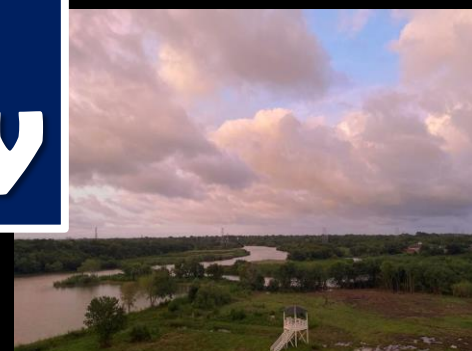


NWS Houston, Texas Annual 2020 Regional Climate Summary

Produced by Jimmy Fowler



Cover Page Photo Credit

The photographs used on the cover of this Annual SE TX Regional Climate Summary, were all taken within the HGX County Warning area during each month of the year. The top left picture on row one starts January and then from left to right we move through the calendar year with the last photograph on the bottom right representing December. NWS Houston Galveston was given permission by the following photographers to use these pictures.

<u>Month</u>	<u>Photographer</u>
January	Wendy Wong
February	Scott Overpeck
March	Wendy Wong
April	Jimmy Fowler
May	Jimmy Fowler
June	Kyle Sikes
July	Jimmy Fowler
August	Jimmy Fowler
September	Jimmy Fowler
October	Patricia Fowler
November	Jimmy Fowler
December	Jimmy Fowler

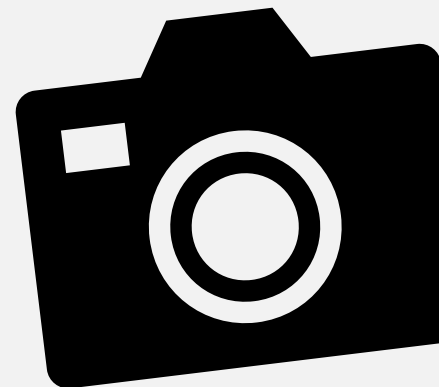


Table of Contents

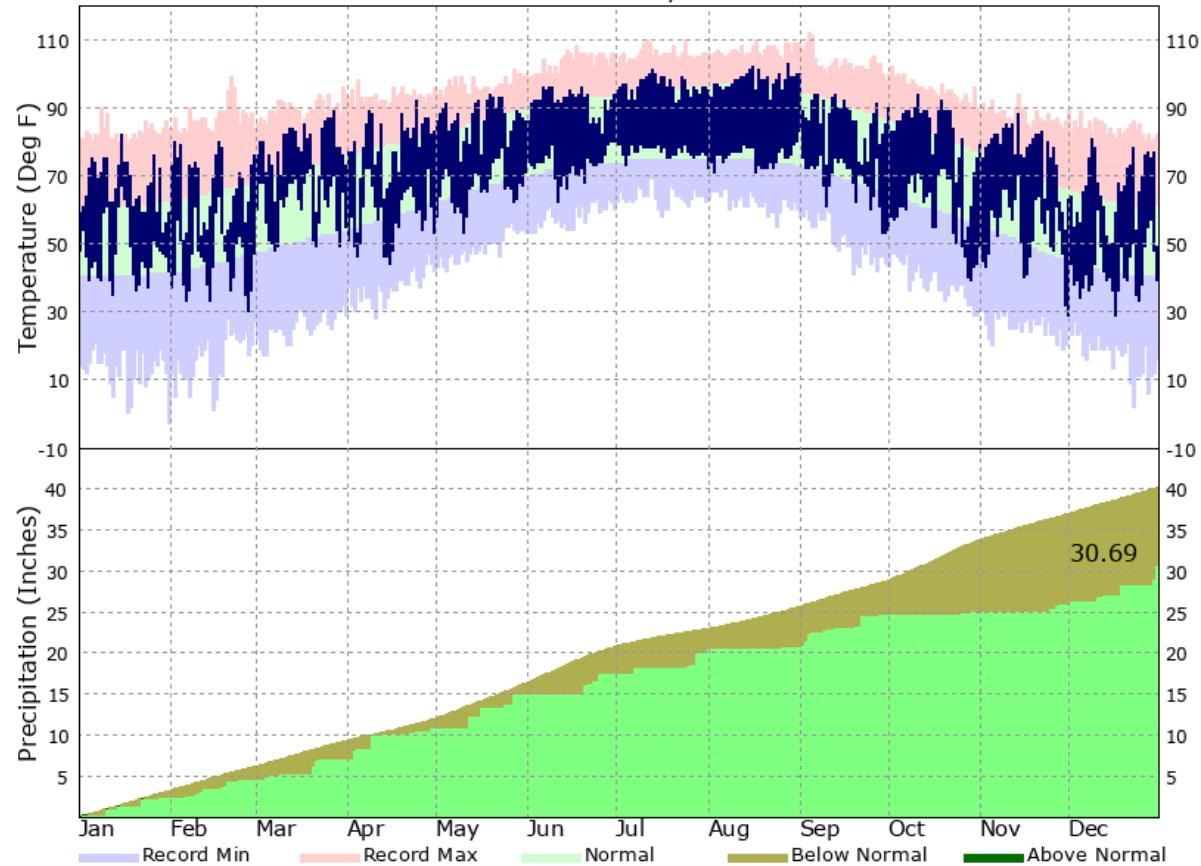
Page Number Page Title

4 – 5	Yearly Temperature and Precipitation Graphs
6 – 7	Significant Annual Statistics
8	2020 Daily Records
9 – 10	January
11 – 12	February
13 – 14	March
15 – 17	April (Weather Event: Onalaska EF-3 Tornado)
18 – 19	May
20 – 23	June (Weather Event: TS Cristobal and Saharan Dust)
24 – 26	July (Weather Event: Hurricane Hanna)
27 – 29	August (Weather Event: Hurricane Laura)
30 – 32	September (Weather Event: Tropical Storm Beta)
33 – 34	October
35 – 37	November
38 – 39	December
40	Tropical Season Review
41	Climate Primary Site History

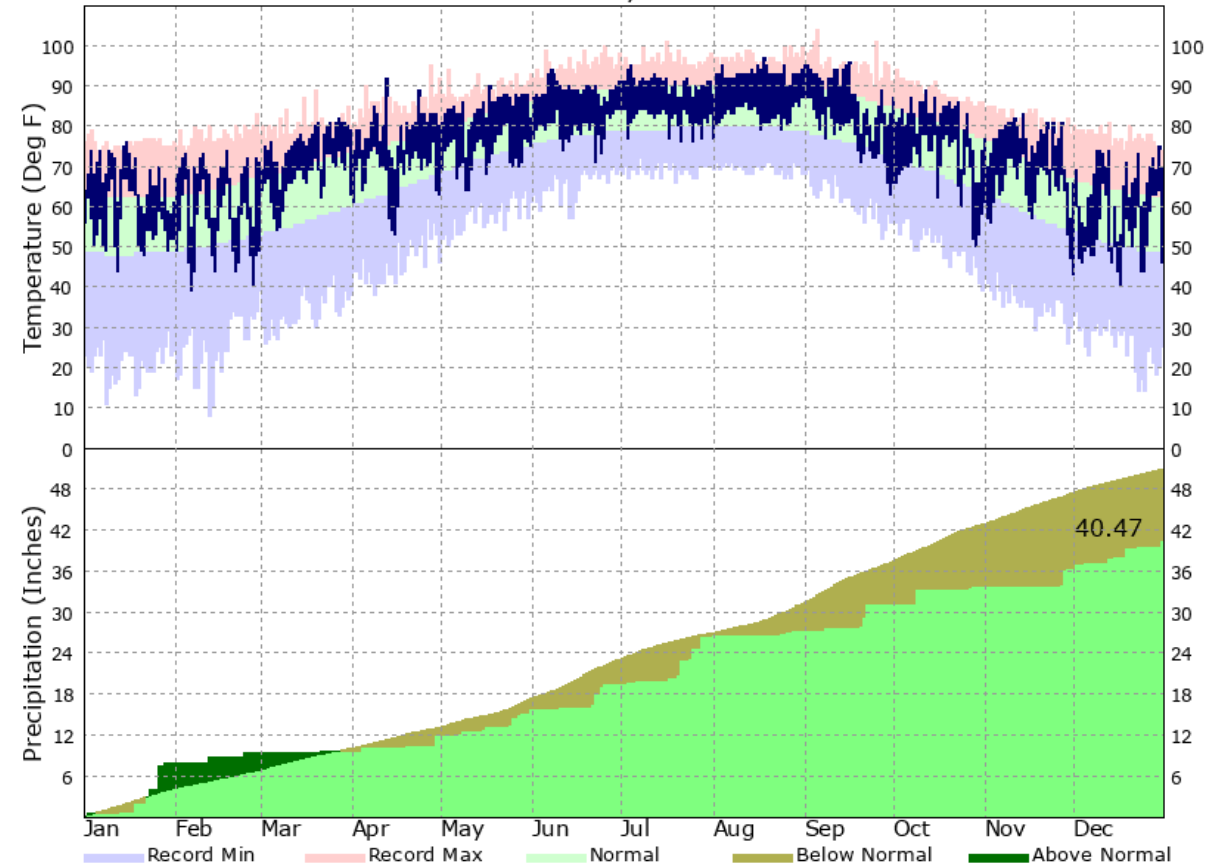


Yearly Temperature and Precipitation Graphs 4

COLLEGE STATION, TX - 2020



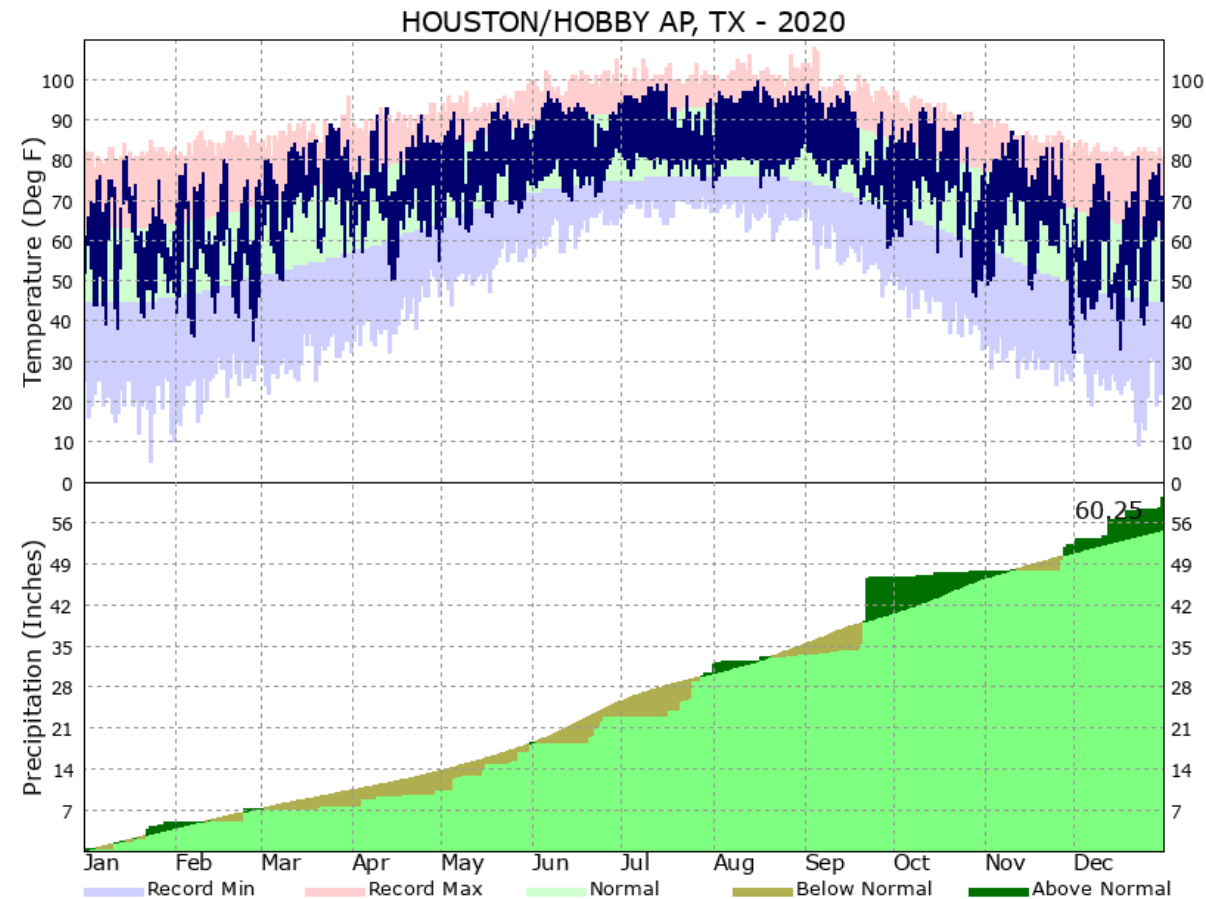
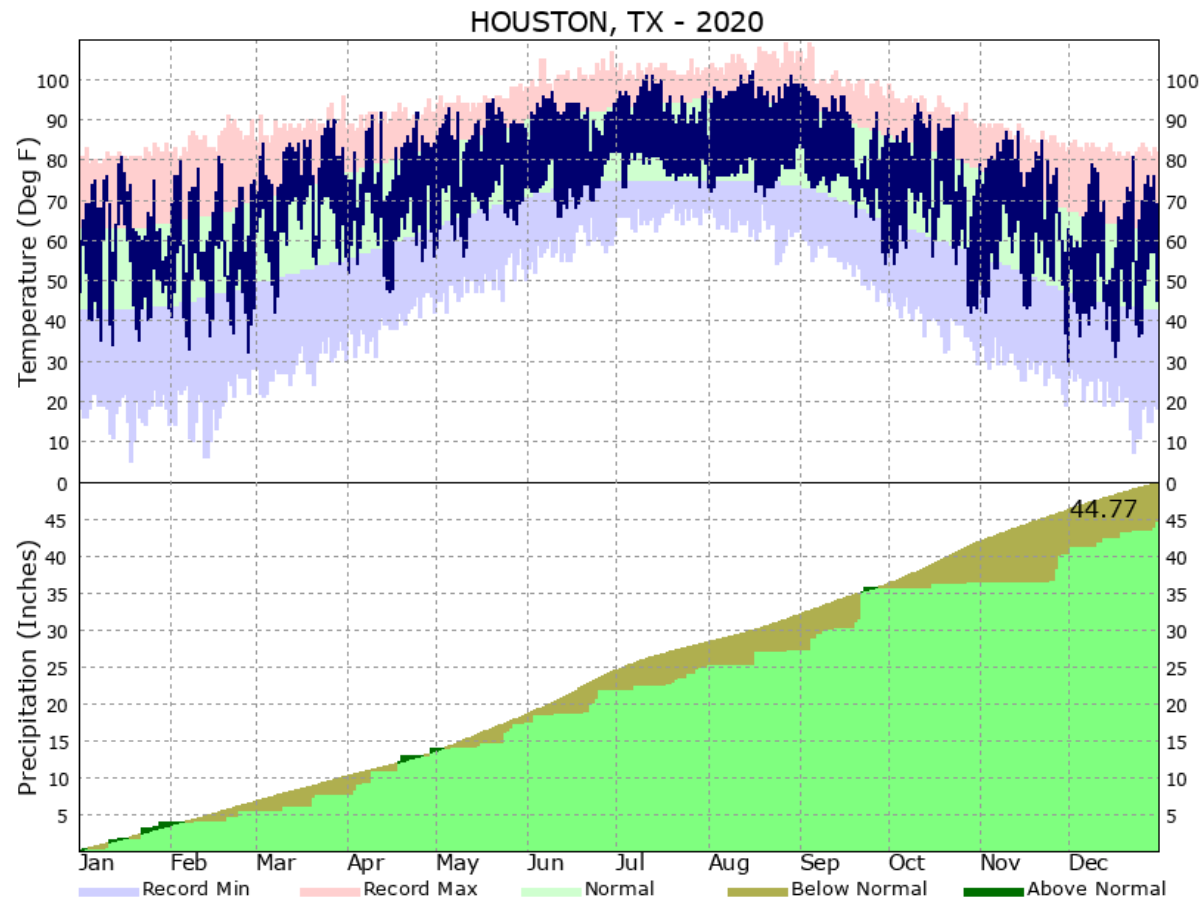
GALVESTON, TX - 2020



Observed temperatures are shown by the dark blue areas, normals with the light green areas, record highs in the light red areas, and record lows in the light blue areas. The bottom portion of the graph indicates the precipitation for the year to date. Periods that have year to date totals above the climatological normals are depicted by dark green areas. Periods that are below normal are represented by the brown areas.

