

# Damaging Winds in Sauk Centre and Other Communities

## Synopsis

During the early afternoon of the 10th, an approaching cool front across the Dakotas had triggered severe thunderstorms in southern North Dakota. These were slow moving at first. By late afternoon however, the storms morphed into clusters and began to propagate more quickly east southeast. This quicker forward motion is often the case when thunderstorms evolve into complexes. Rain-cooled air from each of the thunderstorms merges into a large "cold pool". Such a pool of cooler air has higher density and pressure than the warm air mass around it and in the correct wind shear pattern can propagate quickly. On the forward edge of these cool pools, continued lift of the warm and moist ambient air often favors thunderstorms to keep regenerating. The process is sort of a cycle, which is why complexes of thunderstorms often can last for hours before they move outside of the instability, On July 10th, plenty of instability, due in part to high moisture, was in place in advance of these storms across western and southern Minnesota. They would evolve into two primary complexes as they moved into this area. One would traverse southeast near Interstate 94 bringing damaging winds to Sauk Centre and into the northern Twin Cities metro area. The other would move near the Minnesota River valley across southwest and into south central Minnesota.

## Damage Survey Info

### Sauk Centre

PUBLIC INFORMATION STATEMENT...UPDATED  
NATIONAL WEATHER SERVICE TWIN CITIES/CHANHASSEN MN  
519 PM CDT TUE JUL 12 2011

...PRELIMINARY STORM DAMAGE SURVEY RESULTS FROM THE SAUK CENTRE  
AREA IN NORTHWEST STEARNS COUNTY...

A NATIONAL WEATHER SERVICE STORM DAMAGE ASSESSMENT TEAM CONDUCTED A  
SURVEY OF THE DAMAGE CAUSED BY THE EVENING STORMS ON JULY 10TH  
THAT CAUSED SIGNIFICANT DAMAGE IN THE SAUK CENTRE AREA IN CENTRAL  
MINNESOTA. THE FOLLOWING IS A SUMMARY OF THE DAMAGE IN SAUK CENTRE.

EVENT...DAMAGING STRAIGHT LINE WINDS CAUSED BY A SEVERE DOWNBURST.

WIND SPEEDS...75 TO 90 MPH.

TIME...RADAR ESTIMATED TO BE BETWEEN 808 PM AND 825 PM. SAUK  
CENTRE CITY OFFICIALS NOTED THAT POWER WAS LOST IN THE TOWN AT  
810 PM...WHICH IS WHEN EMERGENCY SIRENS LOST POWER. SEVERAL  
RESIDENTS NOTED THAT VERY GUSTY WINDS LASTED FOR 10 OR MORE  
MINUTES.

DAMAGE...APPROXIMATELY TWO HUNDRED TREES IN SAUK CENTRE WERE  
EITHER UPROOTED OR SNAPPED WITH THIS LINE OF STORMS. TREE DAMAGE  
WAS NOTED FROM INTERSTATE 94 IN THE SOUTH TO THE SAUK CENTRE  
COUNTRY CLUB IN THE NORTH. THE SURVEY NOTED THAT ALL OF THE TREES

WERE LAYING TOWARD THE EAST...INDICATIVE OF DAMAGE CAUSED BY STRAIGHT LINE WINDS. DOZENS OF STRUCTURES WERE ALSO DAMAGED IN THE TOWN...THOUGH ALMOST ALL OF THE STRUCTURAL DAMAGE WAS CAUSED BY FALLING TREES. THERE WAS A TOPPLED TRUCK TRAILER...JUST OVER A DOZEN DOWNED UTILITY POLES...AND SEVERAL SNAPPED ROAD SIGNS.

REMARKS...DAMAGE SEEN TO TREES...UTILITY POLES...AND BILLBOARDS WERE CONSISTENT WITH WHAT WOULD BE EXPECTED FROM WIND SPEEDS UP TO 90 MPH. UNFORTUNATELY...POWER TO THE AIRPORT SOUTHEAST OF TOWN WAS LOST BEFORE THE WINDS COULD BE MEASURED. HOWEVER...THE AIRPORT IN GLENWOOD MEASURED A WIND GUST OF 76 MPH AND A ROAD WEATHER SENSOR NEAR ALEXANDRIA MEASURED A WIND GUST OF 79 MPH WHEN THIS STORM PASSED THROUGH THOSE AREAS.

