Bi-monthly Educational Topic #5 for CCGCD
by Texas Hill Country Weather Services, LLC
March 16, 2025

How about we begin investigating other weather-related drought indexes important to CCGCD and it's decision-making process for their drought restriction stages?

However, let's initially be reminded that CCGCD has Kendall County remaining at Stage 4 Drought Restriction. This stage reflects a drought emergency, and here are the abbreviated restrictions:

- No lawn or turf grass watering is allowed with groundwater at any time by any means.
- Filling of ponds, lakes, tanks, fountains, ornamental ponds, reservoirs or surface impoundments with groundwater is prohibited.
- The use of groundwater to fill or refill pools, other than portable wading pools, is prohibited. Groundwater may be added to pools to replace water lost due to use or evaporation only on the designated watering day.

Even though our weak La Niña is going away soon and converting to an ENSO neutral pattern in April (refer to Climate Prediction Center: ENSO Diagnostic Discussion), La Niña still has a grip on our on-going large-scale dry weather pattern.

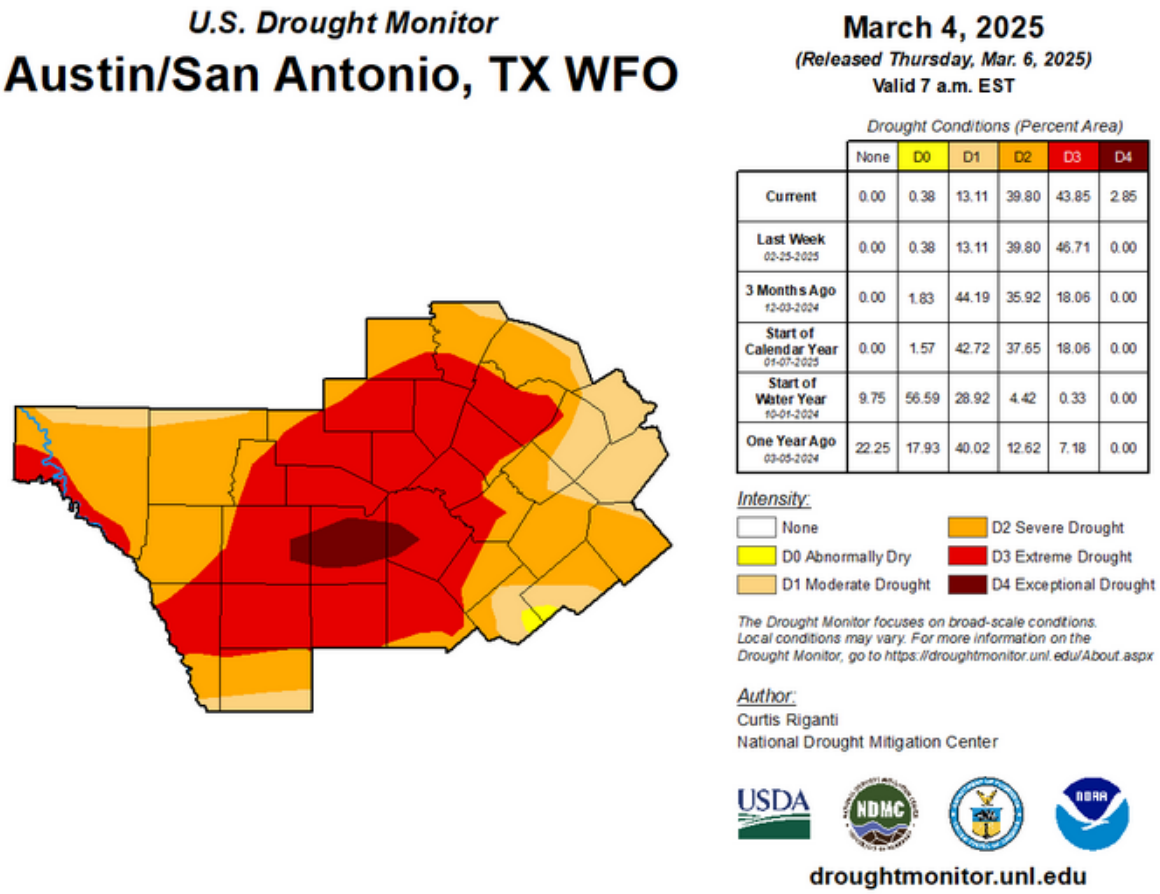
In response, this map attached below from the US Drought Monitor (https://droughtmonitor.unl.edu/) keeps showing the drought getting worse. Additionally, on this website, the US Drought Monitor provides a good discussion on the week's drought conditions.

The area of the extreme drought continues to expand in size, and now a small region of exceptional drought has been added to this map, south of Kendall County. And we continue to experience an increased frequency of critical fire weather days early this spring. Kendall County has been in a consistent drought condition at some level of intensity since late 2021 – close to four consecutive years!!

But, first, it is time to provide a critical review of the attached map below from the US Drought Monitor and then introduce another index that CCGCD utilizes to make its decisions.

This map is essentially a professional scientist's artistic rendering of the overall regional display of drought conditions and is more interpretative than it is diagnostic in application. Additionally, the map represents the large-scale conditions, but the resolution is low meaning local-scale variation is not depicted. Four federal agencies (USDA, NDMC, DOC and NOAA), collaborate to create the weekly map (updated every Thursday), and the map is not a forecast and not based on a statistical model. The data (vapor pressure deficit, standardized relative humidity products, soil moisture deficit, precipitation, stream flow, reservoir levels, temperature and evaporative demand, soil moisture and vegetation health) used to make the map is provided from resources from the recent past.

A contingency of both meteorologists and climatologists (a network of 450 experts) interpret the data (it is a "convergence of evidence approach") and then one of the agencies is tasked with creating the map in which map drawing responsibility switches from agency to agency about every two weeks.



U.S. Drought Monitor - Texas

As indicated above, the US Drought Monitor uses several resources to draw their map. One of their resources is the Palmer Drought Index (PDI). PDI is also known as the Palmer Drought Severity Index (PDSI), and both are the same thing. It is regional in practice, and it uses precipitation and temperature estimates. Developed by meteorologist Wayne Palmer, it is not a forecast, but it is a recent past dataset examining moisture supply and demand via a water balance model establishing current conditions. Evapotranspiration and recharge rates are also considered in the model. The index value is created from the model run, and it has proven to be a valuable resource to determine regionally long-term drought conditions. The index value of zero means a condition is normal, a negative value refers to drought, and a positive value refers to a wet condition. As the values change further from zero then either drought or the wet condition is intensifying. This index is used all across the US. PDI/PDSI does have a weakness as the model does not account for snow or frozen ground conditions, but it is widely used. This interactive website shows a gridded version of current PDSI values that allows a user to zoom in and out of an area of interest with a legend showing the condition. https://www.drought.gov/data-maps-tools/us-gridded-palmer-drought-severity-index-pdsi-gridmet

CCGCD uses PDI/PDSI values to help them make their drought restriction stage decisions. Stay tuned into CCGCD's website page, as TXHCWS will be providing more educational materials on other indexes used within their decision-making process.