NOAA TECHNICAL MEMORANDUM NWS NSSFC-26

SEVERE THUNDERSTORM CASES OF JULY 1988 THRU JUNE 1989

John E. Hales, Jr. and Hugh G. Crowther
National Severe Storms Forecast Center
Kansas City, Missouri 64106-2897

April 1990

U.S. DEPARTMENT OF COMMERCE / National Oceanic and Atmospheric Administration / National Weather Service

National Weather Service
National Severe Storms Forecast Center

The National Severe Storms Forecast Center (NSSFC) has the responsibility for the issuance of severe thunderstorm and tornado watches for the contiguous 48 states. Watches are issued for those areas where thunderstorms are forecast to produce one or more of the following: (1) hailstones of 3/4 inch diameter or greater, (2) surface wind gusts of 50 knots or greater, or (3) tornadoes.

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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 1988 through June 1989 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 1988 and 1989). 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, Debbie Haynes for assistance is typing the text.

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Department of COmmerce, 1989: Storm Data. Environmental Data Services. NOAA, National Climatic Center, Asheville, NC.

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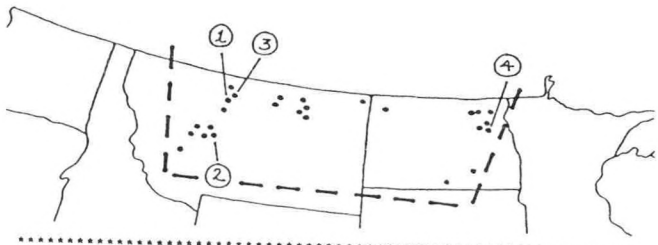
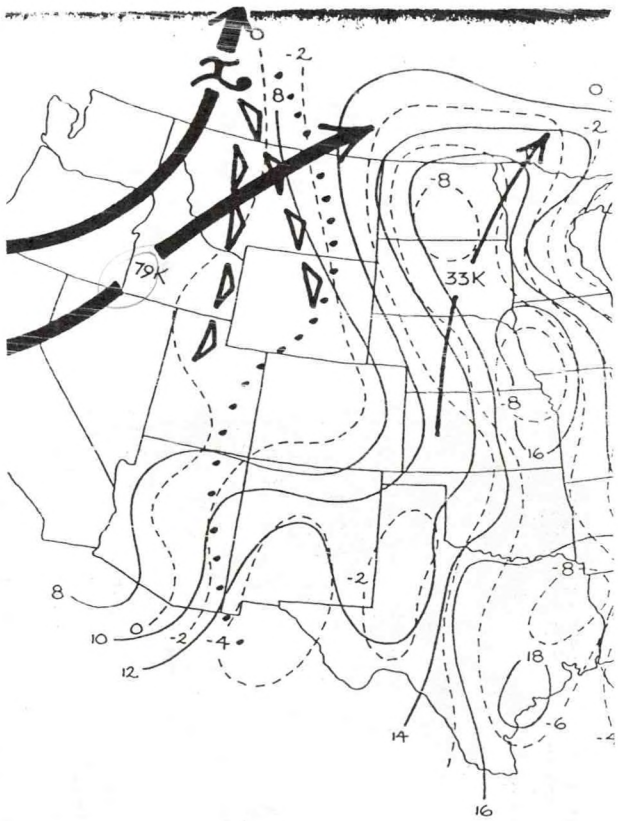


05JUL88-06JUL88 1330-0030 CST 35 REPORTS 14 TORNADOES

NO	TIME	EVENT	ST	LOCATION	REMARKS
1	1530	TORNADO (F-2)	MT	BIG SANDY	2 INJURIES
2	1530	2.75 INCH HAIL	MT	SHONKIN	
3	1645	2.75 INCH HAIL	MT	CHINOOK	
4	2030	35 MPH WIND GUST	ND	FORDVILLE	



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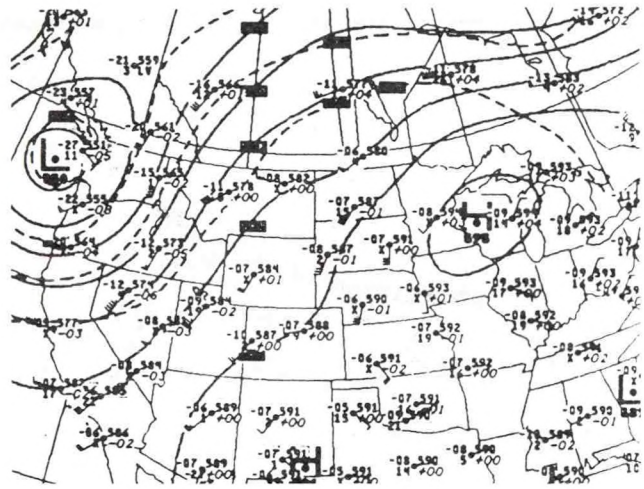

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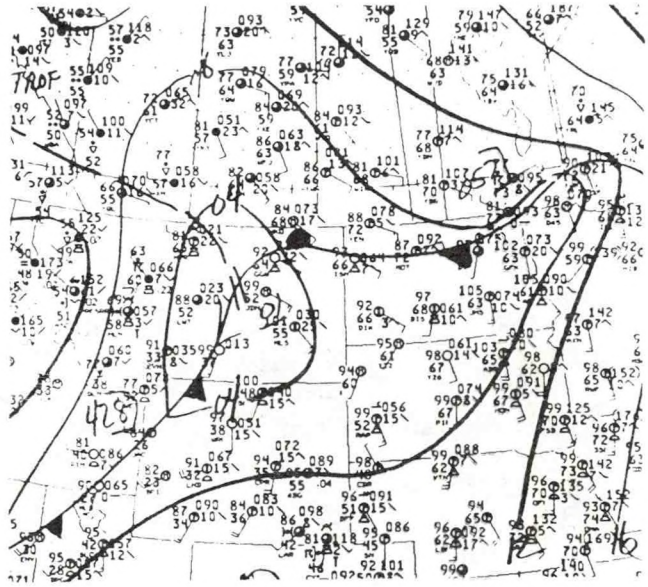

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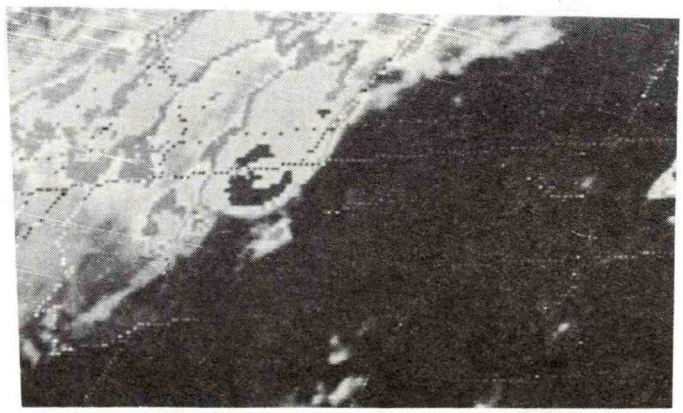

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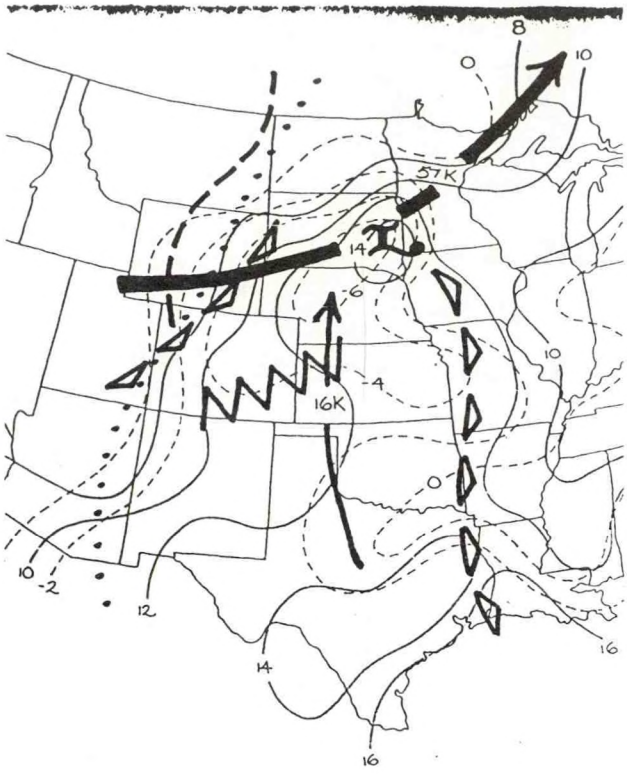

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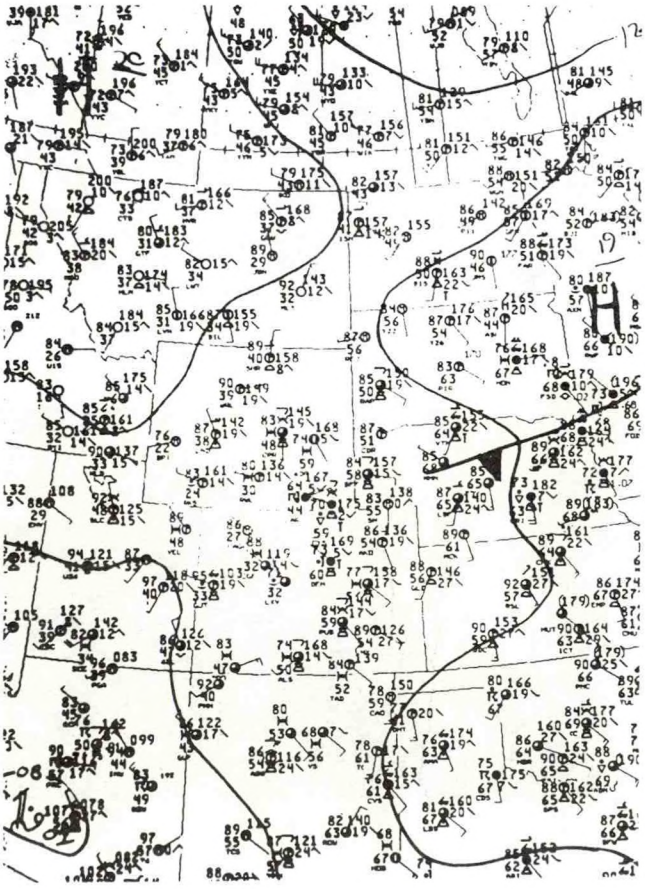
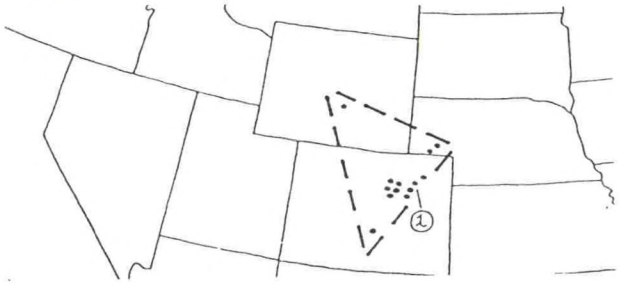


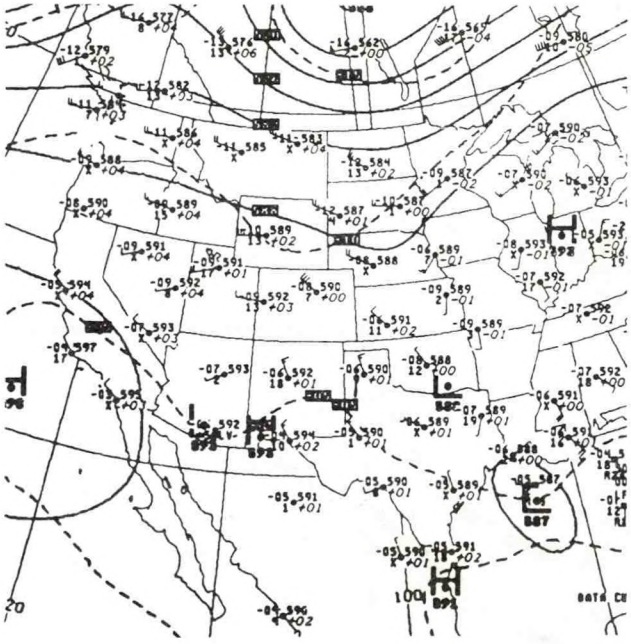
Surface 3PM CST July 8, 1988

08JUL88 1130-1831 CST 21 REPORTS 11 TORNADOES

HAIL IN EASTERN COLORADO DURING THE EVENING HOURS BETWEEN BRUSH AND MERINO CAUSES 2.3 MILLION DOLLARS DAMAGE.

. THUNDERSTORMS PRODUCE GOLF BALL SIZE HAIL AND WIND GUST TO 67 MPH.





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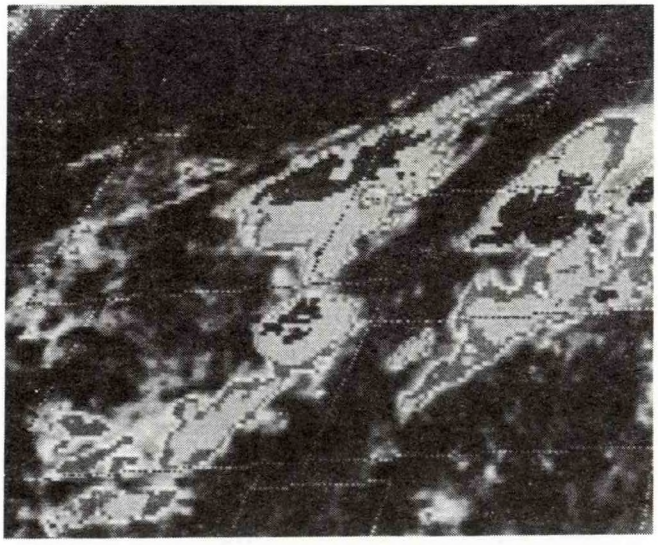

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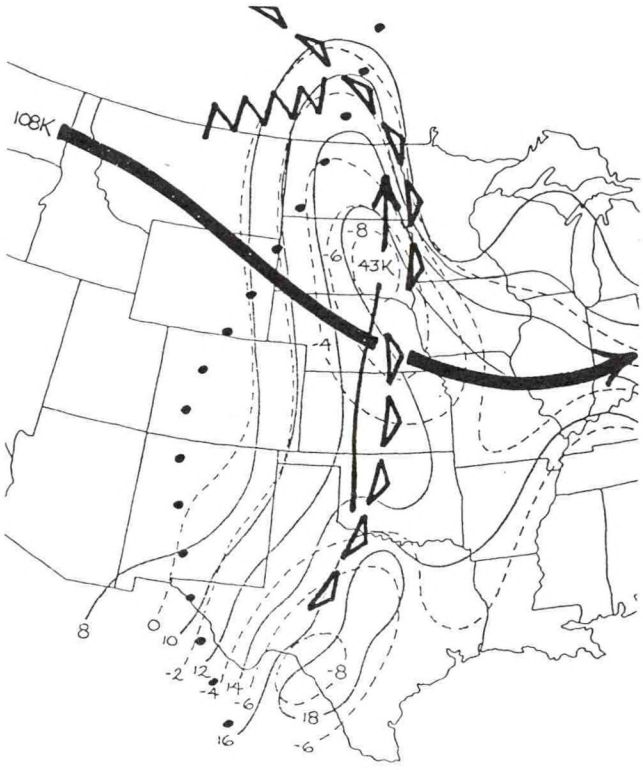
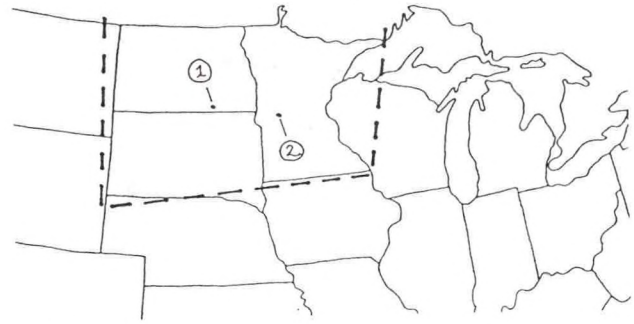
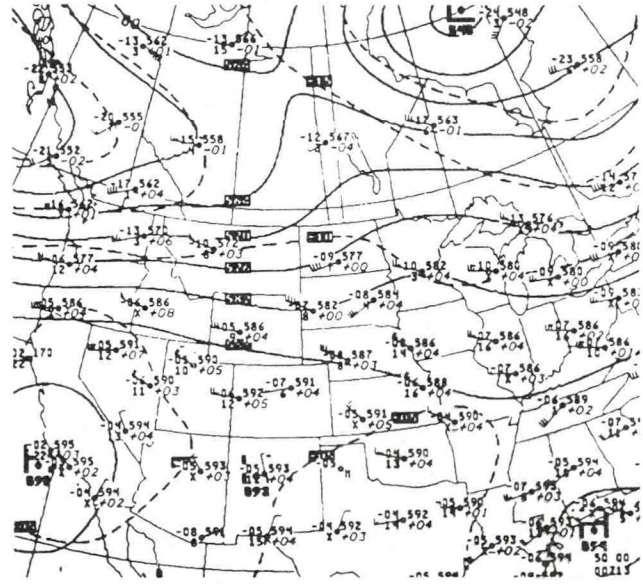


Composite 6PM CST July 12, 1988

12JUL88-13JUL88 1701-0230 CST 20 REPORTS 2 TORNADOES

NO	TIME	EVENT	ST	LOCATION
1	1830	4.50 INCH HAIL	ND	FULLERTON
2	0045	87 MPH WIND GUST	MN	ALEXANDRIA





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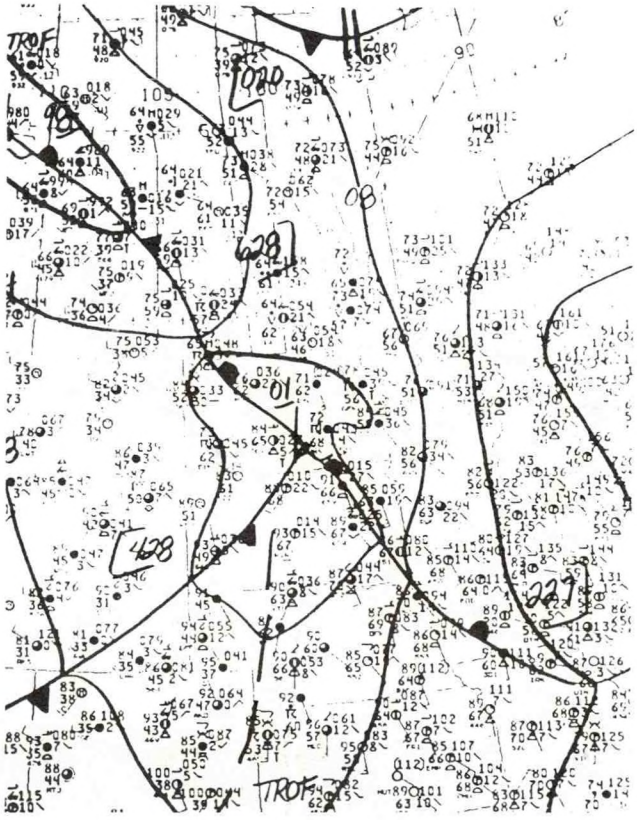

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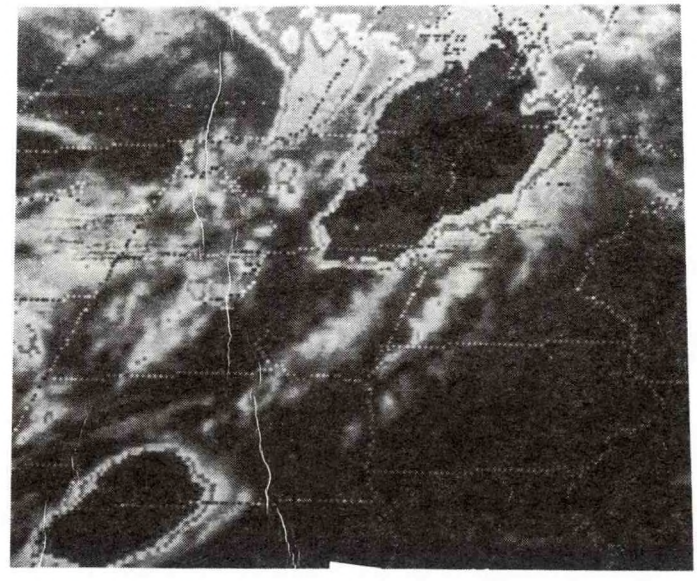

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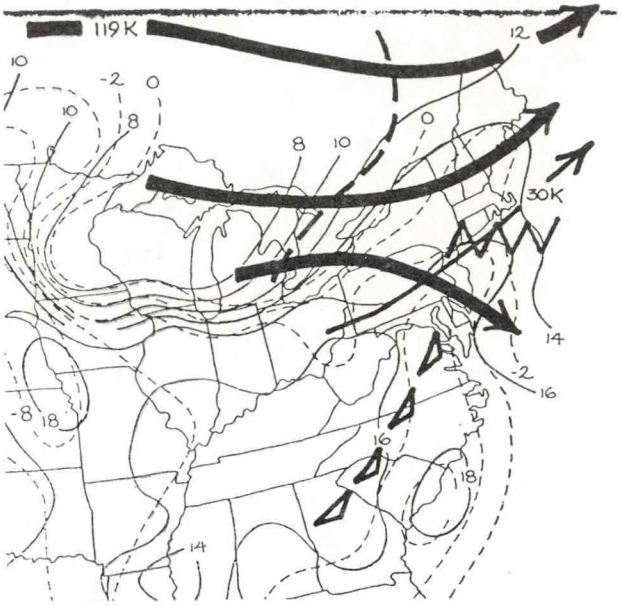

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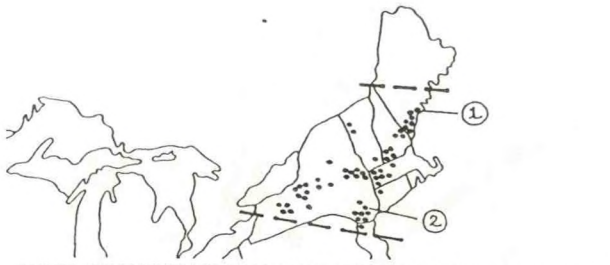
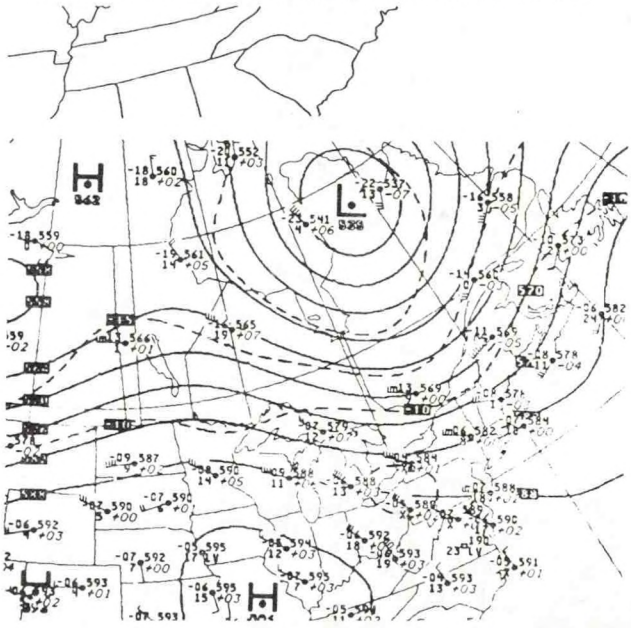


14JUL88 1158-2000 CST 88 REPORTS 3 TORNADOES

NO	TIME	EVENT	ST	LOCATION	REMARKS
1	1520	TORNADO (F-1)	ME	TURNER	$0.6 MILLION DAMAGE
2	1815	TORNADO (F-2)	NJ	PINE ISLAND	1 INJURY

THUNDERSTORMS ALSO CAUSE WIND DAMAGE AND PRODUCE DIME SIZE HAIL.



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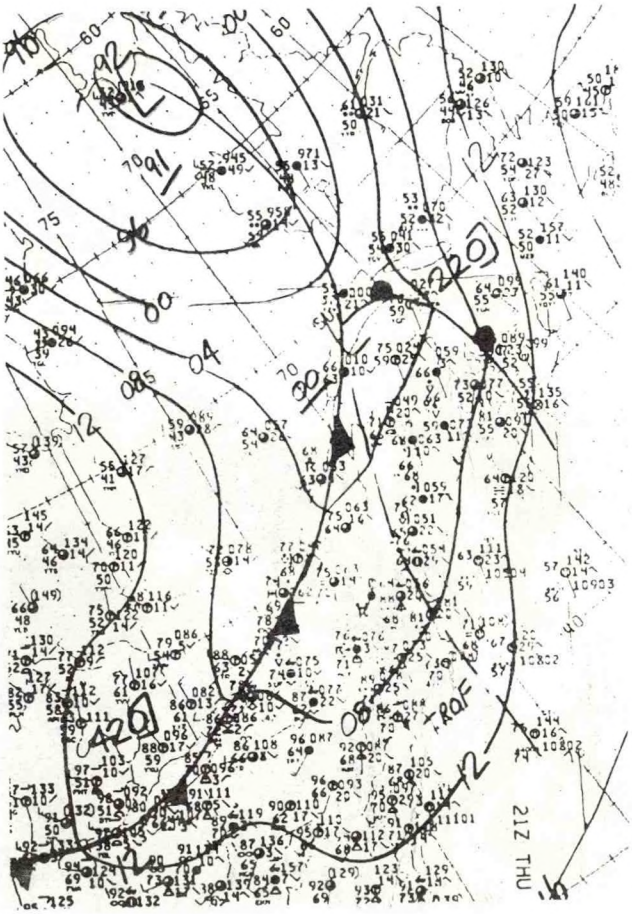

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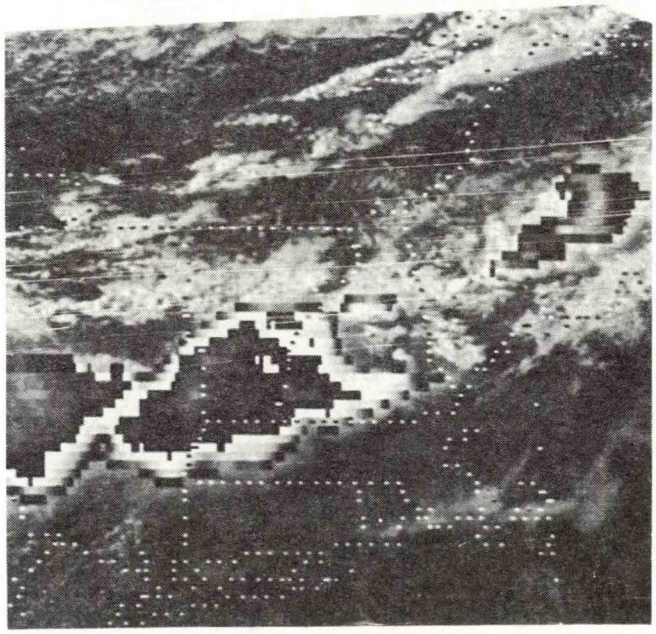

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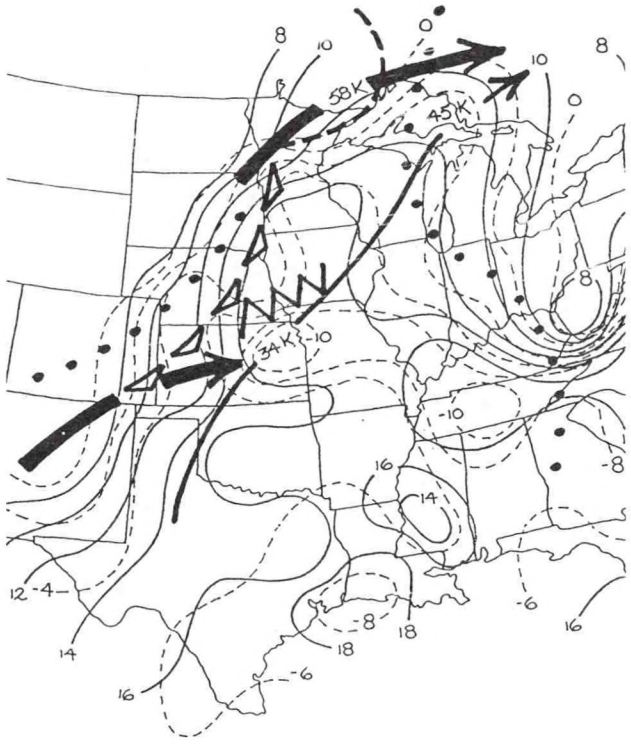

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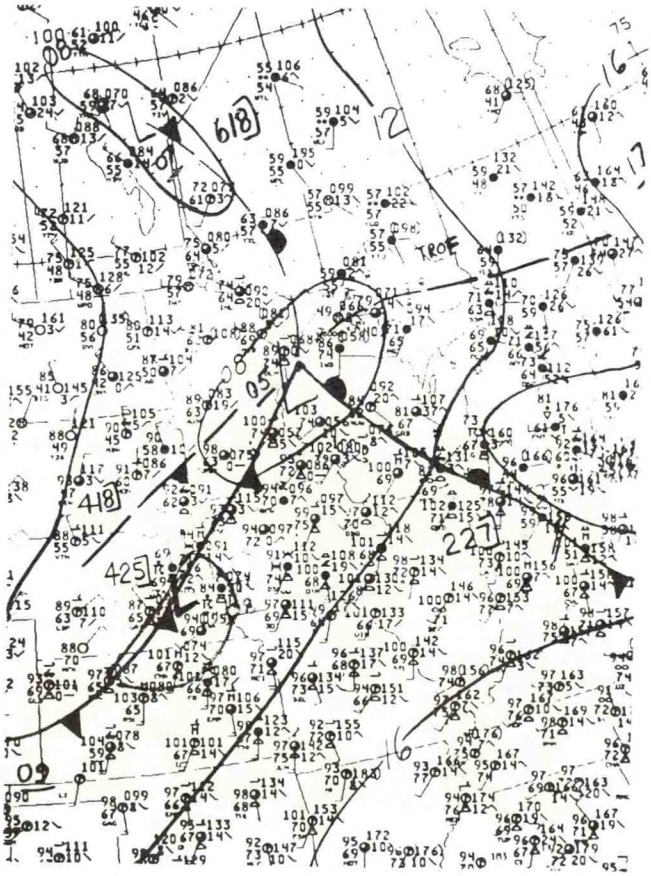
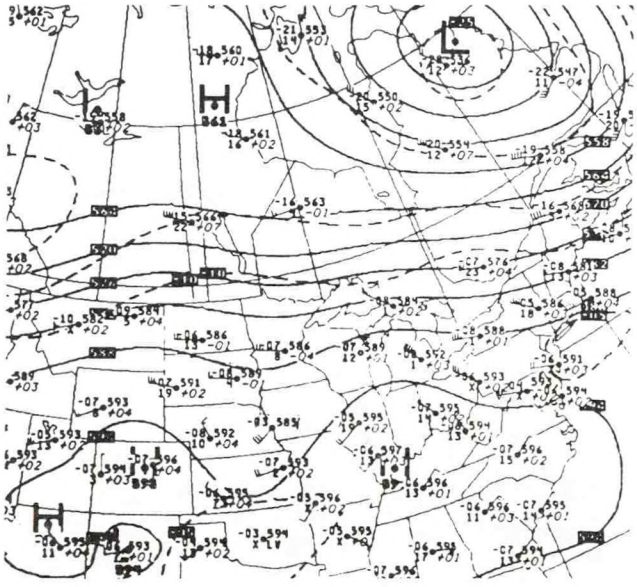


Surface 3PM CST July 15, 1988

15JUL88 1330-2215 CST 72 REPORTS 9 TORNADOES

NO	TIME	EVENT	ST	LOCATION	REMARKS
1	1512	92 MPH WIND GUST	NE	OMAHA	2 INJURIES
2	1514	TORNADO (F-2)	IA	COUNCIL BLUFFS	42 INJURIES
3	1516	TORNADO (F-3)	IA	COUNCIL BLUFFS	34 INJURIES
4	1519	TORNADO (F-1)	IA	COUNCIL BLUFFS	12 INJURIES

THE SEVERE THUNDERSTORMS AND TORNADOES CAUSE 43 MILLION DOLLARS DAMAGE. THUNDERSTORMS ALSO PRODUCE GOLF BALL SIZE HAIL.



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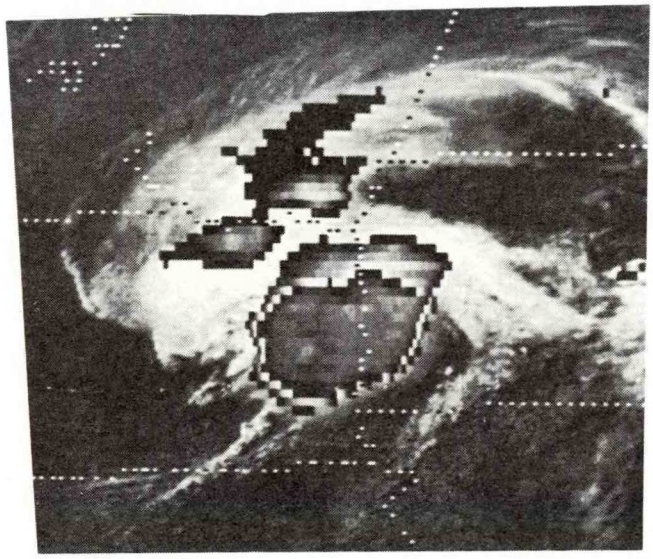

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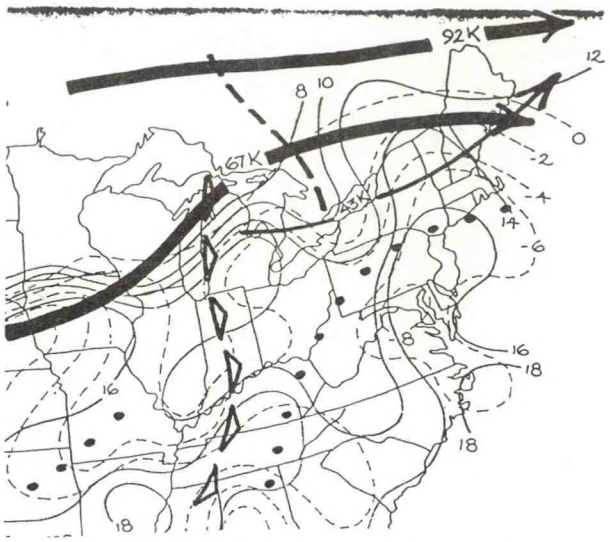

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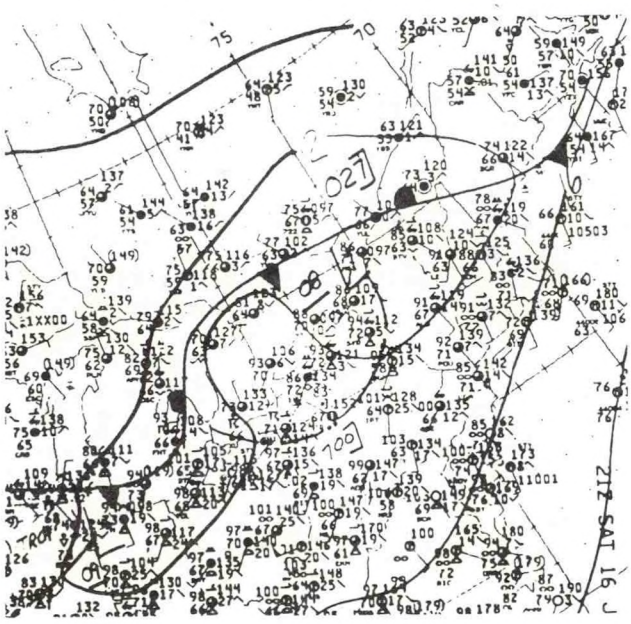


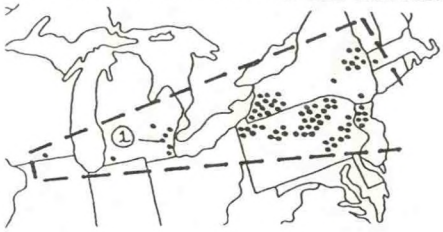
Surface 3PM CST July 16, 1988

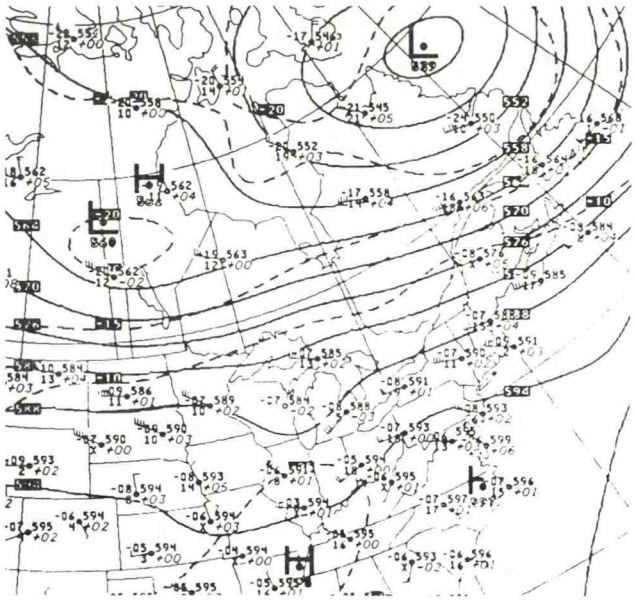
Surface 9PM CST July 16, 1988

16JUL88 1245-2143 CST 98 REPORTS 3 TORNADOES

NO	TIME	EVENT	ST	LOCATION
1	2054	85 MPH WIND GUST	MI	ANN ARBOR

THUNDERSTORMS ALSO PRODUCE GOLF BALL SIZE HAIL.





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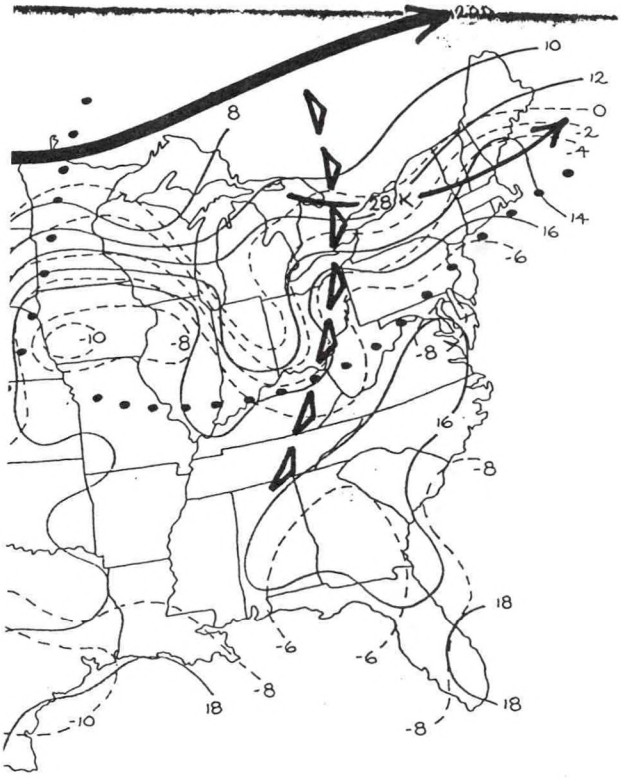
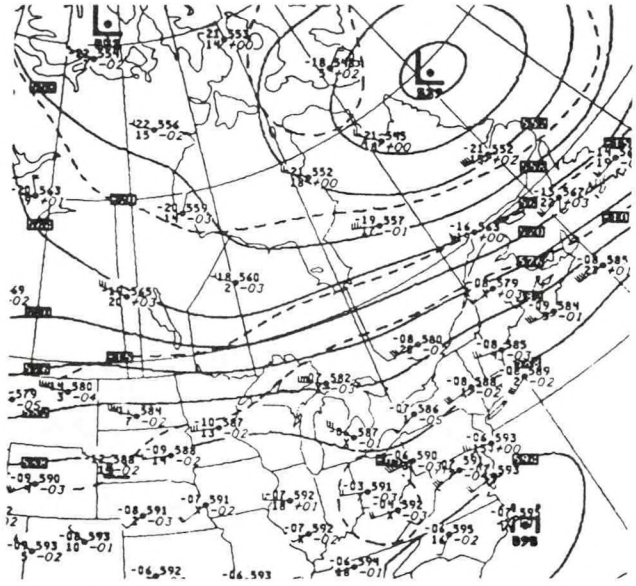


Composite 6AM CST July 17, 1988

17JUL88 1201-1800 CST 67 REPORTS 2 TORNADOES

NO	TIME	EVENT	ST	LOCATION	
1	1529	TORNADO (F-1)	PA	POTTSTOWN	ONE INJURY
2	1615	TORNADO (F-1)?	PA	CHROME	ONE INJURY

THUNDERSTORMS ALSO PRODUCE ONE INCH HAIL AND WIND GUSTS TO 70 MPH.



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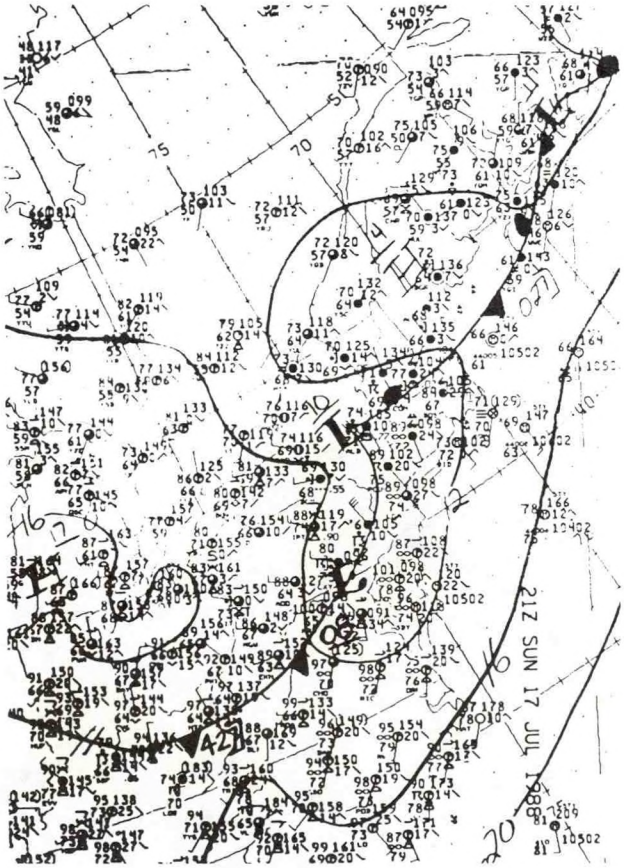

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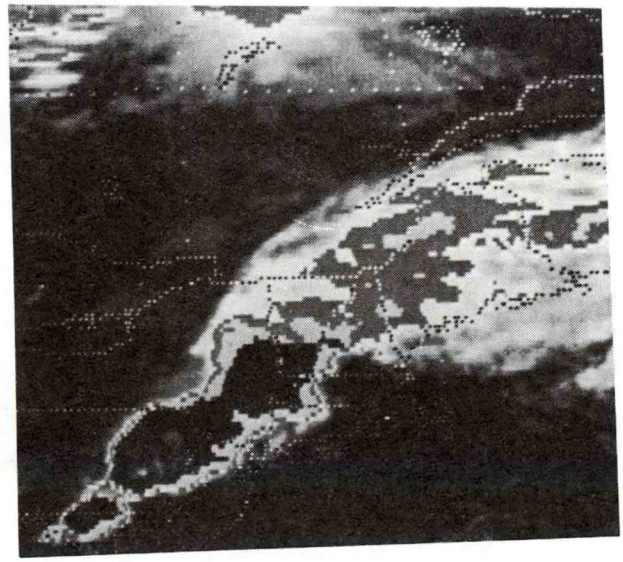

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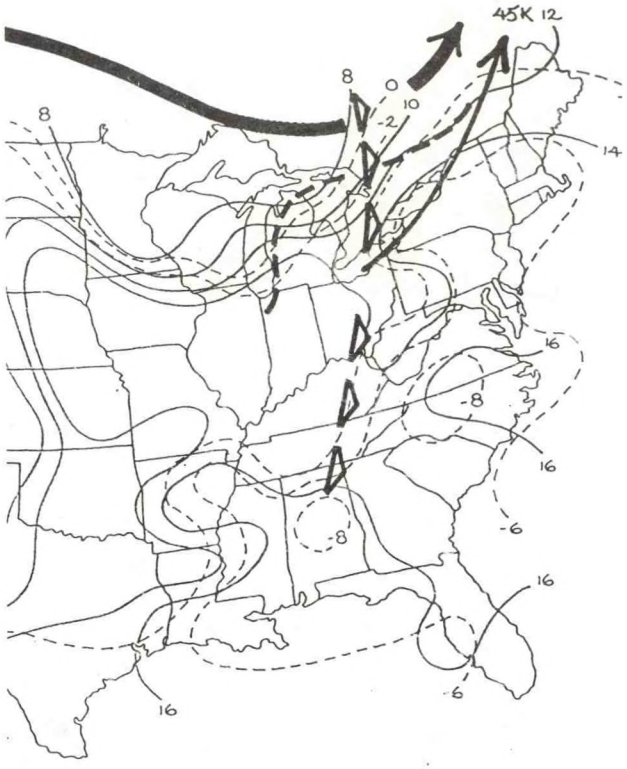
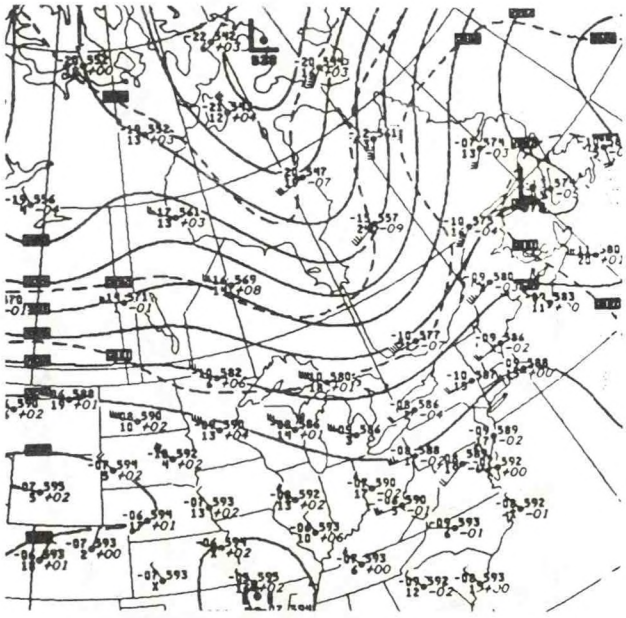


Composite 6PM CST July 30, 1988

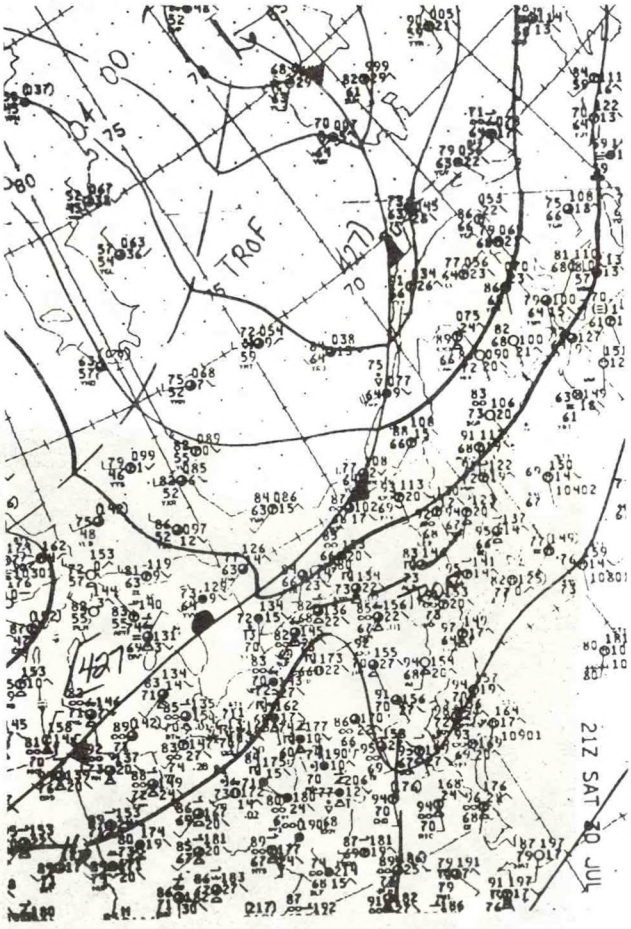
30JUL88 1238-2020 CST 80 REPORTS

NO	TIME	EVENT	ST	LOCATION	REMARKS
1	1510	WIND DAMAGE	PA	ERIE	4 INJURIES

THUNDERSTORMS PRODUCE ONE INCH HAIL AND WIND GUSTS TO 70 MPH.

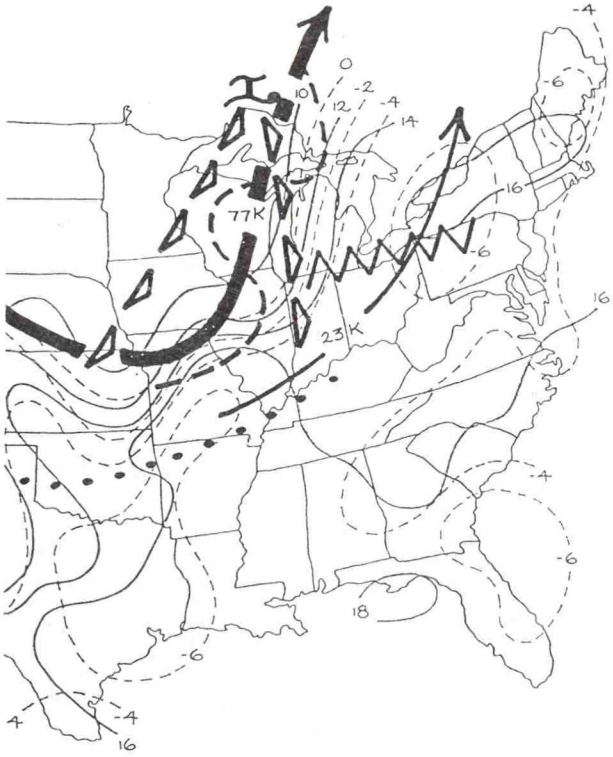


500 MB 6PM CST July 30, 1988



Surface 3PM CST July 30, 1988

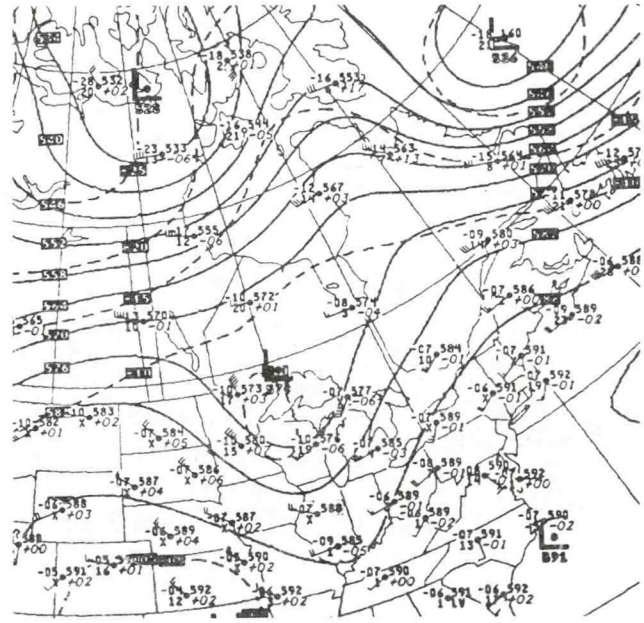
GOES 2:01 PM CST July 30, 1988



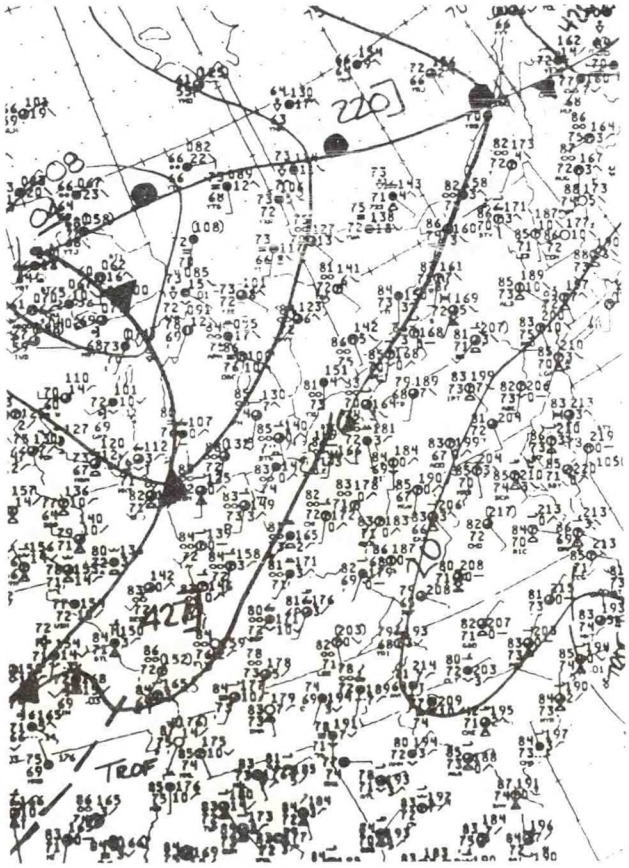
Composite 6PM CST August 5, 1988

05AUG88 1058-2120 CST 59 REPORTS 1 TORNADO

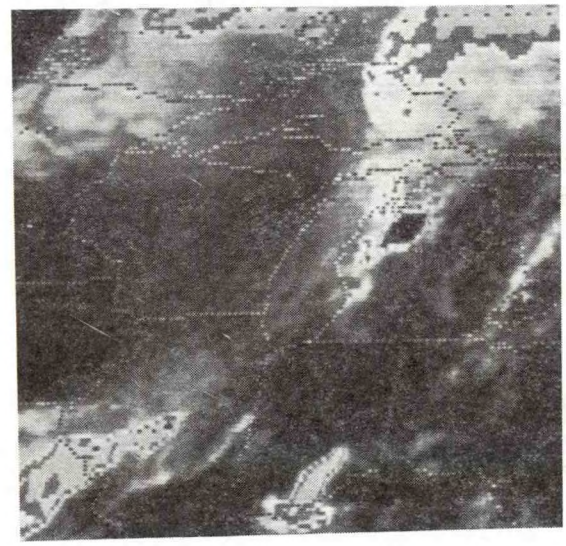
NO	TIME	EVENT	ST	LOCATION
1	1030	80 MPH WIND GUST	MI	ASHLEY
2	1135	80 MPH WIND GUST	MI	HASTINGS
3	1310	80 MPH WIND GUST	MI	LENNON



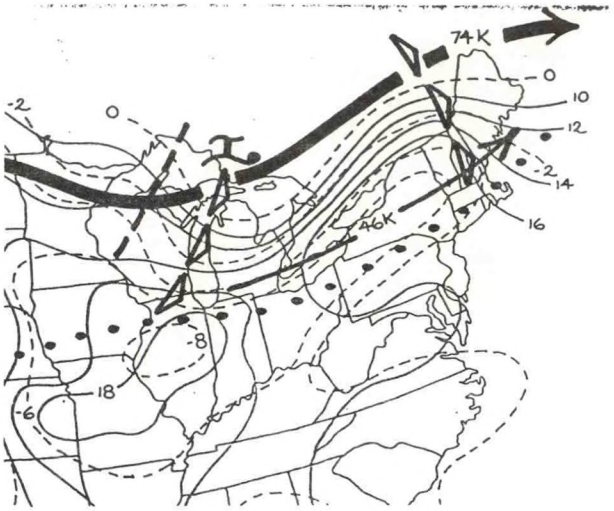
500 MB 6PM CST August 5, 1988



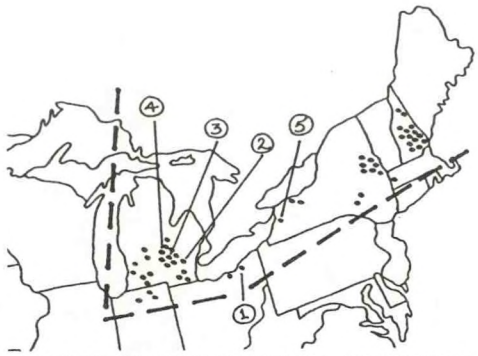
Surface 9AM CST August 5, 1988



GOES 10:01 AM CST August 5, 1988

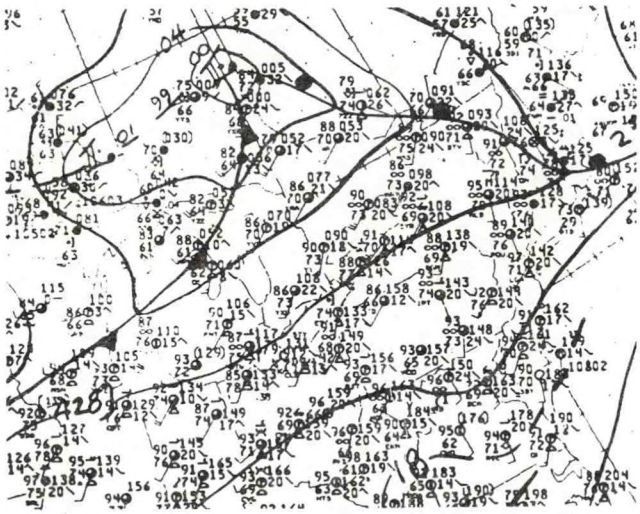


Composite 6PM CST August 14, 1988

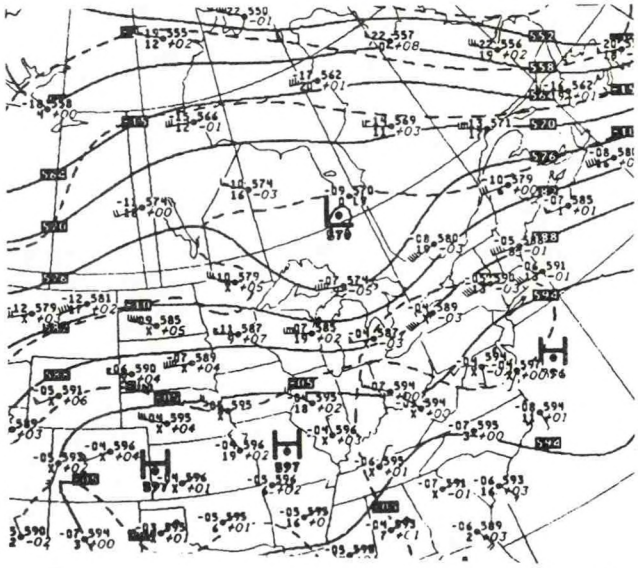


14AUG88-15AUG88 1135-0145 CST 66 REPORTS 2 TORNADOES

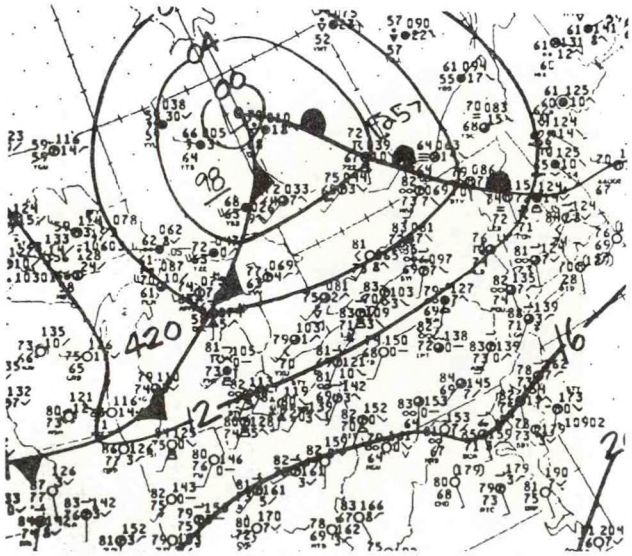
NO	TIME	EVENT	ST	LOCATION	REMARKS
1	1452	79 MPH WIND GUST	OH	LORAIN	
2	1835	WIND DAMAGE	MI	PORT SANILAC	2 DEATHS, 1 INJURY
3	2056	TORNADO (F-2)	MI	EAST LANSING	1 DEATH
4	2120	WIND DAMAGE	MI	STOCKBRIDGE	1 DEATH
5	0057	71 MPH WIND GUST	NY	BUFFALO	



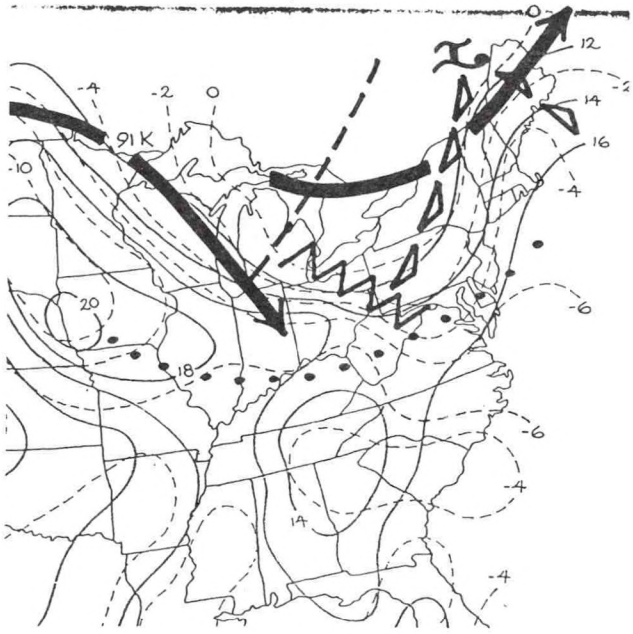
Surface 3PM CST August 14, 1988



500 MB 6PM CST August 14, 1988



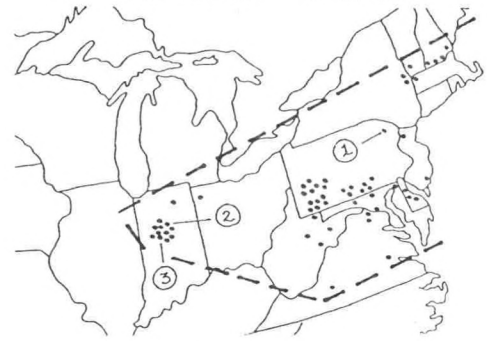
Surface 9PM CST August 14, 1988

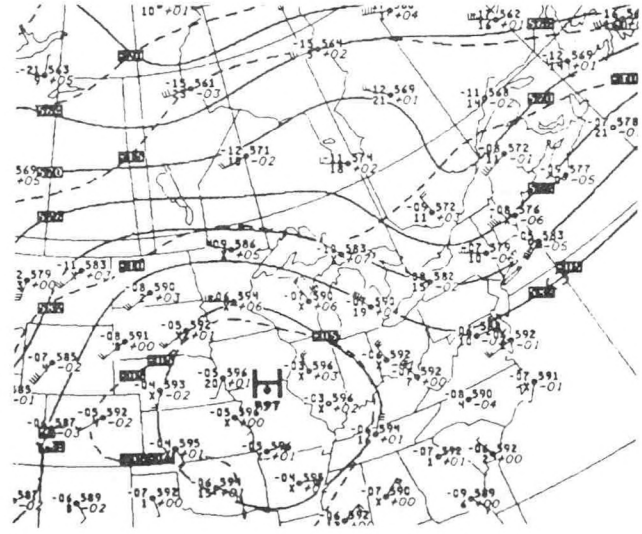


Composite 6PM CST August 15, 1988

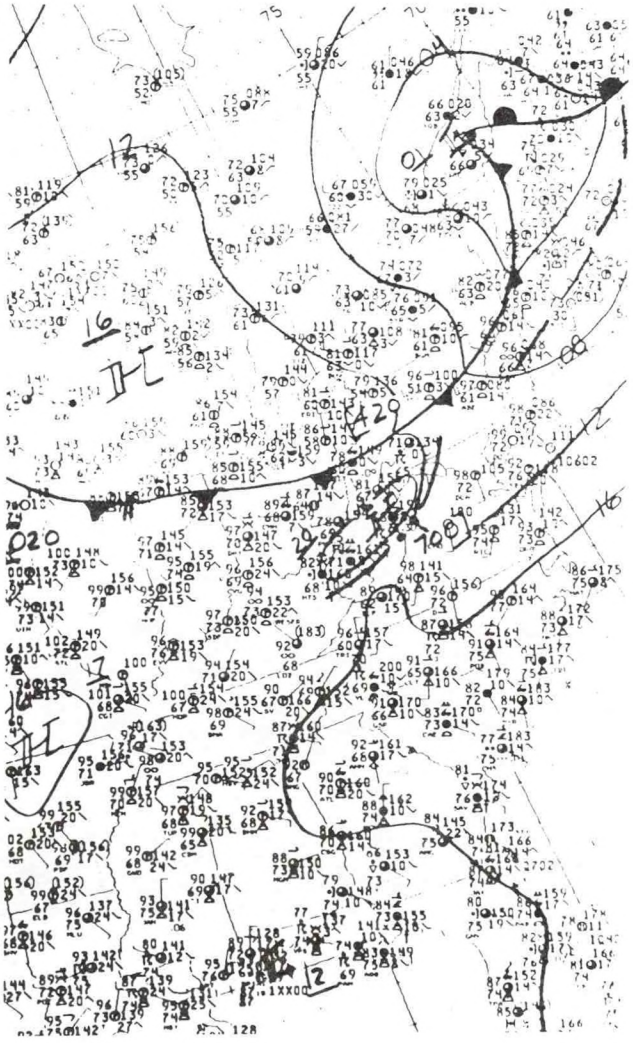
15AUG88 0800-1935 CST 84 REPORTS

NO	TIME	EVENT	ST	LOCATION	REMARKS
1	1530	WIND DAMAGE	PA	WILKES-BARRE	2 INJURIES
2	1730	2.00 INCH HAIL	IN	YOUNG AMERICA	
3	1835	75 MPH WIND GUST	IN	LAFAYETTE	

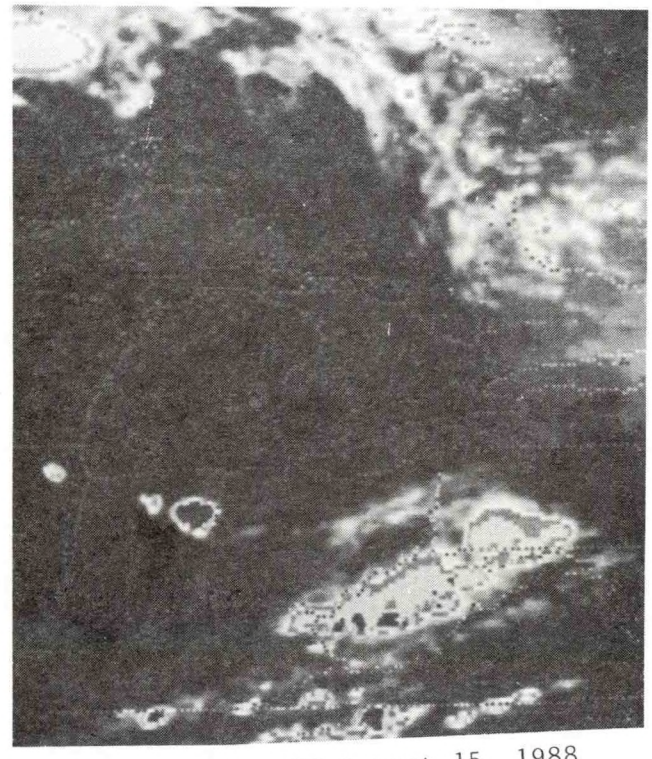




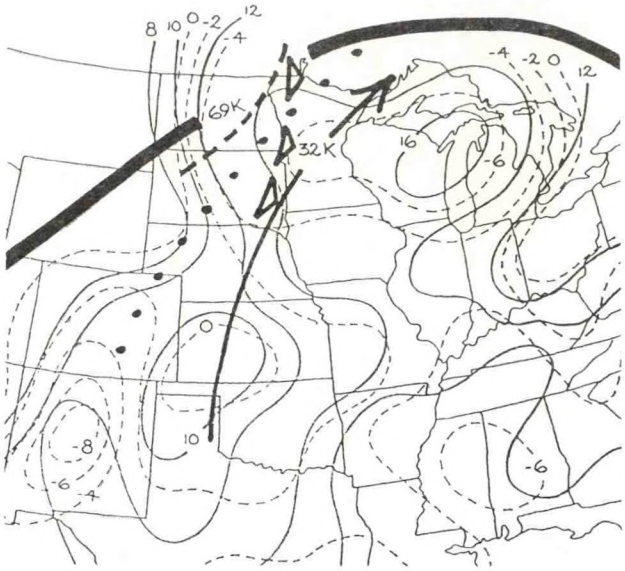
500 MB 6 PM CST August 15, 1988



Surface 3PM CST August 15, 1988



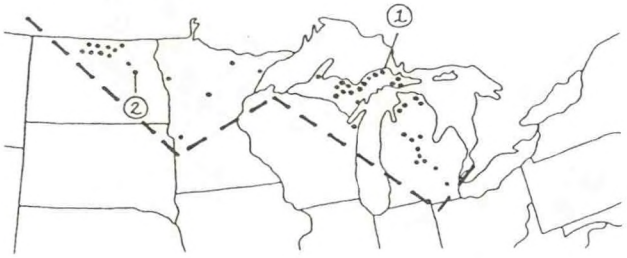
19 GOES 3:01 PM CST August 15, 1988

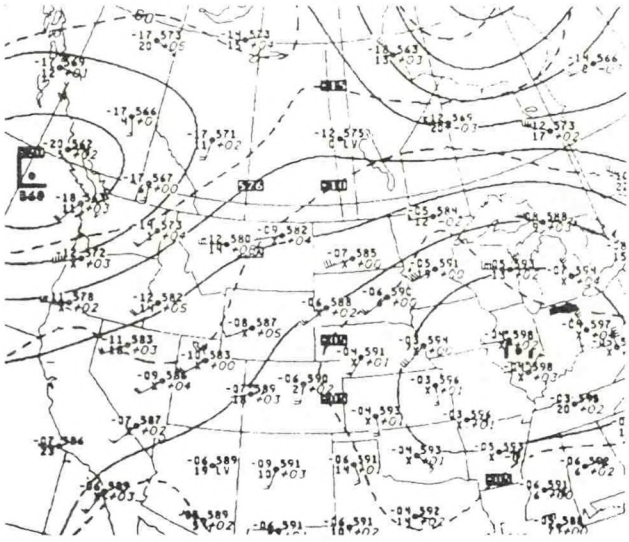


Composite 6PM CST August 16, 1988

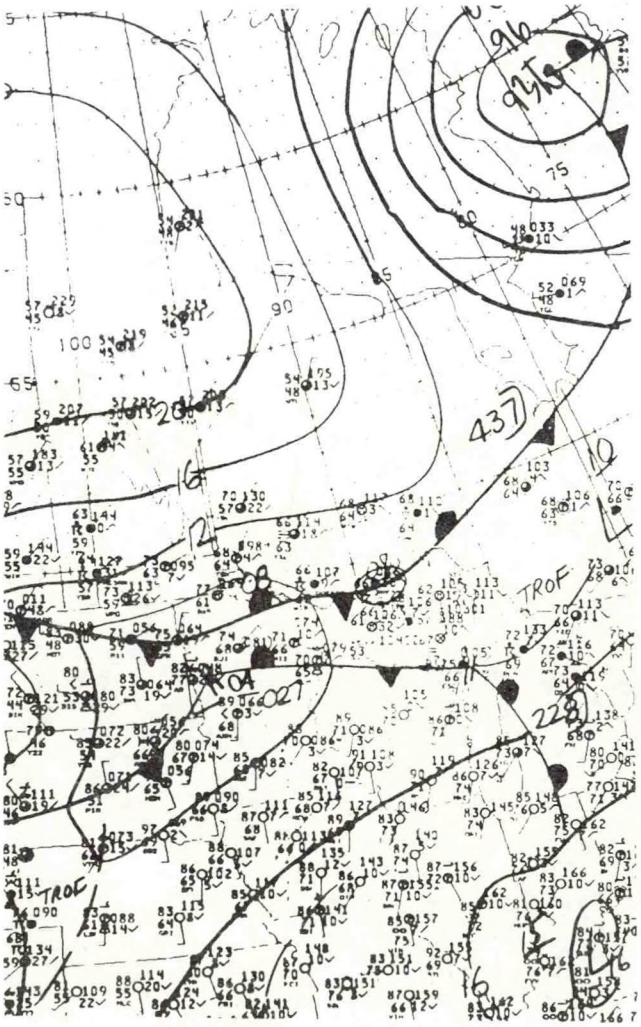
16AUG88 0300-2334 CST 43 REPORTS 2 TORNADOES

