



TEXAS CoCoRaHS OBSERVER

Summer 2020



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.

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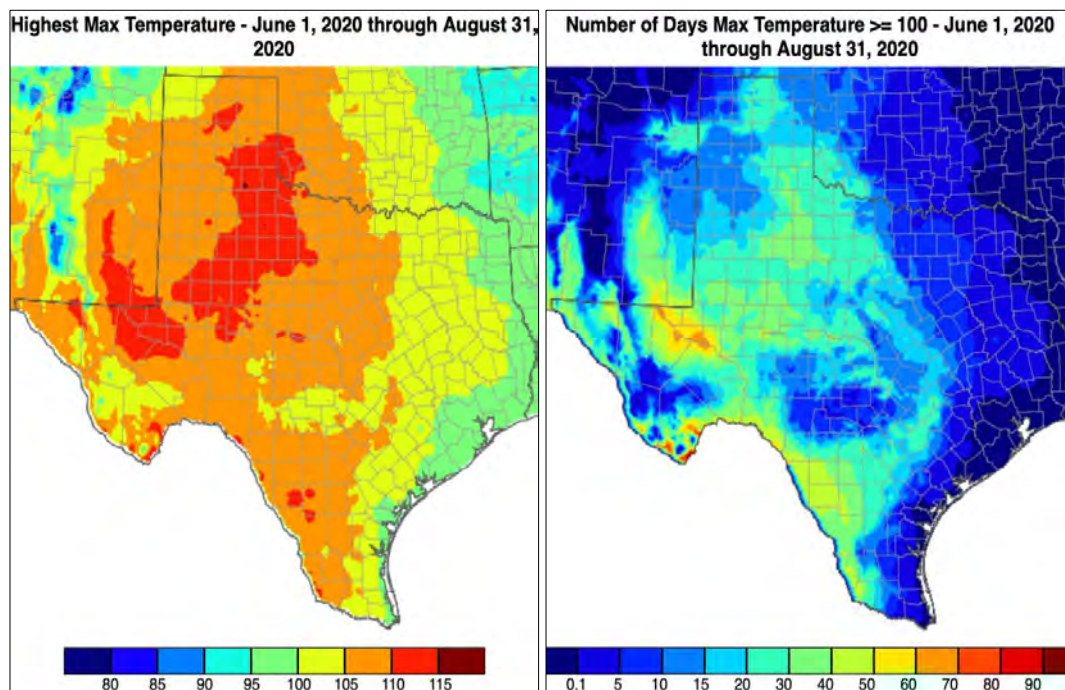
Texas Summer Weather Summary

Another Summer for Texas: Your Experience May Vary

By: John Nielsen-Gammon, Texas State Climatologist

Another summer has come and gone. Meteorologists consider summer (in the Northern Hemisphere) to be June through August. That means we don't have to wait until September 21 or so for summer to end.

Some Texans enjoy summer, especially if they're going to school. Others really don't like it all that much. You can find wide differences of opinions in the same neighborhood, or even the same household. But across the state, part of the difference is that Texans actually don't experience the same summer. Each summer is different, but even a normal summer can be quite different in some places than others. Let's look at what happened this year.



Continued page 2 >

"Because Every Drop Counts, As Do All Zeros"

“Texas Summer Summary (continued)”

Elevation clearly seems to make a big difference. Out West, the milder days are found at the higher elevations. Elevation seems to help in Central Texas, too, with the Hill Country west of Austin and northwest of San Antonio being an oasis from heat almost as effective as the mountains of West Texas even though hills aren't mountains. In fact, elevations in the Hill Country are similar to elevations along the Pecos River where hundred-degree days are common so it's not simply elevation that matters.

Instead, it's elevation relative to nearby areas. Air near the ground is going to be heated up about the same no matter the elevation of the ground, because it's getting about the same sunlight. But air also moves around, and it warms and cools as it sinks and rises. In the Hill Country, most of the air has come from a lower elevation so it has cooled, while along the Pecos River, most of the air has come from a higher elevation so it has experienced extra warming.

What sometimes stresses people more, especially those without air conditioning, is that temperatures often tend to stay high throughout the night. So let's look at minimum temperatures in the same way.

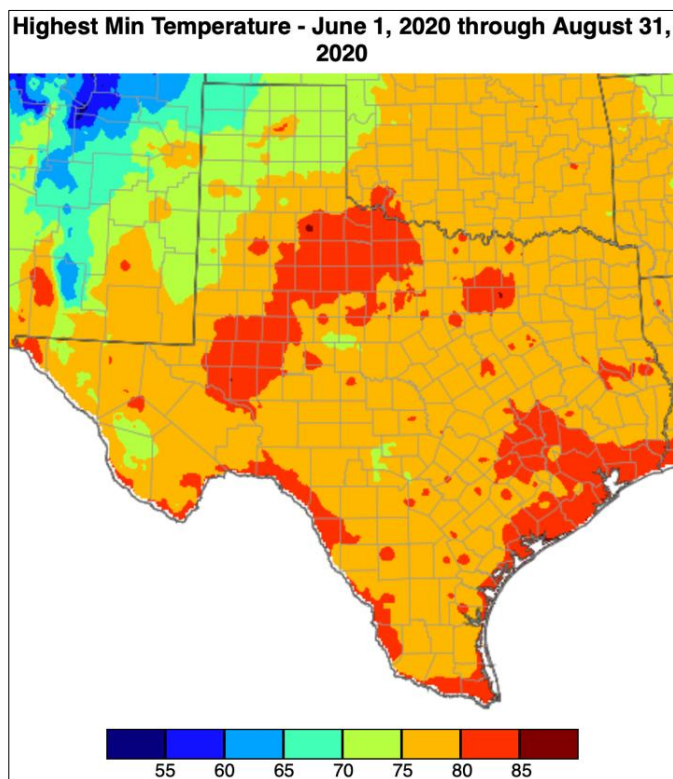


Fig. 3: Highest min temperature this summer.

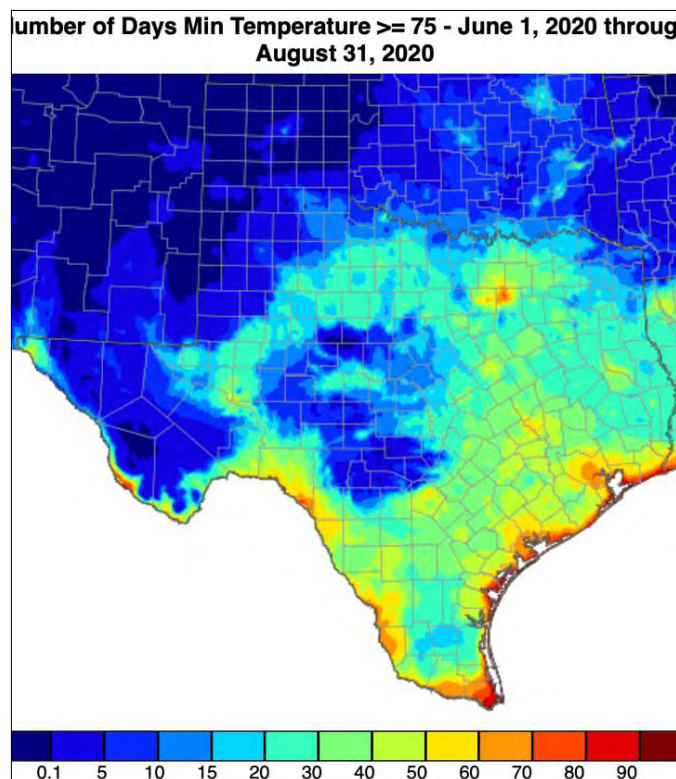


Fig. 4: Number of days min temp. $\geq 75^\circ\text{F}$ this summer.

In western and central Texas, it's a similar tale. Where it was hot during the day, it was hot at night, both on the hottest day of the year and in general. The Pecos River area doesn't come off quite as hot, because it's so dry (especially this summer) that temperatures tend to drop quite a bit at night.

“Texas Summer Summary (continued)”

But coastal and eastern Texas are a different story. While both of those regions avoided very hot days, they were generally unable to avoid very hot nights. Warm nights are most common right along the coast, with temperatures staying at or above 75°F most nights and sometimes staying at or above 80 °F. So you can't avoid the heat along the coast, it's just a steady kind of heat, with the ocean breezes keeping temperatures relatively constant throughout the day and night.

It's plain to see one of the reasons that the Hill Country is so popular in summertime. Temperatures rarely exceed 100 °F, and you can almost always count on the nights to cool off to a decent temperature. And you don't have to drive to the northwest corner of the Panhandle to get those benefits. This matters for those of us not in Amarillo.

You can also see the urban influence on the number of warm nights. It's plain in Dallas, but you can also see elevated warm night counts in Houston and San Antonio. Dallas residents get the hot days of an inland location but the warm nights of a coastal location: the worst of both worlds.

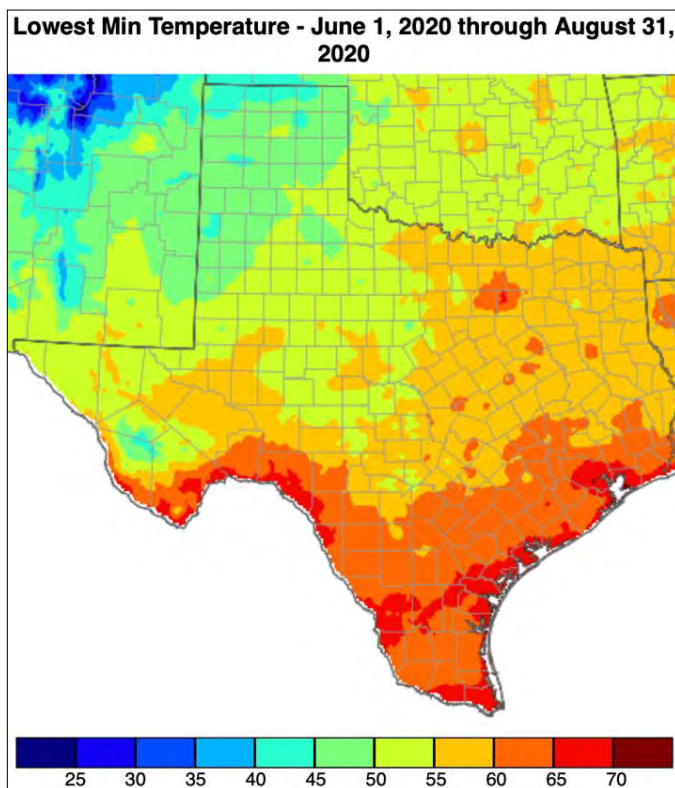


Fig. 5: Lowest min temperature this summer.

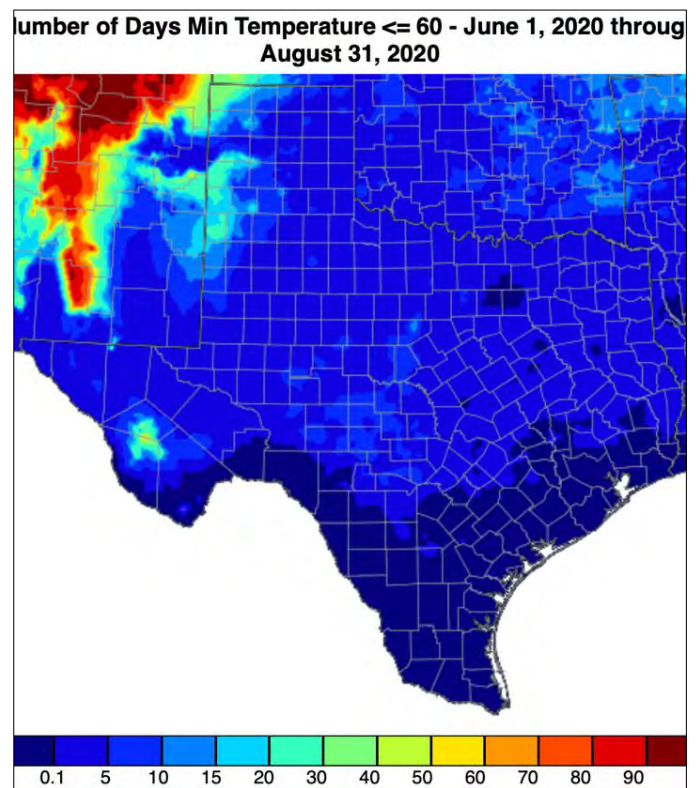


Fig. 6: Number of days min temperature <=60°F this summer.

Maybe you can tolerate a few hot days, but what's really important to you is getting an occasional break from the heat. If a night in the 50s counts as a break, then you weren't very happy in the southern third of the state: it never happened all summer. Unfortunately for them, Dallas had the same experience. Meanwhile, the High Plains and high mountains saw at least one night with temperatures in the 40s.

Even if you caught a break, you probably didn't catch very many of them. Throughout most of the state, nights stayed in the 60s or warmer all but a handful of times. The only exceptions are the Davis Mountain area and parts of the western Panhandle. Especially when you start adding up the number of cool nights, it's easy to see why New Mexico and other states in the Rockies are so popular with Texans in the summertime.

“Texas Summer Summary (continued)”

Or maybe you're a rain fanatic. Well, of course you are, you're a **CoCoRaHS observer**! But the true fanatic measures summer by how often they get to experience a refreshing summer downpour. The rain provides an instant cold shower, and the respite from the heat can last several days until things dry out again.

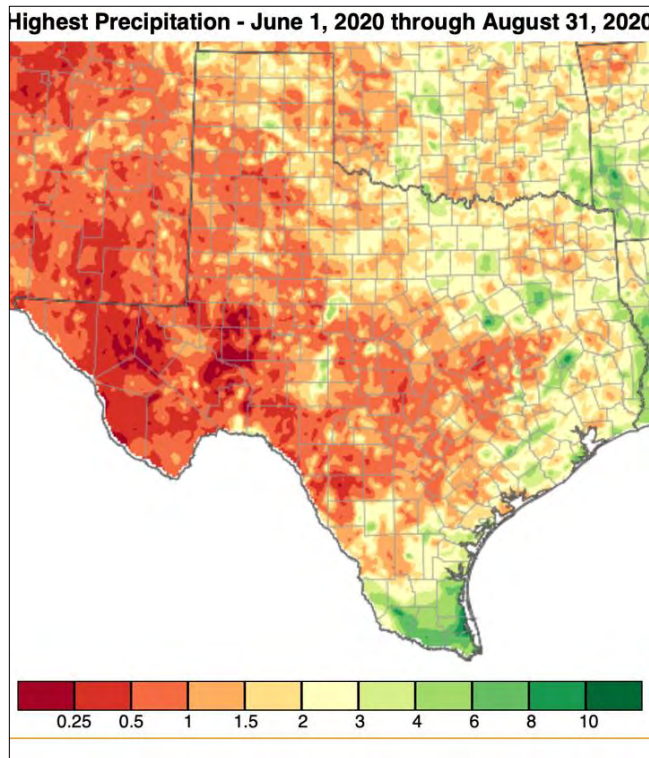


Fig. 7: Highest Precipitation amount this summer.

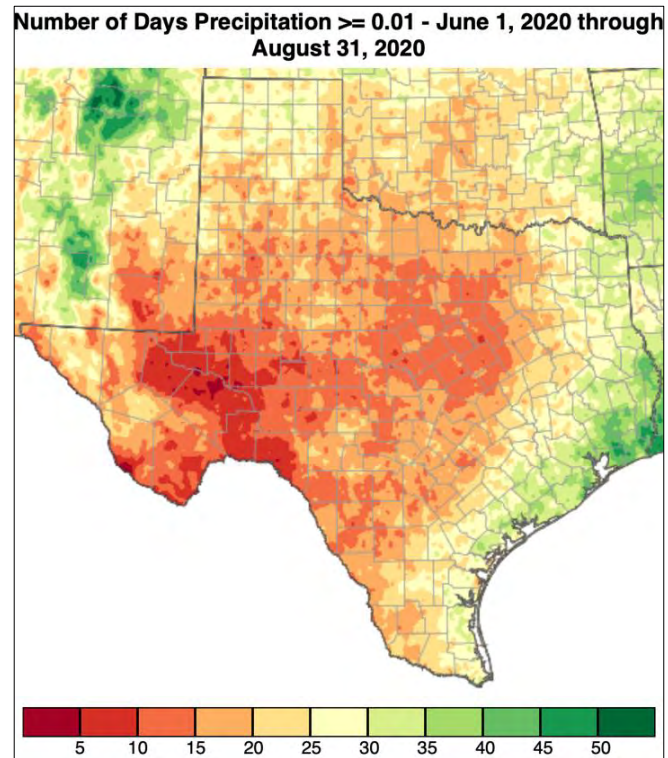


Fig. 8: Number of days of rainfall ≥ 0.01 " this summer.

No matter how you slice it, if you're that sort of person the Pecos River was not the place to be. Some areas saw fewer than five days of measurable precipitation, and for many of those areas the wettest day brought less than a quarter inch of precipitation.

In the Panhandle and west-central Texas, you can see the vagaries of the weather. The number of wet days was not all that different from place to place, but some places got clobbered by at least one decent storm while others missed out almost completely. Dallas itself managed over 4" on one of its 15 rain days. Rain was most reliable in extreme East Texas and Southeast Texas, as it usually is during the summer. Lastly, the swath of heavy precipitation associated with Hurricane Hanna painted green across the Lower Rio Grande Valley. Folks there probably wished the rain could be spread out more evenly through the summer; I already was hearing from people how dry it was in places by the end of August.

So, what do you make of this? Did you find someplace in Texas with your ideal weather? For me, I'd prefer no days over 100 °F, thirty or so days below 65 °F, and about 15 days with rain. Apparently I was out of luck this year, though Marfa and Texline came pretty close. Maybe next year, when I'm actually traveling again, I'll find my best spot.

West Texas and SE New Mexico Regional Summary

A Typical Summer for West Texas and Southeast New Mexico

By: James DeBerry, Meteorologist, National Weather Service Midland

West Texas and Southeast New Mexico had a typical summer, characterized by little convective activity and below-normal rainfall.

June

The summertime ridge strengthened in June, and very little rainfall was noted outside of a few intense cells on the dryline. The summertime ridge is jokingly referred to in meteorological circles as the “Death Ridge”, because it suppresses (kills) thunderstorms. No notable hydrologic events were reported, and annual rainfall at Midland International Air and Space Port went into deficit for the first time.

Monthly radar rainfall estimates ranged from no rainfall in some parts of Presidio County to up to 6” in the upper Colorado River Valley. Highest observed rainfall was 5.13” at Gail in Borden County. Average rainfall was 0.84”.

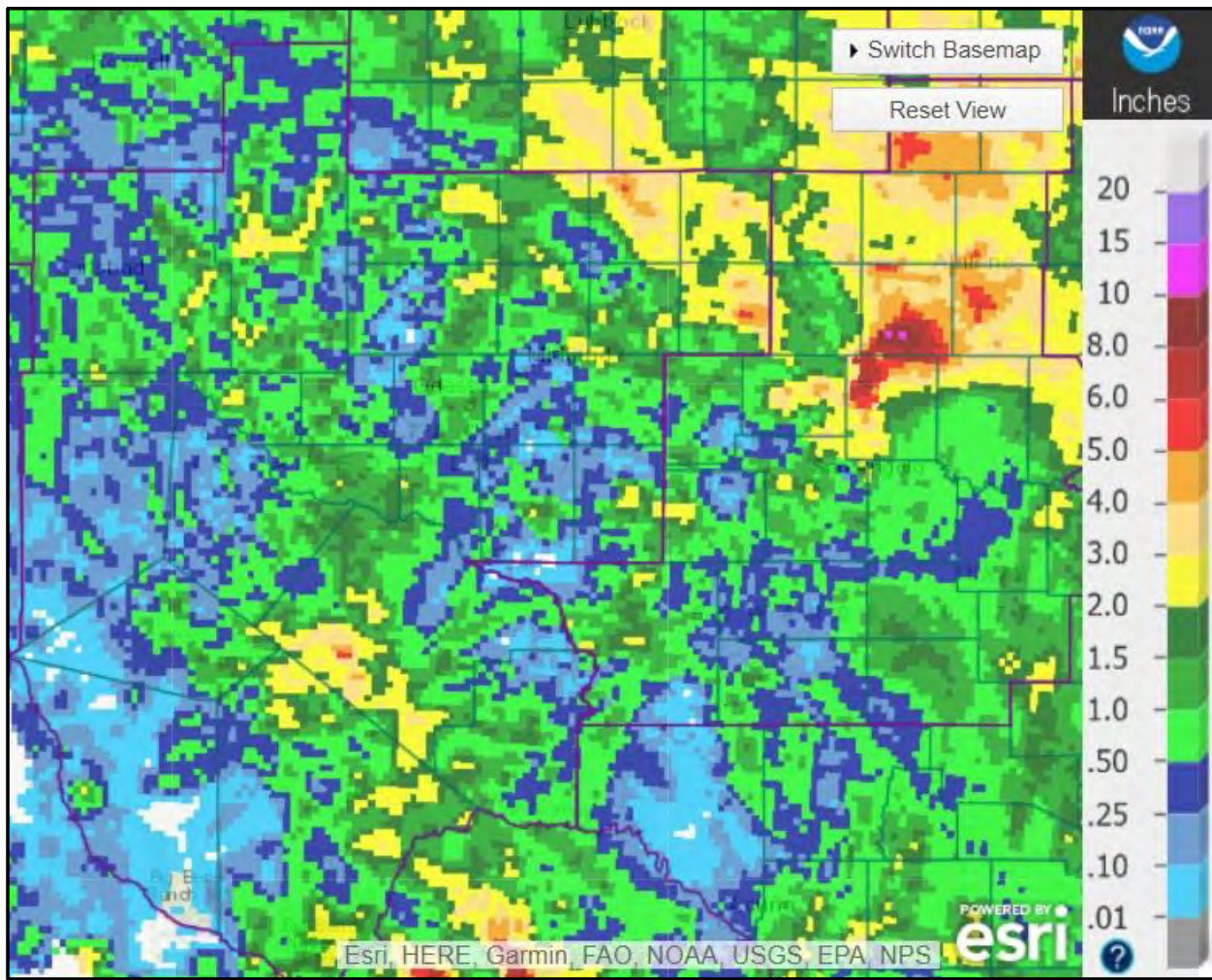


Fig. 1: June Precipitation for West Texas

“West Texas and SE New Mexico Regional Summary (continued)”

July

July was relatively uneventful hydrologically, as is typical under the summertime ridge. Only one flash flood event was reported, on July 23rd, when a thunderstorm dumped an inch or so of rain in less than an hour in Snyder in Scurry County, stranding vehicles in low water crossings.

