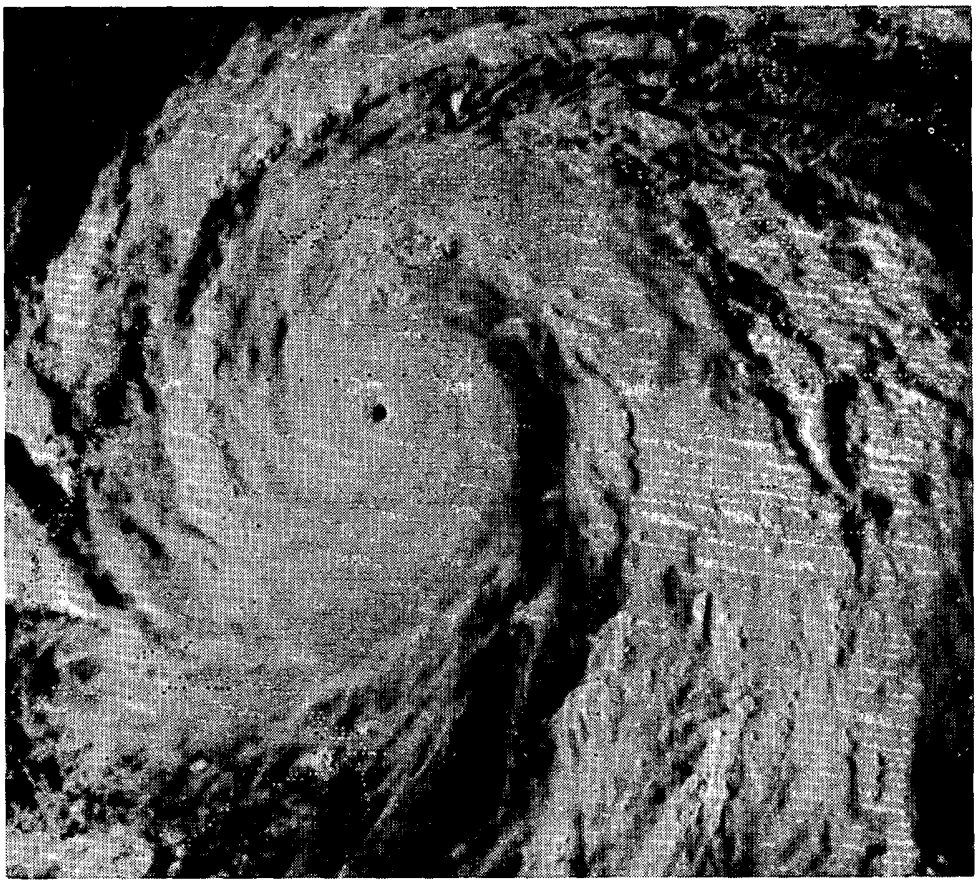
SEPTEMBER 1988 VOLUME 30 NUMBER 9

STORM DATA



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Kenneth D Wadlea

DIRECTOR
NATIONAL CLIMATIC DATA CENTER

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CONTENTS

Cover: Having passed directly over Jamaica and on its way to the Yucatan Peninsula, Hurricane GILBERT is marked by a well-defined eye near 19.5°N, 83.3°W over the Caribbean Sea at 2130 UTC on September 13, 1988 in this GOES 6 satellite, visible image. At the time, the large hurricane's cloud mass filled most of the Caribbean, and its minimum sea-level pressure of 885 mb was not only the lowest for the cyclone, but the lowest of record for the entire Western Hemisphere as well. (See HURRICANE GILBERT...., pages 13 through 29) ---Photo from NHC and provided through AOML/HRD, both of Miami, Florida.

STORM DATA
(ISSN 0039-1972)

The section on Outstanding Storms of the Month is prepared by Professor T. Theodore Fujita, editor, and Duane J. Stiegler, associate editor, the University of Chicago, with funding by the U. S. Office of Naval Research. The Storm Data and Unusual Weather Phenomena narratives, and summaries of Hurricanes/Tropical Storms are prepared by the National Weather Service. The National Climatic Data Center compiles statistics on deaths, injuries, damage and prepares the annual summaries of tornadoes and Lightning. This publication contains our best information on storms, but due to the difficulties inherent in collection of this type of data it is not all-inclusive. Late reports and corrections will be carried quarterly. Maps of zones used in the Storm Data and Unusual Weather Phenomena will be published in all editions.

Storm Data is published monthly by the National Climatic Data Center.

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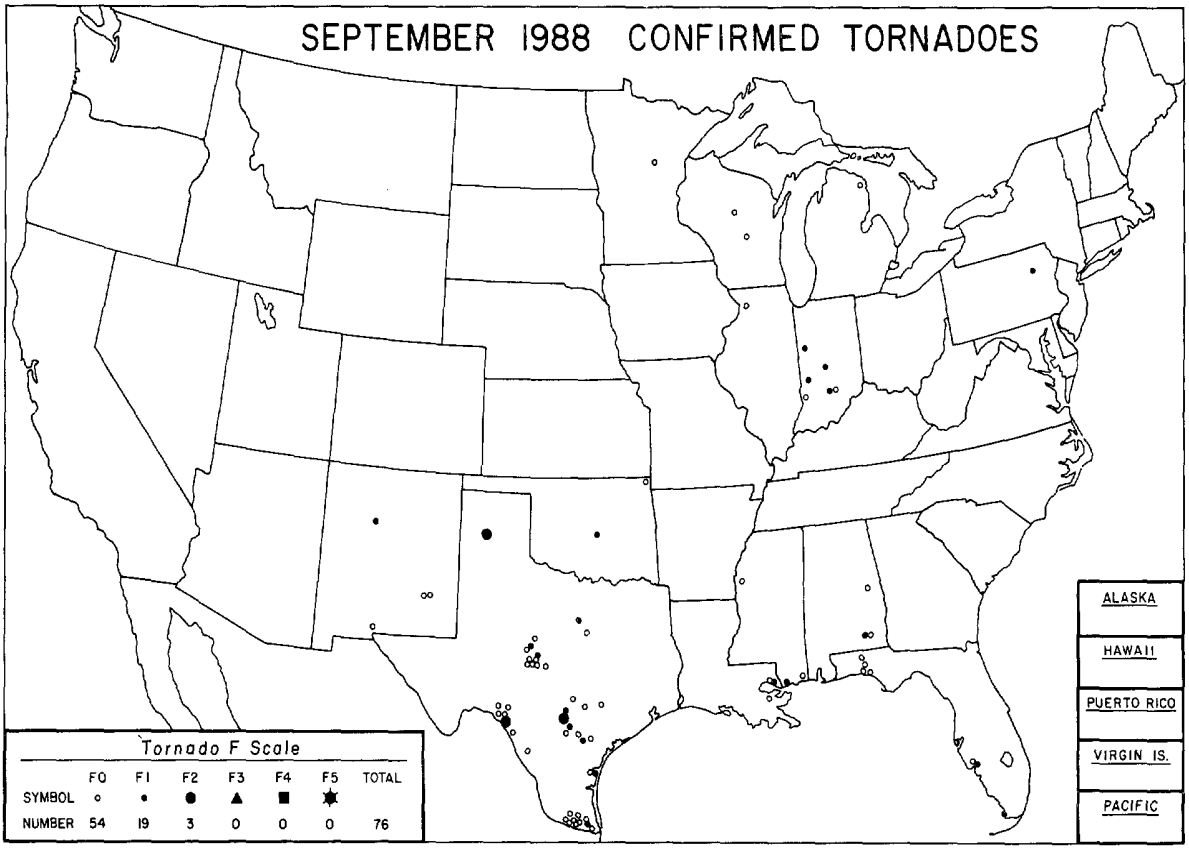
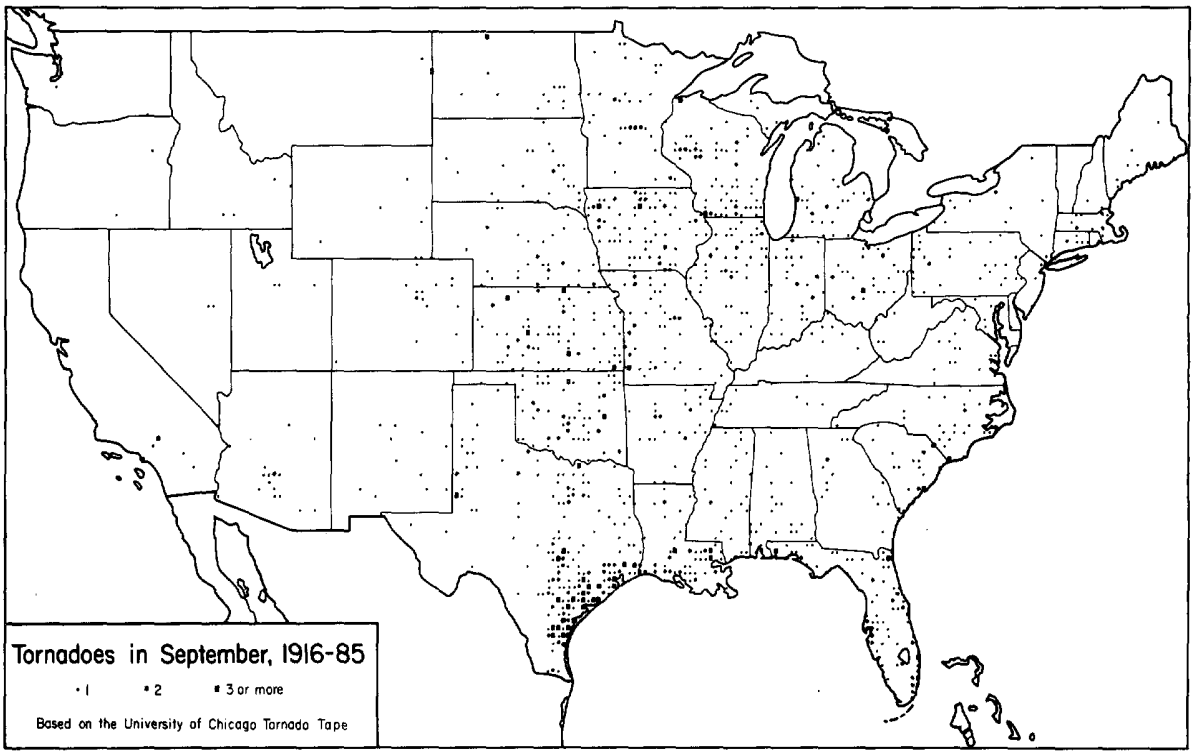
OUTSTANDING STORMS OF THE MONTH

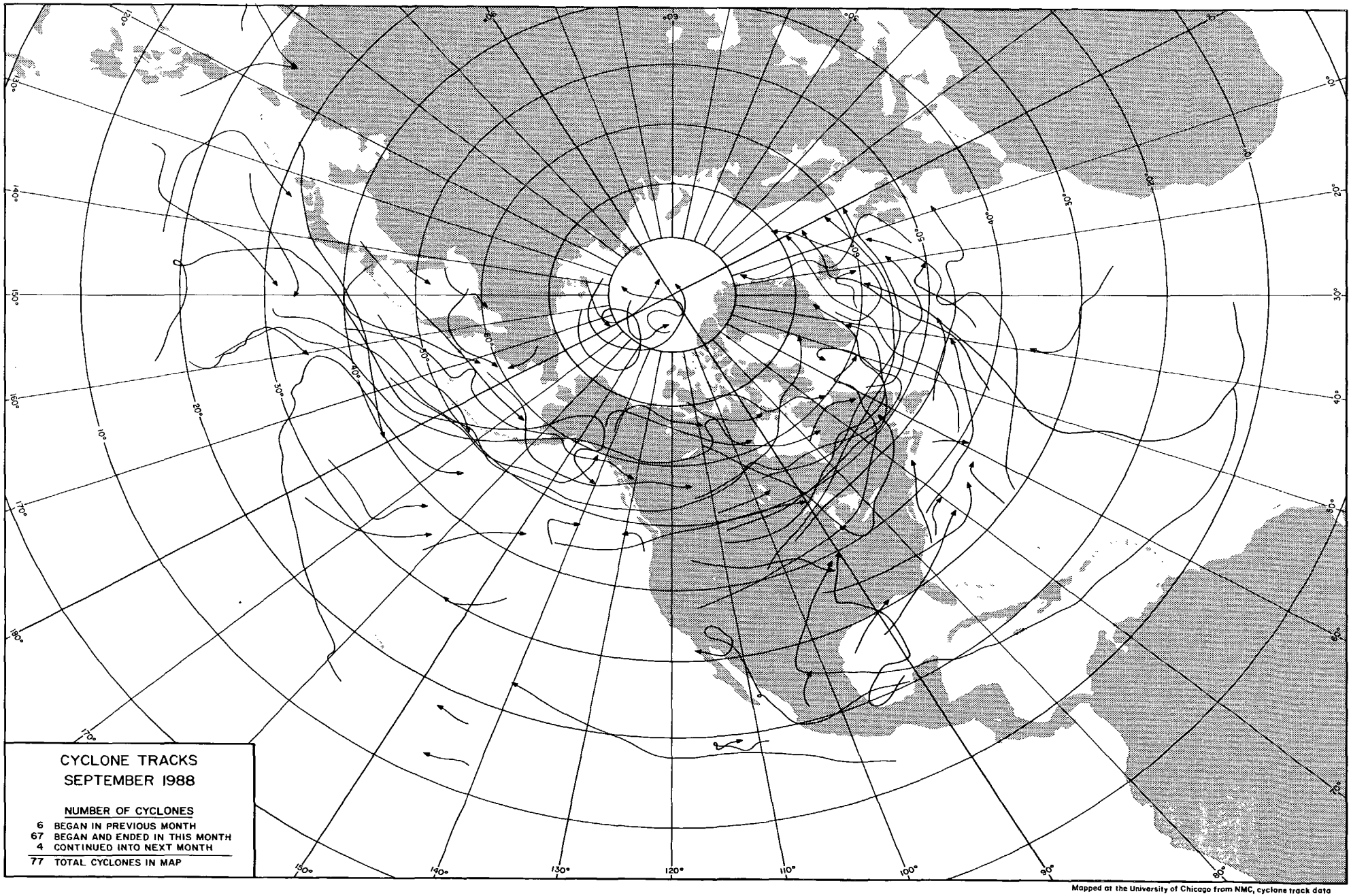


● COMPLETE REPORT RECEIVED
◑ PRELIMINARY REPORT RECEIVED
○ REPORT NOT RECEIVED

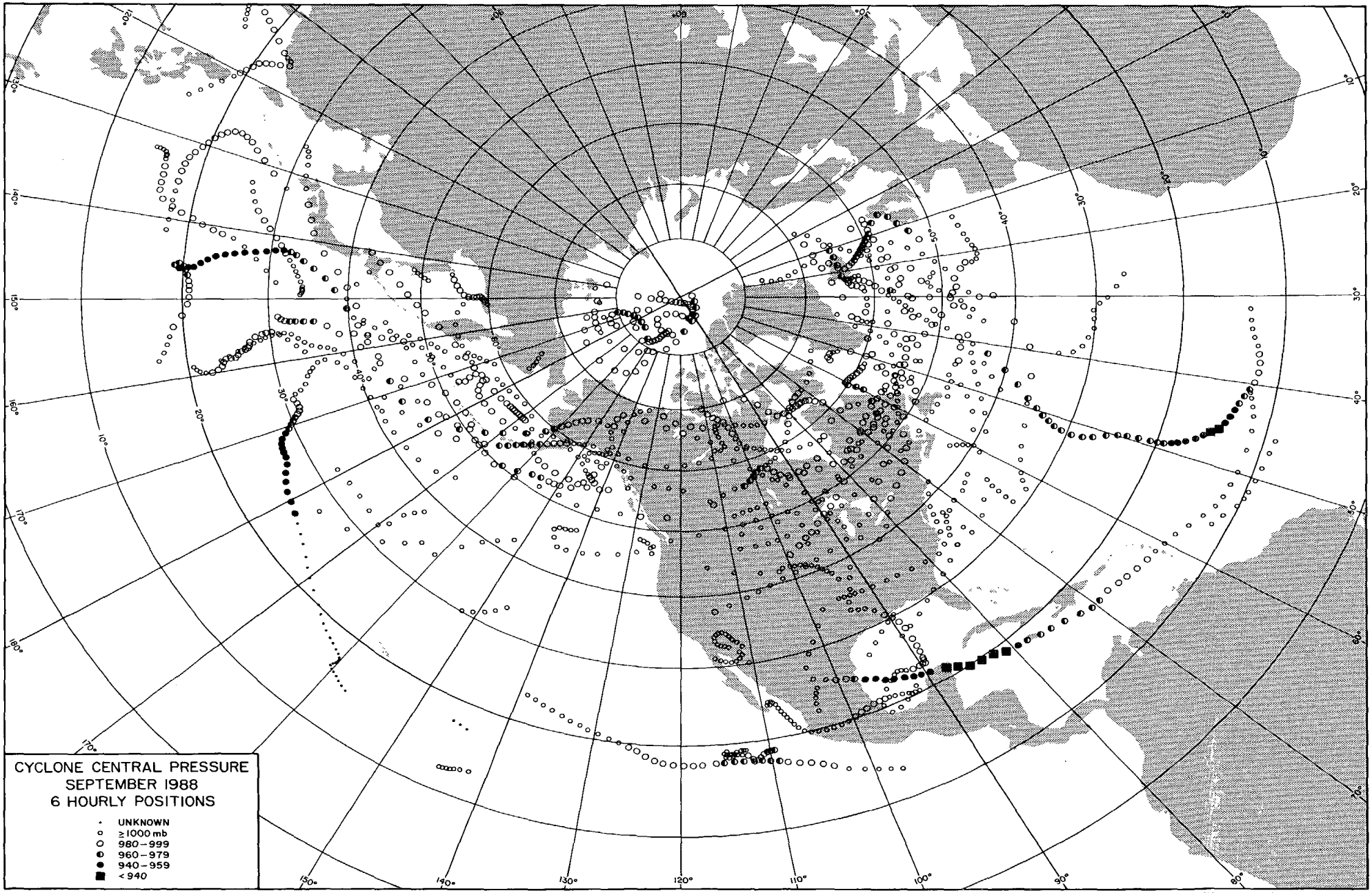
(N) northern (W) western
(S) southern (C) central
(E) eastern (O) coastal
(SE) southeastern

● 1AL	● 7DE	● 14KS	● 21MN	● 28NJ	● 33OH	● 39SD	● 44VA	● 49AK(SE)
● 2AZ	● 8FL	● 15KY	● 22MS	● 29NM	● 34OK	● 40TN	● 45WA	● 50HI
● 3AR	● 9GA	● 16LA	● 23MO	● 30NY(O)	● 35OR	● 41TX(N)	● 46WV	● 51PR
● 4CA(N)	● 10ID	● 17ME	● 24MT	● 30NY(C)	● 36PA(E)	● 41TX(S)	● 47WI	● 52VI
● 4CA(S)	● 11IL	● 18MD	● 25NE	● 30NY(W)	● 36PA(W)	● 41TX(W)	● 48WY	● 53PC
● 5CO	● 12IN	● 19MA	● 26NV	● 31NC	● 37RI	● 42UT	○ 49AK(N)	
● 6CT	● 13IA	● 20MI	● 27NH	● 32ND	● 38SC	● 43VT	● 49AK(S)	

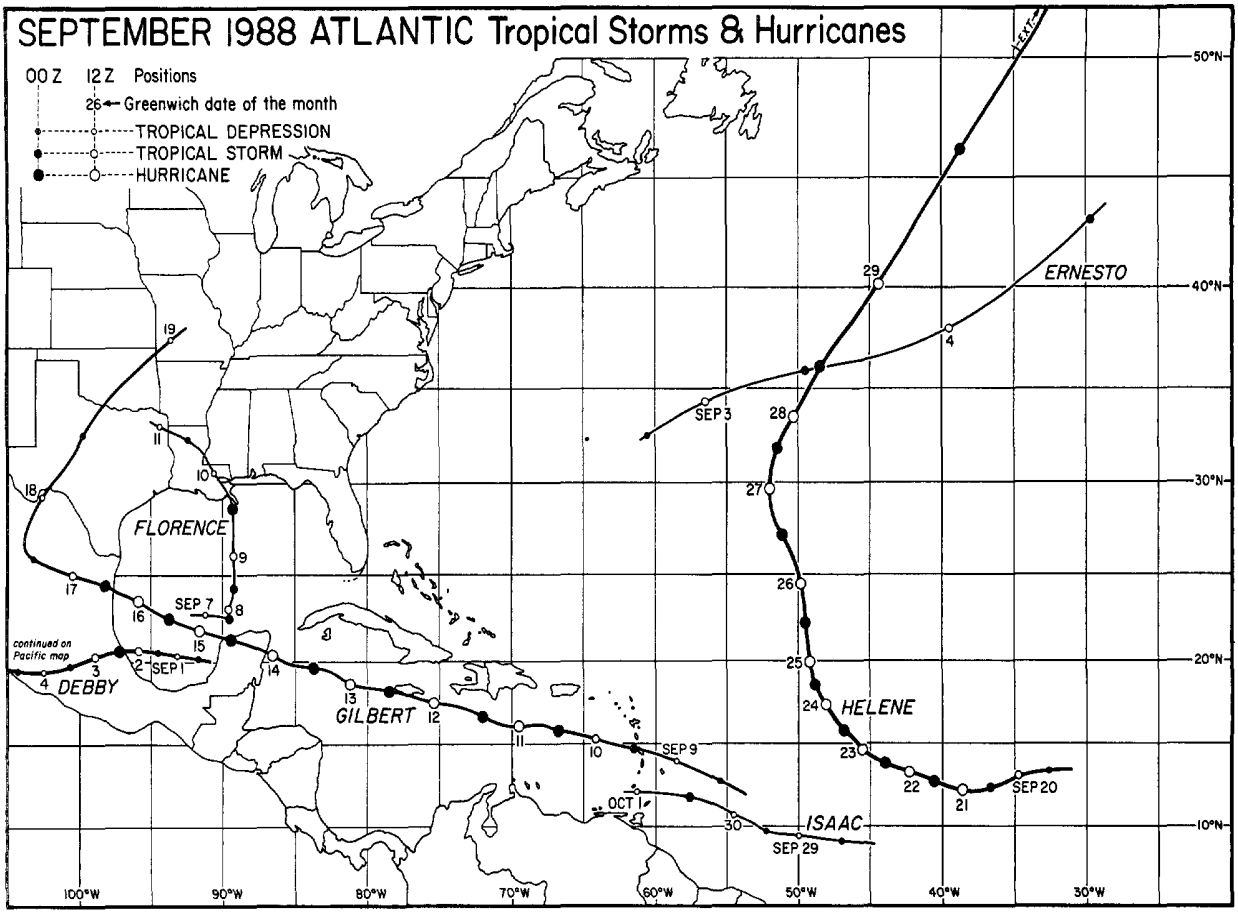


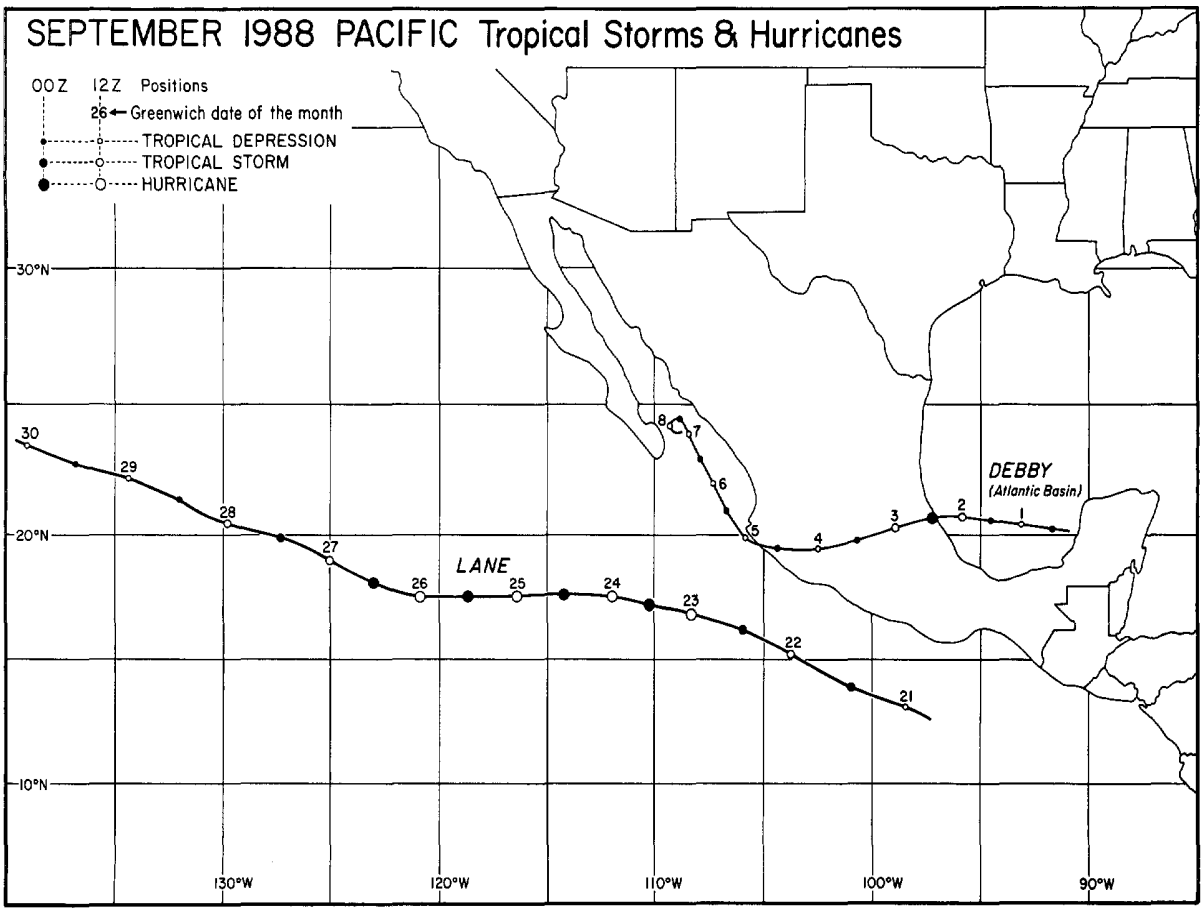


Mapped at the University of Chicago from NMC, cyclone track data

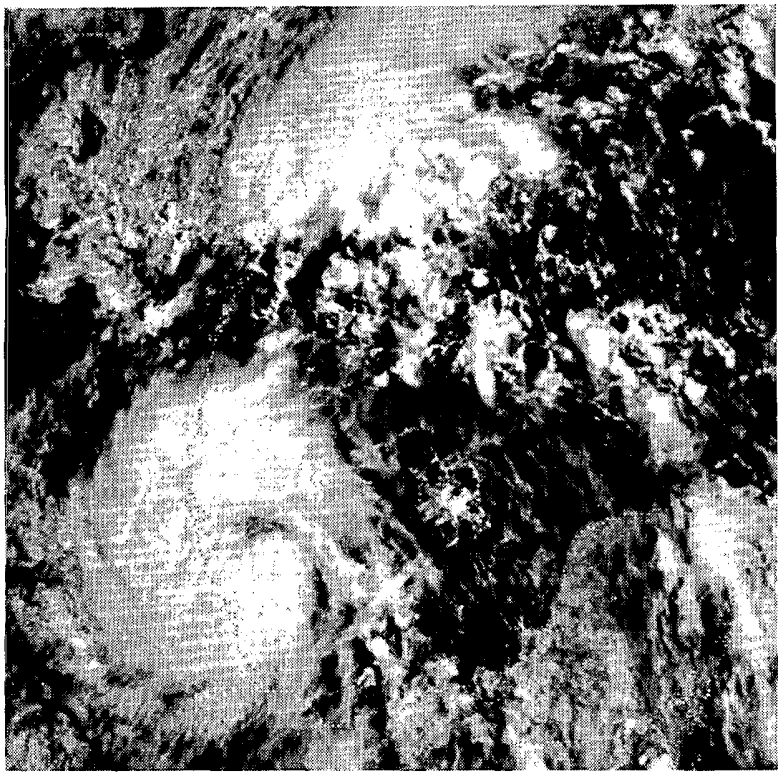

CYCLONE CENTRAL PRESSURE
SEPTEMBER 1988
6 HOURLY POSITIONS
UNKNOWN
≥1000 mb
980–999
960–979
940–959
<940
Mapped at the University of Chicago from NMC, cyclone track data

TROPICAL STORMS and HURRICANES

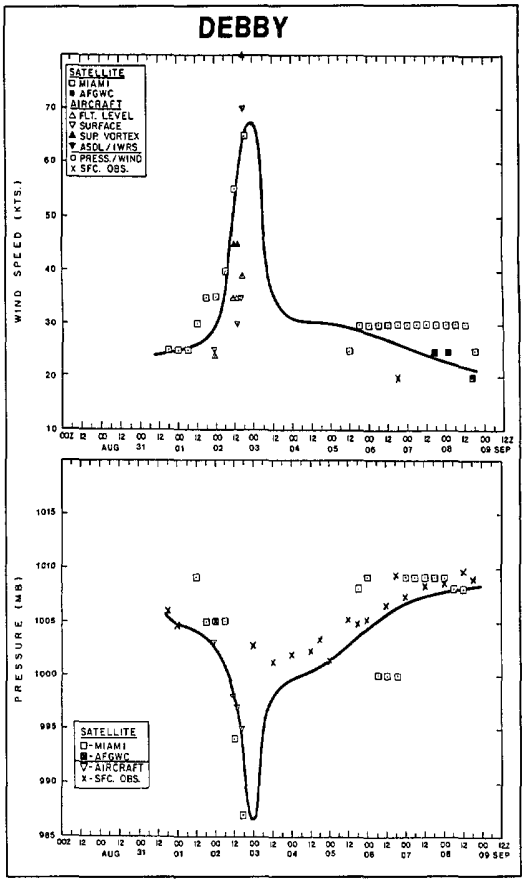




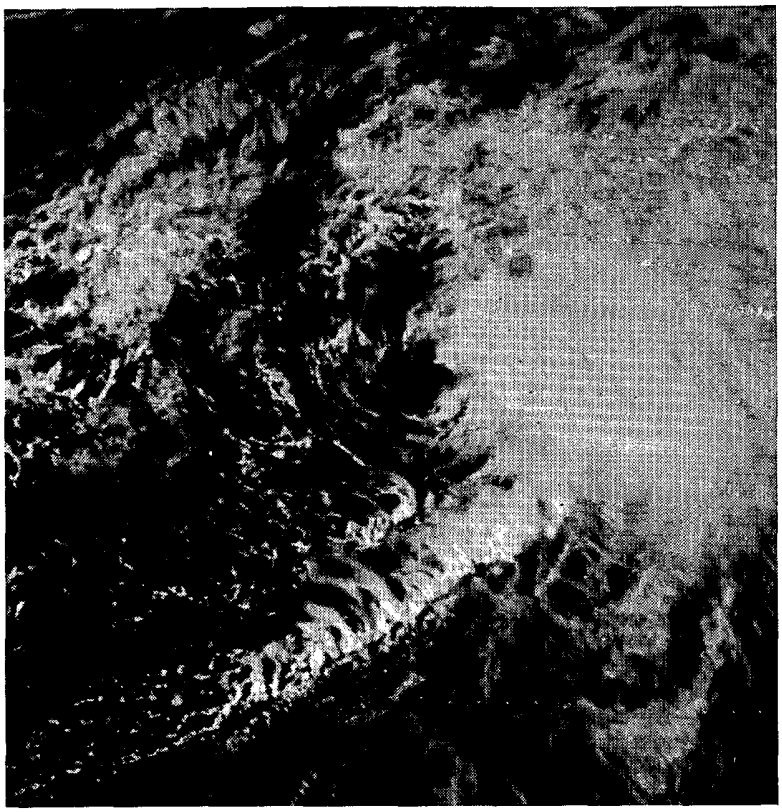
---Best track data in both above maps from the National Hurricane Center, Miami, Florida.



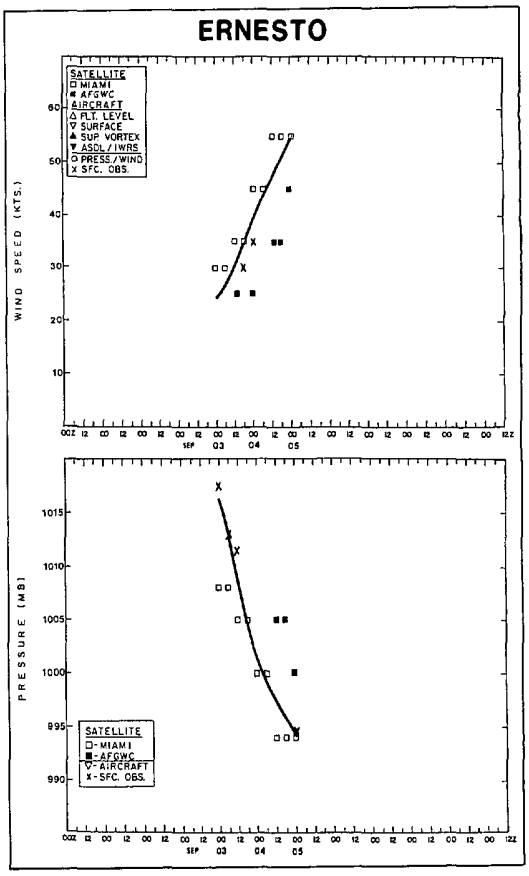
DEBBY, seen here in tropical storm stage over the Gulf of Mexico, was the season's first hurricane and also one of the shortest-lived hurricanes of record. The cyclone achieved minimal hurricane status for only six hours before making landfall just south of Tuxpan, Mexico at 0000 UTC on September 3rd. The last hurricane to make landfall along that portion of the Mexican coast was ANNA in 1956, another short-lived hurricane. However, in the previous year, 1955, three hurricanes, GLADYS, HILDA and JANET, struck that same general area. This GOES 6 satellite, visible image was taken at 1430 UTC on September 2, 1988.



Plots of estimated maximum wind speed and minimum surface pressure versus time for Hurricane DEBBY.



A GOES 6 satellite, visible image taken at 1930 UTC on September 3rd shows Tropical Storm ERNESTO centered near 35°N, 53°W in the North Atlantic, just one and a half hours after attaining its storm status. ERNESTO followed a northeast path totally over ocean surface on September 3rd and 4th before being absorbed by a large extratropical cyclone on the morning of the 5th.

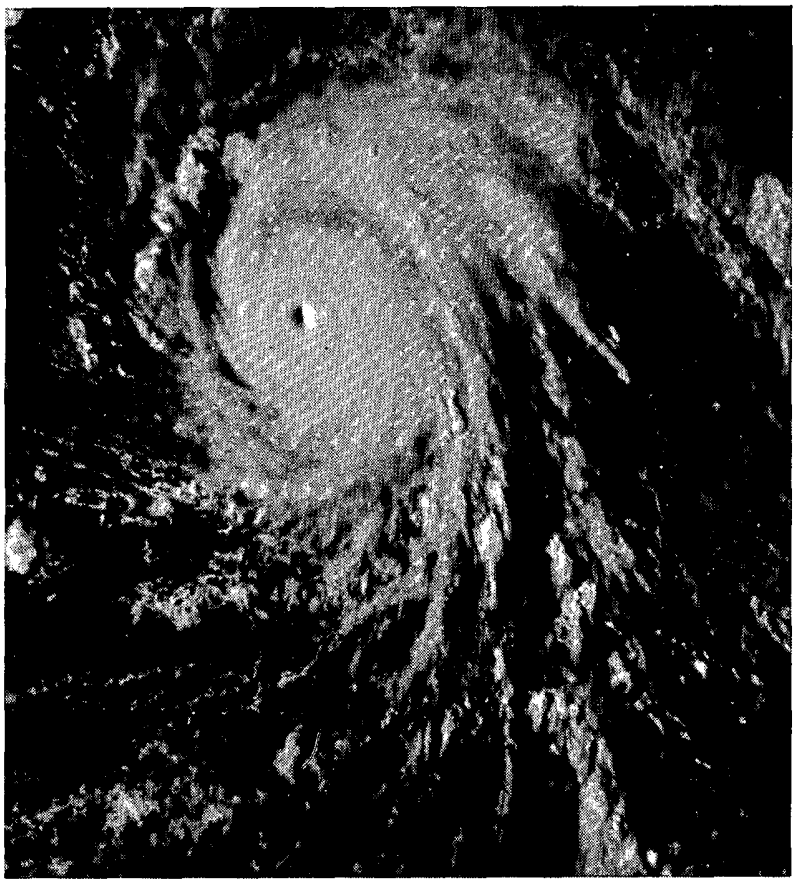


Plots of estimated maximum wind speed and minimum surface pressure versus time for Tropical Storm ERNESTO.

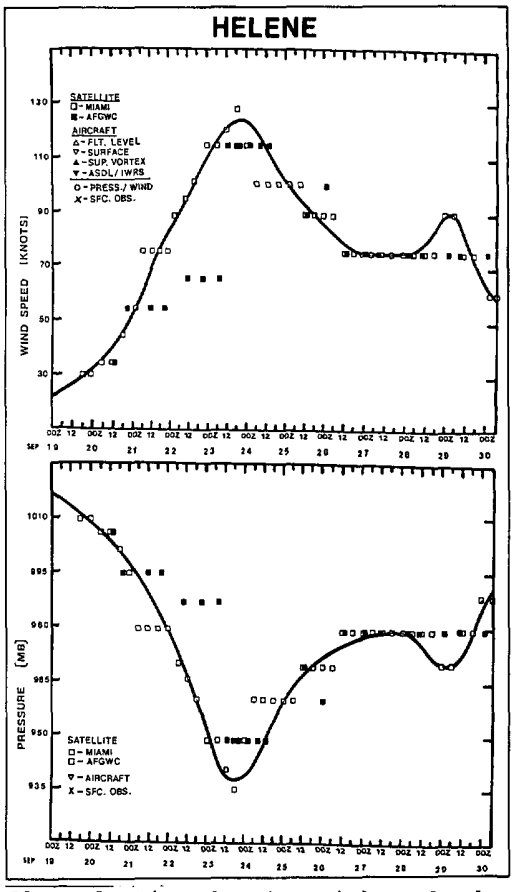
DATE	TIME (UTC)	SHIP	POSITION LATITUDE	POSITION LONGITUDE	PRESSURE (mb)	WIND (dir/kt)
9/03	1200	SXES	36.3	55.0	1011.5	050/10
9/03	1200	SHIP	33.3	56.3	1013.0	230/25
9/03	1200	3EHE	33.5	59.8	1014.5	340/20
9/03	1200	VPFT	38.0	59.4	1014.0	040/25
9/03	1200	KGDF	30.1	56.2	1017.5	220/25
9/03	1200	ZDAZ	28.6	57.2	1016.3	240/25
9/03	1800	SHIP	32.8	50.4	1012.0	200/30
9/04	0000	SHIP	33.0	48.5	1010.9	220/35
9/04	0000	UJUF	33.9	46.1	1013.4	190/25
9/04	0000	CLLV	32.8	50.0	1010.5	220/20
9/04	0600	SHIP	38.7	34.9	1013.8	170/30
9/04	1200	3ESF	35.5	40.8	1003.0	250/35
9/04	1200	GBDT	36.5	38.8	999.1	180/10
9/04	1200	GCCB	37.3	45.3	- - -	280/30
9/04	1800	WVFX	37.1	32.0	1007.9	180/40
9/04	1800	VWVY	37.3	34.4	1001.0	180/35
9/04	1800	GBDT	36.1	38.8	1003.6	240/35
9/04	1800	SHIP	33.9	39.1	1006.9	230/40
9/05	0000	UIZE	44.0	29.2	994.6	140/30
9/05	0000	UUXU	39.8	29.0	1003.8	190/35

Wind and pressure reports from ships that encountered weather associated with Tropical Storm ERNESTO from September 3rd through the 5th, 1988.

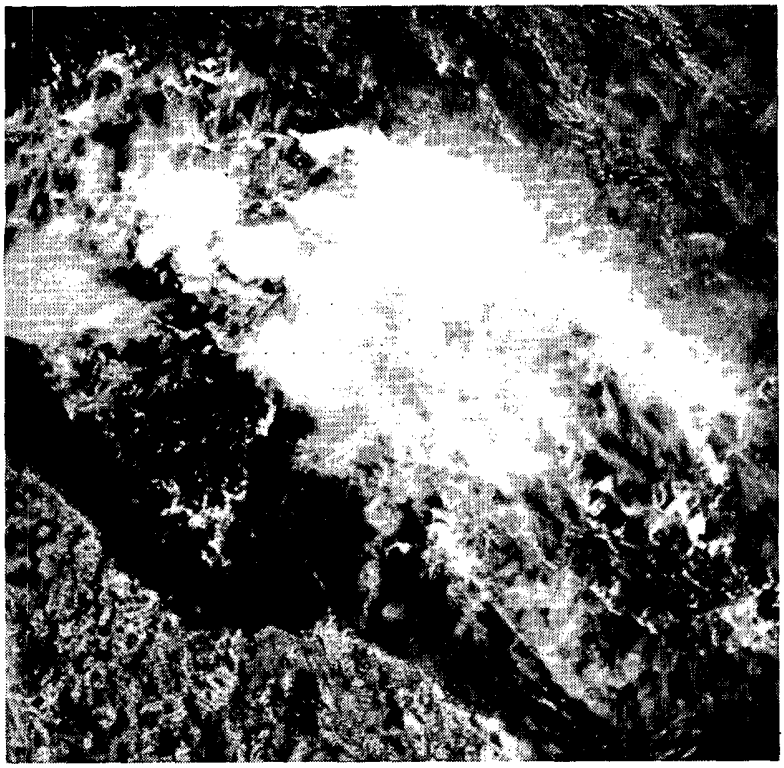
NOTE: Information on Hurricanes FLORENCE and GILBERT appears as Items 1 and 2 on following pages.



