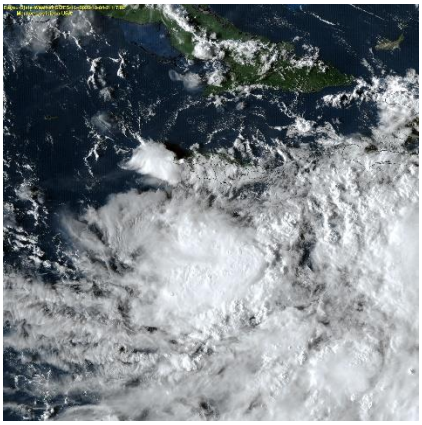
Hurricane Delta – Its Wind and Rain Impacts on Louisiana
A Preliminary Report – October 12, 2020

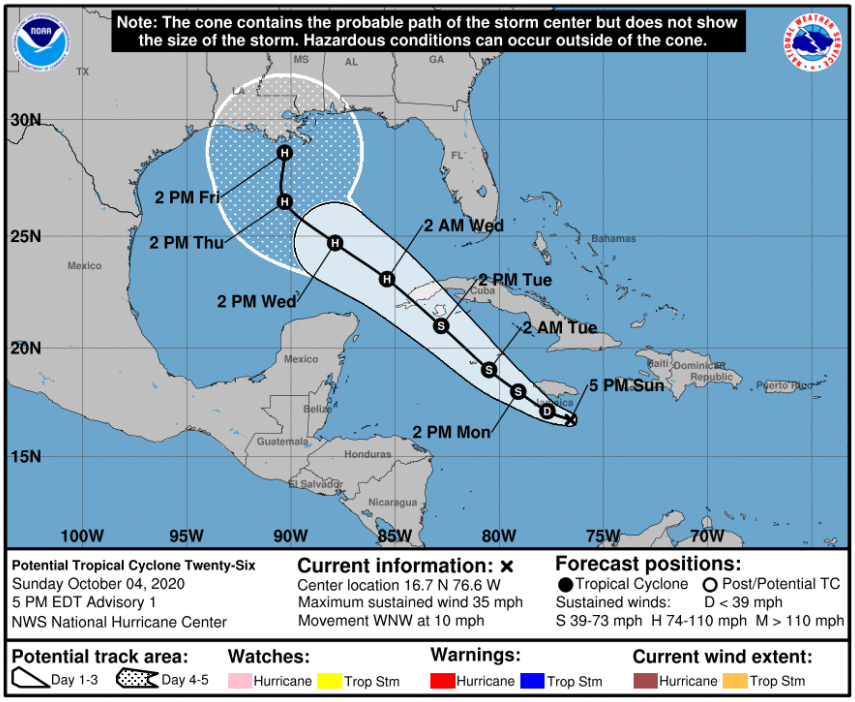
By: Don Wheeler, Meteorologist

Only 44 days a devastating strike from category 4 Hurricane Laura, Hurricane Delta makes landfall near Creole, Louisiana - approximately 15 miles east from where Hurricane Laura came ashore near Cameron on August 27. Delta was the fourth named tropical system to make landfall in Louisiana this season joining Tropical Storm Cristobal, Tropical Storm Marco, and Hurricane Laura. The previous record was set in 2002 when Tropical Storms Bertha, Hanna, and Isidore joined with Hurricane Lili to strike the state. Delta, like its predecessor Laura, caused widespread power outages across the state and dumped heavy rainfall in excess of 10 inches.

Delta began as an area of disturbed weather in the eastern Caribbean the weekend of October 2. Models were indicating tropical formation of this system within a few days as it moved into the central Caribbean. Ahead of the system Tropical Depression 25, soon to become Gamma, was located over the northwestern Caribbean.



The National Hurricane Center issued the first advisory on "Potential Tropical Cyclone 26" at 5PM EDT, Sunday October 4 when the storm was just off the southeast coast of Jamaica. The first forecast track took the storm to the northwest over the western tip of Cuba, then into the southeastern Gulf of Mexico where it was to strengthen to hurricane force. Delta was to move to south of the Louisiana coast, then take a northward turn toward southeast Louisiana in response to an approaching trough. With time, this track would shift west and southwest ever so slightly with the eventual landfall occurring in southwest Louisiana.



First Forecast Track 10/4/2020

Model guidance was rather accurate in predicting the general path of the storm but was initially conservative in the strength of the storm. Delta was initially forecast to approach the western tip of Cuba as a strong tropical storm or minimal hurricane before emerging over the gulf and then becoming a hurricane throughout the remainder of its life. The storm instead took a slightly west and southward jog taking aim on the northeastern tip of the Yucatan.

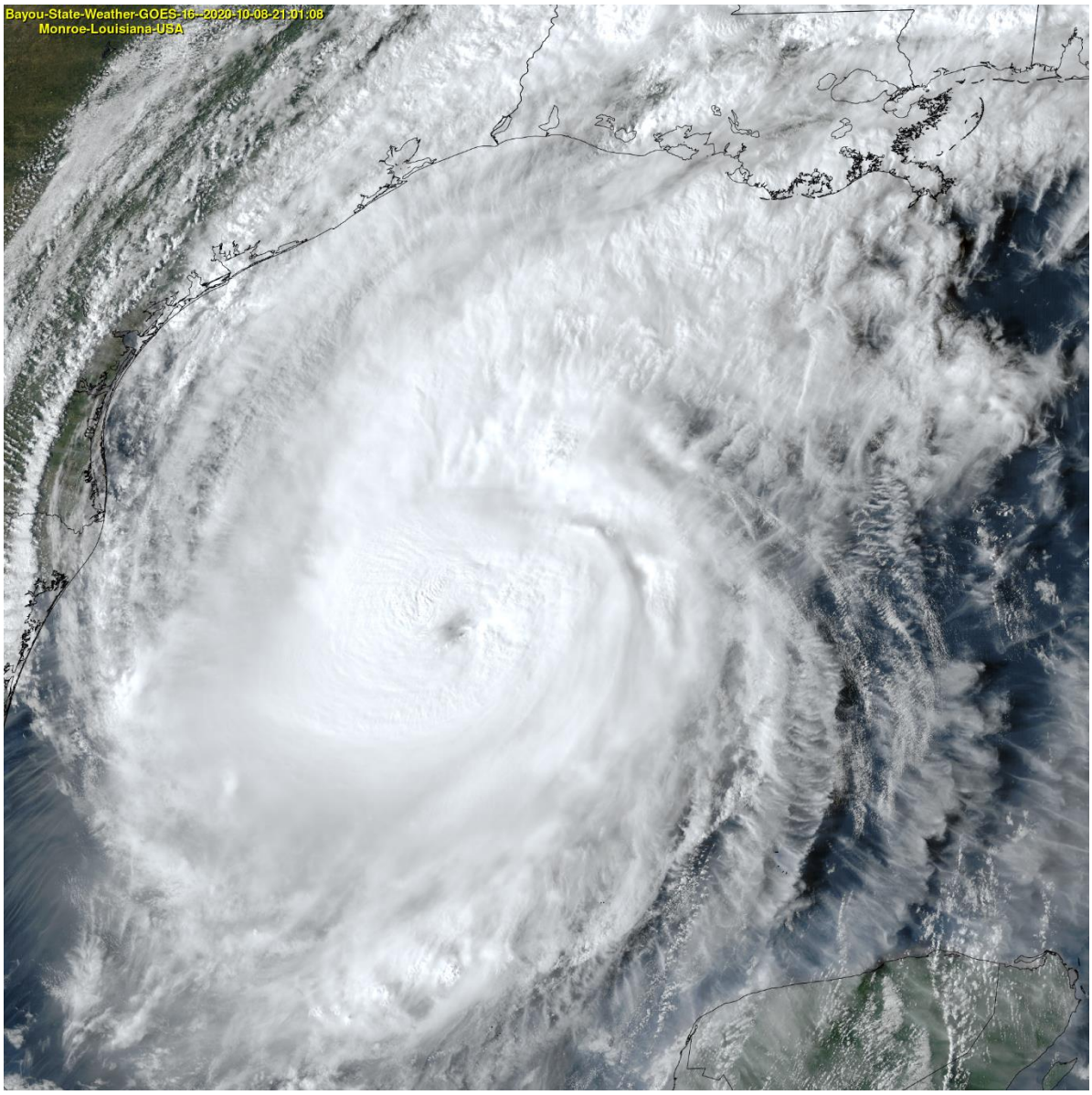
Unexpected rapid intensification occurred Monday night and Tuesday morning as the storm entered the northwestern Caribbean – an area notorious for rapidly intensifying tropical systems. The rapid intensification of the system, however, was not anticipated until Monday afternoon October 5. Delta commenced to set an Atlantic Basin record for fastest intensification of a tropical system from a tropical depression to a category 4 hurricane. As of the 5AM EDT advisory on Monday, October 5, the winds were 35 mph (tropical depression) with a pressure of 1006mb/29.71" of mercury while located 90 miles south of Negril, Jamaica. By 11AM EDT Tuesday, October 6, Delta was a category 4 hurricane with sustained winds of 130 mph and a pressure of 954mb/28.17" – a drop of 52mb in only 30 hours! With pressure changes, the corresponding wind adjustments come several hours later. While the pressure bottomed out at 954mb it did rise to 956 mb on the 2PM EDT advisory. The winds, however, steadily increased to 145 mph as of the 5PM EDT advisory Tuesday.

