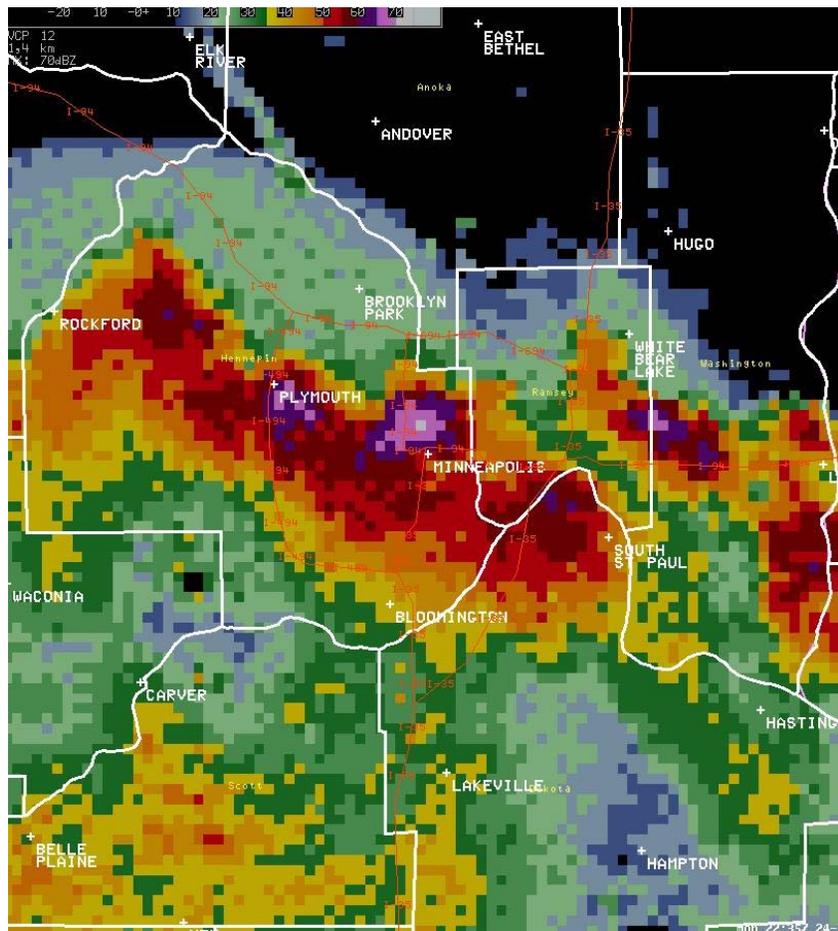


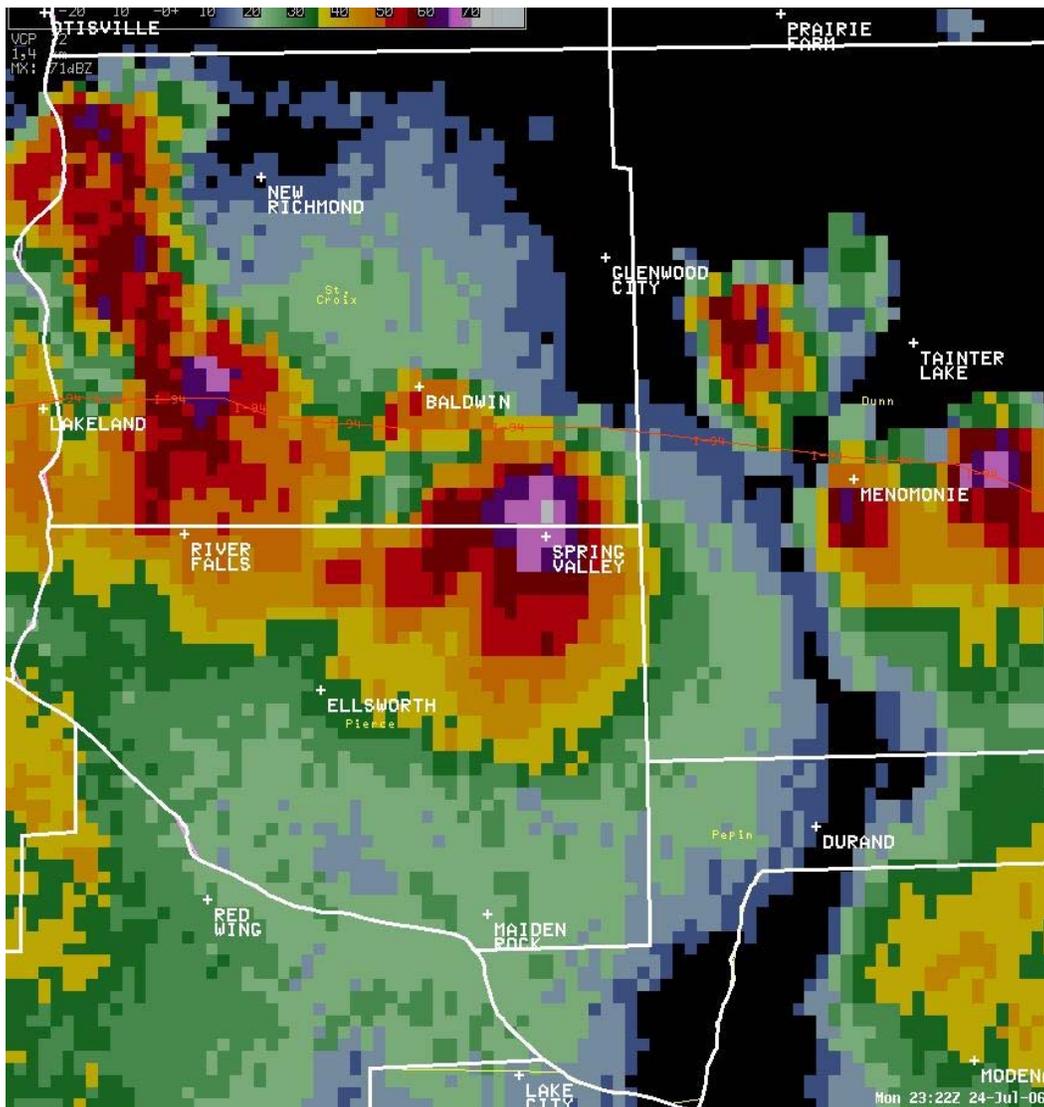
# Large Hail in the Twin Cities and Flooding Near Eau Claire July 24, 2006

## Event Synopsis

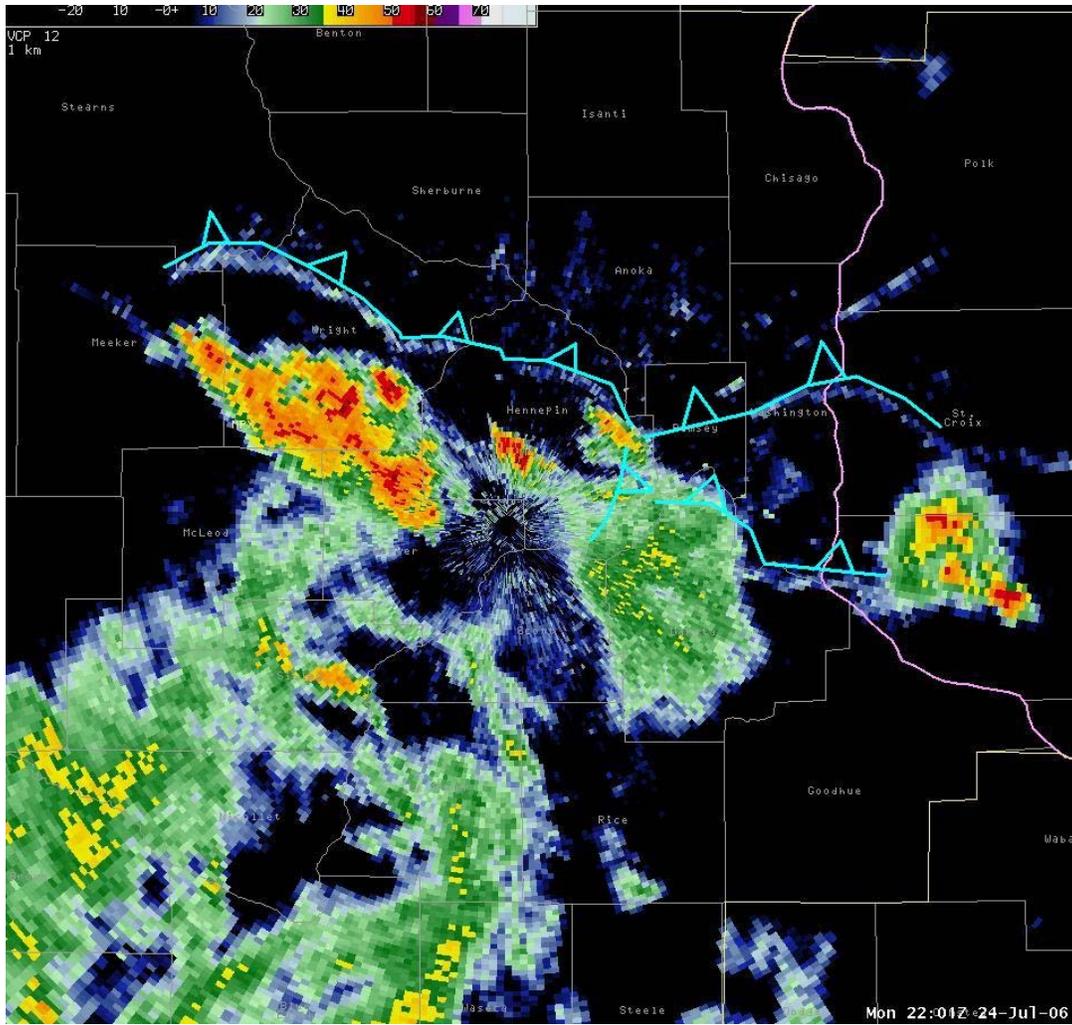
During the early afternoon on July 24th, a cold front moved slowly south across central Minnesota and northern Wisconsin. As this uplifted warm, moist, and unstable mid-summer air, thunderstorms initiated by 2:00 pm. As storms interacted with each other and tapped the maximum heating, the most intense thunderstorms developed between 4:00 and 7:00 pm.