NO	TIME	EVENT	ST	LOCATION
1	2205	83 MPH WIND GUST	MI	MARAIS
2	2334	3.00 INCH HAIL	ND	LAKOTA

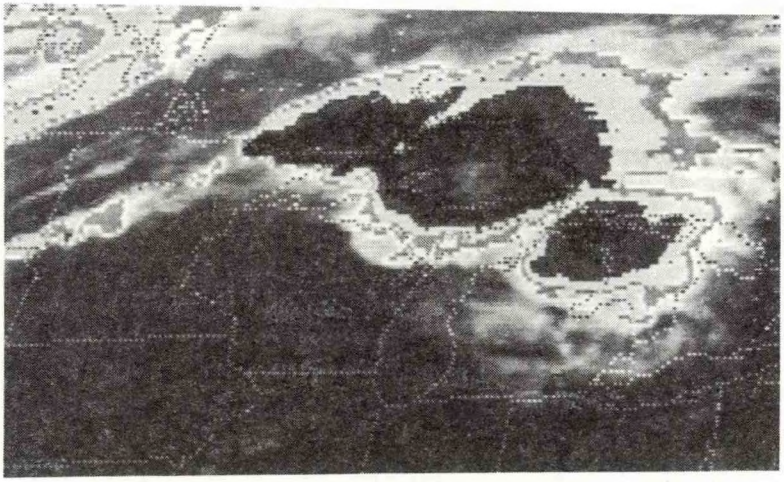




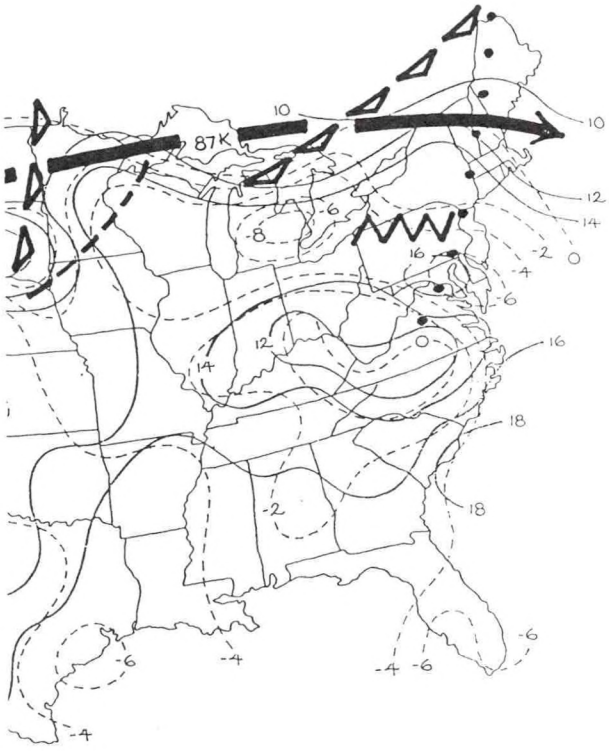
500 MB 6PM CST August 16, 1988



Surface 9 PM CST August 16, 1988



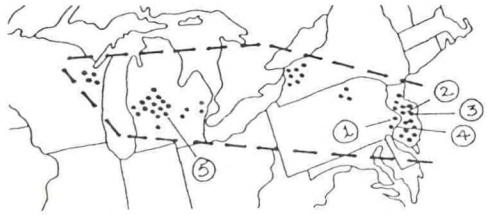
GOES 10:01 PM CST August 16, 1988

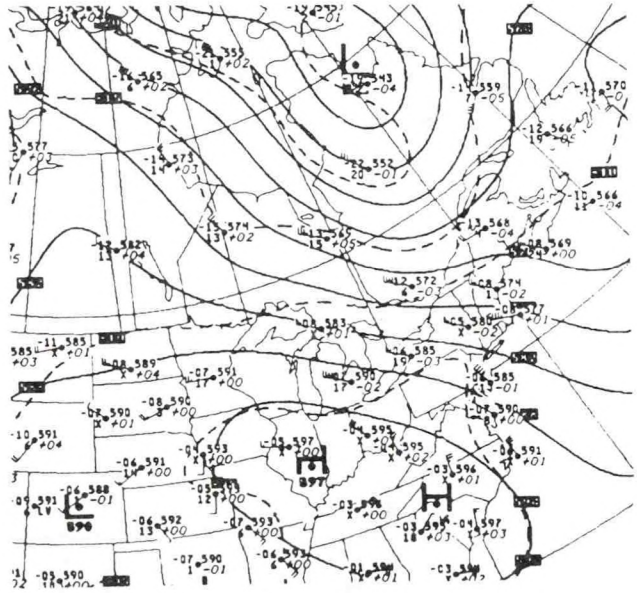


Composite 6PM CST August 17, 1988

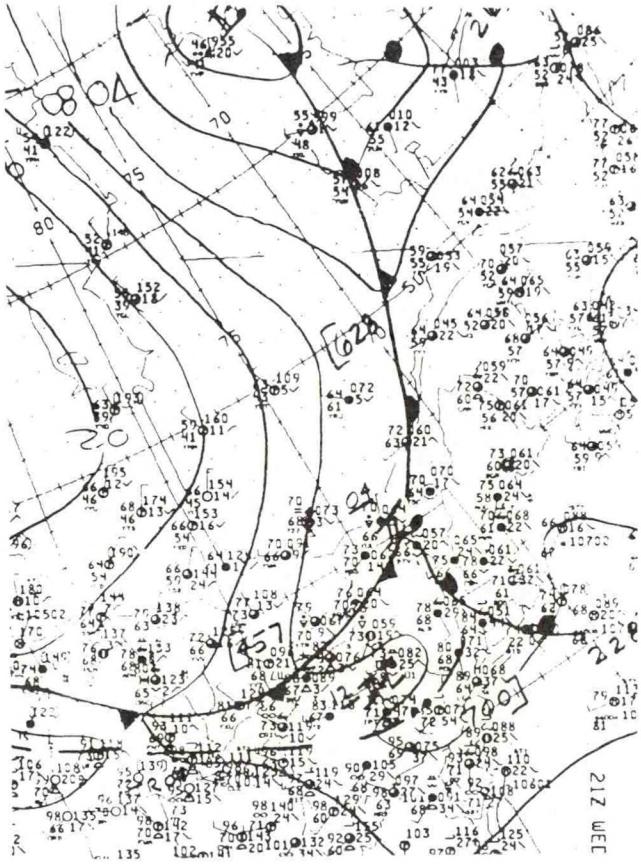
17AUG88 0732-2327 CST 66 REPORTS 1 TORNADO

NO	TIME	EVENT	ST	LOCATION
1	1630	95 MPH WIND GUST	PA	PHILADELPHIA
2	1630	TORNADO (F-2)	NJ	TRENTON
3	1650	85 MPH WIND GUST	NJ	WRIGHTSTOWN
4	1730	TORNADO (F-2)	NJ	CARNEY'S POINT
5	1910	2.00 INCH HAIL	MI	PORTLAND

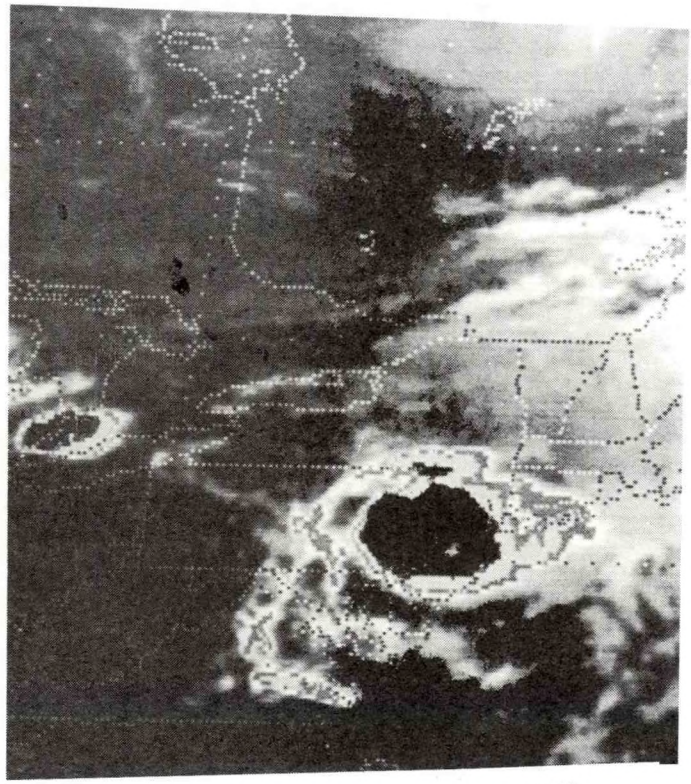




500 MB 6PM CST August 17, 1988



Surface 3PM CST August 17, 1988

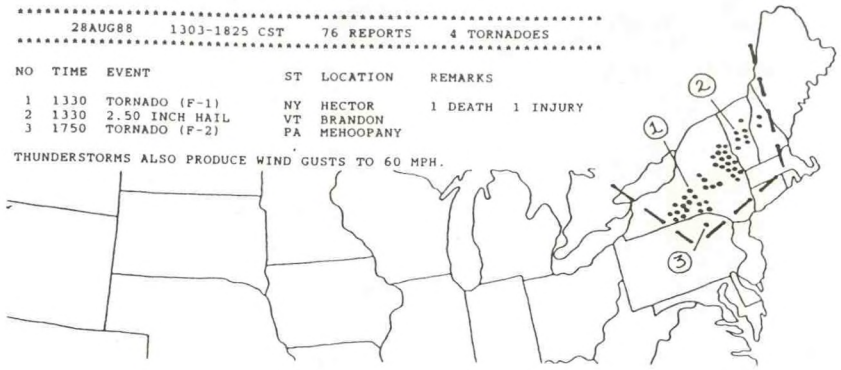


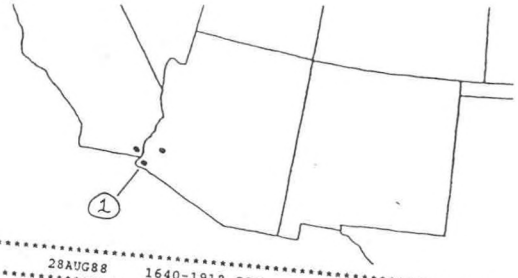
GOES 5:01 PM CST August 17, 1988

28AUG88 1303-1825 CST 76 REPORTS 4 TORNADOES

NO	TIME	EVENT	ST	LOCATION	REMARKS
1	1330	TORNADO (F-1)	NY	HECTOR	1 DEATH 1 INJURY
2	1330	2.50 INCH HAIL	VT	BRANDON	
3	1750	TORNADO (F-2)	PA	MEHOOPANY	

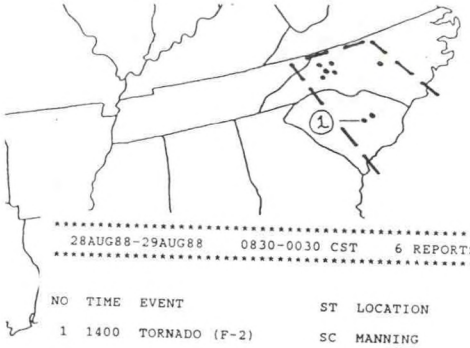
THUNDERSTORMS ALSO PRODUCE WIND GUSTS TO 60 MPH.





28AUG88 1640-1918 CST 3 REPORTS

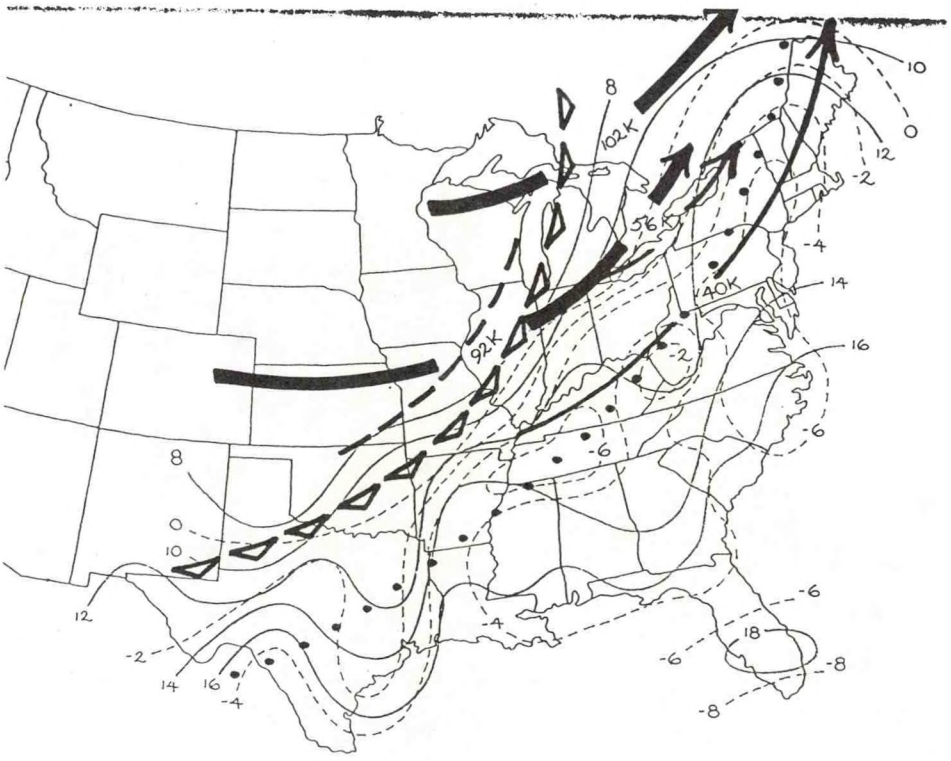
NO	TIME	EVENT	ST	LOCATION
1	1700	60 MPH WIND GUST	AZ	YUMA



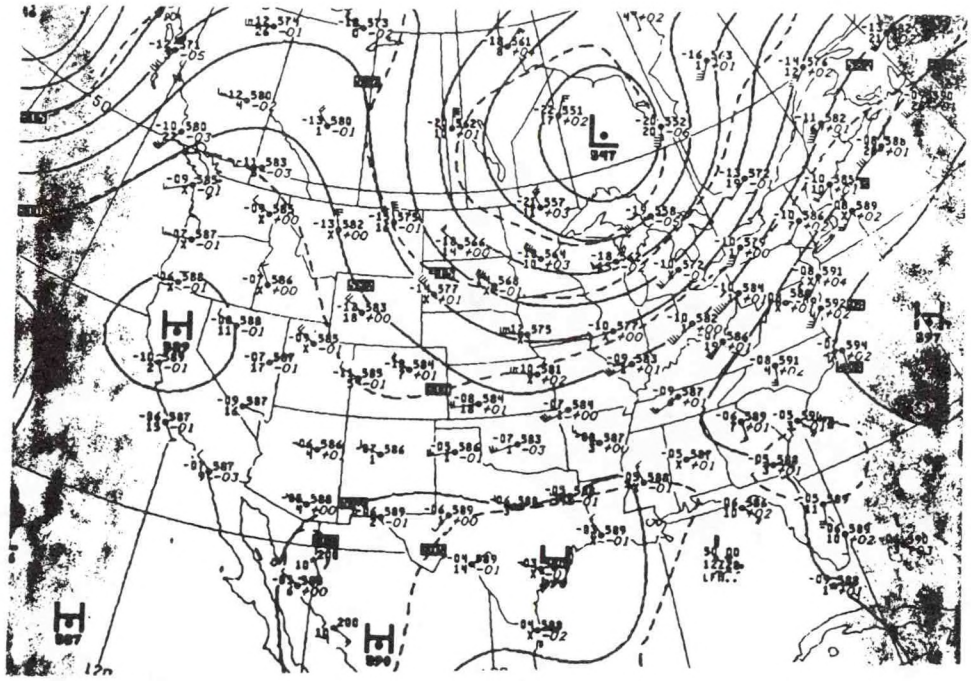
28AUG88-29AUG88 0830-0030 CST 6 REPORTS 4 TORNADOES

NO	TIME	EVENT	ST	LOCATION
1	1400	TORNADO (F-2)	SC	MANNING

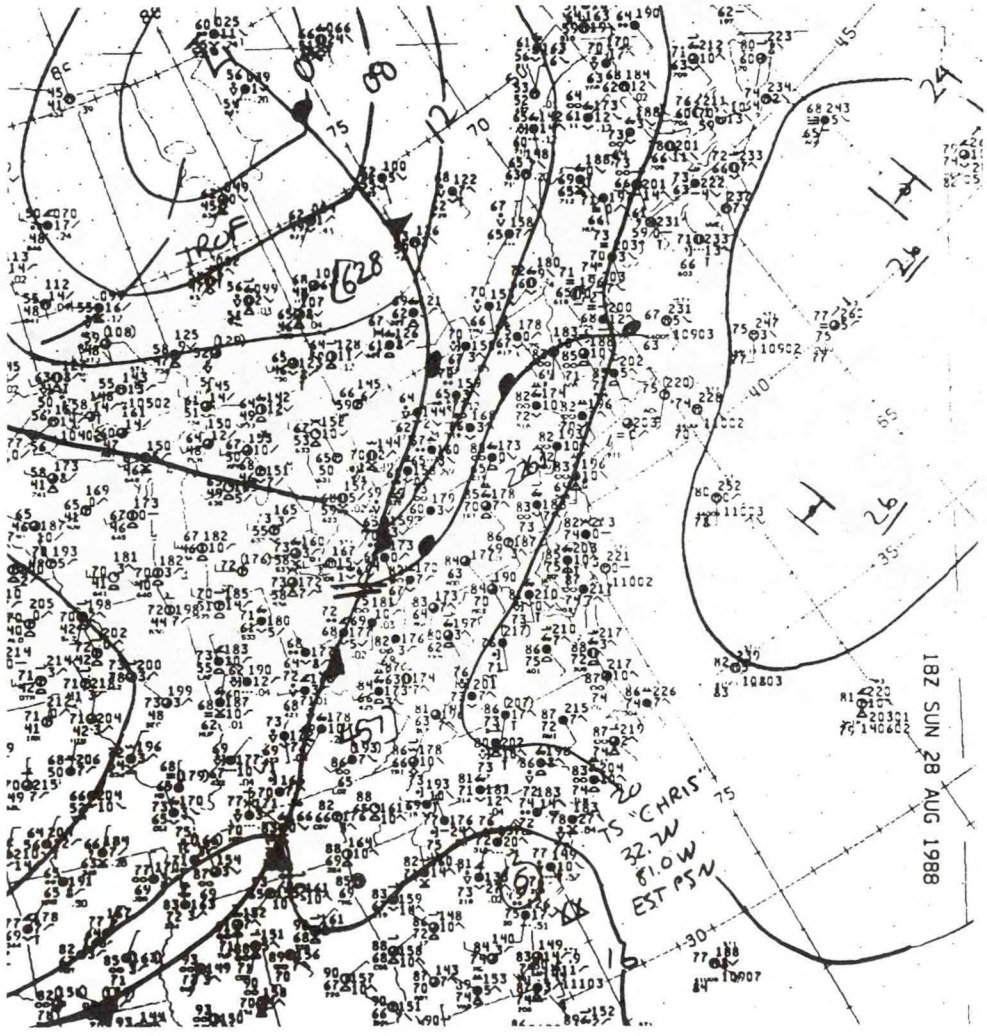
ONE DEATH, ONE INJURY, 50 MOBILE HOMES DAMAGE, 13 MOBILE HOMES DESTROYED.



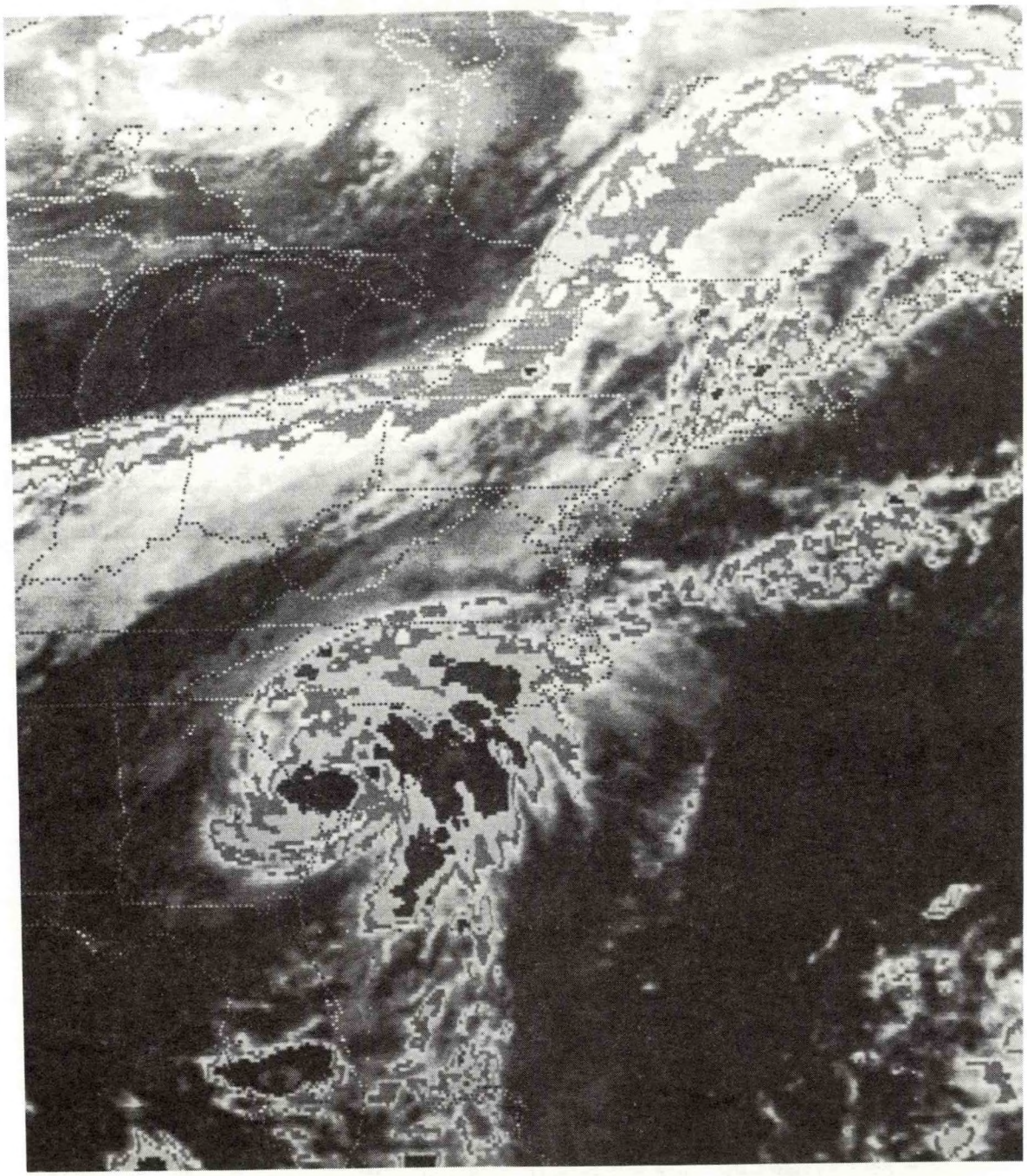
Composite 6AM CST August 28, 1988



500 MB 6AM CST August 28, 1988



Surface 12 Noon CST August 28, 1988



GOES 1:01 PM CST August 28, 1988

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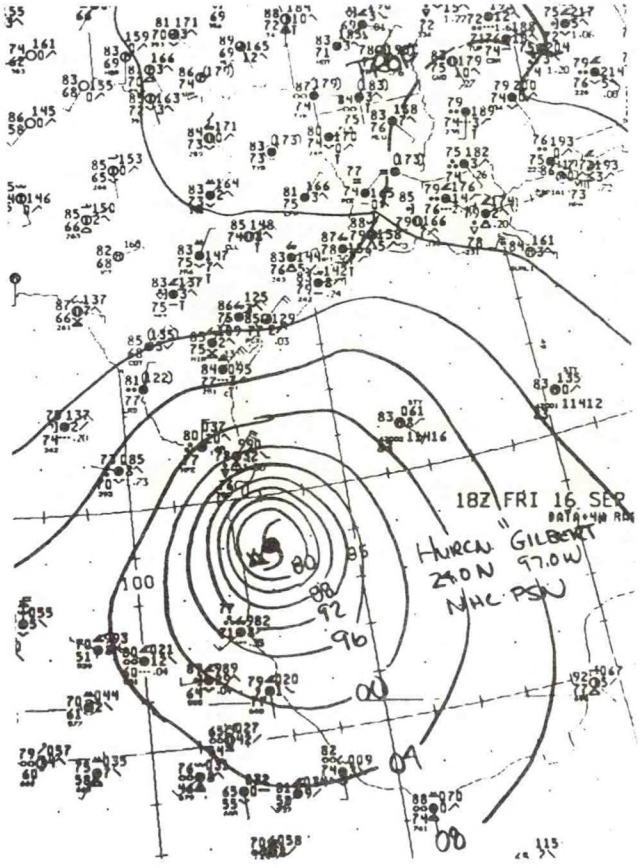
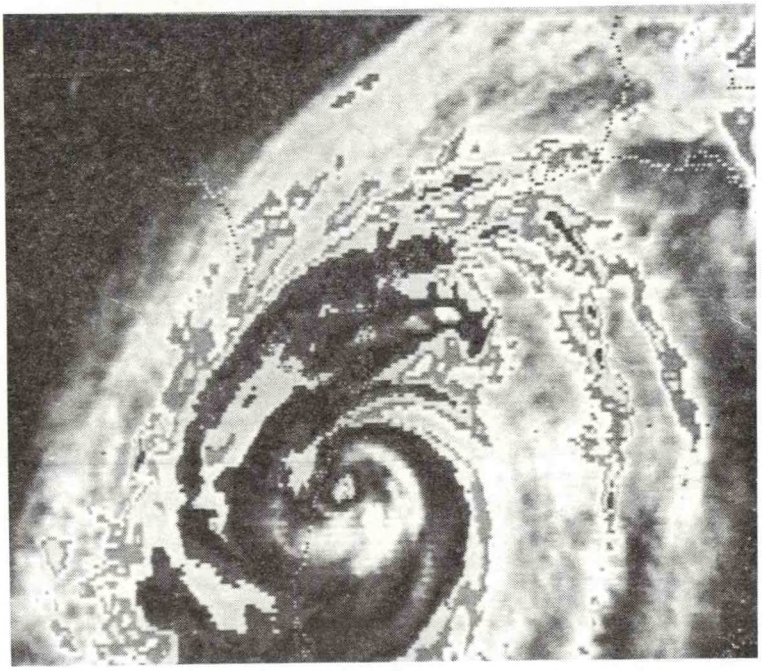
16SEP88-17SEP88 0845-1752 CST 46 TORNADOES

****

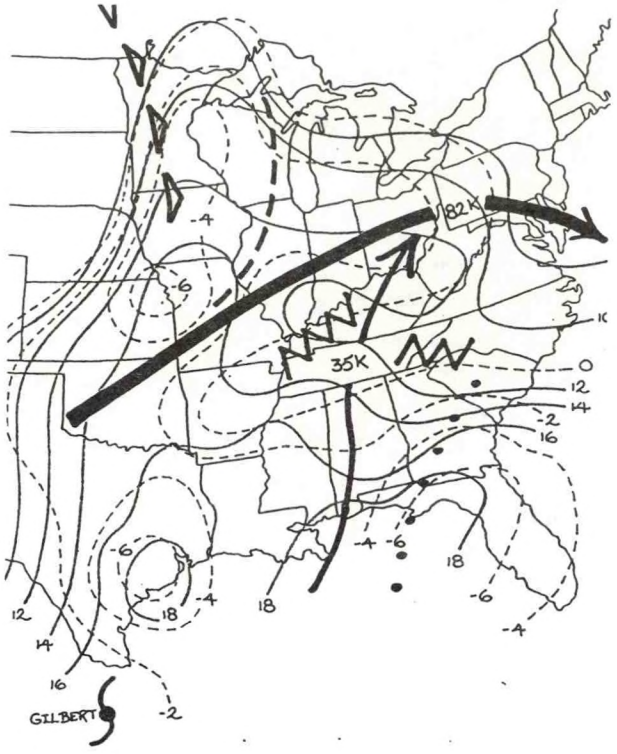
NO	TIME	EVENT	ST	LOCATION	REMARKS
1	1400	TORNADO (F-1)	TX	HARLINGEN	$1 MILLION DAMAGE
2	0445	TORNADO (F-1)	TX	SAN ANTONIO	1 DEATH, 1 INJURY
3	0549	TORNADO (F-2)	TX	SAN ANTONIO	$28 MILLION DAMAGE
4	0630	TORNADO (F-1)	TX	SAN ANTONIO	$6 MILLION DAMAGE
5	1645	TORNADO (F-2)	TX	DEL RIO	2 INJURIES



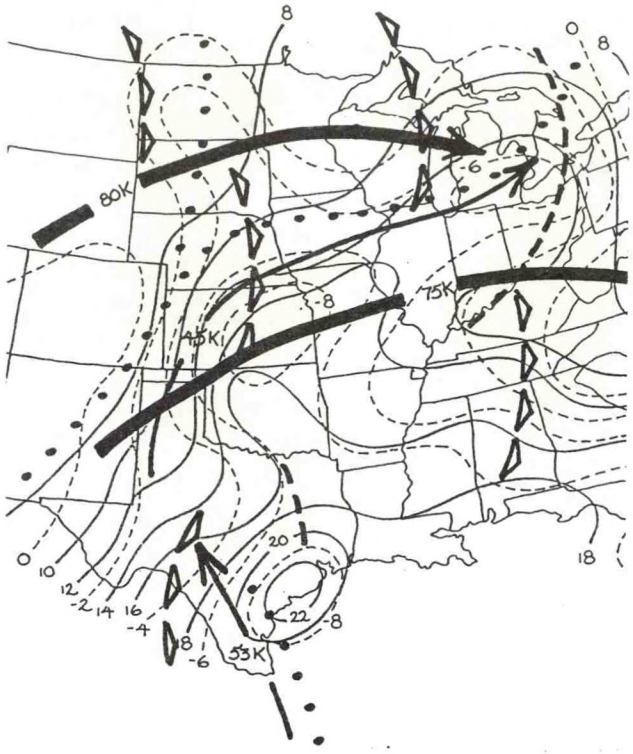
Surface 12 Noon CST September 16, 1988



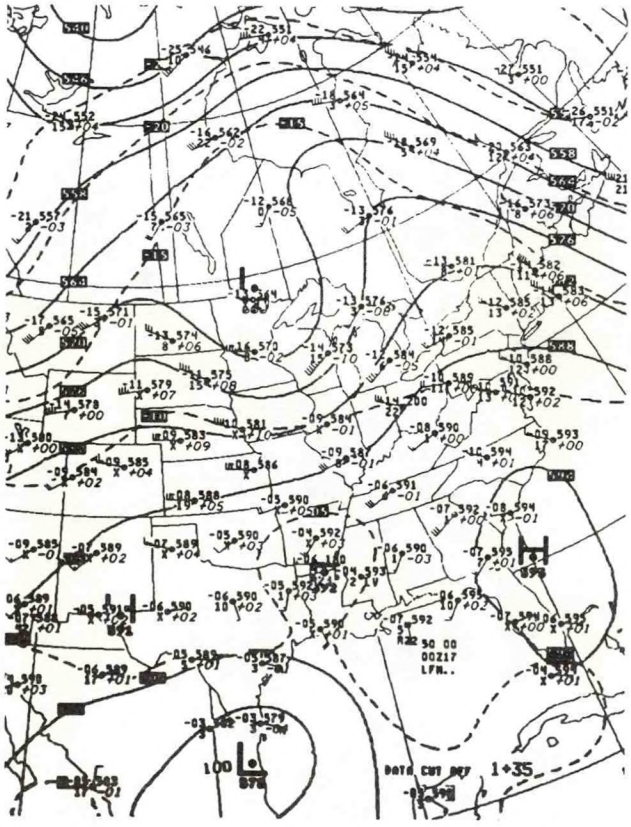
GOES 1:01 PM CST September 16, 1988



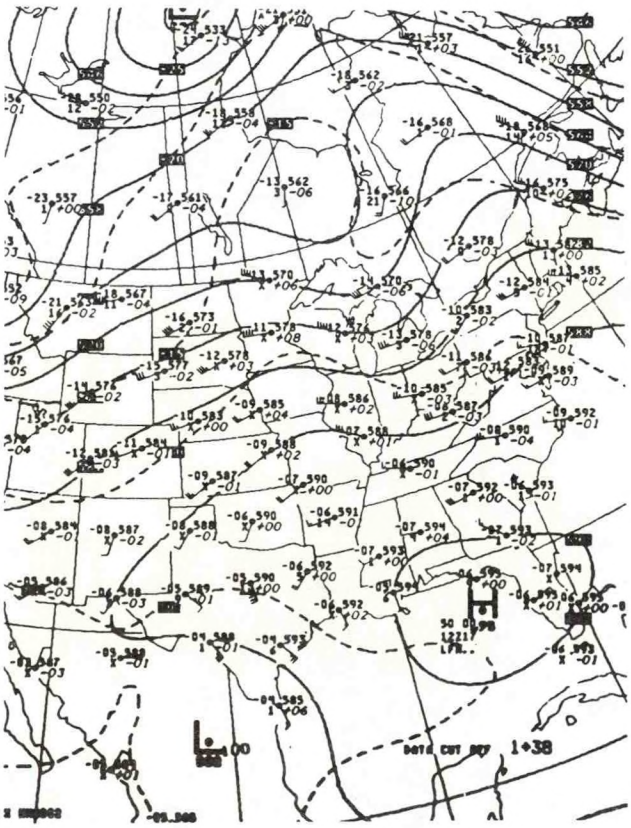
Composite 6PM CST September 16, 1988



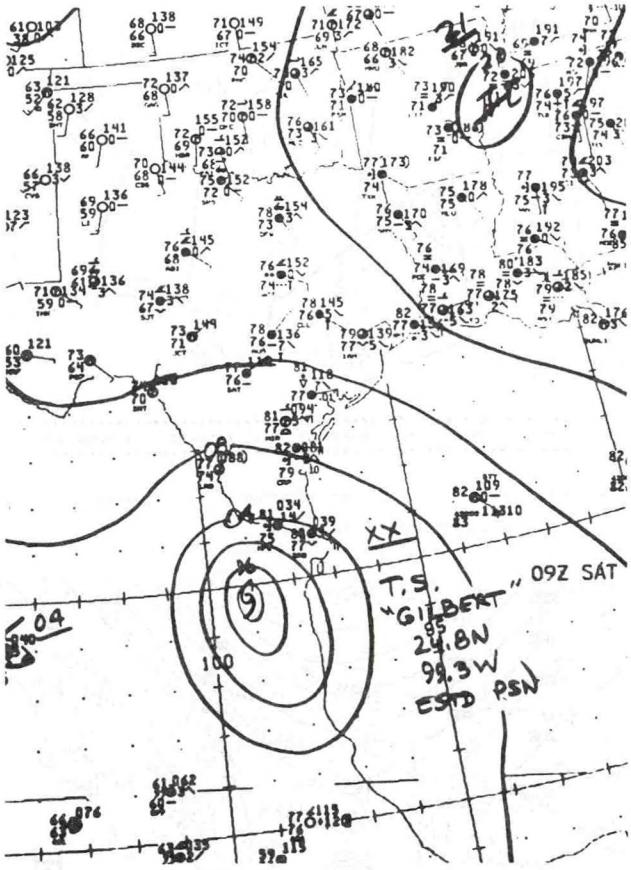
Composite 6AM CST September 17, 1988



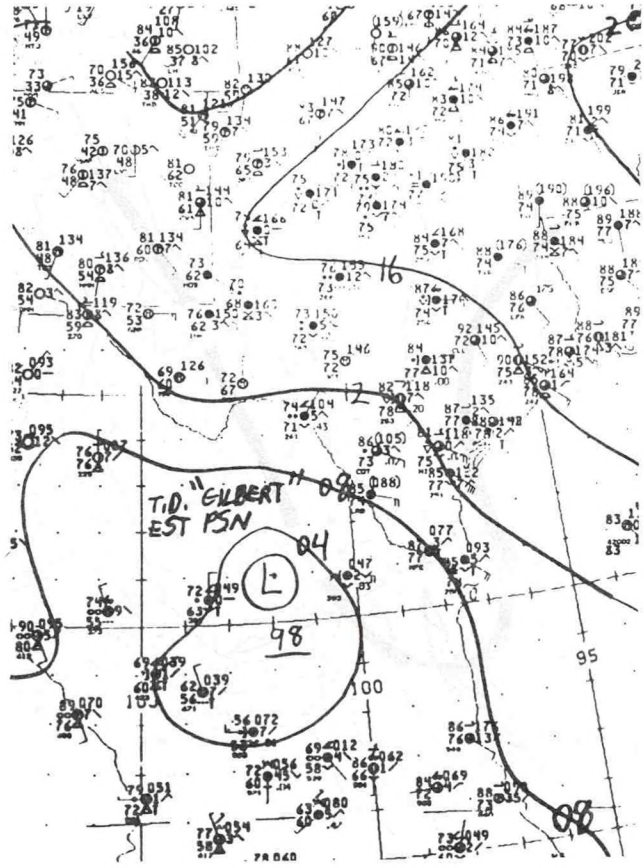
500 MB 6PM CST September 16, 1988



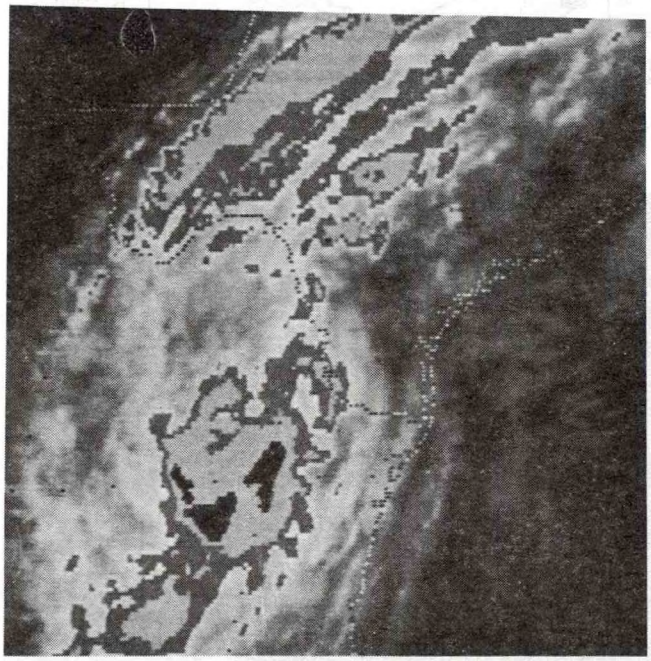
500 MB 6AM CST September 17, 1988



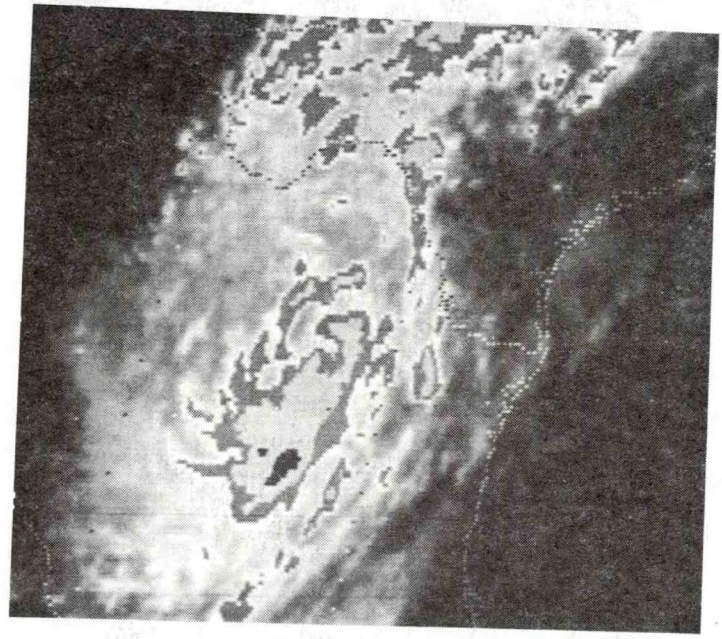
Surface 3AM CST September 17, 1988



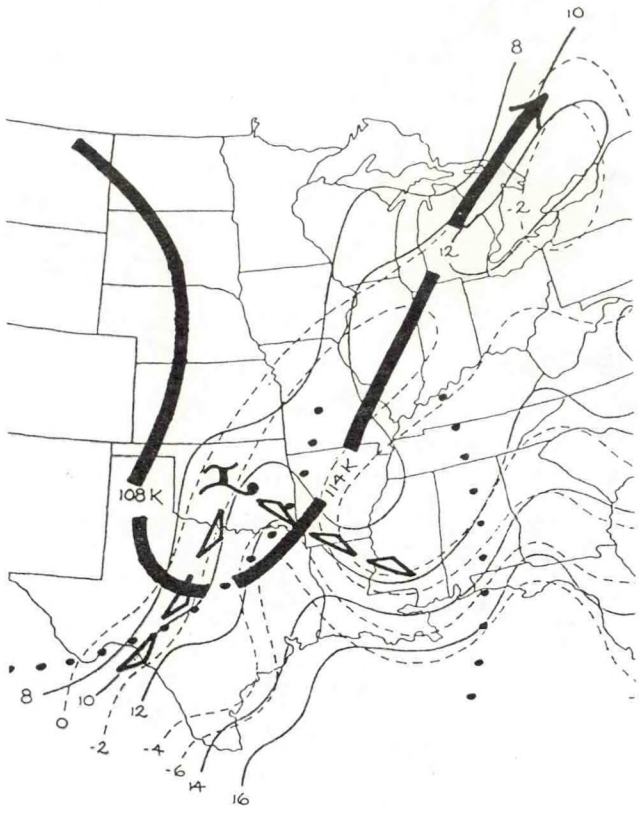
Surface 12 NOON CST September 17, 1988



GOES 6:01 PM CST September 16, 1988



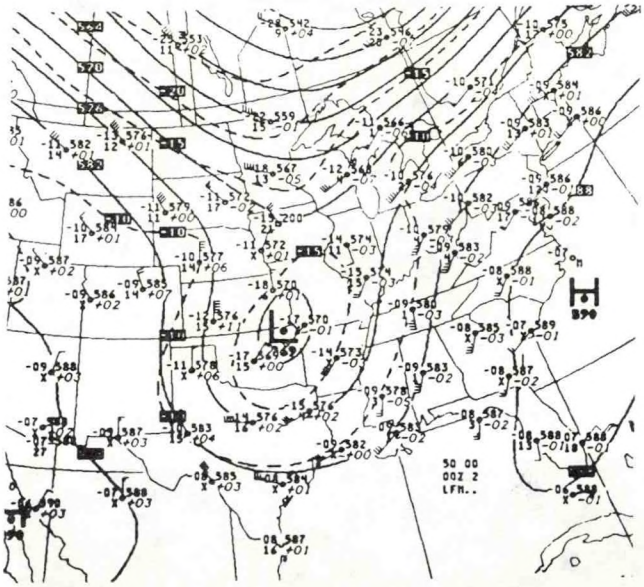
GOES 8:01 PM CST September 17, 1988



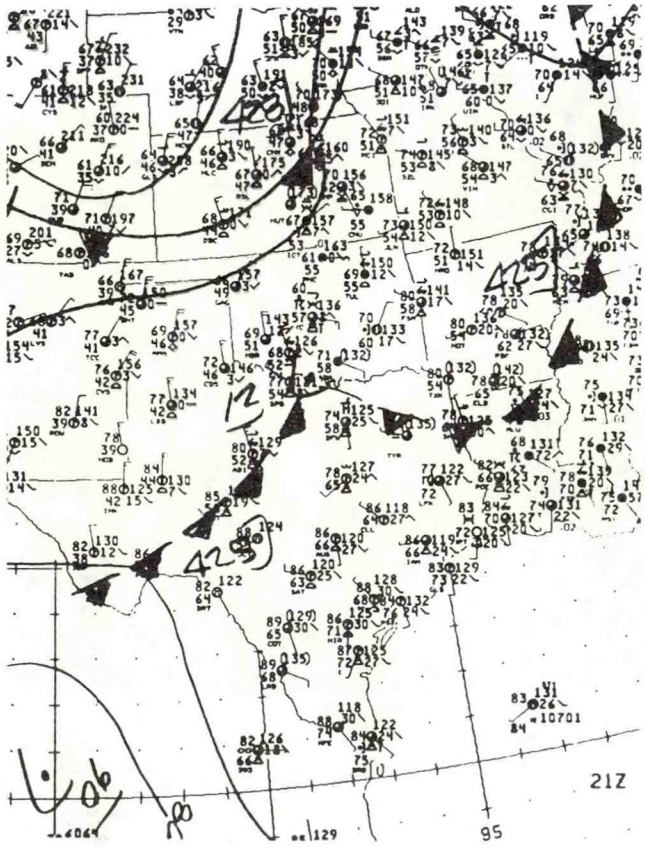
Composite 6PM CST October 1, 1988

010CT88-020CT88 1245-0350 CST 61 REPORTS 4 TORNADOES

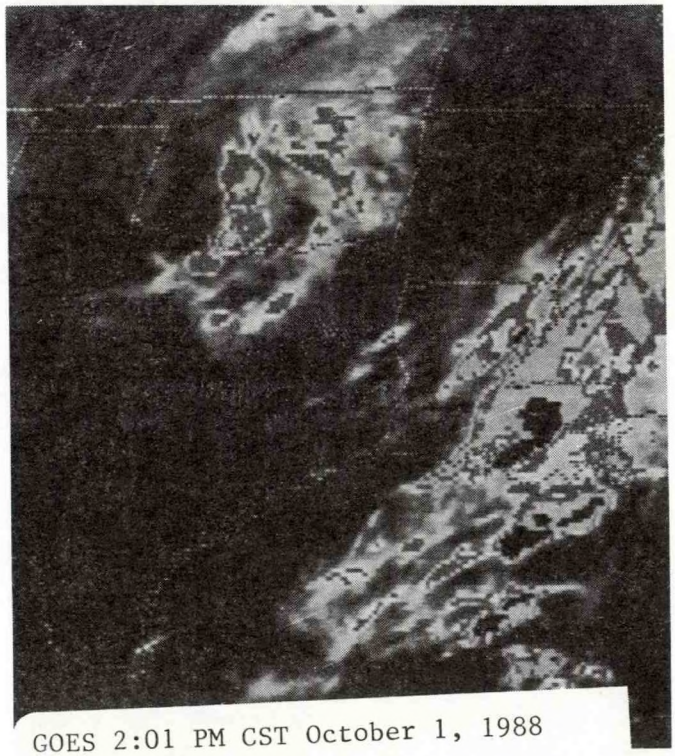
NO	TIME	EVENT	ST	LOCATION	REMARKS
1	1525	4.50 INCH HAIL	TX	NACONA	



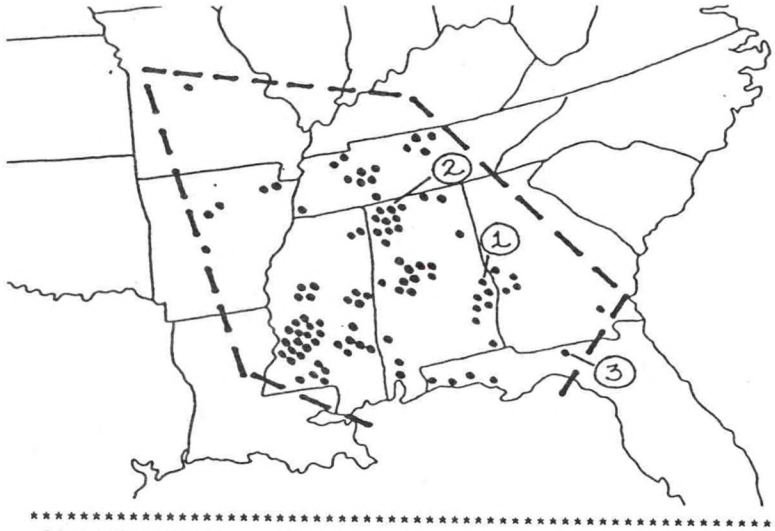
500 MB 6PM CST October 1, 1988



Surface 3PM CST October 1, 1988



GOES 2:01 PM CST October 1, 1988



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04NOV88-05NOV88 1305-0100 CST 111 REPORTS 18 TORNADOES

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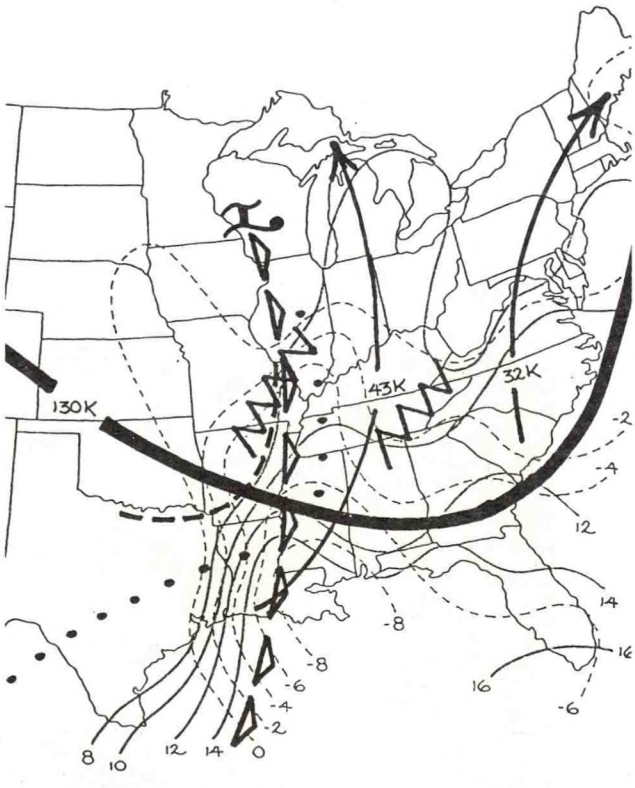
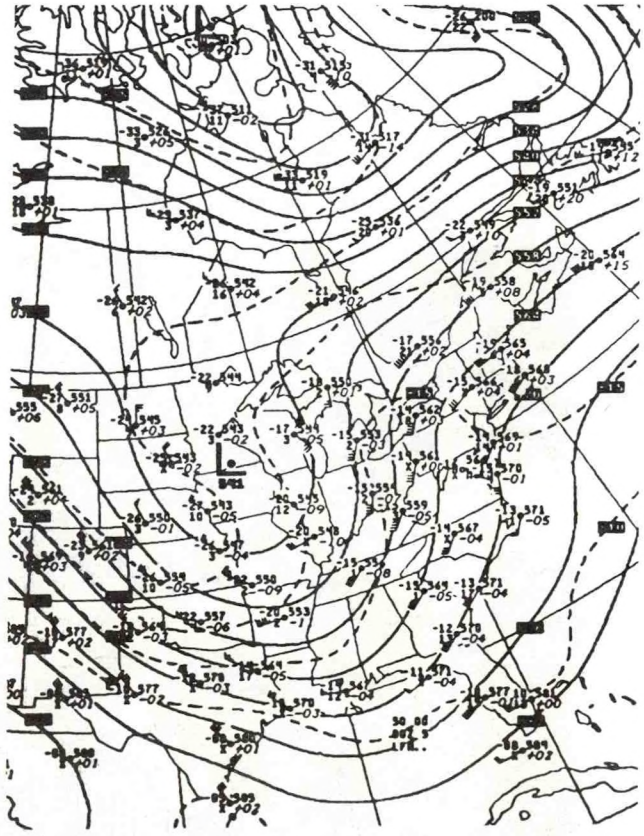
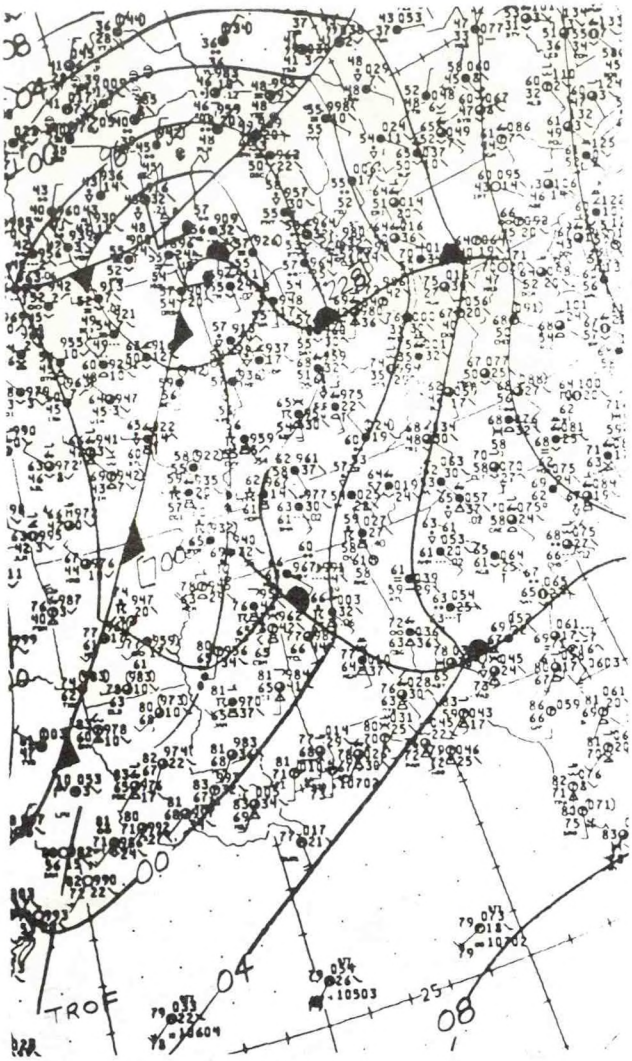
NO	TIME	EVENT	ST	LOCATION	REMARKS
1	1545	2.75 INCH HAIL	AL	PHENIX CITY	
2	1620	TORNADO (F-3)	AL	TUSCUMBIA	$2.2 MILLION DAMAGE, 16 INJURIES
3	0015	TORNADO (F-2)	FL	LEE	1 DEATH, 3 INJURIES



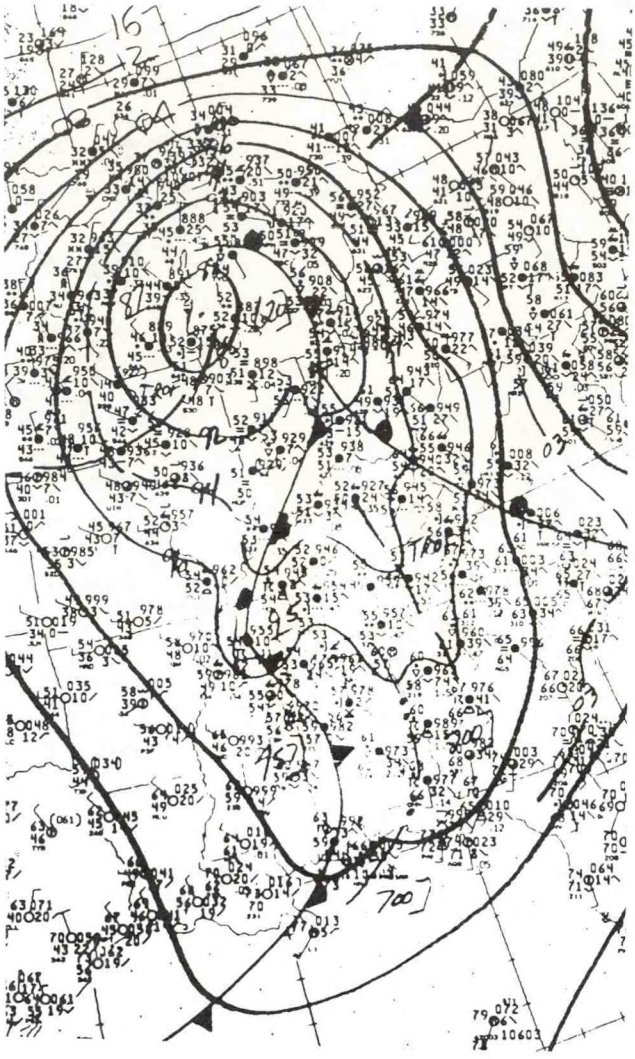
Composite 6PM CST November 4, 1988



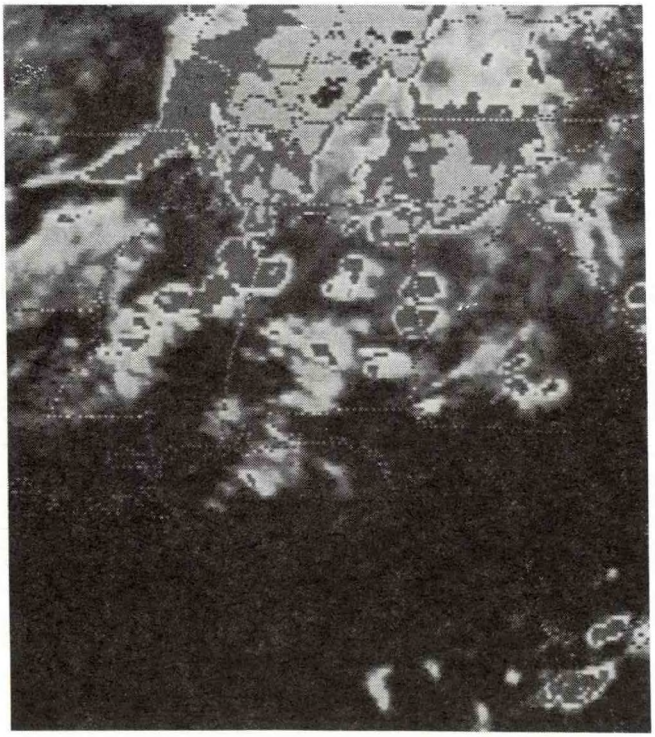
500 MB 6PM CST November 4, 1988



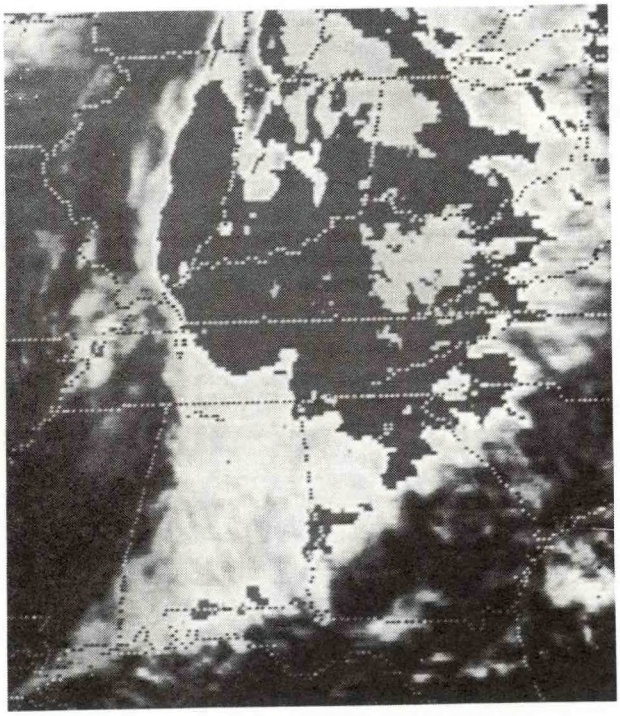
Surface 3PM CST November 4, 1988



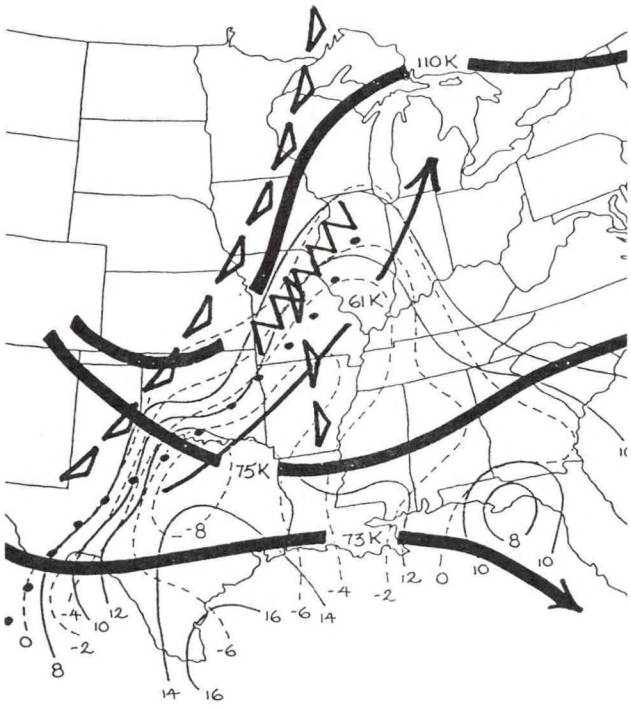
Surface Midnight CST November 5, 1988



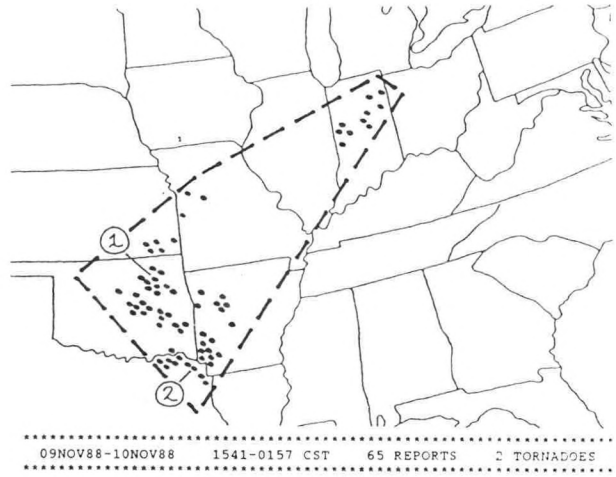
GOES 3:01 PM CST November 4, 1988



GOES 11:31 PM CST November 4, 1988

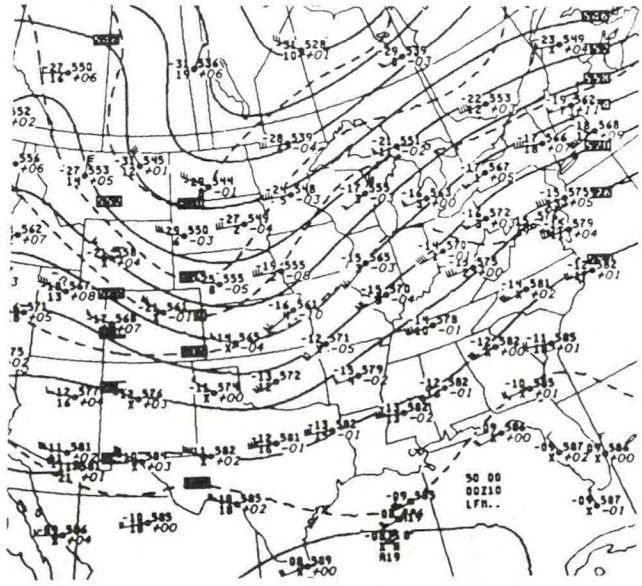


Composite 6PM CST November 9, 1988

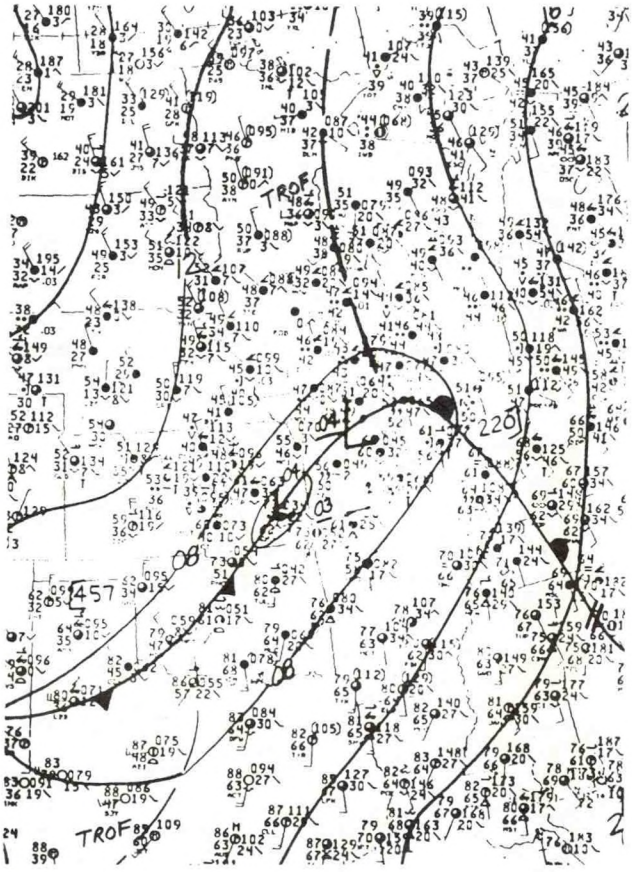


09NOV88-10NOV88 1541-0157 CST 65 REPORTS 2 TORNADOES

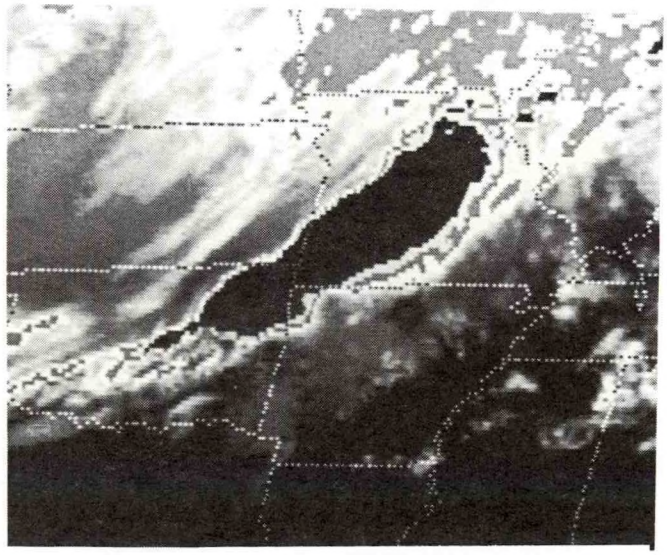
NO	TIME	EVENT	ST	LOCATION
1	1728	2.25 INCH HAIL	OK	SAPULPA
2	2255	70 MPH WIND GUST	TX	DEKALB



