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NOAA TECHNICAL MEMORANDUM NWS NSSFC-29



SEVERE THUNDERSTORM CASES OF JULY 1989 THRU JUNE 1990

John E. Hales, Jr. and Hugh G. Crowther
National Severe Storms Forecast Center
Kansas City, Missouri 64106-2877

April 1991

U.S. DEPARTMENT OF
COMMERCE

/ National Oceanic and
Atmospheric Administration

/ National Weather
Service

National Weather Service
National Severe Storms Forecast Center

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- No. 7 Severe Thunderstorm Cases of 1984. John E. Hales, Jr. and Hugh G. Crowther, May 1985, 88 p., (PB85 210748/AS).

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SEVERE THUNDERSTORM CASES OF JULY 1988 THROUGH JUNE 1989

JOHN E. HALES JR.
HUGH G. CROWTHER

ABSTRACT

Severe thunderstorm occurrences are relatively infrequent in much of the United States. As a result a forecaster only occasionally has an opportunity to forecast their development. This proves to be a problem as certainly one of the more important factors in forecasting severe thunderstorms is the level of experience of the forecaster. Realizing the importance that experience plays and difficulty involved for a meteorologist to study past cases, a summary was compiled of all the organized severe thunderstorm episodes for the period from July 1988 to June 1989. Included in each case were the times and locations of the severe weather reported along with specifics of the more noteworthy events. A composite of those parameters most frequently found to be associated with severe thunderstorms was included. Each case has a surface and 500mb analysis along with an infrared satellite photo. The objective was to give an overview to a forecaster as to what ingredients went into severe development with a more detailed analysis being left up to the individual.

INTRODUCTION

More severe thunderstorms occur in the United States than in any other area of the world. Organized severe thunderstorm episodes can occur in any section of the country and in any month of the year. The synoptic conditions that result in the development of these storms vary widely across the country. Severe storm climatology shows the episode frequency decreasing with distance from the center of the country, however only the Pacific coastal states lack a significant number of cases for any great concern.

One of the more important tools in forecasting severe thunderstorm episodes is experience. The more opportunities a forecaster has in working a severe weather situation, the greater his skill and confidence becomes. Unfortunately, these episodes are infrequent enough that, with the exception of the most active areas in the central United States, an individual forecaster may only work a severe situation once or twice per year.

The usual technique for increasing ones experience base is to go back and examine the synoptic charts, particularly for cases with

which the forecaster was not previously involved. This can be a rather difficult undertaking because charts of interest may not be readily available and/or organized in a systematic manner. This is the case at the NSSFC, but it is often so to a much greater extent at the local field offices.

The purpose of this publication is to identify and organize those severe thunderstorm episodes that occurred across the nation for the period from July 1989 through June 1990 into a handy and easy to use format such that a forecaster can readily review those cases that may be of interest to him. The selection procedure of the cases was not very restrictive and included most of the organized severe thunderstorm episodes that occurred nationally. In those areas where storms are rather infrequent, such as west of the Rocky Mountains, the selection threshold was somewhat lower.

CASE FORMAT

The basic approach in compiling the cases was to provide the interested forecaster with a comprehensive, but not excessive number of charts. The following is a description of what each chart included.

Daily Activity Summary-A plotting of most all the severe reports along with depiction of the days organized convection is shown(solid line). A listing of any noteworthy individual event is included for each day. The criteria for listing a report would be most of the F2(Fujita 1981) or greater tornadoes, tornadoes/wind damage that result in death, a significant number of injuries and/or damage that generally exceeds \$100,000. Storms that resulted in damage in excess of about \$100,000 were included in the listing by category as used in Storm Data(U.S. Dept. of Commerce 1989 and 1990). Those reports were then located on the activity summary chart by number. Also included is a table listing the daily total of severe reports. Following the date there is included the time range of the organized severe occurrence. All times were in CST.

Composite Chart-The purpose of a composite is to represent on one chart those parameters important in producing severe thunderstorms. The basic composite is similar to that done in TR-200(eg., Miller, 1972) with some modifications. Instead of using the 850 Td, the mean mixing ratio(solid line g/kg) was incorporated as a better representation of the low level moisture supply. The relevant short wave trough(line of triangles) was taken from the 700 mb level rather than 500 mb. This was done for two reasons a) the 500 mb analysis being included in the study and b) a more frequent correlation of troughs at 700 mb with severe thunderstorm development. The polar and subtropical jet-stream is depicted by the maximum winds axis(broad solid line with arrowhead in kts) at the 250 mb level. The lifted index analysis(dashed line) used the lower 100 mb of moisture and a forecasted maximum surface

temperature. Any areas of upper diffluence (zig zag line) and mid level drying (heavy dashed line), as well as the low level jet (line with arrow in kts), as shown on the 850 mb analysis, are included.

500 mb Analysis-The NMC operational 500 mb analyses using the observation time most relevant to the severe thunderstorm development was included.

Satellite Photo-The infrared photo closest to the time of the most severe storm occurrence of the day was included, where available. The enhancement curve used was the MB.

SUMMARY

The details of synoptic patterns that are associated with severe weather events are soon forgotten. However similar, a severe weather situation appears to an earlier occurrence, there are always important differences. Having available the pertinent synoptic conditions that were present in a past situation should enable a forecaster to better identify future storm producing patterns.

ACKNOWLEDGEMENTS

Thanks to the Satellite Applications Laboratory, NESDIS, especially Mr. Edwin L. Fisher for supplying many of the satellite photos. Thanks to the NSSFC secretary, Deborah Haynes for assistance in typing the text.

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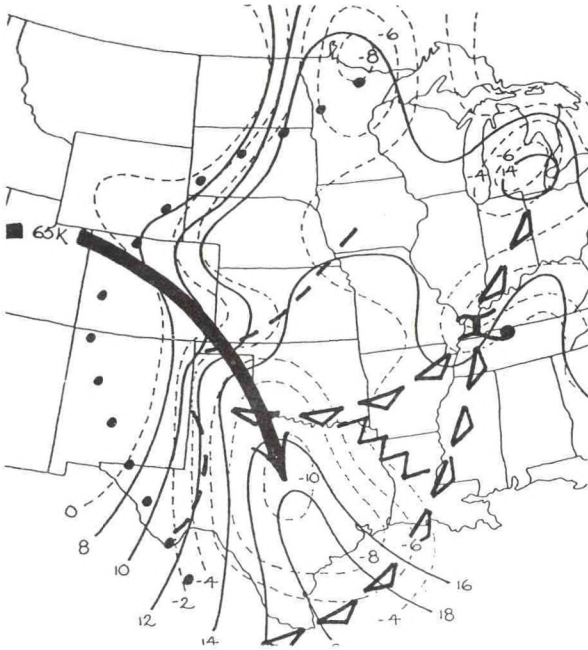
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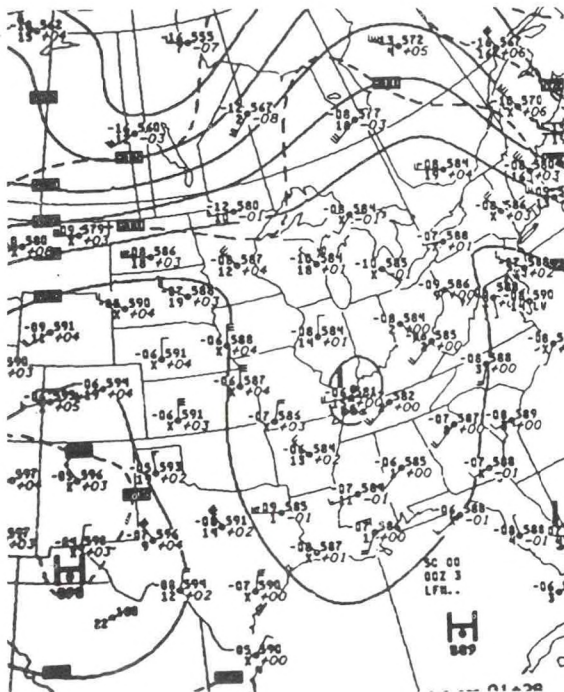
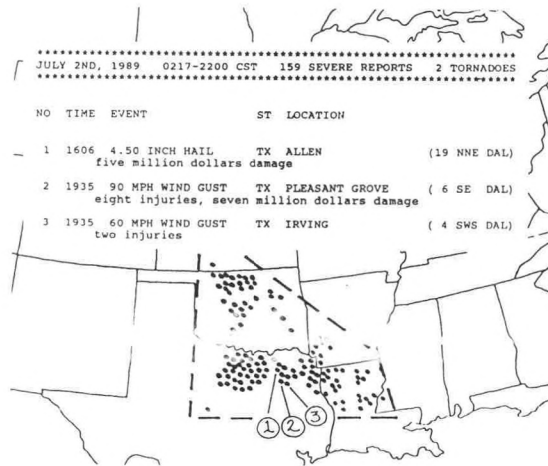
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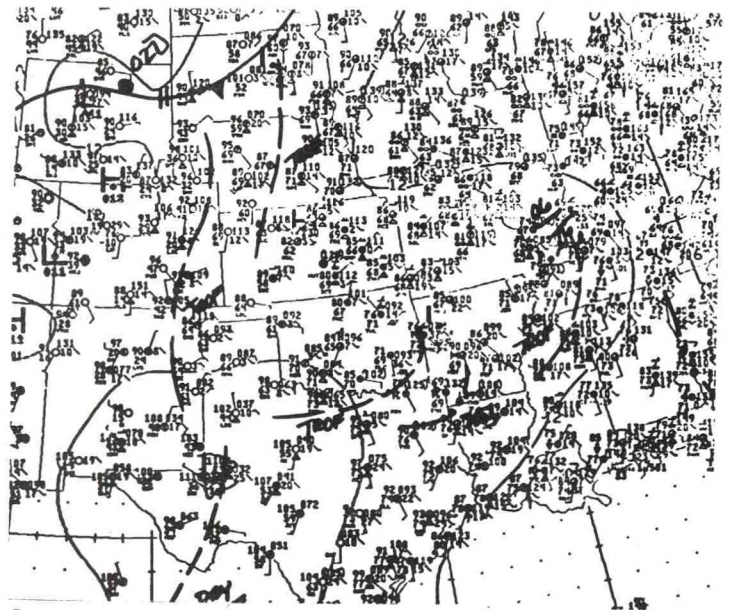
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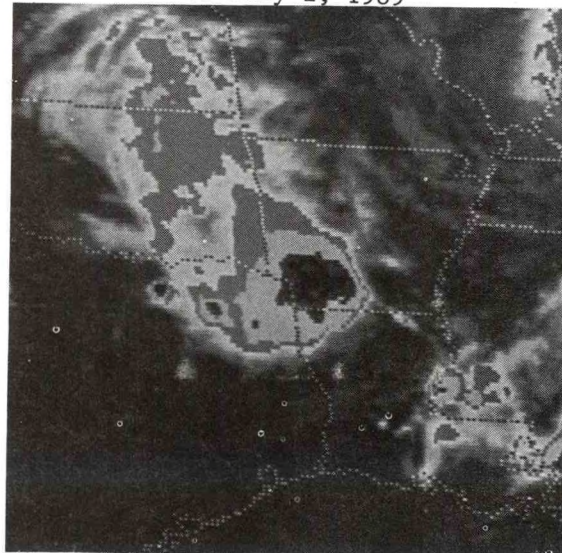
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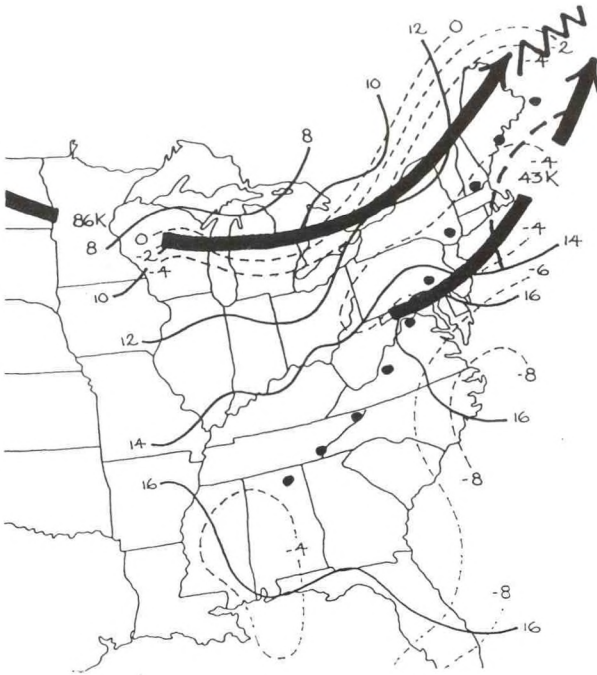
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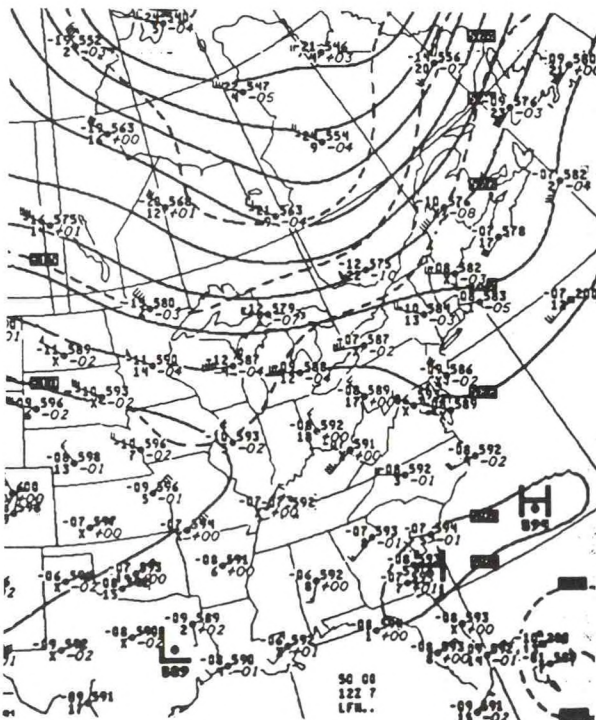
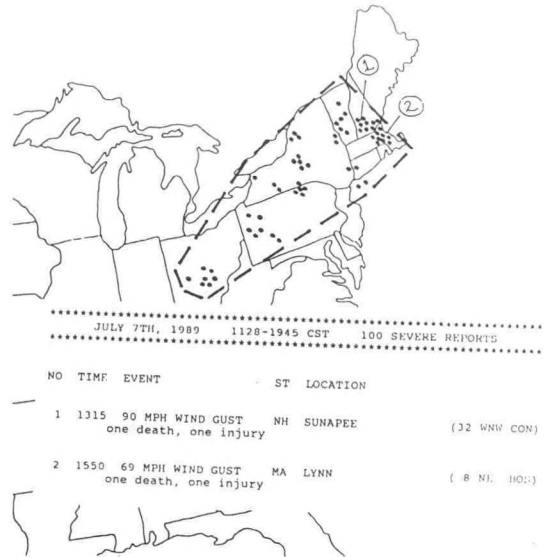
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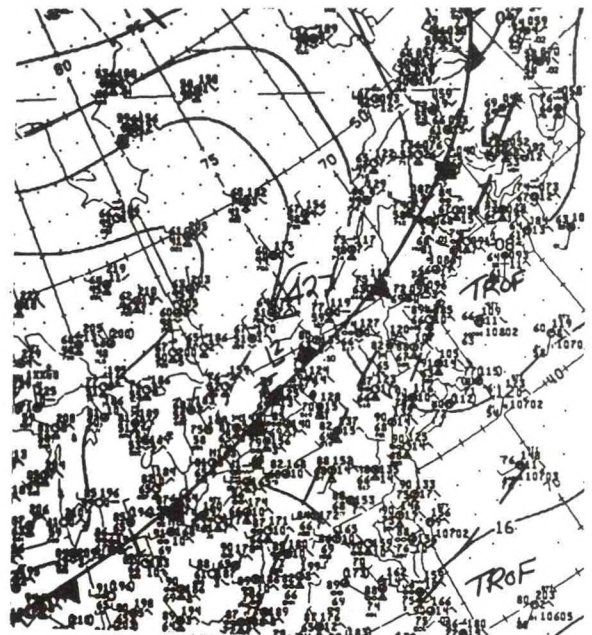
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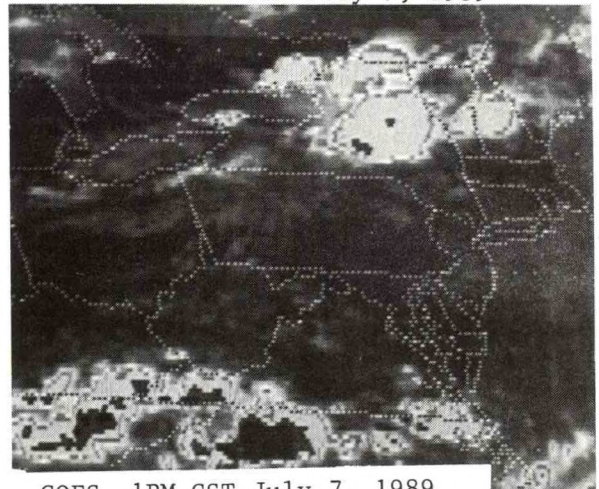
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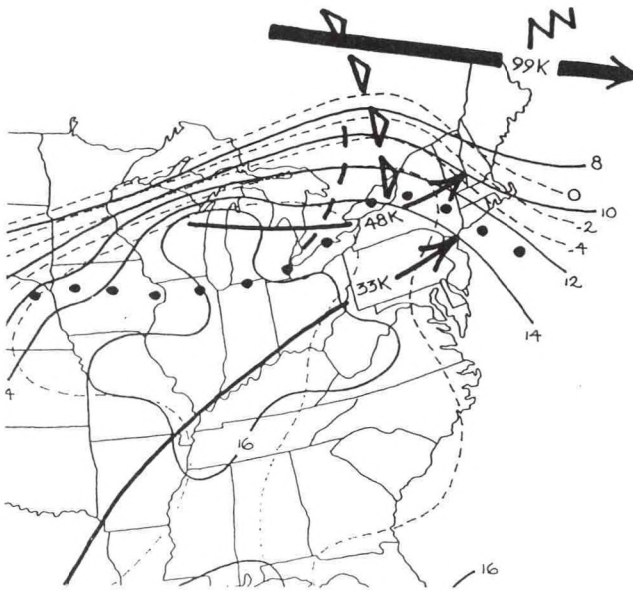


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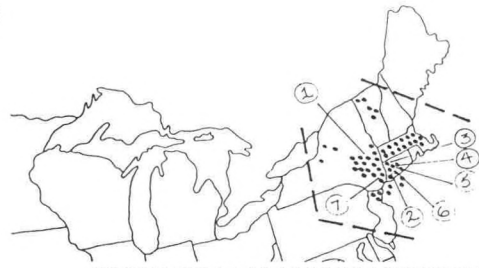


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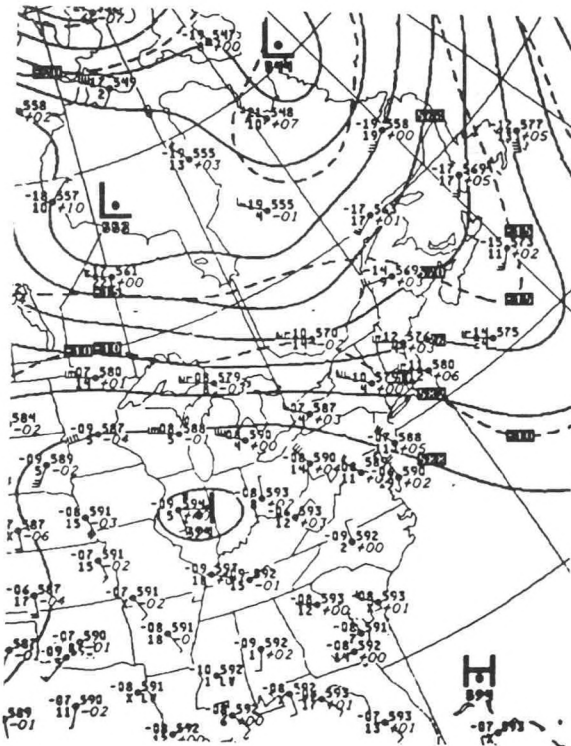


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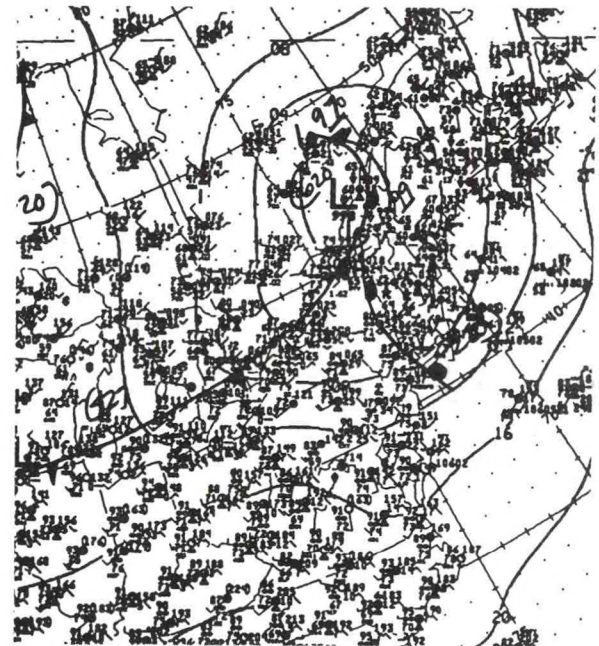


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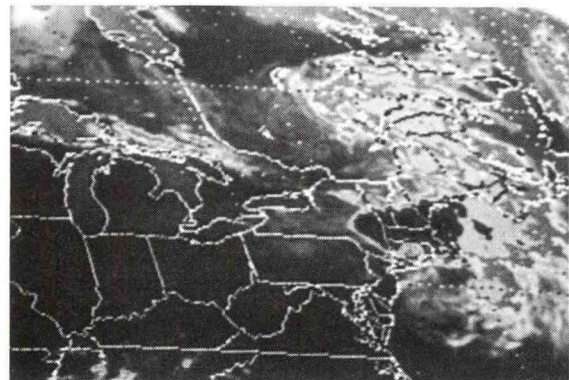
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3	1505	90 MPH WIND GUST	CT	MORRIS (26 NE DXR)
4	1515	80 MPH WIND GUST one death, ten injuries, more than five million dollars damage	CT	WATERTOWN (25 WSW HFD)
5	1515	TORNADO (F-2) seventy injuries, more than five million dollars damage	CT	WATERTOWN (25 WSW HFD)
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500 MB 6AM CST July 10, 1989

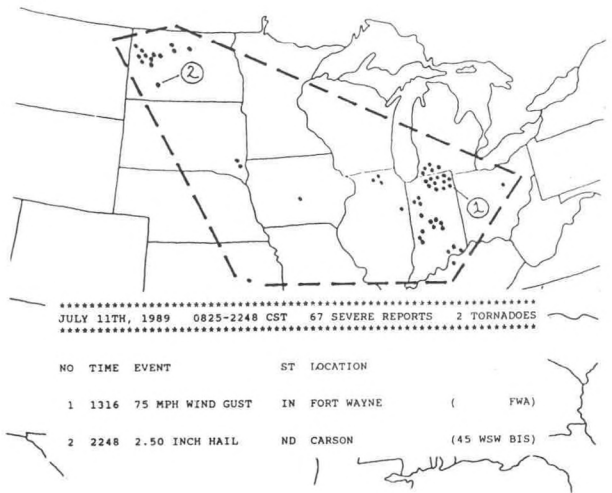
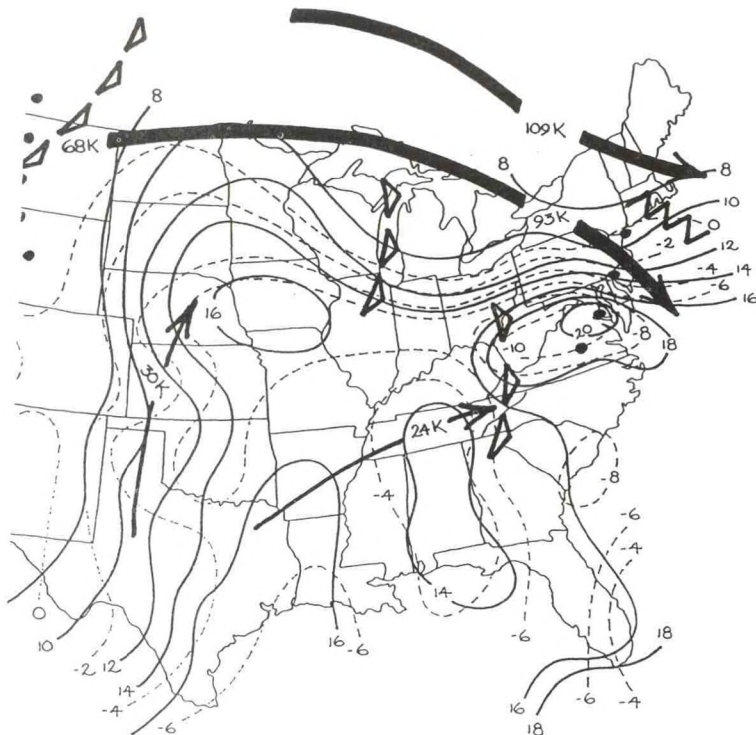


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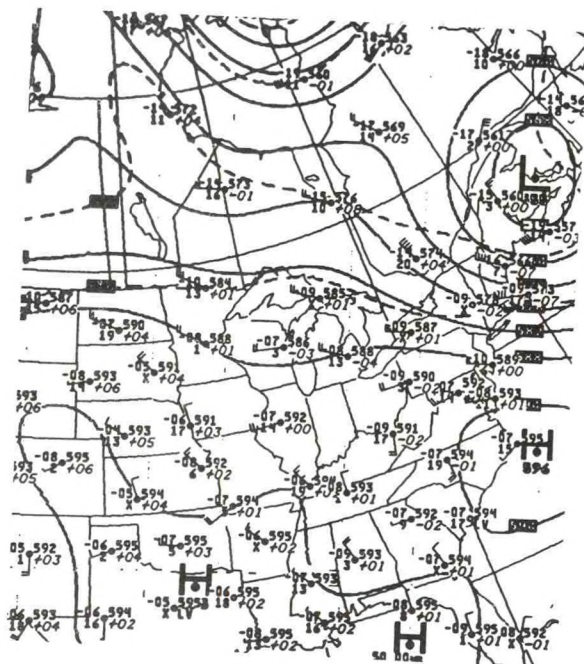


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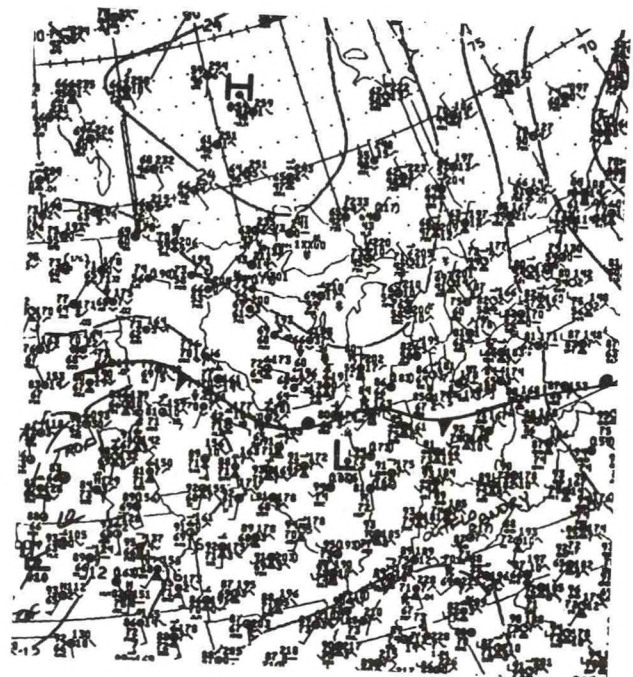
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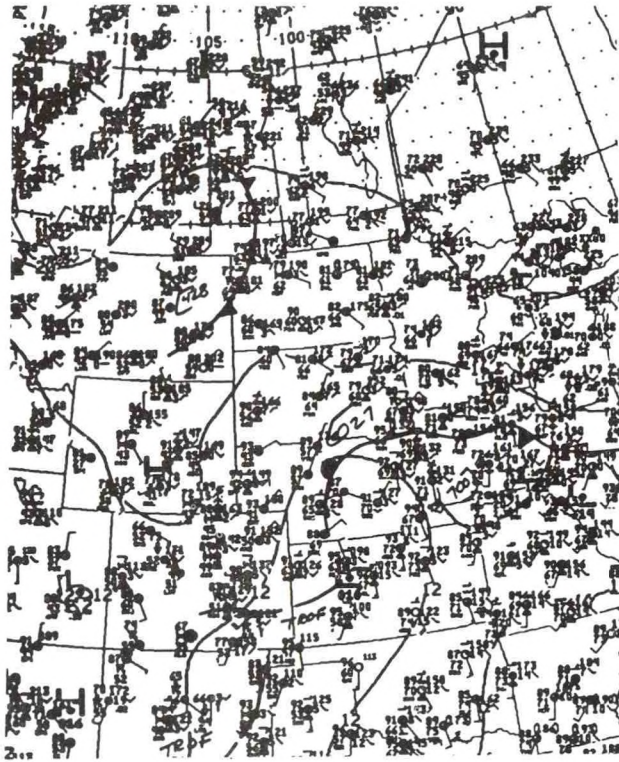
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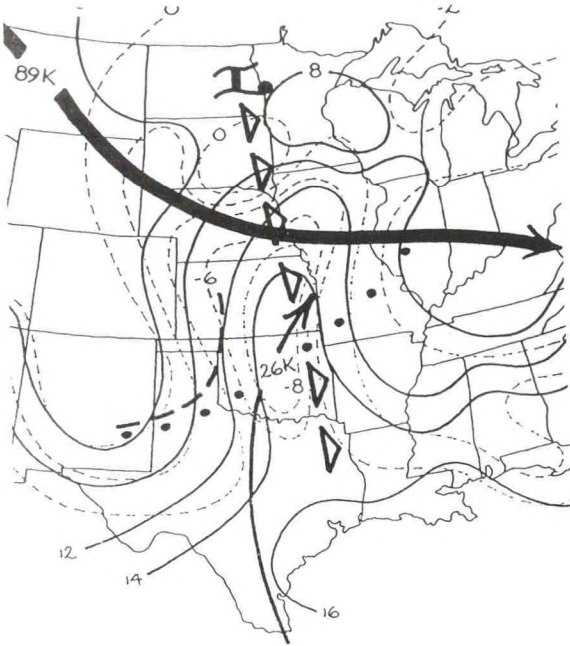
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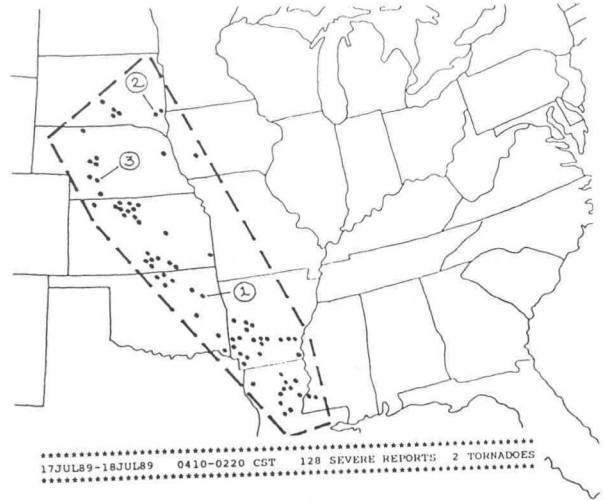
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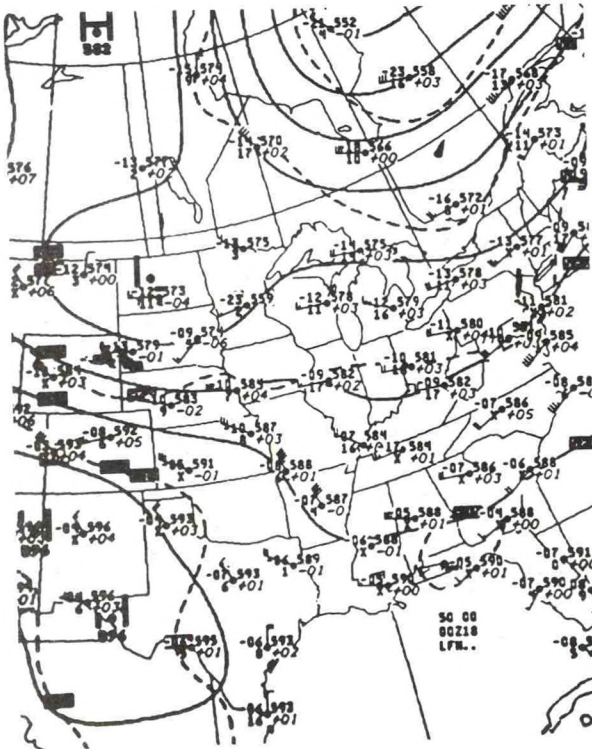


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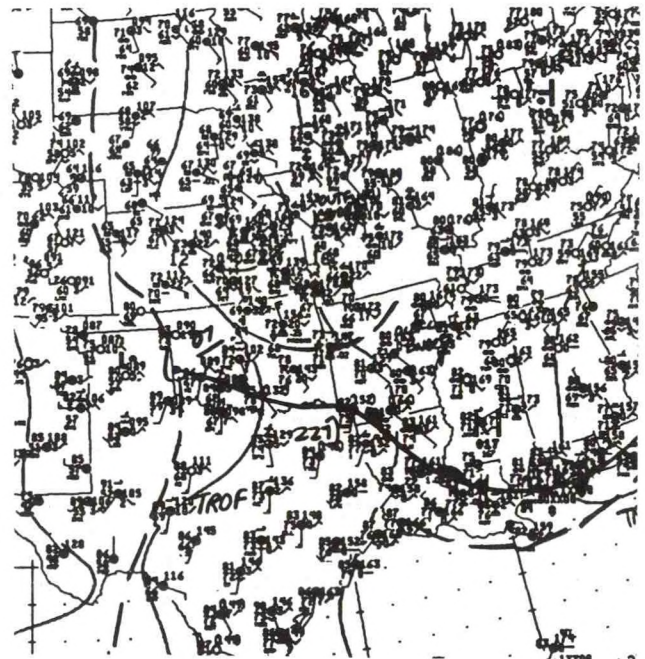


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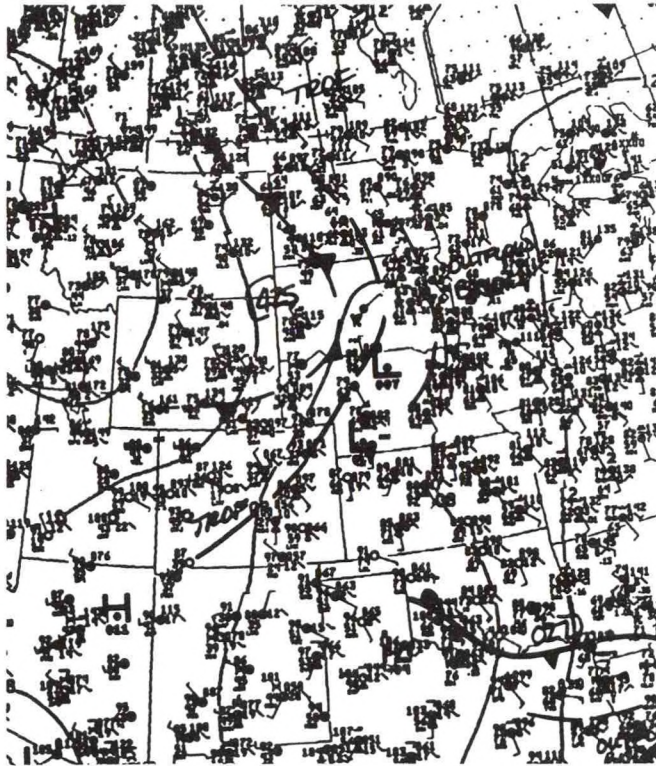
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2	1805	TORNADO (F-1) one injury	SD	SIOUX FALLS	(FSD)
3	2015	4.00 INCH HAIL more than \$100,000 damage	NE	HAYWOOD	(31 N MCK)



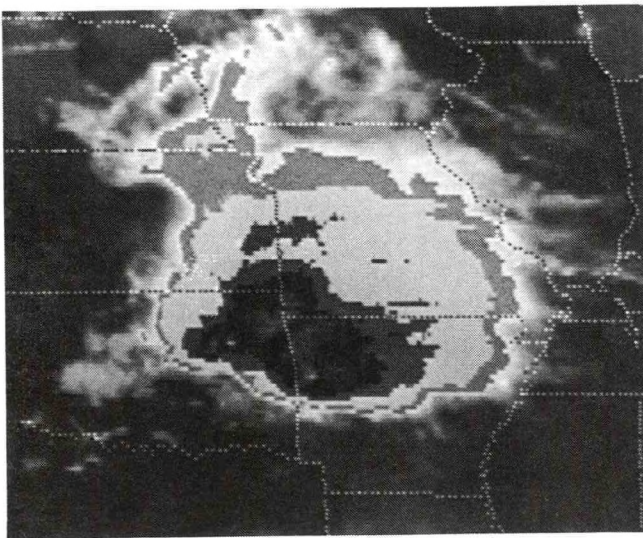
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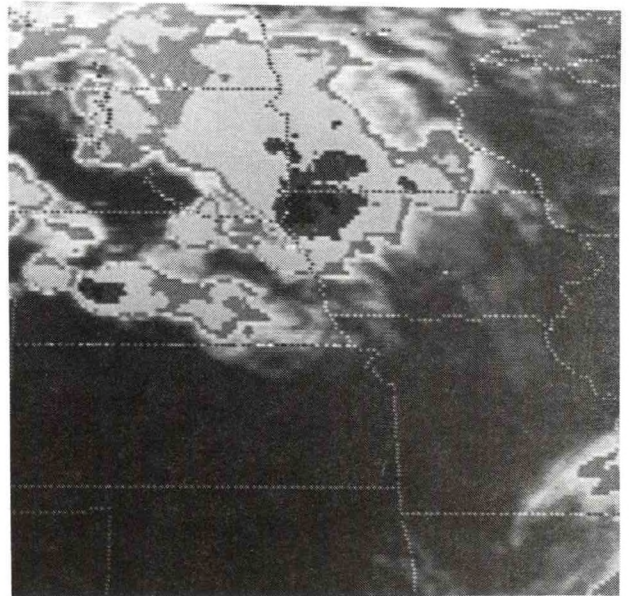
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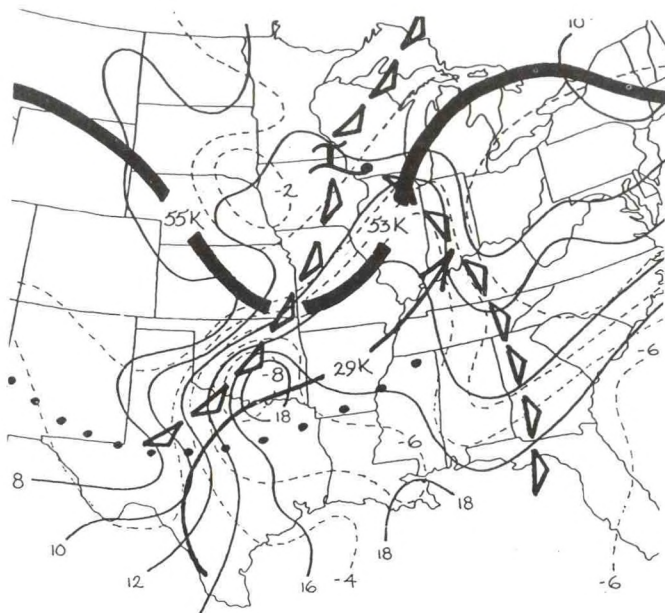


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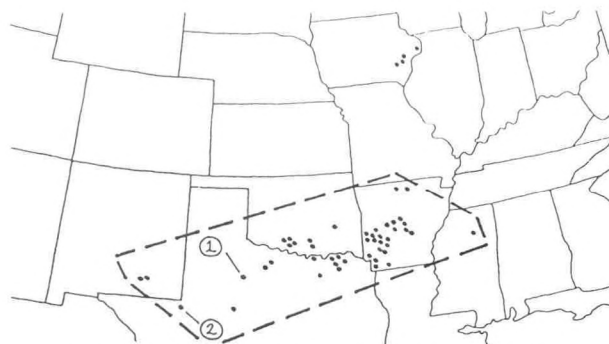


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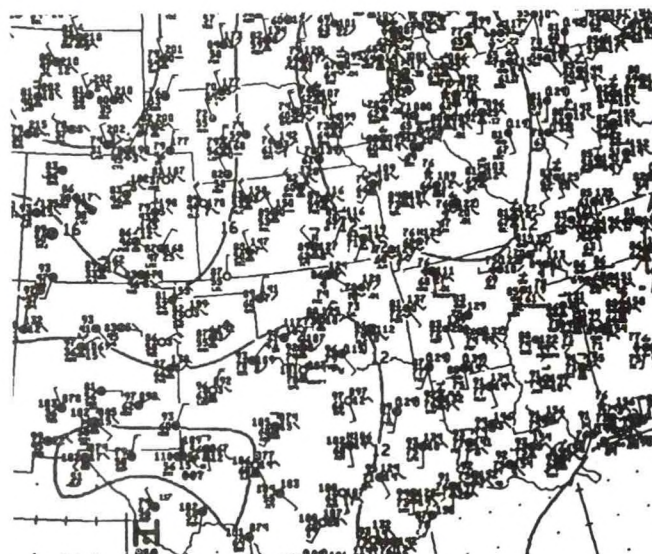


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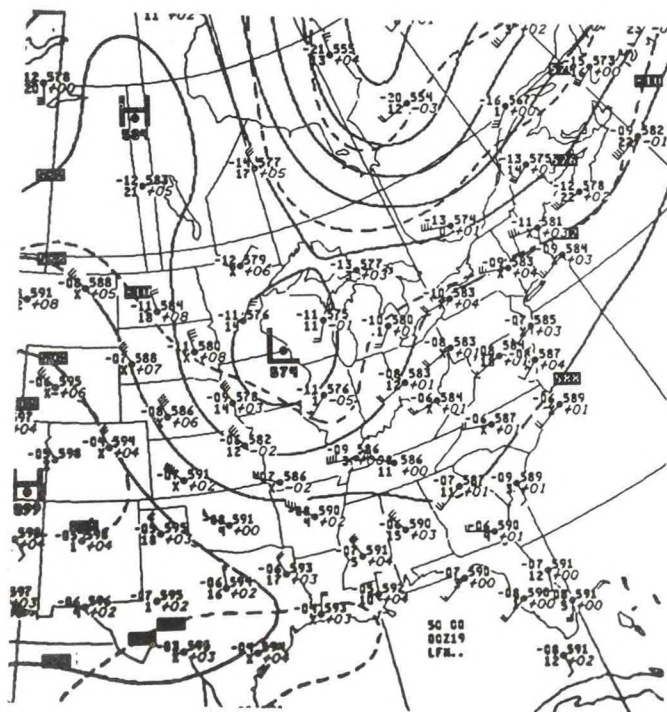


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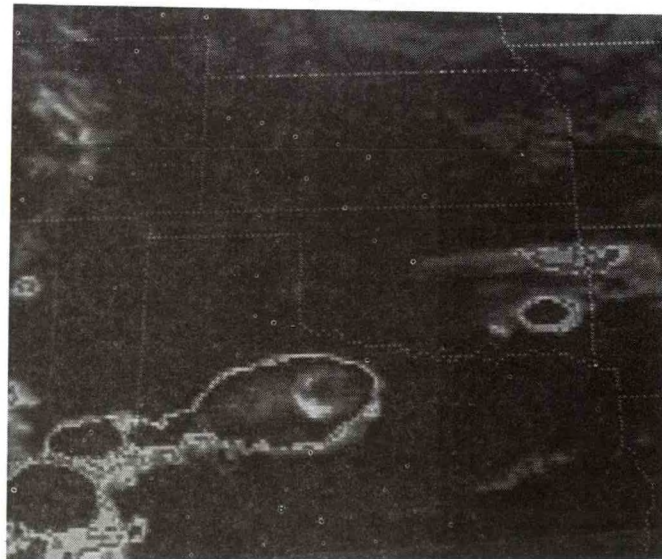
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1	1653	2.75 INCH HAIL	TX	STAMFORD	(37 N ADI)
2	2050	92 MPH WIND GUST	TX	MONOHANS	(72 ESE INK)
one injury, more than half a million dollars damage					



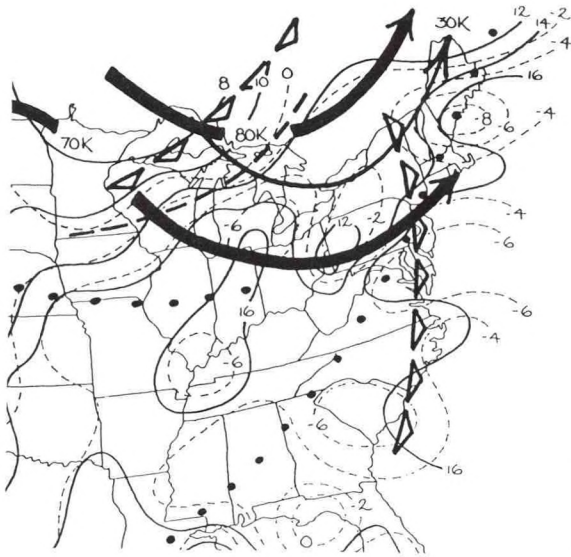
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500MB 6PM CST July 18, 1989



GOES 5PM CST July 18, 1989

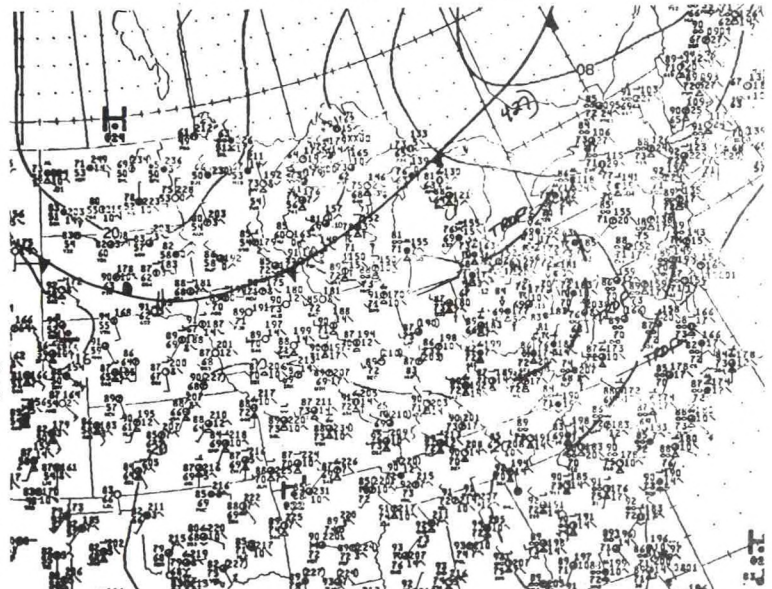


Composite 6PM CST July 27, 1989

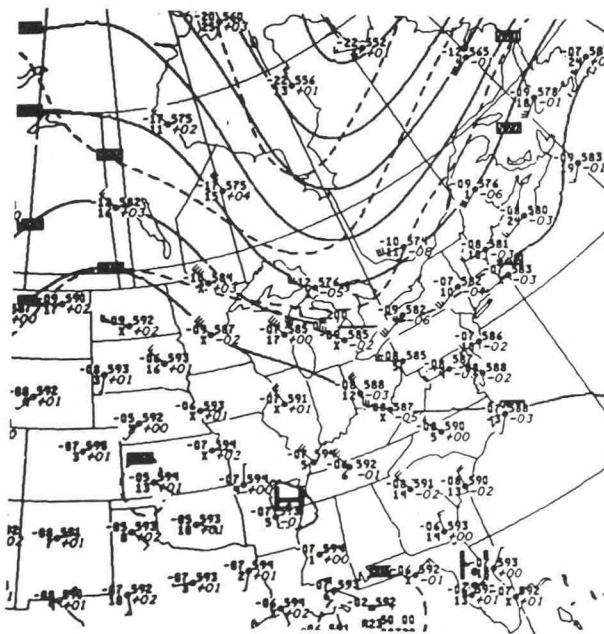


7 JULY 89 0745-2230 CST 103 SEVERE REPORTS

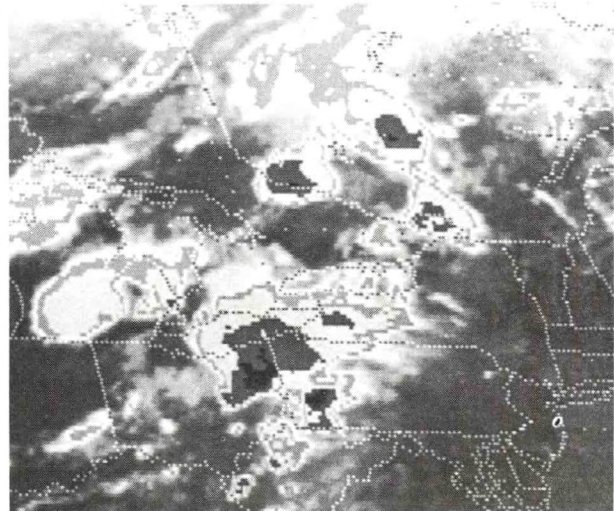
NO	TIME	EVENT	ST	LOCATION
1	1050	3.00 INCH HAIL	WI	OSHKOSH
2	1356	65 MPH WIND GUST	WI	GERMANTOWN



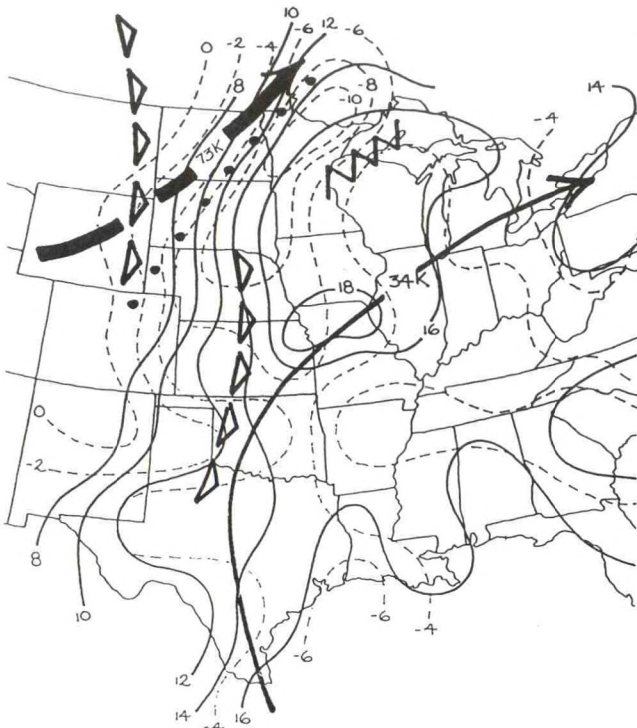
Surface 12 NOON CST July 27, 1989



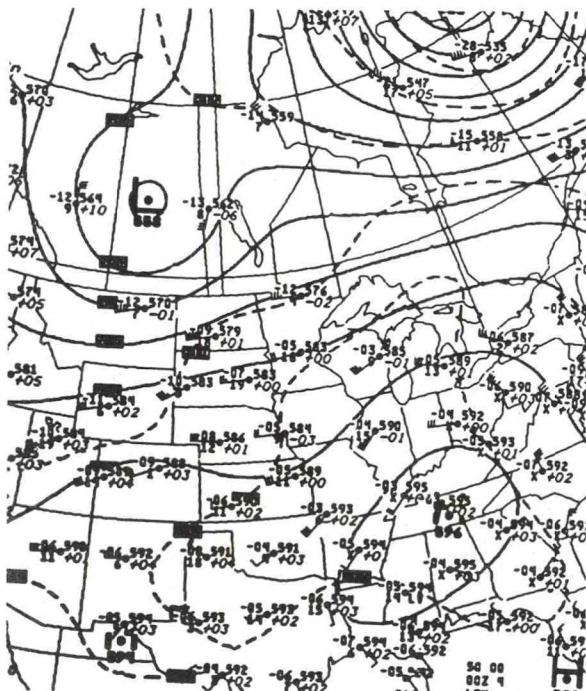
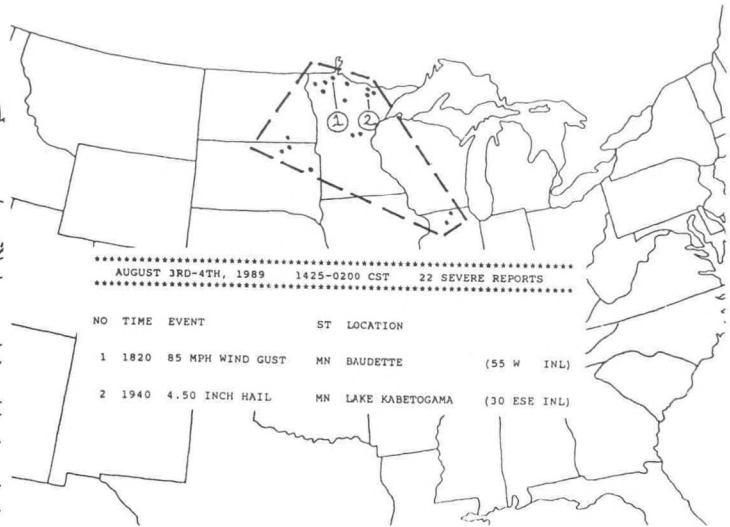
500 MB 6PM CST July 27, 1989



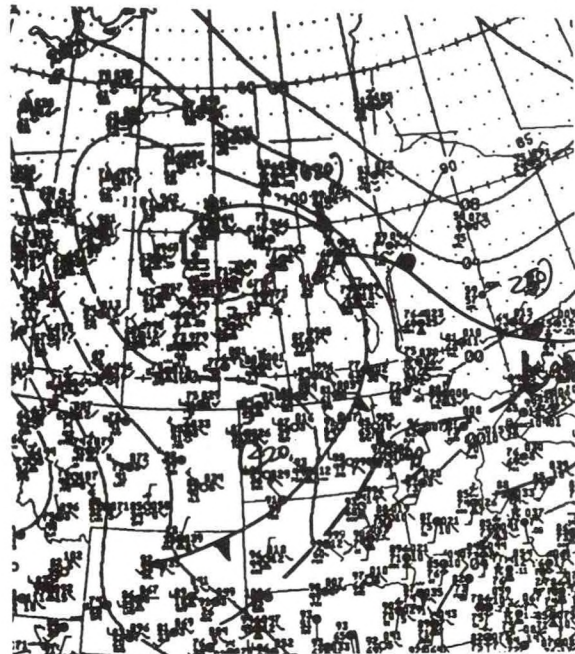
GOES 10AM CST July 27, 1989



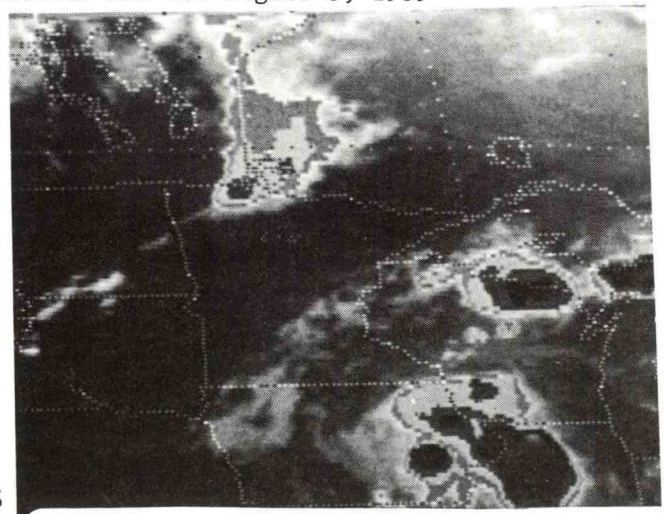
Composite 6PM CST August 3, 1989



500 MB 6PM CST August 3, 1989

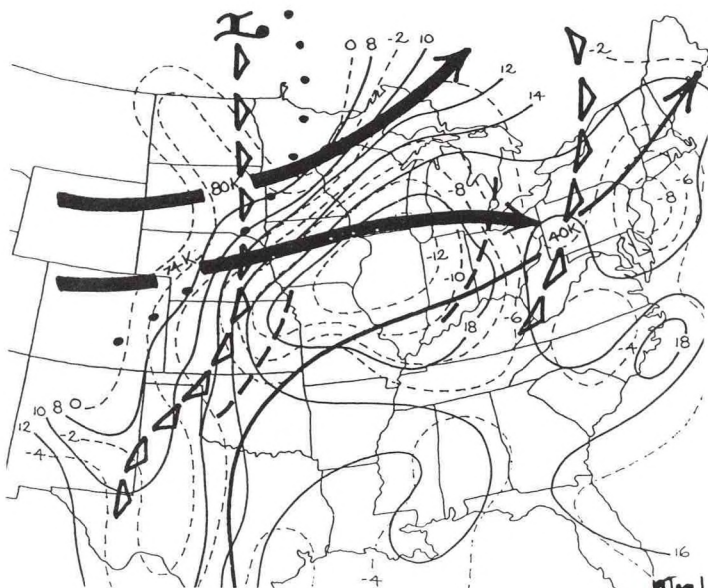


Surface 6PM CST August 3, 1989

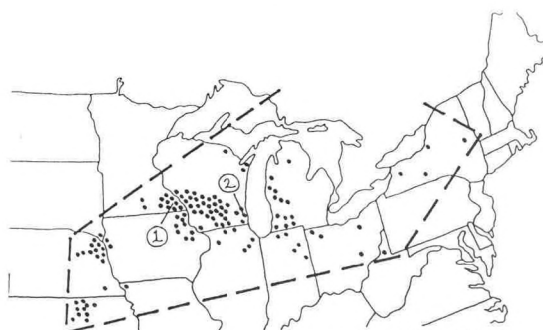


GOES 6PM CST August 3, 1989

No. 9 August 4, 1989

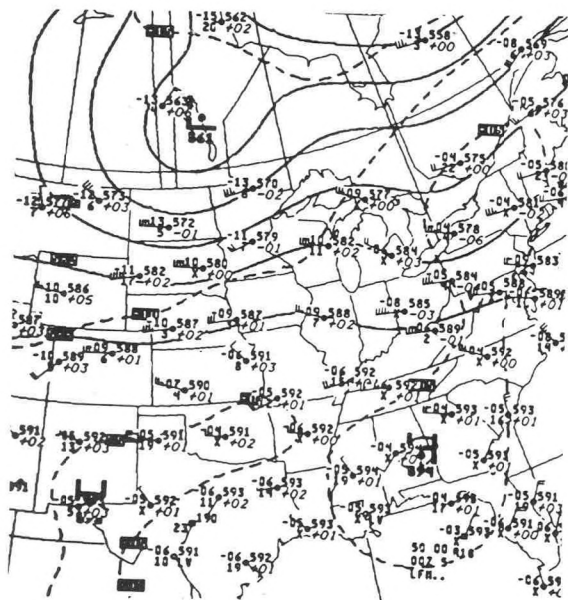


Composite 6PM CST August 4, 1989

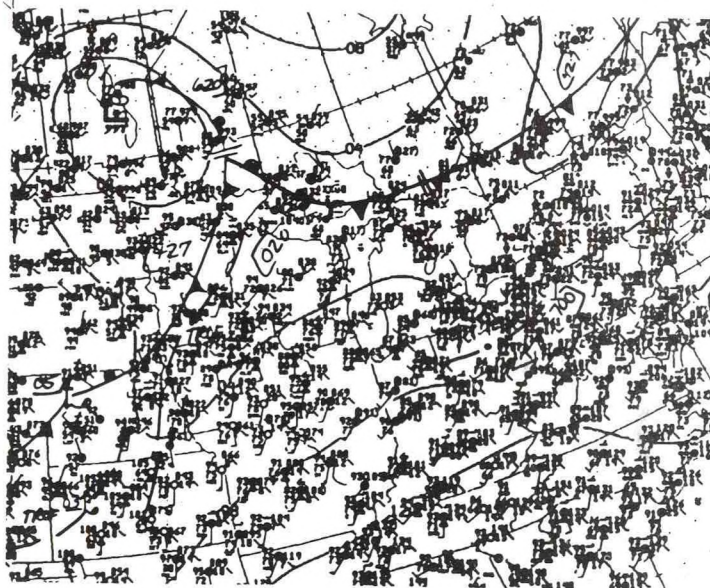


04AUG89-05AUG89 1400-0320 CST 152 SEVERE REPORTS 2 TORNADOES

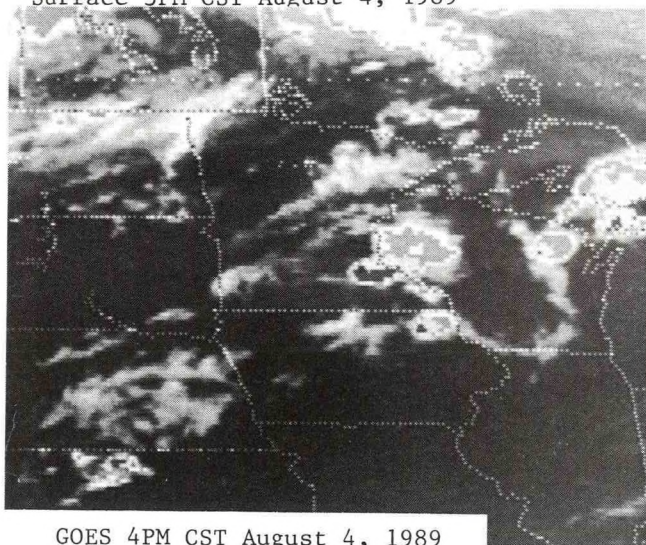
NO	TIME	EVENT	ST	LOCATION
1	1615	2.50 INCH HAIL	MN	CLAREMONT (26 WNW RST)
2	2142	75 MPH WIND GUST	WI	MILWAUKEE (MKE)



500 MB 6PM CST August 4, 1989

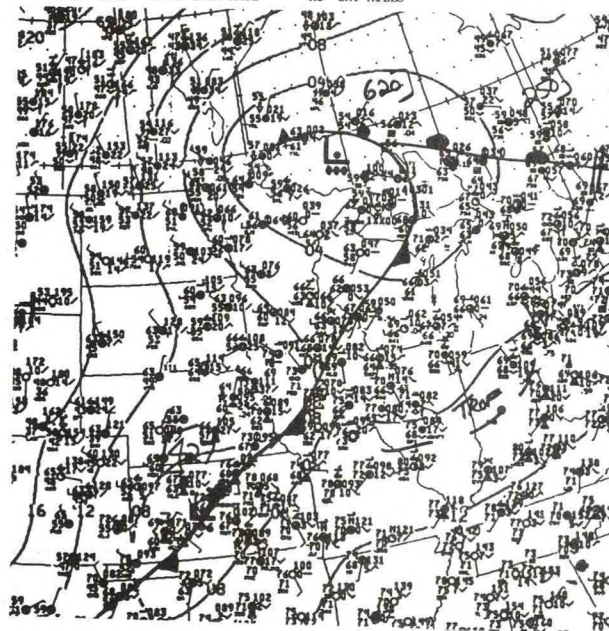


Surface 3PM CST August 4, 1989

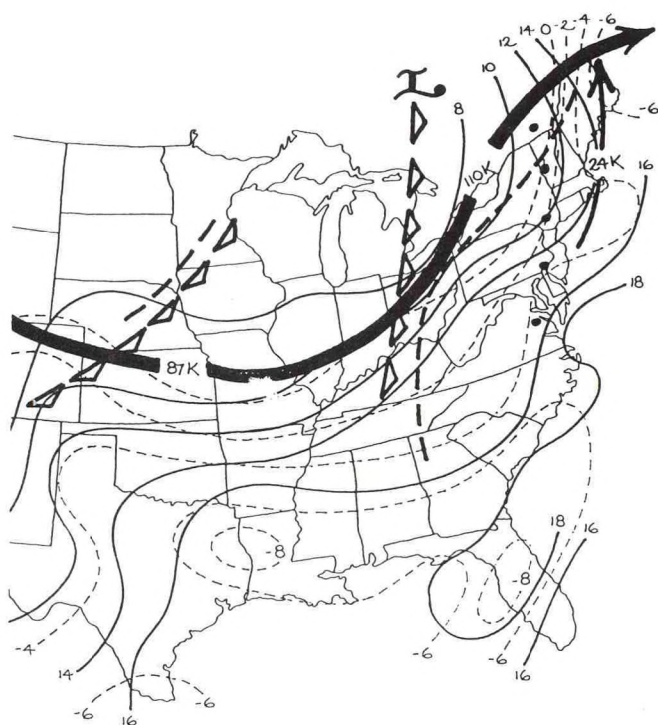


GOES 4PM CST August 4, 1989

NO	TIME	EVENT	ST	LOCATION
1	0710	WIND DAMAGE ten million dollars	IA	CARROLL AND GREENE COUNTIES damage to crops
2	0728	102 MPH WIND GUST	IA	JEFFERSON
3	1510	2.50 INCH HAIL	MI	BAY MILLS



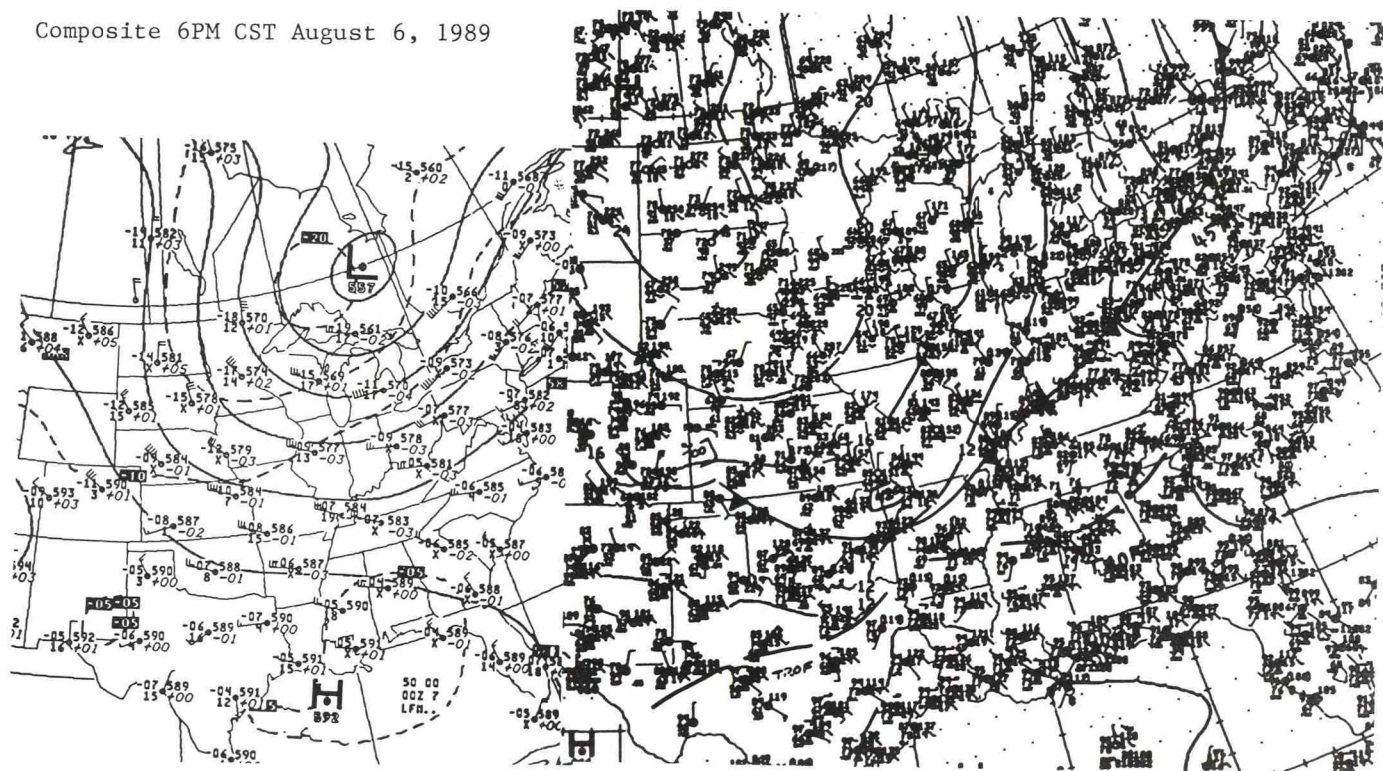
No. 11 August 6, 1989



06AUGUST89 0810-2245 CST 137 SEVERE REPORTS 1 TORNADO

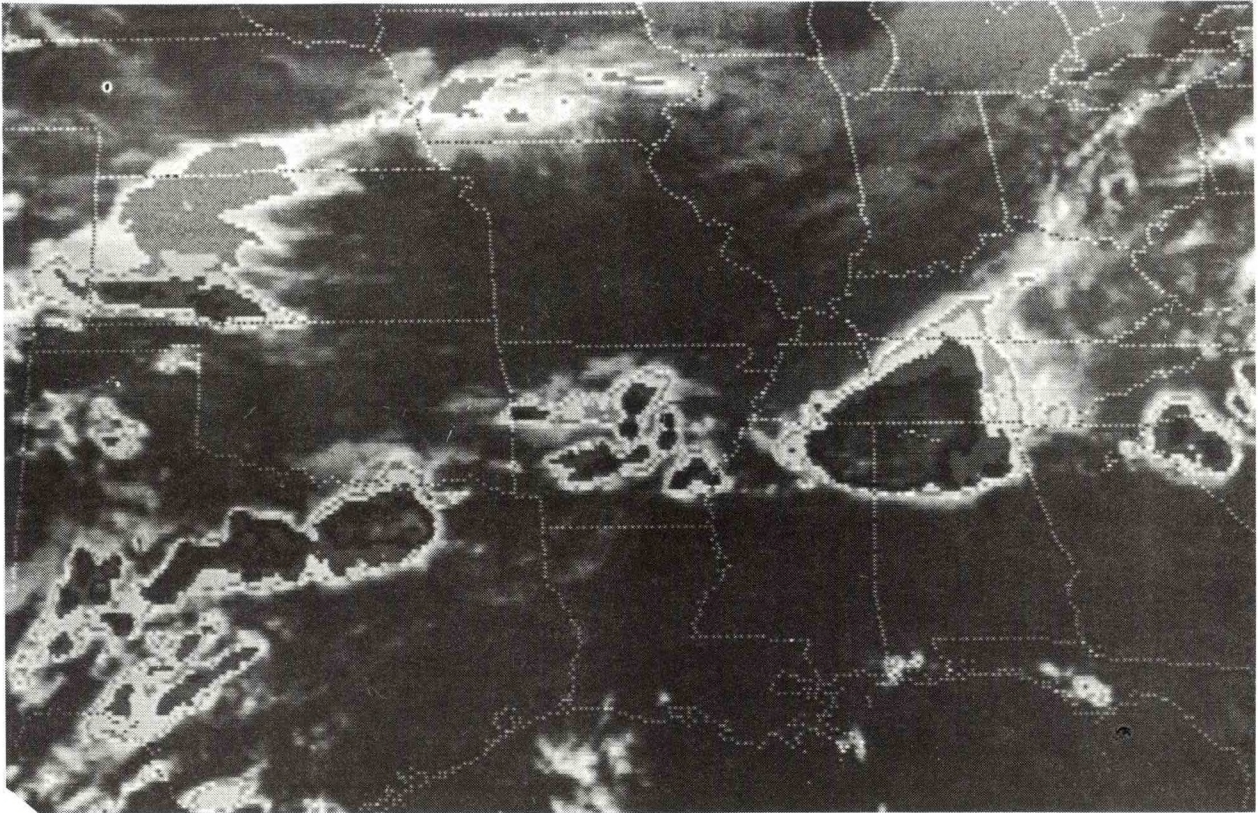
NO	TIME	EVENT	ST	LOCATION
1	1630	2.50 INCH HAIL	OK	5 NW BUFFALO
2	1850	100 MPH WIND GUST	TX	13 E PAMPA

Composite 6PM CST August 6, 1989

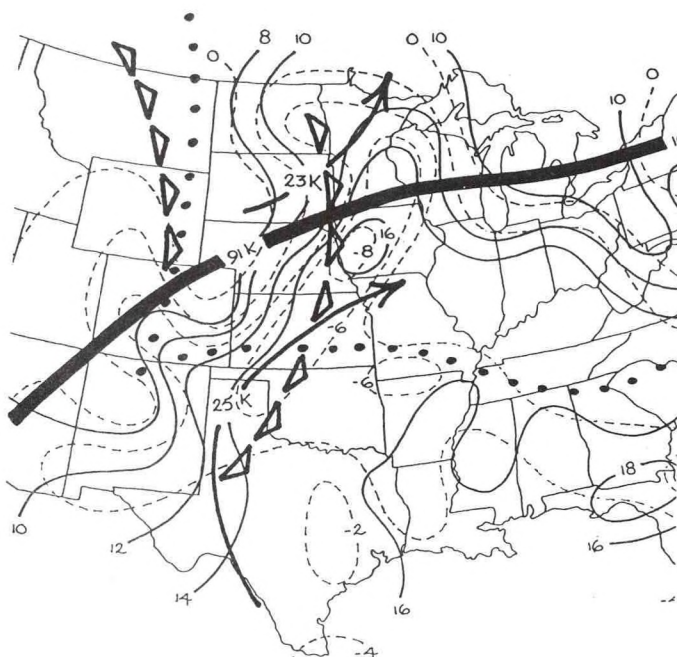


500 MB 6PM CST August 6, 1989

Surface 3PM CST August 6, 1989



GOES 4PM CST August 6, 1989

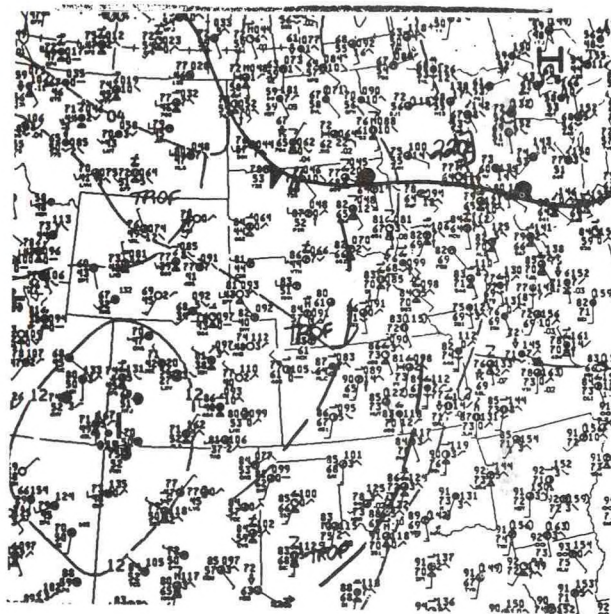


Composite 6PM CST August 21, 1989

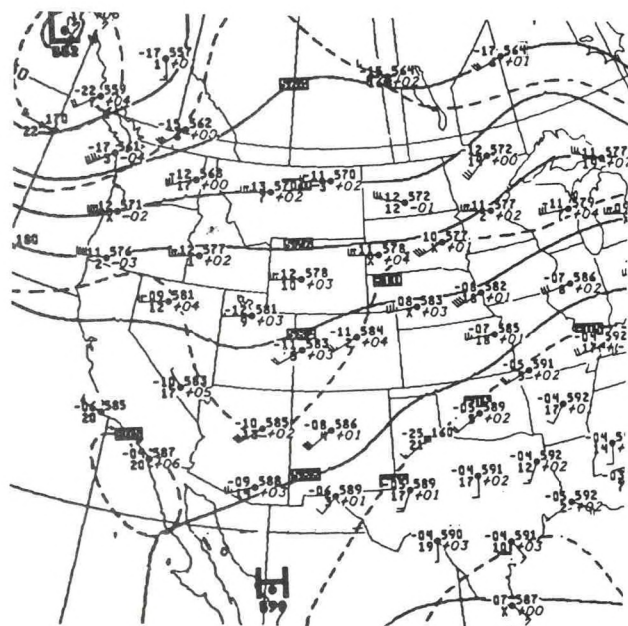


21AUGUST89 1310-2300 CST 62 SEVERE REPORTS 1 TORNADO

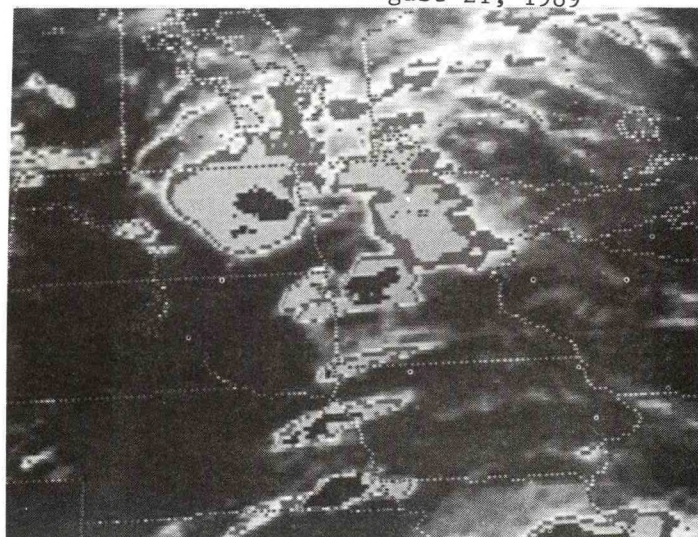
NO	TIME	EVENT	ST	LOCATION
1	1600	2.75 INCH HAIL	MN	CORRELL TO 10 N APPLETON
2	2020	100 MPH WIND GUST	KS	WILSON DAM



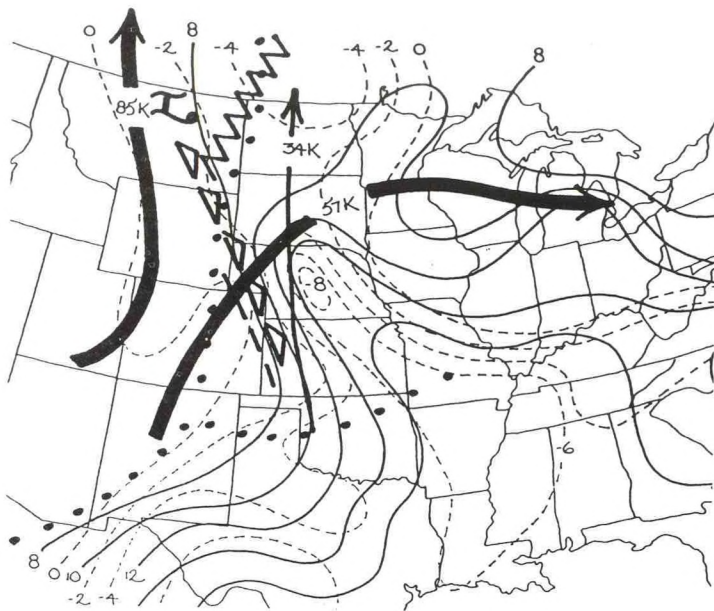
Surface 12 NOON CST August 21, 1989



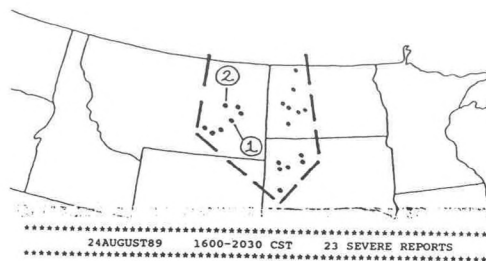
500 MB 6PM CST August 21, 1989



GOES 4PM CST August 21, 1989

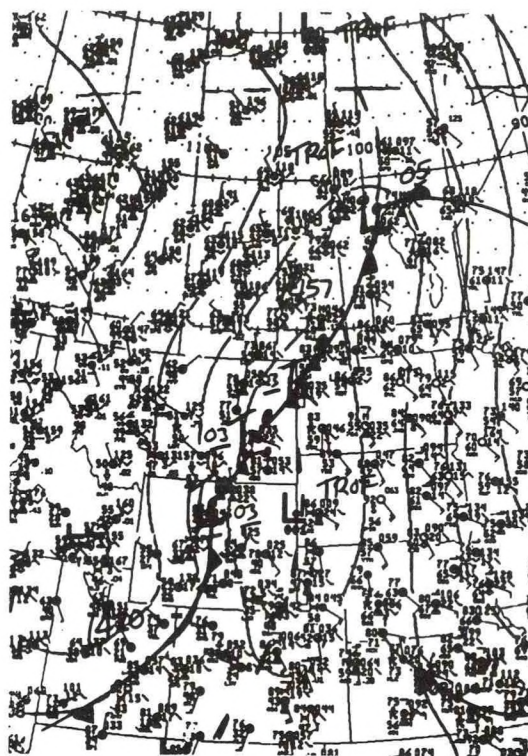


Composite 6PM CST August 24, 1989

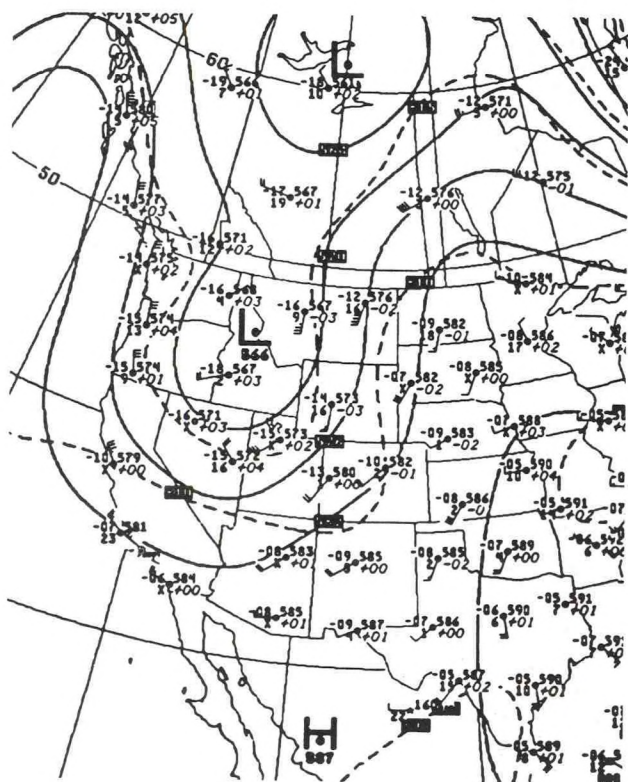


24AUGUST89 1600-2030 CST 23 SEVERE REPORTS

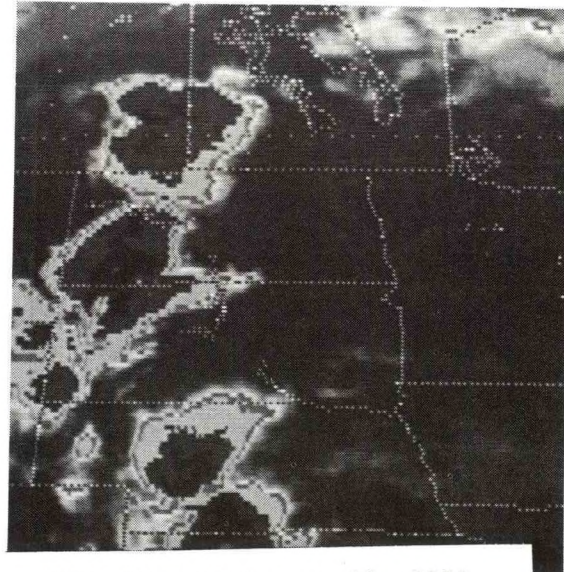
NO	TIME	EVENT	ST	LOCATION
1	1800	1.75 INCH HAIL	MT	ROCK SPRINGS
2	1830	76 MPH WIND GUST	MT	JORDAN



Surface 6PM CST August 24, 1989



500 MB 6PM CST August 24, 1989

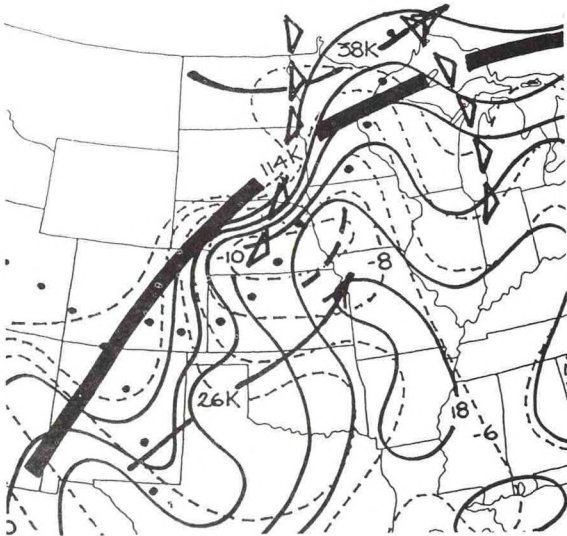


GOES 6PM CST August 24, 1989

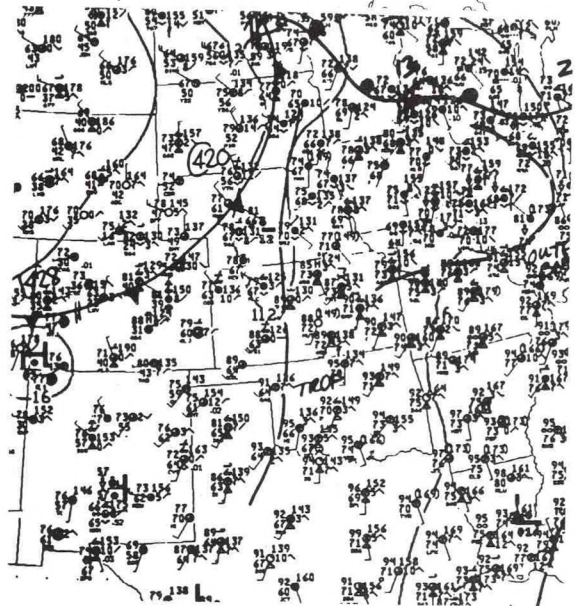
No. 14 August 28, 1989

.....
AUGUST 28TH, 1989 1630-2148 CST 20 SEVERE REPORTS
.....

