

JANUARY 1991

VOLUME 33

NUMBER 1

# 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: East Fork White River flooding on State Route 57, one-quarter mile north of bridge at Petersburg, Indiana, looking east. The trees were damaged by the June 2, 1990 tornado. (Photo credit: Dave Sherrieb, WSFO, Indianapolis)

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### **STORM DATA**

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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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Marietta, GA 30062

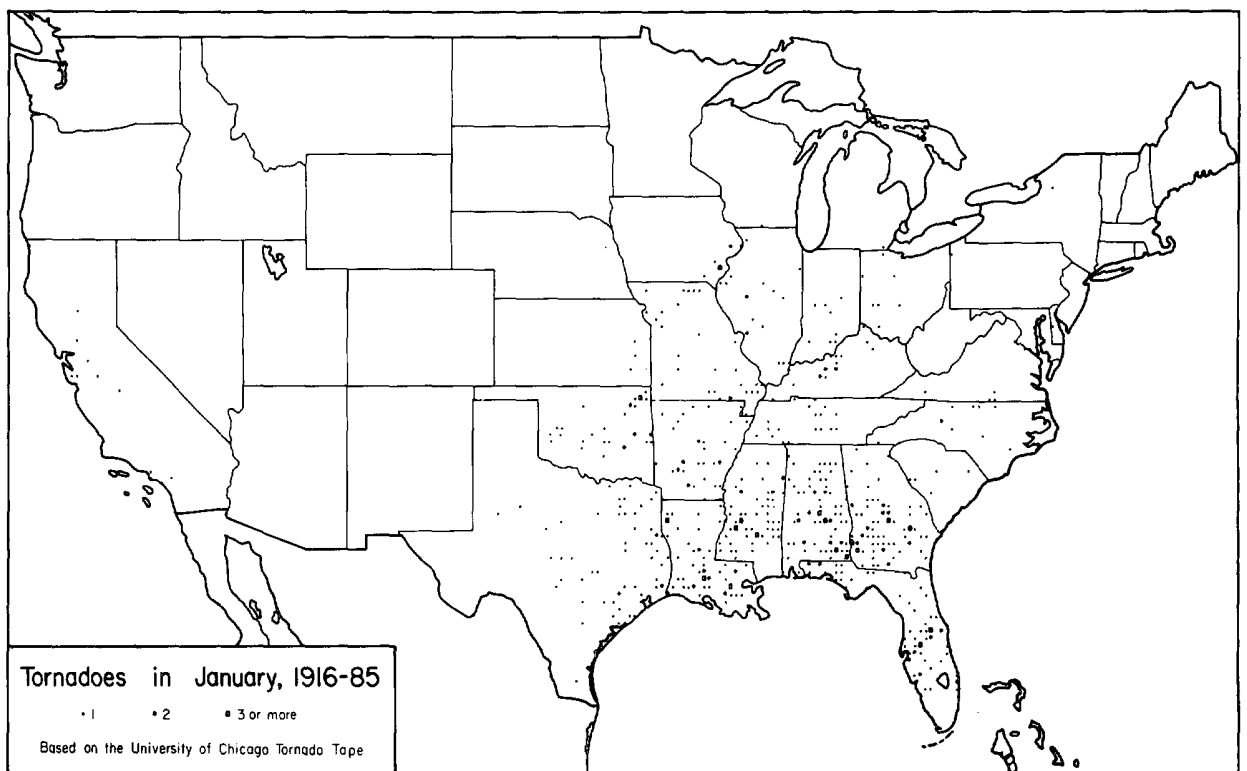
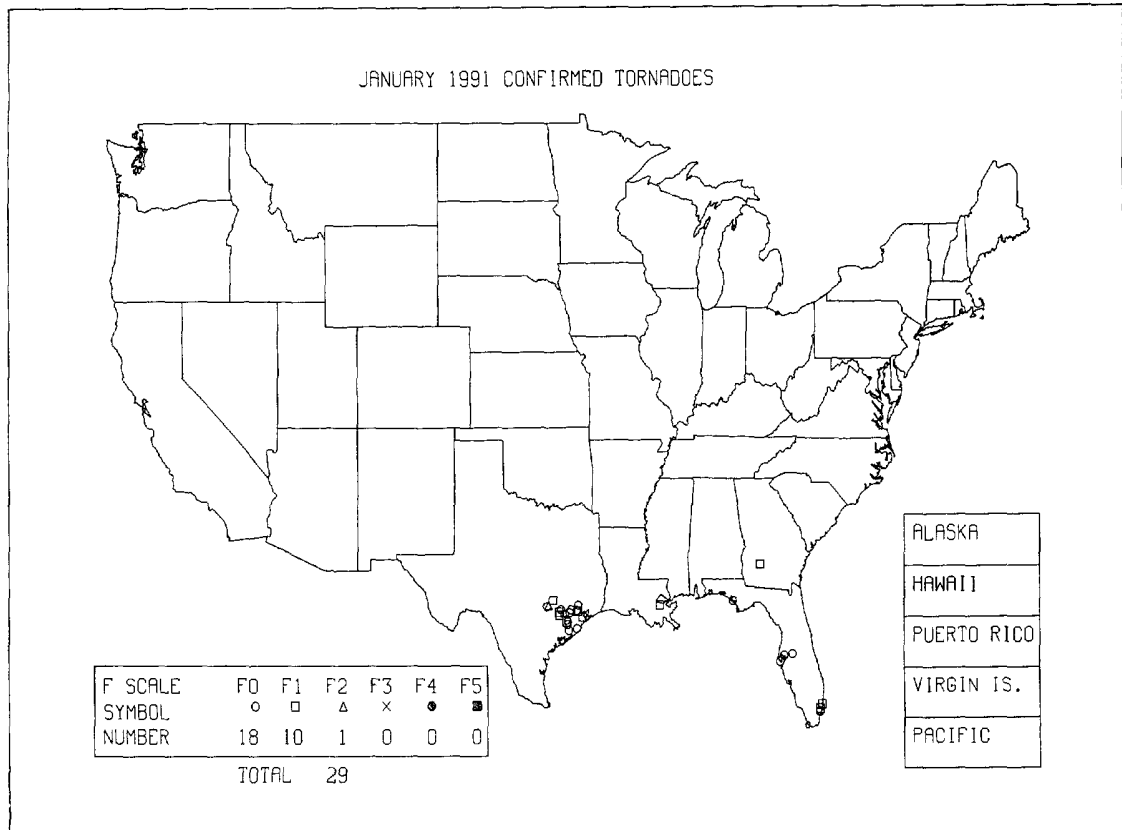
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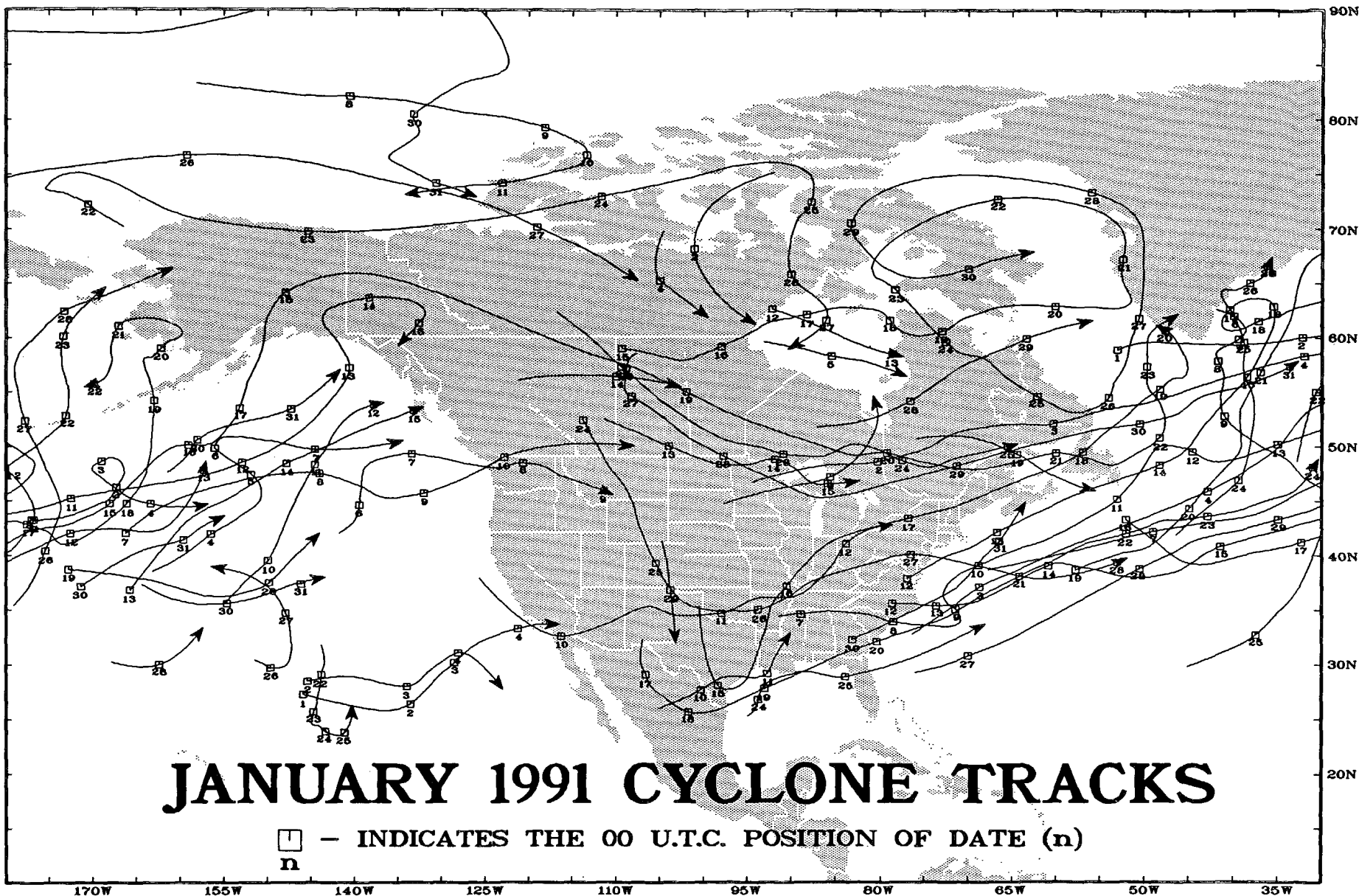
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Director  
National Climatic Data Center

# OUTSTANDING STORMS OF THE MONTH





# JANUARY 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

# 1. PRECIPITATION AND TEMPERATURE ANOMALIES - JANUARY 1991

Table 1 lists the 97-year temperature and precipitation rankings for the nine climatically homogeneous regions outlined in Fig. 1. January 1991 finished as the 32nd coldest January since 1895 with temperatures averaging slightly below the long-term mean. A few areas reported warmer-than-normal January average temperatures—the southern two-thirds of Florida, coastal North Carolina, and central Alaska experienced a +4°F departure from normal while northern Maine, parts of the Great Basin, and the central Rockies endured temperatures more than 4°F below normal (See Fig. 4, page 7). Precipitation was slightly above the long-term mean; the 61st wettest January during the past 97 years. Precipitation varied greatly over the United States. Georgia and Florida recorded the wettest January on record since 1895, while Louisiana and Texas observed the third and fifth wettest January, respectively. Regionally, the Southeast had the second wettest January in the last 97 years. In contrast, extreme drought continued in California, eastern Oregon, and central Washington. Subnormal precipitation also was observed across the northern Plains, upper Midwest, central Great Plains, and the Rockies. The West, the Northwest, and the West-North Central regions saw the fifth, ninth, and thirteenth driest January, respectively of the last 97 years. The below-normal precipitation across much of the nation offset the wet conditions in the Deep South. (See Figs. 2 and 3 on next page.)

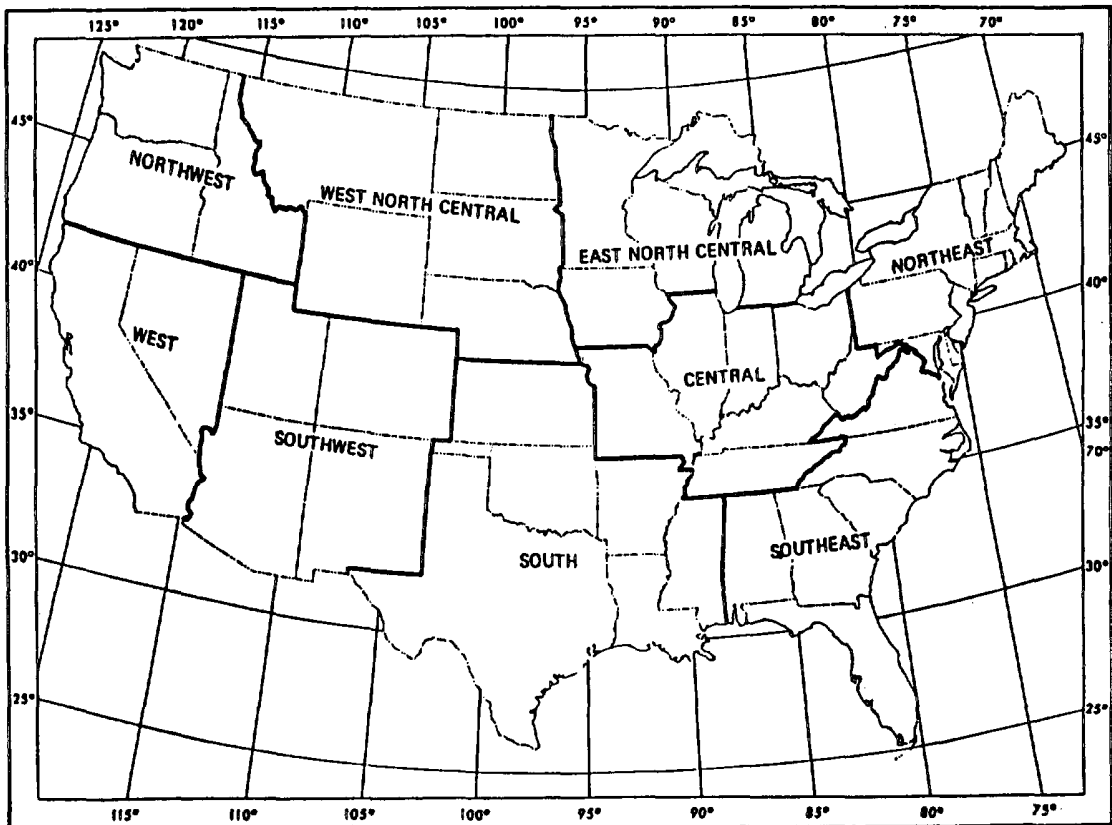
TABLE 1. TEMPERATURE AND PRECIPITATION RANKINGS FOR JANUARY 1991, BASED ON THE PERIOD 1895-1991.

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

REGION	PRECIPITATION	TEMPERATURE
Northeast	42	53
East North Central	26	32
Central	38	37
Southeast	96	65
West North Central	13	40
South	89	24
Southwest	54	27
Northwest	9	32
West	5	42
National	61	32