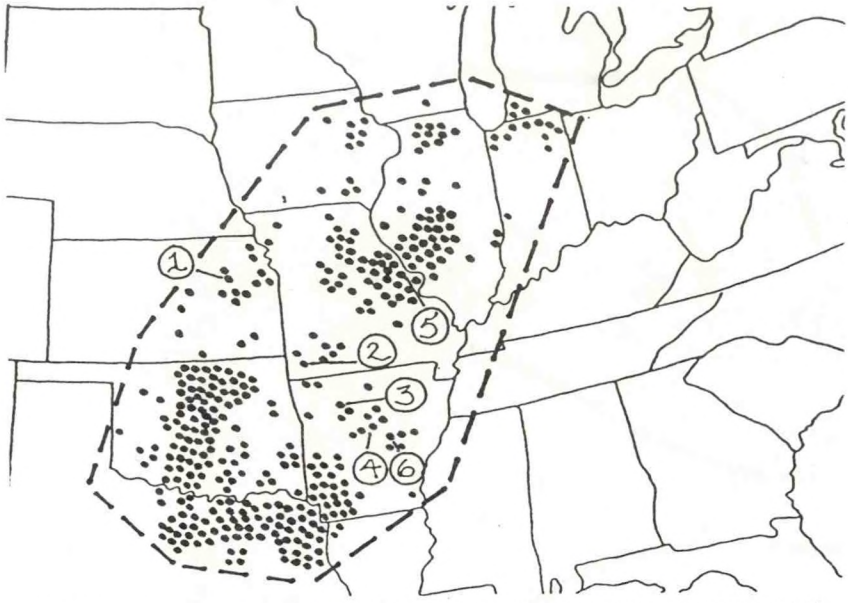
500 MB 6PM CST November 9, 1988



Surface 3PM CST November 9, 1988



GOES 5:31 PM CST November 9, 1988



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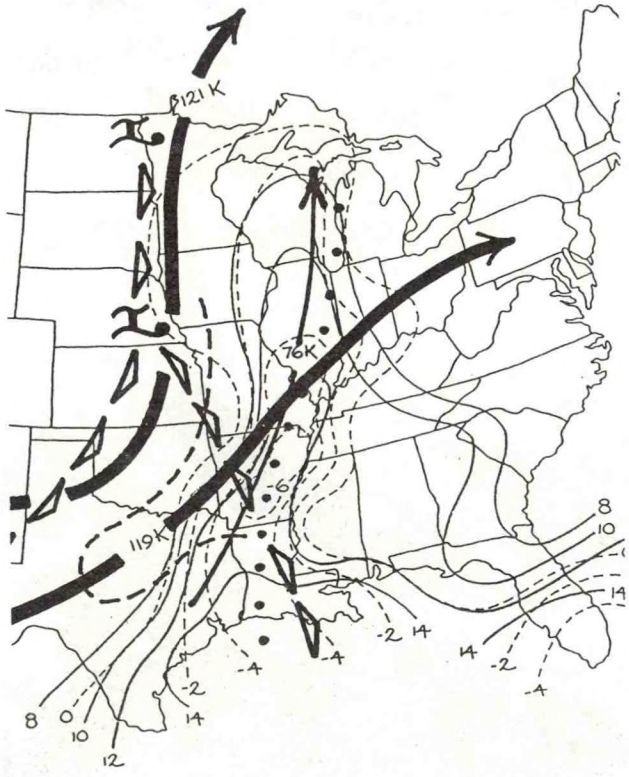
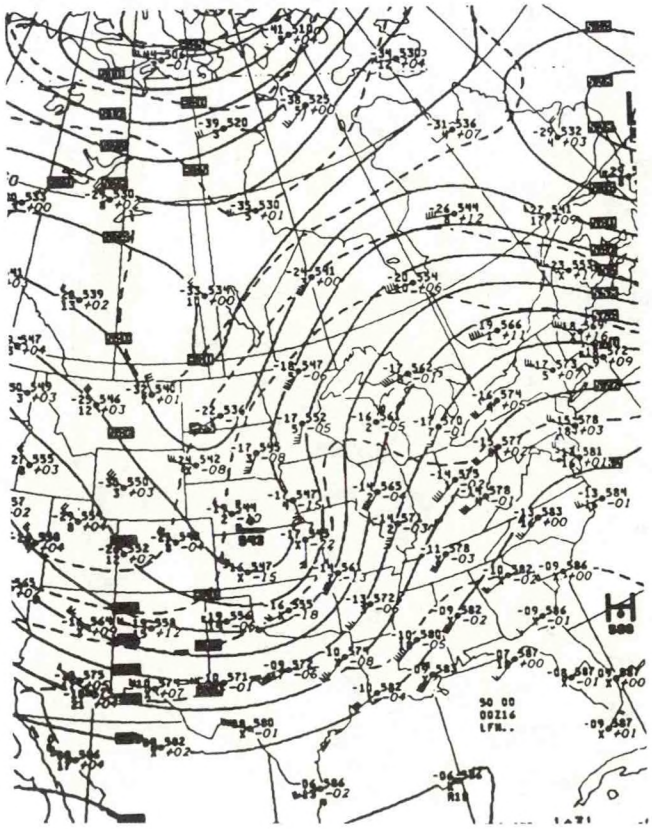
15NOV88-16NOV88 0840-0524 CST 401 REPORTS 44 TORNADOES

****

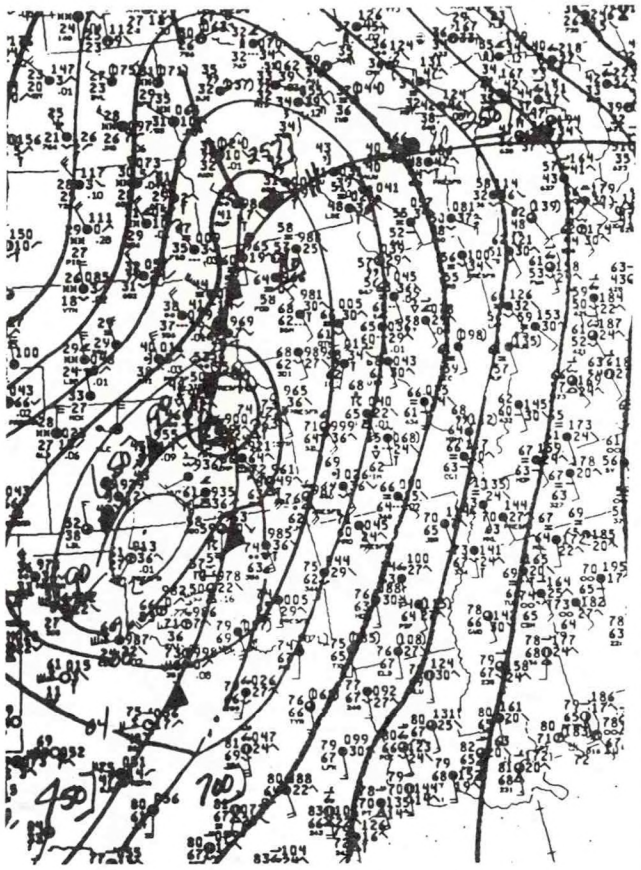
NO	TIME	EVENT	ST	LOCATION	REMARKS
1	1406	TORNADO (F-2)	KS	TOPEKA	$3.9 MILLION DAMAGE, 22 INJURIES
2	1622	TORNADO (F-2)	MO	BUTTERFIELD	1 DEATH, 12 INJURIES
3	1828	TORNADO (F-2)	AR	CLARKSVILLE	$2.0 MILLION DAMAGE, 9 INJURIES
4	1941	TORNADO (F-3)	AR	SOUTHSIDE	1 DEATH, 10 INJURIES, $2.2 MILLION DAMAGE
5	2025	TORNADO (F-3)	MO	O'FALLON	10 INJURIES
6	2136	TORNADO (F-2)	AR	SCOTT	5 DEATHS, 60 INJURIES



Composite 6PM CST November 15, 1988

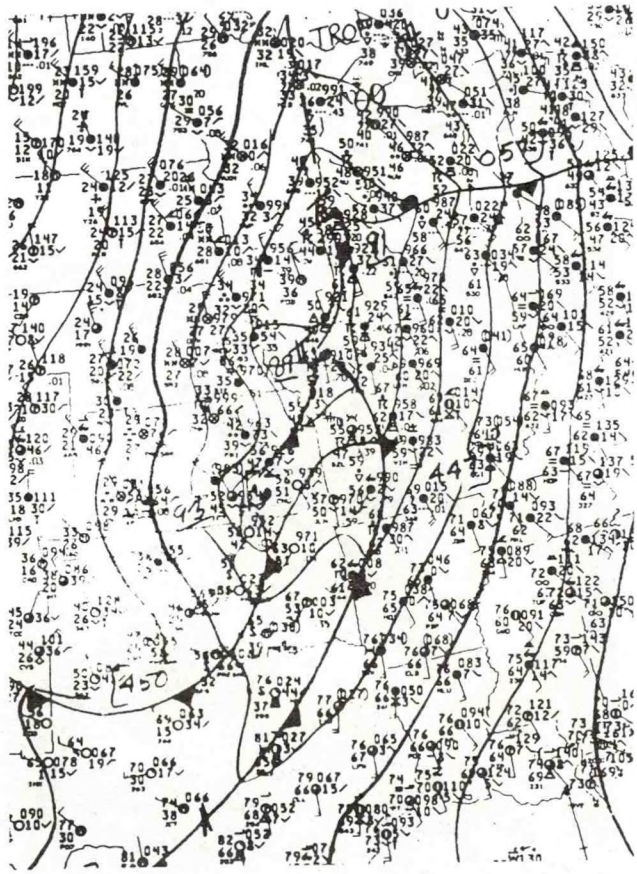


500 MB 6PM CST November 15, 1988



Surface 12 Noon CST November 15, 1988

GOES 2:01 PM CST November 15, 1988

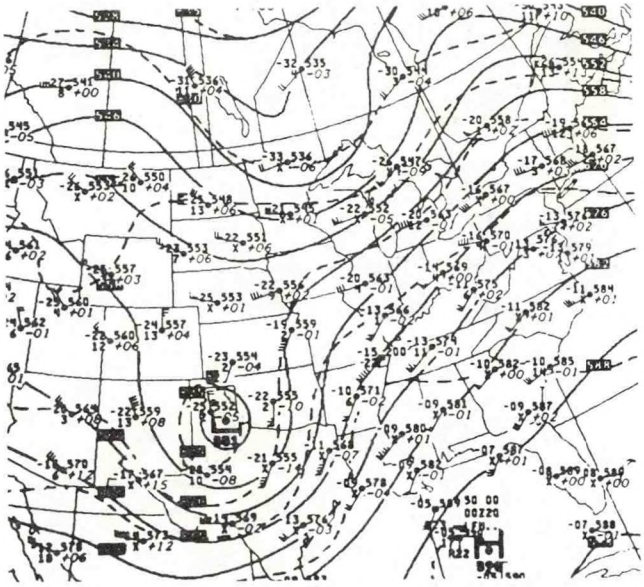


Surface 6PM CST November 15, 1988

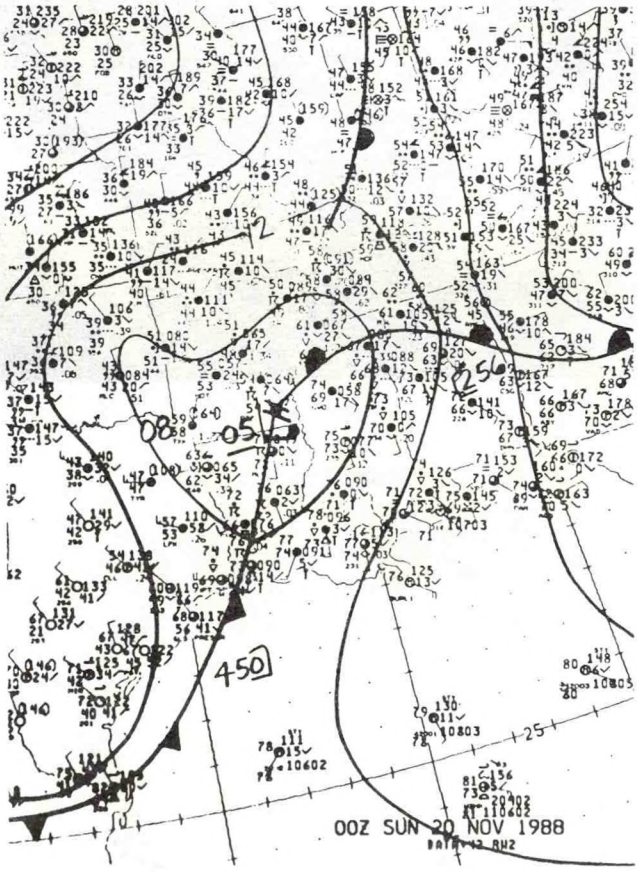
Composite 6PM CST November 19, 1988

19NOV88-20NOV88 0810-0300 CST 131 REPORTS 21 TORNADOES

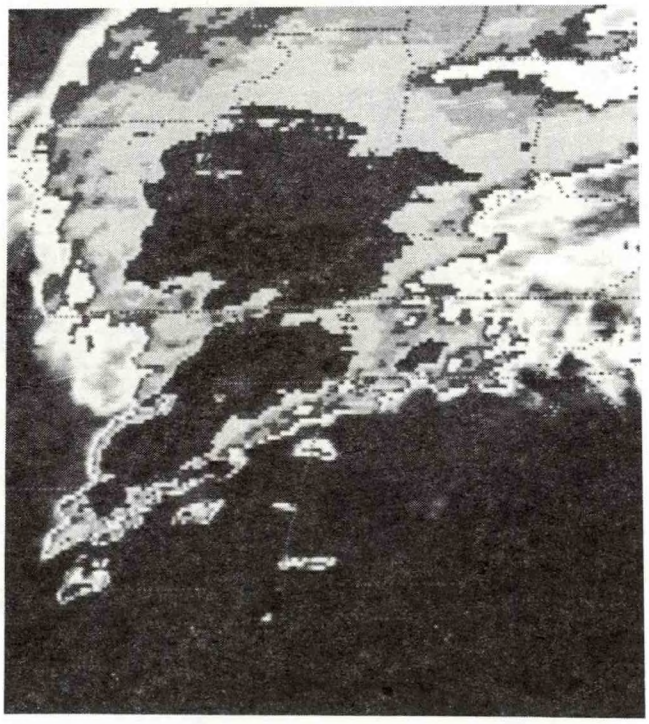
NO	TIME	EVENT	ST	LOCATION	REMARKS
1	1825	TORNADO (F-3)	MS	PARCHMAN	3 INJURIES
2	2215	TORNADO (F-3)	MS	NETTLETON	2 DEATHS, 11 INJURIES
3	0053	TORNADO (F-3)	AL	TUSCALOOSA	$1.2 MILLION DAMAGE, 8 INJURIES



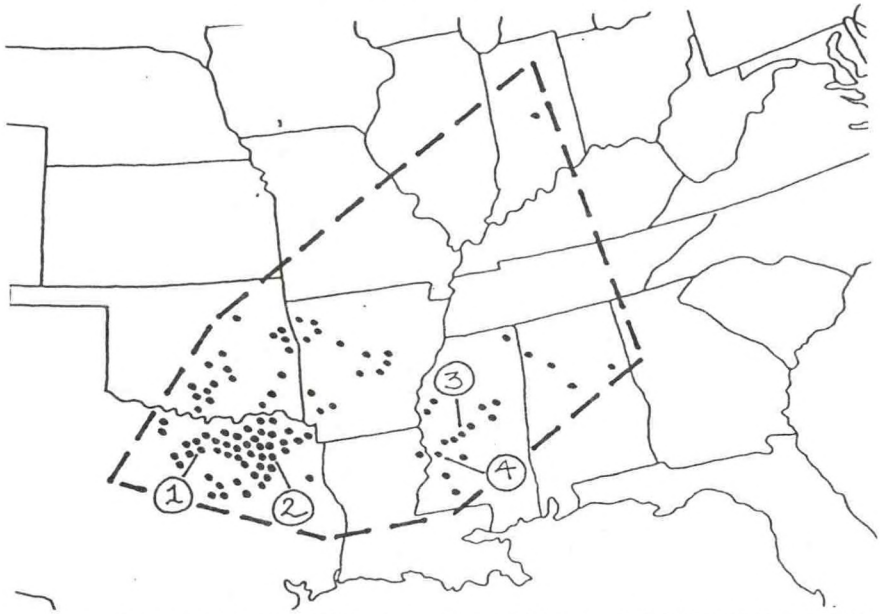
500 MB 6PM CST November 19, 1988



Surface 6PM CST November 19, 1988



GOES 6:31 PM CST November 19, 1988



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25NOV88-26NOV88 1430-1755 CST 112 REPORTS 13 TORNADOES

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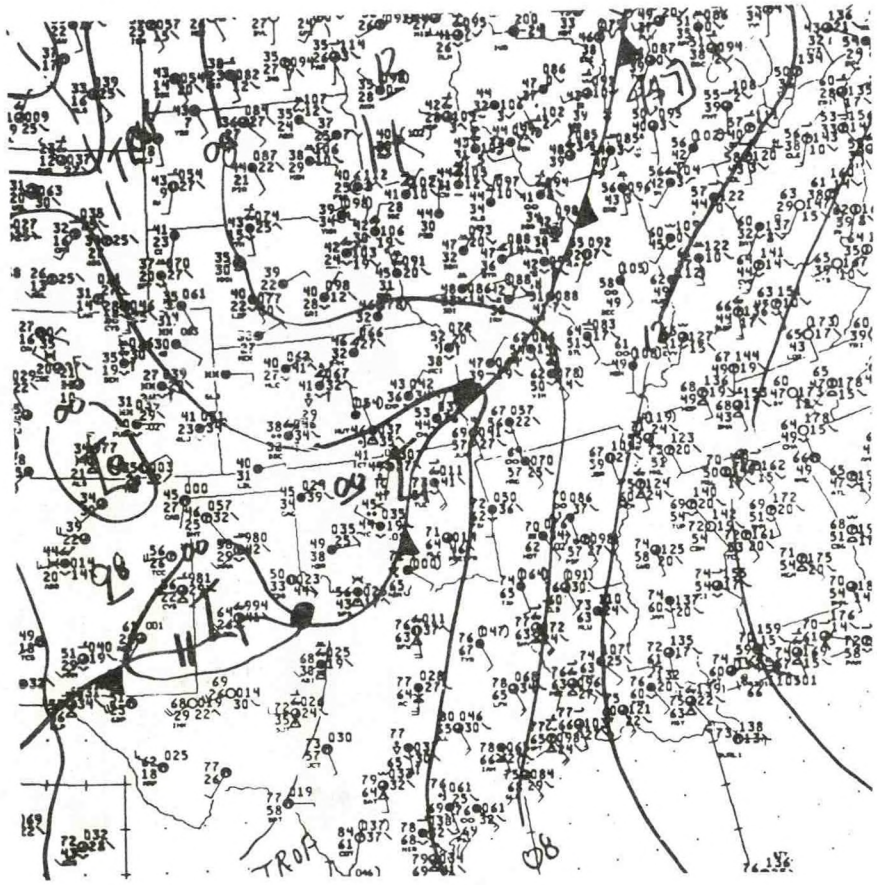
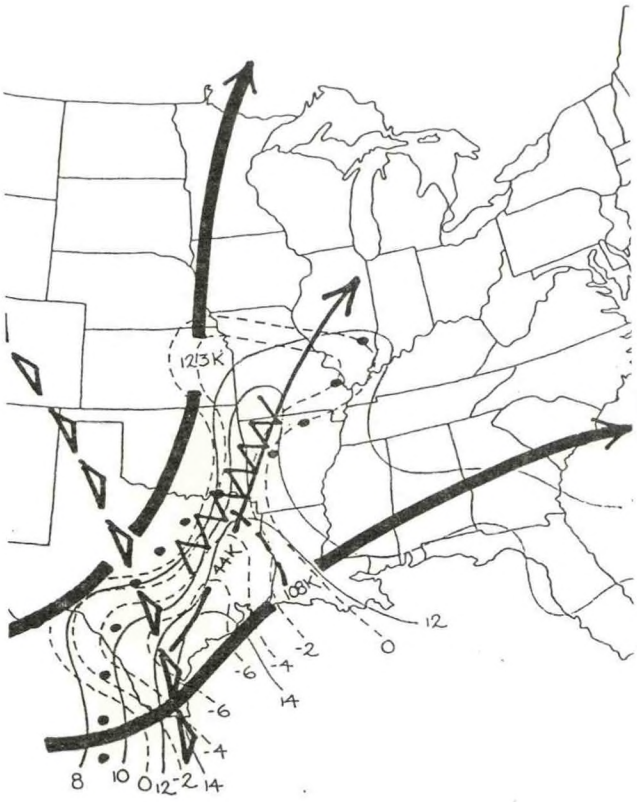
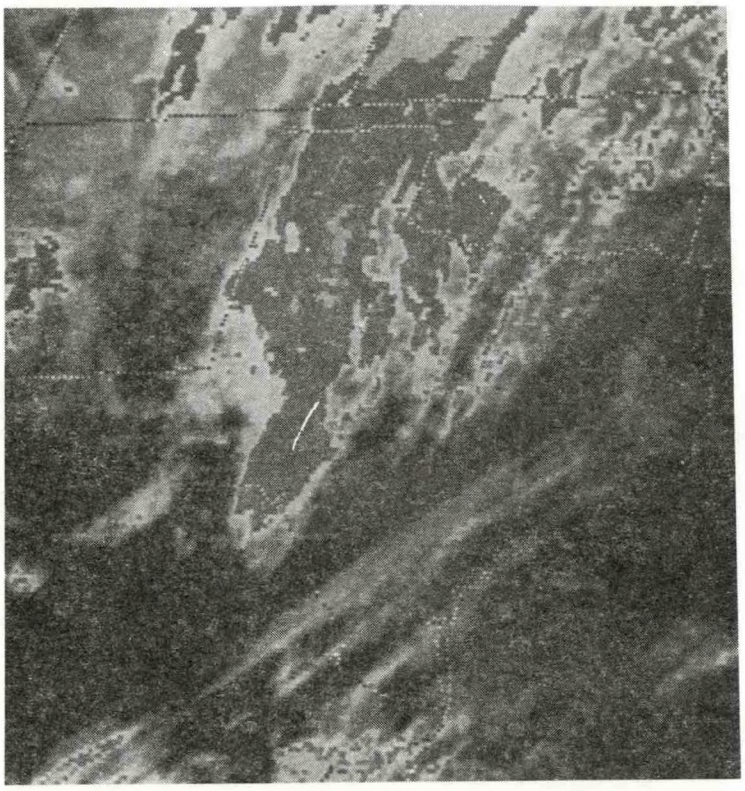
NO	TIME	EVENT	ST	LOCATION	REMARKS
1	1605	80 MPH WIND GUST	TX	KRUM	
2	1945	4.50 INCH HAIL	TX	ALBA	
3	0928	TORNADO (F-2)	MS	RULEVILLE	$2.5 MILLION DAMAGE
4	1200	TORNADO (F-2)	MS	OAK RIDGE	$1.2 MILLION DAMAGE



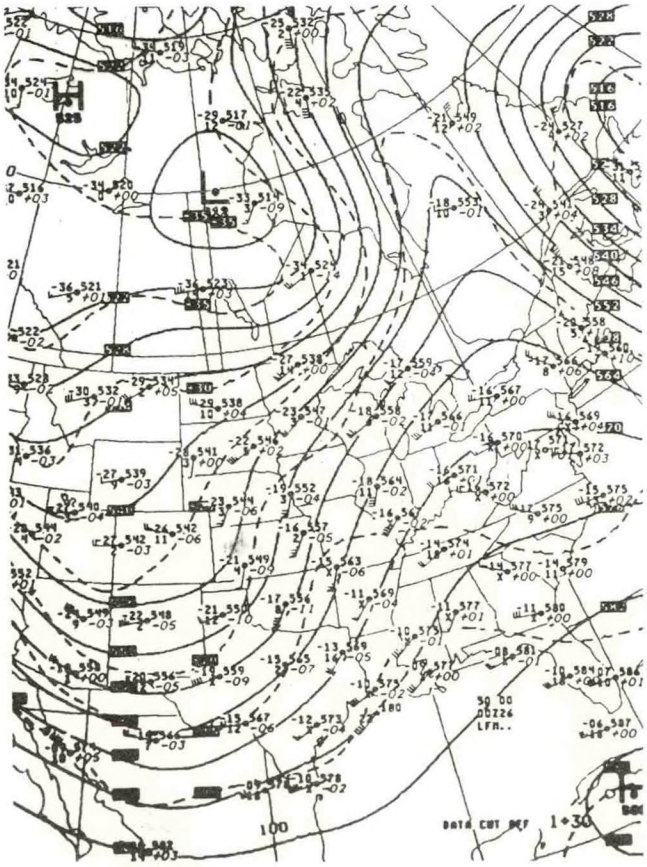
Surface 3PM CST November 25, 1988



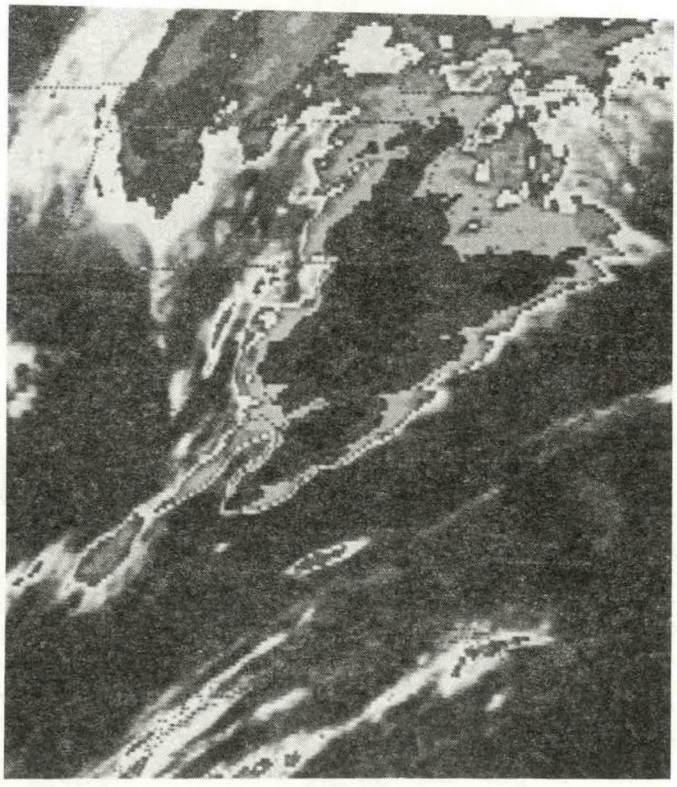
Composite 6PM CST November 25, 1988



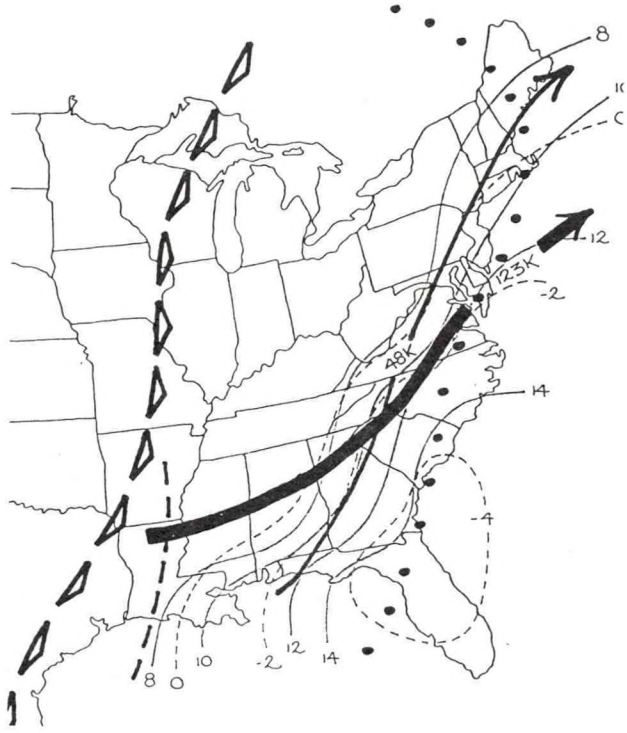
GOES 12:01 PM CST November 25, 1988



500 MB 6PM CST November 25, 1988



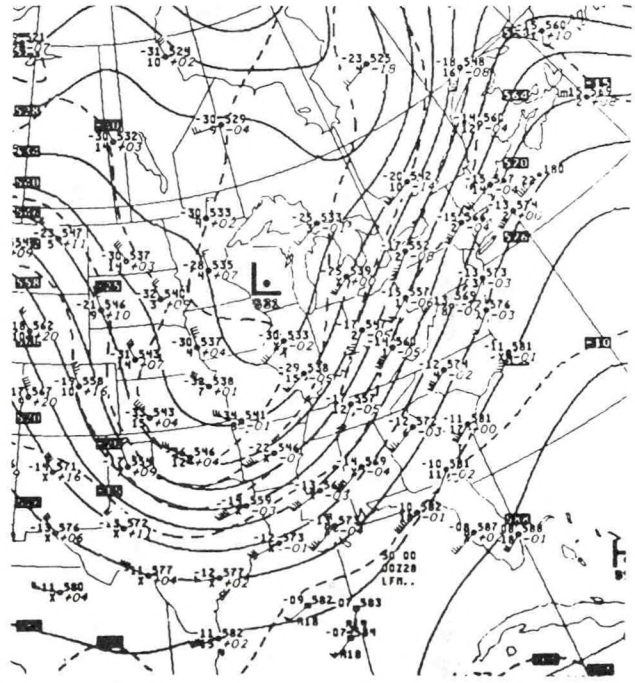
GOES 5:31 PM CST November 25, 1988



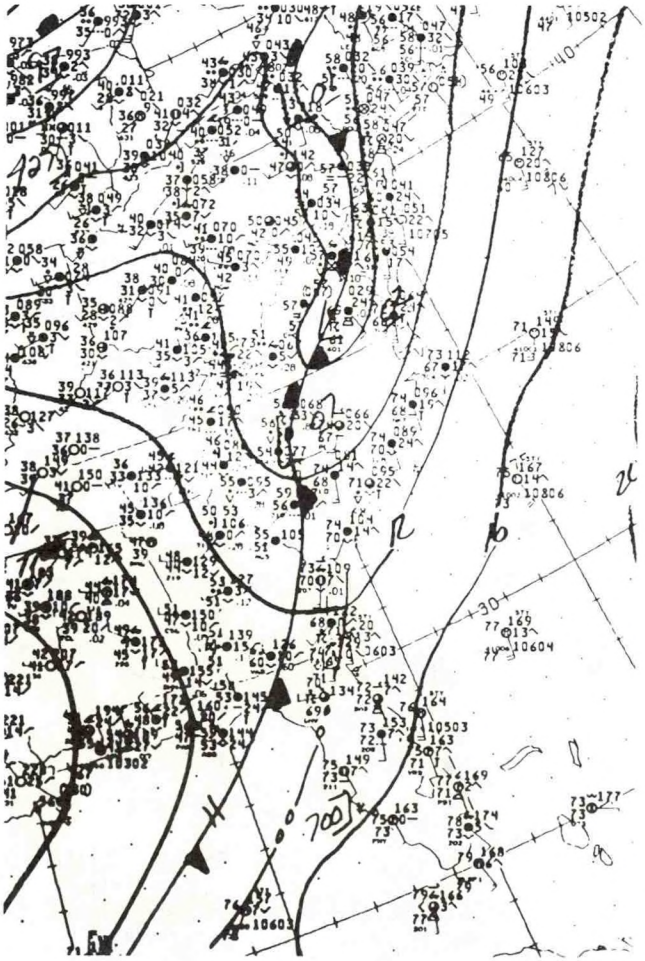
Composite 6PM CST November 27, 1988

28NOV88 0015-0449 CST 8 REPORTS 7 TORNADOES

NO	TIME	EVENT	ST	LOCATION	REMARKS
1	0000	TORNADO (F-4)	NC	RALEIGH	4 DEATHS, 154 INJURIES, $77.2 MILLION DAMAGE

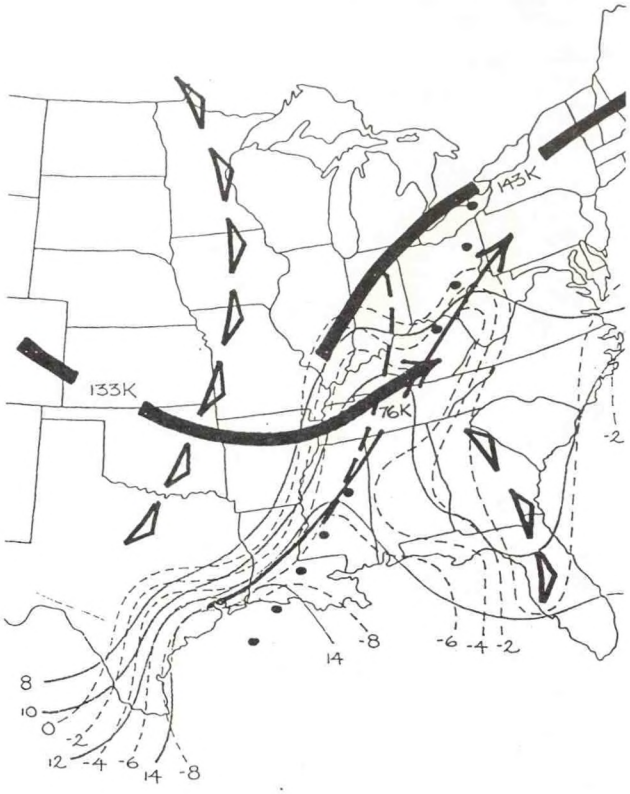


500 mb 6PM CST November 27, 1988

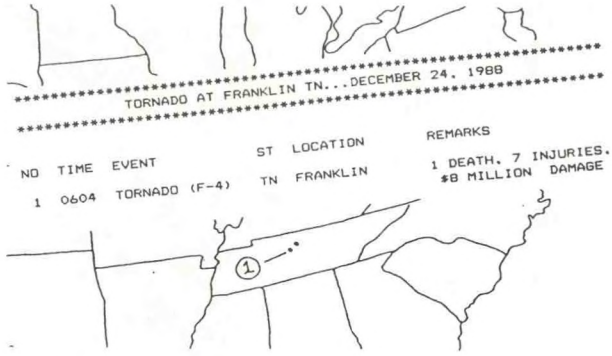


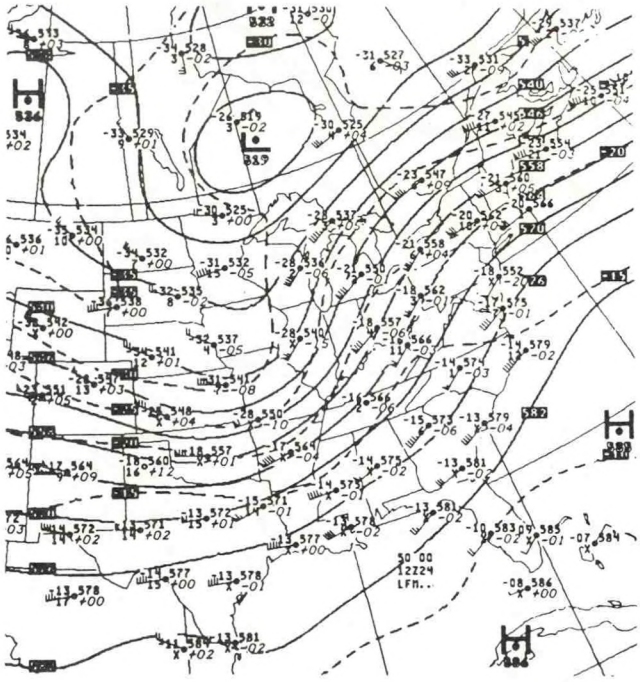
Surface 12 Midnight CST November 28, 198

37 GOES 12 Midnight CST November 28, 1988

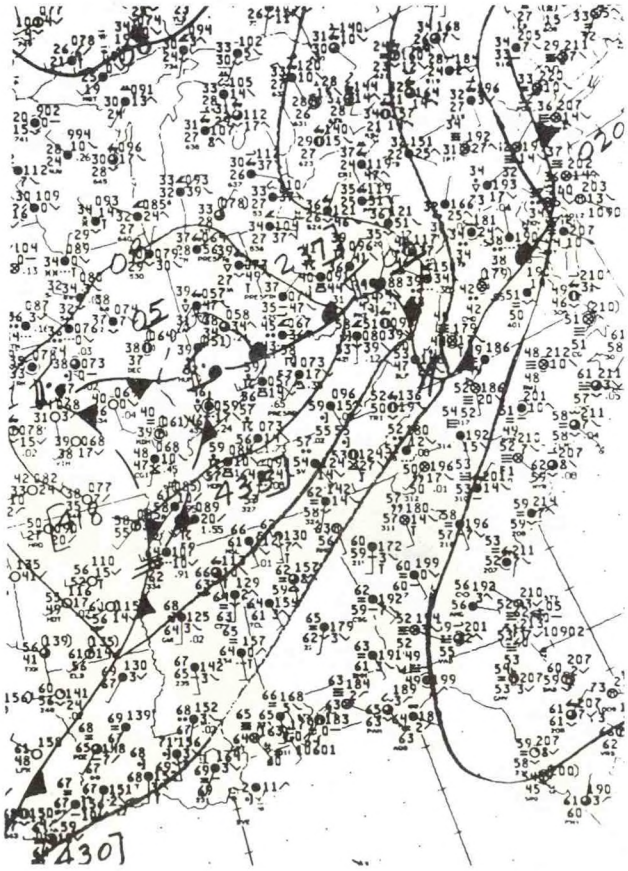


Composite 6AM CST December 24, 1988

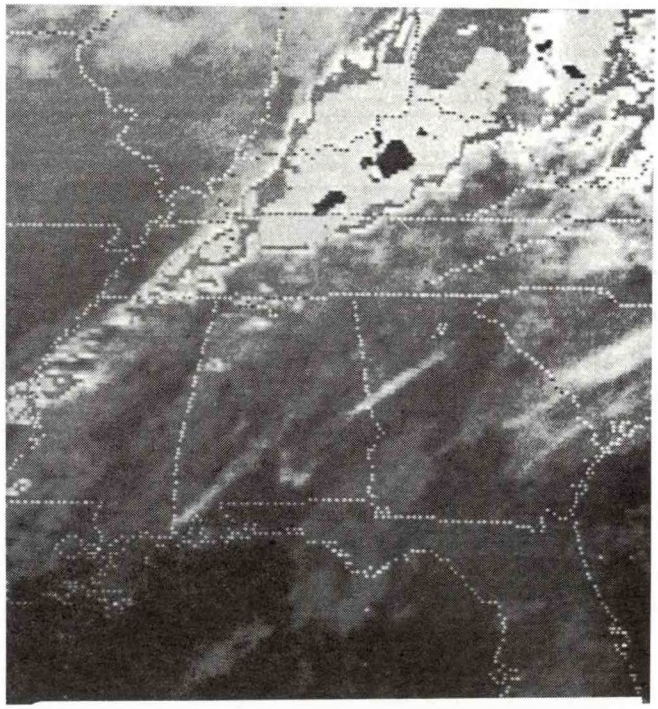




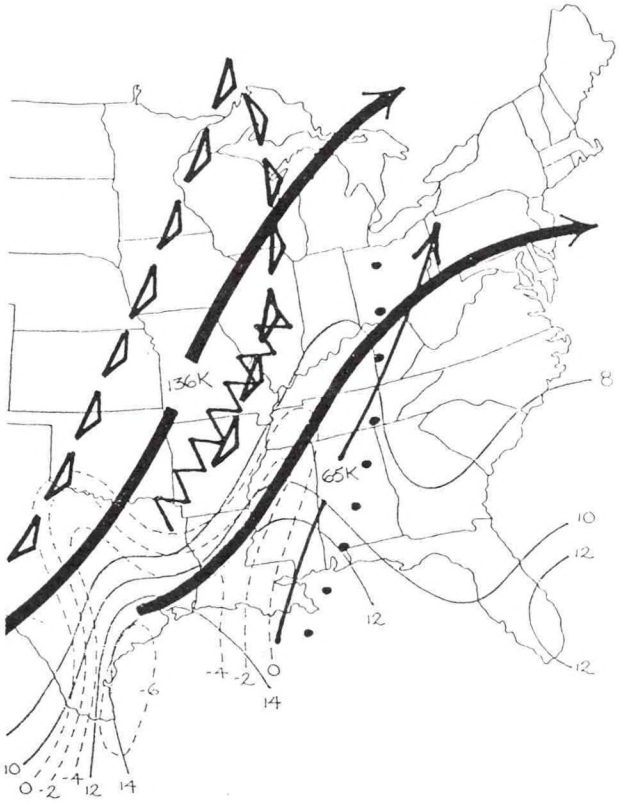
500 MB 6AM CST December 24, 1988



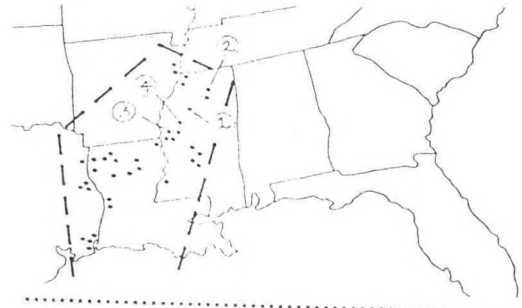
Surface 6AM CST December 24, 1988



GOES 6:01 AM CST December 24, 1988

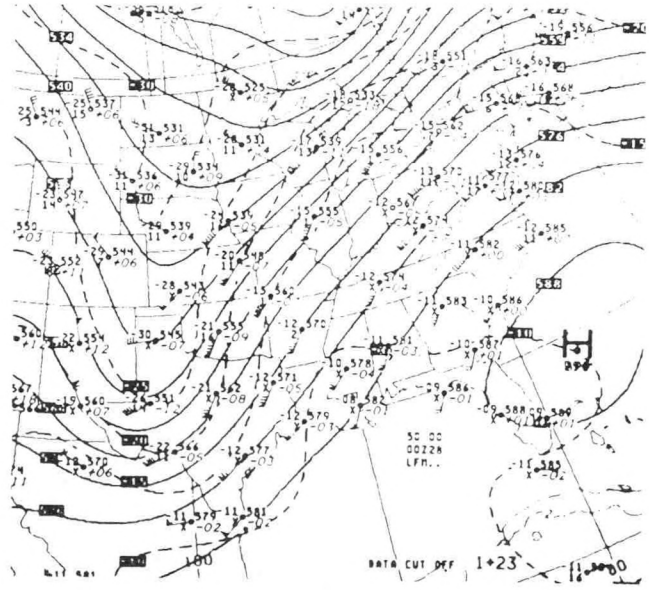


Composite 6PM CST December 27, 1988

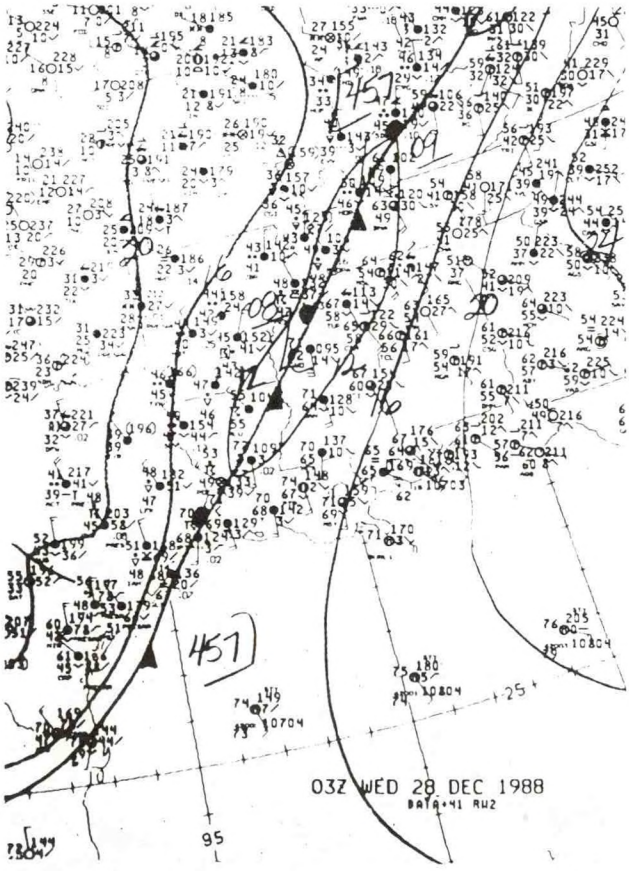


27DEC88-28DEC88 1115-0300 CST 49 REPORTS 12 TORNADOES

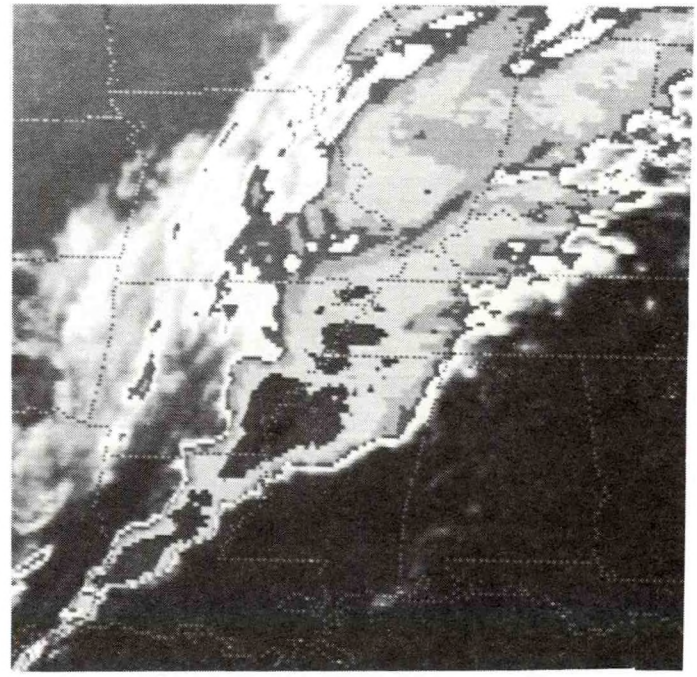
NO	TIME	EVENT	ST	LOCATION
1	2057	TORNADO (F-2)	MS	MINTER CITY
2	2200	TORNADO (F-2)	MS	WATER VALLEY
3	2220	80 MPH WIND GUST	MS	ROLLING FORK
4	2225	TORNADO (F-2)	MS	BELZONI



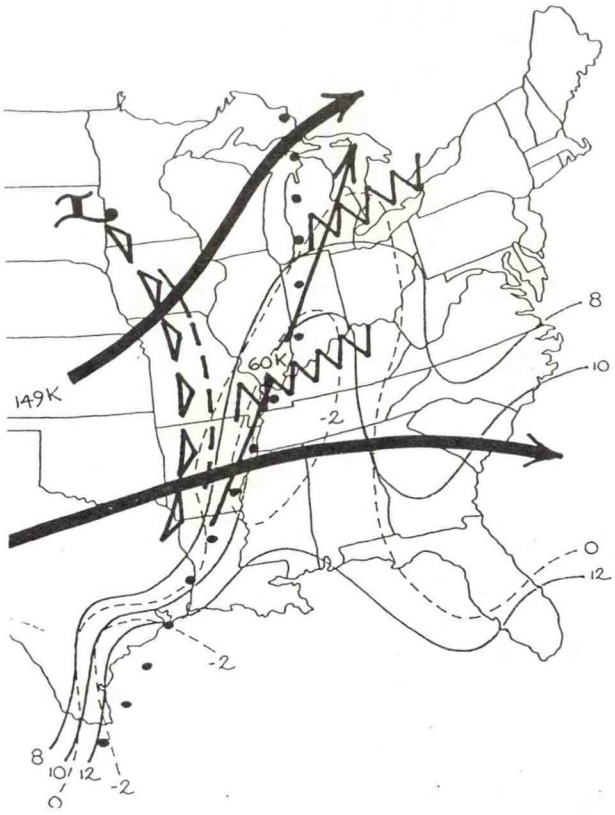
500 MB 6PM CST December 27, 1988



Surface 9PM CST December 27, 1988



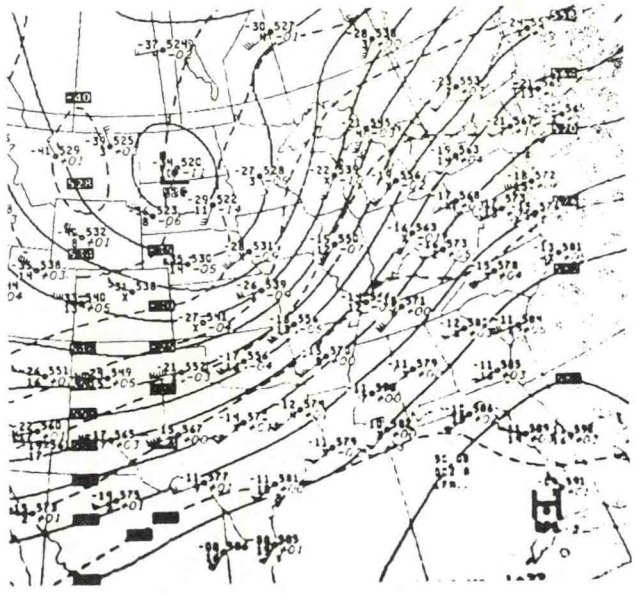
GOES 9:31 PM CST December 27, 1988



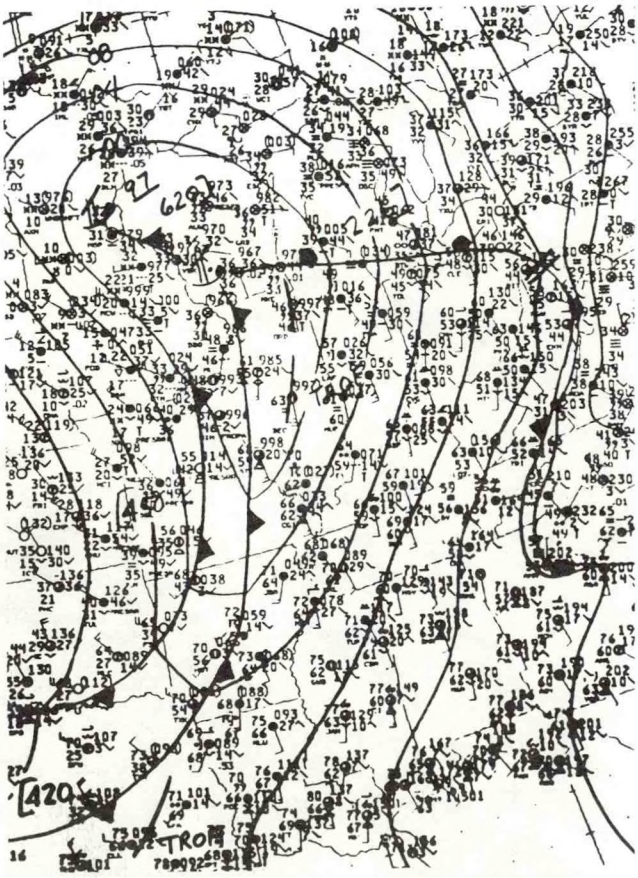
Composite 6PM CST January 7, 1989

07JAN89 1525-2314 CST 37 REPORTS 7 TORNADOES

NO	TIME	EVENT	ST	LOCATION	REMARKS
1	1610	2.50 INCH HAIL	IN	BRIDGETON	
2	1655	TORNADO (F-2)	IL	MILL SHOALS	6 INJURIES
3	1719	TORNADO (F-4)	IL	ALLENDALE	55 INJURIES, $5 MILLION DAMAGE
4	2221	100 MPH WIND GUST	KY	FRANKLIN	$5 MILLION DAMAGE

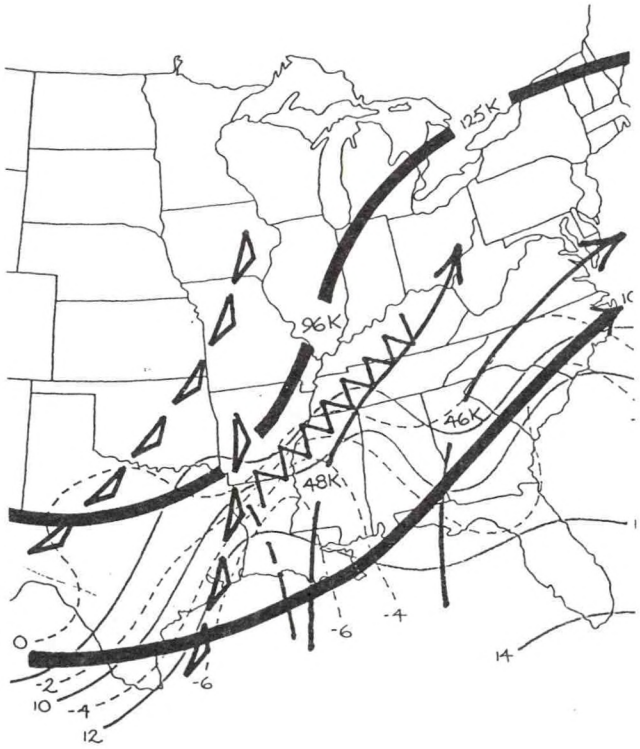


500 MB 6PM CST January 7, 1989



Surface 3PM CST January 7, 1989

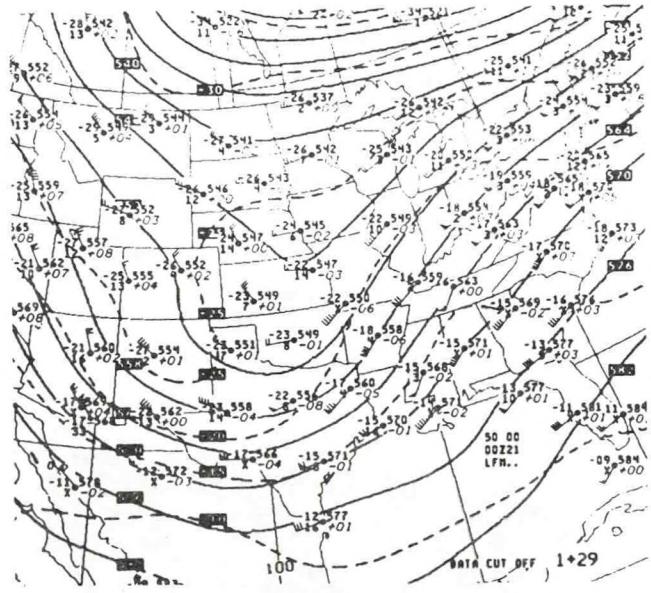
GOES 5:31 PM CST January 7, 1989



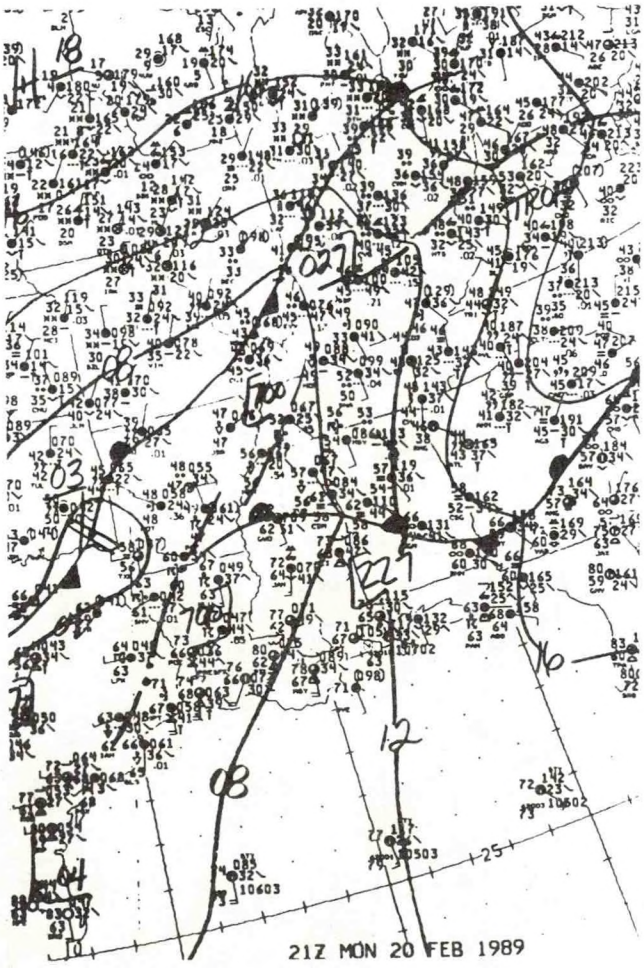
Composite 6PM CST February 20, 1989

20FEB89-21FEB89 1233-0520 CST 66 REPORTS 12 TORNADOES

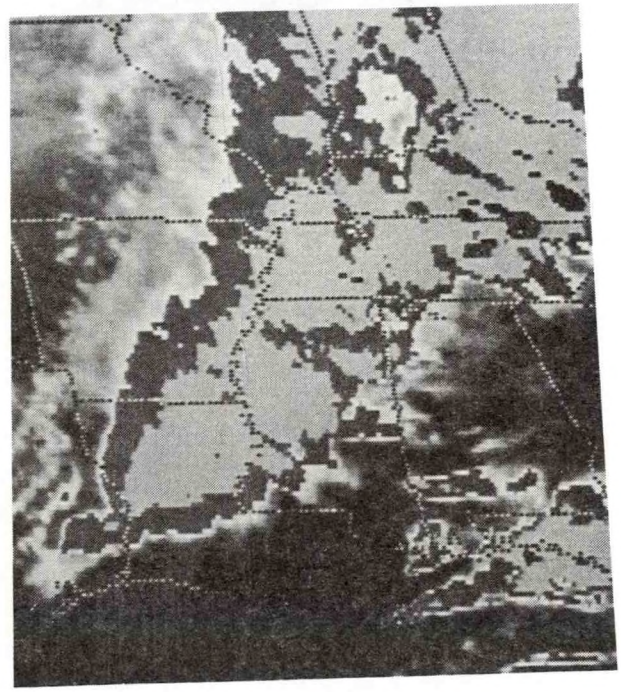
NO	TIME	EVENT	ST	LOCATION
1	1700	90 MPH WIND GUST	MS	VICKSBURG
2	2035	100 MPH WIND GUST	MS	JACKSON



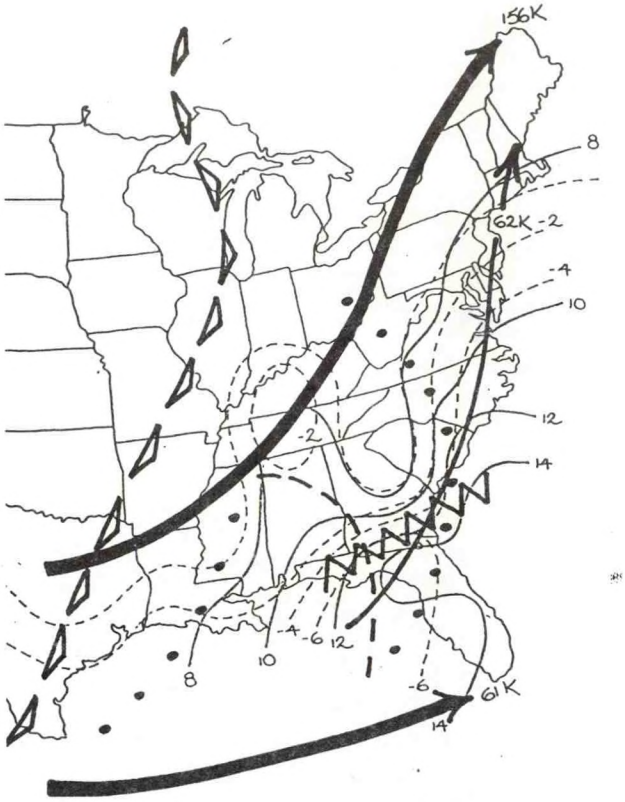
500 MB 6PM CST February 20, 1989



Surface 3PM CST February 20, 1989



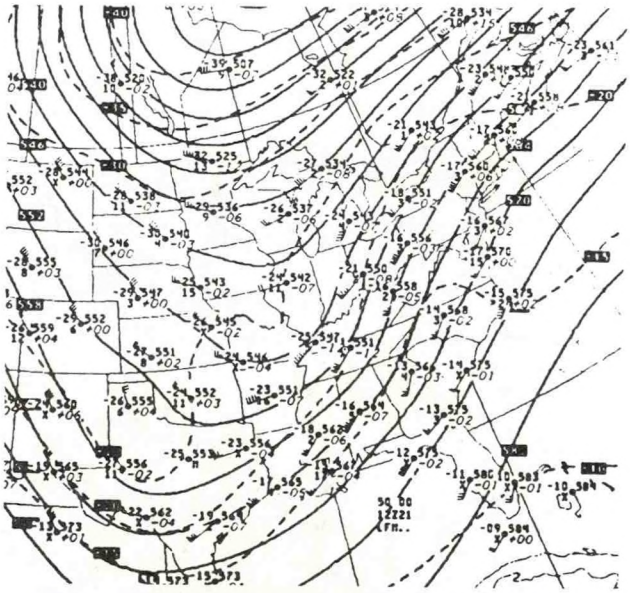
GOES 5:01 PM CST February 20, 1989



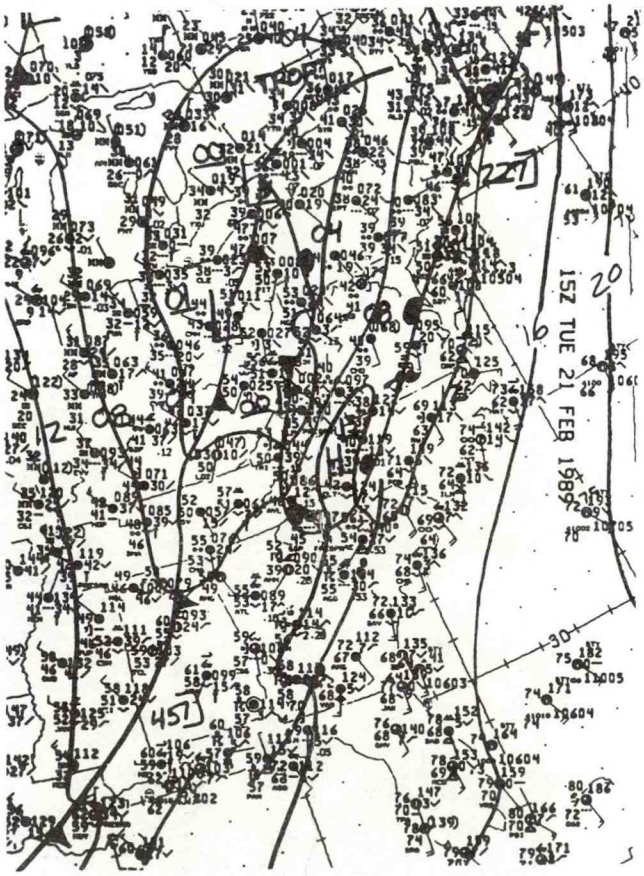
Composite 6AM CST February 21, 1989

21FEB89-22FEB89 0530-1412 CST 66 REPORTS 5 TORNADOES

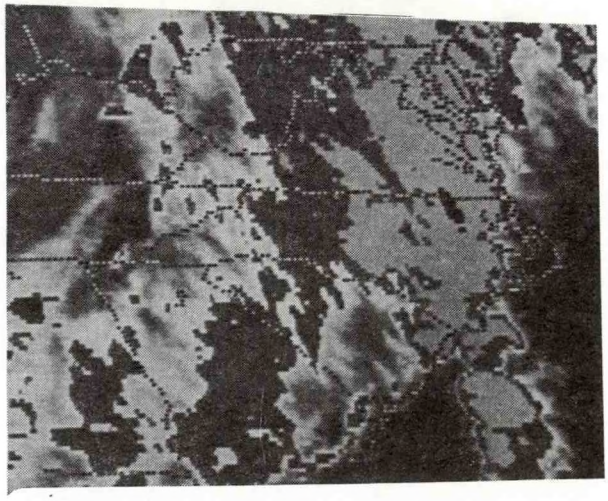
NO	TIME	EVENT	ST	LOCATION	REMARKS
1	1123	80 MPH WIND GUST	NC	ROCKY MOUNT	
2	1210	WIND DAMAGE	NC	LILLINGTON	1 DEATH, 5 INJURIES



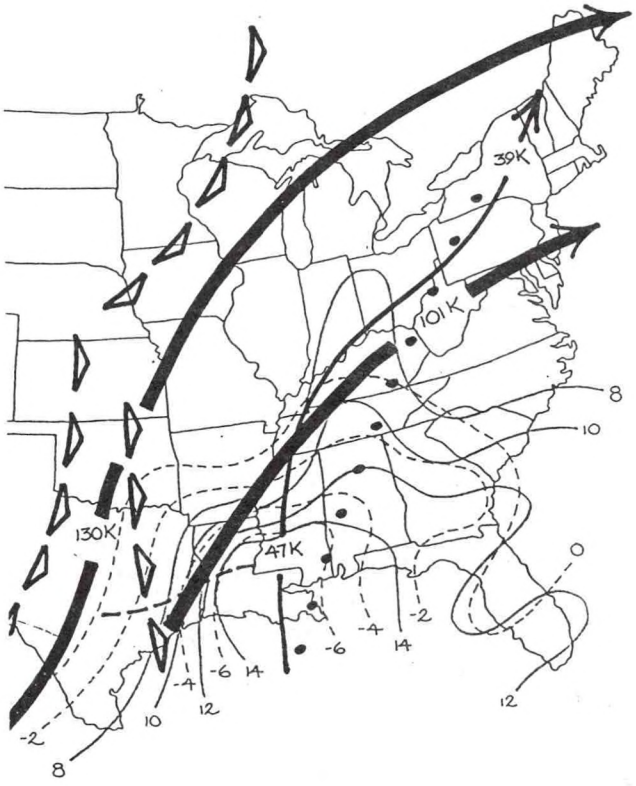
500 MB 6AM CST February 21, 1989



Surface 9AM CST February 21, 1989



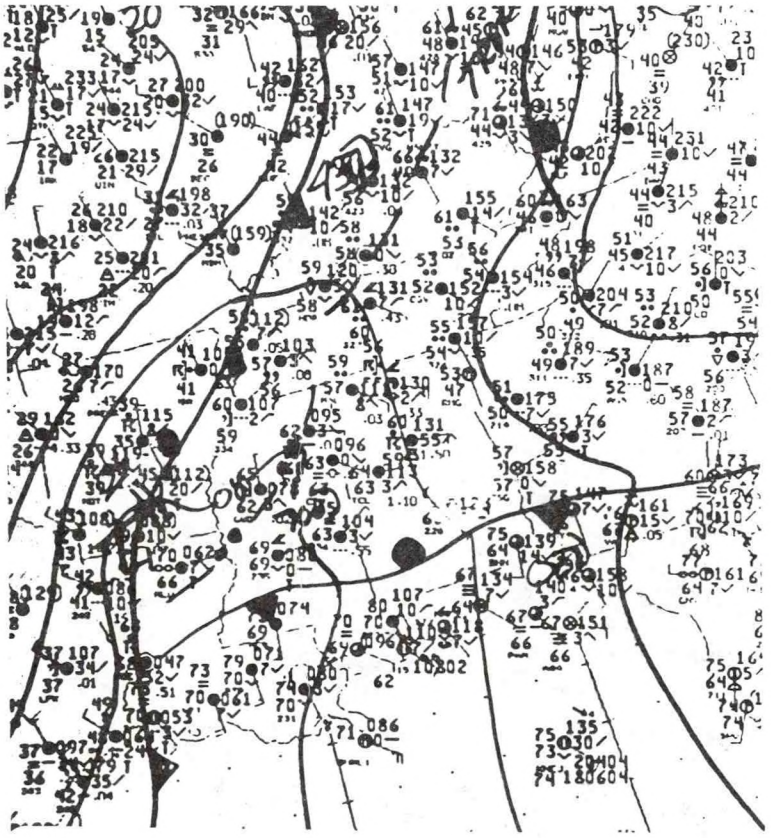
GOES 12:01 AM CST February 21, 1989



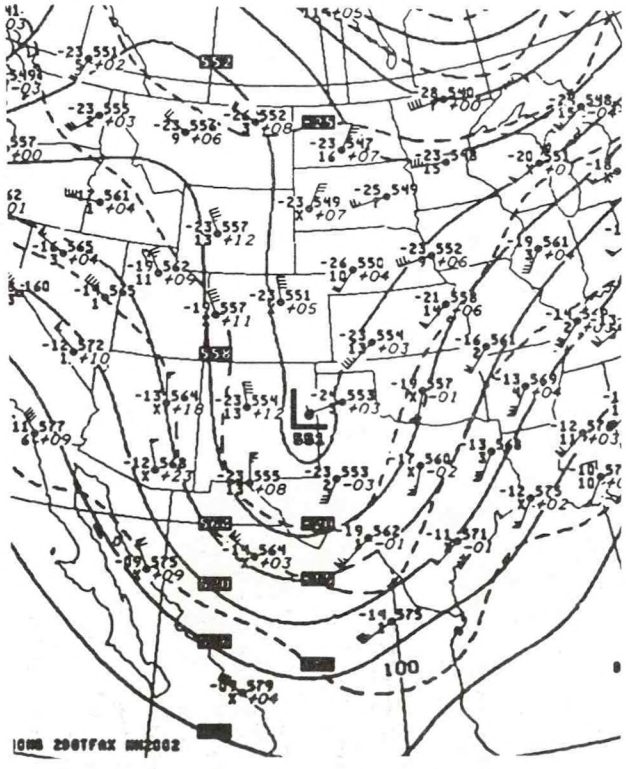
Composite 6PM CST March 4, 1989

04MAR89-05MAR89 1508-0535 CST 50 REPORTS 5 TORNADOES

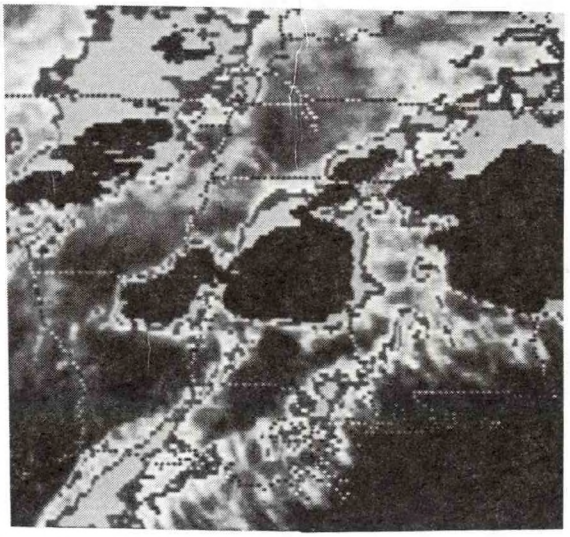
NO	TIME	EVENT	ST	LOCATION	REMARKS
1	1915	TORNADO (F-3)	MS	BROWNSVILLE	5 INJURIES
2	2000	90 MPH WIND GUST	MS	CANTON	