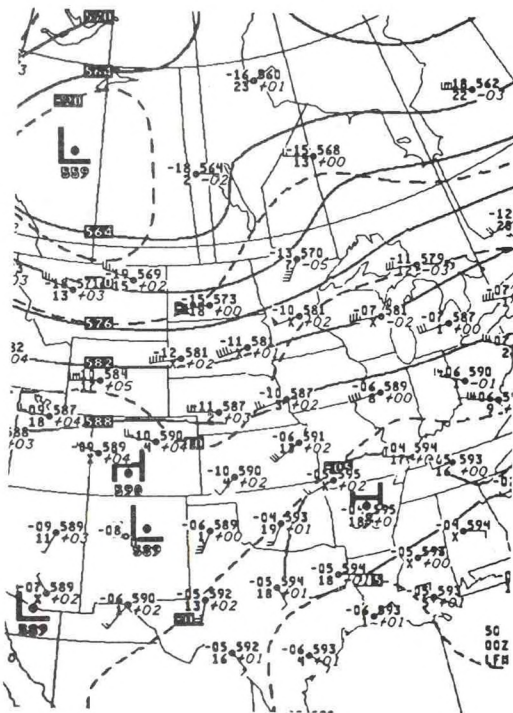
NO TIME EVENT ST LOCATION
1 1700 2.75 INCH HAIL MN PEQUOT LAKES (10 SW BRD)



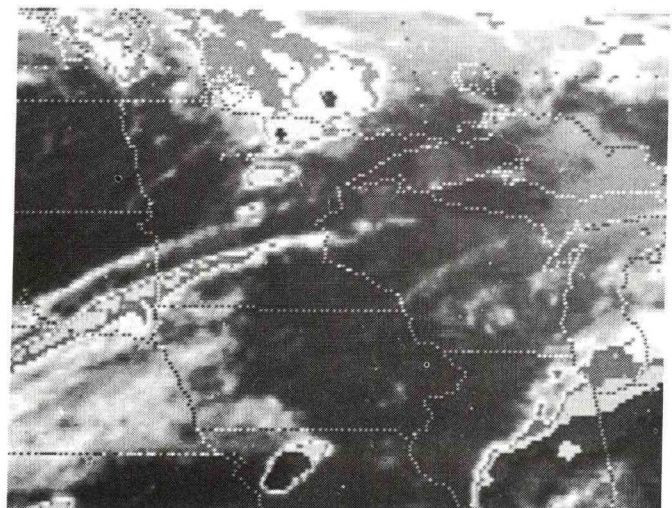
Composite 6PM CST August 28, 1989



Surface 12 NOON CST August 28, 1989

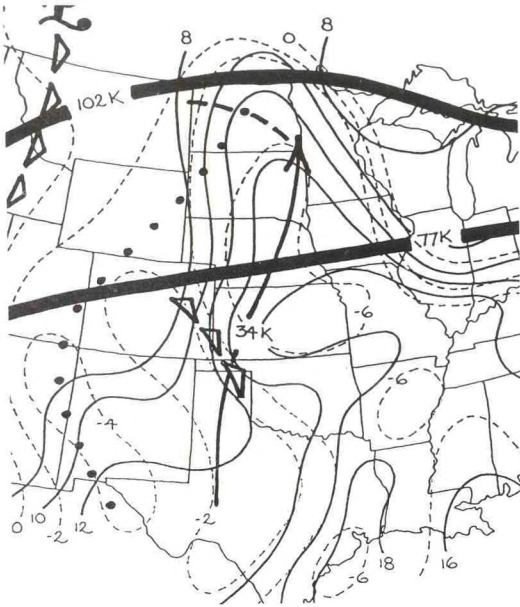


500 MB 6PM CST August 28, 1989

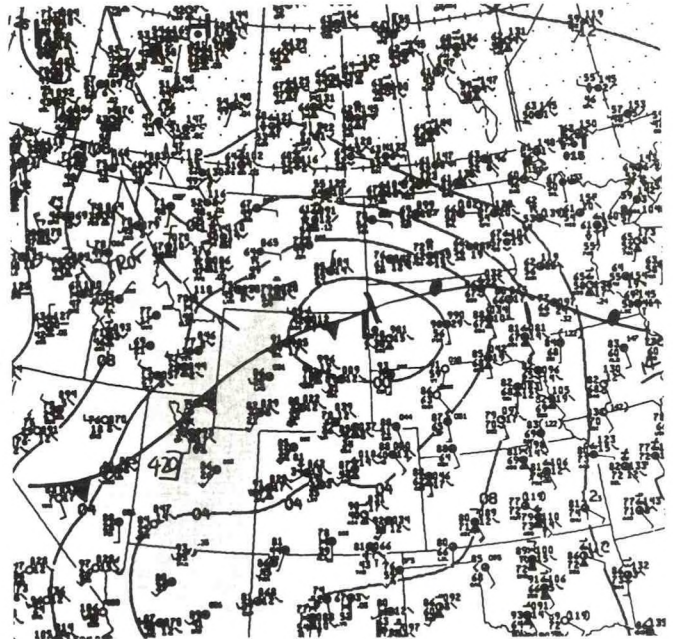
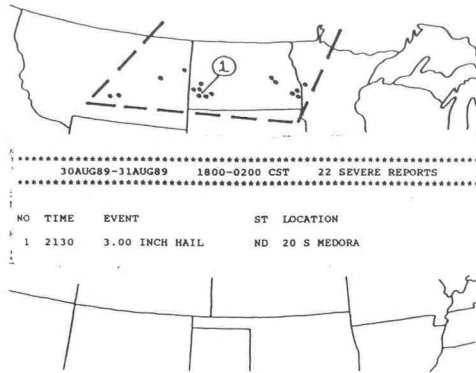


GOES 5PM CST August 28, 1989

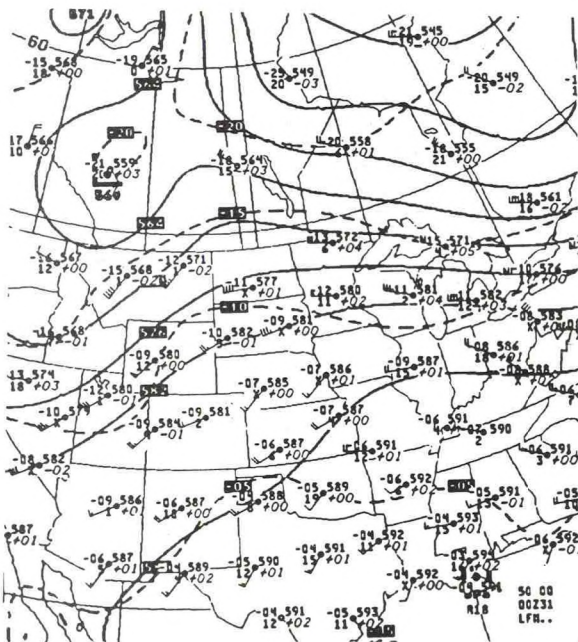
No. 15 August 30, 1989



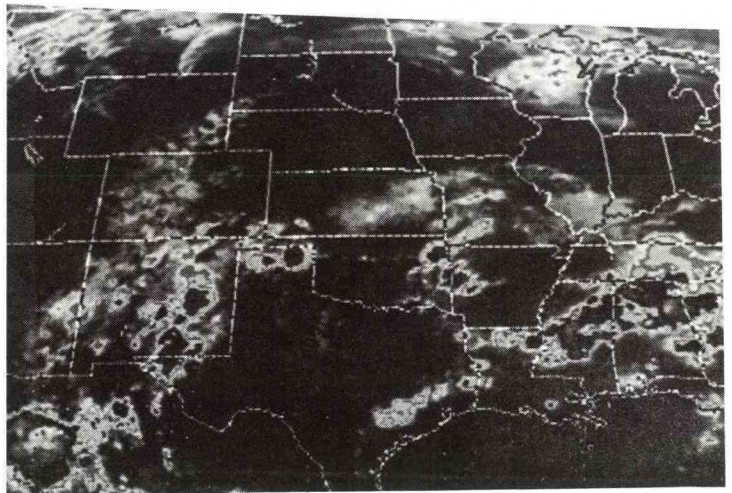
Composite 6PM CST August 30, 1989



Surface 6PM CST August 30, 1989

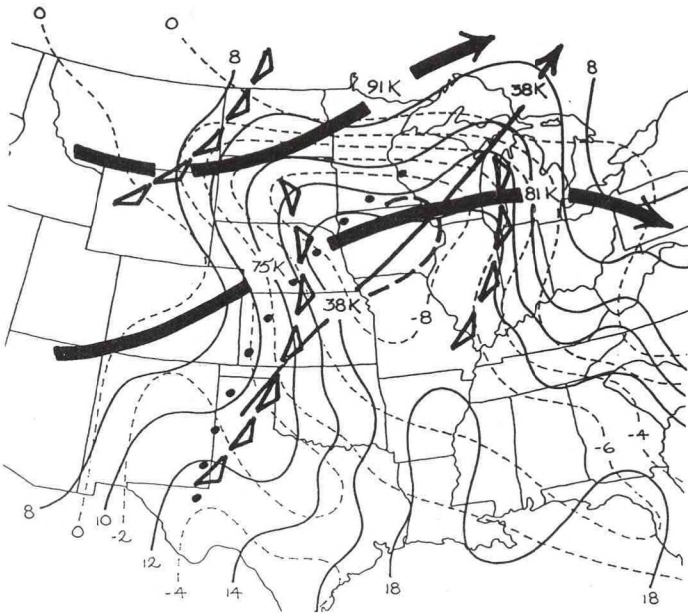


500 MB 6PM CST August 30, 1989

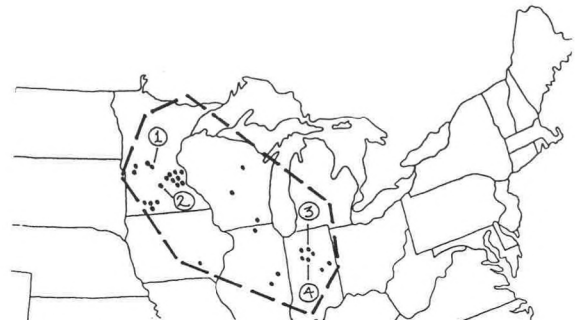


GOES 4PM CST August 30, 1989

No. 16 August 31, 1989

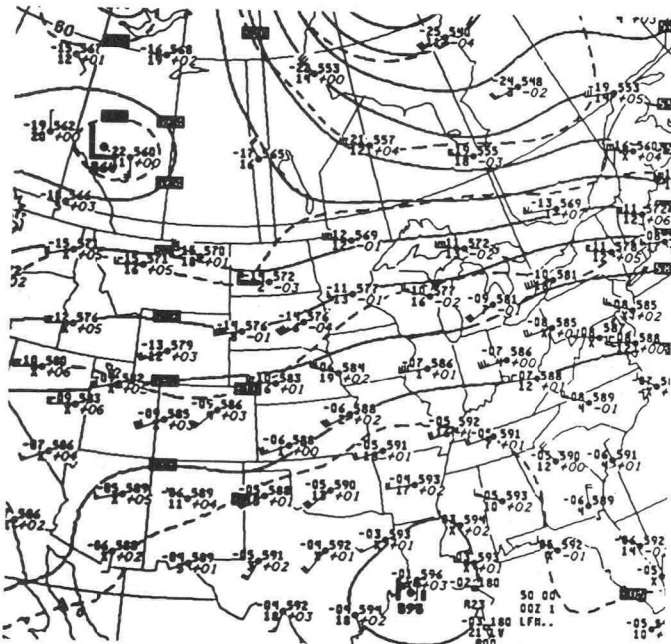


Composite 6PM CST August 31, 1989

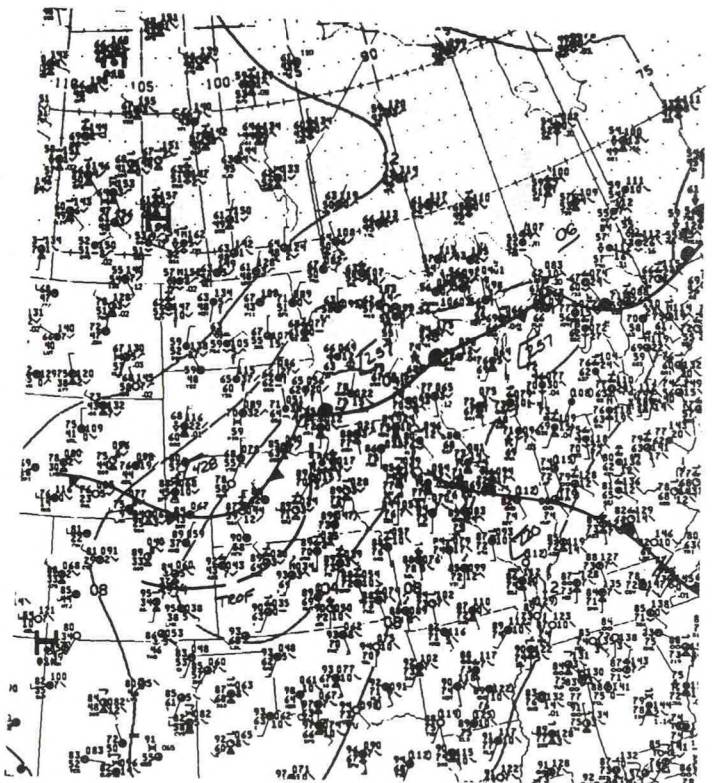


31AUG89-01SEP89 0500-0415 CST 33 SEVERE REPORTS 1 TORNADO

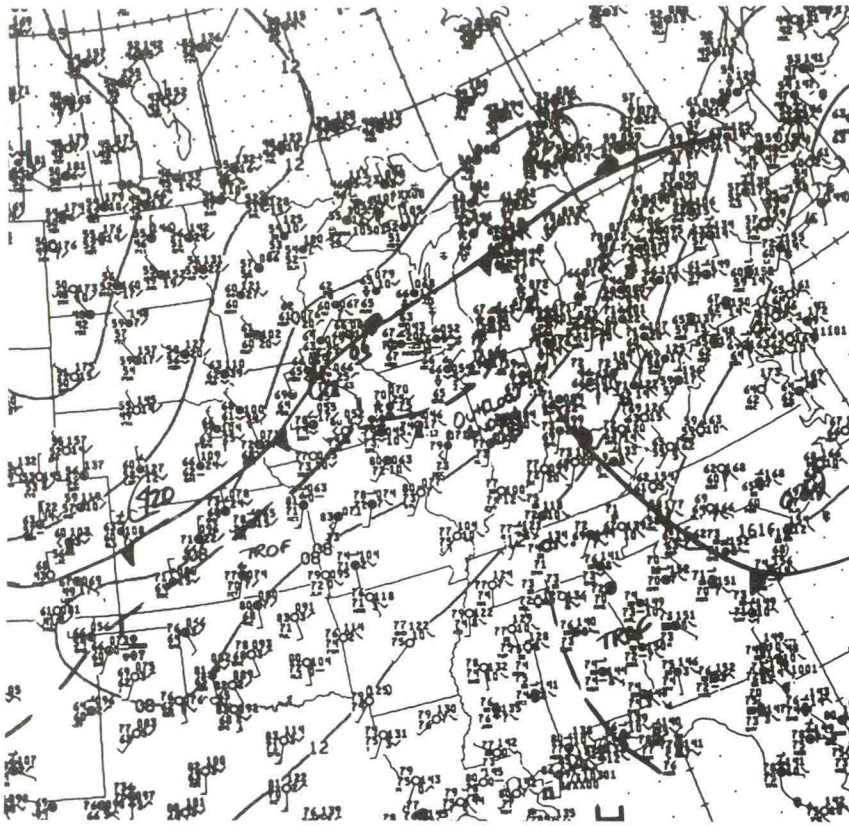
NO	TIME	EVENT	ST	LOCATION	
1	1455	2.75 INCH HAIL	MN	SAINT MICHAEL	(29 SE STC)
2	2210	2.75 INCH HAIL	MN	6 SW HUTCHINSON	(41 NE RWF)
3	0235	TORNADO (F-2) three injuries	IN	BRUCE LAKE	(44 S SBN)
4	0415	WIND DAMAGE one million dollars damage	IN	KOKOMO	(11 S GUS)



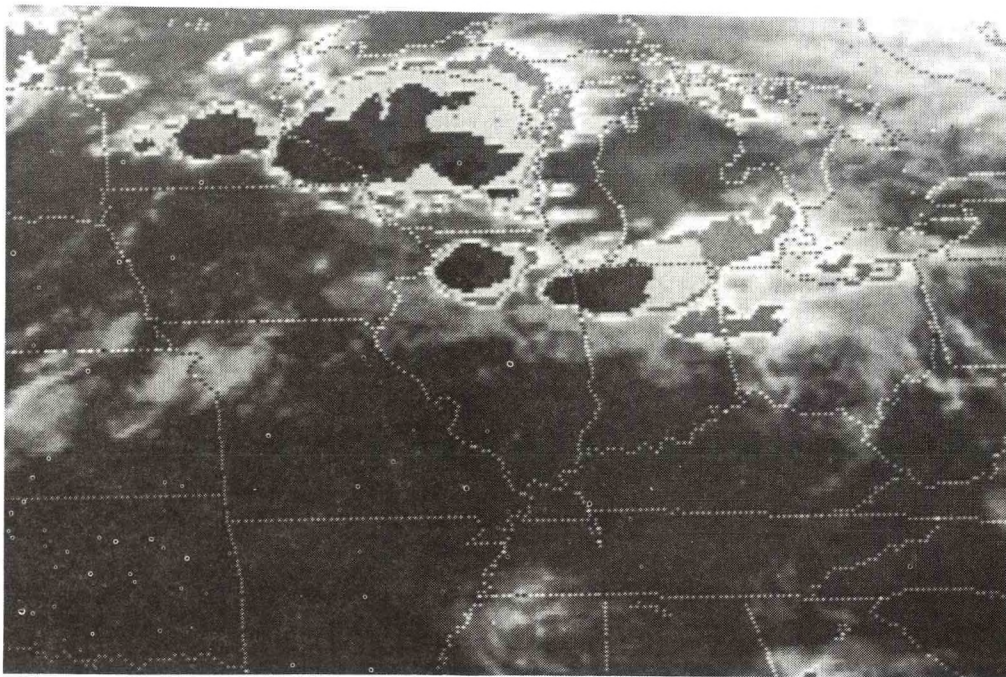
500 MB 6PM CST August 31, 1989



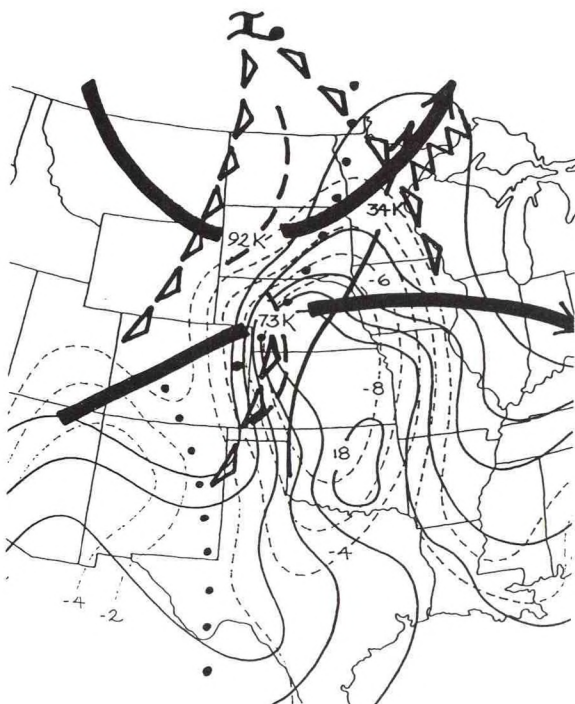
Surface 6PM CST August 31, 1989



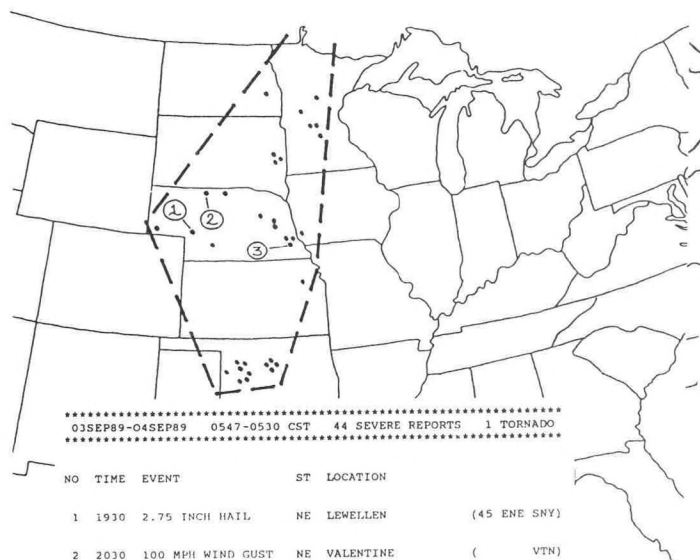
Surface 3AM CST September 1, 1989



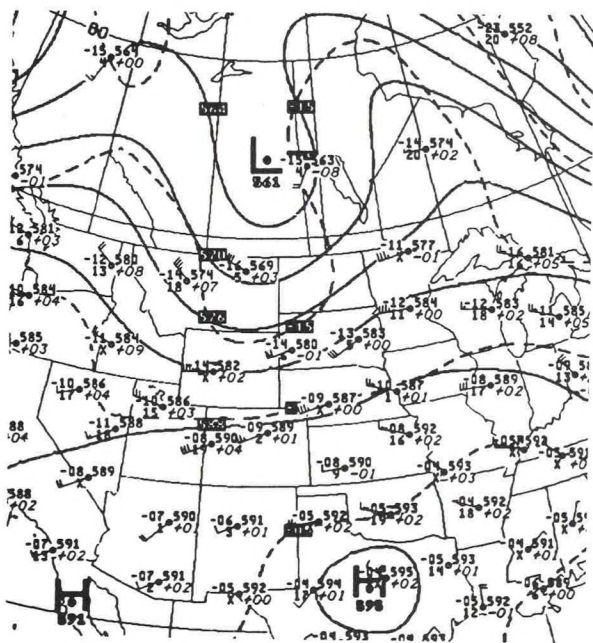
GOES 8:30PM CST August 31, 1989



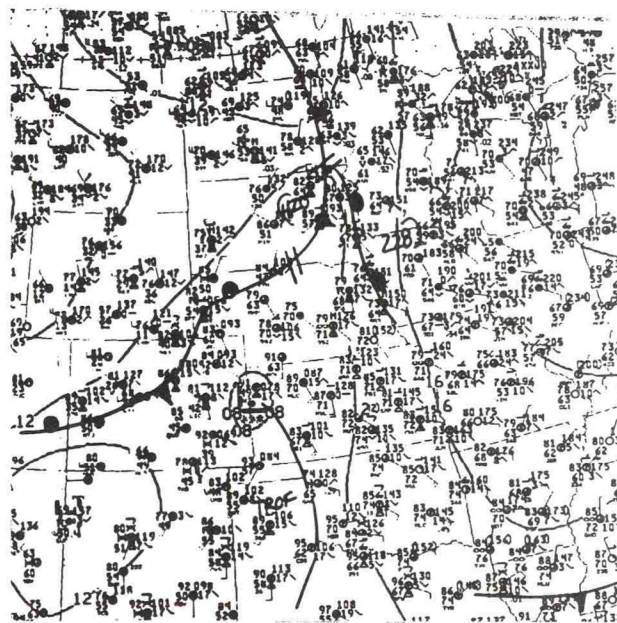
Composite 6PM CST September 3, 1989



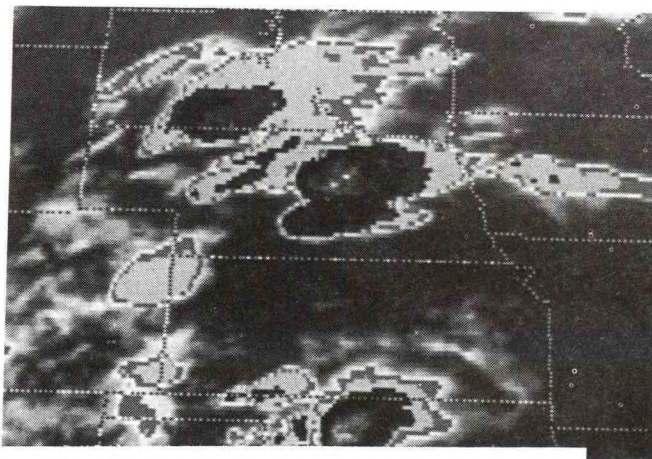
NO	TIME	EVENT	ST	LOCATION	
1	1930	2.75 INCH HAIL	NE	LEWELLEN	(45 ENE SNY)
2	2030	100 MPH WIND GUST one injury	NE	VALENTINE	(VTN)
3	0125	100 MPH WIND GUST	NE	BELLEVUE	(12 S OMA)

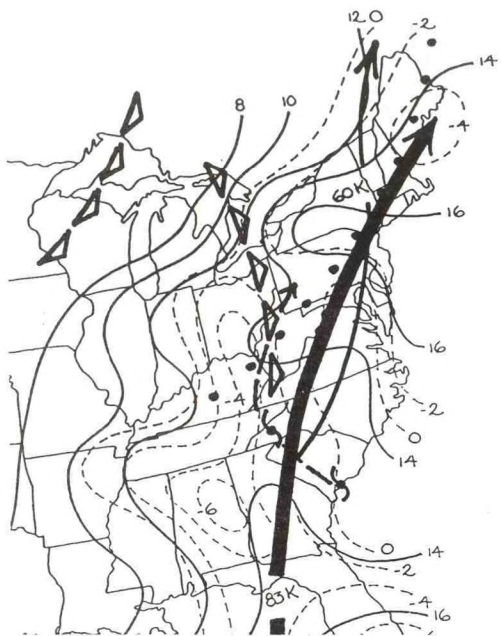


500 MB 6PM CST September 3, 1989

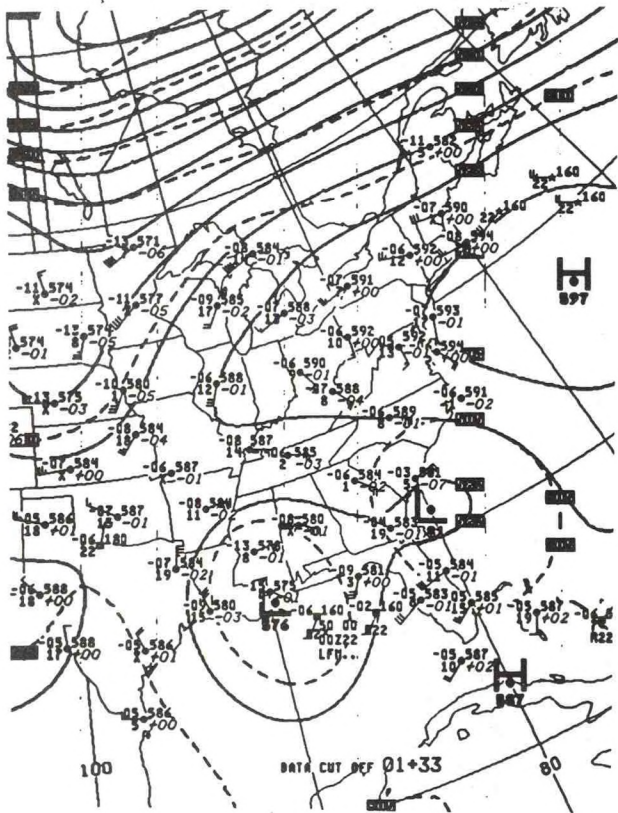


Surface 6PM CST September 3, 1989





Composite 6PM CST September 21, 1989

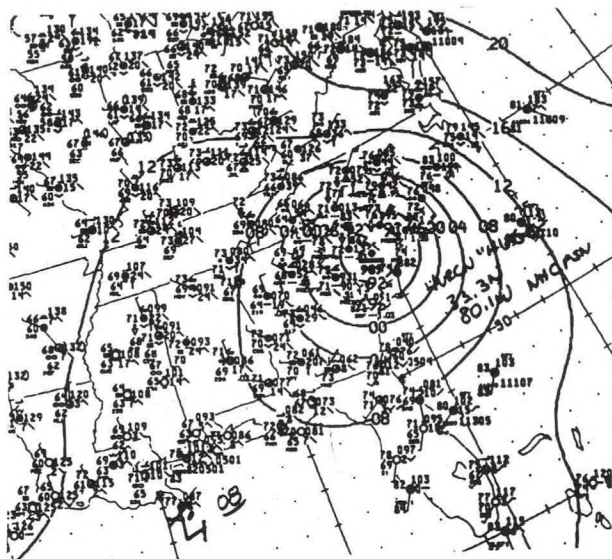


500 MB 6PM CST September 21, 1989



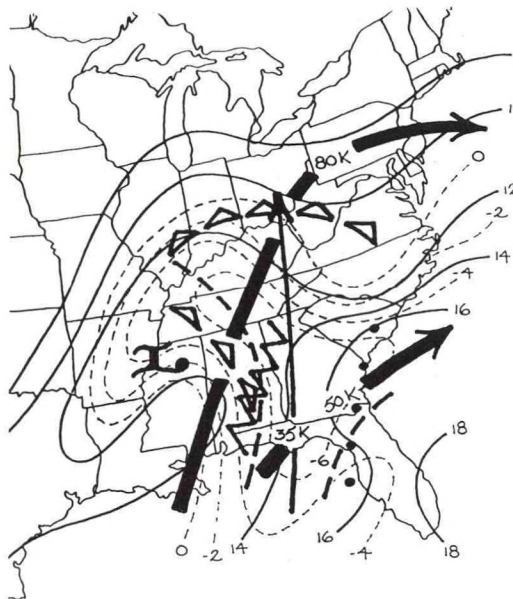
HURRICANE HUGO 22SEP89-23SEP89 8 SEVERE REPORTS 3 TORNADOES

NO	DATE	TIME	EVENT	ST	LOCATION
1	9/22	0030	TORNADO (F-1)	SC	SUMTER COUNTY (10 WNW SSC)
2	9/22	0045	TORNADO (F-1)	SC	KERSHAW (41 N SSC)
3	9/23	1430	WIND DAMAGE fourteen injuries	VA	RICHMOND (RIC)

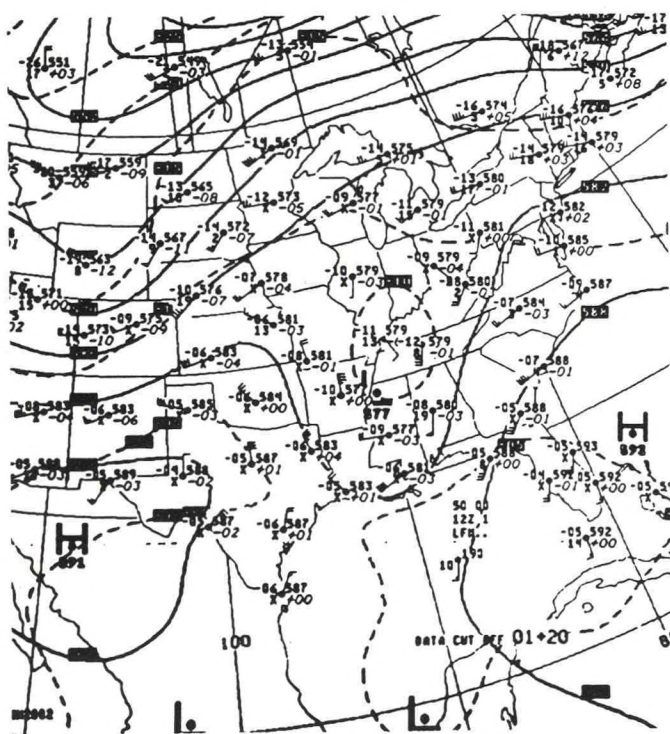


Surface 12 MIDNIGHT September 21, 1989

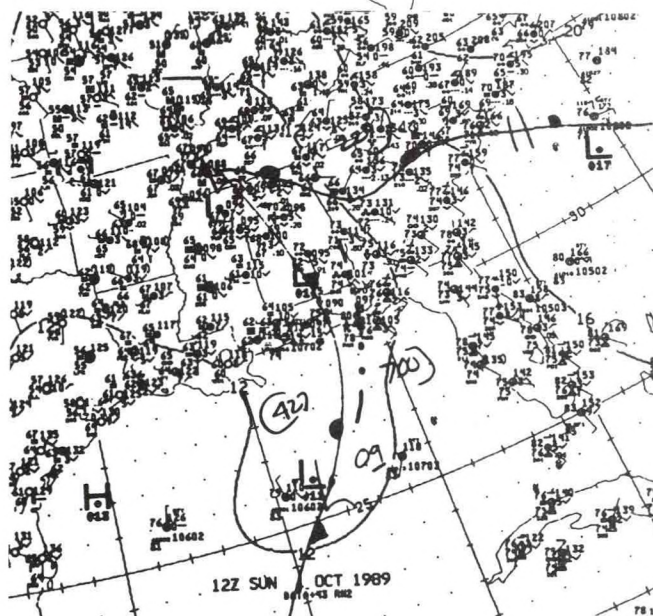
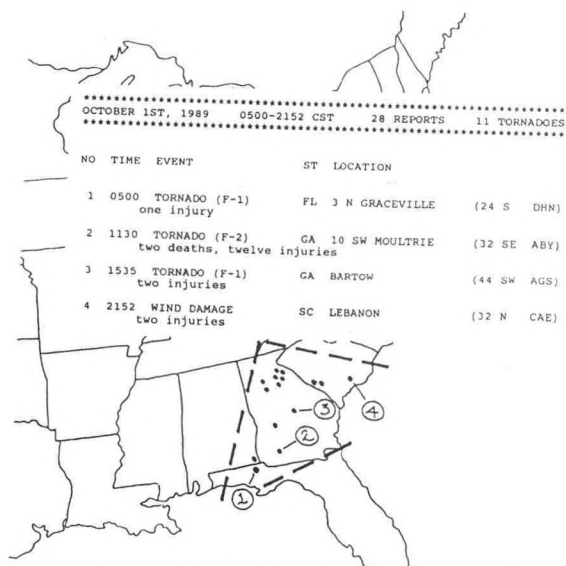
No. 19 October 1, 1989



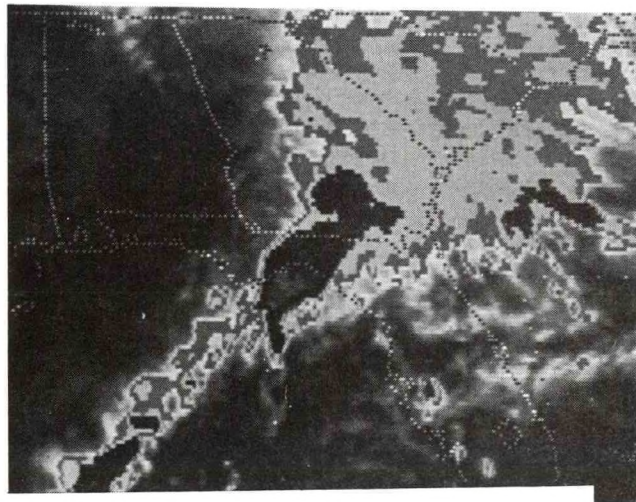
Composite 6AM CST October 1, 1989



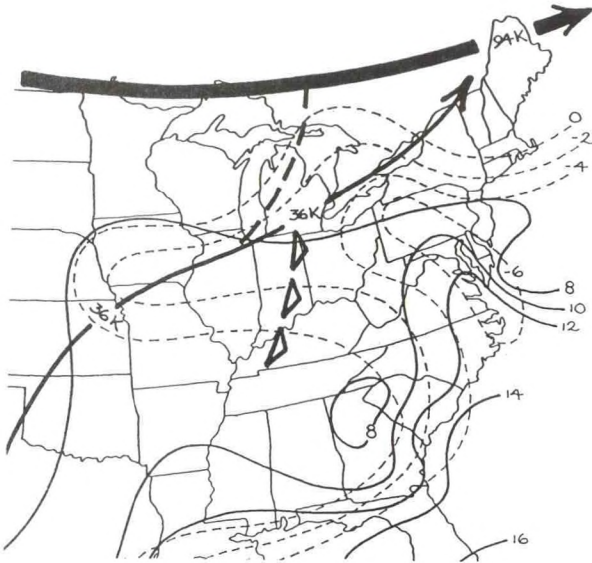
500 MB 6AM CST October 1, 1989



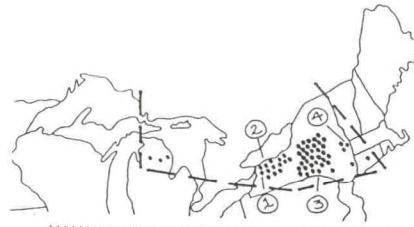
Surface 6AM CST October 1, 1989



GOES 12NOON CST October 1, 1989

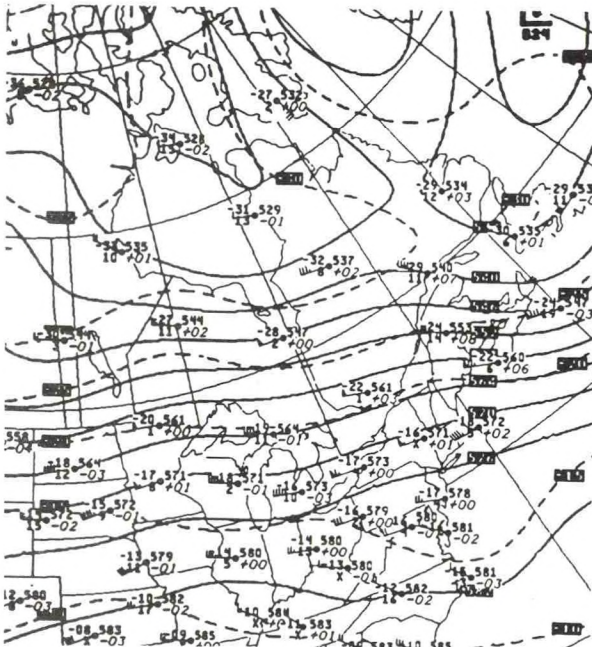


Composite 6PM CST October 14, 1989

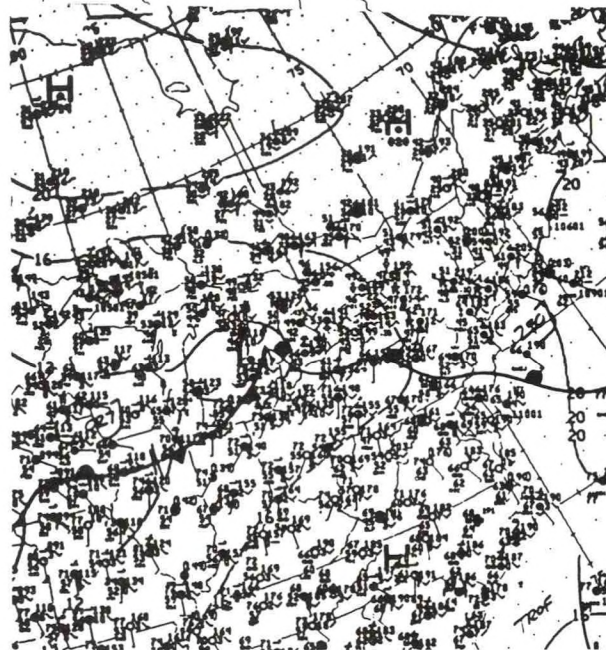


OCTOBER 14TH, 1989 0845-0300 CST 94 REPORTS 2 TORNADOES

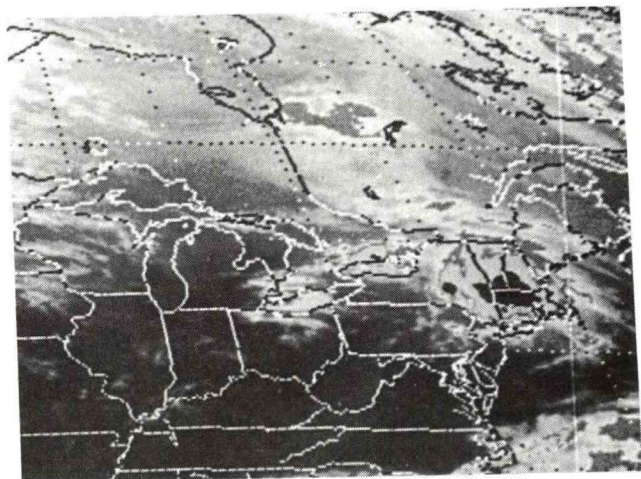
NO	TIME	EVENT	ST	LOCATION	
1	1445	105 MPH WIND GUST	NY	SOMERSET	(25 ENE IAG)
2	1500	90 MPH WIND GUST	NY	MEDINA	(27 NE BUF)
3	1715	TORNADO (F-2) two deaths, three injuries	NY	MCDONOUGH	(22 NE BGM)
4	1900	WIND DAMAGE one death	NY	NASSAU	(18 SE ALB)



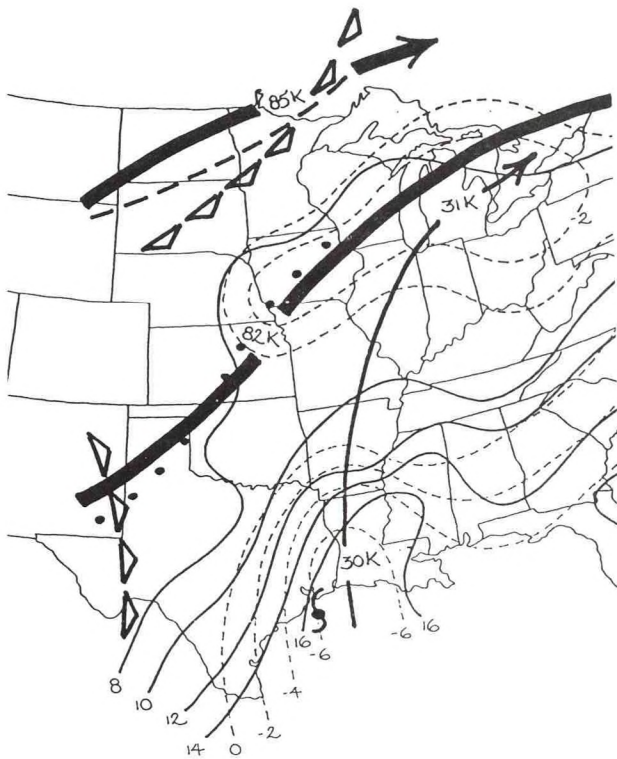
500 MB 6PM CST October 14, 1989



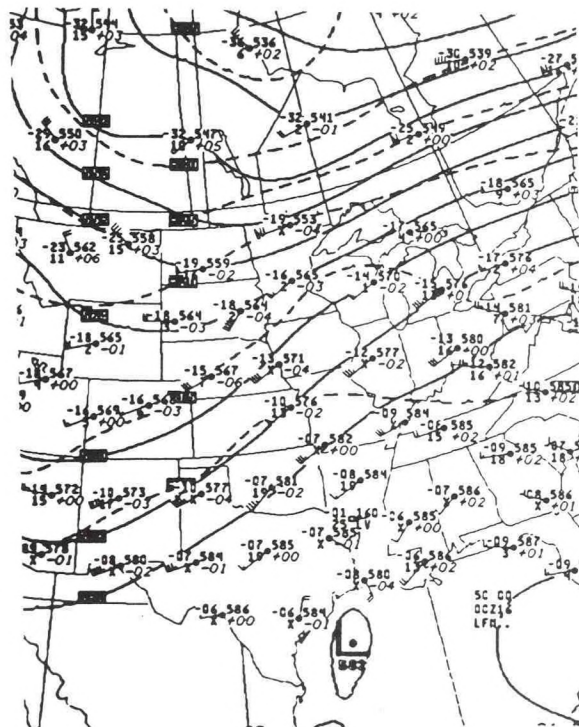
Surface 6PM CST October 14, 1989



GOES 7PM CST October 14, 1989

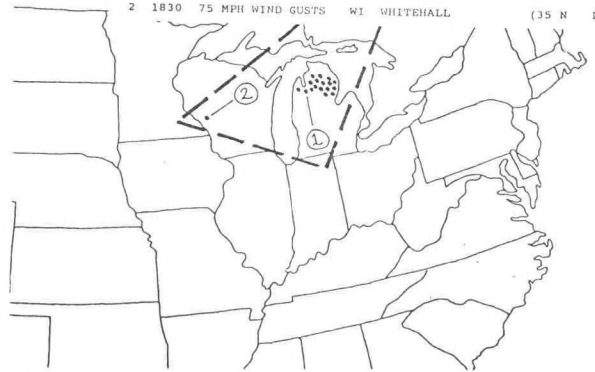


Composite 6PM CST October 15, 1989

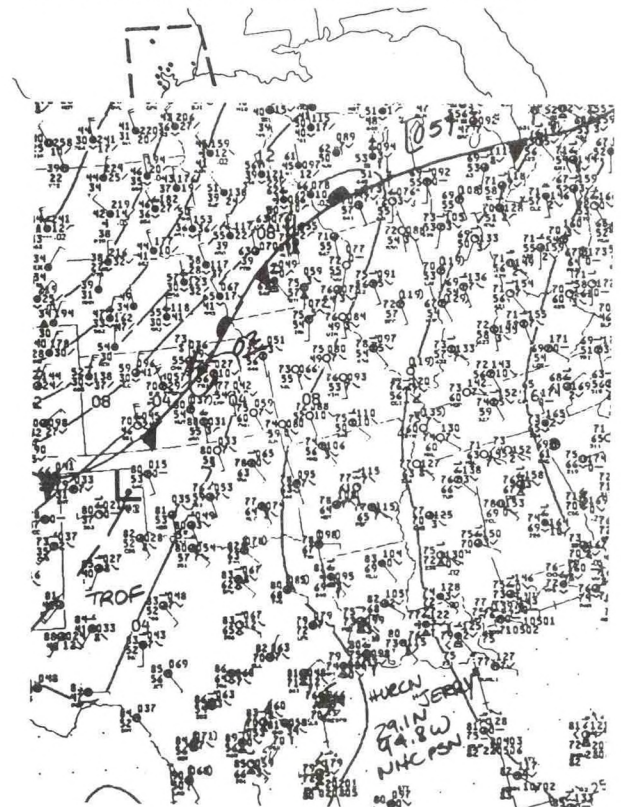


500 MB 6PM CST October 15, 1989

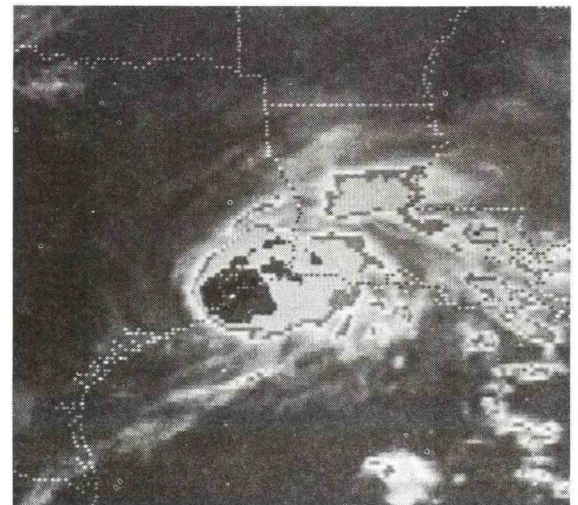
NO	TIME	EVENT	ST	LOCATION	
1	0825	58 MPH WIND GUST two injuries	MI	TRAVERSE CITY	(TVC)
2	1830	75 MPH WIND GUSTS	MI	WHITEHALL	(35 N LSE)



OCTOBER 15TH-16TH, 1989 1855-0150 CST SIX (F-0) TORNADOES

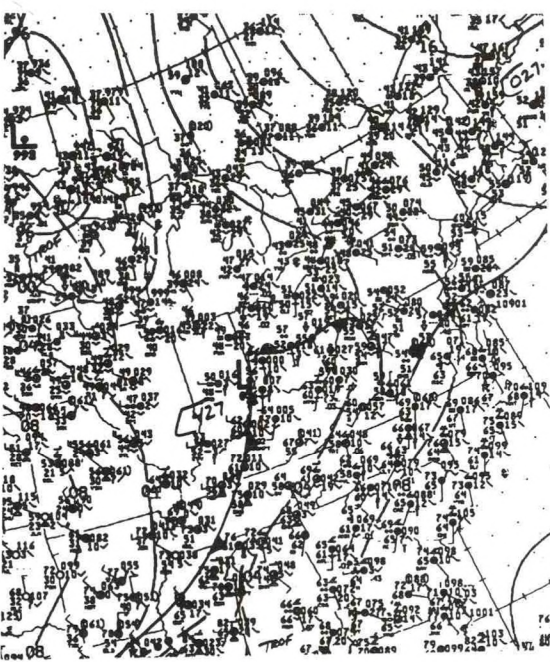
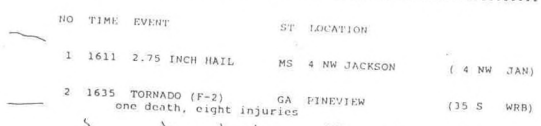


Surface 6PM CST October 15, 1989

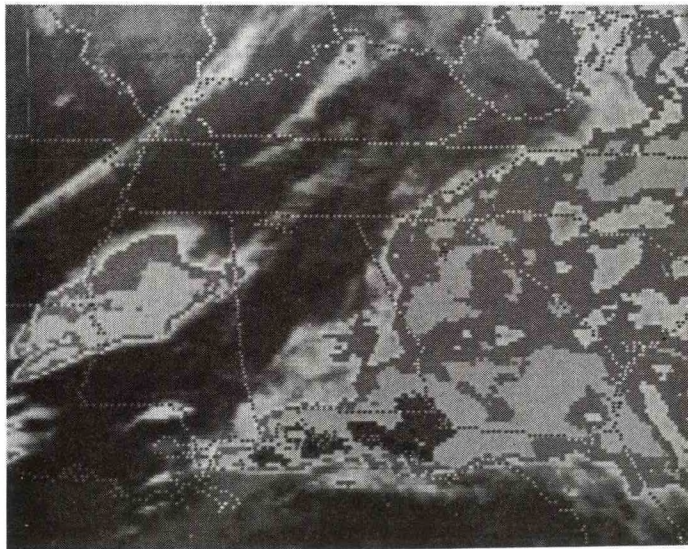


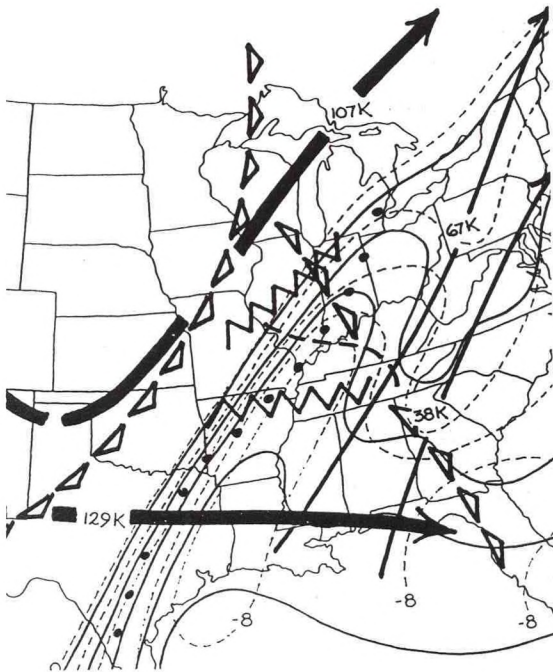
GOES 6:30 PM CST October 15, 1989

07NOV89-08NOV89 1737-2130 CST 90 SEVERE REPORTS 8 TORNADOES



500 MB 6PM CST November 8, 1989



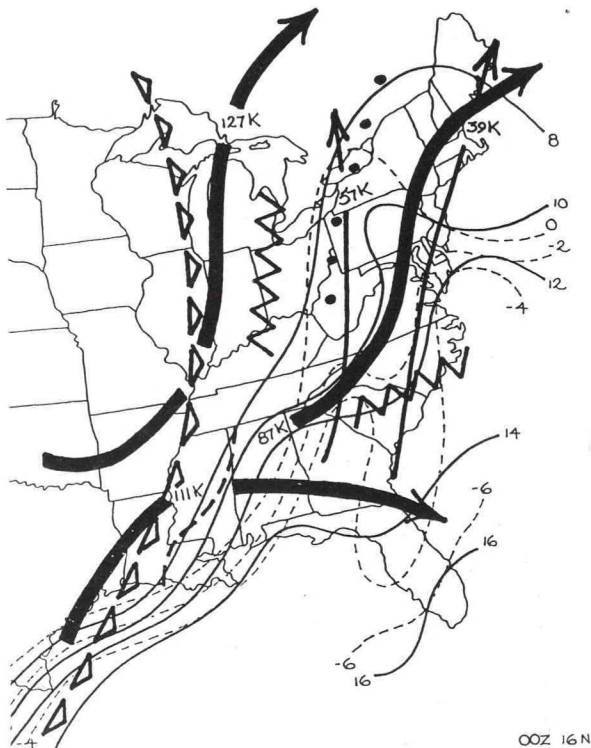
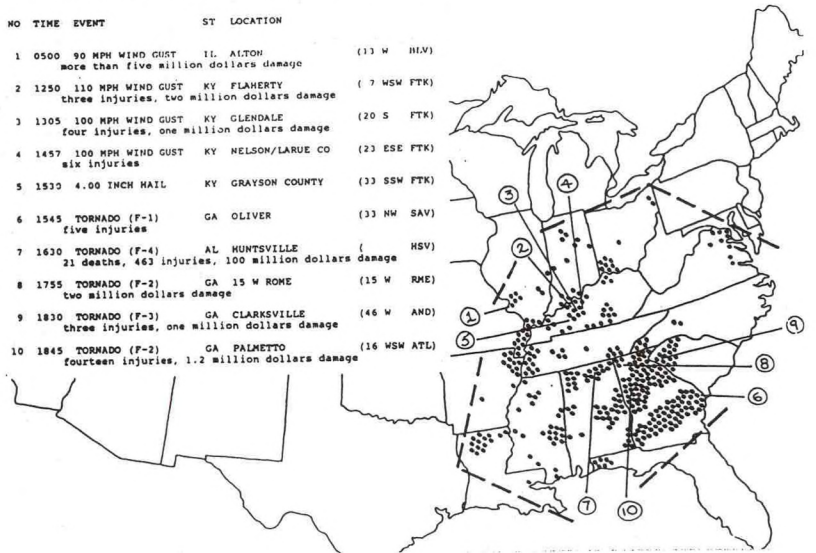


Composite 6AM CST November 15, 1989

15NOV89-16NOV89 0125-0210 CST 350 SEVERE REPORTS 17 TORNADOES

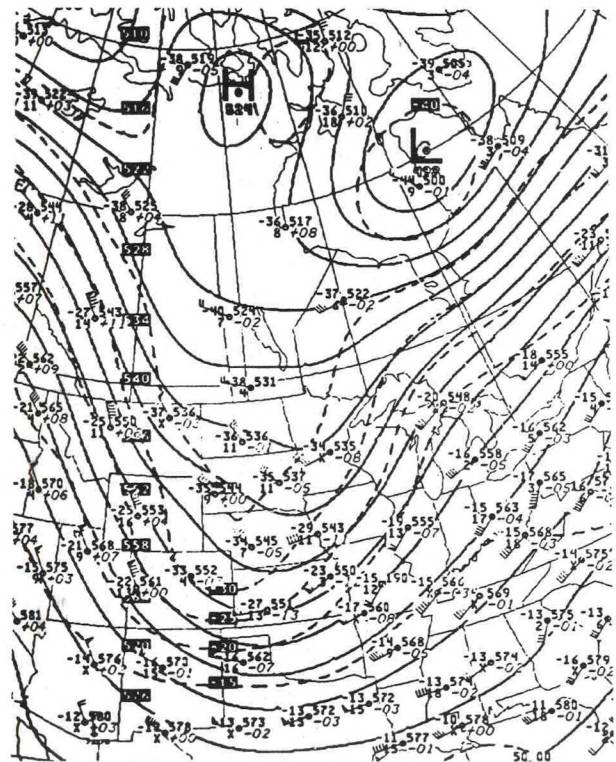
NO TIME EVENT ST LOCATION

- 1 0500 90 MPH WIND GUST IL ALTON (13 W HIM)
more than five million dollars damage
- 2 1250 110 MPH WIND GUST KY FLAHERTY (7 WSW FTK)
three injuries, two million dollars damage
- 3 1305 100 MPH WIND GUST KY GLENDALE (20 S FTK)
four injuries, one million dollars damage
- 4 1457 100 MPH WIND GUST KY NELSON/LARUE CO (23 ESE FTK)
six injuries
- 5 1530 4.00 INCH HAIL KY GRAYSON COUNTY (33 SSW FTK)
- 6 1545 TORNADO (F-1) GA OLIVER (33 NW SAV)
five injuries
- 7 1620 TORNADO (F-4) AL HUNTSVILLE (HSV)
21 deaths, 463 injuries, 100 million dollars damage
- 8 1755 TORNADO (F-2) GA 15 W ROME (15 W RME)
two million dollars damage
- 9 1830 TORNADO (F-3) GA CLARKSVILLE (46 W AND)
three injuries, one million dollars damage
- 10 1845 TORNADO (F-2) GA PALMETTO (16 WSW ATL)
fourteen injuries, 1.2 million dollars damage

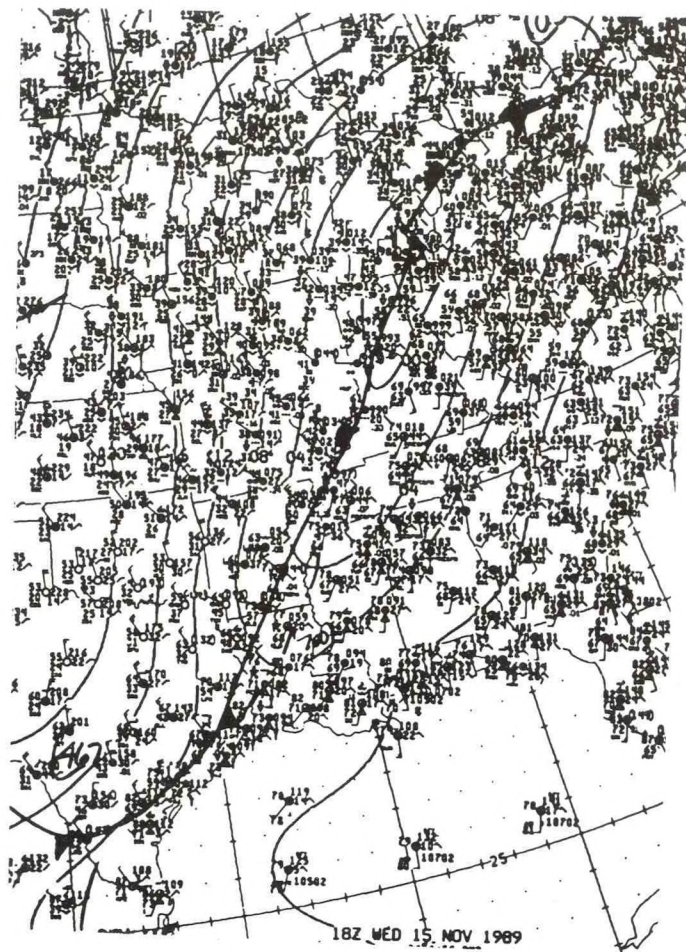


00Z 16N

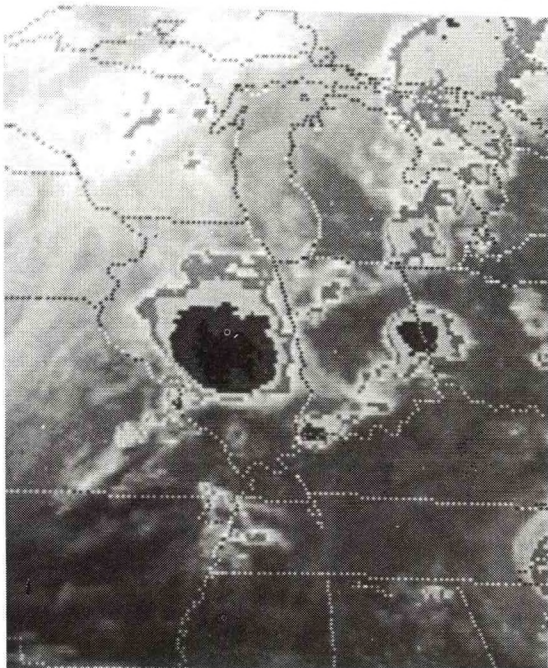
Composite 6PM CST November 15, 1989



500 MB 6AM CST November 15, 1989



Surface 12 Noon CST November 15, 1989

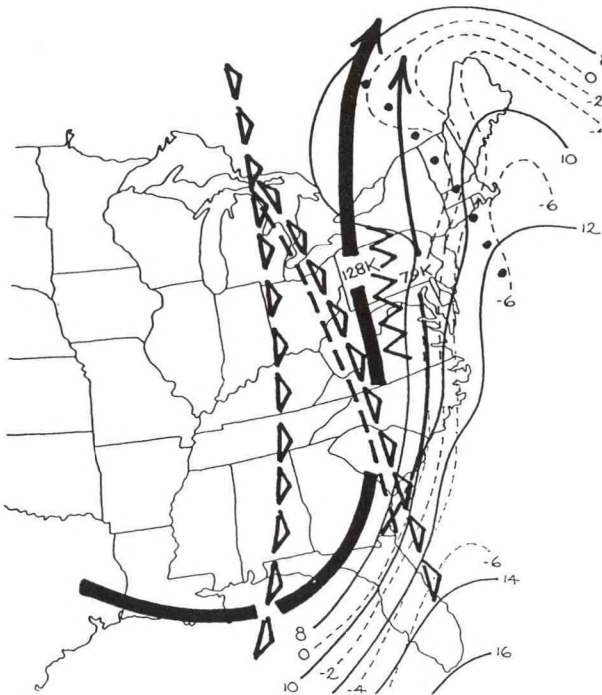


GOES 6AM CST November 15, 1989

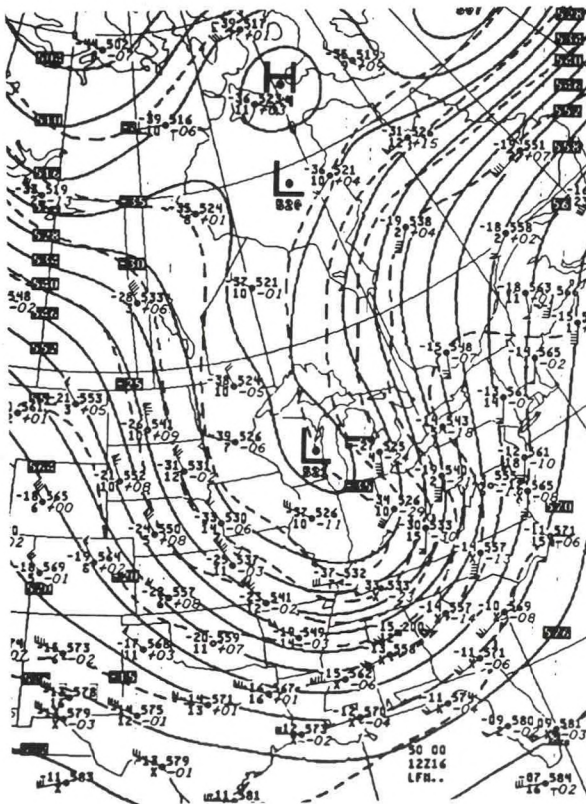


GOES 4PM CST November 15, 1989

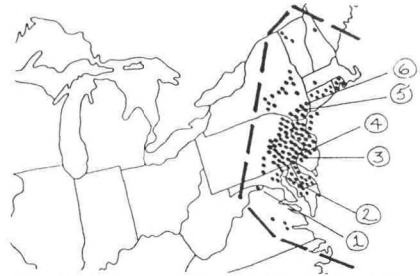
No. 24 November 16, 1989



Composite 6AM CST November 16, 1989

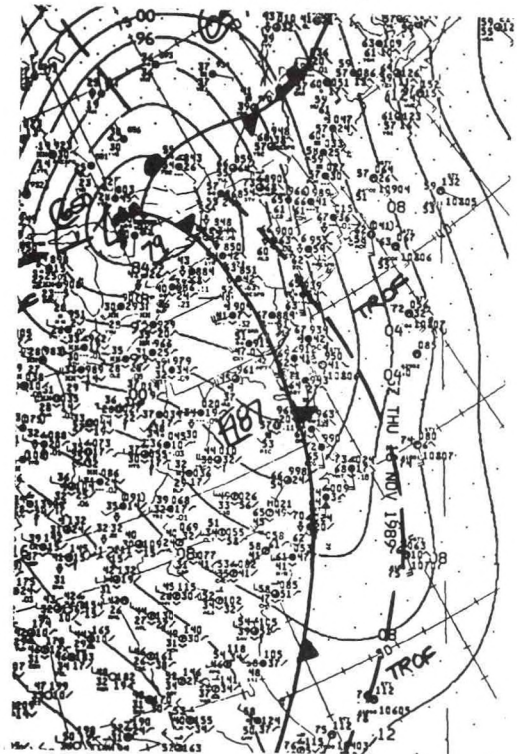


500 MB 6AM CST November 16, 1989

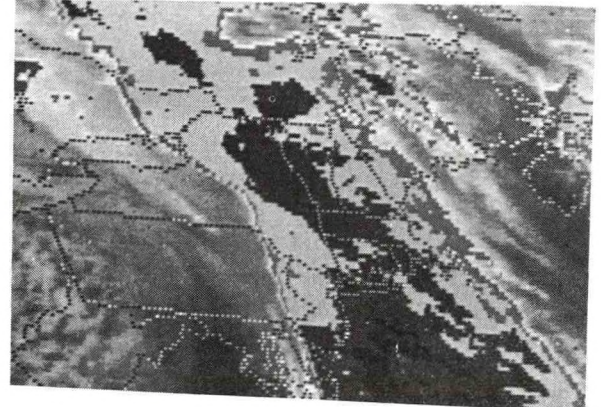


16NOVEMBER89 0100-1400 CST 189 SEVERE REPORTS 23 TORNADES

NO	TIME	EVENT	ST	LOCATION	
1	0400	TORNADO (F-2) three injuries	WV	SUMMIT POINT	(14 SE MRR)
2	0820	75 MPH WIND GUST one injury, more than one million dollars damage	MD	DUMKALK	(9 ENE BWI)
3	0925	100 MPH WIND GUST	PA	MALVERN	(18 WNW PHL)
4	1020	WIND DAMAGE six injuries	NJ	MOORESTOWN	(15 ENE PHL)
5	1100	WIND DAMAGE more than five million dollars damage	NY	ORANGE COUNTY	(15 WSW POU)
6	1105	TORNADO (F-1) nine deaths, eighteen injuries, more than five million dollars damage	NY	COLDENHAM	(15 WSW POU)



