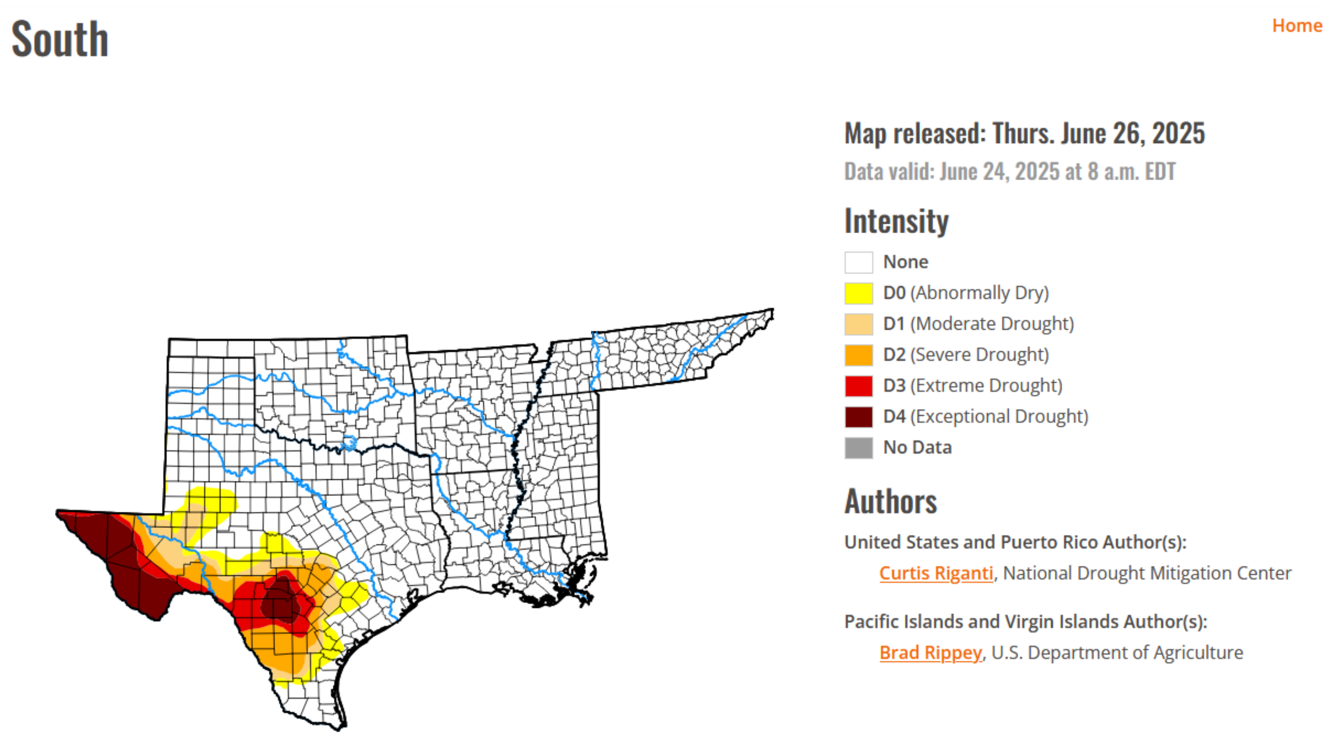
Bi-monthly Educational Topic #12 for CCGCD
by Texas Hill Country Weather Services, LLC
June 26, 2025

<u>Current conditions:</u>
As of June 26, 2025, most of Kendall County has reduced to the D3 extreme drought category (per the latest available US Drought Monitor map provided below) as the region associated with this drought continues. There is a slight sliver of an area of far northeastern Kendall County that is now down to the D2 severe drought category and about ¼ of Kendall County within the far western portion remains in the D4 exceptional drought category. We are now in our typical dry Summer weather pattern in which drier than average and warmer than average conditions are expected to continue. Thus, I do expect our drought to re-intensify through this Summer unless we can experience a tropical storm or hurricane – which is possible for us this hurricane season. CCGCD remains at a Stage 4 drought restriction within this on-going Drought Emergency.



During the week of June 13, 2025 on CCGCD's Facebook page, a local citizen asked very good questions about how CCGCD determines the drought restriction stage. CCGCD responded and answered the questions. However, on Facebook, this platform intends correspondence to be short and to-the-point without a good display available for long drawn-out descriptions.

