DECEMBER 1981 VOLUME 23 NUMBER 12

STORM DATA

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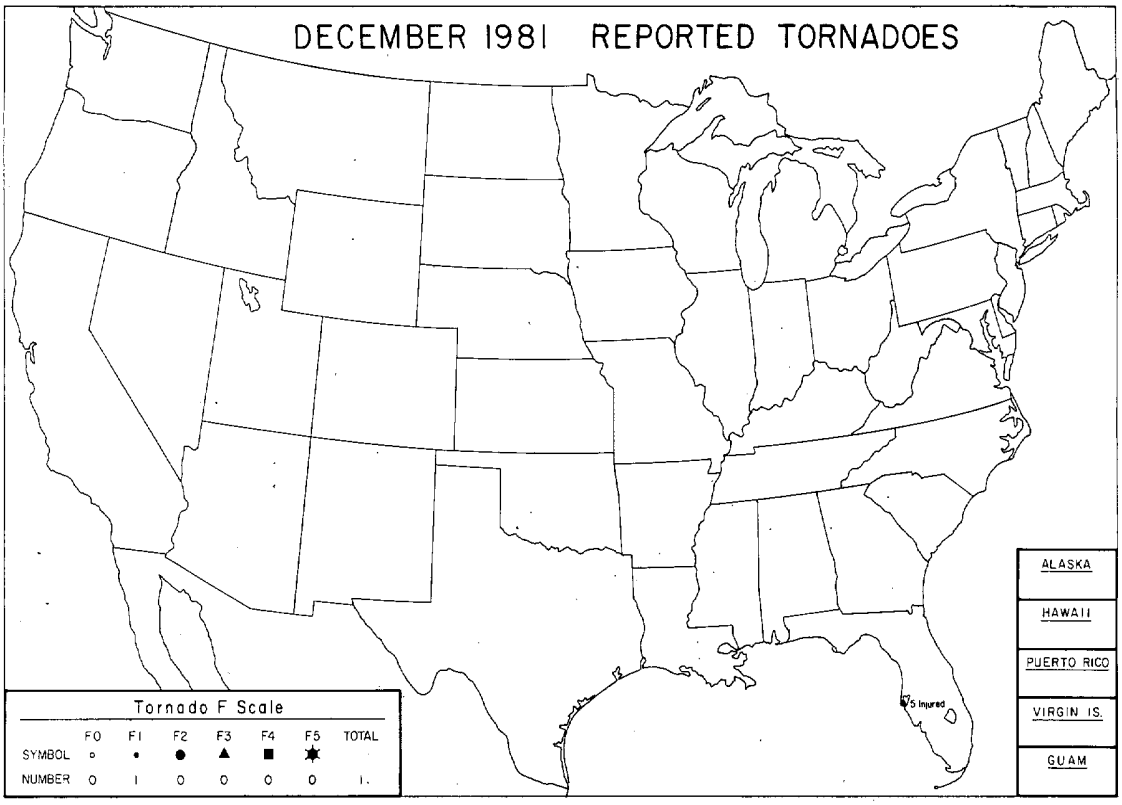
NOTE: This publication contains our best information on storms but, due to the difficulties inherent in collection of this type of data, it is not all-inclusive. Late Reports and Corrections will be carried quarterly.

STORM DATA - (USPS 363-010) is published monthly. Subscription, pricing, and ordering information is available from: Publications Section, The National Climatic Center, Environmental Data and Information Service, NOAA, Federal Building, Asheville, NC 28801.

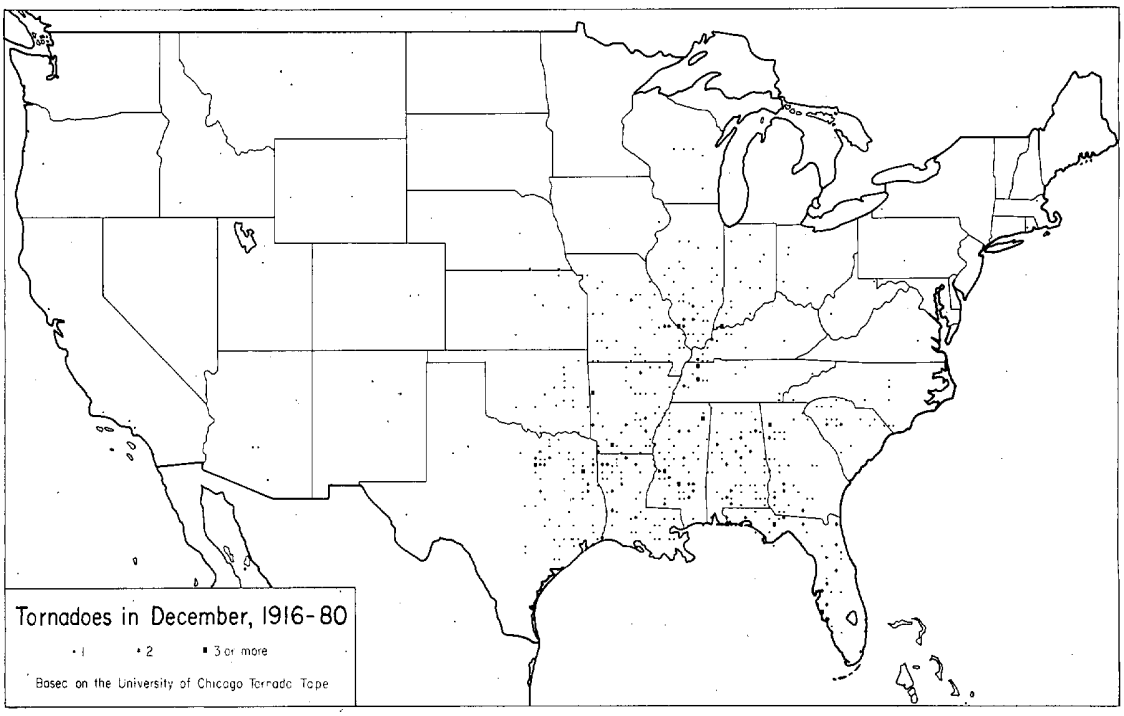
OUTSTANDING STORMS OF THE MONTH



● TYPED REPORT RECEIVED ◑ PRELIMINARY REPORT RECEIVED ○ NO REPORT RECEIVED

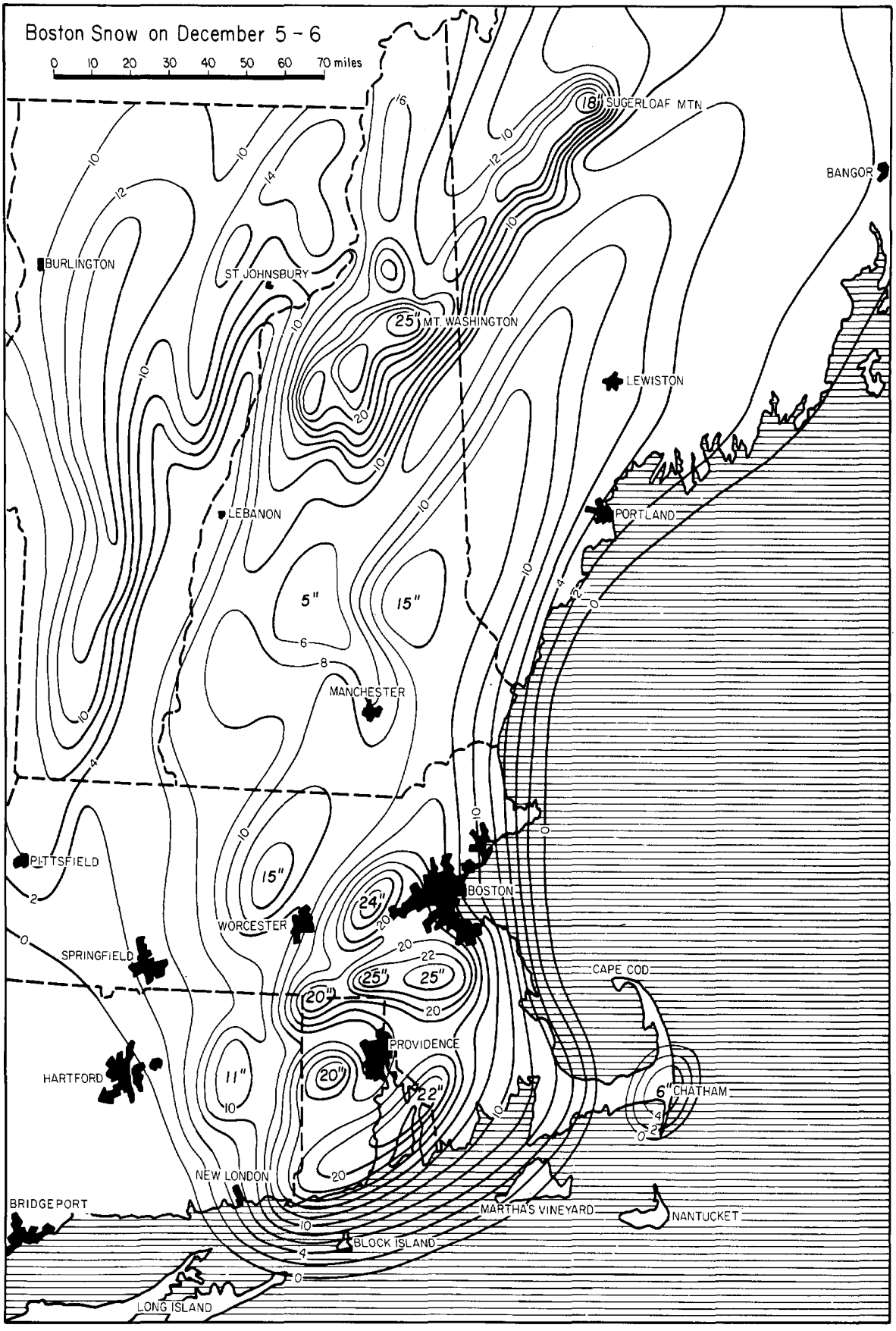
(N) northern (E) eastern (C) central
(S) southern (W) western (O) coastal

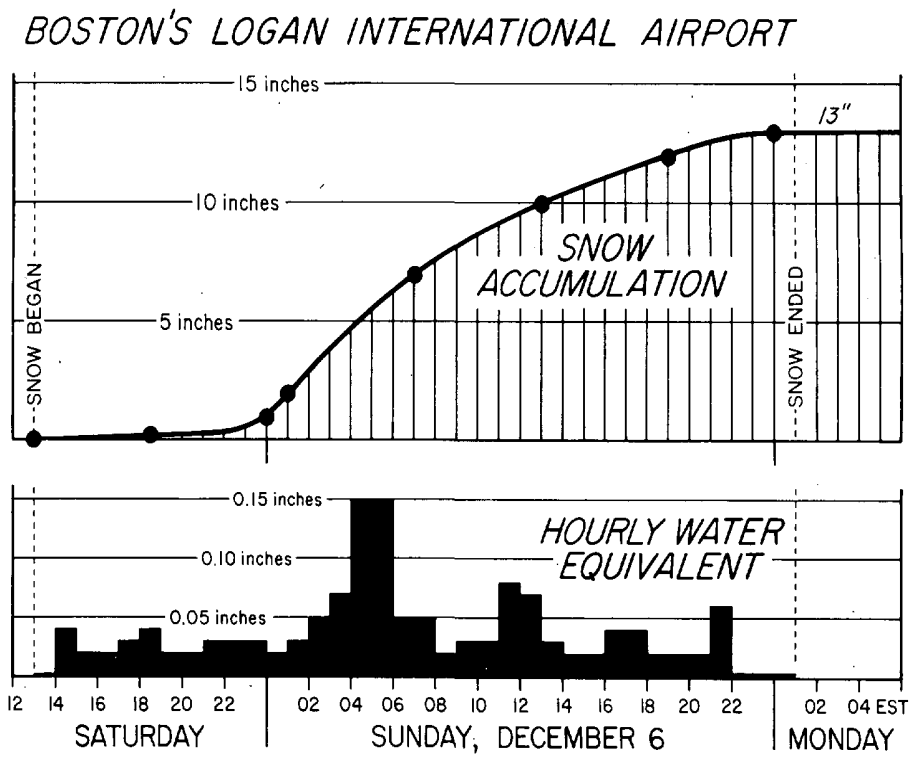
● 1AL	● 5CO	● 10ID	● 15KY	● 20MI	● 25NE	● 30NY(O)	● 33OH	● 37RI	● 41TX(S)	● 45WA	● 50HI
● 2AZ	● 6CT	● 11IL	● 16LA	● 21MN	● 26NV	● 30NY(C)	● 34OK	● 38SC	● 41TX(W)	● 46WV	● 51PR
● 3AR	● 7DE	● 12IN	● 17ME	● 22MS	● 27NH	● 30NY(W)	● 35OR	● 39SD	● 42UT	● 47WI	● 52VI
● 4CA(N)	● 8FL	● 13IA	● 18MD	● 23MO	● 28NJ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



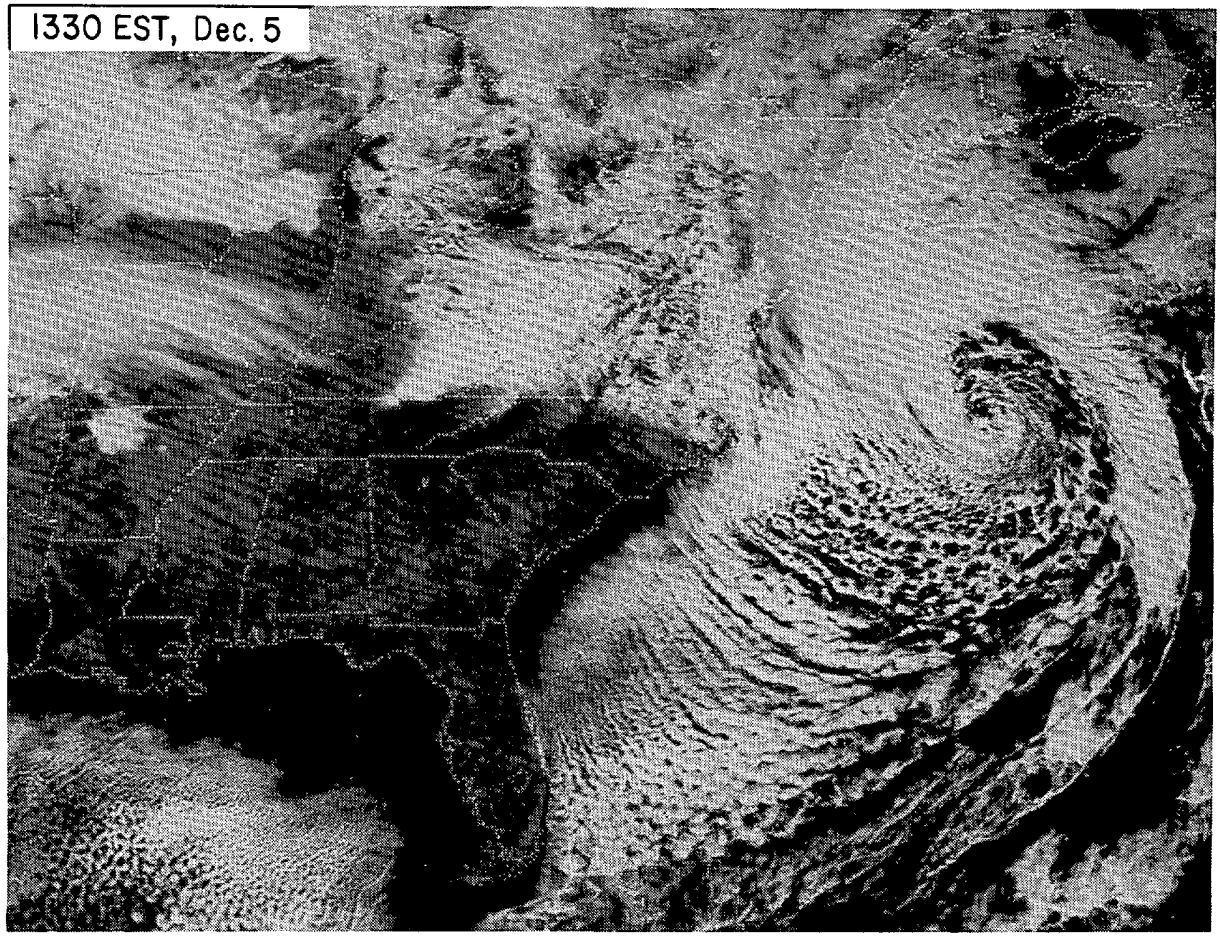
1. BOSTON SNOW on December 5 - 6

Snowfall (in inches) over the New England states caused by the first major winter storm of the season. Snow-depth data were supplied by NWSFOs at Portland, Maine and at Boston, Mass. Additional data were obtained from local authorities.

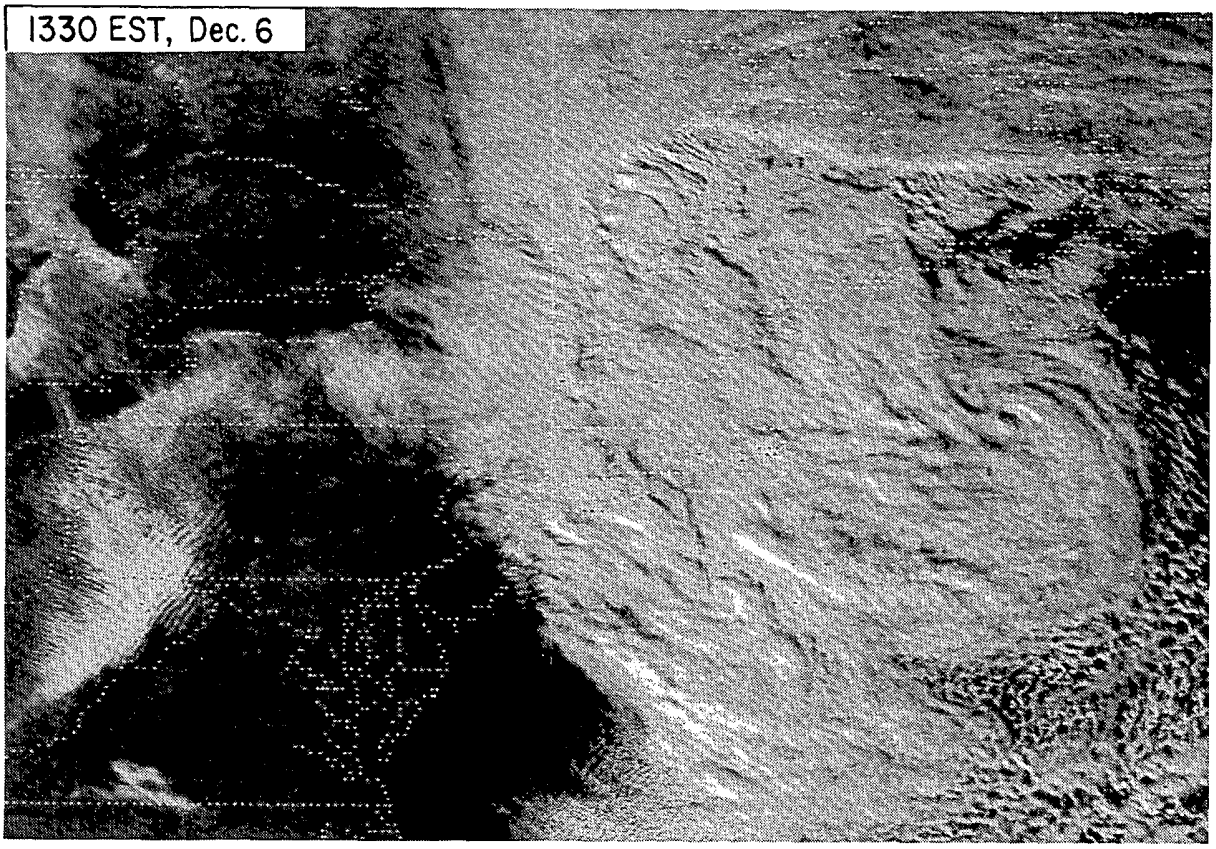




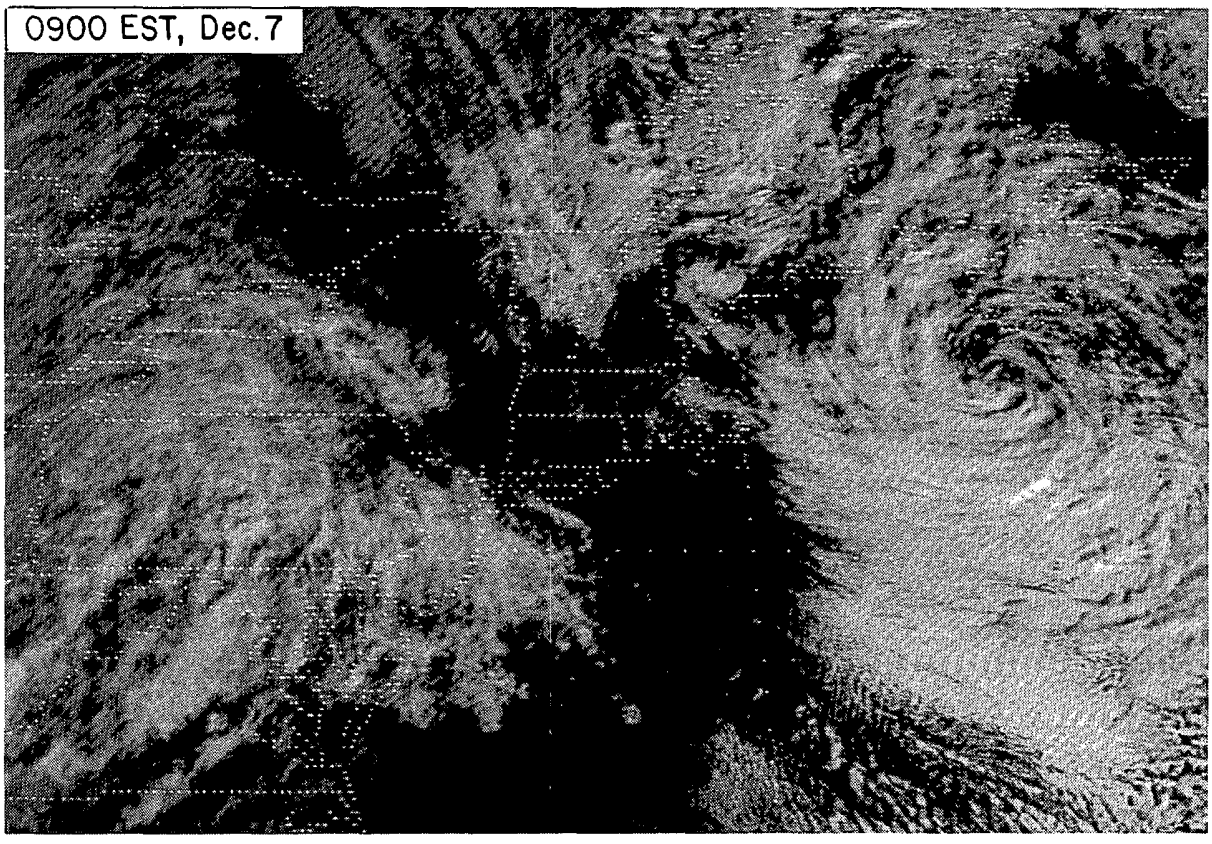
Accumulation of snow at Logan airport and the hourly amounts of melted down precipitation. Data supplied by NWSFO, Boston, Mass.