Yearly Temperature and Precipitation Graphs

5



Observed temperatures are shown by the dark blue areas, normals with the light green areas, record highs in the light red areas, and record lows in the light blue areas. The bottom portion of the graph indicates the precipitation for the year to date. Periods that have year to date totals above the climatological normals are depicted by dark green areas. Periods that are below normal are represented by the brown areas.

Significant Annual Statistics – Temperature

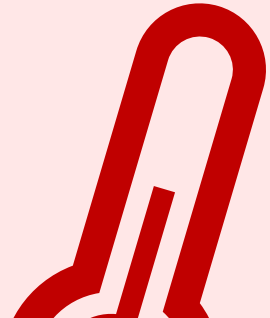


Highest Max Temperatures		
City of College Station	103°F	August 28 th
City of Houston	102°F	August 16 th
Houston-Hobby	100°F	August 16 th
City of Galveston	97°F	August 18 th

Lowest Max Temperatures		
City of College Station	49°F	December 31 st
City of Houston	49°F	December 14 th
Houston-Hobby	49°F	December 14 th
City of Galveston	50°F	December 14 th



Annual Average Temperatures		
City of College Station	70.9°F	5 th Warmest on Record
City of Houston	72.1°F	2 nd Warmest on Record (Tied with 2012)
Houston-Hobby	73.5°F	Warmest Year on Record
City of Galveston	74.3°F	2 nd Warmest Year on Record



Highest Min Temperatures		
City of College Station	83°F	September 1 st
City of Houston	84°F	September 1 st
Houston-Hobby	84°F	September 1 st
City of Galveston	87°F	August 31 st – Sept 3 rd

Lowest Min Temperatures		
City of College Station	29°F	December 1 st & 17 th
City of Houston	30°F	December 1 st
Houston-Hobby	32°F	December 1 st
City of Galveston	39°F	February 6 th

Significant Annual Statistics – Precipitation

Annual Total Precipitation		
City of College Station	30.69"	31 st Driest
City of Houston	44.77"	64 th Driest
Houston-Hobby	60.25"	20 th Wettest
City of Galveston	40.47"	64 th Driest

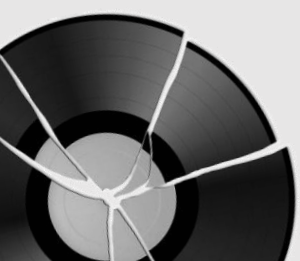
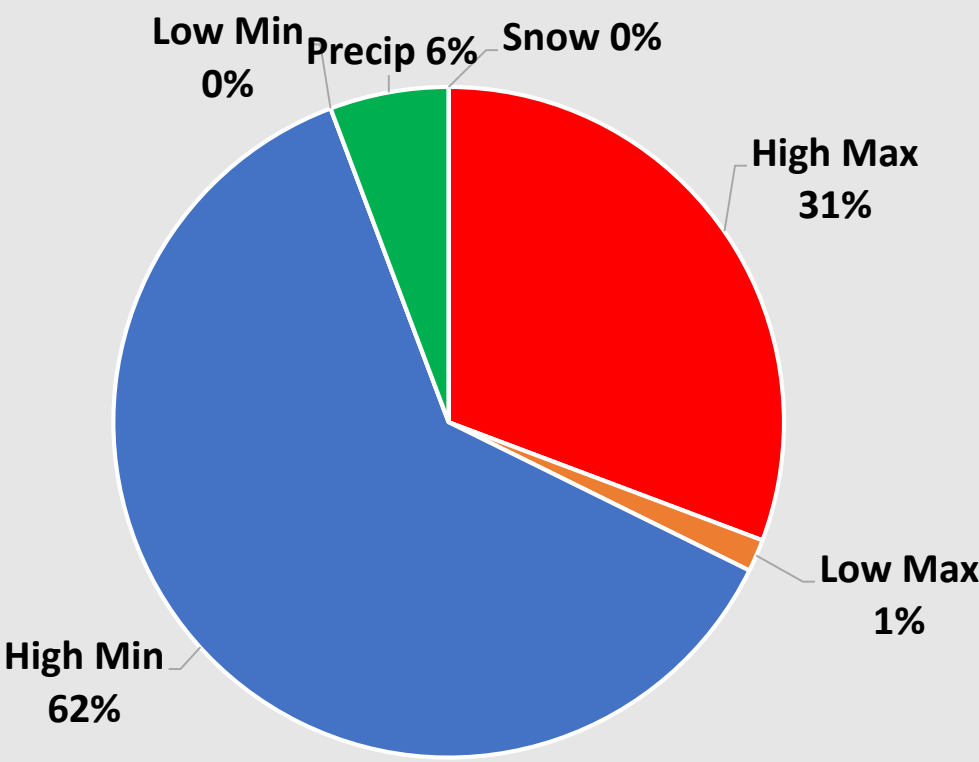
Greatest One Day Total		
City of College Station	1.70"	December 31 st
City of Houston	3.58"	September 22 nd
Houston-Hobby	7.32"	September 22 th
City of Galveston	3.34"	January 26 th

Wettest Month		
City of College Station	4.61"	December
City of Houston	8.53"	September
Houston-Hobby	13.07"	September
City of Galveston	7.90"	January


2020 Daily Records

Record	High Max Temperature	Low Max Temperature	High Min Temperature	Low Min Temperature	Precipitation	Snowfall	Total
City of College Station	2	3	6	0	1	0	12
City of Houston	13	0	24	0	1	0	38
Houston-Hobby	15	0	46	0	7	0	68
City of Galveston	29	0	43	0	2	0	74
Total	59	3	119	0	11	0	192

Percentage of Types of Records



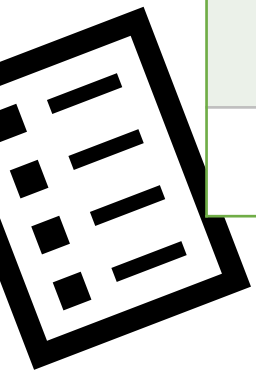
2020 started out a lot like how 2019 ended: unseasonably warm. Most of the area saw temperatures five to six degrees above normal, which put this January in the top ten warmest Januarys on record. This month ended up just around normal precipitation wise, except for the coast which saw well above normal precipitation.



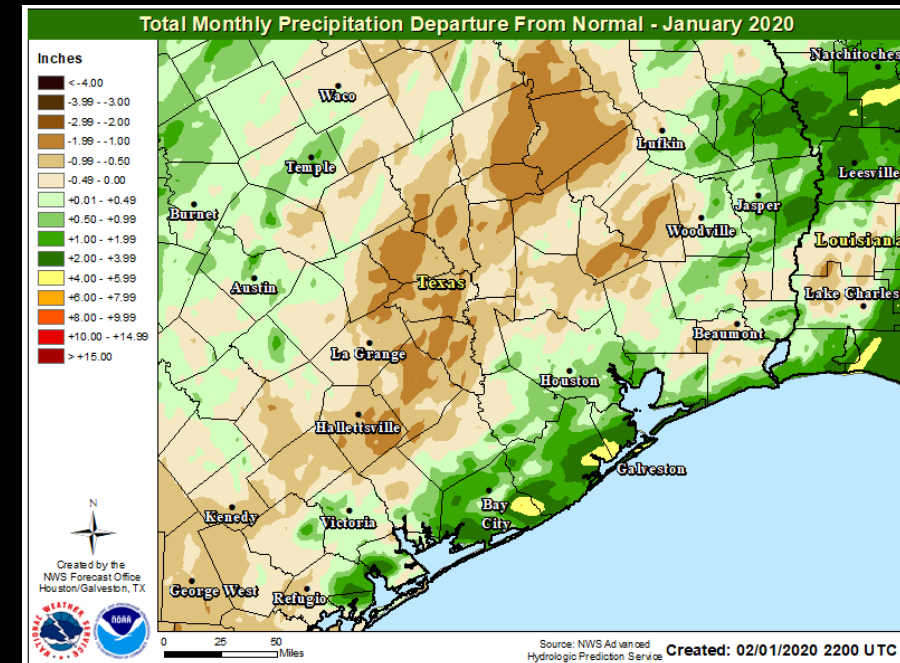
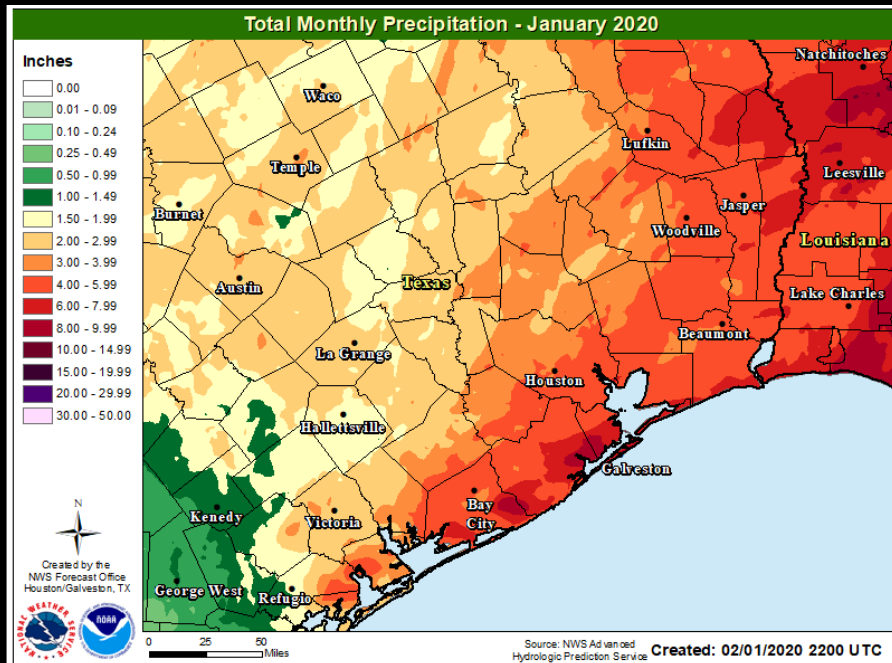
Location	Average High Temp (F)	Average Low Temp (F)	Average Temp (F)	Normal Average Temp (F)	Departure From Normal (F)	Maximum Temperature (F)	Minimum Temperature (F)
Galveston (GLS)	67.3	55.6	61.5	55.2	+6.3	76 on the 15 th	44 on the 12 th
Houston Hobby (HOU)	67.8	51.6	59.7	54.1	+5.6	85 on the 15 th	38 on the 12 th
City of Houston (IAH)	67.2	48.5	57.9	53.1	+4.8	81 on the 15 th	34 on the 12 th
College Station (CLL)	66.9	47.2	57.0	51.1	+5.9	82 on the 15 th	35 on the 12 th

January 2020

10




Location	Total Precipitation (in.)	Departure from Normal (in.)	Number of Thunder Days	Maximum Daily Precipitation (in./date)	
Galveston (GLS)	7.90	+3.70	6	3.34	26 th
Houston Hobby (HOU)	4.92	+1.05	6	1.40	22 nd
City of Houston (IAH)	3.84	+0.46	4	1.30	22 nd
College Station (CLL)	2.49	-0.75	1	0.88	10 th

