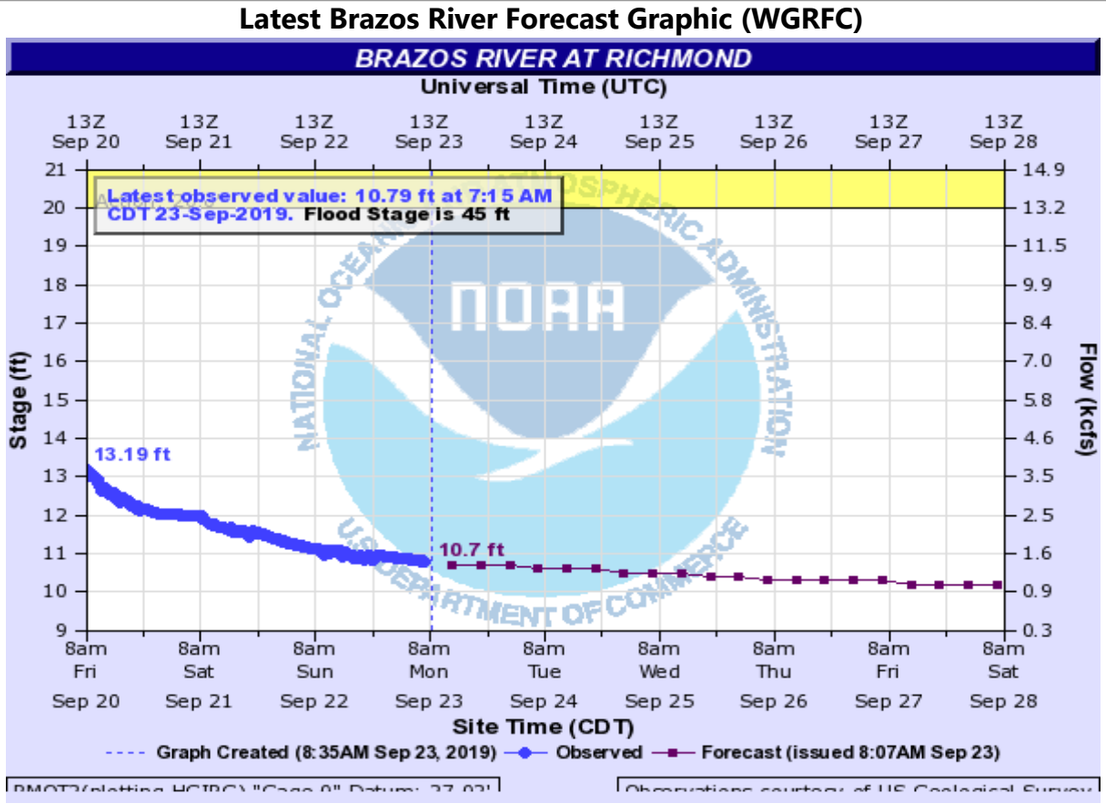
Flood Risk Assessment
Week of September 23, 2019

LJA ENGINEERING

After a Week of Heavy Rainfall, Drier Conditions Return

Brazos River Status

Latest Brazos River Forecast Graphic (WGRFC)



River forecasts for this location take into account past precipitation and the precipitation amounts expected approximately 24 hours into the future from the forecast issuance time.