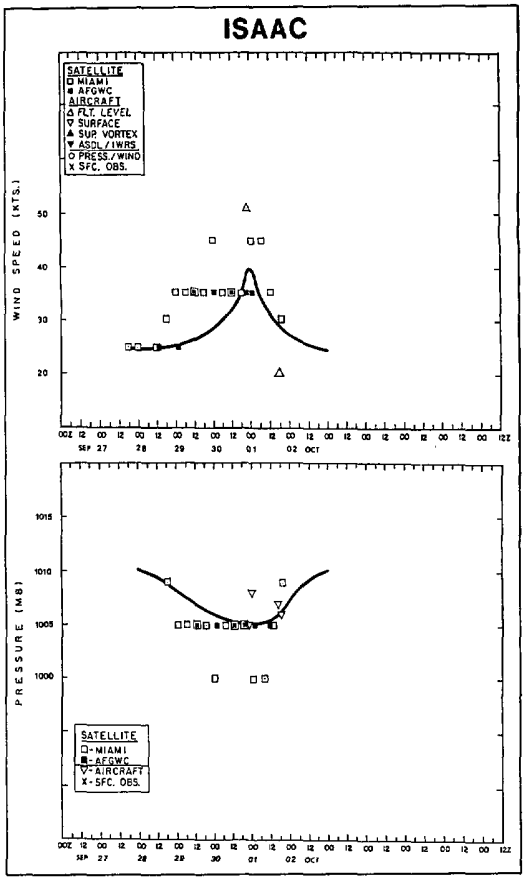
Hurricane HELENE exhibits a well-defined eye at about 15.4°N, 46.2°W in the North Atlantic in this GOES 6 satellite, visible image taken at 1900 UTC on September 23rd, just one hour after the cyclone had reached its estimated minimum central pressure and maximum wind speed, 938 mb and 125 mph respectively. HELENE remained over the open waters of the Atlantic during its entire 11-day lifespan, during which it moved west then north on an arcing path before becoming extratropical on September 30th.



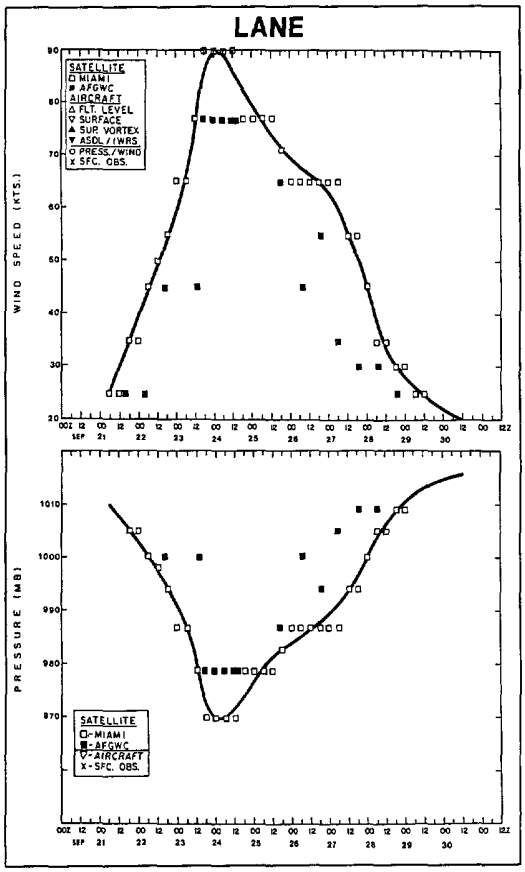
Plots of estimated maximum wind speed and minimum surface pressure versus time for Hurricane HELENE.



The cloud mass of an organized tropical depression centered near 11.2°N, 55.6°W in the Atlantic off the north coast of South America is seen in a GOES 6 satellite, visible image taken at 1630 UTC on September 30th, one and a half hours before the system became a tropical storm and was named ISAAC. For a while ISAAC appeared to be a threat to the Lesser Antilles and a warning was issued for the islands of Barbados, the Grenadines, St. Vincint, St. Lucia, Dominica and Martinique, but ISAAC maintained its minimal storm status for less than 18 hours and quickly dissipated as it moved into the area on October 1st.



Plots of estimated maximum wind speed and minimum surface pressure versus time for Tropical Storm ISAAC.



DATE	TIME (UTC)	SHIP	POSITION LATITUDE	POSITION LONGITUDE	PRESSURE (mb)	WIND (dir/kt)
9/21	1800	WUGL	15.7	98.4	1014.0	090/35
9/21	1800	8JFE	13.2	103.9	1013.9	220/20
9/22	0000	WUGL	15.1	97.0	1014.5	090/35
9/22	0000	SEWX	16.8	101.3	1012.0	110/25
9/22	1200	HPAA	17.2	101.5	1012.0	100/30
9/22	1800	PILF	16.9	102.9	1014.2	100/35
9/22	1800	PJFI	16.8	101.6	1015.0	130/30
9/23	0000	CWDG	18.9	105.6	1010.5	150/25
9/23	0600	UNXE	12.0	103.8	1015.1	210/30
9/23	1200	USLT	13.8	109.2	1009.0	250/15
9/23	1800	USLT	13.4	108.2	1011.1	230/25

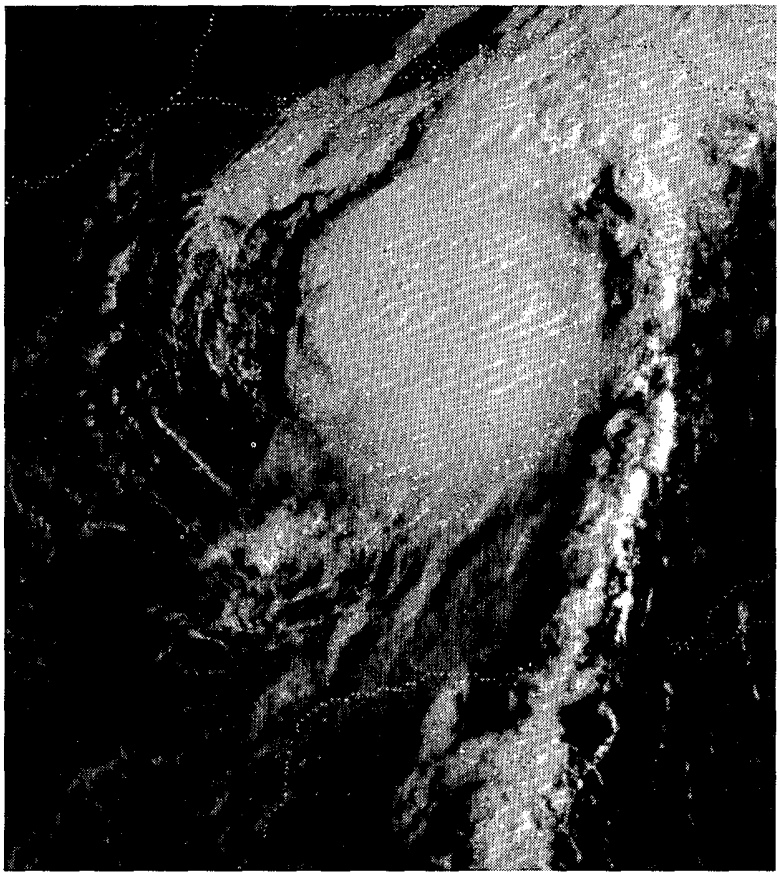
Wind and pressure reports from ships that encountered weather associated with Hurricane LANE as it was intensifying on September 21st through the 23rd. LANE, the only named tropical cyclone for the month and last hurricane of the season in the Eastern Pacific, reached its estimated minimum surface pressure and maximum wind speed, 970 mb and 90 mph respectively, at 0000 UTC on September 24th.

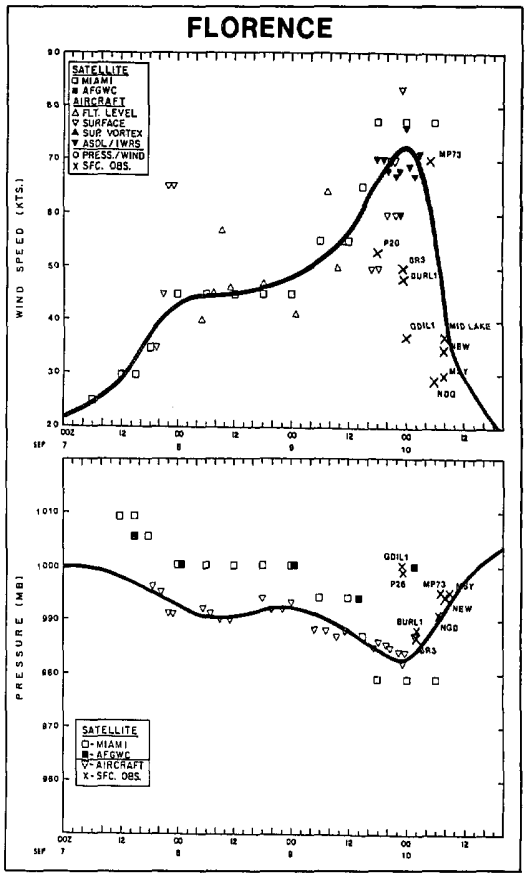
Plots of estimated maximum wind speed and minimum surface pressure versus time for Hurricane LANE.

---All materials on pages 7 through 9 from the National Hurricane Center and provided through the Hurricane Research Division of AOML, both of Miami, Florida.

1. HURRICANE FLORENCE, September 7-11, 1988

As the only hurricane to make landfall in the U.S. during the 1988 season, FLORENCE moved ashore over the Mississippi River Delta of southeast Louisiana on September 10th after having been a hurricane for only 8 hours. FLORENCE began on the morning of September 7th as an organized circulation developed from a stationary front over Gulf of Mexico waters off the northwest tip of the Yucatan Peninsula. After moving a short distance east, FLORENCE turned due north and made headlong for Louisiana. The hurricane packed only 70 knot peak surface winds at

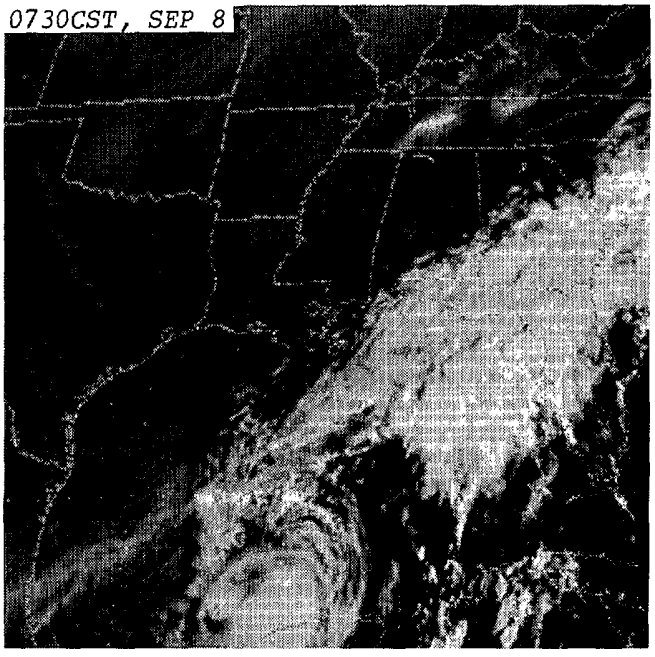




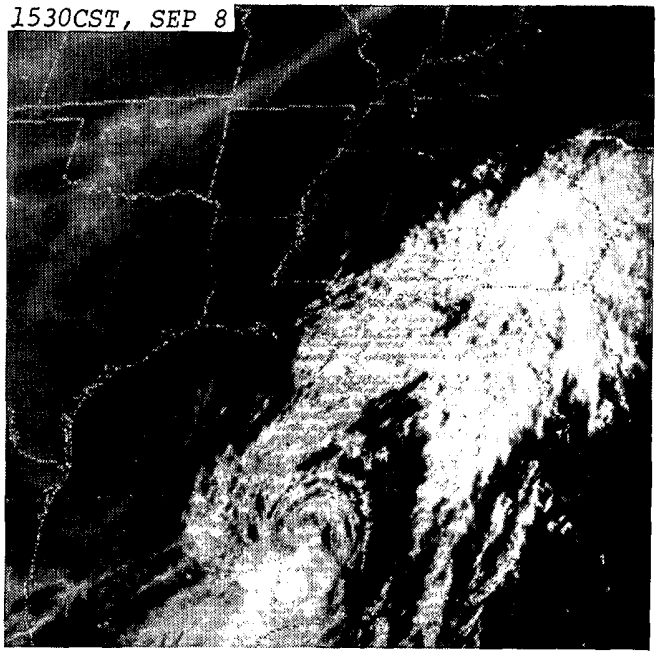
LEFT: As seen in this GOES 6 satellite, visible image, FLORENCE was characterized by an expansive exhaust cloud that obscured the storm's center and a long, arcing band of convection that stretched from the Mississippi River Delta area of the Gulf, around the east side of the storm, and southward to beyond Cozumel, Mexico during the morning of September 9th. This photo was taken at 1330 UTC (0730 CST). RIGHT: Plots of estimated maximum wind speed and minimum surface pressure versus time for Hurricane FLORENCE. ---Photo and plots from NHC and provided through AOML/HRD, both of Miami, Florida.

Below and on the following page, GOES 6 satellite, visible images depict FLORENCE's life-history as the cyclone moved northward from the southern Gulf of Mexico on September 8th to the south-central U.S. where it dissipated on September 11th. ---Photos from NESDIS, Washington, D.C.

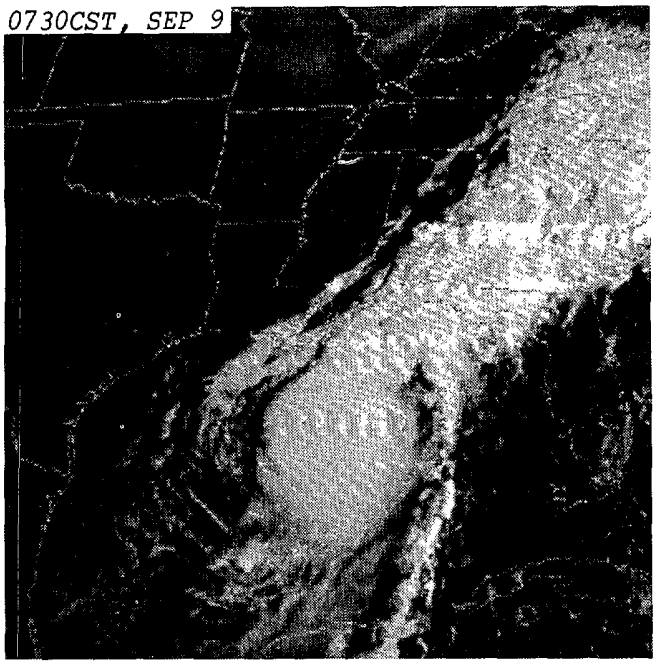
0730CST, SEP 8



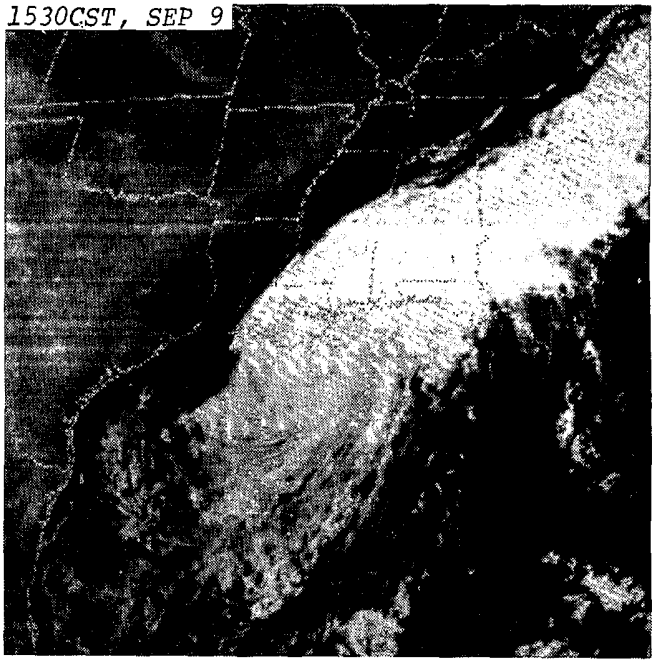
1530CST, SEP 8



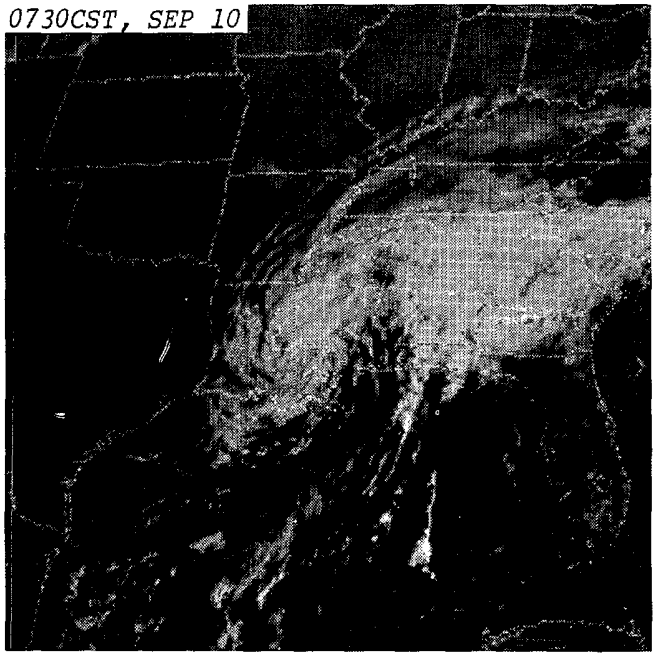
0730CST, SEP 9



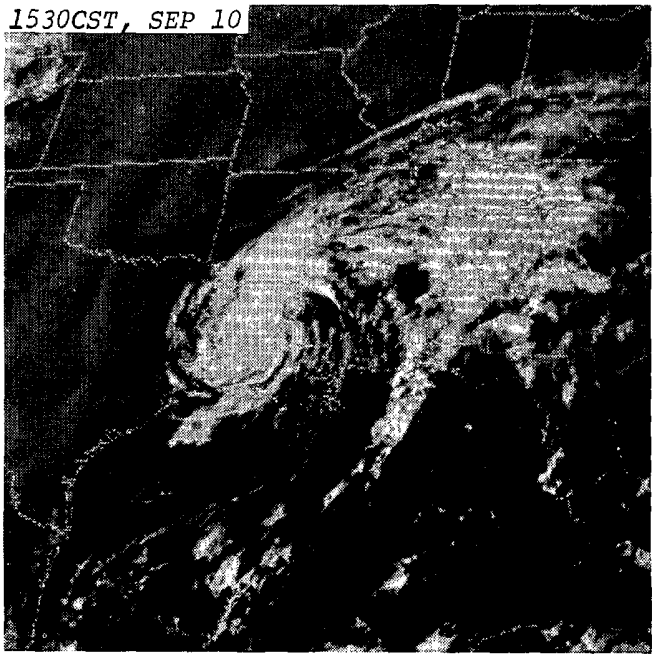
1530CST, SEP 9



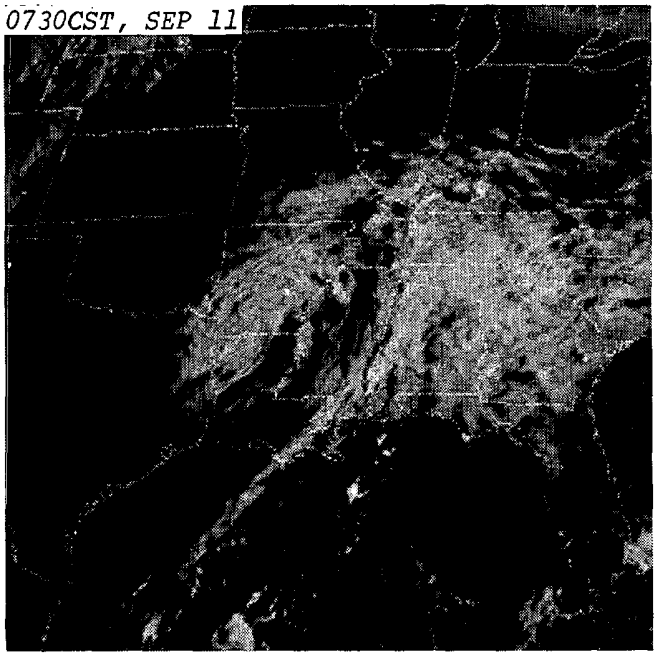
0730CST, SEP 10



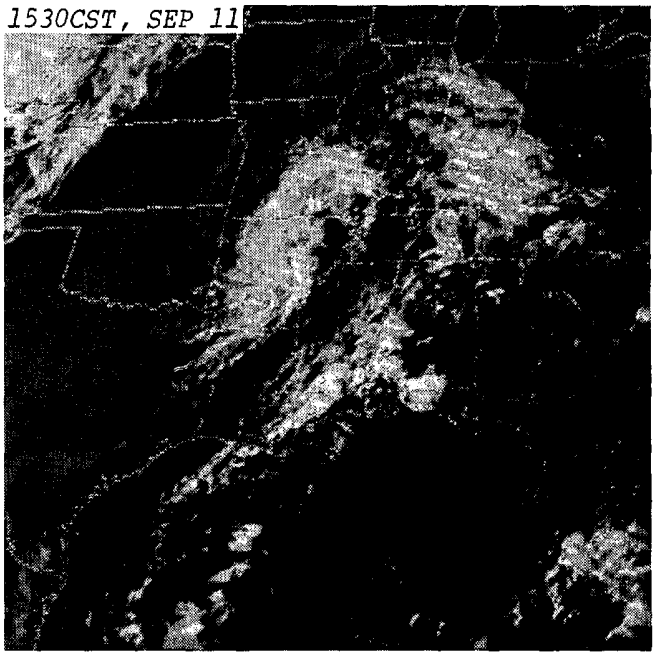
1530CST, SEP 10



0730CST, SEP 11



1530CST, SEP 11



Location	Minimum sea level pressure(mb)		Maximum surface wind speed(kt)			Storm surge(ft)	Rain (in)
	Pressure	Date/time (UTC)	1-minute average	Peak Gust	Date/time (UTC)[1]	Tide height above normal	Storm total
Louisiana							
Tower (GDIL1) *	999.5	09/2300	37	41	09/2200		
Tower (P26) *	999.0	09/2311	53		09/1711		
Tower (BURL1) *	988.0	10/0200	56	66	09/2300		
Coast Guard (8R3)	987.0	10/0200	50	56	09/2300		
Belle Chase (NBG)	990.9	10/0755	29	43	10/0555		
Tower (MP73) *	995.0	10/0711	70		10/0511		
New Orleans (NEW)	994.3	10/0751	35	53	10/0725		
Moisant (MSY)	994.5	10/0851	34	46	10/0750		0.99
Mid Lake Causeway			37	50	10/0800		
Paris Road					10/0620	+4.5 **	
Bayou Bienvenue					10/0800	+6.0	
Industrial Canal					10/0800	+5.5	
West End Marina					10/0800	+3.5 - +4.0	
Rigolets					10/0900	+3.0	
North Lake Causeway					10/1200	+3.5	
Mississippi							
Kessler AFB	1005.8	10/0530	15	20	10/0003		1.71
Hancock Co EOC	1005.8	10/0730	48[e]		10/1000		5.20
McComb (MCB)	1005.2	10/1200	15		10/0750		
Jackson (JAN)			18		10/2057		
Pass Christian						+5.1	
Jackson Co						+3.0	
Alabama							
Dauphin Island	1008.1	09/2330	35	42	10/0012		
Mobile (MOB)	1008.8	10/0043	23		09/2352	+2.0	2.88
Florida							
Pensacola NAS (NPA)	1008.8	09/2255	20		09/0245		5.15
Pensacola (PNS)	1009.4	10/0748	16		10/0450		2.76
Santa Rosa Co						+2.0 - +1.0	

1 - Time of 1-minute wind, except when only a gust is given.
* - Height unknown
** - Gage failed
e - Estimated

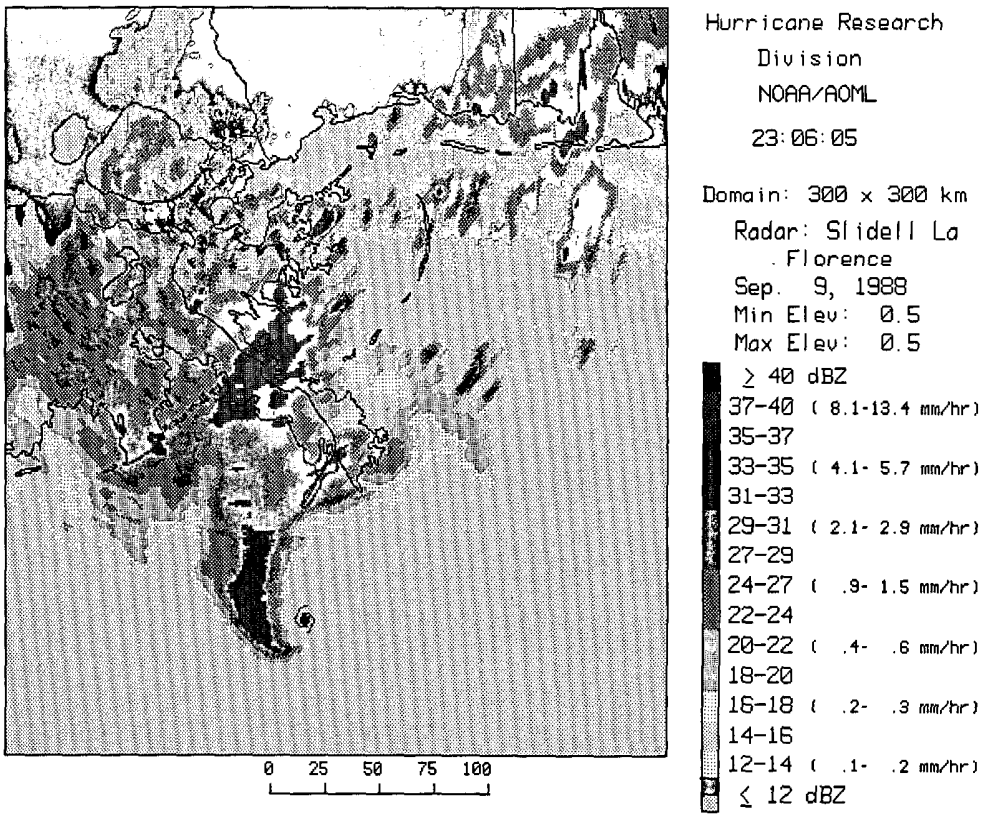
Selected meteorological and hydrological, surface observations associated with Hurricane FLORENCE. ---Table from NHC and provided through AOML/HRD, both of Miami, Florida.

DATE	TIME (UTC)	STATION	POSITION LATITUDE	POSITION LONGITUDE	PRESSURE (MB)	WIND (DIR/KT)
9/06	0600	SHIP	26.0	93.4	1009.2	NNE/20
9/06	0600	SHIP	22.4	90.6	1005.7	SE/20
9/06	1200	SHIP	22.4	88.1	1006.0	S/20
9/06	1800	SHIP	21.7	93.6	1000.7	WNW/30
9/09	0600	42001	25.9	89.7	1002.4	
9/09	1200	42001	25.9	89.7	997.3	

Selected wind and pressure reports from ships and buoys in the Gulf of Mexico that experienced weather associated with the formation and development stages of FLORENCE. ---Table from NHC and provided through AOML/HRD, both of Miami, Florida.

landfall over the mostly desolate delta area, thus damage was relatively minor. Numerous power outages resulted as light to moderate wind damage was done to trees across much of southeast Louisiana; storm surge flooding and beach erosion were experienced along shoreline areas of the region as well. Estimates of the total damage in southeast Louisiana ranged between 2.0 and 2.5 million dollars. There were no deaths or injuries in Louisiana from FLORENCE, however one man died in Alabama as he attempted to secure a boat in Mobile Bay. Also, FLORENCE produced no known tornadoes in Louisiana, but four weak and short-lived tornadoes were spawned in the Florida Panhandle, far from the hurricane's center. As Florence moved inland, its eye passing directly over New Orleans, the weakening system traversed Louisiana from southeast to northwest and dissipated over northeast Texas on September 11th.

A computer-processed, PPI (plan-position indicator) scan produced by the Hurricane Research Division of AOML from the NWS/WSR-57 radar at Slidell, Louisiana provides a view of the horizontal distribution and intensity of echos in FLORENCE's rainbands at 2306 UTC (1706 CST) on September 9th, the time of the hurricane's minimum pressure (982 mb) and about three hours prior to its landfall on the Mississippi River Delta. HRD deployed two land-based radar teams from Miami, Florida during FLORENCE, one to the site at Slidell and another to the radar site at Mobile, Alabama. HRD also conducted two experiments in FLORENCE using two NOAA/OAO P-3 aircraft over the Gulf, a synoptic-flow experiment on September 8th and their long-term monitoring experiment on September 9th. ---Figure from AOML/HRD, Miami, Florida.



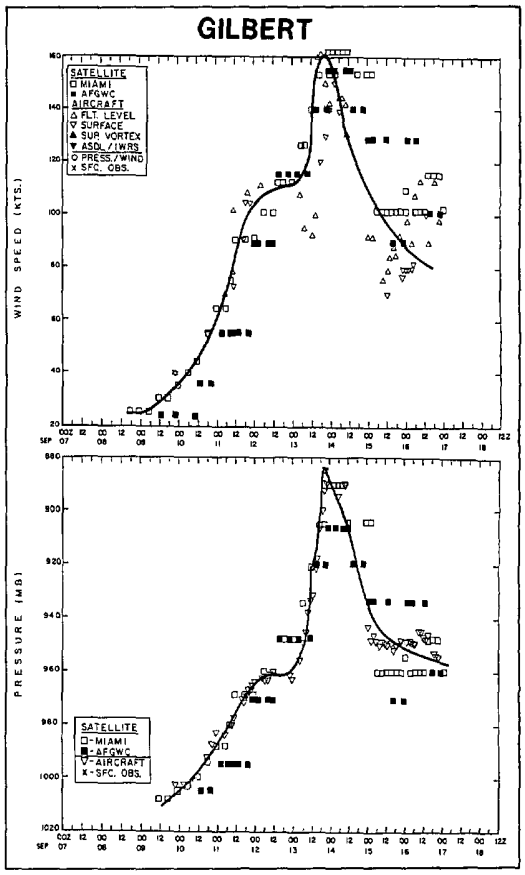
2. HURRICANE GILBERT, September 8-19, 1988

Hurricane GILBERT will long be remembered as the most intense, damaging and dramatic hurricane of the 1988 season, and one of the most significant of record as well. GILBERT began as a tropical wave off the African coast on September 3rd and moved westward across the Atlantic until it developed a low-level circulation on the 8th as it approached the Lesser Antilles. The system reached storm strength on the 9th as it moved through the Lesser Antilles, and by this time was on a west-northwest course from which it did not veer until it reached north-central Mexico. GILBERT attained hurricane status as it passed south of Puerto Rico on the 10th. Continuing through the Caribbean, GILBERT passed just south of Hispaniola, then made a direct hit on Jamaica on September 12th, the hurricane's eye passing over the length of the island. During the passage, the Kingston weather office recorded sustained winds of 101 knots (116 mph) with gusts of up to 122 knots (140 mph). The minimum pressure was 965 millibars (28.49 inches).

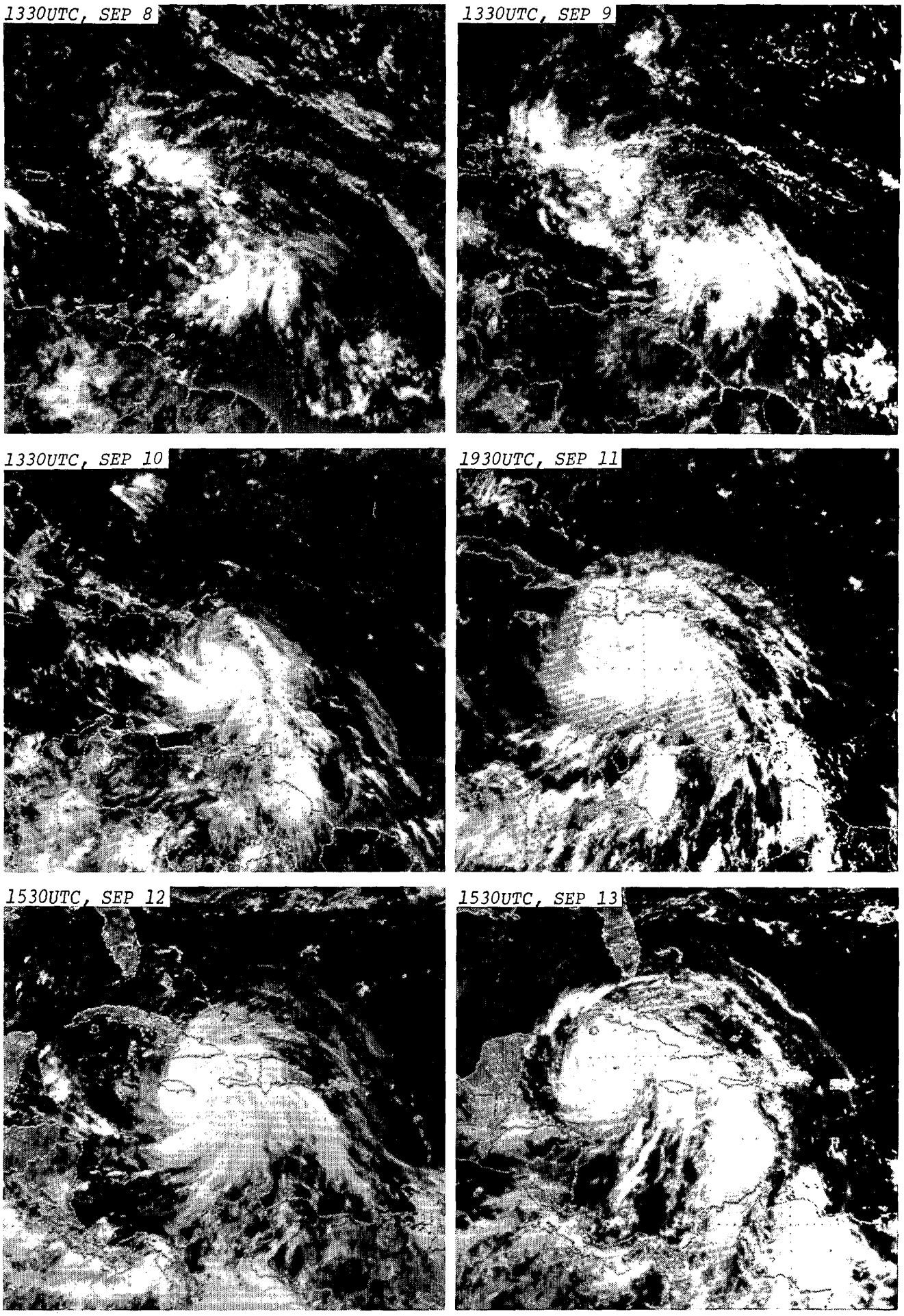
GILBERT underwent a rapid intensification in the 24 hours after its passage over Jamaica, its central pressure dropping 75 mb from 960 mb to 885 mb. This pressure, observed by an NOAA plane near 19.5°N, 83.3°W at 2152 UTC on September 13th, is the lowest sea-level pressure ever recorded in the Western Hemisphere, surpassing the previous record of 892 mb set in the Florida Keys during a September 1935 hurricane. Sustained wind speeds of 160 knots were measured at the 10,000 ft. level simultaneously with the pressure reading.

On September 14th, GILBERT became the first catagory 5 hurricane (highest catagory on the 5-point Saffir/Simpson scale....18+ ft. storm surge and 156+ mph mean wind speed) to make landfall in the Western Hemisphere since CAMILLE in 1969 as it crossed the northeast portion of the Yucatan Peninsula of Mexico. Somewhat weakened but still a strong hurricane, GILBERT then continued on its course across the southern Gulf of Mexico and made its final landfall in northeast Mexico just north of La Pesca at about 2200 UTC on the 16th. GILBERT quickly weakened as it moved inland, passing just south of Monterrey on September 17th. Down to depression stage by the morning of the 18th, GILBERT made its first deviation in course in over a week and turned northward into Texas and eventually Oklahoma where it became a heavy rain storm. GILBERT's remnants finally merged with a developing low pressure system over Missouri on September 19th.

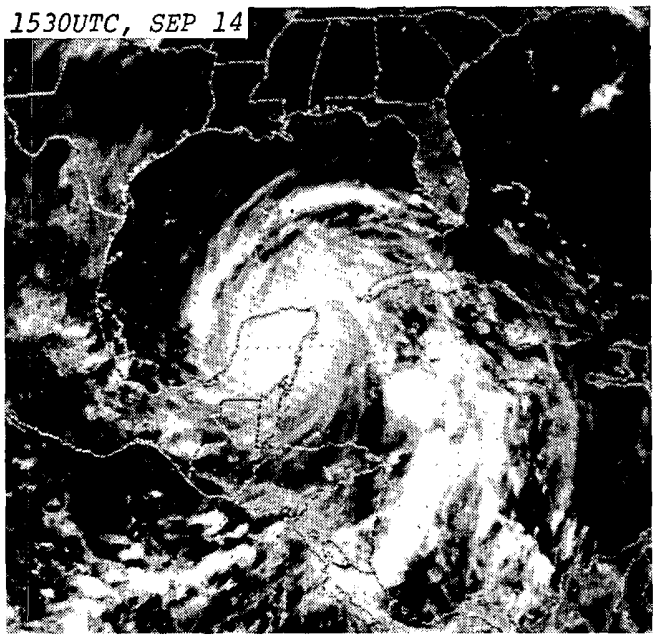
(continued on page 23)

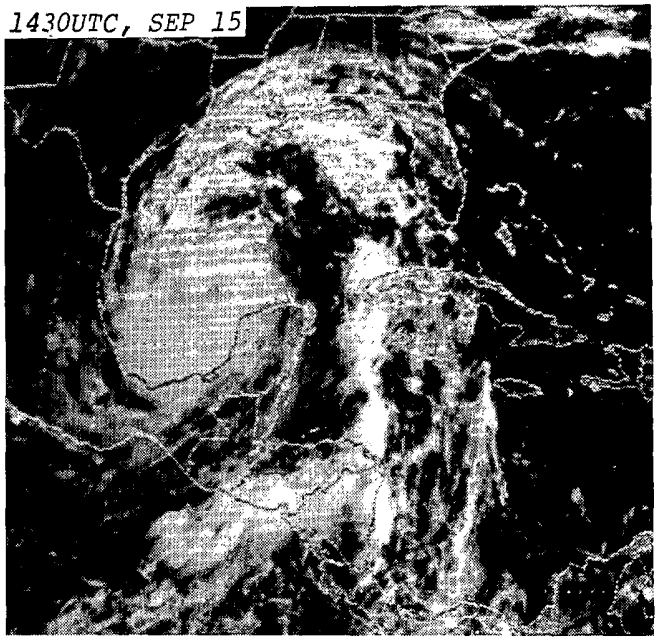


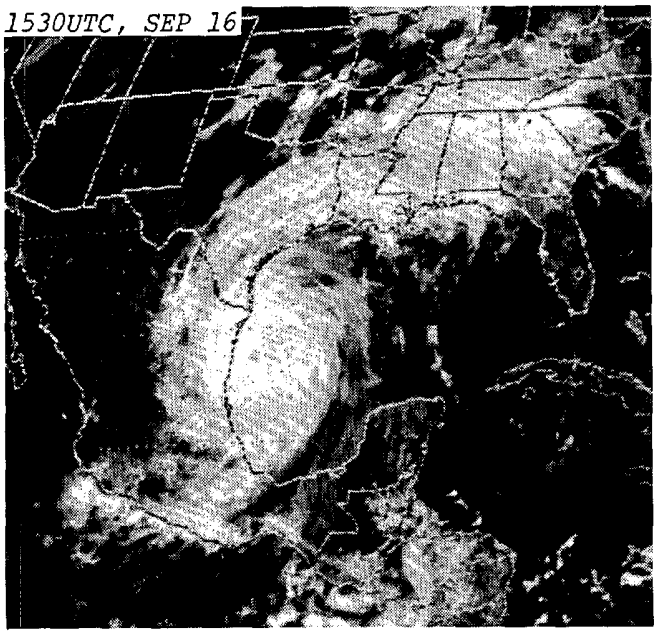
Plots of estimated maximum wind speed and minimum surface pressure versus time for Hurricane GILBERT. ---Plots from NHC and provided through AOML/HRD, both of Miami, Florida.