Satellite picture at 1330 EST when the snowfall at Boston began. The cyclone center was moving toward the north.

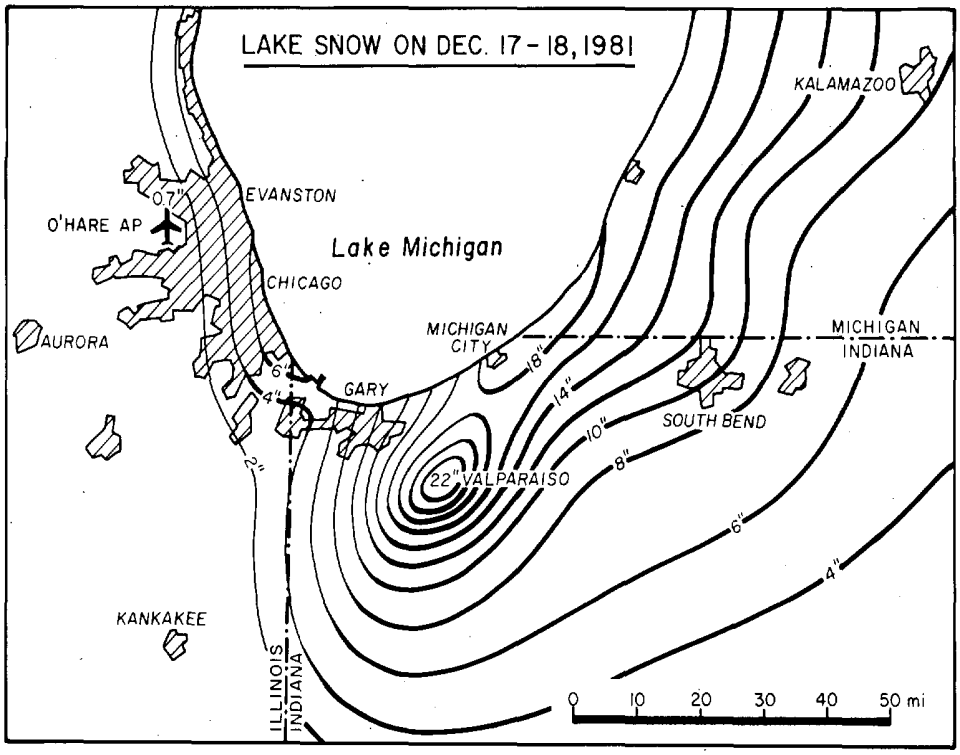


Satellite picture at 1330 EST when 10 inches of snow had accumulated at Logan Airport.

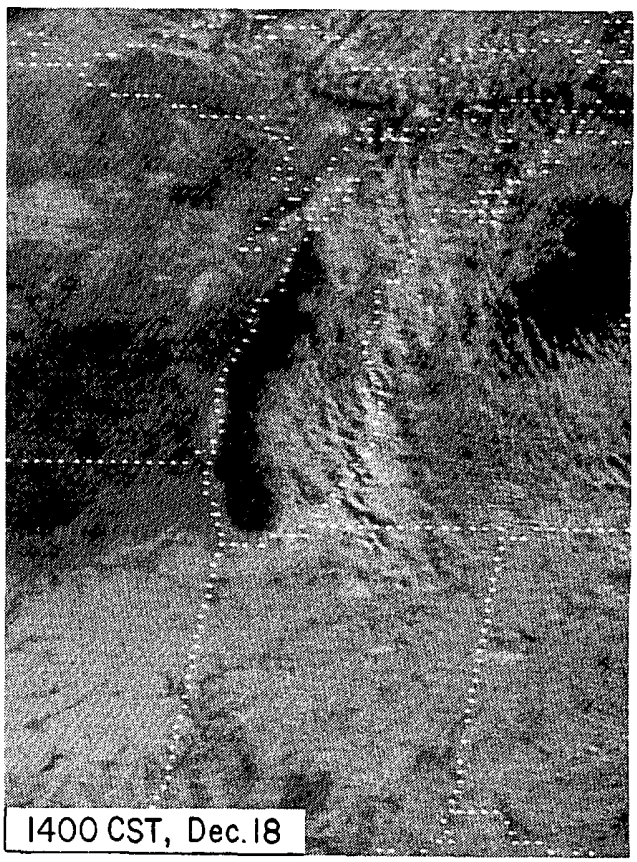


Satellite picture at 0900 EST approximately 8 hours after the end of the Boston snowstorm. The cyclone center was moving eastward. Photos by NESS.

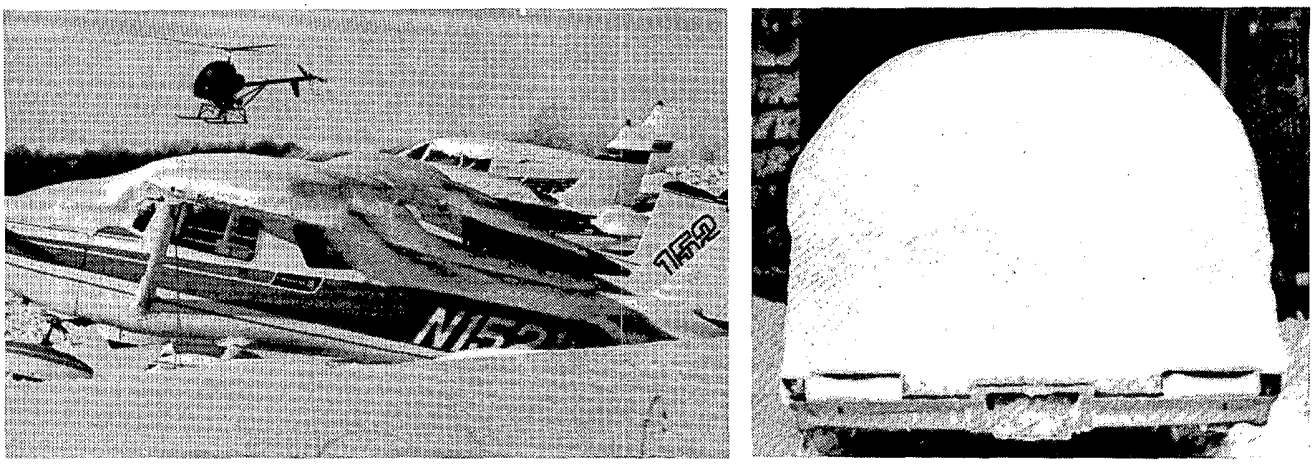
2. VALPARAISO LAKE SNOW on December 17 - 18



A heavy lake-effect snow blanketed the southern and southeastern shores of Lake Michigan on December 17 and 18, leaving up to 22" of snow in Valparaiso, Indiana. --- Data from NWS Indianapolis, IN and the University of Chicago.



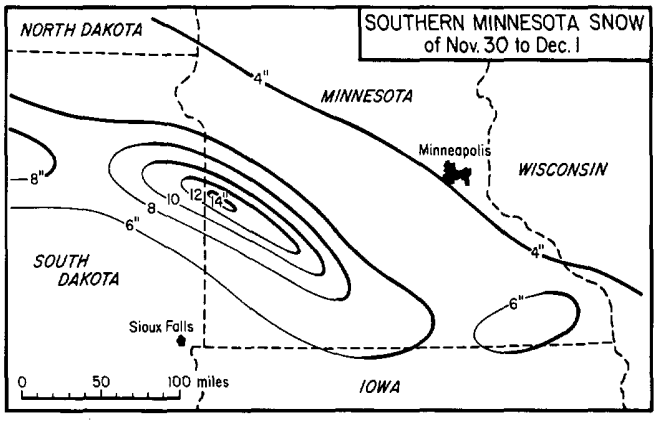
Above left, lake-effect clouds on the 17th when the snowstorm began. The heaviest snow fell overnight as winds slowly shifted to NNW. Snow in Valparaiso ended in the afternoon of the 18th (above right). Satellite pictures from NESS.



Snow-covered aircraft at Porter Co. airport 3 miles east of Valparaiso (left) and a car in Valparaiso (right). Photos courtesy of Vidette Messenger.

3. SOUTHERN MINNESOTA SNOW of November 30 to December 1

Depth of snowfall by the November 30 to December 1 storm which was the second major winter storm in two weeks. Data supplied by NWSFO, Minneapolis, Minn.



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	

1 ALABAMA

Birmingham area, Jefferson County	19	Morning			2	0	0	0	Cold
	Two persons were found dead in their unheated homes early Saturday morning. They apparently froze to death, as the temperature dropped to near 12 degrees.								
Ashville area, St. Clair County	20	1250CST			2	0	0	0	Cold
	Two brothers walking on a frozen farm pond fell through the ice and drowned.								
North and Central Alabama	21	0100CST			3	30	5	0	Freezing Rain
	Freezing rain and sleet spread eastward over most of North and Central Alabama during the early morning. The major impact was on streets and highways. Traffic accidents were numerous with more than 300 reported in the Birmingham area alone. Many of the accidents were minor, but 2 people were killed in southwest Morgan County and one person was killed in an automobile accident near Winfield in Marion County. At least 17 people were injured from slipping and falling on the ice.								
Evergreen, Conecuh County	28	1630CST			0	0	4	0	Lightning
	Lightning struck two homes in Evergreen. The homes were severely damaged by fire that resulted from the lightning strikes.								

2 ARIZONA — NONE REPORTED

3 ARKANSAS

Northeastern Quarter of State	22	Late Afternoon			0	0	4	0	Wind
	High winds, some causing localized damage, preceded line of thunderstorms which moved rapidly eastward. Following are reports received:								
Conway - Faulkner County	22	1500CST	Large restaurant sign heavily damaged with sign plus part of I-beam structure landing atop two nearby cars.						
Salem - Faulkner	22	1505CST	Trees and power lines down. Local radio station measured winds 40 MPH.						
Paragould - Greene County	22	1640CST	Trees and power lines down.						
Lake City - Craighead County	22	1708CST	Minor building damage.						
Blytheville AFB - Mississippi County	22	1710CST	Peak gust 49 MPH (43 knots).						

4 CALIFORNIA, Northern

Northern and Central California Sierra Nevada	26	1400PST							Wind, Snow
	27	1400PST							
	Gusty winds and 1 to 3 feet of snow in the Sierra Nevada. No damage reports but some roads closed including I80 and I50.								
Mt. Shasta Siskiyou and Sierra Nevada	28	1600PST							Snow
	30	1200PST							
	A cold system from the Gulf of Alaska brought low snow levels and closed many roads. 1 to 3 feet of snow reported. Many resorts by this time had record amounts of snow on the ground for the end of Dec.								

4 CALIFORNIA, Southern

Mono County	19				0	0	0	0	High Winds
	& 20								
	High winds, rain and snow hit much of Mono County closing the Mammoth-June Lakes Airport for several hours on both days.								
	Winds gusting to 75 mph lashed the Crowly Lake and Long Valley area on the same days.								

5 COLORADO

Northeastern Foothills	1-2				0	0	4	0	High winds
	Strong winds gusted to over 70 mph along the northeastern foothills from west of Denver to the Wyoming border. The peak gust recorded was 100 mph at Wondervu, in the foothills southwest of Boulder, at 2 pm on the 2nd. A gust of 94 mph was noted just west of Boulder. Roofs on houses were damaged in the Evergreen area, and some mobile homes also suffered damage.								
Northern Mountains, Northeastern Foothills	15-16				0	0	0	0	Heavy snow, high winds
	A storm dumped up to 16 inches of snow in the northern Rockies, along with strong winds. In the foothills north of Denver, 60 mph wind gusts were common. The peak gust recorded was 77 mph at 9pm on the 15th at the Rawhide power plant near Fort Collins.								
Northeast Foothills	20	morning			0	0	0	0	High winds
	A peak gust of 87 mph was recorded at Wondervu.								
Mountains	21-29				3	0	?	0	Heavy snow
	A strong westerly jet stream brought storm after storm into the Colorado Rockies, dumping prodigious amounts of snow. On the 21st a foot of snow fell in just four hours at Vail. The 26th saw snowfalls of 21 inches at Crested Butte and Monarch Pass, and 30 inches fell in two days at Cuchara, west of Walsenburg. Winds gusting as high as 100 mph created blizzard conditions in many areas, and several passes were closed periodically. Travel was very hazardous, and the weather played a part in at least three plane crashes during the period...one at Steamboat Springs, another at Gunnison, and the third in wild country near Buena Vista. At least three deaths were directly attributable to the weather. A cross country skier vanished after starting a trip from Crested Butte to Aspen on Christmas Eve; a hiker disappeared in the mountains near Monarch Pass; and the pilot of a plane was apparently killed by the storm when he walked away from the crash near Buena Vista to seek help and was never found. The four passengers in the aircraft also survived the crash, and were later rescued after searchers tracked the planes emergency beacon for several days. Most heavy weather was confined to the mountains during this time, but 3 to 8 inches of snow fell on the plains to the east on the 21st and 22nd, and wind gusts to around 75 mph were recorded near Colorado Springs on the 26th. The western valleys of Colorado received periodic snowfalls during the period.								

6 CONNECTICUT — NONE REPORTED

7 DELAWARE

New Castle and Kent Counties	15-16				0	0	0	0	Snow
	The first major snowstorm of the season occurred during the night of the 15th into the morning of the 16th. Heaviest fall was near the Pennsylvania border, where snow piled up to 5-6 inches, while 2-4 inches fell elsewhere. An inch or less of snow was observed over Sussex County. Aside from scattered traffic accidents and a few power outages, no damage was reported.								

8 FLORIDA

Pinellas County	15	0925-0945 EST	5.0	150	0	5	5	0	Tornado(F1)
	A tornado was first reported in the Maximo Mooring residential area in extreme southern St. Petersburg. It moved northeastward on a 5 mile track producing damage at the Maximo Marina and the Maximo Plaza Shopping Center. The next damage was in the Lakewood Estates residential area. Finally the tornado moved across the Albert Whitted Airport into Tampa Bay.								
	Severe roof damage was reported at a grocery store in the shoppin center and at the marina. Numerous cars lost windows and a number of homes had damage from either wind or falling trees. Four airplanes were overturned at the airport with an estimated $35,000 damage. A number of boats were also damaged at the marina. Five people sustained minor injuries. Total estimated damage was $200,000.								

9 GEORGIA — NONE REPORTED

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									
Twin Falls, Cassia, Minidoka, and Bannock Counties	15	1000-1300 MST			0	0	5	0	Wind
	A strong cold front passed through southern Idaho during the day. At 1201 MST, sustained winds of 55 mph with gusts to 77 mph were recorded in Pocatello, Bannock County. In Burley, Cassia County, a bank's large sign blew over and damaged the building's roof. Estimated repairs would cost about 10 thousand dollars. Also in Burley, six camper shells were thrown against a nearby truck causing about two thousand dollars in damages. In Rupert, Minidoka County, a junior high school roof was damaged, and one and a half miles of power lines blew down near Oakley, Cassia County.								
11 ILLINOIS — NONE REPORTED									
12 INDIANA									
Northeast & Central Indiana	16-17	Noon EST -- --			0	0	?	0	Heavy snow
	Snowfall of between 4 to 8 inches fell across Central and Northeastern Indiana. The heaviest snow depths reported were in Monroe and Brown Counties which measured 8 inches.								
Southern & South Central Indiana	20	2135EST -- --			0	0	?	0	Freezing rain & sleet
	Freezing rain and sleet covered road surfaces with ¼ to ½ inch of ice, causing many minor accidents. Power lines and tree limbs were broken in southern sections.								
Northeast & Central Indiana	21	1800EST -- --			0	?	?	0	Heavy snow
	Snowfall of between 4 - 6 inches fell across Central Indiana.								
Northeast & North Central Indiana	29	0500EST -- --			0	0	?	0	Heavy snow
	Snowfall of between 4 to 7 inches fell across the area. The heaviest amounts reported were in Carroll, Cass, Howard, Grant, Wells, and Adams Counties.								
13 IOWA									
Southern Third of Iowa	16	0400-2200CST			0	0	5	0	Winter Storm
	A snow producing system moved slowly east across the State depositing 3 to 7 inches of snow over the Southern Third of Iowa. Six to seven inches of new snow were common over the extreme Southwest. Moderately strong steady wind caused considerable blowing and drifting snow that closed many rural roads. Many schools were dismissed early in the afternoon. Numerous traffic accidents occurred and semi-trailer trucks jack-knifed.								
All of Iowa Except the Extreme Northwest	20-21	1600-0300CST			0	0	5	0	Ice Storm
	Freezing rain coated most roads across Iowa. The Eastern Two-Thirds of the State was the hardest hit where ice was one-half inc thick in some places. Numerous vehicles littered roadsides, median and ditches. Semi-trailer trucks skidded off the slick roads with regularity and 5-6 car smashups were common. Loss of traction stranded about 500 vehicles near intersection I-235, I-35 and I-80 northeast of Des Moines. Sanding trucks skidded off the roads into stalled vehicles. Sections of I-80 in Western and Central Iowa were closed as was I-235 through Des Moines because of the excessive ice and stranded vehicles along the roadways. Some power lines snapped under the weight of the heavy ice buildup.								
14 KANSAS — NONE REPORTED									

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
15 KENTUCKY									
Northeast, Kentucky	17	Early Morning			0	3	3	0	Heavy Snow
	Snow began slightly past midnight and by 7 AM Northern Kentucky had received 4 inches of snow. Several minor accidents were reported with no major injuries. The Covington Kentucky/ Cincinnati Ohio Area was hardest hit with "all roads in bad condition" according to police.								
Statewide	20&21				3	25	4	2	Ice Storm
	Freezing rain and sleet moved into Western Kentucky late Sunday, December 20th and overspread most of the State Monday morning. Roads were glazed over and covered by up to 1 inch of snow. Over 25 people were injured in car accidents. The London Kentucky State Police Post said there were "wrecks on top of wrecks". Two people were killed in Ohio County in a weather related accident. Another was killed on Interstate 65 in Jefferson County Most schools were closed due to icy roads and snow. By late afternoon Monday temperatures rose above freezing and conditions improved rapidly.								
McCracken County Paducah Kentucky Area	23	1800CST			0	1	4	2	Severe Thunderstorm
	Several homes were damaged in the Paducah area (McCracken County) during severe thunderstorm winds. Unofficial winds between 95 and 97 MPH were clocked at Union Carbide while the nearby Barkley Regional Airport reported wind gusts of slightly more than 50 MPH. The storms passed over Union Carbide and headed toward Grahamville Two mobile homes were destroyed, one when a tree blew into it and the other when it was overturned.								
16 LOUISIANA — NONE REPORTED									
17 MAINE									
Western	5-6	Late Evening EST			0	0	5	0	Wet Snow, Sleet, Freezing Rain, Damaging Winds
	Snow, sleet, freezing rain, and high winds caused power outages across western Maine for up to 16 hours on Gerrish Island off of Kittery. An estimated 10,000 customers were without power. Strong winds felled many snow-laden trees and limbs which, in turn, tore down power lines and damaged vehicles and buildings. Peak wind gusts reported were 58 mph at Augusta; 48 mph at Portland; 43 mph at Bangor; 37 mph at Brunswick; and 36 mph at Caribou. Snowfall ranged from 3 to 13 inches, with Sugarloaf Mountain in Franklin County reporting 18 inches. Eastern Maine had high winds but mostly rain.								
Coastal	16	0900-2100EST			0	0	?	0	High Winds
	Wind gusts to 71 mph (62 knots) reported at Eastport; and to 45 mph several times at Portland. However, no damage reports were received.								
18 MARYLAND									
Northeast and Central Portions	1	Morning						0	Glaze
	Freezing rain left widespread hazardous road conditions. At least 4 fatalities resulted due to a multitude of traffic accidents, along with numerous injuries.								
Extreme West	8-12				0	0	0	0	Snow
	Nearly continuous snowfall over a three-day period left 4 to 8 inches of new snow over western Allegany County, and a reported 20 inches in sections of Garrett County.								
Central and Northern	15-16				0	0	0	0	Snow
	Snow began late on the 15th and continued into morning of the 16th. This First significant snowfall of the season, east of the mountains, left amounts ranging from 2 to 4 inches over the south central sections and central Eastern Shore...4 to 6 inches in the north central counties..and around 8 inches over the northern portions of Harford and Cecil Counties. The extreme southern sections and Garrett County had 2 inches or less.								
and D.C.									
	15-16				0	0	0	0	Snow
	The first significant storm of the season began the afternoon of the 15th and continued into morning of the 16th. Snow depths ranged from around 2 inches in the downtown area to 4-6 inches in the outlying sections.								

