National Weather Service Grand Rapids Event Summary

High Impact Blizzard

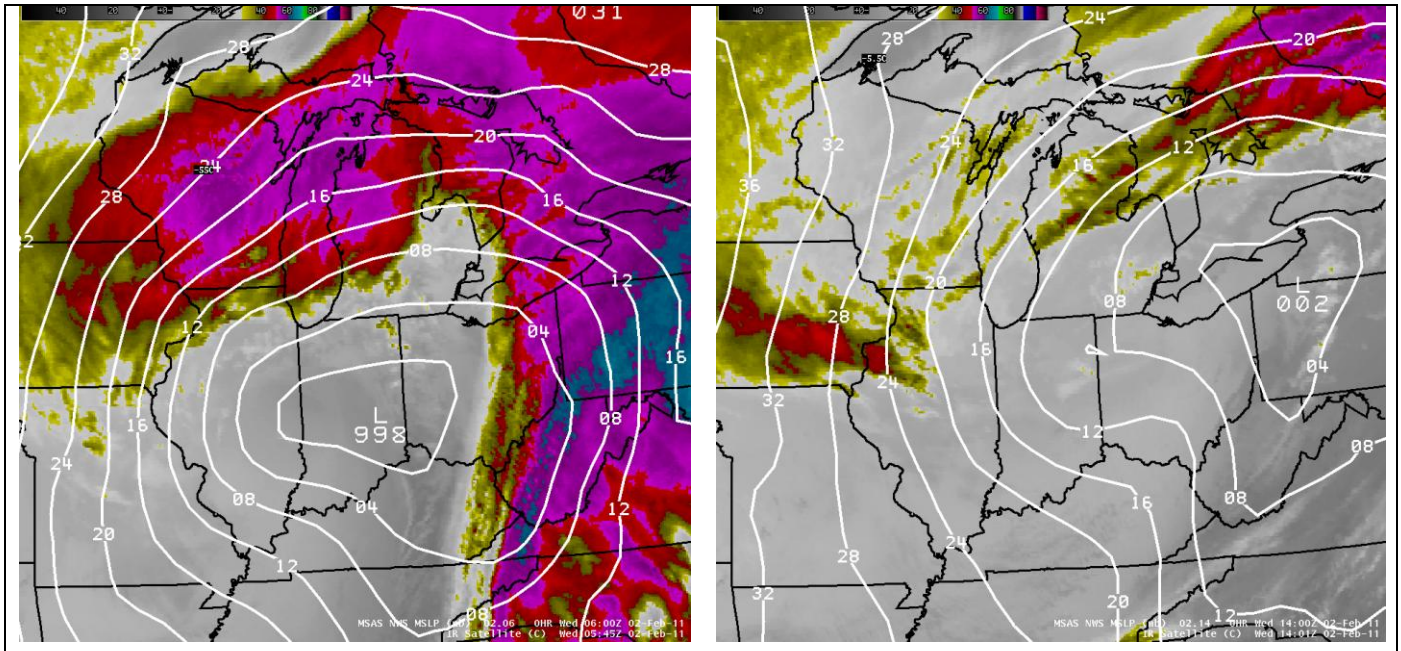
Tuesday 02/01/11 – Wednesday 02/02/11

Overview

A major winter storm affected Southwest Lower Michigan with several hours of blizzard conditions during the early morning hours on February 2nd. Strong northeast winds resulted in snow drifts that were four to five feet in some areas. The impact was very significant. There were closures of hundreds of schools and businesses, and even the Grand Rapids International airport. Traffic remained paralyzed in many areas due to the drifting of the snow.