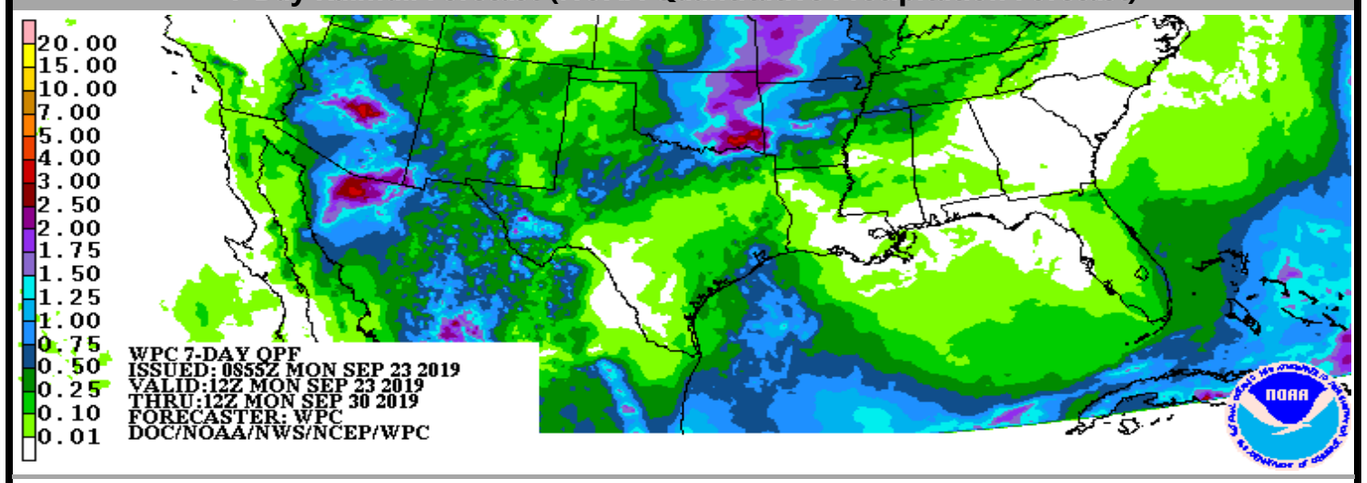
Historical Period Mean:	11.65	(10/98 - 02/19)
Historical Period Peak:	21.13	(10/98 - 02/19)

Flood Categories		Previous 7 Days		Historical Peaks (Top 3)	
Major Flood Stage	50	10.79	Current Reading	High:	61.20 (12/10/1913)
Moderate Flood Stage	48	15.29	Peak Reading		55.19 (09/01/2017)
Flood Stage	45	11.53	Average Reading		54.74 (06/02/2016)
Action Stage	20				
Low Stage	0				

Current Levels **Forecasts Shown Below Current is Proposed Gage Reading at End of Forecast Window*

Location	Datum Adj.	Cur. Stage	Cur. Category	Forecast
Navasota River Near Normangee	245.00	1.46	Below Action	No Forecast
Bryan (Brazos River)	189.30	8.55	Below Action	8.40
Hempstead (Brazos River)	107.90	11.36	Below Action	11.00
Mill Creek Near Bellville	122.82	2.38	Below Action	No Forecast
San Felipe (Brazos River)	0.00	93.64	Below Action	93.50
Richmond (Brazos River)	27.02	10.79	Below Action	10.20
Rosharon (Brazos River)	0.01	8.98	Below Action	6.70