This is an NWS Doppler Radar composite image from 5:35 pm. A composite image shows the highest (maximum) reflectivity, or reflected power from rain and hail, within a storm. Note the extremely high reflectivities within the storm just north of the heart of Minneapolis. Individual radar slices of the storm revealed much of this reflectivity was well above the freezing level at this point, indicating large hail growth. This is the storm that produced golf ball size hail at the University of Minnesota just 10 minutes after this image. These large reflectivities, or 'core' of the storm, collapsed quickly near the time this hail report was received. This collapse led to strong winds across Ramsey county. A gust of 62 mph was recorded at St. Paul airport and some tree damage was also reported in the city

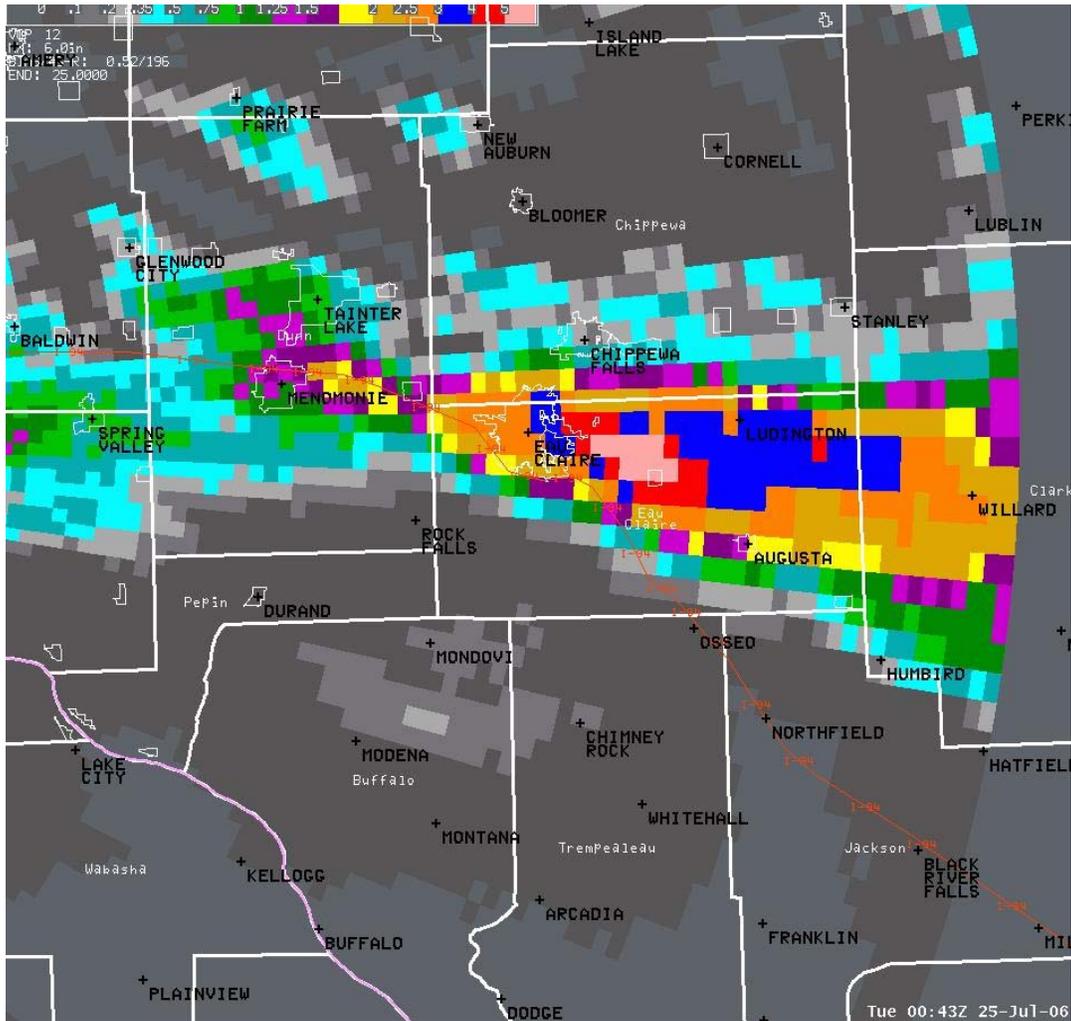


Another composite reflectivity image from the NWS Chanhassen Doppler Radar of a strong storm near 6:25 pm over Spring Valley, WI. This produced golf ball size hail soon after this image in Spring Valley. Note again the very high reflectivities. This storm updraft was further enhanced as a rain-cooled outflow from the strong storm over the Twin Cities (noted above) rushed eastward a half hour after its collapse.



