

### *Tropical Storm Claudette, 16–29 July*

Claudette was a tropical storm for two brief periods separated by a 5-day interval during which it weakened to a disorganized tropical wave. Claudette left the African coast as the strongest wave of the year at midtropospheric levels. The rawinsonde report from Dakar, Senegal at 1200 GMT 12 July showed winds of 85 kt at 550 mb.

A surface circulation was first evident on 16 July about 450 n mi east of the Leeward Islands. Based on Air Force reconnaissance reports of 45 kt winds the next morning, the depression was upgraded to tropical storm Claudette at 1600 GMT 17 July, even though the minimum central pressure was 1011 mb. Once again, gale warnings were required in the first tropical storm advisory because of the proximity of the storm center to the islands. This time the areas warned were the Leeward Islands, the Virgin Islands and Puerto Rico. It was the third consecutive storm in which gale warnings were issued in the first storm advisory. As had been the case with Ana, strong upper level westerly winds caused Claudette to weaken to a depression over Puerto Rico and to a tropical wave over Hispaniola. No sustained gale force winds were reported on any of the islands. The highest gust of 45 kt was reported on Antigua. Rainfall amounts of 7–8 inches fell on Guadeloupe, causing some flooding. Amounts exceeding 9 inches fell in southern Puerto Rico. There was one death by drowning in Puerto Rico and damage was estimated at \$750,000 because of river floods.

Phase two of tropical storm Claudette began as the tropical wave remnants moved into the southeastern Gulf of Mexico on the morning of 21 July. A depression formed later that day, and reached tropical storm strength during the morning of 23 July. Gale warnings were issued with the first tropical storm advisory at 1300 GMT from Biloxi, Mississippi to Freeport, Texas.

At this time, the center of Claudette was poorly defined and elongated in a north-south direction. Satellite center locations fell systematically to the north of reconnaissance center locations. There is some evidence that the satellite images were depict-

ing a middle-level vorticity center which paralleled the track of the surface center as determined from aerial reconnaissance. During the evening of 23 July reconnaissance reports indicated that the surface center to the south had weakened to a depression, so gale warnings were discontinued early on 24 July. A dominant center, however, formed in the northern part of the elongated area and began drifting northward shortly before daybreak. Offshore oil rigs began reporting gale force winds, necessitating gale warnings once again at 1430 GMT. This time they extended from Grand Isle, Louisiana to Galveston, Texas. Because of poor center definition, the best track for Claudette (shown in Fig. 2) is considerably smoothed in the Gulf of Mexico, in order to reconcile satellite and reconnaissance locations that were frequently at variance with each other.

The center crossed the coast near the Texas-Louisiana border about 1800 GMT. It was expected to continue northward and spread heavy rains through the lower Mississippi Valley. Accordingly, gale warnings were discontinued along the coast at 2200 GMT. However, the development of a small high-pressure system aloft to the north of the center blocked the northward movement of Claudette, and caused it to turn slowly to the west, describing a tight loop over extreme southeast Texas during the next 24 h before finally moving off to the north. Because the center remained close to the coast, Claudette did not weaken and offshore oil rigs continued to report winds of gale force for 30 h after the center moved inland. Claudette's lowest pressure of 997 mb occurred near Beaumont, Texas after the center had moved inland. Maximum sustained winds in Claudette were 45 kt both east of the Virgin Islands and in the northwest Gulf of Mexico before landfall.

Claudette will be long remembered along coastal southeast Texas for the torrential rains which occurred while the center was making a loop in that area. A report of 42 inches in 24 h by an observer near Alvin, Texas is a United States 24 h rainfall record. This may also be a record for the world's greatest 24 h rainfall occurring over flat terrain. There were several reports of storm rainfall exceeding 30 inches from Alvin, Freeport and Sargent, Texas, making Claudette one of the wettest tropical cyclones ever to affect the United States. Fig. 3 is an isohyetal map prepared by the National Weather Service's Southern Region Headquarters office in Fort Worth, Texas, based on a bucket survey taken shortly after the storm.

The highest winds on the coast were estimated to be 45–55 kt in gusts at Cameron, Louisiana, around the time of landfall. Tides of 2–4 ft above normal caused minor damage along the Louisiana coast. Table 3 gives the meteorological data for Claudette.

