



# NWS Houston, Texas September 2017 Regional Climate Summary

## Regional Climate Summary

Produced by Nikki Hathaway & Paul Lewis

### **. . . A Dry September Contrasted the Wet Year-to-Date . . .**

*Much below normal rainfall occurred across Southeast Texas during the month of September 2017. However little impacts were noted since the month began with very wet soils and lingering flooding from Tropical Storm Harvey's rainfall at the end of August. Therefore, no drought conditions were experienced across SE Texas throughout September. Other than a two-week period of cool conditions following the season's first real cold front on the 5<sup>th</sup> and 6<sup>th</sup>, September ended with temperatures at or slightly above normal for the month.*

# Precipitation

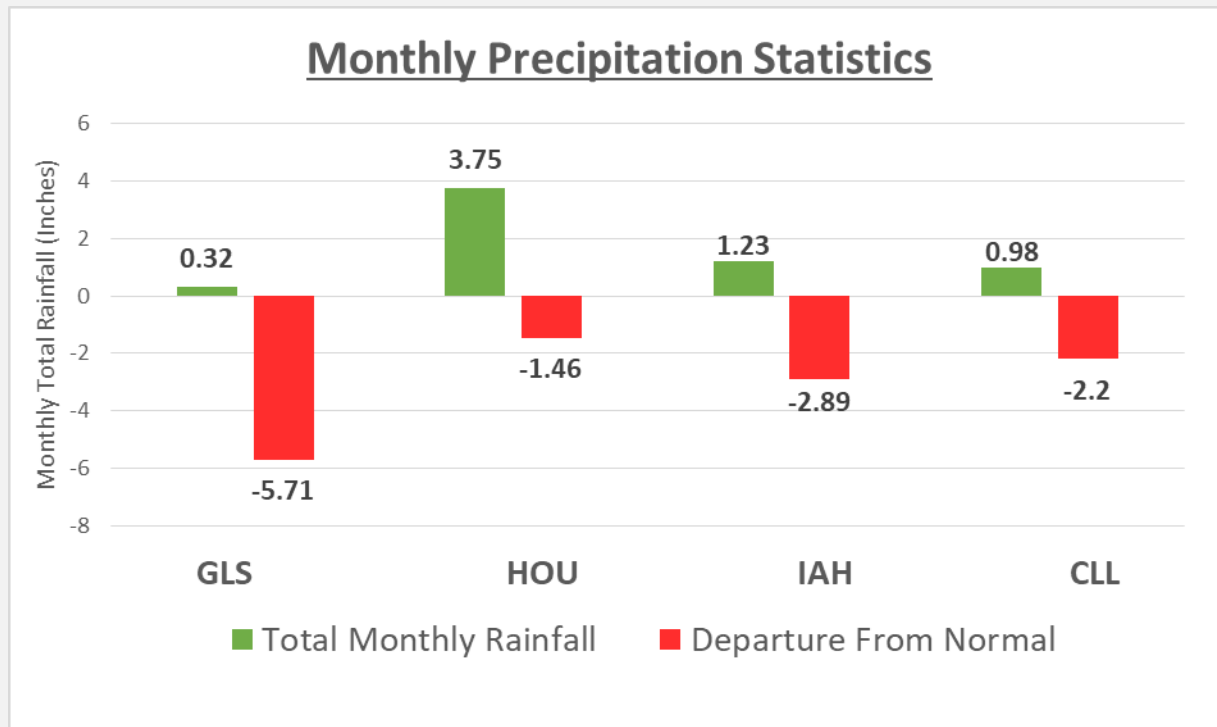
*The dry month of September was in stark contrast to the wet year-to-date by the end of the month. The first day of decent rainfall (more than just a few tenths), did not occur until September 18<sup>th</sup>. The upper level high pressure that was over the region began to weaken allowing for an increase in moisture. Additionally, a trough developed overhead, which helped to produce scattered showers and thunderstorms across SE Texas over the following few days.*

*On September 28<sup>th</sup>, the help of multiple boundaries from both the sea and bay breezes, along with other outflow boundaries and daytime heating allowed scattered showers and thunderstorms to develop. More than a quarter of an inch of rain fell across all four climate sites on this day.*

Site	Total Precipitation (in.)	Departure from Normal (in.)	Number of Thunderstorm Days	Maximum Daily Precipitation (in./date)
Galveston (GLS)	0.32	-5.71	1	0.31 29th
Houston Hobby (HOU)	3.75	-1.46	4	1.32 18th
City of Houston (IAH)	1.23	-2.89	5	0.48 20th
College Station (CLL)	0.98	-2.20	1	0.76 28th



