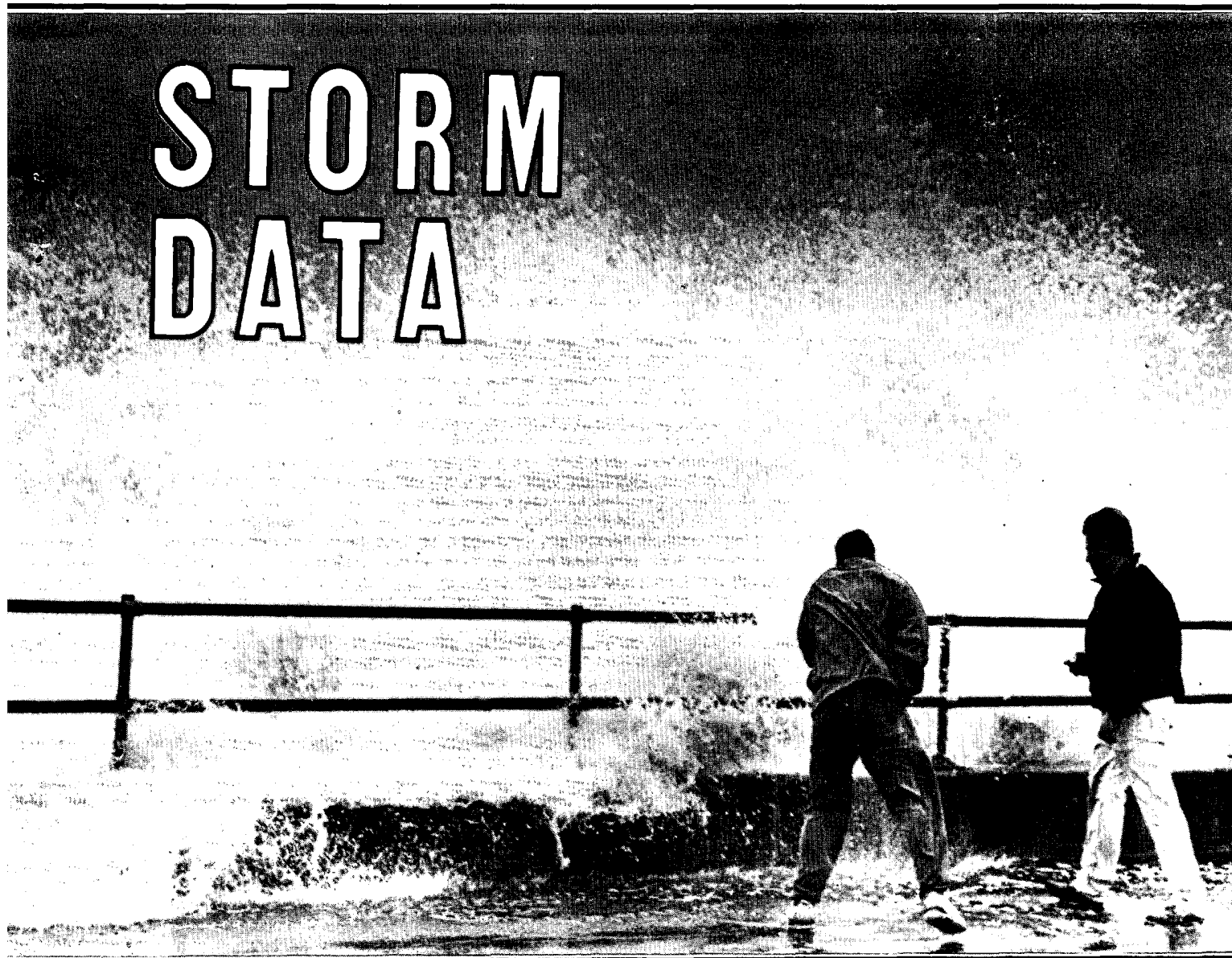


OCTOBER 1991
VOLUME 33
NUMBER 10

STORM DATA



**AND UNUSUAL WEATHER PHENOMENA
WITH LATE REPORTS AND CORRECTIONS**



noaa

NATIONAL OCEANIC AND
ATMOSPHERIC ADMINISTRATION

/ NATIONAL ENVIRONMENTAL SATELLITE,
DATA, AND INFORMATION SERVICE

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ASHEVILLE, N.C.

Cover: Two men watch as waves crash on the seawall at Hampton's Beach in New Hampshire. The waves were caused by an extratropical storm in late October. (See page 12 for further information.) (Photo courtesy: Tim Donovan, Rockingham County Newspapers, Exeter, New Hampshire.)

CONTENTS

	Page
Climatic Data of the Month	4
Outstanding Storms of the Month	8
Storm Data and Unusual Weather Phenomena	19
Late Reports and/or Corrections	71
Storm Summaries	72
Reference Notes and "F" Scale Definitions	75

STORM DATA

(ISSN 0039-1972)

National Climatic Data Center

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The Storm Data and Unusual Weather Phenomena narratives and Hurricane/Tropical Storm summaries are prepared by the National Weather Service. Monthly and annual statistics and summaries of tornado and lightning events resulting in deaths, injuries, and damage are compiled by cooperative efforts between the National Climatic Data Center and the National Severe Storms Forecast Center.

STORM DATA contains all confirmed information on storms available to our staff at the time of publication. However, due to difficulties inherent in the collection of this type of data, it is not all-inclusive. Late reports and corrections are printed in each edition.

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The editors of **STORM DATA** solicit your help in acquiring photographs (prints or slides; black and white, or color), maps, clippings, etc. of significant or unusual weather events (past or present). These could be for use in the "Outstanding Storms of the Month" or "Et Cetera" sections of **STORM DATA**. We request our subscribers or other interested persons to mail such items to:

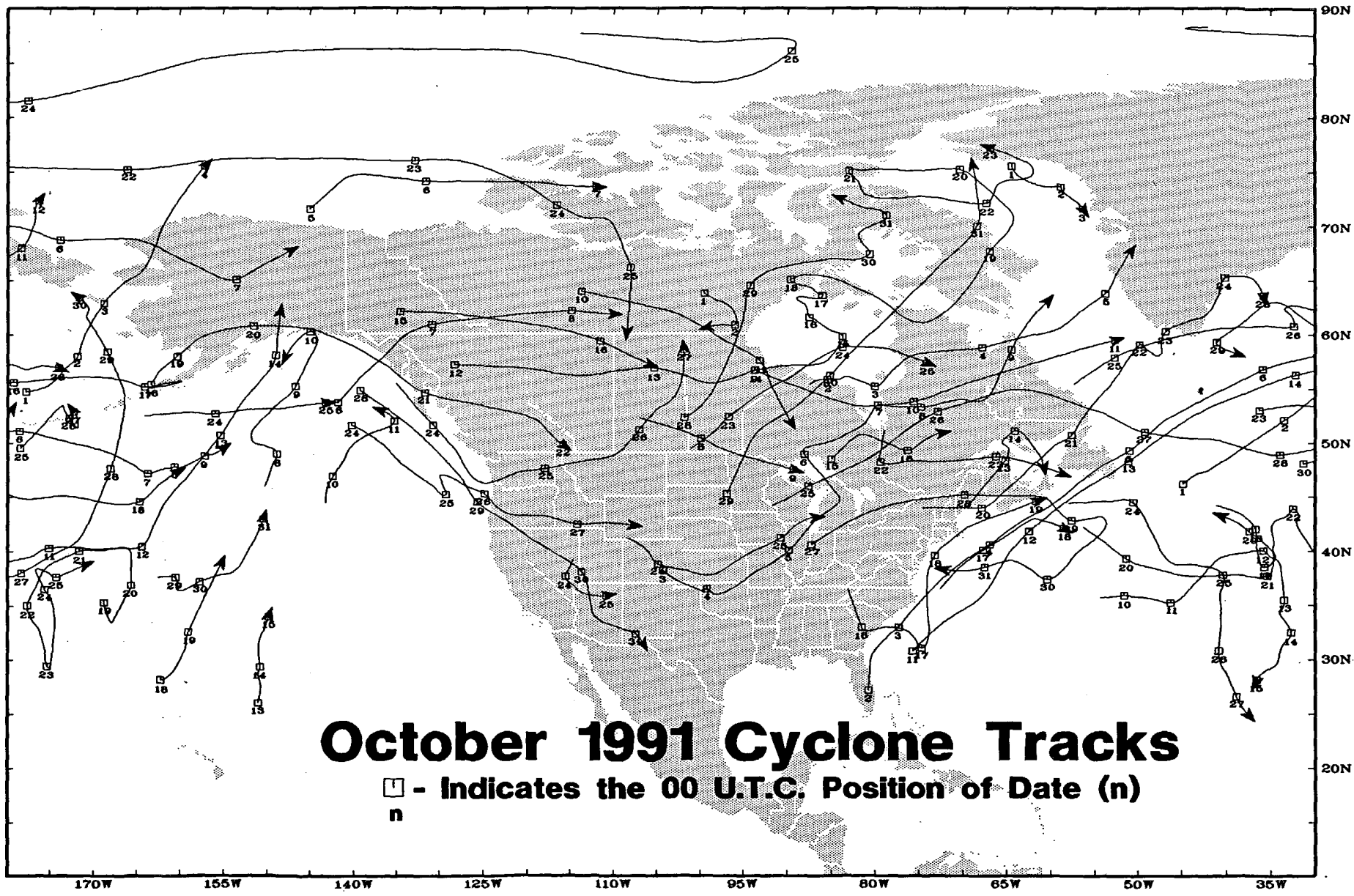
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"I certify that this is an official publication of the National Oceanic and Atmospheric Administration and is compiled from information received at the National Climatic Data Center, Asheville, North Carolina 28801-2733."



Director
National Climatic Data Center



October 1991 Cyclone Tracks

□ - Indicates the 00 U.T.C. Position of Date (n)
n

CLIMATIC DATA OF THE MONTH

PRECIPITATION AND TEMPERATURE ANOMALIES - OCTOBER 1991

Table 1 lists the 97-year temperature and precipitation rankings for the nine climatically homogeneous regions in the United States outlined in Fig. 1 below.

October 1991 was the 41st warmest October since 1895. Mean monthly temperature departures up to +6°F were observed in the interior of California and areas of the desert Southwest. Temperature departures of greater than +2°F were observed over much of the south-central states, and the eastern one-third of the nation. Hawaii and most of Alaska also were above normal. Below normal temperatures (greater than -2°F) were observed in the upper-Mississippi Valley states and portions of northern Florida. Departures of more than -4°F existed in the northern High Plains with the greatest departures (-6°F) in eastern Montana to northern Minnesota (See Figs. 2 and 3 on page 5). Regionally, the West had the 8th warmest October with the West North Central and the East North Central recording their 21st and 29th coldest Octobers, respectively.

October 1991 saw above normal precipitation over the Mississippi Valley, New England area, portions of the Plains and Rockies, and most of Florida. The rest of the nation was slightly or extremely dry. Abnormally (below 75% of normal precipitation) dry conditions existed over the Pacific coast, southern Rockies, remaining portions of the Plains and Rockies, mid-Atlantic and the upper Ohio Valley. Hawaii (with the exception of Oahu), and northern Alaska also recorded abnormally dry conditions. Portions of the Southeast received less than 25% of the normal precipitation (See Figs. 4 and 5 on page 6). Regionally, the East North Central region observed their 17th wettest October, while the Northwest and the Southeast observed their tenth and 16th driest Octobers, respectively, since 1895.

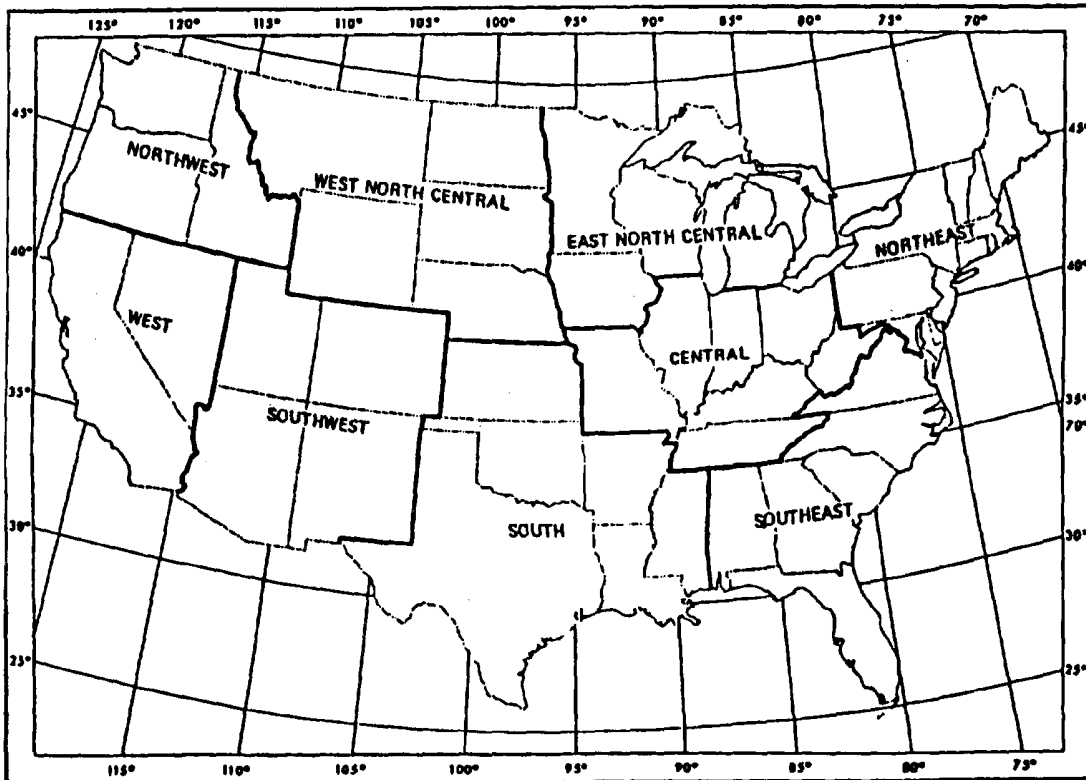
TABLE 1. TEMPERATURE AND PRECIPITATION RANKINGS FOR OCTOBER 1991, BASED ON THE PERIOD 1895-1991.

1 = DRIEST, 97 = WETTEST; 1 = COLDEST, 97 = HOTTEST.

REGION	PRECIPITATION	TEMPERATURE
Northeast	43	63
East North Central	81	29
Central	77	62
Southeast	16	56
West North Central	38	21
South	64	65
Southwest	40	75
Northwest	10	35
West	45	90
National	44	57

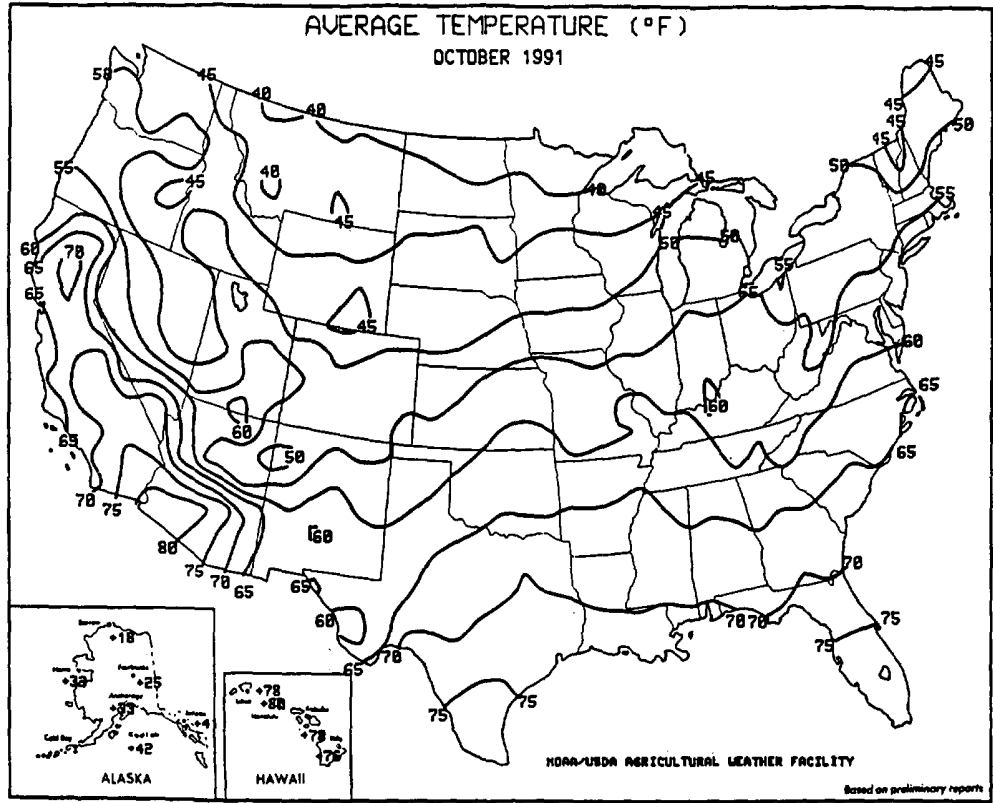
From National Climatic Data Center

Fig. 1



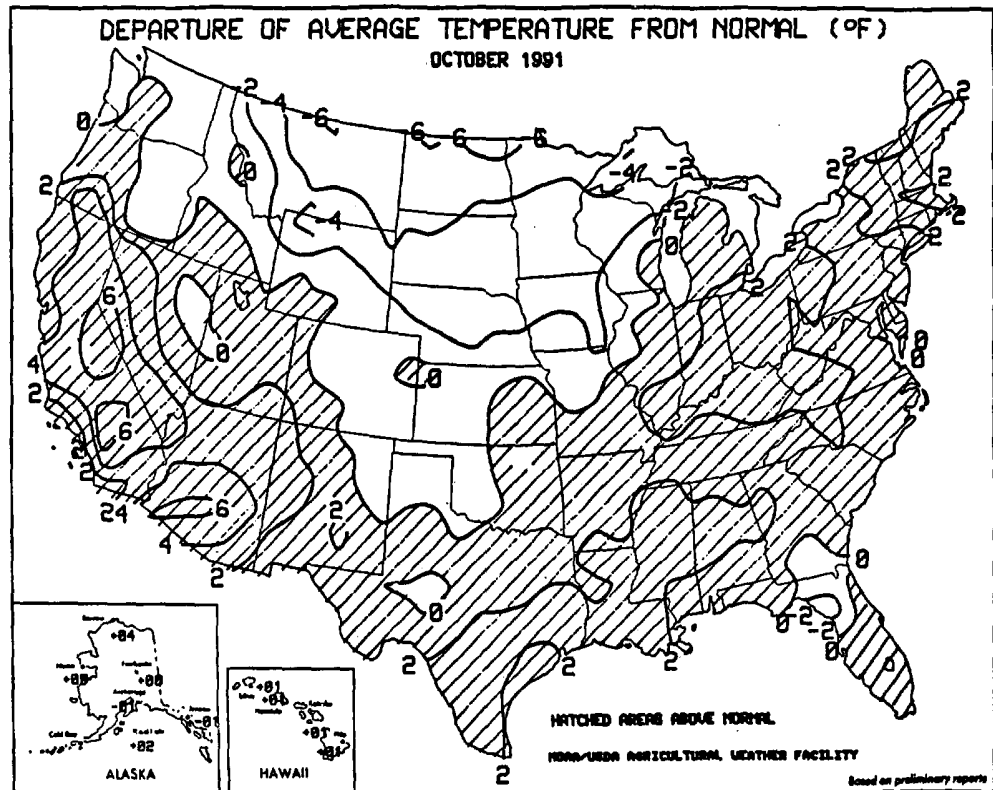
From National Climatic Data Center

Fig. 2



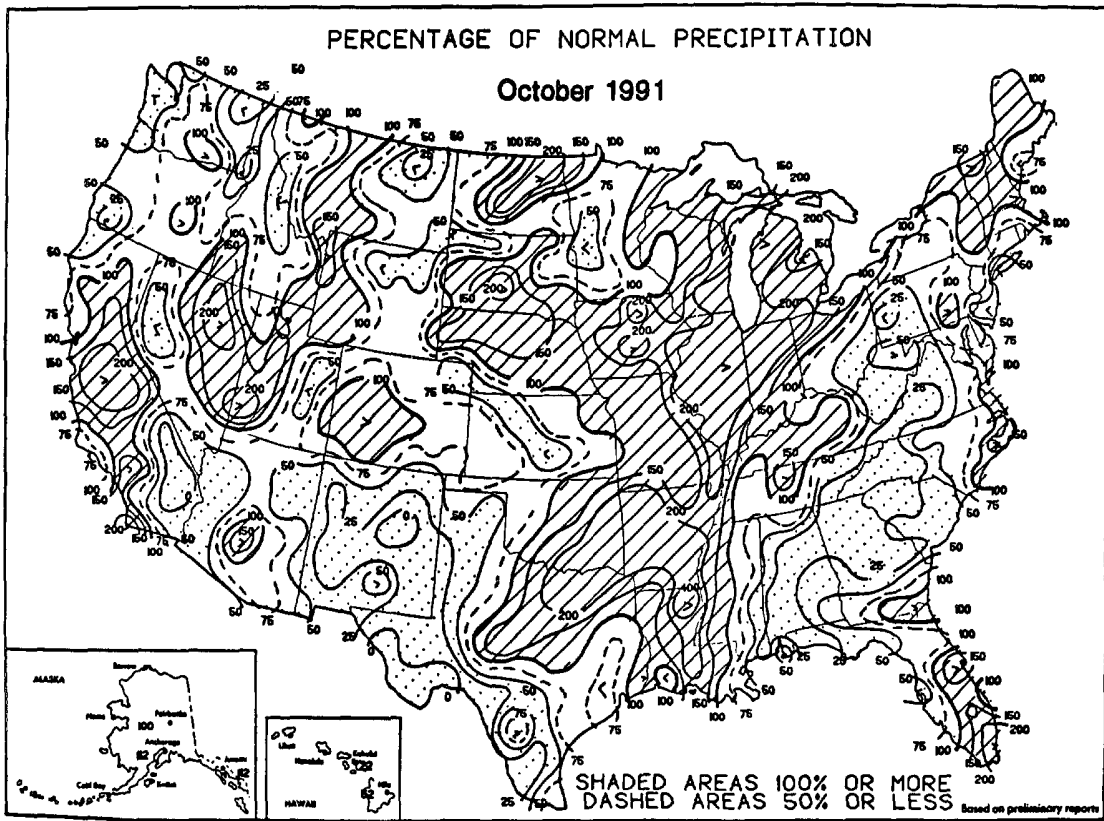
Reprinted from Weekly Weather and Crop Bulletin - November 5, 1991

Fig. 3



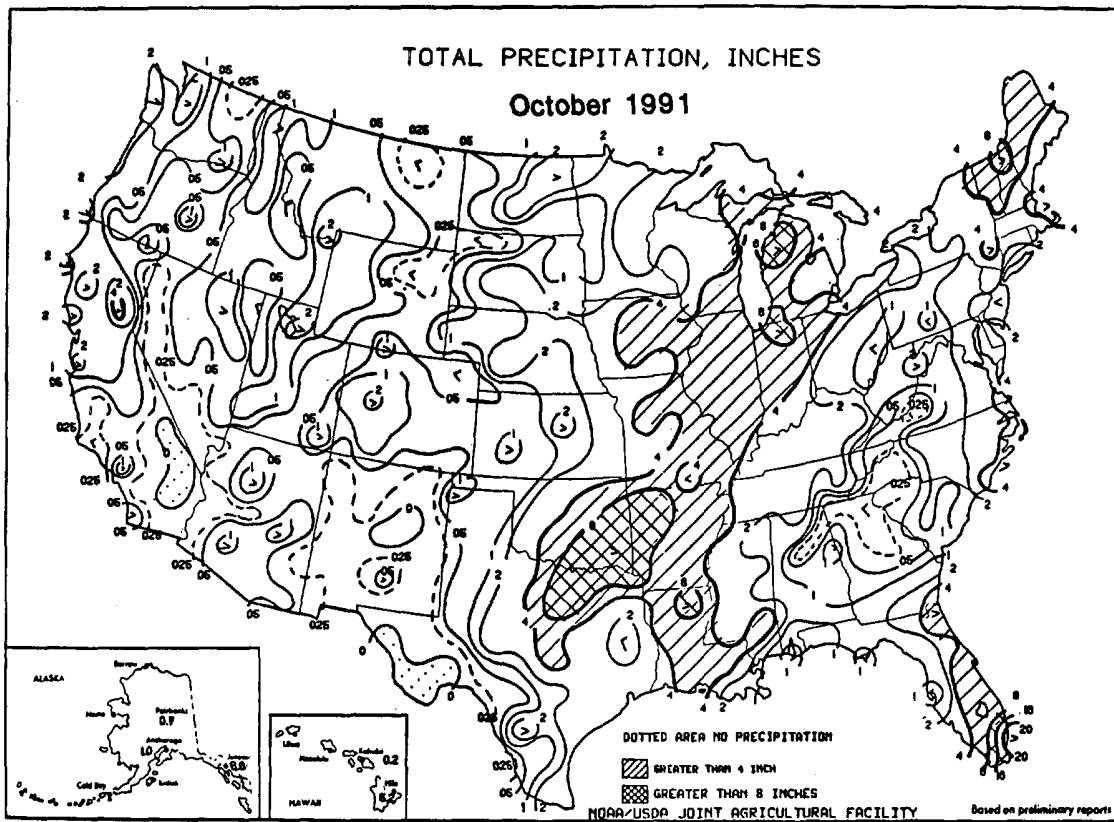
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Fig. 4

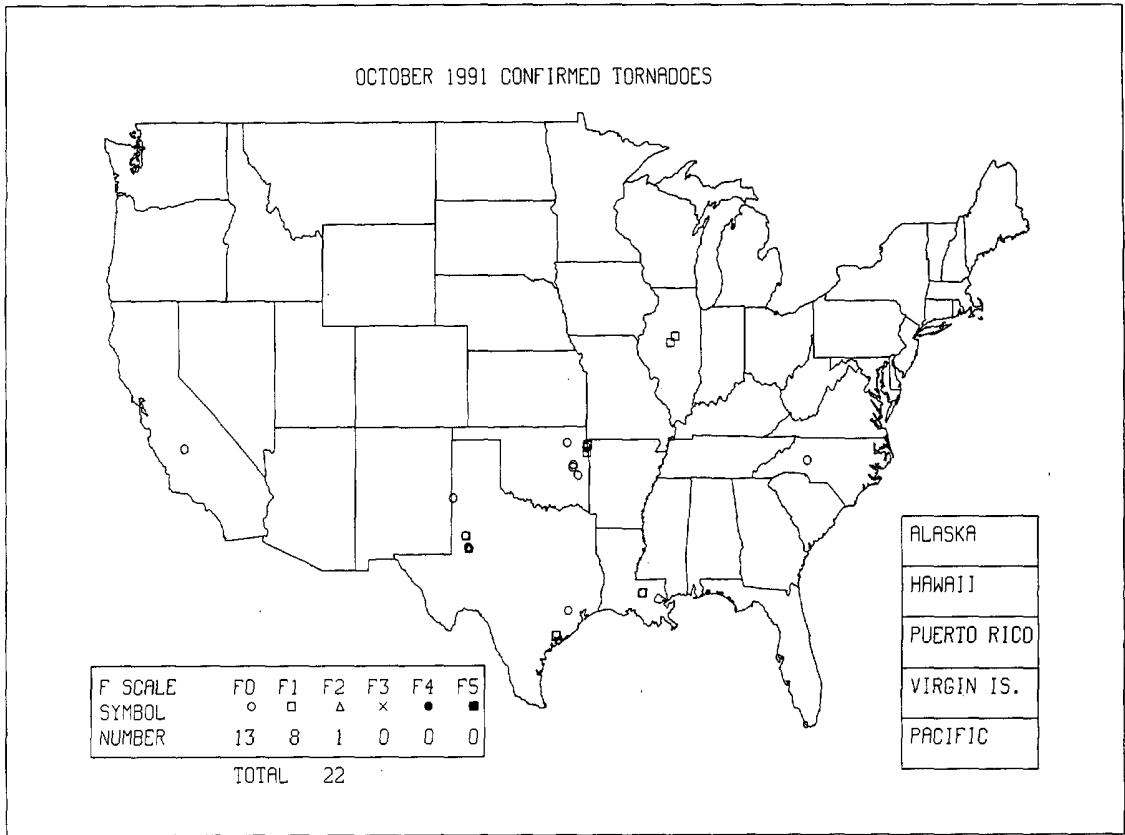


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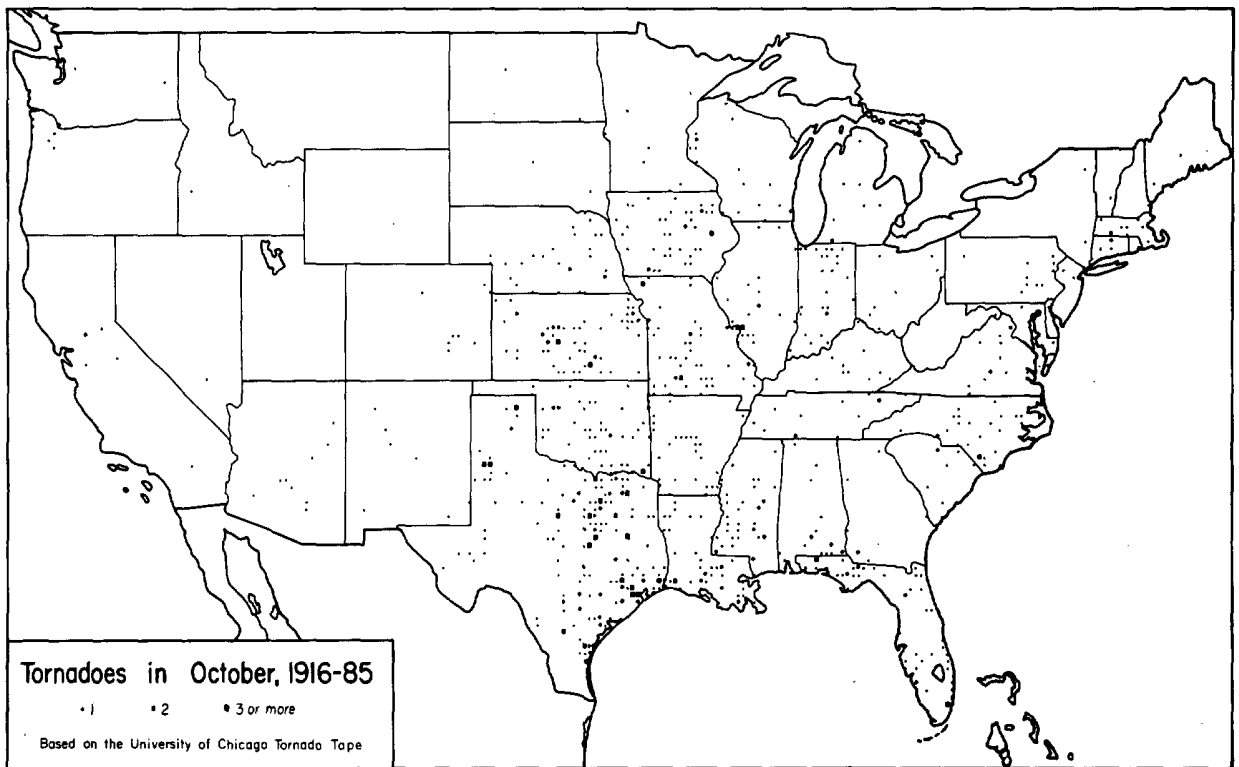
Fig. 5



Reprinted from Weekly Weather and Crop Bulletin - November 5, 1991



In October 1991, a total of 22 tornadoes were recorded. Thirteen were rated F0 strength on the Fujita Tornado Scale. The strongest tornado in October 1991 was an F2 tornado in Texas. Texas had the most tornadoes with eight while Oklahoma was close behind with seven tornadoes. Fortunately, there were no deaths or injuries with any of this month's tornadoes. (See map above.)



OUTSTANDING STORMS OF THE MONTH

1. THE "UNNAMED" HURRICANE

An unusual meteorological event occurred in the latter stage of the 1991 Atlantic hurricane season. This event was the formation of a tropical cyclone of hurricane intensity within an extratropical low pressure system during the days of October 28 thru November 3, 1991. The unnamed hurricane was preceded by two different weather events: Hurricane Grace and a strong extratropical storm.