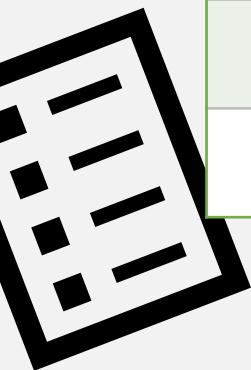


February 2020

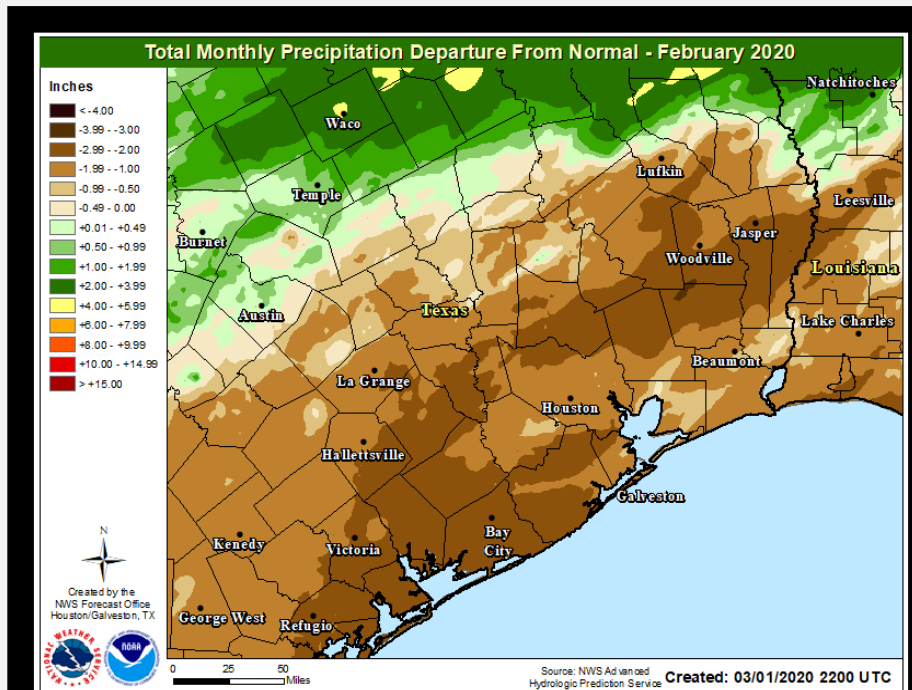
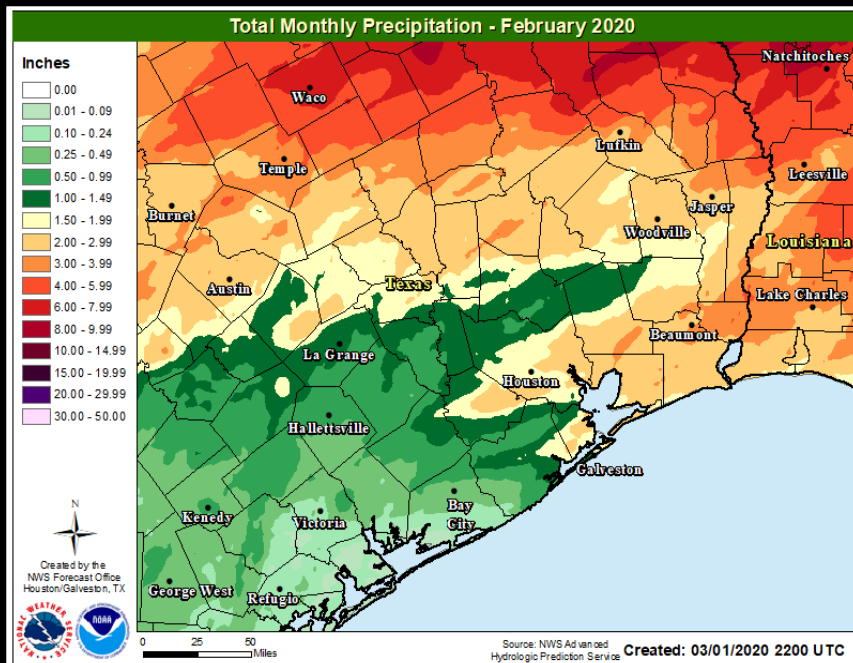
February continued the warmer and drier than normal trend. Frequent stretches of overcast helped to keep temperatures from climbing into any extremes, thus there was only one temperature record set this month (a record high minimum temperature on the 4th in Galveston). Drought conditions improved in the northern part of the region, but continued to degrade in the southwestern counties.



Location	Average High Temp (F)	Average Low Temp (F)	Average Temp (F)	Normal Average Temp (F)	Departure From Normal (F)	Maximum Temperature (F)	Minimum Temperature (F)
Galveston (GLS)	66.6	53.6	60.1	57.6	+2.5	74 on the 18 th	39 on the 6 th
Houston Hobby (HOU)	68.3	49.0	58.7	54.1	+1.4	80 on the 17 th	35 on the 27 th
City of Houston (IAH)	67.4	46.4	56.9	56.4	+0.5	81 on the 17 th	32 on the 27 th
College Station (CLL)	66.4	44.8	55.6	54.6	+1.0	80 on the 17 th	30 on the 27 th



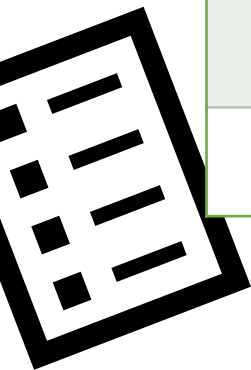
Location	Total Precipitation (in.)	Departure from Normal (in.)	Number of Thunder Days	Maximum Daily Precipitation (in./date)	
Galveston (GLS)	1.51	-1.06	3	0.76	12 th
Houston Hobby (HOU)	2.20	-1.01	1	1.83	24 th
City of Houston (IAH)	1.58	-1.62	2	0.69	24 th
College Station (CLL)	2.13	-0.72	1	0.61	20 th



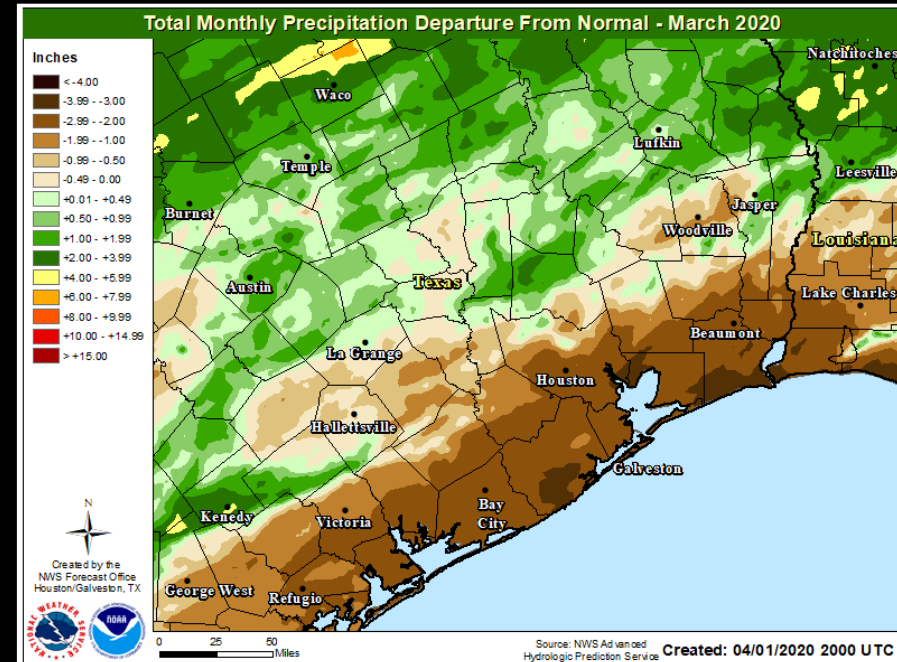
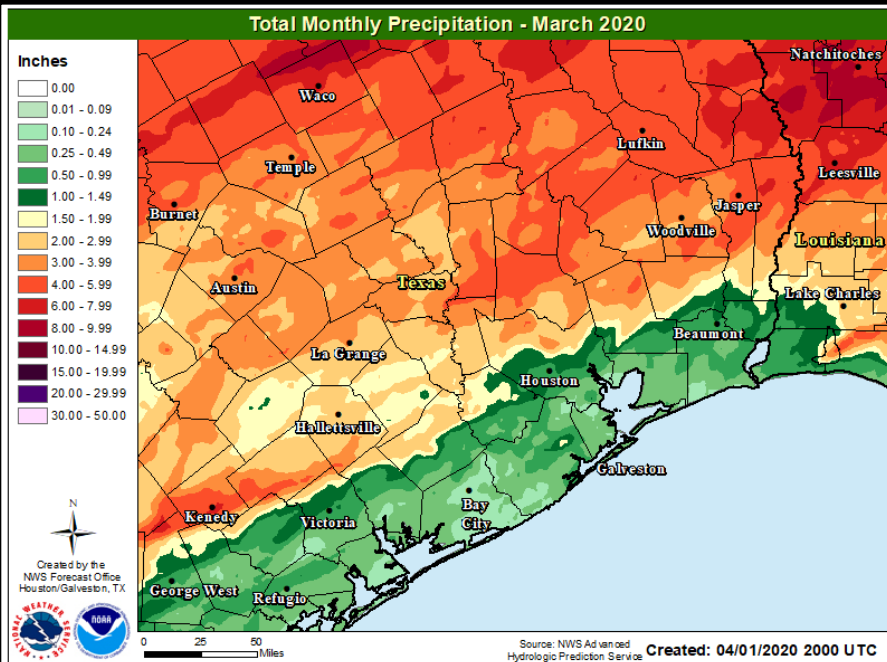
March 2020

This March was one for the record books. Houston-Hobby and the Cities of College Station and Galveston all saw their warmest Marches on record, while the City of Houston experienced its second warmest on record. The average temperature in March was around 71°, which is about the normal average temperature for the start of May. The City of Houston also experienced its first 90° high temperature on March 25th, which is about a month and half before normal. There were a total of 34 daily temperature records set in March (11 High Max Temperatures and 23 High Min Temperatures). Precipitation across the area during the month was near or slightly above normal north of Harris County, while areas along the coast were two to three inches below normal.

Location	Average High Temp (F)	Average Low Temp (F)	Average Temp (F)	Normal Average Temp (F)	Departure From Normal Average (F)	Maximum Temperature (F)	Minimum Temperature (F)
Galveston (GLS)	76.1	66.5	71.3	63.4	+7.9	82 on the 27 th	54 on the 6 th
Houston Hobby (HOU)	79.9	64.3	72.1	63.3	+7.5	89 on the 24 th	50 on the 7 th & 8 th
City of Houston (IAH)	79.9	62.1	71.0	62.7	+8.3	90 on the 25 th & 27 th	42 on the 7 th
College Station (CLL)	78.2	60.8	69.5	61.4	+8.1	89 on the 27 th	48 on the 7 th



Location	Total Precipitation (in.)	Departure from Normal (in.)	Number of Thunder Days	Maximum Daily Precipitation (in./date)	
Galveston (GLS)	0.27	-2.89	0	0.15	22 nd
Houston Hobby (HOU)	0.48	-2.72	0	0.25	20 th
City of Houston (IAH)	2.28	-1.13	2	1.08	20 th
College Station (CLL)	2.49	-0.68	5	0.86	20 th

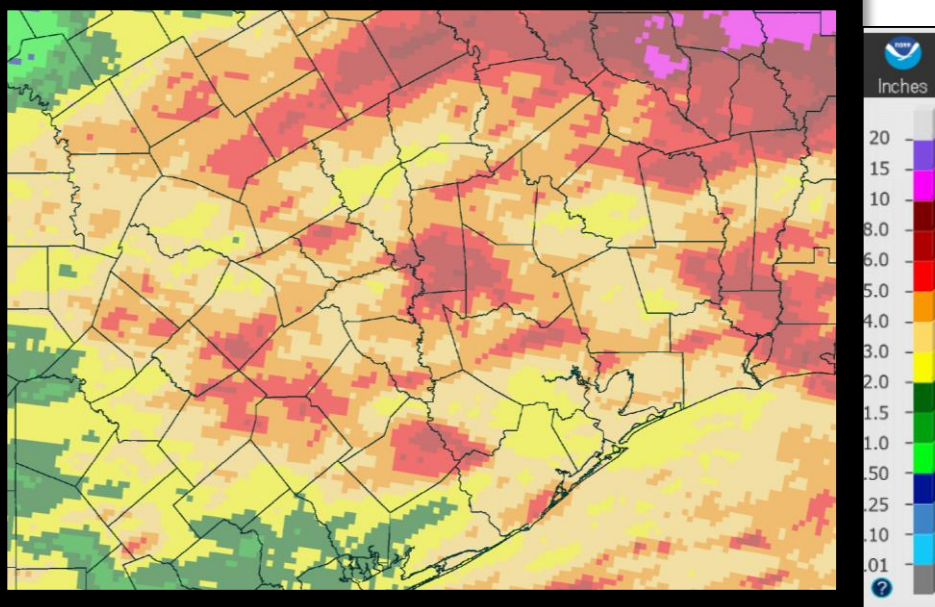


The month of April was a very different month across Southeast Texas compared to March. A series of cold fronts brought rounds of showers and thunderstorms across the region bringing some much needed rain for parts of the region. Although the scattered nature of these showers and thunderstorms did result in some areas getting more precipitation than others. There were some severe weather events during the second half of the month. An EF-3 tornado went through most of Polk County on the 22nd and then a squall line brought damaging winds across the most of the region on the 29th.

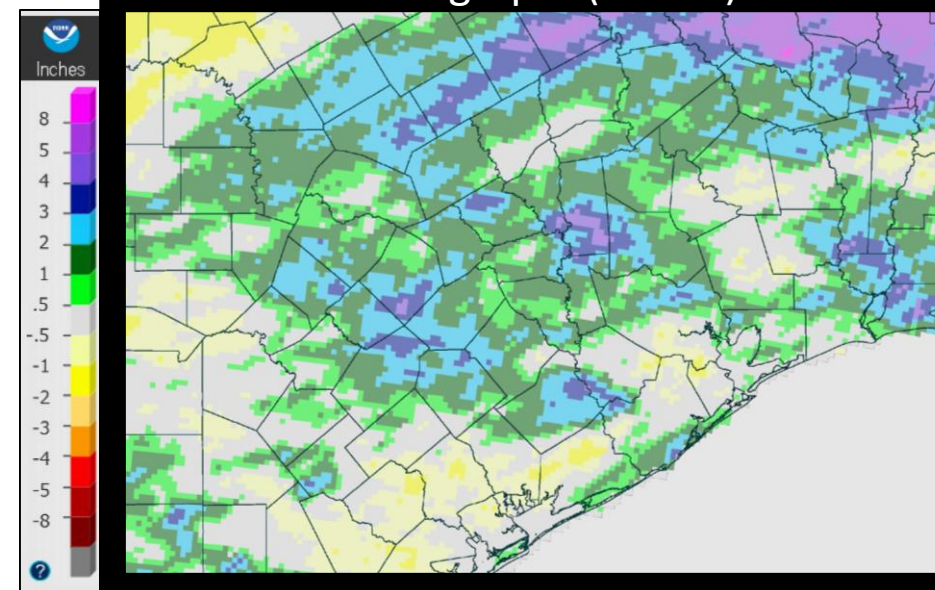
Location	Average High Temp (F)	Average Low Temp (F)	Average Temp (F)	Normal Average Temp (F)	Departure From Normal Average (F)	Maximum Temperature (F)	Minimum Temperature (F)
Galveston (GLS)	79.6	68.1	73.8	70.1	+3.7	92 on the 12 th	53 on the 16 th
Houston Hobby (HOU)	81.4	63.6	72.5	69.8	+2.7	93 on the 12 th	50 on the 14 th & 15 th
City of Houston (IAH)	80.9	60.7	70.8	69.5	+1.3	92 on the 12 th & 24 th	47 on the 15 th
College Station (CLL)	78.9	58.0	68.5	68.5	0.0	92 on the 24 th	44 on the 15 th

Location	Total Precipitation (in.)	Departure from Normal (in.)	Number of Thunder Days	Maximum Daily Precipitation (in./date)	
Galveston (GLS)	2.35	-0.70	5	1.56	29 th
Houston Hobby (HOU)	2.82	-0.43	7	1.20	4 th
City of Houston (IAH)	6.20	+2.89	8	1.57	9 th
College Station (CLL)	3.86	+1.20	8	1.59	9 th

Total Precipitation during April (inches)



Precipitation Total Difference from Normal during April (inches)



April 22nd EF-3 Onalaska Tornado

17



NATIONAL WEATHER SERVICE
OCEANIC AND ATMOSPHERIC ADMINISTRATION



Preliminary Damage Survey Results

San Jacinto-Polk County/Onalaska Tornado

Date	April 22, 2020
Time (Local)	5:35-6:15 PM, CDT
EF Rating	EF-3
Est. Peak Winds	140 MPH
Path Length	32 miles
Max Width	1100 yards
Injuries/Deaths	33/3

On April 22, a tornado touched down on the west coast of Lake Livingston in San Jacinto County. It crossed the lake and struck the city of Onalaska and continued across much of Polk County. NWS meteorologists found evidence that most damage along the path of this tornado was of EF-1 or EF-2 intensity. They did find EF-3 damage in the Paradise Acres subdivision in Onalaska, with estimated winds of 140 mph.