## Meteorological data of Tropical Storm Claudette, 16–29 July 1979.

Location	Date	Pressure (inches)		Wind (mph)				Tide (ft)		Rainfall (inches)		Remarks
		Low	Time <sup>a</sup>	Fastest mile	Time <sup>a</sup>	Peak gust	Time <sup>a</sup>	Highest MSL	Time <sup>a</sup>	Storm total	Dates	
Lesser Antilles												
Martinique	17										2.72	
Guadeloupe	17			SSE 35	1550						7–8	
Antigua	17					52					2.30	
Barbuda	17					46						
Puerto Rico												
Ponce											8.06	17–18
United States												
Texas												
Beaumont-Port Arthur WSO	24	-29.46	1705	53	25/0518	60	25/0521	2–4 <sup>b,c</sup>			12.75	23–26
Port Arthur											16.84	24–27
Sabine CG	25							4–5 <sup>b</sup>				
Galveston WSMO	24	29.66	1813	NE 20	23/1859	NE 33	23/1251	3.8	23/0630		16.95	25–26
Baytown											14.24	25–26
Texas City	23							3.5			12.58	25–26
Houston Int'l Airport											2.83	25–26
Alvin WSO											30.70	24–27
Sargent											34.50	24–27
Freeport	26			SSW 48	0600						30.20	24–27
42 S Freeport	25					45–60 <sup>b</sup>	0750					
Louisiana												
Cameron	24	29.56	1615			50–60 <sup>b</sup>	1415	3.9 <sup>b</sup>	1040			
Lake Charles	24	29.61	1700	S 28	25/0226	39	25/1058	4.0			9.18	23–26
Mobil Oil Rig 28.3°N 93.0°W	24			S 46	1000							
Mobil Oil Rig 28.7°N 92.3°W	24			SE 52	0600							
Mobil Oil Rig 28.2°N 91.8°W	24			SSE 40	0600 <sup>d</sup>							
Conoco Oil Rig 29.3°N 93.0°W	25			S 50	2325							

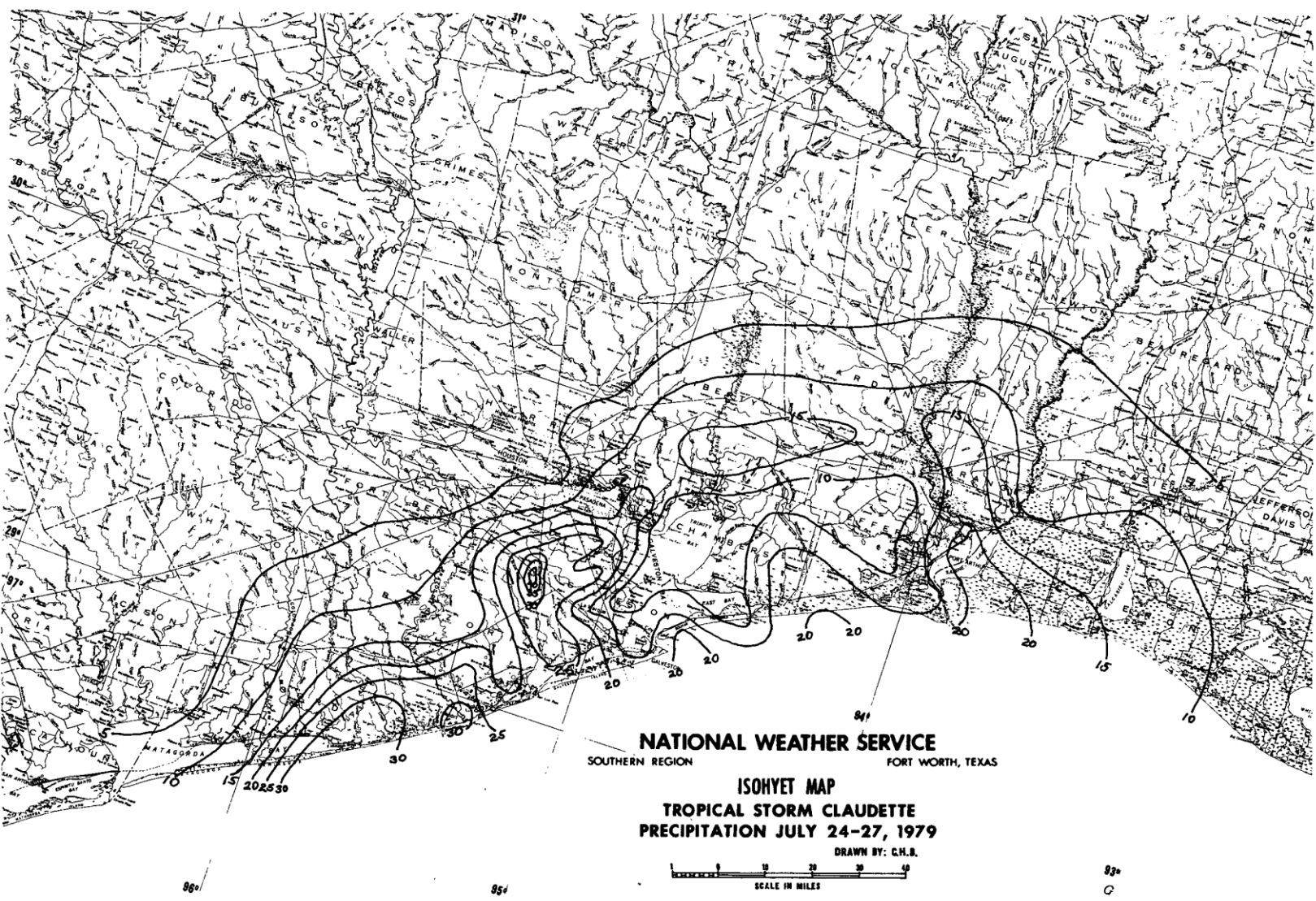
<sup>a</sup> Central Standard Time.

