

SEPTEMBER 1991

VOLUME 33

NUMBER 9

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: Rainfall was locally heavy in parts of Arizona on September 5, 1991. The driver of this car fortunately abandoned the vehicle just before flood waters swept it away. See page 9 for further information. (Photo courtesy: The Copper Era, Clifton, Arizona.)

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STORM DATA

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National Climatic Data Center

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

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

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

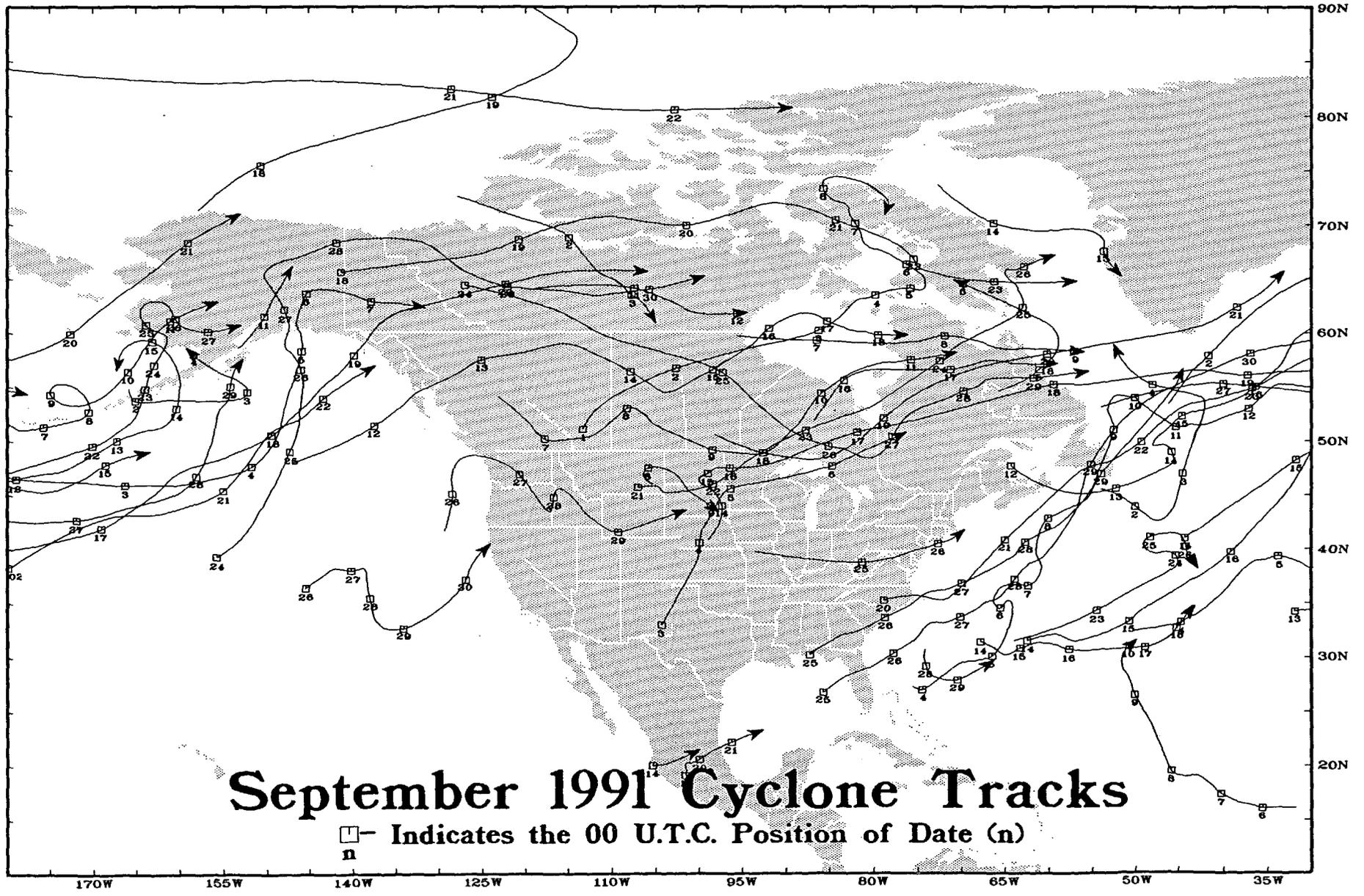
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Director
National Climatic Data Center



September 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 - SEPTEMBER 1991

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

A late summer heat wave in the eastern third of the country broke about 130 daily record high temperatures. Following the heat wave, an outbreak of cold air from Canada brought over 100 record lows. Mean monthly temperature departures of greater than +4°F existed from central Washington to south-central California. Temperature departures of +2°F occurred in the north and central Plains, northern Rockies, central and western Alaska. On the cool side, temperature departures of -4°F existed in western Texas and southern Oklahoma. Subnormal temperatures (more than -2°F) departures occurred in the southern Rockies, southern Plains, and portions of the Northeast. Overall, September 1991 ranked as the 52nd coldest September since 1895. (See Figs. 2 and 3 on page 5.)

Precipitation for the month of September 1991 ranked as the 51st driest September on record. Above normal precipitation occurred over the Rockies, Great Basin, desert Southwest, northern and southern Plains, upper and lower Mississippi Valley, and the Northeast. In contrast, abnormally dry conditions (less than 75% of normal) occurred from the central Plains to the central Appalachians and mid-Atlantic region. The Northwest region experienced near-record dryness as they recorded their 3rd driest September. (See Figs. 4 and 5 on page 6.)

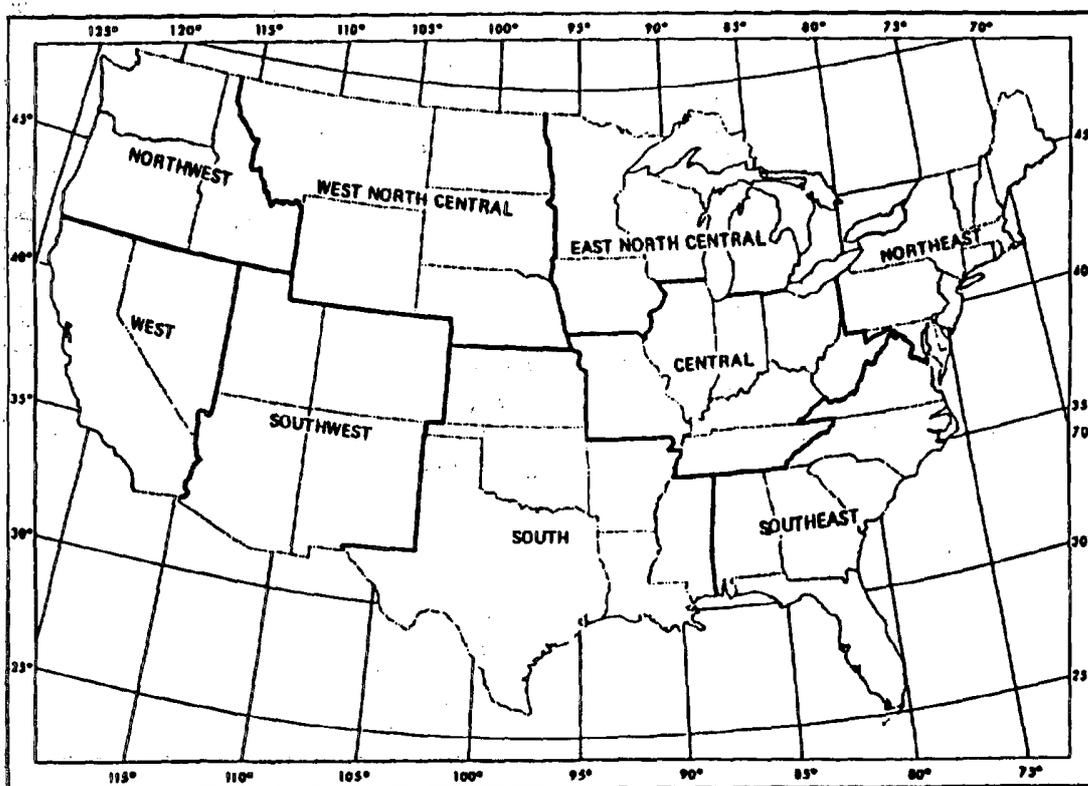
TABLE 1. TEMPERATURE AND PRECIPITATION RANKINGS FOR SEPTEMBER 1991, BASED ON THE PERIOD 1895-1991.

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

REGION	PRECIPITATION	TEMPERATURE
Northeast	64	24
East North Central	55	23
Central	29	49
Southeast	24	51
West North Central	53	69
South	75	19
Southwest	83	49
Northwest	3	87
West	70	93
National	51	52

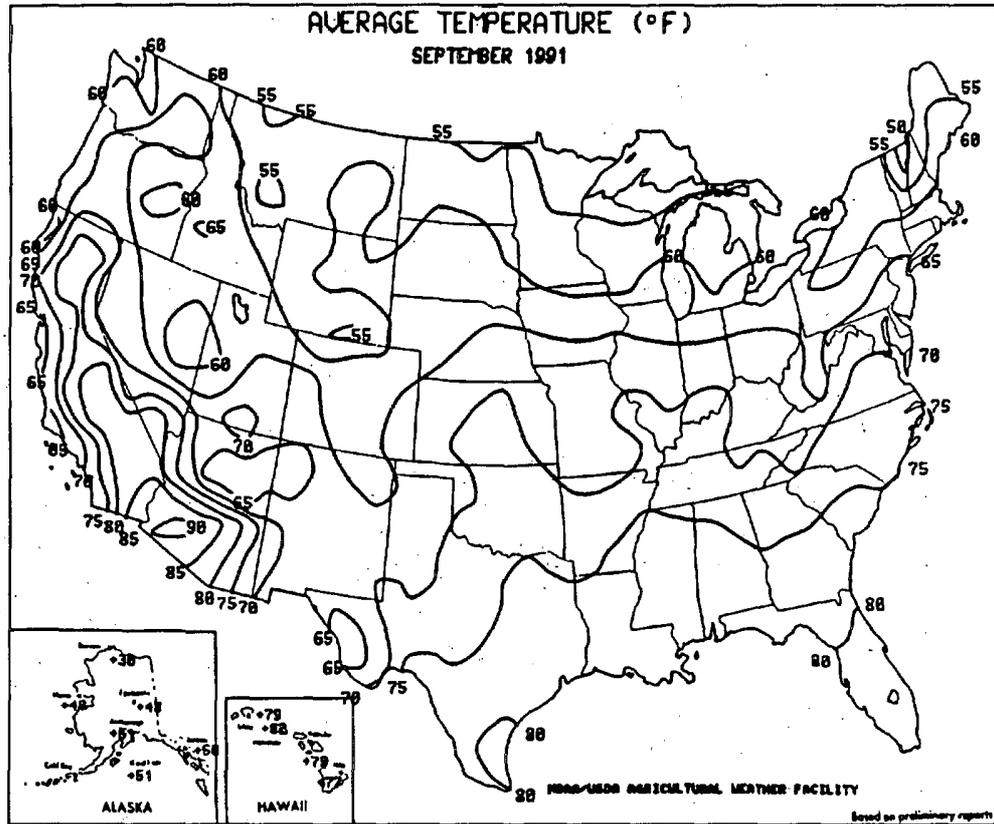
From National Climatic Data Center

Fig. 1



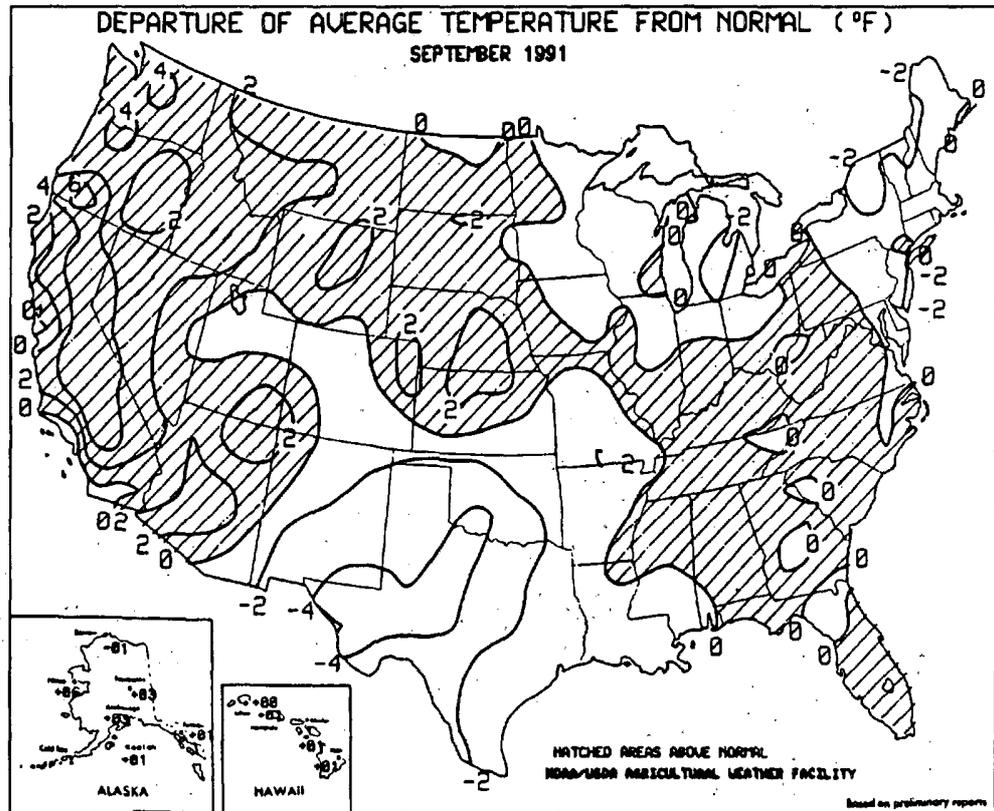
From National Climatic Data Center

Fig. 2



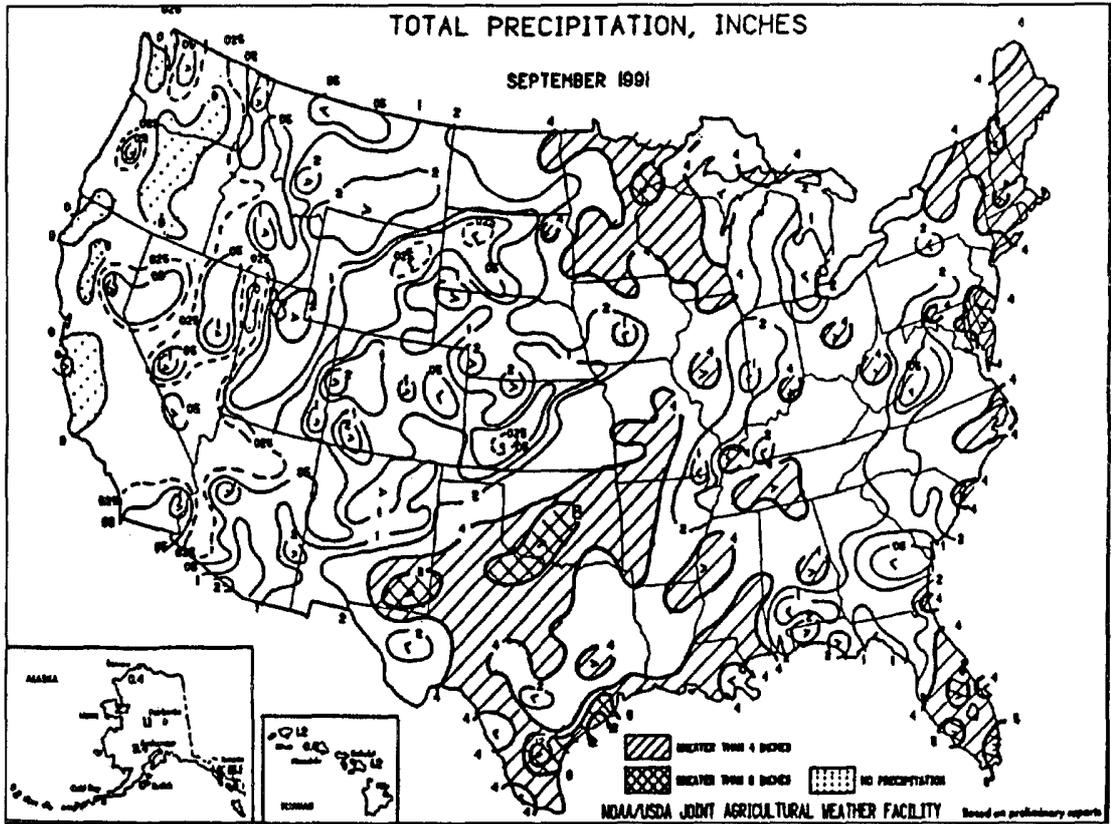
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Fig. 3



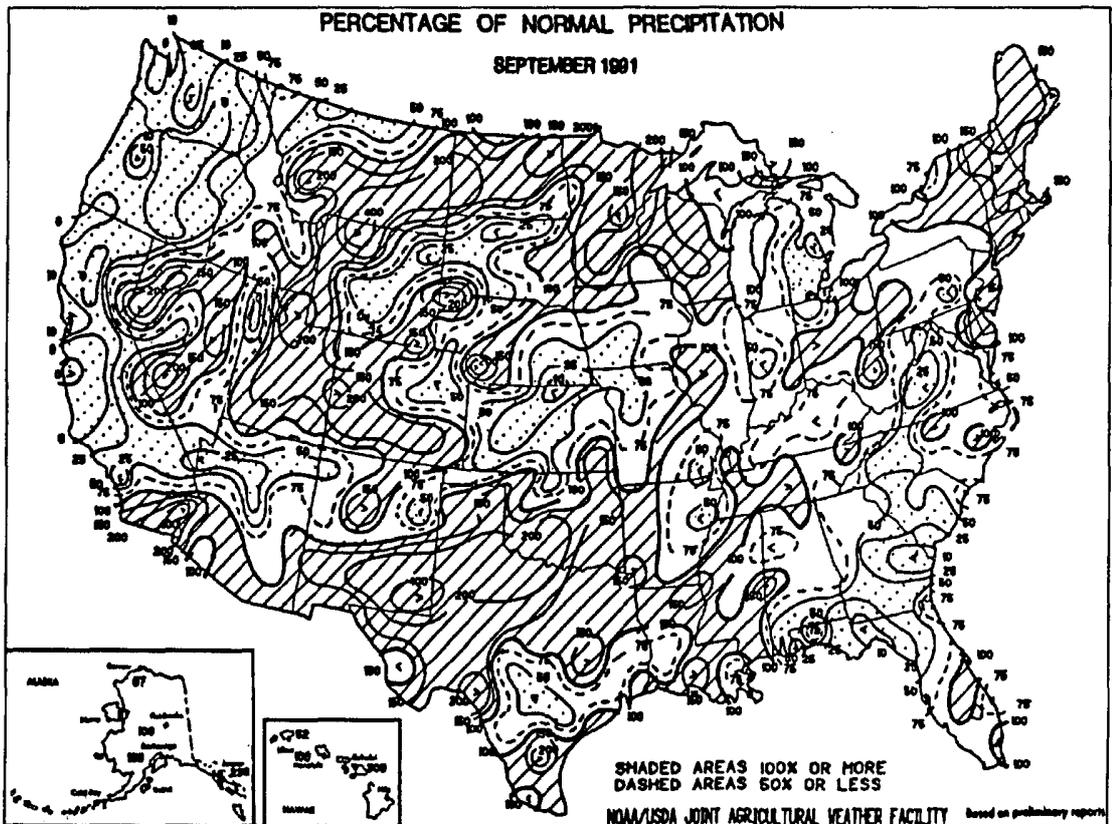
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Fig. 4