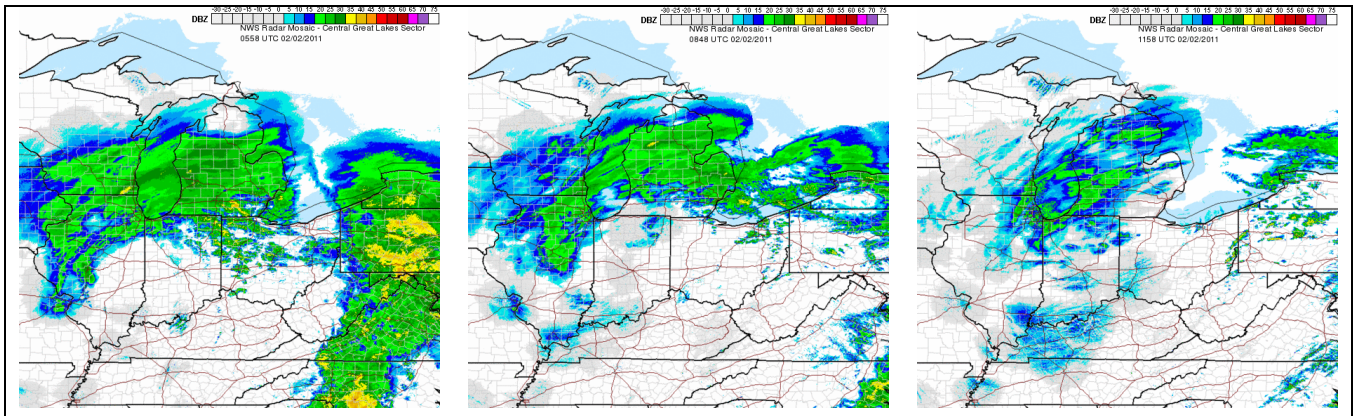
Satellite and radar data

A strong low pressure system moved northeast from the central U.S. towards the Ohio Valley overnight on the 2nd (Fig. 1). Bright colors in Fig. 1 are associated with deep clouds and precipitation, which was in the form of all snow over Southwest Lower Michigan. As the low pressure center moved towards eastern Lake Erie by late morning (Fig. 1a), snow persisted across the area (Fig. 2c).



a) 1 AM EST b) 9 AM EST

Fig. 1. Infrared satellite images and sea level pressure at selected times on February 2nd, 2011.



a) 1 AM EST b) 4 AM EST c) 7 AM EST

Fig. 2. Radar images at selected times on February 2nd, 2011.

Radar Estimated Storm Total Snow

A large area of greater than 10 inches of snow fell across much of Southwest Lower Michigan. On the following page is a radar estimated storm total snowfall graphic. It is typical for the radar to under-estimate snowfall at greater distances (e.g., north of Muskegon) due to the radar beam being too high to detect snowfall. This effect is documented by comparing Fig. 2 to the 24 hour estimated snowfall in Fig. 3.

