TEXAS CoCoRaHS OBSERVER

Winter 2017-18

"Because every drop counts, as do all Zeros."

Welcome to the Texas CoCoRaHS Observer newsletter.

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

If you have questions, comments or suggestions, feel free to contact us via the emails listed on the back page.

Inside this issue:

Texas Winter Climate Summary

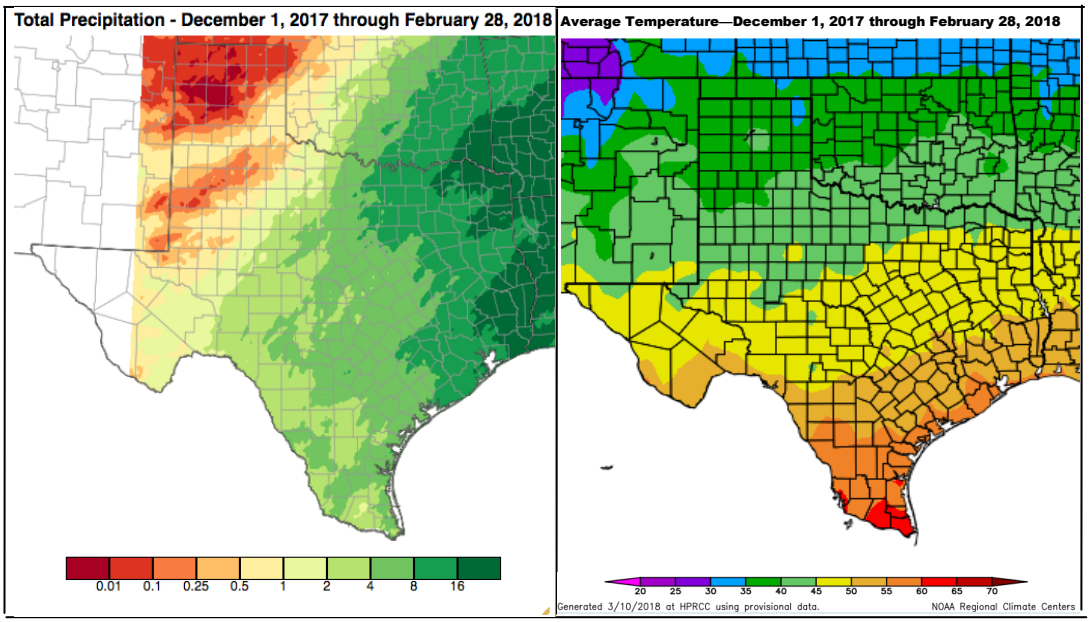
By: John Nielsen-Gammon, Texas A&M University, Texas State Climatologist, Bryan/ College Station Regional CoCoRaHS Coordinator

Texans may have been spoiled by the ridiculously warm conditions last winter. This year, people kept asking me why we were getting all this cold weather. The answer, of course, was that it was wintertime! And while there were some cold spells that brought lows not seen since 1989 to some parts of the state, winter temperatures as a whole were pretty close to normal.

The average winter temperature across the state ended up at 48.0 °F. This is actually 0.8 °F warmer than the 20th century average. Sometimes it didn't seem all that warm; much of central Texas was locked into a pattern of fog and low clouds for many days on end.

Rainfall also came out close to average: 4.85" compared to a 20th century average of 5.00". But those numbers hide wide variations across the state.

If we didn't get many reports of rainfall from the Panhandle, maybe it was because there wasn't any. Amarillo, for example, made it from mid-October to mid-February without any measurable precipitation, by far their longest streak on record. They broke the streak with a dramatic 0.01" on February 17, but they've gone four more weeks (and counting) without any measurable rainfall since then. As the map shows, many spots in the Panhandle went without measurable rainfall the entire winter.

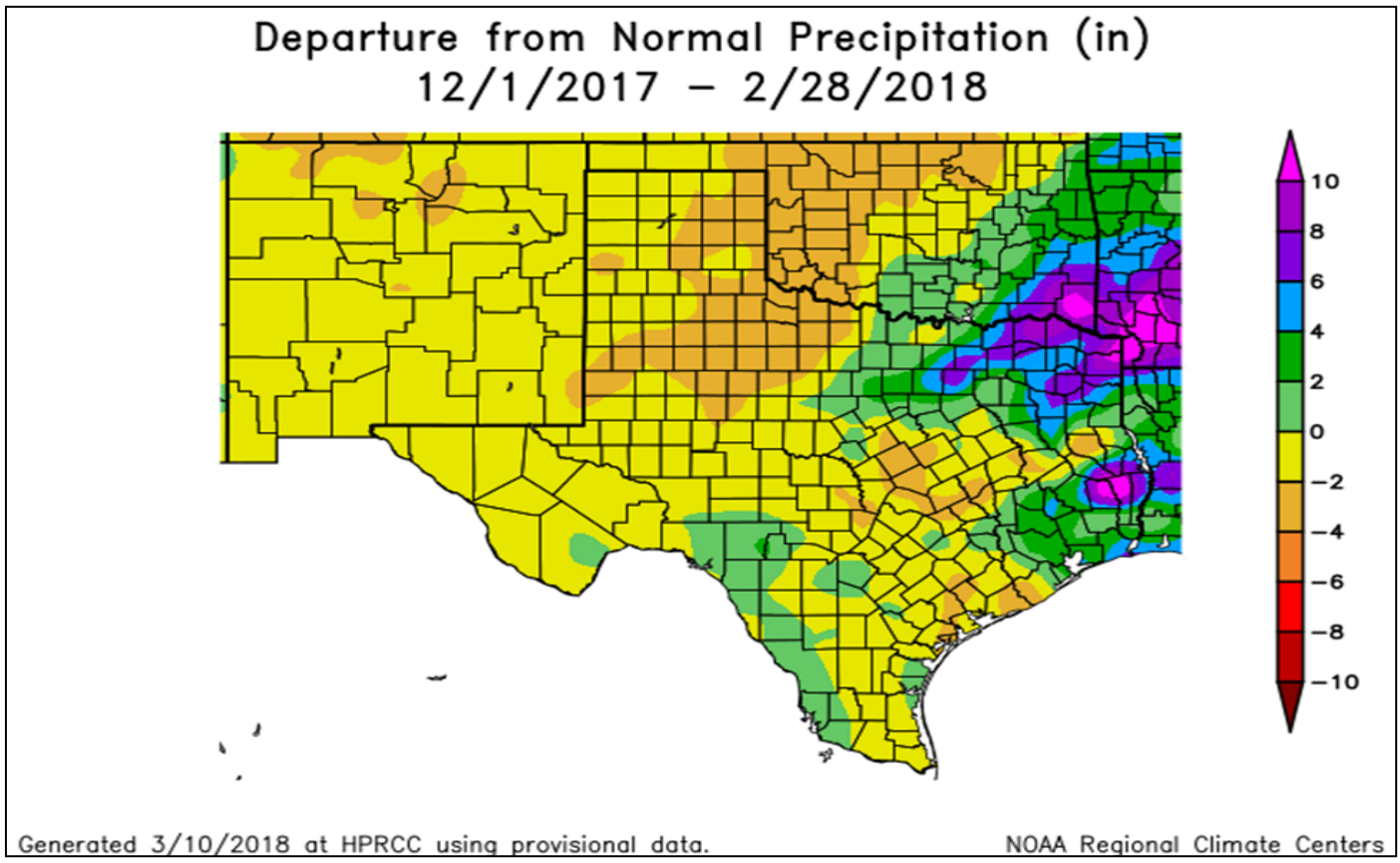


Spring Weather Outlook - La Nina Fades

By Bob Rose
Lower Colorado River Authority

Springtime weather across Texas usually means warming temperatures, periods of severe weather and, of course, lots of wildflowers. This spring's weather is expected to live up to those expectations and then some as La Niña fades and summer attempts to make an early appearance.

Over the winter, rainfall averaged below normal across a good part of Texas thanks to the development of a weak to moderate La Niña. The Panhandle and much of Northwest Texas was the driest part of the state, with some locations recording less than a quarter inch of rain. Much of North and East Texas was the wettest part of the state thanks to heavy rains developing in late February.