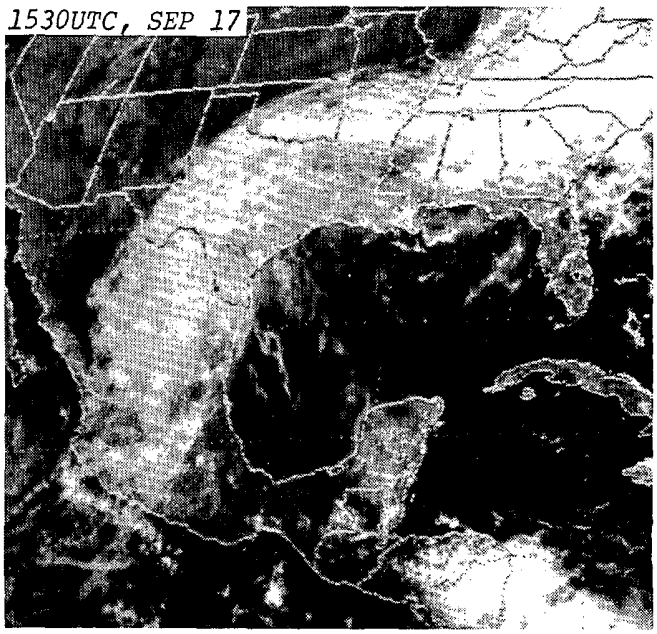


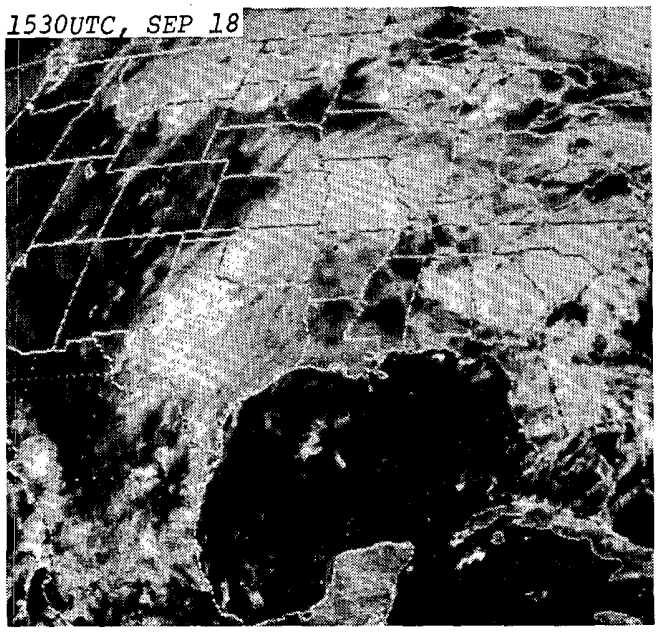
In GOES 6 satellite, visible images taken daily from September 8th through the 19th, GILBERT's life-history is revealed through the changes in its cloud mass which first organized from scattered convection on an easterly wave on the 8th, developed into a huge spiralling comma that at one point nearly filled the entire Caribbean,

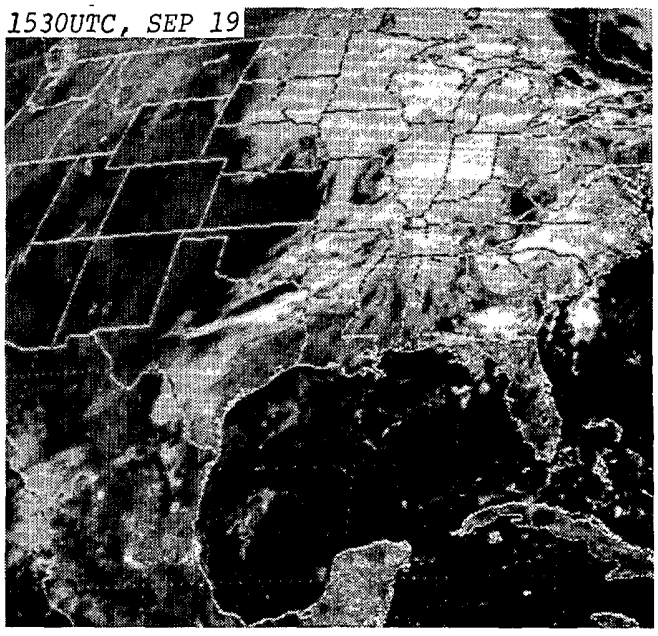




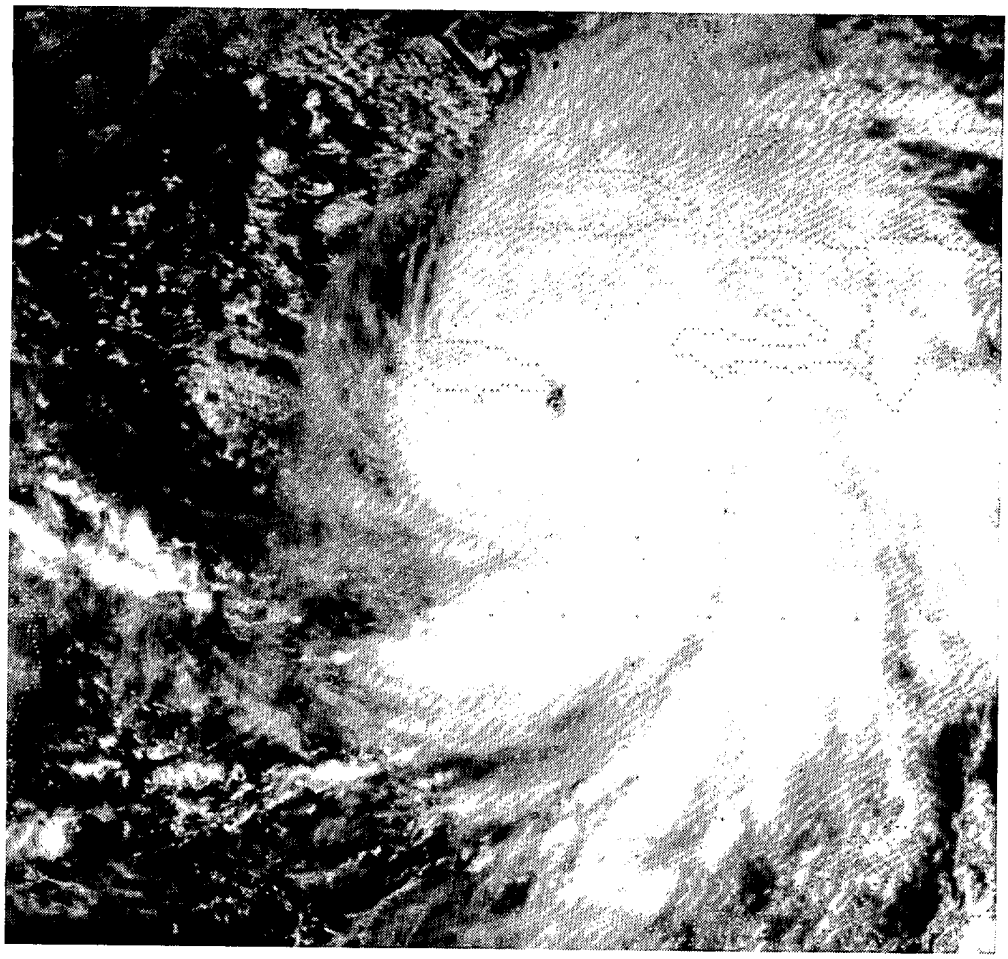




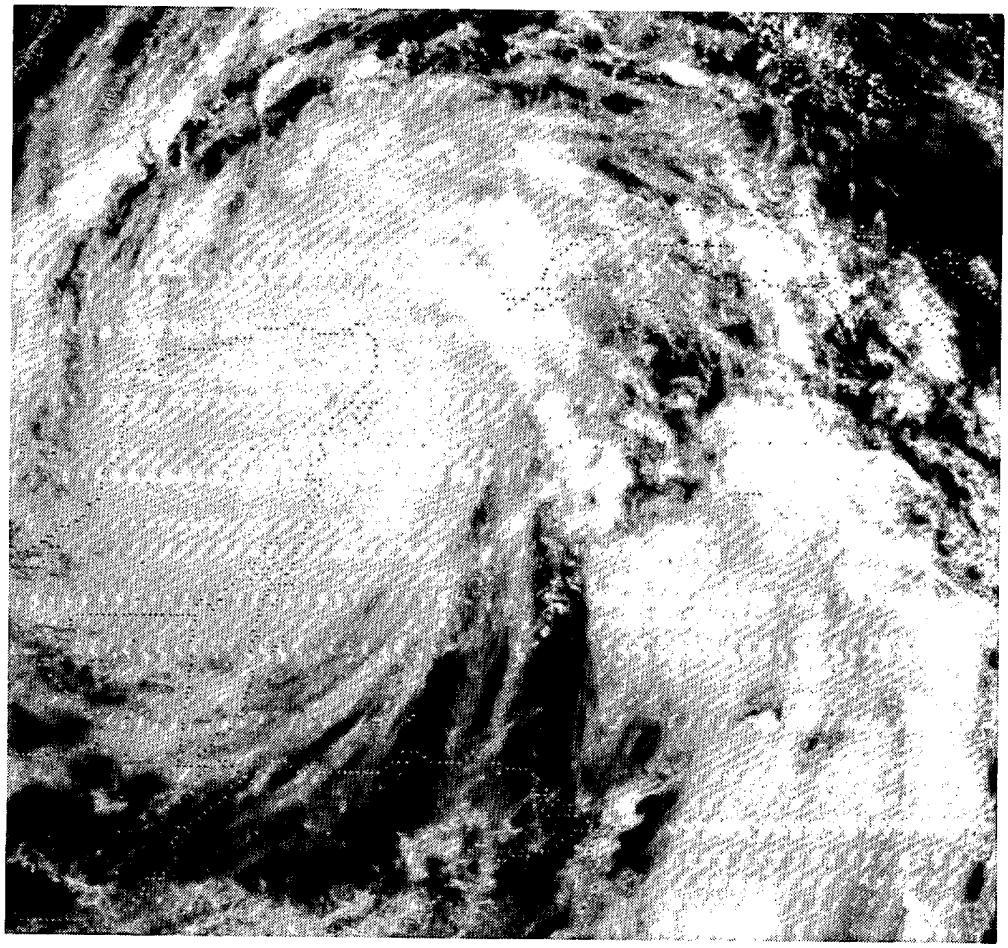




and eventually disorganized in Mexico before being absorbed into a developing mid-latitude cyclone in the south-central U.S. on the 19th. ---Photos from the National Environmental Satellite Data and Information Service, Washington, D.C.

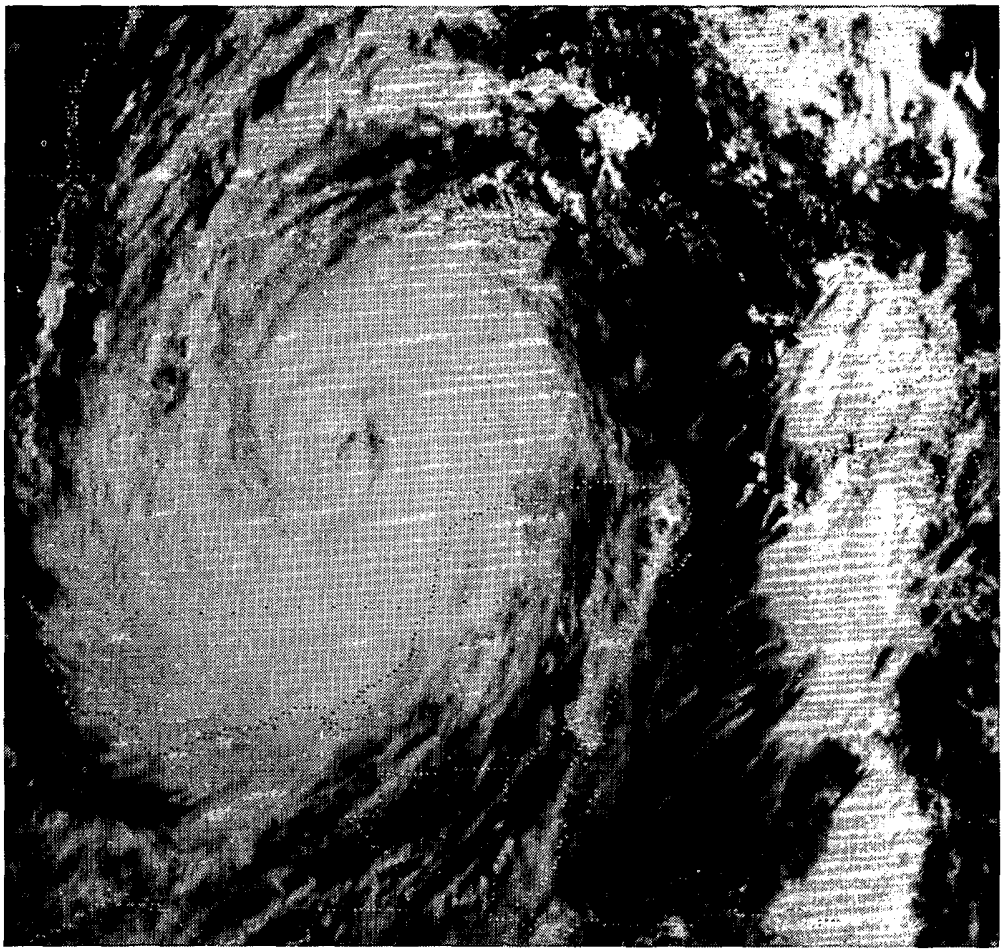


Viewed from 23,000 miles in space, GILBERT's well-defined eye is seen at the southeast tip of Jamaica at 1530 UTC on September 12th. An hour and a half later, GILBERT made landfall on Jamaica with an estimated central pressure of 960 mb and 115 knot sustained winds. An enlargement of GILBERT's eye below shows it to have had interior convection organized in a pattern with anticyclonic curvature, giving it an appearance not unlike a giant belly button.

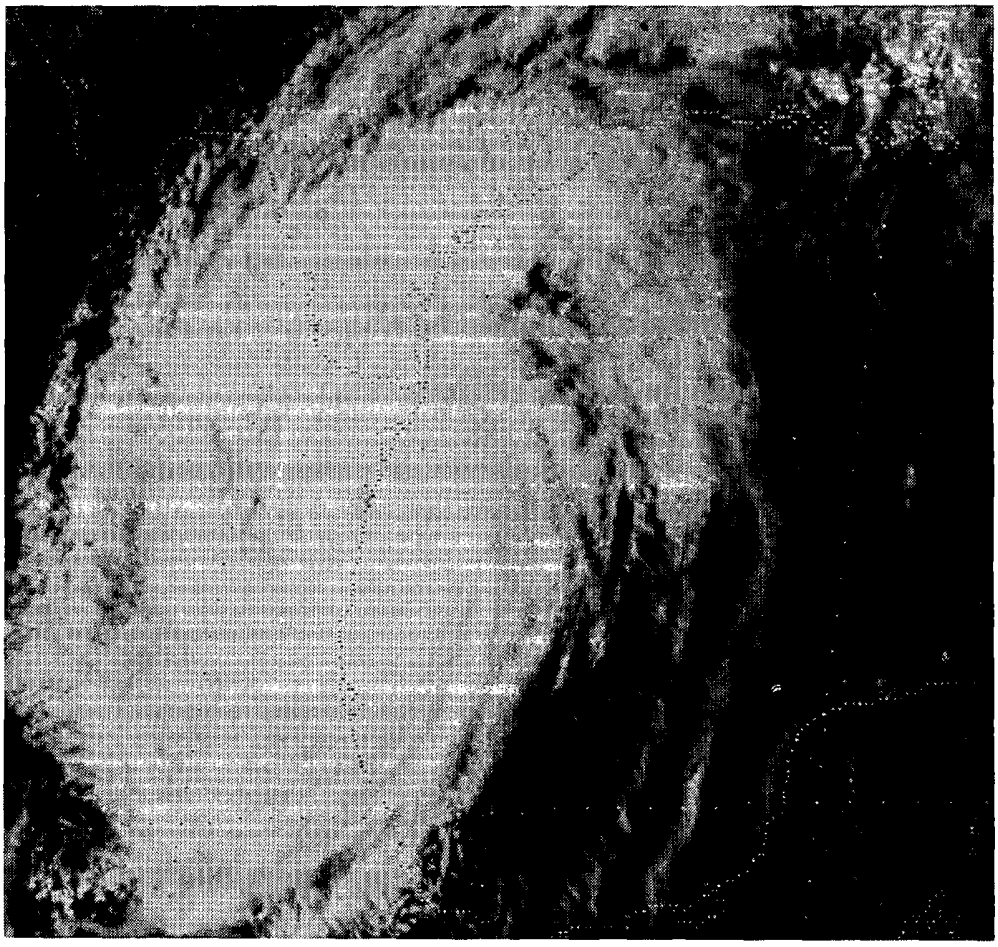


GILBERT as seen at 1530 UTC on September 14th, a half hour after landfall on the Yucatan Peninsula. At the time, GILBERT was fostering a large area of convection over the central Caribbean, far to the east-southeast of the hurricane's main spiralling cloud mass. During its Yucatan landfall, the hurricane had an estimated central pressure of 900 mb and sustained winds of 140 knots.

At 1430 UTC on September 15th, GILBERT fills much of the Gulf of Mexico with its cloud mass while en route to its final landfall in northeast Mexico. Note that convection continued in waves along a north-south line in the Caribbean, well away from GILBERT's main cloud mass.



GILBERT's cloud mass assumes an elongated configuration along the Gulf coast as the hurricane makes its final landfall near La Pesca, Mexico at 2200 UTC on September 16th. GILBERT's estimated central pressure and sustained winds at this time were 955 mb and 110 knots, respectively.



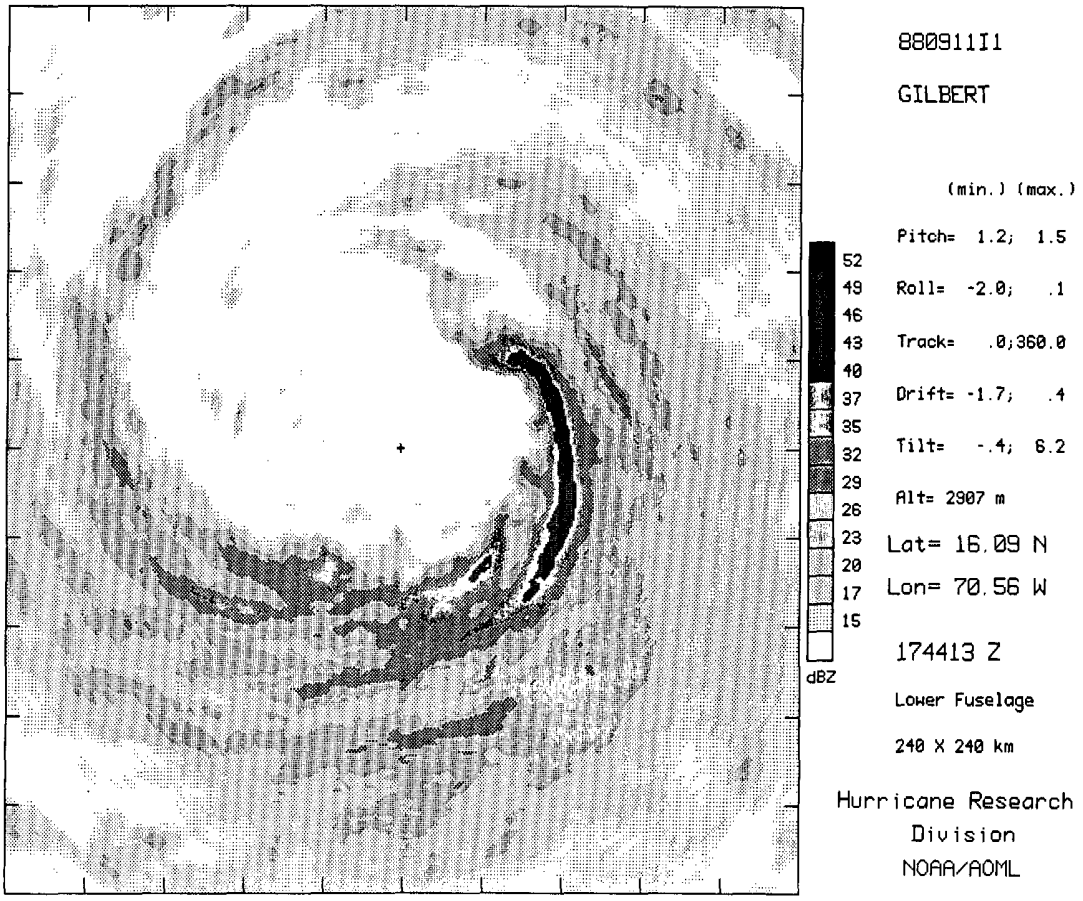
---All photos on pages 16 and 17 are GOES 6 satellite, visible images provided by the National Environmental Satellite Data and Information Service, Washington, D.C.

Location	Lowest Pressure (mb)	Date/time (UTC)	Max. Wind (kt)	Date/time (UTC)	Tide* (ft)	Rain# (in)
Jamaica						
Kingston	964.8	12/1815	101 G122	12/1730Z	5	
15 NE Kingston			105 G128			
NE coast					9	
Grand Cayman Island	976.5	13/1300	119 G136	13/1900	5	
Mexico						
No reports received						
United States(Texas)						
Brownsville	995.3	16/2135	41 G58	16/1809		5.38
South Padre Is.	997.6	16/2210	58 G72	17/0118	6	
Corpus Christi	1006.8	16/1952	32 G53	17/0631		2.65
N. Padre Is.			37 G50		4.4	
Flour Bluff(east Corpus)						4.69
Beeville NAS						4.50
Victoria	1009.8	15/2055	25 G35	15/2119		1.22
Galveston	1011.0	15/2100	22 G34	16/1254	4.2	0.25
Port Arthur	1012.0	15/2115	20 G27	15/2048	4	0.05

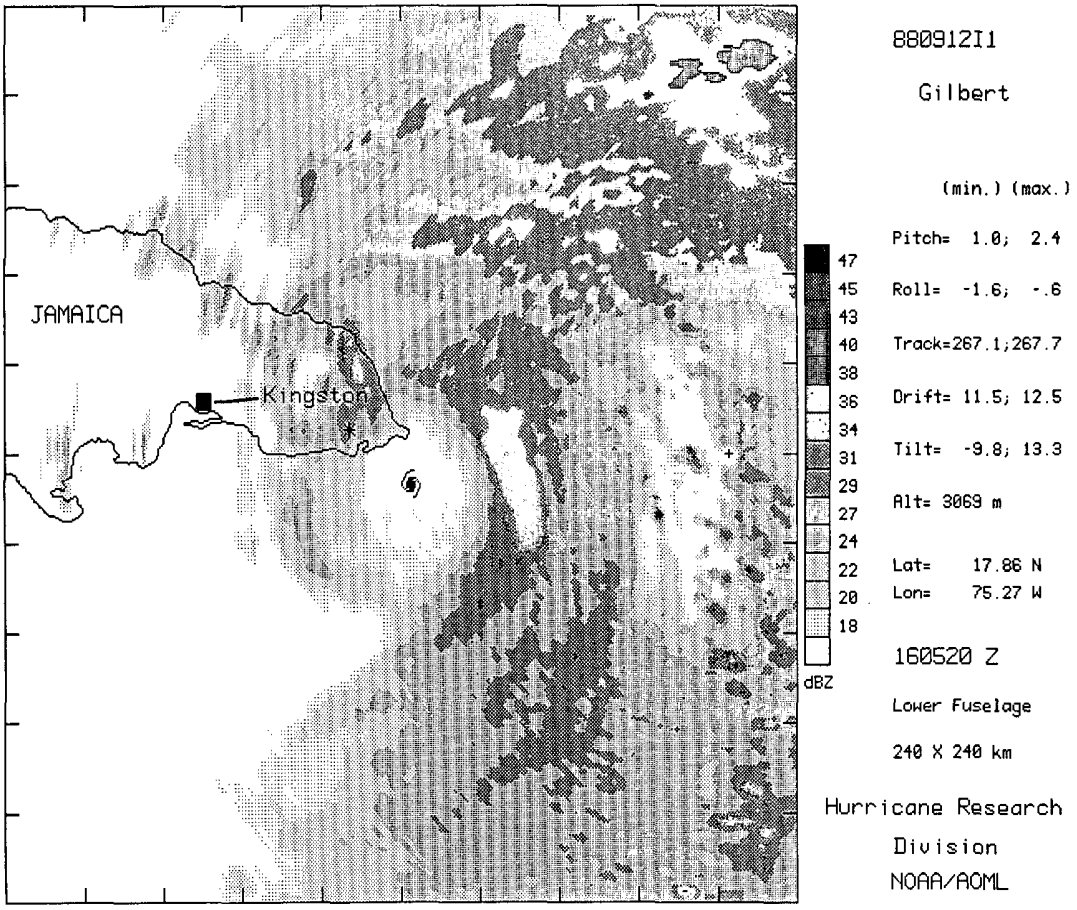
* Height above normal
\# Storm total

Selected meteorological and hydrological, surface observations associated with Hurricane GILBERT. ---Table from NHC and provided through AOML/HRD, both of Miami, Florida.

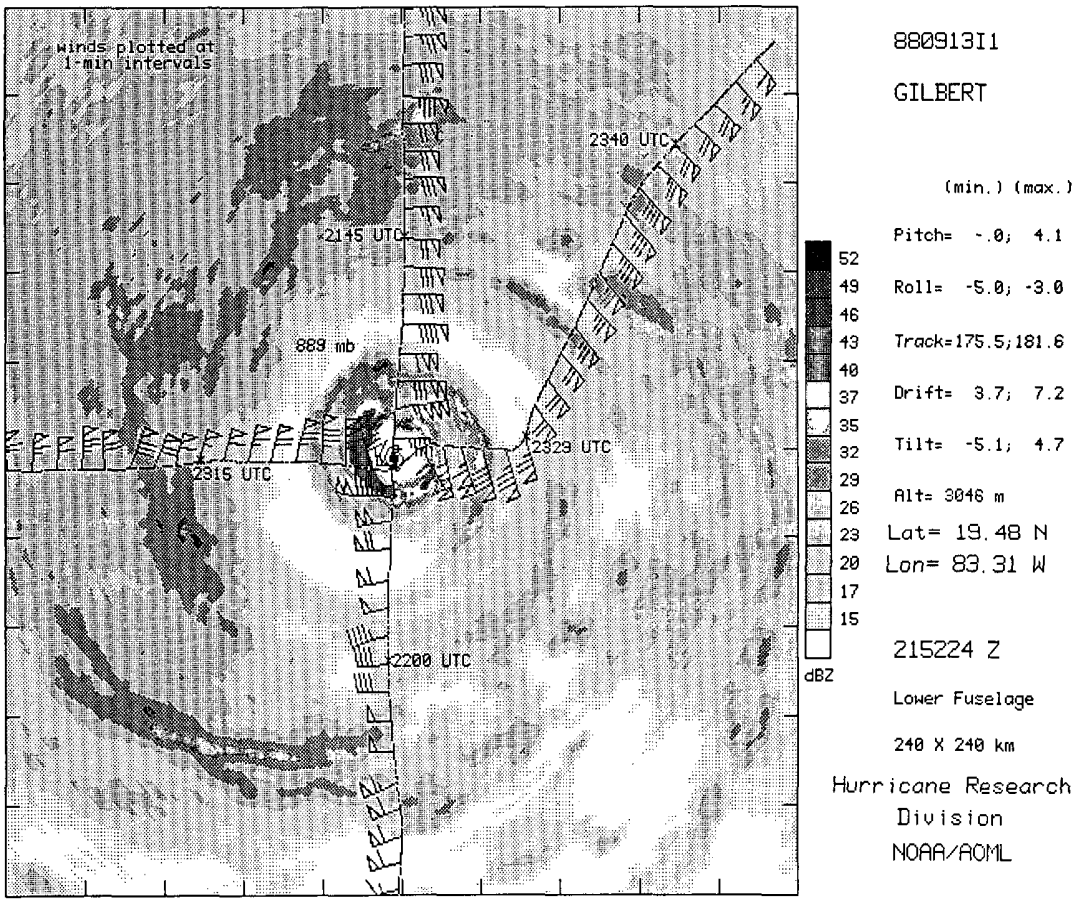
From September 11th through the 19th, the Hurricane Research Division of the Atlantic Oceanographic and Meteorological Laboratory conducted a total of nine research flights and four reconnaissance flights in GILBERT using two NOAA/OAO P-3 aircraft over the Caribbean Sea and Gulf of Mexico. HRD also deployed its land-based radar teams to the NWS 10-cm radar site at Brownsville, Texas and the 5-cm radar site at Corpus Christi, Texas. These missions provided a plethora of information on GILBERT that was useful to both forecasters in real time and researchers for subsequent study. Below and on the following pages 19 through 22 are post-processed (by computer) figures showing reflectivity data collected by airborne and land-based radars during these missions. Photos taken from one of the P-3 aircraft inside the eye of GILBERT appear on pages 23 and 24.



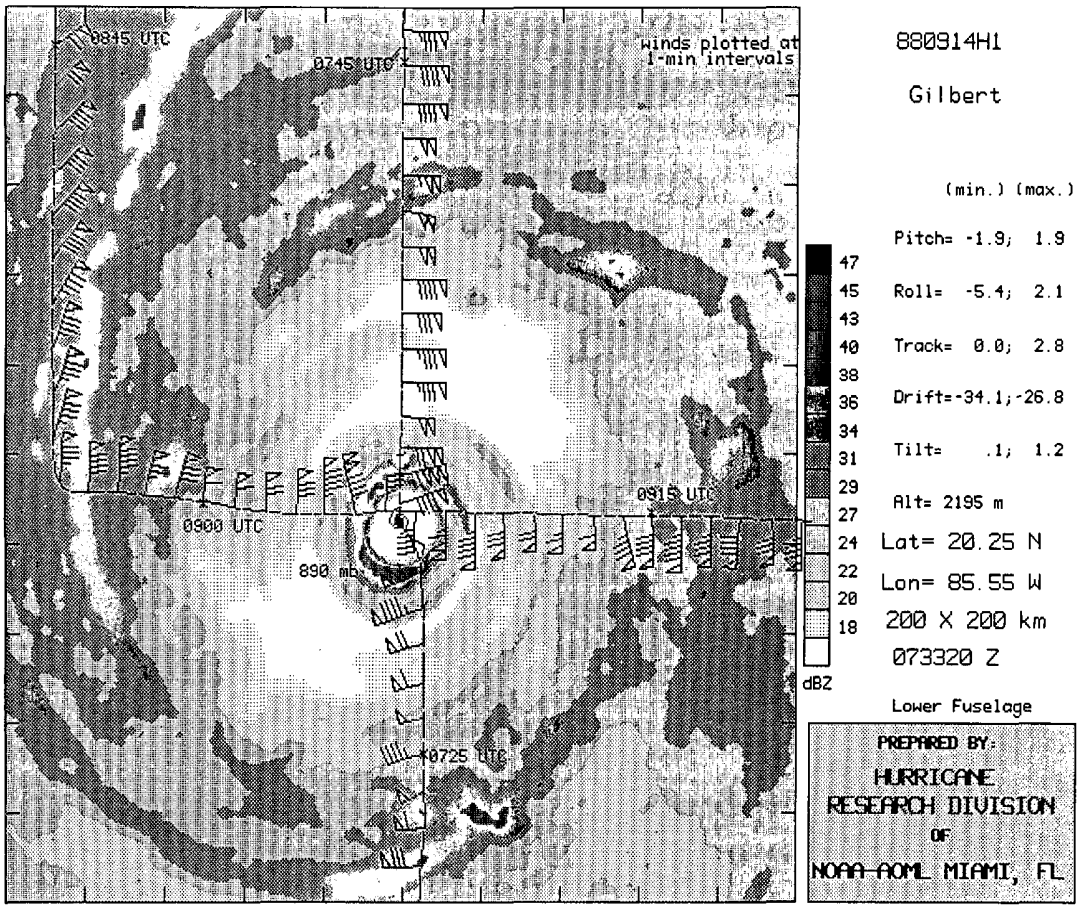
A PPI (plan-position indicator) scan from the lower fuselage radar of an NOAA/OAO P-3 aircraft centered in GILBERT's eye at 1744 UTC on September 11th. GILBERT was located just south of the Dominican Republic at this time.



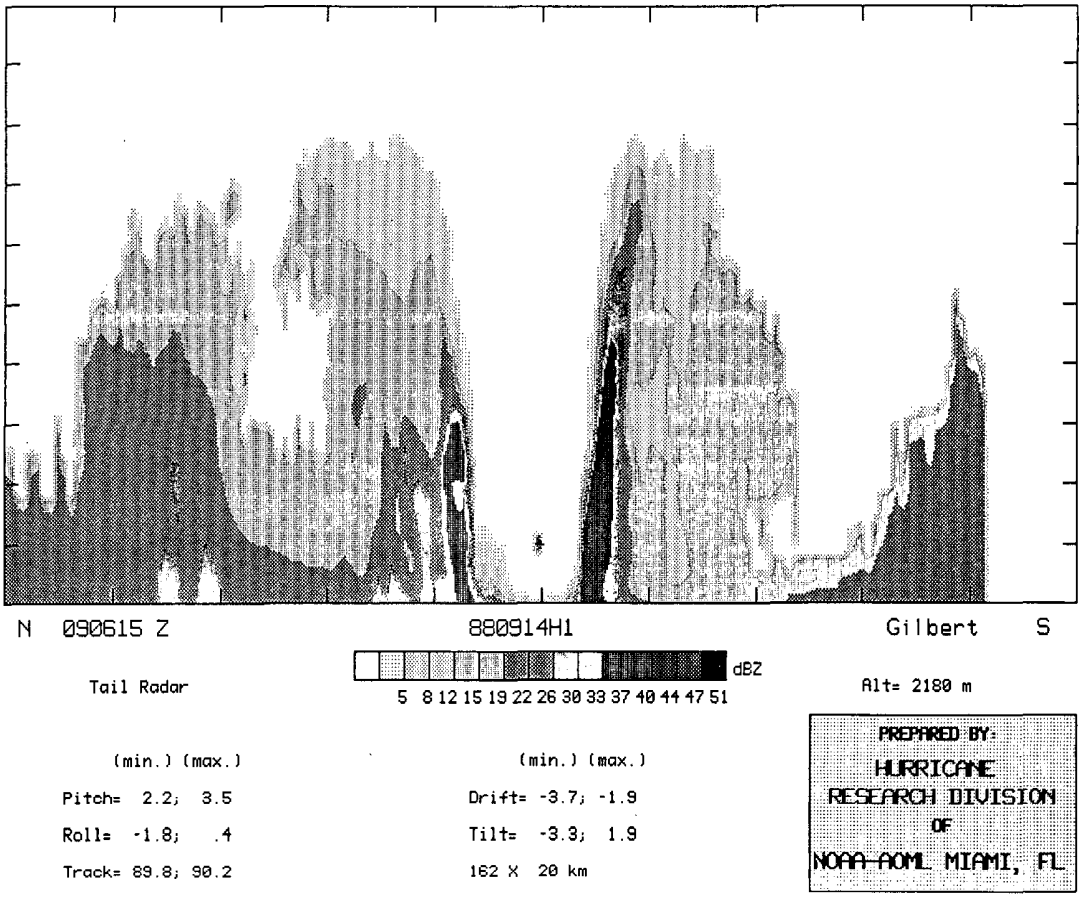
This PPI scan from an airborne, lower fuselage radar shows GILBERT's eye positioned off the southeast tip of Jamaica at 1605 UTC on September 12th, less than an hour before landfall. The aircraft's position is shown by a "+" at the right edge of the figure. Note that GILBERT's location is comparable to that in the satellite image at the top of page 16.

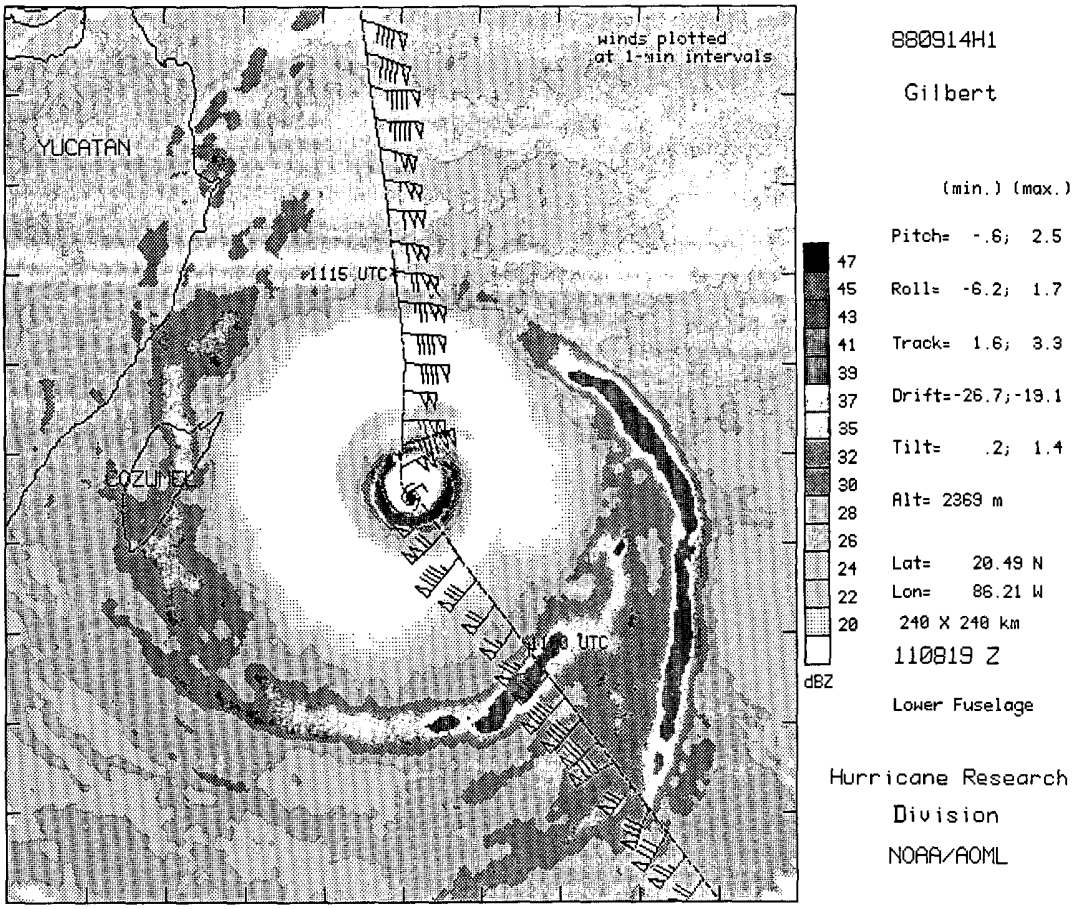


Another PPI scan from one of the airborne, lower fuselage radars shows GILBERT's echo configuration at 2152 UTC on September 13th, the time at which the hurricane attained its record-setting, lowest surface pressure of 885 mb. Superimposed on the figure is a portion of the aircraft flight track and flight-level (10,000 ft.) winds at 1-minute intervals.

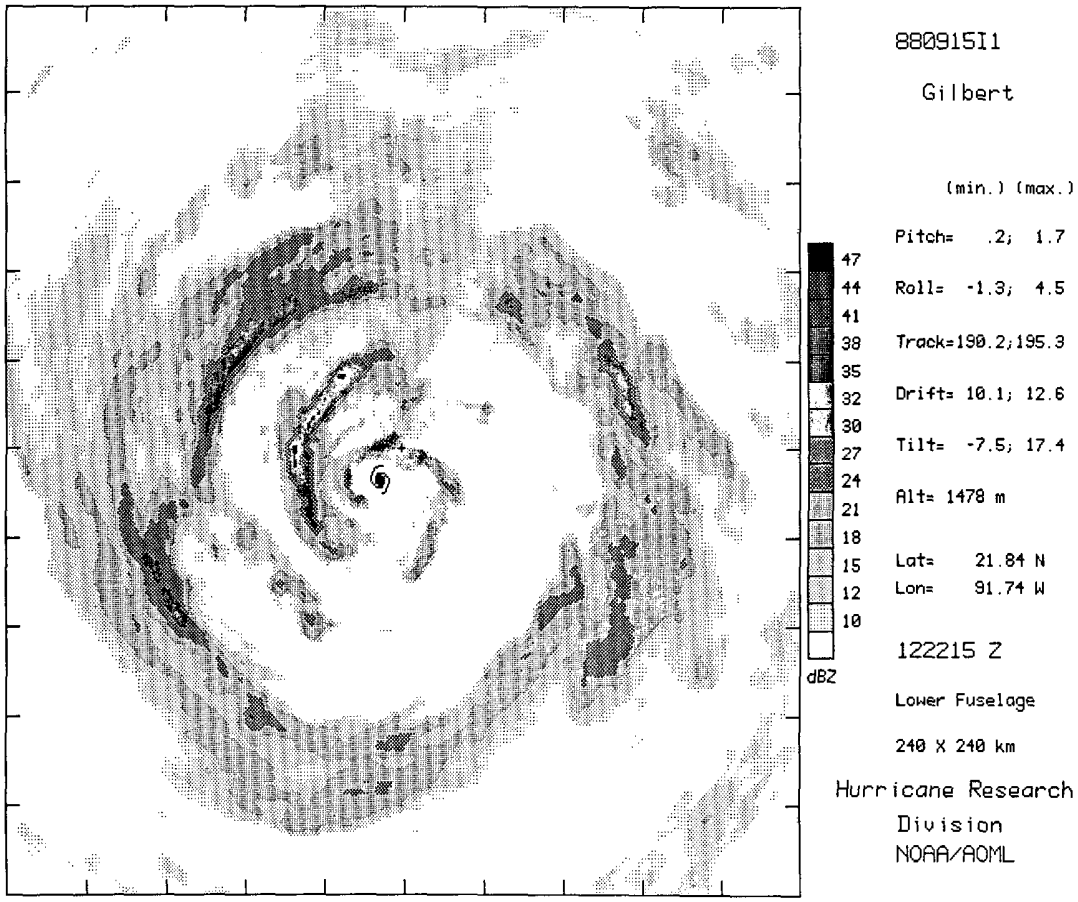


During one of HRD's missions on September 14th, the PPI scan above was made by the lower fuselage radar as the P-3 aircraft first penetrated GILBERT's eye at 0733 UTC. Superimposed are the aircraft flight track and flight-level (7200 ft.) winds at 1-minute intervals. The RHI (range-height indicator) scan below was made by the aircraft's tail radar during a second pass through GILBERT's eye at 1906 UTC. The cross-section shows the hurricane's echo configuration in a north-south profile, made as the plane was flying due east. The aircraft's position is marked by a "+" within the eye (lower center of figure).