Hurricane Grace developed from a subtropical system in the eastern Caribbean and reached hurricane status on October 28th at 0000 UTC. Grace's initial forward movement was at 10 knots toward the northwest.

At the same time (on October 28), an extratropical cyclone formed along a cold front off the New England coast. It rapidly became the most dominant weather feature in the western Atlantic. The wind flow around the southern fringe of the storm became the steering current for Grace. The forward motion of Grace was re-directed from its northwesterly heading to an easterly heading. On October 29th, Grace again turned toward the east-northeast and was overtaken by a strong cold front associated with the extratropical storm. The merger of the storms occurred at 1800 UTC on the 29th. The remnants of Grace were absorbed by the extratropical system.

The extratropical storm continued to strengthen as it reached its peak intensity (as an extratropical storm) around 1200 UTC on October 30. The minimum central pressure was about 972 mb with estimated winds near 70 knots. With the storm system located 340 nautical miles south of Halifax, Nova Scotia, tidal flooding and wave action were causing considerable damage along the United States east coast (see photos on pages 9 and 10).

The extratropical storm turned southwestward, then southward, on the 31st, while the central pressure gradually rose. This motion brought the storm over a section of the Gulf Stream with water temperatures near 26°C (80°F). While the storm was moving over the warmer waters, convection began increasing in bands around the center. By 0600 UTC on November 1st, convection had increased to a point of tropical storm intensity. By 1500 UTC, satellite pictures showed an "eye" was forming (the inner system was near hurricane intensity).

The storm made a complete counterclockwise loop and by late on the 1st turned northeastward. An Air Force Reserve Unit aircraft measured winds of 86 knots at 850 mb (approximately 5,000ft.), and a +4°F air temperature rise in the center (0000 UTC on November 2nd). The radius of the maximum winds was about 30 nautical miles, while the winds for the extratropical circulation extended over 300 nautical miles from the center. The cyclone weakened and accelerated northeastward and made landfall near Halifax, Nova Scotia as a weakening tropical storm. The cyclone dissipated about 10 hours after landfall. See Figure 1 below.

The "Unnamed" Hurricane, to a great extent, was a separate phenomenon from the extratropical storm. By the time the tropical system had formed, the extratropical storm was weakening. This was be the last system of the 1991 hurricane season.

The formation of a tropical cyclone in the center of a non-tropical system is rather unusual. With the central portions of these storms in a region of light wind shear, and warm sea surface temperatures, tropical storm formation is a possibility, like Hurricane Karl in November 1980.

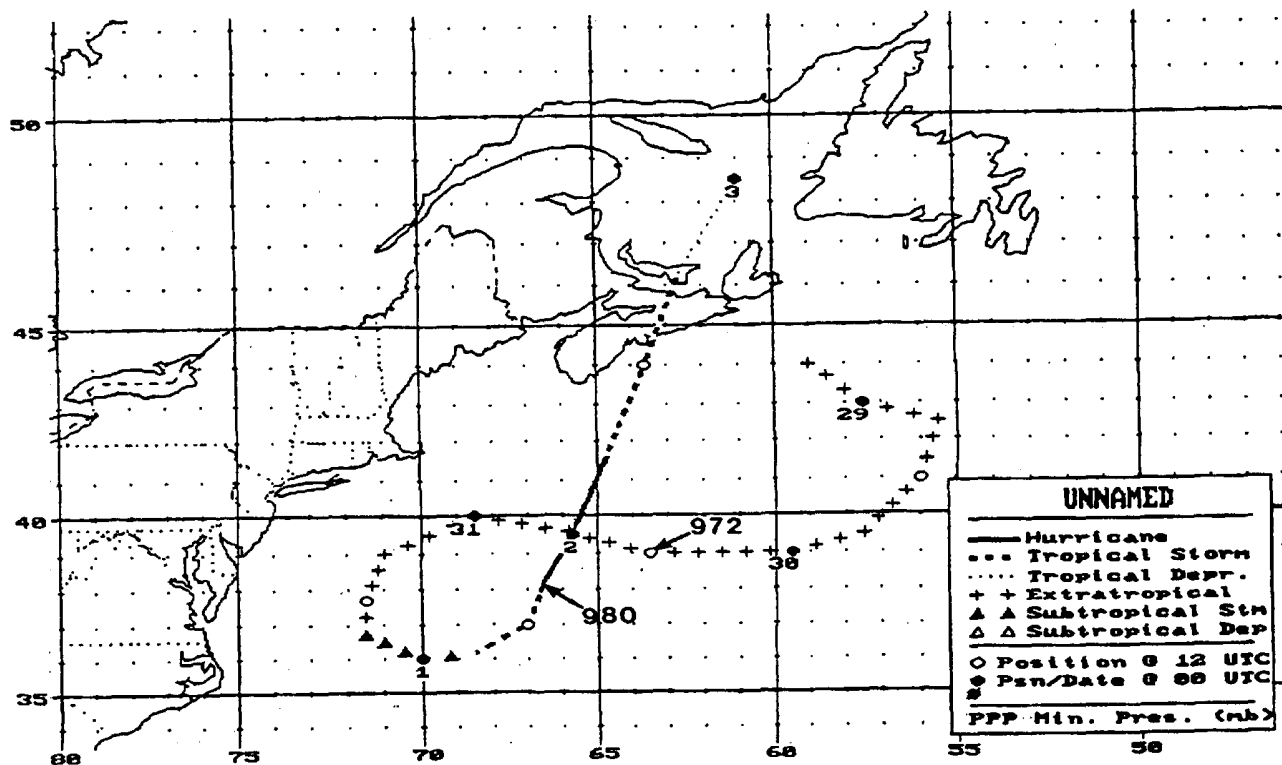
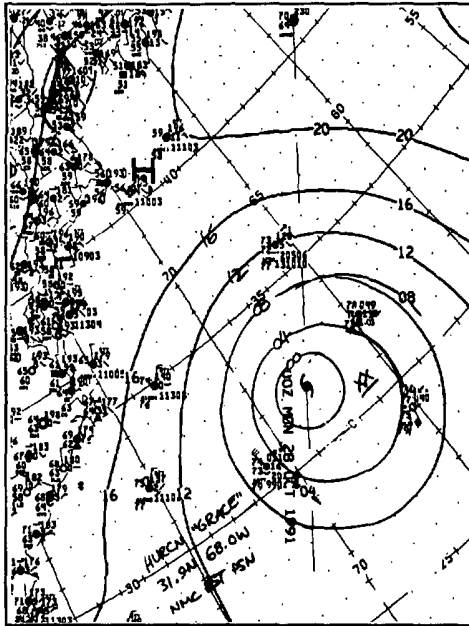
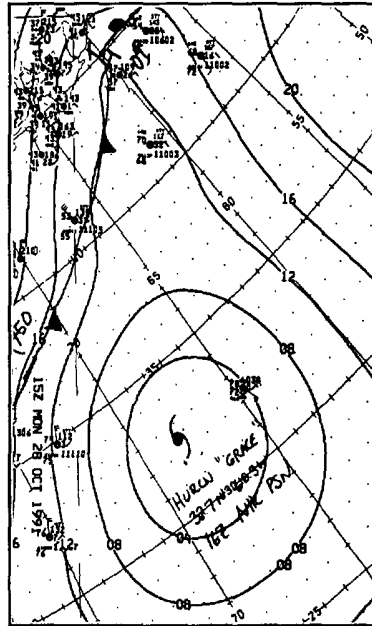


Fig. 1. Best track positions for the extratropical low and the unnamed hurricane, 28 October - 3 November 1991.

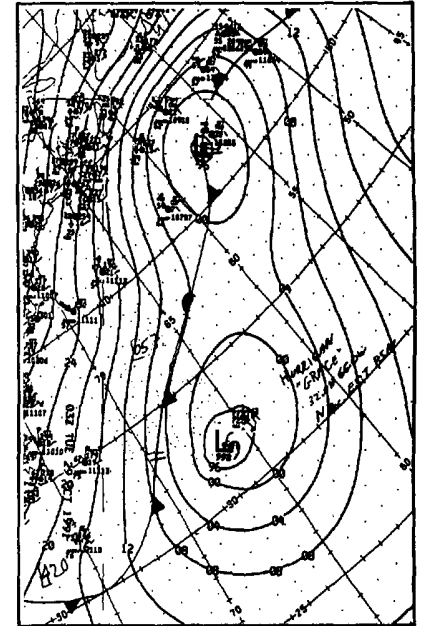
SURFACE ANALYSIS OF GRACE AND THE EXTRATROPICAL STORM



Grace at hurricane status on 00Z October 28, 1991.

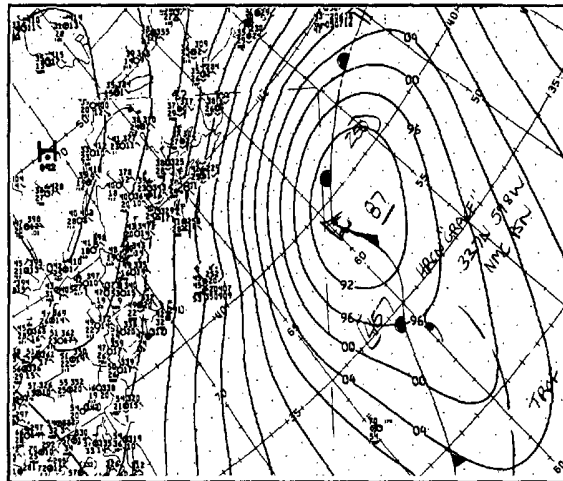


15Z on October 28th.

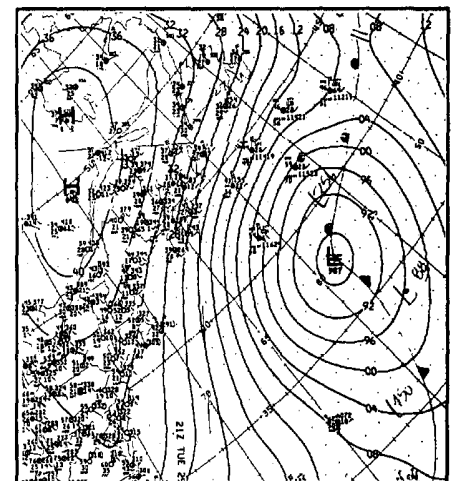


03Z on October 29th.

The extratropical storm continued to intensify . . .

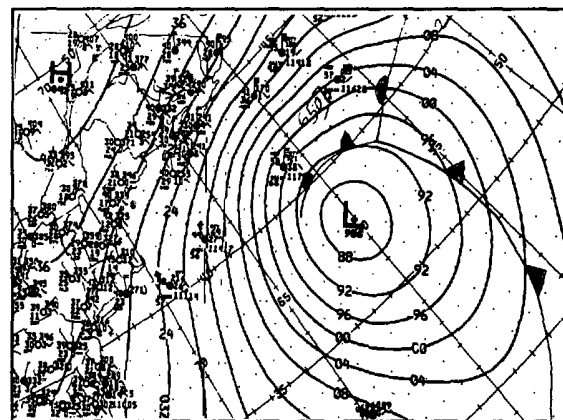


The vigorous cold front overtook Grace at 1800 UTC and Grace was quickly destroyed.

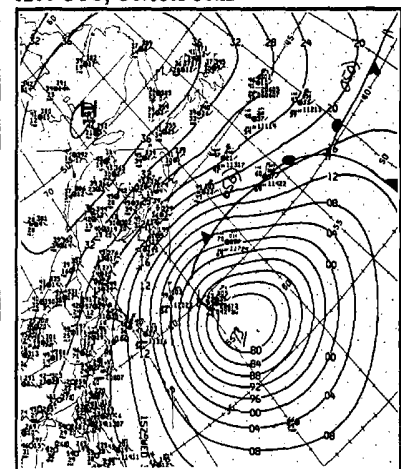


21Z on October 29th.

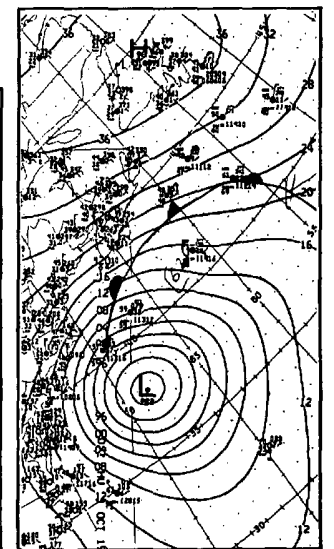
The extratropical storm reached its peak intensity (972 mb. with winds 70 knots) at 1200 UTC, October 30th.



03Z on October 30th.

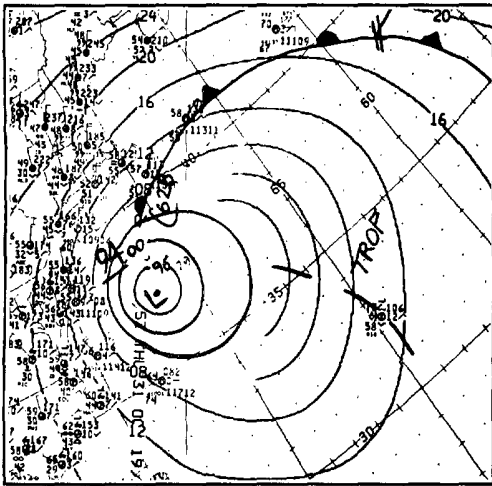


15Z on October 30th.

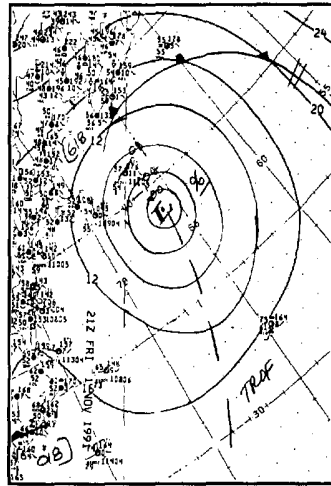


03Z on October 31st.

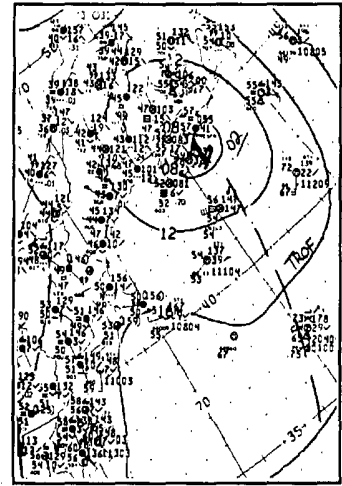
Maps provided by: National Climatic Data Center



15Z on October 31st.

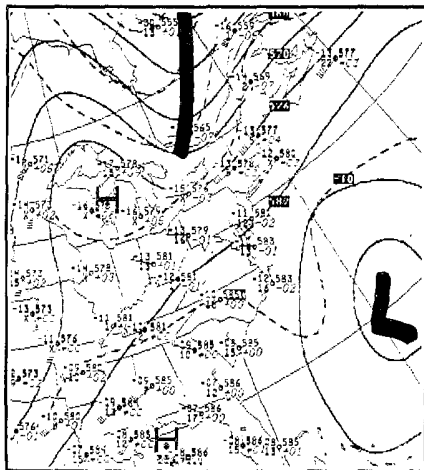


21Z on November 1st.

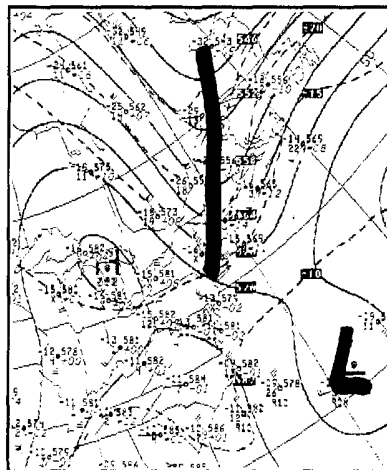


12Z on November 2nd.

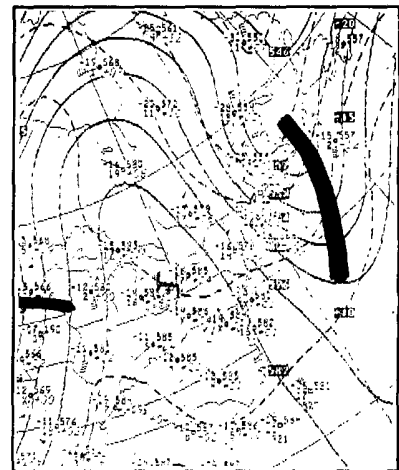
UPPER AIR ANALYSIS SHOWING THE DYNAMICS OF THE STORM



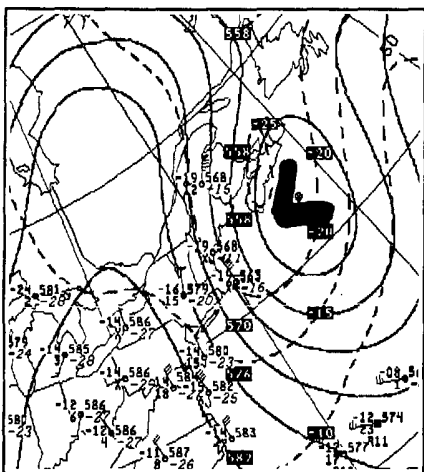
00Z on October 28th.



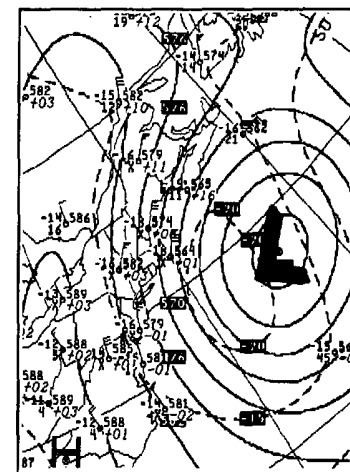
12Z on October 28th.



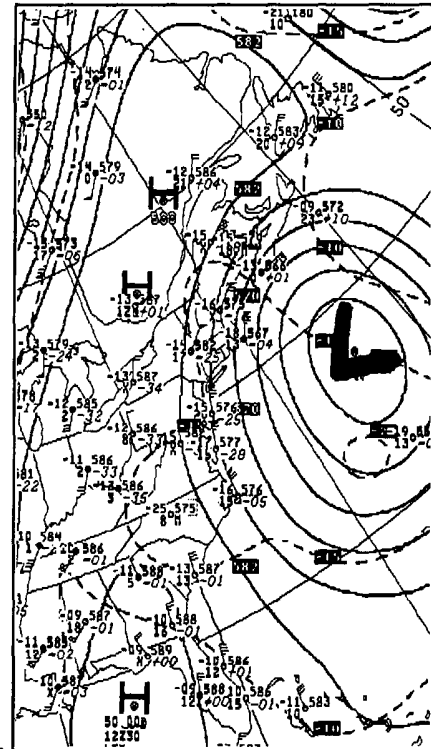
00Z on October 29th.



12Z on October 29th.



00Z on October 30th.

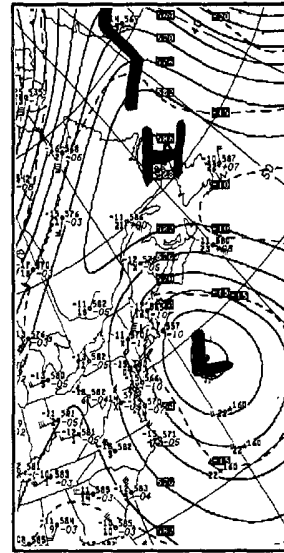


12Z on October 30th.

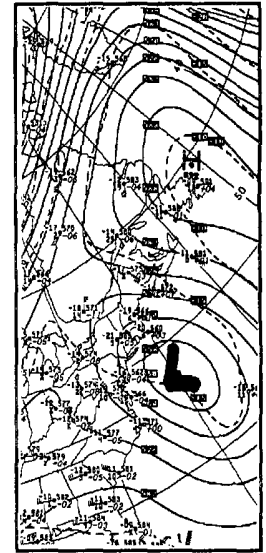
Grace was initially subtropical in character and formed primarily from a mid-level low that extended down to the surface. A shortwave trough to the north absorbed Grace and became a closed low by 12Z on October 29th. In the meantime, a strong high pressure ridge extended from the Gulf of Mexico northeast along the Appalachians into Greenland. By 00Z on October 30, the

upper level ridge started to move over the closed low forming a "Rex-block" (a closed high pressure located north of a closed low.) See map at right dated 00Z October 31st. As the high moved east of the low, a new closed low formed in the mid-western US. This low became part of the massive ice and snow storm that struck the Midwest. Later, the low off the east coast weakened rapidly.

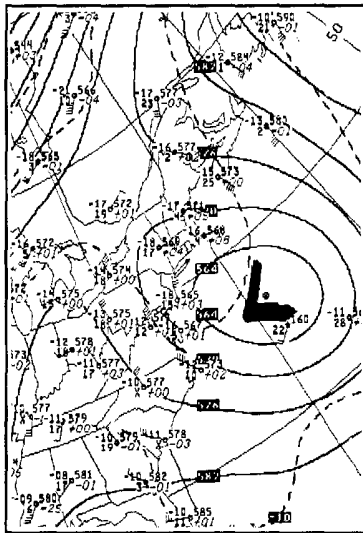
Upper air maps provided by: University of North Carolina at Asheville.



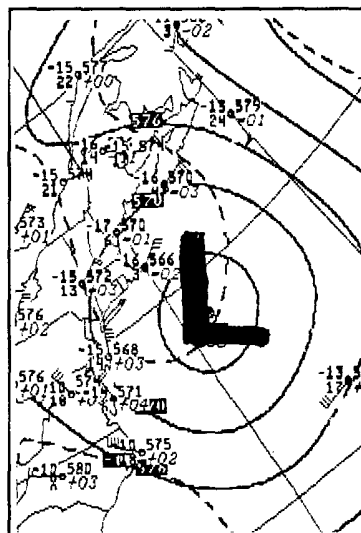
00Z on October 31st.



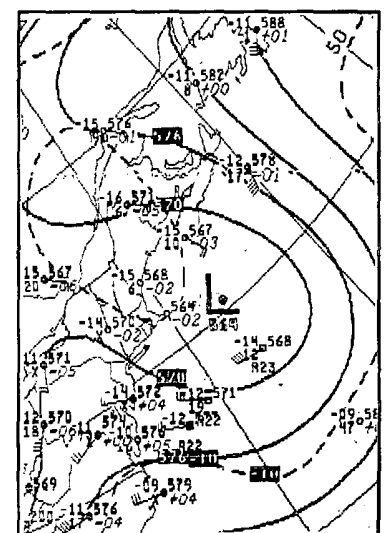
12Z on October 31st.



00Z on November 1st.



12Z on November 1st.



00Z on November 2nd.

THE DESTRUCTION FROM THE EXTRATROPICAL STORM

The intense extratropical storm caused millions of dollars in damage from the east coast of Florida to eastern Canada. Homes, boats, roads, beaches, and sea walls were destroyed by the heavy surf, flooding, and high winds.

The destructive conditions were caused by strong winds that were generated from the tight pressure gradient between a strong high pressure center (approximately 1043 mb., 30.8 in.) centered in eastern Canada, and the extratropical low (approximately 978 mb., 28.9 in.) centered off the New England coast. North Carolina's coast was lashed with winds 35 to 45 mph for five days. Closer to the storm, wind gusts reached hurricane force on the coast of Massachusetts. Several of the peak gusts observed were: 78 mph at the NWS Office in Chatham, MA; 74 mph at Thatcher Island, MA; 68 mph at Marblehead, MA; 64 mph at Blue Hill Observatory, MA; 63 mph at Newport, RI; and 55 mph at Milton, MA. The hurricane force winds pounded the east coast with heavy surf. Waves 10 to 30 feet high were common from North Carolina northward to Nova Scotia. High tides were three to seven feet above normal. A record high tide of 7.8 feet occurred at Ocean City, Maryland on the 30th, which coincided with the highest winds along the coast. The high seas also caused coastal flooding. Tides produced by this storm were comparable to the March 1962 storm.

Overall, damage at coastal locations was also compared to that of the 1944 Hurricane and the "Blizzard of 1978".

THE SURF POUNDS THE NORTHEAST COAST

The heavy pounding by thirty foot waves took their toll on the northeast coast. Maine was especially hard hit as the high seas ripped up piers and catwalks. The Massachusetts coast also took a beating by the 25 foot waves. Beach-front houses were knocked off their foundations. Severe erosion of beaches and dunes occurred from Florida northward. In New York, three boats were sunk on Long Island due to the high seas, and off Staten Island, two young men drowned when their boat capsized.

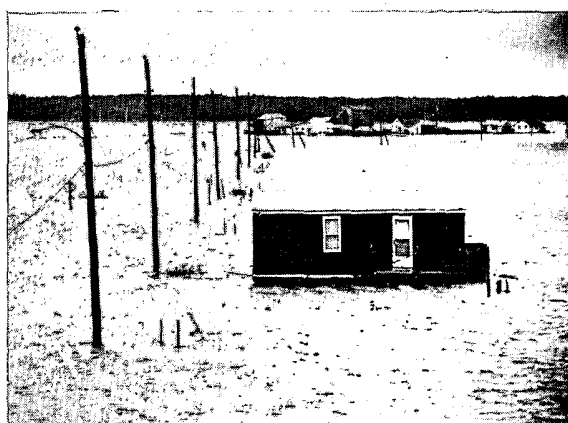


Above(both): Photographs of the heavy surf at "Two Lights State Park". Photos were taken about 3 pm on October 30th using a Minolta camera with a zoom lens. At the same time, a buoy 7 miles offshore was reporting seven foot swells. Two hours after the photos were taken, the same buoy recorded 15 feet seas. The Cashes Ledge buoy, located well offshore measured 39 foot swells. **Above(left):** Waves crash on shore causing damage. (Photo courtesy: John W. Cannon, NWSFO Portland, Maine.) **Above:** Waves wash up to the dunes at Harvey Cedar in New Jersey. (Photo courtesy: Tim Moersh, The Sandpaper, Surf City, New Jersey.)

Left: Two men watch waves crash against the seawall at Hampton's Beach in New Hampshire. (Photo courtesy: Tim Donovan, Rockingham County Newspapers, Exeter, New Hampshire.)

TIDAL AND COASTAL FLOODING CAUSED MANY PROBLEMS

Flooding of roads and low-lying coastal property caused many problems in the northeast. High water flooded homes and highways.



Top(left): High water at Bay Avenue in Beach Haven, New Jersey. *(Photo courtesy: Ray Fisk.)* **Top(right):** Autos make their way along Long Beach Blvd. in Ship Bottom. **Above(left):** A cyclist pushes his bike through the water on Bay Avenue in Mud City. *(Photo courtesy: Tim Moersh.)* **Above(right):** Flooding in West Creek on Cedar Run Dock Rd. *(Photo by Ray Fisk.)* **Below(left):** Jim Snyder (senior and junior) of Cedar Bonnet Island sit in their flooded living room. *(Photo courtesy: Tim Moersh.)* **Below(right):** High water made many roads impassable. *(Photo courtesy: Jay Mann.)*

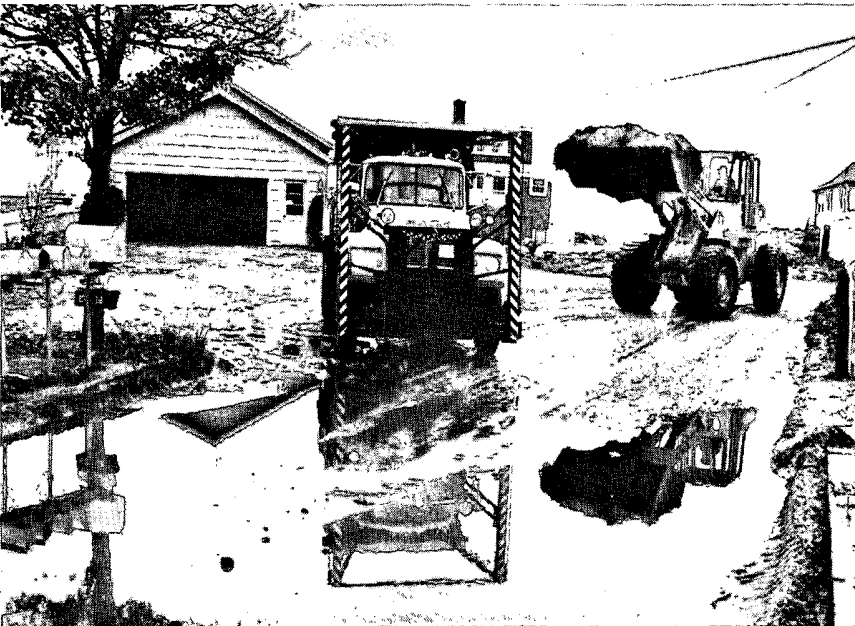
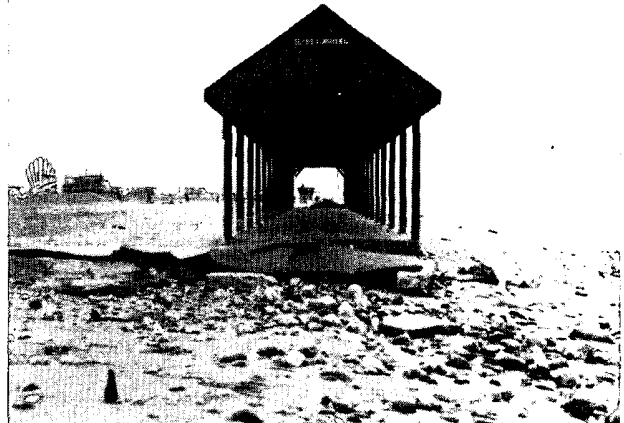


Additional credit to the above contributors: The Sandpaper, Surf City, New Jersey.



DAMAGE FROM THE EXTRATROPICAL STORM

The extratropical storm caused extensive damage. The majority of the damage resulted from the flooding and heavy surf. High winds also added to the damage. Massachusetts reported damage in the hundreds of millions of dollars and southern New Jersey reported total storm damage at \$75 million. Other storm damage totals were: New Jersey (northern) and New York 10's of millions of dollars, Maine \$7.9 million, North Carolina \$6.7 million, New Hampshire \$5.6 million, and Florida \$3 million.



Above(left): Flynn's, a seafood outlet located on Devereux Beach is barely standing after the ocean undermined the front of the building. The building was assessed as a total loss. It was located more than 150 feet from the tidal zone. Photographs were taken on the morning of October 31, 1991. **Above(right):** A causeway located 50 feet from the tidal zone on Devereux Beach was damaged by the waves. *(Photo courtesy: Thomas Adams, Marblehead, Massachusetts.)*

Left: Some of the clean-up efforts after at Plaice Cove in Hampton, New Hampshire. *(Photo courtesy: Tim Donovan, Rockingham County Newspaper, Exeter, New Hampshire.)*

2. EARLY SEASON WINTER STORM HITS THE MIDWEST

A major early season winter storm struck the central Plains during late October and early November. The storm brought heavy snow and high winds causing blizzard conditions. Freezing rain accumulated up to two inches, and rainfall totalled as much as four inches in some areas.

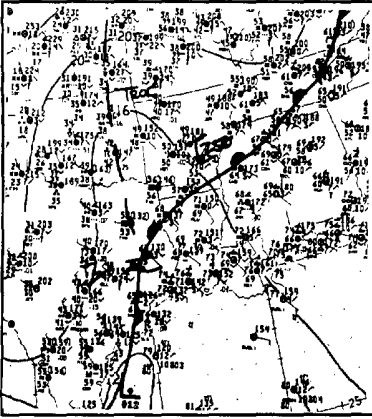
Arctic air rushed in behind the cold front that crossed the Plains states. A low pressure system developed slowly over southern Texas, and moved northeastward along the frontal boundary. As the low moved northeast, warm, moist air was drawn northward, and resulted in different types of precipitation. By November 2nd, the low was moving through the Great Lakes and pulled record cold air into the Plains and changed all precipitation to snow. (See surface maps.)

The storm caused numerous problems with commerce and electrical service. Crops also sustained significant damage. In Iowa, 52 of 99 counties were declared disaster areas. For many areas this was the worst early season storm in many years. (See Storm Data and Unusual Weather Phenomena for further information.)

