



# TEXAS CoCoRaHS OBSERVER



## Autumn 2024

Vol. 10 - 3



Welcome to

The

Texas CoCoRaHS

Observer Newsletter

The purpose of this newsletter is to keep observers informed of the latest news, events, training, and happenings related to the CoCoRaHS program here in Texas, as well as news about the latest weather patterns affecting each region of Texas seasonally.

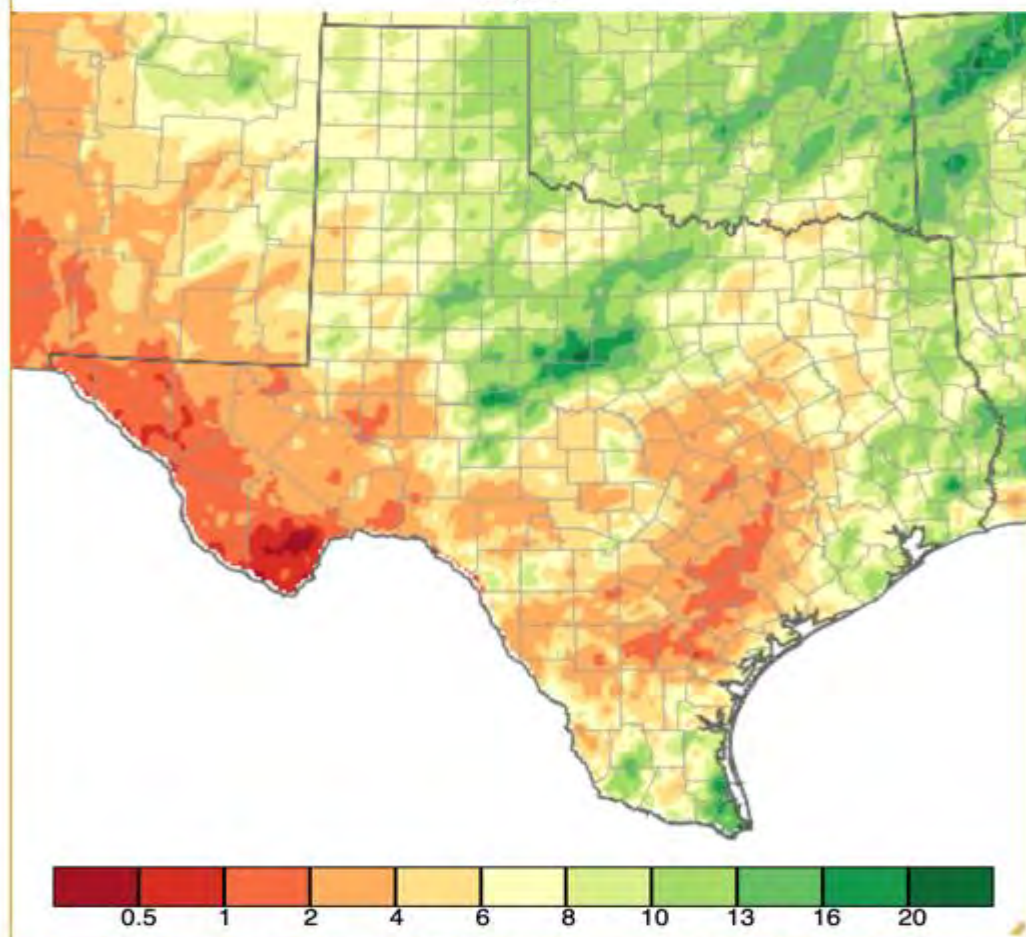
## Texas Autumn Weather Summary

Texas State Autumn Summary

John Nielsen-Gammon, Texas State Climatologist

Texas A&M University

**Total Precipitation - September 1, 2024 through November 30, 2024**



September-November 2024 precipitation (inches), generated by SC-ACIS from Oregon State University PRISM analyses.

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How often do you see the wettest location of the season in the western half of the state?

Continued page 2 >

***“Because Every Drop Counts, As Do All Zeros”***

## Texas Autumn Weather Summary (continued)

The largest reported total was 22.22" from a CoCoRaHS observer near Cross Plains. Usually the second and third wettest locations will be nearby, but not this time. Coming in second was a CoCoRaHS station near the southern tip of Texas, at 19.97", and ranking third was a CoCoRaHS station near Lumberton, measuring 19.45". Conversely, a large swath of the state from south of San Antonio to west of Austin received less than 2" of rain.

I don't know about you, but where I live the precipitation took close to a month-long break in October. Come to think of it, the entire season took a month-long break. When the season resumed, it was about a month behind schedule. We had September's temperatures in October, October's temperatures in November, and who knows where November's weather will eventually end up.

Because the calendar kept moving even though the weather didn't, the fall season was the warmest on record for the majority of the state, including Amarillo, Lubbock, Wichita Falls, and just about every place south of I-30 that's not right along the border with Mexico.

Was it my imagination, or did Christmas decorations go up early this year? Maybe people were trying to remind the weather that it was almost December and that it was supposed to be cooling off. I saw a suggestion that Thanksgiving ought to be moved to the second Thursday in October, because there are too many holidays in the holiday season for this person's liking.

No way! I'm putting my foot down on that one. The sooner we make Thanksgiving, the sooner the Christmas movies start showing up on the Hallmark Channel. And what of Black Friday? Does it simply turn into Black November?

Although it wasn't by design, it was kind of nice that Thanksgiving fell just a few weeks after the presidential election. No matter who you voted for, there was a lot to be thankful for: Joe Biden didn't destroy the country during his four years in office, as some had predicted, so be thankful for that, and also be thankful that the elections themselves were reasonably calm, with all voting and no rioting or decertification. Most importantly, be thankful that many of us can still carry on a conversation without talking about politics.

Oops, I just caught myself talking about politics. I'd better change the subject. But what am I supposed to talk about? The weather or something? Been there, done that. Well, okay, then, as my favorite Thanksgiving movie would say, "You see that Bears game last week?"



## West TX/Southeast NM Weather Summary

### West TX/Southeast NM saw respectable amounts of rain this fall, despite a developing La Nina.

By: James DeBerry, Meteorologist, Hydrology Program Manager, NWS Midland, CoCoRaHS Coordinator

#### September

September got off to a great start, with an upper trough combining with a cold front to produce heavy showers and prolific amounts of rainfall over West Texas and Southeast New Mexico.

On September 1<sup>st</sup>, 2-3" of rain fell in the Rio Conchos and Rio Grande watersheds, briefly bringing the Rio Grande into minor flood below the Rio Conchos and at the Presidio vehicle bridge.

On the 2<sup>nd</sup>, widespread showers and embedded thunderstorms developed along the cold front over the Permian Basin, resulting in widespread flash flooding. The first reports came from Scurry County, where the Emergency Manager reported flooded roadways in the vicinities of Fluvanna and north of Snyder, including US Hwy 84 and FM 1298. Vehicles were stranded, requiring high water rescues. Storms then developed into Mitchell County, flooding roads in and around Colorado City, stranding vehicles there. In Andrews in Andrews County, multiple road closures were reported. In Midland in Midland County, significant water flooded Industrial Avenue, in addition to many other roads. 1-2' of runoff flooded an RV park in west Midland. Business I-20 frontage roads were impassable in spots. Vehicles were stranded throughout the city, and 41 high water rescues were reported. In Big Spring in Howard County, similar conditions were reported. Odessa in Ector County had perhaps the worst flooding, as radar estimates as much as 7" fell northwest of the city in a very short amount of time.

25-30 high water rescues were reported in the city. Runoff flooded up to doorsteps in some areas. St. Hwy 302 flooded near the junction of FM 1936. Flooding was reported along St. Hwy 191 leading into the city. Farther northwest, curb-to-curb flooding was reported in Lovington in Lea County. In Eddy County, 2-3" of rain was reported in various locations, but radar coverage was poor, as

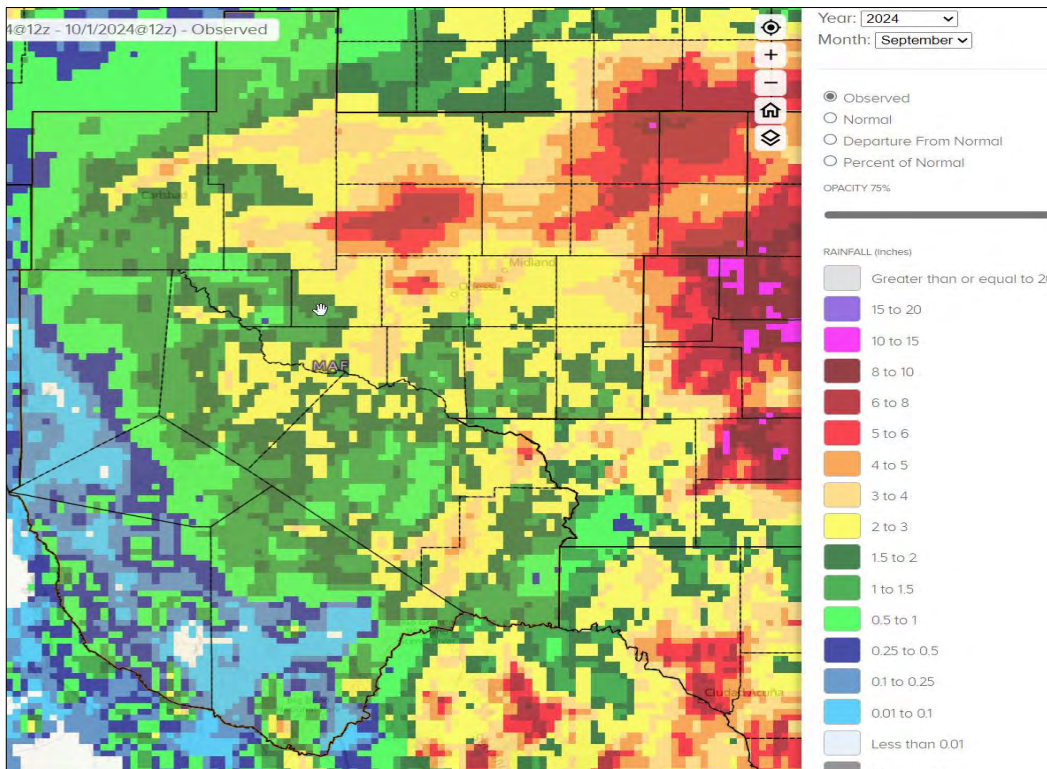


Figure 1: September Precipitation

Unfortunately, that was the only notable hydrologic activity for the month. The rest of September was dominated by a few severe events.

Monthly radar rainfall estimates ranged from nothing in southern Presidio County to up to 15" in southeast Mitchell County. However, the highest observed rainfall was 9.91" 5 miles northeast of Big Spring in Howard County. The average of rainfall reported across West Texas and Southeast New Mexico was 2.23". Reservoir levels averaged 52.3% of conservation capacity as of October 1<sup>st</sup>.

the radar was overshooting much of the activity. Dark Canyon flash flooded, necessitating 3 swift water rescues. In Artesia, Eagle Draw water crossings were closed. Farther south, additional rainfall brought the Rio Grande back into minor flood, again at Presidio, but also downstream at Castolon and Johnson Ranch. Farther north, in Borden County, J.B. Thomas Reservoir rose over 7' in 24 hours. Downstream from that, Deep Creek near Dunn briefly rose into minor flood, as did the Colorado River at Colorado City.

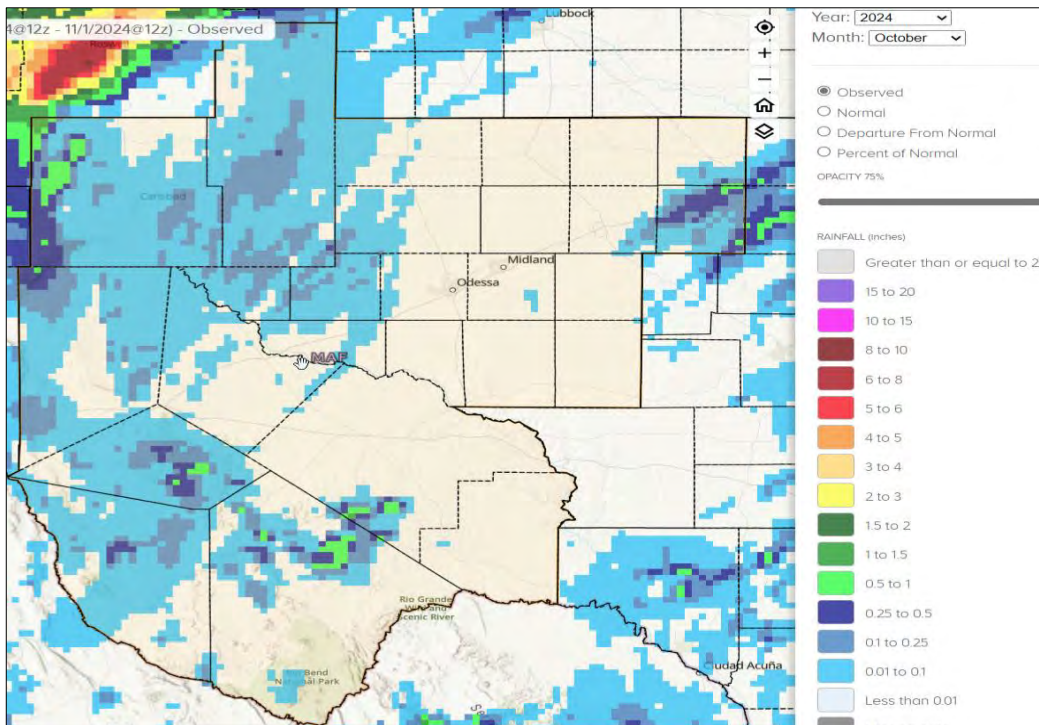
The highest rainfall total for September 2<sup>nd</sup> was 7.10" at Fluvanna in Scurry County. Highest radar estimate was 7.54" northwest of Odessa in Ector County. Midland International Air & Space Port received 3.63" of rainfall, completely erasing its annual deficit, and then some.

## West TX/Southeast NM Weather Summary (continued)

### October

October was uneventful hydrologically, characterized by few storm systems and dry fronts. No notable hydrologic activity was reported, and very little rainfall occurred.

Monthly radar rainfall estimates ranged from nothing across most of the HSA to up to 1.5" in northwest Eddy County. The highest observed rainfall was 0.46" at Pine Springs in Culberson County. The average of precipitation reported across West Texas and Southeast New Mexico was 0.05".



**Figure 2: October Precipitation**

### November

November would have been another dry month, were it not for a single event mid-month, when a Pacific front caught up to and merged with a dryline, resulting in an abundant shot of rainfall over the eastern HSA.

This line of convection first flooded roadways on the evening of November 17 north of Seminole in Gaines County, stalling a few vehicles and even putting one underwater.

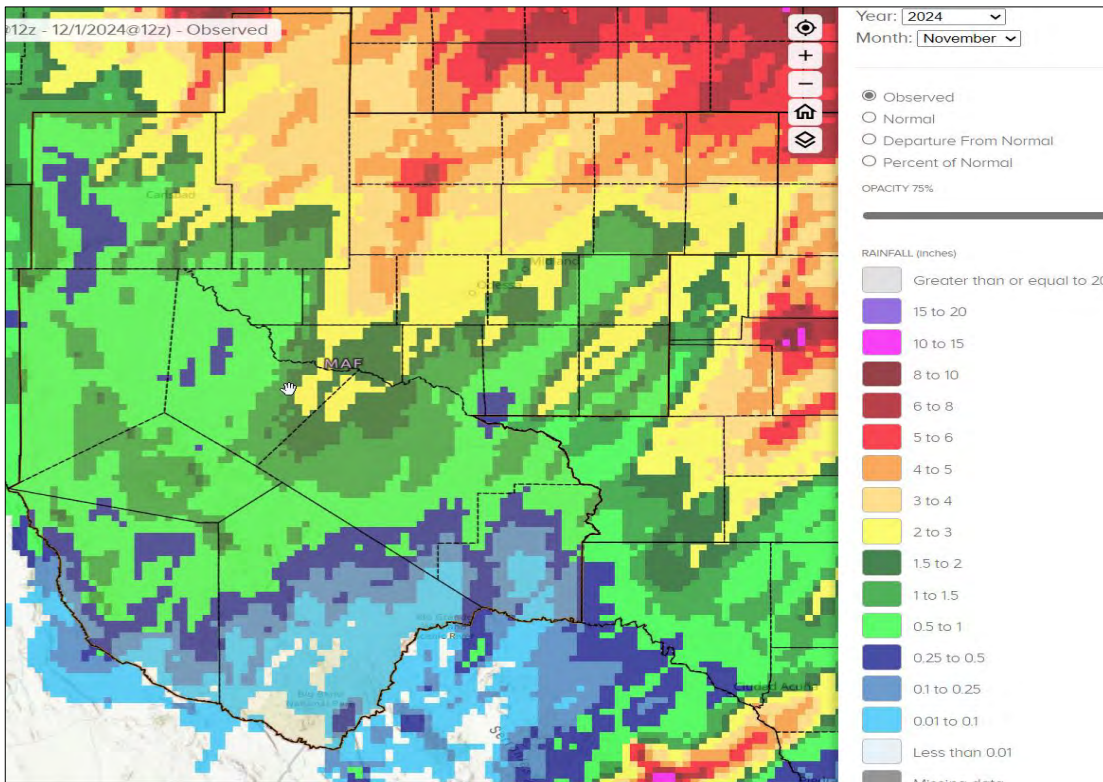
As it moved into Odessa in Ector County, several cars were stranded in high water.

The line of convection continued moving east overnight. QPE suggests rainfall amounts were high enough to flood many other locations, but no other reports came in.

Monthly radar precipitation estimates ranged from nothing over southern Brewster County to up to 8" in northern Scurry and Lea Counties. Indeed, the highest observed rainfall was 6.10" at Fluvanna in Scurry County. The average of precipitation reported across West Texas and Southeast New Mexico was 1.45". See figure 3 next page.



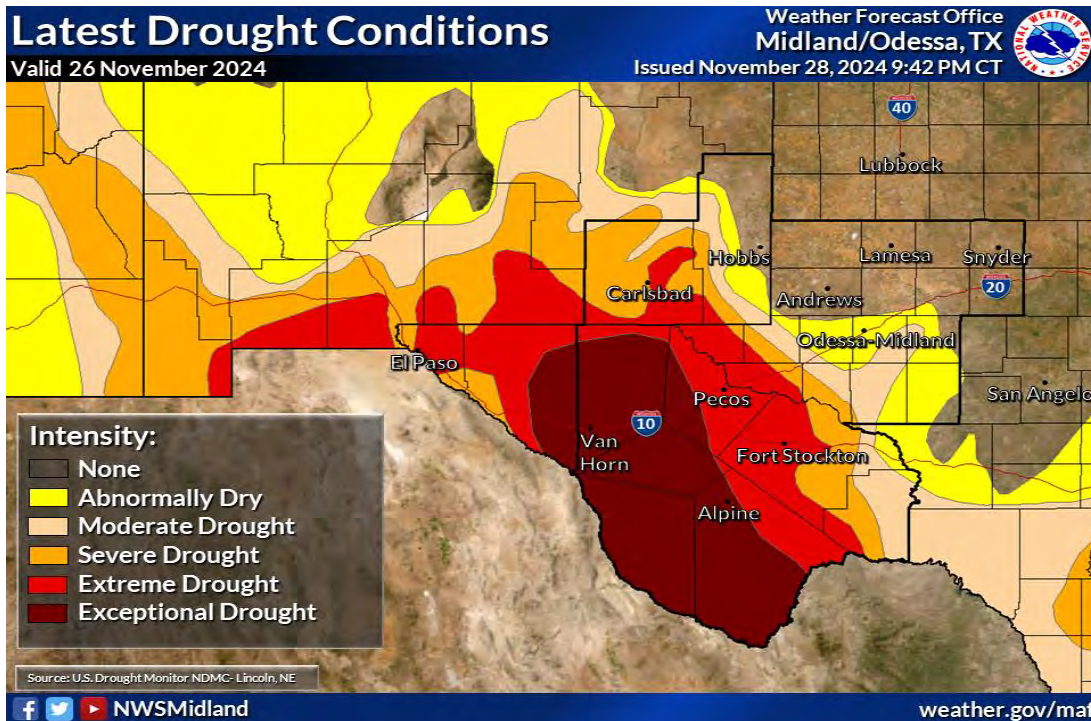
### West TX/Southeast NM Weather Summary (continued)



**Figure 3: November Precipitation**

Overall, fall 2024 was dry for West Texas and Southeast New Mexico along and west of the Pecos.

As of November 26<sup>th</sup>, the West Texas and Southeast New Mexico along and west of the Pecos were generally in severe to exceptional drought. Conditions improve considerably to the east. Area reservoirs are at 58.5% of conservation capacity as of December 1st.



**Figure 4: Drought conditions across West Texas on November 28, 2024**

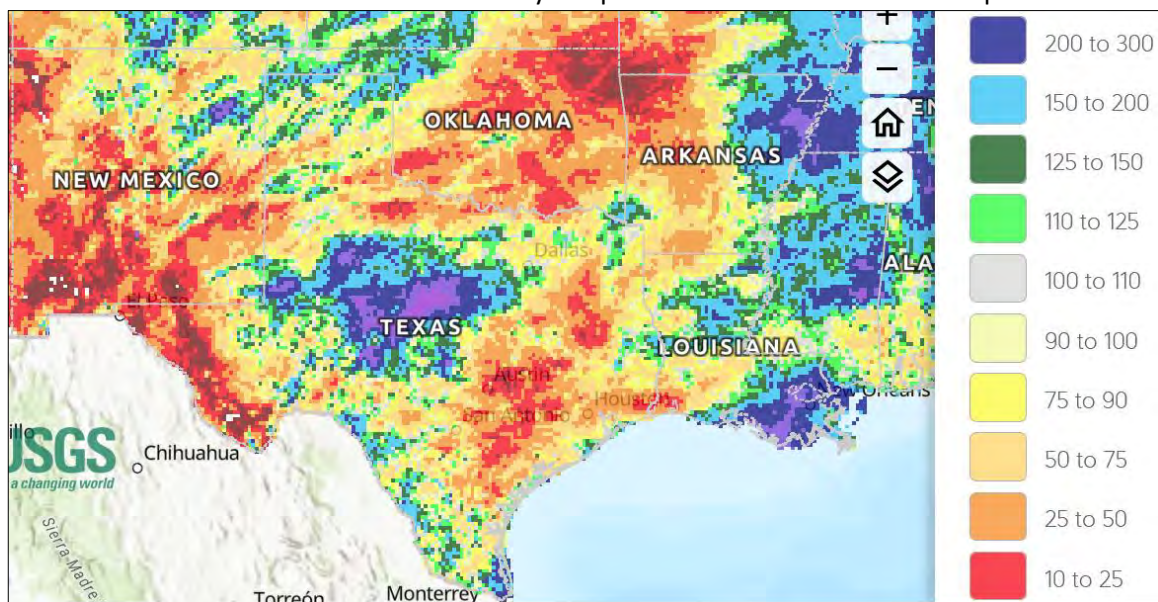
## North Texas Regional Summary

### Very few Storm Systems to cover this Fall Season

By: Greg Story, North Texas CoCoRaHS Regional Coordinator

Hello to all CoCoRaHS observers from the North Texas Regional Coordinator! In this newsletter article I like to review the weather from the past several months, specifically the fall season. Once again, your weather observations helped greatly in determining the amount of rain that actually fell.

Reviewing the weather of the past several months, in April all of northern and eastern Texas saw above normal rainfall, as well as portions of the Texas Panhandle. Some parts of Southeast Texas received much above normal rains. In May all of northern, central and eastern Texas got above normal rainfall. And some locations in Central and Southeast Texas picked up much above normal precipitation. In June the weather started to dry out after the wet spring season. The rainfall was above normal over Northeast Texas and Deep South Texas. The precipitation was below normal from the western parts of North Texas down into Southwest Texas. In July it turned wet again over parts of the state. Above and much above normal rainfall was noted over Central and Southeast Texas. Meanwhile, much of Northwest and Southwest Texas saw below normal precipitation. In August most of Texas had below normal rainfall. Only the northwest Texas Panhandle saw above normal precipitation. In September portions of west Central Texas saw above to much above normal rainfall. But much of eastern, southern and far western Texas saw below normal precipitation. In October it was an extremely dry month statewide, with portions of south central and western Texas receiving no rainfall at all. Only the extreme southern tip of Texas had near normal rains. In November it turned very wet over the northwest third of the state with above to much above normal precipitation observed. The southeast two thirds of Texas had near to below normal rainfall. Only Deep South and Southwest Texas experienced much below normal rains.



**Figure 1: September 2024 Percent of Normal Precipitation Map.** In September portions of west central Texas saw above to much above normal rainfall. But much of eastern, southern and far western Texas saw below normal precipitation.

At DFW airport in September 2024 there was 2.24" of rainfall. The normal amount of precipitation in September is 2.72" so DFW was -0.48" below normal for the month. In Waco for September 2024, there was up 1.17" of rain. The normal amount of rainfall for September is 2.87" so Waco was -1.70" below normal for the month.

For each month, I will highlight the more significant weather events. I know I am giving you a lot of information, and it is my intent for you to pick your "favorite" storm or to look at a particular date each month to see what happened. Which days did you report your heaviest precipitation amounts? You can read about those days here and compare what you observed against the maximum amounts.

There were about six storm systems which affected our weather in September. Here are the highlights of the weather for the month on the next page.



## North Texas Regional Summary (continued)

### September 1 - 4:

The combination of a tropical wave off the Texas Gulf coast and a stationary upper-level low pressure system over West Texas resulted in rainfall for several days. On the 1st the heaviest rain was located over South Texas where 3.78" fell south southeast of Hebbronville and 3.67" occurred northeast of Galveston. In North Texas, northeast of downtown Dallas an observer measured 1.34". The rain continued on the 2nd, especially over West Texas. It became particularly heavy over the southwestern parts of North Texas where 8.14" was observed west northwest of Cross Plains and 7.57" occurred south of Ranger. Near the DFW metroplex on the 2nd the area north northeast of Cresson had 1.43". The rain continued into the 3rd, and became especially heavy over the Texas Hill Country and around Del Rio. There was 7.05" west southwest of Llano and 6.59" east northeast of Hondo. And in North Texas on the 3rd the area northwest of Decatur had 3.07" and an observer west northwest of Benbrook measured 2.75". The rain shifted to more of northern, eastern and southeastern Texas on the 4th. The largest rainfall amount in North Texas was south southwest of Runaway Bay with 1.24". But elsewhere in Texas there was 3.01" northeast of Rockport and 2.88" north northeast of Port Aransas.

### September 5 - 6:

A large area of showers and thunderstorms continued in association with a broad area of low pressure, which interacted with a weak frontal boundary, over the northwestern Gulf of Mexico on the 5th. Then a strong cold frontal boundary moved through Texas on the 6th. Isolated heavy rainfall occurred across portions of the northern Gulf Coast during this period. On the 5th there was 1.97" east northeast of Bon Wier and 1.88" south southwest of Jasper. A few thundershowers persisted over northern and eastern Texas on the 6th. Over North Texas the heaviest rainfall was 0.71" south southeast of Flower Mound. But over Southeast Texas had 1.02" northeast of Galveston and 1.01" southwest of Mauriceville. All the rain moved out of the state or dissipated late on the 6th.

### September 9 - 12:

A tropical system developed on the 9th over the southwestern Gulf of Mexico, which further developed into hurricane Francine on the 10th. Initially Francine dumped very heavy rainfall over the southern tip of Texas on the 9th. There was 7.15" east of Brownsville. Then as Francine moved north, then northeastward, the outer bands continued to produce rainfall along and near the Gulf coast. On the 10th there was 1.72" at Deweyville and 1.42" just west of Evadale. Hurricane Francine made landfall over the coast of Louisiana the afternoon of the 11th. Some rainfall continued on the hurricane's west side over East Texas. There was 4.67" at Gilmer and 2.98" north northwest of Zavalla. By the 12th Francine weakened to a tropical depression and moved from south to north over Mississippi. Most of the rainfall was east of Texas by the 12th.

### September 14 – 16:

An easterly wave of low pressure produced three days of heavy rainfall the 14th through the 16th. On the 14th there was 2.50" north of Laredo and 2.08" at Columbia Bridge. On the 15th there was up 5.61" east of Rancho Viejo and 5.38" west of Harlingen. Then on the 16th there was 3.06" measured northwest of Kingsville and 2.86" at Progresso on the Rio Grande.