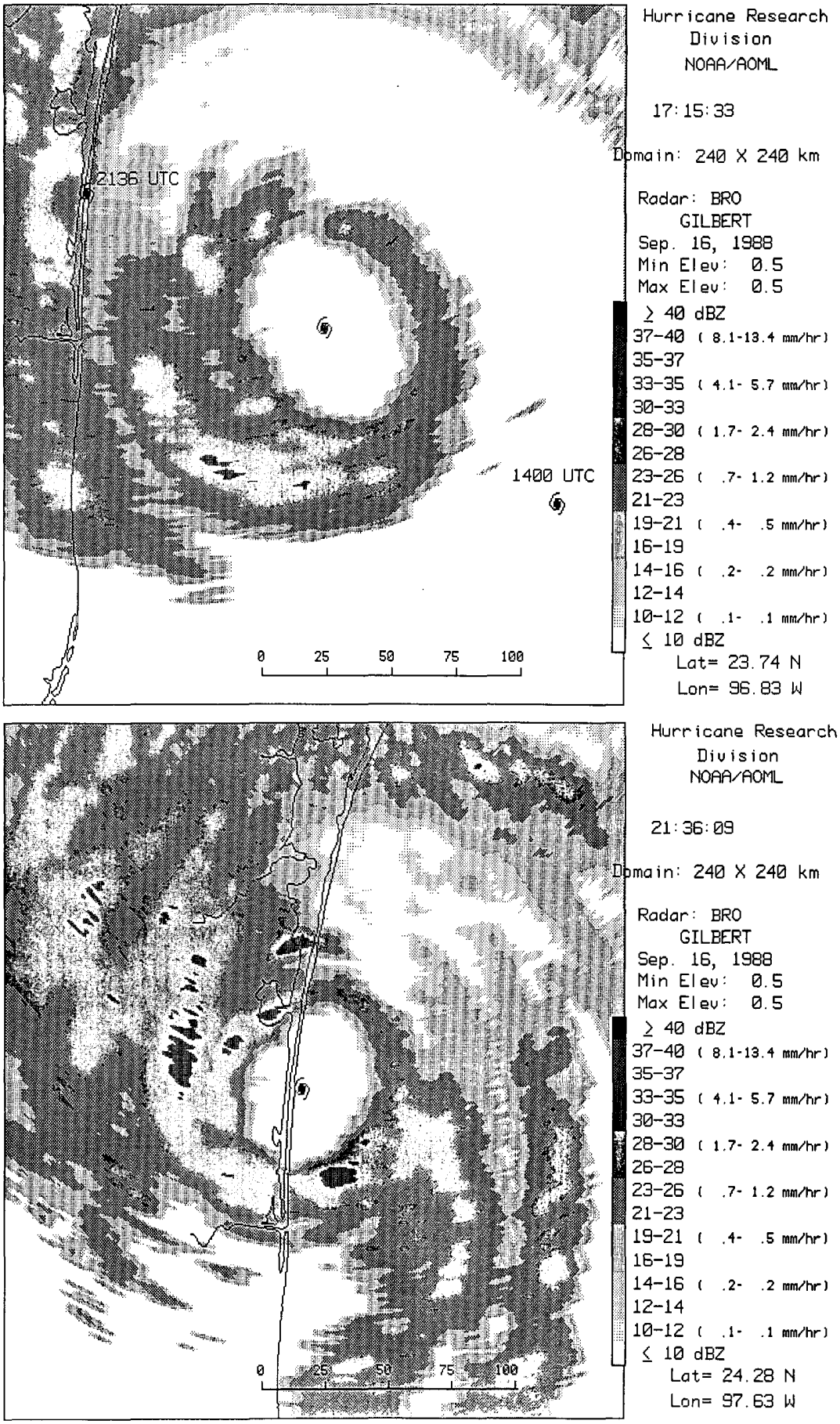




Just prior to landfall on the Yucatan Peninsula, GILBERT exhibited an interesting central structure consisting of a small convective eyewall with a calm, echo-free core, surrounded by a relatively broad, doughnut-shaped area that was echo free and had winds that were less than in either the inner or outer rings of convection. The concentric feature is demonstrated by the reflectivity pattern in this PPI scan from the lower fuselage radar made at 1108 UTC on September 14th, aided by the superimposed flight track with 1-minute interval winds at the 7800 ft. flight level.



A PPI scan from the P-3 aircraft's lower fuselage radar made at 1222 UTC on September 15th after Gilbert had passed over Yucatan and had entered the southwestern Gulf of Mexico.

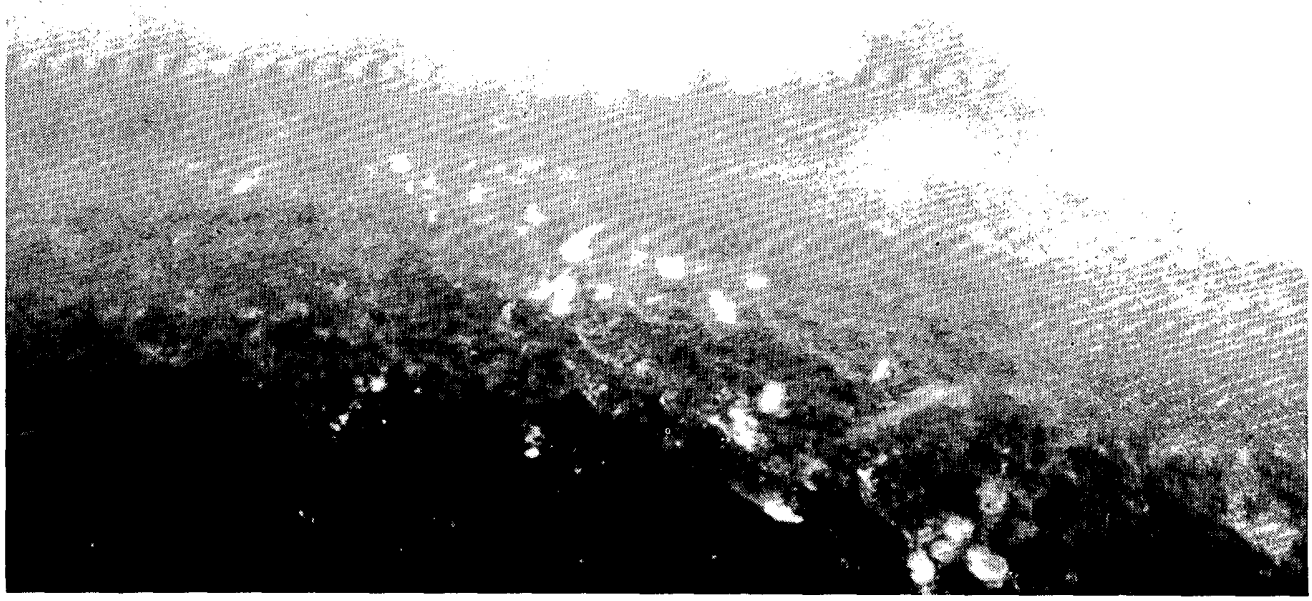


Two PPI scans from the land-based, NWS/WSR-57 radar at Brownsville, Texas show GILBERT on September 16th at 1715 UTC (top) while on approach to its final landfall in northeast Mexico, and at 2136 UTC (bottom) as landfall was in progress.

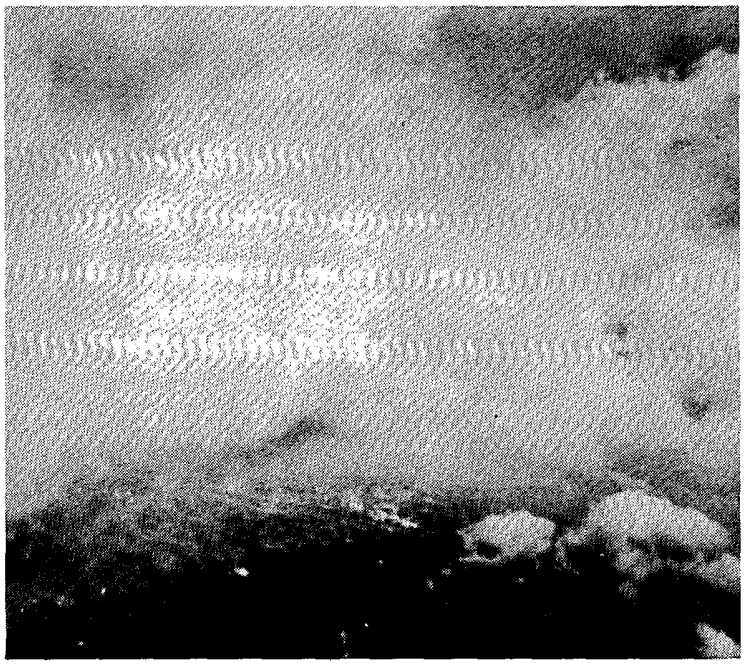
---All radar figures on pages 18 through 22 are from the Hurricane Research Division of the Atlantic Oceanographic and Meteorological Laboratory, Miami, Florida.

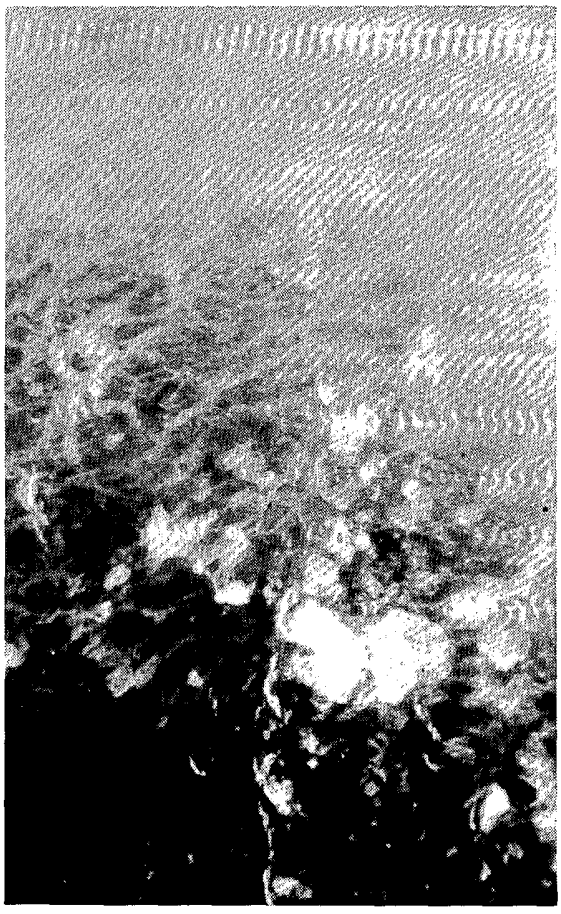
(continued from page 13)

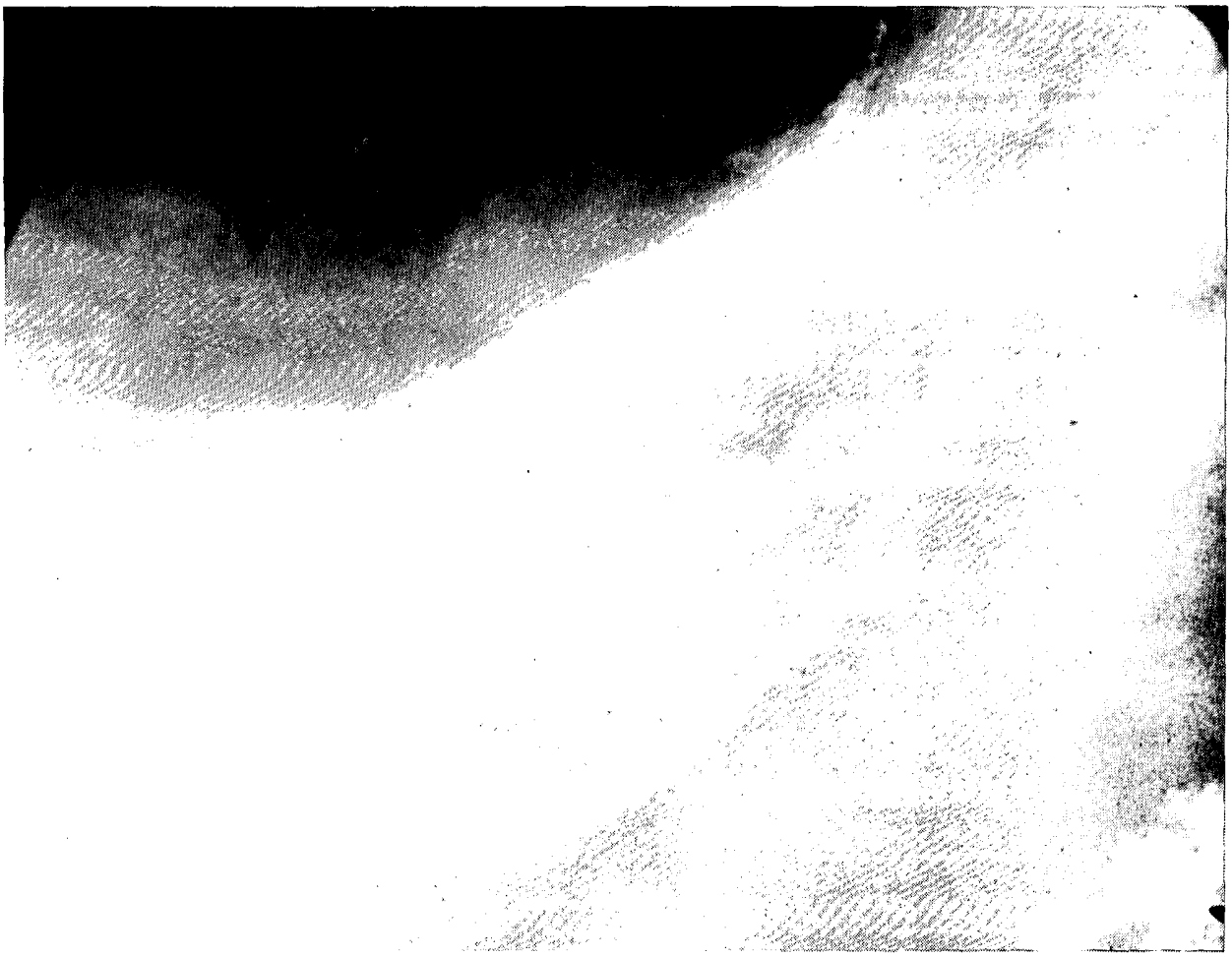
GILBERT's death toll was reported to be 316 people. Death counts by country from largest to smallest in number were: Mexico 202, Jamaica 45, Haiti 30, Guatemala 12, Honduras 12, Dominican Republic 5, Venezuela 5, Costa Rica 2, Nicaragua 2, and United States 1. The single death in the U.S. was caused by a hurricane-spawned tornado south of San Antonio, Texas. Total damages from GILBERT are estimated to be near 5 billion dollars, nearly two billion of which was sustained in Jamaica and one to two billion in Mexico. The Mexican government reported that 60,000 homes were destroyed in that country. Damage in the U.S. was estimated at 40 to 50 million dollars.



As one of the NOAA/OAO P-3 aircraft passed through GILBERT's eye on September 13th, these photos showing the base of the eyewall (above), a larger portion of the eyewall and sea surface (below), and an overview of the agitated sea surface along the inner eyewall (right), were taken between 1913 and 1914 UTC from an altitude of 10,000 feet. Waves on the sea surface were estimated to be 50 to 60 feet high and the white foam patches were estimated to be about 600 feet in diameter. ---All three photos by Michael Black, AOML/HRD, Miami, Florida.

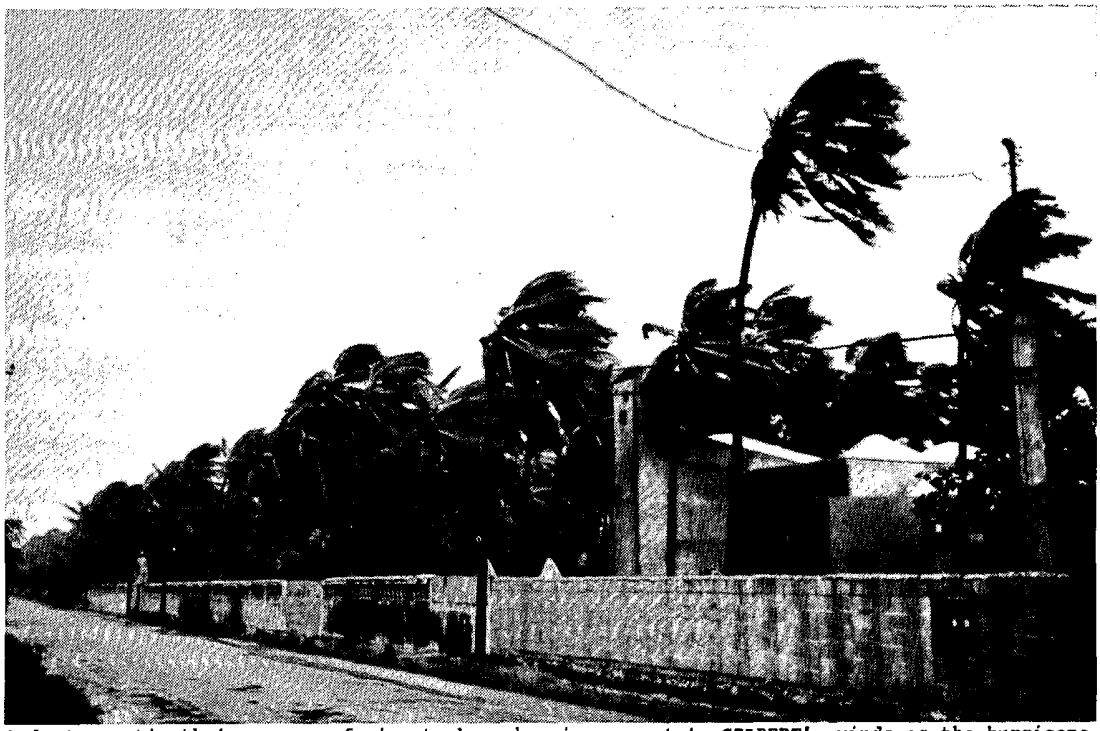






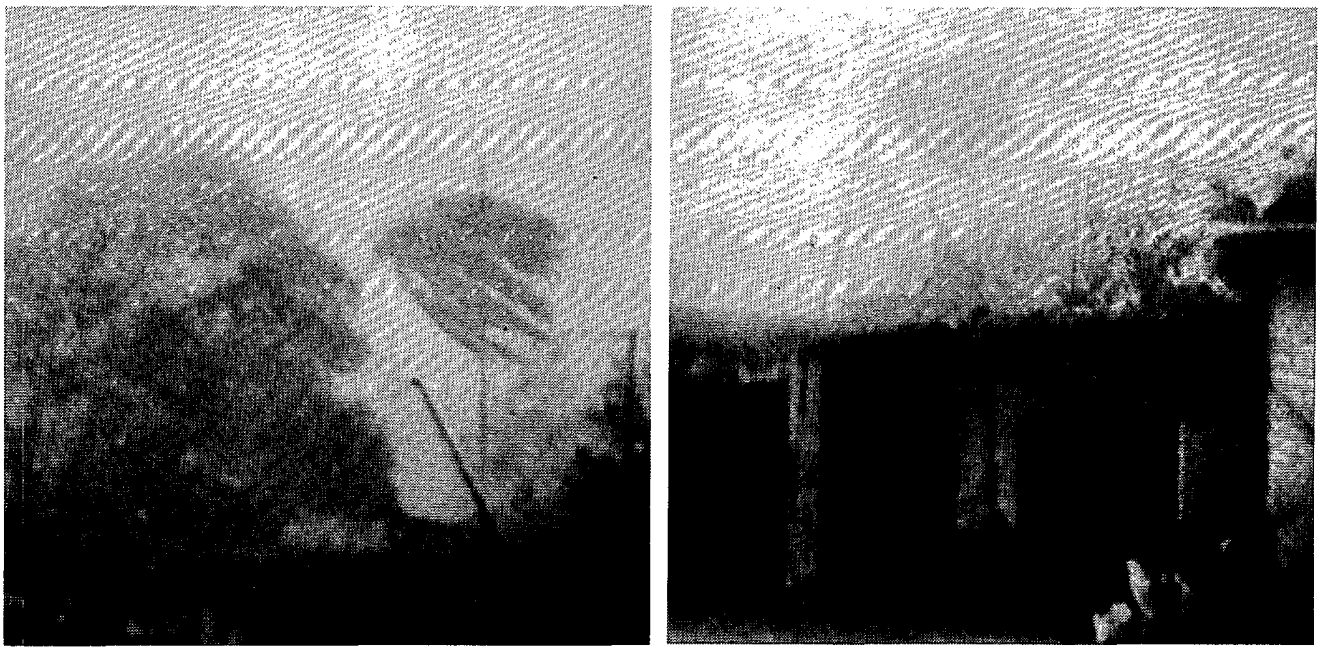
The top portion of GILBERT's eyewall as seen from the NOAA/OAO P-3 aircraft inside the eye at an altitude of 10,000 feet. The time is 2150 UTC on September 13th, two minutes before instruments on the aircraft measured the hurricane's lowest minimum surface pressure, a new record for the lowest sea-level pressure ever recorded in the Western Hemisphere at 885 mb. ---Photo by Michael Black, AOML/HRD, Miami, Florida.

The following group of photos (to the middle of page 26) were all taken at Progresso, Mexico on the northwest coast of the Yucatan Peninsula on September 14th and 15th as GILBERT moved across the area. ---All photos in this group are by Jim Leonard of Florida City, Florida.



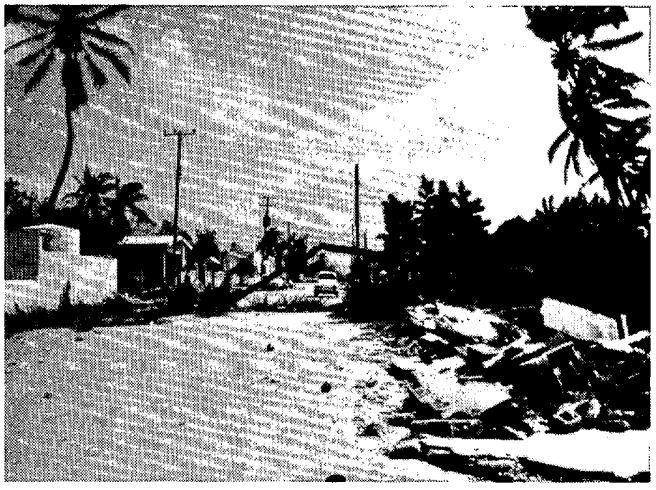
Palm trees tip their crowns of pinnate branches in respect to GILBERT's winds as the hurricane approached Progresso on September 14th.

Also at Progresso on September 14th, these palms began to take a deeper bow as GILBERT's center moved closer and the winds increased. Some of the trees had begun to lose branches.

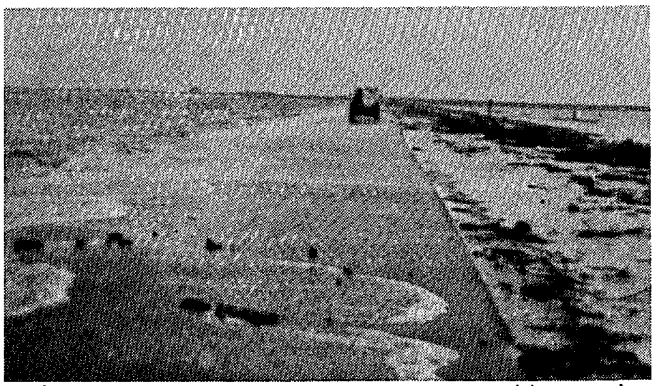


Two still frames from a video tape taken on September 14th during the height of GILBERT's fury at Progresso show two trees being raked by wind and rain (left). Moments later (right), the more rigid, deciduous tree had been downed while the flexible palm continued to sway. At lower right of the right photo, a family huddles together for strength to stay afoot in GILBERT's 120+ mph winds as they move from one building to another in the quest of a safer shelter.

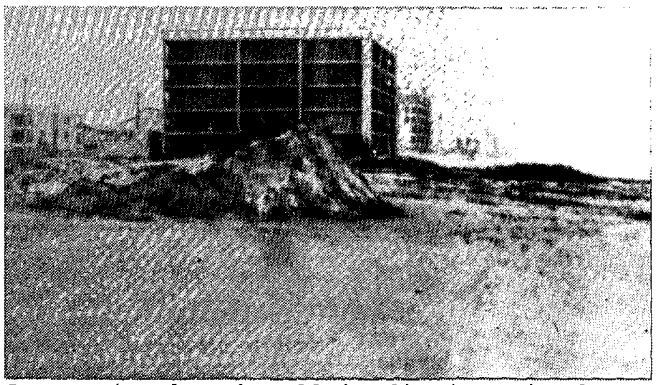
Below and at the top of the next page, six photos show damage at Progresso on September 15th that was caused by GILBERT during the previous day and night. Most of the damage consisted of downed trees and power lines and many collapsed walls of masonry construction. There was a good deal of beach erosion as well.



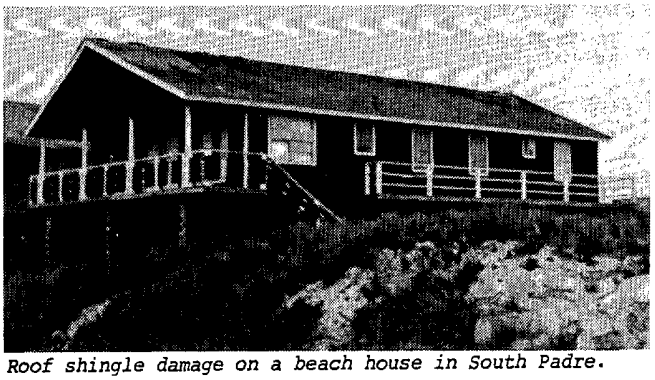
The following group of photos (through the next page) were all taken on September 16th and show damage in southern Texas that was being caused as GILBERT's center passed to the south through northeast Mexico. Other than that of hurricane-spawned tornadoes, damage in the U.S. from GILBERT was confined to beach erosion along Padre Island and minor wind damage that extended inland from the coast through the Lower Rio Grande Valley. ---All photos in this group are by Tim Marshall of Lewisville, Texas.



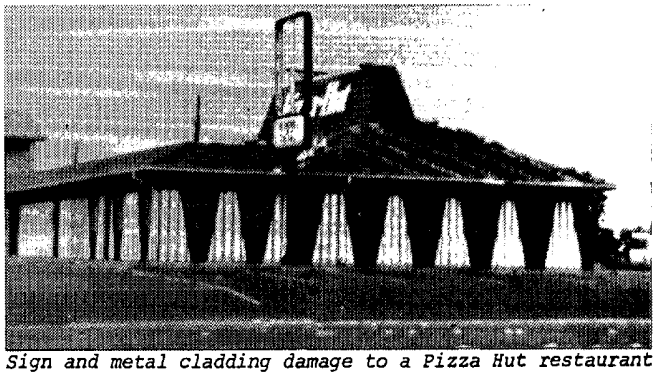
Washover from a 4 foot storm surge at Boca Chica Beach near the mouth of the Rio Grande.



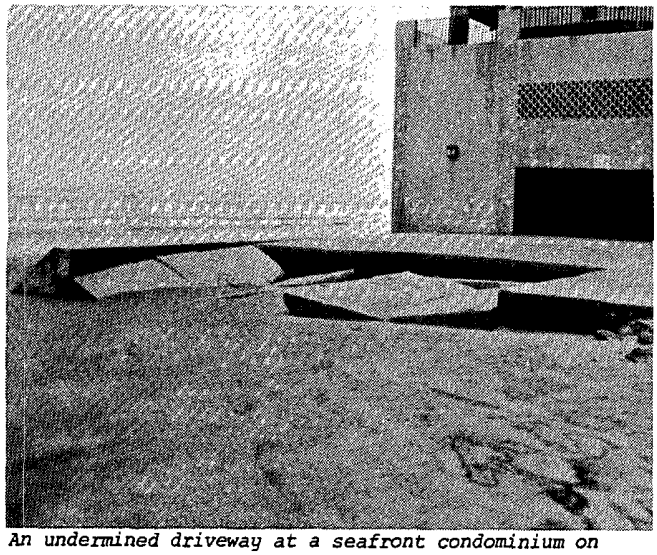
Dune erosion along the Gulf shoreline in South Padre.



Roof shingle damage on a beach house in South Padre.

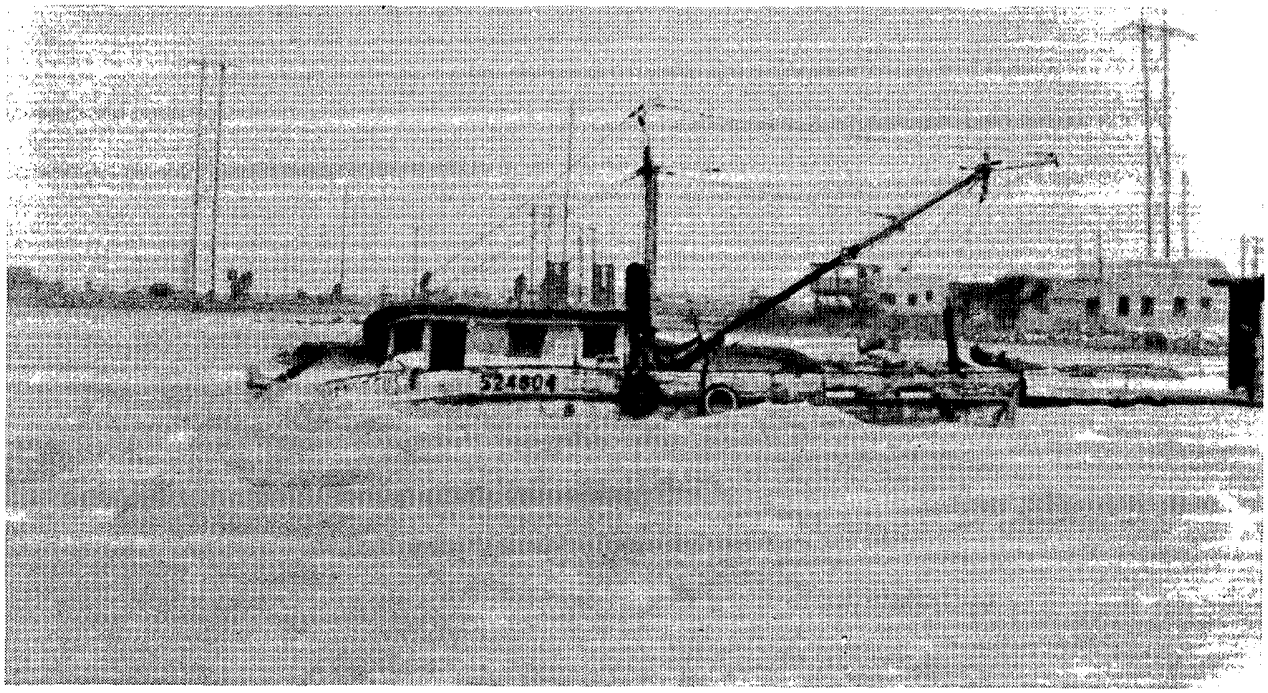


Sign and metal cladding damage to a Pizza Hut restaurant on South Padre Island.

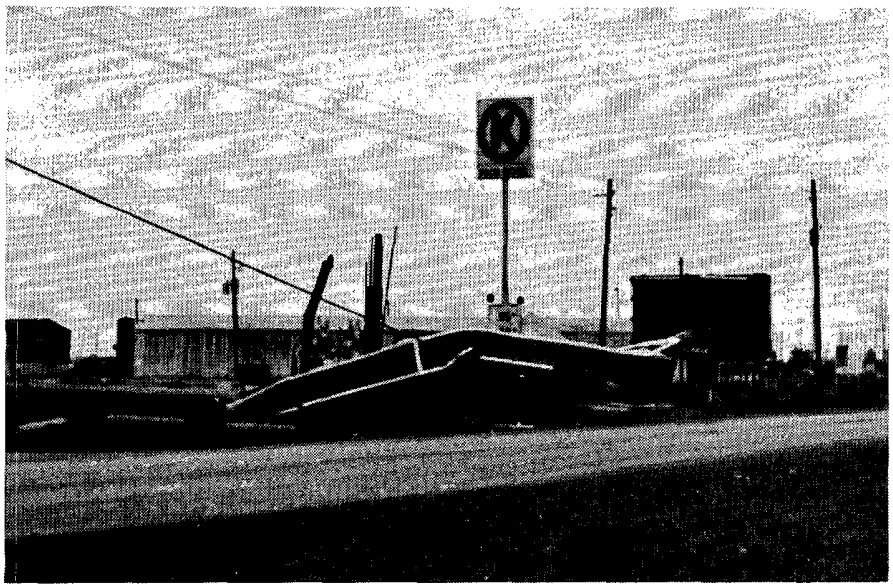


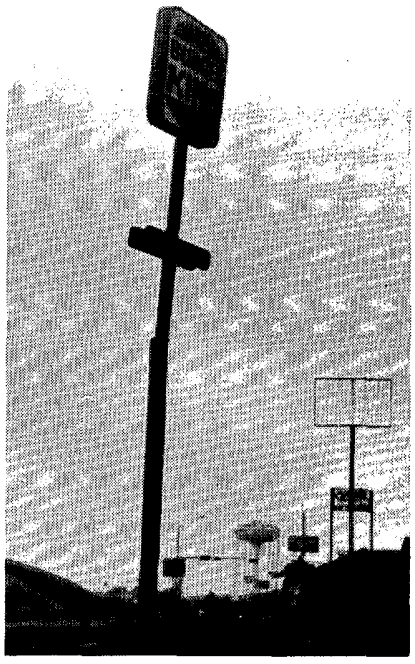
An undermined driveway at a seafront condominium on South Padre Island.

Sand-covered streets on south Padre Island, a result of washover.

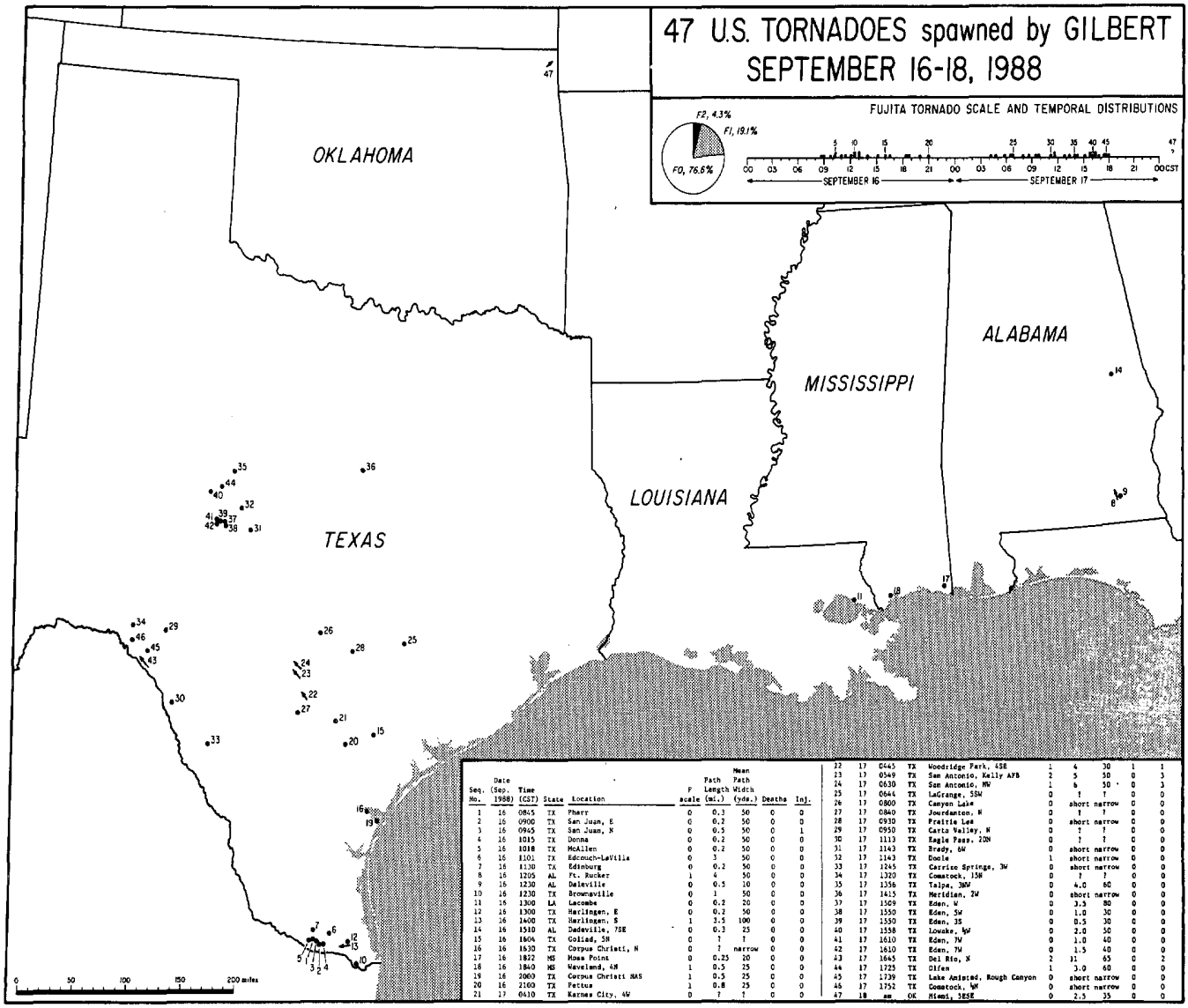


Shrimp boat "Little Susie" submerged in storm surge at Port Isabel.



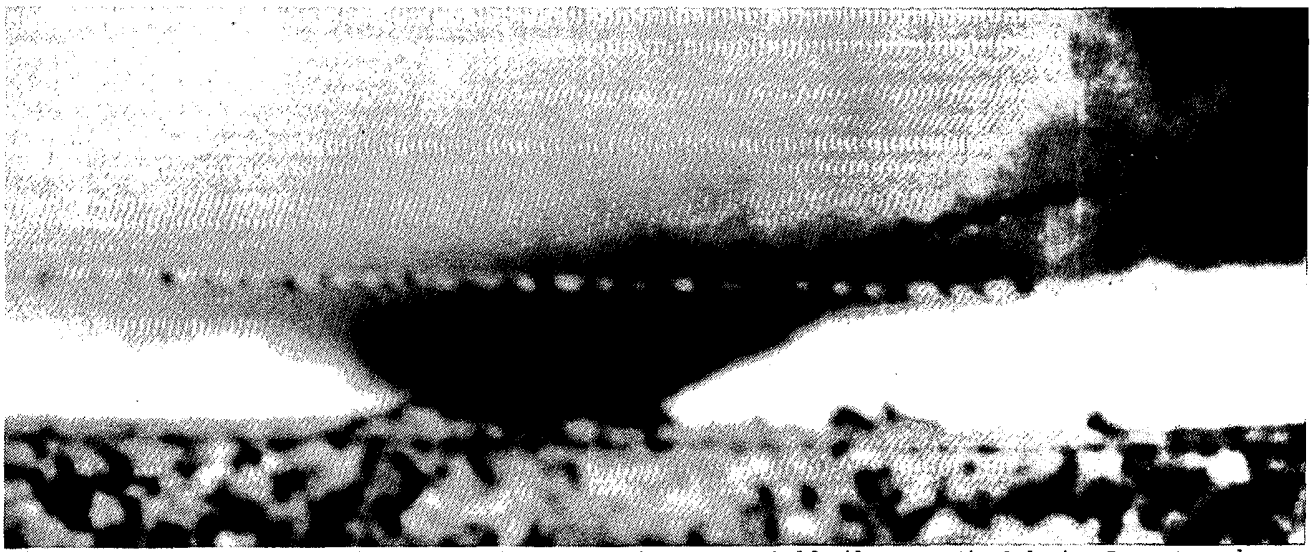


A ripped-off canopy of a gas station / convenience store in Port Isabel, partially suspended on a telephone wire (above), and damaged signs in Brownsville (right).