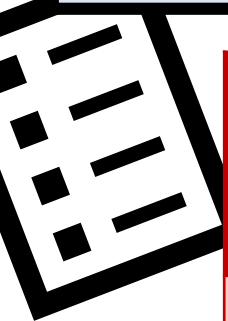
NWS Houston/Galveston

ISSUED: 9:50 PM - Thursday, April 23, 2020



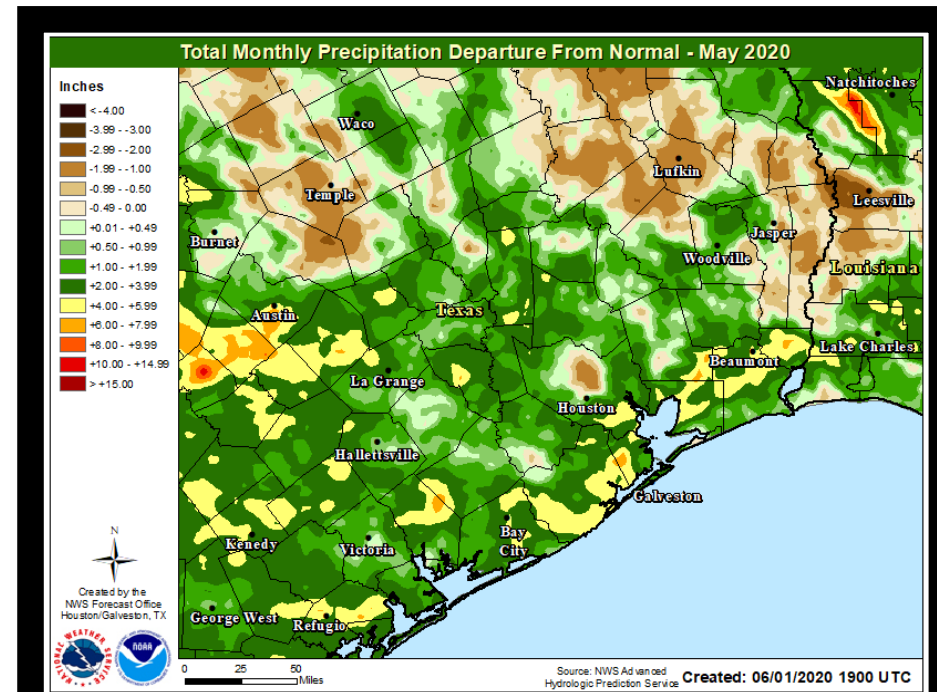
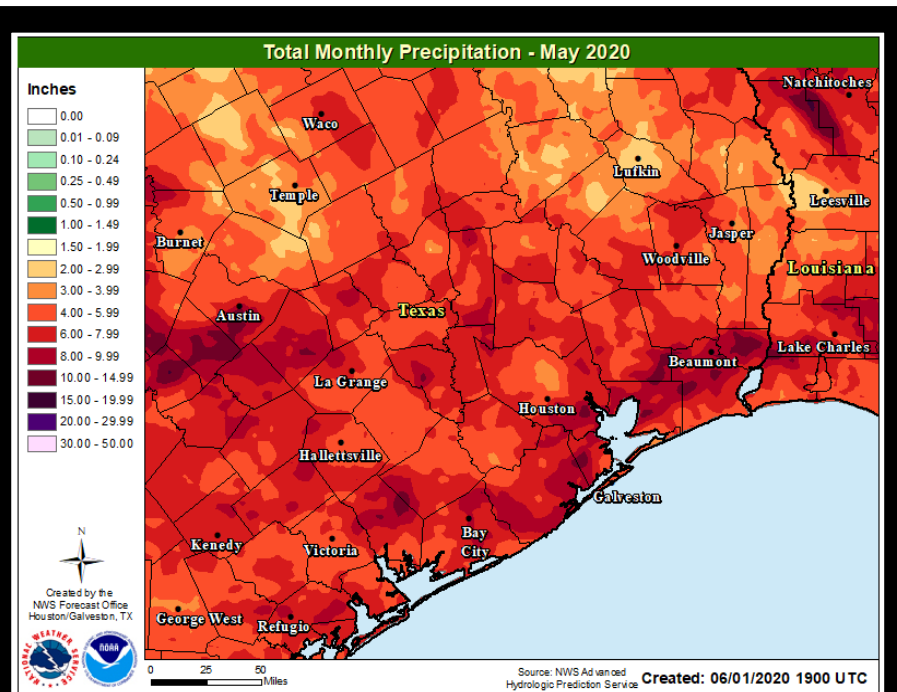
Multiple days of heavy rainfall across the area brought drought relief to the entire region in May. While most of the primary climate sites saw near to below average precipitation, the rest of the area saw above average precipitation – including the southwestern counties which were experiencing the worst drought. Houston-Hobby set a new daily precipitation record on May 5th with 2.17” of rain, beating the old May 5th record of 1.63” of rain set back in 1935. Temperatures across the area continued to be above normal and Galveston experienced its ninth warmest May on record.

Location	Average High Temp (F)	Average Low Temp (F)	Average Temp (F)	Normal Average Temp (F)	Departure From Normal Average (F)	Maximum Temperature (F)	Minimum Temperature (F)
Galveston (GLS)	84.7	73.1	78.9	77.6	+1.3	90 on the 17 th	64 on the 9 th & 10 th
Houston Hobby (HOU)	87.5	69.6	78.6	77.1	+1.5	94 on the 20 th	61 on the 1 st & 10 th
City of Houston (IAH)	88.2	67.7	78.0	76.9	+1.1	95 on the 20 th	56 on the 10 th
College Station (CLL)	86.7	66.3	76.5	76.2	+0.3	94 on the 19 th	53 on the 10 th





Location	Total Precipitation (in.)	Departure from Normal (in.)	Number of Thunder Days	Maximum Daily Precipitation (in./date)	
Galveston (GLS)	3.75	-0.57	11	1.02	25 th
Houston Hobby (HOU)	8.06	+3.31	13	2.17	5 th
City of Houston (IAH)	3.56	-1.53	10	1.50	24 th
College Station (CLL)	4.11	-0.22	5	1.36	12 th



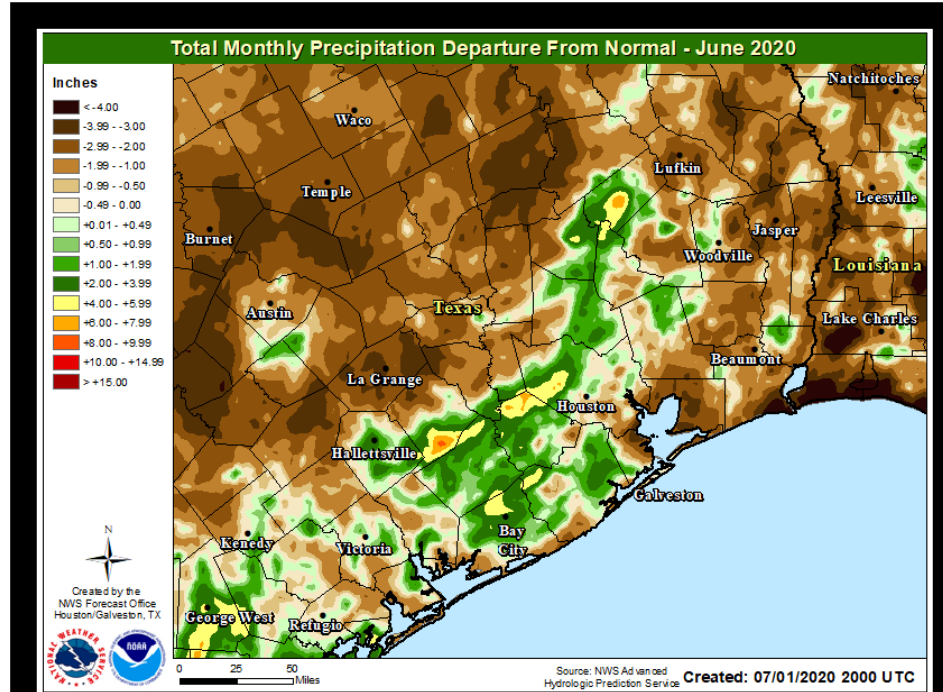
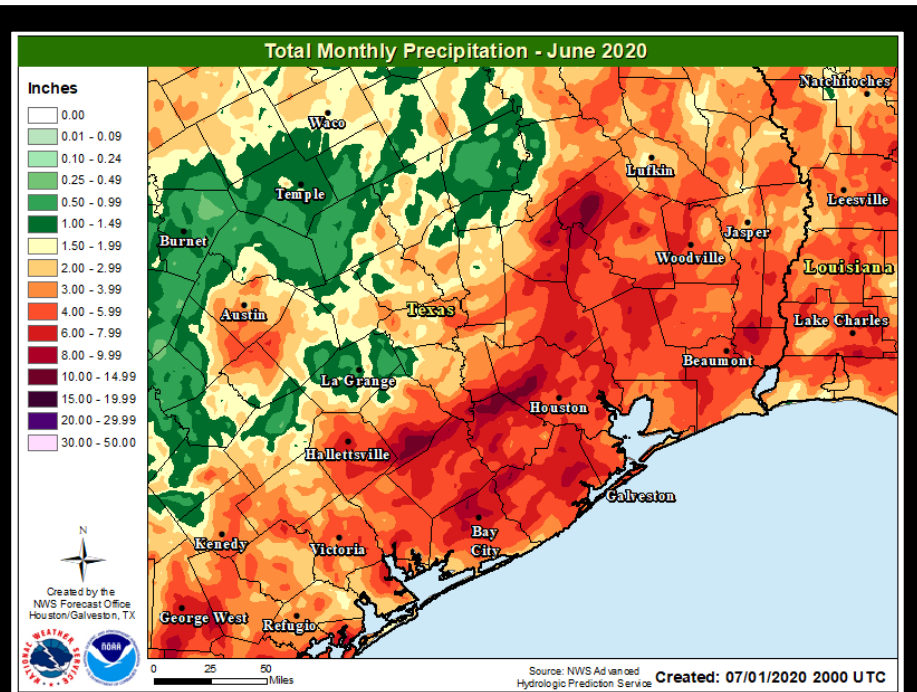
The first half of the month of June was exceptionally dry, but then near stationary and back building storms starting on the 19th and continuing the 25th were able to make up some of that deficit. Abnormally dry conditions developed across the northern counties during the month of June, while drought improvements continued for Jackson County. Tropical Storm Cristobal formed in the Bay of Campeche on June 1st – which was the earliest third named storm on record in the Atlantic Basin – that had the potential of impacting southeast Texas, but ended up staying east making landfall in central Louisiana. The end of the month was characterized with an influx of Saharan Dust providing hazy blue skies during the day, but vivid sunsets and sunrises.

Location	Average High Temp (F)	Average Low Temp (F)	Average Temp (F)	Normal Average Temp (F)	Departure From Normal Average (F)	Maximum Temperature (F)	Minimum Temperature (F)
Galveston (GLS)	89.2	79.3	84.2	82.9	+1.3	94 on the 7 th	71 on the 22 nd
Houston Hobby (HOU)	91.5	75.5	83.5	82.0	+1.5	97 on the 6 th	70 on the 14 th
City of Houston (IAH)	91.8	73.1	82.4	82.4	0	97 on the 9 th	66 on the 11 th & 12 th
College Station (CLL)	91.6	72.9	82.2	82.2	0	96 on the 8 th , 9 th & 19 th	62 on the 11 th





Location	Total Precipitation (in.)	Departure from Normal (in.)	Number of Thunder Days	Maximum Daily Precipitation (in./date)	
Galveston (GLS)	3.83	-1.86	6	1.55	22 nd
Houston Hobby (HOU)	4.57	-2.53	10	1.28	22 nd
City of Houston (IAH)	4.51	-1.42	6	1.31	25 th
College Station (CLL)	2.45	-2.00	7	0.95	20 th

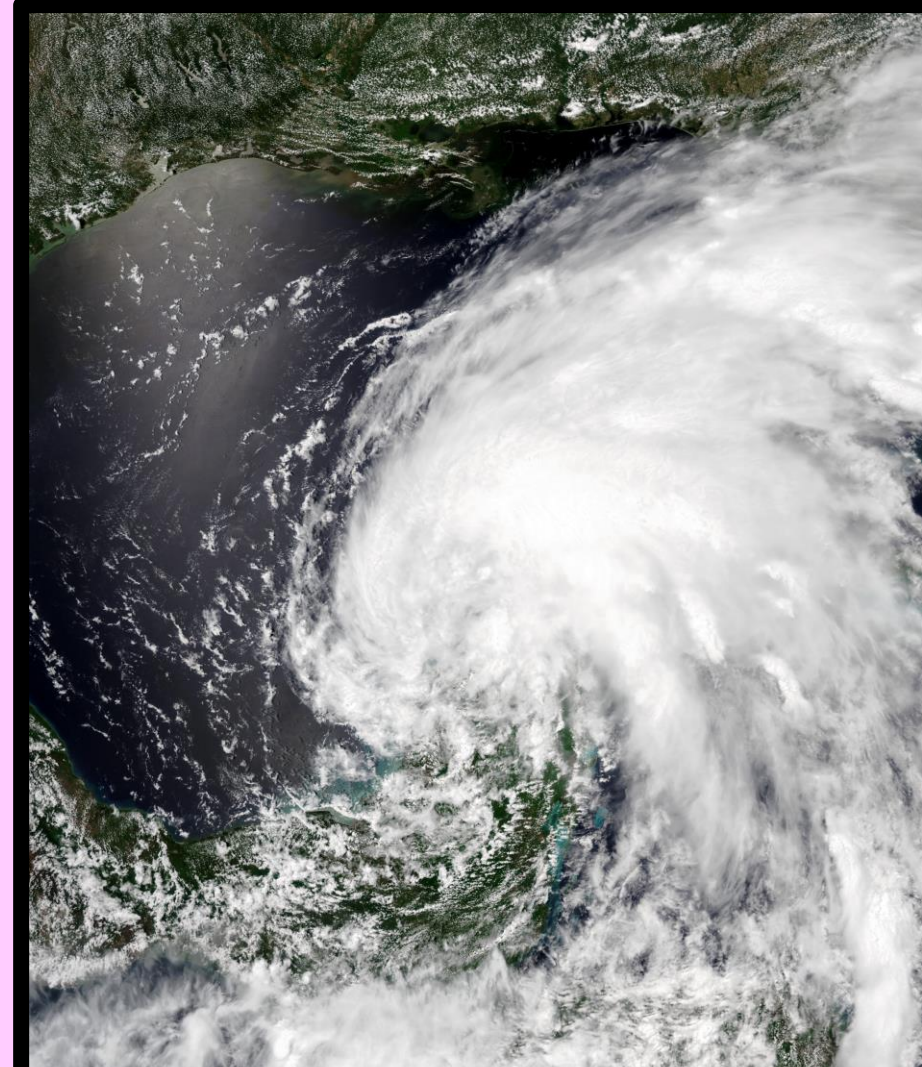


Tropical Storm Cristobal

Tropical Storm Cristobal was the 3rd named tropical storm for the 2020 Hurricane Season - the earliest 3rd named storm on record. It formed on June 1st off the coast of the Yucatan Peninsula from the remains of Tropical Storm Allison that developed in the Eastern Pacific in the days prior. It meandered around the Bay of Campeche for a few days before moving back over the Yucatan Peninsula which weakened it into a Tropical Depression by June 4th. Cristobal then moved northward into the Central Gulf of Mexico heading toward the central Gulf Coast and re-strengthening into a Tropical Storm.