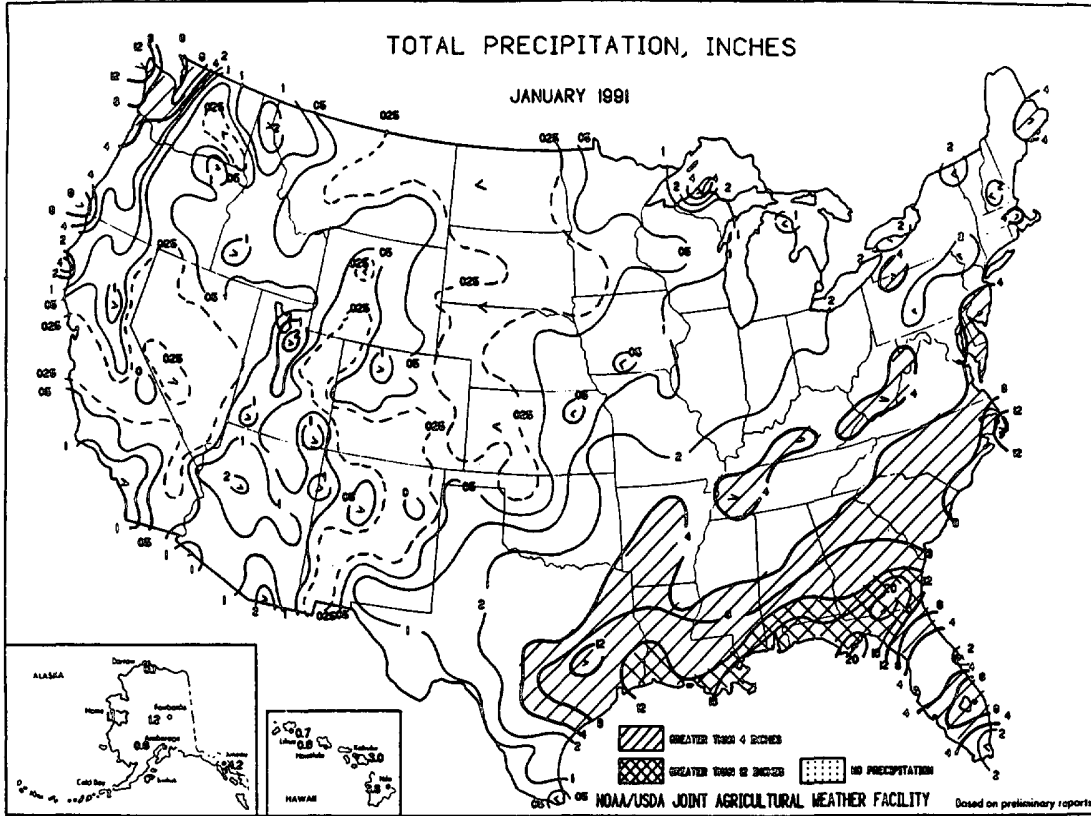
*From National Climatic Data Center*

Fig. 1



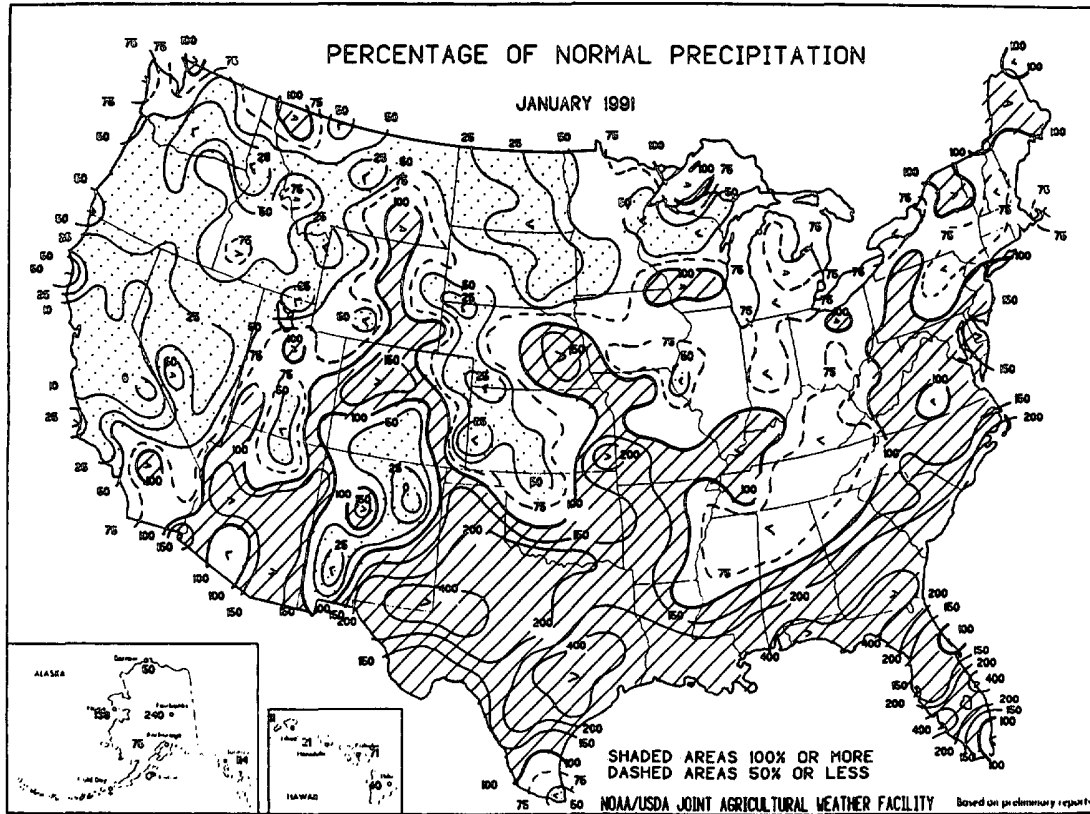
*From National Climatic Data Center*

Fig. 3



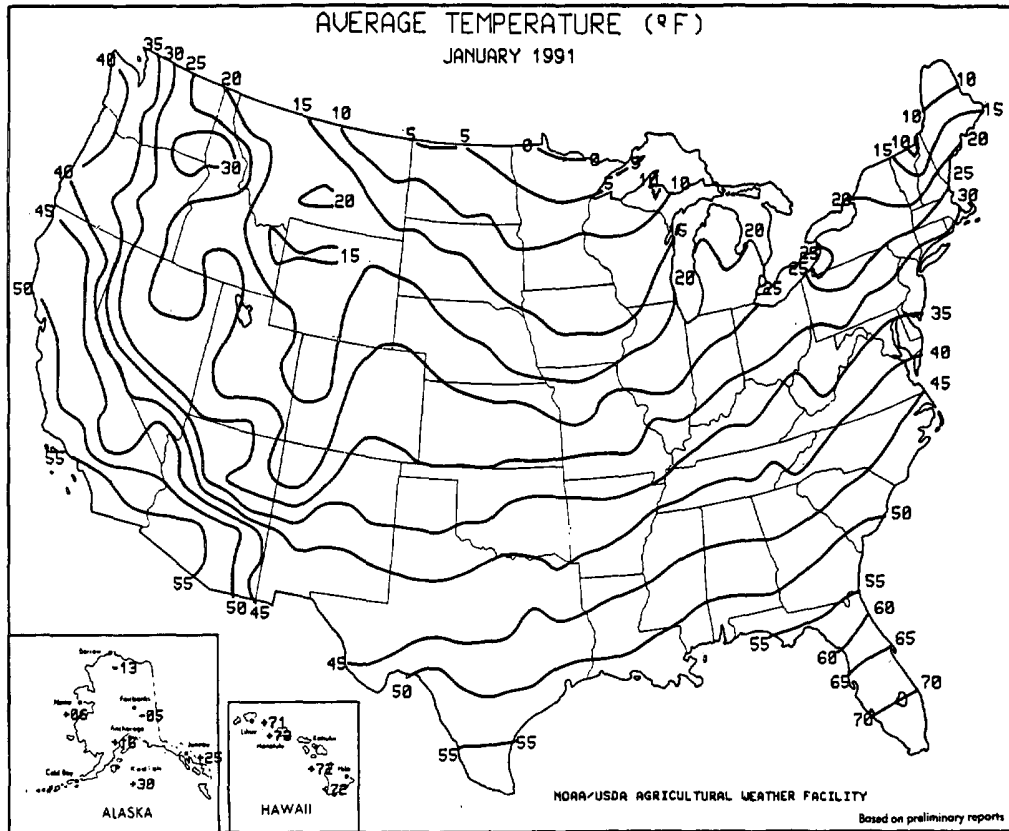
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Fig. 3



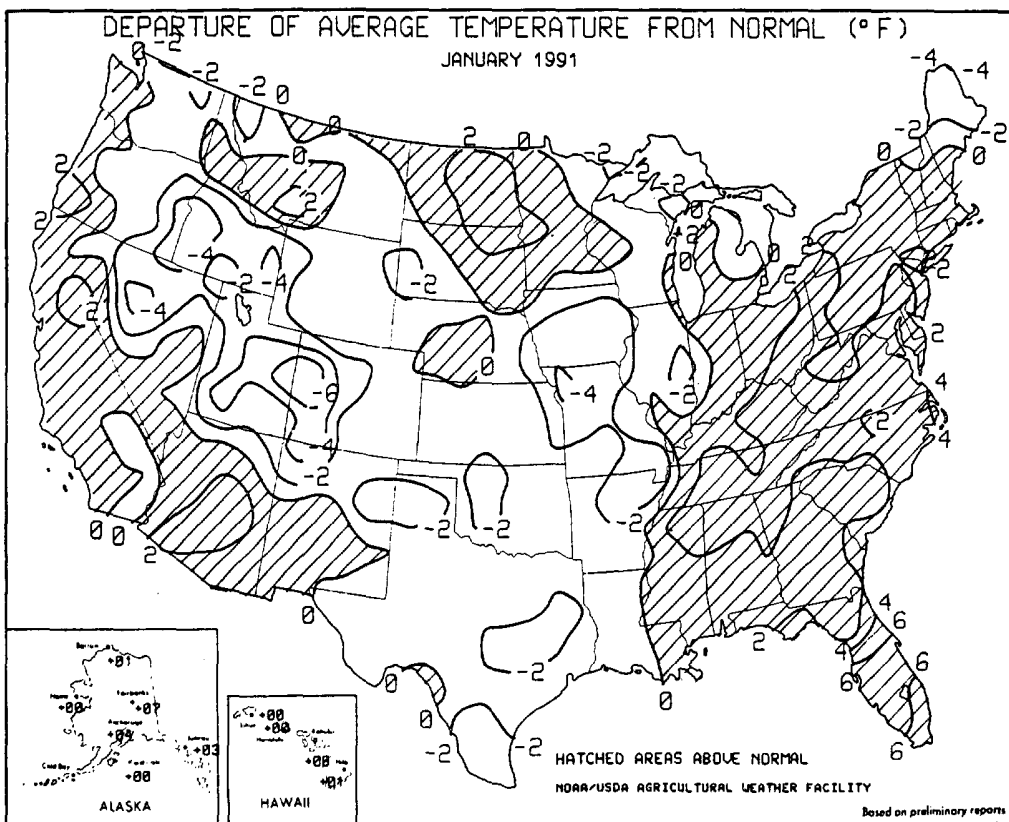
Reprinted from *Weekly Weather and Crop Bulletin* - February 5, 1991

Fig. 4



Reprinted from *Weekly Weather and Crop Bulletin* - February 5, 1991

Fig. 5



Reprinted from *Weekly Weather and Crop Bulletin* - February 5, 1991



## 2. FLOODING AND COLD CONTINUES IN INDIANA AND ILLINOIS - JANUARY 1-7

Floods from December 1990 continued into much of January. During the last week of December 1990 and the first week of January 1991, the Corps of Engineers estimated flood damage between \$50 to \$100 million dollars. Seventy-two of the 92 Indiana counties were declared disaster areas. The cold temperatures during this time froze the floodwaters and left several inches of ice in homes and on the roads. Similar conditions occurred in eastern and central

Illinois. Most of the region suffered the worst floods in the last 15 to 20 years.

The following photographs are of the flooding event that occurred in Indiana and Illinois. The following eight photos were taken by Steve Sumy on January 3, 1991 at an average flight level of 2,500 feet. *(Photos were supplied by Shawn B. Harley, WSFO, Indianapolis.)*



White River—near Highway 41 along Knox and Gibson counties.



White River—upstream from Hazelton, near Bowman, Indiana.

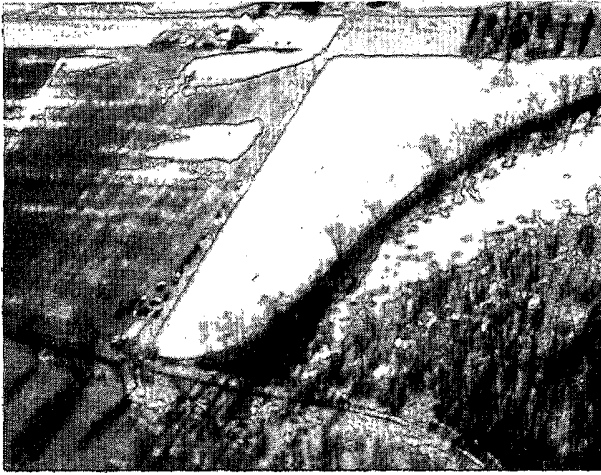


Agricultural levees failed (near center part of slide) near the east fork of White River.



White River near Edwardsport. Notice where the water is overflowing the levee.

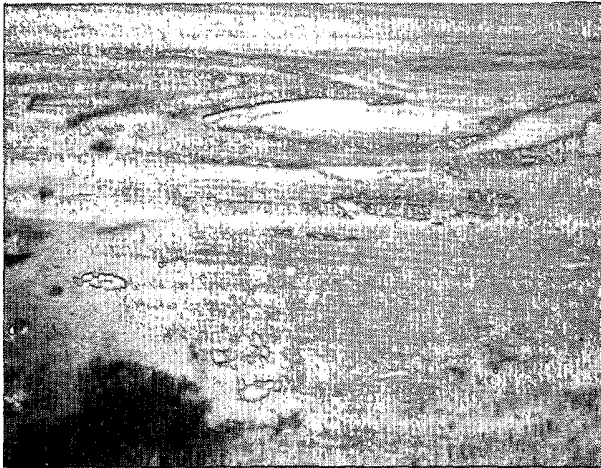




Elnora, Indiana, where the levee failed. Only the outlying areas were flooded; the town itself was not severely affected.



Confluence of White (right) and Wabash rivers (left), looking north.



Flooded farming area just north of Grayville, Illinois.



The Ohio River flooding a peninsula on the Kentucky side just southwest of Evansville. Notice the barges along the near bank of the river.

### 3. TORNADOES STRIKE TEXAS - JANUARY 14

Thunderstorms developing in southern-central and southeastern Texas produced severe weather along with seven tornadoes, which is a rarity in January in any part of Texas.

The Bastrop County, TX Department of Public Safety and the Bastrop County Sheriff's Office reported a weak (F0) tornado which lifted and dissipated. Twenty-five minutes later, a strong (F2) tornado formed which damaged three homes; destroying porches and roofs. It also killed young calves in a pasture. Hail up to 2

inches in diameter fell before the tornado hit.

A weak (F1) tornado hit a mobile home park in Columbus, TX destroying four mobile homes and injuring several residents; one died 13 days later. Six homes also were lost with damages estimated at \$35,000 per home. The 150-year-old William Harbert Plantation was destroyed. Power lines were knocked down and power was lost for three hours in the city. Total damages were placed at several million dollars. In all, there were 11 injuries and one death due to the tornado.

Tornadoes first struck Lee County at approximately 5:00 p.m. CST on the 14th. Below are photographs of the damage caused by an F1 tornado that struck the Dorman Sell ranch

southeast of Giddings. Notice the large piece of tin (left and top) about 35 feet up in the tree. (Bottom) Damage to a barn on the ranch. (Photo credit: Times and News, Giddings, Texas)





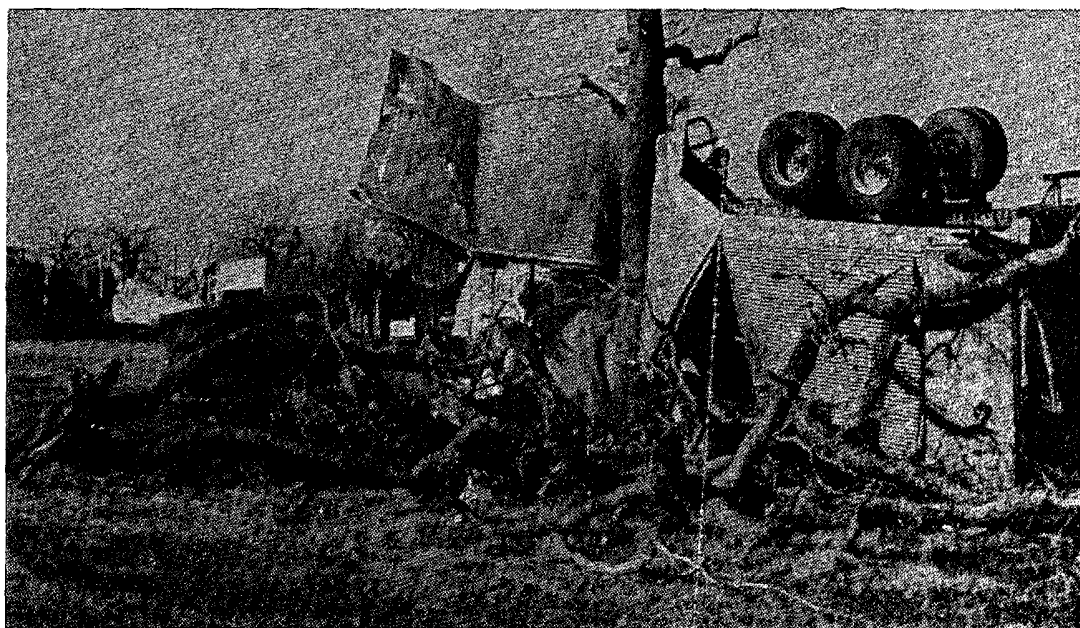
Tornadoes also occurred in Bastrop County. These tornadoes caused no injuries, but destroyed property including the hay barn above. *(Photo credit: The Smithville (TX) Times)*



Shown here is Mr. Lance Carter picking through the remains of his trailer located in Milentz Trailer Park on Texas Highway 71 in Columbus, TX. His trailer was damaged by an F1 tornado. *(Photo credit: The Post, Houston, TX)*



Four trailers were completely destroyed at the Milentz Trailer Park. A large portion of the rubble had been bulldozed before the photo was made. *(Photo credit: Headlight, Eagle Lake, Texas)*

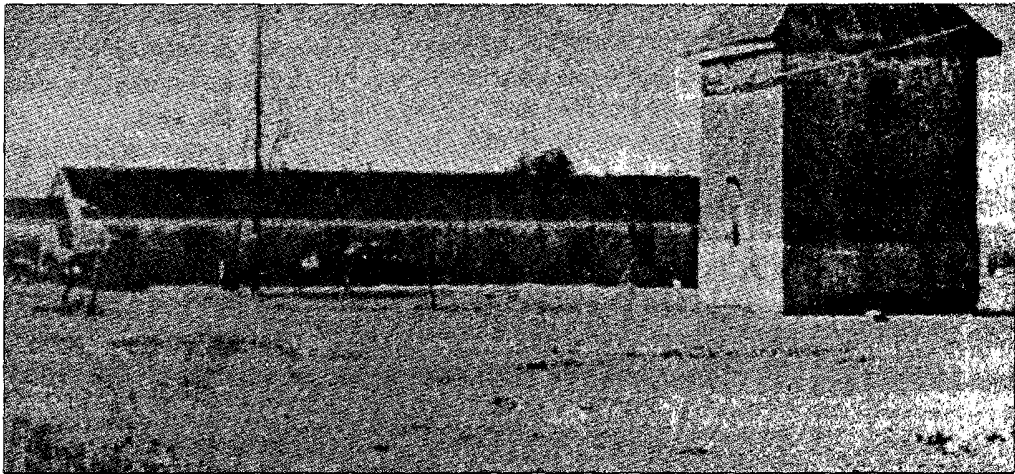


Property damage in Columbus included this tractor-semitrailer located on Reese Lane east of Columbus.

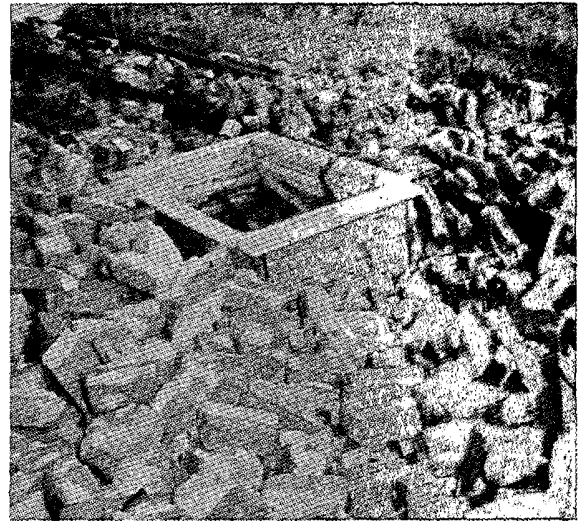
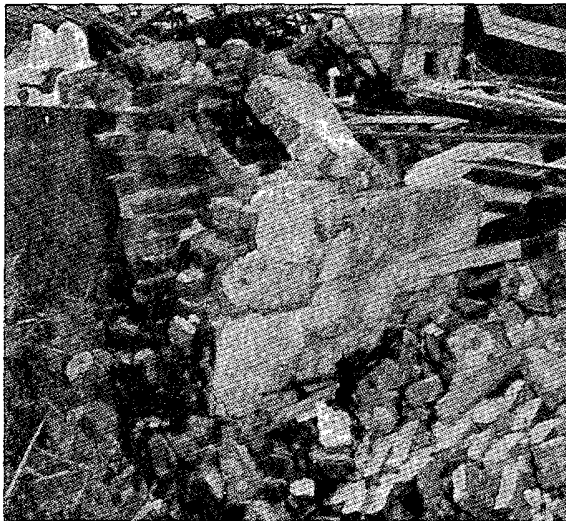


William Harbert's two-story brick smokehouse, built in 1857, was destroyed by a tornado. The building was located on an old county farm east of Columbus on Highway 90. *(Photo credit: Colorado County Citizen, Columbus, TX)*

**BEFORE. . .**

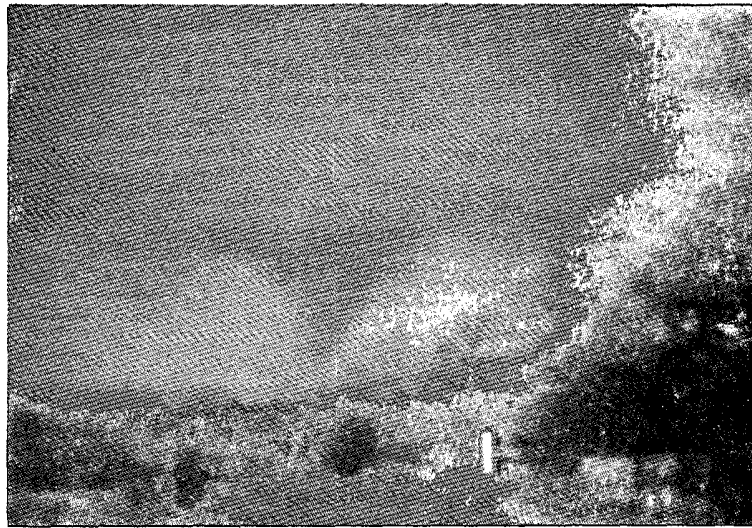


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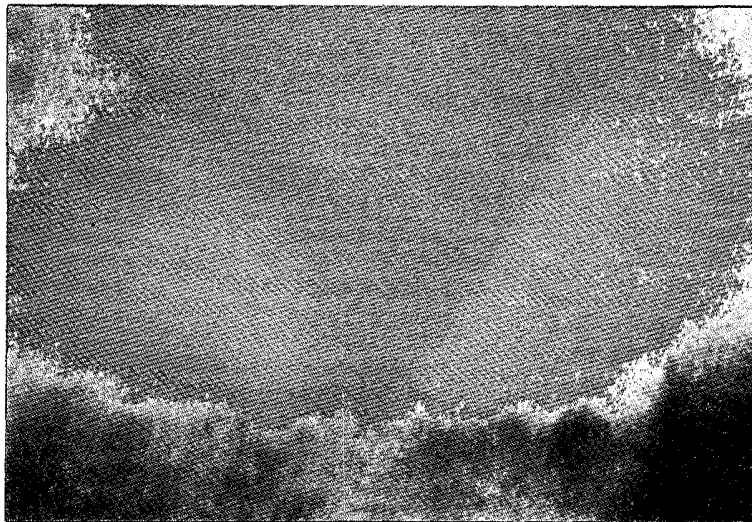


*(Above left)* Photo is of the one wall of the smokehouse left standing. The photo on the right shows the homemade bricks and a window frame. The window frame is almost 2-feet deep, showing how thick the walls were. The twisted steel girders *(left)* are all that remain of a large metal building after being hit by the same tornado as the above smokehouse. The metal girders collapsed on the pickup truck. *(Photo credit: Colorado County Citizen, Columbus, Texas)*

The following three video transfers are of a tornado that occurred in southeastern Bastrop County, Texas. This tornado occurred on January 14th in the afternoon (5:00 p.m. CST). (Photo credit: Donna/Edwin Zimmerhanzel. Tape provided by Troy Kimmel, Chief Meteorologist KVUE-TV, Austin, TX)



Tornado in the early stages of its life cycle.