7 Day Rainfall Forecast (NOAA Quantitative Precipitation Forecast)

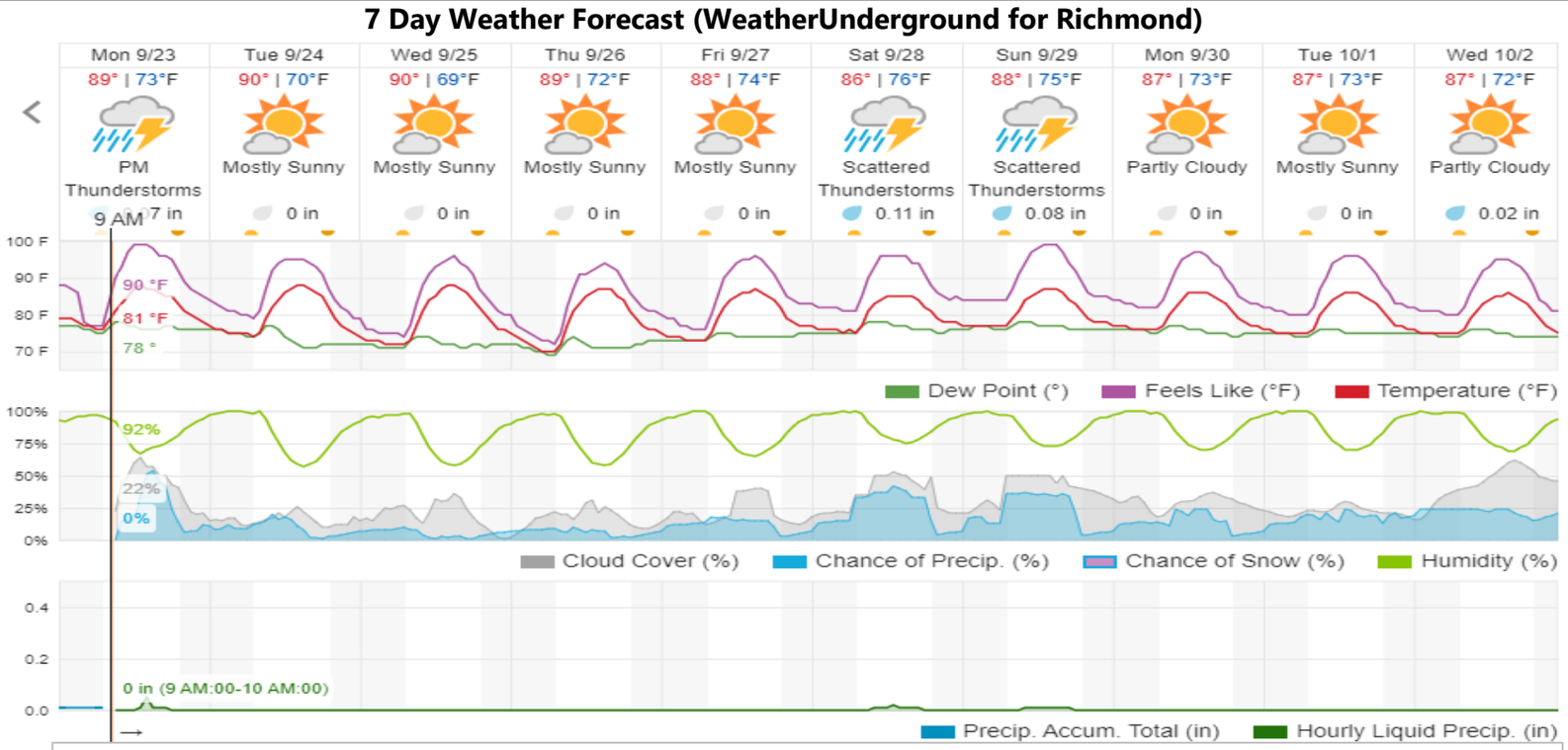


Rainfall (Inches) Summaries for 2019 **As Reported by NWS and USGS, Data Subject to Change*

Location	Week's Forecast	Last Week	Sept. (MTD)	2019 (YTD)	YTD Normal (Thru Sept.)	Drought Cond. (09/17)
College Station (NOAA)	0.10	0.99	2.21	28.79	28.70	Moderate
Brenham (NOAA)	0.10	1.38	2.01	20.76	32.35	Moderate
Richmond (USGS)	0.25	5.01	6.18	29.31	34.91	Moderate
Sugar Land (NOAA)	0.25	6.76	7.75	38.81	36.86	Moderate
Bush Interc. (NOAA)	0.25	12.56	14.29	43.23	35.99	Abnormally Dry

