

March 2008 Climate Narrative for Southwest Lower Michigan

Overview

March of 2008 will most be remembered for being cooler, and for most of the month drier than normal. March of 2008 was only the coolest March since 2005. Out of the past 10 Marches, only 2 were cooler than this March; 2005, and 2002. This was the first time since the fall of 2006 that two months, back to back were colder than normal in southwest Lower Michigan.

For the most part, March 2008 was drier than normal nearly till the end of the month. A system the last two days of the month produced enough rainfall to bring most of the area up to around normal however. Even with that storm, most of southwest Lower Michigan ended up drier than normal (see Figure 5.) Snowfall was greatly reduced compared to the winter months of December, January and February. A major change in the jet stream sent most of the storms just south of Michigan.

Unlike the winter months, March had more dry days than wet. Only a third of the days of March had measurable precipitation.

Table 1. Temperature, precipitation, and snowfall amounts for March 2008.

Location		Temperature (degrees F)	Precipitation (inches)	Snowfall (inches)
Grand Rapids	<i>Reported</i>	32.8	2.47	9.2
	<i>Normal</i>	34.6	2.59	9.0
	<i>Departure</i>	-1.8	-0.12	+0.2
Lansing	<i>Reported</i>	31.9	2.38	7.0
	<i>Normal</i>	33.9	2.33	8.7
	<i>Departure</i>	-2.0	+0.05	-1.7
Muskegon	<i>Reported</i>	31.7	3.16	8.5
	<i>Normal</i>	34.0	2.36	11.1
	<i>Departure</i>	-2.3	+0.80	-2.6

Temperatures

March featured mostly colder than normal temperatures. This cold weather trend started in late January, and continued through February and March (see figure 1 below). The two week moving average (light brown line) is mostly below zero (normal) from late January through the end of March.