Near the end of the month, remnants of Hurricane Hanna produced abundant rainfall in northern Mexico, sending elevated flows down the Rio Conchos, which briefly pushed the Rio Grande into flood at the Presidio International Bridge.

Monthly radar rainfall estimates ranged from nothing in western Terrell County to up to 6” in the Guadalupe Mountains. Highest observed rainfall was 2.93” at Dog Canyon in Culberson County. Average rainfall was 0.77”.

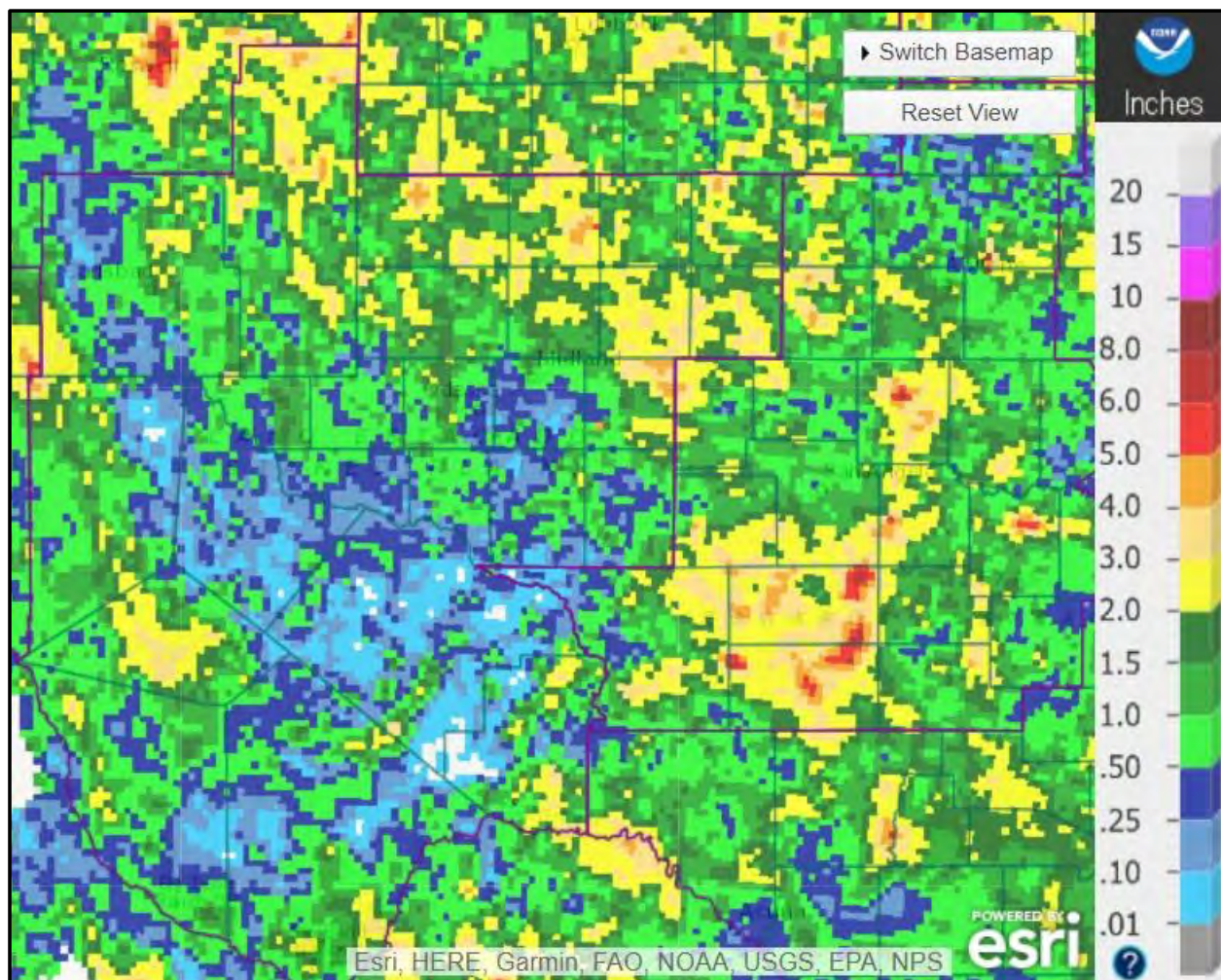


Fig. 2: July Precipitation for West Texas

“West Texas and SE New Mexico Regional Summary (continued)”

August

August was a very dry month for West Texas and Southeast New Mexico, with most of the HSA receiving only 10% or less of normal rainfall, especially south. As a result, no significant hydrologic events were reported. The summertime ridge began breaking down near the end of the month, but not in time to open windows for significant rainfall.

Monthly radar precipitation estimates ranged from nothing in several locations to up to 6" in southern Lea County. Highest observed rainfall was 2.10" at Hope in Eddy County. Average rainfall was 0.40".

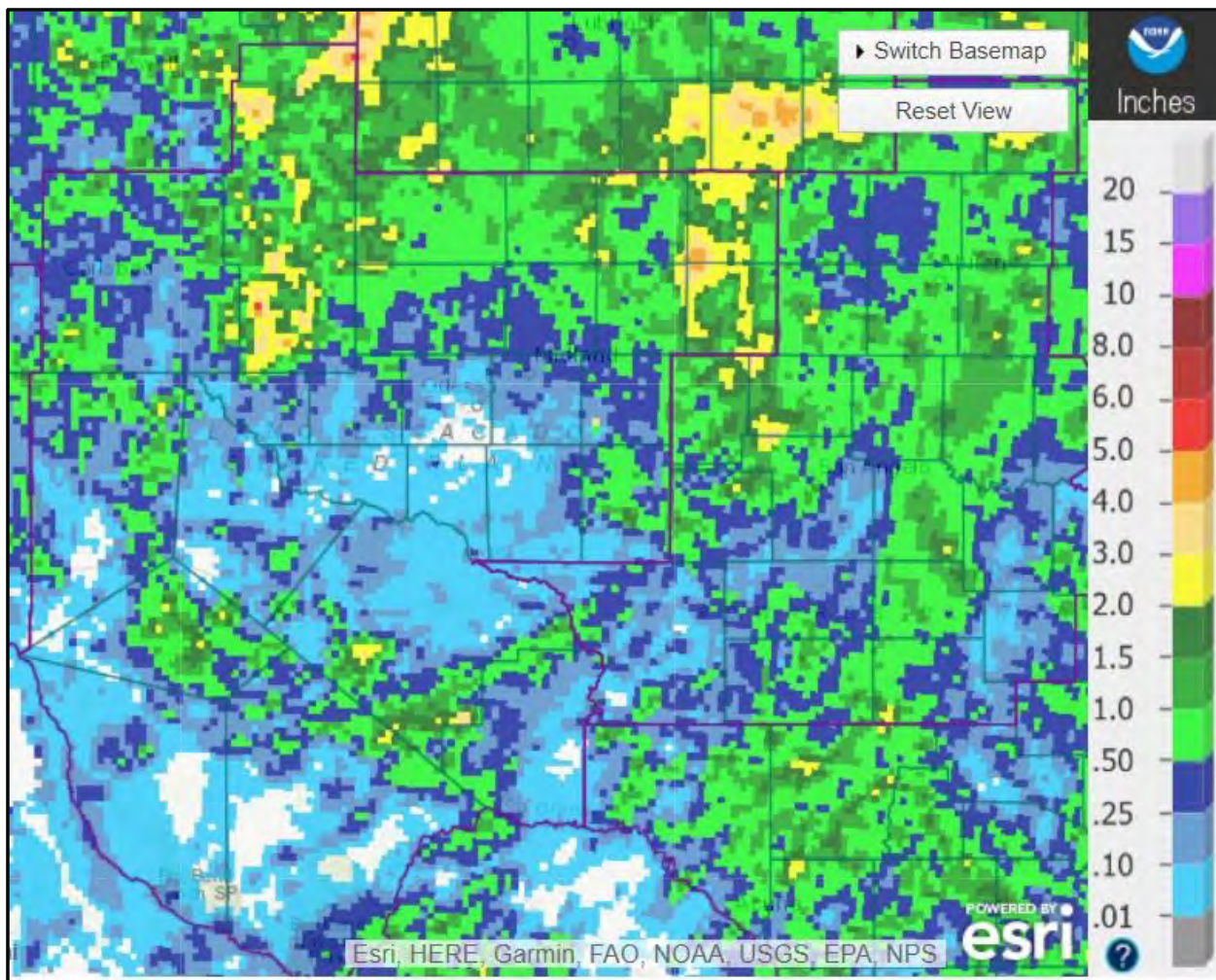


Fig. 3: August Precipitation for West Texas

Overall, the summer of 2020 was dry for West Texas and Southeast New Mexico.

Due to little rainfall, as of August 27th, in Southeast New Mexico, extreme drought had developed in most of Eddy and northern Lea Counties, buttressed mainly by severe drought for the rest of the area. In West Texas, exceptional drought had developed over the Marfa Plateau. This was surrounded by extreme drought. Extreme drought had also developed in parts of the Pecos River Valley. The rest of West Texas was in severe drought, save for a few isolated pockets here and there of moderate drought.

Area reservoirs are at only 40.5% of conservation capacity as of September 1st.

“Amarillo Severe Thunderstorm Winds on Aug. 29th”

Thunderstorm Wind Event of August 29, 2020 near Amarillo

By: Michael Gittinger – Amarillo NWS Forecast Office

Overview...A powerful severe supercell storm developed and moved across the north side of Amarillo. As the storm crossed Highway 287, it became more outflow dominant and several swaths of very strong outflow winds developed and moved across northeast portions of Amarillo and adjacent area on the outskirts of town. Widespread wind damage occurred with these winds.

Thunderstorm Wind Northeast Amarillo:

Peak Wind: E 80-90 mph
Path Length: 4.0 miles
Path Width: 2.0 miles

Survey Summary: A swath of thunderstorm wind damage around 2 miles wide and 4 miles long occurred along the Fritch Highway near Webb Road. Damage with the area included numerous broken or leaning power poles, downed power lines, and damage to roofs, porches and awnings at local residences.

East Amarillo Thunderstorm Wind:

Peak Wind: E 80-90 mph
Path Length: 2.0 mph
Path Width: 7.0 mph

Survey Summary: A corridor of wind damage associated with thunderstorm outflow occurred along Highway 60 near and just east of Loop 335. Within this area, a roof was partially torn off of a metal building at the airport and some siding of another building was stripped off. The roof of the NWS office was slightly uplifted causing leaks. Two separate parked trains had cars blown over and off the tracks adjacent to Highway 60.



Fig. 1: Photo of parked train that was blow off the tracks near Highway 60. Photo by Chip Orton.

“Amarillo Severe Thunderstorm Winds on Aug. 29th (continued)”



Fig. 2: Picture of roof damage from August 29th storm to the NWS office in Amarillo. Photo by Chip Orton.

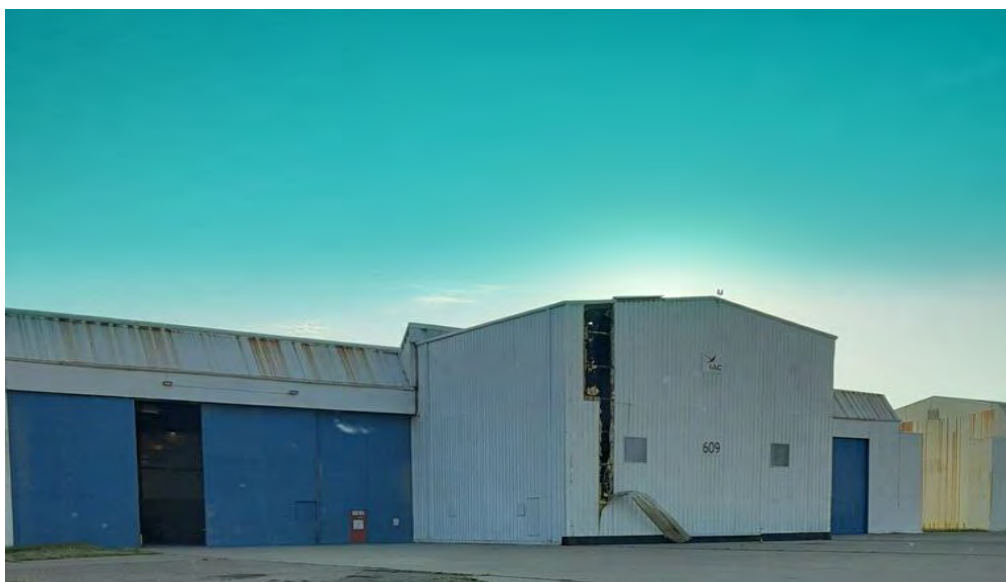


Fig. 3: Damage to building at the Amarillo airport from the August 29th storm. Photo by Chip Orton.

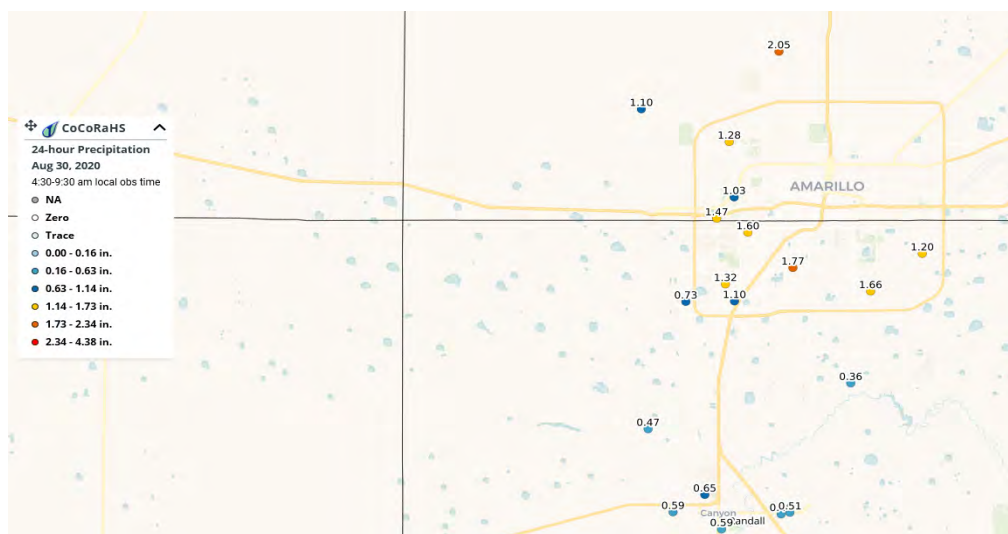


Fig. 4: CoCoRaHS rainfall reports from the morning of Aug. 29th to the morning of Aug. 30th.

“Wichita Falls Regional Summer Rainfall Maps”

New CoCoRaHS Maps Now Available to Track Texas Weather

By: Charles Kuster

CIMMS/NSSL

New CoCoRaHS maps were rolled out this summer that allow for more user control including displaying CoCoRaHS precipitation over a range of days. These maps can be found at maps.cocorahs.org and were used in creating Figure 1a–c below. Summer in the Wichita Falls region was relatively close to average for precipitation with June and July being wetter than August, as indicated by CoCoRaHS reports (Fig. 1a–c). Knox County had an especially dry August and had below average rainfall for the entire season (Fig. 1c–d).

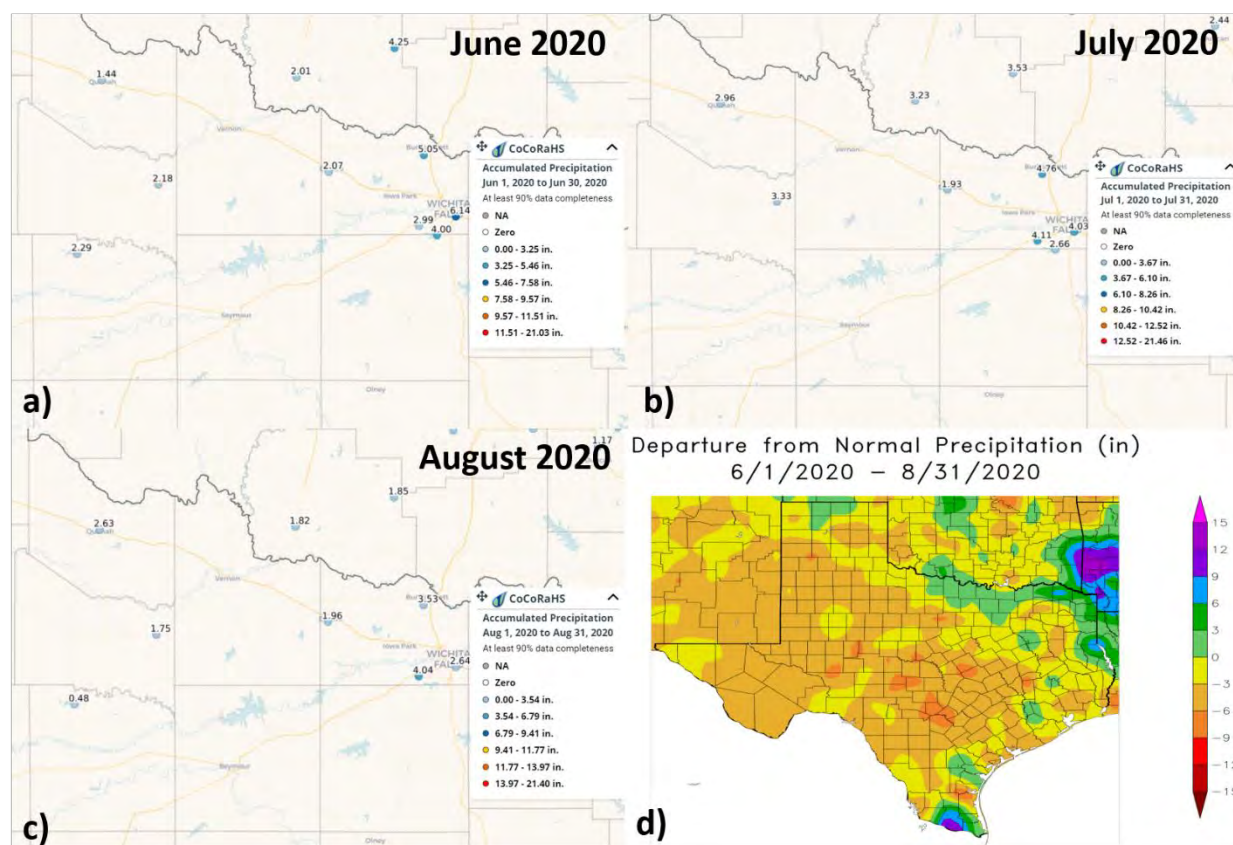


Fig. 1: CoCoRaHS rainfall totals for a) June, b) July, and c) August. Statewide departure from normal precipitation is shown in d) with warmer colors indicating below normal precipitation and cool colors indicating above normal precipitation.

In total, there were 70 dry days (all CoCoRaHS stations reported less than 0.05 inches) and 22 wet days (at least one CoCoRaHS station reported 0.05 inches or more). For comparison, last summer saw 63 dry days and 29 wet days. Drought has increased, according to the U.S. Drought Monitor (available at <https://droughtmonitor.unl.edu/>), across our western three counties, but the overall regional drought picture has improved since this time last year (Fig. 2 on next page).