Tornado is on the ground causing property damage.

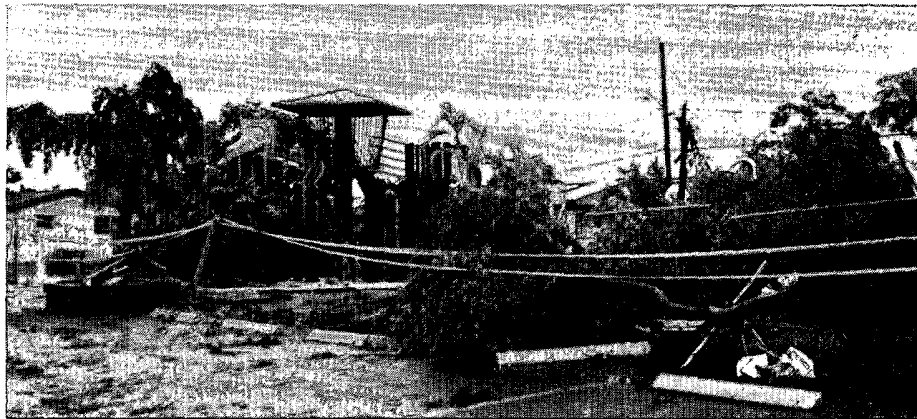


Tornado is lifting and dissipating. It later re-formed and caused more property damage.

#### 4. SUPERCELL HITS MIAMI - JANUARY 15TH

A tornadic supercell was observed at 3:10 p.m. EST over West Miami. Well-defined cyclonic circulation was present in the wall cloud. Tornado touchdown occurred near 3:15 p.m. EST. The tornado hit an elementary school causing light (F0) damage and injuring a teacher. A few minutes later, another tornado caused light tree damage about 2 miles south-southwest of the Miami International Airport. The mesocyclone passed over the airport and then produced a third tornado in Hialeah. The tornado caused weak (F1) damage along a 3.5-mile path: overturning cars, causing three minor injuries, and barely missing a major pari-mutuel race track between 3:35 p.m. and 3:45 p.m. EST. The supercell moved into Broward County where it delivered

the fourth and most intense tornado. Touchdown was in Miramar at 3:54 p.m. EST, approximately 1.5 miles south of North Perry Airport. The tornado (F1) then tracked to North Perry Airport and caused 22 aircraft to be destroyed. Hangar damage was limited to roofs, doors, and non-load-supporting walls. The South Campus of Broward County Community College was hit next, causing heavy damage to modular classrooms. The prefabricated metal gymnasium was flattened and one minor injury occurred. The tornado lifted about 4:05 p.m. EST, ending a 2.5-mile path. The mesocyclone, which lasted for over an hour, ended shortly after 4:10 p.m. EST. The supercell injured five people and caused several million dollars in damage.



Downed trees and a moved parking barricade in a neighborhood playground in Miramar, FL. (Photo credit: Photographer - Martin Nelson; supplied by Roger Edwards, National Hurricane Center, Coral Gables, FL)



Damaged and overturned aircraft at the North Perry Airport. (Photo credit: Photographer - Martin Nelson; supplied by Roger Edwards, National Hurricane Center, Coral Gables, FL)





# STORM DATA AND UNUSUAL WEATHER PHENOMENA

JANUARY 1991

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

## CALIFORNIA, Northern

Kern County	10	0300PST-			2	8	0	0	Dense Fog
San Joaquin County		1200PST			2	0	0	0	Dense Fog
Stanislaus County					1	0	0	0	Dense Fog

Dense fog in the San Joaquin Valley reduced visibilities to near zero. A 22-car pileup in Kern County resulted in two deaths, while single-car accidents in San Joaquin and Stanislaus counties caused three more deaths.

Southern Sierra Nevada and Tehachapi Mountains	16	0700PST-1900PST			0	0	0	0	High Wind
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Strong winds were induced by a pressure gradient between a high-pressure system in the Great Basin and a low-pressure system in Arizona.

Kern County	21	0045PST-1245PST			0	0	3	0	High Wind
-------------	----	-----------------	--	--	---	---	---	---	-----------

Santa Ana conditions produced sustained winds to 60 mph in the southern San Joaquin Valley.

## CALIFORNIA, Southern

CAZALL	16	All Day			0	1	?	0	High Winds
--------	----	---------	--	--	---	---	---	---	------------

Strong, gusty Santa Ana winds caused by a high-pressure system over Nevada and Utah, combined with an upper low-pressure system over Arizona, hit all of southern California. At 0250 PST, an estimated wind gust to 60 mph was reported at Rancho Cucamonga. Other wind reports included: 65 mph at March Air Force Base, 55 mph just off Point Dume, 50 mph at Mt. Wilson, and 45 mph at Ontario. The high winds in western Riverside County felled seven power poles in Mira Loma injuring a city worker. Some 8,000 customers in Corona, Norco, Mira Loma, and Ontario were without power. In Riverside, the winds cut power service to 3,000 to 4,000 customers. In the San Fernando Valley of Los Angeles County, winds to 60 mph snapped 13 power poles in Sylmar causing loss of power to some 4,000 customers. In Orange County (mainly in Costa Mesa and Santa Ana), more than 7,000 customers lost power.

## COLORADO

COZ001-002-003-004-007-008-009 Western Colorado Mountains and San Luis Valley	04-05				0	0	0	0	Heavy Snow
--	-------	--	--	--	---	---	---	---	------------

Heavy snow fell across most of the western two-thirds of the state, as a slow-moving winter storm tracked across the Rockies during the two-day period. Snowfall amounts ranged from 5 to 7 inches in the western and San Luis Valleys, to 12 to 24 inches in the mountains. Snowfall totals for the two days included 5 inches at Rangely (northwestern Plateau) and Alamosa; 7 inches at Fruita (near Grand Junction); 14 inches at Crested Butte and Telluride Ski Areas; 18 inches at Gothic Mountain, Irwin Lodge, and Pagosa Springs; 21 inches at Purgatory Ski Area, and 28 inches at Wolf Creek Ski Area. Of note was 20 inches of snow which fell at Durango.

COZ002-004-008 Northern, Central and Southwestern Mountains	13-14	0000MST-1500MST			0	0	0	0	Heavy Snow
--	-------	-----------------	--	--	---	---	---	---	------------

The mountains received a quick, heavy snowfall, with totals ranging from 5 to 20 inches. Most areas received 12 inches or less. The higher snowfall totals were 21 inches at Steamboat Springs; 17 inches at Loveland; 15 inches at both Beaver Creek and Vail. Other amounts included 11 inches at Telluride; 10 inches at St. Paul; 9 inches at Copper Mountain; 7 inches at Arapahoe Basin; and 5 inches at Berthoud Pass.



# STORM DATA AND UNUSUAL WEATHER PHENOMENA

JANUARY 1991

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

## FLORIDA

**Escambia County** 10 1315EST-  
**Santa Rosa County** 1330EST 0 0 2 0 **Thunderstorm Wind (G50)**

Strong thunderstorm winds blew most of the roof off a commercial office building. Billboards and trees were toppled, and power lines were knocked down.

**Dade County**  
**Miami Area** 15 1515EST 0.5 40 0 1 3 0 **Tornado (F0)**

A small tornado struck an elementary school building 3 miles south of Miami International Airport, peeling off part of its metal roofing and uprooting trees. A female teacher was picked up and flung to the ground; she had minor injuries. The tornado lifted back into the clouds for several minutes, then dropped from its parent cloud to cause minor tree and power line damage 2 miles south of the airport. The tornado dissipated just before the parent storm moved across the airport.

**Dade County**  
**Hialeah** 15 1535EST-  
1546EST 4.0 60 0 3 5 0 **Tornado (F1)**

A tornado touched down in Hialeah about 2 miles north-northeast of the Miami International Airport (from the same thunderstorm system causing the previous F0 tornadoes) at about 1535 EST. Trees were uprooted and power lines taken down; utility sheds and carport roofs were blown apart and several cars were overturned. The sheet metal roof was peeled off the United Parcel Service truck terminal building, and an outdoor flea market was damaged. The tornado lifted back up into the cloud as it passed just east of Opa Locka Airport at 1546 EST.

**Broward County**  
**Hollywood** 15 1554EST-  
1605EST 3.5 60 0 1 6 0 **Tornado (F1)**

A tornado touched down in Hollywood overturning a truck and damaging house roofs and utility sheds. Trees were uprooted, power lines knocked down, and fences blown down. Boats and trailers were moved several feet. The tornado continued northeast across North Perry Airport. Twenty-two small planes were flipped over and suffered varying degrees of damage; most either destroyed or with significant damage. Two aircraft had doors blown in and roof damage. The tornado then struck Broward Community College where several modular classrooms were damaged, a pre-fabricated metal building was destroyed, and large trees were uprooted. One person suffered minor injuries. The tornado continued northeast, near a residential subdivision before dissipating.

**Duval County** 16 1005EST 0 0 1 0 **Thunderstorm Wind**  
**Orange County**  
**St. Johns County**

Strong thunderstorm winds damaged a home in Fruit Cove (St. Johns County). Two large plate glass windows were shattered and lawn furniture was blown into the pool. Several cars were blown a few feet by winds in Mandarin (Duval County). Pea-size hail fell at Ponte Vedra Beach (St. Johns County).

**FLZ009-01-013-015-018**  
**Clay, Highlands, Hillsborough, Lee, Pasco, Pinellas, Polk, Sarasota, Sumter Counties** 19 2205EST-  
20 0155EST 0 5 6 2 **Thunderstorm Wind**

A line of strong thunderstorms, associated with a cold front, moved through northern and central Florida. Some of these storms were severe, resulting in damaging wind gusts, and in several cases, small tornadoes. Near New Port Richey (Pasco County) at 2225 EST, numerous mobile homes were damaged or destroyed. Some billboards and power lines were knocked down. Four people received minor injuries when a car hit the rear of another car which had rammed a tree felled across the road by thunderstorm winds. Near Clearwater and Safety Harbor (Pinellas County) at 2240 EST, trees and power lines were downed. Near Holiday (Pinellas County) at 2245 EST, a shed was destroyed and a mobile home damaged. At Tampa Bay Downs

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		LOCAL STANDARD			KILLED	INJURED	PROPERTY	CROPS	

## FLORIDA Cont'd

(Hillsborough County) at 2250 EST, a barn was damaged, and two horses suffered injuries and had to be destroyed. One person was also injured. Near Lutz (Hillsborough County), trees and power lines were knocked down. A tornado was spotted by the public at 2300 EST in northern Tampa. A tornado was also spotted by Civil Defense, midway between Gulfport and South Pasadena (Pinellas County). Near Zephyrhills and Dade City (Pasco County), trees were uprooted and power lines knocked around at 2335 EST. Light metal roofs and screen enclosures were blown off garages and trailer homes. Trees and power lines were downed in rural Sumter County at 2335 EST. In North Lakeland (Polk County) at 2340 EST, wind gusts ripped the roof off a mobile home and deposited live wires on top, trapping one person inside. At 2346 EST a few miles east of Sarasota (Sarasota County), several homes suffered roof and screen damage. At 2350 EST in Lakeland, a porch was blown away from a house and several nearby homes suffered roof damage. Several parked cars were turned around. Lawn furniture was blown away from a home in northern Lakeland. At 2355 EST in Polk City (Polk County), a wooden fence was smashed to splinters. Also in Polk County at 2355 EST, trees and power lines were downed north of Mulberry and southwest of Lakeland. From 0000 to 0030 EST in Polk County, trees, power lines, and mobile homes suffered damage near Lake Alfred, Polk City, Lake Wales, and Davenport. The door on a church rectory building was blown off in Lake Alfred. Trees were uprooted near Avon Park in Highlands County at 0100 EST. Tree and screen enclosures were downed in Cape Coral in Lee County at 0155 EST.

### Hillsborough County North Tampa

19 2300EST 0.5 30 0 0 0 0 Tornado (F0)

A small tornado was responsible for minor damage to trees, power lines, and roofs. The tornado dissipated without additional damage.

### Pinellas County Gulfport

19 2308EST 0.5 30 0 0 0 0 Tornado (F0)

A small, short-lived tornado downed trees and power lines.

### Polk County Lakeland

19 2350EST 0.8 40 0 0 3 0 Tornado (F0)

A small tornado touched down in a residential area resulting in a screen porch being blown away from a house, and roof damage to several nearby homes. Several parked cars were turned in the opposite direction. Lawn furniture was blown away at a home about 0.50 mile north of the other residential area. The tornado then dissipated.

### St. Lucie County Fort Pierce

20 0317EST 0 0 1 0 Thunderstorm Wind

Metal roofing was peeled off a building by thunderstorm wind gusts. Some tree and power line damage was also reported.

### Alachua County Alachua

24 1620EST 0 0 3 0 Thunderstorm Wind

Strong wind gusts hit a mobile home park uprooting trees and downing power lines. Four trailers were damaged and one destroyed when a falling tree chopped the trailer in half. A tractor-semitrailer was overturned on Interstate 75 just south of Alachua.

### Alachua County 10 S Gainesville

24 2020EST 0 0 1 0 Hail (1.00)

Large hail fell for a short time 10 miles south of Gainesville.

### Bay County Panama City

30 1330EST 0.4 30 0 0 2 0 Waterspout  
Tornado (F0)

A waterspout moved onshore, damaging a roof and uprooting several trees.







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		LOCAL STANDARD			KILLED	INJURED	PROPERTY	CROPS	

## GEORGIA Cont'd

River access roads, riverside residential areas, and streets were flooded around Thomasville; mobile homes were evacuated. Considerable road damage occurred over north-central Thomas County. The flood stage on the Ochlockonee River is 15 feet at Thomasville.

### Jenkins County Scarboro

25	0700EST-					0	0	?	?	Flood
31	2400EST									

The Ogeechee River rose to 9.3 feet at Scarboro by the 31st. Riverside agricultural lands were flooded. The flood stage at Scarboro is 8 feet.

### Echols County Statenville

26	0700EST-					0	0	4	?	Flood
31	2400EST									

Timberlands, farms, and pastures were flooded at Statenville as the Alapaha River rose to 28.5 feet by the 31st. The flood stage on the Alapaha at Statenville is 24 feet. Along the river, about eight residences were evacuated as water flooded them on the 31st.

### GAZ008-GAZ015 Southern Georgia Colquitt County Countywide

29	1900EST-					0	0	4	3	Heavy Rainfall
30	1645EST									

### Brooks County Countywide

29	1900EST-					0	0	4	?	Flash Floods
30	0800EST									

### Thomas County Thomasville

29	1900EST-					0	0	4	?	Flash Floods
30	0800EST									

### Lowndes County Valdosta

29	1900EST-					0	0	5	?	Flash Floods
30	0800EST									

### Pierce County Countywide

29	1900EST-					0	0	3	?	Flash Floods
30	0800EST									

### Bacon County Countywide

29	1900EST-					0	0	4	?	Flash Floods
30	0800EST									

### Coffee County Countywide

29	1900EST-					0	0	4	?	Flash Floods
30	0800EST									

### Brantley County Countywide

29	1900EST-					0	0	?	?	Flash Floods
30	0800EST									

### Ware County Countywide

29	1900EST-					0	0	4	?	Flash Floods
30	0800EST									

### Bulloch County Countywide

29	1900EST-					0	0	4	?	Flash Floods
30	0800EST									

Moisture-laden air from the Gulf of Mexico, combined with a near-stationary frontal system over northern Florida and an approaching cold front from the west, produced moderate to heavy rainfall over southern Georgia. With the ground already saturated from previous rainfall, the precipitation quickly aggravated existing flood conditions and produced many incidents of flash flooding over the area. Considerable soil erosion occurred over agricultural lands and a few earthen dams on farm ponds gave way.

By 2300 EST on the 29th, the heavier rainfall was tapering off; yet, by 0800 EST on the 30th, more than 2 inches of rain had occurred at many locations.

# STORM DATA AND UNUSUAL WEATHER PHENOMENA

JANUARY 1991

PLACE	DATE	TIME	LENGTH OF PATH (MILES)	WIDTH OF PATH (YARDS)	NO. OF PERSONS		ESTIMATED DAMAGE		CHARACTER OF STORM
		LOCAL STANDARD			K I L O M E T E R S	I N C H E S	P R O P R T Y	C R O S S	

## GEORGIA Cont'd

Consistent rainfall continued into the 30th. Scattered thunderstorms developed during the afternoon with localized heavy rain. By 1645 EST, flash flooding was widespread and numerous roads were inundated. Two to 3 inches of rain were common across the area. Isolated amounts up to 5 inches were possible in the rainfall from the 29th through the 30th.

With low-lying areas flooded and many unpaved roads damaged, schools were forced to close in Brooks, Pierce, Bacon, Coffee, and Ware counties.

In northeastern Colquitt County two roads sustained major damage and one home around Indian Lake was flooded. Flooding developed over southwestern Colquitt County along the Ochlockonee River.

With flood conditions already occurring along the Withalacoochee River and over 3 inches of rainfall over Lowndes County, water rapidly backed up into residential sections of Valdosta and entered a few homes. By 2030 EST, numerous roads were closed and several other creeks in and around Valdosta were flooding; only one evacuation had occurred. By 2240 EST the conditions worsened; roads were impassable over a large portion of the county and water entered a few homes.

The flash floods aggravated existing conditions around Valdosta on the Withalacoochee River, and around Thomasville on the Ochlockonee River. Both rivers remained flooded through the end of the month, severely hampering farming and logging operations in the area.

In southern Pierce County, Boight's Bridge sustained minor damage due to flooding on the Alapaha River. In Brantley County residents in several areas were marooned by the waters; in Ware County seven roads were damaged. Over Bulloch County a large number of septic tanks failed, and dirt roads were damaged.

