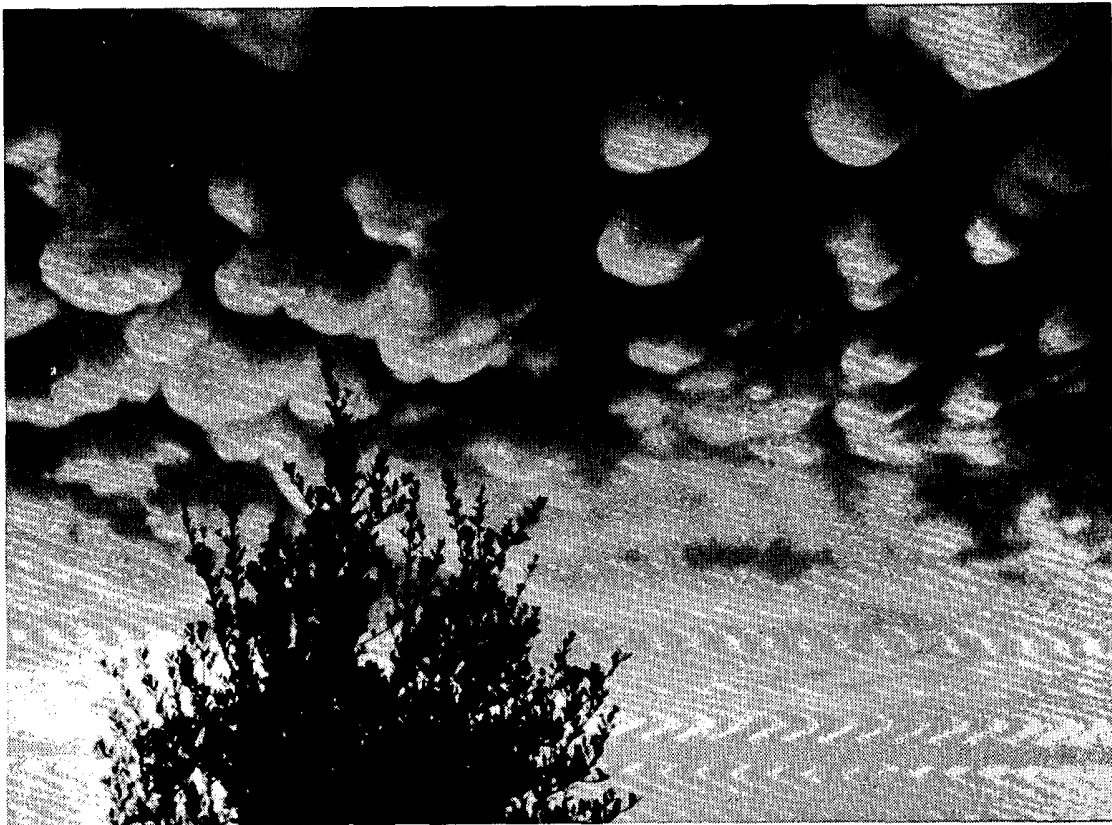


# STORM DATA

## WITH LATE REPORTS/CORRECTIONS



"I CERTIFY THAT THIS IS AN OFFICIAL PUBLICATION OF  
THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
AND IS COMPILED FROM INFORMATION RECEIVED AT THE  
NATIONAL CLIMATIC DATA CENTER, ASHEVILLE NORTH CAROLINA"  
28801

*Kenneth D. Hadler*

DIRECTOR  
NATIONAL CLIMATIC DATA CENTER

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Marine Meteorology Program, Dr. Robert F. Abbey, Jr., Director.  
Extensive data collection efforts are provided by the National Weather Service.

## C O N T E N T S

Cover: Evening sunlight dramatically illuminates some very distinctive mammatus clouds that hung from beneath the rear portion of a thunderstorm anvil over Lewisville, Texas on October 1, 1988. In color the billowy protuberances were turned a bright orange. (see MAMMATUS CLOUDS...., page 10) ---Photo by Tim Marshall, Lewisville, Texas.

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### 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.

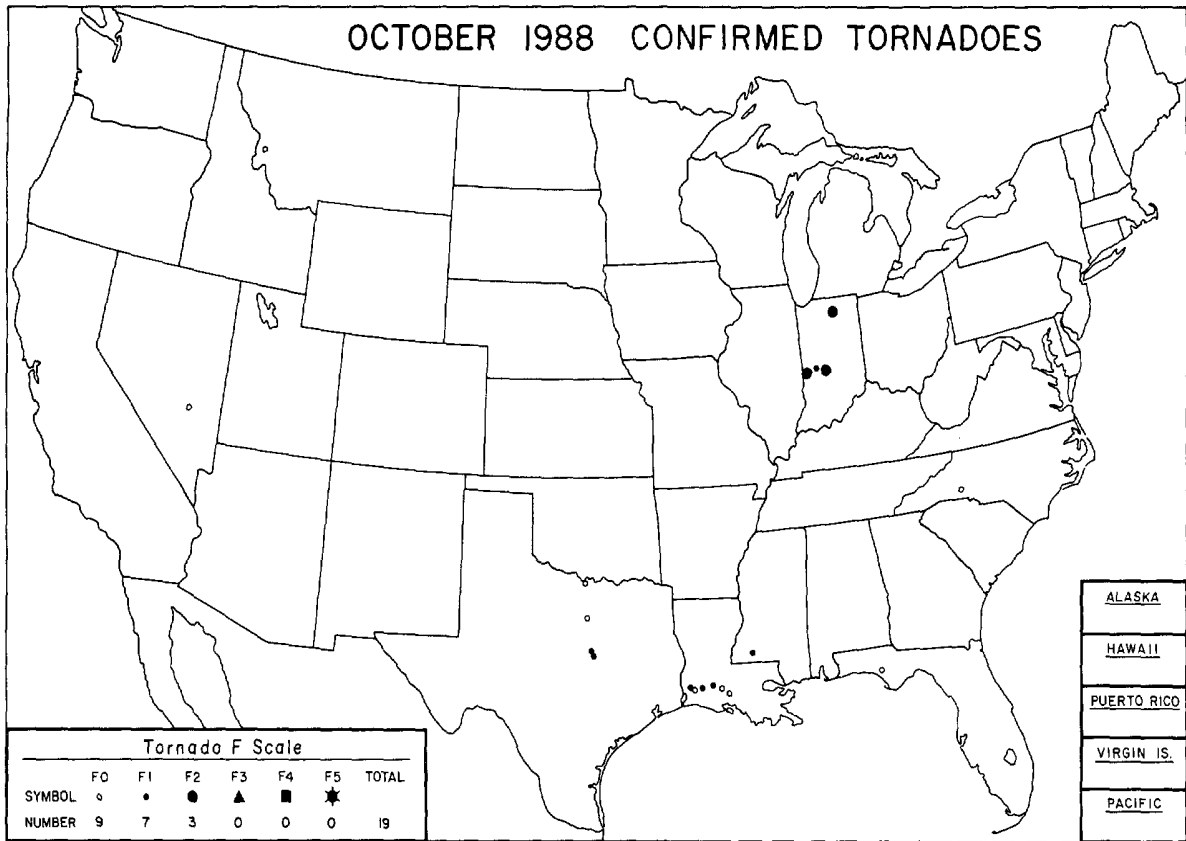
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Supervisory Meteorological Technician	Editorial Clerk

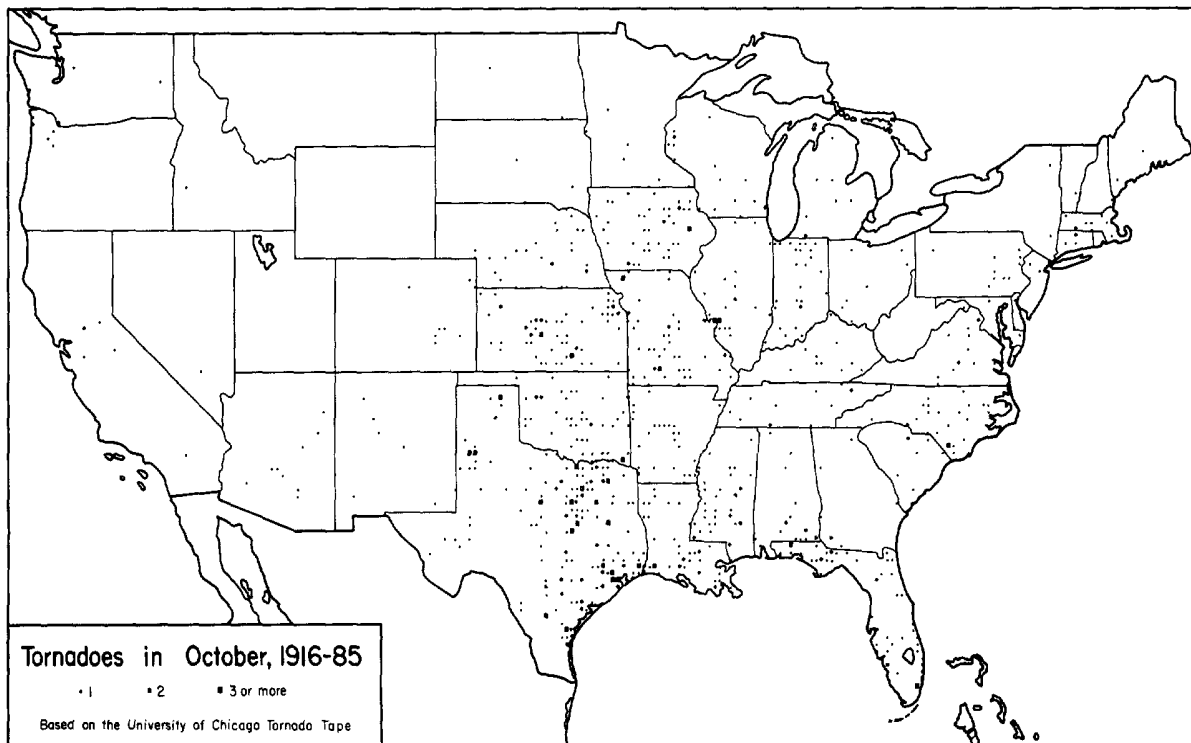
Subscription, pricing, and ordering information is available from:

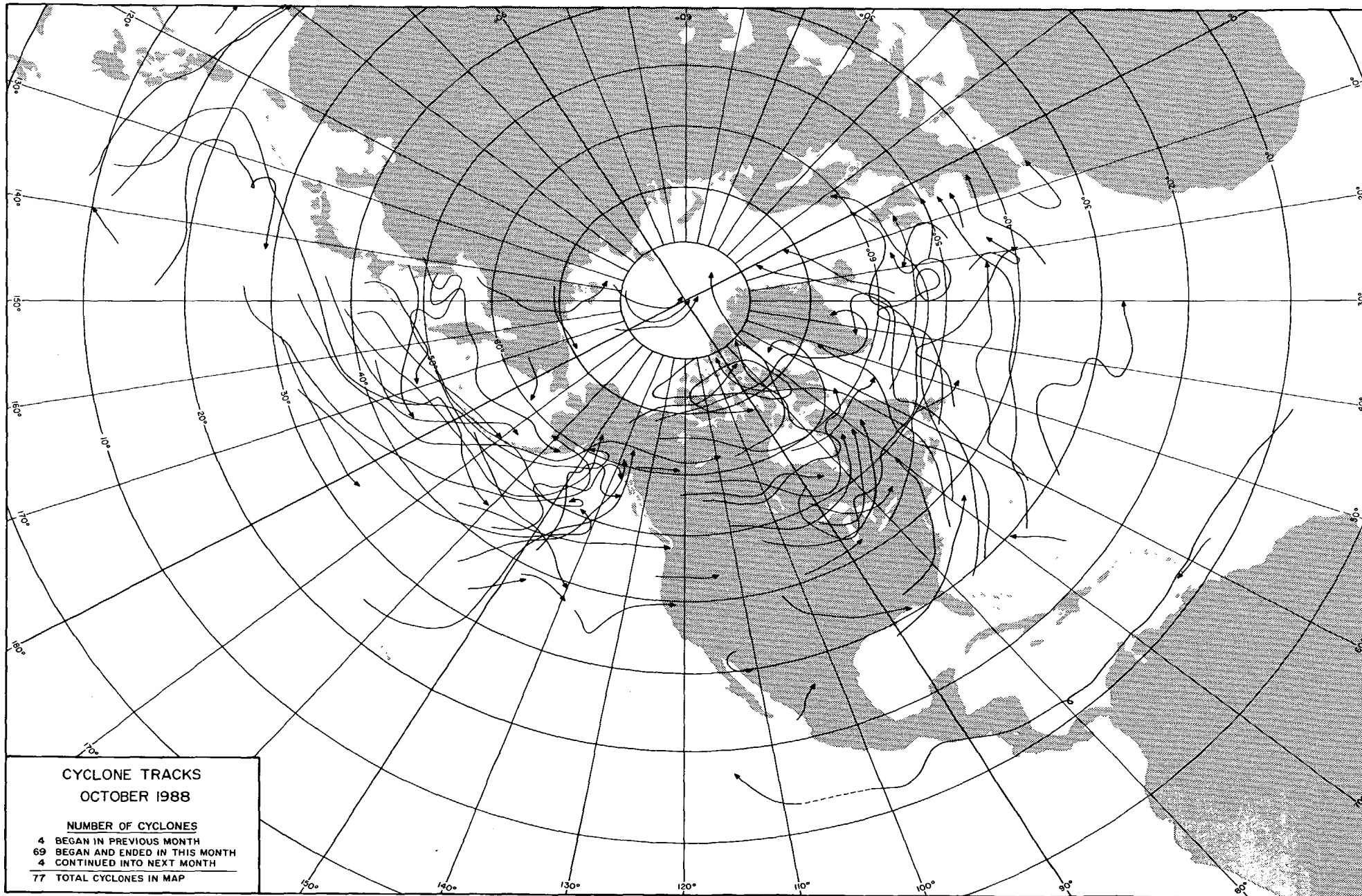
National Climatic Data Center  
Federal Building  
Asheville, NC 28801-2696

# OUTSTANDING STORMS OF THE MONTH



<ul style="list-style-type: none"> <li>● COMPLETE REPORT RECEIVED</li> <li>○ PRELIMINARY REPORT RECEIVED</li> <li>○ REPORT NOT RECEIVED</li> </ul> <p>(N) northern (W) western (S) southern (C) central (E) eastern (O) coastal (SE) southeastern</p>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td>● 1AL</td><td>● 7DE</td><td>● 14KS</td><td>● 21MN</td><td>● 28NJ</td><td>● 33OH</td><td>● 39SD</td><td>● 44VA</td><td>● 49AK (SE)</td> </tr> <tr> <td>● 2AZ</td><td>● 8FL</td><td>● 15KY</td><td>● 22MS</td><td>● 29NM</td><td>● 34OK</td><td>● 40IN</td><td>● 45WA</td><td>● 50HI</td> </tr> <tr> <td>● 3AR</td><td>● 9GA</td><td>● 16LA</td><td>● 23MO</td><td>● 30NY (O)</td><td>● 35OR</td><td>● 41TX (N)</td><td>● 46WY</td><td>● 51PR</td> </tr> <tr> <td>● 4CA (N)</td><td>● 10ID</td><td>● 17ME</td><td>● 24MT</td><td>● 30NY (C)</td><td>● 36PA (E)</td><td>● 41TX (S)</td><td>● 47WJ</td><td>● 52VI</td> </tr> <tr> <td>● 4CA (S)</td><td>● 11IL</td><td>● 18MD</td><td>● 25NE</td><td>● 30NY (W)</td><td>● 36PA (W)</td><td>● 41TX (W)</td><td>● 48WY</td><td>● 53PC</td> </tr> <tr> <td>● 5CO</td><td>● 12IN</td><td>● 19MA</td><td>● 26NV</td><td>● 31NC</td><td>● 37RI</td><td>● 42UT</td><td>○ 49AK (N)</td><td></td> </tr> <tr> <td>● 6CT</td><td>● 13IA</td><td>● 20MI</td><td>● 27NH</td><td>● 32ND</td><td>● 38SC</td><td>● 43VT</td><td>● 49AK (S)</td><td></td> </tr> </table>	● 1AL	● 7DE	● 14KS	● 21MN	● 28NJ	● 33OH	● 39SD	● 44VA	● 49AK (SE)	● 2AZ	● 8FL	● 15KY	● 22MS	● 29NM	● 34OK	● 40IN	● 45WA	● 50HI	● 3AR	● 9GA	● 16LA	● 23MO	● 30NY (O)	● 35OR	● 41TX (N)	● 46WY	● 51PR	● 4CA (N)	● 10ID	● 17ME	● 24MT	● 30NY (C)	● 36PA (E)	● 41TX (S)	● 47WJ	● 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)	
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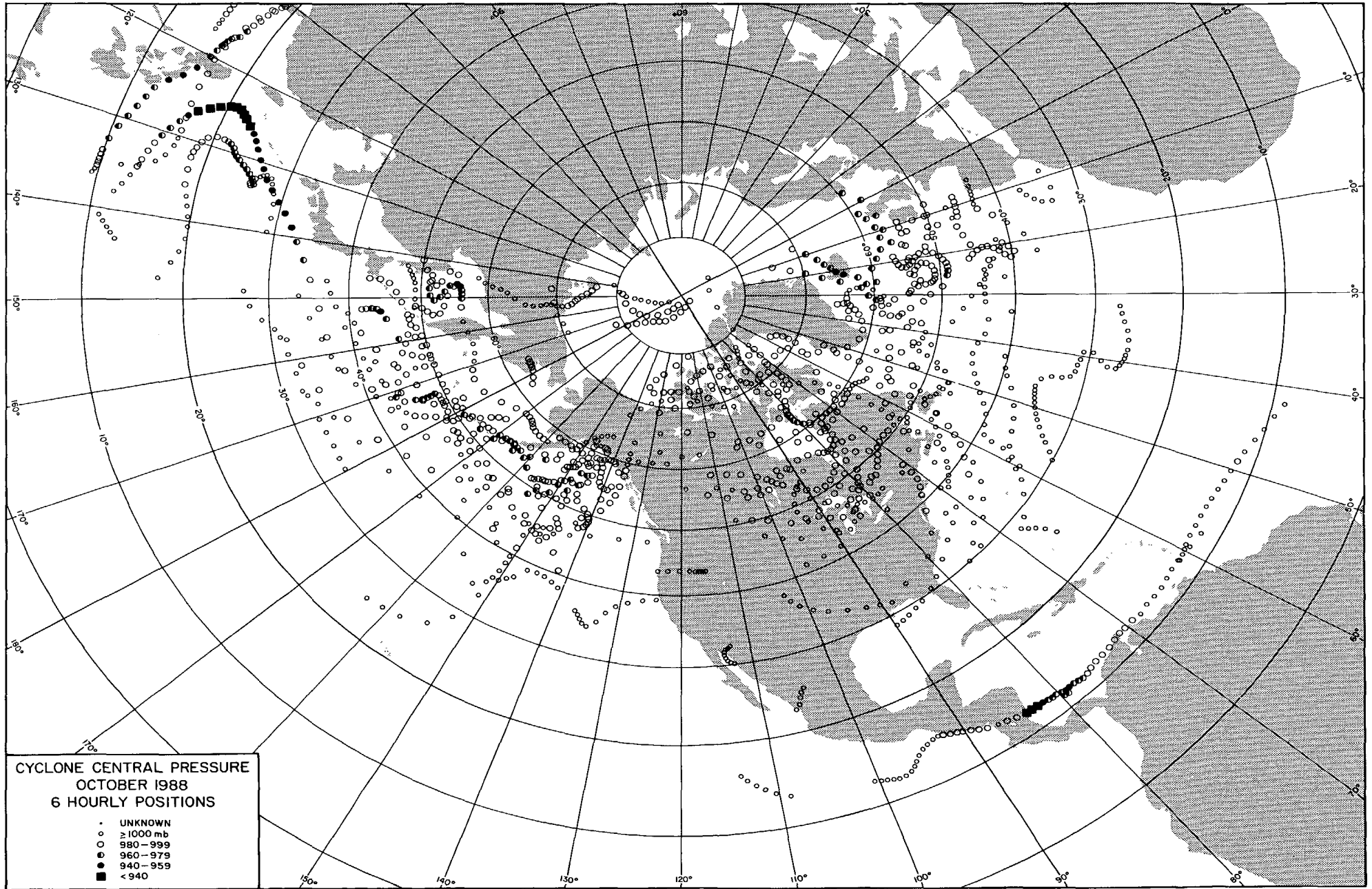