THE NATIONAL WEATHER SERVICE WOULD LIKE TO THANK STEARNS COUNTY EMERGENCY MANAGEMENT AND SAUK CENTRE LAW ENFORCEMENT FOR THEIR HELP IN THE SURVEY.





### **Damage Photos from Sauk Centre**



### **Douglas & Pope Counties**

PUBLIC INFORMATION STATEMENT  
NATIONAL WEATHER SERVICE TWIN CITIES/CHANHASSEN MN  
521 PM CDT TUE JUL 12 2011  
...PRELIMINARY STORM DAMAGE SURVEY RESULTS FROM SOUTHEAST DOUGLAS  
AND NORTHEAST POPE COUNTIES...  
A NATIONAL WEATHER SERVICE STORM DAMAGE ASSESSMENT TEAM CONDUCTED A  
SURVEY OF SOME SPORADIC DAMAGE CAUSED BY THE EVENING STORMS ON JULY

10TH THAT WOULD SOON AFTER CAUSE SIGNIFICANT DAMAGE IN THE SAUK CENTRE AREA IN CENTRAL MINNESOTA. THE FOLLOWING IS A SUMMARY OF THE RESULTS.

EVENT...DAMAGING STRAIGHT LINE WINDS.  
WIND SPEEDS...60 TO 80 MPH.  
TIME...RADAR ESTIMATED TO BE BETWEEN 740 PM AND 805 PM.  
DAMAGE...NUMEROUS TREES WERE UPROOTED IN SPOTTY COVERAGE ACROSS SOUTHEAST DOUGLAS AND NORTHEAST POPE COUNTIES. IN THE COMMUNITY OF FORADA...OVER A DOZEN TREES WERE DOWNED. A BUILDING HAD A SMALL PART OF ITS ROOF BLOWN OFF NEAR ALONG MINNESOTA HIGHWAY 29 AT THE DOUGLAS/POPE COUNTY BORDER.

REMARKS...REPORTS FROM A SKYWARN STORM SPOTTER ON THE SOUTH SIDE OF ALEXANDRIA INDICATE THE STRONG OUTFLOW THAT OCCURRED COINCIDENT WITH A 79 MPH MEASURED GUST AT A ROAD WEATHER SENSOR. ALSO HIS ACCOUNTS REFLECT THE POSSIBILITY THERE WAS A BRIEF GUSTNADO OR TWO ON THE LEADING EDGE OF THE WINDS WITHIN A FEW MILES SOUTH OF ALEXANDRIA.



## **EF-0 Tornado in Kandiyohi County**

PUBLIC INFORMATION STATEMENT  
NATIONAL WEATHER SERVICE TWIN CITIES/CHANHASSEN MN  
524 PM CDT TUE JUL 12 2011

...PRELIMINARY STORM DAMAGE SURVEY RESULTS FROM TORNADO REPORT NEAR THE KANDIYOHI/MEEKER COUNTY LINE...

A NATIONAL WEATHER SERVICE STORM DAMAGE ASSESSMENT TEAM CONDUCTED A

SURVEY NEAR THE KANDIYOHI/MEEKER COUNTY LINE WHERE ON SUNDAY EVENING JULY 10TH THERE HAD BEEN SEVERAL REPORTS OF A BRIEF TORNADO FROM SKYWARN STORM SPOTTERS AND THE PUBLIC. ONE DETAILED NEARBY ACCOUNT FROM A SKYWARN STORM SPOTTER INDICATED THE CONDENSATION OF THE TORNADO REACHED THE GROUND FOR ABOUT 20 SECONDS BEFORE THE TORNADO DISSIPATED. THIS ALL OCCURRED WITHIN THE MIDDLE OF A FIELD WHICH WAS UNREACHABLE TO THE SURVEY TEAM. THE ACCOUNTS ARE CONSISTENT WITH RADAR IMAGERY AND THE ENVIRONMENT AT THAT TIME.