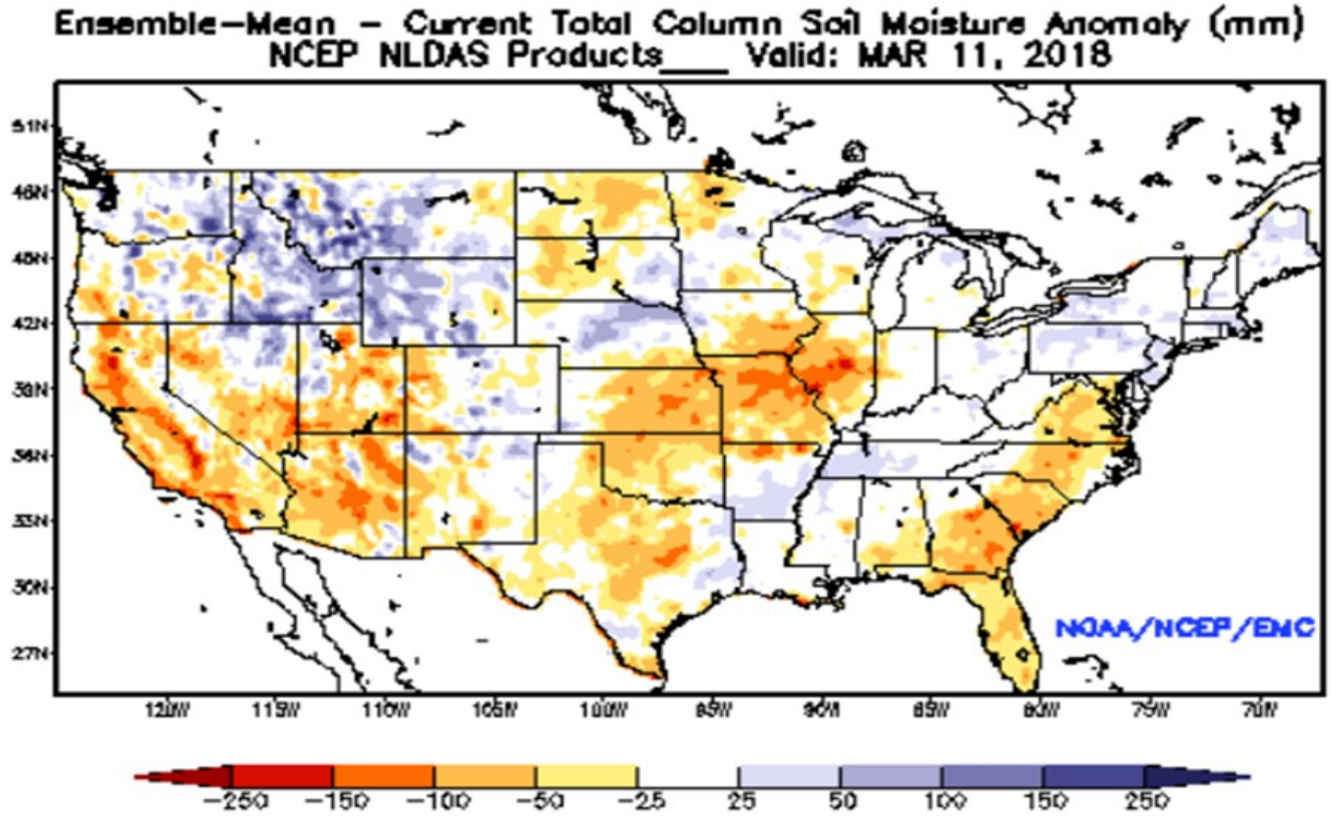


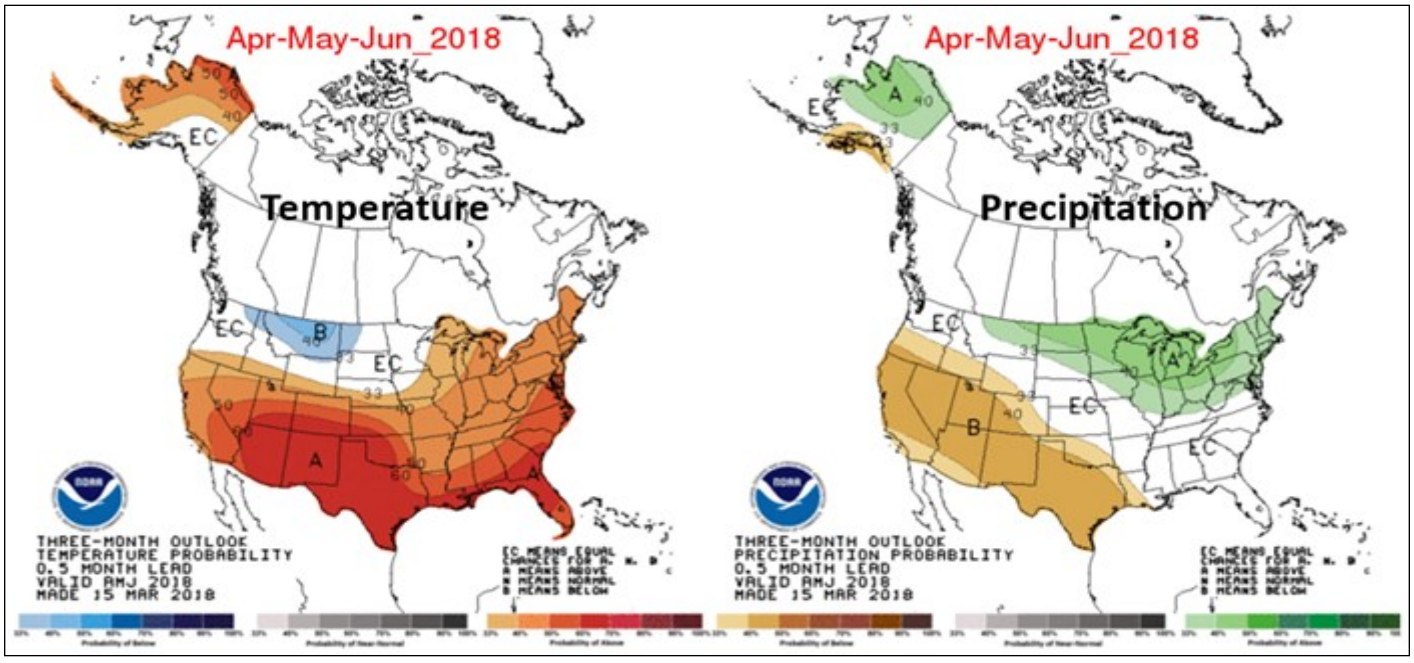
La Niñas typically cause a pattern of below normal rainfall across Texas in the fall, winter and spring seasons. The latest observations indicate La Niña peaked in intensity during January and is now slowly weakening. But most computer-forecast solutions call for the La Nina to hang on through a good part of spring, but fade away by the start of summer.

Taking into account the forecast for at least a weak La Nina persisting through spring, Climate Prediction Center forecasters are indicating there are increased odds for precipitation to average below normal and highly increased odds for temperatures to average above normal this spring across all of Texas.

Spring Weather Outlook - La Nina Fades

The lack of rain this winter has caused soil moisture levels to be well below normal heading into spring. The only areas of the state with surplus soil moisture appear to be across parts of East, Southeast and Southwest Texas:





Spring Weather Outlook - La Nina Fades

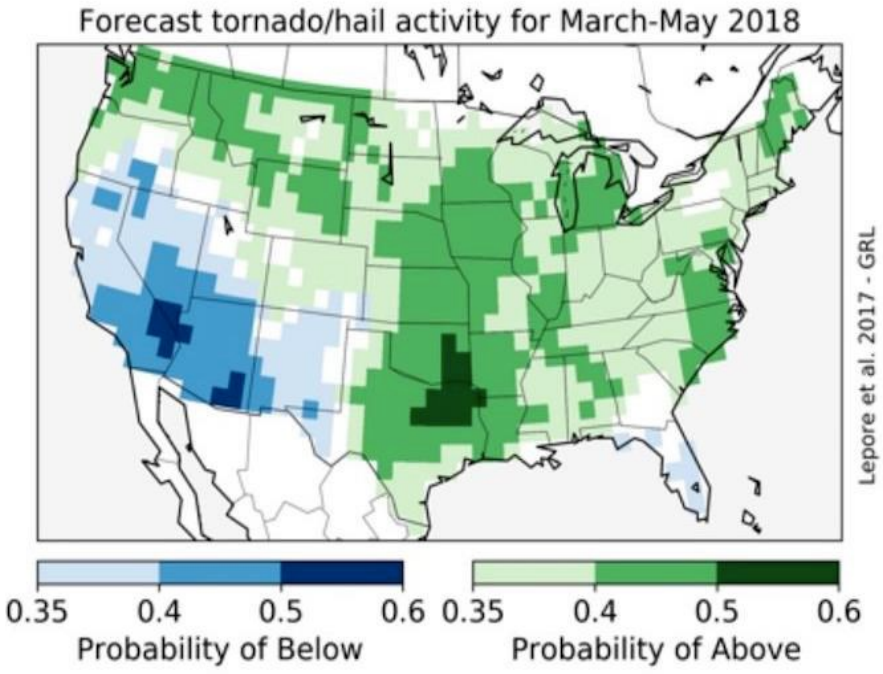
Because of La Niña, the general storm track is forecast to remain to the north of Texas for much of spring, meaning a good part of the state will miss out on several opportunities for rain. While plenty of moisture and instability will often be in place, the lack of storm systems, or triggers, is expected to limit the frequency of widespread and soaking rains. Of course, smaller-scale rain events will still occur from time to time, but rain amounts are not expected to be all that heavy. The forecast is not for zero rainfall, but more for totals that are less than what would be considered normal.

In regards to temperatures, warmer than normal readings are expected through spring as cold fronts become less frequent. The western half of the state will likely see several periods of hot temperatures when the dry line brings very warm air east out of Mexico. And finally, sea surface temperatures in the Gulf of Mexico are currently much warmer than normal. Southerly breezes off the Gulf of Mexico are expected to bring some of this warmth inland, contributing to the outlook for warmer than normal temperatures.

With so many factors pointing toward warmth, I wouldn't be surprised to see some summer-like temperatures showing up in May.

An Enhanced Severe Weather Threat this Spring

Despite the forecast for below normal rainfall, much of Texas could still see a very active severe weather season this spring. A forecast group based at Columbia University has issued an outlook for the period March through May, calling for enhanced odds for tornadoes and hail across much of the nation, especially over the Southern Plains. The outlook is based on research showing that the state of the El Niño/Southern Oscillation (ENSO) during winter provides some skill in predicting large-scale severe weather patterns across the U.S. the following spring. Similar to previous research, the Columbia group has shown that severe weather is more likely over large parts of the nation in the months following a winter La Niña, compared to an El Niño or ENSO neutral winter. The forecast group stresses this outlook is a broad, seasonal outlook and does not pinpoint exactly when, where and how many tornadoes and hails storms will actually occur. Stay weather aware this spring. Don't let the forecast for below normal rainfall and warmer than normal temperatures lure you into thinking this is going to be a quiet spring.



Probabilistic outlook for severe weather across the United States, for the period March through May 2018.: *The 2018 outlook is based on weak to near-moderate La Niña conditions prevailing December 2017 through February 2018. Values in green show where the odds of severe weather (tornadoes and hail) are forecast to be above normal. Northeast Texas and southeast Oklahoma have a greater-than -50% chance of above-normal activity. Image courtesy Chiara Lepore, Columbia University, based on techniques described in Lepore et al., Geophysical Research Letters 2017.*

Wichita Falls Regional Weather Summary

Drought Intensifies Through the Winter

By Charles Kuster

CIMMS/NSSL

The winter was quite dry across much of the Wichita Falls region this year. Precipitation totals were generally 2-4 inches below normal with the greatest deficits occurring across Hardeman, Foard, and Knox County. Many locations in these three counties saw only about 25 percent of their normal precipitation for December through February (Fig. 1). January was an especially dry month. Wichita Falls only received 0.01" of precipitation, which is 1.13" below normal (about 1 percent of normal). This lack of precipitation extended across the whole region as there were 30 dry days (all CoCoRaHS stations reported less than 0.05") and only 1 wet day (at least one CoCoRaHS station reported 0.05" or more) in January. In total, there were 79 dry days and only 11 wet days this winter. With this lack of precipitation, it is not surprising that drought increased in intensity and coverage since early December. The entire region is now under some level of drought according to the U.S. Drought Monitor (Fig. 2; http://droughtmonitor.unl.edu/) and many areas are now under severe or extreme drought (D2–D3).

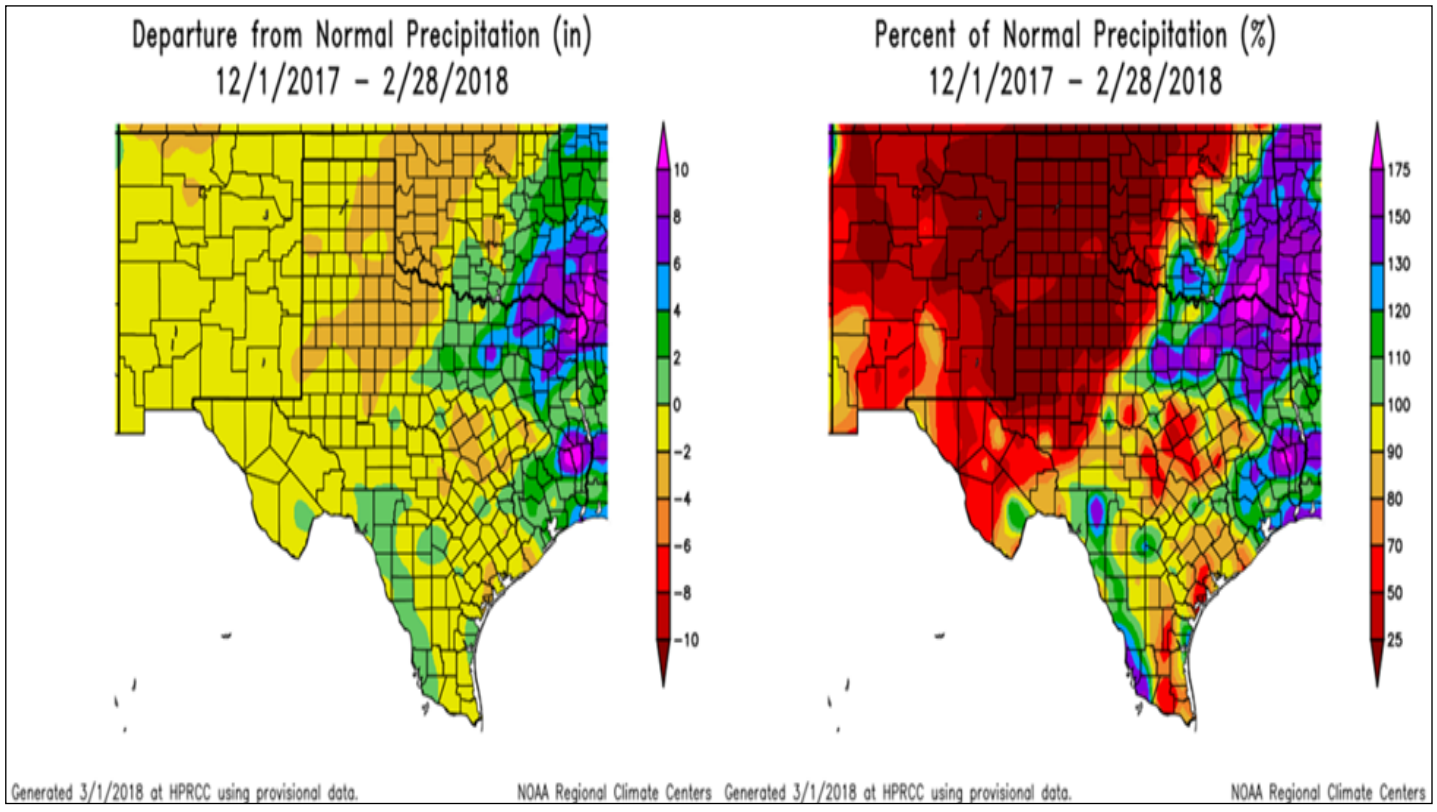


Figure 1: Departure from normal precipitation (left) and percent of normal precipitation (right) for December 2017 through February 2018. Warm colors indicate below normal precipitation and cool colors indicate above normal precipitation.