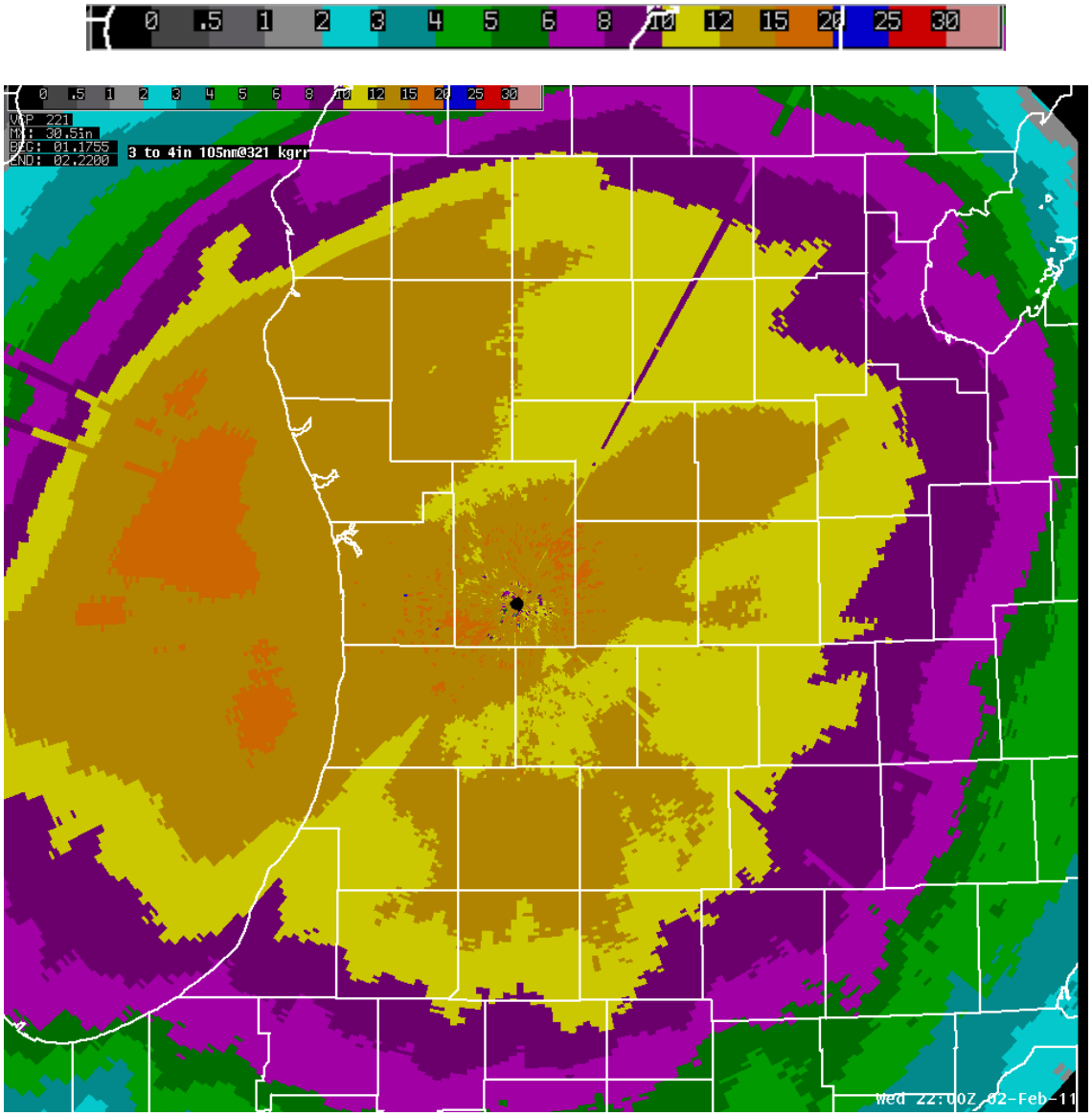


FIG. 3. Radar estimated snowfall ending at 5 PM February 2nd, 2011. Color scale at the top is inches of snowfall.

Preliminary Storm Total Snow Map Using Ground Truth Observations

During snowfall events, the National Weather Service in Grand Rapids receives snowfall reports from Cooperative Observers, the CoCoRahs network, local law enforcement agencies, volunteer spotters, and road commissions. From these, we attempt to illustrate the spatial distribution of the snowfall for the counties we serve. The unofficial, preliminary map below (Fig 4.) represents the National Weather Service's best estimate of how much snow fell across southwest Michigan during the blizzard. It may be updated again once we receive more reports.