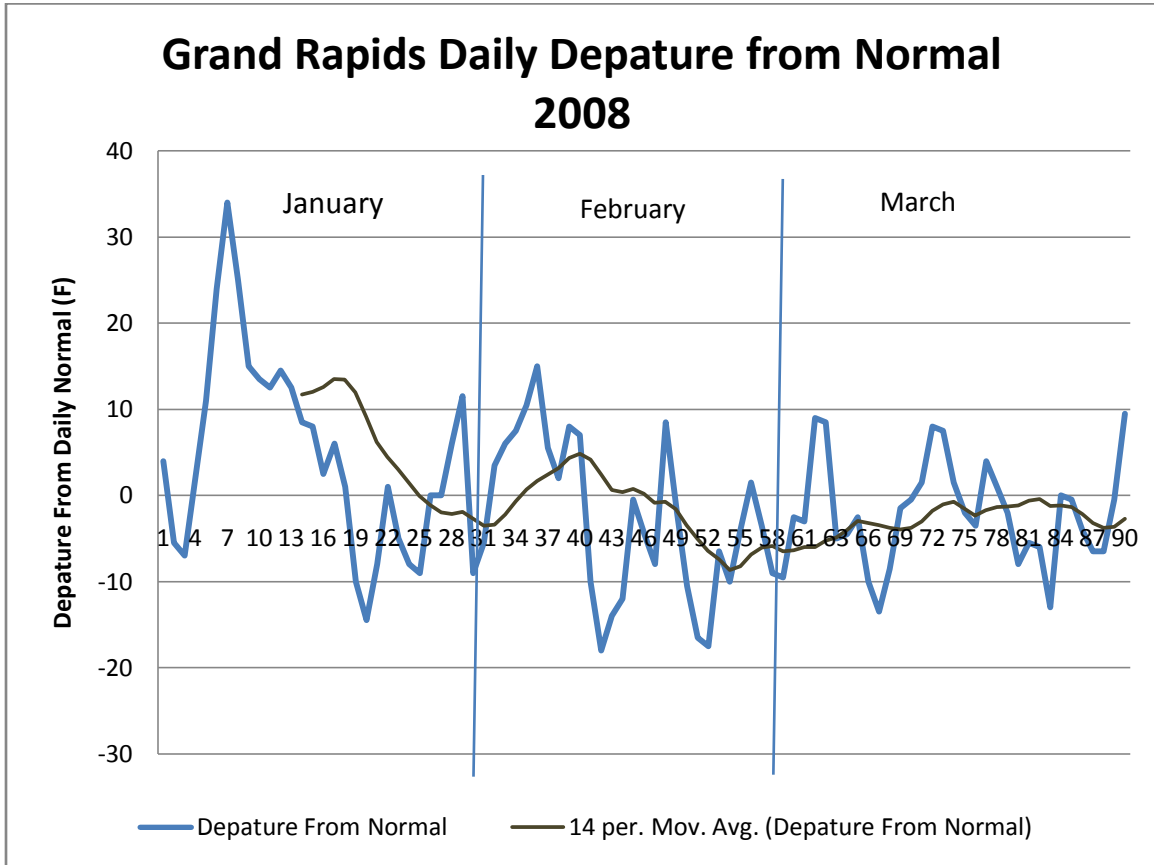
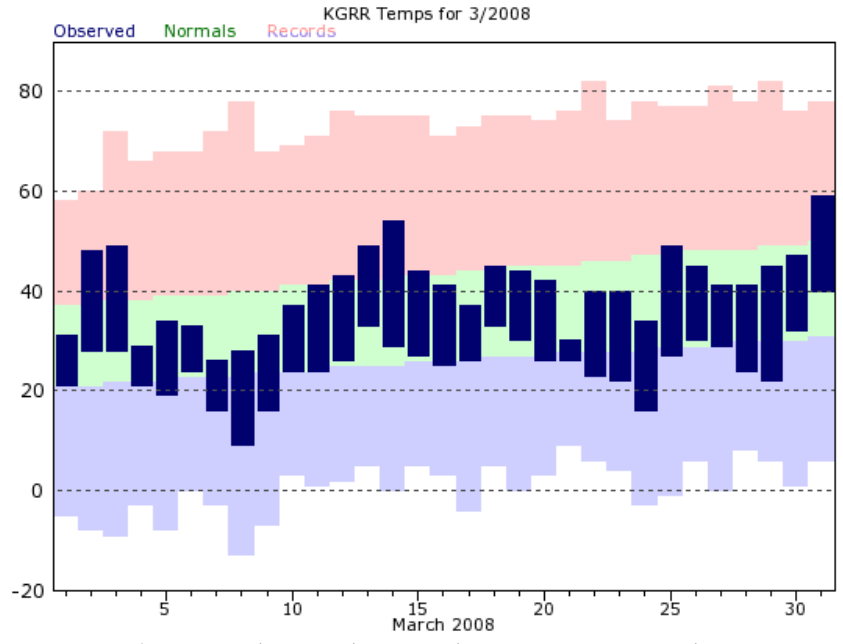
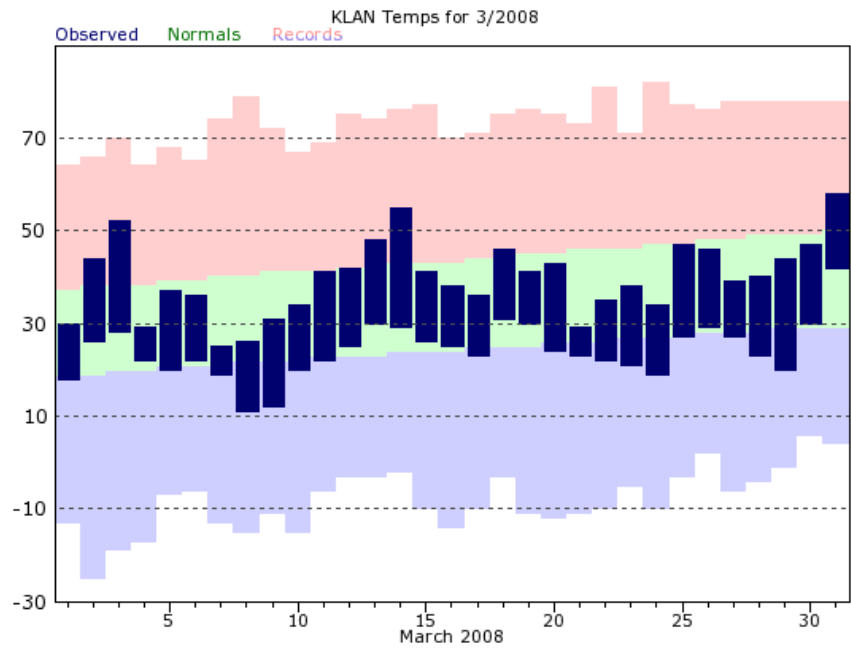