**CYCLONE TRACKS  
OCTOBER 1988**

**NUMBER OF CYCLONES**

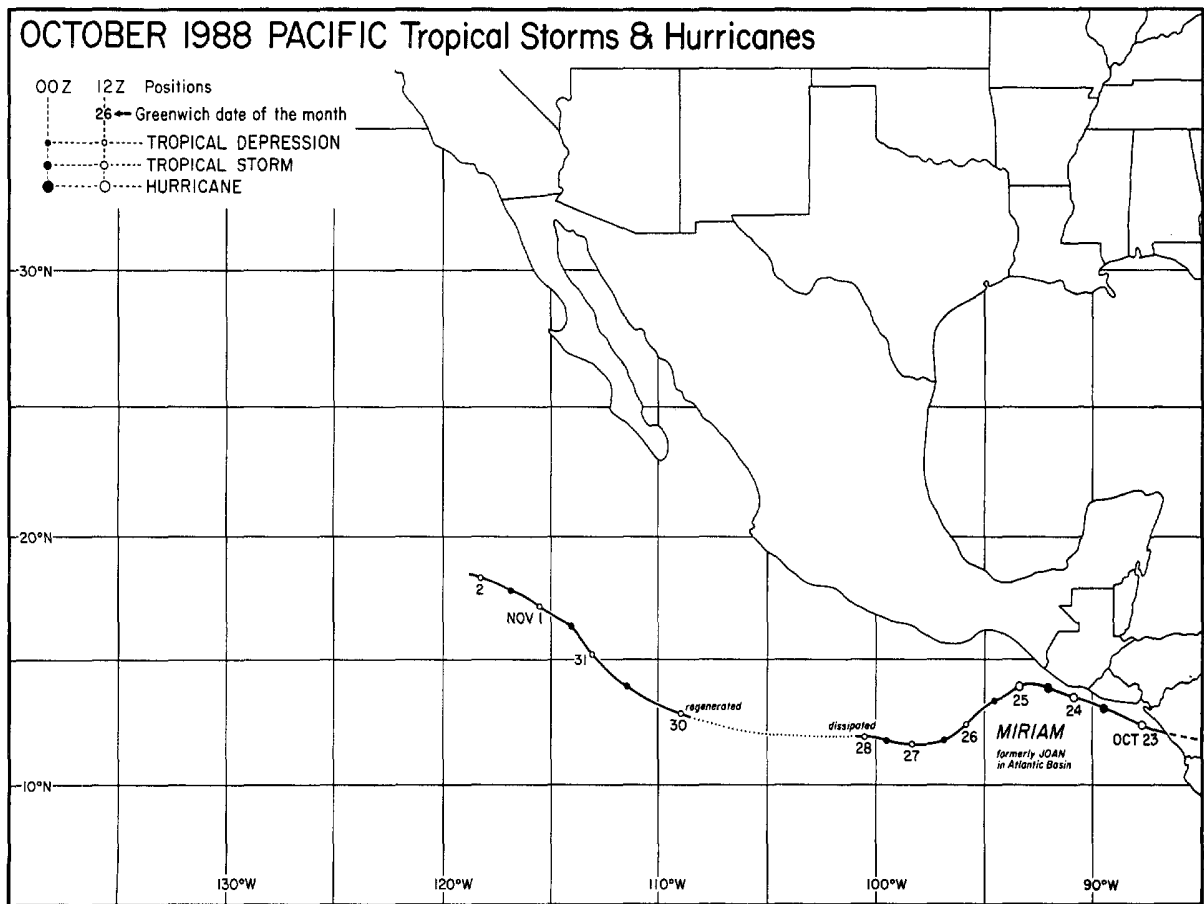
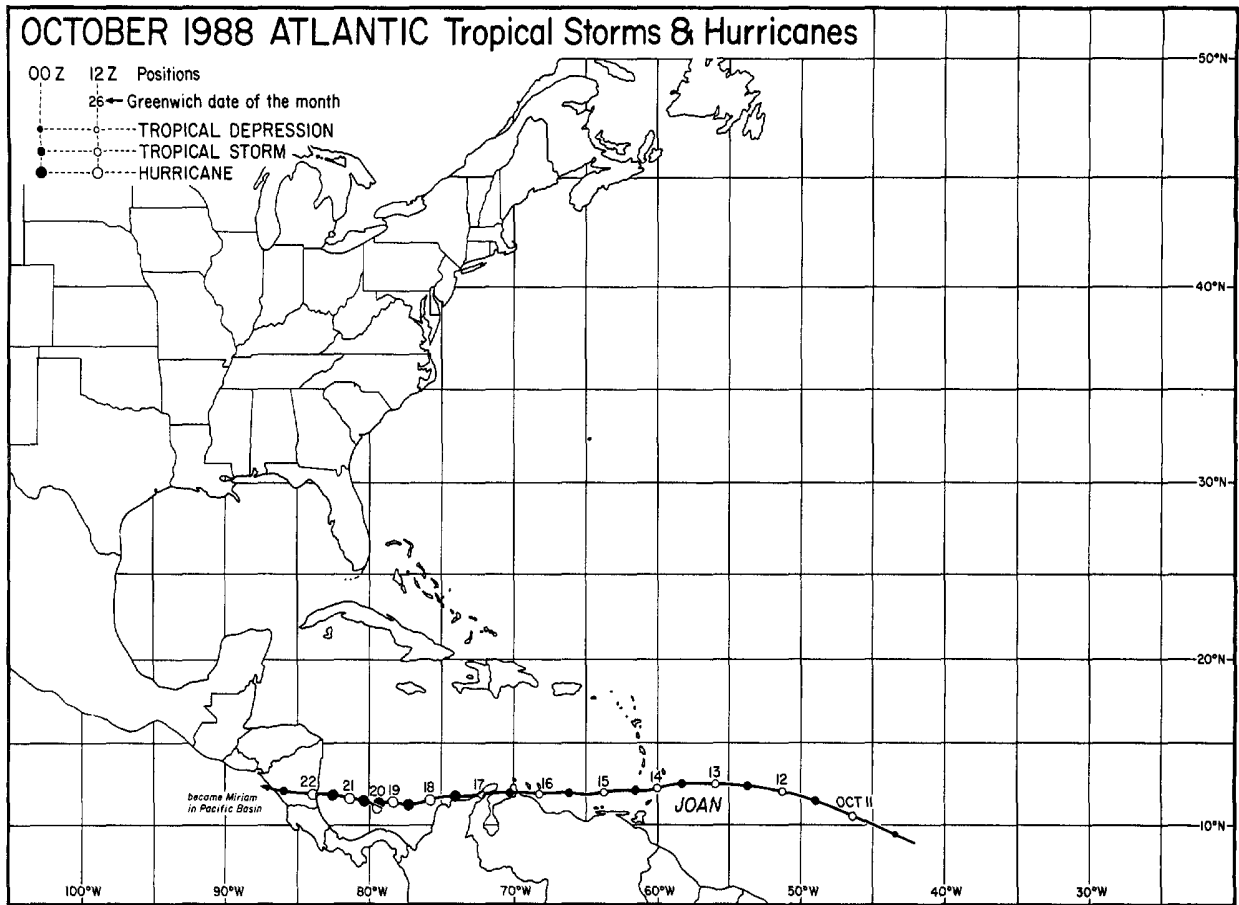
- 4 BEGAN IN PREVIOUS MONTH
- 69 BEGAN AND ENDED IN THIS MONTH
- 4 CONTINUED INTO NEXT MONTH
- 77 TOTAL CYCLONES IN MAP**



**CYCLONE CENTRAL PRESSURE  
OCTOBER 1988  
6 HOURLY POSITIONS**

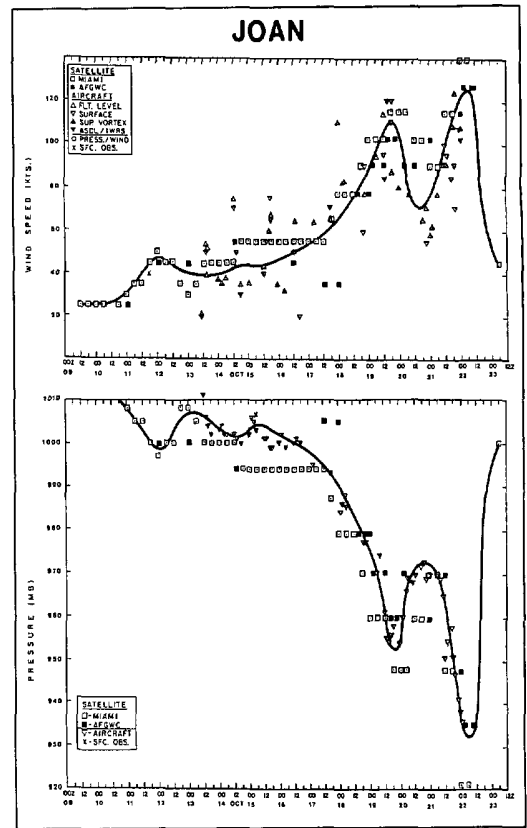
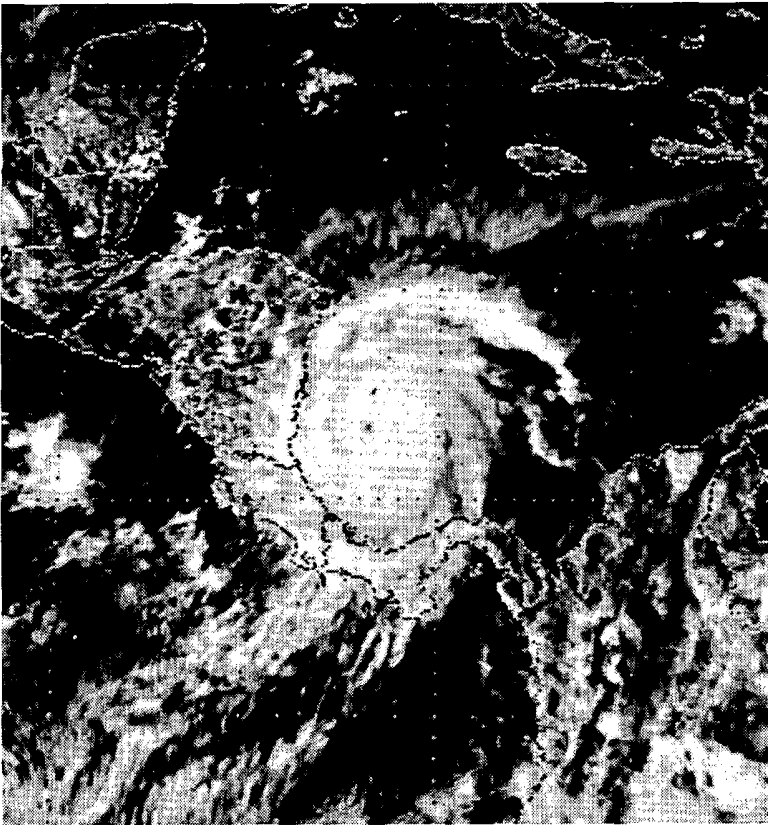
- UNKNOWN
- ≥ 1000 mb
- ◌ 980 - 999
- ◌ 960 - 979
- ◌ 940 - 959
- < 940

# TROPICAL STORMS and HURRICANES



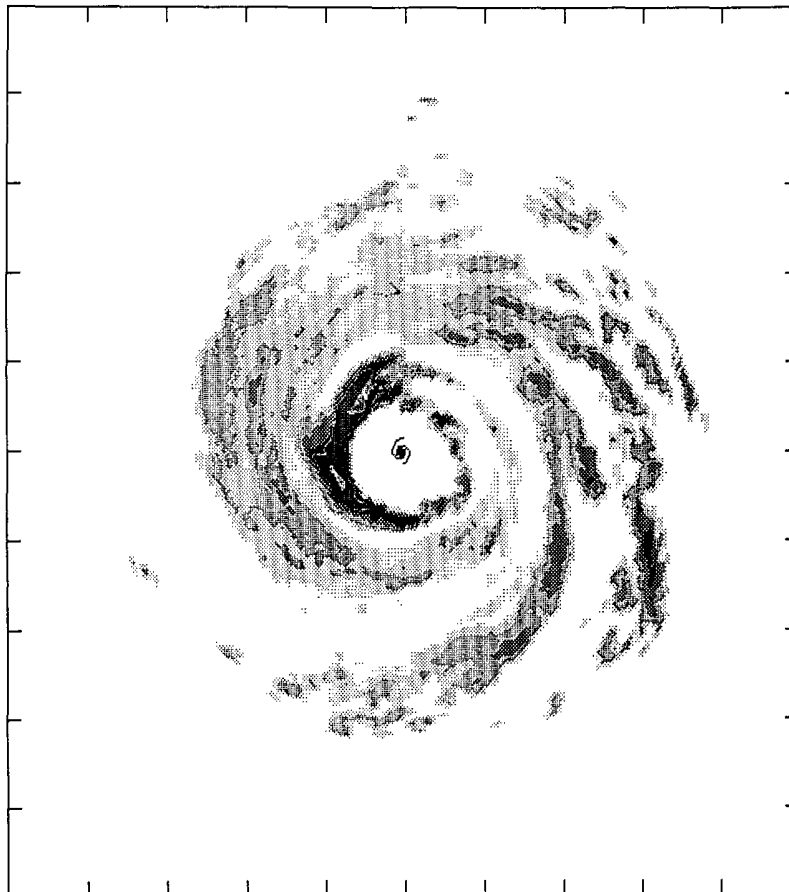
---Best track data in both above maps from the National Hurricane Center, Miami, Florida.

# 1. HURRICANE JOAN - TROPICAL STORM MIRIAM, October 10 to November 2, 1988

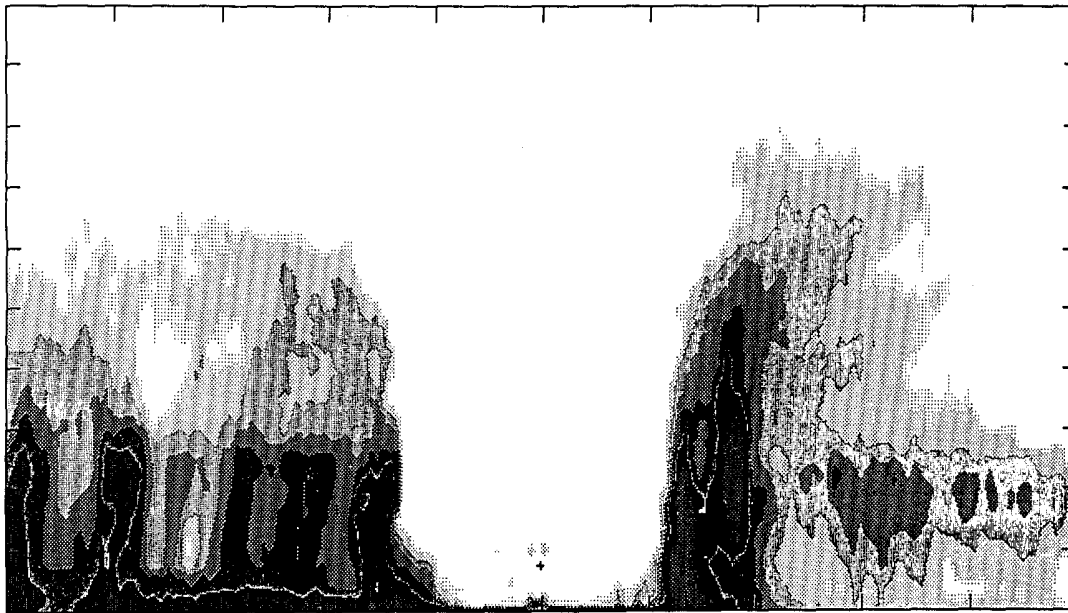


LEFT: Hurricane JOAN, as it appeared during AOML/HRD fly-throughs 16 hours prior to landfall in Nicaragua, is seen in a GOES 6 satellite, visible image taken at 1800 UTC on October 21, 1988. RIGHT: Plots of estimated maximum wind speed and minimum central pressure versus time for Hurricane JOAN. ---Plots and photo from the National Hurricane Center and provided through the Hurricane Research Division of AOML, both of Miami, Florida.