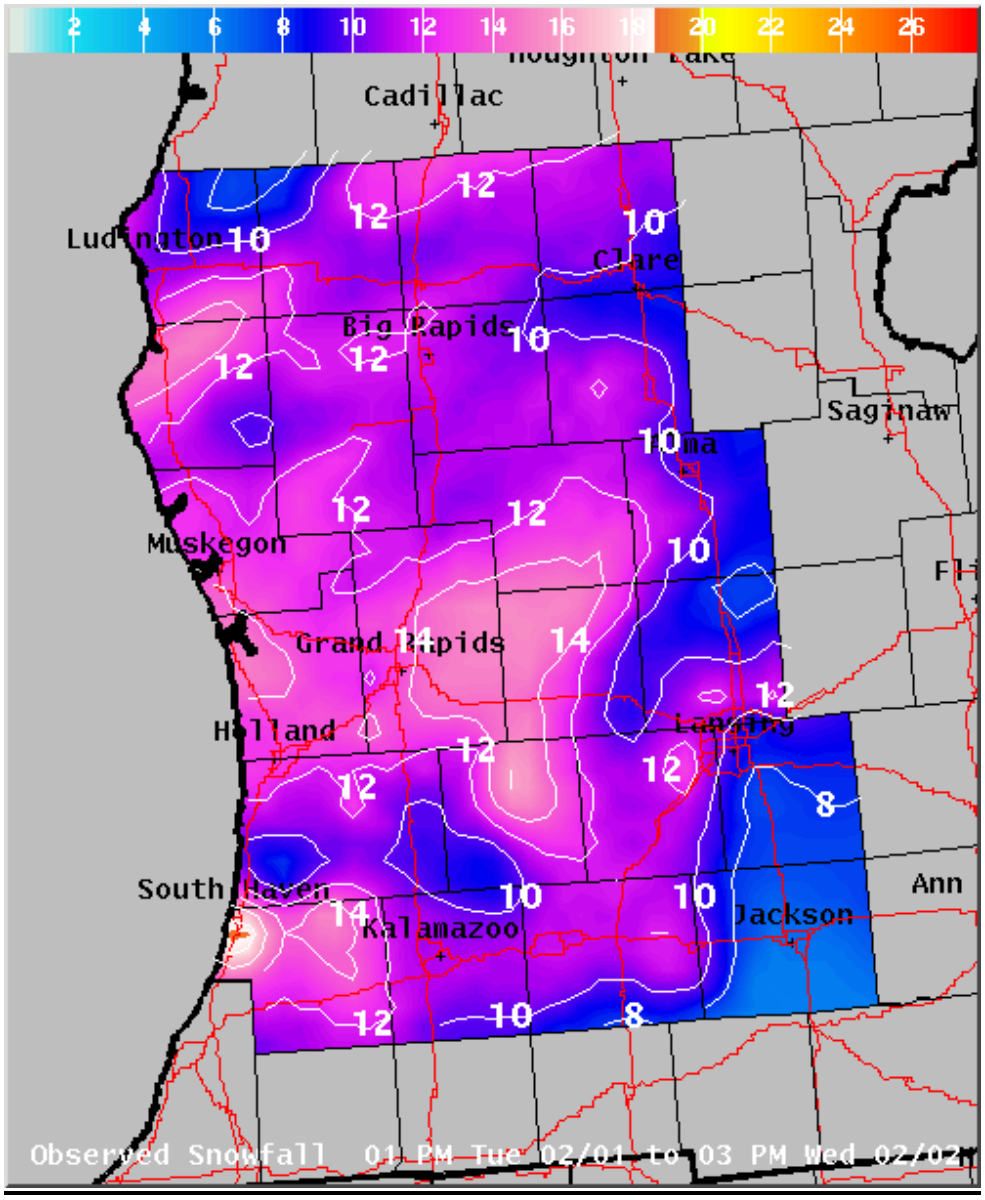


FIG. 4. Preliminary Snow Map using ground truth reports.

Preliminary Storm Total Map in a Regional Sense

The map below (Fig. 5) is similar to the previous one in how it was derived, just in a more regional sense. It shows the swath of very heavy snow from Missouri to Michigan, following the track of the low pressure system. It should still be considered preliminary since more reports may come in through Thursday.