Therefore, the purpose of this topic is to expand on the answers already provided by CCGCD.

<u>First question</u>: "What criteria is used in the drought staging categories?"

<u>Answer to the first question</u>: Kendall County is experiencing not only a meteorological/agricultural drought, but we are additionally experiencing a hydrological drought. A hydrological drought is an

extended period of time (more than 3 months in duration) of below-average water levels in surface and subsurface water bodies, such as the Guadalupe River, the Boerne City Lake, the Trinity aquifer and Edwards-Trinity aquifer. This on-going drought is characterized by a significant reduction in water availability. A lack of consistent replenishing rainfall over the last consecutive four years (going back to 2021) across the Texas Hill Country has been the culpable reason for our continued drought emergency (Stage 4 Drought Restrictions).

There are four stages CCGCD administers as outlined in detail in Rule 11 Drought Management of the District's rules which can be found at (https://ccgcd.org/wp-content/uploads/2025/03/Rule-11-Drought-Management_20250317.pdf).

At each District's monthly meeting, which starts at 6pm on the second Monday of the month (unless otherwise noted) at the District's office meeting room, the staff provides a detailed presentation which displays the following criteria to address current meteorological and hydrological conditions with the county for a drought stage decision:

1. Actual rainfall year and month to date measurements based on approximately 60 manual/automated rainfall gauges from both the CoCoRaHS network and the National Weather Service. The measured cumulative rainfall totals are compared to annual and monthly averages.
2. Groundwater levels in the 48 monitoring wells across Kendall County are assessed on a monthly basis. A visual review of trends of a few monitoring wells is shown.
3. River flow discharge data in the Guadalupe River at Comfort, TX, FM 474 near Bergheim, TX and near Spring Branch, TX is reviewed over the previous 90-day period.
4. The monthly Palmer Hydrological Drought Index (PHDI) over the past annual period is visually reviewed.

The criteria allow the District and the board at the monthly meeting to review the meteorological and hydrological datasets and trends. Additionally, a weather forecast/outlook for the coming month is also addressed within the meeting. Combining the analysis of the criteria and the weather forecast, the board now has the most up-to-date data to make a decision on the drought stage for the month ahead. This same process occurs each and every month.

Second question: "What metrics have to be met to move from one stage to another?"

Answer to the second question: This is an excellent question. In fact, this is the main question the District is asking itself how to improve the decision-making process for the board, as related to the direction of the drought stage. A Kendall County specific index is being developed by the District for the sole purpose of giving the board another scientific tool to help them make a drought stage decision.

At the monthly meeting, the board gets to review the trends of the four criteria described above. To get the drought stage to move one direction or the other, the previous three months and the forecast come into play.

If a less strict drought stage is to be considered the following trends have to show up:

- Rainfall amounts need to be near average values or trending upwards;
- Well levels would need to have leveled off or increase;
- River flow rates would be consistently flowing near the median value or higher;
- The PHDI would need to approach 0 or go positive in value, which is showing increased soil moisture; and

- The weather forecast would need to show a decent chance for above average precipitation to potentially occur for the upcoming month.

The opposite holds true if a steady or more strict drought stage is to be considered:

- Rainfall amounts trending below average;
- Well levels decreasing;
- River flow rates consistently flowing below median values;
- The PHDI would trend more negative in value, which is showing decreased soil moisture; and
- The weather forecast would need to show a decent chance for below average precipitation to potentially occur for the upcoming month.

Third question: “What amount of rain would improve our status?”

Answer to the third question: The District and Board are looking at all of the quantitative monthly and quarterly trends of the criteria listed above. The District does not currently have a threshold amount of rainfall to occur that would result in a drought stage change. However, the District is addressing this issue by developing it’s index tool which will likely include several different meteorological and hydrological metrics.

To conclude this educational topic, we think it is important to recognize that the District and Board are not usually going to shift out of the existing drought stage based on criteria analyzed over the previous month’s data. In other words, one good set of rainfall events in a monthly period is usually not enough to push us to a lower drought stage. Unfortunately, recovery from our on-going hydrological drought emergency will take several months of average to above average rainfall to see improvement for well levels, river flow rates and increased soil moisture. Currently, there are really no significant signs of improvement as of the writing of this topic.

Stay tuned into CCGCD’s website page, as TXHCWS will soon be providing more educational materials.