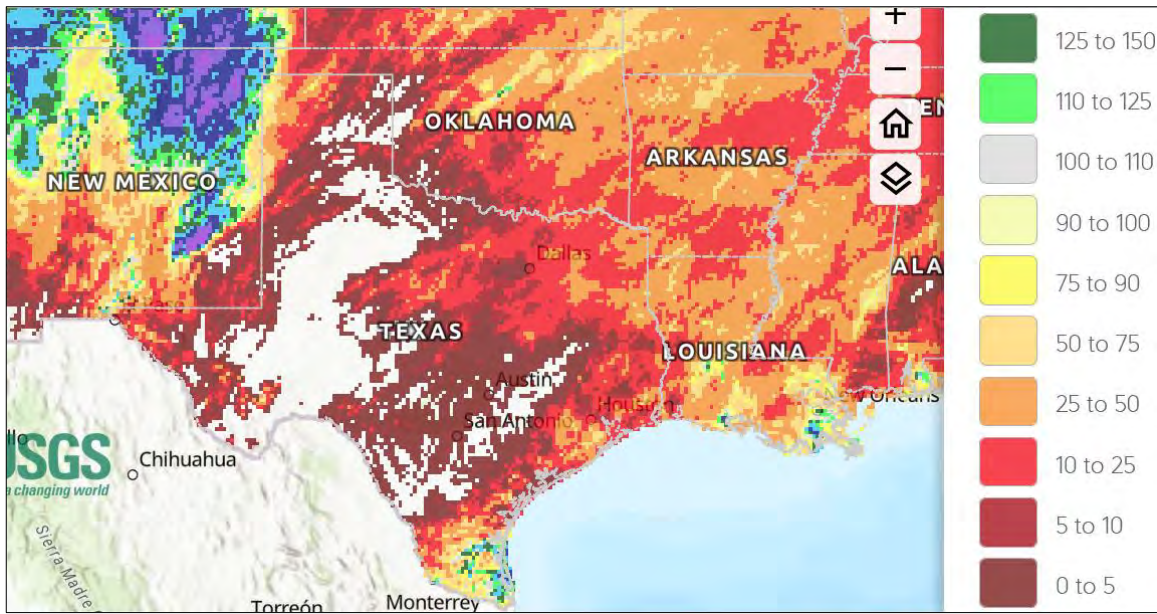
### September 22 – 23:

A cold front moved out of Oklahoma into Texas on the 22nd, and moved toward Central Texas on the 23rd. Rainfall developed on either side of the front on the 22nd, and this rainfall continued into the 23rd. On the 22nd some locally heavy rain occurred over the western parts of North Texas, with the heaviest being 4.70" just northwest of Rising Star and 4.25" south southeast of Abilene. In North Texas on the 22nd the area west of De Leon measured 3.73", south of Ovilla there was up 2.35", and north northwest of Duncanville there was 2.30". During the day on the 23rd the rain shifted to Central and East Texas. The heaviest rainfall reports included the area north of Hamilton with 2.17", Covington with 1.95", and southeast of Midlothian with 1.91".

### September 25:

Another cold front moved south out of Oklahoma into Texas after midnight on the 25th. It generated some showers and thunderstorms over North Texas prior to sunrise. Also, other showers occurred across eastern and southern Texas. The heaviest rainfall in North Texas was west northwest of Pottsboro with 1.76". Meanwhile, the area west southwest of Plano measured 1.58" and the region north northwest of Gordonville received 1.55". Elsewhere in Texas prior to dawn on the 25th there was 2.89" at Lufkin and 2.30" south southwest of Port Aransas. Showers and thunderstorms continued across primarily Southeast Texas during the day on the 25th, but additional rainfall readings were fairly light.

## North Texas Regional Summary (continued)



**Figure 2: October 2024 Percent of Normal Precipitation Map.** In October it was an extremely dry month statewide, with portions of south central and western Texas receiving no rainfall at all. Only the extreme southern tip of Texas had near normal rains.

At DFW airport in October 2024 there was 0.21" of rainfall. The normal amount of precipitation in October is 4.37" so DFW was -4.16" below normal for the month. In fact, this was the 9th driest October on record. In Waco for October 2024, there was up 0.72" of rain. The normal amount of rainfall for October in Waco is 4.41". Waco -3.69" below normal for the month. Dallas/Fort Worth was so dry that it landed on the top 10 list of consecutive days without any precipitation. The dry spell began September 26 and ended on October 28. This was 8th on the list at 33 days. The longest stretch of history was 55 days in 2000. By contrast, Waco's record of consecutive days without any rain was 56 days, and that record was set last year in 2023.

There were only two storm systems which affected our weather in October. Here are the highlights of the weather for the month.

### October 4 - 5:

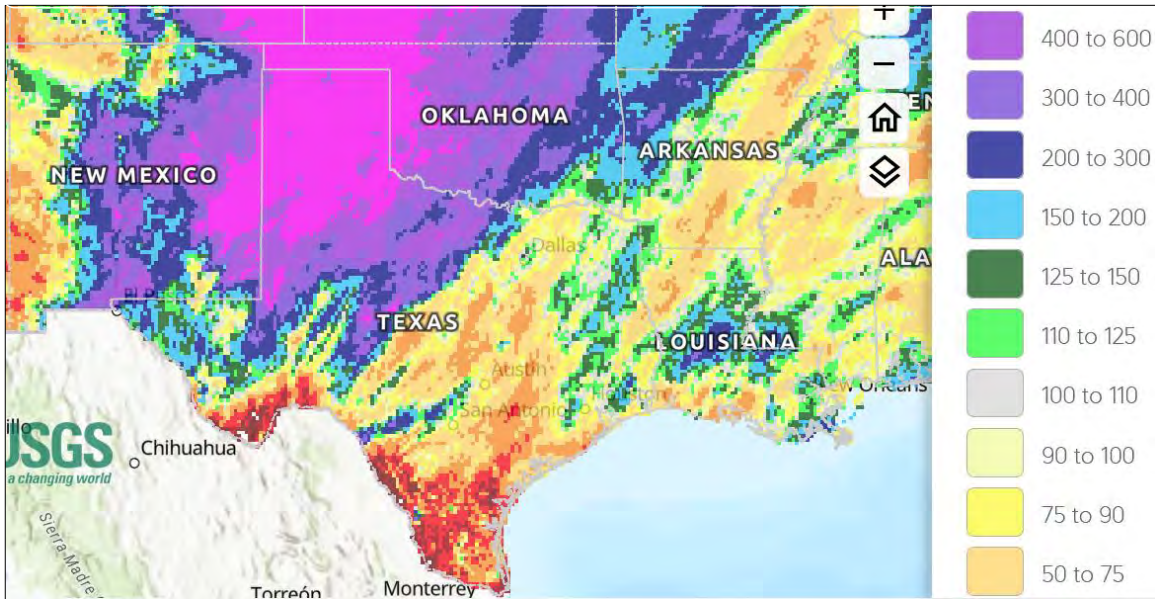
A tropical wave, which later became major hurricane Milton over the southwest Gulf of Mexico on the 7th, produced some rain over the southern tip of Texas. The heaviest rain on the 4th was 1.98" at Buena Vista (Laguna Atascosa) and 1.79" east of Rancho Viejo. Then on the 5th the maximum rainfall was 2.08" at Progreso (Rio Grande at Progreso Bridge) and 1.82" northeast of Harlingen.

### October 30 - 31:

A cold front moved into Texas that finally brought some rainfall. The heaviest rainfall late on the 30th into the early morning hours of the 31st was 1.66" north northwest of Josephine and 1.49" west of Canton. The rain shifted into east and Southeast Texas as the front moved southeastward on the 31st, with the rain leaving the state before midnight. The rain became very heavy over Southeast Texas, with maximum rainfall amounts of 5.16" northeast of Richmond and 3.50" north northeast of Lumberton.



## North Texas Regional Summary (continued)



**Figure 3: November 2024 Percent of Normal Precipitation Map.** In November it turned very wet over the northwest third of the state with above to much above normal precipitation observed. Southeast two thirds of Texas had near to below normal rainfall.

At DFW airport in November 2024 there was 1.60" of rainfall. The normal amount of precipitation in November is 2.53" so DFW was -0.93" below normal for the month. In Waco for November 2024, there was 1.89" of rain. The normal amount of rainfall for November is 2.71" so Waco was -0.82" below normal for the month. Wichita Falls experienced the wettest November of record at 7.85".

There were only three significant storm systems which affected our weather in November. Here are the highlights:

### November 1 - 5:

A long wave trough began to develop on the 1st, and this trough deepened into a large low pressure system south of the Four Corners region by the 4th. Initially, showers developed over both northern and southern Texas on the 1st. Over North Texas the maximum rainfall amounts were at Denton with 1.39" and south of Sanger with 0.98". But further south there was 5.00" northwest of San Angelo and 4.40" northwest of Quemado. On the 2nd more widespread showers and thunderstorms developed over West Texas while more isolated, but locally heavy, rainfall continued over south parts of the state. In North Texas on the 2nd the heaviest rainfall was at Bonita with 3.20" and northwest of Gordonville with 1.69". But further south there was 6.26" northeast of Richmond and 4.74" at Laguna. On the 3rd locally heavy rainfall occurred from across western into extreme northern Texas, as well as over southern parts of the state. For the second day in a row, the maximum rainfall amounts over North Texas were at Bonita with 2.23" and north northwest of Gordonville with 2.01". But over South Texas on the 3rd there was 3.30" south of Brackettville and 2.76" east northeast of Roman Forest. The areas of showers and thunderstorms began to progress slowly eastward toward Central and East Texas on the 4th as a cold front moved southeast. Over North Texas, the area west northwest of Duncanville received 3.63", while north of Quitman there was up 3.49". But over South Texas on the 4th there was 5.44" north northeast of Fair Oaks Ranch and 4.73" northeast of Boerne. The rain moved out of Texas by the evening of the 5th. Residual rainfall reports measured 1.63" at Palacios and 1.53" north northwest of Hedwig Village.

### November 7 - 9:

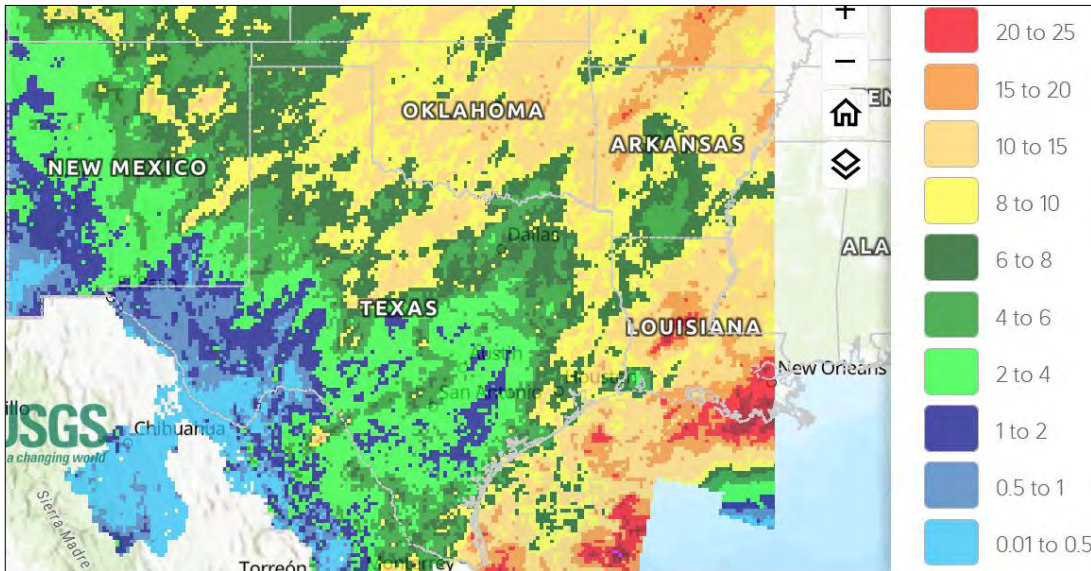
A new closed low pressure system aloft formed over New Mexico on the 7th. Showers and thunderstorms began to develop the morning of the 7th primarily over western and northern Texas. Very heavy rainfall occurred over the Concho valley and the Big Country. The heaviest rainfall on the 7th was 5.44" north northeast of Silver Valley at Lake Coleman, 5.38" at Cross Plains, and 5.05" at San Angelo. In North Texas there was 4.91" southwest of Graford at Possum Kingdom Lake. Showers and thunderstorms continued over West Texas on the morning of the 8th, and these thundershowers advanced into central and eastern Texas as the day progressed. Over North Texas the maximum rainfall on the 8th was at Graham with 1.56" and north of Mesquite with 1.51". But elsewhere in Texas there was 7.12" south of Kountze and 5.17" northwest of Appleby. Most of the rainfall moved out of Texas during the day on the 9th as a cold front crossed the state.

### North Texas Regional Summary (continued)

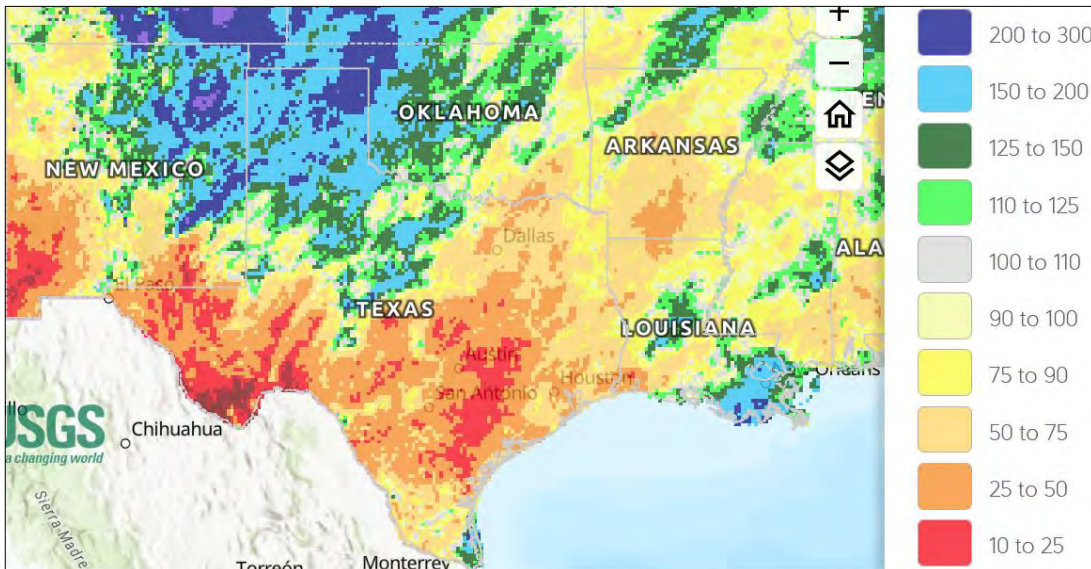
Residual rainfall amounts included 4.61" north northwest of High Island and 3.66" at McFadden. Some locations in Southeast Texas received their largest multi-day rainfall amounts (over 10") during this event since Hurricane Harvey.

November 17 - 18:

A deep upper atmospheric low pressure system began to develop over northwest Mexico on the 17th. This low advanced eastward, then northeastward across West Texas toward the central plains on the 18th. Showers began to develop the morning of the 17th over West Texas, and the rainfall advanced eastward through the day. Showers also developed over Southeast Texas. Prior to dawn on the 17th, there was 0.95" at Houston (Westbury) and 0.93" west northwest of West University Place. Showers and thunderstorms formed into a line across West Texas during the afternoon and evening of the 17th, while clusters of thundershowers continued across eastern portions of the state. During the day and evening on the 17th the maximum rainfall amounts in North Texas were at Fort Worth Eagle Mountain Lake with 3.00" and west northwest of Justin with 2.76". But elsewhere in the state there was up 4.10" at Brownfield and 3.87" southwest of Seagraves. The showers and thunderstorms continued to advance eastward on the 18th and moved east of Texas late in the day. The rainfall amounts on the 18th were all under 1" over North Texas, and the heaviest in the state were 2.42" southwest of Jasper and 2.34" east northeast of Woodville.



**Figure 4: 2024 Fall Season Observed Precipitation Map.** The red, brown, and tan colors indicate the higher precipitation totals, while the light green, navy and light blue colors show the lightest amounts. Note that parts of the lower Texas Gulf coast exceeded 20" for the season.

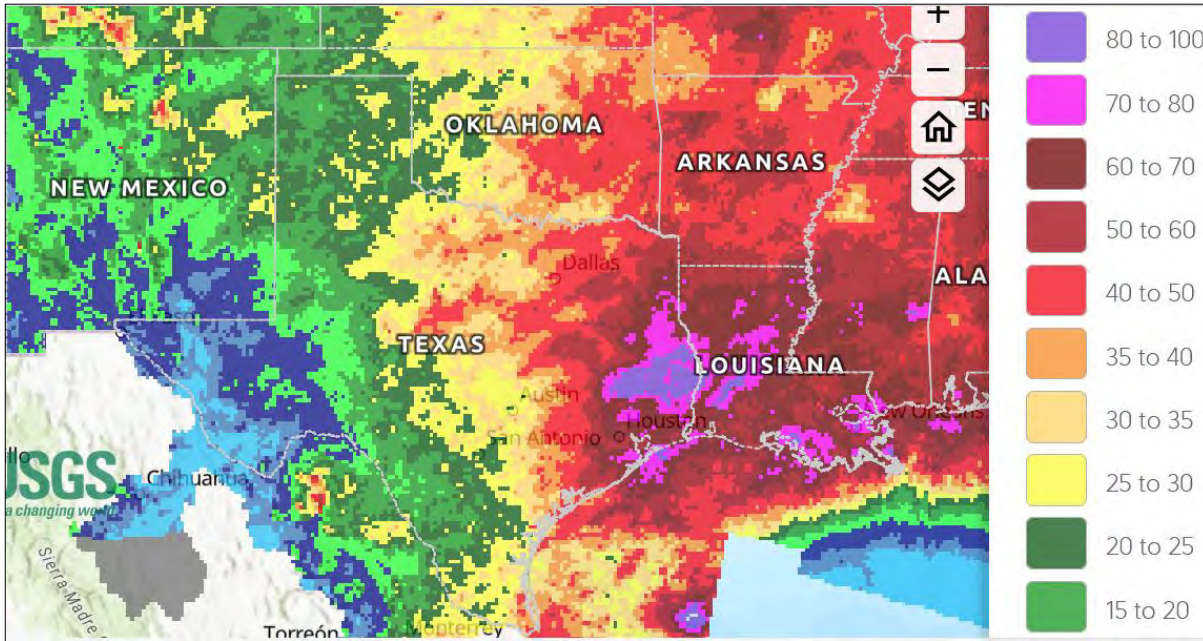


**Figure 5: 2024 Fall Season Percent of Normal Precipitation Map.** It was a wet autumn for Northwest Texas, as well as over the southern tip of the state. But it was a severely dry fall over south central and Southwest Texas.

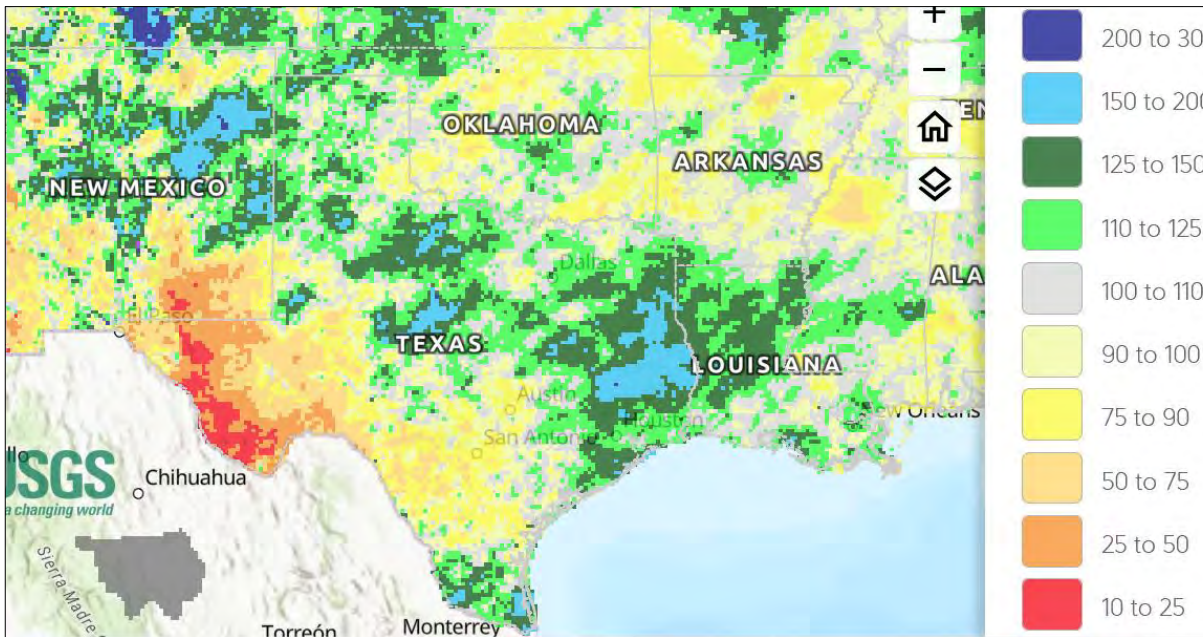


### North Texas Regional Summary (continued)

For the fall season (September through November) DFW airport recorded 4.05" of rainfall. The normal amount for autumn is 9.62" so DFW was -5.57" below normal for the season. In Waco for the fall season, there was up 3.78" of rain. The normal amount of precipitation in autumn is 9.99" so Waco was -6.21" below normal for the season.



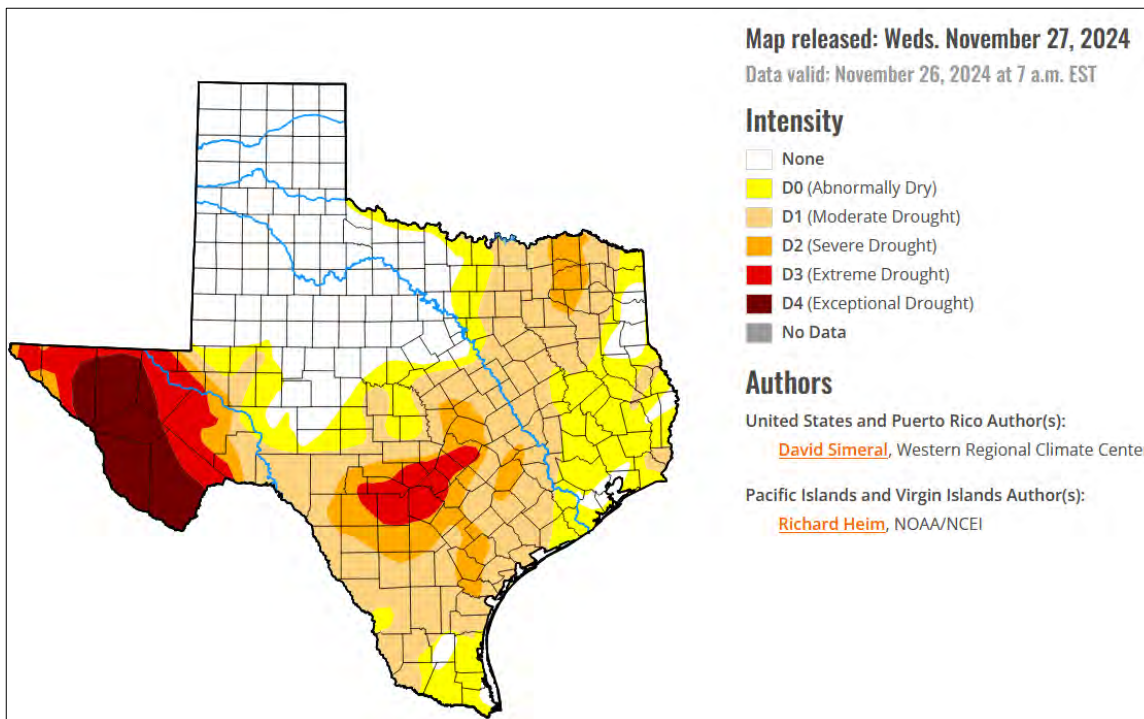
**Figure 6: Year to Date Observed Precipitation Map for January through November 2024.** Note the extremely heavy rainfall which has occurred over east central and Southeast Texas.



**Figure 7: Year to Date Percent of Normal Precipitation Map for the first 11 months of 2024.**

So far in 2024, with one month to go, DFW has received 35.75" (normal amount is 34.17") and Waco has picked up 35.27" (normal amount is 33.53").

## North Texas Regional Summary (continued)



**Figure 8: Current Drought Monitor for Texas as of November 27.**

The results of the wet weather of the past three months show up well on the drought monitor above, with moist soil moisture conditions over most of Northwest Texas and the Texas Panhandle. But the results of the dry weather from this fall also show up well over western Texas and parts of the Hill Country. The western parts of North Texas are in good shape, while the eastern parts are in moderate to severe drought. The areas in Texas that are abnormally dry (or worse) dropped from 81% to 67% in the past three months. This means 33% of the state is free from any drought intensity category. About 50% of the state is experiencing some level of drought. Portions of far West Texas are experiencing the worst drought category, which is exceptional drought (covering 6% of the state).

Thanks again for your dedication in making all your weather observations! I'd like to share a few reminders in closing. First, we know there will be days you may not be home over the Christmas holidays to report your 24-hour rainfall observation. Upon your return, you can make a multi-day accumulation report. There is a link on the CoCoRaHS reporting page you can use for this purpose. Second, all CoCoRaHS data is quality controlled each day. The intent is for us to recognize reporting errors that may occur. So, one of us may contact you one day in case we have any question about one of your reports. If you have difficulty making your observations or have questions on how to report them, please feel free to contact me or your county coordinator. Third, be confident in knowing your rainfall reports are looked at and used every day. As one example, CoCoRaHS data is incorporated by the National Weather Service at the West Gulf River Forecast Center for use in their soil moisture accounting flood forecasting models. So please continue to submit your reports. The more rainfall reports that our collected, the better the chances are of determining the highest rainfall totals during rainfall events. And when it doesn't rain, your zero reports make it easier to determine the exact location of and the magnitude of drought. We appreciate it when you report zero rainfall daily on the dry days.

Thanks to all of you, and have a Merry Christmas and Happy New Year!

Greg Story

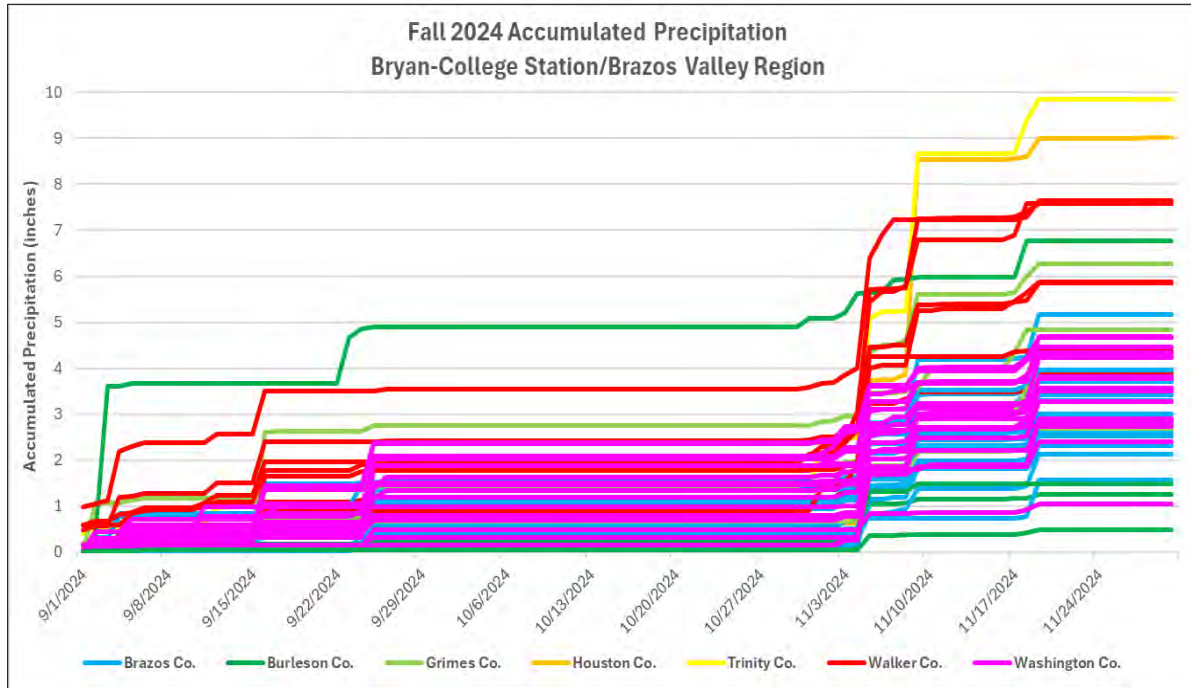


## Brazos Valley Regional Summary

### Fall 2024 Precipitation Summary

#### Bryan-College Station/Brazos Valley Region, Texas

Victoria Elliott Ford, Texas A&M University, Office of the State Climatologist of Texas



#### Summary:

Our region usually sees an increase in precipitation as we move from summer to fall, but this year was an unfavorable exception. The beginning of September was a mixed bag, with some folks receiving a large amount of precipitation while others stayed on the drier side. Once we hit mid-September, precipitation disappeared altogether until the beginning of November. The final month of the quarter saw a few precipitation events that helped bring us closer to our seasonally normal totals but still stopping short of where we would like to be. The overall average rainfall accumulation for our region was 5.49" while the normal seasonal amount is 12.39". As a result, we were 6.89" below what is normally expected for fall in our area. On a county level, precipitation anomalies were below normal across the board. The driest was Burleson County at -9.00" below normal, followed by Brazos (-8.95"), Washington (-8.84"), Grimes (-8.29"), Walker (-6.75"), Trinity (-3.26"), and Houston (-3.16"). As a result of these totals, drought now plagues the Brazos Valley, and this is not expected to improve much over the winter quarter due to the expected La Niña forming.

#### Observer Statistics:

Throughout the fall season, we had 60 active observers reporting their precipitation totals with 32 observers missing no more than 10 days of reporting. Of these, 15 did not miss a single day! Overall, 52 stations were used to calculate this season's records. We thank you for your vital contributions!