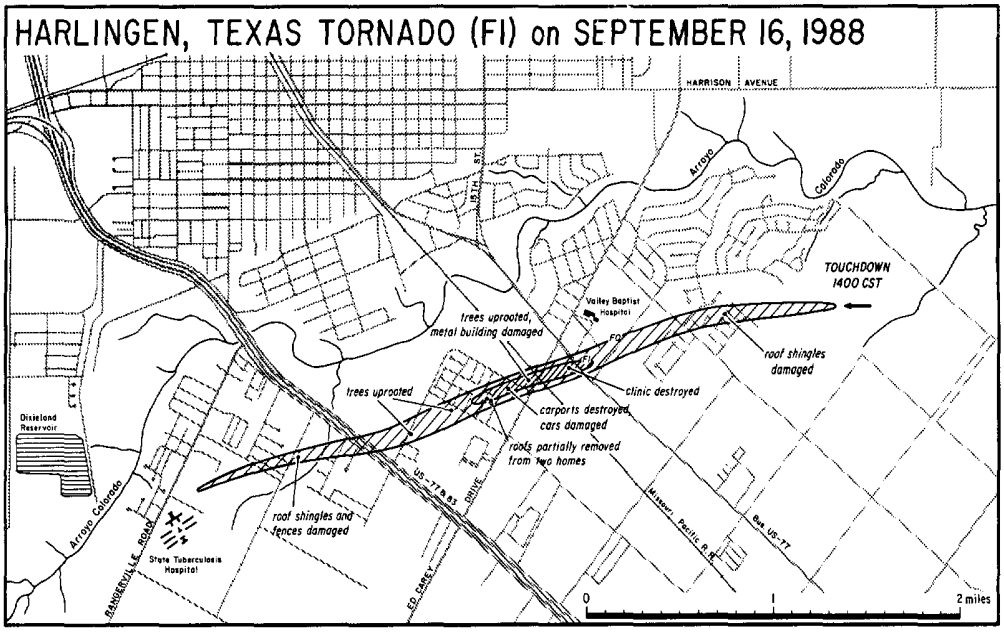


Seq. No.	Date (Sep. 1988)	Time (CST)	State	Location	F scale	Path Length (mi.)	Mean Path Width (yds.)	Deaths	Inj.
1	16	0845	TX	Pharr	0	0.3	50	0	0
2	16	0900	TX	San Juan, E	0	0.2	50	0	0
3	16	0945	TX	San Juan, N	0	0.5	50	0	1
4	16	1015	TX	Donna	0	0.2	50	0	0
5	16	1018	TX	McAllen	0	0.2	50	0	0
6	16	1101	TX	Edcouch-LaVilla	0	3	50	0	0
7	16	1130	TX	Edinburg	0	0.2	50	0	0
8	16	1205	AL	Ft. Rucker	1	4	50	0	0
9	16	1230	AL	Daleville	0	0.5	10	0	0
10	16	1230	TX	Brownsville	0	1	50	0	0
11	16	1300	LA	Lacombe	0	0.2	20	0	0
12	16	1300	TX	Harlingen, E	0	0.2	50	0	0
13	16	1400	TX	Harlingen, S	1	3.5	100	0	0
14	16	1510	AL	Dadeville, 7SE	0	0.3	25	0	0
15	16	1604	TX	Goliad, 5N	0	?	?	0	0
16	16	1630	TX	Corpus Christi, N	0	?	narrow	0	0
17	16	1822	MS	Moss Point	0	0.25	20	0	0
18	16	1840	MS	Waveland, 4N	1	0.5	25	0	0
19	16	2000	TX	Corpus Christi NAS	1	0.5	25	0	0
20	16	2100	TX	Pettus	1	0.8	25	0	0
21	17	0410	TX	Karnes City, 4W	0	?	?	0	0
22	17	0445	TX	Woodridge Park, 4SE	1	4	50	1	1
23	17	0549	TX	San Antonio, Kelly AFB	2	5	50	0	3
24	17	0630	TX	San Antonio, NW	1	6	50	0	3
25	17	0644	TX	LaGrange, SSW	0	?	?	0	0
26	17	0800	TX	Canyon Lake	0	short	narrow	0	0
27	17	0840	TX	Jourdanton, N	0	?	?	0	0
28	17	0930	TX	Prairie Lea	0	short	narrow	0	0
29	17	0950	TX	Carta Valley, N	0	?	?	0	0
30	17	1113	TX	Eagle Pass, 20N	0	?	?	0	0
31	17	1143	TX	Brady, 6W	0	short	narrow	0	0
32	17	1143	TX	Doole	1	short	narrow	0	0
33	17	1245	TX	Carrize Springs, 3W	0	short	narrow	0	0
34	17	1320	TX	Comstock, 15N	0	?	?	0	0
35	17	1356	TX	Talpa, 3NW	0	4.0	80	0	0
36	17	1415	TX	Meridian, 2W	0	short	narrow	0	0
37	17	1509	TX	Eden, W	0	3.5	80	0	0
38	17	1550	TX	Eden, SW	0	1.0	30	0	0
39	17	1550	TX	Eden, 3S	0	0.5	30	0	0
40	17	1558	TX	Lowake, NW	0	2.0	50	0	0
41	17	1610	TX	Eden, 7W	0	1.0	40	0	0
42	17	1610	TX	Eden, 7W	0	1.5	40	0	0
43	17	1645	TX	Del Rio, N	2	11	65	0	2
44	17	1725	TX	Olfen	1	3.0	60	0	0
45	17	1739	TX	Lake Amistad, Rough Canyon	0	short	narrow	0	0
46	17	1752	TX	Comstock, NW	0	short	narrow	0	0
47	18	am	OK	Miami, 18SE	0	2.3	35	0	0

Geographic distribution of 47 tornadoes spawned by GILBERT in the United States on September 16th through the 18th, with a statistical listing in order of their occurrence. Fujita tornado scale and temporal distributions are also given. Most of the damage in the U.S. from GILBERT was caused by tornadoes, the most significant being: an F1 in southern Harlingen, Texas that did one million dollars in damage; an F2 and two F1's in the San Antonio area, one of the F1's causing the only death in the U.S. from GILBERT and the F2 doing 28 million dollars in damage as it raked through Kelly Air Force Base; and an F2 in Del Rio, Texas that destroyed 18 homes and damaged 89 others. No information on tornadoes outside of the U.S. is available. ---Graphic by the University of Chicago from data supplied by NWSFO's at Birmingham, Alabama; Slidell, Louisiana; Jackson, Mississippi; Norman, Oklahoma; Fort Worth, Texas; San Antonio, Texas; and Lubbock, Texas.

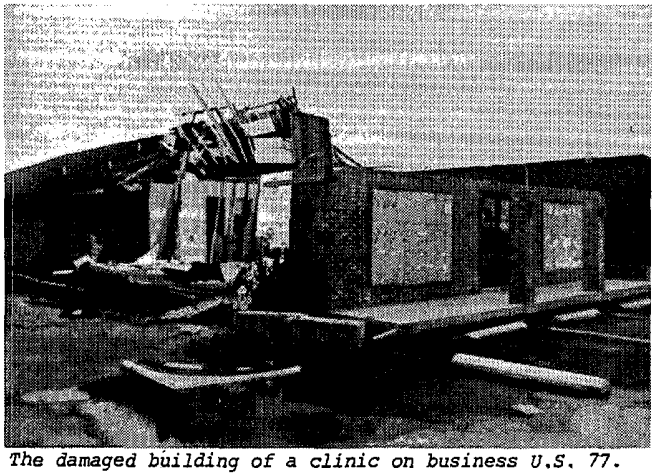


Viewed toward the south through a barbed-wire fence and about one-half mile away, the Del Rio, Texas tornado makes its way through mesquite-covered rangeland just north of Del Rio at 1650 CST on September 17th. Already through northern Del Rio, the tornado was moving northwest at 35 to 40 mph toward the Los Campos subdivision and Lake Amistad. ---Photo by Leon and Martin Humphreys and provided by the NWSO at Del Rio, Texas.

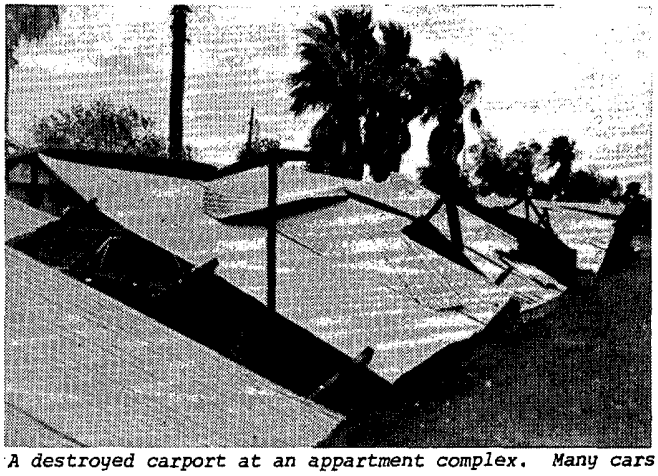


Path of the F1 tornado that struck southern Harlingen, Texas at 1400 CST on September 16th. The GILBERT-spawned tornado, number 13 in the map on the previous page, traveled west-southwest on a 3.5 mile long path, one-half mile south and parallel to the Arroyo Colorado, crossing both business and freeway U.S. 77. The tornado narrowly missed the Valley Baptist Hospital and the State Tuberculosis Hospital.

All photos below are of damage caused by the tornado in southern Harlingen, Texas on September 16, 1988.



The damaged building of a clinic on business U.S. 77. The roof was found 100 yards west of the building.



A destroyed carport at an appartment complex. Many cars beneath the structure were damaged.

Roof damage to a Harlingen home. Unbroken were sliding glass doors just beneath the damaged section of roof which had been taped in anticipation of GILBERT's winds along with all of the windows in the house.

A plywood missle embedded several inches into the ground by the tornado.

---Map and all above photos by Tim Marshall of Lewisville, Texas.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

PLACE	DATE	TIME - LOCAL STANDARD	LENGTH OF PATH (MILES)	WIDTH OF PATH (YARDS)	NO. OF PERSONS KILLED	NO. OF PERSONS INJURED	ESTIMATED† DAMAGE PROPERTY	ESTIMATED† DAMAGE CROPS	CHARACTER OF STORM
1 ALABAMA									
Dale County	16	1205CST-1210CST	4	50	0	0	?	0	Tornado (F1)
	16	1230CST	0.5	10	0	0	?	0	Tornado (F0)
	16	1230CST			0	0	?	0	TSTM Wind
	16	1300CST			0	0	?	0	TSTM Wind
	At 1205CST a small tornado touched down at Cairns Field at Ft. Rucker and moved north about four miles to Lowe Field, uprooting some trees. At 1230 CST a small tornado touched down at Daleville and moved north about one-half mile. Trees were uprooted and several permanent signs were destroyed. At 1300CST trees were blown down at several locations on the Ft. Rucker main base housing areas. There were multiple sightings of funnel clouds throughout the Dale County area.								
Coffee County	16	1315CST			0	0	0	0	TSTM Wind
	Trees were blown down at Victoria.								
Tallapoosa County	16	1510CST	0.3	25	0	0	0	0	Tornado (F0)
	A small tornado touched down about 7 miles southeast of Dadeville and moved north a short distance. Numerous trees were uprooted.								
Shelby County	16	1515CST			0	0	-	-	Funnel Cloud
	A funnel cloud was seen in Shelby County about 5 miles south of Alabaster just off Interstate 65.								
ALZ-011-Clay, Coosa, Randolph, Tallapoosa Counties	16	2200-17 1400CST			1	0	?	0	Flash Flooding
	Heavy rain fell throughout the late night and morning hours over East Alabama causing numerous streams and creeks to swell out of their banks. A washed-out track bed caused a freight train to derail in Randolph County. Several other roads and bridges were also washed out in the other counties. At approximately 0045CST on the 17th, a 33 year old male died in a flash flood event in Tallapoosa County about 10 miles north of Alexander City. He was locking the hubs on a 4-wheel drive vehicle and was swept away in a swollen creek. Flash Flooding M330.								
Madison County	24	1130CST			0	0	?	0	TSTM Wind
	In the city of Madison a tree was blown across a mobile home. Other trees were blown down in the Toney area of Madison County.								
Marshall County	24	1800CST			0	0	0	0	TSTM Wind
	Trees and power lines were blown down in the Guntersville area.								
DeKalb County	24	1820CST			0	0	0	0	TSTM Wind
	Trees and power lines were blown down at Painter, Geraldine, and Crossville.								
2 ARIZONA — NONE REPORTED									
3 ARKANSAS									
Sebastian County	02	1640CST			1	0	0	0	Lightning
	A man was killed by a lightning strike while golfing at a course near Fort Smith. At the time of the strike, the man was walking under a tree. A female companion golfer was knocked down by the lightning, but was not injured. M300								
Jackson County	17	1703CST			0	0	0	0	Funnel Cloud
	Several reports of funnel clouds came in from southern Jackson County near the towns of Ingleside, Olyphant and Auvergne.								
Jackson County	23	1315CST			0	0	0	0	Funnel Cloud
	Numerous reports of funnel clouds were received from the area just southwest of Newport.								
Sebastian County	23	1650CST			0	0	?	?	Thunderstorm Wind
	The Police Department in Lavaca reported several trees were downed by high winds as a severe thunderstorm passed by.								
Pope County	23	1800CST			0	0	?	?	Thunderstorm Wind
	High winds downed trees on Highway 105 just north of Atkins.								
ARKANSAS									
Conway County	23	1830CST			0	0	?	?	Hail (0.75)
	Dime-size hail was reported by a storm spotter at Hattieville.								
Randolph County	29	1915CST			0	0	4	?	Flash Flood
	A thunderstorm dropped over 5 inches of rain on Pocahontas and caused minor flash flooding. A car was washed off a bridge, and the heavy rains caused a large concrete wall along a road to collapse.								
4 CALIFORNIA, Northern — NONE REPORTED									
4 CALIFORNIA, Southern									
Inyo County, Coso Junction	1	1430PST			0	0	0	0	Funnel Cloud
CAZ-011-012-015 016-017-020	3	3 DAYS			0	22	0	0	Extreme Heat
	A sizzling heat wave scorched Southern California over the Labor Day weekend. Many stations surpassed the century mark on Saturday, tying or breaking old existing records. The temperature never really dropped much Saturday night and early Sunday morning, setting the stage for Sunday's assault. Sunday was the hottest of the three days.								
	Leading into the weekend, upper-level high pressure, centered over Southern Idaho, built up over the Northern Rockies producing an easterly flow aloft over Southern California. The pressure gradients continued to trend offshore as the thermal trough shifted westward towards the coast. The air mass, though unstable, continued to dry out under the influence of the high pressure.								
	The downtown Los Angeles Civic Center reached 110 degrees Sunday, tying the hottest day ever recorded in Los Angeles. The only other time the downtown temperature soared so high was Sep 1, 1955. This shattered the record for the day, the old mark was 100 degrees in 1984. The overnight low (80 degrees) was the warmest of any Sep.4th. The old record was 73 degrees in 1984. San Diego's Lindbergh Field also shattered a record high temperature. The airport reached 107 degrees, as compared to the previous high of 95 degrees, set in 1961.								
	Area hospitals reported seven cases of heat stroke and one 2-year-old with respiratory problems related to the heat and a first-stage smog alert. The South Coast Air Quality Management District declared stage 1 smog alerts in southwest Los Angeles County, the Pomona-Walnut Valley, the southwest San Bernardino Valley, northern Orange County, and the San Gabriel Valley. Los Angeles County Lifeguards estimated that 770,000 people jammed the beaches Sunday from San Pedro to the Ventura County line. The sand at the beaches was so hot that the Santa Monica Hospital treated nine people for burned feet. The temperature was 108 degrees at the Los Angeles Memorial Coliseum as the Los Angeles Raiders kicked off the football season against the San Diego Chargers. Four spectators passed out from the heat and one Raiders' cheerleader had to be taken off the field on a stretcher.								
	Grass and brush fires, fueled by the dry heat and hot winds, popped up all over Southern California charring thousands of acres and damaging some twenty homes, some outbuildings, and a half dozen vehicles. Thirty-seven firefighters were treated for smoke inhalation and heat exhaustion Saturday.								
Ventura County, Lake Piru	3	afternoon			0	0	?	0	Lightning
	Lightning caused a brush fire to break out Saturday south of Lake Piru in Ventura County. It rapidly burned out of control, charring over 20,000 acres of rugged brushland. Two firefighters were injured fighting the blaze. It also spread into Los Angeles County late Sunday before being contained on Tuesday.								

STORM DATA AND UNUSUAL WEATHER PHENOMENA

PLACE	DATE	TIME - LOCAL STANDARD	LENGTH OF PATH (MILES)	WIDTH OF PATH (YARDS)	NO. OF PERSONS: KILLED	NO. OF PERSONS: INJURED	ESTIMATED† DAMAGE: PROPERTY	ESTIMATED† DAMAGE: CROPS	CHARACTER OF STORM
5 COLORADO									
Gunnison County: Gothic	1	1300MST			0	1	0	0	Lightning
	A 33 year old man was injured by lightning near Gothic. He was burned, and his shoes were destroyed.								
Douglas County: Castle Rock	6	1826MST			0	0	4	0	High winds
	Strong winds blew down two houses under construction.								
Northern Colorado COZ001-002-003-004-011	11-12				0	0	0	0	Rain, Snow
	A storm brought an early snowfall to some spots in the mountains. 6 inches fell at Echo Lake, in Clear Creek County. Many places in northeastern Colorado received about an inch of rain; 1.54 inches fell at Fort Collins, in Larimer County. Abundant rain also soaked the western slope. Cedaredge, in Delta County, had 2.05 inches in 48 hours.								
Arapahoe County: 15 SW Bennett	14	1300MST			0	0	0	0	Hail (1.5)
Northeastern Co. COZ011-012	18	evening			0	1	6	0	High winds
	A strong cold front blasted through the Front Range area, causing high winds from 1800 to 2200 MST from Fort Collins south to Denver. The highest measured wind speed was 92 mph at 1830 MST in Fort Collins. Gusts reached 82 mph in Longmont at 1910, and 81 mph at the Jefferson County Airport at 1945; a small plane there was totaled when the wind flipped it over. 60 mph winds were recorded in Boulder at 1935, and at the Denver suburb of Wheat Ridge at 2045. Farther east, a gust of 63 mph was recorded in Morgan County at Fort Morgan around 2015 MST. The winds caused about 3 million dollars in damage. Most damage was not severe, but it was widespread, especially in Larimer County in the Fort Collins and Loveland areas where about 1.7 million of the dollar loss occurred. Over 200 trees, some as tall as 100 feet, were blown down in Fort Collins. They downed many power lines, and damaged homes and cars. Some streets in the city were blocked. Similar damage, though on a lesser scale, occurred farther south along the Front Range. The episode's only injury occurred when a 22 year old man was slightly injured as a tree fell on top of his car in Longmont at 2030 MST.								
Logan County: Sterling	25	2100MST			0	0	3	4	Lightning
	Lightning ignited a haystack 7 miles north of Sterling, burning $30,000 worth of hay. In the city, bolts caused several power outages.								
6 CONNECTICUT									
New London County, Ledyard	21	0100EST			0	0	4	0	Lightning
	An early morning thunderstorm resulted in a damaging lightning strike which caused a fire which totally destroyed a barn. Equipment within the barn was damaged.								
7 DELAWARE ——— NONE REPORTED									
8 FLORIDA									
Manatee Co., Bradenton	05	1345EST			0	0	3	0	TSTM wind (55)
	High wind damaged 6 homes. The damage was done to screened porches and sheds, and there were trees downed as well.								
Polk Co., Frostproof	05	1400EST			0	3	2	-	TSTM wind (55)
	High wind blew down a large concession tent. The injuries were minor and were caused by falling tent poles.								
Charlotte Co., Port Charlotte	05	1825EST	1.0	20	0	0	4	0	Tornado (F1)
	A tornado damaged 11 homes. Damage was to roofs and sheds.								
Pinellas Co., St. Petersburg	08	2050EST	1.0	30	0	0	4	0	Tornado (F0)
	A tornado did minor damage to 4 homes and major damage to two homes.								

PLACE	DATE	TIME - LOCAL STANDARD	LENGTH OF PATH (MILES)	WIDTH OF PATH (YARDS)	NO. OF PERSONS: KILLED	NO. OF PERSONS: INJURED	ESTIMATED† DAMAGE: PROPERTY	ESTIMATED† DAMAGE: CROPS	CHARACTER OF STORM
——— FLORIDA									
FLZ010-013 West-Central Florida	05-09	0800EST-0800EST			4	0	7		Flooding
	Heavy rains of up to 20 inches fell on the west-central part of Florida. Four people drowned, a 44 year old male drowned while driving across a flooded roadway, a 93 year old male fell from a bridge and drowned, a 2 year old infant drowned in a stream, and a 17 year old male drowned while swimming across a creek. Evacuation of 1000 homes was required when the flood gates of a storage lake were opened. Extensive urban flooding took place. M44V, M930, M020, M170								
Bay Co., Sunnyside Beach	10	0700CST	1.0	30	0	0	3	0	Tornado (F0)
	A waterspout associated with Hurricane Florence moved ashore and broke several windows and caused some roof damage.								
Walton Co., Mossy Head	10	1115CST	1.0	30	0	0	3	0	Tornado (F0)
	A tornado associated with Hurricane Florence tore the roof off of a porch and destroyed a shed.								
Walton Co., Freeport	10	1238CST	1.0	30	0	0	3	0	Tornado (F0)
	A tornado associated with Hurricane Florence blew over a fence and did roof damage to several homes.								
Walton Co., Choctaw Beach	10	1330CST	1.0	30	0	0	3	0	Tornado (F0)
	A tornado associated with Hurricane Florence damaged a mobile home.								
FLZ001-002 Western Florida Panhandle	10-18				0	0	5	-	Flooding
	Heavy rains of 5 to 10 inches associated with Hurricane Florence fell on the 10th and the 11th. Rains of 5 inches associated with the far outer rainbands of Hurricane Gilbert fell on the 17th and 18th. These rains produced flooding which damaged 39 homes and three businesses. At one time on the 11th, 50 people were stranded in their homes. Seventeen roads were washed out during the Florence rain event.								
Monroe Co., Key West	13	2320EST			0	0	0	0	TSTM wind (50)
	A wind gust of 50 knots was reported at Key West.								
Walton Co., Point Washington	16	1220EST			1	0	0	0	Lightning
	A 37 year old male was struck and mortally hurt by lightning. He was standing near a tree at the time. M39O								
Charlotte Co., Port Charlotte	21	1630EST	1.0	30	0	0	3	0	Tornado (F0)
	A tornado did minor roof damage and downed power lines.								
9 GEORGIA									
Gwinnett County: Lilburn	03	1930EST			0	0	4	0	Lightning
Suwanee	04	0632EST			0	0	5	0	Lightning
	Lightning-caused fires destroyed two homes.								
Chatham County, 9 SE Savannah	09	0620EST			0	0	?	0	TSTM Winds
	09	0620EST							Funnel Cloud
	Thunderstorm winds downed several trees on a golf course on the southern end of Wilmington Island. Two boats, two boat docks, and a dock house were damaged in the area. A funnel cloud was observed in the area at the time.								
Forsyth County	12	0400EST-1000EST			0	0	4	0	Flash Flood
	Heavy rain fell across Forsyth County causing flash flooding. 4.75 inches of rain was measured in Cumming. Unoffical rainfall reports nearby ranged up to 7.2 inches during the morning hours. Several roads were washed out. Many other roads were closed due to 3 to 4 feet of standing water over them.								
Chatham County, Bloomingdale	25	1800EST			0	0	?	0	Lightning
	Lightning struck and set a house on fire in Bloomingdale. Damage was confined to the roof and attic.								
Summer Heat Summary									
	Georgia recorded six heat-related fatalities and 226 heat-related illnesses during the summer months of May through September. This compares to 16 fatalities and 279 illnesses reported in 1987.								

STORM DATA AND UNUSUAL WEATHER PHENOMENA

PLACE	DATE	TIME - LOCAL STANDARD	LENGTH OF PATH (MILES)	WIDTH OF PATH (YARDS)	NO. OF PERSONS KILLED	NO. OF PERSONS INJURED	ESTIMATED† DAMAGE PROPERTY	ESTIMATED† DAMAGE CROPS	CHARACTER OF STORM
10 IDAHO — NONE REPORTED									
11 ILLINOIS									
Hundelein, Lake Co.	4	0035CST			0	0	?	?	Hail
	1/4 to 1/2 inch hail fell continuously for 15 minutes and completely covered the ground in Hundelein. Some hail was still on the ground in the morning.								
Chicago, Cook Co.	17	1500CST			0	0	0	0	Record heat
	On September 17th in the afternoon the temperature at Chicago's O'Hare International Airport reached 90 degrees. This temperature reading was the 47th day during the summer season and for the year that the temperature reached 90 degrees or higher, and established an all-time record for the most 90 degree days in any year in over 117 years of official Chicago weather records.								
Milledgeville, Carroll Co.	19	1240CST	0.1	10	0	0	3	0	Tornado (F0)
	The police chief of Milledgeville confirmed that a small tornado touched down briefly at the intersection of Illinois Route 88 and Polo Blacktop road. Cars in the area had windows blown out. A telephone pole was broken off near the Black Top inn. An eyewitness said lawn chairs and a barbeque grill were "sailing" around in the air in a circular motion.								
Rockford, Winnebago Co.	19	1532CST			0	0	?	0	Tstm.wind(50)
	The National Weather Service Office at Rockford recorded at wind gust to 68 mph.								
Coal City and Joliet, Will Co.	19	1615CST			0	0	4	0	Tstm.wind
	Strong thunderstorm winds blew down and destroyed a large press box at the Coal City Football Stadium. In Joliet high winds caused tree damage and disrupted power to a large part of the city.								
McHenry and Kane counties	19	1630CST			0	0	4	0	Tstm.wind
	Winds estimated in excess of 60 mph caused spotty damage in McHenry and Kane counties. Siding was reported ripped off some homes in the two counties and dozens of trees were uprooted.								
Waukegan, Lake Co.	19	1700CST			0	0	4	0	Tstm.wind
	Strong thunderstorm winds downed power lines, a couple of utility poles, large trees and large tree limbs.								
La Grange and Brookfield, Cook Co.	22	1913CST			0	0	3	0	Tstm.wind
	Numerous power lines and some trees were knocked down by high winds. Many utility customers experienced extended power outages.								
12 INDIANA									
Floyd Co. New Albany	11	AFTN			0	0	4	0	Lightning
	Lightning struck a roof of a seed and plant food store. There was an estimated $20,000 damage due to the ensuing fire.								
Marion, Hamilton & Madison Cos.	12	1415 EST	35	200	0	1	5	0	Tornado (F1)
	A tornado touched down 7 miles west of downtown Indianapolis, skipping up and down on a northeast path for about 5 miles. Light mostly roof and car damage occurred at Rockville Road and Girls School Road...Speedway, and just south of the Lafayette Square shopping center. The tornado then became a funnel cloud, but continued on a northeast path for 9 miles where it touched down again. A construction trailer occupant was injured at this location, 10 miles north-northeast of downtown Indianapolis, near 86th and Dean Road.								
	The funnel continued northeast across extreme southeast Hamilton County and touched down at 245 pm at a construction site near Fishers. Three walls of a building under construction were blown in by the tornado. A debris cloud was visible near Pendleton in southern Madison County. The tornado touched down in the south part of Anderson knocking down trees.								
	Some of the most extensive damage included, nearly 40 automobiles and vans were damaged at a dealership near 38th and Lafayette Road. Part of the roof to a theater was blown off near the Lafayette Square Shopping Mall. Some apartment buildings had some roof damage and the roof was taken off a plumbing wholesale company just east of Dean Road in northern Marion County.								
	The tornado entered southeast Hamilton County around 245 PM EST and southern Madison County around 300 PM EST.								

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INDIANA									
Wayne Co. Greenfork	12	1615 EST			0	0	4	0	Tstm Winds
	Strong thunderstorm winds uprooted one 50 foot tree which damaged the roofs of two houses near State Road 38 in Greenfork.								
Benton Co. 9 ESE Fowler	19	1835 EST	1	50	0	0	4	0	Tornado (F1)
	A small tornado touched down about 9 miles ESE of Fowler at 325 S and 1000 E in southeast Benton County. The tornado moved east-northeast on the ground for about 1 mile. Two barns were destroyed and two homes were damaged. The south wall of a house was moved about two feet from the foundation. Trees were also downed by this tornado.								
Fountain Co. Attica	19	1845 EST			0	0	?	?	Tstm.winds
	Large trees were downed by strong winds.								
White Co. Monticello	19	1910 EST			0	0	4	0	Tstm.Winds
	Two mobile homes were blown over by high winds on the west edge of Monticello.								
La Porte Co.	19	1910 EST			0	0	4	0	Tstm.winds
	Large trees were downed at U.S. 6 in Kingford Heights. In addition, there was $25,000 damage to the roof and some boats at Fay's Marina. A section of the roof was blown off.								
Starke Co.	19	1915 EST			0	0	?	?	Tstm.Winds
	Numerous trees were down on Toto Road near English Lake in southwest Starke County. Power lines and seven trees were blown down one mile south of Knox in Starke County.								
St. Joseph Co. South Bend	19	1929 EST			0	0	0	0	Tstm.Winds
	Wind gusts to 63 miles an hour were recorded at the Michiana Airport in South Bend.								
Clay Co. Billville	19	1935 EST	0.4	30	0	0	3	0	Tornado (F1)
	A mini-tornado touched down briefly at Billville. The tornado destroyed a garage and damaged two houses. A couple of people were cut by flying glass.								
St. Joseph Co.	19	1940 EST			0	0	?	?	Tstm.Winds
	Strong thunderstorm winds downed trees on Douglass Road and a large tree was blown down on Northside Blvd. in South Bend. Large limbs and trees were down at Osceola in northeast St. Joseph County.								
Clinton Co.	19	1945 EST			0	0	?	?	Tstm.Winds
	Trees and power lines were downed by strong winds. Trees were blocking the road at 5th and Main in Michigantown and on County Road 0, north of County Road 500 N.								
Kosciusko Co.	19	1955 EST			0	0	4	?	Tstm.Winds
	A warehouse was partially collapsed and numerous trees and power lines down at Mentone. A building was damaged and large trees and power lines down at Warsaw. Numerous trees and power lines were down at North Webster, and several barns damaged by high winds at Milford.								
Elkhart Co.	19	1955 EST			0	0	?	?	Tstm.Winds
	Several large trees and power lines were down about 5 miles north of Goshen.								
Sullivan Co. Carlisle	19	2000 EST	0.2	30	0	0	3	0	Tornado (F0)
	A small tornado witnessed by a State Police officer touched down briefly and tore the roof off a house and blew the skirting away on a trailer.								

STORM DATA AND UNUSUAL WEATHER PHENOMENA

PLACE	DATE	TIME - LOCAL STANDARD	LENGTH OF PATH (MILES)	WIDTH OF PATH (YARDS)	NO. OF PERSONS KILLED	NO. OF PERSONS INJURED	ESTIMATED† DAMAGE PROPERTY	ESTIMATED† DAMAGE CROPS	CHARACTER OF STORM
INDIANA									
Putnam Co.	19	2005 EST			0	0	3	?	Tstm.Winds
	Strong thundestorm winds downed power lines and did roof damage to a car port and a wellhouse about 5 miles south of Greencastle. Two miles south of Putnamville high winds pushed in the side of a house, blew down poles and damaged a mobile home.								
Marshall Co. Plymouth	19	2005 EST			0	0	?	?	Tstm.Winds
	A large tree was down on U.S. 31 at Plymouth blocking the road. Cars struck the downed tree due to zero visibility and the roadway was flooded.								
Noble Co.	19	2005 EST			0	0	3	0	Tstm.Winds
	Trees were reported down blocking several roads across the county.								
Wabash Co. Wabash	19	2012 EST			0	0	2	0	Tstm.Winds
	The Wabash County Sheriff reported 74 mph winds along with several trees down.								
Huntington Co. Huntington	19	2038-2046 EST			0	0	0	0	Tstm.Winds
	Huntington ham spotter reported 60 mph winds just west of Huntington at 2038 EST. Several rees were also reported down.								
Allen Co. Fort Wayne	19	2100 EST			0	0	3	0	Tstm.Winds
	Six to eight inch diameter trees were reported down in the Time Corners section of Fort Wayne.								
Brown Co.	19	2140 EST	3	80	0	1	5	?	Tornado (F1)
	A tornado touched down on the southwest edge of the Brown County State Park. The tornado first came down in a wooded area just west of the Taylor Ridge campground. Numerous tree tops were sheared off and some trees blown over. At the campground, several large limbs came crashing down on the area. Two vehicles were damaged by the large limbs. At the initial touchdown site the width was about 75 yards and the maximum width was about 100 yards. The tornado moved east-northeast and continued to snap off tree branches and the tops of the trees. A large limb fell on the tent of two people camping at the Racoon Ridge site. A man about 50 years old suffered a head injury. He was treated and released that night from the local hospital. The tornado continued to knock down trees and snap off large limbs before lifting. The track of the tornado was approximately three miles.								
Bartholomew Co. Columbus	19	2205 EST	0.1	20	0	0	4	?	Tornado (F0)
	Quite possibly the same storm that produced the tornado in Brown County produced a small and short-lived tornado that touched down at Tellman Road west of Columbus. Three homes were damaged and some trees were also blown over.								
Decatur Co. 3 S Greensburg	19	2235 EST			0	0	4	0	Tstm.Winds
	The State Police at Versailles reported a house was destroyed by strong straight-line winds 3 miles south of Greensburg.								
13 IOWA									
Pottawattamie County, Council Bluffs	02	1839 CST			0	0	3	1	Tstm.Winds (52)
Story County, Slater	02	1919 CST			0	0	0	0	Funnel Cloud
	A narrow squall line formed along a cold front as it moved across Iowa. As the line moved through the Council Bluffs area, winds of 60 MPH caused some power line damage in the city. Several trees were also downed. Later on, a funnel cloud was sighted near Slater.								

PLACE	DATE	TIME - LOCAL STANDARD	LENGTH OF PATH (MILES)	WIDTH OF PATH (YARDS)	NO. OF PERSONS KILLED	NO. OF PERSONS INJURED	ESTIMATED† DAMAGE PROPERTY	ESTIMATED† DAMAGE CROPS	CHARACTER OF STORM
IOWA									
Fayette County, Oelwein	17	1833 CST			0	0	3	0	Lightning
	Lightning struck a tree in Oelwein, causing it to fall onto a house.								
Buchanan County, Aurora	17	1915 CST			0	0	4	4	Hail (1.75)
	17	1915 CST			0	0	4	4	Tstm.Winds (61)
	A thunderstorm moved through the Aurora area during the evening hours. Golf ball size hail fell from the storm and accumulated to a depth of 2 to 3 inches. The hail was also accompanied by winds of up to 70 MPH. The wind and hail caused damage to soybeans in the area. Several outbuildings were blown over by the strong winds. A dozen large trees were toppled in the city of Aurora.								
Linn County, Cedar Rapids	19	0645 CST			0	0	3	1	Tstm.Winds (50+)
	A narrow line of thunderstorms moved through the Cedar Rapids area. Several trees were downed in the city by what appeared to be a downburst wind.								
IAZ008-009-010-011-014-015-ILZ004 Southern and Eastern Iowa	19	1500 CST to 20 0300 CST			0	0	5	4	High Winds
	Strong westerly winds developed in the wake of a cold front. Winds gusted to 50 to 55 MPH in many areas. Most of the damage was relatively minor, mostly to tree limbs and some power lines. Numerous power outages were caused by limbs falling onto power lines. Several homes were damaged when trees were blown on them.								
Cerro Gordo County, Clear Lake	22	0200 CST			0	0	4	0	Lightning
	A thunderstorm moved through Clear Lake during the early morning hours. A house was struck by lightning in Clear Lake. The lightning blew out two walls of the house and caused a minor fire. Damage to the house was placed at $20,000.								
14 KANSAS									
Johnson and NE Miami Counties	15	0930 to 2130CST			0	0	4	0	Flood
	Thunderstorms produced locally heavy rains across southern portions of the Kansas City metropolitan area from the early morning hours through the late evening hours on the 15th. The heaviest rains fell between 0630-0845 CST and from 2045-2130 CST. Widespread urban flooding occurred with some damage to homes in low-lying areas when water seeped into basements. The rain also caused the Big Blue River to crest 3 feet above flood stage. Some areas in Johnson County and northeast Miami County received between 3 to 5 inches of rain from the thunderstorms.								
Leavenworth Co. Linwood	15	1330CST			0	1	0	0	Lightning
	A 36 year old woman was injured by lightning while talking on the telephone. Lightning struck nearby and entered her home through the phone line. She was taken to a local hospital where she was treated for minor injuries and then released.								
Miami Co. 3SE Paola	15	1400CST			0	0	3	0	TSTM Wind
	A severe thunderstorm produced strong, straight-line winds that destroyed a pole barn southeast of Paola. Damage to the barn was estimated at $4,000.								
Johnson Co. Shawnee	16	0345CST			0	0	4	0	Lightning
	Lightning struck a house in Shawnee during the early morning hours and set the roof on fire. All residents escaped from the fire with no injuries. The roof was totally destroyed, with damage from the fire estimated at $45,000.								
Sherman Co. Ruleton	18	1830CST			0	0	4	0	TSTM Wind (59)
Goodland	18	1848CST			0	0	3	0	TSTM Wind (59)
Edson	18	1907CST			0	0	4	0	TSTM Wind (55)
Thomas Co. Brewster	18	1920CST			0	0	0	0	TSTM Wind (52)
Colby	18	1945CST			0	0	3	0	TSTM Wind (52)
Cheyenne Co. Bird City	18	1930CST			0	0	4	0	Lightning
Graham Co. Hill City	18	2048CST			0	0	3	0	TSTM Wind (50)

STORM DATA AND UNUSUAL WEATHER PHENOMENA

PLACE	DATE	TIME - LOCAL STANDARD	LENGTH OF PATH (MILES)	WIDTH OF PATH (YARDS)	NO. OF PERSONS KILLED	NO. OF PERSONS INJURED	ESTIMATED† DAMAGE PROPERTY	ESTIMATED† DAMAGE CROPS	CHARACTER OF STORM

KANSAS

A strong cold front helped trigger thunderstorms across northwest Kansas during the evening hours, some of which became severe. Strong winds up to 68 mph damaged roofs and downed trees in the area. A wind generator was blown over in Goodland and a grain storage shed in Edson was severely damaged. Lightning struck a church in Bird City, causing the building to catch on fire. The church burned to the ground before the fire could be put out.

Ford Co.									
Dodge City	27	1625CST			0	0	3	0	Hail (1.5)
Dodge City	27	1627CST			0	0	3	0	Hail (1.0)
Dodge City	27	1644CST			0	0	3	0	Hail (1.0)
Wilroads Gardens	27	1743CST			0	0	4	0	TSTM Wind
Hodgeman Co.									
8E Jetmore	27	1717CST			0	0	3	0	Hail (.75)

A cluster of severe thunderstorms formed ahead of a low pressure system over far southwest Kansas during the late afternoon and evening hours. The storms produced large hail and damaging straight-line winds. The community of Wilroads Gardens, 8 miles southeast of Dodge City, was hardest hit by strong winds that downed trees and damaged 11 homes. Large hail also damaged cars and roofs on houses in Dodge City and Jetmore.

Russell Co.									
Russell	27	1940CST			0	0	0	0	Funnel Cloud
Jewell Co.									
Burr Oak	27	2030CST			0	0	2	2	Hail (1.25)

A few severe thunderstorms also formed across portions of north-central Kansas during the late evening hours. A funnel cloud was sighted in northeast Russell, but quickly dissipated. Large hail fell in Burr Oak, doing minor damage to crops and automobiles.

KSZ001-002-003	28	0930 to 2045CST			0	0	0	0	High Winds
Far Western Kansas									

A strong low pressure system over the central Plains produced northwest winds over 40 mph across far western Kansas. Goodland measured a peak gust of 58 mph at 1312CST. No damage resulted from the winds.

Jefferson Co.									
6W Oskaloosa	28	1615CST			0	0	4	2	TSTM Wind
Oskaloosa	28	1630CST			0	0	3	0	Hail (1.5), TSTM Wind (52)
Douglas Co.									
Lawrence	28	1742CST			0	0	5	0	TSTM Wind (68), Hail (1.75)
Eudora	28	1750CST			0	0	3	0	TSTM Wind (52)
Johnson Co.									
5E Desoto	28	1812CST			0	0	2	0	TSTM Wind
Leavenworth Co.									
Tonganoxie	28	1816CST			0	0	3	0	TSTM Wind (51)
Neosho Co.									
Chanute	28	1822CST			0	0	2	0	TSTM Wind (50)
Wyandotte Co.									
Kansas City	28	1825CST			0	0	0	0	TSTM Wind (50)
Johnson, Leavenworth and Wyandotte Counties	28	1945 to 2130CST			0	0	4	0	Flash Flood
Cowley Co.									
Maple City	28	2127CST			0	0	3	0	Hail (1.75)

A broken line of severe thunderstorms formed along a cold front in south-central and eastern Kansas during the late afternoon and evening hours. The storms produced large hail and damaging winds in a few areas. Lawrence was hardest hit by winds that gusted to 80 mph. The strong winds heavily damaged a K Mart building that was under construction. Damage was estimated at $300,000. Several trees were also downed in the storm. Strong winds also tore the roof off a house west of Oskaloosa. Heavy rain from the storms fell across northeast Kansas between 1730 and 2130CST with up to 4 inches reported in the Kansas City area. The heavy rain caused many roads to become flooded in the Kansas City metropolitan area. Standing water up to 5 feet deep resulted in parts of Kansas City, KS. Several rescues of motorists trapped in their vehicles due to high water in low-lying areas had to be performed. Damage was done to some small businesses in downtown Kansas City, KS when the flood waters entered basements in the area. Large hail, up to golfball size, also accompanied a few of the thunderstorms across eastern and south-central portions of the state.

SPECIAL HAIL SUMMARY

Kansas-Oklahoma Hail Loss Service reports indicate hail was especially damaging to crops in the listed counties on the following dates:

27 Ford
28 Anderson

15 KENTUCKY

Lee Co.	23	1625EST			0	0	3	0	Thunderstorm Wind

Wind gusting to around 60 mph damaged a building in Beattyville.

Grayson Co.	23	1630CST			0	0	3	0	Thunderstorm Wind Hail (1.75)

A thunderstorm moving across Grayson County blew numerous large trees down in Peonia, and reports of golfball size hail in Grayson Springs and Big Clifty were received.

Taylor Co.	23	1630EST			0	0	0	0	Hail (0.75)
Hardin Co.	23	1809EST			0	0	0	0	Hail (1.00)

16 LOUISIANA

St. Tammany Parish, Slidell	03	1145CST	.3	20	0	0	4	0	Tornado (F1)

A tornado touched down briefly in a subdivision in north Slidell, removed a portion of a house roof, and caused minor damage to a couple other homes.

LAZ009-010-013-014, Southeast Louisiana	09	0600CST- 10 1200CST			0	0	6	?	Hurricane Florence

Tropical Storm Florence which had formed in the south-central Gulf of Mexico during early afternoon of Sept 7, became a Category 1 hurricane at 1200CST, Sept 9, approximately 100 miles south of Burrwood, LA. The minimal hurricane moved steadily northward crossing the Mississippi River delta near Burrwood around 2000CST, Sept 9, then turned north-northwest with the center of circulation crossing over the greater New Orleans area between 0100CST and 0300CST. Belle Chase Naval Air Station (NBG) reported the eye passed over the station at 0135CST. The hurricane rapidly decreased in intensity after it crossed western Lake Pontchartrain and moved into northern Tangipahoa Parish.