Wichita Falls Regional Winter Climate Summary

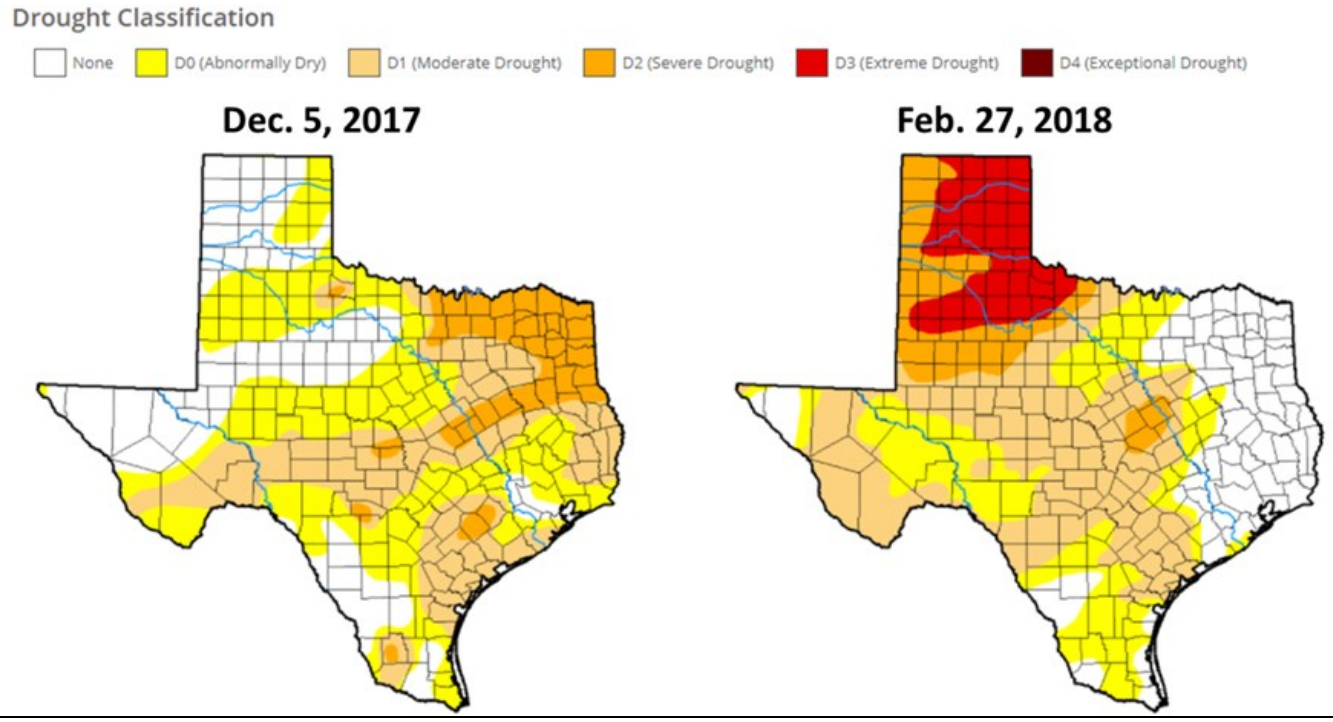


Figure 2: Change in the U.S. Drought Monitor for Texas from December 5, 2017 (left) to February 27, 2018 (right).

There was some drought relief during the last week of February especially in Wichita and Archer County where many locations received at least 2.00" of precipitation (Fig. 3). Unfortunately many locations in the driest counties (Hardeman, Foard, and Knox) typically saw less than 1 inch of precipitation during this time. The most significant precipitation occurred on February 20–21 when a combination of rain, freezing rain, and sleet fell especially over the eastern half of the region. Several CoCoRaHS stations in Wichita and Archer County saw two-day precipitation totals of 1.0-1.5 inches and at least a glazing of ice accumulation.

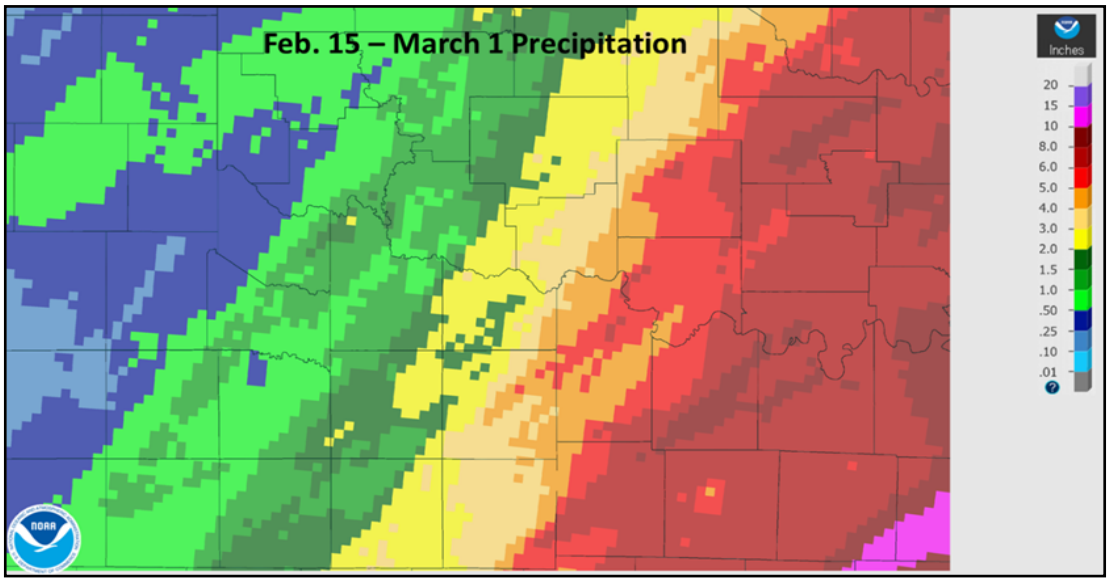


Figure 3: Radar estimated rainfall totals for February 15–March 1, 2018.

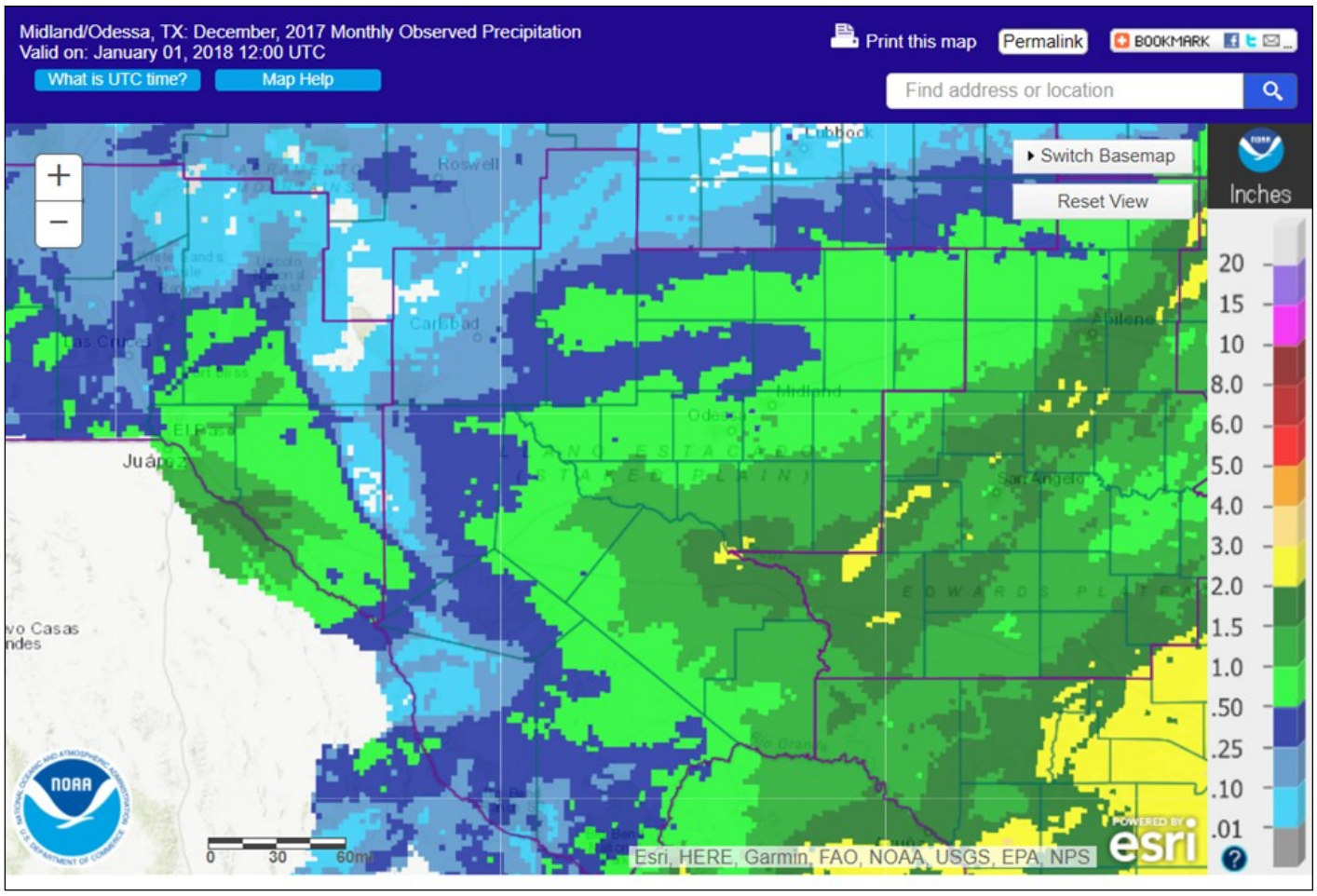
West Texas / SE New Mexico Regional Winter Climate Summary

By James DeBerry
NWS Midland

Winter Climate Summary for West Texas and SE New Mexico

Drought developed into West Texas and Southeast New Mexico during the winter.

December was warm and dry, a sign that La Nina had arrived. No significant hydrologic events were reported or occurred, except for a storm system early in the month that brought a little snow, mainly confined to the higher elevations of the area. Monthly radar rainfall estimates ranged from little to no precipitation over the Diablo Plateau to up to 3" over isolated areas of the Stockton Plateau and southeast Permian Basin. Highest observed rainfall was around 1.75". Average reported rainfall was 0.55". No flooding was reported.



January was a very dry month for West Texas and Southeast New Mexico, as La Nina further settled into the Western Hemisphere. It goes almost without saying that no hydrologic events were reported. This was the driest calendar month since January 2014. Monthly radar rainfall estimates ranged from little to no precipitation along the Rio Grande to up to 1.00" over the upper Colorado River Valley. Highest observed rainfall was 0.50". Average reported rainfall was 0.04".

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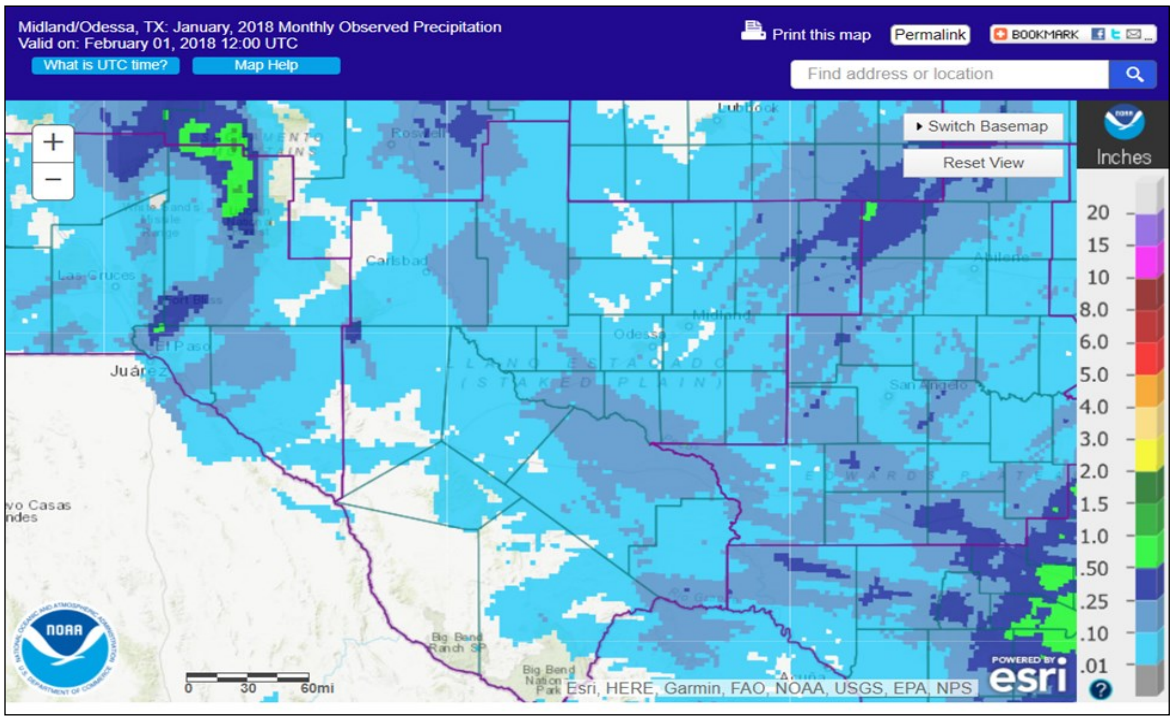
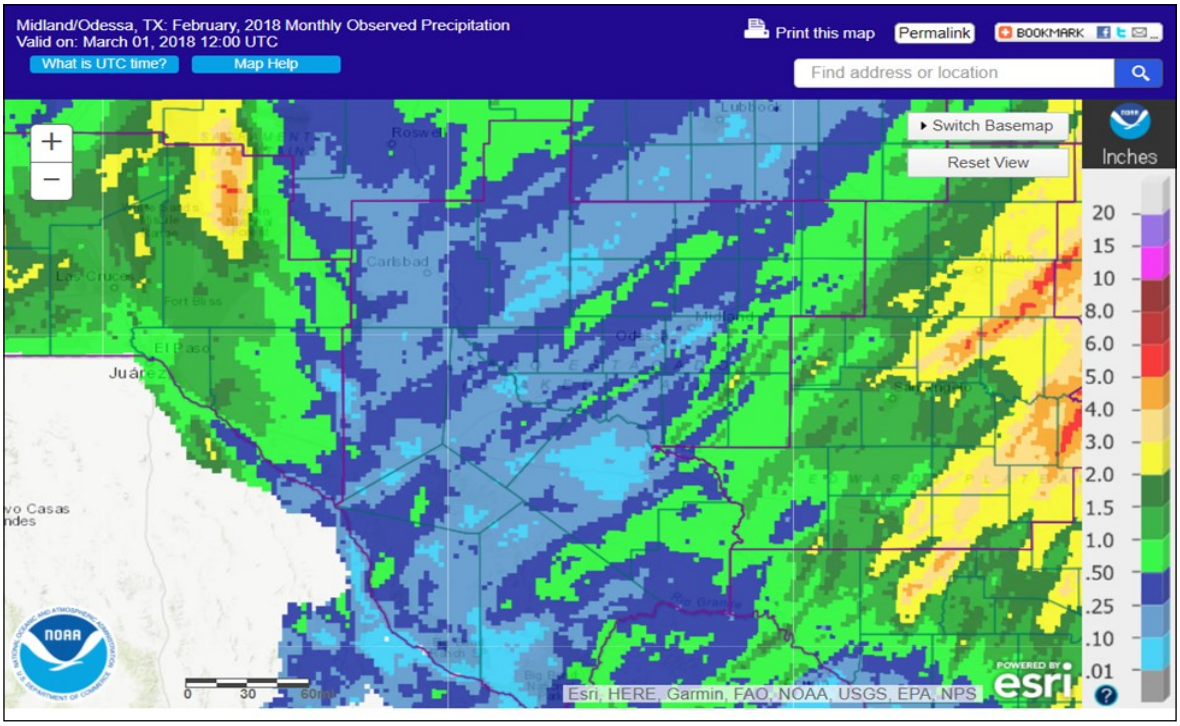
West Texas / SE New Mexico Regional Fall Climate Summary