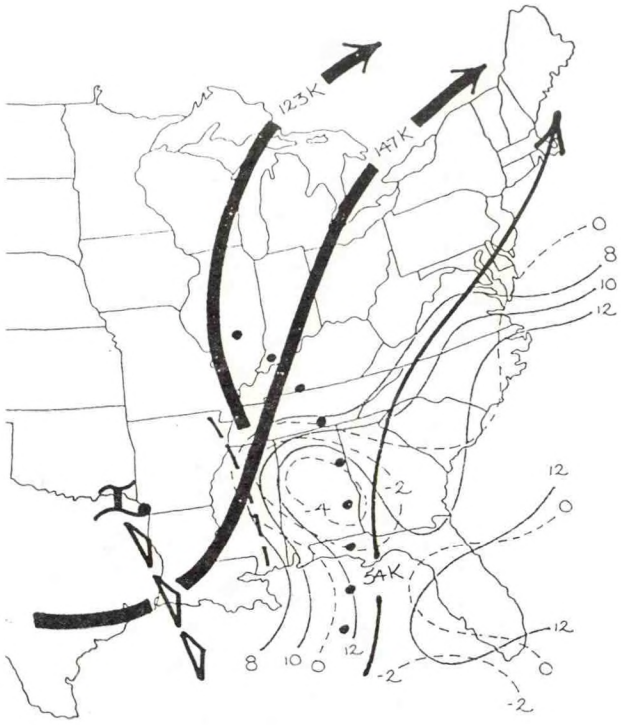
Surface 6PM CST March 4, 1989



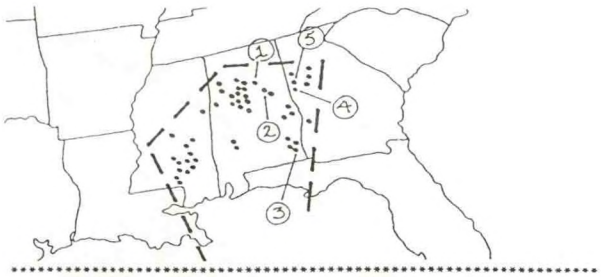
500 MB 6PM CST Mar 4, 1989



GOES 7:01 PM CST March 4, 1989

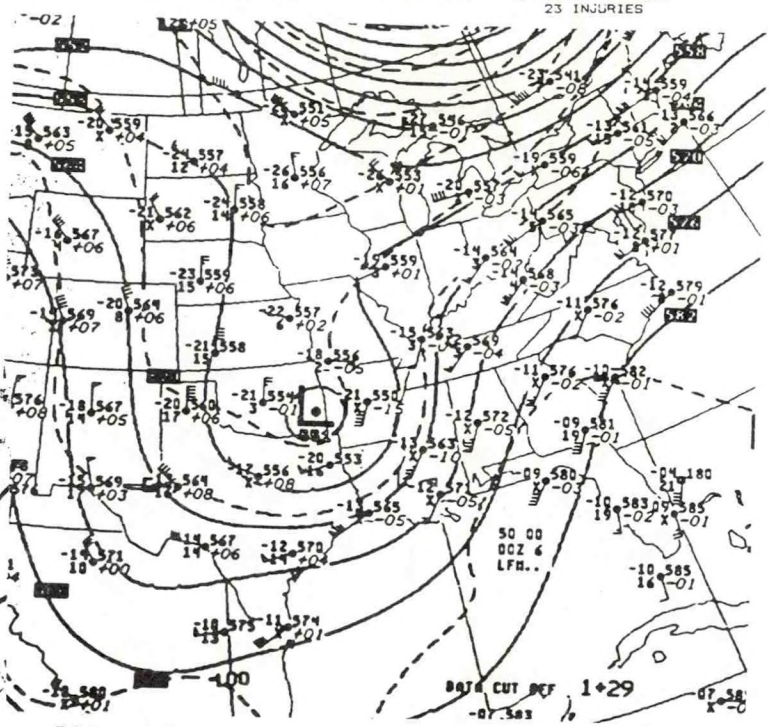


Composite 6PM CST March 5, 1989

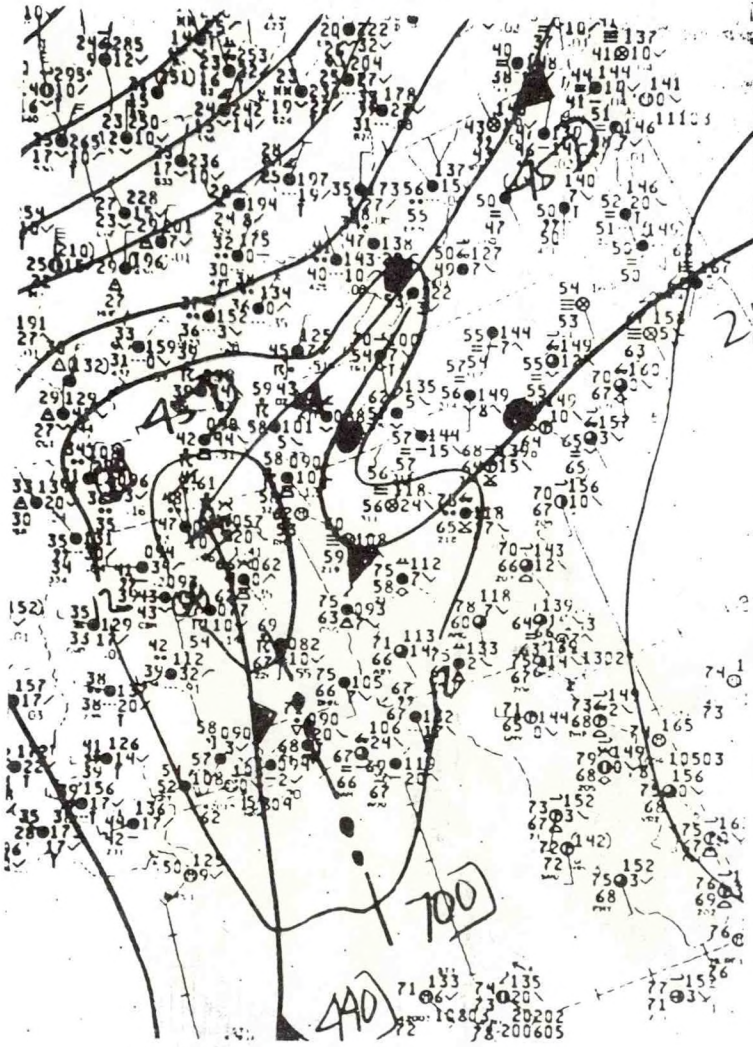


05MAR89 0715-2200 CST 52 REPORTS 9 TORNADOES

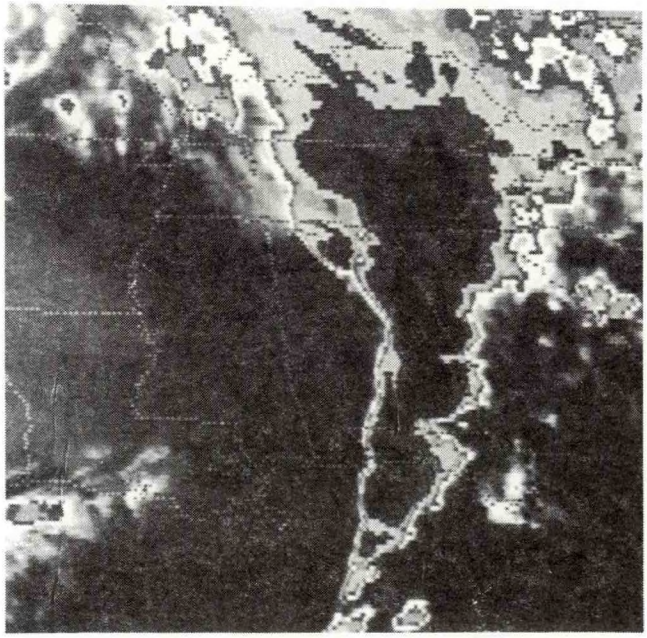
NO	TIME	EVENT	ST	LOCATION	REMARKS
1	1423	2.00 INCH HAIL	AL	HORTON	
2	1716	TORNADO (F-2)	AL	TALLADEGA	2 INJURIES
3	1930	TORNADO (F-1)	AL	BRUNDIDGE	$1 MILLION DAMAGE
4	2000	TORNADO (F-2)	GA	HEARD COUNTY	1 DEATH, 6 INJURIES
5	2112	TORNADO (F-3)	GA	GRANTVILLE	$5 MILLION DAMAGE, 23 INJURIES



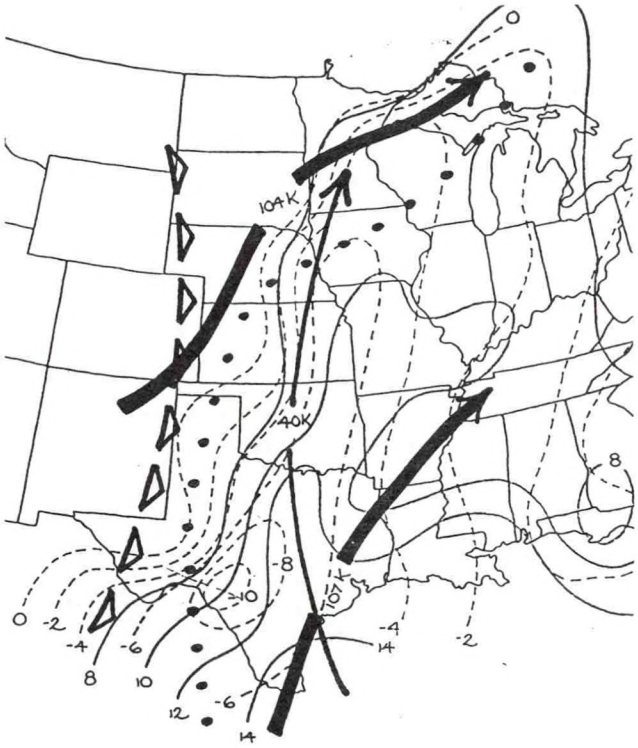
500 MB 6PM CST March 5, 1989



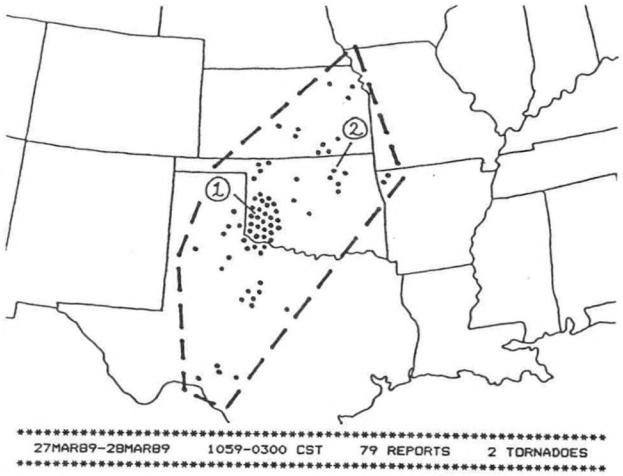
Surface 6PM CST March 5, 1989

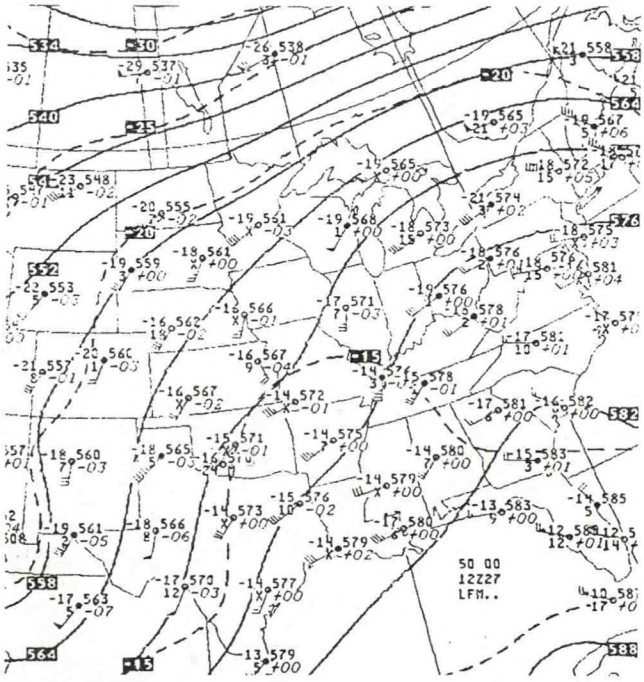


GOES 6:31 PM CST March 5, 1989

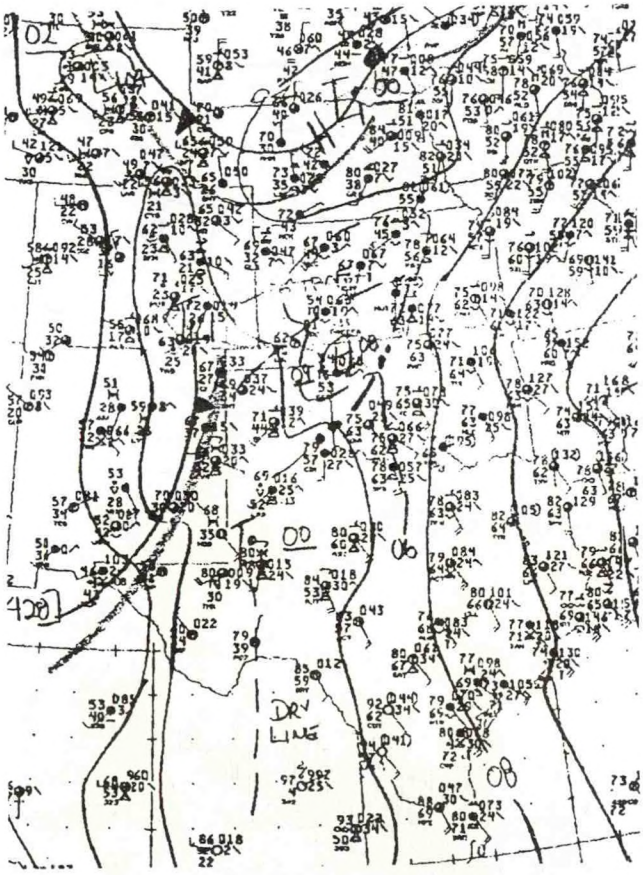


Composite 6PM CST March 27, 1989

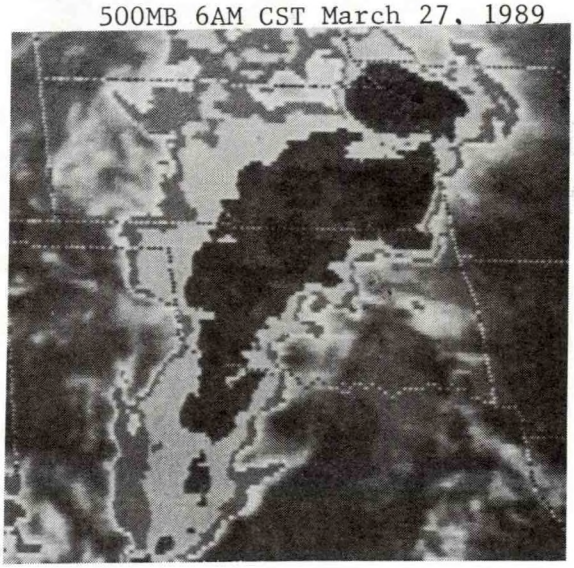




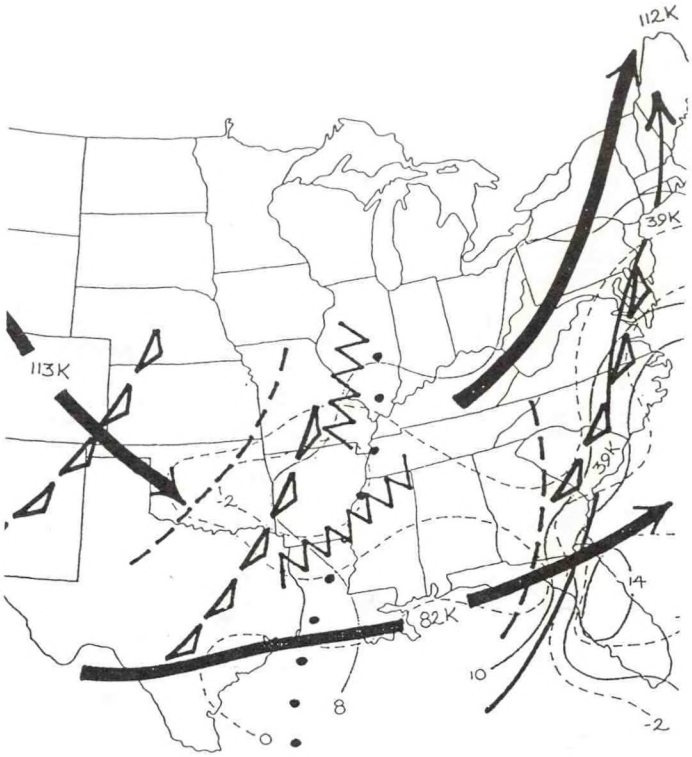
500MB 6AM CST March 27, 1989



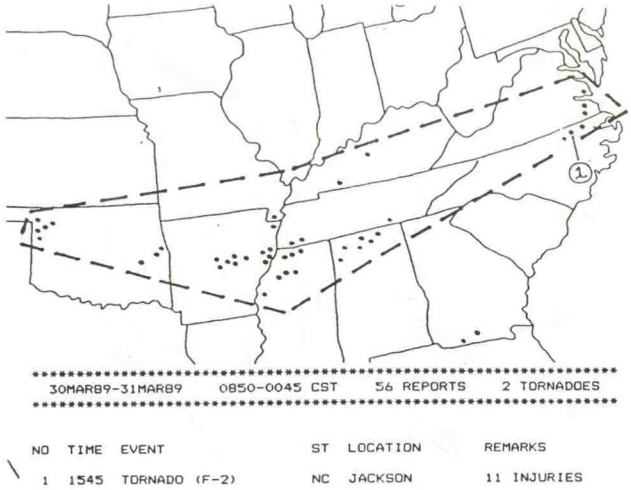
Surface 3PM CST March 27, 1989

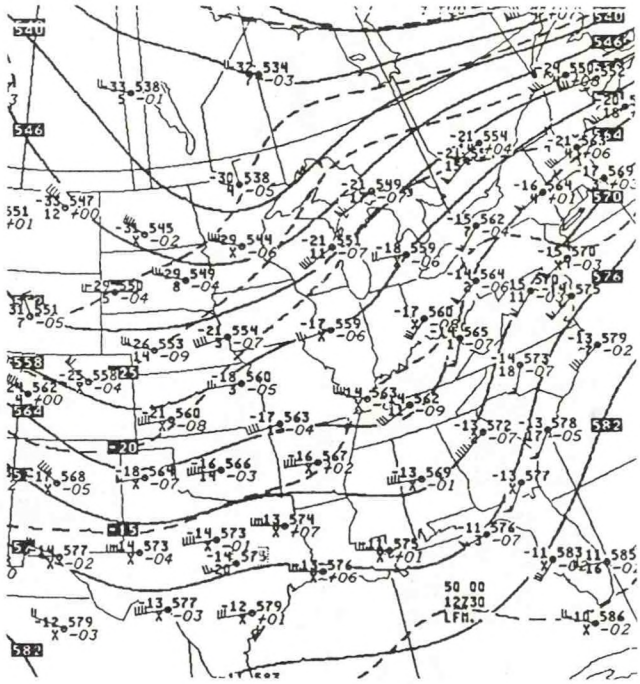


GOES 7:01 PM CST March 27, 1989

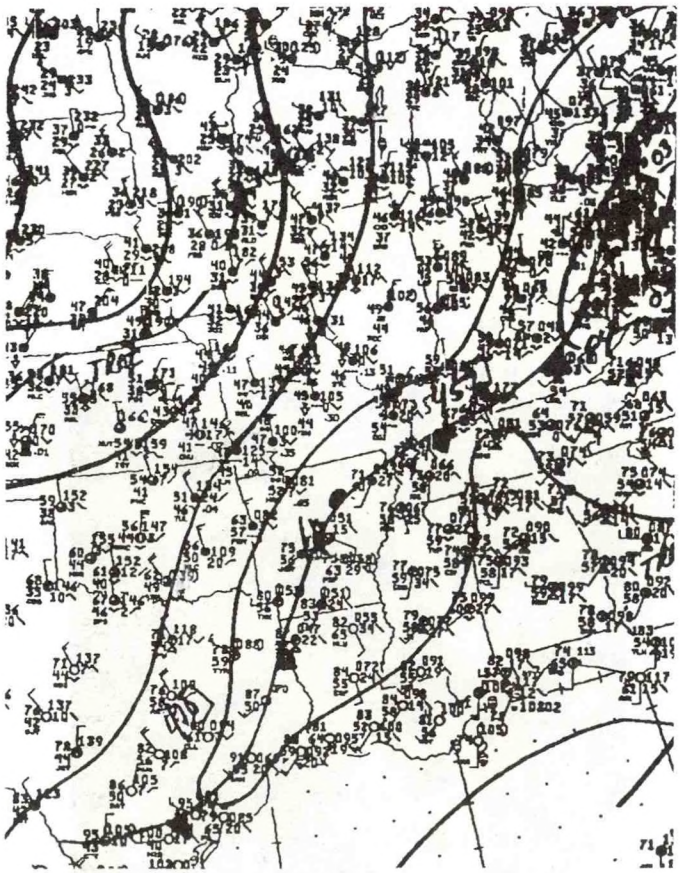


Composite 6PM CST March 30, 1989

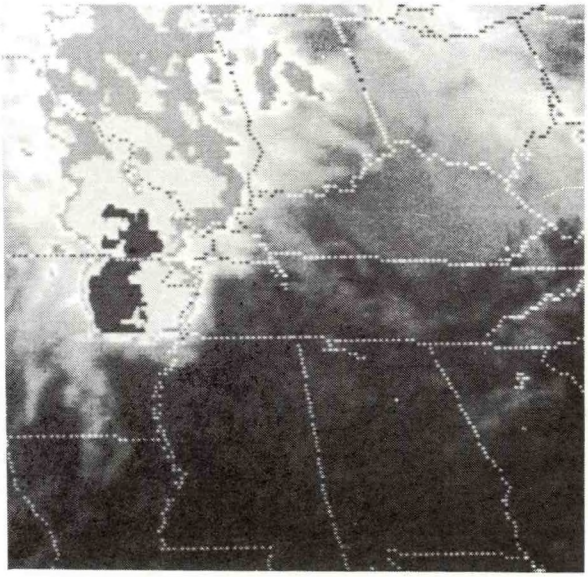




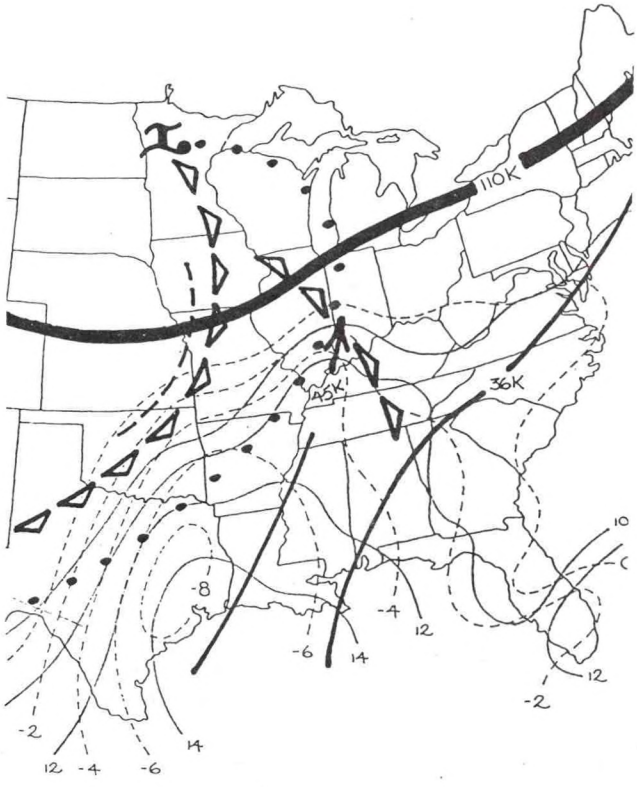
500 MB 6AM CST March 30, 1989



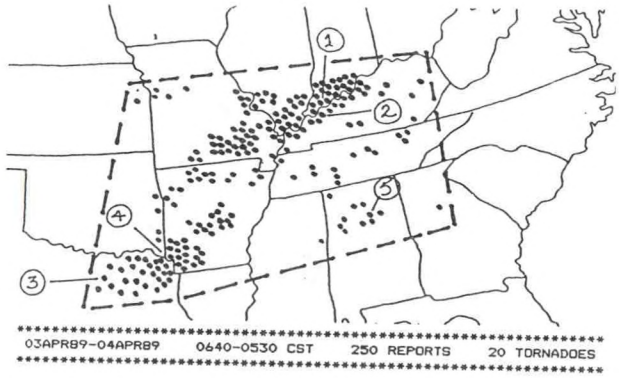
Surface 3PM CST March 30, 1989



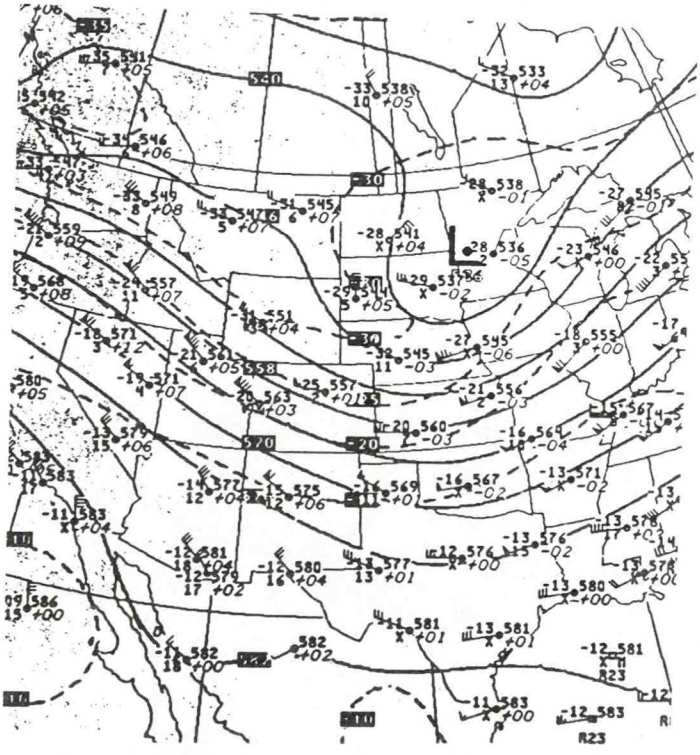
GOES 5:01 PM CST March 30, 1989



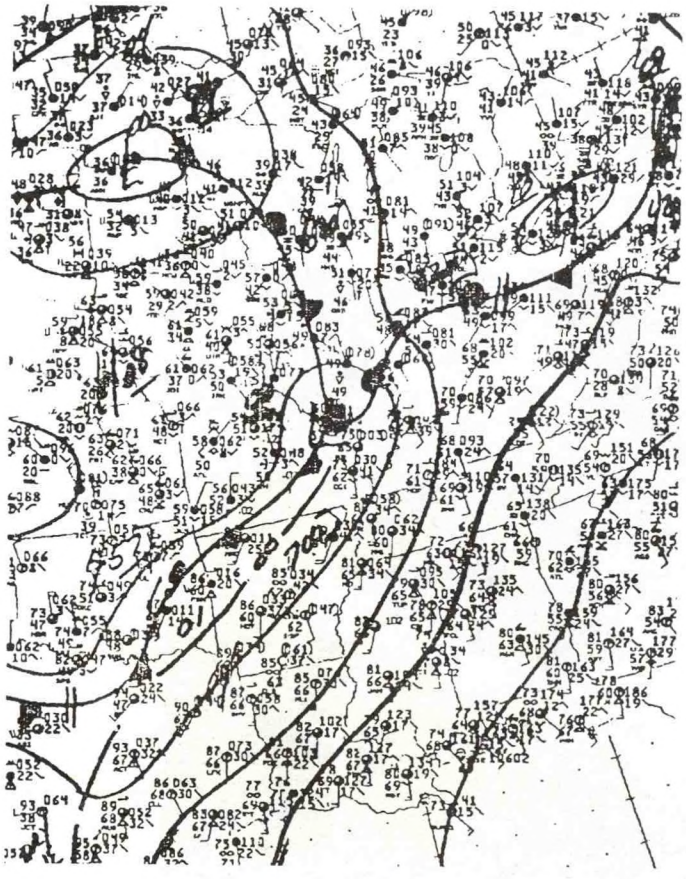
Composite 6PM CST April 3, 1989



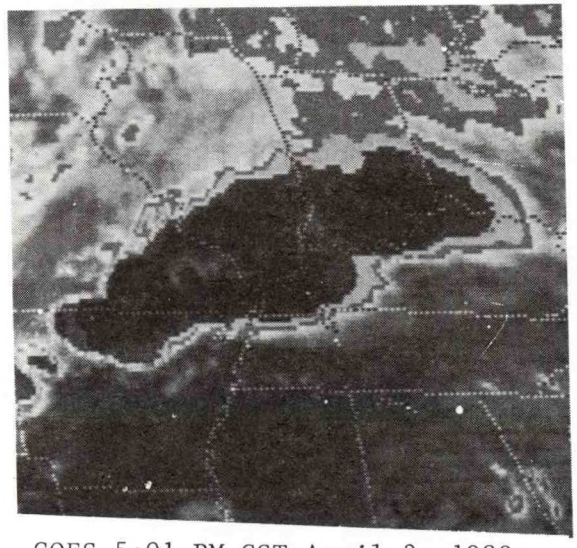
NO	TIME	EVENT	ST	LOCATION	REMARKS
1	1650	TORNADO (F-3)	IN	FORT BRANCH	8 INJURIES,
2	2000	TORNADO (F-2)	KY	PROVIDENCE	$8 MILLION DAMAGE
3	2025	3.50 INCH HAIL	TX	QUINLAN	1 INJURY
4	2115	80 MPH WIND GUST	AR	TEXARKANA	
5	0430	WIND DAMAGE	AL	COLLINSVILLE	1 INJURY



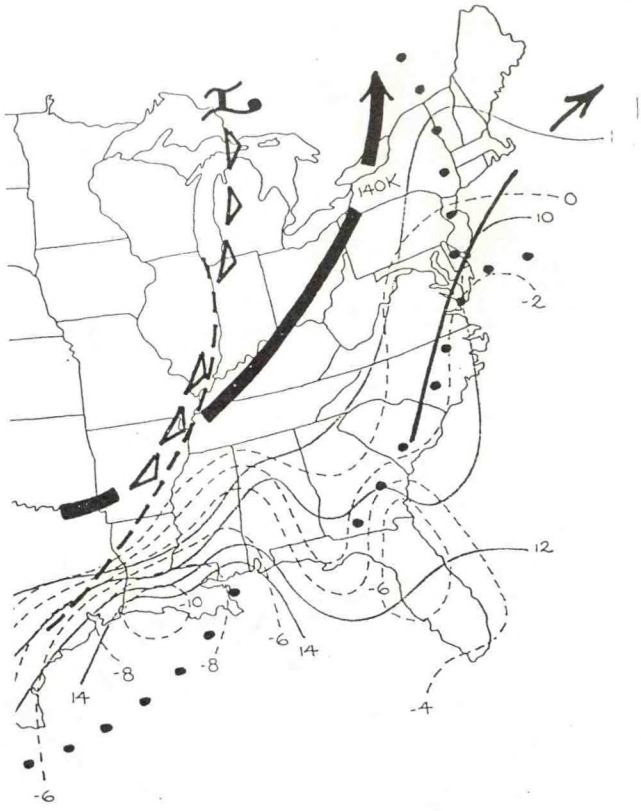
500 MB 6PM CST April 3, 1989



Surface 3PM CST April 3, 1989



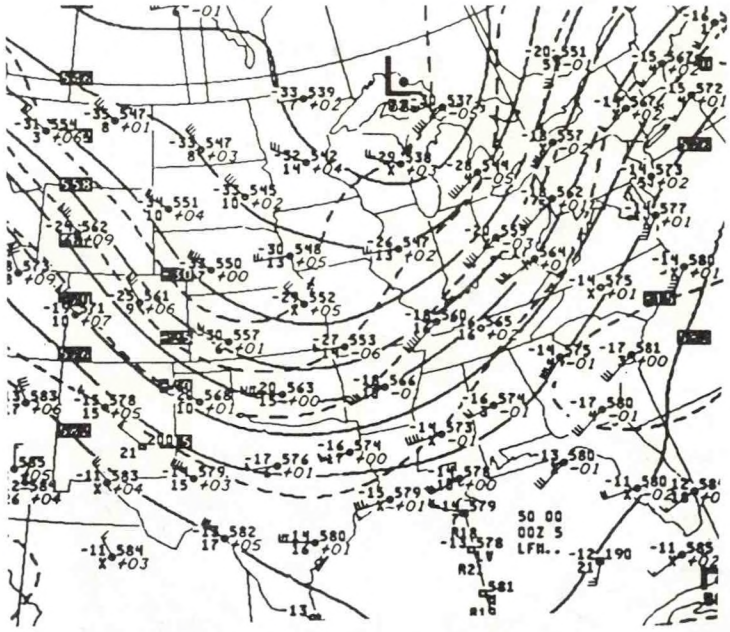
GOES 5:01 PM CST April 3, 1989



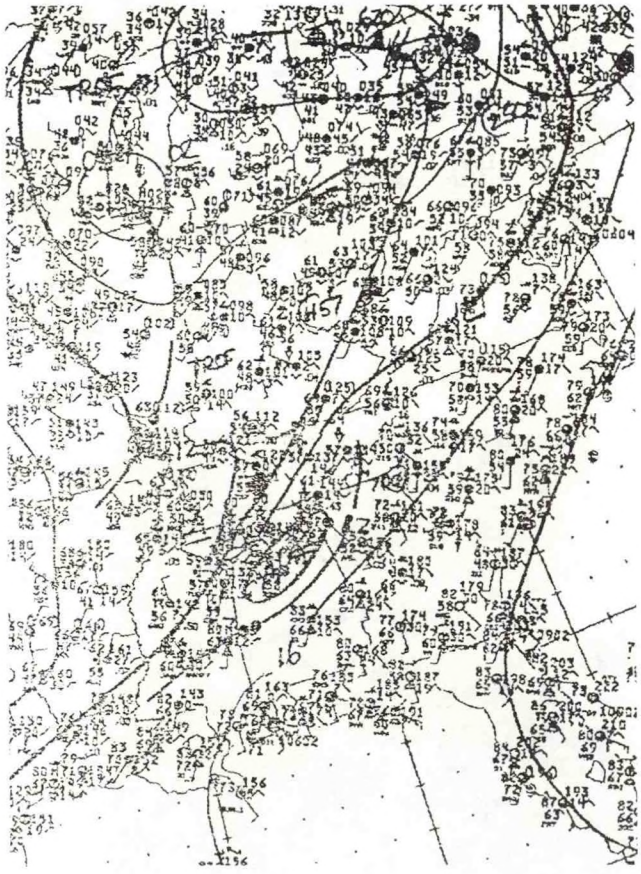
Composite 6PM CST April 4, 1989

04APR89 0630-2150 CST 211 REPORTS 18 TORNADOES

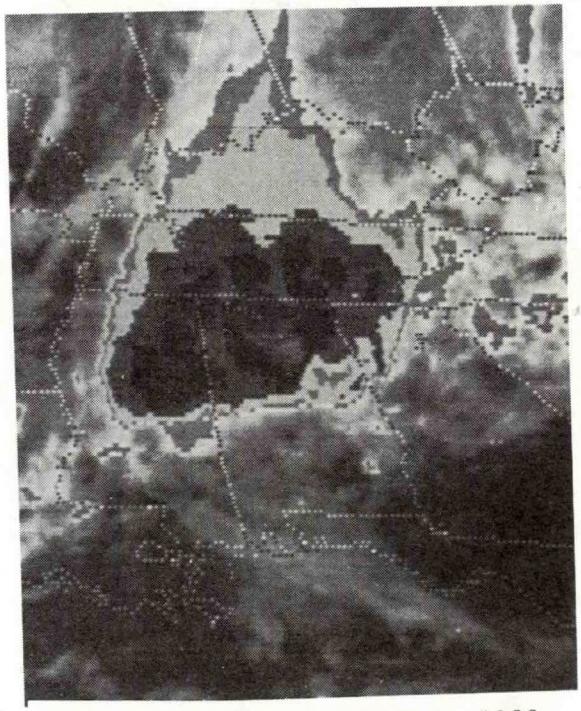
NO	TIME	EVENT	ST	LOCATION	REMARKS
1	1315	90 MPH WIND GUST	GA	BREMEN	1 INJURY
2	1430	TORNADO (F-2)	GA	BALDWIN	3 INJURIES. $2 MILLION DAMAGE



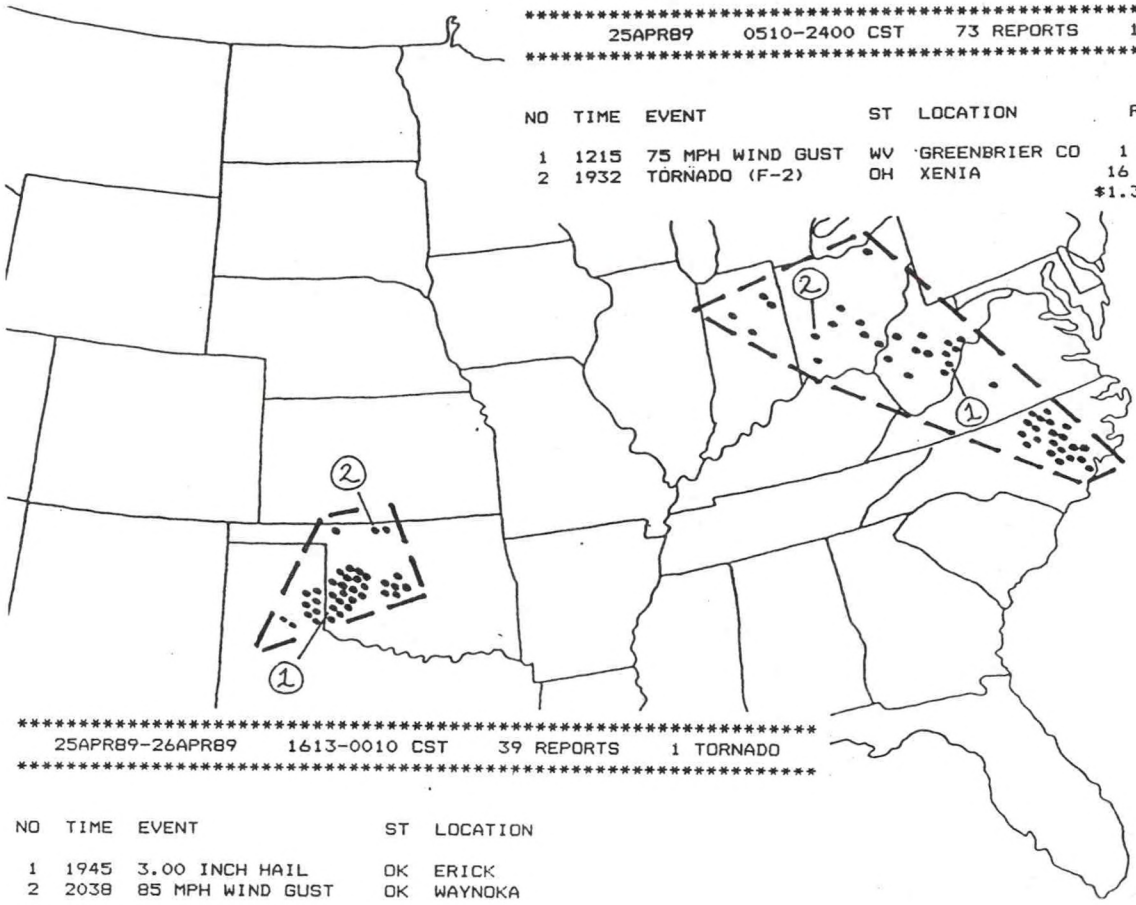
500 MB 6PM CST April 4, 1989



Surface 12 Noon CST April 4, 1989



GOES 12:02 PM CST April 4, 1989

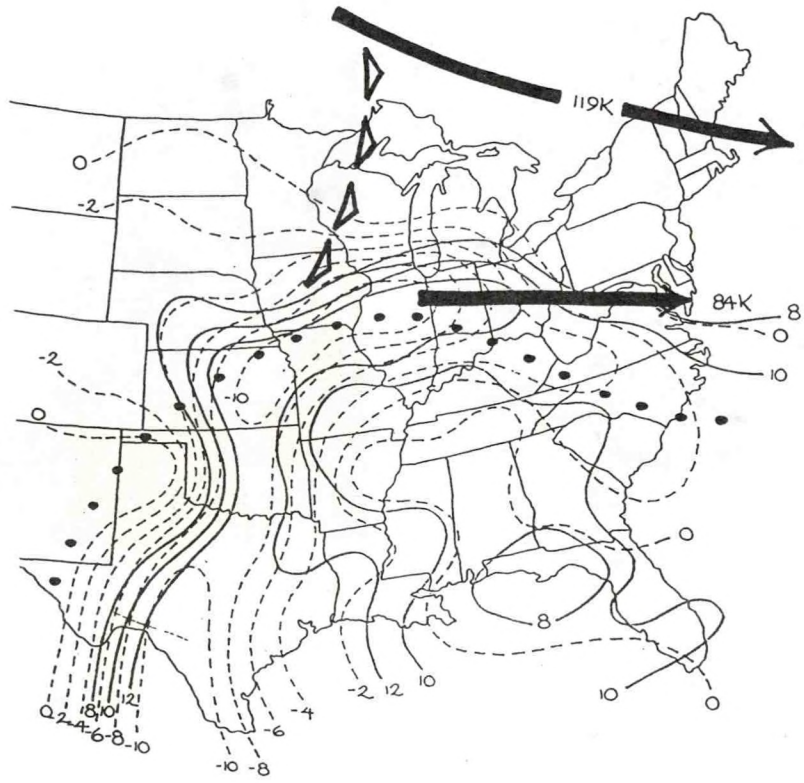


25APR89 0510-2400 CST 73 REPORTS 1 TORNADO

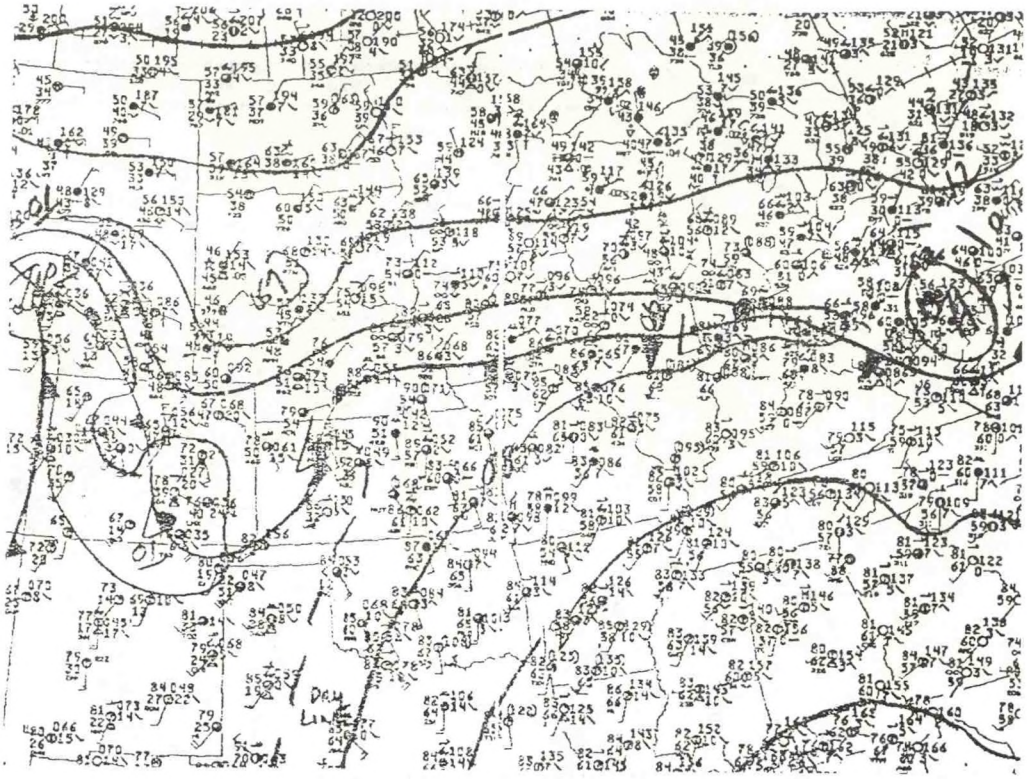
NO	TIME	EVENT	ST	LOCATION	REMARKS
1	1215	75 MPH WIND GUST	WV	GREENBRIER CO	1 DEATH, 1 INJURY
2	1932	TORNADO (F-2)	OH	XENIA	16 INJURIES, $1.3 MILLION DAMAGE

25APR89-26APR89 1613-0010 CST 39 REPORTS 1 TORNADO

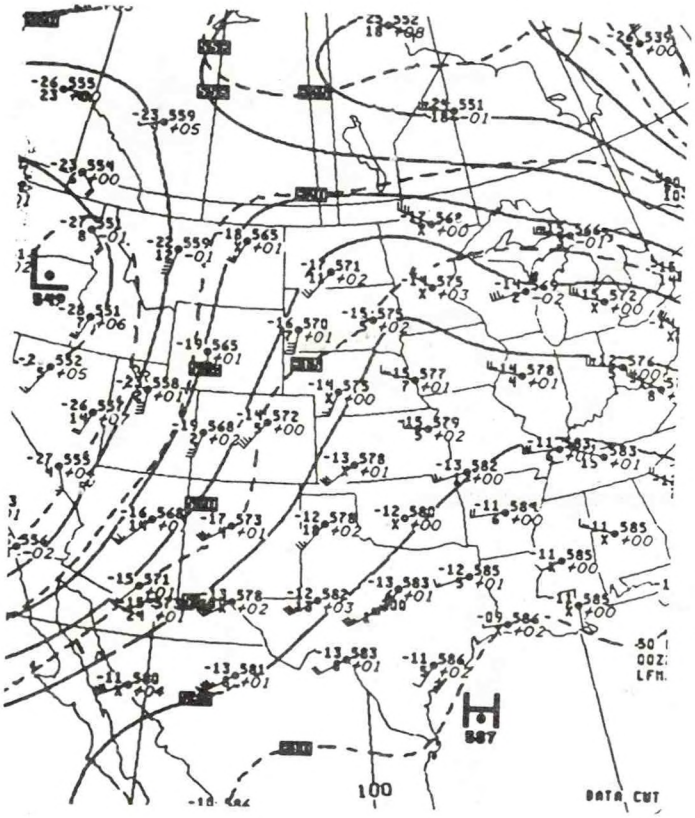
NO	TIME	EVENT	ST	LOCATION
1	1945	3.00 INCH HAIL	OK	ERICK
2	2038	85 MPH WIND GUST	OK	WAYNOKA



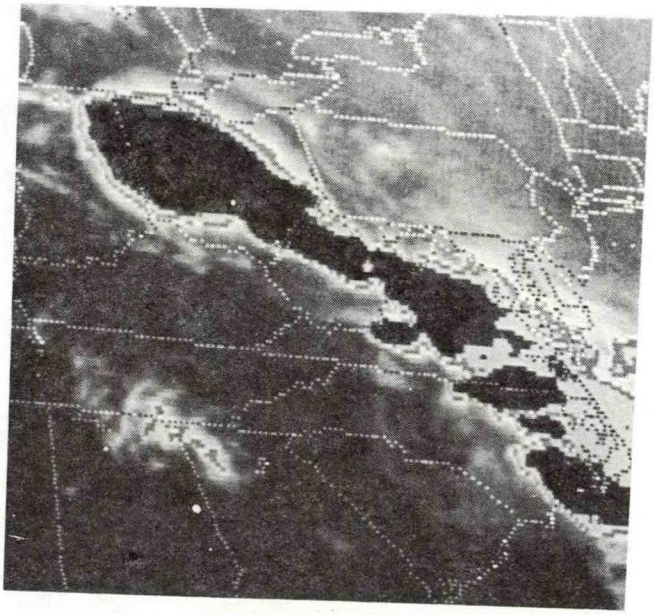
Composite 6PM CST April 25, 1989



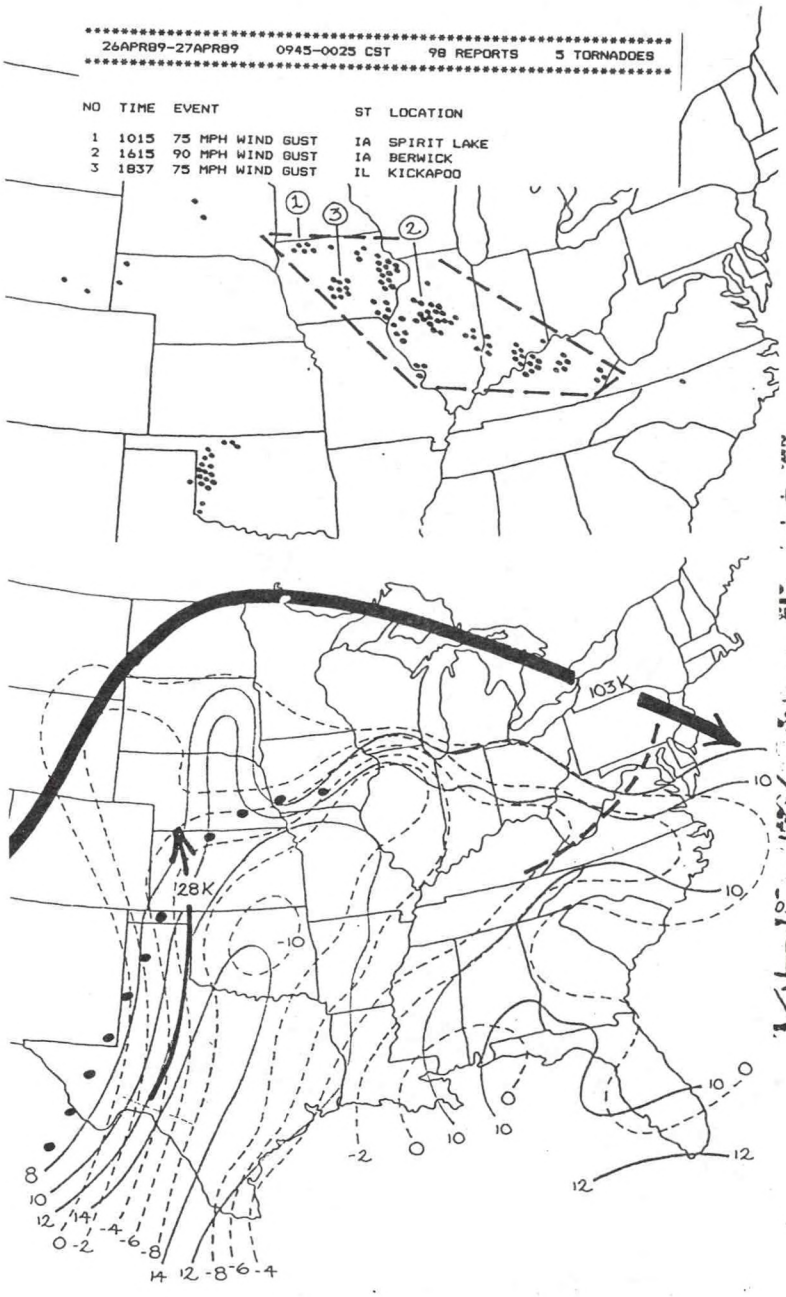
Surface 6PM CST April 25, 1989



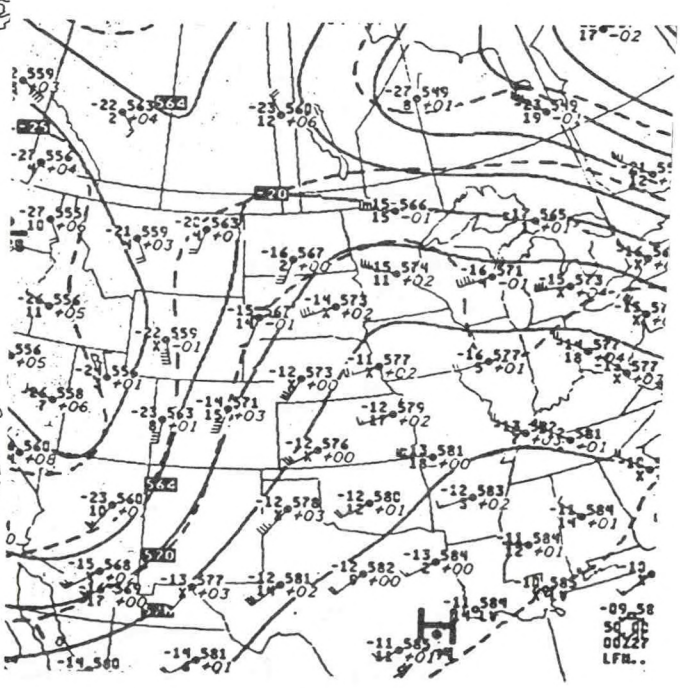
500 MB 6PM CST April 25, 1989



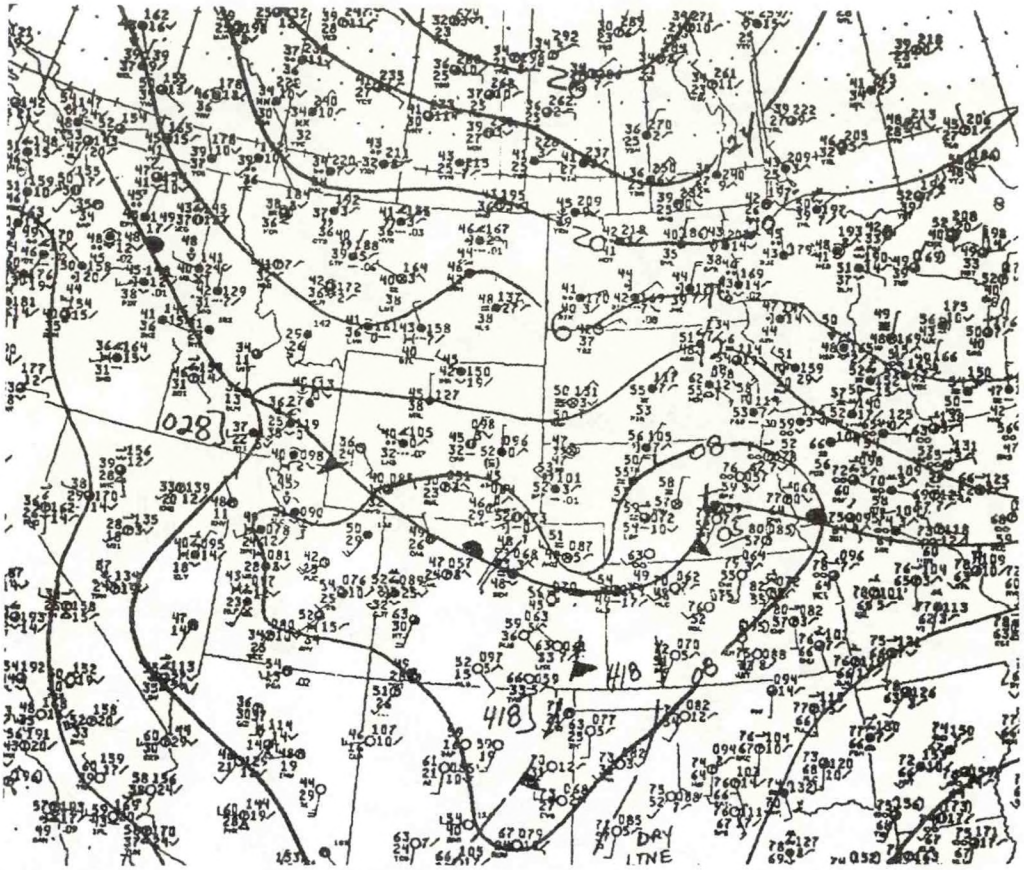
GOES 7:01 PM CST April 25, 1989



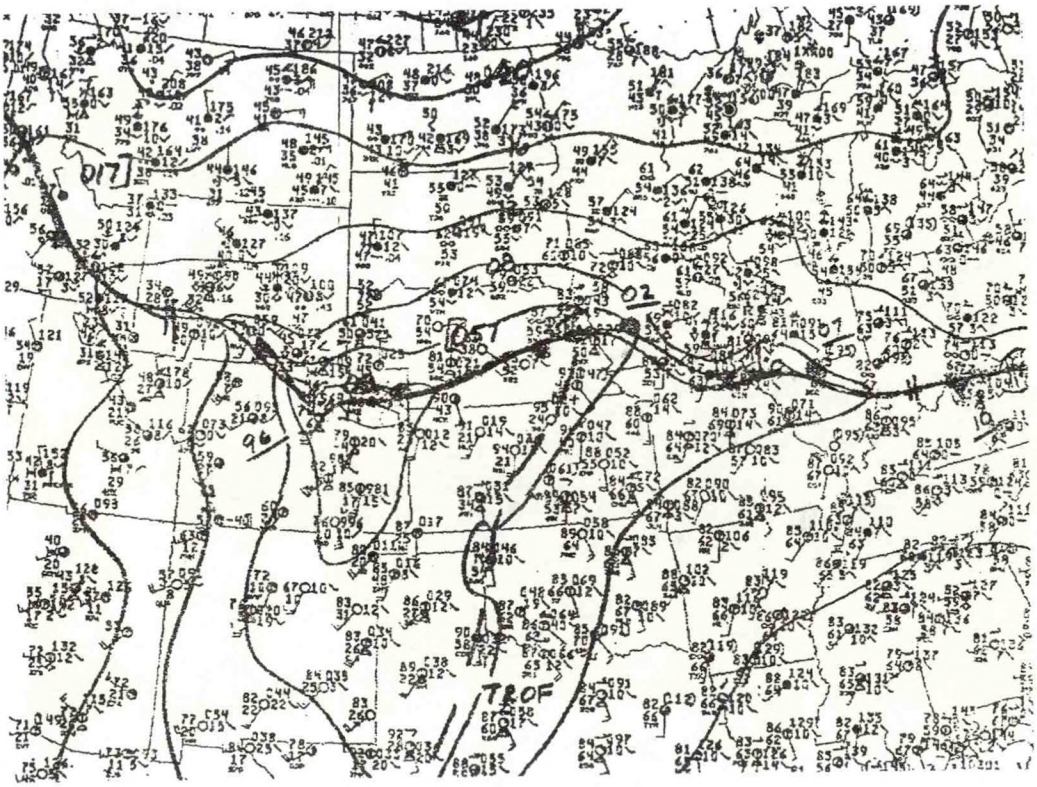
Composite 6PM CST April 26, 1989



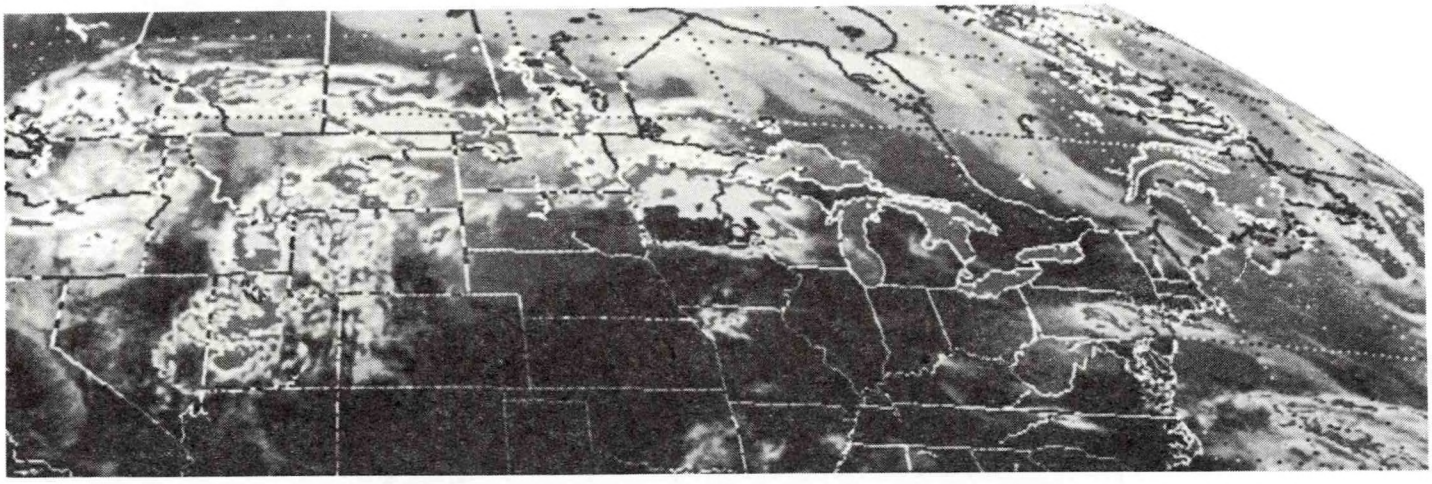
500 MB 6PM CST April 26, 1989



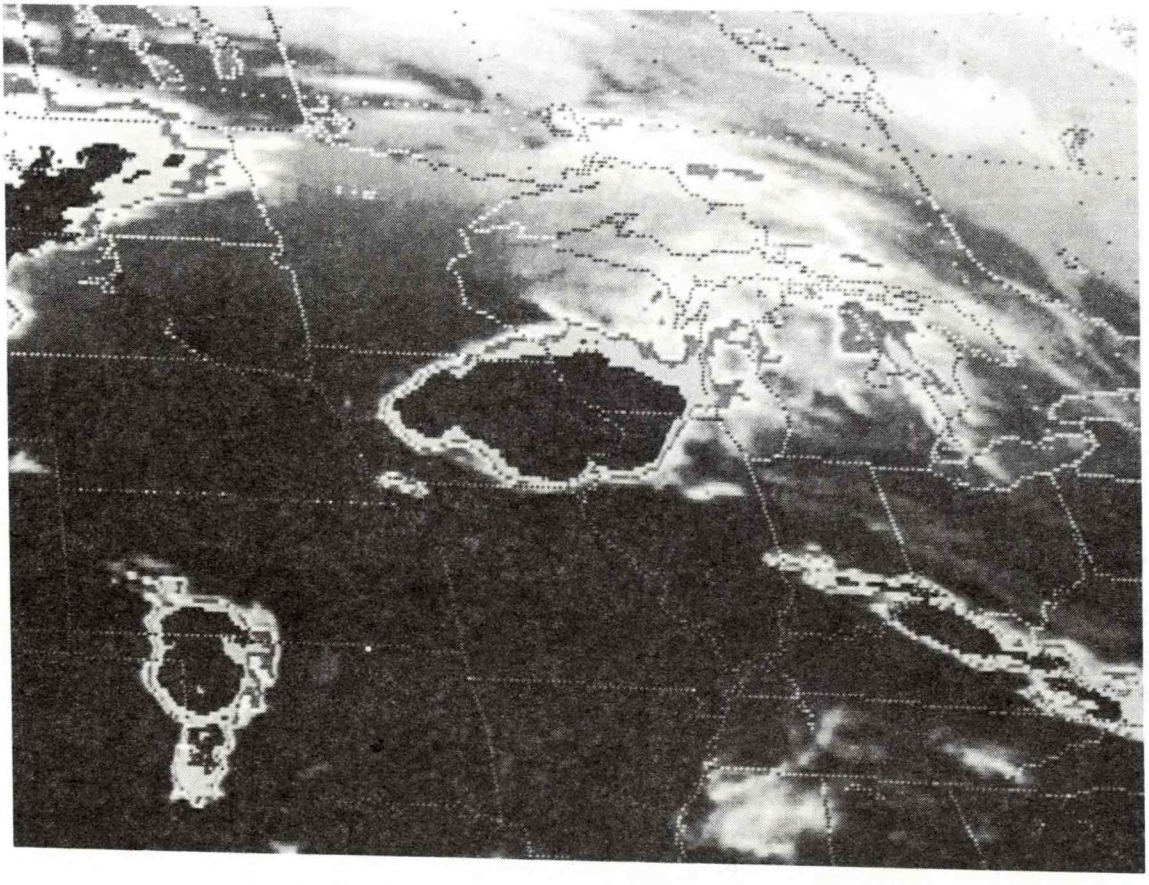
Surface 9AM CST April 26, 1989



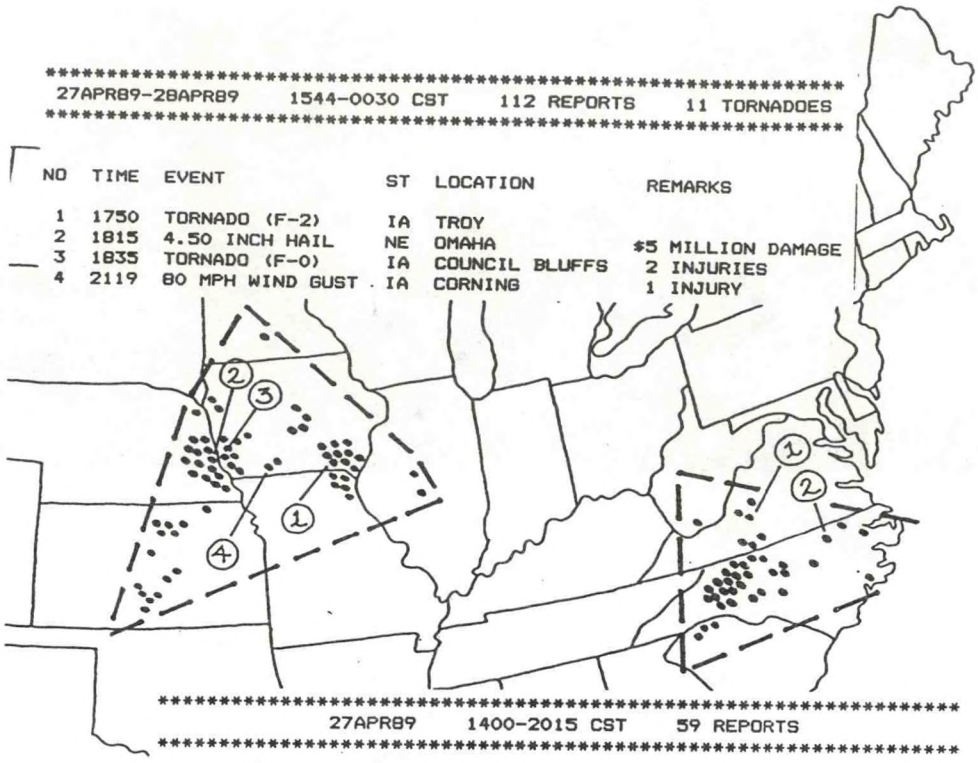
Surface 6PM CST April 26, 1989



GOES 10:01 AM CST April 26, 1989



GOES 6:01 PM CST April 26, 1989

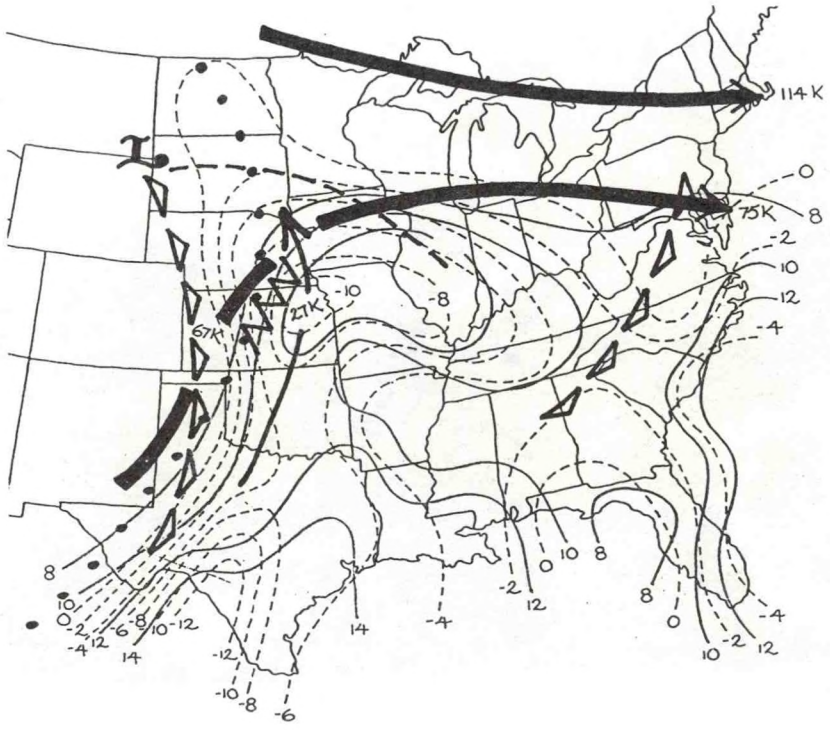


27APR89-28APR89 1544-0030 CST 112 REPORTS 11 TORNADOES

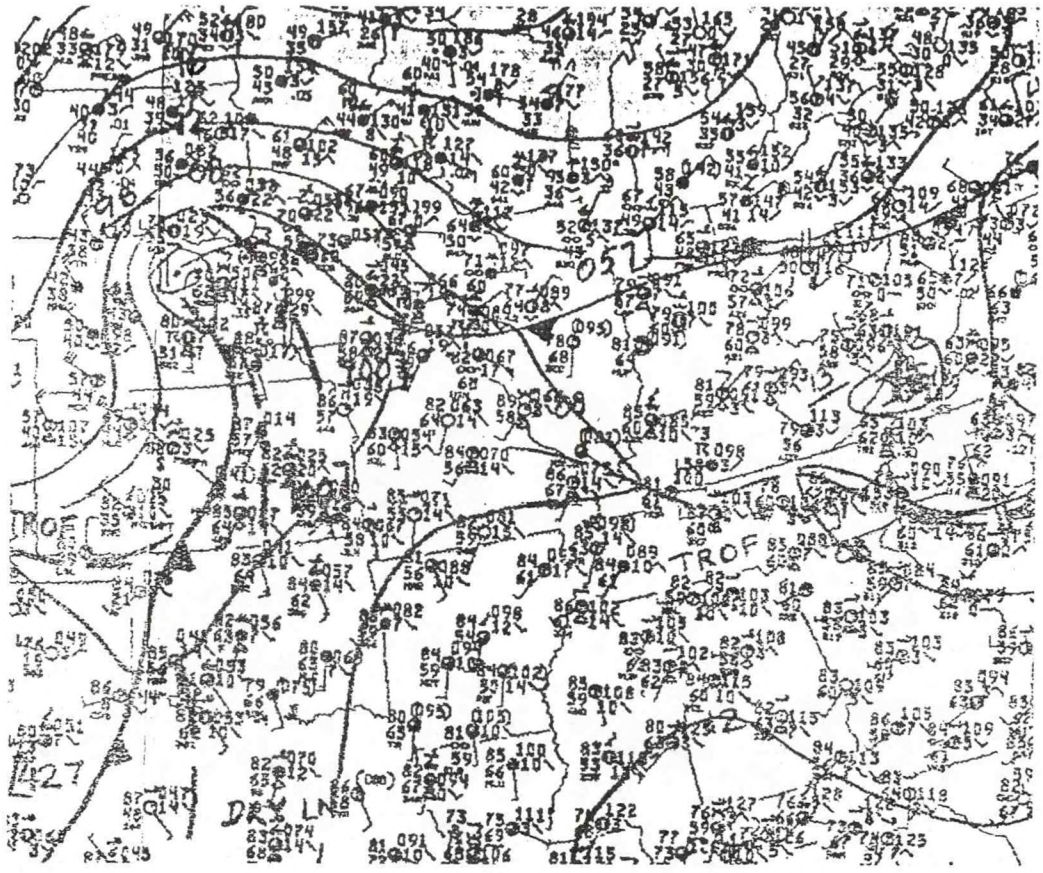
NO	TIME	EVENT	ST	LOCATION	REMARKS
1	1750	TORNADO (F-2)	IA	TROY	
2	1815	4.50 INCH HAIL	NE	OMAHA	$5 MILLION DAMAGE
3	1835	TORNADO (F-0)	IA	COUNCIL BLUFFS	2 INJURIES
4	2119	80 MPH WIND GUST	IA	CORNING	1 INJURY