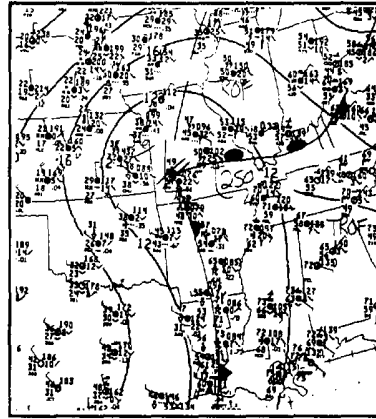
Below: One of the many trees downed by ice and heavy snow. *(Photo courtesy: Atlantic News-Telegraph, Atlantic, Iowa.)*



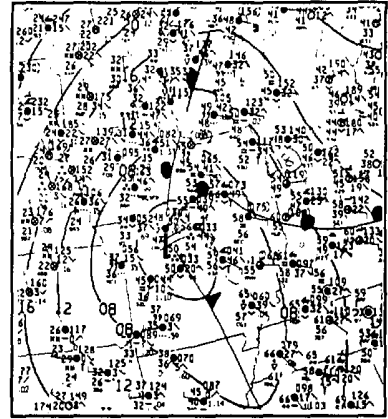
SURFACE ANALYSIS OF THE EARLY MIDWEST WINTER STORM



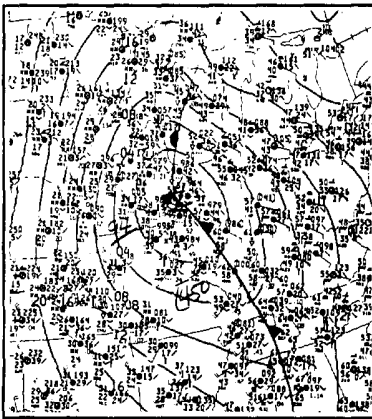
15Z on October 31st.



00Z on November 1st.

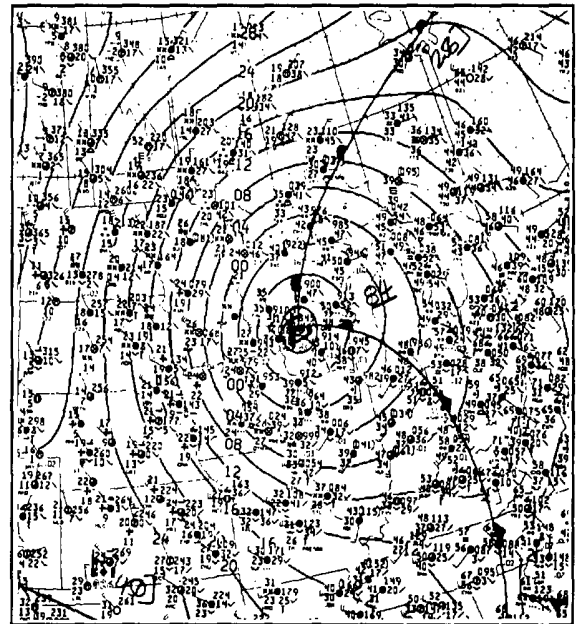


06Z on November 1st.

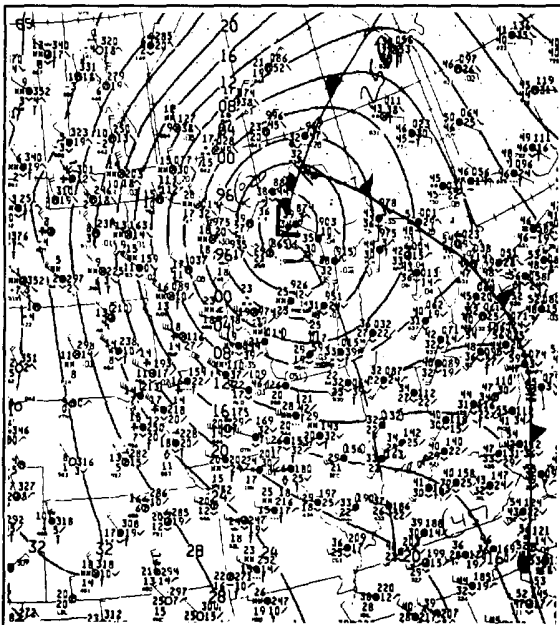


12Z on November 1st.

The storm develops slowly in south Texas on October 31st. By 12Z on November 1st, the low rapidly intensified and moved toward the Great Lakes. The storm reached maximum intensity about 21Z on November 1st.

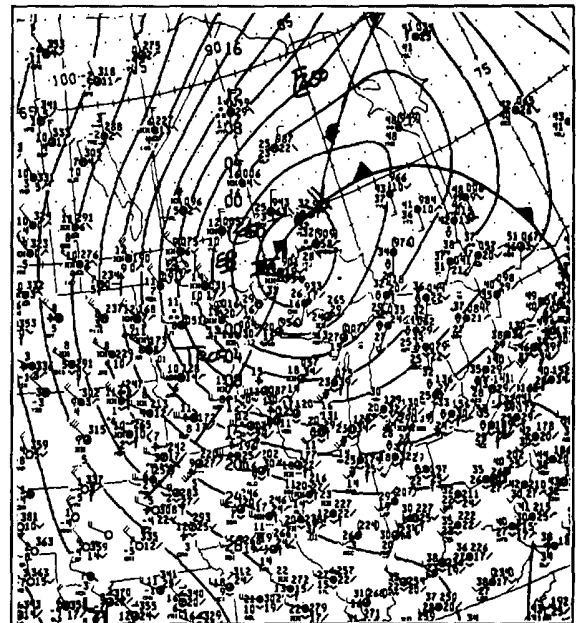


12Z on November 1st.



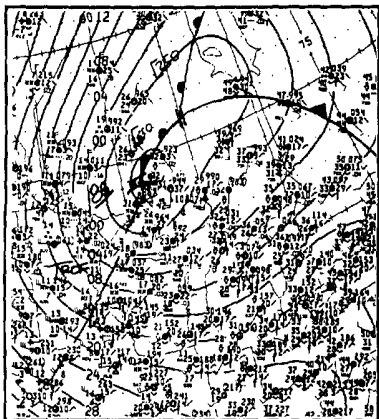
06Z on November 2nd.

The storm slowly weakened over the Great Lakes.

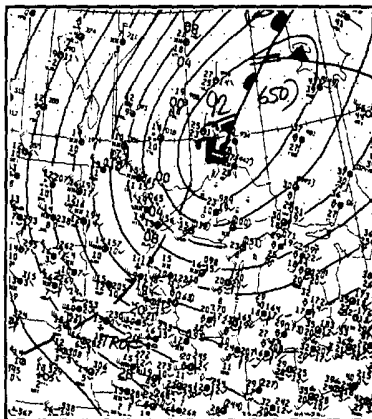


15Z on November 2nd.

Maps provided by: National Climatic Data Center



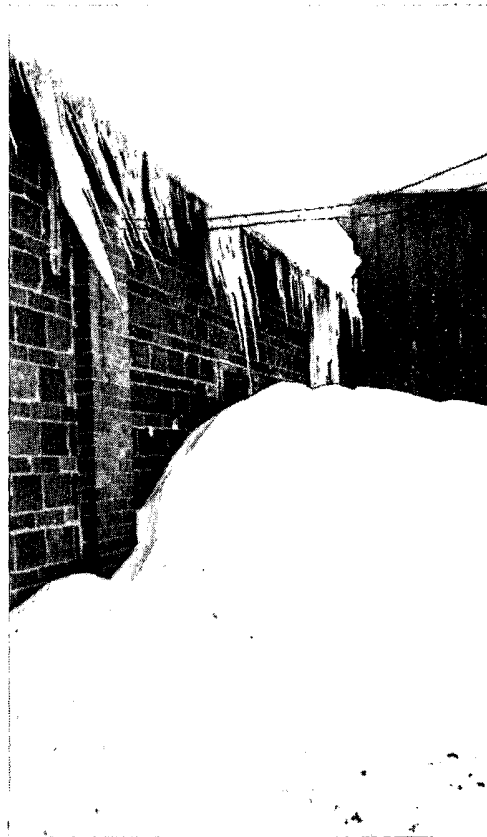
15Z on October 31st.



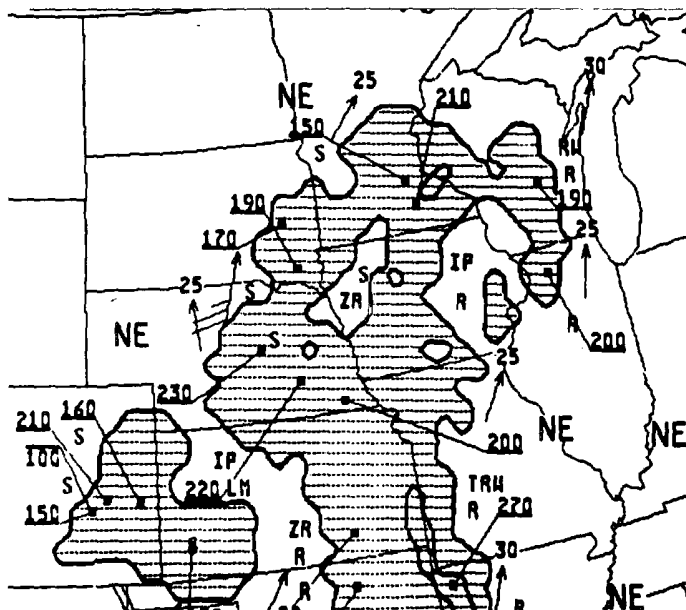
00Z on November 1st.

The storm moved into southern Canada leaving in its wake snow, wind and record cold.

Map provided by:
National Climatic Data Center



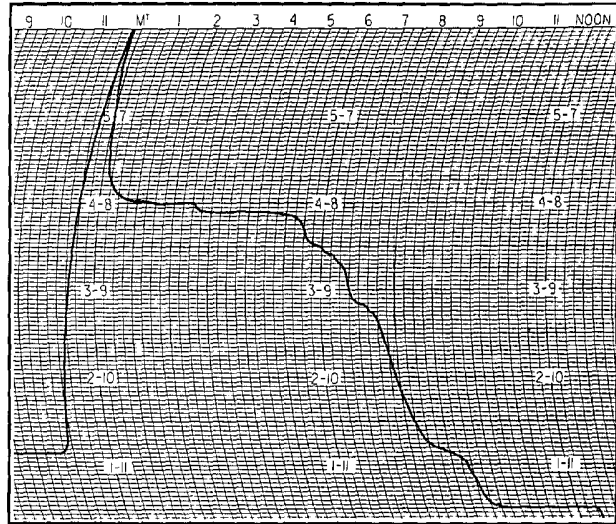
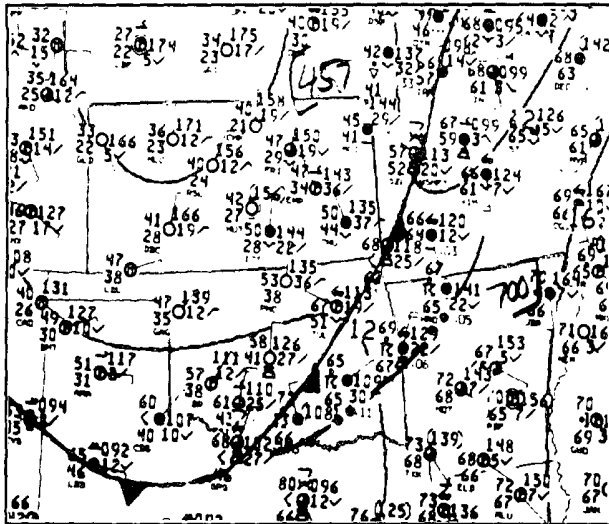
Heavy snow drifted by the wind. Right: Snowdrifts and icicles were a common sight. Notice the blades of grass left bare by the wind. Above: Two men attempting to dig their autos out of the snow. (Photo courtesy: Lauren Donovan, Hazen Star, Bismark, North Dakota.)



Precipitation extended from just west of Lake Michigan south into the Gulf of Mexico. Notice the thunderstorm (TRW) on the east side of the precipitation shield. Further west, precipitation was changing to freezing rain (ZR), ice pellets (IP) and finally to snow (S).

Map provided by: National Climatic Data Center

3. SEVERE STORMS BRING HEAVY RAIN TO OKLAHOMA



Above (left): A small section of the North American surface map from 03Z October 25, 1991 shows a strong cold front crossing the southern Plains. Note the ambient and dewpoint temperature drop behind the front. A squall line is indicated from extreme south central Missouri to the Texas/Oklahoma border. (Notice Ardmore, Oklahoma (ADM) had a severe thunderstorm in progress at the time of observation.) Above (right): A 12 inch dual traverse raingauge trace from Tuskahoma, Oklahoma (located in southeastern Oklahoma) reveals the intensity of some of the rainfall associated with this cold front. A total of 10.35 inches fell in less than 12 hours with 6.10 inches falling in 75 minutes.

Map and precipitation chart provided by: National Climatic Data Center

4. WEST VIRGINIA FOREST FIRES



Above (left): On October 30, 1991, two men watch as a fire burn along Lens Creek in Kanawha County, West Virginia about 6 miles southeast of Charleston. (*Photo courtesy: Chet Hawes, Charleston Daily Mail, Charleston, WV.*) Above (right): The aerial photograph shows a brush fire along Campbell's creek on October 29, 1991. The West Virginia State Capitol Building is only 3 miles to the west. The blaze produced considerable amounts of smoke near the ground especially at night and early morning where warmer air aloft kept the smoke from rising. (*Photo courtesy: Kenny Kemp, Charleston Gazette, Charleston, West Virginia.*)

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
ALABAMA									
Choctaw County	22	1645CST			0	0	?	?	Thunderstorm Winds
	Numerous trees were blown across a road at Yantley.								
Sumter County	22	1715CST			0	0	0	0	Hail (0.75)
Countywide	22	1720CST			0	0	0	0	Hail (0.75)
Countywide	Dime-size hail fell in York at 1715 CST. At 1720 CST, dime-size hail fell 9 miles southwest of Livingston.								
ARIZONA									
Navajo County	10	1509MST			0	0	2	0	Dust Devil
2 W Show Low	A large dust devil damaged parts of the roofs of two mobile homes, while three other roofs were slightly damaged.								
Yuma County	21	1520MST			0	0	0	?	Hail (1.00)
Roll	Thunderstorms developed across much of the desert and moved to the north during the afternoon. Winds reached up to 50 mph along with hail that reportedly bounced 15 inches off the ground. Lettuce, alfalfa, and cotton crops were damaged.								
ARKANSAS									
Crawford County	04	1640CST			0	0	2	0	Thunderstorm Winds
3 E Cedarville	Thunderstorm winds downed a few trees near Cedarville.								
Franklin County	04	1702CST			0	0	0	0	Hail (0.75)
Cass	04	1800CST			0	0	4	0	Thunderstorm Winds
Johnson County	Thunderstorm winds took the roof off a state police garage. Some trees and signs were also downed.								
Clarksville									
Little River County	04	1900CST			0	0	0	0	Hail (1.00)
8 S Central	04	1935CST			0	0	3	0	Hail (1.00)
Pope County	Hail damaged a few recreational vehicles in the extreme southern portion of Russellville.								
Russellville									
Faulkner County	04	1945CST			0	0	3	0	Thunderstorm Winds
1 N Greenbrier	Thunderstorm winds destroyed a garage, some outbuildings, and damaged a roof. A few trees were also downed.								
White County	04	2025CST			0	0	2	0	Thunderstorm Winds
Joy	Thunderstorm winds downed a few trees along Highway 36.								
Searcy	04	2040CST			0	0	3	0	Thunderstorm Winds
	Thunderstorm winds downed trees and power lines in the west part of town.								
Bald Knob	04	2055CST			0	0	3	0	Thunderstorm Winds
	Thunderstorm winds broke large tree branches which downed some power lines.								
Lonoke County	14	0430CST			0	0	4	0	Lightning
10 S Cabot									

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
ARKANSAS Cont'd									
A lightning strike killed 11 cows, 7 of which were with calves. The cows were apparently under the tree that was struck.									
Pulaski County Little Rock	14	0500CST			0	0	3	0	Lightning
Lightning strikes damaged a transformer and tripped fuses knocking out power to about 300 residents.									
Sebastian County Greenwood	24	1525CST			0	0	0	0	Hail (0.75)
Fort Smith	24	1715CST			0	0	2	0	Thunderstorm Winds (G52)
Hartford	25	1905CST			0	0	0	0	Hail (0.75)
Wind gusts up to 60 mph downed several trees in a Fort Smith sub-division.									
Washington County Springdale	25	2330CST			0	0	3	0	Lightning
A lightning strike caused a large tree to virtually explode. Debris from the tree tore two holes in the roof of a residence, and broke windows and a storm door.									
Lincoln Prairie Grove	25	2351CST			0	0	4	0	Thunderstorm Winds
	25	2355CST			0	0	3	0	Thunderstorm Winds
Thunderstorm winds downed trees and power lines, and damaged buildings from Lincoln to Prairie Grove. A 380-foot-long turkey house was destroyed sending more than 10,000 turkeys over several acres. Debris from the turkey house then damaged a nearby mobile home. A barn was also destroyed and its debris caused severe damage the roof of a nearby home.									
Lonoke County 11 N Lonoke	26	0530CST			0	0	4	0	Lightning
A lightning strike killed seven dairy cows, four of which were with calves.									
Pulaski County Little Rock	26	0723CST			0	0	4	0	Thunderstorm Winds (G52)
Thunderstorm winds gusting to 60 mph downed some trees and power lines across the city.									
White County Beebe	26	0750CST			0	0	3	0	Thunderstorm Winds
Thunderstorm winds blew a satellite dish and numerous signs over, and broke off some large limbs from trees.									
Woodruff County Augusta	26	0830CST			0	0	4	0	Thunderstorm Winds
Thunderstorm winds damaged an electric company facility on the northwest side of town. The tin roof of a truck shed was blown off, two storage buildings destroyed, a flat bed trailer was overturned, 20 transformers damaged, and about 300 feet of chain link fence damaged.									
Greene County 2 S Paragould	26	1022CST			0	0	4	0	Thunderstorm Winds
Thunderstorm winds blew two mobile homes over and damaged some roofs. Trees and power lines were also downed in the area.									
Craighead County Brookland	26	1038CST			0	0	2	0	Thunderstorm Winds
Thunderstorm winds downed trees in Brookland.									
Greene County Marmaduke	26	1045CST			0	0	3	0	Thunderstorm Winds
Thunderstorm winds damaged the roof and pushed in the south wall of an industrial building.									

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
ARKANSAS Cont'd									
Benton County Cherokee City to Sulphur Springs	28	0515CST	15	150	0	0	4	0	Tornado (F1)
A tornado entered Arkansas at Cherokee City, and moved northeast near Gravette, and then to Sulphur Springs. Damage was intermittent along the path. Damage included a mobile home and chicken house destroyed at Cherokee City, trees and power lines downed and a camper trailer destroyed 4 miles west of Gravette. Some mobile homes were damaged and outbuildings destroyed at Sulphur Springs.									
Crawford County Mulberry	28	0700CST			0	0	2	0	Thunderstorm Winds
Thunderstorm winds downed trees.									
Sebastian County Bonanza	28	2155CST- 2345CST			0	0	4	0	Flash Flood
Fort Smith	28	2200CST- 2345CST			0	0	4	0	Flash Flood
Heavy rains flooded parts of west Sebastian County. At Bonanza, all roads were reported under water with a couple of homes flooded. In Fort Smith, several roads went under water, and several homes suffered water damage.									
Newton County	28 29	2300CST- 0100CST			0	0	3	0	Flash Flood
Heavy rains washed out county roads across Newton County. Highway 327 was also closed due to high water between Jasper and Parthenon. The public reported 3 to 5 inches of rainfall in 3 hours.									
Boone County	28 29	2300CST- 0100CST			0	0	2	0	Flash Flood
Heavy rains, estimated at 1 inch per hour, flooded low-lying streets in Harrison. Highway 397 west of Harrison also went under water.									
Crawford County	28 29	2300CST- 0130CST			0	0	4	0	Flash Flood
Franklin County	28 29	2300CST- 0130CST			0	0	4	0	Flash Flood
Madison County	28 29	2300CST- 0130CST			0	0	3	0	Flash Flood
Heavy rain flooded numerous roads and bridges. In Crawford County, one car was washed off Highway 59 by flood water.									
Polk County 18 SE Mena	28	2345CST			0	0	3	0	Thunderstorm Winds
Thunderstorm winds downed or uprooted numerous trees at the Shady Lake Recreation Area.									
Sevier County	28 29	2345CST- 0300CST			0	0	4	0	Flash Flood
Five to eight inches of rain caused flash flooding across Sevier County. Washouts occurred on numerous county roads due to overflowing culverts and small streams. A bridge on Highway 34 near Lockesburg was washed away.									
Marion County	29	0000CST- 0230CST			0	0	4	0	Flash Flood
Five to six inches of rain flooded numerous roads across Marion County. County roads around Pyatt, Flippin, Snow, and Bruno had to be closed. Low-water bridges were under water as well as the bridge over Crooked Creek near Flippin.									

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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ARKANSAS Cont'd

Montgomery County

Black Springs	29	0005CST			0	0	4	0	Thunderstorm Winds
Mt. Ida	29	0010CST			0	0	5	0	Thunderstorm Winds

A severe thunderstorm downed trees and power lines, and caused damage to 20 homes in Black Springs. In Mt. Ida, 50 homes and 20 businesses were damaged. Five miles north of Mt. Ida, 10 homes were damaged with numerous trees down. Most of the building damage consisted of roof shingles being blown off, windows broken, and damage from broken tree limbs.

Yell County

Bluffton	29	0026CST			0	0	3	0	Thunderstorm Winds
3 E Onyx	29	0035CST			0	0	3	0	Thunderstorm Winds

Trees and power lines were downed at Bluffton and east of Onyx along Highway 314.

Johnson County

	29	0030CST-			0	0	4	0	Flash Flood
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Logan County

	29	0030CST-			0	0	3	0	Flash Flood
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Rainfall around 5 inches in 24 hours caused flooding across Johnson and Logan Counties. In Logan County, Six-Mile Creek flooded some roads. In Johnson County, roads and bridges were flooded in and around Clarksville. Several buildings in downtown Clarksville were also flooded.

Garland County

Mountain Pine	29	0045CST			0	0	3	0	Thunderstorm Winds
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Hot Springs Village	29	0100CST			0	0	3	0	Thunderstorm Winds
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Thunderstorm winds downed trees and power lines, and moved a couple of mobile homes off their foundations on the north side of Mountain Pine. In Hot Springs Village, trees were downed and a few buildings suffered minor damage from flying tree limbs.

Searcy County

Pindall	29	0100CST-			0	0	4	0	Flash Flood
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Heavy rain flooded a creek near Pindall causing road closures and evacuations. Three families had to be evacuated as four homes and one mobile home were flooded. The public reported 7 to 8 inches of rain from 2200 CST on the 28th to 0200 CST on the 29th.

Perry County

Casa	29	0110CST			0	0	3	0	Thunderstorm Winds
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Thunderstorm winds downed trees and power lines.

Saline County

9 N Paron	29	0115CST			0	0	3	0	Thunderstorm Winds
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Thunderstorm winds downed trees and power lines, and damaged the siding on three buildings.

Conway County

Oppelo	29	0140CST			0	0	2	0	Thunderstorm Winds
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Thunderstorm winds downed trees and power lines.

Pulaski County

Little Italy	29	0145CST			0	0	2	0	Thunderstorm Winds
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Thunderstorm winds downed trees that blocked Highway 300.

Perry County

1 SW Pleasant Valley	29	0145CST			0	0	2	0	Thunderstorm Winds
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Thunderstorm winds downed trees along Highway 300.

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
ARKANSAS Cont'd									
Faulkner County Conway	29	0200CST			0	0	4	0	Thunderstorm Winds
									Thunderstorm winds downed trees and power lines, destroyed a couple of storage buildings, and damaged the roofs of a couple of homes. Most of the damage occurred on the west and southwest side of town.
Little River County	29	0230CST-0800CST			0	0	3	0	Flash Flood
Hempstead County	29	0230CST-0800CST			0	0	4	0	Flash Flood
Howard County	29	0230CST-0800CST			0	0	3	0	Flash Flood
									Rainfall from 6 to 9 inches caused widespread flash flooding. Numerous county roads were washed out with some bridges damaged. Some homes also had to be evacuated in Nashville, Howard County.
Hot Spring County Malvern	29	1200CST-1500CST			0	0	2	0	Flash Flood
									Heavy rain combined with excess water released at Remmel Dam, caused the Ouachita River to quickly rise over its banks. A couple of county roads and one street in the city of Malvern had to be closed.
CALIFORNIA, Northern									
Kings County Hanford Corcoran	11	2215PST	?	?	0	0	0	0	Tornado
									A funnel cloud was reported by the public to have touched down. Isolated thunderstorms were being reported in the San Joaquin Valley at the time.
Alameda County Oakland Berkeley	20 22	1130PST-1800PST			0	0	0	0	High Winds
									Strong northeastern Diablo winds fanned the flames of a small fire which grew explosively into a conflagration that spread over 2,000 acres. In excess of 3,000 homes and 400 apartments were destroyed. Nineteen people lost their lives in the fire with 120 injured. Property damage exceeded \$1 billion. A sea breeze late on the 21st and on the 22nd allowed fire fighters to gain control of the fire.
Northern Sierra Nevada	25 26	1500PST-1200PST			0	0	0	0	Winter Storm
									The first major storm of the season dumped 1 to 3 feet of snow in the mountains.
Kern County	26	1600PST-1700PST			1	0	5	0	High Winds
									A cold front moved through the southern end of the San Joaquin Valley and the Tehachapi Mountains. Winds gusted to near 50 mph causing an umbrella erected as part of an art exhibit to fall and kill a woman. (F330)
CALIFORNIA, Southern									
CAZALL	10	All Day			0	0	0	0	Heat
									A weak Santa Ana wind caused abnormally warm temperatures over southern California, especially along the coast. Some highs were: Monrovia, 112° F; Glendale, 110° F; Long Beach, 109° F; San Gabriel, 108° F; Los Angeles Civic Center and Anaheim, 107° F; Northridge, 106° F; Ontario, 105° F; Burbank, 104° F; and Los Angeles Airport, 95° F.

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons	Estimated Damage	Character of Storm	
					Killed	Injured	Property	Crops

CALIFORNIA, Southern Cont'd

CAZ013-014-019	26	All Day			1	0	5	0	High Winds
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A very active cold front moved into southern California from the north. The storm produced some rain and mountain snow across the area. Strong winds accompanied the storm as it moved through southern California. The high winds in the Tehachapi Mountains was responsible for a weather-related fatality, in association with the "Christo Umbrella Project". Wind gusts from 43 to 46 mph were observed at Sandberg, near Gorman. The approximate time of death was at 1603 PST. (F330)

CAZALL	29-31	All Day			0	0	0	0	High Winds
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A low pressure area in Nevada caused strong winds from 30 to over 50 mph. Wind gusts to 45 mph were reported between 1600 PST and 1800 PST, on the 29th, in the Lancaster and Barstow areas. The winds were also, gusty below passes and canyons in the coastal areas. Sandberg, in the Tehachapi Mountains, had gusts to 52 mph, and Norton Air Force Base, had gusts to 44 mph.

COLORADO

COZ002-004 Northern and Central Mountains	24	0000MST-							
	25	2400MST			0	0	?	?	Heavy Snow

The first snow of the season fell on the Northern and Central Mountains, beginning on the 24th and continuing through the 25th. Most of the snow fell in the western half of the mountains. With the ski areas not yet open, snowfall reports were limited. Of note, however, were 2 day amounts of 40 inches at Snowmass ski area, 23 inches at Aspen Mountain and 20 inches in the town of Aspen.

COZ001-002-004- 007-008-009-010- 011-012-013-015 Mountains, San Luis Valley, Northwestern Plateau, Front Range, Northeastern Plains and the Border and Southern Foothills	27	0600MST-							
	28	2400MST			0	0	?	?	Heavy Snow

The first major snowstorm of the season came to the state as a strong upper level trough pushed through the Great Basin and across Colorado. Meanwhile, a very cold arctic airmass moved down the front range, producing heavy snow in northeastern Colorado. Snowfall amounts ranged from 2 to 4 inches on the Western Slope, 3 to 10 inches in northeastern Colorado and one to two feet in the mountains. Higher amounts were in the Southern and Central Mountains. Climax, a small town in the Central Mountains situated at 11,400 feet, received 17 inches of snow during the two-day event.

COZ001>017 Statewide	30	0000MST-							
	31	2400MST			0	0	?	?	Heavy Snow

After a very short respite, another big snowstorm blasted Colorado, this time affecting the entire state. A closed low swung across the southern border of the state producing heavy snow. Snow began early on the 30th and continued through the 31st. Snow persisted in the southeast into the 1st of November before ending completely. In the western sections of the state, 2 to 6 inches were recorded. The mountains received another 1 to 2 feet as ski areas prepared for an early opening. The plains received amounts ranging from 5 to 20 inches during the storm. The highest amount in the state was 28 inches at Summitville in the San Juan Mountains of southwest Colorado. Pueblo, in southeast Colorado, broke the town's monthly snowfall record for October with 16.5 inches from this one storm.

CONNECTICUT

CTZALL	30-31	1200EST- 0600EST			0	0	5	0	High Winds
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CTZ005-006	31	0200EST- 0500EST			0	0	4	0	Coastal Flood
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Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed Injured	Estimated Damage Property Crops	Character of Storm
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CONNECTICUT Cont'd

A low pressure system formed in the Atlantic southeast of Nova Scotia on the 28th and intensified as it moved west toward the New England coast. This system absorbed the remains of Hurricane Grace which was drawn north from a position east of Bermuda. An unusually strong area of high pressure (approximately 1043 MB., 30.8 inches) was centered to the north of New England and combined with the Atlantic low (approximately 978 MB., 28.9 inches) to produce a powerful "nor'easter" with winds which gusted up to 60 mph. Scattered power outages occurred throughout the state due to falling tree limbs. Coastal areas experienced flooding of coastal roads. U.S. Route 1 at Groton was closed for 4 hours and Sikorsky Airport at Bridgeport was closed for several hours around the time of high tide during the early morning hours of the 31st.

DELAWARE

Zone 01

Bethany, Rehoboth,
and Dewey Beaches

30	0000EST-								
31	2400EST				0	0	6	0	Tidal Flooding

A strong, slow-moving storm, combined with high pressure over southeast Canada, produced a prolonged period of gusty northeast winds, heavy surf, and abnormally high water levels. Most damage occurred at times of high tide on the 30th and 31st. The highest levels were comparable to those reached during the storm of March 1962. Moderate to severe beach erosion occurred. Some homes on the coast at Dewey Beach, Bethany Beach, and Rehoboth Beach had damage to their ground floors. Portions of the boardwalk at Dewey Beach were washed away. Total damage was estimated at \$550,000.

FLORIDA

TLZ008-009-
012-017

Brevard, Clay, Duval,
Flagler, Nassau, Putnam,
St. Johns, and Volusia
Counties

01	0000EST								
					0	0	0	0	Flood

Low-level winds along with a slow-moving cold front combined to produce widespread heavy rains along the Florida northeast and east-central Atlantic coast. Numerous roads, schools, and businesses were closed due to the 4 to 14 inches of rain that fell. Strong winds and heavy surf resulted in minor beach erosion. Flagler, Nassau, Putnam, St. Johns, and Volusia Counties had mostly flooding of streets and low-lying areas. This area also suffered damage to cabbage and potato crops. In Clay County, Black Creek spilled out of its banks, and two schools in Orange Park were closed due to flooding. In Duval County, 20 to 30 roads were closed due to as much as 3 feet of standing water. All the public schools in Jacksonville were closed due to transportation difficulties. In Brevard County, about 75 homes suffered flood damage including 11 which sustained damage equal to at least 40% of their value. Drainage was slow due to the duration of the rainfall and the high water level of the St. Johns River.

Monroe County
5 N Key West

04	1350EST	?	?						
					0	0	0	0	Waterspout

A pilot reported a waterspout 5 miles north of Key West.

Columbia County
Lake City

04	1635EST								
					0	0	0	0	Funnel Cloud

The public reported a funnel cloud near Interstate 10 and U.S. Highway 441 near Lake City.

Brevard County
Northern Portion

06	2000EST								
					0	0	4	0	Flood

An additional 5 to 6 inches of rain fell in northern Brevard County causing additional flooding of some of the same areas. Turnbull, Scottsmeer, and Mims had the most extensive damage to homes and mobile homes.