GAZ006 & GAZ009 Central Georgia	30	0700EST- 1900EST			0	0	?	3	Heavy Rainfall
Peach County	30	1155EST			0	0	?	?	Flash Floods
Fort Valley	30	1205EST			0	0	?	?	Flash Floods
4 E Fort Valley									
Houston County									
Warner Robins	30	1210EST			0	0	4	?	Flash Floods
Perry	30	1215EST			0	0	4	?	Flash Floods
Countywide	30	1215EST			0	0	3	?	Flash Floods
Twiggs County									
Countywide	30	1215EST			0	0	4	?	Flash Floods
Bibb County									
Countywide	30	1215EST			0	0	?	?	Flash Floods

Heavy rainfall with embedded thunderstorms developed over much of central Georgia, with rainfall amounts over 5 inches in some portions of middle Georgia. As a result, urban and street flooding developed, and road damage and soil erosion occurred over central Georgia.

In Peach County, Georgia Highway 96 east of Fort Valley was inundated while several other roads were partially flooded. Many roads were flooded in Twiggs County. In the eastern portion, a house was flooded and Georgia Highway 358 was closed.

Flash floods developed over Bibb County and by 1230 EST, portions of Georgia Highway 247 were impassable in the southern portion of the county. Although the rain had diminished by 1645 EST, Macon received over 4.50 inches of rainfall by 1900 EST.

Approximately 23 roads over Houston County were closed due to flooding along area creeks, including Bay Gall Creek. An apartment building was flooded in Warner Robins; several homes had water in the basements and a few vehicles sustained damages in Perry and Warner Robins, forcing evacuations.

# STORM DATA AND UNUSUAL WEATHER PHENOMENA

JANUARY 1991

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

## GEORGIA Cont'd

### Dougherty County

Albany	30	1159EST			0	0	?	?	Thunderstorm Wind (G52)
7 E Albany	30	1215EST			0	0	?	?	Thunderstorm Wind Small Hail

Scattered power outages occurred when strong thunderstorm winds tore down large tree limbs just north of Acree, about 7 miles east of Albany; small hail also developed. The storm moved due east into Worth County and produced a tornado.

### Worth County

10 E Albany to 5 N Sylvester to 5 NE Sylvester	30	1220EST- 1230EST	0.1	60	0	0	4	?	Tornado (F1)
--	----	---------------------	-----	----	---	---	---	---	--------------

A small tornado developed about 1220 EST near the rural community of Red Rock, 10 miles east of Albany. Several trees were uprooted and power was disrupted, before the tornado lifted back into the parent thunderstorm and moved due east over mostly agricultural land toward Isabella.

At 1225 EST the tornado was at Isabella, 5 miles north of Sylvester; several vehicles were damaged by the storm when trees fell upon them. Roofs were torn from a few buildings and garages. Power in the area was disrupted before the tornado lifted again and skipped easterly to near Shingler.

At 1230 EST, the worst damage occurred 5 miles northeast of Sylvester, near Shingler. More large trees were uprooted and power was disrupted when the tornado briefly touched down and traveled over two farms. The storm damaged a large steel building worth about \$20,000 and unearthed a 250-gallon propane tank on one farm. On the other farm a barn, worth about \$15,000, was destroyed. Total damages at Shingler were estimated to be about \$40,000.

Although the thunderstorm which produced the cell traveled over a path of about 10 miles, the tornado was only on the ground briefly. The storm's longest damage segment (only 400 yards) occurred at Shingler.

### Tift County

3 ENE Sunsweet	30	1300EST			0	0	?	?	Thunderstorm Wind
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Thunderstorm winds tore down large tree limbs and power lines near the Turner-Irwin County lines in northern Tift County. Debris was scattered over several yards of roadway.

### Wilkinson County

Gordon	30	1300EST			0	0	?	?	Flash Floods
Baldwin County Milledgeville	30	1300EST			0	0	4	?	Flash Floods
Crisp County Southwest Crisp County	30	1300EST			0	0	3	5	Flash Floods
Laurens County Dublin	30	1300EST			0	0	4	?	Flash Floods
Countywide	30	1300EST			0	0	4	?	Flash Floods
Crawford County Countywide	30	1300EST			0	0	3	?	Flash Floods
Bleckley County Countywide	30	1400EST			0	0	4	?	Flash Floods
Dodge County Countywide	30	1400EST			0	0	?	?	Flash Floods

With heavy rains continuing over middle Georgia amounts over 3 inches were common. Several areas were inundated during the afternoon with the heavy rainfall diminishing over middle Georgia by 1645 EST.

A few homes in isolated areas of Milledgeville suffered flood damage. At Gordon in Wilkinson County, several streets were flooded and small streams were out of their banks.

# STORM DATA AND UNUSUAL WEATHER PHENOMENA

JANUARY 1991

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

## GEORGIA Cont'd

In southwestern Crisp County, at least seven families were marooned when a dirt road was washed out. A few paved roads were damaged and fields were eroded. An earthen dam on a farm pond in the Hatley community washed out, unearthing several trees.

At Georgia Highway 257 in Laurens County, heavy rainfall caused hundreds of gallons of diesel oil to spill, as two new tanks with 14,000 gallons total capacity were being installed at a truck stop. A trailer park in Dublin was flooded and several roads were damaged or impassable. In Crawford County, several secondary roads were flooded with a few sustaining minor damage.

Dirt roads were damaged in Bleckley and Dodge counties closing schools due to road conditions. Repair costs to the roads in Bleckley County were estimated to be about \$5,000.

### Bryan County Countywide

30	1400EST			0	0	3	?	Flash Floods
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Heavy rainfall produced flash floods, damaging several dirt roads across the county.

### Webster County Preston

31	1000EST- 2400EST			0	0	?	?	Flood
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The Kinchafoonee Creek rose above flood stage and caused widespread flooding of access roads and low-lying areas at Preston. The creek crested at 8.3 feet on the 31st; flood stage on the Kinchafoonee Creek is 7 feet at Preston.

## IDAHO

### IDZ001-002-003- 004-012 Snake River Valley and Southeastern Idaho

01- 31				?	?	?	?	Extreme Drought
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The precipitation deficit during January was 4 to 9 inches, and snowpack was 50 percent of normal. The shortage of snow was associated with a 50 percent loss of business at Sun Valley. Continued drought will extend the largest insect epidemic in Idaho's history.

### IDZ001-002-003- 004-005 Southern Idaho

01- 07				0	0	6	0	Cold Spell
-----------	--	--	--	---	---	---	---	------------

Sub-zero minimum temperatures were experienced each day. The last two weeks of December and the first week of January is the longest period on record at Boise without a thaw. Ice jamming on the Snake River was troublesome. About 5 percent of dairy herds were slaughtered due to frozen teats. (See December 1990 Storm Data for additional damages).

### IDZ001-003 Southern Idaho

01- 10				0	100	?	?	Air Stagnation
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Due to air stagnation, pollutants collected in the air to unhealthy concentrations. A steady stream of persons came to the emergency wards of hospitals with respiratory problems. Wood burning was banned, and dense smog caused some commercial flights to be canceled or delayed on the 4th and 8th. Dense smog closed the Boise Airport for most of the day on the 9th.

### IDZ011-008-009-011 Northern Idaho

06 08	1900PST- 0700PST			0	0	0	0	Heavy Snow
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Up to 18 inches of snow fell in 36 hours.

### IDZ006 Western-Central Idaho

07	0600MST- 1730MST			0	0	0	0	Heavy Snow
----	---------------------	--	--	---	---	---	---	------------

Council received 8 inches of snow.

# STORM DATA AND UNUSUAL WEATHER PHENOMENA

JANUARY 1991

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

## IDAHO Cont'd

**IDZ001**

Southwestern Idaho

07 0800MST-1600MST

0 0 5 0    **Snow**

Numerous accidents were reported on Interstate-84 due to 2 or 3 inches of snow.

**IDZ004**

Southeastern Idaho

07 1900MST-08 0700MST

0 0 0 0    **Heavy Snow**

Five inches of snow fell.

Idaho County  
Lowell 35E

08 1000MST

0 0 4 0    **Avalanche**

Heavy snowfall and warming temperatures caused avalanches to hit a truck, and buried Highway 12 under 18 feet of snow.

**IDZ001-006**

Southwestern Idaho

10 0630MST

1 1 5 0    **Light Snow**

One death occurred on Highway 55 at Gardena due to slippery roads. Interstate 84 East was blocked for 8 hours at Gowen Road when a jackknifed truck was struck by another vehicle, spilling 20 tons of potato products onto the roadway.

**IDZ006-007**

Southwestern Idaho

11 1800MST-12 1800MST

0 0 0 0    **Heavy Snow**

Centerville reported 6 inches of wet snow containing 1.26 inches of water. Avalanches caused Highway 21 over Banner Summit to be impassable through the 15th.

**IDZ001**

Southwestern Idaho

12 0800MST-1600MST

0 0 5 0    **Urban Flooding**

A half inch of rain on melting snow flooded some Boise basements; frozen drains aggravated the flooding.

**IDZ001-002-003**

Southern Idaho

14 0715MST

1 0 5 0    **Light Snow**

A motorist was killed on snow-packed U.S. Highway 91 near Idaho Falls when the vehicle slid sideways hitting a pole. A tractor-semitrailer jackknifed on snow-packed Interstate 84 at Glens Ferry, spilling radioactive materials and general freight, causing the interstate to be closed for 6 hours.

**IDZ012**

Southeastern Idaho

28 0400MST-2030MST

0 0 0 0    **Blizzard**

A combination of wind, snow, and extreme wind chill closed schools.

## ILLINOIS

**ILZ007-015**

Eastern and  
Central Illinois

0 0 6 7    **Flood**

Flooding from December continued through much of January. Some of the rivers most affected were the Kankakee, Vermilion, Sangamon, Embarrass, Wabash, Little Wabash, Saline, Big Muddy, Cache, and all along the Ohio. Many of these areas suffered the worst flooding in the last 15 to 20 years.

# STORM DATA AND UNUSUAL WEATHER PHENOMENA

JANUARY 1991

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

## ILLINOIS Cont'd

**ILZ001-012**      01-06      0   0   6   4      **Winter Storms**  
**Most of Illinois**

A series of snow and ice storms occurred in the first week of January over much of Illinois. All but the southern part of Illinois had snowfalls of 3 to 6 inches, at times mixed with freezing rain and freezing drizzle. Along with snow and ice the Arctic air mass over the area caused low temperatures down to single digits, and occasionally single digits below zero Fahrenheit.

**ILZ001-015**      10-12      0   0   6   4      **Winter Storms**  
**Statewide**

Beginning late on the 10th and continuing through the 11th to the 12th, snow and freezing rain fell over Illinois. Central Illinois was especially hard hit by freezing rain with power lines and trees suffering extensive damage. Snowfalls ranged from 5 to 7 inches for the northern two-thirds of the state, mixed with sleet and glaze, and lesser amounts in southern Illinois.

**ILZ009-014**      28-29      0   0   6   4      **Winter Storm**  
**Southern Half Illinois**

A winter storm caused snow and freezing rain over the southern half of Illinois. Power lines and trees suffered heavy damage. Other than an accumulation of ice, the area also had snowfall of 2 to 5 inches.

## INDIANA

**Statewide**      01-07      3   33   7   ?      **Flooding**

A continuation of the flooding from the latter part of December 1990 was evident during the first week of January. A short synopsis of the flood event follows, with more detailed information in the December 1990 Storm Report.

A classic major flood-event played out in much of the Indianapolis Hydrologic Service Area during the end of December 1990, and the first week of January 1991. The Corps of Engineers estimated flood damage ranged from \$50 to \$100 million. There were more than 2,000 homes and at least 4,000 people evacuated. A total of at least 4,000 homes and more than 10,000 people were touched by various aspects associated with the flooding. Seventy-two of 92 Indiana counties were declared disaster areas as a result of the flooding.

Information on the deaths due to flooding was provided by emergency preparedness officials. While the flood event began at the end of December, the deaths occurred in January. A 56-year-old male drowned on January 1st in Pulaski County after abandoning his automobile. In Grant County, a 43-year-old female died when her automobile was surrounded by the flood waters of the Mississinewa River. She drove her vehicle around barricades that prohibited travel. The third victim was a 48-year-old male whose boat capsized while trying to remove valuables from a house surrounded by floodwaters in Greene County. His body was never recovered. (M560, F43V, M84O).

Since almost all of Indiana's flood plains are flat, the bitterly-cold temperatures from December 31, 1990 to January 4, 1991 contributed greatly to the flood disaster and misery. The cold temperatures froze the floodwaters and left ice several inches thick in homes and on roads. Those homes which were evacuated and had their heat turned off had frozen water pipes. Ice was so treacherous that some residents could not return to their homes.

The most severely affected areas were Marion, Howard, and Hamilton counties. Nearly 1,000 homes had first floor flooding; at least another 1,000 were affected or threatened by possible levee failures. Flooded areas in these counties included Ravenswood, Riverwood, Trails End, Noblesville, southwestern Indianapolis, and Kokomo. Evacuations in these areas probably exceeded 1,000 people.

# STORM DATA AND UNUSUAL WEATHER PHENOMENA

JANUARY 1991

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

## INDIANA Cont'd

**Daviess County Elnora**      02 1505EST      0 ? ? ?      **Flash Flood**

Flooding along the White River caused a failure in the Elnora levee. The break in the levee affected about 10 homes.

**Vanderburgh County Evansville**      06 0930EST      0 ? 1 ?      **Flood**

An inch and a half of rain over a 24-hour period added to flooding along Pigeon Creek on the northern side of Evansville. The creek, unable to drain properly with the Ohio River reaching a crest of 44.6 feet, backed up and flooded parts of the city between 1st Avenue and Stringtown Road. Several families were forced to evacuate their homes.

**St. Joseph, LaPorte Counties**      20 0000EST-  
21 2300EST      0 0 ? ?      **Heavy Snow**

Strong northern winds and bitterly cold temperatures produced lake-effect snow over LaPorte and northwestern St. Joseph counties in north-central Indiana. Snow depths were generally 8 to 12 inches with a maximum snow depth of 20 inches reported at the Toll Road Exit at Michigan City, Indiana. Other snow depths were 13 inches at Westville and 10 inches at LaPorte.

## IOWA

**IAZ004-005-006-007-008-009-010-011-015  
NEZ010-ILZ004  
Most of Iowa**      04 2100CST-  
05 1200CST      0 0 4 0      **Snow and Heavy Snow**

Snow began over the southwestern part of Iowa during the evening hours of the 4th, and developed quickly over the rest of the state. Snowfall was generally in the 5- to 8-inch range in a band extending from southwestern and west-central Iowa, through central, east-central, into southeastern Iowa. The greatest amounts were at Audubon and Little Sioux, with each reporting 8 inches. Over the remainder of the state, snowfall amounts were in the 2- to 4-inch range. There was some freezing precipitation over the southern two tiers of Iowa counties; however, it was quite light and did not cause any really significant problems.

**IAZ012-013-NEZ010  
Southwestern Iowa**      24 2200CST-  
25 1500CST      0 0 3 0      **Snow and Heavy Snow**

A low-pressure system dropped out of Canada into the central United States. The system was a typical "Alberta Clipper," depositing a narrow band of heavy snows. Most of the snow fell over the southwestern and extreme south-central counties of Iowa. Amounts were generally in the 4- to 8-inch range. Heaviest snowfall was over the extreme southwestern corner of the state, with 13 inches recorded just across the border at Nebraska City. Lesser amounts fell over west-central, through central, into southeastern Iowa; in those areas, 1 to 3 inches was recorded. The snow presented little problem as it was of the light and fluffy variety.

## KANSAS

**KSZ017  
Southeastern  
Corner of Kansas**      04 0400CST      0 0 0 0      **Ice Storm**

Labette, Cherokee, Neosho, and Crawford counties had several hours of freezing rain and freezing drizzle producing a 1-inch-thick layer of ice on roads. Schools were closed on January 4th with freezing rain ending by 1600 CST.

**KSZ009-012-017  
Southeastern Kansas**      09 0900CST      0 0 0 0      **Ice Storm**

A winter storm produced a 1- to 2-inch layer of ice over southeastern Kansas. Freezing rain began around 0900 CST and continued through 1900 CST on the 10th. Ice-covered roads closed schools on the 9th and again on the 12th.



# STORM DATA AND UNUSUAL WEATHER PHENOMENA

JANUARY 1991

PLACE	DATE	TIME	LENGTH OF PATH (MILES)	WIDTH OF PATH (YARDS)	NO. OF PERSONS		ESTIMATED DAMAGE		CHARACTER OF STORM
		LOCAL STANDARD			K I L E S	I N J U R I E D	P R O P E R T Y	C R O S S	

## KANSAS Cont'd

**KSZ013-015**      25 0800CST      0 0 0 0      Heavy Snow  
 Northeastern Kansas

Snow began falling over northeastern Kansas around 0800 CST and ended around 1600 CST. Snowfall of 6 to 11 inches occurred with the higher amounts near the Kansas/Nebraska border.

## KENTUCKY

**Boyd County**      01 0700EST      0 0 4 4      Flood  
**Mason County**  
**Jefferson County**

Heavy rain, which fell during the last part of December, forced the Ohio River from Ashland to Louisville to rise into flood on the 1st of January. The river remained above flood until the 7th of the month.

**Daviess County**      01 0000CST      0 0 3 4      Flood  
**Livingston County**  
**McCracken County**

The lower Ohio River remained in flood from heavy rains during the month of December. The lower Ohio stayed in flood until the middle of the month.

**Butler County**      08 0700CST      0 0 3 3      Flood

Heavy rain which fell over central Kentucky forced the Green River at Woodbury to rise into flood. The river rose to 34.5 feet, which is 1.5 feet above the flood stage of 33 feet.

**Nelson County**      08 0700EST      0 0 3 3      Flood

Heavy rain falling on already-saturated ground, forced the Rolling Fork River at Boston to flood. The river rose to 36.5 feet; flood stage is 35 feet.

## LOUISIANA

**LAZ010-013**      06 1000CST-  
**Southeastern**      1800CST      0 0 0 0      Heavy Rain  
**Louisiana**

Heavy rain fell across the Greater New Orleans area, including Slidell, during the late morning and afternoon. Rainfall totals of 2.50 to 4.50 inches were common during the period, with street flooding reported in many areas.

**Iberia Parish**      10 0625CST      0 0 3 0      Thunderstorm Wind  
**Delcambre**

A severe thunderstorm moved onshore Iberia Parish near Delcambre, where wind gusts tore the roof from a barn.

**LAZ001-002-005-**  
**006-007-008-011-**  
**012**      10 0000CST-  
**Northwestern,**      11 1800CST      0 0 0 0      Heavy Rain  
**and Southwestern**

Three to 6 inches of rain fell over much of the state south and west of a Shreveport-Alexandria-Morgan City line. Saturated soil conditions produced considerable runoff, and street flooding was reported in many communities with a few rural roadways closed. Several rural schools were closed or dismissed early due to street flooding and weather conditions.

**Assumption and**      15 0600CST-  
**Northern Terrebone**      31 2400CST      0 0 4 0      Flooding  
**Parishes**

High water stages on the Atchafalaya River created backwater flooding on several bayous in Assumption and northern Terrebonne Parish. A local flood protection levee collapsed near Bayou L'Ourse creating additional flooding. About a dozen homes were flooded in Assumption Parish, and another dozen homes were flooded near Gibson in Terrebonne Parish. Several roadways in the two parishes were also flooded.