Tropical Storm Cristobal made landfall to the east of Grand Isle, Louisiana on June 7, 2020 at 5:10 PM CDT.

Formed	Dissipated	Min Pressure	Max Sustained Wind
June 1 st	June 11 th	992 mb	60 mph



Tropical Storm Cristobal on June 5, 2020
over north of the Yucatan Peninsula

Saharan Dust

23

During the end of June (and continuing into the beginning of July) there was a large plume of dust that made its way all the way from the Saharan Desert into Southeast Texas – also known as the Saharan Dust Layer (SAL).

Effects that the SAL can have:

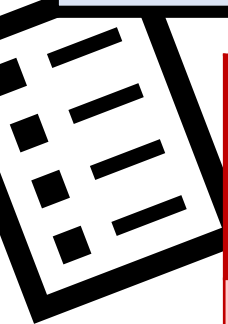
- Degrades air quality
- Creates vivid sunsets and sunrises
 - Dust particles will scatter the sunlight allowing for the reds and oranges to really show
- Makes the sky hazy/grey during the daytime hours
- Suppresses tropical activity
 - The Saharan air is typically drier preventing storms from developing
 - Strong easterly winds, which tropical storms develop easier when these winds are slow

True Color GOES-16 Satellite Imagery on June 21st



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 two degrees above normal with 28 daily temperature records broken through the month. There were also three daily rainfall records set throughout the month due to strong, slow moving thunderstorms: 2.32" on the 21st in Galveston, 1.41" on the 21st in Houston-Hobby, and 1.43" on the 28th in College Station. The storm that brought that record rainfall in College Station also produced a wind gust of 69 MPH.

Location	Average High Temp (F)	Average Low Temp (F)	Average Temp (F)	Normal Average Temp (F)	Departure From Normal Average (F)	Maximum Temperature (F)	Minimum Temperature (F)
Galveston (GLS)	84.7	73.1	78.9	77.6	+1.3	90 on the 17 th	64 on the 9 th & 10 th
Houston Hobby (HOU)	87.5	69.6	78.6	77.1	+1.5	94 on the 20 th	61 on the 1 st & 10 th
City of Houston (IAH)	88.2	67.7	78.0	76.9	+1.1	95 on the 20 th	56 on the 10 th
College Station (CLL)	86.7	66.3	76.5	76.2	+0.3	94 on the 19 th	53 on the 10 th

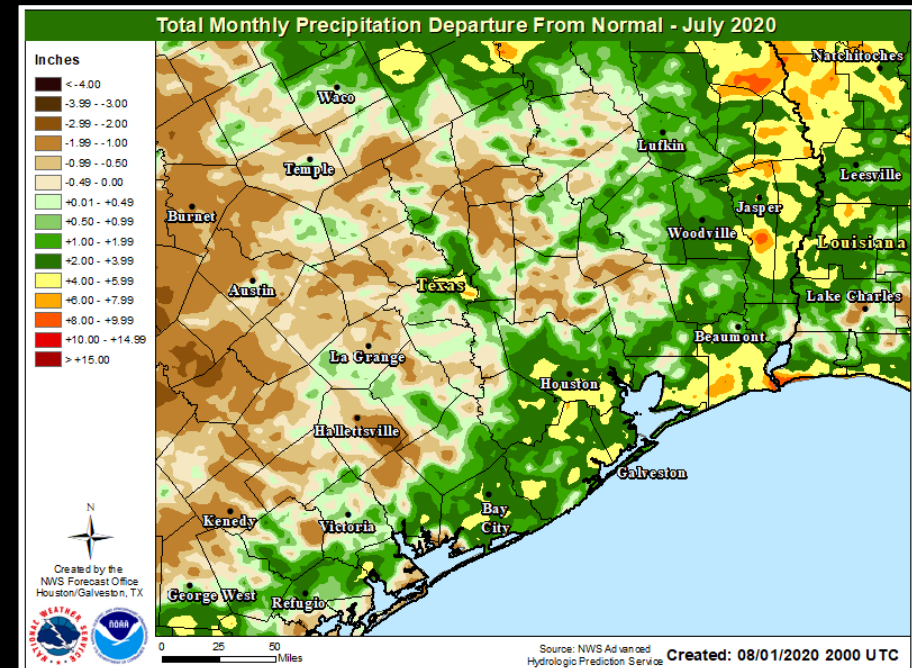
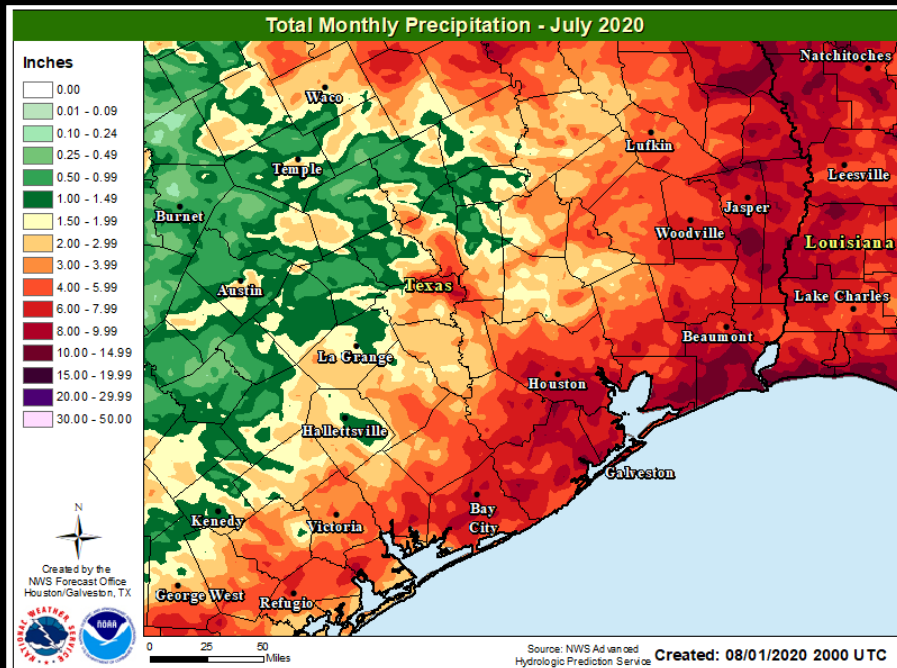


July 2020

25



Location	Total Precipitation (in.)	Departure from Normal (in.)	Number of Thunder Days	Maximum Daily Precipitation (in./date)	
Galveston (GLS)	6.88	+3.08	11	2.32	21 st
Houston Hobby (HOU)	7.36	+2.70	11	2.87	25 th
City of Houston (IAH)	3.01	-0.78	12	0.74	25 th
College Station (CLL)	2.47	+0.60	7	1.43	28 th

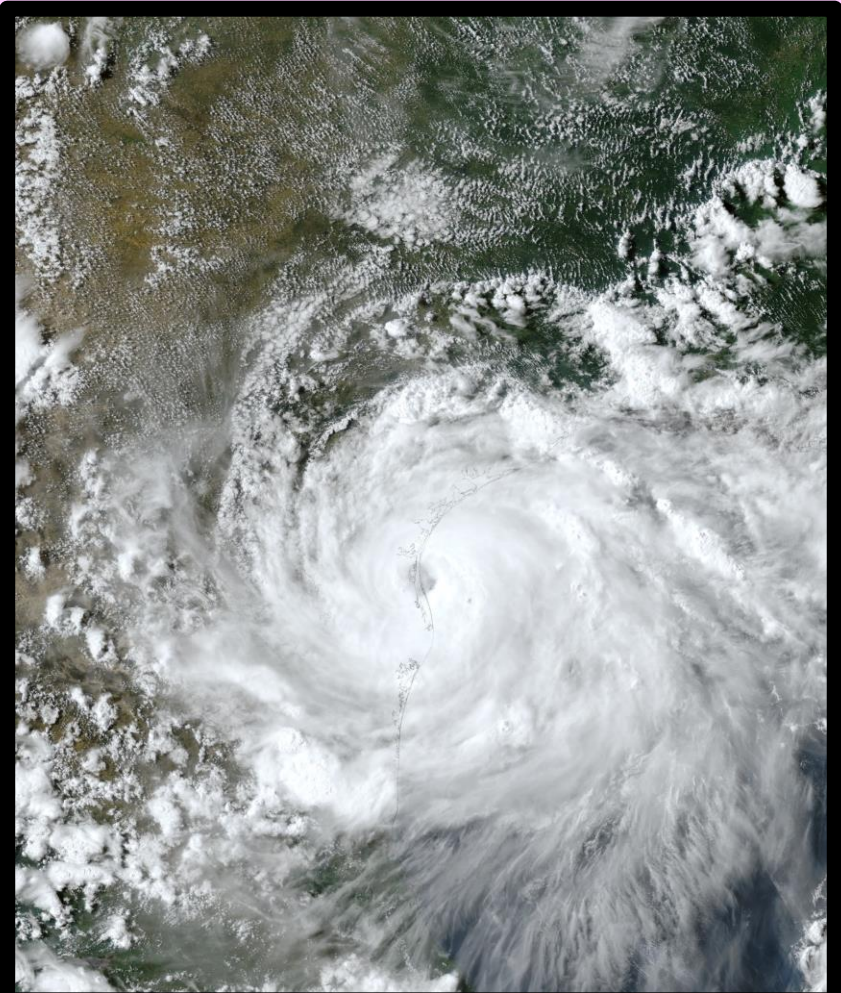


Hurricane Hanna

Hurricane Hanna was the eighth named tropical system and the first hurricane of the season in the Atlantic Basin. Hanna originated from a cluster of strong thunderstorms that moved over Hispaniola on July 19th. It would eventually become Tropical Depression Eight in the central Gulf of Mexico on July 23rd, reach Tropical Storm strength a day later, and become a hurricane on July 25th. It made landfall at 5pm on July 25th in Padre Island, TX with maximum sustained winds of 90 mph. Hanna brought storm surge, strong winds, and extreme rainfall to portions of South Texas and Northern Mexico.

Hanna was the earliest “H” storm to form on record for the Atlantic Basin, beating the old record held by Tropical Storm Harvey which formed on August 2nd, 2005. It was also the first hurricane to make landfall in Texas since Hurricane Harvey in 2017, and the first July landfalling hurricane since Hurricane Dolly in 2008.

Formed	Dissipated	Min Pressure	Max Sustained Wind
July 23 rd	July 27 th	973 mb	90 mph



Hurricane Hanna on July 25th, 2020 making landfall on Padre Island, Texas

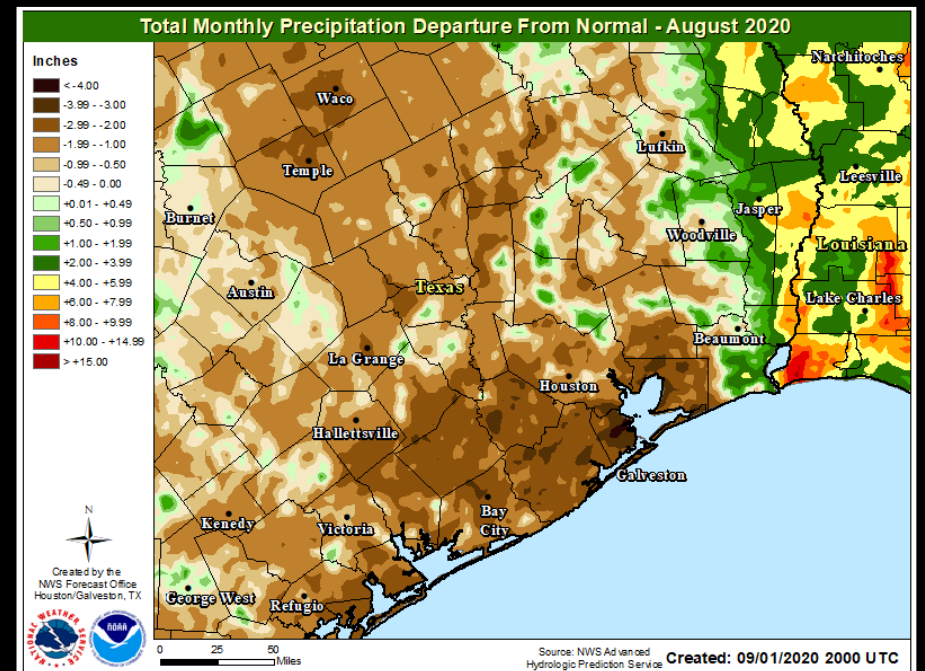
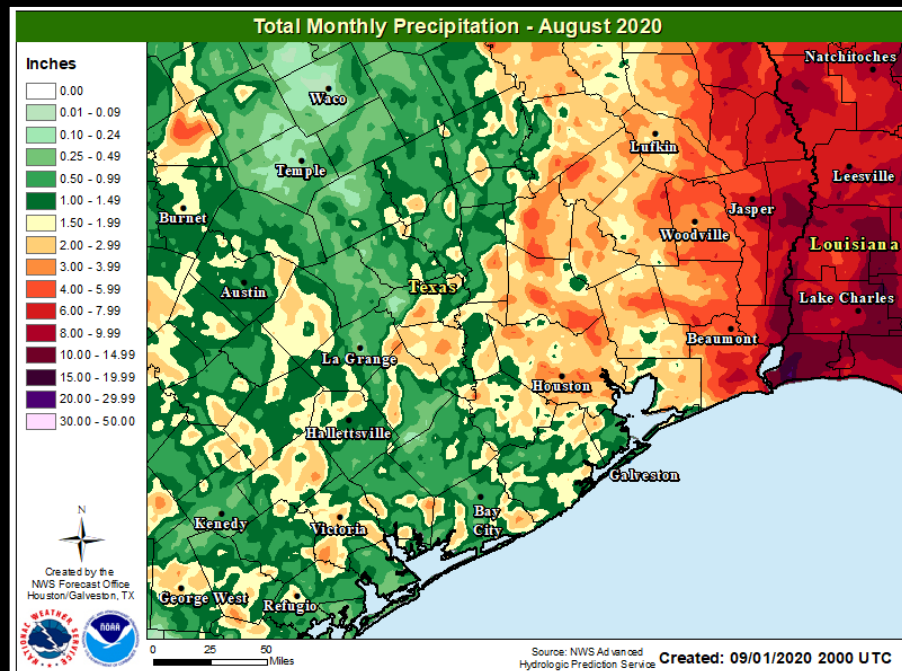
August was another month of unseasonably warm and dry conditions for SE Texas. Most of the region saw average temperatures around two to three degrees above normal with the City of Houston, Houston-Hobby, and the City of Galveston all experiencing all-time record high minimum temperatures on August 31st. The City of Galveston and Houston-Hobby were both the second warmest Augusts on record. Precipitation deficits across the region were anywhere between two and four inches, which lead to the expansion of the drought.