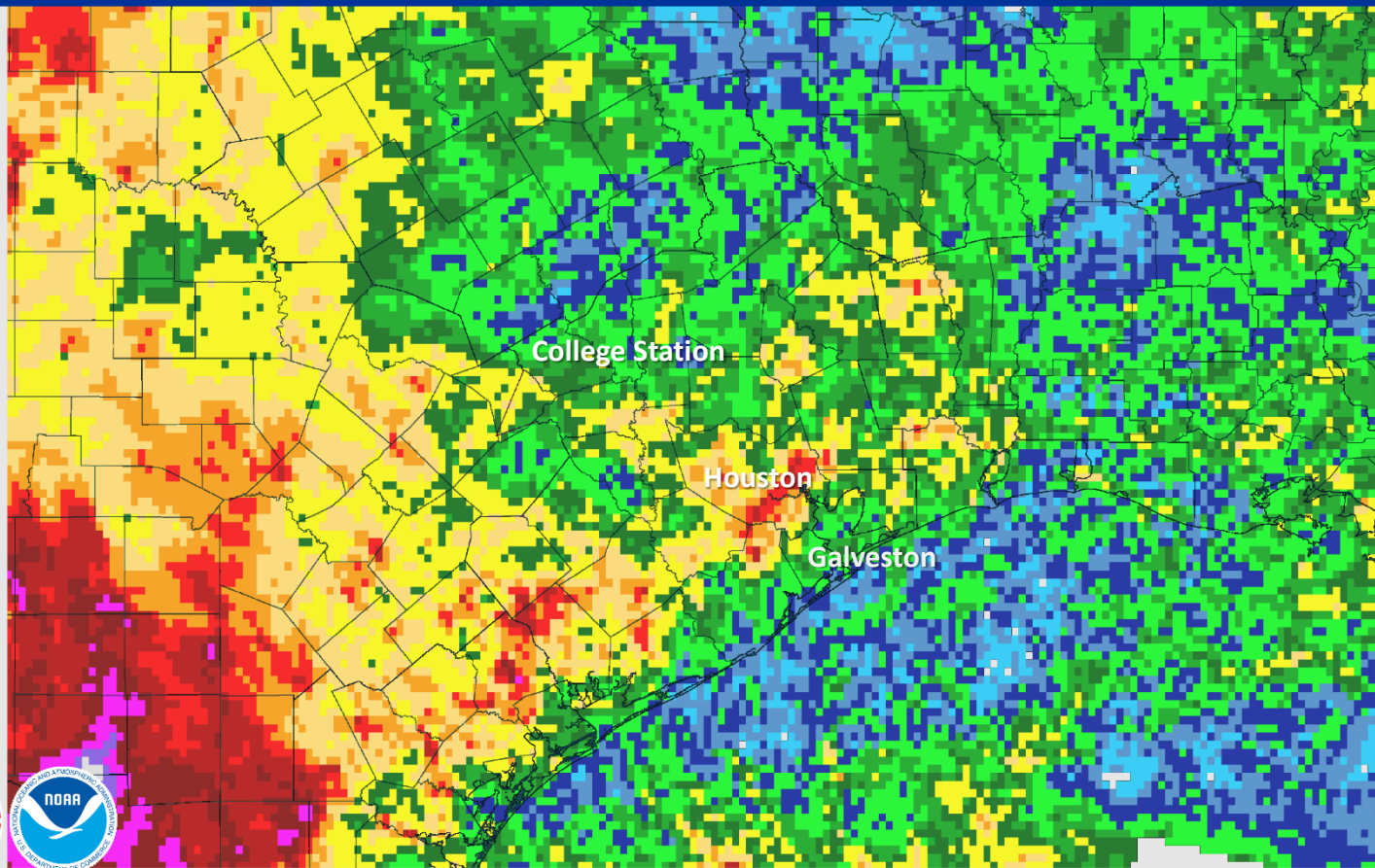
# Precipitation



## September 01, 2017 Monthly Observed Precipitation

Created on: October 04, 2017 - 15:06 UTC

Valid on: October 01, 2017 12:00 UTC



# Precipitation

*The following table list those first- and second-order sites which had nine-month rainfall near or above 90 percent of the normal annual rainfall through September 30<sup>th</sup>.*

Climate Site	Rainfall (inches)	Dep from Annual Norm	Percent of Normal Annual Rainfall
Angleton/Lake Jackson *	47.02	- 3.84	92.4 percent
City of Galveston	50.77	+ 0.01	100.0
City of Houston	72.05	+22.28	144.8
College Station	45.14	+ 5.08	112.7
Conroe Airport	55.43	+ 6.94	114.3
DW Hooks	66.93	+16.45	132.6
Hobby Airport	70.87	+16.22	129.7
Huntsville Airport	55.70	+ 9.56	120.7
Palacios	39.81	- 4.78	89.3
Pearland	73.59	+20.90	139.7
Sugar Land	70.09	+20.61	141.7

\* Note: Angleton/Lake Jackson Airport has missing data from August 30th through September 13th.