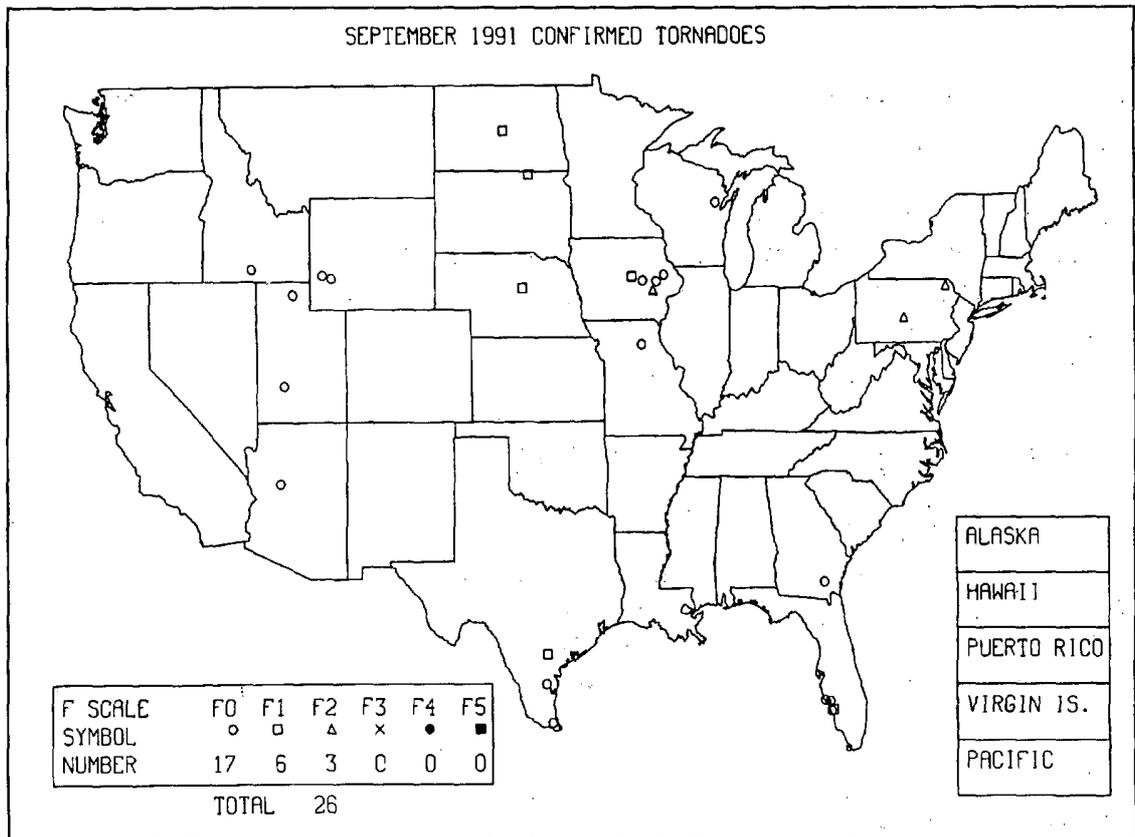


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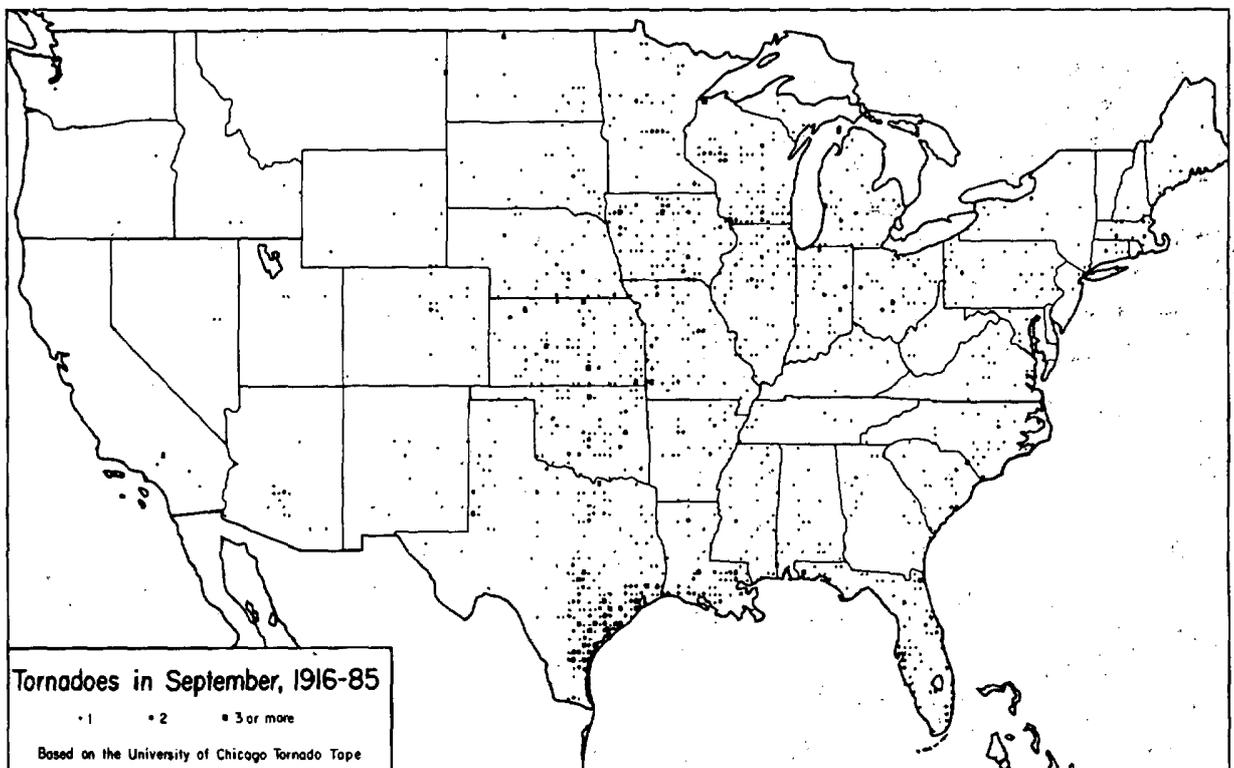
Fig. 5



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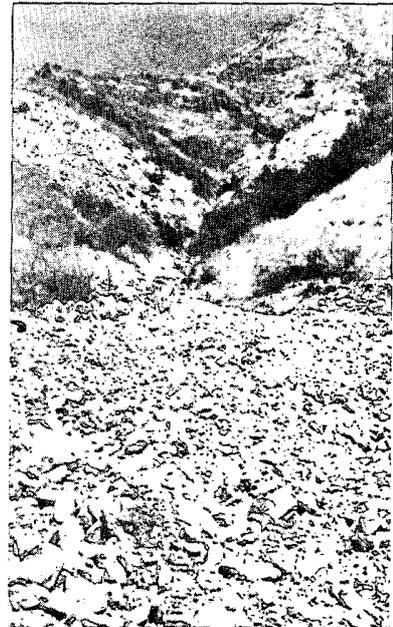
In September 1991, 26 tornadoes were recorded. Seventeen of those were FO strength on the Fujita Tornado Scale. There were three F2 tornadoes in September 1991. The state of Pennsylvania recorded only two tornadoes in the month, however both were F2 in strength. The other F2 tornado occurred in Iowa. There were no reported deaths, but ten injuries did occur in the month. (See map above.)



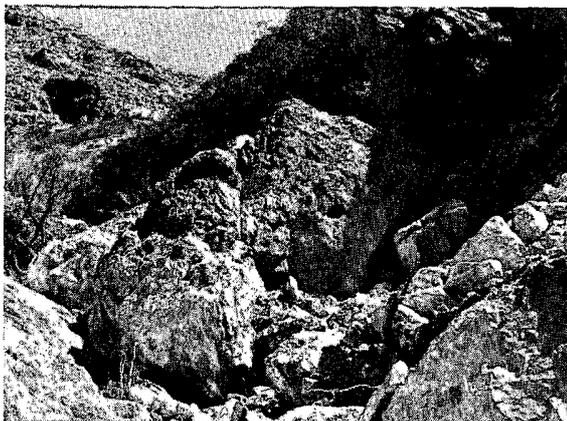
OUTSTANDING STORMS OF THE MONTH

1. FLASH FLOODING CAUSES DAMAGE IN UTAH

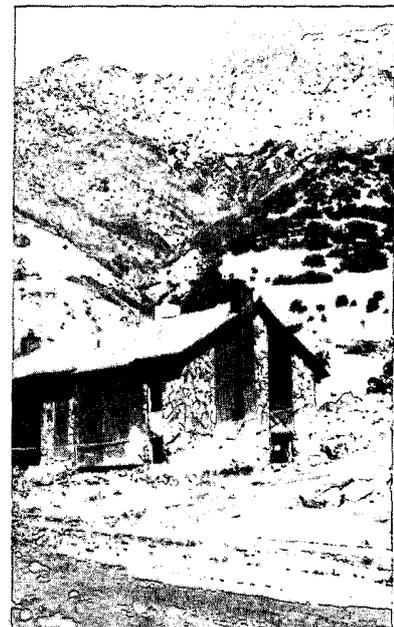
Weber County located in the northeast part of Utah was the site for flooding and mud/rock slides. One of the hardest hit areas was Camarren Cove (See pictures below.) and Lakeside Estates subdivisions, located in North Ogden close to the Wasatch Mountains. Record rains that totaled over 8 inches loosened tons of rock, mud, and other debris in a canyon northeast of the subdivisions. Further downstream, flooding also occurred at Harrisville. Approximately 640 houses received damage from flooding or from the mud/rock slides. Total damages cost were about \$6 million.



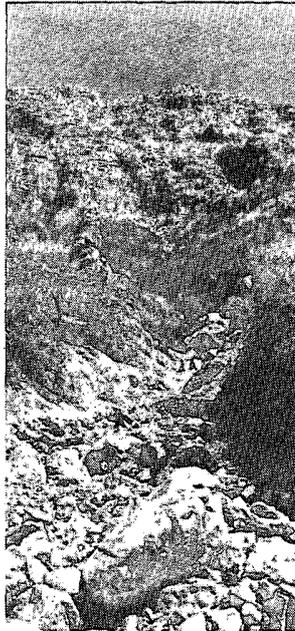
Above(all): Only rocks remain where the flood waters rushed from the canyon bringing mud and other debris with them.



Left: The rock debris shows the path of the flash flood towards the subdivision. **Right:** One of the houses that sustained damage from the mud/rock slides. (Note the runoff scars on the mountain behind the house!) **Bottom(Left):** One of the large boulders that washed out of the canyon.



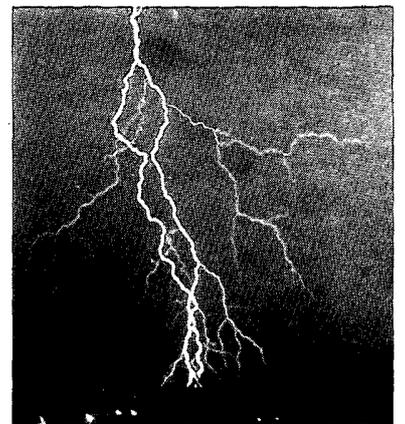
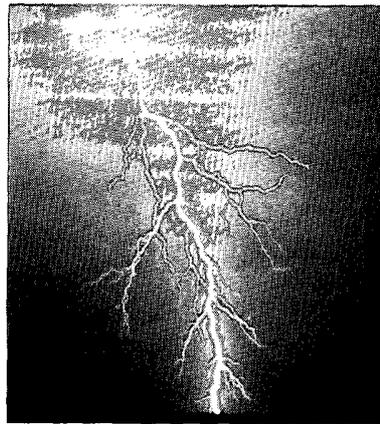
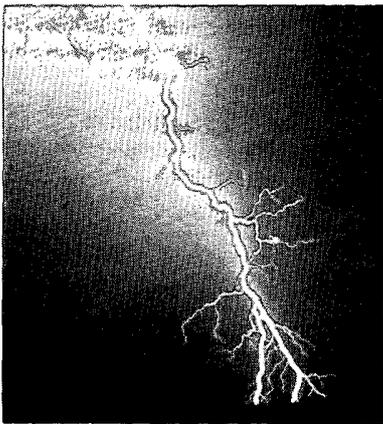
The above photos provided by Mark L. Kramer, Meteorological Evaluation Services, Amityville, New York.



Left and Above: More views of rock debris in the canyon. (Photo courtesy: Mark L. Kramer, Meteorological Evaluation Services, Amityville, New York.)

2. LIGHTNING DISPLAYS OVER WEST CHICAGO

Lightning lit up the night sky over West Chicago on September 9th. View is to the west from Route 59. Approximate time of photos is 9:30 pm CDT. (Photo courtesy and ©: Tim Dorr, Harrison, New York.)



3. FLASH FLOOD WASHES AWAY CAR IN ARIZONA



Rainfall was locally heavy in many areas of Arizona on September 5, 1991. Left: The driver of this car fortunately abandoned the vehicle just before the flood waters along Ward's Canyon Road swept it away. Statistics show that most deaths associated with flash floods result from drivers attempting to cross flooded roadways. (Photo courtesy: Steve Sipple, WSFO Phoenix; photo by The Copper Era, Clifton, Arizona.)

Storm Data and Unusual Weather Phenomena

September 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
ALABAMA									
Baldwin County	05	1210CST			0	0	0	0	Thunderstorm Winds
									Trees were blown onto power lines in Bon Secour.
Baldwin County	17	1555CST			0	0	0	0	Thunderstorm Winds
									Trees were blown across a road in the Silverhill area.
ARIZONA									
Pima County Organ Pipe Cactus National Monument	01	1545MST			0	0	0	0	Flash Flood
									Very heavy rainfall resulted in local flooding. Some roads were closed after 1.16 inches fell in 2 hours.
Yavapai County 20 NW Prescott	02	1438MST	?	?	0	0	0	0	Tornado (F0)
									Pilot reported short-lived tornado in open country.
Yavapai County Bagdad	02	1730MST			0	0	0	0	Flash Flood
									Some homes and streets were flooded. A deputy sheriff estimated about 2 inches of rain fell in 1 hour.
Cochise County 10 E Sierra Vista	03	1545MST			0	0	3	0	Hail (1.00) Thunderstorm Winds
									Winds and hail damaged 2 windows of a home in the Whetstone area and a billboard along Highway 90.
La Paz County Parker	03	1830MST			0	0	4	0	Thunderstorm Winds Flash Flood
									Severe thunderstorm winds blew part of the roof off a home and another home lost its air conditioner. Near Wenden, high winds blew down about 30 power poles. Police reported rocks on Highway 95 north of Parker. Half-inch hail was reported by the Buckskin Fire Department.
Maricopa County Mesa	03	2100MST			0	0	5	0	Thunderstorm Winds (G51)
									An automatic weather station recorded a gust to 58 mph and a large grain elevator was toppled in downtown Mesa. About 14,000 customers were affected by power outages.
Scottsdale	03	2240MST			0	0	4	0	Flash Flood Lightning
									A spotter reported minor flooding near McCormick Ranch. About 0.75 inch fell in 30 minutes near 22nd and Shea Boulevard. Street flooding occurred at Pima and Cactus. Roofs were damaged in Scottsdale due to lightning.
Yuma County Yuma	04	1845MST			0	2	3	0	Thunderstorm Winds (G63)
									Thunderstorms developed near the La Paz County line and propagated southwestward. Yuma Proving Ground had high winds that blew down a 300 foot tower. The roof of a convenience store was ripped off, a window of a restaurant blew in and injured two persons, and a mobile home was flipped over at Martinez Lake.
Greenlee County Clifton	05	1745MST			0	0	4	0	Flash Flood
									Rainfall was locally heavy around many areas of the state this afternoon. A very moist and unstable airmass set the stage for strong thunderstorms that developed by late afternoon. A motorist escaped her car just before raging flood waters along Ward's Canyon Road swept it away. Attempts to save the car and the motorist's belongings failed.

Storm Data and Unusual Weather Phenomena

September 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
ARIZONA Cont'd									
Graham County Safford	12	1445MST			0	0	0	?	Hail (0.75)
									Cotton crops were damaged by large hail.
Apache County 10 E St Johns	12	1500MST			0	0	0	0	Funnel Cloud
Pima County Tucson	17	1400MST			0	0	5	0	Flash Flood
									Strong thunderstorms formed over the city with 1.33 inches of rain, pea-size hail, and a gust to 56 mph at the airport. Washes and roadway dips were flooded. Two miles east of the airport, high winds blew down 14 power poles.
Yavapai County Prescott Valley	19	1549MST			0	0	2	0	Thunderstorm Winds
									High winds blew down power lines along Route 69. An observer about 17 miles southwest of Prescott, reported 2.30 inches and a wind gust to 52 mph. A small rock and mudslide was reported on Route 96 south of Bagdad at about 1800 MST.
Mohave County Lake Havasu City	19	1858MST			0	0	?	0	Thunderstorm Winds (G62)
									A SKYWARN observer reported downburst wind gusts of 58 and 71 mph.
La Paz County Parker	19	1915MST			0	0	0	0	Thunderstorm Winds
Mohave County Dolan Springs	22	1715MST			0	0	0	0	Hail (0.75)
									The fire department reported flooding of all nearby washes.
Maricopa County Phoenix	22	1930MST			0	0	0	?	Hail (0.75)
									Large hail at 3rd Ave and Osborn. Some damage was reported to cotton crops in the Avondale area.
Cochise County Sierra Vista	28	1525MST			0	0	0	0	Flash Flood
									Thunderstorms resulted in heavy rainfall at Fort Huachuca. An off-duty weather observer reported some minor street flooding.
ARKANSAS									
Craighead County Valley View	05	1500CST			?	?	?	?	Funnel Cloud
									Several sightings of a funnel cloud were reported in the Valley View area, just southwest of Jonesboro. The funnel had apparently been visible for about 30 minutes.
Pulaski County Little Rock	16	1505CST			2	3	0	0	Lightning
									A lightning strike in southwest Little Rock claimed the lives of two children and injured three others. The children had gathered under a tree and were preparing to go inside when lightning struck the tree. (M06O) (M07O)
CALIFORNIA, Northern									
Kern County Pine Mountain Club	05	1430PST			0	0	0	0	Hail (1.00)
									Thunderstorms produced hail up to 1.00 inch in diameter in an isolated portion of southern Kery County.

Storm Data and Unusual Weather Phenomena

September 1991

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

CALIFORNIA, Northern Cont'd

W of Ridgecrest Inyokern	05	1745PST- 1930PST			0	0	?	0	Flash Flood
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Thunderstorms formed over the Sierra Nevada then drifted southeastward over northeastern Kern County. Water and mud coursed over Highways 178, 395, and 14.

Monterey County Salinas Soledad	06	0700PST- 0730PST			2	0	0	0	Lightning
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A small area of thunderstorms moved northward up the Salinas and Santa Clara Valleys. A farm worker in Soledad and one in Salinas (both males in their early 20s) were killed by lightning.

Santa Clara County San Jose	06	0730PST- 0800PST			0	2	0	0	Lightning
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Two workers at San Jose Airport were injured when lightning struck near the aircraft they were refueling (both males in their 40s).

Sonoma County Santa Rosa	25	1000PST			0	1	0	0	Lightning
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A woman in her 30s was struck by lightning as she camped in Santa Rosa.

Butte County Chico	26	0730PST			0	0	?	0	Thunderstorm Winds
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Strong wind associated with a high-based thunderstorm lifted a roof off of a deck and carried it 80 feet through the air dumping it on a metal outbuilding. Limbs were ripped off of several trees and a large willow was split in half.

CALIFORNIA, Southern

San Bernardino County Big Bear Lake Western Portion	04	1245PST			0	0	?	0	Hail (0.75 to 1.50)
---	----	---------	--	--	---	---	---	---	---------------------

Marble to golf ball size hail covered the ground 2.50 inches deep. The melted down water was 2.81 inches in one area near Big Bear. The temperature fell to 41 degrees during the height of the storm.

Riverside County Blythe Countywide	05	1400PST			0	0	?	0	Thunderstorm Winds (G60)
	05	1530PST			0	0	?	0	Hail (0.75 to 1.50) Flash Flood

The highway patrol reported golf ball-size hail in the Palm Springs area. Local areas of flash flooding occurred from Cathedral City to Palm Desert and Indio, along with strong gusty winds.

Ventura County Northern Portion	05	1434PST			0	0	?	0	Hail (0.50 to 1.00)
------------------------------------	----	---------	--	--	---	---	---	---	---------------------

Thunderstorms hit the mountains of northern Ventura County with heavy rain and hail.

Kern County Eastern Portion Near Inyokern	05	1745PST			0	0	0	0	Flash Flood
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Slow moving thunderstorms over the southern Sierra Nevada and the western Mojave Desert, produced some flash flooding, near Walker Pass. State Highways 14 and 178 were affected by some flooding and were closed for a time.

Riverside County Eastern Portion and San Bernardino County Southeastern Portion	19	1759PST			0	0	?	0	Thunderstorm Winds (G58)
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At 1800 PST, winds of 58 mph were reported near Lake Havasu. At 1900 PST, Blythe reported winds to 35 mph with visibilities of one-sixteenth of a mile, in blowing dust and sand.

Storm Data and Unusual Weather Phenomena

September 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
CALIFORNIA, Southern Cont'd									
Riverside County Hemet	22	1415PST			0	0	?	0	Flash Flood
									Local street flooding occurred in the Hemet area due to a slow moving thunderstorm.
Los Angeles County Lancaster	25	1300PST			0	0	0	4	Lightning
									About 65 tons of baled hay was charred after a bolt of lightning struck it.
San Bernardino County Daggett	26	1706PST			0	0	0	0	Funnel Cloud
									A funnel cloud was reported west of the Daggett Airport.
CAZ011-012-016-017	26	All Day			0	0	?	0	Thunderstorms
									Thunderstorms hit many coastal and valley areas of southern California. Power was temporarily knocked out at the Ontario Airport. More than 30,000 customers were without power in areas of San Bernardino, Riverside and Los Angeles Counties.
COLORADO									
El Paso County Manitou Springs	03	2250MST			0	0	4	?	Flash Flood
									Thunderstorms moved across northern El Paso County dropped 3.7 inches of rain in a period of 3 hours. Manitou Springs sustained damage when the rains caused mudslides and severe erosion of barren cliffs in and near town. A landscape support wall was damaged. Another cinder block wall next to a drainage ditch was destroyed. Early damage estimates were placed at \$20,000.
Logan County Fleming	04	1810MST			0	0	4	?	Hail (1.75)
Fleming	04	1810MST			0	0	3	?	Thunderstorm Winds (G61)
4 SSW Fleming	04	1815MST			0	0	?	?	Flash Flood
									Thunderstorms near the town of Fleming produced up to golf ball-size hail and wind gusts to 70 mph. HAMS reported damage to several roofs, windows, and trees. Power lines were also reported down. One spotter watched the wind take the roof off a mobile home. Heavy rain (2.25 inches in one hour) just south southwest of Fleming caused flooding of the roads. A camper trailer was overturned.
Costilla County San Luis	07	1300MST			0	1	?	?	Lightning
									A 48-year-old man was struck and injured by lightning while fishing at a creek near San Luis.
Morgan County 9 NW Ft Morgan	11	1908MST			0	0	?	?	Hail (0.75)
Weldona	11	1908MST			0	0	4	?	Thunderstorm Winds
									Thunderstorms produced 0.75-inch hail 9 miles northwest of Fort Morgan. The hail was reported to be 2 inches deep in areas. Several cattle were injured on a farm near Weldona when gusty wind blew over plastic cattle sheds. The cows received cuts from blowing debris.
Sedgwick County Julesburg	12	0008MST			0	0	?	?	Hail (1.75)
									Golf ball-size hail fell in Julesburg.
Larimer County	14	1700MST- 2100MST			0	0	?	?	High Winds
									A cold front which moved across the Front Range late in the afternoon produced bora-type high wind across eastern Larimer County. Cooperative observers near Fort Collins reported wind gusts of over 60 mph (52 knots) while the National Weather Service mesonet station at Fort Collins recorded a gust of 71 mph (62 knots). The highest recorded gust was 73 mph (64 knots) at Masonville.

Storm Data and Unusual Weather Phenomena

September 1991

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

None reported.

DELAWARE

New Castle County Wilmington	17	1830EST				0	0	0	0	Thunderstorm Winds
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Trees were downed by strong winds.

FLORIDA

Monroe County 8 S Marathon	01	0730EST	?	?		0	0	0	0	Waterspout
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A waterspout was observed over the Florida Straits 8 miles south of Marathon.