“Wichita Falls Regional Summer Rainfall Maps (continued)”

Texas Drought Monitor Comparisons of Two Time Periods Listed Below

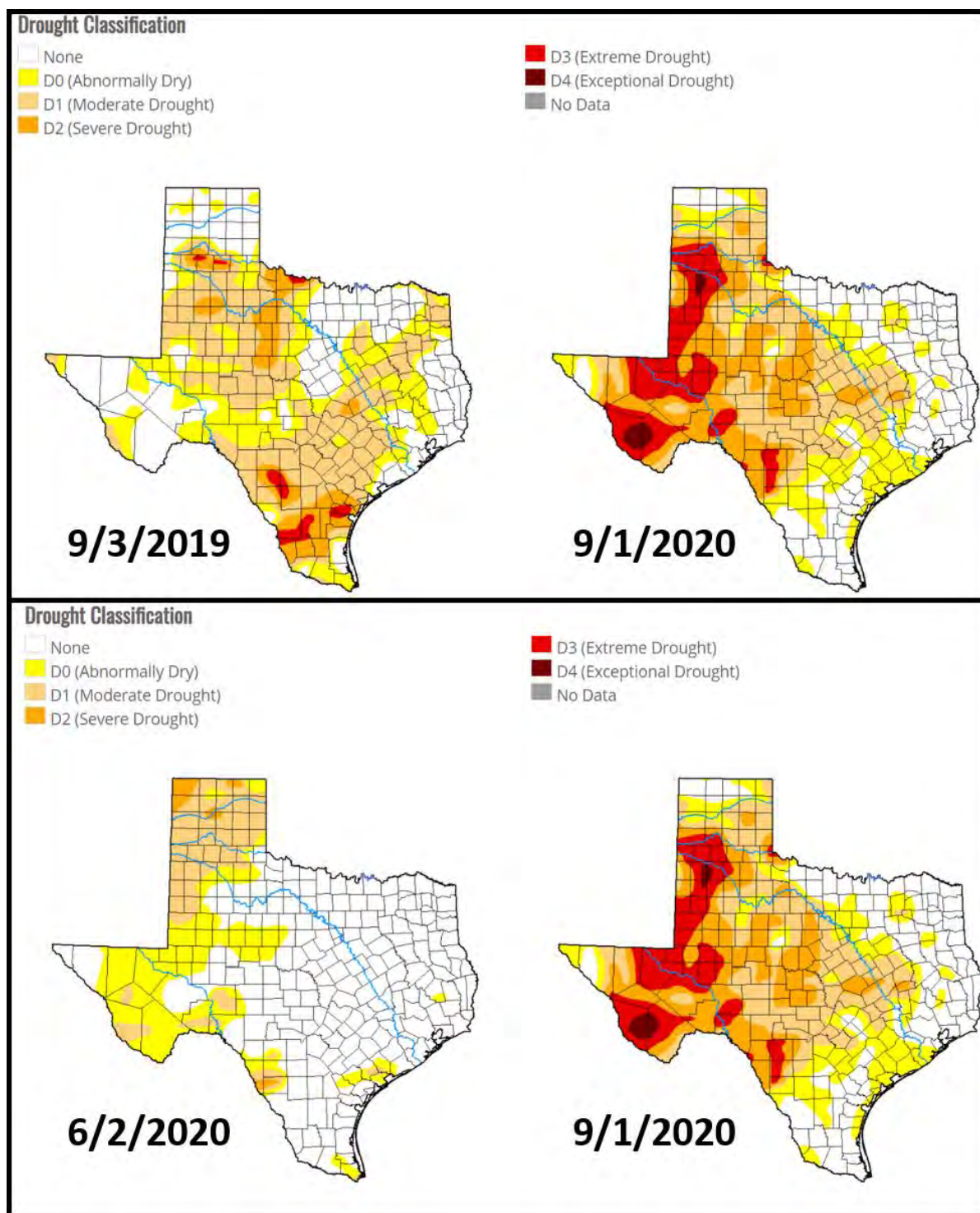


Fig. 2: U.S. Drought Monitor comparison for end of summer 2019 to end of summer 2020 (top) and beginning of the summer 2020 to end of summer 2020 (bottom).

“East Texas Regional Summary”

Rainfall below Normal over East Texas this Summer

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

Overall, below normal precipitation fell for most of East Texas this summer, except for portions of Northeast Texas. Despite the subnormal conditions, enough rainfall fell to keep the region out of significant drought conditions.

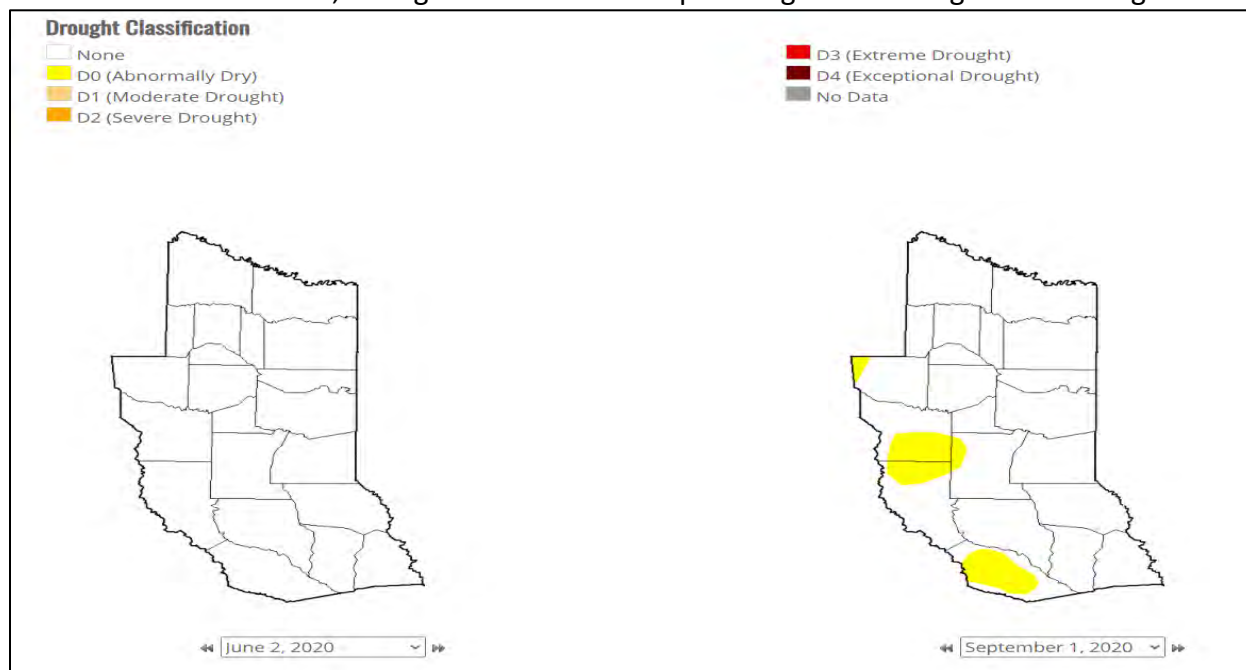


Fig. 1: Drought Monitor Image Courtesy of NDMC/USDA/NOAA

The summer months started out relatively dry, with below normal rainfall across most of the region. For the first half of June, very little rainfall was observed. However, towards the end of the month, the weather pattern became more active. A cold front, along with a series of upper level disturbances moved into the region by the 23rd. This boundary stalled across the region for the next several days, bringing precipitation to the region. Many locations saw over 2" of rainfall, a station in NW Harrison County reported over 3" on the morning of June 24th. Even with this rainfall, most of the CoCoRaHS sites reported less than 4" of rainfall for the month. Based on National Weather Service climate sites in East Texas, the normal rainfall is generally between 4" to 5" for the month of June. However, CoCoRaHS sites in Harrison and Cass Counties reported over 5" for the month.

The weather pattern remained fairly active as we moved into the month of July as rare summer cool fronts moved into the region by the 5th and 6th of the month. This resulted in impressive rainfall reports in several locations, with over 6" reported in NW Harrison County on the 5th and over 5" near Atlanta in Cass County on the morning of July 7th. Seabreeze convection also became active towards the end of the month, resulting in above normal monthly precipitation across the region. A whopping total of near 12" was reported in portions of Harrison County along with another impressive report near 10" in Cass County.

Much like June, weather conditions started out very quiet for the month of August. But by the 12th, a strong thunderstorm complex developed across Eastern Oklahoma/Western Arkansas. This complex dove south into portions of Northeast Texas, particularly in the Texarkana area with rises on local channels (See Fig.2 next page). The National Weather Service climate site at the Texarkana Airport reported a record 7.43" of rainfall for the day. Flash flooding was reported across the entire city, with road closures in several locations.

“East Texas Regional Summary (continued)”



Fig. 2: Water rising under Kennedy Lane in Texarkana, TX - August 12, 2020

Image Courtesy of Texarkana Gazette, Kelsi Brinkmeyer

By the 16th of August, another cool front brought severe weather to the region. Hail was reported in a few locations across the region, which is a rarity for the month of August. Hail up to $\frac{3}{4}$ " was reported at a CoCoRaHS site near Quitman, with broadcast media reporting hail up to half dollar size near the same location.



Fig. 3: Hail between Lake Fork and Lake Quitman, August 16, 2020

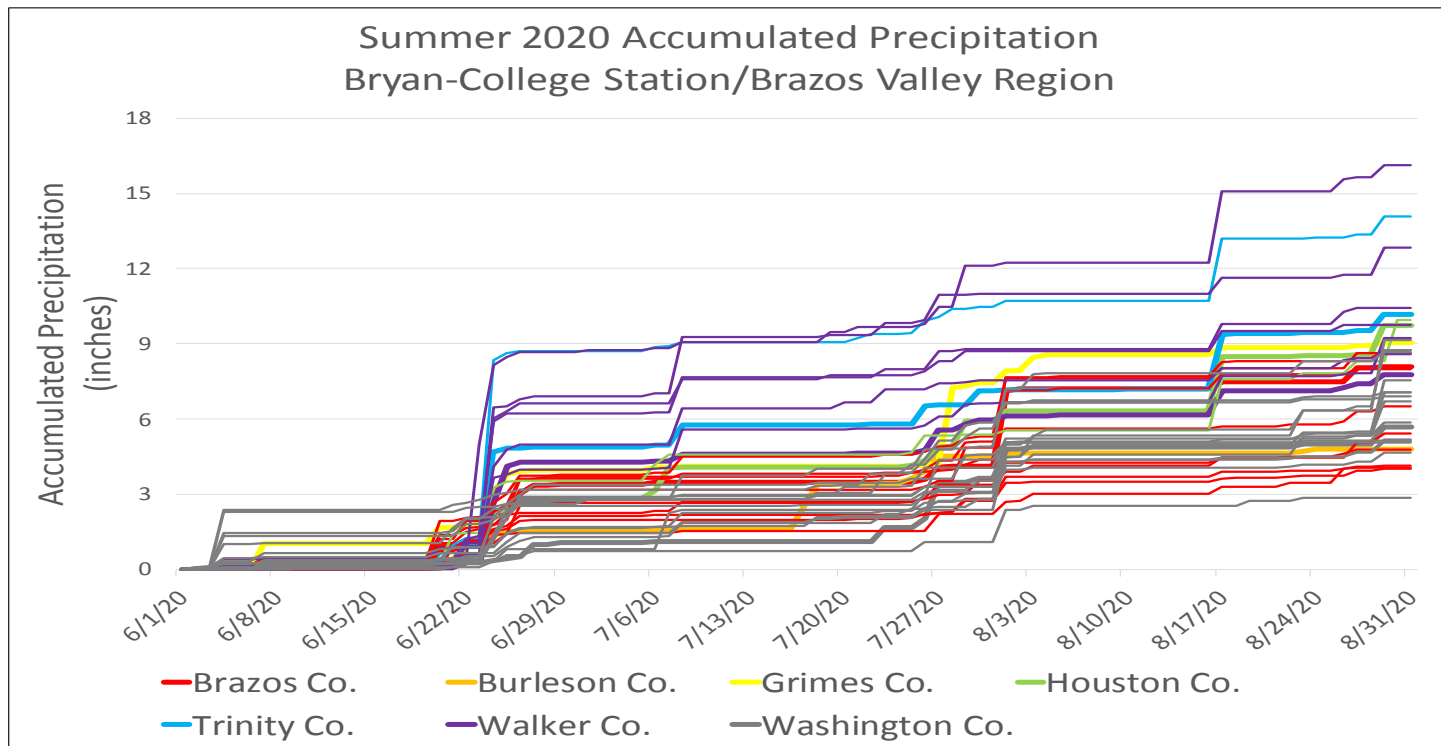
Image Courtesy of KLTV viewer Kristy Wade Turner

The highlight of the month occurred on August 27th, when Hurricane Laura moved across the region. Although East Texas remained on the west side of the hurricane, wind gusts over 50 mph occurred resulting in down trees and powerlines. Unfortunately, a fatality was reported in Sabine County, as a tree fell on a manufactured home. Laura also produced moderate to heavy rain in some locations near the Texas/Louisiana border. Despite the activity for the month, most locations finished the month with below normal precipitation. The exception being for areas of Northeast Texas where several sites reported over 7" of rain for the month.

“Brazos Valley Regional Summary”

Summer 2020 Precipitation Summary Bryan-College Station/Brazos Valley Region, Texas

By: Chris Larson and John Nielsen-Gammon, Texas A&M University, Office of the State Climatologist of Texas



Summary:

The summer started off relatively dry until a major rain event in late June, and then much less substantial rainfall events followed throughout the rest of the season. Walker County and Trinity County seemed to get notably more rainfall than the other counties in the area. Rainfall in this period was very spotty with the wettest station accumulating a little over 12" more than the driest station. Aside from some hail and high winds in late July and early August in Brazos, Grimes, and Washington Counties, there were no days with reported severe weather.

Observer Statistics:

There were no CoCoRaHS observer reports in Madison County, but there were three observers that joined during the summer, one in Walker County, one in Grimes County, and one in Brazos County. 14 stations within the Brazos Valley region reported precipitation values on all 92 days, including multi-day reports, and 13 stations missed fewer than 12 days of recorded values. In total, there were 39 CoCoRaHS observers with a sufficient number of single and multi-day observations to provide a seasonal total precipitation amount.

Season Statistics:

Wettest day: 7.1", June 24, Trinity County

Wettest seasonal total: 16.12", Walker County

Driest seasonal total: 4.01", Brazos County

Soggy Socks Award (longest spell of daily reports with measurable rain): Trinity County had nine consecutive days of rain from June 20 through June 28.

Dusty Soles Award (longest spell of daily reports without measurable rain): Walker County went nearly an entire month without rain, a whopping 28 days, from June 28 through July 25.

“Houston/Galveston Regional Summary”

Locally Heavy Storms in Scattered Areas this summer

By: Ron Havran - CoCoRaHS Houston/Galveston Regional Coordinator

June

Temperatures averaged from near normal to slightly above normal across the region. High temperatures didn't get that hot due to cloud cover from convective showers and storms. Nighttime lows started the month normal but didn't cool off that much toward the end of the month when dew points approached 80 °F.

Precipitation across the area during the month was mostly below normal except for an area running from southern Colorado County NE to Harris County and up north to Polk County (See Fig. 2). A few coastal counties had spots that received plentiful local downpours from the sea breeze frontal activity. Austin County had the lowest CoCoRaHS observer rainfall average with 2.83" of rainfall while Harris County had the highest CoCoRaHS observer rainfall average with 6.29" (See chart 1).

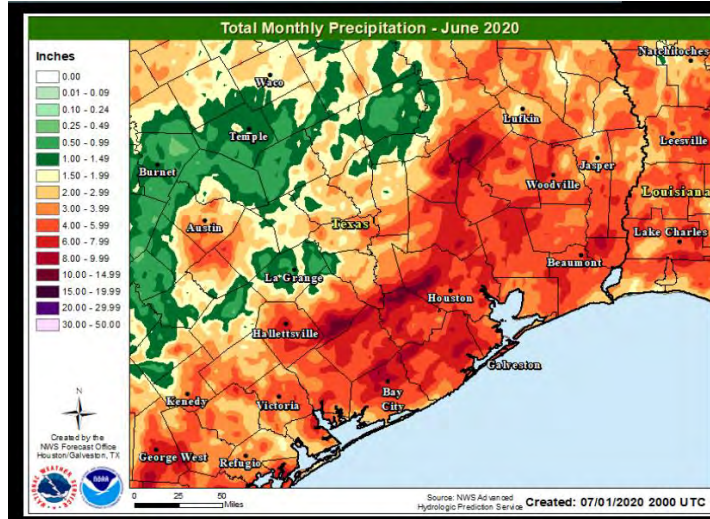


Fig. 1: June 2020 Total Monthly Rainfall

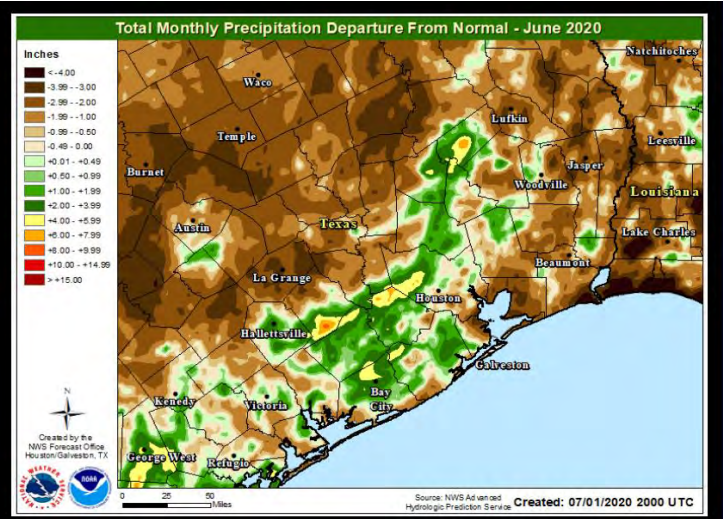


Fig. 2: June 2020 Precipitation Departure from Normal

July

July started unseasonably warm with a heat wave midmonth that brought triple digit heat to the area. Temperatures became closer to normal by the end of the month thanks to increased cloud cover, but not enough to counterbalance the hot start. Overall, the month of July was about 2°F above normal with several daily temperature records broken throughout the month.

Most of the coastal areas experienced two to three inches above normal rainfall due to rain from Hurricane Hanna and from thunderstorms forming along the sea breeze each afternoon. Further inland locations saw near normal to slightly below normal precipitation. Galveston, Brazoria, Harris, and Fort Bend counties had the highest CoCoRaHS rainfall amounts from observers while Montgomery, Austin, and Colorado counties had the lowest CoCoRaHS rainfall amounts (See chart 1).

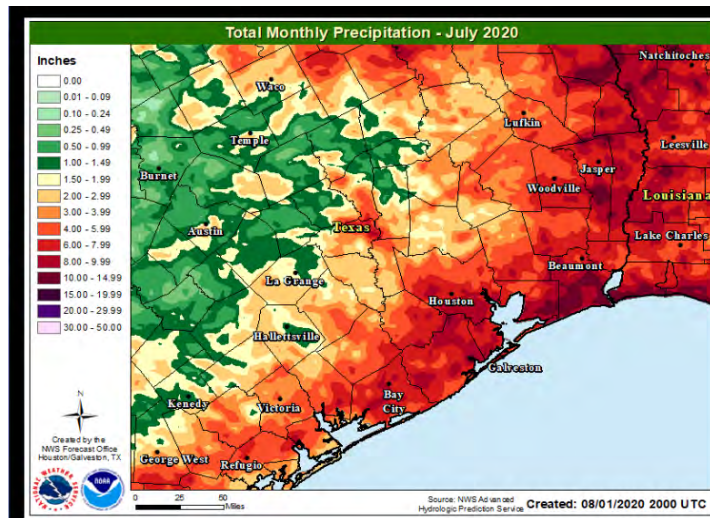


Fig. 3: July 2020 Total Monthly Rainfall

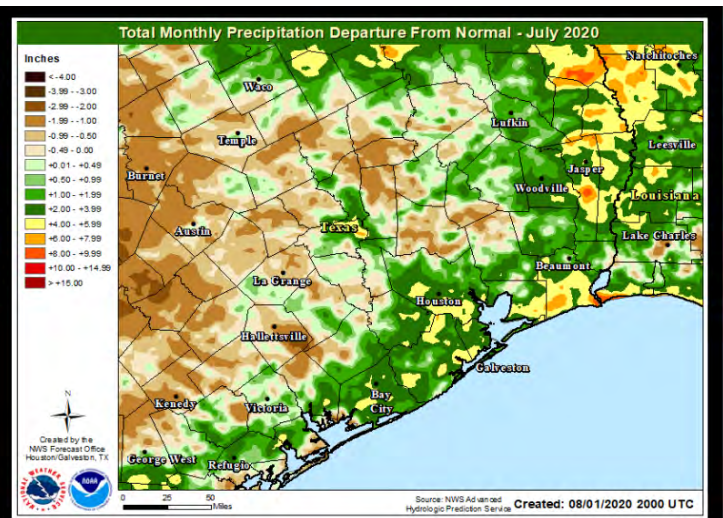


Fig. 4: July 2020 Precipitation Departure from Normal

“Houston/Galveston Regional Summary (continued)”

August

August temperatures were above normal with a few days over 100°F while nighttime temperatures struggled to drop below 80°F across most of the region. Temperatures averaged about 2°F to 3°F above normal. Mostly dry conditions prevailed region wide with below normal rainfall.

The summer average CoCoRaHS observer rainfall total for the region for all counties came to 11.83". Brazoria County had the most rainfall at 15.83" and Harris County a close second with 15.58" while Austin County had the least rainfall for the summer with 7.72" and Colorado County also a close second with 7.82". The sea breeze played a big part in the rainfall patterns this summer. Draw a diagonal line between the two wettest counties and the two driest counties and it nearly matches the dividing line between above normal and below normal rainfall on the map in figure 8.

Figure 8 shows a very contrasting rainfall departure from normal map across the region where part of the region was above normal rainfall for the summer while less than 40 miles to the NW of that area rainfall was below normal. This map clearly shows the average distance the sea breeze front made it inland for most of the summer. The sea breeze was most active in June and parts of July, it mostly disappeared in August due to a NW flow aloft at the 300mb level (30,000 ft.). After this upper level pattern took hold in July with a building ridge, the entire region didn't receive much rain the rest of the summer.

