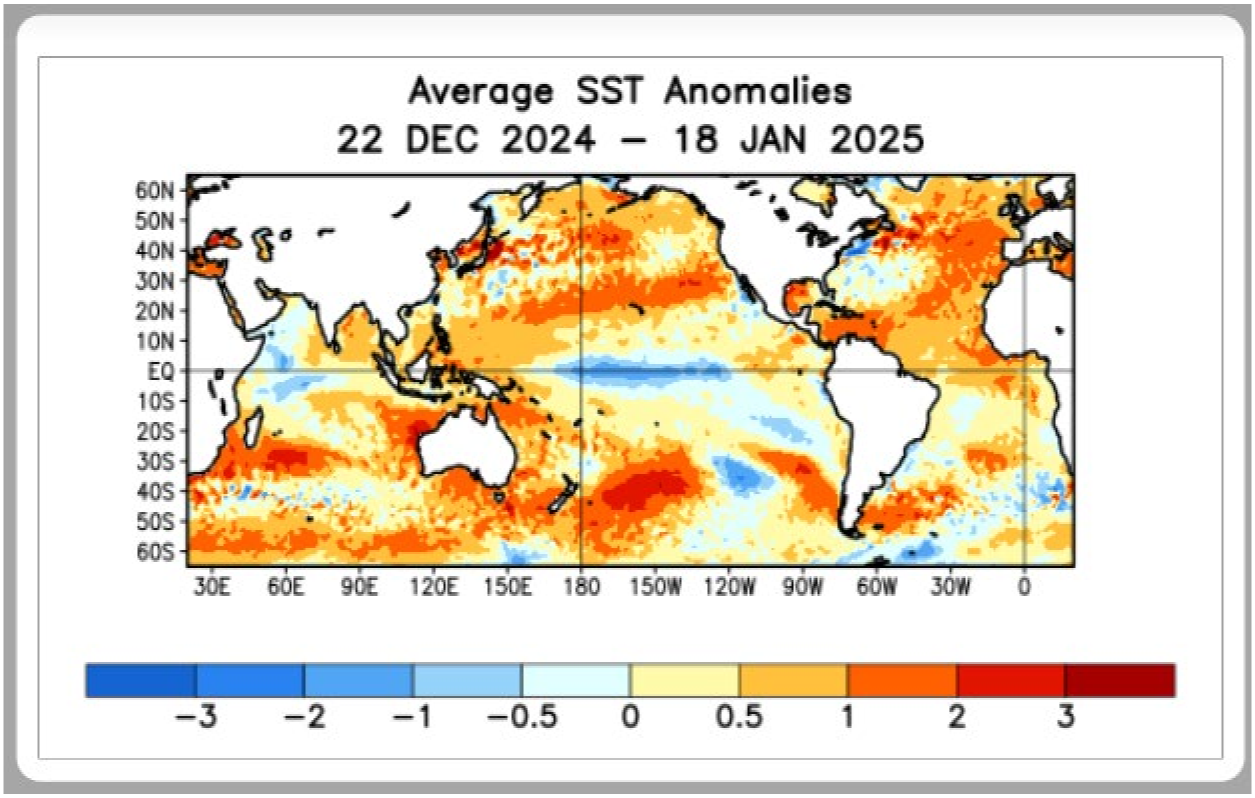
This December 1988 episode dropped to 4° C below the long-term average. It caused a major drought in the Great Plains that extended southward into Texas costing approximately $10 billion in damages (see graphic below from NOAA) to Texas.



Using this same graphic, 20 years of drought events from 1980 through 2024 have cost Texas approximately $200 billion. This graphic also suggests droughts are becoming longer in duration and more frequent when looking at this specific time frame. Approximately 16 of the 20 years of drought were in some type of La Niña episode (whether weak, moderate or strong in intensity). For La Niña episodes, refer to this website:
https://origin.cpc.ncep.noaa.gov/products/analysis_monitoring/ensostuff/ONI_v5.php

So, now let's circle back to current conditions. The map below from NOAA shows current mean SSTs in the blue color less intense than the December 1988 episode. The current SSTs are certainly in a weakened state of La Niña, and current model projections expect this weak La Niña to go away early this spring transiting into neutral ENSO conditions. The weakened state of this La Niña episode is evident by the fact that our area has received several precipitation days (15 rainfall days in the previous 60 days for Boerne) this past December 2024 and January 2025 combined. This is a good sign in that persistence is a good forecast meaning that this La Niña event is not allowing the drought to intensify, but instead drought is being maintained, which is the best scenario we can get from a winter season weak La Niña event. Persistence would also suggest that we could truly get our typical higher rainfall amounts this Spring 2025 since La Niña should not be driving our weather pattern.

As for our air temperatures measured in Boerne, in December 2024 we experienced above average by 6° F and in January 2025 we experienced below average by 6° F, which essentially means we have experienced our average temperature conditions to date and that is good news also.



February 2025 is not looking too cold with a few weather systems expected to give us some rainfall. However, I still can't rule out another wintry precipitation event, but this likelihood remains low.

Stay tuned into CCGCD's website page, as I will be providing more La Niña education.