27APR89 1400-2015 CST 59 REPORTS

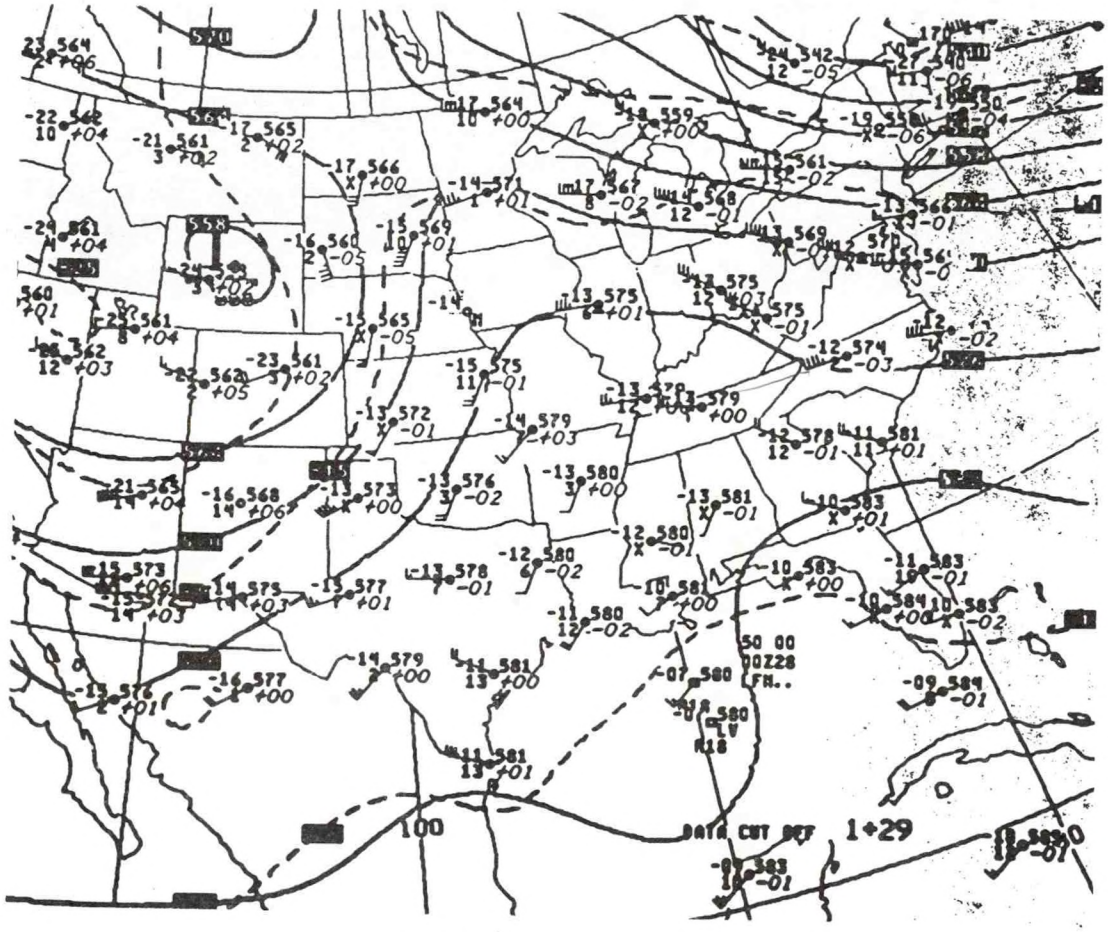
NO	TIME	EVENT	ST	LOCATION
1	1400	77 MPH WIND GUST	VA	ROANOKE
2	1705	2.50 INCH HAIL	NC	SPRING HOPE



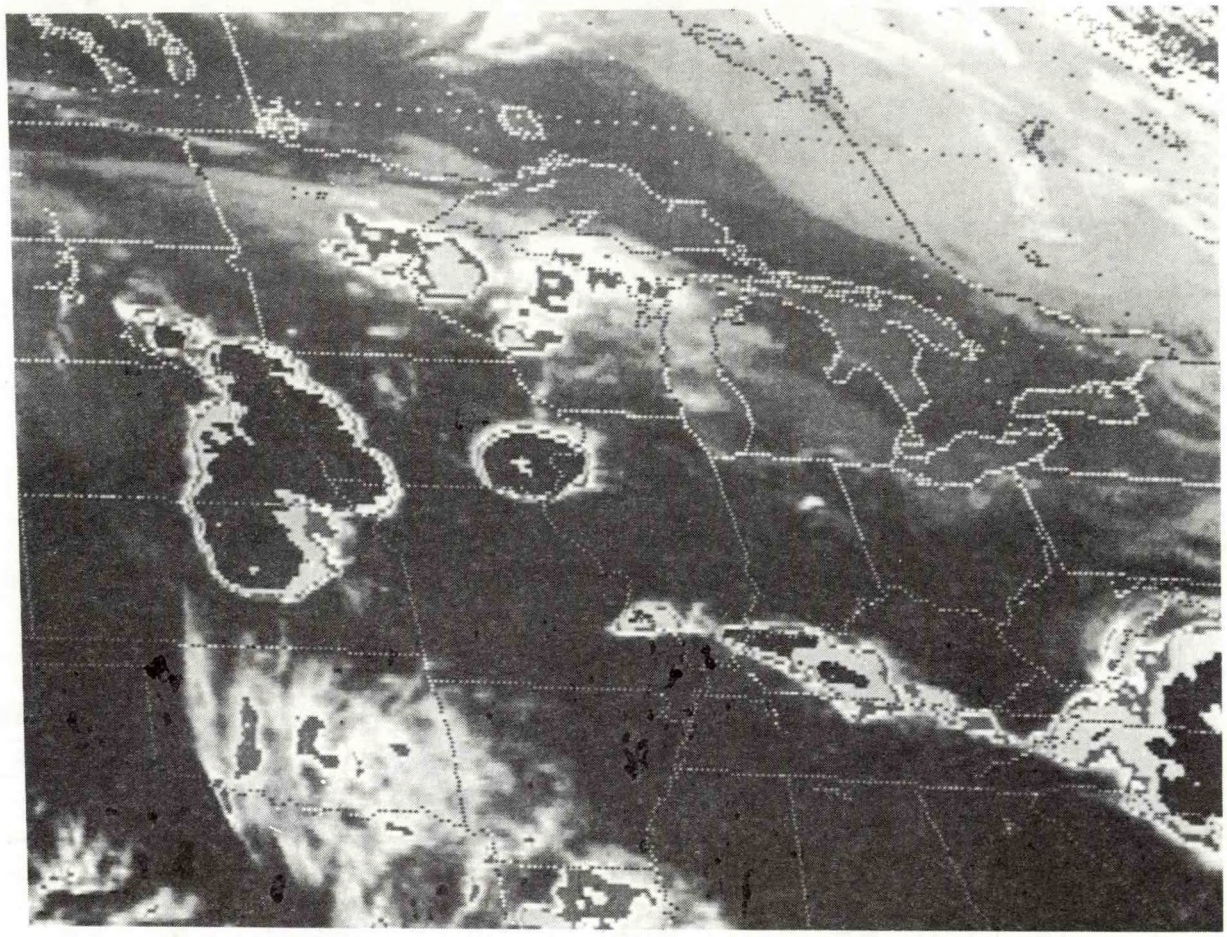
Composite 6PM CST April 27, 1989



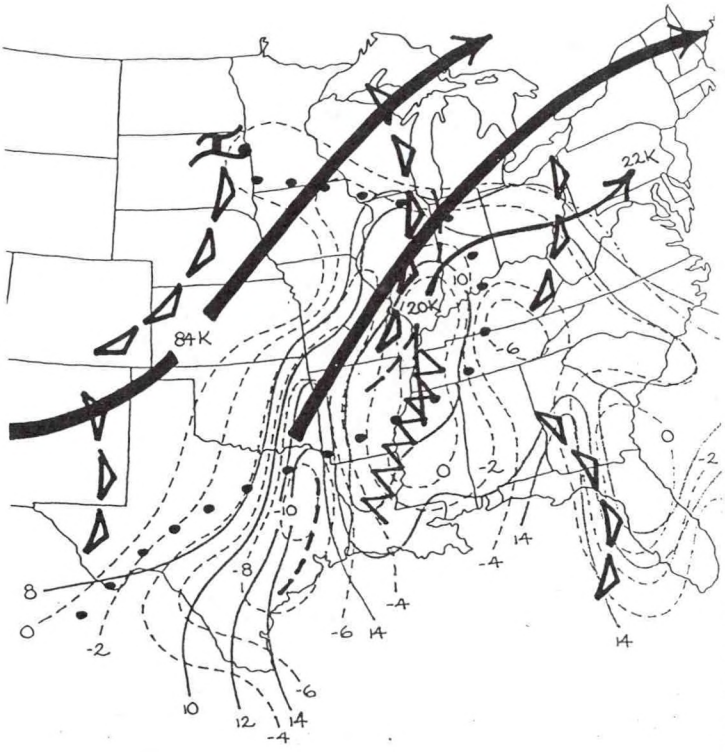
Surface 6PM CST April 27, 1989



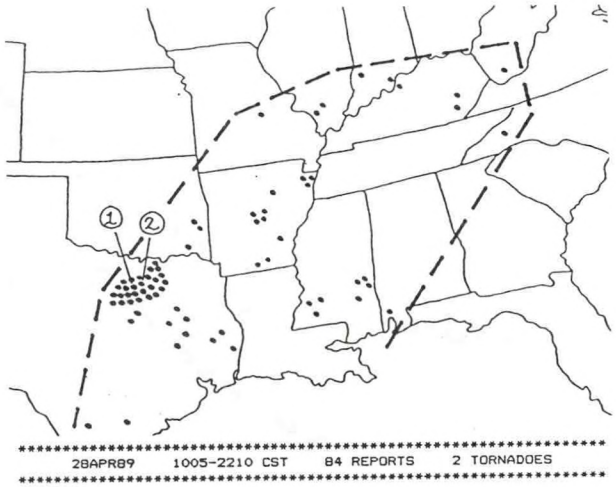
500 MB 6PM CST April 27, 1989



GOES 6:01 PM CST April 27, 1989

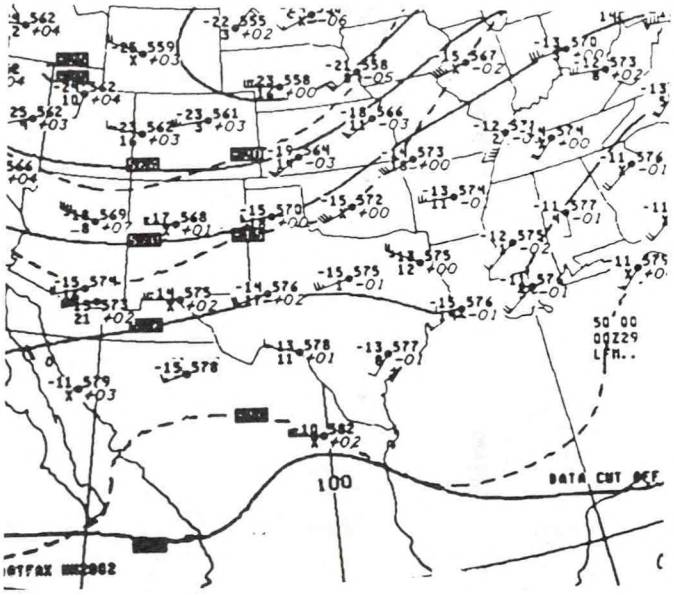


Composite 6PM CST April 28, 1989

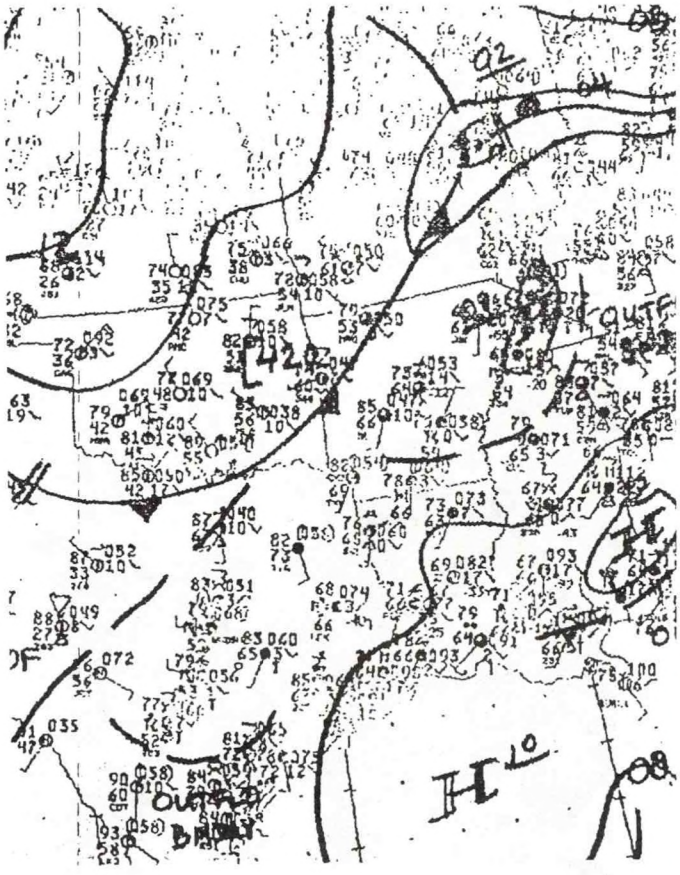


NO TIME EVENT ST LOCATION

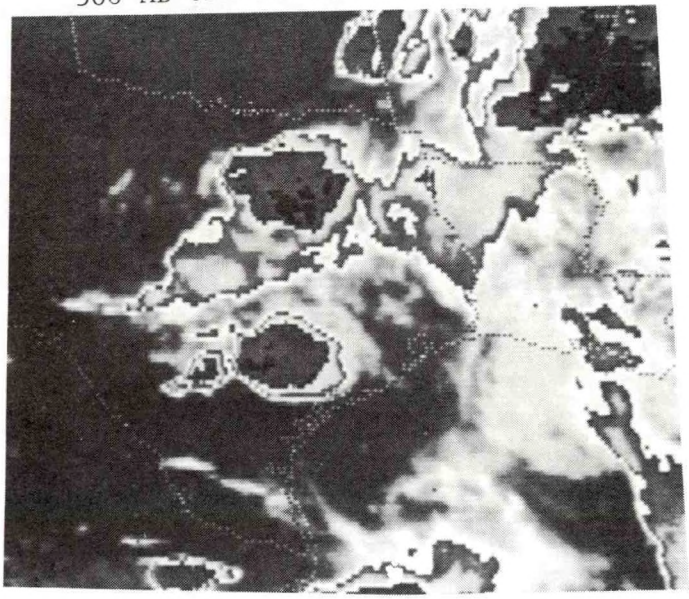
1 1855 4.50 INCH HAIL TX WHITE SETTLEMENT
2 1903 4.50 INCH HAIL TX KELLER



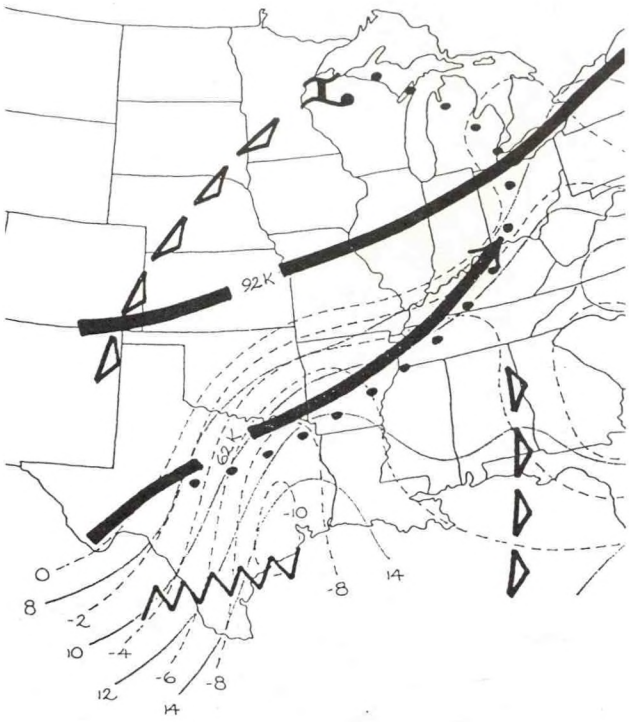
500 MB 6PM CST April 28, 1989



Surface 6PM CST April 28, 1989



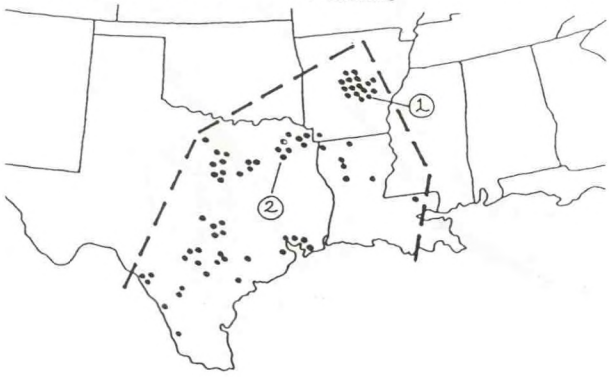
 GOES 6:31 PM CST April 28, 1989

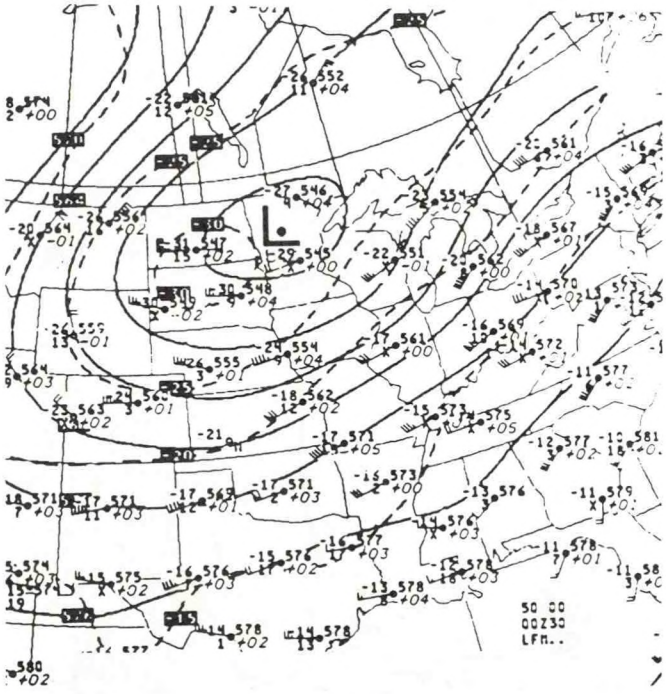


Composite 6PM CST April 29, 1989

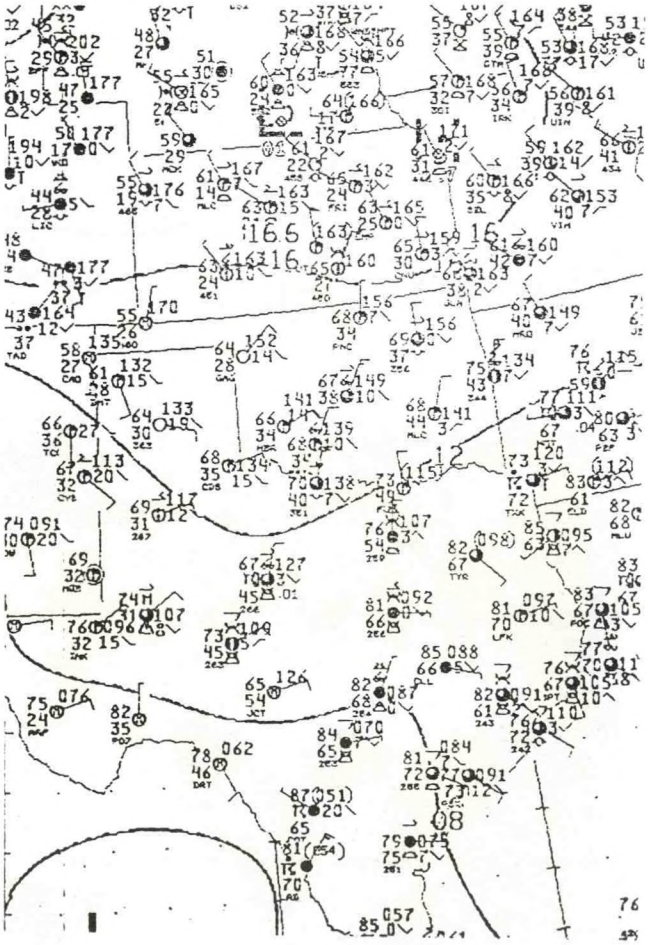
29APR89-30APR89 1045-0115 CST 72 REPORTS 1 TORNADO

NO	TIME	EVENT	ST	LOCATION	REMARKS
1	1931	2.50 INCH HAIL	AR	PINE BLUFF	$10 MILLION DAMAGE
2	2230	4.50 INCH HAIL	TX	PALESTINE	

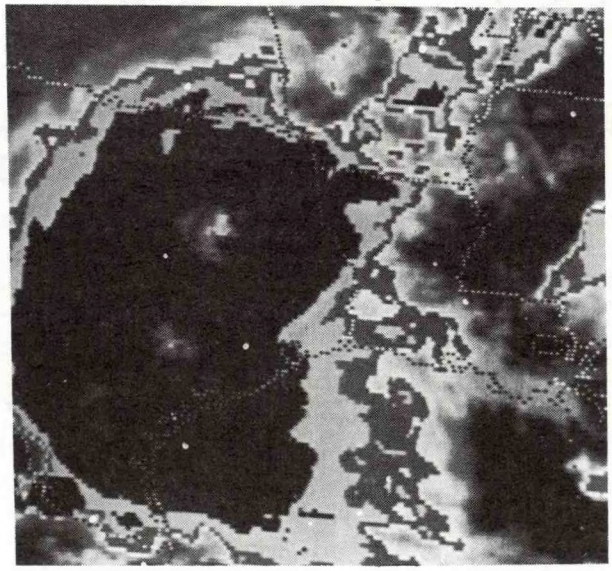




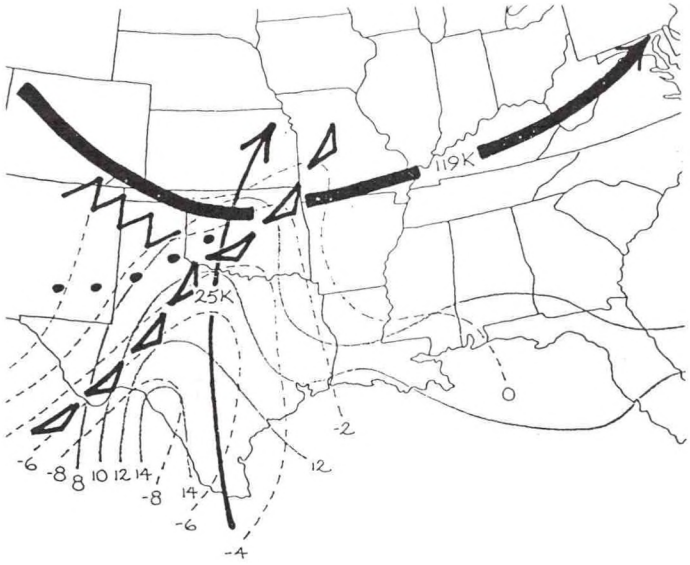
500 MB 6PM CST April 29, 1989



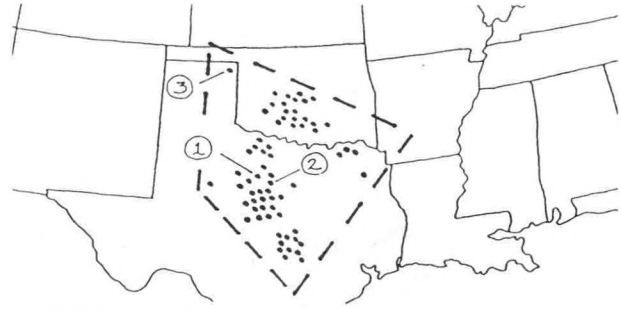
Surface 9PM CST April 29, 1989



GOES 10:01 PM CST April 29, 1989

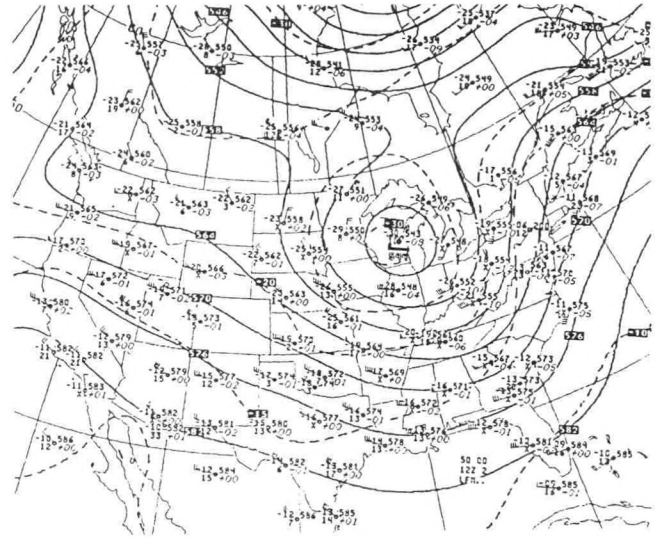


Composite 6PM CST May 2, 1989

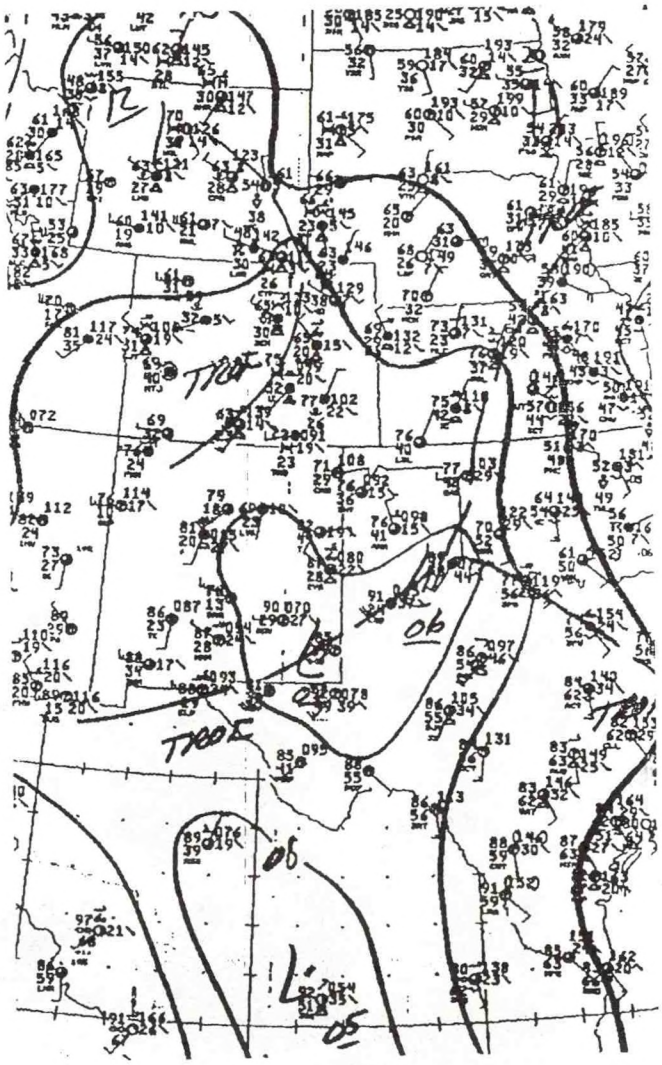


02MAY89-03MAY89 0920-0600 CST 93 REPORTS 2 TORNADOES

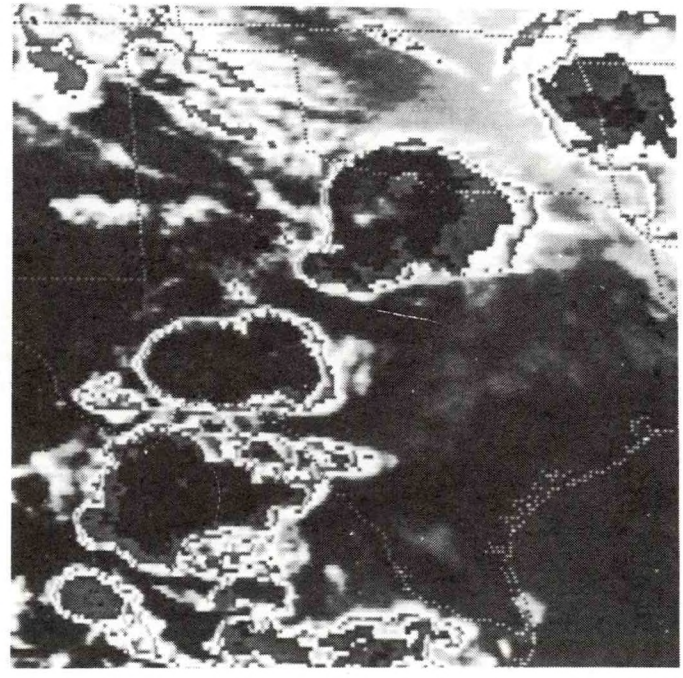
NO	TIME	EVENT	ST	LOCATION
1	1743	2.75 INCH HAIL	TX	BRECKENRIDGE
2	1823	2.75 INCH HAIL	TX	RANGER
3	1955	80 MPH WIND GUST	TX	BEATTIE



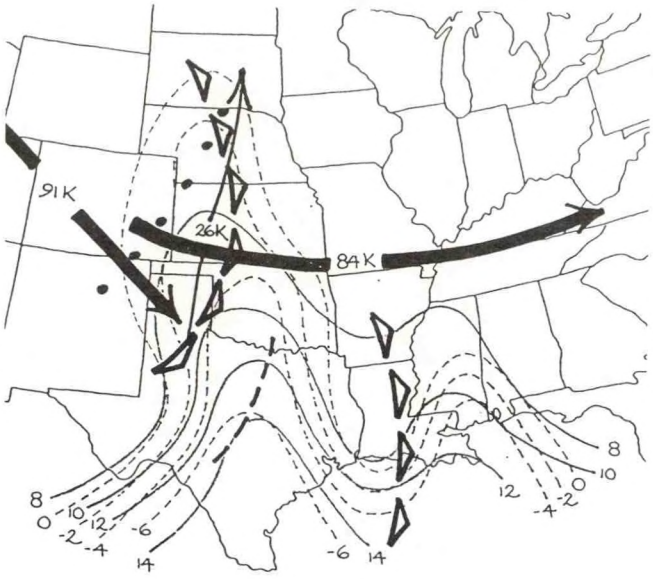
500 MB 6AM CST May 2, 1989



Surface 3PM CST May 2, 1989



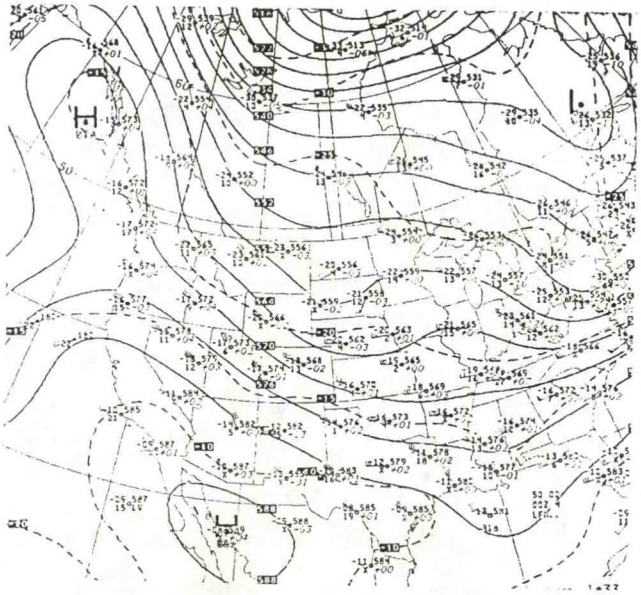
GOES 5:01 PM CST May 2, 1989



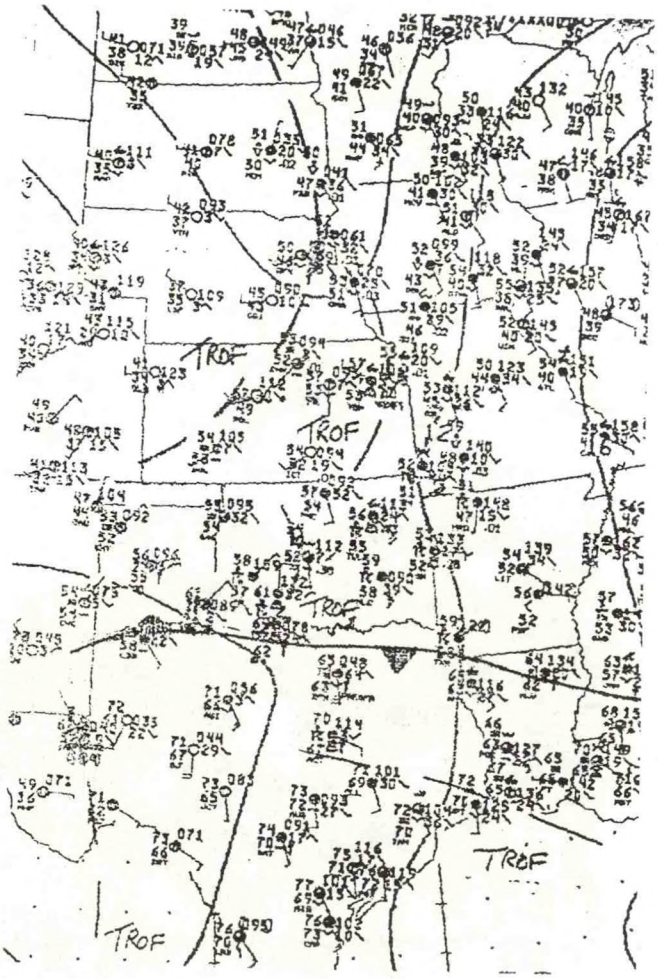
Composite 6PM CST May 3, 1989

03MAY89-04MAY89 1030-0600 CST 93 REPORTS 1 TORNADO

NO	TIME	EVENT	ST	LOCATION
1	0232	2.75 INCH HAIL	TX	LAKE KEMP
2	0340	2.75 INCH HAIL	TX	GRAHAM
3	0350	72 MPH WIND GUST	TX	GRAFORD

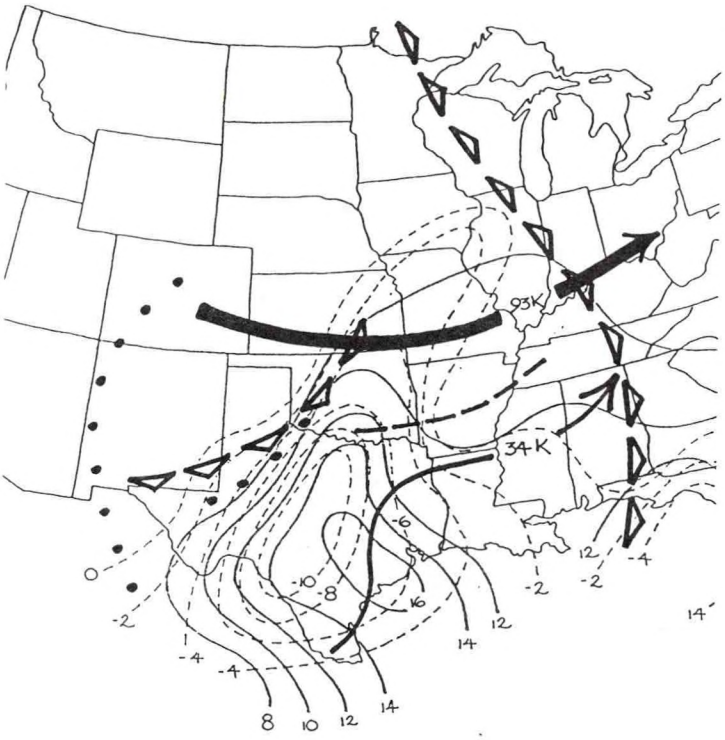


500 MB 6PM CST May 3, 1989

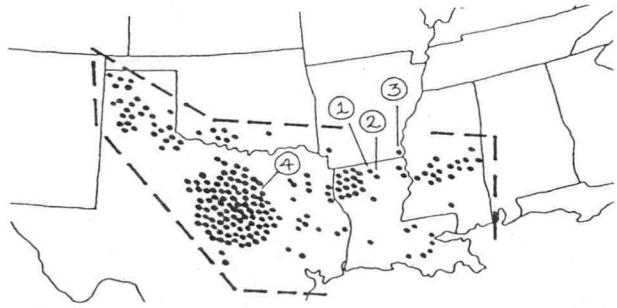


Surface 3AM CST May 4, 1989

GOES 2:31 AM CST May 4, 1989

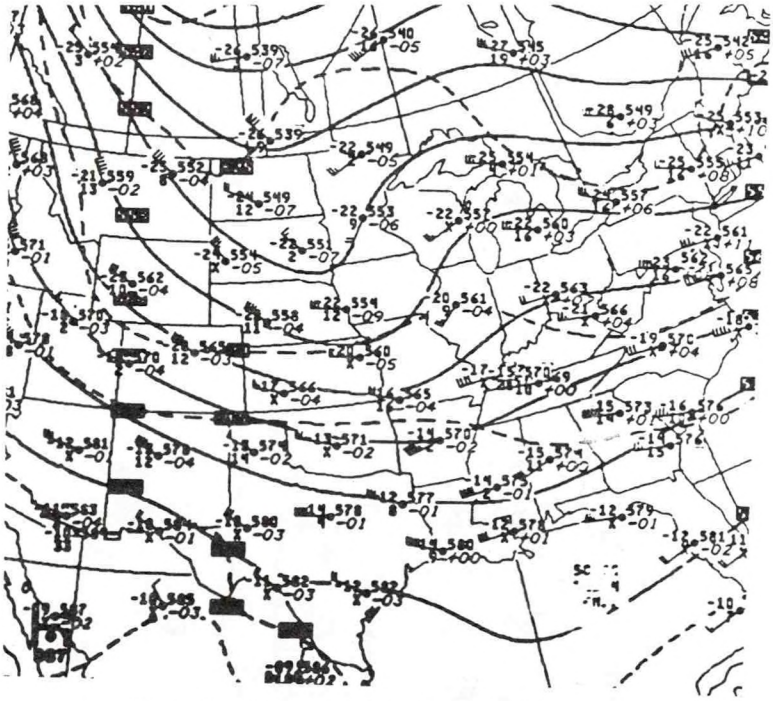


Composite 6PM CST May 4, 1989

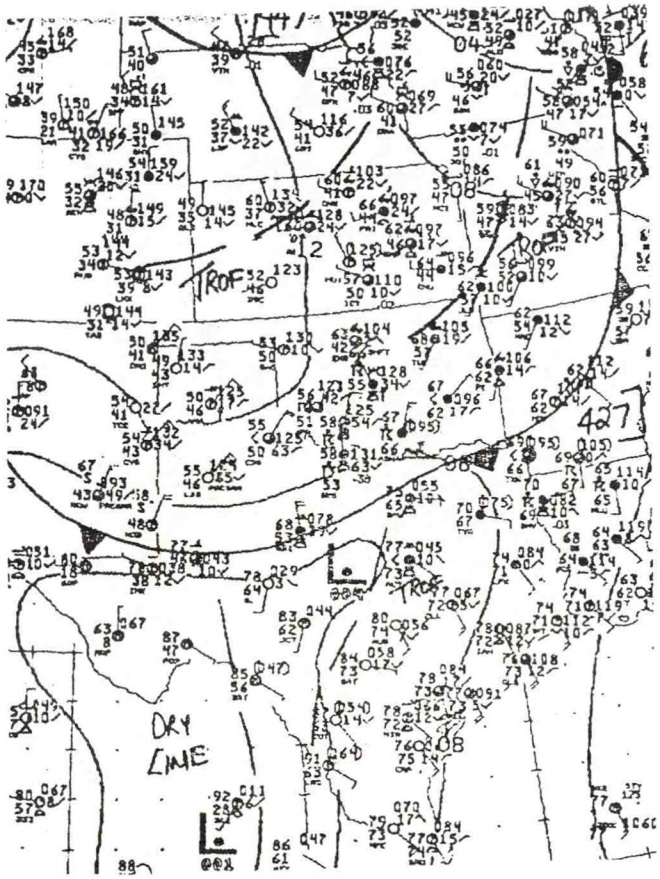


04MAY89-05MAY89 0615-0545 CST 355 REPORTS 15 TORNADOES

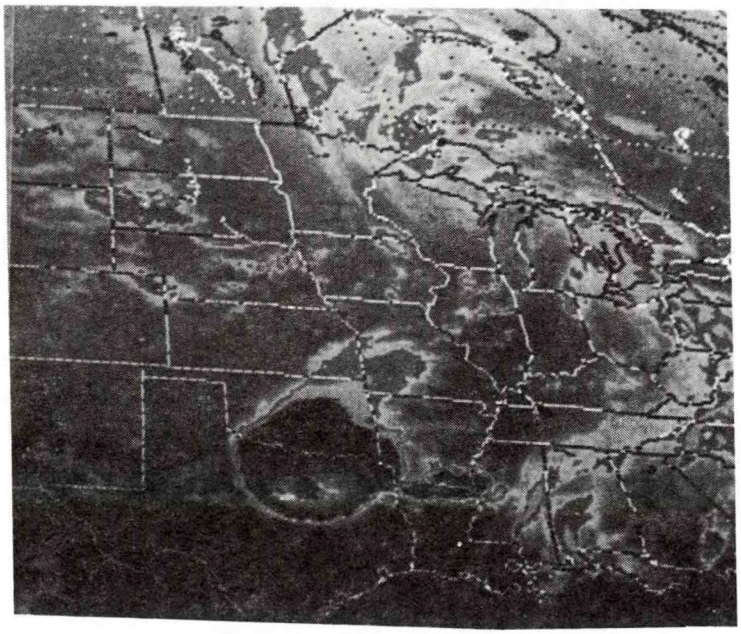
NO	TIME	EVENT	ST	LOCATION	
1	0745	3.00 INCH HAIL	LA	MONROE	$7.1 MILLION DAMAGE
2	0902	100 MPH WIND GUST	LA	EPPS	
3	0910	WIND DAMAGE	AR	PARKDALE	4 INJURIES
4	2225	100 MPH WIND GUST	TX	FORT WORTH	



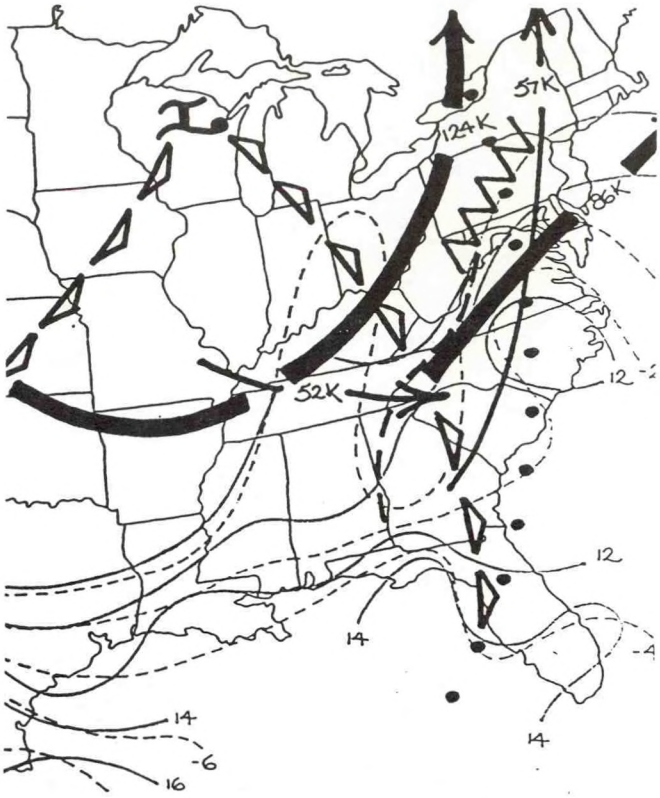
500 Mb 6AM CST May 4, 1989



Surface 9PM CDT May 4, 1989



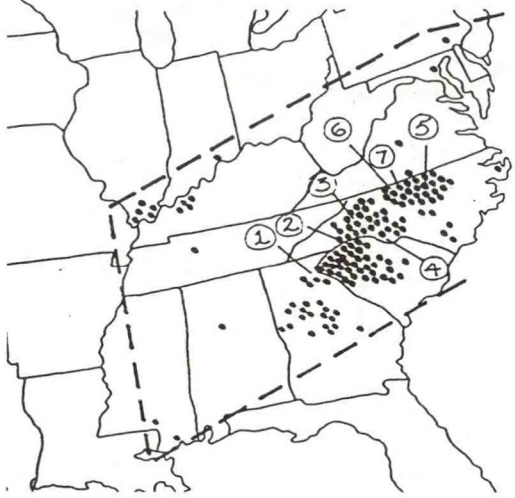
GOES 10:01 PM CST May 4, 1989

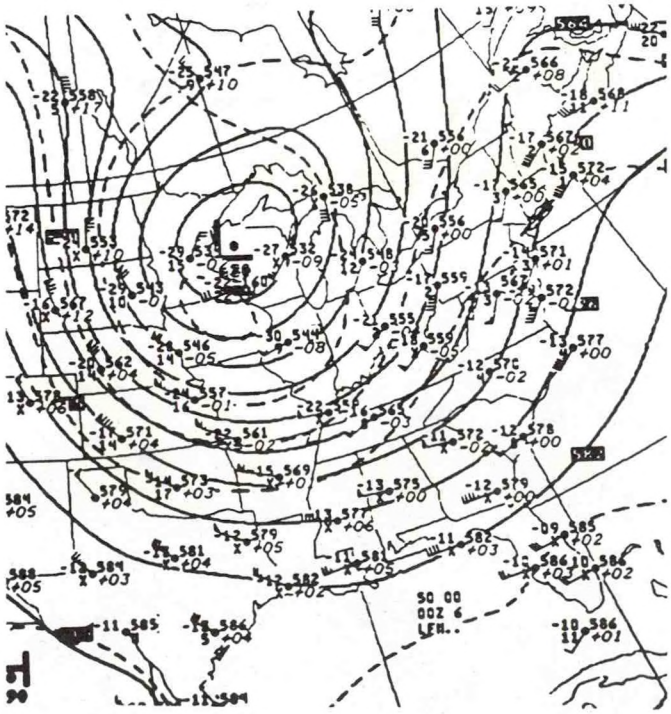


Composite 6PM CST May 5, 1989

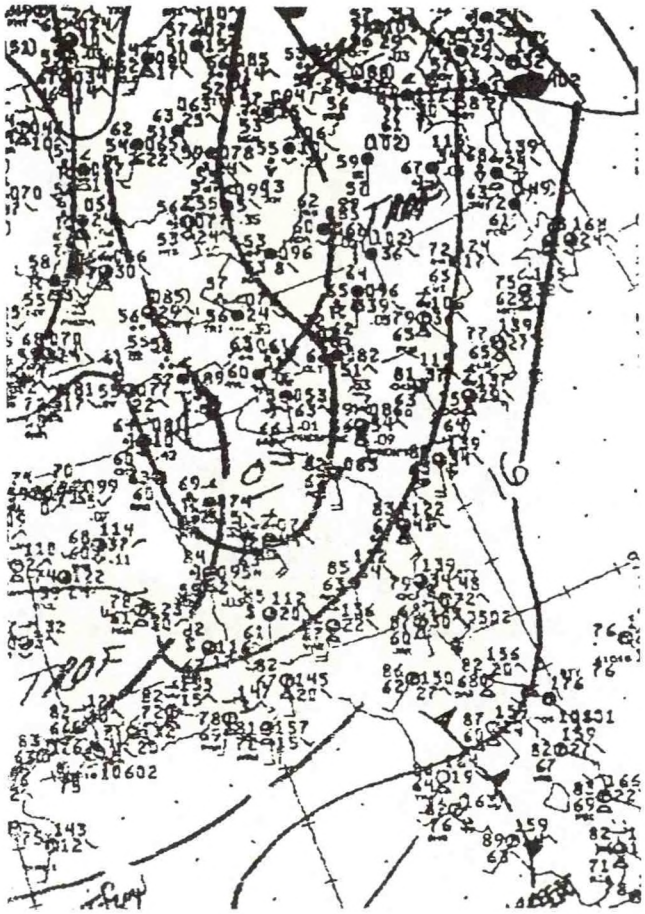
05MAY89 1315-2110 CST 161 REPORTS 17 TORNADOES

NO	TIME	EVENT	ST	LOCATION	
1	1500	TORNADO (F-2)	GA	TOCCOA	$2.5 MILLION DAMAGE, 15 INJURIES
2	1620	TORNADO (F-4)	SC	CHESNEE	$2.8 MILLION DAMAGE, 2 DEATHS, 35 INJURIES
3	1700	TORNADO (F-4)	NC	TOLUCA	$5.6 MILLION DAMAGE, 4 DEATHS, 52 INJURIES
4	1711	TORNADO (F-4)	NC	MONROE	$8 MILLION DAMAGE, 1 DEATH, 6 INJURIES
5	1720	TORNADO (F-2)	NC	DURHAM	$15 MILLION DAMAGE
6	1850	TORNADO (F-3)	NC	WINSTON-SALEM	30 INJURIES
7	1905	TORNADO (F-2)	NC	WINSTON-SALEM	$30 MILLION DAMAGE



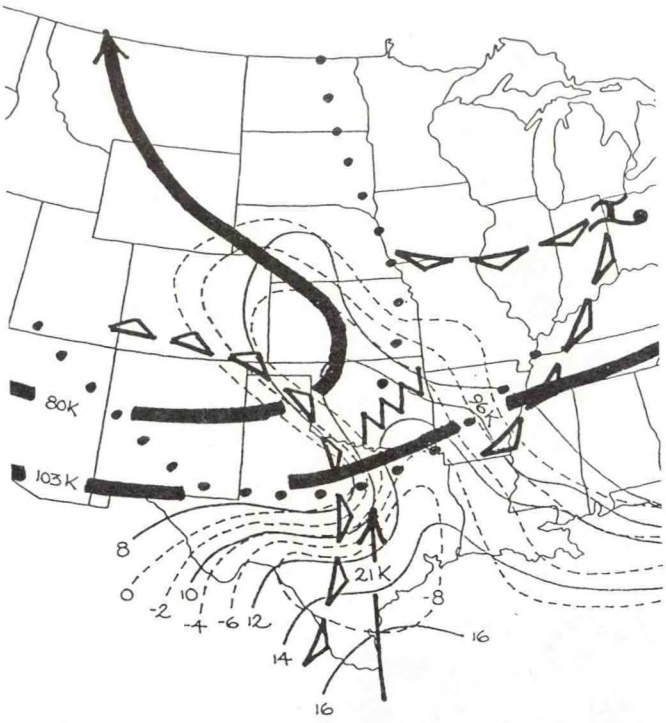


500 MB 6AM CST May 5, 1989

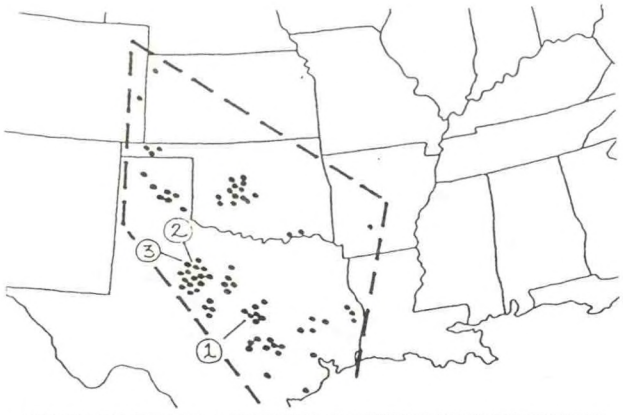


Surface 3PM CST May 5, 1989

GOES 4:01 PM CST May 5, 1989

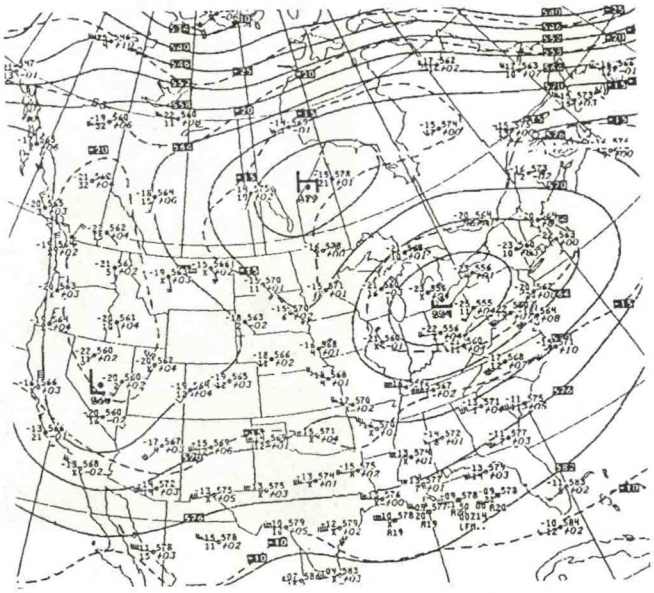


Composite 6PM CST May 13, 1989

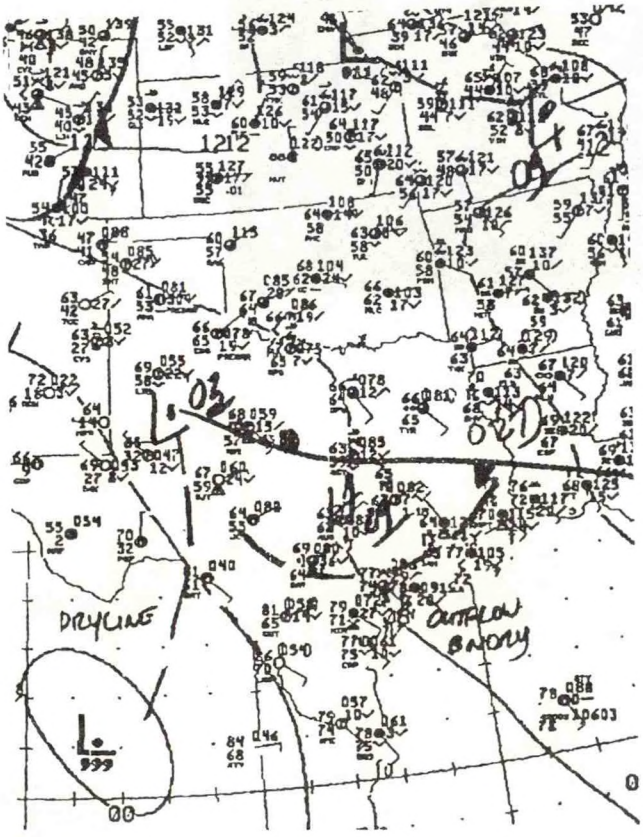


13MAY89-14MAY89 1140-0130 CST 84 REPORTS 3 TORNADOES

NO	TIME	EVENT	ST	LOCATION	
1	1540	95 MPH WIND GUST	TX	FORT HOOD	$500 MILLION DAMAGE
2	1724	TORNADO (F-2)	TX	HODGES	
3	1817	4.50 INCH HAIL	TX	HODGES	

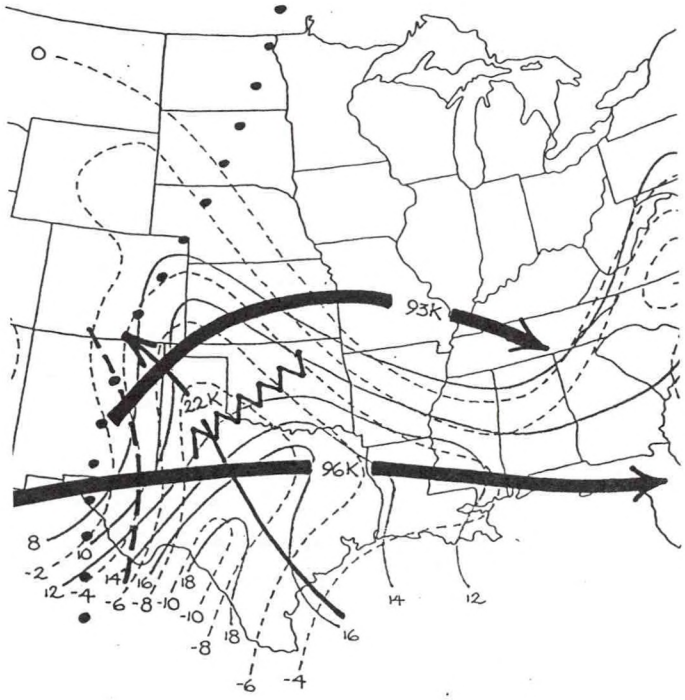


500 MB 6PM CST May 13, 1989

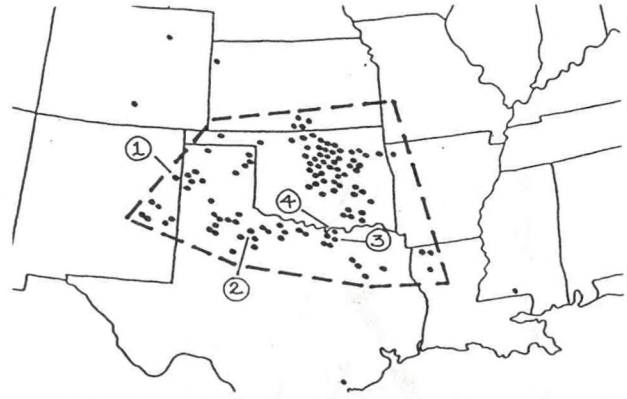


Surface 9PM CST May 13, 1989

GOES 12:01 AM CST May 14, 1989

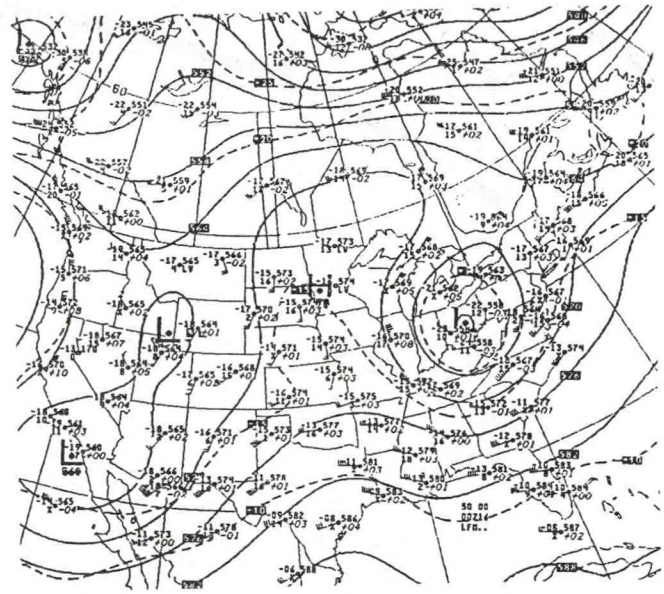


Composite 6PM CST May 15, 1989

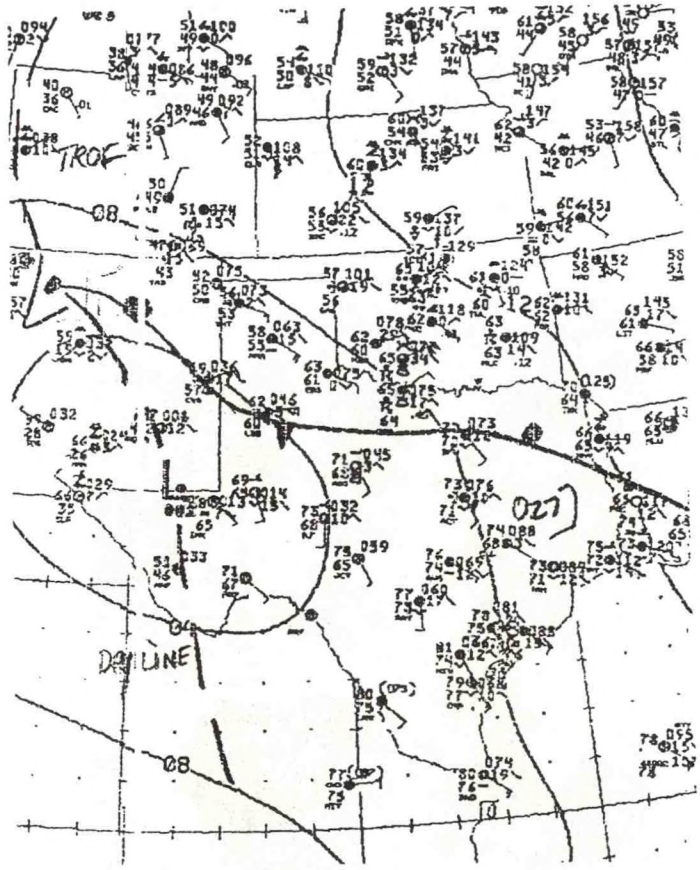


15MAY89-16MAY89 0615-0445 CST 156 REPORTS 11 TORNADOES

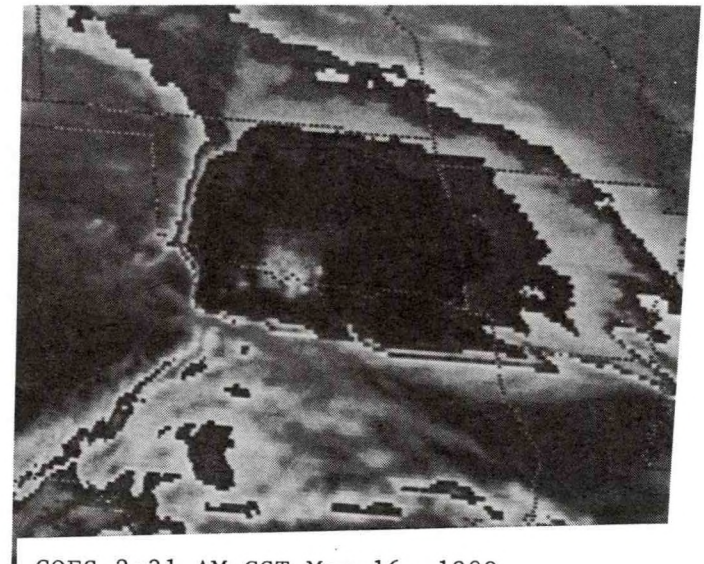
NO	TIME	EVENT	ST	LOCATION	
1	1245	4.00 INCH HAIL	NM	MCALISTER	
2	1605	TORNADO (F-2)	TX	GUTHRIE	
3	0320	4.50 INCH HAIL	TX	SHERMAN	$2.1 MILLION DAMAGE
4	0445	4.50 INCH HAIL	TX	BONHAM	



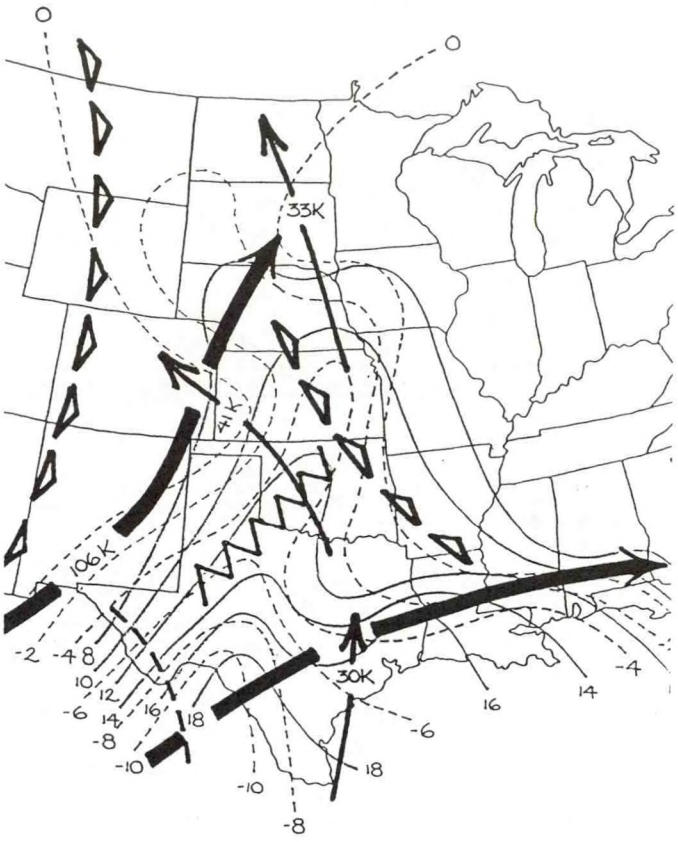
500 MB 6PM CST May 15, 1989



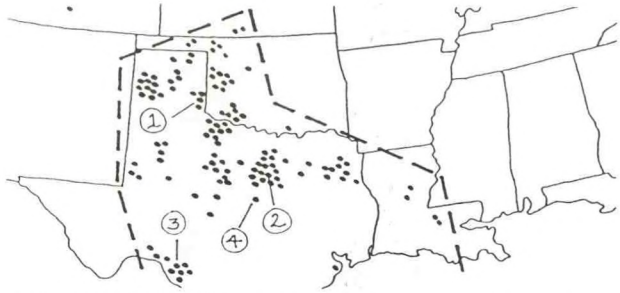
Surface 3AM CST May 16, 1989



GOES 2:31 AM CST May 16, 1989

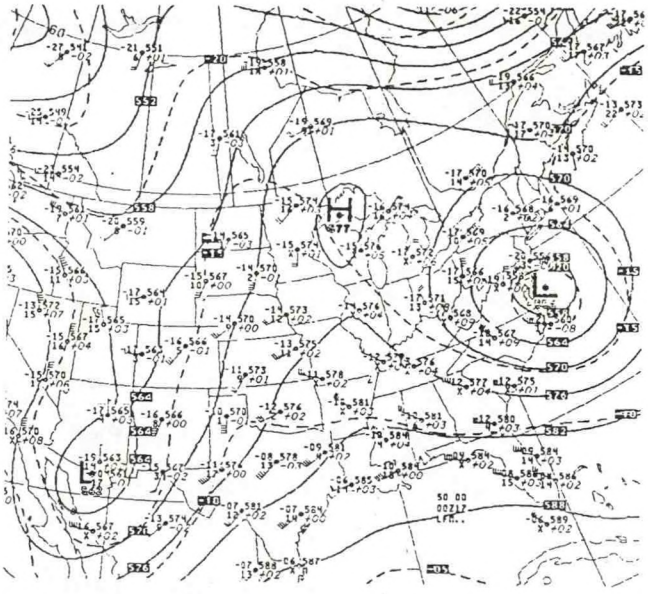


Composite 6PM CST May 16, 1989

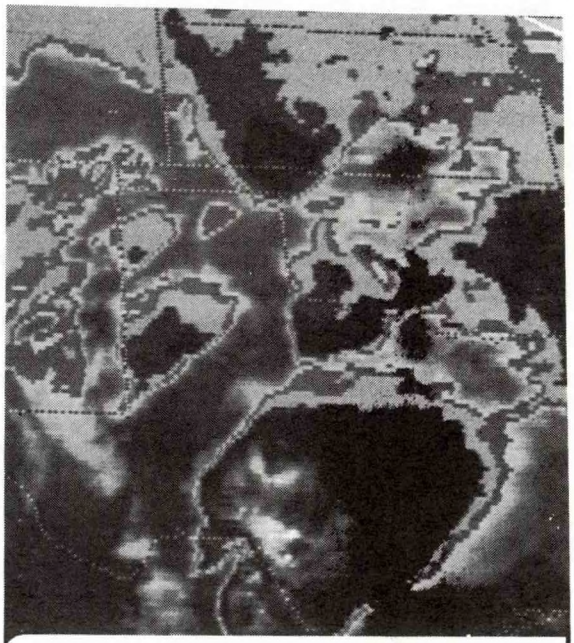


16MAY89-17MAY89 0620-0434 CST 200 REPORTS 20 TORNADOES

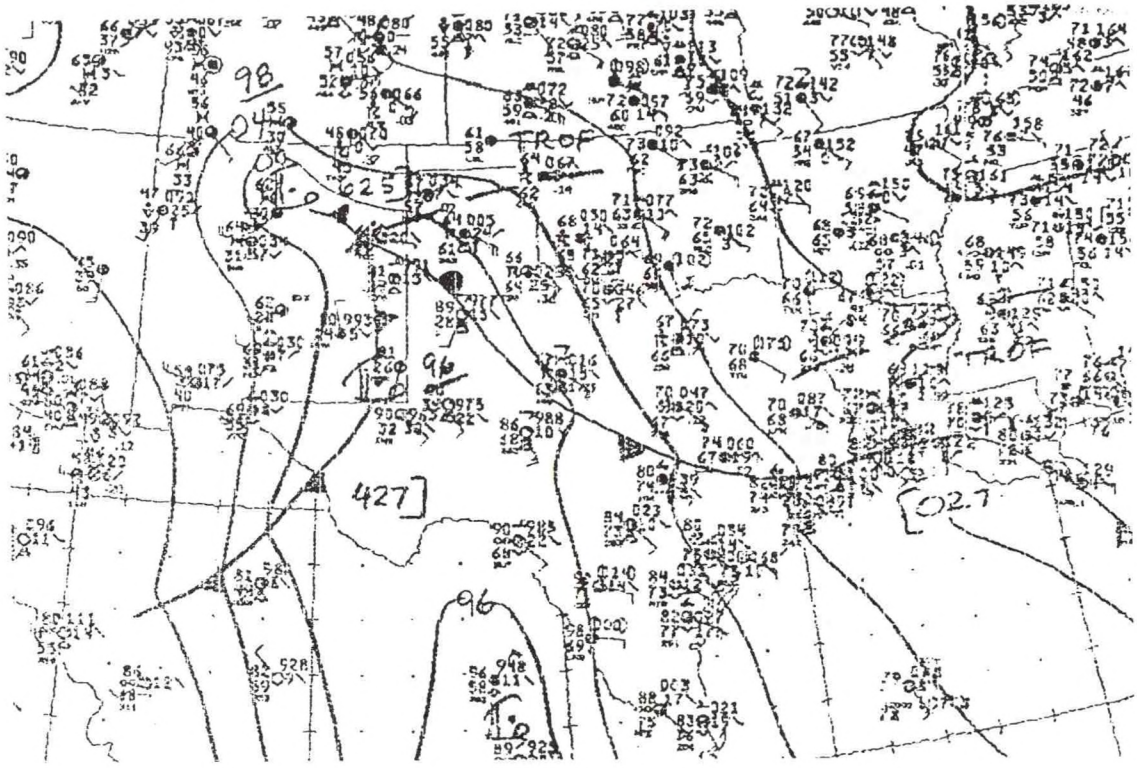
NO	TIME	EVENT	ST	LOCATION	
1	1608	4.50 INCH HAIL	TX	SHAMROCK	
2	1838	TORNADO (F-1)	TX	CLEBURNE	$30 MILLION DAMAGE
3	2308	TORNADO (F-4)	TX	BRACKETTVILLE	
4	0330	TORNADO (F-3)	TX	JARRELL	1 DEATH, 28 INJURIES