# STORM DATA AND UNUSUAL WEATHER PHENOMENA

JANUARY 1991

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

## LOUISIANA Cont'd

**Cameron Parish  
Hackberry**      15 0115CST      0   2   4   0      **Thunderstorm Winds**

A severe thunderstorm produced damaging wind gusts as it moved onshore near Hackberry. One mobile home was destroyed with two of the occupants suffering minor injuries. Four other mobile homes were damaged.

**Iberia Parish  
New Iberia**      15 0300CST      0   0   3   0      **Thunderstorm Winds**

Large tree limbs were ripped from several trees as a severe thunderstorm moved across New Iberia.

**Jefferson Parish  
Kenner**      29 0630CST      0.30      200      0   0   5   0      **Tornado (F1)**

A tornado touched down in a warehouse area just to the north of New Orleans International Airport (MSY). Approximately 50 businesses suffered damage, mainly to roofs; however, the tornado winds collapsed the walls of several buildings constructed of cinder block.

**St. Charles Parish  
Destrahan**      29 0840CST      0   0   2   0      **Thunderstorm Wind**

Thunderstorm wind gusts downed several trees in the Destrahan area.

**LAZ006-009  
East-Central**      10 1200CST-  
31 2400CST      0   0   4   0      **Flooding**

The Mississippi River reached flood stage from Natchez, MS to Donaldsonville during the month, though it remained well within the levee system. The river stages were unusually high for the month of January. The high-water levels created backwater flooding along the Red and Black Rivers and other tributaries. Agricultural land within the levee system was inundated, and several automobile ferries across the Mississippi River were closed due to high water flooded landings.

## MAINE

**MEZ003-004-007  
008-010-011-013  
014  
Coastal Area**      09 Evening  
09 Night      0   0   ?   0      **Freezing  
Rain**

This weather event was caused by an ocean low-pressure system which moved from off the coast of North Carolina, on the morning of January 9th, to a position southeast of Nova Scotia by the morning of January 10th. Numerous automobile accidents resulted from ice on the roads.

**MEZ001-002-003  
004-005-006-007  
008-009-010-011  
012-013-014  
Statewide**      11 Evening  
12 Evening      0   0   ?   0      **Heavy Snow**

A low-pressure system moving northeast from the middle Mississippi Valley started spreading snow into New England late in the day of the 11th. As this low continued moving northeast, a secondary low developed over the Delmarva Peninsula. Intensification of the secondary low occurred as it moved across New Jersey, Cape Cod, and eventually to western Nova Scotia by the evening of the 12th. Snow produced by this pattern ranged from 6 inches over northern Maine to 21 inches over the mountains. As a result of this weather, there were numerous automobile accidents with some fatalities, school closures, and business cancellations.

# STORM DATA AND UNUSUAL WEATHER PHENOMENA

JANUARY 1991

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

## MAINE Cont'd

<b>MEZ005 Northwestern</b>	16	Afternoon Evening			0	0	?	0	Heavy Snow
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On the morning of the 16th, a low pressure system over the Ohio River Valley moved northeast across the eastern Great Lakes, and subsequently down the St. Lawrence River Valley to the Canadian Maritimes by the morning of the 17th. As this low moved through the St. Lawrence River Valley, approximately 5 to 6 inches of snow was deposited over the extreme northwestern section of Maine.

<b>MEZ002-003 005-006-007 Eastern-Central MEZ004-008 011-014 Coastal Area</b>	30	Afternoon-			0	0	?	0	Heavy Snow
	31	Morning			0	0	?	0	Heavy Snow
	30	Afternoon-			0	0	?	0	Freezing
	31	Morning			0	0	?	0	Rain

On the morning of January 30th, a slow-moving cold front extended along the entire length of the eastern United States. One of the several waves on this front developed into a closed low-pressure system and moved from southwestern Kentucky across the Gulf of Maine to Nova Scotia by the morning of the 31st. Close to 9 inches of snow fell across east-central Maine, as rain and freezing rain occurred along the coast. This resulted in numerous automobile accidents, many school closures, and several cancellations.

## MARYLAND and D.C.

<b>MDZ005-009</b>	07	0200EST- 1900EST			0	0	0	0	Heavy Snow
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Several inches of snow fell across western and central Maryland. Representative totals included: 8 to 10 inches in Garrett County, 7 inches at Westminster, 6 inches at Parkton, 5 inches at Cumberland, and 4 to 5 inches across northern Montgomery County.

<b>MDZ005-009</b>	08	1800EST-			0	0	5	0	Ice Storm
	09	0600EST			0	0	5	0	Ice Storm

Light freezing rain and freezing drizzle caused innumerable traffic accidents, including several multi-vehicle crashes, on glazed roads through central and western Maryland. Two motorists lost their lives in weather-related crashes, and at least two others were injured in the same accidents. Tree damage and downed power lines resulted in many power outages.

<b>MDZ007-009</b>	11	0000EST- 1200EST			0	0	0	0	Heavy Snow
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Four to 6 inches of snow fell across western Maryland.

## MASSACHUSETTS

<b>MAZ001-002-004- 005-006-007-008</b>	11	1800EST-			0	0	0	0	Heavy Snow
	12	0800EST			0	0	0	0	Heavy Snow

The first generally-heavy snowstorm of the season deposited between 5 and 9 inches across the state, except Cape Cod and the Islands where 2 to 4 inches fell before a change to rain. The greatest accumulations were confined to the northeastern portion of the state including Middlesex and Essex counties; Woburn reported 11 inches, Reading 10, and Newburyport 9 inches. Boston had 8.5 inches, Worcester had 7 and Springfield 5.5 inches. Snow mixed with and changed to rain, before ending over portions of eastern Massachusetts during the morning of the 12th. Sharply-falling temperatures to the lower 20s during forenoon, quickly turned the slush to ice, complicating snow removal operations. There were numerous reports of skidding accidents and many events were canceled. The fact that the storm occurred on a weekend facilitated snow removal and prevented school and business cancellations.



# STORM DATA AND UNUSUAL WEATHER PHENOMENA

JANUARY 1991

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

## MICHIGAN Cont'd

**MIZ043-046-050-052-054-068**  
Northern Lower Peninsula

05	0700EST-1700EST	0	0	0	0	Heavy Snow
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Snow began falling over southwestern-lower Michigan during the midmorning hours of Saturday, then spread across most of lower Michigan by 0900 EST. The snow became moderate to heavy over a 50-mile-wide area of north-central lower Michigan by 1000 EST. The heavy snow continued across this area until midafternoon (about 1530 EST). The snow ended across Michigan by 1700 EST. All of lower Michigan had at least 1 inch of snow from this storm. Most of the counties (80%) had 2 to 5 inches; however, a 50-mile-wide area which extended east-to-west from near Manistee, and north to near Traverse City had 6 to 10 inches of snow. The heaviest snowfall was in southeastern Kalkaska County. Little wind was reported with this storm, but several dozen traffic accidents were reported. Four people died in three separate crashes. A mother and her daughter were killed in a head-on collision in Tuscola County in the Thumb area during the late morning. A woman died when her car slammed into a jackknifed tractor-semitrailer in Hillsdale County around 1100 EST. During the midafternoon (1530 EST), a man died near the city of Lansing in yet another crash. It is worth noting that none of these accidents were in the heavy snow area.

**MIZ003-006-010-013-014-017-023-026-029-031-034-036-053-058-063-068**  
Most of the Lower Peninsula

10	2200EST-	0	0	0	0	Heavy Snow
12	0500EST	0	0	0	0	

Snow began falling over southwestern-lower Michigan during late-evening hours of Thursday, January 10th, then spread northeast across all of lower Michigan by 0700 EST Friday morning. Heavy snow fell over most of this area from 1300 EST until about midnight on the 11th. Winds were northeast around 10 to 20 mph with some gusts to around 25 mph. This caused drifts to near 2 feet in many areas; the snow ended as flurries early Saturday morning. The snow turned to freezing rain over the southeastern sections of lower Michigan during the early-morning hours on Friday. The freezing rain continued intermittently until late-afternoon. Heavy snow fell north of a line that extended from 50 miles north of the city of Detroit, west to the Allegan/Van Buren County line; in that area, 6 to 10 inches of snow was common. A 50-mile-wide area that extended from just northeast of Grand Rapids to Oscoda had 10 to 12 inches generally; however, central Iosco County reported the heaviest snowfall from the storm, with 14 inches in that area. There was a secondary maximum snowfall area over the northwestern sections of the Michigan Thumb area; there, 8 to 10 inches of snow was common. Like the storm on January 5th, dozens of automobile accidents were reported. Four people were killed in three separate accidents; again, three women and one man died. Several multiple-vehicle accidents occurred. Schools were closed across the Thumb area and most of central-lower Michigan. The freezing rain was light, but was a factor in most of the accidents.

**MIZ001-072-073-075-076-078**  
Southwestern Lower Peninsula and the Northern Upper Peninsula

20	0100EST-	0	0	0	0	Heavy Snow
21	0500EST	0	0	0	0	

Lake-effect heavy snow occurred over the Lake Superior shore counties of the Michigan upper peninsula, and Berrien County of extreme southwestern-lower Michigan. Over the upper peninsula, the snowfalls in the lake-effect areas ranged from 5 to 10 inches. The heaviest reported snowfall was over southwestern Alger County where 10 inches fell. Most other sections had 6 to 8 inches of snow. Over Berrien County, in southwestern-lower Michigan, 6 to 8 inches was common. About 12 inches was reported over the south-central part of the county between Tree Oaks and Galien.

**MIZ005-006-047-051-061-063-069-070-072-075-078**  
Northwestern Lower Peninsula and the Northern Upper Peninsula

22	0000EST-	0	0	0	0	Heavy Snow
26	1200EST	0	0	0	0	

Lake-effect heavy snow occurred over the Lake Superior shore counties of the Michigan upper peninsula, and most of northwestern-lower Michigan on the 22nd through 24th. Only over Alger







# STORM DATA AND UNUSUAL WEATHER PHENOMENA

JANUARY 1991

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

## NEW HAMPSHIRE

**NHZ006-007 Coastal**      **09 Evening-Night**      **0 0 ? 0**      **Freezing Rain**

This weather event was caused by an ocean low which moved from off the coast of North Carolina on the morning of January 9th, to a position southeast of Nova Scotia by the morning of January 10th. There were numerous automobile accidents as a result of ice on the roads.

**Coos County Northwestern**      **10**      **0 0 ? 0**      **Flash Flood**

Minor flooding of roadways and low spots in the Lancaster area was caused by an elevated ice pack in the Israel River.

**NHZ001-002-003 004-005-006-007 Statewide**      **11 Evening-12 Evening**      **0 0 ? 0**      **Heavy Snow**

A low-pressure system moving northeast from the middle Mississippi Valley started spreading snow into New England late in the day of the 11th. As this low continued moving northeast, a secondary low developed over the Delmarva Peninsula. Intensification of the secondary low occurred as it moved across New Jersey, Cape Cod, and eventually to western Nova Scotia by the evening of the 12th. Snow produced by this pattern ranged from 6 inches over the eastern section of the state to 21 inches over the mountains in northern sections. The highest amounts of snow seem to have occurred over the eastern slopes of the mountains.

**NHZ001-002 Northern NH NHZ 005-006 007**      **30 Afternoon-31 Morning**      **0 0 ? 0**      **Heavy Snow**  
**30 Afternoon-31 Morning**      **0 0 ? 0**      **Freezing Rain**

On the morning of January 30th, a slow-moving cold front extended along the entire length of the eastern United States. One of the several waves on this front developed into a closed low, and moved from southwestern Kentucky across the Gulf of Maine to Nova Scotia, by the morning of the 31st. Six to 7 inches of snow fell across northern portions of the state, as rain and freezing rain fell over southern sections. This resulted in numerous automobile accidents, many school closures, and several cancellations.

## NEW JERSEY, Northern

**NJZ001-015 Northwestern and Metropolitan New Jersey**      **11 2000EST**      **0 0 0 0**      **Heavy Snow**

An elongated area of low pressure extending from the Ohio Valley to the mid-Atlantic Coast worked in concert with a high-pressure system off the New England coast, to produce a significant snowfall across the area. Snow began to fall during the early-morning hours and continued until around midnight. At about this time the arrival of warmer air began to change the snow over to rain, with a brief period of sleet and freezing rain in between. Snowfall amounts ranged for the most part between 4 to 6 inches. Harrison, Newton, and Charlottenburg reported 6 inches of snow as well as Newark Airport.

## NEW JERSEY, Southern

**NJZ00S Southern New Jersey**      **07 1300EST**      **0 0 3 0**      **Heavy Snow**

Rain changed to snow between 0500 and 0600 EST and continued until around 1700 EST. By 1300 EST 4 inches of snow had accumulated over much of southern New Jersey. Final accumulations ranged from 2 to 5 inches.

# STORM DATA AND UNUSUAL WEATHER PHENOMENA

JANUARY 1991

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

## NEW JERSEY, Southern Cont'd

**NJZ002-004**  
Gloucester, Camden,  
Burlington, Mercer  
and Portions of  
Ocean and Atlantic  
Counties

09	0700EST		0	0	4	0	Snow Freezing Rain
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Snow began falling from 1800 to 2000 EST on the 8th. One to 2 inches accumulated before changing to freezing rain and sleet, which continued until 0500 to 0700 EST on the 9th before changing to rain. The freezing rain caused icing which brought down trees, tree limbs, and utility lines. The icy roadways resulted in numerous automobile accidents.

**NJZ002-004**  
Gloucester, Camden,  
Burlington, Mercer  
and Portions of  
Ocean and Atlantic  
Counties

11	1600EST		0	0	3	0	Snow Freezing Rain
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Snow began around 0900 EST and continued until 1400 to 1500 EST before changing to sleet and freezing rain; snow accumulations were 2 to 4 inches. The freezing rain and sleet continued until 1900 to 2100 EST before changing to all rain. The freezing rain caused some downed utility lines and tree limbs. The snow and ice caused hazardous road conditions and many traffic accidents. The snow and ice was followed by heavy overnight rain.

**NJZ002-004**  
Camden, Burlington,  
Gloucester, Mercer  
and Portions of  
Ocean and Atlantic  
Counties

12	0100EST		0	0	3	0	Flooding
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One to 2 inches of heavy rain fell on top of snow and ice accumulated from sleet and freezing rain. This heavy rain resulted in urban and small stream flooding. The Assunpink Creek in Mercer County flooded from 0300 to 1200 EST and the crest was at 8.55 feet where flood stage is 7.00 feet.

## NEW MEXICO

**NMZ002-006**  
Rio Arriba County  
Taos County  
McKinley County

03	2000MST-		0	0	0	0	Heavy Snow
04	2200MST						

Heavy snow occurred primarily over the north-central mountains at elevations above 8,000 feet. Snowfall in inches by county included: Rio Arriba 2 to 6 inches, Taos County above 8,000 feet, 7 to 14 inches, and western McKinley County above 8,000 feet, around 7 inches.

**NMZ005-009-012**  
San Miguel County  
Quay County  
Guadalupe County  
Lincoln County  
Otero County

09	1000MST-		0	0	0	0	Heavy Snow
10	1400MST						

Heavy snow occurred mainly over the eastern-central plains and the southern-central mountains. Snowfall in inches by county included: eastern San Miguel County 4 to 8 inches, Quay County, 4 to 5 inches, Guadalupe, 4 to 6 inches, southern Lincoln, 2 to 6 inches, and northern Otero County 5 inches.

**NMZ006-010**  
McKinley County  
Grant County  
Sierra County

16	0100MST-		0	0	0	0	Heavy Snow
18	1100MST						

This particular storm produced heavy snow in western McKinley County (7 inches) early on the 16th, as it moved slowly south through eastern Arizona. It then caused heavy snow over parts of the southwestern mountains (in eastern Grant and southwestern Sierra counties), where 8 to 12 inches fell over the higher elevations, mainly on the 17th and early on the 18th.

# STORM DATA AND UNUSUAL WEATHER PHENOMENA

JANUARY 1991

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

## NEW MEXICO Cont'd

NMZ001-002-006-008

McKinley County	20	2000MST-							
Rio Arriba County	21	1100MST			0	0	0	0	Heavy Snow

San Miguel County  
San Juan County

Snow fell over most of the state from this storm except the northeastern and east-central plains. Although amounts were generally in the 1- to 3-inch range, heavy snow did fall over the following counties: McKinley, 2 to 9 inches, Rio Arriba, 3 to 5 inches, San Juan, 2 to 5 inches, and western San Miguel, 3 to 4 inches. Ski areas over the central-mountain chain received from 4 to 10 inches of snow.

## NEW YORK, Central

Area-Wide	05	PM-							
	06	AM			0	6	5	0	Freezing Rain

Freezing rain created slick road surfaces. Local police agencies reported a rash of car accidents. In the city of Schenectady (Schenectady County), one male was injured when he was hit by a car; the driver of the car was unable to see the walker due to a very intense squall.

Area-Wide	11	1100EST-							
	12	0700EST			0	7	3	0	Snow

Seven to 12 inches of snow covered all of eastern New York. Near the end of the storm, warm air worked its way into New York and changed the precipitation over to sleet for a brief period. For most communities this was the biggest snowfall since 1987.

Area-Wide	16	0500EST-							
		1000EST			2	22	6	0	Freezing Rain

Rain fell across eastern New York; ground temperatures were still below freezing, so the rain quickly turned to ice. (M56V, M80V)

## NEW YORK, Coastal

NYZ014	11	2000EST							Heavy Snow
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Rockland and  
Westchester County

An elongated area of low pressure extending from the Ohio Valley to the mid-Atlantic Coast worked in concert with a high-pressure system off the New England coast, to produce a significant snowfall across the area. Snow began to fall during the early-morning hours and continued to around midnight. At about this time the arrival of warmer air began to change the snow over to rain, with a brief period of sleet and freezing rain in between. Snowfall amounts ranged for the most part between 4 to 6 inches.

## NEW YORK, Western

NYZ022	11	1400EST							Heavy Snow/Ice
NYZ001-021	11	1500EST			0	0	5	0	Heavy Snow/Ice
NYZ002	11	1600EST			0	0	4	0	Heavy Snow/Ice
NYZ003-005	11	1700EST			0	0	5	0	Heavy Snow
NYZ004	11	1800EST			0	0	4	0	Heavy Snow

Low pressure tracked north from Kentucky and spread heavy snow across the area with snowfall amounts ranging from 4 to 7 inches. The snow then combined with freezing rain over western portions during the afternoon and evening, and scattered power outages resulted from lines being downed by the weight of the ice. Police agencies throughout western and central New York reported slippery roads and numerous accidents caused by freezing rain and snow. The treacherous mixture of precipitation forced numerous schools to cancel classes. Some reported snowfalls included: Syracuse, Onondaga County, 7 inches; Watertown, Jefferson County, 6 inches; Ithaca, Tompkins County, 5 inches; Penn Yann, Yates County, 6 inches; Rochester, Monroe County, 5 inches; Little Genesee, Allegany, 6 inches.

# STORM DATA AND UNUSUAL WEATHER PHENOMENA

JANUARY 1991

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

## NEW YORK, Western Cont'd

NYZ004	24	0600EST			0	0	4	0	Heavy Snow
NYZ022	24	0600EST			0	0	4	0	Heavy Snow
NYZ001	24	1300EST			0	0	4	0	Heavy Snow

A westerly flow of Arctic air across the relatively-warm waters of Lakes Erie and Ontario produced lake-effect snow squalls. Snowfall reports included: Barnes Corners, Lewis County, 26 inches; Mayville, Chautauqua County, 15 inches; and Colden, Erie County, 8 inches.