Manatee County Bradenton Beach	01	1215EST	?	?		0	0	0	0	Waterspout
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A waterspout was sighted 1.5 miles off Bradenton Beach.

Indian River County Vero Beach	05	0917EST	?	?		0	0	0	0	Waterspout
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Three waterspouts formed in the Atlantic off Vero Beach. The waterspouts moved toward the coast but dissipated before reaching shore.

Charlotte County Charlotte Harbor	05	1715EST	Short	?		0	0	3	0	Tornado (F0)
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A small tornado did minor damage to homes, downed 40-foot tall trees and power lines.

Brevard County Kennedy Space Center	06	1126EST	?	?		0	0	0	0	Waterspout
---	----	---------	---	---	--	---	---	---	---	------------

A waterspout was spotted just off the Kennedy Space Center, but dissipated before reaching shore.

Volusia County New Smyrna Beach	07	1425EST	?	?		0	0	0	0	Waterspout
------------------------------------	----	---------	---	---	--	---	---	---	---	------------

A waterspout was observed briefly 2 miles off New Smyrna Beach in southern Volusia County.

Lee County Fort Myers	07	1830EST	2.0	80		0	7	5	0	Tornado (F1)
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A tornado touched down several times along a 2-mile path between the Caloosahatchee River south near U.S. Highway 41 to Page Field. Flying glass caused minor injuries to seven people at two shopping malls. Fourteen homes were damaged; two were destroyed and three others suffered major damage. A total of 34 commercial/industrial buildings were damaged with one destroyed and 19 had major damage. Total damage was estimated at \$350,000.

Sarasota County 34 NW Fort Myers	07	1830EST				0	0	2	0	Thunderstorm Winds
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Strong thunderstorm winds downed power lines in Englewood.

Manatee County Northern Portion	07	1835EST				0	0	2	0	Thunderstorm Winds
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Strong thunderstorm winds downed trees and power lines over rural northern Manatee County.

Sarasota County 43 NW Fort Myers	07	1915EST				0	0	2	0	Hail (0.75) Thunderstorm Winds
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Large hail fell briefly at Venice. Power lines were downed by strong winds.

Manatee County 27 S Tampa	07	1920EST				0	0	3	0	Thunderstorm Winds
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Storm Data and Unusual Weather Phenomena

September 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
FLORIDA Cont'd									
Strong thunderstorm winds blew the roof off a mobile home near Palmetto.									
Polk County 43 E Tampa	08	1430EST			0	0	4	0	Thunderstorm Winds (G61)
	Thunderstorm gusts to 70 mph struck Gilbert Airport in Winter Haven. Five hangers sustained door and panel damage and a small plane was overturned. Trees and power lines were downed nearby.								
Manatee County Bradenton	08	1630EST			0	0	3	0	Lightning
	Lightning started a fire that destroyed part of the roof of a house in Bradenton.								
Monroe County 5 NW Key West	09	1611EST	?	?	0	0	0	0	Waterspout
	A waterspout was observed briefly 5 miles northwest of Key West.								
5 NE Key West	10	1308EST	?	?	0	0	0	0	Waterspout
	A waterspout was observed briefly 5 miles northeast of Key West.								
Bahia Honda Key	10	1345EST	?	?	0	0	0	0	Waterspout
	A waterspout was observed in the Gulf of Mexico just off Bahia Honda State Park.								
Brevard County Melbourne Beach	11	0628EST			0	0	0	0	Funnel Clouds
	A police officer spotted three funnel clouds over the coastal waters off Melbourne Beach.								
Monroe County 5 W Key West	12	1340EST	?	?	0	0	0	0	Waterspout
	A waterspout was briefly sighted 5 miles west of Key West.								
10 SE Key West	13	0708EST	?	?	0	0	0	0	Waterspout
	A waterspout was sighted 10 miles southeast of Key West.								
6 NE Key West	17	1609EST	?	?	0	0	0	0	Waterspout
	A waterspout was sighted 6 miles northeast of Key West.								
5 NE Key West	18	1232EST	?	?	0	0	0	0	Waterspout
	A waterspout was sighted 5 miles northeast of Key West.								
Hillsborough County Tampa	18	1600EST			0	0	2	0	Thunderstorm Winds
	Strong thunderstorm winds downed trees and power lines in Tampa.								
Columbia County 35 NNW Gainesville	19	1600EST			0	1	2	0	Lightning
	Lightning struck near a man in Lake City knocking him to the ground. Several power transformers had to be replaced.								
Monroe County 5 N Key West	20	1100EST	?	?	0	0	0	0	Waterspout
	A waterspout was sighted 5 miles north of Key West.								
Palm Beach and Martin Counties	20	1205EST	?	?	0	0	0	0	Waterspout
	A waterspout was sighted in the Atlantic 4 miles off Jupiter Island near the Palm Beach/Martin line.								
Lee County Cape Coral	20	1930EST	Short	?	0	0	3	0	Waterspout

Storm Data and Unusual Weather Phenomena

September 1991

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

FLORIDA Cont'd

<p>Charlotte County 26 NNW Fort Myers</p>	20	2000EST			0	0	3	0	<p style="text-align: right;">Tornado (F0) A waterspout moved onshore collapsing a carport onto a car. A large pool screen enclosure was blown away from the home.</p> <p style="text-align: right;">Lightning Lightning struck a car in Port Charlotte starting a fire which gutted it.</p>
<p>Volusia County Daytona Beach</p>	21	1220EST			0	0	0	0	<p style="text-align: right;">Funnel Cloud A funnel cloud was observed by air traffic controllers offshore from New Smyrna Beach.</p>
<p>Dade County Miami Beach</p>	22	0752EST	?	?	0	0	0	0	<p style="text-align: right;">Waterspout A waterspout was sighted in the Atlantic off Miami Beach.</p>
<p>Sarasota County 34 NW Fort Myers</p>	22	1632EST	Short	?	0	0	4	0	<p style="text-align: right;">Waterspout Tornado (F0) A waterspout formed over Lemon Bay then moved into Englewood damaging three homes. One sustained roof damage, awnings were blown from another, and a porch was damaged on the third home. Six mobile homes in Shady Haven Mobile Home Park sustained mainly carport and awning damage. The tornado moved back out over Lemon Bay and dissipated.</p>
<p>Broward County 3 WNW Fort Lauderdale</p>	22	1330EST			0	0	3	0	<p style="text-align: right;">Lightning Lightning struck a retirement home and caused a fire which knocked out the electricity; no injuries occurred.</p>
<p>Monroe County 9 NW Cudjoe Key</p>	23	0925EST	?	?	0	0	0	0	<p style="text-align: right;">Waterspout A waterspout was sighted 9 miles northwest of Cudjoe Key in the lower Keys.</p>
<p>Palm Beach County Northwestern Portion</p>	23	1256EST			0	0	0	0	<p style="text-align: right;">Funnel Cloud A funnel cloud was sighted over northwest Palm Beach County 8 miles west of Sikorsky Airport.</p>
<p>Indian River County Vero Beach</p>	23	1415EST	?	?	0	0	0	0	<p style="text-align: right;">Waterspout A waterspout was sighted over the Atlantic 10 miles east of Vero Beach.</p>
<p>Putnam County 36 E Gainesville</p>	25	1630EST			0	1	0	0	<p style="text-align: right;">Lightning Three people took refuge from a thunderstorm in a metal shed near San Mateo. Lightning struck a tree beside the shed, jumped through the window and struck near a 18-year-old male knocking him unconscious.</p>
<p>Clay County Orange Park</p>	29	0930EST			0	0	5	0	<p style="text-align: right;">Lightning Lightning struck a church building about 0.5 hour before the start of services and caused a fire. Damage was extensive.</p>
GEORGIA									
<p>De Kalb County Atlanta Doraville</p>	02	0020EST- 0730EST			0	0	5	?	<p style="text-align: right;">Flash Flood</p>

Storm Data and Unusual Weather Phenomena

September 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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GEORGIA Cont'd

**Chamblee
Fulton County
Atlanta**

02	0020EST- 0730EST				0	0	4	?	Flash Flood
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Heavy rains developed over Fulton and De Kalb Counties late on the 1st and into the 2nd. At the Peachtree-De Kalb County Airport, 4.4 inches of rain were measured. By 0020 EST, several streets were flooded in De Kalb and Fulton Counties. Nancy and Peachtree Creeks had begun to flood surrounding areas. By 0140 EST in De Kalb County, along the northern branch of Peachtree Creek, water had risen as high as 3 feet in some areas. At one apartment complex in Chamblee, 46 units were damaged. Two other apartments complexes and a motor lodge in Doraville were flooded as water rose to near 1 foot inside the buildings. At least eight cars were inundated in Doraville. By 0140 EST in Fulton County, several homes along Peachtree Creek were flooded.

**Polk County
Cedartown
Rockmart**

08	0300EST- 0500EST				0	0	?	?	Flash Flood
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Heavy rainfall developed over eastern Polk County. Several roadways from Cedartown to Rockmart were flooded and impassable. Time given is estimated.

**Gordon County
2 W Calhoun**

08	0400EST				0	0	2	?	Thunderstorm Winds
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A tree and a few limbs were blown down across Georgia Highway 156 west of Calhoun. Time given is estimated.

**Bartow County
2 ENE Stilesboro**

08	0500EST				0	0	2	?	Thunderstorm Winds
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Two trees were blown down across Georgia Highway 113. Time given is estimated.

**Cherokee County
Woodstock
Woodstock
Woodstock**

18	1400EST				0	0	3	?	Lightning
18	1430EST				0	0	4	?	Lightning
18	1515EST				0	1	?	?	Lightning

The roof of a house near Georgia Highway 205 was damaged by a lightning-induced fire. Another home in Woodstock suffered extensive damages after lightning set it afire. A man was injured by lightning as a nearby tree was struck.

**Cobb County
Marietta**

18	1515EST				0	0	5	?	Lightning
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Lightning struck the roof of a building and destroyed the top floor of the structure.

**Paulding County
Dallas**

18	1600EST				0	0	4	?	Lightning
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Lightning struck two homes in Dallas and caused minor damages.

**Fulton County
Roswell**

19	1145EST				0	0	4	?	Flash Flood
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Heavy rainfall from slow-moving thunderstorms caused localized floods over a small area in southern Cherokee and northern Fulton Counties. The worst flooding developed around Roswell in Fulton County where water rose almost to the hoods of some cars.

**Ware County
Waycross**

25	1855EST- 1905EST	0.1	30		0	0	5	?	Tornado (F0)
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A small tornado developed over the southwestern portion of Waycross and touched down briefly in two separate areas. The tornado first shifted a mobile home off its foundation and destroyed a nearby utility building. The tornado lifted and traveled about 0.50 mile northeast over six city blocks. When the tornado touched down again, another mobile home was completely destroyed. The tornado dissipated about 1905 EST.

Storm Data and Unusual Weather Phenomena

September 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
IDAHO									
Southern Idaho	01-30				0	0	?	?	Extreme Drought
Portions of southern Idaho continued in severe to extreme drought.									
Idaho County Dixie	01	1000PST			0	2	4	0	Downdraft
The pilot cited a downdraft as a significant factor in a mountainous terrain aircraft accident. (A coldfront had moved through the area a few hours earlier).									
Valley County 8 E McCall	05	1400MST			0	0	0	4	Wind
Upslope winds began to move the holdover Squaw Lake forest fire during the afternoon of September 5th with a Haines Index of 5. The fire was probably ignited by lightning on August 31st. A \$1 million suppression effort was made to prevent the fire from reaching a nearby urban wildlands interface area. The fire was controlled at 280 acres by 0.25-inch rain on September 10th.									
Bannock County Pocatello	08	1215MST- 1222MST			0	0	0	0	Funnel Cloud
Oneida County Holbrook	08	1430MST- 1515MST			0	0	3	4	Heavy Rain
Blaine County Finley	09	1000MST- 1230MST			0	0	0	?	Heavy Rain
The Blaine County Sheriff's Office reported that 2 inches of rain fell.									
Lincoln County 10 E Dietrich	09	1700MST			0	0	0	?	Hail
Hail covered the ground to a depth of 6 inches.									
Owyhee County Grasmere	10	1330MST			0	0	0	0	Hail (0.75)
Twin Falls County 10 NW Buhl	10	1330MST- 1600MST			0	0	4	5	Heavy Rain Funnel Cloud
10 SE Twin Falls	10	1345MST			0	0	0	0	Tornado (F0)
10 SE Twin Falls	10	1400MST	.1	20	0	0	0	0	Hail
10 NW Buhl	10	1430MST			0	0	0	4	Thunderstorm Winds
Twin Falls	10	1430MST			0	0	3	0	Thunderstorm Winds
Gooding County Bliss	10	1430MST			0	0	3	0	Thunderstorm Winds
Lincoln County Dietrich	10	1440MST			0	0	3	4	Thunderstorm Winds
Gooding County	10	1500MST- 1545MST			0	0	3	4	Mudslides
Boise County Bogus Basin	10	1600MST			0	0	4	0	Lightning
Lowman	10	1615MST			0	0	0	0	Hail
Intense thunderstorms were associated with a closed 500-millibar low pressure system to the southwest in Nevada. The upper low was moving northeastward.									
Bonner County	13	1230PST- 1330PST			0	0	4	4	Thunderstorm Winds
Trees and power lines were blown down during a cold front passage.									
Nez Perce County Lewiston	13	1430PST			0	0	3	0	Rainshower
Electrical wires shorted during a shower causing two power pole fires. The fire department captain									

Storm Data and Unusual Weather Phenomena

September 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
IDAHO Cont'd									
Valley County 23 SE Yellow Pine	17	1230MST			0	1	4	0	Heat
commented that the first rain after a long summer dry period often means fires in power poles. Air density associated with a temperature of 71° was cited as a significant factor in a single engine airplane crash onto a mountain 2 miles north of the Indian Creek Airstrip.									
Cassia County Oakley	28	1500MST- 1545MST			0	0	0	?	Heavy Rain
Rain mixed with hail accumulated 1.13 inches in 45 minutes.									
ILLINOIS									
Jersey County Jerseyville	02	1345CST			0	0	3	0	Thunderstorm Winds
The Jersey County Sheriff's Office reported minor roof damage to a house, and downed trees. Power lines were downed and a traffic light was blown down.									
Fayette County Bluff City	03	Morning			0	5	0	0	Lightning
A work crew on Route 40, east of Bluff City, was struck by lightning.									
Cook County Buffalo Grove Barrington	03 03	1145CST 1145CST			0 0	0 1	5 0	0 0	Lightning Lightning
A lightning strike to a house in Buffalo Grove resulted in \$150,000 in damage. A 25-year-old man was struck by lightning as he was inserting a key in a car door at a dealership parking lot.									
Hancock County Carthage	09	1830CST			3	0	?	?	Thunderstorm Winds
A garage was damaged, power poles were broken, and a shed was destroyed. A tree was blown down at Carthage International College and windows were blown out at a Firestone store.									
Rock Island County Port Byron	09	1845CST			0	0	?	0	Thunderstorm Winds
Several trees were blown down along Route 84.									
Lee County Harmon	09	1845CST			0	0	?	?	Hail (1.50)
Ogle County Mt. Morris	09	1856CST			0	0	?	?	Hail (0.75) Thunderstorm Winds
A spotter reported hail and estimated winds to be near 60 mph.									
DuPage County Glen Ellyn	09	1955CST			0	0	5	0	Lightning
Lightning caused \$175,000 in damage to a house.									
LaSalle County Marseilles	09	2035CST			0	0	0	0	Thunderstorm Winds (G52)
A 60-mph wind gust was recorded at Weather Service Meteorological Observatory at Marseilles.									
Grundy County Morris	09	2100CST			0	0	?	0	Thunderstorm Winds
Tree limbs and wires were downed by thunderstorm winds.									

Storm Data and Unusual Weather Phenomena

September 1991

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

ILLINOIS Cont'd

Peoria County Peoria	09	2109CST			0	0	0	0	Thunderstorm Winds (G64)
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A 74-mph wind gust was recorded at the Weather Service Office at Peoria; no damage occurred.

Livingston County Blackstone	09	2135CST			0	0	?	0	Thunderstorm Winds
Pontiac	09	2157CST			0	0	?	0	Thunderstorm Winds

Police reported trees blown down and estimated winds to be near 70 mph at Blackstone. Trees and limbs were blown down in Pontiac.

Rock Island County Moline	12	1720CST			0	0	2	?	Thunderstorm Winds
Cordova	12	1726CST			0	0	2	?	Thunderstorm Winds
Campbell Island	12	1726CST			0	0	2	0	Thunderstorm Winds
Port Byron	12	1726CST			0	0	2	?	Thunderstorm Winds
Whiteside County Erie	12	1732CST			0	0	2	?	Thunderstorm Winds
Fenton	12	1740CST			0	0	2	?	Thunderstorm Winds
Rock Falls	12	1807CST			0	0	3	?	Thunderstorm Winds

Thunderstorms produced damaging winds, but not much rain or hail. A 1.50-foot-diameter tree was blown down in Moline and landed on a chain link fence surrounding a school resulting in hundreds of dollars worth of damage. Many power lines were downed by trees and by falling limbs.

INDIANA

Warrick County Boonville	02	2005EST			0	4	0	0	Lightning
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Four men were injured by a lightning strike while taking down a carnival ride at the county fairgrounds.

Wayne County Dublin	03	1630EST			0	0	3	0	Thunderstorm Winds
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Utility poles and lines were downed by thunderstorm winds.

Vanderburgh County Evansville	10	2020EST- 2145EST			0	0	?	0	Flash Flood
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Thunderstorms produced 2 inches of rain in less than 45 minutes causing flooding on numerous city streets in downtown Evansville.

Johnson County Needham	12	1545EST			0	0	0	0	Thunderstorm Winds
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Numerous trees were downed in the Needham area.

Shelby County 8.5 W Shelbyville 1.5 N Boggstown	12	1545EST			0	0	4	0	Thunderstorm Winds
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Trees, utility poles, and power lines were downed.

Hancock County 4 SW Greenfield	12	1700EST			0	0	5	3	Lightning
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A large barn was destroyed by fire after it was struck by lightning. Approximately 500 bales of hay and straw, some livestock, and an automobile were also lost in the fire.

Marion County Castleton	12	1800EST			0	0	5	0	Lightning
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The roof of an apartment building caught fire when it was struck by lightning. Damage was estimated at \$50,000.

Storm Data and Unusual Weather Phenomena

September 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
INDIANA Cont'd									
Ripley County	12	1800EST			0	0	5	0	Thunderstorm Winds
<p>A storage building at a lumber yard in Versailles had the roof blown off by thunderstorm winds that resulted in the building to collapsing. Also, in Versailles, a large limb went through the roof of an apartment building. Many camps at the National Muzzle-Loader Association meeting in Friendship were damaged by the winds. Numerous trees and limbs were downed across the southern part of the county causing some roads to be blocked.</p>									
Hancock County	12	2130EST			0	0	4	0	Thunderstorm Winds Lightning
<p>In Greenfield, a tree was blown over onto a garage. Limbs and wires were downed all over the county. A lightning strike at the Greenfield Police Department damaged the 911 system, and smoked up the basement. Another lightning strike hit a tree causing it to fall into a house.</p>									
St. Joseph County Mishawaka	13	0948EST			0	0	4	0	Lightning
<p>Lightning struck and destroyed an electric pole and three transformers. Damage was estimated at \$20,000.</p>									
Clinton County 4 N Frankfort	13	1620EST			0	0	0	0	Thunderstorm Winds
<p>Two trees were blown over by thunderstorm winds.</p>									
Carroll County Delphi	13	1640EST			0	0	0	0	Hail (0.88)
Tippecanoe County Lafayette	13	1655EST			0	0	3	0	Thunderstorm Winds
<p>Trees and lines were downed in Lafayette.</p>									
Clinton County 4 W Frankfort	13	1706EST			0	0	0	0	Hail (0.75)
Miami County	13	1750EST			0	0	0	0	Thunderstorm Winds
<p>Numerous trees and limbs were downed in the southern part of the county.</p>									
Union County Liberty Quakertown	13	1940EST			0	0	4	0	Thunderstorm Winds
<p>Large sections of trees were downed in the Liberty area. The hood of a parked car was smashed by a large tree limb. The top of another large tree fell, and damaged the roof of a cottage. Several boats were overturned at the Quakertown Marina on Brookville Lake.</p>									
Orange County	30	0310EST			0	0	3	0	Thunderstorm Winds
<p>Power lines and several large trees were blown down in the eastern portion of the county.</p>									
IOWA									
Lyon County Alvord	07	1710CST			0	0	5	4	Thunderstorm Winds (G50+)
Sioux County Sioux Center	07	1740CST			0	0	4	3	Thunderstorm Winds (G50+)
Lyon County 2 SW Rock Rapids	07	1745CST			0	0	5	4	Thunderstorm Winds (G50+)
<p>Thunderstorms moved into western Iowa. Severe weather occurred in the far northwest. High winds caused considerable damage in the Alvord area of Lyon County. Numerous trees were downed in the town itself, and some farm buildings were flattened in the vicinity. Farther to the east, near the city of Rock Rapids, widespread damage occurred in an area of about 2 square miles.</p>									

Storm Data and Unusual Weather Phenomena

September 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
IOWA Cont'd									
Several silos were flattened, roofs were torn off of some farm buildings, and several farm buildings were destroyed. Several farm buildings were also damaged in the Sioux Center area of Sioux County.									
Allamakee County Postville	09	1714CST			0	0	4	4	Hail (1.75)
Buchanan County Aurora	09	1715CST			0	0	3	4	Hail (1.00)
Clayton County Luana	09	1715CST			0	0	4	4	Hail (1.75)
Scott County Davenport	09	1818CST			0	0	4	3	Hail (1.75)
4 W Le Claire	09	1846CST			0	0	4	2	Thunderstorm Winds (G50+)
Des Moines County Mediapolis	09	1930CST			0	0	4	4	Hail (1.75)
1 NE Danville	09	1940CST			0	0	0	0	Funnel Cloud
Burlington	09	2015CST			0	0	5	3	Thunderstorm Winds (G50+)

A cold front swept across Iowa during the afternoon. Thunderstorms fired up along the front by late afternoon. Many of them produced 30 to 40 mph winds and pea- to marble-size hail. Some of them became severe by the time they reached eastern Iowa. Golf ball-size hail fell at several locations. Winds downed several trees in the northeast part of Bettendorf. One funnel cloud was sighted northeast of Danville, in Des Moines County. Severe lighting accompanied the storms. Considerable damage was done, however, no official accounts other than power transformers being damaged were received.