Weekly Weather Forecast

7 Day Weather Forecast (WeatherUnderground for Richmond)



Below Gage Elevation 11

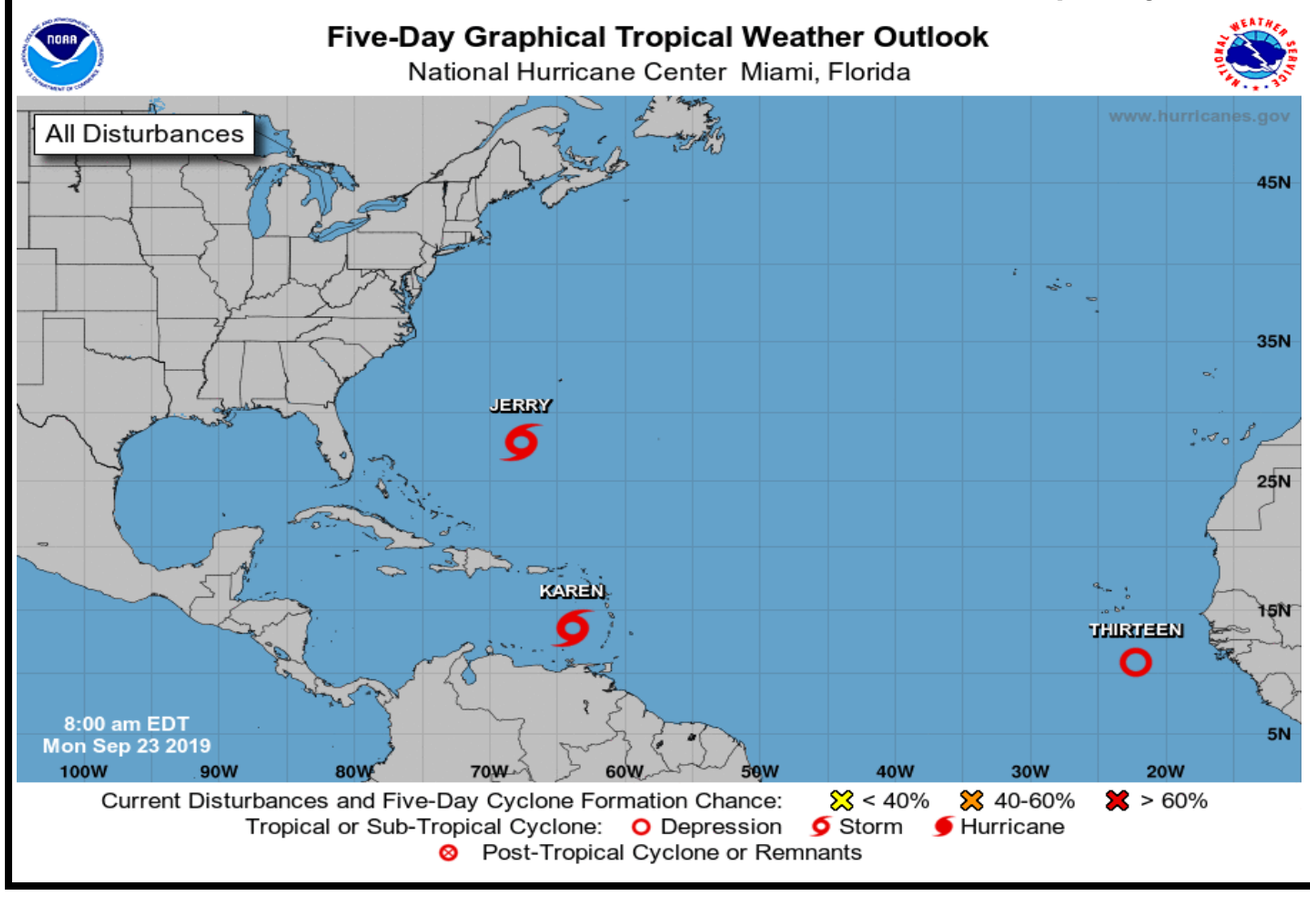
Richmond Daily Forecasted Peak WSE

NWS Forecast Discussion

Radar imagery is continuing to show some streamer shower development over the Gulf waters this morning. Anticipate coverage of showers and isolated thunderstorms to increase throughout the morning and through the afternoon hours. Short term models such as the ARW, TT WRF, and HRRR have also showed stronger development of storms around Galveston Bay by mid morning and into the afternoon hours. This better coverage of storms looks to once again develop along an axis of moisture convergence. The GOES-16 total precipitable water field shows up to 2.0 inches across the Gulf waters and along this axis that stretches into portions of Brazoria, Galveston, and Chambers counties this morning. In general, anticipate most of the precipitation to fill in further inland through the afternoon hours. Best coverage should be along and south of a line from Washington to Montgomery to Polk County. Brief heavy downpours, frequent lightning, and gusty winds look possible with the stronger storms that develop. Additionally, an Areal Flood Warning remains in effect through late morning across portions of Harris, Liberty, and Chambers counties, so any additional rainfall over these locations will only delay any improvements to flood conditions...[Tuesday Through Monday Evening]... Upper-level ridging broadly situated over the central U.S. will be the main force driving a dry start to the week, which will be characterized by moderate onshore flow and high temperatures in the high 80s to low 90s. Global model guidance is currently in good agreement that climatologically low precipitable water (PW) values will persist across Galveston Bay and the greater Houston metro area Tuesday. This should bring down the chances of diurnally-driven showers and thunderstorms across the area fairly significantly through mid-week. Despite this, the typical development of isolated showers and storms over the coastal waters in the morning hours which push further inland by the afternoon cannot be completely ruled out. The prevailing conditions should remain fairly consistent as the ridge slowly propagates eastward, eventually lending way to the development of a relatively zonal upper-level pattern over the Gulf Coast by Thursday. An area of weakness within this flow develops over the northwestern Gulf of Mexico by Thursday evening, and a return to elevated PWs and more typical diurnal convection soon follows. Current indications are that next weekend could be a wet one, as onshore flow combined with ample moisture transport should prove to produce more widespread precipitation coverage Friday through Sunday.

National Hurricane Center (June 1 through November 30)

Tropical Cyclones and Disturbances



Current Tropical Activity is not Expected to Impact the Western Gulf of Mexico.