Lakefront Airport (NEW) recorded the highest wind speed in the New Orleans area with a maximum sustained wind of 40 miles per hour with gusts to 61 miles per hour. The lowest pressure recorded in the New Orleans area was at NBG with 29.26 inches (990.9 mb). Damage across the area was confined to downed trees and power lines, and minor storm surge flooding outside the hurricane protection levees. Rainfall was quite light with most amounts under 2 inches. Greatest 24 hour rainfall totals included: 3.25 inches near Lafitte and 4.05 inches near Watson. Total damage due to Florence was estimated near $2.5 million. A parish by parish summary follows:

Jefferson Parish: Widespread light to moderate wind damage occurred to trees resulting in downed power lines. Some minor flooding was reported along the 17th St. Canal near its entrance into Lake Pontchartrain. Grand Isle suffered significant beach erosion with up to 40 feet of beachfront eroded in a few areas.

Orleans Parish: Widespread moderate wind damage occurred to trees with a number of moderate size trees blown down. Power outages were widespread with 110,000 customers without electricity for a short period of time. Storm surge flooding occurred along Lakeshore Drive, outside the levee, as the lake level was approximately 4 feet above normal.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

PLACE	DATE	TIME - LOCAL STANDARD	LENGTH OF PATH (MILES)	WIDTH OF PATH (YARDS)	NO. OF PERSONS KILLED	NO. OF PERSONS INJURED	ESTIMATED[1] DAMAGE PROPERTY	ESTIMATED[1] DAMAGE CROPS	CHARACTER OF STORM
LOUISIANA									
				Plaquemines Parish: Moderate wind damage to trees was reported, with light damage to a few buildings. Minor storm surge flooding was reported outside the levees. Approximately 15,000 people from the south portion of the parish evacuated in advance of the storm.					
				St. Bernard Parish: Moderate wind damage mainly to trees was reported along with resulting power outages. Storm surge flooding of 2 to 3 ft. above ground level was reported in areas outside the levees. A spoil bank was broken by the storm surge near Delacroix, flooding Louisiana Highway 300. Approximately 2,000 residents living outside the hurricane protection levee evacuated prior to the landfall of the hurricane.					
				St. Tammany Parish: Minor tree damage was reported with sporadic power outages. Approximately 25,000 people were without electricity for a short period of time. Due to the increased level of Lake Ponchartrain on the morning of the 10th, minor storm surge flooding was reported along Lakeshore Drive in Mandeville, along Bayou Lacombe in Lacombe, and in Slidell along Bayou Liberty and Palm Lake.					
				Remainder of southeast Louisiana: Minor wind damage to trees was reported along with sporadic power outages in: East Baton Rouge, Livingston, St. Charles, and Tangipahoa Parishes.					
St. Tammany Parish, Mandeville	11	1400CST-1800CST			0	0	5	0	Heavy Rain, Flash Flooding
		An estimated 5 inches of rain fell between 1300-1600CST in the Mandeville area. The drainage problem in this relatively flat area was aggravated because southerly winds in the wake of Hurricane Florence had caused the level of Lake Ponchartrain to increase along the north shore,restricting rainwater run-off. A 20 block area near the lakeshore was flooded,with water reported in 300 homes and businesses.							
LAZ011-012-013-014 South Louisiana	15-16	1200CST-1800CST			0	0	?	?	Hurricane Gilbert
		Although Hurricane Gilbert passed well to the south of Louisiana, the intense hurricane affected the coastal areas with tides around 2 feet above normal east of the Mississippi River on the 15th. On the 16th, winds shifted to the south and tides west of the Mississippi River increased to 2 to 4 feet above normal. Roads along bayous in south Terrebonne Parish were flooded on the 16th due to the high tides. Grand Isle suffered extensive beach erosion because of high tides and large waves, with up to 60 feet of beachfront lost in some areas. Precautionary evacuation prior to Gilbert included: 15,000 residents from lower Plaquemines Parish, 2,000 from Grand Isle, and 7,500 from Cameron Parish.							
St. Tammany Parish, Lacombe	16	1300CST	0.2	20	0	0	3	0	Tornado (F0)
		A tornado touched down causing minor damage to a small commercial building and ripping limbs from nearby trees.							
St. Tammany Parish, 5 ESE Slidell	16	1415CST			0	0	3	0	TSTM Wind
		Thunderstorm wind gusts caused minor damage to three houses.							
Jefferson Parish, Marrero	25	1640CST	.20	20	0	0	3	0	Tornado (F0)
		A house received minor damage when a tornado touched down.							
St. Tammany Parish, 8 S Mandeville	30	1830CST			0	0	0	0	Funnel Cloud
LAZ001-002-003-004 -005-006, Central and North Louisiana	01-31				0	0	?	?	Drought
		Rainfall increased over north and central portions of the state during the month, except for the extreme west portions, providing relief to many agricultural interests. Monthly rainfall averaged between 3 and 4 inches over all but the northwest and west central areas, where rainfall averaged near 1.5 inches.							
17 MAINE — NONE REPORTED									
18 MARYLAND and D.C. — NONE REPORTED									
19 MASSACHUSETTS — NONE REPORTED									
20 MICHIGAN									
8 NW Alpena, Alpena County	03	1515EST	0.1	10	0	0	0		Tornado(F0)
		Windows were blown out of a house and a wooden shed was damaged. A dog was blown into a tree, and several trees were twisted and broken.							
Jenison, Ottawa Co.	03	1552EST			0	0	0		Hail(1.00)
Marne, Ottawa Co.	03	1558EST			0	0	0		Hail(1.75)
Watervliet, Berrien Co.	03	1615EST			0	0	0	C	Hail(0.75)
Baroda, Berrien Co.	03	1615EST			0	0	0	C	Hail(0.75)
3 NW Dowagiac, Cass County	03	1738EST			0	0	0		Funnel Cloud
near Saranac, Ionia County	03	1742EST			0	0	0		Hail(0.75)
	03	1742EST			0	0	0		Thunderstorm Wind
		Trees were blown down.							
N of Dowagiac, Cass County	03	1803EST			0	0	0		Thunderstorm Wind
		Several trees were down in a path 1 mile long and ½ mile wide.							
3 N Niles, Berrien County	03	1900EST			0	0	4		Thunderstorm Wind
		Trees and power lines were down.							
5 NNW St. Joseph, Lake Michigan	05	1015EST			0	0	0		Waterspout
15 W Saugatuck, Lake Michigan	05	1320EST			0	0	0		Waterspout
5 W St. Joseph, Lake Michigan	06	955EST			0	0	0		Waterspout
Pinckney, Livingston County	16	1900EST			0	13	0		Lightning
		Lightning struck a parking lot adjacent to a football game.							
Allegan County	18	1117EST			0	0	2		Thunderstorm Wind
		Tree limbs were blown down.							
Prairieville, Allegan County	18	1220EST			0	0	2		Hail(0.88)
		Trees were down in the Douglas/Saugatuck area, and in Fennville, Plainwell, and Otsego. Some roads were partially blocked. A car was damaged by hail.							
Barry County	18	1130EST			0	0	0		Thunderstorm Wind
		Several trees were down in Barry, Prairieville, and Yankee Springs Townships.							
Ann Arbor Airport, Washtenaw	18	1522EST			0	0	0		Thunderstorm Wind (62)
Allegan County	19	1900EST			0	0	2		Thunderstorm Wind
Van Buren County	19	1915EST			0	0	2		Thunderstorm Wind
Berrien County	19	1930EST			0	0	2		Thunderstorm Wind
Cass County	19	1945EST			0	0	2		Thunderstorm Wind
		Trees and power lines were blown down. The Coast Guard at St. Joseph reported 50 mph winds. A large television antenna was destroyed and a building damaged at Paw Paw.							
Barry County	19	2048EST			0	0	3		Thunderstorm Wind
Branch County	19	2050EST			0	0	0		Thunderstorm Wind
Calhoun County	19	2100EST			0	0	3		Thunderstorm Wind
Lenawee County	19	2130EST			0	0	3		Thunderstorm Wind
		12 fallen trees blocked roads, several broke power lines in Barry County. Gusts were estimated at 60 mph. Numerous trees 12-14 inches in diameter were blown down north and south of Coldwater. Several roads were blocked. A building under construction at Hudson was blown down. A car was damaged by a falling limb at Morenci, as was a house at Tecumseh.							
Jackson County	19	2100EST			0	0	4		Thunderstorm Wind
		A house under construction was blown down. Several tree limbs and wires were down.							

STORM DATA AND UNUSUAL WEATHER PHENOMENA

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MICHIGAN									
Ionia County	19	2115EST			0	0	2		Thunderstorm Wind
	Power outages were caused by branches falling on lines.								
Calhoun County	19	2135EST			0	0	0		Thunderstorm Wind
	Trees were blown down by wind estimated at 60 mph.								
17 SSW Lansing, Eaton County	19	2140EST			0	0	3		Thunderstorm Wind
	A large tree was blown down, the roof was blown off a porch, and storm windows were blown out.								
Ingham County	19	2145EST			0	0	2		Thunderstorm Wind
	18 inch diameter trees were blown down by wind estimated at 50 to 70 mph. There was structural damage in Mason.								
Lake Michigan, off South Haven	22	1700EST			0	0	0		Waterspout
Grand Rapids, Kent County	22	1930EST			0	0	4		Heavy Rain
	Several basements were flooded or caved in. Sanitary sewers overflowed into the Grand River.								
Fruitport, Ottawa County	22	1940EST			0	2	0		Lightning
	2 persons fell off bleachers following a nearby lightning strike.								
Ottawa County	22	2130EST			0	0	2		Thunderstorm Wind
	Many tree limbs fell on power lines, causing widespread outages.								
Northern Oakland County	22	2315EST			1	1	4		Lightning
	2 houses were destroyed, 1 damaged by fire. A woman suffocated, another suffered smoke inhalation. F90P								
Tecumseh, Lenawee County	22	2320EST			0	0	2		Thunderstorm Wind
	Two houses were damaged by falling trees.								
21 MINNESOTA									
St. Louis Co. Ely	01	1925CST			0	0	0	0	Hail (1.0)
Crow Wing Co. 26NE Brainerd	16	1537-1540CST	0.1	10	0	0	0	0	Waterspout - Tornado (F0)
	A waterspout over Rush Lake was observed moving onshore. It took down a few trees then dissipated rapidly.								
Clay Co. Barnesville	18	1111CST			0	0	0	0	Hail (1.25)
22 MISSISSIPPI									
Harrison County, Biloxi	03	0600CST-1400CST			0	0	4	0	Flash Flood
	Four to five inches of rain caused flooding of numerous streets in Biloxi. Water reached up to porches, but only entered one home. Several streets were barricaded as water reached 1 to 2 feet deep.								

PLACE	DATE	TIME - LOCAL STANDARD	LENGTH OF PATH (MILES)	WIDTH OF PATH (YARDS)	NO. OF PERSONS: KILLED	NO. OF PERSONS: INJURED	ESTIMATED† DAMAGE: PROPERTY	ESTIMATED† DAMAGE: CROPS	CHARACTER OF STORM
MISSISSIPPI									
Harrison, Hancock and Jackson Counties	09-10	1800CST-1200CST			0	0	5	0	Hurricane Florence
	During the afternoon of the 9th, Tropical Storm Florence was upgraded to a hurricane in the central Gulf of Mexico. The Storm was moving northward at 15 mph and nearly 34,000 people evacuated their homes for shelters or points northward. The Hurricane weakened as it moved northward during the night and made landfall just east of the mouth of the Mississippi River. The strongest winds in Mississippi were in Hancock County with winds estimated up to 60 mph on the 10th/0300CST. The lowest pressure was 1005.8 mb in Hancock and Harrison counties around the 10th/0000CST.								
	Rainfall amounts averaged 1 to 3 inches. The largest rain total was in Bay St. Louis with 5.20 inches. No major flooding occurred except for flooding in streets and low-lying areas in Hancock County								
	Storm tides were generally 2 to 4 feet above normal with the highest tide recorded at Pass Christian Harbor at 5.1 feet. Beach erosion was considerable in Hancock County, but insignificant in Jackson and Harrison counties.								
Bolivar County, 2SW Cleveland	16	1545CST			0	0	0	0	Funnel Cloud
Harrison County, Pass Christian	16	1700CST			0	0	0	0	Waterspout
	A large waterspout developed just off shore of Pass Christian, but dissipated before it reached the beach.								
Jackson County, Moss Point	16	1822CST	.25	20	0	0	4	0	Tornado (F0)
	A very small tornado touched down briefly in Moss Point. The tornado damaged a roof, ripped the hood off of a car and scattered garbage around.								
Hancock County, 4N Waveland	16	1840CST	.5	25	0	0	4	0	Tornado (F1)
	A small tornado north of Waveland unroofed a home.								
Leflore County, Greenwood	24	1530CST			0	0	?	?	Hail (1.00)
Leflore County, 4S Greenwood	24	1550CST			0	0	?	?	Hail (1.00)
Carroll County, Centerville	24	1610CST			0	0	?	?	Hail (.75)
Bolivar County, 2SE Choctaw	24	2005CST	.5	50	0	0	0	?	Tornado (F0)
	A tornado moved through a field and ripped out soybeans. The tornado only went through fields and did no structural damage.								
Washington County, Hollandale	30	1530CST			0	0	3	0	Thunderstorm Winds
	A few trees were blown down near Hollandale. One tree fell on a shed and heavily damaged it.								
23 MISSOURI	NONE REPORTED								
24 MONTANA									
Phillips County, Port of Morgan	7	1730 MST			0	0	0	0	TSTM Winds (G 60)
MTZ003	10	1700-2000 MST			0	0	0	0	Heavy Snow
	Six inches of snow fell at Kings Hill in the Little Belt Mountains. Two inches of slush was reported at Rogers Pass in the Rockies.								
MTZ003-004-006	17-18	2000-1100 MST			0	0	6	0	Heavy Snow
	Approximately 400 to 500 power poles were downed in the Great Falls, Fairfield, Valier, Augusta, and Choteau areas. Wet snow built up on power lines, causing poles to snap. Six to 12 inches of wet snow were common in the three zone area, however little damage resulted in MTZ004 and 006 as the wind was lighter in those areas.								

STORM DATA AND UNUSUAL WEATHER PHENOMENA

PLACE	DATE	TIME - LOCAL STANDARD	LENGTH OF PATH (MILES)	WIDTH OF PATH (YARDS)	NO. OF PERSONS		ESTIMATED† DAMAGE		CHARACTER OF STORM
					KILLED	INJURED	PROPERTY	CROPS	
25 NEBRASKA									
Sherman Co. 4N Litchfield	01	1640CST			0	0	3	4	Hail (1.75)
Dodge Co. Dodge	02	1700CST			0	0	3	1	Thunderstorm Wind
Wind gusts broke tree limbs and downed a number of power lines.									
Washington Co. Blair	02	1755CST			0	0	3	2	Thunderstorm Wind (50)
Winds gusted to around 57 m.p.h. causing minor tree and utility line damage.									
Douglas Co. Omaha	02	1833CST			0	0	4	2	Thunderstorm Wind (52)
Winds gusted to 60 m.p.h. causing some tree and power line damage.									
Polk Co. Osceola	02	1835CST			0	0	3	0	Thunderstorm Wind
Strong winds broke tree limbs.									
Cherry Co. 12NE Valentine	10	0930CST			0	0	3	5	Lightning
Fire started by lightning burned about 6000 acres of grass and pasture land. Some hay bales and fence were also destroyed.									
Cherry Co. 5S Crookston	10	0930CST			0	0	2	4	Lightning
Fire started by a lightning strike burned about 6000 acres of grass and pasture land.									
Hitchcock Co. Palisade	18	1900CST			0	0	3	2	Thunderstorm Wind (56)
Wind gusts estimated to 65 m.p.h. caused minor damage.									
Hitchcock Co. Trenton	18	1900CST			0	0	5	2	Thunderstorm Wind (56)
65 m.p.h. wind gusts downed trees and power lines and damaged a few outbuildings.									
Lincoln Co. North Platte	18	1922CST			0	0	4	2	Hail (0.75)
Hail stripped leaves from trees and dented a few vehicles.									
Red Willow Co. McCook	18	1935CST			0	0	4	2	Thunderstorm Wind (56)
Winds estimated gusting around 65 m.p.h. downed trees and power lines.									
Gosper Co. Elwood	18	2000CST			0	0	5	0	Thunderstorm Wind (56)
Wind gusts estimated to 70 m.p.h. damaged a water tower.									
Phelps Co. Bertrand	18	2010CST			0	0	4	0	Thunderstorm Wind (52)
60 m.p.h. wind gusts blew down trees.									
Valley Co. Ord	18	2010CST			0	0	3	1	Thunderstorm Wind (50)
Thunderstorm winds gusted to 57 m.p.h. causing minor damage.									
Buffalo Co. Kearney	18	2045 CST			0	0	4	0	Thunderstorm Wind (52)
Wind gusts estimated to 60 m.p.h. blew down several trees and power lines.									
Buffalo Co. Shelton	18	2110CST			0	0	3	0	Thunderstorm Wind (56)
Wind gusts estimated to 65 m.p.h. blew the back window out of a police car.									
Adams Co. Hastings	18	2130CST			0	0	4	0	Thunderstorm Wind
Strong winds downed tree limbs and power lines.									
Hall Co. Wood River	18	2132CST			0	0	2	0	Thunderstorm Wind (52)
Dundy Co. 8N Benkelman	27	1700CST			0	0	4	6	Hail (2.75)
Hail along with strong winds damaged or destroyed 3 farm buildings, fence and 4330 acres of crops in a 13 mile by 11 mile area.									
Harlan Co. Stamford	27	1830CST			0	0	4	4	Hail (4.00)
Hitchcock Co. Stratton	27	1845CST			0	0	0	0	Funnel Cloud
Hitchcock Co. 4SW Trenton	27	1900CST			0	0	6	4	Thunderstorm Wind
Strong wind gusts damaged farm dwellings, structures and machinery along with trees and fences. Crops were also heavily damaged.									
Lincoln Co. 8S North Platte	27	1930CST			0	0	2	2	Hail (0.75)
Adams Co.	28	0000CST			0	0	2	3	Flood
Rainfall around 4 inches pushed the Little Blue River out of banks over Highway 74 west of Ayr and west of Pauline. Street flooding was reported in parts of Hastings.									
NEBRASKA									
Saunders Co. Colon	28	1503CST			0	0	3	4	Hail (1.75)
26 NEVADA — NONE REPORTED									
27 NEW HAMPSHIRE — NONE REPORTED									
28 NEW JERSEY, Northern — NONE REPORTED									
28 NEW JERSEY — NONE REPORTED									
29 NEW MEXICO									
Eddy County	01	1734MST			0	0	0	0	Funnel Cloud
A funnel cloud was spotted 6 miles east of Carlsbad.									
Eddy County	01	1815MST			0	0	?	?	TSTM Wind (50)
Shingles were blown off of houses and trees were downed by thunderstorm wind estimated at 50 knots.									
Lincoln County	01	2030MST			1	0	?	0	Flash Flood
Two to four inches of rainfall caused extensive flash flooding around Ruidoso. Some roads were washed out. One resident drowned when he drove his pickup truck into a flooded area and was washed away. Streams affected include the Rio Ruidoso, the Rio Hondo, and the Rio Bonito. (M78V)									
Torrance County	12	1805MST			0	0	?	0	Flash Flood
A storm flooded roads 4 miles west of Moriarty.									
Valencia County	13	1345MST			0	0	0	0	Funnel Cloud
A funnel cloud was spotted 10 miles west of Los Lunas by National Weather Service personnel.									
Sandoval County	13	?	?	?	0	0	5	0	Tornado (F1)
A small tornado occurred near Bernalillo. A 75,000 pound crane was moved off its foundation. Damage to the crane was estimated at around 100,000 dollars.									
Valencia County	13	1500MST			0	0	?	0	Flash Flooding
Flooding of roads and homes occurred in Los Lunas.									
Eddy County	20	1800MST			0	0	?	?	Flash Flooding
Flooding occurred around Carlsbad from nearly four inches of rain. Many low water crossings and streets were flooded.									
Eddy County	20	1830MST			0	0	?	0	Hail (1.00), TSTM Wind (50)
Hail and strong thunderstorm winds were reported near Queens Store, 40 miles southwest of Carlsbad. Wind was also reported at Carlsbad Caverns.									
Roosevelt County	20	1950MST			0	0	?	?	Flash Flooding
U.S. Highway 70 was closed by high water between Elida and Portales. Two and a half inches of rain fell.									
Catron and Grant Counties	21	1415MST			0	0	?	0	Flash Flooding
Flash flooding occurred along the west fork of the Gila River after two-inch rains fell quickly upstream of Gila Hot Springs. Flooding or near bankfull conditions at times were reported downstream from Gila Hot Springs to Redrock until 4 am on the 22nd. The river rose to two feet above flood stage at Gila Hot Springs late in the afternoon. The Gila Cliff Dwellings was closed for several weeks until a washed-out bridge was repaired.									

STORM DATA AND UNUSUAL WEATHER PHENOMENA

PLACE	DATE	TIME - LOCAL STANDARD	LENGTH OF PATH (MILES)	WIDTH OF PATH (YARDS)	NO. OF PERSONS KILLED	NO. OF PERSONS INJURED	ESTIMATED† DAMAGE PROPERTY	ESTIMATED† DAMAGE CROPS	CHARACTER OF STORM

NEW MEXICO

Otero County	21	1825MST			0	0	0	0	Funnel Cloud
	A funnel cloud was spotted near La Luz.								
Eddy County	21	2000MST			0	0	?	0	Flash Flooding
	Flooding occurred between Artesia and Carlsbad. Several roads were closed.								
Eddy County	21	2100MST			0	0	?	?	Hail (0.75), TSTM Wind (52)
	Hail fell near Highway 285 and State Road 137. Lakewood had winds estimated near 60 mph.								
Eddy County	21	2135MST			0	0	0	0	Funnel Cloud
	A funnel cloud was spotted by Weather Service personnel 4 miles southeast of Artesia.								
Dona Ana County	22	1435MST	?	?	0	0	0	0	Tornado (F0)
	The public reported a brief touchdown of a tornado 2 miles west of Vado. No damage was found.								
Otero County	22	1600MST			0	0	0	0	Hail (0.75)
	Three-quarter inch diameter hail was reported at Pinon.								
Otero County	22	1700MST			0	0	0	0	Hail (0.75)
	Three-quarter inch diameter hail was reported at La Union.								
Chaves County	22	1742MST	?	?	0	0	0	0	Tornado (F0)
	A tornado was reported west of Highway 285 near the Felix River.								
Chaves County	22	1800MST	?	?	0	0	?	?	Tornado (F0)
	A tornado touched down just west of Hagerman. Some damage was done to a shop and a trailer house. This tornado may have occurred from the same circulation as the tornado at 1742MST, but there is no confirming evidence that they are the same tornado.								

30 NEW YORK, Coastal ——— NONE REPORTED

30 NEW YORK, Central

Warren Co. Glens Falls	10	1345est			0	0	4	0	Tstm.Wind
	Thunderstorm winds knocked down power lines and tree limbs.								
Rensselaer Co. Troy	20	1750est			0	0	5	0	Tstm.Wind
	Thunderstorm-related blackouts resulted in damage to the City of Troy's radio communications equipment. Also affected were power and telephone lines in the city.								

30 NEW YORK, Western

Niagara County:									
Youngstown	05	0200 EST			0	0	4	0	High Winds
Olcott Harbor	05	0600 EST			0	0	4	0	High Winds
	Boats at the Youngstown Yacht Club and Youngstown Village Docks (Niagara River) were torn from their moorings by gale-force winds and sent crashing against the riverbanks. Several boats sustained heavy damage. A tugboat was forced aground from Lake Ontario at Olcott Harbor.								

31 NORTH CAROLINA

Catawba Co. Hickory	04	0030EST			0	0	4	0	TSTM Winds
	Thunderstorm winds blew down trees and power lines in Hickory.								
Brunswick Co. Southport	04	2008EST			0	0	0	0	TSTM Winds (65k)
	A river pilot reported winds of 75 MPH near Southport.								
Carteret Co.	20	1513EST			0	0	0	0	Waterspouts
	Ten waterspouts were sighted over the Atlantic near Bogue Inlet.								
Wilkes Co. Wilkesboro	24	1428EST			0	0	0	0	Hail (1.75)
Northern Iredell Co.	24	1545EST			0	0	4	0	Hail (1.75)
Davie Co. 2 N Mocksville	24	1600EST			0	0	0	0	TSTM Winds
Iredell Co. Mooresville	24	1630EST			0	0	5	0	TSTM Winds
Davidson Co. 3 SW Lexington	24	1630EST			0	0	0	0	TSTM Winds
	A line of severe thunderstorms moved southeast from the foothills to the piedmont producing numerous reports of golf ball size hail and wind damage. Most of the wind damage was to trees except for minor building damage at a construction site in Statesville. Falling trees destroyed a house in Mooresville.								
Durham Co. Durham	24	1450EST			0	0	0	0	Hail (1.75)
Orange Co. 10 NW Chapel Hill	24	1532EST			0	0	0	0	Hail (1.75)
Nash Co. Mt. Pleasant	24	1607EST			0	0	0	0	Hail (1.75)
Wake Co. Zebulon	24	1718EST			0	0	0	0	Hail (0.75)
Nash Co. Bailey	24	1718EST			0	0	0	0	Hail (1.75)
Edgecombe Co. Macclesfield	24	1720EST			0	0	0	0	Hail (1.75)
Chatham Co. 5 S Siler City	24	1800EST			0	0	0	0	Hail (1.75)
Pitt Co.	24	1805EST			0	0	0	0	Hail (1.75)
	Severe thunderstorms produced large hail over the piedmont and into the coastal plains.								
Wayne Co. N of Grantham	24	2030EST			0	2	0	0	Lightning
	Two men in a tent, camping by the Neuse River, were injured by lightning. Lightning struck the ground near the tent. The charge traveled along the wet ground to reach the men in the tent. Both were hospitalized for a short time.								

32 NORTH DAKOTA

Ramsey County, Devils Lake	10	2145CST			0	0	4	0	TSTM Wind
	Strong winds blew down some trees.								
Stutsman County, Montpelier	18	0845CST			0	0	4	4	TSTM Wind (57) Hail (1.50)
	Strong winds snapped off trees, and blew out windows and doors.								
LaMoure County, Marion	18	0925CST			0	0	6	6	TSTM Wind
Barnes County, Litchville	18	0935CST			0	0	6	6	TSTM Wind Hail (0.75)
	Severe thunderstorms occurred over northeastern LaMoure and southwestern Barnes counties. Hail occurred with up to six inches of rain, which left streets and fields in standing water. The hail lasted up to 30 minutes and covered the ground. The hail also stripped leaves from trees, and damaged sunflower, soybean and cover crops.								
	Strong winds blew out granaries at Marion (LaMoure County), destroyed barns and outbuildings, uprooted trees, knocked down power poles, and blew 1000-pound hay bales into ditches in Barnes and LaMoure counties. Some debris was blown a quarter mile away.								
Cass County:									
Chaffee	18	0950CST			0	0	?	?	Hail (1.00)
Fargo	18	1025CST			0	0	6	6	Hail (0.75)
Fargo	18	1030CST			0	0	6	6	Hail (1.75)
Fargo	18	1100CST			0	0	6	6	Hail (1.50)
	Hail was widespread throughout the southern and western sections of the City of Fargo. Dime-sized hail was reported in the west part of Fargo at 1025CST, while golfball-sized hail occurred in the south part of the city at 1030CST. At 1100CST, pingpong ball-sized hail was reported in south Fargo.								

STORM DATA AND UNUSUAL WEATHER PHENOMENA

PLACE	DATE	TIME - LOCAL STANDARD	LENGTH OF PATH (MILES)	WIDTH OF PATH (YARDS)	NO. OF PERSONS KILLED	NO. OF PERSONS INJURED	ESTIMATED† DAMAGE PROPERTY	ESTIMATED† DAMAGE CROPS	CHARACTER OF STORM
NORTH DAKOTA									
Ransom County, Sheldon	18	1045CST			0	0	?	?	Hail (1.75)
Cass County, Fargo	18	1946CST			0	0	0	0	TSTM Wind (54)
	A second severe thunderstorm in the same day affected the City of Fargo, and a wind gust to 62 mph was recorded at the Fargo airport.								
33 OHIO									
Miami County	12	1800 EST			0	0	4	0	Thunderstorm Wind
	Thunderstorm winds damaged a large pole barn and blew down trees in the southwest part of the county.								
Pickaway County	12	2100 EST			0	3	5	0	Thunderstorm Wind
	Thunderstorm winds blew down trees, blew off a barn roof and damaged homes on US Route 22 west of Circleville. Three injuries occurred when an emergency vehicle was blown off US Route 22 near State Route 138.								
Ashtabula County	18	0515 EST			0	0	4	0	Thunderstorm Wind
	Thunderstorm winds blew down trees on North Ridge Road in Ashtabula Township, and on Morgan Road in Plymouth Township.								
Entire State	Entire Month				0	0	0	C	Drought
	Drought conditions continued during September across all of Ohio even though near-normal rain fell. The state averaged three and sixteen hundredths (3.16") inches, which was 105 percent of normal. This was the third month in a row with slightly above normal rainfall. Crops were still struggling to survive, but the ones that did were being harvested. Water conservation measures were still being used in some cities and towns. Rainfall needed to end the long-term drought was between 4 and 10 inches. The Palmer Drought Severity Index was in the extreme category over Northwest and South-Central Ohio. Severe conditions were occurring in North-Central and West-Central Ohio. Moderate conditions were experienced in the Central, Northeast Hills and Southwest sections. The Northeast and Central Hills areas were not experiencing long-term drought conditions.								
34 OKLAHOMA									
Harper County, 2 E May	15	1655CST			0	0	?	?	Hail (0.75)
Woodward County, 5 N Mooreland	15	1730CST			0	0	?	?	Hail (0.75)
Major County, 15 NE Chester	15	1855CST			0	0	?	?	Hail (0.75)
Major County, near Cleo Springs	15	1945CST			0	0	?	?	Hail (0.75)
Alfalfa County, 3 S Helena	15	2000CST			0	0	?	?	Hail (1.00)
Major County, 2 E Meno	15	2015CST			0	0	?	?	Hail (1.75)
Garfield County, E Enid	15	2030CST			0	0	?	?	Hail (1.00)
Osage County, 4 SE Ponca City	15	2200CST			0	0	?	?	Hail (1.75) TSTM Wind
	Around 1630CST one thunderstorm formed near Shattuck and a second developed in northern Ellis County, south of May. Storm 1 moved from east of Gage, across southern Woodward and Major counties to Enid between 1710 and 2040CST. Storm 2 moved from near May to north of Enid by 2040. The two storms merged east of Enid and tracked eastward across Noble County before dissipating east of Pawhuska just before midnight.								
Payne County, Stillwater Area	16	0130CST			0	0	5	?	TSTM Wind
	Roof and tree damage occurred in Stillwater. Eighteen 50 to 90 foot power poles were downed south on Perkins Road, north of Richmond Road.								

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OKLAHOMA									
Ottawa County, 5 ESE Miami	18	AM	2.5	35	0	0	3	0	Tornado (F0)
	A tornado first struck a barn one and a half miles south of Highways 10 and 137. Moving northeast, it destroyed a small building in the middle of the Ottawa Indian Cemetery where 20 tombstones were damaged. A barn was damaged before the tornado crossed Spring River and dissipated in the Moccasin Bend area.								
Kingfisher County, Kingfisher	19	AM			0	0	5	?	Flood
	The remains of Hurricane Gilbert produced nearly 8 to 10 inches of rain in Kingfisher County from the 17th through 19th. Kingfisher Creek flooded its banks on the morning of the 19th and crested about two feet above the flood stage of 22 feet before noon. Nearly 100 persons in the flood-prone northwest section of town were evacuated. Other storm rainfall totals of 5 to 8 inches in western and southwestern Oklahoma resulted in minor flooding.								
Grady County, 3 SW Blanchard	23	1625CST			0	0	4	?	Hail (0.75)
Grady County, 3 SW Blanchard	23	1625CST			0	0	?	?	TSTM Wind
McClain County, Goldsby	23	1638CST			0	0	?	?	Hail (0.88)
Grady County, Rush Springs	23	1650CST			0	0	?	?	Hail (0.75)
Cleveland County, 2 N Noble	23	1657CST			0	0	?	?	Hail (1.00)
Cleveland County, 5 E Noble	23	1657CST			0	0	5	?	TSTM Wind
Cleveland County, 12 E Noble	23	1657CST			0	0	?	?	Hail (4.50)
Cleveland County, 4 ENE Noble	23	1700CST	0.5	30-80	0	1	?	?	Tornado(F1)
Pottawatomie County, 4 S Tecumseh	23	1714CST			0	0	?	?	Hail (0.75)
	Thunderstorms formed in southwest Caddo County around 1430CST and moved east-northeast across Caddo and Grady counties. Several barns were damaged 3 miles southwest of Blanchard. The most significant damage from the storm was east of Noble along a three mile long and one-quarter mile wide swath along Post Oak Road from 48th to 84th Street. Numerous outbuildings were destroyed and several homes damaged. One two-story home was totally unroofed and shifted slightly off its foundation. Tree trunks and large limbs up to a foot in diameter were snapped off. All damage was from straight-line winds except for an area just northeast of 72nd and Post Oak where a tornado touched down briefly. One mobile home was overturned and demolished. One woman was injured by hail and flying debris near the mobile home. Damage was also reported further to the east to near Needmore where tennis ball to softball size hail fell.								
Okmulgee County, Okmulgee	23	1810CST			0	0	?	?	Hail (0.88)
	Thunderstorm formed in western Okfuskee County and moved east-northeast across Okmulgee.								
Carter County, 4 NW Healdton	23	1840CST			0	0	?	?	Hail (0.75)
	Thunderstorm reached severe intensity in northeast Jefferson County and moved northeast across Carter County.								
Pittsburg County, Indianola	23	1910CST			0	0	4	?	TSTM Wind
Pittsburg County, McAlester	23	1910CST			0	0	?	?	TSTM Wind (52)
Haskell County, near Enterprise	23	1920CST			0	0	?	?	Hail (4.50)
Haskell County, Stigler	23	1920CST			0	0	?	?	TSTM Wind (56)
Haskell County, Kinta	23	1930CST			0	0	5	?	TSTM Wind
Haskell County, Lequire	23	1942CST			0	0	?	?	Hail (2.75)
Sequoyah County, Vian	23	1955CST			0	0	?	?	TSTM Wind
Sequoyah County, Marble City	23	1955CST			0	0	?	?	TSTM Wind
	Large thunderstorms moved across the northern half of Pittsburg County northeastward into northern Sequoyah County. Trees and power lines were downed in Indianola. A lot of power lines were knocked down and windows broken out around Kinta with several small buildings destroyed northeast of town.								

STORM DATA AND UNUSUAL WEATHER PHENOMENA

PLACE	DATE	TIME - LOCAL STANDARD	LENGTH OF PATH (MILES)	WIDTH OF PATH (YARDS)	NO. OF PERSONS KILLED	NO. OF PERSONS INJURED	ESTIMATED† DAMAGE PROPERTY	ESTIMATED† DAMAGE CROPS	CHARACTER OF STORM
OKLAHOMA									
Logan County, 1 E Guthrie	28	1619CST			0	0	?	?	Hail (1.00)
Logan County, 4 W Langston	28	1646CST			0	0	?	?	Hail (1.75)
Oklahoma County, 8 N Oklahoma City	28	1646CST			0	0	?	?	Hail (0.88)
Oklahoma County, 5 NW Oklahoma City	28	1655CST			0	0	?	?	Hail (0.75)
Canadian County, Union City	28	1655CST			0	0	?	?	Hail (1.75)
Comanche County, Elgin	28	1700CST			0	0	?	?	TSTM Wind (60)
Payne County, 8 W Perkins	28	1700CST			0	0	?	?	Hail (0.75)
Oklahoma County, 5 NW Oklahoma City	28	1711CST			0	0	?	?	Hail (1.75)
Oklahoma County, 5 NW Oklahoma City	28	1725CST			0	0	?	?	Hail (1.00)
Payne County, 1 S Perkins	28	1730CST			0	0	?	?	Hail (0.75)
Oklahoma County, 2 SE Edmond	28	1731CST			0	0	?	?	Hail (0.88)
Grady County, 6 E Tuttle	28	1800CST			0	0	?	?	Hail (0.75)
Cotton County, 2 E & 3 N Walters	28	1930CST			0	0	4	?	TSTM Wind
Cotton County, 8E & 7N Walters	28	1935CST			0	0	?	?	Hail (0.75)
Comanche County, 10 ESE Lawton	28	1945CST			0	0	?	?	TSTM Wind (60)
		Thunderstorm winds destroyed a barn and blew over a granary northeast of Walters. In Oklahoma City quarter to golfball size hail fell near NW 63rd and Council and at NE 50th and Bryant.							
35 OREGON									
Statewide	1-5				0	0	0	0	Heat Wave
		An unseasonably warm airmass remained over the state during the first week of the month. Temperatures soared into the 90's (°F) and lower 100's, and numerous daily records statewide and a few all-time records for September were newly established. Medford's 110°F, Portland's 105, Salem's 104, and Eugene's 103 on September 2nd set all-time record highs for the month of September.							
36 PENNSYLVANIA, Eastern									
Luzerne County, Dallas	20	2000EST	0.5	50	0	0	4	0	Tornado (F1)
		A tornado touched down briefly, causing damage mostly in forested areas. Many trees were uprooted or sheared off. There was minor damage to 7 nearby homes. The total damage to the homes was estimated to be in the range of $5,000 to $10,000.							
36 PENNSYLVANIA, Western— NONE REPORTED									
37 RHODE ISLAND ———— NONE REPORTED									
38 SOUTH CAROLINA									
Beaufort County, Hilton Head Island	01				0	0	5	0	Urban Flooding
		Heavy rains flooded roads and required the closing of golf courses for several days. Rainfall on Hilton Head Island during September totaled 21.79 inches.							
Anderson County, Anderson	03	night			0	0	4	0	TSTM Wind
		Winds tore a 60 foot hole in the roof of a store, causing damage to the store's contents. Winds also picked up several large, 12 foot long boats.							
Allendale County, Allendale	06	1600EST			0	0	3	0	Lightning
		Lightning damaged a substation, disrupting power to 1,000 customers.							
Charleston County, Charleston	09	1100EST			0	0	5	2	Urban Flooding
		Heavy rains (6.23 inches in 24 hours) in uptown Charleston caused major urban flooding of streets and businesses. Water depths reached up to 4 feet on some streets, with water levels up to car windows.							
Aiken County, Aiken	15	1900EST			0	0	3	0	Urban Flooding
		Heavy rains flooded Richland, Whiskey and Edisto roads, stranding many cars. Some golf courses closed for several days due to the flooding. Also, several houses were flooded.							
Georgetown County, Dunbar	25	1442EST			0	0	3	2	TSTM Wind
		Wind gusts to 62 mph occurred at the Georgetown E.P.D. A few trees were uprooted and small hail was reported at Dunbar. Also, marble size hail was reported at Debordieu Beach.							
Berkeley County, Sangaree	25	1503EST			0	0	2	0	TSTM Wind (G34)
		Wind gusts to 40 mph and small hail occurred at the Mepkin Abby Plantation near Sangaree. Also, mothball size hail was reported at Ladson Road near Sangaree.							
Richland County, 8 E Columbia	25	1907EST			0	0	5	3	Hail (3.00)
		Large hail 8 miles southeast of Columbia to 9 miles northeast of Columbia caused extensive damage to cars, roofs and vegetation over a small area.							
Charleston County, Charleston	26	0800EST			0	0	3	0	Urban Flooding
		The combination of spring tides and northeast winds caused shallow flooding of several streets in Charleston.							
39 SOUTH DAKOTA									
Todd County, 20SW Mission	10	0830 MST			0	0	5	0	Lightning
		Lightning started fires that burned nearly 14,000 acres of grassland and 4,000 acres of timber. The resulting damages were more than $60,000.							
Charles Mix Co:									
Platte	18	1825 CST			0	0	6	6	Hail (2.00)
Platte	18	1825 CST			0	0	0	0	TSTM Wind (52)
		Hail from a severe thunderstorm blew out several windows and damaged roofs in Platte. Most of the crops in a twelve square-mile area near Platte were destroyed. Damage to the buildings totaled near $5 million and the crop damages were nearly $750,000.							
40 TENNESSEE									
Giles County, Pulaski	24	1100CST			0	0	3	0	Thunderstorm wind
		Thunderstorm winds uprooted or broke off a number of trees, knocking out power in Pulaski and east of there. The winds also damaged roofs on houses and barns and damaged a trailer home in the area.							
Lincoln County	24	1215CST			0	0	3	0	Thunderstorm wind
		Thunderstorm winds knocked down a number of trees, limbs and at least eight power poles, knocking out power to the area. The southwestern part of the county was hardest hit.							