# Precipitation

*Nine-month rainfall amounts ended above the annual normal rainfall for many of the major climate and COOP sites across Southeast Texas.*

*The following table list those COOP sites which had nine-month rainfall near or above 90 percent of the normal annual rainfall through September 30<sup>th</sup>.*

Rainfall COOP Site	(inches)	Dep from Annual Norm	Percent of Normal Annual Rainfall
Baytown	92.78	+32.86	154.8 percent
Bellville 6 NNE	47.61	+ 5.89	114.1
Brenham	44.50	- 0.64	98.6
Caldwell	44.68	+ 5.18	113.1
Cleveland	70.52	+16.28	130.0
Columbus	52.96	+ 9.03	120.6
Conroe (COOP)	66.58	+17.81	136.5
Crockett	44.86	- 0.32	99.3
Cypress	61.76	+14.92	131.9
Freeport 2 NW	47.65	- 1.92	96.1
Houston-North Houston	65.94	+13.90	126.7
Houston-Westbury	72.27	+20.45	139.5
Huntsville (COOP)	61.14	+12.06	124.6
Katy Wolf Hill	68.87	+23.34	151.3
Liberty	83.26	+22.01	135.9
Montgomery	57.27	+10.50	122.5
New Caney 2 E	52.38	- 1.11	97.9
NWS League City	85.26	+28.45	150.1
Richmond	69.75	+20.67	142.1
Somerville Dam	40.04	+ 1.37	103.5
Thompsons 3 WSW	49.73	+ 1.95	104.1
Washington State Park	51.82	+10.14	124.3
Wharton	53.03	+ 5.82	112.3

# Temperatures

*Average daily temperatures started off around normal for the first few days of September. Lingering cloud cover from Tropical Storm Harvey allowed for a break from the summer heat. By the end of the first week of September, the first strong frontal passage of the season pushed through SE Texas dropping temperatures roughly five degrees below normal. Cooler, unseasonable temperatures persisted through the second week of September. By September 16<sup>th</sup>, temperatures were back above normal and the warmth continued through the remainder of the month. This extended period of summer-like weather brought the departure from average temperature back up to above normal for the month of September.*