Location	Average High Temp (F)	Average Low Temp (F)	Average Temp (F)	Normal Average Temp (F)	Departure From Normal Average (F)	Maximum Temperature (F)	Minimum Temperature (F)
Galveston (GLS)	93.0	82.7	87.9	85.0	+2.9	97 on the 18 th	77 on the 1 st
Houston Hobby (HOU)	95.6	78.5	87.0	84.2	+2.8	100 on the 16 th	73 on the 1 st & 17 th
City of Houston (IAH)	97.1	86.6	76.0	84.6	+2.0	102 on the 16 th	71 on the 20 th
College Station (CLL)	97.8	75.3	86.5	85.3	+1.2	103 on the 28 th	71 on the 3 rd & 17 th





Location	Total Precipitation (in.)	Departure from Normal (in.)	Number of Thunder Days	Maximum Daily Precipitation (in./date)	
Galveston (GLS)	0.75	-3.65	8	0.34	24 th
Houston Hobby (HOU)	3.20	-1.86	9	1.42	1 st
City of Houston (IAH)	2.26	-1.50	8	1.63	17 th
College Station (CLL)	0.58	-2.10	7	1.43	28 th



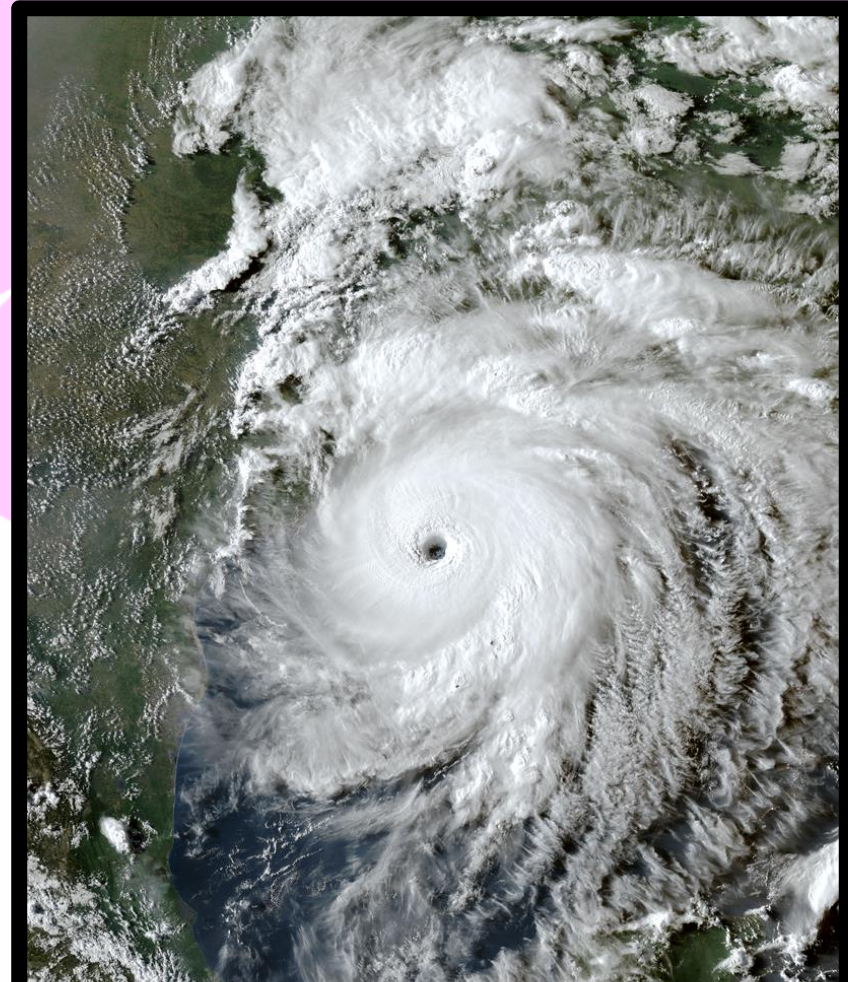
Hurricane Laura

Hurricane Laura was the 12th named tropical system and the 4th hurricane of the season in the Atlantic Basin. It was also the first Major Hurricane of the season. Laura originated from a cluster of strong thunderstorms that moved off the African coast on August 16th. It would eventually become Laura in the Eastern Caribbean on August 21st and move across various Caribbean Islands through the next several days. On the 25th it entered the southern Gulf of Mexico. It moved northwestward through the Gulf towards the TX/LA coastline in the subsequent days while going under rapid intensification. It eventually made landfall near Cameron, LA around 1am on August 27th as a Category 4 Hurricane with maximum sustained winds of 150 mph.

Hurricane Laura brought devastating storm surge, heavy rainfall, and dangerous winds across extreme eastern Texas and across Louisiana. The highest storm surge reported from Laura so far was 17.2 ft in Rutherford Beach. There were 77 fatalities attributed to Laura across the Caribbean and the US.

Formed	Dissipated	Min Pressure	Max Sustained Wind
August 20 th	August 29 th	937 mb	150 mph

29



Hurricane Hanna on August 26th, 2020
approaching the Louisiana coastline

The start of the month was dry and exceptionally warm. Three primary climate sites (Houston-Hobby, City of Houston, and City of Galveston) set new all-time record high minimum temperatures at the start of the month. Overall, there were 21 daily temperature records tied or broken in September with 3 daily rainfall records broken. These broken rainfall records will lead us into the biggest story of the month, Tropical Storm Beta, which caused all 3 of the daily rainfall records. Tropical Storm Beta, the 22nd tropical system of the year, made landfall on the Matagorda Peninsula on the night of September 21st. Dangerous surf preceded Beta by a couple of days, then heavy rainfall and coastal flooding occurred on the 21st and 22nd of the month. The rainfall from Beta helped to wipeout the drought across Southeast Texas.

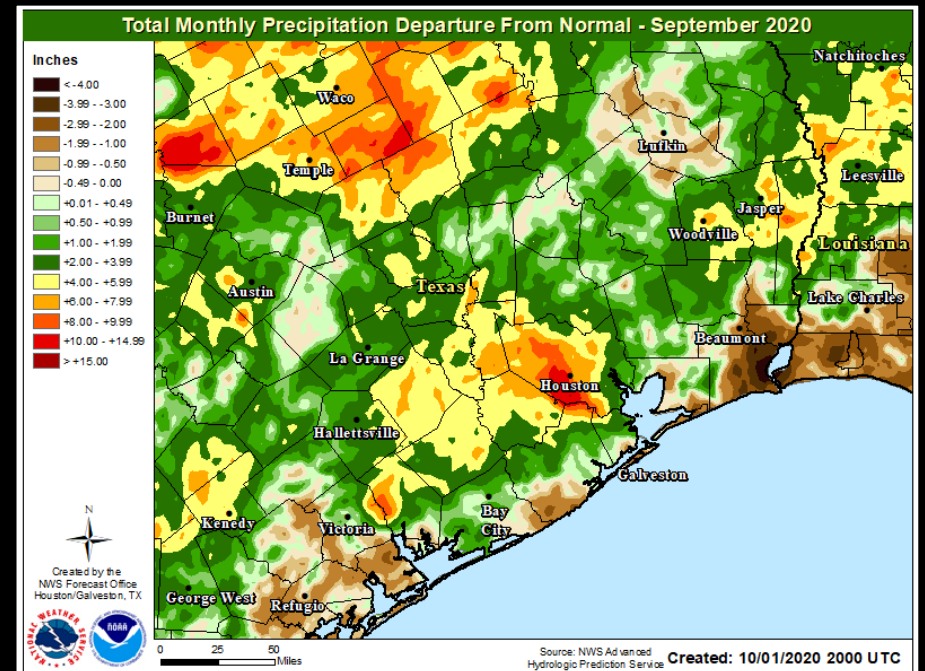
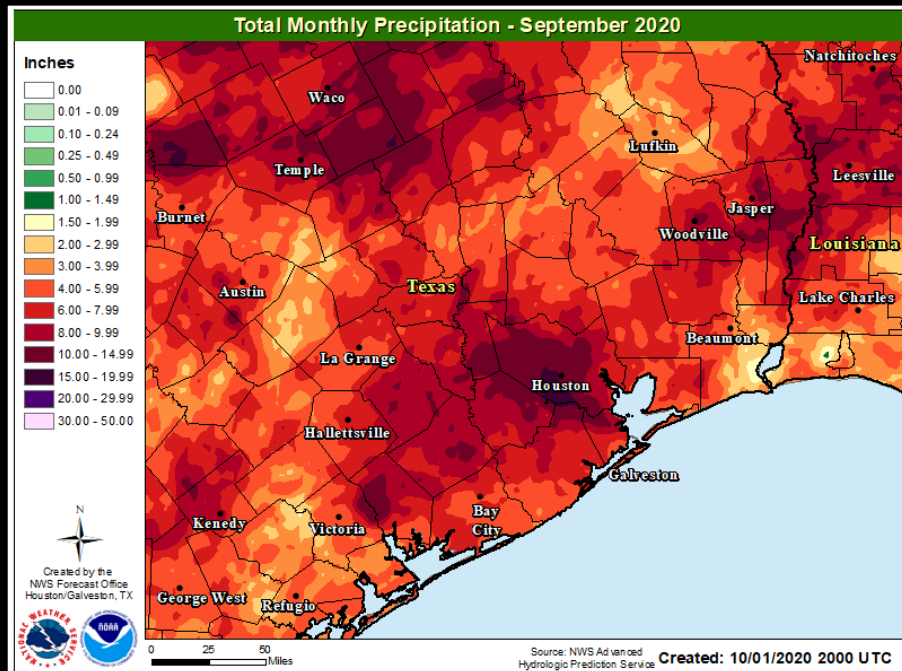
Location	Average High Temp (F)	Average Low Temp (F)	Average Temp (F)	Normal Average Temp (F)	Departure From Normal Average (F)	Maximum Temperature (F)	Minimum Temperature (F)
Galveston (GLS)	88.4	78.0	83.2	81.6	+1.6	96 on the 16 th	63 on the 30 th
Houston Hobby (HOU)	90.0	74.7	82.3	80.1	+2.2	99 on the 2 nd	58 on the 29 th
City of Houston (IAH)	89.8	72.2	81.0	79.8	+1.2	99 on the 1 st & 2 nd	54 on the 30 th
College Station (CLL)	86.7	69.2	77.9	80.0	-2.1	100 on the 1 st	53 on the 29 th & 30 th

September 2020

31



Location	Total Precipitation (in.)	Departure from Normal (in.)	Number of Thunder Days	Maximum Daily Precipitation (in./date)	
Galveston (GLS)	4.01	-2.02	10	1.88	22 nd
Houston Hobby (HOU)	13.07	+7.89	7	7.32	22 nd
City of Houston (IAH)	8.53	+4.41	9	3.58	22 nd
College Station (CLL)	3.82	+0.64	6	1.22	22 nd



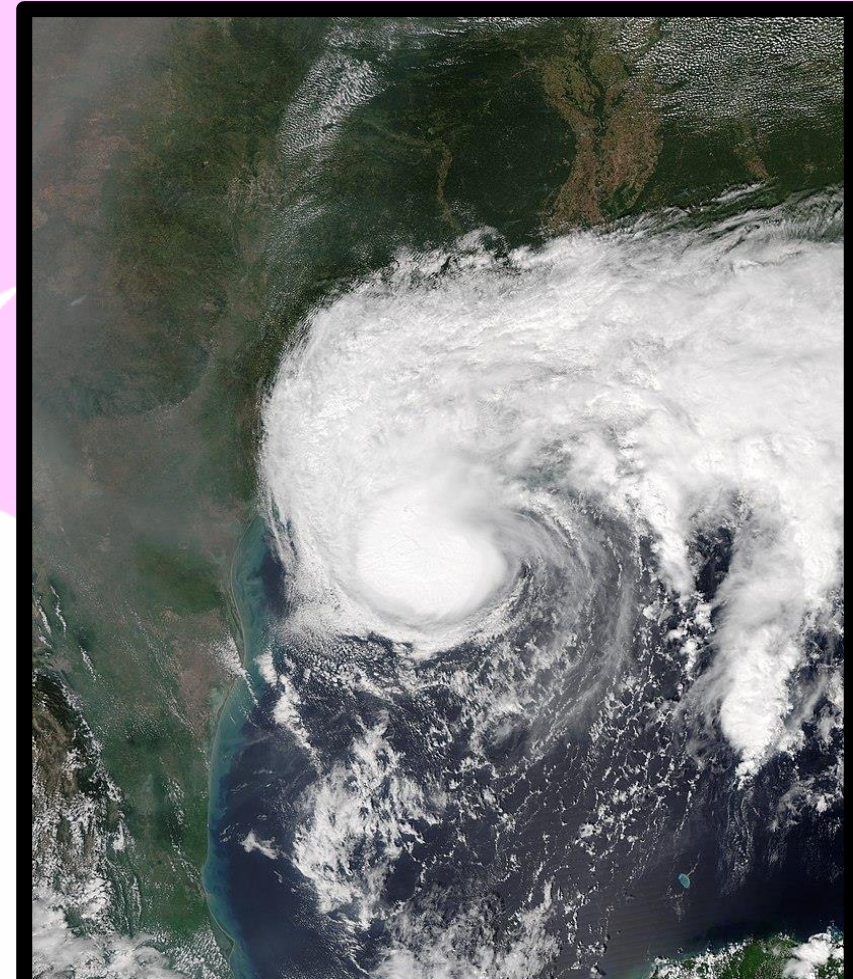
Tropical Storm Beta

32

Formed	Dissipated	Min Pressure	Max Sustained Wind
Sept 17 th	Sept 25 th	994 mb	60 mph

Tropical Storm Beta formed as a depression in the southwestern Gulf of Mexico on September 16th becoming the 22nd tropical system of the year in the Atlantic Basin. It strengthened into a Tropical Storm a day later and very slowly moved northward through the following few days. On September 20th, Beta stalled then took a turn to the west and eventually made landfall on September 21st on the southern tip of the Matagorda Peninsula.