A computer-processed, PPI (plan-position indicator) scan from the lower fuselage radar on the NOAA/OAO P-3 aircraft shows the horizontal distribution and intensity of echos in JOAN's rainbands at 1724 UTC on October 21, 1988. Data was collected during a reconnaissance mission in support of NHC, and will support HRD's long-term monitoring research program as well. ---Figure from AOML/HRD, Miami, Florida.



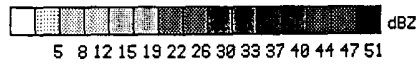
881021I1  
 Joan  
 (min.) (max.)  
 Pitch= .8; 1.5  
 Roll= -1.7; 3.2  
 Track=180.0;180.9  
 Drift= -.3; 1.1  
 Tilt= 2.9; 3.8  
 Alt= 1495 m  
 Lat= 11.71 N  
 Lon= 81.73 W  
 172408 Z  
 Lower Fuselage  
 240 X 240 km  
 Hurricane Research  
 Division  
 NOAA/AOML



E 172504 Z

881021I1

Joan W

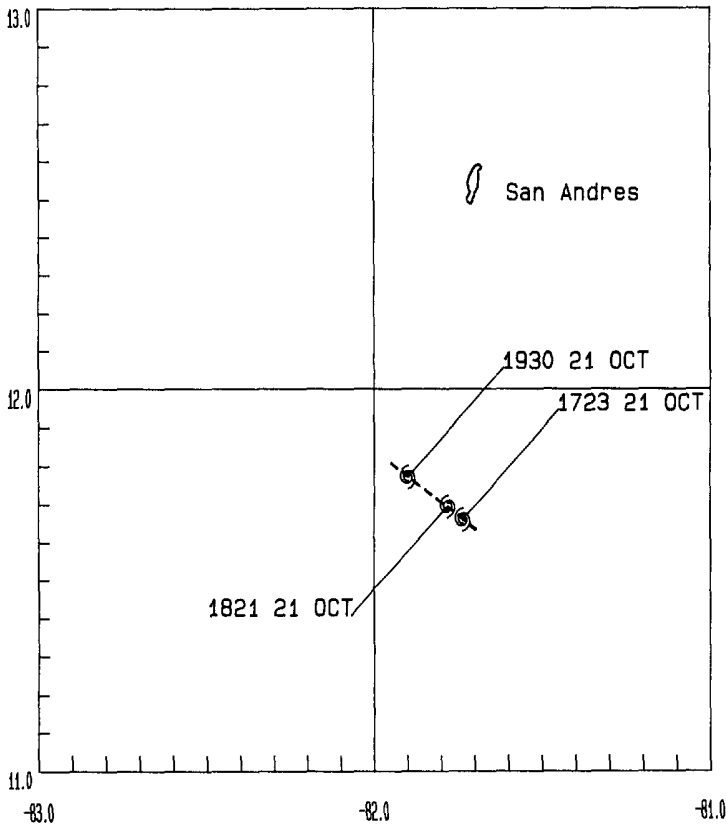


Hurricane Research  
Division  
NOAA/AOML

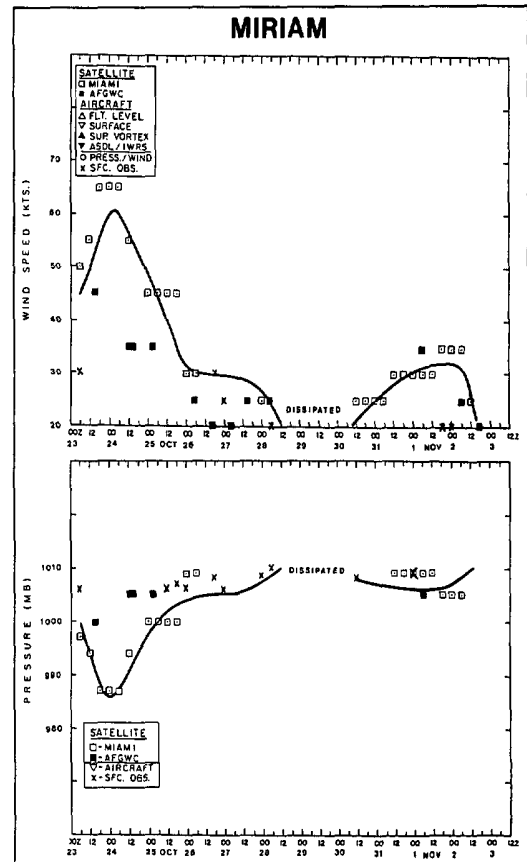
(min.) (max.)	(min.) (max.)
Pitch= 1.6; 2.0	Drift= -6.1; -5.0
Roll= -1.6; -.0	Tilt= -.3; .0
Track=180.0;180.2	120 X 20 km

Tail Radar  
Alt= 1503 m  
Lat= 11.65 N  
Lon= 81.73 W

A computer-processed, RHI (range-height indicator) scan from the tail radar on the NOAA/OAO P-3 aircraft shows the vertical distribution and intensity of echos in JOAN's rainbands along an east-west line through the center of the hurricane at 1725 UTC on October 21, 1988. The aircraft's position is shown by a "+" within the hurricane's eye, lower center in the figure.  
---Figure from AOML / Hurricane Research Division, Miami, Florida.



Hurricane symbols mark JOAN's position at the indicated times (UTC) on October 21st as AOML/HRD flights were being conducted in the vicinity of San Andres Island off the east coast of Nicaragua in the extreme southwest Caribbean. Fixes on the hurricane's center were obtained by the NOAA/OAO P-3 aircraft.  
---Figure from AOML/HRD, Miami, Florida.



Plots of estimated maximum wind speed and minimum central pressure versus time for Tropical Storm MIRIAM. ---Plots from NHC and provided through AOML/HRD, both of Miami, Florida.

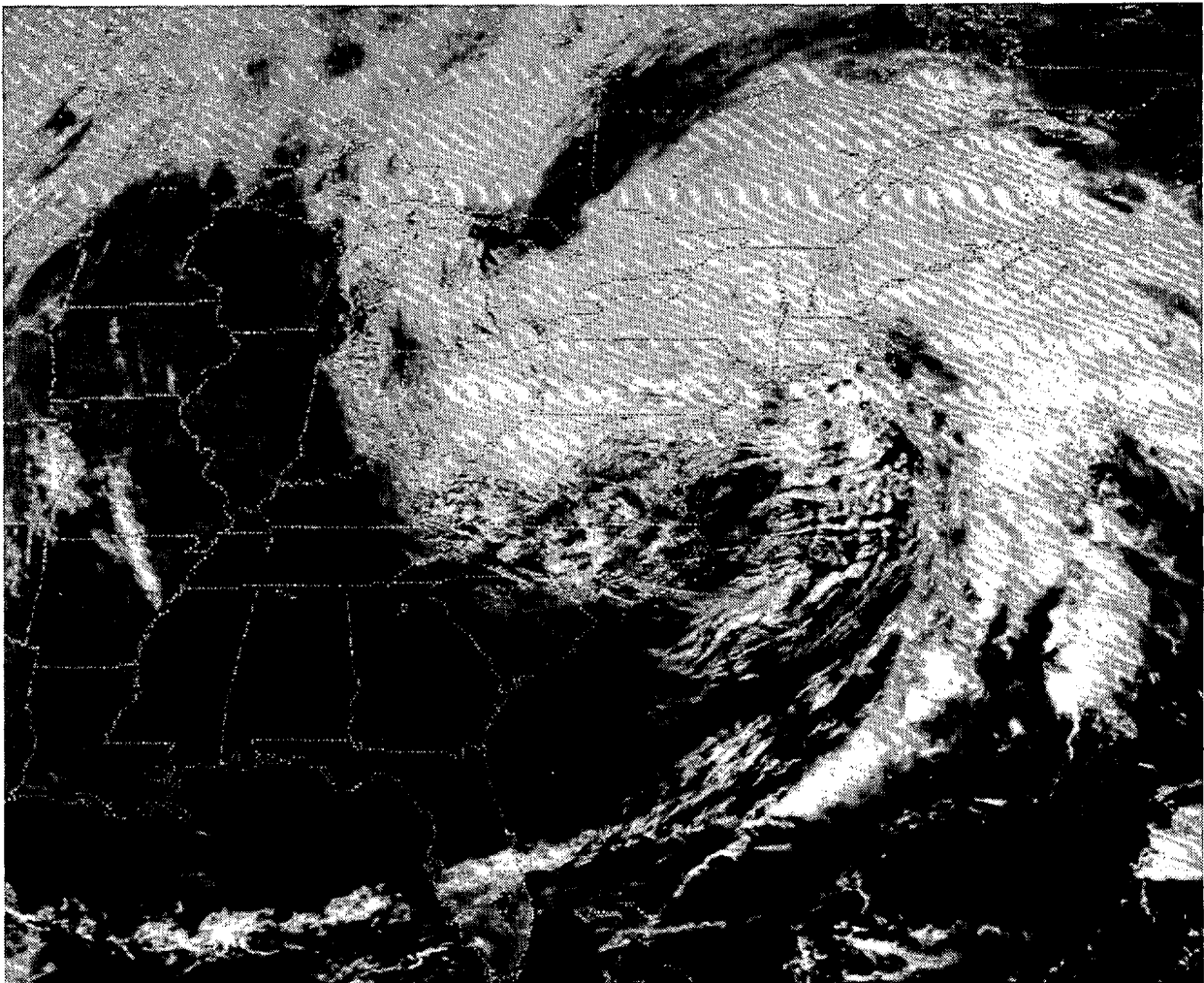


JOAN, the last hurricane of the 1988 season, followed an unusual, due west path through the extreme southern Caribbean that hugged the north coast of South America, crossing the Netherland Antilles and the Guajira Peninsula of Columbia. The only previous tropical cyclone in this century to follow such a course was a tropical cyclone in June, 1933. While in the Caribbean, JOAN never strayed as much as a degree from the 12°N parallel, and although close proximity to land usually inhibits tropical cyclone development, JOAN attained hurricane status just 30 nautical miles north of the Columbia coast near 74°W. The hurricane made a small loop just prior to reaching 80°W, then continued west and made landfall near Bluefields, Nicaragua on October 22nd. JOAN was only the second hurricane of record to strike the southeast coast of Nicaragua south of Bluefields since 1911, and was by far the strongest. JOAN passed directly over Managua and eventually moved into the Pacific just south of Leon on the 23rd. The cyclone most likely maintained tropical storm strength as it moved off the west Nicaraguan coast, and as it is customary to assign the next available name on the Eastern Pacific list to named tropical cyclones that cross Central America from the Atlantic basin to the Pacific basin, JOAN became MIRIAM. The last such renaming occurred in 1974 when FIFI became ORLENE. As MIRIAM, the system never regained hurricane status, but did regenerate on October 30th after having dissipated on the 28th. MIRIAM underwent its final dissipation on November 2nd.

Except for Nicaragua for which meteorological information is not available, most of the damage and deaths associated with JOAN-MIRIAM occurred from heavy rains and mudslides. Throughout Nicaragua and the offshore islands, 148 people were killed, 184 were seriously injured, 100 were missing, and 187,000 were left homeless. In Costa Rica, 28 people were killed, 75 injured, 18 missing, and 7500 left homeless. Deaths in Columbia, Venezuela and Panama numbered 25, 11 and 4, respectively. According to the Nicaraguan Embassy in Washington, D.C., damage in Nicaragua alone was estimated at 840 million dollars. The total damages from JOAN-MIRIAM most probably approached 1.5 billion dollars.

## 2. COASTAL STORM in the NORTHEAST on October 22, 1988

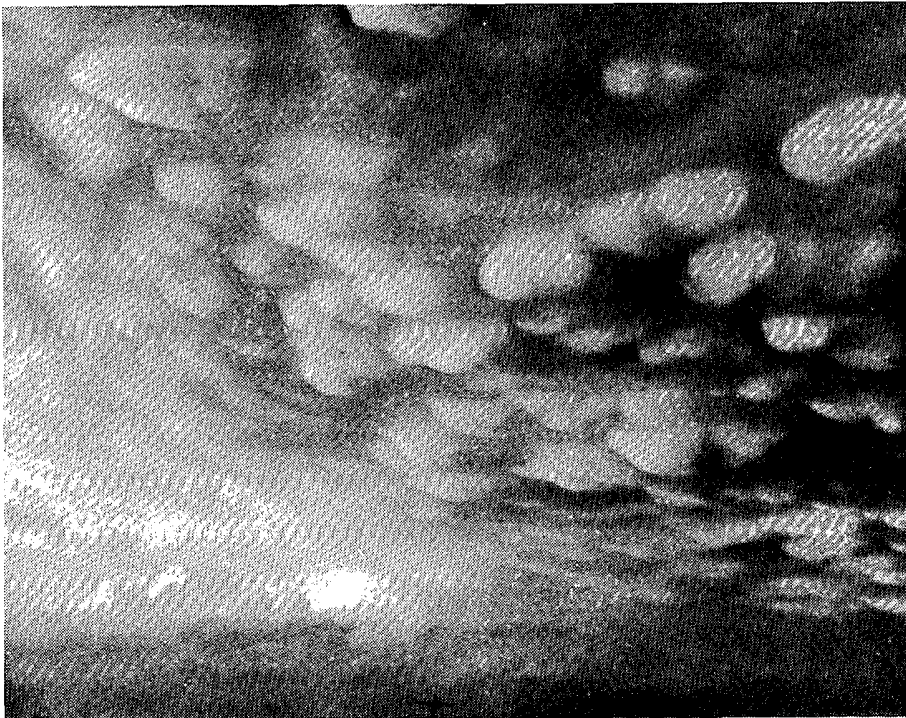
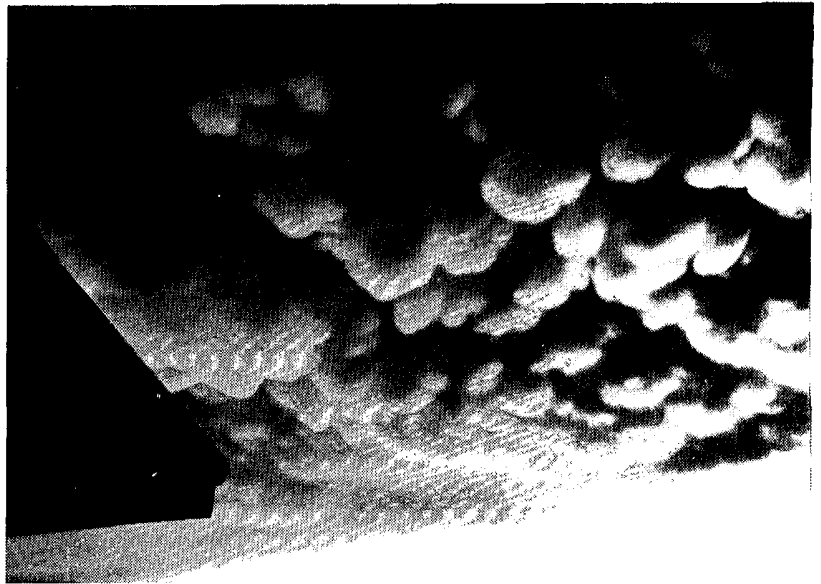
A very intense coastal storm termed a Nor'easter locally, swept up the coast of New England on October 22nd, bringing strong east and southeasterly winds, heavy rains and high winds to coastal areas of Connecticut, Rhode Island, Massachusetts, New Hampshire and Maine. Peak wind gusts ranged from 40 to 75 mph and the pounding high waves, concurrent with high tide, caused extensive shoreline flooding and broke many boats loose from their moorings. Some boats were beached, others were smashed into rocky shores and broken up, and yet others were inundated and sunk. Minor wind damage including downed trees and power outages occurred in scattered locations inland. Further inland, a heavy, wet snow was dumped over much of eastern New York by the storm.



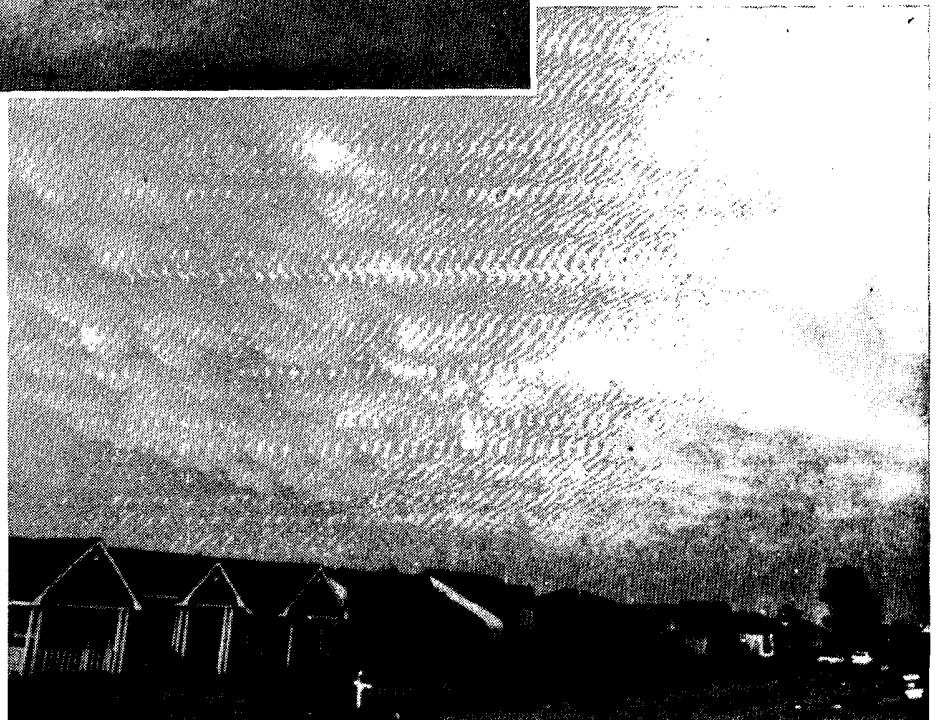
The New England coastal storm's intensity is well demonstrated by the broad, spiralling cloud mass apparent in this GOES 6 satellite, visible image taken at 1230 EST on October 22, 1988. ---Photo from the National Environmental Satellite Data and Information Service, Washington, D.C.