Carroll County 7 E Breda	11	1900CST			0	0	4	4	Thunderstorm Winds (G50+)
Greene County Churdan	11	1910CST			0	0	4	2	Thunderstorm Winds (G50+)

Strong thunderstorms developed along a warm frontal boundary in northwest Iowa. Most of them were just below severe limits. One storm caused wind damage in Carroll County. Trees and power lines were downed east of Breda. The storm also caused some wind damage as it moved into Greene County.

Story County Cambridge	12	1410CST			0	0	4	3	Thunderstorm Winds (G50+)
Colo	12	1415CST			0	0	4	3	Thunderstorm Winds (G50+)
Polk County N Des Moines	12	1430CST			0	0	4	2	Thunderstorm Winds (G50+)
Marshall County 3 N Albion	12	1430CST	.6	20	0	0	4	3	Tornado (F1)
Marshalltown	12	1435CST			0	0	5	3	Thunderstorm Winds (G75)
Green Mountain	12	1436CST			0	0	5	4	Thunderstorm Winds (G70)
Marshalltown	12	1447CST			0	0	4	3	Thunderstorm Winds (G50+)
Tama County Garwin	12	1448CST			0	0	4	3	Thunderstorm Winds (G50+)
Jasper County Colfax	12	1450CST			0	0	4	2	Thunderstorm Winds (G50+)
Tama County Toledo	12	1452CST			0	0	4	3	Thunderstorm Winds (G61)
9 ENE Tama	12	1520CST	.2	15	0	0	2	2	Tornado (F0)
Benton County Vinton	12	1530CST			0	0	4	3	Thunderstorm Winds (G54)
Linn County Fairfax	12	1540CST			0	0	4	3	Thunderstorm Winds (G52)
Cedar Rapids	12	1542CST			0	0	5	2	Thunderstorm Winds (G58)
Johnson County Oxford to Tiffin	12	1552CST- 1559CST	7.0	70	0	0	5	3	Tornado (F2)
Linn County Cedar Rapids	12	1559CST	.1	20	0	0	4	2	Tornado (F0)

Storm Data and Unusual Weather Phenomena

September 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
IOWA Cont'd									
Johnson County									
Iowa City	12	1605CST			0	0	4	3	Thunderstorm Winds (G58)
Solon	12	1610CST			0	0	4	3	Thunderstorm Winds (G52)
Cedar County									
West Branch	12	1610CST			0	0	4	3	Thunderstorm Winds (G50+)
2 NW West Branch	12	1610CST			0	0	0	0	Funnel Cloud
Linn County									
Cedar Rapids	12	1612CST			0	0	4	2	Thunderstorm Winds (G50+)
Waubek	12	1612CST			0	0	4	3	Thunderstorm Winds (G50+)
Central City	12	1615CST			0	0	4	3	Thunderstorm Winds (G52)
Jones County									
1 W Monticello	12	1620CST	.5	20	0	0	3	3	Tornado (F0)
Delaware County									
Hopkinton	12	1640CST			0	0	4	3	Thunderstorm Winds (G50+)
Jones County									
Monticello	12	1650CST			0	0	4	3	Thunderstorm Winds (G50+)
Anamosa	12	1650CST			0	0	4	3	Thunderstorm Winds (G50+)
5 SW Anamosa	12	1650CST			0	0	4	4	Thunderstorm Winds (G70)
Scott County									
Davenport	12	1705CST			0	0	4	2	Thunderstorm Winds (G50+)
Clinton County									
De Witt	12	1709CST			0	0	3	2	Thunderstorm Winds (G50)
Clinton	12	1738CST			0	0	4	3	Thunderstorm Winds (G60+)
Scott County									
Princeton	12	1745CST			0	0	4	3	Thunderstorm Winds (G50+)

A stationary front extended from west-central Iowa into southeast Iowa. Thunderstorms developed over northwest and west-central Iowa, and became severe over the central counties. The storm cluster took on the characteristics of a Derecho as it raced across the state at 60 mph. Very little in the way of hail was reported. Winds of 60 to 70 mph were common. Trees and power lines were downed in many locations. Winds of over 85 mph moved through the Marshalltown area. A communication tower designed to withstand winds in excess of 85 mph was toppled. High winds, in the 80 mph range, also caused structural damage and drove timbers through the wall of a house in Green Mountain. What appeared to be straight line winds overturned cars southwest of Anamosa, near the Jones/Linn County line. There were several brief tornado touchdowns. Only minor damage occurred. One touchdown was north of Albion, in Marshall County. It was on the ground for 30 to 40 seconds, lifted a tree out of the ground and tore the roof from a shed. Another tornado touched down in a field northeast of Tama. A fairly strong tornado touched down in Johnson County. Several buildings were heavily damaged along the track between Oxford and Tiffin. Some damage due to winds was reported as far east as 3 miles northwest of Iowa City. A short time later, winds of 66 mph were recorded in downtown Iowa City. Other brief touchdowns included one in the southwestern part of Cedar Rapids and one near Monticello. The tornado in southwest Cedar Rapids lifted a metal shed over a small building and dropped it into a parking lot.

IAZ001-002-003-004- 005-006-007-008-009- 010-011-012-013-014- 015-SDZ018-NEZ010- ILZ004	18 2300CST- 19 0800CST	0 0 0 8	Freeze
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All of Iowa

IAZ001-002-003-004- 005-006-007-008-009- 010-011-012-013-014- 015-SDZ018-NEZ010- ILZ004	19 2200CST- 20 0800CST	0 0 0 8	Freeze
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All of Iowa

An early season outbreak of Arctic air caused considerable crop damage in Iowa as temperatures fell below freezing. Temperatures fell to the middle 20s to the lower 30s in most locations. The first night brought freezing or sub-freezing temperatures to about the northwest two-thirds of Iowa, while the second night affected the eastern three quarters of the state. Hardest hit was the north half, where temperatures remained at 30 degrees or below for 8 hours in several places. These low

Storm Data and Unusual Weather Phenomena

September 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

temperatures were records for most of the state, several of which were records for the coldest so early in the season. Some crop damage occurred in virtually every county of the state. The first night caused the greatest dollar damage with widespread freezing temperatures and at least some frost statewide. The second night just reinforced the damage. Estimates indicated that about 2% of the corn crop and 5% of the soybean crop were lost due to the freezing temperatures. Damage to crops was in the 10 to 40% range in some areas where crops were planted late due to the wet conditions this past Spring. These percentages amounted to about 31 million bushels of corn, or about \$80 million worth, and 23 million bushels of soybeans, or \$140 million worth.

IAZ011-014	24	1230CST- 1400CST			0 0	0 0	Cold Air Funnel
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Convection developed along a trough line in southeast Iowa. No severe weather occurred; however, there were numerous reports of cold air funnels. None of them touched down. The greatest concentration of them were in the Sigourney area of Keokuk County.

KANSAS

Jewell County							
Ionia	08	1900CST			0 0	3 3	Hail (1.75)
2 E Mankato	08	1920CST			0 0	3 3	Hail (2.0)
5 NE Mankato	08	1930CST			0 0	3 3	Hail (0.75)
Lovewell Reservoir	08	1955CST			0 0	3 3	Hail (1.75)
Thunderstorm Winds (G52)							
Republic County							
3 E Republic	08	2015CST			0 0	3 3	Hail (0.75)
Jewell County							
15 NE Mankato	08	2030CST			0 0	3 3	Hail (0.75)
Washington County							
10 NW Washington	08	2120CST			0 0	3 3	Hail (0.75)
Marshall County							
Waterville	08	2133CST			0 0	0 0	Hail (0.75)
Washington County							
Hanover	08	2150CST			0 0	3 3	Hail (0.75)

A series of thunderstorms moved across Jewell County and the northern parts of Republic and Washington Counties. The severe thunderstorms dropped large hail and occasional high wind gusts.

Douglas County							
Baldwin City	10	0200CST			0 0	4 0	Lightning

Lightning set fire to an unoccupied house 1 mile northwest of Baldwin City.

Marshall County							
5 S Marysville	10	1545CST			0 0	3 0	Hail (1.00)

Large hail damaged several cars that were traveling along U.S. Highway 99, south of Marysville. One car had a 1-inch hole in the grill and another lost a windshield.

Mitchell County							
5 W Beloit	11	1545CST			0 0	3 3	Hail (1.00)
Sumner County							
2 N Caldwell	15	1655CST			0 0	3 0	Thunderstorm Winds (G60)

Ten electrical power poles were blown over on U.S. Highway 49.

KENTUCKY

Taylor County							
	02	1930EST			0 0	3 0	Flash Flood

Over 3 inches of rain fell in less than 1 hour, forcing creeks and streams around Campbellsville out of their banks. Several downtown buildings reported water damage.

Henderson County							
	10	1940CST- 2030CST			0 0	2 0	Flash Flood

Storm Data and Unusual Weather Phenomena

September 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
KENTUCKY Cont'd									
									Heavy rains flooded numerous roads in the eastern part of the county, including secondary roads off of U.S. Highway 60, between Henderson and Daviess Counties.
Hickman County	16	1705CST			0	1	3	0	Thunderstorm Winds
									Strong winds downed trees and power lines around Clinton; one landed on a mobile home. A man was injured by lightning while climbing an aluminum ladder to check a leak on his garage.
Breathitt County	18	1610EST			0	0	3	0	Thunderstorm Winds Hail (1.00)
									Several large trees were blown down in Quicksand and 1.00-inch hail was reported in downtown Jackson.
LOUISIANA									
Livingston Parish Denham Springs	02	1200CST			0	1	0	0	Thunderstorm Winds Lightning
									Lightning struck a 26-year-old woman who was standing near a tree.
Vermilion Parish Henry	02	1645CST			0	0	3	0	Thunderstorm Winds Lightning
									Lightning struck a 100-barrel tank at a petroleum facility causing an explosion and fire which spread to a nearby 300-barrel tank. The fire was quickly contained.
East Baton Rouge Parish Baton Rouge	18	1730CST			0	0	4	0	Thunderstorm Winds Lightning
									Lightning caused a \$25,000 fire at a Baton Rouge home.
St. Tammany Parish 7 S Slidell	24	1420CST			0	0	0	0	Waterspout
									A small short lived waterspout formed over Lake Pontchartrain 7 miles south of Slidell.
Caddo Parish 3 W Oil City	24	1442CST			0	0	0	0	Thunderstorm Winds Hail (0.80)
3 SE Oil City	24	1447CST			0	0	0	3	Thunderstorm Winds
Oil City	24	1447CST			0	0	0	0	Thunderstorm Winds (G53)
									Nickle-size hail was reported 3 miles west of Oil City. Numerous trees were blow down by thunderstorm winds 3 miles southeast of Oil City. A 53 knot gust was measured at the Oil City courthouse.
3 N Blanchard	24	1450CST			0	0	2	0	Thunderstorm Winds Hail (1.00)
									One-inch hail was reported 3 miles north of Blanchard.
Bossier Parish 7 NE Belleveu	24	1502CST			0	0	0	3	Thunderstorm Winds
									Numerous trees were blown down by thunderstorm winds 7 miles northeast of Belleveu.
Bienville Parish Pleasant Hill	24	1521CST			0	0	0	3	Thunderstorm Winds Hail (0.80)
									A severe thunderstorm blew down several trees and produced nickle-size hail in Pleasant Hill.
Desoto Parish 5 W Frierson	24	1523CST			0	0	0	2	Thunderstorm Winds

Storm Data and Unusual Weather Phenomena

September 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 thunderstorm blew down several trees 5 miles west of Frierson.

Longstreet	24	1538CST			0	0	0	2	Thunderstorm Winds
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A thunderstorm blew down several trees in Longstreet.

MAINE

Knox County
St. George

04	1526EST				0	0	?	0	Lightning
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Lightning struck and destroyed an 8-foot, double-cased chimney.

Hancock County

Lamoine

25	1500EST				0	0	?	0	High Winds
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Bar Harbor

25	1515EST				0	0	?	0	High Winds
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Washington County

Cherryfield

25	1545EST				0	0	?	0	High Winds
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Pembroke

25	1630EST				0	0	?	0	High Winds
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Machias

A compact and strengthening low pressure system moved up the Maine coast between 1400 EST and 1700 EST. Strong southeasterly winds over Hancock and Washington Counties knocked trees and power lines down and caused some damage to cars. The automated weather observing system at Bar Harbor in Hancock County reported sustained winds of 40 to 45 mph between 1435 EST and 1535 EST. A 61-mph wind gust was recorded at 1515 EST. Trees and power lines were reported down in Lamoine at 1500 EST. Trees and power lines were also reported down in Cherryfield and Pembroke at 1545 EST. At 1630 EST, several trees and power lines were reported down in Machias. One tree did fall on top of a car causing some damage to the vehicle.

Knox County

Rockport

29	1740EST				0	0	?	0	Thunderstorm Winds
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Waldo County

Lincolntonville

29	1740EST				0	0	?	0	Thunderstorm Winds
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Thunderstorm winds knocked down many trees in Rockport at 1740 EST. It was reported that it took sixteen trucks to haul away the downed trees. Also, large tree limbs fell onto the roof of a home in Lincolntonville at 1740 EST. There was no report of any damage.

Lincoln County

Damariscove

29	1800EST				0	0	?	0	Thunderstorm Winds (G60)
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A ship report from Damariscove reported 69-mph winds at 1800 EST.

Hancock County

Bar Harbor

29	1825EST				0	0	?	0	Thunderstorm Winds Hail
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Thirty trees were reported down in Bar Harbor at 1825 EST. Three cars were damaged when trees fell on top of them. The road to Cadillac Mountain in Acadia National Park was closed due to a heavy buildup of hailstones.

MARYLAND AND DC

Frederick County

5 W Mt. Airy

18	1600EST				0	0	0	0	Hail (1.75)
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State police reported golf ball-size hail.

Carroll County

Mt. Airy

18	1625EST				0	0	0	0	Hail (0.88)
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Eldersburg

18	1715EST				0	0	0	0	Funnel Cloud
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Two reports of a funnel cloud at Eldersburg were received.

Eldersburg

18	1715EST				0	0	4	0	Thunderstorm Winds
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There were numerous reports of roof damage caused by straight line winds. Several trees were

Storm Data and Unusual Weather Phenomena

September 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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MARYLAND AND DC Cont'd

toppled, out-buildings were destroyed, and several hay wagons were rolled about 100 yards. Numerous trees and power lines reported downed in the northern part of the county.

Countywide	18	1830EST			0	0	5	0	Thunderstorm Winds
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Power company officials reported a second round of downed trees and power lines in the northern part of the county as they began to repair the damage caused by the first thunderstorm.

Washington County 3 N Sharpsburg	18	1726EST			0	0	0	0	Hail (0.75)
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In Washington County, hail the size of a robin's egg was reported.

3 N Sharpsburg	18	1726EST			0	0	0	0	Thunderstorm Winds
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Spotters reported trees downed.

Hagerstown	18	1530EST			0	0	4	0	Flash Flood
	19	0100EST							

County Emergency Operations Center officials reported widespread flash flooding throughout Hagerstown. At least a dozen motorists were stranded in vehicles caught in flood waters. Most roads in the city were reported flooded, with a portion of a major downtown street washed away. Five to seven inches of rain fell in about 6 hours. Two residential areas were flooded in the county when the storm runoff burst through catch ponds; many houses in those areas suffered flooded basements.

Montgomery County Silver Spring	19	1520EST			0	2	1	0	Lightning
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An isolated, solitary bolt of lightning during a light rain struck a football practice field. A 15-year-old boy was critically injured after he took the direct hit on the head from the bolt. His helmet was shattered; and his hair, shoulder pads, and the grass surrounding him were singed. Another 15-year-old boy about 25 feet away suffered electrical shock that caused temporary numbness to his right side. About 40 other players on the field felt the shock, and some were knocked down, but they were uninjured.

MASSACHUSETTS

MAZ004	24	2200EST-							
	25	1000EST			1	1	0	0	Heavy Rain

Heavy rain during a 12-hour period amounted to around 3 inches flooding streets and low-lying areas in central Massachusetts. An automobile accident in Paxton resulted in the death of one person and critical injury to another when a motorist lost control of their vehicle on a flooded highway. (F49V)

MAZ007 Dedham	25	1100EST			0	0	?	0	High Winds
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High winds blew down at least five trees in Dedham. Some were more than 5 inches in diameter. Just 20 minutes earlier, wind gusts to 63 mph from the south-southwest direction occurred at the Blue Hill Observatory in Milton.

MAZ007 Charleston	25	1118EST-							
		1130EST			0	0	5	0	High Winds
Charleston	25	1120EST			0	0	0	0	Funnel Cloud

A severe weather event occurred on the northwest edge of Boston at the Charlestown-Somerville line when winds estimated at 75 mph lifted the roof from one building, ripped siding and shingles from several other buildings and popped windows out of at least 18 cars. Also, several windows were broken by flying gravel. Damage appeared to occur along a very narrow path that extended an estimated 100 to 500 yards. An eyewitness reported a funnel cloud that extended 15 feet above a roof top.

This event occurred near the warm front and center of a compact but relatively intense low pressure center which moved north-northeast through the Greater Boston metropolitan area. It was not

Storm Data and Unusual Weather Phenomena

September 1991

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

MASSACHUSETTS Cont'd

possible to confirm whether or not a small tornado occurred. It was more likely that this event was a microburst of at least 70 mph winds. Thunder was not occurring during the time of the event and lightning detection systems did not detect any cloud-to-ground strokes with this system. However, lightning was evident an hour earlier in southern Worcester County about 30 miles west-southwest of Boston.

MICHIGAN

Wasthenaw County Ann Arbor	03	1820EST			0	0	0	0	Thunderstorm Winds (G50)
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Ann Arbor Airport reported zero visibility in heavy and rain with winds sustaining 34 mph with gusts to 58 mph.

Wayne County N Detroit	03	1930EST			0	0	3	0	Thunderstorm Winds
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Strong thunderstorm winds blew down power lines. This resulted in a power outage in that area.

Oceana County East-Central and Northeastern Portion	09	1930EST- 1940EST			0	0	2	0	Thunderstorm Winds
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Strong thunderstorm winds downed trees and power lines on a diagonal path that started near Silver Lake, then continued northeastward across Hart, ending near Crystal Valley. The only damage beyond the downed power lines and trees was a mobile home on 120th and Madison, about 1 mile east of Crystal City. The mobile home had the windows blown out.

Muskegon County Montague Whitehall	09	1930EST- 1940EST			0	0	4	0	Thunderstorm Winds
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Straight line winds caused dozens of trees and power lines to blow down in a 0.75-mile-wide path, that was about 5 miles long. The damage started on the north side of the city of Michillinda and continued northeast along the south edge of White Lake to the east side Whitehall. Beside the downed power, several cars were crushed when trees or large limbs fell on them. Also on home, in Whitehall had \$15,000 damage when a large tree fell on it while the owner was inside. They were not injured, but the roof and some windows were damaged.

Oceana County Silver Lake	09	1940EST			0	0	0	0	Hail (0.75)
Emmet County Petoskey	09	2030EST			0	0	3	0	Thunderstorm Winds

Strong thunderstorm winds downed several trees, tree limbs and power lines. Also, heavy rain caused some minor street flooding.

Charlevoix County Boyne City	09	2030EST			0	0	3	0	Thunderstorm Winds
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Strong thunderstorm winds blew down trees and power lines. On State Street, a home and the family car, parked in front of it, were damaged when a very large tree fell on it. A significant number of trees in Veterans Memorial Park, in Boyne City were either blown down or significantly damaged.

Kent County Jenison	09	2053EST			0	0	0	0	Thunderstorm Winds
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Strong thunderstorm winds blew down tree limbs up to 4 inches in diameter.

Antrim County Central Lake to Bellaire	09	2100EST			0	0	3	0	Thunderstorm Winds
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Very strong thunderstorm winds left boats upside down along the east shore of Torch Lake. Then as the storm continued eastward, over the east central part of Antrim county, many large and very old trees were blown down, as were many power lines. Some buildings were damaged, mostly on

Storm Data and Unusual Weather Phenomena

September 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									
									the roofs, due to trees and large limbs that fell on them. There were several areas that lost power for several hours due to the downed power lines.
Kent County Grand Rapids	09	2101EST			0	0	0	0	Thunderstorm Winds (G56) Thunderstorm wind gusts to 65 mph at Highway 131 and Leonard.
Kent County Jenison	09	2101EST			0	0	3	0	Thunderstorm Winds (G56) Thunderstorm wind gusts to 65 mph blew down large tree limbs and some power lines.
Kent County Belmont	09	2114EST			0	0	0	0	Thunderstorm Winds (G56) Strong thunderstorm winds blew down trees to 1-foot- diameter in Belmont at near 10 mile road.
Cheboygan County 3 N Indian River	09	2120EST			0	0	3	0	Thunderstorm Winds Strong thunderstorm winds blew down trees and power lines.
Cheboygan County 5 NW Onaway	09	2123EST			0	0	0	0	Thunderstorm Winds Strong thunderstorm winds ripped the tops off many 7-inch- diameter trees.
Presque Isle County 3 N Onaway	09	2125EST			0	0	0	0	Thunderstorm Winds Strong thunderstorm winds blew over several maple trees that were approximately 6 inches in diameter.
Emmet County Pellston Airport	09	2134EST			0	0	0	0	Thunderstorm Winds (G60) Thunderstorm winds gusts to 60 knots blew down a few small trees, a few of these were uprooted.
Allegan County Saugatuck and Douglas	09	2225EST			0	0	0	0	Thunderstorm Winds Strong thunderstorm winds blew down trees and power lines. This caused a the power to be out for several hours in both towns.
Alpena County Alpena	09	2235EST			0	0	0	0	Thunderstorm Winds Strong thunderstorm winds twisted off or snapped 1 to 2 feet in diameter tree limbs.
10 S Alpena	09	2240EST			0	0	0	0	Thunderstorm Winds Strong thunderstorm winds uprooted trees that were 2.50-feet in diameter.
Kent County Grand Rapids	09	2310EST			0	0	0	0	Thunderstorm Winds (G52) Thunderstorm winds gusted to 60 mph at WOTV Television Station in Grand Rapids.
MINNESOTA									
Polk County Fosston	02	1700CST			0	0	?	?	Thunderstorm Winds Strong thunderstorm winds blew the roof from a silo, toppled several grain bins, and downed many large trees.