The drought continued in February, with very little rainfall and no hydrologic events reported. Monthly radar rainfall estimates ranged from little to no precipitation in the west to up to an isolated 3" over the southeast Permian Basin. Highest observed rainfall was just over 0.50". Average reported rainfall was 0.14".

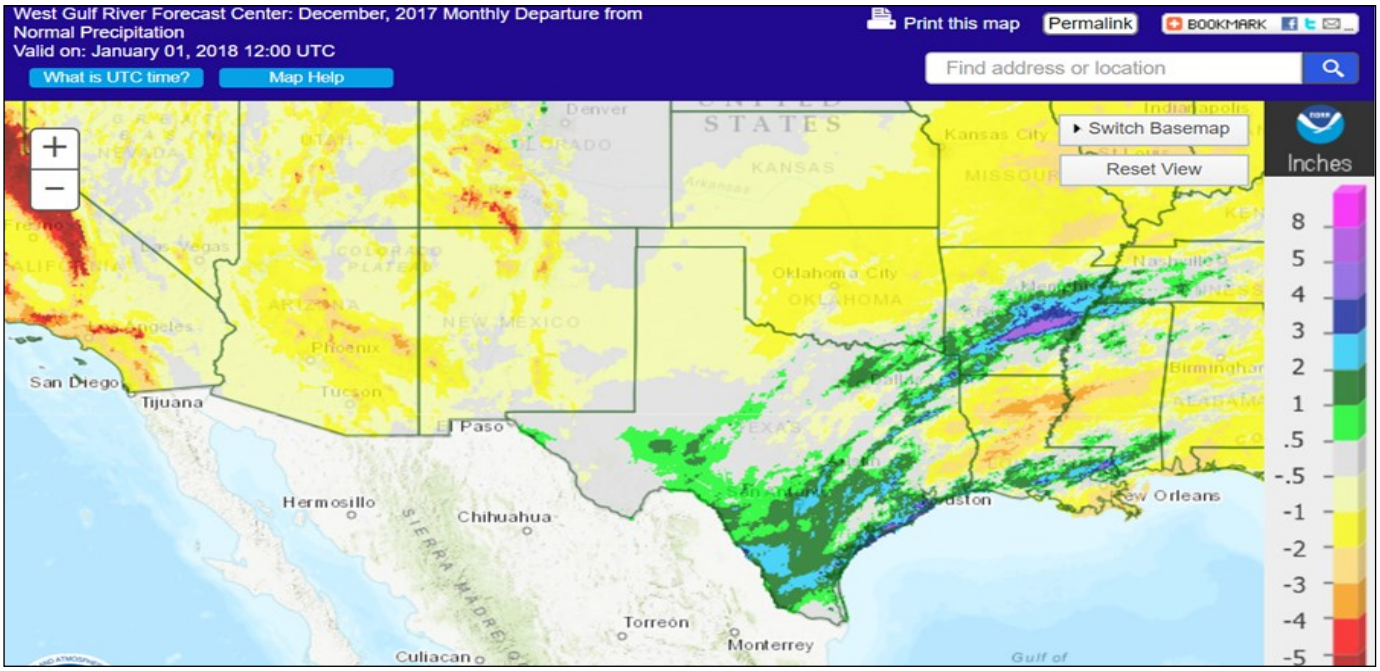


Due to meager rainfall this winter, as of March 8th, severe drought now covers most of northern Lea County, with moderate drought over the rest of Southeast New Mexico. In West Texas, most of the Western Low Rolling Plains and upper Colorado River Valley is now in severe drought. The Trans Pecos is abnormally dry, and the rest of West Texas is in moderate drought.

North Texas Regional Climate Summary

By Greg Story
National Weather Service - Fort Worth

Hello all. I'm Greg Story, the North Texas Regional Coordinator for CoCoRaHS. We really have been on a rainfall roller coaster in north Texas the past several months. Just to review, our region had one of the driest springs of record, and then we ended up with one of the wettest summers of record. Then we took a downturn this fall. September ended as the driest month of 2017 and was the 13th driest September on record. The DFW airport had 30 consecutive days without measurable rain. October and November were dry as well, and the autumn season ended with the lowest total precipitation in five years with 3.40" at DFW airport, and that ranked number 13 among the driest on record.

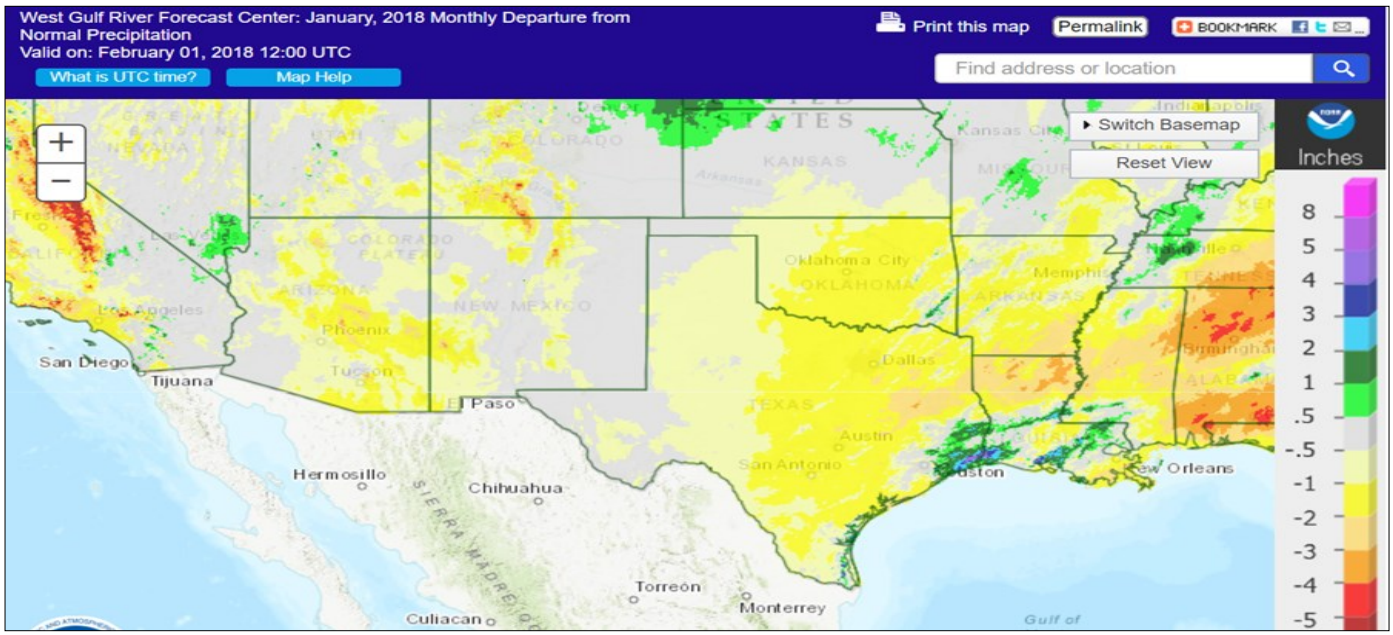


Departure from normal rainfall for December 2017.

We had a mixed bag in the rainfall department for December. One of the driest parts of Texas had been northeast Texas, but at least some of this region received above normal precipitation. Meanwhile, the western parts of north Texas experienced quite dry conditions. In north central Texas we saw above normal precipitation in December with 4.56 inches of precipitation. This was the 12th wettest December on record and the wettest since 1997. Normally in December the region gets 2.55 inches, so this month was 2.01" above normal. Numerous showers and thunderstorms erupted in North Texas December 19. A record 2.95" of rain occurred at DFW Airport, exceeding the previous record of 1.56" in 1911. This was the highest daily total since 3.84" fell last June 24. Higher totals were spotted in Sachse (4.58") and Murphy (4.52") in Collin County and in Garland (4.13") in Dallas County. Richardson received 3.80". The DFW area had almost as much rain in mid-December as we had seen the previous 3½ months combined.

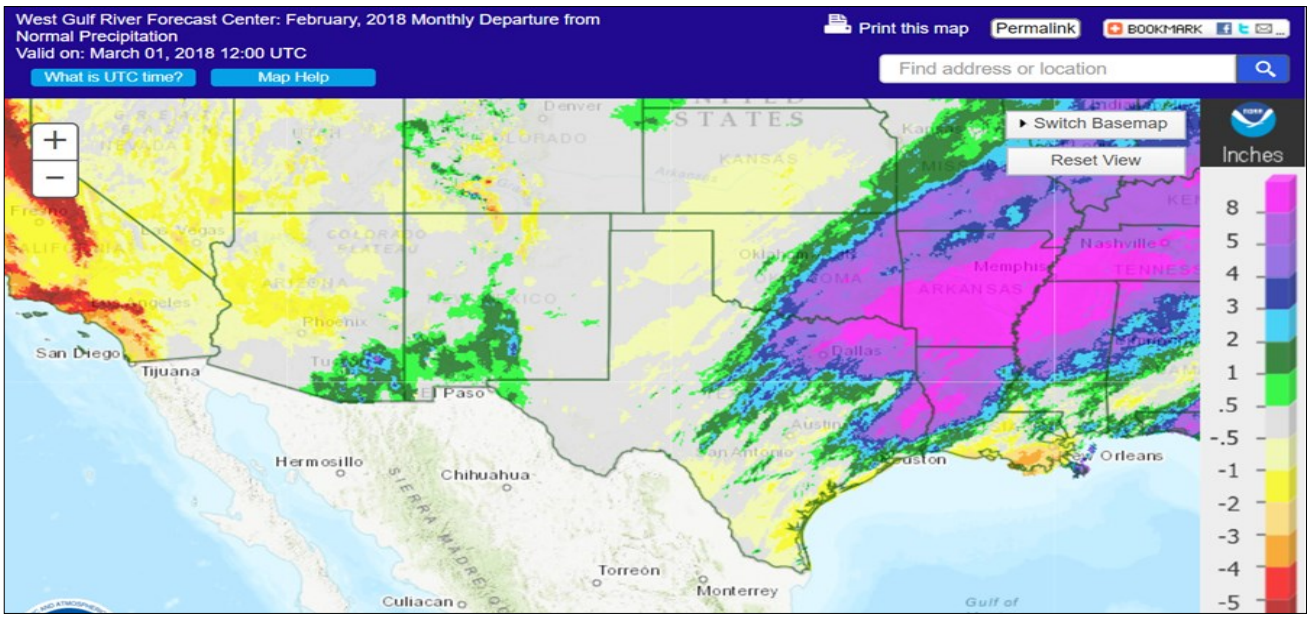
For 2017, the DFW airport received 36.62". The normal amount is 36.14" so officially the precipitation for the year ended up being above normal by +0.48". Continued on page 10 —->

North Texas Regional Climate Summary



January 2018 departure from normal rainfall. The brown, orange and red colors indicate below normal precipitation.