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19 MASSACHUSETTS									
Eastern Portions	5-6	All Day			0	0	?	0	Heavy Snow, Wind
An unusual early season snow of one to two feet brought travel to a halt, knocked down many trees and caused power outages. The low pressure system "backed in" from the southeast as the upper atmosphere flow became southeast. Winds gusted to 50 mph.									
20 MICHIGAN ——— NONE REPORTED									
21 MINNESOTA									
Southern Minnesota	Nov 30 - Dec 1	--	--	--	--	--	--	--	Heavy Snow
Rain and freezing rain began in southwest Minnesota early Monday morning, November 30th. Heavy snow broke out over southern Minnesota during the day and into Tuesday morning. The southwest was the hardest hit with 14 inches at Canby, 10 inches at Springfield and 9 inches at Tracy. Most of southern Minnesota south of St. Cloud received 4 or more inches of snow.									
The heavy snow was from a storm center that moved from Kansas Monday through Iowa Monday night and into Wisconsin Tuesday morning. This same storm produced heavy snow and blizzard conditions over a large area in the Central Plains.									
Travel was especially difficult because of this snow. In southern Minnesota accidents claimed the lives of four people. Many roads including Interstate I-90 were impassable and motorists were forced to find shelter.									
22 MISSISSIPPI ——— NONE REPORTED									
23 MISSOURI									
Central through Northeast	16								Snow
A snowstorm dumped 4 to 8 inches of snow.									
Central, North and East	22								Sleet, Snow
A winter storm affected much of the northern and eastern portions of the state. Rain changed to sleet with heavy sleet in West-Central. Thunder was heard in portions of central and eastern portions with local amounts of snow of 6 inches common. At St. Peters, the snow accumulated 3 inches in one hour at rush hour. The heaviest reported snow was in a thunderstorm near Lake of the Ozarks where 10 inches was reported.									
24 MONTANA ——— NONE REPORTED									
25 NEBRASKA									
Northeast Nebraska	03	1205CST			0	0	?	0	High Winds
Winds gusted to 61 m.p.h. at Norfolk. No damage reported.									
Panhandle of Nebraska	03	1300CST			0	0	?	0	High Winds
A wind gust of 64 m.p.h. was observed at Chadron. No damage reported.									
Northwest, Central and Eastern Nebraska	16	Morning -Evening			0	0	0	0	Heavy Snow
Heavy snow developed during the early morning in northwest Nebraska and spread southeast into the eastern portion by afternoon. Heaviest snow averaging 6 to 9 inches fell in a band from Chadron to Auburn. However, a report of around 12 inches came from Tecumseh in southeast Nebraska. North winds gusting 30 to 40 m.p.h. caused some blowing and drifting snow. Some snowfalls included 8 inches at Lincoln, Falls City, Beatrice, Mullen and Thedford, 7 inches at Chadron, Grand Island, Columbus and Plattsmouth; and 4 inches at Norfolk and Omaha.									
Eastern Nebraska	27	Daytime			0	0	0	0	Heavy Snow
Snowfall of 4 inches was reported around Blair and Wisner.									

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26 NEVADA									
RENO	20	1800-2000 PST	-	-	0	0	5	0	HEAVY RAIN
Six to seven inches of rain in the Sierra Nevada Mountains, west of Reno, caused a rapid rise on the Truckee River. Local overflow in low lying areas and some urban flooding due to local runoff caused damage to trailers and buildings.									
27 NEW HAMPSHIRE									
Statewide	5-6	Evening EST			0	0	5	0	Wet Snow, Sleet, Damaging Winds
Snow, sleet and high winds caused power outages for up to 7½ hours in many communities, especially over central and southern areas of the state. Rochester, alone, had 5,000 homes without electricity. Snowfall appeared heaviest over Coos County where amounts ranged from 12 to 20 inches. A narrow band south of the White Mountains had the least with only 1 to 5 inches reported, while the rest of the state had totals from 5 to 14 inches. Peak wind gusts reported were 98 mph atop Mt. Washington, 51 mph at Concord, 47 mph at Lebanon, 46 mph at Manchester and 37 mph at Portsmouth. Strong winds felled many snow-laden trees and limbs which, in turn, tore down power lines and damaged vehicles and buildings.									
28 NEW JERSEY ——— NONE REPORTED									
29 NEW MEXICO ——— NONE REPORTED									
30 NEW YORK, Coastal ——— NONE REPORTED									
30 NEW YORK, Central									
New York Hudson Valley	6	1000-1700 EST			0	0	4.	0	Wind
Winds from 20 to 45 MPH gusting to over 50 MPH at times downed trees and powerlines. In Poughkeepsie, a newly erected 23-ft. sculpture was blown over on top of a parked car. Many residences suffered from dislodged roof shingles and shutters. In Dutchess County a private home suffered damage when a large ash tree fell on it.									
Hudson Valley and Catskills	15-16	2100-1100 EST			0	0	3	0	Snowstorm
10 to 12 inches of snow covered the area in the season's first major snowstorm. Telephone and power lines were downed in some areas. Many schools were closed and numerous traffic accidents were reported. Winds of 15 to 25 mph following the storm caused blowing and drifting of snow.									
30 NEW YORK, Western									
Rochester in Monroe Co., Wayne Co., Geneseo, Livingston Co., Canandaigua and Manchester in Ontario Co., Orleans Co.	9-10						5		Snow
A snowstorm produced up to 1 1/2 feet of snow and forced school and office closings, travel delays and numerous vehicular accidents.									
31 NORTH CAROLINA ——— NONE REPORTED									
32 NORTH DAKOTA ——— NONE REPORTED									
33 OHIO ——— NONE REPORTED									
34 OKLAHOMA ——— NONE REPORTED									

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35 OREGON

North and Central Coast - Tillamook and Lincoln Counties	2 to 4				0	0	?	?	Rain storm Flooding
North and Central Coast, Willamette Valley, Umpqua Valley Coquille Area	5 to 7				?	?	7	?	Rain storm
	Widespread flooding caused considerable washouts and slides over coastal and western interior river basins.								
North and Central Coast Coquille	14 to 16				0	0	?	?	Rain storm Flooding
Rogue River Basin Coquille Jackson County, Lakeview	18 to 19				0	0	6	?	Rain storm, Flooding.
	Some urban flooding in Medford area. Highway department estimates over $500,000 in Medford area with washouts and slides. Coos County declared State of Emergency. Local flooding in Lakeview								
Coquille area	29 to 30				0	0	?	?	Rain storm Flooding

36 PENNSYLVANIA, Eastern

Eastern Penna.	01	0700 to 1400 EST			0	0	3	0	Glaze
	Freezing rain caused a glaze over the area which caused only minor damage to trees and utility lines. Although direct damage caused by the glaze was minor, the icy roads resulted in numerous traffic accidents with several deaths and numerous injuries.								
Eastern Penna.	14 15	1100 to 0600 EST			0	0	3	0	Heavy Snow
	Snow developed over the area 11:00 A.M. to 1:00 P.M., but changed to rain or freezing rain and sleet south portions 4 to 7 P.M. Precipitation continued as snow north portions with the precipitation ending between 2 A.M. to 6:00 A.M. Accumulations were 1 to 4 inches with up to 6 inches in the mountain sections. Many automobile accidents resulted from the slippery road conditions.								
Eastern Penna.	15 16	1300 to 0700 EST			0	0	4	0	Heavy Snow
	Precipitation began 1 to 2 P.M. falling as rain in the extreme southeast portion, but as snow over the remainder. The rain changed to snow southeast by midnight and the snow ended between 4 and 7 A.M. Accumulations were mainly 2 to 6 inches with up to 8 inches in spots. The heavy wet snow brought down tree limbs and utility lines and 40,000 or more customers had service interrupted. Slippery roads resulted in many accidents with many injuries and three deaths.								

36 PENNSYLVANIA, Western– NONE REPORTED

37 RHODE ISLAND

RHODE ISLAND	5-6	ALL DAY			0	0	?	0	Heavy Snow, Wind
	A very early season snow of over one foot caused all the usual havok of travel disruption, power failure and auto accidents. Winds gusted to 50 mph.								

38 SOUTH CAROLINA

Northwest SC	21	--	-	--	0	0	4	0	Freezing Rain, Sleet
	Freezing rain and sleet caused icy road conditions mainly over the mountain and foothill sections. Damage was mainly to vehicles during traffic accidents.								
Northwest SC	31	--	-	--	0	0	5	0	Freezing Rain, Sleet
	This winter storm, although short-lived, caused icy road conditions and frequent power outages in the mountains and foothills. Greenville County had about 5,000 families affected by power outages. Vehicle accidents were reported as well as some damage to buildings. Brief power interruptions also occurred further south in the Piedmont Sections of the State, notably in Newberry and Greenwood Counties.								

39 SOUTH DAKOTA ——— NONE REPORTED

40 TENNESSEE

East and Middle Tennessee	21-22	Aftn-Mrng			?	?	0	0	? ? Ice storm
	An ice storm was responsible for downing trees and power lines across Middle and East Tennessee. Numerous traffic accidents were attributed to the icy conditions. By Tuesday morning, the 22d, temperatures had warmed above the freezing point.								

41 TEXAS, Northern ——— NONE REPORTED

41 TEXAS, Southern ——— NONE REPORTED

41 TEXAS, Western ——— NONE REPORTED

42 UTAH

Salt Lake City and Ogden Salt Lake, Davis, and Weber Counties	15	2:30 - 3:00 PM MST						5	High Wind
	On Tuesday, a strong, small scale, cold front moved through northwestern Utah. The cold front, moving at about 50 mph, preceded strong, gusty winds. A new December record wind speed of 52 kt was recorded at the Salt Lake International Airport. Two aircraft were flipped over at Ogden Airport. In Salt Lake City, from capitol hill into the downtown area, damage was common. Two large trees were uprooted near the capitol, and several windows and revolving doors were blown out in downtown office buildings. Numerous reports of damaged signs, trees and power lines were also recieved. Damage cost was estimated to be around 125,000 dollars.								

43 VERMONT

AREA WIDE	6-7	0400-0400EST			0	0	3	0	Snowstorm
	The first major snowstorm of the season deposited 8 to 20 inches over the State. Winds gusting to 45 MPH created many snow drifts over the roads and highways as well as causing restricted visibilities and slippery roads for motorists. Numerous traffic accidents were reported, one of which was fatal. Several other deaths were reported as a result of heart attacks while clearing snow from their property.								

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

44 VIRGINIA

Gloucester County	3	0850EST			0	0	0	0	Lightning
Grayson County	13-15				1	1	0	0	***Fog, Rain***
Northern and Mountain Sections	15-16				0	0	0	0	Snow

There was a blast sounding like a bomb going off, and a large centuries-old cedar tree exploded with pieces thrown more than a hundred yards..and the telephone went dead. This was the account of a woman who witnessed an unusual storm that moved through the community of Ordinary, about 5 miles north of the Yorktown bridge. Sleet-like hail also came in windblown waves and recently-hung laundry froze on the clothes line. Power was out for several hours but, otherwise, no damage occurred.

Two hikers, returning from a trek up Mt. Rogers, became lost due to foggy conditions on Sunday the 13th. Fog and rain prevented them from finding the way back to their vehicle on the 14th. A searching party found the woman's body the morning of the 15th.. an apparent victim of hypothermia. Her companion, who had gone on ahead to seek help, was treated for exposure and released from a nearby hospital.

Although weather was a contributing factor in this tragedy, the need for those entering remote areas to be prepared for emergencies...by taking adequate clothing, provisions, matches, etc...cannot be stressed strongly enough.

The first significant snowfall of the season, east of the mountains, began during the afternoon of the 15th and continued into early on the 16th. Snow depths of 4 to 6 inches were reported over northern sections. An equal amount also fell over the mountains in the southwest portion of the state.

45 WASHINGTON — NONE REPORTED

46 WEST VIRGINIA — NONE REPORTED

47 WISCONSIN — NONE REPORTED

48 WYOMING

Cody, Park County	01	0445MST	?	?	0	0	2	0	Wind
Casper, Natrona County	02	1245MST to 2400MST	?	?	0	0	2	0	Wind
Gillette, Campbell County	02	2230MST	?	?	0	0	4	0	Wind

A Pacific Power Company power line pole downed by high wind gust in excess of 60 mph leaving about 200 homes east of Cody without power for several hours.

Blowing dirt due to high wind gusting to 64 mph left dirt drifts of 1 to 2 feet deep on some lawns of the Wolf Creek Subdivision west of Casper.

High winds with peak gusts to 65 mph are suspected for causing a short circuit in the Thunder Basin Transmission Line which caused the WYODAK Power Plant and four other plants operated by Black Hills Power and Light Company to shut down. Affected 35,000 to 40,000 customers by outages up to 3 hours in some areas and all night in parts of west Gillette.

49 ALASKA

South Coast	3				0	1	2	0	Heavy Snow Avalanche
Northwest Coast	7-8				0	?	4	0	Blizzard

Heavy snow over the mountains along the North Gulf Coast caused high avalanche danger for several days. On the Richardson Highway in Thompson pass near Valdez an avalanche buried a motorhome and another vechicle. Seven persons were trapped in the motorhome overnight but escaped with only 1 injury.

East winds of 35 to 45 mph combined with a 5 inch snowfall caused whiteout conditions over a 30 hour period in the Kotzebue area. The storm created snowdrifts 10 to 15 feet high.

50 HAWAII

Statewide	25-26				1	0	6	5	Heavy Rain, Wind

Heavy rains on Christmas Day over the entire state caused scattered flooding. Heaviest rainfall of about 12 inches in 24 hours or 18 inches in 48 occured over the Kau, Puna, and Hilo areas of the Big Island. Extensive damage reported to highways and bridges and other public property with the main road from Hilo to the Kona side around the south end of the island closed for several days. Also temporary road closures reported on Kauai and Oahu due to standing water or rock slides. Squally winds accompanied the showers. One fatality occurred on Oahu as a tree fell on a Schofield Barracks soldier.

51 PUERTO RICO

North Coast	11-14				0	0	7	C	Heavy rain, flooding

A cold front which had moved rapidly off the southeastern coast of the U.S. mainland became quasi-stationary over the north coastal section of Puerto Rico during the four day period of the 11th thru 14th. Intermittent heavy rains and thunderstorms caused serious coastal flooding with total rainfall amounts for the entire event ranging from 20 to 30 inches in some areas. Among the outstanding rainfall statistics were the rainfall amounts for a cooperative observing station at Candelaria-Toa Baja were the 4 day total reached 29.14 inches with one 24 hour total of 16.24 inches and nearly four inches reported in one hour.

The most serious flooding was limited to low lying areas with heavy runoff and ponding along the north coastal flood plain. The fact that high intensity rainfall was restricted for the most part to the coast rather than over the watersheds further inland was a significant factor in reducing the serious flood potential of this event. Those municipalities most affected by flooding were Camuy, Arecibo, Barceloneta, Manatí, Vega Baja, Toa Baja, Dorado, San Juan, Carolina, Canóvanas, Río Grande, Fajardo and Ceiba; all north coastal towns. Among the agricultural losses was the new rice crop in the Manatí-Vega Baja area which was almost entirely wiped out. Water was up to 12 feet deep in some of the low lying housing areas of the previously mentioned towns. Barrio Candelaria in Toa Baja, the scene of heavy flooding during Hurricane David, was again inundated from heavy surface runoff. There was heavy damage to municipal and state roads from erosion and landslides. Two bridges collapsed in Ceiba and Camuy. At one stage there were about 3000 people in Civil Defense shelters at over 20 communities. Fifteen towns were later declared disaster areas by the Governor.

52 VIRGIN ISLANDS — NONE REPORTED

53 PACIFIC

Guam	13-14				0	0	4	4	Wind

Minor wind damage mainly over southern portions of Guam as typhoon Kit passes about 45 miles to the southwest of the island. Winds gusted to 75 mph on the 13th in some southern areas with extensive power outages. Damages mainly to bananas and other tender plants.

STORM SUMMARY

DECEMBER 1981

STATE	TORNADOES					HAILSTORMS				WINDSTORMS				LIGHTNING				@HEAVY SNOWSTORMS AND BLIZZARDS				# ICE STORMS				ϕ ALL OTHER			
								†DAMAGE				†DAMAGE			†DAMAGE				†DAMAGE				†DAMAGE					†DAMAGE	
	NUMBER	DAYS	DEATHS	INJURIES	† DAMAGE	DEATHS	INJURIES	PROPERTY	CROPS	DEATHS	INJURIES	PROPERTY	CROPS	DEATHS	INJURIES	PROPERTY	CROPS	DEATHS	INJURIES	PROPERTY	CROPS	DEATHS	INJURIES	PROPERTY	CROPS	DEATHS	INJURIES	PROPERTY	CROPS
Alabama																4						3	30	5		4			
Arizona																													
Arkansas												4																	
California																													
Colorado												4						3		?									
Connecticut																													
Delaware																													
Florida	1	1		5	5																								
Georgia																													
Idaho												5																	
Illinois																													
Indiana																				?									
Iowa																				5				5					
Kansas																													
Kentucky											1	4	2						3	3		3	25	4	2				
Louisiana																													
Maine												?								5									
Maryland & DC																													
Massachusetts																				?									
Michigan																													
Minnesota																													
Mississippi																													
Missouri																			?	?	?								
Montana																													
Nebraska												?																	
Nevada																													
New Hampshire																												5	
New Jersey																				5									
New Mexico																													
New York												4								5									
North Carolina																													
North Dakota																													
Ohio																													
Oklahoma																													
Oregon																										?	?	?	?
Pennsylvania																				4				3					
Rhode Island																				?									
South Carolina																								5					
South Dakota																													
Tennessee																								?	?				
Texas																													
Utah												5																	
Vermont																				3									
Virginia																										1	1		
Washington																													
West Virginia																													
Wisconsin																													
Wyoming												4																	
Alaska																			?	4									
Hawaii										1		5	5															6	5
Pacific												4	4																
Puerto Rico																												7°	
Virgin Islands																													

GENERAL SUMMARY OF TORNADOES, 1981

HENRY N. VIGANSKY
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
ENVIRONMENTAL DATA AND INFORMATION SERVICE
NATIONAL CLIMATIC CENTER

The 1981 tornado season began on January 22 at 10:30 a.m., when a twister touched down three miles (4.8 km) west of Chico, California. A private home and a pickup truck sustained minor damage. The final tornado of the 1981 season occurred on December 15 at 9:25 a.m., in Saint Petersburg, Florida. The tornado moved northeast damaging the Maximo Marina, Maximo Plaza Shopping Center, and overturned four airplanes at the Albert Whitted Airport. Total estimated damage was $200,000. In 1981, 772 tornadoes were reported on 175 days killing 24 people, injuring 792 others, and causing property damage in excess of 500 million dollars. The outstanding feature of the 1981 season was that only 24 fatalities were recorded, the lowest total since 1916. Tornadoes damaged or destroyed approximately 550 mobile homes resulting in 14 deaths and 107 injuries.