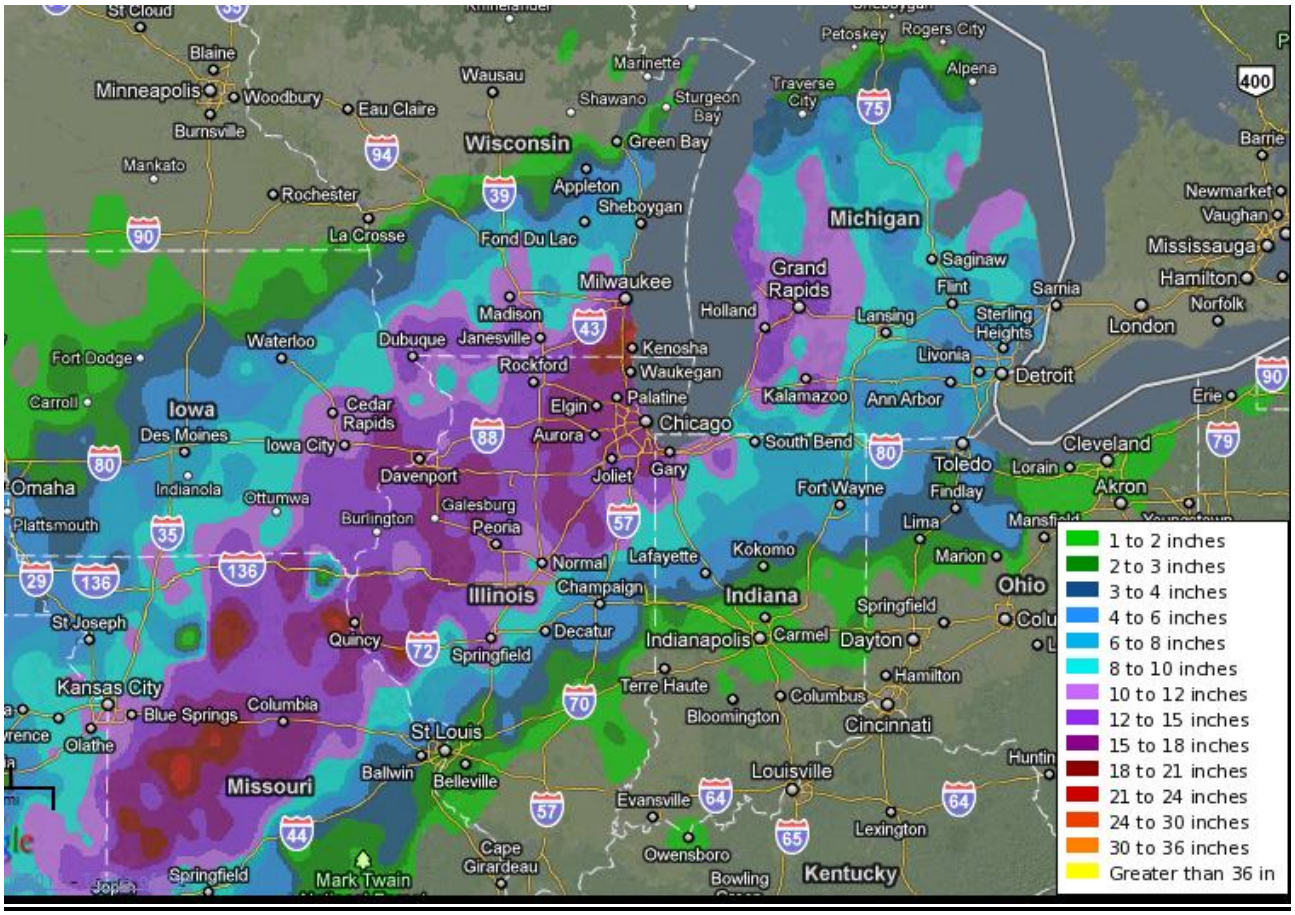


FIG. 5. Preliminary Regional Snow Map

Local Storm Reports

SNOW REPORTS

LOCATION	OBSERVED VALUE	TIME/DATE OF OBSERVATION	LAT	LON
MICHIGAN				
...ALLEGAN COUNTY...				
2 W WAYLAND	7.5 M	700 AM 02/02	42.67N	85.68W
MARTIN	9.0 M	348 PM 02/02	42.54N	85.64W
PLAINWELL	9.0 M	905 AM 02/02	42.44N	85.64W
OTSEGO	10.0 M	348 PM 02/02	42.46N	85.70W
PLAINWELL	10.0 E	246 PM 02/02	42.44N	85.64W
DORR	17.0 M	222 PM 02/02	42.73N	85.72W
...BARRY COUNTY...				
HASTINGS	10.0 M	400 AM 02/02	42.65N	85.29W
YANKEE SPRINGS	10.0 M	548 AM 02/02	42.62N	85.49W
4 SSE MIDDLEVILLE	10.5 M	700 AM 02/02	42.66N	85.43W
HASTINGS	10.5 M	213 AM 02/02	42.65N	85.29W
YANKEE SPRINGS	13.0 M	348 PM 02/02	42.62N	85.49W
HASTINGS	16.0 E	354 PM 02/02	42.65N	85.29W
...CALHOUN COUNTY...				
MARSHALL	3.0 M	945 PM 02/01	42.27N	84.96W
1 ENE MARSHALL	7.8 M	1145 AM 02/02	42.28N	84.95W
3 E BATTLE CREEK	8.5 M	655 AM 02/02	42.32N	85.14W
5 ESE BATTLE CREEK	9.5 M	115 PM 02/02	42.30N	85.11W
2 ESE BATTLE CREEK	11.5 M	1030 AM 02/02	42.31N	85.17W
...CLINTON COUNTY...				
5 SW LAINGSBURG	8.0 M	730 AM 02/02	42.84N	84.42W
5 NNW LANSING	12.2 M	100 PM 02/02	42.80N	84.58W