#### Season Statistics:

*Wettest Day:* 4.65", November 9, Houston County

*Wettest Seasonal Total:* 9.86", Trinity County

*Driest Seasonal Total:* 0.48", Burleson County

*Soggy Socks Award:* (longest spell with measurable rain): 8 days, Oct. 31-Nov. 7, Walker County

*Dusty Soles Award:* (longest spell without measurable rain): 52 days, Sep. 12-Nov. 2, Washington County

## East Texas Regional Summary

### No Rain from late September through October brings Severe Drought Conditions

By: Davyon Hill (Lead Meteorologist/National Weather Service-Shreveport)

Drought conditions were already in place across the region as we moved into the start of the fall season. Despite rainfall from several frontal boundaries during the first half of September, precipitation amounts did very little to improve drought conditions. Unfortunately, the region’s drought situation increasingly got worse from the second half of September through the month of October. In fact, nearly all of our East Texas CoCoRaHS sites didn’t report any rain from the end of September through most of the month of October. This resulted in Severe Drought conditions over the region, along with Burn Bans in nearly every county in East Texas.

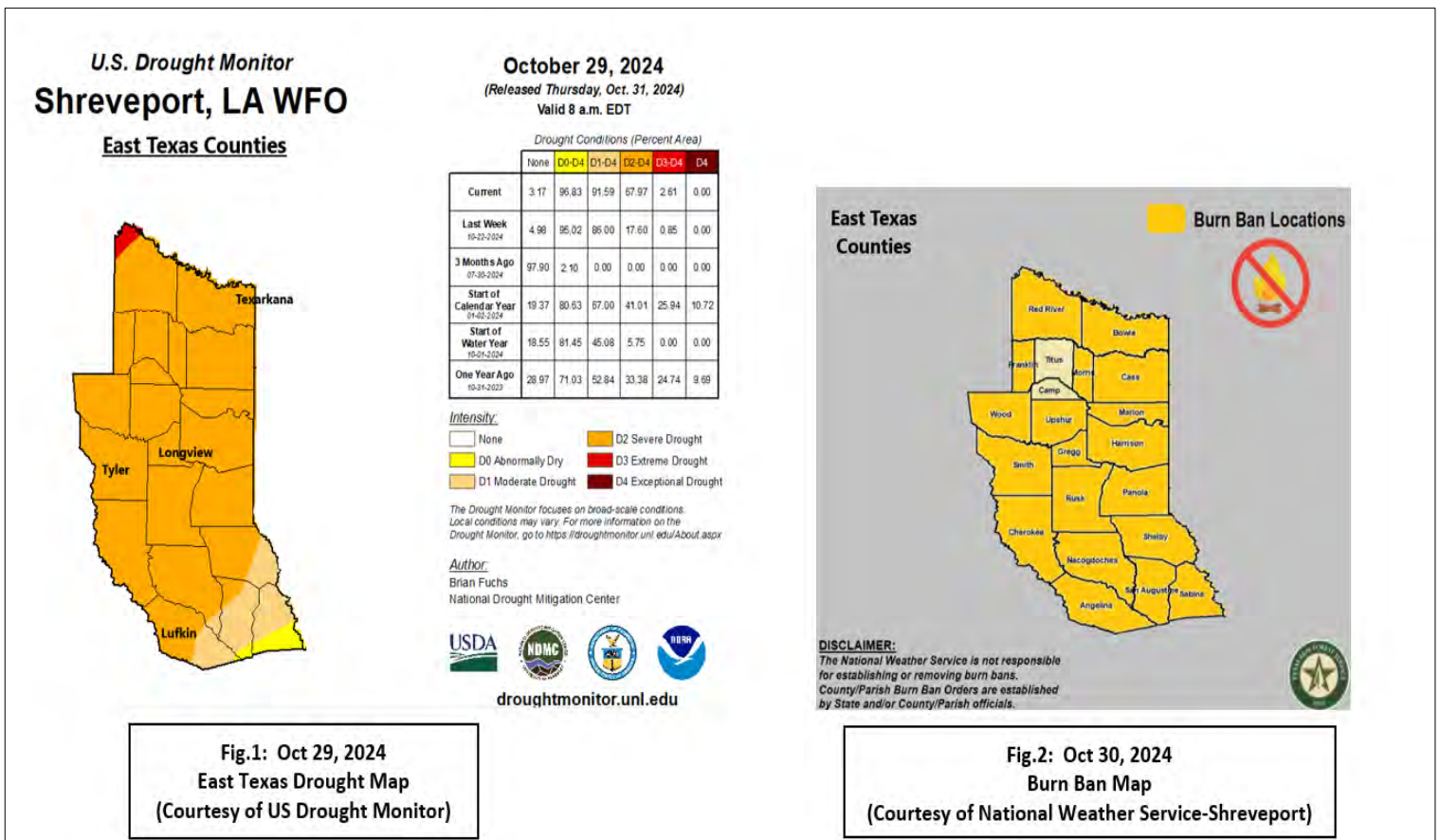
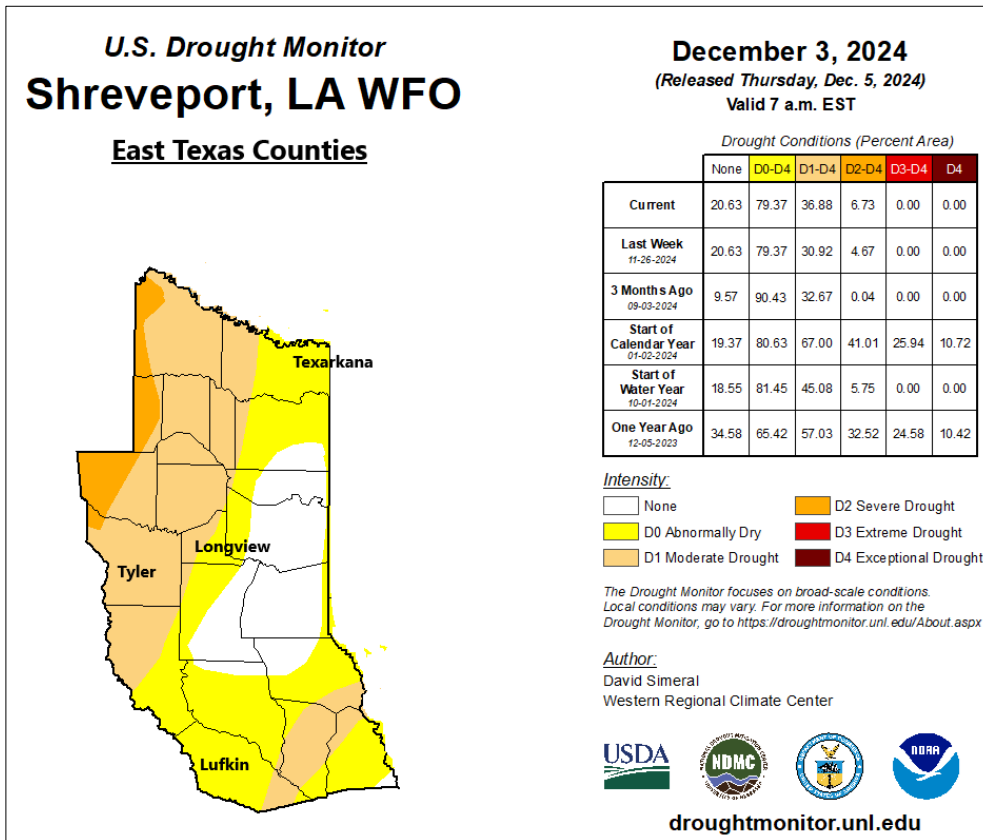


Figure 1 and 2: East Texas Drought Conditions at the end of October



### East Texas Regional Summary (continued)

As we moved into the month of November, the weather pattern become more active. A series of cold fronts, brought much needed rainfall at the beginning of the month along with some hazardous weather. An EF-1 tornado was reported in eastern Red River County on the 4<sup>th</sup>, just west of the town of Avery. Fortunately, only sporadic tree damage was reported. On the following day, heavy rain was reported across the region, with many of our CoCoRaHS sites near and north of the Interstate 20 corridor receiving 2” to 3” of rainfall. The National Weather Service climate sites at both Tyler and Texarkana reported record daily rainfall amounts on the 5<sup>th</sup> of 2.11” and 2.09” respectively. Another frontal boundary brought more significant rainfall on the 8<sup>th</sup> and 9<sup>th</sup> of the month, with CoCoRaHS sites in counties near the Louisiana and Arkansas borders reporting between 2” to 4” on the morning of the 9<sup>th</sup>. However, drier conditions returned for remainder of November. The good news is that the rainfall at the first portion of the month was enough to improve drought conditions over the region and lift nearly all of the burn bans. But, abnormally dry to moderate drought conditions still remain over most of the area for the start of the meteorological winter.



**Fig.3: Drought Monitor**  
**Dec. 3, 2024**  
**Image Courtesy of NDMC/USDA/NOAA**

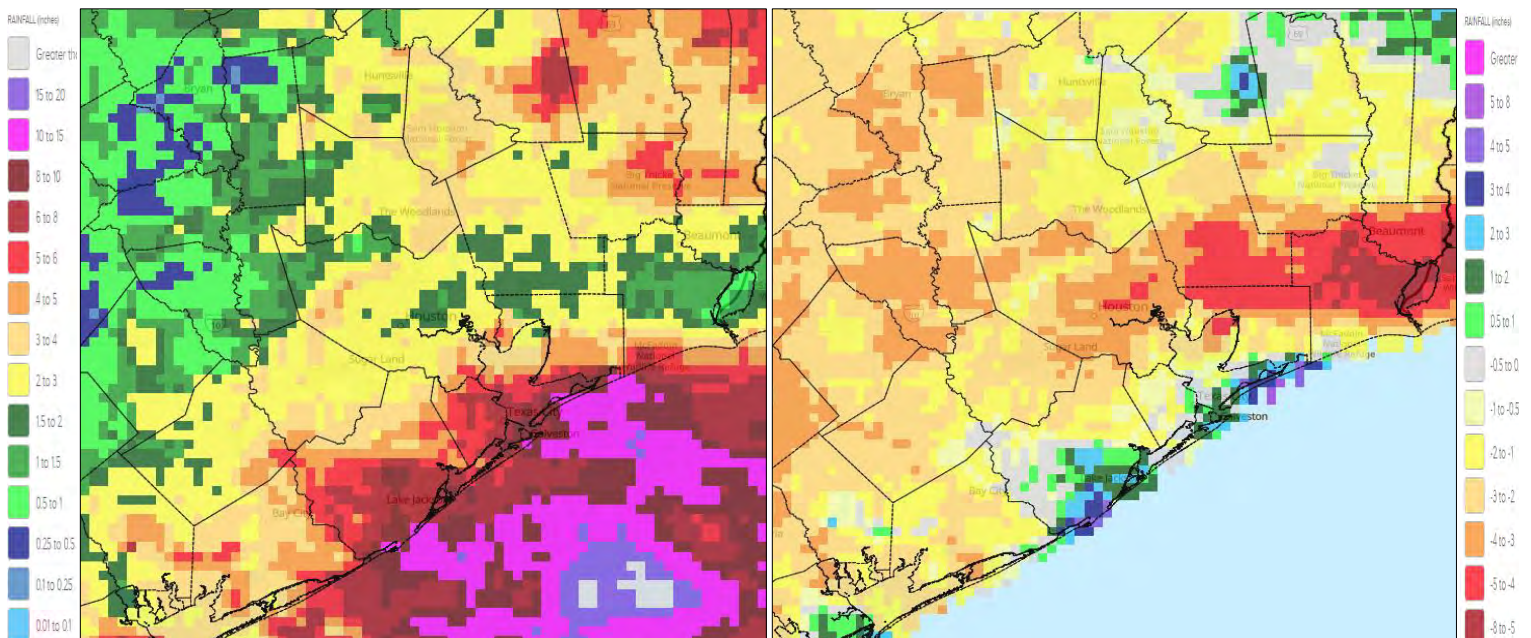
## Southeast Texas Regional Summary

### Very Dry and Warm Autumn across Southeast Texas

By: Ron Havran, Southeast Texas CoCoRaHS Regional Coordinator, HCFCD

#### September

Most of southeast Texas rainfall totals were three to five inches below normal for the month. Coastal counties had the most rainfall this month with Galveston having the most at 5.65", followed by Brazoria (5.39"), and Matagorda (4.98"). Tyler County in the Golden Triangle Section had 4.18". Most inland counties had large rainfall departures from normal. The largest departures from normal were from the Golden Triangle westward to far western parts of the Houston/Galveston Section. The driest county in all southeast was Austin with only 0.74", followed by Colorado (0.88"), Chambers (1.44"), Wharton (1.59"), Jackson (1.64"), and Fort Bend with 1.71". Temperatures were slightly above normal but there was plenty of high heat indexes with dew points running near 80° on most days until the last week of the month.



**Figure 1: September 2024 Total Precipitation and Departure from Normal across Southeast Texas.**

#### October

Most of October was rain-free across all of Southeast Texas until the last few days of the month when a moist onshore flow brought some showers to mainly coastal counties. Most of Southeast Texas had rainfall departures around 3.00" to 5.00" below normal. Inland counties didn't have any rainfall until the last days of the month with only low rainfall totals of less than 1 inch. Jefferson County had the most rainfall reported by CoCoRaHS observers in Southeast Texas with 2.35". The next highest amount was Fort Bend (1.80), followed by Orange (1.83"), Brazoria (1.77"), and Galveston (1.36"). Hot temperatures persisted with temperatures 3° to 5° above normal. The combination of no rain and hot temperatures made severe drought appear very rapidly across Southeast Texas with a "flash drought" occurring.

Texas had its **warmest** and **2<sup>nd</sup> driest** October on record. The average temperature in Texas was 72.8° with an average high of 87.0° and an average low of 58.6°. The average precipitation per station for October was 0.25". This is just behind 1952 with 0.02". There is a 130 year span covered since record keeping began in 1895. See fig. 5 on page 20.



Southeast Texas Regional Summary (continued)

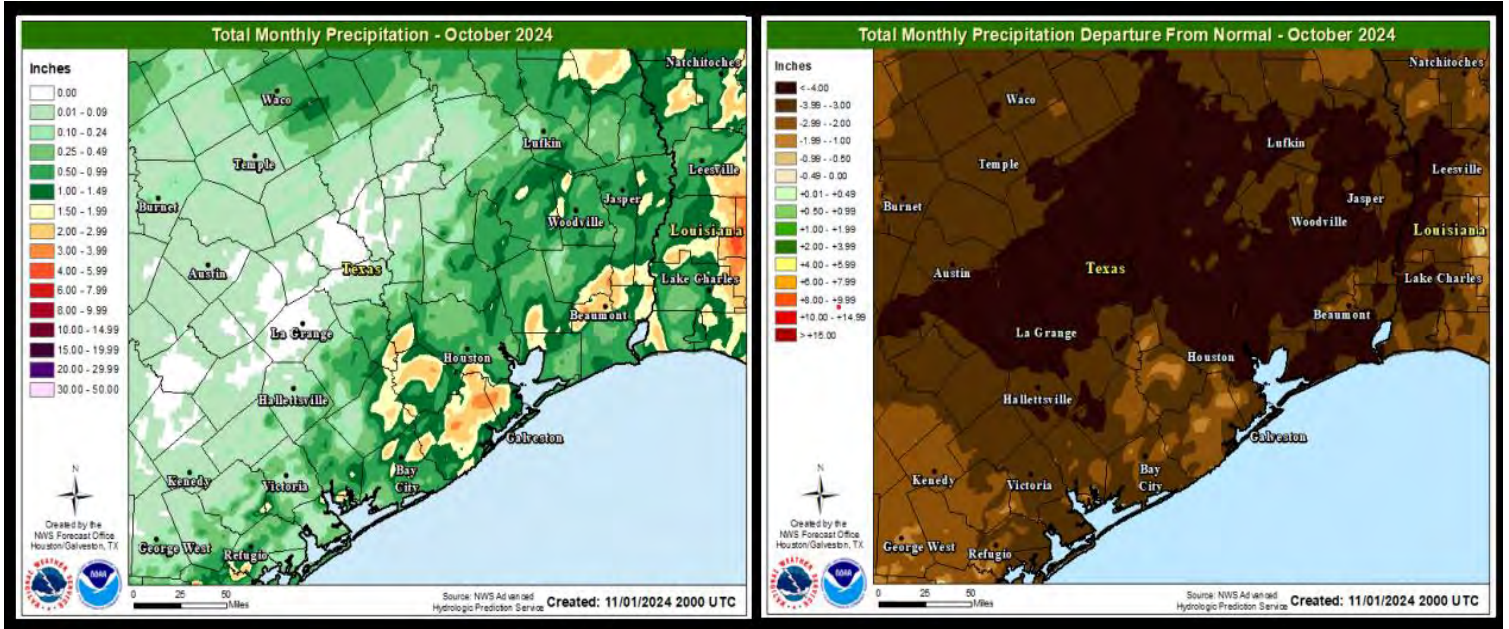


Figure 2: October 2024 Total Precipitation and Departure from Normal across Southeast Texas.

November

Temperatures were very warm with records for November running six to eight degrees above normal. Houston IAH hit 89° for a record high on the 7<sup>th</sup>. Hobby hit 86° on the 4<sup>th</sup>, 7<sup>th</sup>, and 25<sup>th</sup> for record highs. Galveston had a record high of 86° on the 4<sup>th</sup> and Sugar Land had record highs on the 4<sup>th</sup> and 7<sup>th</sup> with 88°. Port Arthur set a record high of 88° on the 7<sup>th</sup>. Parts of Southeast Texas had some significant rains such as the Golden Triangle with the heaviest rainfall and Hardin County with 7.00". Fort Bend had 5.73" followed by San Jacinto (5.67") and Polk (5.46"). Most counties did receive rains of 2.00" to 4.00" which did help erode some of the severe drought conditions. See figure 4 for the latest conditions at the end of autumn.

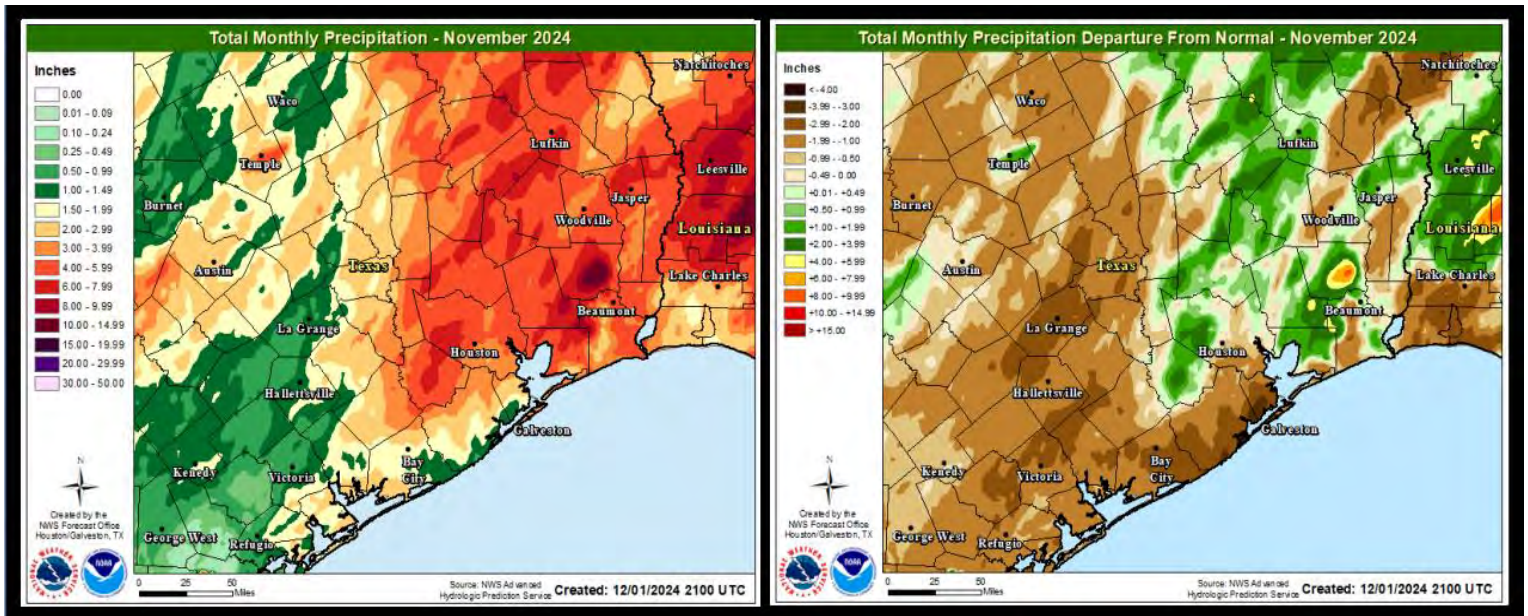


Figure 3: November 2024 Total Precipitation and Departure from Normal across Southeast Texas.



Southeast Texas Regional Summary (continued)

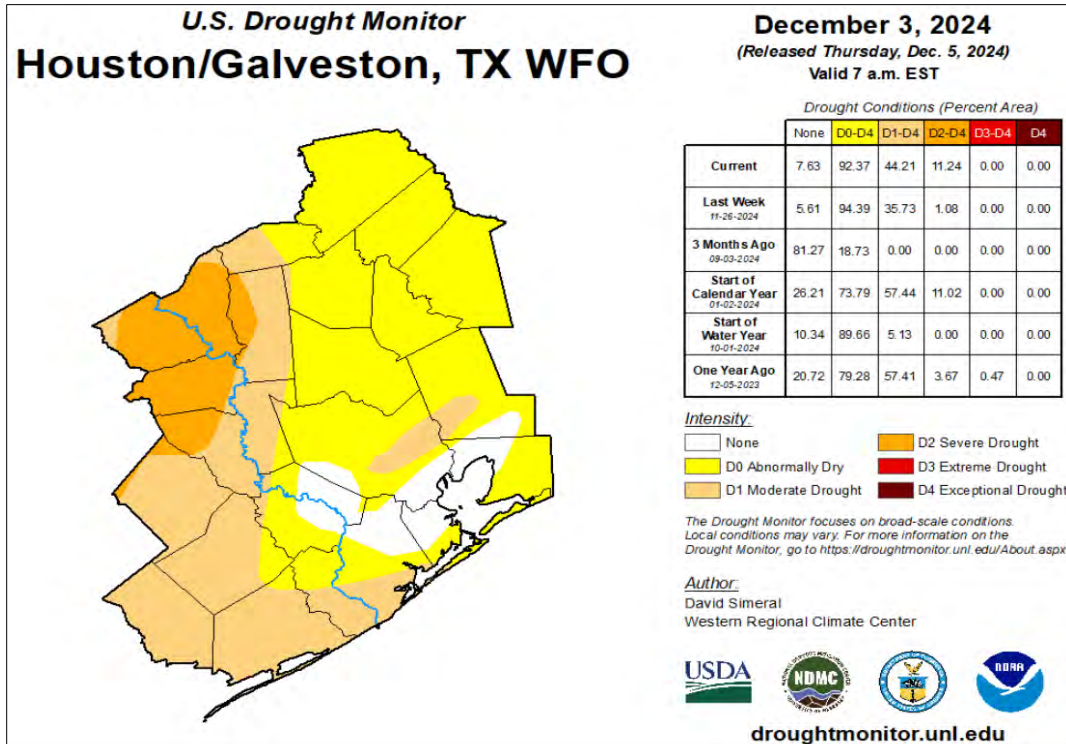


Figure 4: Southeast Texas Drought Monitor on December 3, 2024.

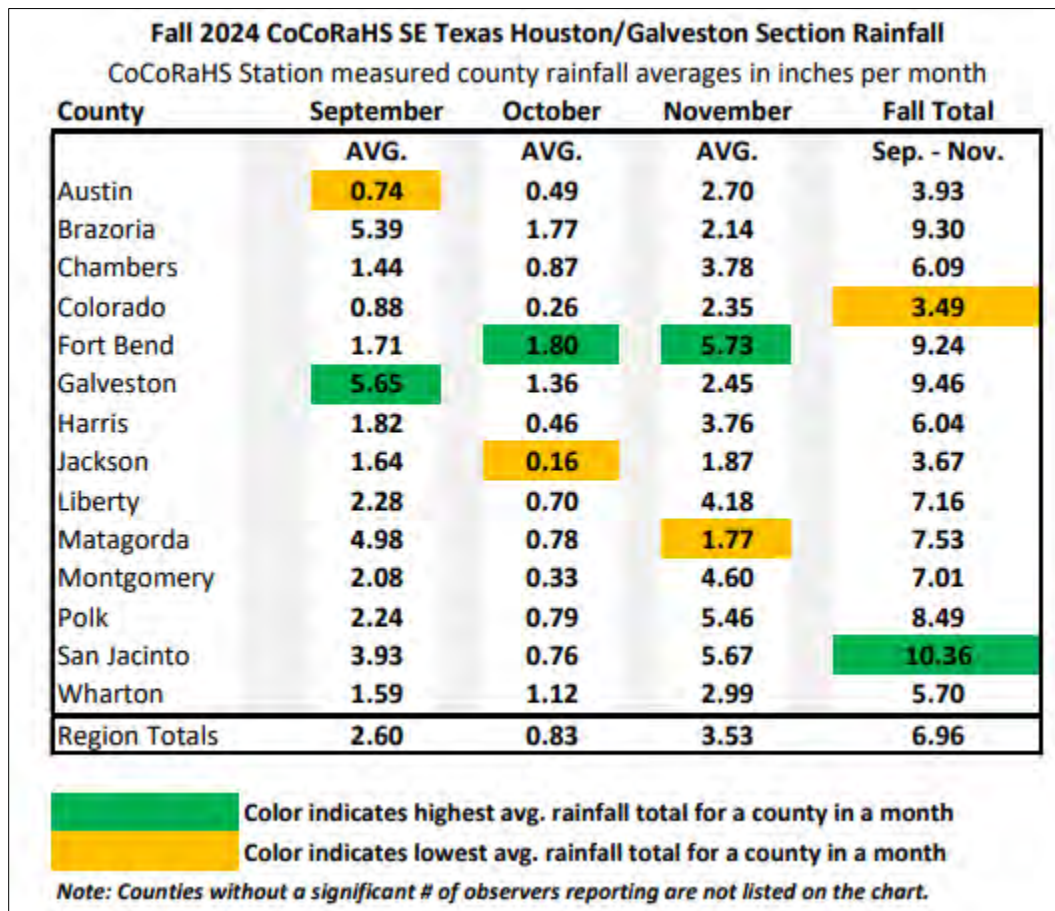


Chart 1: Houston/Galveston Section Rainfall in Southeast Texas for fall 2024.



Southeast Texas Regional Summary (continued)

**Fall 2024 CoCoRaHS SE Texas Golden Triangle Section Rainfall**  
CoCoRaHS Station measured county rainfall averages in inches per month

County	September	October	November	Fall Total
	AVG.	AVG.	AVG.	Sep. - Nov.
Hardin	3.98	1.11	7.00	12.09
Jasper	3.44	0.98	3.33	7.75
Jefferson	1.55	2.35	4.59	8.49
Orange	1.81	1.83	4.09	7.73
Tyler	4.18	0.79	4.15	9.12
Region Totals	2.99	1.41	4.63	9.04

Color indicates highest avg. rainfall total for a county in a month  
 Color indicates lowest avg. rainfall total for a county in a month  
*Note: Counties without a significant # of observers reporting are not listed on the chart.*

Chart 2: Golden Triangle Section Rainfall in Southeast Texas for fall 2024.