New monthly records by state, location of killer tornadoes, and state to state border crossings are shown in the following three tables:

NEW MONTHLY TORNADO RECORDS

MONTH	STATE	NEW RECORD	PREVIOUS RECORD
February	South Carolina	4	(3) 1962
May	Texas	71	(65) 1969
June	Ohio	21	(15) 1975
October	Texas	23	(22) 1974

KILLER TORNADOES

DATE		STATE	COUNTY	TOTAL DEATHS
February	10	Texas	Walker	1
	11	North Carolina	Wake	1
March	30	North Carolina	Hertford	1
April	1	Alabama	Russell	2
	4	Wisconsin	Washington	3
	19	Oklahoma	Tulsa	5
	22	Missouri	Jefferson	1
	22	Missouri	Mississippi	1
	30	Oklahoma	Grady	1
June	13	Ohio	Morrow	4
	14	Minnesota	Hennepin	1
	19	Kansas	Douglas	1
	21	Illinois	Schuyler	1
	21	Missouri	Warren	1

STATE BORDER CROSSINGS

DATE	STATE		STATE
March 30	North Carolina	into	Virginia
July 28	Ohio	into	West Virginia

Some of the more severe or unusual tornadoes are described briefly in the following paragraphs:

On February 10 at 3:25 a.m., the first killer tornado of the season touched down 12 miles (19.2 km) west-northwest of Huntsville, Texas. The twister moved through a mobile home community near Mount Zion. Several mobile homes were demolished causing one death and eight injuries. Debris from the mobile homes

was carried aloft and collected in trees and power lines several miles away. On the same day at 8:40 a.m., another tornado touched down west of Bay Minette, Alabama. The tornado struck the Bay Minette Middle School destroying the gymnasium and damaged several nearby homes. Two students and a bus driver were seriously hurt and 25 other children received minor injuries. Total property damage was estimated at three million dollars.

On March 30, a tornado touched down northwest of Como, North Carolina. The tornado destroyed a mobile home killing the woman occupant and injuring her son. The storm proceeded on a northeast track causing about $200,000 damage in North Carolina. The twister moved into Virginia and left a three mile (4.8 km) path of destruction estimated at $250,000. Two people received minor injuries.

A major tornado struck Hurtsboro, Alabama, on April 1 at 12:30 a.m., killing two people and injuring 23 others. Twenty-five homes, eight mobile homes, and 25 businesses were destroyed. Forty-one homes and 10 businesses sustained major damage. Property losses were estimated at over eight million dollars.

Shortly after midnight on April 4th, a tornado with extremely rare clockwise rotation struck West Bend, Wisconsin. Dr. T. Theodore Fujita of the University of Chicago, confirmed the clockwise rotation and estimated the winds at 225 mph (362 km/h). Damage was estimated at 12.9 million dollars. Three people lost their lives and 53 were injured.

On April 19, a tornado touched down 1.5 miles (2.4 km) south of Glenpool, Oklahoma, moved east, and struck the Bixby Heights Mobile Home Park killing five people. Most of the 49 injuries occurred when the tornado struck a church near the mobile home park.

At 7:15 p.m. on May 17, a tornado touched down two miles (3.2 km) northwest of Sumner, Texas. Eyewitnesses described the tornado when it first touched the ground as being the size of an automobile hood. The tornado rapidly intensified and reached its maximum width of 450 yards (411 m) as it roared into the small town of Emberson, Texas. Ninety percent of the town was destroyed. Thirty people were hurt, six of them seriously. One man narrowly escaped death as he huddled in a bathtub which was deposited 1/4 mile (.4 km) from his demolished house.

Thornton, a suburb of Denver, Colorado, was struck by a tornado on June 3rd. The twister left a path of destruction through the center of the city. Approximately 600 homes were in the path of the storm, 87 were destroyed, 110 severely damaged and the others received minor damage. The worst damage was reported at a shopping center in northeast Thornton. Roofs were blown off the shopping center and a nearby bank, and numerous windows were blown out of an apartment complex. Fortunately, there were no casualties, but forty-two people were injured, seven requiring hospitalization.

Cardington, Ohio was struck by a tornado on June 13 at 2:23 p.m., which resulted in the deaths of four people and injuries to 56 others. Over 100 homes were damaged or destroyed and 50 businesses including the Cardington Mills Apartment Complex were destroyed. Property damage was estimated in excess of five million dollars.

A tornado touched down at 2:49 p.m., on June 14, in Edina, Minnesota, a southwest suburb of Minneapolis. The twister continued on a 15 mile (24.1 km) path of destruction and at times was 2.5 blocks wide moving northeast through the center of Minneapolis before lifting. Tornadic winds varied from 80 mph (128.7 km/h) to 160 mph (257.4 km/h). As a result of the storm there was one fatality and 83 injuries.

At 6:32 p.m. on June 19, a tornado struck the southwest section of Lawrence, Kansas and moved to the southeast. One death resulted from the storm when it knocked over the wall of a store, and 30 people were injured at various other locations throughout the city. Twenty-one homes were demolished and 30 sustained considerable damage. Sixty mobile homes were destroyed and 115 were damaged. A shopping complex sustained major damage, and several smaller buildings nearby were leveled. Hailstones three to four inches (8 to 10 cm) in diameter fell from the storm in southern Jefferson and northern Douglas counties.

During July through September 188 tornadoes were reported. Fortunately there were no fatalities, and only 40 people were injured. Overall property damage was estimated at 40 million dollars.

On October 13, a small but destructive tornado left a two mile (3.2 km) path of rubble through Waco, Texas. Damage included two churches, a supermarket, and 40 homes. One hundred and fifty cars had their windshields blown out. Insurance estimates of damage exceeded seven million dollars.

At 4:30 p.m., on October 25, a tornado touched down on the southwest side of Blountstown, Florida, and moved north to the west side of town. Three homes were destroyed, 72 others damaged, and the high school football stadium was demolished. Total damage was estimated at two million dollars. Twelve people were injured.

A few minutes past midnight on the 20th of October, a tornado created havoc at the Atlanta International Airport. The tornado damaged the skyroof on Concourse B and damaged windshields of several airplanes

parked at the loading gates. A DC-8 had an engine ripped off as it taxied to a stop, and three small aircraft were picked up and flipped over. Five airline employees suffered minor injuries. The tornado proceeded on to Hapeville, Georgia, and tore off part of the roof of an apartment building. Several homes were damaged by falling trees and tree limbs.

Additional information is presented in the following tables and charts. Continuing efforts of the National Severe Storms Forecast Center, Weather Service Forecast Offices, University of Chicago and the National Climatic Center have resulted in several corrections to the previous tables.

More detailed information about tornadic activity can be obtained from the monthly Storm Data publications. The National Severe Storms Forecast Center has developed a magnetic tape containing tornado statistics for the period 1950-1981. A copy of this tape can be obtained by contacting the National Climatic Center, Federal Building, Asheville, North Carolina 28801.

TORNADO SUMMARY, 1981

STATE	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ANN
ALABAMA													
Number		2	8	1	1		1	1					14
Days		1	4	1	1		1	1					9
Deaths				2									2
Injuries		67		23									90
ALASKA													
(None)													
ARIZONA													
Number									3				3
Days									1				1
Deaths													0
Injuries													0
ARKANSAS													
Number				1	8					1			10
Days				1	4					1			6
Deaths													0
Injuries					10								10
CALIFORNIA													
Number	2		1										3
Days	2		1										3
Deaths													0
Injuries													0
COLORADO													
Number					5	10	6	3	1				25
Days					3	3	4	3	1				14
Deaths													0
Injuries						44							44
CONNECTICUT													
(None)													
DELAWARE													
(None)													
DISTRICT OF COLUMBIA													
(None)													
FLORIDA													
Number		5	4	2	10	17	10	8	3	1		1	61
Days		4	2	2	7	11	6	5	3	1		1	42
Deaths													0
Injuries			13	2		1				12		5	33
GEORGIA													
Number			4	1	1		1				1		8
Days			1	1	1		1				1		5
Deaths													0
Injuries											5		5
HAWAII													
(None)													
IDAHO													
Number				1			1						2
Days				1			1						2
Deaths													0
Injuries													0
ILLINOIS													
Number			1	9	1	18	3	1					33
Days			1	4	1	4	3	1					14
Deaths						1							1
Injuries				36		12							48
INDIANA													
Number				2	1	4	1			2	1		11
Days				2	1	4	1			1	1		10
Deaths													0
Injuries													0

TORNADO SUMMARY, 1981

STATE	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ANN
IOWA													
Number			1	10	10	8		1					30
Days			1	4	1	5		1					12
Deaths													0
Injuries				11		1							12
KANSAS													
Number			2	3	14	11	8		1				39
Days			1	2	6	8	6		1				24
Deaths						1							1
Injuries						33	9						42
KENTUCKY													
Number					1	1		1			1		4
Days					1	1		1			1		4
Deaths													0
Injuries						7		3			2		12
LOUISIANA													
Number				1	5	11	2	1	1				21
Days				1	3	5	2	1	1				13
Deaths													0
Injuries						10		2					12
MAINE													
Number						1							1
Days						1							1
Deaths													0
Injuries													0
MARYLAND													
Number					1				1				2
Days					1				1				2
Deaths													0
Injuries					2								2
MASSACHUSETTS													
Number						1							1
Days						1							1
Deaths													0
Injuries						3							3
MICHIGAN													
Number				1		3							4
Days				1		3							4
Deaths													0
Injuries													0
MINNESOTA													
Number			1	4	1	12	7	5					30
Days			1	1	1	2	5	2					12
Deaths						1							1
Injuries				2		91		1					94
MISSISSIPPI													
Number		1	2		1	2			1				7
Days		1	1		1	1			1				5
Deaths													0
Injuries			2		1								3
MISSOURI													
Number				11	4	15	2	1					33
Days				2	3	7	1	1					14
Deaths				2		1							3
Injuries				32	1	7							40
MONTANA													
Number					1			2					3
Days					1			1					2
Deaths													0
Injuries													0

TORNADO SUMMARY, 1981

STATE	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ANN
NEBRASKA													
Number				3		5	6	5					19
Days				1		3	5	4					13
Deaths													0
Injuries													0
NEVADA													
(None)													
NEW HAMPSHIRE													
Number						1							1
Days						1							1
Deaths													0
Injuries													0
NEW JERSEY													
Number						1	1			1			3
Days						1	1			1			3
Deaths													0
Injuries													0
NEW MEXICO													
Number					1	4	1	2					8
Days					1	4	1	2					8
Deaths													0
Injuries													0
NEW YORK													
Number								1	2				3
Days								1	1				2
Deaths													0
Injuries													0
NORTH CAROLINA													
Number		5	1			3	1		1				11
Days		1	1			1	1		1				5
Deaths		1	1										2
Injuries		2	1			1							4
NORTH DAKOTA													
Number				1		4	9						14
Days				1		3	5						9
Deaths													0
Injuries													0
OHIO													
Number				3		21	1						25
Days				2		5	1						8
Deaths						4							4
Injuries						71	5						76
OKLAHOMA													
Number			1	11	44	7	5	2	2	3	1		76
Days			1	6	5	7	4	1	2	3	1		30
Deaths				6									6
Injuries				61	26	6	5			2			100
OREGON													
(None)													
PACIFIC													
Number	1												1
Days	1												1
Deaths													0
Injuries													0
PENNSYLVANIA													
Number				2	1	4	8	1	1				17
Days				2	1	2	3	1	1				10
Deaths													0
Injuries							6						6
PUERTO RICO													
(None)													

TORNADO SUMMARY, 1981

STATE	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ANN
RHODE ISLAND													
(None)													
SOUTH CAROLINA													
Number		4		3	1		2	1					11
Days		2		2	1		2	1					8
Deaths													0
Injuries					6								6
SOUTH DAKOTA													
Number						6	7	4	2				19
Days						3	3	1	2				9
Deaths													0
Injuries							2						2
TENNESSEE													
Number				1	2	4				1			8
Days				1	2	1				1			5
Deaths													0
Injuries													0
TEXAS													
Number		7	7	9	71	26	5	20	5	23	3		176
Days		2	5	5	16	10	3	9	4	8	2		64
Deaths		1											1
Injuries		11	2	3	50	1		4		10	2		83
UTAH													
Number					1		1						2
Days					1		1						2
Deaths													0
Injuries													0
VERMONT													
(None)													
VIRGINIA													
Number		1	1		1		2						5
Days		1	1		1		2						5
Deaths													0
Injuries													0
VIRGIN ISLANDS													
(None)													
WASHINGTON													
Number						1			1				2
Days						1			1				2
Deaths													0
Injuries													0
WEST VIRGINIA													
Number						1	2						3
Days						1	2						3
Deaths													0
Injuries							3						3
WISCONSIN													
Number				3		10	5	3					21
Days				2		4	3	2					11
Deaths				3									3
Injuries				59		3							62
WYOMING													
Number				1			1	1	1				4
Days				1			1	1	1				4
Deaths													0
Injuries													0
UNITED STATES													
Number	3	25	33*	84	187	212	98*	64	26	32	7	1	772*
Days †	3	5	13	18	24	29	27	22	16	12	5	1	175
Deaths		2	1	13		8							24
Injuries		80	18	229	96	291	30	10		24	9	5	792

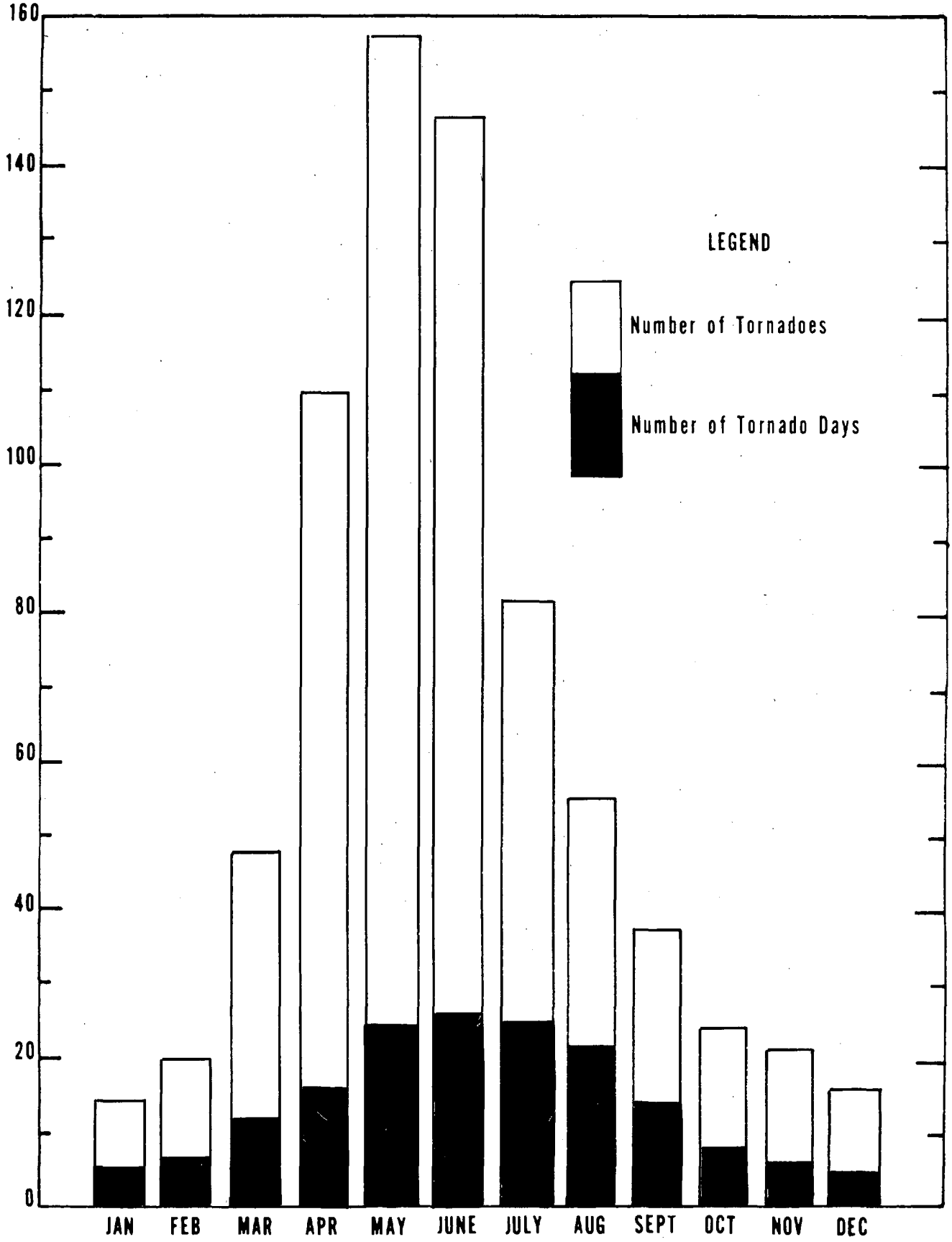
* Corrected for boundary-crossing tornadoes.
† Tornado Days for Country as a whole.