...EATON COUNTY...				
1 SSW GRAND LEDGE	11.0 M	1220 PM 02/02	42.73N	84.76W
BELLEVUE	11.0 M	140 PM 02/02	42.44N	85.02W
DIMONDALE	11.7 M	735 AM 02/02	42.65N	84.65W
DIMONDALE	13.3 M	230 PM 02/02	42.65N	84.65W
DIMONDALE	13.3 M	305 PM 02/02	42.65N	84.65W
...GRATIOT COUNTY...				
ALMA	6.2 M	1100 AM 02/02	43.38N	84.66W
...INGHAM COUNTY...				
4 ENE HOLT	7.0 M	941 AM 02/02	42.66N	84.45W
6 W STOCKBRIDGE	8.0 E	1200 AM 02/02	42.45N	84.30W
...ISABELLA COUNTY...				
MOUNT PLEASANT	11.0 M	348 PM 02/02	43.60N	84.77W
...JACKSON COUNTY...				
4 W HANOVER	4.0 M	800 AM 02/02	42.10N	84.63W
JACKSON	4.0 M	1130 PM 02/01	42.25N	84.41W
5 SE HORTON	6.1 M	900 AM 02/02	42.10N	84.45W
...KALAMAZOO COUNTY...				
4 NE SCHOOLCRAFT	0.0 U	1210 AM 02/02	42.16N	85.57W
10 SW KALAMAZOO	4.0 M	945 PM 02/01	42.18N	85.73W
3 NE KALAMAZOO	5.0 M	1142 PM 02/01	42.31N	85.55W
KALAMAZOO	7.0 M	1246 AM 02/02	42.28N	85.59W
6 E KENDALL	9.0 E	1100 AM 02/02	42.36N	85.70W
OSHTEMO	11.0 M	700 AM 02/02	42.26N	85.68W
...KENT COUNTY...				
1 SW CUTLERVILLE	0.0 U	1230 PM 02/02	42.83N	85.68W
KENTWOOD	2.5 M	900 PM 02/01	42.90N	85.59W
LOWELL	4.5 M	1222 AM 02/02	42.93N	85.34W
4 WNW CALEDONIA	9.0 M	740 AM 02/02	42.81N	85.59W