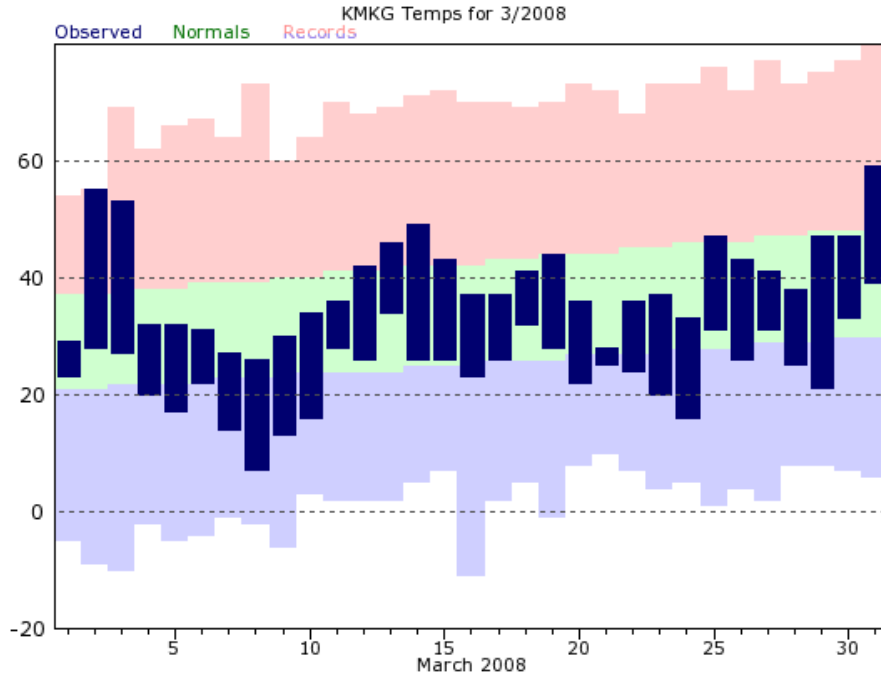
Figure 1: January through March Grand Rapids Daily Departure from Normal.



a) Grand Rapids March Temperature Plot



b) Lansing March Temperature Plot



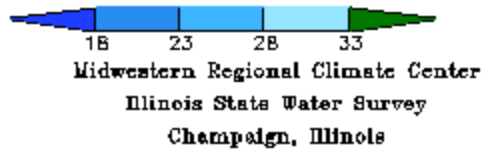
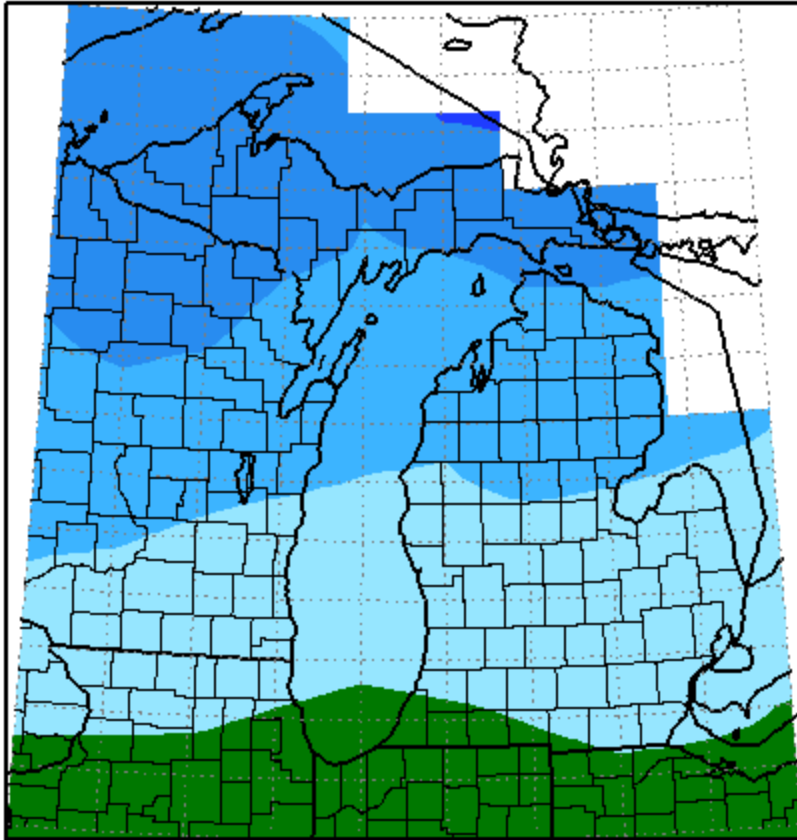
c) Muskegon March Temperature Plot

Figure. 2: The Grand Rapids (a), Lansing (b), Muskegon (c) daily temperatures for March of 2008. Dark blue bars represent the temperature range recorded for each day. The green area represents the normal range of temperatures. The upper (lower) bound of the pink (blue) shaded area represents the record maximum (minimum) temperature for that day.

There were only truly 2 warm periods. Both lasted only 2 days, the first warm spell began on the 3rd and lasted through the 4th. Both days were nearly 10 degrees warmer than normal. The second short warm spell began on the 13th and lasted through the 14th. Like the first warm spell, it lasted only 2 days and was about 10 degrees warmer than normal. This can be seen in Figures 1 and 2. Most of the area did not reach 60 degrees the entire month. The warmest day of the month was the last day of the month but most reporting stations only reached the upper 50's. The last time highs have reached 60 degrees over most of the area was on January 7th (note the warm spike on Figure 1).