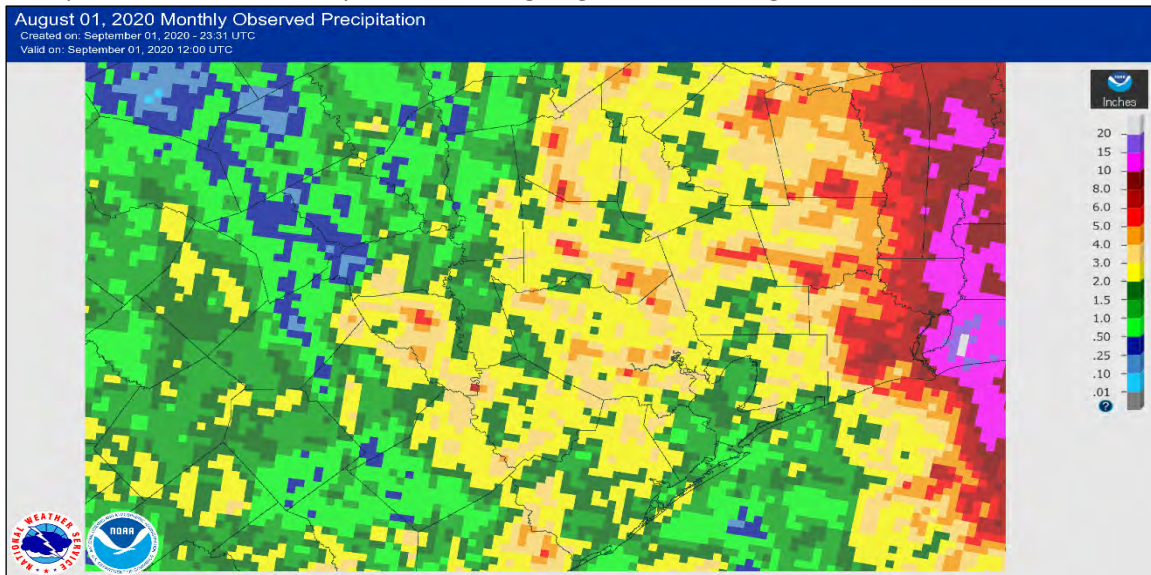


Fig. 5: August 2020 Total Monthly Rainfall

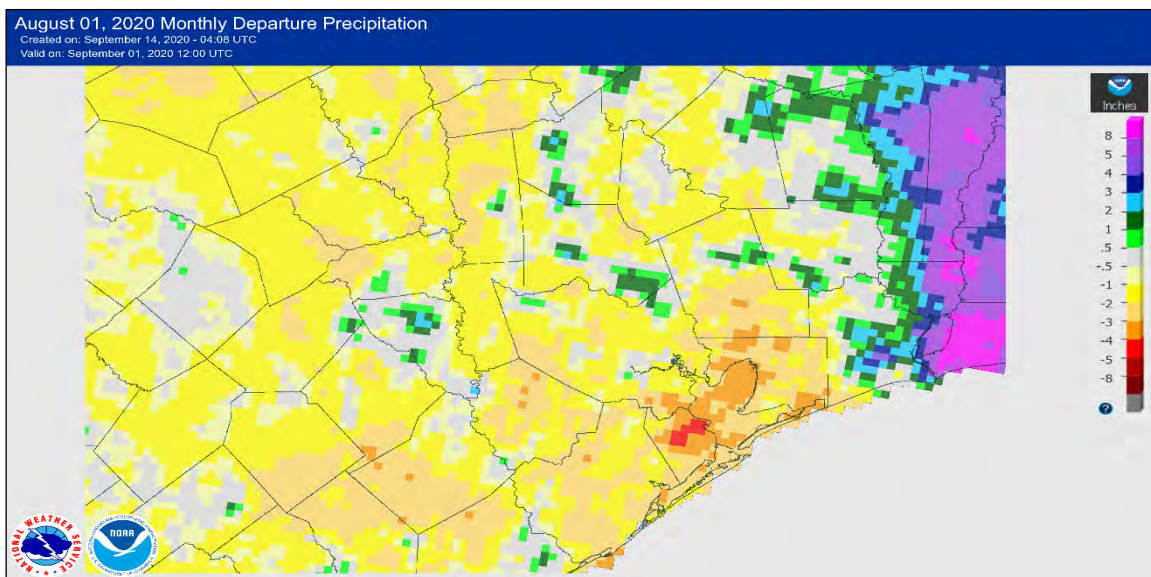


Fig. 6: August 2020 Precipitation Departure from Normal

“Houston/Galveston Regional Summary (continued)”

September 01, 2020 90-Day Observed Precipitation

Created on: September 01, 2020 - 23:00 UTC

Valid on: September 01, 2020 12:00 UTC

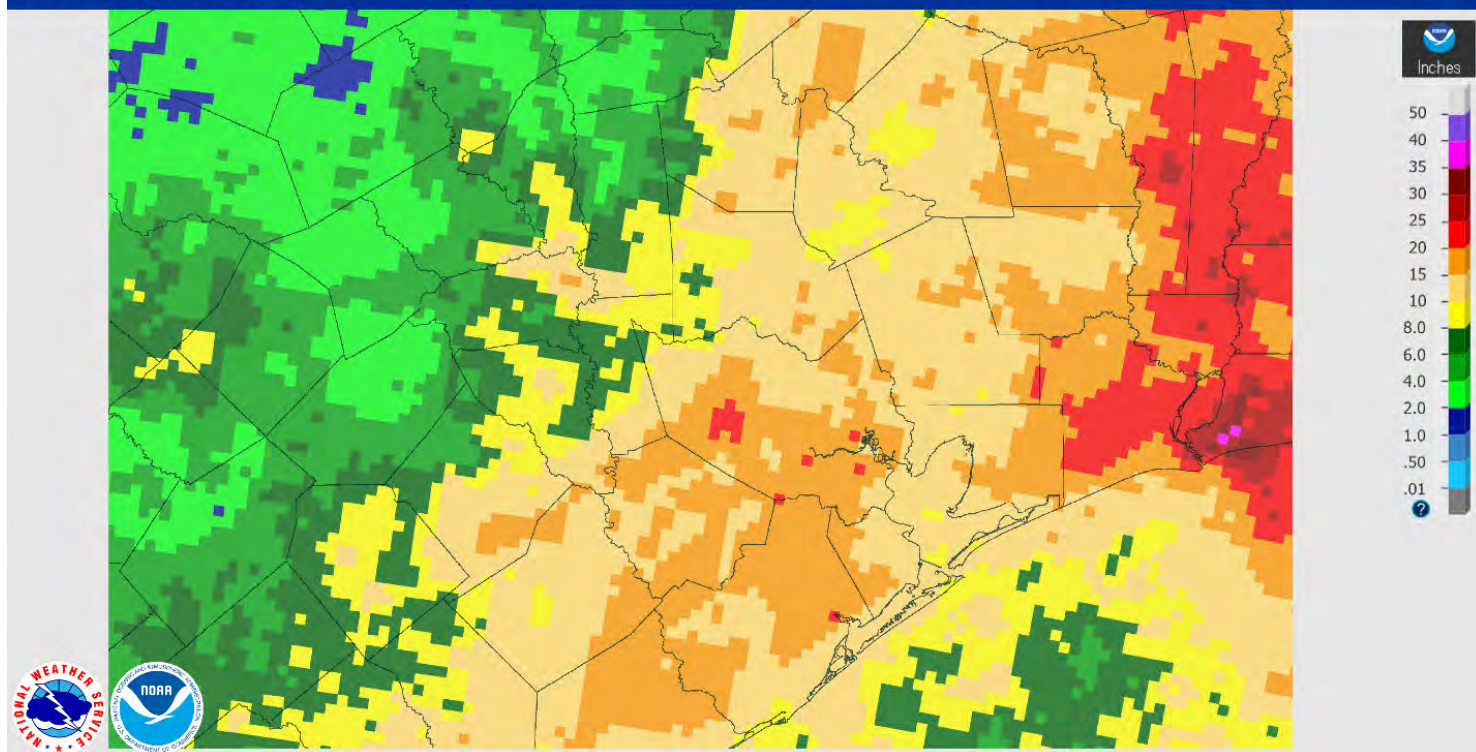


Fig. 7: SE Texas Summer 2020 Rainfall Jun. - Aug.

September 01, 2020 90-Day Departure Precipitation

Created on: September 01, 2020 - 23:06 UTC

Valid on: September 01, 2020 12:00 UTC

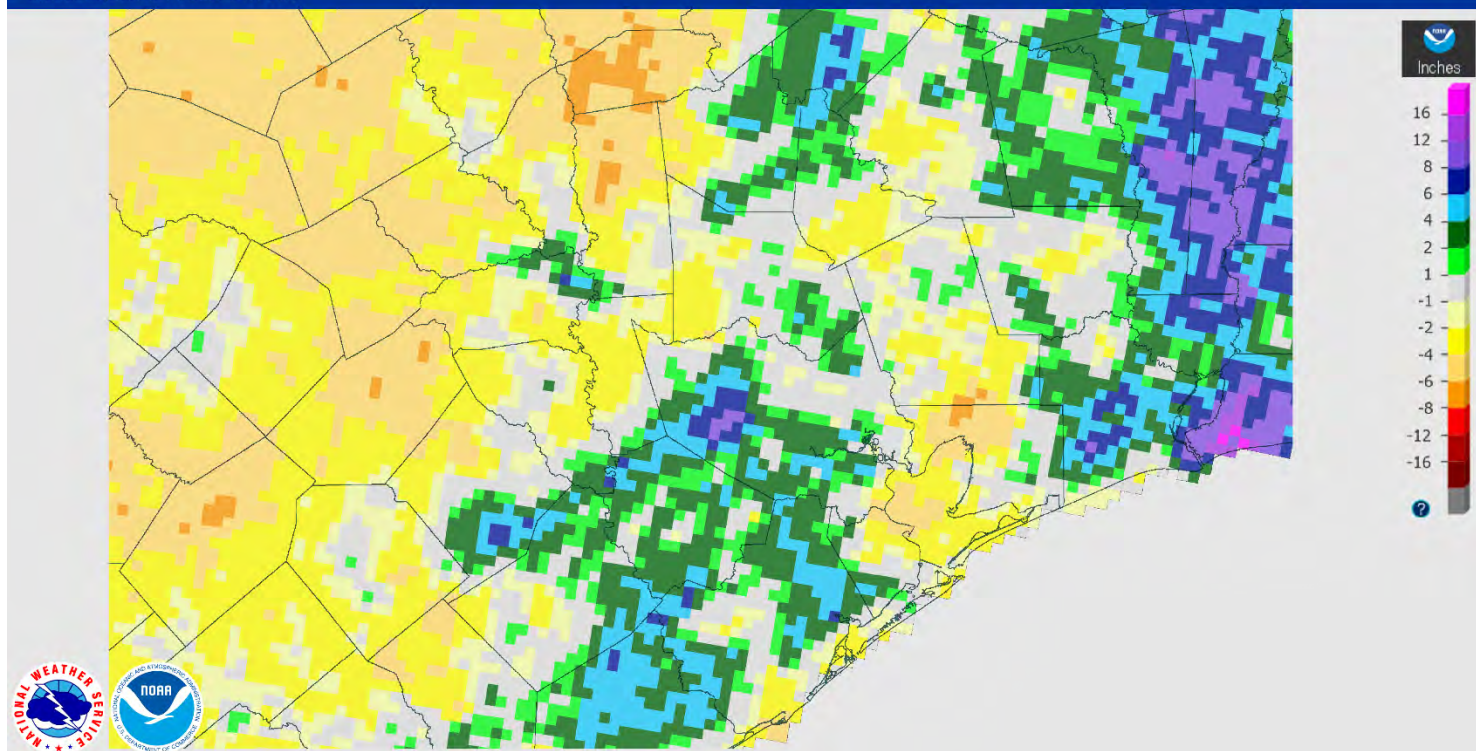


Fig. 8: SE Texas Summer 2020 Rainfall Departure from Normal Jun. - Aug.

“Houston/Galveston Regional Summary (continued)”

Summer 2020 CoCoRaHS Stations Houston/Galveston Region Rainfall

Actual Station Measured County Rainfall Averages in inches per month

County	June	July	August	Summer Total
	AVG.	AVG.	AVG.	Jun.- Aug.
Austin	2.83	2.16	2.73	7.72
Brazoria	5.90	7.71	2.22	15.83
Chambers	4.69	6.65	2.60	13.94
Colorado	3.61	2.70	1.51	7.82
Fort Bend	5.39	6.44	1.59	13.42
Galveston	4.84	7.76	1.48	14.08
Harris	6.29	6.77	2.52	15.58
Jackson	4.92	3.43	0.65	9.00
Liberty	6.27	4.93	2.01	13.21
Montgomery	5.83	1.53	2.17	9.53
Polk	5.19	4.63	2.13	11.95
San Jacinto	5.87	4.39	2.09	12.35
Wharton	5.13	3.13	1.09	9.35
Region Totals	5.14	4.79	1.91	11.83

Highlights wettest month for a category

Highlights driest month for a category

Note: All data taken from the CoCoRaHS website in Total Precipitation Summary Report

Note: Only counties with 2 or more active observers reporting are displayed in this chart.

Chart 1: Total rainfall averages measured by CoCoRaHS observers in the Houston/Galveston Region.

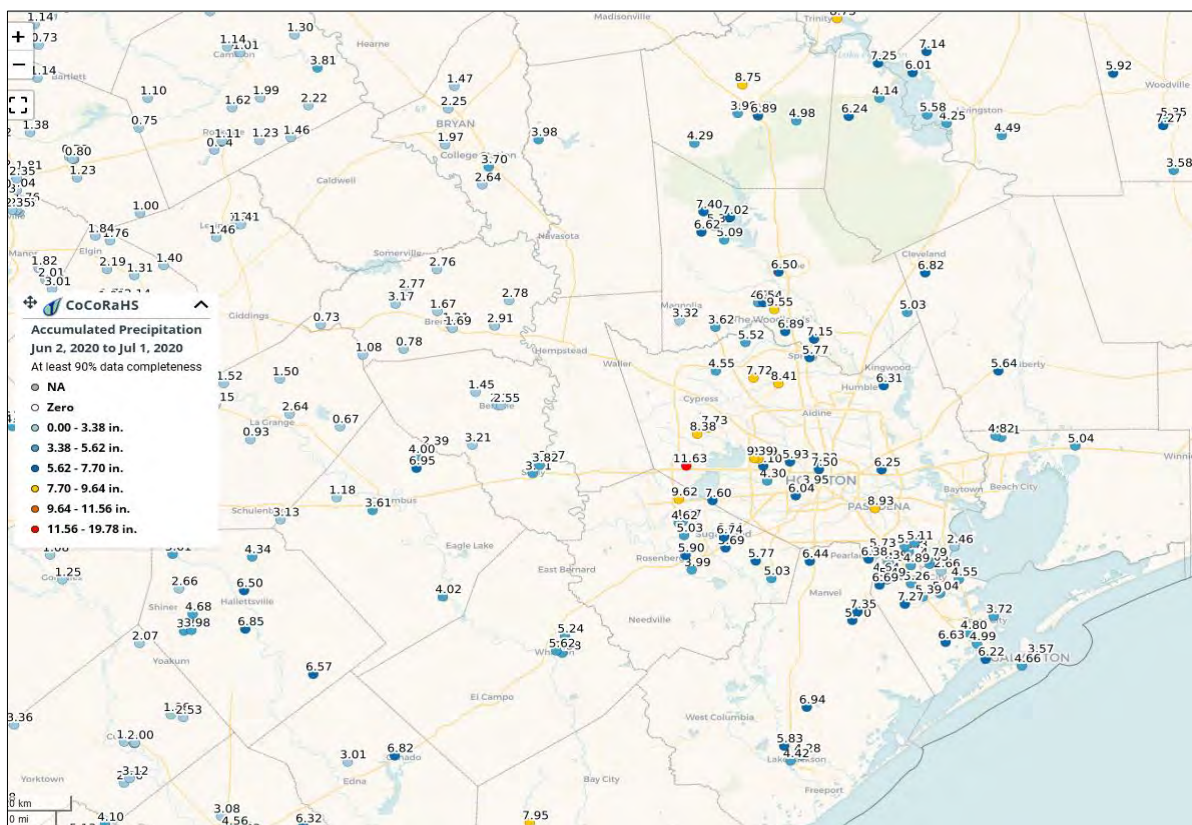


Fig. 9: CoCoRaHS observer rainfall for June 2020 in Houston/Galveston Region

“Houston/Galveston Regional Summary (continued)”

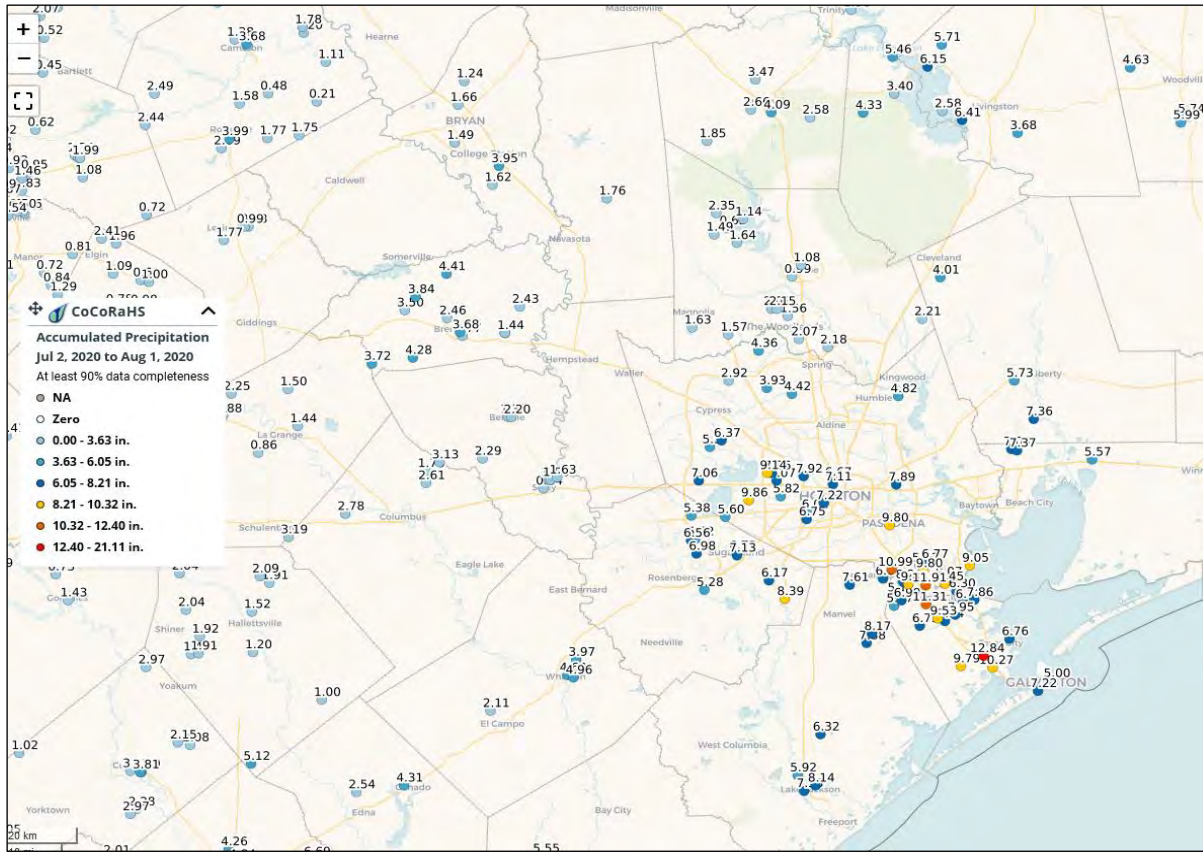


Fig. 10: CoCoRaHS observer rainfall for July 2020 in Houston/Galveston Region

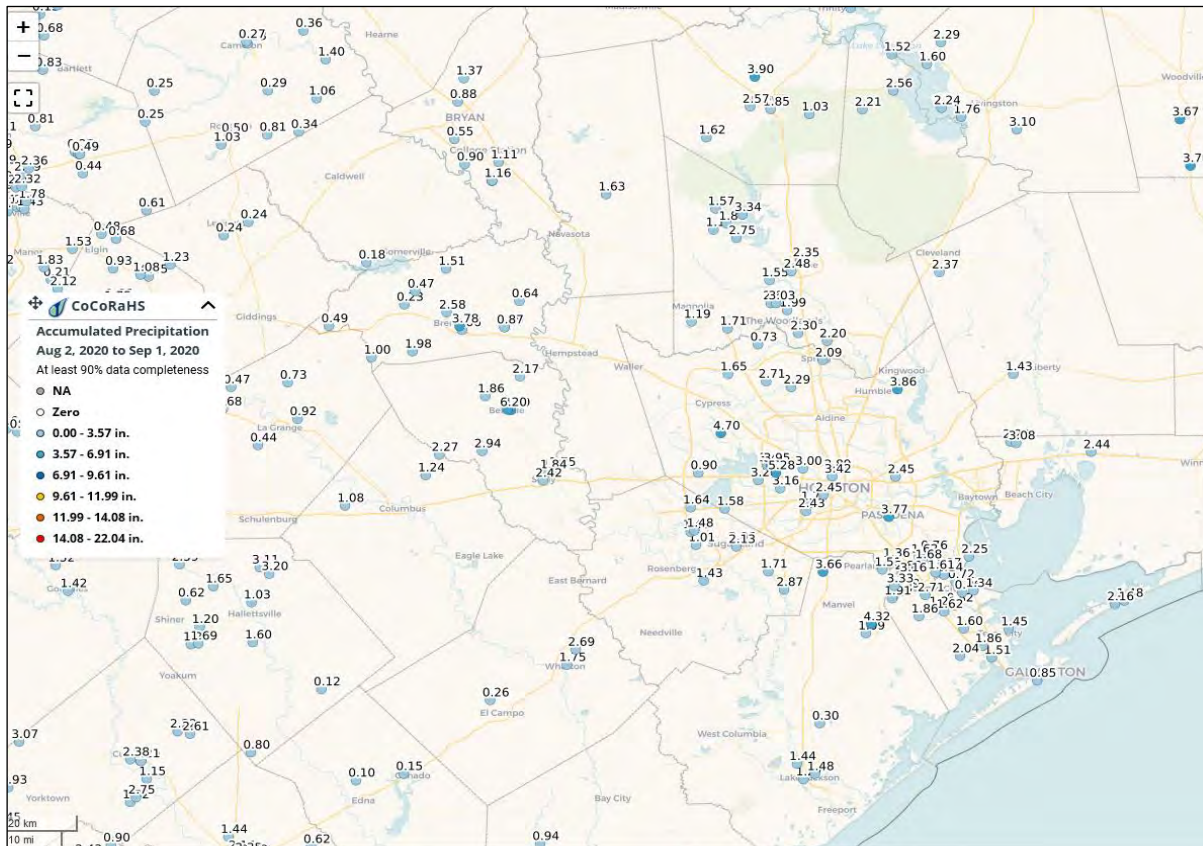


Fig. 11: CoCoRaHS observer rainfall for August 2020 in Houston/Galveston Region

“West Central Texas Summary”

West Central Texas Precipitation Summary

By: Joel Dunn, Observation Program Leader, NWS WFO San Angelo

Summer for the southern portion of West Central Texas remained dry with below normal precipitation for June, July and August, while northern portions of the area were only below normal for June and August. Along with below normal precipitation, above normal temperatures dominated West Central Texas all summer long. The Abilene area experienced their 48th driest summer on record with a total precipitation of 5.65". With a total of 3.69", the San Angelo area saw their 34th driest summer on record, however, the Junction area in southern West Central Texas saw their 4th driest summer with a total reaching only 1.95".