Houston/Galveston Temperature & Rainfall Data for 2024 Fall Season

September Climate							
Site Location (record start)	Hi	Lo	Mean	Departure	Rain	Normal	Departure
Bush Airport (1888)	92.9	72.5	82.7	2.2	2.53	4.71	-2.18
Hobby Airport (1930)	91.6	74.7	83.2	2.1	1.60	5.76	-4.16
Galveston (1871)	87.8	76.6	82.2	-0.2	8.79	6.65	2.14
Sugar Land (2000)	92.5	72.5	82.5	1.9	1.13	4.42	-3.29
October Climate							
Site Location (record start)	Hi	Lo	Mean	Departure	Rain	Normal	Departure
Bush Airport (1888)	89.8	63.4	76.6	4.8	0.32	5.46	-5.14
Hobby Airport (1930)	88.2	67.6	77.9	4.9	1.92	5.78	-3.86
Galveston (1871)	84.8	71.7	78.3	3.0	0.52	5.15	-4.63
Sugar Land (2000)	90.2	63.8	77.0	4.3	2.43	4.65	-2.22
November Climate							
Site Location (record start)	Hi	Lo	Mean	Departure	Rain	Normal	Departure
Bush Airport (1888)	79.8	58.7	69.3	7.3	4.00	3.87	0.13
Hobby Airport (1930)	79.0	60.9	70.0	6.7	2.41	3.90	-1.49
Galveston (1871)	78.0	66.5	72.2	6.7	3.05	4.28	-1.23
Sugar Land (2000)	79.9	58.5	69.5	6.1	5.81	3.78	2.03

Chart 3: Temperature & Rainfall Data for First Order Climatological Stations in the Houston/Galveston Section

### Southeast Texas Regional Summary (continued)

#### Golden Triangle Temperature & Rainfall Data for 2024 Fall Season

September Climate							
Site Location	Hi	Lo	Mean	Departure	Rain	Normal	Departure
Beaumont Port Arthur	91.8	71.3	81.1	1.1	1.09	6.69	-5.60
Beaumont Research Center	89.8	70.2	80.0	1.0	1.65	6.55	-4.90
Orange 9N	88.9	68.8	78.8	1.8	2.38	6.44	-4.06
October Climate							
Site Location	Hi	Lo	Mean	Departure	Rain	Normal	Departure
Beaumont Port Arthur	87.3	63.0	75.1	3.5	0.40	5.47	-5.07
Beaumont Research Center	87.0	60.3	73.6	3.0	0.17	5.30	-5.13
Orange 9N	85.0	56.2	70.6	2.5	1.26	5.96	-4.70
November Climate							
Site Location	Hi	Lo	Mean	Departure	Rain	Normal	Departure
Beaumont Port Arthur	78.7	59.9	69.3	7.4	3.31	3.89	-0.58
Beaumont Research Center	77.7	57.7	67.7	6.8	0.97	4.68	-3.71
Orange 9N	76.0	56.0	66.0	7.7	3.55	4.71	-1.16

Chart 4: Temperature & Rainfall Data for First Order Climatological Stations in the Golden Triangle Section

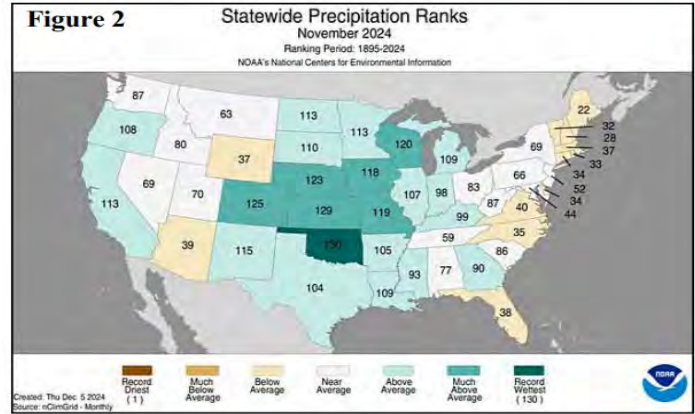
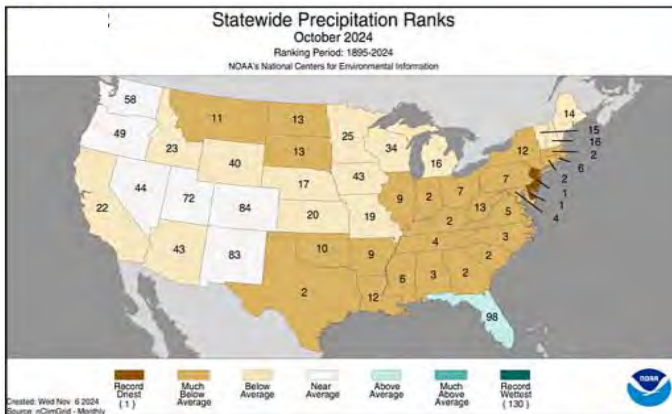
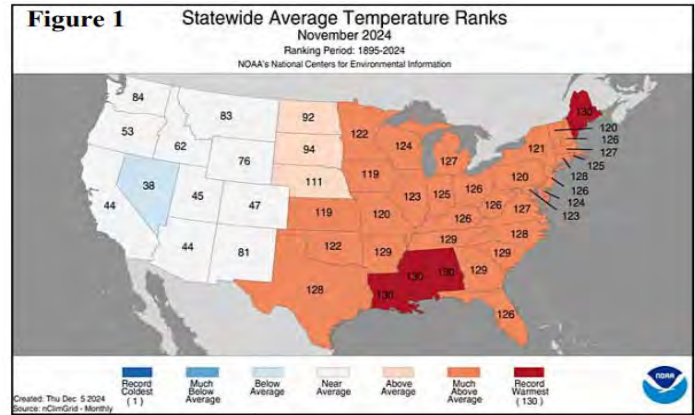
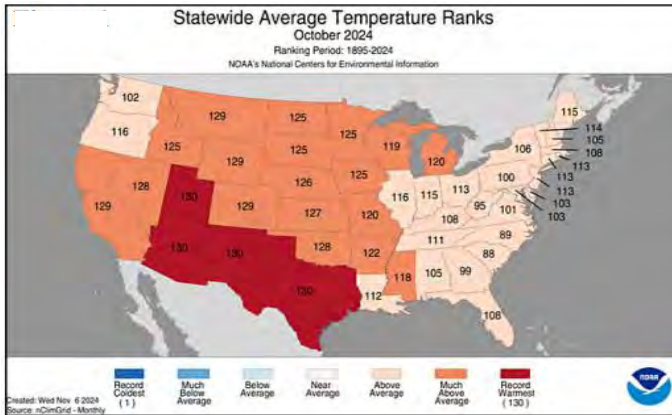


Figure 5: Texas had its warmest and 2<sup>nd</sup> driest October.

Figure 6: Texas had its 3<sup>rd</sup> warmest and 26<sup>th</sup> wettest November.

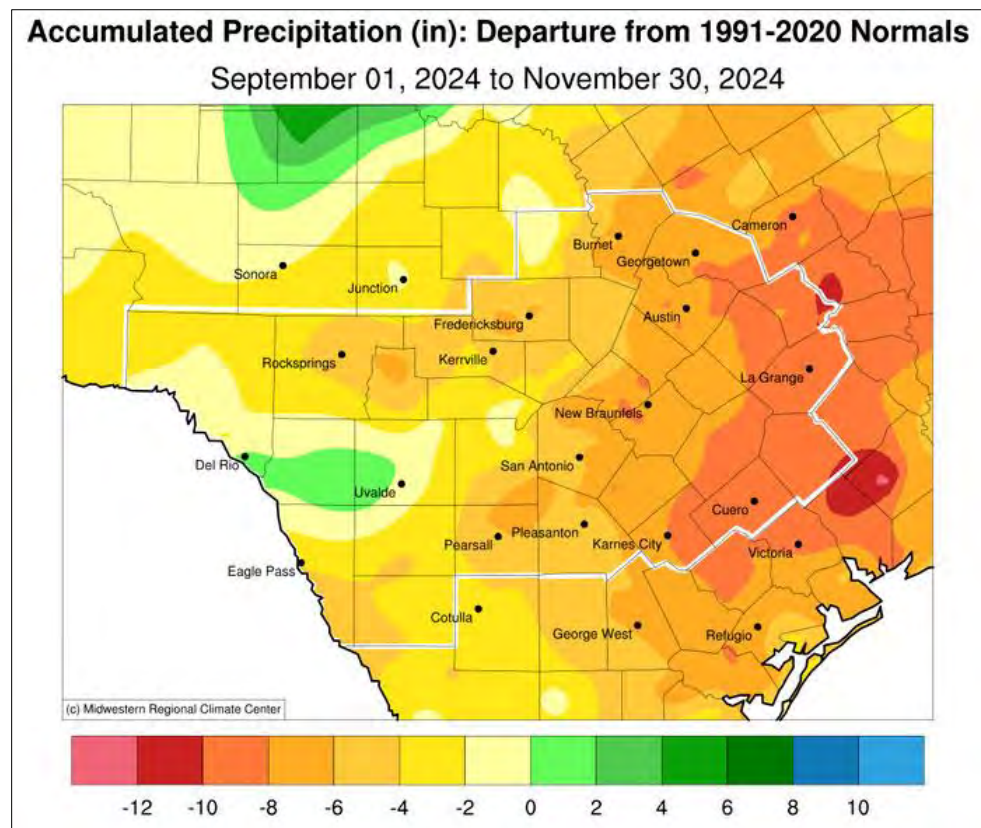


## Austin/San Antonio Regional Summary

**Warmest Fall on record along with one of the driest Octobers on record results in less than desirable Fall for South Central Texas.**

**By Mack Morris, Meteorologist at NWS Austin/San Antonio**

Fall 2024 will go down as the warmest on record at all four climate sites in the Austin/San Antonio CWA, and would likely have been one of the driest at San Antonio and Del Rio if not for early September rains at both sites. Meanwhile, the driest fall on record was observed at Austin Bergstrom with the 8th driest on record at Austin Camp Mabry. Despite periodic rainfall, virtually the entire service area saw below normal rainfall for the fall months.



**Figure 1: Precipitation departure from normal Sept 1-Nov 30th**

### September

Despite the record warmth and dryness, the month of September got off to a wet start for many locations, with most seeing measurable rainfall each day through the 5th of September. Some CoCoRaHS sites in Llano, Val Verde, and Medina counties had 5-day rainfall totals from the 1st-5th of September of 5" to 8". Outside of those counties, most locations along and east of I-35 picked up from 1" to 4" of rain through the first 5 days of September. Of all 5 days, September 3rd was the wettest, with many locations over central and western Bexar County reporting from 1" to 4" of rain. In Llano County, CoCoRaHS around Horseshoe Bay and the city of Llano reported over 5" of rainfall, with some observers reporting over 7" in Llano.

### Austin/San Antonio Regional Summary (continued)

Unfortunately, after September 6th, no rain would be observed until September 19/20th, and even then, it was very isolated and confined to Medina, Bexar, Comal, Guadalupe, and Wilson Counties. Another limited rain event occurred on September 24th over north Austin and into Bastrop and Fayette Counties. Several CoCoRaHS observers in North Austin reported nearly 2.00" of localized rainfall. Sporadic amounts between 0.25" to 1.5" were reported in Bastrop and Fayette Counties as well. With regard to temperatures, the last 2 weeks of September were nearly unbearable, with highs routinely in the mid to upper 90s.

#### October

Moving into the month of October, not much would change as rainfall was at a premium across not just south-central Texas, but the state of Texas itself. In fact, October would go down as the 2nd driest on record across the entire state of Texas and the warmest October on record for the entire state, including at all 4 of our official climate sites in south central Texas. To put the lack of rainfall in the month of October in perspective, looking at all CoCoRaHS sites from Oct 1-31st, no station outside of a couple that reported between 0.3" to 0.4" of rainfall in Llano and Burnet Counties, reported more than 1/10th of an inch of rainfall! October was exceptionally dry and this led to anywhere from 1 to 4 class degradations in the U.S. Drought Monitor for south central Texas.

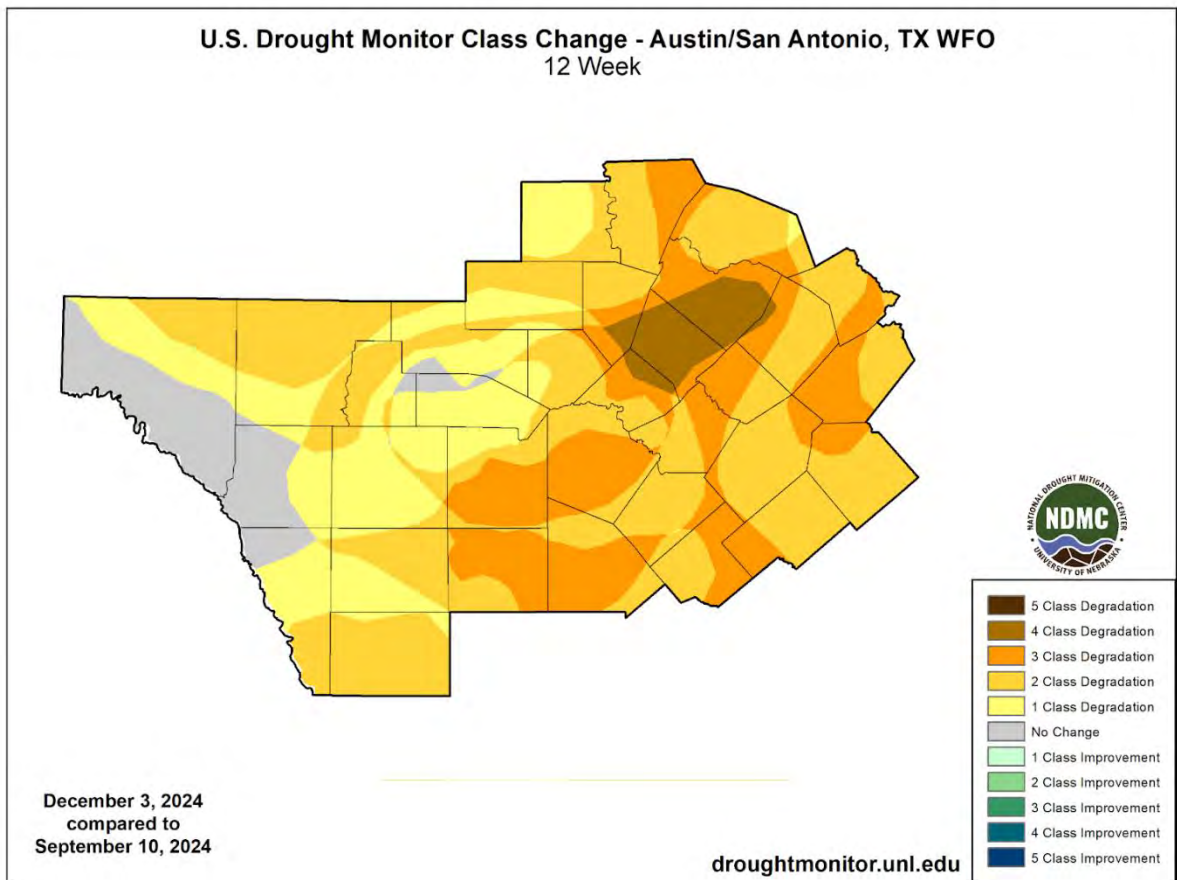


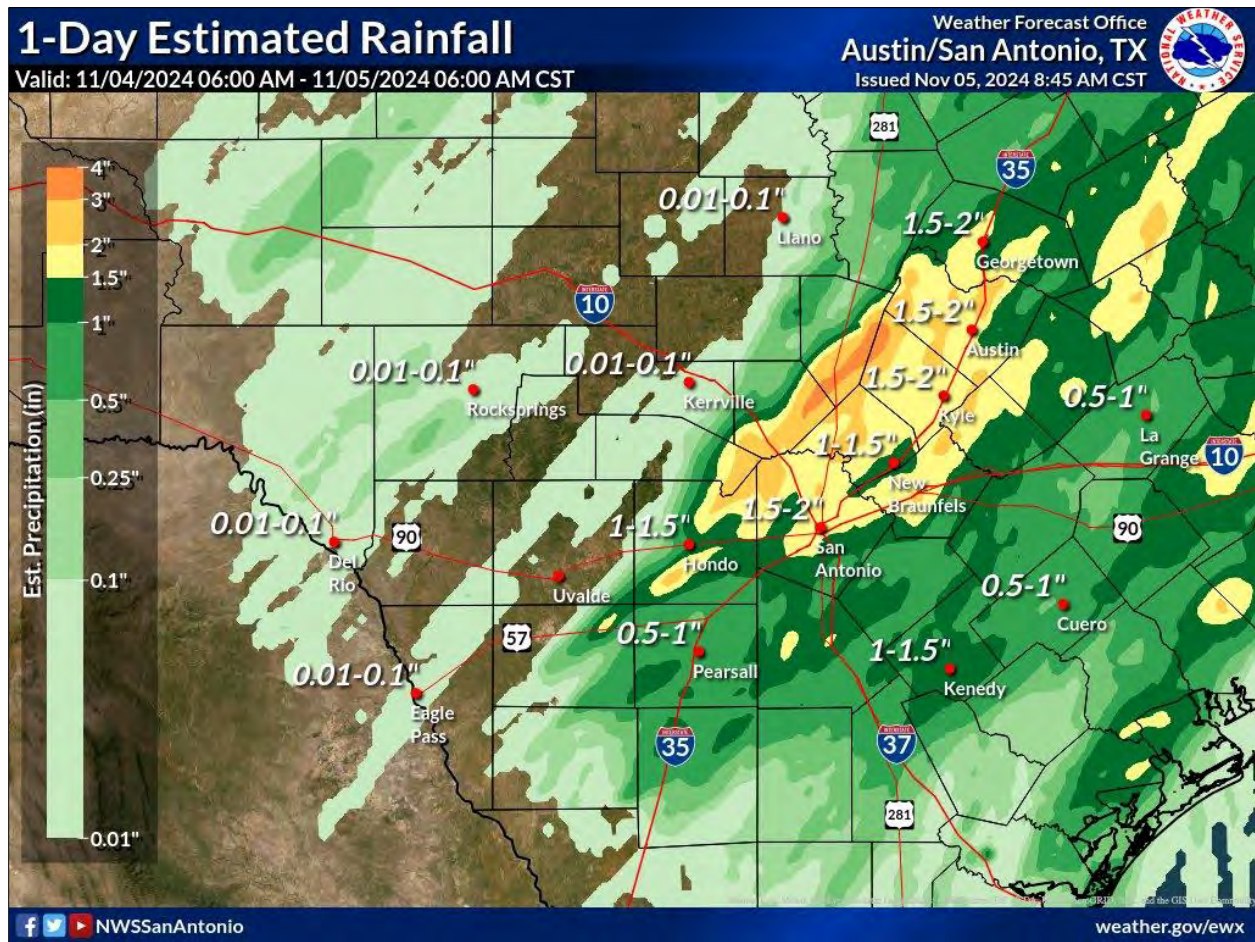
Figure 2: U.S. Drought Monitor 12 week change map valid 7am Dec 3rd



## Austin/San Antonio Regional Summary (continued)

### November

The month of November would bring some short-term relief with regard to temperatures and rainfall. On November 2nd, significant rainfall occurred over portions of the Edwards Plateau, with CoCoRaHS sites in Uvalde County (Cancan and Utopia) reporting between 4"-5" of rainfall due to a very moist environment ahead of an approaching upper-level storm system that was set to arrive on the 4th. Several other observers in eastern Bandera, northern Medina, and central and southern Kendall also saw from 1" to 4" of much-needed rainfall. On the evening of the 4th, a frontal boundary and dryline interaction resulted in heavy rainfall and flash flooding along and west of the I-35 Corridor from San Antonio northward into the Austin metro. From 2" to 4" of rain was reported by many CoCoRaHS observers in Bexar, Comal, Hays, Travis, and Williamson Counties. Several observers in eastern Kendall and southern Blanco County, such as near the cities of Boerne, Bergheim, and Blanco reported 3"-6" of rain with this frontal boundary!



**Figure 3: 24 Hour Rainfall from November 4th-5th**

While the rainfall was helpful for short term drought issues brought up by the dry September and October time period, it did little to alleviate the long-term drought conditions that have existed over the region since 2021. With La Nina expected to intensify over the coming months, the outlook for rainfall across south central Texas is not particularly promising.

## Corpus Christi Regional Summary

### Minimal Rainfall this Fall

By: Nicholas Price, Meteorologist, Corpus Christi NWS

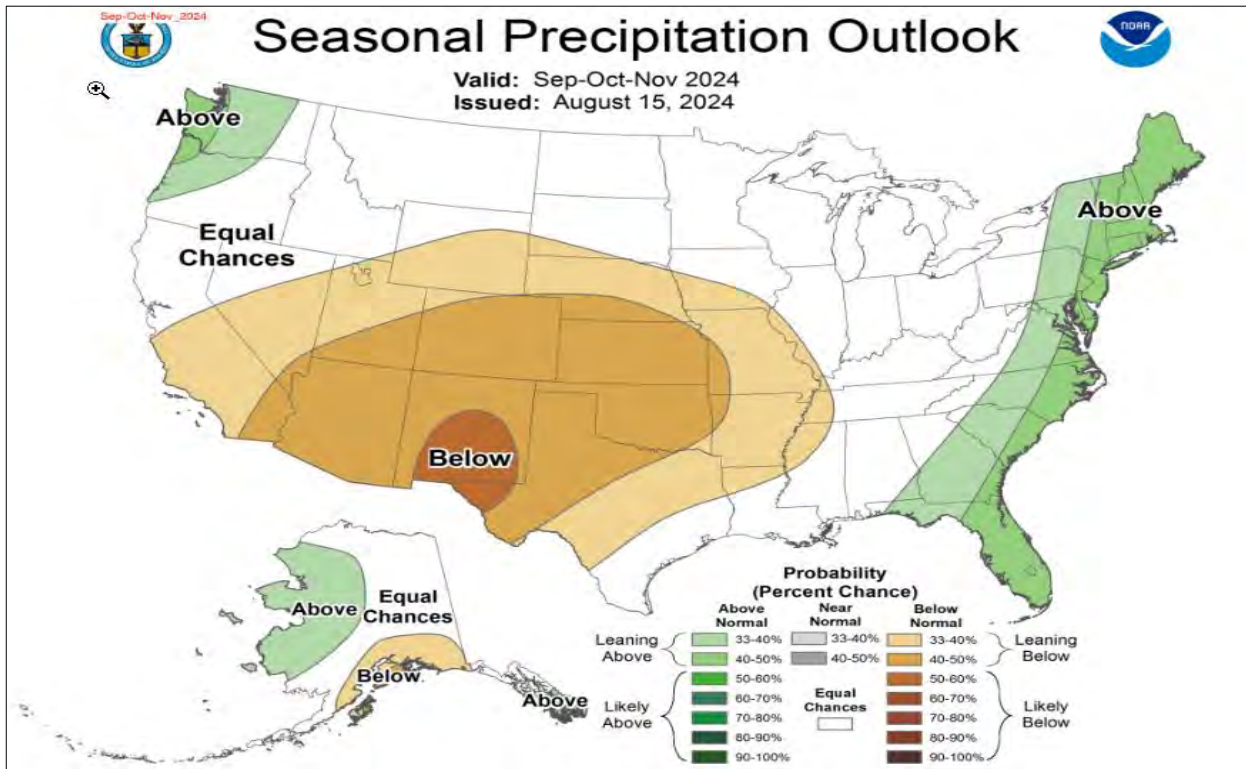


Figure 1: A look back at the Fall Season Precipitation Outlook

The season was predicted to be normal in terms of precipitation for South Texas (Figure 1). The month of September, however, turned out to be well above normal in the Brush Country/Rio Grande plains, while remaining below normal along most of the Coastal Bend and Victoria Crossroads. The region saw the majority of the rain falling on the 3<sup>rd</sup> of the month with the next substantial rainfall falling on the 14<sup>th</sup> and 15<sup>th</sup> with some falling on the 16<sup>th</sup> as well. This was thanks to some well above normal moisture moving into the region from a remnant tropical system. Rainfall totals were around 4-6" in the Laredo area alone during this span which would equate to their total for the month (Figure 2). Other totals along the Coastal Bend came primarily from the disturbance that tracked into the area during the beginning of the month. Observers in the Corpus Christi area saw about 4-4.5" on the 4<sup>th</sup> which is about a 2" shy of their monthly total. Overall, most of the eastern portions of the region saw about a 1-4" negative departure from normal rainfall (Figure 3). Thanks to the generous amount of rainfall during the middle of the month, the western portions of the area received around their normal amount of rainfall for the month.



Corpus Christi Regional Summary (continued)

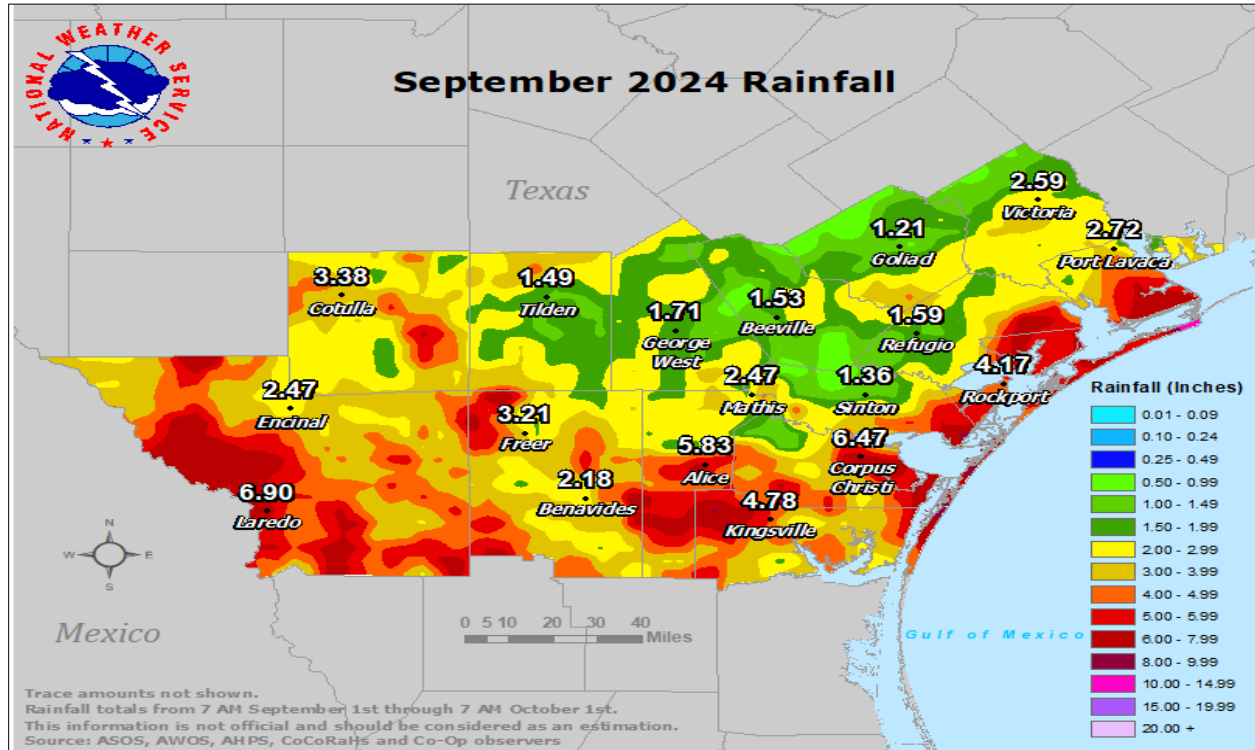


Figure 2: September 2024 Estimated Rainfall Totals

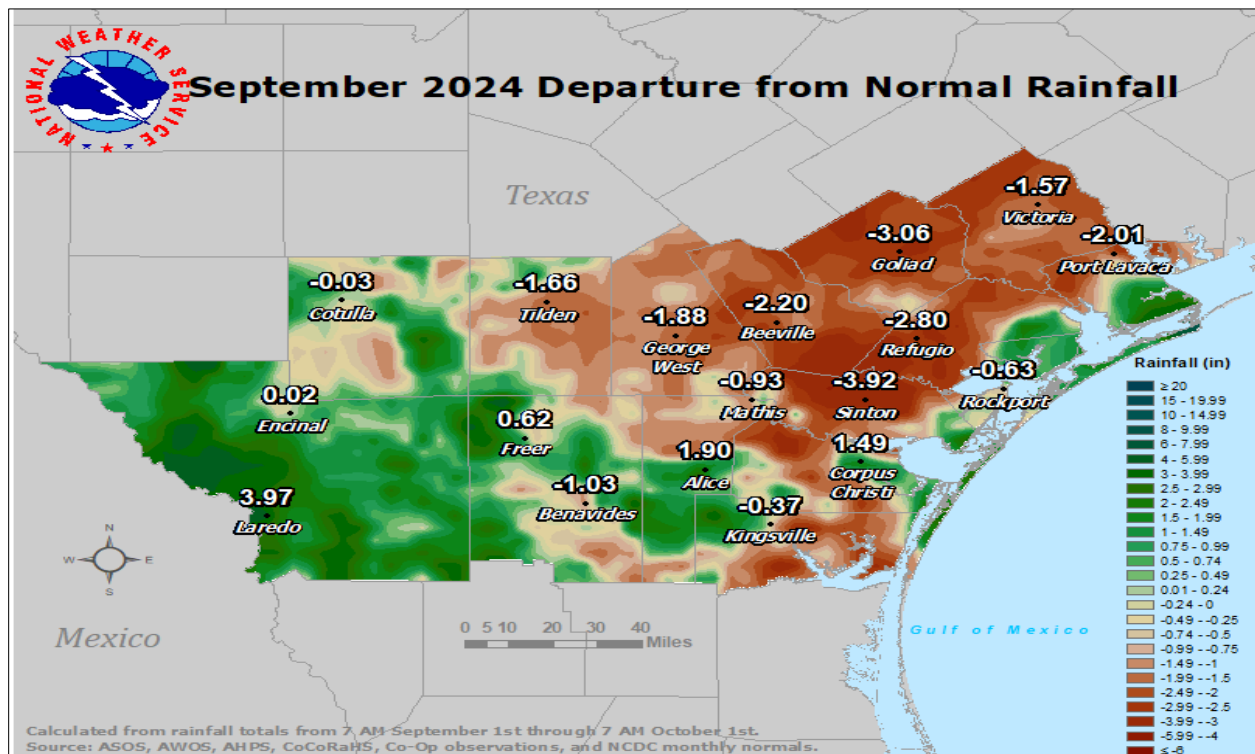


Figure 3: September 2024 Departure from Normal Rainfall

October kicked off a down trend in rainfall across the region with only the southern portions of the area seeing any measurable rainfall. The maximum amount received across the northern portions of the area was only about 0.40" which was received by observers in Goliad (Figure 4). Most of the rain was attributed to a couple of disturbances that passed through the region, mainly along the coast. This, combined with some occasional above normal moisture, allowed for some brief increases in rain chances along the Coastal Bend. Outside of the rare showers this month, the

### Corpus Christi Regional Summary (continued)

area remained very dry. This was evident on the United States Drought Monitor, where you could see the majority of South Texas was in Moderate to Severe Drought with counties farther to the south experiencing abnormally dry conditions (Figure 6). The area saw a widespread negative departure from normal rainfall with the highest number occurring in Victoria at -4.59" (Figure 5). Even with areas like Kingsville receiving the most rain for the month at 1.53", a negative 1.85" departure from normal rainfall was still observed. This continued through the next month where conditions continued to dry out.