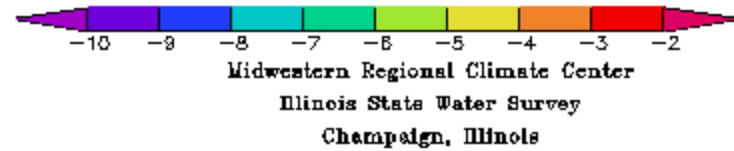
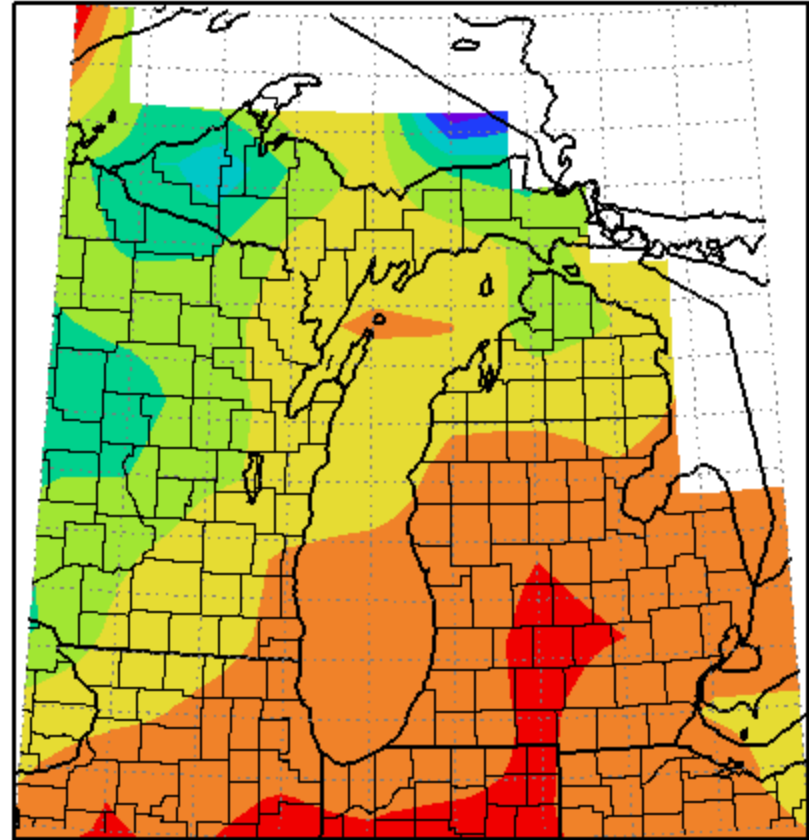
In general southwest Lower Michigan averaged around 3 degrees below normal (Figure 3b). The farther north you were in Lower Michigan the greater the departure from normal was. Parts of northern Lower Michigan averaged over 5 degrees colder than normal. Southwest Michigan averaged around 29 degrees (Figure 3a).

Average Temperature in Degrees F
March 1, 2008 to March 31, 2008



(a)

Average Temperature Departure from Mean in Degrees F
March 1, 2008 to March 31, 2008



(b)

Figure 3: Western Great Lakes average daily temperature (a) and departure from normal (b) for February 2007 (courtesy of the Midwestern Regional Climate Center).

Precipitation

March 2008 over Southwest Lower Michigan was a dry month. Figure 4 shows the wettest part of southwest Lower Michigan was near Jackson. Those areas had more than 3 inches of total precipitation for the month. Only the extreme southeast part of the southwest quarter of Lower Michigan was actually near normal in precipitation. The remainder of Lower Michigan was drier than normal. Most of the northern two thirds of the southwest quarter of Lower Michigan had precipitation departures of an inch or more from normal (Figure 5).