June

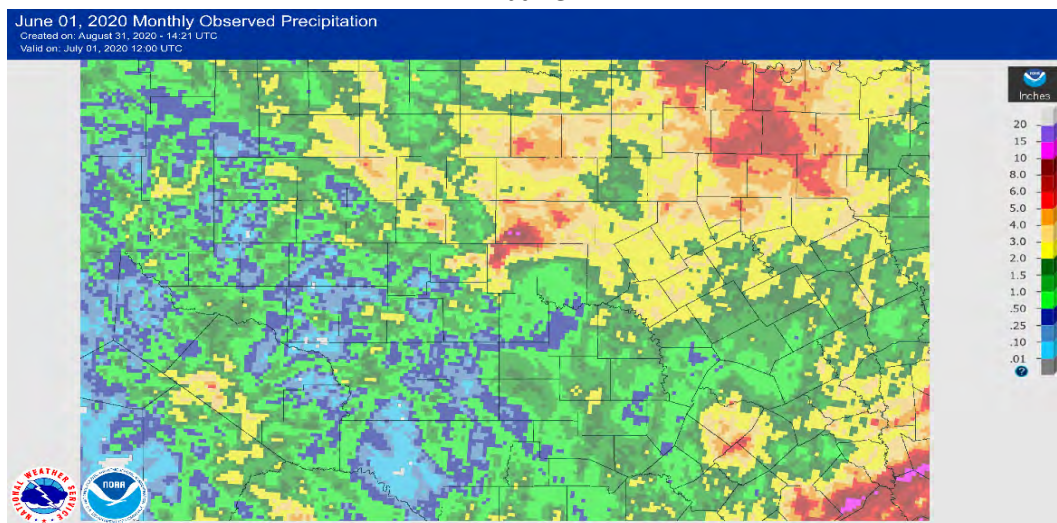


Image 1 - June Observed Precipitation

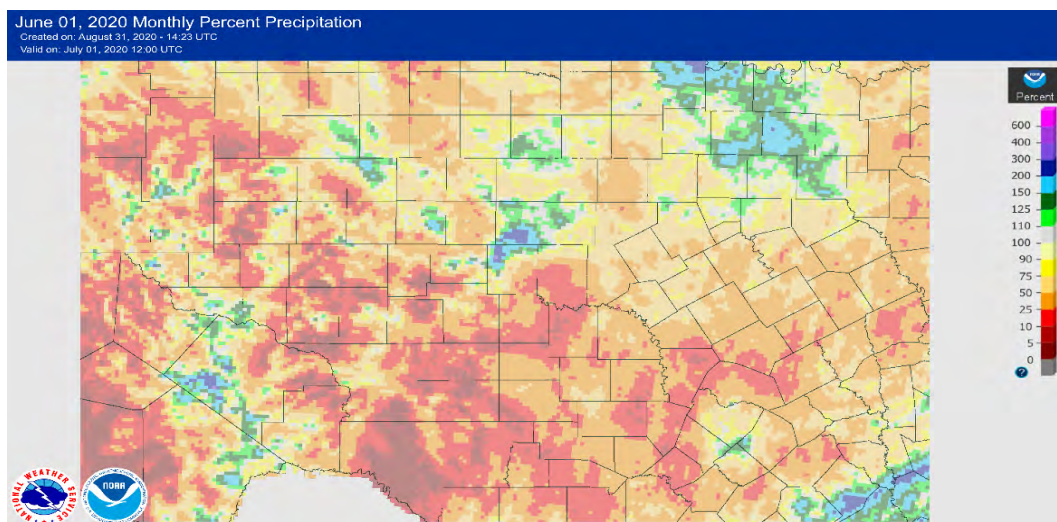


Image 2 - June Percent of Normal

As can be seen in the images above, portions of the Big Country, had significant rainfall during the month of June, while the rest of West Central Texas experienced dry conditions.

The Top 5 Wettest June Totals

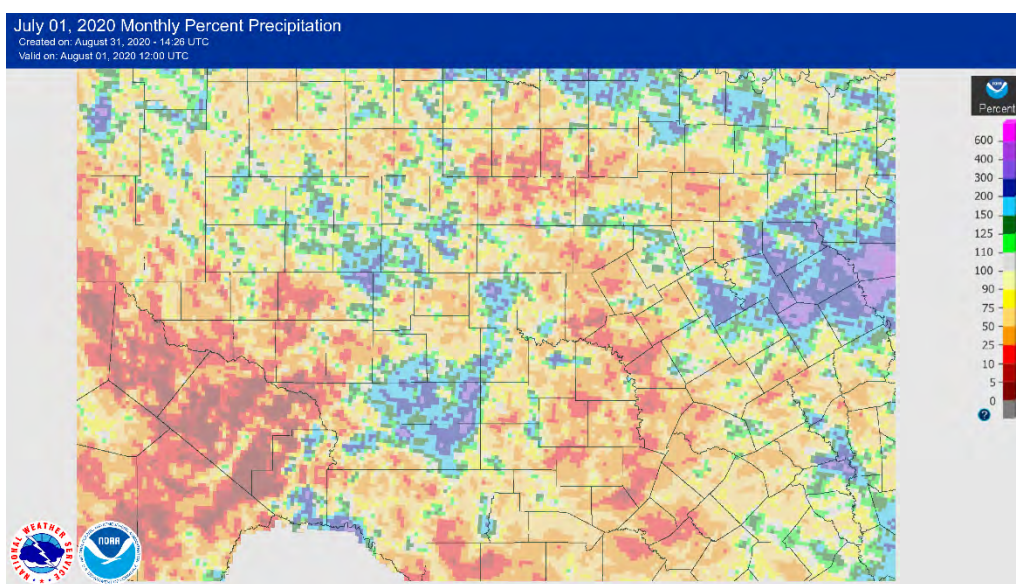
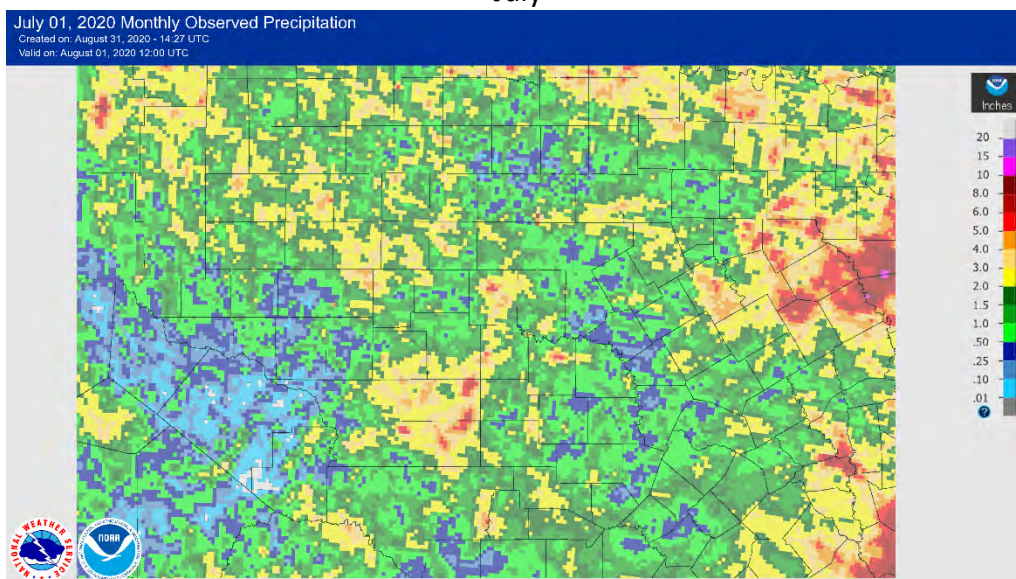
Station	Rainfall (in.)
Tuscola 9.6 WNW	6.04
Wingate 0.2 E	5.80
Throckmorton 0.3 WSW	4.65
Tuscola 13.1 WNW	4.06
Merkel 5.8 SW	3.80

Top 5 Driest June Totals

Station	Rainfall (in.)
Ozona 19.6 S	0.00
Carlsbad 2.4 WNW	0.03
Eldorado 22.6 ENE	0.03
Mason 8.3 W	0.08
Eldorado 0.2 WSW	0.10

“West Central Texas Summary (continued)”

July



The month of July was slightly wetter across West Central Texas, though about half of the area remained drier than normal. On the 2nd of July a storm system moved south east across portions of the Concho Valley and Northern Edward's Plateau bringing much needed rain to the area. Otherwise, only a few scattered showers were observed.

Top 5 Wettest July Totals

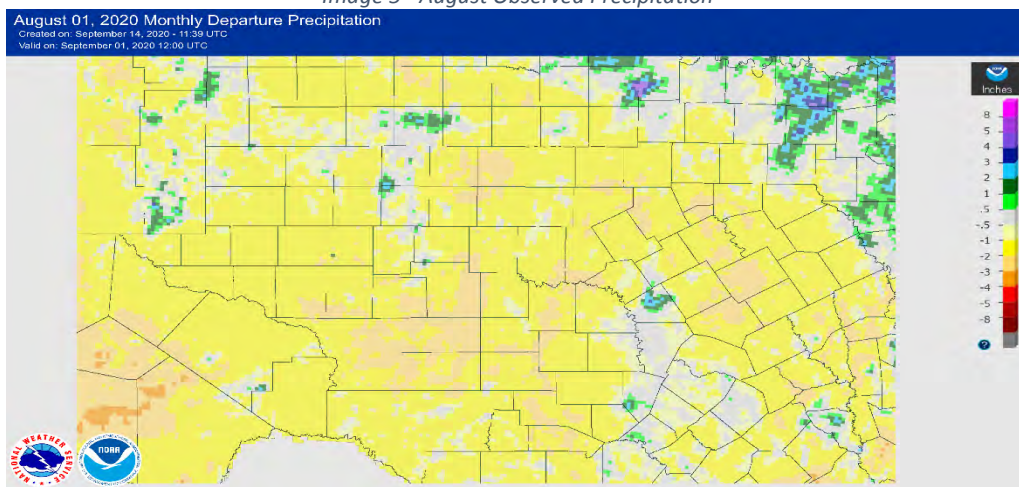
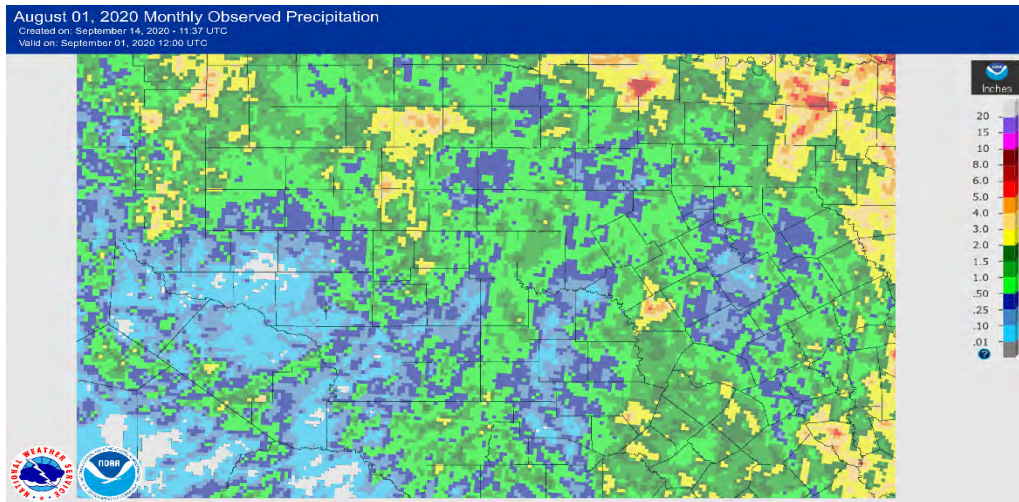
Station	Rainfall (in.)
Knickerbocker 3.2 SW	6.46
Eldorado 22.6 ENE	4.12
Brady 8.1 NNE	3.43
Eldorado 0.2 WSW	3.18
Merkel 8.5 ENE	3.11

Top 5 Driest July Totals

Station	Rainfall (in.)
Mason 0.7 SSW	0.12
Stamford 2.4 E	0.14
Sterling City 0.7 NE	0.20
San Angelo 12.5 NNE	0.21
Fredonia 3.7 NE	0.24

“West Central Texas Summary (continued)”

August



Though the trend of below normal precipitation continued across West Central Texas a few areas received much needed rainfall though it came at the price of wind damage. On the 22nd of August a line of storms entered the City of San Angelo.

National Weather Service conducted a storm survey across San Angelo. A severe thunderstorm brought damaging straight line winds of 60 to 100 mph across the City of San Angelo Friday night or August 22, knocking down power poles and power lines, resulting in widespread power outages. Numerous large tree limbs and some trees were also uprooted. A wind gust of 86 mph was measured at the National Weather Service at 201 AM CDT last night. Within the large downburst were microbursts seen on some photos circulating on social media. One microburst of winds around 100 mph struck the area on Loop 306 near the Chadbourne Exit. Another one impacted the area at Knickerbocker and Johnson Street to Sunset.

Excerpt from the Public Information Statement released by WFO San Angelo on August 24, 2020

Top 5 Wettest August Totals

Station	Rainfall (in.)
San Angelo 4.0 WSW	1.72
Brownwood 2.7 SSE	1.46
Cherokee 0.7 S	1.39
San Angelo 1.0 NNW	1.36
San Angelo 5.5 SSW	1.20

Top 5 Driest August Totals

Station	Rainfall (in.)
Mason 8.3 W	0.00
Merkel 5.8 SW	0.01
Miles 6.5 SSE	0.02
Fredonia 3.7 NE	0.04
Mason 0.6 SSE	0.04

“North Texas Weather Summary”

Several Storm Systems Bring Significant Rains

By: Greg Story, Retired NWS Meteorologist

Greetings from North Texas! I just returned from assisting the Lake Charles and Moss Bluff, Louisiana communities in cleanup after hurricane Laura. The devastation there is breathtaking, and it will take weeks if not months for these areas to recover. My thoughts and prayers go out to the people of these communities. And, a special thank you to the CoCoRaHS observers in southeast Texas and southwest Louisiana for making your reports during this time!

It is incredible how busy we had been in measuring rainfall so far this year, up until July and August. As I will highlight, it was a near-record setting year for the first six months. Then the weather turned to a more normal hot, dry summer regime. I am thankful to each and every one of you for reporting your rainfall via CoCoRaHS! With rainfall as variable as it is, your reports continue to help the National Weather Service (and other entities) to assess how widespread the rainfall events are. Over the past several months, March saw much of northern and western Texas having above normal rainfall, while southeast Texas was below normal. April actually turned drier, especially over the second half of the month. Below normal rainfall occurred over most of Texas, except for a few locations in eastern and southern parts of the state. Rainfall was much below normal in the far west. Then in May it was a mixed bag again, with northern and southern Texas receiving above normal rain, while central Texas was fairly dry. In June most of Texas had near to below normal rainfall. But north Texas was one of the spots that had above normal rainfall. So did the middle and lower Texas Gulf coastal regions. In July it was quite wet over east Texas (into western Louisiana), as well as over Deep South Texas. But it was drier than normal over central and southwest Texas. In August it was dry over almost all of the state. Only extreme east Texas saw above normal rainfall, and that was from hurricane Laura at the end of the month.

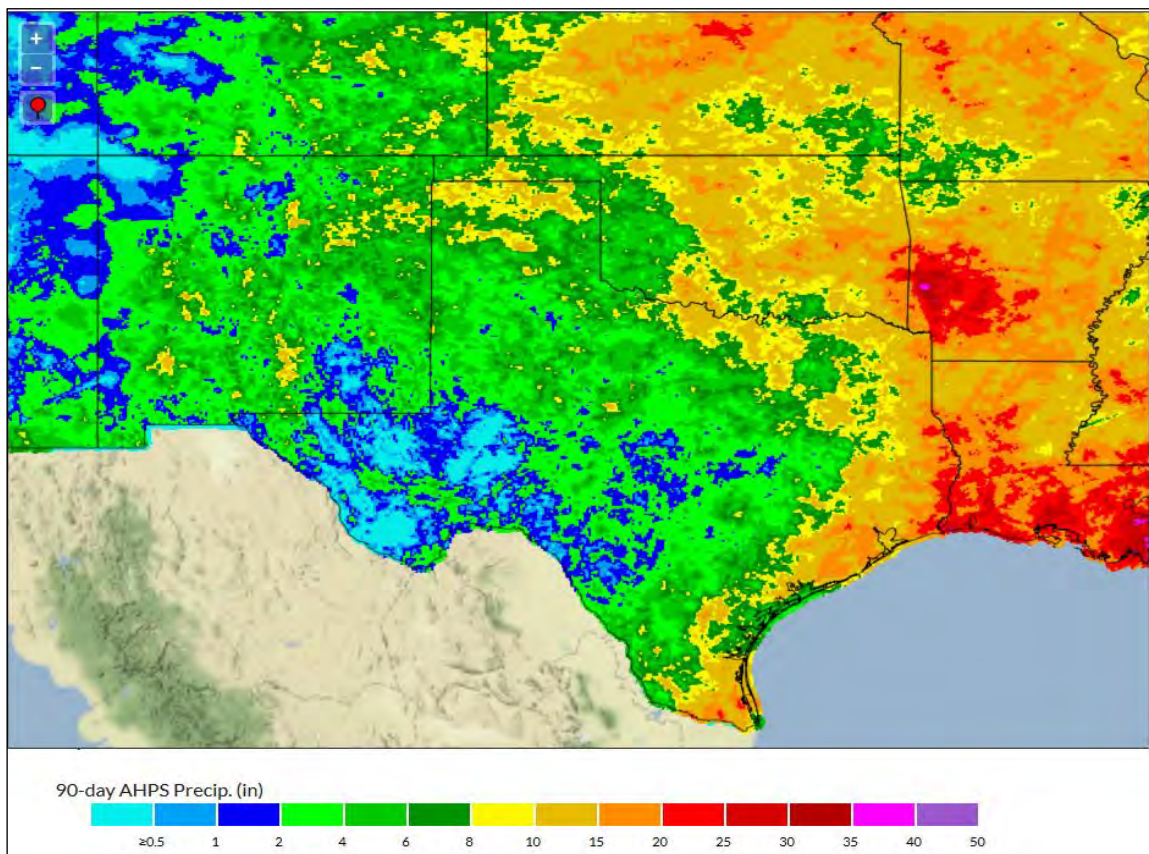


Fig. 1: Summer season precipitation 2020. The bright red and orange colors indicate the largest rainfall totals while the light green and blue colors show light amounts.

“North Texas Weather Summary (continued)”

At DFW Airport they received 5.35” in June. The normal amount of rainfall is 3.79” so they were 1.56” above normal for the month. Through June in 2020 DFW had received 30.42”. The normal amount for the first 6 months of the year is 20.04” so they were 10.38” above normal. Through June 24, DFW had already received 85% of their yearly allotment of rain and had the 4th wettest start to a year on record. Of course, the weather dried out considerably thereafter.

There were about three significant storm systems which affected our weather in June. Here are the highlights of the weather for the month.

June 5:

After a dry start to June, a few dryline thunderstorms developed over the Texas panhandle and western Oklahoma on the 5th. A few of the thunderstorms made it southward into extreme north Texas.

June 19 – 20:

A mesoscale convective system (MCS) from Oklahoma moved south into Texas. And, thunderstorms formed along the dryline over west Texas moved east. The combination of these two systems resulted in 4 - 6” of rain over Dallas county. In northern Tarrant County, an average amount of 1.32” was measured while Waco received 1.09”.

June 21 – 24:

On the morning of the 21st, thunderstorms developed near the Red River and moved into north Texas. Then late on the 21st to early on the 22nd thunderstorms formed over southwest Kansas and moved all the way across Oklahoma into north Texas as an MCS. This resulted in 2 - 4” falling near the Red River, specifically 4” in Montague County. A little less than 1” fell in Tarrant County. Then in the early morning hours of the 23rd, thunderstorms from northeast New Mexico and the Texas panhandle formed an MCS and moved southeast into north Texas. There was 3 - 4” of rain in Denton county. In Tarrant County they received in general a little over 1”. However, there was a record rainfall recorded at the DFW airport of 2.49”. The previous record for June 23 was 0.84” in 1947. June 23 was the 2nd wettest day of 2020 behind May 16th when 3.57” was recorded. The thunderstorms then shifted southeastward later on the 23rd and dumped heavy rain on east Texas. There was 6 to 8.50”, with the heaviest centered on Trinity TX. The MCS developed a mesoscale vorticity center (MVC) on the 24th and continued to produce thunderstorms over southeast Texas. There was 4 - 6” of rain on the west side of Houston.