NUMBER OF TORNADOES, TORNADO DAYS, AND DEATHS BY MONTHS, 1953- 1980

	JANUARY			FEBRUARY			MARCH			APRIL			MAY			JUNE			JULY			AUGUST			SEPTEMBER			OCTOBER			NOVEMBER			DECEMBER			ANNUAL		
YEAR	NUMBER	DAYS	DEATHS	NUMBER	DAYS	DEATHS	NUMBER	DAYS	DEATHS	NUMBER	DAYS	DEATHS	NUMBER	DAYS	DEATHS	NUMBER	DAYS	DEATHS	NUMBER	DAYS	DEATHS	NUMBER	DAYS	DEATHS	NUMBER	DAYS	DEATHS	NUMBER	DAYS	DEATHS	NUMBER	DAYS	DEATHS	NUMBER	DAYS	DEATHS	NUMBER	DAYS	DEATHS
1953	14	6	0	16	3	3	40	10	24	47	16	34	94	21	161	111	24	244	31	19	0	24	15	0	5	4	0	6	4	0	12	6	0	21	8	49	421	136	515
1954	2	1	0	17	9	2	63	13	10	112	22	3	101	22	9	107	26	5	45	23	0	49	21	1	21	10	3	14	8	2	2	2	0	17	3	1	550	160	36
1955	3	2	0	4	3	0	43	15	5	99	18	7	147	26	103	154	28	2	49	21	5	33	18	0	15	8	2	23	7	1	20	4	1	3	2	0	593	152	126
1956	2	2	0	47	12	8	31	7	1	85	15	67	79	24	4	65	21	0	91	26	1	43	20	2	16	10	0	29	8	0	7	6	0	9	4	0	504	155	83
1957	17	3	13	5	3	0	38	7	1	216	21	29	227	26	87	147	25	14	55	19	0	20	14	0	17	10	2	18	11	2	58	11	25	38	4	19	856	154	192
1958	12	7	0	20	5	13	15	10	0	76	19	4	68	21	0	127	27	42	121	30	1	46	20	1	24	14	1	9	6	4	45	6	0	1	1	0	564	166	66
1959	16	2	3	20	5	21	43	11	9	30	12	1	226	28	8	73	25	2	63	24	0	38	18	0	58	15	14	24	10	0	11	4	0	2	2	0	604	156	58
1960	9	4	0	28	10	0	28	10	0	70	20	7	201	26	34	124	27	3	43	22	0	47	23	1	22	13	0	18	10	1	25	6	0	1	1	0	616	172	46
1961	1	1	0	31	8	0	124	17	7	74	19	3	137	25	23	107	23	2	77	27	0	27	16	0	53	16	15	14	5	0	36	7	1	16	5	0	697	169	51
1962	12	3	1	25	7	0	37	9	17	41	8	1	200	22	3	171	29	0	78	26	0	51	21	6	24	11	0	11	10	0	5	4	0	2	2	0	657	152	28
1963	15	5	1	6	3	0	48	12	8	84	14	16	71	21	1	91	23	0	62	26	0	26	13	2	33	13	3	13	5	0	15	6	0	0	0	0	464	141	31
1964	14	3	10	2	2	0	36	11	6	157	23	15	135	20	16	136	24	0	63	23	0	79	23	2	25	10	0	22	4	22	17	8	0	18	5	2	704	156	73
1965	21	11	0	32	4	0	34	9	2	129	20	264	275	25	17	147	28	6	86	26	0	61	23	1	64	21	0	16	4	1	34	6	5	7	4	0	906	181	296
1966	1	1	0	28	5	0	12	6	58	80	20	12	98	17	0	126	28	19	100	27	3	58	21	0	22	13	0	29	6	6	20	3	0	11	3	0	585	150	98
1967	39	4	7	8	5	0	42	14	3	149	18	73	116	25	3	210	28	6	90	25	1	28	16	2	139	16	5	36	7	4	8	5	0	61	10	10	926	173	114
1968	5	3	0	7	3	0	28	8	0	102	15	40	145	26	72	136	27	11	56	22	2	66	23	2	25	14	0	14	9	0	44	12	3	32	9	1	660	171	131
1969	3	1	32	5	5	0	8	2	1	68	15	2	145	25	4	137	28	7	99	27	0	69	21	19	20	11	0	26	10	0	5	3	0	23	7	1	608	155	66
1970	9	5	0	16	3	0	25	12	2	117	16	29	88	19	26	134	24	6	81	26	3	55	21	0	54	20	0	50	13	6	10	4	0	14	8	0	653	171	72
1971	18	7	1	83	12	131	40	13	2	75	14	11	166	24	7	199	28	1	100	30	1	50	21	0	47	15	0	38	12	0	16	7	0	56	9	2	888	192	156
1972	33	10	5	7	4	0	69	17	0	96	20	16	140	27	0	114	25	2	115	29	0	59	23	2	49	19	0	34	10	0	17	4	2	8	6	0	741	194	27
1973	33	7	1	10	4	0	80	16	17	150	22	10	250	26	35	224	26	2	80	26	0	51	23	4	69	22	3	25	11	0	81	11	12	49	12	3	1102	206	87
1974	24	8	2	23	9	0	36	12	1	269	22	313	144	28	10	194	26	31	59	19	0	107	26	0	25	11	0	45	10	4	13	8	0	8	5	0	947	184	361
1975	52	7	12	45	12	7	84	16	12	108	20	13	188	30	5	196	28	6	79	26	2	60	25	2	34	17	0	12	7	0	40	8	0	22	8	1	920	204	60
1976	12	5	0	37	6	5	180	18	21	113	23	1	155	24	8	169	26	3	84	28	2	38	18	1	35	15	3	11	5	0	0	0	0	1	1	0	835	169	44
1977	5	4	0	17	3	2	64	15	0	88	15	26	228	29	4	132	27	0	99	27	1	82	26	6	65	21	1	25	5	1	24	10	0	23	7	2	852	189	43
1978	23	7	2	6	3	0	17	8	0	107	17	4	213	27	7	148	28	17	143	30	11	65	24	1	20	10	6	7	5	0	9	5	0	30	9	5	788	173	53
1979	16	9	0	4	3	0	53	13	1	120	17	58	112	23	2	150	24	8	132	30	1	127	27	5	68	19	2	47	12	7	21	8	0	2	1	0	852	186	84
1980	5	4	0	11	9	0	41	15	2	137	16	4	203	25	8	217	30	7	95	26	5	73	27	0	37	14	1	43	7	1	3	2	0	1	1	0	866	176	28
1981	3	3	0	25	5	2	33	13	1	84	13	13	187	24	0	212	29	8	98	27	0	64	22	0	26	16	0	32	12	0	7	5	0	1	1	0	772	175	24
1953-81																																							
TOTAL	419	135	90	585	165	194	1392	339	211	3083	515	1076	4539	706	657	4258	762	454	2374	737	39	1596	609	60	1112	408	61	691	233	62	605	171	49	477	138	96	21131	4918	3049
MEAN	14	5	3	20	6	7	48	12	7	106	18	37	157	24	23	147	26	16	82	25	1	55	21	2	38	14	2	24	8	2	21	6	2	16	5	3	729	170	105

AVERAGE NUMBER OF TORNADOES AND TORNADO DAYS EACH MONTH IN THE UNITED STATES

(BASED ON 21,131 TORNADOES THAT OCCURRED FROM 1953–1981)



NUMBER OF TORNADOES, TORNADO DAYS, DEATHS, AND RESULTING LOSSES BY YEARS, 1916-81

YEAR	Number Tornadoes	Tornado Days	Total Deaths	Most Deaths in Single Tornado	Total Property Losses †	PROPERTY LOSS FREQUENCY*		
						Category 5	Category 6	Category 7 and Over
1916	90	36	150	30	6	7	1	0
1917	121	38	551	101	7	21	9	0
1918	81	45	136	36	7	20	5	0
1919	64	35	206	59	7	10	2	0
1920	87	50	499	87	7	14	10	0
1921	105	55	202	61	7	22	3	0
1922	108	64	135	16	7	27	5	0
1923	102	59	110	23	6	21	1	0
1924	130	57	376	85	7	26	11	1
1925	119	65	794	689	7	34	2	1
1926	111	57	144	23	6	28	0	0
1927	163	62	540	92	7	42	9	1
1928	203	79	95	14	7	40	7	0
1929	197	74	274	40	7	48	4	0
1930	192	72	179	41	7	38	6	0
1931	94	57	36	6	6	14	1	0
1932	151	67	394	37	7	23	1	1
1933	258	96	362	34	7	46	9	0
1934	147	77	47	6	6	10	3	0
1935	180	77	71	11	6	29	0	0
1936	151	71	552	216	7	17	5	1
1937	147	75	29	5	6	24	0	0
1938	213	76	183	32	7	29	6	0
1939	152	75	91	27	7	21	3	0
1940	124	62	65	18	7	13	2	0
1941	118	57	53	25	6	24	1	0
1942	167	66	384	65	7	42	10	0
1943	152	61	58	5	7	28	8	0
1944	169	68	275	100	7	50	9	0
1945	121	66	210	69	7	21	10	1
1946	106	65	78	15	7	29	7	0
1947	165	78	313	169	7	46	7	1
1948	183	68	139	33	7	62	11	2
1949	249	80	211	58	7	54	13	0
1950	200	88	70	18	7	47	9	0
1951	262	113	34	6	7	35	11	2
1952	240	98	229	57	7	53	19	0
1953	421	136	515	116	8	63	18	7
1954	550	160	36	6	7	63	8	1
1955	593	152	126	80	7	74	13	1
1956	504	155	83	25	7	83	24	1
1957	856	154	192	44	8	129	26	3
1958	564	166	66	19	7	70	8	1
1959	604	156	58	21	7	70	4	1
1960	616	172	46	16	7	65	11	1
1961	697	169	51	16	7	103	21	1
1962	657	152	28	17	7	51	10	0
1963	464	141	31	5	7	77	15	1
1964	704	156	73	22	7	113	17	5
1965	906	181	296	44	8	126	30	11
1966	585	150	98	58	8	79	13	4
1967	926	173	114	33	8	125	33	8
1968	660	171	131	34	8	82	26	6
1969	608	155	66	32	8	98	16	3
1970	653	171	72	26	8	97	24	6
1971	888	192	156	58	8	71	30	5
1972	741	194	27	6	8	100	28	1
1973	1102	206	87	7	9	219	67	9
1974	947	184	361	34	9	166	82	25
1975	920	204	60	9	9	189	31	11
1976	835	169	44	5	8	145	41	5
1977	852	189	43	22	8	173	40	6
1978	788	173	53	16	9	153	53	6
1979	852	186	84	42	9	169	62	11
1980	866	176	28	5	9	201	79	13
1981	772	175	24	5	9	144	43	12
Means: 1953-81	729	170	105	---	---	114	30	6

NOTE: - - The above estimated losses are based on values at time of occurrence.

† Storm damages in categories:

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 and over

*Number of times property losses reported in Storm Data in Categories 5, 6, 7 and over.

NUMBER OF TORNADOES, TORNADO DAYS, AND DEATHS BY STATES, 1953-81

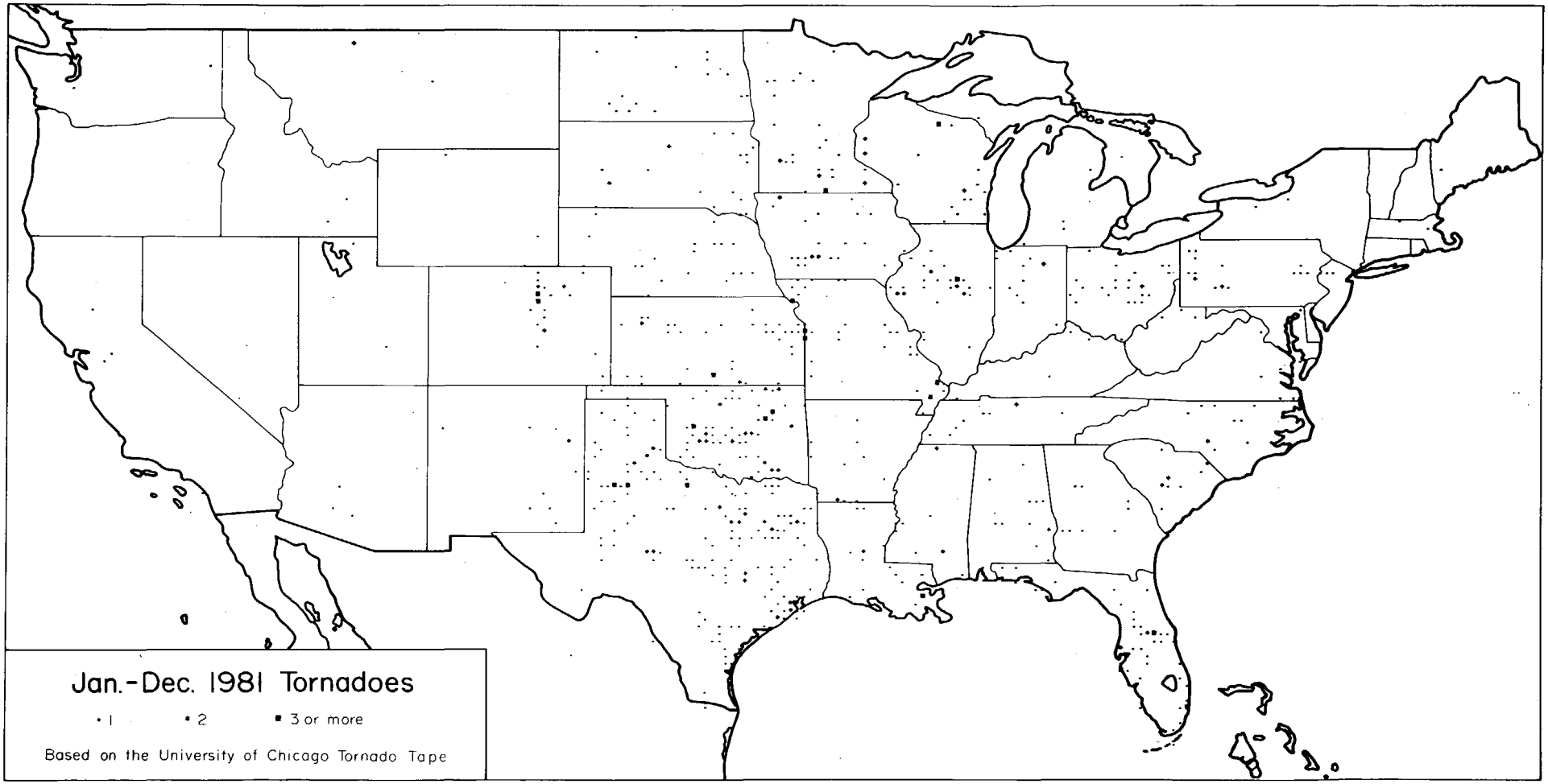
STATE	TORNADOES							DAYS		DEATHS		
	TOTAL	AVERAGE	GREATEST	YEAR	LEAST	YEAR	Per # 10,000 Sq. Mi.	TOTAL	AVERAGE	TOTAL	AVERAGE	Per @ 10,000 Sq. Mi.
ALABAMA	577	20	45	1973+	5	1956	3.86	316	11	204	7	40
ALASKA	1	0	1	1959	0	1981+	00	1	0	0	0	0
ARIZONA	103	4	17	1972	0	1965+	.31	84	3	3	0	0
ARKANSAS	581	20	50	1973	2	1969+	3.77	289	10	122	4	23
CALIFORNIA	99	3	13	1978	0	1968+	.22	75	3	0	0	0
COLORADO	485	17	42	1976	1	1959	1.60	317	11	2	0	0
CONNECTICUT	41	1	8	1973	0	1981+	2.82	37	1	4	0	8
DELAWARE	26	1	5	1975	0	1981+	4.36	24	1	0	0	0
DISTRICT OF COLUMBIA	0	0	0	---	0	1981+	.00	0	0	0	0	0
FLORIDA	1216	42	97	1975	10	1956	7.16	779	27	52	2	9
GEORGIA	602	21	46	1971+	7	1960	3.53	346	12	72	2	12
HAWAII	17	1	4	1971	0	1981+	.91	14	0	0	0	0
IDAHO	39	1	5	1967+	0	1977	.16	31	1	0	0	0
ILLINOIS	783	27	107	1974	4	1953	4.79	364	13	130	4	23
INDIANA	649	22	48	1973	6	1972+	6.17	312	11	205	7	56
IOWA	796	27	54	1964	7	1956+	4.88	368	13	54	2	10
KANSAS	1251	43	97	1955	14	1976	5.24	587	20	163	6	20
KENTUCKY	230	8	34	1974	0	1953	1.96	131	5	101	3	25
LOUISIANA	567	20	55	1974	3	1955	4.03	359	12	88	3	18
MAINE	71	2	11	1971	0	1980+	.74	63	2	1	0	0
MARYLAND	80	3	10	1975	0	1970+	2.61	64	2	1	0	1
MASSACHUSETTS	108	4	12	1958	0	1959	4.51	78	3	99	3	120
MICHIGAN	447	15	39	1974	2	1959	2.65	262	9	231	8	40
MINNESOTA	499	17	34	1968	5	1972	2.05	294	10	75	3	9
MISSISSIPPI	619	21	44	1973	1	1979	4.47	328	11	316	11	66
MISSOURI	791	27	79	1973	6	1953	3.91	375	13	123	4	18
MONTANA	119	4	13	1978	0	1974+	.28	88	3	0	0	0
NEBRASKA	1004	35	78	1975	10	1966	4.48	498	17	49	2	6
NEVADA	18	1	4	1964	0	1981+	.06	17	1	0	0	0
NEW HAMPSHIRE	61	2	9	1963	0	1979+	2.26	55	2	0	0	0
NEW JERSEY	47	2	8	1973	0	1978+	2.07	39	1	0	0	0
NEW MEXICO	240	8	18	1972	0	1953	.68	183	6	3	0	0
NEW YORK	103	4	8	1978	0	1953	.72	87	3	2	0	0
NORTH CAROLINA	339	12	38	1973	2	1970	2.22	214	7	24	1	5
NORTH DAKOTA	487	17	52	1976	2	1961	2.38	280	10	21	1	3
OHIO	427	15	43	1973	3	1966+	3.57	226	8	151	5	37
OKLAHOMA	1553	54	107	1957	21	1978	7.66	660	23	183	6	26
OREGON	24	1	3	1975+	0	1981+	.09	20	1	0	0	0
PACIFIC	2	0	1	1981+	0	1980+	--	2	0	0	0	0
PENNSYLVANIA	235	8	23	1976	0	1959	1.79	166	6	8	0	2
PUERTO RICO	9	0	2	1979+	0	1981+	.91	8	0	0	0	0
RHODE ISLAND	1	0	1	1972	0	1981+	.28	1	0	0	0	0
SOUTH CAROLINA	266	9	23	1973	1	1970+	2.95	183	6	24	1	8
SOUTH DAKOTA	702	24	64	1965	1	1958	3.14	344	12	8	0	1
TENNESSEE	324	11	44	1974	1	1962	2.64	177	6	74	3	18
TEXAS	3520	121	232	1967	32	1953	4.54	1436	50	372	13	14
UTAH	34	1	5	1970+	0	1980+	.13	27	1	0	0	0
VERMONT	24	1	5	1962	0	1981+	.86	21	1	0	0	0
VIRGINIA	167	6	22	1975	1	1963+	1.41	117	4	16	1	4
VIRGIN ISLANDS	2	0	1	1979+	0	1981+	--	2	0	0	0	0
WASHINGTON	34	1	4	1978	0	1977+	.17	28	1	6	0	1
WEST VIRGINIA	63	2	6	1980+	0	1960+	.90	49	2	1	0	0
WISCONSIN	535	18	43	1980	3	1953	3.29	299	10	59	2	11
WYOMING	257	9	42	1979	0	1970	.91	183	6	2	0	0
TOTAL: UNITED STATES	*21131	729	1102	1973	421	1953	2.02	†4918	170	3049	105	8

\+ Also in earlier year(s).
* Corrected for boundary-crossing tornadoes.
† Tornado Days for Country as a whole.

\# Mean annual tornadoes per 10,000 square miles.
@ Number of deaths per 10,000 square miles.

NUMBER OF FUNNEL CLOUDS, 1981

STATE	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	ANN
ALABAMA			3	1		1	3	4					12
ALASKA								4					4
ARIZONA													0
ARKANSAS			1	2	26		2	4					35
CALIFORNIA			3		1								4
COLORADO			3		8			5					16
CONNECTICUT													0
DELAWARE													0
DISTRICT OF COLUMBIA													0
FLORIDA					23	33	25	17	14				112
GEORGIA							1						1
HAWAII													0
IDAHO													0
ILLINOIS				2	1								3
INDIANA				4		5							9
IOWA				14	15	24	20	19					92
KANSAS			7	3	7	15	7						39
KENTUCKY					1								1
LOUISIANA					11	2							13
MAINE													0
MARYLAND													0
MASSACHUSETTS													0
MICHIGAN						1		2	6				9
MINNESOTA			5	7	6	5	13	7					43
MISSISSIPPI			2	1	3	2	2						10
MISSOURI				5	1	5	5						16
MONTANA													0
NEBRASKA					1	27	6		1				35
NEVADA													0
NEW HAMPSHIRE													0
NEW JERSEY													0
NEW MEXICO						3	1						4
NEW YORK													0
NORTH CAROLINA													0
NORTH DAKOTA						26	21	5					52
OHIO				1									1
OKLAHOMA				18	14	7					10		49
OREGON													0
PACIFIC													0
PENNSYLVANIA				1									1
PUERTO RICO													0
RHODE ISLAND													0
SOUTH CAROLINA													0
SOUTH DAKOTA					1	11	5						17
TENNESSEE						1							1
TEXAS			3	22	57	69	20	31	11	3	5		221
UTAH													0
VERMONT													0
VIRGINIA													0
VIRGIN ISLANDS													0
WASHINGTON							2						2
WEST VIRGINIA													0
WISCONSIN							2	2					4
WYOMING													0
TOTAL: UNITED STATES	0	0	27	81	176	237	135	100	32	3	15	0	806


Jan.-Dec. 1981 Tornadoes
• 1
• 2
■ 3 or more
Based on the University of Chicago Tornado Tape

GENERAL SUMMARY OF LIGHTNING, 1981

HENRY N. VIGANSKY
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
ENVIRONMENTAL DATA AND INFORMATION SERVICE
NATIONAL CLIMATIC CENTER

During 1981, 66 people in the United States were killed by lightning. This number is well below the annual average of 102 deaths. There were 291 injuries, 43 above the annual average of 248. The location and percentage frequency of lightning fatalities and injuries are shown in the following table.

LOCATION AND PERCENTAGE FREQUENCY OF LIGHTNING DEATHS AND INJURIES
1981

	PERCENTAGE FREQUENCY	
LOCATIONS	DEATHS	INJURIES
Open fields, ball fields, etc.	29	43
Under trees	24	9
Boating, fishing, and water related	18	3
Tractors and heavy road equipment	9	7
Golfing	5	6
Telephones	2	4
Various other or unknown locations	13	28
TOTALS	100%	100%

Some of the more unusual lightning incidents are described briefly in the following annual summary.

