

NOVEMBER 1991

VOLUME 33

NUMBER 11

# STORM DATA

AND UNUSUAL WEATHER PHENOMENA  
WITH LATE REPORTS AND CORRECTIONS



**noaa** NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION / NATIONAL ENVIRONMENTAL SATELLITE, DATA, AND INFORMATION SERVICE / NATIONAL CLIMATIC DATA CENTER ASHEVILLE, N.C.

**Cover:** An aerial view of the Woodbride Estates subdivision, located in southeast Springfield, Missouri. On November 29, an F4 strength tornado struck the subdivision and killed one man. The tornado was on the ground for approximately 20 minutes and caused an estimated \$15 million in damage. See page 9 for further information. (Photo courtesy: Jim Krampfer, NWSFO St. Charles, MO., photo by Bob Linder, The News-Leader.)

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### STORM DATA

(ISSN 0039-1972)

National Climatic Data Center

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**STORM DATA** is prepared, funded, and distributed by the National Oceanic and Atmospheric Administration (NOAA). The Outstanding Storms of the Month section is prepared by the Data Operations Branch of the National Climatic Data Center.

The Storm Data and Unusual Weather Phenomena narratives, as well as, the Hurricane/Tropical Storm summaries are prepared by the National Weather Service. Monthly and annual statistics of tornado and lightning events that resulted in any deaths, injuries, or damage are compiled by the cooperative efforts of 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.

Maps of the National Weather Service Forecast Zones which are used in the Storm Data and Unusual Weather Phenomena section will be printed in all editions.

Except for limited editing to correct grammatical errors, materials submitted are generally published as received.

Subscription, pricing, and ordering information is available from:

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Asheville, NC 28801-2733  
(704) 259-0682 or (704) CLIMATE

The editor of **STORM DATA** solicits 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:

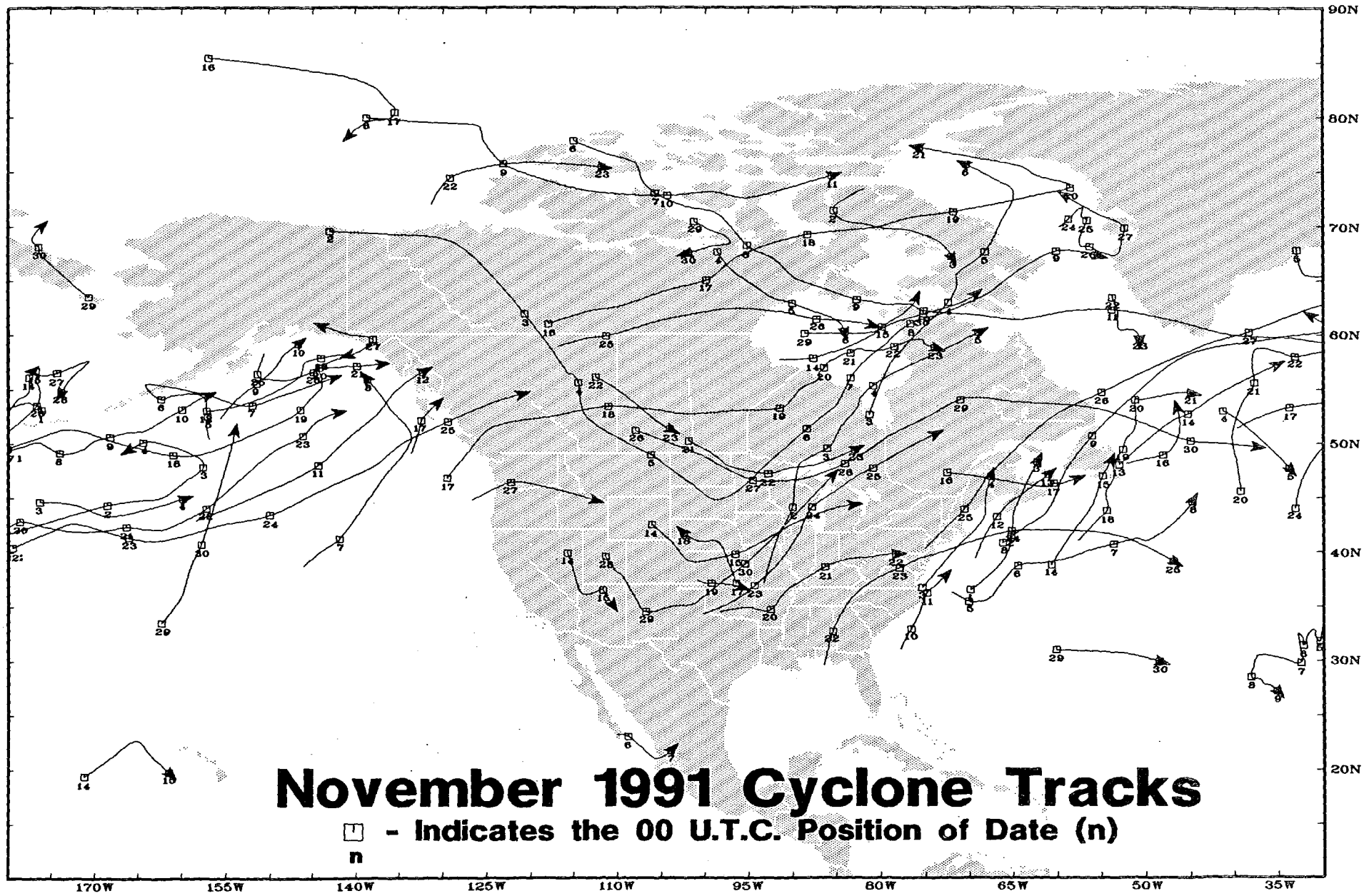
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Director  
National Climatic Data Center



# November 1991 Cyclone Tracks

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

170W 155W 140W 125W 110W 95W 80W 65W 50W 35W

90N  
80N  
70N  
60N  
50N  
40N  
30N  
20N

# CLIMATIC DATA OF THE MONTH

## PRECIPITATION AND TEMPERATURE ANOMALIES - NOVEMBER 1991

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

November 1991 ranked as the 12th coldest November since 1895. Well below normal temperatures occurred in the north-central states and northern Alaska where mean monthly temperature departures were as much as -6°F. Parts of the East North Central region recorded monthly temperature departures of -8°F. Regionally, the South and East North Central region recorded their sixth and eighth coldest November, respectively. In contrast, above normal mean monthly temperatures were experienced in the Northeast, Far West, and parts of the mid-Atlantic and southern Florida. Departures of +2°F occurred in scattered areas of the Far West and Northeast. Southern Alaska and Hawaii also observed above normal temperatures. (See Figures 2 and 3 on page 5.)

November 1991 saw storm systems bring record snowfall, freezing rain, and cold arctic air to the nation's midsection. Above normal precipitation occurred in this area and the Northwest region, the Appalachians, the Northeast, and southern Alaska. The East North Central and Southwest regions recorded their second and sixth wettest November, respectively. Extremely dry conditions occurred over California, most of Texas, Florida, and the mid-Atlantic area. Northern Alaska and Hawaii were also very dry. Regionally, the West had their 14th driest November on record. Overall, November 1991 ranked as the 34th wettest November on record, since 1895. (See Figures 4 and 5 on page 6.)

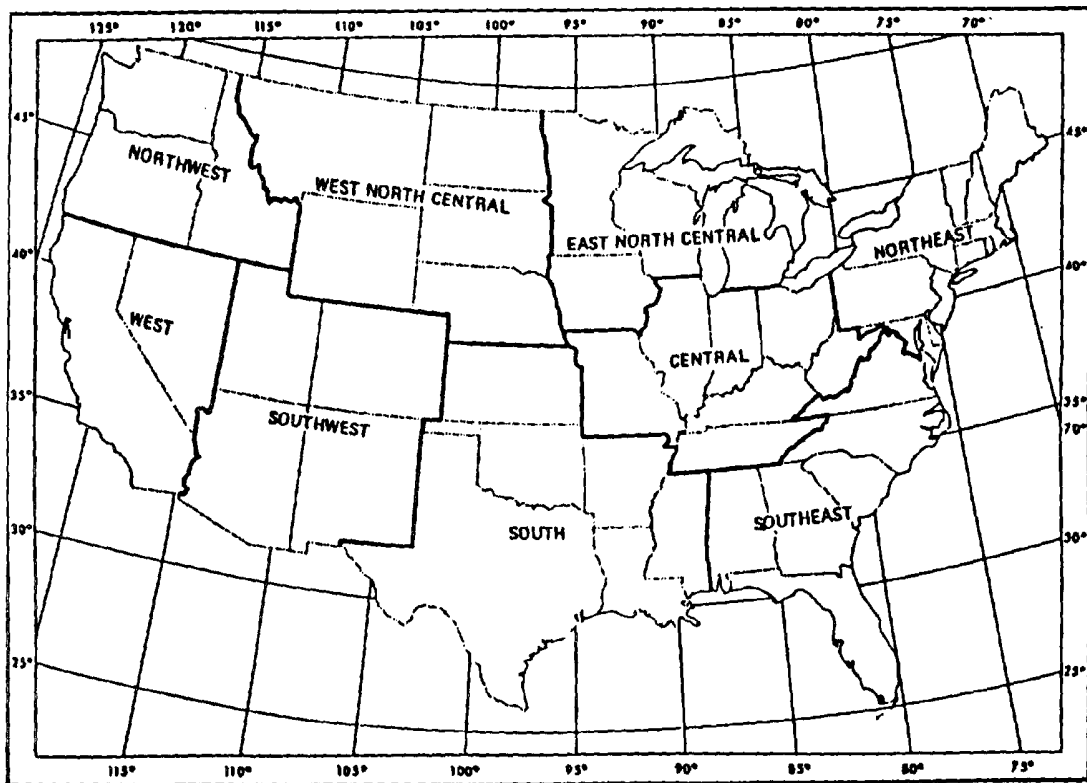
**TABLE 1. TEMPERATURE AND PRECIPITATION RANKINGS FOR NOVEMBER 1991, BASED ON THE PERIOD 1895-1991.**

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

REGION	PRECIPITATION	TEMPERATURE
Northeast	39	62
East North Central	96	8
Central	60	17
Southeast	43	25
West North Central	83	12
South	44	6
Southwest	92	25
Northwest	66	42
West	14	63
National	64	12

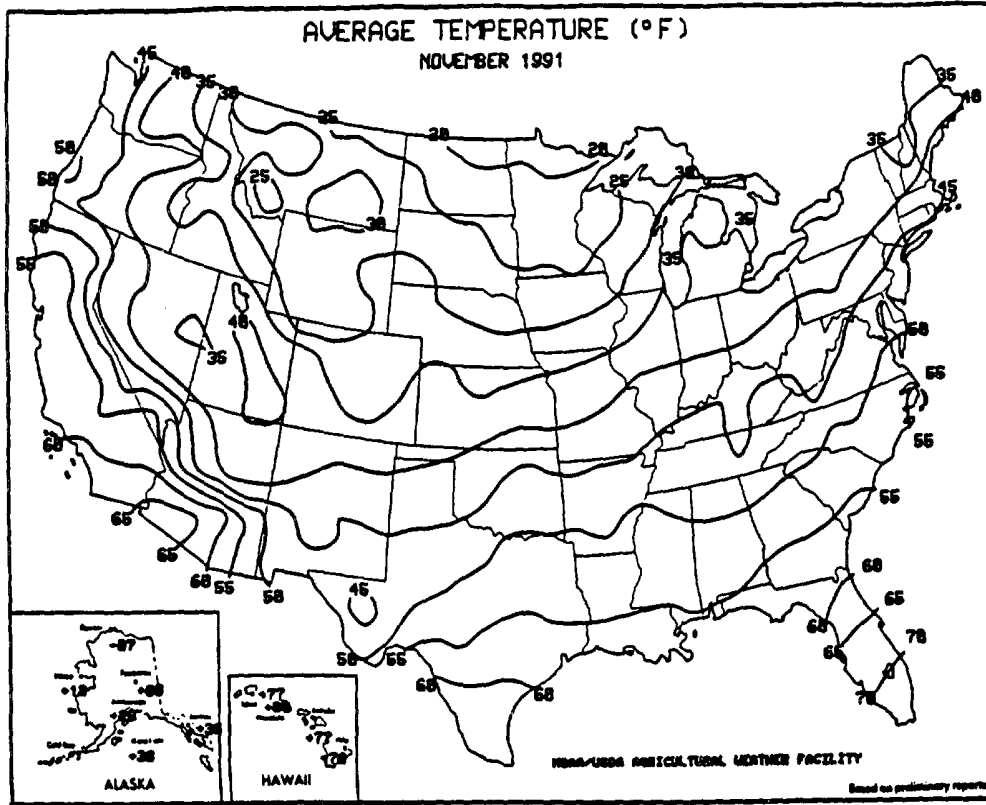
*From National Climatic Data Center*

Fig. 1



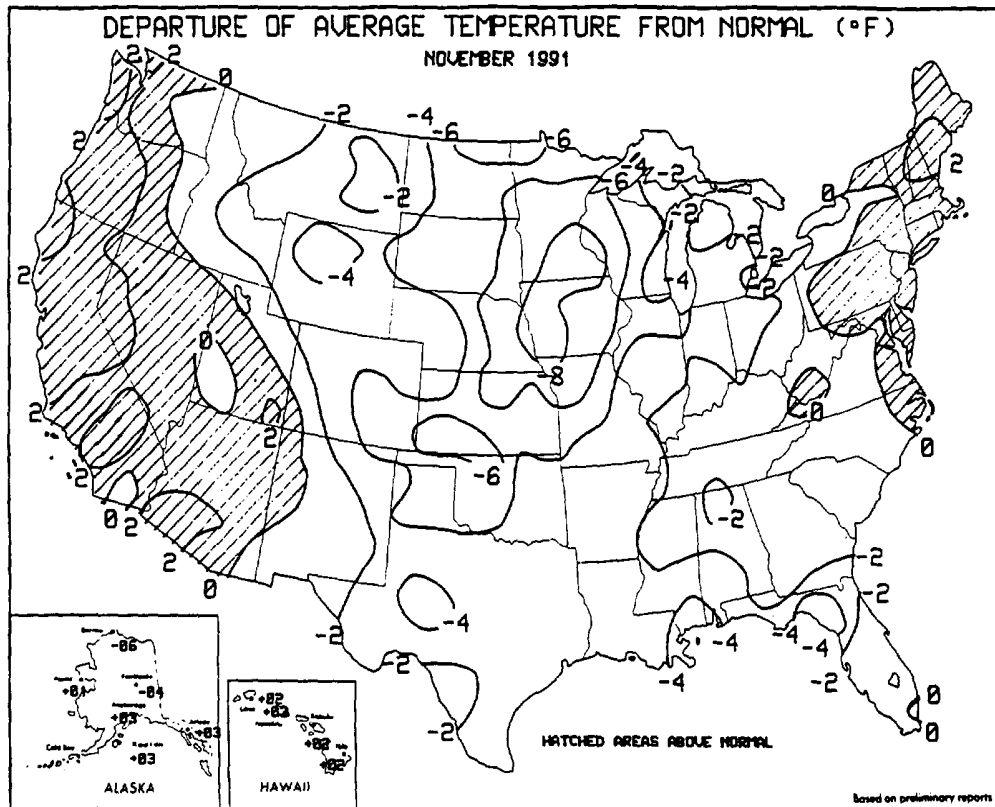
*From National Climatic Data Center*

Fig. 2



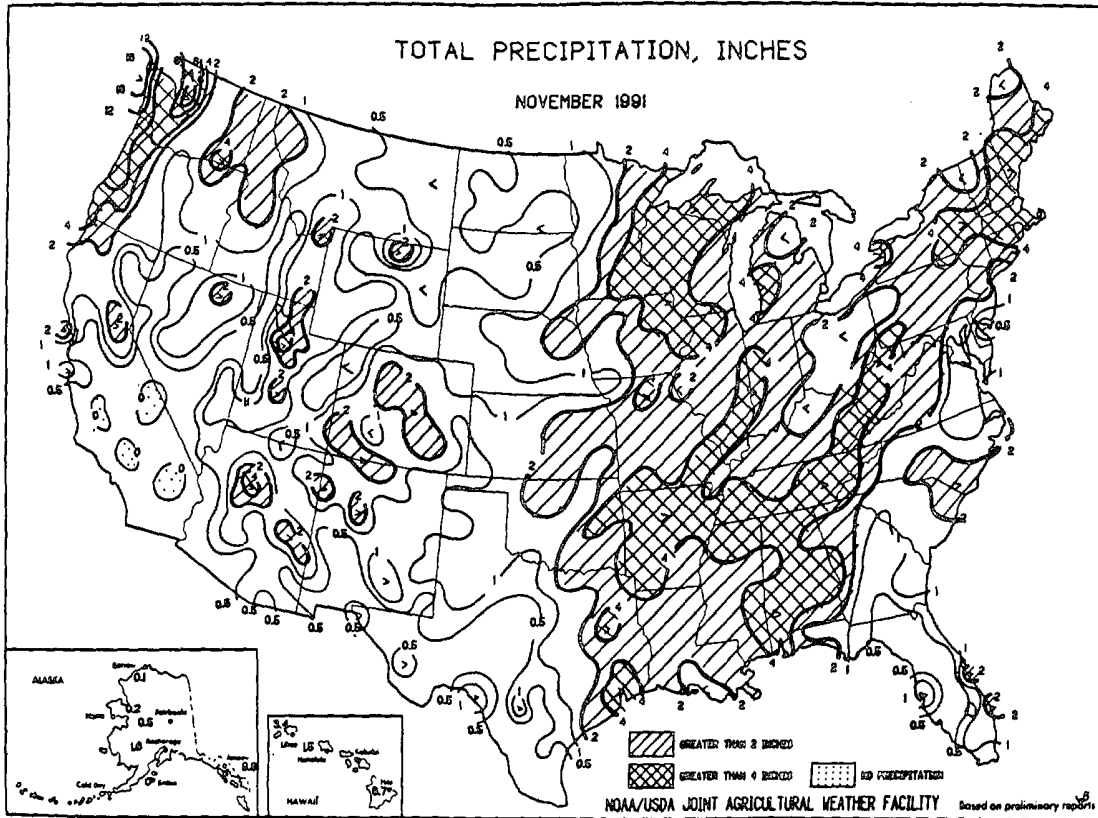
Reprinted from *Weekly Weather and Crop Bulletin* - December 10, 1991

Fig. 3



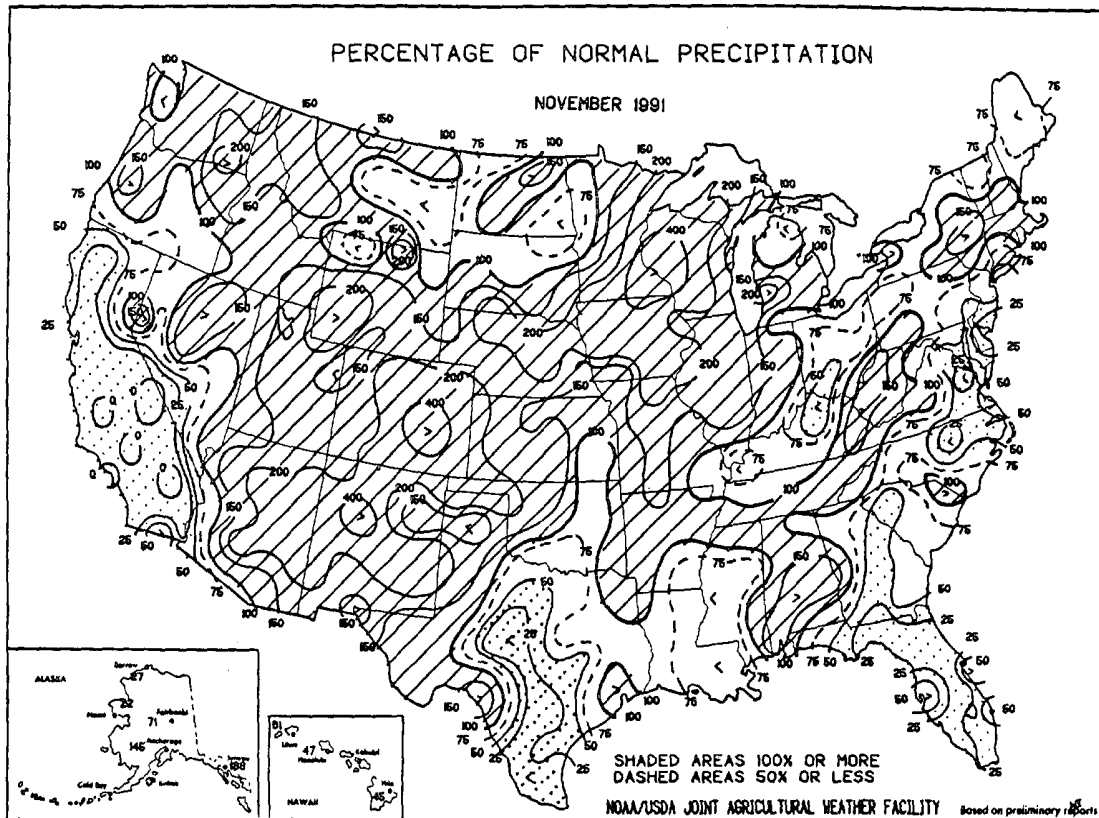
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Fig. 4

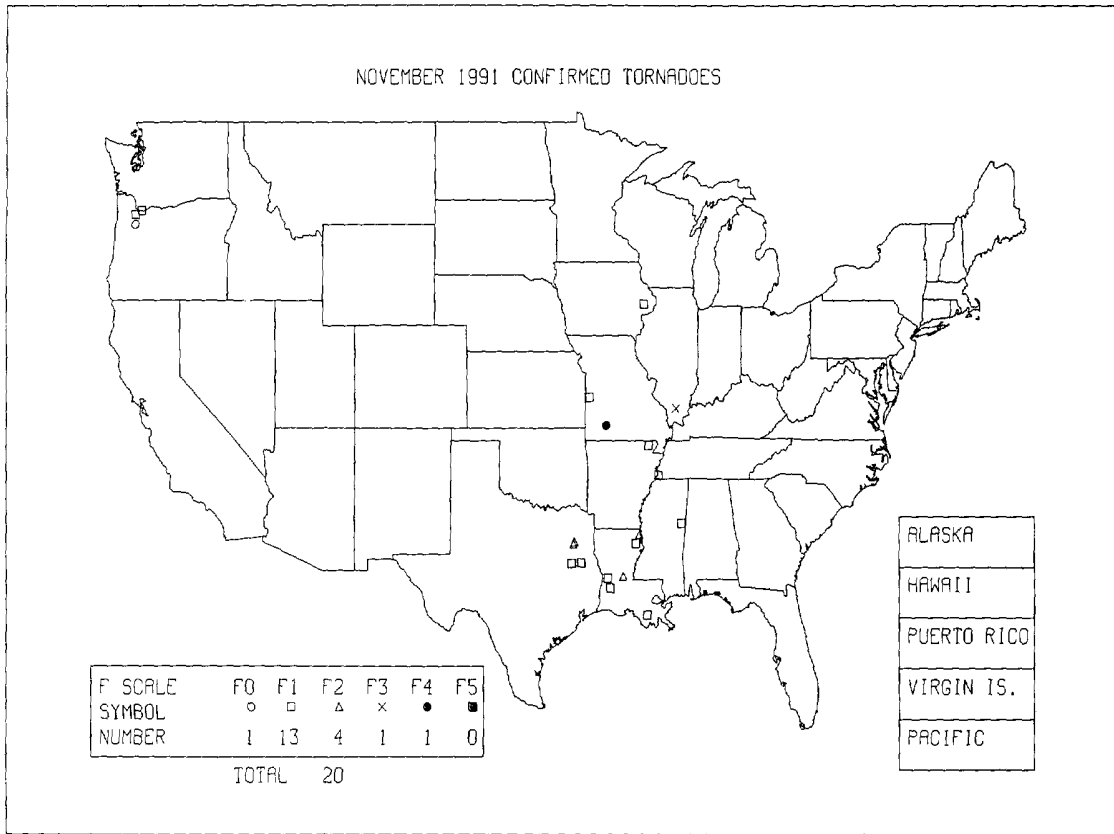


*Reprinted from Weekly Weather and Crop Bulletin - December 10, 1991*

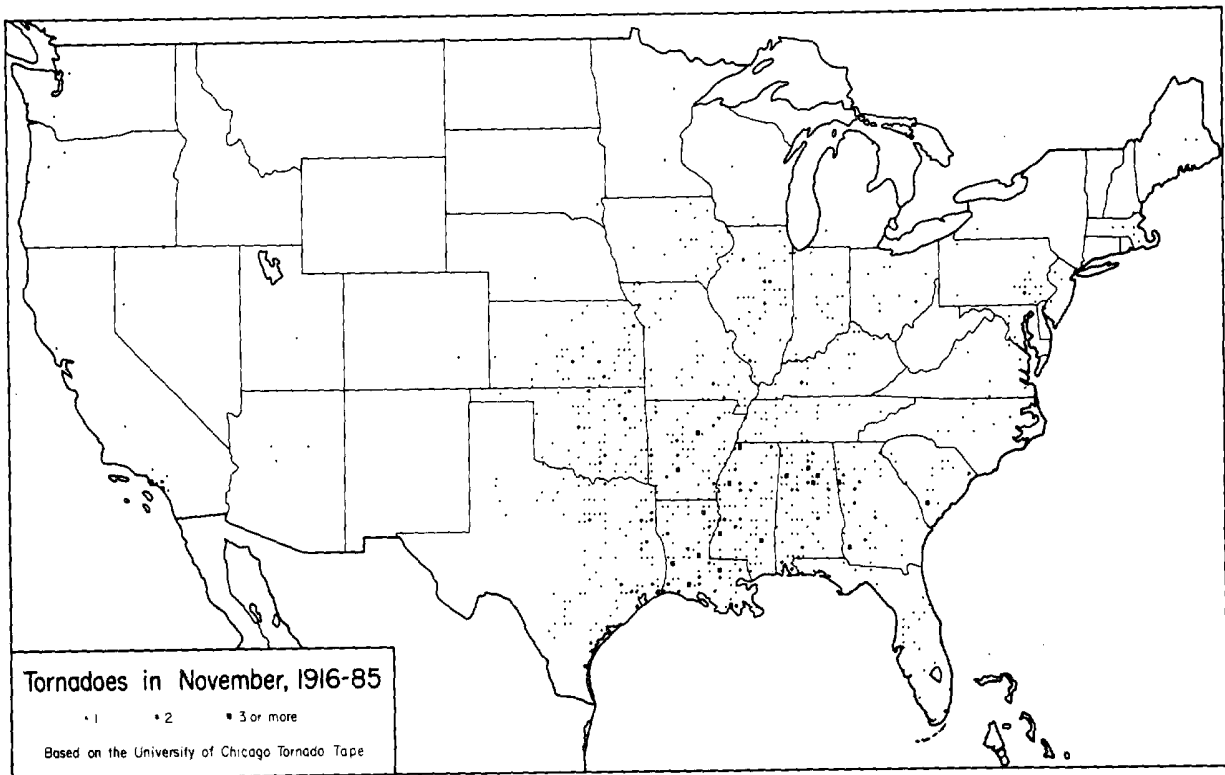
Fig. 5



*Reprinted from Weekly Weather and Crop Bulletin - December 10, 1991*



Several strong tornadoes occurred in November 1991. Of the twenty observed tornadoes, six were rated at or above an F2 intensity on the Fujita Tornado Scale. The first F4 tornado to hit the United States since April 1991 struck Springfield, Missouri on November 29th. Two deaths, 64 injuries, and over \$15 million in damage resulted from this tornado. (See map above.) Nationally, all tornadoes caused two deaths and 104 injuries.