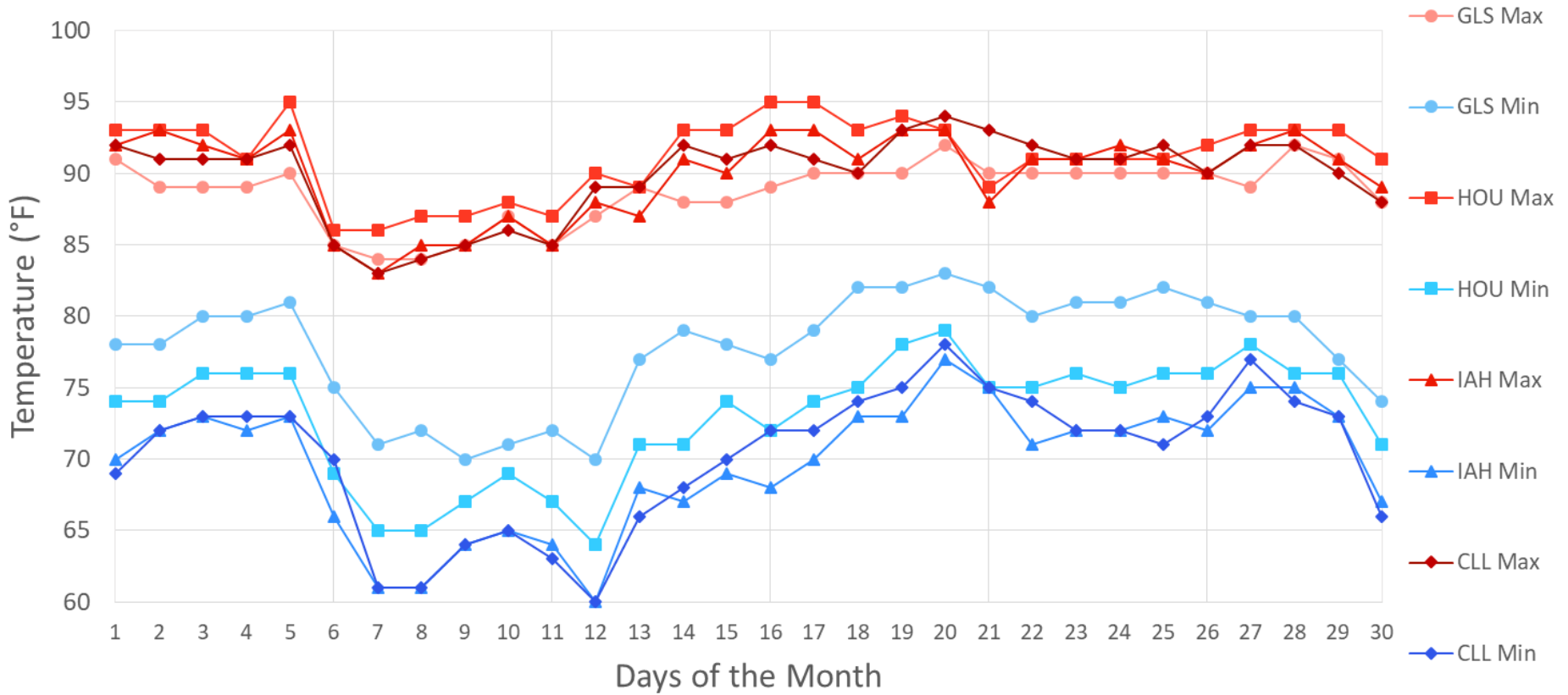
Site	Average Temp (°F)	Average High Temp (°F)	Average Low Temp (°F)	Departure From Normal (°F)	Maximum Temperature (°F)	Minimum Temperature (°F)
Galveston (GLS)	83.2	88.7	77.8	+1.6	92	70
Houston Hobby (HOU)	82.1	91.2	73.0	+2.0	95	64
City of Houston (IAH)	79.8	89.9	69.7	0.0	93	60
College Station (CLL)	80.1	89.9	70.2	+0.1	94	60



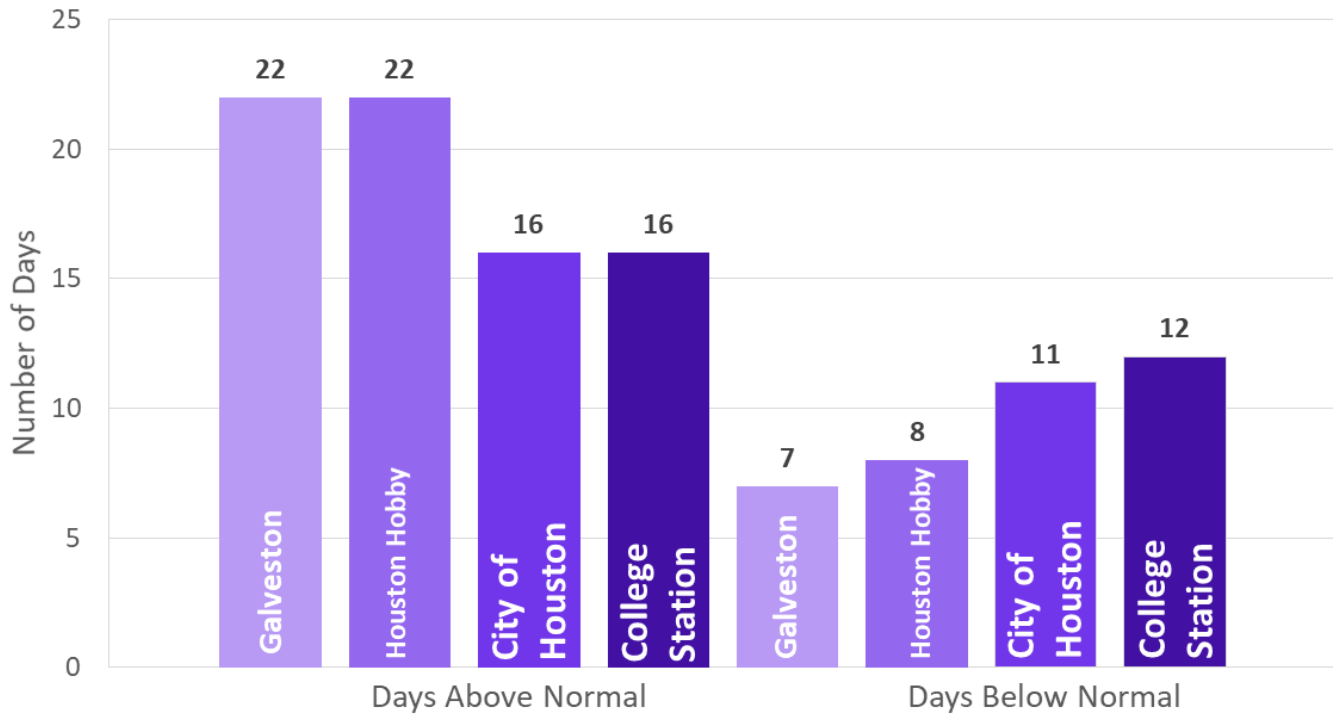
# Temperatures (Continued)