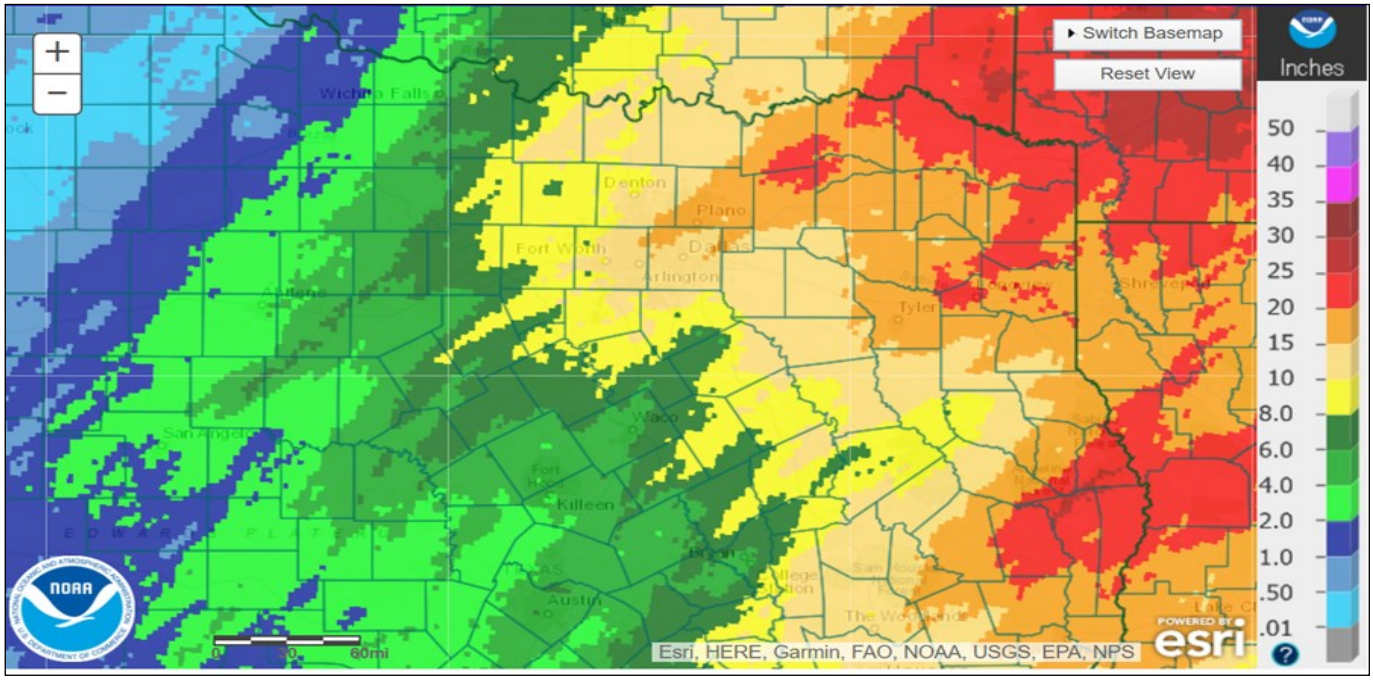
In north Texas, after December had above normal precipitation, January was dry. In January the DFW airport received 0.85 of an inch of precipitation. Normally in January, DFW gets 2.05", so this month was 1.20" below normal. As an interesting side note, the Austin Bergstrom International Airport has had more snow this winter with 1.3" than DFW Airport has recorded. San Antonio has had more snow than DFW's trace as well. On January 11 and 12, while east central and southeast Texas had good rainfall amounts, the DFW Airport observed nothing measurable but did get a trace of snow. Light snow also fell in Denton and at Fort Worth Alliance Airport. On January 16 and 17 an arctic front moved through north Texas. One-to-two-inch snows fell in Canton and Ben Wheeler in Van Zandt County while sleet and freezing rain occurred further south. Also, Tyler got 1-2 inches of snow which fell on top of a thin coat of ice in east Texas.



February 2018 departure from normal rainfall. The brown, orange and red colors indicate below normal precipitation.

North Texas Regional Climate Summary

After starting off dry in February, most of north Texas got drenched. At DFW airport, the monthly rain total was 11.31", making it the wettest February on record. The record was broken by nearly 4.00". The normal February rainfall is 2.66", so they were 8.65" above normal. On February 10 – 11 heavy rainfall fell over southeast Texas, but in north Texas there was a mix of wintry precipitation which caused some travel concerns. Thundersleet was observed by residents in Alvarado, Glen Rose, Hillsboro, Stephenville and Waco. Light snow and snow flurries were also reported in Alvarado and at the Cleburne Municipal Airport. DFW Airport officially received a trace of ice pellets. A strong cold front also made its way into the state on the 21st and early on the 22nd which enhanced rainfall rates from the DFW area into east central and northeast Texas. Prior to the cold front, it started out warm on the 20th with thunderstorms occurring. There were EF-0 tornadoes in Joshua in Johnson County and another in DeSoto in southern Dallas County. As the front plowed through Wichita Falls, the temperature plummeted from 71 degrees at 11 a.m. to 35 at noon. A winter weather advisory and an ice storm warning was issued for the northwest portions of north Texas on the 21st. Trees and power lines were coated with ice in Gainesville, and it was icy in Bowie. There were also reports of sleet-covered roads in Jacksboro. Ice accumulated on trees as close to the Metroplex as Springtown. Here are some of the highest rainfall totals from February 17-24: Honey Grove (Fannin County) had 10.89", White Rock Creek (Dallas Co) received 10.23", Paris - Cox Field (Lamar Co) got 10.03", Cooper (Delta Co) had 9.23" and Greenville (Hunt Co) received 9.14". The DFW Airport totaled 6.27", and Richardson had 4.91". To end the month, the rain on February 28 of 4.72 " was a daily record for the date and was the highest one-day rain total since last June 14. DFW airport ended the month receiving a record 4.32" in the last six hours before midnight on the 28th.



Winter precipitation 2017 - 2018.

Continued on page 12 —->

North Texas Regional Climate Summary

Adding up the totals for this winter (December through February), north central and northeast Texas ended up being very wet. The DFW airport tied for the wettest winter on record with 16.72" (last set in 1931-32). Normal winter precipitation is 7.34" so DFW was 9.38" above normal.

So in conclusion, I want each of you to know how valuable your rainfall readings are to us at the National Weather Service. I can assure you that your rainfall readings have become increasingly important to our daily operations.

Additionally, I want to encourage all of you to consider making significant weather reports when possible. These reports can be either for hail or heavy rainfall (snowfall). These reports are entered using the links under "Enter New Reports" after you log into your CoCoRaHS account, specifically the link which says "Significant Weather". After entering your station number, you will fill out the significant weather report form. You enter the date and time of the observation, the time duration of the rain (or snow) event, and the amount which occurred during that duration. Specifically, *rainfall amounts in real time that are entered here are a great help to us at the NWS* (i.e. it has rained 1.20 inches in the past hour ending at 7 PM CDT). In fact, when these reports arrive, they "alarm" on our operations work stations so that we are sure to see them. An example of what these reports look like to us at the NWS is shown below (this report was during Hurricane Harvey):

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NZUS45 KBOU 280509
CCRAHS

intense rain report from CoCoRAHS spotter:

08/28/2017 12:00 AM local time
County: Brazos TX
College Station 1.6 S (number TX-BZS-92)
Latitude: 30.577365
Longitude: -96.31456
15.33 inches so far, with 0.28 inches in the past 60 mins
Flooding: Unusual
Comments: Hurricane Harvey rainfall from 2300-2359 on 8/27

Received NWS Boulder Sun Aug 27 23:09:31 2017 MDT
Sent to WFOs: HGX,FWD,FWR

All of today's CoCoRAHS observations are in WRKCCR (Boulder and Pueblo only)
Or at http://www.cocorahs.org (click on reports)
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Just remember that this report does not replace your 24 hour report that you make each morning. It supplements it. Just as a reminder, the rainfall in a significant weather report is to be included the following morning with any other rainfall you receive over the entire 24 hour period.

Thank YOU so much for your efforts. Have a great spring season!

Brazos Valley Regional Climate Summary

Winter 2017-2018 Precipitation Summary

Bryan-College Station/Brazos Valley Region, Texas

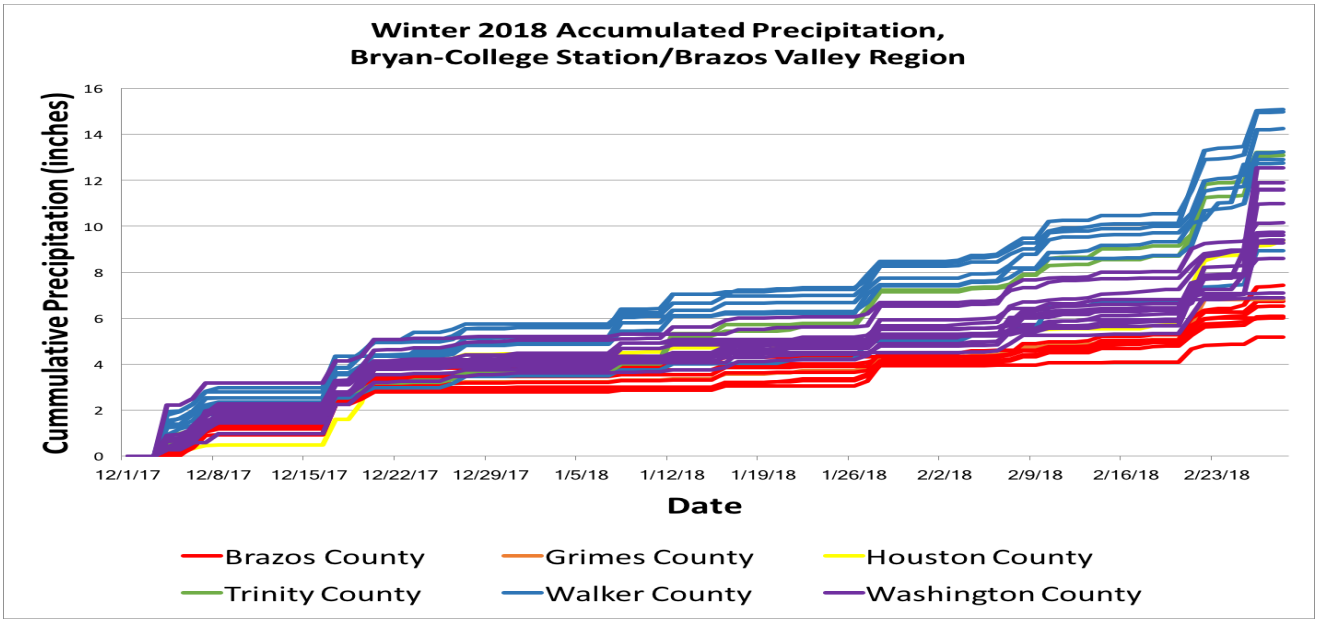
Jeramy Dedrick, Graduate Assistant for the Office of the State Climatologist
Brooke Barker, Graduate Assistant for the Office of the State Climatologist
John Nielsen-Gammon, Texas A&M University, Texas State Climatologist, Regional CoCoRaHS Coordinator

Summary:

This winter saw a mixed bag of precipitation events throughout the Bryan-College Station/Brazos Valley Region. A dry start of the season in December transitioned to wintry precipitation events in southeast Texas that allowed for snow, freezing rain, and ice to accumulate in amounts that hadn't been seen in years. These events in early December gave us a large portion of the measurable precipitation amounts before more rain fell later in the month. A relatively dry period ensued beginning in late December and continued for the majority of January. February saw some measurable precipitation throughout the month before events in the final days increased cumulative amounts to about 8 inches with most counties finishing the season around this total or greater.

Observer Statistics:

There were 48 active CoCoRaHS observers during the winter period, an increase of 4 more active observers from the fall! 5 observers during the season reported for the full 90 days, while over 27 observers reported for at least 80% of the period, providing 32 active observers with reliable measurements across 6 counties.



Accumulated Precipitation:

The accumulated precipitation graph shows that the period extending from mid-December to the end of January was the driest period, while the month of February was the wettest during the season. Brazos County generally observed the least amount of total precipitation during the season as they received nearly 4.00" less than the other counties.

Season Statistics:

Wettest Day: 3.76", February 26 (Washington County)
Wettest seasonal total: 15.09", (Walker County)
Longest spell of days without measurable rain: 8 (Brazos, Grimes, Houston, Trinity, Walker, Washington Counties)
Longest spell of days with measurable rain: 16 (Walker County)

Houston/ Galveston Regional Climate Summary

By Ron Havran
Houston/ Galveston Regional Coordinator

December 2017

The first month of the winter season started warm for the first week. Western and Northwestern counties received 2-4 inches of rainfall during this time. Coastal areas of Galveston county received up to 4.00" of rain. Cold weather followed suit which allowed for a bit of wintry precipitation. Snow fell across the region on December 7th and 8th with widespread accumulations of 1-3 inches. The middle of the month had slightly below normal temperatures with mostly dry conditions. These dry conditions worsened drought conditions across parts of the region. Rainfall returned from the 16th to the 19th with 1-3 inches across the region helping reduce drought conditions. Cold weather with near freezing temperatures and light rain ended the month. Temperatures for the month averaged slightly below normal to near normal across the region. Precipitation was above normal across western and southern parts of the region while the northeastern parts of the region had much below normal rainfall (Fig.2). The yearly rainfall set records at many locations across SE Texas (Fig.3). The city of Houston set a record with 79.69" topping the previous record of 72.86" in 1900.