1 SSW EAST GRAND RAPIDS	10.0 M	700 AM	02/02	42.93N	85.62W
LOWELL	10.0 M	257 AM	02/02	42.93N	85.34W
3 NE BYRON CENTER	11.0 M	700 AM	02/02	42.84N	85.68W
EAST GRAND RAPIDS	12.1 M	156 PM	02/02	42.94N	85.61W
GRANDVILLE	12.5 M	135 PM	02/02	42.91N	85.76W
4 E HUDSONVILLE	13.0 M	1205 PM	02/02	42.88N	85.79W
3 WSW CANNONSBURG	14.0 E	847 AM	02/02	43.04N	85.52W
4 E KENTWOOD	16.0 M	100 PM	02/02	42.90N	85.51W
4 ESE CEDAR SPRINGS	17.5 M	300 PM	02/02	43.20N	85.49W
...LAKE COUNTY...					
BALDWIN	10.0 M	600 AM	02/02	43.90N	85.85W
...MASON COUNTY...					
SCOTTVILLE	10.0 M	625 AM	02/02	43.95N	86.28W
...MECOSTA COUNTY...					
PARIS	7.0 M	625 AM	02/02	43.77N	85.50W
1 ENE BIG RAPIDS	7.3 M	800 AM	02/02	43.70N	85.46W
PARIS	10.0 E	1230 PM	02/02	43.77N	85.50W
STANWOOD	12.0 E	1230 PM	02/02	43.58N	85.45W
...MONTCALM COUNTY...					
GREENVILLE	12.8 M	1150 AM	02/02	43.18N	85.26W
GREENVILLE	14.0 M	1154 AM	02/02	43.18N	85.26W
...MUSKEGON COUNTY...					
MUSKEGON	6.0 M	1222 AM	02/02	43.22N	86.25W
NORTON SHORES	7.5 M	137 AM	02/02	43.16N	86.26W
NORTON SHORES	8.0 E	303 AM	02/02	43.16N	86.26W
3 ESE WOLF LAKE	11.0 M	700 AM	02/02	43.24N	86.05W
MUSKEGON	11.0 M	353 AM	02/02	43.22N	86.25W
NORTON SHORES	11.0 M	301 PM	02/02	43.16N	86.26W
5 SSE TWIN LAKE	12.0 M	911 AM	02/02	43.30N	86.13W
MUSKEGON	13.5 M	230 AM	02/02	43.22N	86.25W
FRUITPORT	14.0 E	354 PM	02/02	43.13N	86.16W
MUSKEGON	14.0 M	320 AM	02/02	43.22N	86.25W
4 NW WOLF LAKE	19.7 M	302 PM	02/02	43.29N	86.16W
...NEWAYGO COUNTY...					
6 NE GRANT	9.0 E	1030 AM	02/02	43.40N	85.73W
CROTON	11.0 M	657 AM	02/02	43.44N	85.66W
...OCEANA COUNTY...					
4 NNE WALKERVILLE	8.4 M	700 AM	02/02	43.77N	86.09W
7 N HESPERIA	9.7 M	1100 AM	02/02	43.67N	86.04W
3 WSW HART	14.0 M	419 AM	02/02	43.68N	86.42W
3 WSW HART	14.0 M	700 AM	02/02	43.68N	86.42W
...OTTAWA COUNTY...					
4 NNE HOLLAND	9.5 M	600 AM	02/02	42.84N	86.08W
4 NNW HOLLAND	10.5 M	800 AM	02/02	42.84N	86.14W
1 SSW ALLENDALE	11.0 M	800 AM	02/02	42.96N	85.96W
5 W HOLLAND	13.0 M	725 AM	02/02	42.78N	86.20W
3 W WALKER	13.5 M	630 AM	02/02	43.00N	85.83W
HUDSONVILLE	14.0 M	330 AM	02/02	42.87N	85.87W
3 S GRAND HAVEN	14.8 M	851 AM	02/02	43.02N	86.22W
HUDSONVILLE	18.0 M	730 AM	02/02	42.87N	85.87W
...VAN BUREN COUNTY...					
4 NNE PAW PAW	7.0 M	700 AM	02/02	42.27N	85.86W
2 N LAWTON	11.0 E	600 AM	02/02	42.20N	85.85W
PAW PAW	13.0 M	1005 AM	02/02	42.22N	85.89W
5 SW PAW PAW	13.8 M	1100 AM	02/02	42.17N	85.96W
2 E SOUTH HAVEN	18.0 M	411 PM	02/02	42.40N	86.24W
SOUTH HAVEN	20.0 M	411 PM	02/02	42.40N	86.28W