Storm Data and Unusual Weather Phenomena

September 1991

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

St. Louis and Carlton Counties	06 07	2330CST- 1300CST			0	0	?	?	Flash Flood
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Thunderstorms producing heavy downpours dumped 5 inches of rain in Cloquet in 12 hours washing out many county roads. In Duluth, over 3 inches of rain fell in about 12 hours causing significant street flooding. The sanitary sewer system could not handle the huge volume of water and sewage backed up into many businesses and homes. Mudslides occurred in areas where road construction was taking place inundating roads with mud and construction debris.

Carver, Kandiyohi, McLeod, Renville, Pope, Sibley, Sherburne, and Stearns Counties	07	1100CST- 2300CST			0	0	?	?	Flash Flood
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Slow moving thunderstorms, producing very heavy rain, developed during the late morning and continued through the evening over west-central and central portions of the state. Between 0200 and 2200 CDT, rainfalls totaling more than 6 inches fell roughly in a line from Hector to Glencoe and from Breckenridge south to Paynesville. The greatest amount reported was 11 inches near Glenwood (Pope County). About 1,000 homes in Glencoe (McLeod County), and 300 homes in Stewart (McLeod County) received water damage due to flooded basements in homes and businesses. The National Guard was activated to help in sandbagging efforts in Glencoe as the Buffalo Creek overflowed its banks. Many roads were flooded across southern McLeod County before the Buffalo Creek crested on September 11. Small creeks overflowed their banks in Pope County and many business and residential basements were flooded in Glenwood (Pope County). Downtown Paynesville (Stearns County) was flooded and the walls of three businesses collapsed due to the pressure of high water. The Crow River rose rapidly and overflowed its banks flooding or washing out many county roadways across Carver County. The river crested at Delano (Carver County) on September 14. Flooding of basements and county roads also occurred near Hector and Buffalo Lake (Renville County), Willmar and New London (Kandiyohi County), Watertown and Delano (Carver County) and in Elk River (Sherburne County). Severe crop damage occurred over portions of Sibley County due to flooding.

McLeod County 5 S Hutchinson	07	1615CST			0	0	?	?	Thunderstorm Winds
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Strong thunderstorm winds leveled a home that was under construction.

Brownton	07	1615CST			0	0	?	?	Thunderstorm Winds
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Thunderstorm winds blew down several large trees and destroyed a shed and a garage.

Kandiyohi County Willmar	07	1910CST			0	0	5	0	Thunderstorm Winds (G65)
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Wind gusts to 75 mph were recorded at the local airport in Willmar. The strong winds leveled a hangar and damaged eight small planes. Damage was estimated at \$250,000.

Wadena County Sebeka	15	0125CST			0	0	?	?	Hail (1.75)
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Crow Wing County Brainerd	15	0215CST			0	0	?	?	Hail (1.00)
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St. Louis County Duluth	15	2214CST			0	0	?	?	Thunderstorm Winds (G52)
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A 60-mph wind gust was recorded at the Duluth office of the National Weather Service.

Proctor	15	2230CST			0	0	?	?	Thunderstorm Winds
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Strong winds blew down several power lines.

Duluth	15	2230CST			0	0	5	0	Thunderstorm Winds
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A metal aircraft shelter belonging to the Air National Guard was moved 4 feet from its foundation by strong winds. Damage was estimated at \$50,000.

Storm Data and Unusual Weather Phenomena

September 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
MISSISSIPPI									
Kemper County	18	1730CST			0	0	2	0	Thunderstorm Winds
	Several power outages were reported across the county due to trees being blown down on or across the lines.								
MISSOURI									
Boone County Columbia	01	1900CST			0	1	0	0	Lightning
	A 11-year-old boy was struck by lightning while practicing his golf swing in the driveway of his house.								
St. Louis County St. Louis City	02	1250CST			0	3	0	0	Lightning
	Several people were injured when lightning hit the Arch area in downtown St. Louis during a fair.								
Jennings	03	1900CST			0	2	0	0	Lightning
	Two men were injured by lightning while playing golf.								
Clay County 4 SE Kearney W Kearney	09 09	1912CST 1930CST			0 0	0 0	3 3	0 0	Thunderstorm Winds Thunderstorm Winds
	The Clay County Sheriff's Office reported minor house damage and tree limbs down 4 miles southeast of Kearney at 1912 CST. The Missouri State Police reported power lines and poles down west of Kearney at 1930 CST. Other reports of strong winds and large hail were received from spotters.								
Jackson County Kansas City	09	2135CST			0	0	3	0	Thunderstorm Winds
	The Kansas City Fire Department reported large trees and power lines down.								
Callaway County Fulton	15	1810CST			0	0	5	0	Thunderstorm Winds
	Approximately 13 mobile homes were damaged when the skirting was blown away, and two mobile homes were moved off their blocks. Three storage sheds were blown away, roof damage to houses was reported, and large trees were blown down.								
Macon County Macon	24	1830CST	.25	.75	0	0	4	0	Tornado (F0)
	People attending a ball game sighted a small tornado on the east side of Macon. The Macon Fire Department reported the roof blown off of a barn and a large tree destroyed, with debris said to have been thrown in a circular pattern. An automobile was also completely turned around when the tornado passed nearby. One eyewitness reported a 2-foot-wide funnel.								
MONTANA									
Big Horn County Hardin	10	2000MST- 2130MST			0	0	4	5	Flash Flood
	Four inches of rain fell in 90 minutes resulting in flooding in the city of Hardin.								
NEBRASKA									
Garfield County 2.5 SW Burwell	12	0645CST	0.5	50	0	0	4	?	Tornado (F1)
	A tornado destroyed a garage on a farm, tipped over outbuildings, and damaged roofs. Debris, limbs, and boards became airborne and were thrown against buildings. One garage had 5-foot boards stuck through its side.								

Storm Data and Unusual Weather Phenomena

September 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 JERSEY, Southern									
Salem County 1 NW Deepwater	17	1810EST			0	0	5	0	Thunderstorm Winds (G96)
Thunderstorm downburst winds blew over from the Delaware River and into an industrial plant. The highest gust seen on an anemometer on top of a 90-foot tower was 110 mph. A pier was ripped up and thrown into a 8-foot cyclone fence. Three sections of heavy portable stairways, weighing 400 to 600 pounds each were moved 100 to 150 feet. At least one was flipped over and broke into small pieces. Two turbo ventilators, 75 pounds each, were ripped from the top of a building and could not be found. A 8-foot fence was bent at a 45° angle. Mobile homes were dented by wind driven hail, but not size was determined. Large billboards, of especially strong construction, were blown down and a high rise Exxon sign was blown out.									
Salem County Pennsville	17	1810EST			0	0	3	0	Thunderstorm Winds
Woodstown	17	1852EST			0	0	?	?	Hail (1.00)
Thunderstorm wind gusts brought a tree down on an automobile in Pennsville. Hail measuring 0.50 to 1.00 inches in diameter was reported in Woodstown. A wind gust to 57 mph was reported in Maning Township at 1905 EST.									
Gloucester County Deptford	17	1930EST			0	0	3	0	Thunderstorm Winds
Gibbstown	17	1930EST			0	0	3	0	Thunderstorm Winds
National Park	17	1930EST			0	0	3	0	Thunderstorm Winds
Thunderstorm wind gusts downed trees and utility lines in Deptford and utility lines in Gibbstown and National Park between 1930 EST and 2000 EST.									
NEW MEXICO									
San Miguel County	06	0815MST- 1000MST			0	0	3	0	Flash Flood
Heavy rains caused flooding in the western part of the county. Flooding was reported along the Gallinas River and several roads were closed.									
Eddy County Hope	08	1602MST			0	0	4	0	Hail (2.50)
Lakewood	08	1645MST			?	?	?	?	Hail (2.00)
A Flight Service weather observer reported dime-size hail in Lakewood at 1602 MST which increased to 2.00-inch-diameter hail at 1625 MST. Another observer reported tennis ball-size hail in Hope, with damage to cars, roofs, and a greenhouse. Officials at Brantley Lake State Park reported golf ball-size hail. Residents at a mobile home park reported 1.00 to 2.00-inch-diameter hail, with numerous dents and broken glass.									
Lea County	09 10	1848MST- 0045MST			0	0	3	0	Flash Flood
The Emergency Management Coordinator in Hobbs reported flooding of streets and roadways in Lea County and in Hobbs. U.S. Highway 385 was closed from Tatum to the Texas state line. More than 4 inches of rain fell during this period.									
San Juan County	11	1230MST- 1600MST			0	0	4	0	Flash Flood
					0	0	2	3	Hail (0.50)
Heavy thunderstorm rains caused flash flooding at many locations in the northern part of the county. Marble-size hail accumulated up to 6 inches deep in Kirtland, where one farmer lost 65 acres of hay. At Fruitland, part of U.S. Highway 64 was closed after an arroyo flooded across it. In Farmington, numerous roads were closed and three mobile home parks were evacuated when Glade Arroyo flooded. An arroyo in Flora Vista flooded, and one resident reported that floodwaters entered her basement and also picked up her car and washed it into her pickup truck. Several roads were flooded in Aztec and one mobile home park had to be evacuated.									
Dona Ana County	11	1819MST- 1825MST			?	?	?	?	Funnel Cloud

Storm Data and Unusual Weather Phenomena

September 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 MEXICO Cont'd

A pilot reported a funnel cloud 4 miles southwest of the Las Cruces Airport.

Eddy County	11	2343MST			0	0	2	0	Lightning
Calsbad	12	0015MST			0	0	3	0	Hail (1.75)
Seven Rivers									Thunderstorm Winds

Lightning struck a tree in Carlsbad, sending a branch through a window in a home. The lightning also blew out a VCR and cordless telephone in the home. At Seven Rivers (15 miles northwest of Carlsbad), a weather spotter reported golf ball-size hail and estimated wind gusts to between 60 to 70 mph.

Cibola County	12	1733MST			?	?	?	?	Funnel Cloud
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The state police reported a brief funnel cloud near San Mateo, about 20 miles northeast of Grants.

Eddy County	12	1845MST-			0	0	4	0	Thunderstorm Winds
Carlsbad		1925MST							

The Carlsbad Police Department reported numerous telephone poles and trees downed, and several windows blown out from strong winds due to a thunderstorm.

Carlsbad	12	2000MST-			0	0	3	0	Flash Flood
		2220MST							

Strong thunderstorms redeveloped over Carlsbad, with an estimated 2.50 inches of rain falling in the city. Floodwaters closed several roads and stranded numerous cars. One motor home was washed off a highway but there were no injuries.

Lea County	18	0326MST-			0	0	4	0	Flash Flood
Hobbs		1000MST							

The Hobbs Police Department reported flooding in Hobbs at 0326 MST. The Emergency Management Coordinator in Hobbs reported eight homes and three businesses flooded from train-effect thunderstorms which occurred over Hobbs at 0852 MST. The rains abated over Hobbs by 1000 MST.

Torrence County	18	1400MST			?	?	?	?	Funnel Cloud
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The police and a pilot reported a funnel cloud just south of Moriarty.

NEW YORK, Central

Herkimer County	10	1800EST			0	0	3	0	Lightning
Dolgeville	10	1815EST			0	0	3	0	Lightning
Manheim									
Fulton County	10	1852EST			0	0	3	0	Lightning
Northville									
Cortland County	10	1900EST			0	0	3	0	Lightning
Cortland									
Otsego County	10	1929EST			0	0	3	0	Lightning
Cherry Valley									
Delaware County	10	2030EST			0	0	2	0	Lightning
Walton									
Columbia County	10	2200EST			0	0	2	0	Lightning
Spencertown	10	2310EST			0	0	3	0	Lightning
Stuyvesant Falls	11	0100EST			0	0	2	0	Lightning
Niverville	11	0230EST			0	0	2	0	Lightning
Chatham									

Thunderstorms swept across portions of eastern New York during the evening of the 10th and early morning of the 11th. Damage from the thunderstorms was due to lightning strikes which struck transformers, power lines, and tree limbs, leaving over 6,000 customers without electricity.

Storm Data and Unusual Weather Phenomena

September 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

Oneida County									
Floyd	16	1610EST			0	0	4	0	Thunderstorm Winds
Marcy	16	1610EST			0	0	4	0	Thunderstorm Winds
Floyd	16	1610EST			0	0	4	0	Lightning
Fulton County									
Caroga Lake	16	1730EST			0	0	4	0	Lightning
Gloversville	16	1750EST			0	0	3	0	Lightning
Saratoga County									
Greenfield	16	1835EST			0	0	3	0	Lightning

A squall line moved east from Lake Ontario causing considerable damage in the towns of Floyd and Marcy, in Oneida County with trees uprooted and several roads blocked by downed trees and tree limbs. Intense lightning accompanied the storms resulting in a fire which burned a summer camp to the ground in Caroga Lake and also shattering trees and downing wires in the town of Greenfield in Saratoga County.

Cortland County Cortland

17	0233EST				0	0	3	0	Lightning
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Lightning struck a Niagara Mohawk Power Company Switch near the County Recycling Center lighting up the sky and knocking out power to 3,800 customers.

Albany County Guilderland Center

18	2230EST				0	0	4	0	Lightning
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Lightning started a fire which destroyed a repair shop on Meadowdale Road in Guilderland Center.

Putnam County Patterson

19	1018EST				0	0	3	0	Thunderstorm Winds
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Thunderstorms packing high winds brought down large tree limbs and power lines leaving 350 customers without power in Patterson.

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 continued the Drought Alert for the following nine counties in eastern New York: Delaware, Dutchess, Greene, Orange, Otsego, Putnam, Schoharie, Sullivan, and Ulster. The Drought Alert continued since the New York City Reservoir Storage remained below 63.6% of usable storage.

Areawide

	All Month				0	0	0	0	Cold
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September 1991 marked the first time that the average monthly temperature had been below normal in at least a year. Most areas recorded average monthly temperatures which were 1 to 2 degrees below normal. The last time average monthly temperatures were below normal in eastern New York was May 1990 over eastern sections and September 1990 over western sections of the area.

NEW YORK, Coastal

Westchester County Mt. Vernon

25	0800EST				1	0	?	0	High Winds
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A low pressure system moving northeastward along the Atlantic coast generated some very strong winds across the area. On Mt. Vernon, a large tree fell between two homes. At Miller Place, one gust downed a tree onto the cab of a truck, killing the driver. (M39V)

NEW YORK, Western

Wayne County Arcadia Lyons

16	1415EST				0	0	4	0	Thunderstorm Winds
16	1425EST				0	0	3	0	Thunderstorm Winds

A cold front crossed the area producing severe thunderstorms during the afternoon. The thunderstorm winds downed power lines and large trees. In the town of Arcadia, the roof of an industrial building was damaged and structural damage was done to a garage.

Storm Data and Unusual Weather Phenomena

September 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
NORTH CAROLINA									
Carteret County 5 E Beaufort	03	1550EST			0	0	0	0	Waterspout
Onslow County 3 S Jacksonville	06	1630EST			0	0	0	0	Thunderstorm Winds Several large trees were blown down in Camp LeJeune (USMC).
Rockingham County Price	07	0045EST			0	0	0	0	Hail (0.75)
Craven County New Bern	14	1830EST			0	0	5	0	Thunderstorm Winds A warehouse containing furniture-quality lumber was destroyed and a county sheriff's office radio dispatch transmitter was knocked down. Estimated damage was close to \$500,000.
Transylvania County Brevard	17	1337EST			0	0	?	0	Thunderstorm Winds Several trees, numerous medium-sized limbs, and an athletic field fence were blown down.
Pender County 5 E Surf City	19	0650EST			0	0	0	0	Waterspout
Randolph County Archdale	19	1900EST			0	0	4	0	Lightning Eighteen dairy cattle were struck and killed near a large cedar tree.
Pitt County Ayden	25	1630EST			0	1	0	0	Lightning A man was seriously injured as he was getting into his car and lightning struck.
Onslow County 10 N Jacksonville	25	2026EST			0	0	0	0	Funnel Cloud Funnel was sighted by a military pilot.
Craven County 15 NNW New Bern	25	2100EST			0	0	0	0	Funnel Cloud
NORTH DAKOTA									
Grand Forks County 1 N Grand Forks	02	1430CST			0	0	4	0	Thunderstorm Winds Winds blew down trees and large branches, causing some power outages in the city of Grand Forks.
Cass County 1 SE Fargo	02	1645CST			0	0	4	0	Thunderstorm Winds Winds downed 6-inch-diameter tree limbs in the city of Fargo.
Wells County Harvey	07	1730CST			0	0	4	0	Thunderstorm Winds A wind and rainstorm blew down huge cottonwood trees, causing power outages, in the town of Harvey. Rainfall amounts up to 5 inches were reported in east-central North Dakota overnight on the 7th and 8th.
Burke County Bowbells	14	1755CST			?	?	?	?	Funnel Cloud
Renville County 12 W Sherwood	14	2300CST			0	0	4	4	Lightning Lightning struck two oil storage tanks, starting a fire and subsequent explosions. Eight firemen received burn injuries; one of the firemen, a 37-year-old man, later died of his injuries. (M370)

Storm Data and Unusual Weather Phenomena

September 1991

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

Sheridan County 6 SW Goodrich	15	1640CST	0.2	50	0 0	5 5	Tornado (F1)
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A tornado destroyed four barns 6 miles southwest of Goodrich. The tornado was unusual not only because it occurred so late in the season, but also because it moved toward the west. Meanwhile, 6 miles northwest of Goodrich, 6.50 inches of rain fell in 3 hours.

OHIO

Hardin County 1 SE Kenton	03	1700EST			0 0	4 0	Thunderstorm Winds
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Ashland County Nova	03	1820EST			0 1	0 0	Lightning
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Greene County Kettering	03	2030EST			0 1	0 0	Lightning
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Thunderstorms blew a barn off its foundation near Kenton. Lightning injured a boy in a field in Nova, and a woman in a building in Kettering.

Licking County Newark	09	1730EST			0 1	0 0	Lightning
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A man was injured by lightning while working in his garage.

Hocking County South Bloomingville	10	1730EST			0 0	4 0	Thunderstorm Winds
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A thunderstorm blew down many large trees.

Guernsey County Fairview	13	1630EST			0 0	3 0	Hail (0.75)
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Belmont County Barnesville	13	1700EST			0 0	5 0	Thunderstorm Winds
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Washington County Lowell	13	1705EST			0 0	4 0	Hail (1.75)
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Jackson County Jackson	13	1715EST			0 0	5 0	Thunderstorm Winds
Jackson	13	1715EST			0 0	3 0	Hail (0.75)

Thunderstorms moved through southeast Ohio blowing down trees and power lines and dropping large hail. A house lost its roof in Jackson and Barnesville.

Wyandot County Upper Sandusky	16	1750EST			0 0	4 0	Thunderstorm Winds
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A thunderstorm blew down trees and power lines.

Meigs County Portland	18	1800EST			0 0	5 0	Thunderstorm Winds
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A thunderstorm blew down trees and power lines, took the roof off of several barns and damaged homes.

Statewide	Entire Month				0 0	0 ?	Drought
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Below normal rainfall continued across Ohio and most areas were in the severe to extreme drought categories of the Palmer Drought Severity Index. Only the extreme southwest part of Ohio has received near normal rainfall the past few months. Crops continued to fail across much of Ohio, especially the northeast quarter.

OKLAHOMA

Oklahoma County Southwestern Portion	02	1830CST			0 0	? ?	Flash Flood
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Cleveland County Norman							Flooding closed roads in the southwestern parts of Oklahoma and in portions of Norman.
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Storm Data and Unusual Weather Phenomena

September 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
OKLAHOMA Cont'd									
Stephens and Comanche Counties	02	1830CST			0	0	?	?	Flash Flood
Flash flooding forced creeks out of their banks in Stephens and Comanche Counties and two homes had to be evacuated in Duncan due to flood water from rainfall which measured 4 to 6 inches.									
Custer County	14 15	2130CST- 0330CST			0	0	3	2	Flash Flood
Flash flooding occurred across the county when an estimated 8 inches of rain sent Bear, Beaver and Turtle Creeks out of their banks, causing the Washita River to flood in and around Clinton. Houses and businesses were flooded in the Essaryville section of town along old Highway 66, and a railroad bridge and 1,500 feet of track were washed out 1 mile east of the Clinton Municipal Airport. Freshly worked fields eroded badly, covering low-lying sections of paved roads with deep mud.									
Oklahoma County	15	1430CST			0	0	?	?	Flash Flood
The Village	15	1445CST			0	1	?	?	Flash Flood
NW Oklahoma City									
Very heavy thunderstorms, some dumping as much as 0.75 inch of rain in 8 minutes, pounded central Oklahoma, causing isolated flooding and one injury. In the city of The Village, heavy rainfall flooded streets and overflowed drainage ditches. In northwestern Oklahoma City, an 11-year-old boy was slightly injured when the drainage ditch he was playing in filled rapidly and swept the boy downstream into a creek. The rapid current in the creek carried the boy 1 mile downstream, where he was able to grab a branch of a tree and pull himself from the stream.									
Tulsa County	16	0046CST			0	0	3	?	Lightning
S Tulsa									
Lightning struck a house in southern Tulsa, and the resulting fire caused \$4,500 in damage.									
Carter and Love Counties	16	1115CST			0	0	?	?	Flash Flood
Heavy rain from thunderstorms caused flooding of creeks, and washed out roadways in Carter and Love Counties.									
Carter County	18	0700CST			0	0	?	?	Flash Flood
Ardmore									
Comanche County	18	1500CST			0	0	?	?	Flash Flood
Lawton									
Heavy rains from thunderstorms caused flooding of roadways in Ardmore in the morning, and in Lawton during the afternoon.									
Grady County	24	0815CST			0	0	?	?	Thunderstorm Winds (G52)
1 WSW Cox City									
Stephens County	24	0815CST			0	0	?	?	Thunderstorm Winds (G52)
6 SSE Bray									
Garvin County	24	0845CST			0	0	?	?	Thunderstorm Winds (G52)
2 NW Hennepin									
Carter County	24	0851CST			0	0	?	?	Thunderstorm Winds
Ratliff City									
2 SW Ratliff City	24	0852CST			0	0	5	?	Thunderstorm Winds
6 N Lone Grove	24	0855CST			0	0	?	?	Thunderstorm Winds (G61)
Murray County	24	0920CST			0	0	?	?	Hail (1.00)
Dougherty									
Dougherty	24	0920CST			0	0	5	?	Lightning
Carter County	24	0940CST			0	0	4	?	Thunderstorm Winds
1 W Springer									
Johnston County	24	0944CST			0	0	?	?	Hail (1.00)
Mannsville									
Marshall County	24	1001CST			0	0	?	?	Hail (0.75)
Oakland									
Bryan County									

Storm Data and Unusual Weather Phenomena

September 1991

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

Durant	24	1027CST			0	0	?	?	Hail (1.00)
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Severe thunderstorms rolled across the south-central portion of the state. Damage to trees and roofs was reported in Ratliff City. A 96-foot tall oil drilling rig was destroyed when severe thunderstorm winds blew it over causing an estimated \$75,000 in damage. The rig was at work 2 miles southwest of Ratliff City. Near Dougherty lightning struck a historic home and caused a fire that completely destroyed the home. One mile west of Springer, along Interstate 35, a severe thunderstorm blew a tractor-semitrailer off the Interstate and piled hail over 1 foot deep.