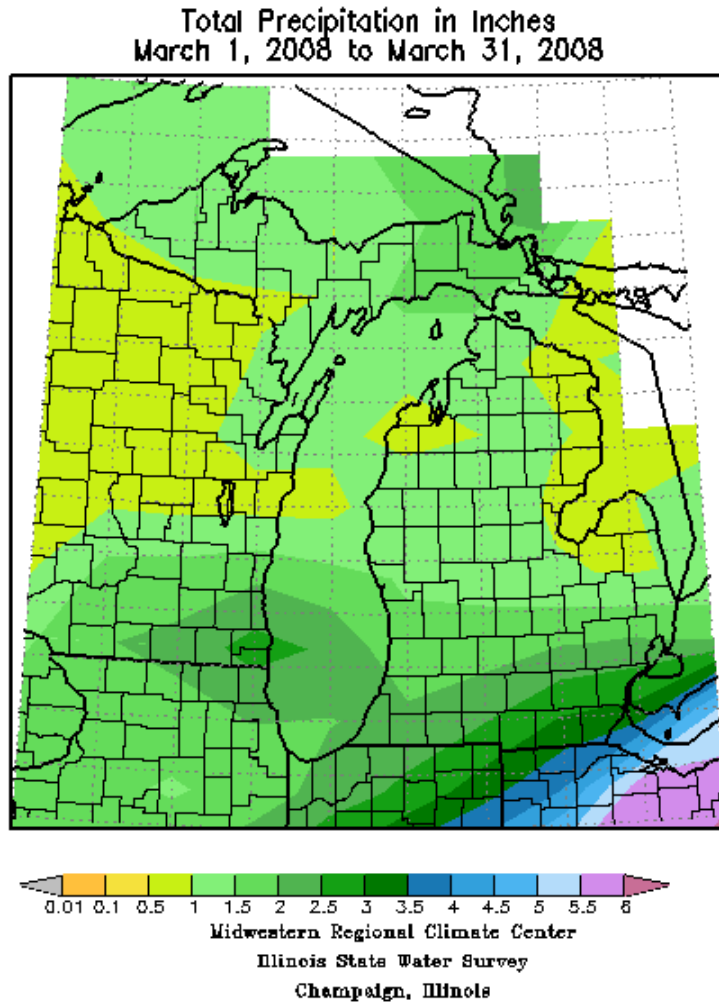
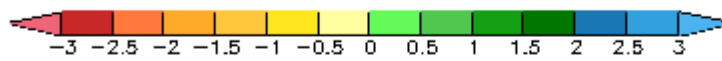
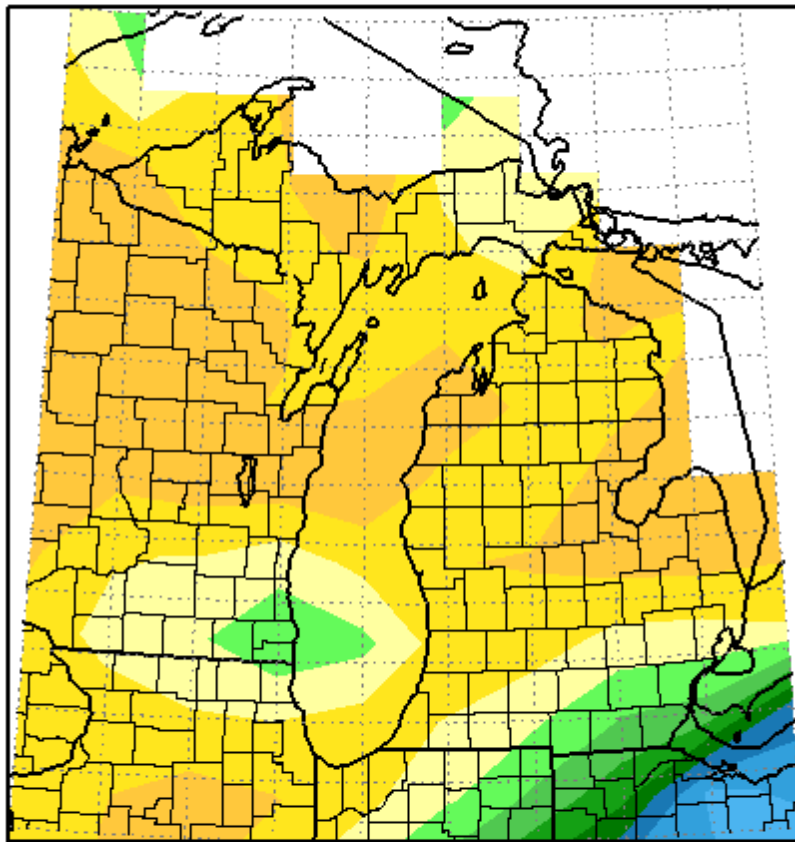


Figure 4: March precipitation totals in inches.

Total Precipitation Departure from Mean in Inches
March 1, 2008 to March 31, 2008



Midwestern Regional Climate Center

Illinois State Water Survey

Champaign, Illinois

Figure 5: March precipitation Departure from Normal in inches.

Snowfall

Figure 6 shows the total snowfall over Michigan for March of 2008. This was an unusual snowfall pattern in that the southeast sections had the most snowfall. More typically areas near west of U.S. 131 and north of Interstate 96 would receive the most snowfall. However due to the prominence of the southern stream storm track this year, the southeast sections ended up with the greatest snowfall (Figure 6). Figure 7 shows the area with the least amount of snowfall was the area that would normally get the most snowfall in March.