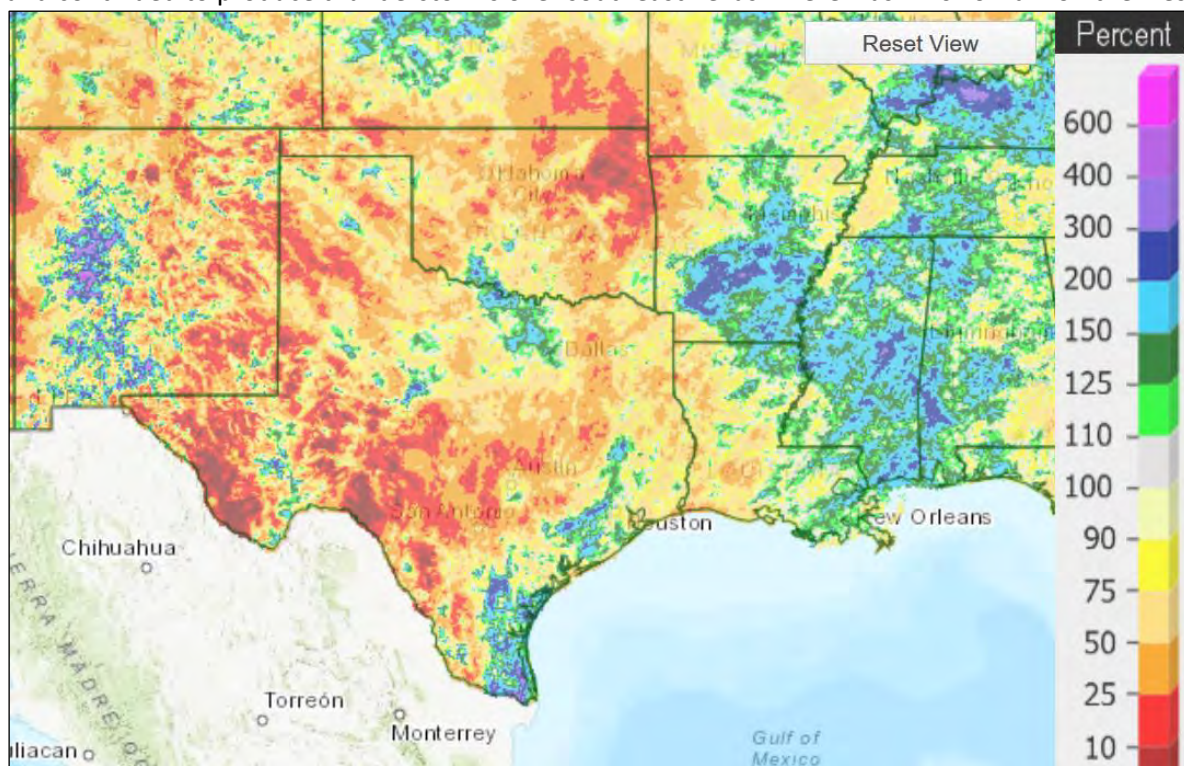


Fig. 2: Percent of normal rainfall for June 2020. The green and light yellow colors indicate near normal precipitation; the blue and purple colors indicate above normal, while the red indicates below normal precipitation. June was pretty dry over a good part of Texas. Only a few regions got above normal precipitation, including the middle and lower Texas Gulf coast and north central Texas. Most of northeast and central Texas had below normal precipitation.

“North Texas Weather Summary (continued)”

At DFW Airport they received 2.31” in July. The normal amount of rainfall is 2.16” so they were very close to being near normal...just 0.15” above normal for the month.

There were about four significant storm systems which affected our weather in July. Here are the highlights of the weather for the month.

July 2:

A weakness in the upper air pattern, along with a breakage in the “cap” led to afternoon and evening thunderstorms. Northern Tarrant County averaged around 1.32” of rain.

July 5 – 7:

On the 5th afternoon thunderstorms developed across northern and eastern Texas. Additionally, thunderstorms moved in from West Texas late on the 5th into the 6th. This thunderstorm complex formed an MCV that produced persistent thunderstorms over east Texas. These storms resulted in 4 - 7” of rain over east Texas, with the heaviest at Athens, TX on the 6th. Then on the 7th, 3 - 4.50” of rain fell from Aquilla to Maypearl from scattered thunderstorms. A storm total amount of 3.25” occurred over northern Tarrant County over these three days while Waco received 2.78”.

July 25 – 26:

Hurricane Hanna moved west over the Gulf of Mexico and made landfall south of Corpus Christi. Rain drenched Deep South Texas, with over 10” of rain in Harlingen. A few “feeder bands” brought spotty rainfall to north Texas, but widespread rainfall did not occur.

July 27 - 28:

Thunderstorms drifted south out of Oklahoma late on the 27th and continued over Texas on the 28th. Heavy rainfall did not occur, with around an average amount of 0.33” over Tarrant county.

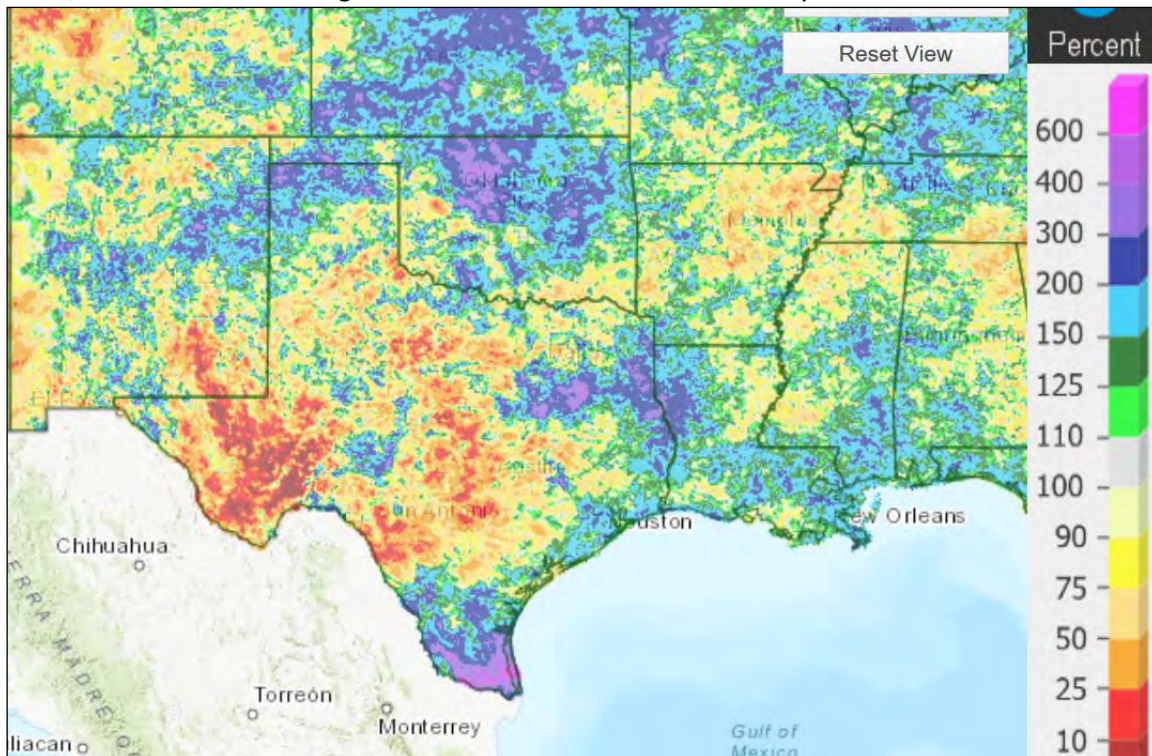


Fig. 3: Percent of normal rainfall for July 2020. The red and yellow colors indicate below normal precipitation, while the blue and purple indicate above normal rain. In July, most of the state had near to below normal precipitation. There were some locations which got above normal precipitation, but there were more that were below normal. Much of far western Texas and parts of northern and central Texas received below normal precipitation in July. But, parts of eastern Texas (including the southeast parts of north Texas) and Deep South Texas had above normal precipitation.

“North Texas Weather Summary (continued)”

At DFW Airport they received 1.28” in August. The normal amount of rainfall is 1.91” so they were 0.63” below normal for the month. Meanwhile, Waco only got 0.01” for the month, which was 2.04” below normal.

There were about five significant storm systems which affected our weather in August. Here are the highlights of the weather for the month.

August 2 – 4:

Tropical storm (and temporarily hurricane) Isaias moved just off the east coast of Florida through the Carolinas into the Middle Atlantic States. This storm had no impact on Texas, other than to set the weather pattern up for a dry spell. No significant rainfall was noted until the middle of August.

August 16 - 17:

Late on the 16th a cold front moved through the region. Strong thunderstorms from Oklahoma produced high winds across north Texas as the storms moved through. Around 3” fell along and near the Red River centered near Sherman. But amounts were much less further south in the DFW metroplex.

August 22:

Showers and a few thunderstorms moved southward from Oklahoma. They intensified early over central Texas and they produced around a 0.50” around Temple and Killeen. Meanwhile, only 0.01” fell nearby in Waco for their only measurable rain this month.

August 26 – 28:

Hurricane Laura moved northward from the Gulf of Mexico which made landfall near Cameron, LA early on the 27th. Laura moved north, then northeast across western and northern Louisiana. An outer band from Laura clipped DFW with an afternoon thundershower. They received 0.68” northwest of Springtown. The heaviest rain fell over extreme east Texas and Louisiana with 2+” of rainfall.

August 30:

There was a record high of 106 at DFW. The heat broke a strong capping inversion which helped to generate an area of thunderstorms across north Texas, some which produced downbursts over north Fort Worth and Briar, TX. There was over 2” in isolated locations of Tarrant County from these thunderstorms.

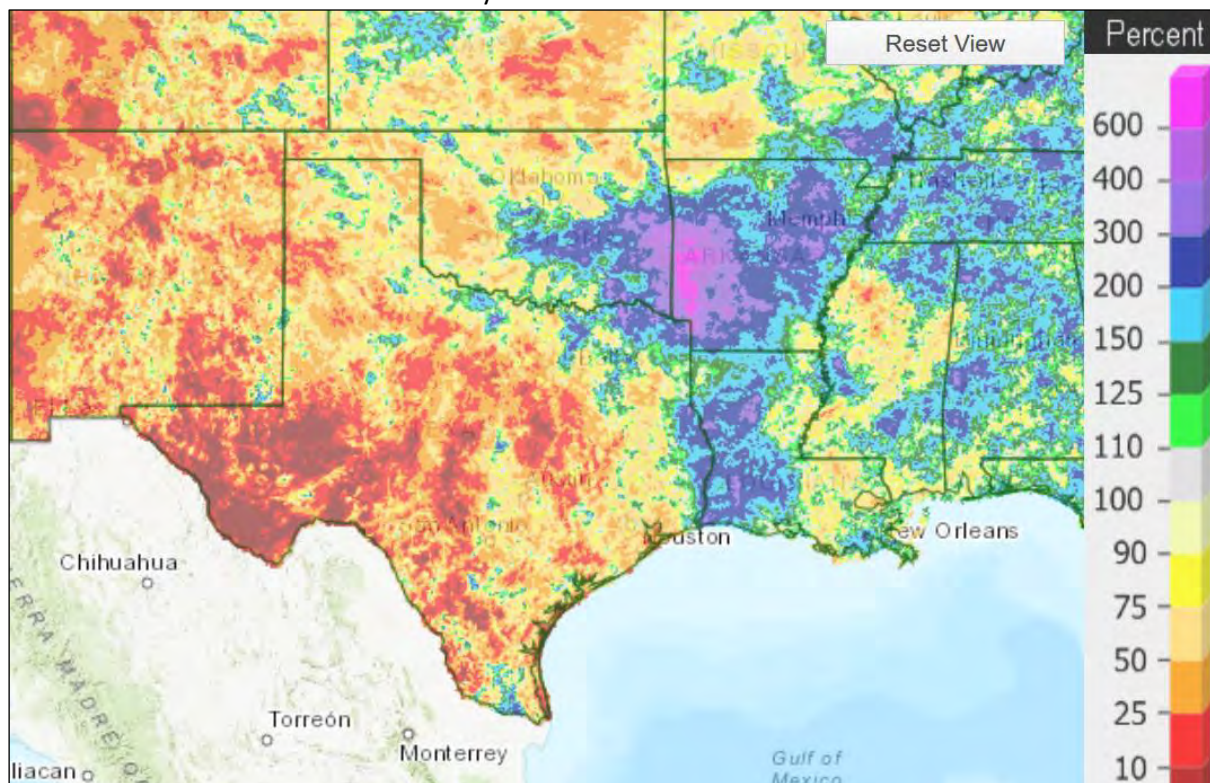


Fig. 4: Percent of normal rainfall for August 2020. The yellow and red colors indicate below normal precipitation, while the green, blue and purple colors indicate above normal rain. In August parts of extreme northern and eastern Texas got above normal precipitation, but the vast majority of Texas received below normal precipitation. Parts of far western Texas received much below normal precipitation in August. But, parts of Deep South Texas had near normal precipitation.

“North Texas Weather Summary (continued)”

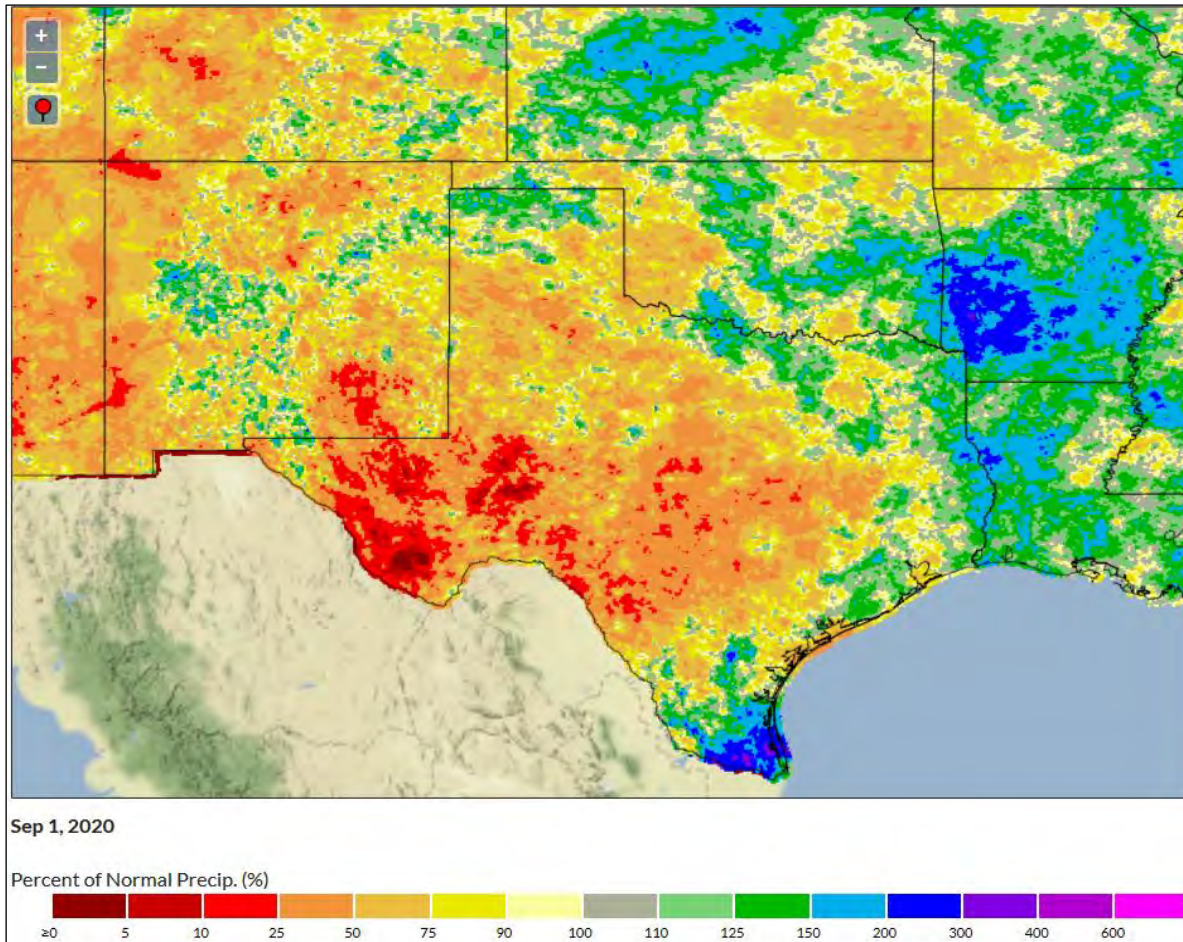


Fig. 5: Percent of Normal Precipitation for Summer 2020. The dark green, blue and purple colors indicate above normal rainfall. The brown, yellow and red colors indicate below normal amounts. Note the prolonged dryness over southwest and far west Texas into southeast New Mexico. The rainfall the past 3 months was lower than previous months, with the most significant rains occurring with tropical activity over Deep South and extreme east Texas.

At DFW Airport, the summer rainfall (June to August) was 8.94". The normal amount is 7.86" so they were +1.08" above normal.

For Waco this summer season, they received 4.68" (quite a bit less than Dallas/Fort Worth). The normal amount is 7.27" so they were 2.59" below normal for the season.

Since January 1 at DFW Airport they received 34.01" in 2020. The normal amount is 24.11" so they were 9.90" above normal for the first 8 months.

I wanted to remind you that having an accurate amount of the rainfall which fell at your station is extremely important and valuable information to the National Weather Service's West Gulf River Forecast Center. Please consider inviting your neighbors and friends to join CoCoRaHS!

I realize that this has been a difficult time for many of you due to COVID-19. I want to thank ALL of you for faithfulness in submitting your rainfall readings to CoCoRaHS during this summer season. Your dedication helps us out a lot. Have a great autumn season!

Greg Story

“Fall Weather Outlook”

La Niña Pattern Officially Declared in Eastern Pacific

By: Bob Rose, Meteorologist, Lower Colorado River Authority

Summer 2020 ended as one of the hottest summers on record across Texas—very similar to summer of 2018 and nearly one degree warmer than last summer. But summer is finally fading and fall is on the horizon. To some folks, fall is the best season of the year as temperatures become much more tolerable and rainfall generally increases. And after such a brutal summer, I think we all could all use some cooler weather.

In putting together the outlook for this autumn, forecasters are looking to the tropical Pacific for clues to the upcoming season across North America. One of the biggest forecasting clues comes from sea surface temperatures in the tropical Pacific. Since late spring, sea surface temperatures between the west coast of South American and the International Date Line have steadily cooled. By early September, the water temperatures cooled past the threshold for the development of La Niña. In fact, Climate Prediction Center (CPC) forecasters noted these cool waters have recently linked up with rising air in the western Pacific and sinking air across the eastern Pacific to officially declare this the start of La Niña. La Nina is a significant driver for weather across Texas in the fall and winter months as it tends to alter the normal position of the jet stream.

In a La Nina, sinking air across the eastern Pacific creates an area of high pressure in the upper atmosphere that builds north to Alaska and western Canada. The Jet stream coming east from Asia is forced to bend north around this ridge into Alaska and Canada instead of coming east into Texas. With the jet staying further to the north, it will limit the number of storm systems that would otherwise track east across Texas in the fall and winter months. At the same time, with the jet stream staying further to the north, it limits the number of cold fronts and cold air outbreaks from spreading south into Texas.

TYPICAL LA NIÑA WINTERS

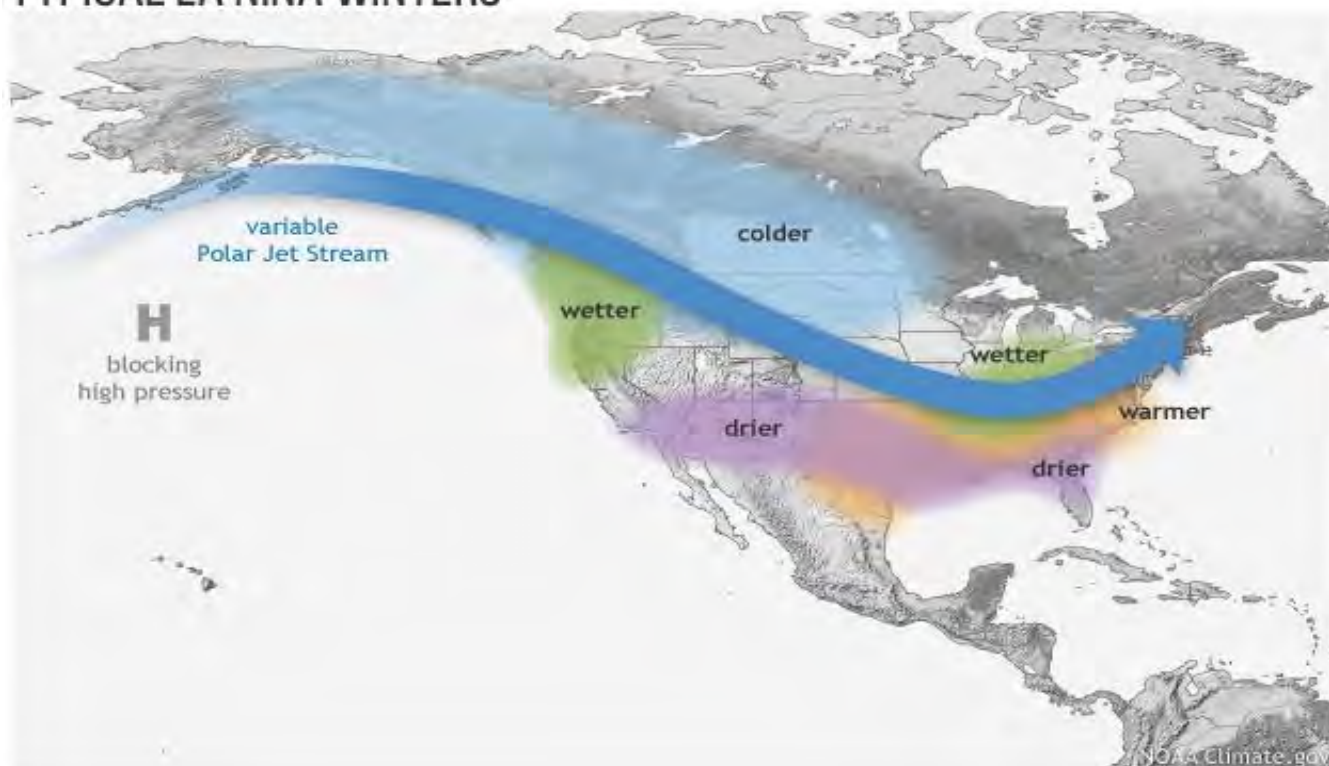


Fig. 1: Typical La Niña patterns bring warmer and drier than normal conditions to Texas in the winter months.