April -- In Bowie, Maryland, at 9:30 p.m., on the eleventh, lightning entered a bedroom of a house via the television antenna cable. No one was in the house; the resulting fire gutted the bedroom and damaged two other rooms. Total damage was estimated at $25,000. On the thirteenth at 8:30 p.m., lightning struck a house seven miles (11.3 km) southeast of Lexington, Illinois, and caused a fire that destroyed the house. At about the same time in Kincaid, Illinois, another lightning bolt struck an outside telephone line and the electrical charge traveled along the wire into a home causing the telephone to explode, killing the person who was using the telephone.

May -- On the twenty-ninth at 7:15 p.m., in Gallup, New Mexico, lightning ignited and damaged a butane/propane loading facility. Seven tankers and their contents were destroyed. On the thirteenth near Port Republic, Virginia, 19 beef cattle standing under a tree were killed by a single bolt of lightning. The cattle were valued at $10,450.

June -- In Lubbock, Texas, on the first at 6:12 p.m., a young woman was struck by lightning in a city park where she was playing soccer. The lightning struck just above the right shoulder near her neck, passing right to left through her body. Her warm-up suit was torn in several places and both of her tennis shoes exploded. The force of the lightning strike lifted the woman two feet (.6 m) into the air. A nearby spectator was credited with saving her life by immediately applying cardio-pulmonary resuscitation. After several days of recuperation, she was released from the hospital. At 8:30 p.m., on the third, lightning struck an oil tank near Welch, Texas; 1,400 barrels of oil were lost due to the fire. Loss was estimated at $35,000. On the nineteenth at 10:30 a.m., in southeast Memphis, Tennessee, 19 construction workers were jolted by a bolt of lightning as they worked on a concrete slab. At 10:30 p.m., on the twenty-first, lightning struck and destroyed the Savannah Electric and Power Substation located at East Broad and Bolton Streets, Savannah, Georgia. Damage was estimated at two million dollars. On the twenty-ninth, thunderstorms plagued the Enid, Oklahoma area for three hours. Lightning caused extensive damage to houses, barns, businesses, and power lines; and, it exploded an oil tank battery. Damages were estimated in excess of one million dollars.

July -- On the eighth in Ladysmith, Wisconsin, lightning struck among a group of youths playing baseball at the Ladysmith Industrial Park ball diamond. One youth was killed and 16 others sustained minor injuries. On the thirteenth, lightning stunned 21 Boy Scouts who had sought shelter in a cabin at the Boy Scout camp near Manchester, New Hampshire. Four boys were hospitalized with first-degree burns on their legs. The bolt of lightning traveled 50 feet (15.2 m) down a tree, furrowed 37 feet (11.3 m) along the ground to the cabin. During the early afternoon on the twenty-ninth near Vance, Alabama, 50 head of beef cattle, each weighing about 800 pounds, were killed by lightning. The lightning appeared to have struck a tree and then spread along the ground, killing the cattle. A short distance away, about 30 head of cattle under another tree were unharmed.

GENERAL SUMMARY OF LIGHTNING

August -- On the third at 1:30 p.m., at a state prison farm located in Lincoln County, Arkansas, two inmates were killed and four other inmates and a prison guard were injured while working in an okra field when lightning struck them. In Clearwater County, Minnesota, on the fifth, ball lightning was reported to have entered a house through the telephone. It bounded along the piano keyboard and around the living room causing minor damage. A severe thunderstorm on the eleventh moved through southern Cortland and northern Tioga Counties, New York. Twenty-five people attending the Empire Farm Days (farm equipment exhibition) on a farm in Cortland County, sought shelter from the storm under a tractor and wagon. Lightning struck the tractor and wagon; 15 people were injured and one man was killed.

September -- At 7:00 p.m., on the tenth, lightning struck the clubhouse at the Country Club of Coral Springs, Florida. Lightning caused 80 battery chargers to explode and set the building on fire. Damage to the building, including 82 golf carts destroyed, was estimated at $300,000. During the afternoon of the thirteenth, lightning struck a home in Tucson, Arizona. The house was destroyed by fire and damage was estimated at $70,000.

October -- During the early morning hours on the sixteenth in Sherman, Texas, lightning struck and burned a $90,000 home.

November -- In North Canton, Ohio, on the fifth at 4:45 p.m., a thunderstorm moved over a soccer field. A bolt of lightning struck a monkey-bar set located near the field where a group of boys were playing soccer. The lightning arced from the bars to the boys, killing an eight-year old youth and injuring 11 others. On the twenty-sixth at 9:40 a.m., in a wooded public hunting ground located 20 miles (32.2 km) west of Madison, Wisconsin, a 69-year old man was struck and killed by lightning. His 38-year old son standing next to him suffered burns and temporary paralysis.

Additional lightning information is presented in the following tables.

More detailed information about lightning can be obtained from the monthly Storm Data publications. The National Climatic Center has lightning data on magnetic tape for the period 1959-1981. The tape contains the date/time (year, month, day, and hour), location (state and county), number of fatalities, number of injuries, and amount of property damage. A copy of this tape can be obtained by contacting the National Climatic Center, Federal Building, Asheville, North Carolina 28801-2696.

LIGHTNING FATALITIES, 1981

STATE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
ALABAMA	0	0	0	0	0	0	2	1	0	0	0	0	3
ALASKA	0	0	0	0	0	0	0	0	0	0	0	0	0
ARIZONA	0	0	0	0	0	0	0	1	0	0	0	0	1
ARKANSAS	0	0	0	0	0	1	1	3	0	0	0	0	5
CALIFORNIA	0	0	0	0	0	0	0	0	0	0	0	0	0
COLORADO	0	0	0	0	1	1	1	2	0	0	0	0	5
CONNECTICUT	0	0	0	0	0	0	0	0	0	0	0	0	0
DELAWARE	0	0	0	0	0	0	0	0	0	0	0	0	0
DISTRICT OF COLUMBIA	0	0	0	0	0	0	0	0	0	0	0	0	0
FLORIDA	0	0	0	0	0	1	0	0	1	0	0	0	2
GEORGIA	0	0	0	0	0	0	1	1	0	0	0	0	2
HAWAII	0	0	0	0	0	0	0	0	0	0	0	0	0
IDAHO	0	0	0	0	0	0	0	0	0	0	0	0	0
ILLINOIS	0	0	0	1	0	0	0	0	0	0	0	0	1
INDIANA	0	0	0	0	0	0	0	0	0	0	0	0	0
IOWA	0	0	0	0	0	0	0	0	0	0	0	0	0
KANSAS	0	0	0	0	0	0	0	0	0	0	0	0	0
KENTUCKY	0	0	0	0	0	0	0	0	0	0	0	0	0
LOUISIANA	0	0	0	0	1	2	1	0	1	0	0	0	5
MAINE	0	0	0	0	0	0	0	0	0	0	0	0	0
MARYLAND	0	0	0	0	1	0	0	0	0	0	0	0	1
MASSACHUSETTS	0	0	0	0	0	0	0	0	0	0	0	0	0
MICHIGAN	0	0	0	1	0	1	0	2	0	0	0	0	4
MINNESOTA	0	0	0	0	0	0	0	0	0	0	0	0	0
MISSISSIPPI	0	0	0	0	0	0	0	0	1	0	0	0	1
MISSOURI	0	0	0	0	2	0	0	0	0	0	0	0	2
MONTANA	0	0	0	0	0	1	0	1	0	0	0	0	2
NEBRASKA	0	0	0	0	0	0	1	1	0	0	0	0	2
NEVADA	0	0	0	0	0	0	0	0	0	0	0	0	0
NEW HAMPSHIRE	0	0	0	0	0	0	0	0	0	0	0	0	0
NEW JERSEY	0	0	0	0	0	0	0	0	0	0	0	0	0
NEW MEXICO	0	0	0	0	0	0	3	0	0	0	0	0	3
NEW YORK	0	0	0	0	0	0	0	1	0	0	0	0	1
NORTH CAROLINA	0	0	0	0	0	0	4	1	0	0	0	0	5
NORTH DAKOTA	0	0	0	0	0	0	0	0	0	0	0	0	0
OHIO	0	0	0	0	0	2	0	0	0	0	1	0	3
OKLAHOMA	0	0	0	0	0	1	0	0	0	0	0	0	1
OREGON	0	0	0	0	0	0	0	0	0	0	0	0	0
PENNSYLVANIA	0	0	0	0	0	0	0	0	1	0	0	0	1
PUERTO RICO	0	0	0	0	0	0	0	0	0	0	0	0	0
RHODE ISLAND	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH CAROLINA	0	0	0	0	0	0	3	1	0	0	0	0	4
SOUTH DAKOTA	0	0	0	0	0	0	0	0	0	0	0	0	0
TENNESSEE	0	0	0	0	0	0	0	0	0	0	0	0	0
TEXAS	0	0	0	1	0	1	0	0	1	0	0	0	3
UTAH	0	0	0	0	0	0	1	2	0	0	0	0	3
VERMONT	0	0	0	0	0	0	0	0	0	0	0	0	0
VIRGINIA	0	0	0	0	0	1	0	0	0	0	0	0	1
WASHINGTON	0	0	0	0	0	0	0	0	0	0	0	0	0
WEST VIRGINIA	0	0	0	0	0	0	0	0	0	0	0	0	0
WISCONSIN	0	0	0	1	0	0	1	1	0	0	1	0	4
WYOMING	0	0	0	0	0	0	0	1	0	0	0	0	1
TOTAL	0	0	0	4	5	12	19	19	5	0	2	0	66

LIGHTNING INJURIES, 1981

STATE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
ALABAMA	0	0	1	0	0	0	8	0	0	0	0	0	9
ALASKA	0	0	0	0	0	0	0	0	0	0	0	0	0
ARIZONA	0	0	0	0	0	0	3	2	0	0	0	0	5
ARKANSAS	0	0	0	0	1	1	0	8	0	0	0	0	10
CALIFORNIA	1	0	0	3	0	0	0	0	0	0	1	0	5
COLORADO	0	0	0	0	11	3	1	3	0	0	0	0	18
CONNECTICUT	0	0	0	0	0	0	0	1	0	0	0	0	1
DELAWARE	0	0	0	0	0	0	0	0	0	0	0	0	0
DISTRICT OF COLUMBIA	0	0	0	0	0	0	0	0	0	0	0	0	0
FLORIDA	0	0	0	0	0	8	2	1	0	2	0	0	13
GEORGIA	0	0	0	0	1	1	3	0	0	0	0	0	5
HAWAII	0	0	0	0	0	0	0	0	0	0	0	0	0
IDAHO	0	0	0	0	0	0	0	0	0	0	0	0	0
ILLINOIS	0	0	0	0	0	0	0	0	0	0	0	0	0
INDIANA	0	0	0	0	2	0	0	0	0	0	0	0	2
IOWA	0	0	0	2	0	0	0	0	0	0	0	0	2
KANSAS	0	0	0	1	1	3	1	1	0	0	0	0	7
KENTUCKY	0	0	0	0	2	0	0	0	0	0	0	0	2
LOUISIANA	0	0	0	0	1	5	4	0	0	0	0	0	10
MAINE	0	0	0	0	0	0	0	0	0	0	0	0	0
MARYLAND	0	0	0	0	1	0	2	0	1	0	0	0	4
MASSACHUSETTS	0	0	0	0	8	0	1	5	2	0	0	0	16
MICHIGAN	0	0	0	0	1	0	13	4	0	0	0	0	18
MINNESOTA	0	0	0	0	0	0	0	0	0	0	0	0	0
MISSISSIPPI	0	0	0	0	0	1	1	0	0	0	0	0	2
MISSOURI	0	0	0	0	1	0	0	0	0	0	0	0	1
MONTANA	0	0	0	0	0	0	0	2	0	0	0	0	2
NEBRASKA	0	0	0	0	0	0	0	0	0	0	0	0	0
NEVADA	0	0	0	0	0	0	0	0	0	0	0	0	0
NEW HAMPSHIRE	0	0	0	0	0	0	21	1	0	0	0	0	22
NEW JERSEY	0	0	0	0	0	0	0	0	0	0	0	0	0
NEW MEXICO	0	0	0	0	0	1	1	1	0	0	0	0	3
NEW YORK	0	0	0	0	0	0	0	16	0	0	0	0	16
NORTH CAROLINA	0	0	0	0	0	2	16	0	0	0	0	0	18
NORTH DAKOTA	0	0	0	0	0	0	0	0	0	0	0	0	0
OHIO	0	0	0	2	1	2	0	0	2	0	11	0	18
OKLAHOMA	0	0	0	0	0	0	0	0	0	0	0	0	0
OREGON	0	0	0	0	0	0	0	0	0	0	0	0	0
PENNSYLVANIA	0	0	0	0	0	0	0	1	2	0	0	0	3
PUERTO RICO	0	0	0	0	0	0	0	0	0	0	0	0	0
RHODE ISLAND	0	0	0	0	0	0	0	1	0	0	0	0	1
SOUTH CAROLINA	0	0	0	0	0	0	3	1	0	0	0	0	4
SOUTH DAKOTA	0	0	0	0	0	0	2	0	0	0	0	0	2
TENNESSEE	0	0	0	0	1	21	1	0	0	0	0	0	23
TEXAS	0	0	1	1	1	6	1	0	1	1	0	0	12
UTAH	0	0	0	0	0	0	5	3	0	0	0	0	8
VERMONT	0	0	0	0	0	0	0	0	0	0	0	0	0
VIRGINIA	0	0	0	0	1	0	0	0	1	0	0	0	2
WASHINGTON	0	0	0	0	0	0	0	0	0	0	0	0	0
WEST VIRGINIA	0	0	0	0	0	0	0	0	0	0	0	0	0
WISCONSIN	0	0	0	0	0	6	19	0	0	0	1	0	26
WYOMING	0	0	0	0	0	0	0	1	0	0	0	0	1
TOTAL	1	0	2	9	34	60	108	52	9	3	13	0	291

TOTAL LIGHTNING FATALITIES BY STATE FOR PERIOD, 1959–81

STATE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
ALABAMA	0	0	2	2	4	15	22	13	1	1	0	0	60
ALASKA	0	0	0	0	0	0	0	0	0	0	0	0	0
ARIZONA	0	0	0	0	1	1	12	12	6	0	0	0	32
ARKANSAS	0	0	8	0	10	28	21	18	3	0	0	0	88
CALIFORNIA	0	0	0	0	0	2	2	5	3	0	0	0	12
COLORADO	0	0	0	0	7	9	28	13	0	1	0	0	58
CONNECTICUT	0	0	0	0	0	3	5	3	1	0	0	0	12
DELAWARE	0	0	0	0	0	2	3	3	0	0	0	0	8
DISTRICT OF COLUMBIA	0	0	0	0	0	1	1	1	0	0	0	0	3
FLORIDA	0	0	3	3	17	59	62	52	29	2	1	1	229
GEORGIA	0	0	2	3	4	15	21	9	2	1	0	0	57
HAWAII	0	0	0	0	0	0	0	0	0	0	0	0	0
IDAHO	0	0	0	1	1	5	5	5	1	0	0	0	18
ILLINOIS	0	0	0	4	7	21	12	10	7	2	0	0	63
INDIANA	0	0	1	2	6	20	15	12	4	2	0	0	62
IOWA	0	0	1	3	9	14	6	11	4	4	0	0	52
KANSAS	0	0	0	3	8	5	10	6	4	1	1	0	38
KENTUCKY	1	0	0	2	7	15	15	7	10	0	0	0	57
LOUISIANA	0	0	1	5	7	19	30	12	11	0	1	1	87
MAINE	0	0	0	0	0	3	4	6	0	3	0	0	16
MARYLAND	0	0	0	0	1	5	5	6	1	0	0	81	99
MASSACHUSETTS	0	0	0	1	3	2	5	7	1	0	0	0	19
MICHIGAN	0	0	0	1	6	18	15	19	5	0	0	0	64
MINNESOTA	0	0	0	2	2	6	5	10	8	1	0	0	34
MISSISSIPPI	1	0	4	0	10	7	17	17	5	0	0	0	61
MISSOURI	0	0	5	4	19	17	10	7	3	1	0	0	66
MONTANA	0	0	0	0	2	8	6	2	0	0	0	0	18
NEBRASKA	0	0	0	1	3	12	8	6	4	0	0	0	34
NEVADA	0	0	0	0	0	1	0	2	0	0	0	0	3
NEW HAMPSHIRE	0	0	0	0	0	3	1	0	0	0	0	0	4
NEW JERSEY	0	0	0	1	2	5	16	14	3	0	0	0	41
NEW MEXICO	0	0	0	1	3	8	20	21	3	0	0	0	56
NEW YORK	0	0	0	0	5	18	38	24	4	2	0	0	91
NORTH CAROLINA	0	1	3	2	18	23	42	31	2	0	0	0	122
NORTH DAKOTA	0	0	0	0	0	4	3	3	0	0	0	0	10
OHIO	0	0	0	3	6	17	37	14	7	2	2	0	88
OKLAHOMA	0	1	1	9	11	11	7	14	11	2	1	0	68
OREGON	0	0	0	0	1	0	0	1	2	0	0	0	4
PENNSYLVANIA	0	1	0	0	7	24	26	24	7	1	0	0	90
PUERTO RICO	0	0	0	0	0	3	2	4	5	3	0	0	17
RHODE ISLAND	0	0	0	0	0	0	1	0	2	0	0	0	3
SOUTH CAROLINA	0	0	1	0	5	9	27	9	4	0	0	0	55
SOUTH DAKOTA	0	0	0	0	2	1	4	0	3	2	0	0	12
TENNESSEE	0	1	1	4	12	29	14	12	11	2	2	0	88
TEXAS	0	0	0	10	24	11	35	21	13	5	1	0	120
UTAH	0	0	0	0	0	5	2	6	2	0	0	0	15
VERMONT	0	0	0	0	0	4	5	4	0	0	0	0	13
VIRGINIA	0	0	0	0	9	6	8	8	2	0	0	0	33
WASHINGTON	0	0	0	0	0	1	0	0	0	0	0	0	1
WEST VIRGINIA	0	0	0	0	4	2	8	2	1	0	0	0	17
WISCONSIN	0	0	0	1	0	8	12	8	2	1	1	1	34
WYOMING	0	0	0	0	2	3	7	6	2	0	0	0	20
TOTAL	2	4	33	68	245	508	660	500	199	39	10	84	2352