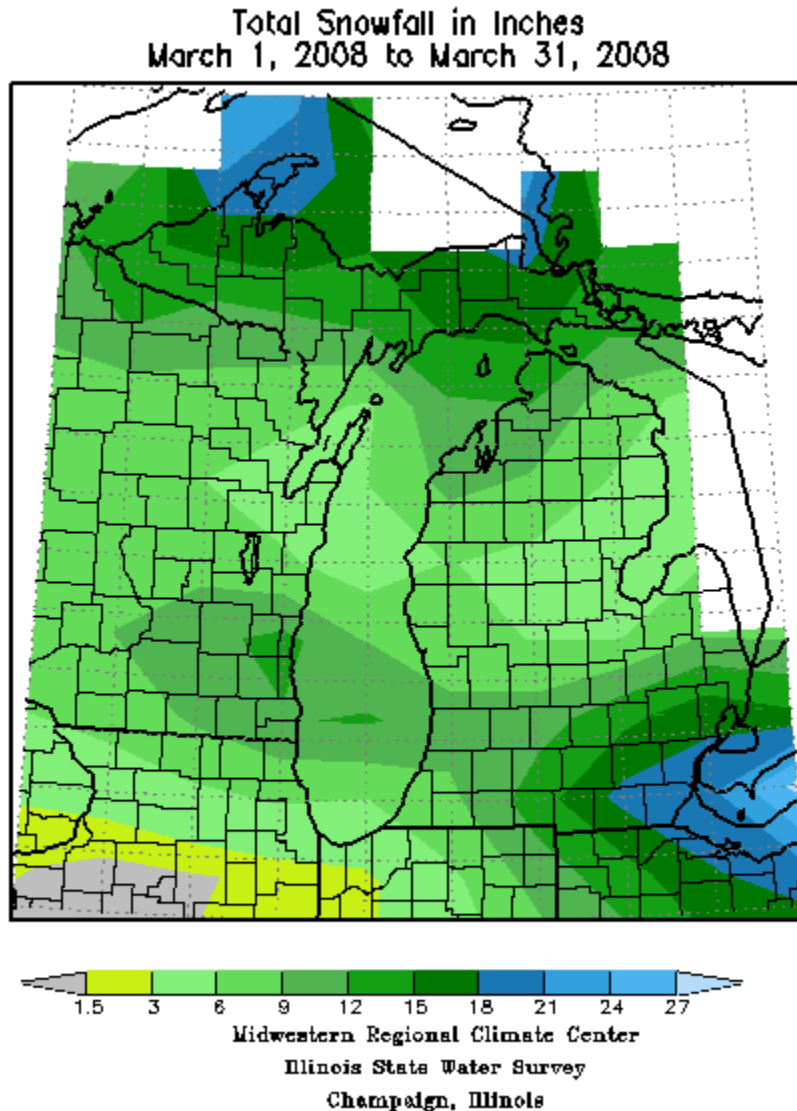
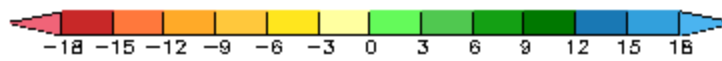
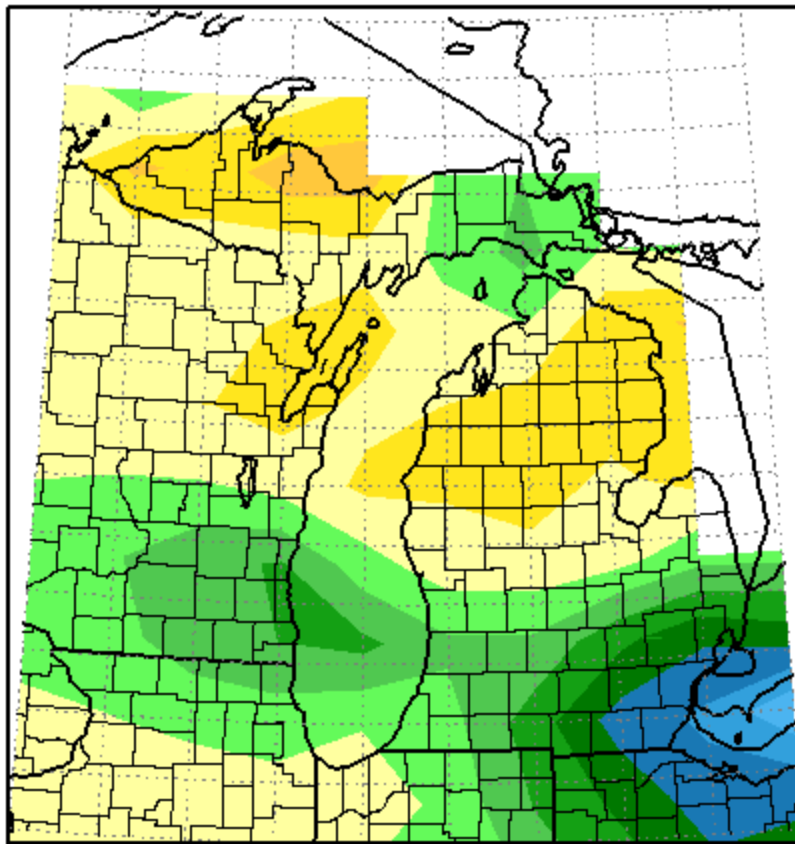