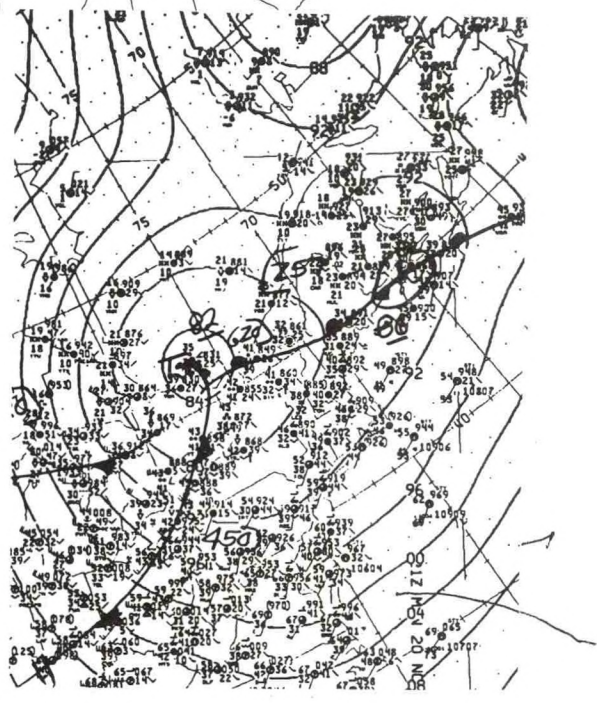
Surface 9AM CST Novmeber 16, 1989



GOES 11AM CST November 16, 1989

20NOVEMBER89 1711-2130 CST 196 SEVERE REPORTS 2 TORNADOES

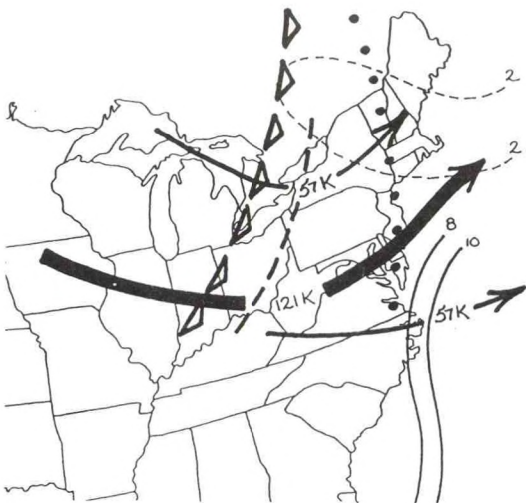
NO	TIME	EVENT	ST LOCATION
1	1800	TORNADO (F-2)	PA McALEVY'S FORT (21 SE PSB)
2	2000	92 MPH WIND GUST	NY POUGHKEEPSIE (POU)
3	2000	94 MPH WIND GUST	NY STEWART AIRPORT (12 SW SWF)



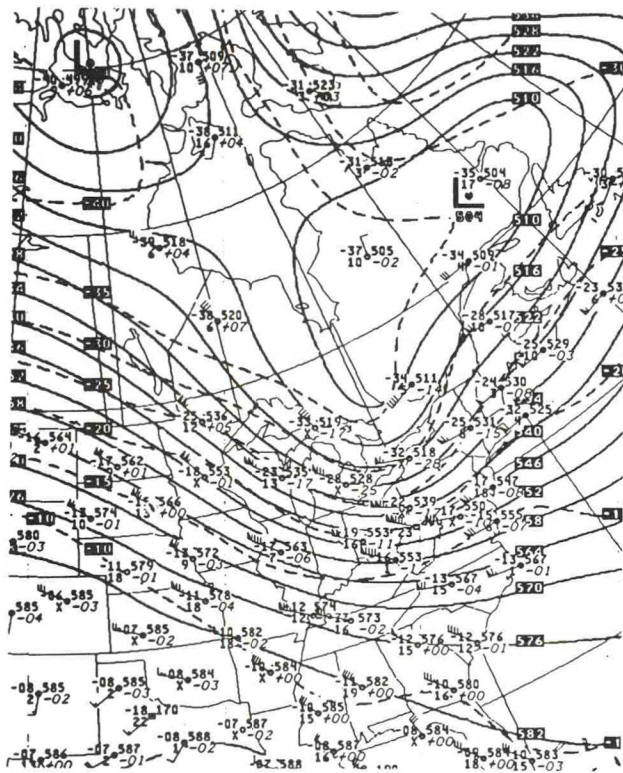
Surface 3PM CST November 20, 1989



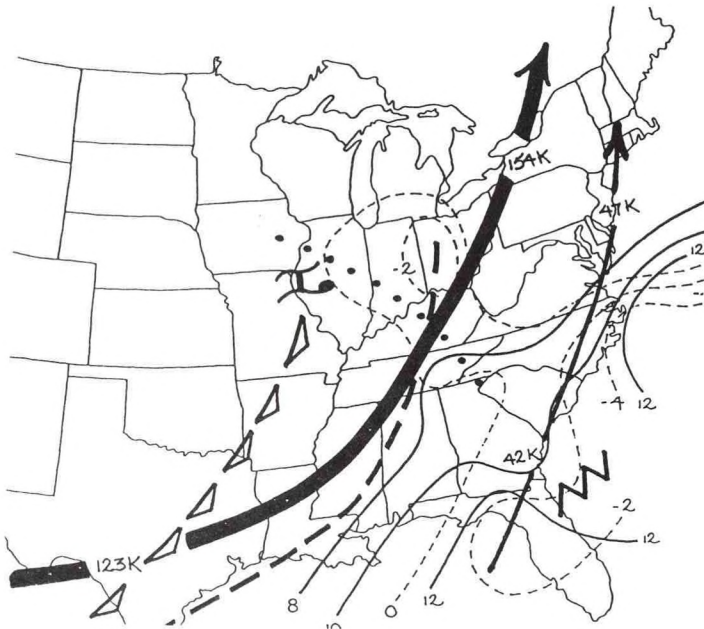
GOES 4PM CST November 20, 1989



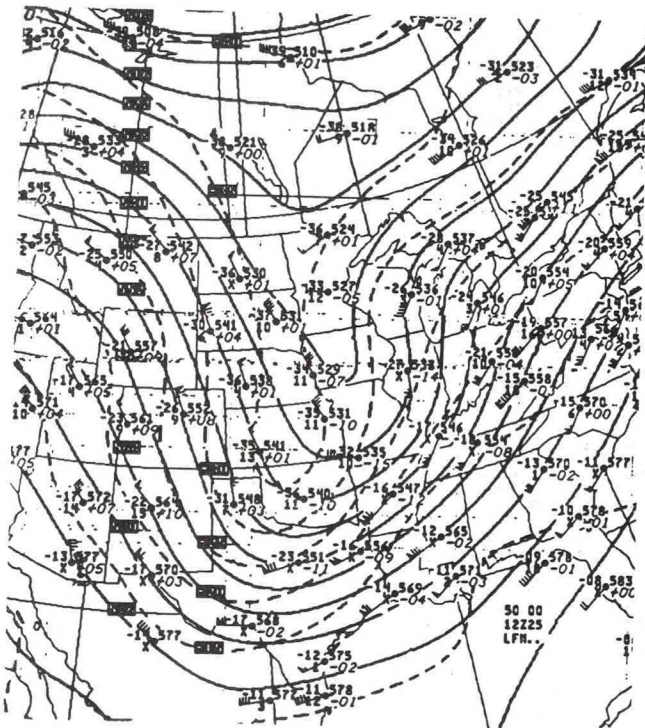
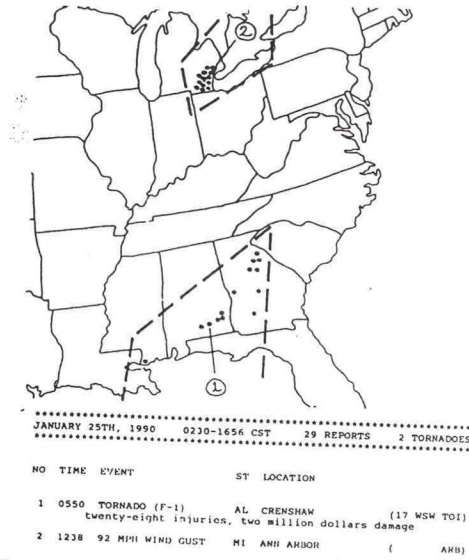
Composite 6PM CST November 20, 1989



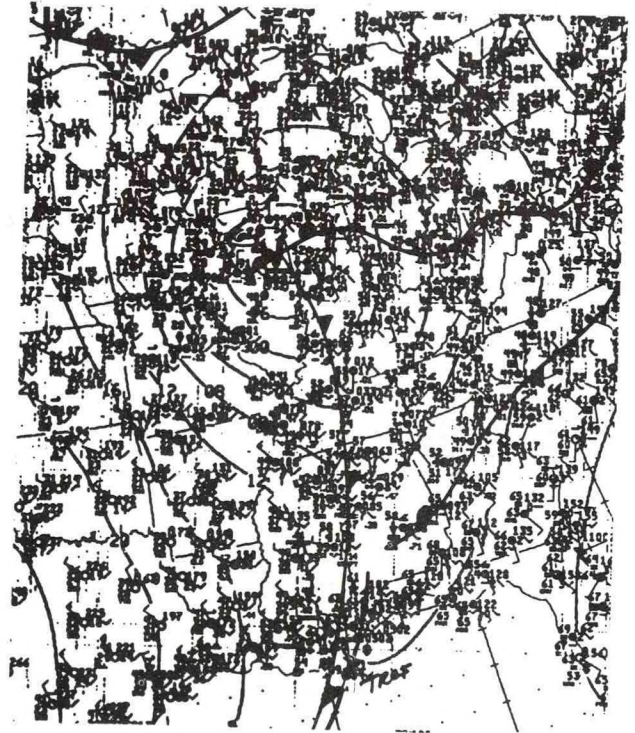
500 MB 6PM CST November 20, 1989



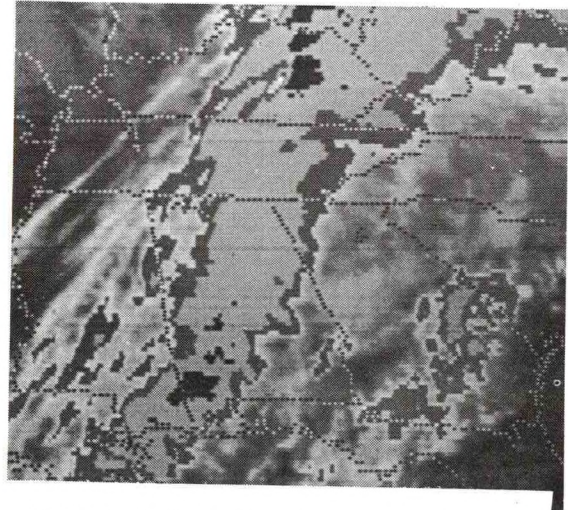
Composite 6AM CST January 25, 1990



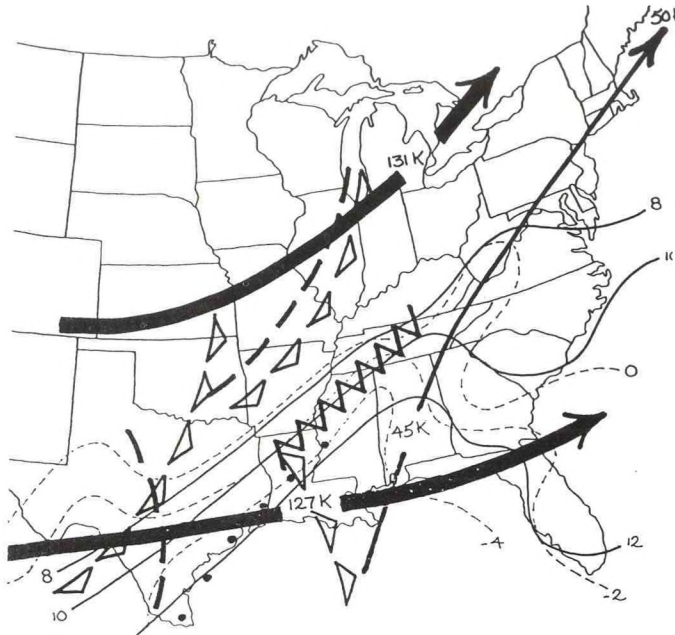
500 MB 6AM CST January 25, 1990



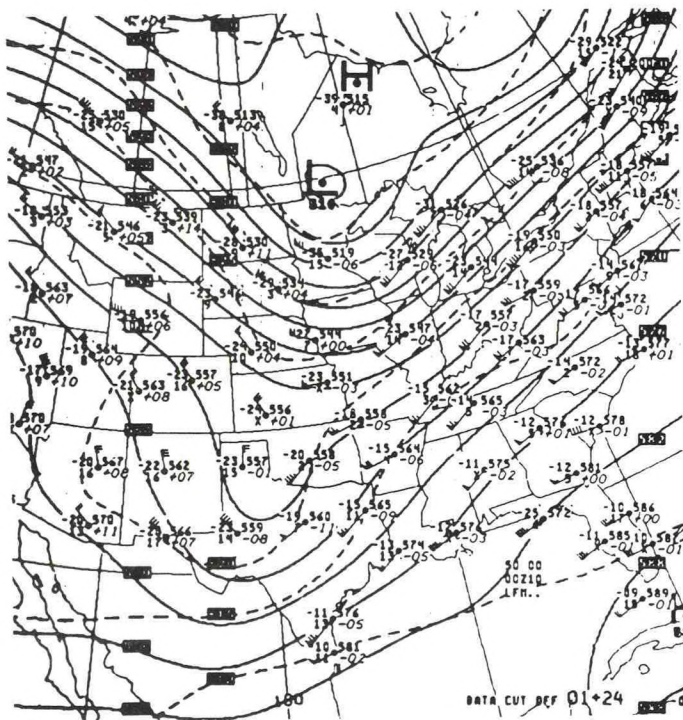
Surface 6AM CST January 25, 1990



GOES 5AM CST January 25, 1990



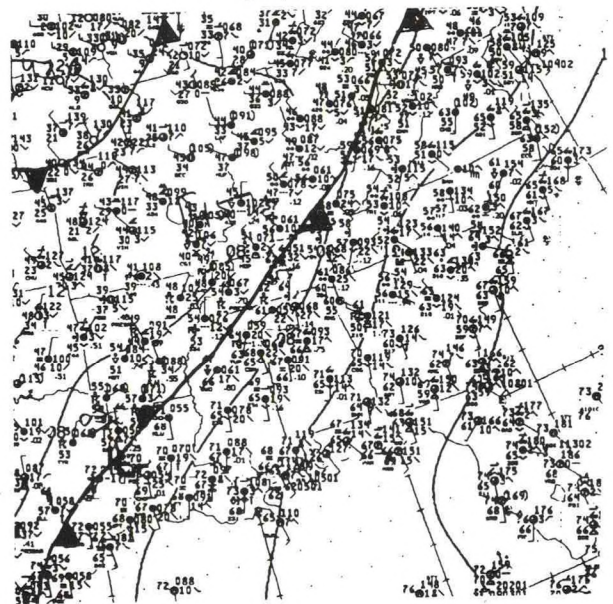
Composite 6PM CST February 9, 1990



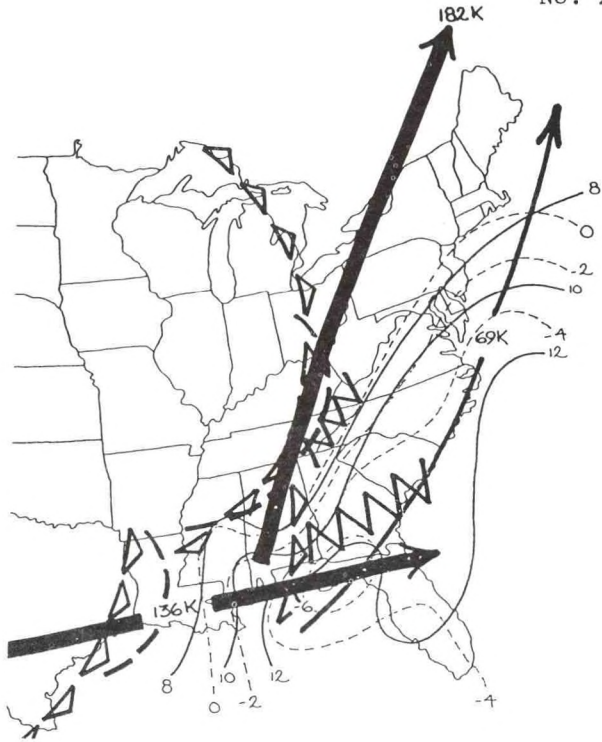
500 MB 6PM CST February 9, 1990

FEBRUARY 9TH-10TH, 1990 1130-1540 CST 374 REPORTS 29 TORNADOES

NO	TIME	EVENT	ST	LOCATION
1	1716	TORNADO (F-2) one injury	TX	HAT (32 M LFK)
2	1740	2.50 INCH HAIL more than half a million dollars damage	LA	SHREVEPORT (SHV)
3	0200	67 MPH WIND GUST eleven injuries, four million dollars damage	AL	TUSCALOOSA COUNTY (TCL)
4	0242	WIND DAMAGE twenty-two injuries, five million dollars damage	AL	SHELBY COUNTY (18 SSW BHM)
5	0315	WIND DAMAGE twenty-six injuries, three million dollars damage	AL	TALLADEGA (17 WSW ANB)
6	0455	TORNADO (F-2) two injuries, two million dollars damage	GA	4 WNW AUSTELL (7 M FTY)
7	0505	WIND DAMAGE two injuries	GA	COMETA COUNTY (28 SW ATL)
8	0545	87 MPH WIND GUST one injury	GA	KACON (MCN)
9	0800	TORNADO (F-2)	NC	6 S SHELBY (35 M CLT)



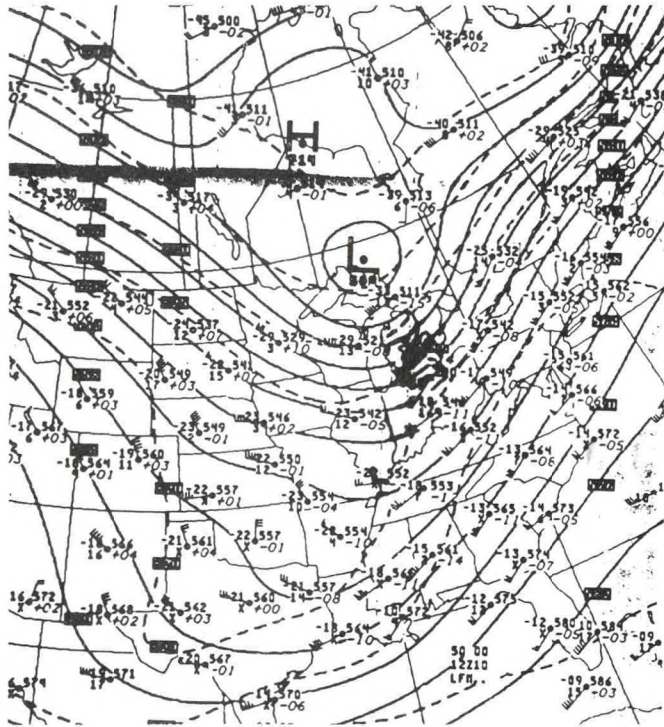
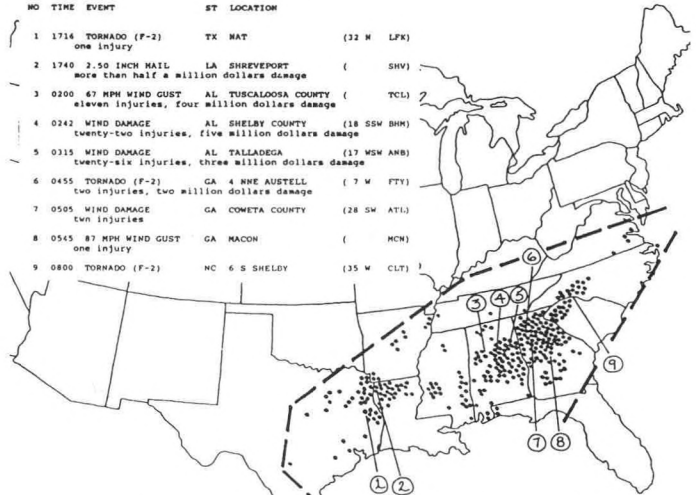
No. 28 February 10, 1990



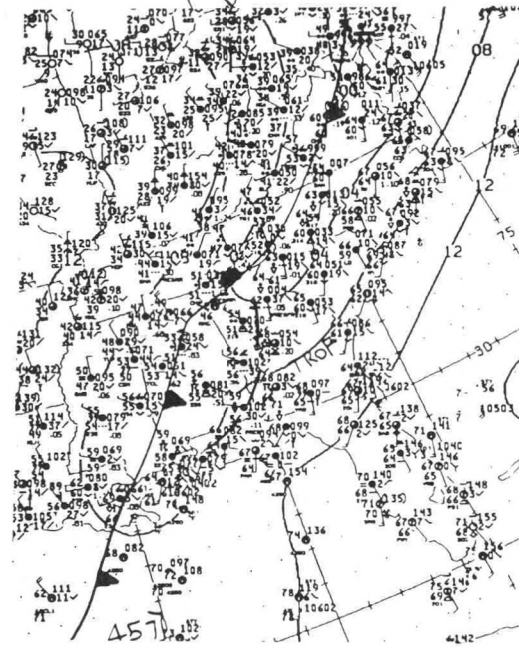
Composite 6AM CST February 10, 1990

FEBRUARY 9TH-10TH, 1990 1130-1540 CST 274 REPORTS 39 TORNADOES

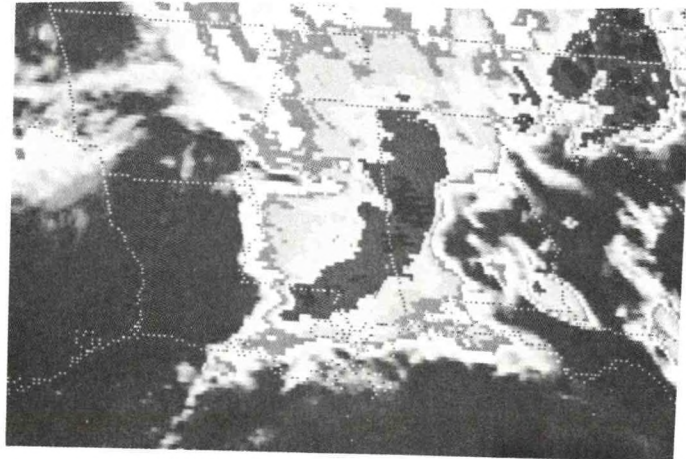
NO	TIME	EVENT	ST	LOCATION	
1	1714	TORNADO (F-2)	TX	MAT	(32 N LFK)
		one injury			
2	1740	2.50 INCH HAIL	LA	SHREVEPORT	(SHV)
		more than half a million dollars damage			
3	0200	67 MPH WIND GUST	AL	TUSCALOOSA COUNTY	(TCL)
		eleven injuries, four million dollars damage			
4	0242	WIND DAMAGE	AL	SHELBY COUNTY	(18 SSW BHM)
		twenty-two injuries, five million dollars damage			
5	0315	WIND DAMAGE	AL	TALLADEGA	(17 SSW ANB)
		twenty-six injuries, three million dollars damage			
6	0455	TORNADO (F-2)	GA	4 MNE AUSTELL	(7 W FTY)
		two injuries, two million dollars damage			
7	0505	WIND DAMAGE	GA	COMET COUNTY	(28 SW ATL)
		two injuries			
8	0545	87 MPH WIND GUST	GA	MACON	(MCH)
		one injury			
9	0800	TORNADO (F-2)	NC	6 S SHELBY	(35 W CLT)



500 MB 6AM CST February 10, 1990

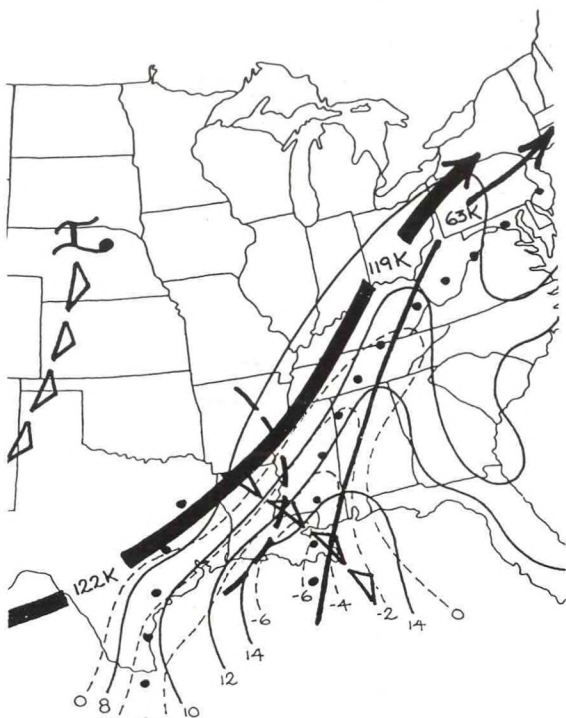


Surface 6AM CST February 10, 1990

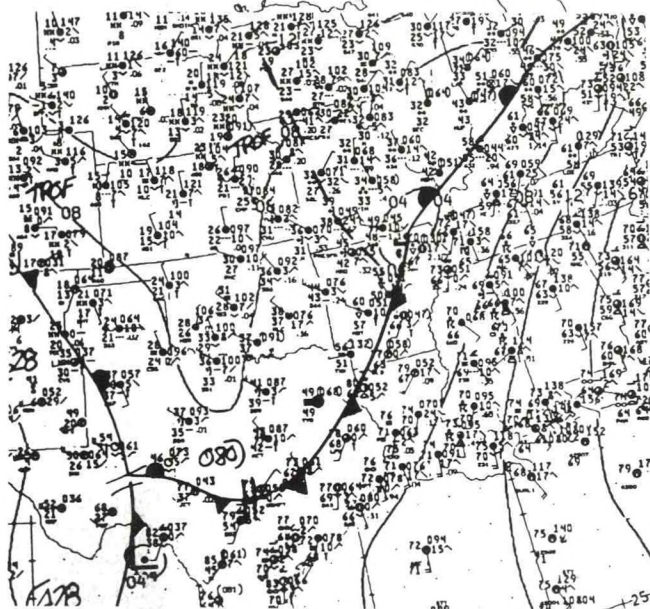


38 GOES 1:30 AM CST February 10, 1990

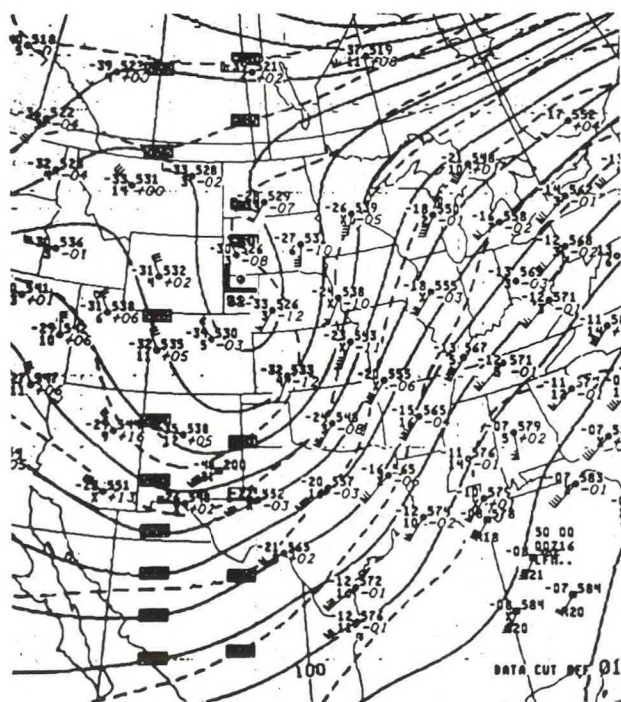
NO	TIME	EVENT	ST	LOCATION	
1	1840	2.75 INCH HAIL	MS	JACKSON	(JAN)
2	0305	WIND DAMAGE four injuries	AL	GOODWATER	(37 SSW ANR)
3	0435	TORNADO (F-2) eleven injuries	GA	2 E CARROLLTON	(35 W ATL)



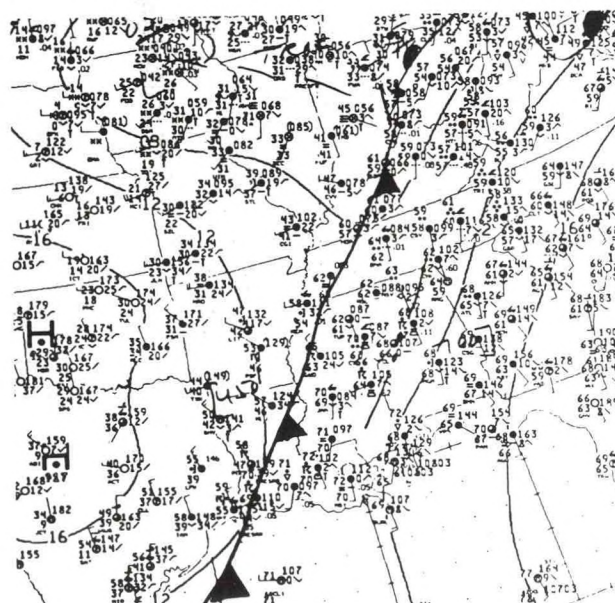
Composite 6PM CST February 15, 1990



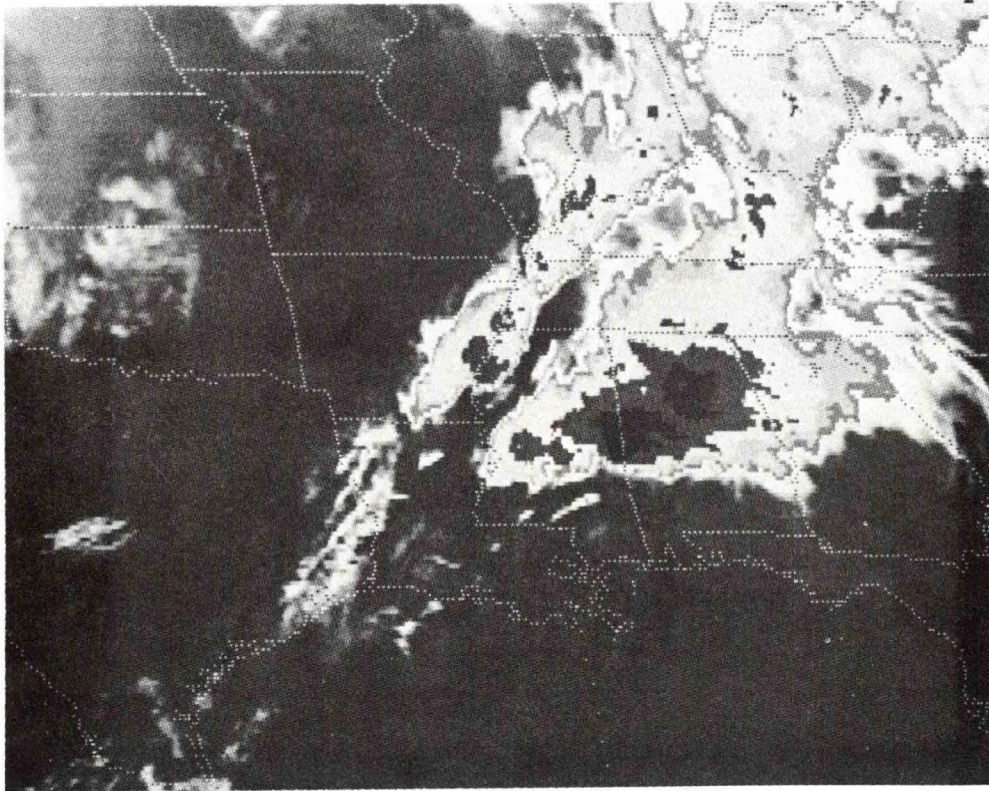
Surface 12 Noon CST February 15, 1990



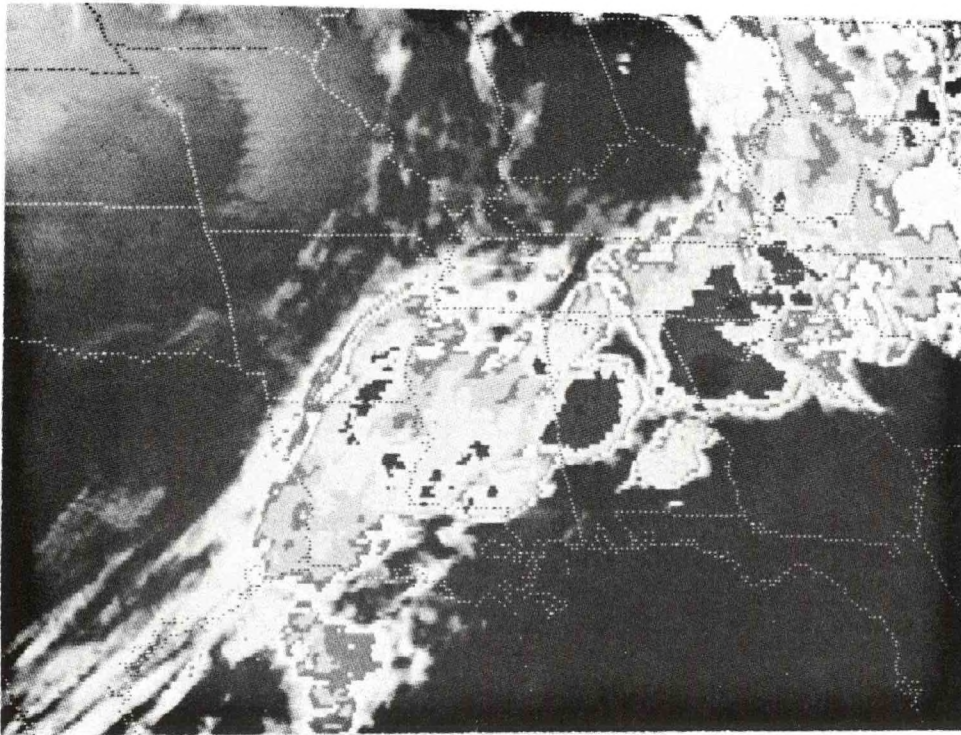
500 MB 6PM CST February 15, 1990



Surface 3AM CST February 16, 1990



GOES 4:30 PM CST February 15, 1990

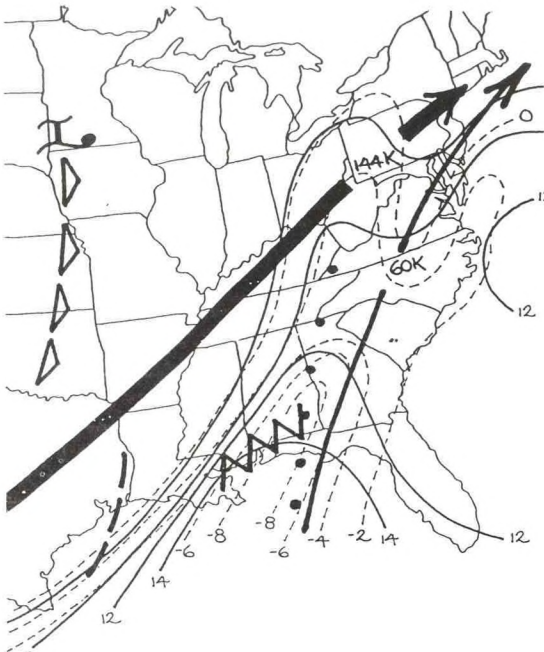


GOES 4:30 AM CST February 16, 1990

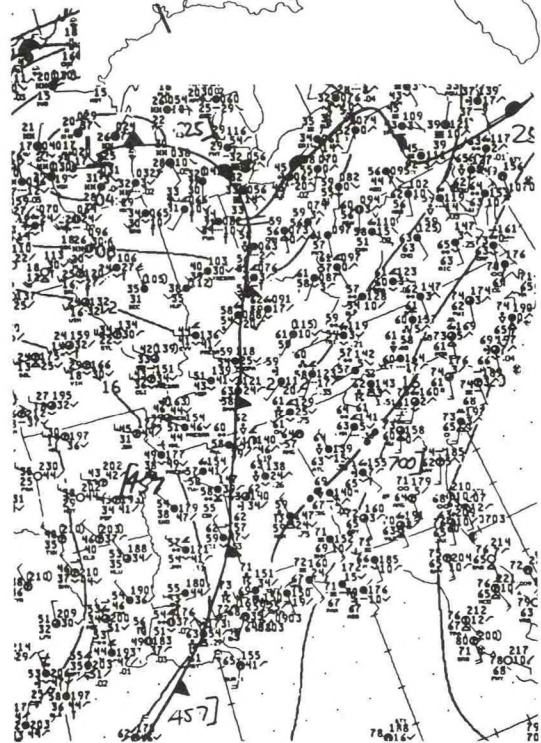
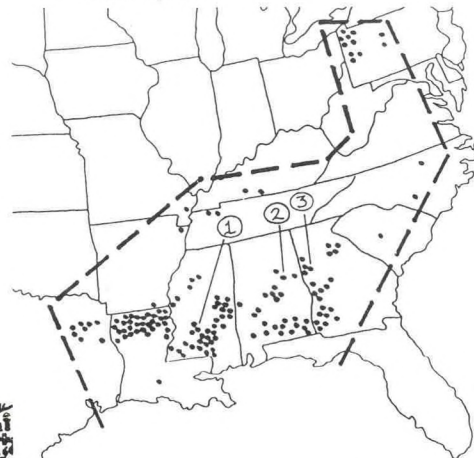
30. February 16, 1990

FEBRUARY 15-16TH, 1990 0910-1835 CST 145 REPORTS 13 TORNADOES

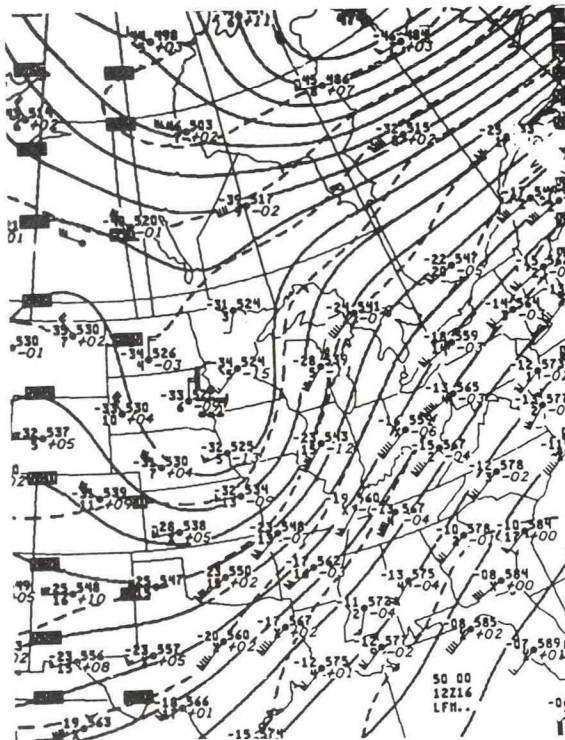
NO	TIME	EVENT	ST	LOCATION	
1	1640	2.75 INCH HAIL	MS	JACKSON	(JAN)
2	0305	WIND DAMAGE four injuries	AL	GOODWATER	(37 SSW ANB)
3	0435	TORNADO (F-2) eleven injuries	GA	2 E CARROLLTON	(35 W ATL)



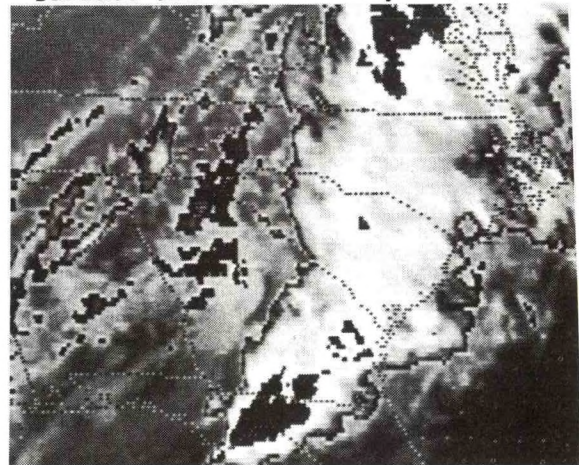
Composite 6AM CST February 16, 1990



Surface 9AM CST February 16, 1990

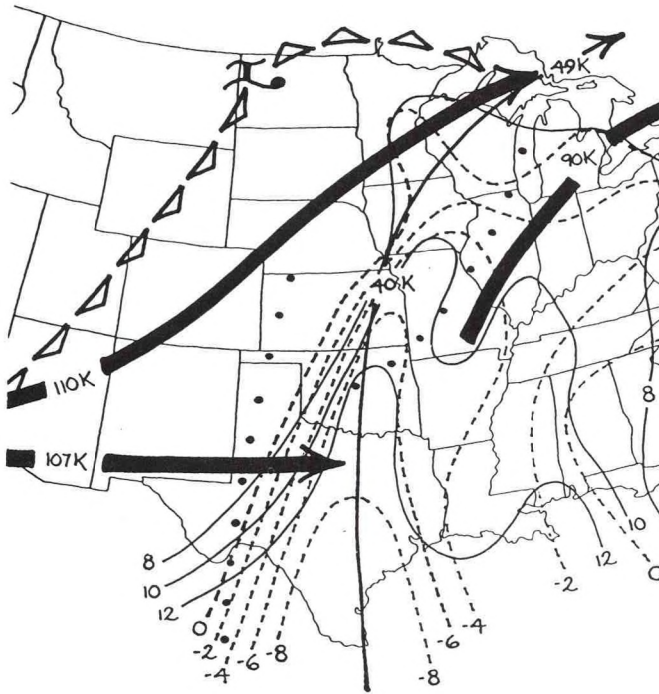


500 MB 6AM CST February 16, 1990

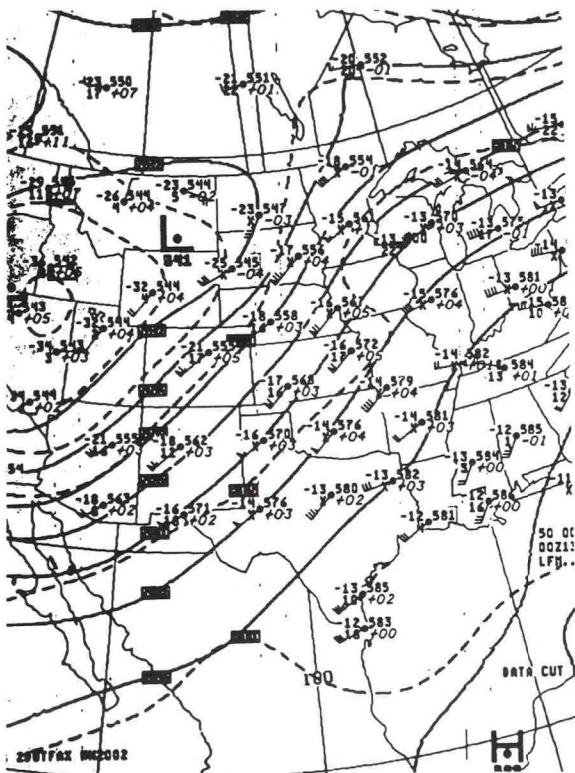


GOES 5PM CST February 16, 1990

31. March 12, 1990



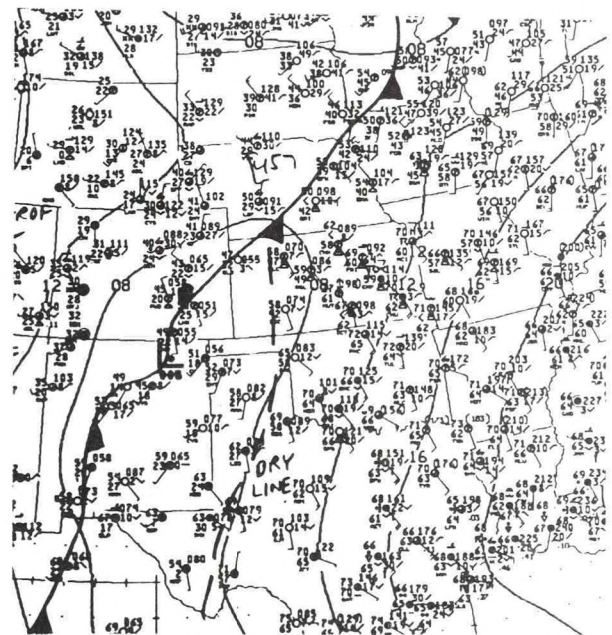
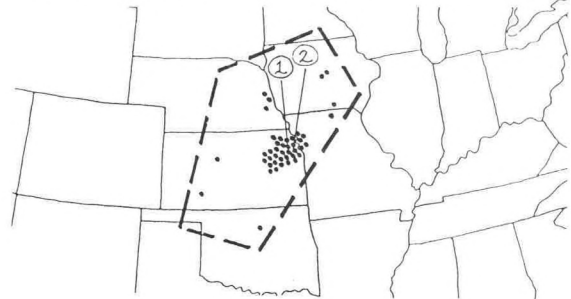
Composite 6PM CST March 12, 1990



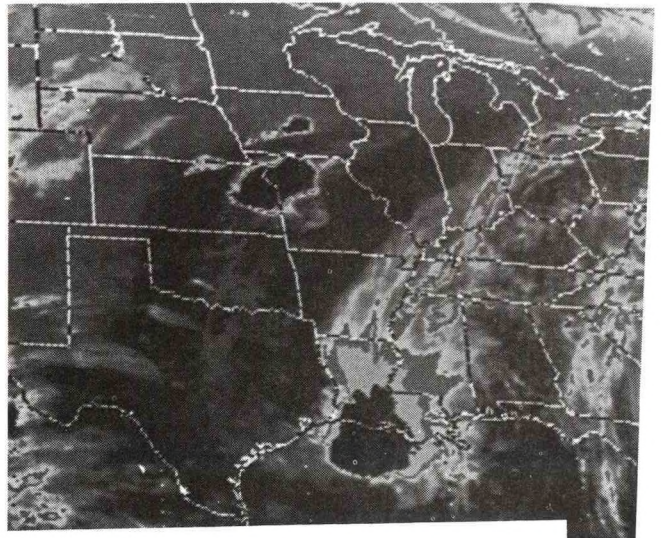
500 MB 6PM CST March 12, 1990

MARCH 12TH-13TH, 1990 1748-0520 CST 43 REPORTS 2 TORNADOES

NO	TIME	EVENT	ST	LOCATION	
1	2147	1.75 INCH HAIL	KS	TOPEKA	(TOP)
2	2349	TORNADO (F-1)	KS	4 SE TOPEKA	(4 SE TOP)



Surface 9PM CST March 12, 1990



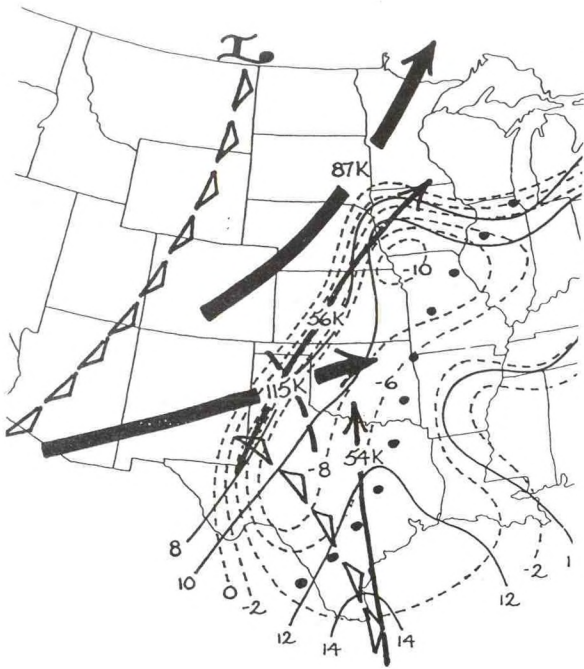
GOES 10PM CST March 12, 1990

No. 32 March 13, 1990

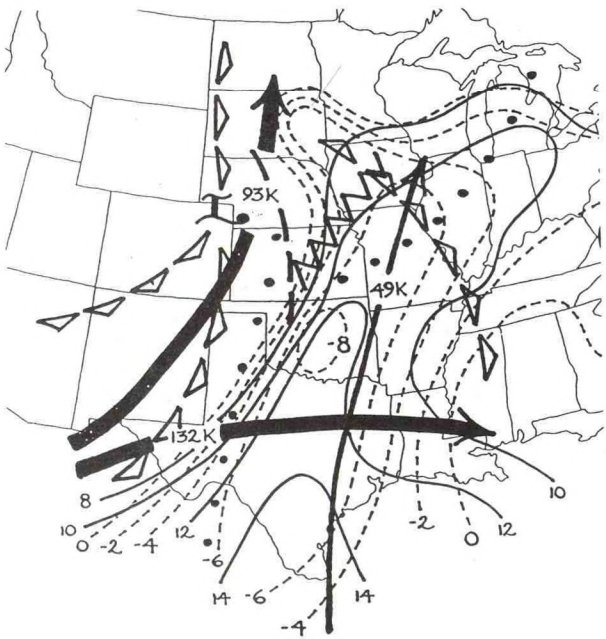
MARCH 13TH-14TH, 1990 0630-0340 CST 258 REPORTS 60 TORNADOES

NO TIME EVENT ST LOCATION

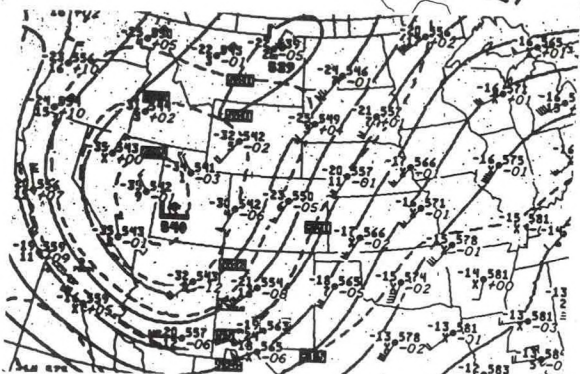
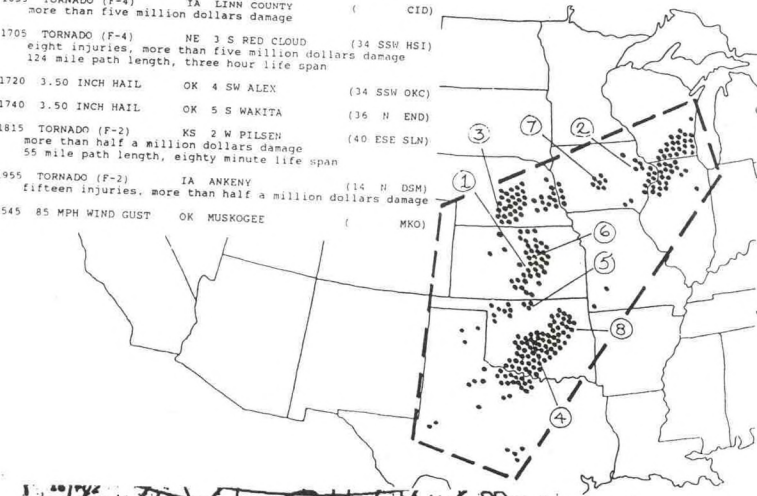
- 1 1634 TORNADO (F-5) KS HESSTON (21 SSW HUT)
two deaths, sixty injuries, 67 mile path length,
two hour life span, more than 22 million dollars damage
- 2 1653 TORNADO (F-4) IA LINN COUNTY (CID)
more than five million dollars damage
- 3 1705 TORNADO (F-4) NE 3 S RED CLOUD (34 SSW HSI)
eight injuries, more than five million dollars damage
124 mile path length, three hour life span
- 4 1720 3.50 INCH HAIL OK 4 SW ALEX (34 SSW OKC)
- 5 1740 3.50 INCH HAIL OK 5 S WAKITA (36 N END)
- 6 1815 TORNADO (F-2) KS 2 W PILSEN (40 ESE SLN)
more than half a million dollars damage
55 mile path length, eighty minute life span
- 7 1955 TORNADO (F-2) IA ANKENY (14 N DSM)
fifteen injuries, more than half a million dollars damage
- 8 0545 85 MPH WIND GUST OK MUSKOGEE (MKO)



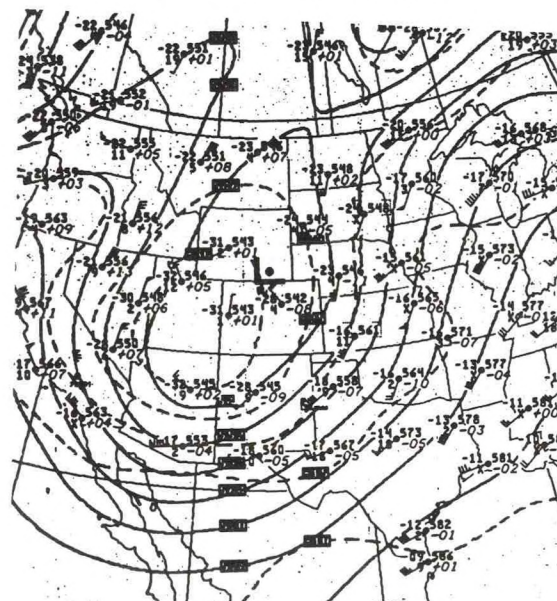
Composite 6AM CST March 13, 1990



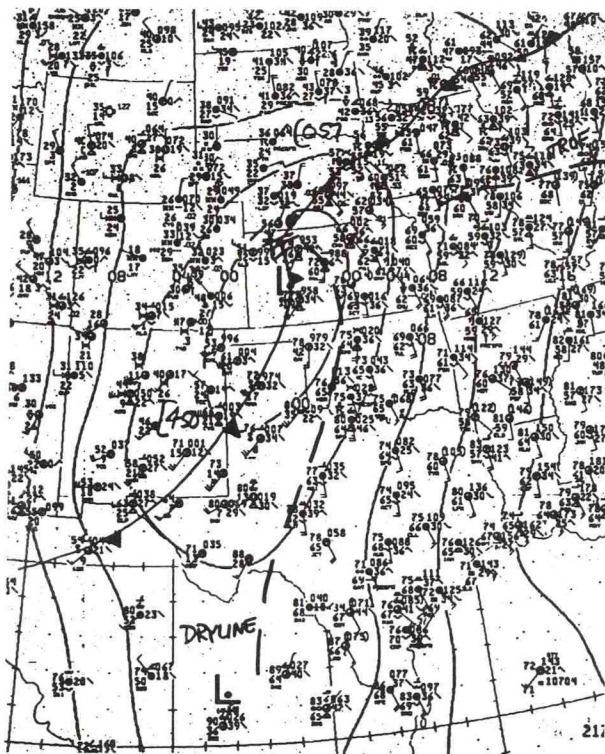
Composite 6PM CST March 13, 1990



500 MB 6AM CST March 13, 1990



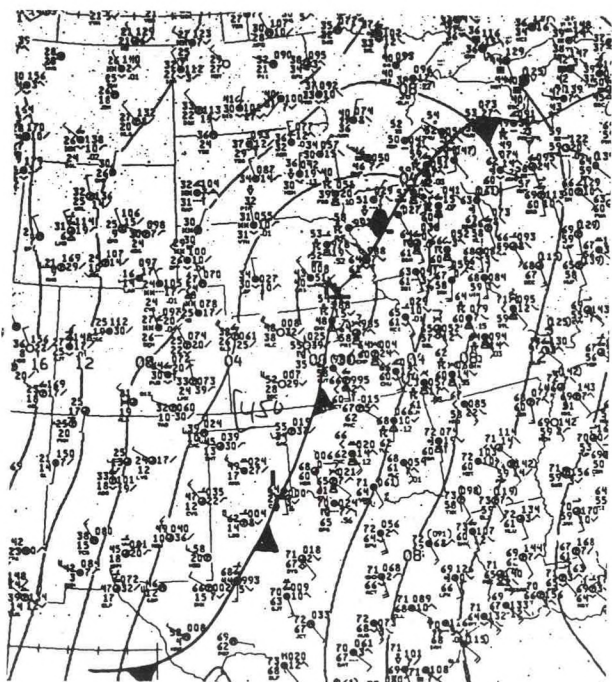
500 MB 6PM CST March 13, 1990



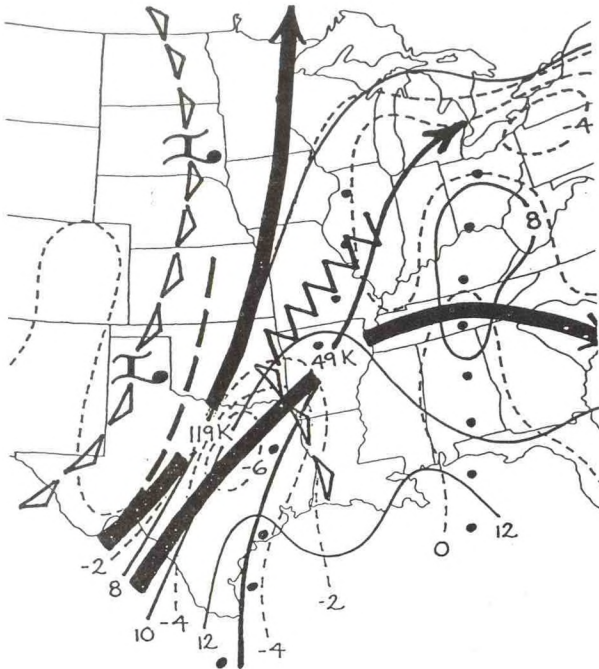
Surface 3PM CST March 13, 1990



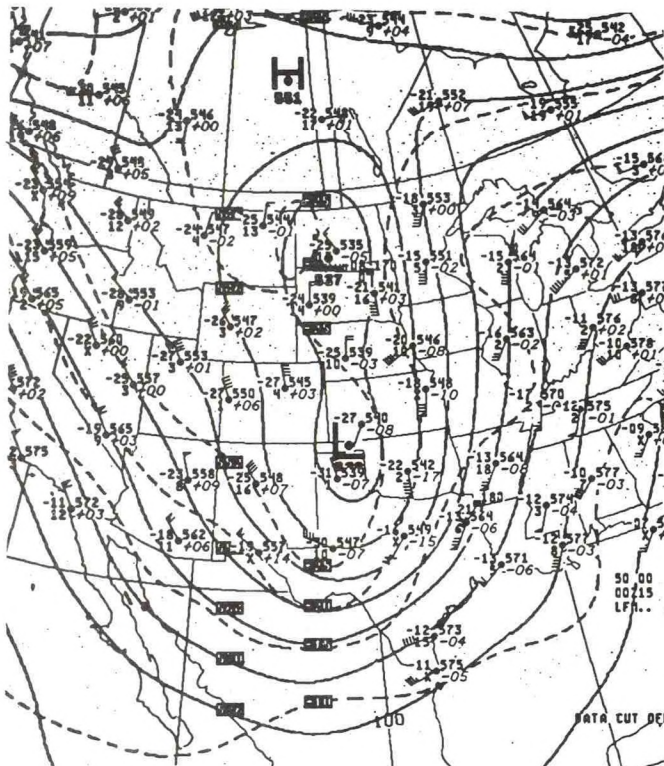
GOES 6PM CST March 13, 1990



Surface 9PM CST March 13, 1990



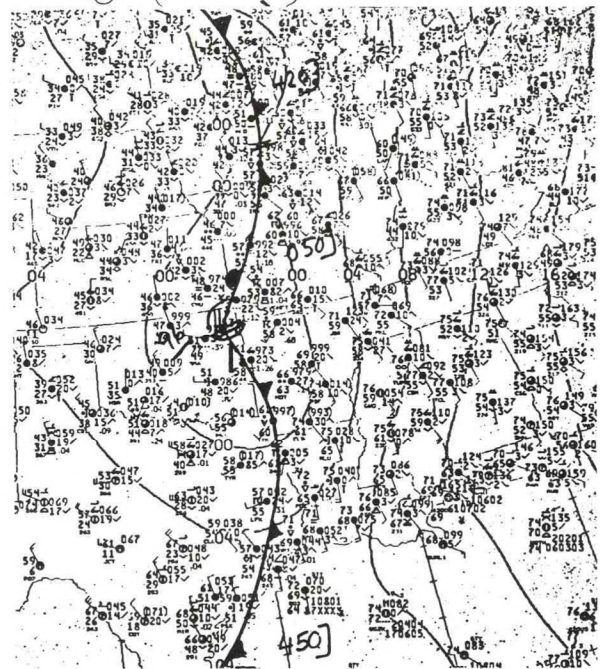
Composite 6PM CST March 14, 1990



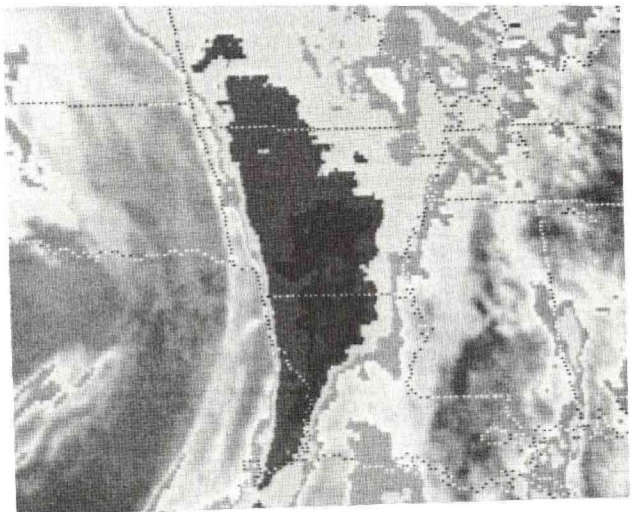
500 MB 6PM CST March 14, 1990

MARCH 14TH-15TH, 1990 0730-0435 CST 38 REPORTS 10 TORNADOES

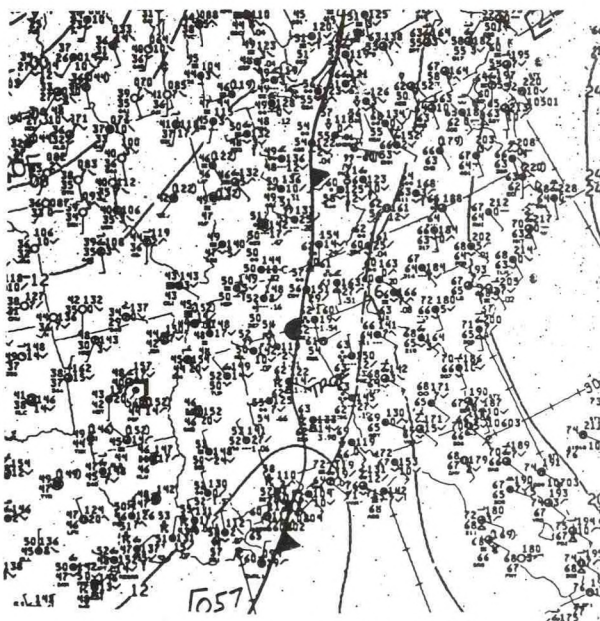
NO	TIME	EVENT	ST	LOCATION	
1	0945	TORNADO (F-3)	TX	2 W BELTON	(6 SW TPL)
2	1940	TORNADO (F-2) one death, six injuries	AR	FORDYCE	(37 SW PBF)
3	2100	WIND DAMAGE four injuries	LA	BASTROP	(20 NNE MLU)



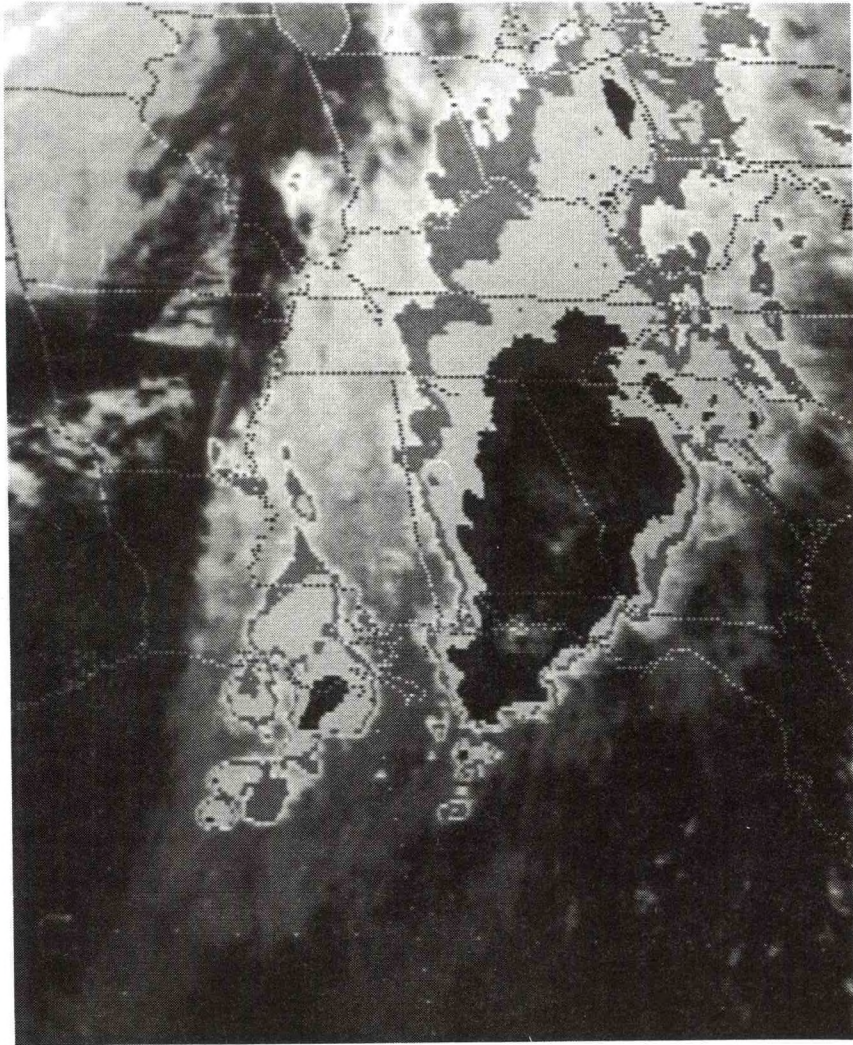
Surface 6PM CST March 14, 1990



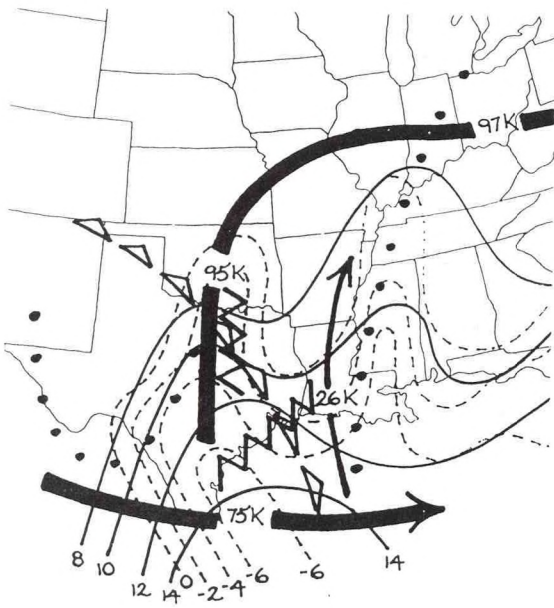
NO	TIME	EVENT	ST	LOCATION
1	0830	75 MPH WIND GUST	FL	2 SE FLORIDATOWN (8 NINE PMS)



46



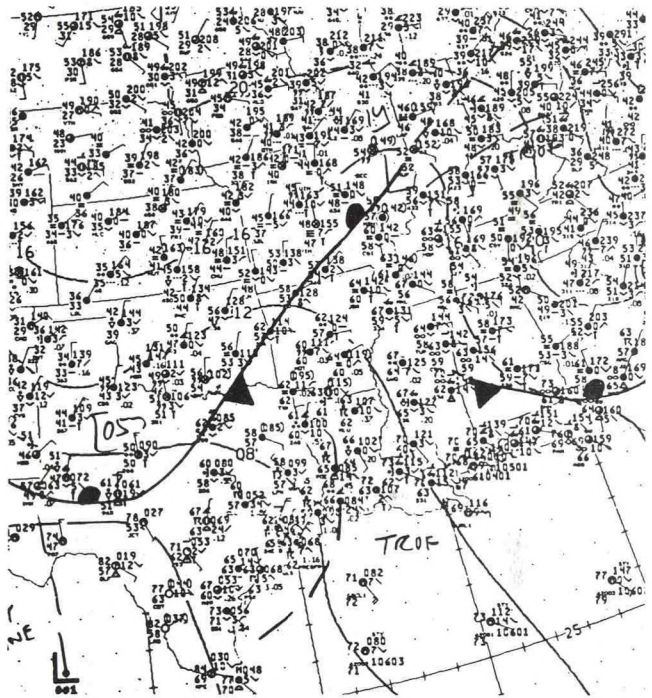
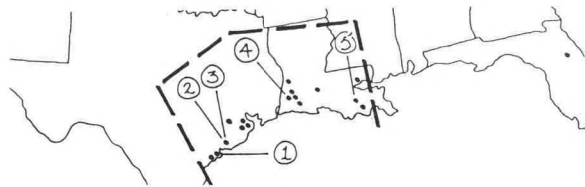
GOES 4PM CST March 16, 1990



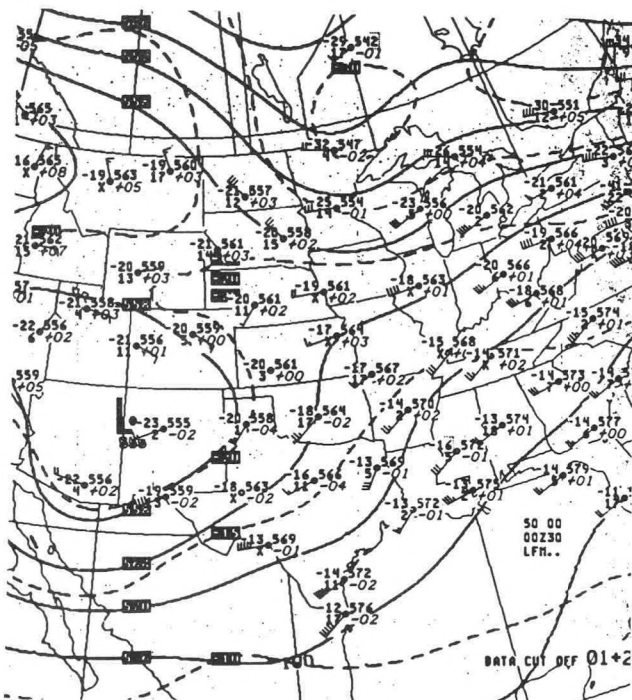
Composite 6PM CST March 29, 1990

MARCH 29TH, 1990 1242-2350 CST 16 REPORTS 7 TORNADOES

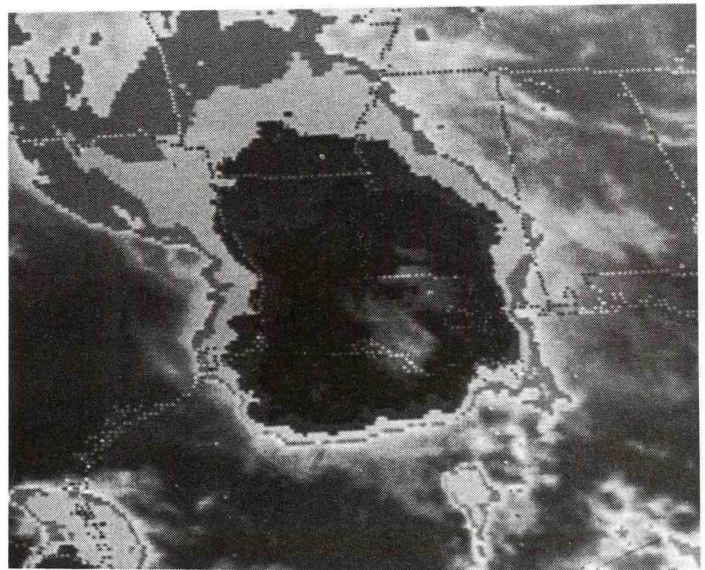
NO	TIME	EVENT	ST	LOCATION	
1	1300	WIND DAMAGE one death	TX	SEADRIFT	(32 SSE VCT)
2	1345	1.75 INCH HAIL	TX	PORT O'CONNER	(21 SSW PSX)
3	1345	70 MPH WIND GUST	TX	PORT O'CONNER	(21 SSW PSX)
4	1855	WIND DAMAGE one injury	LA	LAKE CHARLES	(LCH)
5	2200	TORNADO (F-1) seven injuries	LA	GRAY	(11 NW HUM)