NYZ001	31	1000EST			0	0	4	0	Heavy Snow
NYZ004	31	1100EST			0	0	4	0	Heavy Snow
NYZ005	31	1100EST			0	0	4	0	Heavy Snow
NYZ022	31	1100EST			0	0	4	0	Heavy Snow

Strong western-to-northwestern winds combined with cold air, to produce intense bands of lake-effect snow off Lakes Erie and Ontario. Reported snowfall amounts included: Oswego, Oswego County, 18 inches; Mayville, Chautauqua County, 12 inches; and Hamburg, Erie County, 6 inches.

## NORTH CAROLINA

Moore County	16	1140EST			0	0	0	0	Hail (0.75)
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Nickel-size hail was reported in Aberdeen in southern Moore County.

## NORTH DAKOTA

NDZ007 Part of South-Central North Dakota	22	0900CST- 1500CST			1	0	0	0	High Winds
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Northwestern winds of 25 to 50 mph occurred in the city of Bismarck. A carpenter was killed after he fell 30 feet at a construction site. The man had momentarily climbed to the roof to tie down loose panels when the winds caused him to slip and fall. (M250)

## OHIO

Washington County Portsmouth	01 04	0700EST- 0600EST			0	0	5	0	Flood
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The Ohio River at Portsmouth crested at 53.7 feet at 2000 EST on the 2nd. This was nearly 4 feet above flood stage.

OHZ009 South-Central	06 07	2100EST- 0500EST			0	0	4	0	Heavy Snow
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Heavy snow moved into southern Ohio during the evening of the 6th. It was mixed with freezing rain and sleet which coated roads, trees, and power lines with ice. Snow depths reached 4 inches across extreme southern Ohio around 0400 EST on the 7th, with maximum depths of 5 inches near Pomeroy in Meigs County.

OHZ002-004 Central Lakeshore Northeastern Lakeshore Northeastern- Inland	20 21	2000EST- 2400EST			0	0	4	0	Heavy Snow
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Heavy snow moved into northeastern Ohio during the evening of the 20th. The snow fell through the night reaching 6 inches in Chardon at 0700 EST, the Cleveland area at 1200 EST, and around Richfield at 2000 EST, all on the 21st. Total accumulations ranged from 3 to 10 inches across northeastern Ohio.





# STORM DATA AND UNUSUAL WEATHER PHENOMENA

JANUARY 1991

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

## PENNSYLVANIA, Western Cont'd

PAZ005 Laurel Mountains	07	1500EST			0	0	0	0	Heavy Snow Glencoe, in Somerset County, reported 8 inches of snow.
PA006 Southern-Central Mountains	07	1500EST			0	0	0	0	Heavy Snow Six to 7 inches of snow fell in Bedford County.
PA013 Southern-Central	07	1500EST			0	0	0	0	Heavy Snow In Fulton County, six inches of snow fell in Town Hill.
PAZ005 Laurel Mountains	11	0740EST			0	0	0	0	Heavy Snow Six inches of snow accumulated in Somerset County.
PAZ006 Southern-Central Mountains	11	0850EST			0	0	0	0	Heavy Snow Six inches of snow accumulated in Bedford County.
PAZ005 Laurel Mountains	11	0945EST			0	0	0	0	Heavy Snow Six inches of snow accumulated in Cambria County and 8 inches in southern Somerset County.
PAZ013 Southern-Central Mountains	11	0955EST			0	0	0	0	Heavy Snow Six to 8 inches of snow fell in Fulton County.
Westmoreland County Latrobe	11	1235EST			0	0	0	0	High Wind Trees were downed in Latrobe by non-convective high wind.
PAZ002 Northwestern	21	1403EST			0	0	0	0	Heavy Snow Southern Erie County received 8 inches of snow overnight.
PAZ005 Laurel Mountains	21	1530EST			0	0	0	0	Heavy Snow Five to 10 inches of snowfall was reported. Somerset County at Jennerstown had 9 inches and Laurel Mountain in Westmoreland County had 8 inches.
PAZ014 Northern-Central Mountains	21	1530EST			0	0	0	0	Heavy Snow Five to 10 inches of snow fell in this zone.
PAZ005 Laurel Mountains	31	0930EST			0	0	0	0	High Wind Somerset reported gusts to 63 mph.

## RHODE ISLAND

RIZ001 Northern Rhode Island	11 12	1800EST- 0800EST			0	0	0	0	Heavy Snow Snow accumulated from 4 to 7 inches over the northern portion of the state resulting in numerous (mostly minor) skidding accidents. Snow changed to rain before ending in some areas. A sharp drop in temperature caused a quick freeze-up of wet snow and slush during forenoon, which created problems for snow removal.
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# STORM DATA AND UNUSUAL WEATHER PHENOMENA

JANUARY 1991

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

## SOUTH CAROLINA

**SCZ001-002**  
Mountains and Foothills      16   Unknown      1   0   0   0      Cold Exposure  
A 66-year-old Greenville County man died of exposure. (M66?)

**SCZ006**  
Southern Midlands      24   Unknown      1   0   0   0      Hypothermia  
A 70-year-old Richland County man died of hypothermia. (M70?)

**SCZ001-002-003**  
Mountains, Foothills, Eastern Piedmont      24   0700EST-1200EST      0   0   ?   0      Heavy Snow  
A marginal winter storm produced up to 6 inches of snow in the mountains of South Carolina. Snow also fell at a rapid rate across the foothills, piedmont, and midlands. Accumulations ranged from a trace to about 4 inches in those areas due to soil and pavement temperatures. The snow disrupted travel, business, and government activities during the afternoon and early-evening hours.

## SOUTH DAKOTA

Lincoln County  
I-29 Near Worthing      15   0545CST      0   2   ?   0      Dense Fog

Dense fog over southeastern South Dakota caused a six-car pileup. The first car involved in the accident overturned on a slick road, then five other cars smashed into each other trying to avoid the first car. Two middle-aged women were hospitalized with injuries.

Perkins County  
South of Bison      22   1400CST      0   0   5   0      High Winds (G69)

High winds raked across most of western South Dakota flipping a tractor-semitrailer near Bison. The driver was not injured, however, the truck was damaged.

Pennington County  
Just South of Rapid City      28   1455CST      0   2   ?   0      Snow-Packed Road

A young woman lost control of her car on Highway 44, 3 miles west of Rapid City; the road was snow-packed. The young woman slid into an oncoming car in the opposite lane. Both drivers suffered minor injuries.

## TENNESSEE

None reported.

## TEXAS, Northern

McLennan County  
Connally      09 2230CST-10 0030CST      0   0   0   0      Flash Flooding

High water covered several low-water crossings along the White Rock Creek.

Shelby County      10 0400CST-1000CST      0   0   0   0      Flash Flooding

Heavy rainfall of 2 to 3 inches in a 24-hour period resulted in high water covering Farm-to-Market Roads 138 and 139.

Anderson County      10 0330CST-1200CST      0   0   0   0      Flash Flooding

High water resulted in the closing of several farm-to-market and county roads throughout Anderson County.





# STORM DATA AND UNUSUAL WEATHER PHENOMENA

JANUARY 1991

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

## TEXAS, Southern Cont'd

southern Texas. Thunderstorms formed across Matagorda and Austin counties just before 0600 CST as a result of this lifting motion. The storms moved toward the north-northeast at 20 mph. Rainfall was generally moderate (with occasionally heavy rain), but the rain began to accumulate faster since the storms continued to form and move across the same area over and over. Rainfall was concentrated in Montgomery, Harris, and Fort Bend counties, with Harris County receiving the greatest amount of rain. Flooding began near 0700 CST in the city of Houston as accumulations reached just over 4 inches. The Department of Public Safety reported that many of the roads across the county were under water. The rainfall began to taper off near noon and the flash flooding ended near 1330 CST.

**Jefferson County  
Orange County**

10	1000CST- 1400CST				0	0	5	0	Flooding
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Already-saturated ground became flooded, when thunderstorms produced by the system described in the above paragraph produced widespread heavy rainfall over the two counties. Rainfall averaged from 2 to 3 inches, with the maximum of 7 inches in the Vidor area. This resulted in the flooding of several homes and the closing of many secondary roads.

**Lee County  
Giddings**

14	1700CST	1.0	100	0	0	4	0	Tornado (F1)
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A severe thunderstorm moved across Lee County in the late afternoon, producing a tornado and spotty heavy rainfall of up to 5 inches. The tornado struck a ranch area just southeast of Giddings, taking the roof off several hay barns and destroying another barn. The damage was spread out over the distance of nearly a half mile. Large sheets of tin were left hanging 30 to 40 feet above the ground in nearby oak trees. The tornado damaged the roof of a home 0.5-mile east of the ranch area, then dissipated.

**Burleson County  
Lake Somerville**

14	1740CST			0	0	4	0	Hail (0.75)
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Three-quarter-inch-diameter hail was reported in a severe thunderstorm 15 miles south of Caldwell, near Lake Somerville in southern Burleson County. The storm was moving to the north-northeast at 15 mph.

**Bastrop County  
Rosansky  
2 SW Smithville to  
3 NE Smithville  
Bastrop County**

14	1750CST	0.2	20	0	0	2	0	Tornado (F0)
14	1814CST	5.0	60	0	0	5	2	Tornado (F2)
14	1816CST			0	0	0	2	Hail (2.00)

The Department of Public Safety and Bastrop County Sheriff's Office reported a tornado near the city of Rosansky moving to the northeast at 25 mph. The tornado lifted up and dissipated shortly afterward. About 25 minutes later, the same thunderstorm produced a second tornado that was much larger and more devastating. It first touched down 5 miles southwest of Smithville, destroying barns and fences and uprooting trees. It moved across Smithville and lifted northeast of the city, just before moving across the Bastrop/Fayette County line. Along its path it damaged three homes, destroying porches and roofs, but caused no injuries. It also killed 10 young calves in a pasture. The public reported hail as large in diameter as a hen's egg had begun to fall just before the tornado struck.

**Colorado County  
Columbus**

14	1818CST	1.5	250	1	11	7	5	Tornado (F1)
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Department of Public Safety officers reported a tornado had touched down at 1818 CST in Columbus. The tornado first struck a trailer park, destroying four mobile homes. It injured several residents of the trailer park, one of whom died of injuries 13 days later. The tornado struck a convenience store, then lifted briefly over a residential area and touched down again. People were trapped briefly in the convenience store. Six homes were lost to the tornado with damages estimated at \$35,000 per home. Total damage was placed at several million dollars. The tornado also destroyed the historic William Harbert Plantation which was over 150 years old. Several tractor-semitrailers were damaged near Interstate 10 and two were lifted up, turned sideways and tossed on the side of the road. Power lines were knocked down and power was lost in the city for approximately 3 hours. The tornado killed one and injured 11, most of whom were residents of the mobile homes which were destroyed. (M??M)

# STORM DATA AND UNUSUAL WEATHER PHENOMENA

JANUARY 1991

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

## TEXAS, Southern Cont'd

### Wharton County

Wharton	14	1818CST	0.5	50	0	0	5	0	Tornado (F1)
Hungerford	14	1820CST	0.2	20	0	0	3	0	Tornado (F0)
Lane City	14	1825CST	0.2	20	0	0	3	0	Tornado (F0)
Burr	14	1830CST	0.2	20	0	0	3	0	Tornado (F0)

Thunderstorms moving rapidly eastward across Wharton County produced a series of small and short-lived tornadoes. The first was reported by Department of Public Safety officers at 1818 CST near Wharton. It damaged the roof at a livestock auction barn; tore an awning off the high school gymnasium; damaged several sheds, and knocked down power lines in the town. Several trees were broken in half near the barn. Brief touchdowns were later confirmed in Hungerford, Lane City, and Burr.

### Guadalupe County Seguin

	14	1855CST			0	0	4	2	Hail (0.75)
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A cluster of thunderstorms formed in western Guadalupe County as an upper-level disturbance approached from the west. One storm briefly intensified as storms around it weakened. It began to produce pea- to marble-size hail near LaVernia at 1830 CST; the storm moved northeastward at 20 mph. As the storm moved across the city of Seguin at 1855 CST, it produced 0.75-inch diameter hail.

### Caldwell County Luling

	14	1920CST			0	0	3	0	Hail (1.75)
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Thunderstorms had formed just southwest of the city of Lockhart at 1845 CST. They moved to the north-northeast at 20 mph.

### Bastrop County Red Rock

	14	1925CST			0	0	0	0	Hail (1.75)
--	----	---------	--	--	---	---	---	---	-------------

Large hail was reported in a severe thunderstorm near Red Rock.

### Gonzales County Gonzales

	14	1925CST			0	0	4	2	Hail (1.00)
--	----	---------	--	--	---	---	---	---	-------------

A second thunderstorm from the same cluster as the Guadalupe County storm began to intensify around 1945 CST. This storm also moved to the northeast (at 20 mph), toward the city of Gonzales. On radar, it showed a tendency toward rotation at 1955 CST, then ended the rotation after a few minutes. The storm reached the city of Gonzales around 1920 CST, and began to produce 1-inch diameter hail at 1925 CST. The storm then weakened as it moved northeastward out of the city.

### Matagorda County Matagorda Bay City

Matagorda	14	1945CST			0	0	3	0	Hail (1.75)
Bay City	14	1955CST	0.6	15	0	0	3	0	Tornado (F0)

A cluster of intense thunderstorms entered the western portion of Matagorda County near 1930 CST, moving to the northeast at 25 mph. At 1945 CST, spotters reported marble- to golf ball-size hail in a severe thunderstorm in the city of Matagorda. At 1955 CST, a second severe storm produced a tornado at Bay City. The tornadic winds blew two cars into a ditch on the Van Vleck Road, but caused no injuries.

### Guadalupe County Seguin

	14	2000CST			0	0	4	2	Hail (1.00)
--	----	---------	--	--	---	---	---	---	-------------

The third, and final, severe thunderstorm developed at 1940 CST from the same cluster as the previous Guadalupe County and Gonzales storms above. It began to intensify rapidly after formation, with a well-defined flanking line and a suggestion of rotation in its large, single updraft area. It began to produce marble-size hail at 1955 CST as it moved into the city of Seguin. Just as it reached its greatest intensity, the cells to its southeast (inflow side) re-formed into a weak line that cut off flow to this storm. The storm began to produce hail of up to 1 inch in diameter for a few minutes, then began to weaken as it moved out of the city.





# STORM DATA AND UNUSUAL WEATHER PHENOMENA

JANUARY 1991

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

## TEXAS, Southern Cont'd

Colorado County	18	0705CST	0.5	50	0	0	3	0	Torando (F1)
10 W Eagle Lake	18	0710CST			0	0	0	0	Thunderstorm Wind
Eastern Colorado County	18	0725CST	0.2	30	0	0	3	0	Tornado (F0)
Chesterville									

A tornado touched down 10 miles west of Eagle Lake at 0705 CST. It damaged a barn, tearing off a portion of the roof and tossing it onto a road several hundred feet away. As the parent thunderstorm that spawned the tornado moved to the east-northeast at nearly 40 mph, it caused minor wind damage to a mobile home and satellite equipment, and tore the roofs off two homes in Eagle Lake. It blew a large tree over on Calhoun Road and broke limbs of 6 to 8 inches in diameter off several other trees. A second tornado was produced by the thunderstorm as it reached Chesterville, causing major roof damage to a barn and knocking down power lines; the tornado then dissipated. Additional wind damage was visible from near Chesterville to the Austin County line.

Austin County	18	0730CST			0	0	4	0	Thunderstorm Wind
Southern Austin County									

The Colorado County storm continued to produce damaging winds as it moved eastward into Austin County. Minor damage was reported to sheds and vehicles from the county line eastward. The wind-damage path finally dissipated near San Felipe on the Austin-Waller County line.

Colorado County	18	0730CST	0.4	10	0	0	3	0	Tornado (F0)
20 NE Columbus									

A second tornado was spotted 20-miles northeast of the city of Columbus in the northern portion of this area of thunderstorms at 0730 CST.

Harris County	18	0745CST	0.5	15	0	1	3	0	Torando (F0)
Katy	18	0815CST	0.4	8	0	0	3	0	Tornado (F0)
5 WNW Houston	18	0830CST	0.5	10	0	0	3	0	Tornado (F0)
15 SW (IAH)	18	0850CST	1.5	40	0	3	4	0	Tornado (F1)
Houston									

The thunderstorm cluster indicated in the two tornado reports (in Colorado County above), continued its movement to the east at 35 mph reaching Harris County just before 0800 CST. At 0800 CST, the Katy Police Department reported a tornado near Peek Road and Mason Road. It caused damage to the roof and many of the windows in an elementary school, uprooted several trees, and twisted fencing around the playground. No students were injured since the staff had urged parents to delay the students' arrival for class. One teacher was injured while walking toward the school. The tornado also knocked down power lines in the Katy area. The thunderstorms began to form a line as they moved across Harris County just after 0800 CST. At 0815 CST, a second tornado was reported 5 miles to the west-northwest of the city of Houston at the intersection of Bingle and Kempwood Roads. It tore the roof off a two-story building in a commercial complex. A third tornado was reported at 0830 CST some 15-miles southwest of Houston Intercontinental Airport, on the northwestern edge of the city of Houston. The last tornado in the event occurred in the Maple Leaf Gardens subdivision in the city of Houston at 0850 CST, destroying three trailer homes and causing damage to at least ten others. Three people were injured by the tornado. It was by far the largest and longest-lived of the four tornadoes. The storm system was responsible for power failures in over 30,000 homes.

Matagorda County	18	1000CST	0.2	20	0	0	3	0	Tornado (F0)
Bay City									

A small tornado was sighted in a thunderstorm at the Bay City Municipal Airport near 1000 CST. It caused minor damage on the airport property and knocked out phone lines.

# STORM DATA AND UNUSUAL WEATHER PHENOMENA

JANUARY 1991

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

## TEXAS, Southern Cont'd

**Brazoria County**  
**Lake Jackson**

18 1020CST    0.4    11    0    0    5    2    Tornado (F0)

Thunderstorms moving to the east near 25 mph entered Brazoria County around 1000 CST. A spotter reported that a small tornado accompanied by heavy rain touched down in Lake Jackson. Witnesses saw it lift a pickup truck off the ground and turn it on its side. It damaged an apartment complex, tossing air conditioning units around, damaging roofs, and breaking windows. Residents of the complex reported hearing a roaring sound as the tornado struck. A mobile home was lifted up and damaged, with the owner inside reporting "a steady roar like a train coming." The tornado also downed power lines, snarled traffic lights, and caused a blackout in parts of Lake Jackson.

**Galveston County**  
**20 SW Galveston**  
**15 WNW Galveston**  
**Scholes (GLS)**

18 1045CST    0    0    0    0    Thunderstorm Wind (G61)  
18 1045CST    0    0    0    0    Thunderstorm Wind  
18 1059CST    0    0    0    0    Thunderstorm Wind (G55)

Widespread reports of minor wind damage were received from around Galveston County as thunderstorms moved across the area on the morning of the 18th. Wind gusts to 61 knots were reported on the west end of Galveston Island, with gusts to 55 knots indicated at Scholes Field.

## TEXAS, Western

**Most of Western Texas**

03 Early AM-  
04 Evening    0    0    3    1    Ice Storm

An Arctic cold front moved through all of western Texas except the extreme western portion. Areas of freezing rain and freezing drizzle developed across much of the region during the morning of the third. The resulting ice brought hazardous driving and walking conditions to much of the area. Although no casualties and only minor damage could be directly attributed to the weather, numerous traffic accidents occurred. Two people were killed and 11 injured as a result of accidents on the icy roads.