TOTAL LIGHTNING INJURIES BY STATE FOR PERIOD, 1959–81

STATE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
ALABAMA	6	1	7	2	1	12	48	27	0	2	0	0	106
ALASKA	0	0	0	0	0	0	0	0	0	0	0	0	0
ARIZONA	2	0	0	0	6	1	25	18	12	0	0	0	64
ARKANSAS	1	2	2	9	23	15	28	53	9	0	0	0	142
CALIFORNIA	1	0	0	3	0	0	6	7	1	0	1	1	20
COLORADO	0	0	0	0	19	32	40	38	4	0	0	0	133
CONNECTICUT	0	0	1	0	3	14	10	11	6	0	0	0	45
DELAWARE	0	0	0	0	1	9	0	1	2	0	0	0	13
DISTRICT OF COLUMBIA	0	0	0	0	0	4	1	1	0	0	1	0	7
FLORIDA	0	1	12	11	22	150	148	149	107	14	0	1	615
GEORGIA	0	0	2	2	13	38	81	29	3	5	0	0	173
HAWAII	0	0	0	0	0	0	0	0	0	0	0	0	0
IDAHO	0	0	0	1	6	15	13	15	4	1	0	0	55
ILLINOIS	0	0	0	2	12	37	22	25	9	1	0	0	108
INDIANA	0	0	0	4	18	31	26	21	1	0	0	0	101
IOWA	0	0	1	7	21	39	32	15	16	2	1	0	134
KANSAS	0	0	4	10	11	21	36	19	20	4	1	0	126
KENTUCKY	0	0	0	2	19	45	45	13	10	1	0	0	135
LOUISIANA	1	0	6	2	13	13	66	32	13	0	1	1	168
MAINE	0	0	0	0	3	5	17	46	0	0	1	0	72
MARYLAND	0	0	0	0	15	15	25	15	4	0	0	0	74
MASSACHUSETTS	0	0	1	11	16	30	97	65	26	4	2	1	253
MICHIGAN	0	0	1	8	33	120	73	180	18	6	0	0	439
MINNESOTA	0	0	0	0	6	17	12	13	5	3	0	0	56
MISSISSIPPI	1	2	3	2	10	9	91	30	6	1	1	1	157
MISSOURI	0	1	1	8	13	16	4	13	3	2	0	0	61
MONTANA	0	0	0	0	5	9	10	8	0	0	0	0	32
NEBRASKA	0	0	0	2	10	6	7	10	5	0	0	0	40
NEVADA	0	0	0	0	0	0	0	2	0	0	0	0	2
NEW HAMPSHIRE	0	0	0	0	2	17	24	2	2	0	0	0	47
NEW JERSEY	0	0	0	0	3	11	48	18	14	0	0	0	94
NEW MEXICO	0	0	0	1	17	9	29	15	6	0	0	0	77
NEW YORK	0	0	0	0	4	45	63	103	20	3	1	0	239
NORTH CAROLINA	0	2	8	12	37	53	82	69	16	2	1	0	282
NORTH DAKOTA	0	0	0	0	1	0	0	3	2	0	0	0	6
OHIO	0	0	0	3	14	36	35	83	42	3	11	0	227
OKLAHOMA	0	1	3	12	24	36	30	30	18	2	5	1	162
OREGON	0	0	0	0	2	2	0	9	3	0	0	0	16
PENNSYLVANIA	0	5	0	0	9	66	65	125	12	2	0	0	284
PUERTO RICO	0	0	0	0	0	0	1	0	2	1	0	0	4
RHODE ISLAND	0	2	0	0	1	5	3	11	2	0	1	0	25
SOUTH CAROLINA	0	0	0	1	15	5	71	16	14	0	0	0	122
SOUTH DAKOTA	0	0	0	1	2	12	6	5	1	0	0	0	27
TENNESSEE	0	1	4	2	23	49	56	30	16	4	0	0	185
TEXAS	0	2	4	27	40	36	31	33	22	7	2	0	204
UTAH	0	0	0	0	1	18	6	9	4	0	0	0	38
VERMONT	0	0	0	0	0	3	10	2	0	0	0	0	15
VIRGINIA	0	0	0	2	5	12	35	21	1	0	0	0	76
WASHINGTON	0	0	0	0	4	1	5	7	0	0	0	0	17
WEST VIRGINIA	0	0	0	0	0	2	22	25	1	1	0	0	51
WISCONSIN	0	1	2	2	4	25	47	9	6	1	2	0	99
WYOMING	0	0	0	0	4	32	16	21	6	0	0	0	79
TOTAL	12	21	62	149	511	1178	1668	1502	494	72	32	6	5707

LIGHTNING FATALITIES AND INJURIES BY YEAR, 1959–81

LIGHTNING FATALITIES

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
1959	1	0	1	4	18	25	50	39	13	7	0	0	158
1960	0	0	1	5	7	33	25	17	9	0	0	0	97
1961	0	0	1	2	9	23	47	20	10	1	0	0	113
1962	0	0	3	6	27	20	26	28	9	1	0	0	120
1963	0	0	4	3	11	37	42	20	10	2	0	81	210
1964	0	0	9	6	15	21	29	19	7	1	1	0	108
1965	0	0	2	4	12	34	39	28	4	2	0	0	125
1966	0	0	1	1	8	15	21	16	11	3	0	0	76
1967	1	0	1	2	3	26	21	14	1	2	1	1	73
1968	0	0	0	1	5	24	30	29	9	3	1	1	103
1969	0	0	1	5	13	17	27	13	14	3	0	0	93
1970	0	0	0	1	17	25	27	19	21	1	0	0	111
1971	0	0	2	1	12	27	33	19	19	0	0	0	113
1972	0	0	1	1	5	21	31	28	3	1	0	0	91
1973	0	1	2	3	10	24	31	18	13	2	1	0	105
1974	0	2	0	7	12	21	28	24	6	0	2	0	102
1975	0	1	3	3	11	19	28	18	6	2	0	0	91
1976	0	0	0	1	9	19	19	19	3	2	0	0	72
1977	0	0	0	4	9	19	16	35	14	1	0	0	98
1978	0	0	1	1	9	26	24	22	3	1	0	1	88
1979	0	0	0	3	11	4	20	16	4	3	2	0	63
1980	0	0	0	0	7	16	27	20	5	1	0	0	76
1981	0	0	0	4	5	12	19	19	5	0	2	0	66
TOTAL	2	4	33	68	245	508	660	500	199	39	10	84	2352
AVERAGE	0	0	1	3	11	22	29	22	9	2	0	4	102

LIGHTING INJURIES

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
1959	0	0	0	5	27	52	110	103	23	3	1	1	325
1960	0	0	2	11	12	70	28	50	16	9	4	0	202
1961	0	0	7	14	15	49	83	50	31	5	1	1	256
1962	0	0	3	5	39	38	90	49	12	6	0	0	242
1963	7	0	0	6	14	64	55	44	18	1	0	0	209
1964	0	0	10	15	14	38	99	53	8	1	1	0	239
1965	3	2	2	4	26	42	59	59	19	1	0	0	217
1966	0	2	1	2	37	39	42	44	15	1	0	0	183
1967	0	0	0	4	7	35	59	33	4	2	0	1	145
1968	0	0	4	2	16	52	117	155	14	9	1	0	370
1969	0	0	0	4	19	75	39	23	12	0	0	1	173
1970	0	0	1	5	40	40	82	43	43	4	1	0	259
1971	0	1	0	1	24	71	79	54	22	1	1	0	254
1972	0	0	8	6	12	24	72	54	24	2	1	0	203
1973	0	0	10	2	20	23	74	59	29	9	2	0	228
1974	1	9	1	3	12	27	56	51	12	1	0	0	173
1975	0	3	0	1	30	60	107	154	42	1	0	1	399
1976	0	1	0	7	16	39	73	68	13	1	0	1	219
1977	0	0	0	3	35	58	58	67	62	4	4	0	291
1978	0	0	5	3	19	100	73	54	42	5	0	0	301
1979	0	2	4	26	32	73	55	49	9	2	2	0	254
1980	0	1	2	11	11	49	50	134	15	1	0	0	274
1981	1	0	2	9	34	60	108	52	9	3	13	0	291
TOTAL	12	21	62	149	511	1178	1668	1502	494	72	32	6	5707
AVERAGE	1	1	3	6	22	51	73	65	21	3	1	0	248

NORTH ATLANTIC TROPICAL CYCLONES, 1981

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All of the tropical storms and hurricanes in 1981 formed in the Atlantic except for the first and last storms of the year. For only the third time this century, not a single storm entered the Gulf of Mexico, and storms existed in the Caribbean Sea on only 5 days. The season was dominated by a series of five September hurricanes that tracked northward through the western Atlantic and then curved toward the northeast (fig. 3). Shipping in the western Atlantic was disrupted by the existence of one or more storms almost continuously during August and September.

Even though the season got off to an early start with Arlene in May and ended late with Katrina in November, the totals of four tropical storms and seven hurricanes were near the long term averages of four and six, respectively (tables 1-3). No hurricane made landfall. Tropical Storm Dennis dumped 20 in of rain on south Florida causing damages estimated at $25 million. Tropical Storm Katrina caused two deaths in Cuba, the only known storm fatalities of the year. This was only the fourth year in the past 40 in which there were no deaths in the United States caused by tropical cyclones (table 2). A summary of tropical cyclone statistics is given in table 1.

A list of reports from ships which encountered winds of 50 kn or more is given in table 4. Hurricane force winds were reported from the vicinity of only two storms, Harvey and Irene, the two strongest hurricanes of the year.

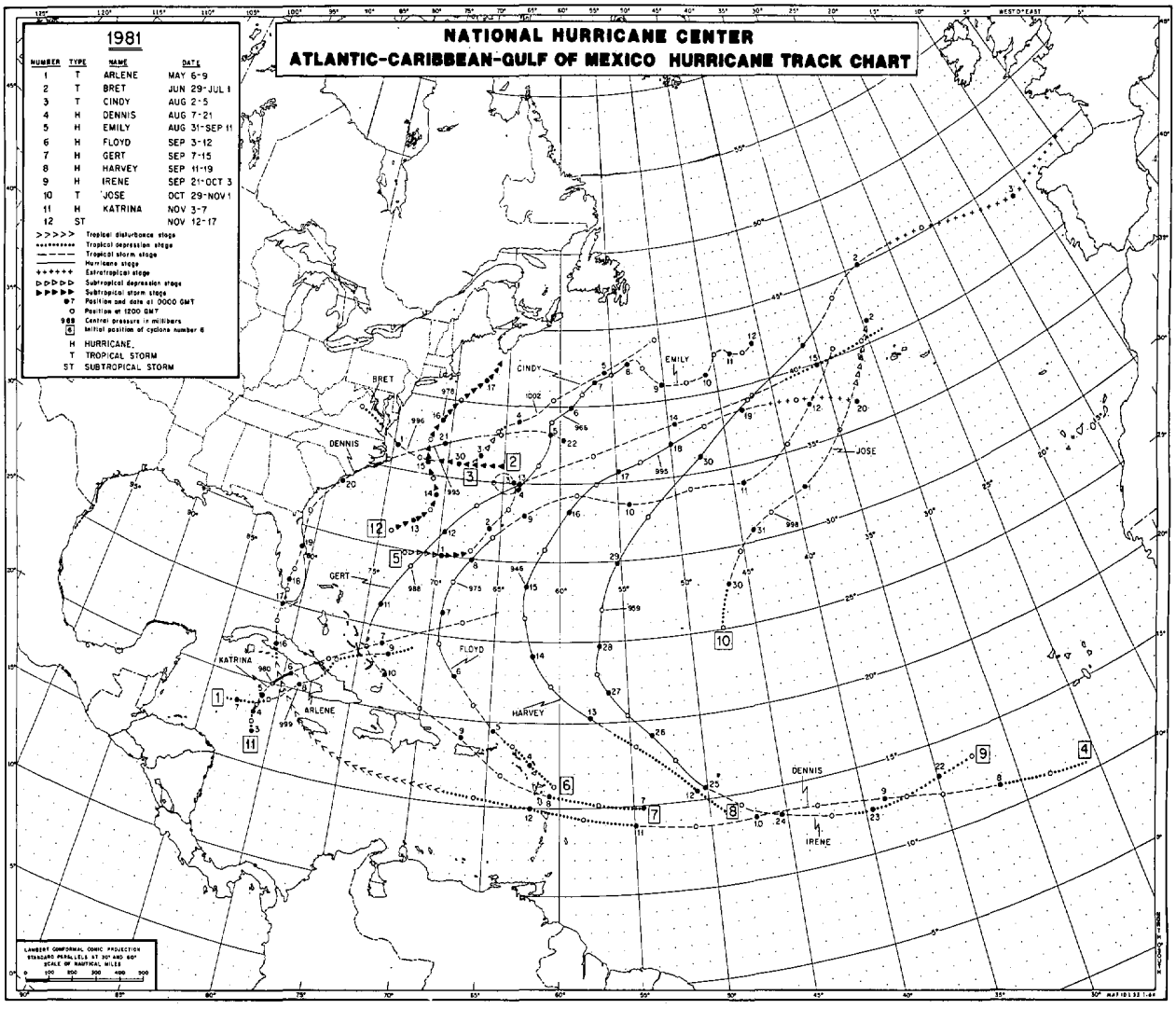

Figure 3.--Tracks of the 1981 North Atlantic tropical cyclones.

Table 1.--North Atlantic tropical cyclone statistics, 1981

Cyclone number	Name	Class[1]	Dates[2]	Maximum sustained wind (kn)	Lowest pressure (mb)	U.S. damage (millions of $)	Deaths
1	Arlene	T	May 6-9	50	999		
2	Bret	T	Jun 29-Jul 1	60	996	minor	
3	Cindy	T	Aug 2-5	50	1002		
4	Dennis	H	Aug 7-21	70	995	25	
5	Emily	H	August 31-Sep 11	80	966		
6	Floyd	H	Sep 3-12	100	975		
7	Gert	H	Sep 7-15	90	988		
8	Harvey	H	Sep 11-19	115	946		
9	Irene	H	Sep 21-Oct 3	105	959		
10	Jose	T	Oct 29-Nov 1	45	998		
11	Katrina	H	Nov 3-7	75	980		Cuba 2
12		ST	Nov 12-17	60	978	minor	

[1] T - tropical storm (winds 34-63 kn)
H - hurricane (winds 64 kn or higher)
ST - subtropical storm (winds 34-63 kn)

[2] Day starts at 0000 GMT

TROPICAL STORM ARLENE - MAY 6-9

Arlene was only the 14th tropical storm to form in May according to records dating back to 1886. Arlene was also unusual in that it formed from a weather disturbance that moved into the northwestern Caribbean Sea from the Pacific Ocean.

Arlene's winds strengthened to 45 kn as the storm slowly approached Cuba. The storm then weakened to a tropical depression on May 8 while crossing Cuba. Upon reaching the Bahamas, Arlene briefly regained strength as the winds increased to 50 kn. However, the storm was rapidly absorbed by an elongated trough of low pressure as it moved out to sea.

TROPICAL STORM BRET - JUNE 29-JULY 1

After a lull of almost 2 mo, tropical cyclone activity resumed with the development of Bret in late June. Bret formed as a subtropical LOW within a stationary frontal zone off the mid-Atlantic coast. As the LOW moved westward toward the coast, it developed the deep convection and tightly banded cloud structure of a tropical storm (fig. 4). Gale warnings were issued for the coast from Cape Hatteras, N.C., to Ocean City, Md., at 2200 GMT, June 30.

The DOCEBARRA (PPGH) encountered 50 kn winds at 1800, June 30, and the U.S. Navy Cruiser SPRUANCE reported 45 kn at 2300.

The INVICTUS, a 42-ft sloop, encountered 60 kn winds at 0300, June 30, approximately 300 mi east of the North Carolina coast, and close to Bret's center.

A 35-ft sloop passed through the storm center at 1400 of the same day and the captain gave the following account:

Table 2
NORTH ATLANTIC TROPICAL CYCLONES FOR PAST YEARS

TOTAL NUMBER OF TROPICAL CYCLONES, LOSS OF LIFE AND DAMAGE

Year	Total Number Tropical Cyclones* All Areas	Total Number Tropical Cyclones* Reaching U.S. Coast	Total Number Hurricanes All Areas	Total Number Hurricanes Reaching U.S. Coast	Loss of Life Total All Areas	Loss of Life United States	Damage by Categories** Total All Areas	Damage by Categories** United States
1931	9	2	2	0		0		*
1932	11	5	6	2		6		*
1933	21	7	9	5		63		7
1934	11	5	6	3		17		6
1935	6	2	5	2		414		7
	58	21	28	12				
1936	16	7	7	3		9		6
1937	9	4	3	0		0		4
1938	8	4	3	2		600		8
1939	5	3	3	1		3		3
1940	8	3	4	2		51		6
	46	21	20	8				
1941	6	4	4	2		19		7
1942	10	3	4	2	17	8	7	7
1943	10	4	5	1	19	10	7	7
1944	11	4	7	3	1,076	64	8	8
1945	11	5	5	3	29	7	8	8
	48	20	25	11				
1946	6	4	3	1	5	0	7	7
1947	9	7	5	3	22	53	8	8
1948	9	4	6	3	21	3	7	7
1949	13	3	7	2	4	4	8	8
1950	13	4	11	3	27	19	7	7
	50	22	32	12				
1951	10	1	8	0	244	0	7	6
1952	7	2	6	1	16	3	6	6
1953	14	6	6	2	3	2	7	7
1954	11	4	8	3	729*	193	9	9
1955	12	5	9	3	1,518*	214	9	9
	54	18	37	9				
1956	8	2	4	1	76	21	8	7
1957	8	0	3	1	476	306	8	8
1958	10	1	7	0	19	2	7	7
1959	11	7	7	3	87	24	7	7
1960	7	5	4	2	185	65	8	8
	44	20	25	7				
1961	11	3	8	1	345	46	8	8
1962	5	1	3	0	4	4	6	6
1963	9	1	7	1	7,218*	11	9	7
1964	12	6	6	4	266	49	9	9
1965	6	2	4	1	76	75	9	8
	43	13	28	7				
1966	11	2	7	2	1,040	54	9	7
1967	8	2	6	1	68	15	8	8
1968	8	3	5	1	11	0	7	7
1969	18	3	12	2	304	256	9	9
1970	10	3	5	1	74	11	9	8
	55	13	35	7				
1971	13	5	6	3	44	8	8	8
1972	7	3	3	1	128	121	9	9
1973	8	1	4	0	16	5	7	7
1974	11	2	4	1	3,000*	1	8	8
1975	9	1	6	1	80	21	9	9
	48	12	23	6				
1976	10	4	6	1	77	9	8	8
1977	6	1	5	1	10	0	7	7
1978	12	2	5	0	41	35	7	7
1979	9	5	5	3	1,285	22	9	9
1980	11	2	9	1	236	2	9	8
	48	14	30	6				
1981	12	2	7	0	2	0	7	7
Total	506	176	290	85				
Mean	9.9	3.5	5.7	1.7				

**The Environmental Data Service has for some time recognized that, without detailed expert appraisal of damage, all figures published are merely approximations. Since errors in dollar estimates vary in proportion of the total damage, storms are placed in categories varying from 1 to 9 as follows:

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

* Including hurricanes and after 1967 subtropical cyclones
+ Not reported in literature, believed minor.
• Additional deaths for which figures are not available.

Table 3

NORTH ATLANTIC TROPICAL CYCLONES FOR PAST YEARS

Frequency of Tropical Cyclones (Including Hurricanes) by Months and Years										Frequency of Tropical Cyclones Reaching Hurricane Intensity by Months and Years									
		May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total		May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1931			1	1	2	3	1	1		9	1931					2				2
1932		1			3	3	3	1		11	1932				3	1	1	1		6
1933		1	1	3	7	5	3	1		21	1933		1	1	3	3	1			9
1934		1	1	1	2	2	3	1		11	1934		1	1	1	1	1	1		6
1935					3	1	2			6	1935				2	1	2			5
1936			3	2	6	4	1			16	1936		1	1	3	2				7
1937				1	2	6				9	1937					3				3
1938					3	1	3	1		8	1938				2	1				3
1939			1		1	1	2			5	1939				1		2			3
1940		1			3	2	2			8	1940				3	1				4
1941						4	2			6	1941					3	1			4
1942					3	3	3	1		10	1942				3			1		4
1943				1	2	4	3			10	1943			1	1	2	1			5
1944				3	2	4	2			11	1944			2	1	3	1			7
1945			1	1	4	3	2			11	1945		1		1	1	2			5
1946			1	1	1	1	2			6	1946			1		1	1			3
1947				1	2	3	3			9	1947				2	1	2			5
1948		1		1	2	3	1	1		9	1948				1	3	1	1		6
1949					3	7	2	1		13	1949				2	4	1			7
1950					4	3	6			13	1950				4	3	4			11
1951		1			3	4	2			10	1951	1			2	3	2			8
1952	(Feb.) 1				2	2	2			7	1952				2	2	2			6
1953		1			3	4	4	1	1	14	1953				2	3	1			6
1954			1	1	2	4	1	1	1	11	1954		1		2	3	1		1	8
1955				1	4	5	2			12	1955				3	5	1			9
1956			1	1	1	4	1			8	1956			1	1	1	1			4
1957			2		1	4	1			8	1957		1			2				3
1958			1		4	4	1			10	1958				3	3	1			7
1959		1	2	2	1	3	2			11	1959		1	2		3	1			7
1960			1	2	1	3				7	1960			1	1	2				4
1961				1		6	2	2		11	1961			1		5	1	1		8
1962					2	2	1			5	1962				1	1	1			3
1963				1	1	5	2			9	1963			1	1	4	1			7
1964			1	1	4	4	1	1		12	1964				2	3	1			6
1965			1		2	2	1			6	1965				2	1	1			4
1966			1	4	1	4		1		11	1966		1	3	1	1		1		7
1967					1	4	3			8	1967				1	3	2			6
1968			3		1	3	1			8	1968		2		1	1	1			5
1969				1	5	6	5	1		18	1969				4	4	3	1		12
1970		1		1	3	3	2			10	1970	1			1	1	2			5
1971				1	4	6	1	1		13	1971				2	4				6
1972		1	1		2	2		1		7	1972		1		1	1				3
1973				2	2	2	2			8	1973			1	1	1	1			4
1974			1	1	4	4	1			11	1974				2	2				4
1975			1	1	2	3	1		1	9	1975			1	2	3				6
1976		1		1	5	2	1			10	1976				4	1	1			6
1977					1	3	2			6	1977				1	3	1			5
1978	(Jan) 1			1	4	3	3			12	1978				2	2	1			5
1979			1	2	3	2	1			9	1979			1	2	2				5
1980					3	5	1	2		11	1980				3	3	1	2		
1981		1	1		2	5	1	1		11	1981				1	5	1	1		
1982											1982									
1983											1983									
1984											1984									
1985											1985									
Totals	(Jan) 1 (Feb) 1	12	28	41	129	176	94	20	3	505	Totals	2	11	19	80	114	48	10	1	291

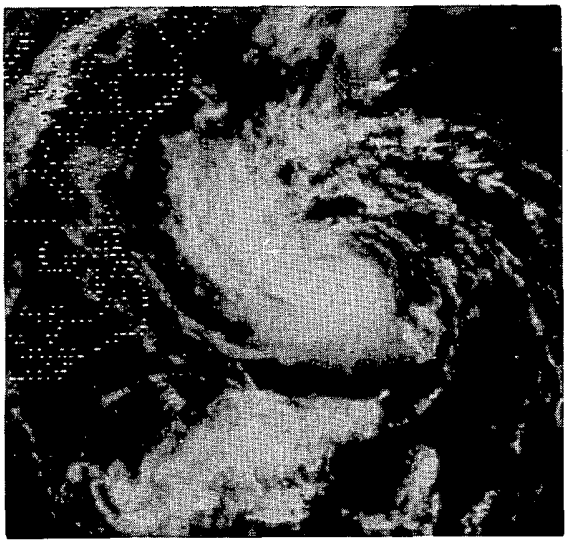

Figure 4.--Bret becomes a tropical storm as it heads for Chesapeake Bay on June 30.