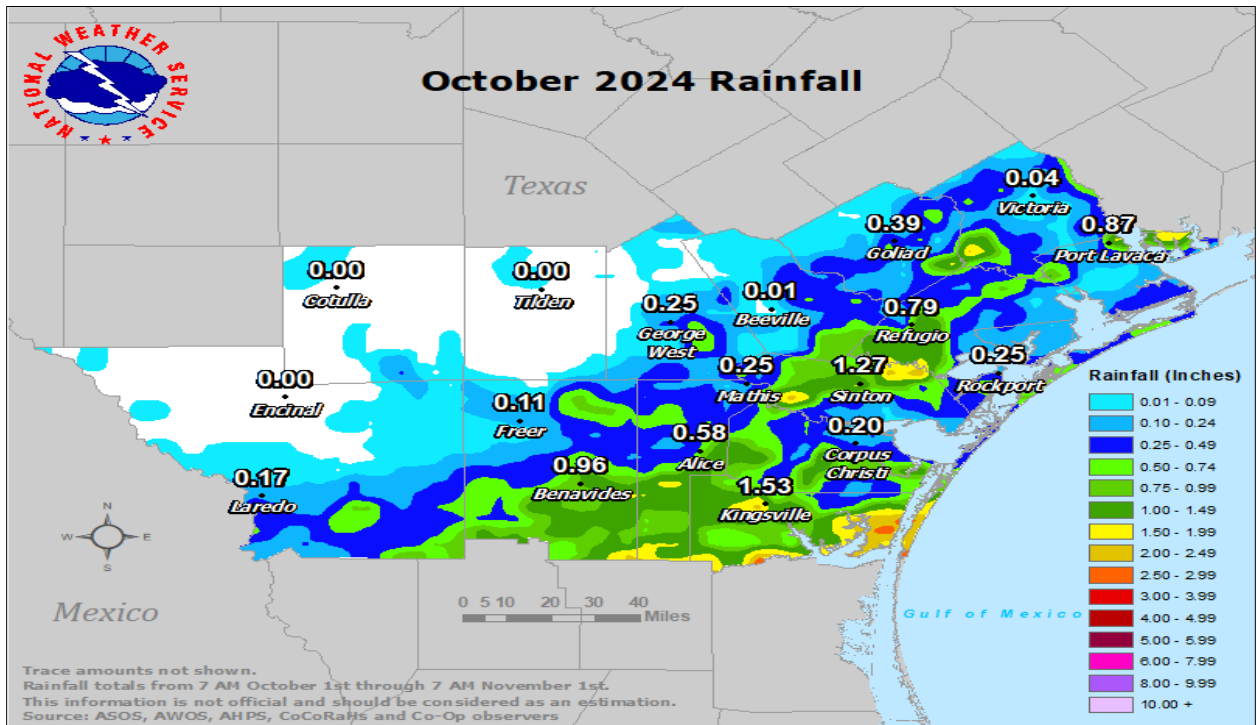


Figure 4: October 2024 Estimated Rainfall Totals

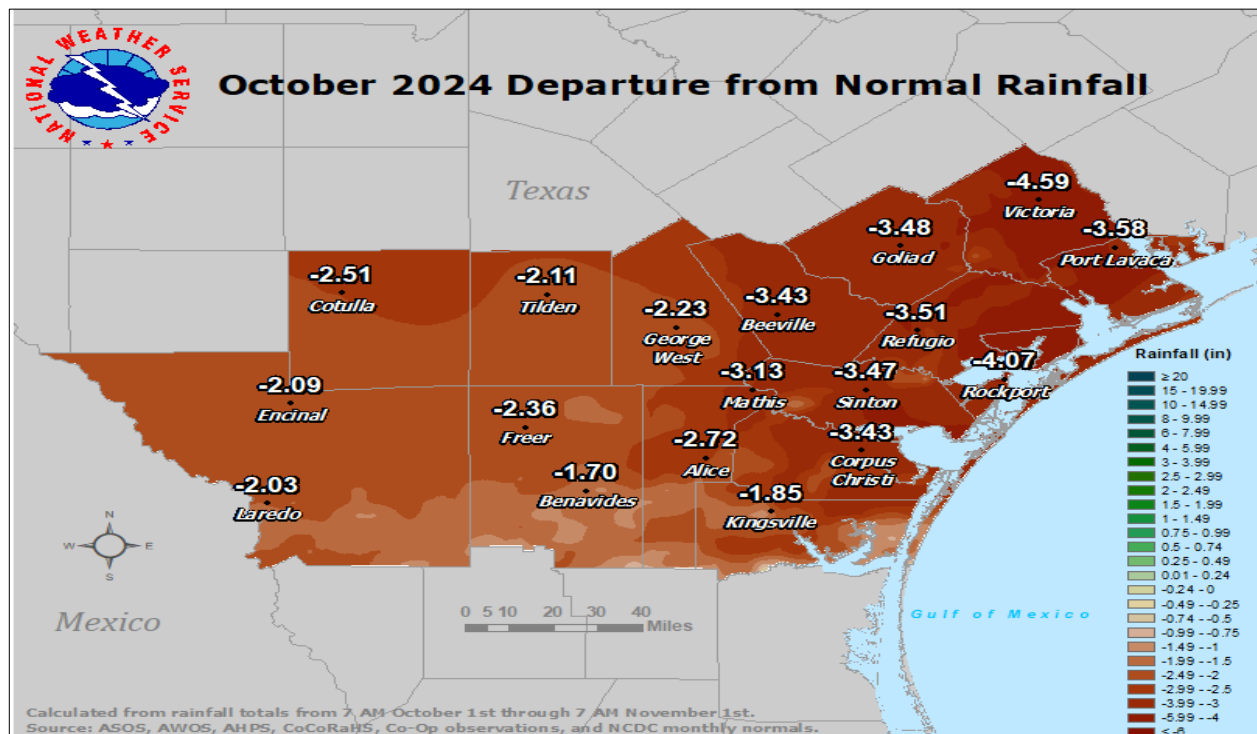


Figure 5: October 2024 Estimated Departure from Normal Rainfall



Corpus Christi Regional Summary (continued)

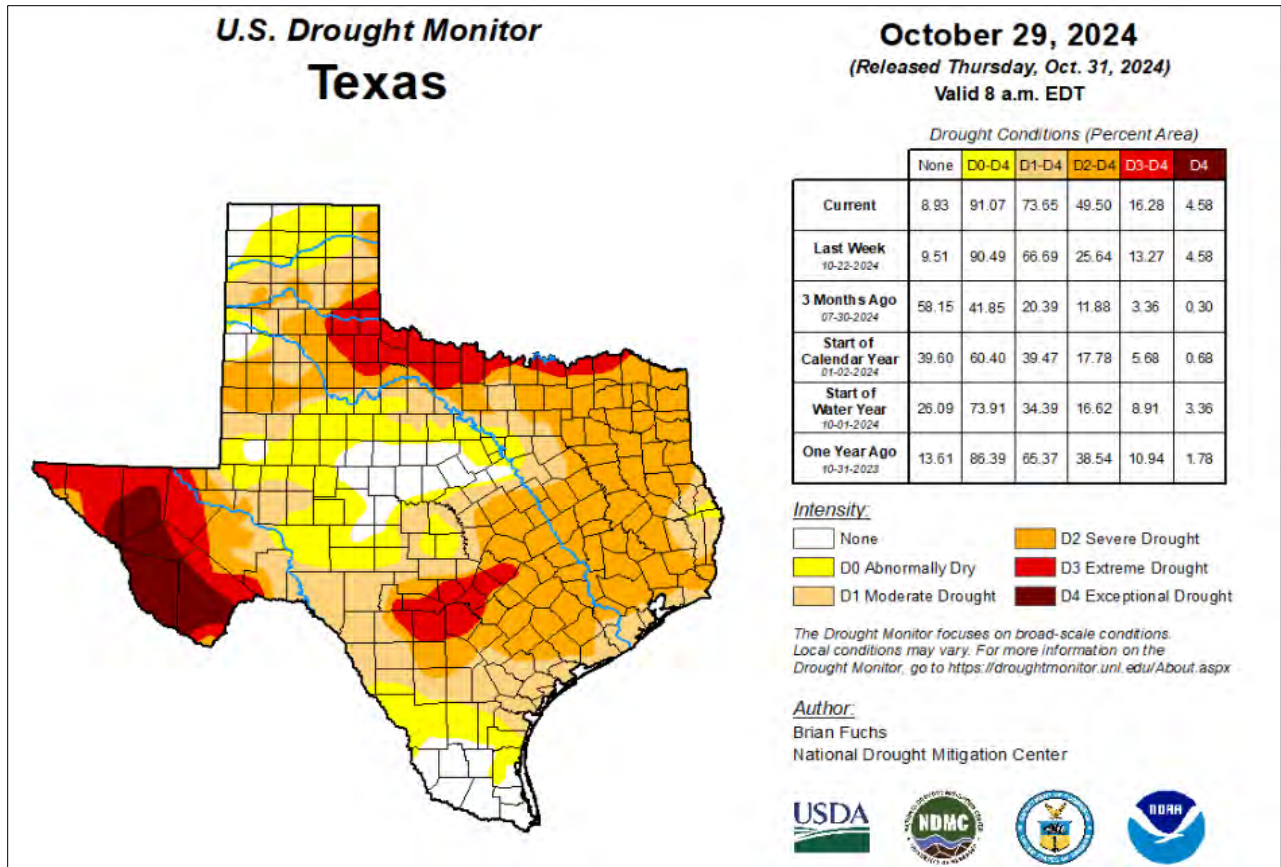


Figure 6: U.S. Drought Monitor Summary for the month of October

The month of November featured much of the same conditions experienced last month. This time around, only one area saw above 1" of rain for the month. Everywhere else saw less than an inch with observers in Cotulla seeing 0.05" shy of an inch (Figure 7). Observers in the Victoria Crossroads received most of the rainfall for the month from one event earlier on. This was in association with a cold front that swept through the region bringing some stronger thunderstorms. Observers around that region saw around 1.70" of rain on the 5<sup>th</sup> of the month with only around a tenth of an inch being received for the remainder of the month. South Texas again experienced another widespread negative departure from normal rainfall for the month outside of a bulls-eye just south of Laredo. The Victoria Crossroads again saw the highest negative departure from normal with 2.71" as the rest of the region saw about 1 inch or so (Figure 8). The lack of rainfall caused already occurring drought conditions to further deteriorate following the conclusion of the month. Severe drought conditions spread into Goliad, Bee, and San Patricio counties in response to this. While Moderate drought conditions further spread covering the entirety of South Texas (Figure 9).

### Corpus Christi Regional Summary (continued)

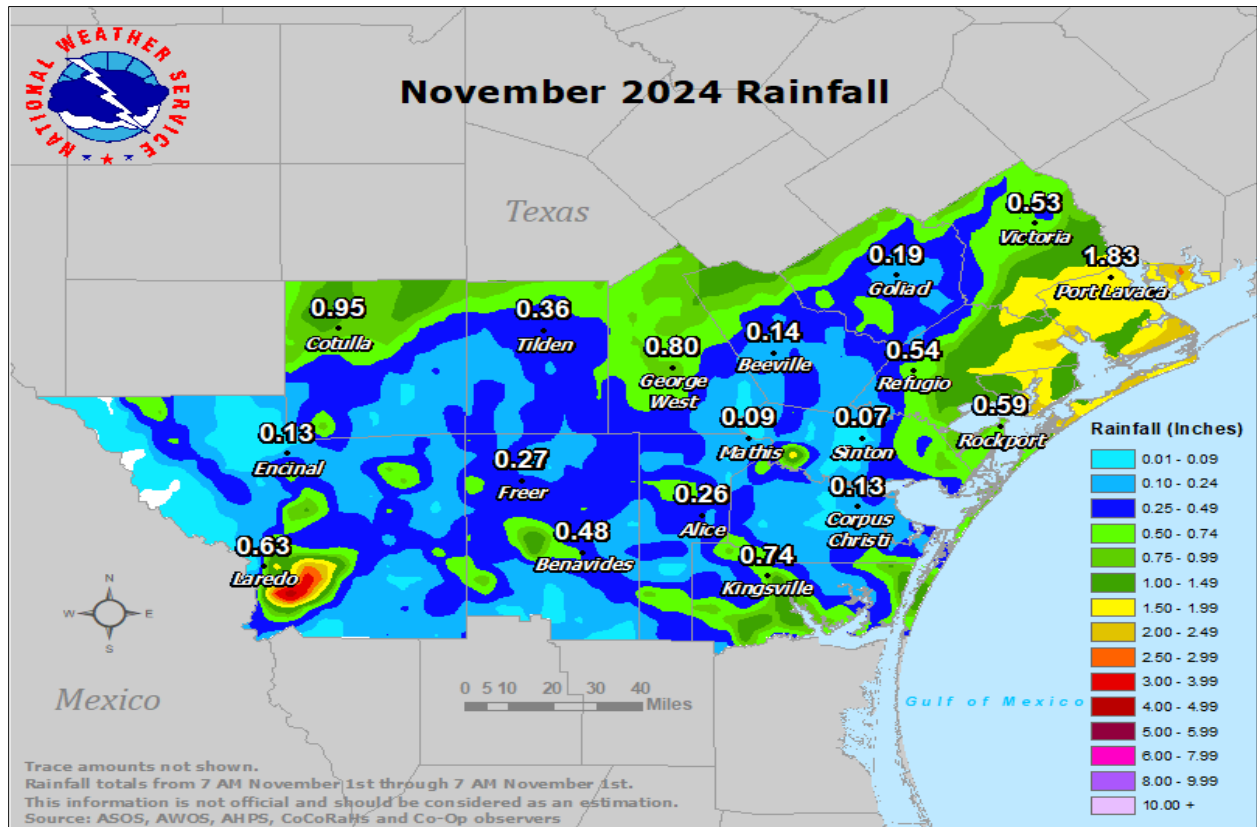


Figure 7: November 2024 Estimated Rainfall Totals

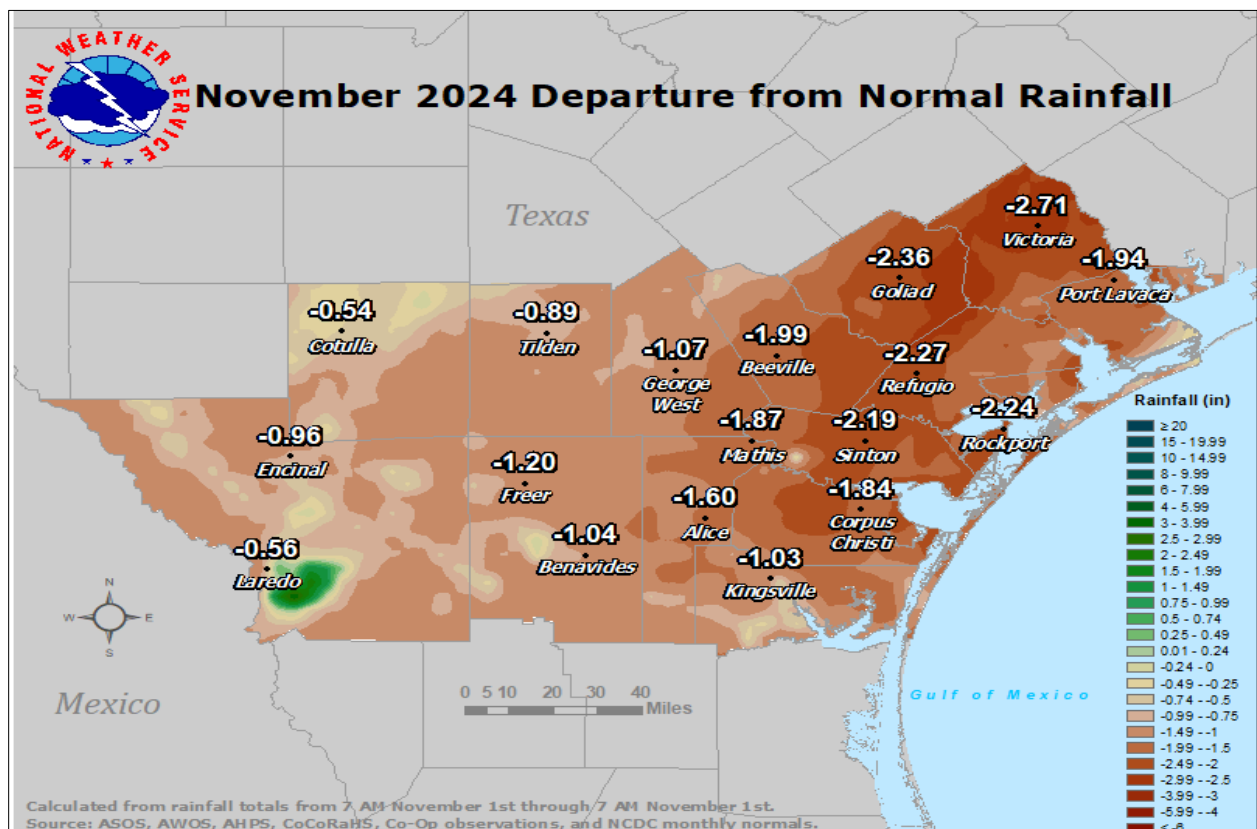


Figure 8: November 2024 Estimated Departure from Normal Rainfall



Corpus Christi Regional Summary (continued)

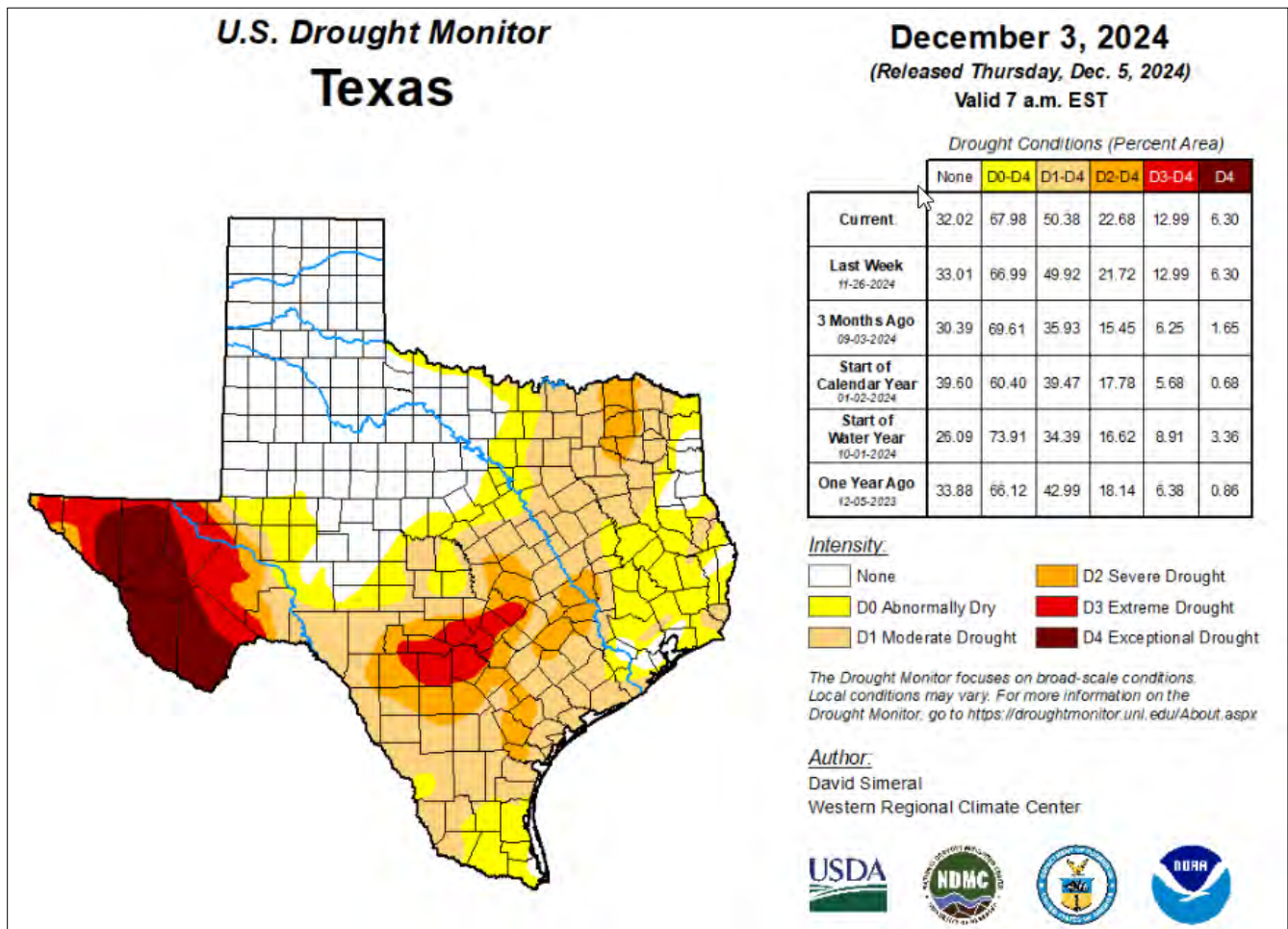


Figure 9: U.S. Drought Monitor Summary for the month of November

### El Paso Regional Summary

#### Infrequent Autumn Rains Not Enough to Improve Drought Conditions

By: Connor Dennhardt, Lead Meteorologist - National Weather Service El Paso

Drought conditions remain in place across West Texas as we head into the winter 2024-2025 season. This autumn season featured a few rounds of abnormally heavy rain in El Paso County, but the infrequency of rain resulted in generally below normal precipitation from September through November 2024. Drought conditions remain in Extreme (D3) to Exceptional (D4) Drought Status across El Paso and Hudspeth Counties as well as much of southern New Mexico, according to the U.S. Drought Monitor. Precipitation totals finished below normal. Much of the area recorded seasonal totals an inch or more below the already low 90-day normal of **2.54"**.



Figure 1: Wave clouds over the Franklin Mountains in El Paso, TX on November 17th, 2024. Photo Credit: Ray Chiarello

September began with scattered showers and thunderstorms. Rainfall totals for Labor Day (September 2nd) ranged from 0.25" to 0.50". The rest of the month was almost completely dry as an early end to the summer monsoon season kept moisture confined to our south. Light rains fell over portions of El Paso County on September 13th and 20th, otherwise no measurable rains fell over the area through the rest of the month. Rain totals were heavier on the west side of El Paso compared to the east.

October was another very dry month which resulted in record-setting warmth for much of the region. The only mentionable period of rain occurred on October 17<sup>th</sup> to 19<sup>th</sup> as a Pacific low moved across the region and scattered thunderstorms brought 0.10" to 0.25" to the Lower Rio Grande Valley.

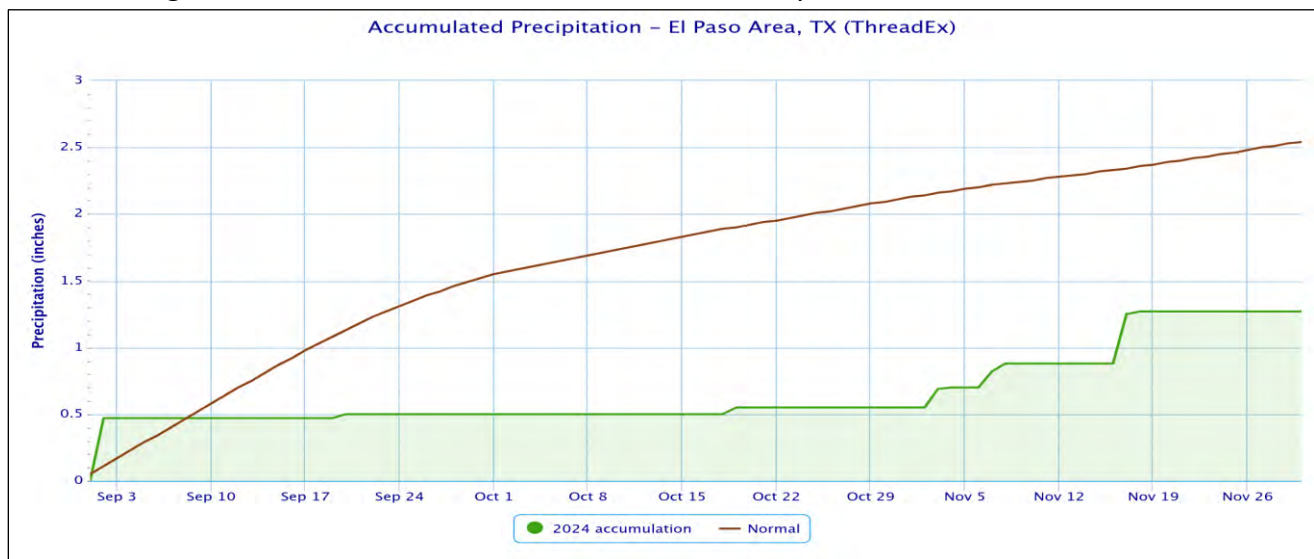
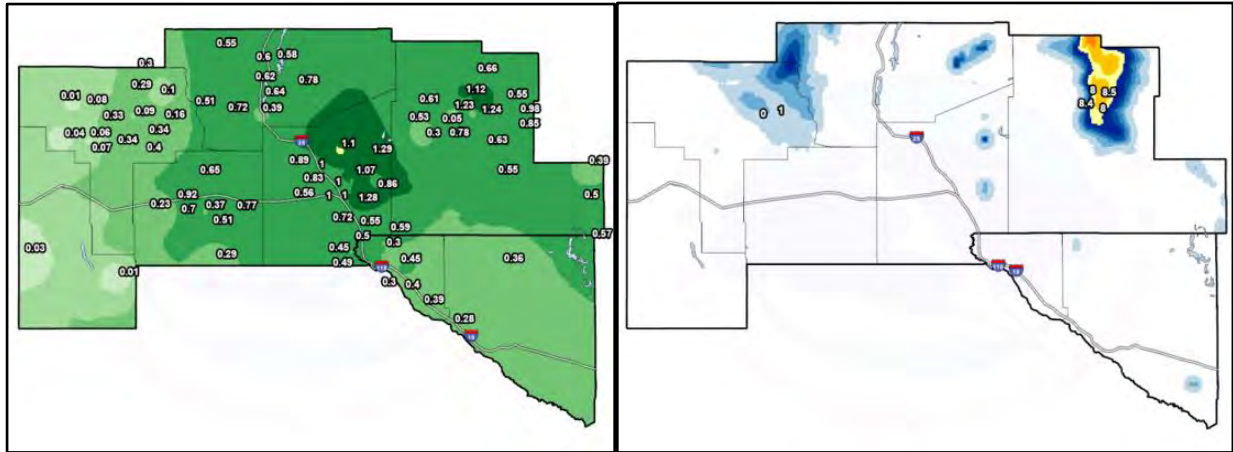


Figure 2: 2024 autumn precipitation in El Paso, TX compared to climate normals (1991-2020).



## El Paso Regional Summary (continued)

November finally featured a slight uptick in rain chances, the most notable being November 17-18. A strong winter season cold front moved across the area, aided by an upper low pressure system. Widespread rain fell during the evening and overnight hours, along with heavy snow over the southern New Mexico mountain forests. 48-hour precipitation totals ranged from **0.40" to 0.60"**, with even higher numbers north toward Las Cruces, NM. This rain event alone helped us surpass El Paso's monthly normal of **0.43"**. The majority of this rainfall occurred on November 10th. No snow has been recorded over the Texas mountains yet as we head into the winter.



*Figure 3: Observed rain and snowfall totals for November 17-18, 2024 precipitation event. El Paso County averaged 0.40-0.60" of rain.*

The upcoming winter season looks to lean toward the warmer and drier-than normal side as the forecasted onset of a weak-to-moderate La Niña suggests the Pacific storm track will be further north and likely miss the southern U.S. more times than usual. The Climate Prediction Center's winter outlook highlights a 50-60% chance of below normal precipitation through February. Drought conditions are expected to linger through the winter season.

90-day precipitation totals of **1.00" to 2.00"** were consistently below normal in El Paso and Hudspeth Counties. Infrequent rain events were not enough to alleviate drought conditions in the area. The fall season featured 38 active observers in El Paso County, and 1 in Hudspeth County. A total of 1,753 daily reports were submitted, along with 39 multiple-day reports. Only 12% of total reports had measurable precipitation, which means our regional observers continue to do a great job reporting days with 0.00". An observer in El Paso submitted a Condition Monitoring report in November after a rain event. No Significant Weather Reports were submitted. Thanks again to all our local observers who participated in the 2024 autumn season!