### 3. MAMMATUS CLOUDS over LEWISVILLE, TEXAS on October 1, 1988

Near sunset on the evening of October 1st, low angle sunlight striking the underside of a thunderstorm anvil cloud over Lewisville, Texas bathed some very pronounced mammatus clouds in a fiery orange light, creating a colorful display over the town and surrounding area north of Dallas. The pouchlike, hanging protuberances dipped from the rear portion of the anvil and were thus visible as the storm moved away toward the east. The storm was one of several over northern Texas that, during the afternoon and evening of the 1st, dropped widespread hail, some of it up to 4.5 inches in diameter, and produced strong winds and four tornadoes as well. This storm pelted the Dallas-Fort Worth area with hail of up to golf ball size.

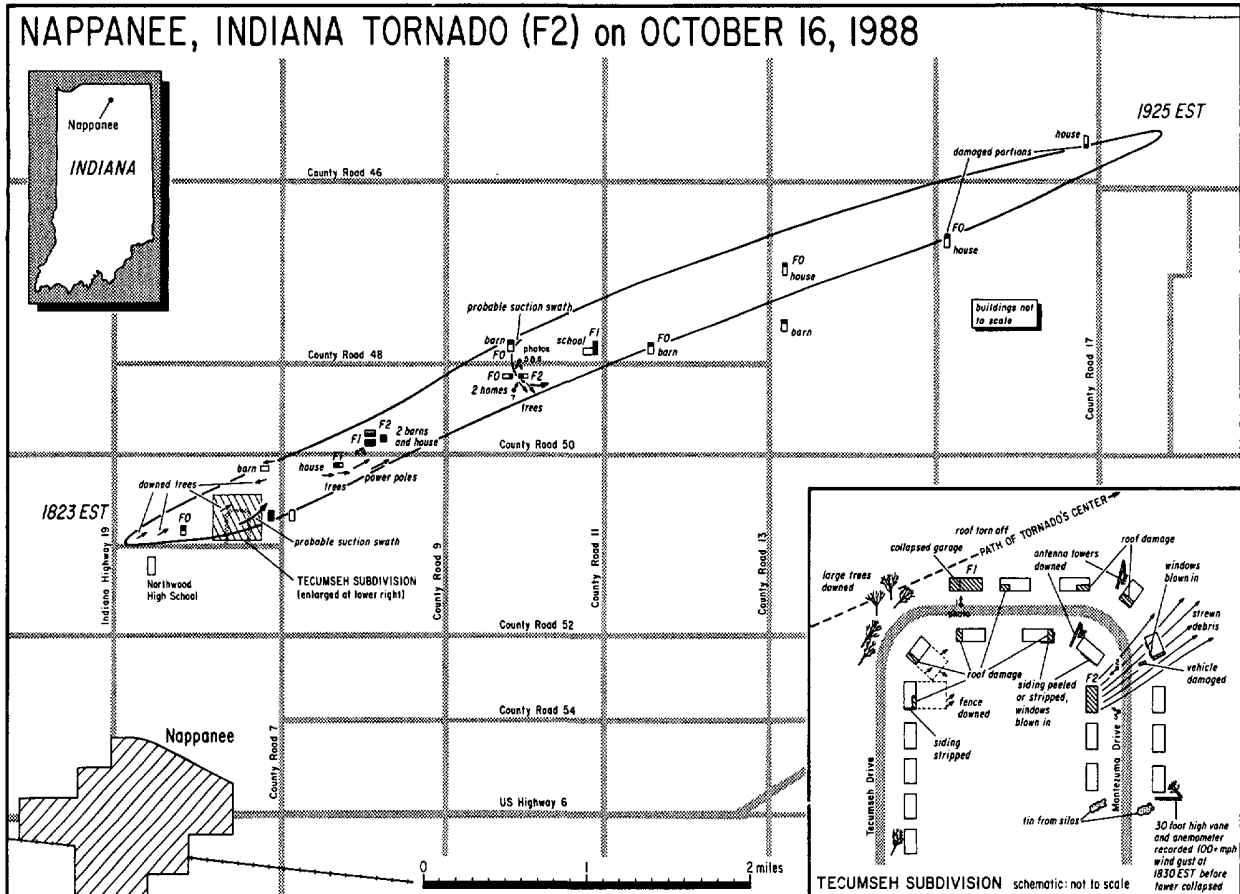


*Mammatus clouds over Lewisville, Texas on the evening of October 1st as viewed toward the west, including overhead mamma and the anvil edge (above), toward the north (left), and toward the northeast as the storm moved away (below). ---All three photos by Tim Marshall, Lewisville, Texas.*

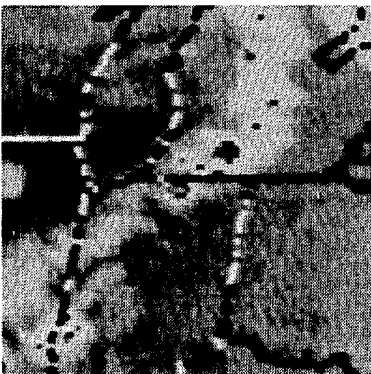


#### 4. TORNADO near NAPPANEE, INDIANA on October 16, 1988

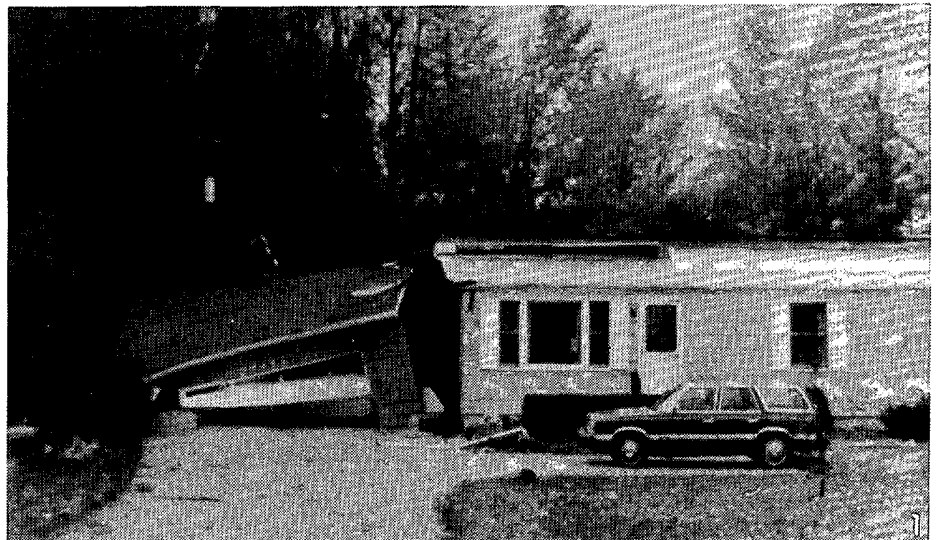
Taking slightly over an hour during the early evening of October 16th, a tornado carved a 6 mile long, east-northeast path through a mostly rural area of north-central Indiana. The extremely slow-moving tornado touched down 1.5 miles north of Nappanee, just 300 yards north of a high school, and shortly thereafter moved through a small subdivision where 11 homes sustained damage. Along the entire path, 21 homes were damaged, three of them having sustained considerable damage. The tornado's path was characterized by two areas of locally stronger damage that reached F2 intensity and were most likely caused by suction vortices. One of the probable vortices moved through the northeast corner of the subdivision. Amazingly no one was injured during the tornado, but total damages were estimated at 0.5 million dollars. This tornado was one of only three F2 tornadoes to occur in the country during the month, and the three F2 tornadoes were the strongest in the nation as well — unusual in that October is noted for having few and mostly weak tornadoes climatologically. Interestingly however, all three occurred in Indiana, this one on the 16th and the other two on the 17th.



Path of the Nappanee, Indiana tornado on October 16, 1988 with damaged structures and photo locations indicated. The path width is drawn slightly larger than scale to accommodate structures which are also not to scale. ---Mapping from a survey conducted by Tim McClung and Monty Wheeler, NWSO at South Bend, Indiana and Ron W. Przybylinski, NWSFO at Indianapolis, Indiana.



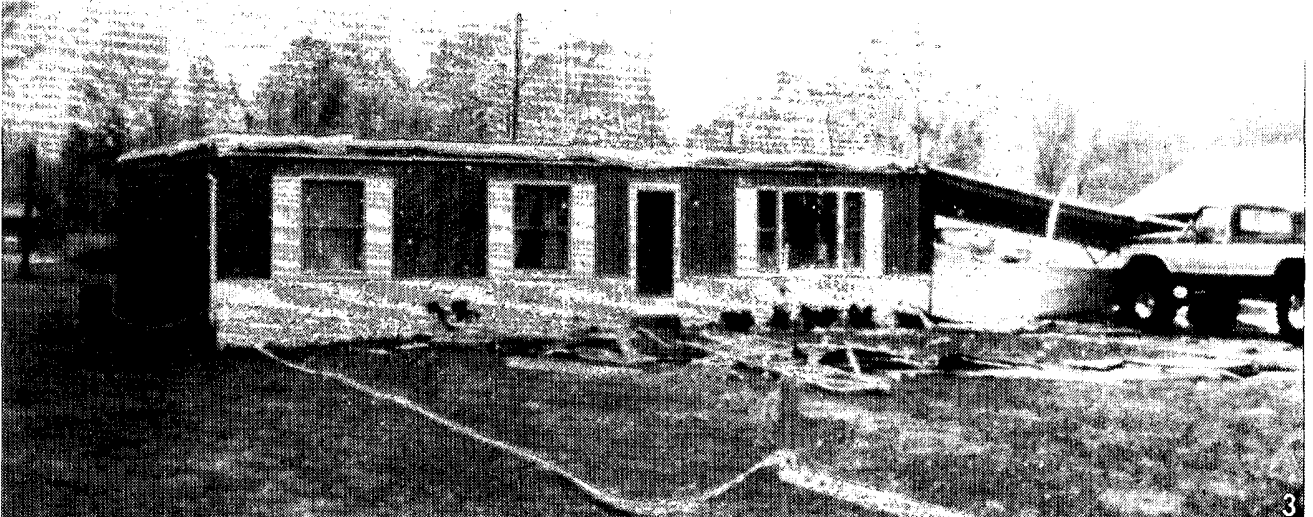
A GOES 6 satellite, infrared image shows the culprit, tornado-producing thunderstorm in north-central Indiana at 1830 EST on October 16th, just as the tornado was making its way through the Tecumseh subdivision north of Nappanee. ---Photo from NESDIS, Washington, D.C.



On the north edge of the Tecumseh subdivision, this house suffered a collapsed garage and the loss of its roof. As with all the damage photos, the location and direction of view are indicated by the photo's number in the above map.



2



3

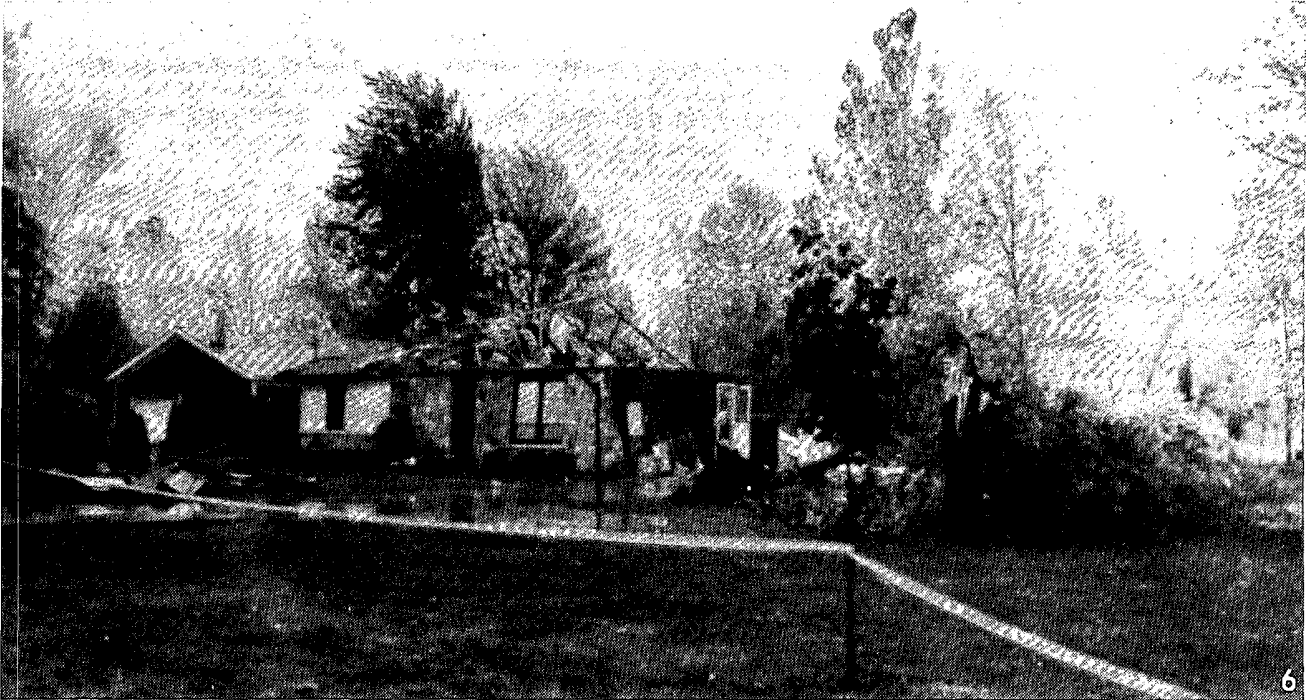
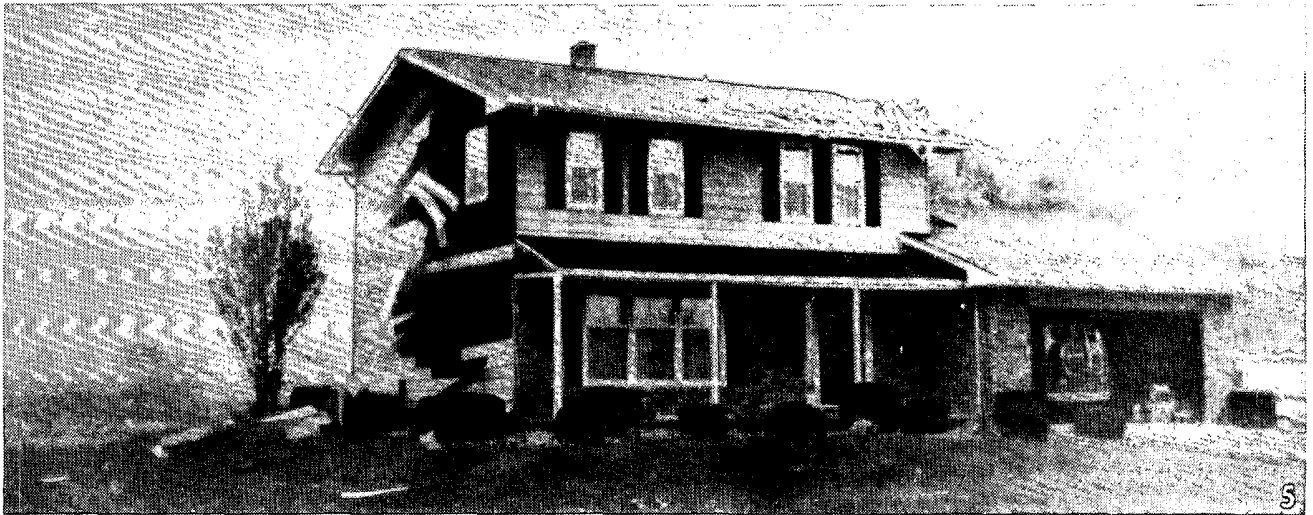
Southwest (top) and northwest views of a home on Montezuma Drive in the Tecumseh subdivision show it to have lost its roof which was completely dismantled, the pieces being scattered several hundred yards to the northeast. As the home suffered damage of a much greater degree than surrounding homes of the same construction, it is probable that it was struck by a suction vortex within the wall of the parent tornado.



4

A destroyed barn along County Road 50 between County Roads 7 and 9 is in the process of being cleaned up, while repairs are being made to a nearby barn and house that were damaged.





As was determined from the pattern and intensity of their damage, the two homes above, located side by side along the south side of County Road 48 between County Roads 9 and 11, were probably struck by a suction vortex that came at them from the northwest as it spun around the backside of the parent tornado. The westernmost home, viewed toward the southwest at top, received roof and siding damage as it was most likely clipped by the vortex, while the other home, viewed toward the southeast, had extensive damage done to its west half, on which the vortex would have scored a direct hit.



A northeast view of the southwest corner of the house in above photo 6.

---All damage photos on pages 11 through 13 by Ron W. Przybylinski, NWSFO at Indianapolis, Indiana.