Figure 6: March Snowfall totals over Southwest Michigan.

Total Snowfall Departure from Mean in Inches
March 1, 2008 to March 31, 2008



Midwestern Regional Climate Center

Illinois State Water Survey

Champaign, Illinois

Figure 7: March Snowfall Departures from Normal.

Significant Storms of the Month

There were three significant winter storm events and one rain storm in March of 2008. Below are maps of each of the storm events and their associated snow (precipitation) totals.

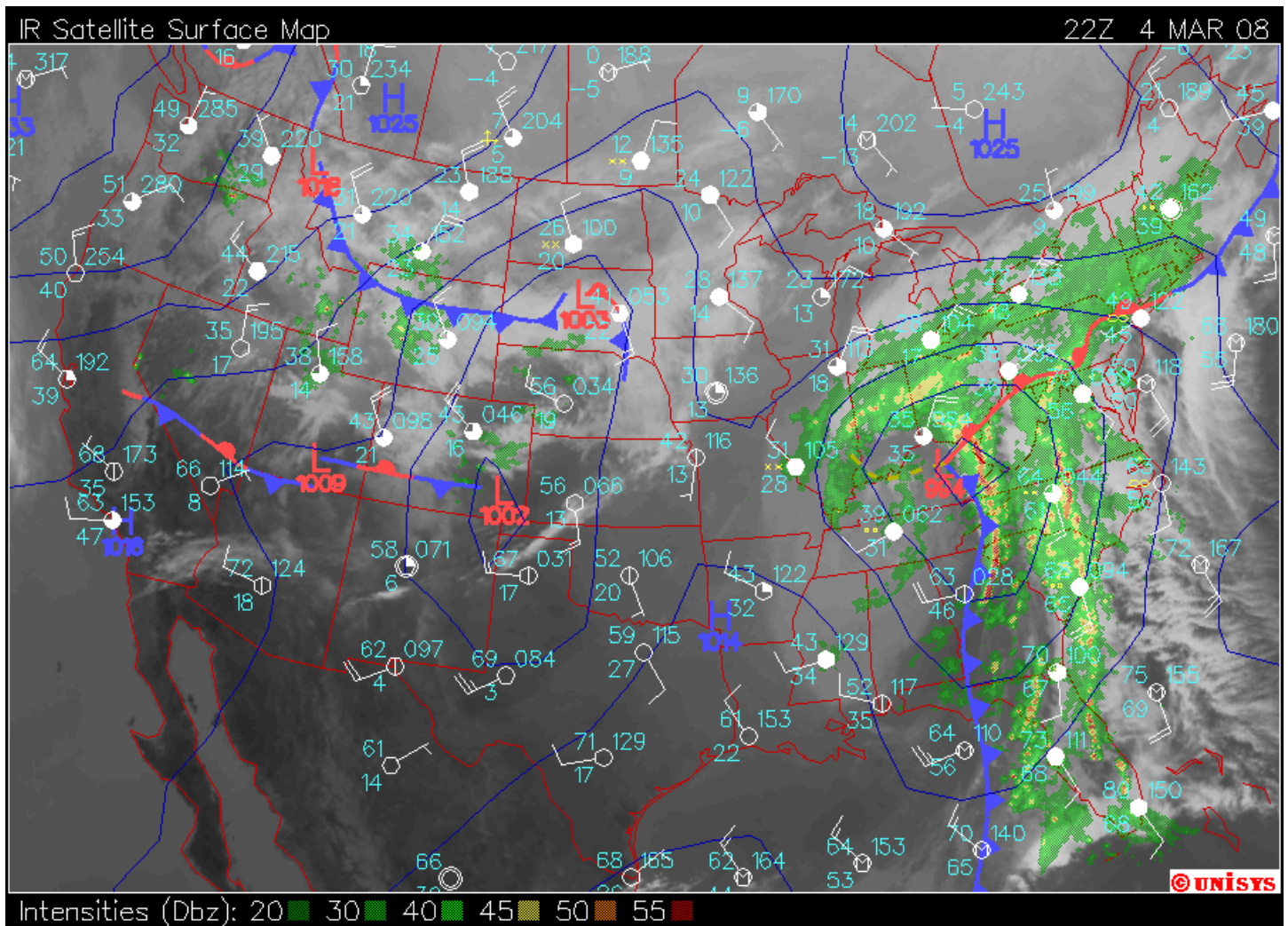


Figure 8: Surface Weather Map of Snow Storm on March 4th, 2008 at 5 PM.