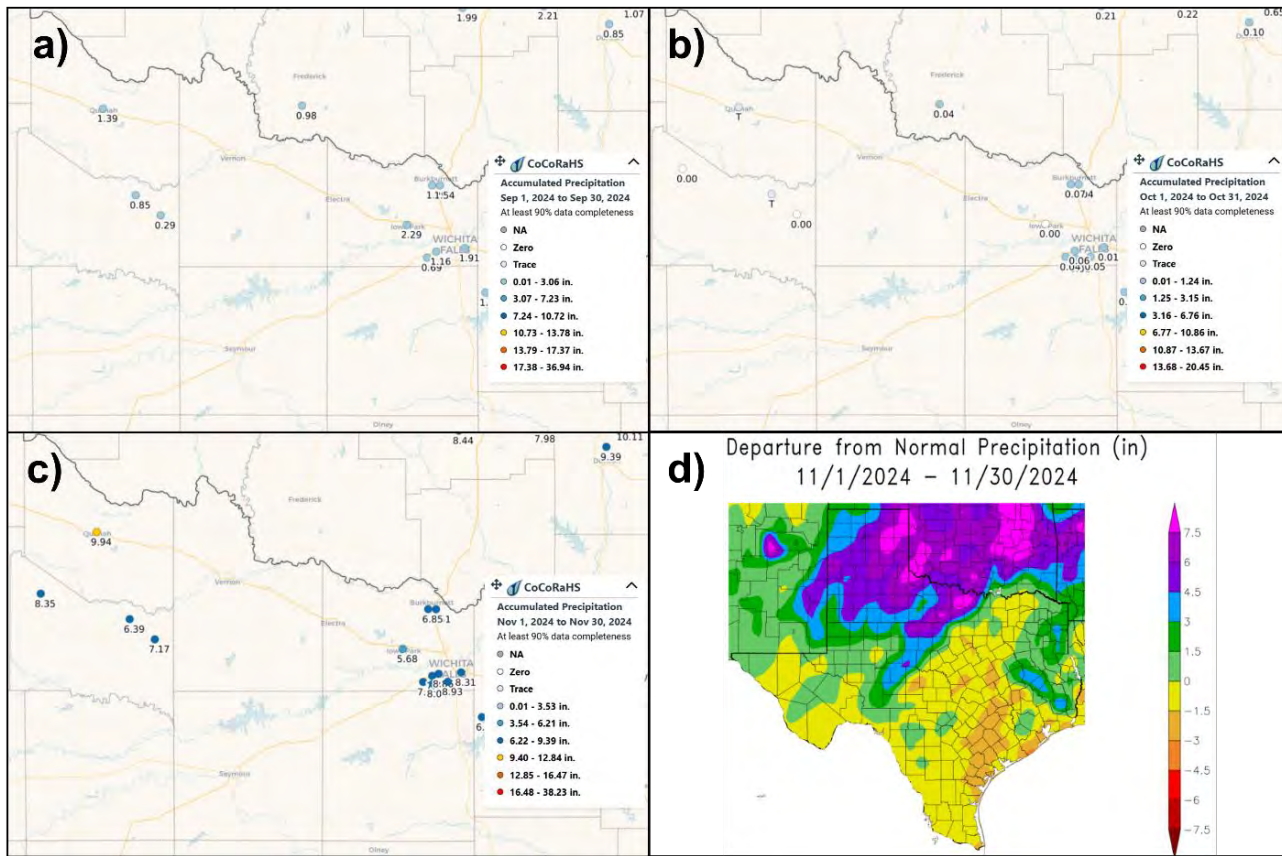
## Wichita Falls Regional Summary

### A Tale of Three Months

**By: Charles Kuster**

**National Severe Storms Laboratory, Wichita Falls CoCoRaHS Regional Coordinator**

Our region experienced three rather different months this fall. September brought slightly below normal precipitation and seven wet days (at least one CoCoRaHS station reported 0.05” or more). Most CoCoRaHS stations reported over 1” for the month (Fig. 1a). Then, October came and it was a very dry month. There was only one wet day and all CoCoRaHS stations reported less than 0.10” for the entire month (Fig. 1b). We then saw a drastic change in November with a rainy pattern to start off the first 10 days of the month. Heavy rain occurred on November 3<sup>rd</sup> and 4<sup>th</sup> and then again on the 8<sup>th</sup> and 9<sup>th</sup>. All CoCoRaHS stations reported at least 5” of rain for the month, with several reporting over 8” (Fig. 1c). Most of our region was 3” to 4.5” above normal in terms of precipitation for the month (Fig. 1d). November only saw six wet days, which means when the rain fell, it was likely heavy.

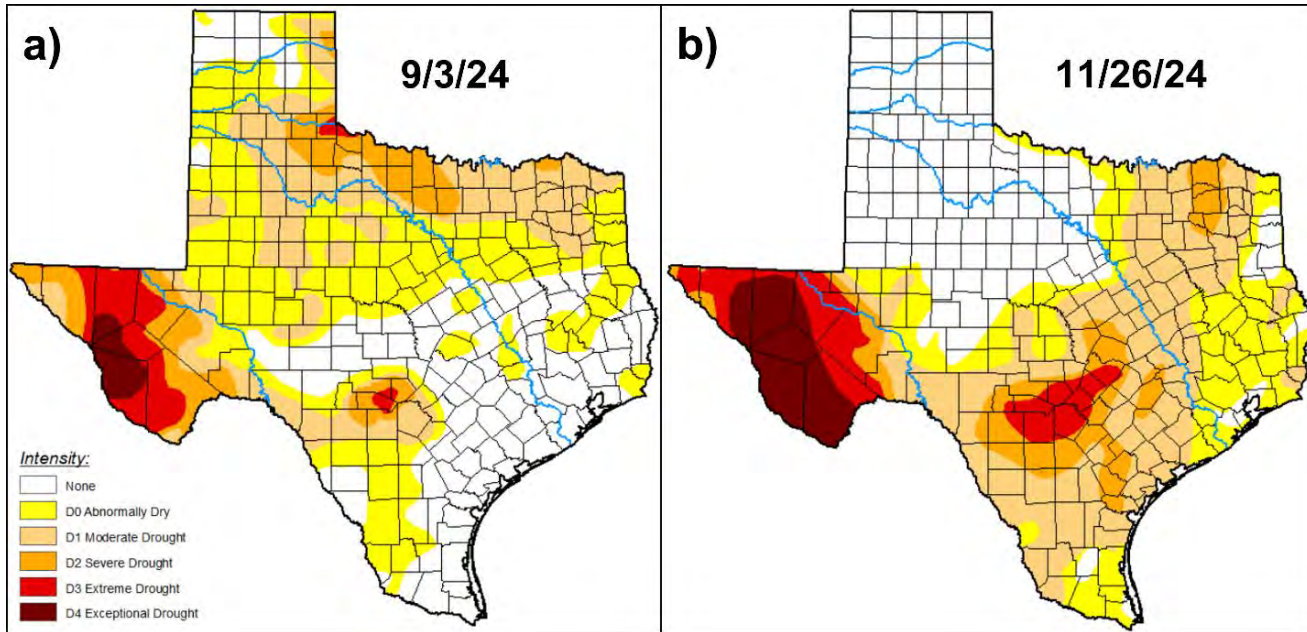


**Figure 1. Monthly CoCoRaHS precipitation totals for a) September, b) October, and c) November. In d) departure from normal precipitation for the month of November is shown. Cool colors indicate above normal precipitation and warm colors indicate below normal precipitation.**

In total, our region experienced 77 dry days (all CoCoRaHS stations reported less than 0.05”) and 14 wet days. For comparison, the region experienced 69 dry days and 22 wet days last fall. The heavy rainfall, especially in November, helped alleviate drought conditions across much of our region according to the U.S. Drought Monitor (Fig. 2).



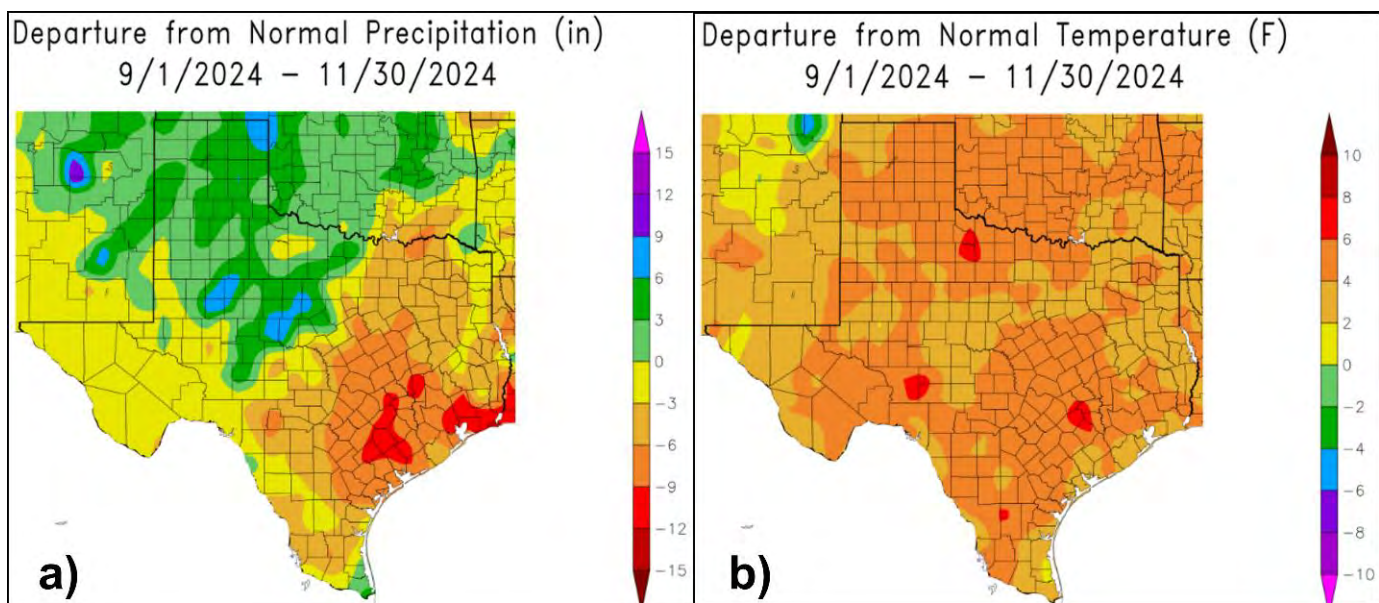
## Wichita Falls Regional Summary (continued)



**Figure 2.** Changes in drought conditions over the area according to the U.S. Drought Monitor (available at <https://droughtmonitor.unl.edu/>) for Texas on a) September 3, 2024 and b) November 26, 2024.

This fall, we experienced near normal precipitation (Fig. 3a) and well above normal temperatures (Fig. 3b). This is now the second Fall in a row where our area has seen temperatures at least three degrees Fahrenheit above normal. Despite the warm temperatures, winter will likely make an appearance eventually, so now is a good time to review info on measuring winter precipitation at this link:

[https://media.cocorahs.org/docs/WinterPrecipitationMeasurements\\_V3.0\\_Nov2022.pdf](https://media.cocorahs.org/docs/WinterPrecipitationMeasurements_V3.0_Nov2022.pdf).



**Figure 3.** Departure from normal a) precipitation and b) temperature for the beginning of September through the end of November. Warm colors indicate below normal precipitation (a) and above normal temperatures (b), while cool colors indicate above normal precipitation (a) and below normal temperatures (b).

## Abilene/San Angelo Regional Summary

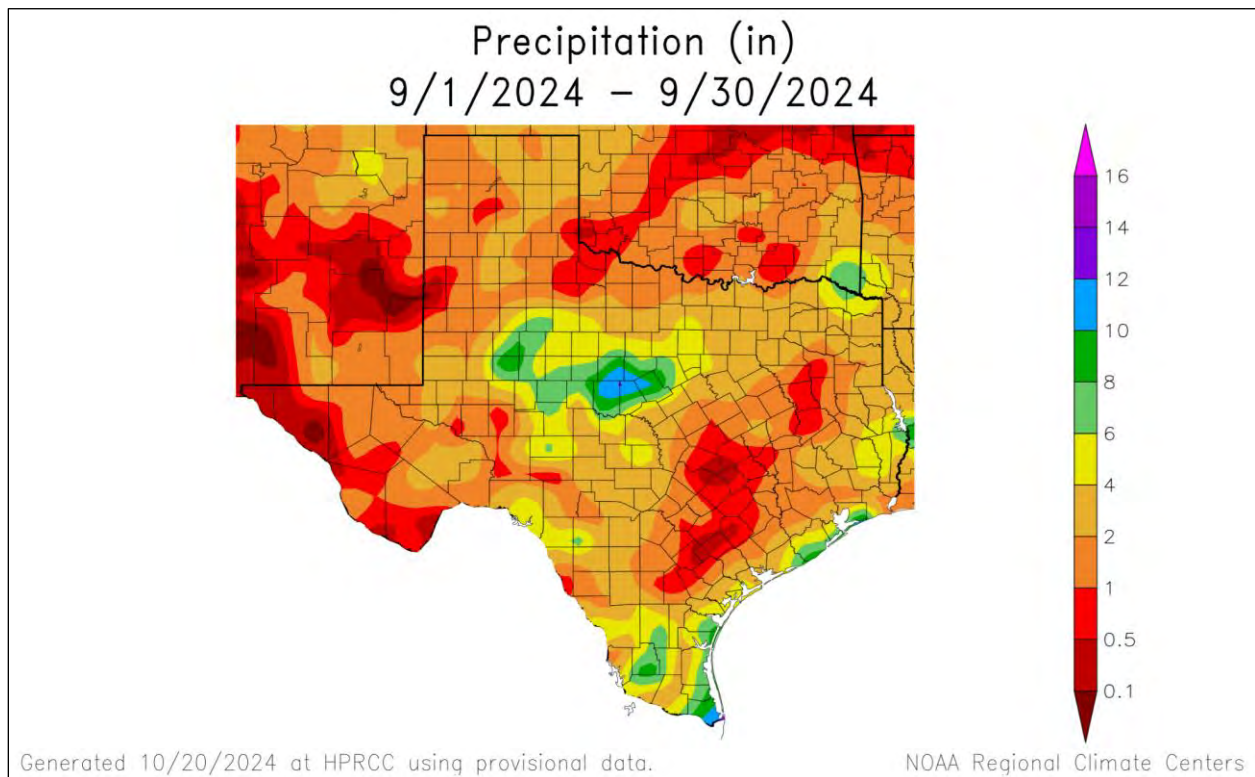
### Heavy rains in September to exceptionally dry October followed by Unique November Climate and Precipitation

By: Joel Dunn, Observation Program Lead NWS Abilene/San Angelo, CoCoRaHS Regional Coordinator

#### September

September brought a refreshing change to West Central Texas, beginning with an uncharacteristically wet start to the month. Heavy rainfall dominated the first week, drenching the region and providing much-needed relief after a punishingly dry summer. This marked the beginning of a dramatic shift in weather patterns as the area transitioned into autumn.

Rainfall totals for the month were impressive. On average, most areas in West Central Texas recorded between 2" to 5" of precipitation. However, specific locations, including those between Eldorado, San Angelo, and Brownwood, experienced extraordinary totals ranging from 6" to 10", with some isolated areas reporting up to 14". This deluge not only replenished soil moisture but also revitalized local reservoirs and water supplies.

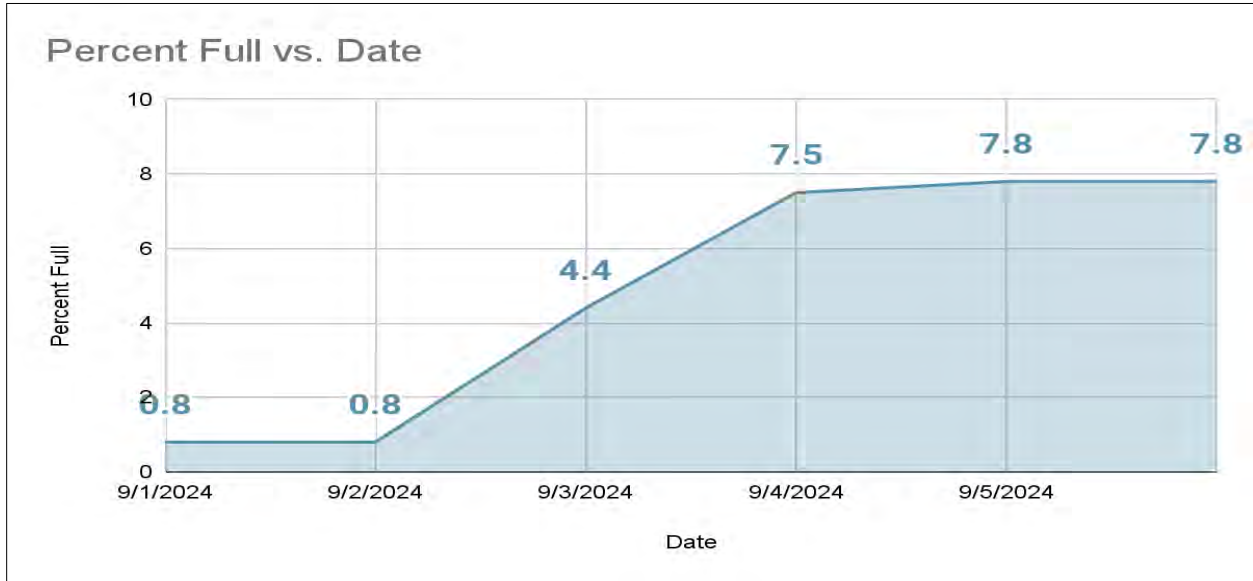


**Image 1 - Observed Precipitation for the month of September 2024**

One notable beneficiary of this generous rainfall was O.C. Fisher Lake, which had dropped to a shocking 1% capacity during the summer. Thanks to the early September rains, the lake recovered to 8% capacity, an increase equivalent to 9,684 acre-feet of water. To put this in perspective, the City of San Angelo consumes approximately 14,000 acre-feet of water annually, highlighting the critical importance of this replenishment for the region's water security.

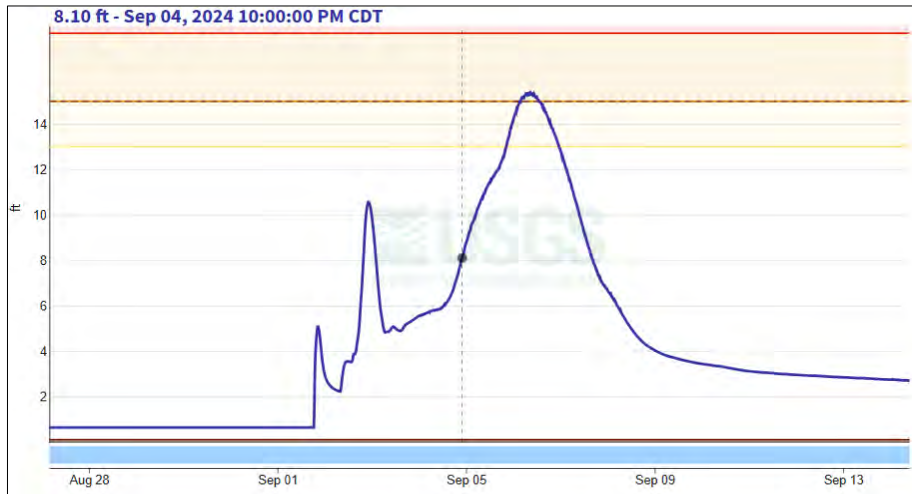


### Abilene/San Angelo Regional Summary (continued)



**Chart 1 - O.C. Fisher Percent full from September 1st to September 6th, 2024.**

The rainfall also impacted local waterways, with the Colorado River south of Silver, Texas, and then reaching minor flood stage during the early days of September. While the flooding was not severe, it underscored the intensity and volume of the rainfall. This event was a vivid reminder of how quickly conditions can shift from drought to excessive water in the semi-arid climate of West Central Texas.

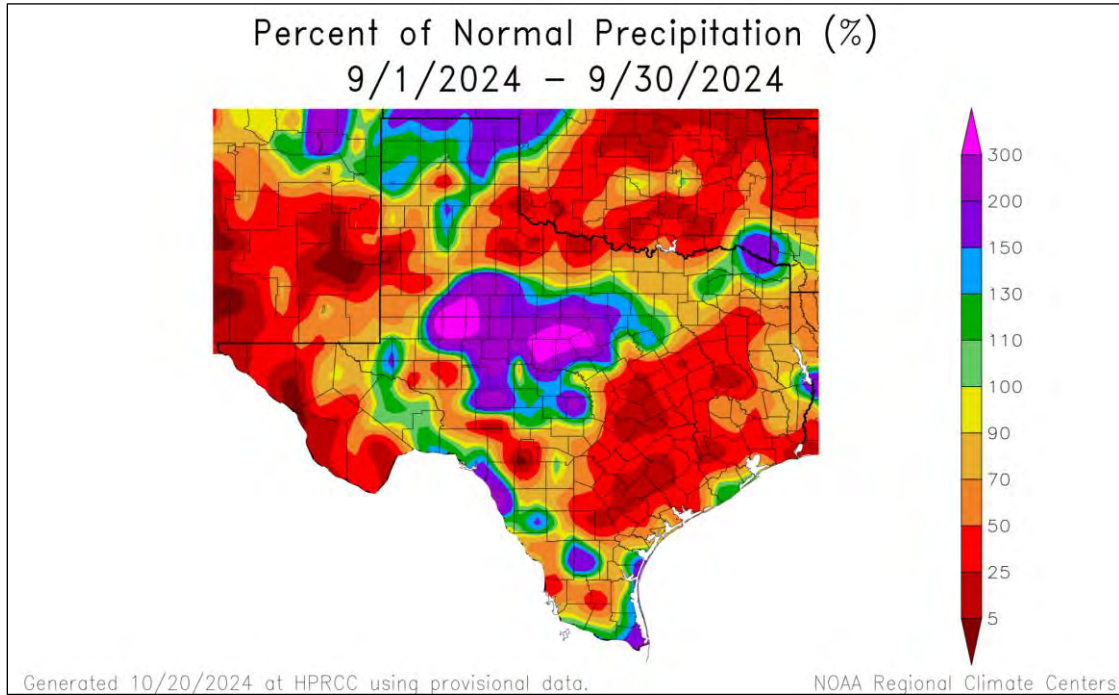


**Chart 2 - Hydrograph showing the Colorado River south of Silver, TX reaching moderate flood stage**

Midway through the month, the autumn equinox brought with it a significant weather change. A cold front swept through the region, accompanied by additional precipitation. This marked a turning point in the season, as the cooler and wetter conditions signaled the arrival of fall. The shift was welcomed by many after the relentless heat of summer.

As September progressed, another round of rainfall occurred near the end of the month, shortly after the autumnal equinox. While not as dramatic as the earlier events, this additional precipitation further boosted monthly totals and reinforced the wetter-than-normal conditions. The region experienced a sense of renewal as vegetation began to green up and reservoirs showed signs of improvement. By the time September came to a close, the region had enjoyed a considerably wetter-than-average month. Temperatures for the month ended near normal, a stark contrast to the scorching conditions of August. The combined impact of heavy early-month rains, the arrival of cooler weather, and late-month precipitation left the area much better positioned to face the fall season.

### Abilene/San Angelo Regional Summary (continued)

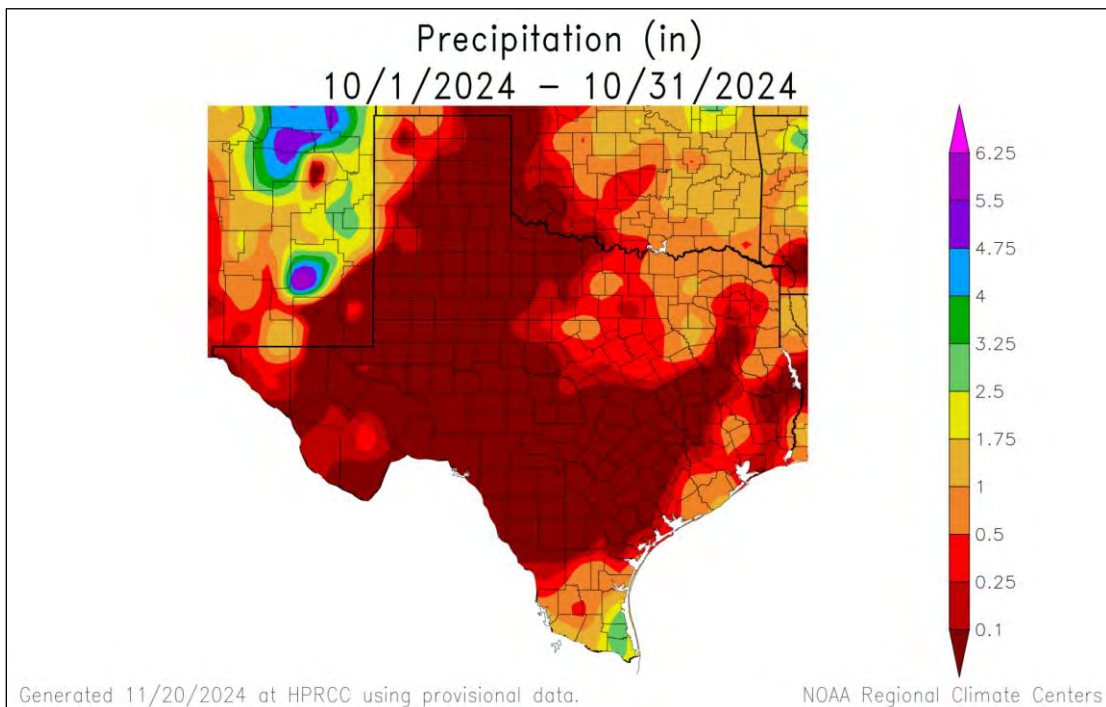


**Image 2 - September 2024 Percent of normal**

Overall, September brought much-needed relief to West Central Texas, replenishing water resources and breaking the prolonged dry spell. The month stood out not only for its rainfall totals but also for the profound change in weather patterns.

#### October

October 2024 brought a stark deviation from the typical weather patterns expected during the month across West Central Texas. Known climatologically for being a period of moderate rainfall, this October was exceptionally dry. Abilene experienced its 11th driest October on record, while San Angelo and Junction recorded their 3rd and 2nd driest Octobers, respectively, underscoring the severity of the dry conditions.



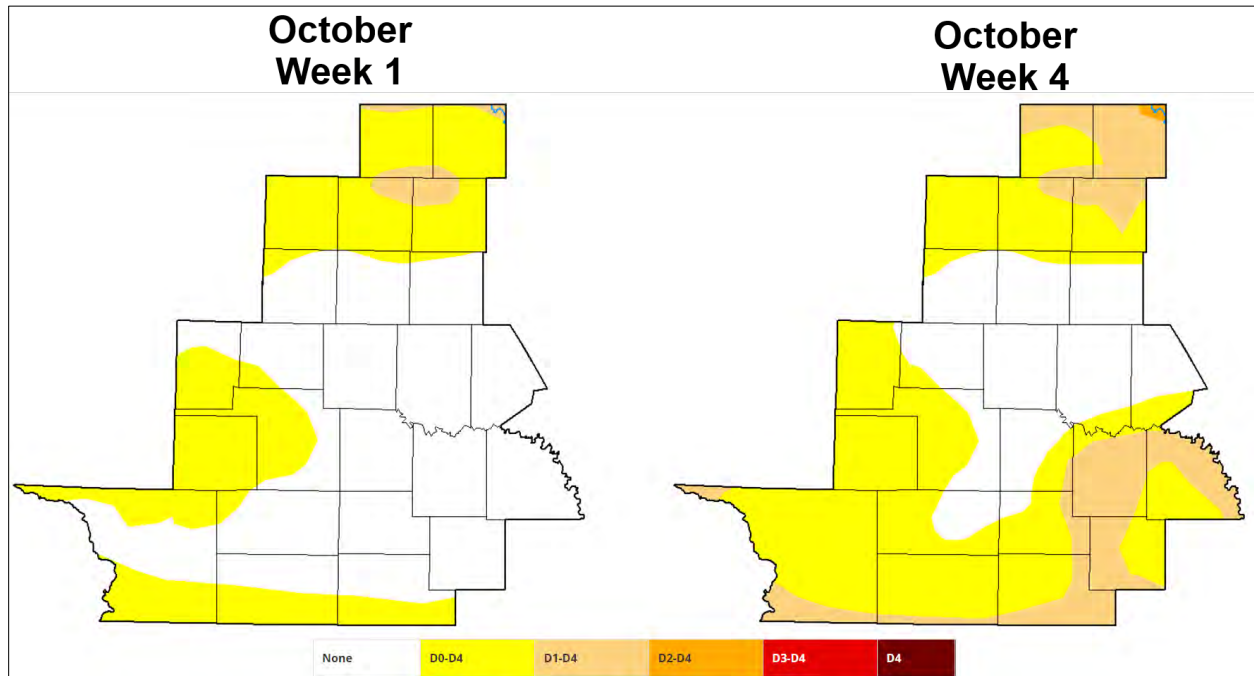
**Image 3 - Observed Precipitation for the month of October 2024**



## Abilene/San Angelo Regional Summary (continued)

With minimal rainfall to cool the region, temperatures soared, making October 2024 the warmest on record for West Central Texas. Daily highs regularly exceeded seasonal averages, and nighttime lows offered little relief due to persistent dryness, which typically helps moderate temperatures. The unusual combination of heat and dryness set the stage for a challenging month.

The dry conditions extended beyond their immediate impact on temperatures. Vegetation across the region began to show signs of stress, with soil moisture levels dropping significantly. For areas that had benefited from September's rainfall, October's dry spell reversed some of the gains, leaving many reservoirs, fields, and ecosystems under renewed strain. Abnormally dry conditions and drought were introduced in the U.S. Drought Monitor (see image below).



**Image 4 - Drought monitor comparison between the first and last week of October 2024**

Record warmth further compounded these challenges. With clear skies dominating the month, solar radiation remained unmitigated, driving temperatures well above normal. The warm, dry weather also elevated the risk of wildfires, adding another layer of concern for residents and emergency management teams across West Central Texas.