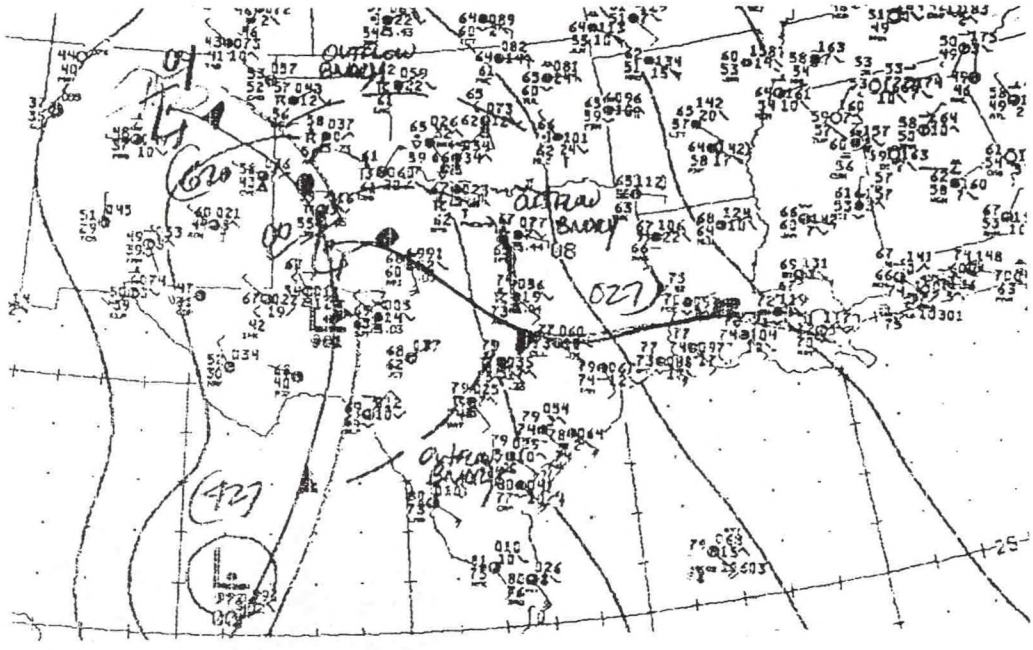
500 MB 6PM CST May 16, 1989



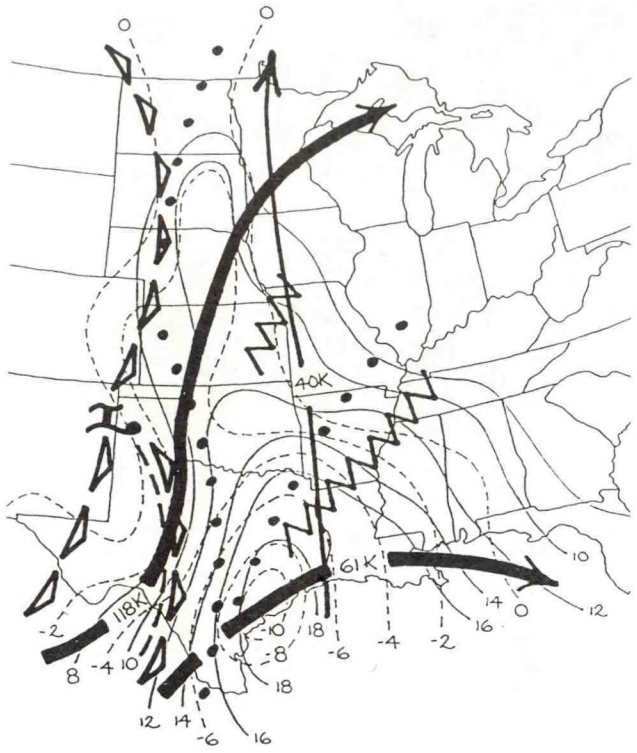
GOES 11:01 PM CST May 16, 1989



Surface 6PM CST May 16, 1989



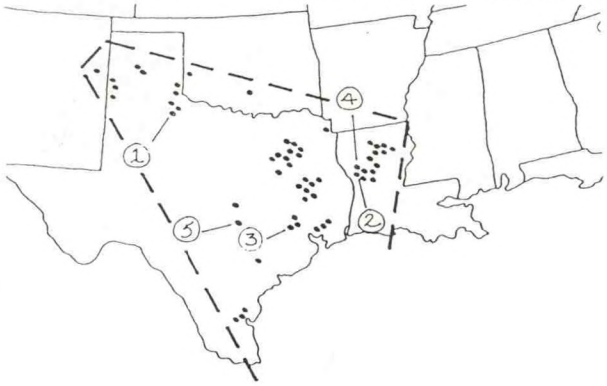
Surface 3AM CST May 17, 1989

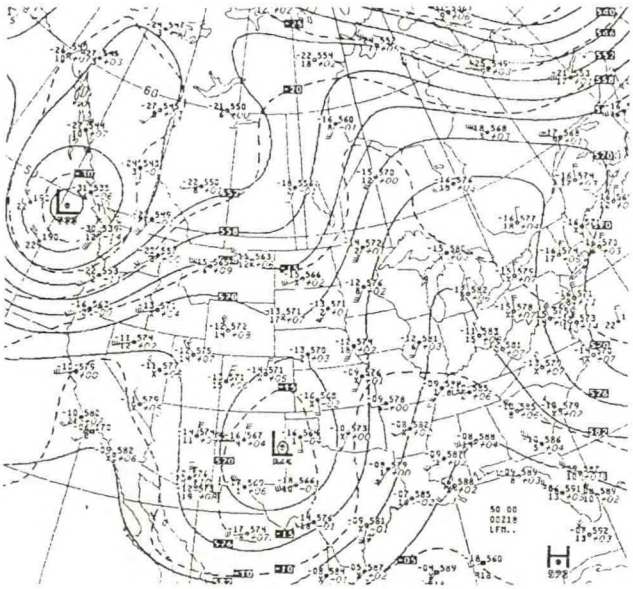


Composite 6PM CST May 17, 1989

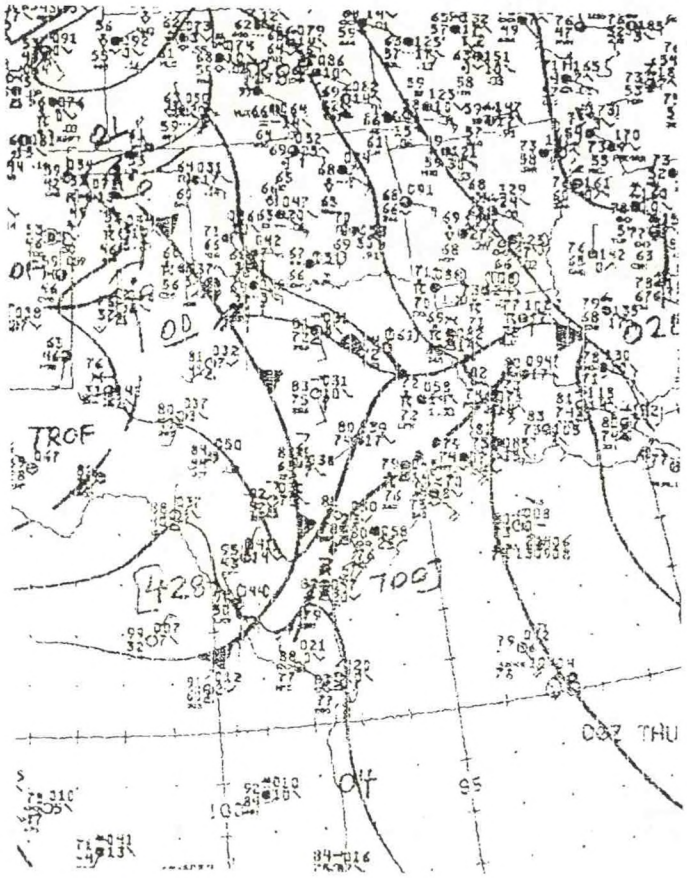
17MAY89 0700-2310 CST 62 REPORTS 19 TORNADOES

NO	TIME	EVENT	ST	LOCATION	REMARKS
1	1532	2.75 INCH HAIL	TX	MATADOR	
2	1535	WIND DAMAGE	LA	MARTHAVILLE	2 INJURIES
3	1600	TORNADO (F-2)	TX	APPLE SPRINGS	14 INJURIES, $2 MILLION DAMAGE
4	1615	WIND DAMAGE	TX	NATCHITOCHES	2 INJURIES
5	1815	WIND DAMAGE	TX	WALLER COUNTY	2 INJURIES



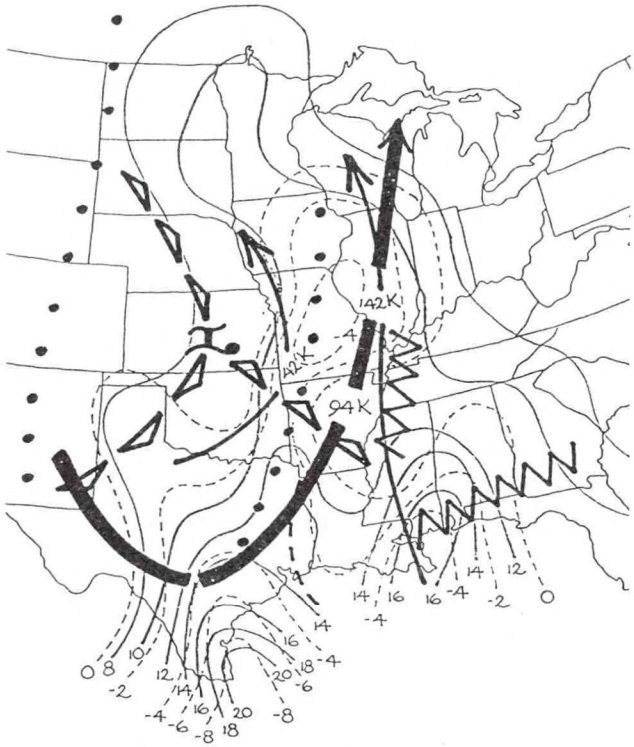


500 MB 6PM CST May 17, 1989

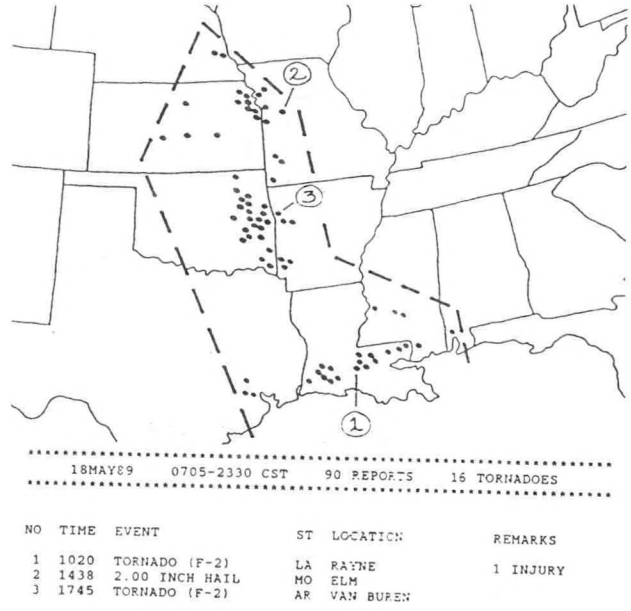


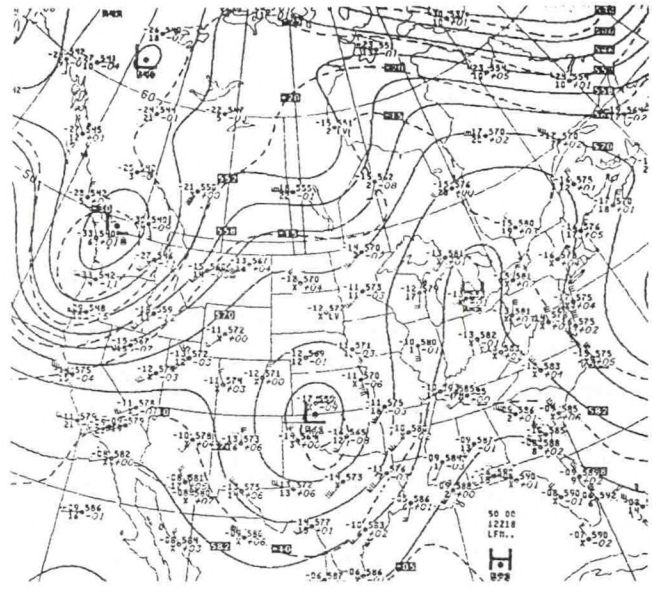
Surface 6PM CST May 17, 1989

GOES 5:01 PM CST May 17, 1989

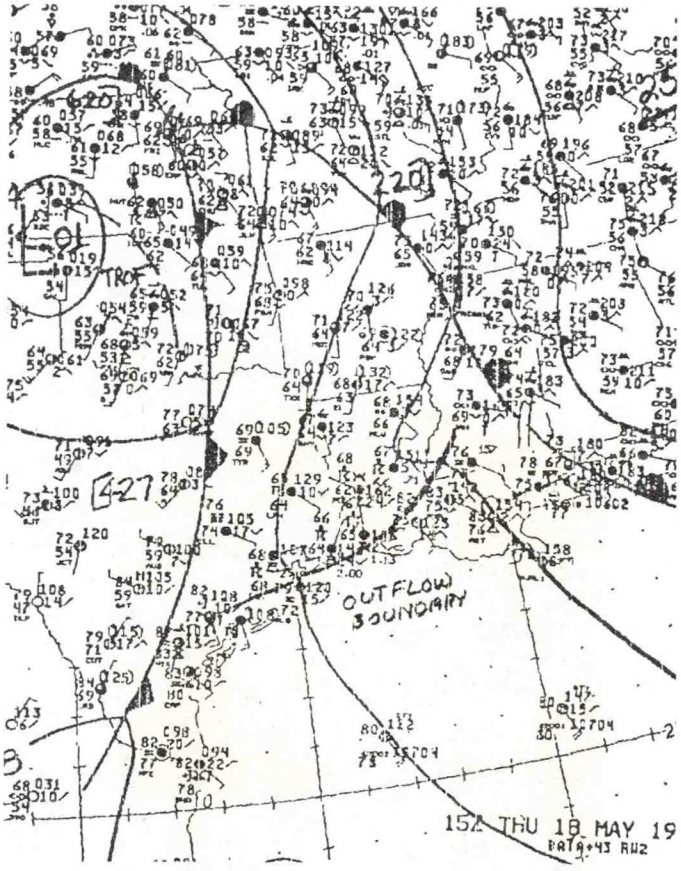


Composite 6PM CST May 18, 1989

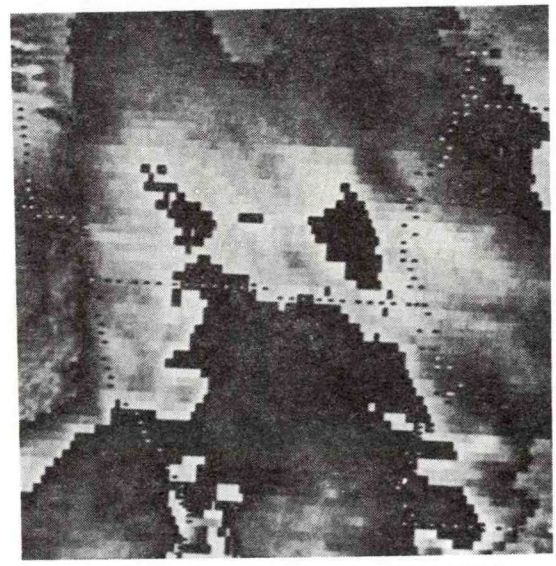




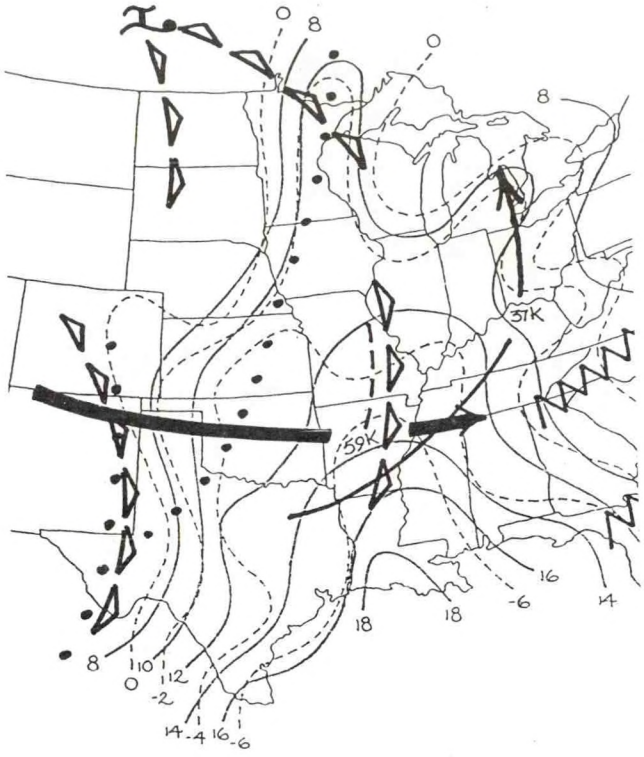
500 MB 6AM CST May 18, 1989



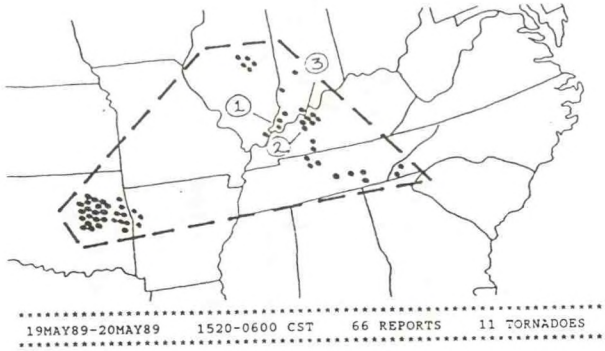
Surface 9AM CST May 18, 1989



GOES 10:01 AM CST May 18, 1989

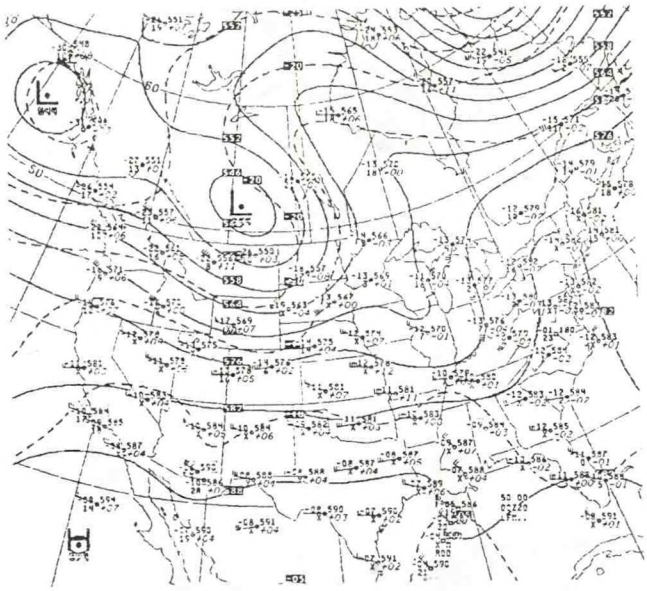


Composite 6PM CST May 19, 1989

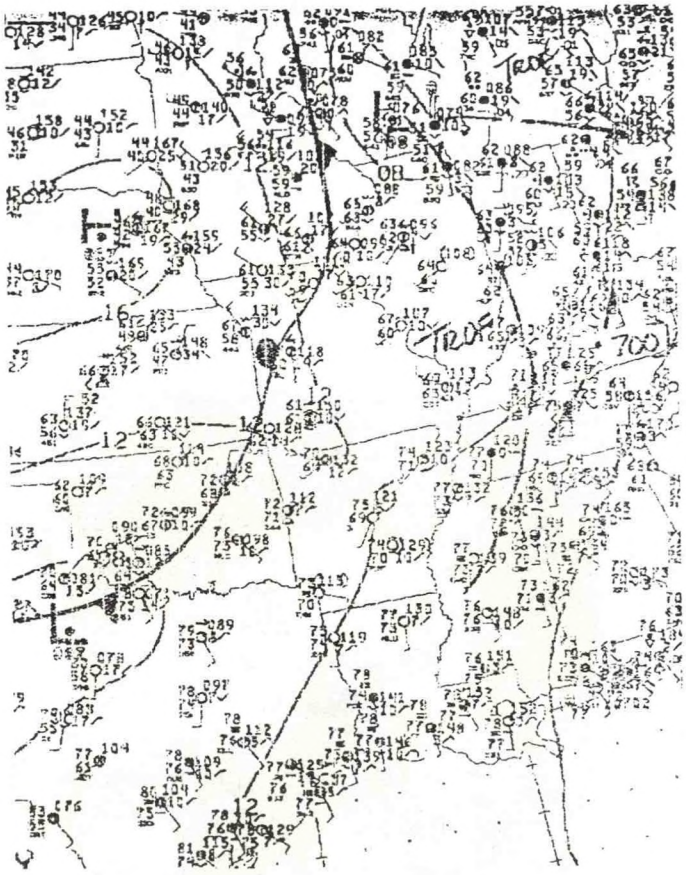


19MAY89-20MAY89 1520-0600 CST 66 REPORTS 11 TORNADOES

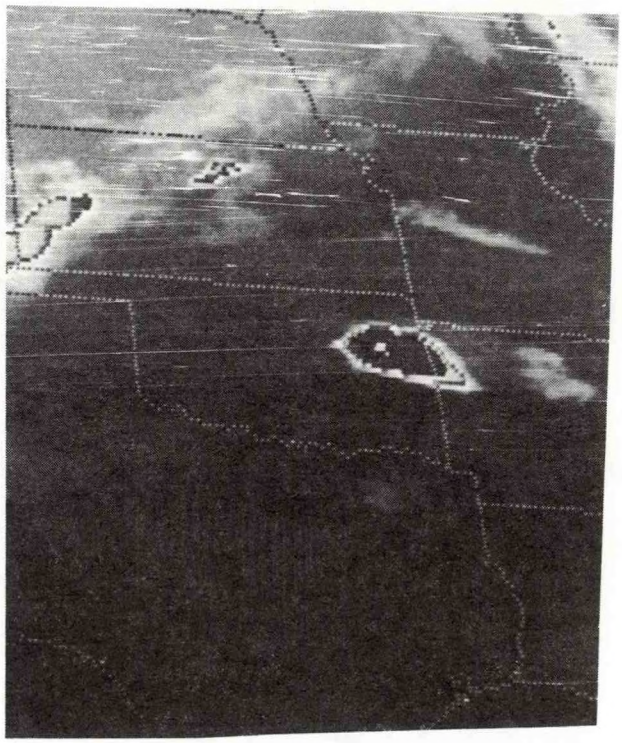
NO	TIME	EVENT	ST	LOCATION
1	1805	2.00 INCH HAIL	IN	EVANSVILLE
2	1823	TORNADO (F-2)	KY	MASONVILLE
3	2030	TORNADO (F-2)	KY	PHILPOT



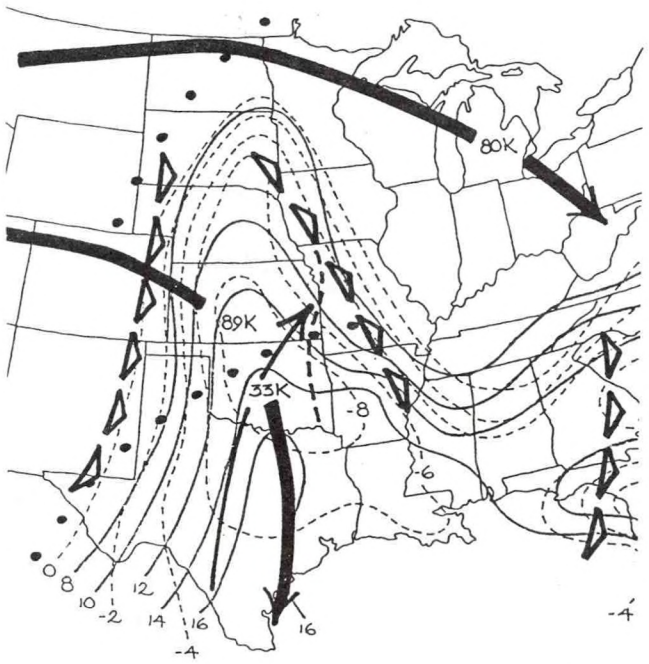
500 MB 6PM CST May 19, 1989



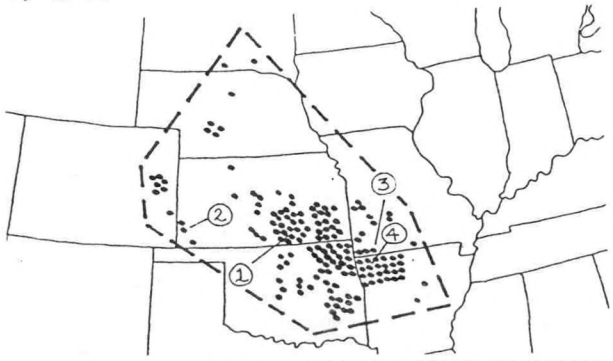
Surface 12 Midnight CST May 20, 1989



GOES 12:31 AM CST May 20, 1989

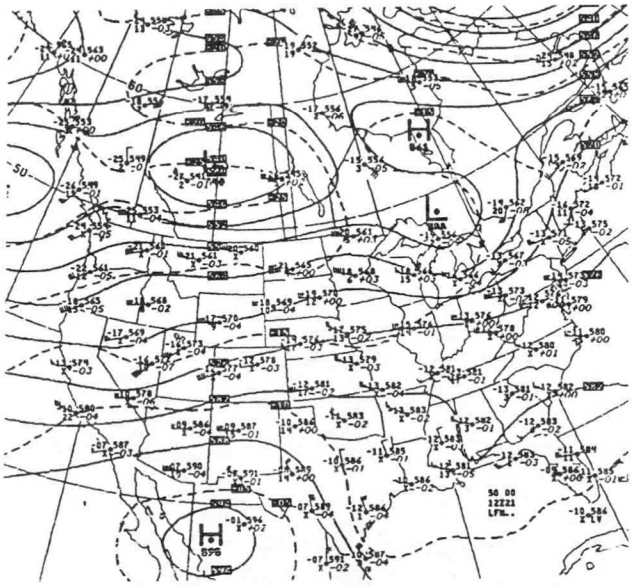


Composite 6PM CST May 21, 1989

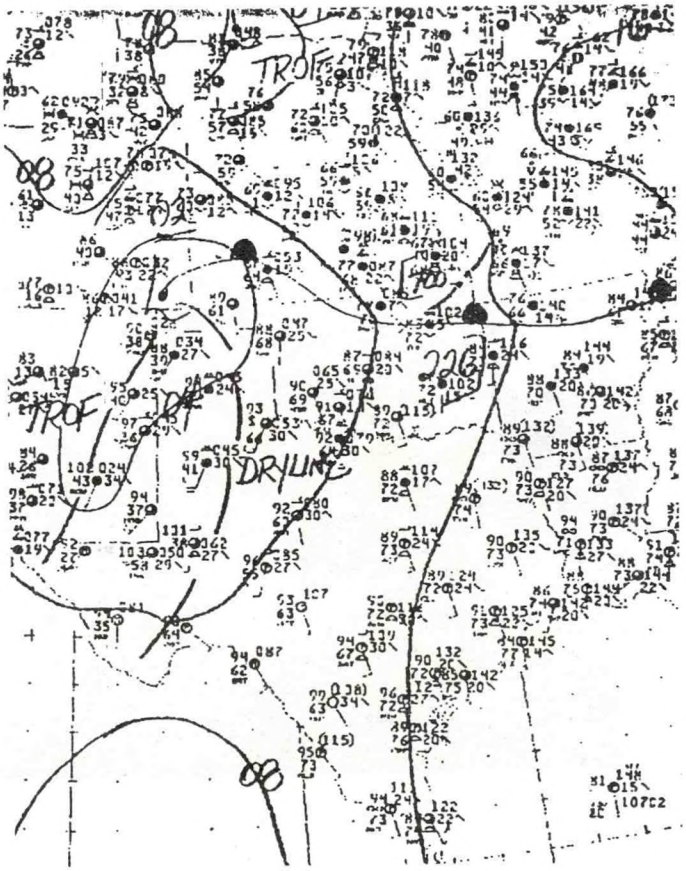


21MAY89-22MAY89 0624-0822 CST 247 REPORTS 4 TORNADOES

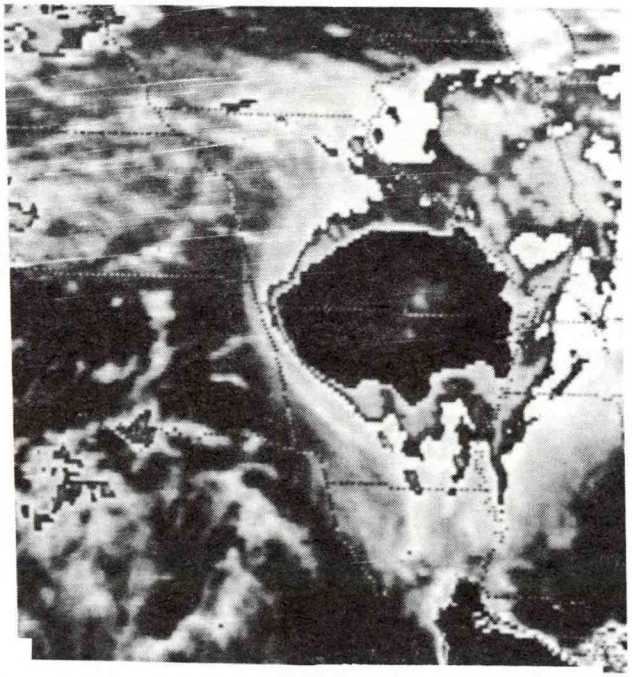
NO	TIME	EVENT	ST	LOCATION	REMARKS
1	0935	2.75 INCH HAIL	KS	AUGUSTA	
2	2030	98 MPH WINDS	KS	JOHNSON	
3	0000	TORNADO (F-2)	MO	GREENE COUNTY	
4	0320	WIND DAMAGE	AR	FAYETTEVILLE	3 INJURIES



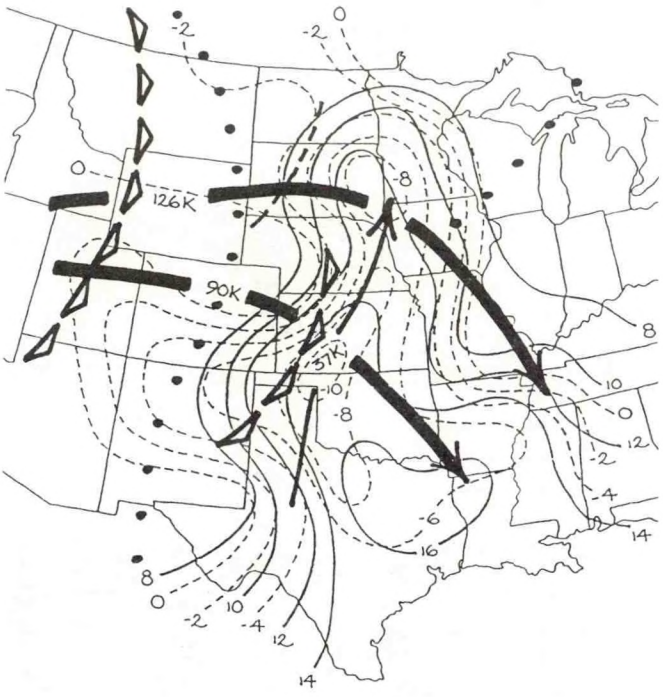
500 MB 6AM CST May 21, 1989



Surface 3PM CST May 21, 1989



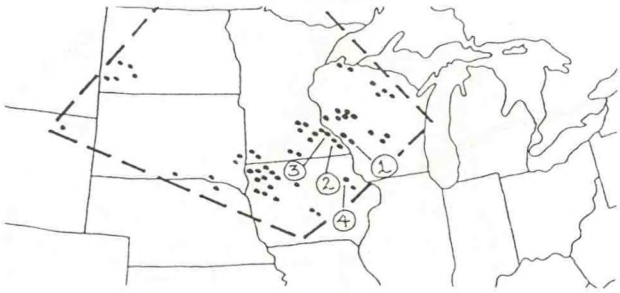
 GOES 12:31 AM CST May 22, 1989

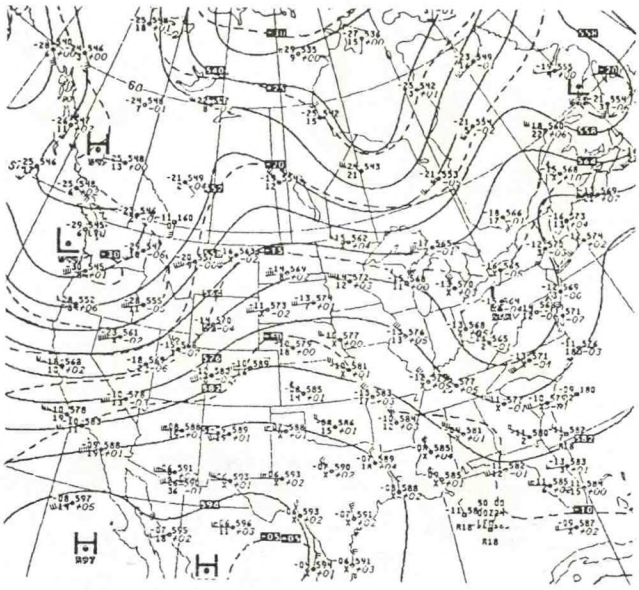


Composite 6PM CST May 23, 1989

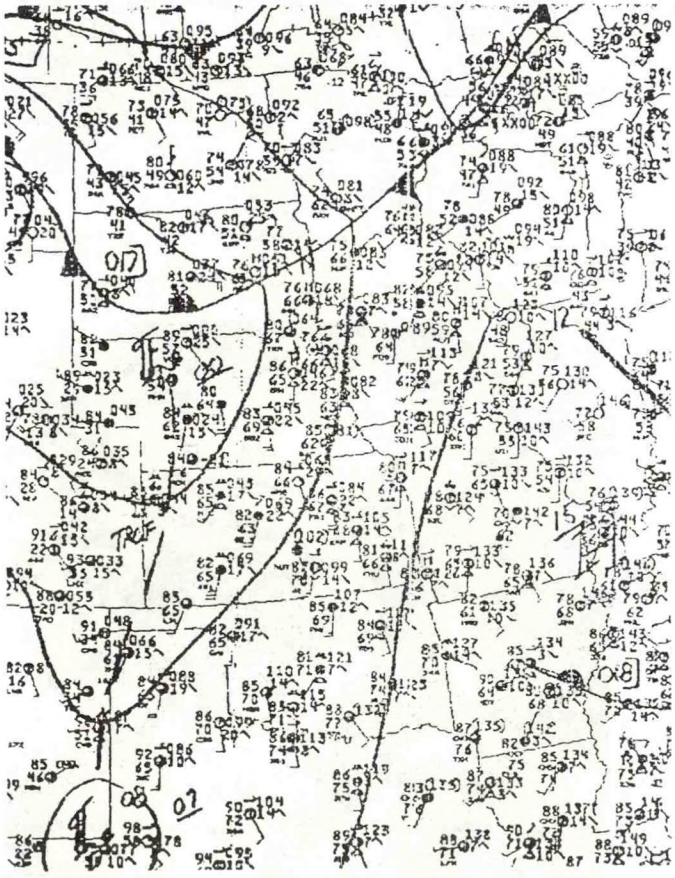
23MAY89-24MAY89 1238-0600 CST 99 REPORTS 1 TORNADO

NO	TIME	EVENT	ST	LOCATION	REMARKS
1	1530	1.75 INCH HAIL	WI	BUFFALO CITY	$1 MILLION DAMAGE
2	1705	2.75 INCH HAIL	MN	NORTHFIELD	
3	1725	2.75 INCH HAIL	MN	RANDOLPH	
4	0240	95 MPH WIND GUST	IA	DUNKERTON	

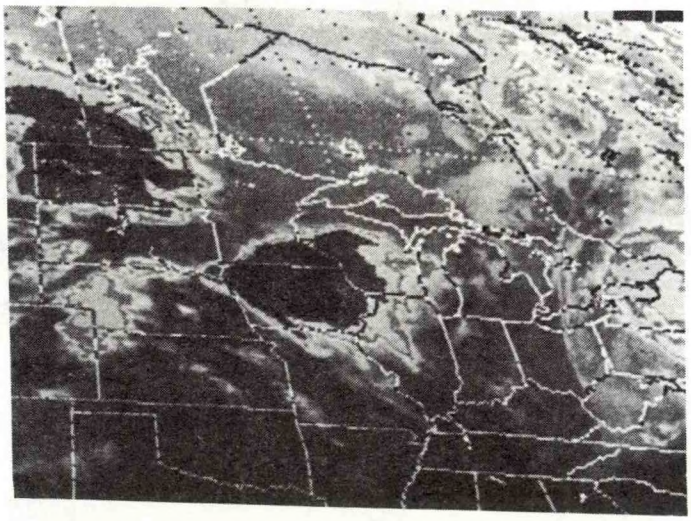




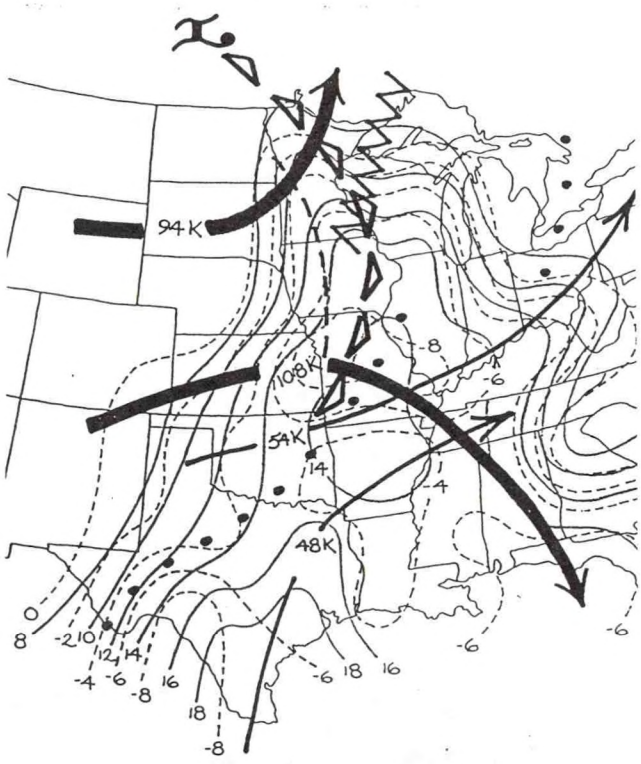
500 MB 6PM CST May 23, 1989



Surface 12 Noon CST May 23, 1989



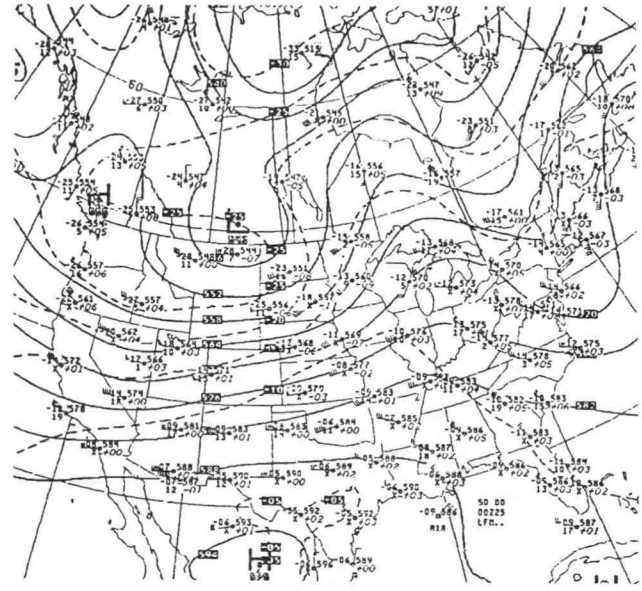
GOES 10:01 PM CST May 23, 1989



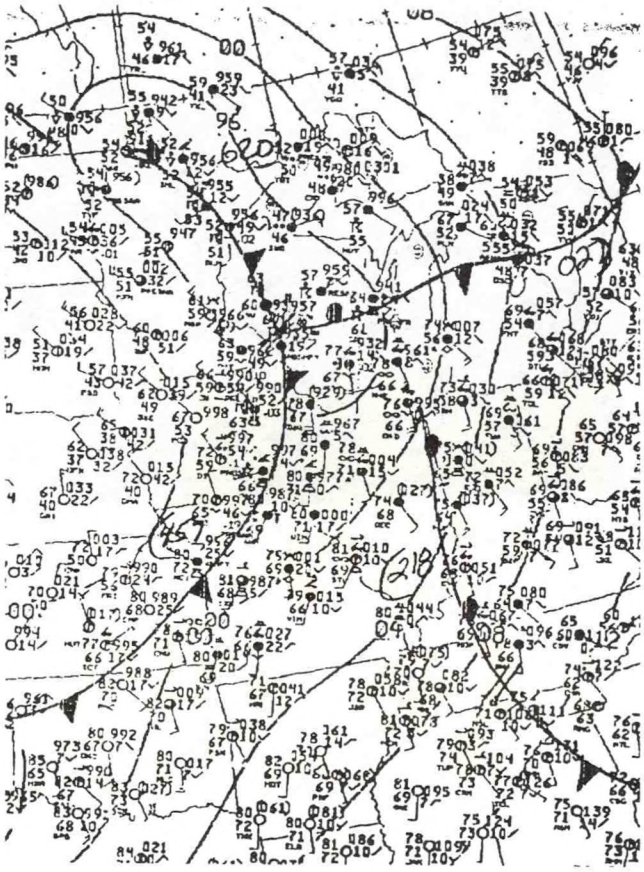
Composite 6PM CST May 24, 1989

24MAY89-25MAY89 0600-0600 CST 188 REPORTS 30 TORNADOES

NO	TIME	EVENT	ST	LOCATION	REMARKS
1	1413	91 MPH WIND GUST	MN	PINE CITY	
2	1711	TORNADO (F-3)	IA	CORNING	$5 MILLION DAMAGE
3	1720	TORNADO (F-4)	IA	TRAER	$5 MILLION DAMAGE
4	2130	88 MPH WIND GUST	WI	STEPHENSVILLE	1 DEATH, 5 INJURIES
5	0050	WIND DAMAGE	IL	SPRINGFIELD	6 INJURIES

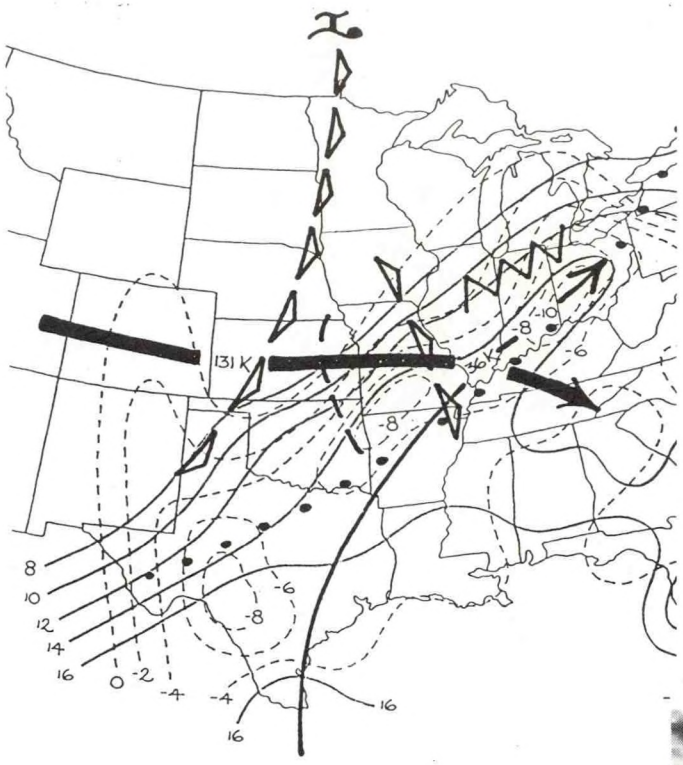


500 MB 6PM CST May 24, 1989



Surface 9PM CST May 24, 1989

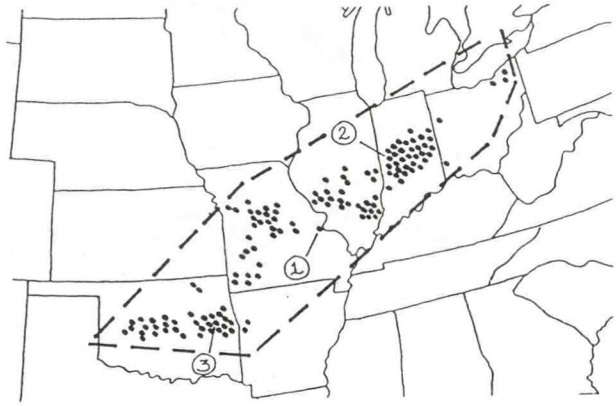
GOES 10:01 PM CST May 24, 1989

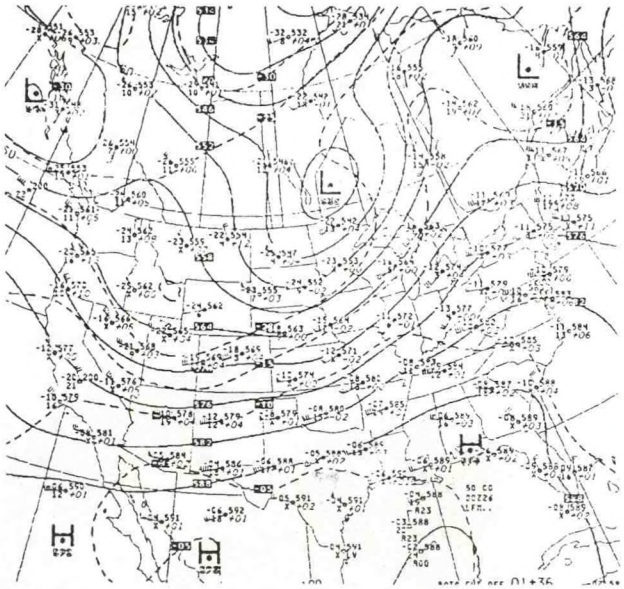


Composite 6PM CST May 25, 1989

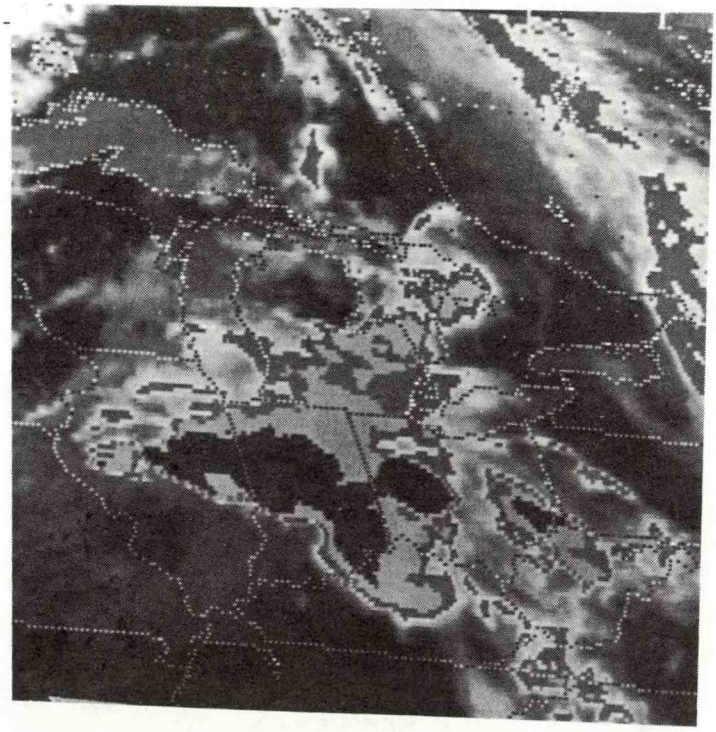
25MAY89-26MAY89 0600-0703 CST 164 REPORTS 9 TORNADOES

NO	TIME	EVENT	ST	LOCATION	REMARKS
1	0955	3.50 INCH HAIL	MO	DITTMER	
2	1730	90 MPH WIND GUST	IN	ROCKVILLE	$20 MILLION DAMAGE, 1 INJURY
3	0415	90 MPH WIND GUST	OK	MUSKOGEE COUNTY	

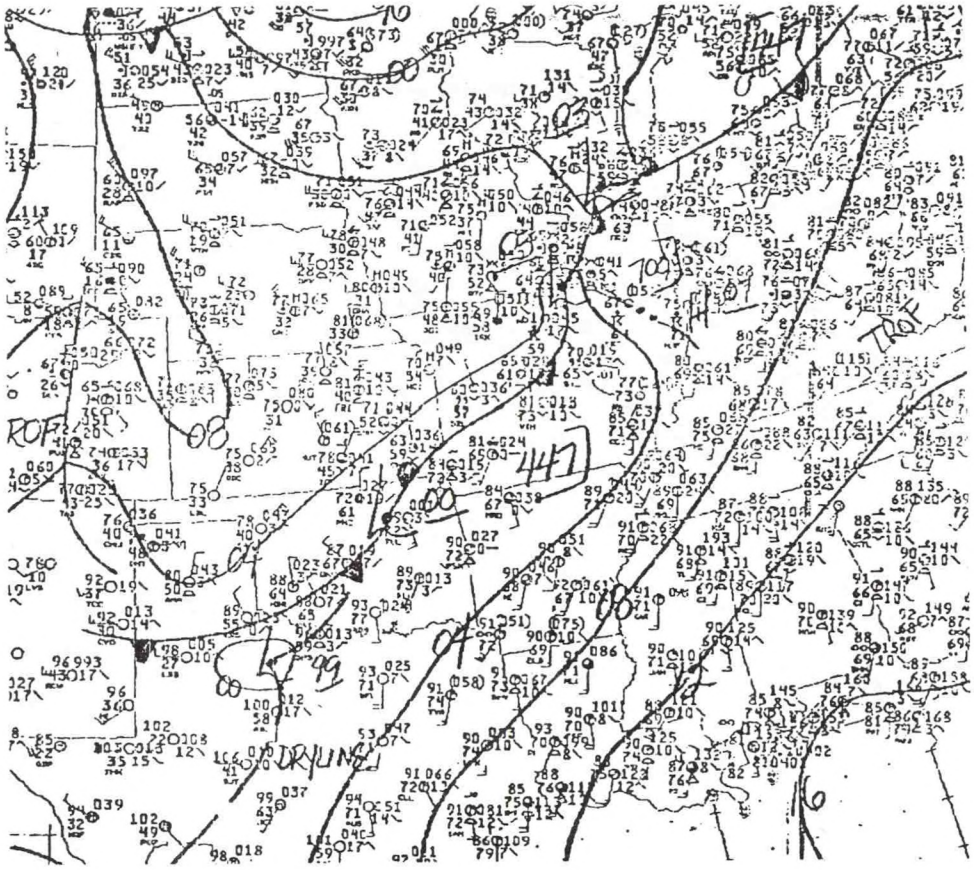




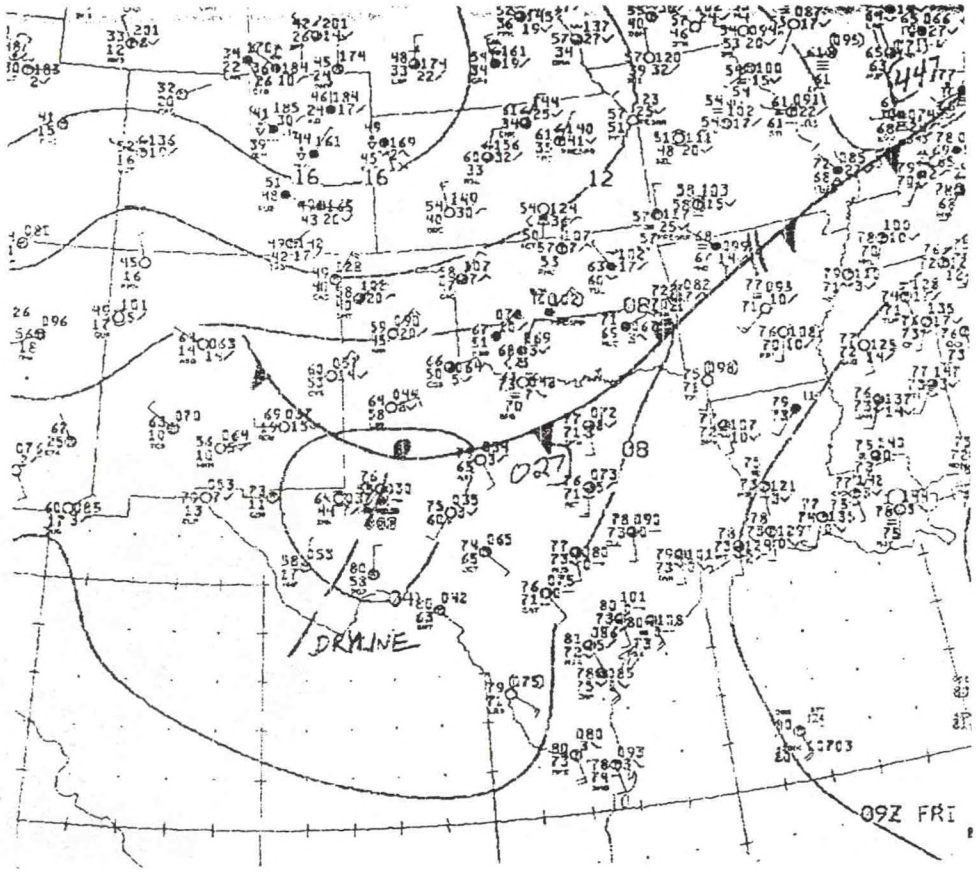
500 MB 6PM CST May 25, 1989



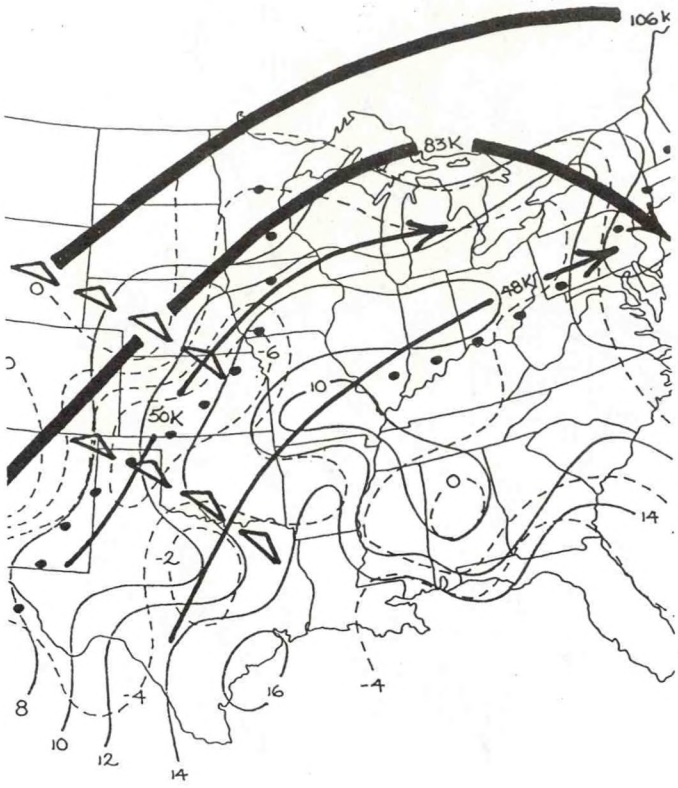
GOES 5:01 PM CST May 25, 1989



Surface 3PM CST May 25, 1989



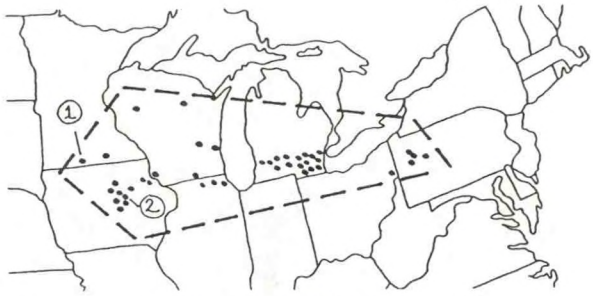
Surface 3AM CST May 26, 1989

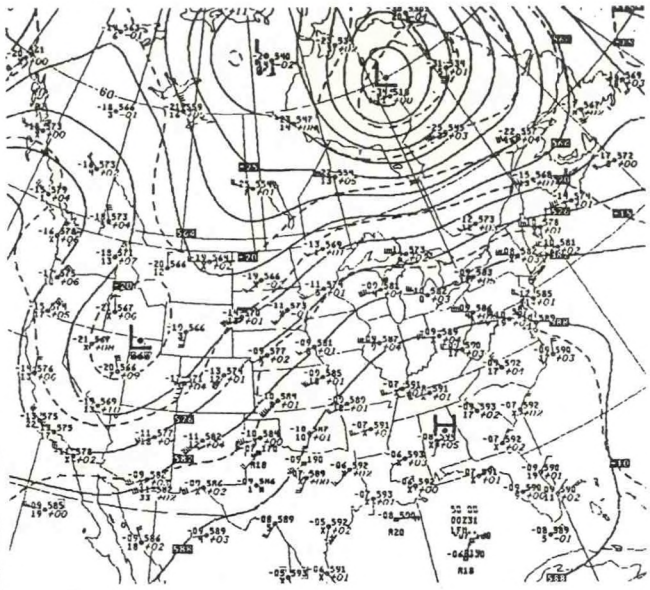


Composite 6AM CST May 30, 1989

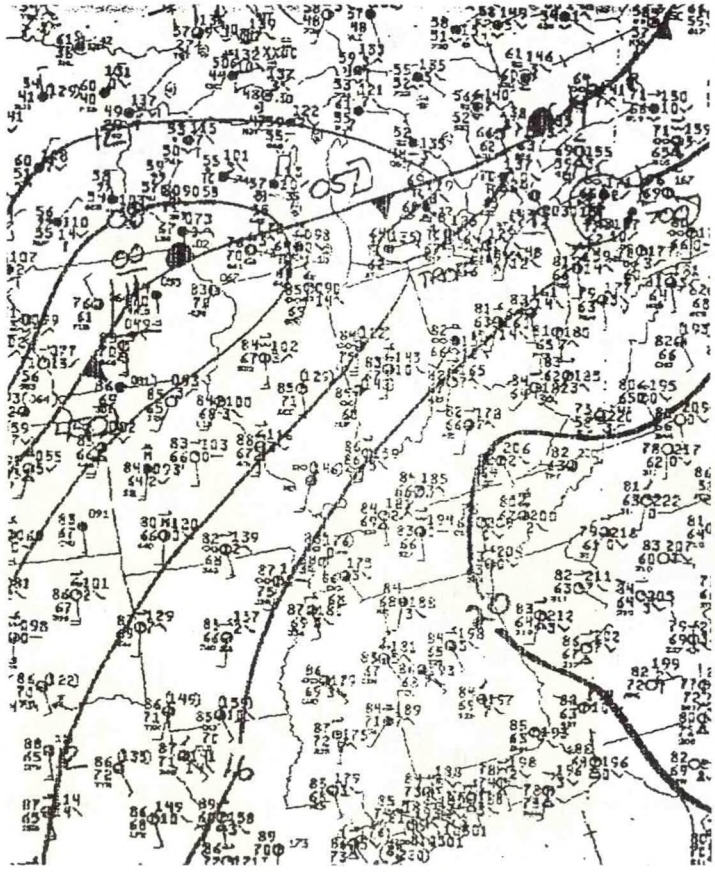
30MAY89 0534-1845 CST 41 REPORTS 6 TORNADOES

NO	TIME	EVENT	ST	LOCATION	REMARKS
1	0625	2.75 INCH HAIL	MN	BLUE EARTH	
2	1850	TORNADO (F-4)	IA	NEW PROVIDENCE	3 INJURIES, $1 MILLION DAMAGE

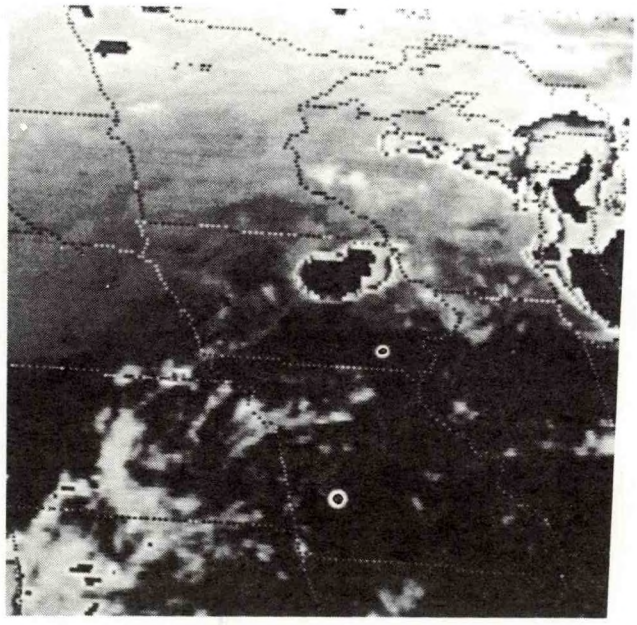




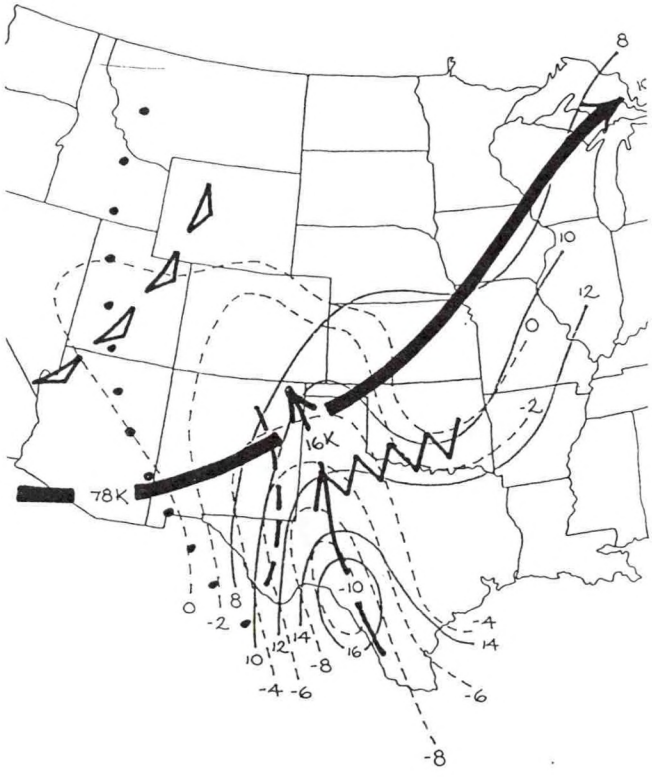
500 MB 6PM CST May 30, 1989



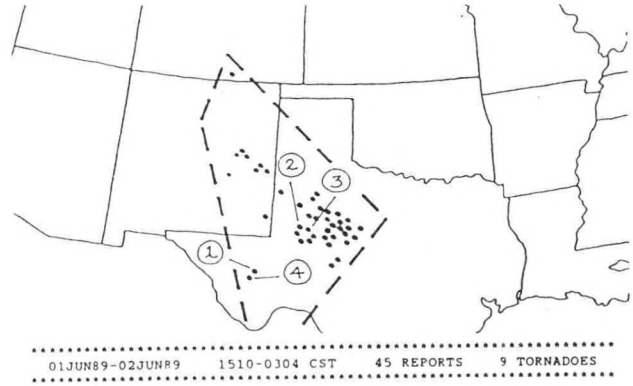
Surface 6PM CST May 30, 1989



GOES 6:31 PM CST May 30, 1989

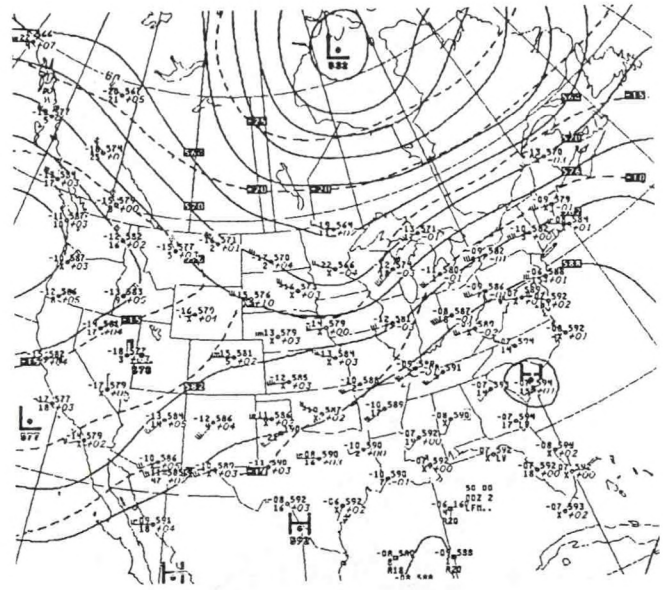


Composite 6PM CST June 1, 1989

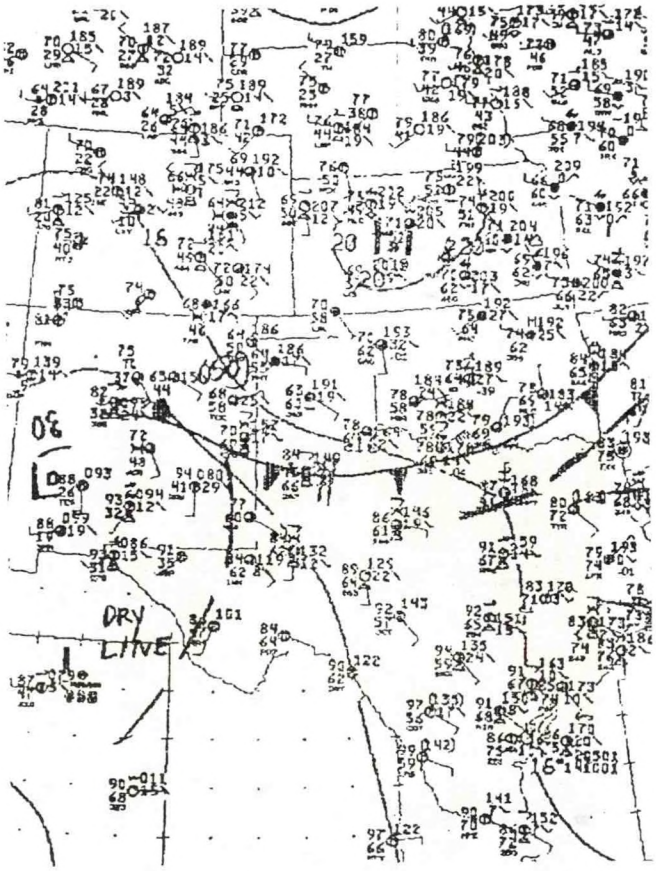


01JUN89-02JUN89 1510-0304 CST 45 REPORTS 9 TORNADOES

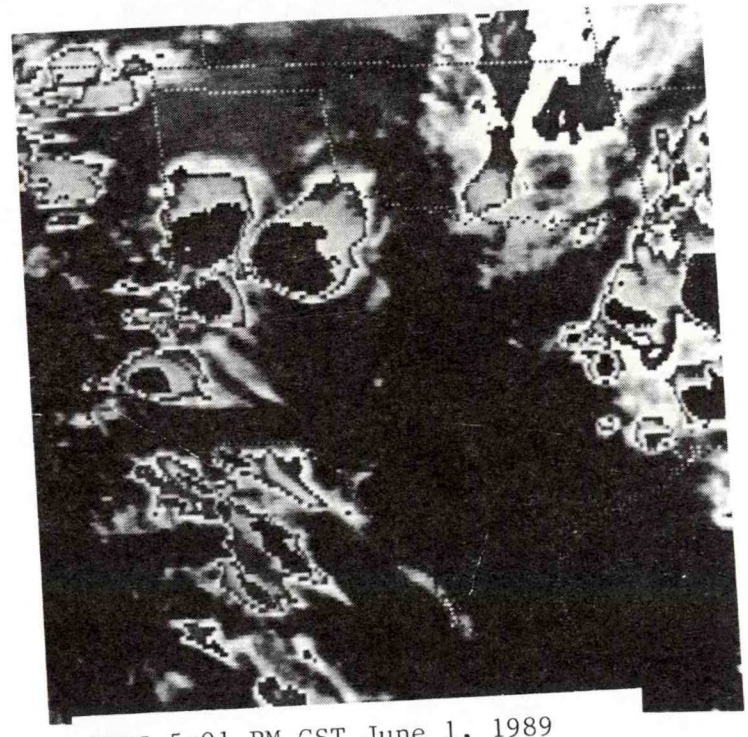
NO	TIME	EVENT	ST	LOCATION
1	1715	2.75 INCH HAIL	TX	BALMORHEA
2	1745	2.75 INCH HAIL	TX	FLUVANNA
3	1750	80 MPH WIND GUST	TX	ALPINE
4	1930	2.75 INCH HAIL	TX	BORDEN COUNTY