Below is a line graph of temperature trends for the four primary climate sites, as well as a bar graph comparing above and below normal temperature days throughout the month of September.

**September Temperature Trends**



**Mean Departure from Normal Distribution**



# Temperatures

*Average temperatures were very warm across Southeast Texas through the end of September. As a matter of fact, 2017 is the warmest year-to-date through September 30<sup>th</sup> on record for three of the four first-order climate sites. The following table lists the top-ten warmest first nine months of the year on record for the City of Houston and the City of Galveston (with ten or less missing days of data each year):*

Top-10 Warmest 9-Month Average Temperatures  
January 1st through September 30th

City of Houston...			City of Galveston...		
9-Month			9-Month		
Rank	Ave Temp	Year	Rank	Ave Temp	Year
1	74.9	2017	1	76.6	2017
tie		2012	2	76.3	2012
tie		2011	3	74.9	2000
4	74.4	1911	4	74.8	2006
5	74.3	1962	5	74.6	2005
6	73.8	2009	6	74.4	1999
tie		1907	7	74.1	1995
8	73.7	1954	8	74.0	2016
tie		1953	tie		1927
tie		1927	tie		1876





# Temperatures

*The following table lists the top-ten warmest first nine months of the year on record for Hobby Airport and College Station (with ten or less missing days of data each year):*

Top-10 Warmest 9-Month Average Temperatures  
January 1st through September 30th

Hobby Airport...			College Station...		
9-Month			9-Month		
Rank	Ave Temp	Year	Rank	Ave Temp	Year
1	75.8	2017	1	75.0	2011
2	75.2	2011	2	74.5	2012
3	75.1	2012	tie		1911
4	74.8	1998	4	74.1	2017
5	74.7	2000	tie		1925
6	74.5	2016	6	73.7	2009
7	74.2	2009	7	73.3	2000
tie		1999	8	73.1	2006
9	73.9	2008	9	72.9	1990
10	73.7	2006	tie		1916
tie		2005			



# SE TX Climate Sites

*The following table lists the preliminary monthly temperature and rainfall data for climate sites across Southeast Texas in addition to the COOP site at the League City National Weather Service office.*

## September 2017 Data

Site	AVE High	AVE Low	Monthly Daily	AVE DEP	Monthly Rain	Monthly DEP	Year-to-Date Rain	Year-to-Date Dep
IAH	89.9	69.7	79.8	0.0	1.23	-2.89	72.05	+36.06
GLS	88.7	77.8	83.2	+1.6	0.32	-5.71	50.77	+13.56
CLL	89.9	70.2	80.1	+0.1	0.98	-2.20	45.14	+16.44
HOU	91.2	73.0	82.1	+2.0	3.75	-1.46	70.87	+30.56
CXO	88.9	65.2	77.1	-0.3	0.34	-3.50	50.87	+16.86
UTS	88.9	68.0	78.5	+0.3	0.85	-2.86	49.23	+16.18
DWH	89.7	68.4	79.1	+1.1	2.23	-2.34	62.80	+26.14
SGR	91.4	70.5	80.9	+2.0	1.60	-2.92	67.38	+31.32
LBX *	90.8	73.7	82.3	+3.8	0.10	-5.88	41.78	+4.52
PSX	87.4	69.4	78.4	-1.6	0.57	-4.56	35.41	+2.54
LVJ	91.0	72.3	81.6	+2.6	2.08	-3.18	69.22	+30.86
HGX	88.4	70.8	79.6	+1.7	1.02	-6.15	76.33	+34.40

\* Note: The Angleton/Lake Jackson Airport has missing data from September 1st through the 13th.