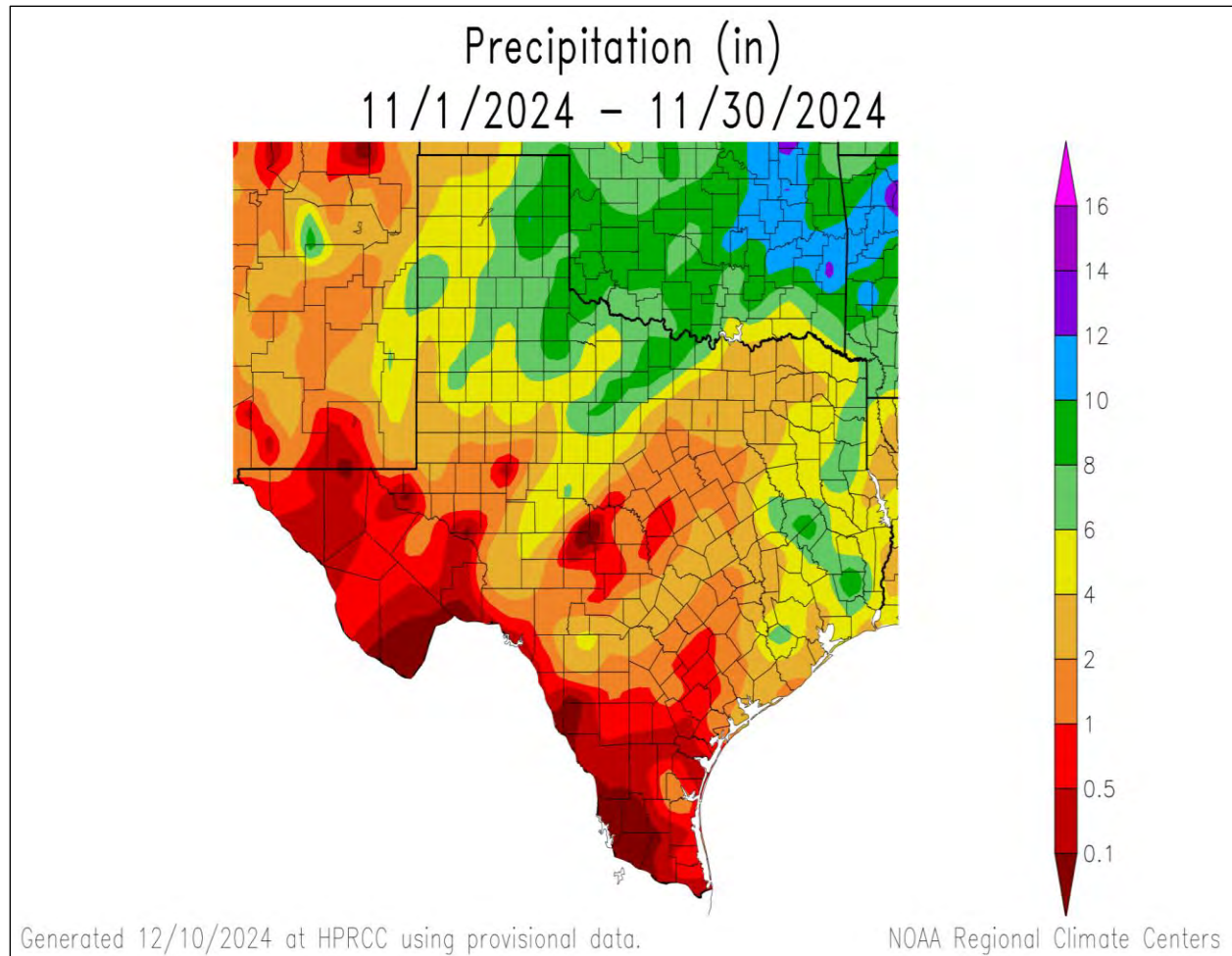
As October came to a close, the month's weather left an indelible mark on the climate records of the region. The combined effects of heat and dryness were felt across various sectors, from agriculture to water management. The extreme departure from normalcy emphasized the variability and unpredictability that can characterize weather in the region.

October 2024 will be remembered as a month of extremes, setting records for heat and dryness. The warmest October on record and among the driest for key cities in the region, the month ended significantly drier and warmer than climatological norms.

### November

November 2024 brought a significant departure from typical weather patterns across West Central Texas. Climatologically a dry month, this November became the second wettest on record for the region. A series of weather systems delivered ample rainfall, replenishing soil moisture and boosting reservoir levels in many areas. However, the Interstate 10 corridor missed out on the heaviest rain, though Junction recorded its 19th wettest November—a respectable rank but still drier compared to the rest of the region.

Rainfall totals varied widely across the area, with most locations well above average for November. The persistent rain events brought much-needed moisture, benefiting agricultural operations and easing drought concerns in many places. However, for areas along Interstate 10, rainfall remained sparse, leaving Junction drier than normal despite the wetter conditions elsewhere.

**Abilene/San Angelo Regional Summary (continued)****Image 5 - Observed monthly precipitation for the month of November 2024**

Another standout feature of November 2024 was the delay in the season's first freeze. Typically occurring around November 11th or 12th, the first freeze this year arrived several weeks late. Across the Concho Valley and areas southward to Junction, temperatures finally dipped below freezing on November 21st.

In Abilene and the Big Country, cloud cover played a pivotal role in keeping temperatures mild, further delaying their first freeze. Residents in these areas didn't experience their first freeze until November 29th, nearly the end of the month. The persistent overcast skies not only moderated temperatures but also contributed to the warmer-than-average conditions experienced throughout the region.

Wetter-than-normal conditions dominated the narrative for most of West Central Texas. The frequent rain events brought a sense of renewal to landscapes still recovering from the summer's dryness. However, for areas along Interstate 10, the limited rainfall meant conditions remained closer to the drier end of the spectrum, creating a patchwork of weather experiences across the region.



## Abilene/San Angelo Regional Summary (continued)

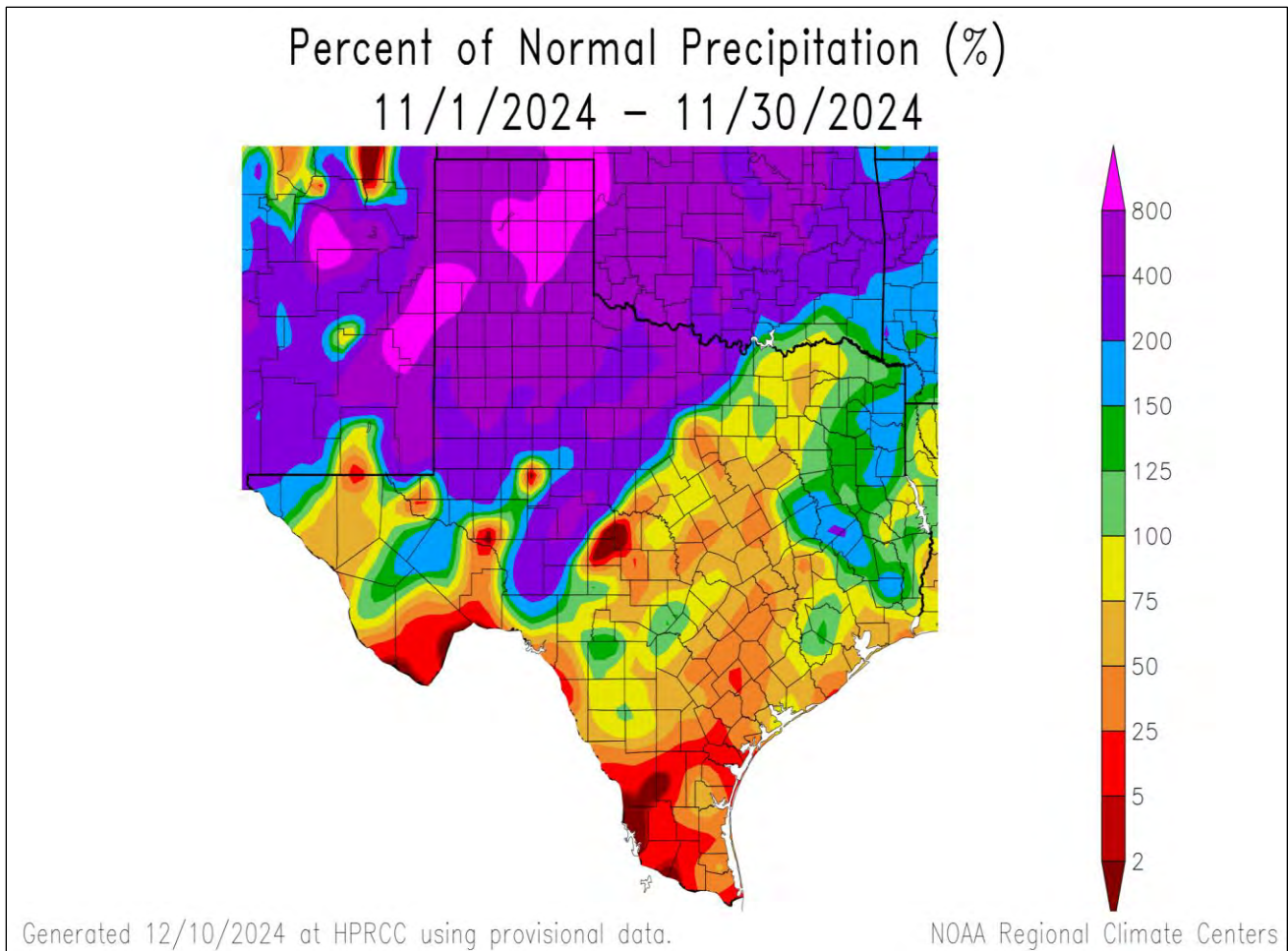


Image 6 - November 2024 Percent of Normal

The interplay between warmer-than-normal temperatures and increased rainfall made November 2024 unique. While the warmth delayed typical seasonal transitions like the first freeze, the moisture ensured that November would stand out in the climate records as a month of extremes. The contrasts between wetter northern areas and drier southern regions further emphasized the variability inherent to West Central Texas's climate.

In summary, November 2024 was a month of contrasts and extremes. While the region as a whole experienced its second wettest November on record, the delayed first freeze and warmer-than-normal temperatures highlighted the interplay of multiple weather factors. From the wetter-than-expected conditions in most areas to the drier-than-normal Interstate 10 corridor, November left an indelible mark on the region's climate history.

## Brownsville/Rio Grande Valley Regional Summary

### Autumn 2024 Weather Story for the Rio Grande Valley: Summer Just Never Really Quit

Record to Near-Record Seasonal Heat; Rainfall “Winners” Near the Lower Texas Coast

By: Barry Goldsmith

Warning Coordination Meteorologist  
NWS Brownsville/Rio Grande Valley

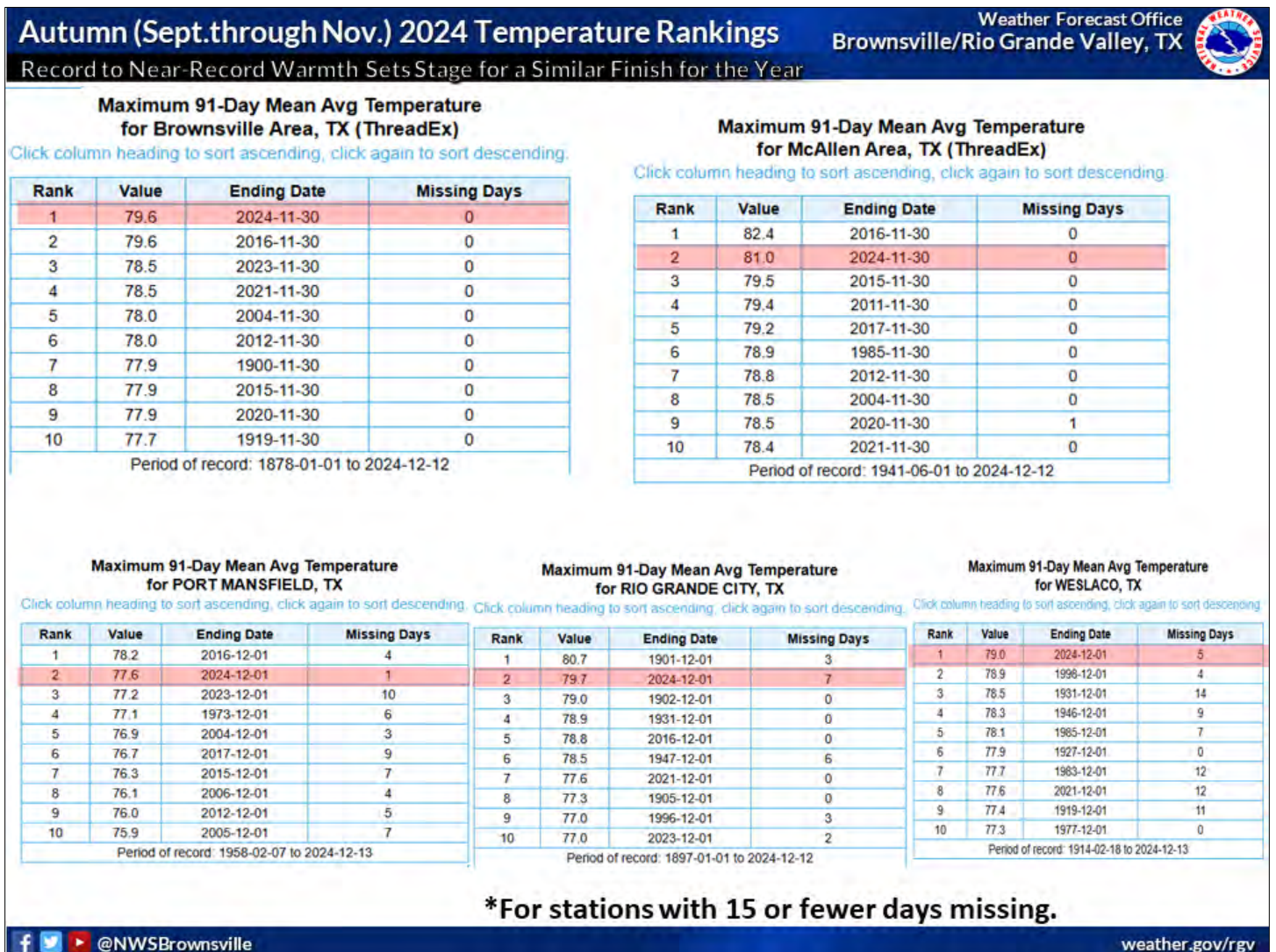


Figure 1. Summer never really ended in autumn 2024 across the Rio Grande Valley, it just faded very slowly away. Record to near record heat (shown are total average day/night temperatures combined) for September through November 2024, for available locations with the longest and most complete periods of record.



Brownsville/Rio Grande Valley Regional Summary (continued)

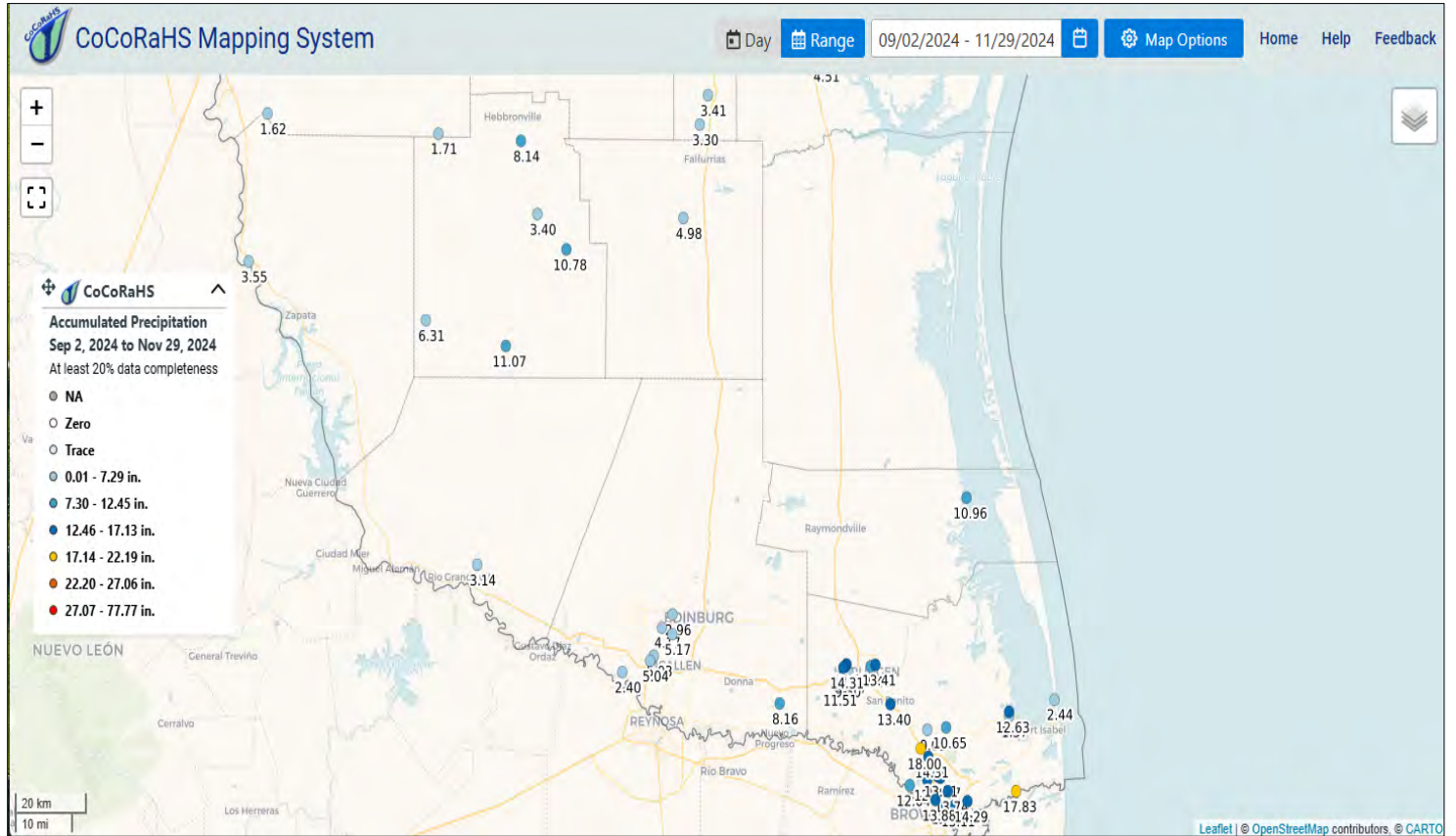


Figure 2: Winners...and losers: Copious rainfall fell on Cameron and parts of Willacy County, especially during September 2024 – while inland counties from Hidalgo and Brooks to Zapata County saw notably lower rainfall – in most cases below the 30-year and period of record averages. Credit Tropical Storm Francine in early September, and a small but potent thunderstorm cluster on September 15<sup>th</sup>, for providing more than 75% of the total rainfall.

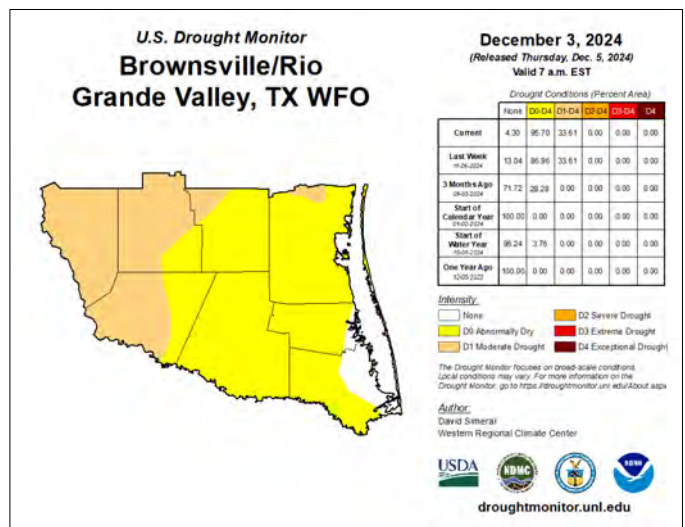
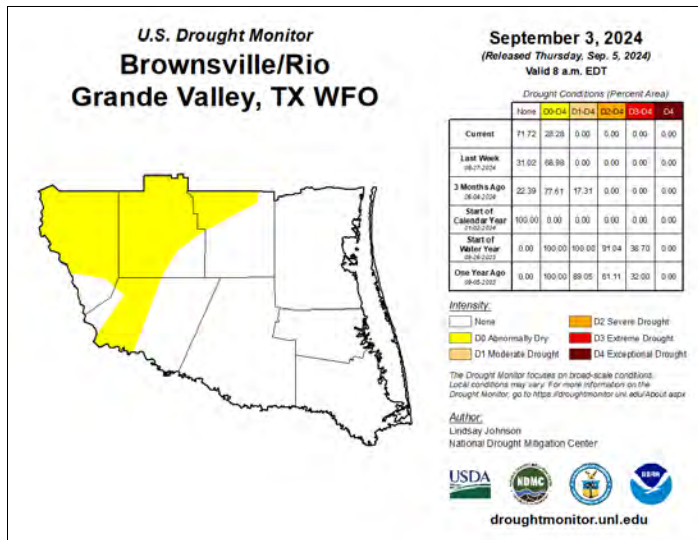


Figure 3. U.S. Drought Monitor showed dryness/drought conditions developed and worsened gradually through autumn. Eastern Cameron and southeastern Willacy remained drought/dryness free, while the remainder of the region saw slowly wilting grasses and brush, most common across the Brush Country and Rio Grande Plains by the end of November.

## Brownsville/Rio Grande Valley Regional Summary (continued)

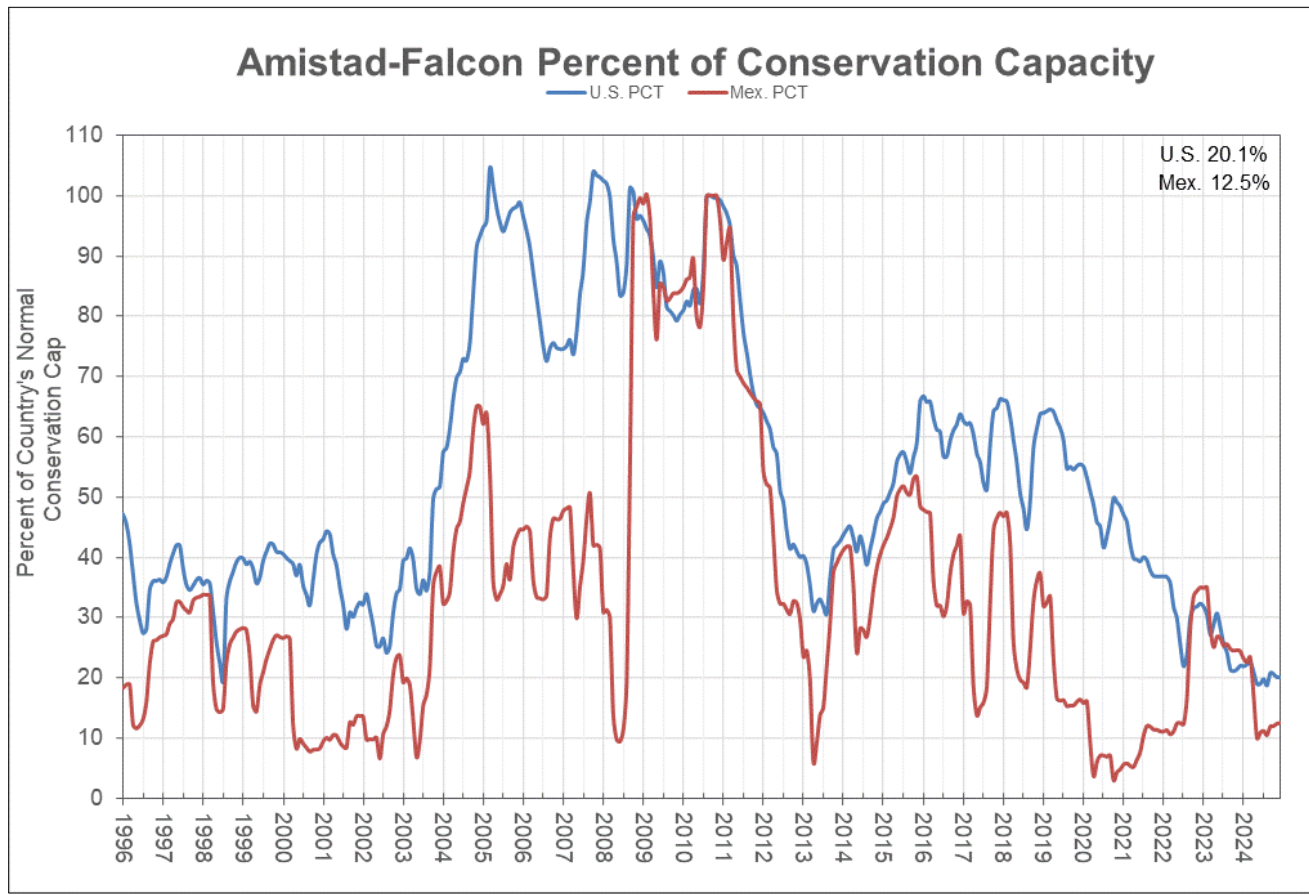


Figure 4. U.S. International Boundary and Water Commission (IBWC) combined percentage of conservation capacity for Amistad and Falcon International Reservoirs, as of the start of December 2024. The combined low values remained at the lowest on record for early December since each dam was constituted (Falcon in 1954; Amistad in 1971) – as meager inflows, even during the normally wetter September and early October period – prevailed. Water levels for the Rio San Juan basin (El Cuchillo and Marte Gomez) – set up to maximum storage by Tropical Storm Alberto, a follow-up wave in late June, and additional rains in July – remained above 100 percent through autumn. A recent minute ([Minute 331](#)) – an amendment – to the 1944 Water Treaty allowed some of the distributions to be used (diverted) into the Lower Valley for agriculture and municipal use during the 2024/2025 winter. Something is better than nothing.

### Month-by-Month Summary

**September** was the month of note for rainfall – but even then, the climatologically wettest month of the calendar year only achieved in Cameron and parts of Willacy County. In fact, many locations overachieved in each county based on their periods of record; Brownsville’s September finished 14<sup>th</sup> (10.75”) based on records back to 1878; Port Isabel finished 17<sup>th</sup> (8.64”) (gaps in the database included nearly 30 years in the early 20<sup>th</sup> century and other five to ten year gaps through the late 2010s) and Port Mansfield 13<sup>th</sup> (8.29”), records back to 1958. The main stories in September included:

- [Tropical Storm Francine](#), which skirted east of the Lower Texas Coast but dropped between 5 and 7.5” of rain along and east of Interstate Highway 69E in Cameron County. Local inundation of water depth 2 to 3 feet was noted in poor drainage locations from east Brownsville out toward Port Isabel and South Padre Island.

An organized, but small, cluster of thunderstorms that dropped between 3 and 6 inches of rain in Cameron County between Harlingen and downtown Brownsville on September 15<sup>th</sup>. Pockets of heavy rainfall between 2 and 4 inches also occurred in southern Willacy, rural eastern Hidalgo, and around Edinburg (where a pocket of poor drainage flooding was noted around the courthouse area) (Figure 6). Rapid-onset urban flooding occurred, mostly in poor drainage locations, from Brownsville to Harlingen. Some of the water entered vehicles and properties from this event.

## Brownsville/Rio Grande Valley Regional Summary (continued)

Otherwise, temperatures for September ended up a hair above the recent 30-year averages (1991-2020) – but still among the top 10 to 15 percent warmest on record. Brownsville, at 83.7°F, ranked 15<sup>th</sup> hottest (records back to 1878); Harlingen, at 83.2°F, ranked 23<sup>rd</sup> hottest (records back to 1912), and McAllen, at 85.9°F, ranked 9<sup>th</sup> hottest (records back to 1942).