EVENT...EF-0 TORNADO.

LOCATION...FOUR AND A HALF MILES NNE OF ATWATER JUST WITHIN THE KANDIYOHI COUNTY LINE.

PATH LENGTH...ESTIMATED LESS THAN AN EIGHTH OF A MILE.

MAXIMUM WIND SPEEDS...ESTIMATED 65 MPH.

TIME...RADAR ESTIMATED TO BE APPROXIMATELY 847 PM.

DAMAGE...NONE FOUND THOUGH SOME MINOR CROP DAMAGE MAY HAVE OCCURRED.

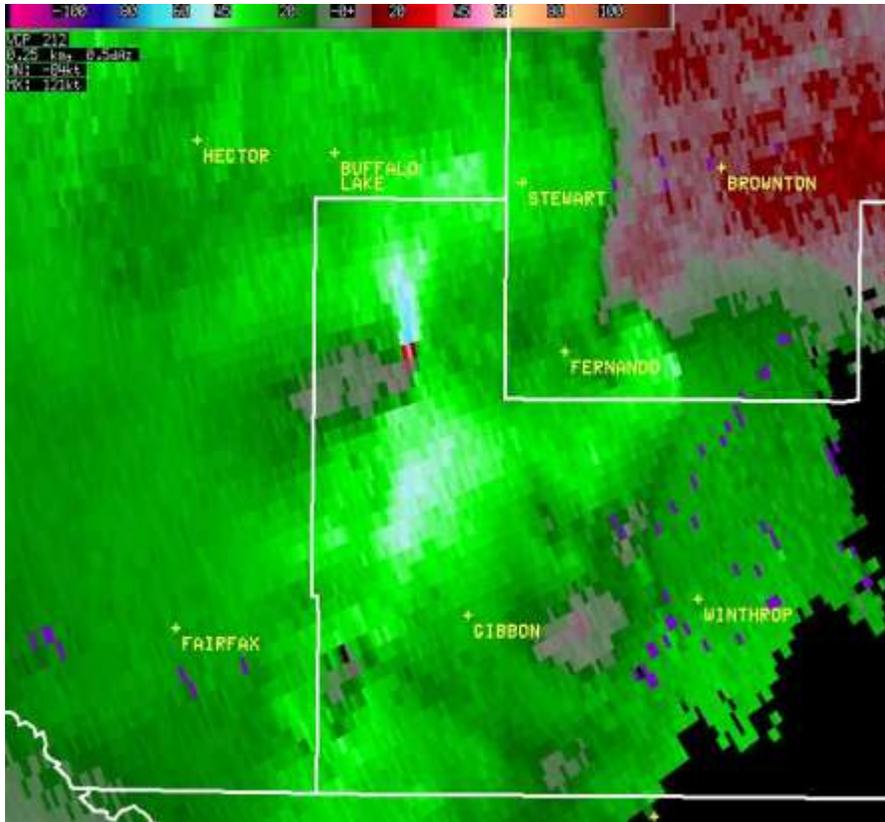
REMARKS...THE NATIONAL WEATHER SERVICE WOULD LIKE TO THANK THE GROVE CITY FIRE DEPARTMENT FOR THEIR HELP WITH THIS SURVEY.