Fortunately for residents of the Yucatan, the storm did weaken considerably prior to coming ashore. Delta made landfall along the northeast coast of the Yucatan Peninsula near Puerto Morelos, Mexico around 5:30 AM CDT (1030UTC) with maximum winds of 110 mph (category 2). Delta moved across the extreme northeastern tip of the Yucatan and re-emerged over the warm waters of the southern Gulf of Mexico Tuesday afternoon. Winds decreased to 85 mph

while over land but the storm was forecast to re-strengthen over the warm waters of the central and western gulf and to once again become a major hurricane.

Model guidance was rather consistent in bringing the storm inland somewhere along with Louisiana coast. Initially the southeast Louisiana coast was targeted but the track shifted west with time. Unfortunately, it was becoming increasingly apparent that Delta could strike eerily close to Laura's landfall and affect already storm-weary portions of the state. If there was to be a silver lining to the storm, Delta was forecast to begin a weakening trend just prior to striking the coast due to forecast southwesterly windshear and colder sea-surface temperatures near the coast.

Delta did re-intensify to major hurricane status with 115 mph winds as of the 4PM CDT advisory Thursday, October 8 while 345 miles south of Cameron, Louisiana. Satellite imagery was showing an ominous and growing storm that took up the western half of the Gulf of Mexico. The imagery was also showing evidence of wind shear over the Texas coast and across Louisiana which was good news in that it would serve to weaken the system prior to landfall.



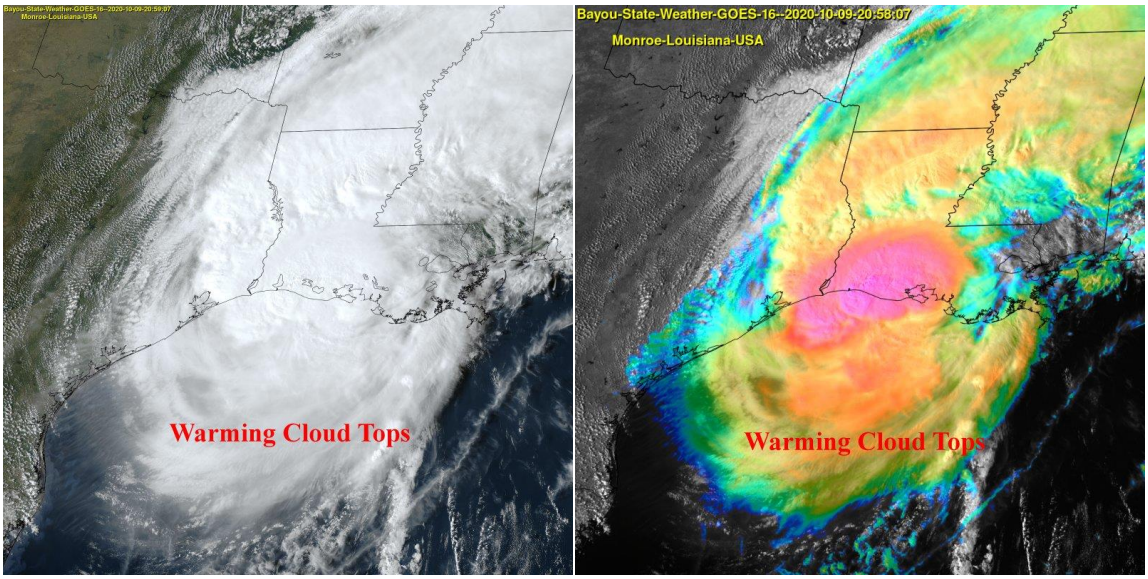
Major Hurricane Delta with 115 MPH Winds (Source: Bayou State Weather)

Delta maintained major hurricane status through the 1PM CDT special advisory with winds of 115 mph, although briefly peaking at 120 mph for a few hours Thursday night/Friday Morning. As forecast, Delta began to encounter conditions not conducive for further strengthening and was, in fact, forecast to weaken slightly before making landfall.

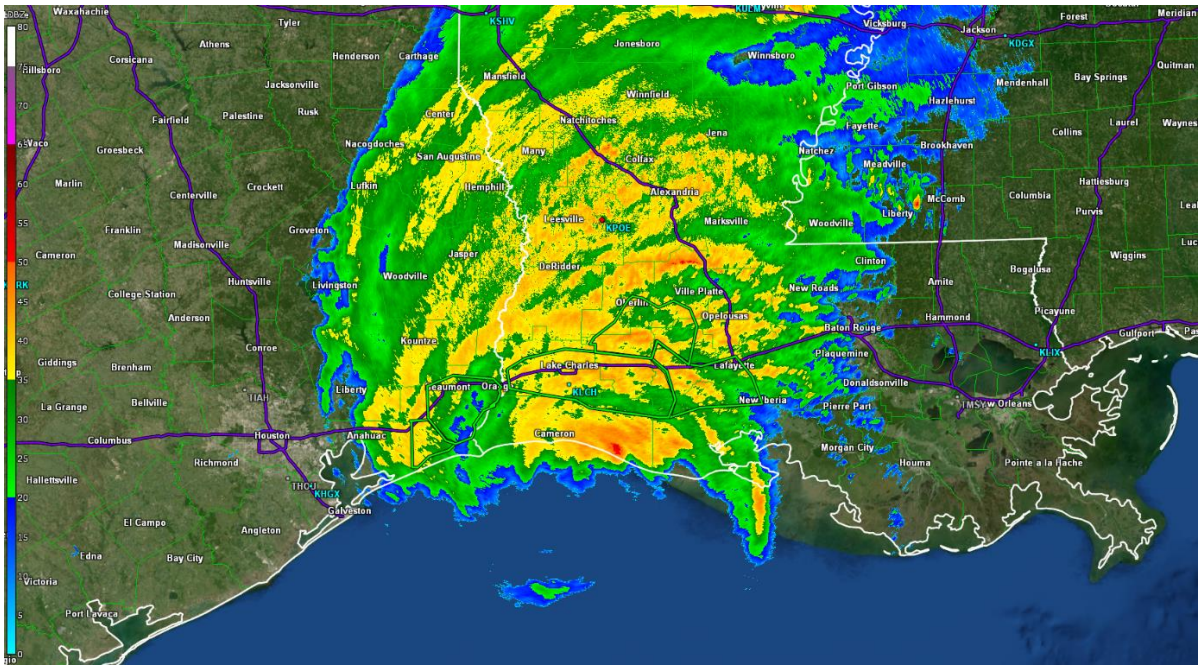
Increased wind shear from the southwest, cooler sea-surface temperatures, and dry air intrusion did indeed begin to affect Delta as it approached the coast. Satellite imagery and reconnaissance indicated signs of disorganization by late morning Friday.

Delta weakened to category 2 status as of the 1PM CDT advisory with sustained winds of 110 mph. The vertical structure of the storm was being disrupted due to the increased wind shear

from the southwest. The once partially visible eye disappeared. Radar imagery showed an asymmetrical storm with the bulk of the precipitation found in the northern hemisphere due to dry air intrusion. Visible and infrared satellite imagery depicted a warming of the clouds in the southern hemisphere at 21:00Z