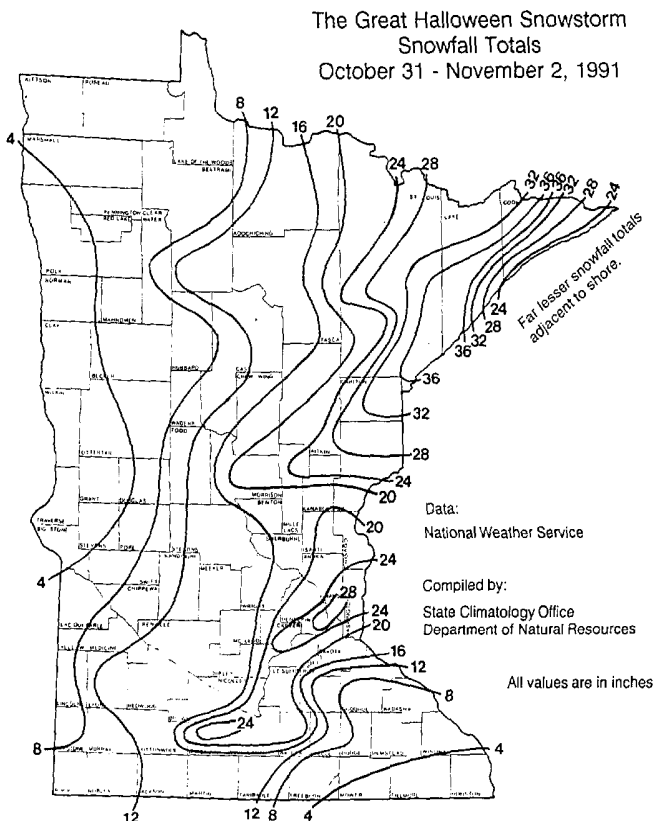
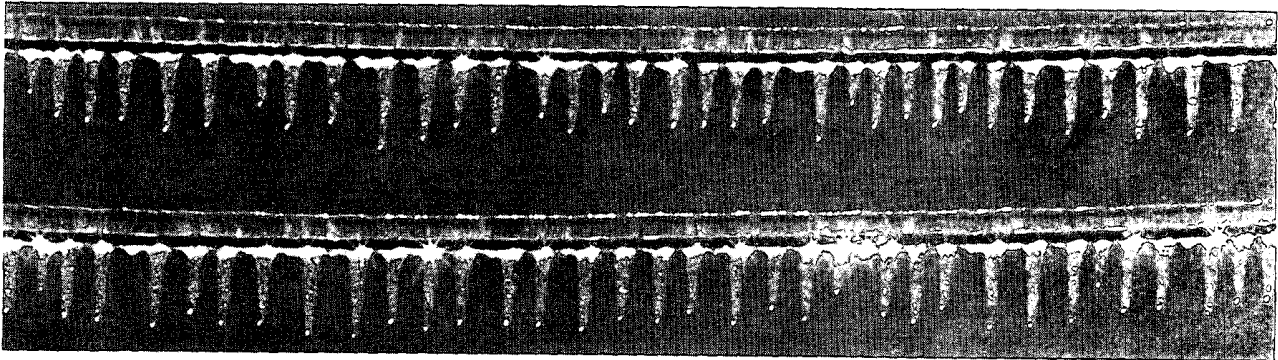


# OUTSTANDING STORMS OF THE MONTH

## 1. MIDWEST WINTER STORM MOVES EAST

(See October 1991 *STORM DATA* issue for additional information)

An early season winter storm wreaked havoc from Texas northward into southern Canada from October 31st thru November 3rd. The storm brought heavy rain, ice, and blizzard conditions to many areas of the Mississippi Valley. Businesses and schools were closed due to the severity of the storm. Electrical power was lost in many areas, with some places being without power for a week. Roofs collapsed, trees were downed, and crops remaining in the field were damaged.



Above and below: The early season winter storm brought different types of precipitation to the state of Minnesota. Ice accumulated up to three inches in some locations while snowfall amounts reached three feet. The Duluth National Weather Service Office recorded a storm total of 36.8 inches (3 day total). Of that total, 32.6 inches fell in the first two days of November. The total November snowfall was 50.1 inches which was not only a record for November, but for any month. The 24.1 inches of snowfall on November 1st was also Duluth's greatest 24 hour amount for any day. (Photo courtesy: Mike Oldenburg, Owatonna People's Press, Owatonna, Minnesota.)

Snowfall Map courtesy: Greg Spoden, State Climatology Office, St. Paul, Minnesota.







Left: Snow and ice downed many trees. The wintry precipitation made driving conditions extremely dangerous. (Photo courtesy: Mike Oldenburg, Owatonna People's Press, Owatonna, Minnesota.)

## 2. TORNADO STRIKES MISSOURI ON NOVEMBER 29TH



A tornado struck southeast Springfield, Missouri on November 29, 1991. Shortly after touchdown, the tornado reached F3 intensity, approximately 3 miles north of Nixa. The tornado continued northeastward uprooting trees as it weakened to F0-F1 intensity. While crossing Highway 65, the tornado picked up a truck and dropped it onto a frontage road, killing one passenger. Ten other people were injured in the resulting multi-vehicle pile-up. The tornado intensified to F4 strength as it moved through the Woodbridge and Natural Bridge Estates subdivisions where 15 homes were destroyed. (See photo at left.) Altogether, two people were killed and 64 others injured. Later, the tornado dissipated west of Turners after being on the ground for twenty minutes (6:05 to 6:25 pm CST). The average forward speed of the tornado was about 45 mph with a path length of 10 miles. Damage was estimated at \$15 million. (Photo courtesy: Jim Kramper, NWSFO St. Charles, MO., photo by Bob Linder, The News-Leader.)

# Storm Data and Unusual Weather Phenomena

November 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<b>ALABAMA</b>									
Montgomery County	20	1159CST			0	0	?	?	Thunderstorm Winds
Straight-line thunderstorm winds uprooted trees 3 miles east of Dannelly Field in Montgomery. Several more trees were uprooted in the airport area.									
Colbert County	30	0655CST			0	0	?	?	Thunderstorm Winds
Strong thunderstorm winds blew out the windows, blew the roof off, and destroyed an awning of a service station. A truck in the station parking lot was also overturned. Trees were blown down about 1.5 miles southwest of the station, as were a few trees in the immediate station vicinity.									
<b>ARIZONA</b>									
Northern Arizona	30	0100MST- 2300MST			0	0	?	0	Heavy Snow
A very cold winter storm developed over the Western U.S. on Friday the 29th, and led to heavy snow between Winslow and Tuba City on the 30th. Drifts were 5 to 7 feet deep along route 15, between Leupp and Dilkon where some 60 people were stranded in vehicles. Winds up to 56 mph struck Lake Havasu City along with blowing dust. In Mayer, just east of Prescott, 16 inches of snow fell by early afternoon. Numerous traffic accidents were reported throughout northern Arizona.									
<b>ARKANSAS</b>									
Perry County Pleasant Valley	19	1200CST			0	0	3	0	Thunderstorm Winds
Thunderstorm winds downed some power lines.									
Van Buren County Damascus	19	1310CST			0	0	2	0	Thunderstorm Winds
Thunderstorm winds downed some trees and damaged a hay barn.									
Columbia County 2 W Waldo	19	1350CST			0	0	0	0	Hail (1.00)
Howard County Mineral Springs	19	1350CST			0	0	0	0	Hail (1.00)
Pike County 2 SW Glenwood	19	1431CST			0	0	0	0	Hail (1.00)
Faulkner County Conway	19	1500CST- 1600CST			0	0	2	0	Flash Flood
Heavy rain flooded downtown streets causing several streets to be closed.									
Clark County Arkadelphia	19	1515CST			0	0	0	0	Hail (0.75)
Garland County Lake Hamilton	19	1515CST			0	0	4	0	Thunderstorm Winds
Thunderstorm winds tore roof shingles off several homes.									
Hot Spring County Bismarck	19	1515CST			0	0	2	0	Thunderstorm Winds
Thunderstorm winds downed trees in Bismarck.									
Lafayette County 5 SE Bradley	19	1535CST			0	0	0	0	Hail (1.00)
Lawrence County Walnut Ridge	19	1545CST			0	0	0	0	Hail (1.75)
Walnut Ridge	19	1600CST			0	0	3	0	Hail (2.00)
Hail up to 2.00 inches in diameter damaged some cars.									

## Storm Data and Unusual Weather Phenomena

November 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<b>ARKANSAS Cont'd</b>									
Nevada County Waterloo	19	1605CST			0	0	0	0	Hail (1.75)
Dallas County Sparkman	19	1629CST			0	0	0	0	Hail (2.00)
Saline County Sardis	19	1630CST			0	0	0	0	Hail (1.00)
Clay County 2 SW Knobel	19	1635CST	0.5	100	0	0	4	0	Tornado (F1)
A small tornado touched down just southwest of Knobel along Highway 90, damaging farm buildings and two homes. Several trees were uprooted and two grain bins destroyed. An 18-wheel truck was overturned and a mobile home destroyed. A carport was also destroyed. Witnesses described the tornado as wedge shaped and black as tar. It was visible for only a few minutes.									
Clay County Palatka	19	1640CST			0	0	4	0	Thunderstorm Winds
Thunderstorm winds downed trees and power lines along Highway 328 mainly near Palatka. The roof over a back room on a house was also blown away.									
Cleveland County Kingsland	19	1700CST			0	0	3	0	Thunderstorm Winds
Thunderstorm winds downed power lines.									
Jefferson County 6 S Pine Bluff	19	1720CST			0	0	0	0	Hail (1.75)
Pulaski County Hensley	19	1720CST			0	0	0	0	Hail (1.00)
Ouachita County Bearden	19	1725CST			0	0	3	0	Thunderstorm Winds
Thunderstorm winds downed trees and power lines.									
Cleveland County Randall	19	1730CST			0	0	4	0	Hail (3.00)
Hail up to 3.00 inches in diameter damaged roofs on several homes in the Randall area.									
Pulaski County Woodson	19	1745CST			0	0	0	0	Hail (0.75)
Jefferson County Pine Bluff	19	1755CST			0	0	2	0	Thunderstorm Winds (G52)
Wind gusts, measured at 60 mph at the county Office of Emergency Services, downed some trees and power lines.									
Grant County Grapevine	19	1800CST			0	0	3	0	Thunderstorm Winds
Thunderstorm winds downed a power pole and power lines.									
Desha County Dumas	19	1815CST			0	0	3	0	Thunderstorm Winds
Thunderstorm winds downed power lines on the south side of Dumas.									
Lincoln County Star City	19	1825CST			0	0	3	0	Thunderstorm Winds
Thunderstorm winds downed power lines on the south side of Star City.									
Lonoke County Carlisle	19	1845CST			0	0	3	0	Thunderstorm Winds
Thunderstorm winds downed power lines in the Carlisle area.									

## Storm Data and Unusual Weather Phenomena

November 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<b>ARKANSAS Cont'd</b>									
<b>Prairie County</b>									
Slovak	19	1850CST			0	0	3	0	Thunderstorm Winds
Fairmont	19	1850CST			0	0	3	0	Thunderstorm Winds
Thunderstorm winds downed power lines in Fairmont.									
<b>Lincoln County</b>									
Gould	19	1855CST			0	0	3	0	Thunderstorm Winds
Thunderstorm winds damaged a couple of grain bins. The debris then downed some power lines.									
<b>Arkansas County</b>									
Stuttgart	19	1945CST- 2045CST			0	0	2	0	Flash Flood
The last of three strong thunderstorms to pass over Stuttgart caused street flooding throughout the city.									
<b>Crittenden County</b>									
West Memphis	19	2105CST			0	0	3	0	Thunderstorm Winds
Thunderstorm winds downed trees and power lines and caused minor damage to a few buildings.									
<b>Washington County</b>									
Elkins	29	1630CST			0	0	3	0	Thunderstorm Winds
Thunderstorm winds downed trees and power lines.									
<b>Benton County</b>									
Healing Springs	29	1630CST			0	0	2	0	Thunderstorm Winds
Thunderstorm winds downed trees across Highway 264.									
<b>Benton County</b>									
Rogers	29	1647CST			0	0	0	0	Hail (1.75)
10 W Rogers	29	1649CST			0	0	0	0	Hail (1.75)
Rogers	29	1654CST			0	0	0	0	Thunderstorm Winds (G52) Hail (1.75) Thunderstorm Winds (G52)
<b>Sebastian County</b>									
Fort Smith	29	1727CST			0	0	0	0	Hail (0.75)
Fort Smith	29	1728CST			0	0	2	0	Hail (1.75)
Fort Smith	29	1729CST			0	0	3	0	Hail (2.00)
Fort Smith	29	1730CST			0	0	2	0	Hail (1.75)
Fort Smith	29	1732CST			0	0	3	0	Hail (1.75)
Fort Smith	29	1735CST			0	0	0	0	Hail (1.50)
Fort Smith	29	1735CST			0	0	3	0	Thunderstorm Winds
A severe thunderstorm produced hail up to 2.00 inches in diameter that damaged some roofs and dented cars. Wind gusts also downed a billboard and broke some windows in the downtown area.									
<b>Crawford County</b>									
Kibler	29	1738CST			0	0	0	0	Hail (0.75)
<b>Crawford County</b>									
Figure Five	29	1738CST			0	0	3	0	Hail (3.50)
Hail reported up to 3.50 inches in diameter damaged some roofs.									
<b>Crawford County</b>									
Van Buren	29	1745CST			0	0	3	0	Thunderstorm Winds
Rudy	29	1745CST			0	0	0	0	Hail (1.00)
Thunderstorm winds downed trees and power lines in Van Buren.									
<b>Sebastian County</b>									
Fort Smith	29	1830CST			0	0	0	0	Thunderstorm Winds (G51)
Barling	29	1840CST			0	0	2	0	Thunderstorm Winds

## Storm Data and Unusual Weather Phenomena

November 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<b>ARKANSAS Cont'd</b>									
A wind gust of 59 mph was recorded at the Weather Service Office. A tree was downed and fell on a truck in Barling.									
<b>Crawford County</b> Van Buren	29	1830CST			0	1	5	0	Thunderstorm Winds
Thunderstorm winds caused considerable damage to a boat dock and boats along the Arkansas River. One man suffered minor injuries. Damage was estimated at \$50,000. The Delta Queen Riverboat also suffered damage estimated at \$15,000.									
<b>Newton County</b> Deer	29	1900CST			0	0	3	0	Thunderstorm Winds
Thunderstorm winds downed a couple of electric service lines.									
<b>Sebastian County</b> Huntington	29	1905CST			0	0	2	0	Thunderstorm Winds
Thunderstorm winds downed trees at the intersection of Highways 71 and 252.									
<b>Logan County</b> Booneville	29	1920CST			0	0	0	0	Thunderstorm Winds (G52)
Booneville	29	1924CST			0	0	0	0	Hail (0.75)
Ham radio spotters estimated wind gusts to 60 mph.									
<b>Scott County</b> Waldron	29	1941CST			0	0	3	0	Thunderstorm Winds
Thunderstorm winds downed trees and power lines.									
<b>Johnson County</b> Knoxville	29	1951CST			0	0	0	0	Hail (0.75)
<b>Newton County</b> Vendor	29	2000CST			0	0	3	0	Thunderstorm Winds
Thunderstorm winds took the roof off a barn and downed power lines.									
<b>Yell County</b> Dardanelle	29	2015CST			0	0	2	0	Thunderstorm Winds
Thunderstorm winds damaged some large storage barrels at the Dardanelle Lock and Dam.									
<b>Sevier County</b> 3 E King	29	2015CST			0	0	2	0	Thunderstorm Winds
	29	2015CST			0	0	0	0	Hail (1.75)
Thunderstorm winds downed trees.									
<b>Howard County</b> 4 SE Baker Springs	29	2025CST			0	0	0	0	Hail (1.00)
<b>Yell County</b> Danville	29	2030CST			0	0	3	0	Thunderstorm Winds
Thunderstorm winds downed trees and power lines.									
<b>Van Buren County</b> Alread	29	2030CST			0	0	3	0	Thunderstorm Winds
Thunderstorm winds downed power lines in Alread.									
<b>Pope County</b> Atkins	29	2035CST			0	0	3	0	Thunderstorm Winds
Thunderstorm winds downed trees and power lines in and around Atkins.									
<b>Van Buren County</b> Dennard	29	2045CST			0	0	3	0	Thunderstorm Winds
Thunderstorm winds downed trees and power lines.									

# Storm Data and Unusual Weather Phenomena

November 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

Montgomery County 4 S Mt. Ida	29	2130CST			0	0	0	0	Hail (1.75)
Faulkner County Saltillo	29	2300CST			0	0	4	0	Thunderstorm Winds
A thunderstorm downburst damaged buildings and downed trees and power lines in and around Saltillo. A church lost part of its roof while other nearby roofs sustained damage to shingles.									
Pulaski County Roland	29	2310CST			0	0	2	0	Thunderstorm Winds (G43)
Thunderstorm winds, estimated at 50 mph, downed a few trees in Roland.									

## CALIFORNIA, Northern

Siskiyou County Lake Shastina	16	2100PST-							
Weed	17	1200PST			0	0	0	0	High Winds
Kern County Mojave	18	0400PST- 1500PST			0	0	?	0	High Winds
A strong frontal band moved southeastward causing high winds at opposite ends of the state. In the northwest, wind gusts to 60 mph were reported at two locations and in the southeast, one area estimated wind gusts to 100 mph. Downed power lines, fallen trees, and minor dwelling damage were reported.									

Fresno County 45 SSE Low Banos	29	0800PST- 2100PST			17	135	6	0	Blowing Dust
Winds with a frontal system gusted to 45 mph down the western side of the San Joaquin Valley. Blowing dust reduced visibilities to less than 50 feet, causing a pile-up of over 100 vehicles on an isolated stretch of Interstate 5. (M37V) (M32V) (M03V) (M01V) (F67V) (M68V) (F69V) (F70V) (M30V) (M39V) (F37V) (F08V) (F05V) (F??V) (M??V) (M??V) (M??V)									

## CALIFORNIA, Southern

CAZ019	18	0640PST			0	0	?	0	High Winds
Strong winds blew across many desert areas behind a cold front, that moved through southern California. At 0600 PST winds of 48 mph were reported at Twenty-nine Palms and 46 mph at Daggett. A wind gust estimated at 100 mph was reported in the town of Mojave.									

CAZ011-012-013- 014-015-016-018- 019-020-021	29 30	All- Day			1	3	?	0	High Winds
Strong winds and cold temperatures moved into the area, from behind a cold front. Winds of 46 mph with gust from 58 to 70 mph, were observed at the Mojave Airport. At 1700 PST winds at the Van Nuys Airport, in the San Fernando Valley of Los Angeles, gusted to 62 mph. Santa Monica Airport had gusts to 50 mph. As many as 20,000 customers were without power in a dozen neighborhoods in the Los Angeles area, as winds blew down power lines. In San Diego, about 38,000 households and businesses were blacked out from the winds. The winds also fanned many small brush fires. Many roads had near zero visibilities in blowing dust and sand. A woman was killed and three others were injured in a traffic accident, caused by a dust and sand storm.									

CAZ013	29	All Day			0	2	?	0	Snow
Snow fell down to the 3,000 foot level in the mountains of southern California. In the Big Bear Lake area from 4 to 6 inches of snow fell. There were numerous traffic accidents on the mountain roads. In the San Gabriel Mountains, at the 8,500 foot level of Mt. Baldy, two hikers were trapped by a sudden and fierce snowstorm. The two hikers endured 43 hours of temperatures that dropped to about 13 degrees, and winds of 100 mph with a wind-chill factor of 35 degrees below zero. The two were treated for frostbite and dehydration.									

# Storm Data and Unusual Weather Phenomena

November 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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## COLORADO

COZ002-004-005-006-008-009-010-011-014-015-016-017	01	0000MST-							
	02	1800MST			0	0	?	?	Snow

Mountains, Gunnison, San Luis and Upper Arkansas Valleys, Front Range, Pikes Peak/Palmer Divide, Southern Foothills, Southeast Plains and Border

The storm system which blasted much of the state at the end of October continued until early November. An arctic air mass pushed into eastern Colorado and produced enough upslope to drop snows ranging from 2 to 9 inches. In the northeast, Alans Park recorded 7 inches. Six inches fell at Morrison. Other Front Range amounts were generally 3 inches or less. While the higher amounts were isolated in the northeast, the southeast had a more widespread and uniform snowfall. Pueblo received 8.8 inches, in addition to the 16.5 inches recorded during the last two days of October. Cañon City recorded 6 inches. The mountains and high valleys also received snow ranging from 3 to 9 inches. Cuchara received 9 inches; Alamosa, Rollinsville and Walsenburg each had 6 inches; Coaldale, Divide and Empire had 5 inches; Leadville, Nathrop and Cedaredge had 4 inches. The Northern and Central Mountains received snows of 7 to 12 inches with 12 inches at Winter Park; 8 inches at Gothic ski area; and 7 inches at Loveland.

Statewide	02	1200MST-							
	03	1800MST			0	0	?	?	Record Cold

A frigid arctic high pressure system barreled through the Rockies and high plains, bringing a bitterly cold airmass to Colorado shattering temperature records across the state. A few high temperatures on the 2nd occurred early in the morning as the mercury fell throughout the day. A combination of the cold air and cloud cover kept the maximum temperature at Colorado Springs at 10 degrees while Pueblo only reached 17 degrees. Both were record low maximum temperatures for the date, breaking old records of 29 degrees (1956) and 24 degrees (1911), respectively. Temperatures really plummeted after sunset when the coldest air settled in and skies cleared. By midnight, the record lows for the 2nd had fallen at Pueblo (minus 10 degrees -- old record minus 6 degrees in 1951) and at Alamosa (minus 21 degrees -- old record minus 4 degrees in 1972). The morning of the 3rd saw more records crash as Pueblo dropped to minus 17 degrees (old record plus 11 in 1936); Colorado Springs was down to minus 2 degrees (old record minus 1 in 1936); Grand Junction fell to plus 15 degrees (old record plus 17 in 1967); and Alamosa bottomed out at minus 26 degrees (old record minus 8 in 1956). Denver reached plus 5 degrees, missing the record of plus 4 degrees set in 1936. Other minimum temperatures on the 3rd from around the state included: minus 30 at Fraser; minus 20 at Granby; minus 19 at Coaldale; minus 18 at Lamar; minus 17 at Leadville; minus 16 at Craig; and minus 15 at Trinidad.

COZ002-004-011 Northern and Central Mountains Front Range	06	0000MST							High Winds
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High winds blew across the Front Range during the morning of the 6th. Shortly after midnight, a National Weather Service mesonet station at Rollinsville recorded a gust of 84 mph (73 kts) and later of 89 mph (77 kts). Estes Park had a recorded gust to 59 mph (51 kts). The strong wind eventually reached the lower foothills where Boulder recorded a gust to 51 mph (44 kts) just before sunrise. The wind gradually died down in the late morning with gusts of 30-40 mph (26-35 kts) reaching into the plains east of Interstate 25.