**Panhandle and South Plains**

09    0    0    2    1    Ice Storm

A small, but vigorous, upper-level disturbance tracked across the western south plains and panhandle. The disturbance produced a swath of heavy snow from west of Lubbock to near Amarillo. Up to 10 inches of snow fell over portions of Amarillo, with 5- to 8-inch totals common across the western panhandle. Snow totals of 4 to 6 inches were reported across the northwestern south plains. Only minor damage was caused by the fall of the heavy, wet snow.

**Permian Basin**

29 Afternoon-  
30 Afternoon    0    0    3    1    Ice Storm

Another Arctic front moved through western Texas, bringing a mixture of freezing rain, sleet, and snow to the Permian Basin. Traffic in the Midland-Odessa area on the mornings of the 30th was slowed to a crawl by the ice-covered roadways. Numerous weather-related accidents occurred across the area, but only minor damage was directly attributed to the winter weather, and no injuries were reported.

## UTAH

**UTZ001-003**  
**Northwestern Valleys**

02 0500MST-  
03 1200MST    4    18    5    0    Dense Fog

High pressure over the area created a strong inversion which in turn caused areas of dense fog. One area of dense fog formed in a low-lying area of Interstate 215 just south of the Great Salt Lake during the morning of the 3rd. This caused four multi-vehicle accidents involving 52 vehicles; the accidents resulted in 4 fatalities and 18 injuries.

# STORM DATA AND UNUSUAL WEATHER PHENOMENA

JANUARY 1991

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

## UTAH Cont'd

UTZ005-006-007  
008-011  
Southern Utah

03	2000MST-								
05	0900MST				0	0	3	0	Heavy Snow

An upper-level trough over southern California spread a very moist air mass over the southern half of the state. Although the brunt of the storm was felt in the southern half of the state, light snow fell as far north as Vernal and the southern end of the Salt Lake Valley. Valley locations in the southern half received 6 to 16 inches while the mountains received 10 to 18 inches. Moab received 8 inches of snow, the most in a 24-hour period since 1949. Two dozen drivers lost control of their vehicles on Interstate 15 at the southern end of the Salt Lake Valley. No serious injuries were reported.

## Iron, Beaver, and Millard Counties

04	0130MST-								
	0900MST				0	0	3	0	Freezing Rain

Because of the cold air still trapped in many of the valleys of southwestern Utah, freezing rain occurred as the same upper-level trough advected in a warm, moist air-mass over the area. Tractor-semitrailers jackknifed and an unspecified number of cars slid off of a section of Interstate 15 between Cedar City and Beaver. No injuries were reported.

## UTZ001-002-003-006-010 Northwestern Valleys and Mountains

07	2100MST-								
08	1200MST				3	3	4	0	Heavy Snow Dense Fog

A weak, but moist, storm located over northern Nevada intensified over the northwestern portion of the state. The heaviest reported snowfall was over northwestern Utah with lighter amounts received across the remainder of the state. The valleys received 6 to 12 inches and mountains 10 to 14 inches. Because of the storm, roads in the northwestern portion were snowpacked and slick, causing numerous accidents. Three separate accidents along the Wasatch Front resulted in three deaths and three injuries. The heavy snow also caused power outages in several areas along the Wasatch Front. After the snow ended and skies cleared, dense fog formed in the western valleys.

## UTZ001-002-003-006 Western Valleys

08	1830MST-								
09	1000MST				0	0	0	0	Dense Fog

With the air mass still moist from the previous storm, widespread dense fog re-formed in the valleys of western Utah from Cedar City to the Utah-Idaho border.

## UTZ001-002-003-010-011 Northwestern Valleys and All Mountains

15	0700MST-								
16	0500MST				0	6	5	0	Heavy Snow

A series of weak disturbances embedded in a moist northwestern flow had been giving the northwestern valleys some light snow and local freezing rain, and nearly continuous light snow to the northwestern mountains since the 12th. The heaviest snow then occurred in all the mountains on the 15th and 16th. Valley locations received 6 to 12 inches, with 12 to 18 inches reported at most mountain locations. A few mountain areas had locally higher amounts. For example, Alta Ski Resort had a 24-hour total of 33 inches ending at 0500 MST on the 16th. Because of the heavy snowfall and the high-water content of the snow, several avalanches occurred in canyons along the Wasatch Front from Provo to Ogden on the 15th. One avalanche in Big Cottonwood Canyon pushed a vehicle off the road. The four people in the vehicle suffered minor injuries. Due to slick and snowpacked roads dozens of accidents occurred in the northwestern valleys on the morning of the 16th. Fortunately, only two people suffered minor injuries as a result of the large number of accidents. On the morning of the 15th, the roof of a building collapsed under the weight of heavy snow.

## VERMONT

Statewide

11	1700EST								Snow
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Snow accumulated to between 8 and 14 inches across Vermont.



# STORM DATA AND UNUSUAL WEATHER PHENOMENA

JANUARY 1991

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

## VERMONT Cont'd

**VTZ005**  
Southeastern Vermont      31 1600EST      0   13   6   0      Snow Squall

Snow squalls throughout the zone created localized white-out conditions. The worst of these occurred about 1600 EST on Interstate 91, near Brattleboro. In this accident a 17-year-old female was pinned in a car for three hours; the vehicle was crushed under the weight of two logging trucks. A total of nine persons were injured in the 15-car mishap near Brattleboro.

## VIRGINIA

**VAZ005-011**      07 0200EST-1900EST      0   0   0   0      Heavy Snow

Several inches of snow fell across northwestern Virginia. Representative totals included: 7 inches at Delaplane; 6 inches at Woodstock and Washington, VA; 5.5 inches at Winchester; and 4 inches at Dulles International Airport (IAD), northern Arlington County, and Broadway.

**VAZ003-007-017**      08 1500EST-09 0500EST-      0   0   5   0      Ice Storm

Several hours of freezing rain and drizzle coated roads throughout east-central and northern Virginia, leading to innumerable traffic accidents and many power outages. A man in Farmville was killed in a weather-related traffic accident.

**VAZ005-011-013**      11 0000EST-2100EST      0   0   5   0      Heavy Snow Glaze

Four to 6 inches of snow fell across the northern Shenandoah Valley, and in Loudoun and northern Fauquier counties in extreme northern Virginia; also in parts of the west-central Highlands area. Representative snowfall totals included: 5 inches at Winchester and Bergton; 4 inches at The Plains and Linden. Freezing rain fell in the latter stages of the storm causing power outages. Some damage was also reported from trees falling onto houses in Bath County.

**VAZ005-010-014-015**      11 0000EST-2100EST      0   0   5   0      Ice Storm

Significant accumulations of freezing precipitation occurred across Rappahannock and Culpeper counties and southern Fauquier County, south and southwest through the Piedmont and Blue Ridge areas. Thousands were without power due to downed trees and power lines. The Blue Ridge Parkway running through Patrick, Henry, Floyd, and Roanoke counties was closed, and it has been estimated that several months will be needed to complete cleanup work from damage caused by ice-covered trees and wires downed by high winds. A man lost his life in Farmville in a weather-related traffic accident.

**VAZ014**      12 0000EST-13 0000EST      1   0   5   0      Flooding

Widespread minor flooding occurred in southwestern Virginia. In Vinton, a woman drove through barriers set up to warn of water over the bridge. She died when her car stalled in the water which was about 3 feet over the bridge, and the water swept the car off. (F31V)

## WASHINGTON

**WAZ001-003**  
Puget Sound Area      06 1500PST-2300PST      0   0   0   0      Heavy Snow

**WAZ002**  
Northwestern Interior      06 1500PST-08 2300PST      0   0   0   ?      Heavy Snow

# STORM DATA AND UNUSUAL WEATHER PHENOMENA

JANUARY 1991

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

## WASHINGTON Cont'd

### WAZ00E

Eastern Washington 07 Morning 0 0 0 ? Heavy Snow

A Pacific weather system moved into western Washington on the afternoon of the 6th. With cold air over the area, the precipitation initially fell as snow. Snow amounts of 2 to 4 inches were reported in Kitsap County and between Olympia and Chehalis. With northeastern winds flowing out of the Fraser River Canyon into northwestern Washington, the snow lasted into the evening of the 8th. Snow amounts around Bellingham ranged from 4 to 12 inches. As the system moved into eastern Washington on the 7th, more snow was reported with the heaviest amounts in the northeastern corner of the state. Both Spokane and Colville received 4 to 6 inches while across the rest of eastern Washington amounts ranged from 1 to 3 inches.

### WAZ006 Northeastern Washington

09 0 0 0 ? Heavy Snow

A cold front moved out of British Columbia and clipped the northeastern corner of the state. The heaviest snowfall occurred in the extreme northeastern corner with Colville reporting 6 inches of new snow. Snowfall amounts around Spokane ranged from 1 to 3 inches.

### WAZ010 Whitman County

13 1200PST 0 0 5 ? Flash Flood

The combination of heavy rains and warming temperatures, on the evening of the 12th and the morning of the 13th, caused the North Fork of the Palouse River to overflow its banks. The hardest-hit area was the Colfax Golf Course where a wall of water, along with numerous chunks of ice, covered the course. Damage elsewhere was minor with a few roads around the Colfax area closed for a time due to the high water.

### WAZ009 Adams County

28 1000PST-1300PST 0 0 5 ? High Winds

Northern winds in the wake of a cold front gusted to 70 mph in Othello. A few houses in the area lost portions of their roofs. Scattered power outages were reported due to trees falling over lines.

## WEST VIRGINIA

### WV001 002-003 Ohio River

01 0000EST-02 1600EST 0 0 ? 0 River Flood

The Ohio River crested at its highest levels since 1979 for many river towns. The crest was 2- to 5-feet higher than the minor flooding that occurred less than two weeks earlier.

The wet December had saturated the ground in the upper Ohio Valley. For example, over 8 inches of total precipitation fell at Parkersburg for the wettest December on record. The rain event of December 30th, when 1.50 to 2 inches fell, was the final event leading to the flood.

Homes were evacuated in low-lying areas as water surrounded the dwellings. City streets and rural routes paralleling the river were blocked. Backwater flooding occurred near mouths of creeks and the larger tributaries, such as the Little Kanawha and Kanawha Rivers.

#### Crests included:

Wellsburg	38.8 ft	0400EST		Jan	1st
Pike Island	39.3 ft	0700EST			
Moundsville	39.5 ft	1000EST			
Hannibal Lock	35.1 ft	1400EST			
Willow Island	38.8 ft	1800EST			
Parkersburg	39.0 ft	1900EST			
Belleville	41.3 ft	0300EST		Jan	2nd
Racine	46.5 ft	0600EST			
Pomeroy	49.4 ft	0600EST			
Pt. Pleasant	46.3 ft	1200EST		Jan	2nd
Gallipolis	50.4 ft	0900EST			
Huntington	51.7 ft	0900EST			

# STORM DATA AND UNUSUAL WEATHER PHENOMENA

JANUARY 1991

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

## WEST VIRGINIA Cont'd

**WV002-005-009-010-011**  
Northern Counties and Eastern Panhandle

06	2100EST-								
07	1200EST				0	0	0	0	Heavy Snow

Four to 7 inches of snow fell along a 50-mile-wide band that extended west to east and crossed the mountains. Grafton measured 7 inches; Morgantown and Philippi 5 inches; Parkersburg and Fairmont 4 inches. It was the first major storm of the season for zones 2 and 5.

**WV010-011**  
Eastern Panhandle

11	0000EST-1000EST								
					0	0	0	0	Heavy Snow

Another 4- to 7-inch snowstorm affected counties east of the Allegheny Front. Martinsburg and Burlington reported 7 inches; Keyser, Cacapon, and Petersburg all measured 5 to 6 inches; Franklin had 4 inches.

**WV009-012**  
Northern and Central Mountains

21	0000EST-								
22	0700EST				0	0	0	0	Heavy Snow

Four to 7 inches of snow fell in the lower elevations with 8 to 14 inches over high terrain. The snow was the result of a cold and moist wind from the northwest. Snow depths on the morning of January 22nd included 15 inches at Pickens; 11 inches at Thomas; 10 inches at Snowshoe, Cheat Bridge, and Cannan Valley; 9 inches at Richwood; and 8 inches at Terra Alta. In the lower elevations, Elkins had 4 inches, while Parsons and Valley Head had 6 inches.

## WISCONSIN

**WIZ011-012-013-014-016-017-018-019-020**  
Southern Wisconsin

10	Evening into								
11	Late Evening				0	0	?	0	Heavy Snow

Up to 10.5 inches of snow fell across southern Wisconsin with southeastern portions receiving the heaviest amounts. Snowfall amounts included Wind Lake (Racine County) 10.5 inches, Racine 10.3 inches, and Milwaukee 8.2 inches.

**WIZ001-002**  
Lake Superior Snowbelt

20	Early Evening into								
20	Late Evening				0	0	?	0	Heavy Snow

Heavy snow squalls in the Lake Superior snowbelt region deposited 6 to 12 inches of snow. The most affected towns were Wentworth, Poplar, and Maple of northern Douglas County, which collected 12 inches of snow.

## WYOMING

**WYZ012-016-017**  
Eastern Plains  
Laramie Valley  
Southeastern Plains

12	0800MST-1400MST								
					0	0	0	0	High Winds

Wind gusts up to 60 mph blew across the higher elevations of southeastern Wyoming. A peak gust to 65 mph occurred at Vedauwoo around 1130 MST.

**WYZ001-004-007**  
Northwestern,  
Big Horn, and  
Western Mountains

14	2000MST-								
15	0600MST				0	0	0	0	Heavy Snow

Snowfall of 6 to 10 inches occurred in the mountains of northern and western Wyoming.

**WYZ004**  
Big Horn Mountains

22	0400MST-2200MST								
					0	0	0	0	Heavy Snow

Snowfall of 6 to 10 inches occurred in the northern and central parts of the Big Horn Mountains.

# STORM DATA AND UNUSUAL WEATHER PHENOMENA

JANUARY 1991

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

## WYOMING Cont'd

WYZ012-015-016-017

Eastern Plains	27	0800MST-							High Winds
Southern Mountains		1800MST			0	0	0	0	

Laramie Valley  
Southeastern Plains Strong winds blew across the higher elevations of southeastern Wyoming. Gusts up to 65 mph were recorded at Vedauwoo at 1300 MST.

WYZ012-015-016-017

Eastern Plains	30	0600MST-							High Winds
Southern Mountains	31	0800MST			0	0	0	0	

Laramie Valley  
Southeastern Plains Periods of strong winds buffeted the higher elevations of southeastern Wyoming. Gusts to 70 mph were logged near Wheatland around 1415 MST on the 30th, while gusts to 85 mph also occurred infrequently in the same area, from 2100 MST on the 30th to 0400 MST on the 31st.

## ALASKA, Southeastern

AKZ012 Lynn Canal and Glacier Bay	02	Early Morning Late Evening							High Winds
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As intense Arctic high-pressure system built over the Yukon Territory, pressure gradients increased over the northern panhandle of Alaska. Sustained winds as high as 41 mph and gusts up to 63 mph were recorded at Skagway.

AKZ-016 Eastern Gulf Coast	30	Late Evening							Heavy Snow
	31	Early Evening			0	?	?	0	

AKZ-012 Lynn Canal and Glacier Bay	31	Morning Early Afternoon							Heavy Snow
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A nearly-stationary low-pressure system in the eastern Gulf of Alaska produced heavy snow north of an Arctic front, which lay over the northern panhandle and across the northeastern gulf. Between midnight and 0430 AST on the 31st, 6 inches of snow fell at Haines at the northern end of Lynn Canal. Twenty-four hours later, more than 2 feet of new snow had fallen. Gusty winds produced blowing and drifting snow at times. On the eastern gulf coast, Yakutat received over 12 inches of snow on the 31st as well as a few hours of freezing rain.

## ALASKA, Southern

Bristol Bay, Coastal, Cook Inlet, Susitna Valley, St. Paul Island	18- 1200UTC 19								Winter Storm
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An intense 946-millibar low-pressure system moved northward across the western Alaska Peninsula to the Yukon River Delta where the storm weakened. Blizzard conditions were reported at St. Paul Island for most of the 18th and into the early morning of the 19th with wind speeds of 45 to 50 mph. Bristol Bay and Cook Inlet experienced locally high winds. Along the western slopes of the Alaska Range at Port Alsworth, a peak wind of 69 mph was recorded. In the Anchorage area, the storm produced high winds along eastern hillside neighborhoods; a 63 mph gust was reported.

Cook Inlet Susitna Valley	19- 0000AST 20								High Wind
------------------------------	-------------------	--	--	--	--	--	--	--	-----------

A strong low-pressure area moved northward through the Gulf of Alaska and turned northwest across Kodiak Island and the eastern side of Cook Inlet during the night. An unofficial peak gust of 127 mph was recorded by a citizen's wind equipment at high elevation. Chugach Electric Association reported that weather-related power outages resulted in service interruption to as many as 4,000 customers.

# STORM DATA AND UNUSUAL WEATHER PHENOMENA

JANUARY 1991

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

## ALASKA, Southern Cont'd

Western Alaska Peninsula Eastern Aleutians St. Paul Island	23- 24	0000AST							High Winds
--	-----------	---------	--	--	--	--	--	--	------------

An intense low-pressure area moved from the north Pacific to the western Bering Sea early on the 23rd. Wind gusts to 101 mph were recorded at Shemya Air Force Base. Amchitka Island reported sustained winds to 69 mph with gusts to 96 mph. The strongest winds at St. Paul and Cold Bay were on the 24th. Wind gusts reached 60 mph at Cold Bay and 54 mph at St. Paul.

St. Paul Island	29- 30	0000AST							High Winds
-----------------	-----------	---------	--	--	--	--	--	--	------------

A strong area of high pressure over Siberia and the northern Bering Sea produced strong northeastern winds across the Bering Sea. A gust of 55 mph was recorded at St. Paul on the morning of the 30th. Several ships in the nearby coastal waters reported winds in excess of 50 knots. Buoy reports indicated seas as high as 33 feet.

## HAWAII

Hawaii All Islands	27								Wind, Flooding
-----------------------	----	--	--	--	--	--	--	--	----------------

A cloud and shower band, associated with a deep low-pressure system moving eastward just north of the state, moved southeastward down across the chain. It crossed Kauai shortly after midnight, Oahu during the predawn hours, Maui around noon, and the Big Island in the afternoon. The Kona side of the Big Island sustained most of the damage, due to wind and heavy rain, though scattered damage occurred on Maui also. Only minor damage occurred on Oahu and Kauai. A number of boats were lost or sustained severe damage at Kona as winds locally gusted to 60 to 80 mph. Seven homes in the Kona area also lost their roofs. A residence in the Fern Forest in Puna was blown off its foundation and landed on a car. Heavy rains on the Kohala and Kona slopes caused extensive flooding and erosion of secondary roads. Damage to boats at Kona alone exceeded \$1 million.

## PACIFIC

None reported.

## PUERTO RICO

None reported.

## VIRGIN ISLANDS

None reported.

## CORRECTIONS

### OCTOBER 1990

**WEST VIRGINIA** - Page 71 - First line of narrative should read:

Remnants of Tropical Storm Marco dumped 3.5 inches of rain between 0100 and 0700 EST.