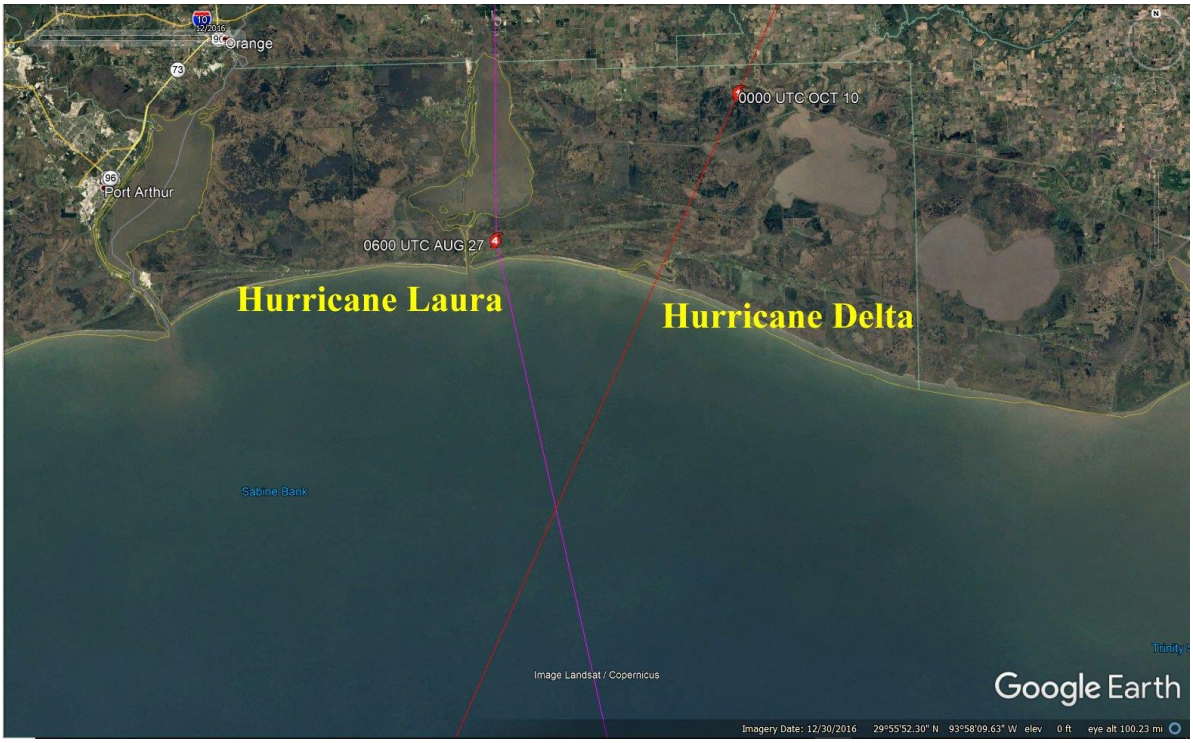
Visible/IR Satellite Imagery Depicting Warming Clouds in the Southern Semicircle (Source: Bayou State Weather)



Radar Image at 2100Z Showing Lack of Rainfall in the Southern Semicircle (Source: Bayou State Weather)

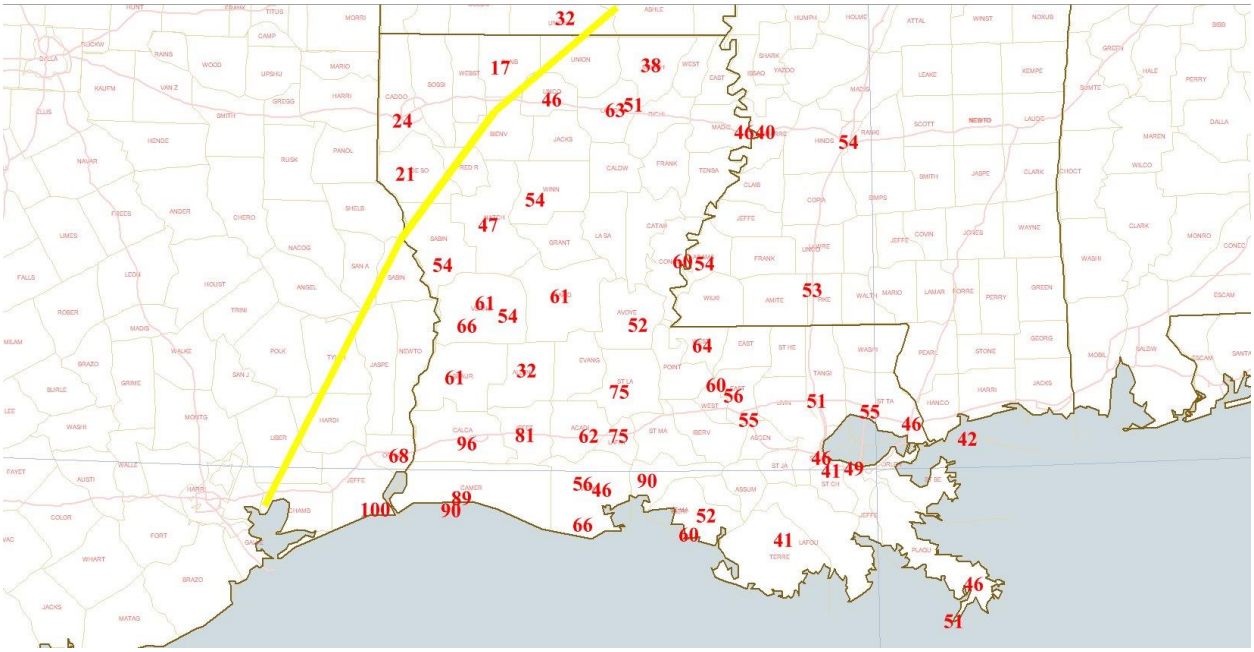
Hurricane Delta made landfall near Creole, Louisiana at 6:00 PM CDT (2300Z). The landfall was less than 15 miles from where Hurricane Laura came ashore near Cameron just 44 days

earlier. Sustained winds at the time of landfall had decreased to 100 mph. The highest recorded gust for the event was 100 mph which occurred in extreme southeast Texas at Texas Point near the Louisiana border.



Hurricane Laura Landfall (left) and Hurricane Delta Landfall (right)

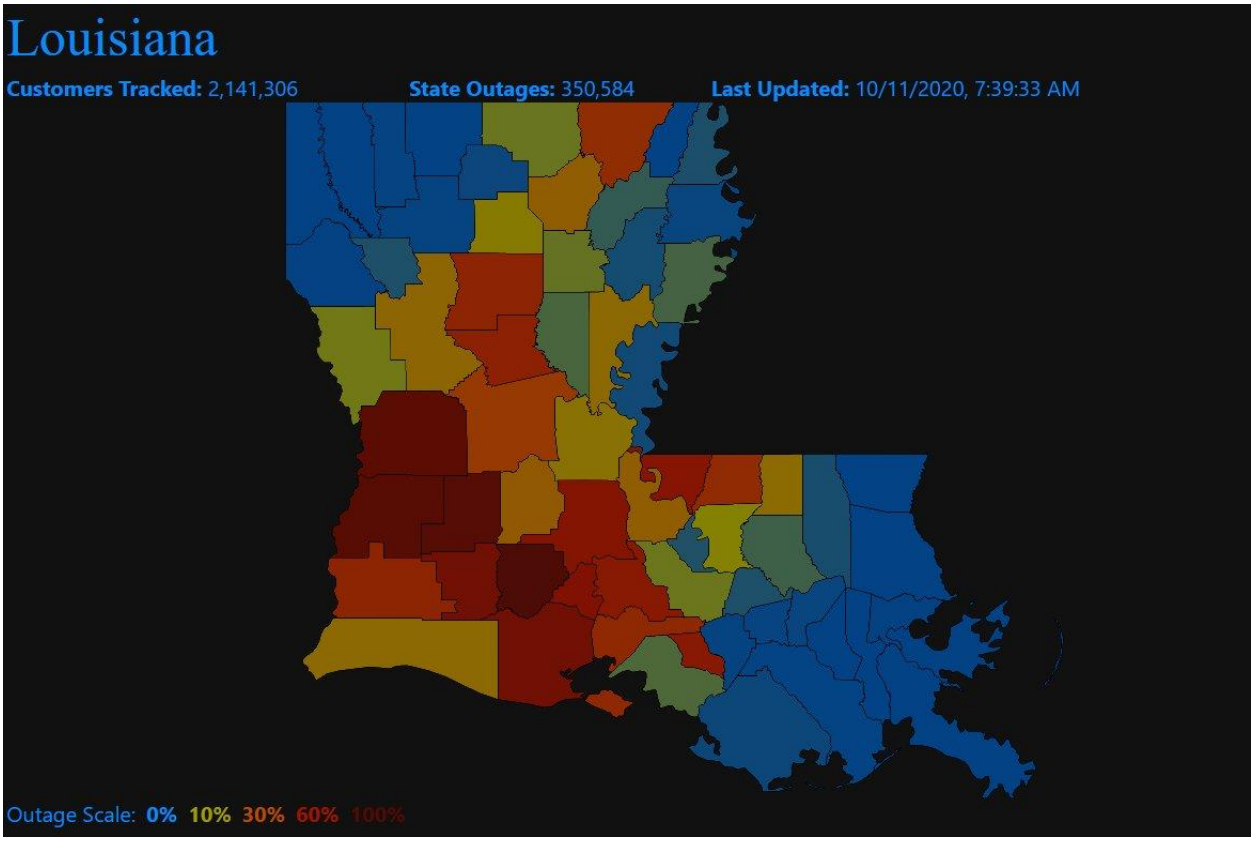
Upon landfall, Delta began to weaken at it began its northeastward trek across Louisiana from southwest to northeast. A trend that began prior to landfall, an expansion of the wind field, continued. Delta produced winds in excess of tropical storm force across much of the state, perhaps 85%. These winds were also experienced in adjacent east Texas, much of south and western Mississippi, and southeast Arkansas. Gusts exceeding 60 mph were recorded as far north as northeast Louisiana where the Monroe Regional Airport recorded a 63mph gust at 1:30 AM Saturday morning, October 10.