# STORM DATA AND UNUSUAL WEATHER PHENOMENA

OCTOBER 1988

PLACE	DATE	TIME - LOCAL STANDARD	LENGTH OF PATH (MILES)	WIDTH OF PATH (YARDS)	NO. OF PERSONS		ESTIMATED <sup>1</sup> DAMAGE		CHARACTER OF STORM
					KILLED	INJURED	PROPERTY	CROPS	
<b>1 ALABAMA</b> ————— NONE REPORTED									
<b>2 ARIZONA</b>									
Pinal Co. Eloy	10	0900MST			0	0	0	4	Hail
Many cotton fields were damaged by large hail and rain during the morning. Strong winds blew many cotton bolls away.									
Maricopa Co. Phoenix	10	2000MST			0	0	4	0	Lightning
A short-lived thunderstorm caused locally heavy rains and flooded streets, downed several power lines, and left about 5,000 homes without electricity. Lightning started a fire at a house in central Phoenix, and started fires in palm trees.									
Maricopa Co. Phoenix area	14	0858MST			0	3	6	6	Hail(1.0) Lightning Thunderstorm wind
A low pressure system in Southern California spread moisture rapidly eastward and northward into Arizona. Thunderstorms formed during the early morning and moved northeast at about 35 mph. Hail and lightning damaged homes, automobiles, and at least one aircraft at the airport. The Red Cross reported 7 single family dwellings with major damage, 11 with minor damage. About 30 apartments were damaged. Lightning struck a car dealership on E. Camelback, 3 persons received minor shocks and were treated at a nearby hospital. Widespread urban flooding lasted well into the afternoon, forcing the closure of a few ramps to I-17. Power outages affected some 25,000 customers. Cotton fields and other crops sustained widespread losses.									
Maricopa Co. East Mesa	14	1130MST			0	0	6	0	Thunderstorm wind
Many mobile homes and travel trailers were damaged by high winds estimated to be at least 70 mph. The greatest damage was at the Valle Del Oro Trailer Park near Ellsworth and Baseline. The Monte Vista Mobile Home Park also was hit hard by winds and rain. Not a single injury was reported with this storm! In all, about 487 homes or trailers had at least minor damage.									
Cochise Co. Benson	14	1800MST			1	0	0	0	Lightning
A woman was struck and killed in an open field by lightning. (F430)									
Cochise Co. Bisbee	16	1830MST			0	1	5	2	Hail(2.0) Thunderstorm wind
Strong thunderstorms formed around a low pressure system in northern Baja California. In just 30 minutes, Bisbee received large hail and estimated winds up to 60 mph in the Warren neighborhood. The Bisbee High School had about 180 skylight panes destroyed. One resident suffered bruises and lacerations from large hail. Windshields shattered. Some paint was stripped off and shingles damaged on some houses. Considerable tree damage was reported. Most of the hail was one inch in diameter.									
Pima Co. Tucson	19- 20	2324MST			0	0	4	0	Lightning
Lightning struck two homes late Wednesday and early Thursday. The first started a fire in a living room of an apartment on W. President St. at 11:24 pm. Damage to the apartment was \$8,000 and the resident, a 79 year-old woman was treated for smoke inhalation and released. The second lightning-sparked fire at about midnight caused about \$35,000 in damage to a home on E. Calle Maria. The residents escaped uninjured. Minor flooding was also reported with several streets and intersections closed. Two stalled vehicles were towed from the Rillito River.									
<b>3 ARKANSAS</b> ————— NONE REPORTED									
<b>4 CALIFORNIA, Northern</b> ————— NONE REPORTED									
<b>4 CALIFORNIA, Southern</b> ————— NONE REPORTED									
<b>5 COLORADO</b>									
Larimer County: Fort Collins	5	1500 MST			0	0	3	0	Lightning Lightning caused minor damage to a dormitory on the Colorado State University campus at Fort Collins.
Routt County: Steamboat Springs	8	1405MST			0	0	0	0	Hail (0.75)
Boulder County: Boulder	17	0210MST			0	0	3	0	High winds A gust of 62 mph was recorded in east-central Boulder. The winds in the area caused a few brief power outages. An old smoldering brush fire in the hills west of town was reignited by the gusts.
Clear Creek Cy: Mount Evans	17	0212MST			0	0	0	0	High winds A gust of 112 mph was measured on the summit of Mount Evans, over 14000 feet above sea level.
Otero County: La Junta	19	1530MST			0	0	0	0	High winds A gust of 63 mph was noted at La Junta.
<b>6 CONNECTICUT</b>									
CT2005-006 Coastal area	22	0000- 0700EST			0	0	5	0	High Winds
Gale force, east and southeast winds gusting up to 50 to 60 mph combined with a high tide to rip a number of small boats from their moorings at scattered locations along the coast. Some boats were beached and others landed on rocky shores. There was no estimate as to damage to the small craft. Scattered power outages affected several thousand electric customers. A number of shoreline roads were flooded around the time of high tide.									
<b>7 DELAWARE</b> ————— NONE REPORTED									
<b>8 FLORIDA</b>									
Bay Co., Bayou George	03	0430CST	1.0	30	0	0	4	0	Tornado (F0)
A tornado moved a mobile home 5 feet off of its foundation and also damaged the roof. A fence was blown over and two sheds were destroyed and a grocery store roof was damaged.									
Leon Co., Tallahassee	03	0830EST			0	0	2	0	TSTM wind (55)
High wind blew over a tree onto a house, causing minor roof damage.									
Dixie Co., Cross City	03	1155EST			0	0	4	0	TSTM wind (55)
High wind blew the roof off of a mobile home and onto a car. Trees and power lines were downed.									
<b>9 GEORGIA</b>									
Glynn County, 2N Saint Simons Island	03	1308EST			0	0	4	0	TSTM Winds
Thunderstorm winds downed or snapped off 15 to 18 trees and tree limbs punched holes in the roofs of five homes. The entrance to one home collapsed under a falling tree.									

# STORM DATA AND UNUSUAL WEATHER PHENOMENA

OCTOBER 1988

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	
<b>10 IDAHO</b>									
Statewide	1-31				0	0	6	6	DROUGHT
	<p>Most of Idaho experienced severe to extreme drought conditions during October. No rain was received in most of the Snake River Valley of southern Idaho. This is the only October in this century that Boise received not even a trace of rainfall. This is the second consecutive October without measurable rainfall for some locations in southern Idaho. The lack of rainfall was associated with warmer than normal temperatures. October 1988 had the warmest average temperature on record at Boise, and the average temperature at Pocatello was exceeded only by that of October 1933 by three-tenths of a degree.</p> <p>Large fires burning in the mountains and wilderness areas of Idaho at the beginning of the month were still burning at the end of the month. Some of these fires were the 40,000 acre Battleaxe in the Challis National Forest, the 20,000 acre Ladder and the 44,000 acre Moose Creek Complex in the Nez Perce National Forest, and the 69,000 acre Silver Fire in the Payette National Forest. Portions of these fires were allowed to burn naturally.</p>								
<b>11 ILLINOIS</b>									
Peoria and Woodford Counties	17 0745-0900CST				0	1	5	0	Tstm. winds (55)
	<p>Very strong thunderstorm downburst winds caused extensive damage roughly along a path from Princeville, Dunlap, Alta, North Peoria, Mossville, Spring Bay, Germantown Hills and to Metamora. High winds damaged roofs, uprooted trees and downed power lines. Roof damage occurred to the Mossville Grade School and to the Caterpillar Plant in Mossville. A section of roof was blown off at the Dunlap High School. A mobile home was destroyed several miles west of Metamora. A 12 foot by 12 foot plate glass window was shattered by high winds in Metamora. Some homes in the north part of Peoria were damaged by fallen trees and many utility wires in the area were blown down. A few silos and barns were badly damaged in rural areas along the storm's path. Peoria county's ESDA office recorded wind gusts to 63 mph.</p>								
Colfax, McLean Co.	17 1015CST				0	0	5	0	Hail (2.0)
	<p>Hail 1.5 to 2.0 inches in diameter pelted an area that was 1 and 3/4 miles wide and stretched 7 miles long and extended just to the north of Colfax. The large hail broke windows and put some holes in roofs of homes in the area.</p>								
Gillespie and Benid, Macoupin Co.	17 1100CST				0	0	4	0	Tstm. winds
	<p>Nine power line poles were snapped by very high thunderstorm winds along a two mile stretch of Route 4 between Gillespie and Benid. Some buildings and roofs in Gillespie were damaged. The Gillespie High School football field press box was destroyed by high winds.</p>								
Cook, DuPage, Lake, & Will Counties	17 1200-1615CST				0	1	?	0	Tstm. winds, Heavy rain, Lightning
	<p>Heavy rains of between 1.5 and 3.5 inches fell over the Chicago metropolitan area and surrounding suburbs. The rains triggered numerous traffic accidents and caused some flooding of streets, underpasses and to home basements. The weather station at O'Hare International Airport, Chicago's official station, recorded 3.61 inches of rain on the 17th of the month. (3.19 inches fell in a 4 hour period between noon and 400 pm est. ) Lightning strikes caused many short duration power outages across the region. A couple of house fires were reportedly started by lightning. 4 persons were jolted by lightning while standing near a concourse at O'Hare Airport. One person was treated at a hospital and released and the three other persons declined treatment.</p>								
<b>12 INDIANA</b>									
St. Joseph County, South Bend	9 1345 EST				0	0	5	?	Lightning
	<p>A lightning strike from a lone thundershower struck Castle Point Apartments, causing an estimated \$150,000 damage.</p>								
St. Joseph County, North Liberty Lakeville	16 1745 EST 16 1815 EST				0	0	?	?	Hail (0.75) Hail (1.75)
Elkhart County, IN Nappanee	16 1823 to 16 1925 EST 6	400	0	0	6	?			Tornado (F2)
	<p>A tornado touched down near SR 19 and CR 150, 1.5 miles north of Nappanee, Indiana. The tornado moved in an east-northeast direction about 6 miles. The last observed damage was 0.2 miles north of CR 46 on CR 17. A total of 21 homes and several barns sustained varying degrees of damage.</p>								
<b>INDIANA</b>									
Noble County, Wolcottville	16 1930 EST				0	0	0	0	Hail (0.75)
Tiptecanoe County, Montmorencie	17 1420 EST				0	0	0	0	Hail (1.0)
Laporte County, Hudson Lake	17 1605 EST				0	0	?	?	Tstm. Wind
St. Joseph County, New Carlisle	17 1605 EST				0	0	?	?	Tstm. Wind
	<p>Several trees and power lines were downed along the Laporte-St. Joseph county line just west of New Carlisle.</p>								
St. Joseph County, South Bend	17 1645 EST				0	0	?	?	Tstm. Wind
	<p>Large tree limbs were downed on the east side of South Bend.</p>								
Laporte County, St. Joseph County, Elkhart County	1730 to 17 2100 EST				0	0	?	?	Flash Flooding
	<p>A bridge was washed out on Lake Shore Drive in Michigan City. A car was swept off Kern Road 2 miles south of Mishawaka. Numerous city streets, intersections, and underpasses were flooded with up to 2 feet of water. Many basements flooded. Small streams and drainage ditches were reported flooded throughout the area.</p>								
Vigo County, Libertyville to Vermillion County, Clinton	17 2055 to 2120 EST	5.5	60		0	4	5	?	Tornado (F2)
	<p>A tornado touched down at Libertyville in extreme northwest Vigo County around 2055 EST. It did damage to a dozen homes and a church. One mobile home, several storage sheds, and several garages were destroyed. Two or three high voltage towers on the southwest corner of the town were twisted to destruction. Two people were injured, one in a mobile home and the other in a house.</p> <p>The tornado was of F2 intensity with an average path width of 60 yards, although in places it was as wide as 200 yards. Its path was 5 1/2 miles long.</p> <p>The tornado moved northeast out of Vigo County, and the next damage observed was in southern Vermillion County. Just north of Universal a mobile home was blown 50 feet and destroyed. Two injuries occurred when a man and his wife were tossed from the demolished trailer. Numerous trees were snapped off and one tree was uprooted. In this area the tornado was 50 to 100 yards wide.</p> <p>The next damage was found two miles northeast of the mobile home. Minor damage (F0) included a small travel trailer overturned, a trailer part blown against a house, and some tree limbs downed. The damage was just east of S.R. 63 and just south of S.R. 163 on the west side of Clinton. The width of the tornado had decreased to 25 yards.</p>								
Allen County, Fort Wayne	2130 to 17 2330 EST				0	0	5	0	Flash Flood
	<p>Rainfall in excess of 4 inches in a 3-hour period produced flooding of roadways and small streams on the north side of Fort Wayne and in northern Allen County. Cars were reported floating at several locations on the north side of Fort Wayne and many were reported stalled due to high water. Water damage occurred at several businesses on the north side of the city.</p>								
Putnam County, W Bainbridge	2145 to 17 2200 EST 3.5 30				0	0	5	?	Tornado (F1)
	<p>A small tornado touched down near U.S. 231 and U.S. 36 in north-central Putnam County. Trees were snapped off and minor damage was done to a house. The tornado continued east to west of Bainbridge. A mile west of town the storm did some structural damage to several outbuildings. A boat, a camper shell, and a porch swing were blown into a field. The roof of a barn was blown off.</p>								
Allen County, 105W Fort Wayne	17 2203 EST				0	0	0	0	Tstm. Wind
	<p>The Indiana State Police reported 60 mph winds 10 miles southwest of Fort Wayne.</p>								
Hendricks County, 1SE Plainfield	17 2210 EST 0.5 100				0	0	5	?	Tornado (F2)
	<p>A tornado touched down in southeast Hendricks County, along Six Points Road about a mile south of U.S. 40. The tornado destroyed a barn and uprooted a large tree one mile south of U.S. 40. It continued northeast about a half mile, snapping off trees and producing light to moderate damage to two homes. The tornado then crossed a field, twisting off 3-inch diameter tree limbs.</p>								

# STORM DATA AND UNUSUAL WEATHER PHENOMENA

OCTOBER 1988

PLACE	DATE	TIME - LOCAL STANDARD	LENGTH OF PATH (MILES)	WIDTH OF PATH (YARDS)	NO. OF PERSONS		ESTIMATED <sup>1</sup> DAMAGE		CHARACTER OF STORM
					KILLED	INJURED	PROPERTY	CROPS	
<b>INDIANA</b>									
Marion County, Indianapolis	17	2225 EST			0	0	0	0	Tstm.Wind
Beech Grove	17	2245 EST			0	0	0	0	Tstm.Wind
High winds blew a car off the road on the west side of Indianapolis and downed trees in Beech Grove near the southeast side of the city.									
Fayette County, Connersville	18	0005 EST			0	1	6	0	Tstm.Wind
High winds blew down a wall at the Ford Electrical Plant in Connersville. The wall was 30 feet high and 200 feet long. One employee was injured. The damage was estimated at \$2-3 million.									
<b>13 IOWA</b>									
SDZ018-IAZ001-004-005-006-007-009-010-011-012-013-014-NEZ010	23	1000 to 1800 CST			0	0	5	0	High Winds
Much of Iowa Strong northwest winds blew across much of Iowa. Damage was minor with mostly tree limb damage and scattered power outages reported. Winds gusted to around 50 MPH. The top of a silo was blown off east of Fayette.									
IAZ001-002-004-005-006-007-009-010-011-012-013-014-NEZ010-SDZ018	27	0800 to 2400 CST			0	0	5	0	High Winds
Much of Iowa A strong frontal system moved through the state. Behind it, strong northwest winds of 40 to 55 MPH were common. The strongest gust was at Carroll, where a wind gust of 68 MPH occurred during the morning. Damage was limited to tree limbs and power outages.									
<b>14 KANSAS</b>									
Stafford Co. St. John	13	1500CST			0	0	2	0	TSTM Wind
Widely scattered thunderstorms developed ahead of a cold front during the afternoon hours across central Kansas. Strong winds from one of the thunderstorms blew down a tree that landed on top of a camper in St. John. Only minor damage was reported.									
Labette Co. Altamont	15	2350CST			0	0	6	0	Hail (1.75)
An isolated severe thunderstorm produced large hail, up to golfball size, as it moved across the town of Altamont in far southeast Kansas. The hail caused widespread property damage to automobiles and to roofs and windows of homes in the area. Damage from the hailstorm totaled nearly one million dollars.									
<b>15 KENTUCKY</b>									
Hardin Co.	17	2244EST			0	0	0	0	Thunderstorms Wind
Winds gusting to 67 miles an hour were reported with a strong thunderstorm as it passed through Fort Knox.									
<b>16 LOUISIANA</b>									
Tangipahoa Parish, Amite	01	0730CST			0	1	0	0	Lightning
A man suffered minor injuries when lightning struck a building he was standing near.									
Lafayette Parish, Scott	02	0350CST	Short 25		0	0	3	0	Tornado (F0)
A tornado was sighted touching down near Scott. Several large signs and tree limbs were blown down.									
DeSoto Parish, Logansport	02	1128CST			0	0	?	?	Hail (1.00)
Evelyn	02	1215CST			0	0	?	?	Hail (0.88)
Washington Parish, 8 N Franklinton	02	1945CST			0	0	?	?	TSTM Wind
Several trees were blown down along Louisiana Highway 25.									
Ouachita Parish, 10 SE Monroe	23	1500CST			0	1	4	?	TSTM Wind
Richland Parish, Atto	23	1530CST			0	0	?	?	Hail (1.00)
Franklin Parish, Baskin	23	1540CST			0	0	?	?	Hail (1.00)
Severe thunderstorms developed over northeast Louisiana at mid afternoon and moved east producing a few reports of large hail and strong wind gusts. Near Monroe, thunderstorm wind gusts rolled a mobile home 40 yards from its foundation and knocked another mobile home off its foundation. An elderly woman suffered minor injuries.									
Caddo Parish, Blanchard	26	0200CST			0	0	?	?	Hail (1.00)
Bossier Parish, 5 E Bossier City	26	0230CST			0	0	?	?	Hail (0.75)
Caddo Parish, Keithville	26	0240CST			0	0	?	?	Hail (0.75)
DeSoto Parish, 2 N Grand Cane	26	0250CST			0	0	?	?	Hail (1.75)
Evelyn	26	0255CST			0	0	?	?	Hail (0.75)
Red River Parish, 7 N Coushatta	26	0326CST			0	0	?	?	TSTM Wind
Natchitoches Parish, 5 W Natchitoches	26	0420CST			0	0	?	?	Hail (0.75)
Winn Parish, 5 SW Atlanta	26	0420CST			0	0	?	?	Hail (0.75)
Natchitoches Parish, Provençal	26	0610CST			0	0	?	?	Hail (1.75)
Gorum	26	0615CST			0	0	?	?	Hail (1.75)
A line of severe thunderstorms moved across northwest Louisiana in advance of a cold front. Strong wind gusts and scattered reports of large hail were reported with the passage of the thunderstorms. Near Coushatta, thunderstorm wind gusts blew trees down along U.S. Highway 71. A short time later an automobile crashed into the fallen trees fatally injuring the driver.									
Calcasieu Parish, Sulphur	26	1030CST	1.0 30		0	0	3	?	Tornado (F1)
1 SW Lake Charles	26	1100CST	0.3 20		0	0	?	?	Tornado (F0)
Acadia Parish, 5 N Crowley	26	1113CST	0.5 40		0	0	4	?	Tornado (F1)
Crowley	26	1140CST			0	0	4	?	TSTM Wind
Jefferson Davis Parish, Roanoke	26	1130CST	0.5 40		0	0	4	?	Tornado (F1)
Jennings	26	1130CST			0	0	3	?	TSTM Wind (60)
Cameron Parish, Cameron	26	1150CST			0	0	?	0	TSTM Wind (50)
Iberia Parish, New Iberia	26	1215CST			0	0	4	?	TSTM Wind
St. Martin Parish, 3 S St. Martinville	26	1300CST	0.3 30		0	0	4	?	Tornado (F0)
An area of severe thunderstorms moved eastward across southwest and south-central Louisiana in advance of a cold front. The thunderstorms spawned several tornadoes and produced damaging winds. At Sulphur, a tornado skipped along an intermittent path, moving a small building off its foundation and downing trees in a park. A tornado touched down north of Crowley damaging a bridge and downing trees, and near Roanoke, a tornado ripped the roof off a garage and toppled several telephone poles. A tornado near St. Martinville, knocked down several trees and destroyed a farm building. Thunderstorm wind gusts damaged the roof of a large store in Crowley, and thunderstorm wind gusts damaged signs and trees in Jennings as winds were clocked at 75 mph (60 knots). In New Iberia, thunderstorm wind gusts blew down several trees and ripped numerous large branches from trees.									