### **Strong Rotation in Sibley County**

PUBLIC INFORMATION STATEMENT  
NATIONAL WEATHER SERVICE TWIN CITIES/CHANHASSEN MN  
525 PM CDT TUE JUL 12 2011

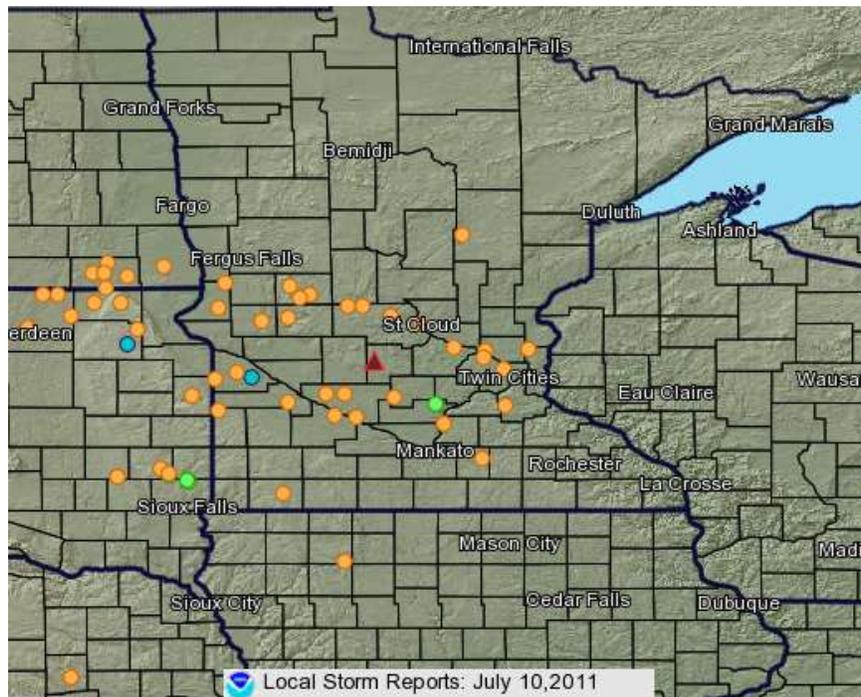
...PRELIMINARY STORM DAMAGE SURVEY RESULTS FROM A FEW MILES SOUTHEAST OF BUFFALO LAKE...

A NATIONAL WEATHER SERVICE STORM DAMAGE ASSESSMENT TEAM CONDUCTED A SURVEY IN FAR NORTHWEST SIBLEY AND FAR SOUTHWEST MCLEOD COUNTIES WHERE ON SUNDAY EVENING JULY 10TH THERE HAD BEEN STRONG AND TIGHT ROTATION SEEN BRIEFLY ON RADAR AT 1005 PM. NO INDICATION OF A TORNADO WAS FOUND BY THE SURVEY TEAM...WITH ONLY OBSERVED SPORADIC WIND DAMAGE TO LARGE TREE BRANCHES AND ROAD SIGNS.



*A Tight Couplet Indicative of Rotation, as Seen on the NWS Chanhassen 0.5° Storm-Relative Motion*

### Storm Reports



..TIME...	...EVENT...	...CITY LOCATION...	...LAT.LON...
..DATE...	....MAG....	..COUNTY LOCATION..ST..	...SOURCE....
	..REMARKS..		
0725 PM 07/10/2011	TSTM WND GST M54.00 MPH	MORRIS STEVENS MN	45.59N 95.91W TRAINED SPOTTER
0725 PM 07/10/2011	TSTM WND DMG	MORRIS STEVENS MN	45.59N 95.91W TRAINED SPOTTER
	4 INCH DIAMETER BRANCHES DOWN IN TOWN.		
0730 PM 07/10/2011	TSTM WND DMG	6 WSW ALEXANDRIA DOUGLAS MN	45.84N 95.49W TRAINED SPOTTER
	LARGE TREES DOWNED.		
0740 PM 07/10/2011	TSTM WND DMG	FORADA DOUGLAS MN	45.79N 95.36W NWS STORM SURVEY
	OVER A DOZEN LARGE TREES DOWNED WITHIN TOWN. ESTIMATED WIND SPEEDS 60 TO 80 MPH.		
0747 PM 07/10/2011	TSTM WND GST M79.00 MPH	ALEXANDRIA DOUGLAS MN	45.87N 95.38W MESONET
	MNDOT I-94 AND MN HWY 29 MILE POST 46		
0750 PM 07/10/2011	TSTM WND DMG	5 W STARBUCK POPE MN	45.62N 95.63W TRAINED SPOTTER
	SCATTERED LARGE UP TO 30 DIAMETER TREES.		
0752 PM 07/10/2011	TSTM WND DMG	BRANDON DOUGLAS MN	45.97N 95.60W LAW ENFORCEMENT
	LARGE TREES AND POWERLINES DOWN		
0753 PM 07/10/2011	TSTM WND GST M63.00 MPH	ALEXANDRIA DOUGLAS MN	45.87N 95.38W MESONET
	AXN AIRPORT		
0757 PM 07/10/2011	TSTM WND GST M54.00 MPH	FREEPORT STEARNS MN	45.66N 94.69W TRAINED SPOTTER
0758 PM 07/10/2011	TSTM WND GST M65.00 MPH	5 S MARIETTA LAC QUI PARLE MN	44.94N 96.42W MESONET
	MEHURIN US-HWY 212 MILE POST 1		
0759 PM 07/10/2011	TSTM WND DMG	GLENWOOD POPE MN	45.65N 95.38W CO-OP OBSERVER
	EIGHT INCH DIAMETER TREE DOWN.		