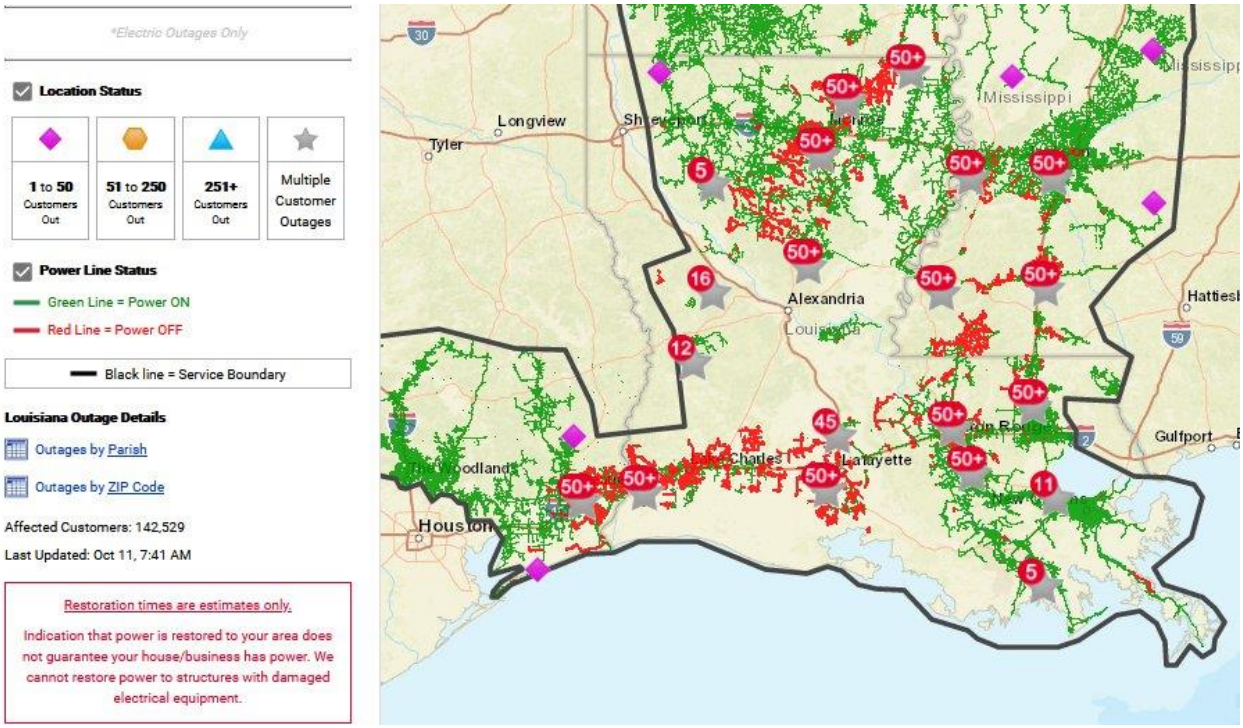
Recorded Wind Gusts – Yellow Line Depicts Extent of Tropical Storm Force Winds (39 mph or higher) (Source: Bayou State Weather)

Widespread power outages occurred across the state due to the extensive wind field exceeding 600,000 outages. In a statement by Louisiana Governor John Bel Edwards, "The peak was 638,000 outages across the state of Louisiana. As of noon [Saturday] that number had decreased to 600,000. So, restoration appears to be happening more rapidly than was the case after Laura, and that's because the damage to the infrastructure is not as significant. But that's still an awful lot of power outages," he added. This figure accounts for nearly 25% of all power customers in the entire state. (Source: WAFB TV)

Entergy, which does not provide all power needs to the state, reported 495,000 power outages within all of Entergy's service territories (east Texas, Louisiana, Arkansas, and Mississippi). (Source: Entergy).



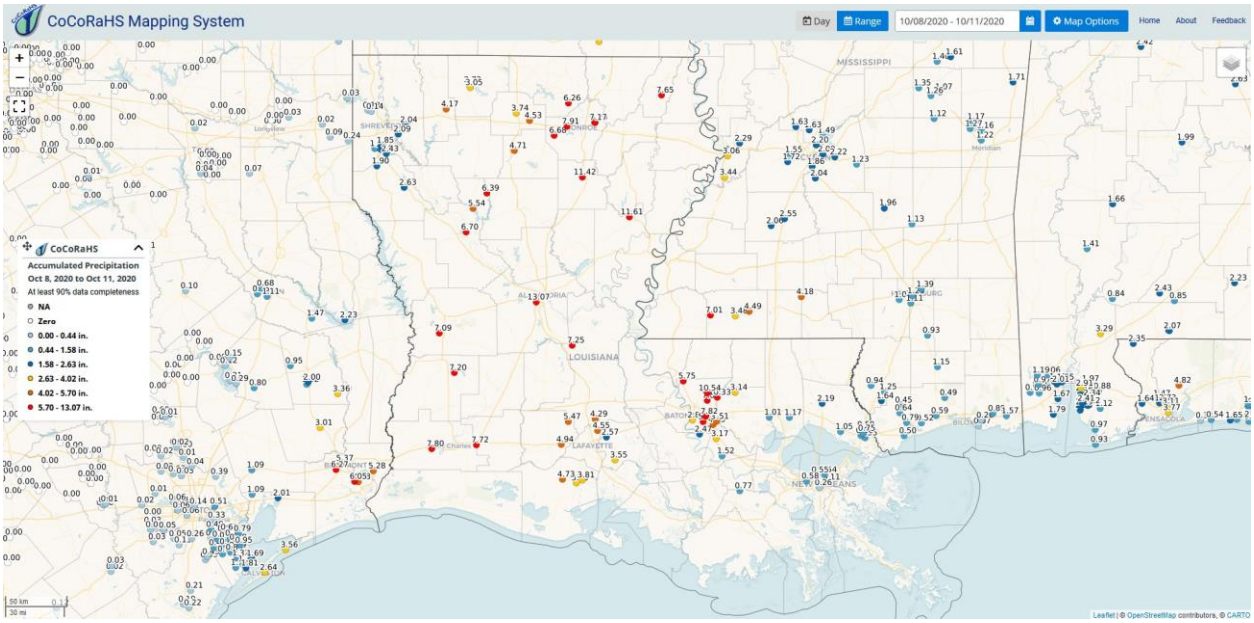
Louisiana Power Outage Map as of 10/11/2020 (Source: PowerOutage.US)



Entergy Power Outage Map as of 10/11/2020 (Source: Entergy)

Rainfall totals were extensive across the state. Measured readings from the Community Collaborative Rainfall, Hail, and Snow Network (CoCoRaHS) recorded four-day totals exceeding 10 inches across portions of central, northeast, and southeast Louisiana most of which fell from Friday, October 9 through Saturday morning, October 10. Alexandria reported the highest value of 13.07". Another cluster of higher totals exceeding 10 inches was noted northeast of the Baton Rouge area where the highest value of 10.54" was recorded at station Brownfields 5.8 NE.