# STORM DATA AND UNUSUAL WEATHER PHENOMENA

OCTOBER 1988

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					KILLED	INJURED	PROPERTY	CROPS	KILLED	INJURED	PROPERTY	CROPS	

## 17 MAINE

York County, Ogunquit and York 08-09 3 0 0 0 Heavy Surf/Waves  
 Heavy surf which resulted from a large storm over the area swept three people off shoreline rocks and into the ocean.

MEZALL Statewide 08-09 0 4 0 0 Snow  
 Snow occurring over the state was mostly on the light side, but some heavier amounts were recorded in eastern Maine. Some minor car accidents that were reported resulted in four persons being sent to the local hospital in Wesley in eastern Maine. No report as to the extent of the injuries was received. Spotty power outages with up to 10,000 customers affected were reported.

Following is a list of snow amounts in inches and by zone:

Zone 001 Caribou 1	Zone 006 Gulfport 2
Zone 002 Houlton 1	Zone 007 Bangor 2
Zone 003 Charlotte 6	Zone 009 Eustis 3
Zone 004 Eastport 1	Arcadia N.P. 3
Machias 1	

MEZ004-008-011-014 Downeast - Southwest Coast 22 0 0 6 0 High Wind / Waves  
 High winds and waves resulting from an ocean storm sent numerous boats aground or to the bottom. The largest were two lobster boats of 38 and 42 feet in length. They were located just off of Rockland where there were winds of 40 to 50 mph and seas of 15 to 25 feet (Zone 011). At least ten sailing boats of 30 to 40 feet in length sank in the coastal waters from Portland to Bar Harbor/Southwest Harbor and to Eastport. Winds of 90 mph were registered at Southwest Harbor (Zone 008), and 40 to 50 mph winds were registered at Eastport (Zone 004). Numerous reports of winds in the 40 to 75 mph range were received from along the coast as the storm moved northeast to the east of Nova Scotia.

## 18 MARYLAND and D.C. — NONE REPORTED

## 19 MASSACHUSETTS

MA2002-003-007-008-009 22 0100-0900EST 0 0 6 0 High Winds  
 Gale force, east and southeast winds gusting up to 50 to 70 mph during the early morning hours raised havoc with many small craft moored in harbors along the coast. Marblehead, Duxbury, Plymouth and Marion harbors were hardest hit. Numerous boats were sunk, beached or driven onto rocks. As many as twenty craft were driven ashore in Marblehead, fifteen in Duxbury, and two dozen in Plymouth. Along the south coast from Falmouth to New Bedford there were similar scenes. Inland, falling tree limbs and a few falling trees damaged autos and a few houses. Scattered power outages also occurred. Peak wind gusts were recorded up to 54 mph at Boston and estimated up to 70 mph in the Plymouth and Duxbury area. Damage to pleasure craft was estimated at more than one million dollars.

## 20 MICHIGAN

Oakland and Macomb Counties; Royal Oak, Roseville, East Detroit, Sterling Heights, Rochester and Shelby 10 afternoon 0 0 3 Thunderstorm Wind  
 Eight trees and several power lines were blown down.

## MICHIGAN

Kent County, Grandville	16 1735EST	0 0 0	Hail (1.00)
Ottawa County, Hudsonville	16 1735EST	0 0 0	Hail (1.00)
Cass County, Marcellus and Glenwood	16 1845EST	0 0 0	Hail (1.75)
St. Joseph County, Mottville	16 1845EST	0 0 0	Hail (1.75)
	16 1845EST	0 0 0	Thunderstorm Wind
			Large trees were blown down.
Berrien County, New Buffalo	17 1528EST	0 0 0	Thunderstorm Wind
			Many trees and power lines were blown down. Gusts were estimated at 60 mph.
Berrien County, Three Oaks	17 1600EST	0 0 2	Thunderstorm Wind
			Numerous trees were blown down, several struck houses. Gusts were estimated at over 70 mph.
Berrien, Cass, and St. Joseph Counties	17 1730-2100EST	0 0 3	Flooding
			Roads were washed out in southern Berrien County. Local street flooding occurred throughout the area.
Lake Michigan near North Manitou Island	20 1230EST	0 0 0	Waterspouts
			Boaters reported 8 separate waterspouts.
Lake Michigan, 6-8 miles offshore of Holland	20 1340EST	0 0 0	Waterspouts
			Boaters reported several waterspouts.

## 21 MINNESOTA — NONE REPORTED

## 22 MISSISSIPPI

Amite County, 15NE Liberty	02 1815CST	0 0 4 0	Thunderstorm Winds
			Numerous trees and power lines were blown down in northeastern Amite County. Several roofs in the area were damaged.
Amite County, 7E Liberty	02 1830CST 1.0 60	0 0 4 0	Tornado (F1)
			A tornado went through the Glading Community in eastern Amite County. A roof was blown off one home, and numerous trees were blown down.
Pike County, McComb	02 1830CST	0 0 4 0	Thunderstorm Winds
			Scattered trees were blown down across McComb.
Pike County, Fernwood	02 1845CST	0 1 5 0	Thunderstorm Winds
			Numerous trees and power lines were blown down in Fernwood. Several homes were damaged by fallen trees and a couple of mobile homes were overturned. A man was injured when a tree fell in front of his car and he drove into it.
Walthall County, 5E Tylertown	02 1910CST	0 0 4 0	Thunderstorm Winds
			Several trees and power lines were blown down in southwestern Walthall County.

# STORM DATA AND UNUSUAL WEATHER PHENOMENA

OCTOBER 1988

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					KILLED	INJURED	PROPERTY	CROPS																	
<b>23 MISSOURI</b>																									
Cooper County, Clifton City	17	1635CST			0	0	0	0	Hail (0.75)																
Moniteau County, California	17	1706CST			0	0	2	0	TSTM Wind (66) Winds up to 77 mph were observed.																
Cole County, Jefferson City	17	1740CST			0	0	3	0	TSTM Wind Winds downed large trees and left some trees leaning over.																
Callaway County, Jefferson City	17	1745CST			0	0	2	0	TSTM Wind Large tree limbs were downed at the Jefferson City Airport.																
St. Francois County, 1 S Bonne Terre	17	2015CST			0	0	0	0	Hail (1.00)																
<b>24 MONTANA</b>																									
Ravalli County, Hamilton	16	1430 MST	?		0	0	2	0	Tornado (F0) A small tornado set down in Hamilton and destroyed a carport in Harbeson Trailer Court.																
MTZ003-007	21	2230 MST			0	0	0	0	High Wind (54)																
MTZ003	27	0500 MST			0	0	0	0	Heavy Snow Six inches of snow accumulated at Cut Bank as did four inches at Great Falls.																
<b>25 NEBRASKA</b> — NONE REPORTED																									
<b>26 NEVADA</b>																									
Lincoln County	06	1305PST	3.0	10	0	0	0	0	Tornado (F0)  A helicopter pilot sighted a tornado 75 miles east-southeast of Tonopah, NV, near the Worthington Mountain Range. The tornado was on the ground for approximately 12 minutes. Several people in the town of Rachel also spotted a tornado.																
<b>27 NEW HAMPSHIRE</b>																									
NH2005-006-007 Southern Interior-Coastal	08-09				0	0	0	0	Snow  Snow mixed with rain occurred late on the 8th and continued into early on the 9th. The storm center was well south of the state, thus snowfall was generally light. Only one incident was noted during this period of snow, near the 5500 foot level on Mount Washington, three totally unprepared men were stranded overnight due to snow drifts and poor visibility.  Following is a list of snow amounts in inches and by zone: <table style="margin-left: 20px; border: none;"> <tr> <td><u>Zone 005</u></td> <td><u>Zone 006</u></td> <td><u>Zone 007</u></td> <td></td> </tr> <tr> <td>Dublin 2</td> <td>Monadnock 3</td> <td>Portsmouth 1/2</td> <td></td> </tr> <tr> <td>Rindge 2</td> <td>Durham 1</td> <td></td> <td></td> </tr> <tr> <td>Antrim 2</td> <td>Temple Mtn. 4</td> <td></td> <td></td> </tr> </table>	<u>Zone 005</u>	<u>Zone 006</u>	<u>Zone 007</u>		Dublin 2	Monadnock 3	Portsmouth 1/2		Rindge 2	Durham 1			Antrim 2	Temple Mtn. 4		
<u>Zone 005</u>	<u>Zone 006</u>	<u>Zone 007</u>																							
Dublin 2	Monadnock 3	Portsmouth 1/2																							
Rindge 2	Durham 1																								
Antrim 2	Temple Mtn. 4																								
NH2005-006-007 Southern Interior-Coastal	22				0	2	4	0	High Wind, Heavy Rain  A strong ocean storm moved from the Delaware coast northeast to east of Nova Scotia, Canada, and affected southern and coastal areas with strong winds and heavy rain. As this was the foliage season, large numbers of people were in the area to view the changes, but most missed the opportunity as the trees in many areas were stripped of the bright foliage by the gusty winds and rain. Power outages occurred throughout the affected zones and some store front windows were blown out. Numerous reports of downed trees came from Keene, Laconia and Lebanon. Along the coast, boats were torn from their moorings, utility poles snapped near Durham, and two injuries from a car rollover on Interstate 95 near Portsmouth were reported. Wind gusts of 38 mph at Concord, 39 mph at Portsmouth, and 60 mph at Isle of Shoals were recorded. Rainfall amounts of around one inch were common, but Portsmouth recorded 1.74 inches for the period of the storm.																
<b>28 NEW JERSEY, Northern</b> — NONE REPORTED																									
<b>28 NEW JERSEY, Southern</b> — NONE REPORTED																									
<b>29 NEW MEXICO</b> — NONE REPORTED																									
<b>30 NEW YORK, Coastal</b> — NONE REPORTED																									
<b>30 NEW YORK, Central</b>																									
Herkimer Co.	18	0925est			0	3	4	0	Rain																
Herkimer	18	0930est			0	3	4	3	Tstm.Wind																
Oneida Co.	18	0933est			0	1	4	4	Tstm.Wind																
Madison Co.	18	1125est			0	0	5	0	Tstm.Wind																
Franklin Co.																									
									Strong winds and heavy rain blew down power lines and large trees. Several trees fell on cars, resulting in injuries. A rain-slick portion of the Thruway caused a tractor-trailer to jackknife which resulted in three injuries.																
Area-wide	22	0700est			0	26	6	4	Snow																
St. Lawrence Co.	22	0830est			1	4	5	0	Snow																
Dekalb	22	1005est			1	5	5	0	Snow																
Madison Co.	22	1450est			1	0	4	4	Snow																
Hamilton																									
Otsego Co.																									
Franklin Co.																									
									Snow fell over all of Eastern New York. One male died of a heart attack, after a car accident. One male and one female also died in separate car accidents. Power lines were downed in many areas of eastern New York State.																
									M-73-V Town of Otsego M-7-V Village of Hamilton F-21-V Town of Dekalb																
<b>30 NEW YORK, Western</b>																									
Niagara County	10	1630 EST			0	0	4	0	Lightning																
Lockport	10	1730 EST			0	0	3	0	Lightning																
Hartland									Lightning bolts bore 3-foot holes through an apartment wall in Lockport and ignited a barn in Hartland.																
Erie County	18	0400 EST			0	0	4	0	High Winds (53)																
Buffalo Area	18	0415 EST			0	0	4	0	High Winds (53)																
Niagara County	18	0415 EST			0	0	4	0	High Winds																
Lewiston																									
N. Tonawanda & Town of Tonawanda	18	0430 EST			0	0	4	0	High Winds																
Cambria	18	0430 EST			0	0	4	0	High Winds																
Lockport	18	0430 EST			0	0	4	0	High Winds																
Chautauqua County	18	Morning			0	0	3	0	Lightning																
Stockton	18	0815 EST			0	0	4	0	Flash Flood																
Sherman		to 1000 EST																							
Cattaraugus County	18	Morning			0	0	4	0	High Winds																
Ashford, Ellipticville, & Salamanca									A cold front with gale-force winds toppled trees and power lines.  Heavy rains (3.5 ins.) that occurred in about 3 hours caused French Creek in Chautauqua County to flood a few roads, basements, and backyards. Pendergast and Bemus creeks, also in Chautauqua County reportedly caused some problems.																

# STORM DATA AND UNUSUAL WEATHER PHENOMENA

OCTOBER 1988

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	PROPERTY	CROPS	
<b>NEW YORK, Western</b>											
Tompkins County Ithaca	22	Morning			0	0	4	0	Snow		
Schuyler County Watkins Glen	22	Morning			0	0	4	0	Snow		
Steuben County Some portions	22	Morning			0	0	3	0	Snow		
	From six to 10 inches of snow fell during the early morning hours. Tree limbs and power lines were downed.										
Erie County Colden	26	Morning			0	0	3	0	Snow		
Chautauqua County Sherman	26	Morning			0	0	3	0	Snow		
	Up to a foot of snow fell during the early morning hours over portions of Colden. Sherman reported 7 inches.										
<b>31 NORTH CAROLINA</b>											
Wake Co.					0	0	0	0	Record Cold		
	October was the coldest on record at the Raleigh-Durham International Airport. The average temperature for the month was 54.4 degrees. The old record was 54.6 degrees in 1987.										
Lincoln Co. 10 W Lincolnton	02	1215EST	0.5	60	0	0	3	0	Tornado (F0)		
	A small tornado touched down briefly about 10 miles west of Lincolnton. An eyewitness saw the tornado as it destroyed a shed and snapped off the tops of trees.										
Pasquotank Co. 3 N Nixonton	21	1700EST			0	0	?	0	TSTM Winds		
Dare Co. Stumpy Point	21	1745EST			0	0	4	0	TSTM Winds		
	Severe thunderstorm winds blew down about 30 trees just north of Nixonton. Trees were reported down in other isolated parts of Pasquotank County. In Stumpy Point trees were blown down, a shed was destroyed, several roofs were damaged, and a mobile home was moved from its foundation.										
Nash Co. Nashville	22	1330EST			0	0	4	0	Lightning		
	Lightning struck a church, setting fire to the church steeple and exterior.										
<b>32 NORTH DAKOTA — NONE REPORTED</b>											
<b>33 OHIO</b>											
OHZ001-005-008-010 Northwest, Miami Valley, Southwest and West Central	17-18	2200 EST 0100 EST			0	0	5	0	High Wind		
OHZ002-006-011 Central Lakeshore, Central and Central Highlands	18	0000 EST 0200 EST			0	0	5	0	High Wind		
	Winds gusting to between 40 and 52 mph occurred over the western two-thirds of Ohio. Trees, branches and power lines were blown down. Many houses, vehicles and buildings were damaged.										
Entire State	Entire Month				0	0	0	0	Drought		
	Drought conditions continued during October across most of Ohio, but some improvement occurred. The state averaged two and fifty-one hundredths (2.51") inches of precipitation, which was 107 percent of normal. The northern third received much above normal precipitation.										
	Rainfall needed to end the long-term drought dropped slightly to between three and one-half to nine and one-half inches. Northwest and South-Central Ohio remained in the Extreme category of the Palmer Drought Severity Index. North-Central and West-Central Ohio improved from the Severe to the Moderate category. Central, Northeast Hills, Southwest and Southeast Ohio remained in the Moderate category, while the Northeast and Central Hills areas were not experiencing long-term drought.										
<b>34 OKLAHOMA</b>											
Grady County, 5 SW Minco	01	1245CST			0	0	?	?	Hail (0.88)		
Grady County, 7 NE Chickasha	01	1328CST			0	0	?	?	Hail (1.00)		
Grady County, 1 SE Chickasha	01	1428CST			0	0	?	?	Hail (0.75)		
Grady County, 18 S Chickasha	01	1430CST			0	0	?	?	Hail (0.75)		
Grady County, 2 NW Bradley	01	1430CST			0	0	?	?	Hail (1.25)		
Jefferson County, Ryan	01	1438CST			0	0	?	?	Hail (1.75)		
Grady County, 5 E Rush Springs	01	1445CST			0	0	?	?	Hail (0.88)		
Grady County, Alex	01	1500CST			0	0	?	?	Hail (1.00)		
Jefferson County, 3 S Oscar	01	1530CST			0	0	?	?	Hail (1.00)		
McClain County, 4 NW Lindsay	01	1530CST			0	0	?	?	Hail (0.75)		
Stephens County, Velma	01	1545CST			0	0	?	?	Hail (1.00)		
Stephens County, 3 NW Alma	01	1600CST			0	0	?	?	Hail (1.00)		
Jeffers n County, 6 N Ringling	01	1615CST			0	0	?	?	Hail (0.75)		
Garvin County, 1 NW Hennepin	01	1730CST			0	0	?	?	Hail (0.88)		
	Severe thunderstorms produced a swath of large hail from southwest of Oklahoma City southward to the Red River.										
Oklahoma County, near Jones	15	1805CST			0	0	?	?	TSTM Wind		
	Large trees were blown down in the Jones area.										
Carter County, 2 S Pooleville	27	1850CST			0	0	?	?	Hail (0.75)		
Murray County, Dougherty	27	1852CST			0	0	?	?	Hail (1.00)		
Johnston County, 3 S Hill Creek	27	1945CST			0	0	?	?	Hail (0.88)		
Love County, 1 W Orr	27	2000CST			0	0	?	?	Hail (1.75)		
Marshall County, 2 NW Madill	27	2023CST			0	0	?	?	Hail (0.75)		
Bryan County, Bryan Co.	27	2100CST			0	0	?	?	Hail (1.00)		
McCurtain County, near Wright City	27	2225CST			0	0	?	?	Hail (1.00)		
McCurtain County, 1 SW Tom	27	2320CST			0	0	?	?	TSTM Wind		
	Severe thunderstorms produced large hail along the Red River Valley from northwest of Ardmore to the Arkansas border.										
<b>35 OREGON</b>											
Statewide	entire month								Drought		
	Portland had its driest October since records began in 1940. Salem had its driest October in 63 years while Eugene had its 3rd driest October. Medford received only 0.12 inches of rain during the month, making this its 5th driest October. The Dalles and Hood River each had only 0.01 inches of rain during the month. Klamath Falls also had only 0.01 inches of rain, making this its 2nd driest October on record. No rainfall was recorded in Harney County at all.										
<b>36 PENNSYLVANIA, Eastern — NONE REPORTED</b>											
<b>36 PENNSYLVANIA, Western</b>											
Butler County, 13 SW Butler	24	0515 EST			0	0	0	0	Thunderstorm Wind		
	Trees were downed in Zelenople due to thunderstorm winds.										