STORM DATA AND UNUSUAL WEATHER PHENOMENA

PLACE	DATE	TIME - LOCAL STANDARD	LENGTH OF PATH (MILES)	WIDTH OF PATH (YARDS)	NO. OF PERSONS KILLED	NO. OF PERSONS INJURED	ESTIMATED† DAMAGE PROPERTY	ESTIMATED† DAMAGE CROPS	CHARACTER OF STORM
41 TEXAS, Northern									
Dallas County Richardson	3	0720CST			0	0	?	?	Flash Flooding
	Rainfall of up to 5.26 inches in Richardson flooded a number of roadways and pushed creeks out of their banks.								
Wichita County Wichita Falls	13	1130CST			0	0	?	?	TSTM Wind (52)
	A downburst produced winds which were measured at 60 miles per hour at Wichita Falls.								
Wise County Rhome	14	1750CST			0	0	?	?	TSTM Wind
Tarrant County Crowley	14	1845CST			0	0	?	?	TSTM Wind
Johnson County 5 N Joshua	14	1845CST			0	0	?	?	TSTM Wind (52) and Hail (0.75)
	A downburst damaged the roof of a house in Rhome and also blew down a satellite dish and a 65 foot radio tower. Another downburst did extensive damage to the roof of a house in Crowley and destroyed a couple of nearby barns. Several trees were also uprooted in Crowley. Winds gusted to 60 miles per hour five miles north of Joshua where 3/4 inch diameter hail also fell.								
Hardeman County 8 N Crowell	15	2220CST			0	0	?	?	TSTM Wind
	Several tanks at an oil tank battery were damaged by a downburst.								
McCulloch County: 6 W Brady Doole	17	1143CST	Short	Narrow	0	0	0	?	Tornado (F0)
	17	1143CST	Short	Narrow	0	0	3	?	Tornado (F1)
	A tornado touched down briefly in open country just west of Brady Lake (6 W Brady). A tornado also touched down briefly in Doole damaging an outbuilding.								
Bosque County 2 W Meridian	17	1415CST	Short	Narrow	0	0	0	?	Tornado (F0)
	A tornado was observed briefly two miles west of Meridian in open country.								
Collin County: Allen 2.5 NE Allen to 3.5 SW McKinney	17	1635CST			0	0	4	?	TSTM Wind
	17	1640CST			0	2	6	?	TSTM Wind
Denton County: 5 NE Denton	17	1710CST			0	0	0	0	Funnel Cloud
Denton	17	1720CST			0	0	?	?	TSTM Wind (61)
Cooke County Valley View	17	1740CST			0	0	?	?	TSTM Wind and Funnel Cloud
	A downburst damaged the roof of a shopping mall in Allen, uprooted trees and ripped the trim off a high school gymnasium. Intense downbursts produced intermittent damage along a three mile track from 2.5 miles northeast of Allen to 3.5 miles southwest of McKinney. At the beginning of the track, a large awning over the patio of a nursery was ripped off with debris scattered up to 100 yards away. A short distance to the northwest, a hardware and lumber store was almost flattened by a downburst. Property loss at the store was expected to approach $2 million. Toward the end of the track, the roof of a house was damaged and the frames of several homes under construction were flattened. Several vehicles were also blown around by the wind. A funnel cloud was observed 5 miles northeast of Denton at 1710CST. A downburst with winds measured at 70 miles per hour knocked down several powerlines in Denton. A downburst knocked down several powerlines at Valley View where a funnel cloud was observed a short distance away.								
Montague County 4 N Saint Jo	23	1815CST			0	0	?	?	TSTM Wind
	A thunderstorm downburst destroyed a garage, damaged several barns and blew windows out of a house four miles north of Saint Jo.								
Jones County 2 W Anson	28	1845CST			0	0	?	?	Hail (1.75)
Young County 1 SW Olney	28	1910CST			0	0	?	?	TSTM Wind (52)
Jones County 9 NNE Abilene	28	1920CST			0	0	?	?	TSTM Wind
Taylor County: 18 SW Abilene	28	1938CST			0	0	?	?	Hail (0.75)
View	28	2030CST			0	0	?	?	Hail (1.75)
Wichita County Burkburnett	28	2025CST			0	0	?	?	Hail (1.00)
Throckmorton County 6 E Throckmorton	28	2030CST			0	0	4	?	TSTM Wind
Young County: Graham	28	2054CST			0	0	?	?	TSTM Wind
6 NW Graham	28	2110CST			0	0	?	?	TSTM Wind
Palo Pinto County: Graford	28	2145CST			0	0	?	?	Hail (0.75)
1 N Graford	28	2215CST			0	0	?	?	Hail (0.75)

PLACE	DATE	TIME - LOCAL STANDARD	LENGTH OF PATH (MILES)	WIDTH OF PATH (YARDS)	NO. OF PERSONS KILLED	NO. OF PERSONS INJURED	ESTIMATED† DAMAGE PROPERTY	ESTIMATED† DAMAGE CROPS	CHARACTER OF STORM
TEXAS, Northern									
Stephens County Breckenridge	28	2200CST			0	0	?	?	TSTM Wind
Eastland County 2 N Eastland	28	2307CST			0	0	?	?	Hail (1.75)
Erath County 6 N Stephenville to 5.5 NE Stephenville	29	0050CST-0055CST	0.5	50	0	0	0	?	Tornado (F1)
	A line of thunderstorms moved through North Texas producing hail up to golf ball size and isolated downburst damage. A downburst with winds up to 60 miles per hour downed trees one mile southwest of Olney. Several outbuildings were damaged by a downburst on the east side of Fort Phantom Lake (9 NNE Abilene). A downburst overturned an oil well service unit 6 miles east of Throckmorton producing damage estimated at $40,000. Downbursts downed powerlines and trees in Graham and knocked down a carport and destroyed a boat dock at the north end of Lake Graham (6 NW Graham). A downburst downed powerlines in Breckenridge. A tornado was observed in open country six miles north of Stephenville.								
41 TEXAS, Southern									
Brazoria, Galveston, and Harris Counties	03	0200-0500CST			0	0	4	0	Flooding
	5 to 8 inches of rain fell over portions of the above counties and produced extensive street and highway flooding. Many vehicles stalled in high water. The area most affected by the heavy rains and flooding was northern Brazoria, southern Harris and all of Galveston counties. Flooding began around 0200CST in northern Brazoria County where the National Weather Service Office in Alvin, recorded 6.50 inches of rain. The heavy rain moved east and southeast into southern Harris and later into Galveston County. The Galveston NWS office measured 5.15 inches of rain in a 6 hour period at 0600CST. A two day total at Galveston was near 8 inches. Flood waters covered Texas Hwy.87 on Bolivar Peninsula. Serious street flooding was reported in the Seabrook, Webster and Dickinson area. For a time, the runoff produced a two foot seiche at Kemah at the edge of Galveston Bay.								
Southern Texas	16-18				1	10	7	5	Hurricane Gilbert
	In the early morning hours of the September 8, while most weather eyes were on tropical storm Florence in the central Gulf of Mexico, (she later made landfall in southeastern Louisiana), satellite sensors were showing an unusual amount of cloudiness that was associated with a westward-moving tropical wave about 400 miles east of Barbados. By evening, the wave had developed into a tropical depression. At Noon, AST on the following day, the TD had moved to 50 miles north of Barbados and was intensifying slowly. On the morning of the 10th, the tropical depression had intensified to tropical storm strength and had been named Gilbert. By 1030 PM, AST on the 10th, Gilbert had strengthen to hurricane force and was located 225 miles southeast of Santo Domingo,Dominican Republic and was moving west-northwest on a track which he did not deviate from in the following week. This track took the eye of Gilbert over the entire length of the middle of the island of Jamaica. It also moved just south of the resort island of Grand Cayman and over Cozumel, Mexico on the Yucatan Peninsula. There was extensive wind damage as well as flooding problems at all of these resort islands. At 6 PM EDT, on the 13th, when the storm was 150 miles east-southeast of Cozumel, Mexico, Gilbert had the distinction of being the most severe or intense hurricane on record in the Atlantic, Caribbean or the Gulf of Mexico. The central pressure in Gilbert dropped to 885 millibars or 26.13 inches of mercury. This low pressure reading exceeded the great Florida Hurricane of 1935, Hurricane Camille of 1969 and Hurricane Allen of 1980. As the mighty storm moved across the Yucatan on the 14th, the land mass took energy out of the storm that was never regained. Gilbert maintained a category 3 storm across the southern and southwestern Gulf of Mexico until landfall. The storm made landfall on the northern Mexican Coast near the fishing village of La Pesca at 430 PM CDT on the 16th. This position is about 125 statue miles south of Brownsville, Texas. The effects of Gilbert on the Texas Coast can be described as minimal and are detailed below in paragraphs divided as lower, middle and upper Texas Coast. The most destructive force from the hurricane in South Texas was from the tornadoes that were spun off on the 16th and 17th. There were a total of 29 confirmed tornadoes. This number is lower than first reported and no doubt a very conservative amount. Considering that most of South Texas is sparcely populated (populace heavily weighted) and remote, there were no doubt many other tornadoes and funnel clouds that were not reported. 22 funnel clouds were reported, none to Brownsville and Victoria NWS Offices. The Corpus Christi area reported 6, Del Rio area 9 and the San Antonio area 7. The tornadoes are listed below in chronological order. 14 tornadoes occurred on the 16th near the coast and 15 occurred on the 17th well inland. The latter were considerably more destructive.								

STORM DATA AND UNUSUAL WEATHER PHENOMENA

PLACE	DATE	TIME - LOCAL STANDARD	LENGTH OF PATH (MILES)	WIDTH OF PATH (YARDS)	NO. OF PERSONS		ESTIMATED† DAMAGE		CHARACTER OF STORM
					KILLED	INJURED	PROPERTY	CROPS	

TEXAS, Southern

While Gilbert did bring beneficial rains to South Texas, flooding was almost nonexistent as the bulk of the heavy core rains fell in the mountains of Mexico, mainly west and northwest of Monterey. There were some scattered heavy amounts along the mid and lower coast, with the heaviest report from the community of Lamar in Aransas County where 8.71 inches was measured. In the lower Rio Grande Valley, 6.40 fell at Adams Garden. Amounts such as these were isolated and not widespread. Later, as the storm moved north out of Mexico 4 to 5 inch rains fell over the extreme west and northwest part of Val Verde County. These rains produced some flash flooding. High water on the Devils River at Bakers Crossing northwest of Del Rio closed Tx. Hwy. 163 on the morning of the 18th.

The Lower Texas Coast
The highest wind gust at the National Weather Service Office in Brownsville was 67 MPH on the afternoon of the 16th. No doubt higher gusts occurred out on South Padre Island. The high winds over the area did minimal damage. There were some trees that were uprooted and lots of limbs downed. There was minor damage to signs and fences. Only a few power poles and lines were downed. There was little damage to mobile homes in the area, even out on South Padre Island. Agriculture damage in the area was slight, most of it occurring to citrus trees and a few crops. One floating marina on the bay at Port Isabel suffered major damage. The lowest barometric pressure at Brownsville was 29.39 at 1535 CST on the 16th. Rainfall at the Brownsville NWS was 5.38 inches, with the greatest amount falling from heavy squalls between 1000 CST and 2200 CST on the 16th. No significant flooding occurred in the area. The highest storm surge tide on South Padre Island was estimated to be about 6 feet above normal. The storm surge and wave action did erode about 3 to 4 feet of the height of the beaches so that the water is now about 75 feet further inland than it was before the storm. There was about 3 million dollars worth of damage done by Gilbert in the lower Texas Coast area. This amount includes the damage done by 10 confirmed tornadoes in the area.

The Middle Texas Coast
The effects of Hurricane Gilbert on the Coastal Bend area of Texas was very minimal. Damage was considered to be less than one million dollars. Gilbert made landfall over 250 miles south of the Corpus Christi area so this area was about the northern extent of any damage except for tidal effects on the upper Texas Coast which are described below. The highest wind in the Corpus Christi area was a gust to 61 MPH from a squall in the early morning hours of the 17th. Rainfall in the area was heaviest at Flour Bluff where 4.69 inches was recorded. The Corpus Christi National Weather Service Office measured 2.65 inches with the bulk of that amount falling from heavy squalls in the late evening of the 16th. Storm tides in the area on the Gulf beaches was 4-5 feet above normal. Numerous beach access roads were awash but no significant damage was reported. The high water and pounding surf eroded about 4-5 feet off of the heights of the fore dunes. Corpus Christi Bay experienced about 3 feet of high tide. The JFK causeway leading to the island from Corpus Christi at one time had about one foot of water covering it and the road was considered closed but emergency vehicles could get through. Further up the coast, tides were about 3 to 4 feet above normal in Aransas Bay and Rockport area. The Key Allegro development at Rockport and Fulton had some slight erosion with slight damage to piers in the area. Several boats in the area were sunk while tied to their moorings. There were 3 confirmed tornadoes in the Coastal Bend area. The tornadoes and times are listed chronologically below with other storm events.

The Upper Texas Coast
Hurricane Gilbert effects on the Upper Texas Coast were considered very minimal. The highest tides in the area were about 4 feet above normal sea level on Galveston Island. The high tides did produce some minor coastal flooding in the low areas of Matagorda, Brazoria, Galveston, Chambers and Harris counties. Peak wind at the National Weather Service Office in Galveston during the storm was 39 MPH at 0554 CST on the 16th.

Hidalgo County	16	0845CST	.3	50	0	0	5	0	Tornado (FO)

A tornado touched down on the north side of the town of Pharr. There was very little damage.

Hidalgo County	16	0900CST	.2	50	0	0	4	0	Tornado (FO)

A tornado touched down on the east side of the town San Juan. Damage was not significant.

Hidalgo County	16	0945CST	.5	50	0	1	5	?	Tornado (FO)

A tornado touched down on the north side of the town of San Juan. The tornado damaged 5 homes. There was an injury to a 3 year old girl when she was cut on the head.

Hidlago County	16	1015CST	.2	50	0	0	5	?	Tornado (FO)

A tornado touched down on the outskirts of the town of Donna. A couple of homes were demolished.

Hidlago County	16	1018CST	.2	50	0	0	?	?	Tornado (FO)

A tornado touched down briefly in McAllen, but there was little damage.

PLACE	DATE	TIME - LOCAL STANDARD	LENGTH OF PATH (MILES)	WIDTH OF PATH (YARDS)	NO. OF PERSONS		ESTIMATED† DAMAGE		CHARACTER OF STORM
					KILLED	INJURED	PROPERTY	CROPS	

TEXAS, Southern

Hidalgo County	16	1101CST	3	50	0	0	5	?	Tornado (FO)

A tornado touched down and skipped along a 3 mile path in the Edcouch-LaVilla area. The tornado destroyed one home and a church. There was considerable roof damage to other homes in the area. At least one mobile home was demolished. Many trees were snapped off at their trunks. There was intermittent damage for several miles.

Hidalgo County	16	1130 CST	.2	50	0	0	5	?	Tornado (FO)

A tornado was reported to have touched down in Edinburg near the campus of Pan American University. Only slight damage was reported.

Cameron County	16	1230CST	1	50	0	0	5	0	Tornado (FO)

A tornado hit on the north side of the City of Brownsville. The tornado did considerable roof damge to residences and apartment complexes. Most of the damage was to roofing material and not structural framework. Automobile windshields were damaged also.

Cameron County	16	1300CST	.2	50	0	0	5	0	Tornado (FO)

A tornado was seen touching down briefly on the east side of the city of Harlingen. No significant damage was reported.

Cameron County	16	1400CST	3.5	100	0	0	6	0	Tornado (F1)

A tornado touched down in the southeast portion of Harlingen and moved west-southwest across the southern section of the city, about 1/2 mile south and parallel to the Arroyo Colorado. The tornado moved across both the business and freeway sections of U.S. Highway 77. The tornado collapsed one wall and the roof of a doctors office. Windows were blown out of a nearby hospital and residences. There was roof damage to some homes and apartment complexes. Twenty to thirty cars lost windshields in the area. Damage was estimated at one million dollars.

Cameron County	16	1548CST			0	0	0	?	Wind Squall (54)

A squall produced a gust to 67 MPH at the National Weather Service Office in Brownsville. For details on wind damage see discussion paragraph Lower Texas Coast.

Goliad County	16	1604CST	?	?	0	0	0	0	Tornado (FO)

A tornado that was reported by the public touched down 5 miles north of Goliad and moved northwest in open country. No damage was reported.

Nueces County	16	1630CST	?	small	0	0	0	?	Tornado (FO)

A tornado was reported by the public on the north side of Corpus Christi in the Up River Road area. Lots of trees were downed.

Duval County	16	1740CST			0	0	0	?	Wind Squall (?)

High winds from heavy squalls did considerable tree damage in the San Diego area.

Refugio County	16	1950CST			0	0	0	?	Wind Squall (?)

High winds from heavy squalls did tree damage 6 miles east of Refugio. Wind speed was not reported.

Nueces County	16	2000CST	.5	25	0	0	5	0	Tornado (F1)

A tornado touched down at the Corpus Christi Naval Air Station. The tornado hit an uninhabited housing development and did considerable damage to roofs in the area. There was some other damage to buildings on the base.

Bee County	16	2100CST	.8	25	0	0	5	?	Tornado (F1)

A tornado touched down at Pettus and destroyed a municipal water-works, frame building. 2 mobile homes were also destroyed in the same area. Other outbuildings were also leveled.

Nueces County	17	0132CST			0	0	5	?	Wind Squall (53)

A feeder band into Hurricane Gilbert produced heavy squalls in the Coprus Christi area. A heavy squall produced a wind gust to 61 MPH at the NWS Office at the Corpus Christi International Airport. Wind damage in the area was minimal and occurred mostly to trees, signs and fences.

Karnes County	17	0410CST	?	?	0	0	4	?	Tornado (FO)

A tornado touched down 4 miles west of Karnes City. The tornado did slight damage to a house and tore up a shed. A nearby chain-link fence was demolished.

Bexar County	17	0445CST	4	30	1	1	6	5	Tornado (F1)

A tornado hit in the southern part of the county and killed a woman in a mobile home. Her son who was also in the mobile home was injured. The tornado first touched down west of I-37 near Hardy Road, and moved northwest off and on the ground for about 4 miles to Woodridge Park near US Hwy. 281. It was reported to be about 100 yards wide. 9 homes were totally destroyed along with 5 mobile homes. Many trees in the area were uprooted. Also many outbuildings were leveled. F59M

STORM DATA AND UNUSUAL WEATHER PHENOMENA

PLACE	DATE	TIME - LOCAL STANDARD	LENGTH OF PATH (MILES)	WIDTH OF PATH (YARDS)	NO. OF PERSONS: KILLED	NO. OF PERSONS: INJURED	ESTIMATED† DAMAGE: PROPERTY	ESTIMATED† DAMAGE: CROPS	CHARACTER OF STORM

—— TEXAS, Southern

Bexar County	17	0549CST	5	50	0	3	7	0	Tornado (F2)

A tornado hit Kelly Air Force Base and stayed on the ground for about 2 miles. It then continued northwest for about 3 more miles off and on the ground doing scattered damage to residential homes. The tornado first touched down just outside the base on the east side and moved northwest over the base. The hardest hit area was rows of warehouse storage buildings. About 12 of the buildings in the path suffered major damage. Damage was mostly to roofs and and few outside walls. 2 of the warehouses or large sections were totally destroyed which supported a borderline F2 assessment. The warehouses were constructed of concrete block and large wooden support beams for the roofing. Scarring of outside walls by flying debris suggested an intense vortex. Most of the damage however could be considered as F1. At least 20 vehicles were damaged. There was roughly 15 employees in the warehouse area and 3 were injured. They were treated at a local hospital and released. Base officials stated that it was extremely fortunate that the tornado hit on Saturday. During the week there is normally 1500 employees in the area hit. Estimated damage at the base was put at near 28 million dollars (3 million to warehouses and 25 million to contents).

Bexar County	17	0630CST	6	50	0	3	7	0	Tornado (F1)

A third tornado hit the Bexar County area on the northwest side of the City of San Antonio. It apparently first touched down just inside Loop 410, just west of the I-10 intersection. It tore several roofs off of homes in the Hillcrest and Oak Hills area. The tornado then moved northwest into the Texas Medical Complex area. Most of the damage in the medical area was to the Audy Murphy Hospital. Windows were blown out in the hospital and severe damage was done to the roof of the building where air conditioning equipment was blown loose. Nearby windows in other hospitals and a tall apartment building were blown out as well. The tornado continued to move northwest and heavily damage an apartment complex where several units were unroofed. Three persons were injured at this apartment complex but the injuries were considered minor. From the South Texas Medical Complex area, the tornado moved on to the northwest along a skipping path for another 4 miles, causing scattered damage. A large supermarket had part of its roof taken off. Homes were unroofed just west of Babcock Road in the Babcock North subdivision and in the Oxbow area. Total homes that were destroyed numbered about 78 with 173 suffering major damage. 135 homes had minor damge. As estimated, 500 vehicles in the area had damage, with numerous vehicles considered a total loss. The damage to residential homes and apartment complexes in the area was put at 4 million dollars. Damage to hospitals was 2 million dollars.

Fayette County	17	0644CST	?	?	0	0	4	4	Tornado (F0)

A tornado touched down 5 miles southwest of LaGrange. The tornado ripped several roofs off of outbuildings and barns. At least 15 trees in the area were uprooted.

Comal County	17	0800CST	short	narrow	0	0	5	?	Tornado (F0)

A tornado touched down on the north side of Canyon Lake. The roof of a mobile home was taken off. There was some minor damage to roofs of homes in the area. One man said he saw the tornado skip across the lake before doing any damage.

Atascosa County	17	0840CST	?	?	0	0	0	?	Tornado (F0)

A tornado was reported in open country north of Jourdanton moving northwest. No damage was reported.

Caldwell County	17	0930CST	short	narrow	0	0	4	?	Tornado (F0)

A tornado demolished two barns in the southwestern part of the county near Prairie Lea. Nearby trees were also toppled.

Edwards County	17	0950CST	?	?	0	0	0	?	Tornado (F0)

A tornado was reported in open country in the western part of the county near the Val Verde County line. This was apparently north of Carta Valley. No damage was reported.

Maverick County	17	1113CST	?	?	0	0	0	0	Tornado (F0)

A tornado was reported in open country 20 miles north of Eagle Pass. No damage was reported.

Dimmit County	17	1245CST	short	narrow	0	0	4	0	Tornado (F0)

A tornado touched down 3 miles west of Carrizo Springs and tore the roof off of a mobile home. No other damage was reported.

Val Verde County	17	1320CST	?	?	0	0	0	0	Tornado (F0)

A tornado was observed to have touched down in open country near Comstock (15 miles north). No damage was reported.

—— TEXAS, Southern

Val Verde County	17	1645CST	11	65	0	2	6	?	Tornado (F2)

A tornado hit the north side of the City of Del Rio. The tornado did extensive damage in 3 subdivisions. The tornado totally destroyed 18 homes and severly damaged 89 others. Several mobile homes were either destroyed or heavily damaged. At least 15 to 20 cars were considered a total loss. The tornado skipped along another 8 to 10 miles and did scattered damage. It did considerable damage to a marina on the edge of Lake Amistad. 2 persons were injured. The tornado dropped out of some very low-based clouds and took on the appearance of a classic Midwestern tornado. It was well photographed and filmed on a home video camera. NWS personnel at the airport viewed a well-defined wall cloud previous to the tornado formation.

Val Verde County	17	1739CST	short	narrow	0	0	0	0	Tornado (F0)

The National Park Service at Lake Amistad reported a tornado near Rough Canyon. No damage occurred.

Val Verde County	17	1752CST	short	narrow	0	0	4	0	Tornado (F0)

A tornado was reported to have touched down a half mile north of Comstock. It was in open country mostly, but it did do some damage to some outbuildings.

Val Verde County	18	Morning			0	0	?	0	Flash Flooding

4 to 5 inch rains fell in the extreme west and northwest part of the county and the run-off from these rains along with heavy rains to the west and northwest of the county produced significant rises in streams and rivers in the area. Flooding occurred along the Pecos and Devils rivers. At Bakers Crossing on the Devils River the Texas Highway 163 bridge was covered with water and the road was closed.

Williamson County	29	1340CST			0	0	0	0	Tstm.Wind (52)
	29	1340CST			0	0	0	0	Hail (1.50)

High winds from a thunderstorm produced a wind gust estimated at 60 MPH at Hutto. The same thunderstorm produced one and a half inch diameter hail. Damage was not significant.

Val Verde County	30	1100CST			0	0	5	0	Tstm.Wind (?)

High winds from a thunderstorm blew over a two wheel vacation trailer. A roof was blown off of a commercial building. Trees and limbs were also downed in the area. Heavy rains accompanied the thunderstorm and produced some serious street flooding and a few streets had to be barricaded in Del Rio.

41 TEXAS, Western

Lubbock County	01	1849CST							Funnel

The Lubbock Police reported a funnel cloud near War Highway, adjacent to Reese Air Force Base. The same funnel was observed by the public at 1902 CST near West 19th Street, 2 miles east of Reese AFB.

Howard County	01	2300CST			0	0	4	0	Flash Flood

Rains of between 3 and 4.3 inches caused flooding in the City of Big Spring and nearby communities. Roadblocks were required at the intersections of Second at Owens Street and Alamesa at Parkway Road when several automobiles stalled in the high water. Water did not enter businesses or residences and receded after about 3 hours.

Ector County	02	0200CST			0	0	4	0	Flash Flood

Thunderstorm rains, totalling generally between 3 and 6 inches, brought widespread street flooding to the Odessa metropolitan area. One Odessa fire station gaged 6.76 inches of rain during a three-hour period.

Many urban streets in Odessa were closed for up to 6 hours due to high water and stranded vehicles.

Lubbock County	02	1110 CST							Funnel

An off-duty Weather Service Meteorologist observed a funnel cloud near Wolfforth. The large, well-developed funnel extended about halfway to the ground, but Department of Public Safety officers reported no evidence of surface rotation.

STORM DATA AND UNUSUAL WEATHER PHENOMENA

PLACE	DATE	TIME - LOCAL STANDARD	LENGTH OF PATH (MILES)	WIDTH OF PATH (YARDS)	NO. OF PERSONS KILLED	NO. OF PERSONS INJURED	ESTIMATED† DAMAGE PROPERTY	ESTIMATED† DAMAGE CROPS	CHARACTER OF STORM

TEXAS, Western

Oldham County	14	1730CST			0	0	0	0	Hail (1.75)
		1750CST			0	0	0	0	Hail (1.75)
		Hail the size of golf balls struck at Boys' Ranch, 28 miles north-northeast of Vega, without inflicting notable damage. Twenty minutes later another storm brought golf ball size hail to Vega, according to the police department. Again, damage was not discernible.							
Randall County	14	1930CST			0	0	0	0	Hail (1.75)
		1935CST			0	0	4	0	Flash Flood
		2005CST			0	0	0	0	Hail (1.00)
		2015CST			0	0	0	0	Tstm.Wind (52)
		A severe, long-lived thunderstorm deposited golf ball size hail in southwest Amarillo, along Bell Street between 34th and the Canyon E-Way. Intense rainfall associated with the storm flooded the Interstate 40 underpass at Bell Street.							
		A Department of Public Safety Officer encountered one-inch hail at 2005 CST on I-27 halfway between Amarillo and Canyon, and at 2015 CST 52 knot winds were reported by Skywarn Storm Spotters five miles south of Amarillo on I-27.							
Randall County	14	2100CST	0.75	175	0	0	5	4	Tornado (F2)
		2104CST			0	0	0	0	Hail (1.00)
		A strong, though brief, tornado ripped through residential southwest Amarillo. The twister caused an estimated 300,000 dollars damage as it churned through a 3 to 4 block area, striking the Southgate Mobile Home Park as well as dozens of permanent residences. Many of the permanent homes were unroofed, and some lost exterior wall sections.							
		At 2104 CST the public and Amarillo police reported one-inch hail accompanying the storm in southeast Amarillo.							
Randall and Potter Counties	14-	2100CST							
	15	-0200CST			0	0	5	?	Flash Flood
		The tornadic thunderstorm that struck the Amarillo area about 2100 CST on the 14th brought heavy rains that resulted in flash flooding across the two-county area. Rains unofficially totalling up to five inches flooded virtually every street in Amarillo, with the most serious problems resulting from the deeply flooded underpasses along Interstate 27 and Interstate 40. Every underpass along both highways through town had stalled vehicles. Abandoned cars littered the area around Lawrence Lake which was a mile out of its banks.								
		Remarkably, no deaths or injuries were reported.							
Donley County	15	1541CST			0	0	0	0	Hail (1.75)
		1547CST			0	0	0	0	Hail (1.75)
		The City Police at Clarendon reported golf ball size hail from the City of Clarendon to 6 miles east-southeast of town on U. S. Highway 287. At 1547 CST hail of the same size was encountered by Department of Public Safety Officers halfway between Clarendon and Hedley, near the community of Lelia Lake.							
		No damage was reported.							
Collingsworth Co.	15	1712CST			0	0	0	0	Hail (0.75)
		1825CST			0	0	0	0	Hail (2.75)
		The Donley County supercell that brought golf ball size hail along U. S. Highway 287 continued a slow east-southeast movement, bringing dime size hail to the City of Wellington. At 1825 CST, the nearly stationary storm deposited hail from the size of golf balls to baseballs along U. S. Highway 83, eight miles south of Wellington.							
Childress and Cottle Counties	15	Est. 2200CST			0	0	5	5	Tstm.Wind (Est. 70)
		Thunderstorm winds, estimated at 70 knots, inflicted severe structural damage in both southern Childress and northern Cottle counties. Beginning near the Community of Tell, in southwest Childress County, and continuing to near Lazare, in northeast Cottle County, numerous occurrences of wind damage were documented during the 45-minute period beginning around 2200 CST.							
		A dozen Gate City electrical power poles were found snapped about 10 feet above the ground, eight of which were in Lazare. Five miles south of Kirkland, 1/4 mile north of the Childress-Cottle county line, a granary was totally destroyed. In the same location, chicken houses were unroofed, a television transmission tower downed and windows broken. Meanwhile, 6.5 miles south of Childress on U. S. Highway 62-83, a travel trailer was blown off its anchors and a barn blown down. Barns were heavily damaged in the Lazare Community, and one mile south of Kirkland, in southeast Childress County, chemical tanks were damaged.								

TEXAS, Western

Runnels County	17	1356CST	4.0	60	0	0	0	0	Tornado (F0)
		A tornado was sighted by Department of Public Safety Officers crossing the Coleman-Runnels county line north of U. S. Highway 67, three miles northwest of Talpa. The twister was in open ranchland and inflicted no significant damage.							
Concho County	17	1430CST							Funnels
		Department of Public Safety Officers observed a funnel cloud four miles west of Eden on U. S. Highway 87. At 1446 CST a funnel was spotted by the same officers five miles northwest of Eden, moving northwest.							
Concho County	17	1509CST	3.5	80	0	0	3	3	Tornado (F0)
		A tornado moved across the west side of Eden, doing minor damage to a barn and downing several trees.							
Concho County	17	1550CST	1.0	30	0	0	0	0	Tornado (F0)
		1550CST	0.5	30	0	0	0	0	Tornado (F0)
		A Department of Public Safety Officer observed two small, brief tornadoes that migrated simultaneously across open country. One was spotted five miles west of Eden and the other 3 miles south of Eden. Neither twister produced significant damage.							
Concho County	17	1558CST	2.0	50	0	0	0	0	Tornado (F0)
		The Department of Public Safety reported a tornado 0.5 mile west of the Community of Lowake in the northwest corner of the county, five miles south of Rowena. No damage was observed.							
Concho County	17	1610CST	1.0	40	0	0	0	0	Tornado (F0)
		1610CST	1.5	40	0	0	0	0	Tornado (F0)
		Department of Public Safety Officers observed two small tornadoes cross U. S. Highway 87 seven miles west of Eden. In open ranchland, the tornadoes inflicted no discernible damage.							
Runnels County	17	1725CST	3.0	60	0	0	4	0	Tornado (F1)
		The Ballinger Police Department reported that a tornado downed power lines at the small Community of Olfen, located eight miles south of Ballinger.							
Nolan County	18	1445CST			0	0	3	0	Tstm.Wind
		Thunderstorm winds of undetermined speed inflicted minor boat and dock damage at Lake Sweetwater.							
Randall County	18	Est. 1930CST			0	0	4	4	Tstm.Wind
		1940CST			0	0	3	0	Lightning
		Thunderstorm winds of undetermined speed moved through the Canyon vicinity, destroying three mobile homes and inflicting other widespread roof and tree damage.							
		Three mobile homes located five miles north of Canyon on Interstate 27 were totally destroyed, while permanent houses within the area sustained roof damage. In the same area, a large number of trees were uprooted.							
		Around 1940 CST lightning struck several poles, burning out transformers and blowing fuses that caused electrical service interruptions to approximately 150 customers in Canyon and Happy. Lightning also struck a transmission tower and put Amarillo television channels 4, 10, and 14 off the air for more than one hour.							
El Paso County	20	2145 MST			0	0	3	0	Tstm.Wind (52)
		Thunderstorm winds estimated to have gusted to 52 knots blew down a barn at Tornillo, in the southeast corner of the county.							
Hudspeth County	21	1900MST			0	0	5	4	Tstm.Wind (75)
		An intense microburst roared through Dell City, partially unroofing a school house and completely destroying an airport hangar. According to El Paso Weather Service Office personnel who surveyed the area, a Cessna 150 aircraft housed within the destroyed hangar was flipped and snapped in two. Numerous elm trees were uprooted as the windstorm passed through the area.							
Dallam County	21	2005CST			0	0	4	0	Tstm.Wind (52)
		Thunderstorm wind gusted to 52 knots at Dalhart, in the southernmost section of the county. The storm unroofed several buildings.							
Hartley County	21	2055CST			0	0	4	0	Tstm.Wind (52)
		An apparent microburst accompanied a thunderstorm through the Community of Hartley, resulting in scattered minor roof damage. Also, portable buildings and horse trailers were flipped and either heavily damaged or totally destroyed.							

STORM DATA AND UNUSUAL WEATHER PHENOMENA

PLACE	DATE	TIME - LOCAL STANDARD	LENGTH OF PATH (MILES)	WIDTH OF PATH (YARDS)	NO. OF PERSONS: KILLED	NO. OF PERSONS: INJURED	ESTIMATED† DAMAGE: PROPERTY	ESTIMATED† DAMAGE: CROPS	CHARACTER OF STORM
—— TEXAS, Western									
Hale County	22	0200CST			0	0	4	4	Tstm.Wind (70)
		0210CST			0	0	5	0	Hail (2.75)
	A fast-moving thunderstorm roared through southern and eastern parts of Plainview, accompanied by damaging straight-line winds and large hail. According to Police Chief Danny Miller, thunderstorm winds uprooted numerous trees (at least one falling on a house and another on an automobile) in both the Hillcrest and Frisco additions and destroyed a storage shed in the same area. A truck was overturned near the FM400/FM2286 intersection, and fences were downed throughout the southern and eastern part of town.								
	Golf ball to baseball size hail accompanied the storm and, according to one insurance adjuster, destroyed at least a dozen roofs in the southern part of the city.								
Lamb County	22	1935CST			0	0	0	0	Tstm.Wind (50)
	A strong thunderstorm rolled across the northeast part of the county, generating wind gusting to 50 knots at Olton. According to the Olton Fire Department, the strong winds inflicted no apparent damage but were accompanied by pea to marble size hail.								
Hale County	22	2010CST			0	0	4	3	Tstm.Wind (Est. 65)
	Thunderstorm winds estimated at 65 knots downed awnings and snapped power lines in Plainview, according to the Plainview Emergency Operations Center. One 24' x 24' awning at the Sands Motel was blown across Fifth Street and blocked traffic for two hours.								
Floyd County	22	2040CST			0	0	?	?	Tstm.Wind (50)
		2044CST							Funnel
	Thunderstorm winds gusting to 50 knots were observed by a Sheriff's Deputy three miles north of Lockney on State Highway 378. At 2044 CST a Department of Public Safety Officer observed a funnel cloud one mile south of the county line on State Highway 207, north of the community of South Plains.								
Lubbock County	22	2155CST			0	0	0	0	Tstm.Wind (50)
	Thunderstorm winds gusting to 50 knots were measured at the Weather Service Forecast Office, Lubbock International Airport. No damage occurred.								
Crosby County	22	2227CST			0	0	0	0	Tstm.Wind (65)
	Skywarn storm spotters reported thunderstorm winds gusting to 65 knots in Crosbyton. The fast-moving storm apparently inflicted no significant damage.								
Lynn County	22	2245CST			0	0	0	0	Tstm.Wind (52)
	Thunderstorm winds gusting to 52 knots were observed by Skywarn storm spotters at Tahoka. No damage was noted.								
Nolan County	28	1833CST			0	0	?	?	Hail (3.00)
		1850CST			0	0	0	0	Hail (0.88)
	The public-reported hail the size of lemons at the Community of Nolan, located in the southeast corner of the county. Damage was undetermined. At 1850 CST hail the size of nickels was reported by parishioners at Nolan Methodist Parsonage in the same community.								
42 UTAH									
Iron County Cedar City	02	1705MST			0	0	1	0	Thunderstorm Wind (G54)
	A thunderstorm wind gusted to 62 mph at the Cedar City Airport.								
UTZ003 Wasatch Front	10	1800MST			0	0	3	0	High Wind
	A blustery cold front produced damaging winds which knocked 10 power poles down as the front moved through the Salt Lake Valley. A nearby TV station recorded winds to 53 mph.								
UTZ003 Wasatch Front	12	0525MST			0	0	3	0	High Wind (G67)
	Easterly canyon winds gusted to 77 mph in Centerville. Two campers were blown off the road near the mouth of Weber Canyon on Highway 89.								
UTZ001 Cache Valley	12	2142MST			0	0	1	0	High Wind (G52)
	Easterly canyon winds gusted to 60 mph in Logan.								

PLACE	DATE	TIME - LOCAL STANDARD	LENGTH OF PATH (MILES)	WIDTH OF PATH (YARDS)	NO. OF PERSONS: KILLED	NO. OF PERSONS: INJURED	ESTIMATED† DAMAGE: PROPERTY	ESTIMATED† DAMAGE: CROPS	CHARACTER OF STORM
—— UTAH									
Emery County Clawson	21	1630MST			0	0	1	0	Hail (1.00)
Emery County Castledale	21	1648MST			0	0	1	0	Hail (0.75)
	A thunderstorm moving northward through Emery County produced large hail in two small communities. No damage was reported with the hail.								
43 VERMONT —— NONE REPORTED									
44 VIRGINIA —— NONE REPORTED									
45 WASHINGTON									
Central Puget Sound and Southern Snohomish County	09	1900PST			0	0	2	0	Thunderstorm Wind
	A post-frontal Puget Sound convergence zone formed late in the afternoon hours with evening rainshowers and thunderstorms throughout the area. Thunderstorm winds gusted to 55 miles an hour on the south side of Whidbey Island in central Puget Sound. Little damage was reported although several small tree and brush fires were touched off by the lightning.								
46 WEST VIRGINIA —— NONE REPORTED									
47 WISCONSIN									
Outagamie Co., Little Chute	02	1730CST			0	0	0	0	Hail (1.75)
Dane Co., 1N Middleton	02	1750CST			0	0	0	0	Hail (0.75)
Monona	02	1945CST			0	0	0	0	Hail (1.75)
3N Utica	02	2005CST			0	0	0	0	Hail (0.75)
	Severe thunderstorms deposited hail up to golfball size at Little Chute, one mile north of Middleton, at Monona, and 3 miles north of Utica.								
Green Lake Co., Berlin	03	1335CST			0	0	3	?	Hail (1.00)
	A severe thunderstorm produced hail up to 1 inch in diameter which damaged some roofs, broke windows and dented cars near Berlin.								
Marinette Co., Marinette	12	1330CST			0	0	0	0	Hail (0.75)
	Hail up to 3/4 inch in diameter fell from a severe thunderstorm at Marinette.								
Trempealeau Co., Eleva	16	1620CST			0	0	0	0	Hail (1.75)
	A severe thunderstorm dropped golfball size hail near Eleva.								
WIZ005-007-008-011-012-014-015-016-017-018-019-020 Central, East and South Wisconsin	19	1400-1900CST			0	0	5	?	High Wind
Waushara Co., 1E Plainfield	19	1605CST	0.1	25	0	0	0	0	Tornado (F0)
Marathon Co., 1W Edgar	19	1637CST	0.1	25	0	0	0	0	Tornado (F0)
Shawano Co., Bowler	19	1745CST			0	0	3	0	Thunderstorm Wind

STORM DATA AND UNUSUAL WEATHER PHENOMENA

PLACE	DATE	TIME - LOCAL STANDARD	LENGTH OF PATH (MILES)	WIDTH OF PATH (YARDS)	NO. OF PERSONS KILLED	NO. OF PERSONS INJURED	ESTIMATED† DAMAGE PROPERTY	ESTIMATED† DAMAGE CROPS	CHARACTER OF STORM

—— WISCONSIN

An intense cold front swept across central, southern, and eastern Wisconsin generating winds up to 69 mph. Widespread wind damage occurred to trees and power lines in 31 counties. There were scattered reports of damage to numerous roofs, several garages and sheds. Several cars were also crushed by falling trees. A catamaran was flipped onto a roof of a home along Lake Winnebago. Three mobile homes were destroyed or damaged near Port Edwards (Wood County) and Marathon City (Marathon County). Isolated severe thunderstorms developed along the front and downed trees and power lines at Bowler. A pair of small tornadoes set down in rural areas near Plainfield and Edgar.

48 WYOMING

WYZALL	01 10	0001 TO 2400MST			0	0	0	0	SMOKE

AS THE RESULT OF THE INTENSE FOREST FIRES OVER THE NORTHWESTERN UNITED STATES INCLUDING THE ONES IN YELLOWSTONE NATIONAL PARK AND THE BIG HORN MOUNTAINS, THICK PLUMES OF SMOKE WERE INGESTED INTO THE ATMOSPHERE TO ELEVATIONS AS HIGH AS 30,000 FEET MEAN SEA LEVEL. THIS SMOKE WAS OBSERVED ALL ACROSS WYOMING, THE DENSEST BEING A FUNCTION OF THE WIND DIRECTION. WHEN CHEYENNE (ABOUT 300 MILES FROM THE FIRES) WAS DOWNWIND, A SMOKE LAYER ON THE ORDER OF 10,000 FEET ABOVE GROUND LEVEL WAS COMMON. SOMETIMES THE SMOKE WAS SO THICK THAT THE DISK OF THE SUN WAS BARELY VISIBLE, ESPECIALLY BEFORE 1800 MST. WHEN THERE WAS MIXING, SURFACE VISIBILITIES WOULD FREQUENTLY DROP BELOW 3 MILES, EVEN AT CHEYENNE. ADDITIONALLY, ASH COULD BE SEEN FALLING AT THE SURFACE FROM THE PLUME CLOUD AT A FEW WYOMING LOCATIONS. FINALLY, THERE WERE SPECTACULARLY RED SUNRISES AND SUNSETS ACROSS THE COWBOY STATE.