COZ002-004-011-012-014-015	05	1200MST-							
	07	1200MST			0	0	?	?	Snow

Northwesterly flow aloft and another shot of arctic air produced snow across the Northern and Central Mountains and along the Front Range. The heavier snow occurred in the mountains along the Continental Divide and ranged from 4 to 18 inches during the 2 days. The greatest amounts fell at Winter Park ski area with 18 inches and in Berthoud Pass and Loveland with 17 inches. Along the Front Range, snow was considerably lighter with amounts less than 4 inches. Gusty wind up to 50 mph (44 kts) blew across the mountains, causing some blowing snow mainly in the higher peaks and passes.



# Storm Data and Unusual Weather Phenomena

November 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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## COLORADO Cont'd

COZ002-004-006-008-	14	0000MST-			0	0	?	?	Heavy Snow
009-011-012-013-	17	1200MST							
014-015-016-017									

Eastern Colorado,  
Mountains, San Luis  
and Upper Arkansas  
Valleys and  
Four-Corners

A closed-low moving through the southwestern United States on the 14th, began a northeastward track and dumped snow across most of the state. Snow was enhanced in Eastern Colorado on the 15th and 16th as a surface high pressure ridge triggered widespread upslope conditions. In the mountains snowfall amounts ranged from 6 to 31 inches during the 2.5 days with heavier amounts in the San Juan Mountains in southwestern Colorado. The greatest snowfall, 31 inches, occurred at Wolf Creek in the San Juans. Other mountain snowfall amounts include 29 inches at Telluride; 25 inches at Silverton; 20 inches at Red Mountain Pass; 18.5 inches at Monarch ski area; 15 inches at Coaldale and Nathrop in the Upper Arkansas Valley; 12 inches at Ouray and at Powder Horn ski area; and 5 inches at Alamosa in the San Luis Valley. The eastern portion of the state received snowfall ranging from 1 to 15 inches. The higher amounts included 15 inches at Castle Rock and Conifer; 14 inches at Morrison, Woodland Park and Parker; 13 inches at Pueblo; 12 inches at Kiowa and Eaglecrest; 11 inches at Denver Stapleton Airport; 10 inches at Aspen Springs, Hugo and Longmont; 9 inches at Woodrow, Colorado Springs and Limon; and 8 inches at Loveland and Nunn.

Statewide

17	1800MST-				0	0	?	?	Heavy Snow
19	2400MST								

Another in a series of southwestern United States troughs moved across the region, producing heavy snows over the state. Snowfall over the mountains occurred mainly on the 17th and 18th with amounts ranging from 3 to 24 inches. Higher amounts included 24 inches at Divide; 23 inches at Cuchara; 15 inches at Berthoud Pass and Mary Jane Ski Area, both in the Northern Mountains; 12 inches at Gothic and Woodland Park; 10 inches at Loveland, Winter Park, Snowmass and Wolf Creek ski areas; 9 inches at Copper Mountain, Aspen Mountain, Conifer and Monarch; and 8 inches at Henderson ski area and Steamboat Springs. In the Four-Corners region, up to 12 inches of heavy snow fell in Cortez damaging several trees still bearing leaves. Snowfall in the eastern portion of the plains ranged from 2 to 20 inches. The heaviest snowfall occurred at Rye where 20 inches fell. Other high amounts included 15 inches at Wiggins; 11 inches at Wooten Ranch; 10 inches at Denver, Doubleheader, Kiowa and Eaglecrest (SE of Denver); 9 inches at Parker; 8 inches in southeast Denver, Morrison and Wheatridge; 6 inches at Colorado Springs and 4 inches at Raton and Trinidad.

COZ001-002-004-008-	20-				0	0	?	?	Snow
010-011-014-015-016	22								

Northwest Plateau,  
Mountains, Front  
Range, Pikes Peak/  
Palmer Divide,  
Southern Foothills  
and Southeast Plains

Snow fell across the mountains and the Front Range as a trough moved across the Rockies and a Canadian airmass surged through eastern Colorado. Mountain snow amounts ranged from 3 to 19 inches. The higher amounts included 19 inches at Steamboat Springs; 17 inches at Vail; 15 inches at Arapahoe Basin ski area; and 12 inches at Breckenridge and Copper Mountain ski areas and at Berthoud Pass. On the Front Range snow totals ranged from 1 to 5 inches with 5 inches at Pueblo; 4 inches at Rye, Castle Rock and Eaglecrest.

COZ001-002-004-008	24-				0	0	?	?	Snow
Northwestern	26								

Northwestern  
Plateau, Northern,  
Central and South-  
west Mountains

Northwesterly flow aloft and moisture from the Pacific Northwest provided the mountains and northwest Colorado with a couple of days of snow. Amounts ranged from 3 inches in the lower elevations of the northwest to 19 inches in the mountains. The higher amounts included 19 inches at Arapahoe Basin ski area; 18 inches at Copper Mountain; 15 inches at Loveland and Mary Jane

# Storm Data and Unusual Weather Phenomena

November 1991

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

## COLORADO Cont'd

ski areas; 11 inches at Vail, Berthoud Pass and Bear Lake; 10 inches at Winter Park; 9 inches at Breckenridge; and 6 inches at Granby, Grand Lake and Steamboat Springs.

COZ002-004-011 Northern and Central Mountains and Front Range	26	0000MST- 1200MST			0	0	?	?	High Winds
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During the early morning hours, high winds blew along the Front Range of Colorado. A National Weather Service mesonet station at Rollinsville recorded a gust of 71 mph (62 kts) at around 0220 MST. Shortly before sunrise, Boulder had a gust of 45 mph (39 kts) while at the U.S. Atomic Energy Commission's Rocky Flats Plant a wind gust of 51 mph (44 kts) was recorded. Winds gusted to 40 mph the rest of the morning before dying down.

COZ002-003-004-006- 007-008-010-011-012- 013-014-015-016-017 Eastern Colorado, Mountains, Upper Arkansas Valley, West Central Valleys and Four-Corners	28- 30				0	0	?	?	Snow
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A series of waves moving through an upper trough over the Great Basin combined forces with a surface low in Arizona and New Mexico to drop snow over Colorado. The southern half of the state was hardest hit with snow amounts up to 26 inches in the mountains. Mountain snowfall totals include 26 inches at Wolf Creek; 17 inches at Telluride; 12 inches at Purgatory; 13 inches at Berthoud Pass; 11 inches at Monarch and Breckenridge; 10 inches at Conifer and Golden Gate Canyon; and 9 inches at Mary Jane ski area. The Western Valleys received some snow with 7 inches at Montrose. Nathrop and Coaldale in the Upper Arkansas Valley received 8 inches. In the east higher snow amounts were along the Southern Foothills with 17 inches recorded at Rye. Other amounts include 11.5 inches at Morrison; 7 inches at Kiowa; 6 inches at Castle Rock and Parker; and 5 inches at Crook.

## CONNECTICUT

New London County Montville		11 0315EST			0	0	0	0	Hail (1.75)
Norwich		11 0340EST			0	0	0	0	Hail (1.75)

Thunderstorms moved northward into southeast coastal Connecticut producing locally heavy rainfall and hail. Police reported golf ball-size hail in Montville and Norwich. A severe weather spotter observed nickel- and half dollar-size hail in Montville. There were no reports of damage.

## DELAWARE

DEZ001		01 0000EST- 1200EST			?	?	?	?	Coastal Flood
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Coastal flooding continued on the 1st from a strong storm that affected the mid-Atlantic coast on October 30th and 31st. See October 1991 *Storm Data* for more details.

DEZ001 > 003		09 1500EST- 10 2400EST			0	0	4	0	Coastal Flood
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The second major coastal storm in less than two weeks brought a return of high winds, heavy surf, and flooding to the mid-Atlantic coast. Generally minor flooding occurred, however moderate dune erosion was reported at Bethany Beach and Dewey Beach, hard hit by the Halloween Storm. A few low-lying roads were flooded around Indian River Inlet in Sussex County.

# Storm Data and Unusual Weather Phenomena

November 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<b>FLORIDA</b>									
Monroe County 6 SE Key West	01	1220EST	?	?	0	0	0	0	Waterspout
									A waterspout was sighted 6 miles southeast of Key West.
Key West	01	1713EST	?	?	0	0	0	0	Waterspout
									Three waterspouts were sighted 5 miles north and 4 miles southeast of Key West.
Martin and St. Lucie Counties Hutchinson Island	09	1030EST			0	0	4	0	High Winds
									Strong winds and heavy surf led to significant beach erosion on Hutchinson Island. The base of a concrete swimming pool was undermined and the pool collapsed.
Franklin County Apalachicola	21	1945EST			0	0	4	0	Thunderstorm Winds
									Strong thunderstorm winds blew down trees, lifted shingles off the roof of a house, and damaged a shed.
<b>GEORGIA</b>									
Sumter County	04 06	0700EST- 0700EST			0	0	?	6	Cold Spell
									Winter-like temperatures produced considerable crop damage over Sumter County. The overnight low temperature plunged to 24°F on the 4th, 27°F on the 5th, and 30°F on the 6th. Daytime high temperatures over the period were in the 50s. Damages to crops, including cucumbers, green beans, peanuts, and squash, were estimated at \$1 million.
<b>IDAHO</b>									
Southern Idaho	01- 30				0	0	0	?	Extreme Drought
									Portions of southern Idaho continued in severe to extreme drought.
IDZ003 Southeastern Idaho	01	0500MST- 1700MST			0	0	4	0	Heavy Snow
									Up to 4 inches of snow was a factor in 20 automobile accidents and 80 drivers to sliding off the highways.
Pocatello	02	Unknown			0	0	0	0	Early Cold
									The temperature dropped to -2°F, establishing a new record cold temperature for this early in the season.
IDZ009 Northern Panhandle	05	0800PST- 1600PST			0	0	0	0	Heavy Snow
									Six inches of snow fell at Porthill.
Pocatello	08	2100PST							Aurora
									Spectacular brilliant red sheets of auroral light were observed.
Southern Idaho	23								Early Snowpack
									Sun Valley Ski Resort opened the earliest in its 56-year history.
IDZ007 South Central Mountains	26 27	2200MST- 1000MST			0	0	0	0	Heavy Snow
									Nine inches of snow fell at Galena Lodge.
IDZ010-011 Central Mountains	27	0100MST- 1300MST			0	0	0	0	Heavy Snow

# Storm Data and Unusual Weather Phenomena

November 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<b>IDAHO Cont'd</b>									
Five to ten inches of snow fell.									
IDZ009 Panhandle	28	1700PST-							
	29	0500PST			0	0	0	0	Heavy Snow
Nine inches of snow fell at Mullan.									
IDZ006 West Central Mountains	28	2000MST-							
	29	0800MST			0	0	0	0	Heavy Snow
Twelve inches of snow fell on Brundage Mountain.									
<b>ILLINOIS</b>									
Williamson County Marion	19	1655CST	1.5	70	0	16	7	0	Tornado (F3)
A tornado struck Marion, causing 30 million dollars damage. Forty-five homes were destroyed, another 23 had major damage and 250 had minor damage. Twenty-two cars were destroyed and an additional 90 were damaged. Some of the homes sustained F3 tornado damage. The hardest hit area was Midway Court on the southwest side of town. Part of the roof on a high school gym was peeled off and glass doors were shattered. In the business district, signs were damaged, windows were broken, a lumber store sustained major damage and a warehouse roof was torn off.									
Jackson, Franklin, and Williamson Counties	19	1700CST- 2200CST			0	0	?	0	Flash Flood
At Makanda in southeast Jackson County, people were evacuated from low lying areas. The Illinois Central railroad tracks were under 10 inches of water at Makanda. Carbondale police reported that 50 to 60 streets were flooded. Roads were also flooded in Franklin County. In West Frankfort, the hospital emergency room was closed and sandbagging began around 1700 CST. Nine homes were surrounded by water. The high school gym basement was flooded. There was flooding in Marion, Williamson County, as 6.59 inches of rain fell. There were unofficial reports of 7 to 8 inches of rain in the area. In Marion, a nursing home was evacuated as high water approached. There was as much as 3 feet of water on some Marion streets. The C.O. & E. railroad tracks on the east side of Marion sustained \$10,000 in damage when water washed away rock and railroad ties.									
Edwards County	19	1910CST			0	0	?	0	Flash Flood
White County	19	1935CST			0	0	0	0	Flash Flood
Wabash County	19	1940CST- 2000CST			0	0	?	0	Flash Flood
Heavy rains left city streets in Albion and Highway 130 between Grayville and Albion under water. Route 45 north of Enfield was flooded. Several rural roads were impassable in Wabash County.									
Madison County Alton Edwardsville	29	2200CST			0	0	?	0	Thunderstorm Winds
Trees, limbs and power lines were blown down and windows were damaged by winds in Alton. A tree was blown down in Edwardsville and power lines were downed in Glen Carbon.									
Randolph County Steeleville	29	2235CST			0	0	2	0	Thunderstorm Winds
The Randolph County Sheriff's Office reported several large trees blown down near Steeleville.									
Mercer County Kiethsburg	29	2250CST			0	0	0	0	Thunderstorm Winds
5 E Aledo	29	2319CST			0	3	4	0	Thunderstorm Winds
2 ENE Viola	29	2320CST			0	0	4	0	Thunderstorm Winds
6 NE Viola	29	2325CST			0	0	4	0	Thunderstorm Winds

The Mercer County Sheriff's Department reported trees down on cars and homes in Kiethsburg. A mobile home was rolled over in the Gilcrest area, near Aledo, injuring three people. The roof was blown off a mobile home 2 miles east and 1 mile north of Viola. Six miles northeast of Viola,

# Storm Data and Unusual Weather Phenomena

November 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<b>ILLINOIS Cont'd</b>									
a machine shed, a garage and a barn were damaged and trees were uprooted.									
Clinton County Carlyle	29	2250CST			0	0	4	0	Thunderstorm Winds
The Clinton County Sheriff's Office reported minor structural damage to several houses, a box trailer turned over, and several large trees downed.									
Washington County 2 W Okawville	29	2252CST			0	0	3	0	Thunderstorm Winds
Several large trees and power lines were knocked down.									
Randolph County Red Bud	29	2255CST			0	0	3	0	Thunderstorm Winds
Several large trees were blown down and sheds were damaged.									
Perry County Pickneyville Cutler	29	2305CST			0	0	3	0	Thunderstorm Winds
Several large trees were blown down in Pickneyville. The roof of a lumber storage shed was damaged and debris damaged nearby mobile homes. Barns and fences were also damaged. A farm building south of Cutler was also damaged.									
Marion County Salem	29	2320CST			0	0	4	0	Thunderstorm Winds
The Marion County Sheriff's Office reported numerous trees and power lines down with highways blocked. Some trees fell on cars and damaged houses in the Salem area.									
Jefferson County	29	2330CST			0	0	2	0	Thunderstorm Winds
Several large trees were blown down in the northeastern portion of the county.									
Henry County Orion	29	2330CST			0	0	3	0	Thunderstorm Winds
Kewanee	29	2340CST			0	0	2	0	Thunderstorm Winds
Trees were blown down near Orion, Andover and Kewanee.									
Rock Island County Joslin Moline	29	2350CST			0	0	3	0	Thunderstorm Winds
Trees and a barn were blown down along old Route 2 near Joslin. A few trees were also blown down in Moline.									
Whiteside County Rock Falls Sterling	29	2355CST			0	0	3	0	Thunderstorm Winds
A house roof was damaged just southwest of Rock Falls. Numerous light and power poles were blown down in Rock Falls and Sterling.									
Jackson County Murphysboro	30	0000CST			0	0	3	0	Thunderstorm Winds
A garage was damaged, trees and power lines were blown down.									
Johnson County	30	0038CST			0	0	?	0	Thunderstorm Winds
The Johnson County Sheriff's Office reported large tree limbs down.									
White County Carmi	30	0050CST			0	0	4	0	Thunderstorm Winds
Thunderstorm winds downed trees, signs and power lines in Carmi.									

## Storm Data and Unusual Weather Phenomena

November 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<b>INDIANA</b>									
Knox County	19	2200EST 2330EST			0	0	0	0	Thunderstorm Winds
Heavy rains caused water to flood many Knox County roads, including parts of Highway 41 in Vincennes and Oaktown, and along Highway 67 between Vincennes and Bicknell.									
Newton County Kentland	30	0120EST			0	0	3	0	Thunderstorm Winds
Vigo County Terre Haute	30	0140EST			0	0	4	0	Thunderstorm Winds (G68)
Tippecanoe County Lafayette	30	0156EST			0	0	3	0	Thunderstorm Winds
Clay County	30	0200EST			0	0	0	0	Thunderstorm Winds
Putnam County Greencastle	30	0202EST			0	0	3	0	Thunderstorm Winds
Montgomery County Crawfordsville	30	0203EST			0	0	4	0	Thunderstorm Winds
Owen County	30	0210EST			0	0	3	0	Thunderstorm Winds
Posey County	30	0212EST			0	0	4	0	Thunderstorm Winds
Greene County	30	0216EST			0	0	0	0	Thunderstorm Winds
Knox County Vincennes	30	0216EST			0	0	4	0	Thunderstorm Winds
Clinton County Frankfort	30	0225EST			0	0	4	0	Thunderstorm Winds
Boone County 5 SE Lebanon	30	0225EST			0	0	4	0	Thunderstorm Winds
Miami County Grissom Air Force Base	30	0230EST			0	0	0	0	Thunderstorm Winds (G50)
Hendricks County Danville	30	0230EST			0	0	5	0	Thunderstorm Winds (G87)
Pittsboro 3 NW Brownsburg Plainfield									
Daviess County	30	0235EST			0	0	3	0	Thunderstorm Winds
Vanderburgh County	30	0235EST			0	0	4	0	Thunderstorm Winds
Morgan County	30	0240EST			0	0	3	0	Thunderstorm Winds
Hamilton County Carmel	30	0240EST			0	0	0	0	Thunderstorm Winds
Marion County Indianapolis International Airport	30	0241EST			0	0	3	0	Thunderstorm Winds (G58)
Monroe County Stinesville	30	0245EST			0	0	3	0	Thunderstorm Winds
Hancock County Fortville	30	0301EST			0	0	4	0	Thunderstorm Winds
Madison County Anderson	30	0305EST			0	0	4	0	Thunderstorm Winds
Randolph County Lynn	30	0355EST			0	0	3	0	Thunderstorm Winds
Ripley County Versailles	30	0435EST			0	0	3	0	Thunderstorm Winds
Dubois County	30	0440EST			0	0	3	0	Thunderstorm Winds
Franklin County	30	0440EST			0	0	0	0	Thunderstorm Winds
Dearborn County Dillsboro	30	0452EST			0	0	0	0	Thunderstorm Winds

A line of severe thunderstorms moved eastwardly across central and southern Indiana during the early morning of November 30. In Newton County, windows were blown out of a glassed-in porch. Trees, limbs, and/or power lines were downed in Clay, Vigo, Putnam, Tippecanoe, Hendricks, southwest Morgan, southwest Owen, Greene, Hamilton, Monroe, Madison, Randolph,

# Storm Data and Unusual Weather Phenomena

November 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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## INDIANA Cont'd

Knox, Daviess, Ripley, Dearborn, Franklin, and Dubois Counties. In northern Vanderburgh County trees and power lines were downed along Interstate 64. In Posey County trees were downed between Mt. Vernon and New Harmony. Flashing was ripped from a building at the Indianapolis International Airport. In Crawfordsville a gas station was damaged, and signs were blown down. Light poles were downed in Clinton County, and trailers were blown over at a construction site in Frankfort. Telephone lines were downed in Boone County, and two highway signs were blown down 5 miles southeast of Lebanon. Hendricks County was especially hard hit. Wind gusts of 100 mph were measured in Danville. Power lines were downed in Pittsboro, and a church roof was blown off 3 miles northwest of Brownsburg. In Plainfield, a 40-foot steel sign at a car dealership blew over, and crushed two new cars. In Fortville, Hancock County, the roof was blown off of a store. In Anderson, Madison County, a barn roof was blown off.

## IOWA

IAZ001-004-005-009-SDZ018-NEZ010 Northwestern Iowa	30 01	2100CST- 0900CST			0	0	5	0	Snow Heavy Snow
IAZ002-005-006-009-010-012-013 Southwest into North-central Iowa	31 01	0000CST- 1200CST			0	0	6	0	Major Ice Storm
IAZ001-004-005-SDZ018 Northwestern Iowa	01	0000CST- 1700CST			0	0	5	5	Blizzard
IAZ001-002-003-004-005-006-007-008-009-010-011-012-013-014-015-SDZ018-NEZ010-ILZ004 All of Iowa	01 02	0600CST- 0300CST			0	0	6	5	High Winds
IAZ003 Northeast Iowa	01 02	1500CST- 0000CST			0	0	5	0	Heavy Snow

The first two entries are the conclusion of the storm that began in late October. By sunrise on the morning of the 1st, deep low pressure moved into eastern Iowa, resulting in high winds. North to northwesterly winds of 30 to 50 mph were common statewide, with occasional gusts to around 60 mph. This caused blizzard conditions during much of the day over the northwest, and caused extensive tree fall in the areas where the freezing rain event occurred. As the low pulled northeastward, a backlash of snow hit northeast Iowa, with 4 to 6 inches common over the extreme northeast. The wet snow, when combined with the winds, caused many trees and power lines to fall. Some crop damage occurred due to the high winds and blizzard. As much as 10 to 15 percent of the states corn crop was still in the ground at the time. Although the crop remaining was not a total loss, some damage did occur to the stands in the field.

IAZ002-003-005-006-007-008-009-010-011-012-013-NEZ010 Much of Iowa	22 23	1000CST- 2000CST			0	0	5	0	Snow Heavy Snow
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An arctic cold front sagged slowly south across Iowa during the night of the 21st and during the daytime hours of the 22nd. Low pressure developed over Oklahoma, and tracked northeast across Illinois. Snow began falling over southwest and west central Iowa during the morning of the 22nd. The heaviest part of the storm moved in during the late afternoon of the 22nd and continued through much of the day on the 23rd. Snow came to an end over the northeast counties during the evening hours of the 23rd. Snowfall amounts were generally in the 5 to 10 inch range in a 140-mile-wide band extending from the southwest to the northeast corners of the state. Snowfall was heavier in the northeast quarter of Iowa, with many areas receiving 8 to 12 inches. The heaviest snowfall



# Storm Data and Unusual Weather Phenomena

November 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 was at Lansing, where 15 inches of new snow was recorded. Along with the snow came a strong north to northwest wind. By the early morning hours of the 23rd, and continuing through the day, winds of 20 to 40 MPH were reported over all of the state. These winds caused considerable blowing and drifting of the newly fallen snow. Many roadways became impassible and drifted shut. By the late afternoon hours of the 23rd, most roads in the northeast quarter of the state were either closed or restricted to one-lane travel. Accidents were numerous. As the snow began, many areas had a brief period of freezing rain and ice pellets. This caused some icing problems, but the more significant cause was the warm ground temperatures. It had been quite warm in advance of the storm. As the snow fell, road surfaces were warm enough to cause the initial snow to melt. This led to considerable compacting of snow, with virtually all road surfaces covered by a thick layer of ice. Parts of the Interstate system had to be closed down due to the number of trucks and cars in ditches and blocking roadways. Many events had to be canceled. One was the University of Northern Iowa football game on the 23rd. The reason for the cancellation was the domed stadium that they play in was closed for safety reasons. The weight of the snow caused the domed roof to sag, and measures had to be taken to keep the roof from collapse. After the snow stopped, blowing and drifting continued through the night of the 23rd and into the 24th. Elsewhere around the state, light snowfall occurred. The northwest counties generally received an inch or less of snow, while one to two inches fell over the southeast.

IAZ001-004-005-  
SDZ018  
Northwest Iowa

29	0700CST- 2300CST	0	0	7	0	Ice Storm
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A strong warm front was located to the south of Iowa. During the early morning hours, a low pressure developed over the Texas panhandle. The low moved to the northeast, along the warm front, eventually taking a track across southwest Iowa into southeast Minnesota. Precipitation broke out north of the warm front. Much of it was in the form of freezing rain over the northwest part of the state. Over the northwest quarter, 1 inch or more of ice accumulated in many areas, with up to 2 inches of ice in some locations. Numerous trees were downed and power was lost in most communities of northwest Iowa. To add to the problems, thunderstorms accompanied the freezing rain. A mixture of ice pellets and snow occurred at times. The extreme northwest part of the state received some significant snowfall. Two to five inches of snow fell northwest of a Sioux City to Spencer line. There were isolated areas that received up to 7 inches of snow, mainly in the Cherokee and Sibley areas. The local areas of heavy snow was caused by the intense snowfall under the Thunderstorms. Travel became hazardous if not impossible in the area. During the later stages of the storm, precipitation changed over to all snow and was heavy for a brief period. Northwest winds of 20 to 40 mph caused considerable blowing and drifting of snow and reduced visibility to near zero at times. Some sections of electrical transmission lines were downed by the winds and ice accumulation. Damage from this storm was well into the millions of dollars. Severe damage was done to both trees and electrical lines in the area. Iowa Public Service alone reported over \$1.3 million in damage to their lines. Some freezing rain fell to the southeast of the ice storm area. Some travel problems were caused by this, however, the accumulation was on the order of one to two tenths of an inch. Since winds were quite light in these areas, no significant damage occurred before the ice melted.