This is a picture that gives a little further insight behind why the storm over Minneapolis intensified so rapidly. The image is a 0.5 degree reflectivity image from the Doppler Radar at 5:01 pm, or about 40 minutes prior to when the storm started producing significant hail near Minneapolis. Annotated on the image are boundaries, which NWS warning meteorologists keep a close eye on during severe weather situations. These are boundaries between rain-cooled air in place from earlier thunderstorms, and warm and unstable air in place from the summer afternoon heating. The intersection of three boundaries promoted further storm growth in the storm near downtown Minneapolis.

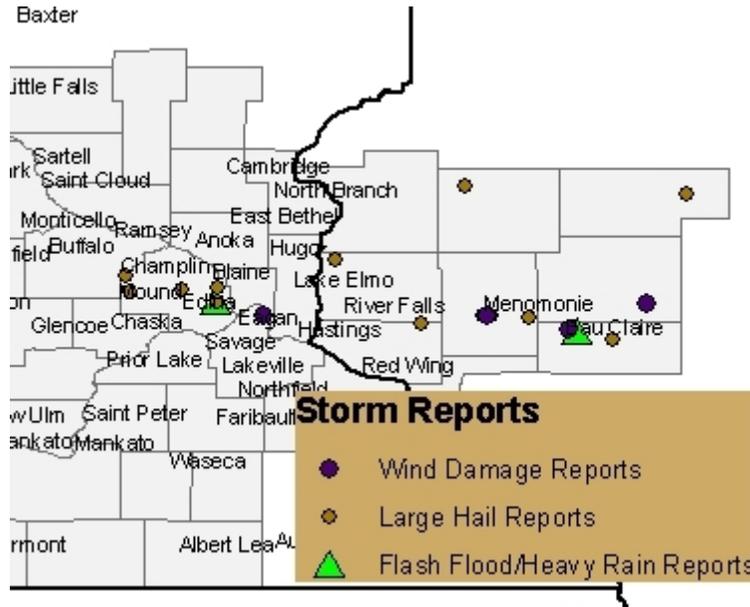
## Rainfall Amounts



The rainfall totals near Eau Claire, WI to the left are estimated from the KMPX Doppler Radar and during the time range from 415 to 715 pm. Estimates of over five inches are indicated near Altoona, which is just east of Eau Claire

Community	Rainfall (in.)/Time
Downtown Minneapolis, MN	1.75 in./3 hours
Eau Claire, WI	3.00 in./2 hours
Bloomer, WI	2.50 in./1.5 hours

## Storm Reports



The map above and the below listing are of severe weather reports received during or soon after the event by the National Weather Service from local government officials or trained storm spotters. These reports should be considered preliminary and are open to further quality controlling by NWS officials.