Monroe County
8 SW Key West

07	1350EST								
					0	0	0	0	Waterspout

A waterspout was briefly observed 8 miles southwest of Key West.

Broward and Dade
Counties

08	0000EST- 1800EST								
					0	0	5	0	Flood

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	

FLORIDA Cont'd

Heavy rains fell mostly in a narrow band from central Broward County across northern Dade County in an 18-hour period. Seven to thirteen inches fell in southern Broward County, with lesser amounts in central Broward and northern Dade Counties that resulted in flooded roads and homes. Several cars floated away in high water.

Monroe County
Marathon

10	0805EST	?	?	0	0	0	0	0	Waterspout
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Several waterspouts were sighted by the public just south of Bahia Honda and Key Colony Beach.

Cudjoe Key

11	0915EST	?	?	0	0	0	0	0	Waterspout
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A waterspout was sighted by the public 3 miles southwest of Cudjoe Key in the lower keys.

SW of Marathan

11	1625EST	?	?	0	0	0	0	0	Waterspout
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The sheriff's office sighted a waterspout over the straits just south of the Seven Mile Bridge.

Brevard County
Melbourne

14	1050EST			0	0	0	0	0	Funnel Cloud
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Several reports noted a funnel cloud over the Indian River near the Melbourne Causeway.

Monroe County
8 SW Key West

20	1435EST	?	?	0	0	0	0	0	Waterspout
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A waterspout was sighted 8 miles southwest of Key West.

2 S Key West

27	0906EST	?	?	0	0	0	0	0	Waterspout
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A waterspout was noted 2 miles south of Key West.

FLZ008-012-017-
020-022-023
Fernandina Beach
Key Largo

31	0700EST			0	14	6	0	0	High Winds
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Strong easterly winds and large Atlantic swells combined to produce heavy surf, beach erosion, seawall and pier damage, and flooded coastal roads. Nassau, Duval, St. Johns, Flagler, and Volusia Counties reported minor beach erosion. Brevard County had minor beach erosion, and a few dune walk-overs damaged. Indian River County reported \$75,000 damage to two buildings and minor beach erosion. St. Lucie County had minor beach erosion. Martin County had \$600,000 damage to two residences that combined with the cost of the cleanup, the total damage was \$1 million. Palm Beach County reported damage to public and private property of just over \$2 million; 14 minor injuries; and sections of the Lake Worth Pier collapsed during the event. Broward County reported Highway A1A on the coast was flooded, and sand blew over the seawall and onto the road. Dade County had minor beach erosion. Monroe County reported that Card South Road running from the mainland to the upper Keys was flooded.

GEORGIA

None reported.

IDAHO

Southern Idaho

01- 31				0	0	0	?	?	Extreme Drought
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Portions of southern Idaho were in severe to extreme drought. The entire state remained in varying degrees of drought.

Cassia County

03	1500MST- 1900MST			0	0	0	0	0	Dust Storm
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Interstate 84, between Junction I-86 and Sublette, was closed due to zero visibility. A wind gust to 49 mph was recorded at Burley. The storm was associated with strong northwesterly winds aloft combined with a strong surface pressure gradient.

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
IDAHO Cont'd									
Southern Idaho	15				0	0	0	5	Excessive Heat
The sugar beet harvest was halted when receiving stations closed due to excessive heat causing onset of rot in piled beets. Boise's high temperature of 87°F was a record for this date as was Pocatello's high of 79°F.									
IDZ008-009-011 Northern Idaho	16	0730PST- 1400PST			1	8	6	5	High Winds
Strong pressure gradient winds, associated with a cold front and a 988 millibar low pressure system center in British Columbia, gusted to 60 mph and felled trees over a widespread area. The falling trees blocked highways and broke numerous power lines. The broken power lines ignited drought-cured brush and trees. Dust blown in from the Palouse dropped visibility to near zero halting traffic on major highways and triggering city street lights to burn at noon. Power outages prompted many schools to close. A power outage also closed the Coeur d'Alene Airport from 0900 to 1130 PST. Three-fourths of the cablevision customers were without service. Governor Cecil Andrus declared a state of emergency in Bonner and Kootenai Counties about 1620 PST. The Kootenai County Emergency Operations Center was activated for the first time since the May 1980 ashfall from Mount St. Helens. (For additional details see "Firestorm" below).									
IDZ009 Idaho Panhandle	16	0800PST- 1800PST			?	?	?	?	Firestorm
Numerous wind-driven crowning wildfires were ignited by wind-thrown trees breaking power lines. Eight homes and structures were burned in Kootenai County. Eight persons were treated for injuries in Kootenai and Bonner Counties. A contract fire fighter was killed in Kootenai County when the front-end loader he was operating turned over and crushed him. A "High Wind Warning" issued at 0630 PST from the National Weather Service Forecast Office in Boise, Idaho by veteran forecaster Paul Rausch, activated disaster preparedness plans throughout the Idaho Panhandle, enabling fire fighters to make extremely aggressive initial attacks on the fires. Firefighters were assisted by volunteers, including many home owners who refused to obey evacuation orders. Power companies in some incidences turned off the power to prevent broken lines from starting fires. No rain had occurred for over 30 days in the longest dry spell on record since the dust bowl days of 1934. (M35V) (See "High Winds" entry above for additional details.)									
IDZ006,010 Central Mountains	16	1200MST- 1600MST			0	0	4	0	High Winds
IDZ003-012 Southeastern Idaho	16	1300MST- 1700MST			3	0	4	0	High Winds
Winds gusted to 60 mph at Craters of the Moon, Sage Junction, and St. Anthony. In some areas visibility was reduced to a 0.50 mile by blowing dust. A missing single engine aircraft had departed Driggs, Idaho to conduct grizzly bear research 25 miles northeast of Jackson, Wyoming; the pilot and two passengers were presumed dead. (M48V) (M29V) (M28V)									
IDZ006-007-010-011 Central Mountains	26	0100MST- 1200MST			0	0	4	5	Heavy Snow
Four to twelve inches of early season wet snow delighted skiers. The weight of the snow broke large tree limbs all over the southern part of Blaine County. A search was organized for the three hunters lost in the North Fork of the Boise River.									
IDZ004-012 Southeast Idaho	26 27	1600MST- 0400MST			0	0	0	0	Heavy Snow
Four inches of wet snow fell at Soda Springs and 10 to 16 inches of snow fell in the mountains.									

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
IDAHO Cont'd									
Ada County									
Boise	29				0	0	0	0	Early Snow
One inch of snow was the earliest Boise snow of "1 inch or greater" since 2 inches fell on October 29, 1919.									
ILLINOIS									
McDonough County									
Prairie City	02	1838CST			0	0	?	0	Thunderstorm Winds
Spotters reported 50- to 70-mph wind gusts.									
Schuyler County									
Rushville	04	1540CST			0	0	?	?	Hail (1.75)
Golf ball-size hail fell between Rushville and Beardstown along Route 67.									
Pike County									
Griggsville	04	1540CST			0	0	0	0	Funnel Cloud
8 S Griggsville	04	1602CST			0	0	2	2	Hail (1.75)
A thunderstorm produced a funnel cloud near Griggsville at 1540 CST while golf ball-size hail was reported by the county sheriff's office 8 miles south of Griggsville at 1602 CST.									
Fulton County									
4.5 E Canton	04	1613CST			0	0	?	0	Thunderstorm Winds
Trees and limbs were blown down by thunderstorm winds. A large tree was down across Route 9.									
Morgan County									
1 NW Jacksonville	04	1625CST			0	0	3	0	Thunderstorm Winds
Thunderstorm winds uprooted several trees, broke limbs off others, and damaged a garage. Also, skirting was torn off of several mobile homes.									
Mason County									
Manito	04	1650CST			0	0	?	0	Thunderstorm Winds
Trees were blown down by thunderstorm winds in Manito.									
Calhoun County									
5 S Kampsville	04	1650CST			0	0	0	0	Thunderstorm Winds (G52)
The Calhoun County Sheriff's Office reported wind gusts to 60 mph.									
Jersey County									
Jerseyville	04	1700CST			0	0	3	2	Thunderstorm Winds
Wind gusts to 60 mph and damage from winds were reported by the Jersey County Sheriff's Office.									
Sangamon County									
5 W Springfield	04	1700CST			0	0	?	0	Thunderstorm Winds
A farmer reported wind gusts estimated to be 67 mph (58 knots), 5 miles west of Springfield.									
Tazewell County									
5 S Hopedale	04	1709CST- 1714CST	0.4	20	0	0	5	0	Tornado (F1)
A small tornado touched down twice, south of Hopedale near the intersection of Routes 121 and 122. The twister ripped the roofs off of several homes according to a state police report. A camping trailer was smashed by an uprooted tree but there were no injuries to the two occupants. A farm machinery shop on Route 122 was destroyed. The storm went through the Indian Creek Industrial Park ripping the roof off a warehouse and damaging a medical building.									

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
ILLINOIS Cont'd									
Menard County Fancy Prairie	04	1715CST			0	0	?	0	Thunderstorm Winds
	Thunderstorm winds uprooted several trees at Fancy Prairie.								
Logan County Emden	04	1730CST			0	0	4	0	Thunderstorm Winds
	A machine shed and cattle barn were destroyed by strong winds. Just east of U.S. Highway 136 and State Road 121, two windows were blown out at a farmhouse and the kitchen was damaged. Trees were also blown down, damaging a car in a garage. At Beason, roads were littered with fallen tree limbs.								
DuPage County Glendale Heights	04	1730CST			0	0	4	0	Thunderstorm Winds
	Trees and limbs were blown down; one tree fell on a car.								
McLean County Carlock	04	1734CST	0.1	10	0	0	?	0	Tornado (F1)
	A small tornado touched down briefly in Carlock; large trees were also blown down.								
Grundy County 5 E Morris	04	1800CST			0	0	5	0	Thunderstorm Winds
	At Reichhold Chemical Company a construction trailer was overturned, a port-a-john was destroyed, roof vents on a number of structures were blown off, six to ten windows were blown out, wall partitions were damaged, and trees were uprooted. At Dresden Lock and Dam, 20 to 30 trees were damaged or uprooted, an antenna and the roof of an outbuilding was damaged. Windows were broken by wind at the Mazon fire station. Total damages were in excess of \$100,000.								
De Witt County 2 E Hallsville	04	1815CST			0	0	?	0	Thunderstorm Winds
	A tree was blown down across Highway 10 between Hallsville and Jenkins Switch.								
Livingston County Dwight Cullom Chatsworth	04	1820CST			0	0	?	0	Thunderstorm Winds (G50)
Ford and Iroquois Counties 7 E Cullom	04	1835CST			0	0	?	0	Thunderstorm Winds
	A 58-mph wind gust was reported at Dwight Airport. Large tree limbs were blown down in the eastern part of the Livingston County. Trees were downed on Route 116 at the boundary between Ford and Iroquois Counties.								
Christian County Kincaid Taylorville	04	1829CST			0	0	?	0	Thunderstorm Winds
	A number of trees and tree limbs were blown down in Kincaid. At Taylorville, numerous tree limbs were blown down.								
Macoupin County Carlinville	04	1837CST			0	0	?	0	Thunderstorm Winds
	Power lines were blown down in Carlinville.								
Macon County Decatur	04	1845CST			0	0	0	0	Thunderstorm Winds (G55)
	The Decatur Airport recorded thunderstorm winds to 63 mph.								
Kankakee County Kankakee Bradley	04	1840CST- 1910CST			0	0	?	0	Thunderstorm Winds (G50)

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons	Estimated Damage	Character of Storm	
					Killed	Injured	Property	Crops

ILLINOIS Cont'd

A 50-knot wind gust was recorded on the IKK AWOS (Kankakee) at 1850 CST. Trees and power poles were blown down by thunderstorm winds in Kankakee and Bradley.

Will County Manhattan New Lenox	04	1900CST			0	0	?	0	Thunderstorm Winds
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Winds damaged trees and power lines, and broke windows near New Lenox. Tree tops were damaged by winds near Manhattan.

Piatt County Monticello	04	1906CST			0	0	?	0	Thunderstorm Winds
Champaign County 2 W Mahomet	04	1915CST			0	0	?	0	Thunderstorm Winds

Power lines were blown down in Monticello and 2 miles west of Mahomet.

McDonough County Industry	23	1205CST			0	0	?	?	Hail (2.00)
Industry	23	1400CST			0	0	5	0	Lightning

Lightning caused a fire which destroyed the 100-year-old Camp Creek Presbyterian Church.

Tazewell County Washington	23	1515CST			0	0	?	?	Hail (1.75)
Woodford County Metamora	23	1525CST			0	0	?	?	Hail (1.00)
Brown County 2 E Mount Sterling	23	1525CST			0	0	0	0	Hail (0.75)
Mercer County New Boston	23	1610CST			0	0	?	?	Hail (1.25)
Tazewell County 5 SW Green Valley	23	1540CST			0	0	4	0	Lightning

Lightning started a fire which gutted a two-story farmhouse, resulting in \$45,000 in damage.

Rock Island County Taylor Ridge	23	1640CST			0	0	3	0	Thunderstorm Winds
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A home owner in Taylor Ridge, estimated winds in excess of 60 mph. This same home owner reported extensive roof damage due to the wind.

INDIANA

Lake County	04	2020EST			0	0	?	0	Thunderstorm Winds
Porter County	04	2040EST			0	0	?	0	Thunderstorm Winds

Trees were downed across Lake and Porter Counties.

LaPorte County	04	2045EST			0	0	3	0	Thunderstorm Winds
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Trees and power lines were downed near Union Mills, and across U.S. Highway 421, south of Westville.

St. Joseph County Michiana Regional Airport	04	2119EST			0	0	0	0	Thunderstorm Winds (G51)
South Bend	04	2130EST			0	1	3	0	Thunderstorm Winds Hail (1.00)

Civil Defense officials reported 0.75 to 1.00-inch-diameter hail, and winds up to 60 mph between Lilac and Auten Roads. A tree fell on a car and injured one man.

Tippecanoe County 5 SE Lafayette	26	1833EST			0	0	4	0	Thunderstorm Winds
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A barn roof was blown off, and tree limbs which were blown down knocked down power lines.

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
IOWA									
Muscatine County Muscatine	18	1400CST			0	0	3	2	Hail (0.75)
									Thunderstorms developed in southeast Iowa, in response to a strong upper level disturbance. Rain, hail, and ice pellets occurred with these storms. Most of the hail was only pea-size, however dime-size hail fell in the Muscatine area.
Louisa County Wapello	23	1545CST			0	0	3	2	Hail (0.75)
									Thunderstorms developed along a very slow moving cold front across the southeast part of Iowa. Spotty severe weather occurred, with 0.75-inch hail reported in Wapello.
Wright County 5 N Eagle Grove	23	1857CST			0	0	3	2	Hail (0.75)
Cerro Gordo County 1 W Mason City	23	1955CST			0	0	4	3	Hail (1.50)
									The combination of a cold pool of air aloft and an upper level disturbance moving across the region, resulted in strong convection. Many of the thunderstorms produced hail the size of acorns. Only a few reports of larger hail were received in north-central Iowa.
Monroe County Albia	24	0249CST			0	0	4	2	Hail (1.00)
Mahaska County Oskaloosa	24	0309CST			0	0	4	2	Thunderstorm Winds (G50+)
									A cold front was moving southeast across Iowa. An upper level disturbance moving northeast along the front triggered strong thunderstorms across southeast Iowa. Most of them remained below severe levels, but gusty winds and marble-size hail were common. One-inch-diameter hail fell at Albia. A short time later, marble-size hail and high winds struck Oskaloosa. Several trees were downed in the Oskaloosa area.
Muscatine County Muscatine	24	0930CST			0	0	4	0	Lightning
									Thunderstorms moved over eastern Iowa during the morning hours. Lightning struck three homes in Muscatine. Damage was done to electrical appliances in all of the houses. Lightning blew off the switchplates in one of the homes as a 6 to 8 inch ball of fire shot out of the wall.
IAZ001-004-005-009, SDZ018-NEZ010 North-western Iowa	30 Nov01	2100CST-0900CST			0	0	6	5	Snow and Heavy Snow
IAZ002-005-006-009-010-012-013, Southwest through North-central Iowa	31 Nov01	0000CST-1200CST			0	0	8	6	Major Ice Storm
									Arctic air rushed into Iowa following the passage of an Arctic cold front. Later on, an intense low pressure moved northeast along the frontal boundary. Snow began falling in northwest Iowa on the evening of the 30th, with the heaviest falling during the afternoon and night of the 31st. Eight to fifteen inches of snow fell in the northwest counties. Estherville received the most, with 15 inches. Trees were downed by the heavy snow and gusty winds. During the 31st, freezing rain fell over the southwest into the north-central counties of Iowa. One to two inches of ice accumulation occurred in many areas. Numerous trees were downed with electrical power being knocked out to 80,000 homes at one point. It took over a week to restore power in some of the rural areas. Several high voltage transmission lines collapsed due to the ice and wind. One segment stretched 24 miles from Boone to Lehigh, with 116 towers downed. A 65-mile stretch of the same line, with 270 towers, also collapsed from Lehigh to Sioux City. An 18-mile stretch of another line was downed from Garner to Clear Lake. Another section of transmission line was downed by ice between Council Bluffs and Glenwood. Utility damage alone was estimated near \$63 million. Hardest hit by the downed transmission lines was Iowa Public Service, with \$21 million in damage. Another \$6 million in damage was recorded by Iowa-Illinois Electric. Other damage to lines

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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IOWA Cont'd

reported by individual utility companies included \$11 million by Iowa Electric, \$6 million by Interstate Power, \$2 million each by Iowa Public Service and Iowa power, and between \$15 and \$20 million by RECs. The REC in Guthrie County, for example, expected damage to total about \$1.5 million in their area. Several of the REC's in the ice storm affected area reported between 70 and 90 percent of their customers being without electricity at some point during the storm. Since the storm damage was so severe, power was not restored to many areas for extended periods. In addition to the obvious inconvenience, several communities were without water for a period of time. Many highways were closed, including Interstate 35, by downed lines. Near blizzard conditions occurred during the later stages of the storm, as snow was whipped by 30- to 40-mph winds. The Governor of Iowa declared 52 of the 99 counties in Iowa disaster areas because of the severity of the ice storm. Crop damage was caused by the ice build-up and gusty winds. As much as 10 to 15 percent of the states corn crop remained in the field at the time. The ice, snow, and wind flattened some fields. Although not a total loss, significant damage did occur to the crops. In dollar damage, this storm caused much more damage than the ice storm of 1990 even though the area of extent was not as large. The difference between the two was that there was very little wind during the 1990 storm, and temperatures warmed above freezing quickly the next day. This storm not only had strong winds associated with it, but temperatures remained below freezing for many days following the storm. The ice storm was considered the most costly ice storm in Iowa history.

KANSAS

Johnson County
Edgerton
Atchison County

02	1654CST				0	0	1	0	Thunderstorm Winds (G52)
02	Unknown				0	0	0	5	Hail

Strong thunderstorms moved through Atchison County and produced damaging hail, strong winds and heavy rain. Some farmers reported up to 100% of their soybean crops were destroyed as well as damage to their corn and milo crops.

Doniphan County

02	1600CST- 1700CST				0	0	4	6	Hail (0.50)
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Several thunderstorms moved across Doniphan County dropping pea- to marble-size hail for up to 30 minutes. Many farmers reported near or total loss of their soybean crops along with some structural damage to houses and barns.

Shawnee County

02	1811CST				0	0	6	0	Hail (1.75)
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A severe thunderstorm moved through Shawnee County producing up to golf ball-size hail, 2.25 inches of rain and a wind gust of 85 mph. This storm moved through the Topeka where most of the damage occurred.

Johnson County
Shawnee

02	2000CST				0	0	4	0	Hail (1.00)
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Lightning was the primary cause of damage. Lightning struck several homes and caused numerous power outages.

Douglas County

03	0015CST				0	0	2	0	Hail (1.25)
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Cowley County
Arkansas City

24	0015CST				0	0	0	0	Thunderstorm Winds (G52)
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KSZ003-006-009
Southwestern Kansas

30	0622CST				3	5	5	0	Heavy Snow
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A strong winter storm brought southwest Kansas its first snowfall for the year, dumping up to 14 inches in Garden City. A large storage shed collapsed due to heavy snows in Johnson, and slippery roads caused a lot of havoc and claimed the life of a child in an automobile accident. Bitter cold temperatures also accompanied the heavy snows, and wind gusts up to 45 mph brought wind chills down to the 20 below zero range. The frigid conditions and blowing snow claimed the lives of two men, both of exposure in separate incidents, when the left their cars after they got stuck. Both men tried to make their way back home. (M290) (F06V) (M910)

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed Injured		Estimated Damage Property Crops		Character of Storm	
KANSAS Cont'd										
Northeastern Kansas										
	31		Unknown			0	0	5	0	Ice Storm
A winter storm moved across northeast Kansas. Freezing rain 0.50 to 0.75 inch thick caused many tree limbs to break and caused many power outages across northeast Kansas. At one point half of Emporia was without power.										
South-central Kansas										
	31		0025CST- 1425CST			0	0	4	0	Ice Storm
Freezing rain and sleet fell across south-central Kansas. This precipitation caused extensive tree and power line damage. Two inches of ice accumulated in some spots. Derby, Mulvane, and Haysville were hardest hit. Tree limbs up to 10 inches in diameter were snapped off and caused widespread electrical outages. At one point all of Mulvane was without power and about 12,000 customers in Wichita and El Dorado lost power. In central Kansas the Marion County courthouse sustained minor damage when the weight of ice and snow burst a hole through the roof.										
KENTUCKY										
None reported.										
LOUISIANA										
St. Tammany Parish										
1 NE Slidell	04		1422CST			0	0	2	0	Thunderstorm Winds (G50)
The St. Tammany Parish Sherrif's Office reported that a thunderstorm produced 50 knot winds just northeast of Slidell.										
East Baton Rouge Parish										
Baton Rouge	22		1808CST			0	0	7	0	Thunderstorm Winds Hail (1.75)
Baton Rouge	22		1815CST	0.75	200	0	0	6	0	Tornado (F1)
Baton Rouge	22		1825CST	0.50	100	0	0	4	0	Tornado (F0)
A severe thunderstorm snapped numerous pine and oak trees in half, produced golf ball-size hail, and at least two tornadoes. Rainfall amounts of 7.50 to 8.00 inches fell 1.5 miles on either side of an axis that extended from Interstate Highways 10 and 12, split east-northeast to the East Baton Rouge and Livingston Parish border. The majority of the damage was from fallen trees and wind blown debris. The East Baton Rouge Office of Emergency Management found that one single family home was crushed by a large fallen tree. In addition, 50 single family homes and 56 apartments suffered major damage while 191 homes and 37 apartments received minor damage. A damage survey conducted by the National Weather Service showed that a small tornado struck the area surrounding the Interstate 12 and Millerville Road exit. More extensive damage occurred by another tornado in the Broadmoor section. The Broadmoor Elementary School had its roof torn off, one of its walls collapsed, and most of its windows damaged by a tornado. This allowed its interior to be flooded by torrential rains. Damage to the school is estimated to be between \$500,000 to \$750,000. Golf ball-size hail did major damage to the new car inventories of two automobile dealerships, and minor damage to another car dealer in the Interstate Highway 12, Airline Highway area. Some \$7.1 million damage insurance claims have been filed. Electrical power remained out in some areas for up to 3 days. City and parish clean up costs to remove tons of fallen debris, were estimated to be around \$200,000. There were no injuries or fatalities.										
Livingston Parish										
Denham Springs	22		1930CST- 2330CST			0	0	3	0	Flash Flood
A slow moving thunderstorm produced about 8 inches of rain in Denham Springs resulting in numerous streets, approximately eight homes, and several businesses being flooded. In addition, several parked cars were also inundated by flood waters.										
Tangipahoa Parish										
Roseland	23		0925CST- 1100CST			0	0	3	0	Flash Flood

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
LOUISIANA Cont'd									
Roseland	23	0930CST			0	0	4	0	Thunderstorm Winds
A large cluster of slow moving thunderstorms flooded roads and an elementary school in Roseland. In addition, thunderstorm winds blew down some large trees, pushed a mobile home off its blocks, and damaged the roofs of some homes and apartments in Roseland.									
Madison Parish 5 SW Tallulah	23	1712CST			0	0	2	0	Thunderstorm Winds Hail (1.00)
A thunderstorm produced 1.00-inch hail 5 miles southwest of Tallulah.									
Lafayette Parish Lafayette	27	0930CST- 1330CST			0	0	5	0	Flash Flood
A 6 to 11 inch deluge of rain fell on Lafayette between 0930 CST to 1330 CST. In the downtown area, flood waters rose rapidly and inundated streets, underpasses, and the basements of several businesses. In addition, flood waters broke through the glass doors of a Lafayette hospital and flooded its emergency room with up to a 0.50 foot of water. Several classrooms, a cafeteria, and a gym were flooded at two Lafayette schools. The Lafayette Office of Emergency Management reported about 50 homes were inundated with water amounts ranging from a few inches to 1.50 feet. Many streets remained impassable until the afternoon. About 30 automobiles were flooded, several of which were completely submerged.									
Caddo Parish Oil City	29	1444CST			0	0	3	0	Thunderstorm Winds Hail (1.00)
A severe thunderstorm produced 1.00-inch hail near Oil City.									
Desoto Parish Benson	29	1525CST			0	0	3	0	Thunderstorm Winds
A severe thunderstorm blew down numerous trees and the roof and porch of a home in Benson.									
10 NE Benson	29	1540CST			0	0	0	3	Thunderstorm Winds
4 W Dixie	29	1545CST			0	0	3	0	Thunderstorm Winds Hail (1.00)
Bossier Parish 5 W Plain Dealing	29	1550CST			0	0	3	0	Thunderstorm Winds Hail (1.50)
Elm Grove	29	1610CST			0	0	0	3	Thunderstorm Winds
A north-south-line of severe thunderstorms, moving east about 20 knots through Desoto and Bossier Parishes, produced large hail 4 miles west of Dixie and 5 miles west of Plain Dealing. Thunderstorm winds blew down several trees in Elm Grove and 10 miles northeast of Benson.									
Jefferson Davis 3 W Welch	29	2330CST			0	0	3	0	Thunderstorm Winds
Straight-line winds from a severe thunderstorm blew down six large utility poles and attached power lines 3 miles west of Welch.									
Red River Parish 8 NW Coushatta	31	1445CST			0	0	0	0	Thunderstorm Winds Hail (0.75)
Bienville Parish 5 S Ringgold	31	1520CST			0	0	3	0	Thunderstorm Winds Hail (1.00)
Ringgold	31	1605CST			0	0	4	0	Thunderstorm Winds (G67)
3 N Brycecland	31	1618CST			0	0	3	0	Thunderstorm Winds Hail (1.00)

A line of severe thunderstorms that formed along a fast moving cold front moved through Red River and Bienville Parishes between 1445 CST and 1618 CST. Most of the wind damage was confined to the Ringgold area where 67-knot winds damaged the roofs of three businesses, blew down trees on top of the roofs of eight single family homes, and knocked down some power lines. The thunderstorms also blew down approximately 18 trees 5 miles south of Ringgold. Large hail was reported 8 miles northwest of Coushatta, 5 miles south of Ringgold, and 3 miles north of Brycecland.

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed Injured	Estimated Damage Property Crops	Character of Storm
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MAINE

Southern and Coastal Areas of Maine

30	1200EST-0000EST				0 2 7 0		Ocean Storm
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A powerful Atlantic Ocean storm drifted westward toward Maine, battering the coastline with high winds and seas. The southern coastline of Maine was hit the hardest by this storm with greater than 50-mph winds and a high tide 3.4 feet above normal in addition to the 15- to 30-foot seas. A total of \$7.9 million in damage was sustained; \$2.5 million in damage to roads, seawalls, and other public property, and \$5.4 million in damage to private property. Cumberland, Lincoln, Knox, Sagadahoc, and York Counties were declared federal disaster areas. Along the York County coastline, two homes were destroyed in Camp Ellis, 49 homes sustained severe structural damage, and 390 homes sustained moderate damage. President Bush's home in Kennebunkport suffered damage as windows were blown out, water flooded the building, and some structural damage also occurred. Many of the homes along the York County coastline experienced similar damage. Many communities in York county had significant flooding of houses and streets particularly in the towns of Camp Ellis, Wells, Kennebunk Beach, Kennebunkport, Biddeford, Saco, and Old Orchard Beach. Two minor injuries occurred in York county. A Camp Ellis man broke his ankle when he fell into a hidden hole while walking through a flooded room. A York county firefighter suffered minor injuries while rescuing an elderly man from his damaged oceanfront home. The firefighter was swept against some trees by a large wave. Several lighthouses along the southern Maine coast also suffered damage at a cost of \$40,000. The high winds from the ocean storm ripped five boats from their moorings at Willard Beach as well as tearing down a chain link fence at the Portland Headlight. The high seas ripped up piers and catwalks at the Prout's Neck Yacht Club in Scarborough. Thousands of dollars worth of lobster traps were lost along the Maine coastline and dozens of weirs, nets used for the herring industry, were severely damaged in the Grand Manan of Maine. Further north along the coast, minor flooding occurred in the town of Bath in Sagadahoc County as the Kennebec River spilled over its banks. Beach erosion was experienced at Popham Beach in Sagadahoc County. Boothbay Harbor in Lincoln County suffered extensive damage to small boats, several homes and cars suffered minor damage when tree limbs fell onto them. One boat sunk at Rockland Harbor in Knox County. Numerous telephone poles and lines were knocked down in response to the high winds across portions of Androscoggin, Cumberland, and Lincoln Counties.

MARYLAND AND DC

Zone 01	30	0000EST-					
Ocean City	31	2400EST			0 0 5 0		Tidal Flooding

A strong, slow-moving storm, combined with high pressure over southeast Canada, produced a prolonged period of gusty northeast winds, heavy surf, and abnormally high water levels. Most damage occurred at times of high tide on the 30th and 31st. The highest levels were comparable to those reached during the storm of March 1962. At Ocean City, light to moderate damage was reported to the beaches. A number of homes and businesses suffered water damage to basements and ground floors. Many places were flooded by water seeping from the ground due to elevated water tables. A record high tide of 7.8 feet occurred at Ocean City on the 30th, which exceeded the record of 7.5 feet during the March 1962 coastal storm.

MASSACHUSETTS

MAZ002-003-007-008	30	1200EST-2000EST			0 0 8 0		Coastal Flood
MAZ001-002-003-004-007-008	30	1000EST-2300EST			0 2 5 0		High Winds

A low pressure system formed in the Atlantic southeast of Nova Scotia on the 28th and intensified as it moved west toward the New England coast. This system absorbed the remains of Hurricane Grace which was drawn north from a position east of Bermuda. An unusually strong high pressure system (approximately 1043 MB., 30.8 inches) was centered north of New England. The high combined with the Atlantic low (approximately 978 MB., 28.9 inches) produced a powerful "nor'easter" with hurricane force gusts. The long "fetch" of relatively cold northeast winds over the warm waters of the Atlantic caused 25-foot waves to reach the shoreline atop a high tide that was 4 feet above normal. The time of high tide in the late afternoon of the 30th coincided with the time of highest winds at most points along the coast. At Boston, the tide reached about 14.1 feet

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed Injured	Estimated Damage Property Crops	Character of Storm
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MASSACHUSETTS Cont'd

above mean low water or about 1 foot less than the high tide associated with the "Blizzard of 1978". In some places the damage from this storm rivaled or was worse than the 1978 storm. For Cape Cod and the Islands the high tide and wave battery was worse than the 1978 storm. Coastal flooding and wave battery resulted in hundreds of millions of dollars in property damage along the north and east facing coastlines from north of Cape Ann to Nantucket. Major erosion and damage to seawalls occurred along most beaches. Many beach-front houses were knocked off their foundations by waves up to 25 feet high which broke over seawalls. Cellars and first floors of other houses were flooded with several feet of seawater which washed completely over barrier beaches. Away from the immediate effects of wave battery the unusually high tide flooded low-lying coastal property and roads. Many roads were closed causing traffic tie-ups. Up to several hundred residents were evacuated from their homes in communities stretching from Salisbury to Marblehead, Revere, and Nahant to the north of Boston and to Hull, Scituate, Marshfield, and Duxbury to the south. Peninsulas such as Hull were isolated by flooding at high tide. In Marshfield, 31 houses were destroyed and another 20 had major damage in the Humarock section. On Cape Cod, severe erosion of the beaches and dunes occurred at the National Seashore Park at Chatham. Fourteen houses were swept away off of North Beach while 23 others were severely damaged. On Nantucket Island, the downtown area was flooded with 3 to 4 feet of water and 15 houses were lost in the Brant Point section. On Martha's Vineyard, coastal flooding damaged many roads. Peak wind gusts included 78 mph at the National Weather Service Office in Chatham, 74 mph at Thatcher Island off Gloucester, 68 mph at Marblehead, 64 mph at the Blue Hill Observatory in Milton, and 55 mph at Boston. The counties of Barnstable, Dukes, Nantucket, Essex, Plymouth, Norfolk, and Suffolk were later declared major federal disaster areas. Heavy rain accompanied this storm over a 3-day period starting late on the 30th with an east-west band of very heavy rainfall of 4 to 6 inches centered to the south of Boston. Blue Hill Observatory in Milton received 5.76 inches.