*These climate sites all report hourly data besides the COOP site at the League City National Weather Service site HGX.*



# CO-OP Observer Sites – p. 1 of 3

*The following table lists the rainfall data from the volunteer network of COOP observers. Note that some of these numbers are incomplete and may be updated at a later date. Year-to-date totals reflect any updates to previous months during the year.*

## COOP Rainfall Observations for September 2017

Location	Monthly		Year-to-Date	
	Rain	Dep	Rain	Dep
Anahuac	0.63	-5.76	36.16	-7.14 #
Angleton 2 W	*	*	29.64	-12.26 #
Bay City Water Works	*	*	39.36	+3.37
Baytown	1.99	-3.53	92.78	+48.90
Bellville 6 NNE	1.87	-1.71	47.61	+17.12
Brenham	2.73	-1.73	44.50	+12.15
Caldwell	1.50	-1.45	44.68	+16.91
Cleveland	*	*	70.52	+32.60
Columbus	2.23	-0.83	52.96	+21.29
Conroe COOP	0.95	-2.80	66.58	+32.47
Crockett	0.05	-2.97	44.86	+12.53
Cypress	0.45	-3.84	61.67	+28.35
Danevang 1 W	2.38	-2.68	40.43	+5.97
Eagle Lake Research Center	1.48	N/A	47.93	N/A &
El Campo	3.29	N/A	51.52	N/A



# CO-OP Observer Sites – p. 2 of 3

*The following table lists the rainfall data from the volunteer network of COOP observers. Note that some of these numbers are incomplete and may be updated at a later date. Year-to-date totals reflect any updates to previous months during the year.*

Freeport 2 NW	0.09	-6.64	47.65	+11.22
Houston-North Houston	*	*	65.94	+27.31
Houston Westbury	2.55	-2.04	72.27	+34.33
Huntsville COOP	0.65	-3.51	61.14	+26.07
Katy Wolf Hill	1.74	-2.14	68.87	+36.79
Lake Livingston	0.79	N/A	42.25	N/A &
Liberty	*	*	83.26	+39.02
Livingston 2 NNE	*	*	28.18	-8.65 #
Madisonville	4.04	+0.62	40.07	+8.09
Matagorda No 2	0.50	-5.26	23.53	-10.26 #
Montgomery	1.75	-2.00	57.27	+25.22
New Caney 2 E	1.52	-3.21	52.38	+14.30 &
Richmond	1.05	-3.22	69.75	+34.84
Somerville Dam	2.20	-0.99	10.04	+12.48 &
South Madisonville	*	N/A	36.26	N/A &
Thompsons 3 WSW	0.15	-4.61	49.73	+14.89
Washington State Park	1.79	-1.57	51.82	+21.95
West Columbia 1 ESE	1.90	N/A	54.67	N/A
Wharton	1.20	-3.41	53.03	+19.08



# CO-OP Observer Sites – p. 3 of 3

## Notes:

\* Current monthly data is unavailable for these sites. The year-to-date data for these stations have been updated through the end of the previous month.

# The "Year-to-Date" rainfall data for these sites was impacted by incomplete August rainfall data which did not include any data for Tropical Storm Harvey.

& The "Year-to-Date" rainfall data for the following sites was impacted because of only partial data for Tropical Storm Harvey in August:

- Eagle Lake Research Center appears to have missed rainfall for August 26th. The site did have a 4-day total of 19.50 inches for August 26th-30th.
- The COOP form shows that Lake Livingston missed rainfall for August 26th and 27th while the 28th-31st were for 1-day totals.
- New Caney 2 E had missing data on August 29th.
- Somerville Dam did not report an observation for August 29th.
- South Madisonville did not report observations for August 25th or 29th. (In addition, South Madisonville did not report any rainfall for all of June and July.)

# Monthly Record Temperature and Rainfall Data

*There were only two records tied during September 2017—both at the same site.*

Site	Date	Record Type	New Record	Previous Record
CLL	None			
GLS	Sep 20 <sup>th</sup>	High Min Temp	83	Tied 1900
	Sep 25 <sup>th</sup>	High Min Temp	82	Tied 1998 & prev
HOU	None			
IAH	None			