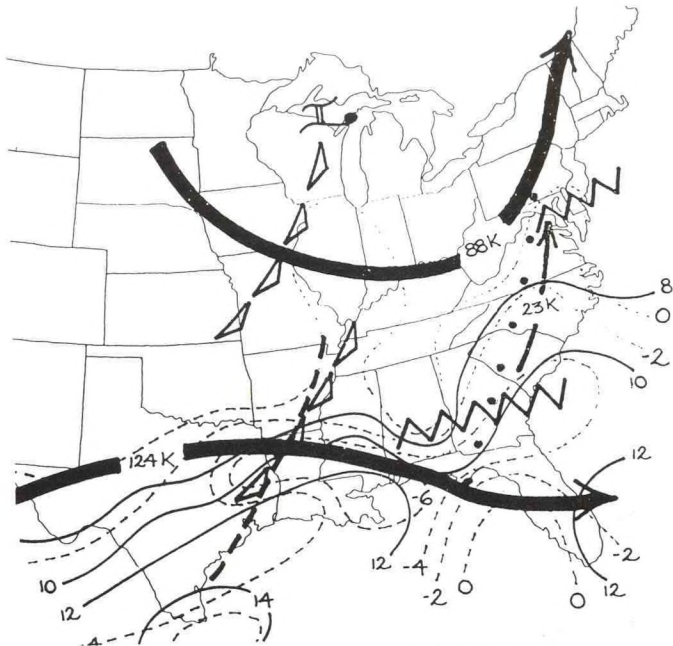
Surface 6PM CST March 29, 1990



500 MB 6PM CST March 29, 1990



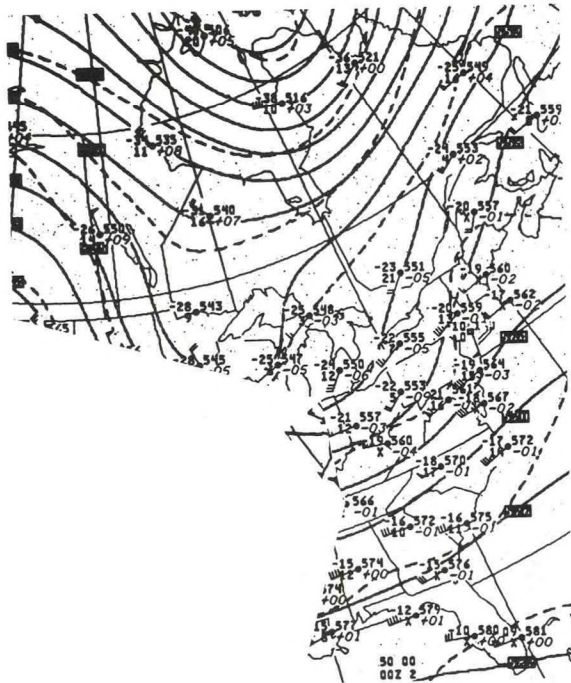
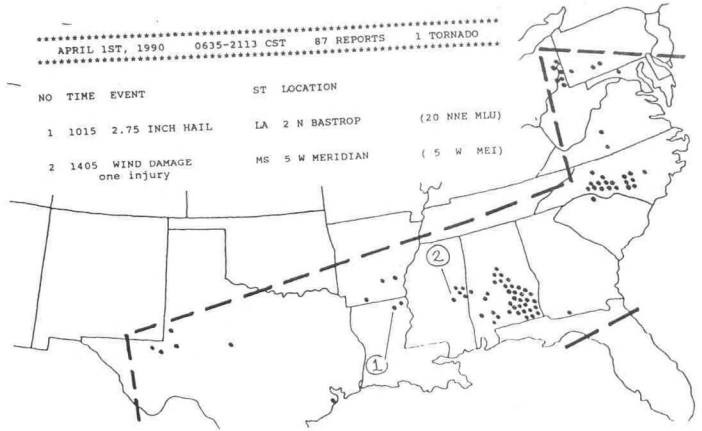
GOES 10PM CST March 29, 1990



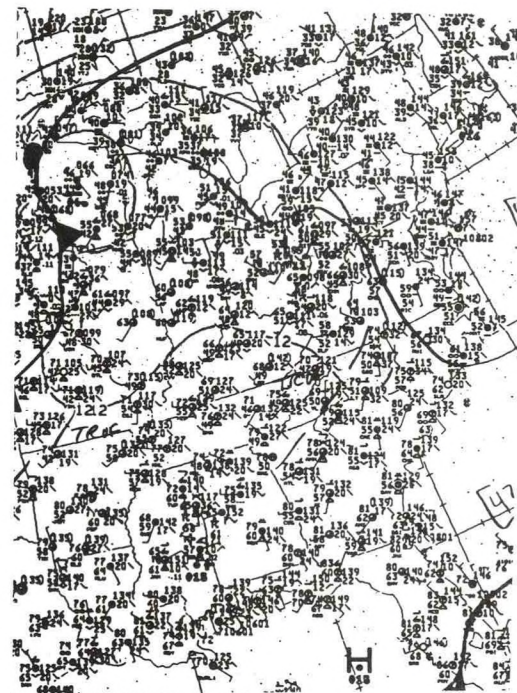
Composite 6PM CST April 1, 1990

APRIL 1ST, 1990 0635-2113 CST 87 REPORTS 1 TORNADO

NO	TIME	EVENT	ST	LOCATION	
1	1015	2.75 INCH HAIL	LA	2 N BASTROP	(20 NNE MLJ)
2	1405	WIND DAMAGE one injury	MS	5 W MERIDIAN	(5 W MEI)



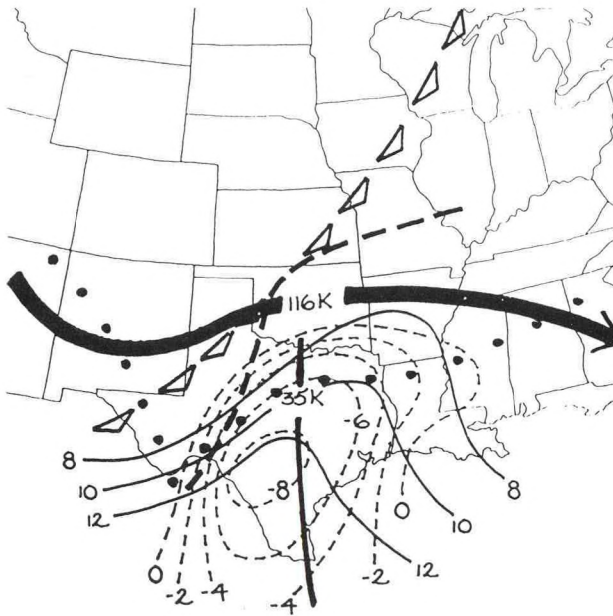
500 MB 6PM CST April 1, 1990



Surface 3PM CST April 1, 1990



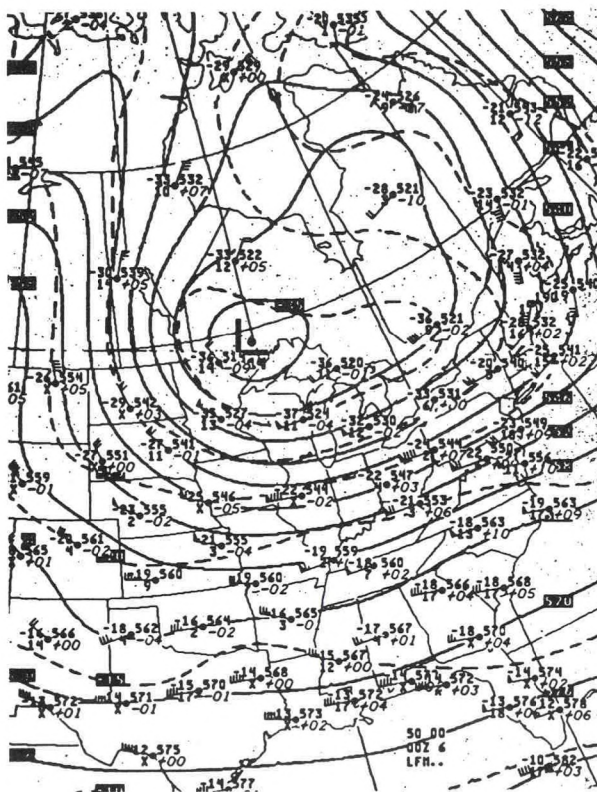
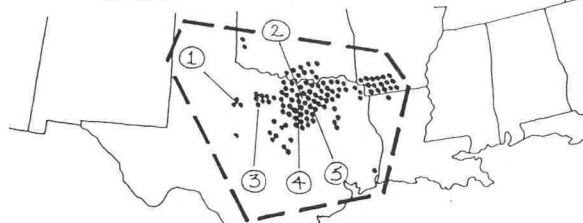
GOES 4PM CST April 1, 1990



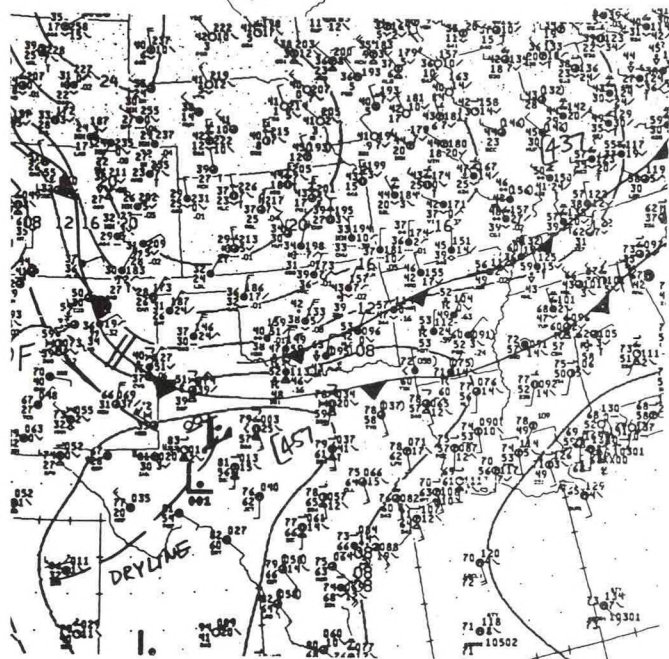
Composite 6PM CST April 5, 1990

APRIL 5TH, 1990 1225-2337 CST 110 REPORTS 12 TORNADOES

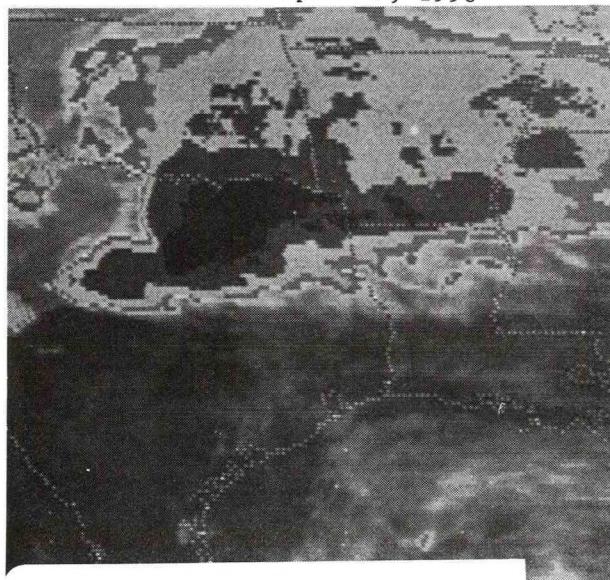
NO	TIME	EVENT	ST	LOCATION	
1	1750	70 MPH WIND GUST one injury	TX	ABILENE	(ABI)
2	1933	1.75 INCH HAIL one million dollars damage	TX	WHITE SETTLEMENT	(FWH)
3	1955	80 MPH WIND GUST	TX	CROSS PLAINS	(35 ESE ABI)
4	1950	3.50 INCH HAIL	TX	10 W FORT WORTH	(10 W FTW)
5	2033	TORNADO (F-2) one million dollars damage	TX	FORT WORTH	(FTW)



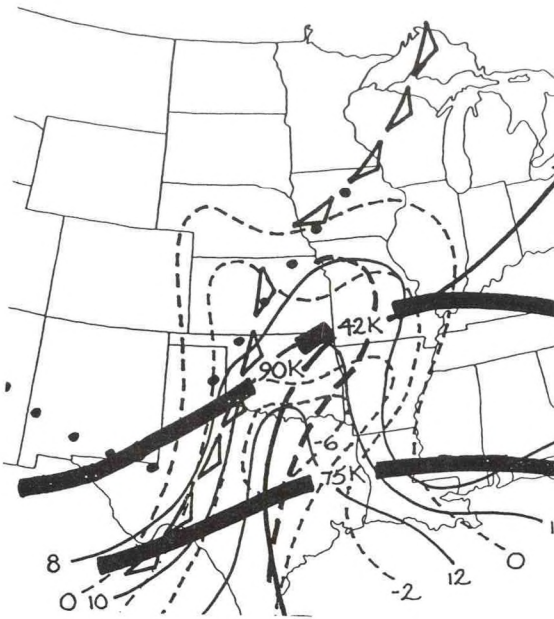
500 MB 6PM CST April 5, 1990



Surface 6PM CST April 5, 1990



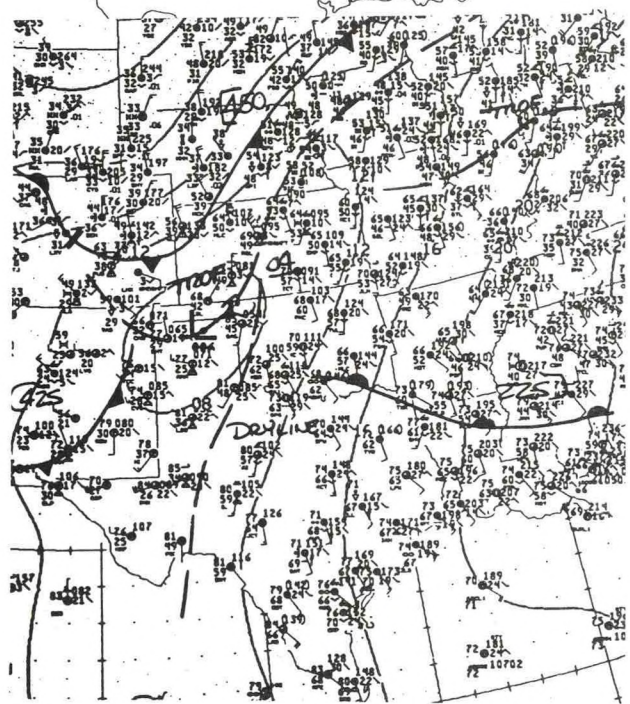
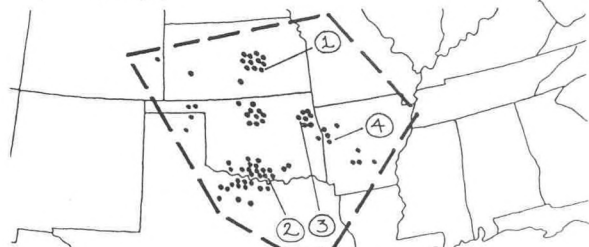
GOES 9PM CST April 5, 1990



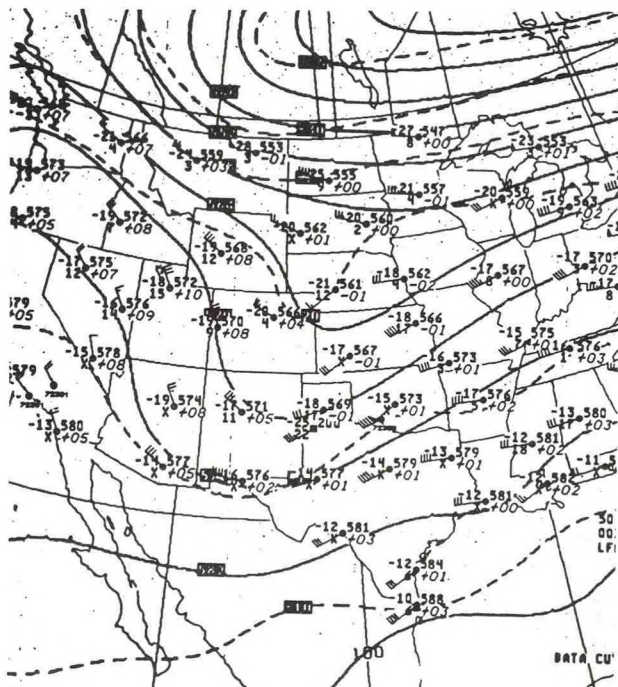
Composite 6PM CST April 9, 1990

APRIL 9TH-10TH, 1990 1535-0505 CST 75 REPORTS 5 TORNADOES

NO	TIME	EVENT	ST	LOCATION	
1	1845	3.00 INCH HAIL	KS	HALSTEAD	(19 ESE HUT)
2	2310	TORNADO (F-2) four injuries	OK	ARDMORE	(10 SW ADM)
3	0130	70 MPH WIND GUST	OK	KELLYVILLE	(24 SW TUL)
4	0215	WIND DAMAGE one injury	AR	MIDLAND	(15 S FSM)



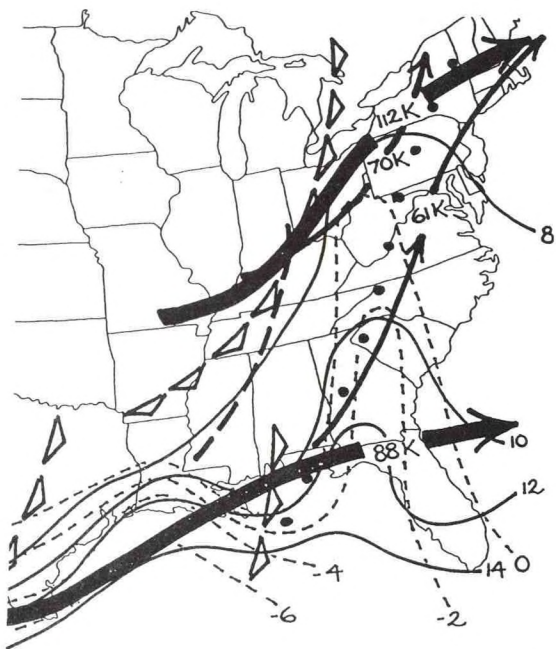
Surface 3PM CST April 9, 1990



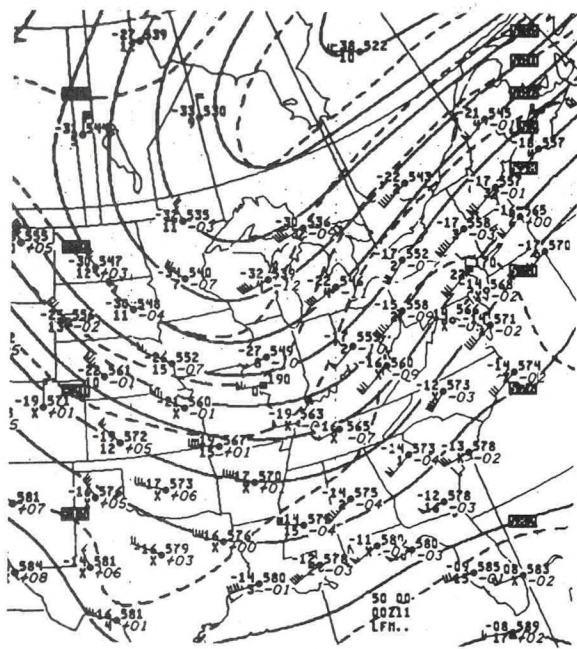
500 MB 6 PM CST April 9, 1990

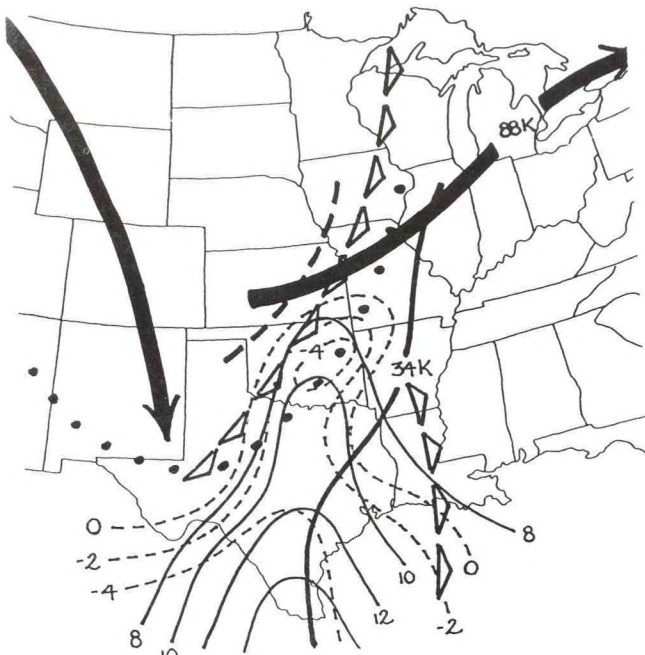


GOES 10PM CST April 9, 1990

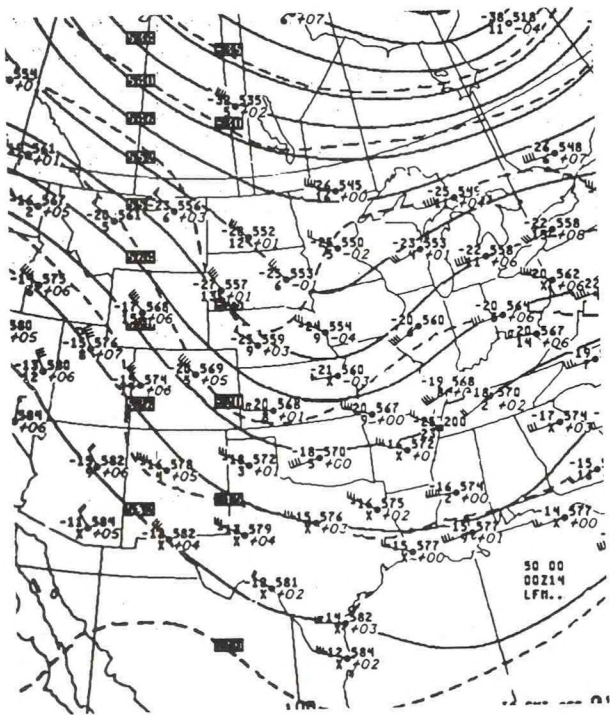


Composite 6PM CST April 10, 1990

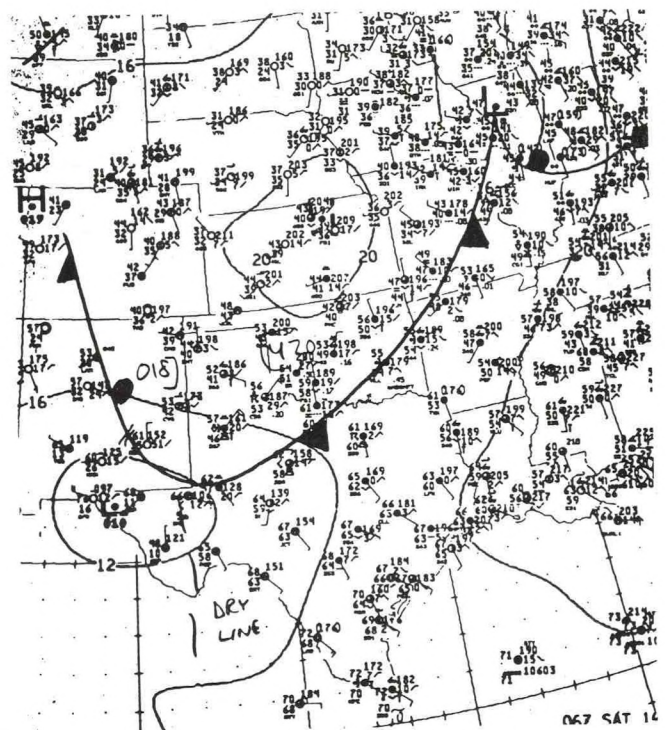
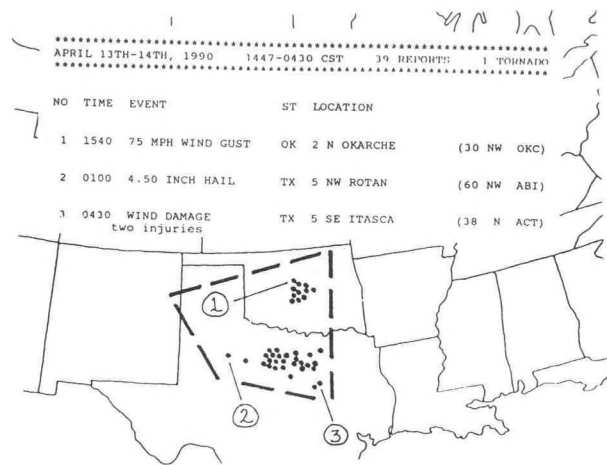




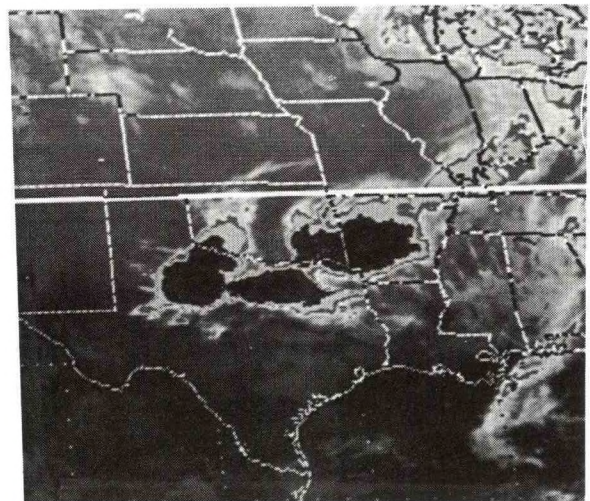
Composite 6PM CST April 13, 1990



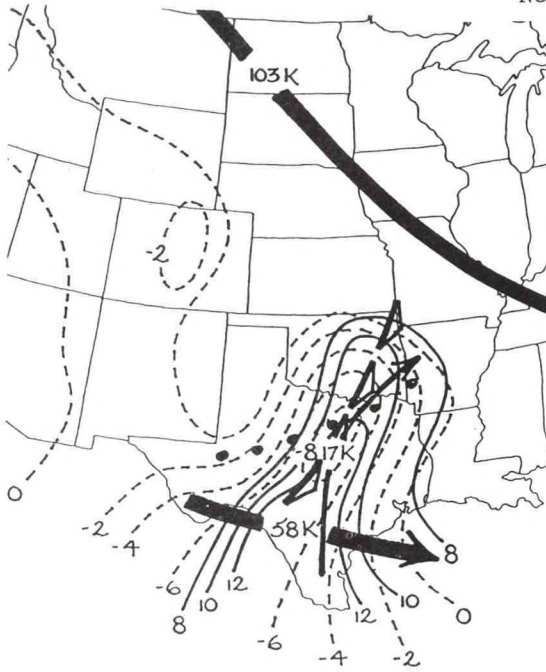
500 MB 6PM CST April 13, 1990



Surface 12 Midnight CST April 13, 1990



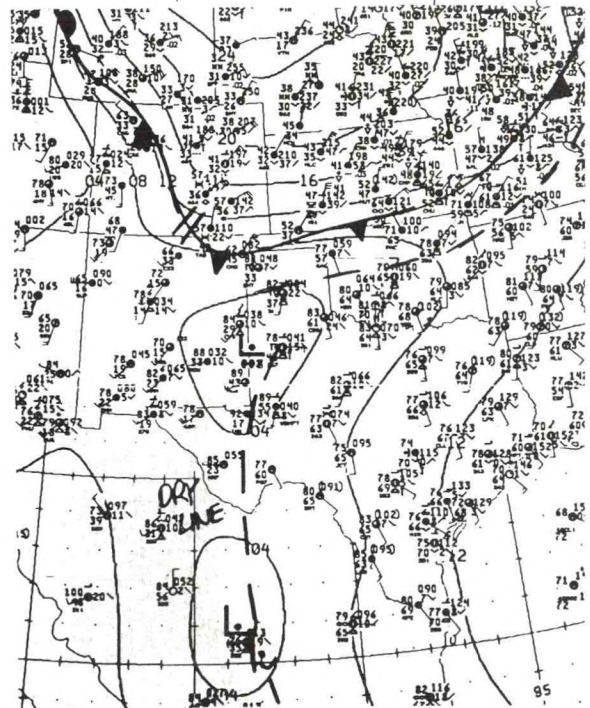
No. 41 April 15, 1990



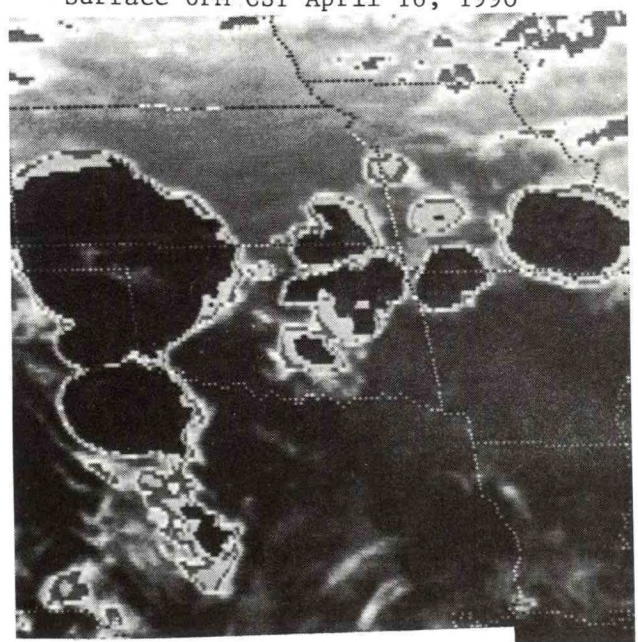
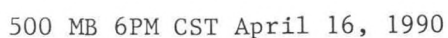


NO	TIME	EVENT	ST	LOCATION	
1	1917	2.75 INCH HAIL	OK	2 S CARNEY	(42 NE OKC)
2	1920	90 MPH WIND GUST	TX	HIGGINS	(19 SW GAG)
3	2222	92 MPH WIND GUST	OK	OKLAHOMA CITY WSPFO	(OKC)
4	2237	62 MPH WIND GUST one injury	OK	TINKER AFB	(TIK)
5	2245	100 MPH WIND GUST	OK	OKLAHOMA CITY	(OKC)

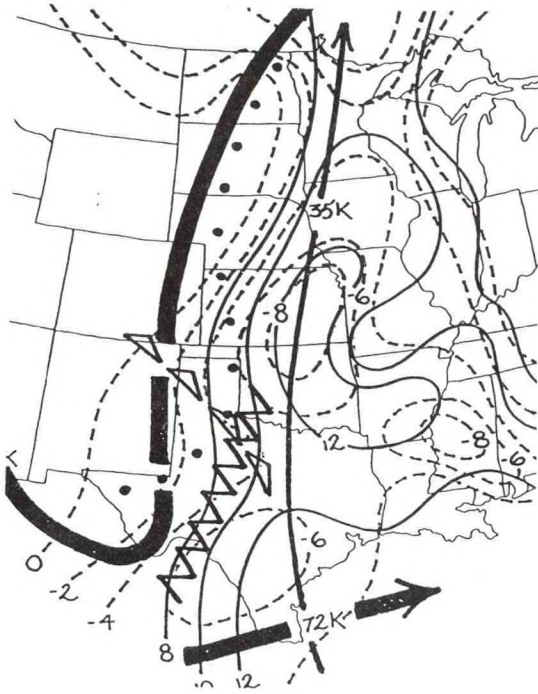
Many Federal tax returns were swept away by the high winds while being transported from a mail cart to a waiting truck



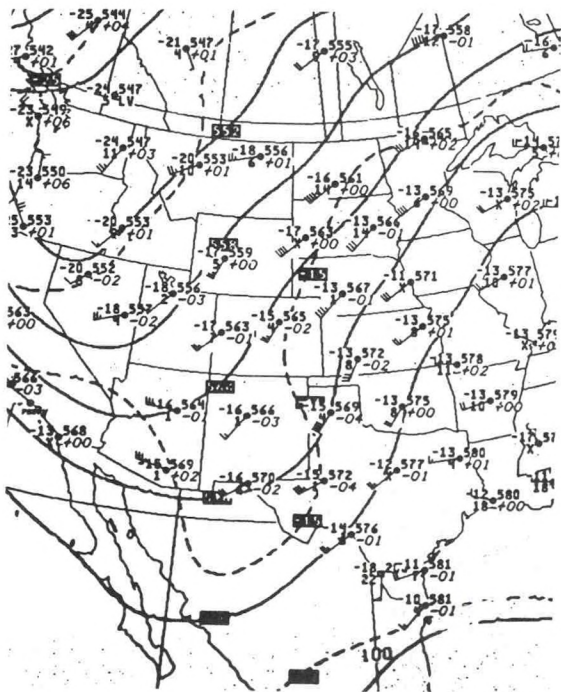
Surface 6PM CST April 16, 1990



GOES 7PM CST April 16, 1990



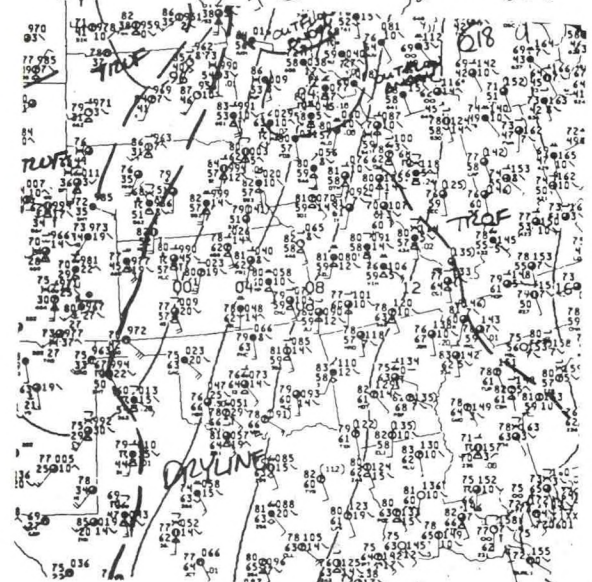
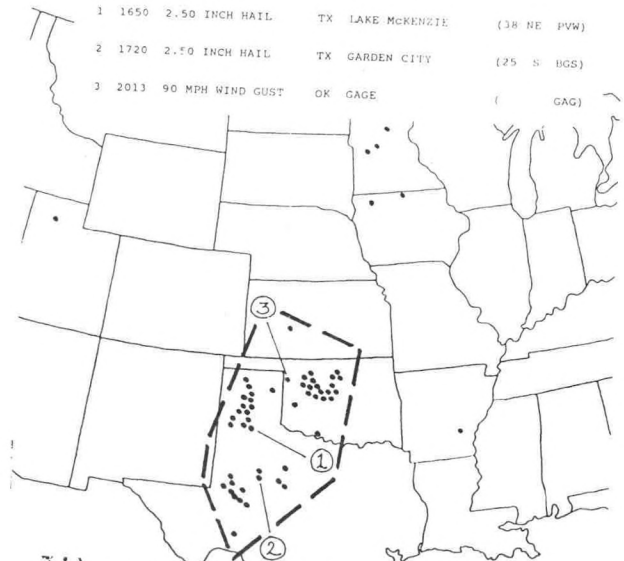
Composite 6PM CST April 23, 1990



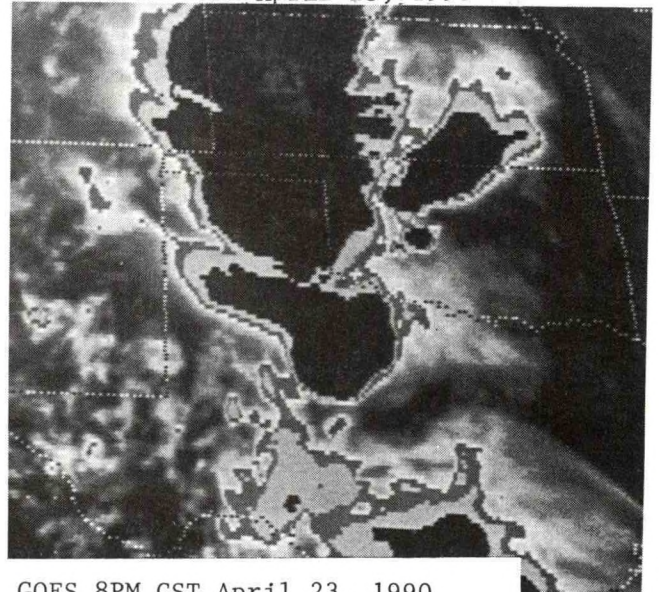
500 MB 6PM CST April 23, 1990

APRIL 23RD, 1990 1045-0145 CST 51 REPORTS TORNADES

NO	TIME	EVENT	ST	LOCATION
1	1650	2.50 INCH HAIL	TX	LAKE MCKENZIE (38 NE PVW)
2	1720	2.50 INCH HAIL	TX	GARDEN CITY (25 S BGS)
3	2013	90 MPH WIND GUST	OK	GAGE (GAG)



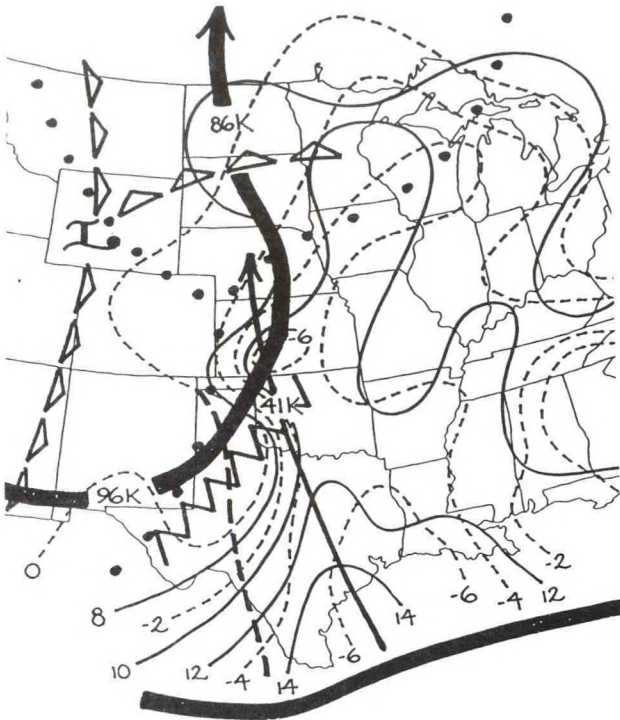
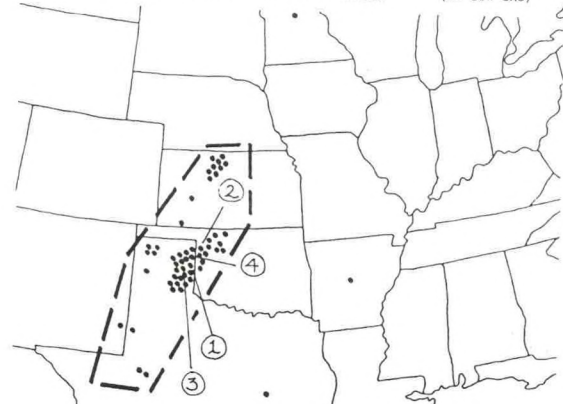
Surface 6PM CST April 23, 1990



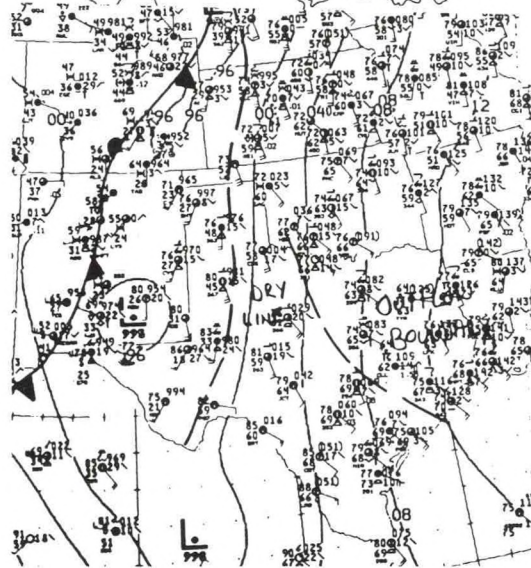
GOES 8PM CST April 23, 1990

APRIL 24TH-25TH, 1990 1540-0250 CST 53 REPORTS 10 TORNADOES

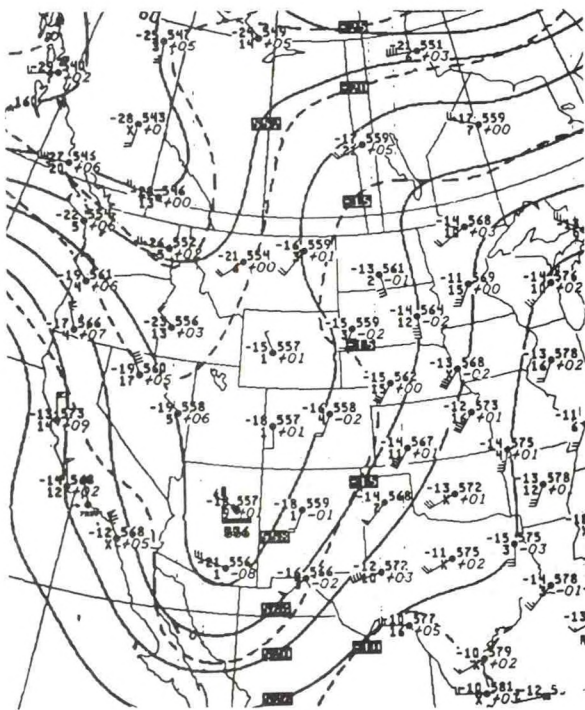
NO	TIME	EVENT	ST	LOCATION	
1	1821	4.50 INCH HAIL	TX	WHEELER	(60 W CSM)
2	2123	TORNADO (F-2) five injuries, 1.5 million dollars damage	OK	SHATTUCK	(6 WSW GAG)
3	2230	TORNADO (F-1) one injury	TX	10 W SHAMROCK	(69 W CSM)
4	0045	85 MPH WIND GUST	OK	15 SW ARNETT	(40 SSW GAG)



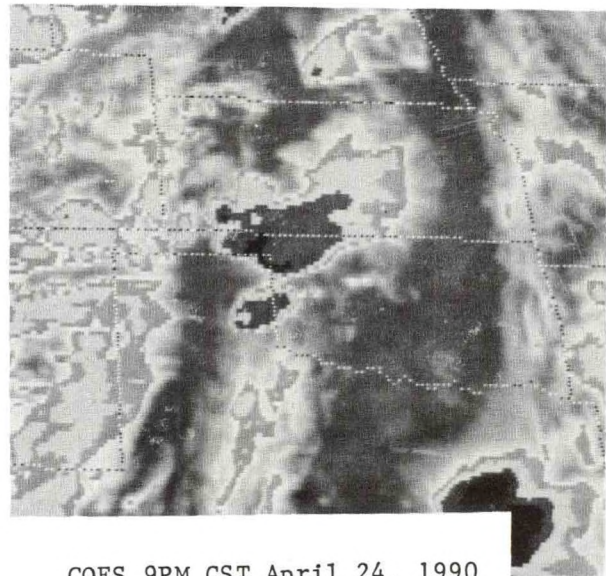
Composite 6PM CST April 24, 1990



Surface 6PM CST April 24, 1990

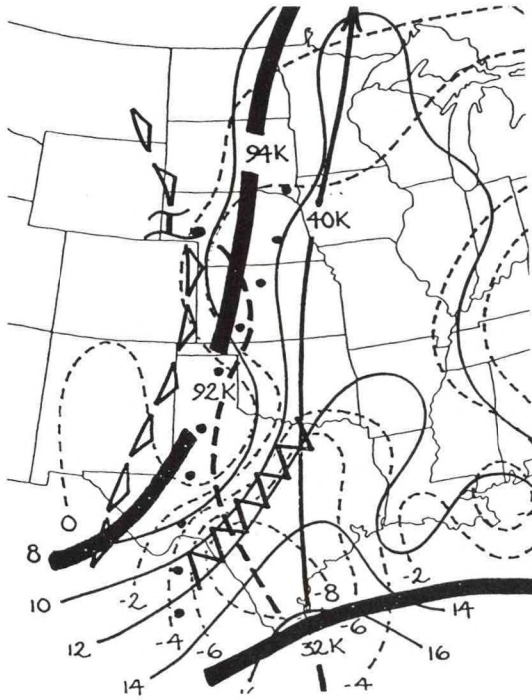


500 MB 6PM CST April 24, 1990



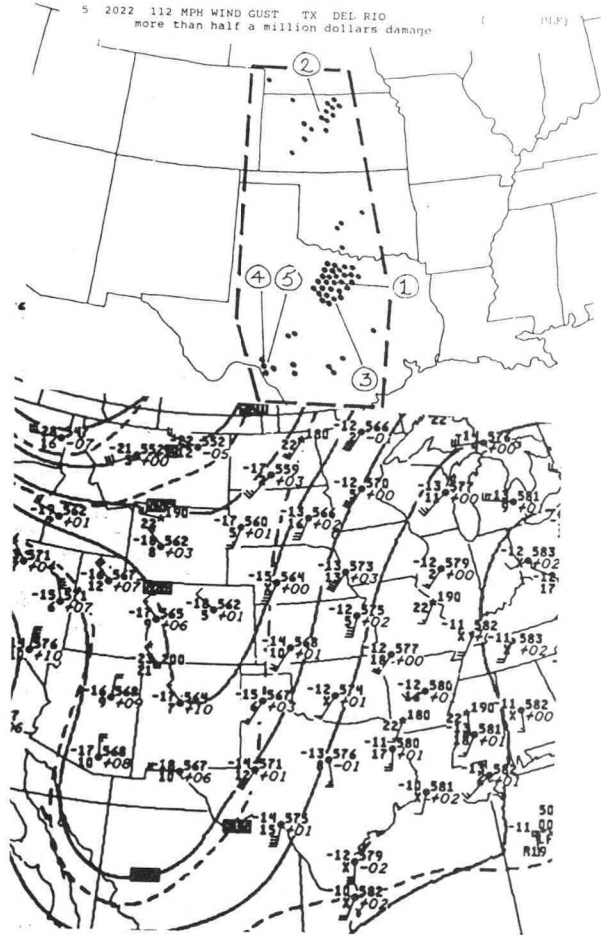
GOES 9PM CST April 24, 1990

APRIL 25TH-26TH, 1990 1516-0520 CST 59 REPORTS 15 TORNADOES

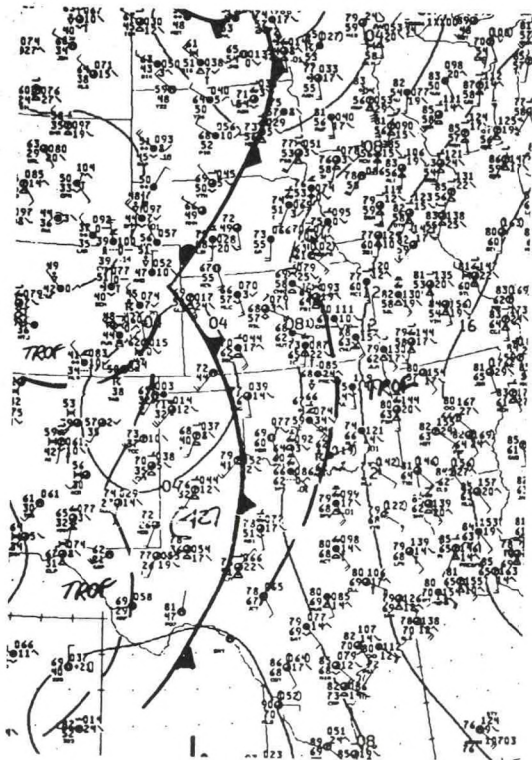


Composite 6PM CST April 25, 1990

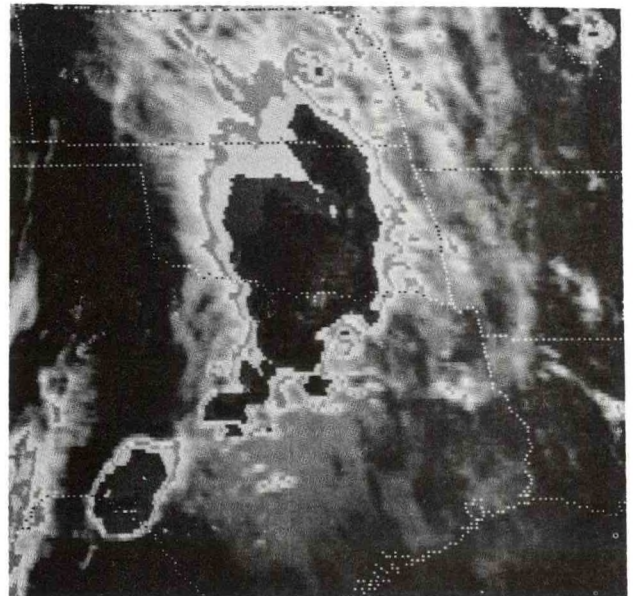
NO	TIME	EVENT	ST	LOCATION
1	1544	TORNADO (F-4) more than half a million dollars damage	TX	2 NW WEATHERFORD (15 E 88W)
2	1700	TORNADO (F-3) 0.75 million dollars damage, 38 mile path length	KS	15 N HAYS (15 87W 88E)
3	1725	TORNADO (F-3) more than five million dollars damage	TX	COMYN (53 88W 90E)
4	2010	2.00 INCH HAIL	TX	DEL RIO ()
5	2022	112 MPH WIND GUST more than half a million dollars damage	TX	DEL RIO ()



500 MB 6PM CST April 25, 1990

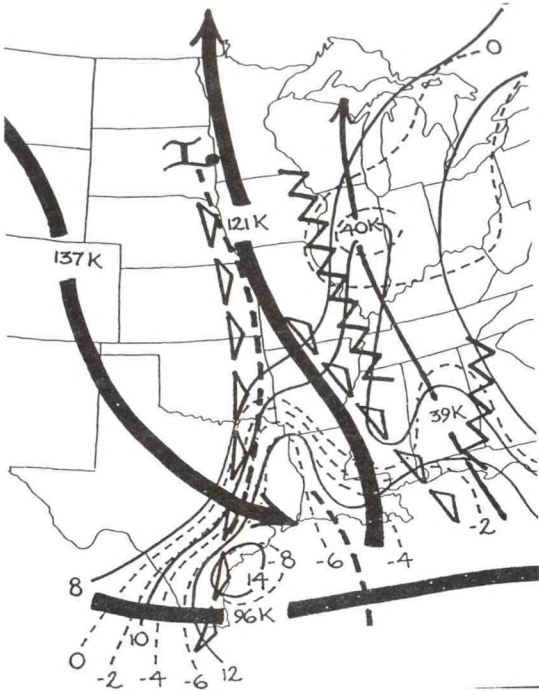


Surface 3PM CST April 25, 1990

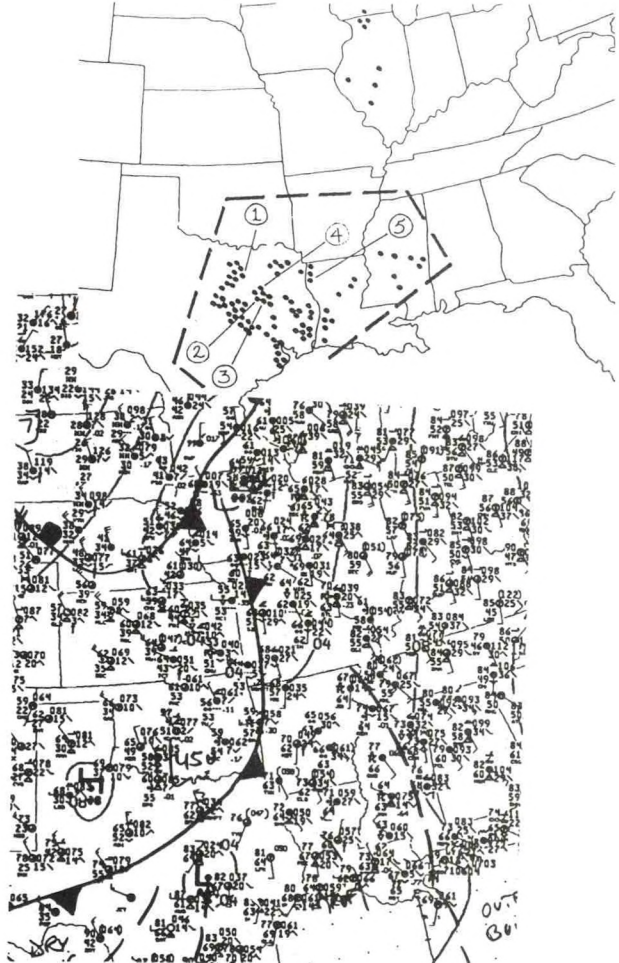


GOES 3PM CST April 25, 1990

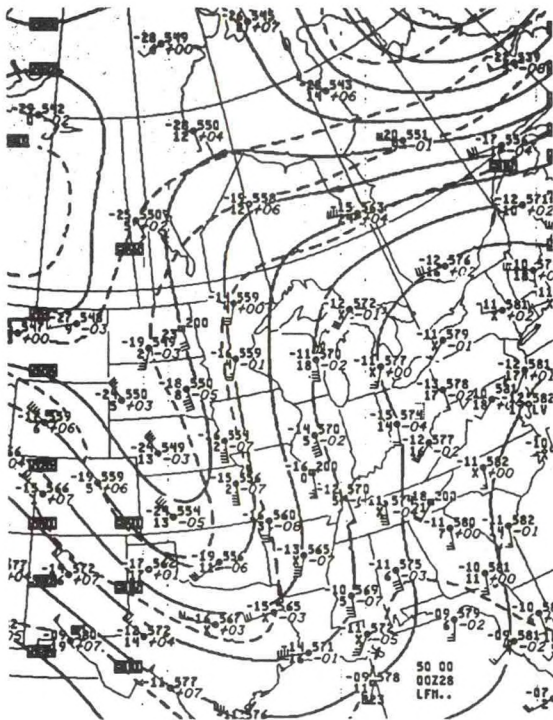
NO	TIME	EVENT	ST	LOCATION	
1	1503	70 MPH WIND GUST	TX	VENUS	(30 SSE FTW)
2	1540	TORNADO (F-3) more than half a million dollars damage	TX	5 S MEXIA	(45 E ACT)
3	1619	2.75 INCH HAIL	TX	MEXIA	(43 E ACT)
4	1645	TORNADO (F-2) eight injuries, more than five million dollars damage	TX	5 SW COOLIDGE	(55 NE TPL)
5	1855	2.75 INCH HAIL	LA	SHREVEPORT	(SHV)



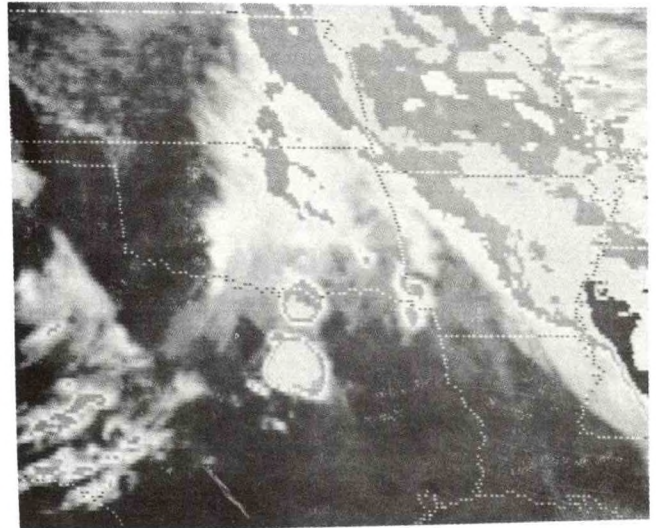
Composite 6PM CST April 27, 1990



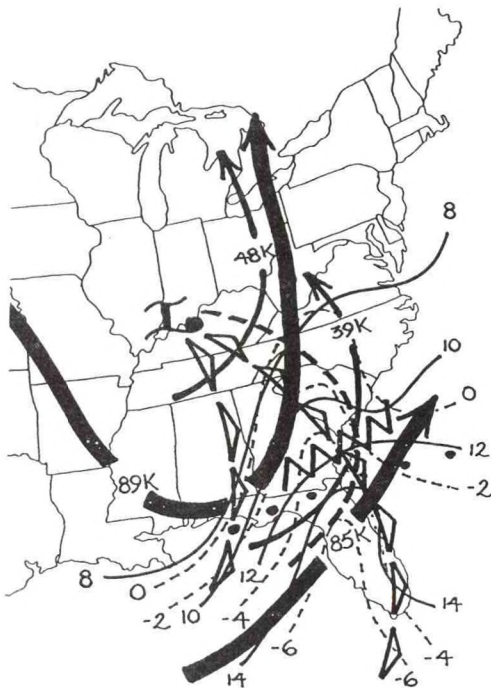
Surface 3PM CST April 27, 1990



500 MB 6PM CST April 27, 1990



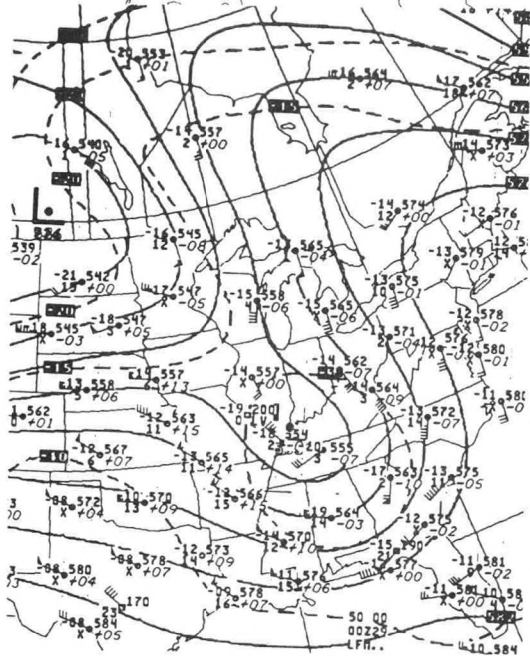
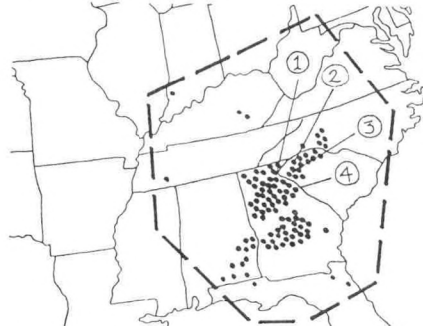
GOES 3PM CST April 27, 1990



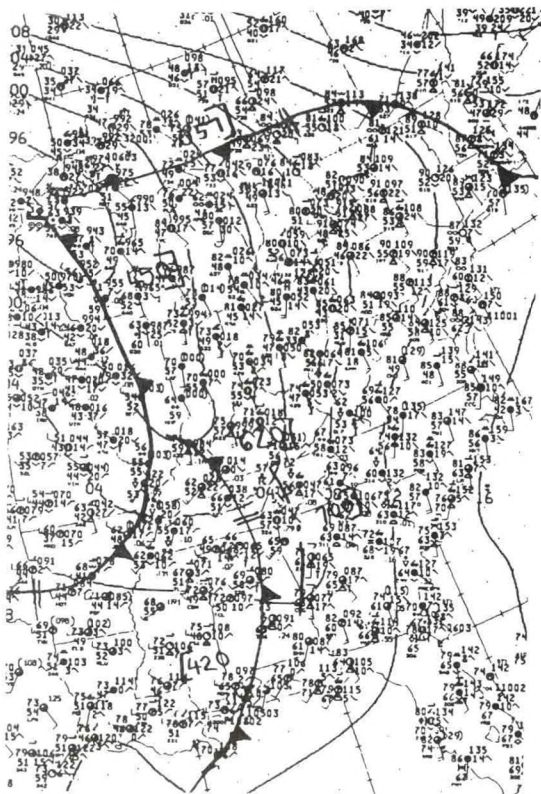
Composite 6PM CST April 28, 1990

APRIL 28TH, 1990 1100-1920 CST 102 REPORTS 4 TORNADOES

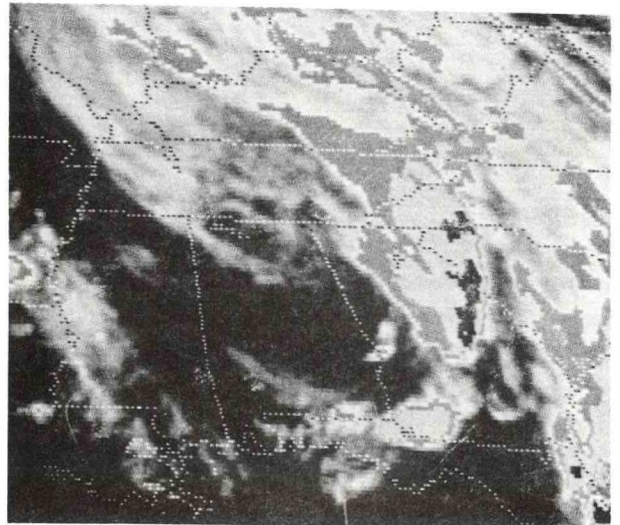
NO	TIME	EVENT	ST	LOCATION	
1	1415	WIND DAMAGE one injury	GA	2 N DANIELSVILLE	(12 HNE AHN)
2	1620	TORNADO (F-1) four injuries	SC	INMAN	(11 NE CSP)
3	1655	WIND DAMAGE four injuries	SC	SADLER'S CREEK	(13 SW ASD)
4	1720	WIND DAMAGE two injuries	GA	1 W WRENS	(26 NWB AHS)



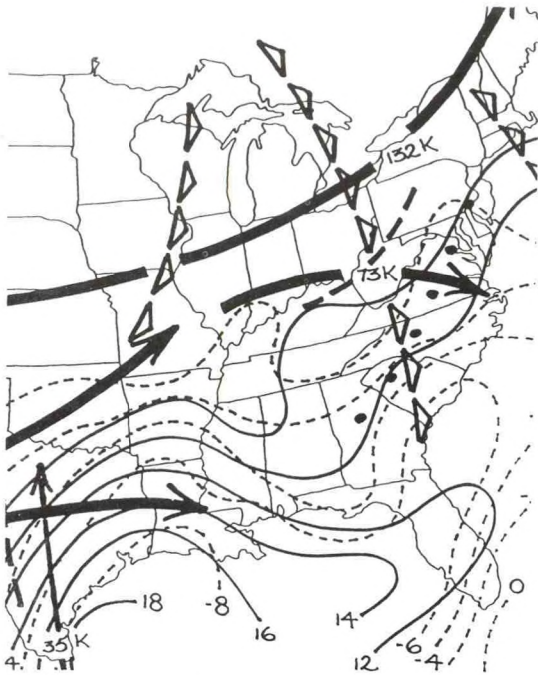
500 MB 6PM CST April 28, 1990



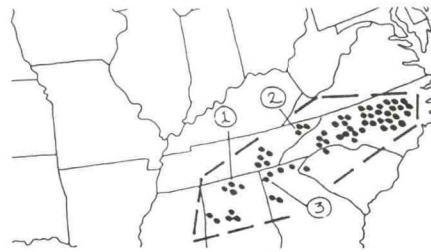
Surface 12 Noon CST April 28, 1990



GOES 4PM CST April 28, 1990

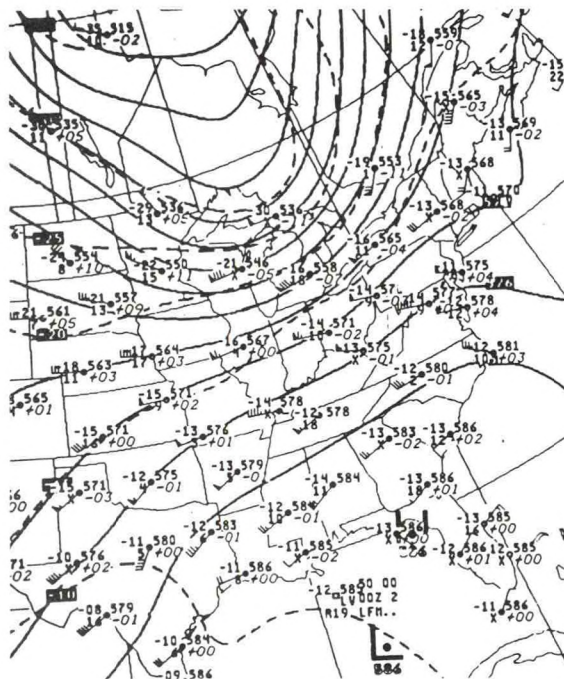


Composite 6PM CST May 1, 1990

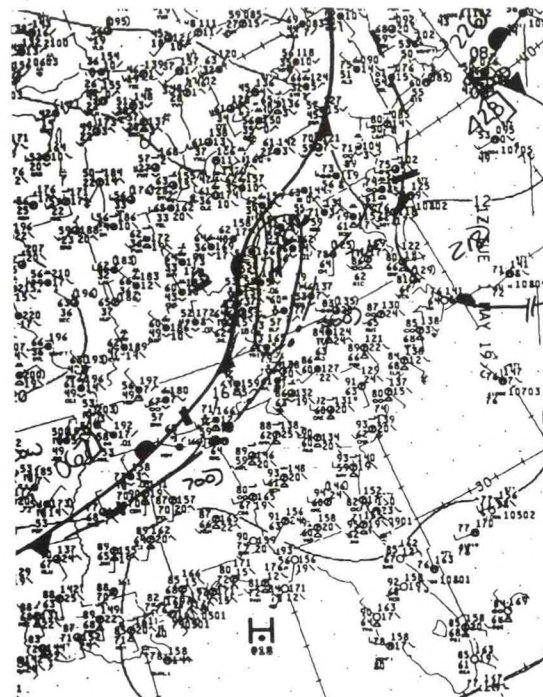


MAY 1ST, 1990 1306-2000 CST 63 REPORTS

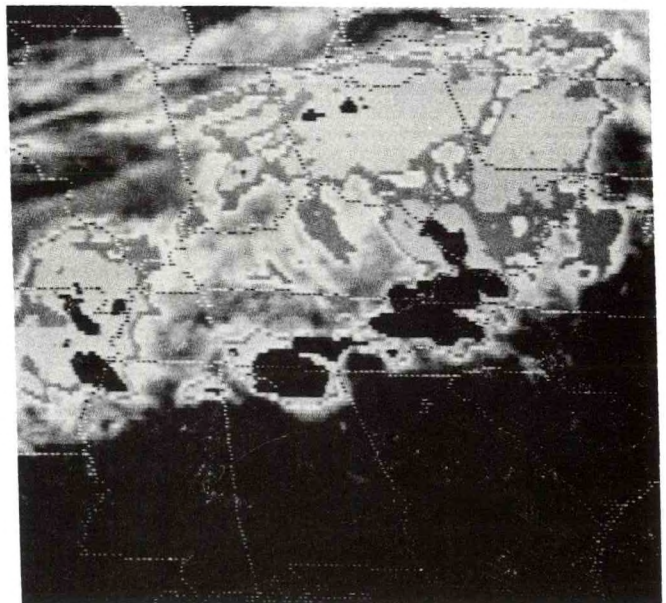
NO	TIME	EVENT	ST	LOCATION	
1	1306	69 MPH WIND GUST	AL	HUNTSVILLE	(HSV)
2	1452	2.75 INCH HAIL	TN	UNICOI COUNTY	(40 SSW TRI)
3	1640	4.00 INCH HAIL	GA	5 NNW CARTERSVILLE	(24 ESE RMG)



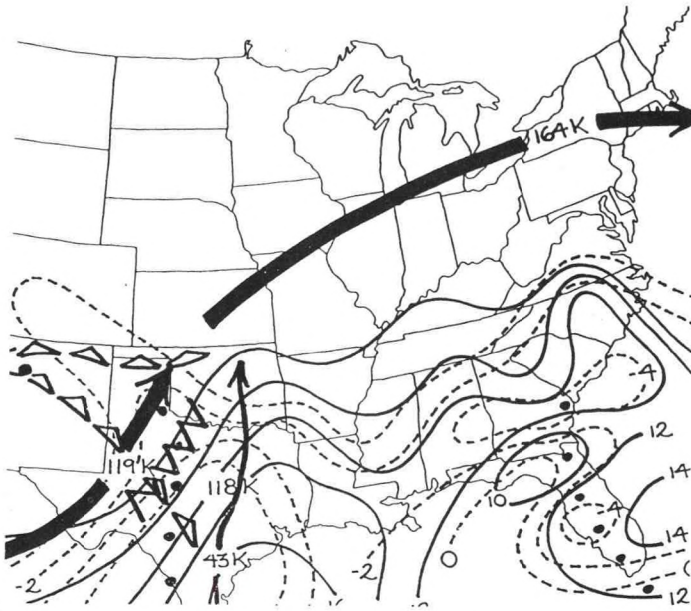
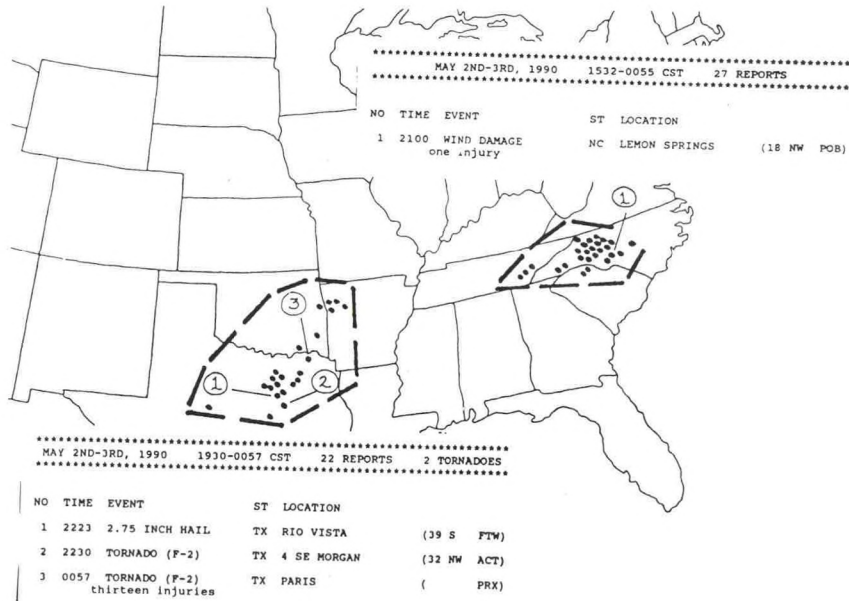
500 MB 6PM CST May 1, 1990