MICHIGAN

Berrien County Southern Portion	04	2110EST			0 0	3 0	Thunderstorm Winds
Strong thunderstorm winds blew down trees, tree limbs, and power lines between New Buffalo and Berrien Springs.							

Cass County	04	2145EST			0 0	3 0	Thunderstorm Winds
Strong thunderstorm winds blew down trees and power lines in many areas of the county.							

MIZ049 Osceola County	31	0900EST			0 0	0 0	Flooding
The Muskegon River at Evert reached its flood stage of 12 feet by midmorning on the October 31st. The river continued to rise slowly past midnight. No significant damage was reported. The river crested on November 2nd at 12.5 feet, 0.50 foot above flood stage.							

MIZ014 Newaygo County	31	1600EST			0 0	0 0	Flooding
The Muskegon River, in Newaygo County reached its flood stage of 11 feet by late afternoon on the October 31st. The river continued to rise slowly past midnight. No significant damage was reported. The river crested on November 2nd at 11.3 feet, one-third of a foot above flood stage.							
Heavy rain, almost 3.50 inches, fell on the 25th, over the Muskegon River basin. This caused the soil moisture values to become quite high over the Muskegon River basin. When 1.70 inches of rain fell over the basin on the 30th, and another 0.70 inch fell over the basin on the 31st, the river then rose above flood stage. The Croton Dam, upstream of Newaygo was able to control the river flow and thus moderate the flood crest at Newaygo. This helped to minimize the damage caused by the heavy rain.							

MINNESOTA

MNZ018-019 South-Central and Southeastern Minnesota	18	0500CST- 1500CST			0 0	0 0	Early Snow
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A mixture of rain and sleet began falling across extreme southern Minnesota during the early morning hours. By late morning the rain turned to snow and fell heavily at times across a small part of south-central and southeastern Minnesota causing hazardous driving conditions. Five traffic accidents and one fatality resulted from the slush covered roadways.

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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MINNESOTA Cont'd

A 20-mile wide band of snow from 2 to 4 inches fell from Albert Lea to near Rochester. The Rochester National Weather Service Office reported nearly 4 inches of snow which was the greatest snowfall ever recorded so early in the season in that area.

MNZ001 > 019
All of Nov
Minnesota

31	1000CST-								
03	0300CST			0	0	?	?		Blizzard Ice Storm

A major autumn snowstorm developed over northeast Texas around noon on October 31st and moved north-northeast through the Mississippi Valley to the western shores of Lake Superior by the morning on November 2nd. The storm intensified and became a blizzard as it moved across eastern Iowa into central Wisconsin by evening on November 1st. The storm gradually weakened as it moved into Ontario Canada during the early morning hours of November 3rd.

Ahead of the storm, a moist southerly flow of air developed and encompassed the entire Mississippi Valley region. A mixture of freezing rain, sleet, and snow moved into extreme southern Minnesota by midmorning of October 31st and continued through the late afternoon on November 1st. Two to three inches of ice accumulated on roads, trees, and power lines in the Austin and Albert Lea areas. At least 20,000 people experienced power outages from October 31st - November 2nd as many power lines and poles snapped under the weight of the ice. Many rural areas were without power for about a week. The Governor declared a state of emergency in Freeborn and Mower Counties. The National Guard was called upon to help provide generators to rural farmsteads. The National Guard Armory and a local mall in Albert Lea were both used as shelter for the many stranded motorists November 1st and 2nd. At the height of the storm, a 180 mile long stretch of Interstate 90 from the South Dakota border to Rochester was closed.

Snow, heavy at times, fell across southwest into east-central during the afternoon and eventually moved into northeast sections by evening on the 31st. Snowfall rates were occasionally ranging 1 to 2 inches an hour. Thundersnow developed over the southeast corner and lifted north across parts of the Twin Cities and to Duluth during the evening as the storm moved into Wisconsin. Northwest winds increased with portions of southwest Minnesota seeing wind gusts to 60 mph causing blizzard conditions and snow drifts up to 10 feet. Accumulating snow ended over the entire state by midday on November 2nd, but blowing and drifting snow continued into the morning hours of November 3rd in the northeast.

Over 900 schools and businesses were closed on November 1st. Hundreds of motorists were stranded at some time during the storm. At least 20 persons died in traffic accidents or from heart attacks digging out from the storm. A number of roofs collapsed on buildings as well as several small "domed" businesses due to the weight of the snow. A number of long-standing snowfall records fell at both the Duluth and Twin Cities offices of the National Weather Service.

All but a small area in western and southeast Minnesota saw snowfalls in excess of 6 inches. The area west of a line from Roseau to Alexandria and Canby in western Minnesota and the area south of Bricelyn to Rochester and Harmony saw snowfalls less than 6 inches.

Snowfall amounts in excess of 1 foot fell east of line from Baudette-Park Rapids-Sauk Centre-Granite Falls to Luverne. The area west of a line from Red Wing to Blue Earth also saw over a foot of snow.

A swath of snow in excess of 2 feet was deposited from Crane Lake-Rush City-across the Twin Cities to Le Center and to Stillwater. The greatest reported snowfall from the storm was about 37 inches from the Duluth office of the National Weather Service.

MISSISSIPPI

Lauderdale County
Daleville
Wayne County

14	2200CST								
22	1830CST			0	0	0	0		Hail (0.75)
				0	0	3	0		Flooding

As much as 6 inches of rain fell over southeast Wayne County. Numerous secondary road were under water. One road was severely damaged and two others sustained major washouts.

Clarke County
11 SE Quitman

22	1605CST								
				0	0	0	0		Hail (1.75)

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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MISSISSIPPI Cont'd

Rankin County									
3 SW Pelahatchie	23	1615CST			0	0	0	0	Hail (1.75)
3 SW Pelahatchie	23	1615CST			0	0	3	0	Thunderstorm Winds (G68)

Several trees were blown down and windows were blown out of a church.

Jones County									
5 N Laurel	23	1627CST			0	0	0	0	Hail (0.88)
Madison County									
5 SW Farmhaven	23	1750CST			0	0	2	0	Thunderstorm Winds

Six trees were blown down along the Natchez Trace Parkway.

Leake County									
Ofahoma	23	1805CST			0	0	0	0	Hail (1.75)
4 N Ofahoma	23	1807CST			0	0	0	0	Hail (1.75)
Attala County									
Kosciusko	23	1840CST			0	0	0	0	Hail (0.75)
Lamar County									
Purvis	23	2000CST			0	0	4	0	Flash Flooding

Heavy rainfall around Purvis flooded many county roads. As many as 15 roads had to be closed.

Yazoo County									
6 NE Yazoo City	26	1750CST			0	0	2	0	Thunderstorm Winds

Six trees were blown down along a county road.

Adams County									
Natchez	26	1920CST			0	0	5	0	Flash Flooding

Torrential rains overwhelmed the city and county roads. The drainage structure could not handle the run-off. Motorists had to be evacuated as well as a few residents in a housing area near downtown Natchez. Many roads had 3 to 4 feet of water over them. Water was 2 to 3 feet deep in three homes.

MISSOURI

Scotland County									
Near Memphis	02	1610CST			0	0	3	2	Hail (1.50)
Near Memphis	02	1622CST			0	0	0	0	Hail (0.75)

The public reported pea- to ping-pong ball-size hail near and north of Memphis. Minor damage was reported to several vehicles.

Clark County									
Kahoka	02	1645CST			0	0	0	0	Thunderstorm Winds (G52)

Thunderstorm wind gusts to 60 mph were reported by the Kahoka City Police dispatcher.

Adair County									
10 SW Kirksville	02	1935CST			0	0	0	0	Hail (1.75)

Golf ball-size hail was reported by the public in southwest Adair County; no damage was reported.

Marion County									
Philadelphia	02	2034CST			0	0	0	0	Hail (1.75)

The public reported golf ball-size hail, but no damage was reported.

Boone County									
Columbia	02	2035CST			0	0	2	0	Thunderstorm Winds

A large tree was blown down by thunderstorm wind gusts.

Jackson County									
Raytown	02	2040CST			0	0	5	0	Hail (0.75)

The Raytown Police Department reported hail in Raytown. Lightning also damaged numerous houses.

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
MISSOURI Cont'd									
Platte County N Kansas City	02	2100CST			0	0	5	0	Hail (1.00) Lightning
One-inch hail was reported by an off-duty National Weather Service employee 7 miles southeast of Kansas City International Airport. Lightning also damaged numerous structures with widespread damage and power outages.									
Clay County N Kansas City	02	2105CST			0	0	5	0	Hail (1.00) Lightning
The Kansas City Police Department reported one-inch hail covering ground in northern Kansas City. Lightning damaged many houses in the area.									
Johnson County Sedalia	03	1610CST			0	0	0	0	Thunderstorm Winds (G55)
A 55-knot wind gust was reported at the airport near Sedalia.									
Pettis County 5 W Sedalia Sedalia	03 03	1620CST 1655CST			0 0	0 0	3 0	2 0	Hail (1.75) Hail (0.75)
Golf ball-size hail was reported at 1620 CST, while 0.75-inch hail covered the ground 2 inches deep in Sedalia, at 1655 CST.									
Cooper County Western Portion	03	1655CST			0	0	2	0	Hail (1.75)
Golf ball-size hail was reported in western Cooper County.									
Moniteau County Clarksburg	03	1755CST			0	0	4	0	Hail (2.00)
Two-inch hail was reported in Clarksburg.									
Macon County La Plata	03	1945CST			0	0	0	0	Hail (0.75)
La Plata	03	2045CST			0	0	0	0	Hail (0.75)
Audrain County 5 N Mexico	04	1440CST			0	0	2	0	Hail (1.50)
Pike County Curryville	04	1512CST			0	0	3	0	Hail (1.75)
Curryville	04	1525CST			0	0	2	0	Hail (1.00)
Bowling Green	04	1525CST			0	0	2	0	Thunderstorm Winds (G52)
The county sheriff dispatcher reported golf ball-size hail and high wind at 1512 CST, with 1.00-inch hail and water over Highway 154, at 1525 CST. Wind gusts to 60 mph were reported in Bowling Green.									
Montgomery County Jonesburg	04	1605CST			0	0	0	0	Hail (1.00)
Lincoln County Northern Portion	04	1617CST			0	0	0	0	Hail (0.75)
Hail, measuring 0.75 inches in diameter, was reported by the county sheriff over northern Lincoln County. No damage was reported.									
Warren County Warrenton	04	1625CST			0	0	2	0	Thunderstorm Winds (G52)
Emergency Management officials reported wind gusts to 60 mph at Warrenton, and around Warren County.									
St. Charles County St. Paul	04	1645CST			0	0	2	0	Thunderstorm Winds

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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MISSOURI Cont'd

Large trees were uprooted by thunderstorm winds.

Lincoln County Old Monroe	04	1705CST			0	0	4	0	Thunderstorm Winds
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Ham radio operators reported large trees and power lines down at Old Monroe and Winfield.

Franklin County Union	04	1715CST			0	0	0	0	Funnel Cloud
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Several reports of funnel clouds were received near Union by area fire departments.

St. Louis County Western Portion	04	1750CST			0	0	3	0	Thunderstorm Winds
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Spotters and ham radio operators reported wind damage and gusts estimated to 60 mph near Ballwin. Many other reports were received of trees down and power outages across West St. Louis County.

Franklin County St. Clair	04	1814CST			0	0	0	0	Hail (0.75)
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Ham radio operators reported 0.75-inch hail, but no damage occurred.

Washington County	04	1925CST			0	0	3	0	Thunderstorm Winds
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Various reports were received from the Missouri State Highway Patrol and the county sheriff of large tree limbs downed by winds and of wind gusts to 60 mph.

St. Francois County Bismarck	04	1952CST			0	0	0	0	Thunderstorm Winds (G52)
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The St. Francois County Sheriff's Office reported wind gusts to 60 mph and hail; no damage was reported.

Iron County Ironton	04	1954CST			0	0	0	0	Hail (0.75)
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The Iron County Sheriff's Office reported 0.75-inch hail.

Montgomery County Big Spring	23	1110CST			0	0	3	0	Hail (2.00)
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New Florence	23	1120CST			0	0	2	0	Hail (1.00)
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St. Charles County O'Fallon	23	1338CST			0	0	2	0	Hail (1.75)
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County Emergency Management reported golf ball-size hail and minor damage.

St. Louis County Fenton	23	1345CST			0	0	3	0	Hail (1.75)
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The public reported golf ball-size hail.

Douglas County Ava	23	1640CST			0	0	2	0	Hail (1.75)
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Ava	23	1650CST			0	0	2	0	Hail (1.50)
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Golf ball size-hail was reported at 1640 CST, and 1.50-inch hail was reported at 1650 CST.

MONTANA

MTZ003	12	1200MST- 1400MST			0	0	0	0	High Winds (G53)
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Great Falls reported a gust to 61 mph.

MTZ001-002-003- 004-005-006-007- 008	16	0900MST- 2000MST			0	0	7	0	High Winds (G74)
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Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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MONTANA Cont'd

Very strong winds moved across the state ahead of a Pacific cold front. West of the Divide and in southwestern Montana, much of the damage was due to falling trees which took out power lines and damaged homes and vehicles. Roof damage was extensive in northwestern Montana. Several large forest fires were ignited by arcing power lines. East of the Continental Divide many power lines were down and a truck was blown over near Browning. Several homes lost their roofs and grain bins were blown over. In addition, a large grass and timber fire (180,000 acres) in Blaine County was driven by the strong winds as was a fire in the Judith Mountains near Lewiston. Wind gusts reached 85 mph along the eastern slopes of the Rockies and between 60 and 75 mph in most other places.

MTZ003	21	0810MST			0	0	0	0	High Winds (G50)
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Cut Bank reported a gust to 58 mph.

MTZ003	22	0300MST- 0900MST			0	0	3	0	Heavy Snow
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Six inches of snow fell at Dupuyer, East Glacier and St. Mary.

MTZ004	26	1200MST- 27 0500MST			0	0	0	0	Heavy Snow
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Four to six inches of snow fell across southwestern Montana.

MTZ007	31	1200MST- 01 0500MST			2	0	3	0	Winter Storm
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Heavy snow, sub-zero temperature readings and strong winds hit the mountains of south-central Montana. As much as 1 foot of snow fell in the Absarokee Mountains south of Livingston. Two hunters died from hypothermia south of Livingston. (M41O) (M44O)

NEBRASKA

NEZ001-005-011 Nebraska Panhandle	28	0200MST- 1700MST			0	0	?	?	Heavy Snow
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Six to nine inches of snow fell over the Nebraska panhandle.

NEZ002-006-007- 012-013-016-017	28	0400CST- 2000CST	0	0	0	0	4	?	Ice Storm
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Three inches of sleet and freezing rain covered areas in the north central Nebraska with up to 1 inch of ice coating surfaces in southwest Nebraska. Snow fell on top of the ice, creating hazardous driving and causing numerous traffic accidents. Unharvested corn and winter wheat crops left in the fields were damaged.

NEZ012-013-016-017 Southwest Nebraska	30	0400CST- 31 1900CST			0	0	4	?	Heavy Snow
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Snow began during the morning of the 30th and continued until the evening of the 31st. Accumulations ranged from 6 to 13 inches in Haigler which is located in extreme southwest Nebraska.

NEZ004-008 > 010- 014-015-018 > 020	30	2200CST- 31			0	0	6	?	Heavy Snow Ice Storm
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South-central to eastern Nebraska a major winter storm dumped 6 to 10 inches of snow from south-central to northeastern Nebraska. The precipitation initially started as freezing rain in the southeastern corner of the state (south and east of Omaha, Lincoln, and Beatrice), coating surfaces with 1 to 2 inches of ice. The weight of the snow and ice downed trees and power lines and collapsed roofs. The storm continued into November.

NEVADA

NVZ001-002 Truckee-Tahoe Area/Central	26	0000PST- 2200PST			0	0	0	0	Heavy Snow
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Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons	Estimated Damage	Character of Storm
					Killed	Injured	Property
							Crops

NEVADA Cont'd

Sierra East
Slopes

A strong Pacific storm system brought the first significant snowfall of season to the Sierra. Above 7,000 feet, snowfall totals ranged from 12 to 24 inches. Most of the precipitation fell in the form of rain at Lake Tahoe level. However, late in the afternoon the rain did change to snow and most areas near lake level received 4 to 6 inches of snow.

NEW HAMPSHIRE

Rockingham County	30	1200EST- 0000EST			0	0	7	0	Ocean Storm
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The coastal sections of New Hampshire were hit by an intense Atlantic Ocean storm during the afternoon and evening hours on the 30th. The storm brought high winds and rough seas to the New Hampshire coastline causing damage to homes, flooding of streets and homes, extensive damage to boats and piers, and significant losses to the lobster industry. A total of \$5.6 million in damage was sustained; \$4.0 million in damage to businesses and private property, and \$1.6 million in damage to public property. As a result, Rockingham County was declared a federal disaster area. One house on Seabrook Beach was wiped out by the powerful wind and waves. Another house in Hampton was destroyed, while other homes suffered damage from flying rocks and debris, pounding surf, and flooding waters. The Hampton Police and Fire stations had extensive flooding as both buildings were under 2 feet of water. Several streets were also flooded in Hampton. Rye Harbor suffered some significant damage as two boats were damaged, several boat docks were ripped out of place, and one condominium had its windows blown out which allowed water and sand to flow into the building. Ten thousand lobster traps in Rye Harbor were destroyed or lost in the high wind and waves. In the town of Rye, a harbor boat was lost and a commercial fishing pier suffered damage. Some street flooding along Route 1A in Rye was also reported. Street flooding also occurred in the towns of Portsmouth, New Castle, Stratham, Newmarket, and Exeter. The Isle of Shoals lighthouse, just off the New Hampshire coastline, suffered \$45,000 in damage.

NEW JERSEY, Northern

NJZ005-007-015 Coastal Areas of Northern New Jersey	30 Nov01	1300EST- 0100EST			0	0	7	0	Coastal Flood
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For nearly 2 days, an intense Atlantic storm lashed coastal sections. During the early morning hours of October 30th the storm was located nearly 500 miles east of Montauk, Long Island. Tracking in an unusual east-to-west direction, the storm moved to about 150 miles east southeast of Montauk on October 31st before its westward progress was stopped. It turned toward the southwest briefly then performed a complete loop, heading off to the northeast on November 1st. Dubbed the Halloween storm, it generated strong winds, a very heavy surf and most important of all, abnormally high tides. Indeed, tides almost reached record levels. Not since the Hurricane of 1944 has such devastating damage been done to coastal locations. Shore damage ran into the tens of millions of dollars as homes, boats, roads, beaches and sea walls were destroyed by the crashing surf and massive coastal flooding. Even the Hackensack and Passaic Rivers experienced tidal flooding when they were unable to contain the ocean surge during high tides. Erosion along the coast line was severe with some beaches literally disappearing. Although no homes were reported to be completely destroyed, hundreds were damaged to some extent.

NEW JERSEY, Southern

Southeastern New Jersey	17	1000EST			0	0	3	0	Tropical Storm (Fabian)
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The remnants of Tropical Storm Fabian moved north off the New Jersey coast causing windy conditions over much of southern New Jersey. The highest gusts reported were 68 mph at Ocean City. Atlantic City reported gusts to 50 mph. Some trees were downed in Cumberland County, limbs and utility lines were downed through much of the area and at least one street sign was blown out.

NJZ003 Coastal Southern New Jersey	31	All Month			0	0	8	0	Tidal Flood
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The remains of Tropical Storm Fabian and Hurricane Grace combined with low pressure off Newfoundland well off the New Jersey coast. The storms were far enough off shore that winds were not strong enough along the shore to cause any significant damage and did not even reach gale

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed Injured	Estimated Damage Property Crops	Character of Storm
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NEW JERSEY, Southern Cont'd

force. However, the storms persisted long enough, October 29th through November 1st, and had such a long overwater fetch that extremely high tides developed along the New Jersey coast. The greatest tidal departures of winter storms of record occurred during this event. At Ventnor, a departure of 5.3 feet above normal occurred on Thursday, October 31st at 0200 EST, and at 1400 EST it was 4.6 feet above normal. The tide heights were 9.0 feet above Mean Low low water at 0200 EST, and 9.02 feet at 1400 EST. These tide heights were exceeded only by the great Atlantic Hurricane of 1944. The result was extensive ocean front and back bay flooding, with many roadways and other areas flooded. Many houses and other buildings were flooded. The most damage was to the beaches. Many beaches were greatly eroded with great amounts of sand being washed away. The sand of the some dunes was gone, and in others the dune was breached in spots. The surf damaged or washed out broadwalks and bulkheads. Some stone seawalls were undermined. Total storm damage exceeded \$75 million with much of the damage being to the beaches and dunes.

NEW MEXICO

Chaves and Eddy Counties	27	1800MST- 1945MST			0 0	3 0	High Winds
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Strong downslope winds developed east of the Sacramento Mountains in south-central New Mexico. There were several tree limbs downed and one tree uprooted in Roswell. A Flight Service Observer estimated wind gusts at 56 mph in Lakewood and 61 mph in Artesia.

NMZ001-002-004- 005-006-008- 009-012	29 31	1700MST- 0900MST			0 0	0 0	Heavy Snow
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An early season snowstorm swept across New Mexico, with most of the snow falling on the 30th. The mountains were hardest hit, with a foot or more of snow reported at Chama and Lindrieth (Rio Arriba County), McGaffey (McKinley County), and Ruidoso (Lincoln County). Between 6 and 12 inches fell at other mountain locations, including Raton (Colfax County), Red River (Taos County), and Sandia Park (Bernalillo County). One to three inches fell at the lower elevations of all but the southwestern part of the state. Traffic accidents accounted for four indirect fatalities all were male. A 24-year-old was killed in Hobbs; a 28-year-old was killed just west of Hobbs; a 37-year-old died near Elida; and a 62-year-old was killed on Interstate 40 near San Jon. There were numerous additional minor injuries statewide.

Bernalillo County 8 NE Albuquerque	30	1330MST- 1400MST			0 0	3 0	High Winds
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Strong east winds blew through Tijeras Canyon into Albuquerque most of the day, finally becoming strong enough between 1330 and 1400 MST to knock down four large trees in eastern Albuquerque.

NEW YORK, Central

NYZ013-020 Lower Hudson Valley	01	1520EST- 1600EST			0 0	3 0	High Winds
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Greater Capital District of New York High winds knocked down tree limbs and power lines in the Ravena and New Baltimore areas.

Herkimer County Little Falls	01	1600EST			0 0	3 0	Lightning
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Lightning shorted out the security system control panel of a residence in Little Falls.

Fulton County Johnstown	01	1641EST			0 0	3 0	Thunderstorm Winds
Perth	01	1653EST			0 0	4 0	Thunderstorm Winds
Otsego County Cherry Valley	01	1710EST			0 0	3 0	Thunderstorm Winds

Severe thunderstorms moved through parts of the eastern Mohawk Valley and northern portions of the Susquehanna Region on the 1st leaving 650 customers without electricity in parts of Fulton County, and another 1,000 customers without power in the Cherry Valley area. The Perth area was

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	

NEW YORK, Central Cont'd

hardest hit as thunderstorm winds toppled a tree onto a travel trailer.

Cortland County

Homer	04	0100EST			2	2	4	0	Fog
Cortlandville	04	0440EST			0	1	5	0	Fog

A one-car accident that occurred because of dense fog, resulted in two fatalities and two injuries in Homer. A tractor semi-trailer went off the road in the thick fog on Interstate 81 above Hoxie Gorge in the town of Cortlandville. (F26V) (F23V)

NYZ007

St. Lawrence Valley of New York

05	Morning- Afternoon				0	0	3	0	High Winds
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A strong cold front moving through New York state resulted in high winds across parts of northern New York which downed tree limbs and power lines. Among the areas affected were Ogdensburg, Potsdam and Gouverneur.

Ulster County

31	0630EST- 1100EST				0	0	4	0	Flood
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A strong Atlantic storm produced strong winds and unusually high tides along the Hudson River which resulted in some flooding in parts of Ulster County. The hardest hit areas were the historic district of Kingston along the Rondout Creek, and in the Eddeyville area on State Route 213 near the Eddeyville Bridge. The high tide resulted in foot-high flooding in the streets of both areas as well as water in the basements of many homes.

Lower Hudson Valley, Susquehanna and Catskill Regions in Eastern New York

All Month					0	0	?	0	Drought
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The New York State Department of Environmental Conservation replaced the Drought Alert with a Drought Warning on the 15th, for the following counties in eastern New York: Delaware, Dutchess, Greene, Orange, Otsego, Putnam, Schoharie, Sullivan, and Ulster. The Drought Warning was issued due to a further decrease in the New York City Reservoir Storage.

NEW YORK, Coastal

NYZ015-016-017

Coastal Areas of Southeastern New York	30 Nov01	1300EST- 0100EST			3	0	7	0	Coastal Flood
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For nearly 2 days, an intense Atlantic storm lashed coastal sections. During the early morning hours of October 30th the storm was located nearly 500 miles east of Montauk, Long Island. Tracking in an unusual east-to-west direction, the storm moved to about 150 miles east-southeast of Montauk on October 31st before its westward progress was stopped. It turned toward the southwest briefly then performed a complete loop, heading off to the northeast on November 1st. Dubbed the Halloween storm, it generated strong winds, a very heavy surf and most important of all, abnormally high tides. Indeed, tides almost reached record levels. Not since the Hurricane of 1944 has such devastating damage been done to coastal locations. Shore damage ran into the tens of millions of dollars as homes, boats, roads, beaches, and sea walls were destroyed by the crashing surf and massive coastal flooding. Even the Hudson River experienced tidal flooding when it was unable to contain the ocean surge during high tides. Erosion along the coast line was severe with some beaches literally disappearing. Around 50 homes were completely destroyed and hundreds of homes damaged to some extent on Long Island and in Brooklyn. Numerous boats were damaged or destroyed at their berths. Three boats were sunk on Long Island Sound due to high seas. All the people on board were rescued. However, off Staten Island, two young men drown when their boat capsized. Another storm related fatality occurred when a man fishing from a bridge was either blown or swept off. (M400) (M170) (M140)

NEW YORK, Western

Chautauqua County

Carroll	04	1700EST			0	0	4	0	Hail (1.00)
Little Valley	04	1705EST			0	0	4	0	Thunderstorm Winds
Frewsburg	04	1715EST			0	0	4	0	Thunderstorm Winds

A warm front moved north of the area and ushered in a southerly flow of warm moist air. Severe

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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NEW YORK, Western Cont'd

thunderstorms developed during the evening hours producing damaging winds and hail up to 1.00 inch in diameter. The strong winds downed trees and power lines while the heavy downpours from the thunderstorms caused localized poor drainage flooding.

NORTH CAROLINA

Iredell County
5 SSW Statesville

5	1330EST	0.5	20	0	0	3	0	Tornado (F0)
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Eye witnesses reported that the white funnel seemed to stay right at tree top height, blowing roofing off one house and some sheds and blowing down trees.

Vance County
Henderson

17	0200EST			0	0	0	0	Thunderstorm Winds
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Four trees were blown down and numerous limbs broken off throughout the city.

**Outer Banks of Dare
and Currituck
Counties**

28	1900EST-			0	0	7	0	Coastal Flood
31	1900EST							

A series of three large weather systems - Hurricane Grace, a strong high pressure system, and an intense oceanic storm - combined to produce a prolonged period of coastal flooding and high winds along the upper coast of North Carolina. This was part of a major east coast storm that extended north to Maine.

High seas and heavy surf began to batter the Outer Banks on 28 October. Waves of 10 to 15 feet and occasional winds of 35 to 45 mph lashed the coast for five days. Heavy surf, beach erosion and flooding caused damage to 525 houses and 28 businesses, estimated at \$6.7 million. The only highway to Hatteras Island was blocked in several places by sand and water up to 3 feet deep.

NORTH DAKOTA

**NDZ003-004-006 >
008-011 > 013-016**
Parts of Southwest
South Central and
Northeast North Dakota

23	0200CST- 1900CST			0	0	5	5	Heavy Snow
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Six to ten inches of snow fell over parts of North Dakota on the 23rd. The snow began in southwest and south-central North Dakota early morning of the 23rd, and in northeast North Dakota late in the morning. The snow ended over the state by evening.

This early-season heavy snow in North Dakota delayed completion of harvests in northeast North Dakota.

**NDZ005 > 012-
Central and
Southwest North
Dakota**

27	2000CST-			0	0	6	5	Heavy Snow Ice Storm
29	1500CST							

A major winter storm brought heavy snow, ice, and sleet to central and southwest North Dakota. Much of this region received 12 to 18 inches of snow, in addition to ice deposits 1.5 inches thick. The storm was unprecedented for October in North Dakota, and many stations had record-breaking single-storm snowfall amounts. Combined with the snow that fell a few days earlier, it was by far the snowiest October ever for much of North Dakota.

The precipitation began as rain in central North Dakota the evening of the 27th, and changed to freezing rain around midnight. The freezing rain changed to sleet early morning of the 28th. There were also isolated thunderstorms over central and southwest North Dakota during this period of rain, freezing rain and sleet.

The sleet gradually changed to snow in north-central North Dakota during the morning and early afternoon of the 28th, but the sleet in south-central North Dakota did not completely change over to snow until mid afternoon of the 28th.

Meanwhile in southwestern North Dakota, snow began early morning of the 28th. In addition,

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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NORTH DAKOTA Cont'd

northwest winds gusting to 40 mph developed late morning and early afternoon of the 28th in southwest and north-central North Dakota, and caused near blizzard conditions. The snow and blowing snow spread into south-central North Dakota late afternoon of the 28th.

Snow and blowing snow, with near blizzard conditions at times, continued throughout central and southwest North Dakota overnight the 28th and 29th. But visibilities improved rapidly in southwest North Dakota the morning of the 29th and in central North Dakota early afternoon.

The combination of ice-covered surfaces, wind, and snow caused a passenger bus to skid off Interstate 94 and overturn. Nine people were injured. The ice and snow on homes and vehicles kept many doors frozen shut. Some motorists were stranded up to 16 hours in the storm. Heavy ice buildups on trees and power lines caused widespread power outages.

NDZ013 > 017-
Most of Eastern
North Dakota

28	1500CST-								
29	1100CST			0	0	5	5		Ice Storm

Rain over eastern North Dakota changed to freezing rain and sleet the afternoon and night of the 28th. The freezing rain and sleet changed to snow during the early morning the 29th, although sleet continued over parts of extreme eastern North Dakota through the morning of the 29th.

The rain, freezing rain, and sleet caused heavy ice buildups on trees and power lines.

This moisture came as part of the same storm that brought ice and heavy snow to central and southwest North Dakota.

OHIO

Lake County

Madison

Ashtabula County

1 S Geneva

04	1530 EST			0	0	4	0		Hail (1.75)
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04	1555 EST			0	0	4	0		Hail (0.75)
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A thunderstorm produced large hail in far northeast Ohio which damaged cars.

Statewide

Entire Month				0	0	0	?		Drought
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Drought conditions improved slightly over parts of Ohio during October. Severe to extreme drought conditions were still occurring in all but southern and northwest Ohio.

OKLAHOMA

Pushmataha County

Moyers

Le Flore County

Talihina

McCurtain County

8 NW Wright City

8 NW Wright City

Latimer County

5 W Talihina

04	1608CST			0	0	?	?		Hail (0.75)
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04	1630CST			0	0	?	?		Hail (0.75)
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04	1730CST			0	0	?	?		Hail (1.75)
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04	1730CST			0	0	?	?		Thunderstorm Winds
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04	1630CST			0	0	?	?		Hail (0.75)
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An isolated severe thunderstorm developed during the late afternoon of the 4th and produced dime-size hail 5 miles west of Talihina.