OREGON

None reported.

PENNSYLVANIA, Eastern

Perry County

Shermans Dale	16	1642EST			0	0	4	0	Thunderstorm Winds
1 S Duncannon	16	1700EST			0	0	3	0	Thunderstorm Winds

Thunderstorm wind gusts downed several hundred trees and utility lines, and caused extensive damage to several buildings in Shermans Dale. One inch of rain also fell. In Penn Township near Duncannon, a large tree was blown down.

Huntingdon County

Warriors Mark	18	1600EST			0	0	3	0	Lightning
Warriors Mark	18	1610EST			0	0	?	?	Hail (1.75)

A lightning strike caused a fire that resulted in \$20,000 damage to a home. Golf ball-size hail was also reported.

Centre County

2.5 SE Marengo	18	1610EST			0	0	4	2	Thunderstorm Winds (G61)
2 SE Gatesburg	18	1610EST			0	0	?	3	Hail (1.75)
Pine Grove Mills	18	1610EST			0	0	4	3	Thunderstorm Winds (G69)
Boalsburg	18	1610EST			0	0	?	?	Hail (1.00)
State College	18	1715EST			0	0	3	0	Thunderstorm Winds

Thunderstorm wind gusts caused a 2.5 miles damage path from near Baileyville, southeast of Marengo, to the east-southeast. There was minor roof damage to a house and a barn and more than a dozen trees were broken off, uprooted, or suffered extensive loss to major limbs. Some corn plants were also blown down. Marble- to golf ball-size hail shredded leaves of the mature corn plants. Another damage path started southeast of Gatesburg and extended 3.5 miles to the southeast. Wind gusts blew down potato and corn plants, damaged farm machinery, peeled off part of a barn roof, uprooted or broke off numerous trees and downed a utility pole. Wind-blown hail damaged crops, made holes in vinyl siding on two homes, broke windows in one house and dented an aluminum door frame and broke plastic window moldings on an outbuilding. The hail was marble to golf ball size. One inch hail was reported in Boalsburg and trees were downed in State College.

Huntingdon County

2 N McAlevys Fort	18	1610EST	4.0	330	0	3	5	0	Tornado (F2)
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A tornado touched down a number of times. On the first touchdown the roofs of a house and a barn were seriously damaged. About 0.75 mile northeast of that point, a mobile home with tie downs that was sitting on hill, was overturned and torn apart. One occupant saw the tornado funnel cloud just moments before it struck. The three occupants received minor injuries. Over the next 3 miles, it touched down briefly at least four more times snapping off and uprooting numerous large trees. Minor roof damage to another home also occurred.

Franklin County

Mont Alto	18	1610EST			0	0	3	0	Thunderstorm Winds
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Thunderstorm wind gusts downed some scattered trees and utility lines in the southeastern portion of the county.

Storm Data and Unusual Weather Phenomena

September 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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PENNSYLVANIA, Eastern Cont'd

PAC133, York County Paradise Township	19	0030EST			0	0	?	0	Flash Flood
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Heavy rain caused flooding along the Conewago and Beaver Creeks. Roads were closed for a couple of hours.

PENNSYLVANIA, Western

None reported.

RHODE ISLAND

None reported.

SOUTH CAROLINA

Charleston County Awendaw	01	1630EST			1	1	0	0	Lightning
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Five people witnessed a 26-year-old woman being struck by lightning and killed while grabbing on a cement pier on the Intracoastal Waterway at Moore's Landing. Her husband was knocked to the ground by the strike, but suffered only minor injuries. (F260)

Aiken County North Augusta	01	PM			0	0	4	0	Thunderstorm Winds Lightning
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Thunderstorm winds caused more than \$12,000 in damage.

Horry and Georgetown Counties Cherry Grove Garden City Beach N Myrtle Beach	03	0330EST- 1530EST			0	0	?	0	Coastal Flooding
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Unusually high tides along with northeast winds caused coastal flooding twice in one day.

Charleston County Charleston	15	1500EST- 1830EST			0	0	?	0	Urban Flooding Lightning
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Lightning struck buildings and trees, knocking out power to 10,000 customers. At the Charleston City weather station, 4.31 inches of precipitation fell in 1 hour.

Spartanburg County Western Portion	17	PM			0	0	?	0	Lightning
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Lightning caused scattered power outages.

Cherokee County Gaffney	18	0930EST			0	0	?	0	Lightning
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Lightning struck a transformer knocking out power to a school and water pumping station.

Western Portion	18	1900EST			0	0	?	0	Lightning
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Spartanburg County Southern Two- Thirds Portion	18	1930EST- 2200EST			0	0	4	0	Lightning
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Greenville County Central and Southern Portions	18	2000EST			0	0	5	0	Lightning
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A small area of thunderstorms with intense lightning developed over the southern foothills. The lightning was almost continuous for several hours and caused extensive damage to electrical and

Storm Data and Unusual Weather Phenomena

September 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 Cont'd

electronic systems. There were also a number of structure fires including some homes which burned. Heavy rain, up to 4 to 5 inches, fell in a few locations although significant flooding was not reported.

Pickens County Near Table Rock State Park	19	1445EST			0	0	2	0	Thunderstorm Winds
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A severe thunderstorm blew down a number of large tree limbs and a few trees fell across roadways. Some hail fell, but the size was not reported.

Abbeville County Abbeville	19	1500EST			0	0	?	0	Lightning Hail
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Lightning struck a transformer, knocking out power to Dixie High School. Hail was also reported, but the size was unknown.

Sumter County Sumter	19	2100EST- 2200EST			0	0	3	0	Lightning
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Lightning started several house fires. The total damage from the blazes was less than \$1000.

Horry County Northern and Eastern Portions	25	1730EST- 1900EST			0	0	?	0	Lightning
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Lightning knocked out power to several sections of Horry County including Loris, Longs, Conway, Myrtle Beach, and North Myrtle Beach.

Georgetown County Murrells Inlet	25	1730EST			0	0	5	0	Lightning
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Lightning sparked a house fire causing more than \$50,000 in damage.

SOUTH DAKOTA

Spink County 1 E Frankfort	02	1650CST			0	0	3	0	Thunderstorm Winds (G48)
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Thunderstorm winds blew a 90-year-old barn over.

Beadle County 7 W Virgil	02	1713CST			0	0	2	0	Thunderstorm Winds (G72)
2 SW Virgil	02	1715CST			0	0	3	0	Thunderstorm Winds (G70)

Part of a barn roof was blown off by thunderstorm winds.

9 WSW Virgil	02	1715 CST			0	0	4	0	Thunderstorm Winds
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Winds lifted the roofs from a house and garage. They were then redeposited on their respective buildings. Fences and tree limbs were blown down and a few hog sheds were destroyed. A garage-size shed was blown over.

Brown County 11.5 W Fredrick	08	1515CST			0	0	0	0	Funnel Cloud
Elm Lake	08	1520CST			0	0	2	3	Hail (0.75)
McPherson County 8 NE Leola	08	1530CST	0.5	35	0	0	1	1	Tornado (F1)

A tornado was observed in an open field causing minimal damage.

Brown County 7 SW Fredrick	08	1540CST			0	0	1	1	Thunderstorm Winds (G52)
Haakon County Philip Airport	08	1553CST			0	0	0	0	Thunderstorm Winds (G50)
Brown County Houghton	08	1705CST			0	0	2	3	Hail (1.00)

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SOUTH DAKOTA Cont'd

Hail stripped bark from trees in Houghton.

Faulk County 3 E Faulkton	08	1720CST			0	0	1	2	Hail (0.75)
Brown County Groton	08	1840CST			0	0	5	5	Thunderstorm Winds (G61)
Many trees were blown down and there were several houses and other buildings damaged by thunderstorm winds. The top of the city water tower was blown off by the strong winds.									
Spink County Mellette	08	1840CST			0	0	0	0	Thunderstorm Winds (G52)
Brown County 4 SE Stratford	08	1950CST			0	0	1	1	Hail (0.75)
Spink County Redfield	08	1950CST			0	0	0	0	Hail (0.75)
Mellette	08	2001CST			0	0	1	1	Thunderstorm Winds (G52)

TENNESSEE

Rutherford County Murfreesboro	08	2100CST			0	0	4	0	Lightning
One house was burned by a fire that was started by lightning.									
Wilson County Lebanon	11	0100CST			0	0	3	0	Heavy Rain
The roof of a manufacturing plant collapsed due to the weight of rain water.									
Williamson County Franklin	18	1300CST			0	1	0	0	Lightning
One person was injured as lightning struck an umbrella he was holding.									
Hamilton County Chattanooga	18	1400CST			0	0	3	0	Thunderstorm Winds
TEXAS, Northern									
Titus County Mount Pleasant	02	1300CST- 1500CST			0	0	?	?	Flash Flooding
High water up to 3 feet deep was observed at the intersection of State Highway 49 and U.S. Highway 271 in the southern portion of Mount Pleasant. A hospital also observed high water entering its lower floor.									
Van Zandt County Northern Portion	02	1430CST- 1630CST			0	0	?	?	Flash Flooding
Wills Point	02	1500CST			0	0	?	?	Thunderstorm Winds
Heavy rains of 4.5 inches produced flash flooding of State Highway 19 and 80 located just east of Edgewood. Strong winds blew down several trees at Wills Point.									
Hood County	07	1430CST- 1630CST			0	0	?	?	Flash Flooding
Flash flooding was observed at several low water crossings.									
Wichita County	16	0930CST- 1100CST			0	0	?	?	Flash Flooding
Heavy rains of 1 to 2 inches in a 1 hour period produced flash flooding of numerous rural streets and low lying areas.									

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					Killed	Injured	Property	Crops	
TEXAS, Northern Cont'd									
Stephens County 1 E Breckenridge	16	1230CST			0	0	5	?	Lightning
									Lightning ignited a fire to a residence.
Tarrant County Southern Portion	16	1600CST- 1900CST			0	0	?	?	Flash Flooding
									Heavy rains of 3.30 inches in a 45 minute period in Benbrook resulted in the flash flooding of several roadways and drainage ditches.
Brown County	19	0900CST- 1100CST			0	0	?	?	Flooding
									Heavy rains of 6 inches in a 24 hour period resulted in the flooding of low lying areas and low water crossings along the Pecan Bayou located at the north end of Lake Brownwood. Both Lake Brownwood and Lake Coleman observed water up to 3 feet in depth over their respective spillways.
Coryell and Bell Counties Southern Portion	19	0900CST- 1230CST			0	0	?	?	Flash Flooding
									Heavy rains of 4 inches in a 7 hour period produced flash flooding of low lying areas, creeks, and numerous rural roadways between Copperas Cove and Temple.
Bell County	23	0730CST- 1030CST			0	0	?	?	Flash Flooding
									Heavy rains produced flash flooding of several creeks and streams along State Highway 36 and Farm-to-Market Road 3117.
Cooke County 11 NW Gainesville	24	1035CST			0	0	4	?	Thunderstorm Winds
Muenster	24	1035CST			0	0	3	?	Thunderstorm Winds
Gainesville	24	1040CST			0	0	4	?	Thunderstorm Winds Hail (0.75)
5 E Gainesville	24	1045CST			0	0	5	?	Thunderstorm Winds
									Strong winds damaged the roof of a home and uprooted approximately 20 trees at Moss Lake. Several trees were snapped and an outdoor shed was destroyed in Muenster. In Gainesville, a restaurant sign and power lines were blown down while a few trees were uprooted. A downburst severely damaged five mobile homes at the Oak Ridge Mobile Home Park.
Grayson County Whitesboro	24	1059CST			0	0	3	?	Thunderstorm Winds
Howe	24	1140CST			0	1	5	?	Thunderstorm Winds
									Strong winds blew down power lines at Whitesboro. Several trees were uprooted, a tractor shed and farm house were damaged, and one person was injured when a trailer-semi trailer was overturned at Howe.
Denton County Aubrey	24	1145CST			0	0	?	?	Thunderstorm Winds (G52)
Collin County Melissa	24	1150CST			0	0	?	?	Thunderstorm Winds
McKinney	24	1200CST			0	0	3	?	Thunderstorm Winds (G52)
Plano	24	1200CST			0	0	4	?	Lightning
									Strong winds blew down several trees at McKinney while lightning ignited a fire to the roof of a home in Plano.
Hunt County Celeste	24	1205CST			0	0	?	?	Thunderstorm Winds (G52)
Greenville Majors Airport	24	1214CST			0	0	?	?	Thunderstorm Winds (G50)

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					Killed	Injured	Property	Crops	
TEXAS, Northern Cont'd									
Greenville	24	1217CST			0	0	4	?	Thunderstorm Winds
Greenville	24	1225CST			0	0	5	?	Thunderstorm Winds
Greenville	24	1230CST			0	0	?	?	Hail (0.75)
In Greenville, at 1217 CST, strong winds blew down power lines and large tree limbs and collapsed the metal awning of a residence. At 1225 CST, the wall of a building was destroyed and the roof of an outdoor building was blown onto a tractor-semi trailer.									
Hopkins County									
Cumby	24	1230CST			0	0	?	?	Thunderstorm Winds (G61)
5 S Sulphur Springs	24	1255CST			0	0	?	?	Hail (1.75)
8 S Sulphur Springs	24	1300CST			0	0	5	?	Thunderstorm Winds
Strong winds destroyed a barn and blew down street signs and power lines at the Union community.									
Rains County									
Emory	24	1245CST			0	0	3	?	Thunderstorm Winds
Strong winds blew down large tree limbs.									
Wood County									
5 N Quitman	24	1310CST			0	0	?	?	Hail (1.75)
Yantis	24	1315CST			0	0	3	?	Thunderstorm Winds
Strong winds blew down large tree limbs.									
Franklin County									
4 NW Winnsboro	24	1315CST			0	0	?	?	Hail (1.75)
1 N Mount Vernon	24	1315CST			0	0	?	?	Hail (0.75)
Upshur County									
Gilmer	24	1330CST			0	0	?	?	Hail (0.75)
Smith County									
Tyler	24	1415CST			0	0	4	?	Thunderstorm Winds
Strong winds blew down power lines and large tree limbs and lifted the metal awning off a residence.									
Gregg County									
Kilgore	24	1430CST			0	0	5	?	Thunderstorm Winds
Strong winds lifted the roof off a lumber company and blew down power lines and large tree limbs.									
Angelina County									
Lufkin	24	1705CST			0	0	4	?	Thunderstorm Winds
Strong winds blew down power lines and large tree limbs.									
TEXAS, Southern									
Maverick County									
7 SE Eagle Pass	01	0052CST			0	0	5	?	Thunderstorm Winds
The sheriff's office reported extensive damage in the Pueblo Nuevo area of Maverick County. One mobile home was demolished by high wind and others received minor damage. Several U-Haul trailers were blown on to the El Indio Highway.									
Kleberg County									
7 NW Kingsville	03	1335CST	.05	5	0	0	?	?	Tornado (F0)
Several funnel clouds were observed by the Kleberg Sheriff's Office; one touched down for a brief period without doing any damage.									
Brazos County									
College Station	03	1630CST			0	0	4	?	Lightning
Lightning struck a house in College Station destroying the telephones and wiring.									
Brazoria County									
Texas City	04	2000CST-							

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					Killed	Injured	Property	Crops	
TEXAS, Southern Cont'd									
	05	0100CST			0	0	?	?	Flash Flood
The Texas City Police Department reported several streets closed due to flooding in the city.									
Hidalgo County Edinburg	05	1400CST			0	0	3	?	Flash Flood
Heavy rains over Edinburg caused streets to flood in the downtown area. Several merchants reported hundreds of dollars in damage.									
Val Verde County	14	0220CST- 1200CST			0	0	3	?	Flash Flood
Over 5 inches of rain fell in parts of Val Verde County early Saturday morning. The Highway Department closed Highway 163 near Juno and Farm-to-Market 1024, 30 miles north of Comstock. Many streets and low-lying areas in Del Rio were also flooded. The flooding did not subside until late in the afternoon.									
Real County	14	0900CST- 1600CST			0	0	3	?	Flash Flood
Up to 4 inches of rain fell over the northern part of Real County. The sheriff's office reported Farm-to-Market 337 closed between Leakey and Camp Wood, and Farm-to-Market 335 closed between Vance and Highway 41. The flooding subsided in the afternoon.									
Bandera, Kerr, Real, Uvalde and Val Verde Counties	15 16	0035CST- 0700CST			0	0	4	?	Flash Flood
Repeated thunderstorms over the area caused flooding of low-lying areas and roadways. Rainfall amounts over 2 inches in less than an hour were not uncommon. The Texas Department of Public Safety reported several roadways throughout the area under water. The flood waters were very slow to subside. A 17-year-old male, tried to cross the Devil's River in Val Verde County early Sunday morning. The car was swept off the low water crossing into the river, the youth was able to climb out on to the car. He declined to be rescued by a group of hunters that passed by and was found dead the next morning as a result of hypothermia. One school, in Hunt, was closed on the 16th due to the threat of continued flooding. School buses in other areas did not run Monday morning due to flooded roads. Ten people had to be rescued from a car that stalled in a low water crossing in hunt. (M170)									
Real and Uvalde Counties	15 16	1500CST- 1200CST			0	0	4	?	Flooding
Heavy rains over the northern part of Real County on Sunday morning, and again Monday morning caused the Frio River to flood. The river crested at Garner Park around 0800 CST on Monday morning. The Department of Public Safety reported that seven people had to be rescued by helicopter in the park, and 25 campers in the Oakmont camping area had to move to higher ground. Approximately 25 paddle boats were washed downstream from the park area, and a restroom building in the campground had 4 feet of water in it.									
Blanco County 10 E Blanco	18	1900CST			0	0	4	?	Lightning
Lightning struck a home east of Blanco; the ensuing fire destroyed the house.									
Val Verde County	19	0715CST- 1200CST			0	0	3	?	Flash Flood
The Highway Department closed Highway 163 and Farm-to-Market Road 1024 in the county. Three to four feet of water was reported across the roads in some areas. The water slowly receded.									
Val Verde County	19	0800CST			0	0	5	?	Flooding
Over 4 inches of rain fell over Val Verde County on Thursday morning, along with a large release of water from the Amistad Reservoir. Over 50 people had to be evacuated from the Vega Verde area of Del Rio and along the Rio Grande River. A few houses and a mobile home were flooded.									

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TEXAS, Southern Cont'd									
Real County	23	0700CST- 1230CST			0	0	3	?	Flash Flood
									Rainfall on saturated ground of only a 0.50 inch was sufficient to cause flooding. Highway 336 north of Leakey had to be closed once again.
Cameron County 1 E Arroyo City	23	1130CST	.02	5	0	0	?	?	Tornado (F0)
									A tornado was reported 1 mile east of Arroyo City. No damage was reported with this storm.
Bee County 5 E Pawnee	24	2025CST	1	10	0	0	4	?	Tornado (F1)
									The Department of Public safety reported a tornado north of Beeville on Highway 181. A double-wide mobile home was knocked over and several trees were uprooted in the area.
TEXAS, Western									
Garza County Post	03	1445CST			0	0	4	1	Thunderstorm Winds
									A microburst damaged a hanger and a mobile home at the Post/Garza County Airport; no injuries were reported.
Carson County 2 N Pantex	03	2030CST			0	0	0	0	Hail (0.75)
									A SKYWARN spotter reported dime-size hail just north of Pantex; no damage was observed.
Potter County 2 W Amarillo	03	2041CST			0	0	0	0	Hail (0.75)
Randall County 2 SW Amarillo	03	2046CST			0	0	0	0	Hail (0.75)
									Severe thunderstorms moved through the Amarillo area. Dime-size hail was reported by a National Weather Service employee in Potter County. Later, a meteorologist with KAMR Television Station relayed a public report of dime-size hail in southwest Amarillo.
Bailey County Fairview	08	1738CST			0	0	0	3	Hail (0.75)
									The Fairview Fire Department reported dime-size hail in Fairview. The hail caused light damage to the area cotton crop.
Bailey County Muleshoe	08	1840CST			0	0	0	2	Hail (1.00)
Lamb County 2 E Fairview	08	1855CST			0	0	0	3	Hail (0.75)
Bailey County Muleshoe	08	1900CST			0	0	0	2	Hail (1.00)
									The Bailey County Sheriff's Office reported quarter-size hail in Muleshoe at 1840 CST. The public reported dime-size hail in western Lamb County. The Muleshoe Police Department observed quarter-size hail again in Muleshoe at 1900 CST. Light damage to crops was reported.
Hartley County Channing	09	1515CST			0	0	0	0	Hail (0.88)
									Nickel-size hail was reported in Channing by the Hartley County Sheriff's Office; no damage was noted.
Reeves County Pecos	16	2205CST			0	0	2	0	Flash Flood
									Slow-moving thunderstorms dropped heavy rain on Reeves County. The sheriff's office reported street flooding and stalled cars in Pecos. Only minor damage was noted.