# STORM DATA AND UNUSUAL WEATHER PHENOMENA

OCTOBER 1988

PLACE	DATE	TIME - LOCAL STANDARD	LENGTH OF PATH (MILES)	WIDTH OF PATH (YARDS)	NO. OF PERSONS		ESTIMATED DAMAGE		CHARACTER OF STORM
					KILLED	INURED	PROPERTY	CROPS	
<b>37 RHODE ISLAND</b>									
RIZ002 Coastal areas	22	0000-0800EST			0	0	5	0	High Winds
		Gale force, east and southeast winds gusting up to 60 to 70 mph combined with an incoming and unusually high tide to cause a number of small boats to break from their moorings. The most damage was reported in Wickford Harbor in Narragansett Bay. The damage there, consisting of small craft that were blown onto rocks or sunk, was estimated to be around a half million dollars. Inland, scattered power outages occurred as a result of the high winds.							
<b>38 SOUTH CAROLINA</b> ——— NONE REPORTED									
<b>39 SOUTH DAKOTA</b>									
Pennington Co., Rapid City	22	1147 to 1400 MST			0	0	2	0	High Wind
		High winds occurred in southwestern South Dakota on the 22nd. A peak gust of 59 mph was recorded at Rapid City Regional Airport at 1147 MST. The strong winds downed power lines, causing temporary power outages in a few areas.							
Meade County, BNE Rapid City	26	2255 MST			0	0	0	0	TSTM Wind (S2)
Pennington Co., Rapid City	26	2305 MST			0	0	0	0	High Wind
		A peak wind gust of 67 mph was recorded at Rapid City Regional Airport.							
<b>40 TENNESSEE</b> ——— NONE REPORTED									
<b>41 TEXAS, Northern</b>									
Shelby County Huxley	1	1455CST			0	0	?	?	Hail (1.00)
		Hail up to the size of ice cubes fell near Huxley.							
Montague County: 5 NW Nocona	1	1525CST	Short Narrow		0	0	0	?	Tornado (F0)
5 NW Nocona	1	1525CST			0	0	?	?	Hail (4.50)
Cooke County 4 N Muenster	1	1600CST			0	0	?	?	Hail (0.75)
		An intense thunderstorm produced a brief tornado and softball size hail five miles northwest of Nocona. Smaller hail fell near Muenster.							
Wise County: Park Springs	1	1552CST			0	0	?	?	Funnel Cloud, Hail (2.75), TSTM Wind (S2)
Rhone Boyd	1	1651CST			0	0	0	0	Funnel Cloud
Tarrant County: 4 S Haslet	1	1730CST			0	0	?	?	Hail (1.75)
Saginaw	1	1740CST			0	0	?	?	Hail (1.00)
Wetuga	1	1740CST			0	0	?	?	Hail (1.00)
Dallas County 1 SE Dallas-Fort Worth Airport	1	1752CST			0	0	?	?	Hail (0.88)
Ellis County Palmer	1	1910CST			0	0	?	?	TSTM Wind
Kaufman County 3 SW Kaufman	1	1912CST			0	0	?	?	TSTM Wind
Henderson County Athens	1	2007CST			0	0	?	?	Hail (1.75)
		An intense thunderstorm moved southeastward from northwest Wise County through the Dallas-Fort Worth metroplex to Athens. The storm produced hail up to baseball size and at least two funnel clouds. A downburst produced winds up to 60 miles per hour at Park Springs. Powerlines were downed by downbursts at Palmer and 3 miles southwest of Kaufman.							
<b>TEXAS, Northern</b>									
Hood County 9 SE Granbury	1	1608CST			0	0	?	?	TSTM Wind
Somervell County 3 NW Glen Rose	1	1617CST	Short Narrow		0	0	0	?	Tornado (F0)
Bosque County: Walnut Springs	1	1700CST			0	0	?	?	Hail (0.75)
Morgan	1	1715CST			0	0	?	?	Hail (1.75)
Walnut Springs	1	1725CST			0	0	?	?	Hail (1.75)
4 W Lake Whitney	1	1743CST			0	0	?	?	Hail (0.75)
McLennan County: 1,5 NW Gholson	1	1827CST			0	0	?	?	Hail (1.75)
Riesel	1	1855CST			0	0	?	?	Hail (1.00)
Falls County 4 S Otto	1	1925CST			0	0	?	?	Hail (1.75)
		An intense thunderstorm moved southeastward from eastern Erath County through the Waco area to northern Falls County. Trees were uprooted by a downburst 9 miles southeast of Granbury and a tornado was briefly observed 3 miles north-northwest of Glen Rose. Hail up to golf ball size fell through Bosque, McLennan and Falls counties.							
Coryell County: 4 N Gatesville	1	1752CST			0	0	?	?	Hail (1.75)
5 W McGregor	1	1810CST	Short Narrow		0	0	?	?	Tornado (F1)
Bell County: 4 SW Moody	1	1839CST			0	0	?	?	TSTM Wind (S2)
7 N Temple	1	1859CST	1.0 75		0	0	?	?	Tornado (F1)
1 W Troy	1	1906CST			0	0	?	?	Hail (2.75)
		An intense thunderstorm moved from northern Coryell County southeastward into eastern Bell County. A tornado was observed briefly 5 miles west of McGregor. Another tornado was observed 7 miles north of Temple. A downburst produced winds measured at 60 miles per hour 4 miles southwest of Moody. Hail up to baseball size also fell.							
McLennan County Bellseed	1	1927CST			0	0	?	?	Hail (1.75)
		Golf ball size hail fell at Bellseed.							
Harrison County Darco	1	2150CST			0	0	?	?	Hail (0.88)
Shelby County Shelbyville	1	2242CST			0	0	?	?	Hail (1.00)
Nacogdoches Nacogdoches	1	2245CST			0	0	?	?	Hail (1.00)
		Thunderstorms produced scattered hail in Northeast Texas.							
Throckmorton County 4 S Woodson	25	2200CST			0	0	?	?	Hail (1.75)
Young County: Newcastle	25	2245CST			0	0	?	?	Hail (4.50)
2 NW Newcastle	25	2245CST			0	0	?	?	TSTM Wind
Titus County Mt. Pleasant	25	2300CST			0	0	?	?	Hail (1.00)
Jack County Jacksboro	25	2330CST			0	0	5	?	Hail (4.50)
Marion County 1 S Jefferson	26	0145CST			0	0	?	?	Hail (1.00)
Harrison County 2 NW Karmack	26	0220CST			0	0	?	?	Hail (1.00)
Panola County Gary	26	0225CST			0	0	?	?	Hail (0.75)
Clay County 2 N Bellevue	26	0235CST			0	0	?	?	Hail (0.75)
Montague County Bowie	26	0320CST			0	0	?	?	Hail (1.75)
Upshur County 8 N Gilmer	26	0400CST			0	0	?	?	Hail (0.75)
		Thunderstorms developed along a slow-moving cold front and produced scattered areas of hail. At least 150 windows were broken by softball size hail in Newcastle. A downburst damaged the roof of a home northwest of Newcastle. Hail up to softball size produced severe damage to the roofs of about 75 homes in Jacksboro.							
Grayson County 5 E Denton	27	2153CST			0	0	?	?	TSTM Wind
Fannin County 5 W Bonham	27	2205CST			0	0	?	?	Hail (1.75)
Leann County 2,5 E Paris	27	2255CST			0	0	?	?	TSTM Wind
Hunt County Commerce	27	2300CST			0	0	?	?	TSTM Wind
Bowie County Dekalb	28	0020CST			0	0	?	?	TSTM Wind
		Thunderstorms developed along a cold front producing several downbursts and some large hail. Downbursts blew over trees 5 miles east of Denton and 2.5 miles east of Paris. A downburst downed powerlines and a power pole in Commerce. A downburst blew down three light standards at the Dekalb High School football stadium.							

# STORM DATA AND UNUSUAL WEATHER PHENOMENA

OCTOBER 1988

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	
<b>41 TEXAS, Southern</b>									
Milam County	01	1915CST			0	0	?	?	Tstm Wind (?)
									High wind from a thunderstorm uprooted trees and downed power lines in Cameron. Winds were estimated at near 60 MPH.
Milam County	01	1930CST			0	0	?	?	Tstm Wind (?)
									High winds from a thunderstorm downed trees and power lines and caused roof damage to homes and outbuildings in and near Minerva. The high winds also blew over some fences. Winds were estimated at near 60 MPH.
Liberty County	01	2305CST			0	0	0	0	Hail (0.75)
									Three-quarter inch diameter hail fell at Liberty.
Harris County	01	2321CST			0	0	?	0	Tstm Wind (50)
									A thunderstorm wind gust was measured at 58 MPH at the Houston Intercontinental Airport just west of Humble.
Cameron County	24	1500CST			0	0	5	0	Tstm Wind (?)
									High winds from a thunderstorm did scattered damage in the City of Brownsville. One roof was torn off of a business building and blown onto a nearby residence. Power lines were downed from fallen trees and limbs. Signs and fences were also damaged.
<b>41 TEXAS, Western</b>									
Scurry County	31	0005 CST			0	0	4	0	Lightning
									A heavy thunderstorm roared across the county, bringing 1.70 inches of rain at Ira and generating lightning that knocked out power to much of the county. The lightning struck a conductor at the Ira substation, which caused a chain reaction that blacked out 11 other regional substations. Approximately 3,450 customers were without power for more than an hour, 3,100 of them in Snyder. Some Ira residents were without power until 7:45 a.m.
<b>42 UTAH</b> ————— NONE REPORTED									
<b>43 VERMONT</b>									
Statewide	18	1020est			0	3	6	3	Tstm. Wind
									Wind gusts of up to 47 mph were measured at Burlington International Airport. Gusty winds were responsible for a building collapse in Swanton, the knocking off the air of Vermont Public Radio, and the serious injury of a woman and her son in East Montpelier.
<b>44 VIRGINIA</b> ————— NONE REPORTED									
<b>45 WASHINGTON</b>									
Waz003-004	16	late morning			0	0	0	0	Flood
									After two days of rainfall over the west slopes of the Cascades on the 14th and 15th, heavy orographic rain developed during the morning of the 16th. Areas along the Cascade west slopes received about 2 inches of rain between midnight and 6AM. Runoff during the morning hours caused rapid rises in river levels. The Skagit and Stillaguamish rivers as well as the Skykomish-Snoqualmie-Snohomish River System all crested above flood stage. Little damage was caused in the brief time that the rivers were outside their banks.
<b>46 WEST VIRGINIA</b> ————— NONE REPORTED									
<b>47 WISCONSIN</b> ————— NONE REPORTED									
<b>48 WYOMING</b>									
ALABANY CO. 25W CHEYENNE	05	1430MST			0	0	?	0	LIGHTNING
									ON THE AFTERNOON OF THE 5TH, LIGHTNING FROM A CLUSTER OF INTENSE THUNDERSTORMS STARTED AN UNKNOWN NUMBER OF TREES ON FIRE. THESE STORMS ALSO PRODUCED A HALF INCH TO ONE INCH OF RAINFALL IN A SHORT PERIOD OF TIME.
WY2001 NORTHWEST MOUNTAINS	16	0001 TO 1200MST			0	0	0	0	HEAVY SNOW
									DURING THE MORNING OF THE 16TH, HEAVY SNOW FELL OVER THE SOUTHEASTERN SECTION OF YELLOWSTONE PARK. THIS FORCED THE CLOSURE OF ALL ROADS IN THAT AREA. THE MOST SNOW REPORTED WAS AT THE SOUTH ENTRANCE OF YELLOWSTONE PARK, WHERE 10 INCHES FELL.
WY2002-015-018-017 NORTHWEST CHINOOK, SOUTHERN MOUNTAINS, LARAMIE VALLEY, SOUTHEAST PLAINS	16	0600 TO 1500MST			0	0	0	0	HIGH WIND
									DURING THE 16TH, STRONG WINDS WERE REPORTED ALONG THE EAST SLOPES OF THE ABSAROKA MOUNTAINS OF NORTHWEST WYOMING AND OVER THE EXTREME SOUTHEAST PART OF THE STATE. ALONG INTERSTATE 90 FROM JUST WEST OF CHEYENNE TO NEAR RAWLINS, SUSTAINED WINDS OF 25 TO 40 MPH WERE COMMON WITH GUSTS TO AROUND 60 MPH. JUST BEFORE 0900 MST, THE CITY OF CODY HAD A WIND GUST TO 62 MPH, DURING A SEVERAL-HOUR PERIOD OF SUSTAINED WINDS BETWEEN 35 AND 50 MPH.
WY2014-015-016-017 RED DESERT, SOUTHERN MOUNTAINS, LARAMIE VALLEY, SOUTHEAST PLAINS	17	0001 TO 1200MST			0	0	0	0	HIGH WIND
									ON THE MORNING OF THE 17TH, SUSTAINED WINDS OF 25 TO 40 MPH WITH GUSTS TO NEAR 70 MPH OCCURRED OVER SOUTHERN WYOMING AHEAD OF A VIGOROUS ARCTIC COLD FRONT. IN SOUTH CHEYENNE, WINDS GUSTED UP TO 67 MPH. A 68 MPH WIND GUST WAS REPORTED AT TIE SIDING, LOCATED 16 MILES SOUTH OF LARAMIE.
LARAMIE CO. CHEYENNE	19	1510 TO 1530MST			0	0	0	0	SMALL HAIL
									DURING THE AFTERNOON OF THE 19TH, A THUNDERSTORM PRODUCED ONE-QUARTER TO ONE-HALF INCH DIAMETER HAIL IN THE CITY OF CHEYENNE.
WY2002-005-006 NORTHWEST CHINOOK, NORTHERN FRONT RANGE, NORTHEASTERN PLAINS	22	0200 TO 1400MST			0	0	0	0	HIGH WIND
									SUSTAINED WINDS OF 25 TO 40 MPH WITH GUSTS TO 70 MPH ACCOMPANIED A COLD FRONT MOVING THROUGH NORTHERN WYOMING DURING THE 22ND. NUMEROUS GUSTS OF UP TO 60 MPH WERE RECORDED IN AND NEAR CODY BETWEEN 0645 AND 0800 MST. FROM 1030 UNTIL 1300 MST, THE CITY OF GILLETTE HAD SUSTAINED WINDS OF 30 TO 40 MPH WITH A GUST TO 61 MPH REPORTED BY A RADIO STATION JUST SOUTH OF THAT CITY.

# STORM DATA AND UNUSUAL WEATHER PHENOMENA

OCTOBER 1988

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

**WYOMING**

WYZ005 NORTHERN FRONT RANGE	26	1900 TO 2000MST	0	0	4	0	HIGH WIND
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VERY STRONG WINDS OCCURRED IMMEDIATELY AFTER THE PASSAGE OF A STRONG ARCTIC COLD FRONT IN THE CITY OF SHERIDAN ON THE EVENING OF THE 26TH. AT 1958 MST, THE SHERIDAN COUNTY AIRPORT RECORDED A PEAK WIND GUST OF 62 MPH. SEVERAL TREE LIMBS WERE BROKEN AND FEW TREES BLOWN OVER BY THE WINDS. A DYING COTTONWOOD TREE, HAVING A CIRCUMFERENCE OF MORE THAN 10 FEET, WAS BLOWN OVER ONTO A 1984 LINCOLN TOWN CAR. THE CAR WAS TOTALED. THERE WAS OTHER MINOR DAMAGE TO ANOTHER CAR AND SOME HOMES.