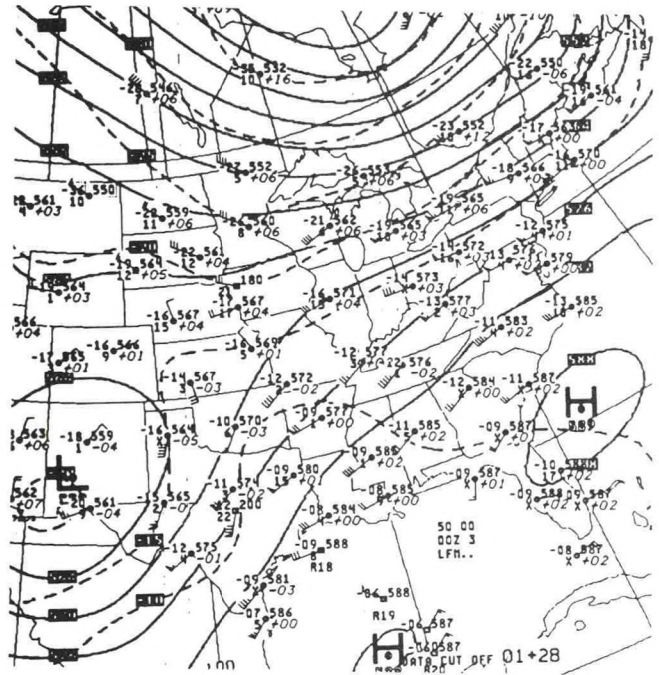
Surface 3PM CST May 1, 1990



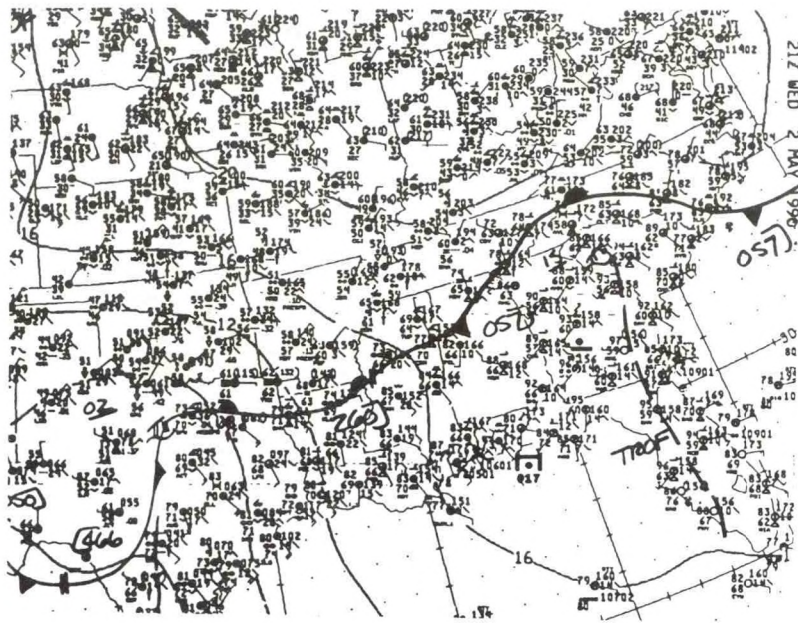
GOES 1PM CST May 1, 1990



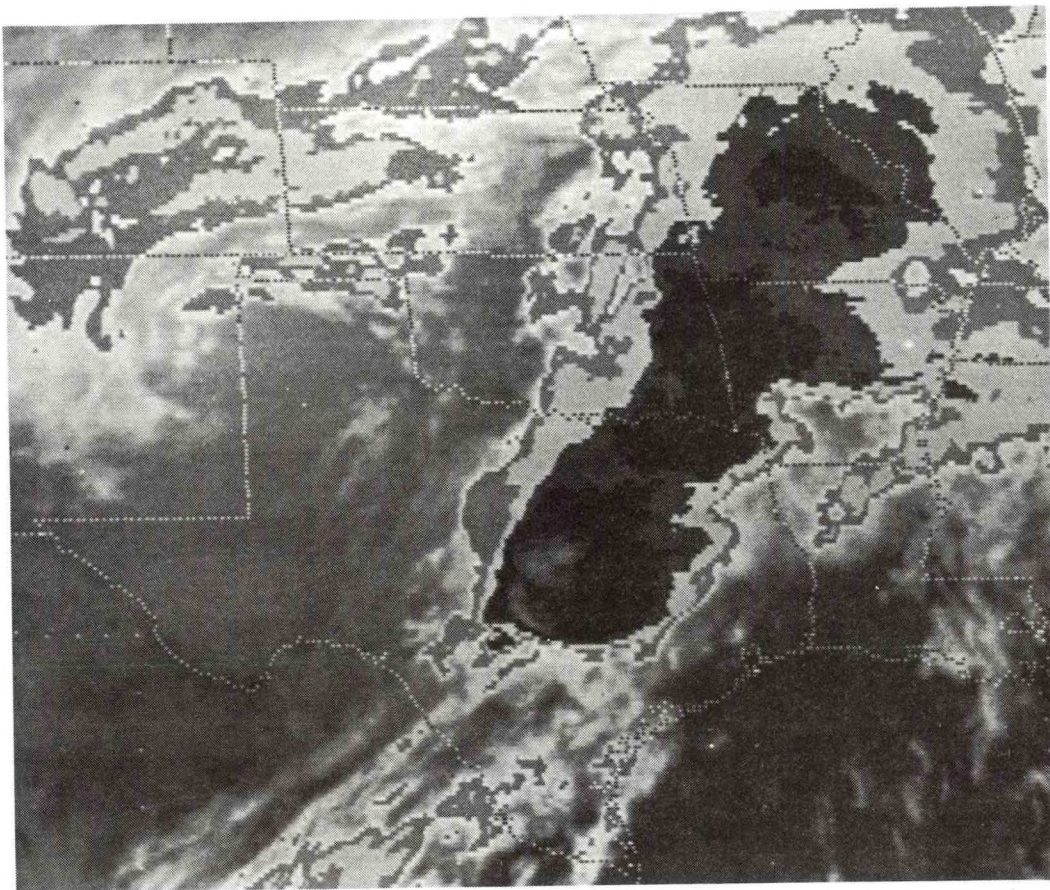
Composite 6PM CST May 2, 1990



500 MB 6PM CST May 2, 1990

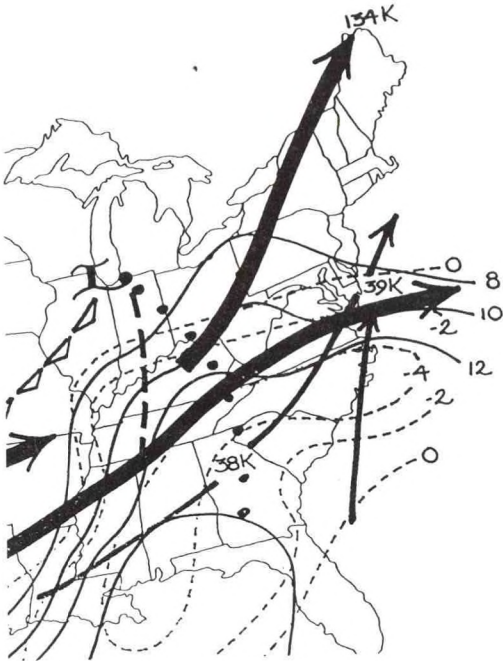


Surface 3PM CST May 2, 1990

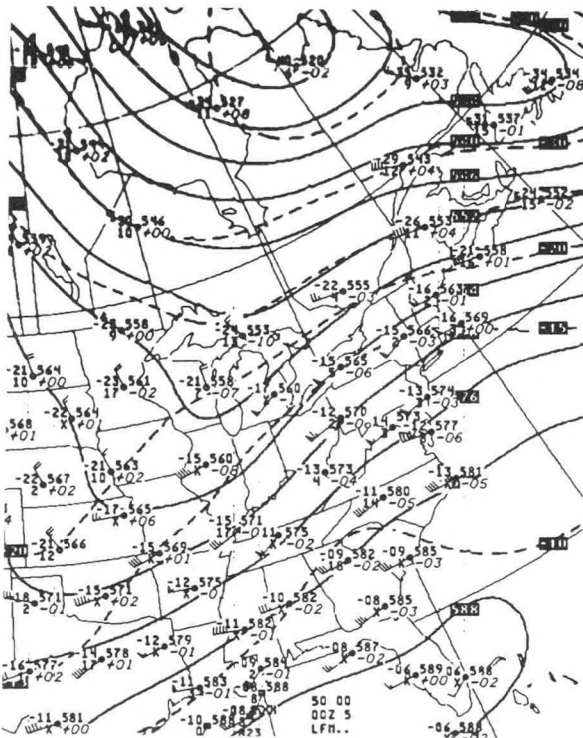


GOES MIDNIGHT CST May 3, 1990

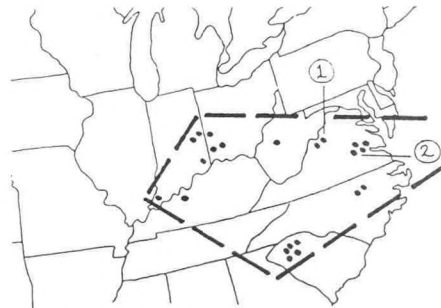
50. May 4, 1990



Composite 6PM CST May 4, 1990

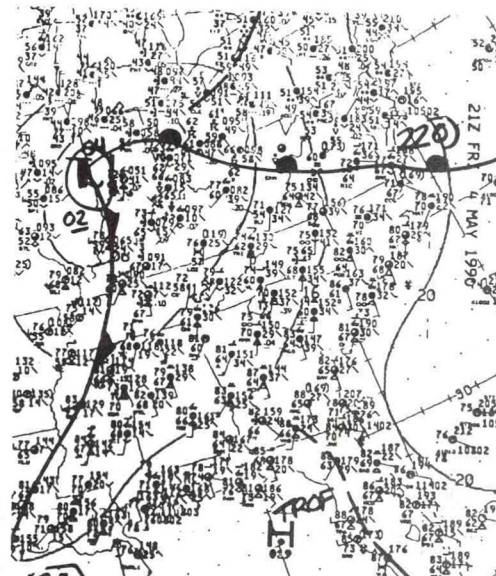


500 MB 6PM CST May 4, 1990

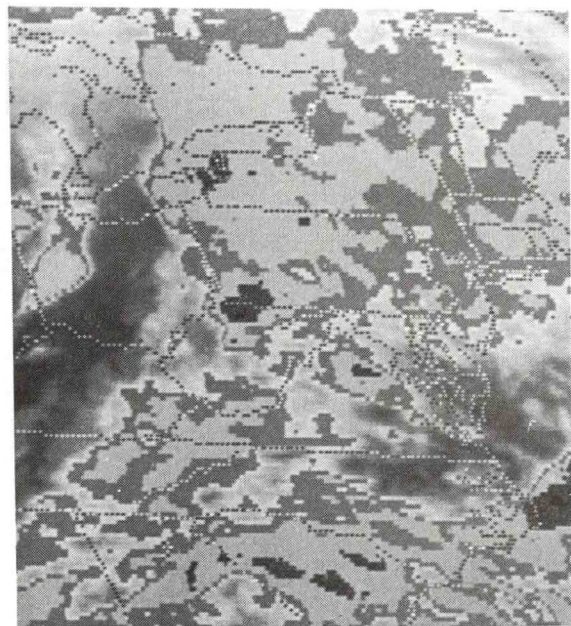


MAY 4TH, 1990 0950-2020 CST 22 REPORTS 3 TORNADOES

NO	TIME	EVENT	ST	LOCATION	REMARKS
1	1722	TORNADO (F-2)	VA	AUGUSTA SPRINGS	(28 ENE NSP) two deaths, ten injuries, 0.8 million dollars damage
2	1945	TORNADO (F-3)	VA	COLONIAL HEIGHTS	(15 S RIC) 1.7 million dollars damage

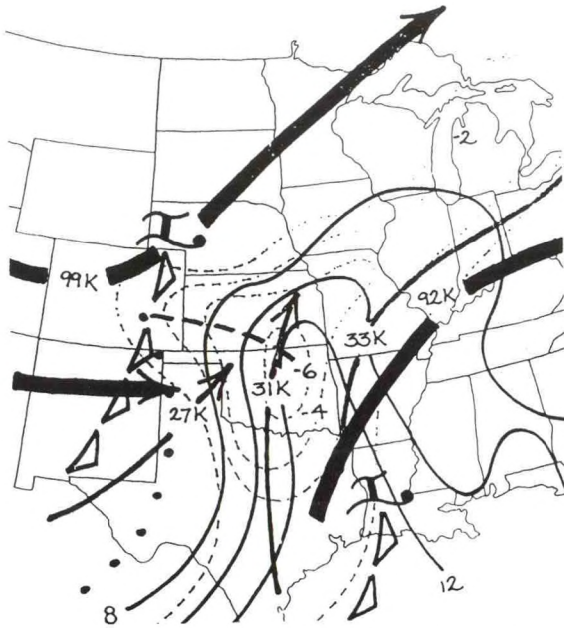


Surface 3PM CST May 4, 1990

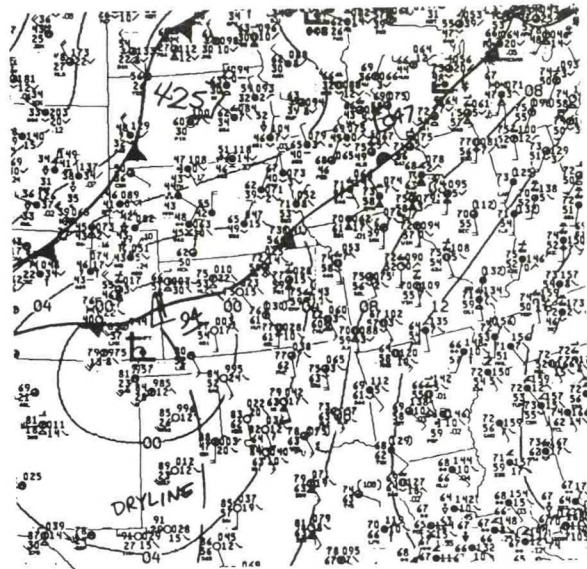
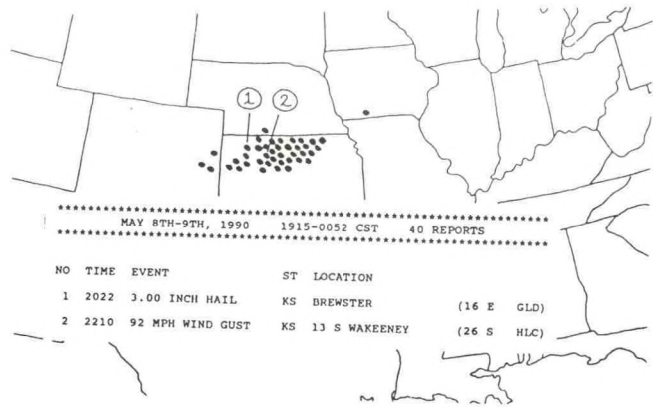


GOES 6PM CST May 4, 1990

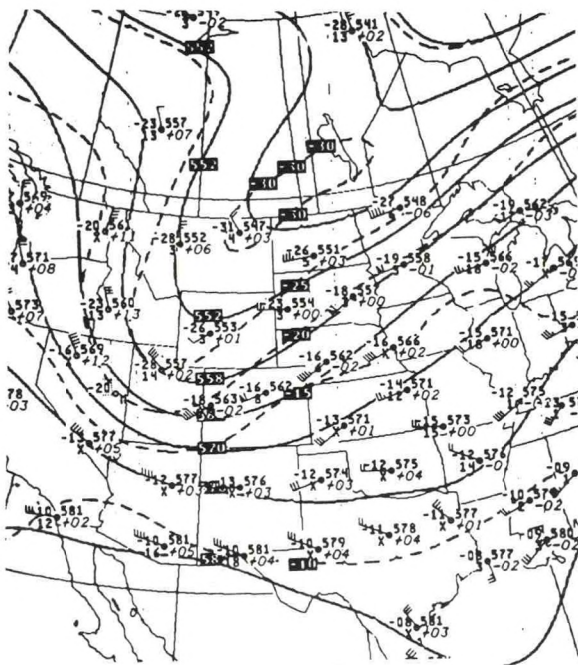
51. May 8, 1990



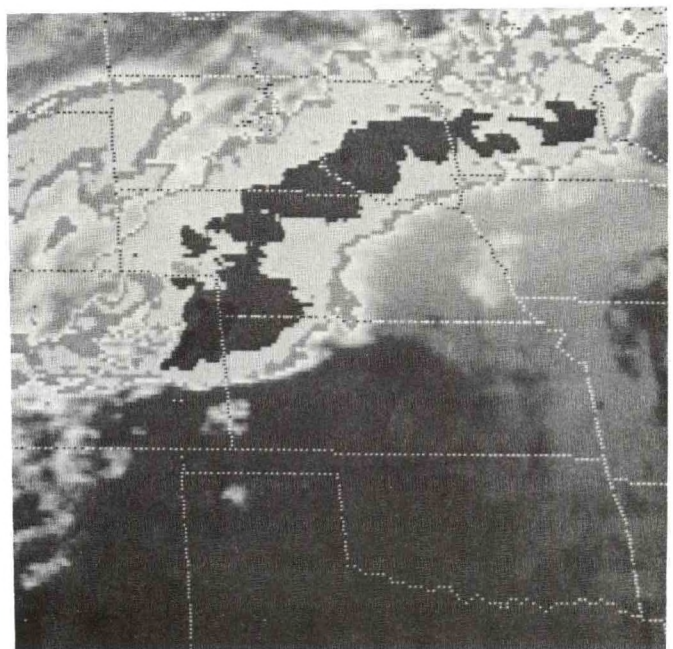
Composite 6PM CST May 8 1990

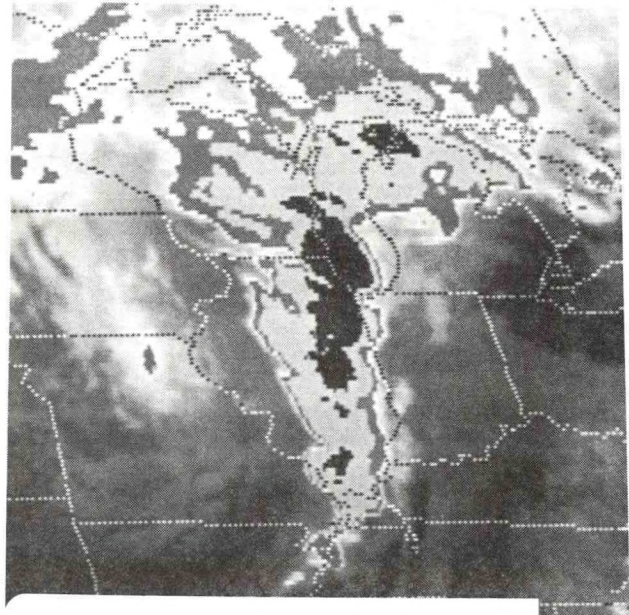
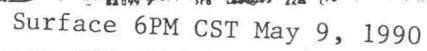


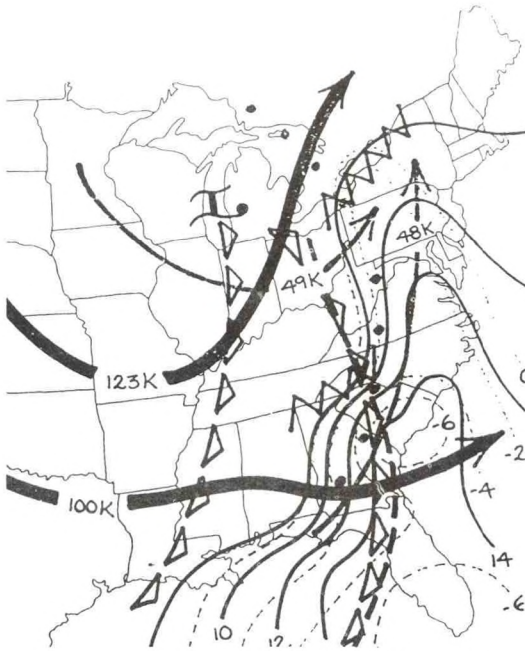
Surface 6PM CST May 8, 1990



500 MB 6PM CST May 8, 1990



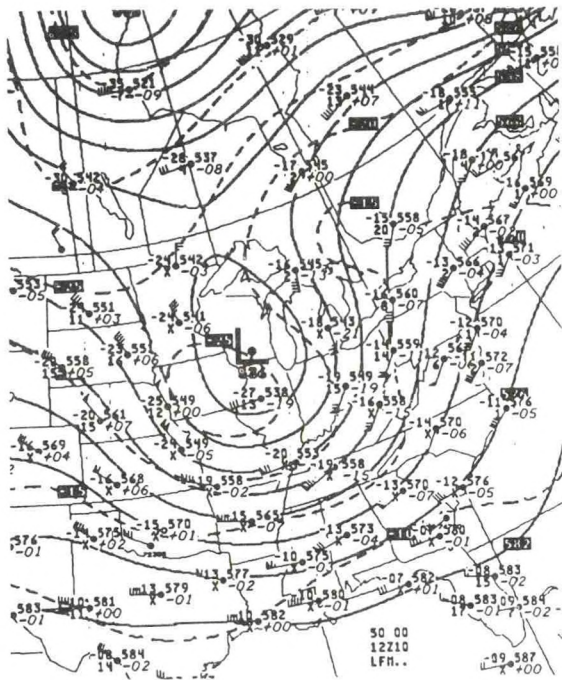
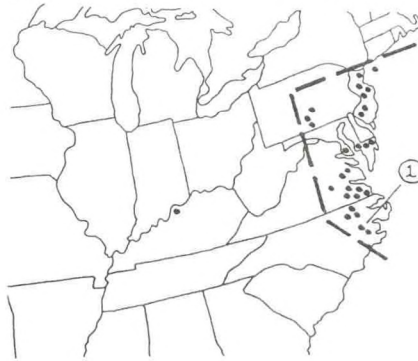




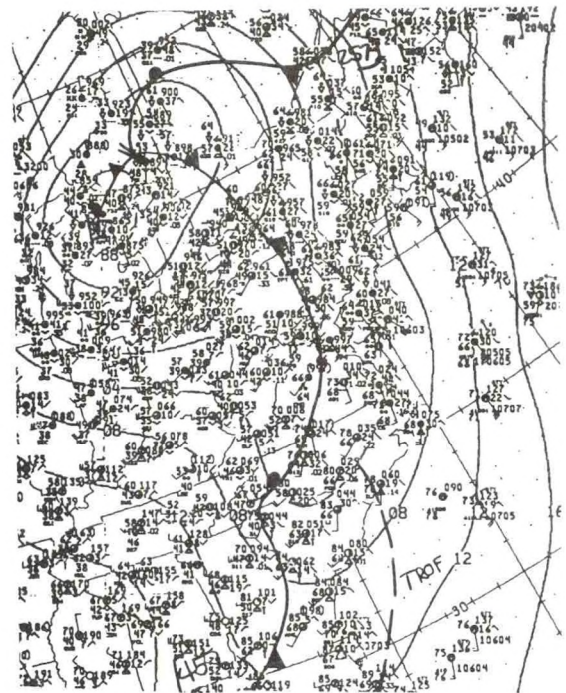
Composite 6AM CST May 10, 1990

MAY 10TH, 1990 1200-1850 CST 28 REPORTS 4 TORNADOES

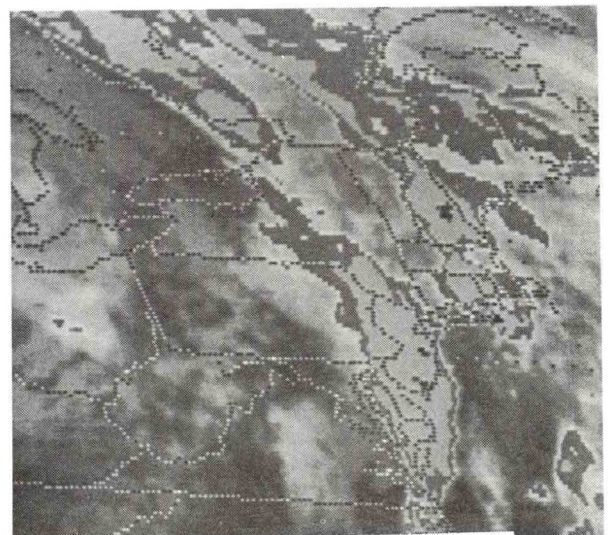
NO TIME EVENT ST LOCATION
1 1808 WIND DAMAGE NC WISE FORKS (26 ESE GSB)



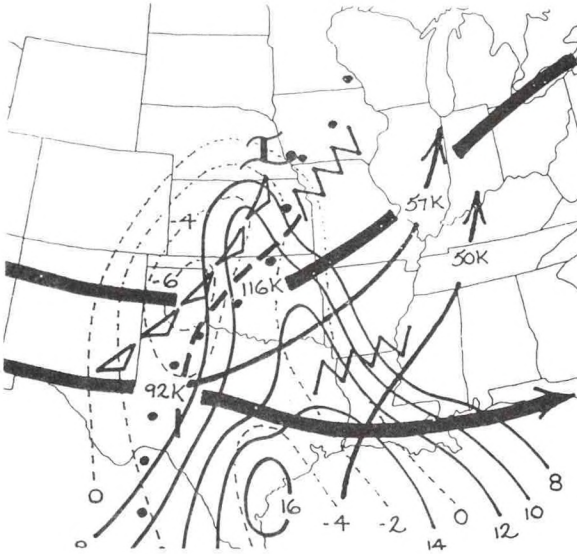
500 MB 6AM CST May 10, 1990



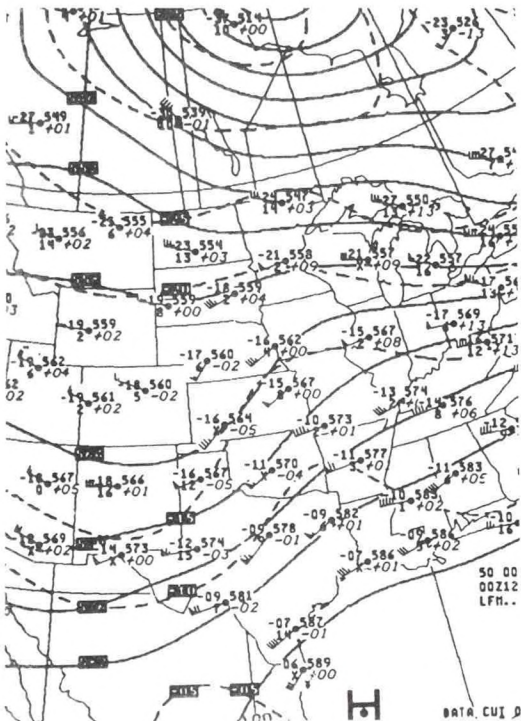
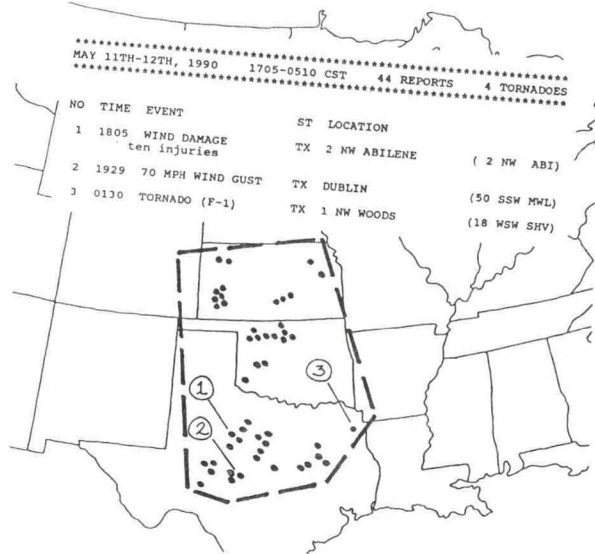
Surface 12 Noon CST May 10, 1990



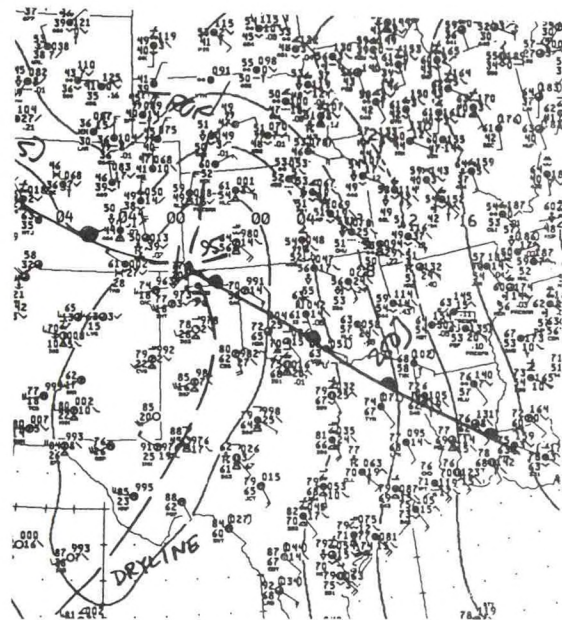
GOES 6PM CST May 10, 1990



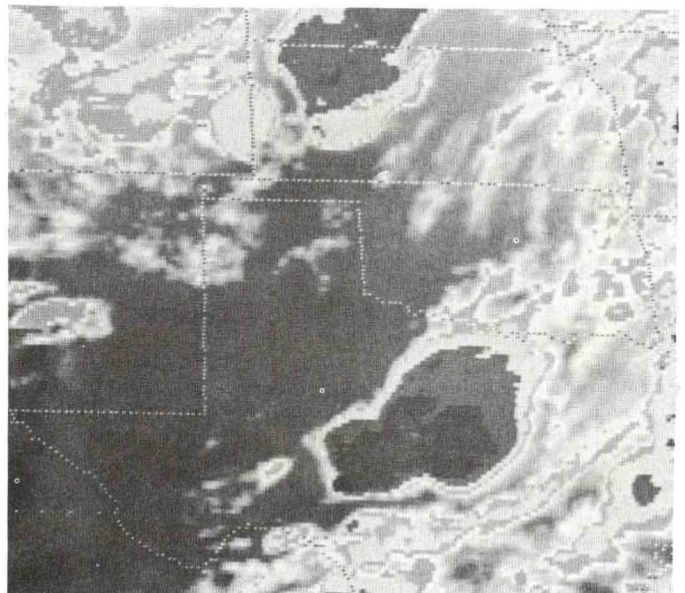
Composite 6PM CST May 11, 1990



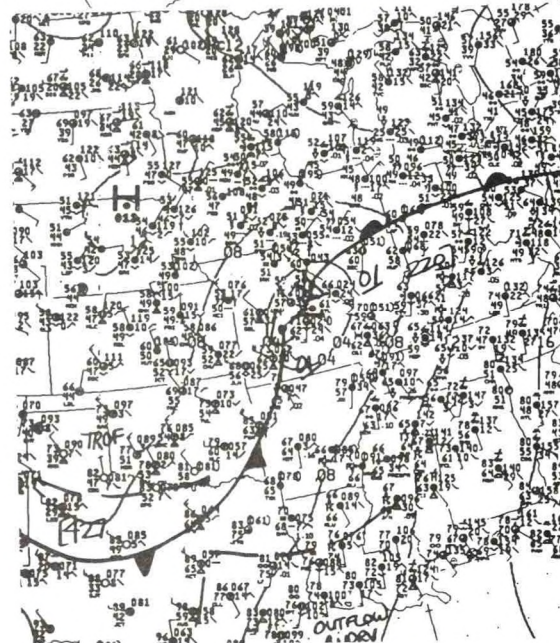
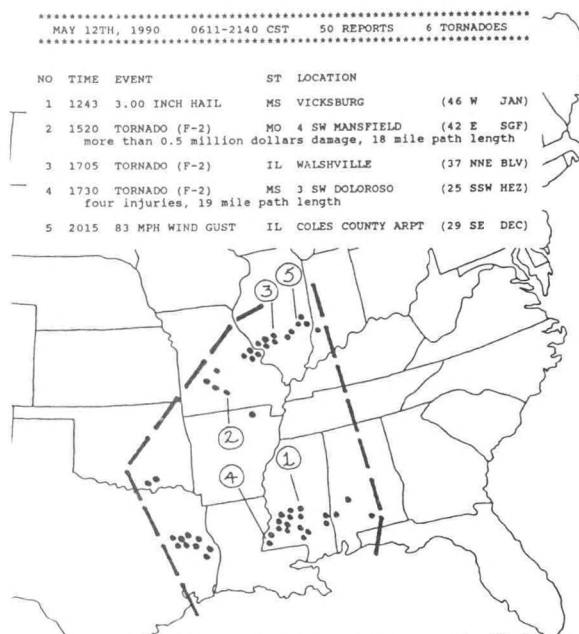
500 MB 6PM CST May 11, 1990



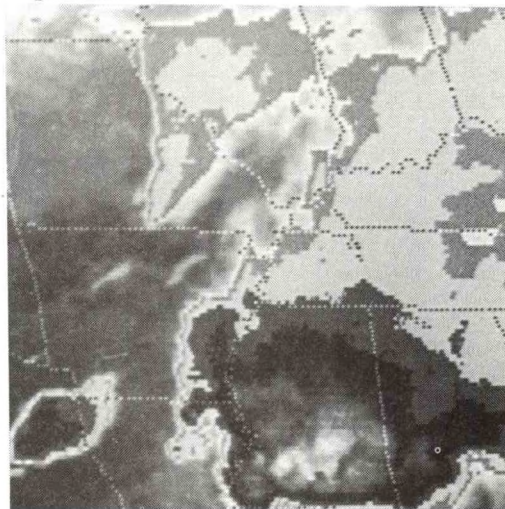
Surface 6PM CST May 11, 1990



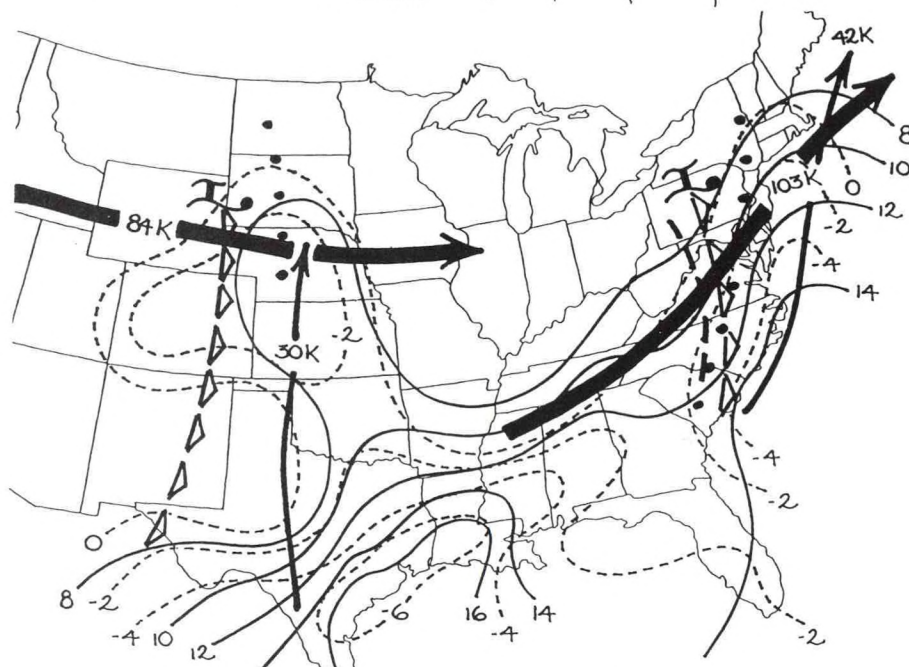
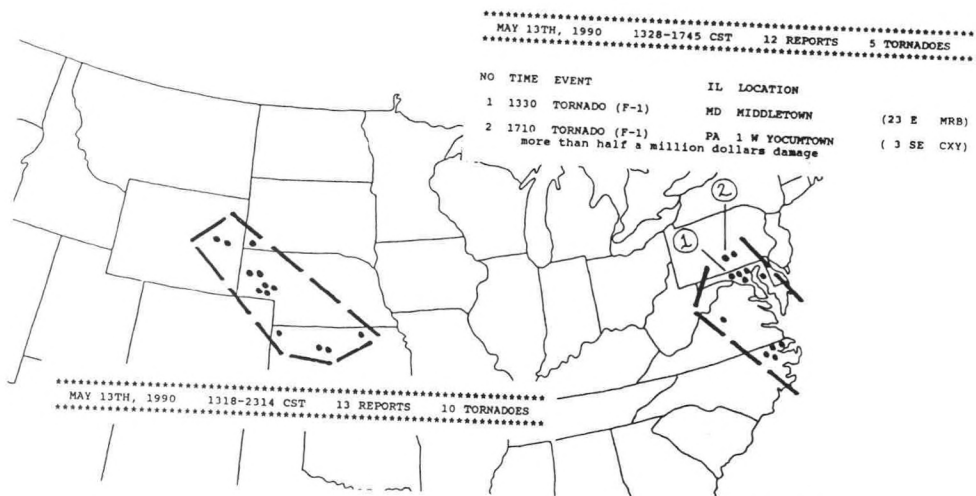
GOES 6:30 PM CST May 11, 1990

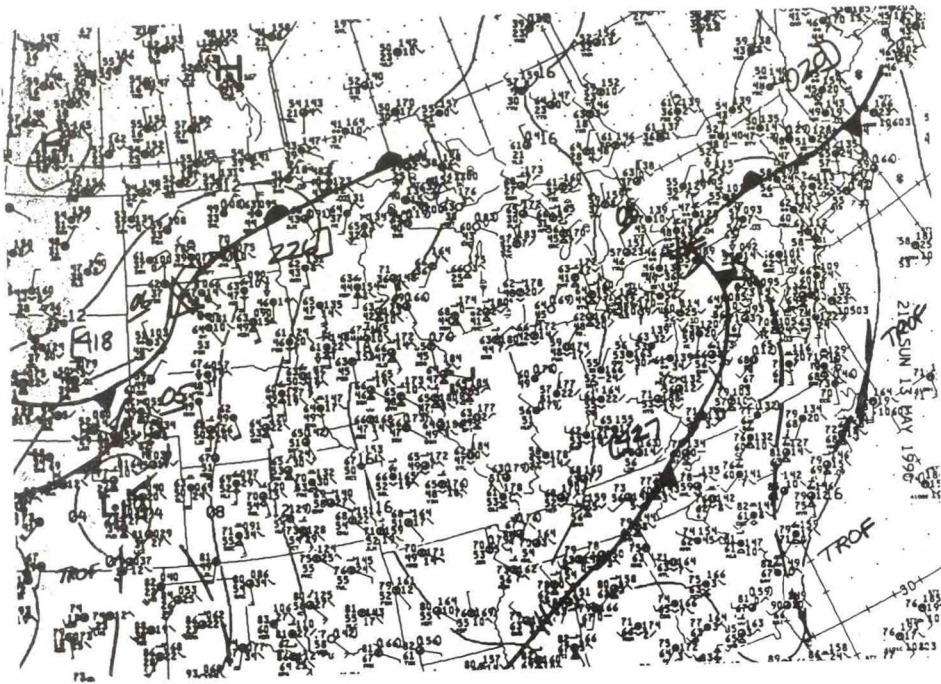


Surface 3PM CST May 12, 1990

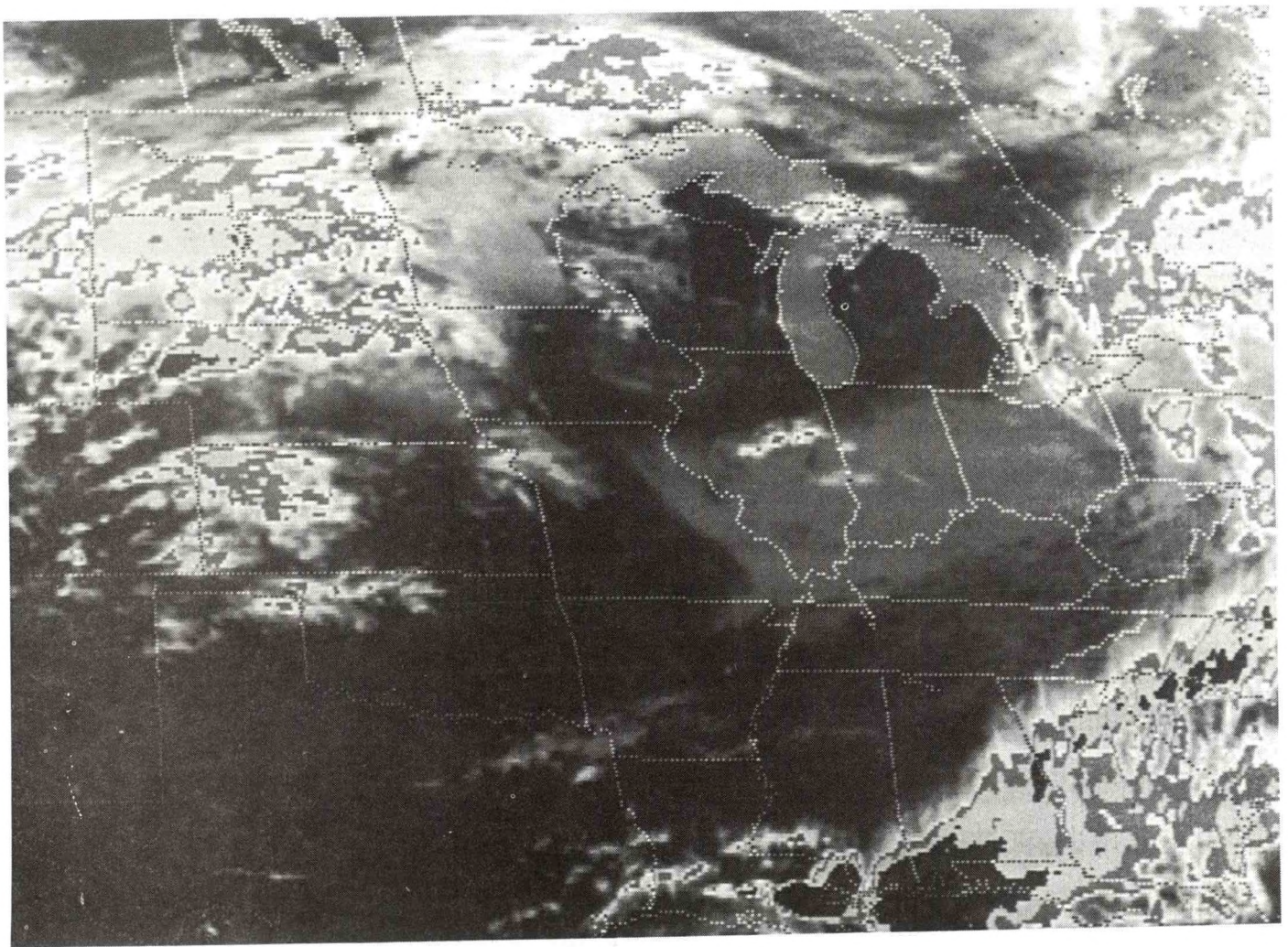


GOES 5PM CST May 12, 1990





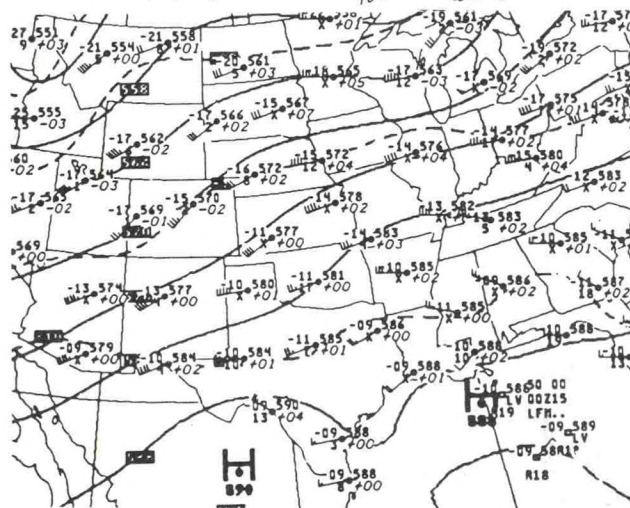
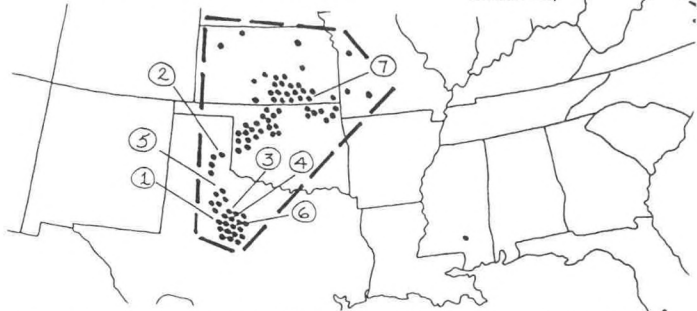
Surface 3PM CST May 13, 1990



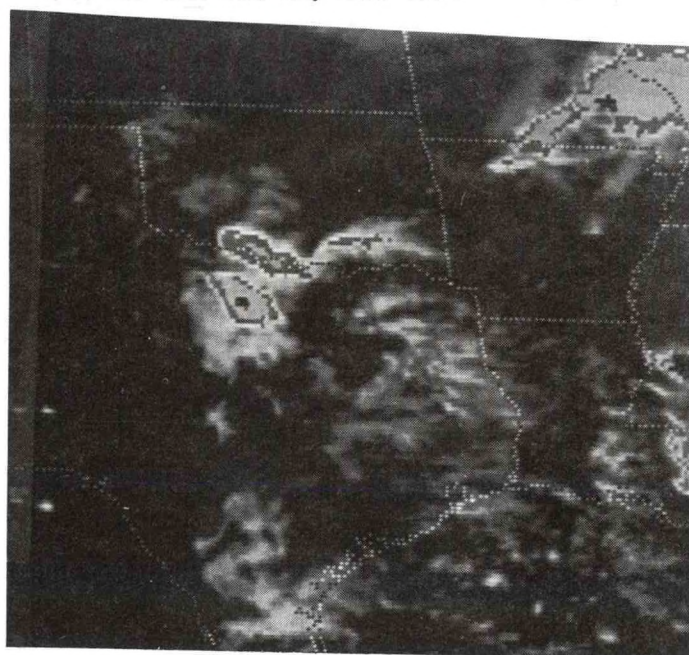
GOES 2PM CST May 13, 1990

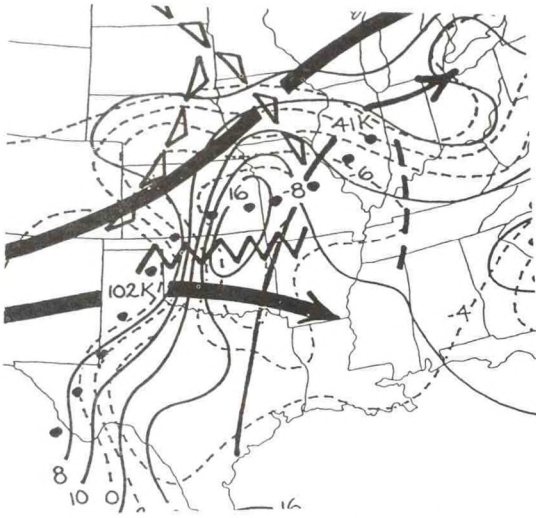


NO	TIME	EVENT	ST	LOCATION	
1	1645	TORNADO (F-2) two injuries	TX	4 W TUXEDO	(40 NW ABI)
2	1704	4.00 INCH HAIL	TX	SHAMROCK	(54 N CDS)
3	1708	TORNADO (F-2) two injuries	TX	7 E HAMLIN	(40 NNW ABI)
4	1730	TORNADO (F-2) three injuries	TX	RADIUM	(34 NW ABI)
5	1740	4.50 INCH HAIL	TX	15 SE GUTHRIE	(70 SSE CDS)
6	1748	TORNADO (F-3) two injuries	TX	8 N ANSON	(26 NNW ABI)
7	2050	70 MPH WIND GUST	OK	COPAN	(11 NNE BVO)



500 MB 6PM CST May 14, 1990

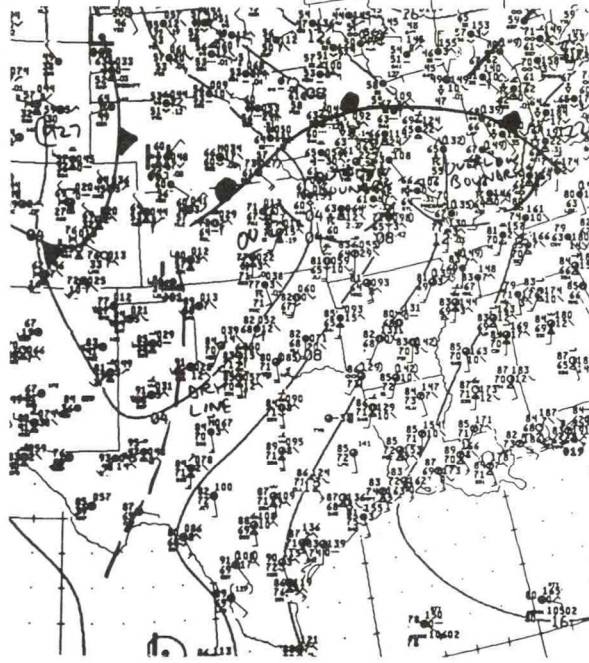
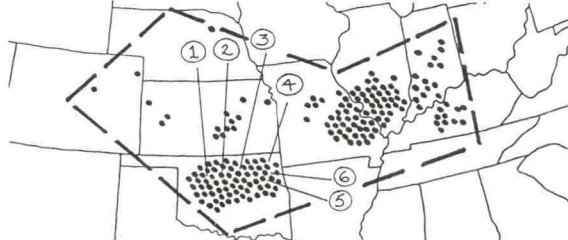




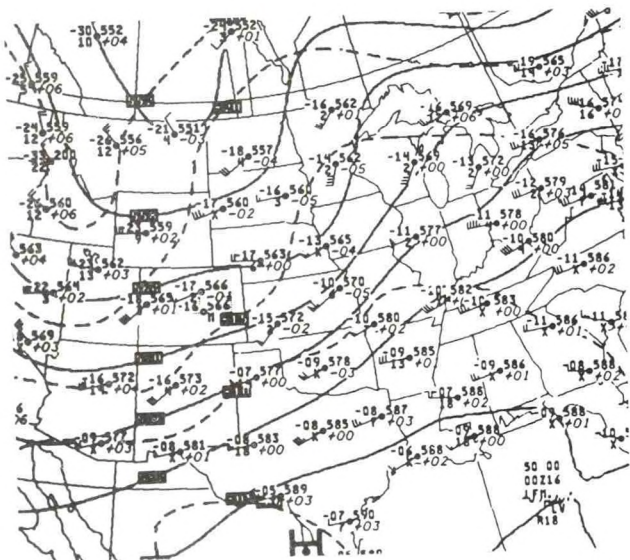
Composite 6PM CST May 15, 1990

MAY 15TH-16TH, 1990 1130-0400 CST 180 REPORTS 15 TORNADOES

NO	TIME	EVENT	ST	LOCATION	
1	1540	4.75 INCH HAIL	OK	12 N OAKWOOD	(58 NNE CSM)
2	1547	4.50 INCH HAIL	OK	CANTON	(42 MSW END)
3	1841	TORNADO (F-3) one death, twelve injuries, four million dollars damage	OK	4 W STILLWATER	(42 S PNC)
4	2220	92 MPH WIND GUST	OK	OLOGAN LAKE	(20 NE TUL)
5	2230	TORNADO (F-2) eight injuries	OK	2 W FOYIL	(24 ENE TUL)
6	2240	TORNADO (F-2)	OK	7 W ADAIR	(31 ENE TUL)



Surface 12 Noon CST May 15, 1990



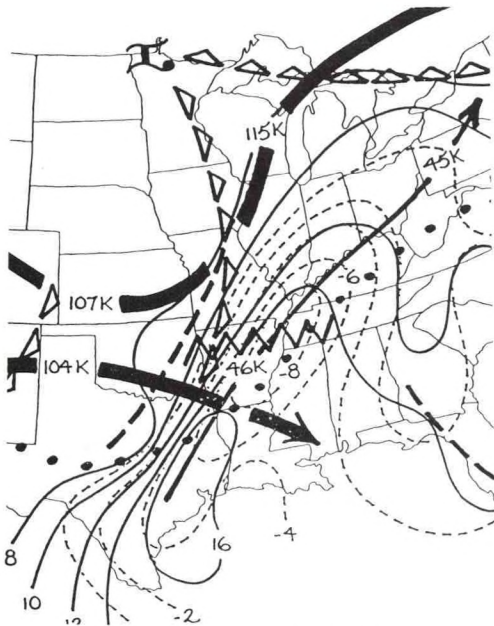
500 MB 6PM CST May 15, 1990



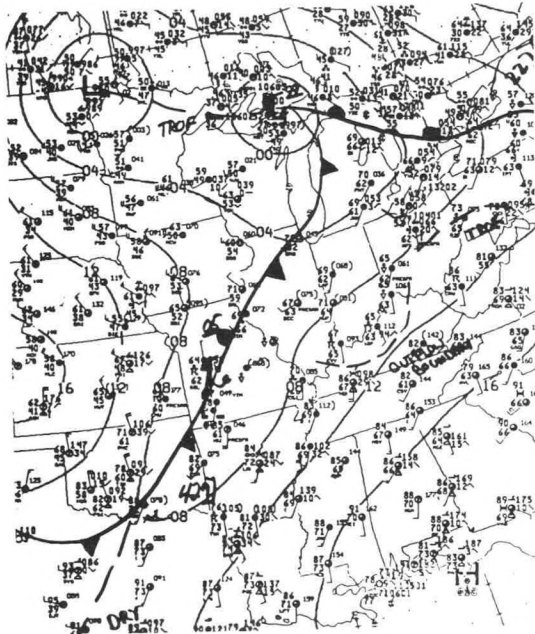
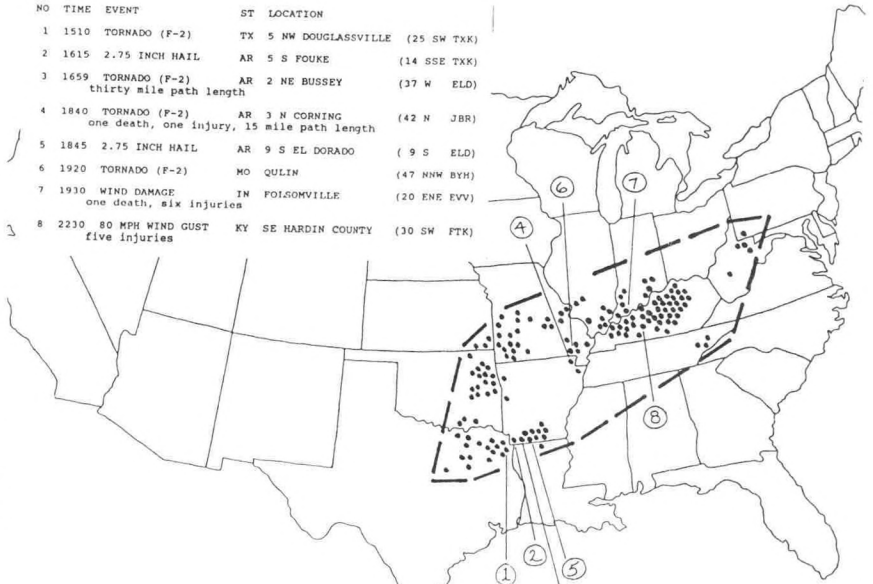
GOES 6PM CST May 15, 1990

MAY 16TH-17TH, 1990 1212-0230 CST 145 REPORTS 17 TORNADOES

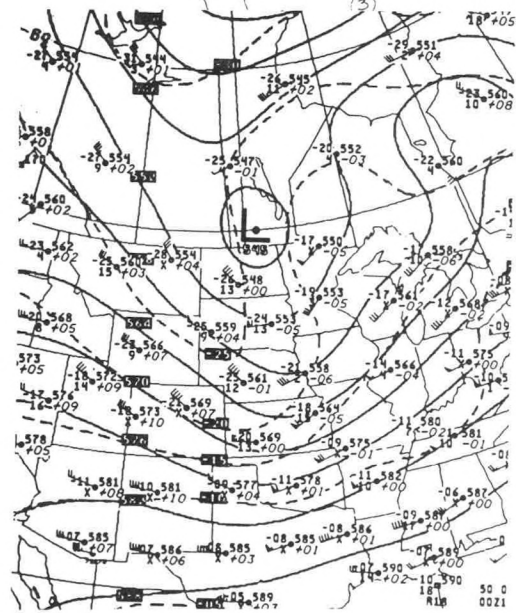
NO	TIME	EVENT	ST	LOCATION	
1	1510	TORNADO (F-2)	TX	5 NW DOUGLASSVILLE	(25 SW TXX)
2	1615	2.75 INCH HAIL	AR	5 S FOUKE	(14 SSE TXX)
3	1659	TORNADO (F-2) thirty mile path length	AR	2 NE BUSSEY	(37 W ELD)
4	1840	TORNADO (F-2) one death, one injury, 15 mile path length	AR	3 N CORNING	(42 N JBR)
5	1845	2.75 INCH HAIL	AR	9 S EL DORADO	(9 S ELD)
6	1920	TORNADO (F-2)	MO	QULIN	(47 NNW BYH)
7	1930	WIND DAMAGE one death, six injuries	IN	FOLSOMVILLE	(20 ENE EVV)
8	2230	80 MPH WIND GUST five injuries	KY	SE HARDIN COUNTY	(30 SW FTK)



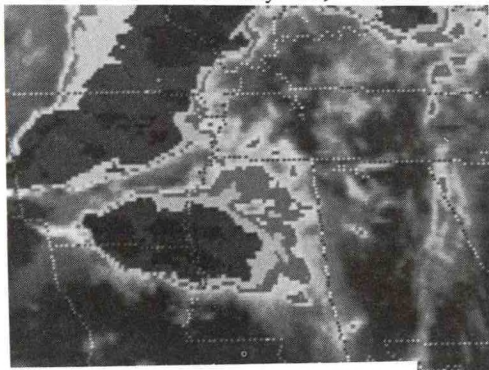
Composite 6PM CST May 16, 1990



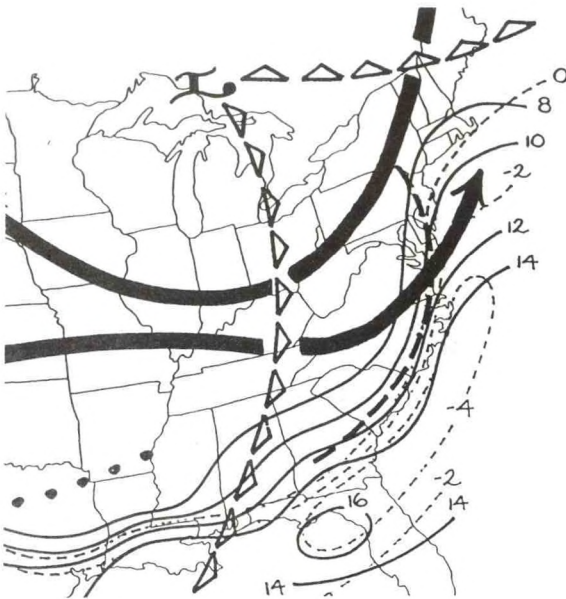
Surface 3PM CST May 16, 1990



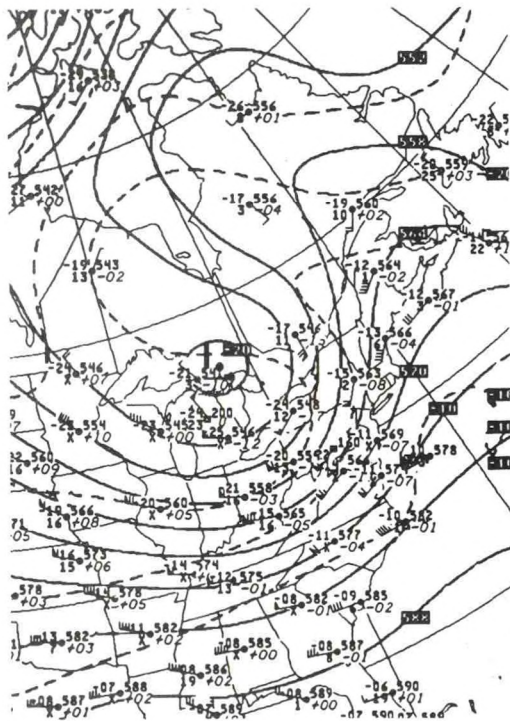
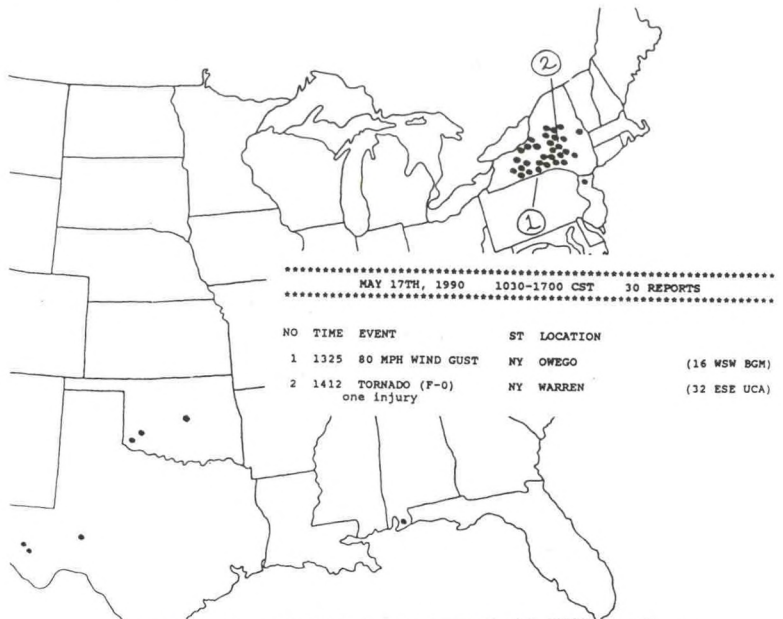
500 MB 6PM CST May 16, 1990



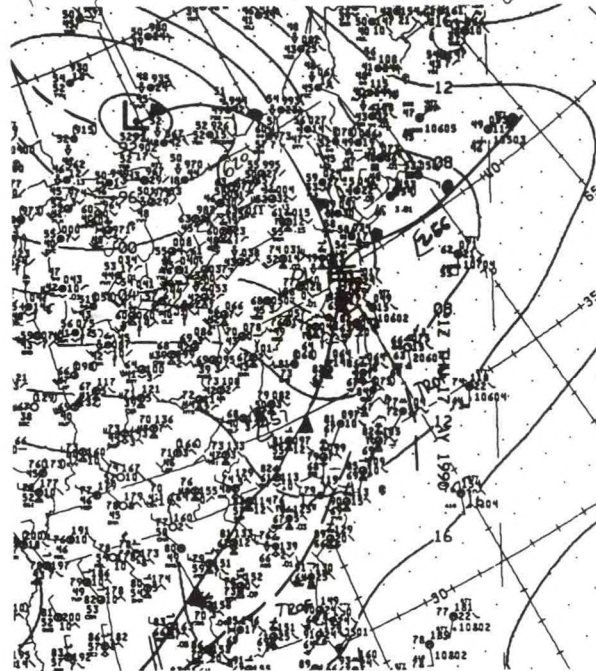
GOES 6PM CST May 16, 1990



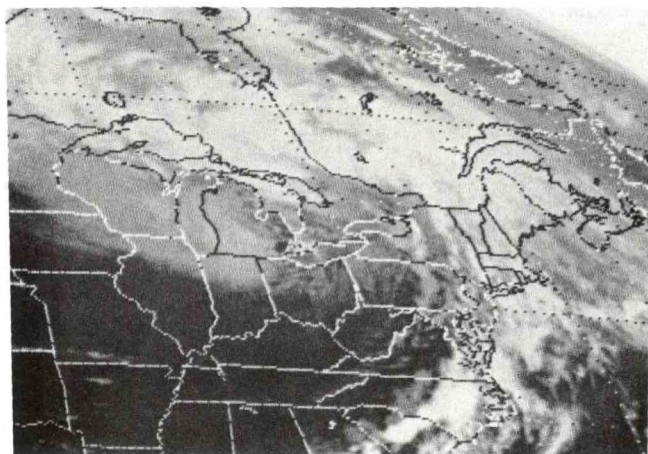
Composite 6PM CST May 17, 1990



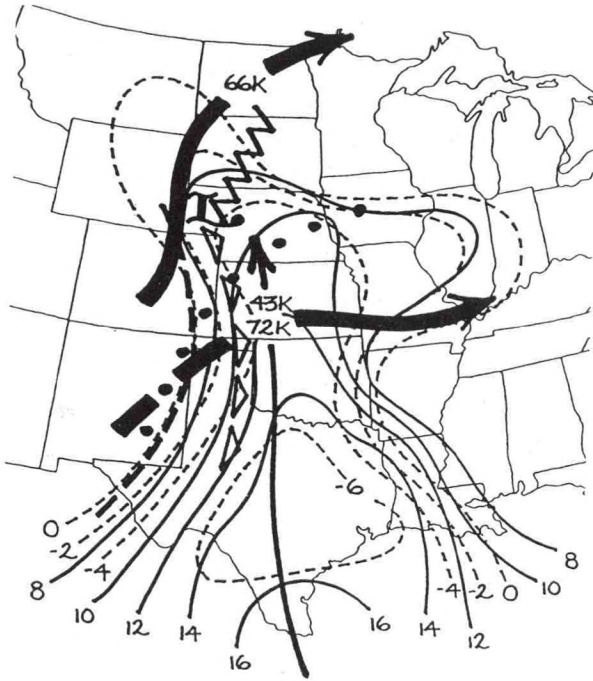
500 MB 6PM CST May 17, 1990



Surface 3PM CST May 17, 1990



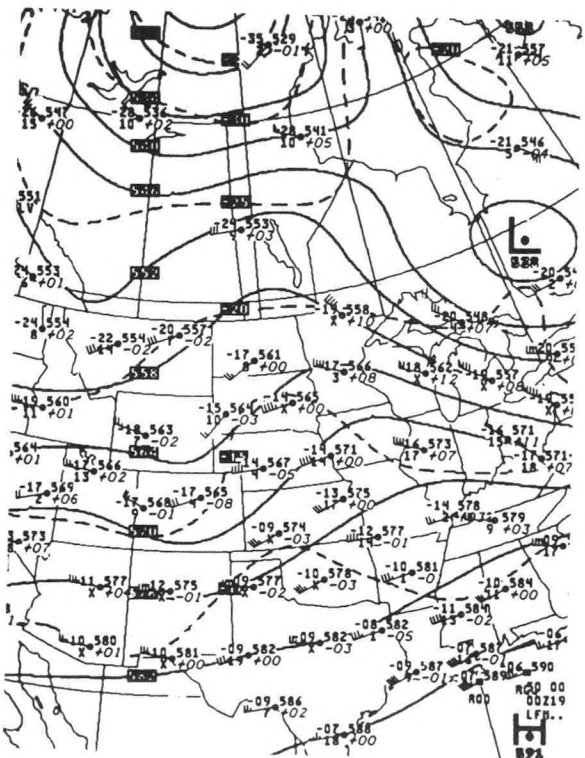
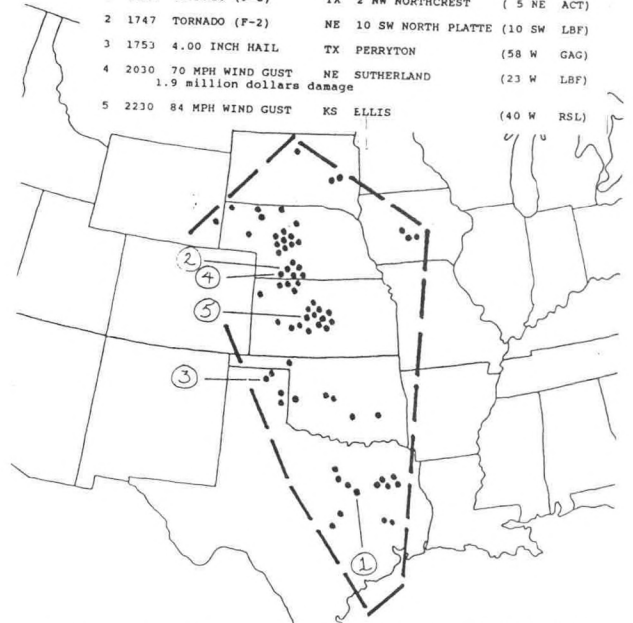
GOES 1PM CST May 17, 1990



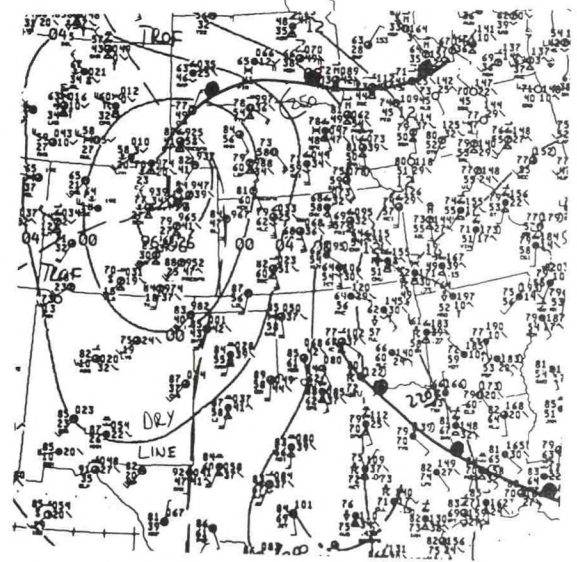
Composite 6PM CST May 18, 1990

MAY 18TH-19TH, 1990 1420-0145 CST 70 REPORTS 16 TORNADOES

NO	TIME	EVENT	ST	LOCATION
1	1525	TORNADO (F-2)	TX	2 NW NORTHCREST (5 NE ACT)
2	1747	TORNADO (F-2)	NE	10 SW NORTH PLATTE (10 SW LBF)
3	1753	4.00 INCH HAIL	TX	PERRYTON (58 W GAG)
4	2030	70 MPH WIND GUST 1.9 million dollars damage	NE	SUTHERLAND (23 W LBF)
5	2230	84 MPH WIND GUST	KS	ELLIS (40 W RSL)



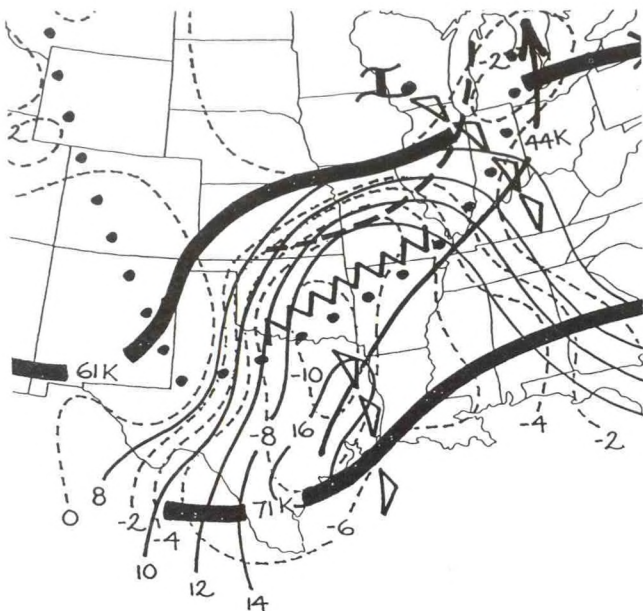
500 MB 6PM CST May 18, 1990



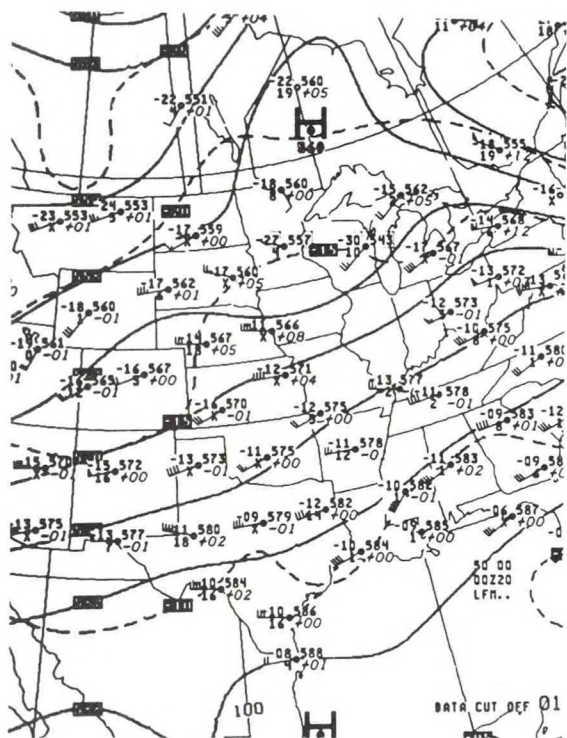
Surface 3PM CST May 18, 1990



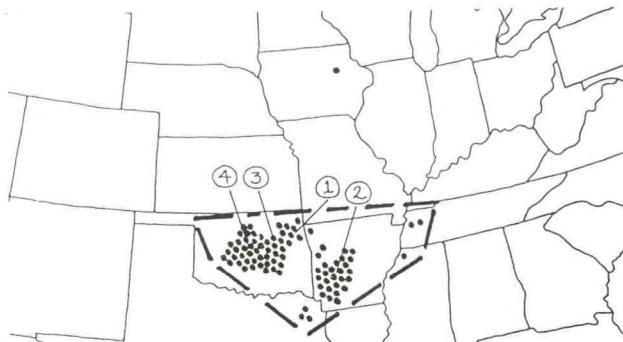
GOES 3PM CST May 18, 1990



Composite 6PM CST May 19, 1990

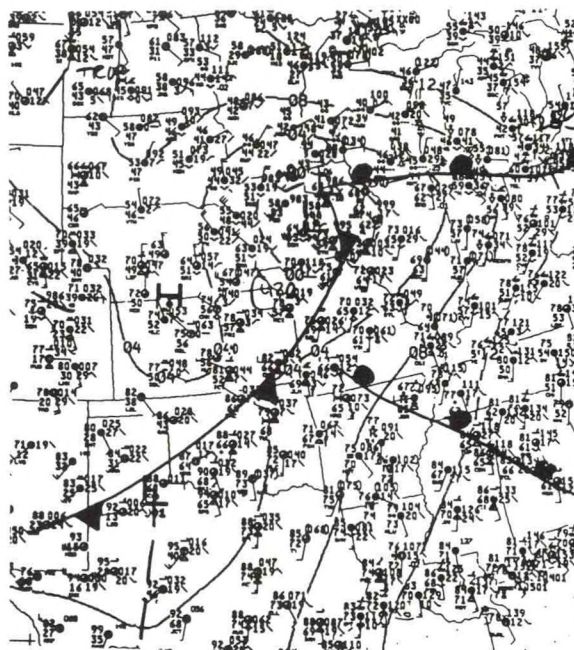


500 MB 6PM CST May 19, 1990

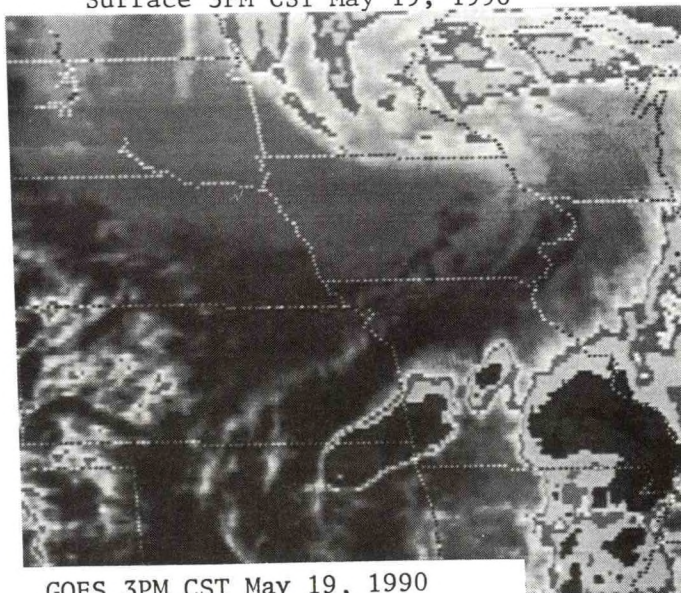


MAY 19TH-20TH, 1990 1320-0030 CST 85 REPORTS 6 TORNADOES

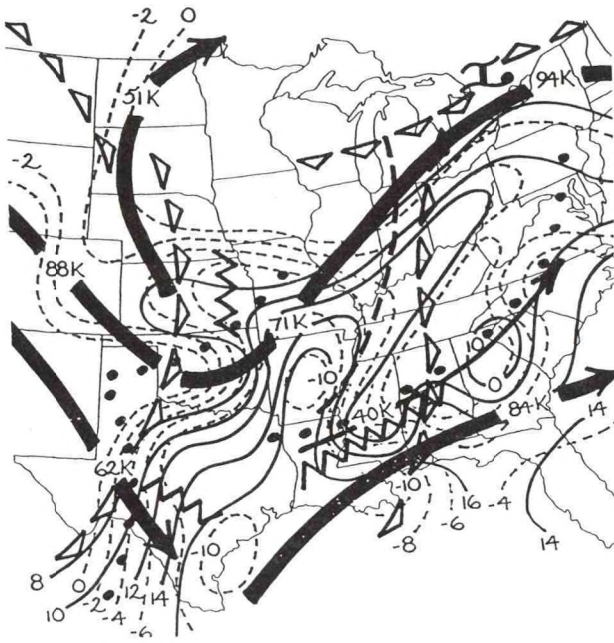
NO	TIME	EVENT	ST	LOCATION	
1	1655	75 MPH WIND GUST	OK	1 N PRIOR	(33 E TUL)
2	1750	TORNADO (F-0) one injury	AR	KIRBY	(34 WSW TUL)
3	1847	2.75 INCH HAIL	OK	2 SW CUSHING	(50 WSW TUL)
4	2023	3.25 INCH HAIL	OK	OKLAHOMA CITY	(OKC)



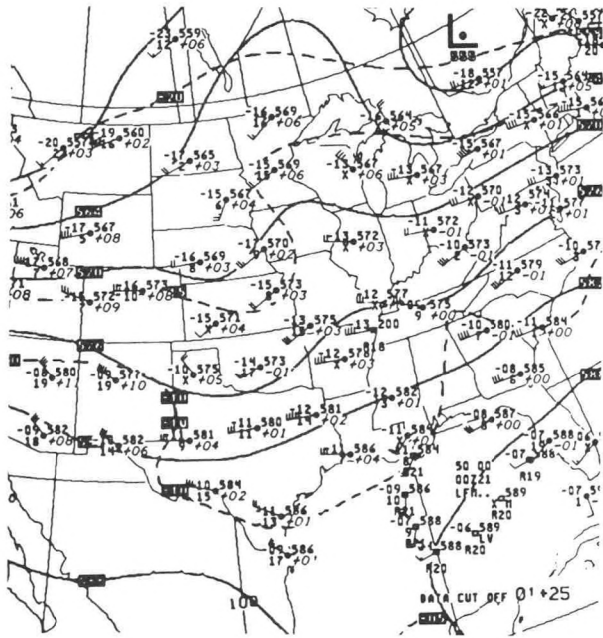
Surface 3PM CST May 19, 1990



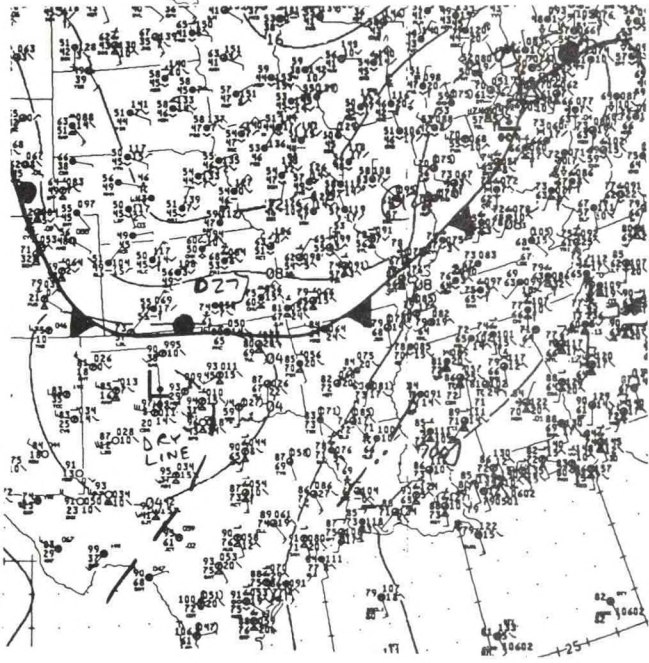
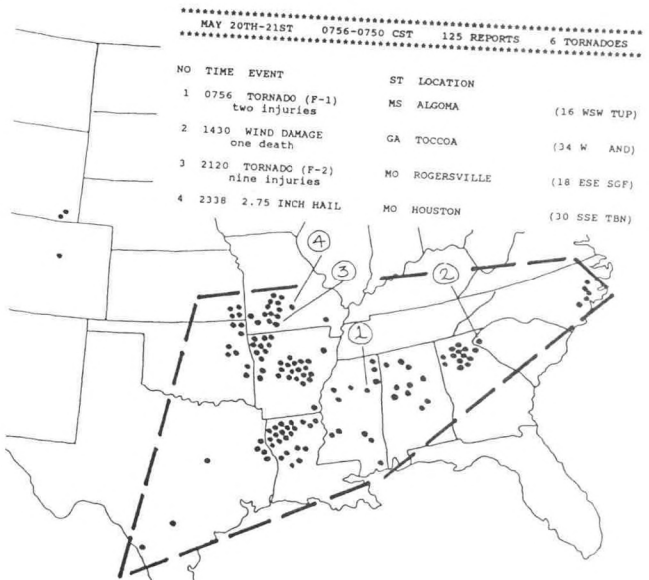
GOES 3PM CST May 19, 1990