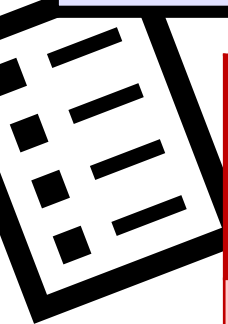
While Beta did not have strong winds associated with it, the slow nature of it allowed for dangerous marine conditions to begin days before landfall. Coastal flooding, high waves, and rip currents all occurred before and during Beta. Heavy rainfall associated with Beta occurred in Galveston, Fort Bend, and Harris counties. The heavy rainfall led to multiple road closures due to street flooding as well as flooding of creeks and bayous. There was one fatality during the storm along Brays Bayou.

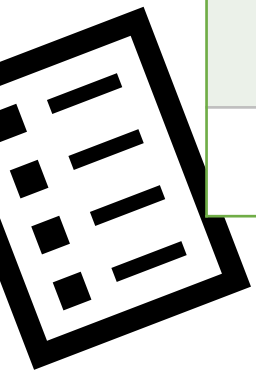


Tropical Storm Beta on September 20th, 2020 as it stalled in the western Gulf

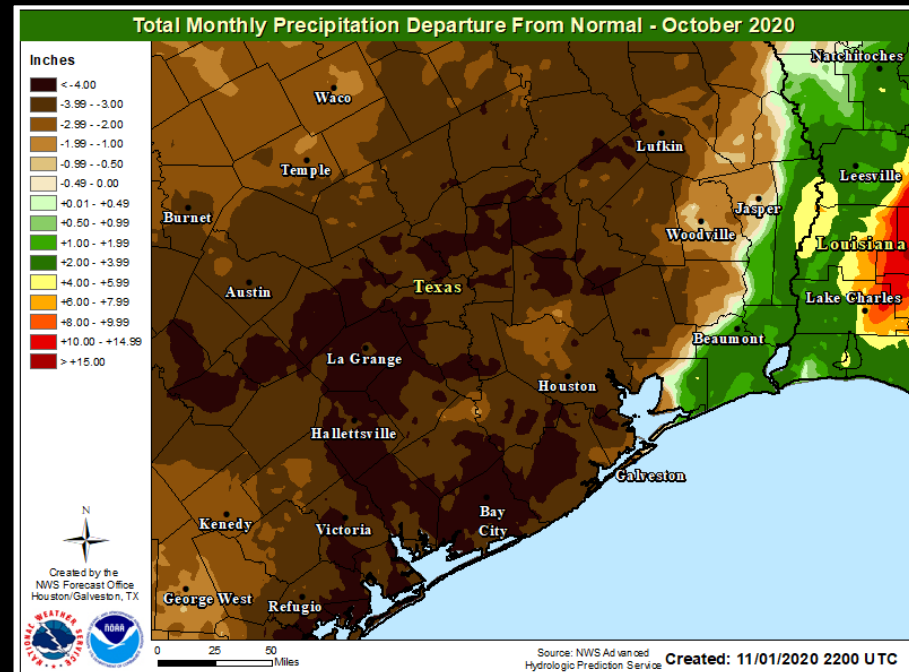
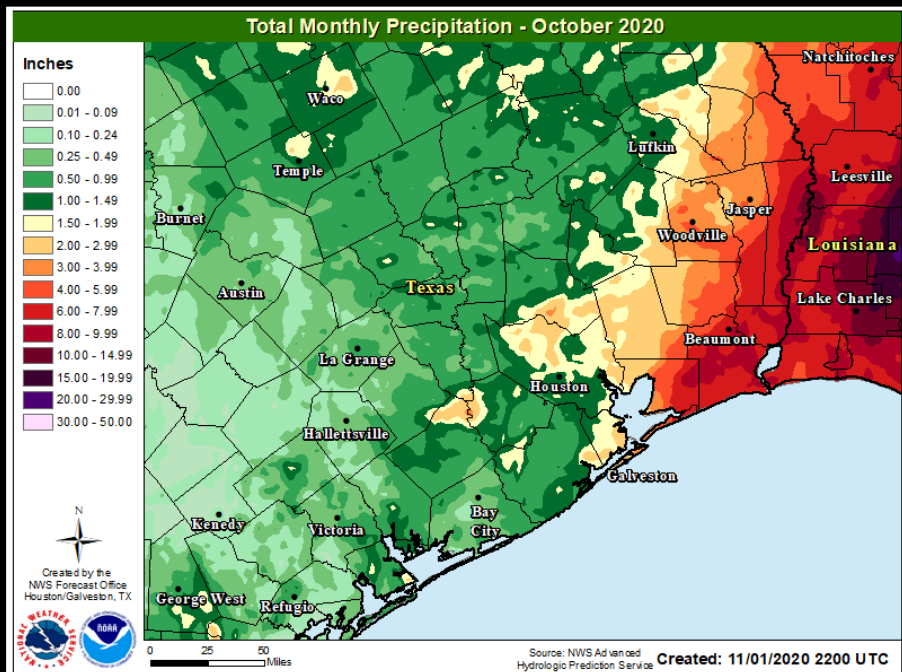
Unlike September, October was an abnormally dry month across Southeast Texas. This led to drought conditions forming across portions of the area, and unfortunately drier than normal conditions are expected to continue through November. Temperatures skewed warmer than normal across the area. A couple of potent cold front moved through the region towards the end of the month bringing sharp decreases in temperatures. However, these cooler temperature typically only lasted for a couple of days or would stall halfway through the region.

Location	Average High Temp (F)	Average Low Temp (F)	Average Temp (F)	Normal Average Temp (F)	Departure From Normal Average (F)	Maximum Temperature (F)	Minimum Temperature (F)
Galveston (GLS)	81.3	69.2	75.3	74.3	+1.0	89 on the 12 th	50 on the 29 th
Houston Hobby (HOU)	83.6	65.1	74.3	72.1	+2.2	93 on the 11 th & 15 th	46 on the 29 th
City of Houston (IAH)	82.6	60.9	71.7	71.5	+0.2	94 on the 11 th	42 on the 29 th
College Station (CLL)	82.1	59.0	70.6	70.8	-0.2	94 on the 11 th	39 on the 29 th





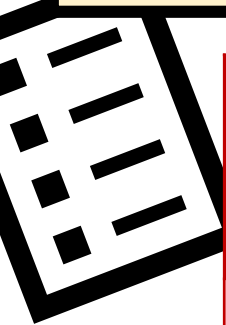
Location	Total Precipitation (in.)	Departure from Normal (in.)	Number of Thunder Days	Maximum Daily Precipitation (in./date)	
Galveston (GLS)	2.50	-3.02	2	2.10	9 th
Houston Hobby (HOU)	1.13	-4.86	2	0.43	15 th
City of Houston (IAH)	0.67	-5.03	2	0.53	16 th
College Station (CLL)	0.45	-4.46	1	0.17	28 th



November 2020

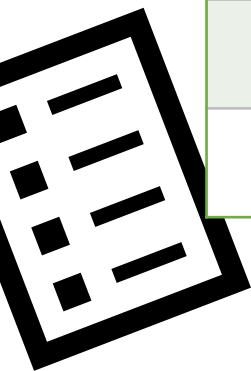
Drought conditions expanded across the area during the month of November due to the area experiencing almost no precipitation through the first three weeks of the month. These dry conditions allowed for above normal temperatures to persist through the majority of the month as well. This all changed when a complex system involving a stalled front, coastal low, and eventual cold front at the end of the month brought some much needed rain for the region. This allowed for most of the area to finish off the month closer to near normal precipitation totals.

Location	Average High Temp (F)	Average Low Temp (F)	Average Temp (F)	Normal Average Temp (F)	Departure From Normal Average (F)	Maximum Temperature (F)	Minimum Temperature (F)
Galveston (GLS)	76.0	64.4	70.2	65.1	+4.4	83 on the 14 th	47 on the 30 th
Houston Hobby (HOU)	78.2	59.2	68.7	63.2	+5.5	87 on the 10 th	39 on the 30 th
City of Houston (IAH)	77.8	54.1	66.0	62.3	+3.7	87 on the 10 th & 14 th	37 on the 30 th
College Station (CLL)	77.2	53.7	65.4	60.8	+4.6	88 on the 14 th	32 on the 30 th

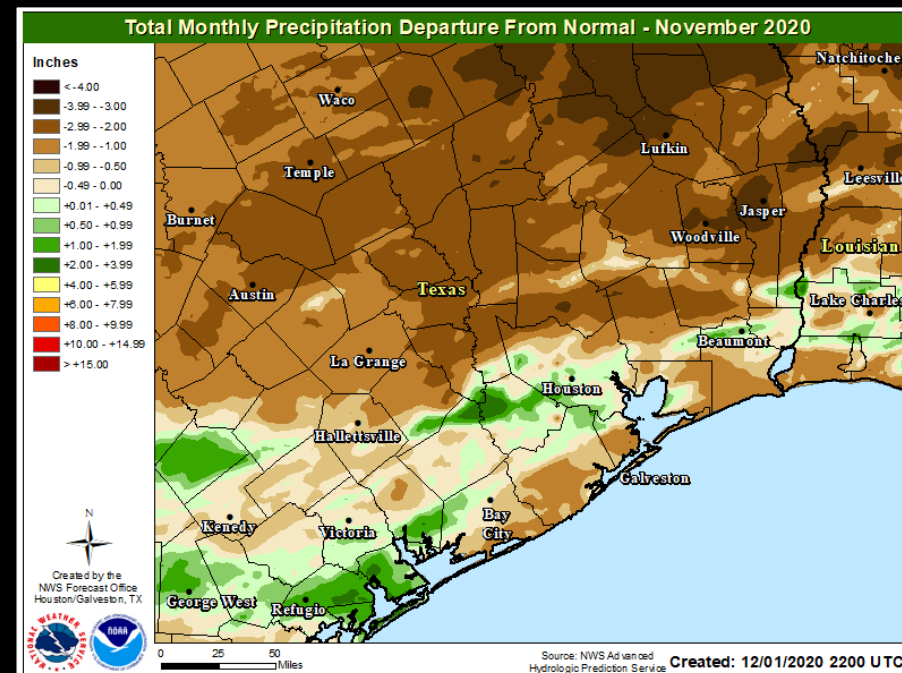
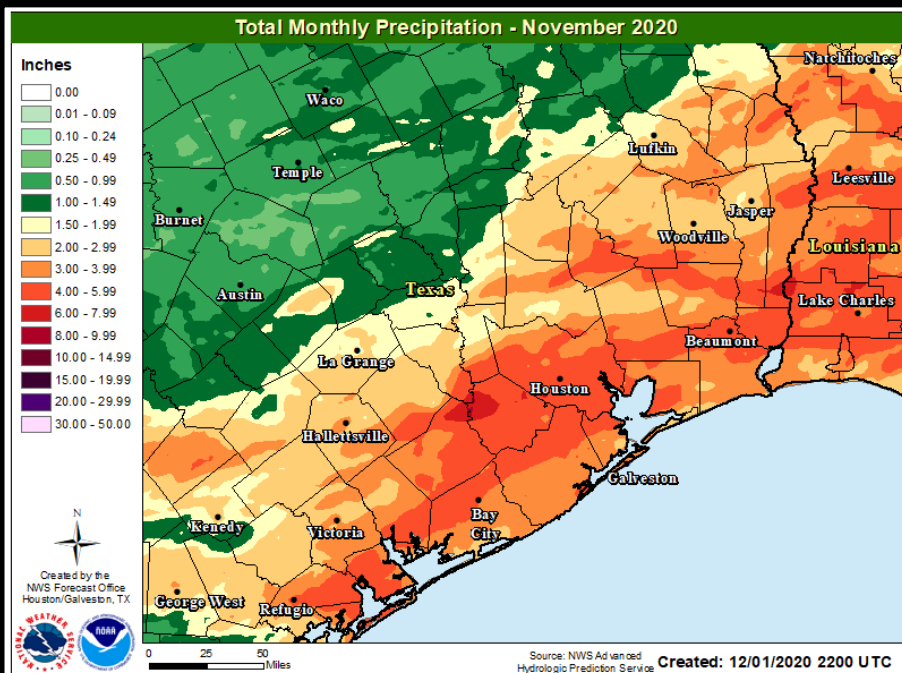