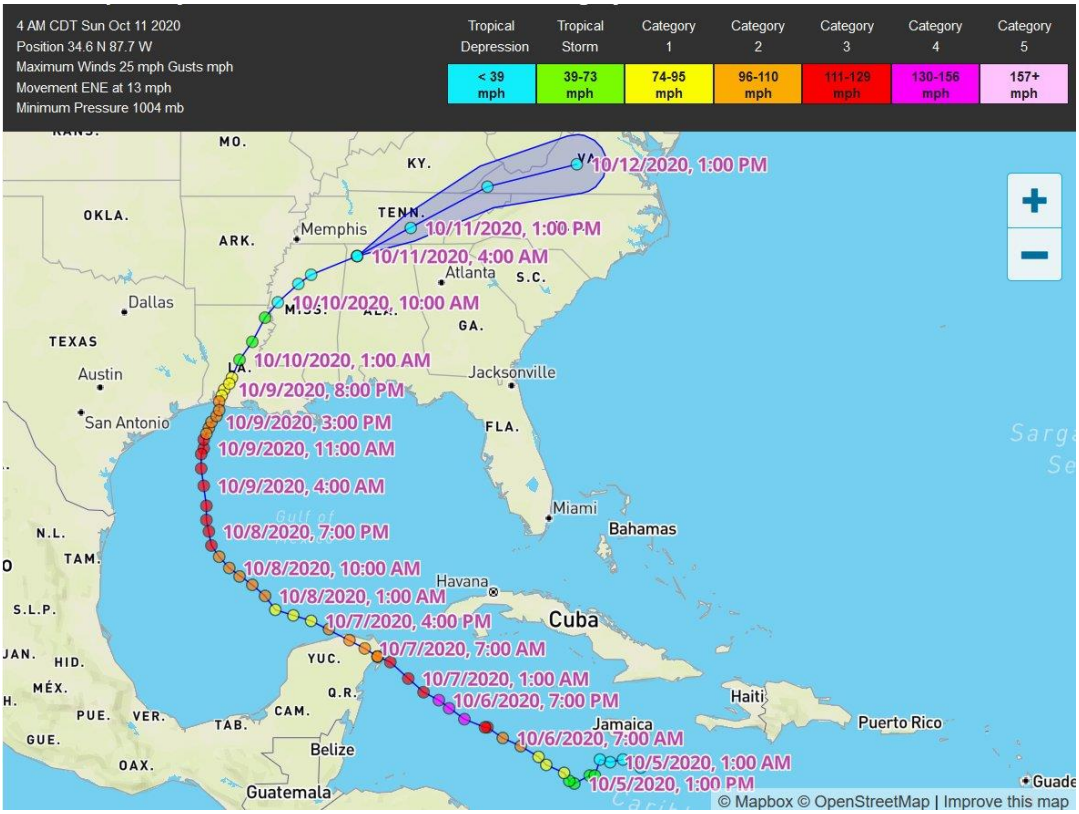
Automated gauges across southwest Louisiana recorded values in excess of 15 inches. A recording station in Calcasieu Parish, EB L-14 @ Packing House Road, recorded 17.57" for the highest amount. The heavy rainfall amounts did produce flash flooding along and on either side of the center of the storm's path. The dry air that did intrude the storm assisted in keeping the totals from being even higher.

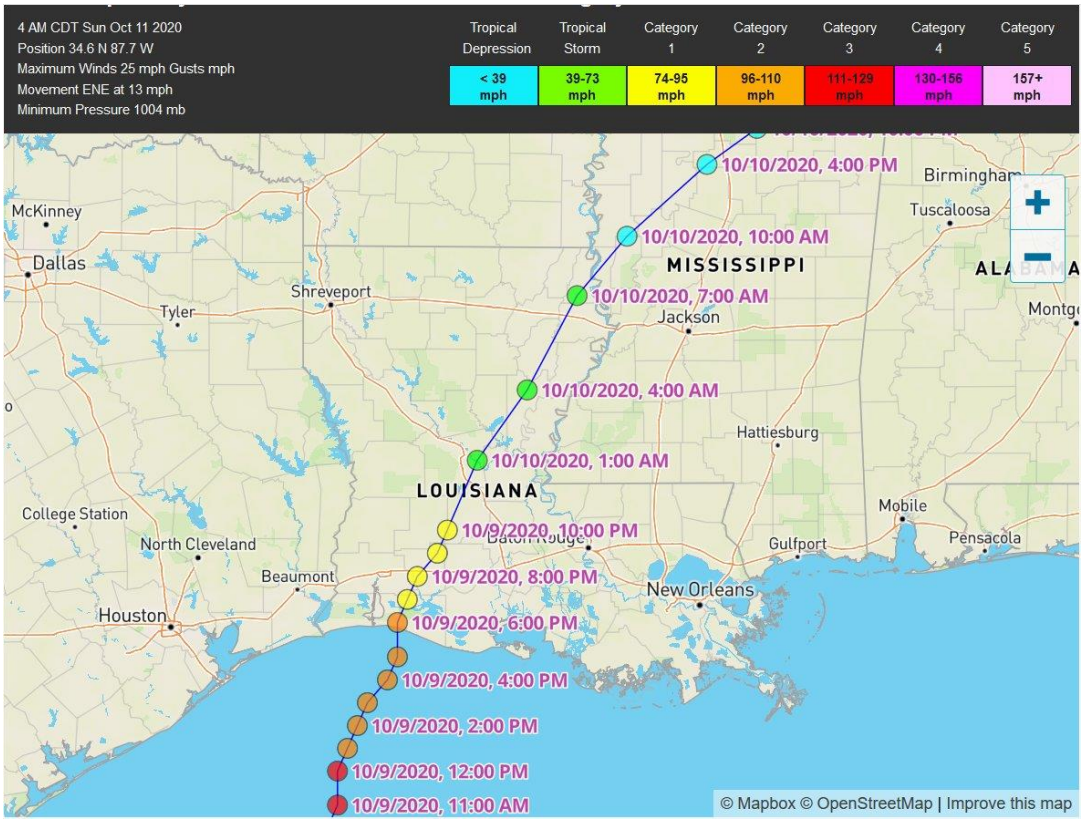


4-Day Rainfall Totals from the CoCoRaHS Network from October 8-11

Delta's final track took it through the heart of Louisiana maintaining hurricane strength just south of Alexandria. It was downgraded to a tropical storm with 60 mph winds as of the 1AM CDT advisory 15 miles east-southeast of Alexandria. Delta continued northeastward as a tropical storm while over extreme northeast Louisiana 45 miles east of Monroe, then was downgraded to a tropical depression 65 miles north-northwest of Jackson, Mississippi at 10AM CDT.

Supporting Images




4 AM CDT Sun Oct 11 2020
Position 34.6 N 87.7 W
Maximum Winds 25 mph Gusts mph
Movement ENE at 13 mph
Minimum Pressure 1004 mb
Tropical Depression
< 39 mph
Tropical Storm
39-73 mph
Category 1
74-95 mph
Category 2
96-110 mph
Category 3
111-129 mph
Category 4
130-156 mph
Category 5
157+ mph
10/10/2020, 4:00 PM
10/10/2020, 10:00 AM
10/10/2020, 7:00 AM
10/10/2020, 4:00 AM
10/10/2020, 1:00 AM
10/9/2020, 10:00 PM
10/9/2020, 8:00 PM
10/9/2020, 6:00 PM
10/9/2020, 4:00 PM
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10/9/2020, 12:00 PM
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McKinney
Dallas
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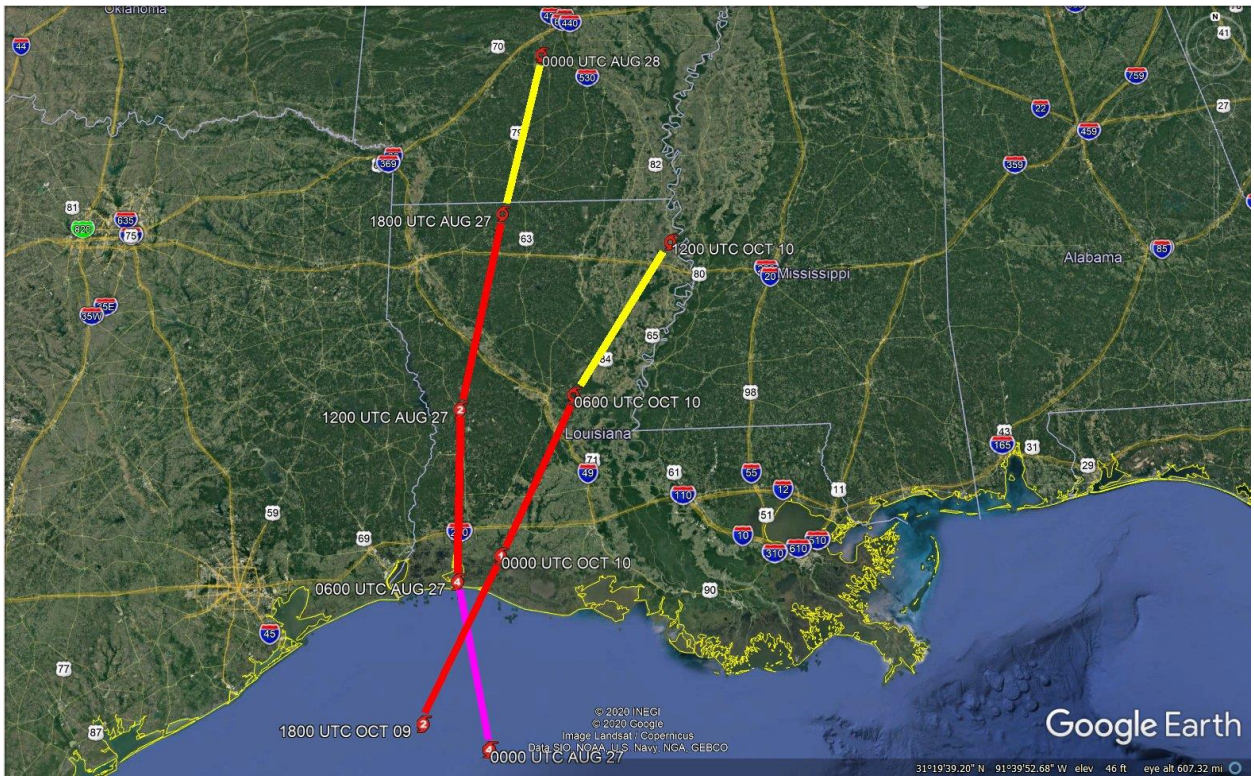


Hurricane Laura and Hurricane Delta Paths through Louisiana

Report Commissioned by:

PUBLIC INFORMATION STATEMENT
NATIONAL WEATHER SERVICE LAKE CHARLES LA
421 PM CDT SAT OCT 10 2020

...LOCAL HURRICANE DELTA RAINFALL REPORTS...