Wayne County	29	2035CST	0	0	4	0	Thunderstorm Winds (G50+)
Promise City	29	2035CST	0	0	5	0	Thunderstorm Winds (G61)
2 W Seymour							
Wapello County	29	2110CST	0	0	4	0	Thunderstorm Winds (G50+)
2 W Ottumwa							
Davis County	29	2115CST	0	0	4	0	Thunderstorm Winds (G50+)
Savannah	29	2120CST	0	0	4	0	Thunderstorm Winds (G50+)
Dunnville							
Mitchell County	29	2130CST	0	0	4	0	Thunderstorm Winds (G52)
5 SE New Haven							
Van Buren County	29	2145CST	0	0	5	0	Thunderstorm Winds (G50+)
7 SW Boneparte							
Iowa County	29	2150CST	0	0	4	0	Thunderstorm Winds (G50+)
1 W Millersburg							
Louisa County	29	2224CST	0	0	4	0	Thunderstorm Winds (G50+)
Columbus Junction							
Des Moines County	29	2230CST	0	0	5	0	Thunderstorm Winds (G65)
Danville							

Downburst winds caused damage in Danville.

## Storm Data and Unusual Weather Phenomena

November 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<b>IOWA Cont'd</b>									
Cedar County									
Lowden	29	2300CST	1.0	30	0	0	4	0	Tornado (F1)
NW Davenport	29	2315CST-							
1 E Eldridge		2324CST			0	2	5	0	Thunderstorm Winds (G75)
									Downburst winds.
Davenport	29	2320CST			0	0	3	0	Lightning
Clinton County									
Clinton	29	2335CST			0	0	4	0	Thunderstorm Winds (G50+)

A dry line advanced rapidly east across Iowa during the evening hours. A band of thunderstorms developed ahead of the dry line. Gusty winds occurred with most of these storms, as they moved northeast at over 50 mph. Majority of the damage occurred over the southeastern portion of the state, where the most intense portion of the line was located. Several buildings were downed by high winds in Van Buren County, southwest of Bonaparte. There were other reports of damage to farmsteads in southeast Iowa. Thunderstorm winds downed a barn in Mitchell County, and another in Louisa County. There were several reports of winds toppling power poles in Davis and Wapello Counties. As the line of thunderstorms moved through Cedar County, 50 mph winds swept through the Lowden area. After the initial wind, the storm produced a tornado. The tornado struck a building at the co-op observing station in Lowden. It lifted part of the roof off of a concrete structure. The observer recorded a wind gust of 90 mph as the tornado moved through. Damage to the building was estimated at several thousand dollars. One storm produced a downburst at Danville, in Des Moines County. Winds were estimated around 75 mph from this storm. Another storm produced a downburst in Scott County. The first reports came from northwest Davenport as the winds caused damage in a mobile home court. Eight mobile homes were completely destroyed, with 14 others sustaining major damage. Minor damage was done to 32 others. Two children were injured in the mobile homes. The injuries were minor, and the children were treated and released. Two homes were damaged in the northwest part of Davenport as well. Numerous power lines were downed. As the downburst moved northeast from the city, little damage occurred until it hit a cattle confinement structure just east of Eldridge. Structural damage was reported to the building. The wind speeds were estimated, but from the damage that occurred winds in the 80 to 90 mph-range seemed reasonable. Farther to the northeast, the same line of thunderstorms caused damage in Clinton. Plate glass windows were blown out at a car dealership in Clinton. Lightning struck a house in Davenport. Some damage occurred, although it was relatively minor.

IAZ003-007-008-  
010-011-013-  
014-015-ILZ004-  
Southeastern Iowa

29	2300CST-								
30	0500CST				0	0	5	0	High Winds

As intense low pressure moved from southwestern into north-central Iowa, high winds developed over the southeastern part of the state. Sustained winds were in the 35 to 50 mph range, with occasional gusts between 65 and 70 mph. A 66 mph wind gust was recorded at both Ottumwa and Cedar Rapids during the early morning hours. The observer at Lowden recorded a 60 mph wind gust at 0145 CST. Waterloo reported winds gusting to nearly 60 mph. The period of strongest winds was between 1000 CST on the 29th and 0300 CST on the 30th. Some damage occurred from the winds. Many trees were downed, with some damage done to buildings. Most of the building damage was to out buildings. Winds diminished after 0500 CST, but continued to blow in the 20 to 40 mph range for several hours. The swath of strongest winds was in a 75-mile-wide area extending from near Centerville to northeast of the Cedar rapids area. By the time the winds reached the Dubuque area, they had diminished somewhat.

### KANSAS

Brown County	01	0000CST			0	0	5	0	Ice Storm
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A cable television tower collapsed from the weight of ice and 40 mph winds.

### KENTUCKY

Logan County	30	0800CST			0	0	4	0	Thunderstorm Winds
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Thunderstorm winds damaged a mobile home, a barn and grain bins. Trees and power lines were also blown down.

# Storm Data and Unusual Weather Phenomena

November 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<b>LOUISIANA</b>									
<b>Terrebonne Parish Houma</b>	<b>01</b>	<b>0025CST</b>	<b>0.3</b>	<b>20</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>Tornado (F1)</b>
The Houma City Police Department reported that a small tornado on an intermittent path moved rapidly through the eastern portion of the city around 0025 CST. The first report of damage came when the tornado damaged some utility poles and power lines near Industrial Boulevard and Van Avenue. The bulk of the damaged occurred several miles to the east where the tornado tore off the roof and partially collapsed the walls of a video store and florist shop near Tunnel Boulevard and Odette Street and to a gas station at Grand Caillou and Morris Street. The last report of tornado damage was to a roof of a home two blocks east of the gas station. There were no injuries or fatalities.									
<b>Claiborne Parish 1 E Lisbon</b>	<b>03</b>	<b>0700CST</b>			<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>Cold</b>
A 51-year-old homeless woman died from exposure after spending the night in a drainage ditch. (F51O)									
<b>Vernon Parish Fort Polk</b>	<b>19</b>	<b>0815CST</b>	<b>0.3</b>	<b>20</b>	<b>0</b>	<b>1</b>	<b>4</b>	<b>0</b>	<b>Tornado (F1)</b>
A small tornado damaged a UH60 Blackhawk helicopter and injured a soldier at the Rosepine training area. Eight AH64 Apache and four AH1 Cobra helicopters that were tied down had their rotors, masts and hubs damaged by the tornado at the Fort Polk Army Airfield.									
<b>Caddo Parish 3 NE Blanchard</b>	<b>19</b>	<b>1431CST</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>Thunderstorm Winds</b>
<b>12 NW Shreveport</b>	<b>19</b>	<b>1431CST</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>Funnel Cloud</b>
<b>3 SSW Dixie</b>	<b>19</b>	<b>1447CST</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>Thunderstorm Winds (G50)</b>
<b>3 SSW Dixie</b>	<b>19</b>	<b>1447CST</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>Funnel Cloud</b>
<b>Bossier Parish 10 S Plain Dealing</b>	<b>19</b>	<b>1455CST</b>			<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>Thunderstorm Winds Hail (1.75)</b>
<b>10 S Plain Dealing</b>	<b>19</b>	<b>1455CST</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>Funnel Cloud</b>
A severe thunderstorm moving north-northeast across rural parts of Caddo and Bossier Parishes blew down some trees 3 miles northeast of Blanchard, 3 miles south-southwest of Dixie and 10 miles south of Plain Dealing where golf ball- size hail was reported. The severe thunderstorm produced some funnel clouds which were observed 12 miles northwest of Shreveport, 3 miles south-southwest of Dixie and 10 miles south of Plain Dealing.									
<b>Lincoln Parish Ruston</b>	<b>19</b>	<b>1515CST</b>			<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>Thunderstorm Winds</b>
A severe thunderstorm blew down several large pine trees onto the roof of a few homes in Ruston.									
<b>Claiborne Parish 1 E Haynesville</b>	<b>19</b>	<b>1545CST</b>			<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>Thunderstorm Winds</b>
Thunderstorm winds blew down some large trees and tore off the roof from a barn just east of Haynesville.									
<b>Rapides Parish Echo</b>	<b>19</b>	<b>1745CST-</b>	<b>10.0</b>	<b>100</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>?</b>	<b>Tornado (F2)</b>
<b>Ruby</b>	<b>19</b>	<b>1754CST-</b>			<b>0</b>	<b>0</b>	<b>4</b>	<b>?</b>	
<b>Avoyelles Parish Effie</b>	<b>19</b>	<b>1810CST</b>			<b>0</b>	<b>1</b>	<b>4</b>	<b>?</b>	
A tornado moving rapidly north along the border of Rapides and Avoyelles Parishes began in Echo where it tore the roof off from a home and allowed torrential rains to flood the interior with a couple of inches of rain water. The Louisiana State Highway Patrol said that the tornado blew down some trees and power lines in Echo. The tornado damaged about four homes and blew down some trees and power lines near Ruby. The tornado then moved northeast towards Effie where it did heavy damage to the roof and porch of a home; in addition, it destroyed a camper trailer and a 16- x 16-foot storage shed. One man was injured from a flying debris in Effie.									

# Storm Data and Unusual Weather Phenomena

November 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<b>LOUISIANA Cont'd</b>									
Ouachita Parish Monroe	19	1830CST			0	0	1	0	Thunderstorm Winds
A severe thunderstorm blew down a tree and some power lines in Monroe trapping a motorist inside of his automobile.									
Caldwell Parish 10 SW Columbia	19	1930CST			0	0	0	0	Thunderstorm Winds
A severe thunderstorm blew down several trees onto U.S. Highway 165, 10 miles southwest of Columbia.									
Franklin Parish 3 N Bakers	19	1939CST			0	0	4	0	Thunderstorm Winds (G67)
A severe thunderstorm with 67 knot gusts blew down several trees and tore the roof off from a grocery store on Louisiana Highway 17, 3 miles north of Bakers.									
Madison Parish Waverly	19	1940CST	1.0	200	0	1	5	?	Tornado (F1)
A tornado tore down five 500kw high transmission towers and power lines just west of Waverly. As the tornado moved to just north of Waverly near the intersection of Louisiana Highways 577 and 579, it destroyed a mobile home injuring its occupant and caused minor to moderate damage to six other homes.									
Richland Parish Warden	19	1945CST			0	0	5	0	Thunderstorm Winds
A "bow echo" severe thunderstorm moving north-northeast about 50 knots heavily damaged one home and did lesser damage to five other homes in Warden.									
West Carroll Parish 5 E Epps	19	1945CST			0	0	0	0	Thunderstorm Winds
East Carroll Parish 18 SW Lake Providence	19	1946CST			0	1	5	0	Thunderstorm Winds
Another "bow echo" severe thunderstorm moving north-northeast about 50 knots blew down several trees 5 miles east of Epps. The strong winds from the thunderstorm destroyed a mobile home and heavily damaged four homes and a barn 18 miles southwest of Lake Providence; there was one minor injury.									
5 W Transylvania	19	1955CST			0	0	0	0	Thunderstorm Winds
A severe thunderstorm blew down numerous trees 5 miles west of Transylvania.									
Lake Providence	19	1956CST	0.8	100	0	6	6	0	Tornado (F2)
A tornado destroyed two homes, a new car dealership and caused heavy damage to a state high maintenance barn just across the street from the new car dealership in the southwest part of Lake Providence. A 77-year-old woman was pulled from the debris of her destroyed home; she died from a heart attack that evening. The woman's husband and four grandchildren were treated for injuries and released from a local hospital. Another child suffered minor contusions after escaping the tornado which destroyed the other Lake Providence home. The automobile dealer said that the tornado destroyed 40 new cars and did an estimated \$1 million damage to his business. (F77H)									
Tensas Parish Waterproof	19	1958CST			0	0	0	0	Thunderstorm Winds (G58)
St. Joseph	19	2000CST			0	0	3	0	Thunderstorm Winds
Severe thunderstorms blew down several trees just north of Waterproof, knocked down some power lines, damaged the roof of a storage building, and overturned some loaded cotton trailers in St. Joseph.									
Beauregard Parish Dry Creek	19	2030CST	0.5	20	0	0	4	0	Tornado (F1)

# Storm Data and Unusual Weather Phenomena

November 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

A small tornado did about \$20,000 damage to a church in Dry Creek where it ripped the shingles off its roof and heavily damaged one of its brick walls. Roof shingles from the church were found about 0.5 miles away.

## MAINE

MEZ001-002-005-  
006-007-009-010-  
012-013  
MEZ001-002

11	0400EST-								
12	0100EST				0	?	?	0	Glaze
11	2100EST-								
12	1400EST				0	0	0	0	Heavy Snow

Low pressure stretching from the Delmarva Peninsula to just southeast of Cape Cod, brought a combination of rain, sleet, freezing rain, and snow to most of Maine. The wide variety of precipitation made roads very slippery as a coating of ice, slush, and snow formed on roadways. The icy road conditions resulted in many accidents, numerous cars slid off the road, with damage to some vehicles, and several injuries being sustained. Northern and central Maine were the first to experience the icy road conditions. In Aroostook county, five cars skidded off ice covered roads in Patten, Hodgon, Merrill, Madawaska, and Monticello. No injuries were reported, but damage was sustained to each car. In Houlton at 0445 EST a vehicle skidded on an ice covered bridge, hit a guardrail, and then rolled over on its side. The driver suffered minor injuries and \$3,000 to \$4,000 in damage was sustained to the vehicle. A tractor-semitrailer driver in New Limerick, lost control of the vehicle on slush covered roads causing it to roll over. The driver sustained rib and stomach injuries and the truck was extensively damaged. Portions of northern Penobscot County reported three overturned trucks in the morning hours along Interstate 95 between Medway and Howland. No injuries were reported, but damage was sustained to each truck. Oxford County in western Maine also reported icy roads and numerous car accidents throughout the day. Several car accidents were reported in Norway, Paris, and Bethel, but no injuries occurred. In Brownfield, icy roads led to a car skidding off the road and into a ditch. The car suffered \$1,000 in damage, but the driver was not hurt. Oxford Hills reported rather icy roads which led to two vehicles skidding off the road. Icy and slush covered roads caused a jeep to roll over in Otisfield. No injuries were sustained, but \$2,000 in damage occurred. Two vehicles in South Paris suffered damage when one skidded off the road while the other rolled over. A car rolled over in the town of Hebron in response to icy roads. No injuries were reported. Along the Sumner-Peru line in Oxford County, a car skidded off an icy road and crashed into a brook. The car was totaled and the driver suffered some injuries. Up to 40 minor accidents were reported in the Augusta area of Kennebec County throughout the day in response to a mixture of snow, sleet, and freezing rain. Six accidents occurred in Franklin County around 1530 EST due to a mixture of rain, sleet, and snow on the roads. Four were in Farmington, one in Phillips, and one in Stratton. Only minor personal injuries were reported. Also at 1530 CST in the town of Bridgton in Cumberland County, a head-on collision sent three people to the hospital. Icy roads caused the accident. Several cars skidded off ice covered roads in the town of Pittsfield in southern Somerset County during the evening hours on the 11th. No injuries were sustained, but damage was reported to the vehicles. Heavy snow fell across the far northern portions of Maine during the nighttime hours on the 11th and continued into the 12th. Six to eight inches of snow fell over the northern half of Aroostook County.

York County  
Kennebunk

11	Unknown								
					0	0	?	0	Lightning

Lightning struck the chimney of a house before getting into the electrical system. The entire house was destroyed by the resulting fire.

Penobscot County  
Old Town

30	Unknown								
					0	5	?	0	Glaze

Rain turned to freezing rain causing roads to ice up which resulted in a three car accident. Five injuries resulted when a car skidded into two broken down vehicles on the side of the road. One woman was in critical condition while the four others received minor injuries.

# Storm Data and Unusual Weather Phenomena

November 1991

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

## MARYLAND AND DC

District of Columbia 2 SE Naval Observatory	05	0600EST			1	0	0	0	Cold
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A homeless man was found dead of exposure. His death was officially listed as due to critical hypothermia. Overnight temperatures in the area were in the upper 20s. (M350)

MDZ001	09	1500EST-			0	0	5	0	Coastal Flood
	10	2400EST							

The second major coastal storm in less than 2 weeks brought a return of high winds, heavy surf, and flooding to the mid-Atlantic coast. Officials at Ocean City reported no serious flooding at time of high tide on the 10th, however there were areas of moderate beach erosion.

MDZ005-006 District of Columbia	10	0600EST- 1000EST			0	0	4	0	Glaze
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Freezing rain during the morning rush hour caused numerous traffic accidents. One fatality and four injuries occurred in the accidents.

## MASSACHUSETTS

None reported.

## MICHIGAN

MZ075 > 078 Western Upper Peninsula	02	1800EST-			0	0	0	0	Heavy Snow
	03	0400EST							

Heavy snow fell across the four westernmost counties of the Upper Peninsula. Light snow began falling over this area around 0400 EST on Saturday, November 2nd, as the center of this very deep storm was moving north across western Lake Superior. The heavy snow began once the center of the storm passed north of Lake Superior, during the evening hours of Saturday, November 2nd. The heavy snow continued for about nine hours, tapering off to light snow during the early morning hours of Sunday, November 3rd. During the day time on Saturday, temperatures had fallen from the upper 20s to the mid 20s on a southwesterly wind of 20 to 30 mph with gusts to near 40 mph. During the evening of Saturday, the wind became more westerly and decreased to 15 to 20 mph with gusts to near 30 mph. It was at this point that the heavy snow began falling. During the following nine hours, visibilities remained at or below 0.25 mile and wind chills at 10 to 20 below zero. Snowfalls across Keweenaw, Houghton, Ontonagon, and Gogebic Counties were rather uniform with around 10 inches. Light snow and blowing snow kept visibilities at or below 3 miles over this area until around 2000 EST on Sunday, November 3rd.

MZ003-004-013- 015-016-060- 062 Northwest and West Central Lower Michigan	02	2300EST-			0	0	0	0	Heavy Snow
	04	1300EST							

The low pressure system that caused the heavy snow over western Upper Michigan, also caused lake effect heavy snow over two areas of western Lower Michigan. Two heavy snow bands developed over Lake Michigan when the cold air crossed the lake just before midnight on Saturday, November 2nd. The first band was over the widest part of the lake, between Milwaukee, Wisconsin and Grand Rapids, Michigan. This resulted in a 50-mile wide area of heavy snow. The area extended from north of Benton Harbor to just south of Muskegon and went inland for 50 miles. Snowfall of 12 to 18 inches fell over most of this area during the 34 hours of this event. The heaviest snowfall was near the Kent County Airport, just northeast of downtown Grand Rapids. The second area of heavy snow occurred over the counties of Charlevoix, Emmet and Cheboygan. Snowfalls over this area were around 15 inches. Considerable blowing and drifting snow was also reported in each area.

MZ076 > 077 Western Upper Peninsula	05	1300EST-			0	0	0	0	Heavy Snow
	06	0700EST							

# Storm Data and Unusual Weather Phenomena

November 1991

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

## MICHIGAN Cont'd

Heavy snow fell over two counties of the Western Upper Peninsula of Michigan during an 18-hour period from early afternoon on Tuesday, November 5th to the midmorning hours of November 6th. Snowfalls of 8 to 10 inches were common across Houghton and Ontonagon Counties. The first part of the storm was the result of an occluded front crossing the area during the evening hours of Tuesday, the snow after midnight, was mostly lake effect. Some light snow continued until around 1800 EST on Wednesday, November 6th.

MZ072 > 080 West and Central Upper Peninsula	24	0000EST-							
	25	2000EST			0	0	0	0	Heavy Snow

The heaviest snowstorm of the new season resulted from a deepening storm that moved northeast across Wisconsin during the afternoon hours of Saturday, November 23rd. The storm then moved northeast across northern Lake Michigan during the early morning hours of Sunday, November 24th, then continued northeast over the eastern Upper Peninsula around 0700AM EST Sunday morning. From there, the storm rapidly moved northeast away from Michigan across eastern Canada. During the 44 hours that significant snow fell over Michigan, snowfalls of 12 to 24 inches were common over west and central Upper Michigan, 2 to 5 inches over eastern Upper Michigan and 2 to 6 inches over western Lower Michigan. The city of Allegan in Allegan County (southwestern Lower Michigan), reported 8 inches of snow for the maximum snowfall over Lower Michigan. Over Upper Michigan, while 12 to 24 inches of snow was common over the western and central sections, the Weather Service Office in Marquette reported 31.5 inches of snow, which was the storm's maximum snowfall over Michigan. Over the western parts of the Upper Peninsula, the heavy snow combined with northeast winds of 15 to 25 mph. Winds gusted frequently to near 35 mph and the city of Ontonagon reported a wind gust to 78 mph during Saturday night. This resulted in drifts to 8 feet in many areas. People living on back or side roads were stranded for several days as a result of this. The main roads in the cities of Marquette, Ishpeming and Negaunee remained driveable. While there were several traffic accidents reported, they were few and minor since the residents drove slowly, if they drove at all.

MZ015-016-025- 033-934-040 South Central and Lower Peninsula	28	1400EST-							
	29	0400EST			0	0	0	0	Heavy snow

Heavy, wet snow fell began falling over south-central Lower Michigan during the midafternoon hours of Thanksgiving Day. This heavy wet snow resulted from overrunning of a front that became stationary over the northern portion of Ohio during the afternoon hours of Thursday, November 28th. Most of the heavy snow fell in an area that was 100 miles long and 50 miles wide. This area was from the central part of the Michigan thumb, west to just east of Grand Rapids, Michigan. In this area, 6 inches of heavy wet snow was quite general. In the area 50 miles north and south of this, and to the lakes on either side of it, 2 to 4 inches of snow was common. Some freezing rain and sleet occurred at the beginning and ending the precipitation, adding to the driving problems. Several accidents and considerable problems for travelers over this area into Friday morning.

MZ075 > 078 Western Upper Peninsula	29	1800EST-							
	30	0900EST			0	0	3	0	Heavy Snow

Another heavy snowstorm besieged the western portion of Upper Michigan. This was the fourth big storm for this area. A deep surface low pressure system moved quickly northeast from western Iowa during the evening hours of Friday, November 29, to central Upper Michigan by 0700 EST on Saturday, November 30th. As a result, the snow began over the western Upper Peninsula around 1800 EST on Friday evening, then continued to fall until the midmorning hours of Saturday, November 30th. Snowfall amounts of 8 to 12 inches were widespread across all four counties of the western Upper Peninsula, near Lake Superior. The maximum snowfall was 22.8 inches at Houghton and Ironwood was a distant second with 15 inches. The very heavy snow and strong northwesterly wind of 15 to 30 mph wreaked havoc with power lines for several hours in some parts of Copper County. The combination of strong winds and heavy snow caused near zero visibility in many area, forcing motorist to pull off the to the side of the road along Michigan route 28, near Houghton. It took until Sunday morning to get the power back on in most areas.



# Storm Data and Unusual Weather Phenomena

November 1991

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

## MINNESOTA

MNZ001 > 003-006 > 008-010-011 Northwest and Central Portion	09	0800CST- 2200CST			0	0	?	?	Freezing Rain
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A mixture of sleet and freezing rain moved into the northwestern corner of Minnesota by midmorning and continued in a slow eastward progression into central portions by late evening. Roads became ice covered and treacherous by late afternoon. Thirty to fifty cars slid off a portion of Interstate 94 east of Moorhead with at least 10 automobile accidents attributed to the slick conditions. Highway maintenance crews were called off the roadways during the early evening in parts of northwest Minnesota because of the heavy accumulation of ice.

MNZ019 Southeastern Portion	22 23	1600CST- 2200CST			0	0	?	0	Heavy Snow
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Another strong snowstorm developed over the Oklahoma panhandle region during the afternoon on the 22nd and lifted north-northeast across Missouri and into central Wisconsin by evening on the 23rd. Snow began to fall heavily during the day on the 23rd and was accompanied with thunder at times as the storm moved into Wisconsin. Northwest winds increased and gusted to over 30 mph creating near blizzard conditions. Snow drifts to three feet were reported in the Mississippi River Valley region where over a foot of snow accumulated. A number of roads were impassable at the height of the storm and several road maintenance crews were called from the roadways due to the persistent blowing and drifting snow.

The storm deposited snowfalls in excess of 6 inches east of a line from near Lake City, Zumbrota and Austin. A swath of snow in excess of a foot fell east of a line from near Winona, Lanesboro and Preston. The greatest snowfall reported was a 14-inch total at both Preston and Harmony.

MNZ008-009- 011 > 019 Southeastern Portion	29 30	1000CST- 0500CST			0	0	?	?	Heavy Snow
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A strong snowstorm moved from Kansas during the morning of the 29th, across Iowa and Wisconsin and north of Lake Superior by noon on the 30th. A mixture of rain, freezing rain and sleet fell over much of the southern one-quarter of the state. Heavy accumulations of ice on trees and power lines knocked out power to at least 4,000 residents across the area. Interstate 90 was ice covered and treacherous with numerous car accidents reported.

At the same time, snow fell heavily across southwest into east central Minnesota. Forty-mph winds buffeted the area as the storm moved through Wisconsin and many rural roadways were impassable.

Snowfall tallies in excess of 6 inches occurred east of a line from Madison (west central), to Bird Island, Melrose to near Duluth. The eastern extent of this area was located from Worthington to the southeast portion of the Twin Cities metropolitan area (southern St. Paul).

Amounts of 12 inches or more fell in a 20- to 50-mile wide area from Springfield and across the Twin Cities metropolitan area, to Hinkley and Stillwater. The greatest snowfall total was reported from St. Francis with 17 inches.

## MISSISSIPPI

DeSoto County Walls	19	1630CST			0	0	3	0	Thunderstorm Winds
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Two barns were damaged in Walls.

Jefferson County 3 W Lorman	19	2000CST			0	0	2	0	Thunderstorm Winds
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Several power lines were blown down.

Issaquena County 4 E Tallula	19	2044CST			0	0	4	0	Thunderstorm Winds
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Several houses were damaged and numerous trees were blown down.