**PRELIMINARY LOCAL STORM REPORT...SUMMARY  
 NATIONAL WEATHER SERVICE TWIN CITIES/CHANHASSEN MN  
 1018 PM CDT MON JUL 24 2006**

..TIME...	...EVENT...	...CITY LOCATION...	...LAT.LON...
..DATE...	....MAG....	..COUNTY LOCATION..ST..	...SOURCE....
..REMARKS..			
0110 PM	HAIL	GLEN FLORA	45.50N 90.89W
07/24/2006	E0.88 INCH	RUSK WI	TRAINED SPOTTER
0155 PM	HAIL	SHELDON	45.31N 90.96W
07/24/2006	M1.25 INCH	RUSK WI	TRAINED SPOTTER
0240 PM	HAIL	CUMBERLAND	45.54N 92.02W
07/24/2006	E0.75 INCH	BARRON WI	LAW ENFORCEMENT
HAIL STILL FALLING AS OF 250 PM.			
0254 PM	HAIL	CUMBERLAND	45.54N 92.02W
07/24/2006	M0.88 INCH	BARRON WI	TRAINED SPOTTER
0420 PM	HAIL	3 W MAPLE PLAIN	45.01N 93.72W
07/24/2006	E0.88 INCH	HENNEPIN MN	TRAINED SPOTTER
0511 PM	HAIL	MONTROSE	45.07N 93.91W
07/24/2006	E0.75 INCH	WRIGHT MN	FIRE DEPT/RESCUE
0524 PM	HAIL	1 W ROCKFORD	45.09N 93.76W
07/24/2006	E0.75 INCH	WRIGHT MN	FIRE DEPT/RESCUE

0525 PM	HAIL	ROCKFORD		45.09N 93.74W
07/24/2006	E0.75 INCH	HENNEPIN	MN	TRAINED SPOTTER
0525 PM	HAIL	FALL CREEK		44.76N 91.27W
07/24/2006	E0.75 INCH	EAU CLAIRE	WI	TRAINED SPOTTER
0530 PM	HAIL	MINNEAPOLIS		44.96N 93.27W
07/24/2006	E1.75 INCH	HENNEPIN	MN	TRAINED SPOTTER
REPORTED NEAR BROADWAY AND MARSHALL IN NORTHEAST MPLS.				
0536 PM	HAIL	PLYMOUTH		45.02N 93.46W
07/24/2006	E0.75 INCH	HENNEPIN	MN	AMATEUR RADIO
0543 PM	TSTM WND GST	ST PAUL		44.95N 93.10W
07/24/2006	M62.00 MPH	RAMSEY	MN	ASOS
MEASURED AT THE ST PAUL AIRPORT				
0545 PM	TSTM WND DMG	SOUTH ST PAUL		44.89N 93.04W
07/24/2006		DAKOTA	MN	TRAINED SPOTTER
FOURTEEN INCH DIAMETER TREE BRANCH TOPPLED ONTO A CAR ON WARBURTON AVE.				
0545 PM	HAIL	MINNEAPOLIS		44.96N 93.27W
07/24/2006	E1.75 INCH	HENNEPIN	MN	TRAINED SPOTTER
REPORTED AT THE UNIVERSITY OF MINNESOTA CAMPUS.				
0546 PM	TSTM WND DMG	ST PAUL		44.95N 93.10W
07/24/2006		RAMSEY	MN	TRAINED SPOTTER
SIX INCH TREE DOWN.				
0549 PM	HAIL	MINNEAPOLIS		44.96N 93.27W
07/24/2006	E1.00 INCH	HENNEPIN	MN	TRAINED SPOTTER
REPORTED NEAR THE METRODOME.				
0554 PM	HAIL	ST PAUL		44.95N 93.10W
07/24/2006	E0.88 INCH	RAMSEY	MN	TRAINED SPOTTER
0556 PM	HAIL	ST PAUL		44.95N 93.10W
07/24/2006	E1.50 INCH	RAMSEY	MN	TRAINED SPOTTER
0603 PM	HEAVY RAIN	MINNEAPOLIS		44.96N 93.27W
07/24/2006	M2.48 INCH	HENNEPIN	MN	TRAINED SPOTTER
NEAR 38TH AND LONGFELLOW SOUTH.				
0605 PM	HAIL	MENOMONIE		44.89N 91.91W
07/24/2006	M1.25 INCH	DUNN	WI	TRAINED SPOTTER
HAILED FROM 1 W MENOMONIE TO NORTH SIDE OF MENOMONIE.				
0606 PM	HEAVY RAIN	MINNEAPOLIS		44.96N 93.27W
07/24/2006	M1.75 INCH	HENNEPIN	MN	TRAINED SPOTTER
1.75 INCHES OF RAIN IN 45 MINUTES NEAR LAKE HARRIET.				
0614 PM	HAIL	MENOMONIE		44.89N 91.91W
07/24/2006	E1.00 INCH	DUNN	WI	TRAINED SPOTTER
0624 PM	HAIL	3 N SOMERSET		45.17N 92.68W
07/24/2006	E0.75 INCH	ST. CROIX	WI	TRAINED SPOTTER