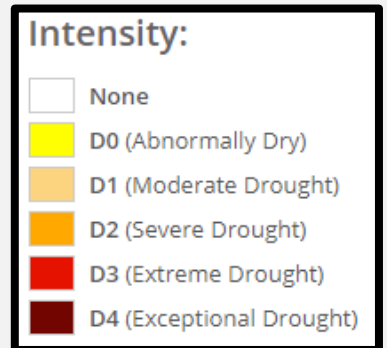
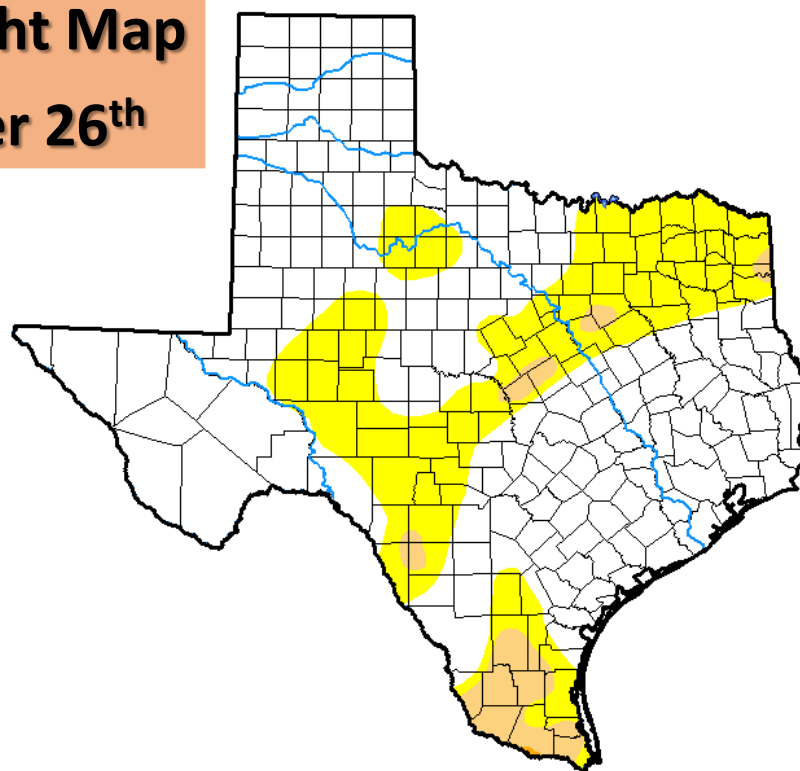


# Drought Conditions

*With the previous month of August extremely wet due to the widespread heavy rainfall from Tropical Storm Harvey, SE TX remained clear from drought conditions over the past few weeks. The month of September reaped the benefits of saturated top soil and a lengthy departure from abnormal dryness. As a result, there were no drought conditions or impacts noted across the entire area of SE Texas, though the top soil has continued to dry out throughout the last month. As a result, an absence from drought criteria will not last long into October. The following table lists the abnormal dry or drought conditions as well as the counties impacted, as noted by the U.S. Drought Monitor.*

For the week ending on:	Intensity and Impacts	Impacting the following Counties
September 5 <sup>th</sup>	No Drought Conditions	None
September 12 <sup>th</sup>	No Drought Conditions	None
September 19 <sup>th</sup>	No Drought Conditions	None
September 26 <sup>th</sup>	No Drought Conditions	None