# Storm Data and Unusual Weather Phenomena

November 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<b>MISSISSIPPI Cont'd</b>									
Adams County 7 S Natchez	19	2045CST			0	0	2	0	Thunderstorm Winds
									Several power lines were blown down.
Warren County 7 SE Vicksburg	19	2111CST			0	5	5	0	Thunderstorm Winds
									Five mobile homes were destroyed and 10 permanent structures were damaged. Five people were injured and two required hospitalization.
Panola County 3 SE Batesville	19	2300CST			0	4	4	0	Thunderstorm Winds
									One mobile home was destroyed and one house was damaged. Four injuries were reported.
Lee County Tupelo	20	0300CST			0	0	2	0	Thunderstorm Winds
									Numerous trees and power lines were blown down across the city of Tupelo. One aluminum awing was blown over. The roof of a business had moderate to heavy damage.
Noxubee County Brooksville	20	0430CST	0.5	440	0	15	5	0	Tornado (F1)
									Twenty-five frame homes or mobile homes were totally destroyed. Numerous trees and power lines were blown down. Fifteen people were injured, two seriously.
Monroe County Gattman	20	0500CST			0	0	5	0	Thunderstorm Winds
									One home was totally destroyed, and numerous trees and power lines were blown down.
Rankin County 6 SW Florence	30	1230CST			0	0	4	0	Thunderstorm Winds
									Two houses had roof damage. One patio cover and storage shed was destroyed. Many power lines were blown down.
Neshoba County 7 NE Philadelphia	30	0547CST			0	0	3	0	Thunderstorm Winds
									Two mobile homes were damaged, and a dozen trees were blown down.
Yazoo County 2 SW Yazoo City	30	1830CST			0	0	3	0	Thunderstorm Winds
									Strong winds blew the tin roof off of a two story barn, and downed several power lines, and limbs.
<b>MISSOURI</b>									
MOZ001-004 Extreme Northwest	01	0000CST- 1900CST			?	?	4	0	Heavy Snow Glaze
									An area of freezing rain and snow moved across extreme northwest Missouri overnight and into the early afternoon. The freezing rain produced glaze that caused numerous problems. Eight to ten inches of snow also occurred. Many areas were without electricity because of downed power lines and broken trees. Especially hard hit were Holt, Atchison, and Nodaway Counties. Record cold temperatures were set across most of Missouri after the storm.
MOZ001-002-003- 004-005-006-007- 008-009-010-011- 012 Northern Missouri	06 07	2100CST- 0700CST			?	?	5	0	Heavy Snow Glaze

# Storm Data and Unusual Weather Phenomena

November 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

A band of snow from 3 to 7 inches fell across the northern half of Missouri. The heaviest snowfall was from north-central Missouri, to near Hannibal. For most areas it was the second greatest snowfall so early in the season. Numerous accidents were reported since glaze also accumulated with a period of freezing rain. A woman in Lee's Summit was struck by a car while standing next to her vehicle. Other fatalities were reported by the Highway Patrol. Ice also snapped power lines and downed many trees over much of northwest Missouri. Especially hard hit was Tarkio in Atchison County. Record cold temperatures invaded the state for 2 days afterward. (F33O)

### Mississippi County Charleston

29	1930CST				0	0	4	0	Thunderstorm Winds
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The roof of the Vocational-Agriculture building at Charleston High School was torn off by high wind gusts. Several other buildings in the area also suffered roof damage. Time was estimated.

### Bates County 5 S Butler

29	1710CST	0.8	45		0	0	5	3	Tornado (F1)
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An intense thunderstorm over south-central Bates County produced a small tornado which touchdown along a very short path. Mobile homes and trailers were extensively damaged with roofs blown off some. Major damage to barns and weaker buildings occurred as well.

### Johnson County Whiteman Air Force Base

29	1755CST				0	0	0	0	Thunderstorm Winds (G66)
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A 76-mph wind gust was recorded at Whiteman Air Force Base.

### Christian and Greene Counties 3 N Nixa to 4 E Springfield

29	1805CST- 1825CST	10.0	400		2	64	7	0	Tornado (F4)
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A tornado touched down in a subdivision 3 miles north of downtown Nixa, just east of U.S. Highway 160 near CC Highway. Although minor wind damage was reported west and northwest of Nixa before touchdown, the tornado reached F3 intensity quickly. The tornado then continued northeast for about ten miles, lifting over southeast Springfield, just before reaching Sunshine Street. Light wind damage continued to be produced by the storm to about 0.5 mile northeast of Sunshine Street in east Springfield. Minor damage did occur to three houses along the southern portion of Springfield Lake, along with trees topped off and uprooted. Tornado damage intensity increased again in a cementary on a hill north of Springfield Lake, becoming F2 to F3 intensity and destroying a house just west of U.S. Highway 65. The tornado then picked up a truck from Highway 65 and flipped it onto a frontage road, killing one passenger. Ten other individuals were injured in an ensuing multi-vehicle crash on Highway 65. The storm continued northeast producing F3 to F4 intensity damage for about 1.5 miles in the subdivisions of Woodbridge and Natural Bridge Estates before lifting. The other fatality occurred to a man in his house in southeast Springfield. Damage was estimated at over \$15 million and includes extensive damage to utility and telephone poles. (M54V) (M68P)

### Nodaway County Near Conception Junction

29	1902CST				0	0	5	2	Thunderstorm Winds
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Major structural damage occurred to barns and other weaker buildings. Windows were broke out of several mobile homes.

### Morgan County

29	1913CST				0	0	4	0	Thunderstorm Winds
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The Morgan County Sheriff's Office reported a collapsed building and power lines down due to thunderstorm winds. Winds estimated at 35 to 45 mph.

### Moniteau County Fortuna

29	1925CST				0	0	3	0	Thunderstorm Winds
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The sheriff's office reported broken windows due to strong winds and hail.

### Pulaski County Ft. Leonardwood

29	2015CST				0	0	3	0	Thunderstorm Winds
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The state police reported trees and power lines down.

## Storm Data and Unusual Weather Phenomena

November 1991

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

Phelps County	29	2109CST			0	0	3	0	Thunderstorm Winds
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The Phelps County Sheriff's Office reported a small shed blown into a tree and skirting on a mobile home blown away.

Washington County 5 S Potosi	29	2140CST			0	0	2	0	Thunderstorm Winds
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Several large trees were down, blocking Highway 21.

Jefferson County Northern Portion	29	2150CST			0	0	2	0	Thunderstorm Winds
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The Jefferson County Sheriff's Office reported numerous trees down in the northern and northeastern portion of the county.

St. Francois County Farmington	29	2150CST			0	0	4	0	Thunderstorm Winds
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A convenience store roof was blown off, several trees were knocked down, and many windows throughout the Farmington area were broken.

### MONTANA

MTZ001	04	0600MST- 1500MST			0	0	4	0	Heavy Snow
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Four to six inches of snow fell.

MTZ007	20	1703MST			0	0	4	0	High Winds
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Livingston reported a wind gust to 75 mph.

MTZ006-007	21 22	1100MST- 0400MST			0	0	4	0	Heavy Snow
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A narrow band of heavy snow fell from Lewistown southeastward to the Bull Mountains to Busby and Colstrip. Roads around Lewistown were closed. Six to ten inches of snow fell.

MTZ004-007	27	0500MST- 1300MST			0	0	4	0	Heavy Snow
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Eight to ten inches of snow fell in the mountains and from four to eight inches fell in the valleys.

### NEBRASKA

South-Central and Eastern Nebraska NEZ004-009-010- 014-015-018-019	01	0000CST- 1200CST			0	0	7	?	Heavy Snow
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A major winter storm that began October 30 continued into November. Many locations received 10 to 16 inches of snow. The snow, ice, and wind knocked down trees and power lines, closed roads, and virtually paralyzed the state. Some areas were without power for over a week.

NEZALL	01- 07				0	0	?	?	Extreme Cold
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Extremely cold air settled into the area behind the "Halloween" storm. Record minimum temperatures were shattered at most stations in the state, including earliest below zero readings ever observed.

North-Central Nebraska NEZ006-007	06	0600MST- 1300MST			0	0	?	?	Heavy Snow
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A fast moving storm dumped up to 6 inches of snow in a few hours on the Nebraska Sand Hills.

# Storm Data and Unusual Weather Phenomena

November 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<b>NEBRASKA Cont'd</b>									
Southeastern Nebraska NEZ010-020	22 23	0600CST- 0200CST			0	0	?	?	Heavy Snow
			Six to eight inches of snow fell over southeast Nebraska.						
NEZ009-010-015 -014-018 South-Central to East-Central Nebraska	28 29	2000CST- 2200CST			0	0	7	?	Ice Storm
NEZ002 > 008-011 -017, Southern Panhandle to Northeastern Nebraska	29 30	0400CST- 0400CST			0	0	6	?	Heavy Snow
			Up to 10 inches of snow fell from the southern panhandle to northeast Nebraska. Gusty winds and drifting snow caused numerous accidents. The area south and east of the snow, from just north of Omaha and Lincoln to Grand Island and Hastings, received freezing rain that formed a layer of ice a couple of inches thick. The weight of the ice took down trees and power lines.						
<b>NEVADA</b>									
NVZ006 Northeastern Nevada	13	0300PST- 2330PST			0	0	0	0	Heavy Snow
			A cold low pressure system produced snow across much of Northeastern Nevada. Snow totals were generally less than 4 inches although 8 inches fell at Wildhorse.						
NVZ008 South-central Nevada	14	1100PST- 2230PST			0	0	0	0	Heavy Snow
			Six inches of snow fell in Pioche as a low pressure system moved through Southern Nevada.						
NVZ003 Extreme Western Nevada	16 17	2030PST- 1200PST			0	0	0	0	High Winds
			A strong Pacific cold front produced strong winds in extreme Western Nevada. Sustained winds of 40 mph were reported along with local gusts to 65 mph.						
NVZ001-002 Truckee-Tahoe Area/Central Sierra Eastern Slopes	17 18	0300PST- 0200PST			0	0	0	0	Heavy Snow
			A Pacific storm system dumped 12 to 24 inches of snow above 7,000 feet. Most areas around Lake Tahoe received 6 to 10 inches of snow.						
NVZ006 Northeastern Nevada	21	1115PST			0	0	0	0	Funnel Cloud
			There were several public reports of a funnel cloud in the Spring Creek area south of Elko.						
NVZ006 Northeastern Nevada	29	0200PST- 1200PST			0	0	0	0	Heavy Snow
			A cold front moved through Northeastern Nevada resulting in a localized heavy snow event at Jarbidge. Snowfall totals were generally 2 to 4 inches throughout the rest of the area.						
<b>NEW HAMPSHIRE</b>									
NHZ003-004-005- 006	11	0800CST- 2000CST			1	?	?	0	Glaze
			A combination of rain, sleet, freezing rain, and snow produced by an intensifying low pressure system near Cape Cod, caused many car accidents, numerous injuries, and one fatality over portions of southern and central New Hampshire. Slick road conditions in the town of Hopkinton in Merrimack County caused a car to skid out of control on a bridge at 1425 EST. The driver, a 25						

# Storm Data and Unusual Weather Phenomena

November 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 HAMPSHIRE Cont'd

year old woman, died. Also in Merrimack County, a two car collision in Concord occurred in response to ice covered roads. No injuries were reported, but damage was sustained to both vehicles. Hillsborough County in south-central New Hampshire reported many accidents and injuries. Forty accidents were called in throughout the day in Milford due to icy roads. Numerous accidents in Peterborough were reported, many of which were cars skidding off ice covered roads. Freezing rain caused a seven car pile-up on a sharp curve on Route 101 in Temple. Minor injuries were reported by some of the passengers. Nine other separate accidents were reported in and around the town of Temple. In New Ipswich, icy roads caused eight cars to skid off the road. Damage was sustained to several of the cars, but no injuries were reported. In Antrim, two vehicles collided on very slick road conditions. Extensive damage was reported to both vehicles, but no injuries were sustained. One car skidded off the road in Hancock and hit a tree. Damage was sustained to the front end of the car. In Bennington, two cars skidded off ice covered roads, one suffered minor damage, while the other hit a telephone pole and incurred extensive damage. No injuries were sustained by the drivers. Cheshire County also reported many accidents due to ice covered roads. In the town of Dublin alone, slick roads caused 16 cars to slide off the road. Minor damage was sustained to each vehicle. A two car collision was also reported in Dublin which caused three injuries and both vehicles to be heavily damaged. Two minor injuries were reported in Jaffrey as ice covered roads caused a two car collision. Ten other minor accidents were also reported throughout the day in Jaffrey. Three cars skidded off ice covered roads in Keene and Stoddard around 1530 EST. The driver of the car in Keene suffered a bump to the head while passengers in the two vehicles in Stoddard suffered neck and back injuries. A two car collision in Rindge on ice covered roads at 1700 EST caused damage to the vehicles, but no injuries were sustained. No injuries were reported with a car that skidded off an ice covered road in Londonderry in Rockingham county. The vehicle did suffer some damage. A dozen other accidents were reported in Londonderry throughout the day. Many minor accidents were reported in the Lake Sunapee region of Sullivan County as rain changed to sleet and snow in the midafternoon. Ten other storm related accidents were also reported in Claremont and Springfield of Sullivan County. In the town of Meredith in Belknap County, numerous cars were reported off the road due to icy road conditions with one car rolling over on its side while another hit a tree. No injuries were reported, but damage was sustained to each car. Also in Meredith, a two car collision resulted from snow and sleet covered roads. Three people sustained injuries.

### Rockingham County Brentwood

11	1119CST				0	0	?	0	Lightning
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Lightning struck a home on Scrabble Road in Brentwood, setting fire to the home's electrical system. There were no damage estimates at the time.

### Exeter

11	1130CST				0	0	?	0	Lightning
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Lightning struck the safety complex knocking out several electrical grids. Telephone service was interrupted for several hours as a result.

### Carroll County Moultonboro

11	Unknown				0	0	?	0	High Winds
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High winds blew a large pine tree onto a summer home on Lake Kanasatka causing extensive damage as the tree crashed through the roof. Numerous trees and power lines were also reported down throughout the town.

### Belknap County Laconia Tilton Sanbornton

11	Unknown				0	0	?	0	High Winds
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High winds caused trees and power lines to be knocked down in Laconia, Tilton, and Sanbornton. Numerous power outages resulted throughout each town.

## NEW JERSEY, Northern

None reported.

## NEW JERSEY, Southern

### NJZ003 Coastal Southern New Jersey

10	0950EST				0	0	6	0	Tidal Flood
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A coastal storm brought flooding. The storm winds of 35 to 40 mph pushed tides to 2.5 feet above normal and caused flooding of roadways, mainly from back bay flooding. The high tides along the shore washed away more of the beaches, still vulnerable after the last storm.

# Storm Data and Unusual Weather Phenomena

November 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<b>NEW MEXICO</b>									
NMZ004	02	1000MST- 1700MST			0	0	0	0	Heavy Snow
A snowstorm clipped northeastern New Mexico. Most amounts were less than 3 inches, but heavy snow fell in Colfax County. Four inches of snow fell at Cimarron and 5 inches fell on Interstate 25 at Springer.									
NMZ002	11	0600MST- 1630MST			0	0	0	0	Heavy Snow
A winter storm affected higher elevations in the northern mountains, with Santa Fe ski area (Santa Fe County) recording 7 inches and Red River (Taos County) recording 10 inches.									
NMZ001-002-004- 006-008	15 16	0200MST- 2100MST			0	0	0	0	Heavy Snow
A strong but slow moving storm struck northern New Mexico. The heaviest snow fell during the daylight hours on the 16th. The eastern slopes of the Sangre de Cristo and Sandia Mountains were hardest hit. In the eastern portion of Bernalillo County, 22 inches fell at Sandia Crest, 15 inches at Sandia Park and 13 inches at Tijeras. Other storm totals included: 9 inches at Wolf Canyon, Sandoval County; 8 inches at Estancia, Torraine County; 6 inches at Lindrieth, Rio Arriba County; and 5 inches at Clayton and Pasamonte, both in Union County.									
NMZ002-004-006- 007-010	29 30	2330MST- 2400MST			0	0	0	0	Heavy Snow
A very strong winter storm brought heavy snow to parts of northern and western New Mexico, starting on the 29th at night and lasting through the night of the 30th. Some leftover snow fell on December 1st, but amounts were light; the heaviest snow occurred on November 30. The most snow fell on the northern and western mountains, with numerous amounts over 6 inches. Gascon (Mora County) recorded 9 inches as did Luna (Catron County). Seven inches fell at Quemado Lake (Catron County) while 6 inches fell at Reserve (Catron County) and Fence Lake (Cibola County). Hundreds of motorists were stranded in Gallup (McKinley County), where 6 to 8 inches fell, forcing the State Police to close Interstate 40. Even some lower elevations received significant snow, as over 5 inches fell in Socorro (Socorro County).									
<b>NEW YORK, Central</b>									
Oneida County Boonville	10	0800EST			1	0	0	0	Cold
A Washington County man died of exposure to cold after his truck crashed in a ravine along Moose River Road. The man laid along the Mile Brook Creek for several hours in bitter cold temperatures. Overnight, temperatures in the area had dipped to 14°F degrees. (M370)									
NYZ004 Eastern Lake and Ontario Counties	11	AM			0	0	5	?	Ice Storm
The northern portion of Oneida County, especially the Boonville area, received 0.50 to 1 inch of freezing rain which downed trees and power lines leaving 2,500 to 3,000 customers in the Boonville area without power. Some of the customers were without power for as long as 25 hours.									
Area Wide	11	PM			2	22	6	0	Snow
Rain changed to snow during Veterans Day afternoon with 1 to 5 inches of snow having fallen by late evening across the area. Hundreds of vehicle accidents, two deaths and over 20 injuries were attributed to snow-covered roadways. There were also scattered power outages with over 100 customers left without power in the Cortland area. Ray Brook, Canton and Berne received the most snowfall with 5 inches reported. The two deaths occurred in Gouverneur in St. Lawrence County where a Richville woman and her daughter were killed when their car slid into an oncoming car on a snow-covered road. (F11V) (F35V)									
Area Wide	20	Afternoon			0	0	0	0	Record Heat
Afternoon temperatures were abnormally high for mid-to-late November as the mercury climbed to the mid 60s to mid 70s during the afternoon. Many reporting stations broke records including Albany and Binghamton.									

# Storm Data and Unusual Weather Phenomena

November 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

Delaware County	22	2039EST-							
	23	0720EST			0	0	4	0	Flood

Two days of heavy rains resulted in various types of flooding in Delaware County. A beaver dam gave way at 2039 EST on the 22nd flooding Route 23 in Harpersfield, just west of the Village of Stamford. At 2300 EST, County Route 33 in Bloomville was flooded. Around midnight flooding was reported in Delhi along Turnpike Road and Elk Creek Road. At the same time, flooding started along the Beaverkill which continued until 0539 EST on the 23rd. At 0515 EST, the west branch of the Delaware River was reported over its banks in Delhi with garbage floating in the river. The flood waters receded and streams and rivers were back within their banks by 0720 EST on the 23rd. One other related incident was a mud slide which occurred off Bell Hill Road in the Village of Delhi which temporarily blocked traffic. No related accidents or injuries were reported due to the flooding or the mud slide.

Otsego County Morris Morris	25	1604EST			0	2	4	0	Snow
	25	1712EST			0	1	3	0	Snow

Slippery travel conditions as a result of a couple of inches of new snow resulted in two accidents in the Town of Morris along State Route 23. Three vehicles were involved in the two accidents which resulted in three injuries.

Oneida County Camden	25	Night			0	2	3	0	Snow
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Slippery travel conditions as a result of several inches of new snow resulted in an accident in Camden. Two people were injured in the accident which occurred along River Road.

Cortland County Cortland Homer Cortlandville	26	0815EST			0	1	3	0	Snow
	26	1025EST			0	1	3	0	Snow
	26	1055EST			0	1	3	0	Snow

Snow squalls late on the 25th and early on the 26th left several inches of snow over Cortland County where slippery travel conditions led to several accidents. Three people were injured in separate accidents which took place along Penguin Drive in Cortland, Route 90 in Homer and Route 13 in Cortlandville.

NYZ007 Saint Lawrence Valley of New York	30	1330EST- 2000EST			0	0	4	0	High Winds
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A strong pressure gradient associated with a storm system moving east from the Upper Great Lakes Region produced winds which gusted to over 50 mph across parts of northern New York. The first report of damage was of a large tree down across a road in Saint Lawrence County at 1330 EST. The highest official wind gust occurred at the Massena Airport where a gust to 58 mph was recorded at 1821 EST. Most of the damage was confined to power outages and downed trees and tree limbs. Also hard hit was the Malone area in northern Franklin County where over 2200 customers were left without power.

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 November 15, 1991 for the following 9 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

None reported.



## Storm Data and Unusual Weather Phenomena

November 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, Western

<b>NYZ001-021</b> Erie and Niagra Counties <b>NYZ004</b> Lewis County Jefferson County	03 04 04	2100EST 1000EST 2200EST			0 0 0	0 0 0	4 4 4	0 0 0	Heavy Snow Heavy Snow Heavy Snow
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A strong flow of cold air across the warm waters of Lakes Erie and Ontario produced lake effect snow squalls. Between 6 and 12 inches of snow fell in localized areas to the lee of the lakes. Specific reports were as follows: Erie County - Cheektowaga 8 inches, Lancaster 7 inches; Niagara County - Tonawanda 6 inches; Lewis County - Barnes Corners 12 inches; Jefferson County - Adams Center 12 inches, Fort Drum 10 inches.

<b>NYZ004</b> Lewis County	11	1052EST			0	0	4	0	Ice Storm
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Nearly 1 inch of ice accumulated across portions of Lewis County. There were many large tree limbs down and numerous power outages were reported. Brisk northerly winds aggravated the problems.

<b>NYZ001</b> Erie County <b>NYZ004</b> Lewis County <b>NYZ001</b> Erie County <b>NYZ004</b> Lewis County <b>NYZ022</b> Cattaraugus County <b>NYZ002</b> Wayne County <b>NYZ005</b> Onondaga County	24 25 25 25 25 26 26	1800EST 0600EST 1000EST 1000EST 1000EST 0200EST 0200EST			0 0 0 0 0 0 0	0 0 0 0 0 0 0	4 4 4 4 4 4 4	0 0 0 0 0 0 0	Heavy Snow Heavy Snow Heavy Snow Heavy Snow Heavy Snow Heavy Snow Heavy Snow
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Snow squalls were once again produced by the cold air passing over the warm waters of Lakes Erie and Ontario. Snowfall amounts of up to 1.5 feet were reported to the lee of the lakes. Numerous automobile accidents were blamed on the heavy snow and poor visibilities. Specific reports included: Erie County - Lancaster 12 inches, Depew 12 inches, Cheektowaga 6 inches; Lewis County - Highmarket 16 inches, Barnes Corners 9 inches; Cattaraugus County - New Albion 9 inches.

<b>NYZ021</b> Orleans County	30	1500EST			0	0	4	0	High Winds
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Deep low pressure over the Upper Great Lakes produced very strong winds across the region during the afternoon hours. Winds frequently gusted over 50 mph. In Orleans County, the damaging winds downed trees and power lines.

### NORTH CAROLINA

Durham County Northeastern Portion	22	1245EST- 1300EST			0	0	0	0	High Winds
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High winds associated with a narrow band of heavy showers knocked down five trees and a telephone pole in scattered locations of the northeastern part of the city of Durham.

### NORTH DAKOTA

None reported.