"We entered the eye of Bret at 1400 GMT and remained there for aapproximately 25 minutes. Our barometer reading was 29.53 inches (1000 millibars). Two large seas were running...one from the north and one from the east/northeast at 15 to 25 feet. The waves were very steep and oftentimes the sloop would hang on the edge of a wave with the forward section, up to the mast, totally free of water, with a sheer drop to the bottom of the trough. The wind shifted from north to south after the eye passed, making confusion of the wave trains."

Bret weakened to a tropical depression as it crossed Chesapeake Bay on July 1. The dying system spread 4-in rains westward to the Ohio Valley, and a tornado was reported at Virginia Beach, VA.

TROPICAL STORM CINDY - AUGUST 2-5

A month elapsed between the development of Bret and Cindy. As was the case with Bret, Cindy developed from a subtropical system off the mid-Atlantic coast. Cindy was a minor storm throughout her life both in size and strength. Highest

winds reached 50 kn on August 4, but the central pressure never fell below 1002 mb. The storm accelerated northeastward on August 5, losing tropical characteristics and weakening, as it passed well to the southeast of Newfoundland.

Cindy is one of a number of similar storms that have been observed to develop north of the subtropical ridge in recent years. Prior to the era of continuous satellite surveillance, many such storms were probably not classified as tropical systems. The formation process is initially subtropical, and the transition to a tropical storm is indicated by the evolution of the cloud pattern into the characteristic tropical cyclone structure as observed on satellite images. The tropical cyclone stage may last for only a brief period before the influence of the cold environment destroys the deep convection.

HURRICANE DENNIS - AUGUST 7-21

Dennis became a tropical storm over the eastern Atlantic on August 8. Some of the most intense hurricanes of record have developed in that region during August. Satellite photos on the 8th show that Dennis had a well-developed cloud structure (fig.5) and it seemed likely that it would soon become a hurricane. However, as the storm approached the Caribbean it encountered strong westerly winds aloft which disrupted the circulation, and Dennis weakened to a tropical depression and finally to a disorganized disturbance.

As the system turned northward across Cuba and toward Florida it became a tropical storm once again. Heavy rains deluged the extreme southeastern part of the state with accumulations up to 20 in, as the storm moved slowly up the Florida peninsula. Flood damage was estimated at $25 million.

On August 19 the storm moved out over the Atlantic near Cape Canaveral, skirted the coast of the Carolinas, and then turned eastward. Dennis briefly acquired hurricane strength over the warm Gulf Stream before becoming extratropical over colder waters late on August 21.

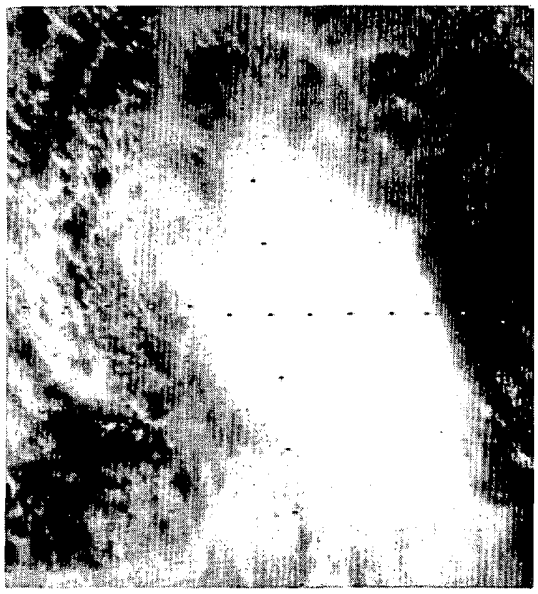

Figure 5.--Tropical Storm Dennis forms in the hurricane-breeding zone of the eastern tropical Atlantic on August 8.

HURRICANES EMILY (AUGUST 31-SEPTEMBER 11), FLOYD (SEPTEMBER 3-12), GERT (SEPTEMBER 7-15), HARVEY (SEPTEMBER 11-19), AND IRENE (SEPTEMBER 21-OCTOBER 3)

On only two previous occasions in the past 100 yr, 1893 and 1955, have five hurricanes formed in 1 mo. For the second consecutive year the fifth, sixth and seventh storms have co-existed on the same day - September 8 (fig. 6).

Emily began as a subtropical storm between Florida and Bermuda on August 31 but evolved into a tropical storm on September 1. Emily's path was blocked by a large high-pressure area to the north and the storm followed a slow, erratic, northeastward track, at one point tracing a counterclockwise loop. The combination of Emily and the large HIGH to the north produced large swells over the western Atlantic and caused high tides and beach erosion along the northeast and middle Atlantic coastline of the United States.

The next four hurricanes, Floyd, Gert, Harvey and Irene, all formed from tropical disturbances

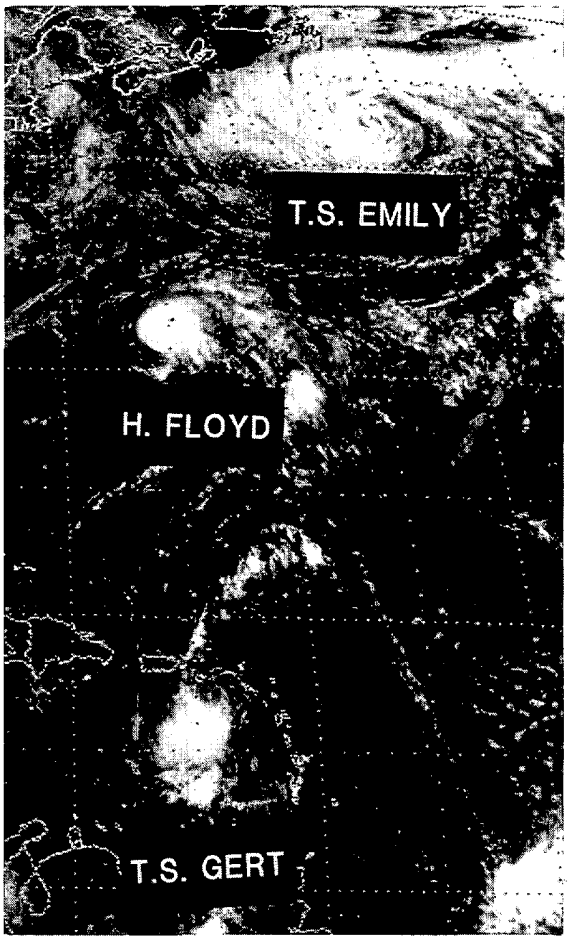

Figure 6.--Tropical Storms Emily and Gert and Hurricane Floyd on September 8.

and followed recurving tracks through the western Atlantic. The track of each storm was influenced to some extent by the trough left in the wake of the hurricane that preceded it.

Gert passed over the southern Leeward Islands, Puerto Rico and the eastern Bahamas while still a tropical storm and caused rains of up to 6 in. Floyd also produced heavy rains over the Leewards. Floyd and Gert, as well as Emily, briefly threatened Bermuda.

Floyd, Harvey and Irene were the strongest storms of the year, with winds reaching 100 kn or more. Of these, Harvey was the most intense with winds of 115 kn (fig. 7). A French ship, the CAVALIER DE LA SALLE (FNIC), passed near the center of Hurricane Harvey during August 16-17. At 1200, August 16, the ship reported east-northeasterly winds of 65 kn to the north of the center. Six hours later it experienced east winds of 45 kn slightly to the east of its previous location. No reports were received for the next 12 hr but at 1200, August 17, the ship's winds had shifted to westerly at 45 kn as the ship travelled about 100 mi to the southeast. Examination of the track of Harvey and the path of the ship suggests that the CAVALIER DE LA SALLE must have passed close to the eye of the hurricane, which at the time had maximum winds of about 90 kn.

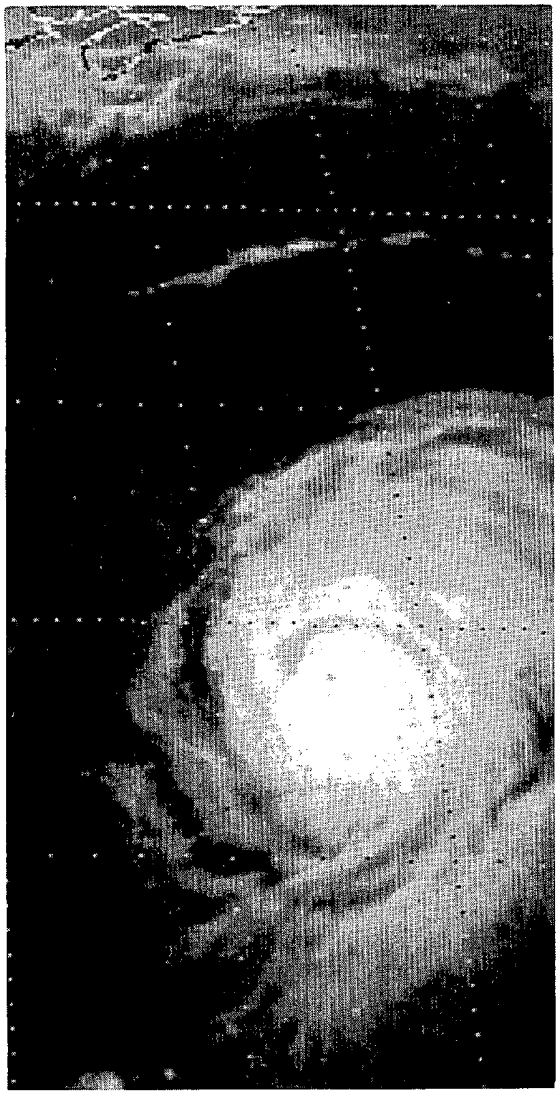

Figure 7.--GOES Infrared image of Hurricane Harvey at time of maximum strength with winds of 115 kn, 0300 GMT, September 15.

The most remarkable feature of Hurricane Irene, the last of the series, was its persistence. After losing tropical characteristics on September 2, the storm headed eastward toward Europe. On September 4 it crossed into France as a large extratropical low-pressure system.

TROPICAL STORM JOSE - OCTOBER 29-NOVEMBER 1

Jose developed in an unusual manner from a North Atlantic low-pressure system which moved southward through the central Atlantic during the last week of October. Eventually a cloud circulation center appeared on satellite photos and the system met the criteria for classification as a tropical storm. The tropical storm reversed the course of the earlier LOW, and headed northward through the data-void expanses of the central Atlantic. It accelerated to a forward speed of 40 kn before losing identity west of the western Azores on November 1.

HURRICANE KATRINA - NOVEMBER 3-7

The first and last tropical storms of the year both formed in the northwest Caribbean Sea and moved across eastern Cuba and the Bahamas before weakening in the southwest North Atlantic.

Katrina began as a tropical depression centered about 150 mi southwest of Grand Cayman on November 3. As it curved northeastward toward Cuba, it strengthened to a tropical storm and briefly became a hurricane. On November 5 a reconnaissance flight reported a sea-level pressure of 980 mb and

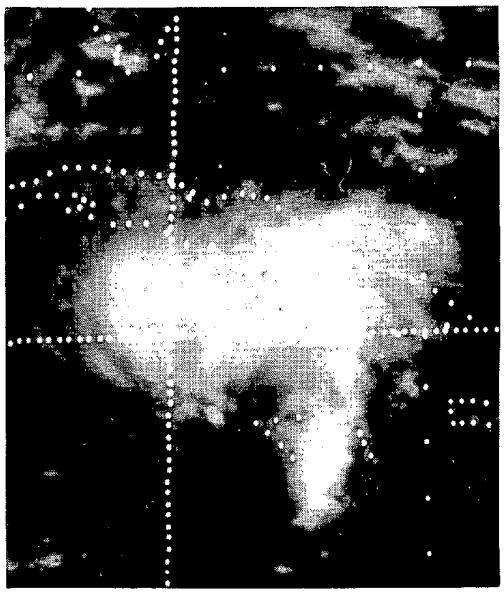

Figure 8.-- Katrina lashes the eastern half of Cuba.

Table 4.--Ships encountering tropical cyclone winds of 50 knots or more in the North Atlantic during 1981

Call	Vessel Name	Nationality	Date Mo.	Day	Time GMT	Ship Position Lat. °N	Long. °W	Wind Dir. 10°	Speed (kn)	Pressure (mb)	Sea Waves Period (sec)	Height (m)	Sea Swells Dir. 10°	Period (sec)	Height (m)
ARLENE (None)															
BRET															
	INVICTUS	American	06	30	03	35.8	70.1	--	60						
PPCH	DOCEBARRA	Brazil	06	30	18	35.0	73.9	36	50	1014.0					
CINDY (None)															
DENNIS															
KYVN	ARECIBO	American	07	21	00	37.8	70.4	04	50	1007.3	8	5	07	8	5
4XSX	HAR CARMEL	Israel	07	21	06	37.0	71.9	07	55	1007.0	7	5			
EMILY															
LSDY			09	03	08	35.7	66.0	01	50	1001.0					
DDGR			09	08	12	40.5	55.0	21	55	994.6					
DHES			09	08	18	42.8	53.0	20	50	995.0					
FLOYD (None)															
GERT (None)															
HARVEY															
FNDR			09	12	23	19.6	58.3	14	55	996.0					
FNIC	CAVELIER DE LA SALLE	FR.	09	16	12	36.8	56.6	07	65	1011.0	6	2	16	11	2
KSDF			09	16	12	35.7	57.5	05	55	998.0					
IRENE															
SGLM	WINTER STAR	Swiss	09	27	21	23.0	56.9	26	50	999.5	5	4	36	10	10
"	"	"	09	28	00	23.6	56.0	17	50	1001.4					
ELAP			09	28	12	22.2	54.6	14	65	999.8	99	14	14	13	10
"			09	28	18	22.1	54.6	17	65	986.7	99	14	18	14	11
"			09	29	00	22.1	54.5	23	60	1010.6	99	14	23	14	10
VTLX			09	29	18	34.5	47.2	13	50	998.7	7	4			
"			09	30	00	34.0	47.0	23	70	991.7	8	5			
LICX	HOEGH CAIRN	Norway	10	01	00	39.3	35.1	25	50	998.0					
JOSE (None)															
KATRINA															
SHIP			11	07	00	22.1	74.4	32	50	1005.8	4	5	25	7	5

estimated surface winds of 50 kn. However, Katrina weakened to a tropical storm before crossing Cuba, where news sources reported heavy flood-induced agricultural losses and two fatalities - the only storm-related deaths of the season (fig. 8).

Katrina moved northeastward through the Bahamas before merging with a frontal system on November 6.

SUBTROPICAL STORM - NOVEMBER 12-17

The season ended with a subtropical storm which formed off northern Florida along the remnants of a cold front. Ship reports indicated that a 1004 mb LOW with 45 kn winds had developed 400 mi east of Jacksonville on November 12.

The low moved on a meandering course paralleling the east coast of the United States. For a time the storm posed a threat to the Northeast as its northward course became partially blocked by a high pressure ridge while the storm strengthened to 60 kn and the central pressure fell to 978 mb. Gale warnings were issued from Cape Hatteras, N.C., to Eastport Me. However, the storm remained offshore. The slow moving storm caused coastal flooding and beach erosion along much of the Atlantic Seaboard from north Florida to Maine.

REFERENCE NOTES

† Storm damage categories are from 1 to 9 as follows:

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

* Miles instead of yards
** Yards instead of miles
° Includes crop damage
@ Includes heavy sleet storm
# Freezing drizzle and freezing rain, commonly known as glaze
‡ Not received or incomplete

"F" SCALE DEFINITIONS

0 =	40-72	MPH	Breaks branches off trees; signboards damaged.
1 =	73-112	MPH	Peels surface off roofs; trailer houses pushed or damaged.
2 =	113-157	MPH	Tears roofs off frame houses and outbuildings; cars blown off highway.
3 =	158-206	MPH	Windows of skyscrapers smashed; frame houses destroyed; cars lifted off ground.
4 =	207-260	MPH	Skyscrapers twisted; frame houses leveled; cars blown some distance.
5 =	261-	MPH	or greater.

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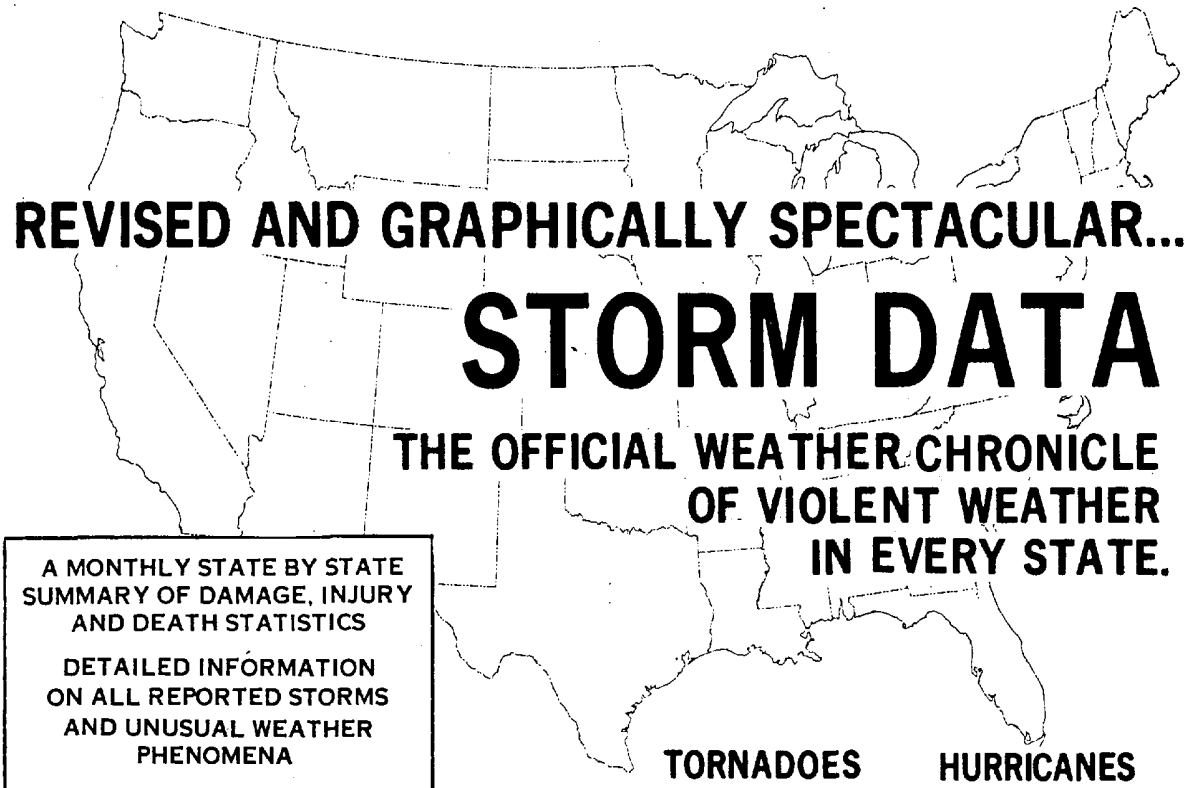

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