**Most Recent Drought Map**  
**Posted: September 26<sup>th</sup>**



Source:  
<http://droughtmonitor.unl.edu>



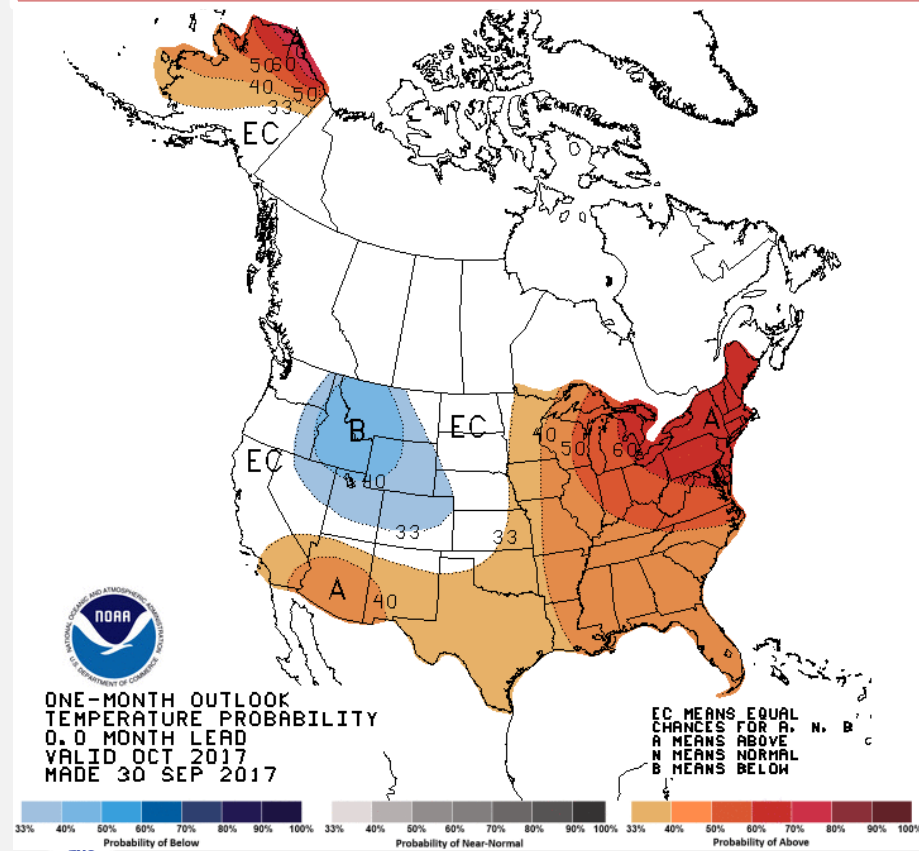
# October Outlook

*The latest outlook from the Climate Prediction Center (CPC) calls for an increased likelihood of above normal temperatures and near normal precipitation for the month of October.*

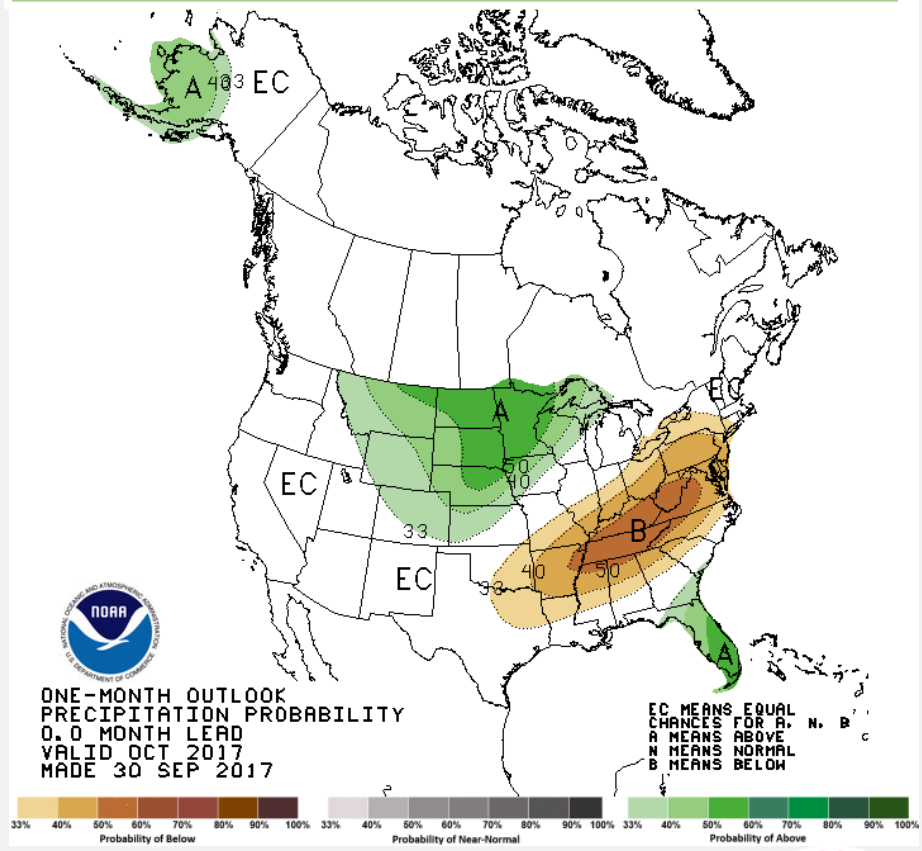
Site	Average Temp(°F)	Normal High (°F)	Normal Low (°F)
Galveston	74.3	68.1	80.6
Houston Hobby	72.1	63.1	81.2
City of Houston	71.5	60.9	82.0
College Station	70.8	60.3	81.4

Site	Normal Monthly Precipitation (in.)
Galveston (GLS)	5.52
Houston Hobby (HOU)	5.99
City of Houston (IAH)	5.70
College Station (CLL)	4.91

## Upcoming Temperature Outlook



## Upcoming Precipitation Outlook





# 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 Sante 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).*

## Houston Hobby (HOU)

*Records are based upon observations beginning in August 1931.*

## 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*

## 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.*