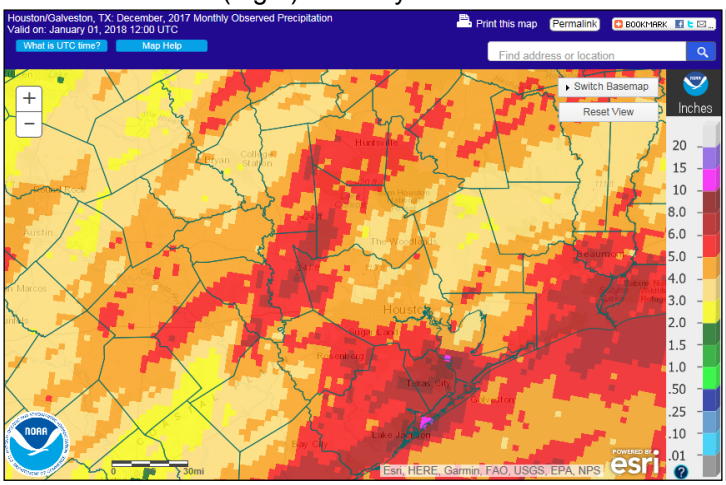


Fig. 1: December 2017 observed precipitation.

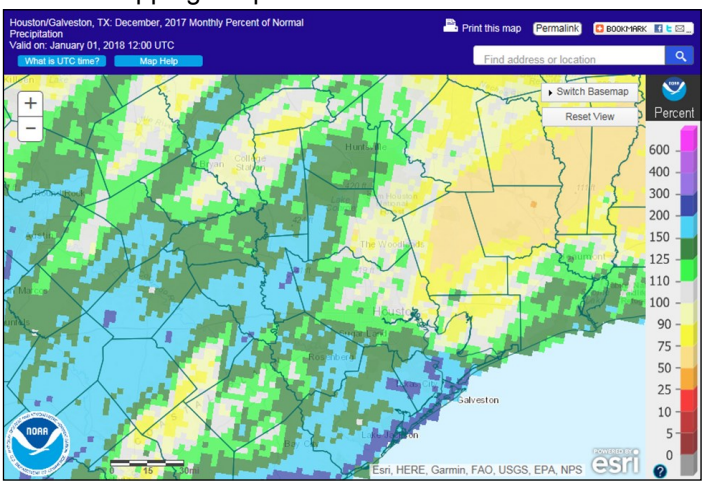


Fig. 2: December 2017 departure from normal rainfall. The brown and yellow colors indicate below normal precipitation while blue and green are above normal precipitation.

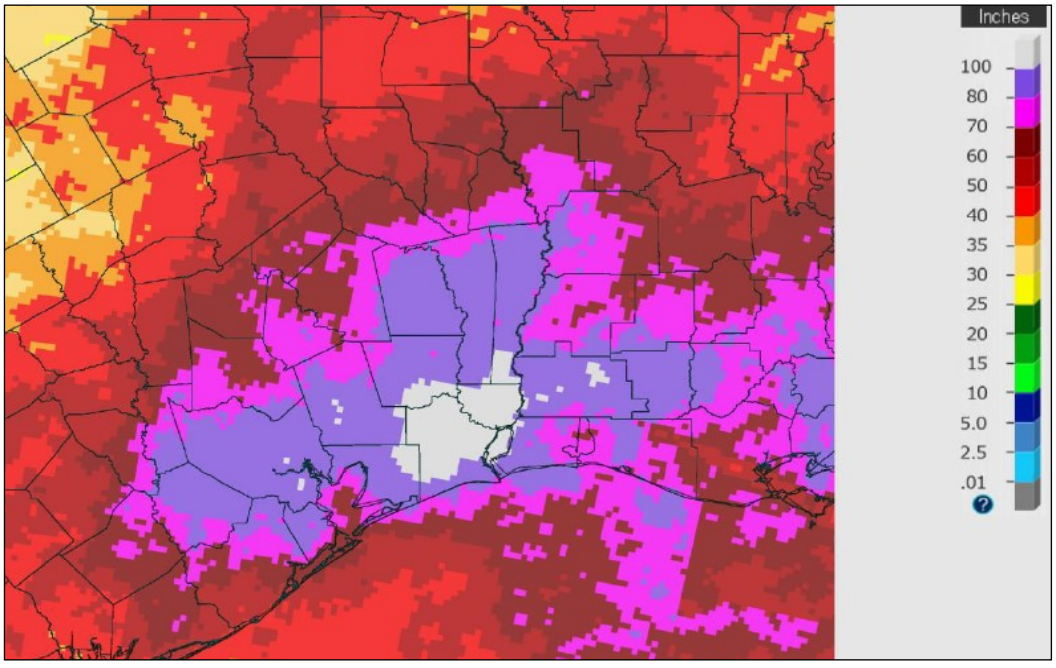


Fig. 3: Total 2017 observed precipitation across SE Texas. Many locations received over 70 inches of rainfall.

Houston/ Galveston Regional Climate Summary

January 2018

January brought below normal temperatures, resulting in a 3-5 degree departure from normal across most of the region. Average high temperatures struggled to reach into the 60s, while average low temperatures remained in the 30s across most of the region besides along the coast which made it into the low 40s. Overall, the month of January was rather dry, with roughly five days producing a majority of the monthly precipitation. Little precipitation left a deficit of 1 to 3 inches for monthly rainfall across the region, except for some eastern parts of the region (Fig. 5). A strong cold front in the middle of the month allowed low temperatures to reach their coldest point, the upper teens to low twenties. Coldest temperatures were from the 16th -18th with the morning of the 17th the coldest. These temperatures were the lowest readings since February of 1996 and the only time colder temperatures were recorded in this region was in December of 1989. It was the 14th coldest January on record for the City of Houston and the 11th coldest at Houston Hobby. Additionally, high temperatures did not break into the 70s for 28 consecutive days (Fig. 6). Strong wet cold fronts pushed through the region setting daily snowfall records due to wintry precipitation. Hail, ice pellets (sleet), light snow flurries and freezing rain were all experienced this month.

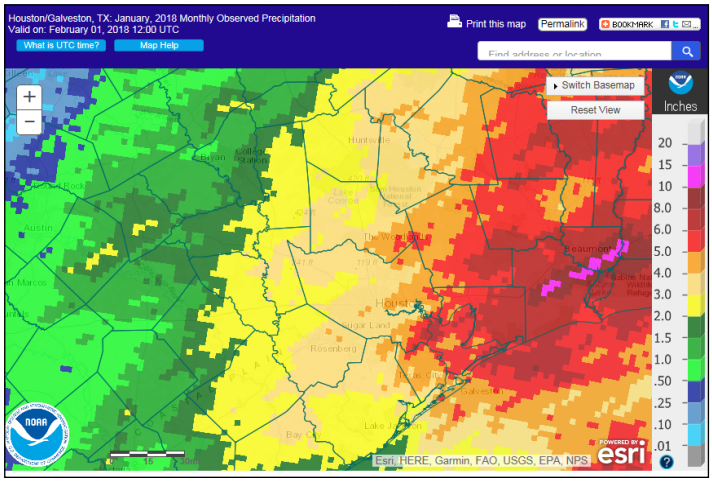


Fig. 4: January 2018 observed precipitation.

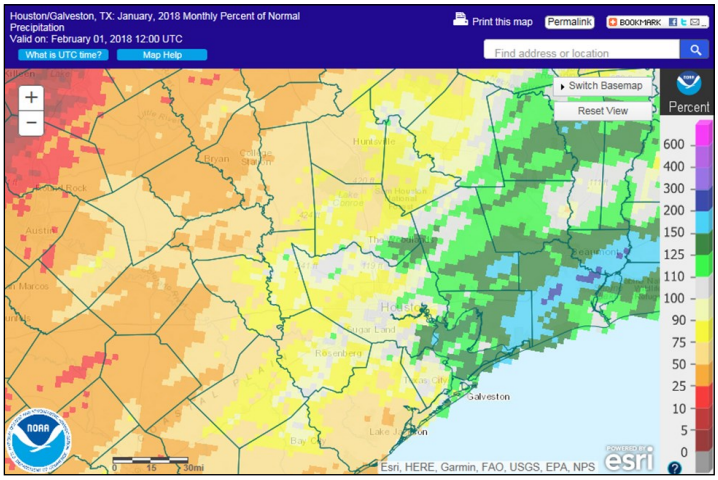


Fig. 5: January 2018 departure from normal rainfall. The brown and yellow colors indicate below normal precipitation while blue and green are above normal precipitation.

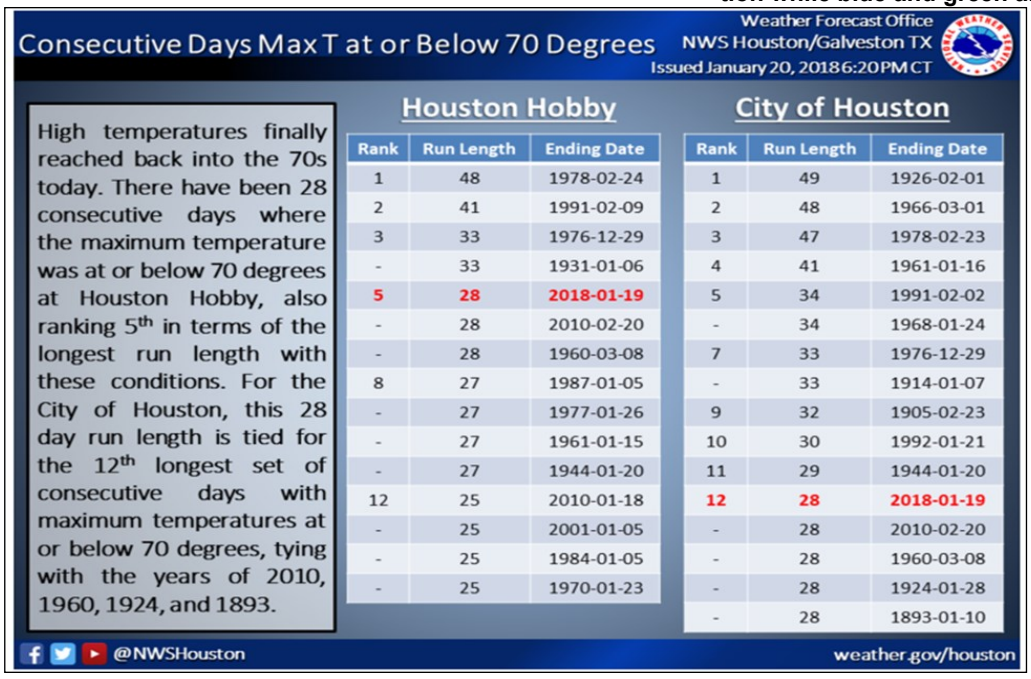


Fig. 6: NWS twitter image

Continued on page 16 —>

Houston/ Galveston Regional Climate Summary

February 2018

The month of February was rather wet, with most of the forecast area seeing anywhere from a half inch to 6.00" above normal. Rainfall totals were closer to normal and even below normal along the coast and also in the western zones from Matagorda and Jackson counties (Fig. 8). This yielded in drought conditions across these regions throughout the month. Temperatures flip-flopped from below normal in January to much above normal in February. The daily average temperature was well above normal by five to ten degrees across most of the region. Most of the rainfall was produced due to various frontal boundaries. Particularly, on February 10th, the combination of both an approaching cold front and a coastal trough resulted in rainfall amounts between 0.25 to 2.25 inches across the region. Similarly on February 21st, an approaching cold front and area of low pressure helped to produce showers and thunderstorms which brought 0.50 to 1.50 inches of rainfall, with values along the higher end of this range closer to the City of Houston. The lack of sunshine this month was the big story. Since at least 1973, no February has been cloudier in Houston. Of all hourly observations last month, 81% had cloud cover reported. The next closest February was 1989, when 65% of the month had cloud cover. February 2016 was the least cloudy February since at least 1973. See images bottom of page and next page (Figure 9 and 10).