“Fall Weather Outlook (continued)”

From a historical context, most La Niñas have tended to cause a pattern of below normal rainfall and milder than normal temperatures across much of Texas and the southern US fall through winter. This year, the drier-than-normal and milder-than-normal influence from La Nina is forecast to begin affecting Texas weather by late September, with similar conditions persisting through late winter.

Based on the signal from La Niña, CPC’s autumn outlook calls for increased odds rainfall will average below normal across all of Texas. In fact, with decreased rainfall, mild drought conditions could develop in areas of the state by the start of winter. Fall’s noticeably cooler temperatures may be slow to arrive as the temperature outlook shows increased odds temperatures will average warmer-than-normal normal across all of Texas. There will be several cold fronts this fall, but the cool air isn’t expected to remain in place for very long.

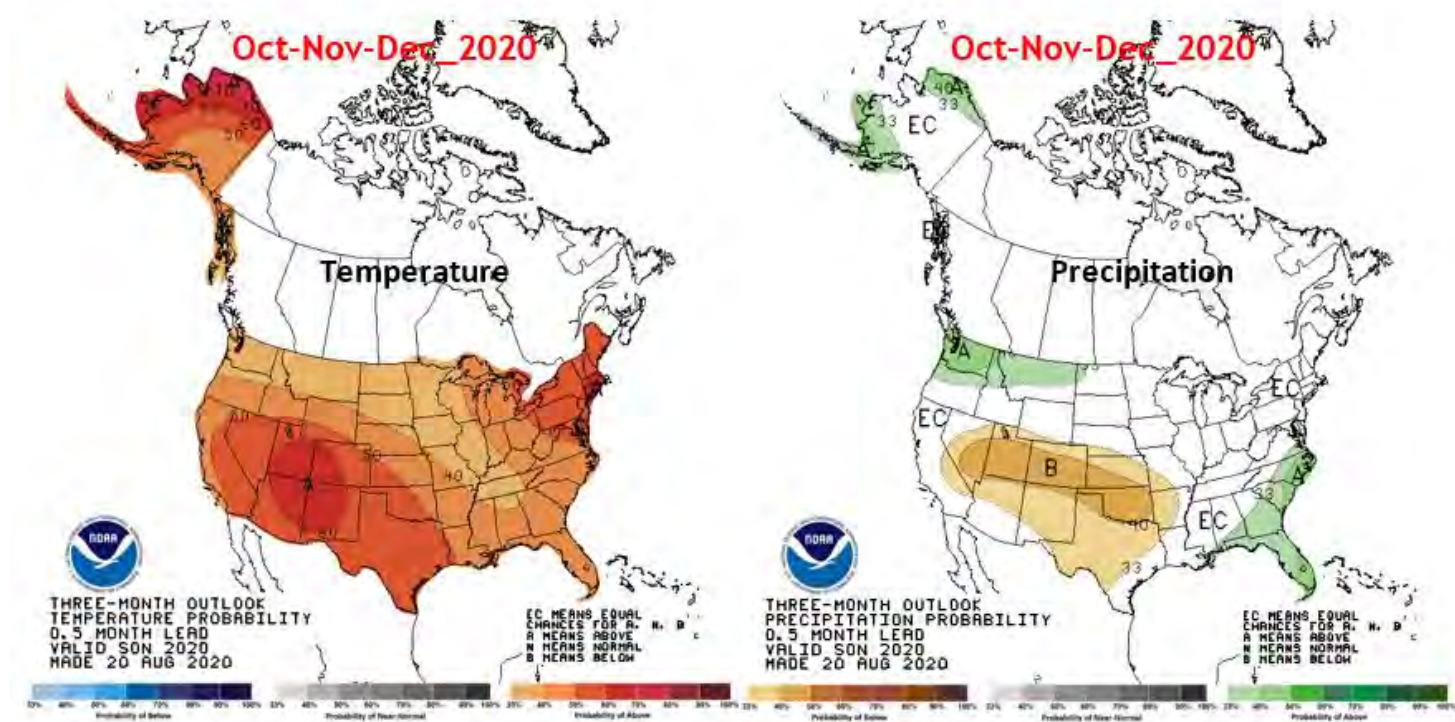


Fig. 2: Climate Prediction Center temperature and rainfall outlook for October-November-December

As autumn begins, we can all breathe a sigh of relief as the scorching temperatures of summer are finally behind us. Less hot and more comfortable weather is finally on the horizon. But sweater weather may be a little delayed this year as warm temperatures look to hang on for a while. And forecasts point toward the start of a drier period as we enter fall. But do keep in mind that every La Niña event is different as other oscillations in the oceans and atmosphere can at times overwhelm the typical La Niña response. Don’t be too surprised if we happen to see some occasional cold shots and periods of significant rain.

“Hanna Hits South Texas Region”

Hurricane Hanna Hits South Texas July 25 – 27, 2020

By: Barry Goldsmith, Meteorologist, National Weather Service Brownsville

Three times was *not* the charm for the Rio Grande Valley in July, 2020. For the third summer in a row, significant to locally devastating flooding inundated parts of the Rio Grande Valley...in some cases in the same neighborhoods with similar water levels. In 2018, the culprit was an elongated tropical wave that brought abundant moisture from the western Caribbean, eastern tropical Pacific, and southwest Gulf for days. In 2019, the combination of outflow boundaries from southeast Texas, upper level energy in northeast Mexico, and a highly unstable atmosphere did the deed. In 2020? It was an early-season hurricane.

Hurricane Hanna, the 2020 Atlantic season's first Hurricane, made landfall along the unpopulated Padre Island National Seashore on the mid-Kenedy County coastline at around 5 PM Central Time Saturday, July 25th, carrying sustained 90 mph winds with gusts over 100 mph in a small portion of the inner eye wall. The hurricane spun slowly but steadily into southern Kenedy and northern Hidalgo County through just after midnight on the 26th, then through Starr County as a Tropical Storm before moving into Tamaulipas before daybreak and eventually near Monterrey, Nuevo Leon, by noon before dissipating during the evening of the 26th.

Hanna marked the first direct landfall and track of a hurricane across Deep South Texas and the Rio Grande Valley for the first time since Hurricane Dolly in 2008, which coincidentally crossed the Valley just a few days earlier (July 23-24, 2008). The cyclone began as a disorganized area of showers and thunderstorms associated with a tropical wave near Hispaniola on July 19th. Over the next three days, the wave struggled to develop, fighting off dry air and a bit of wind shear as it slowly edged westward. By July 23, however, the wave moved into an area of low wind shear and higher "fuel" in the form of very warm sea surface temperatures. Soon after, Tropical Depression 8 formed, and by late evening on the 23rd, Hanna was born as a Tropical Storm over the west-central Gulf, about 225 miles south of the Louisiana coast. Hanna steadily strengthened on the 24th while on a westward heading, and became Hurricane Hanna at daybreak on the 25th, just 90 miles east of Port Mansfield.

Following the passage of the inner eye wall, broad feeder bands of torrential rains and gusty tropical storm force winds continued through the mid to late morning hours of July 26th, slowly migrating from east to west across the populated Rio Grande Valley. Additional feeder bands redeveloped in unstable air Monday afternoon and evening in western Cameron and eastern Hidalgo County, exacerbating the ongoing flood conditions there.

Throughout Hanna's life cycle, the most rain and wind activity was in the southern semicircle. Other than storm surge flooding, which peaked just north of Baffin Bay on the Kleberg and Nueces County coast near Corpus Christi, Hanna's memory for the Rio Grande Valley will be flooding rainfall, power outages, and an array of damage to poorly constructed buildings, from minor roof damage to complete demolition. The rainfall map (Fig. 1) for Hanna and two days of remnant squalls, was similar to both Hurricane Dolly and the Great June Flood of 2018. Review the data on following pages for details on rainfall, wind speeds, river/stream flows, storm surge, and even a small tornado that brushed by our office on the east side of Brownsville early on the 26th. Below is the "Tale of the Tape" from Hurricane Hanna.

- Including post-Hanna feeder bands, **8 to 15 inches of rain fell** from Port Mansfield southwest to Harlingen, than along the Interstate 2 and US 83 corridor from Harlingen through Sullivan City and La Grulla (Starr County)
- The rainfall combined with poor drainage systems in Hidalgo and Cameron County left **18 inches to up to 4 feet of water** in many areas between Santa Rosa/La Feria (Cameron) and east of Edinburg, as well as in the Mission/La Joya/Sullivan City area (Hidalgo)
- Measured and estimated **peak wind speeds** were the following in the Rio Grande Valley:
 - 80 to 85 in Port Mansfield
 - 75 to 80 mph in Raymondville
 - 70 to 75 mph in Lyford
 - 65 to 75+ mph in northeast Hidalgo County

“Hanna Hits South Texas Region (continued)”

- 60 to 65 mph along Interstate 2 and points north, between Harlingen/San Benito and the McAllen/Mission area
 - 55 to 60 mph in Starr County
- At the peak of the event, at least **250,000 Rio Grande Valley customers** were without power. This included nearly 100 percent of Willacy County, and likely up to 50 percent of Cameron and Hidalgo County
- **Hundreds of poorly built homes and other structures were damaged**, mainly roofs but also some siding and walls. Dozens of buildings in *colonias* were uninhabitable, with an unknown number demolished
- **Tens of thousands of tree limbs** were blown down, and **hundreds of trees were snapped or uprooted**. Hundreds of power poles were snapped, blown down, or leaning.
- Virtually **all of the budding and unharvested cotton crop was destroyed** by the deluge.
- Citrus was heavily damaged across the Valley with young fruit blown off trees. Sugarcane was heavily damaged, and an unknown number of vegetable crops were expected to be a total loss.
- Crop damage overall was **\$177 million** in South Texas, the majority in the **Rio Grande Valley**. When including economic/production losses, the preliminary total was estimated at **\$366 million**.
- Measured and estimated **storm surge**, or levels above mean higher high water, ranged from 1.67 feet on South Padre Island to 2.64 to 3.43 between Port Mansfield and Rincon del San Jose (landfall point in Kenedy County). At the South Padre Island beaches, this amounted to "run-up" to the dune line at wide beaches, and into the dunes a little ways at narrow beaches. Predicted (astronomical) tides were seasonally low, which likely saved South Padre from more significant damage or erosion.

When the damage and economic loss is counted to infrastructure and agriculture combined, it is likely that Hanna cost at least **one billion dollars** across the Rio Grande Valley and the Deep S. Texas ranch country. Disaster declarations were in effect to collect the data, and this site will be updated with those estimates between August and October 2020 and beyond.

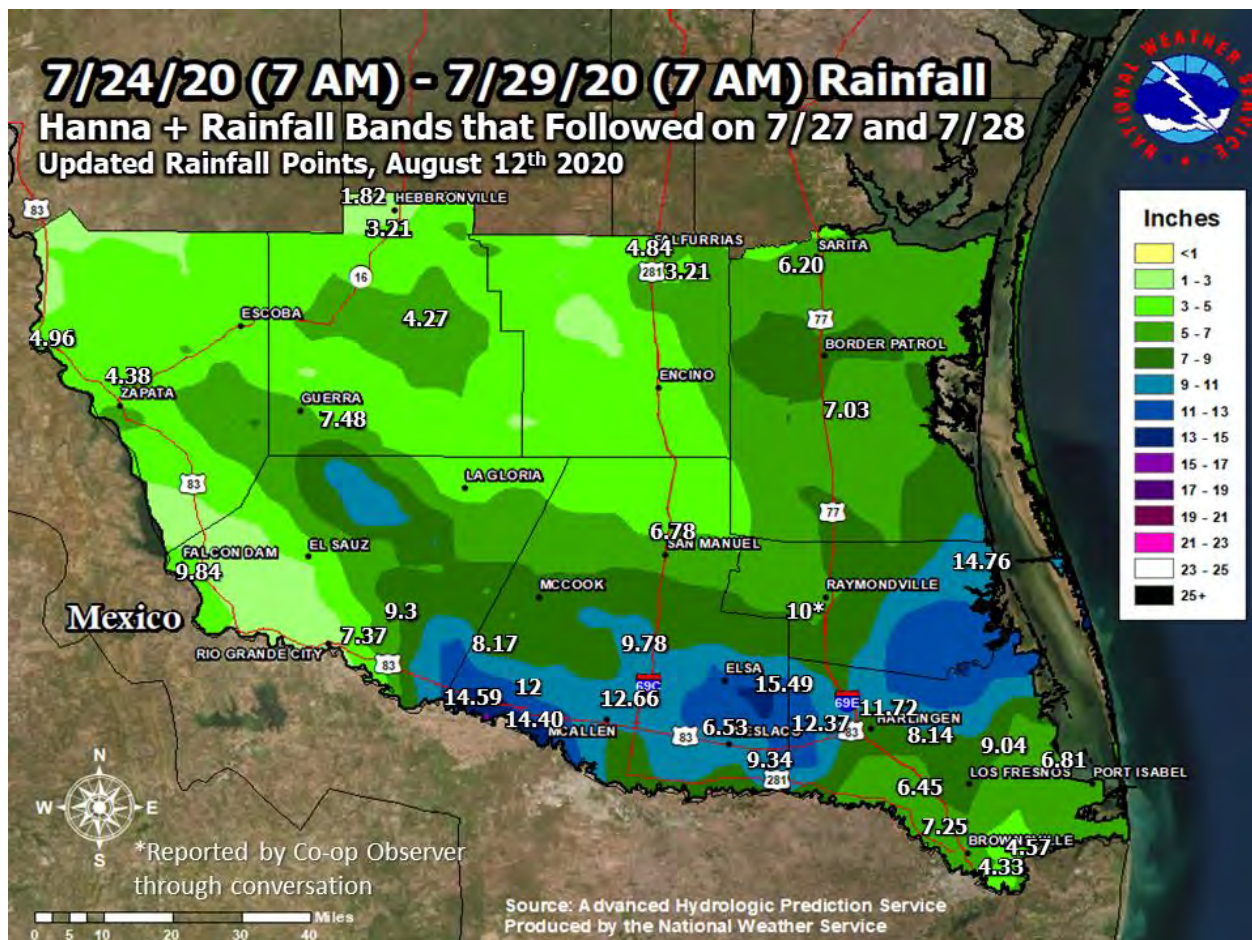


Fig. 1: Storm Total Rainfall for Hurricane Hanna

“Hanna Hits South Texas Region (continued)”

Location	County	Speed	Time of Occurrence
Rincon Del San José, TX (Marine Station)	Kenedy	103	0206 PM 07/25
Port Mansfield 53 ENE (Buoy 42020)	Gulf of Mexico	87	0220 PM 07/25
Texas Agriscience 7 SW Lyford	Hidalgo	80	1105 PM 07/25
Armstrong Ranch (DTN)	Kenedy	64	1000 PM 07/25
Rancho Las Comitas (La Gloria 6.0 NW - TWDB)	Starr	64	0315 AM 07/26
Harlingen	Cameron	63	0612 PM 07/25
Laguna Vista 11 N	Cameron	62	0600 PM 07/25
Linn-San Manuel	Hidalgo	61	0946 PM 07/25
McAllen	Hidalgo	60	1028 PM 07/25
Weslaco Midvalley	Hidalgo	59	0935 PM 07/25
South Padre (BZST2 Marine Station)	Cameron	58	0355 PM 07/25
SPW Park (Marine Station)	Cameron	55	0427 PM 07/25
Port Isabel	Cameron	55	0322 PM 07/25
Laguna Vista	Cameron	55	0253 PM 07/25
Laguna Atascosa	Cameron	55	0353 AM 07/26
Edinburg Intl	Hidalgo	54	0615 PM 07/25
South Padre Island C.G. Station	Cameron	53	0436 PM 07/25
Falfurrias	Brooks	53	0815 PM 07/25
Falcon Lake	Starr	52	0211 AM 07/26
Encino 11.8 SW (DTN)	Brooks	49	1215 AM 07/26
Brownsville	Cameron	48	0347 AM 07/26
South Padre Island 42 ENE (Buoy 42045)	Gulf of Mexico	45	0600 PM 07/25
Hebbronville	Jim Hogg	44	0646 AM 07/26
Encino 10.8 NW (DTN)	Brooks	42	1000 PM 07/25
Zapata	Zapata	41	0940 AM 07/26
Los Fresnos	Cameron	41	0446 PM 07/25
Santa Ana NWR	Hidalgo	38	1045 PM 07/25
1 N South Padre Island (Marine Station)	Cameron	36	0425 PM 07/25

Fig. 2: Peak wind gust from Hurricane Hanna

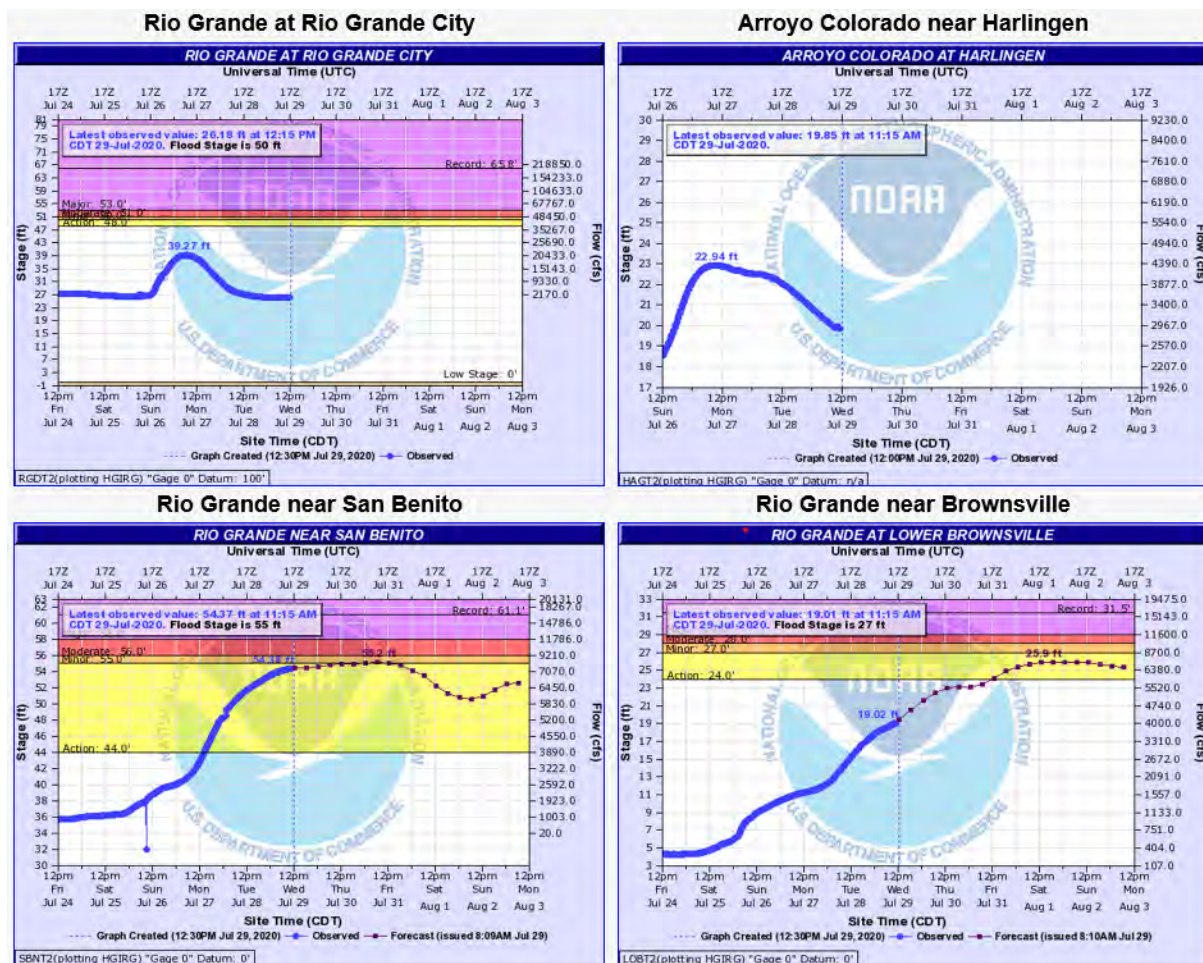


Fig. 3: Hydrologic River Data showing observed and forecasted stage levels.

“Hanna Hits South Texas Region (continued)”

PUBLIC INFORMATION STATEMENT...UPDATED
NATIONAL WEATHER SERVICE BROWNSVILLE TX
200 PM CDT Fri Jul 31 2020

...NWS DAMAGE SURVEY FOR 7/26/2020 TORNADO EVENT IN BROWNSVILLE...

.Overview...Hurricane Hanna made landfall along the Kenedy county coast on the evening of July 25, 2020. As Hanna pushed inland, its eastern outer rain bands produced several areas of rotation. One area of stronger rotation developed south of Brownsville just across the Rio Grande in Mexico. The Brownsville radar briefly detected a debris signature as it moved northward toward the Brownsville airport. The Brownsville airport, in addition to residents in nearby neighborhoods, reported wind damage. Therefore, a damage survey was conducted this afternoon to confirm a brief tornado.