NEAR HIGHWAY 35 AND 210TH.

0626 PM HAIL 1 E MENOMONIE 44.89N 91.89W  
07/24/2006 E1.50 INCH DUNN WI TRAINED SPOTTER

0627 PM HAIL EAU CLAIRE 44.82N 91.49W  
07/24/2006 M1.00 INCH EAU CLAIRE WI TRAINED SPOTTER

0628 PM HAIL SPRING VALLEY 44.85N 92.24W  
07/24/2006 E1.75 INCH PIERCE WI LAW ENFORCEMENT

0630 PM HAIL ELK MOUND 44.88N 91.69W  
07/24/2006 M1.00 INCH DUNN WI TRAINED SPOTTER

0632 PM TSTM WND DMG EAU CLAIRE 44.82N 91.49W  
07/24/2006 EAU CLAIRE WI LAW ENFORCEMENT

SCATTERED POWER LINES AND TELEPHONE LINES FELLED FROM 3  
MILES WEST OF EAU CLAIRE TO THE NORTHWEST PORTION OF  
TOWN.

0635 PM HAIL EAU CLAIRE 44.82N 91.49W  
07/24/2006 M0.75 INCH EAU CLAIRE WI TRAINED SPOTTER  
LOCATED ON WEST SIDE OF TOWN.

0643 PM HAIL EAU CLAIRE 44.82N 91.49W  
07/24/2006 E0.75 INCH EAU CLAIRE WI TRAINED SPOTTER  
HAIL OCCURRED ON WEST SIDE OF EAU CLAIRE...AND LASTED FOR  
ABOUT 10 MINUTES.

0645 PM HAIL EAU CLAIRE 44.82N 91.49W  
07/24/2006 E1.00 INCH EAU CLAIRE WI TRAINED SPOTTER  
HAIL OCCURRED OVER WESTERN PORTION OF EAU CLAIRE.

0645 PM HAIL SPRING VALLEY 44.85N 92.24W  
07/24/2006 E2.00 INCH PIERCE WI TRAINED SPOTTER  
TWO TO THREE INCH BRANCHES WERE ALSO REPORTED DOWN.

0645 PM HAIL EAU CLAIRE 44.82N 91.49W  
07/24/2006 E1.00 INCH EAU CLAIRE WI TRAINED SPOTTER

0645 PM HAIL 1 NE EAU CLAIRE 44.83N 91.48W  
07/24/2006 E0.75 INCH EAU CLAIRE WI TRAINED SPOTTER

0651 PM TSTM WND DMG MENOMONIE 44.89N 91.91W  
07/24/2006 DUNN WI AMATEUR RADIO  
EIGHT INCH TREE DOWN AT HIGH SCHOOL.

0655 PM FLASH FLOOD ALTOONA 44.81N 91.44W  
07/24/2006 EAU CLAIRE WI AMATEUR RADIO  
CARS STALLED IN AT LEAST 1 FOOT OF WATER BETWEEN EAU  
CLAIRE AND ALTOONA NEAR FAIRFAX STREET. BOAT FLOATED OFF  
OF TRAILER.

0730 PM HAIL EAU CLAIRE 44.82N 91.49W  
07/24/2006 E1.00 INCH EAU CLAIRE WI TRAINED SPOTTER  
ON WEST SIDE OF EAU CLAIRE.

0830 PM HEAVY RAIN BLOOMER 45.10N 91.49W  
07/24/2006 M2.50 INCH CHIPPEWA WI TRAINED SPOTTER  
2.50 INCHES OF RAIN BETWEEN 700 PM AND 830 PM.