## Storm Data and Unusual Weather Phenomena

November 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<b>OHIO</b>									
<b>OHZ-003 Northeast Lakeshore</b>	<b>25</b>	<b>0000EST- 0900EST</b>			<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>Lake Effect Snow</b>
									Heavy lake effect snow moved into the extreme northeast corner of Ohio. At 0700 EST, snow depths reached 6 inches around Conneaut before ending.
<b>OHZ-003 Northeast Lakeshore</b>	<b>25 26</b>	<b>0900EST- 0300EST</b>			<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>Lake Effect Snow</b>
									Heavy lake effect snow moved south into the interior of northeast Ohio and deposited from 6 to 15 inches of snow from Painesville to Thompson and Jefferson. Snow depths reached 6 inches at many areas at 1300 EST. The highest amount was 15 inches at Perry in Lake County.
<b>Allen County Lima</b>	<b>30</b>	<b>0430EST</b>			<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>Thunderstorm Winds</b>
<b>Hamilton County Hamilton</b>	<b>30</b>	<b>0500EST</b>			<b>0</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>Thunderstorm Winds</b>
<b>Butler County Hamilton</b>	<b>30</b>	<b>0508EST</b>			<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>Thunderstorm Winds</b>
									Thunderstorms moved through western Ohio blowing down trees in many locations and taking the roof off a home in Forest Park, in Hamilton County. An Arby's restaurant sign was blown down and a small golf course building was destroyed in Lima.
<b>OKLAHOMA</b>									
<b>Statewide</b>	<b>02</b>				<b>0</b>	<b>0</b>	<b>?</b>	<b>?</b>	<b>Winter Weather</b>
									A weak storm system combined with an Arctic airmass to produce record lows, ice, and snow throughout much of the state. Snowy and icy roads caused many traffic problems, especially on bridges and overpasses. Snowfalls ranged from 2 inches across the northwestern half of the state to barely a trace in the south. Numerous traffic accidents and scattered power outages were reported due to the weather, U.S. Highway 75 in Okmulgee County was impassable due to ice for several hours. The hard freeze killed tree foliage, lawns, gardens, and warm weather pastures throughout the state.
<b>Statewide</b>	<b>07</b>				<b>0</b>	<b>0</b>	<b>?</b>	<b>?</b>	<b>Heavy Snow</b>
									Another blast of Arctic air covered the state. An upper level storm system moved over the Arctic air and produced snow across the northwest half of the state and the eastern Panhandle. Six inches was reported from Woodward, 4 inches and Laverne and Gate, and Arnett, Gage, Hennessey, and Fairview each reported 2 inches. Record low temperatures were set at Oklahoma City and Tulsa and wind chill values across the northern portion of the state were in the single digits. Numerous traffic accidents, some with injuries, resulted from the winter weather.
<b>McCurtain County Smithville</b>	<b>21</b>	<b>1700CST</b>			<b>0</b>	<b>2</b>	<b>3</b>	<b>?</b>	<b>Flash Flood</b>
									A 71-year-old man and his 69-year-old wife were injured when their truck was swept off a partially submerged causeway and carried 200 yards downstream on the rain-swollen Mountain Fork River. The couple was trapped for 5 hours in the vehicle as rescue crews from as far as 50 miles away struggled to save them.
<b>Logan County Crescent</b>	<b>29</b>	<b>1315CST</b>			<b>0</b>	<b>0</b>	<b>?</b>	<b>?</b>	<b>Thunderstorm Winds</b>
<b>Mulhall</b>	<b>29</b>	<b>1315CST</b>			<b>0</b>	<b>0</b>	<b>?</b>	<b>?</b>	<b>Hail (0.75)</b>
<b>Creek County 5 S Mannford</b>	<b>29</b>	<b>1335CST</b>			<b>0</b>	<b>0</b>	<b>?</b>	<b>?</b>	<b>Hail (1.50)</b>
<b>Noble County 4 S Perry</b>	<b>29</b>	<b>1338CST</b>			<b>0</b>	<b>0</b>	<b>2</b>	<b>?</b>	<b>Thunderstorm Winds (G52)</b>
<b>Perry</b>	<b>29</b>	<b>1344CST</b>			<b>0</b>	<b>0</b>	<b>?</b>	<b>?</b>	<b>Hail (0.88)</b>
<b>Tulsa County 7 W Sand Springs</b>	<b>29</b>	<b>1345CST</b>			<b>0</b>	<b>0</b>	<b>?</b>	<b>?</b>	<b>Hail (0.88)</b>
<b>Creek County Near Mannford</b>	<b>29</b>	<b>1345CST</b>			<b>0</b>	<b>0</b>	<b>?</b>	<b>?</b>	<b>Thunderstorm Winds</b>
<b>Osage County 5 W Skiatook</b>	<b>29</b>	<b>1409CST</b>			<b>0</b>	<b>0</b>	<b>?</b>	<b>?</b>	<b>Hail (0.75)</b>

## Storm Data and Unusual Weather Phenomena

November 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<b>OKLAHOMA Cont'd</b>									
Washington County 3 N Ramona	29	1415CST			0	0	?	?	Thunderstorm Winds (G52)
Garvin County 2 N Wynnewood	29	1420CST			0	0	?	?	Thunderstorm Winds
Pottawatomie County Macomb	29	1425CST			0	0	?	?	Thunderstorm Winds (G52)
Garvin County 2 W Purdy	29	1430CST			0	0	?	?	Thunderstorm Winds (G52)
Nowata County 7 W Delaware	29	1435CST			0	0	?	?	Hail (0.75)
7 W Delaware	29	1435CST			0	0	?	?	Thunderstorm Winds (G52)
Tulsa County Collinsville	29	1454CST			0	0	?	?	Thunderstorm Winds
Pittsburg County Krebs	29	1506CST			0	0	?	?	Hail (0.88)
Krebs	29	1506CST			0	0	?	?	Thunderstorm Winds
Haskell County 2 W Tamaha	29	1520CST			0	0	?	?	Hail (0.88)
2 W Tamaha	29	1520CST			0	0	?	?	Thunderstorm Winds (G52)
Pittsburg County Blocker	29	1530CST			0	0	?	?	Hail (0.88)
Sequoyah County 5 ESE Gore	29	1545CST			0	0	?	?	Hail (0.88)
Tulsa County Near Glenpool	29	1547CST			0	0	?	?	Thunderstorm Winds (G52)
Pittsburg County Blocker	29	1645CST			0	0	?	?	Hail (0.75)
Haskell County Tamaha	29	1655CST			0	0	?	?	Hail (0.75)
Mayer County 8 ENE Adair	29	1700CST			0	0	4	?	Thunderstorm Winds
Adair County 6 SE Stillwell	29	1715CST			0	0	?	?	Hail (0.88)
Westville	29	1715CST			0	0	?	?	Thunderstorm Winds
Le Flore County Spiro	29	1715CST			0	0	?	?	Hail (1.75)
Sequoyah County Roland	29	1720CST			0	0	3	?	Thunderstorm Winds
Delaware County Bernice	29	1725CST			0	0	3	?	Thunderstorm Winds
Latimer County Red Oak	29	1735CST			0	0	?	?	Thunderstorm Winds
Haskell County Tamaha	29	1745CST			0	0	?	?	Hail (0.75)
Le Flore County Spiro	29	1815CST			0	0	?	?	Thunderstorm Winds
McCurtain County Countywide	29	1845CST			0	0	?	?	Hail (1.00)
Sherwood	29	1915CST			0	0	?	?	Thunderstorm Winds

Severe thunderstorms developed in the central and eastern portions of Oklahoma ahead of a dryline during the afternoon on November 29th. There were numerous occurrences of dime- to nickel-size hail, with an isolated occurrence of walnut-size hail 5 miles south of Mannford. Damaging winds also accompanied some of the storms. A barn was blown down and roofs were taken off old barns and houses 8 miles east northeast of Adair. Trees were downed in Collinsville, Westville, near Winnewood, and Red Oak, and power lines were downed in Mannford, Krebs, and Bernice. Thunderstorm winds also blew over a shed in Bernice and caused minor damage to a house in Perry.

# Storm Data and Unusual Weather Phenomena

November 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<b>OREGON</b>									
<b>Multnomah County</b> 1 N Troutdale	12	1435PST	0.2	30	0	0	4	0	Tornado (F1)
	An tornado occurred during a cold frontal passage. Eighty feet of fencing was damaged, part of a roof was torn off, an outbuilding was twisted, and part of a wall was ripped out of a steel building.								
<b>Washington County</b> 1 W Tualatin	12	1500PST	0.2	40	0	0	4	0	Tornado (F1)
	Employees at a small business reported windows shaking violently and a roaring wind. Two dumpsters was lifted several feet off the ground and traveled 30 feet across a parking lot into a van. A front door to another office nearby was sucked open and ceiling panels were pulled to the ground.								
<b>Marion County</b> 2 SE Silverton	12	1600PST	0.1	20	0	0	4	0	Tornado (F0)
	This tornado ripped through a 700-square-foot barn throwing metal and wood debris around. Most items in the barn were buried and damaged. The house on one side of the barn and a boat and trailer on the other side were left undamaged.								
<b>ORZ001-003</b> Coastal Area	15 16	0900PST- 2400PST			0	0	5	0	High Winds
	A slow moving, windy frontal system brought damage to parts of the entire Oregon coast, mainly during the day and evening of Saturday the 16th. Winds were measured to 115 mph at Cape Blanco in Curry County, 87 mph at Netarts in Tillamook County, and 83 mph at Gold Beach in Curry County. A 6-ton trailer was blown over into the Skipanon River in Clatsop County. A radio station was knocked off the air when the transmitter was blown over. Many coastal hotel signs were destroyed. One mobile home was blown over in Newport in Lincoln County. Another mobile home had its roof torn off in Gold Beach which subsequently damaged the two nearby mobile homes. Falling trees damaged homes, boats, closed some roads and knocked out power to thousands of homes. An accompanying thunderstorm produced lightning which just missed one home but did blow out all the household appliances and outdoor lighting. Waves just offshore were measured up to 25 feet high.								
<b>ORZ001-003</b> Coast	19	1300PST- 2400PST			0	0	?	0	High Winds
	Another front brought more strong wind to the coast. Around noon on the 19th wind speeds reached 87 mph at Cape Blanco in Curry County and Netarts in Tillamook County, 85 mph at Oceanside in Tillamook County and 80 mph at Garibaldi in Tillamook County.								
<b>ORZ013</b> Southern Cascades	28	1800PST- 2400PST			0	0	5	0	High Winds
	The owner of the Odell Lake Lodge reported heavy damage from a windy storm on Thanksgiving night. A falling tree totaled a parked car. The marina dock was torn loose and sank. A house and a cabin were also damaged. Winds were estimated to exceed 60 mph.								
<b>PENNSYLVANIA, Eastern</b>									
<b>Adams County</b> Heidlersburg	22	1710EST			0	0	3	0	Thunderstorm Winds
	Thunderstorm wind gusts tore a 5- by 8-foot roof off a storage building and carried it 130 feet.								
<b>PENNSYLVANIA, Western</b>									
<b>PAZ001</b> Lakeshore	25	1530EST			0	0	0	0	Heavy Snow
	Lake effect snow dropped 10 to 12 inches of snow along the Lakeshore.								
<b>RHODE ISLAND</b>									
	None reported.								

# Storm Data and Unusual Weather Phenomena

November 1991

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

## SOUTH CAROLINA

SCZ006 Richland County	04	Unknown			1	0	0	0	Hypothermia
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A 67-year-old man died of hypothermia in Richland County (M67?)

## SOUTH DAKOTA

SDZ012-017-018-020 Southeastern South Dakota	01	0000CST- 1600CST			2	100	5	0	Blizzard
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A blizzard swept through southeastern South Dakota dropping over 16 inches of snow in places. The snow combined with winds gusting to 60 mph at times produced blizzard conditions. Interstates 29 and 90 as well as most other roads east and south of Sioux Falls were closed the storm. There were hundreds of traffic accidents in the Sioux Falls area alone. The hospital emergency rooms were swamped with victims of automobile accidents, injuries sustained while shoveling snow and from people falling on slippery walkways. Two men died from heart problems while shoveling the snow. (M50P) (M62P)

SDZ004-005-011-018-020 Eastern South Dakota	11	0700CST- 1200CST			0	10	4	0	Ice Storm
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Widespread freezing rain caused many traffic accidents in eastern South Dakota. Several injuries were reported, however they were all minor.

SDZ007 Black Hills	21	1200CST- 2200CST			0	0	0	0	Heavy Snow
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Between 4 and 7 inches of snow fell over the central Black Hills.

SDZ004-005-011-012-018-020 Eastern South Dakota	26	0300CST- 1600CST			0	1	4	0	Ice Storm
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Freezing rain was widespread across eastern South Dakota. The hardest hit area was across the northeastern corner of the state between Aberdeen and Sisseton. At least one traffic accident was caused by ice covered roads in Aberdeen.

SDZALL South Dakota	28	1300CST- 1100CST			0	2	5	0	Blizzard Winter Storm
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The third major winter storm of the season moved from the central plains to eastern South Dakota. The storm generally dropped between 4 and 8 inches of snow over the eastern third of the state. The Black Hills also received between 4 and 8 inches of snow. New snow accumulations of 2 to 5 inches occurred over the rest of the state. Some specific snow reports follow:

Aberdeen	2 inches	Vermillion	7 inches
Lead	6 inches	Watertown	3 inches
Sioux Falls	6 inches	Woonsocket	8 inches

Strong winds developed after the snow fell. This produced widespread blowing and drifting snow especially over the Black Hills and the northeast corner of South Dakota. Blizzard conditions occurred in the Black Hills. An eight car traffic accident occurred near Sturgis due to limited visibilities. At least 50 cars were involved in an accident east of Rapid City. Only two people were reported to be injured in these accidents.

## TENNESSEE

Shelby County Memphis	19	1705CST	10.0	50	0	0	6	0	Tornado (F1)
Shelby County	19	1710CST			0	0	5	0	Thunderstorm Winds
Tipton County	19	1815CST			0	0	5	0	Thunderstorm Winds

A severe thunderstorm moved through the southwest corner of Tennessee during the late afternoon hours. The thunderstorm produced a tornado which skipped through parts of southeast and northeast Memphis. The tornado touched down about three times along the 10 mile path and was on the ground for 0.5 mile. Several apartment complexes sustained damage, mainly to roofs and shingles. A shopping complex also received roof damage. A few miles further north, the tornado produced

# Storm Data and Unusual Weather Phenomena

November 1991

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

## TENNESSE Cont'd

damage to a cement wall. A mobile home was blown off its foundation and 2 poles were bent. The thunderstorm also produced some straight line wind damage with numerous trees down in the area. In Tipton County, eight homes and one business received damage from thunderstorm winds.

Greene County  
Baileyton

22	0750CST				0	0	4	0	Thunderstorm Winds
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An apartment building and a church lost part of their roofs. Several trees and power lines were knocked down. A propane tank was overturned.

## TEXAS, Northern

McLennan County  
Mood

19	0930CST				0	0	0	5	Thunderstorm Winds
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Strong winds destroyed a mobile home and several outdoor buildings.

Henderson County  
Chandler  
4 N Athens

19	1045CST				0	2	5	?	Thunderstorm Winds
19	1115CST				0	0	?	?	Hail (0.75)

A downburst overturned two vehicles, destroyed or severely damaged a restaurant and five businesses, and damaged a church and a residence. Two people were injured by flying glass when the windows of the restaurant were blown in. Total damage was estimated at approximately \$400,000.

Smith County  
1 SE Lindale  
Swan  
Sand Flat  
2 N Sand Flat  
Red Springs  
5 W Whitesboro  
Bullard  
Arp  
  
Arp  
Whitehouse  
5 W Whitehouse

19	1110CST				?	?	?	?	Funnel Cloud
19	1120CST-								
	1135CST	7.0	150		0	0	5	?	Tornado (F2)
19	1137CST-								
	1143CST	2.5	100		0	0	4	?	Tornado (F2)
19	1215CST				0	0	?	?	Hail (1.75)
19	1215CST				0	0	?	?	Hail (0.75)
19	1245CST				0	0	?	?	Thunderstorm Winds (G52) Hail (0.75)
19	1250CST				0	0	?	?	Hail (2.00)
19	1310CST				0	0	?	?	Hail (0.75)
19	1325CST				0	0	?	?	Hail (1.75)

A tornado touched down near Swan and moved northeast to Sand Flat. A second tornado developed 2 miles north of Sand Flat and moved northeast to Red Springs. Along the damage path of both tornadoes, several barns and storage buildings were destroyed, 10 homes and businesses were severely damaged, and a number of trees were uprooted or snapped.

Anderson County  
1 S Palestine  
Slocum  
  
1 W Palestine  
8 NE Palestine

19	1125CST				0	0	?	?	Hail (1.50)
19	1130CST-								
	1131CST	Short	Narrow		0	0	4	?	Tornado (F1)
19	1305CST				0	0	?	?	Hail (1.75)
19	1310CST				0	0	3	?	Thunderstorm Winds

A tornado touched down briefly near Farm-to-Market Road 2419 in Slocum. Several outdoor buildings were destroyed, a few residences were also damaged, and numerous trees were blown down. A downburst blew down several trees 8 miles northeast of Palestine.

Wood County  
Quitman

19	1130CST				0	0	3	?	Thunderstorm Winds
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Strong winds blew down several trees.

Cherokee County  
Jacksonville  
Mount Selman  
8 NE Mount Selman  
1 SW Rusk

19	1200CST				0	0	?	?	Hail (1.00)
19	1215CST				0	0	?	?	Hail (0.75)
19	1316CST				0	0	2	?	Thunderstorm Winds
19	1425CST				0	0	?	?	Hail (0.75)

# Storm Data and Unusual Weather Phenomena

November 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 blew down a large tree on County Road 3502, 8 miles northeast of Mount Selman.

Upshur County									
3 NE Rhonesboro	19	1200CST			0	0	3	?	Thunderstorm Winds Hail (1.00)
2 N Cox	19	1245CST			0	0	?	?	Funnel Cloud
Ore City	19	1335CST			0	0	?	?	Hail (0.75)

Several trees were blown down along Farm-to-Market Road 556, 3 miles northeast of Rhonesboro.

Camp County									
Pittsburg	19	1215CST			0	0	?	?	Hail (1.00)
Rusk County									
8 N Overton	19	1310CST			0	0	?	?	Hail (1.00)
2 SE Concord	19	1520CST			0	0	3	?	Thunderstorm Winds Hail (1.50) Funnel Cloud

Strong winds blew down several trees 2 miles southeast of Concord.

Gregg County									
5 NW Kilgore	19	1312CST			0	0	?	?	Hail (0.75)
3 W White Oak	19	1315CST			0	0	?	?	Hail (1.75)
5 N Longview	19	1322CST			0	0	?	?	Funnel Cloud
White Oak	19	1331CST			0	0	?	?	Hail (0.75)
Countywide	19	1330CST- 1530CST			0	0	?	?	Flash Flood

Heavy rains produced flash flooding of several roadways near Liberty City and Gladewater. One automobile was submerged at an intersection just east of Liberty City. Several places along State Highway 135 observed flash flooding of low water crossings.

Harrison County									
4 N Hallsville	19	1335CST			0	0	?	?	Hail (1.75)
8 S Marshall	19	1340CST			0	0	?	?	Hail (1.75)
8 E Marshall	19	1410CST			0	0	?	?	Hail (1.75)
5 NW Waskom	19	1420CST			0	0	3	?	Thunderstorm Winds (G61) Hail (1.75) Funnel Cloud

Strong winds measured at 70 mph blew down several trees 5 miles northwest of Waskom.

Anderson, Cherokee, and Smith Counties									
	19	1400CST- 1730CST			0	0	5	?	Flash Flood

Heavy rains up to 7 inches in a 5-hour period produced widespread flash flooding of secondary roadways, low water crossings, and flood prone areas.

Denton County									
Denton	19	1530CST			0	0	4	?	Thunderstorm Winds

A downburst destroyed an outdoor building.

Panola County									
4 SE Clayton	19	1532CST			0	0	3	?	Thunderstorm Winds Hail (1.00)

Strong winds blew down several trees on the northern portion of Lake Marvail (4 miles southeast of Clayton).

Denton County									
Krum	29	1500CST			0	0	4	?	Thunderstorm Winds

A downburst lifted the roof off a residence.

Fannin County									
Bonham	29	1700CST			0	0	4	?	Thunderstorm Winds Hail (1.00)

Strong winds blew down several trees, lifted the metal roof off an outdoor building, and damaged a residence and a business.

# Storm Data and Unusual Weather Phenomena

November 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<b>TEXAS, Southern</b>									
<b>Kendall County Boerne</b>	17	0130CST			0	0	4	?	<b>Thunderstorm Winds</b>
A violent thunderstorm moved through the county in the early morning hours. Several trees were uprooted and a few utility poles were damaged. A drive-through roof of a bank was destroyed by the storm.									
<b>Harris County</b>	17	0800CST- 1300CST			0	0	4	?	<b>Flash Flood</b>
Several problems were reported in Harris County. A few houses and several cars were flooded. The water began to recede in the early afternoon.									
<b>Nacogdoches County 1 SE Douglass</b>	19	1446CST	0.5	30	0	0	4	?	<b>Tornado (F1)</b>
The sheriff's office reported several trees uprooted in the Goodman Bridge area of the county.									
<b>TEXAS, Western</b>									
<b>Howard County Big Spring</b>	16	1530CST			0	0	3	3	<b>High Winds</b>
Strong winds associated with an upper-level storm uprooted trees and caused minor damage to roofs in Big Spring.									
<b>UTAH</b>									
<b>UTZ002-003-010</b>	01 02	1900MST- 0700MST			0	0	0	0	<b>Heavy Snow</b>
A moist northwesterly flow produced snow over most of northern Utah with the heaviest amounts reported from the northwest portion of the state. Amounts in the valleys ranged from 4 to 9 inches while the mountains received 10 to 15 inches.									
<b>UTZ010</b>	14 15	0100MST- 0100MST			0	0	0	0	<b>Heavy Snow</b>
A cold front moved into northwest Utah during the early evening hours of the 13th, and started producing heavy snow in the early morning hours of the 14th. Amounts ranged from 10 to 15 inches. Localized amounts of 5 to 7 inches were reported from a few bench areas along the western slopes of the northwestern mountains.									
<b>UTZ006-007-011</b>	14 15	1100MST- 1500MST			0	0	0	0	<b>Heavy Snow</b>
The same storm that produced the heavy snow in northern Utah moved into the southern half of the state. Most valley locations received 5 to 6 inches, but localized amounts of 18 to 20 inches were received because of favorable upslope flow. Most mountain locations received 10 to 14 inches with localized amounts of up to 26 inches reported.									
<b>UTZ001-003</b>	15	0550MST- 1300MST			0	0	3	0	<b>High Winds</b>
Favorable conditions were favorable for strong and gusty, easterly canyon winds in northwest Utah by the storm producing the heavy snow over the southern half of the state. Several gusts from 61 to 76 mph were reported along the Wasatch Front and in the Cache Valley. These winds caused a 53-foot empty tractor-semitrailer to flip over in the Centerville area about 0830 MST. Some power outages occurred because of these winds.									
<b>UTZ010-011</b>	17 18	1500MST- 1900MST			0	0	0	0	<b>Heavy Snow</b>
A cold front that moved into northwest Utah during the midafternoon hours of the 17th, produced rain and snow over much of the state. The heavy snow began in the northwestern mountains that afternoon, and spread into the southern mountains by late on the 17th. Amounts in the northern mountains ranged from 16 to 32 inches with the highest amounts reported from the Wasatch Mountains. High mountain valleys and bench areas along the western slopes of the Wasatch									



# Storm Data and Unusual Weather Phenomena

November 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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## UTAH Cont'd

Mountains reported 7 to 9 inches. Also in northwest Utah, a small localized area in the southwest portion of Salt Lake City received 4 to 8 inches of snow from the late night hours of the 18th to the early morning hours of the 19th due to lake effect from the Great Salt Lake. The southwestern portion of the southern mountains received the brunt of the storm there. Amounts through late afternoon on the 18th were 12 or 13 inches.

UTZ003-010

20	2300MST-							
22	1200MST			1	0	3	0	Heavy Snow

A cold front that moved into northwestern Utah during the late afternoon early evening hours of the 20th produced heavy snow in the northern mountains and rain and snow mixed in the western valleys. This began late on the 20th and early on the 21st, and spread statewide by the evening of the 21st. The mountains received 1 to 2 feet with a few reports up to 27 inches. The time period for the heavy snow assigned to the header data covers the snowfall in the mountains. Up until the evening of the 21st, the snow had been light or mixed with rain along the Wasatch Front. But because of lake effect and an upper level disturbance moving through, heavy snow fell from 1930 MST on the 21st until 0600 MST on the 22nd. In this short time, many locations received 4 to 6 inches while the remainder of the same area reported 2 to 3 inches. Because of this snowfall, roadways in the area became very slick. Because of this, numerous accidents occurred the morning of the 22nd. However, most of the accidents did not result in any serious injuries or damage except for one. One man was killed in Orem when his car slid off the road and into a tree. This occurred about 0441 MST, and was witnessed by an Orem police officer. (M??V)

UTZ003

27	1700MST-							
28	0500MST			0	0	2	0	Heavy Snow

Another storm moved in, and produced heavy snow along the Wasatch Front. Snowfall amounts ranged from 5 to 10 inches. Valley locations to the north and south of the area received 2 to 3 inches. Although the criteria for heavy snowfall was not met in the northern mountains, snowfall there ranged from 5 to 8 inches. As a result of the snowfall, roadways became slick, and caused numerous accidents. However, no one was injured, and damage to vehicles was minor.

UTZ006-011

28	0100MST-							
	0900MST			0	0	0	0	Heavy Snow

The same storm that produced heavy snow in the northwest, caused heavy snow in the southwest valleys and mountains. Valley locations received 6 inches, and mountain areas received around 10 inches.

UTZ003-010

29	0330MST-							
	1800MST			0	0	0	0	Heavy Snow

Another in a series of storm systems moved into northwest Utah in the early morning hours of the 29th. The heavy snowfall along the Wasatch Front began at 0730 MST, and lasted until 1500 MST. This is included within the time period of heavy snowfall in the mountains which is the time period designated in the header information. Snowfall amounts along the Wasatch Front ranged from 4 to 6 inches. Snowfall amounts in the mountains ranged from 11 to 19 inches. Because of the heavy snow, many minor traffic accidents did occur, but there were no injuries or significant damage.

## VERMONT

Statewide

11	PM							
				0	1	5	0	Snow

Rain changed to snow from north to south across Vermont during the afternoon with 1 to 4 inches of accumulation across the state before tapering off before midnight. Dozens of vehicle accidents were attributed to snow-covered roads and the wet snow caused scattered power outages as well. Only one injury was reported in an accident in Randolph where a van carrying seven Boy Scouts and their scout leader flipped over along Interstate 89. About 450 customers, mostly in the southern Vermont communities of Brattleboro, Townshend and Shrewsbury, were left without power. Some snowfall accumulations around the state included 1 inch at St. Johnsbury, 3 inches at Ludlow, and 4 inches at East Wallingford.

Statewide

20	Afternoon							
				0	0	0	0	Record Heat

Abnormally high temperatures in the mid 60s to the low 70s were recorded during the afternoon of the 20th as a strong southwest flow of very warm air moved into the state late on the 19th and the 20th. Burlington reached 71°F which broke the previous record of 69°F set in 1953.