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TEXAS, Western Cont'd

Lubbock, Crosby, and Dickens Counties	18 19	0330CST- 1400CST			0	0	4	3	Flood
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Persistent moderate to heavy rain, not associated with thunderstorms, resulted in flooding on the South Plains. Rainfall totals of 3 to 7 inches were common across the area. The resulting floodwaters caused minor damage to homes and vehicles in the cities of Lubbock and Dickens. Crop damage was reported in Crosby and Dickens Counties.

Presidio County Presidio

	25 30	0800CST- 2400CST			0	0	6	4	Flood
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Large water releases from Luis Leon Reservoir in Mexico resulted in flooding of the Rio Grande River near Presidio. The floodwaters damaged the international railroad bridge and washed out portions of U.S. Highway 170 and other secondary highways in the area. The Redford community, 15 miles southeast of Presidio, was isolated for 4 days. The flooding continued into early October.

UTAH

Wayne County	06	0900MST- 1100MST			0	0	2	0	Flash Flood
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Tropical moisture began moving into southern and eastern Utah on the 5th. The thunderstorm activity and widespread rain began late that afternoon and continued through the 6th as the moisture increased, and moved north and east. Although there were no reports of flash flooding on the 5th, the rainfall on that day, and the early morning of the 6th saturated the ground setting the stage for the flooding that took place later on the 6th.

A woman traveling on a dirt road 35 miles southeast of Bicknell was caught in a flash flood causing her to climb to the top of her vehicle to escape. She also reported significant flash flooding along the 7 mile stretch of road that she had traveled. Some damage was done to the vehicle. Otherwise many sections of the dirt roads in the area were washed out. Minor street flooding was reported in Torrey, about 30 miles to the northwest of the flash flood area, at about the same time.

Grand and Uintah Counties

	06	1600MST- 1800MST			0	0	0	0	Flash Flood
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Garfield County	06	1647MST- 1800MST			0	0	0	0	Flash Flood
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By late afternoon, the heavy and continuous rainfall caused many dry washes to overflow across southern Uintah and northern Grand Counties. Water was running 1 to 2 feet deep across a section of Interstate 70, 40 miles east of Green River. It closed the highway for an hour. No major damage was reported in either county.

Brief and heavy rainfall in northern Garfield County caused many of the washes and creeks to run full to overflowing; no damage was reported.

Emery and Carbon Counties

	06	2025MST- 2330MST			0	0	0	0	Flash Flood
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Very slow moving thunderstorms over central Emery County produced moderate to heavy rainfall over an area that had already received heavy rainfall the past 12 to 24 hours. Many of the small streams and washes in both counties filled rapidly, resulting in some flash flooding. No damage was reported.

Carbon and Duchesne Counties

	07	1330MST- 1445MST			0	0	3	0	Flash Flood
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An upper level low which moved into central Utah enhanced the already heavy rainfall. The rainfall had now moved farther north and east from the previous day, and now covered the entire state. Slow moving thunderstorms produced heavy rain over much of Carbon and southern Duchesne Counties. By mid-afternoon, the Utah Highway Patrol in the area reported water up to a foot deep running over the streets in northern Price. A car was pushed along one of those streets

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UTAH Cont'd

by the running water. In the town of Hiawatha, in eastern Carbon County, water was reported in basements. Two roads were closed for a time. One of these roads, Nine-mile Canyon Road, that runs from Wellington to Duchesne in southern Duchesne County was closed because of flooding and rock slides. The other road was also closed due to flooding and rock slides extended south out of Wellington. Also, half mile south of Price, 2 feet of water was reported running over a road in a subdivision. According to the Carbon County Road Department every gravel road in the county received some damage. No damage was reported from southern Duchesne County.

Beaver County 5 E Beaver

07	1530MST	Short	10	0	0	0	0	0	Tornado (F0)
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The tornado was spotted by two people. The funnel cloud lasted 5 to 10 minutes, but the tornado touched the ground only briefly. Since this tornado occurred in open country, it caused no damage.

Weber County

07	1600MST-								
08	1530MST				0	0	7	0	Flash Flood

North Ogden and Harrisville were the areas that received the brunt of the flooding. A band of cells remained over the area throughout Saturday afternoon and evening. The event began with the flooding of basements in North Ogden late in the afternoon, and got much worse after that. The hardest hit areas in North Ogden were the Camarren Cove and Lakeside Estates subdivisions which are located very close to the slopes of the Wasatch Mountains. By 1900 MST, the prolonged, intense rain loosened tons of rock, mud, and other debris in a canyon northeast of these subdivisions. A large amount of water that was dammed by rocks and debris in the canyon, also flowed through the area. The debris flow and flooding caused significant damage to these subdivisions. The natural drainage of the flood waters from North Ogden was toward the Great Salt Lake. This caused considerable flooding further downstream in Harrisville. The hardest hit area in Harrisville was in the Misty Meadows subdivision.

Most and the worst portion of the flash flooding was from 1600 MST on the 7th, to 0400 MST on the 8th. However, additional minor flash flooding occurred in the area until mid-evening of the 8th. Additional damage after the first 12 hours of the event was inconsequential due to the significant damage caused by the initial flash flooding.

About 640 houses received some kind of damage either from flooding or mud/rock slides. One house was totally destroyed (mud slide in North Ogden), eight received major damage, 79 had minor damage, and more than 500 reported flood problems. Damages will run about \$6 million.

Heavy rainfall in the Salt Lake Valley on the afternoon and evening of the 8th caused localized occurrences of minor basement and street flooding with no significant damage reported.

Salt Lake County Sandy Murray

09	1619MST				0	0	1	1	Hail (1.00)
09	1710MST				0	0	1	1	Hail (0.75)

Utah County Provo

09	1740MST				0	0	1	1	Hail (0.75)
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A moist and unstable air mass remained over northwest Utah. The first report of hail received from Sandy at 1619 MST. Besides the reports of large hail, several reports of 0.25- to 0.50-inch size hail were received from Sandy, Murray, Mill Creek, and Holladay until 1716 MST. The report from Provo was the only occurrence of large hail received from that area. Damage was minor, and consisted mainly of shredded trees and plants.

Provo Orem

09	1846MST				0	0	5	0	Thunderstorm Winds (G90)
09	1932MST				0	0	5	0	Thunderstorm Winds (G68)

Several wind gusts, from 68 to 90 mph, were reported in the Provo and Orem area for this time period. The first report of these winds was received from David James, a spotter for the National Weather Service and an employee of Brigham Young University. He was at his home in Provo when the winds first occurred, and he called in with an estimated gust of 70 mph. He then went to the BYU campus where there was recording equipment. From that equipment, he reported to the forecast office that a gust to 90 mph was recorded for the time of the initial wind gusts. At the time of his second call at 1932 MST, the wind equipment was currently reporting a gust to 68 mph.

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					Killed	Injured	Property	Crops	

UTAH Cont'd

Damage was widespread. Many large trees were either uprooted or damaged, two dozen on the BYU campus alone. Some of the trees at BYU that were uprooted or damaged were 60 to 90 feet tall. Uprooted trees were blown into power lines, houses, and onto cars. Minor damage was done to four cars at BYU, and three homes were slightly damaged in the Provo area. Other damage in Provo included a roof that was lifted off an apartment. In Orem, an aluminum roof on a carport was lifted off, and carried 100 yards. Throughout the area, numerous power lines were broken, and shingles ripped off houses. Several streets in the area were closed due to large tree limbs and uprooted trees blocking them.

Box Elder County Brigham City

10	1200MST	Short	10	0	0	2	0	Tornado (F0)
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A tornado touched down in several spots in the southeast portion of Brigham City about 1200 MST. It was located in the vicinity of 100 East and 400 North. The tornado touched down in several spots in a four-by-four block area. It uprooted or damaged about 20 trees, destroyed a shed, and peeled siding off a house.

Tooele County Vernon

12	1645MST			0	0	1	0	Hail (1.50)
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Hail measure 1.50 inch in diameter, was reported 2 miles east of Vernon by a National Weather Service spotter. The spotter indicated that the hail decreased in size to about 0.75 inch in diameter a few minutes later. The hail accumulated to a depth of 1 inch. No other reports of large hail were received from the area although a report of 0.50-inch hail was received from Grantsville at approximately the same time the large hail occurred.

Grand County

29	2100MST- 2130MST			0	0	2	0	Flash Flood
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A flash flood occurred in a campground 15 miles southeast of Moab. Pack Creek runs through this campground. The creek flooded washing a car and its driver down the river a short distance. The driver was rescued a short time later. Some minor damage was done to the campground. This event was not reported to the forecast office until well after its occurrence.

VERMONT

Statewide

All Month				0	0	0	0	Cold
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September 1991 marked the first time that the average monthly temperature had been below normal in over a year. Most areas recorded average monthly temperatures which were 1 to 2 degrees below normal. The last time average monthly temperatures were below normal was May 1990.

VIRGINIA

City of Hampton 5 E Langley Field

01	1700EST			1	0	0	0	Rip Current
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Three men were fishing in the surf at Grandview Beach when heavy surf and rip currents began to pull them under. One man drowned when he was unable to swim back onto land. (M??O)

Greensville County 4 NW Brink

14	1510EST			0	0	3	0	Thunderstorm Winds
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The sheriff's office reported that trees were downed and the roofs of several sheds were blown off.

Prince Edward County Farmville

14	1900EST			0	0	3	0	Thunderstorm Winds
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Large trees were downed; one fell onto a house.

Fairfax County 2 S Herndon

17	1930EST			0	0	3	0	Lightning
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A car traveling on a multilane highway was struck by lightning. The lightning struck the antenna causing extensive damage to the car's electrical system and computer. The two occupants of the car were uninjured when they managed to bring the car to a safe halt.

Storm Data and Unusual Weather Phenomena

September 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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VIRGINIA Cont'd

Mathews County 4 E New Point	19	1500EST			0	4	5	0	High Winds
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Four men in a houseboat were slightly injured when their boat sank in rough seas and strong winds which followed a cold front passage. The boat had been valued at \$52,000.

City of Suffolk Driver	19	1757EST			0	0	0	0	Thunderstorm Winds
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The police department reported trees downed by thunderstorm winds.

City of Virginia Beach Cape Henry	19	1800EST			0	0	5	0	Thunderstorm Winds
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A U.S. Army vessel sank after colliding with a floating pier that was displaced by strong winds.

WASHINGTON

None reported.

WEST VIRGINIA

Pleasants County Belmont	13	1739EST			0	0	0	0	Thunderstorm Winds
Willow Island	13	1756EST			0	0	0	0	Thunderstorm Winds
Eureka	13	1759EST			0	0	0	0	Hail (0.88)

Winds gusted to 60 mph at Belmont and Willow Island, while nickel-size hail covered the ground at Eureka.

Ritchie County Dutchman	13	1940EST			0	0	0	0	Thunderstorm Winds
1 S Dutchman	13	1945EST			0	0	3	0	Hail (0.75)

Several small trees were uprooted in Dutchman. Along Route 21, 6 vehicles were dented by dime-size hail.

Jackson County 3 NE Sandyville	13	2050EST			0	0	3	0	Thunderstorm Winds
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Several trees were uprooted in a 600 yard path that affected 5 farms along Turkey Fork. Minor roof damaged occurred and windows were broken.

Mineral County 2 S Headsville	18	1330EST			0	0	4	0	Lightning
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Lightning ignited a fire that destroyed a barn and 400 bales of hay along Beaver Run Road.

Hampshire County Hoy	18	1420EST			0	0	0	0	Hail (0.88)
4 SE Romney	18	1435EST			0	0	0	0	Thunderstorm Winds
Cacapon Springs	18	1635EST			0	0	0	0	Thunderstorm Winds

Nickel-size hail covered the ground at Hoy. Several trees and large branches were blown down near Route 10 and along River Road in Cacapon Springs.

Ritchie County Smithville	18	1430EST			0	0	3	0	Hail (1.75)
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Golf ball-size hail damaged shingles on roofs and porches.

Berkeley County 4 S Martinsburg	18	1505EST			0	0	0	0	Hail (0.88)
3 E Spring Mills	18	1505EST			0	0	0	0	Hail (0.88)
1 SW Martinsburg	18	1507EST			0	0	0	0	Hail (0.75)
Martinsburg	18	1510EST- 1515EST			0	0	4	0	Thunderstorm Winds

Storm Data and Unusual Weather Phenomena

September 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
WEST VIRGINIA Cont'd									
Several large trees and power lines were blown down in the city, causing power outages.									
Doddridge County New Milton	18	1515EST			0	0	0	0	Thunderstorm Winds
Numerous large branches were blown down causing blocked roads and power outages.									
Harrison County 4 NE Clarksburg	18	1524EST			0	0	0	0	Thunderstorm Winds
Winds gusted to 58 mph at the airport.									
Berkeley County Berkeley Springs	18	1540EST			0	0	0	0	Hail (0.75)
Berkeley Springs	18	1638EST			0	0	0	0	Thunderstorm Winds (G61)
10 N Martinsburg	18	1700EST			0	0	0	0	Hail (1.75)
4 E Martinsburg	18	1700EST			0	0	0	0	Thunderstorm Winds
Martinsburg	18	1710EST			0	0	0	0	Hail (1.00)
Trees up to 1 foot in diameter were knocked down while golf ball-size hail fell in the county.									
Jefferson County 1 SW Shepherds- town	18	1715EST			0	0	0	0	Hail (1.00)
Jackson County Millwood	18	1755EST			0	0	4	0	Thunderstorm Winds
Winds gusted to an estimated 75 mph. Roofs sustained damage; windows were broken, a lumber yard had materials thrown about, and few large walnut trees were broken in half by strong thunderstorm winds.									
Wirt County Newark	18	1815EST			0	0	4	0	Thunderstorm Winds
Two trees fell through the roofs and windows of two homes. Several power lines and trees were downed by thunderstorm winds; one tree fell onto an apartment building.									
Hampshire County Augusta	18	2200EST- 2300EST			0	0	0	0	Small Stream Flooding
Small streams overflowed with mud and debris on roads.									
Berkeley County	18	2000EST- 19 0100EST			0	0	4	0	Flash Flood
Five to seven inches of rain in 2 to 3 hours caused widespread flash flooding; many basements were flooded.									
WV007-008-010-011 New, Greenbrier, and Potomac River Basins	01- 30				0	0	0	0	Drought
The drought continued in the Potomac River basin, but it's severity eased with 1 to 2 inches of rain. Drought conditions spread south and east to include the Greenbrier Valley. Meanwhile, above normal rainfall fell over most of the western lowlands, improving surface water supply. State assistance to augment public water supply ended.									
WISCONSIN									
Milwaukee County 1 E St. Francis	03	1720CDT			0	0	0	0	Funnel Clouds
A pair of funnel clouds were sighted over Lake Michigan just off shore from St. Francis.									
Lacrosse County Lacrosse	09	1615CDT			0	0	?	0	Hail (1.00)
Lacrosse	09	1630CDT			0	0	?	0	Hail (0.75)
Lacrosse	09	1645CDT			0	0	5	0	Hail (1.00)

Storm Data and Unusual Weather Phenomena

September 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
WISCONSIN Cont'd									
Milwaukee County									
Whitefish Bay	09	1749CDT			0	0	?	0	Hail (0.75)
Milwaukee	09	1752CDT			0	0	?	0	Hail (0.75)
West Allis	09	1802CDT			0	0	?	0	Hail (1.00)
Milwaukee	09	1809CDT			0	0	4	0	Hail (1.00)
Milwaukee	09	1829CDT			0	0	4	0	Hail (2.00)
Milwaukee	09	1832CDT			0	0	4	0	Hail (1.75)
St. Francis	09	1833CDT			0	0	4	0	Hail (0.75)
Waukesha County									
Brookfield	09	1754CDT			0	0	?	0	Hail (0.75)
Shawano County									
Tigerton	09	1745CDT			0	0	4	0	Thunderstorm Winds
1 S Gresham	09	1800CDT			0	0	?	0	Thunderstorm Winds
Shawano	09	1815CDT			0	0	4	0	Thunderstorm Winds
Brown County									
Suamico	09	1905CDT			0	0	?	0	Thunderstorm Winds
Oconto County									
2 S Oconto	09	1905CDT			0	0	4	0	Thunderstorm Winds
Marinette County									
Peshtigo	09	1920CDT			0	0	4	0	Thunderstorm Winds
Marinette	09	1925CDT			0	0	4	0	Thunderstorm Winds
Door County									
Sturgeon Bay	09	1926CDT			0	0	?	0	Thunderstorm Winds
Washington Island	09	1930CDT			0	0	4	0	Thunderstorm Winds
Baileys Harbor	09	1930CDT			0	0	4	0	Thunderstorm Winds
Kewaunee County									
Slovan	09	1925CDT			0	0	4	0	Thunderstorm Winds
Algoma	09	1930CDT			0	0	?	0	Thunderstorm Winds
Walworth County									
3 N Elkhorn	09	2023CDT			0	0	?	0	Thunderstorm Winds (G56)

An isolated severe thunderstorm dropped hail up to 1.00 inch in diameter in Lacrosse causing hail damage to at least 65 cars, mostly at auto dealerships. Scattered severe thunderstorms then deposited hail up to 2.00 inches in diameter over the Milwaukee area causing damage to numerous vehicles. Over northeast Wisconsin clusters of severe thunderstorms generated winds up to 60 mph which downed power lines, hundreds of trees and caused property damage. Especially hard hit were the areas of Shawano (Shawano County), Peshtigo (Marinette County) and Washington Island (Door County).

Jackson County									
4 W City Point	14	1630CDT			0	0	?	0	Thunderstorm Winds
Wood County									
Dexterville	14	1645CDT			0	0	?	0	Thunderstorm Winds
2 E Dexterville	14	1700CDT			0	0	?	0	Thunderstorm Winds
Vesper	14	1720CDT			0	0	?	0	Thunderstorm Winds
Juneau County									
Mauston	14	1830CDT			0	0	?	0	Thunderstorm Winds
Adams County									
5 S Brooks	14	1900CDT			0	0	4	0	Thunderstorm Winds (G52)
Shawano County									
2 W Green Valley	14	1900CDT	0.1	25	0	0	4	0	Tornado (F0)
Marquette County									
Oxford	14	1905CDT			0	0	?	0	Thunderstorm Winds

Scattered severe thunderstorms with violent winds caused minor property damage to homes and camping trailers while knocking over numerous trees. A small tornado touched down briefly near Green Valley (Shawano County) causing damage to trees and a pair of sheds.

WYOMING

Sweetwater County									
2 E Green River	07	1550MST			0	0	0	0	Funnel Cloud

Storm Data and Unusual Weather Phenomena

September 1991

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

WYOMING Cont'd

Scattered thunderstorms in southwestern Wyoming spawned a funnel cloud just east of Green River at 1550 MST.

Yellowstone Park	07	1830MST			0	0	0	0	Mud Slide
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Moderate rain through the day produced mud slides in Yellowstone Park the afternoon and evening of the 7th. The largest slide was in Gibbon Canyon. A plow cleared the road in less than 2 hours.

Lincoln County
7 W LaBarge

	19	1640MST	0.3-	25-					
		1641MST	0.5	50	0	0	0	0	Tornado (F0)

A thunderstorm in southwestern Wyoming produced a tornado. The tornado touched down for a brief time and uprooted some trees along a ridge 7 miles west of LaBarge.

Sweetwater County
18 W Farson

	09	1656MST	0.2-	20-					
		1658MST	0.4	40	0	0	0	0	Tornado (F0)

The sheriff's office in Sweetwater County reported a tornado 18 miles west of Farson and on the ground for 2 minutes. No damage or injuries were reported from the storm.

Park County

Cody	10	1748MST			0	0	0	0	Hail (0.75)
Cody	10	1810MST			0	0	5	0	Hail (1.75)
Cody	10	1830MST			0	0	0	0	Hail (1.50)

A series of thunderstorms around Cody brought hail to that town the evening of the 10th. Some property damage with no injuries reported.

12 W Rock Springs	10	1755MST			0	0	0	0	Funnel Cloud
3 NE Rock Springs	10	1755MST			0	0	0	0	Funnel Cloud

Two funnel clouds were noted by the public the evening of the 10th.

Big Horn County

5 E shell	10	1840MST			0	0	0	0	Hail (0.85)
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Park County

Powell	10	1845MST			0	0	0	0	Hail (1.00)
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Hot Springs County

40 W Thermopolis	10	1905MST			0	0	0	0	Hail (1.00)
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Big Horn County

3 E Lovell	10	1910MST			0	0	0	0	Thunderstorm Winds (G50)
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Scattered thunderstorms in north-central Wyoming brought hail and gusty winds to three counties during the evening of the 10th. No damage or injuries were reported.

Laramie County

4 NE Cheyenne	12	1454MST			0	0	0	0	Funnel Cloud
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2 E Cheyenne	12	1510MST			0	0	0	0	Funnel Cloud
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The public reported a funnel cloud 4 miles northwest of Cheyenne the afternoon of the 12th. The public noted a funnel cloud 2 miles east of the airport in Cheyenne at 1510 MST.

WYZ004

	15	1700MST-							
	16	0600MST			0	0	0	0	Heavy Snow

A storm brought 7 inches of snow to Burgess Junction in the Big Horn Mountains the night of the 15th and the morning of the 16th.

ALASKA, Northern

AKZ024

Saint Lawrence Island

	14	0900AST-							
		2400AST			0	0	?	0	High Winds

A moderately strong low pressure system in the Bering Sea caused gale force northerly winds over St. Lawrence Island; Gambell had peak winds of 44 knots.