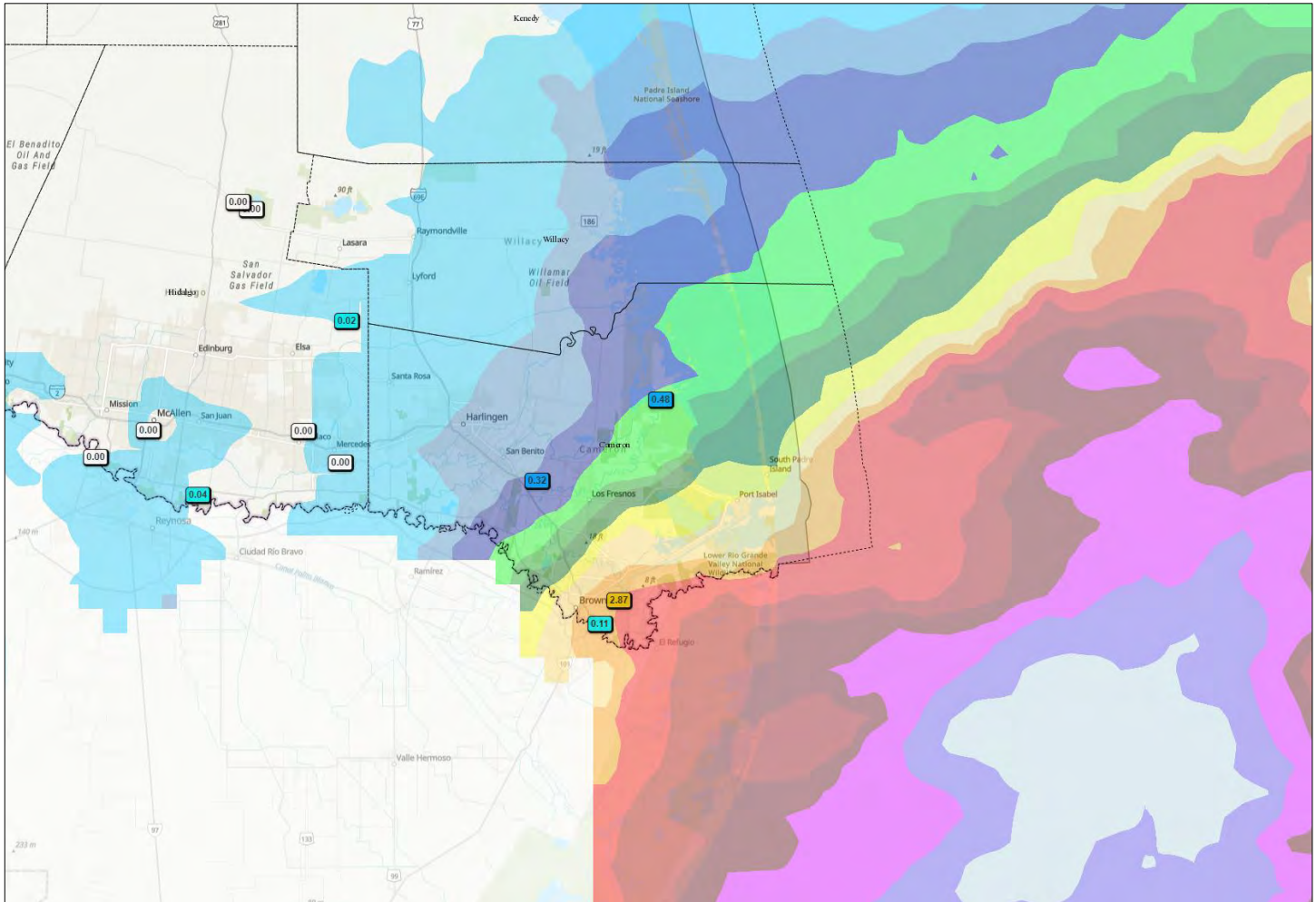


Figure 5. Radar estimated rainfall for the 24 hour period between 7 AM September 9<sup>th</sup> and 7 AM September 10<sup>th</sup>, 2024. These estimates do not include the continuation of heavy rainfall through mid to late morning on the 10<sup>th</sup>, particularly around the Harlingen area and in southeast Willacy County. The tight gradient of rainfall was real, however; between 7 AM September 9<sup>th</sup> and 7 AM September 10<sup>th</sup>, Brownsville received 3.77 inches (airport) while Harlingen/Valley International Airport only received 0.22”.



### Brownsville/Rio Grande Valley Regional Summary (continued)

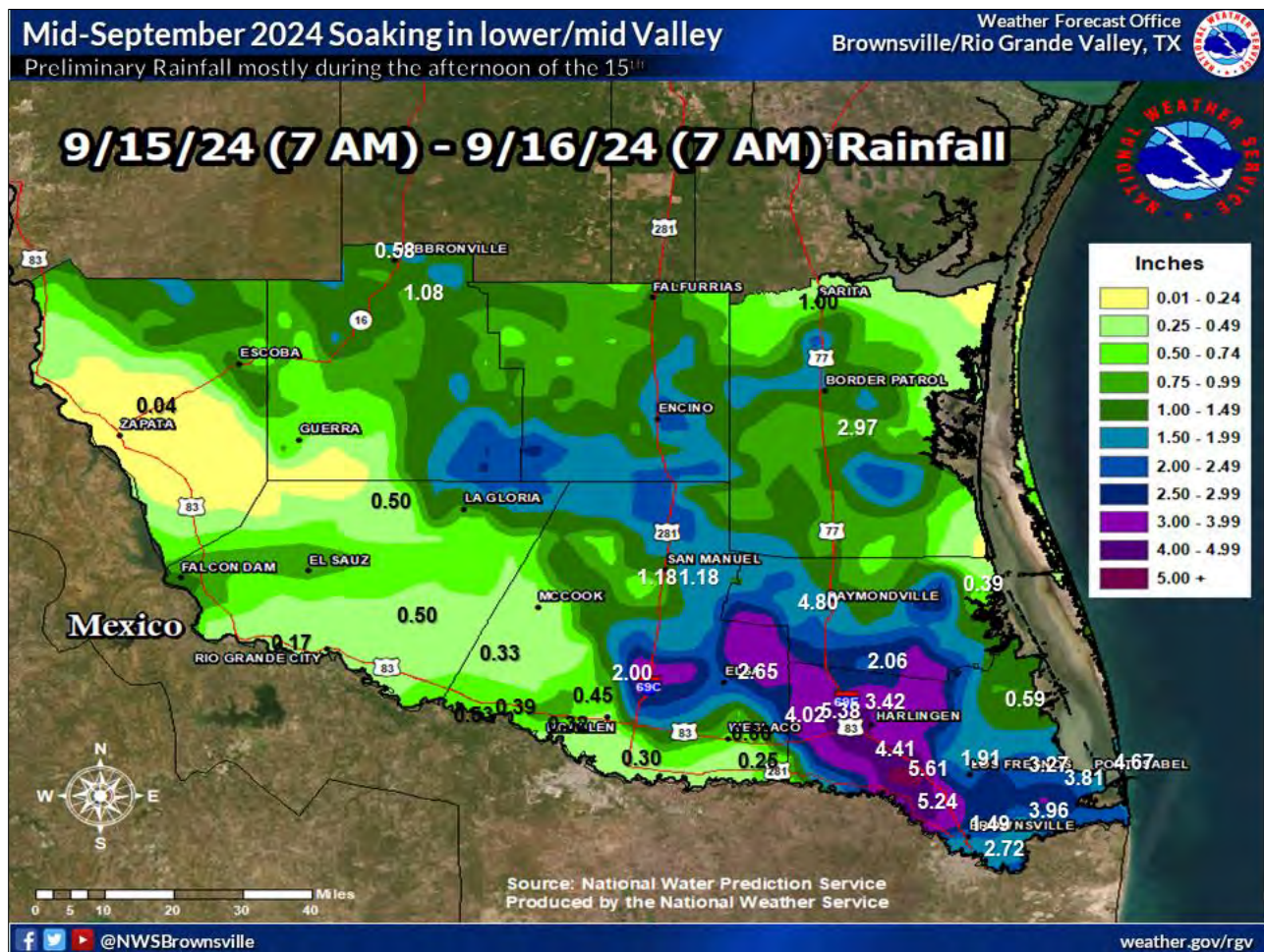


Figure 6. Radar estimated rainfall (annotated with CoCoRaHS, ASOS, AWOS, and Mesonet data) for the 24 hour period between 7 AM September 15<sup>th</sup> and September 16<sup>th</sup>, 2024. Once again, much of Cameron County, with some extension into eastern Hidalgo and southern Willacy, were the winners – though urban flooding cause notable impacts especially from Olmito to north Brownsville.

**October** featured two specific rain events – once again favoring Cameron and Willacy County on the 4<sup>th</sup> and 5<sup>th</sup>. The events of October 4-5 were the result of an upper-level tropical wave just south of the U.S./Mexico border, which led to a weak coastal trough that assisted the local downpours. Thereafter, the only pocket of “scary” rain fell late Halloween afternoon and just into the start of the trick-or-treat hours across mainly rural Hidalgo and much of Brooks County. Fortunately, the showers and embedded thunderstorms dissipated before reaching the populated Rio Grande Valley – and the warm/sticky end to October was fitting for yet another month of the same. Once again, the “winners” of the October rainfall contest were Cameron and Willacy County, with parts of Brooks and Kenedy seeing some benefits (Figure 7). However, inflow regions to Falcon and Amistad were on the dry side...a harbinger of things to come in November.

## Brownsville/Rio Grande Valley Regional Summary (continued)

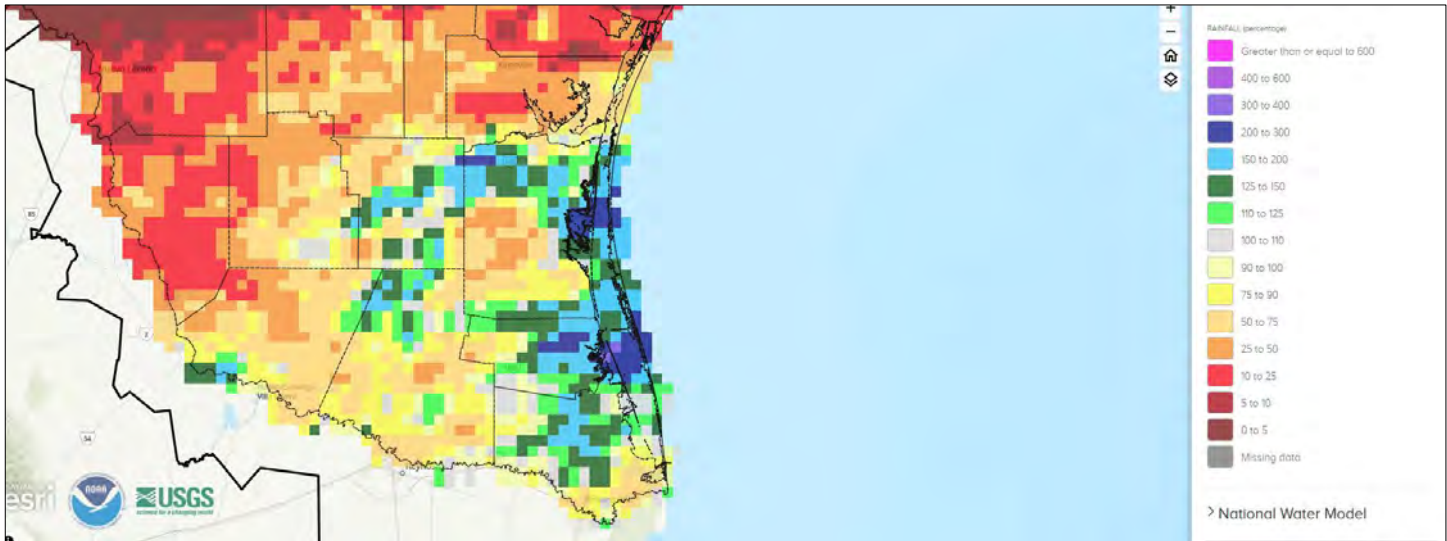


Figure 7. Precipitation percentage of average for October 2024. Courtesy of <https://water.weather.gov> .

Temperatures for October were once again above the 1991-2020 average by 1 to near 3°F – placing the month among the top ten warmest all-time for all available locations.

October's warmth set the stage for **November**, which was dominated by “endless summer” fading heat for nearly all of the month. Surf temperatures held at or above 80 until the week before Thanksgiving, when the season's first “dry” front plunged morning temperatures into the comfort zone for the first time this season (lower 40s to lower 50s) – and the coolest morning temperatures (21<sup>st</sup>) since February 19<sup>th</sup>, 2024. The morning chill wasn't enough to keep full sunshine from warming things back into the lower 80s. A Thanksgiving Day (November 28<sup>th</sup>) was modest but notable in cooling things down following a near 90°F Thanksgiving Eve Day, and “Black Friday” was the coolest daytime for most of the Valley of the autumn...yet still in the 60 to 65°F range for most. Some years, November sees a day and night temperature plunge into the 30s and 40s. 2024 was not one of those years.

Rainfall was sparse, with just a pocket of locally heavy rain (just over an inch) around Harlingen on the 5<sup>th</sup>. November, typically a dry month, lived up to its billing and then some. Climatological average rainfall (generally 1 to 1.8” from west to east) was only achieved in very small pockets. Once again, the Brush Country/Rio Grande Plains saw virtually no rain (less than 10 percent of the average in most locations, Figure 8), which led to the development of moderate (level 1 of 4) drought conditions there by month's end.

The lack of notable rainfall and a much above average atmospheric pattern led to a record-warm (hot) month for most locations, as comparative to the warmer 1991-2020 averages showed between 3.5 and nearly 6°F above them. Figure 9 shows the rankings.



### Brownsville/Rio Grande Valley Regional Summary (continued)

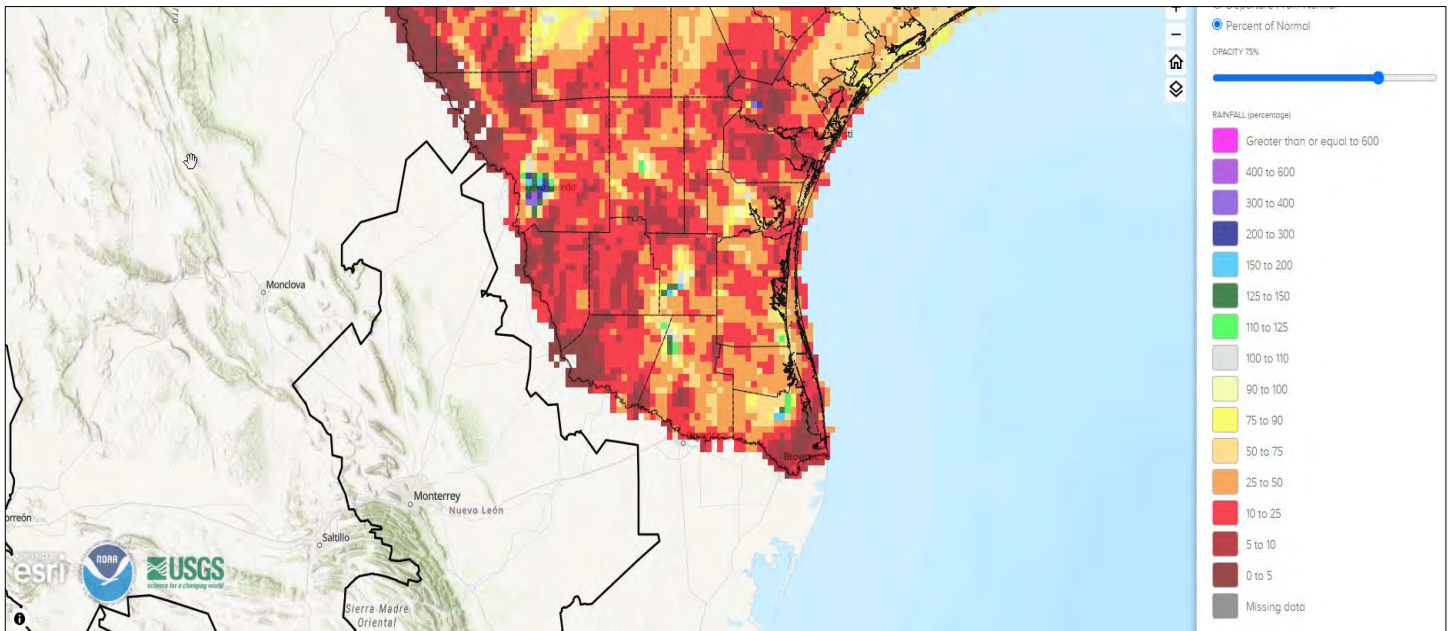


Figure 8. Percent of average rainfall for south Texas, November 2024. Average rainfall is 1 to 1.8” across the region, lowest across the Brush Country and highest across the Cameron/Willacy area.

## November 2024 Temperature Rankings

Record to Near-Record Warmth Sets Stage for a Similar Finish for the Year

Weather Forecast Office  
Brownsville/Rio Grande Valley, TX

### Maximum 30-Day Mean Avg Temperature for Brownsville Area, TX (ThreadEx)

Click column heading to sort ascending, click again to sort descending.

Rank	Value	Ending Date	Missing Days
1	75.8	2024-11-30	0
2	74.7	1909-11-30	0
3	74.5	1973-11-30	0
4	74.3	2020-11-30	0
5	73.9	2017-11-30	0
-	73.9	1994-11-30	0
7	73.9	1927-11-30	0
8	73.6	2015-11-30	0
9	73.3	2016-11-30	0
10	73.2	1945-11-30	0

Period of record: 1878-01-01 to 2024-12-12

### Maximum 30-Day Mean Avg Temperature for McAllen Area, TX (ThreadEx)

Click column heading to sort ascending, click again to sort descending.

Rank	Value	Ending Date	Missing Days
1	76.1	2024-11-30	0
2	75.6	2016-11-30	0
-	75.6	1994-11-30	0
4	74.1	2020-11-30	0
5	74.1	1945-11-30	0
6	74.0	1973-11-30	0
7	74.0	1985-11-30	0
8	73.6	2017-11-30	0
9	72.4	1983-11-30	0
10	72.4	1965-11-30	0

Period of record: 1941-06-01 to 2024-12-12

### Maximum 30-Day Mean Avg Temperature for HARLINGEN, TX

Click column heading to sort ascending, click again to sort descending.

Rank	Value	Ending Date	Missing Days
1	73.6	1994-12-01	0
2	73.5	1945-12-01	1
3	73.5	2020-12-01	1
4	73.5	2024-12-01	1
5	73.4	1927-12-01	0
6	73.2	2016-12-01	0
7	72.8	1931-12-01	1
8	72.4	1985-12-01	1
9	72.2	1921-12-01	1
10	71.8	1913-12-01	0

Period of record: 1912-02-07 to 2024-12-13

### Maximum 30-Day Mean Avg Temperature for RIO GRANDE CITY, TX

Click column heading to sort ascending, click again to sort descending.

Rank	Value	Ending Date	Missing Days
1	74.5	2024-12-01	0
2	73.8	1901-12-01	2
3	73.8	1902-12-01	0
4	72.8	1994-12-01	0
5	71.9	2016-12-01	0
6	71.3	1931-12-01	0
7	71.2	1946-12-01	5
8	71.2	1905-12-01	0
9	70.7	1973-12-01	0
10	70.5	1965-12-01	0

Period of record: 1897-01-01 to 2024-12-12

### Maximum 30-Day Mean Avg Temperature for WESLACO, TX

Click column heading to sort ascending, click again to sort descending.

Rank	Value	Ending Date	Missing Days
1	75.1	1994-12-01	4
2	74.3	1985-12-01	5
3	73.7	1927-12-01	0
4	73.7	2024-12-01	0
5	73.6	1990-12-01	4
6	73.1	1965-12-01	0
7	73.0	1945-12-01	1
8	72.7	1988-12-01	0
9	72.5	1931-12-01	5
10	72.4	1921-12-01	0

Period of record: 1914-02-18 to 2024-12-13

\*For stations with 5 or fewer days missing.

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weather.gov/rgv

Figure 9. November 2024 temperature rankings for available locations across the Rio Grande Valley. Brownsville, McAllen, and Rio Grande City were between 0.5 and 1.7°F above their prior records. Harlingen came up just shy of their all-time record warm/hot November.



## Brownsville/Rio Grande Valley Regional Summary (continued)

**Autumn** will be remembered for its persistent heat, but oh-so-frustratingly close proximity of the mid Valley (i.e. Weslaco, McAllen) to the repeated welcome rains that left the Cameron/Willacy area in good stead headed into December. In fact, early December saw multiple decent rain events in these same areas – ensuring that drought would be a long time returning. Not so for the thirsty areas of western Hidalgo/Brooks through Zapata (areas west of IH-69C and US 281) where the prospects were poor for sufficient rain to alleviate drought – and a likelihood of Severe (level 2 of 4) drought to develop by late December, along with an increasing potential for rapid wildfire spread behind strong, dry fronts (should any wildfires begin).

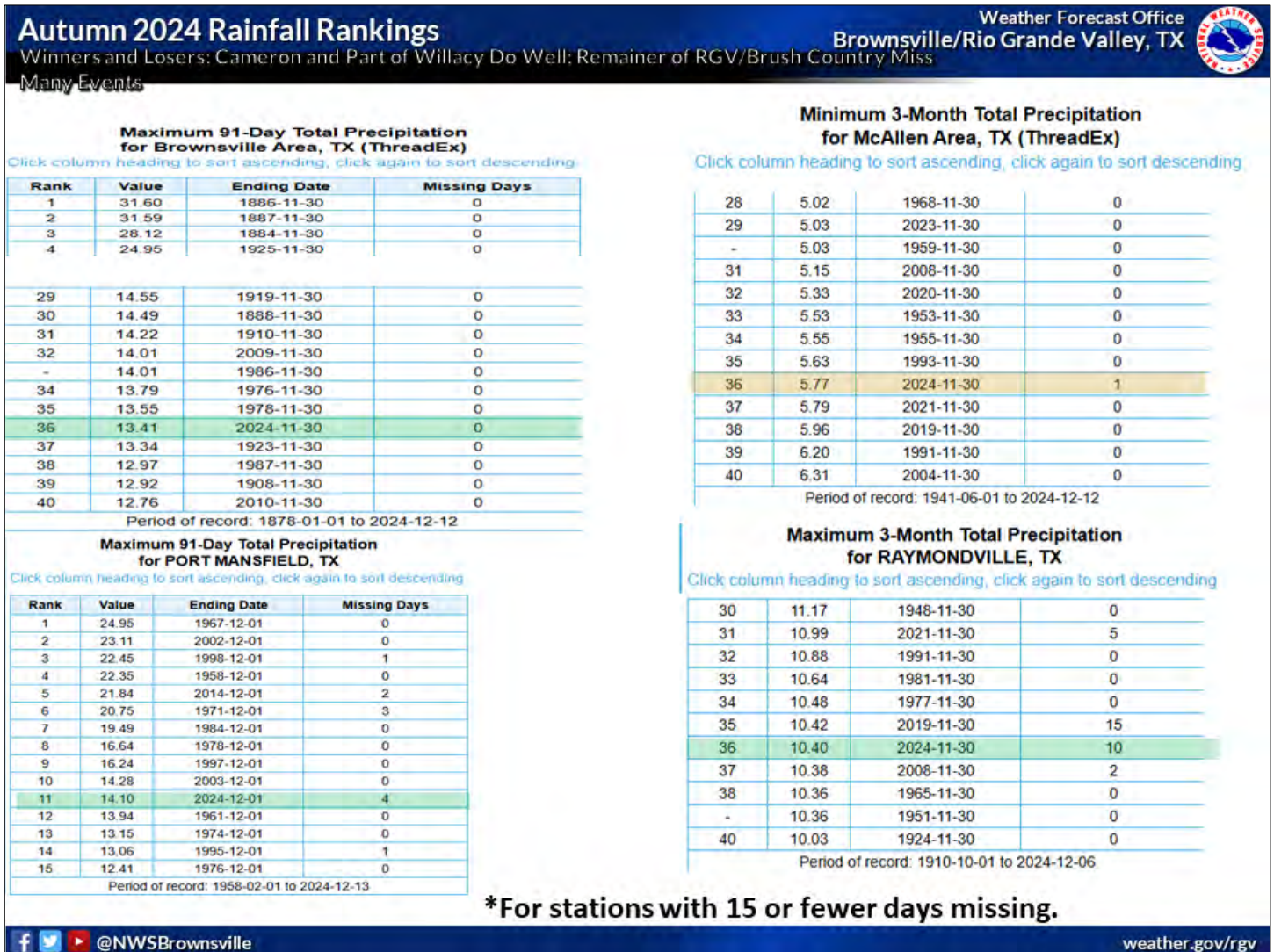


Figure 10. Autumn 2024 rainfall rankings for available locations. It was feast or famine in a sense; While Cameron and Willacy locations (green bars) finished among their top 25% wettest autumns on record, McAllen (tan bar) finished among its top 45% driest autumns on record.



*Merry Christmas to all CoCoRaHS Observers & Readers*





## Winter Weather Outlook

### A Warmer & Drier than Normal Winter Ahead

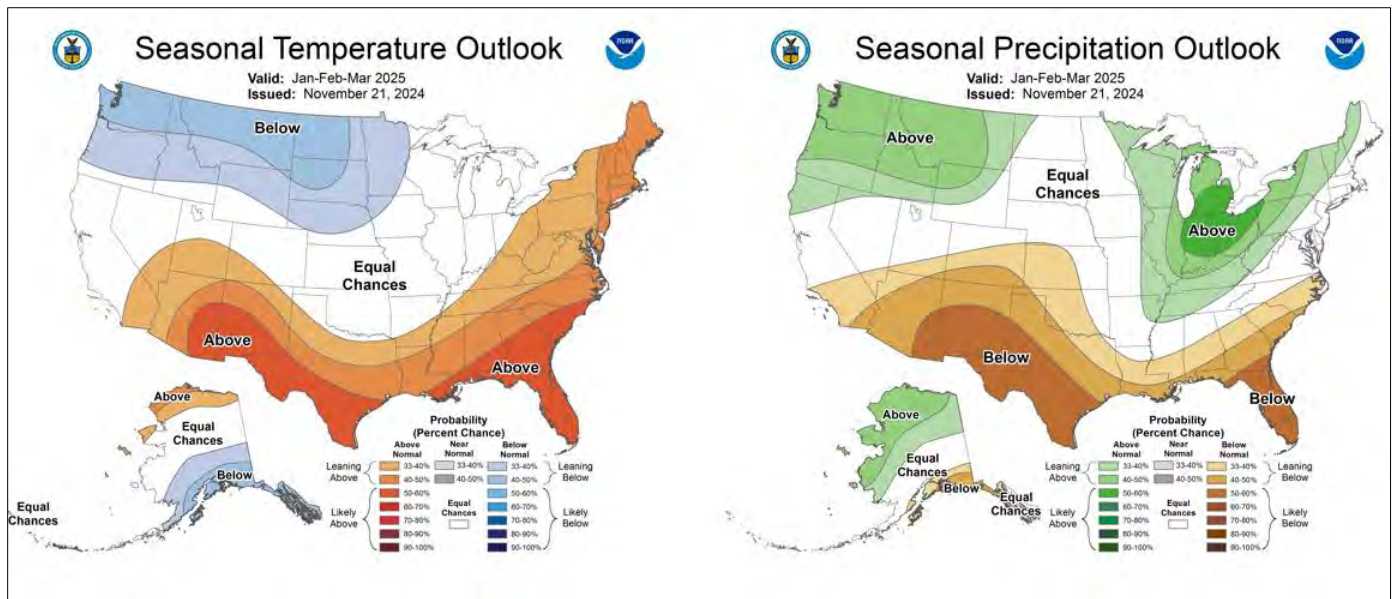
**By: Bob Rose, Meteorologist, Lower Colorado River Authority**

This year, it seemed summer just didn't want to end as the temperature stayed in the 80s and 90s all the way into November. Texas recorded its third warmest November and warmest October, so it's no surprise that autumn season was the warmest on record. But after wearing out its welcome, summer finally moved on in late November, allowing cooler, more seasonable temperatures to take hold just in time for the start of winter. In most years, the winter season is relatively short. 80-degree temperatures can sometimes return by February. Even though Texas winters are relatively short, they can often bring numerous challenges of brutally cold air and dangerous wintry precipitation. We don't have to look back very far back in history to know that winters can at times be quite impactful and dangerous.

The winter of 2024-2025 is shaping up to be mild and drier than normal across Texas. Although many factors go into predicting the winter outlook, the primary driver this year is expected to be a weak La Niña. A tongue of cooler than normal water began to take shape across the eastern and central tropical Pacific Ocean back in August, and this area of cool water has persisted ever since. As of mid-December, this area of cool water didn't quite meet the threshold to be given the official designation of La Niña. However, most forecasters feel conditions are still favorable for a weak La Niña to develop over the winter. Whether La Niña officially develops or not, that tongue of cooler than normal water won't be going away anytime soon. It is predicted to influence the atmosphere across the Pacific in a way that will help to guide the jet stream further to the north than usual into western Canada and the northern Plains states. A storm track this far north will tend to keep many of this winter's storm systems and much of the very cold air to the north and away from Texas. With fewer storm systems and strong cold fronts, this winter weather across Texas is expected to average milder and drier than normal.

The Climate Prediction Center's winter outlook shows strong odds the temperature across most of Texas will average above normal. At the same time, there are strong odds for precipitation to average below normal. This is very close to the typical weather pattern we often see during most La Niña winters.

### Winter Weather Outlook (continued)



***The Climate Prediction Center's Temperature and Precipitation Outlook for January-February-March***

While the overall winter is expected to be milder and drier than normal, there will likely be brief stretches of bone-chilling cold weather from time to time as the La Niña pattern relaxes, allowing cold fronts and storm systems to pay us a visit. Short periods of rain may also occur as other atmospheric oscillations briefly overwhelm the La Niña. If the cold and wet weather happen to coincide at the same time, periods of snow and ice will be possible. But these interruptions are expected to be brief.

While the winter outlook is looking to be mild and on the drier side, we can't ever let our guard down. We never know for sure in advance what surprises Mother Nature might want to throw our way.



## Scheduled CoCoRaHS Webinars & Information

**SPECIAL WEBINAR** - January 9, 2025 - 1:00 PM Eastern

### "A Review of Significant Weather Events Occurring in 2024"

**Greg Carbin**  
Meteorologist  
Barnard, VT



Greg will present an overview of hazardous weather episodes impacting life and property within the United States during 2024. Selected events will be presented in quasi-chronological order and described with photos, maps, and loops of satellite and radar data. While many of the events selected for this talk captured the attention of the media and public, some of these "meteorological memories" may have been forgotten as more substantial weather events occurred throughout the year. This review will highlight some of the "big stories", as well as smaller short-term events. The presentation will include descriptions of significant and deadly weather events of the past year including winter storms, tornadoes and floods. Along with the meteorological set-up for each event, an impact summary will also be provided.

**Webinar #93** - Thursday, February 2025

### SNOTEL - SNOpack TELEmetry

**Karl Wetlaufer**  
USDA-NRCS Snow Survey  
Denver, CO

Karl's presentation will explain the history, logistics, uses, etc. of SNOTEL (Snowpack Telemetry), which is a remote backcountry array of weather station equipment that measures snow and transmits the data wirelessly to scientists. More information to follow.

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Questions, Comments, and Suggestions about this newsletter are welcomed at the above email addresses.