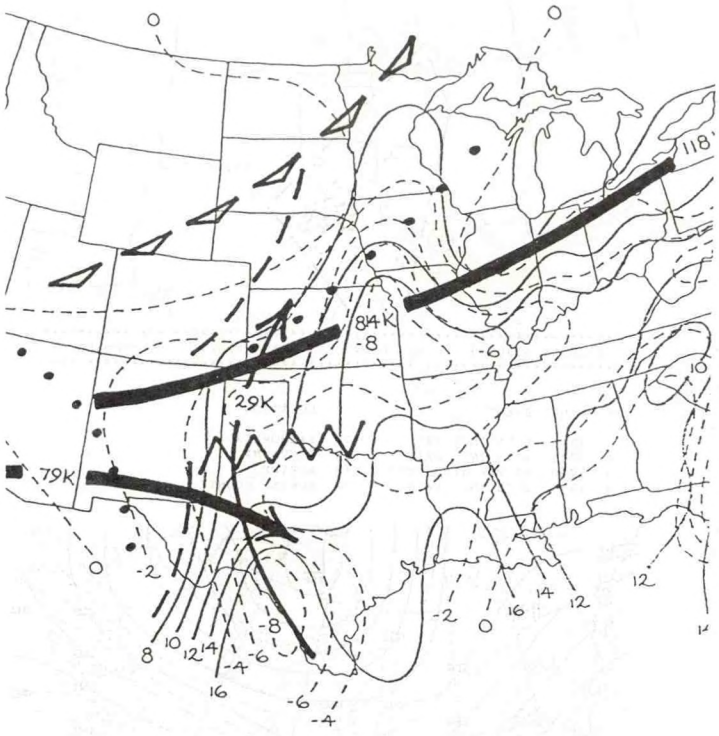
500 MB 6PM CST June 1, 1989



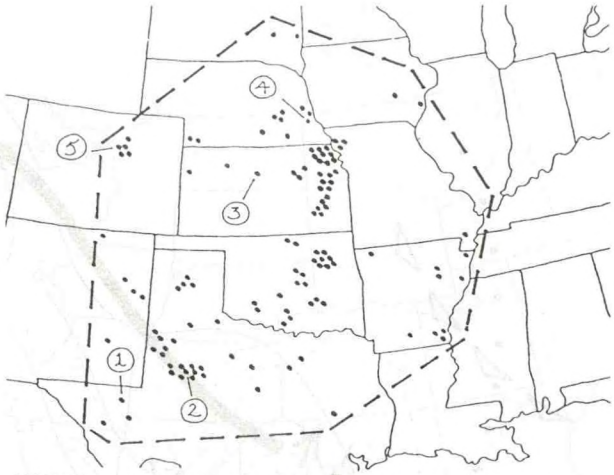
Surface 6PM CST June 1, 1989



GOES 5:01 PM CST June 1, 1989

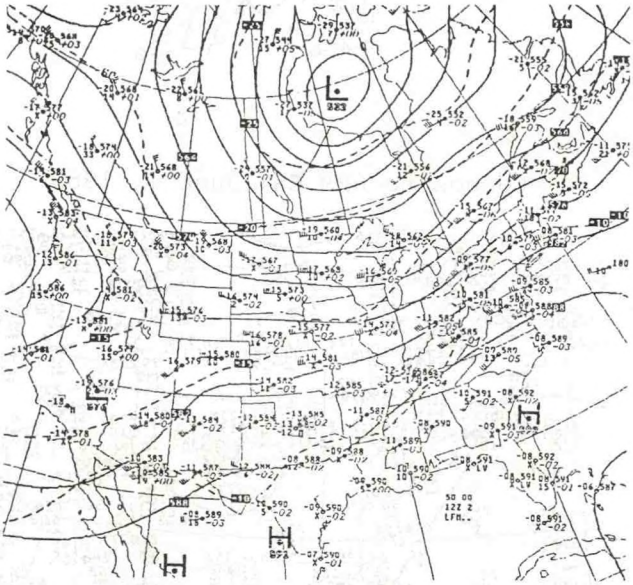


Composite 6PM CST June 2, 1989

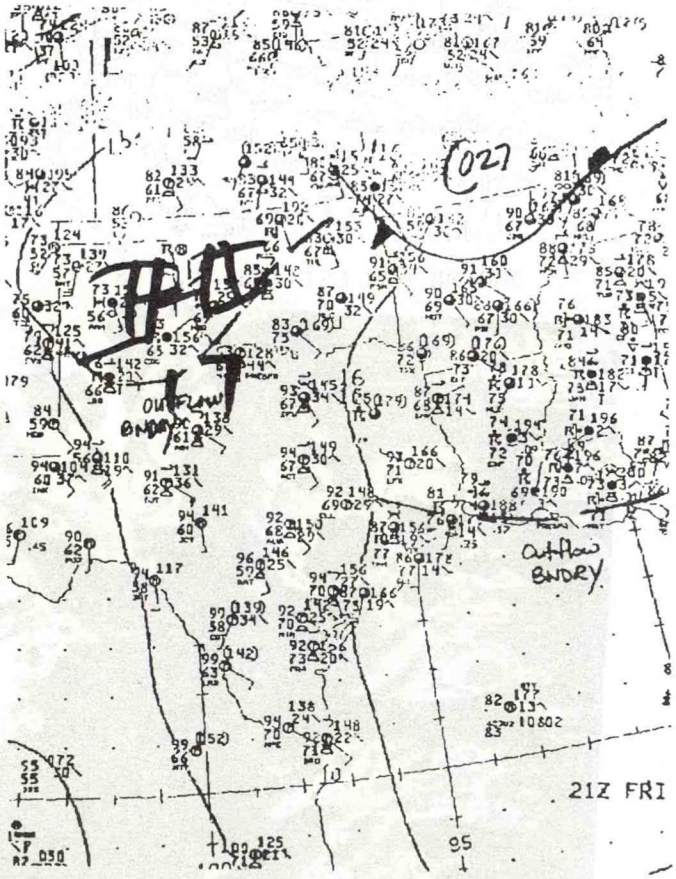


02JUN89-03JUN89 1017-0350 CST 135 REPORTS 12 TORNADOES

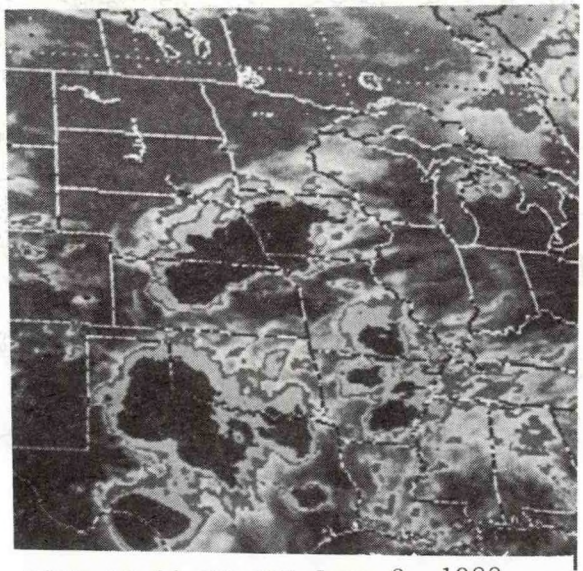
NO	TIME	EVENT	ST	LOCATION	
1	1646	2.75 INCH HAIL	TX	REEVES COUNTY	
2	1815	2.75 INCH HAIL	TX	CUTHBERT	
3	1955	78 MPH WIND GUST	KS	RUSSELL	
4	2036	WIND DAMAGE	NE	BRANCHED OAK LAKE	6 INJURIES
5	2250	2.75 INCH HAIL	CO	DENVER	



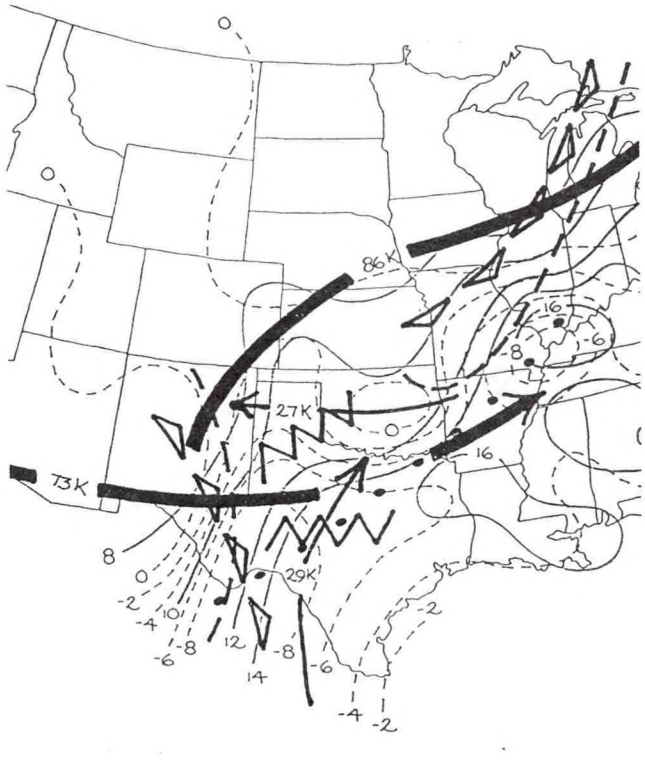
500 MB 6AM CST June 2, 1989



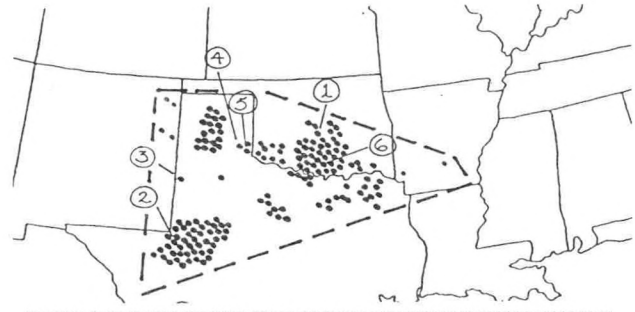
Surface 3PM CST June 2, 1989



GOES 10:01 PM CST June 2, 1989

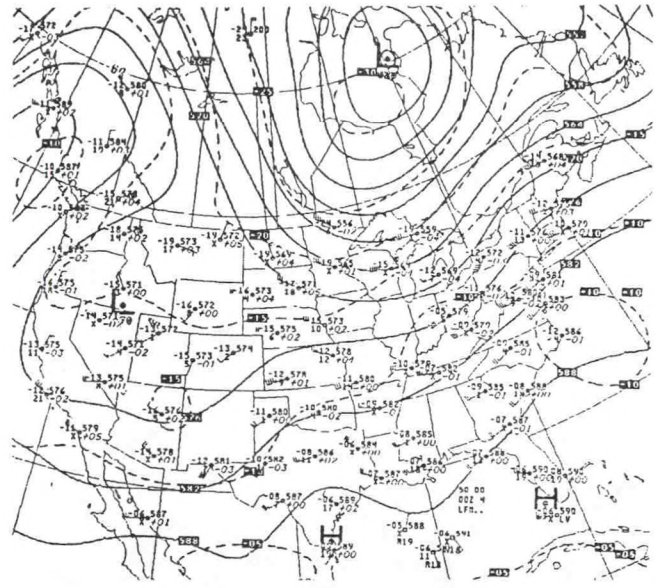


Composite 6PM CST June 3, 1989

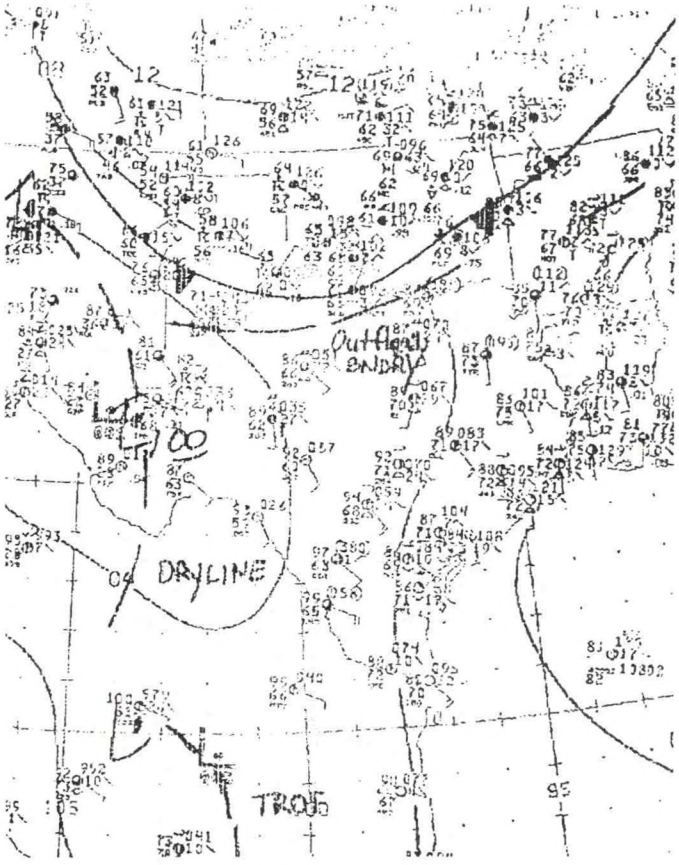


03JUN89-04JUN89 0640-0520 CST 180 REPORTS 11 TORNADOES

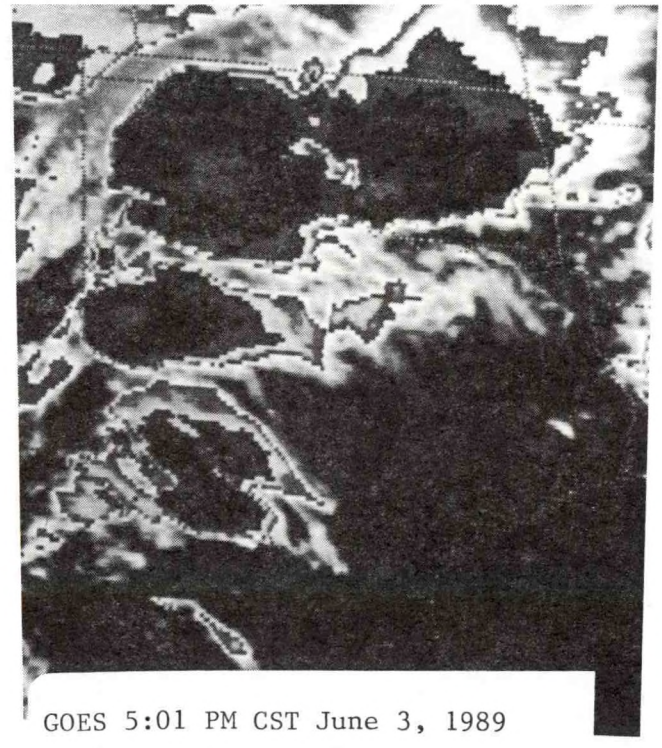
NO	TIME	EVENT	ST	LOCATION	
1	1510	80 MPH WIND GUST	OK	NEWCASTLE	
2	1630	4.50 INCH HAIL	TX	MONAHANS	$6 MILLION DAMAGE
3	1930	TORNADO (F-2)	TX	MULESHOE	
4	2050	4.50 INCH HAIL	TX	CHILDRESS	
5	2145	4.50 INCH HAIL	TX	GROESBECK	
6	0000	80 MPH WIND GUST	OK	WILSON	



500 MB 6PM CST June 3, 1989

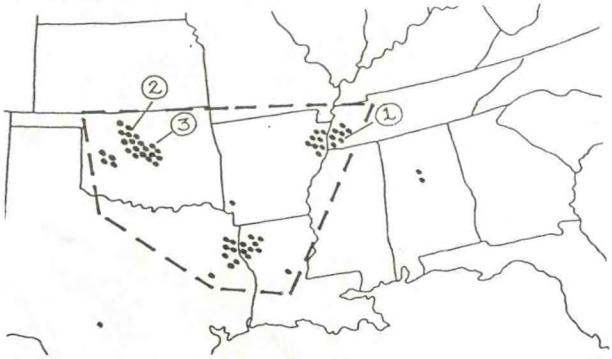


Surface 6PM CST June 3, 1989



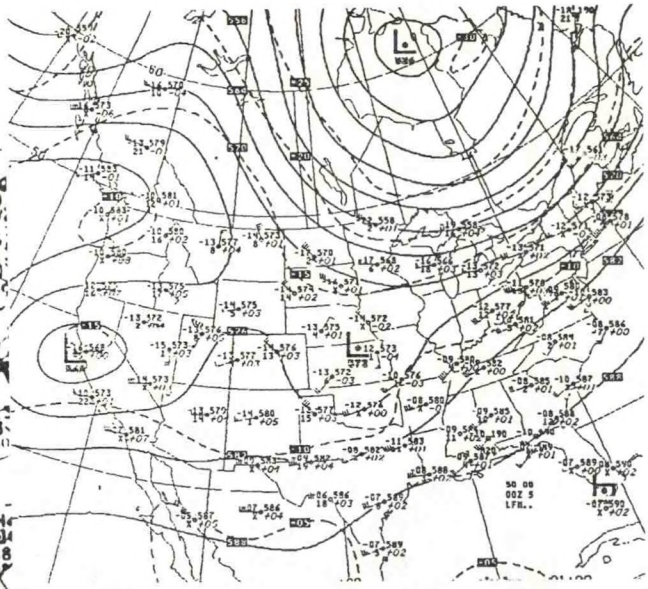
GOES 5:01 PM CST June 3, 1989

Composite 6PM CST June 4, 1989

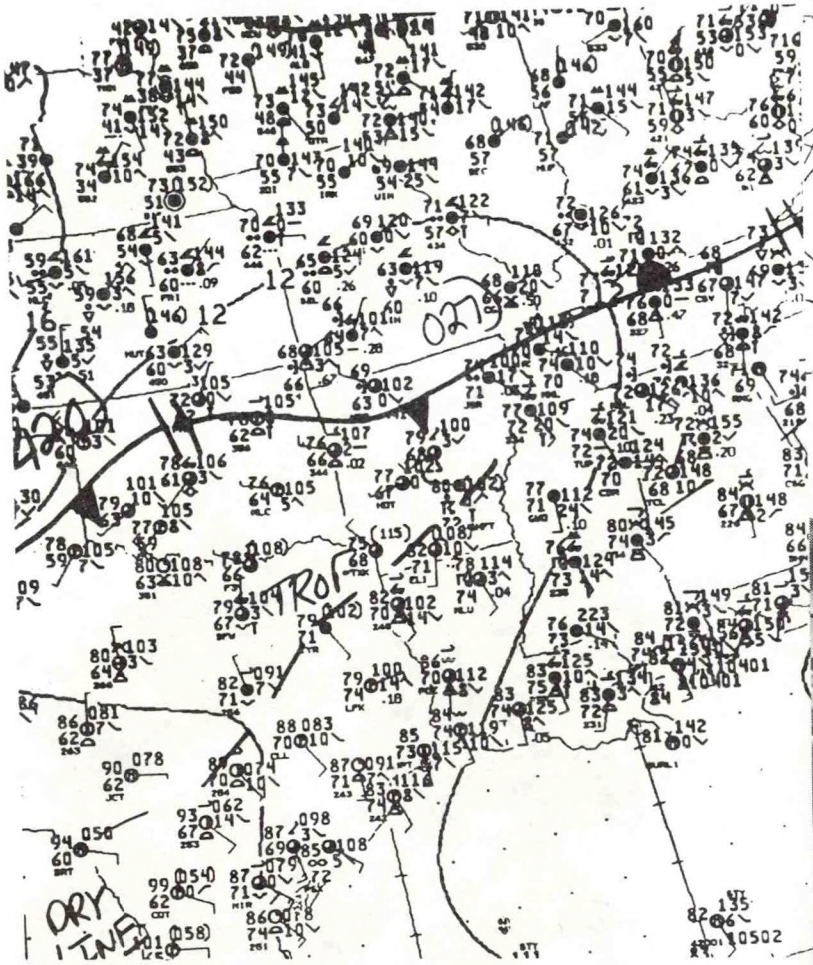


04JUN89-05JUN89 1545-0000 CST 63 REPORTS 8 TORNADOES

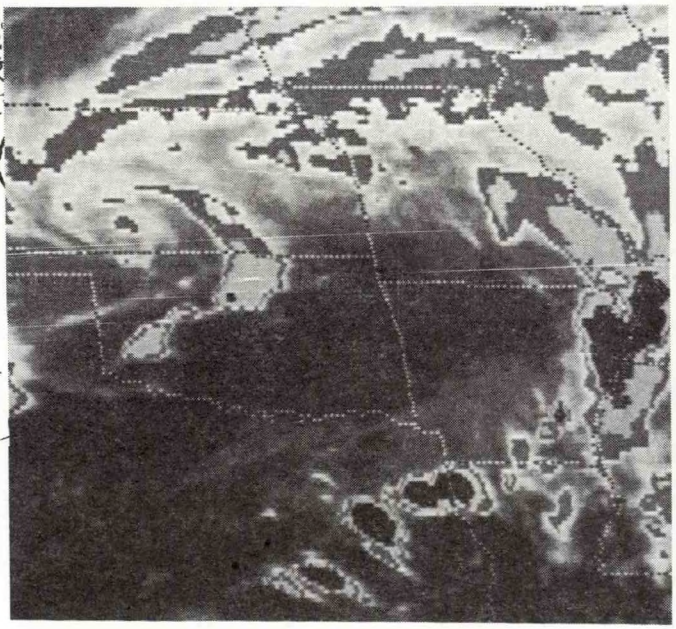
NO	TIME	EVENT	ST	LOCATION
1	1830	TORNADO (F-2)	TN	MILLINGTON
2	1920	3.00 INCH HAIL	OK	ENID
3	2045	70 MPH WIND GUST	OK	COYLE



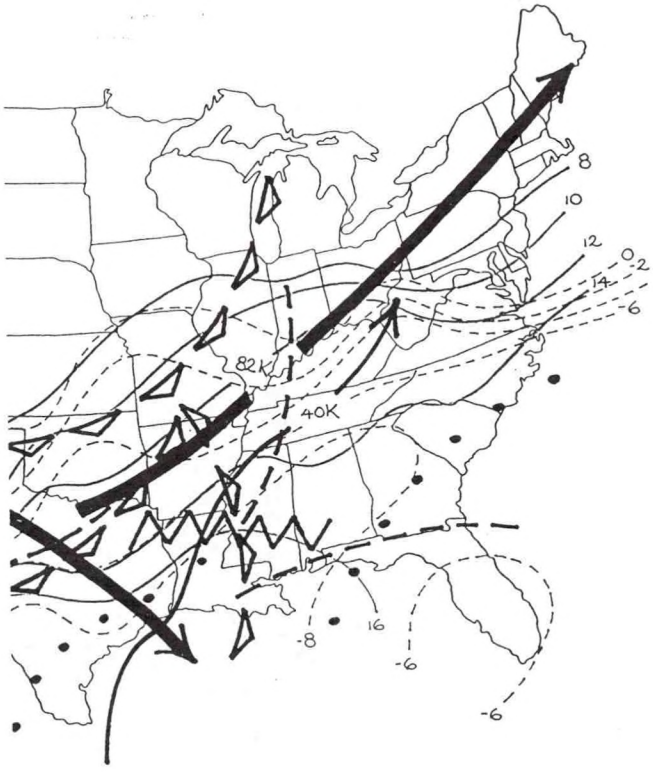
500 MB 6PM CST June 4, 1989



Surface 6PM CST June 4, 1989

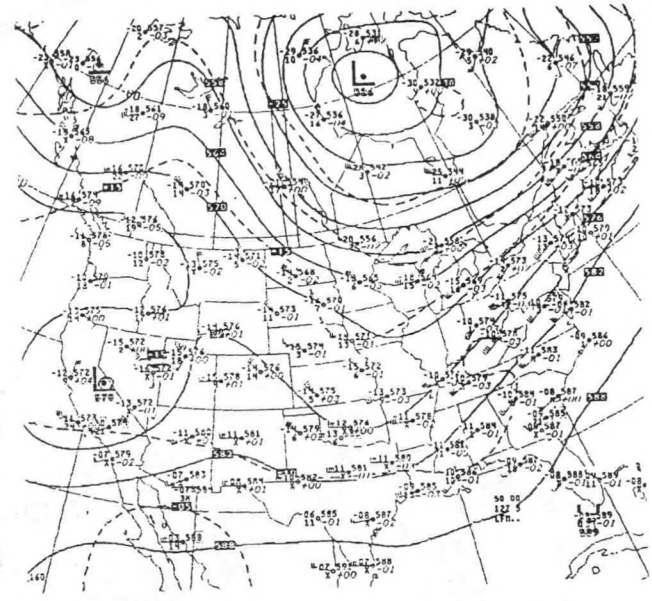


GOES 8:31 PM CST June 4, 1989

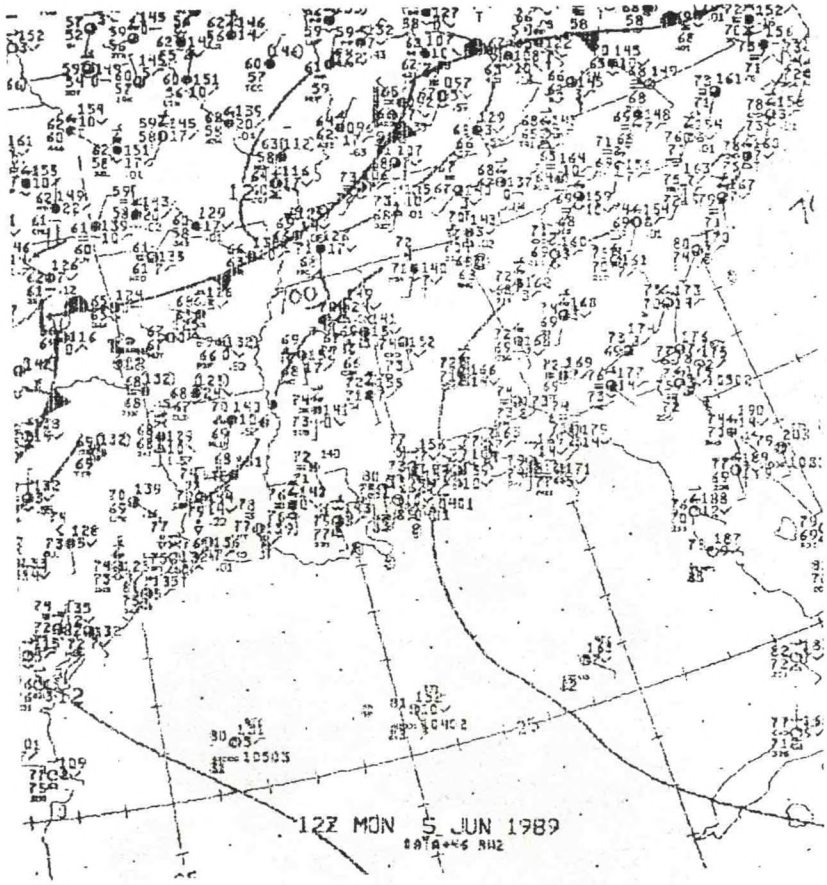


Composite 6AM CST June 5, 1989

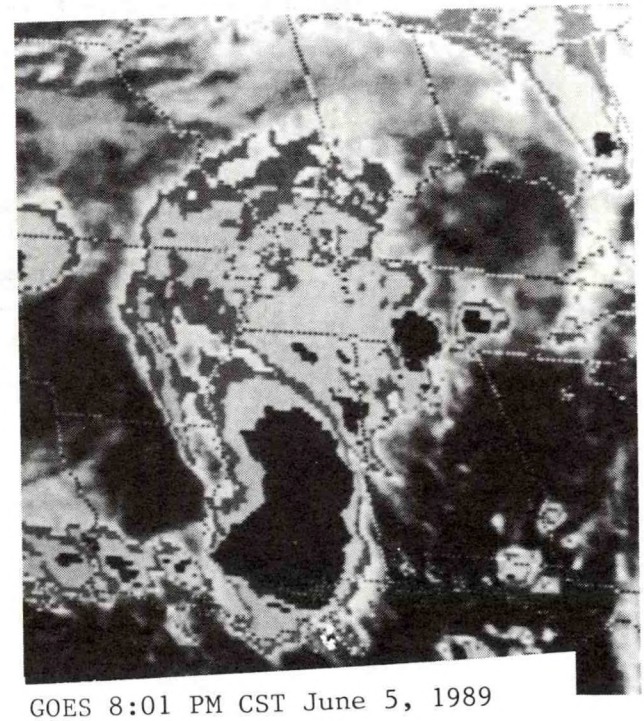
05JUN89-06JUN89 0815-0030 CST 91 REPORTS 4 TORNADOES



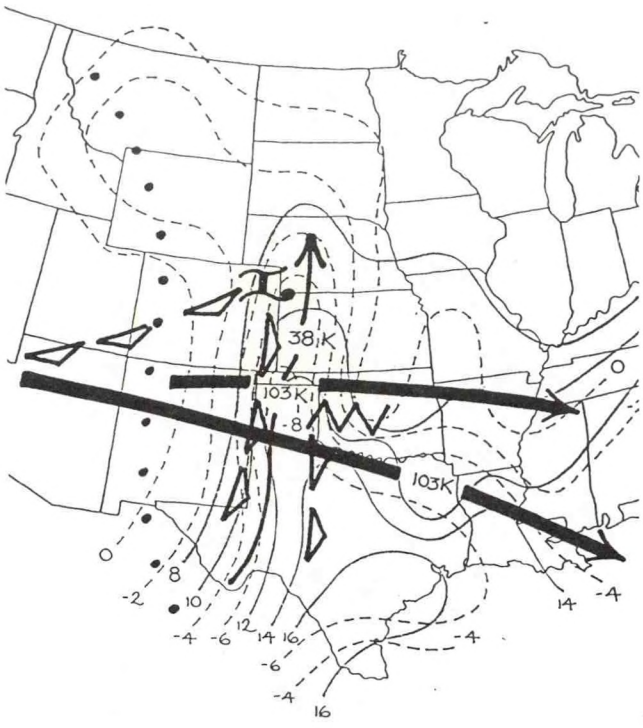
500 MB 6AM CST June 5, 1989



Surface 6AM CST June 5, 1989



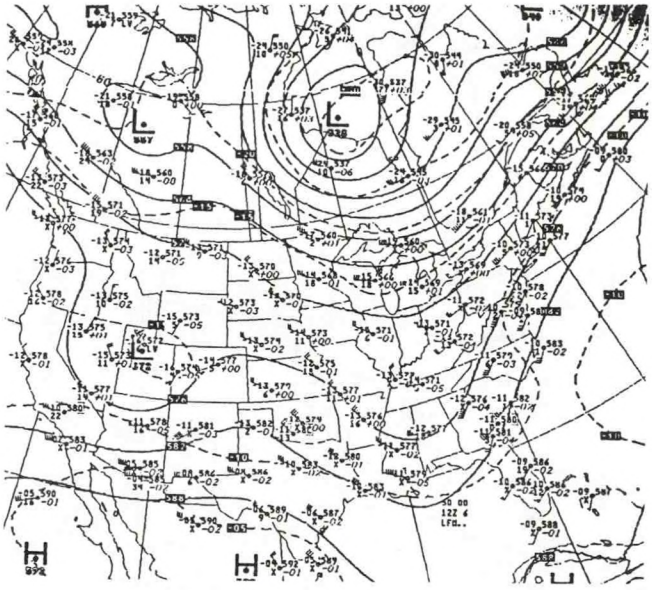
GOES 8:01 PM CST June 5, 1989



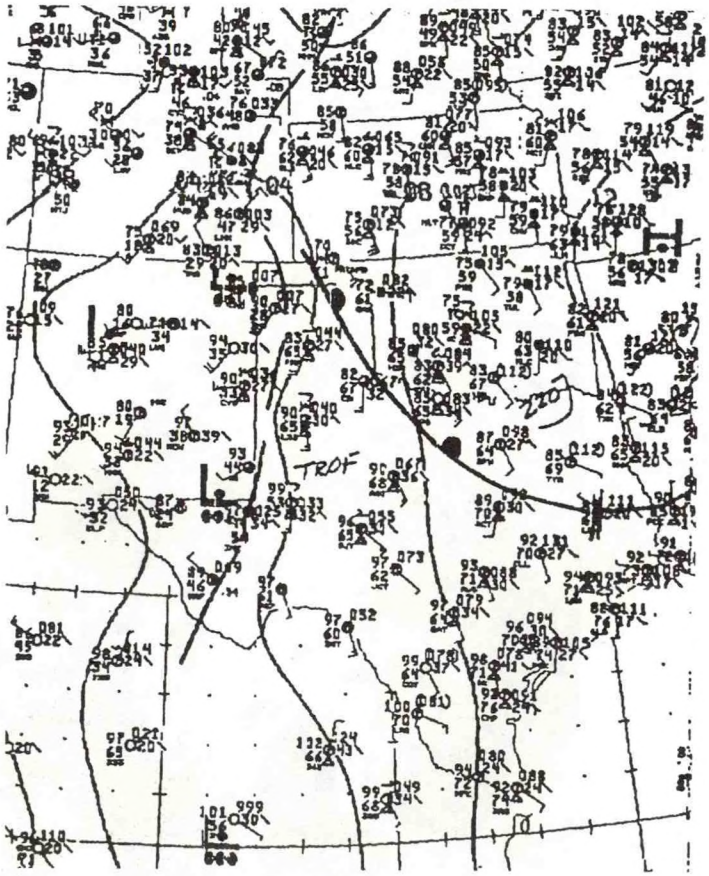
Composite 6PM CST June 6, 1989

06JUN89-07JUN89 1120-0555 CST 167 REPORTS 13 TORNADOES

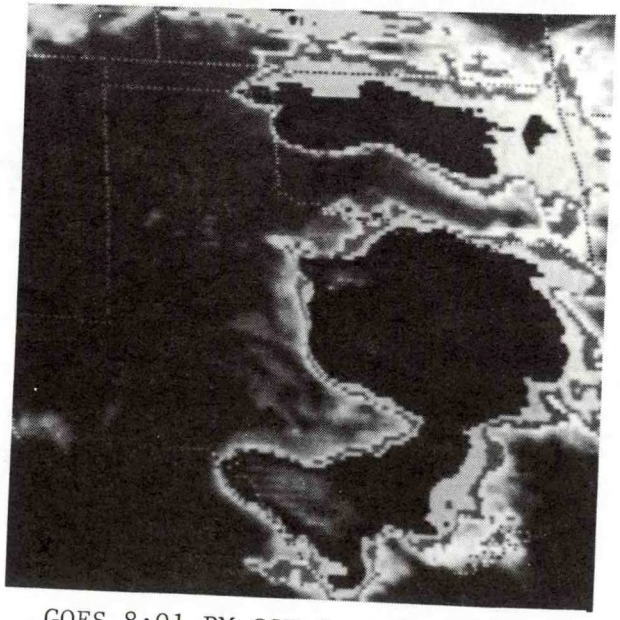
NO	TIME	EVENT	ST	LOCATION	
1	1558	TORNADO (F-3)	KS	LIBERAL	
2	1635	100 MPH WIND GUST	TX	GLASSCOCK CITY	1 DEATH
3	1650	TORNADO (F-3)	TX	LORENZO	6 INJURIES
4	1918	4.50 INCH HAIL	TX	LIPSCOMB	
5	1947	4.50 INCH HAIL	TX	GLEN COVE	



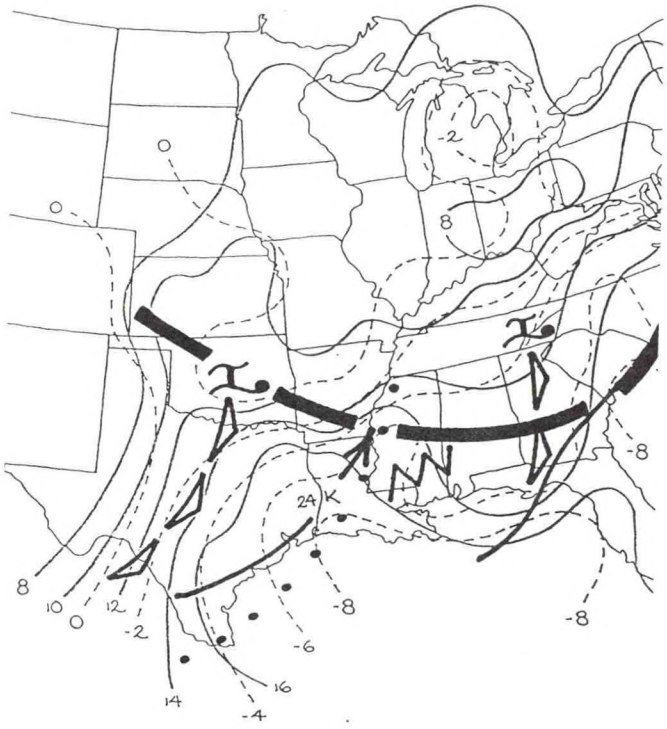
500 MB 6AM CST June 6, 1989



Surface 3PM CST June 6, 1989



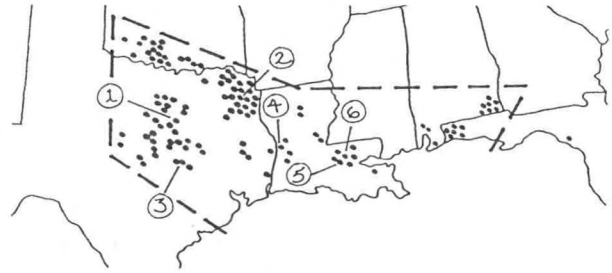
GOES 8:01 PM CST June 6, 1989

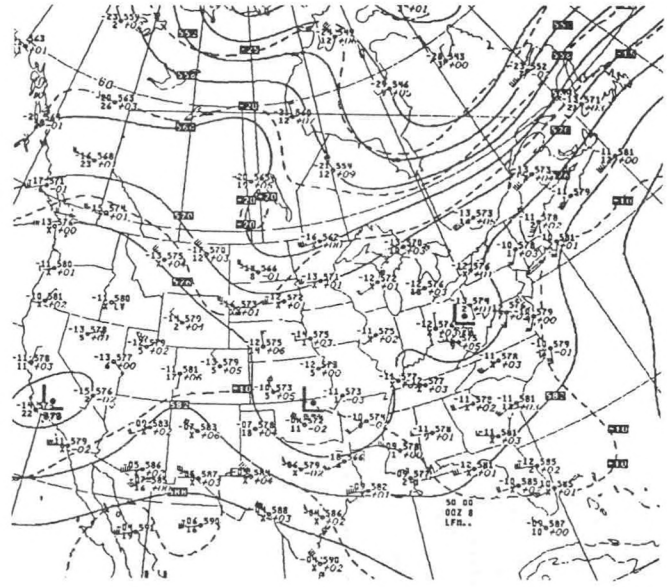


Composite 6PM CST June 7, 1989

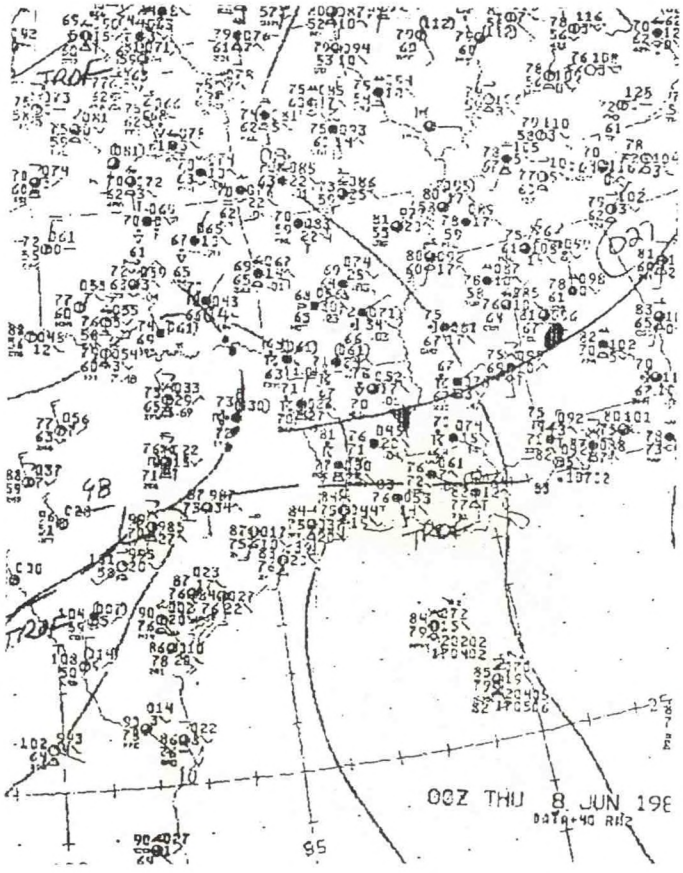
07JUN89-08JUN89 0614-0530 CST 141 REPORTS 22 TORNADOES

NO	TIME	EVENT	ST	LOCATION	
1	1628	4.50 INCH HAIL	TX	HILLSBORO	
2	1655	TORNADO (F-3)	TX	GARY	4 INJURIES
3	1840	TORNADO (F-2)	TX	MILANO	4 INJURIES
4	2135	TORNADO (F-2)	LA	LONGVILLE	6 INJURIES
5	0504	TORNADO (F-2)	LA	GROSS TETE	$1.3 MILLION DAMAGE 2 DEATHS, 30 INJURIES
6	0530	TORNADO (F-2)	LA	LOBDELL	60 INJURIES

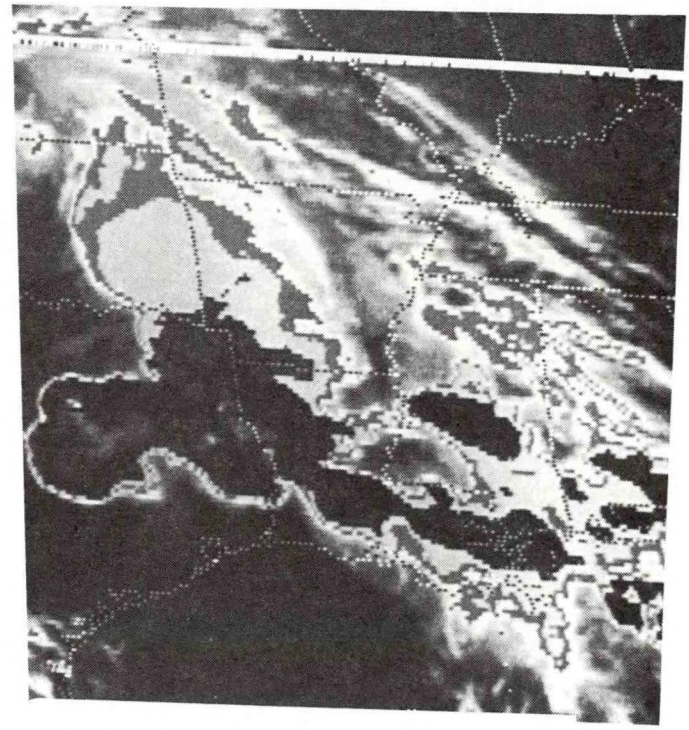




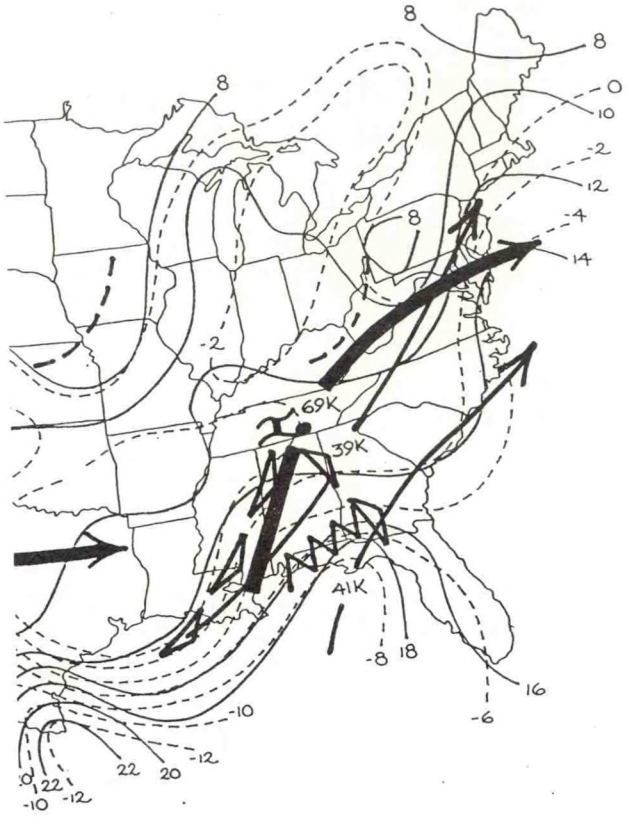
500 MB 6PM CST June 7, 1989



Surface 9PM CST June 7, 1989



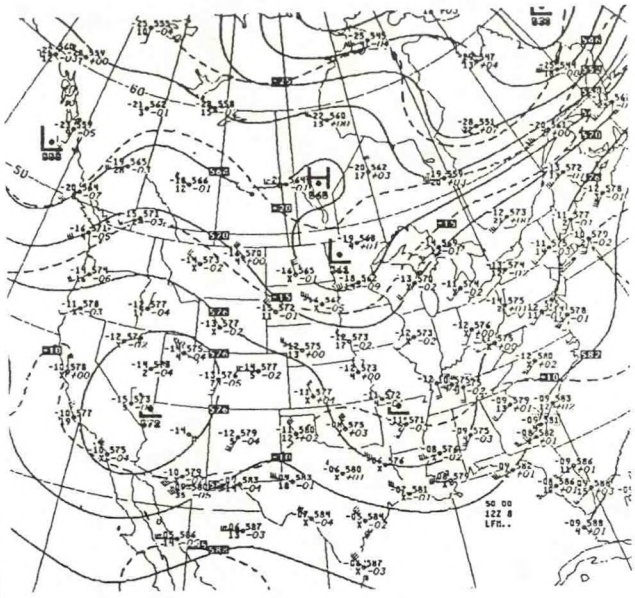
GOES 5:01 PM CST June 7, 1989



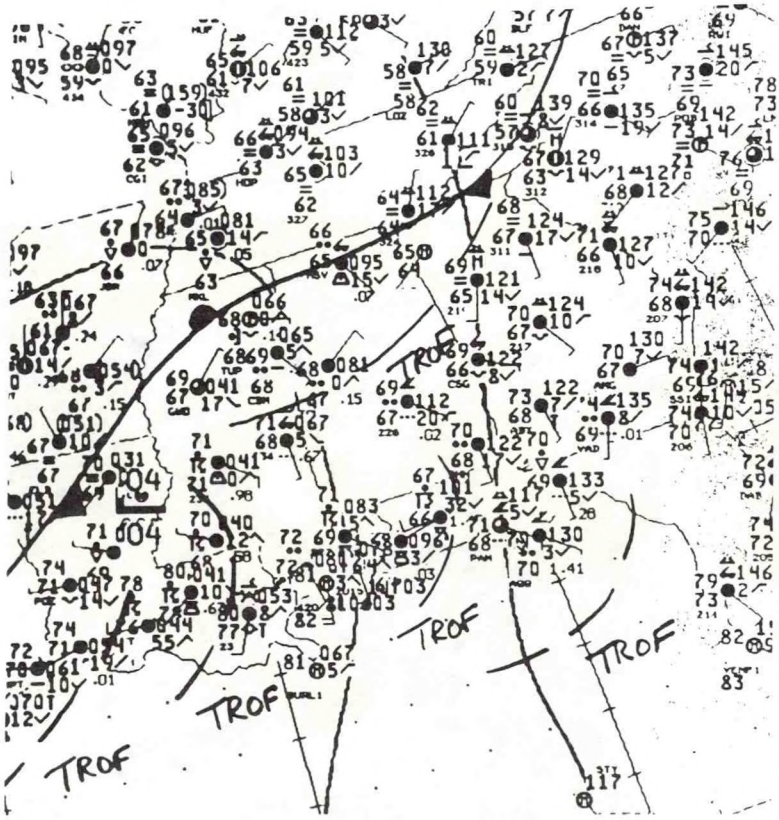
Composite 6PM CST June 8, 1989

08JUN89 0600-2015 CST 46 REPORTS 17 TORNADOES

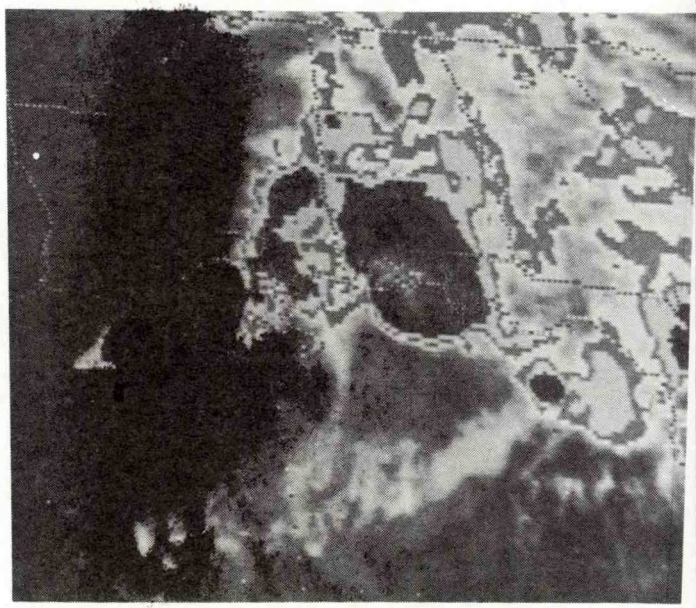
NO	TIME	EVENT	ST	LOCATION	
1	0600	TORNADO (F-2)	LA	WILSON	
2	0851	TORNADO (F-1)	AL	ORANGE BEACH	10 INJURIES, $1 MILLION DAMAGE
3	1300	90 MPH WIND GUST	AL	MOBILE	3 DEATHS, 4 INJURIES
4	1600	TORNADO (F-2)	FL	EAST POINT	



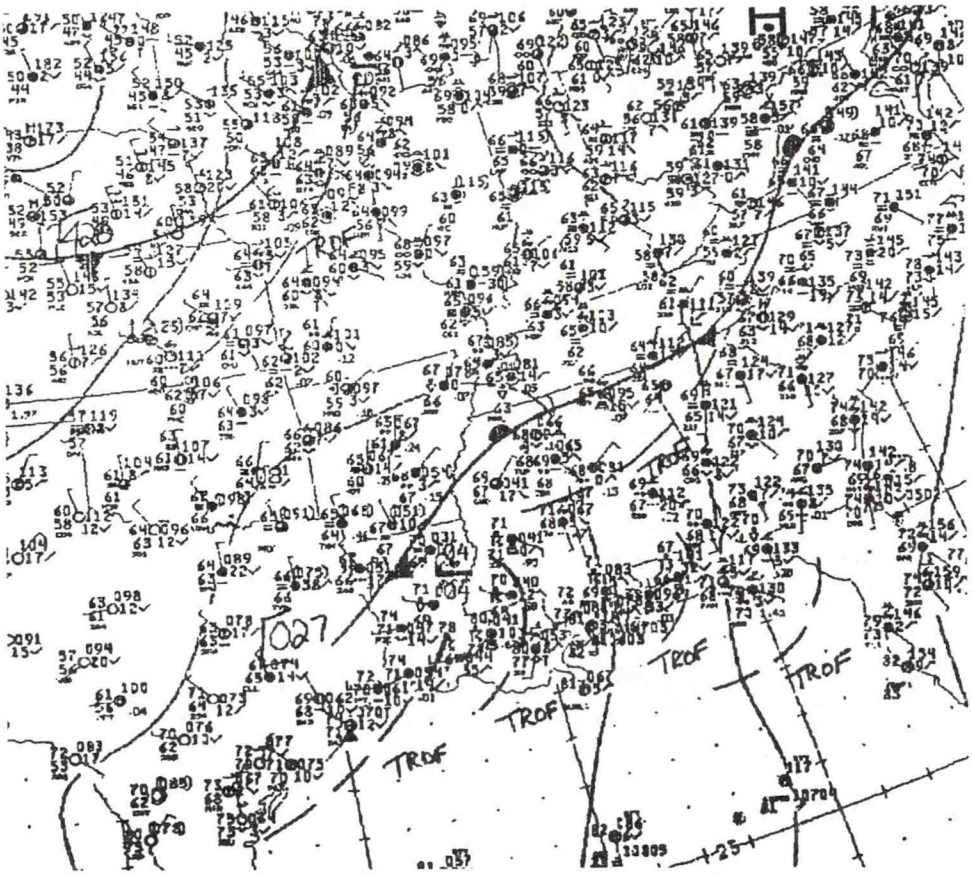
500 MB 6AM CST June 8, 1989



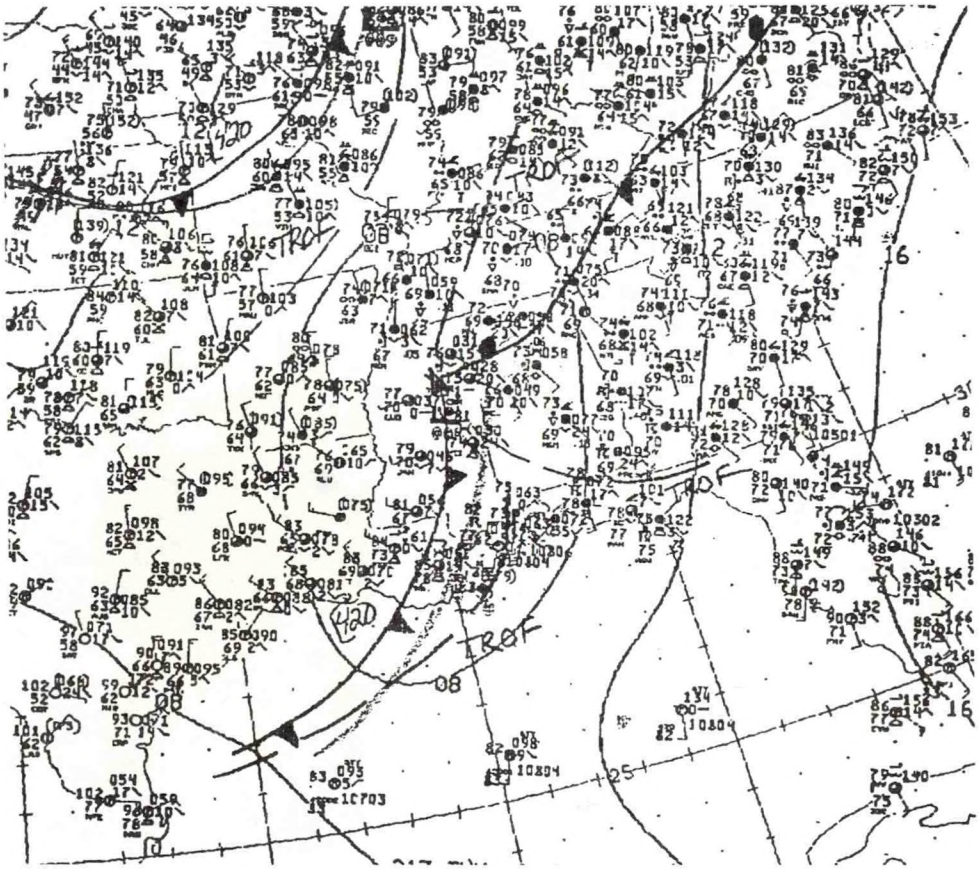
Surface 6AM CST June 8, 1989



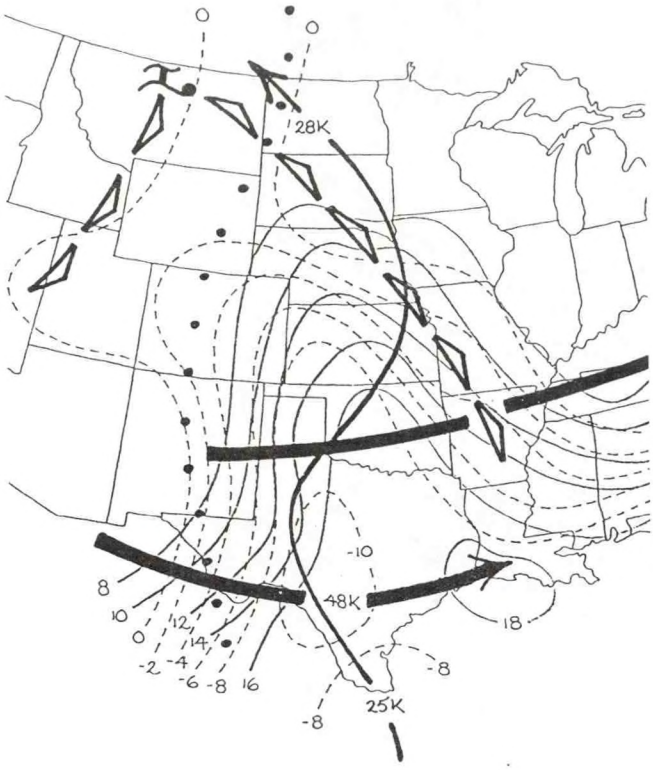
GOES 9:01 AM CST June 8, 1989



Surface 6AM CST June 8, 1989



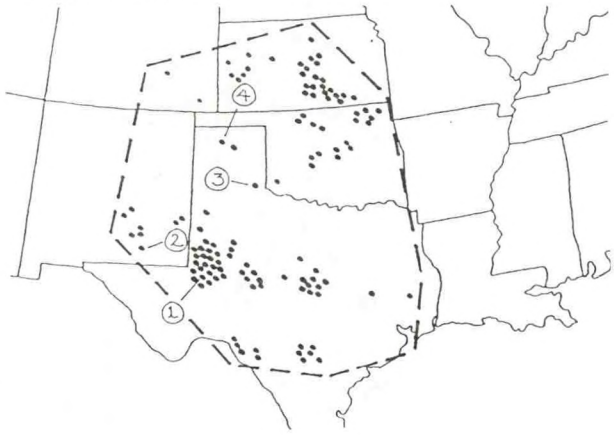
Surface 3PM CST June 8, 1989

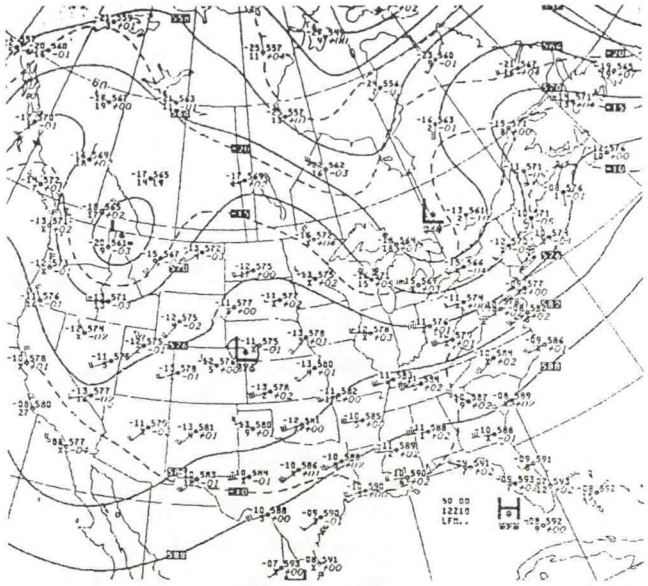


Composite 6PM CST June 10, 1989

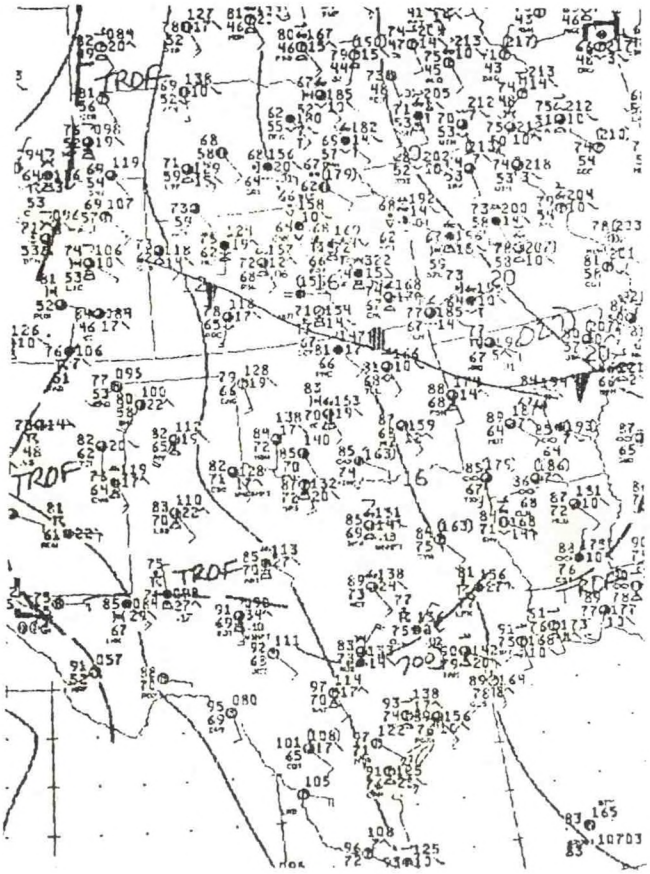
10JUN89-11JUN89 1004-0130 CST 156 REPORTS 14 TORNADOES

NO	TIME	EVENT	ST	LOCATION	
1	1627	80 MPH WIND GUST	TX	ODESSA	
2	1740	3.00 INCH HAIL	NM	CARLSBAD	$3 MILLION DAMAGE
3	1908	4.00 INCH HAIL	TX	ESTELLINE	
4	2015	4.00 INCH HAIL	TX	STINNETT	

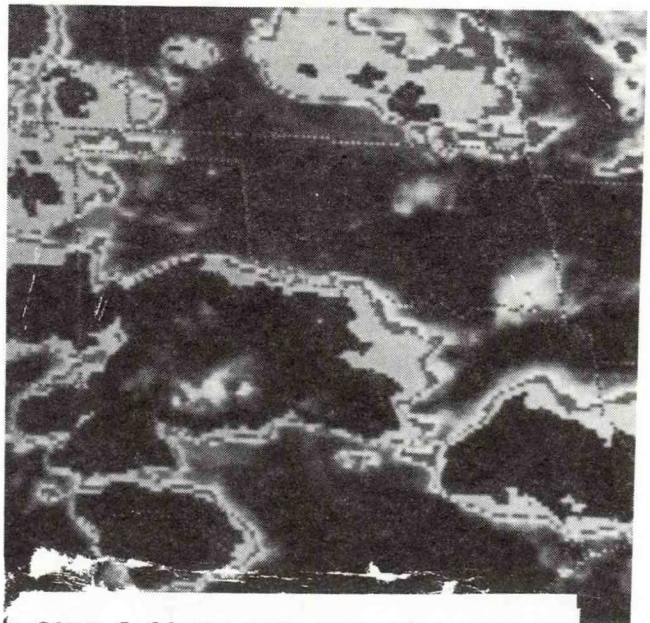




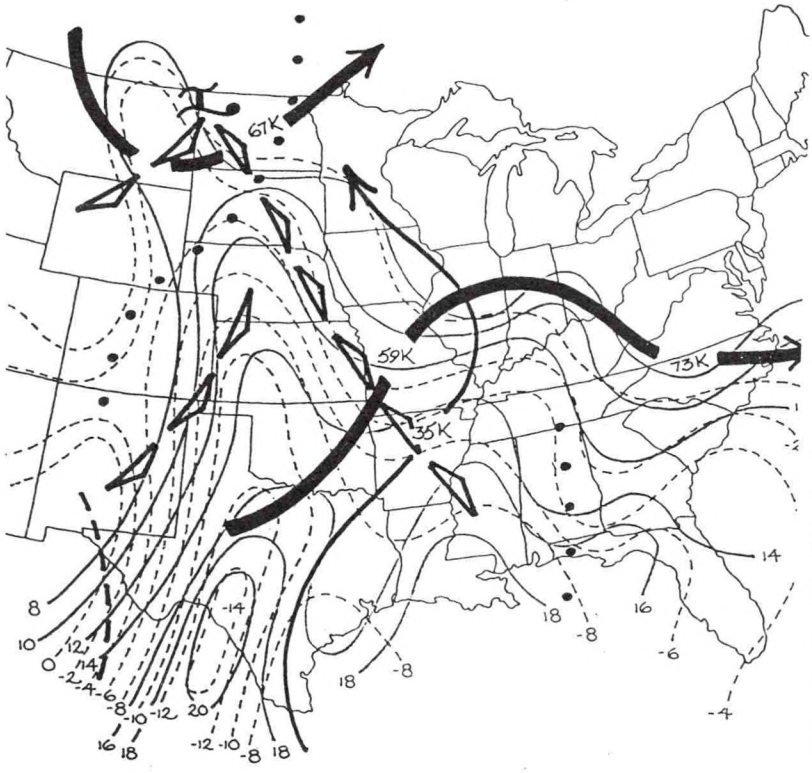
500 MB 6AM CST June 10, 1989



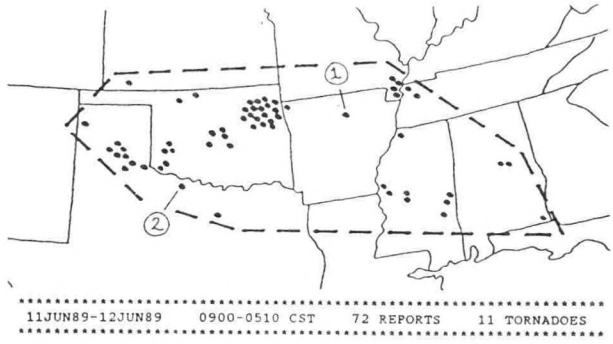
Surface 3PM CST June 10, 1989



GOES 5:01 PM CST June 10, 1989

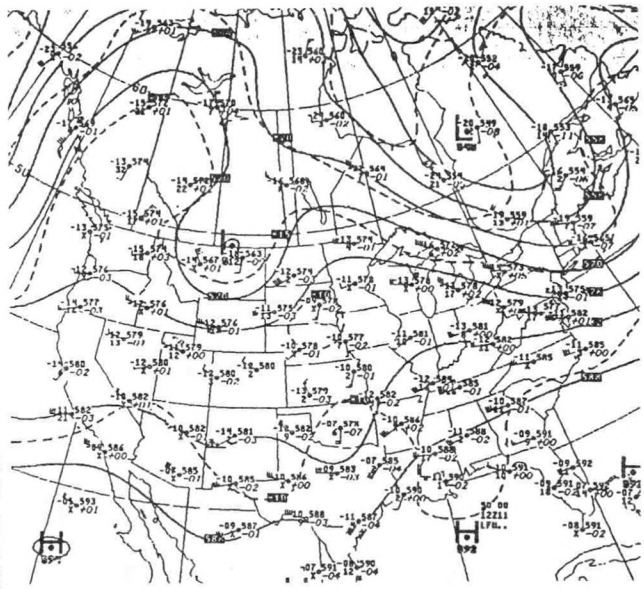


Composite 6PM CST June 11, 1989

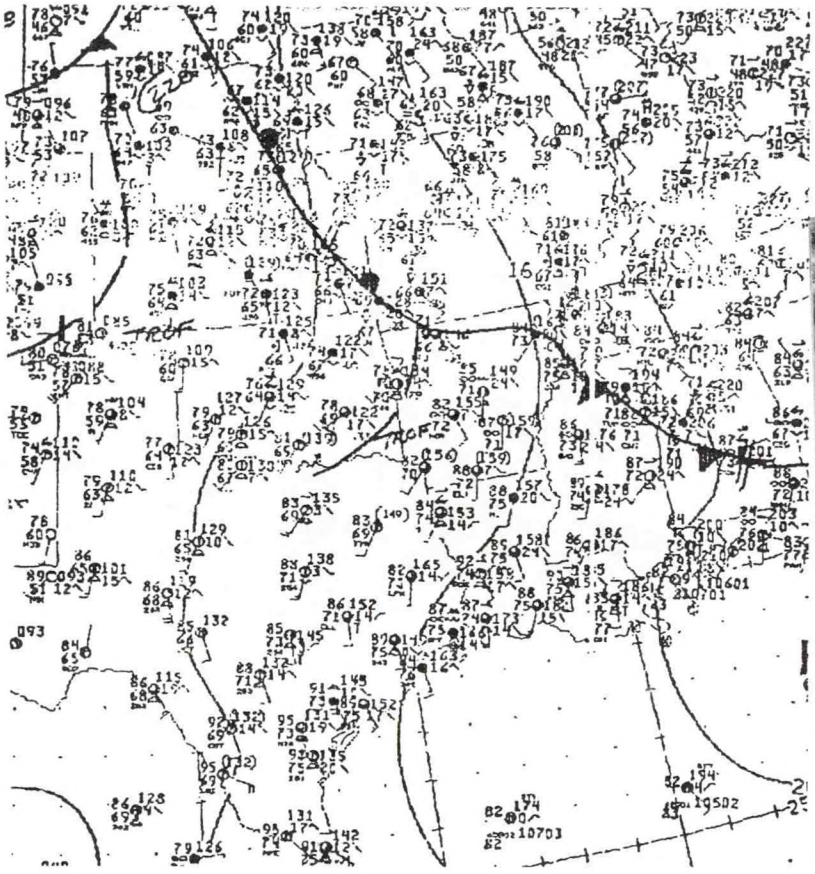


11JUN89-12JUN89 0900-0510 CST 72 REPORTS 11 TORNADOES

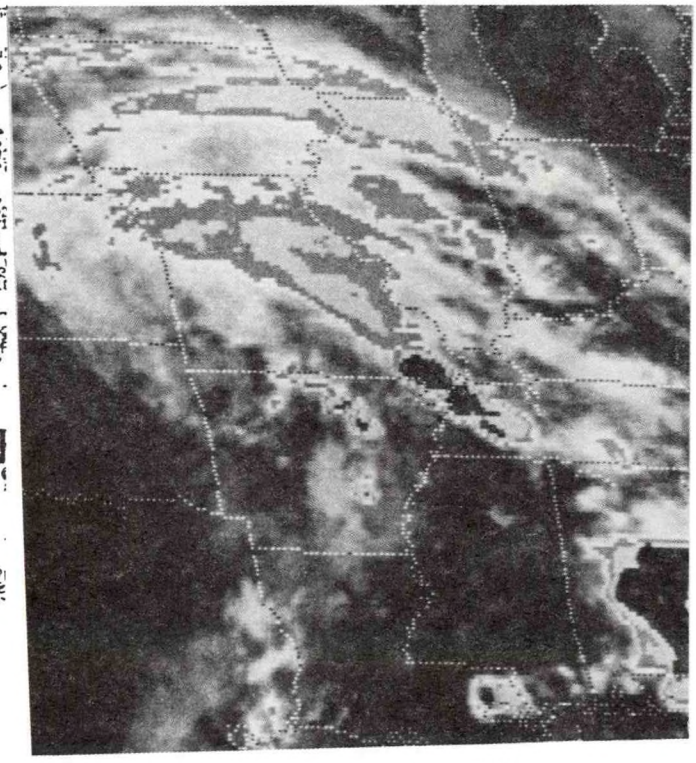
NO	TIME	EVENT	ST	LOCATION	
1	1328	TORNADO (F-2)	AR	BEE BRANCH	6 INJURIES
2	0204	76 MPH WIND GUST	TX	WICHITA FALLS	