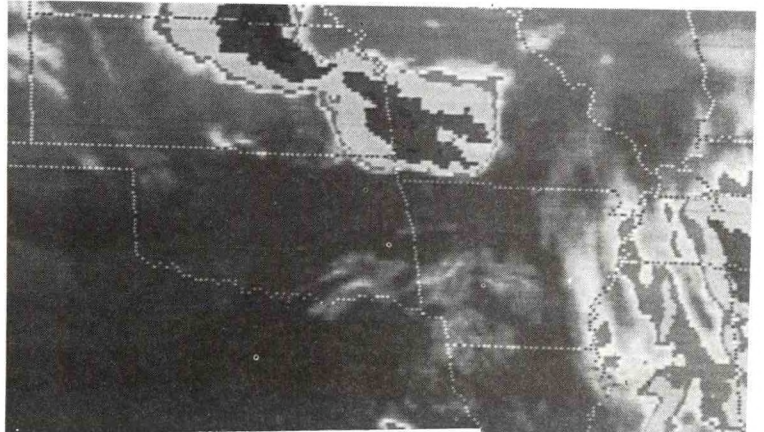
Composite 6PM CST May 20, 1990



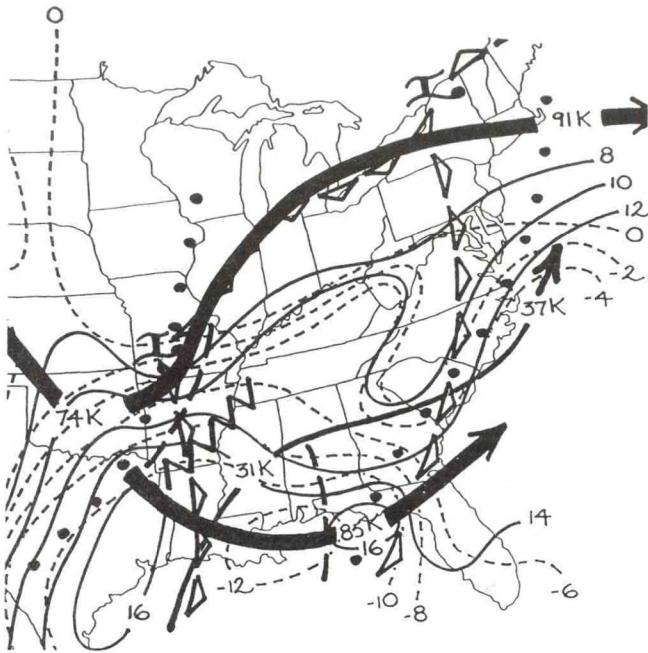
500 MB 6PM CST May 20, 1990



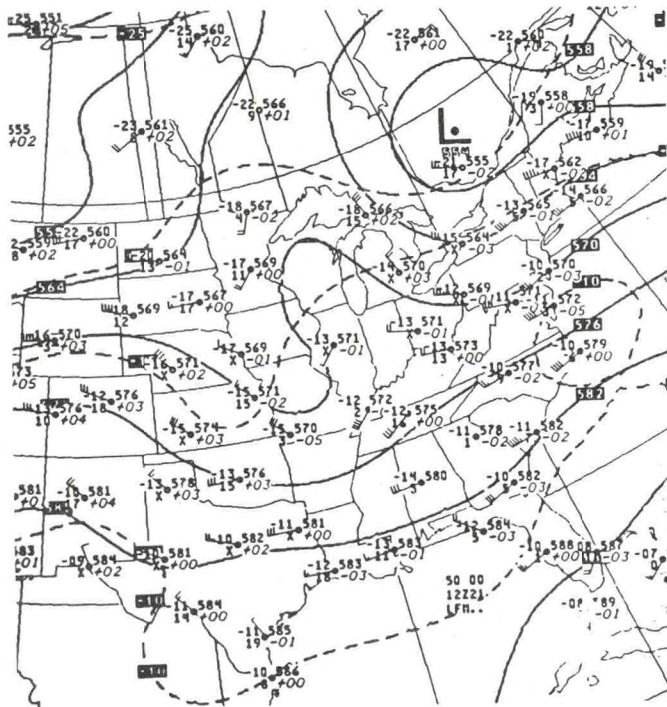
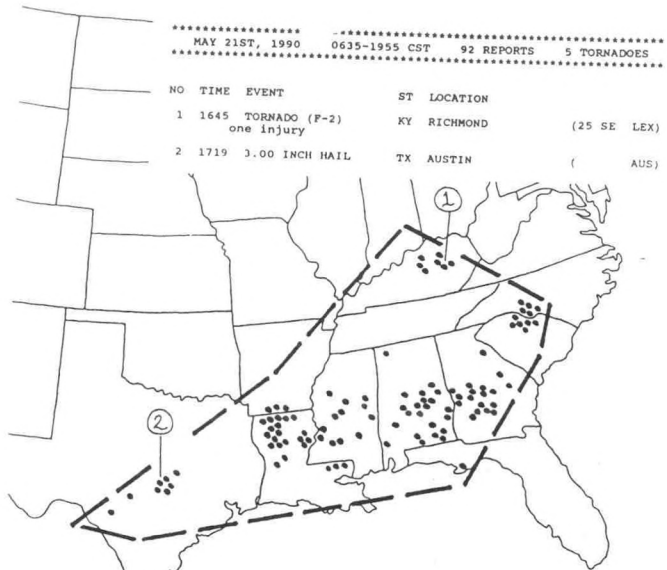
Surface 3PM CST May 20, 1990



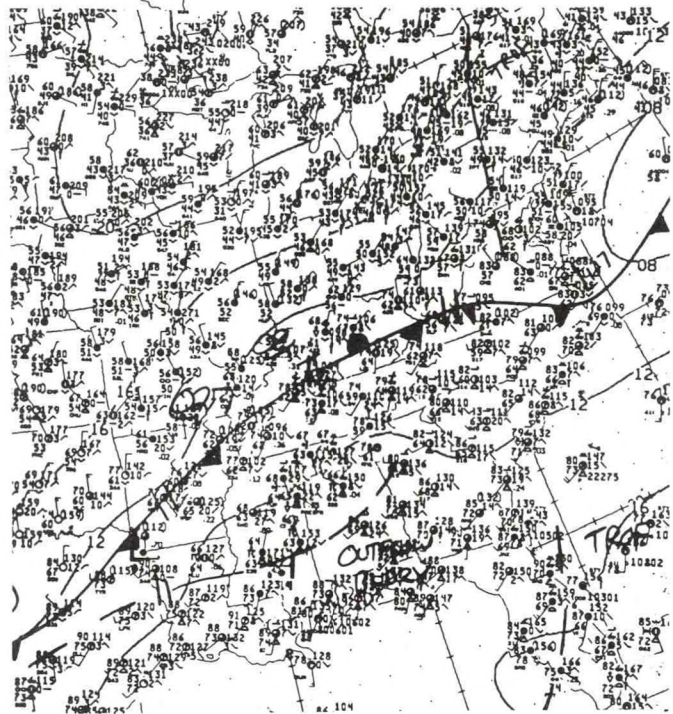
GOES 8:30 PM CST May 20, 1990



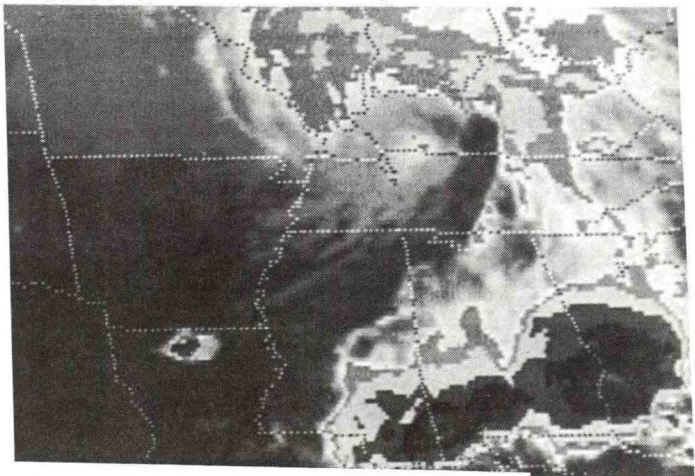
Composite 6AM CST May 21, 1990



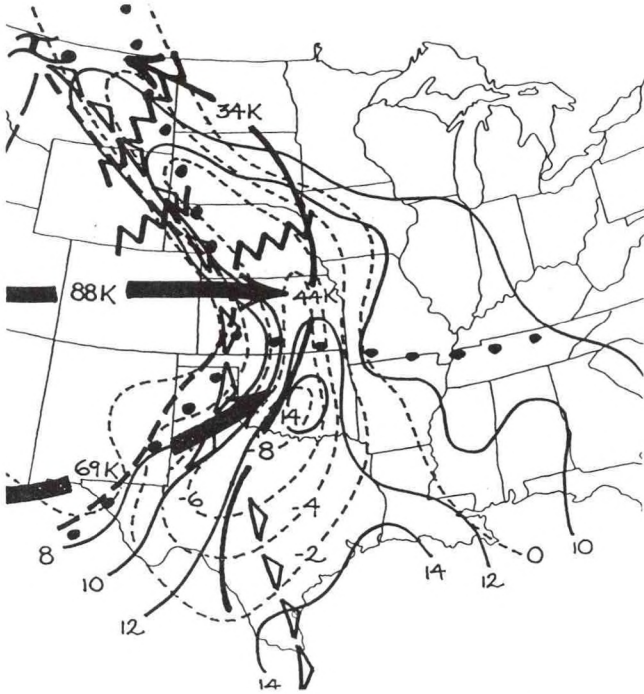
500 MB 6AM CST May 21, 1990



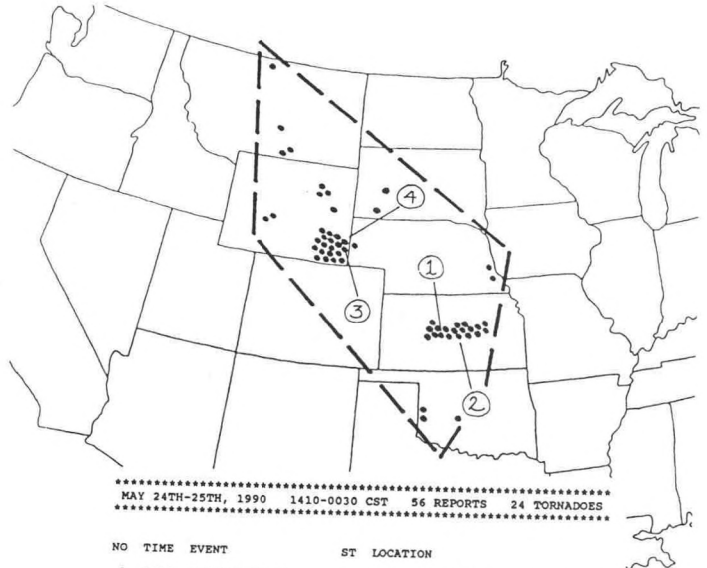
Surface 12 Noon CST May 21, 1990



GOES 3PM CST May 21, 1990

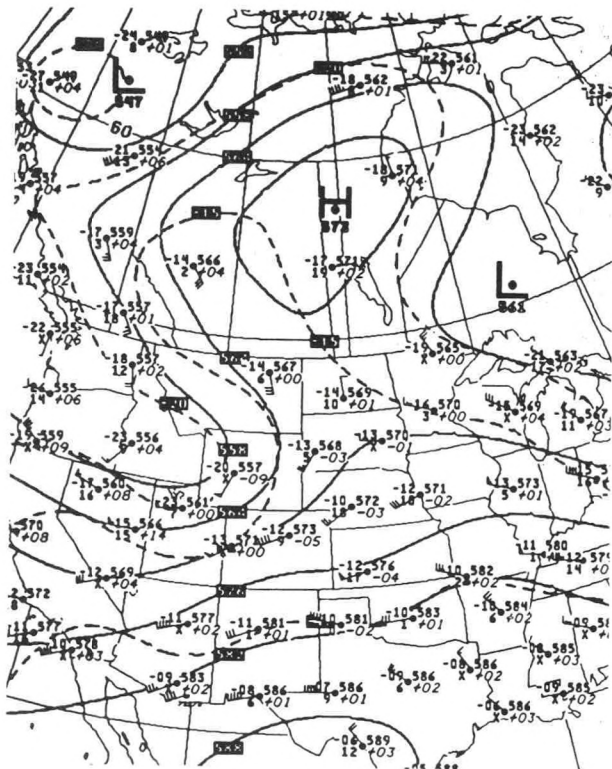


Composite 6PM CST May 24, 1990

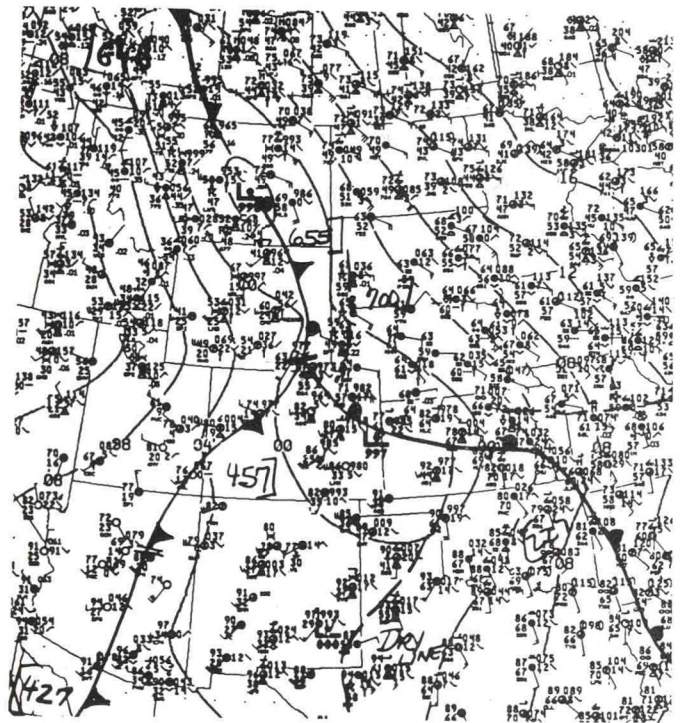


MAY 24TH-25TH, 1990 1410-0030 CST 56 REPORTS 24 TORNADOES

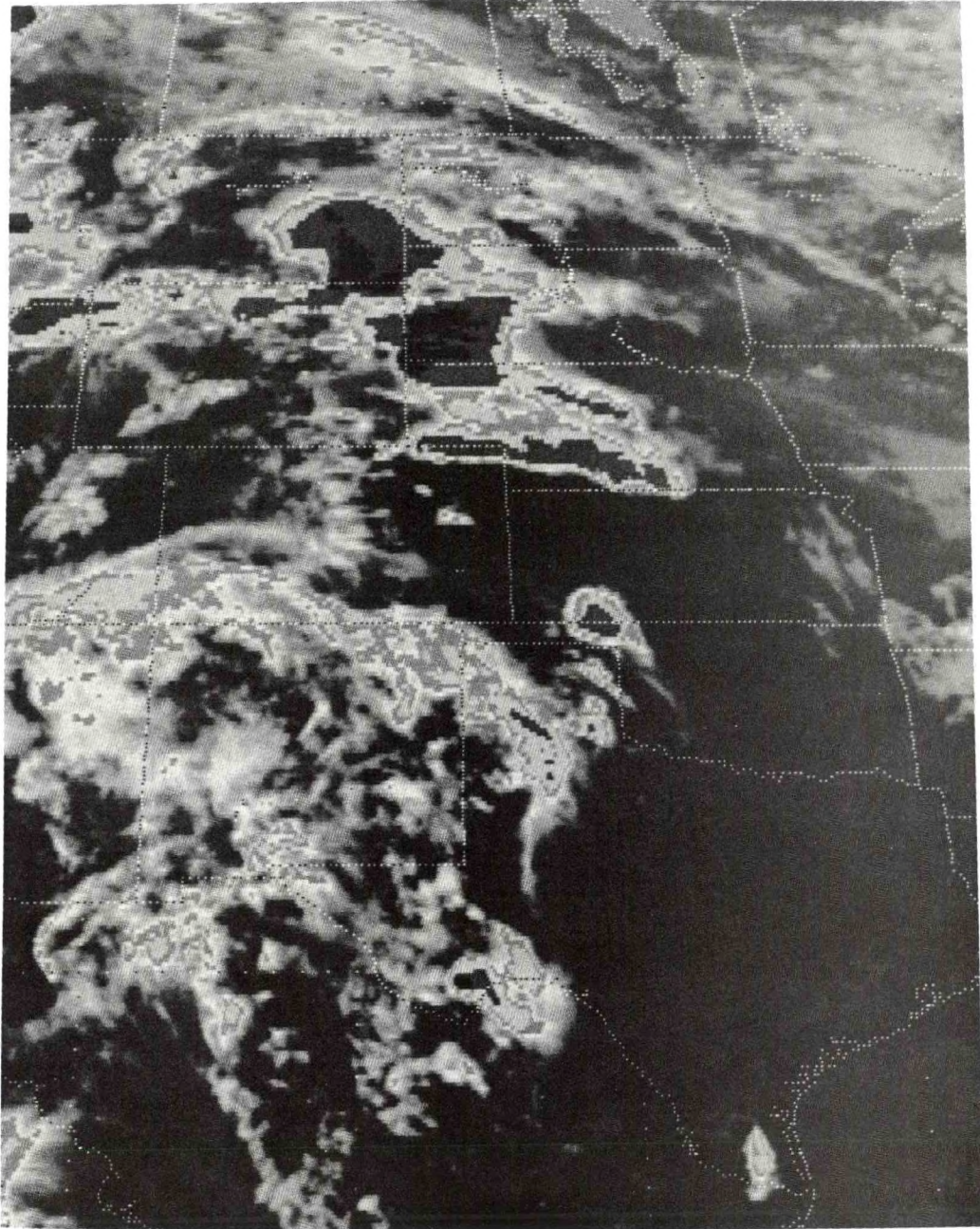
NO TIME EVENT ST LOCATION
 1 1610 TORNADO (F-3) KS CHEYENNE BOTTOMS (29 SSE RSL)
 six injuries, more than half a million dollars damage
 2 1650 TORNADO (F-3) KS 2 SW GENESEO (33 WSW SIN)
 more than 3.9 million dollar damage
 3 1655 TORNADO (F-2) WY 25 NE CHEYENNE (25 NE CYS)
 4 1755 2.75 INCH HAIL WY ALBIN (40 SW BFF)



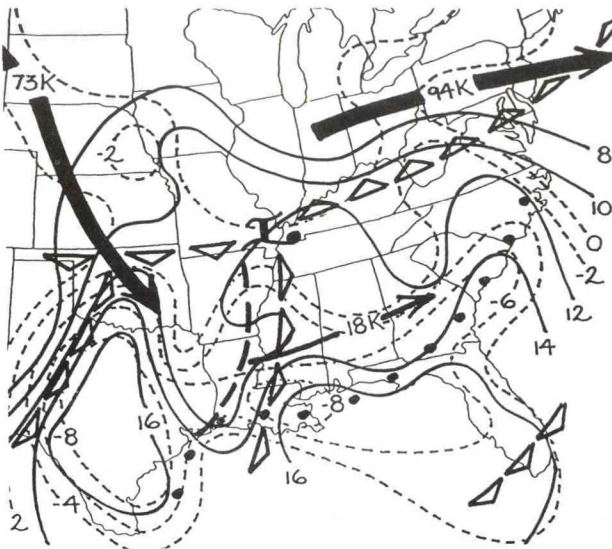
500 MB 6PM CST May 24, 1990



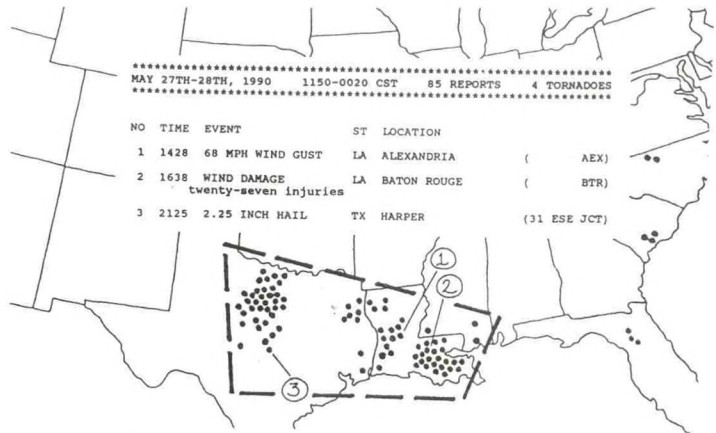
Surface 6PM CST May 24, 1990



GOES 5PM CST May 23, 1990

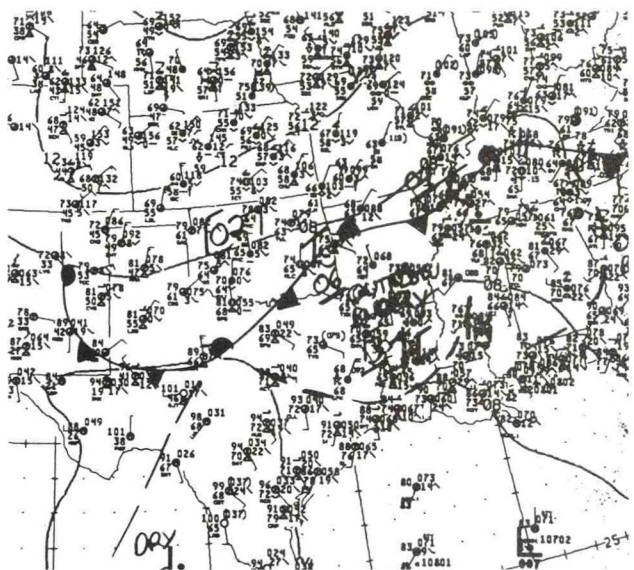


Composite 6PM CST May 27, 1990

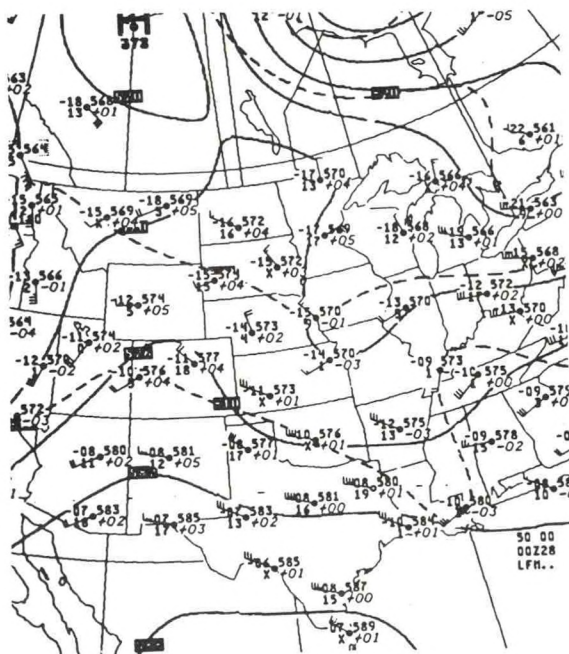


MAY 27TH-28TH, 1990 1150-0020 CST 85 REPORTS 4 TORNADOES

NO	TIME	EVENT	ST	LOCATION	
1	1428	68 MPH WIND GUST	LA	ALEXANDRIA	(AEX)
2	1638	WIND DAMAGE twenty-seven injuries	LA	BATON ROUGE	(BTR)
3	2125	2.25 INCH HAIL	TX	HARPER	(31 ESE JCT)



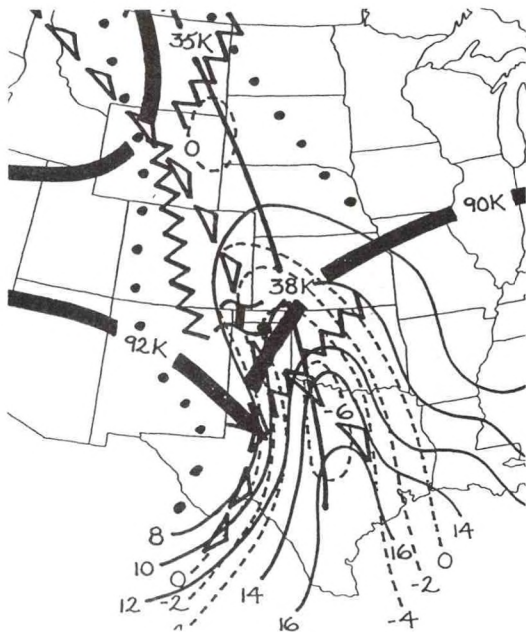
Surface 3PM CST May 27, 1990



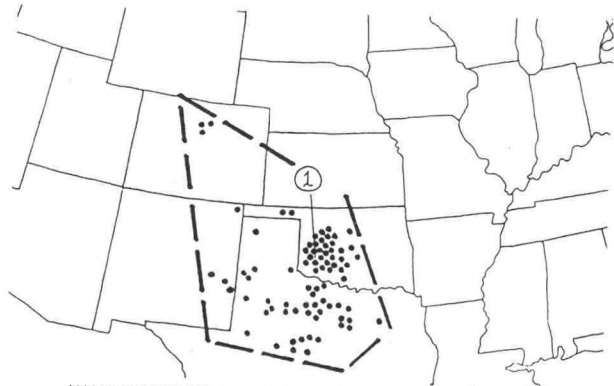
500 MB 6PM CST May 27, 1990



GOES 6PM CST May 27, 1990

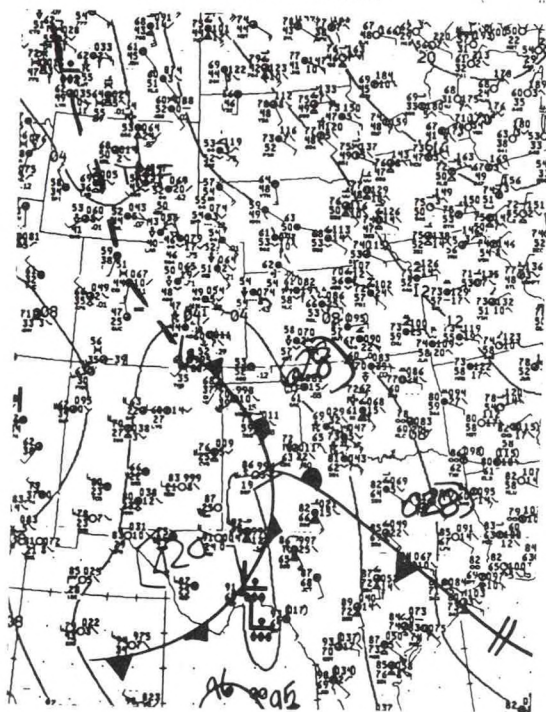


Composite 6PM CST May 29, 1990

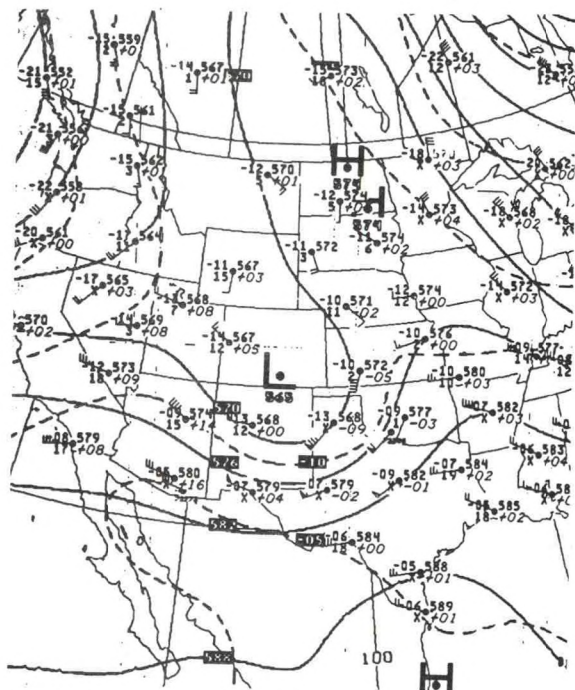


MAY 29TH, 1990 1102-2130 CST 74 REPORTS 4 TORNADOES

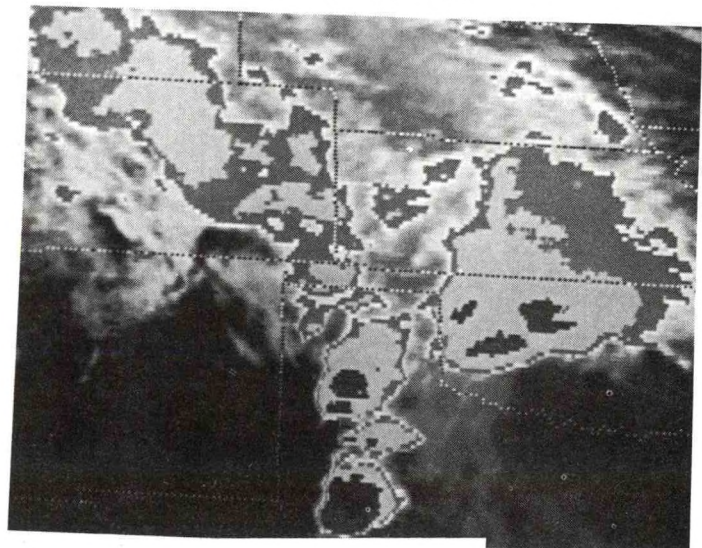
NO	TIME	EVENT	ST	LOCATION	
1	1336	90 MPH WIND GUST	OK	HOBART	(HBR)



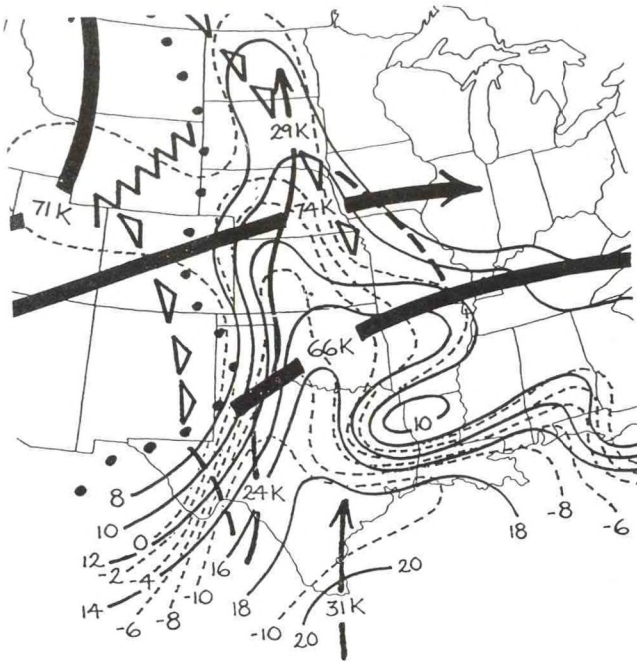
Surface 6PM CST May 29, 1990



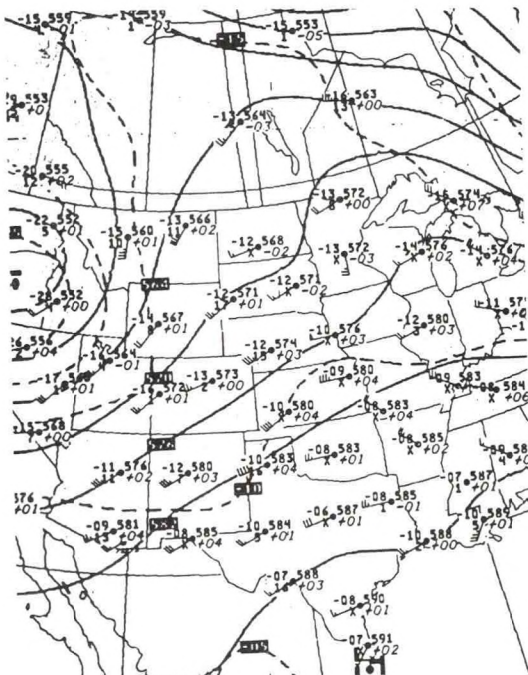
500 MB 6PM CST May 29, 1990



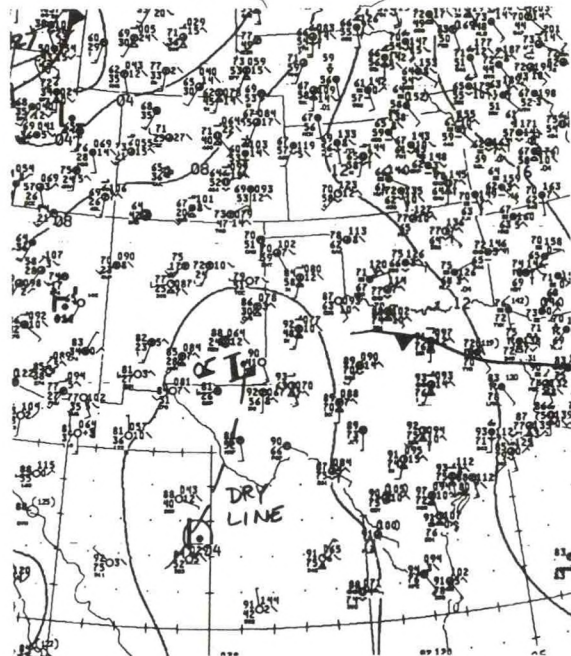
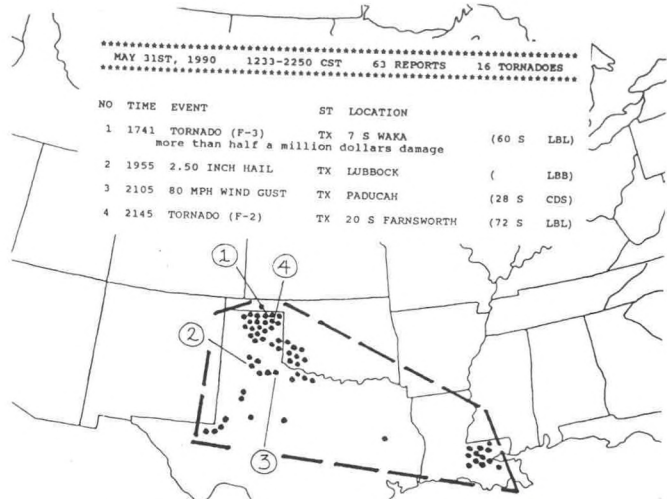
GOES 6PM CST May 28, 1990



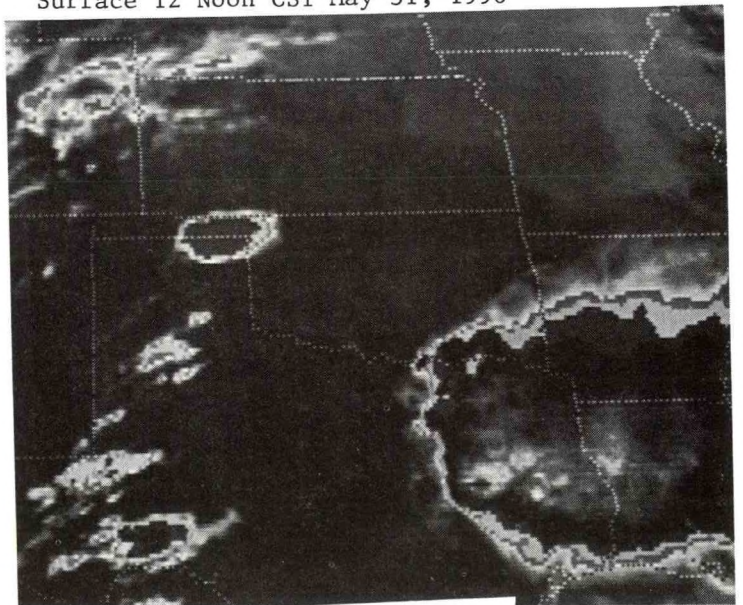
Composite 6PM CST May 31, 1990



500 MB 6PM CST May 31, 1990

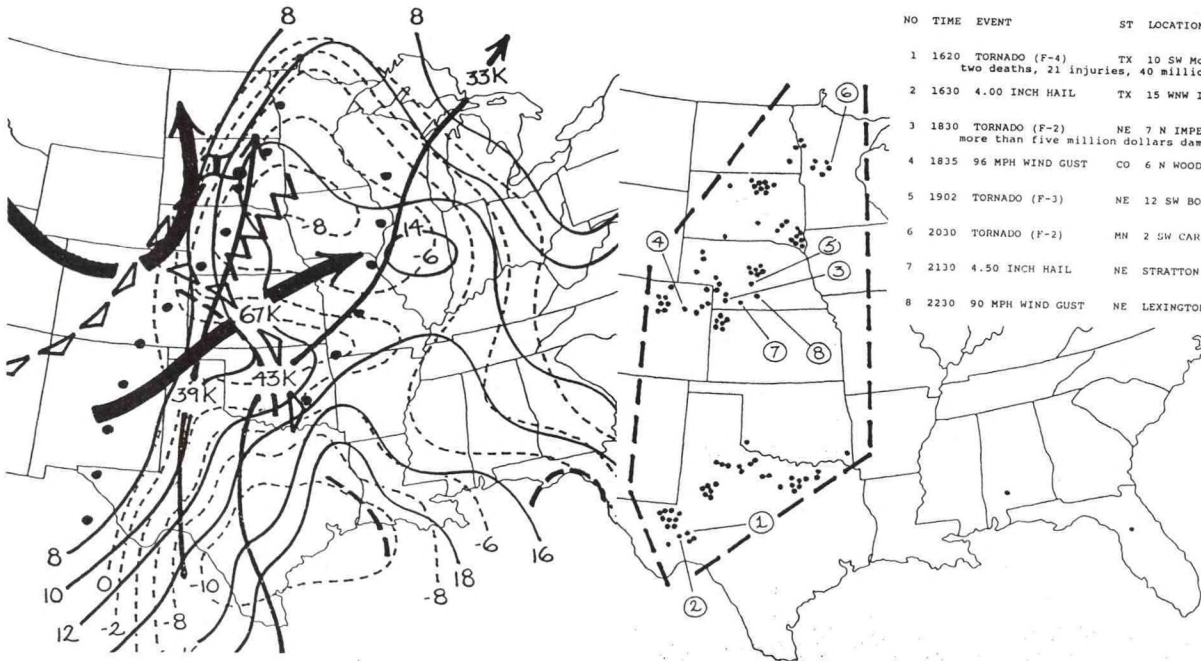


Surface 12 Noon CST May 31, 1990



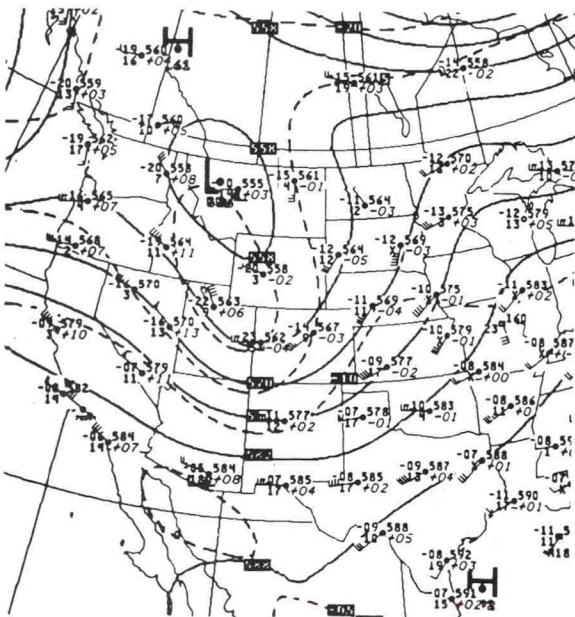
GOES 4PM CST May 31, 1990

JUNE 1ST-2ND, 1990 0810-0250 CST 104 REPORTS 21 TORNADOES

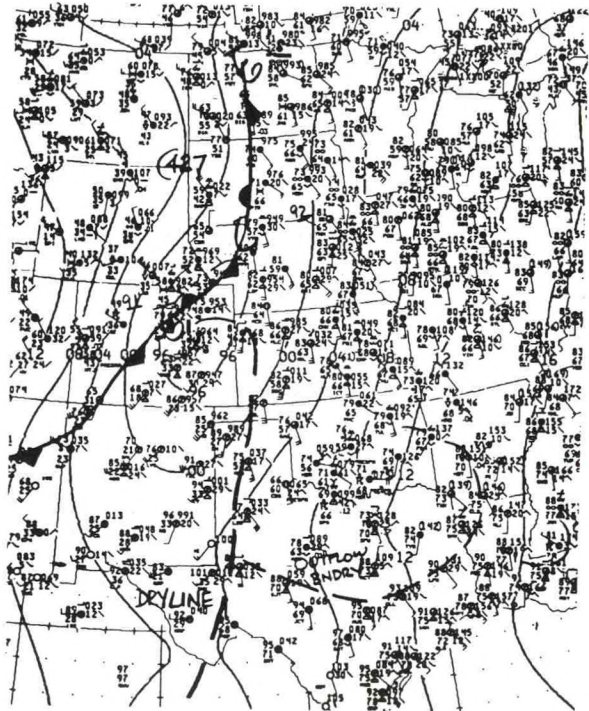


NO	TIME	EVENT	ST	LOCATION	
1	1620	TORNADO (F-4)	TX	10 SW McCAMEY	(65 S MAF)
		two deaths, 21 injuries, 40 million dollars damage			
2	1630	4.00 INCH HAIL	TX	15 WNW IRAAN	(80 SW MAF)
3	1830	TORNADO (F-2)	NE	7 N IMPERIAL	(7 N IML)
		more than five million dollars damage			
4	1835	96 MPH WIND GUST	CO	6 N WOODROW	(23 WSW AKO)
5	1902	TORNADO (F-3)	NE	12 SW BORKEN BOW	(12 SW BBW)
6	2030	TORNADO (F-2)	MN	2 SW CARLOS	(6 NE AXN)
7	2130	4.50 INCH HAIL	NE	STRATTON	(34 W MCK)
8	2230	90 MPH WIND GUST	NE	LEXINGTON	(44 S BBW)

Composite 6PM CST June 1, 1990



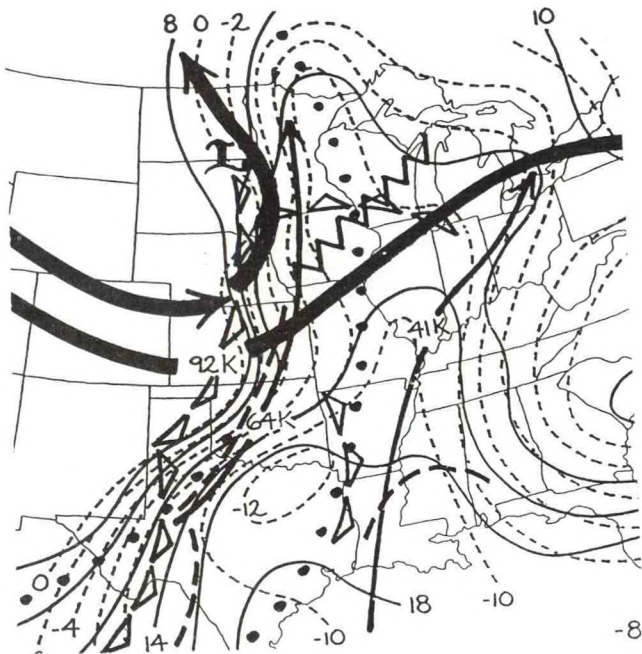
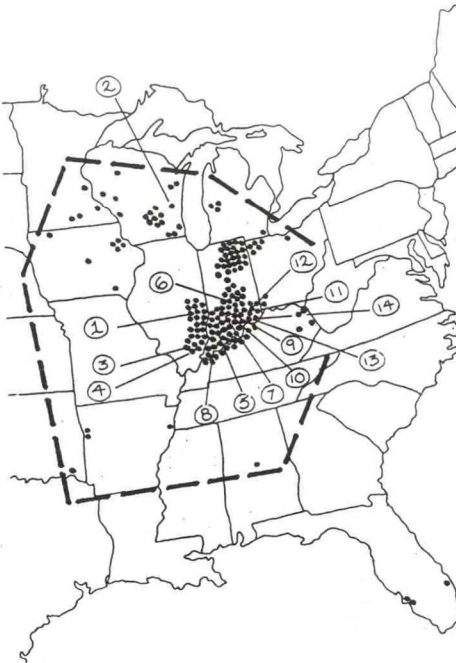
500 MB 6PM CST June 1, 1990



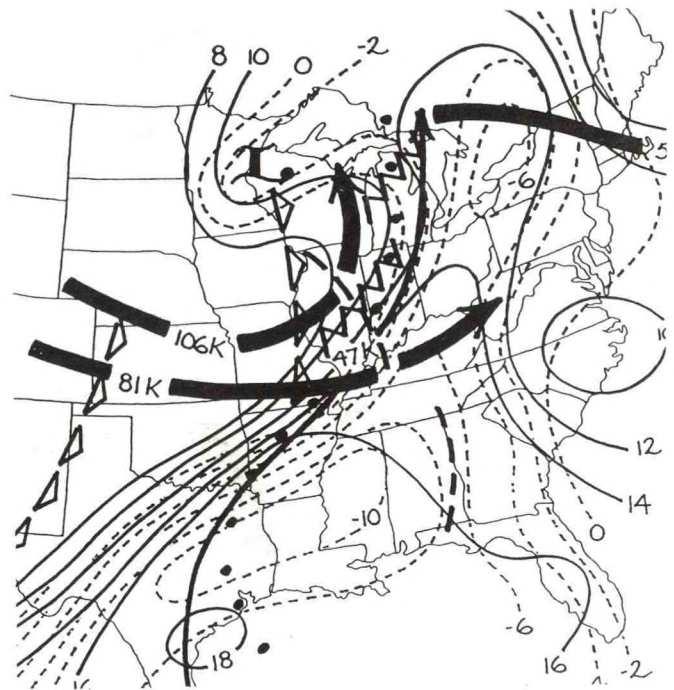
Surface 3PM CST June 1 1990

JUNE 2ND, 1990 1020-2310 CST 161 REPORTS 74 TORNADOES

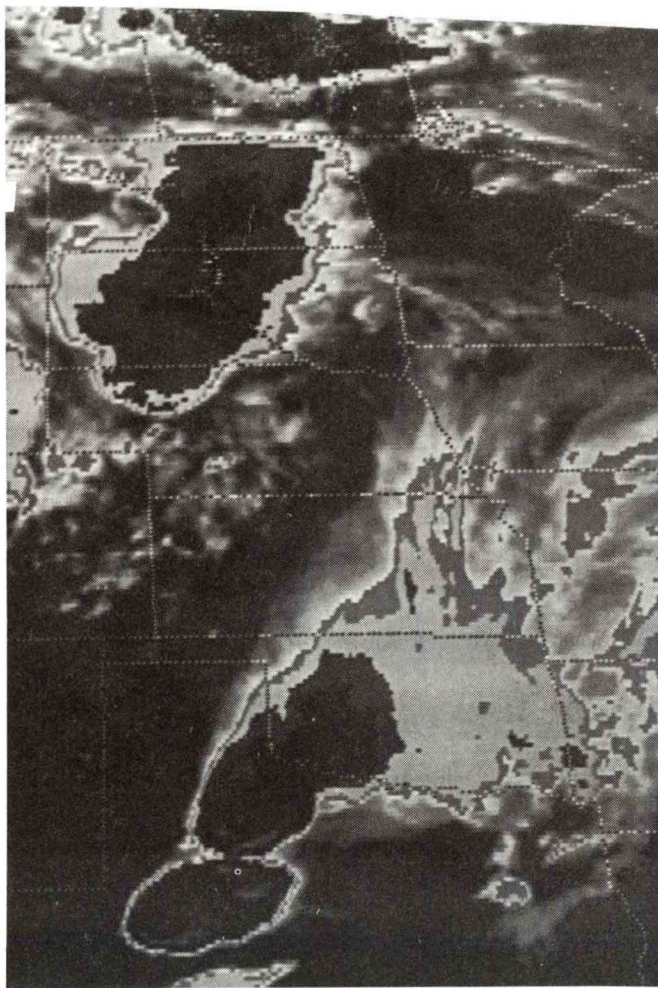
NO	TIME	EVENT	ST	LOCATION	
1	1645	TORNADO (F-4)	IL	RINARD	(61 WNW EVV)
		two injuries, 23 mile path length			
2	1700	TORNADO (F-2)	WI	POND DU LAC	(16 SSE OSH)
		one injury, two million dollars damage			
3	1707	TORNADO (F-4)	IL	JASPER	(56 WSW HUF)
		six injuries, 12.5 mile path length			
4	1720	TORNADO (F-4)	IL	1 N ADEN	(52 W EVV)
		one death, 11 injuries, 94 mile path length			
5	1819	TORNADO (F-3)	IN	1 S MONTGOMERY	(49 NE EVV)
		one death, 30 injuries			
6	1830	TORNADO (F-2)	IN	NEW MAYSVILLE	(24 W IND)
		one death, 6 injuries			
7	1850	TORNADO (F-4)	IN	2 NE BRYANTSVILLE	(25 S BMG)
		one death, 51 injuries, 11 mile path length			
8	1917	TORNADO (F-4)	IN	2 W UNION	(29 NNE EVV)
		six deaths, 60 injuries, 13 mile path length more than five million dollars damage			
9	1920	TORNADO (F-4)	IN	5 SW CLEAR SPRINGS	(26 ESE BMG)
		nine injuries, 18 mile path length, 0.4 mile path width			
10	2025	TORNADO (F-3)	IN	1 S MILLPORT	(37 SE BMG)
		thirty-one mile path length			
11	2100	TORNADO (F-4)	IN	2 W BRIGHT	(15 NW CVG)
		thirty-seven injuries, 28 mile path length more than 5.5 million dollars damage			
12	2140	TORNADO (F-3)	IN	1 SE MARYSVILLE	(28 N SDF)
		five injuries, 17 mile path length			
13	2157	TORNADO (F-3)	IN	1 NW GALENA	(16 NW SDF)
		seven injuries			
14	2230	TORNADO (F-3)	KY	GOSHEN	(17 NE SDF)



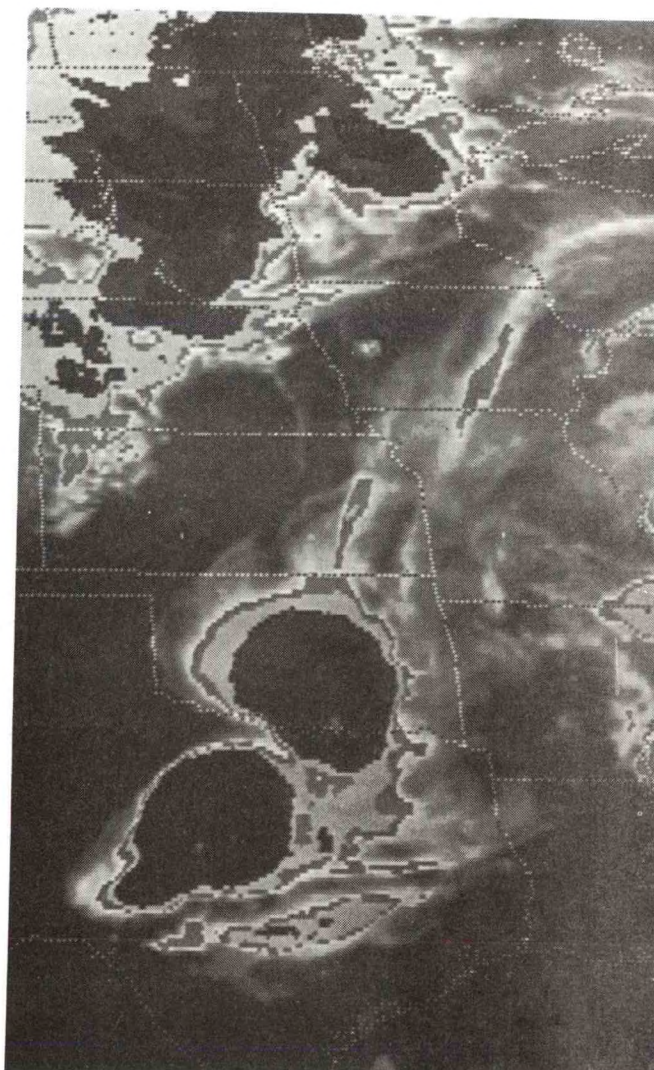
Composite 6AM CST June 2, 1990



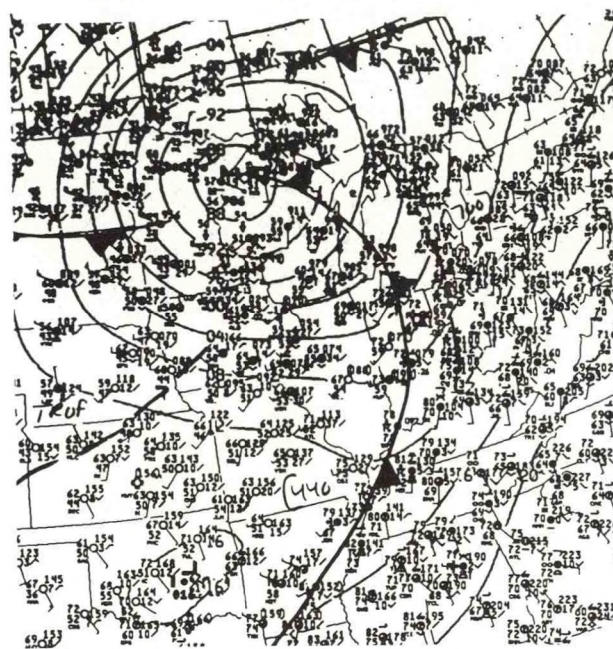
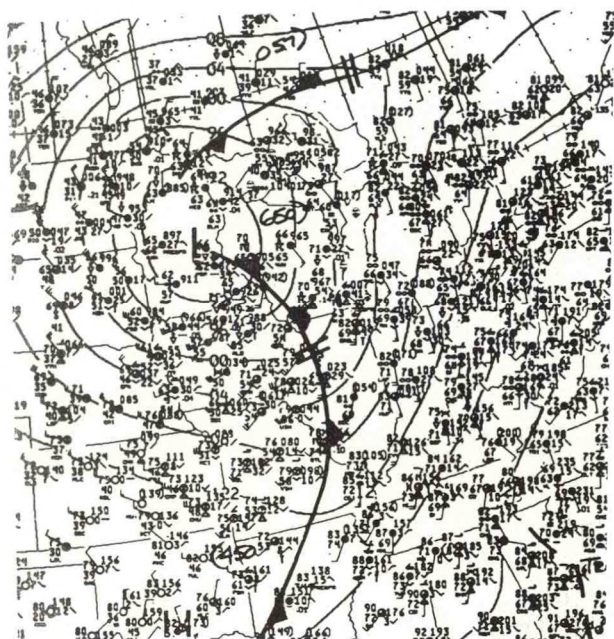
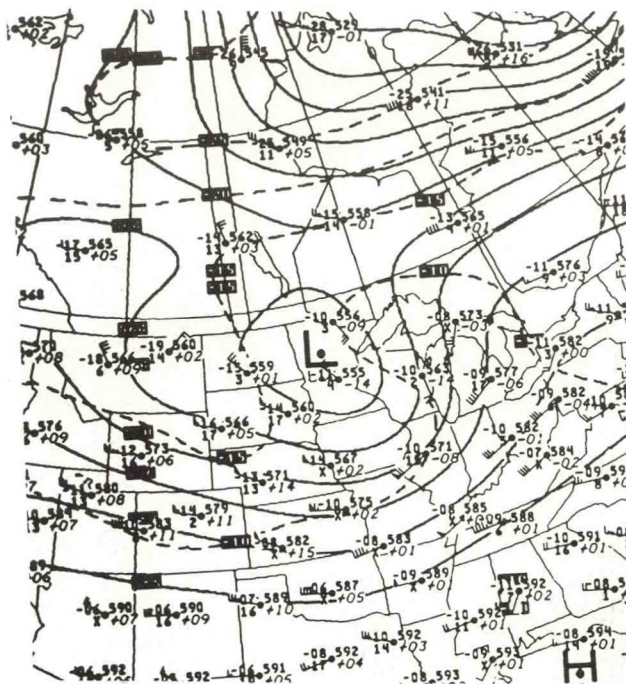
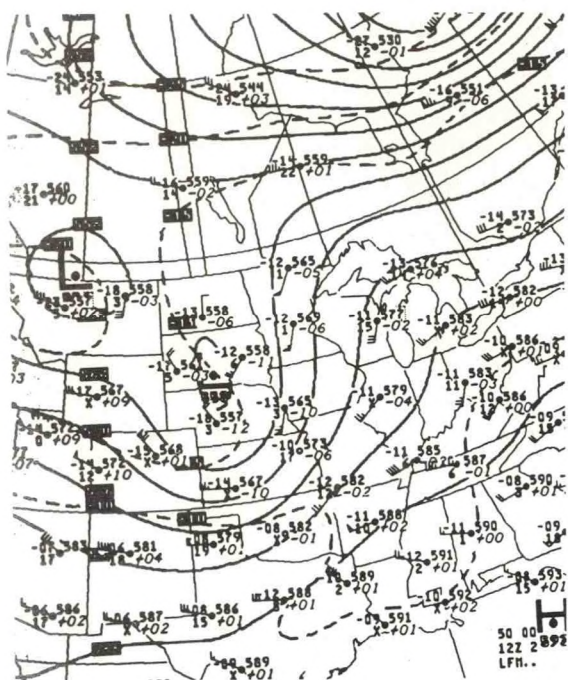
Composite 6PM CST June 2, 1990

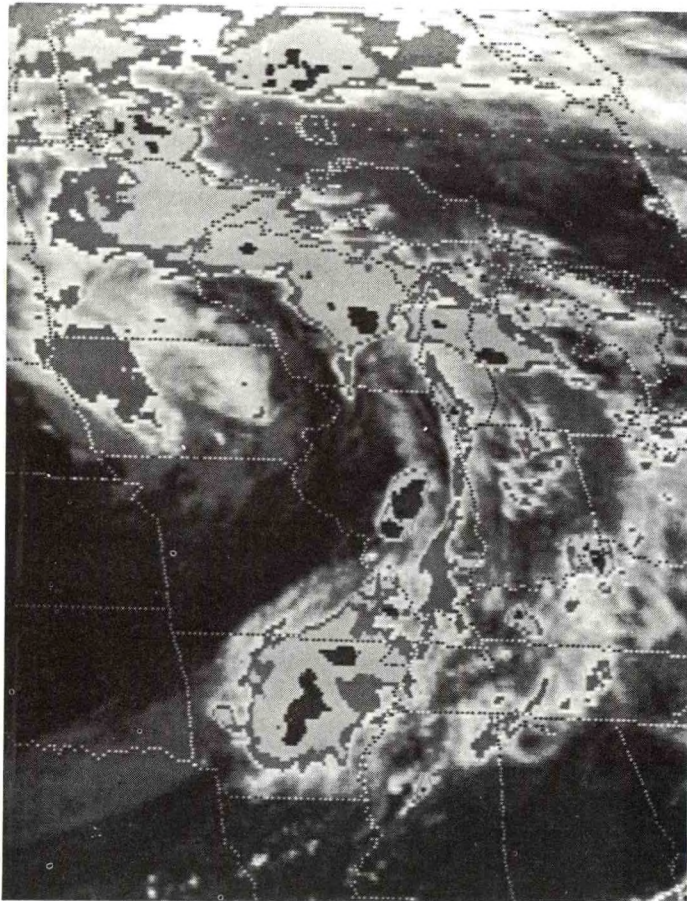


GOES 4PM CST June 1, 1990

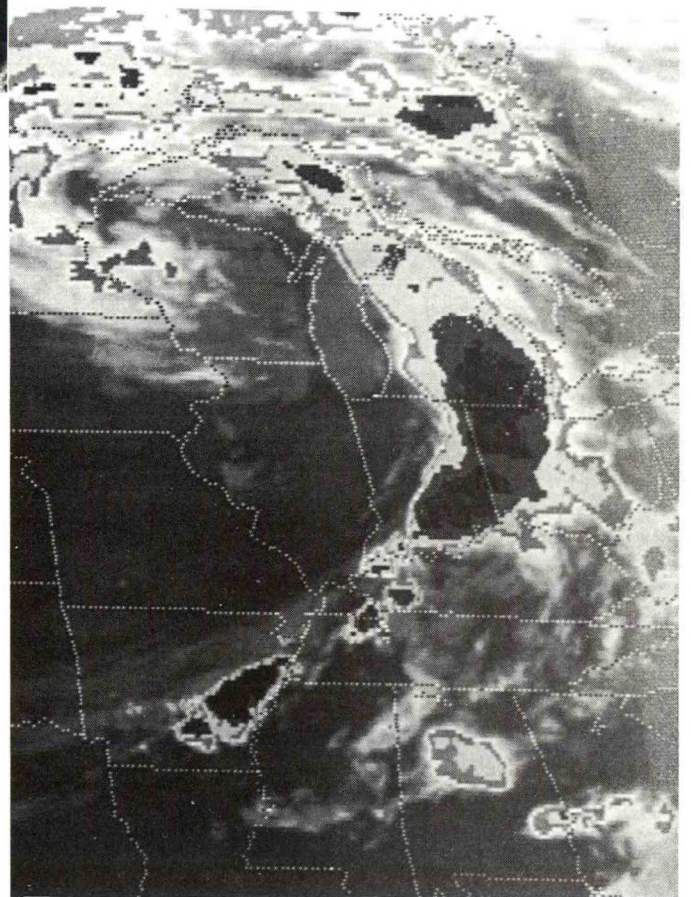


GOES 9:30 PM CST June 1, 1990





GOES 3PM CST June 2, 1990



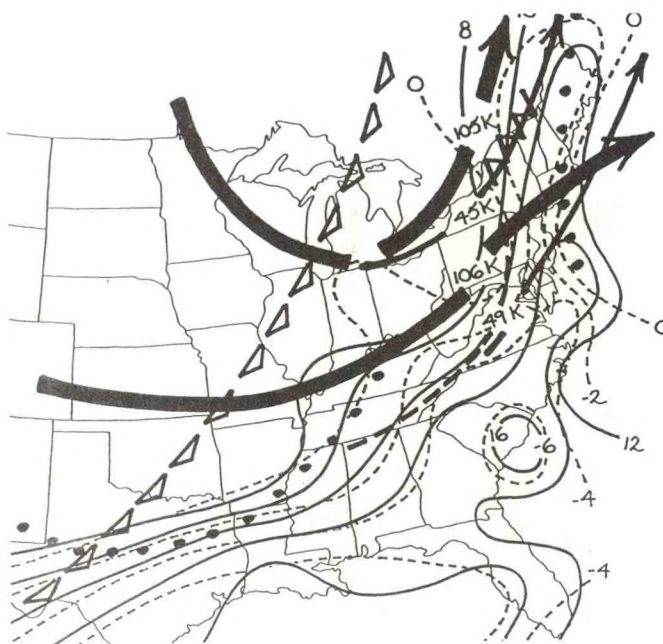
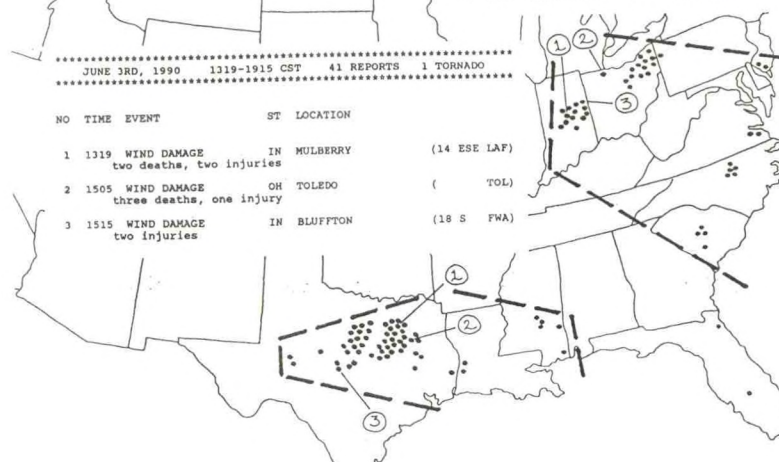
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JUNE 3RD-4TH, 1990 1405-0025 CST 58 REPORTS

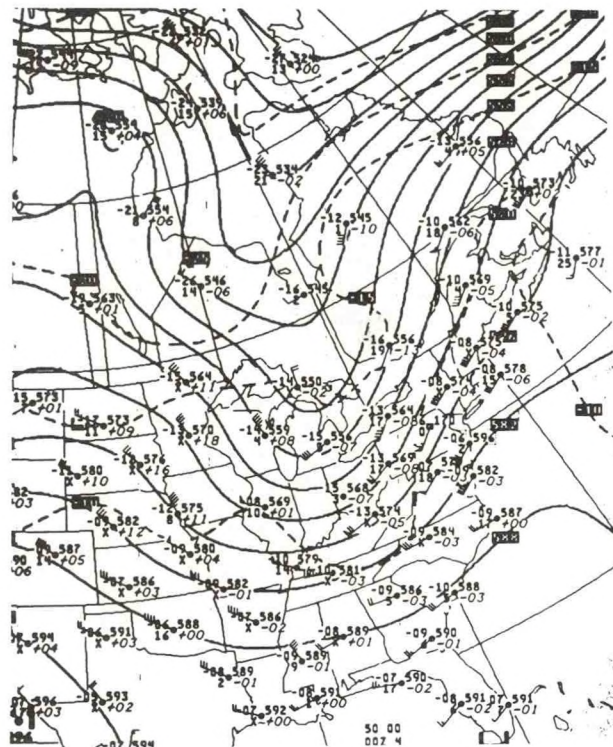
NO	TIME	EVENT	ST	LOCATION	
1	1405	85 MPH WIND GUST	TX	GARLAND	(13 ENE DAL)
2	1645	WIND DAMAGE four injuries, 2.5 million dollars damage	TX	JACKSONVILLE	(29 SSE TYR)
3	2005	2.75 INCH HAIL	TX	MAY	(52 ESE ABI)

JUNE 3RD, 1990 1319-1915 CST 41 REPORTS 1 TORNADO

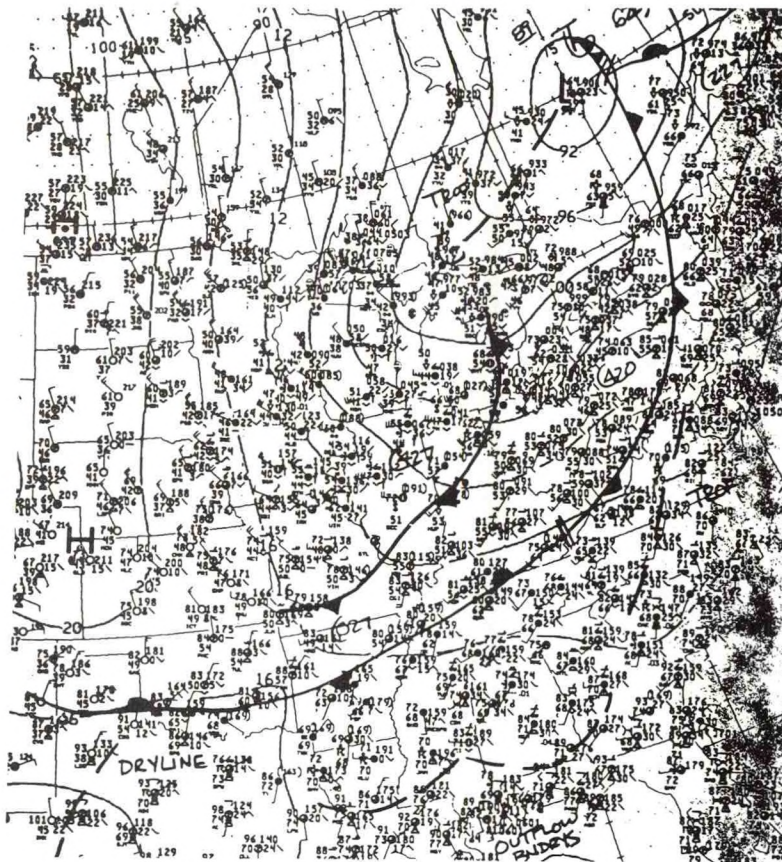
NO	TIME	EVENT	ST	LOCATION	
1	1319	WIND DAMAGE two deaths, two injuries	IN	MULBERRY	(14 ESE IAF)
2	1505	WIND DAMAGE three deaths, one injury	OH	TOLEDO	(TOL)
3	1515	WIND DAMAGE two injuries	IN	BLUFFTON	(18 S FWA)



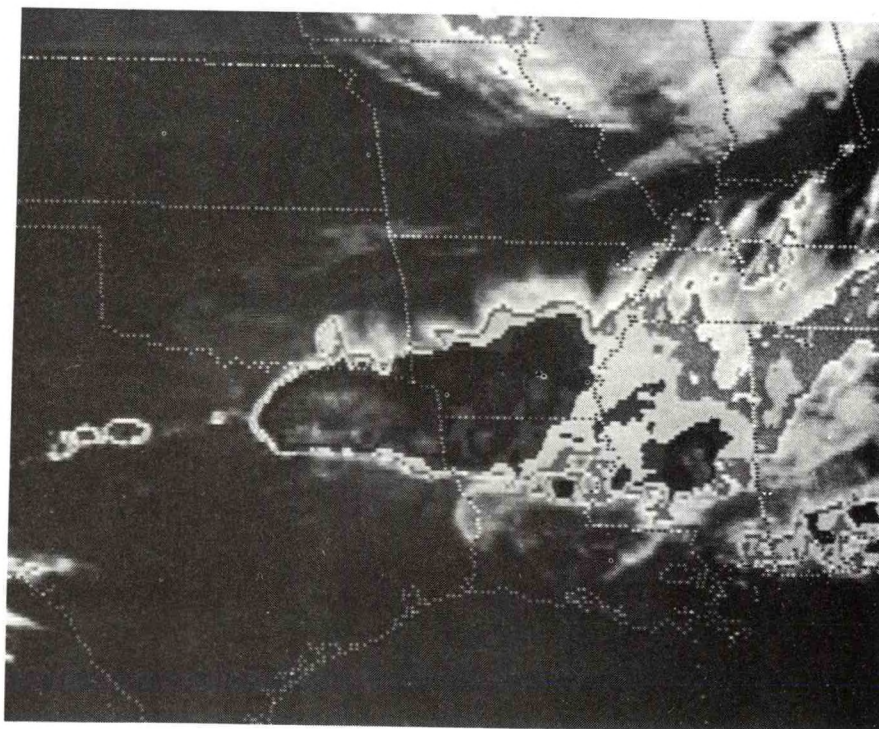
Composite 6PM CST June 3, 1990



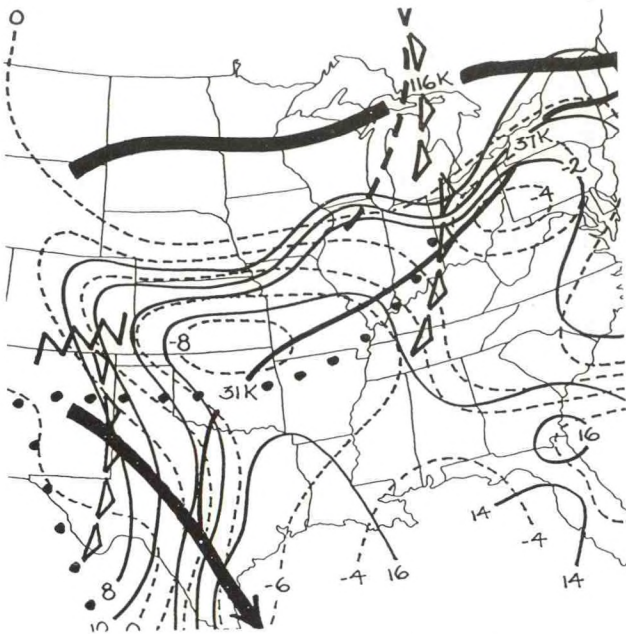
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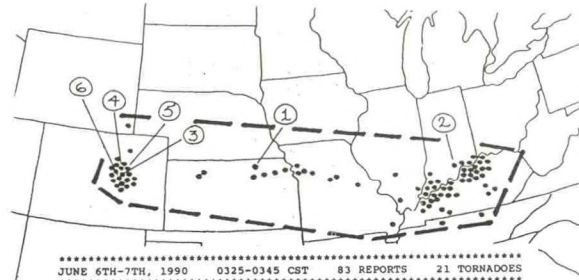
Surface 3PM CST June 3, 1990