# Storm Data and Unusual Weather Phenomena

November 1991

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

## VIRGINIA

VAZ001-002 Virginia Beach	09 10	1500EST- 2400EST			0	0	5	0	High Winds Coastal Flood
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The second major coastal storm in less than 2 weeks brought a return of high winds, heavy surf, and flooding to the mid-Atlantic coast. Moderate flooding occurred all along the Virginia coast. At Virginia Beach, dunes were destroyed in many areas; in the Sandbridge section, overwash flooded roads and brought sea water into garages and the first floor of several beachfront homes. Four homes sustained damage in the Oceanview area of Norfolk due to water up to 4.5 feet deep. Total damage in the Sandbridge area was estimated at \$116,000, including \$2,500 in road damage. In Accomack County, the causeway from the mainland to Chincoteague was flooded. Winds were recorded up to 82 mph at Langley Air Force Base around 1800 EST on the 9th.

VAZ011 > 016	10	0400EST- 1900EST			0	0	4	0	Glaze
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Freezing rain caused ice to accumulate on trees and power lines, especially over higher elevations. Road surfaces in general were not affected, although roads were blocked by fallen trees. Power outages affected more than 3,000 households and closed schools for 2 days in Tazewell County. Another 3,400 homes were powerless in Carroll County where a heavy ice accumulation on trees and power lines occurred; winds in the morning brought many limbs down.

## WASHINGTON

WAZ002,004 Northern Coast and Northwestern Interior	11	0600PST- 1100PST			0	?	4	?	High Winds
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A deep area of low pressure off the southeast Alaskan coast caused strong winds over the northwestern corner of the state. Most of the high winds were reported over water areas with sustained winds of 40 mph at Destruction and Smith Islands and 50 mph with gusts to 58 mph at Tatoosh Island off the northern coast. Winds of 50 mph were also reported at Neah Bay along the northern coast.

WAZ002-005 Western Washington	16	0700PST- 1300PST			0	?	5	?	High Winds
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A fast moving weather system moved through western Washington on the morning of the 16th causing minor, but widespread damage. Winds of 45 to 60 mph were reported in the San Juan Islands around 0730 PST along with winds of 50 to 60 mph at Tatoosh and Smith Islands. By noon, reports of wind damage in Thurston, Mason, and Grays Harbor Counties came in including a float plane that flipped over on Summit lake west of Olympia.

WAZ001-005 Western Washington	16 17	2000PST- 0100PST			0	?	6	?	High Winds
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A rapidly developing system off the Washington coast moved inland on the evening of the 16th. Strong winds began along the coast around 10 pm with winds of 55 mph reported at Westport and gusts to 60 mph at Ocean Shores. The system moved into the interior during the next 3 hours with the strongest winds occurring between 2300 PST and 0100 PST. During that time winds of 50 to 55 mph were reported at Point Robinson, Alki Point, and at the Evergreen Point Bridge in Seattle with gusts between 70 and 79 mph at Alki Point and at the bridge. Just after midnight, Bellingham recorded a peak wind of 69 mph. Damage was widespread across western Washington with the hardest hit area being the northeast King County. A total of 400,000 customers throughout western Washington were without power. The last storm to cause such a large amount of power outages was the Thanksgiving storm of 1983. In all, over 500 homes were damaged by the winds and falling trees. At Alki point in west Seattle, an apartment building had the roof blown off. Almost all of the power had been restored by the time the next system hit the area.

WAZ002,004,005 Coast and North- western Interior	19	0600PST- 1400PST			0	?	5	?	High Winds
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The second strong weather system in the last 4 days moved through western Washington on the morning of the 19th. Strongest winds were reported around both the west and east entrances to the Strait of Juan de Fuca. Between 0600 PST and 0800 PST, sustained winds near 50 mph with 70 to 75 mph gusts occurred off Port Townsend and Partridge Point off Whidbey Island. Between

# Storm Data and Unusual Weather Phenomena

November 1991

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

## WASHINGTON Cont'd

1000 PST and 1200 PST peak winds along the coast of 60 to 70 mph were reported from Cape Disappointment, Hoquiam, and Neah Bay. Around 1100 PST, a wind gust blew out windows above a grocery store in downtown Port Townsend. The last of the strong winds occurred between 1300 PST and 1400 PST with Bellingham and Whidbey Island reporting peak weak winds of 59 and 58 mph respectively.

<b>WAZ005</b> Southern Coast	28	1800PST- 2100PST			0	?	4	?	High Winds
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Gusty southwesterly winds developed behind a cold front that moved through western Washington during the afternoon of the 28th. Winds along the south coast at Ocean Shores reached sustained speeds of 58 mph with a gust to 81 mph recorded. Damage was minimal.

<b>WAZ012</b> Washington Cascades	29	1600PST			3	0	4	?	High Winds
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Three people were killed on Highway 410 near the Crystal Mountain cutoff when a Douglas fir tree fell on their vehicle. Due to the series of weather systems during the last 2 weeks of the month, 58,000 people were without power on the 29th due to the storm even though peak wind gusts were only in the 35 to 45 mph range. (F27V) (F11V) (M09V)

## WEST VIRGINIA

<b>WV003-004-005</b> <b>006-007-012</b> Southern and Central Counties	01		0	1	5	6			Brush Fires
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The outbreak of brush fires, that started in late October, reached its peak on the 1st. Visibility at Charleston was reduced to one-eighth of a mile in smoke and falling ash. At Huntington, the surface visibility dropped to 0.75 of a mile. The air quality index at Charleston was 350 on the 1st. A reading over 300 on the index is considered hazardous to peoples' health. Most outdoor activities were cancelled. Some outdoor workers wore masks over their nose and mouth. Eventually, the smoke seeped into most dwellings, making it difficult to avoid the hazard. Much colder air arrived by the 2nd and continued until the end of the brush fire episode. The colder air slowed the spread of existing fires. In addition, there were fewer fires. As a result, the increased personnel from local, state, and federal agencies were able to bring most fires under control by the 7th. Prior to that, thick smoke engulfed Huntington and Charleston again on the 5th and 6th. The smoke spread north to Wheeling and Pittsburgh during the pre dawn on the 6th, surprising many upper Ohio Valley residents. Moisture from the Atlantic finally doused the remaining fires with rain, sleet, freezing rain, and snow on the 10th and the 11th. Total precipitation was from a 0.50 to over 1.50 inches. The state of emergency was lifted by the governor on the 10th. The state forestry division reported over 600 total fires, burning more than 300,000 acres in the whole outbreak. One home was extensively damaged by the brush fires in Rawl of Mingo County.

Over 90% of the fires were set by arsonists. The cost to contain the fires and damage to woodlands was estimated well into the millions of dollars.

<b>WVZALL</b>	05		0	0	0	0			Record Cold
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Dawn temperatures were in the teens with single digits in the mountains. It was the coldest on record for so early in the season for many counties.

<b>WVZ007-0122</b> Southern and Central Mountains	10	0300EST-							
	11	0300EST			0	0	6	0	Ice Storm

Atlantic moisture was thrown back over West Virginia by a storm off the coast of North Carolina. Freezing rain fell with temperatures near 30. The hardest hit region was the high plateau region around Beckley, Oak Hill, Fayetteville, Rainelle, and Richwood. Total precipitation at Beckley during the freezing rain was over 1.5 inches. Ice accumulated from 1 to 2 inches thick on trees, poles, and wires. The warmer ground kept most roads from freezing. After the ice storm, 1.00 inch or less snow fell, adding more weight to trees and wires. Many of the old and larger trees had branches broken by the weight of the ice. The falling tree limbs did minimal damage to homes, but blocked roads and caused extensive/prolonged power outages. The two power companies, serving the region, reported a total of 35,000 customers

# Storm Data and Unusual Weather Phenomena

November 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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## WEST VIRGINIA Cont'd

without electricity at the height of the storm. Over 4,000 customers were still without electricity on the 13th. Power was not totally restored until the 15th. Several transmission lines had to be repaired more than once, as tree limbs continued to fall on the 11th and 12th.

Many longtime power employees described the storm as the worst in the company's history. Stores quickly sold out of flashlights, candles, kerosene heaters, generators, and fuel. Shelters were set up at local fire departments and a National Guard Armory, for people without an alternate heat source. Problems would of been compounded had the storm not hit on a Sunday and Monday holiday. Yet, schools in Fayette and Raleigh Counties did not open until the 14th. Total damage was estimated at \$4 million.

WV003-004-006- 007-008-010-011 Eastern and Southern Counties	01 30				0	0	0	0	Drought
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Drought conditions peaked again during the first week. State assistance was given to Kopperston of Wyoming County. A water tanker truck was sent to augment the public water supply. The storm on the 10th and 11th produced widespread precipitation and stopped the deteriorating water supply. Another storm followed on the 21st and 22nd. Rains of 2 to 3 inches were widespread. The drought of 1991, that started in June, was fading.

## WISCONSIN

WIZ001-002-003- 004-005-006- 007-008-010- 011-014- Northern, Central and Southwestern Wisconsin	22 PM- 23 PM				0	0	?	0	Heavy Snow
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A major snowstorm dumped a wide area of heavy snow with amounts up to 15 inches across the northern, central and southwest portions of the state. Numerous accidents occurred and many vehicles were stranded or abandoned. A number of hunters on the opening day of the gun-deer season got stuck in ditches when attempting to pull off roads to get out and hunt. Snowfall amounts included 15 inches at Lacrosse in Lacrosse County, Alma in Buffalo County, and Westby and Viroqua in Vernon County with 14 inches at Sparta in Monroe County, and Black River Falls in Jackson County.

WIZ001-003-005- 007-008-011- Northwest, Central and Northeast Wisconsin	26 PM- 27 AM				0	0	?	0	Heavy Snow
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A snowstorm deposited up to 7 inches of snow over sections of northwest, central and northeast Wisconsin. Snowfall totals included 7 inches at Drummond in Bayfield County and Seymour in Outagamie County, and 6 inches at Sarona in Washburn County, Crivitz in Marinette County, and Iola in Waupaca County.

WIZ001-002-003- 006 Northwest Wisconsin	29 PM- 30 AM				0	0	?	0	Heavy Snow
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A swath of heavy snow with amounts up to 20 inches fell from a major snowstorm over parts of northwest Wisconsin. Numerous accidents occurred and hundreds of scattered power outages took place. Some snowfall measurements included 18 to 20 inches at Hayward in Sawyer County, 18 inches at Cumberland in Barron County, and 16 to 18 inches at Drummond in Bayfield County, Ashland in Ashland County, and Sarona in Washburn County.

## WYOMING

WYZ065-067-069- 071	04 1600MST- 2030MST				0	0	0	0	Heavy Snow
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Strong winds occurred over portions of southeastern Wyoming the evening of the 4th. Wind gusts

## Storm Data and Unusual Weather Phenomena

November 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<b>WYOMING Cont'd</b>									
									to 80 mph were reported by the Wyoming Highway Department 12 miles southeast of Wheatland.
WYZ050-056	13	1300MST- 1845MST			0	0	0	0	Heavy Snow
									A Pacific storm brought 5 to 8 inches of snow to the Big Horn Mountains during the afternoon.
WYZ050-056	13 14	1845MST- 0445MST			0	0	0	0	Heavy Snow
									A storm low pressure brought 13 additional inches of snow to Burgess Junction in the Big Horn Mountains 4 to 8 inches of snow was reported in the southern portion of the Big Horn Mountains.
WYZ013	14	0100MST- 1135MST			0	0	0	0	Heavy Snow
									A Pacific storm brought 8 inches of new snow to the airport in Lander the morning of the 14th.
WYZ022	14	0500MST- 1600MST			0	0	0	0	Heavy Snow
									Five inches of snow fell at the airport in Casper during the day.
WYZ029-030-032- 033-034-063-065	14	1700MST- 0830MST			0	0	0	0	Heavy Snow
									A moist storm from the west brought 6 to 8 inches of snow to the southwestern and south-central portions of Wyoming during the night.
WYZ059-067-069- 071	20	0700MST- 1615MST			0	0	0	0	High Winds
									Strong winds buffeted southeastern Wyoming during the day. Wind gusts to 80 mph were reported from 12 miles southeast of Wheatland in the morning and gusts to 85 mph at 1530 MST. Wind gusts to 65 mph were noted on the summit between Cheyenne and Laramie at 1530 MST.
WYZ050	21 22	0800MST- 0800MST			0	0	0	0	Heavy Snow
									A snow storm left 10 inches of snow at Burgess Junction in the Big Horn Mountains in 24-hour period.
WYZ067-071	23				0	0	0	0	High Winds
									Strong winds occurred in southeastern portion of Wyoming during the evening of the 23rd. Wind gusts to 55 mph were noted on the summit between Cheyenne and Laramie.
WYZ059-067-069- 071	25	1215MST- 1600MST			0	0	0	0	High Winds
									Winds of 30 to 45 mph with gusts to 60 mph buffeted the area east of the Laramie range during the afternoon.
WYZ008-009	27	1530MST- 2330MST			0	0	0	0	Heavy Snow
									Moisture from the Pacific northwest brought 14 inches of snow to Hoback Junction during the evening. Eight to ten inches of snow was common to the mountains in west-central Wyoming.
WYZ013	28	0800MST- 1630MST			0	0	0	0	Heavy Snow
									Seven inches of snow fell during the day at the Lander Airport.
WYZ051-057-060- 061-062	28	1000MST- 1630MST			0	0	0	0	Heavy Snow
									A snow storm left 6 to 8 inches of snow along the east slopes of the Big Horn Mountains and the plains in east central Wyoming.

## Storm Data and Unusual Weather Phenomena

November 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
<b>ALASKA, Northern</b>									
AKZ006 Norton Sound Coast	03 04	1400AST- 1600AST			0	0	?	0	High Winds
Strong east winds at Unalakleet of up to 55 mph on the evening of the 3rd and northeast gusts to 55 mph at Nome through midday of the 4th.									
AKZ007 Salcha Slough in the Tanana Valley	11 12	1200AST- 1800AST			0	0	3	0	Ice Jam Flood
An ice jam formed on the Tanana River just downstream from Salcha Slough, which is near mile 330 on the Richardson Highway. Water overflowed the banks of the slough and caused minor damage to two homes and to a couple of driveways. The high water subsided on the 12th.									
AKZ006 Eastern Norton Sound	13	1716AST- 2300AST			0	0	?	0	High Winds
Easterly winds of 40 to 50 mph blew at Unalakleet on the evening of the 13th and diminished shortly before midnight.									
AKZ024 St. Lawrence Island	13 14	1900AST- 1100AST			0	0	?	0	High Winds
At Gambell, northerly winds of 40 mph sustained through the morning of the 14th; peak gusts were near 50 mph.									
AKZ007 Chena River near Pikes Landing	23	0600AST- 2400AST			0	0	2	0	Ice Jam
An ice jam formed just below the mouth of the Chena River on the 23rd. No flooding occurred, but the lifting of the ice and the overflow along the west bank, which was over 1 foot deep, caused at least two vehicles to become struck in the slush (the overflow on top of the ice and within the snow cover).									
AKZ007 Northern Slopes of Alaska Range in the Lower Tanana Valley	27 28	1900AST- 0600AST			0	0	?	0	Heavy Snow
At Denali Park and Healy, 4 to 6 inches of snow fell in less than 12 hours on the night of the 27th and 28th.									
AKZ005 Northern Kobuk Valley	28	0500AST- 1600AST			0	0	?	0	High Winds
East winds of 40 to 50 mph at Kotzebue were reported on the morning of the 28th. At Red Dog Port at 0900 AST, winds were from the east at 42 mph and gusting to 60 mph.									
AKZ007 Tanana Valley	30	1300AST- 2400AST			0	0	?	0	Heavy Snow
On the 30th, 4 inches of snow fell at Northway, 6 inches at Healy, and 8 inches at the Healy Highway camp, in a northwesterly flow of moist air aloft.									
<b>ALASKA, Southern</b>									
Kodiak Island	01	Unknown			?	?	?	?	Record Rainfall
The old, 1-day rainfall record for November was broken with 2.84 inches of rain. The old record was 2.64 inches and was set on November 25, 1936. This gives a 2 day total of 10.28 inches.									
Cold Bay	02	1500AST			?	?	?	?	Record High Temperature
The old daily record of 49°F that was set in 1967 was broken with a 50°F reading.									
King Salmon	06	1630AST			?	?	?	?	Record High Temperature
The old daily record of 48°F that was set in 1957 was broken when the temperature reached 49°F.									

# Storm Data and Unusual Weather Phenomena

November 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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## ALASKA, Southern Cont'd

St. Paul Island	17	0000AST-			?	?	?	?	Record Low Temperature
	18								

Two records were set around midnight. Just before midnight on the 17th, the temperature dipped to 15°F breaking the old record of 16°F which was set in 1974. Then, just after midnight on the 18th, the temperature reached 12°F and broke the old record of 16°F that was set in 1983.

Alaska Peninsula Kodiak Island	18-				?	?	?	?	High Winds Near Blizzard
	19								

A strong and nearly stationary low pressure area southeast of Kodiak Island brought sustained winds of 30 to 40 mph with gusts as high as 60 mph. Up to 1 foot of snow fell on Kodiak Island creating near blizzard conditions in the strong winds.

Alaska Peninsula Kodiak Island	22-				?	?	?	?	High Winds Near Blizzard
	23								

Strong low pressure 500 miles southeast of Kodiak along with high pressure over northern Alaska and the Bering Sea brought northwest winds gusting to 80 mph at the coast guard base on Kodiak Island. Winds of 30 to 45 mph with snow showers produced zero visibilities at times in and around Cold Bay.

Pribilofs	26	1830AST-			?	?	?	?	High Winds
	27								

A vigorous weather front pushed through St. Paul. Winds behind the front gusted to 62 mph.

Kodiak Island Cook Inlet Kenai Peninsula	30				?	?	?	?	High Winds Heavy Snow
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A strong and fast moving storm that was about 100 miles southeast of Homer at 0900 AST, moved to just south of Prince William Sound by 1500 AST and to near Cape Yakatage by 0900 AST. This storm dumped a foot or more of snow along the upper Anchorage Hillside. Glen Alps picked up 17 inches for the largest reported amount; one of the heaviest on record. Snow amounts decreased as you went west across Anchorage with the airport picking up 5.4 inches. This storm also produced strong winds with 81 mph gusts reported at Middleton Island. In the storm's wake, Kodiak recorded sustained northwesterly winds of 30 to 35 mph with gusts over 60 mph. Homer Spit in Cook Inlet had wind gusts close to 50 mph.

## ALASKA, Southeastern

AKZ013-014 Central and Southern Portion of Southeastern Alaska	14	Late Afternoon-			0	0	4	0	High Winds
	15	Early Morning							

AKZ012 Lynn Canal Glacier Bay	14	Morning-			0	0	0	0	Heavy Snow
	15	Morning							

A strong low moved to the northeastern Gulf of Alaska producing very strong winds over much of the panhandle. Sustained winds at Five Finger Lighthouse reach 48 mph. The peak wind recorded at the Weather Service Office in Annette was 64 mph. The strongest winds from the indicator on the roof of the Ketchikan Airport terminal building were as high as 81 mph. Winds in the vicinity of Annette and Ketchikan were estimated in excess of 100 mph. According to the Coast Guard in Ketchikan, 115-mph winds pulled a 420-foot cargo ship from its mooring lines at Metlakatla. The ship damaged part of a cannery dock but there were no injuries and no damage to the ship. Power lines and trees were downed including one tree which crushed a van.

This same storm also forced moist air over an Arctic air mass in the northern panhandle. The police department at Haines reported that about 30 inches of snow fell in less than 2 days. The heavy snow caused tree limbs to break which downed many power lines.

AKZ014-015 Southern and Coastal Southeastern Alaska	22	Late Afternoon-			0	0	0	0	High Winds
	23	Early Morning							

# Storm Data and Unusual Weather Phenomena

November 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 Cont'd

A strong low moved northeast into the central Gulf of Alaska producing strong winds over the outer coastal and southern sections of southeastern Alaska. Sustained winds at Cape Spencer reached 46 mph while a gust at Cape Decision was recorded at 70 mph.

## HAWAII

None reported.

## PACIFIC

Northern Marianas	03-04				0	0	?	?	Typhoon Seth
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Super typhoon Seth brushed by the northern Marianas.

Marshall Islands	23				0	0	?	?	Typhoon Yuri
Pohnpei	25				0	0	?	?	Typhoon Yuri
Chuuk	26				0	0	?	?	Typhoon Yuri
Guam	27				0	0	?	?	Typhoon Yuri

Typhoon Yuri formed in the Marshall Islands just south of Kwajalein and east of Kosrae on the 23rd. It then passed close to Pohnpei and Chuuk aiming at Guam. The center of Yuri passed 50 miles south of Guam on the 27th as a large and powerful super typhoon with sustained winds of 165 mph near its center. Extensive damage occurred along the east facing shores as winds as high as 115 raked the area. The southern village of Inarajan was hard hit. An unusually strong high pressure system to the north caused an intense pressure gradient with easterly winds of long fetch and duration causing severe beach erosion and coastal damage.

Marshall Islands	28-29				0	0	?	?	Typhoon Zelda
------------------	-------	--	--	--	---	---	---	---	---------------

Typhoon Zelda in its formative stages caused damage to many islands and atolls within the Marshall Islands as 40 to 60 mph squalls moved through the area. Some wind and water damage occurred at Ebeye and Kwajalein. More severe damage was reported at Ujae and Lae atolls.

## PUERTO RICO

001-002-003-004	01	0000AST-							
	02	1400AST			1	0	6	0	Flood

Large northerly swells of about 15 feet 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 of Quebradillas and the surf swept him away. Large swells were observed since the end of October. (H170)

001-002-003-005	08	2200AST-							
	09	1900AST			0	0	?	0	Flash Flood

A moist and unstable airmass gave rise to thunderstorms over the eastern half of the island. Heavy rains caused urban and small stream flooding; there were also reports of a few mudslides along roads, and some vehicles were trapped in the flood waters.

Culebra	14	1525AST	?	?	0	0	0	0	Waterspout
---------	----	---------	---	---	---	---	---	---	------------

A waterspout was sighted by the crew of an airplane just east of Culebra.

## VIRGIN ISLANDS

St. Thomas	05	1253AST	?	?	0	0	0	0	Waterspout
------------	----	---------	---	---	---	---	---	---	------------

The crew of a small aircraft reported a waterspout 15 miles west of St. Thomas Airport.

St. Croix	14	1525AST	?	?	0	0	0	0	Waterspout
-----------	----	---------	---	---	---	---	---	---	------------

An airplane crew reported a waterspout 10 miles west of St. Croix.

St. Thomas	19	1728AST	?	?	0	0	0	0	Waterspout
------------	----	---------	---	---	---	---	---	---	------------

Two waterspouts were sighted by an aircraft crew 13 miles southwest of St. Thomas.



# Storm Data and Unusual Weather Phenomena

November 1991

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

## CORRECTIONS

**APRIL 1991 - Page 115**

**MAZ002-003,006-007-008**

21	1130EST- 1600EST				0	0	6	0	High Wind
----	---------------------	--	--	--	---	---	---	---	-----------

An intense low pressure system moving north along the mid-Atlantic coast gave the region a "nor'easter". Winds frequently gusted between 40-60 mph across the coastal plain and in the Berkshires. At Boston's Logan Airport winds averaged 34 mph for a time with a gust to 54 mph. Blue Hill Observatory in Milton, just south of Boston, recorded sustained winds of 40 to 50 mph with gust over 60 mph. Numerous power outages affected 10,000 to 18,000 electric customers. Some were without power for more than 12 hours. Scattered property damage (houses and automobiles) resulted from falling trees and limbs.

**MAY 1991 - Page 114**

**New Marlboro**

30	1600EST- 1900EST				0	0	7	0	Flash Flood
----	---------------------	--	--	--	---	---	---	---	-------------

**Sheffield**

31	0400EST				0	0	7	0	Flash Flood
----	---------	--	--	--	---	---	---	---	-------------

Three thunderstorms produced 5.65 inches of rain between 1600 and 1900 EST resulting in severe flooding. Many roads and several bridges were washed out eventually isolating the villages of New Marlboro and Sheffield. About 89 miles of roads were damaged. Typical washouts ranged up to 8 feet deep and roads that were 25 feet wide were reduced to only 10 feet. Power outages were widespread and a state of emergency was declared. The flooding was the worst since 1955 and damage was estimated between \$5 to \$10 million. Road damage was reported in adjacent towns, but was much less severe.

## STORM DAMAGE CATEGORIES

## 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.



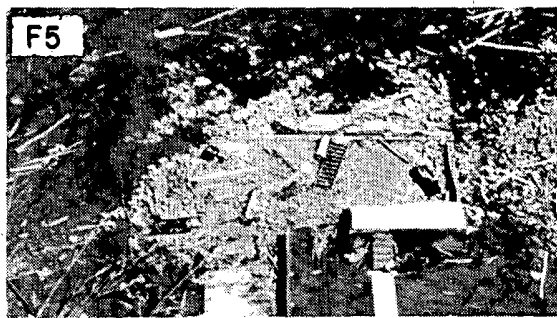
(F2) Significant tornado (113-157 mph): Considerable damage  
 Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light-object missiles generated.