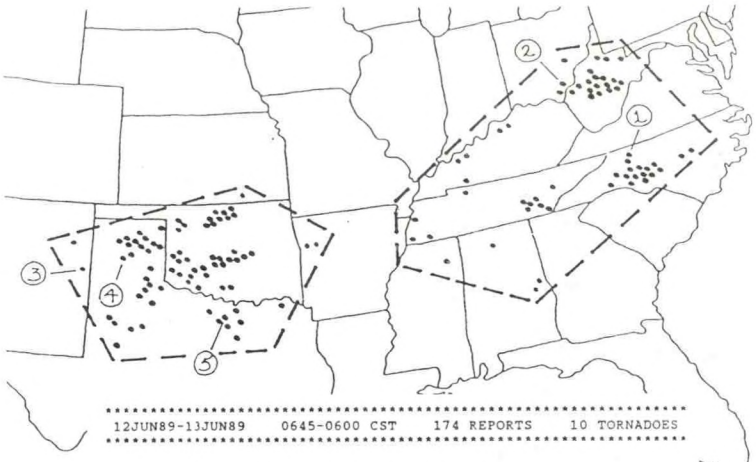
500 MB 6AM CST June 11, 1989



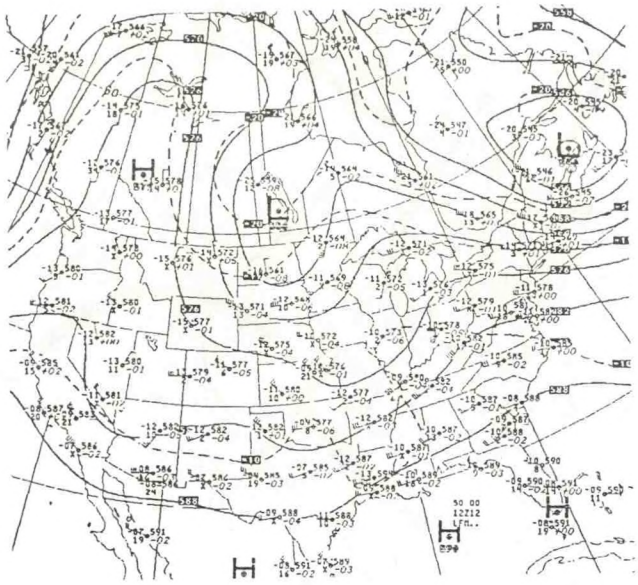
Surface 12 Noon CST June 11, 1989



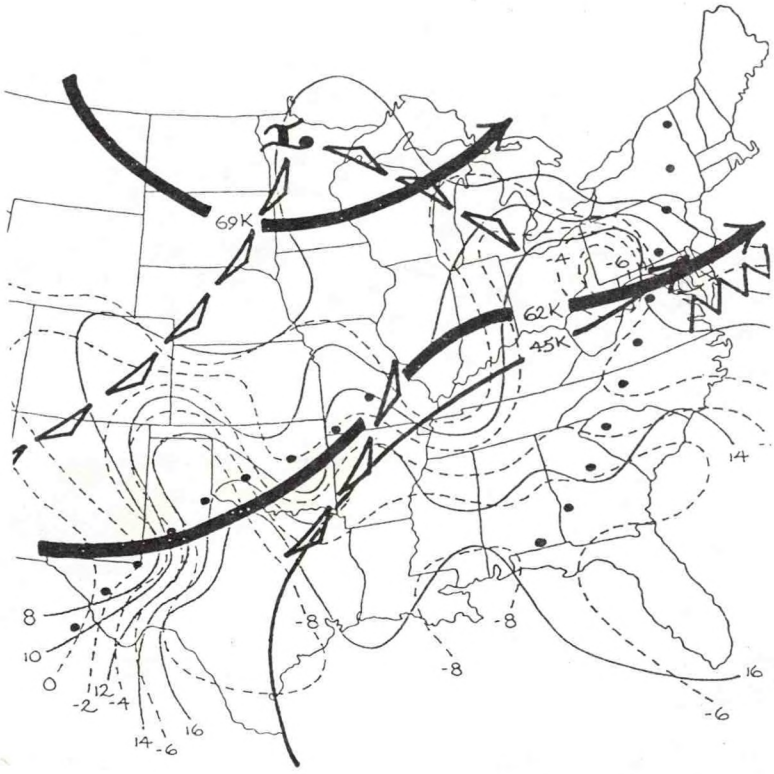
GOES 2:01 PM CST June 11, 1989



NO	TIME	EVENT	ST	LOCATION	
1	1420	WIND DAMAGE	NC	WILKESBORO	1 INJURY
2	1510	2.50 INCH HAIL	OH	GALLIA CITY	
3	1600	3.00 INCH HAIL	NM	TUCUMCARI	1 INJURY
4	2125	100 MPH WIND GUST	TX	AMARILLO	
5	0345	110 MPH WIND GUST	TX	DENTON	

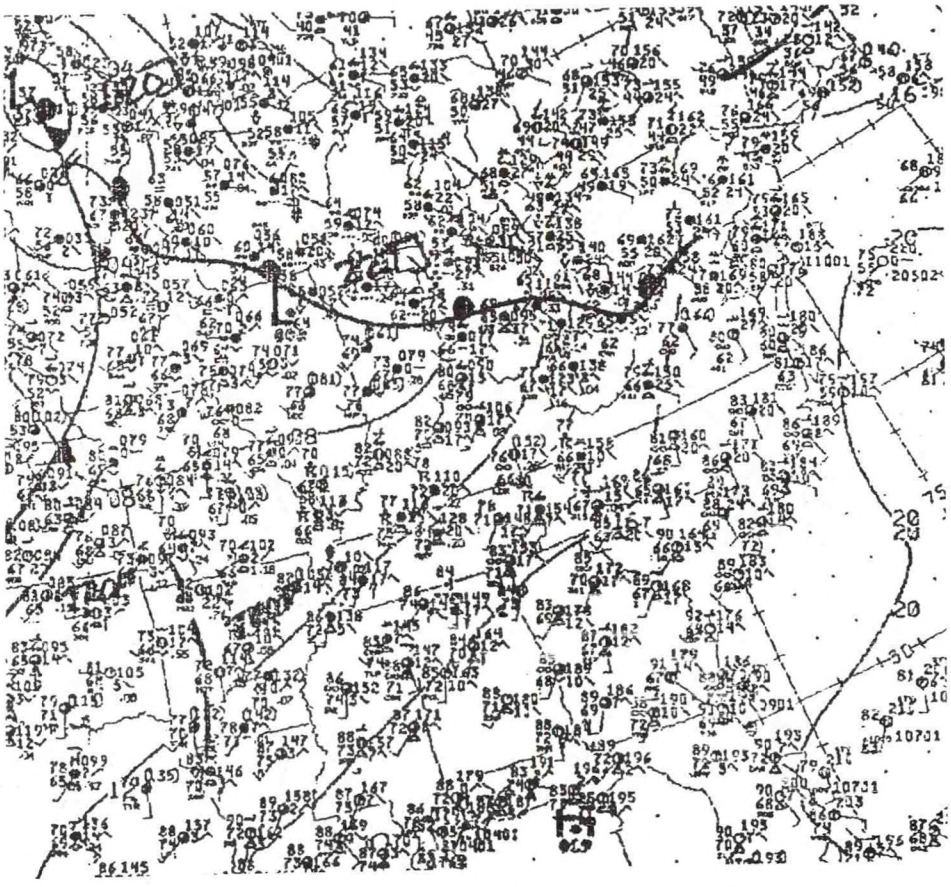


500 MB 6AM CST June 12, 1989

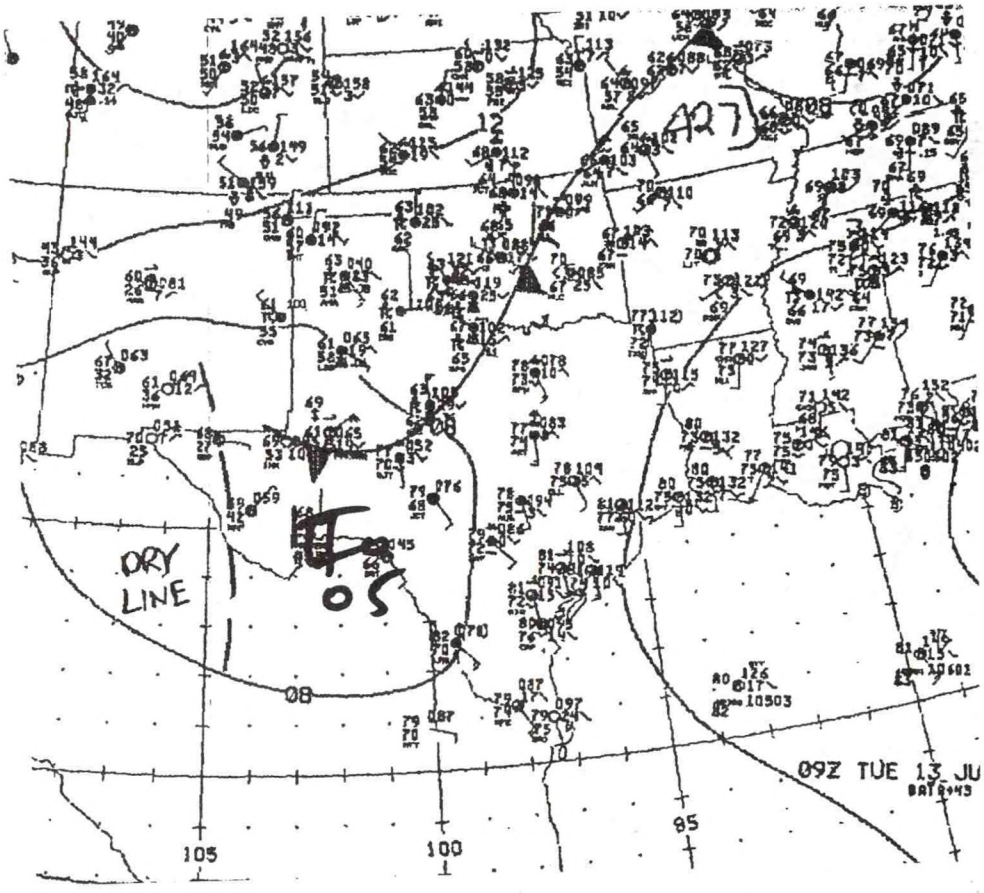


Composite 6PM CST June 12, 1989

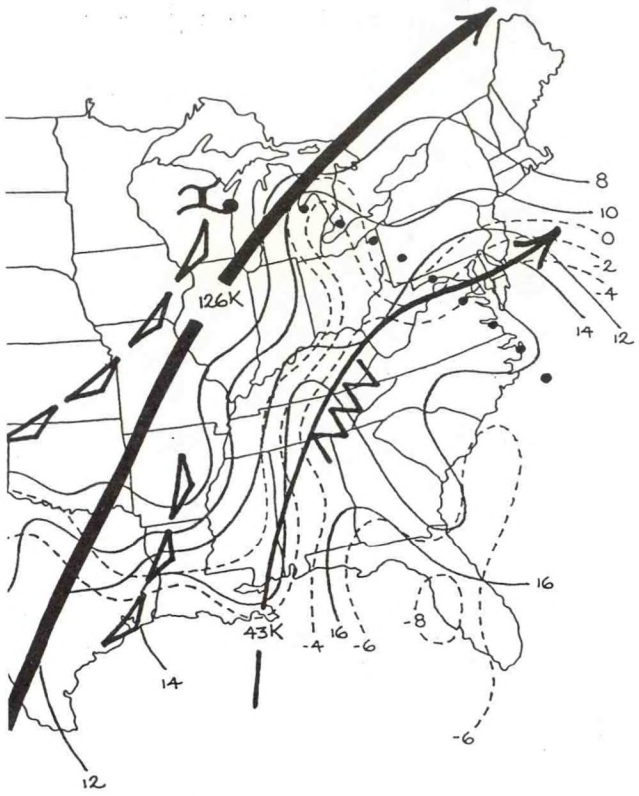
GOES 3:31 AM CST June 13, 1989



Surface 12 Noon CST June 12, 1989



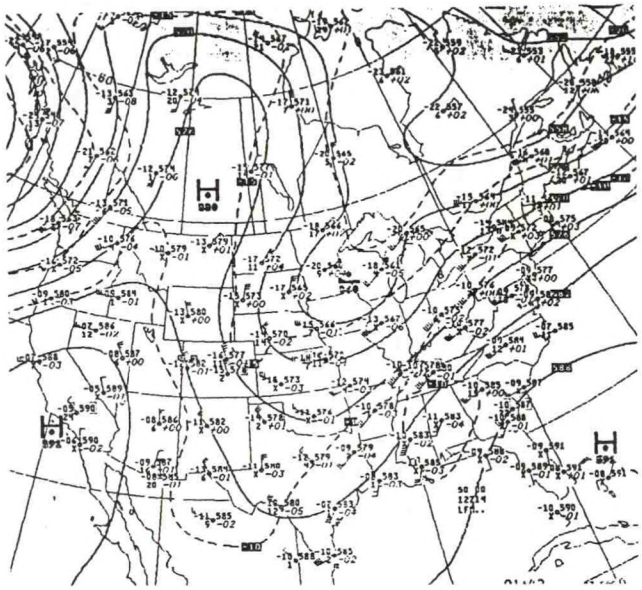
Surface 3AM CST June 13, 1989



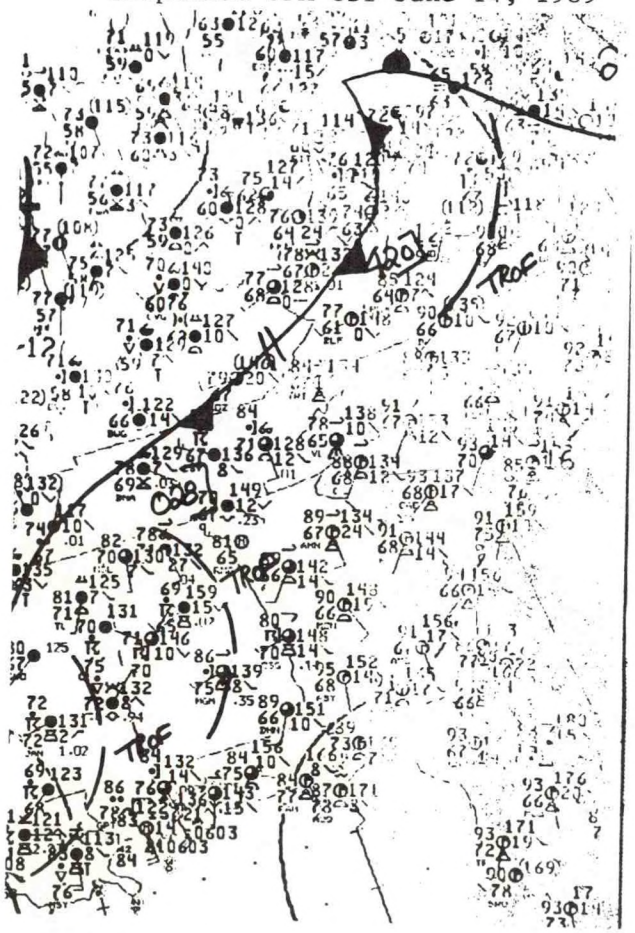
Composite 6PM CST June 14, 1989

14JUN89-15JUN89 0710-0350 CST 62 REPORTS

NO	TIME	EVENT	ST	LOCATION	
1	1440	WIND	MD	MONTGOMERY COUNTY	$28 MILLION DAMAGE



500 MB 6AM CST June 14, 1989

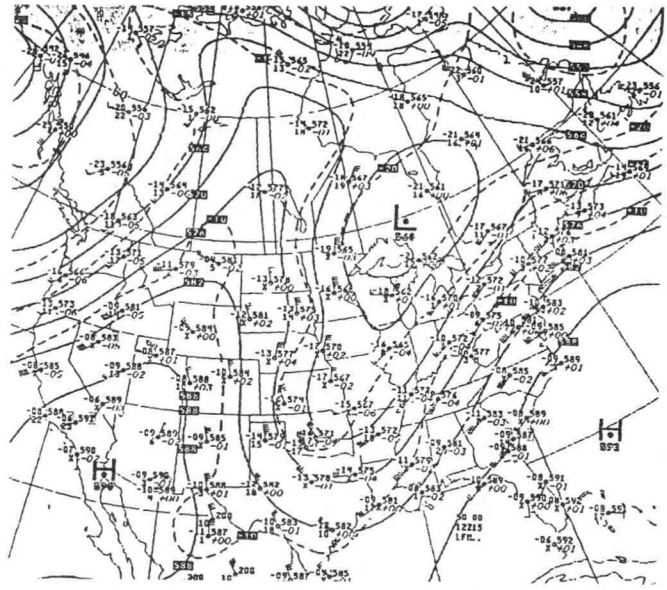


Surface 12 Noon CST June 14, 1989

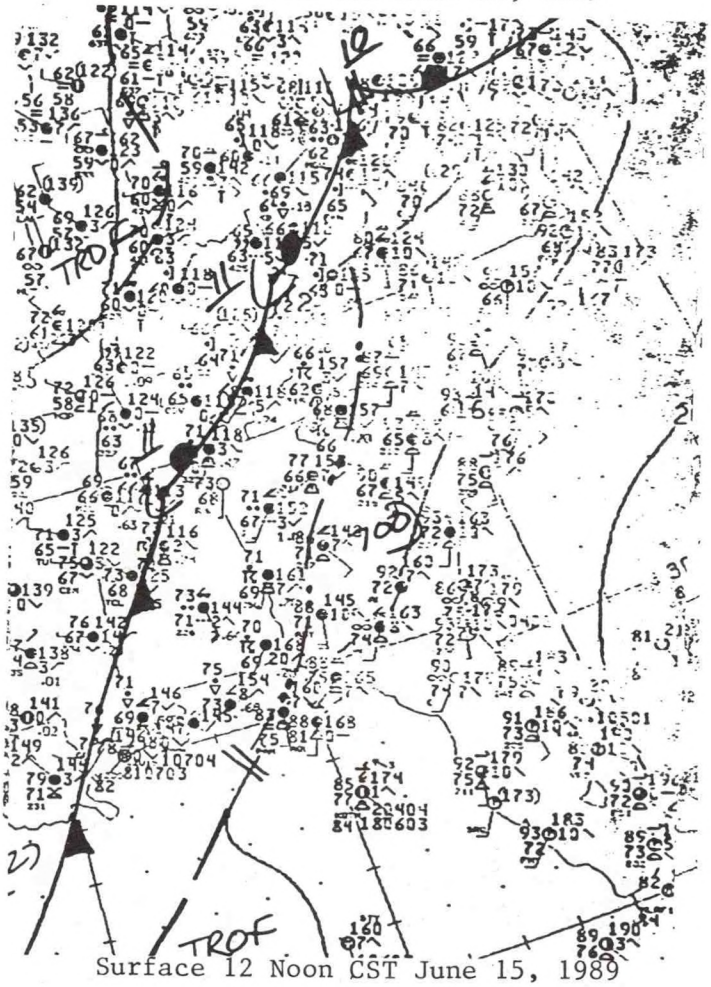
Composite 6PM CST June 15, 1989

15JUN89 1040-1845 CST 119 REPORTS 8 TORNADOES

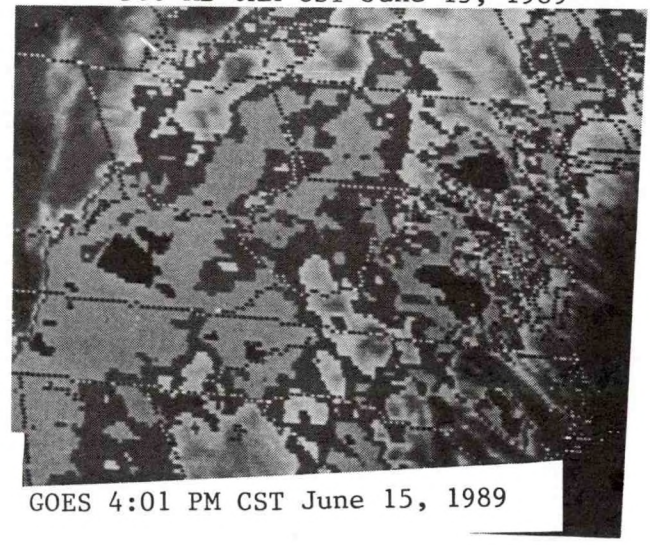
NO	TIME	EVENT	ST	LOCATION	
1	1155	80 MPH WIND GUST	SC	HOGBACK MOUNTAIN	
2	1630	TORNADO (F-3)	PA	MOUNTVILLE	3 INJURIES
3	1645	TORNADO (F-3)	PA	COLUMBIA	4 INJURIES
4	1652	WIND DAMAGE	VA	RICHMOND	1 DEATH
5	1906	80 MPH WIND GUST	VA	NORFOLK	



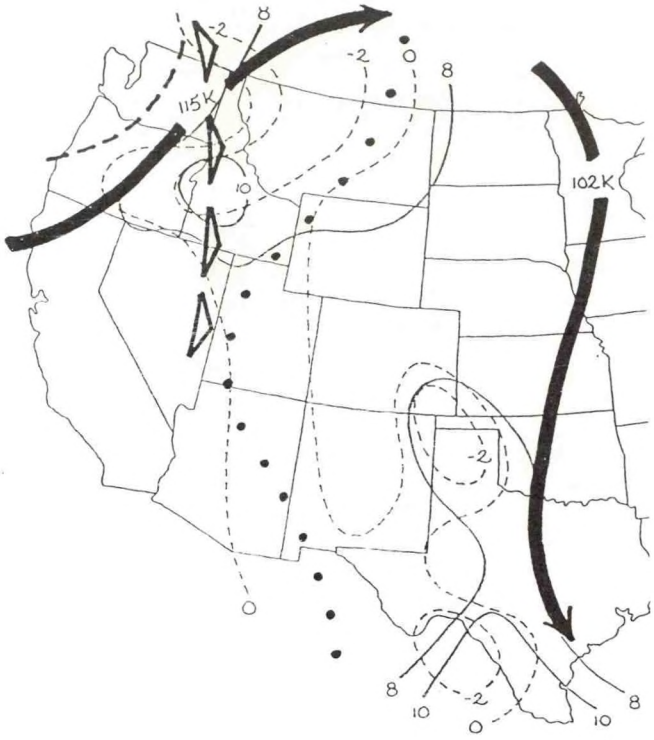
500 MB 6AM CST June 15, 1989



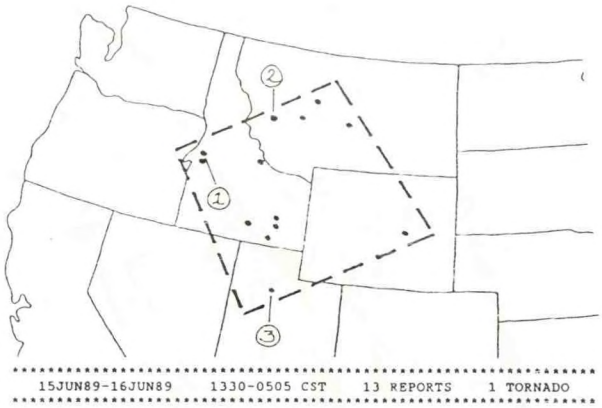
Surface 12 Noon CST June 15, 1989



GOES 4:01 PM CST June 15, 1989

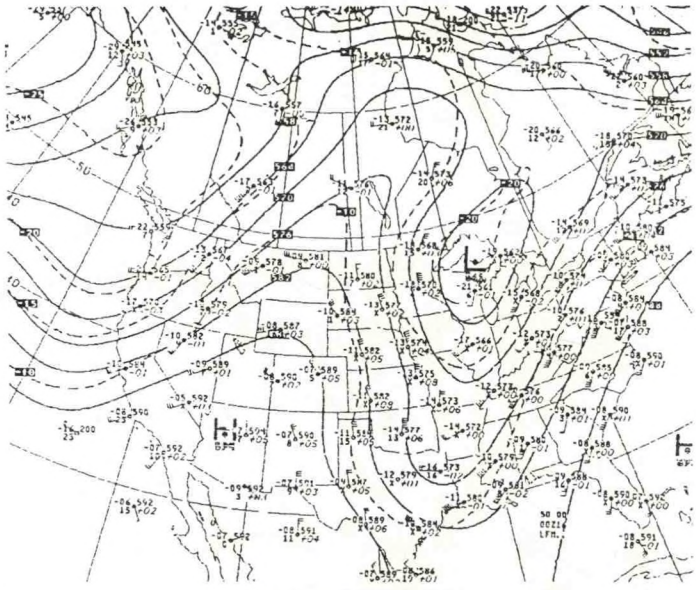


Composite 6PM CST June 15, 1989

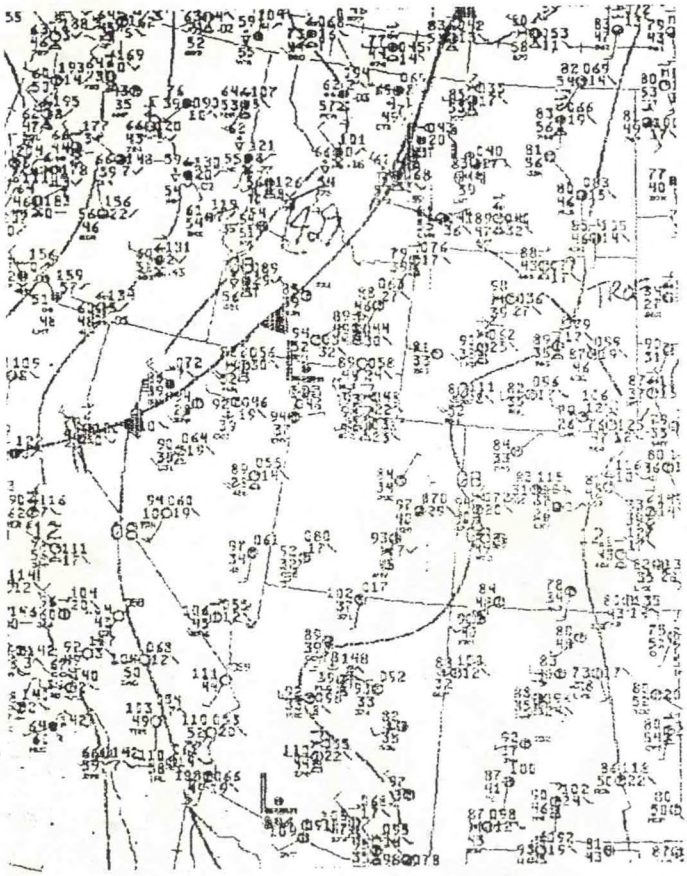


15JUN89-16JUN89 1330-0505 CST 13 REPORTS 1 TORNADO

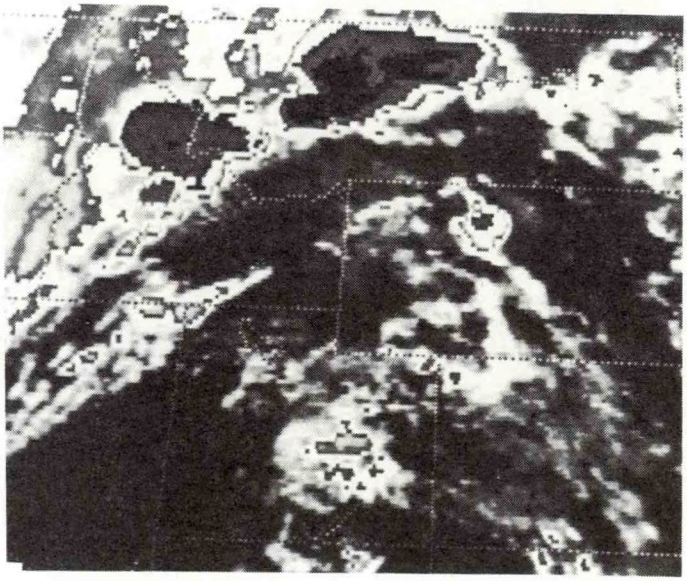
NO	TIME	EVENT	ST	LOCATION	
1	1330	80 MPH WIND GUST	ID	CASCADE	
2	1400	1.75 INCH HAIL	MT	CLINTON	3 INJURIES
3	1745	78 MPH WIND GUST	UT	WEST VALLEY CITY	
4	0505	80 MPH WIND GUST	WY	CASPER	



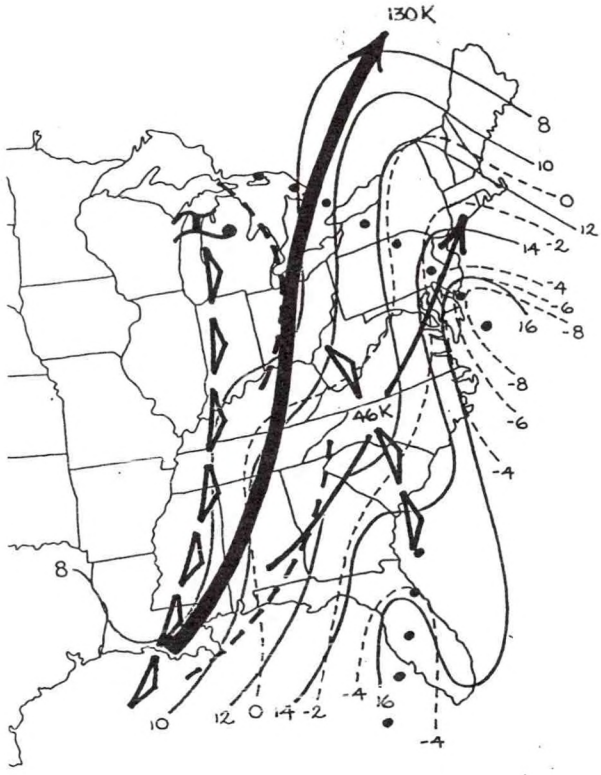
500 MB 6PM CST June 15, 1989



Surface 6PM CST June 15, 1989



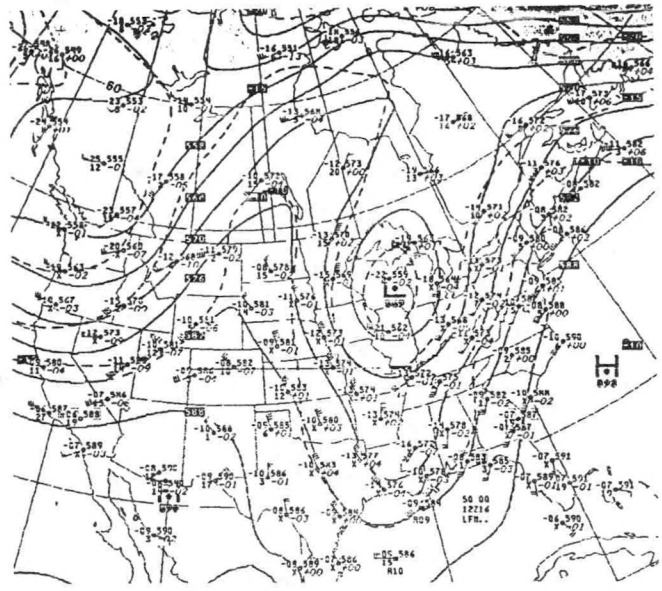
GOES 6:01 PM CST June 15, 1989



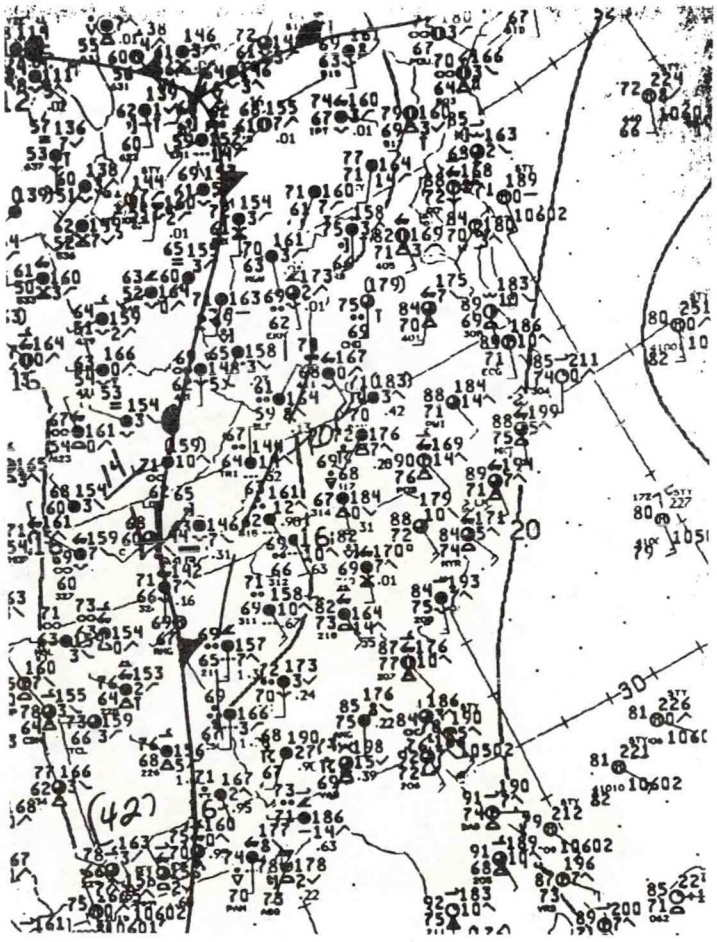
Composite 6PM CST June 16, 1989

16JUN89 0826-1905 CST 146 REPORTS 8 TORNADOES

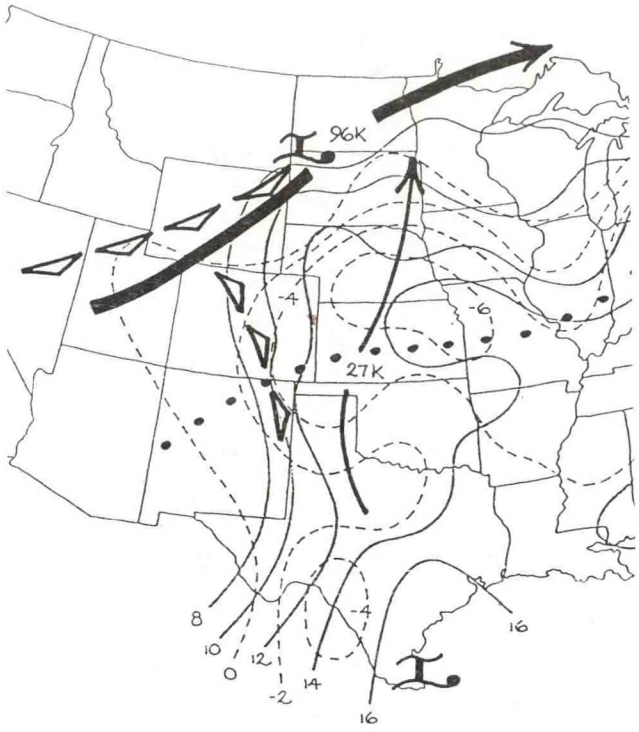
NO	TIME	EVENT	ST	LOCATION	
1	1230	WIND DAMAGE	NC	MCLEANSVILLE	1 DEATH
2	1400	80 MPH WIND GUST	FL	INVERNESS	
3	1446	87 MPH WIND GUST	SC	COLUMBIA	$20 MILLION DAMAGE



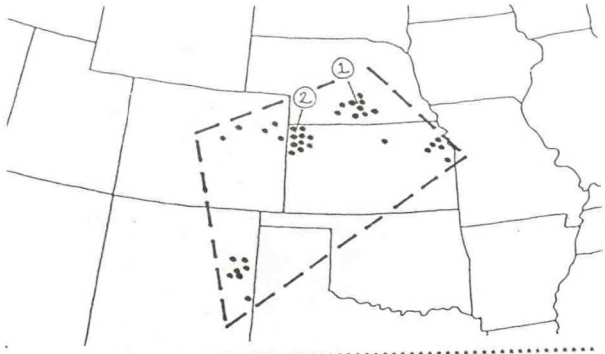
500 MB 6AM CST June 16, 1989



Surface 12 Noon CST June 16, 1989

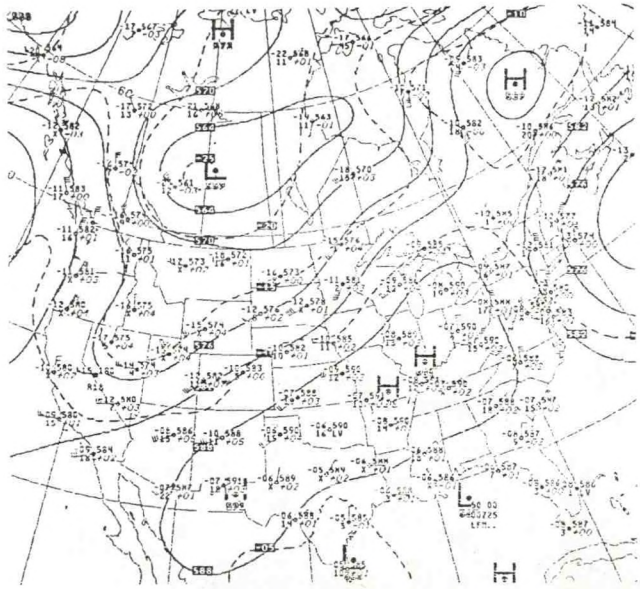


Composite 6PM CST June 24, 1989

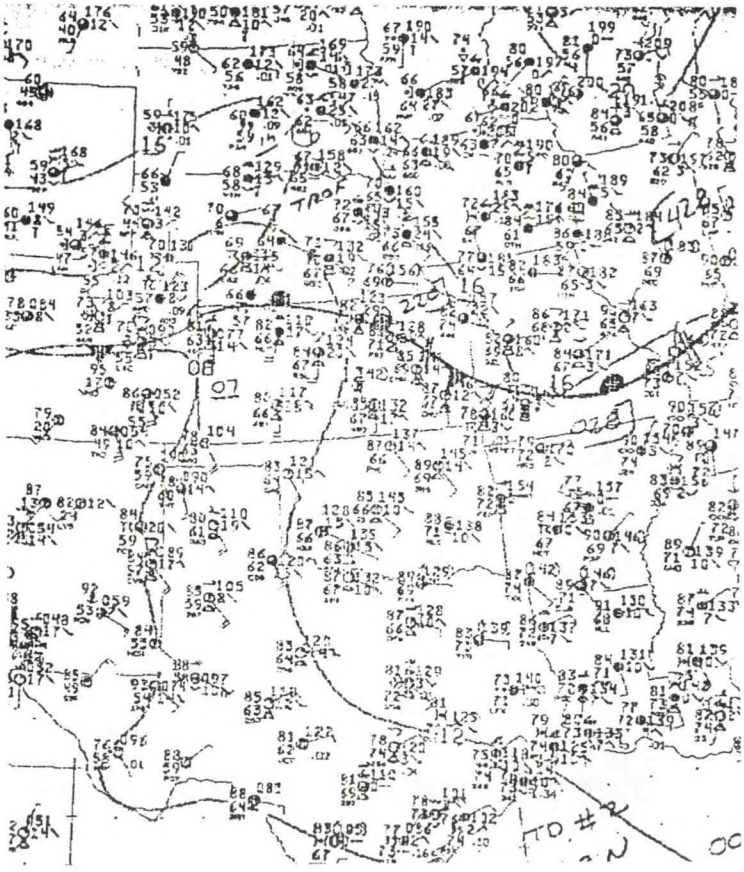


24JUN89-25JUN89 1217-0130 CST 49 REPORTS 7 TORNADOES

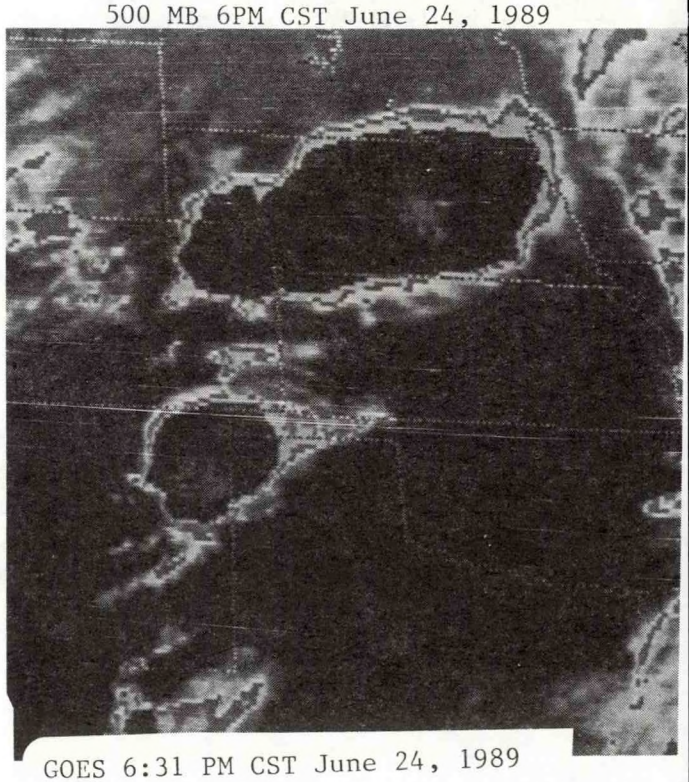
NO	TIME	EVENT	ST	LOCATION
1	1815	80 MPH WIND GUST	NE	WOOD RIVER
2	1830	3.00 INCH HAIL	KS	WHEELER



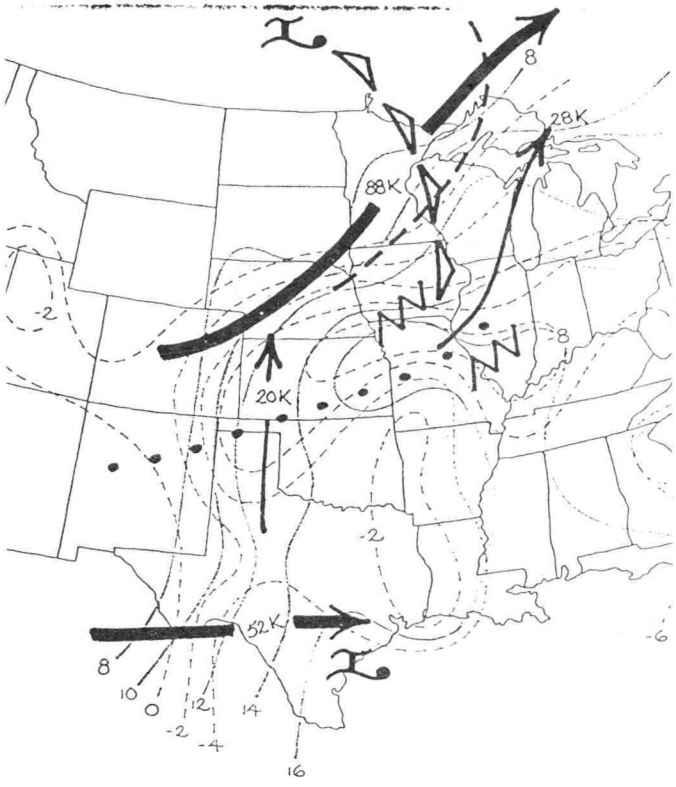
500 MB 6PM CST June 24, 1989



Surface 6PM CST June 24, 1989



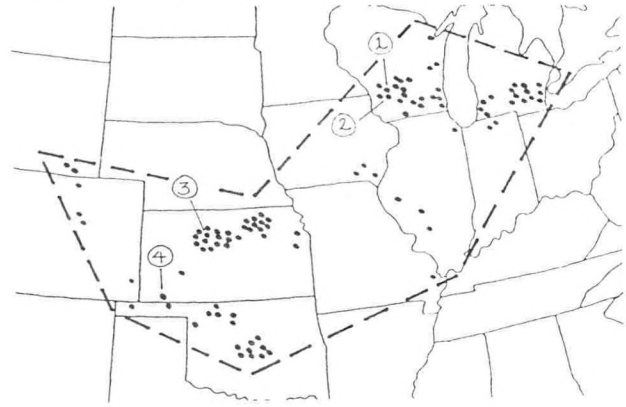
GOES 6:31 PM CST June 24, 1989

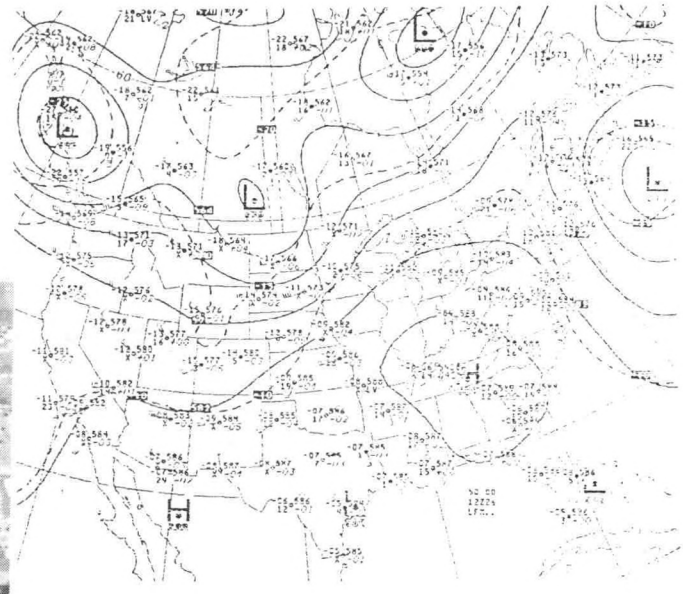


Composite 6PM CST June 26, 1989

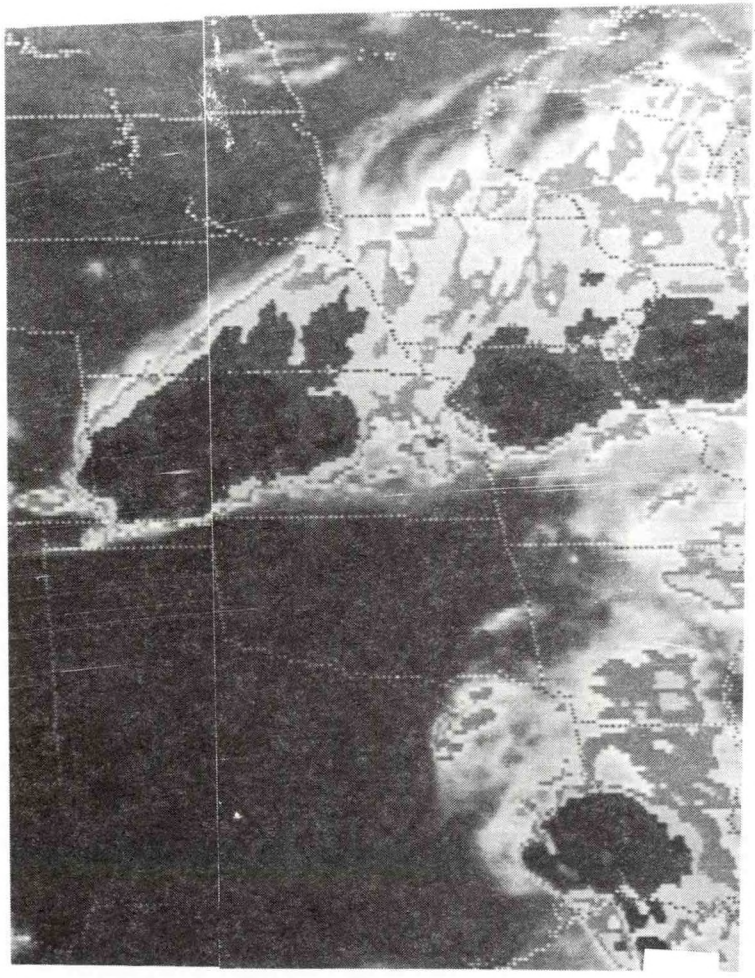
26JUN89-27JUN89 0930-0315 CST 129 REPORTS 2 TORNADOES

NO	TIME	EVENT	ST	LOCATION	
1	1035	TORNADO (F-2)	WI	HILLPOINT	
2	1100	TORNADO (F-1)	WI	LAKE DELTON	4 INJURIES
3	1840	4.00 INCH HAIL	KS	QUINTER	
4	2140	90 MPH WIND GUST	KS	LIBERAL	

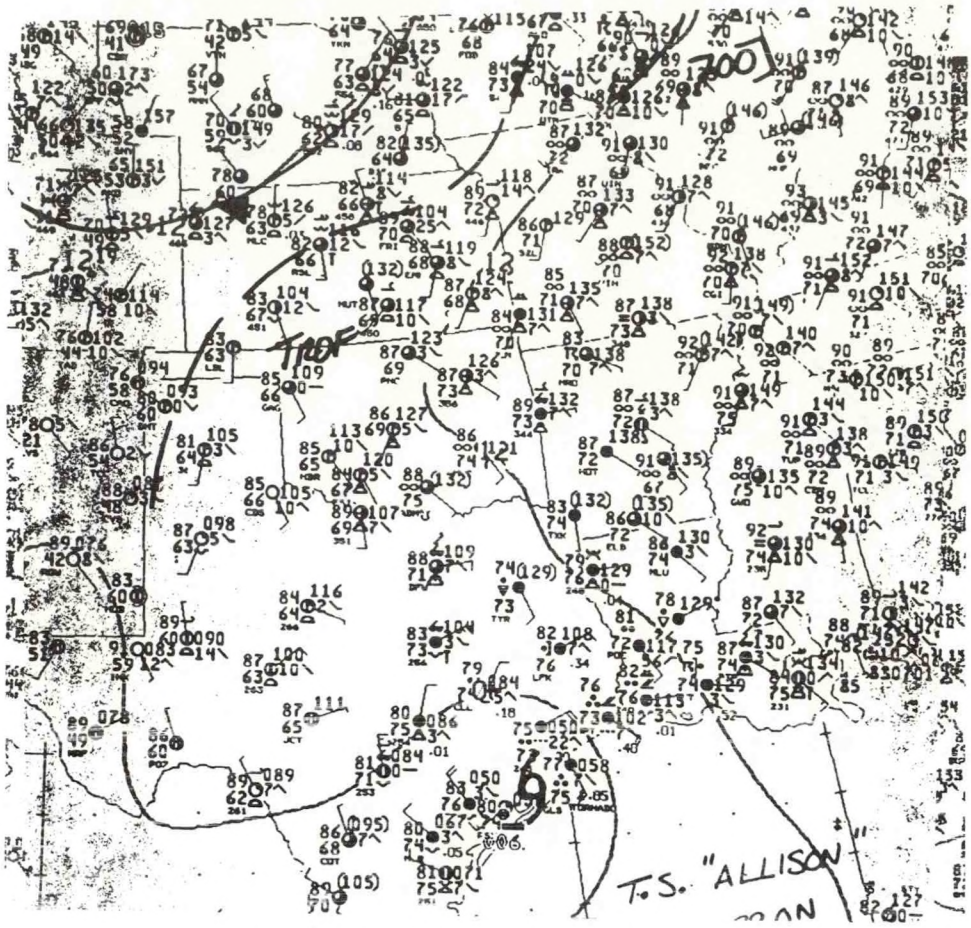




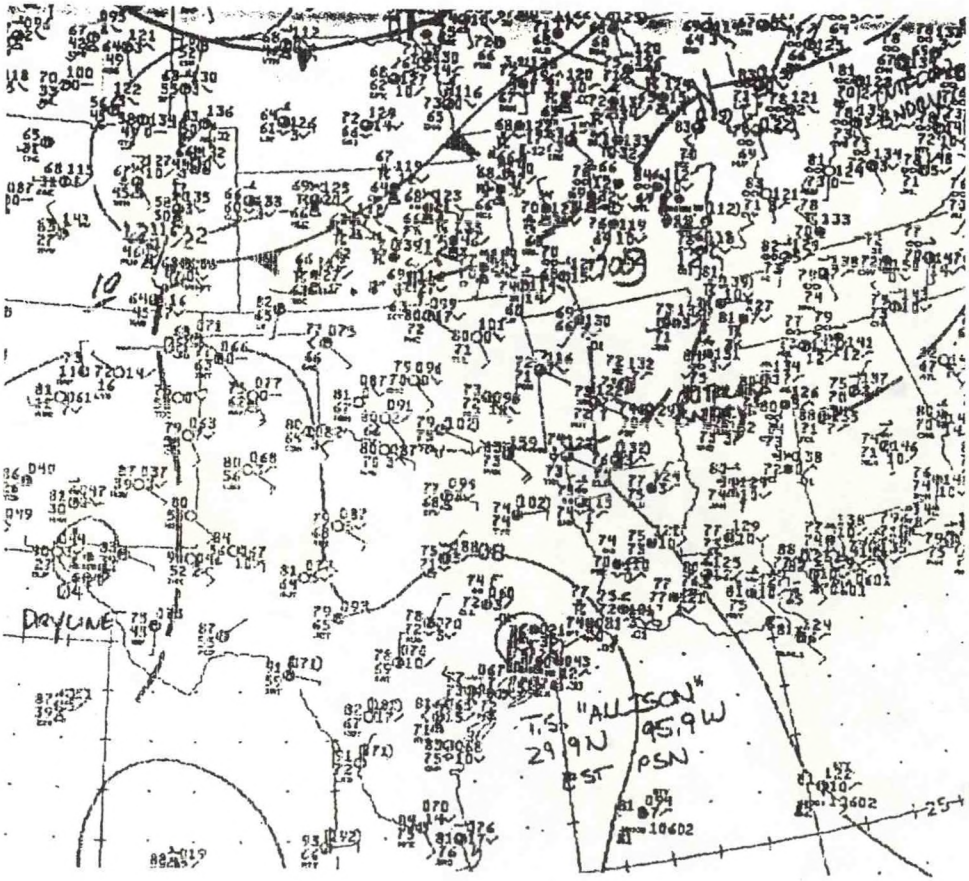
500 MB 6AM CST June 26, 1989



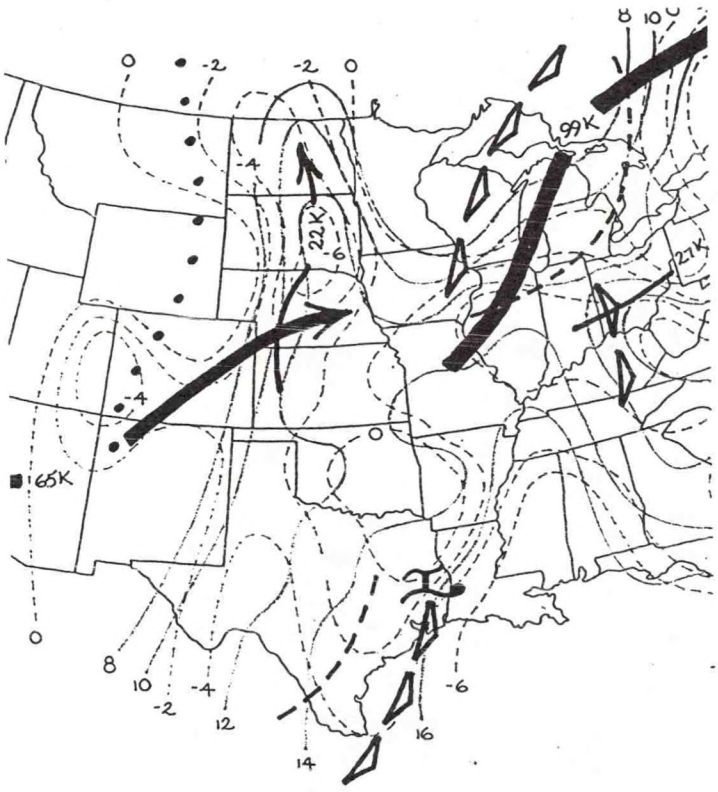
GOES 10:01 PM CST June 26, 1989



Surface 12 Noon CST June 26, 1989



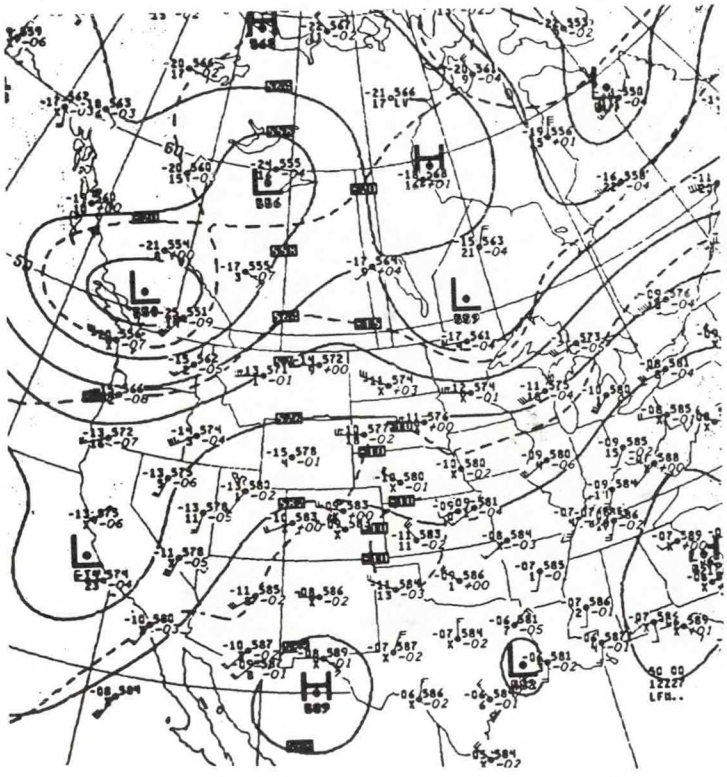
Surface 9PM CST June 26, 1989



Composite 6PM CST June 27, 1989

TROPICAL DEPRESSION "ALLISON" SPAWNS SIX TORNADOES IN LOUISIANA

NO	TIME	EVENT	ST	LOCATION	
1	0720	TORNADO (F-1)	LA	HACKBERRY	2 INJURIES



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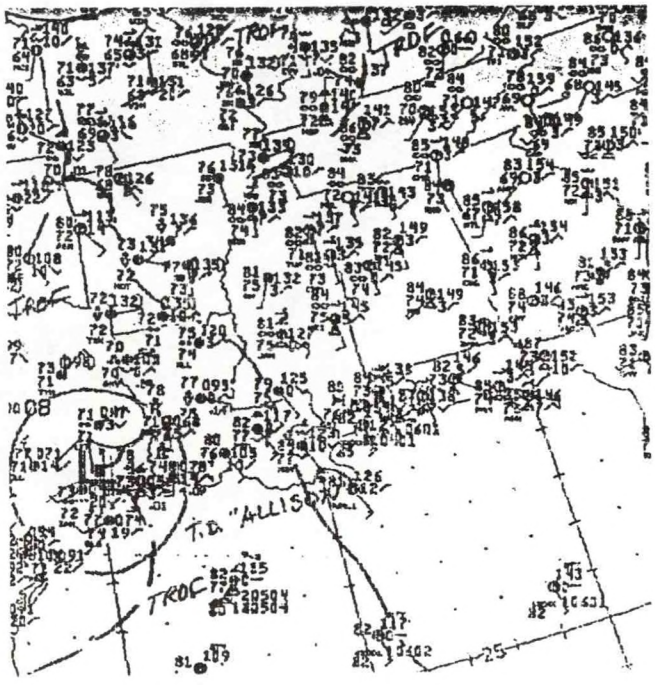
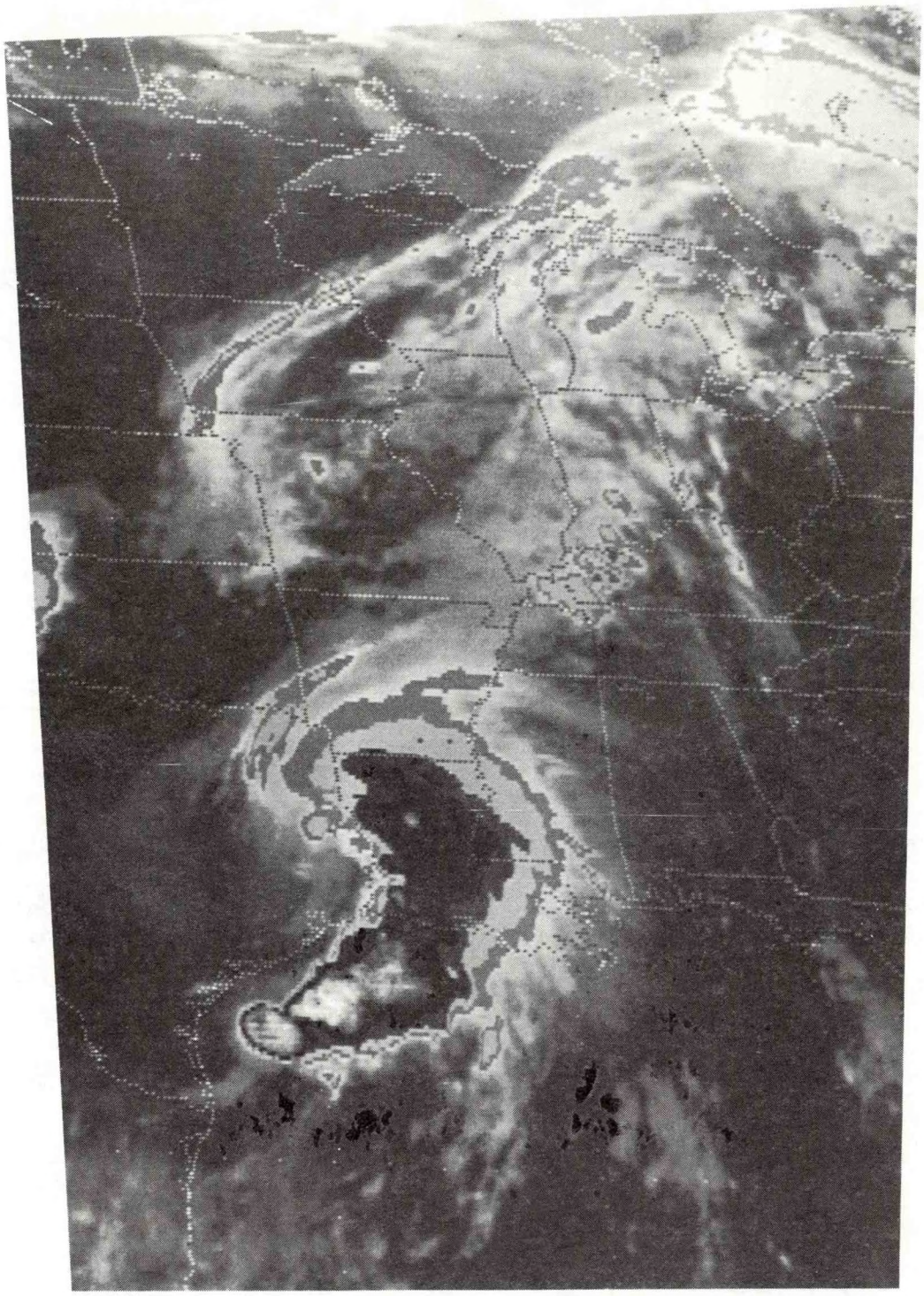


Surface 9AM CST June 27, 1989

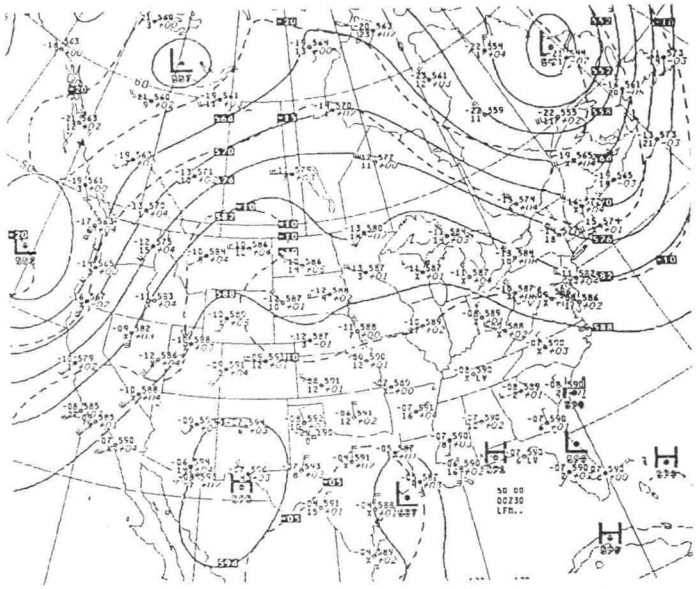


GOES 7:01 PM CST June 27, 1989

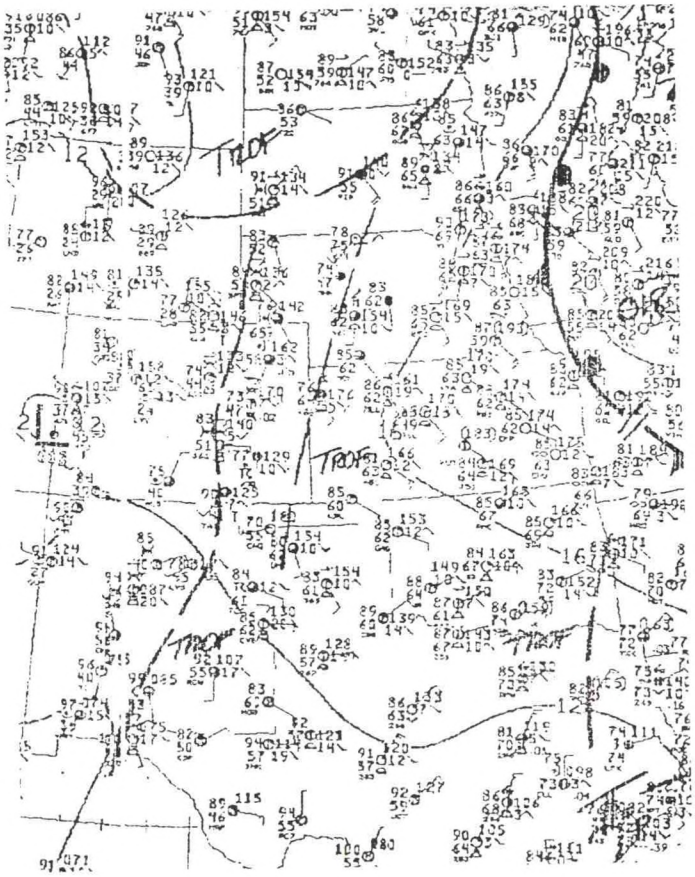
Composite 6PM CST June 29, 1989

29JUN89-30JUN89 1335-0105 CST 16 REPORTS 6 TORNADOES

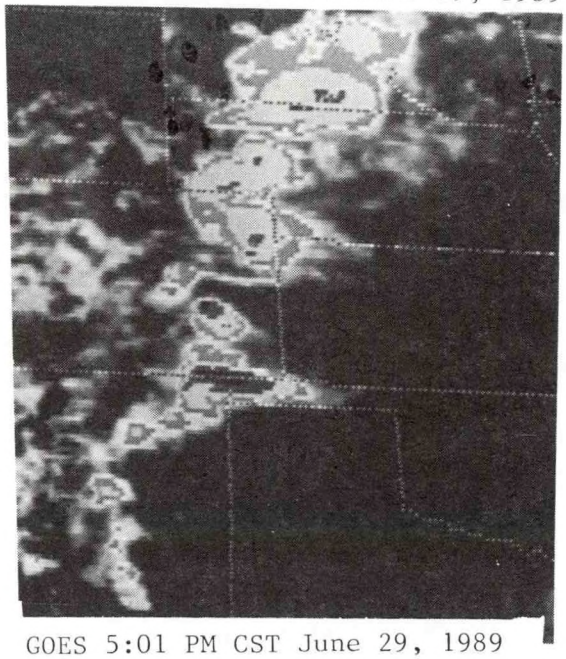
NO	TIME	EVENT	ST	LOCATION
1	1730	4.50 INCH HAIL	CO	KIT CARSON COUNTY



500 MB 6PM CST June 29, 1989



Surface 6PM CST June 29, 1989



GOES 5:01 PM CST June 29, 1989

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).

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.

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