Cotton County

15 W Walters

Comanche County

Faxon

1 SW Lawton

1 W Lawton

McClain County

1 W Newcastle

Oklahoma County

Near Oklahoma

City

23	1600CST			0	0	?	?		Hail (0.88)
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23	1610CST			0	0	?	?		Hail (1.75)
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23	1625CST			0	0	?	?		Hail (1.75)
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23	1647CST			0	0	?	?		Hail (0.75)
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23	1755CST			0	0	?	?		Hail (0.75)
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23	2308CST			0	0	?	?		Hail (0.75)
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Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
OKLAHOMA Cont'd									
Severe thunderstorms during the afternoon, produced hail that was sometimes larger than golf balls across portions of central and southwest Oklahoma.									
Creek County Drumright	24	0033CST			0	0	?	?	Thunderstorm Winds (G52)
Lincoln County Agra	24	0035CST			0	0	?	?	Hail (0.88)
Payne County Cushing	24	0105CST			0	0	?	?	Hail (1.75)
Cushing	24	0105CST			0	0	3	?	Thunderstorm Winds
Creek County 2.5 W Mannford	24	0130CST			0	0	?	?	Hail (1.75)
3 W Mannford	24	0130CST			0	0	?	?	Thunderstorm Winds (G56)
Tulsa County 2 E Turley	24	0218CST			0	0	?	?	Hail (0.88)
Washington County Vera	24	0230CST			0	0	?	?	Thunderstorm Winds (G52)
Pontotoc County Ada	24	0330CST			0	0	?	?	Hail (1.00)
Tulsa County Broken Arrow	24	0645CST			0	0	?	?	Hail (0.88)
Southeastern Portion	24	0652CST			0	0	?	?	Hail (0.88)
Wagoner County 2 E Broken Arrow	24	0654CST			0	0	?	?	Hail (0.88)
Tulsa County Broken Arrow	24	0800CST			0	0	?	?	Hail (0.88)
Wagoner County 2 E Broken Arrow	24	0805CST			0	0	?	?	Hail (0.75)
Pittsburg County Quinton	24	1140CST			0	0	?	?	Hail (1.75)
5 E Eufaula	24	1154CST			0	0	?	?	Hail (1.00)
Haskell County Kinta	24	1210CST			0	0	?	?	Hail (1.75)
4 E Kinta	24	1216CST	.01	20	0	0	?	?	Tornado (F0)
Le Flore County	24	1430CST			0	0	?	?	Hail (0.75)
Haskell County McCurtain	24	1430CST			0	0	?	?	Thunderstorm Winds (G52)
Tulsa County Collinsville	24	1512CST	.25	40	0	0	3	?	Tornado (F0)
Seminole County 5 SW Sasakwa	24	1552CST			0	0	?	?	Hail (1.75)
Tulsa County Broken Arrow	24	1559CST			0	0	?	?	Hail (0.75)
Wagoner County 2 E Broken Arrow	24	1600CST			0	0	?	?	Hail (0.75)
Carter County 3 N Healdton	24	1600CST			0	0	?	?	Hail (1.00)
Okmulgee County 1 NE Okmulgee	24	1640CST			0	0	?	?	Hail (0.75)
Le Flore County Pocola	24	1710CST			0	0	?	?	Hail (1.75)
Hughes County 3 S Horntown	24	1720CST			0	0	?	?	Hail (1.00)
Pontotoc County 8 WNW Ada	24	1730CST			0	0	?	?	Hail (1.00)
Muskogee County 6 S Muskogee	24	1740CST			0	0	?	?	Hail (0.75)
Hughes County 2.5 S Atwood	24	1750CST			0	0	?	?	Hail (0.75)
Muskogee County 2 SE Muskogee	24	1750CST			0	0	?	?	Hail (0.75)

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of		Estimated		Character of Storm
					Killed	Injured	Property	Crops	
Hughes County 9.5 E Holdenville	24	1800CST			0	0	?	?	Hail (1.75)
McIntosh County 3 SW Checotah 2 SE to 3 SE	24	1812CST			0	0	4	?	Thunderstorm Winds
Checotah	24	1819CST	1.0	100	0	0	4	?	Tornado (F0)
2 E Rentiesville	24	1830CST	?	?	0	0	?	?	Tornado (F0)
Muskogee County Keefeton	24	1840CST			0	0	?	?	Hail (0.75)
Cherokee County 8 SW Tahlequah	24	1900CST			0	0	?	?	Hail (0.88)
Pontotoc County 1 S Fittstown	24	1905CST			0	0	?	?	Hail (0.75)
1 S Fittstown	24	1905CST			0	0	?	?	Thunderstorm Winds
Pittsburg County Indianola	24	1906CST			0	0	3	?	Thunderstorm Winds
5 SSW Quinton	24	1945CST			0	0	?	?	Hail (1.75)
6 E Haywood	24	1950CST			0	0	?	?	Hail (0.88)
Haskell County 2 E Kinta	24	2000CST			0	0	?	?	Hail (0.75)
Pittsburg County 6 N Hartshorne	24	2030CST			0	0	?	?	Hail (0.75)
Latimer County 7 NW Wilburton	24	2040CST			0	0	?	?	Hail (0.75)
Atoka County 5 WNW Daisy	24	2045CST			0	0	?	?	Hail (0.75)
Coal County Lehigh	24	2051CST			0	0	?	?	Hail (1.50)
Marshall County 5 WSW Oakland	24	2114CST			0	0	?	?	Hail (0.88)
Atoka County 5 E Stringtown	24	2122CST			0	0	?	?	Hail (1.00)
Latimer County 16 SSE Wilburton	24	2130CST			0	0	?	?	Hail (0.75)
Atoka County Redden	24	2148CST			0	0	?	?	Hail (1.00)
Latimer County 6 E Yanush	24	2200CST			0	0	?	?	Hail (0.75)
Marshall County 7 E Kingston	24	2210CST			0	0	?	?	Hail (0.88)
Pushmataha County 3 W Antlers	24	2305CST			0	0	?	?	Thunderstorm Winds
McCurtain County 3 W Battiest	25	0015CST			0	0	?	?	Hail (1.00)
3 W Battiest	25	0015CST			0	0	?	?	Thunderstorm Winds

Several clusters and lines of severe thunderstorms developed ahead of a cold front and moved across eastern and portions of southern Oklahoma late on the 23rd continuing into the 24th. The first of these storms moved out of Oklahoma County late in the evening of the 23rd, and on into Creek, Lincoln, and Payne Counties shortly after midnight. Golf ball-size hail and strong winds were reported in Cushing, where a storage shed was damaged by the winds. West of Mannford, golf ball-size hail and 65-mph winds were reported. The storms continued northeast and produced large hail and damaging winds in Tulsa and Washington Counties. Another area of severe storms moved into eastern Oklahoma around sunrise and produced dime- to nickel-size hail in the Broken Arrow area. These storms weakened as they moved east during the morning, but strengthened around midday and they reached Haskell and Pittsburg Counties. Golf ball-size hail fell at Quinton and near Kinta. The first of four small tornadoes that occurred during the afternoon and evening, touched down at 1216 CST between Kinta and Lequire in Haskell County. This tornado was a brief touchdown with no damage reported and was rated as F0 intensity. Additional severe thunderstorms developed further west around midafternoon and moved across eastern Oklahoma during the late afternoon and evening. There were numerous occurrences of dime- to nickel-size hail with these

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	

OKLAHOMA Cont'd

storms, with an isolated occurrence of golf ball-size hail 5 miles south-southwest of Quinton. Sixty-mph winds downed trees in McCurtain and strong winds caused carport damage in Indianola. Tree damage was reported in Fittstown, 3 miles west of Antlers and 3 miles west of Battiest. Three additional small tornadoes were also associated with these storms. The first of these tornadoes touched down briefly on the northeast side of Collinsville in Tulsa County, at 1512 CST. One outbuilding was destroyed, but no other damage was reported from this F0 tornado. The other two tornadoes were associated with a severe thunderstorm in McIntosh County. The storm producing the two tornadoes produced strong winds which flipped over a tractor-semitrailer on Interstate 40, 2 miles southwest of Checotah. The storm continued northeast and produced an F0 tornado 2 miles southeast of Checotah at 1819 CST. The tornado traveled along a 1-mile path and destroyed a woodframe home, a mobile home, a camper, and three barns. The storm continued moving northeast and produced a second tornado 2 miles east of Rentiesville. This F0 tornado occurred at 1830 CST in an open field, but caused no damage.

Bryan County	25	0337CST-			0	0	?	?	Flash Flood
	26	0230CST							
Choctaw County	25	0540CST-			0	0	?	?	Flash Flood
		1208CST							
Pushmataha County	25	1030CST-			0	0	?	?	Flash Flood
		1240CST							

Heavy rains of up to 9 inches fell in Bryan, Choctaw, and Pushmataha Counties. Many roads were reported as being closed. Many reports of flooding were received from Calera, and Highway 3 in Antlers was under 4 feet of water.

Carter County	25	1740CST			0	0	?	?	Hail (0.88)
3 SW Ratliff City									
Tillman County	25	1815CST			0	0	?	?	Hail (0.75)
6 E Davidson									
Caddo County	25	1815CST			0	0	?	?	Hail (1.00)
2 W Binger									
Le Flore County	25	1853CST			0	0	?	?	Hail (1.75)
Heavener									
McClain County	25	1900CST			0	0	?	?	Hail (0.75)
5 SW Purcell									
Seminole County	25	2140CST			0	0	?	?	Hail (1.00)
5 SSW Maud									
Tulsa County	25	2200CST			0	0	?	?	Flash Flood
Broken Arrow									
Wagoner County	25	2200CST			0	0	?	?	Flash Flood
Western Portion									
Caddo County	25	2205CST			0	0	?	?	Hail (1.00)
Eakly									
Payne County	25	2215CST			0	0	?	?	Hail (0.75)
Stillwater									
Seminole County	25	2215CST			0	0	?	?	Thunderstorm Winds (G55)
Wewoka									
Hughes County	25	2230CST			0	0	?	?	Hail (1.00)
Holdenville									
Muskogee County	25	2230CST			0	0	?	?	Hail (0.88)
Muskogee									
Cherokee County	25	2245CST			0	0	?	?	Thunderstorm Winds
1 S Cookson									
Muskogee County	25	2300CST			0	0	?	?	Thunderstorm Winds
S Muskogee									
Muskogee	25	2300CST			0	0	?	?	Flash Flood
Cherokee County	25	2355CST			0	0	?	?	Flash Flood
S Tahlequah									
Tahlequah									

An area of thunderstorms developed over southern and central Oklahoma during the late afternoon hours. Some of the storms became severe. The storms continued strong as they moved into eastern Oklahoma during the evening, producing more reports of severe weather. As they moved across

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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OKLAHOMA Cont'd

eastern Oklahoma during the evening. Large tree branches were broken off by strong winds just south of Muskogee, and strong winds uprooted trees just south of Cookson. Heavy rains from the storms also produced flash flooding during the evening of October 25 and the early morning of October 26. In the southern portion of Broken Arrow, 4.85 inches of rain fell and resulted in flooding which made several roads impassable. In western Wagoner County, 81st Street was closed due to 2.50 to 3.00 feet of water over the roadway. Several roads in and around Muskogee and Tahlequah were closed due to high water, including Highway 62. Ross Creek in Cherokee County overflowed its banks at 0016 CST on October 26, with water from the creek reported over a bridge. Numerous reports of lightning damage were received. A lightning strike in Guthrie destroyed a house due to fire. Lightning struck the police communications tower in Bristol, causing a loss of communications. Numerous lightning strikes also caused fires in Oklahoma City.

Mc Curtain County	26	Unknown			0	0	?	?	Flood
Flooding occurred on the Little and Glover Rivers, and on the headwater streams of the Little River in McCurtain County, causing washouts of bridges and roadways.									
Hughes County 13 NW Holdenville	26	0700CST			0	0	4	?	Lightning
Lightning struck an oil tank battery and set it on fire.									
Love and Southern Carter Counties	27	2209CST			0	0	?	?	Flash Flood
Love County Marietta	27	2209CST			0	1	6	?	Thunderstorm Winds
Marshall County Kingston	27	2232CST			0	0	?	?	Hail (0.75)
Marshall County Madill	27	2232CST			0	0	?	?	Thunderstorm Winds (G52)
Marshall County Madill	27	2232CST			0	0	?	?	Hail (0.75)
Jackson County Altus Air Force Base (LTS)	27	2334CST			0	0	?	?	Thunderstorm Winds (G53)
Marshall County Northern Portion	27	2335CST			0	0	?	?	Flash Flood
Pittsburg County Kiowa	28	0050CST			0	0	?	?	Thunderstorm Winds (G52)
Pittsburg County McAlester	28	0050CST			0	0	?	?	Thunderstorm Winds
Pittsburg County McAlester	28	0130CST			0	0	?	?	Flash Flood
Muskogee County Briartown	28	0310CST			0	0	?	?	Thunderstorm Winds
Murray County Davis	28	0313CST			0	0	?	?	Thunderstorm Winds (G59)
Carter County Ardmore	28	0335CST			0	0	?	?	Flash Flood
Adair County 3 NW Westville to 4 NW Watts	28	0415CST	10.3	400- 800	0	0	5	?	Tornado (F1)
Pittsburg County Kinta	28	0420CST			0	0	?	?	Thunderstorm Winds
Pittsburg County McAlester	28	0430CST			0	0	4	?	Thunderstorm Winds
McIntosh County Eufaula	28	0445CST			0	0	?	?	Thunderstorm Winds (G52)
Okmulgee County Okmulgee	28	0445CST			0	0	?	?	Thunderstorm Winds
Delaware County Moseley to 1.5 E Moseley	28	0445CST	1.5	100	0	0	3	?	Tornado (F0)
Pittsburg County Quinton	28	0445CST			0	0	?	?	Thunderstorm Winds

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
OKLAHOMA Cont'd									
Wagoner County 2 E Wagoner	28	0500CST			0	0	5	?	Thunderstorm Winds
Haskell County Near Enterprise	28	0505CST			0	0	4	?	Thunderstorm Winds
Haskell County Near Kinta	28	0510CST			0	0	?	?	Thunderstorm Winds
Delaware County 4.75 E to 6.5 ENE Colcord	28	0510CST	2.0	400	0	0	5	?	Tornado (F1)
Pittsburg County Quinton	28	0515CST			0	0	?	?	Thunderstorm Winds
McIntosh County Checotah	28	0525CST			0	0	?	?	Thunderstorm Winds
Craig County 4 W Vinita	28	0530CST			0	0	?	?	Thunderstorm Winds
Latimer County 2 NE Red Oak	28	0530CST			0	0	?	?	Thunderstorm Winds
Muskogee County Warner	28	0530CST			0	0	?	?	Thunderstorm Winds
Muskogee County Porum	28	0545CST			0	0	?	?	Thunderstorm Winds
Muskogee County Briartown	28	0545CST			0	0	?	?	Thunderstorm Winds
Le Flore County Poteau	28	0615CST			0	0	?	?	Thunderstorm Winds
McCurtain County 5 W Smithville	28	0641CST			0	0	?	?	Thunderstorm Winds

Severe thunderstorms were widespread across southern and eastern Oklahoma during the late evening of the 27th through the early morning of October 28th. Three tornadoes occurred in northeast Oklahoma. The first tornado touched down at 0415 CST three miles west of Westville in Adair County, and moved north northeast before lifting 4 miles northwest of Watts at 0435 CST. The tornado was on the ground for 10.3 miles and was 0.50-mile wide at its widest point. Several homes suffered mostly roof damage, and a mobile home was overturned. Three large chicken barns and several hay barns were destroyed, and many trees were toppled. The heaviest damage was about 1 mile south of the town of Chance. This tornado was rated as F1 intensity; damage is estimated at \$75,000. The second tornado touched down at 0445 CST in Moseley in Delaware County, and moved northeast about 1.50 miles before lifting. Damage from the FO tornado occurred to trees and a few outbuildings. Minor roof and awning damage was done to the Moseley School. The damage path was 100 yards wide. The third tornado touched down at 0510 CST, 4.75 miles east of Colcord in Delaware County and then moved northeast into Benton County, Arkansas at 0515 CST. Several homes in Oklahoma suffered significant roof damage, and one cinder-block building had a collapsed wall. Numerous trees and power lines were also downed. The Oklahoma portion of the path was almost 2 miles long and up to 0.25 mile wide. The tornado caused approximately \$100,000 damage in Oklahoma and was rated as an F1 in Oklahoma. Severe Thunderstorm winds also caused damage in many locations. The most significant wind damage in east central and southeast Oklahoma occurred at the Wagoner Airport 2 miles east of Wagoner where several hangers were damaged or destroyed, telephone poles and trees were downed. Damage at the airport is estimated at \$50,000. In southern Oklahoma, severe thunderstorm winds caused damage estimated at \$1,000,000 in Marietta. Over \$250,000 in damage alone was done to the Oklahoma Gas and Electric Company electrical distribution system in Marietta, and an apartment complex suffered \$150,000 damage. In addition, 25 businesses and about 100 homes suffered some damage. One injury was reported, due to flying glass. In Briartown, a barn was totally destroyed, the roof was taken off a house, and a travel trailer was blown over. A garage and a shed was blown away near Enterprise. Significant damage also occurred in McAlester, where numerous windows were blown out of businesses, and awnings and carports were damaged. Trees and power lines were downed in many areas of east-central and southeast Oklahoma. In addition to the tornado and severe thunderstorm damage, heavy rains also produced flash flooding in Pittsburg County, with many roads closed due to high water near McAlester. Highway 71 near Quinton was also closed due to high water, and roads were closed in Ardmore and Marietta due to flooding. In northern Marshall County, heavy rains caused flooding to agricultural areas.

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
OKLAHOMA Cont'd									
Choctaw County Fort Towson	28	1550CST			0	0	?	?	Hail (0.75)
McCurtain County 4 SW Battiest	28	1640CST			0	0	?	?	Hail (0.88)
Bryan County Bennington	28	1930CST			0	0	?	?	Flash Flood
Pushmataha County Antlers	28	2130CST			0	0	?	?	Flash Flood
Atoka County NW Wardville	28	2200CST			0	0	?	?	Flash Flood

Heavy rainfall from thunderstorms resulted in the flooding of roadways.

Oklahoma Panhandle	30	0800CST- 2400CST			0	0	?	?	Winter Weather
Oklahoma Panhandle	31	0000CST- 1900CST			0	0	?	?	Heavy Snow

An unusually early winter storm moved into the Oklahoma Panhandle on the final day of October. A series of arctic cold fronts combined with an upper level system which moved in from the southwest, dumped more than 4 inches of snow across the region. The snowfall ranged from 4 inches in Beaver County, to 8 inches at Boise City in Cimarron County. Six inches of snow also fell at Guymon in Texas County. No deaths or injuries were reported with this storm. The early winter storm also brought extremely cold temperatures to the Oklahoma Panhandle. Sub-freezing temperatures were reported across the Panhandle on the 30th and 31st.

OREGON

ORZ07, Biggs	16	1000PST			0	0	?	0	High Winds
ORZ10, Irrigon	16	1000PST			0	0	3	0	High Winds
ORZ11, Enterprise	16	1220PST			0	0	4	0	High Winds

The first strong Pacific frontal system of the fall season was followed by strong wind through Northern Oregon east of the Cascade Mountains. Wind gusts were in the 40-50 mph range. A tractor-semitrailer overturned on Highway 97 at Biggs. A tree was blown over on to a spotter's house in Irrigon. Several tall fir trees were blow over onto two cars parked at the Wallowa County Courthouse in Enterprise.

PENNSYLVANIA, Eastern

Lehigh County Germansville	06	0125EST			0	0	3	0	Thunderstorm Winds
1.5 SW Slatedale	06	0130EST			0	0	4	0	Thunderstorm Winds

Thunderstorm wind gusts downed trees in Germansville. Southwest of Slatedale, in Washington Township, wind gusts ripped shingles and siding from two buildings and ripped a gaping hole in the side of a barn. A portion of the roof to a small barn was blown off and several trees were uprooted or torn off.

Lancaster County Georgetown	17	1155EST			0	0	3	0	Thunderstorm Winds
Christiana	17	1205EST			0	0	3	0	Thunderstorm Winds

Thunderstorm wind gusts downed trees and utility lines.

PENNSYLVANIA, Western

None reported.

RHODE ISLAND

RIZ002	30- 31	1100EST- 0600EST			0	0	5	0	High Winds
RIZALL	31	0100EST- 0500EST			0	0	4	0	Coastal flood

A low pressure system formed in the Atlantic southeast of Nova Scotia on the 28th and intensified

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed Injured	Estimated Damage Property Crops	Character of Storm
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RHODE ISLAND Cont'd

as it moved west toward the New England coast. This system absorbed the remains of Hurricane Grace which was drawn north from a position east of Bermuda. An unusually strong area of high pressure (approximately 1043 MB., 30.8 inches) was centered to the north of New England and combined with the Atlantic low (approximately 978 MB., 28.9 inches) to produce a powerful "nor'easter" with gale force winds. Highest gusts reached 63 mph from the northeast at Newport and 55 mph at Warwick. On the 29th, a fisherman was swept off the rocks at Narragansett by heavy surf and presumed drowned. Only minor property damage occurred along the coast but many coastal roads were flooded by the early morning high tide on the 31st. A few boats were driven from their moorings. The high winds caused scattered brief power outages statewide.

SOUTH CAROLINA

None reported.

SOUTH DAKOTA

SDZ001-002-003-004-006-007-008-009-010-013-014-015	27	1900CST-			0	3	5	0	Winter Storm
	29	1200CST							

Western and Northern South Dakota

The first winter storm of the season moved across western and northern South Dakota. The storm produced widespread areas of snow and freezing rain. Strong winds also produced blowing snow which caused blizzard conditions. Some snowfall totals for the storm included:

Bison	11 inches	Pierre	5 inches
Buffalo	5 inches	Rapid City	3 inches
Hill City	8 inches	Spearfish	9 inches
Hot Springs	8 inches	Sturgis	8 inches
Lemmon	7 inches	Wall	6 inches

Many schools and businesses in western South Dakota were closed. Snow drifts, as high as 6 feet, made many roads impassable. Travel across western South Dakota was extremely difficult, if not impossible. Forty traffic accidents occurred in the Black Hills while five accidents were reported in Pierre. A tractor-semitrailer overturned east of Kadoka. Many major roads were closed at one time or another due to the snow.

The Rapid City Regional Airport was closed for most of the day on the 28th. Flights were resumed late in the day, but many passengers and air crews were delayed or temporarily stranded.

Freezing rain downed electric and telephone lines in Mobridge, Gettysburg, Belvidere, Midland, and Mission. Ice also broke six power poles in Walworth County. Some rural areas were without electricity for 30 hours. Three traffic accidents in Aberdeen were attributed to slippery roads due to freezing rain.

SDZ012-017-018-020, Southeastern South Dakota	31	1200CST-2359CST			0	50	5	0	Winter Storm
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A major low pressure system moved across the central plain states and spread snow across most of southeast South Dakota. Some snowfall reports included:

Brookings	4 inches	Sioux Falls	11 inches
Mitchell	4 inches	Vermillion	16 inches
Canton	12 inches	Yankton	14 inches

The snow caused massive traffic problems in the Sioux Falls area where 137 accidents occurred. Snow also closed the Sioux Falls Regional Airport during the night.

TENNESSEE

Sumner County Westmoreland	05	0230CST			0	0	4	0	Lightning
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Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	

TENNESSEE Cont'd

One house was destroyed by a fire after being struck by lightning.

Lawrence County Lawrenceburg	05	0745CST			0	1	0	0	Lightning
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One boy was injured when he was struck by lightning after touching a metal gate.

TEXAS, Northern

Fannin County 7 N Bonham	04	1634CST			0	0	?	?	Hail (0.75)
Delta County Pecan Gap	04	1709CST			0	0	?	?	Hail (0.75)
Hunt County 10 NE Lone Oak	04	1745CST			0	0	?	?	Hail (1.00)
Kaufman County Jiba	04	1810CST			0	0	?	?	Hail (1.75)
Kemp	04	1820CST			0	0	?	?	Hail (0.75)
Wood County 6 NE Quitman	04	1840CST			0	0	?	?	Hail (1.00)
Henderson County Gun Barrel City	04	1854CST			0	0	?	?	Hail (0.75)
Brown County Bangs	23	1605CST			0	0	?	?	Hail (1.75)
Zephyr	23	1820CST			0	0	?	?	Hail (1.75)
Cherokee County Alto	23	1730CST			0	0	3	?	Thunderstorm Winds

A downburst blew down power lines and large tree limbs.

Parker County Dennis	23	1734CST			0	0	?	?	Hail (1.75)
Archer County Archer City	23	1815CST			0	0	?	?	Hail (0.75)
1 N Scotland	23	1905CST			0	0	?	?	Hail (0.88)
Clay County 6 S Jolly	23	1925CST			0	0	?	?	Hail (0.88)
Palo Pinto County Strawn	23	2130CST			0	0	?	?	Hail (1.75)
Palo Pinto	23	2230CST			0	0	?	?	Hail (1.75)
Archer County 2 N Scotland	24	1805CST			0	0	?	?	Funnel Cloud
3 S Scotland	24	1807CST			0	0	?	?	Thunderstorm Winds Hail (0.75)

Strong winds were measured at 75 mph at Lake Arrowhead (3 miles south of Scotland).

Clay County Henriette	24	1845CST			0	0	?	?	Hail (0.88)
Montague County Nocona	24	1955CST			0	0	?	?	Hail (0.75)
Hardeman County Chillicothe	25	1638CST			0	0	?	?	Hail (0.88)
Wilbarger County 1 S Vernon	25	1754CST			0	0	?	?	Hail (1.00)
Stephens County Eolian	25	1825CST			0	0	?	?	Hail (1.75)
Breckenridge	25	1905CST			0	0	?	?	Hail (0.88)
Breckenridge	25	1920CST			0	0	?	?	Hail (0.75)
Palo Pinto County Mineral Wells	25	1949CST			0	0	?	?	Hail (1.75)
Haskell County Haskell	25	2000CST			0	0	?	?	Hail (1.75)
Parker County 5 NW Weatherford	25	2040CST			0	0	?	?	Thunderstorm Winds (G52)

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
TEXAS, Northern Cont'd									
1 N Weatherford Wise County	25	2053CST			0	0	?	?	Hail (1.75)
Decatur Denton County	25	2120CST			0	0	?	?	Hail (0.75)
Aubrey	25	2130CST			0	0	4	?	Thunderstorm Winds
Strong winds destroyed a barn that was valued at \$15,000 and lifted shingles off the roof of a residence.									
Jack County Joplin	25	2304CST			0	0	?	?	Hail (1.00)
Grayson County Sherman	25	2340CST			0	0	5	?	Thunderstorm Winds (G54)
Sherman	26	0000CST			0	0	?	?	Hail (0.75)
Pottsboro	26	0000CST- 0400CST			0	0	?	?	Flash Flood
Strong winds measured at 62 mph damaged the roof of a residence, blew down fences and several trees onto power lines, and lifted shingles off the roofs of residences. Heavy rains of 4.26 inches in a 6-hour period produced flash flooding of several creeks with high water observed up to 2 feet in depth over roadways in Pottsboro.									
Wise County	26	0020CST- 1100CST			0	0	?	?	Flash Flood
Heavy rainfall up to 8 inches in a 24-hour period resulted in the flash flooding of several roadways and low-lying areas near Cottdale. Several vehicles were swept away by high water at the intersection of State Highway 114 and Elizabeth Creek, State Highway 730 near Boyd, and at the Lake Bridgeport bridge off U.S. Highway 380.									
Palo Pinto County Mineral Wells	26	0030CST			0	0	?	?	Hail (1.00)
Dallas County Seagoville	26	0120CST			0	0	?	?	Thunderstorm Winds (G56)
Jack County Southern Portion	26	0200CST- 0500CST			0	0	?	?	Flash Flood
A heavy rainfall intensity measured near 4 inches in a 40-minute period resulted in the flash flooding of U.S. Highway 199 at Boons Creek where several vehicles were swept away into water several feet in depth.									
Dallas County Dallas	26	0202CST			0	0	?	?	Hail (0.75)
Parker County	26	0220CST- 1100CST			0	0	?	?	Flash Flood
Heavy rainfall of 5.34 inches in 24 hours at Springtown resulted in the flash flooding of State Highways 51 and 199 where several vehicles were swept off the roadway. Several swollen creeks produced flash flooding over numerous county and Farm-to-Market roads.									
Whichita County Whichita Falls	26	0225CST			0	0	?	?	Hail (0.75)
Whichita Falls	26	0230CST			0	0	?	?	Hail (1.75)
Archer County Holliday	26	0240CST			0	0	?	?	Hail (0.75)
Tarrant County	26	0400CST- 1100CST			0	0	?	?	Flash Flood
Heavy rains resulted in the flash flooding of low-lying areas in Lake Worth and three bridges along Farm-to-Market Road 730 in Azle.									
Denton County	26	0815CST- 1200CST			0	0	?	?	Flash Flood

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
TEXAS, Northern Cont'd									
Heavy rains of 3.80 to 4.50 inches in a 6-hour period resulted in several streams and creeks overflowing their banks over rural roadways at several locations.									
Anderson County Elmwood	26	1340CST			0	0	?	?	Hail (1.50)
Erath County 1 N Lipan	26	1600CST			0	0	5	?	Thunderstorm Winds
A downburst destroyed a mobile home.									
Jones County 1 W Hamlin	26	1615CST			0	0	?	?	Hail (1.75)
Comanche County Comanche	27	0040CST- 0830CST			0	0	?	?	Flash Flood
Several creeks overflowed their banks and produced flash flooding of several county roadways near Comanche.									
Tarrant County Tarrant	27	0045CST- 1100CST			1	0	?	?	Flash Flood
Heavy rains of 3.30 inches in a 3-hour period and over 5 inches in a 12-hour period resulted in the flash flooding of numerous roadways in Fort Worth, Arlington, Everman, and Mansfield. Several mobile homes and a portion of one school was flooded along Village Creek in Arlington. In Arlington, one fatality occurred at 0130 CST when a pickup truck was driven on a barricaded street that intersected Johnson Creek and was swept away. (M270)									
Parker County	27	0050CST- 1100CST			0	0	?	?	Flash Flood
State Highways 51 and 199 near Springtown were closed due to high water crossing over the roadway while one vehicle was swept off a low-water crossing over the roadway while one vehicle was swept off a low-water crossing in the Horseshoe Bend portion of southern Parker County.									
Dallas County	27	0100CST- 1100CST			0	0	?	?	Flash Flood
Heavy rains resulted in flash flooding of Johnson Creek in Grand Prairie where several homes were flooded. Over a dozen intersections were closed while several residences in the southwestern and southeastern portions of Dallas County were evacuated.									
Kaufman County Terrell	27	0130CST- 0700CST			0	0	?	?	Flash Flood
Heavy rains up to 6 inches in 24 hours resulted in several streams overflowing their banks onto several roadways and low-lying areas.									
Johnson County	27	0130CST- 0430CST			0	0	?	?	Flash Flood
Several creeks overflowed their banks and results in the closing of County Roads 1015 and 915.									
Hunt County Greenville	27	0430CST- 0830CST			0	0	?	?	Flash Flood
Heavy rains produced flash flooding of several roadways and low-water crossings.									
Franklin County Mount Vernon	27	0400CST- 0700CST			0	0	?	?	Flash Flood
High water was observed over several low-water crossings that intersected Farm-to-Market roads.									