0759 PM TSTM WND GST GLENWOOD 45.65N 95.38W  
07/10/2011 M76.00 MPH POPE MN AWOS

MEASURED AT GLENWOOD MUNICIPAL AIRPORT.

0810 PM TSTM WND DMG SAUK CENTRE 45.74N 94.96W  
07/10/2011 STEARNS MN NWS STORM SURVEY

APPROXIMATELY TWO HUNDRED TREES IN SAUK CENTRE WERE  
EITHER UPROOTED OR SNAPPED WITH THIS LINE OF STORMS. TREE  
DAMAGE WAS NOTED FROM INTERSTATE 94 IN THE SOUTH TO THE  
SAUK CENTRE COUNTRY CLUB IN THE NORTH. DOZENS OF  
STRUCTURES WERE ALSO DAMAGED DUE TO MAINLY FALLING TREES.  
ALSO THERE WAS A TOPPLED TRUCK TRAILER...OVER A DOZEN  
DOWNED UTILITY POLES...AND SEVERAL SNAPPED ROAD SIGNS.  
ESTIMATED WIND SPEEDS 75 TO 90 MPH.

0814 PM TSTM WND GST MADISON 45.01N 96.19W  
07/10/2011 M70.00 MPH LAC QUI PARLE MN MESONET

AIRPORT AWOS

0815 PM HAIL 2 NNE DAWSON 44.96N 96.03W  
07/10/2011 M1.00 INCH LAC QUI PARLE MN TRAINED SPOTTER

0822 PM TSTM WND GST 1 SE GEORGEVILLE 45.43N 94.93W  
07/10/2011 M50.00 MPH STEARNS MN MESONET

0823 PM HAIL 5 NNW BOYD 44.92N 95.93W  
07/10/2011 M0.50 INCH LAC QUI PARLE MN TRAINED SPOTTER

0840 PM HAIL 6 SSE MONTEVIDEO 44.87N 95.69W  
07/10/2011 M0.88 INCH YELLOW MEDICINE MN TRAINED SPOTTER

0845 PM TSTM WND DMG 4 WSW PLEASANT BEACH 45.75N 94.81W  
07/10/2011 STEARNS MN TRAINED SPOTTER

ENTIRE ROW OF FULL GROWN 16 INCH DIAMETER TREES DOWN  
ALONG WITH WITH 2 TO 8 INCH BRANCHES.

0845 PM TSTM WND GST HANLEY FALLS 44.69N 95.62W  
07/10/2011 M62.00 MPH YELLOW MEDICINE MN MESONET

MNDOT HWY 23 AND MILE POST 94

0845 PM TSTM WND DMG 4 WSW PLEASANT BEACH 45.75N 94.81W  
07/10/2011 STEARNS MN TRAINED SPOTTER

POWER LINES DOWN.