FREEMONT CO. LANDER	10	1130MST	0	0	3	0	THUNDER-STORM WIND(56)
FREEMONT CO. RIVERTON	10	1255MST	0	0	0	0	HAIL (1.25)
FREEMONT CO. RIVERTON	10	1356MST	0	0	3	0	THUNDER-STORM WIND(55)
WASAKIE CO. WORLAND	10	1527MST	0	0	0	0	THUNDER-STORM WIND(52)

A COLD FRONT, ASSOCIATED WITH A VIGOROUS, DEEPENING UPPER-LEVEL LOW OVER THE NORTHERN ROCKIES, MOVED INTO NORTHERN WYOMING ON THE AFTERNOON OF THE 10TH. THE FRONT SPAWNED A LINE OF INTENSE THUNDERSTORMS ACROSS CENTRAL WYOMING. NO DAMAGE WAS REPORTED FROM THE 1 1/4 INCH HAIL THAT FELL IN RIVERTON. ONLY MINOR DAMAGE OCCURRED FROM THE THUNDERSTORM WINDS IN LANDER AND RIVERTON, WITH NONE REPORTED AT WORLAND. DURING THE EARLY AFTERNOON OF THE 10TH, THOSE WINDS TORE THE CARPORT FROM A MOBILE HOME IN EAST LANDER AND CAUSED MINOR DAMAGE TO ONE OTHER HOME IN THAT AREA.

WYZALL	11 12	0001 TO 1200MST			0	0	0	0	EARLY SNOW, EARLY COLD

A DEEP AND INTENSE UPPER-LEVEL STORM SYSTEM MOVED SOUTHWARD THROUGH THE ROCKY MOUNTAINS DURING THE 11TH AND 12TH. THIS CAUSED AN ABRUPT CHANGE TO THE HOT AND DRY WEATHER THAT MOST OF WYOMING HAD BEEN EXPERIENCING FOR AT LEAST THE PAST 2 MONTHS. DURING ABOUT A 36 HOUR PERIOD, A VARIETY OF CONDITIONS OCCURRED. THESE RANGED FROM LIGHT SNOW TO THUNDERSTORMS WITH SMALL HAIL. BY THE MORNING OF THE 11TH, 1 TO 2 INCHES OF SNOW HAD COVERED YELLOWSTONE NATIONAL PARK AND THE BIG HORN MOUNTAINS. THAT WAS A GREAT BLESSING TO FIRE-FIGHTERS DEALING WITH THE LARGE FOREST FIRES IN THOSE AREAS. DURING THE AFTERNOON OF THE 11TH, THUNDERSTORMS PRODUCING BRIEFLY HEAVY RAIN AND 1/4 TO 1/2 INCH DIAMETER HAIL DEVELOPED OVER EXTREME SOUTHEAST WYOMING. THESE STORMS HIT THE CITY OF CHEYENNE. BY THE LATE MORNING OF THE 12TH, CHEYENNE HAD RECEIVED A TOTAL OF 1.45 INCHES OF LIQUID PRECIPITATION FROM THIS EVENT, WHICH WAS ABOVE THE NORMAL OF 1.06 FOR THE ENTIRE MONTH OF SEPTEMBER. ADDITIONALLY, THE RAIN CHANGED TO LIGHT SNOW DURING THAT MORNING AND ALMOST 1/4 OF AN INCH FELL. IN GENERAL, MOST OF WYOMING GOT 1/4 TO 1/2 INCH OF MEASURABLE LIQUID PRECIPITATION FROM THIS STORM, WITH THE RAIN CHANGING TO SNOW ABOVE 6,000 FEET MEAN SEA LEVEL BEFORE THE EPISODE ENDED. ALSO, TEMPERATURES ACROSS WYOMING BY THE MORNING OF THE 12TH WERE ONLY IN THE 20S AND 30S, WELL BELOW SEASONAL NORMAL (IN CONTRAST TO HIGHS IN THE 80S AND LOW 90S A FEW DAYS AGO).

LARAMIE CO. 10E CHEYENNE	11	1300MST			0	0	0	?	SMALL HAIL(.50)

CONSIDERABLE SMALL HAIL OCCURRED OVER SOUTHEASTERN LARAMIE COUNTY DURING THE EARLY AFTERNOON OF THE 11TH. THE RESULT WAS A FEW HUNDRED ACRES OF CROP DAMAGE MOSTLY TO CORN, BEANS, WHEAT, ALFALFA, AND SUNFLOWERS.

ALBANY CO. LARAMIE	14	1400MST			0	0	0	0	FUNNEL CLOUD

DUE TO THE PRESENCE OF COLD, UNSTABLE AIR ACROSS SOUTHEAST WYOMING, WIDELY SCATTERED THUNDERSTORMS DEVELOPED. A FUNNEL CLOUD WAS SIGHTED IN THE VICINITY OF LARAMIE.

WYZ001-004 NORTHWEST AND BIG HORN MOUNTAINS	18 19	0700 TO 1000MST			0	0	0	0	EARLY SNOW, EARLY COLD

ABOUT A WEEK AFTER THE COLD AND WET WEATHER OF A PREVIOUS STORM, ANOTHER WEAK UPPER-LEVEL SYSTEM DEEPENED OVER THE NORTHERN ROCKIES CAUSING WIDE-SPREAD LIGHT RAIN AND SNOW ACROSS THE NORTHERN THIRD OF WYOMING. ABOVE 6,000 FEET MEAN SEA LEVEL, AMOUNTS OF 1/2 TO 4 INCHES OF SNOW WERE REPORTED IN YELLOWSTONE NATIONAL PARK AND THE BIG HORN MOUNTAINS. TEMPERATURES ON THE MORNING OF THE 19TH WERE IN THE 30S. THIS COLD AND WET WEATHER CONTINUED TO HELP FIRE-FIGHTING EFFORTS WITH THE FOREST FIRES.

SWEETWATER CO. ROCK SPRINGS	27	1430MST			0	0	3	0	LIGHTNING

DURING THE AFTERNOON OF THE 27TH, LIGHTNING ASSOCIATED WITH INTENSE THUNDERSTORMS IGNITED A 30 ACRE FIRE NEAR ROCK SPRINGS. IT BURNED IN OPEN COUNTRY AND RESULTED IN A LOST RESOURCE VALUE OF ABOUT 3,000 DOLLARS.

LARAMIE CO. 8NW CHEYENNE	27	1443MST			0	0	4	?	HAIL (1.50)
LARAMIE CO. CHEYENNE	27	1510MST			0	0	4	?	HAIL (2.50)
LARAMIE CO. 7E CHEYENNE	27	1551MST			0	0	4	?	HAIL (2.00)
LARAMIE CO. 18E CHEYENNE	27	1620MST			0	0	4	?	HAIL (1.75)

DURING THE AFTERNOON OF THE 27TH, A LINE OF SEVERE THUNDERSTORMS DEVELOPED ACROSS SOUTHEASTERN WYOMING. THESE WERE CAUSED BY THE COMBINATION OF A VERY INTENSE, DEEPENING UPPER-LEVEL LOW AND A STRONG SURFACE COLD FRONT. THE RESULT WAS, CLIMATOLOGICALLY, AN UNUSUALLY LATE FALL OF LARGE HAIL. THE STORMS DEVELOPED ABOUT 15 MILES NORTHWEST OF CHEYENNE, AND MOVED EAST-SOUTHEASTWARD, AGAINST THE UPPER-LEVEL SOUTHWEST FLOW. IN A 1 1/2 TO 2 HOUR PERIOD, THERE WERE COUNTLESS REPORTS OF HAIL WITH DIAMETERS RANGING FROM 1 TO 2 1/2 INCHES ACROSS SOUTHEAST LARAMIE COUNTY. FROM 1449 TO 1535 MST, LARGE HAIL FELL ACROSS MAINLY THE NORTHEAST HALF OF THE CITY OF CHEYENNE, INCLUDING THE CHEYENNE AIRPORT. AS WAS THE CASE WITH ALL OF THE REPORTS, THE HAIL WAS SOFT, SPLASHING AND SHATTERING INTO SEVERAL PIECES UPON IMPACT WITH THE GROUND, BUILDINGS, CARS, ECT.. THAT GREATLY MINIMIZED THE DAMAGE. NO CATASTROPHIC LOSSES WERE REPORTED. SOME PEOPLE DESCRIBED THE HAIL AS "HARD SLUSHBALLS OF SNOW FALLING."

STORM DATA AND UNUSUAL WEATHER PHENOMENA

PLACE	DATE	TIME - LOCAL STANDARD	LENGTH OF PATH (MILES)	WIDTH OF PATH (YARDS)	NO. OF PERSONS		ESTIMATED† DAMAGE		CHARACTER OF STORM
					KILLED	INJURED	PROPERTY	CROPS	

49 ALASKA, Northern ——— NO REPORT RECEIVED

49 ALASKA, Southern

ALASKA PENINSULA	9-10	1500 AST			0	0	2	0	High Winds

A storm moved from south of Adak Island in the Aleutians to near Sand Point on the Alaska Peninsula. The storm produced winds to 65 mph around Kodiak Island and to 55 mph along portions of the Alaska Peninsula.

SOUTHWEST COAST	18-19	1500 AST			0	0	5	0	High Winds

A strong 957 mb low (extratropical, old Typhoon Al) moved from the north Pacific across the eastern Aleutians into Bristol Bay. Winds gusted to generally 45-60 mph along the Aleutians, Alaska Peninsula, and Bristol Bay. The strongest winds ever recorded at Cold Bay on the Alaska Peninsula were observed reaching 75 mph with peak gusts to 96 mph.

SOUTH CENTRAL	28	0800 AST			0	0	4	0	High Winds

A storm in the Gulf of Alaska brought gusting winds of 50-60 mph to the Matanuska and Susitna Valleys and around Valdez on the North Gulf Coast.

49 ALASKA, Southeastern —— NONE REPORTED

50 HAWAII

Oahu and Kauai	2-3				2	0	3	0	Rough Surf

Hurricane ULEKI became stationary southwest of the Hawaiian Islands near 17°N, 160°W for 24 to 48 hours on September 2nd and 3rd. A swell moving northward toward the islands caused rough surf along south shores of mainly Oahu and Kauai. Two drownings on Oahu were blamed on the rough water.

All Islands	26-27				0	0	4	0	Flash Flooding

Remnant circulation and moisture from what was once Tropical Storm WILA brought heavy showers and minor flash flooding to all islands, beginning along the windward side of Hawaii at about noon of the 26th, reaching eastern Maui in the evening, and spreading westward to the other islands early on the 27th. Rainfall amounts were locally in the 6 to 12 inch range.

51 PUERTO RICO

PRZ000 ALL ISLAND	9-10				0	0	?	?	Hurricane GILBERT

An easterly wave strengthened to tropical depression as it crossed the Lesser Antilles on September 9th. On September 10th the depression was upgraded to tropical storm Gilbert. As the storm moved into the Caribbean marine advisories were issued for rough sea conditions around the Virgin Islands and eastern Puerto Rico coastal waters.

The evening of September 10th, Gilbert intensified to hurricane force just 130 miles south of Ponce, Puerto Rico. Above normal seas were reported along the south coast of Puerto Rico. The coastal sections of the Virgin Islands were very much affected by the passage of Gilbert. The island of St. Croix reported 59 MPH gusts with heavy squall around 4:00 P.M. Breakers on the order of 12 feet were reported along the south coast of Puerto Rico. Road #3 was impassable due to coastal flooding between Naguabo and Humacao, also between Patillas and Maunabo. During that night some localities reported 50 MPH gusts and numerous downed electrical lines, toppled utility poles and downed trees.

Although hurricane Gilbert kept gaining strength as it passed south of Puerto Rico, the main threat was the bands of heavy rain sweeping outward from the storm center. At that moment Gilbert was about 150 miles south of Cabo Rojo located in the southwestern corner of Puerto Rico. Later, during the afternoon all watches and advisories were discontinued for Puerto Rico and Virgin Islands area.

Rainfall amounts were on the order of 3 to 5 inches during the 10th and 11th. The most affected areas were south and southeastern portions of Puerto Rico. Damages were mainly caused by the breakers and rough conditions of the sea in that same area. During Saturday night a total of 79 persons had to be evacuated due to coastal flooding. Six persons were evacuated in Juana Diaz due to a landslide.

Considering the strength of Gilbert and all the damage caused later on in Jamaica, Puerto Rico and Virgin Islands received just minor damages. No deaths were reported. Damages were estimated in about 5 million dollars.

52 VIRGIN ISLANDS

All Islands	9-10				0	0	?	?	Tropical Storm

The Virgin Islands experienced rough sea conditions during the passage of Tropical Storm GILBERT. The island of St. Croix reported gusty winds of up to 59 mph. Neither St. Thomas or St. John reported damages. St. Croix reported on the order of 50 to 100 thousand dollars in total damage.

53 PACIFIC ——— NONE REPORTED

STORM SUMMARY

SEPTEMBER 1988

TYPE	ALABAMA	ARIZONA	ARKANSAS	CALIFORNIA	COLORADO	CONNECTICUT	DELAWARE	FLORIDA	GEORGIA	IDAHO	ILLINOIS	INDIANA	IOWA	KANSAS	KENTUCKY	LOUISIANA	MAINE	MARYLAND & DC	MASSACHUSETTS	MICHIGAN	MINNESOTA	MISSISSIPPI	MISSOURI	MONTANA	NEBRASKA	NEVADA	NEW HAMPSHIRE
TORNADOES		0					0			0							0	0	0				0			0	0
Number	3							7			1	6				3				1	1	3					
Days	1							4			1	2				3				1	1	2					
Deaths	0							0			0	0				0				0	0	0					
Injuries	0							0			0	2				0				0	0	0					
Property Damage	?							5			3	5				4				0	0	5					
Crop Damage	0							0			0	?				0				0	0	?					
HAIL																											
Deaths			0								0		0	0						0		0			0		
Injuries			0								0		0	0						0		0			0		
Property Damage			?								?		4	4						2		?			5		
Crop Damage			?								?		4	2						?		?			6		
THUNDERSTORM WINDS																											
Deaths	0		0					0	0		0	0	0	0	0	0				0		0			0		
Injuries	0		0					3	0		0	0	0	0	0	0				0		0			0		
Property Damage	?		?					3	?		5	5	5	5	4	3				4		3			6		
Crop Damage	0		?					0	0		0	?	4	2	0	0				0		0			4		
HIGH WINDS																											
Deaths					0								0														
Injuries					1								0														
Property Damage					6								5														
Crop Damage					0								4														
LIGHTNING																											
Deaths			1	0	0	0		1	0			0	0	0						0					0		
Injuries			0	0	1	0		0	0			0	0	1						13					0		
Property Damage			0	?	3	4		0	5			4	4	5						4					3		
Crop Damage			0	0	4	0		0	0			0	0	0						0					5		
FLASH FLOODS																											
Deaths	1		0						0					0		0						0					
Injuries	0		0						0					0		0						0					
Property Damage	?		4						4					4		5						4					
Crop Damage	0		?						0					0		0						0					
FLOODS																											
Deaths								4						0											0		
Injuries								0						0											0		
Property Damage								7						4											2		
Crop Damage								0						0											3		
HEAVY SNOWSTORMS AND BLIZZARDS @																											
Deaths																								0			
Injuries																								0			
Property Damage																								6			
Crop Damage																								0			
ICE STORMS #																											
Deaths																											
Injuries																											
Property Damage																											
Crop Damage																											
HURRICANES AND TROPICAL STORMS																											
Deaths																0						0					
Injuries																0						0					
Property Damage																6						5					
Crop Damage																?						0					
ALL OTHERS																											
Deaths				0												0				0							
Injuries				22												0				0							
Property Damage				0												?				4							
Crop Damage				0												?				0							

SEE REFERENCE NOTES FOR STORM DAMAGE CATEGORIES

STORM SUMMARY

SEPTEMBER 1988

TYPE	NEW JERSEY	NEW MEXICO	NEW YORK	NORTH CAROLINA	NORTH DAKOTA	OHIO	OKLAHOMA	OREGON	PENNSYLVANIA	RHODE ISLAND	SOUTH CAROLINA	SOUTH DAKOTA	TENNESSEE	TEXAS	UTAH	VERMONT	VIRGINIA	WASHINGTON	WEST VIRGINIA	WISCONSIN	WYOMING	ALASKA	HAWAII	PACIFIC	PUERTO RICO	VIRGIN ISLANDS	NATIONAL DEATH & INJURY TOTALS
	0							0		0						0	0		0			#		0			
TORNADOES																											
Number		4					2		1					42						2							
Days		2					2		1					4						1							
Deaths		0					0		0					1						0							1
Injuries		0					1		0					10						0							13
Property Damage		5					4		4					7						0							
Crop Damage		?					?		0					6						0							
HAIL																											
Deaths		0		0	0		0				0	0		0	0					0	0						
Injuries		0		0	0		0				0	0		0	0					0	0						
Property Damage		?		4	6		?				5	6		5	1					3	5						
Crop Damage		?		0	6		?				3	6		?	0					?	?						
THUNDERSTORM WINDS																											
Deaths		0		0	0	0	0				0		0	0	0			0		0	0						0
Injuries		0		0	0	3	0				0		0	2	0			0		0	0						8
Property Damage		?		5	6	5	5				4		3	6	1			2		3	4						
Crop Damage		?		0	6	0	?				2		0	5	0			0		0	0						
HIGH WINDS																											
Deaths			0												0					0							0
Injuries			0												0					0							1
Property Damage			5												3					5							
Crop Damage			0												0					?							
LIGHTNING																											
Deaths				0							0	0		0							0						2
Injuries				2							0	0		0							0						17
Property Damage				0							3	5		3							3						
Crop Damage				0							0	0		0							0						
FLASH FLOODS																											
Deaths		1												0									0				2
Injuries		0												0									0				0
Property Damage		?												5									4				
Crop Damage		?												?									0				
FLOODS																											
Deaths							0				0			0													4
Injuries							0				0			0													0
Property Damage							5				5			4													
Crop Damage							?				2			0													
HEAVY SNOWSTORMS AND BLIZZARDS @																											
Deaths																											
Injuries																											
Property Damage																											
Crop Damage																											
ICE STORMS #																											
Deaths																											
Injuries																											
Property Damage																											
Crop Damage																											
HURRICANES AND TROPICAL STORMS																											
Deaths														0											0	0	
Injuries														0											0	0	
Property Damage														?											6	5	
Crop Damage														?											?	?	
ALL OTHERS																											
Deaths						0																	2				2
Injuries						0																	0				22
Property Damage						0																	3				
Crop Damage						?																	0				

SEE REFERENCE NOTES FOR STORM DAMAGE CATEGORIES

STORM DAMAGE CATAGORIES

1 Less than $50
2 $50 to $500
3 $500 to $5,000
4 $5,000 to $50,000
5 $50,000 to $500,000
6 $500,000 to $5 Million
7 $5 Million to $50 Million
8 $50 Million to $500 Million
9 $500 Million to $5 Billion

REFERENCE NOTES

0/Blank	None reported.
*	Miles instead of yards.
**	Yards instead of miles.
@	Includes heavy sleet storm.
#	Freezing drizzle and freezing rain, commonly known as glaze.
≠	Report incomplete.
≠≠	Report not received.
o/c	Indicates Crop Damage amount is included in the value given for property damage.

When reports are not received or are incomplete, the Storm Summary National Death and Injury totals may also be incomplete.

Definition of Fujita Tornado Scale (F scale)

(F0) Gale tornado (40-72 mph): Light damage
Some damage to chimneys; break branches off trees; push over shallow-rooted trees; damage sign boards.

(F1) Moderate tornado (73-112 mph): Moderate damage
The lower limit (73 mph) is the beginning of hurricane wind speed; peel surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads.

(F2) Significant tornado (113-157 mph): Considerable damage
Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light-object missiles generated.

(F3) Severe tornado (158-206 mph): Severe damage
Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off ground and thrown.

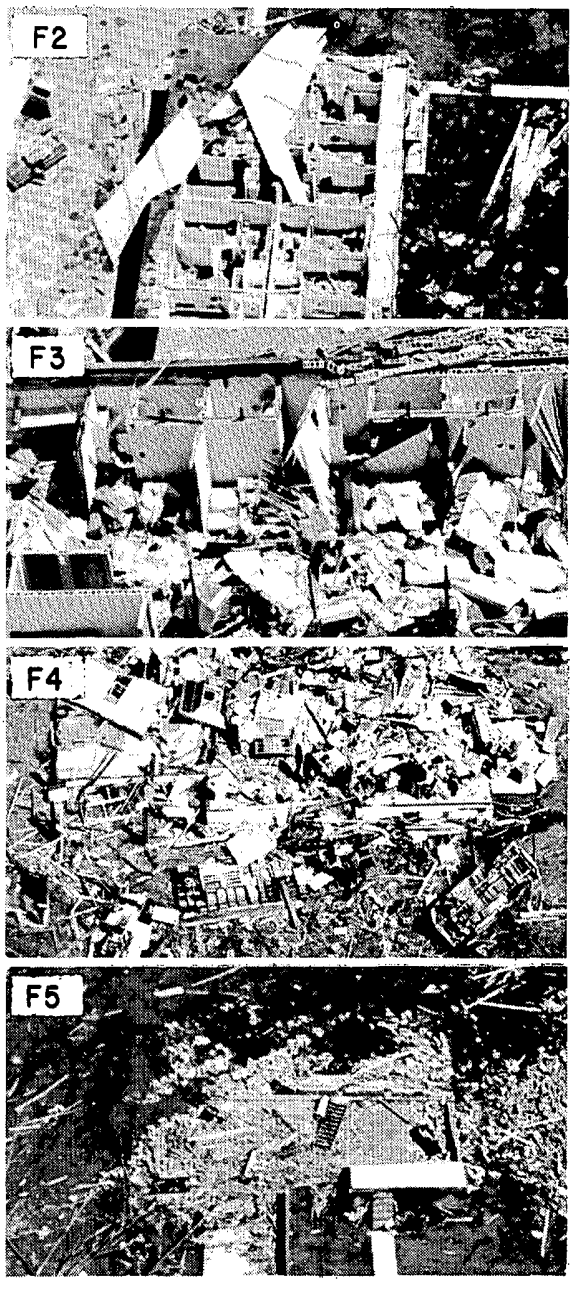
(F4) Devastating tornado (207-260 mph): Devastating damage
Well-constructed houses leveled; structure with weak foundation blown off some distance; cars thrown and large missiles generated.

(F5) Incredible tornado (261-318 mph): Incredible damage
Strong frame houses lifted off foundations and carried considerable distance to disintegrate; automobile-sized missiles fly through the air in excess of 100 m; trees debarked; incredible phenomena will occur.

(F6-F12) (319 mph to Mach 1, the speed of sound): The maximum wind speeds of tornadoes are not expected to reach the F6 wind speeds.

(F0+F1) Weak Tornado
(F2+F3) Strong Tornado
(F4+F5) Violent Tornado

From J. Atmos. Sci., August 1981, p. 1517-1519



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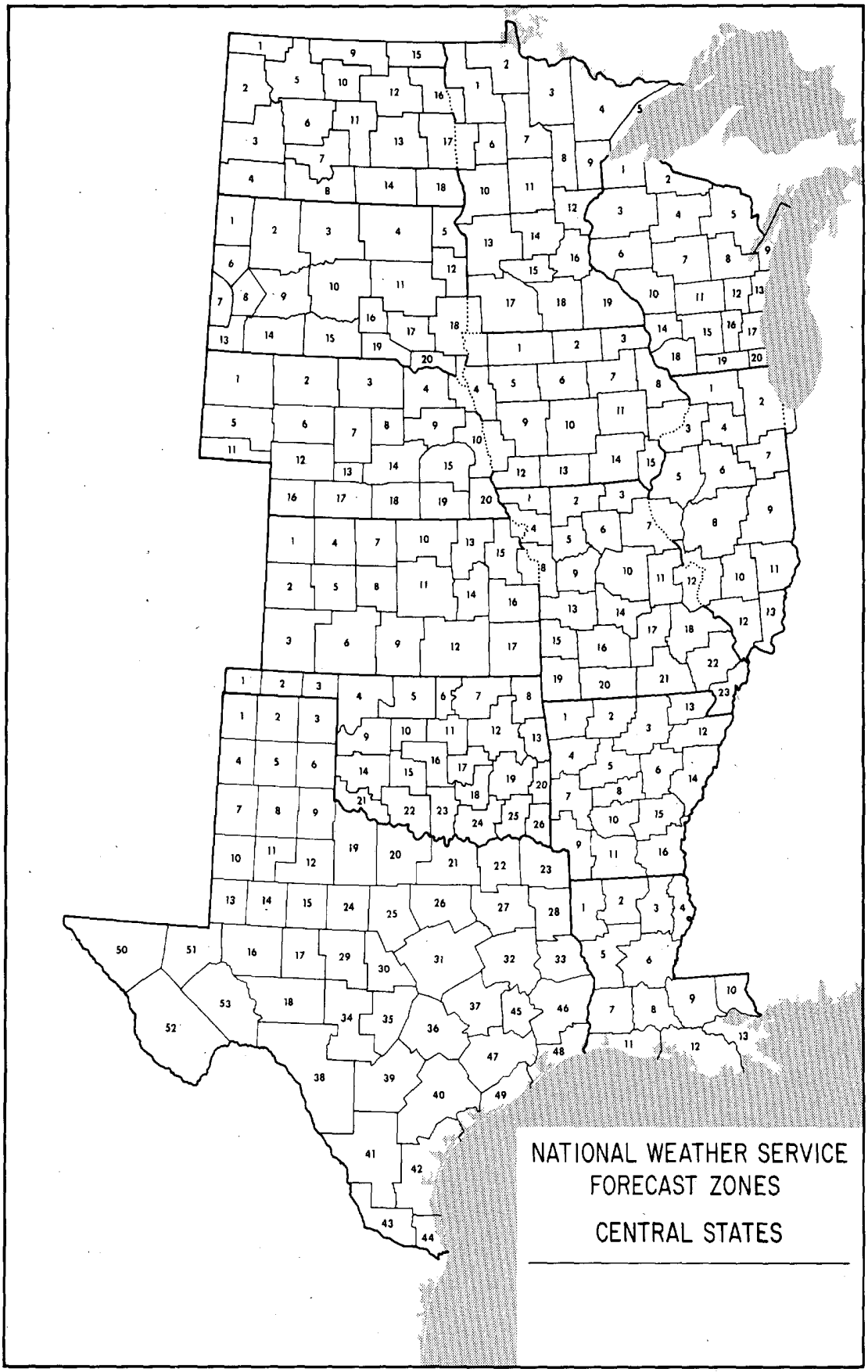
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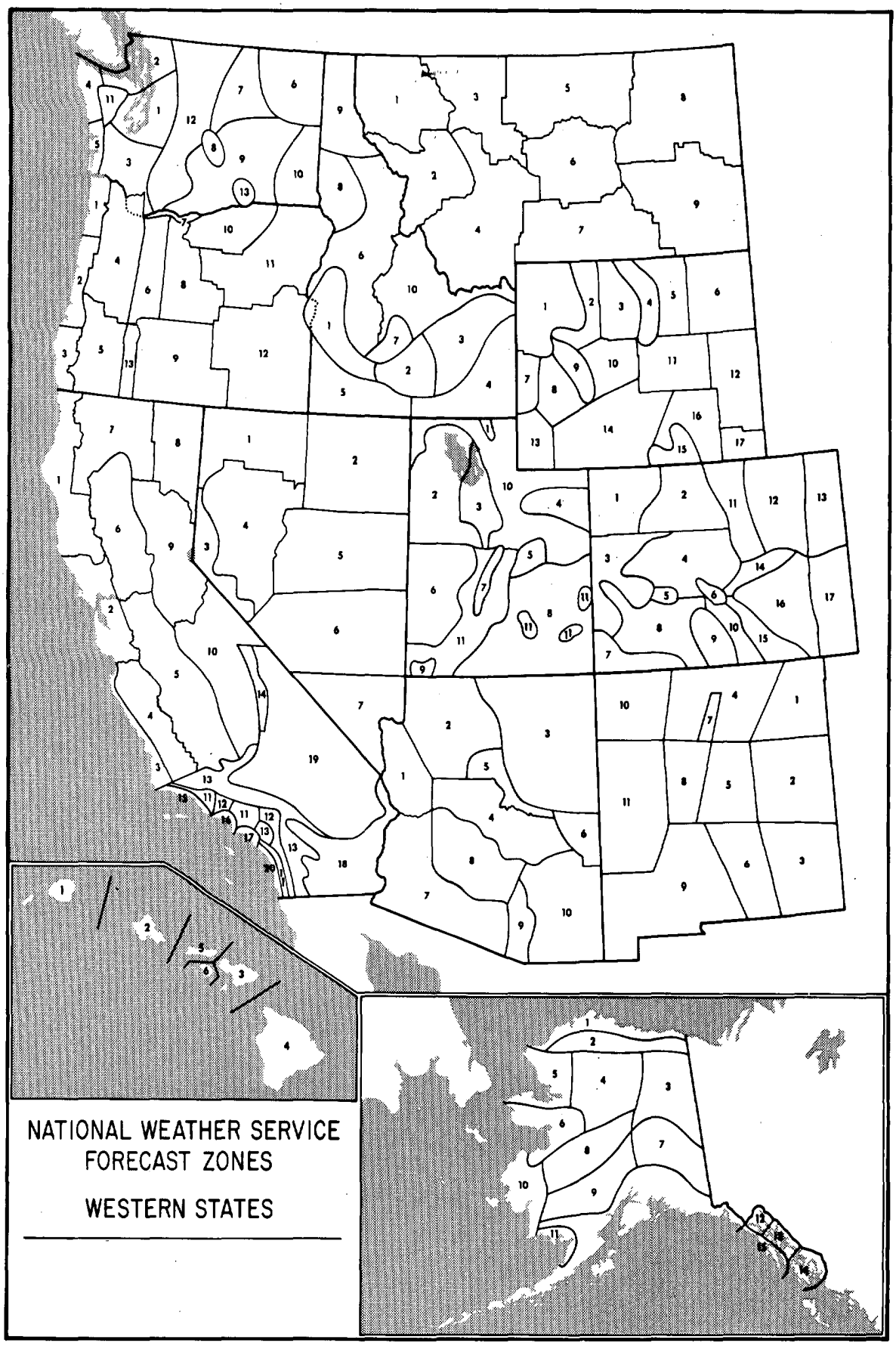

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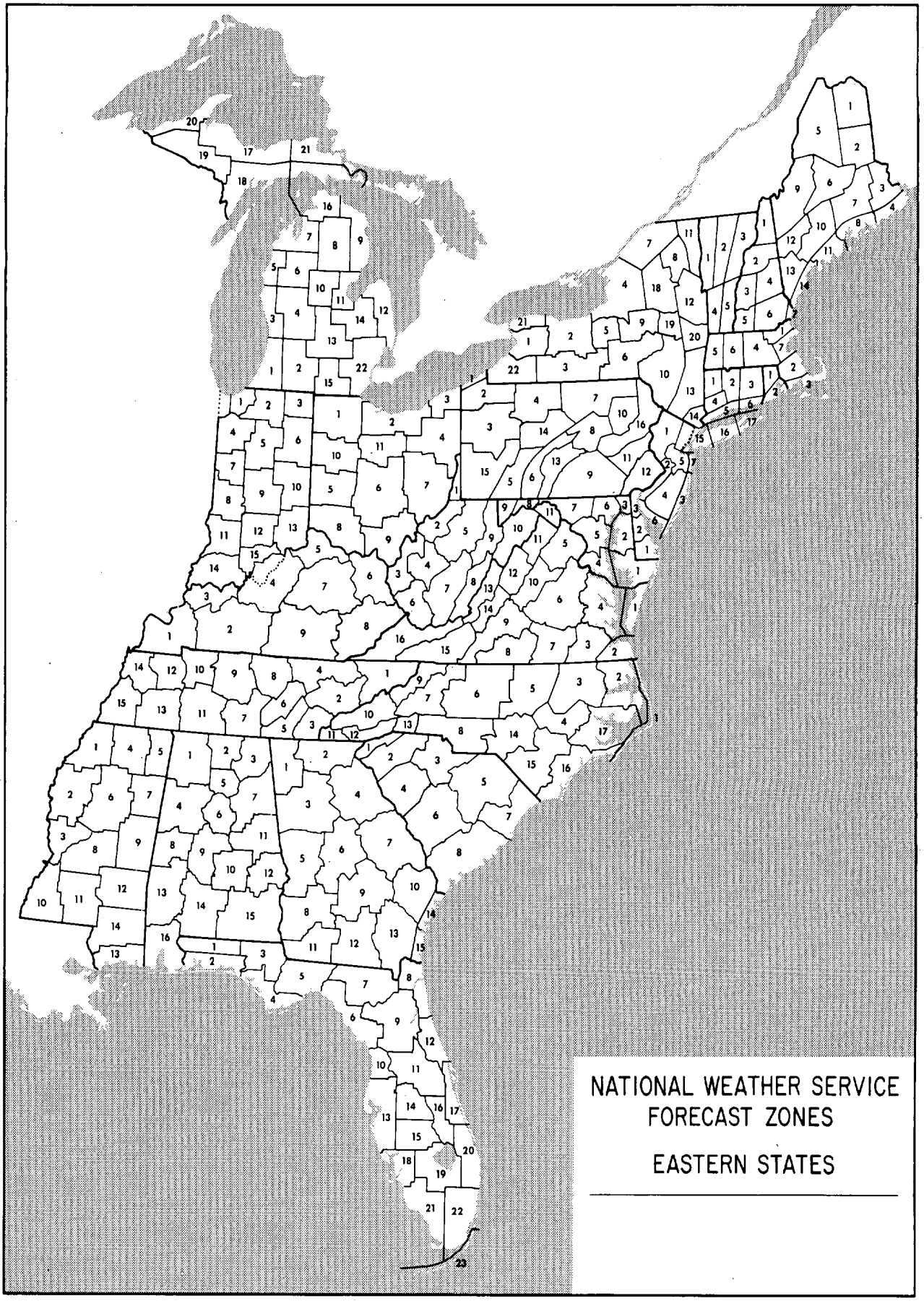

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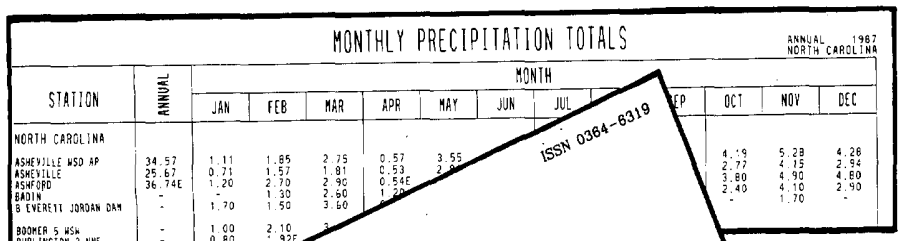
MONTHLY PRECIPITATION TOTALS

ANNUAL 1987
NORTH CAROLINA

STATION	ANNUAL	MONTH											
		JAN	FEB	MAR	APR	MAY	JUN	JUL		OCT	NOV	DEC
NORTH CAROLINA												
ASHEVILLE WSO AP	34.57	1.11	1.85	2.75	0.57	3.55				4.19	5.28	4.26
ASHEVILLE	25.67	0.71	1.57	1.81	0.53	2.8				2.77	4.15	2.94
ASHFORD	36.74E	1.20	2.70	2.90	0.54E					3.80	4.90	4.80
BADIN	-	-	1.30	2.60	1.20					2.40	4.10	2.90
B EVERETT JORDAN DAM	-	1.70	1.50	3.60	-					-	1.70	-
BOOMER 5 WSW	-	1.00	2.10	3								
BURLINGTON 3 NNE	-	0.80	1.92E									
CAPE HATTERAS WSO	48.86	5.75										
CARTHAGE 8 SE	-	1.70										
CATALOOCHEE	-	0.8										
CHARLOTTE WSO AP	26.91											
CLINTON 2 NE	38											
DALTON												
DOBSON												
EDEN												
ELIZ												
ELI												
FAYE												
FRANK												
GREENS												
GREENVI												
HELTON												
HOBUCKEN												
LAKE LURE												
LAURINBURG												
LEXINGTON												
MOORESVILLE 2												
MOREHEAD CITY												
MOUNT PLEASANT												
N WILKESBORO 12												
POLKTON 2 NE												
QUEBEC												
RALEIGH-DURHAM WSFO												
ROANOKE RAPIDS												
ROARING GAP 1 NW												
SHELBY 2												
SNEADS FERRY 2 ENE												
SWANNANOA 2 SSE												
WILMINGTON WSO AP												
WILSON 3 SW												
YADKINVILLE 6 E	28											

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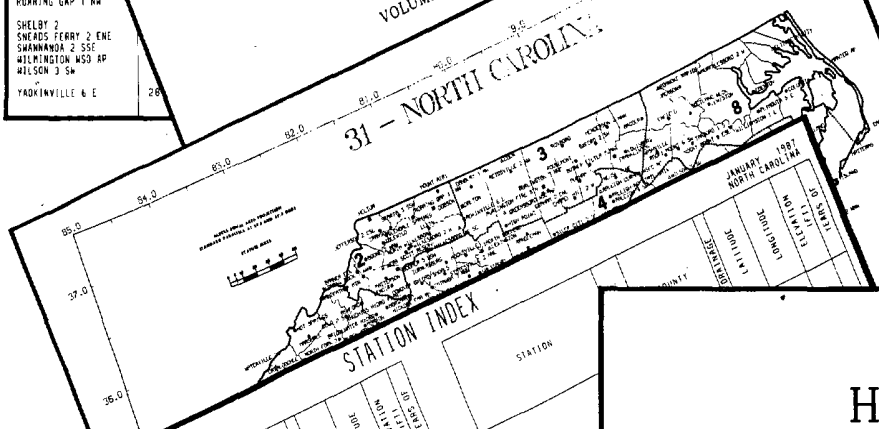
HOURLY PRECIPITATION DATA

NORTH CAROLINA

DECEMBER 1987
WITH ANNUAL SUPPLEMENT
VOLUME 37 NUMBER 12



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MONTHLY PRECIPITATION MAXIMA

HOURLY PRECIPITATION

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HOURLY PRECIPITATION DATA

NORTH CAROLINA

JANUARY 1987

VOLUME 37 NUMBER 1

HOURLY PRECIPITATION DATA is published monthly and presents daily, hourly, and maximum short duration data for recording rain gage stations in each state except Alaska. Also included are a published station index and a locator map for the state. In addition to the regularly published data, the December publication contains a tabulation of monthly and annual total precipitation amounts as an annual supplement.

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CLIMATOLOGICAL DATA is a unique source of weather information derived from data collected by over 8,000 cooperative weather observers located throughout the United States, Puerto Rico, the Virgin Islands, and U. S. Pacific Islands. It is published monthly, with an Annual Summary, for each State or combination of States/Areas by the National Climatic Data Center, Asheville, North Carolina.

✸ MONTHLY editions contain:

- Temperature and precipitation extremes and summarized data.
- Daily precipitation, maximum and minimum temperatures, snowfall, soil temperatures, and evaporation & wind.
- Graphical displays of various climatological features.
- Station indices and locator maps.
- Monthly totals of heating degree days and snowfall are published as seasonal tables in the July issue.

✸ ANNUAL SUMMARY contains monthly and annual:

- Total precipitation and departures from normal.
- Average temperatures and departures from normal.
- Temperature extremes and freeze data.
- Soil temperatures.
- Total evaporation and wind movement.
- Monthly and seasonal cooling degree days.
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ISSN 0364-5843

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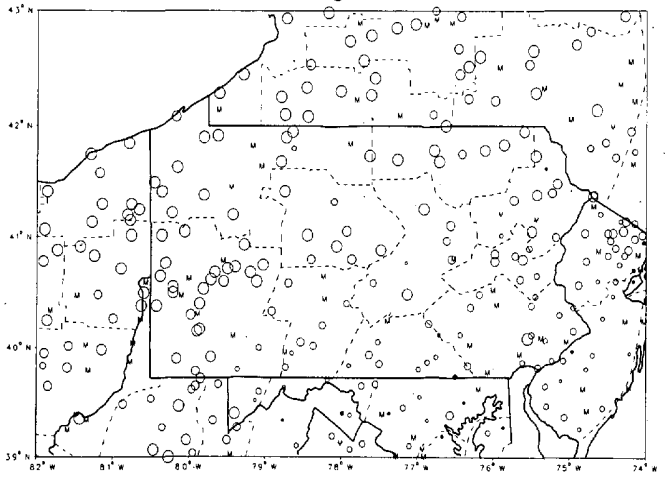
CLIMATOLOGICAL DATA
PENNSYLVANIA
JANUARY 1988
VOLUME 93 NUMBER 1

MONTHLY PRECIPITATION DEPARTURE FROM INDIVIDUAL STATION NORMALS (1951–1980)

M INCOMPLETE DATA FOR THE MONTH
0 EXACTLY NORMAL
○ 5,10,20,...50% OR MORE BELOW NORMAL
● 10,20,40,...100% OR MORE ABOVE NORMAL



CIRCLE DIAMETER IS PROPORTIONAL TO DEPARTURE ON A CONTINUOUS SCALE

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