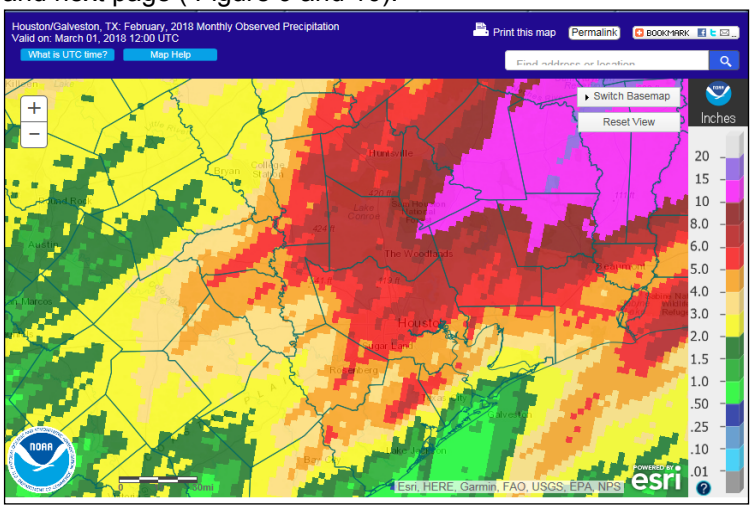


Fig. 7: February 2018 observed precipitation.

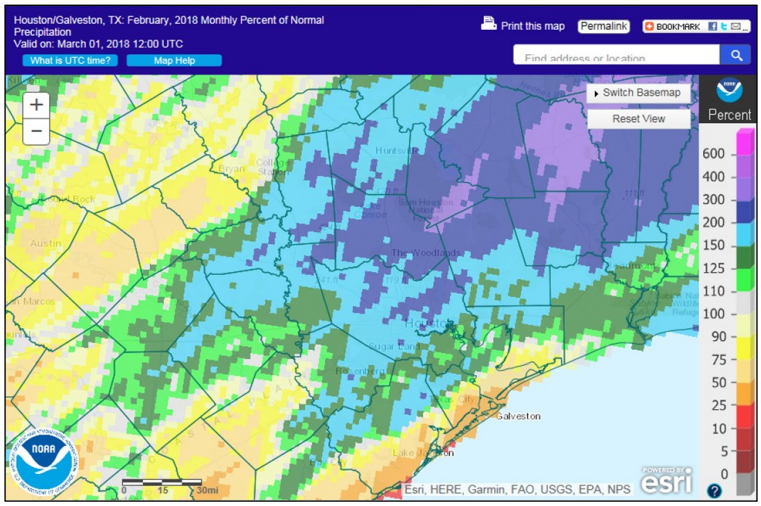
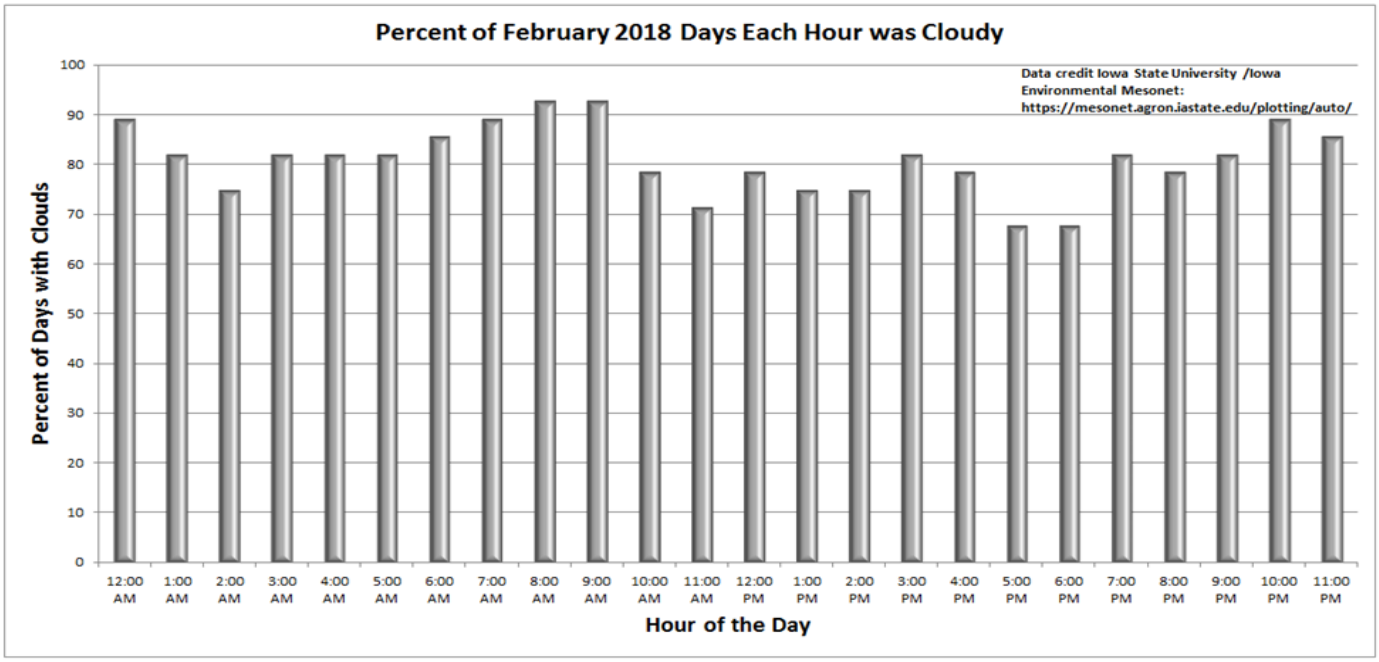


Fig. 8: February 2018 departure from normal rainfall. The brown and yellow colors indicate below normal precipitation while blue and green are above normal precipitation.

Fig. 9: Percent of cloudy days by hour for the Houston area.



Houston/ Galveston Regional Climate Summary

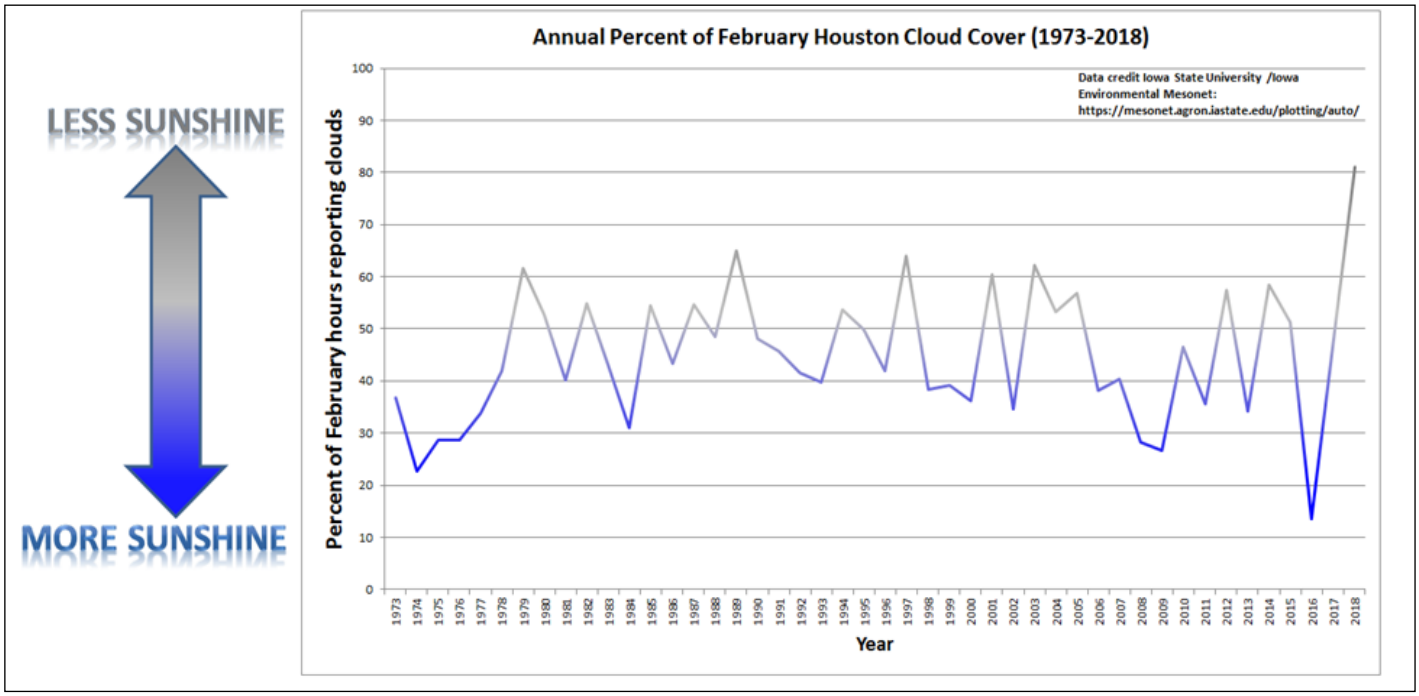


Fig. 10: Annual percent of cloudy days in Houston area since 1973.

Winter 2017-2018 CoCoRaHS Houston/Galveston Region Rainfall

County Rainfall Average and County Station Rainfall Maximum Total in inches per month

County	December		January		February		Winter Total
	AVG.	MAX.	AVG.	MAX.	AVG.	MAX.	3-Month Rain Total
Austin	5.03	6.82	1.90	2.35	4.48	5.93	11.41
Brazoria	4.57	5.25	2.59	2.90	3.83	6.27	10.99
Chambers	N/A	3.22	N/A	4.24	N/A	5.19	N/A
Colorado	4.21	5.32	1.38	1.95	3.04	4.35	8.63
Fort Bend	4.18	5.89	2.61	3.68	6.61	4.71	13.40
Galveston	7.02	9.20	4.93	7.95	3.72	6.15	15.67
Harris	4.34	5.73	3.59	6.13	5.22	8.00	13.15
Jackson	N/A	3.18	N/A	1.99	N/A	1.49	N/A
Liberty	3.43	3.64	4.32	4.99	6.98	8.97	14.73
Matagorda	N/A	3.99	N/A	1.83	N/A	3.30	N/A
Montgomery	4.44	6.01	2.84	3.76	6.71	8.53	13.99
Polk	4.28	5.01	3.41	3.83	7.69	9.30	15.38
San Jacinto	4.09	4.73	3.31	3.97	7.14	7.33	14.54
Waller	N/A	7.64	N/A	2.08	N/A	4.27	N/A
Wharton	3.33	4.21	1.69	1.93	2.74	3.10	7.76
Region Totals	4.45	9.20	2.96	7.95	5.29	9.30	12.70

Fig. 11: CoCoRaHS observer Winter 2017-18 rainfall across the Houston/ Galveston Region.

East Texas Regional Climate Summary

By: Davyon Hill (Meteorologist-NWS Shreveport)

It was a very eventful 2017-2018 winter across East Texas. Most of the region entered the month of December in a Severe Drought, and generally speaking the month was quiet.

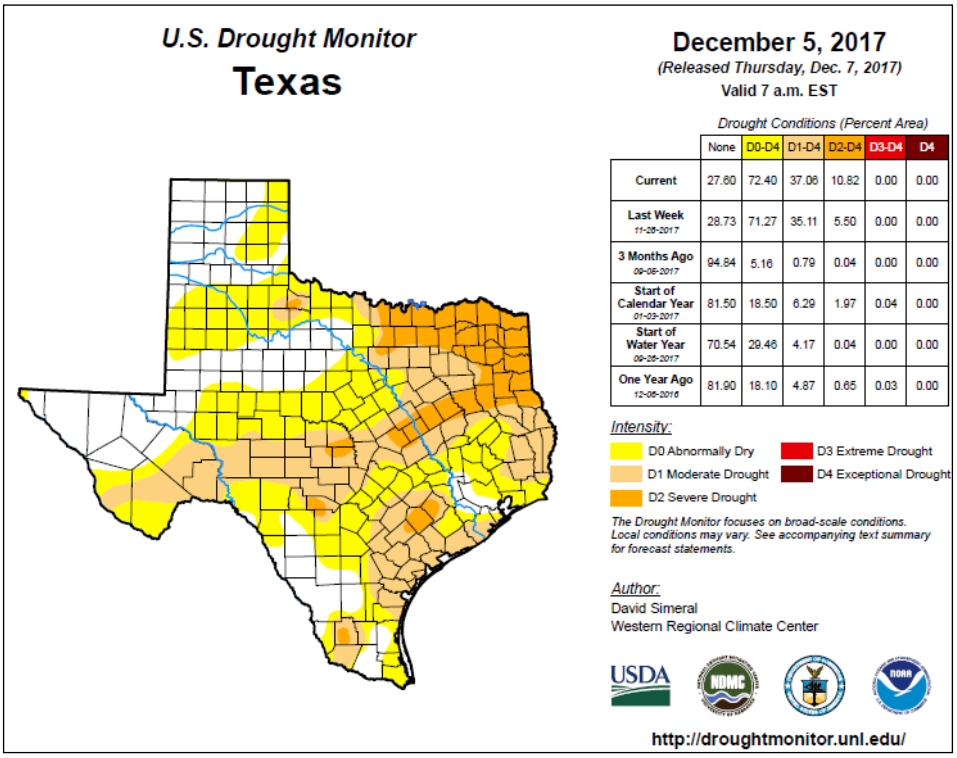


Fig. 1: Texas Drought monitor map for December 5th 2017

However a couple of events really stood out. On the evening of December 7, a rare winter storm moved across portions of southeast Texas. The northern edge of the snowfall extended into portions of Deep East Texas. Snowfall amounts ranged from 0.5 to 2 inches. The CoCoRaHS observer at TX-SA-1 (Broaddus 15.3 SE) reported 0.9" and the observer at TX-AG-2 (Zavalla) reported 0.5". Also, on the 19th a heavy rainfall resulted in 24 hour record precipitation at the following National Weather Service-Shreveport East Texas climate stations: Texarkana 1.73", Tyler 2.96", and Longview 2.48". There was also record precipitation on the 22nd at Texarkana of 2.73"

By the start of January 2018, drought conditions improved from Severe to Moderate as 2-3 inches of rainfall fell across the region during the month. However, this amount of rain was still about 2 inches below normal. The highlight of the month was snowfall on the 16th. Several locations recorded snowfall amounts over an inch. The highest amounts were measured across portions of northeast Texas where the observer at TX-BWE-6 near Texarkana measured 3.00" and the observer at TX-MRN-5 near Avinger measured 2.80"

East Texas Regional Climate Summary

Fig. 2: (Ian Looper, Scottsville, TX)-January 16, 2018 frozen precipitation.