<sup>b</sup> Estimated.

<sup>c</sup> Above normal.

<sup>d</sup> First of several occurrences.

There was one death in Texas by drowning. The damage from the flooding produced by Claudette's heavy rains is estimated at \$400 million. Claudette was the tenth costliest tropical cyclone in United States history, and the only one not of hurricane intensity to rank in the top 25 (Hebert and Taylor, 1979).



Map of tropical storm Claudette rainfall (inches) 24-27 July 1979. (Courtesy NWS Southern Region Headquarters, Fort Worth, TX.)

## TROPICAL STORM CLAUDETTE

July 1979

Best Track

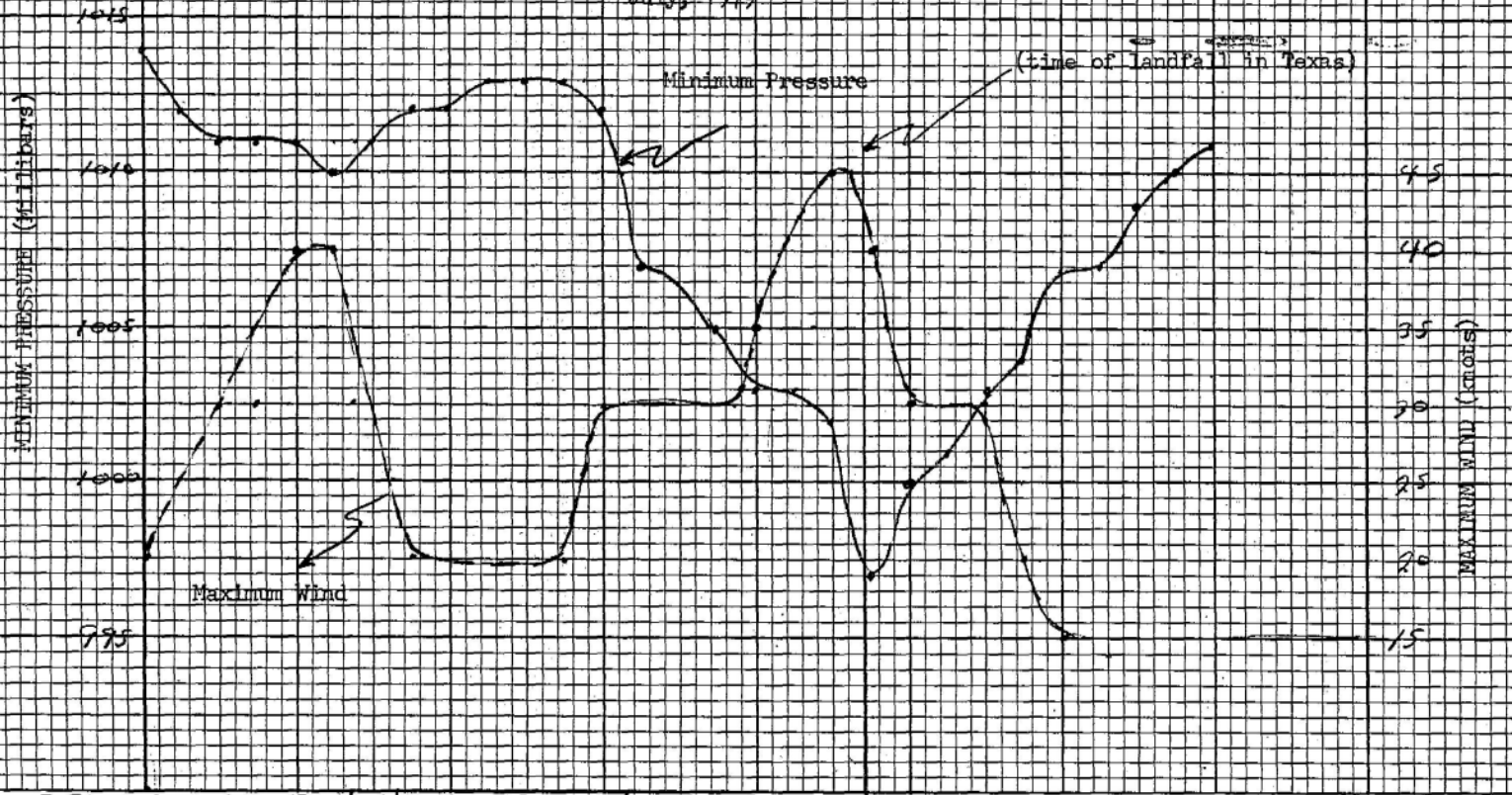
DAY	TIME Z	LATITUDE	LONGITUDE	MIN. PRES. (mbs)	MAX WIND (kts)	CATEGORY
15	12	12.5	46.3	1014	20	trop disturbance
	18	12.8	48.4	1014	20	
16	00	13.4	50.4	1012	25	trop disturbance
	06	14.6	52.1	1012	25	
17	12	15.7	53.8	1011	30	trop depression
	18	16.5	55.5	1011	30	
	00	17.0	57.2	1011	30	trop storm
	06	17.5	58.8	1011	30	
18	12	17.8	60.3	1011	40	trop storm
	18	18.0	62.1	1010	40	
	00	18.2	63.8	1010	40	trop depression
	06	18.3	65.4	1011	30	
19	12	18.4	67.0	1011	30	trop. disturbance (wave)
	18	18.5	68.5	1012	25	
	00	18.7	69.5	1012	20	trop disturbance
	06	18.8	70.5	1012	20	
20	12	18.8	71.4	1012	20	trop disturbance
	18	19.0	72.4	1012	20	
	00	19.0	73.3	1013	20	trop disturbance
	06	19.2	74.7	1013	20	
21	12	19.5	76.7	1013	20	trop disturbance
	18	20.0	78.7	1013	20	
	00	20.6	80.4	1013	20	trop disturbance