GOES 3PM CST June 3, 1990

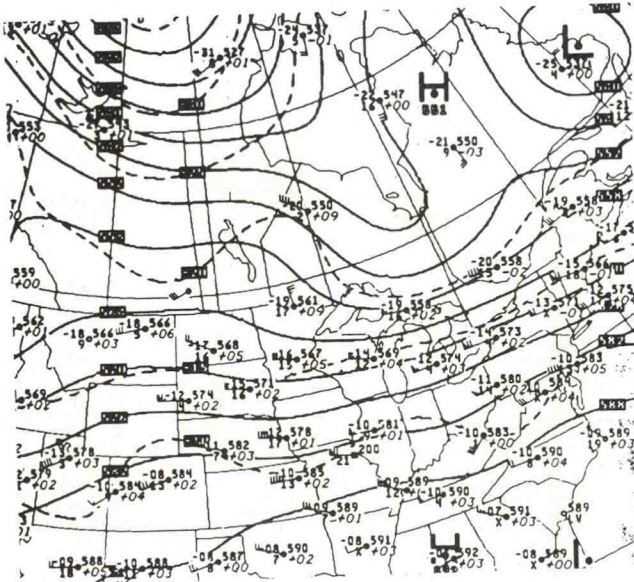


Composite 6PM CST June 6, 1990

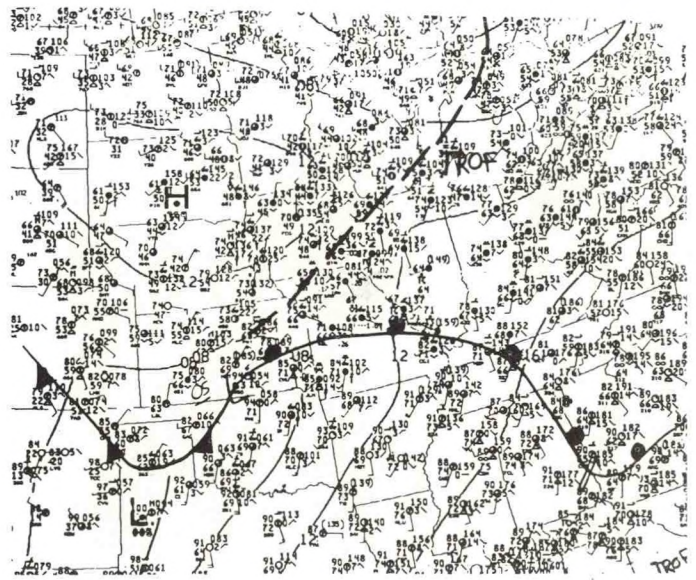


JUNE 6TH-7TH, 1990 0325-0345 CST 83 REPORTS 21 TORNADOES

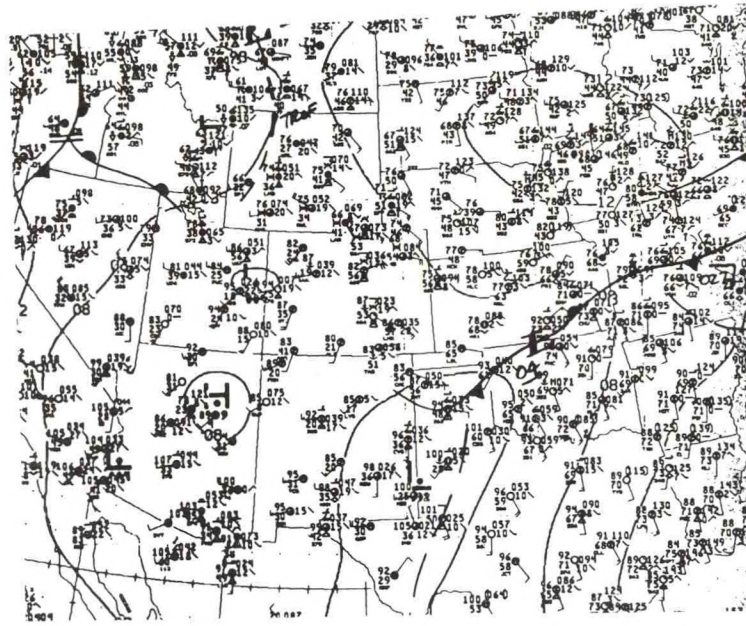
NO	TIME	EVENT	ST	LOCATION	
1	0530	104 MPH WIND GUST 1.75 million dollars damage	KS	5 NW MARYSVILLE	(32 SSE BIE)
2	1418	TORNADO (F-1) two injuries	IN	CORYDON	(21 W SDF)
3	1910	TORNADO (F-1)	CO	12 SW LIMON	(12 SW LIC)
4	1930	2.50 INCH HAIL	CO	5 S LIMON	(5 S LIC)
5	1945	TORNADO (F-3) fourteen injuries, 12.8 million dollars damage	CO	5 S LIMON	(5 S LIC)
6	2230	TORNADO (F-2) two injuries	CO	RUSH	(31 SW LIC)



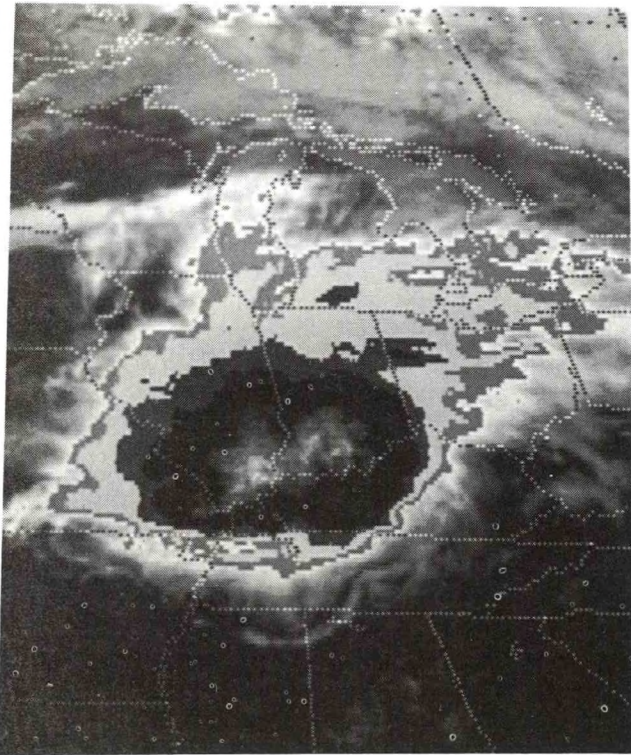
500 MB 6PM CST June 6, 1990



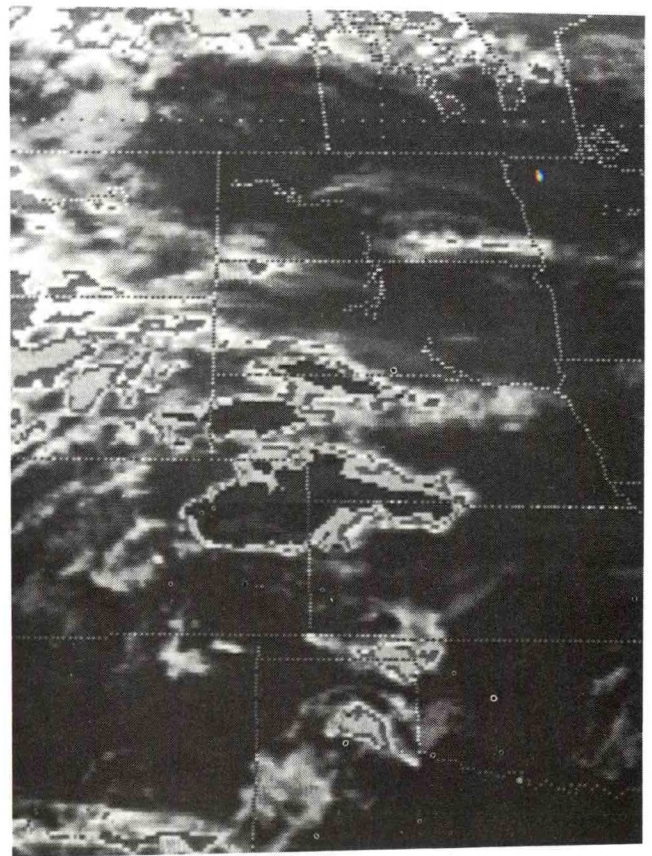
Surface 12 Noon CST June 6, 1990



Surface 6PM CST June 6, 1990



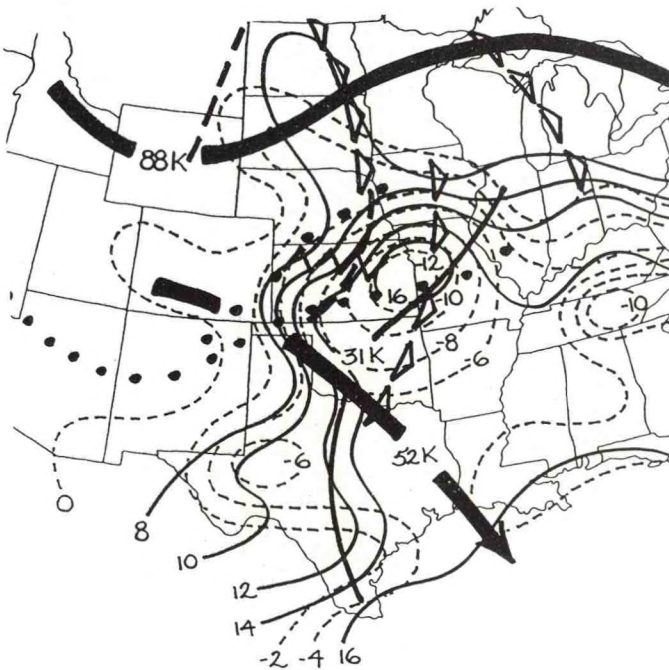
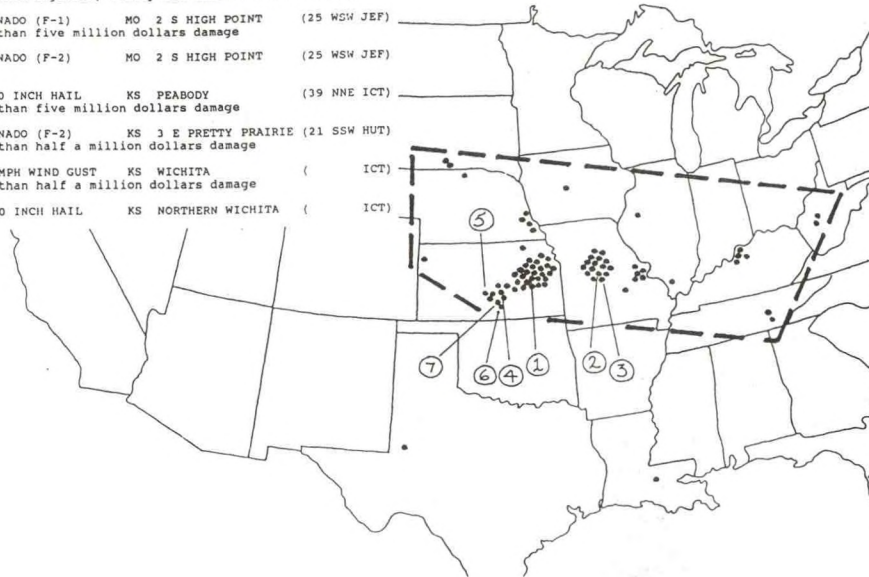
GOES 2PM CST June 6, 1990



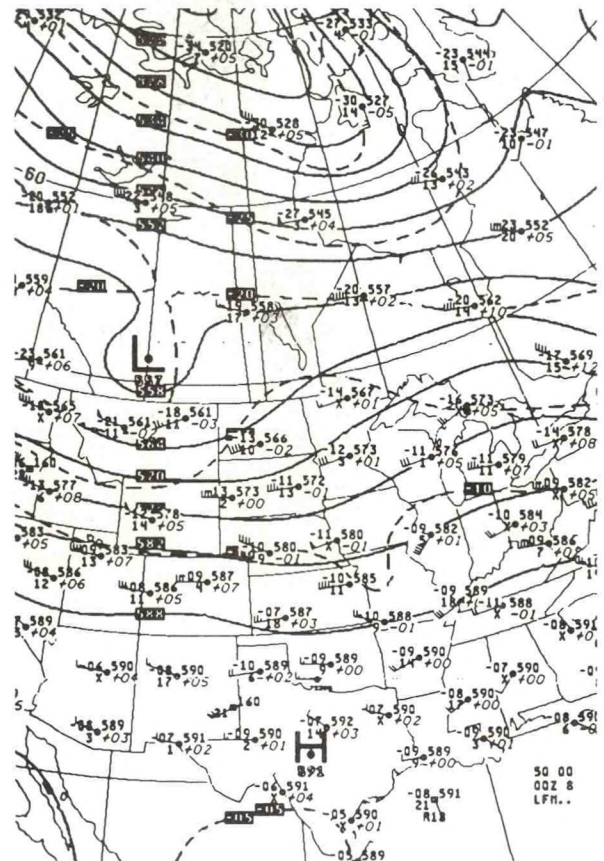
GOES 7PM CST June 6, 1990

JUNE 7TH-8TH, 1990 0635-0540 CST 81 REPORTS 11 TORNADOES

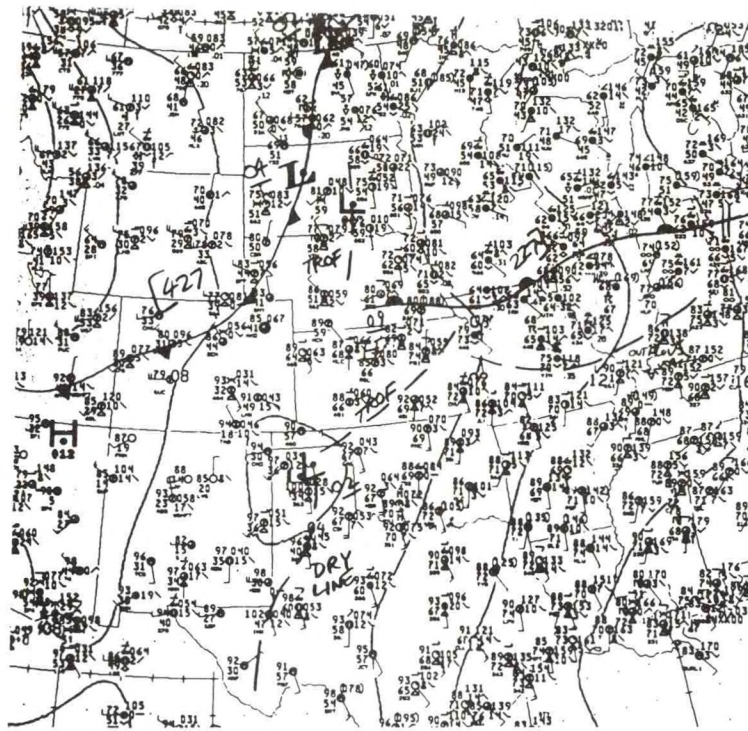
NO	TIME	EVENT	ST	LOCATION	
1	1830	TORNADO (F-2)	KS	6 SW EMPORIA	(6 SW EMP)
		seventeen injuries, twenty-six million dollars damage			
2	2010	TORNADO (F-1)	MO	2 S HIGH POINT	(25 WSW JEF)
		more than five million dollars damage			
3	2020	TORNADO (F-2)	MO	2 S HIGH POINT	(25 WSW JEF)
4	2125	3.00 INCH HAIL	KS	PEABODY	(39 NNE ICT)
		more than five million dollars damage			
5	2150	TORNADO (F-2)	KS	3 E PRETTY PRAIRIE	(21 SSW HUT)
		more than half a million dollars damage			
6	2157	86 MPH WIND GUST	KS	WICHITA	(ICT)
		more than half a million dollars damage			
7	2222	4.50 INCH HAIL	KS	NORTHERN WICHITA	(ICT)



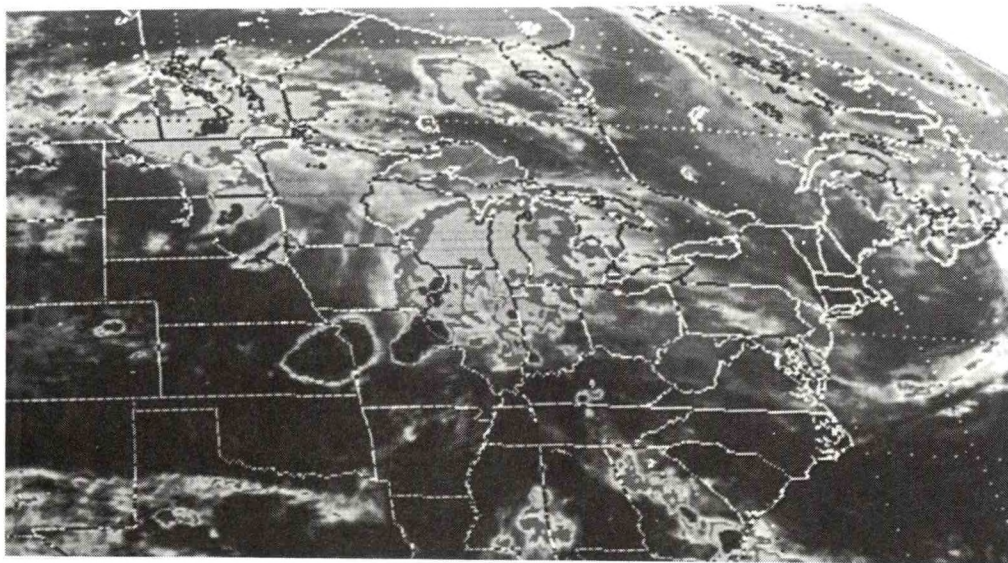
Composite 6PM CST June 7, 1990



500 MB 6PM CST June 7, 1990



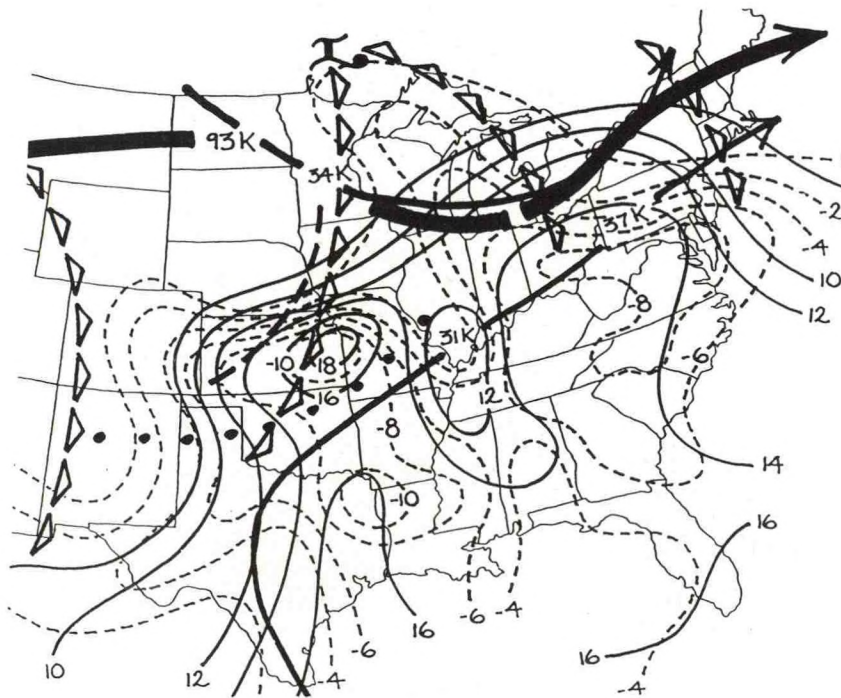
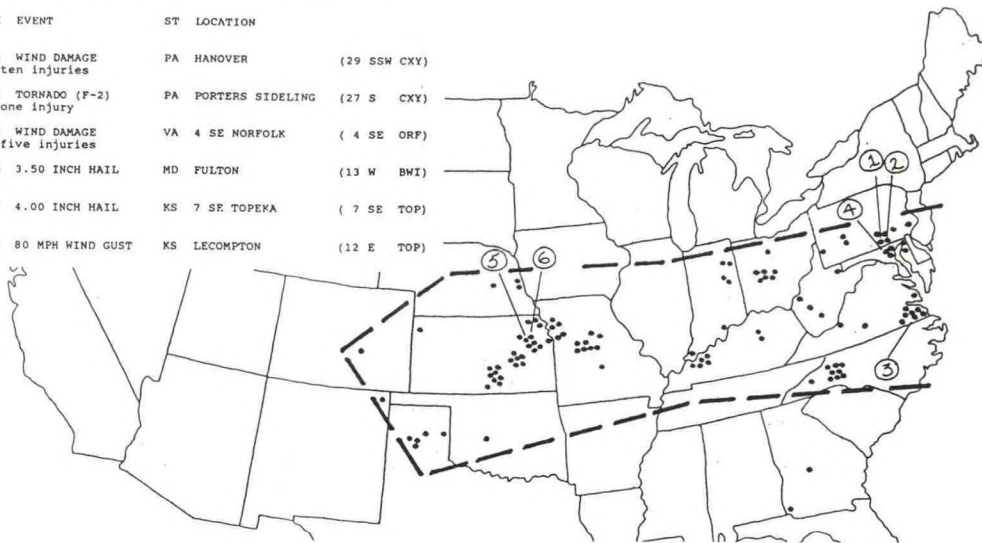
Surface 6PM CST June 7, 1990



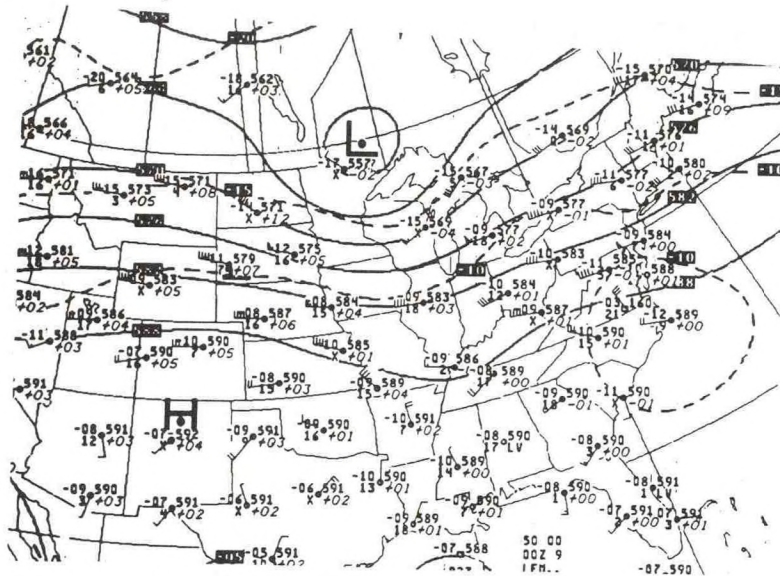
GOES 7PM CST June 7, 1990

JUNE 8TH-9TH, 1990 0601-0555 CST 110 REPORTS 6 TORNADOES

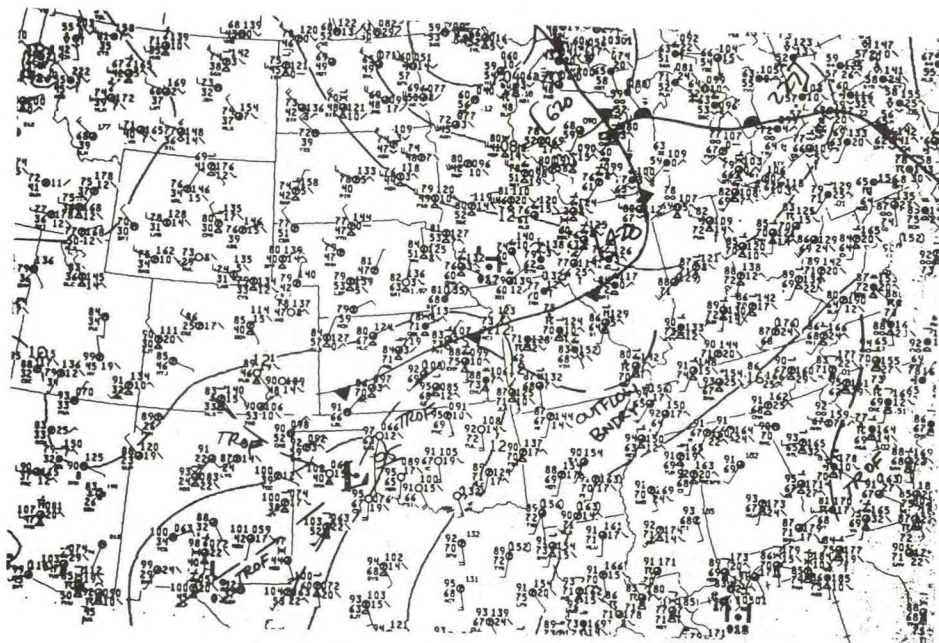
NO	TIME	EVENT	ST	LOCATION	
1	1540	WIND DAMAGE ten injuries	PA	HANOVER	(29 SSW CXY)
2	1600	TORNADO (F-2) one injury	PA	PORTERS SIDELING	(27 S CXY)
3	1615	WIND DAMAGE five injuries	VA	4 SE NORFOLK	(4 SE ORF)
4	1730	3.50 INCH HAIL	MD	FULTON	(13 W BWI)
5	1857	4.00 INCH HAIL	KS	7 SE TOPEKA	(7 SE TOP)
6	1940	80 MPH WIND GUST	KS	LECOMPTON	(12 E TOP)



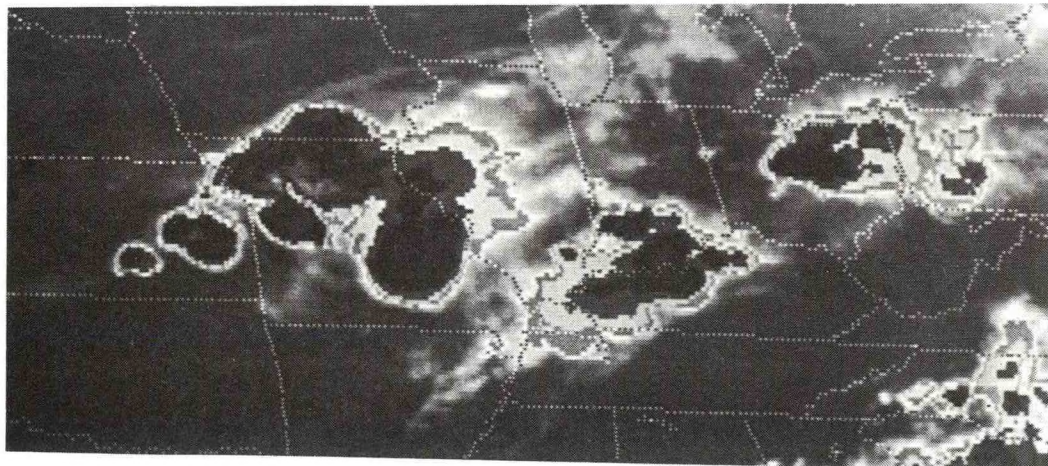
Composite 6PM CST June 8, 1990



500 MB 6PM CST June 8, 1990



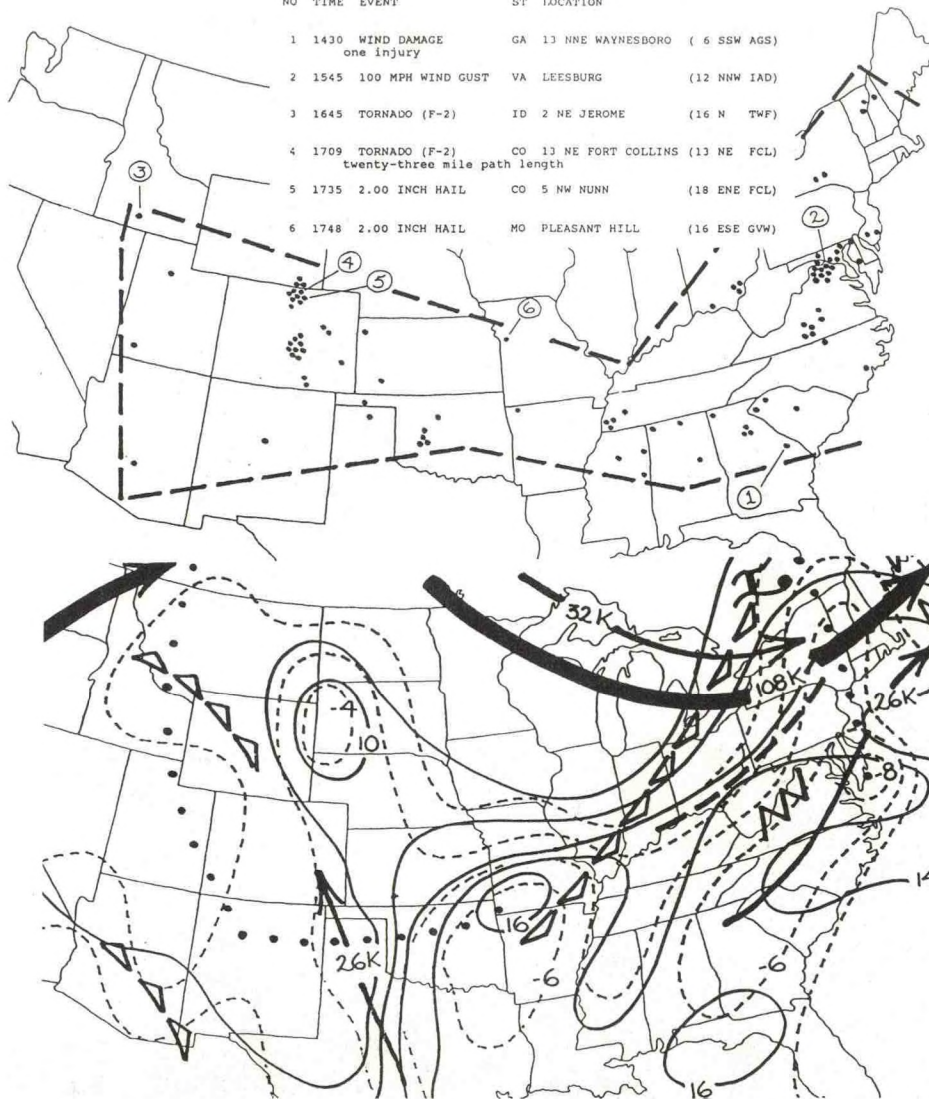
Surface 3PM CST June 8, 1990



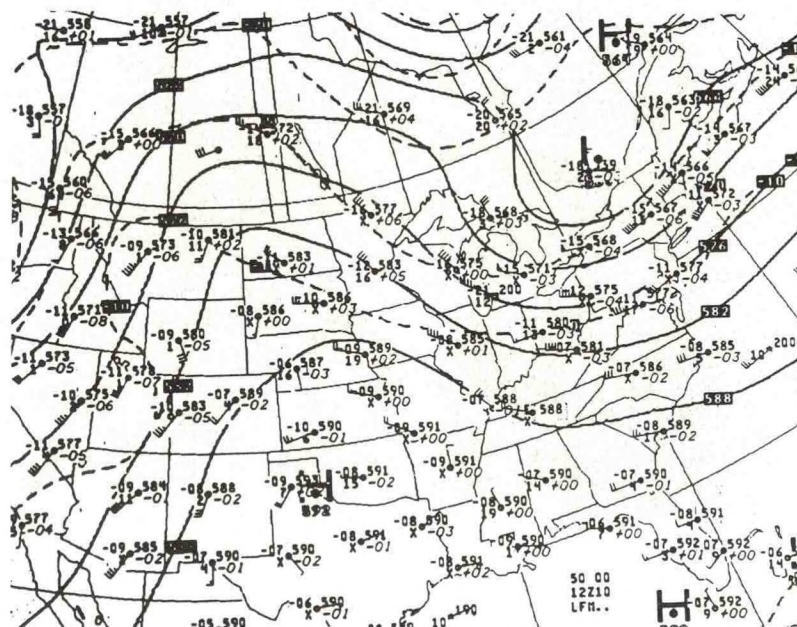
GOES 6PM CST June 8, 1990

JUNE 9TH, 1990 0923-2127 CST 93 REPORTS 11 TORNADOES

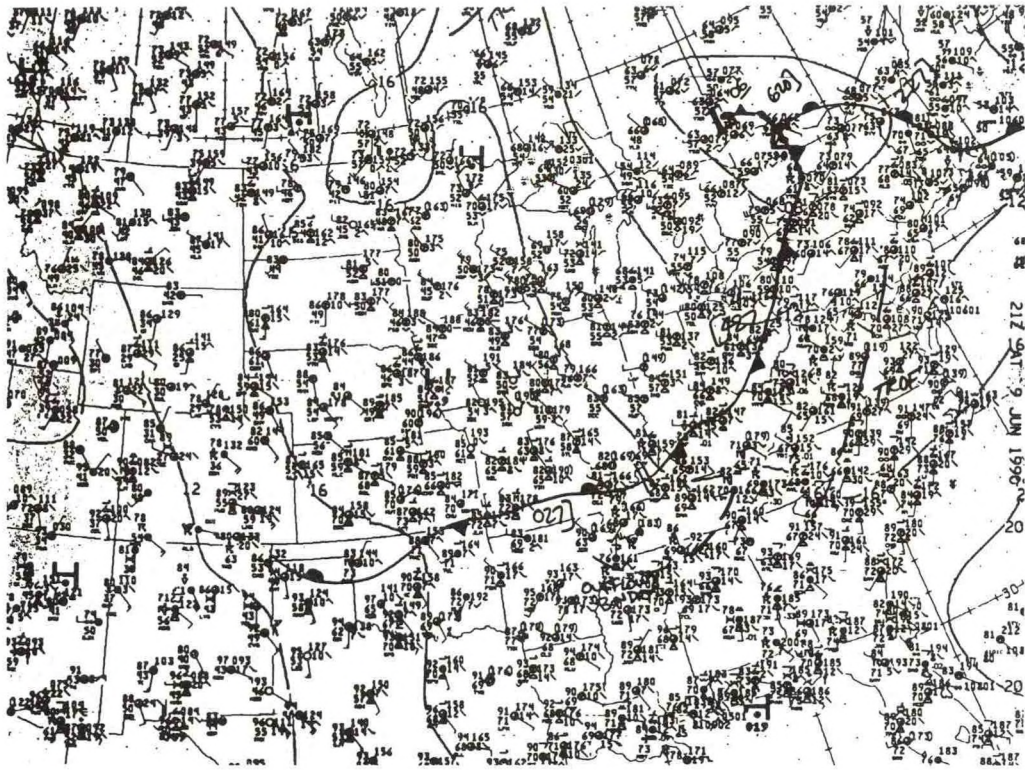
NO	TIME	EVENT	ST	LOCATION
1	1430	WIND DAMAGE one injury	GA	13 NNE WAYNESBORO (6 SSW AGS)
2	1545	100 MPH WIND GUST	VA	LEESBURG (12 NNW IAD)
3	1645	TORNADO (F-2)	ID	2 NE JEROME (16 N TWF)
4	1709	TORNADO (F-2) twenty-three mile path length	CO	13 NE FORT COLLINS (13 NE FCL)
5	1735	2.00 INCH HAIL	CO	5 NW NUNN (18 ENE FCL)
6	1748	2.00 INCH HAIL	MO	PLEASANT HILL (16 ESE GVW)



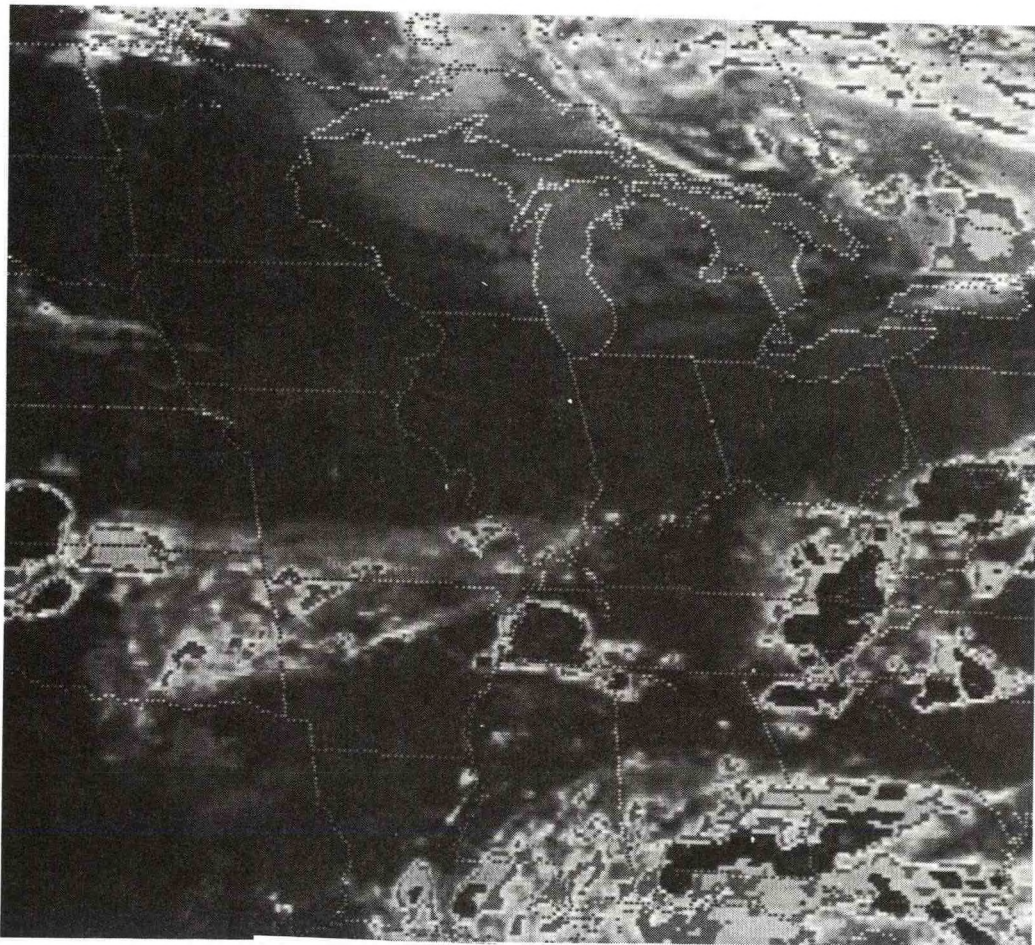
Composite 6PM CST June 9, 1990



500 MB 6PM CST June 9, 1990

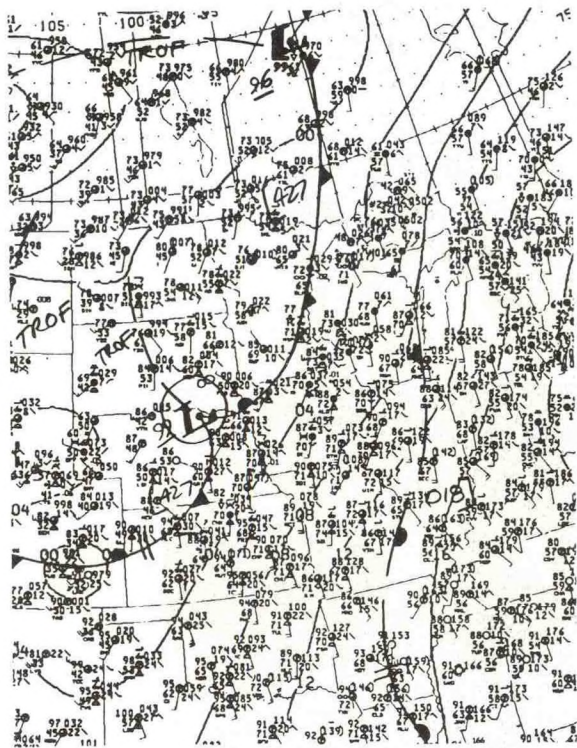


Surface 3PM CST June 9, 1990



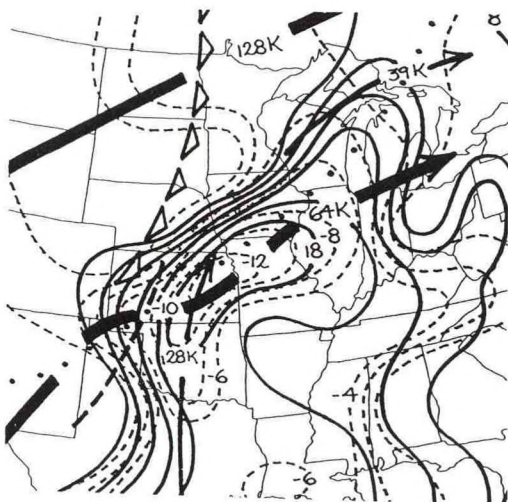
GOES 3PM CST June 9, 1990

NO	TIME	EVENT	ST	LOCATION	
1	1830	6.00 INCH HAIL	NE	GIBBON	(8 E EAR)
2	1835	TORNADO (F-1) one injury	WI	4 WSW ELLSWORTH	(33 E MSP)
3	1910	WIND DAMAGE three injuries	WI	I N KNAIPP	(10 W EAU)
4	1920	WIND DAMAGE four million dollars damage	WI	WHEELER	(25 WNW EAU)
5	EVNG	HAIL DAMAGE twenty-six million dollars damage	NE	BUFFALO/MERRICK CO	(28 ENE GRI)
6	0330	85 MPH WIND GUST	IA	REINBECK	(19 SW ALO)

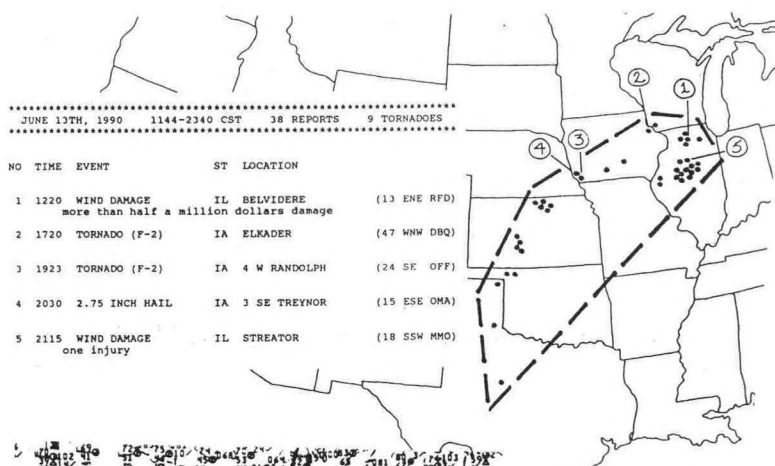


An aerial photograph of a coastal region, likely in the Philippines, showing a grid of dashed lines overlaid on the terrain. The grid is composed of both horizontal and vertical lines, creating a series of rectangular cells. The terrain is rugged and mountainous, with varying shades of gray indicating different elevations and vegetation. In the lower right portion of the image, there are several distinct, rounded, and somewhat irregular shapes that appear to be small islands or peninsulas. These shapes are also covered by the grid lines. The overall image has a grainy, high-contrast quality typical of older aerial photography.

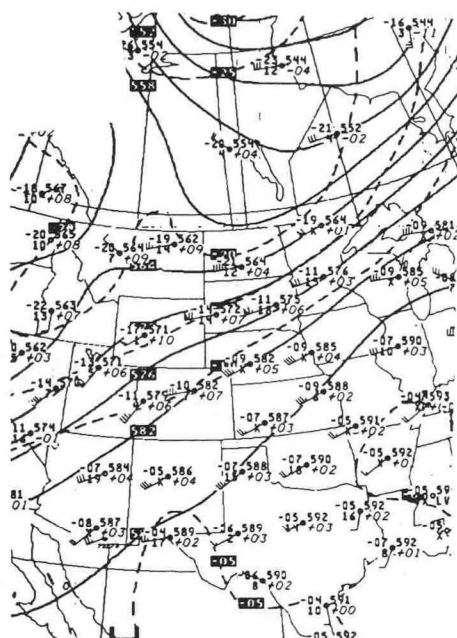
100



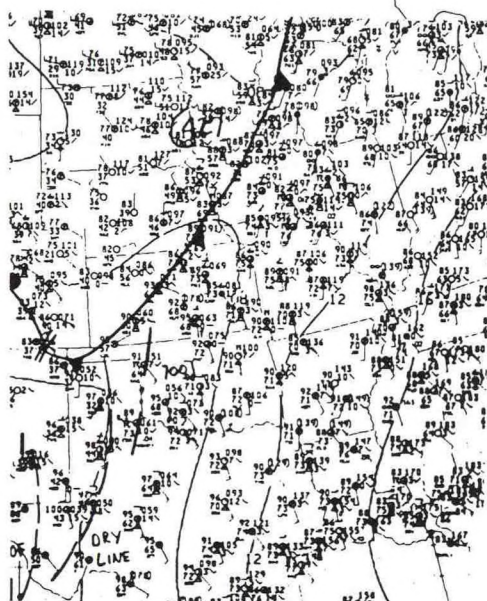
Composite 6PM CST June 13, 1990



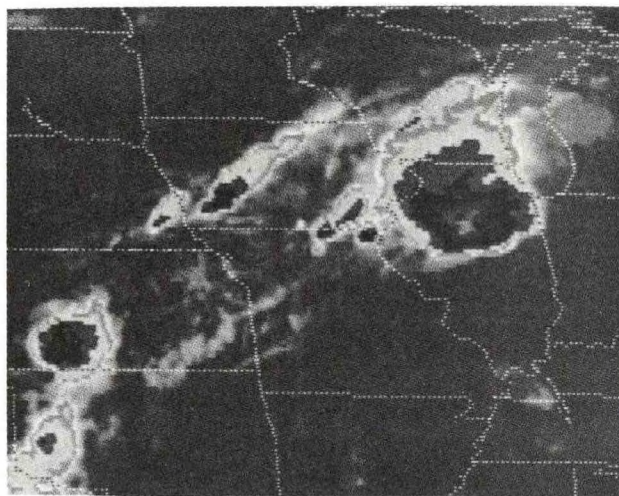
JUNE 13TH, 1990 1144-2340 CST 38 REPORTS 9 TORNADOES			
NO	TIME EVENT	ST LOCATION	
1	1220 WIND DAMAGE more than half a million dollars damage	IL BELVIDERE	(13 ENE RFD)
2	1720 TORNADO (F-2)	IA ELKADER	(47 WNW DBQ)
3	1923 TORNADO (F-2)	IA 4 W RANDOLPH	(24 SE OFF)
4	2030 2.75 INCH HAIL	IA 3 SE TREYNOR	(15 ESE OMA)
5	2115 WIND DAMAGE one injury	IL STREATOR	(18 SSW MMO)



500 MB 6PM CST June 13, 1990



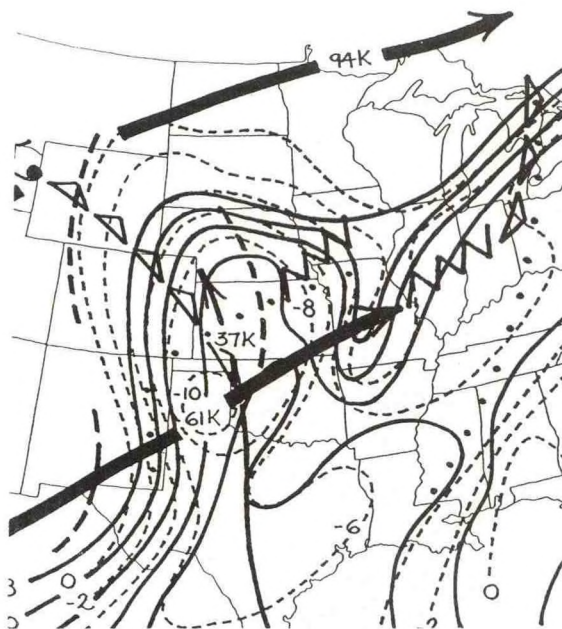
Surface 6PM CST June 13, 1990



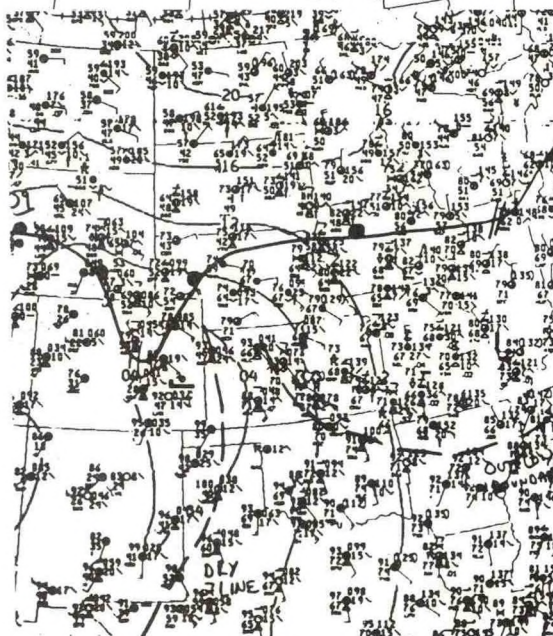
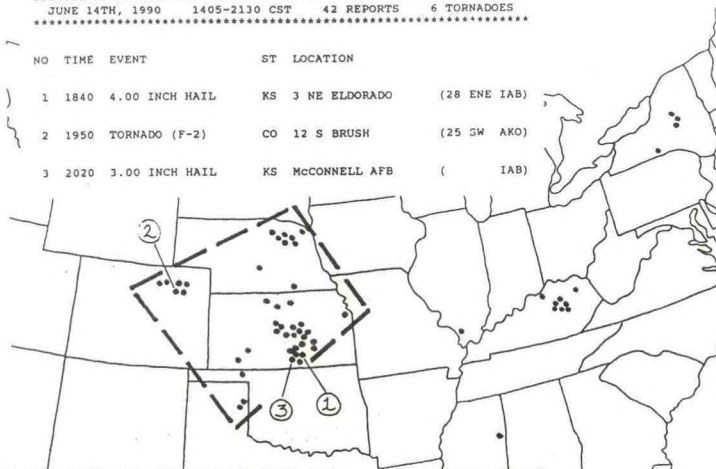
GOES 7:30 PM CST June 13, 1990

JUNE 14TH, 1990 1405-2130 CST 42 REPORTS 6 TORNADES

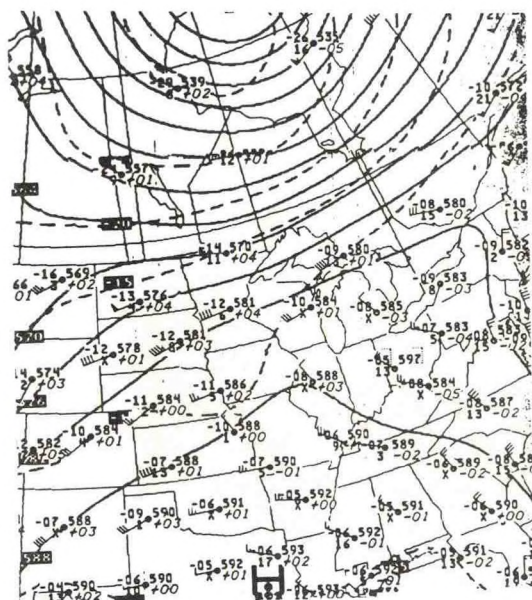
NO	TIME	EVENT	ST	LOCATION	
1	1840	4.00 INCH HAIL	KS	3 NE ELDORADO	(28 ENE IAB)
2	1950	TORNADO (F-2)	CO	12 S BRUSH	(25 SW AKO)
3	2020	3.00 INCH HAIL	KS	McCONNELL AFB	(IAB)



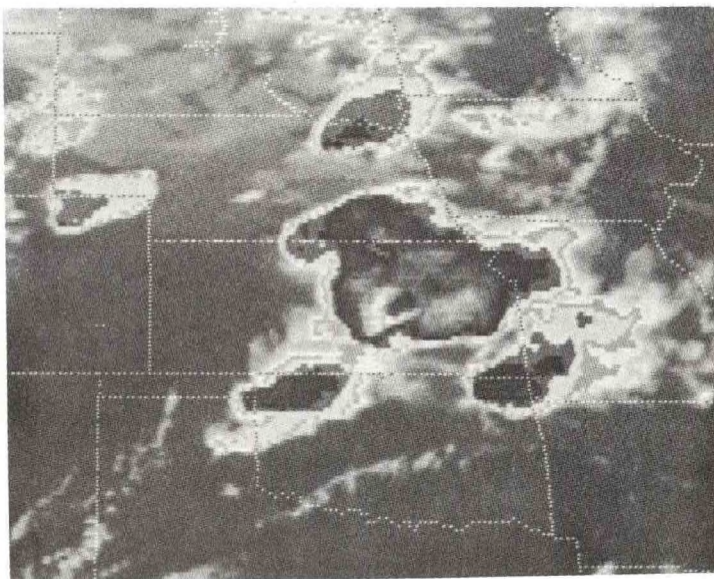
Composite 6PM CST June 14, 1990



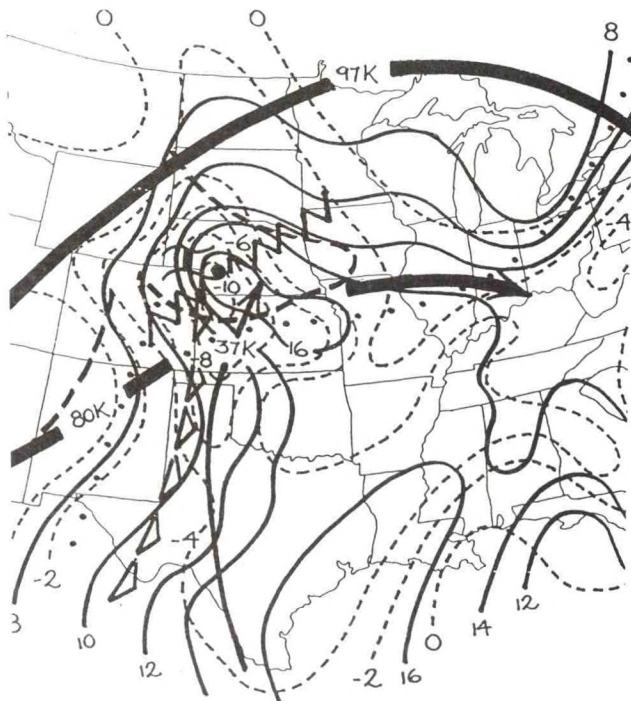
Surface 6PM CST June 14, 1990



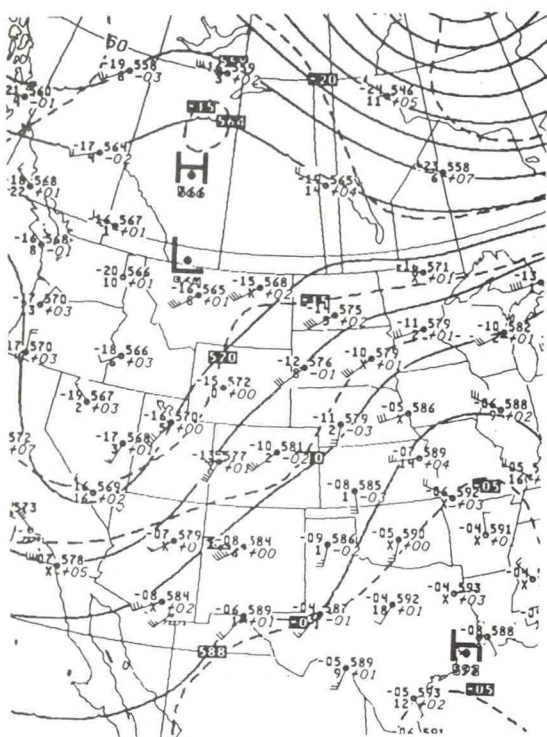
500 MB 6PM CST June 14, 1990



GOES 7PM CST June 14, 1990



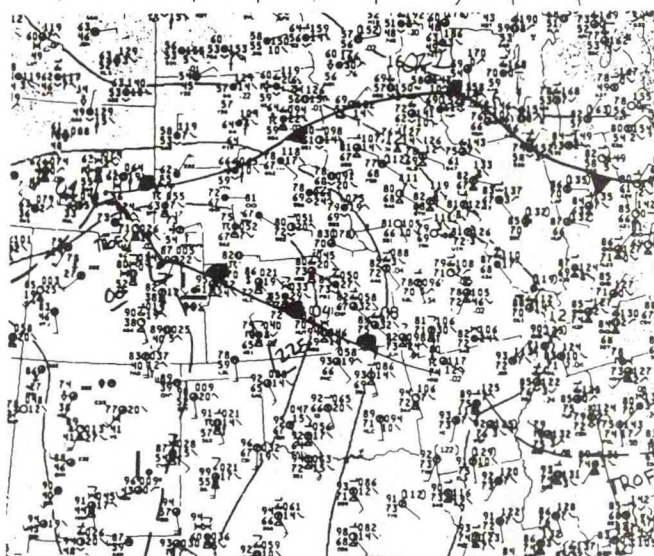
Composite 6PM CST June 15, 1990



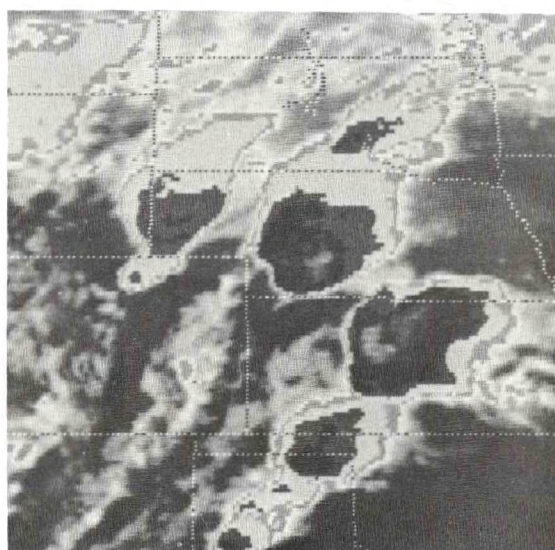
500 MB 6PM CST June 15, 1990

JUNE 15TH, 1990 0745-2125 CST 43 REPORTS 12 TORNADOES

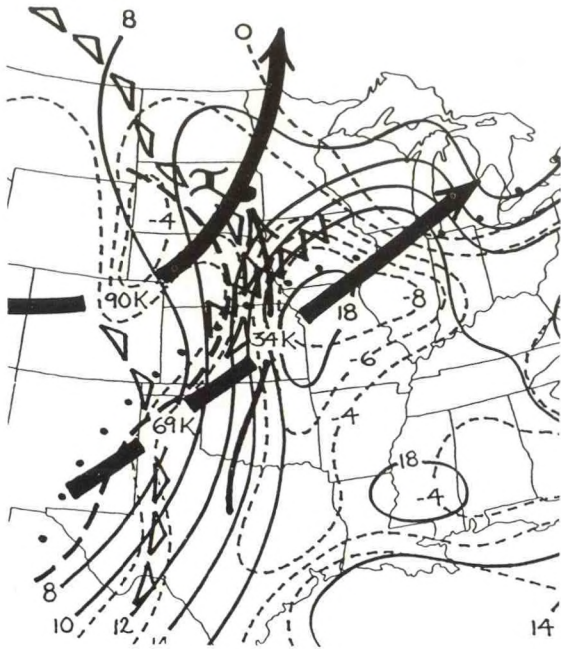
NO	TIME	EVENT	ST	LOCATION	
1	0920	80 MPH WIND GUST three injuries	KS	SILVER LAKE	(12 W TOP)
2	1749	2.00 INCH HAIL	NE	18 W KIMBALL	(54 W SNY)
3	1800	TORNADO (F-3) one injury, nearly two million dollars damage, twenty-eight mile path length	NE	18 W KIMBALL	(54 W SNY)
4	1900	92 MPH WIND GUST	KS	WILSON LAKE DAM	(15 ENE RSL)



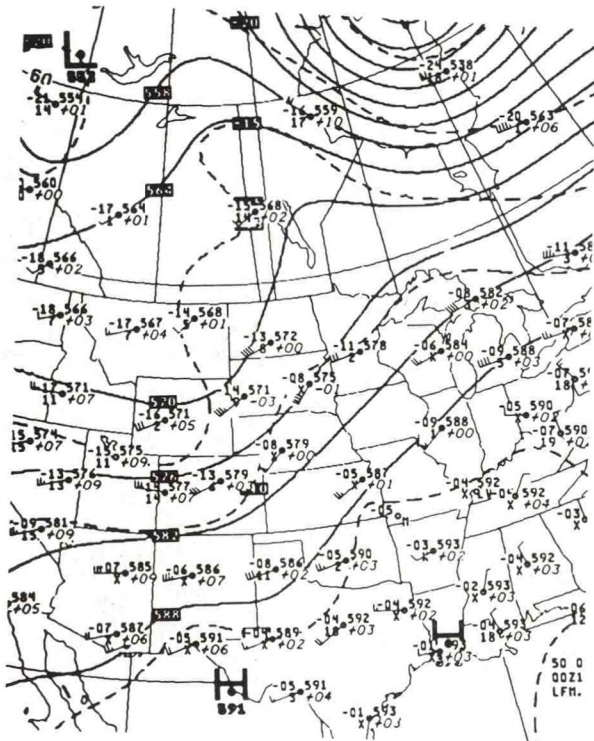
Surface 6PM CST June 15, 1990



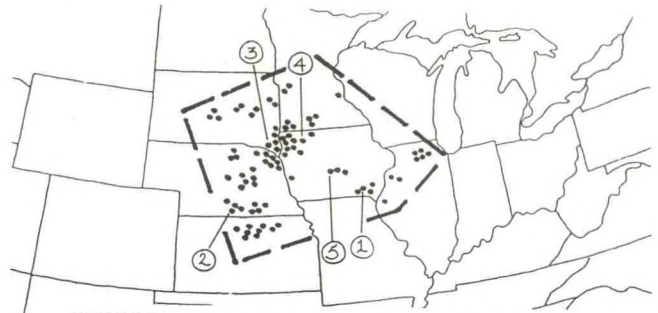
GOES 6PM CST June 15, 1990



Composite 6PM CST June 16, 1990

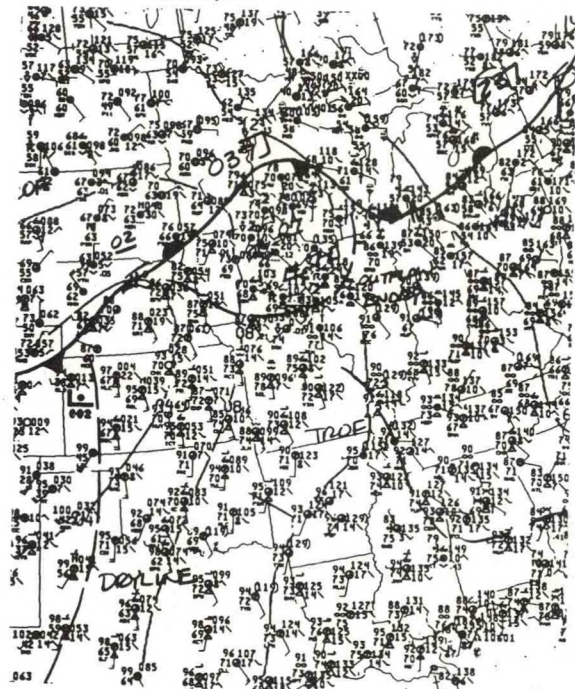


500 MB 6PM CST June 16, 1990

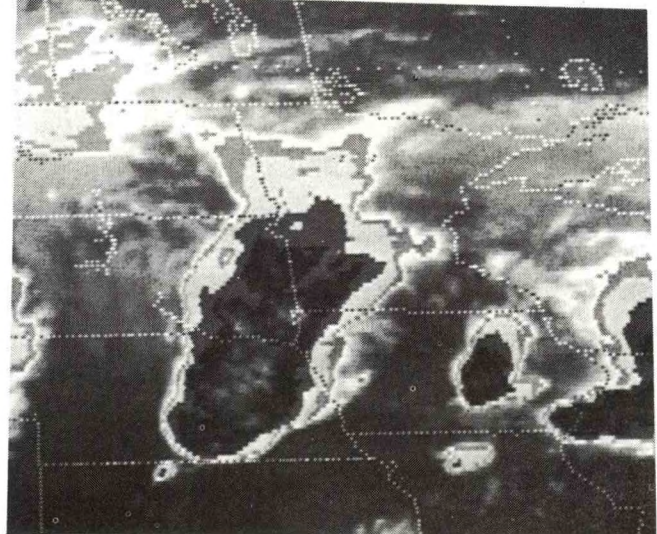


JUNE 16-17TH 0515-0345 CST 83 REPORTS 29 TORNADOES

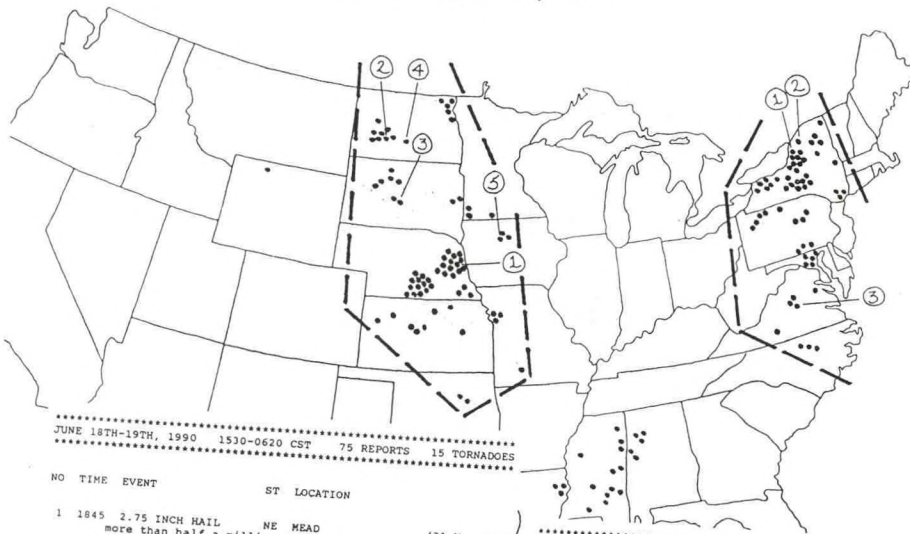
NO	TIME	EVENT	ST	LOCATION	
1	1233	TORNADO (F-2)	IA	8 SW OTTUMWA	(8 SW OTM)
2	1600	4.00 INCH HAIL	NE	ALMA	(47 SSW EAR)
3	1710	TORNADO (F-1) two million dollars damage	SD	3 E HUB CITY	(28 E YKN)
4	2028	105 MPH WIND GUST	IA	SPENCER	(3SE)
5	2345	WIND DAMAGE three injuries	IA	VAN METER	(16 W DSM)



Surface 3PM CST June 16, 1990



GOES 6PM CST June 16, 1990

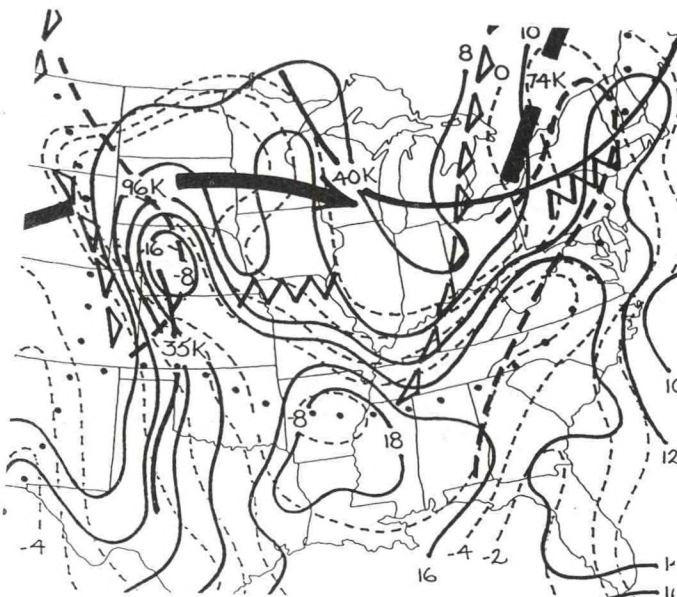


JUNE 18TH-19TH, 1990 1530-0620 CST 75 REPORTS 15 TORNADOES

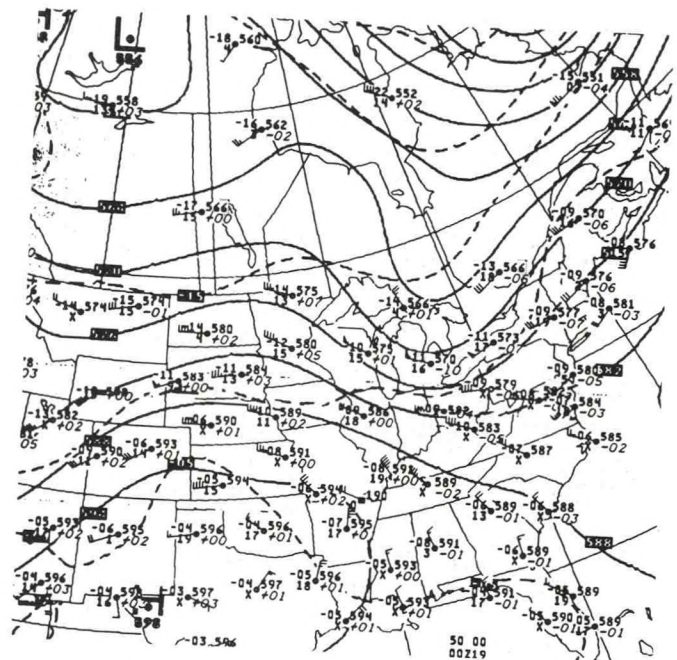
NO	TIME	EVENT	ST	LOCATION	
1	1845	2.75 INCH HAIL more than half a million dollars damage	NE	MEAD	(31 W OMA)
2	1940	3.50 INCH HAIL more than half a million dollars damage	ND	GOLDEN VALLEY	(48 NE DIK)
3	2207	85 MPH WIND GUST	SD	PIERRE	(PIR)
4	2010	TORNADO (F-2)	ND	6 W HANOVER	(40 WNW BIS)
5	0515	TORNADO (F-2) more than half a million dollars damage, 16 mile path	IA	16 N MANSON	(18 W PDD)

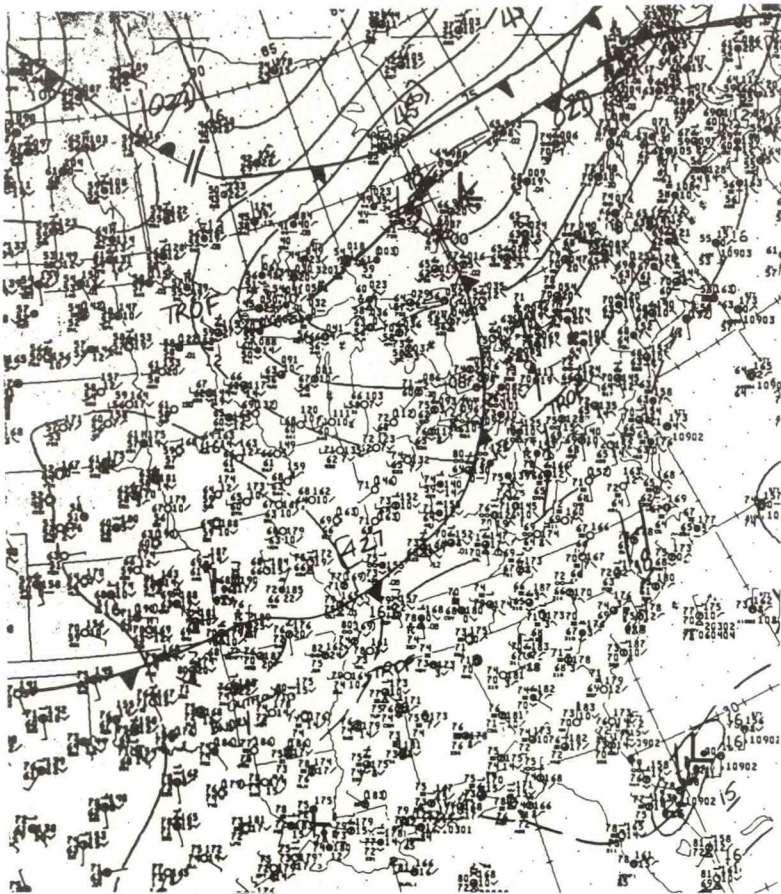
JUNE 18TH, 1990 0605-2034 CST 58 REPORTS

NO	TIME	EVENT	ST	LOCATION	
1	0822	80 MPH WIND GUST one injury	NY	STILLWATER RESERVOIR	(45 ENE ART)
2	0942	WIND DAMAGE two injuries	NY	NORFOLK	(11 SW MSS)
3	1439	80 MPH WIND GUST	VA	VOLENG	(29 SSE LWH)

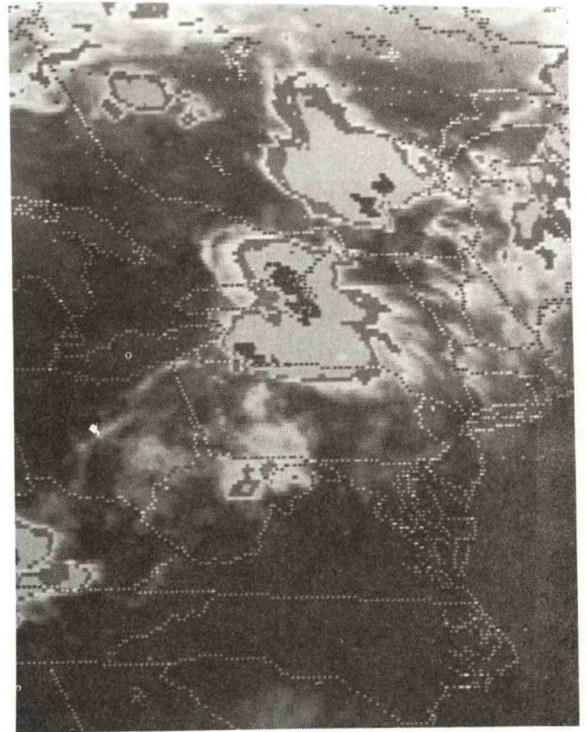


Composite 6PM CST June 18, 1990

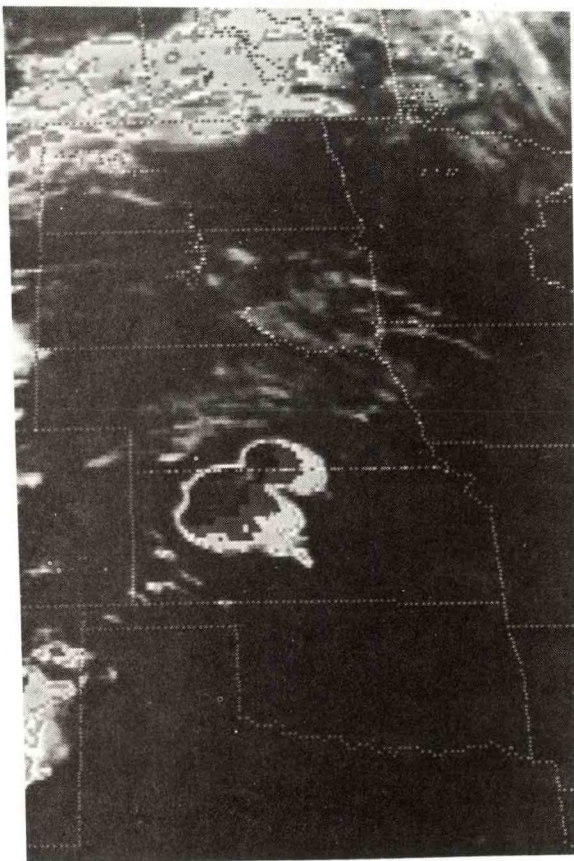




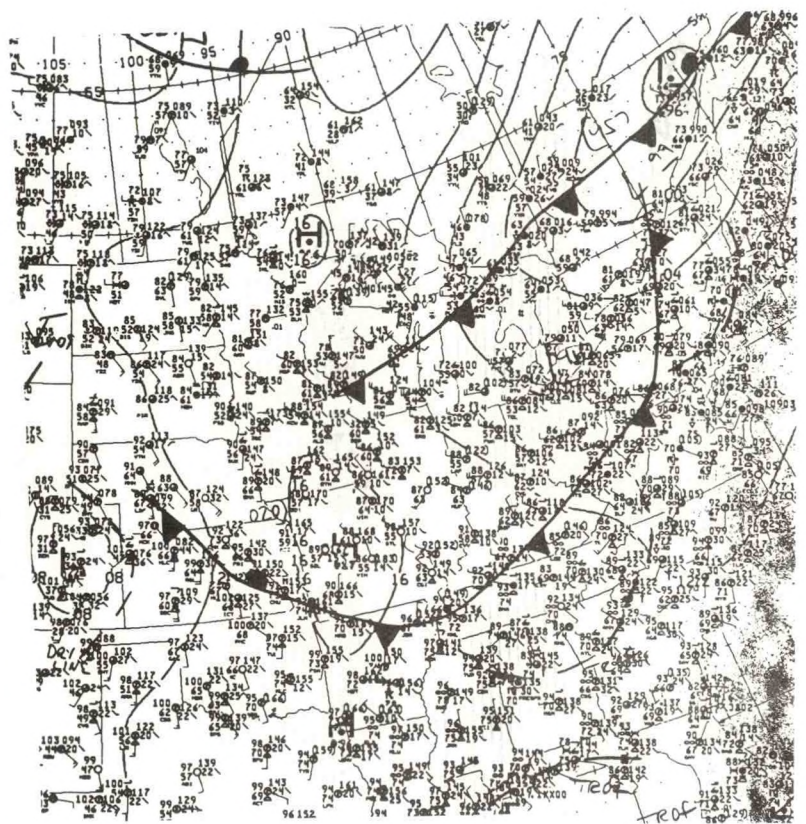
Surface 6AM CST June 18, 1990



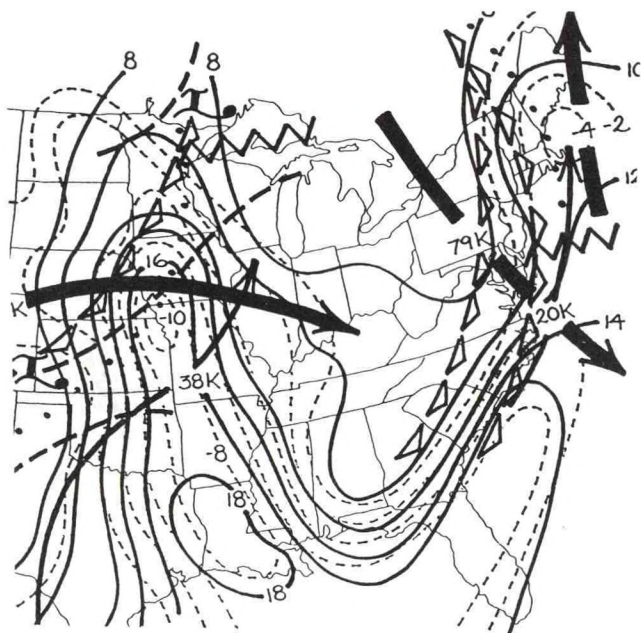
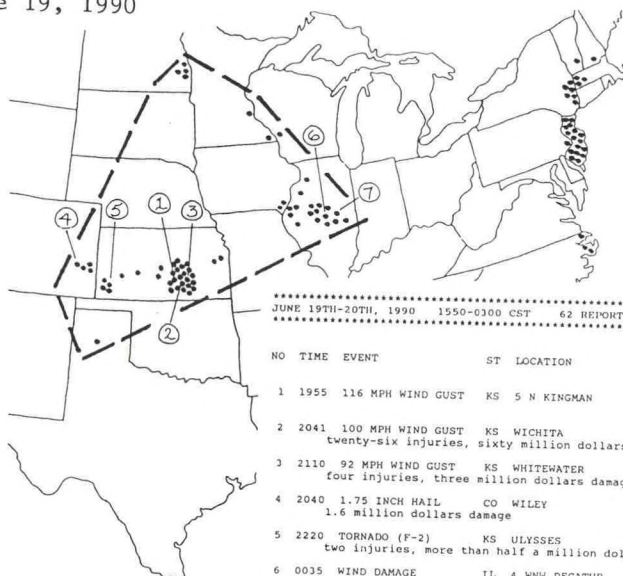
GOES 7AM CST June 18, 1990