0847 PM TORNADO 5 N ATWATER 45.21N 94.76W  
07/10/2011 KANDIYOHI MN NWS STORM SURVEY

ESTIMATED LOCATION AND TIME. MULTIPLE REPORTS OF A  
TORNADO ON THE GROUND IN THIS AREA. A DETAILED ACCOUNT  
INDICATED THIS WAS IN THE MIDDLE OF A FIELD THAT WAS  
UNREACHABLE TO THE SURVEY TEAM.

0848 PM	TSTM WND GST	CLARA CITY		44.96N 95.37W
07/10/2011	M51.00 MPH	CHIPPEWA	MN	MESONET
0855 PM	TSTM WND GST	4 ENE ALBANY		45.64N 94.49W
07/10/2011	M62.00 MPH	STEARNS	MN	TRAINED SPOTTER
TREES DOWN LARGE BRANCHES				
0855 PM	HAIL	SACRED HEART		44.78N 95.35W
07/10/2011	E0.75 INCH	RENVILLE	MN	TRAINED SPOTTER
SMALL BRANCHES DOWN				
0904 PM	TSTM WND DMG	WATKINS		45.31N 94.41W
07/10/2011		MEEKER	MN	LAW ENFORCEMENT
A FEW LARGE TREES DOWN.				
0913 PM	TSTM WND GST	ST AUGUSTA		45.44N 94.19W
07/10/2011	E50.00 MPH	STEARNS	MN	TRAINED SPOTTER
0915 PM	TSTM WND DMG	RENVILLE		44.79N 95.21W
07/10/2011		RENVILLE	MN	TRAINED SPOTTER
POWER OUT				
0922 PM	TSTM WND GST	ST CLOUD		45.55N 94.17W
07/10/2011	M64.00 MPH	STEARNS	MN	MESONET
STC AIRPORT ASOS				
0924 PM	TSTM WND GST	OLIVIA		44.78N 95.00W
07/10/2011	E64.00 MPH	RENVILLE	MN	MESONET
OVL AIRPORT AWOS ESTIMATED TIME.				
0925 PM	TSTM WND GST	REDWOOD FALLS		44.54N 95.11W
07/10/2011	M55.00 MPH	REDWOOD	MN	MESONET
RWF AIRPORT ASOS				
0930 PM	TSTM WND DMG	1 SE FRANKLIN		44.52N 94.87W
07/10/2011		RENVILLE	MN	TRAINED SPOTTER
DAMAGE OVER A 3/4 MILE PATH				
0950 PM	TSTM WND DMG	2 SW RAMSEY		45.24N 93.47W
07/10/2011		ANOKA	MN	TRAINED SPOTTER
30 FOOT PINE TREE SNAPPED OFF SUNDAY EVENING				
0950 PM	TSTM WND GST	MONTICELLO		45.30N 93.80W
07/10/2011	M55.00 MPH	WRIGHT	MN	TRAINED SPOTTER
I-94 AND COUNTY ROAD 18.				