November 2020

36



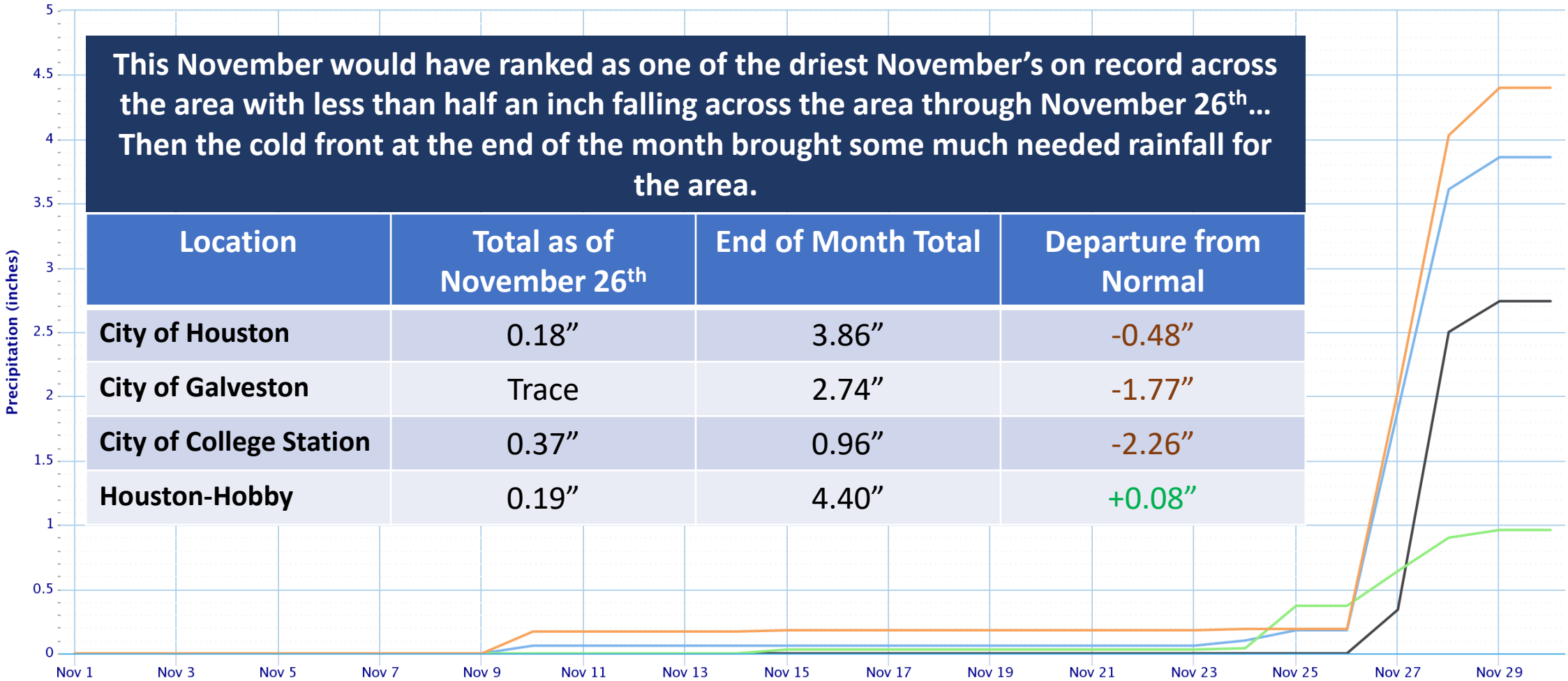
Location	Total Precipitation (in.)	Departure from Normal (in.)	Number of Thunder Days	Maximum Daily Precipitation (in./date)	
Galveston (GLS)	2.74	-1.77	1	2.16	28 th
Houston Hobby (HOU)	4.40	+0.08	1	1.99	28 th
City of Houston (IAH)	3.86	-0.48	1	1.72	28 th
College Station (CLL)	0.96	-2.26	1	0.33	25 th



Precipitation Accumulation Graph

Accumulated Precipitation

Green/black diamonds represent subsequent/missing values



This November would have ranked as one of the driest November's on record across the area with less than half an inch falling across the area through November 26th... Then the cold front at the end of the month brought some much needed rainfall for the area.

Location	Total as of November 26 th	End of Month Total	Departure from Normal
City of Houston	0.18"	3.86"	-0.48"
City of Galveston	Trace	2.74"	-1.77"
City of College Station	0.37"	0.96"	-2.26"
Houston-Hobby	0.19"	4.40"	+0.08"

City of Houston

City of Galveston

City of College Station

Houston-Hobby



December 2020

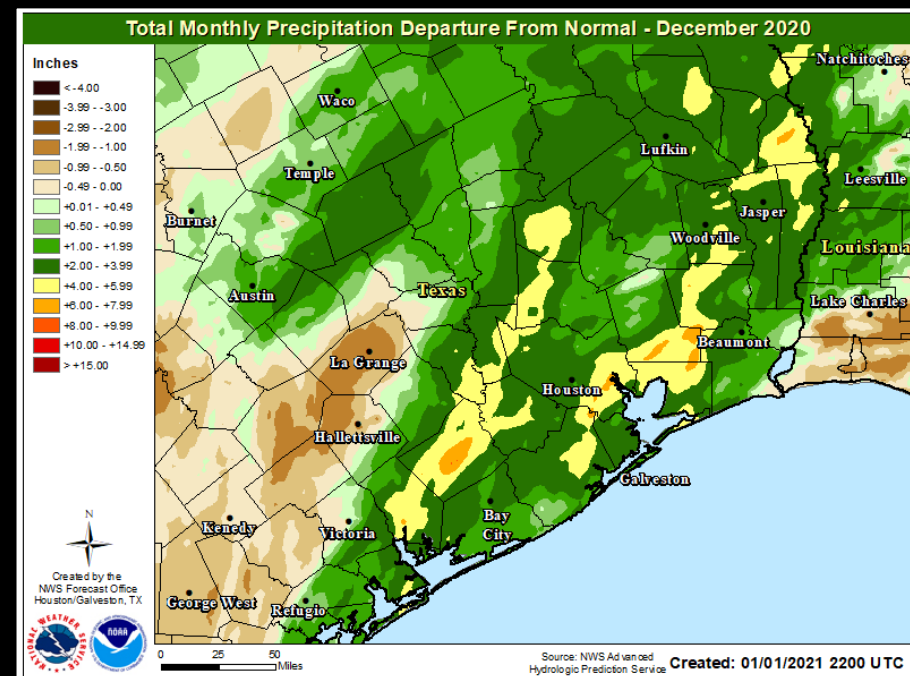
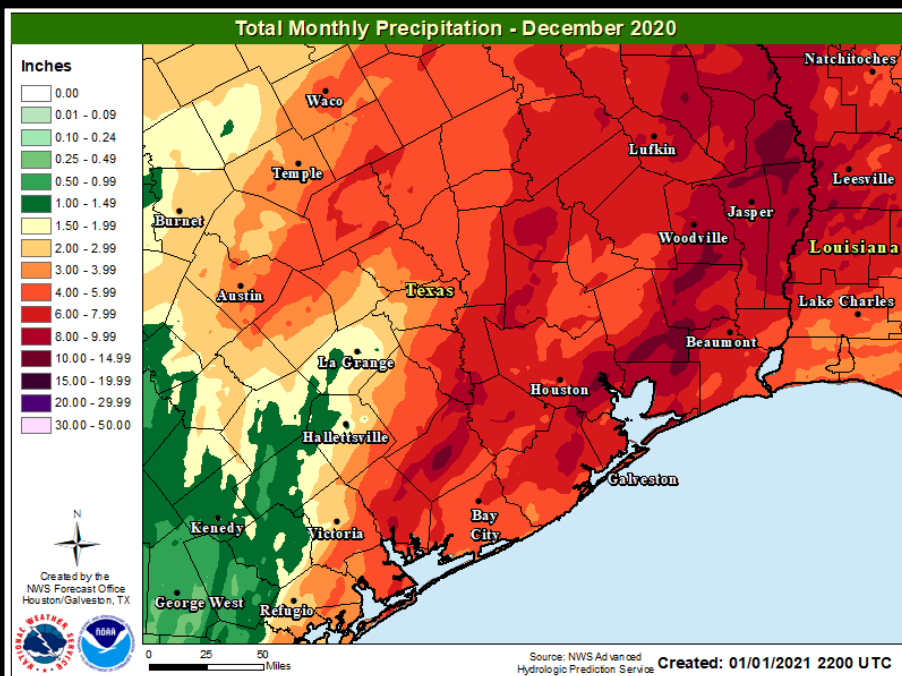
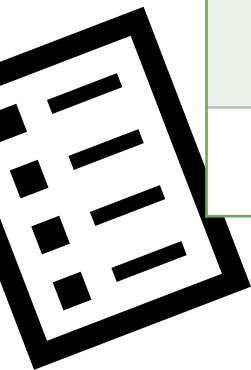
Multiple cold fronts moved through the region during the month of December bringing periods of rain and a bit of a rollercoaster of temperatures. Generally around three to six inches of rain fell across the area through the month, but there were some localized higher totals such as at Houston-Hobby and Pearland which each got around eight inches total for the month (around four inches more than normal). Despite the wetter than normal conditions, the month ended on average around one to two degrees above normal.

Location	Average High Temp (F)	Average Low Temp (F)	Average Temp (F)	Normal Average Temp (F)	Departure From Normal Average (F)	Maximum Temperature (F)	Minimum Temperature (F)
Galveston (GLS)	65.3	52.2	58.7	57.3	+1.4	75 on the 30 th	40 on the 17 th
Houston Hobby (HOU)	67.9	47.4	57.6	55.6	+2.0	81 on the 23 rd	32 on the 1 st
City of Houston (IAH)	66.8	43.9	55.4	54.4	+1.0	84 on the 23 rd	30 on the 1 st
College Station (CLL)	65.6	41.6	53.6	52.2	+1.4	81 on the 9 th	29 on the 1 st & 17 th



December 2020

Location	Total Precipitation (in.)	Departure from Normal (in.)	Number of Thunder Days	Maximum Daily Precipitation (in./date)	
Galveston (GLS)	3.98	+0.46	4	1.23	19 th
Houston Hobby (HOU)	8.04	+4.03	4	2.65	13 th
City of Houston (IAH)	4.47	+0.73	6	1.03	2 nd
College Station (CLL)	4.61	+1.38	2	1.70	31 st



2020 Atlantic Tropical Summary

40



12

Storms hit the U.S. coastline, (5 of which came ashore in Louisiana)

Previous record: 9 in 1916

13

Hurricanes

Average season has six

6

Major hurricanes

Average season has three

10

Named storms that formed in September

Most for any month on record

10

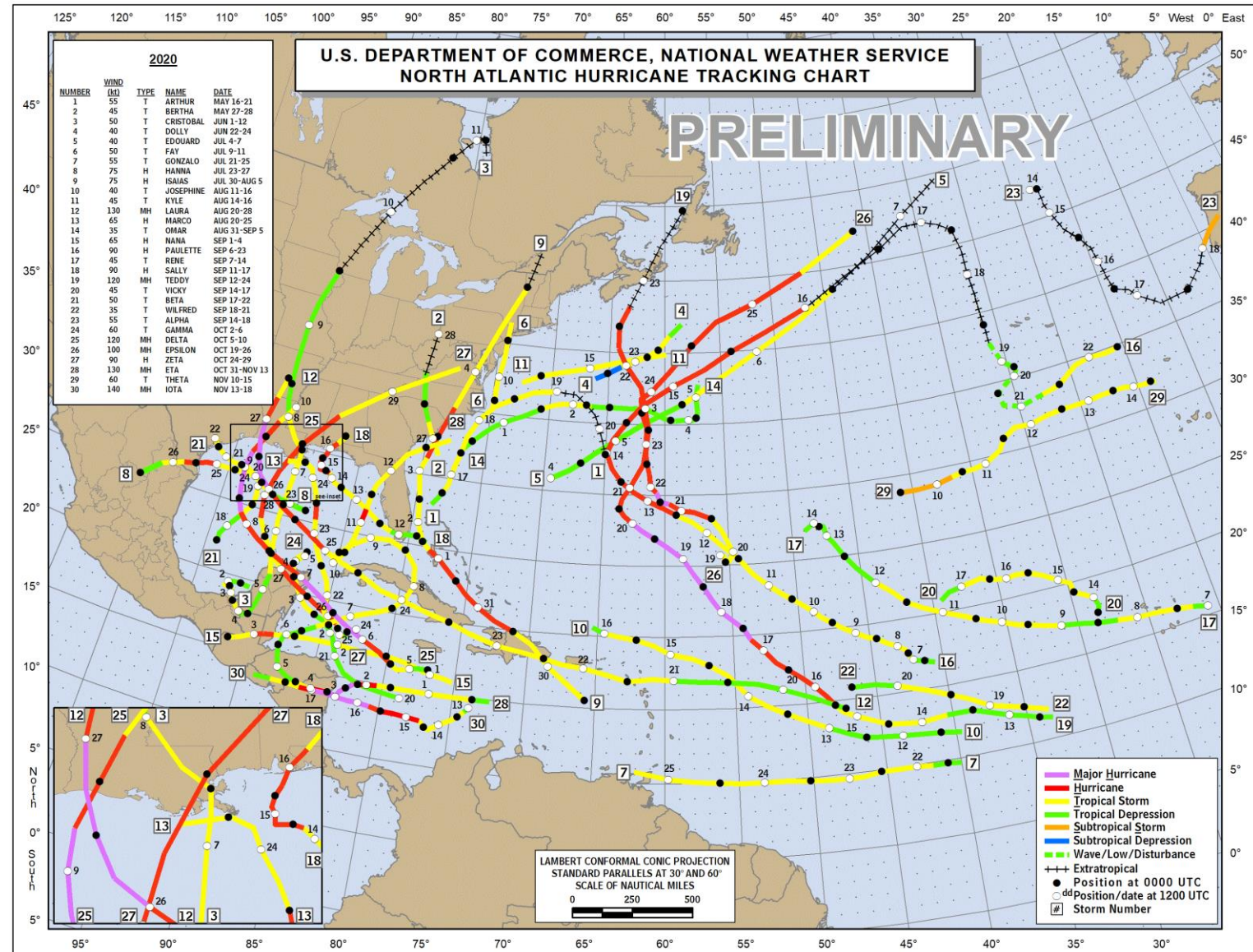
Rapidly intensifying storms sampled

by NOAA and the U.S. Air Force

30

Named storms

Arthur	Paulette
Bartha	Rene
Cristobal	Sally
Dolly	Teddy
Edouard	Vicky
Fay	Wilfred
Gonzalo	Alpha
Hanna	Beta
Isaias	Gamma
Josephine	Delta
Kyle	Epsilon
Laura	Zeta
Marco	Eta
Nana	Theta
Omar	Iota



Climate Primary Site History

Galveston (GLS)

Records for Galveston are from observations at the following locations: 67-69 Strand (April 1, 1871 - Aug 31, 1874); 23rd and the Strand (Sep 1, 1874 - July 29, 1878), 1.75 miles WSW of the previous location; the Custom House at Bath Street and the Strand (July 30, 1878 - May 8, 1882); Colorado and Santa Fe Railroad Building at 25th and the Strand (May 9, 1882 - March 14, 1883); back to the Custom House which later became the Cotton Exchange Building (March 15, 1883 - June 24, 1898), about a 1/3 of a mile E of the previous Custom House location; The Levy Building at 2223 Market Street (June 25, 1898 - Nov 26, 1900); the Trust Building at Tremont and Post Office Streets (Nov 27, 1900 - June 24, 1946), one-quarter mile south of the Levy Building; the U.S. Post Office Building at 601 Rosenberg (June 25, 1946 - 1994); Scholes Field (January 1995 to present).

College Station (CLL)

Records from 1893 through July 1951 are based on observations taken at the Texas Agriculture Experiment COOP Station main farm located 6 miles southwest of College Station. Records from August 1951 through the present are based on observations taken at Easterwood Field. Normal temperatures are calculated from 1981 to 2000 period.

City of Houston (IAH)

Records for the City of Houston are from observations at the following locations: Cotton Station from July 1881 through September 1909, Stewart Building at Preston and Fannin from September 1909 through February 1926, Shell Building at Texas and Fannin from March 1926 through August 1938, Federal Building at Franklin and Fannin from August 1938 through May 1969, Intercontinental Airport from June 1969 to the present .

Houston Hobby (HOU)

Records are based upon observations beginning in August 1931.