Storm Data and Unusual Weather Phenomena

September 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, Southern									
Kodiak Island	02	1200AST			?	?	?	?	High Winds
	A 1000 mb low centered 50 miles wouth of Sand Point with a strong trough extending eastward, brought sustained winds to 46 mph at Sitkinak Airport. The National Weather Service at Kodiak State Airport recorded sustained northeast winds of 35 mph with a peak gust of 44 mph.								
St. Paul Island	02	2200AST			?	?	?	?	Record High Temperature
	Under sunny skies, the temperature climbed to 55 degrees which broke the old record of 54°F which was set in 1989. This was the Islands first sunny day since July 6th - 60 days ago.								
St. Paul Island	06 07	1500AST- Unknown			?	?	?	?	Record Rainfall
	Two daily rainfall records were broken. On the 6th, 0.67 inches broke the previous record of 0.55 inches which was set in 1964. On the 7th, 1.21 inches of rain fell and exceeded the old record of 0.79 inches that was set in 1949.								
Alaska Peninsula Briston Bay Pribilofs	21 22	1500AST- Unknown			?	?	?	?	High Winds
	An intense low pressure area that moved to the Alaska Peninsula, sustained winds of 45 mph with gusts to 60 mph. Cold Bay recorded a wind gust of 75 mph with frontal passage. King Salmon recorded gusts to 60 mph. Sustained winds of 40 mph with gusts to 53 mph were observed at St. Paul Island.								
Kodiak Island	28	0000AST			?	?	?	?	Record Rainfall
	At the Kodiak State Airport, 2.52 inches of rain fell that set a new daily rainfall record. The old record was 1.57 inches and was set in 1985.								
Aleutians Alaska Peninsula	28 30	2100AST- Unknown			?	?	?	?	High Winds
	An intense storm moving along the Aleutians brought 45 to 65 mph winds to the area. Amchitka observed wind gusts over 70 mph. Shemya recorded gusts over 65 mph while Akak and Cold Bay reported 60 mph gusts.								
ALASKA, Southeastern									
	None reported.								
HAWAII									
Oahu	08	1320HST			0	0	3	0	Dust Devil
	A large dust devil in the Maili area caused minor damage to two homes. One house lost part of its roof.								
Oahu	21	1400HST			0	0	3	0	Flood
	A small cyclonic vortex moved across Oahu accompanied by heavy showers. Minor street flooding occurred from the Kalihi area eastward to Aina Haina and Hawaii Kai.								
Hawaii	22	Unknown			0	0	4	0	Flash Flood
	Heavy rains from the North Hilo area northward along the Hamakua coast caused some streams to overflow and some rock and mud slides.								
PACIFIC									
	None reported.								

Storm Data and Unusual Weather Phenomena

September 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of		Estimated		Character of Storm
					Killed	Injured	Property	Crops	
PUERTO RICO									
Culebra	05	1705AST	?	?	0	0	0	0	Waterspout
									A waterspout was sighted by a boater in the vicinity of Culebra Island.
Ceiba	08	1416AST	?	?	0	0	0	0	Waterspout
									A waterspout was sighted by military aircraft about 3 miles southeast of Ceiba.
Maricao Orocovis	12	1500AST			0	0	4	0	Thunderstorm Winds
									Thunderstorms produced pea-size hail over both municipalities, and strong winds downed several trees and damaged the roofs of two houses in Orocovis. Also, NOAA Weather Radio transmitter in Maricao was knocked off the air for several hours due to a power failure in that area.
Guayanilla	16	1400AST			0	0	0	0	Mudslide
									The roads were impassable due to a mudslide that caused many cars and people to be stranded for several hours.
Fajardo	18	1545AST	?	?	0	0	0	0	Waterspout
									Two waterspouts were sighted; one was sighted 10 miles east of Fajardo, and the other one was sighted 1.5 miles east of Roosevelt Roads Naval Station in Ceiba.
Caguas	19	1400AST			0	0	3	0	Thunderstorm Winds
									Trees and power lines were blown down as well as several commercial signs due to thunderstorm winds.
PRZ001-005	22	1300AST- 1500AST			0	0	0	0	Heavy Rain
									One to two inches of heavy rain fell during the afternoon over the eastern portion of Puerto Rico and caused urban flooding and minor mudslides along a few roads. There were also reported of downed trees and power lines due to thunderstorm winds.
San Juan	27	1400AST- 1500AST			0	0	0	0	Urban and Small Stream Flood
									Heavy rains of 1 to 2 inches fell in less than 2 hours in the San Juan metropolitan area and caused small streams and creeks to rise and flood low-lying areas. There was also wide-spread street flooding, and many cars and people were stranded.
Naguabo	29	0500AST			0	0	5	0	Heavy Rain
									The foundation of a three-story house in Barrio Daguao, gave way due to saturation and caused the house to collapse.
San Sebastian	29	0900AST			0	0	?	0	Heavy Rains
									Due to several days of rain, 300 feet of a road subsided 1 foot.
U.S. VIRGIN ISLANDS									
St. Thomas	02	1315AST	?	?	0	0	0	0	Waterspout
									This waterspout was sighted 5 miles southeast of St. Thomas by a Coast Guard vessel and St. Thomas Tower.
St. Thomas	06	1130AST	?	?	0	0	0	0	Waterspout
									This waterspout was sighted by a boater 2 miles south of St. Thomas Harbor.
St. Croix	11	1440AST	?	?	0	0	0	0	Waterspout
									A waterspout was sighted 10 miles west of St. Coix.
St. Thomas	12	1420AST			0	0	0	0	Funnel Cloud
									There were several funnel clouds about 5 miles west of St. Thomas.

Storm Data and Unusual Weather Phenomena

September 1991

Location	Date	Time Local/ Standard	Path Length (Miles)	Path Width (Yards)	Number of Persons		Estimated Damage		Character of Storm
					Killed	Injured	Property	Crops	
U.S. VIRGIN ISLANDS Cont'd									
St. Thomas	15	1200AST	?	?	0	0	0	0	Waterspout
Waterspouts were sighted about 10 miles west of St. Thomas.									
St. Croix	19	1125AST	?	?	0	0	0	0	Waterspout
A waterspout was sighted by aircraft 17 miles west of St. Croix.									
St. Thomas	24	1255AST	?	?	0	0	0	0	Waterspout
A waterspout and three funnel clouds were sighted between eastern Puerto Rico and St. Thomas.									
St. Croix	27	1200AST	?	?	0	0	0	0	Waterspout
A waterspout was sighted by a pilot 17 miles west of St. Croix.									

CORRECTIONS

OCTOBER 1990 - Page 14, Summary of October 18th Tornadoes, Rhode Island entry should read one F1 tornado not one F0.

APRIL 1991 - Page 115

MAZ003-008 Coastal Berkshires	21	1130EST- 1600EST	0	0	6	0	High Wind
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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 1700 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 SUMMARY

SEPTEMBER 1991

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

STORM SUMMARY

SEPTEMBER 1991

TYPE	NEW MEXICO	NEW MEXICO	NEW MEXICO	NORTH CAROLINA	NORTH DAKOTA	OHIO	OKLAHOMA	OREGON	PENNSYLVANIA	RHODE ISLAND	SOUTH CAROLINA	SOUTH DAKOTA	TENNESSEE	TEXAS	UTAH	VERMONT	VIRGINIA	WASHINGTON	WEST VIRGINIA	WISCONSIN	WYOMING	ALASKA	HAWAII	PACIFIC	PUERTO RICO	VIRGIN ISLANDS	& INJURY NATIONALLY DEATHS
TORNADOES								0		0						0		0						0	0		
Number					1				2			1		3	2					1	2						
Days					5				0			1		0	0					0	0						10
Deaths																											
Injuries																											
Property Damage																											
Crop Damage																											
HAIL																											
Deaths	0	0																									
Injuries	0	0																									
Property Damage	0	0																									
Crop Damage	0	0																									
THUNDERSTORM WINDS																											
Deaths	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Injuries	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Property Damage	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Crop Damage	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
HIGH WINDS																											
Deaths	0	0	1																								1
Injuries	0	0	0																								
Property Damage	0	0	0																								
Crop Damage	0	0	0																								
LIGHTNING																											
Deaths									1																		5
Injuries									2																		36
Property Damage									0																		
Crop Damage									0																		
FLASH FLOODS																											
Deaths																											1
Injuries																											
Property Damage																											
Crop Damage																											
FLOODS																											
Deaths																											
Injuries																											
Property Damage																											
Crop Damage																											
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Deaths																											
Injuries																											
Property Damage																											
Crop Damage																											
ALL OTHERS																											
Deaths																	1										2
Injuries																											
Property Damage																											
Crop Damage																											

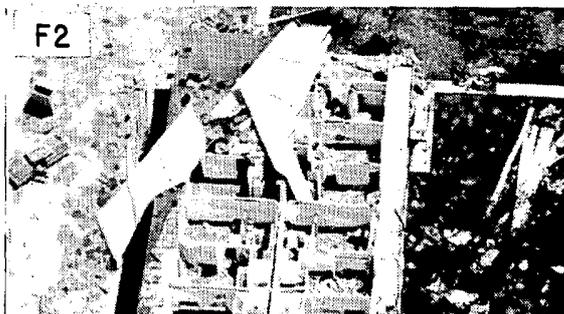
- 1 Less than \$50
- 2 \$50 to \$500
- 3 \$500 to \$5,000
- 4 \$5,000 to \$50,000
- 5 \$50,000 to \$500,000
- 6 \$500,000 to \$5 Million
- 7 \$5 Million to \$50 Million
- 8 \$50 Million to \$500 Million
- 9 \$500 Million to \$5 Billion

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

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

Definition of Fujita Tornado Scale (F scale)

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



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



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

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



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

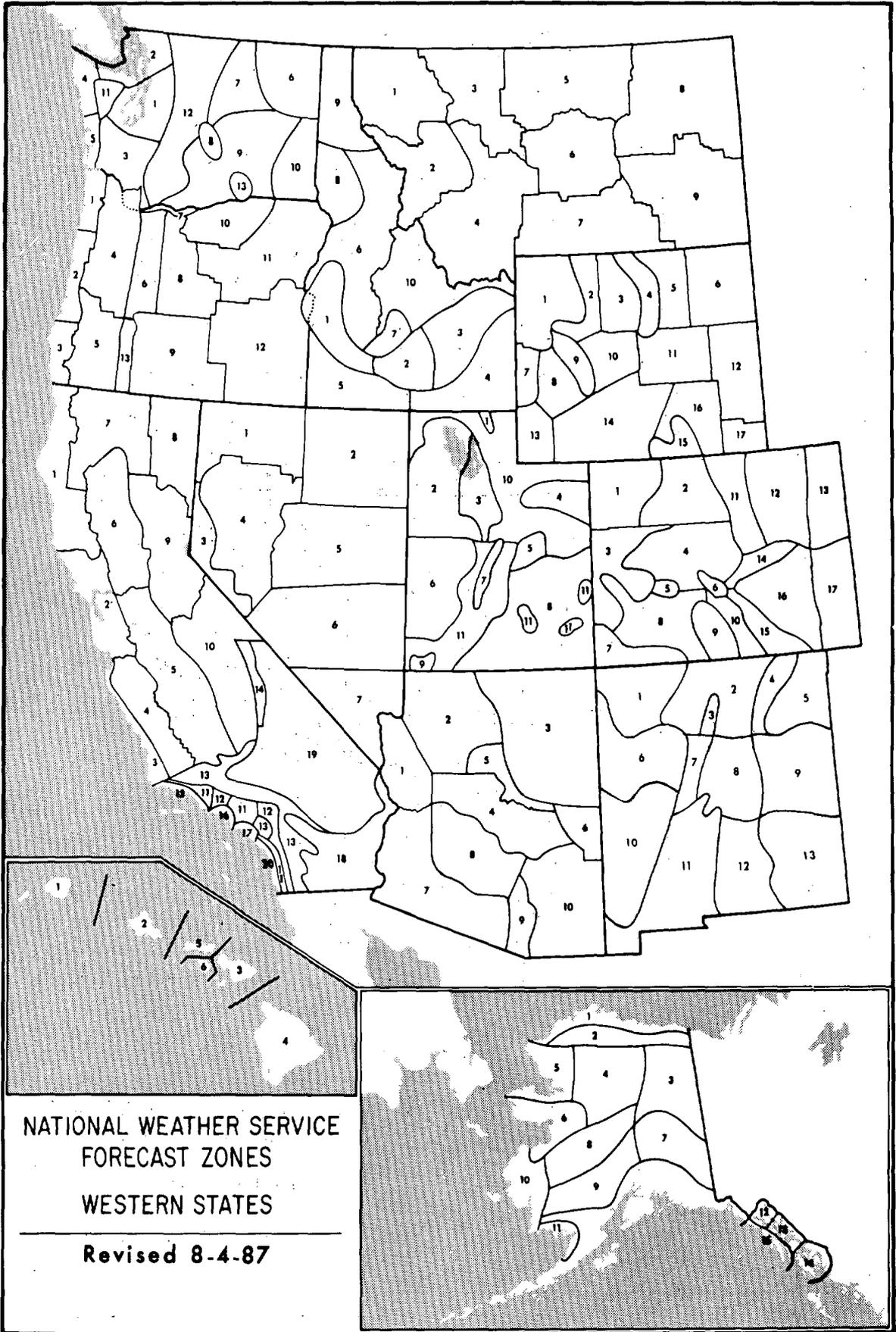
(F5) Incredible tornado (261-318 mph): Incredible damage
Strong frame houses lifted off foundations and carried considerable distance to disintegrate; automobile-sized missiles fly through the air in excess of 100 m; trees debarked; incredible phenomena will occur.



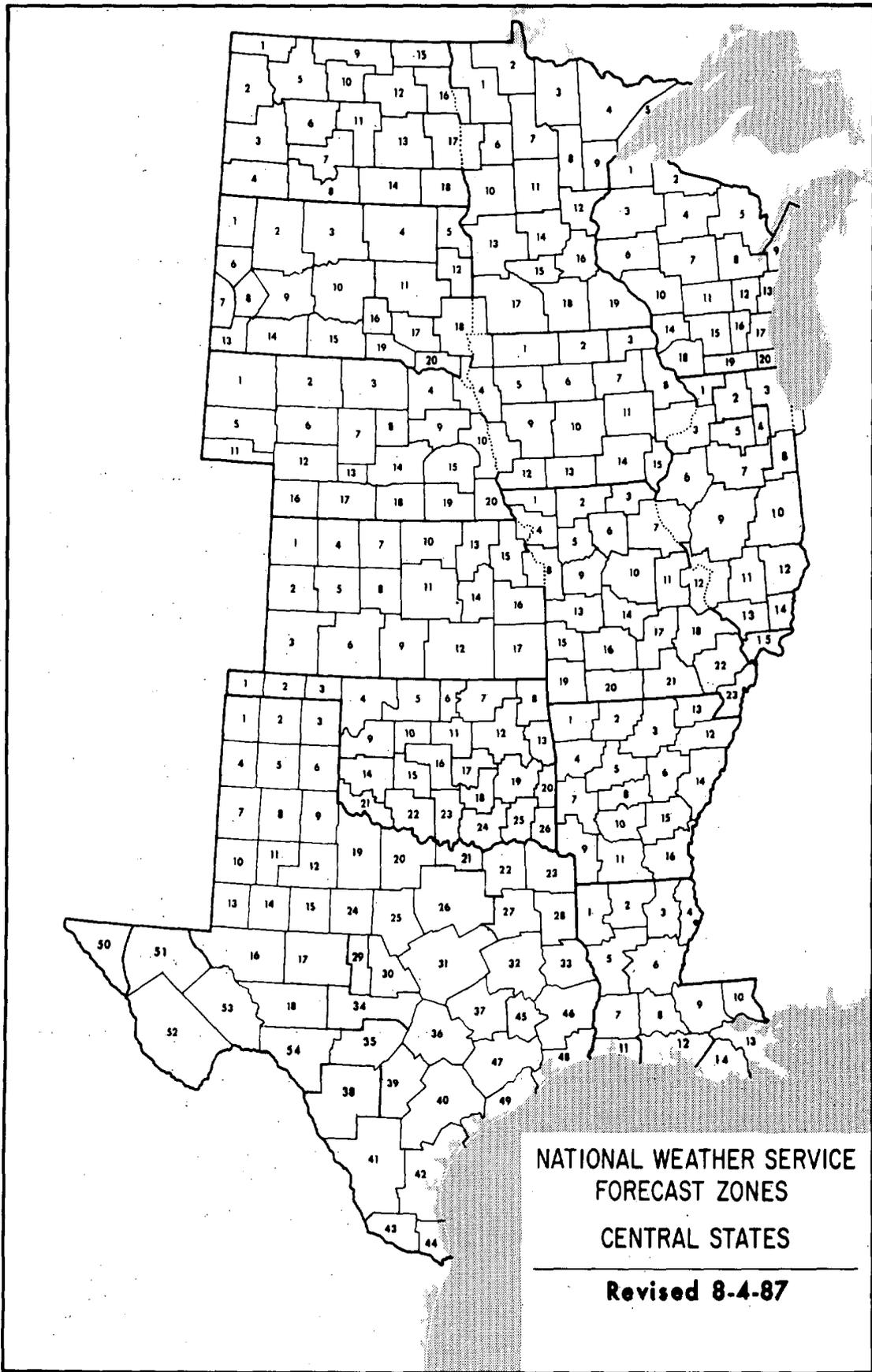
(F6-F12) (319 mph to Mach 1, the speed of sound):
The maximum wind speeds of tornadoes are not expected to reach the F6 wind speeds.

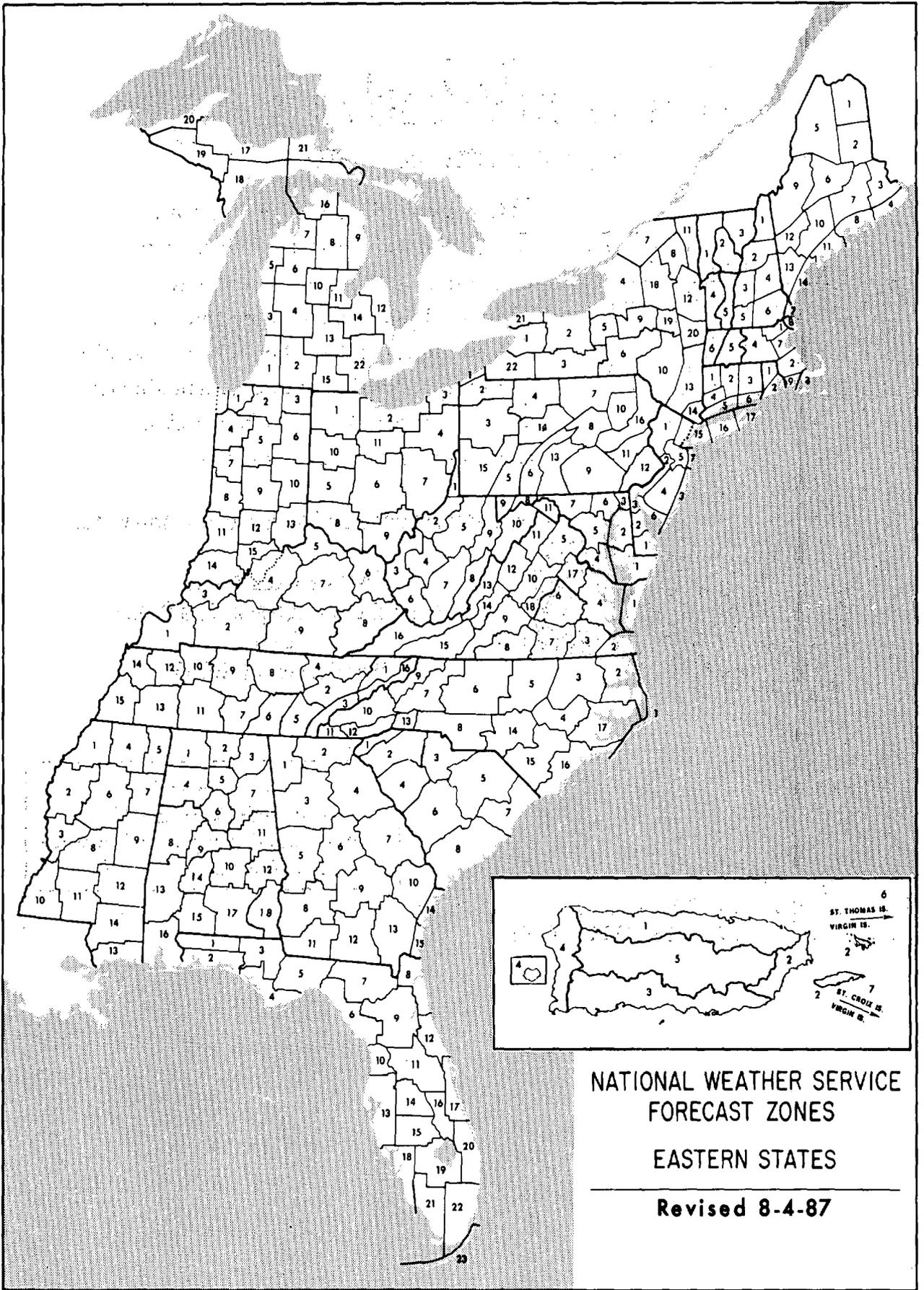
-
- (F0+F1) Weak Tornado
 - (F2+F3) Strong Tornado
 - (F4+F5) Violent Tornado
-

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



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

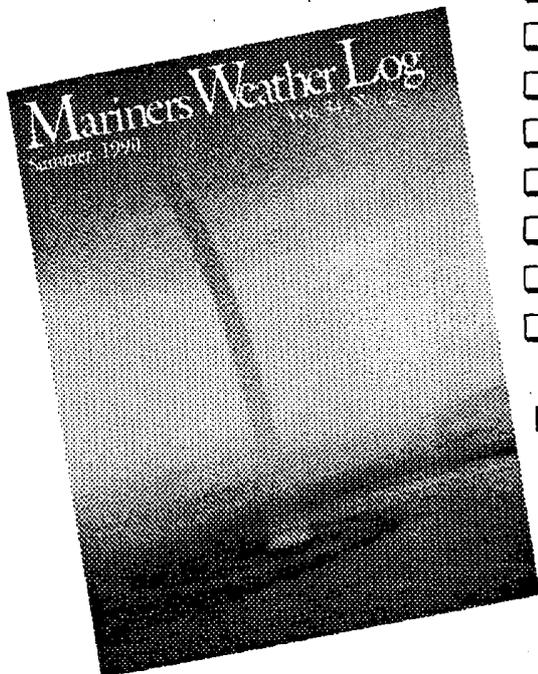




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