February 2018 was an extremely wet month. Many locations received monthly rainfall totals over 10 inches, which is twice the average for the region. Just like the snow in January, the highest monthly totals were observed across northeast Texas where the observer at TX-CSS-8 (near Douglassville) received 17.38" and the observer at TX-BWE-5 (near Wake Village) received 17.24". These rainfall totals caused Flash Flooding and rapid rises in creeks, rivers, and lakes across the region. Several rivers rose to major Flood levels. The one positive note from the heavy rainfall was that it removed the entire region from drought status by the end of the month. However, with La Nina conditions still in place, below average rainfall is expected through the spring months.

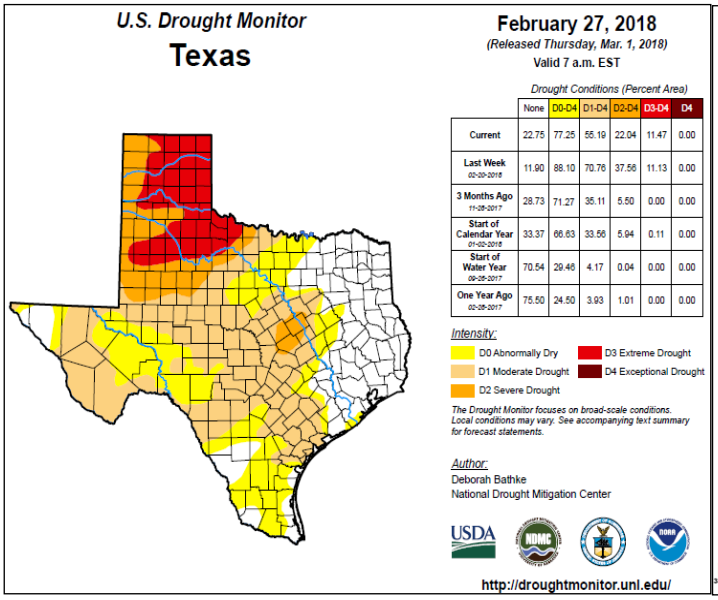


Fig. 3: Texas Drought monitor map for February 27th 2017

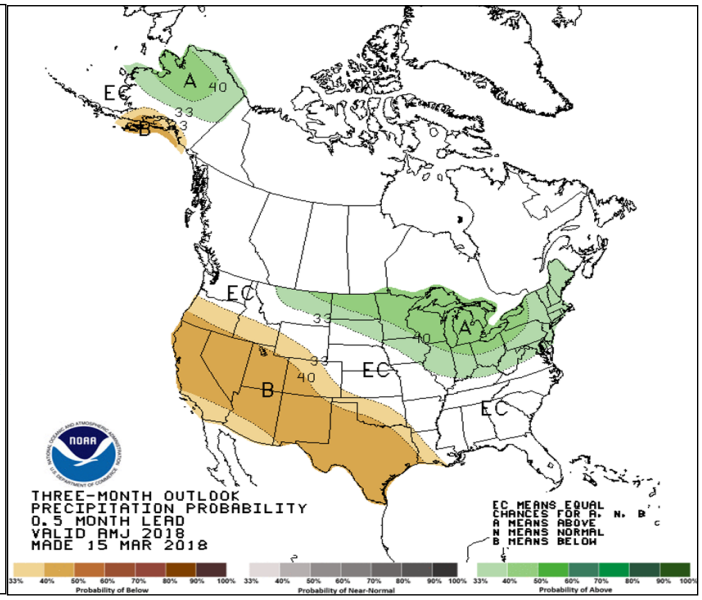


Fig. 4: Three month precipitation outlook (3/15)

AMS 2018 98th Annual Meeting in Austin, TX

Texas CoCoRaHS was in attendance at the AMS 98th Annual Meeting in Austin, Texas the week of January 7th – 12th 2018. The theme of this year's annual meeting was Communication: "Transforming Communication in the Weather, Water, and Climate Enterprise Focusing on Challenges Facing Our Sciences". Over 4500 attendees were at this years meeting.

AMS highlighted Hurricanes Harvey, Irma, and Maria with a special Presidential Town Hall Meeting, *The Devastating 2017 Hurricane Season: Opportunities, Challenges, and Future Directions for the Weather Enterprise.* Panelists discussed the season and its impacts, the forecasts, the communication and response, the extent to which climate change may or may not have contributed, the social costs of these hurricanes, and the plans for recovery and resilience.

Teachers, students, and families from the local Austin area enjoyed a day of hands-on science activities and presentations at WeatherFest. Now in its 17th year, WeatherFest is a free event for the general public offered at the Annual Meeting.

More than 600 students attended sessions with invited speakers from the private, broadcast, academic, and government sectors, with a focus on potential career options in the atmospheric sciences. During the conference, a career fair gave students the opportunity to personally interact with potential employers and graduate institutions, and a special poster session allowed students to showcase their research.

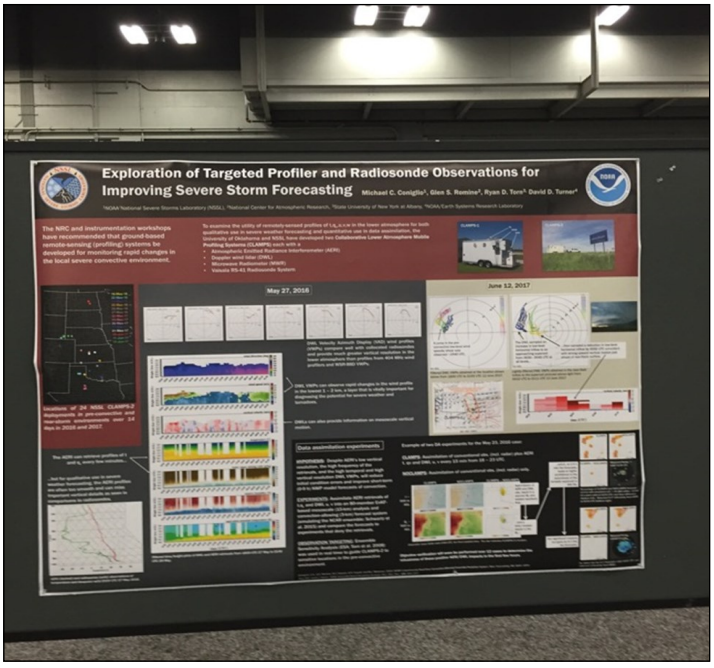
Exhibitors from all over the United States and abroad showcased a wide range of products, publications, and services to attendees. The Annual Meeting is host to the largest exhibit program anywhere in the atmospheric, oceanic, and related sciences.

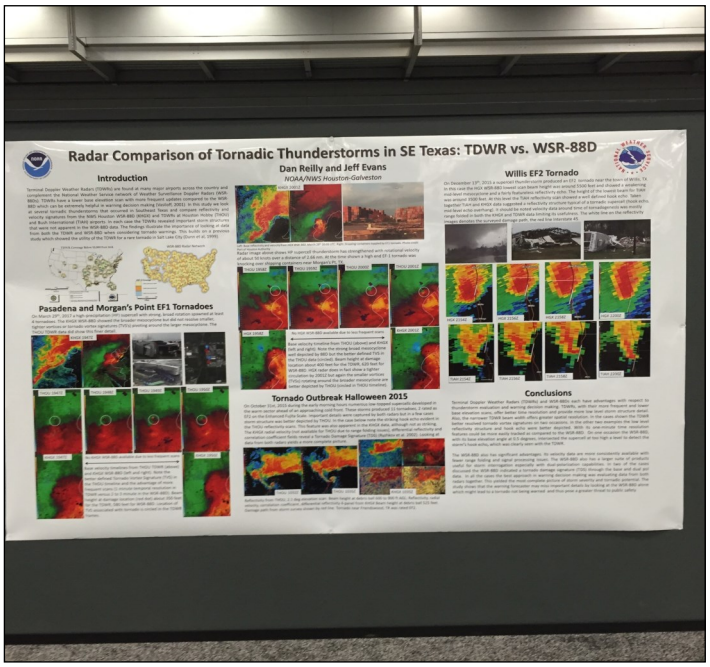
There was 419 sessions, 2,181 oral presentations, 1226 poster presentations, and 21,900 square feet of exhibits. See attached photos below, page 19, and last page of newsletter.

AMS Conference pictures

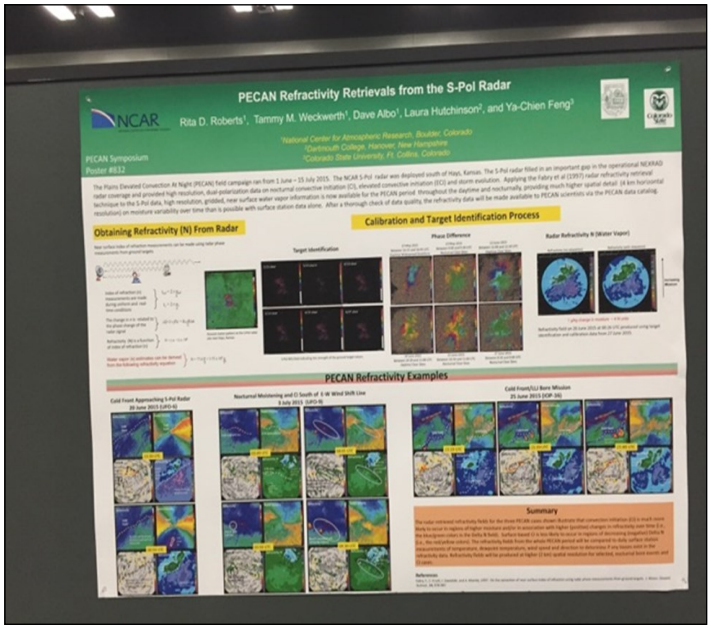
AMS 2018 98th Annual Meeting in Austin, TX

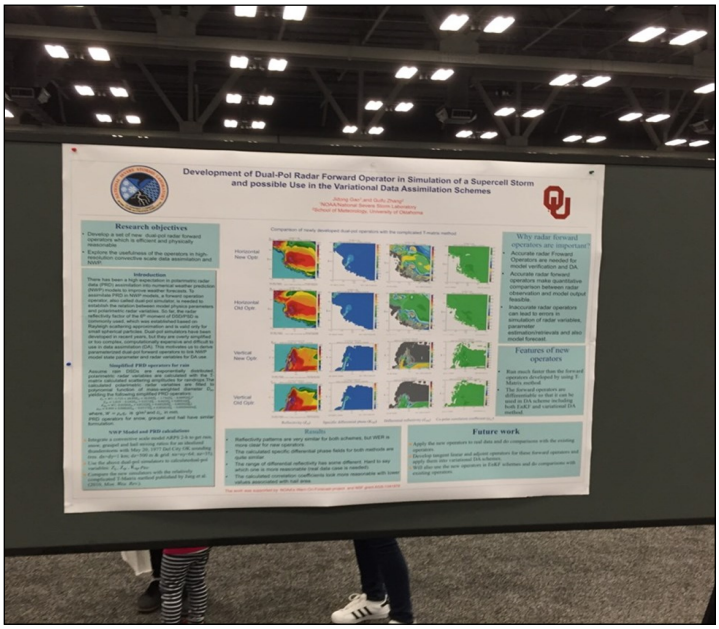
AMS Conference pictures





AMS 2018 98th Annual Meeting in Austin, TX - Photos





If your club, organization, or group would like a speaker to do a presentation about CoCoRaHS please contact Texas CoCoRaHS at texas@cocorahs.org

Texas CoCoRaHS Observer

The official newsletter of Texas CoCoRaHS

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