THE FOLLOWING OBSERVATIONS FROM THE CALCASIEU PARISH POLICE JURY AND JEFFERSON COUNTY DRAINAGE DISTRICT #6 GAGES REPRESENT THE TOTAL RAINFALL MEASURED OVER THE 48-HOUR PERIOD BETWEEN 8 AM OCTOBER 8, 2020 AND 8 AM OCTOBER 10, 2020.

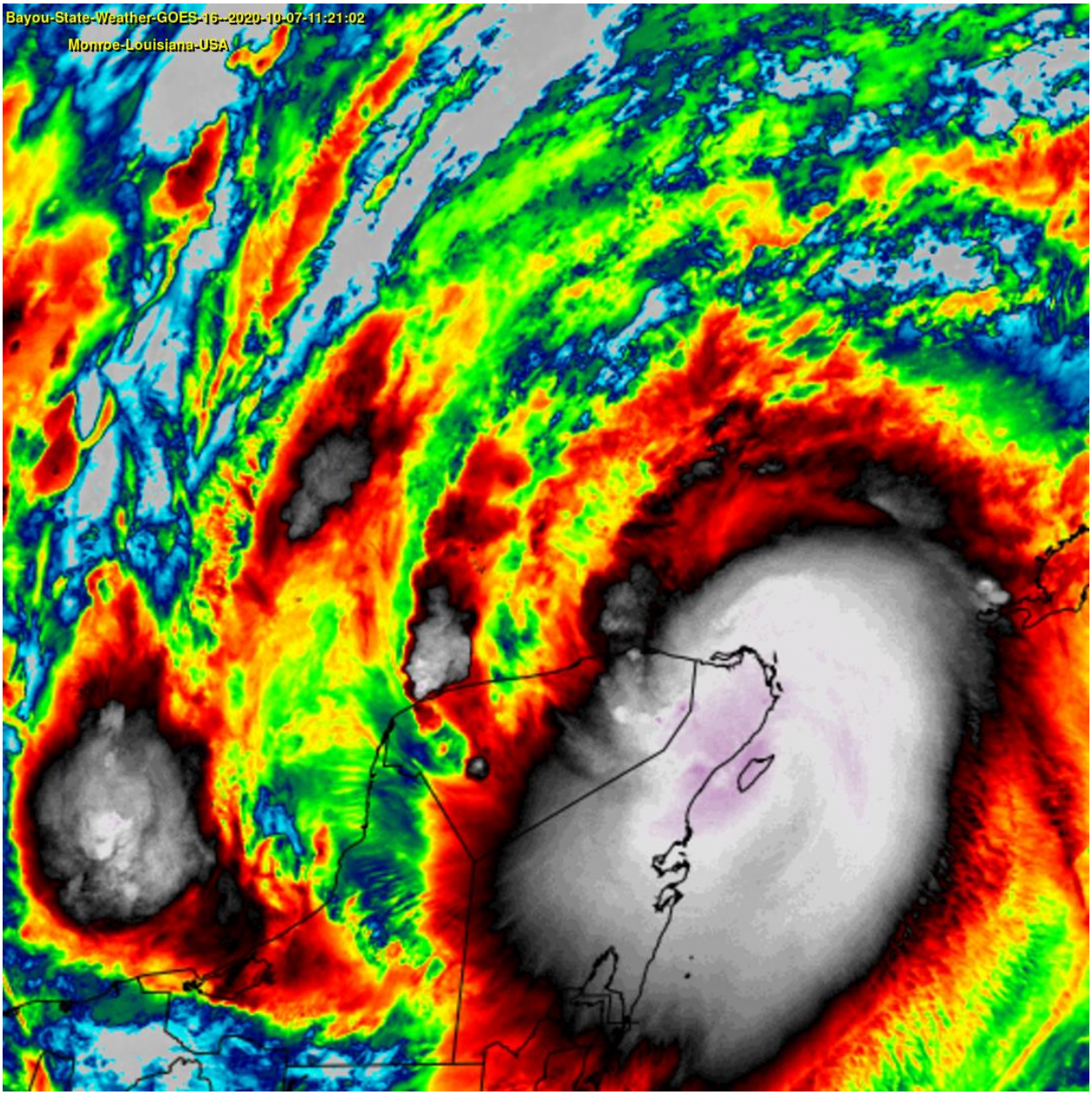
LOCATION	AMOUNT	LAT/LON
...CALCASIEU PARISH POLICE JURY NETWORK...		
EB L-14 @ PACKING HOUSE ROAD	17.57 IN	30.24N/93.07W
EB L-14 @ BOYS VILLAGE ROAD	16.78 IN	30.24N/93.08W
ENGLISH BAYOU @ PUJOL ROAD	16.31 IN	30.25N/93.13W
BAYOU ARSENE @ HECKER ROAD	15.84 IN	30.31N/93.07W
KENNER GULLY @ CLAUDE HEBERT ROAD	15.72 IN	30.27N/93.08W
L-3 @ CHAISSON ROAD	15.09 IN	30.29N/93.10W
CALCASIEU RIVER @ WHITE OAK PARK	15.01 IN	30.30N/93.12W
GOLDSMITH CANAL @ GOOS ROAD	14.34 IN	30.33N/93.17W
MOSS GULLY @ HIGHWAY 378	13.95 IN	30.30N/93.21W
KAYOUCHEE COULEE @ BROAD STREET	13.75 IN	30.23N/93.17W
L-3 @ TANK FARM ROAD	13.67 IN	30.13N/93.16W
EB L-12 @ MCCOWN ROAD	13.61 IN	30.22N/93.04W
W-14 @ JOE SPEARS ROAD	13.56 IN	30.20N/93.12W
BFD-3 @ PARK ROAD	12.96 IN	30.32N/93.22W
INDIAN BAYOU @ COFFEY ROAD	12.96 IN	30.34N/93.25W
KAYOUCHEE COU. @ E. PRIEN LAKE RD	12.88 IN	30.20N/93.17W
L-5 @ COMMON STREET	12.80 IN	30.16N/93.21W
BA L-2 @ BOWMAN ROAD	12.49 IN	30.29N/93.06W
BELFIELD DITCH @ JOE MILLER ROAD	11.94 IN	30.34N/93.21W
LACASSINE BAYOU @ LORRAINE BRIDGE	11.90 IN	30.13N/92.91W
KENNER GULLY @ MARK LEBLEU ROAD	11.86 IN	30.26N/93.12W
GOLDSMITH CANAL @ HIGHWAY 171	11.70 IN	30.35N/93.20W
L-1 @ TANK FARM ROAD	11.62 IN	30.12N/93.21W
MARSH ROAD @ WELCOME ROAD	11.58 IN	30.40N/93.15W
W-6 @ WARD LINE ROAD	10.99 IN	30.15N/93.13W
LITTLE INDIAN BAYOU @ TOPSY ROAD	10.84 IN	30.37N/93.20W
WEST FORK @ DUNN FERRY ROAD	10.72 IN	30.34N/93.29W
L-32-C @ WILLIAMS ROAD	10.68 IN	30.26N/93.25W

ALL OTHER CPPJ GAGE TOTALS WERE LESS THAN 10 INCHES

...JEFFERSON COUNTY DD6 NETWORK...		
GIWW @ SH 124 (BRIDGE)	9.53 IN	29.60N/94.39W
NEEDMORE DIVERSION @ SH 73	8.00 IN	29.85N/94.17W
MAYHAW BAYOU @ ENGLIN ROAD	6.85 IN	29.79N/94.33W
HIGHLAND AVENUE @ DITCH 104	6.50 IN	30.03N/94.08W
MHMR SOUTH 8TH STREET @ DITCH 110	6.46 IN	30.06N/94.12W
SH 124 @ HILLEBRANDT BAYU DITCH 100	6.26 IN	30.04N/94.18W
KEITH LAKE BOAT LAUNCH @ SH 87	6.26 IN	29.77N/93.95W
CRAIGEN RD @ TAYLORS BAYU DITCH 500	6.18 IN	29.88N/94.26W
SPINDLETOP BAYOU @ DAM DITCH 8100	6.14 IN	29.72N/94.32W
GLENBROOK DRIVE @ DITCH 407	6.07 IN	29.94N/94.23W
BOONDOCKS @ TAYLORS BAYOU SO FORK	6.07 IN	29.85N/94.23W
LAUREL/EASTEX FWY @ DITCH 116	5.95 IN	30.08N/94.14W
GLADYS AVE @ HILLEBRANDT BAYOU	5.87 IN	30.09N/94.16W
RIDGEWOOD DETENTION POND @ 7TH ST	5.87 IN	30.10N/94.13W
EAST LANE @ WILLOW MARSH BAYOU	5.79 IN	30.06N/94.21W
MAYHAW BAYOU @ STRUCTURE FORK	5.79 IN	29.75N/94.34W
MAYHAW BAYOU @ BRUSH ISLAND ROAD	5.75 IN	29.85N/94.35W
EAST LUCAS @ DITCH 002	5.67 IN	30.13N/94.12W
TYRRELL PARK DETENTION @ PHELPS RD	5.63 IN	30.02N/94.16W
SOUTH PINE ISLAND ROAD @ DITCH 607	5.59 IN	30.04N/94.25W
GIWW @ BLIND LAKE OUTFALL	5.59 IN	29.77N/94.04W
TAYLORS BAYOU @ SALTWATER BARRIER	5.56 IN	29.86N/94.00W
PINE ISLAND BAYOU @ LNVA PUMP STA	5.52 IN	30.18N/94.19W