	06	21.4	82.2	1013	25	
22	12	22.1	83.5	1012	30	trop depression
	18	22.8	85.0	1010	30	
	00	23.5	86.5	1007	30	trop depression
	06	24.0	87.4	1007	30	
23	12	24.5	88.5	1007	30	trop depression
	18	25.0	89.5	1006	30	
	00	25.4	90.5	1005	30	trop storm
	06	25.9	91.4	1004	30	
24	12	26.4	92.4	1003	35	trop storm
	18	26.9	92.9	1003	35	
	00	27.5	93.4	1003	35	trop storm
	06	28.3	93.5	1003	35	
25	12	28.8	93.7	1002	45	trop storm
	18	29.6	93.9	1000	45	
	00	30.3	93.9	997	40	trop depression
	06	30.3	94.3	998	35	
26	12	30.5	94.8	1000	30	trop depression (overland)
	18	30.5	95.2	1001	30	
	00	30.2	95.3	1001	30	

TROPICAL STORM CLAUDETTE  
Best Track (cont.)

Day	Time	Latitude	Longitude	Min. Pres.	Max Wind	Category
26	06	30.6	95.1	1002	30	trop depression (over land)
	12	30.8	95.4	1003	30	
	18	31.3	96.3	1004	25	
27	00	31.8	96.6	1004	20	
	06	32.7	96.4	1006	20	
	12	34.0	95.9	1007	15	
	18	35.3	95.3	1007	15	
	00	36.4	94.6	1007	15	
28	06	37.8	93.4	1008	15	
	12	38.6	91.0	1009	15	
	18	38.8	88.0	1009	15	
	00	39.0	85.2	1010	15	
29	06	39.0	82.8	1011	15	
	12	39.0	80.2	1011	15	

TROPICAL STORM CLAUDETTE

July, 1979



DAY 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29

(17)

T. Dist.      T. Dep.      T.S.      T. Dep.      Tropical Storm      Tropical Depression (over land)

Tropical Storm Disturbance (wave)      Storm      Depression (over land)

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