1000 PM 07/10/2011	TSTM WND DMG	DAYTON HENNEPIN	MN	45.19N 93.47W TRAINED SPOTTER
				LARGE TREE DOWN.
1004 PM 07/10/2011	TSTM WND DMG	6 WSW FERNANDO SIBLEY	MN	44.63N 94.57W NWS STORM SURVEY
				NUMEROUS LARGE BRANCHES DOWNED ALONG WITH SEVERAL ROAD SIGNS BLOWN DOWN.
1005 PM 07/10/2011	TSTM WND GST M65.00 MPH	2 NE STEWART MCLEOD	MN	44.75N 94.46W TRAINED SPOTTER
1027 PM 07/10/2011	TSTM WND GST M49.00 MPH	MADELIA WATONWAN	MN	44.05N 94.42W MESONET
				MNDOT HIGHWAY 60 MILE POST 60
1030 PM 07/10/2011	TSTM WND DMG	ST JAMES WATONWAN	MN	43.98N 94.63W TRAINED SPOTTER
				TWO INCH DIAMETER TREE BRANCHES DOWN.
1042 PM 07/10/2011	TSTM WND DMG	1 SW HENDERSON SIBLEY	MN	44.52N 93.92W LAW ENFORCEMENT
				NUMEROUS POWERLINES DOWN THROUGHOUT THE COUNTY. A LARGE TREE DOWNED 1SW HENDERSON.
1045 PM 07/10/2011	TSTM WND DMG	EDINA HENNEPIN	MN	44.89N 93.36W TRAINED SPOTTER
				ONE FOOT DIAMETER TREE BRANCH FELLED.
1045 PM 07/10/2011	TSTM WND DMG	ANOKA ANOKA	MN	45.21N 93.39W TRAINED SPOTTER
				TEN INCH DIAMETER TREE DOWN.
1045 PM 07/10/2011	TSTM WND GST M54.00 MPH	HAMBURG CARVER	MN	44.73N 93.96W LAW ENFORCEMENT
1045 PM 07/10/2011	TSTM WND DMG	RAMSEY ANOKA	MN	45.26N 93.45W TRAINED SPOTTER
				10 INCH TREE DOWN.
1050 PM 07/10/2011	TSTM WND DMG	COLUMBIA HEIGHTS ANOKA	MN	45.05N 93.25W TRAINED SPOTTER
				POWER OUT 38TH TO 44TH CENTRAL AVE.
1100 PM 07/10/2011	TSTM WND DMG	FOREST LAKE WASHINGTON	MN	45.28N 92.99W TRAINED SPOTTER
				TWO INCH DIAMETER TREES DOWN.

1100 PM TSTM WND DMG LE SUEUR 44.46N 93.91W  
07/10/2011 LE SUEUR MN LAW ENFORCEMENT

TREES AND POWER LINES DOWN. SOME BUILDING DAMAGE.

1108 PM TSTM WND DMG LE SUEUR 44.46N 93.91W  
07/10/2011 LE SUEUR MN TRAINED SPOTTER

SEVERAL TWELVE INCH DIAMETER TREES DOWNED. OCCURRED IN DIFFERENT PARTS OF TOWN.

1120 PM TSTM WND GST WASECA 44.08N 93.50W  
07/10/2011 M59.00 MPH WASECA MN AWOS

1138 PM TSTM WND GST 1 N HAMMOND 44.99N 92.44W  
07/10/2011 M52.00 MPH ST. CROIX WI TRAINED SPOTTER

1200 AM TSTM WND DMG RED WING 44.58N 92.60W  
07/11/2011 GOODHUE MN LAW ENFORCEMENT

POWERLINE DOWN

1209 AM TSTM WND GST PINE ISLAND 44.20N 92.65W  
07/11/2011 M58.00 MPH GOODHUE MN TRAINED SPOTTER

MEASURED WITH ANEMOMETER.

1223 AM TSTM WND GST EAU GALLE 44.69N 92.01W  
07/11/2011 M74.00 MPH DUNN WI TRAINED SPOTTER

MEASURED WITH ANEMOMETER.

1228 AM TSTM WND DMG 3 N MENOMONIE 44.93N 91.91W  
07/11/2011 DUNN WI TRAINED SPOTTER

EIGHT INCH DIAMETER TREE TOPPLED ONTO POWERLINES.

1230 AM TSTM WND DMG 1 NW MENOMONIE 44.90N 91.93W  
07/11/2011 DUNN WI TRAINED SPOTTER

THREE INCH DIAMETER TREE FELL OVER ROAD.

1231 AM TSTM WND DMG 3 E BOYCEVILLE 45.04N 91.98W  
07/11/2011 DUNN WI TRAINED SPOTTER

PICK-UP TRUCK WITH TRAILER HAULING SEVERAL CANOES ROLLED OVER. OCCURRED ON HIGHWAY 170.

0100 AM TSTM WND DMG MENOMONIE 44.89N 91.91W  
07/11/2011 DUNN WI TRAINED SPOTTER

EIGHT INCH DIAMETER TREE TOPPLED OVER ROAD. OCCURRED ON 770TH AVE...BEWTEEN HWY 40 AND 808TH ST.