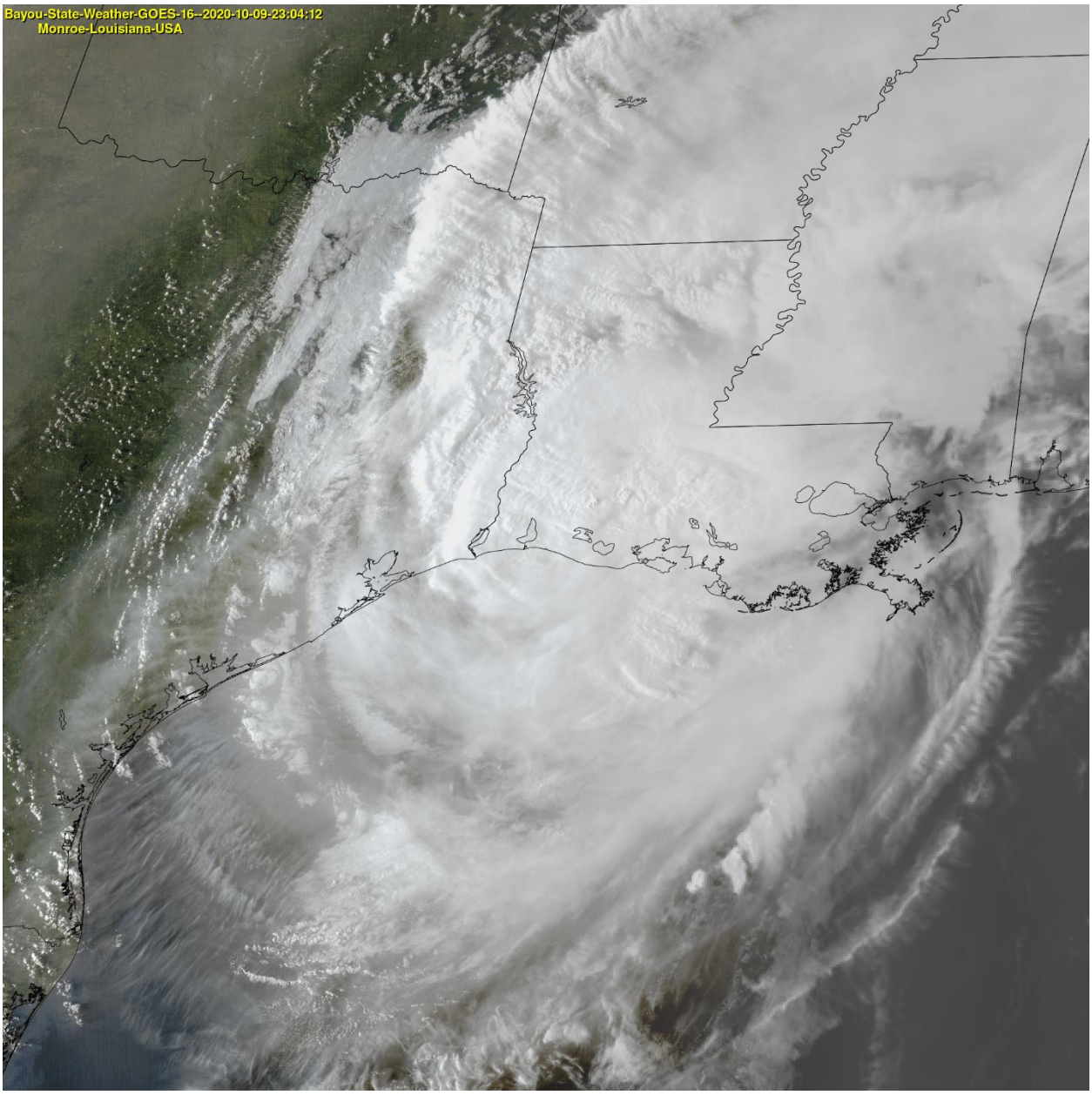
ALL OTHER DD6 GAGE TOTALS WERE LESS THAN 5.50 INCHES

Automated Gage Rainfall Totals Calcasieu Parish and Jefferson County, Texas

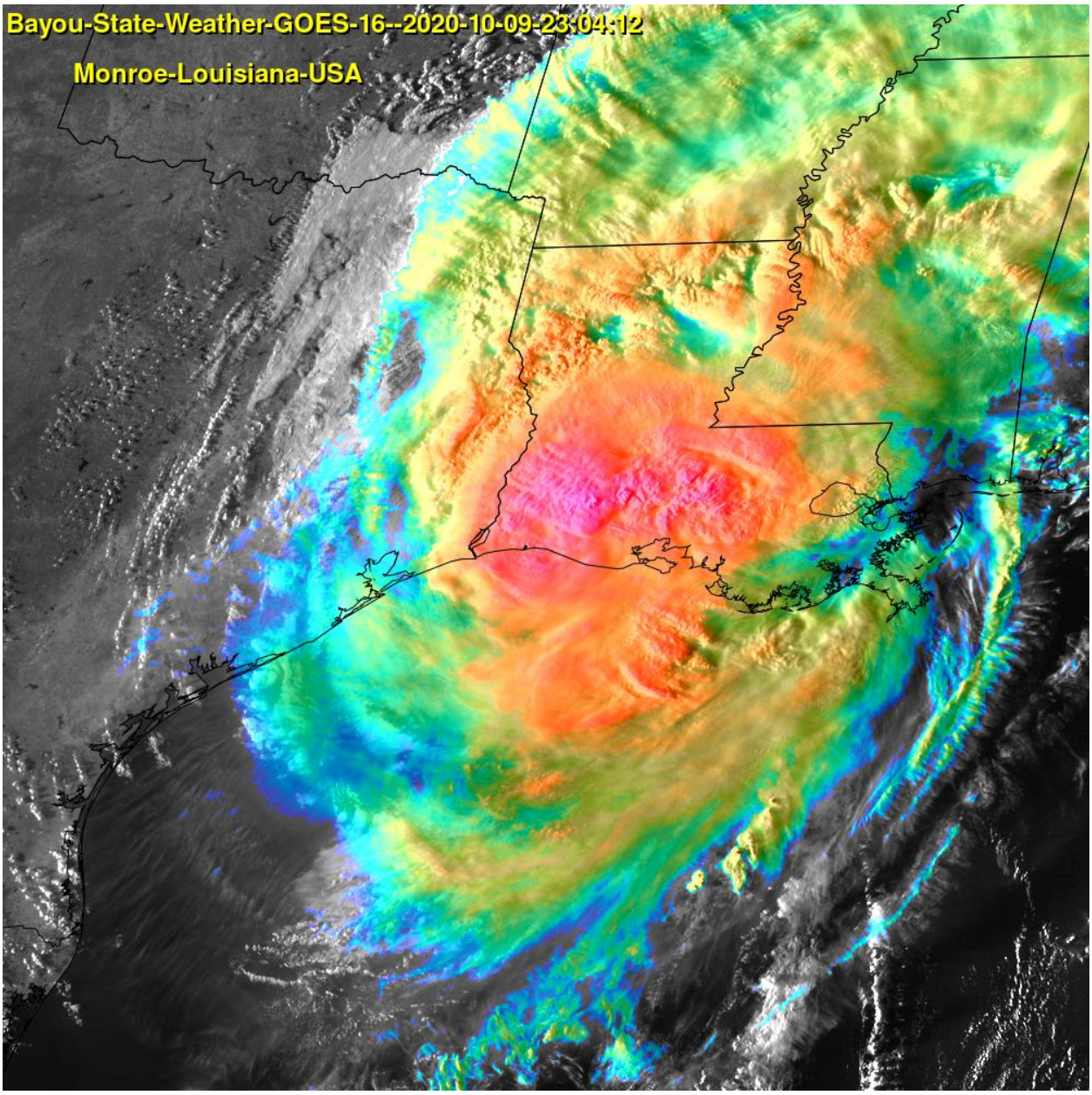


Hurricane Delta Yucatan Peninsula Landfall

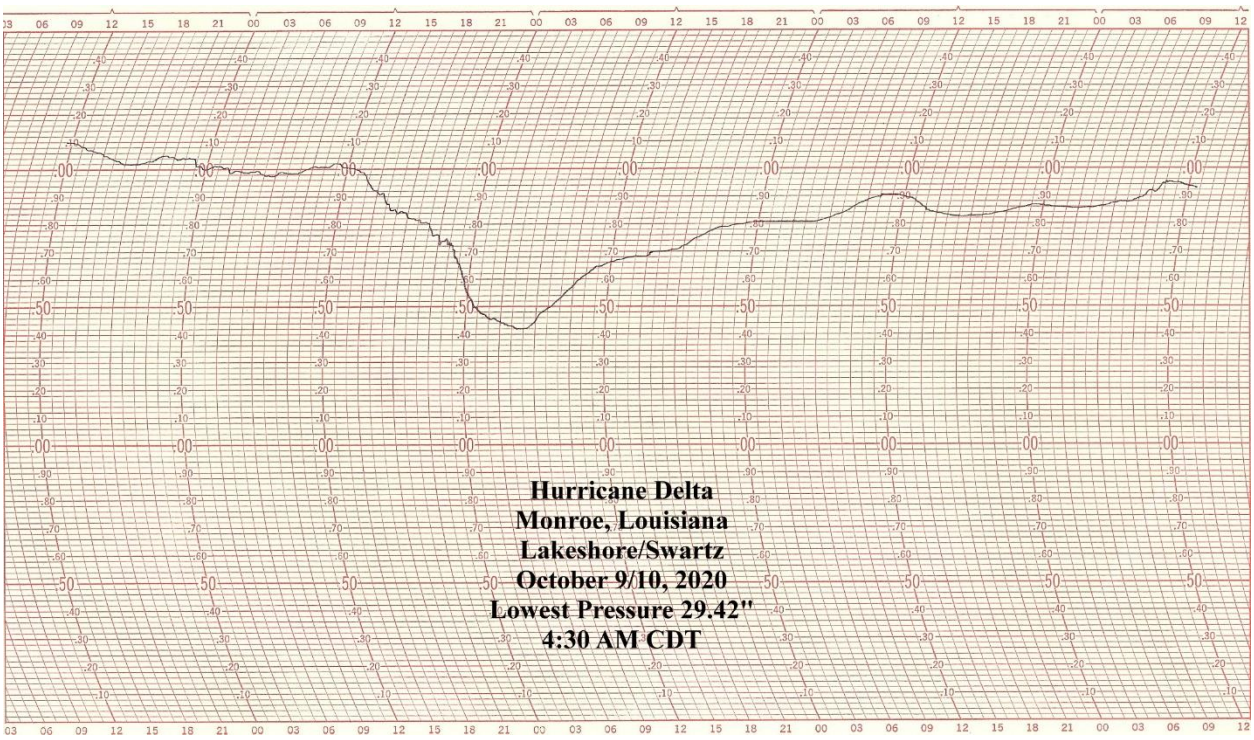
Report Commissioned by:



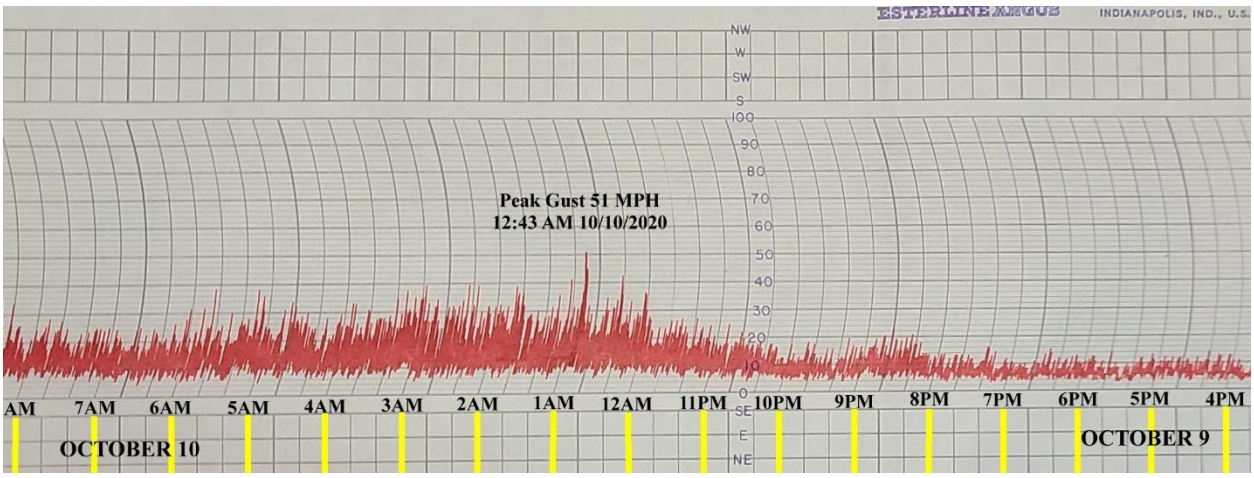
Hurricane Delta Louisiana Landfall (Visible Image)



Hurricane Delta Landfall (IR Enhanced Image)

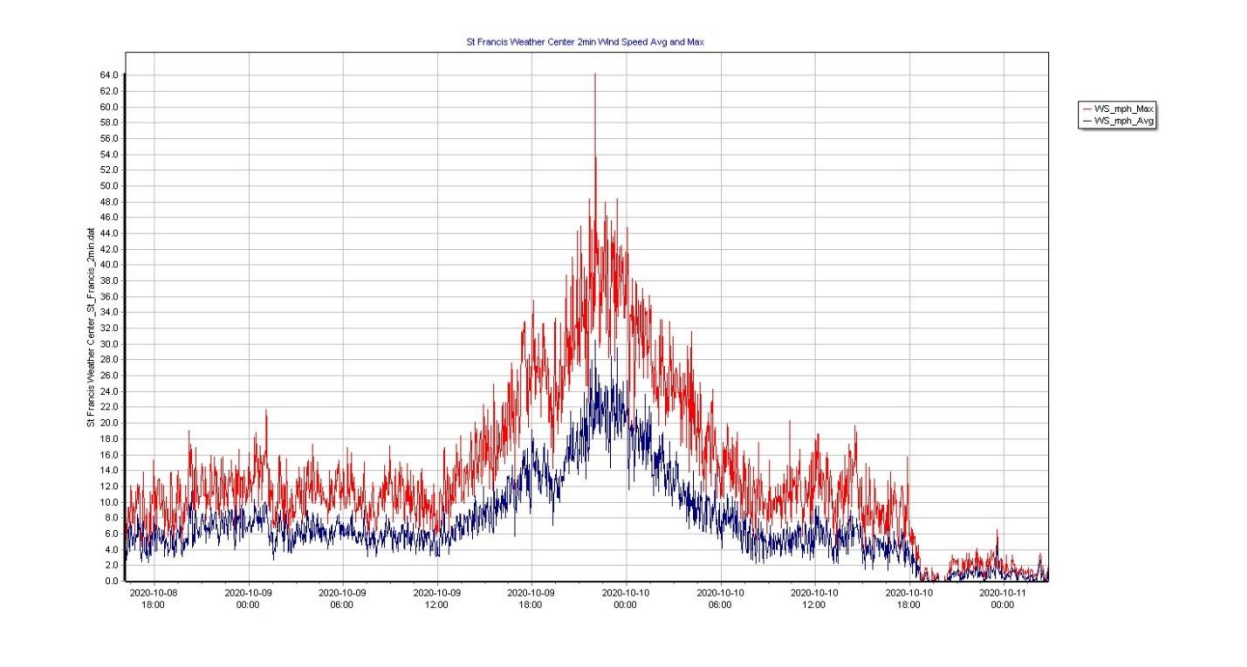


Barograph Tracing from Monroe/Lakeshore/Swartz, Louisiana



Delta Wind Trace from Lakeshore/Swartz (Ouachita Parish)

Report Commissioned by:



Delta Wind Trace from St. Francisville, LA (St. Francis Weather)

Sources

Bayou State Weather, LLC
Community Collaborative Rainfall, Hail, and Snow (CoCoRaHS) Network
Entergy
National Weather Service – Lake Charles
National Weather Service – Shreveport
National Weather Service – Jackson
National Weather Service – New Orleans
National Hurricane Center
PowerOutage.US
St. Francis Weather, LLC
WAFB-TV
Weather Underground