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
TEXAS, Northern Cont'd									
Eastland County Cisco	27	0400CST- 0830CST			0	0	?	?	Flash Flood
									High water was observed over several low-water crossings near Cisco.
Camp County Pittsburg	27	0430CST- 0900CST			0	0	?	?	Flash Flood
									High water up to 6 inches deep, flooded a hospital and several roadways that intersected low-water crossings.
Rains County Emory	27	0500CST- 0800CST			0	0	?	?	Flash Flood
									A business observed high water up to 1 foot deep while flash flooding was observed at several low-water crossings.
Erath County Stephenville	27	0525CST- 0800CST			0	0	?	?	Flash Flood
									Flash flooding was widespread at low-water crossings that intersected most secondary roads in Stephenville while State Highway 914 was closed.
Bell County Temple	27	1000CST- 1300CST			0	0	?	?	Flash Flood
									Heavy rains resulted in the flash flooding of low-water crossings.
Archer County Holliday	27	2205CST			0	0	?	?	Hail (1.75)
Wichita County Wichita Falls	27	2208CST			0	0	?	?	Hail (1.00)
Wichita Falls	27	2218CST			0	0	?	?	Hail (2.75)
Ellis County Ennis	28	1030CST- 1200CST			0	0	?	?	Flash Flood
									Several roadways were closed at low-water crossings in Ennis.
Hunt County	28	1425CST- 1600CST			0	0	?	?	Flash Flood
									Heavy rains of 4.40 inches in 12 hours resulted in the flash flooding of Farm-to-Market Road 1565, State Highway 36 (located just north of State Highway 276), State Highway 69 North and 380, and all Interstate 30 service roads.
Harrison County 4 SW Scottsville	28	1545CST			0	0	?	?	Hail (1.00)
Hamilton County 4 W Evant	28	1600CST			0	0	?	?	Hail (1.75)
Falls County 4 S Marlin	28	1642CST			0	0	?	?	Hail (1.00)
Marlin	28	1800CST- 2000CST			0	0	?	?	Flash Flood
									Heavy rains produced flash flooding of low-water crossings along Farm-to-Market Roads 206, 3356, 1827, 455, and County Roads 466, 465, 9, 290, 279, 206, 277, and 372.
Fannin County Bonham	28	1655CST			0	0	?	?	Hail (1.75)
Countywide	28	1800CST- 29 0600CST			0	0	?	?	Flash Flood

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
TEXAS, Northern Cont'd									
Heavy rains up to 8.43 inches measured in a 24-hour period at Honey Grove resulted in the flash flooding of several roadways that intersected low-water crossings in Bonham, and Farm-to-Market Road 271 and 100.									
Henderson County 1 N Athens	28	1717CST			0	0	4	?	Thunderstorm Winds
A downburst lifted the roof off a mobile home.									
Hill County 10 NE Whitney	28	1738CST			0	0	?	?	Hail (1.75)
Woodbury	28	1742CST			0	0	?	?	Hail (1.75)
Countywide	28	2000CST-							
	29	0600CST			0	0	?	?	Flash Flood
Flash flooding was observed over Farm-to-Market Road 933, State Highway 171 at Covington, and Farm-to-Market roads near Blum.									
Hunt County	28	1800CST-							
	29	0800CST			0	0	?	?	Flash Flood
Flash flooding was observed along State Highways 36, 69 North, and 380, as well as Farm-to-Market Road 1565 and all Interstate 30 service roads.									
Grayson County	28	2030CST-							
		2300CST			0	0	?	?	Flash Flood
Heavy rains of 6.13 inches in 24 hours resulted in the flash flooding of a low-water crossing at Farm-to-Market Road 455 at Anna, and Farm-to-Market Road 3356.									
Coryell County Gatesville	28	2010CST			0	0	?	?	Hail (0.75)
Coryell	28	2035CST			0	0	?	?	Hail (0.75)
Red River County	28	2200CST-							
	29	0800CST			0	0	?	?	Flash Flood
Heavy rains up to 8 inches in a 24-hour period resulted in the flash flooding of several low-water crossings and low-lying areas.									
Northern Texas	29-								
	31				0	0	?	?	Flood
Heavy rains ranging from 5 to 10 inches across the northern portions of Texas that resulted in parts of the Trinity, Sabine, and Sulphur Rivers to surpass their flood stage by up to 10 feet in some sections, and resulted in considerable low-land flooding.									
Bell County Northern Portion	29	0030CST-							
		0300CST			0	0	?	?	Flash Flood
Flash flooding was observed near Morgans Point and on State Highway 317 between Moody and the state Highway 36 interchange.									
Bowie County	29	0300CST-							
		0600CST			0	0	?	?	Flash Flood
Flash flooding was observed at several low-water crossings.									
Rusk County Henderson	29	0320CST			0	0	3	?	Thunderstorm Winds
Strong winds blew a tree onto a power line.									
Erath County Bluffdale	29	0550CST			0	0	?	?	Hail (0.88)
Johnson County Godley	29	0815CST			0	0	4	?	Thunderstorm Winds

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
TEXAS, Northern Cont'd									
Strong winds damaged the roof of two homes and blew down a power pole.									
Dallas and Tarrant Counties	29	0900CST- 1200CST			0	0	?	?	Flash Flood
Heavy rains resulted in the flash flooding of numerous roadways, low-water crossings, and creeks. Several homes in Duncanville and Arlington were flooded by high water up to 2 feet deep.									
Gregg County 1 N Longview	29	1325CST			0	0	?	?	Hail (1.00)
Harrison County 10 NW Marshall	29	1342CST			0	0	?	?	Hail (1.75)
7 N Marshall	29	1345CST			0	0	?	?	Funnel Cloud
10 W Karnack	29	1355CST			0	0	?	?	Hail (1.00)
10 W Karnack	29	1355CST			0	0	4	?	Thunderstorm Winds
5 S Karnack	29	1450CST			0	0	?	?	Hail (0.88)
Strong winds blew down numerous trees 10 miles west of Karnack.									
Rusk County 12 SW Henderson	29	1420CST			0	0	3	?	Thunderstorm Winds (G52) Hail (0.88)
A downburst blew down several trees.									
Panola County 4 S Clayton	29	1448CST			0	0	3	?	Thunderstorm Winds Hail (0.88)
Strong winds blew down several trees on the western portion of Lake Marvail (4 miles south of Clayton).									
Marion County 2 W Gray	29	1450CST			0	0	?	?	Hail (1.25)
Bell County Killeen	29	1630CST			0	0	4	?	Thunderstorm Winds
A downburst lifted the roof off a church and damaged a billboard.									
TEXAS, Southern									
Jackson County 4 S Lolita	01	1635CST	.06	50	0	0	5	?	Tornado (F1)
The sheriff's office reported a tornado south of Lolita. The storm passed over the construction site of Formosa Plastics and demolished a portion of a building. Estimate damage to the building was a quarter of a million.									
Calhoun County 7 W Port Lavaca	01	1730CST			0	0	4	?	Thunderstorm Winds
Several trees were uprooted in Calhoun County along Highway 87 west of Port Lavaca.									
Harris County SW Houston	02	1505CST			0	0	2	?	Hail (1.00)
SW Houston	02	1505CST			0	0	2	?	Thunderstorm Winds
SW Houston	02	1525CST			0	0	3	?	Hail (1.00)
Quarter-size hail was reported across the southwest part of Houston in the late afternoon. Several windows were broken by the hail and high winds.									
Fort Bend County 11 N Sugarland	02	1545CST	.01	10	0	0	?	?	Tornado (F0)
A tornado was reported north of Sugarland by the public and the sheriff's office; no damage was									

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
TEXAS, Southern Cont'd									
reported.									
Williamson County Round Rock	28	1445CST			0	1	5	?	Thunderstorm Winds
A tractor-semitrailer was blown over onto a car while moving on Interstate 35. The only injuries were to the driver of the car. Several trees, a few roofs, and a commercial sign were damaged by gusty winds Monday afternoon. A utility pole was blown over and resulted in a power outage.									
Jefferson County Southern Portion	29	0100CST			0	0	4	?	Lightning
Port Arthur	29	0100CST			0	0	5	?	Thunderstorm Winds
Lightning caused several power outages across the southern part of the county. In Port Arthur, several trees and a fence were blown down by gusty winds.									
Bastrop County Smithville	29	1600CST			0	0	4	?	Lightning
Lightning struck a historical house in town causing extensive damage.									
Victoria County Victoria	29	1930CST			0	2	3	?	Lightning
Lightning struck a house destroying the chimney and shocking two youths inside. One youth was using the telephone the other was near the television.									
Jackson County 2 N Edna	29	2030CST			0	0	5	?	Lightning
Lightning caused a fire that destroyed seven oil storage tanks.									
Aransas County Rockport	30	0130CST- 0700CST			0	0	4	?	Flash Flood
The Rockport Police Department reported extensive street flooding from overnight rains. Several businesses in the downtown area inundated with 1 to 2 inches of water.									
San Patricio County	30	0330CST- 0700CST			0	0	4	?	Flash Flood
The San Patricio Sheriff's Office reported extensive street flooding in and around Gregory. Highway 881 was closed between Gregory and Rockport. The floating roofs of three oil tanks in Ingleside had their roofs sunk by the heavy rains.									
Nueces County Corpus Christi	30	0400CST- 0800CST			0	0	5	?	Flash Flood
The Corpus Christi Police Department reported extensive street flooding, several cars were flooded and a few homes reportedly had water in them.									
Cameron and Hidalgo Counties	30 31	0530CST- 0100CST			0	0	5	?	Flash Flood
Over 6 inches of rain fell across the area early Wednesday morning. Most of the rain fell within a 2 hour period causing extensive street flooding. Several homes had water in them and a few schools were dismissed early due to flooding.									
Galveston County Texas City	31	0835CST			0	0	?	?	Hail (1.75)
Texas City	31	0845CST			0	0	?	?	Hail (1.75)
The Texas City Police Department reported golf ball-size hail at 0835 CST. Golf ball-size hail was reported again 10 minutes later by the public.									

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
TEXAS, Western									
Presidio County									
Presidio	01 05	0000CST- 1130CST			0	0	3	3	Flood
Flooding continued along the Rio Grande River near Presidio. Although most of the significant damage occurred during late September, the river remained above flood state until late morning on the 5th. Minor damage to U.S. Highway 170 and to farmland near the river was reported.									
Borden County									
8 E Gail	25	1719CST			0	0	0	0	Hail (0.75)
The Borden County Sheriff's Office reported dime-size hail in eastern Borden County.									
Scurry County									
Snyder	25	1745CST			0	0	2	2	Hail (1.75)
Golf ball-size hail fell in and just west of Snyder. No significant damage resulted.									
Howard County									
Vincent	25	1855CST			0	0	0	0	Hail (0.75)
The Howard County Sheriff's Office reported dime-size hail in Vincent.									
Coke County									
5 N Robert Lee	26	1710CST			0	0	2	1	Hail (1.75)
The Department of Public Safety reported golf ball-size hail north of Robert Lee. No significant damage was observed.									
Howard County									
Big Spring	26	1803CST			0	0	0	0	Hail (0.75)
A SKYWARN spotter reported dime-size hail in Big Spring.									
Scurry County									
Snyder	26	1810CST			0	0	1	1	Hail (1.75)
Golf ball-size hail fell in Snyder; no significant damage resulted.									
Martin County									
4 N Stanton	26	1812CST			0	0	0	0	Hail (0.75)
The Martin County Sheriff's Office reported dime-size hail north of Stanton.									
Howard County									
Big Spring	26	1816CST			0	0	0	0	Hail (0.75)
A SKYWARN spotter reported dime-size hail in Big Spring at 1816 CST.									
Runnels County									
Winters	26	1830CST			0	0	3	2	Thunderstorm Winds
The Winter's Police Department reported damage to power poles, gas pumps, and trees from downburst winds. No injuries were noted.									
Howard County									
Big Spring	26	1840CST			0	0	2	1	Hail (1.00)
Big Spring	26	1907CST			0	0	2	2	Hail (1.75)
Big Spring	26	1915CST			0	0	1	1	Hail (1.75)
Big Spring	26	1915CST			0	0	3	0	Thunderstorm Winds
Big Spring	26	1928CST			0	0	3	0	Flash Flood

The thunderstorms which moved earlier into Howard County became stationary over Big Spring. Reports of quarter- to golf ball-size hail were received from SKYWARN spotters and the Howard County Sheriff's Office. No significant damage resulted from the hail. The Big Spring Police Department reported power lines downed by a microburst and flash flooding along Interstate 20. Several cars were swept off of the highway but no injuries resulted.

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
TEXAS, Western Cont'd									
Scurry County Snyder	26	1930CST			0	0	2	2	Flash Flood
									Torrential rainfall from thunderstorms resulted in extensive street flooding in Snyder. No injuries or significant damage resulted from the flooding.
Runnels County 5 W Norton 10 N Winters	26	1900CST- 2000CST			0	0	0	6	Hail
									Marble-size hail, driven by 35 to 45 mph wind gusts, damaged 8,000 acres of mature cotton in northwestern Runnels County. The hail accumulated in 4-inch deep drifts. Damage is estimated at near \$1 million.
Winters	26	2130CST			0	0	4	0	Thunderstorm Winds
									An apparent downburst snapped a 69,000 volt power line and damaged three houses in Winters.
Ector County Odessa 10 W Odessa	27	1607CST			0	0	2	0	Hail (1.75)
	27	1619CST			0	0	1	0	Hail (1.75)
									A SKYWARN spotter reported dime- to golf ball-size hail in western Odessa at 1607 CST. Ten minutes later, an amateur radio operator observed golf ball-size hail near Penwell. No significant damage resulted.
Bailey County 11 W Muleshoe	27	1640CST	0.5	30	0	0	3	1	Tornado (F0)
									A tornado touched down in northwestern Bailey County, damaging a mobile home. No injuries resulted.
Midland County 5 W Midland	27	1700CST			0	0	1	0	Hail (1.75)
									An off-duty National Weather Service employee reported golf ball-size hail 5 miles west of Midland. No significant damage was observed.
Dawson County 12 W Lamesa	27	1702CST	0.5	75	0	0	0	0	Tornado (F0)
									An off-duty National Weather Service employee observed a tornado in western Dawson County near the Sand community. No damage resulted.
Ector County Odessa	27	1704CST			0	0	2	0	Hail (1.75)
									A SKYWARN spotter reported dime- to golf ball-size hail in west Odessa.
Dawson County 12 S Welch 8 S Welch	27	1706EST- 1720CST	4.0	120	0	0	1	1	Tornado (F1)
									SKYWARN spotters, the Dawson County Sheriff's Office, and off-duty National Weather Service personnel observed a tornado in western Dawson County. The tornado touched down just north of the Sand community and moved 4 miles north before lifting. The tornado remained over open county and no significant damage was noted.
Pecos County 5 S Iraan	27	1730CST			0	0	3	0	Hail (2.75)
									The Pecos County Sheriff's Office reported golf ball-size to baseball-size hail between Iraan and Sheffield. The hail broke the windshield of a deputy sheriff's car.
Martin County 5 S Tarzan 4 S Tarzan	27	1740CST	0.5	50	0	0	0	0	Tornado(F0)
	27	1745CST-							

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
TEXAS, Western Cont'd									
3 SW Tarzan	27	1755CST	1.0	200	0	0	0	0	Tornado (F2)
		1830CST	0.3	20	0	0	0	0	Tornado (F0)
A supercell over southern Martin County produced three tornadoes. An off-duty National Weather Service employee reported a tornado 5 miles south of Tarzan. Five minutes later, a larger tornado developed 4 miles south of Tarzan. The Martin County Civil Defense reported a tornado 3 miles southwest of Tarzan at 1830 CST. The tornadoes remained over open country and no damage resulted.									
Hartley County 8 S Dalhart	27	1800CST			0	0	2	0	Flash Flood
The Dalhart Police Department reported flash flooding over a major highway south of Dalhart. The floodwaters washed a pickup truck off of the road, but no injuries resulted.									
Hockley County 6 SW Whitharral 5 NE Levelland	27	1841CST			0	0	0	1	Hail (0.88)
		1925CST			0	0	0	3	Hail (0.88)
The public reported nickel-size hail 6 miles southwest of Whitharral. Dime- to nickel-size hail was reported covering the ground northeast of Levelland. The hail caused minor damage to cotton crops in the area.									
Howard County Vealmoor 5 S Vealmoor Vealmoor	27	1933CST			0	0	2	0	Hail (2.75)
		1933CST			0	0	3	0	Thunderstorm Winds (G51)
		1945CST			0	0	2	0	Hail (1.75)
The public reported baseball-size hail and 60-mph wind gusts near Vealmoor in northern Howard County. Twelve minutes later, the Howard County Sheriff's Office observed golf ball-size hail in Vealmoor. No significant damage resulted from the hail, but a tin storage building was damaged by the wind.									
Borden County 12 SW Gail	27	2000CST			0	0	2	0	Hail (1.75)
The public reported golf ball-size hail in extreme southwestern Borden County. No significant damage resulted.									
Ector County Odessa Odessa Odessa	27	2040CST			0	0	3	0	Hail (2.75)
		2053CST			0	0	3	0	Hail (2.00)
		2055CST			0	0	1	0	Hail (1.00)
A severe thunderstorm moved over Odessa. Numerous reports of quarter- to baseball-size hail were received from the public. Minor damage to roofs and cars resulted from the hail.									
Dawson County 9 NE Lamesa	27	2141CST			0	0	2	0	Hail (0.88)
The public reported nickel-size hail 9 miles northeast of Lamesa. No significant damage resulted.									
Tom Green County Carlsbad Grape Creek	28	0134CST			0	0	2	1	Hail (1.75)
		0145CST			0	0	1	1	Hail (1.75)
A severe thunderstorm moved over northwestern Tom Green County. The sheriff's office reported golf ball-size hail in Carlsbad and near Grape Creek. No significant damage resulted.									
TXZ001-002-003-005, Panhandle	31	0000CST-1900CST			0	0	0	0	Heavy Snow
An early winter storm was tracked across the northern Panhandle. Snowfall totals of 4 inches were common across the area, with the heaviest snowfall of 7 inches occurring at Perryton. No casualties were reported with this storm.									

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons	Estimated Damage	Character of Storm	
					Killed	Injured	Property	Crops

UTAH

Millard County
Fillmore
Delta

23	1200MST				0	0	5	0	Lightning
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Lightning struck two different buildings at approximately the same time. The most damage was done in Fillmore. Lightning struck the main communications antenna at the Millard County Public Safety Building. The lightning bolt knocked out all power in the building, destroyed all the circuits, exploded plastic circuit casings, and welded stainless steel plates together. Although no one was injured, the dispatcher on duty at the time of the incident was knocked against a wall. The damage is estimated between \$60,000 to \$100,000.

Another lightning event occurred at approximately the same time in Delta 40 miles northwest of Fillmore. A lightning bolt hit Delta North Elementary School sending a minor surge of power through the electrical system, exploding bricks off the chimney smoke stack, and causing minor damage to the school's roof. No damage was done to the electric system. Damage here was slight compared to the first event with the damage estimate at less than \$500.

Washington County
St. George

24	0015MST				0	0	0	0	Thunderstorm Winds (G58)
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A cold front moving through southern Utah produced thunderstorms along, and just behind it. The automated reporting station at St. George reported a single 58-mph gust from one of these thunderstorms. This was an isolated event with no other reports of severe or near severe thunderstorm winds. In fact, 20 minutes later, the same station was only reporting gusts to 25 mph. The Utah Highway Patrol at St. George reported heavy rain and lots of lightning, but no damage of any kind.

UTZ010-011

27	0030MST-				0	0	0	0	
28	0800MST				0	0	0	0	Heavy Snow

A cold front moved into northwestern Utah during the midevening hours of the 27th, and the heavy snow began early in the morning of the 28th in the northwestern mountains. This spread south and east to all the mountains through the remainder of the 27th, and continued until the morning of the 28th. Amounts were in the 1- to 3-foot range with locally higher amounts of 41 to 51 inches in the Wasatch Mountains.

UTZ006

27	0600MST-				0	0	0	0	
28	0100MST				0	0	0	0	Heavy Snow

Heavy snow was produced in southwestern Utah from the cold front, and upper level disturbances that moved through the area after the front. Most of the amounts reported were in the 8- to 10-inch range.

UTZ003

27	1900MST-				0	0	0	0	
28	0700MST				0	0	0	0	Heavy Snow

With a moist, cold, and unstable air mass in place following the front, heavy snow was produced over the eastern half of Tooele County due to a northerly flow over the Great Salt Lake. Nine to ten inches of snow were reported from the area.

UTZ007-011

29	0600MST-				0	0	0	0	
30	0700MST				0	0	0	0	Heavy Snow

One more in a series of cold, winterlike storms brought snow to most of Utah. The brunt of this storm was felt over the southern portion of the state. One to two feet of snow was reported in the southern mountains while the valley locations received 7 to 8 inches.

VERMONT

Orleans County

06	1230EST-				0	0	?	0	Flood
	2100EST								

Caledonia County

06	1500EST-				0	0	?	0	Flood
	2100EST								

Windsor County

06	1840EST-				0	0	?	0	Flood
	2045EST								

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
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VERMONT Cont'd

Heavy rains associated with a cold front which moved through Vermont, resulted in flooding of parts of the state on the 6th. One to three inches of rain fell across much of the state between Saturday night of the 5th and Sunday night of the 6th. There were isolated reports of rainfall in excess of 4 inches in the parts of the Northeast Kingdom such as Lyndonville. Flooding was reported in fields along the Barton River, in Orleans County; along the Millers Run near Route 122 in Lyndonville, and the Passumpsic River, in Caledonia County; and along the Black River, between Ludlow and Cavendish in Windsor County. Much of the flooding was confined to fields and low-lying areas:

VIRGINIA

Loudoun County
1 SW Round Hill

05	2100EST				0	0	4	0	Lightning
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Lightning struck a barn, setting it afire; damage was estimated at \$20,000.

Zone 02
7 SE Oceana Naval
Air Station

30	0000EST-								
31	2400EST				0	0	5	0	Tidal Flooding

A strong, slow-moving storm, combined with high pressure over southeast Canada, produced a prolonged period of gusty northeast winds, heavy surf, and abnormally high water levels. Most damage occurred at times of high tide on the 30th and 31st. The highest levels were comparable to those reached during the storm of March 1962. At Sandbridge Beach, about 10 homes were damaged due to sand being removed from around the buildings; a bridge was also washed out. Only minimal damage occurred at other shore locations.

WASHINGTON

WAZ007-008-009-
010-011-012-013,
Eastern Washington

16	0900PDT- 1600PDT				4	?	7	?	High Winds
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The weather system that broke the 45-day dry spell in Seattle, moved into eastern Washington on the morning of the 16th. The strong winds along with the existing dry conditions in eastern Washington created large areas of near zero visibility in blowing dust. The winds also knocked down power lines which started numerous fires. By the time in was over, 104 homes had been destroyed (mostly around Spokane), an estimated 44,473 acres had been burned, numerous people were injured in car accidents, and four people died. Fire damage was the worst in Spokane, Stevens, and Pend Oreille Counties. Among the car accidents was a 25-car pile-up 30 miles north of Moses Lake and a 10-car pile-up 10 miles east of Marlin. All the major highways between Yakima, Pasco and Spokane were closed at one time or another during the event due to near zero visibility. Peak winds reported during the storm include: 61 mph at Spokane, 55 mph at Hanford, 47 mph at Walla Walla and Prosser, 46 mph at Pasco and Yakima, and 45 mph at Moses Lake. Property damage from the storm has been estimated to be around \$23 million. (F290) (M260)

WAZ008,009
Eastern Washington

21	1100PDT- 1500PDT				0	?	4	?	High Winds
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The second, strong cold front in 5 days caused high winds along the east slopes of the Cascades and in Grant County. Winds gusts to 58 mph were reported at the Kittitas County Airport, 62 mph at Wanapum Dam, and 48 mph at Priest Rapids Dam.

WAZ009,013
Eastern Washington

21	1200PDT- 1600PDT				0	?	0	0	Blowing Dust
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Winds gusting to 43 mph at Pasco and 35 mph Hanford created areas of near zero visibilities in blowing dust closing six highways in the area.

WAZ002
Western Washington

28	1300PDT- 1900PDT				0	?	0	0	Snow
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Warm air moving over the top of cold arctic air flowing out of the Fraser River valley, brought snow to the northwest corner of the state on the 28th. Snowfall amounts ranged from 1 inch on the north end of Whidbey Island, 3 inches in Bellingham and Anacortes, and 5 inches in the foothills above Port Angeles.

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	

WEST VIRGINIA

WV003-004-006- 007-008-010-011	01- 31				0	0	0	0	Drought
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The drought continued and spread back over the southern lowlands. Monthly rainfall totals were less than an inch in the Greenbrier and New River basins. Union of Monroe County had only 0.17 inch. The ground water supply began to fall.

WV003-004-005- 006-007-012 Southern and Central Counties	29- 31				0	0	?	0	Brush Fires
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A warm and dry weather pattern became established for the last 2 weeks of the month. The last significant rain was on the 15th. Temperatures were in the 70s and lower 80s with dew points as low as the 20s. Brush fires became widespread, using the fallen leaves as fuel. Governor Caperton declared a state of emergency late on the 29th. He banned all outdoor burning. By the 31st, the governor closed all forests in a 14 county region south of the Kanawha and New Rivers. The expanding smoke plume went southeast on the 31st, choking the Beckley/Bluefield region. Surface visibility was lowered to 0.25-mile at Beckley. The smoke was noticed as far away as the South Carolina coast.

By the end of the month, over 100,000 acres had burned. National Guard units, plus National Park Service and U.S. Forest Service firefighters were being activated to help state and local personnel. The fire episode continued into early November.

WISCONSIN

Dodge County Horicon	24	2324CST			0	0	?	0	Thunderstorm Winds
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A severe thunderstorm with strong winds bent over two traffic light poles and blew out windows to several businesses in Horicon.

WIZ001-003-006- 010-014 Extreme Northwest and Western	31 Nov02	Evening- Late Morning			2	0	5	?	Heavy Snow
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A major winter storm struck extreme west and northwest Wisconsin from late on Halloween into the morning hours of November 2nd. This storm dumped 15 to 35 inches of snow in the area with the highest totals falling along the Wisconsin-Minnesota border. Strong northwesterly winds created 6 to 10 foot drifts and combined with the wet heavy snow that downed trees and power lines. Two hunters were missing, and are presumed dead when their boat was found capsized in Lake Onalaska during the storm. The storm closed schools and businesses as well as bridges and public transportation systems, some for several days. In addition to the numerous accidents, hundreds of vehicles were abandoned by drivers. Football games and dog races were also cancelled. Snowfall amounts included 35 inches at Superior (Douglas County), 30 inches at Iron River (Bayfield County), Danbury (Burnett County), Balsam Lake (Polk County), Somerset (St. Croix County), and Prescott (Pierce County), and 26 inches at Spooner (Washburn County). (M260) (M290)

WYOMING

WYZ001-002	22 23	1700MST- 0500MST			0	0	0	0	Heavy Snow
------------	----------	---------------------	--	--	---	---	---	---	------------

A moist Pacific storm brought 1 foot of snow to portions of Yellowstone Park. Norris Junction in Yellowstone Park reported 16 inches of snow during the night.

WY029	23	0500MST- 1430MST			0	0	0	0	Heavy Snow
-------	----	---------------------	--	--	---	---	---	---	------------

Snow amounts of 6 to 8 inches were collected at Evanston during the day.

WYZ001-002	25 26	1800MST- 1300MST			0	0	0	0	Heavy Snow
------------	----------	---------------------	--	--	---	---	---	---	------------

Snowfall of 12 to 14 inches collected inside Yellowstone Park. Grant Village collected 18 inches of snow.

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
WYOMING Cont'd									
WYZ001-002-008	26	2000MST- 1000MST			0	0	0	0	Heavy Snow
									One foot of snow was reported from portions of Yellowstone Park and the mountains south of the Park. The south entrance to the park noted 13 inches during the night. Togwatee Pass on U.S. Highway 26 noted 8 inches of new snow.
WYZ050-056	27 28	1900MST- 0700MST			0	0	0	0	Heavy Snow
									A snow storm left 7 to 10 inches of snow on the eastern slopes of the Big Horn Mountains during the night.
WYZ013-014-015 016-017	27 28	0700MST- 0700MST			0	0	0	0	Heavy Snow
									Heavy snow was noted along and to the east of the Wind River Mountains the 27th, and morning of the 28th. Five miles south of Lander, 21 inches of new snow fell while the Lander Airport reported 14 inches of snow. Thermopolis reported 1 foot of snow with 11 inches of snow in Jeffrey City.
WYZ019	29 30	1800MST- 0600MST			0	0	0	0	Heavy Snow
									Meadowlark Lodge 15 miles east of Ten Sleep in the Big Horn Mountains, received 2 feet of snow in the night.
ALASKA, Northern									
AKZ007 Northern Slopes of the Alaska Range in the Tanana Valley	13 14	1900AST- 0800AST			0	0	?	0	Heavy Snow
									Heavy snow fell over the northern slopes of the Alaska Range. Seventeen inches was reported at Denali National Park Headquarters. At lower elevations in the Tanana Valley, places such as Fairbanks, had only 2 to 3 inches.
AKZ001-007 Northern Slopes of the Brooks Range of the Alaska Range	22 23	0800AST- 0800AST			0	0	?	0	Heavy Snow
									At Denali Park, in the Alaska Range, 8 inches of snow fell in 24 hours, and at Sag River Highway Camp, on the northern slopes of the Brooks Range, 6 inches of snow fell in the same interval.
AKZ024 Bering Strait Coast	20 21	2200AST- 1200AST			0	0	?	0	High Winds
									North winds to 45 mph through the Bering Strait blew on the nights of October 20th and 21st as high pressure continued to build from the Arctic.
AKZ004-005 Kobuk and Koyukuk Valleys	20 22	1800AST- 1800AST			0	0	?	0	Heavy Snow
									A surge of maritime air from the southwest caused 2 days of heavy snowfall over the northwestern interior of Alaska. Storm totals were as much as 15 to 17 inches at Coldfoot and Chandalar Road Camps.
AZK001 Arctic Slope Coast	22 22	1100AST- 2400AST			0	0	?	0	Blizzard
									Low pressure in the Arctic combined with high pressure over the interior portion to cause a westerly blizzard over the eastern Arctic coast. Winds to 40 mph and visibility commonly from zero to one-eighth mile accompanied this storm.
AKZ007 Western Tanana Valley	22	0400AST- 2000AST			0	0	?	0	Heavy Snow
									Southwesterly flow aloft brought 6 inches of snow to Fairbanks and 8 inches to Montana Creek on the 22nd.

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons Killed	Injured	Estimated Damage Property	Crops	Character of Storm
----------	------	----------------------------	---------------------------	--------------------------	--------------------------------	---------	---------------------------------	-------	--------------------

ALASKA, Northern Cont'd

AKZ024	26	1115AST-							
St. Lawrence Island	27	0600AST			0	0	?	0	High Winds

North winds sustained near 40-mph blew at Gambell all day on the 26th, and peak gusts were from 50 to 55 mph during the nights of the 26th and 27th.

ALASKA, Southern

St. Paul Island	05	0400AST			?	?	?	?	Record Low Temperature
-----------------	----	---------	--	--	---	---	---	---	------------------------

Twenty-five degrees recorded at St. Paul broke the previous record of 26 degrees that was set in 1987.

South-central Alaska	13- 14	1600AST			?	?	?	?	Record Snowfall
-------------------------	-----------	---------	--	--	---	---	---	---	-----------------

A 985 mb low moved north along the eastern side of the Kenai Peninsula resulting in a 11.6 inch snowfall in Anchorage. This established a new 24-hour snowfall record for the month of October and was one of the heaviest of all time. The old 24-hour record was 10 inches which was set on October 10, 1940. The rapid accumulation of heavy wet snow on the evening of the 13th resulted in widespread power outages across parts of Anchorage.

Kodiak Island	19	1600AST			?	?	?	?	Record High Temperature
---------------	----	---------	--	--	---	---	---	---	-------------------------

Low pressure near Anchorage and high pressure over the Bering Sea produced dry west to northwest winds over Kodiak Island. At Kodiak State Airport a temperature of 55°F was recorded and broke the old record high to date of 54°F which was set in 1982.

Valdez	23	1745AST			?	?	?	?	Record High Temperature
--------	----	---------	--	--	---	---	---	---	-------------------------

Warm downslope winds combined with clear skies allowed for the temperature to rise to 47°F which broke the old record of 46°F that was set in 1986.

Eastern Aleutians Alaska Peninsula Bristol Bay	25- 26	Unknown			?	?	?	?	High Winds
--	-----------	---------	--	--	---	---	---	---	------------

Low pressure produced strong winds and moderate rain. Cold Bay reported sustained winds of 55 mph with a peak gust of 67 mph. They also recorded 1.51 inches of rain.

Alaska Peninsula Bristol Bay Yukon and Kuskikwim Delta	28	Unknown			?	?	?	?	High Winds
---	----	---------	--	--	---	---	---	---	------------

Low pressure moving toward Nunivak Island brought 60 to 70 mph winds to Cold Bay and Port Heiden. Wind gusts measured at 50 to 60 mph were reported in the King Salmon and Bethel areas.