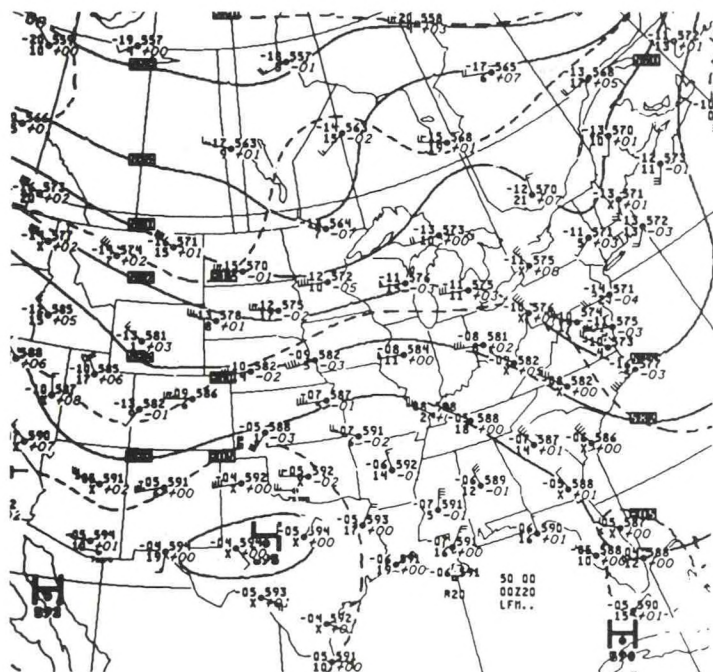
GOES 4PM CST June 18, 1990



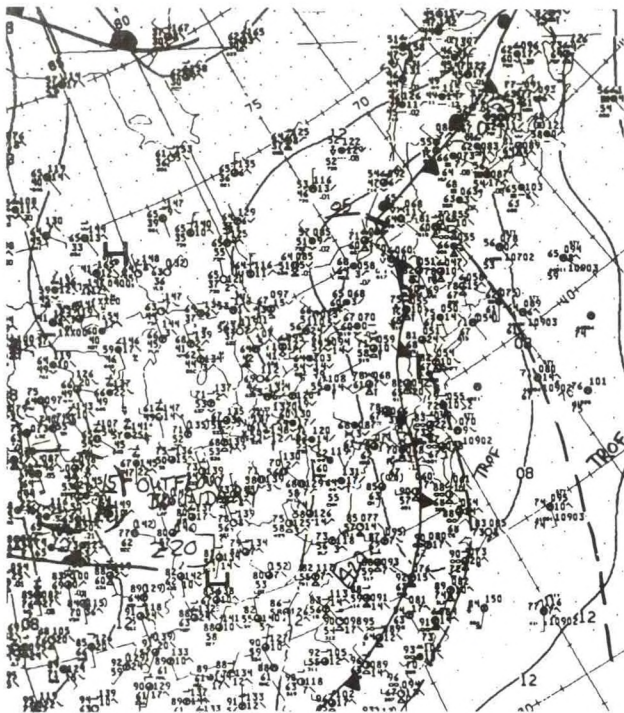
106 Surface 3PM CST June 18, 1990



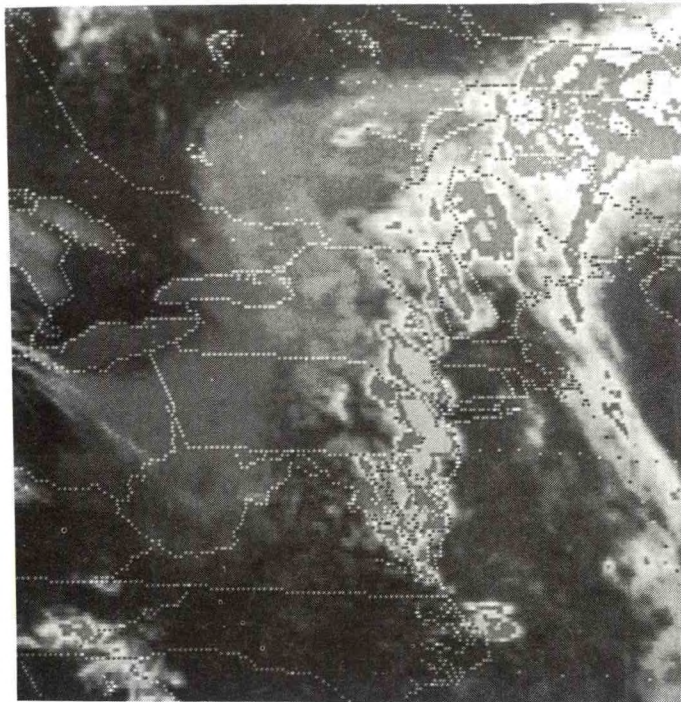
Composite 6PM CST June 19, 1990



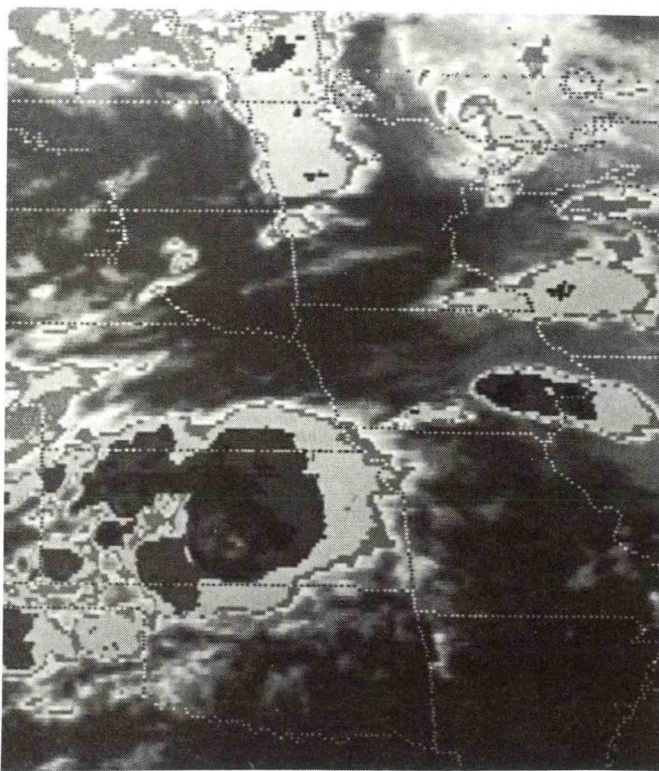
500 MB 6PM CST June 19, 1990



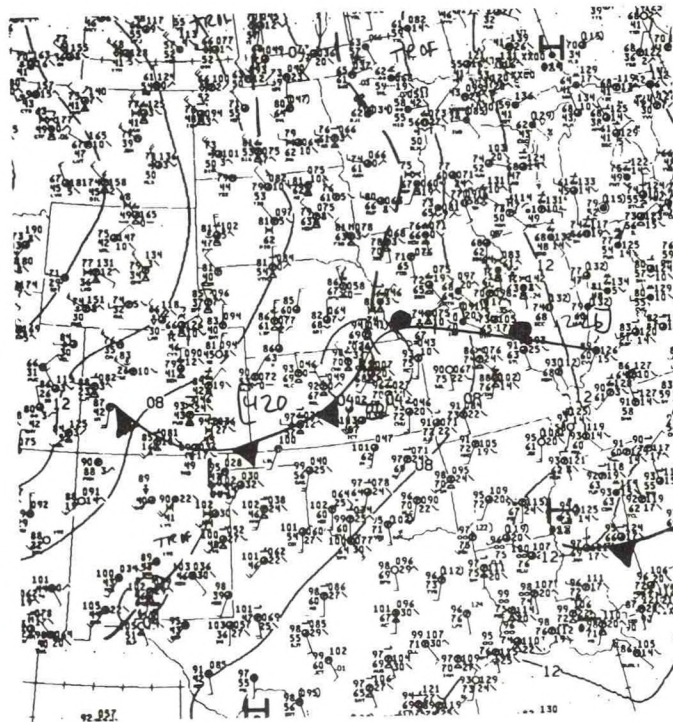
Surface 12 Noon CST June 19, 1990



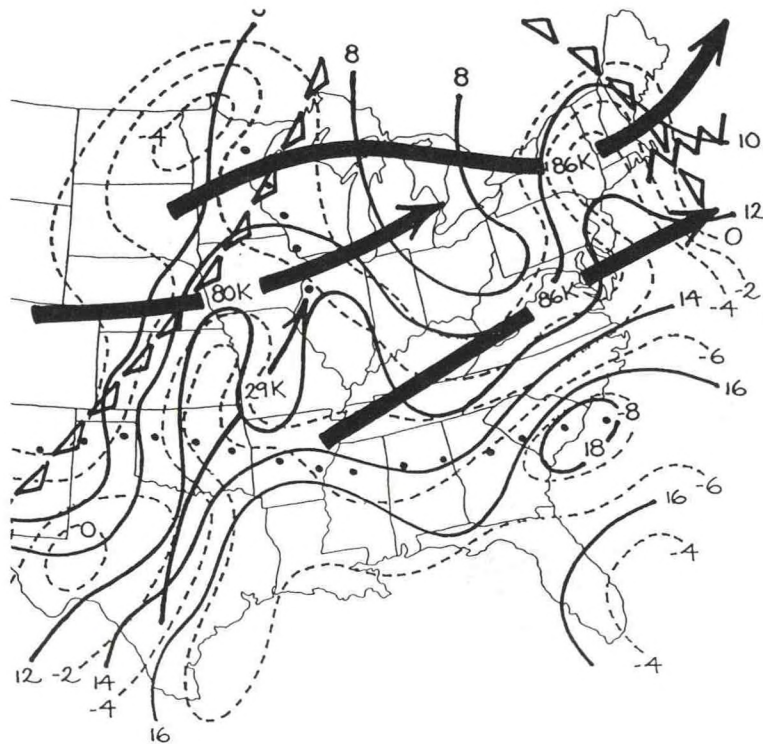
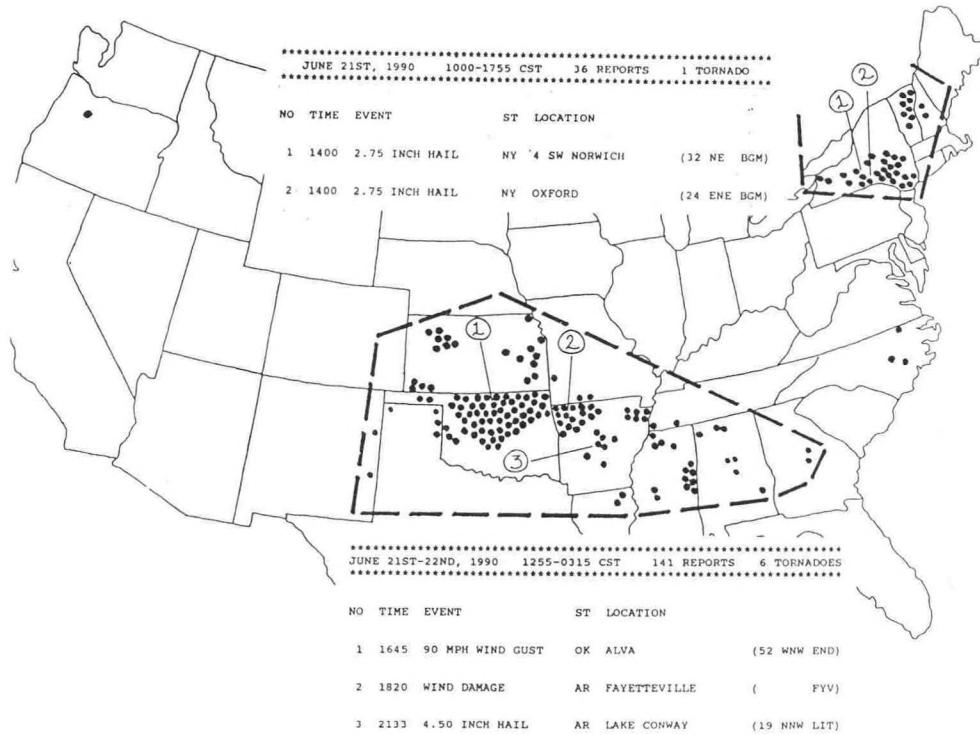
GOES 2PM CST June 19, 1990



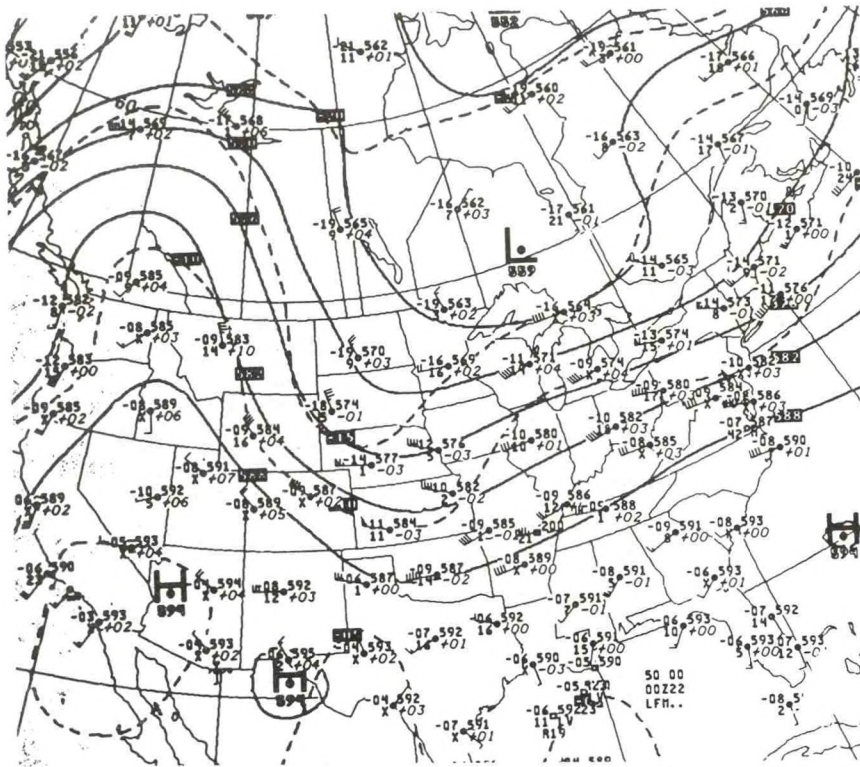
GOES 8PM CST June 19, 1990



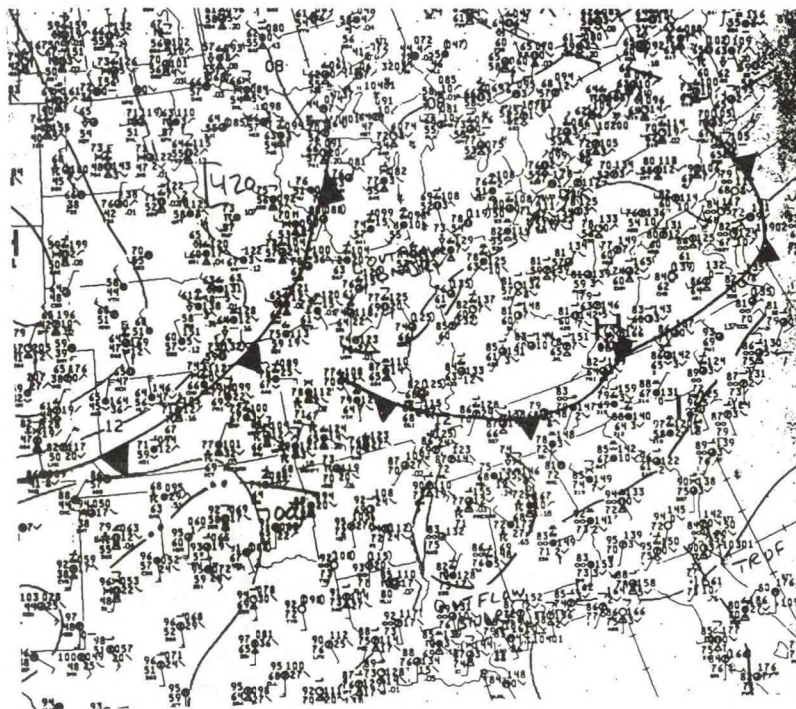
Surface 3PM CST June 19, 1990



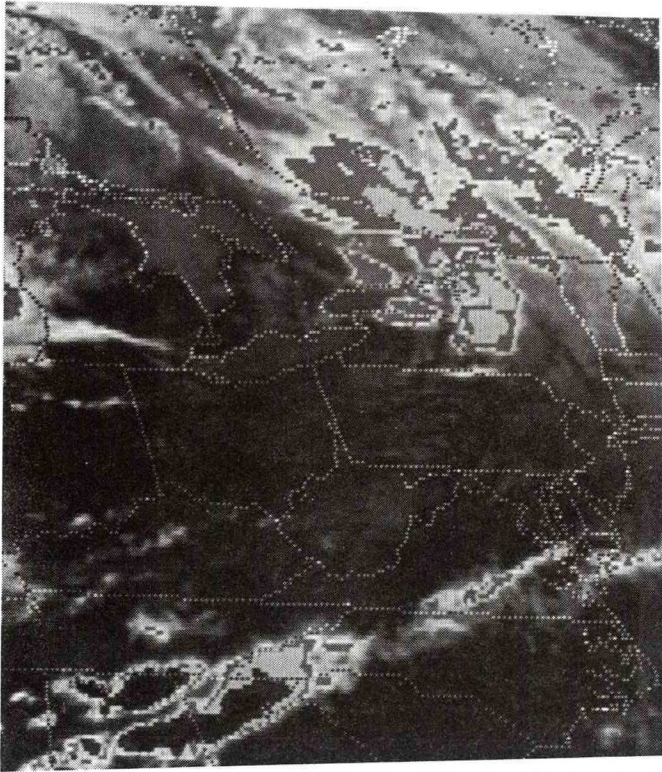
Composite 6PM CST June 21, 1990



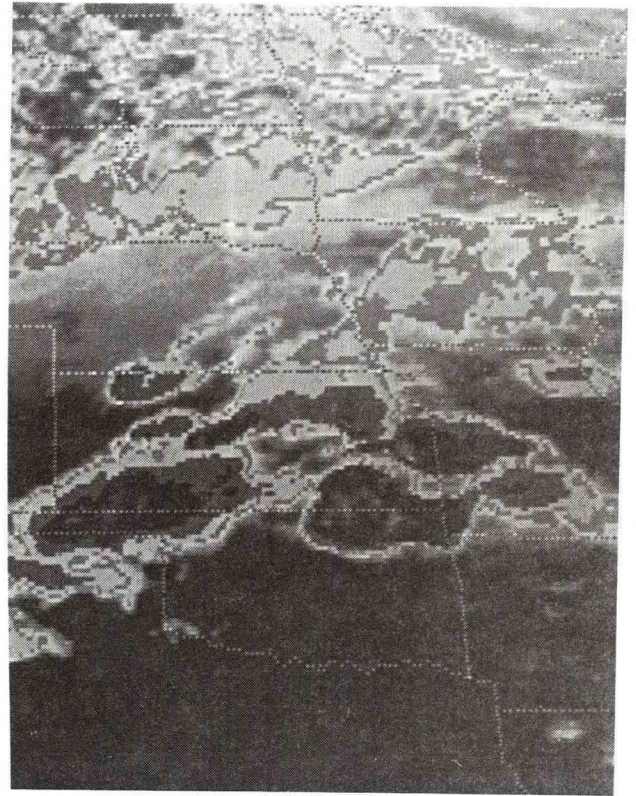
500 MB 6PM CST June 21, 1990



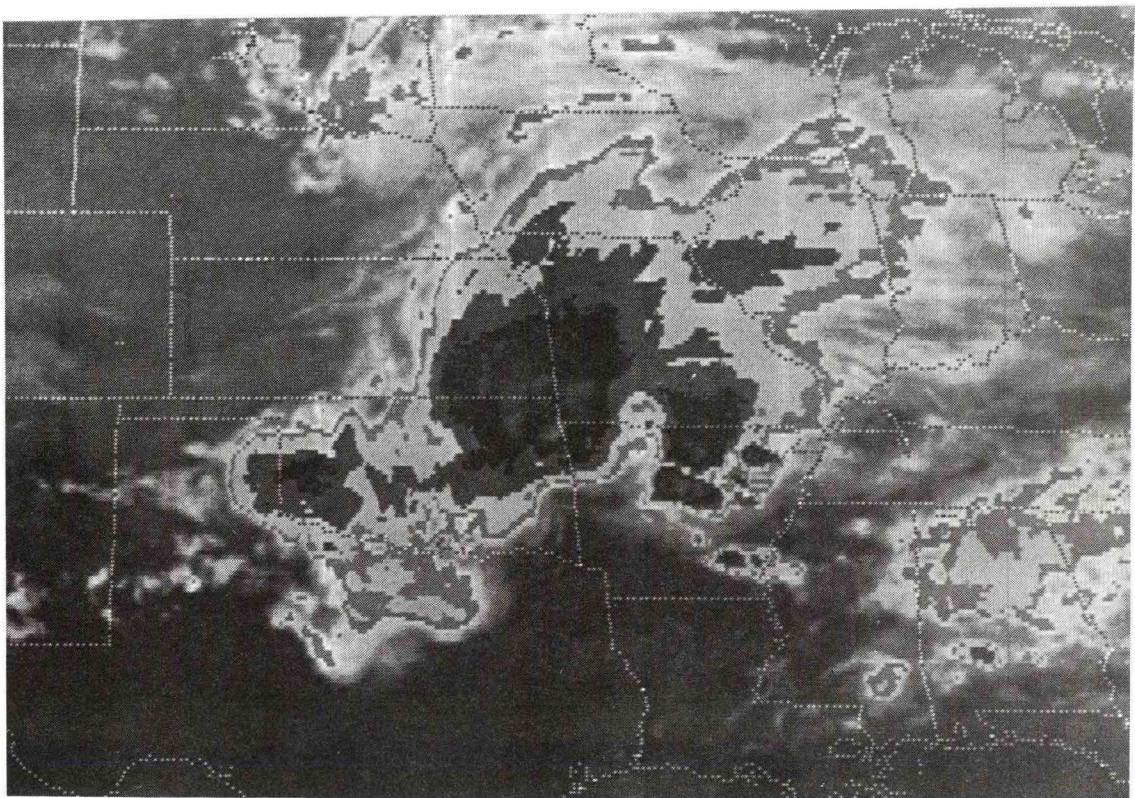
Surface 6PM CST June 21, 1990



GOES 1PM CST June 21, 1990

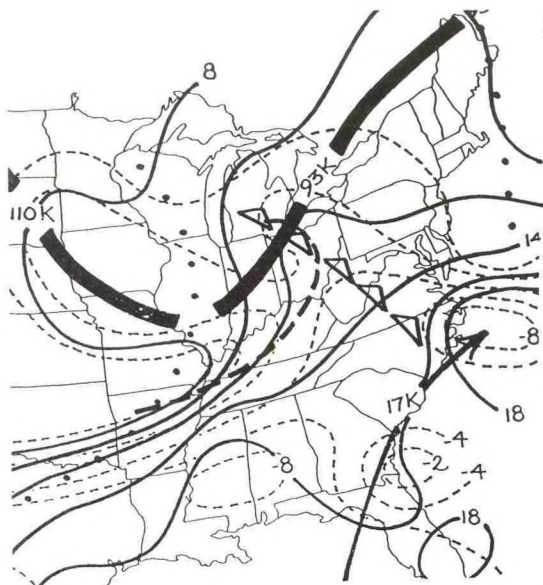


GOES 3PM CST June 21, 1990



GOES 9PM CST June 21, 1990

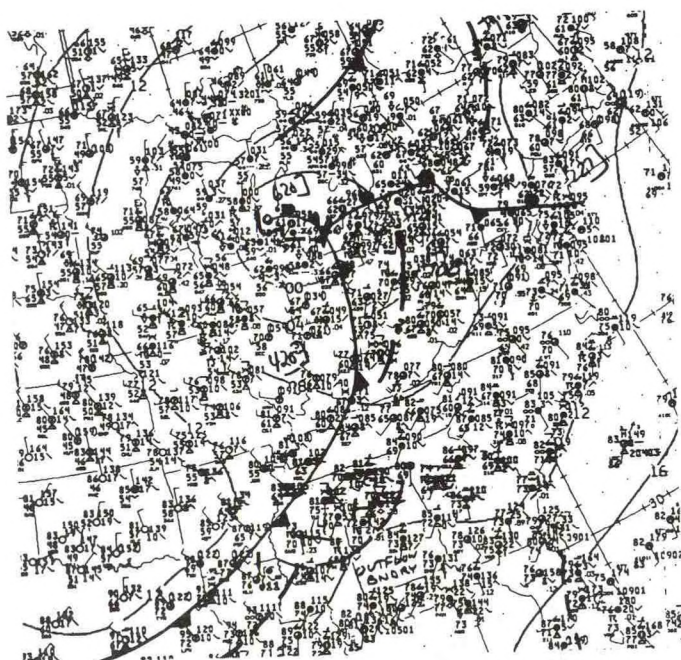
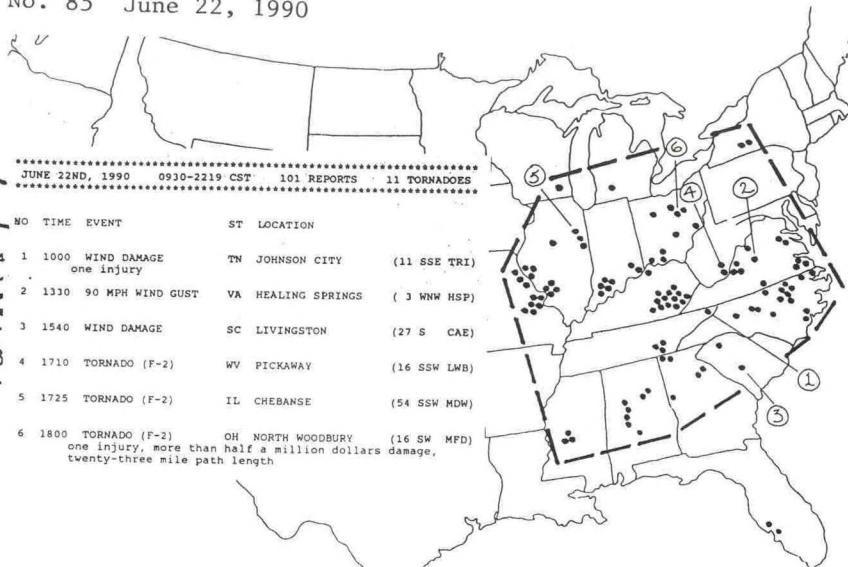
No. 85 June 22, 1990



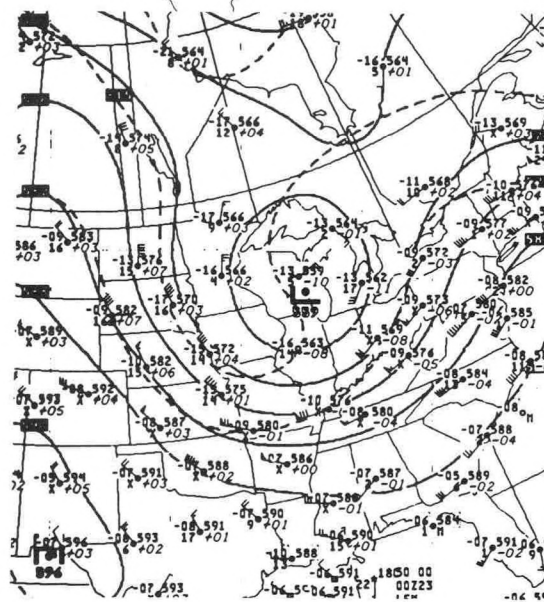
Composite 6PM CST June 22, 1990

JUNE 22ND, 1990 0930-2219 CST 101 REPORTS 11 TORNADOES

NO	TIME	EVENT	ST	LOCATION	
1	1000	WIND DAMAGE one injury	TN	JOHNSON CITY	(11 SSE TRI)
2	1330	90 MPH WIND GUST	VA	HEALING SPRINGS	(3 WNW HSP)
3	1540	WIND DAMAGE	SC	LIVINGSTON	(27 S CAE)
4	1710	TORNADO (F-2)	WV	PICKAWAY	(16 SSW LWB)
5	1725	TORNADO (F-2)	IL	CHEBANSE	(54 SSW MDW)
6	1800	TORNADO (F-2) one injury, more than half a million dollars damage, twenty-three mile path length	OH	NORTH WOODBURY	(16 SW MFD)



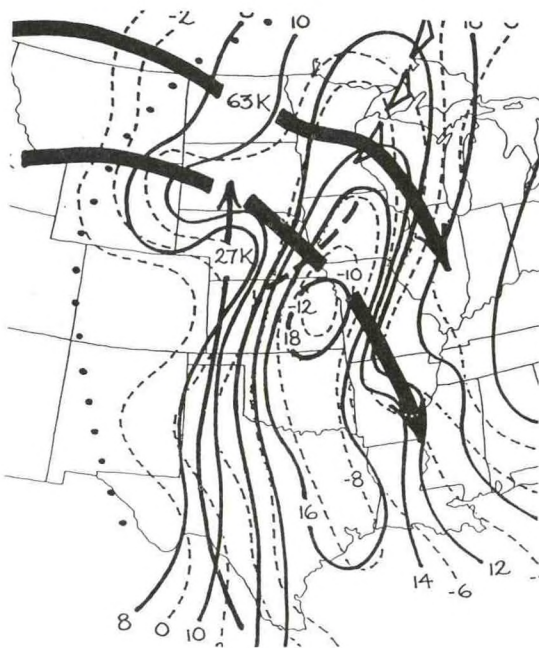
Surface 6PM CST June 22, 1990



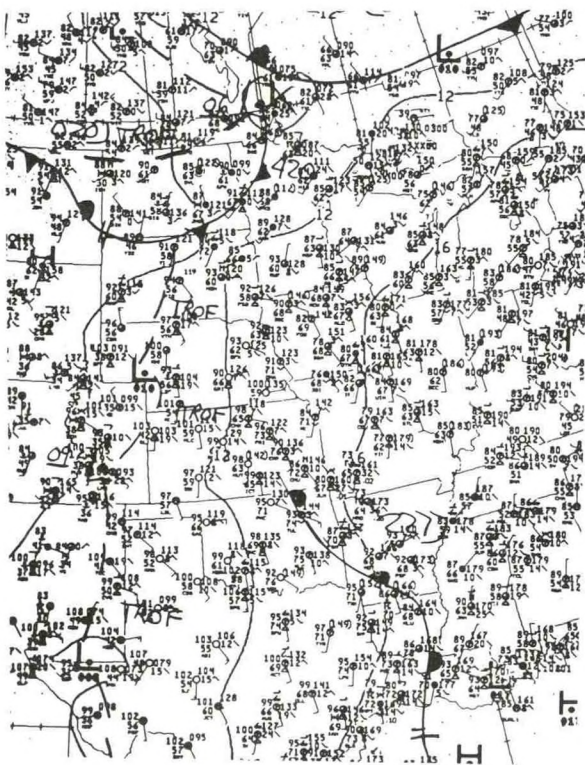
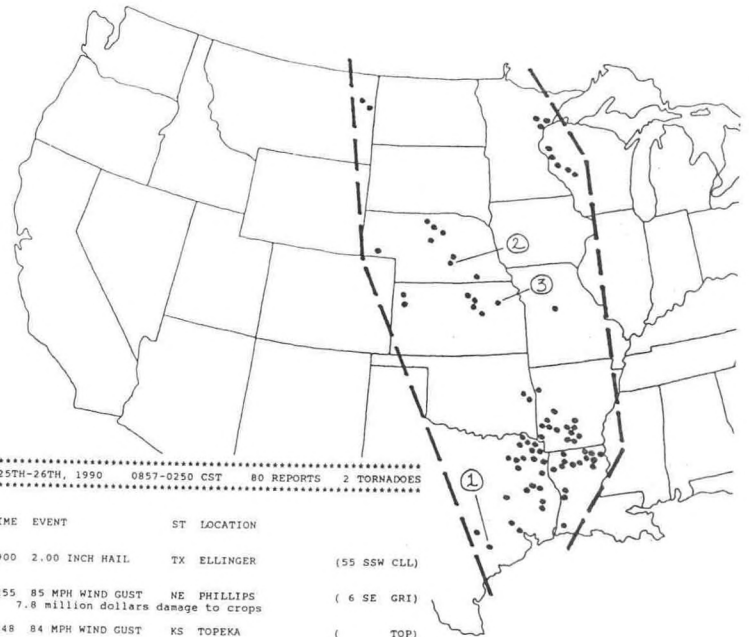
500 MB 6PM CST June 22, 1990



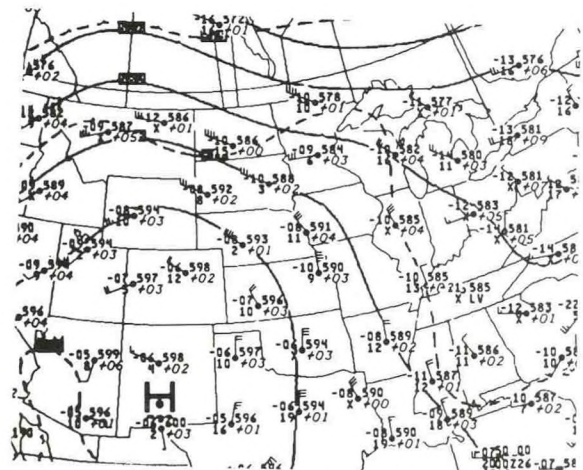
GOES 6PM CST June 22, 1990



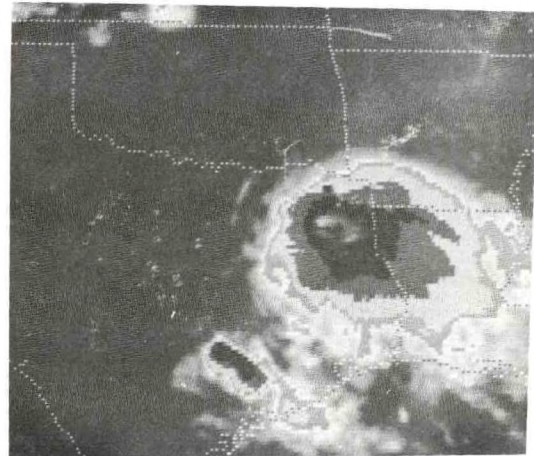
Composite 6PM CST June 25, 1990



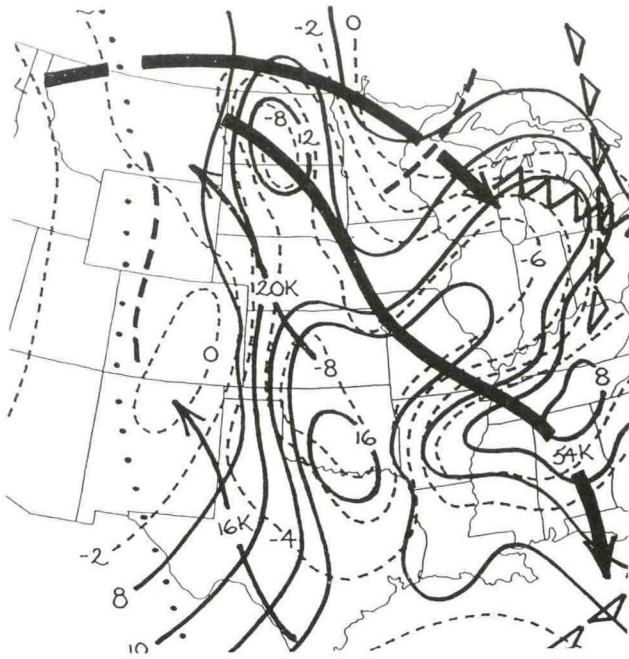
Surface 3PM CST June 25, 1990



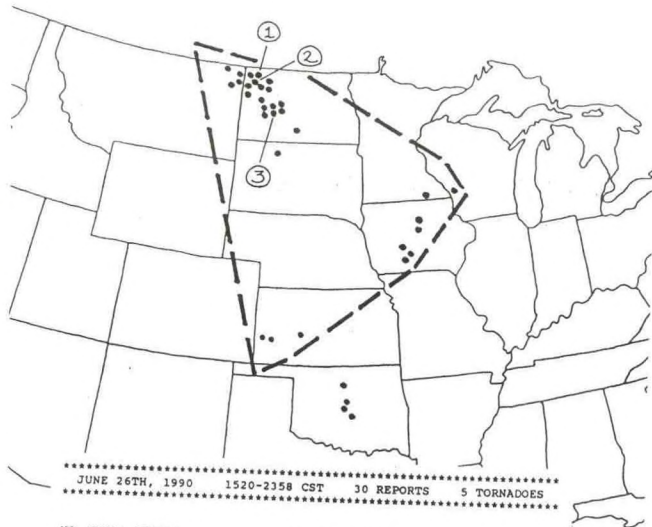
500 MB 6PM CST June 25, 1990



GOES 8PM CST June 25, 1990

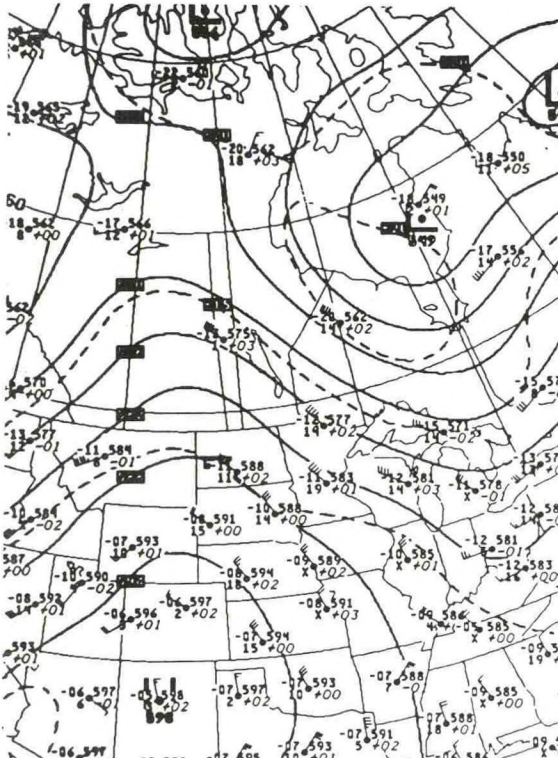


Composite 6PM CST June 26, 1990

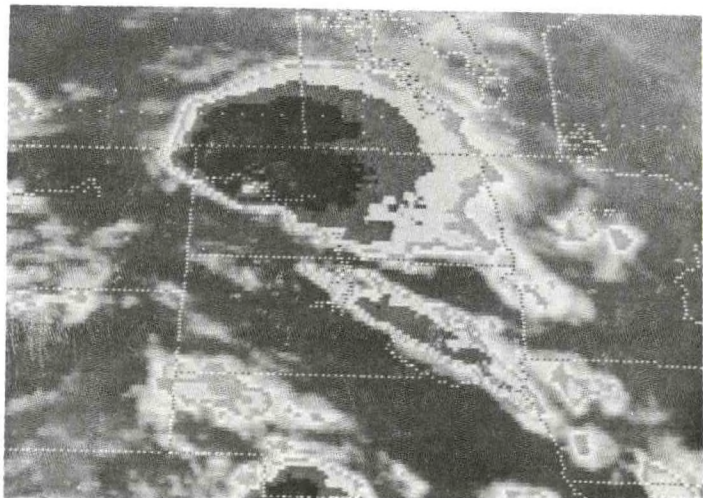


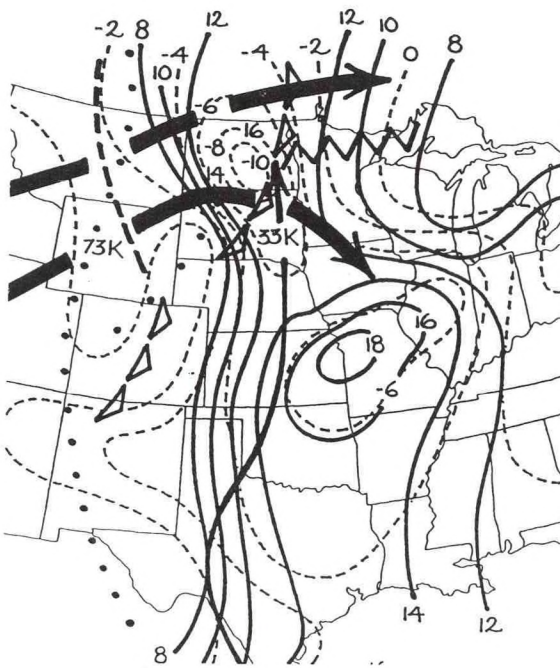
JUNE 26TH, 1990 1520-2358 CST 30 REPORTS 5 TORNADOES

NO	TIME	EVENT	ST	LOCATION	
1	2015	2.75 INCH HAIL	ND	WATFORD CITY	(30 SE ISN)
2	2116	70 MPH WIND GUST one death, one injury, more than 0.5 million dollars damage	ND	26 E WILLISTON	(26 E ISN)
3	2247	73 MPH WIND GUST	BEULAH		(58 ENE DIK)

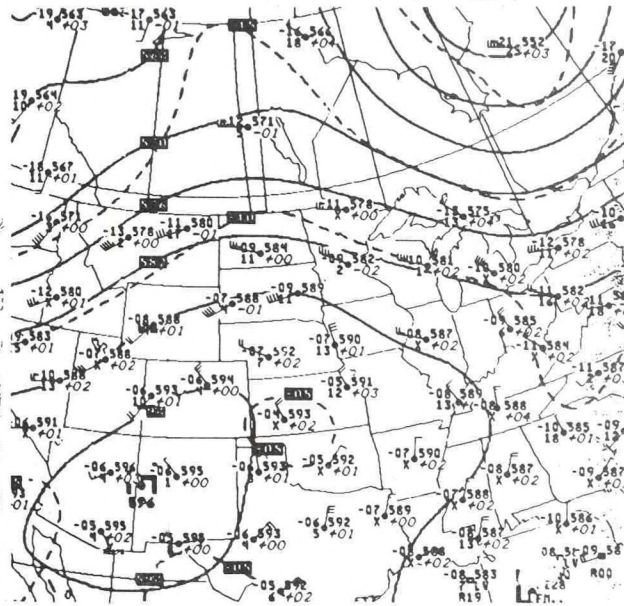
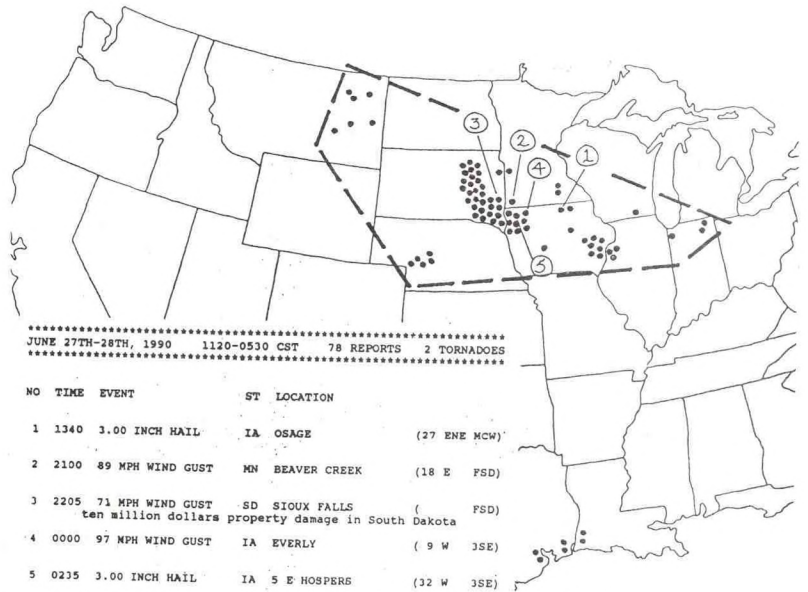


Surface 9PM CST June 26, 1990

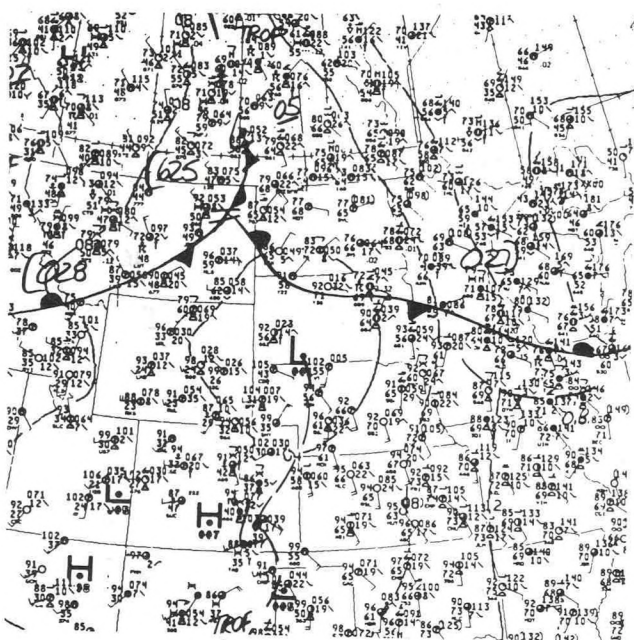




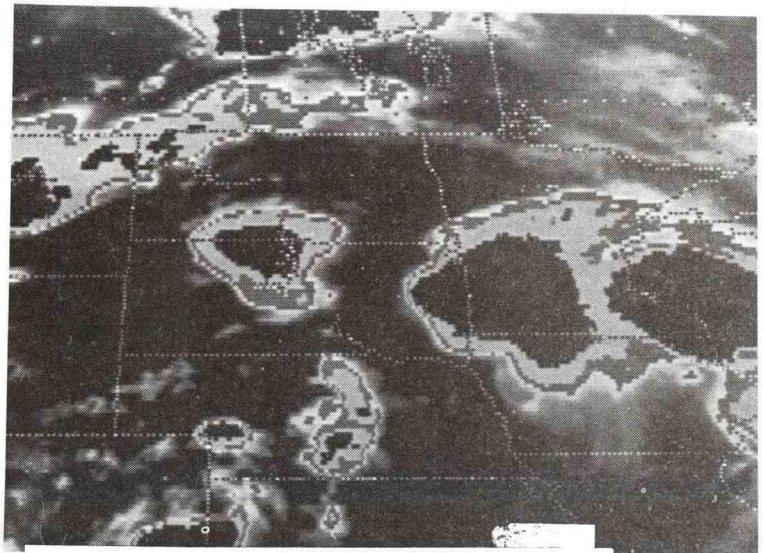
Composite 6PM CST June 27, 1990



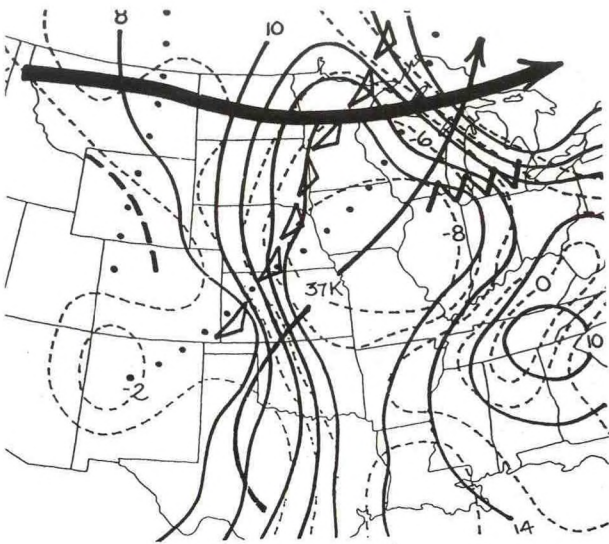
500 MB 6PM CST June 27, 1990



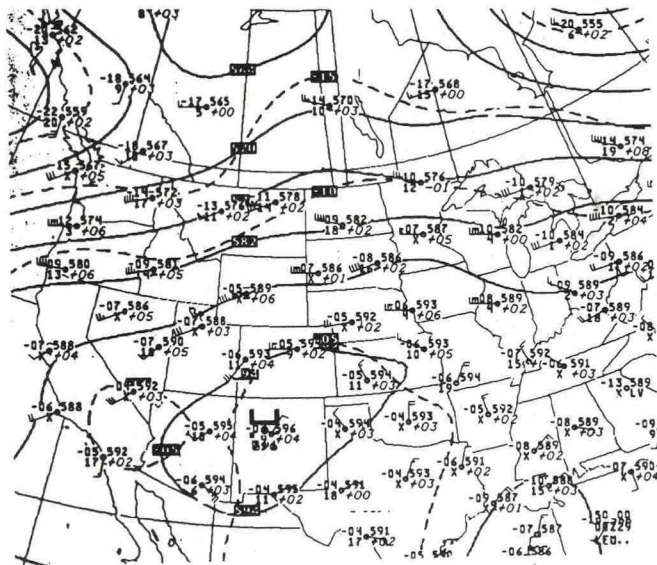
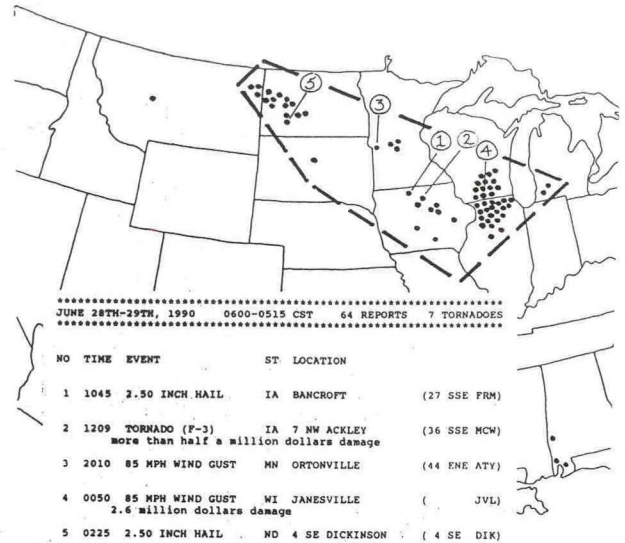
Surface 6PM CST June 27, 1990



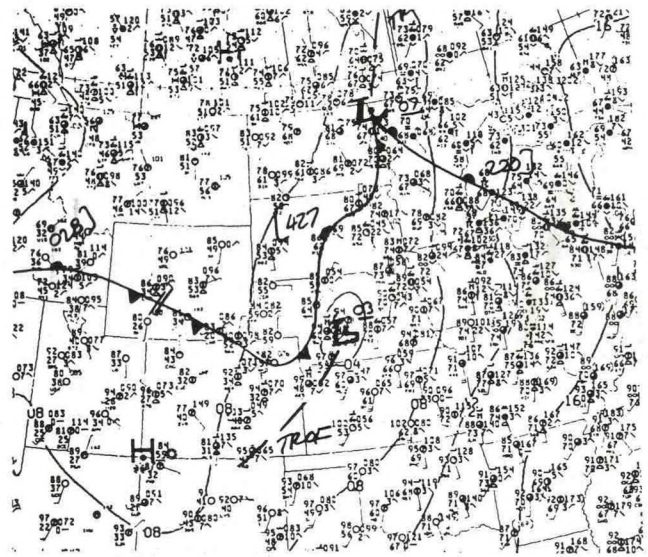
GOES 9PM CST June 27, 1990



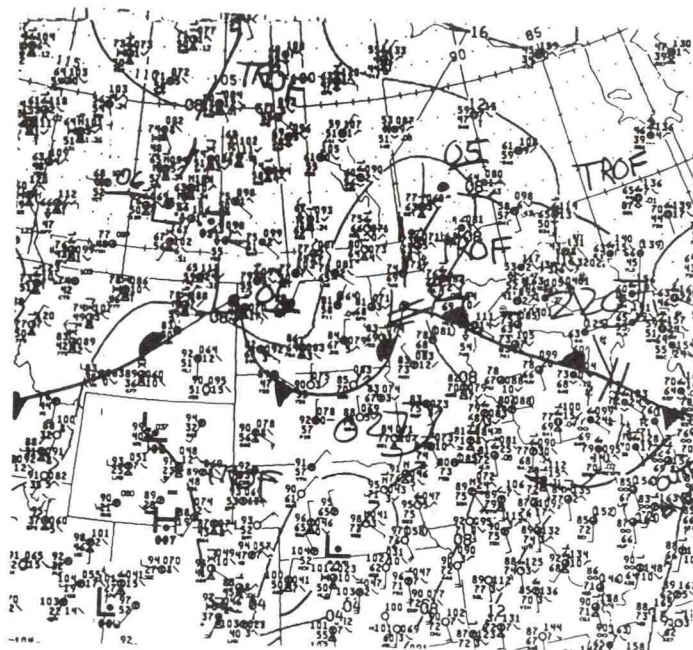
Composite 6PM CST June 28, 1990



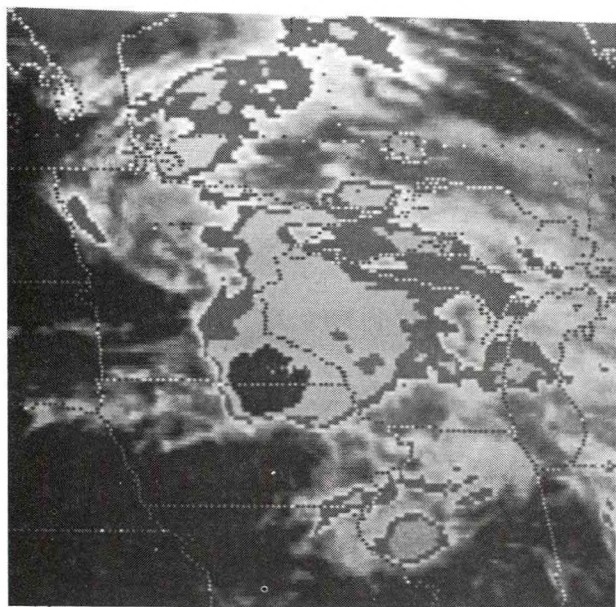
500 MB 6PM CST June 28, 1990



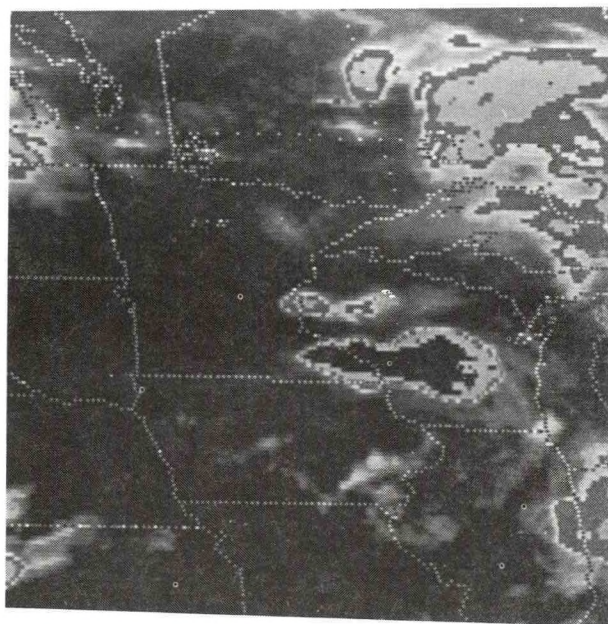
Surface 12 Noon CST June 28, 1990



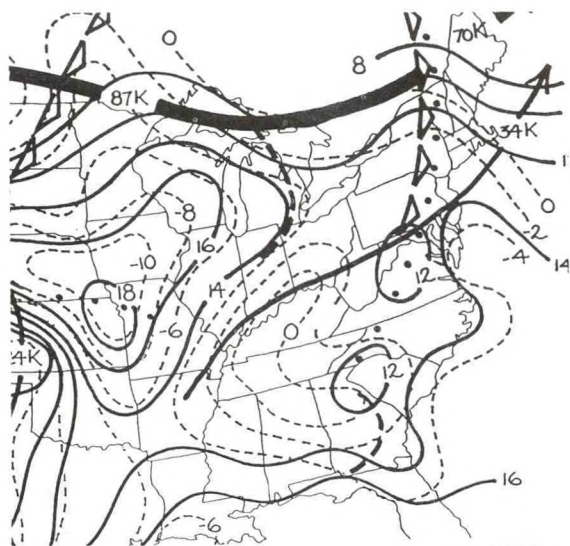
Surface 6PM CST June 28, 1990



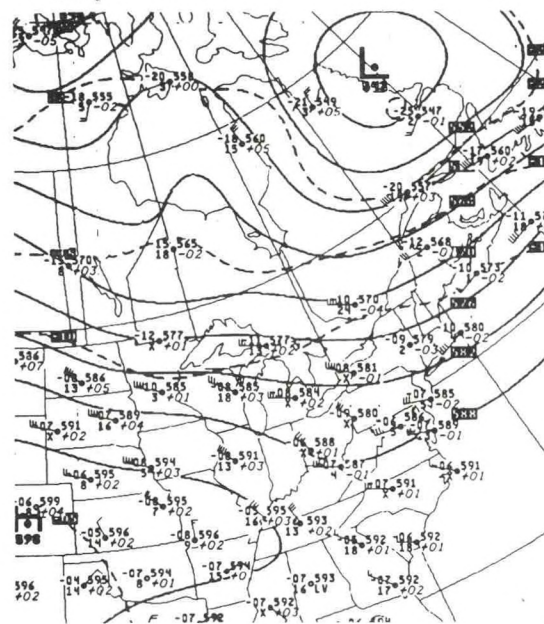
GOES 12 NOON CST June 28, 1990



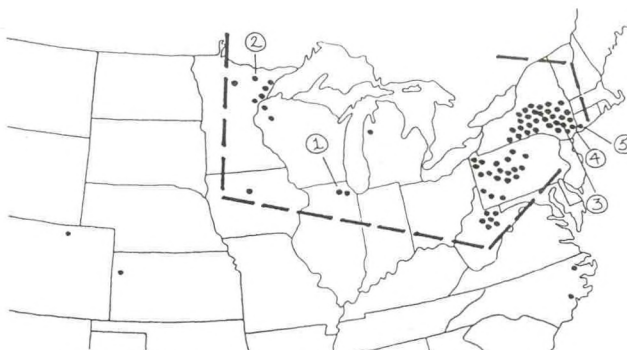
GOES 9 9:30 PM CST June 28, 1990



Composite 6PM CST June 28, 1990

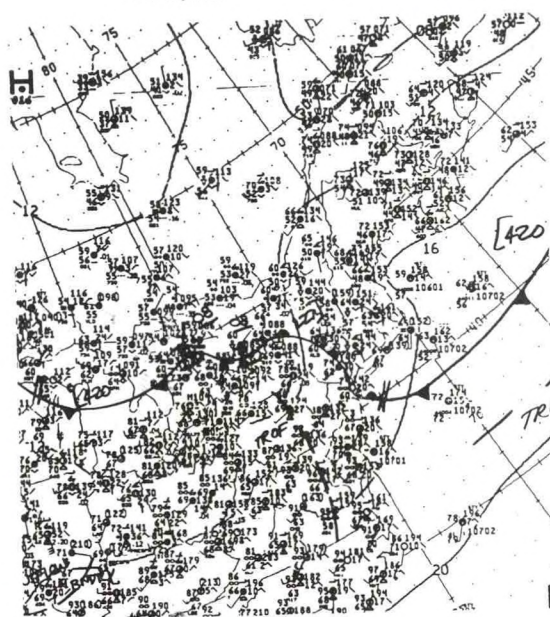


500 MB 6PM CST June 29, 1990

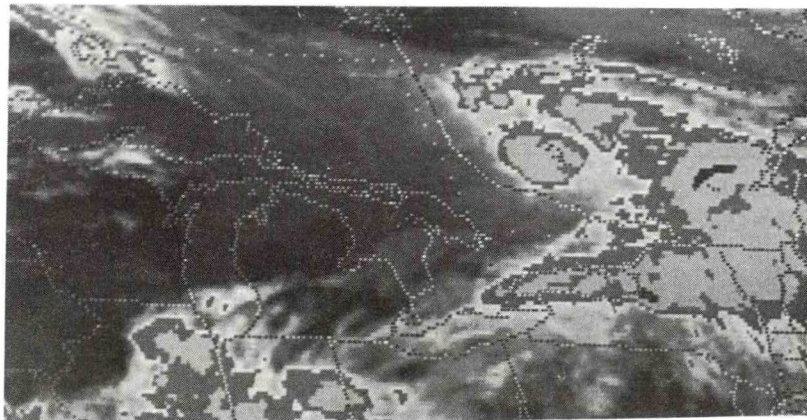


JUNE 29TH, 1990 1245-2045 CST 67 REPORTS 7 TORNADOES

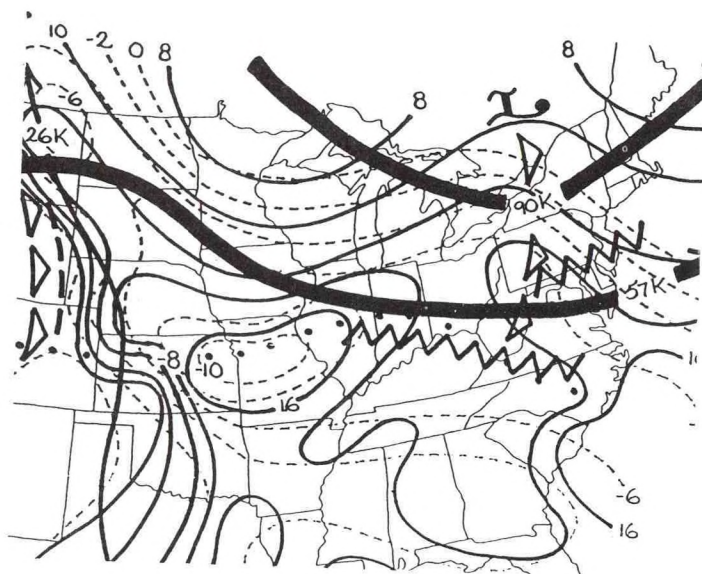
NO	TIME	EVENT	ST	LOCATION	
1	0710	150 MPH WIND GUST one death, six injuries, more than ten million dollars damage	IL	STREAMWOOD	(14 WNW ORD)
2	1707	2.00 INCH HAIL	MN	10 E BEAR RIVER	(29 NNW HIB)
3	1740	116 MPH WIND GUST three deaths, eight injuries	NY	WALLKILL	(8 NW SWF)
4	1755	123 MPH WIND GUST	NY	NEWBURGH	(4 E SWF)
5	1845	TORNADO (F-0) seven injuries	CT	DANBURY	(23 WNW BDR)



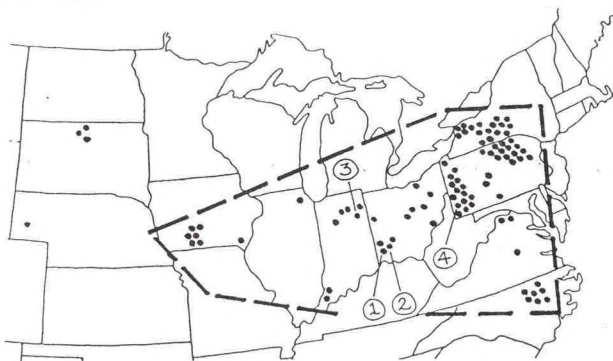
Surface 12 Noon June 29, 1990



GOES 12 NOON CST June 29, 1990

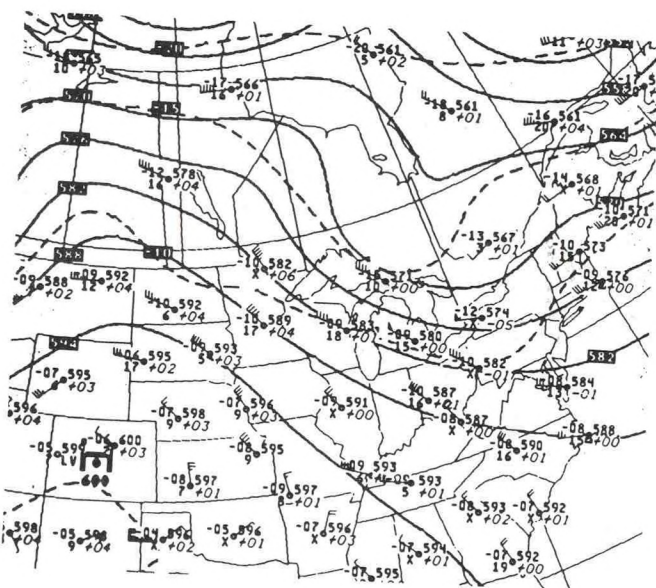


Composite 6PM CST June 30, 1990

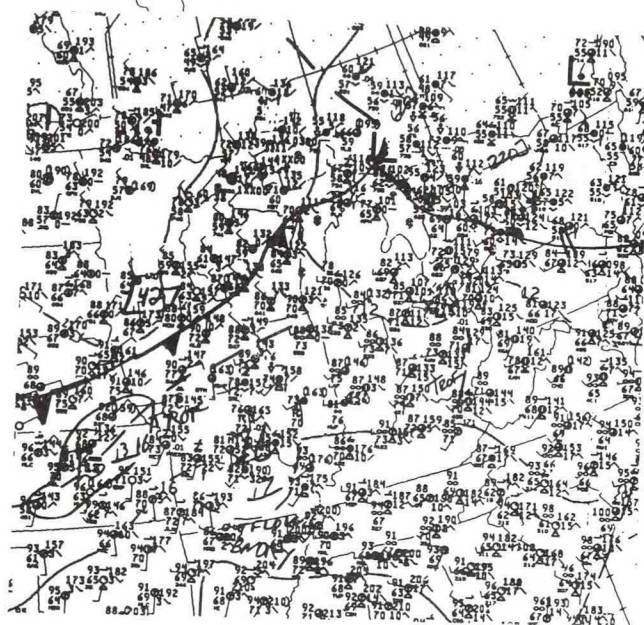


JUNE 30TH, 1990 1135-2100 CST 87 REPORTS 3 TORNADOES

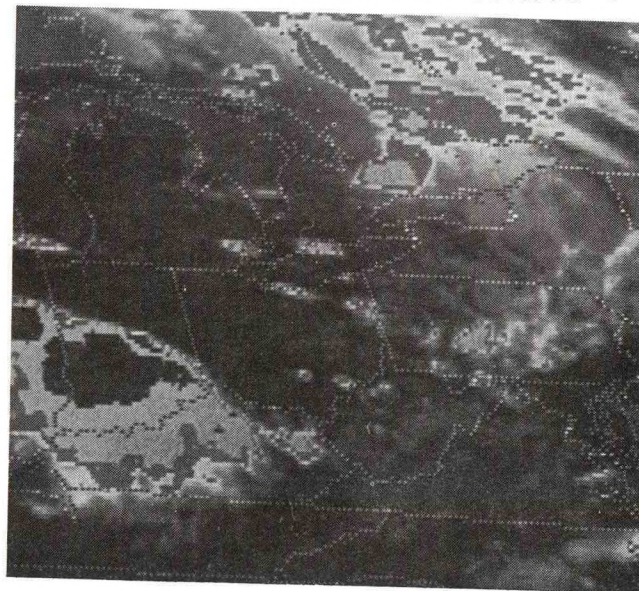
NO	TIME	EVENT	ST	LOCATION	
1	1530	2.75 INCH HAIL more than half a million dollars damage	OH	MIDDLETOWN	(28 SSW DAY)
2	1605	4.00 INCH HAIL more than half a million dollars damage	OH	FRANKLIN	(23 SSW DAY)
3	1730	2.75 INCH HAIL	IN	LIBERTY CENTER	(21 SSW FWA)
4	1740	TORNADO (F-2)	PA	6 SE WASHINGTON	(27 E HLG)



500 MB 6PM CST June 30, 1990.



Surface 12 Noon CST June 30 1990



GOES 2PM CST June 30, 1990

- No. 8 A Minimum Assumption Tornado Hazard Probability Model. Joseph T. Schaefer, Donald L. Kelly, and Robert F. Abbey, May 1985, 30 p., (PB85 20692/AS).
- No. 9 Verification of Severe Local Storm Forecasts Issued by the National Severe Storms Forecast Center: 1984. Preston W. Leftwich, Jr., November 1985, 23 p., (PB86 128105/AS).
- No. 10 Severe Local Storm Warning Verification: 1984. Preston W. Leftwich, Jr. and Leo A. Grenier, December 1985, 14 p., (PB86 148244).
- No. 11 Severe Thunderstorm Cases of 1985. John E. Hales, Jr. and Hugh G. Crowther, February 1986, 51 p., (PB86 164340/AS).
- No. 12 Severe Local Storm Warning Verification Preliminary Procedures. Leo A. Grenier and John T. Halmstad, April 1986, 16 p., (PB86 194362).
- No. 13 Verification of Severe Local Storm Forecasts Issued by the National Severe Storms Forecast Center: 1985. Preston W. Leftwich, Jr., November 1986, 9 p., (PB87 137139/AS).
- No. 14 Severe Local Storm Warning Verification: 1985. Preston W. Leftwich, Jr. and Leo A. Grenier, December 1986, 16 p., (PB87 137147/AS).
- No. 15 An Examination of the National Weather Service Severe Local Storm Warning Program and Proposed Improvements. John E. Hales, Jr., January 1987, 32 p., (PB87 147948/AS).
- No. 16 Severe Thunderstorm Cases of July 1985 through June 1986. John E. Hales, Jr. and Hugh G. Crowther, February 1987, 72 p., (PB87 163911/AS).
- No. 17 Severe Local Storm Warning Verification: 1986. Leo A. Grenier, John T. Halmstad and Preston W. Leftwich, Jr., June 1987, 19 p., (PB87 195939).
- No. 18 Verification of Severe Local Storm Forecasts Issued by the National Severe Storms Forecast Center: 1986. Preston W. Leftwich, Jr., September 1987, 9 p., (PB88 101407).
- No. 19 Severe Thunderstorm Cases of July 1986 through June 1987. John E. Hales, Jr. and Hugh G. Crowther, April 1988, 83 p., (PB88 214085).

- No. 20 Severe Local Storm Warning Verification: 1987. Leo A. Grenier, John T. Halmstad and Preston W. Leftwich, Jr., June 1988, 19 p., (PB88 241393).
- No. 21 Verification of Severe Local Storm Forecasts Issued by the National Severe Storms Forecast Center: 1987. Preston W. Leftwich, Jr., December 1988, 11 p., (PB89 159719/AS).
- No. 22 Severe Thunderstorm Cases of July 1987 thru June 1988. John E. Hales, Jr. and Hugh G. Crowther, April 1989, 92 p., (PB89 206411/AS)
- No. 23 Severe Local Storm Warning Verification: 1988. Leo A. Grenier, John T. Halmstad and Preston W. Leftwich, Jr., June 1989, 26 p., (PB89 226310/AS).
- No. 24 Verification of Severe Local Storm Forecasts Issued by the National Severe Storms Forecast Center: 1988. Preston W. Leftwich, Jr., September 1989, 18 p., (PB90-140211/AS).
- No. 25 A Dyad of Papers Concerning Joint Verification of Severe Local Storm Watches and Warnings During Tornado Events: Preston W. Leftwich, Jr. and John E. Hales, Jr., January 1990, 36 p., (PB90-219387/AS).
- No. 26 Severe Thunderstorm Cases of July 1988 thru June 1989: John E. Hales, Jr. and Hugh G. Crowther, April 1990, 106 p., (PB90-226424/AS)
- No. 27 Severe Local Storm Warning Verification: 1989. Leo A. Grenier, John T. Halmstad and Preston W. Leftwich, Jr., May 1990, 25p., (PB90-248592)
- No. 28 Verification of Severe Storms Forecasts Issued by the National Severe Storms Forecast Center: 1989. Preston W. Leftwich, Jr. and Richard W. Anthony, September 1990, 17 p., (PB91-132-472/AS)

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