**DECEMBER 1990 - STORM SUMMARY** - Page 101 - National Floods Deaths & Injuries Totals

<u>Floods</u>	<u>Was</u>	<u>Change To</u>
Deaths	10	7
Injuries	40	7
Property Damages		
Crop Damage		

# STORM SUMMARY

JANUARY 1991

TYPE	ALABAMA	ARIZONA	ARKANSAS	CALIFORNIA	COLORADO	CONNECTICUT	DELAWARE	FLORIDA	GEORGIA	IDAHO	ILLINOIS	INDIANA	IOWA	KANSAS	KENTUCKY	LOUISIANA	MAINE	MARYLAND & DC	MASSACHUSETTS	MICHIGAN	MINNESOTA	MISSISSIPPI	MISSOURI	MONTANA	NEBRASKA	NEVADA	NEW HAMPSHIRE
<b>TORNADOES</b>					0																						
Number								7	1							1			0	0	0		0			0	
Days								5	0							0											
Deaths								0	0							0											
Injuries								0	0							0											
Property Damage								0	0							0											
Crop Damage								0	0							0											
<b>HAIL</b>																											
Deaths								0	0																		
Injuries								0	0																		
Property Damage								0	0																		
Crop Damage								0	0																		
<b>THUNDERSTORM WINDS</b>																											
Deaths	0							0	0							0						0					
Injuries	0							0	0							0						0					
Property Damage	0							0	0							0						0					
Crop Damage	0							0	0							0						0					
<b>HIGH WINDS</b>																											
Deaths				0																				0			
Injuries				0																			0				
Property Damage				0																			0				
Crop Damage				0																			0				
<b>LIGHTNING</b>																											
Deaths						0																					
Injuries						0																					
Property Damage						0																					
Crop Damage						0																					
<b>FLASH FLOODS</b>																											
Deaths			0									0											0				0
Injuries			0									0										0					0
Property Damage			0									0										0					0
Crop Damage			0									0										0					0
<b>FLOODS</b>																											
Deaths																											
Injuries																											
Property Damage																											
Crop Damage																											
<b>HEAVY SNOWSTORMS AND BLIZZARDS a</b>																											
Deaths																											
Injuries																											
Property Damage																											
Crop Damage																											
<b>ICE STORMS #</b>																											
Deaths																											
Injuries																											
Property Damage																											
Crop Damage																											
<b>HURRICANES AND TROPICAL STORMS</b>																											
Deaths																											
Injuries																											
Property Damage																											
Crop Damage																											
<b>ALL OTHERS</b>																											
Deaths																											
Injuries																											
Property Damage																											
Crop Damage																											

# STORM SUMMARY

JANUARY 1991

TYPE	VERMONT	NEW MEXICO	NEW YORK	NORTH CAROLINA	NORTH DAKOTA	OHIO	OKLAHOMA	MONTRO	PENNSYLVANIA	RHODE ISLAND	SOUTH CAROLINA	SOUTH DAKOTA	TENNESSEE	TEXAS	UTAH	VERMONT	VIRGINIA	WASHINGTON	WEST VIRGINIA	WISCONSIN	WYOMING	ALASKA	HAWAII	PACIFIC	PUERTO RICO	VIRGIN ISLANDS	NATIONAL TOTALS	& INJURY DEATHS
<b>TORNADOES</b>		0		0						0			0												0	0	0	
Number														20														1
Days														15														20
Deaths														5														
Injuries														5														
Property Damage														5														
Crop Damage														5														
<b>HAIL</b>																												
Deaths																												
Injuries																												
Property Damage																												
Crop Damage																												
<b>THUNDERSTORM WINDS</b>																												
Deaths																												
Injuries																												
Property Damage																												
Crop Damage																												
<b>HIGH WINDS</b>																												
Deaths																												
Injuries																												
Property Damage																												
Crop Damage																												
<b>LIGHTNING</b>																												
Deaths																												
Injuries																												
Property Damage																												
Crop Damage																												
<b>FLASH FLOODS</b>																												
Deaths																												
Injuries																												
Property Damage																												
Crop Damage																												
<b>FLOODS</b>																												
Deaths	0																											
Injuries	0																											
Property Damage	0																											
Crop Damage	0																											
<b>HEAVY SNOWSTORMS AND BLIZZARDS a</b>																												
Deaths	0																											
Injuries	0																											
Property Damage	0																											
Crop Damage	0																											
<b>ICE STORMS #</b>																												
Deaths	0																											
Injuries	0																											
Property Damage	0																											
Crop Damage	0																											
<b>HURRICANES AND TROPICAL STORMS</b>																												
Deaths																												
Injuries																												
Property Damage																												
Crop Damage																												
<b>ALL OTHERS</b>																												
Deaths																												
Injuries																												
Property Damage																												
Crop Damage																												
<b>TOTALS</b>																												
Deaths																												16
Injuries																												130
Property Damage																												
Crop Damage																												

STORM DAMAGE CATAGORIES

REFERENCE NOTES

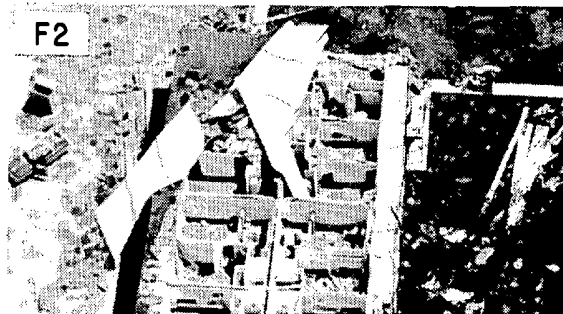
- 1 Less than \$50
- 2 \$50 to \$500
- 3 \$500 to \$5,000
- 4 \$5,000 to \$50,000
- 5 \$50,000 to \$500,000
- 6 \$500,000 to \$5 Million
- 7 \$5 Million to \$50 Million
- 8 \$50 Million to \$500 Million
- 9 \$500 Million to \$5 Billion

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

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

Definition of Fujita Tornado Scale (F scale)

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



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



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

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



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

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



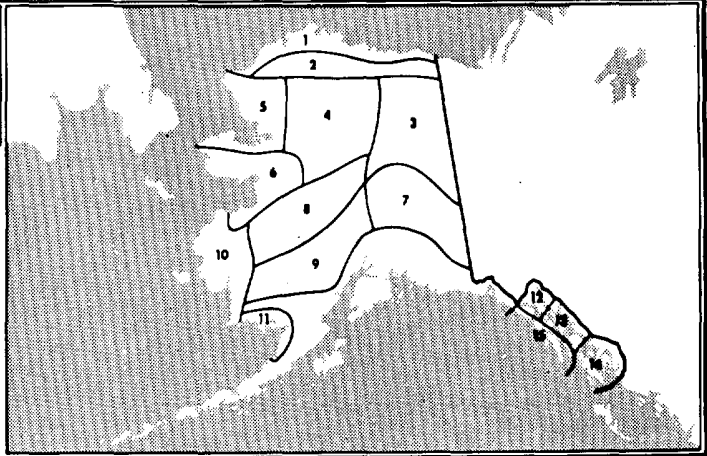
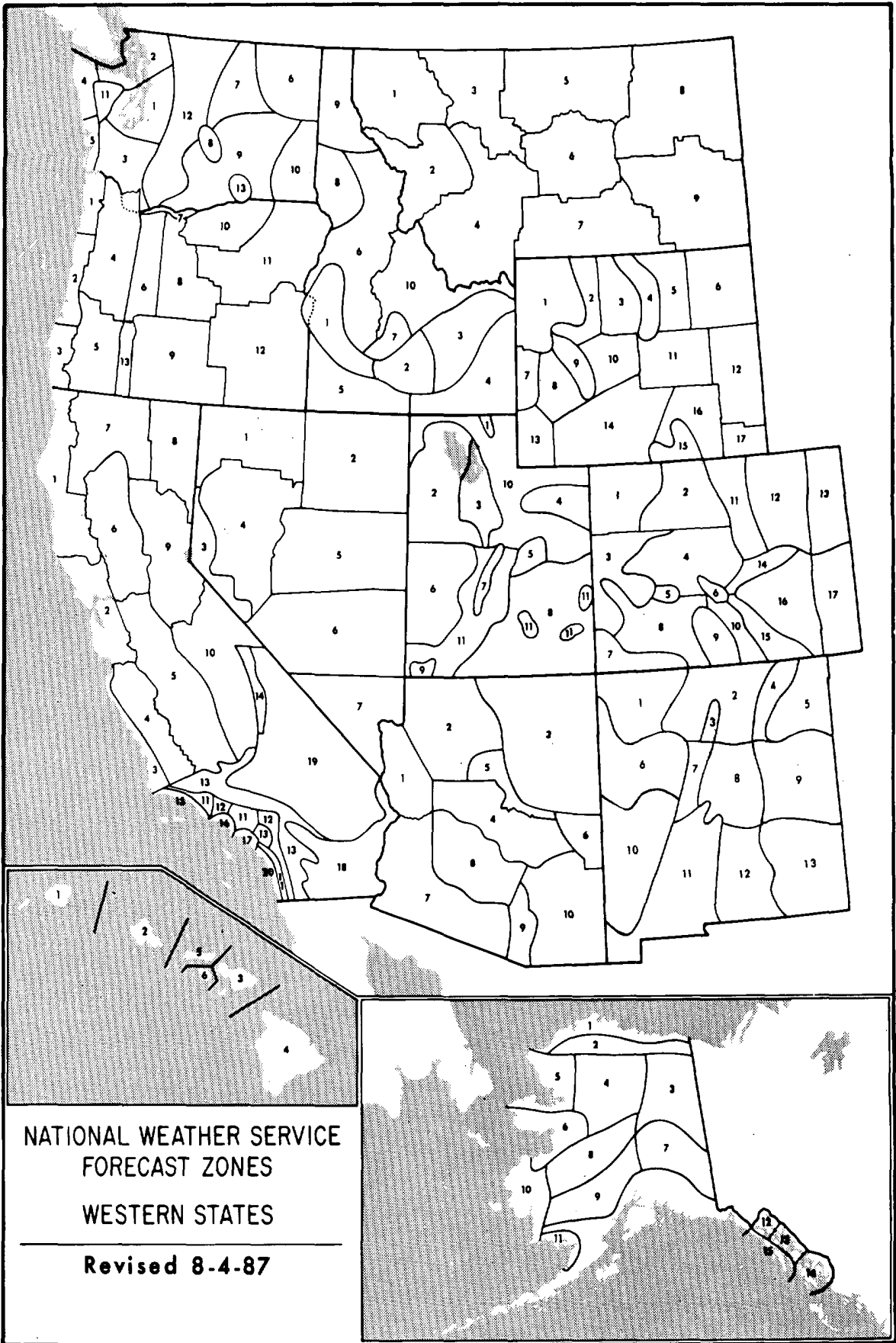
(F6-F12) (319 mph to Mach 1, the speed of sound):  
The maximum wind speeds of tornadoes are not expected to reach the F6 wind speeds.

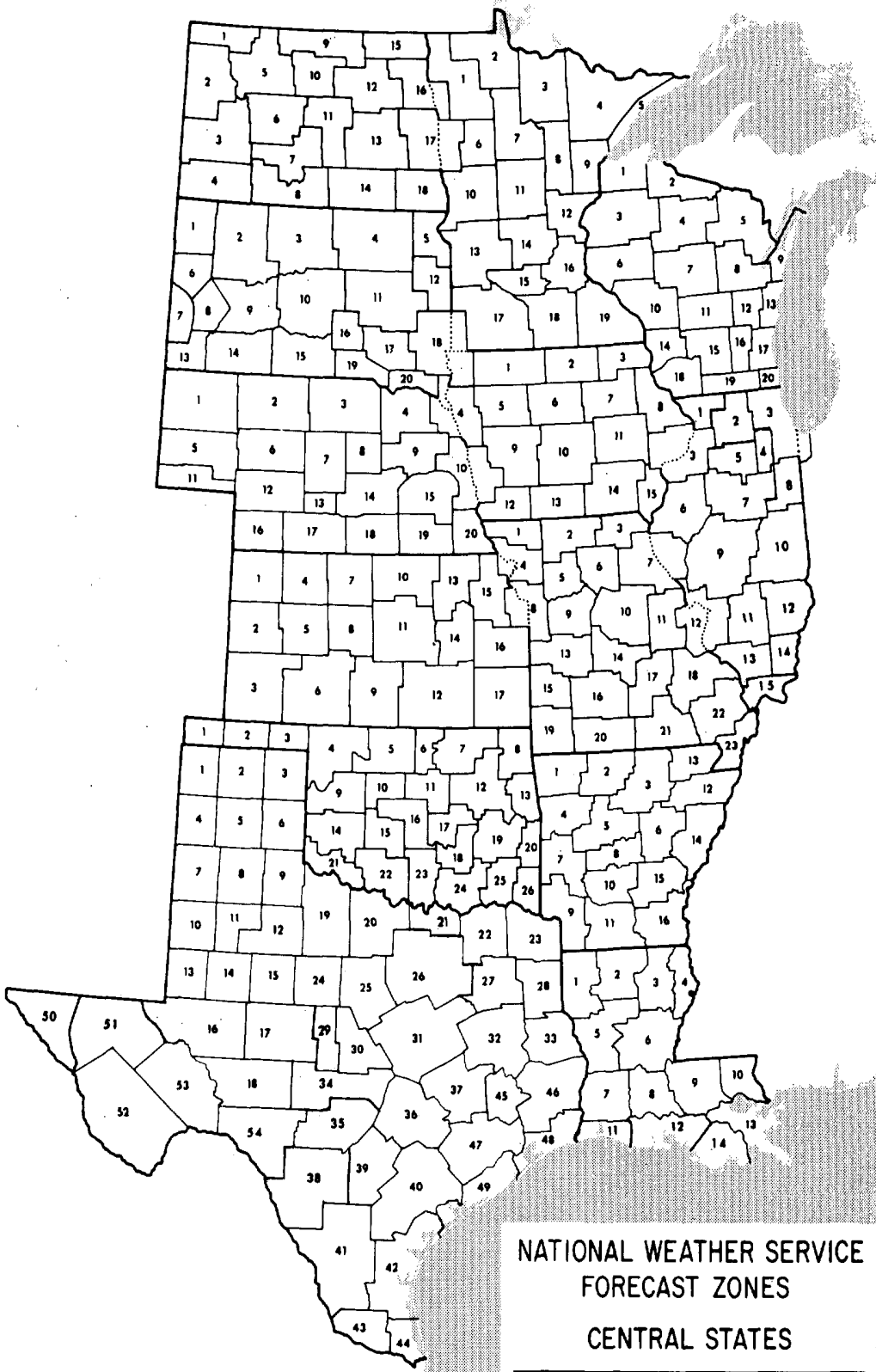
- 
- (F0+F1) Weak Tornado
  - (F2+F3) Strong Tornado
  - (F4+F5) Violent Tornado
- 

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

USCOMM-NOAA-ASHEVILLE, N.C. 1992-1800

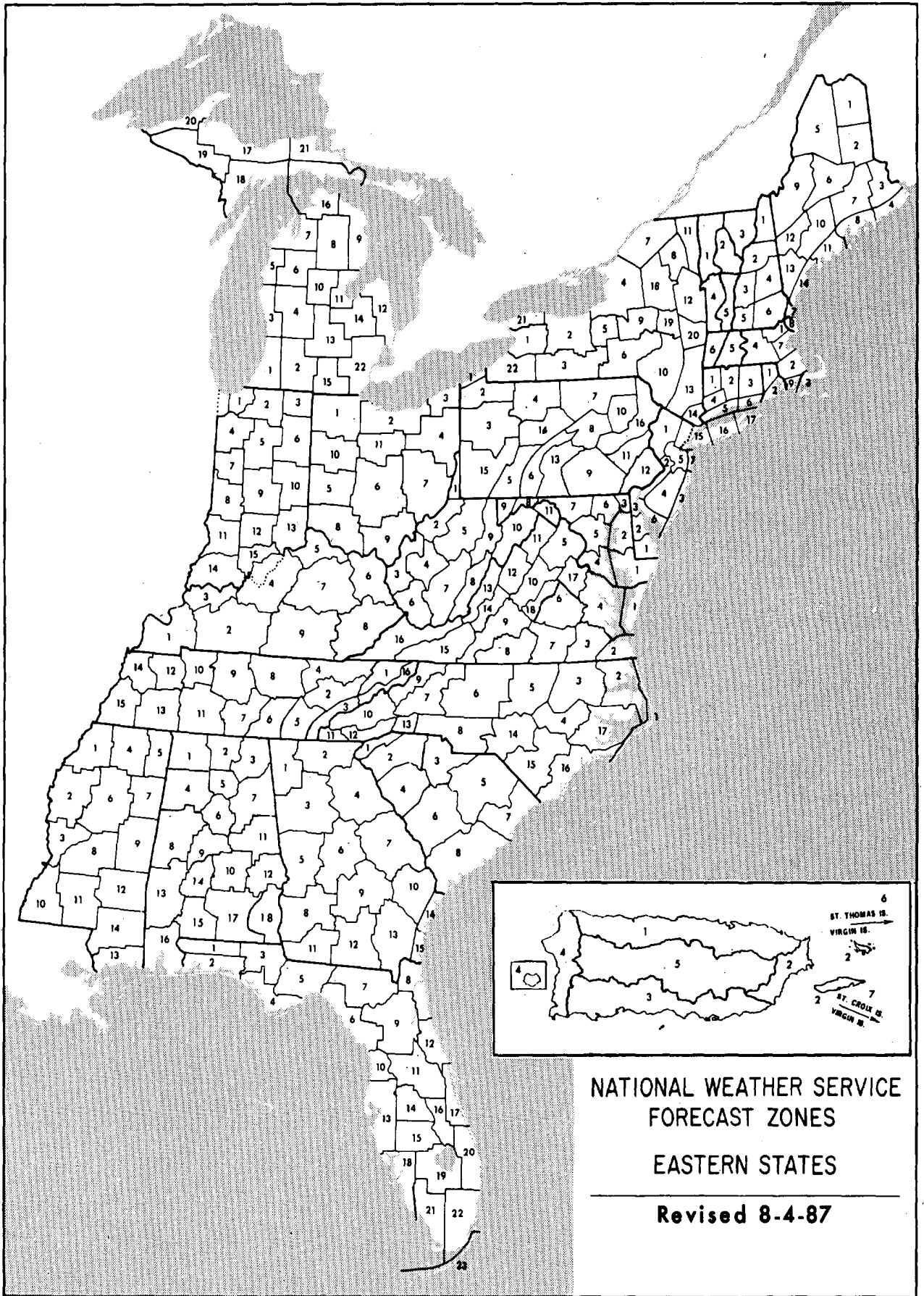






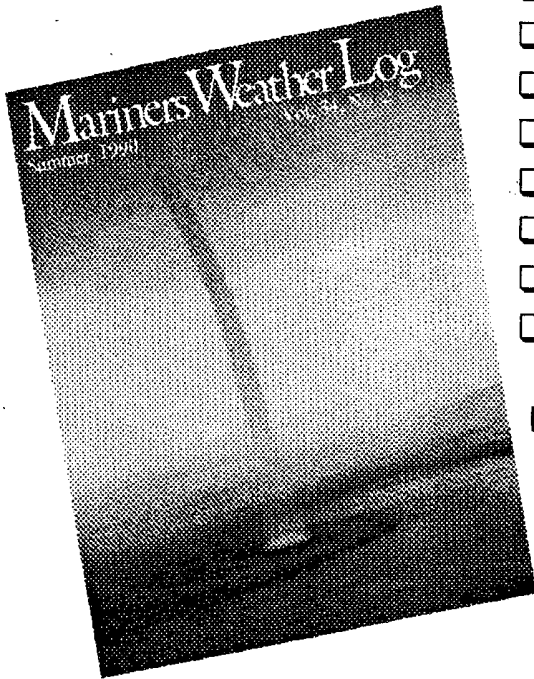
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