Cold Bay	31	1600AST			?	?	?	?	Record High Temperature
----------	----	---------	--	--	---	---	---	---	-------------------------

Record high temperature of 51°F broke the previous record of 50°F that was set in 1989.

Pribilofs	31	Unknown			?	?	?	?	Record Warmth
-----------	----	---------	--	--	---	---	---	---	---------------

Record high minimum temperature tied or broke for the 5th consecutive day. Also, two record daily highs were set during this period.

Kodiak Island	31- Nov 01	Unknown			?	?	?	?	Flood Record Rainfall
---------------	---------------	---------	--	--	---	---	---	---	--------------------------

An all-time 24-hour precipitation record was set at Kodiak State Airport with 7.79 inches of rain. This broke the old 24-hour record of 4.53 inches which was set in February 25, 1947. These heavy rains resulted in floods and mudslides that closed roads, destroyed two homes and caused the evacuation of 150 people from the city's largest hotel. Mudslides cut off electricity to some parts of town and closed the road to the airport for 2 days. City damage to streets, power, sewer, and water lines and other public facilities is estimated at \$5 million. Governor Walter J. Kickel declared the city a disaster area.

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
ALASKA, Southeastern									
AKZ013 Central South- eastern Alaska	21	Early Morning- Late Afternoon			0	0	?	0	High Winds
An area of strong surface high pressure built over interior Alaska and the Yukon Territory of Canada. This, in combination with a trough off the outer coast of southeastern Alaska, produced a strong northerly gradient over the panhandle. Sustained winds at Five Finger Lighthouse were recorded as high as 54 mph. Winds at Port Alexander reached 63 mph with one gust at 86 mph.									
AKZ013 Central South- eastern Alaska	29	Morning- Late Evening			0	0	4	0	Heavy Snow
A deep layer of cold air had settled over the Alaska Panhandle. On the 29th of October, a 1000 mb low moved to the eastern Gulf of Alaska, forcing moist air over the cold layer. The low then slid southeast along the outer coast of the panhandle on the 30th. During the evening of the 29th in Juneau, reported snow depths ranged from over 5 inches at the airport, to 8 inches in the Mendenhall Valley, to over 1 foot on the North Douglas Island. Between midnight and 0800 AST on the 30th, generally less than 1 inch of additional snow fell. This first significant snowfall of the season produced slick and hazardous roads, causing many traffic accidents.									
HAWAII									
Oahu	15- 16				0	0	0	0	Flash Flood
Two days of heavy rains beginning shortly after midnight on the 15th brought widespread, mainly minor flooding to the island of Oahu. The heaviest rain fell north of a line from Kaneohe to Nanakuli. Rainfall accumulations were mostly between 5 and 10 inches with some amounts near 15 inches in 48 hours. Flash flooding concentrated along the northern shore, and northern portions of the Windward Coast, central Oahu, and along the Waiānae Coast. Two soldiers, males in their 20's, drowned while attempting to ford a rainswollen stream near Kahuku. The heavy showers and thunderstorms formed in a nearly stationary convergence line from Oahu northward with the showers moving northeastward across the island bringing rains to lowlands and mountain areas alike. The island of Kauai shared in these spotty heavy showers.									
PACIFIC									
None reported.									
PUERTO RICO									
Culebra	03	1500AST	?	?	0	0	0	0	Waterspout
A waterspout was sighted by an aircraft about 0.50 mile east of Culebra.									
Culebra	05	1655AST	?	?	0	0	0	0	Waterspout
A pilot reported three waterspouts 2 miles north of Culebra.									
Culebra	14	1155AST	?	?	0	0	0	0	Waterspout
A small aircraft reported a waterspout 1 mile north of Culebra.									
Culebra	14	1340AST	?	?	0	0	0	0	Waterspout
Three waterspouts were observed 1 mile north of Culebra.									
Caguas	22	1400AST			0	0	5	0	Flash Flood
Heavy rains flooded several streets and low lying areas affecting a few houses. Also, thunderstorm winds downed several street signs.									
Barceloneta	29	Afternoon			1	0	0	0	Flash Flood
A person was fishing in the Manati River when a wall of water rushed downstream and swept him away. (H160)									
Z001-002-003-004	30 31	1400AST- All Day			1	0	6	0	Flood

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	

PUERTO RICO Cont'd

Large northerly swells, about 15 feet high, affected several municipalities along the coasts of Puerto Rico. Coastal flooding resulted in damages to recreational areas, utility lines, roads and streets, houses and businesses. The Department of Housing gave shelter to 32 people in Toa Baja, Loiza and San Juan. One person died while sitting on a rock along the shoreline in Aguadilla and the surf swept him away.

Large swells continued into the first days of November. (H170)

Z005	31	Afternoon			0	0	5	0	Flash Flood
------	----	-----------	--	--	---	---	---	---	-------------

Heavy rains associated to an upper trough, affected the towns of Ciales and Morovis. Damages in Ciales were to several municipal facilities, 152 houses, a bridge and the communications, sewer and electrical facilities. Morovis had to evacuate 18 families since their houses either had no roof or were flooded.

VIRGIN ISLANDS

St. Croix	08	1200AST	?	?	0	0	0	0	Waterspout
-----------	----	---------	---	---	---	---	---	---	------------

Two waterspouts were sighted 20 miles northwest of St. Croix.

St. Croix	08	1500AST	?	?	0	0	0	0	Waterspout
-----------	----	---------	---	---	---	---	---	---	------------

A waterspout was observed just off the coast northeast of St. Croix.

St. Croix	18	1232AST	?	?	0	0	0	0	Waterspout
-----------	----	---------	---	---	---	---	---	---	------------

Several waterspouts were observed around 7 miles northwest of St. Croix.

St. Croix	19	1320AST	?	?	0	0	0	0	Waterspout
-----------	----	---------	---	---	---	---	---	---	------------

A pilot reported a waterspout 15 miles northwest of St. Croix.

St. Croix	21	1000AST	?	?	0	0	0	0	Waterspout
-----------	----	---------	---	---	---	---	---	---	------------

A naval aircraft spotted a waterspout 15 miles northwest of St. Croix.

St. Thomas	21	1739AST	?	?	0	0	0	0	Waterspout
------------	----	---------	---	---	---	---	---	---	------------

Personnel from St. Thomas Airport reported a waterspout about 3 miles south of the airport.

St. Croix	22	1650AST	?	?	0	0	0	0	Waterspout
-----------	----	---------	---	---	---	---	---	---	------------

A pilot reported two waterspouts 10 miles west of St. Croix.

St. Thomas	23	1300AST	?	?	0	0	0	0	Waterspout
------------	----	---------	---	---	---	---	---	---	------------

A waterspout was sighted 3 miles of St. Thomas.

St. Thomas	23	1545AST	?	?	0	0	0	0	Waterspout
------------	----	---------	---	---	---	---	---	---	------------

A waterspout was reported 4 miles north of St. Thomas.

St. Croix	25	1500AST	?	?	0	0	0	0	Waterspout
-----------	----	---------	---	---	---	---	---	---	------------

A small craft reported two waterspouts 15 miles north of St. Croix.

St. Thomaas	30	0705AST	?	?	0	0	0	0	Waterspout
-------------	----	---------	---	---	---	---	---	---	------------

A waterspout was reported about 1 miles south of St. Thomas Airport.

Storm Data and Unusual Weather Phenomena

October 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	

APRIL 1991

ADDITIONS

KANSAS

Sedwick County

1 W Valley Center to
3 E Sedwick

26	1710CST	11.0	50	0	0	4	0	Tornado (F1)
----	---------	------	----	---	---	---	---	--------------

Tornado touched down west of Valley Center damaging a few trees. It then travelled northeast into Sedwick County (see Harvey County 1716).

Sedwick County

7 NW Wichita

26	1710CST			0	0	0	0	Hail (0.75)
----	---------	--	--	---	---	---	---	-------------

Three quarter inch hail observed at the NWS office in Wichita.

Harvey County

3 E Sedwick to
6 NE Sedwick

26	1716CST	5.0	10	0	0	0	0	Tornado (F0)
----	---------	-----	----	---	---	---	---	--------------

Small tornado moved in from Sedwick County damaging trees at a rest area along Interstate 135. People at the rest area sought shelter in the rest rooms. Storm spotters estimated winds at 60 to 80 mph.

Jackson County

3 N Whiting

26	1722CST			0	0	0	0	Hail (0.75)
----	---------	--	--	---	---	---	---	-------------

Cowley County

5 W Arkansas City to
3 NW Burden

26	1730CST	25.0	500	1	0	7	4	Tornado (F4)
----	---------	------	-----	---	---	---	---	--------------

Tornado touched down 6 miles west of Arkansas City moving northeast passing west of Arkansas City to south of Hackney where it destroyed several homes. It went east of Winfield to near Tisdale. Near Tisdale, a woman was killed when she stayed in her mobile home, even though other residents had warned her of the tornado. The tornado dissipated 3 miles northwest of Burden. Property damage in Cowley County was \$3,675,900 to homes, \$1,577,950 to farm buildings, \$50,000 to schools and \$344,500 to a radio tower.

CORRECTIONS

JUNE 1991

CONNECTICUT

New Haven County

16	1455EST- 1515EST			0	0	4	0	Thunderstorm Winds
----	---------------------	--	--	---	---	---	---	--------------------

Downed trees caused power outages in many towns, including Seymour, Beacon Falls, Oxford, Southbury, Hamden, Naugatuck, and Bethany. A house was damaged by a falling tree in Naugatuck.

SEPTEMBER 1991

OREGON

Crook County

5	1445PST- 1600PST			1	0	6	6	Flash Flood
---	---------------------	--	--	---	---	---	---	-------------

A wall of water that was five-feet by 200-feet wide, rolled out of Newsome Creek Canyon and into the Aspen Valley Ranch, 2 miles southeast of Post. One man drowned after the section of fence he was holding onto broke loose. Farm equipment, autos, and animals were moved from 1 to 6 miles downstream. (M230)

SOUTH CAROLINA

Storm Summary (page 57)

Lightning deaths and injuries entered as 0 should read 1 each, with the National Total entered as 5 deaths and 36 injuries should read 6 deaths and 37 injuries.

STORM SUMMARY

October 1991

TYPE	ALABAMA	ARIZONA	ARKANSAS	CALIFORNIA	COLORADO	CONNECTICUT	DELAWARE	FLORIDA	GEORGIA	IDAHO	ILLINOIS	INDIANA	IOWA	KANSAS	KENTUCKY	LOUISIANA	MAINE	MARYLAND & D.C.	MASSACHUSETTS	MICHIGAN	MINNESOTA	MISSISSIPPI	MISSOURI	MONTANA	NEBRASKA	NEVADA	NEW HAMPSHIRE
TORNADOES	0				0				0						0											0	
Number			1	1							2					2											
Days			1	1							1					1											
Deaths			0	0							0					0											
Injuries			0	0							0					0											
Property Damage			0	0							0					0											
Crop Damage			0	0							0					0											
HAIL																											
Deaths		0	0								0					0											
Injuries		0	0								0					0											
Property Damage		0	0								0					0											
Crop Damage		0	0								0					0											
THUNDERSTORM WINDS																											
Deaths											0	0				0				0							
Injuries											0	0				0				0							
Property Damage											0	0				0				0							
Crop Damage											0	0				0				0							
HIGH WINDS																											
Deaths				1				0																			
Injuries				0				14																			
Property Damage				0				0																			
Crop Damage				0				0																			
LIGHTNING																											
Deaths																											
Injuries																											
Property Damage																											
Crop Damage																											
FLASH FLOODS																											
Deaths																											
Injuries																											
Property Damage																											
Crop Damage																											
FLOODS																											
Deaths							0	0																			
Injuries							0	0																			
Property Damage							0	0																			
Crop Damage							0	0																			
HEAVY SNOWSTORMS AND BLIZZARDS @																											
Deaths																											
Injuries																											
Property Damage																											
Crop Damage																											
ICE STORMS #																											
Deaths																											
Injuries																											
Property Damage																											
Crop Damage																											
HURRICANES AND TROPICAL STORMS																											
Deaths																											
Injuries																											
Property Damage																											
Crop Damage																											
ALL OTHERS																											
Deaths																											
Injuries																											
Property Damage																											
Crop Damage																											

SEE REFERENCE NOTES FOR STORM DAMAGE CATEGORIES

STORM SUMMARY

October 1991

TYPE	NEW JERSEY	NEW MEXICO	NEW YORK	NORTH CAROLINA	NORTH DAKOTA	OHIO	OKLAHOMA	OREGON	PENNSYLVANIA	RHODE ISLAND	SOUTH CAROLINA	SOUTH DAKOTA	TENNESSEE	TEXAS	UTAH	VERMONT	VIRGINIA	WASHINGTON	WEST VIRGINIA	WISCONSIN	WYOMING	ALASKA	HAWAII	PACIFIC	PUERTO RICO	VIRGIN ISLANDS	NATIONAL TOTALS	INJURY DEATHS
TORNADOES				110030			700000				0			800000														
Number																												
Days																												
Deaths																												
Injuries																												
Property Damage																												
Crop Damage																												
HAIL																												
Deaths																												
Injuries																												
Property Damage																												
Crop Damage																												
THUNDERSTORM WINDS																												
Deaths																												
Injuries																												
Property Damage																												
Crop Damage																												
HIGH WINDS																												
Deaths																												
Injuries																												
Property Damage																												
Crop Damage																												
LIGHTNING																												
Deaths																												
Injuries																												
Property Damage																												
Crop Damage																												
FLASH FLOODS																												
Deaths																												
Injuries																												
Property Damage																												
Crop Damage																												
FLOODS																												
Deaths																												
Injuries																												
Property Damage																												
Crop Damage																												
HEAVY SNOWSTORMS AND BLIZZARDS a																												
Deaths																												
Injuries																												
Property Damage																												
Crop Damage																												
ICE STORMS #																												
Deaths																												
Injuries																												
Property Damage																												
Crop Damage																												
HURRICANES AND TROPICAL STORMS																												
Deaths																												
Injuries																												
Property Damage																												
Crop Damage																												
ALL OTHERS																												
Deaths																												
Injuries																												
Property Damage																												
Crop Damage																												
TOTALS																												
Deaths																												
Injuries																												
Property Damage																												
Crop Damage																												

SEE REFERENCE NOTES FOR STORM DAMAGE CATEGORIES

STORM DAMAGE CATAGORIES

REFERENCE NOTES

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

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

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

Definition of Fujita Tornado Scale (F scale)

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

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

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

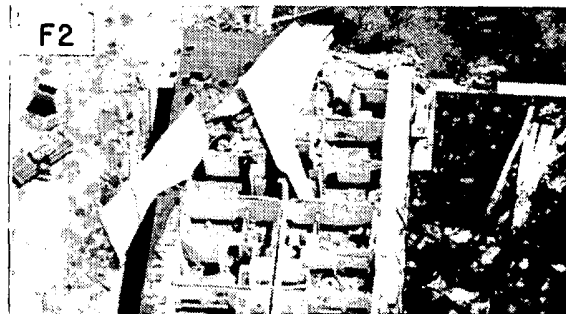
(F3) Severe tornado (158-206 mph): Severe damage
Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off ground and thrown.

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

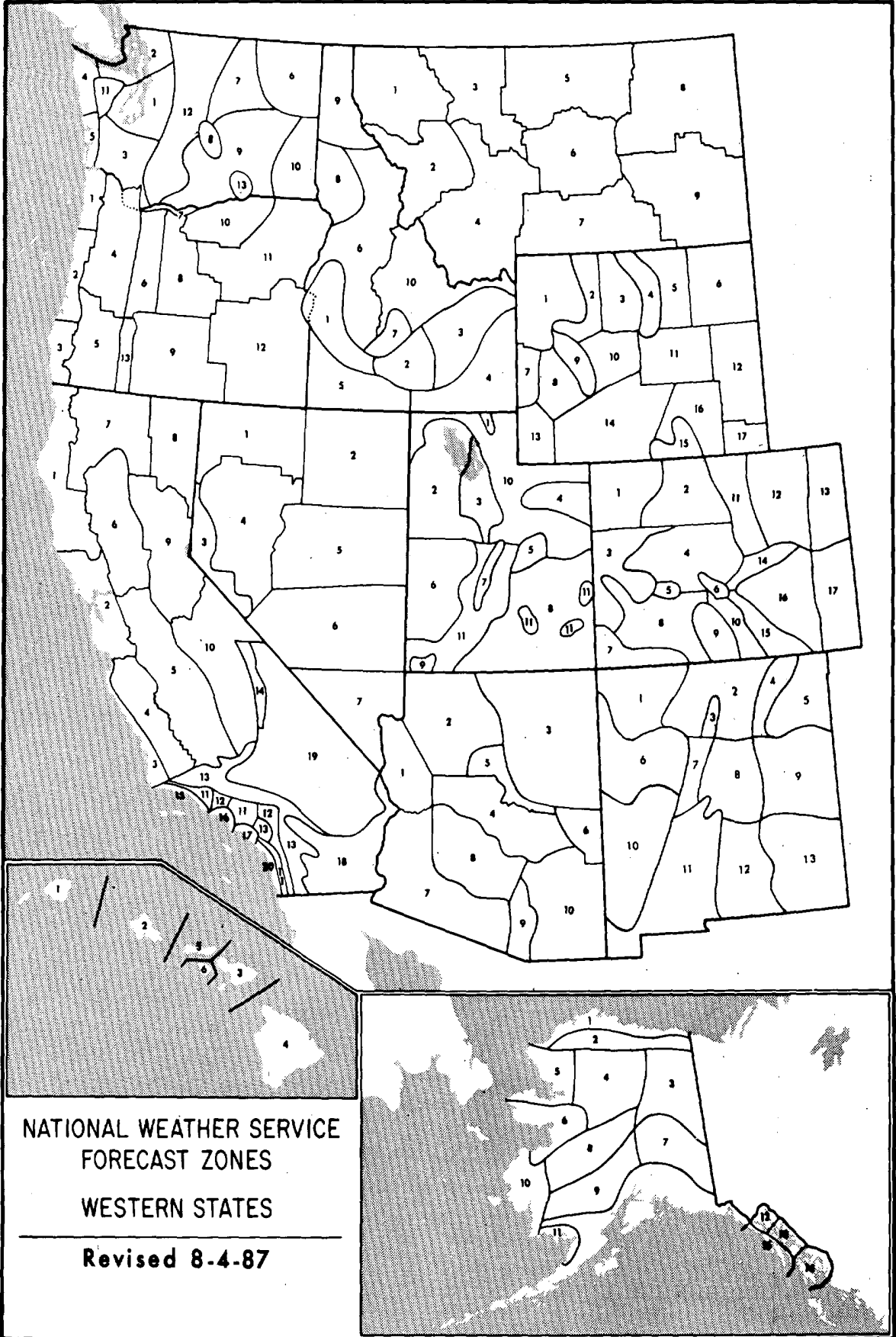
(F5) Incredible tornado (261-318 mph): Incredible damage
Strong frame houses lifted off foundations and carried considerable distance to disintegrate; automobile-sized missiles fly through the air in excess of 100 m; trees debarked; incredible phenomena will occur.

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

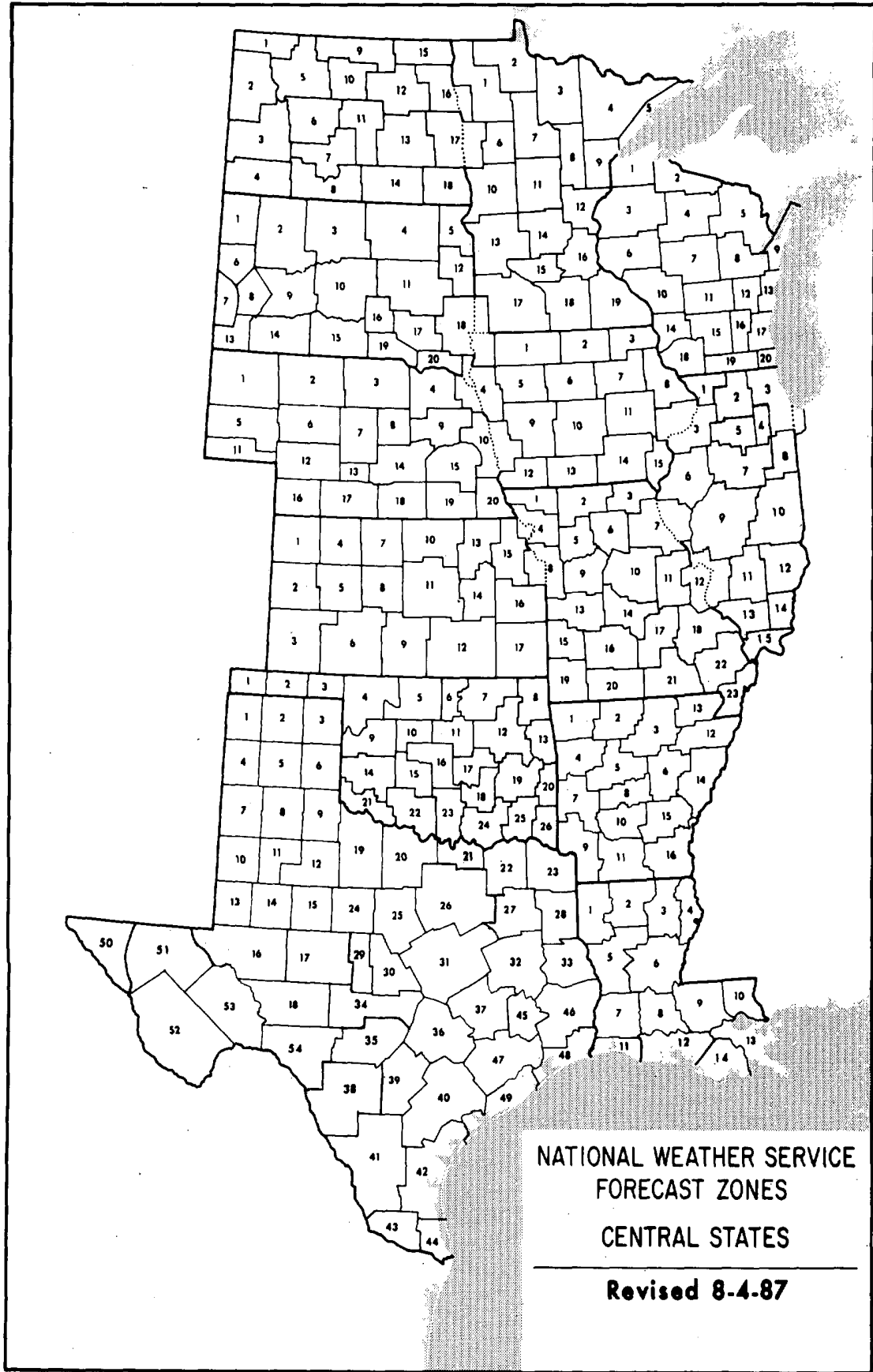
-
- (F0+F1) Weak Tornado
 - (F2+F3) Strong Tornado
 - (F4+F5) Violent Tornado
-



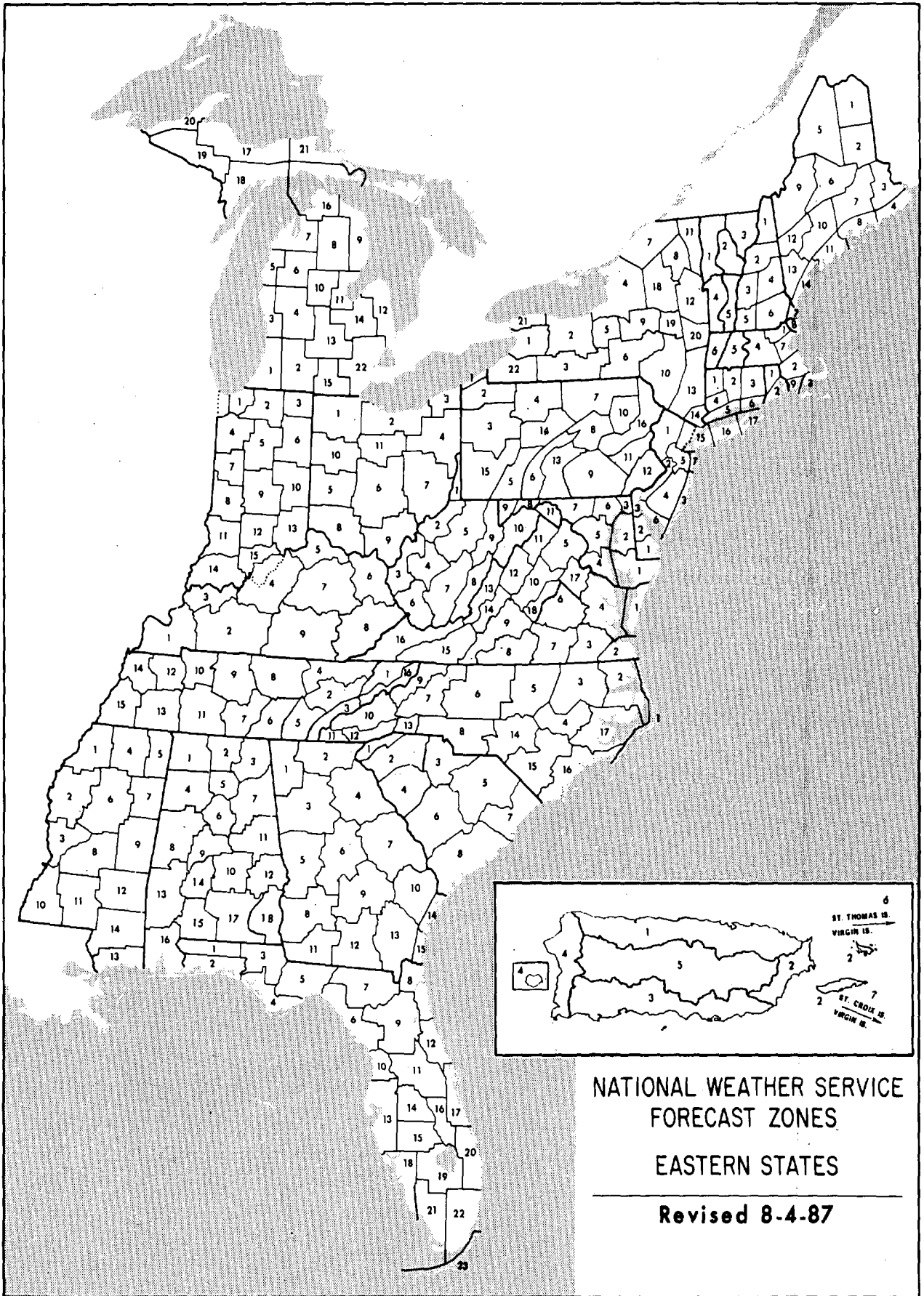
From J. Atmos. Sci., August 1981, p. 1517-1519



NATIONAL WEATHER SERVICE
FORECAST ZONES
WESTERN STATES
Revised 8-4-87



NATIONAL WEATHER SERVICE
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CENTRAL STATES
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FORECAST ZONES

EASTERN STATES

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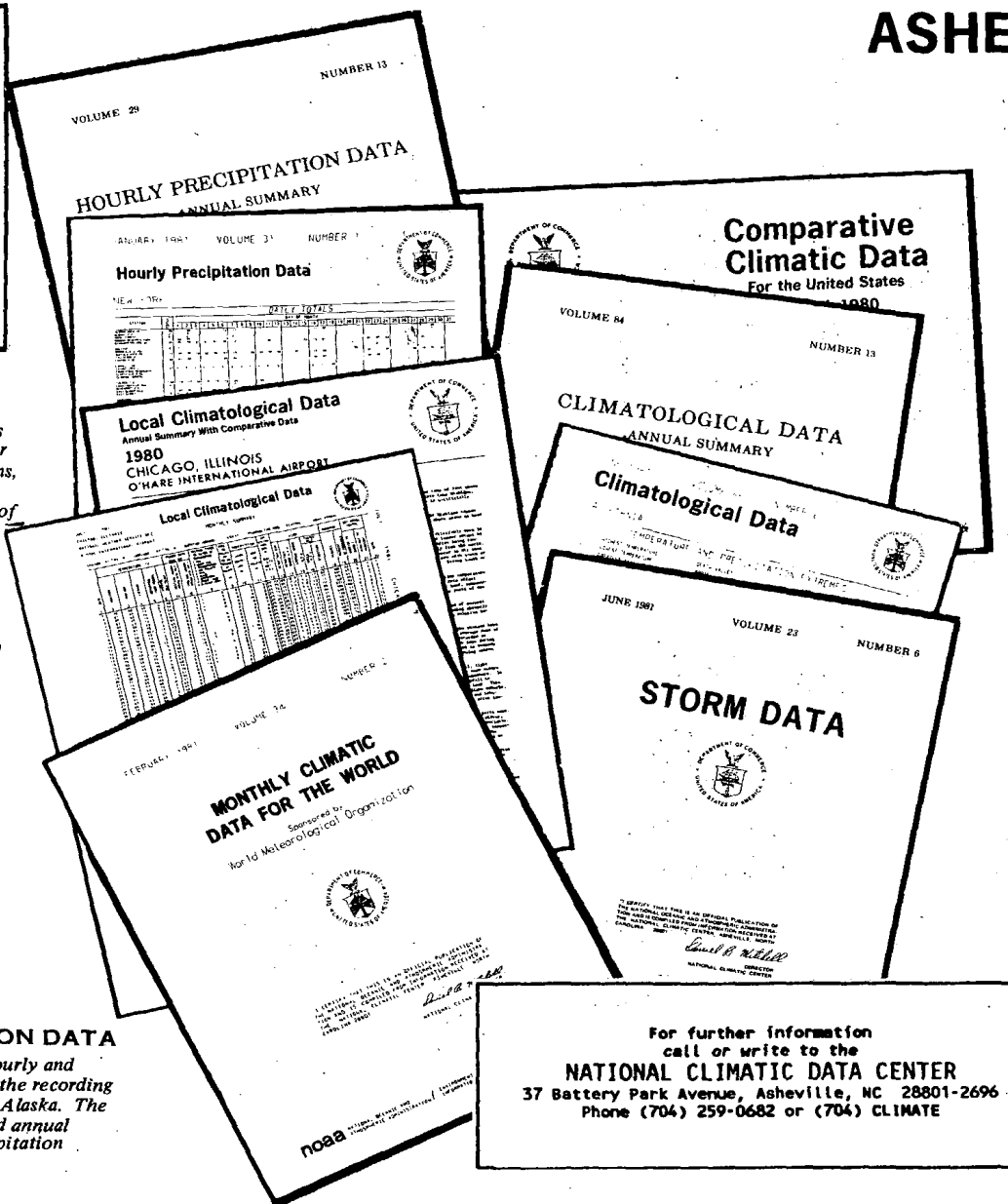
Monthly issue presents a chronological listing, by states, of occurrences of storms and unusual weather phenomena, together with data on the paths of individual storms, deaths, injuries, and estimated property damage, and a brief narrative description of each event. A new section in the bulletin entitled "OUTSTANDING STORMS OF THE MONTH" highlights severe weather and includes descriptive photographs of storms, their tracks, and analyzed maps. The December issue includes annual summaries of tornadoes and lightning and North Atlantic tropical cyclones.

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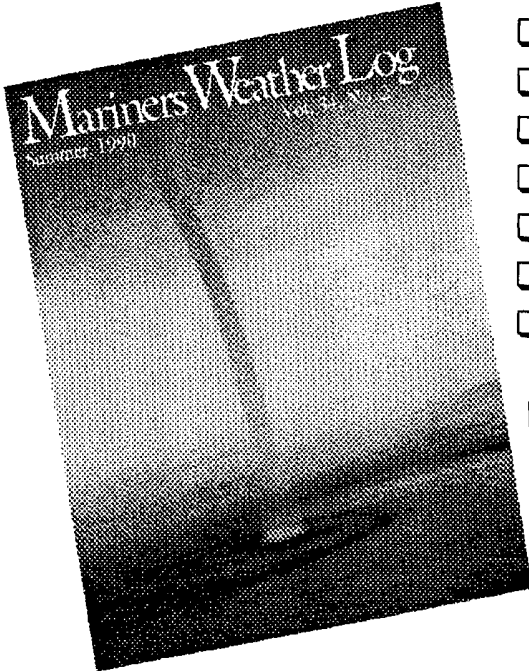
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