NON-TSTM WND GST REPORTS

LOCATION	WIND GUST (MPH)	TIME/DATE OF OBSERVATION	LAT	LON
MICHIGAN				

...ALLEGAN COUNTY...					
ALLEGAN	40.00 M	802 PM	02/01	42.53N	85.86W
2 S HOLLAND	44.00 M	1232 AM	02/02	42.75N	86.11W
...CALHOUN COUNTY...					
1 SSE MARSHALL	32.00 M	1116 PM	02/01	42.26N	84.96W
1 NW BATTLE CREEK	40.00 M	1107 PM	02/01	42.33N	85.21W
...CLINTON COUNTY...					
5 NNW LANSING	43.00 M	324 AM	02/02	42.80N	84.58W
...EATON COUNTY...					
1 ENE CHARLOTTE	43.00 M	1015 PM	02/01	42.57N	84.82W
...GRATIOT COUNTY...					
3 E ALMA	43.00 M	100 AM	02/02	43.38N	84.61W
4 SSW ALMA	44.00 M	955 PM	02/01	43.32N	84.69W
3 E ALMA	55.00 M	300 AM	02/02	43.38N	84.60W
...INGHAM COUNTY...					
2 SE MASON	35.00 M	1012 PM	02/01	42.56N	84.42W
...IONIA COUNTY...					
IONIA	44.00 M	913 PM	02/01	42.98N	85.06W
...ISABELLA COUNTY...					
1 NE MOUNT PLEASANT	33.00 M	755 PM	02/01	43.61N	84.76W
...JACKSON COUNTY...					
3 WNW JACKSON	36.00 M	1007 PM	02/01	42.26N	84.46W
...KALAMAZOO COUNTY...					
4 SSE KALAMAZOO	40.00 M	851 PM	02/01	42.23N	85.56W
...KENT COUNTY...					
EAST GRAND RAPIDS	46.00 M	643 PM	02/01	42.94N	85.61W
3 SSW CASCADE	49.00 M	923 PM	02/01	42.88N	85.52W
...MASON COUNTY...					
2 ENE LUDINGTON	33.00 M	415 AM	02/02	43.97N	86.41W
BIG SABLE POINT	53.00 M	720 AM	02/02	44.06N	86.51W
...MECOSTA COUNTY...					
2 NW BIG RAPIDS	29.00 M	955 PM	02/01	43.72N	85.51W
2 NNW BIG RAPIDS	33.00 M	554 AM	02/02	43.72N	85.50W
...MUSKEGON COUNTY...					
4 S MUSKEGON	41.00 M	657 PM	02/01	43.17N	86.24W
4 W MUSKEGON	45.00 M	150 AM	02/02	43.23N	86.34W
...NEWAYGO COUNTY...					
3 SW FREMONT	39.00 M	152 AM	02/02	43.44N	85.99W
...VAN BUREN COUNTY...					
4 SSE SOUTH HAVEN	39.00 M	1054 PM	02/01	42.35N	86.25W