(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
- 

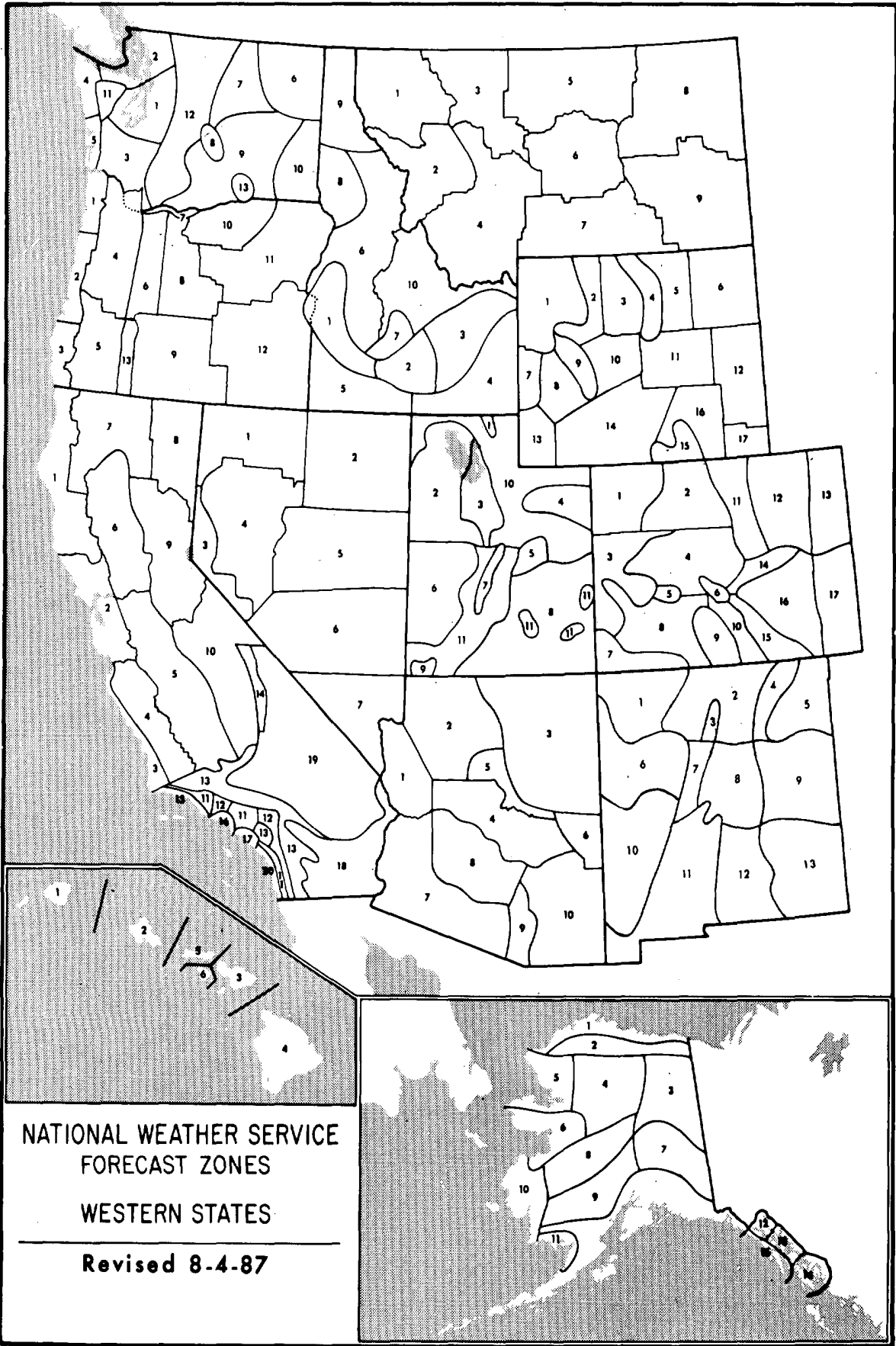
From J. Atmos. Sci., August 1981, p. 1517-1519

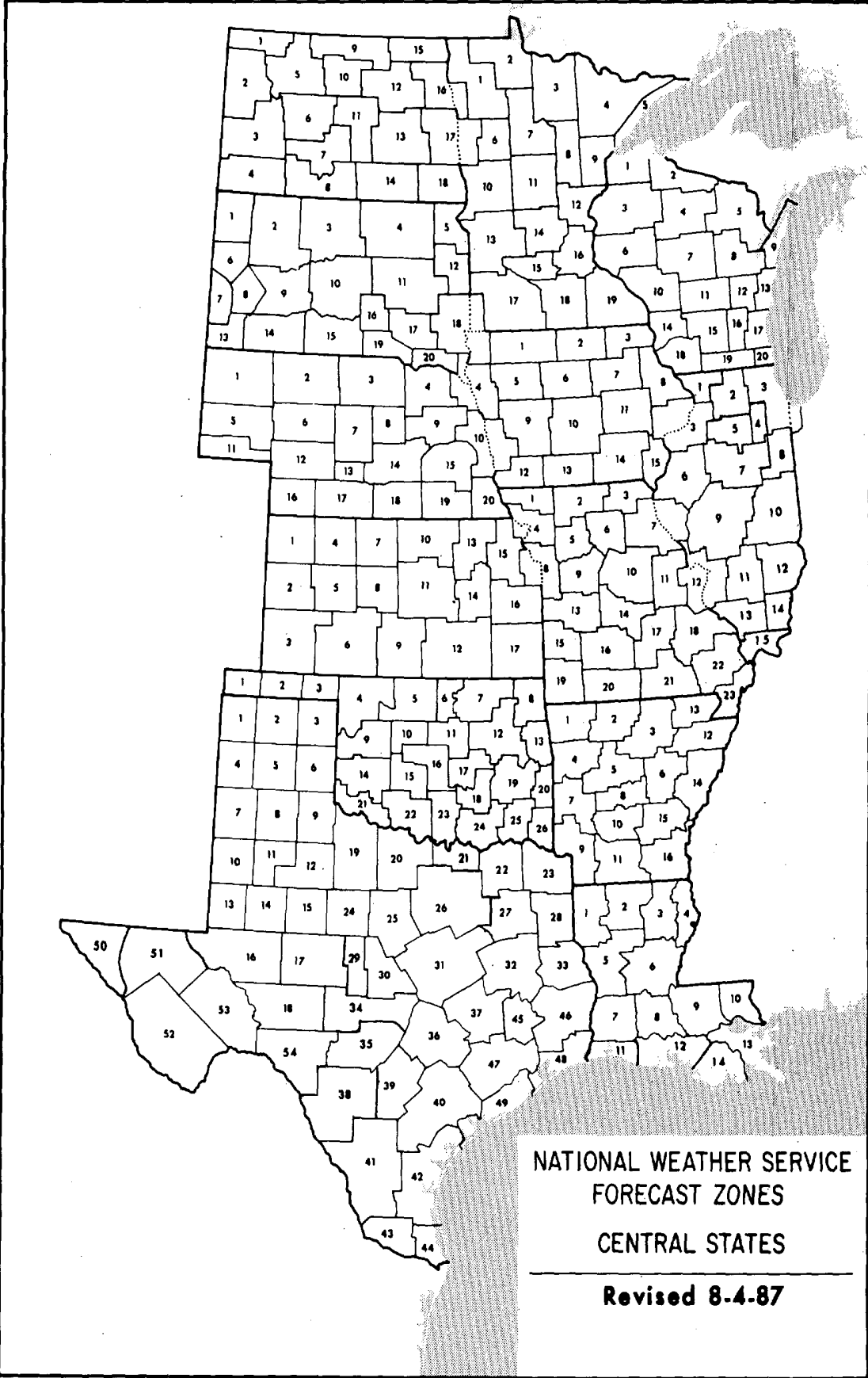
# STORM SUMMARY

November 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
<b>TORNADOES</b>			1		0	0					1		1			6			0				1	2			0
Number			1								1		1			6						1	2				
Days			0								0		0			0						0	0				
Deaths			0								0		0			0						0	0				
Injuries			0								0		0			0						0	0				
Property Damage			0								0		0			0						0	0				
Crop Damage			0								0		0			0						0	0				
<b>HAIL</b>																											
Deaths			0																								
Injuries			0																								
Property Damage			0																								
Crop Damage			0																								
<b>THUNDERSTORM WINDS</b>																											
Deaths	0		0					0			0	0	0		0							0	0				
Injuries	0		0					0			0	0	0		0							0	0				
Property Damage	0		0					0			0	0	0		0							0	0				
Crop Damage	0		0					0			0	0	0		0							0	0				
<b>HIGH WINDS</b>																											
Deaths				1				0																0			0
Injuries				3				0															0				0
Property Damage				0				0															0				0
Crop Damage				0				0															0				0
<b>LIGHTNING</b>																											
Deaths																											0
Injuries																											0
Property Damage																											0
Crop Damage																											0
<b>FLASH FLOODS</b>																											
Deaths			0								0																
Injuries			0								0																
Property Damage			0								0																
Crop Damage			0								0																
<b>FLOODS</b>																											
Deaths							0																				
Injuries							0																				
Property Damage							0																				
Crop Damage							0																				
<b>HEAVY SNOWSTORMS AND BLIZZARDS a</b>																											
Deaths			0							0			0										0	0		0	
Injuries			0							0			0									0	0		0		
Property Damage			0							0			0									0	0		0		
Crop Damage			0							0			0									0	0		0		
<b>ICE STORMS #</b>																											
Deaths																											
Injuries																											
Property Damage																											
Crop Damage																											
<b>HURRICANES AND TROPICAL STORMS</b>																											
Deaths																											
Injuries																											
Property Damage																											
Crop Damage																											
<b>ALL OTHERS</b>																											
Deaths																											
Injuries																											
Property Damage																											
Crop Damage																											



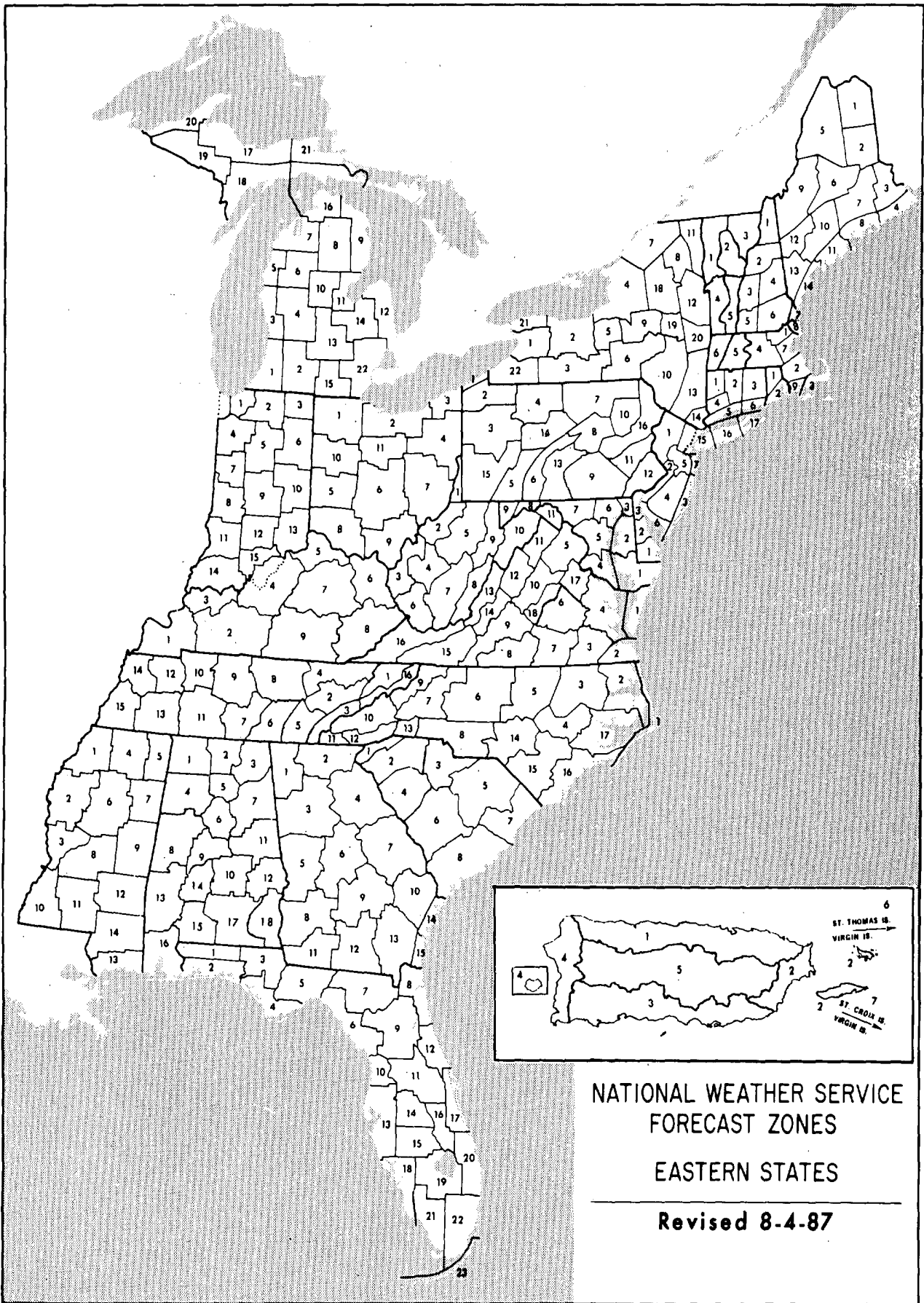




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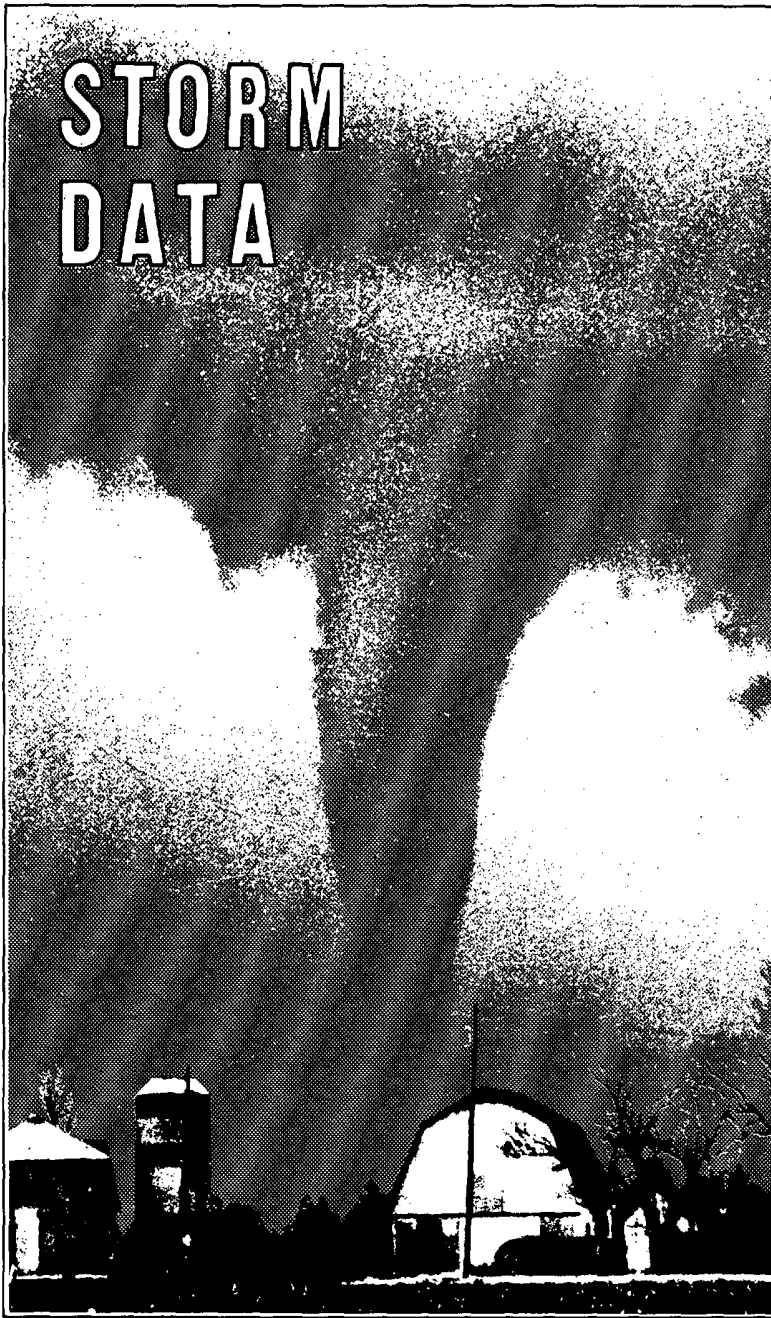
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Revised 8-4-87



# STORM DATA

Photo courtesy: Larry Miller, Kansas Heritage Photography



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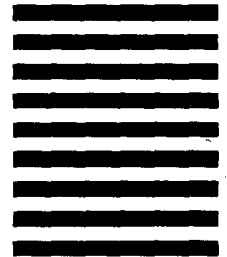
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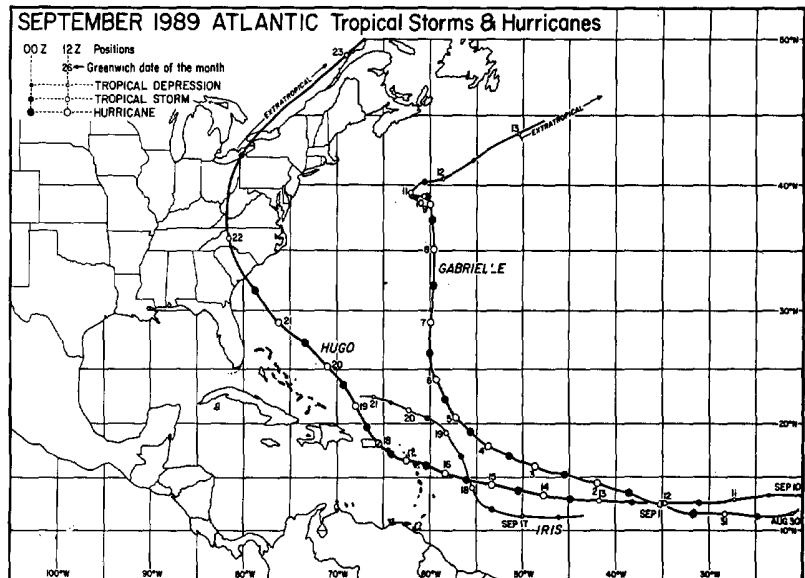
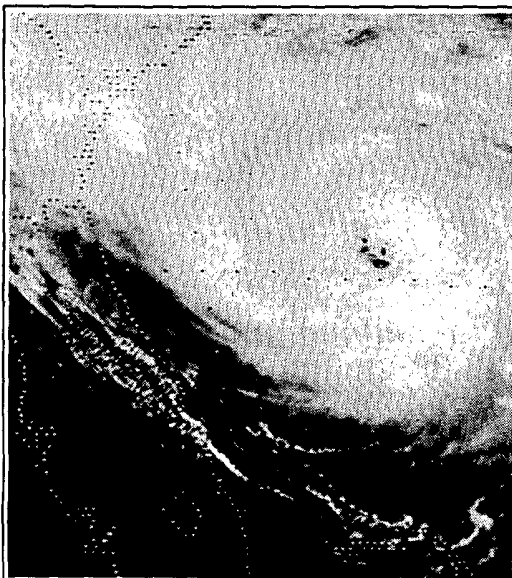
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**HURRICANE HUGO, SEPTEMBER 10-22, 1989**

Despite excellent warning lead times and excellent government and public response to the warnings, the fury of Hurricane Hugo took many by surprise and will undoubtedly haunt the memory of many Americans for years to come. Along with numerous deaths and injuries, HUGO brought large-scale devastation to much of the Carolinas, Puerto Rico, the Virgin Islands and other islands of the Caribbean, making it the costliest hurricane in U.S. history.

Over the course of slightly less than two weeks, HUGO followed a trajectory that was typical for an Atlantic Basin tropical system: originating near Africa in the vicinity of the Cape Verde Islands, traveling west across the tropical Atlantic to the Leeward Islands, turning northwest toward the U.S. coast until making landfall in the Carolinas, and once inland, turning northeast under the influence of the Westerlies and becoming extratropical while skirting the eastern U.S.-Canada border (see map below). The system originated from a cluster of thunderstorms that moved off the African coast on September 9th and organized into a tropical depression on the 10th just southeast of the Cape Verde Islands. The system moved west at 18 knots, attaining storm status on the 11th, and hurricane status on the 13th while located about 1100 nautical miles east of the Leeward Islands. HUGO gradually turned west-northwest and slowed in its translation as it headed for the Islands. While still several hundred miles east of the Islands on the 15th, the first reconnaissance aircraft reported HUGO as having a minimum central pressure of 918 mb and an estimated maximum surface wind of 140 knots. This turned out to be HUGO's maximum intensity.



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### STORM DATA

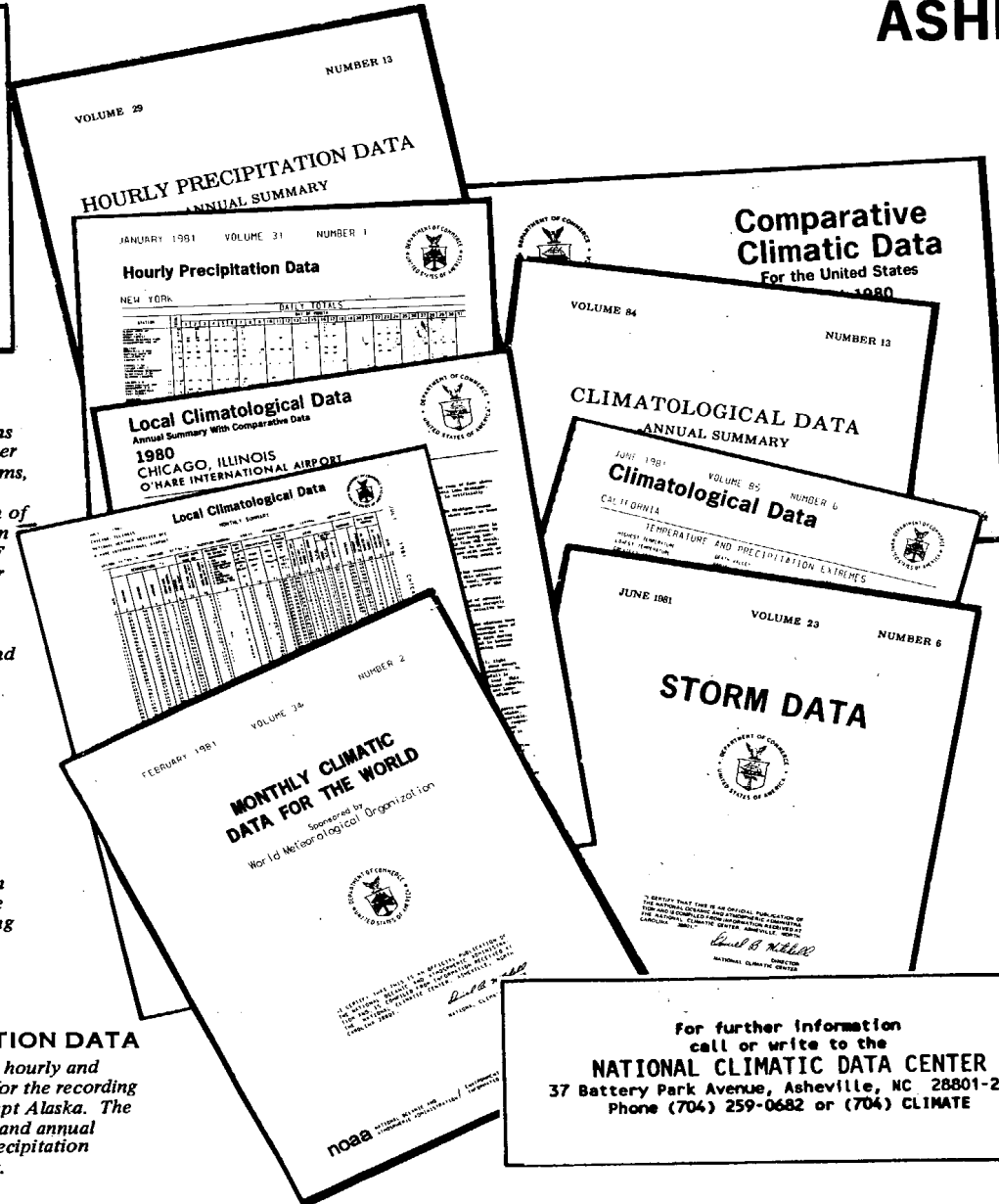
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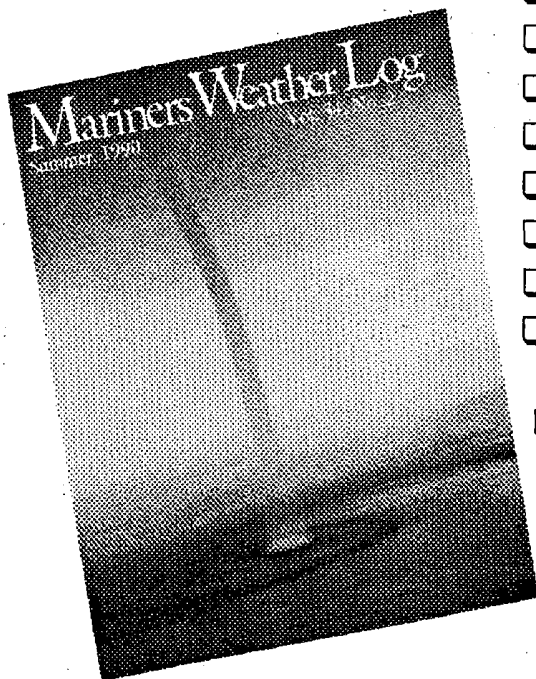
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