Rating: EF-0
Estimated Peak Wind: 75 MPH
Path Length (Statute): 3.43 MILES (SEGMENTED)
Path Width (Maximum): 50 YARDS
Fatalities: 0
Injuries: 0

Start Date: July 26, 2020
Start Time: 332 AM CDT
Start Location: 4.7 Miles East-Southeast of Brownsville
Start LAT/LON: 25.8729/-97.4287

End Date: July 26, 2020
End Time: 336 AM CDT
End Location: 4 Miles Northeast of Brownsville
End LAT/LON: 25.9222/-97.4355

Updated: An initial touchdown was discovered about 2.3 miles south of Brownsville/South Padre Island International Airport. Here, an empty tractor trailer was moved on an angle into a stand of trees, an unanchored travel trailer was flipped, a storage shed was flattened, and several mesquite trees lost large limbs. A few minutes later, several areas of damage occurred on the west side of the Brownsville airport. A dozen windows were blown out of an airplane hangar building, an unanchored old jet staircase was flipped and a garage door collapsed inward. In addition, a 737 airplane was moved into a hangar, causing damage to the hangar wall. No damage was noted to the plane itself. As the tornado moved to the north northwest, several large tree limbs were snapped, in addition to a weak uprooted tree. Finally further north, two homes lost large sections of their roofs with most walls still standing. The brief tornado then lifted with no other tornado damage found.

Fig. 4: Tornado damage survey done by NWS Brownsville

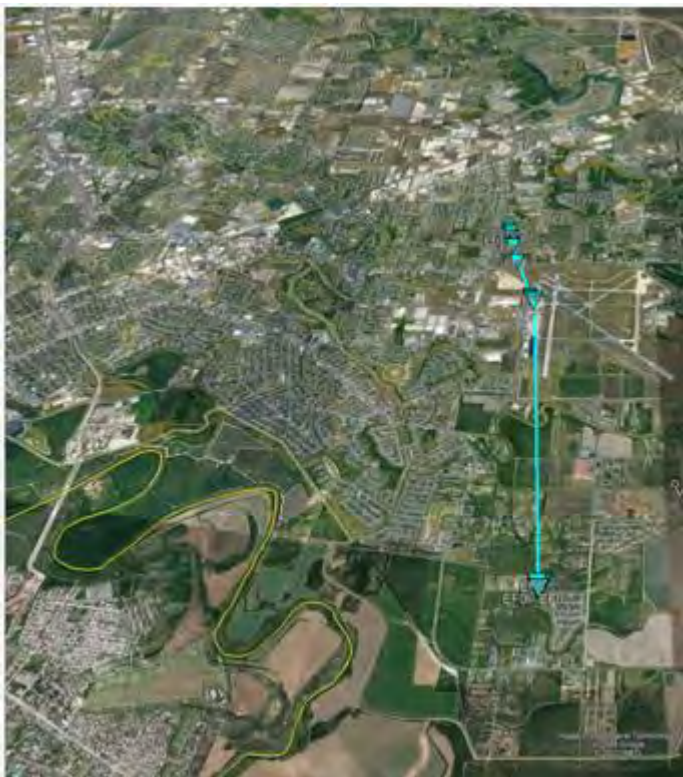


Fig. 5: Tornado track on Google Maps

Preliminary Damage Survey Results	
EF0 Tornado - Brownsville, TX (Hanna)	
Date	July 26, 2020
Time (Local)	3:32 AM – 3:36 AM
EF Rating	EF-0
Est. Peak Winds	75 MPH
Path Length	3.43 Miles (two segments)
Max Width	50 Yards
Injuries/Deaths	0 Injuries / 0 Deaths

Issued: 12:33 PM - Friday, July 31, 2020



Fig. 6: Tornado Damage Survey Results from July 26th tornado.

“Corpus Christi Regional Precipitation Summary”

South Texas Welcomes Beneficial Rain

By: Juan Pena, Meteorologist, NWS Corpus Christi

Beneficial rainfall from the latter half of July and early August led to improvements in the drought across South Texas. With the rainfall, the moderate drought was able to be removed from the Victoria Crossroads area with only a sliver of Abnormally Dry conditions remaining. Elsewhere, drought conditions aren't being observed. The most significant rainfall events ranged from a late season front to several disturbances as well as a tropical cyclone with Hurricane Hanna affecting South Texas in late July.

June started off wet, mainly across the Coastal Bend and slowly spreading inland. The most significant rainfall totals were located across the Coastal Bend where rainfall amounts between 2" to 4" were reported. On June 9th, a late season cold front moved through the region into an area of deep tropical moisture resulting in shower and thunderstorms, mainly across the Brush Country. Webb and La Salle counties reported rainfall amounts between 0.5" to 2" with some observers reporting up to 3". After a week of dry conditions behind the front, precipitation returned as a mid-level disturbance propagated across the region. With sufficient moisture in place, this disturbance resulted in showers and thunderstorms with observers reporting between 0.5" to 2". The Coastal Bend received an additional 3" inches on June 18th as thunderstorms developed offshore and slowly drifted inland towards Corpus Christi. The next and most beneficial rainfall for the month came June 23rd through the 27th. Multiple disturbances interact with surface boundaries resulting in showers and thunderstorm across South Texas. Observers across the Coastal Plains reported total between 1" to 4" with the highest total across Jim Wells and Live Oak with amounts near 6", which prompted a Flash Flood Warning to be issued on June 26th. After this event, Saharan Dust filtered over the region which inhibited rainfall for the remainder of June.

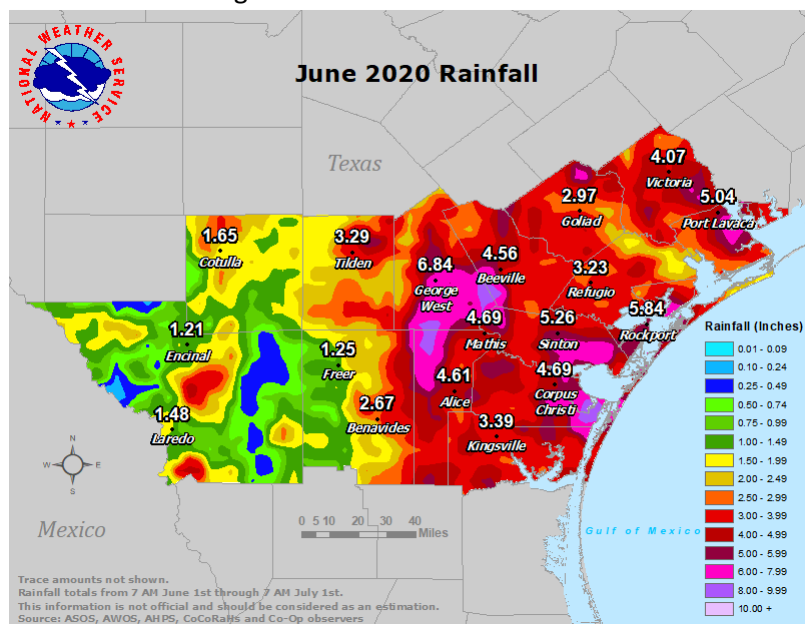


Fig.1: June 2020 Rainfall for Corpus Christi Region

The first half of July was extremely dry with minimal showers developing. Saharan Dust and high pressure were the main factors in suppressing rainfall activity. Even when enough moisture made its way into South Texas, there just wasn't enough lifting to support the development of showers and thunderstorms. However, things changed in mid-July as the high pressure that dominated the region drifted slightly northward and the landfall of a hurricane with its deep tropical moisture. Hurricane Hanna made landfall on July 25th dumping as much as 6" of rain. Observers reported rainfall amounts ranging between 3" to 6" across the Coastal Bend, including Jim Wells, Kleberg, southern Live Oak, Nueces and San Patricio Counties. Hanna quickly moved away from the region on July 26th, however, residual moisture left in the wake of the hurricane resulted in showers and thunderstorms through July 29th which resulted in another 1" to 2" of rain. Another unseasonably late frontal boundary moved through Texas stalling just shy of South Texas on July 31st. However, the tail-end of the boundary brought a mesoscale convective system (MCS) through western Brush Country with resulted in rainfall accumulations between 1" to 4".

“Corpus Christi Regional Summary (continued)”

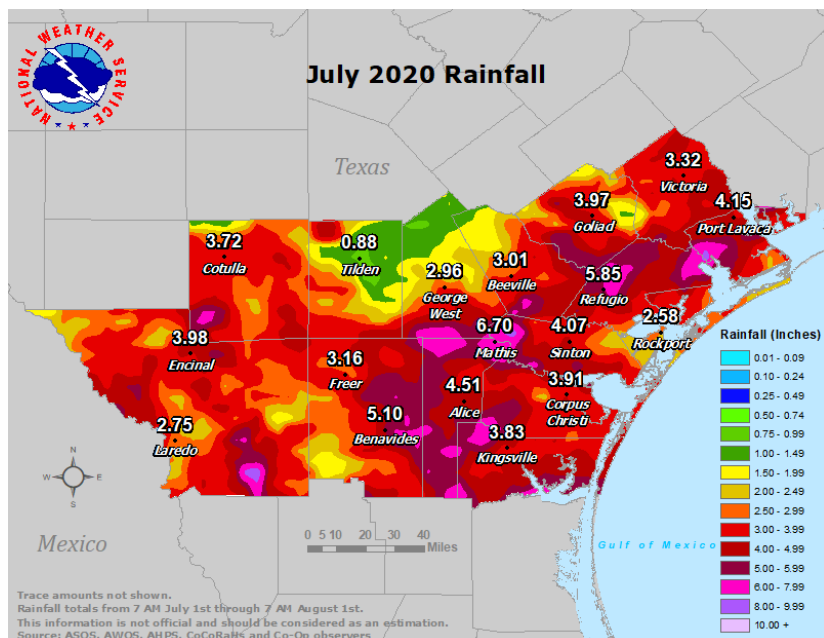


Fig.2: July 2020 Rainfall for Corpus Christi Region

Similar to July, August began relatively dry as an area of high pressure settled in across South Texas for the first week before shifting slightly northward allowing showers to develop, with only a few showers and thunderstorms lingering from the MCS that affected the region in late July. Despite the passage of several shortwaves, August was a relatively dry month with rainfall values below normal, despite the development of thunderstorms across the sea breeze most days during the middle and end of the month. The observer with highest rainfall amount for month reported was near 2.5" in Bee County with the lowest amount reported around 0.5" in Jim Wells with some coastal locations reporting less than 0.10" of precipitation. Despite the minimal amounts of precipitation in August, we accumulated just enough in June and July to maintain near normal summer totals.

The main story of the summer was when it rained, it rained. With several plumes of Saharan Dust reaching South Texas and ridging persisting as long as it did, rain chances were at a minimum. If it wasn't for the big rain events this summary would be telling a different story. Thankfully, due to the rainfall associated with late season fronts/boundaries and a tropical system, we were able to break even. With the appearance of La Niña occurring for the winter months, the outlook for South Texas is to have a drier than normal winter with the Climate Prediction Center giving South Texas a 30% chance of drier winter season.

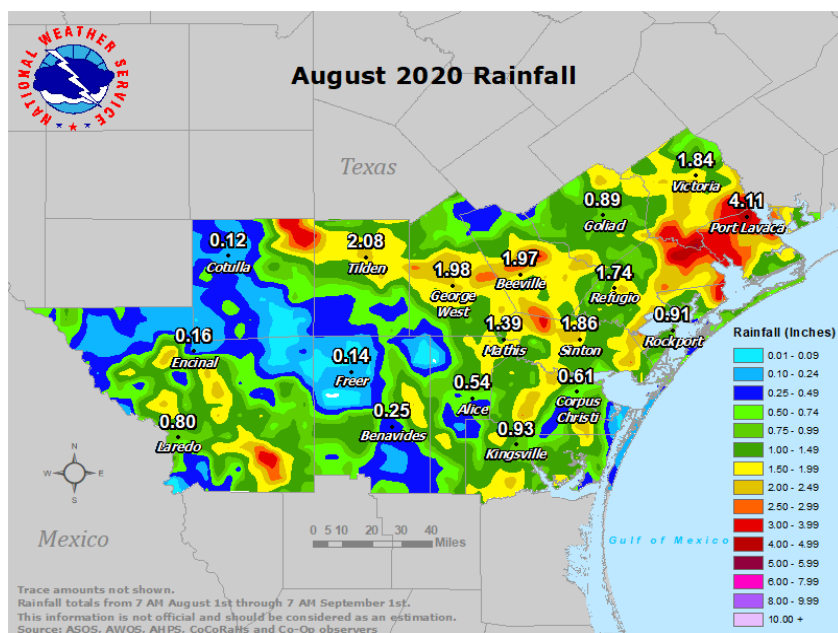


Fig.3: Aug. 2020 Rainfall for Corpus Christi Region

“Observer Tips & Training Material”

Back to Basics - Observation Time

When you signed up for CoCoRaHS you selected an observation time. This is the time that automatically appears in the Observation Time field on the Daily Report form, and for the many of us this is 7:00 a.m. The time is automatically entered into the field as a convenience since we assume that's when you will regularly take your observation. However, if for some reason you make your observation at an earlier or later time other than the "standard" time you chose, be sure to enter that actual observation time in the Observation Time field. This is especially important when we have rain occurring at the time of observation. A difference of 30 minutes could make a big difference between what you measure and what surrounding stations measured 30 minutes earlier. So if your observation time is more than 5 minutes either side of your chosen time, enter the actual observation time in the field. Also, the observation time is the time you make your measurement, NOT the time you enter it on the web. For example, if you make your measurement at 7:00 a.m. but don't enter it on the web until 3:00 p.m., your observation time remains as 7:00 a.m.

The rainfall you report each morning is the total that has accumulated since the previous day's observation. The total is reported on the day of the observation, not necessarily the day the rain fell. For example, let's say you had 1.23" rain on the afternoon of April 1st, and your next regular observation is the morning of April 2nd. Your observation for the morning of April 2nd would be 1.23", representing all of the rain that fell since your last regular observation (the morning of April 1st). It would be helpful if you noted when the rain fell in your comments.

The Importance of Significant Weather Reports and Hail Reports

Significant Weather Reports (SWR's) submitted by CoCoRaHS observers are a huge help to the National Weather Service. All SWRs are automatically routed to the local NWS office, and forecasters use these reports to monitor the progress of storms. Questions we get from time to time are "What is significant weather?" and "How often should I submit a Significant Weather report?" First, Significant Weather Reports are supplementary reports and **DO NOT replace your Daily Report nor should it be submitted in lieu of a Daily Report**. The SWR is great for updating rainfall after your regular observation time. You should not be updating your daily report once it is submitted, except to make a correction or add additional information.

What is "significant weather"? In general, it is heavy rain (falling at a rate of an inch an hour or more), snow accumulations, high winds, icing from freezing rain, or flooding. However, you are not limited to this list - use your best judgment. How often should you report? You should report as often as needed to convey what is happening. Comments included with your Significant Weather report are very useful. Comments with a Hail Report are extremely important for a NWS office to immediately make a decision on issuing a severe thunderstorm warning for a location.

“Observer Tips & Training Material (continued)”

Gauge Maintenance - Cleaning the CoCoRaHS Gauge

Is your rain gauge inner-cylinder starting to look a little grungy these days? It's that time of year! For most of us dirt will eventually build up on the bottom of your CoCoRaHS rain gauge inner-cylinder. In humid climates, algae growth can also be a bother. Usually maintenance of the CoCoRaHS 4 inch diameter gauge should be done about 3-4 times a year to insure that your gauge is properly set-up, clean, and ready to measure the worst storms that you will ever see. Some other important things to make sure are good include the following. A quick inspection of your mounting post to make sure it hasn't moved in the soil from heavy rains earlier in the year. Any movement of post can cause the gauge to not be level and give false reading of rainfall that are either too high or too low. Use a level to check the mounting post and the top of the CoCoRaHS gauge for a correct level reading. A quick inspection of the mounting plate attached to post is important to see if it is securely mounted into the post. Also inspect the mounting plate for any cracks in the plastic. Taking a little time to do this quick inspection will pay off when that derecho moves through your area with 100 mph winds and your gauge measures the storm without the post being blown down or the plastic cylinder and inner tube being sent flying off somewhere.

If you want to keep your gauge clean and looking like new, put some warm water with a little gentle liquid hand soap in the tube and let it soak for a few minutes. Then twist a thin soft towel and spin it into the cylinder until it reaches the bottom. This will wipe out most of the dirt. Also available online is a soft brush cleaner for the inner funnel which works very well at cleaning dirt, mold, and algae growth from inside the tube. Make sure to use the brush with gentle liquid hand soap to avoid any scratching of the surface of the inner tube.



Sometimes birds can be a big problem in some areas. One of the best things to keep birds off of your CoCoRaHS gauge so they don't leave anything behind before they fly away is to use ***holographic reflective scare tape***. This reflective ribbon will flash dramatically in daytime light and sunlight. Birds will keep away from the flashing tape and will not fly near your gauge. See pictures below.



You may even find a pot of gold sitting under your CoCoRaHS gauge by using the scare tape, but even if you don't your CoCoRaHS gauge will be able to measure that golden rainfall that falls from a sky of golden clouds and a double rainbow.

“County Coordinators Wanted in Texas”

Texas CoCoRaHS Counties by Region Without a County Coordinator						
CoCoRaHS is recruiting observer/ volunteers to be county coordinators. See if your county needs a coordinator. If you would like to be a county coordinator please contact the Texas state coordinator at Texas.CoCoRaHS@austin.rr.com						
						Updated 9/15/2020
Amarillo	Lubbock	Midland/Odessa	El Paso	Abilene/San Angelo	Wichita Falls	East/NE Texas
Armstrong	Bailey	Andrews	El Paso	Brown	Baylor	Marion
Carson	Briscoe	Borden	Hudspeth	Coleman	Clay	Panola
Collingsworth	Castro	Crane		Coke	Foard	Sabine
Deaf Smith	Childress	Culberson		Concho	Hardeman	
Donley	Cochran	Dawson		Crockett	Knox	
Gray	Crosby	Ector		Fisher	Wilbarger	
Hansford	Cottle	Gaines		Haskell		
Hartley	Floyd	Glasscock		Irion		
Hemphill	Garza	Howard		Jones		
Hutchinson	Hale	Jeff Davis		Menard		
Lipscomb	Hall	Loving		Nolan		
Moore	Hockley	Martin		Schleicher		
Ochiltree	Kent	Mitchell		Shackelford		
Oldham	King	Pecos		Sterling		
Potter	Lamb	Presidio		Sutton		
Randall	Lubbock	Reagan		Taylor		
Roberts	Lynn	Reeves		Throckmorton		
Sherman	Motley	Scurry				
Wheeler	Parmer	Terrell				
	Stonewall	Upton				
	Swisher	Ward				
	Terry	Winkler				
	Yoakum					
Corpus Christi/	Bryan/ College Station/	Austin/San Antonio/	Houston/	Dallas/Ft. Worth	Brownsville/	Beaumont/
Victoria/ Laredo	Brazos Valley	Del Rio	Galveston	Waco/Temple	McAllen	Golden Triangle
Bee	Brazos	Bastrop	Brazoria	Anderson	Brooks	Jasper
Duval	Burleson	Bexar	Chambers	Cooke	Cameron	Newton
Goliad	Grimes	Caldwell	Fort Bend	Eastland	Hidalgo	
Jim Wells	Houston	Dimmit	Galveston	Falls	Kenedy	
Live Oak	Madison	Edwards	Jackson	Fannin	Starr	
McMullen	Trinity	Val Verde	Matagorda	Freestone	Willacy	
Refugio	Walker	Zavala	San Jacinto	Hamilton	Zapata	
San Patricio			Wharton	Henderson		
				Hill		
				Jack		
				Leon		
				Limestone		
				Milam		
				Mills		
				Palo Pinto		
				Parker		
				Robertson		
				Somervell		
				Stephens		
				Wise		
				Young		

“Scheduled CoCoRaHS Webinars”

Webinar #71 - Thursday, September, 30, 2020, 1PM EDT

NOAA Weather Radio

Bruce Thomas
Chief Marketing Officer
Weather2020
Kansas City, MO



Webinar #72 - Thursday, October 15, 2020, 1PM EDT

Awesome or Awful? Ranking Winter Severity with the Accumulated Winter Season Severity Index (AWSSI)

Barb Boustead
NOAA/NWS's Warning Decision Training Division
Norman, OK



[\(biography\)](#)

This webinar will look at the Accumulated Winter Season Severity Index (AWSSI). AWSSI provides a scientific way to quantify the severity of a winter at any given location compared to its weather history. Using daily temperature, snowfall, and snow depth measurements, the AWSSI assigns a point total to each day of winter. Daily points add up through the winter season, giving a whole-season total at the end of winter. Besides the curiosity factor of having the numbers to support perceptions of whether a winter was severe or mild, AWSSI can be used to compare severity among sites or to compare the severity of one winter to others at a given site. The index can provide insight into wildlife and vegetation patterns, transportation and education impacts, and relationships between winter severity and other weather and climate patterns.

“Scheduled CoCoRaHS Webinars”

Webinar #73 - Thursday, November 5, 2020, 1PM EST

The History of Commercial Weather Sector Innovation and Challenges of the Future

Joel Myers

Founder, President, CEO & Chairman

AccuWeather

State College, PA







[\(Biography\)](#)

Since he started forecasting the weather in the 1950s, AccuWeather Founder and CEO Joel Myers has witnessed profound progress in the ability of the American Weather Enterprise to provide more specific, more accurate and more useful weather forecasts, warnings, and data, and communicating these with increasing value, thereby saving countless lives, enhancing the national and global economy, and improving the quality of life for billions of people.

These incredible advancements are due to the dedication and numerous innovations in all three sectors – academia, government, and America's Weather and Climate Industry – enhanced by the partnership that has developed between the sectors, and the important role of the American Meteorological Society in facilitating this understanding.

In this presentation, Joel will review key innovations and contributions to this success from the three sectors and especially America's Weather and Climate Industry. He will examine some past events where weather changed history and address the challenges of the future as we face dramatic changes and transformations in technology and society.

	<p><i>Texas CoCoRaHS Observer</i> The official newsletter of Texas CoCoRaHS</p>	
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