49 ALASKA, Northern ——— NO REPORT RECEIVED

**49 ALASKA, Southern**

Gulf of Alaska	2	1100 AST	0	0	5	0	High Winds
A storm moved over Kodiak Island. Gusty winds to 52 mph were observed at Kodiak. Stronger winds were observed at sea around Kodiak Island.							
North Gulf Coast	5	1300 AST	0	0	?	0	High Winds
A storm moved from the north Gulf of Alaska into south-central Alaska producing winds gusting to 60 mph along the North Gulf Coast							
North Gulf Coast	7	1500 AST	0	0	?	0	High Winds
A storm moved rapidly from near Kodiak Island northeast into Canada. Winds to 65 mph and 55 mph were reported along the North Gulf Coast in the Prince William Sound and at Yakutat, respectively.							
Alaska Peninsula	9	1900 AST	0	0	?	0	High Winds
An intense Arctic storm moved from the northern Bering Sea area south across the Alaska Peninsula. Winds to 60 mph were observed at Dutch Harbor and 45 mph at Cold Bay.							
Aleutians	10	1100 AST	0	0	?	0	High Winds
A storm in the Western Aleutians produced wind gusts to 60+ mph along the Aleutians from Shemya to Adak.							
Kodiak Island	28	1600 AST	0	0	?	0	High Winds
A storm south of Kodiak Island produced winds from 50-65 mph around the Island.							

49 ALASKA, Southeastern ——— NONE REPORTED

50 HAWAII ——— NONE REPORTED

51 PUERTO RICO ——— NONE REPORTED

52 VIRGIN ISLANDS ——— NONE REPORTED

53 PACIFIC ——— NONE REPORTED

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# STORM SUMMARY

OCTOBER 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
<b>TORNADOES</b>	0		0	0			0								0										0		
Number								1				4				6						1		1		1	
Days								1				2				2						1		1		1	
Deaths								0				0				0						0		0		0	
Injuries								0				4				0						0		0		0	
Property Damage								4				6				4						4		2		0	
Crop Damage								0				?				?						0		0		0	
<b>HAIL</b>																											
Deaths											0	0			0	0											
Injuries		0									0	0			0	0											
Property Damage		1									0	0			0	0											
Crop Damage		6									0	?			0	?											
<b>THUNDERSTORM WINDS</b>																											
Deaths		0						0	0		0	0			0	0				0	0		0				
Injuries		0						0	0		1	1			0	1				0	0		0				
Property Damage		6						4	4		5	6			2	4				3	5		3				
Crop Damage		o/c						0	0		?	?		0	?	?				0	0		0				
<b>HIGH WINDS</b>																											
Deaths					0	0							0						0								0
Injuries					0	0							0						0								0
Property Damage					3	5							5						6								0
Crop Damage					0	0							0						0								0
<b>LIGHTNING</b>																											
Deaths	1				0						0	0				0											
Injuries	3				0						4	?				1											
Property Damage					3						?	5				0											
Crop Damage	0				0						0	?				0											
<b>FLASH FLOODS</b>																											
Deaths													0														
Injuries													0														
Property Damage													0														
Crop Damage													?														
<b>FLOODS</b>																											
Deaths											0										0						
Injuries											0										0						
Property Damage											?										3						
Crop Damage											0										0						
<b>HEAVY SNOWSTORMS AND BLIZZARDS @</b>																											
Deaths																											
Injuries																											
Property Damage																											
Crop Damage																											
<b>ICE STORMS #</b>																											
Deaths																											
Injuries																											
Property Damage																											
Crop Damage																											
<b>HURRICANES AND TROPICAL STORMS</b>																											
Deaths																											
Injuries																											
Property Damage																											
Crop Damage																											
<b>ALL OTHERS</b>																											
Deaths																											
Injuries																											
Property Damage																											
Crop Damage																											

SEE REFERENCE NOTES FOR STORM DAMAGE CATEGORIES



# STORM SUMMARY

OCTOBER 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
<b>TORNADOES</b>	0	0			0			0	0		0		0		0		0	0	0	0		0	0	0	0	0	
Number				1										4													
Days				1										0													
Deaths				0										0													0
Injuries				0										0													4
Property Damage				0										?													
Crop Damage				0										?													
<b>HAIL</b>																											
Deaths							0							0													0
Injuries							0							0													1
Property Damage							?							5													
Crop Damage							?							?													
<b>THUNDERSTORM WINDS</b>																											
Deaths			0	0			0							0		0											0
Injuries			4	0			0							0		2											9
Property Damage			5	4			?							5		6											
Crop Damage			4	0			?							?		3											
<b>HIGH WINDS</b>																											
Deaths			0			0				0	0										0						
Injuries			0			0				0	0										0						
Property Damage			5			5				5	2										4						
Crop Damage			0			0				0	0										0						
<b>LIGHTNING</b>																											
Deaths			0	0										0							0						1
Injuries			0	0										0							0						8
Property Damage			4	4										4							?						
Crop Damage			0	0										0							0						
<b>FLASH FLOODS</b>																											
Deaths			0																								
Injuries			0																								
Property Damage			4																								
Crop Damage			0																								
<b>FLOODS</b>																											
Deaths																											
Injuries																											
Property Damage																											
Crop Damage																											
<b>HEAVY SNOWSTORMS AND BLIZZARDS @</b>																											
Deaths			0																								
Injuries			0																								
Property Damage			6																								
Crop Damage			4																								
<b>ICE STORMS #</b>																											
Deaths																											
Injuries																											
Property Damage																											
Crop Damage																											
<b>HURRICANES AND TROPICAL STORMS</b>																											
Deaths																											
Injuries																											
Property Damage																											
Crop Damage																											
<b>ALL OTHERS</b>																											
Deaths			0			0																					3
Injuries			0			0																					0
Property Damage			4			0																					
Crop Damage			0			?																					

SEE REFERENCE NOTES FOR STORM DAMAGE CATEGORIES

## LATE REPORTS

NONE

## CORRECTIONS

## STORM SUMMARY

JULY 1988 -

Page 68: MISSOURI - Tornadoes - Number = 2 (vice 1)  
Days = 2 (vice 1)

## STORM DAMAGE CATAGORIES

## REFERENCE NOTES

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

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.

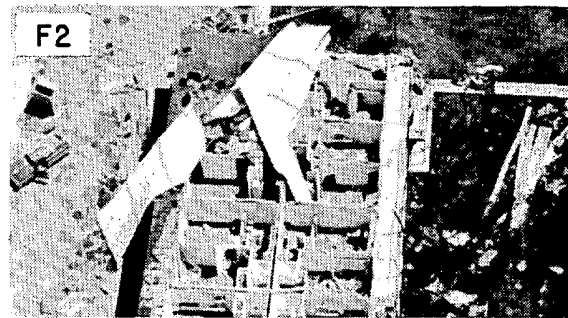
(F5) Incredible tornado (261-318 mph): Incredible damage  
Strong frame houses lifted off foundations and carried considerable distance to disintegrate; automobile-sized missiles fly through the air in excess of 100 m; trees debarked; incredible phenomena will occur.

(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.

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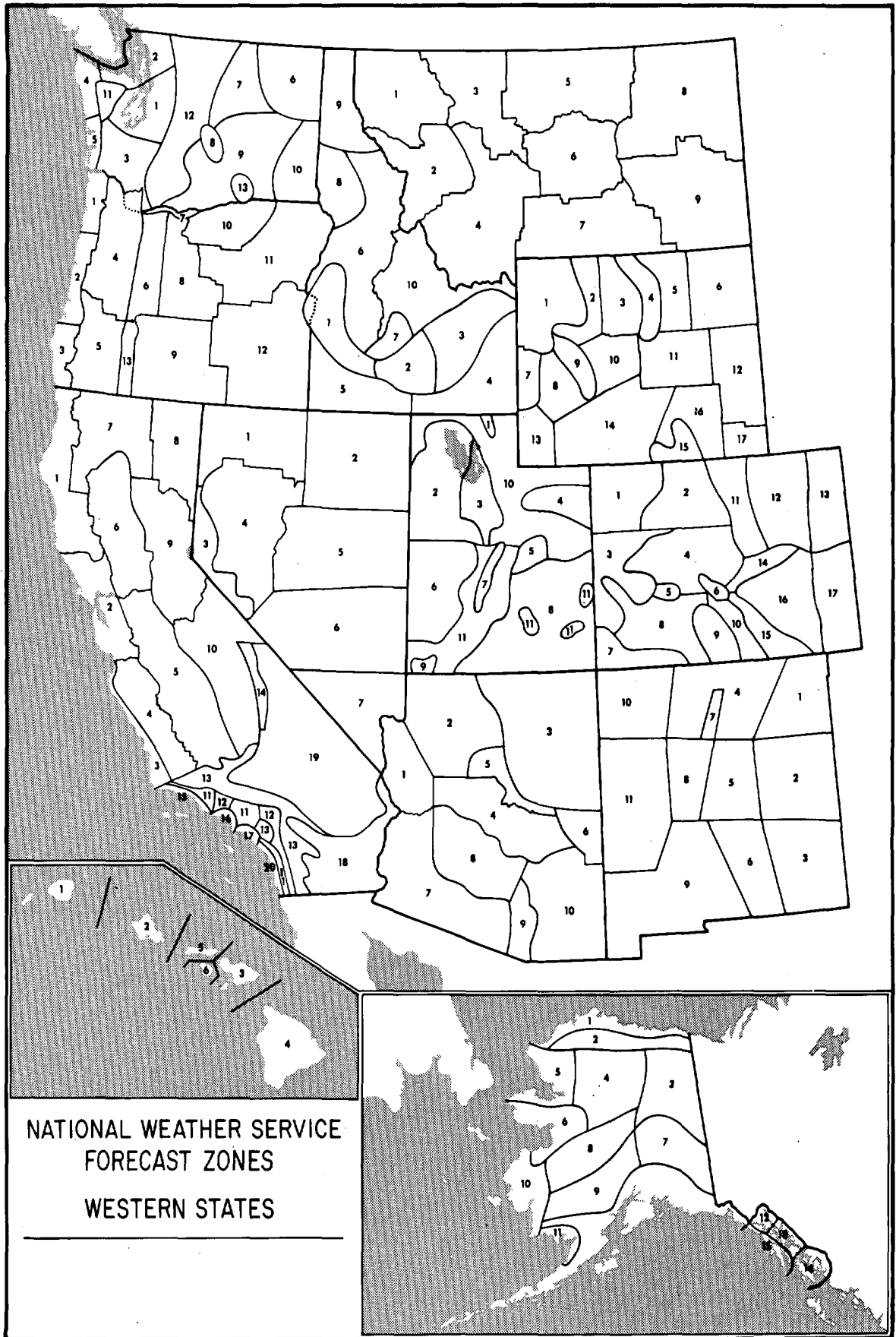
(F0+F1) *Weak Tornado*  
(F2+F3) *Strong Tornado*  
(F4+F5) *Violent Tornado*

---

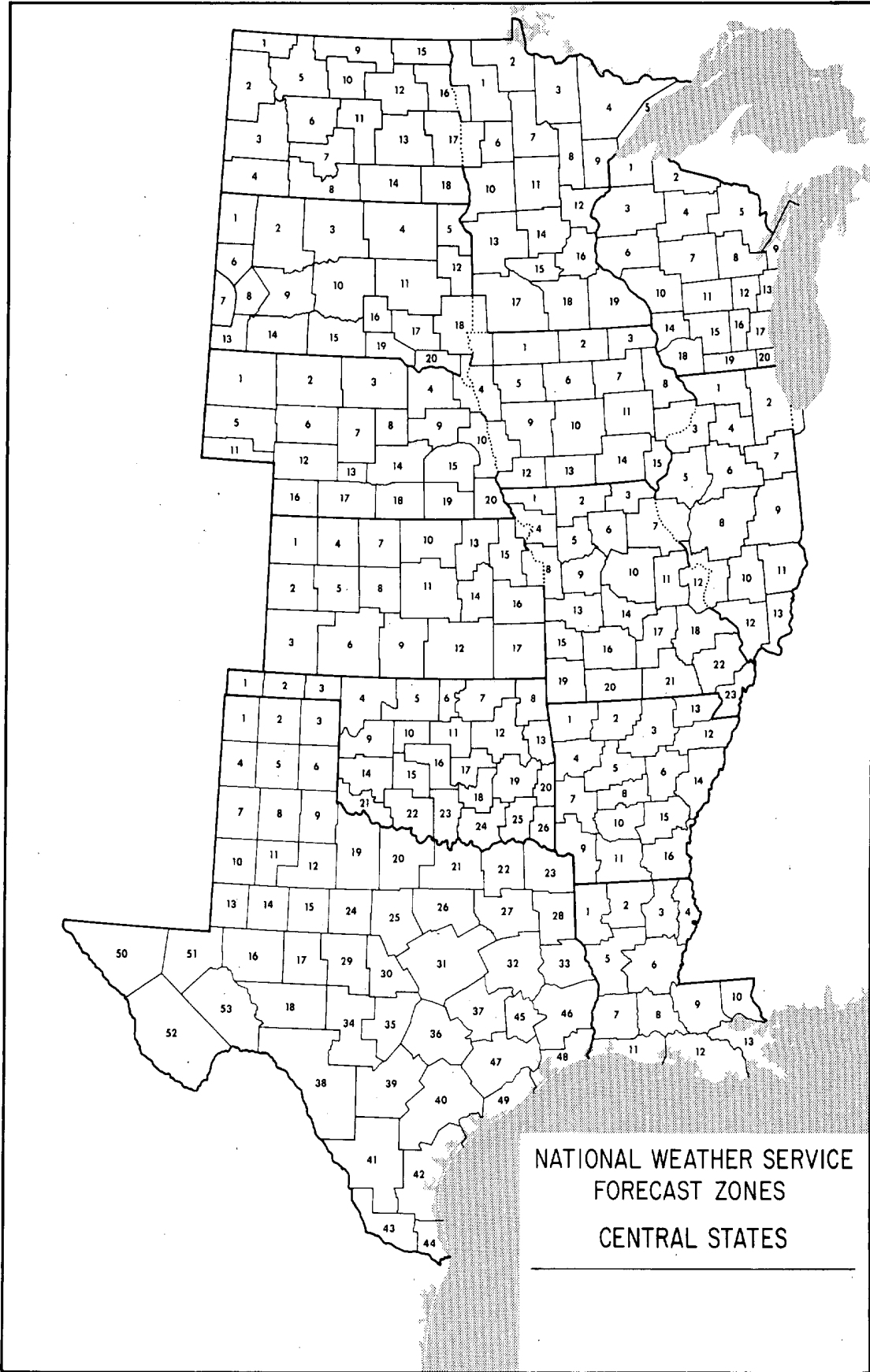


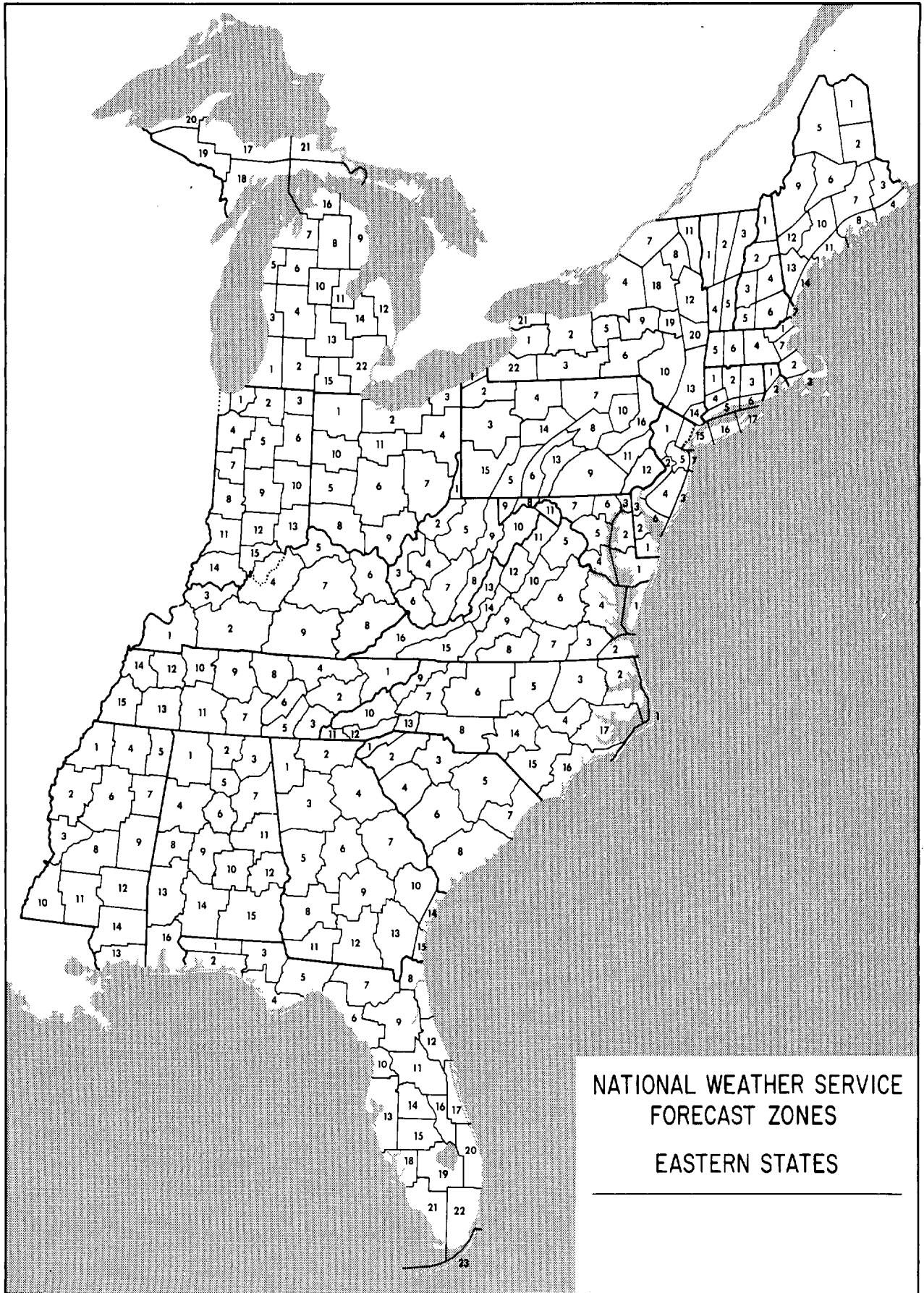
From J. Atmos. Sci., August 1981, p. 1517-1519

USCOMM-NOAA-ASHEVILLE, N.C. 1988-1800



NATIONAL WEATHER SERVICE  
FORECAST ZONES  
WESTERN STATES





NATIONAL WEATHER SERVICE  
FORECAST ZONES  
EASTERN STATES



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