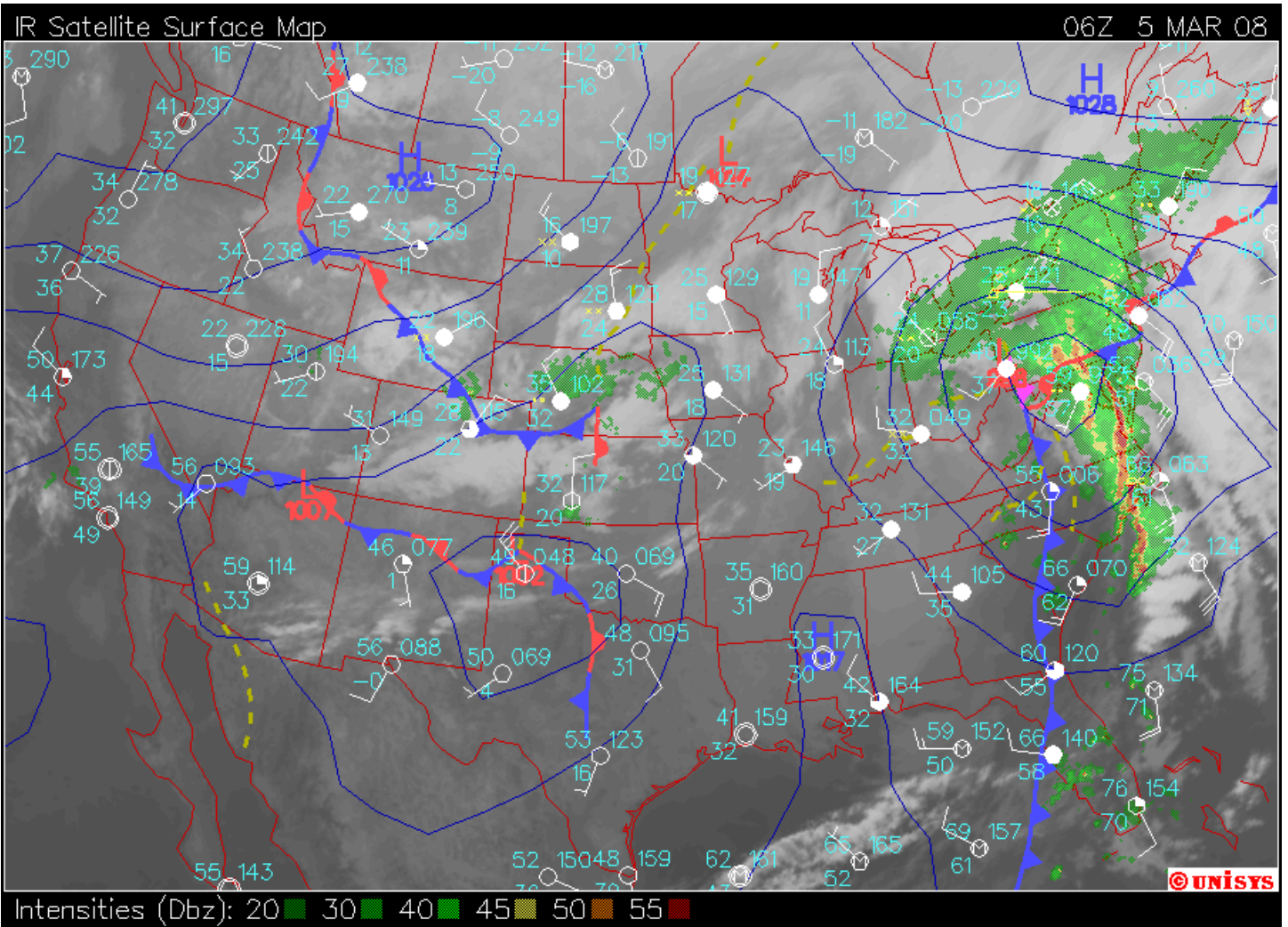


Figure 9: Surface Weather Map of Snow Storm on March 5th, 2008 at 1 AM.

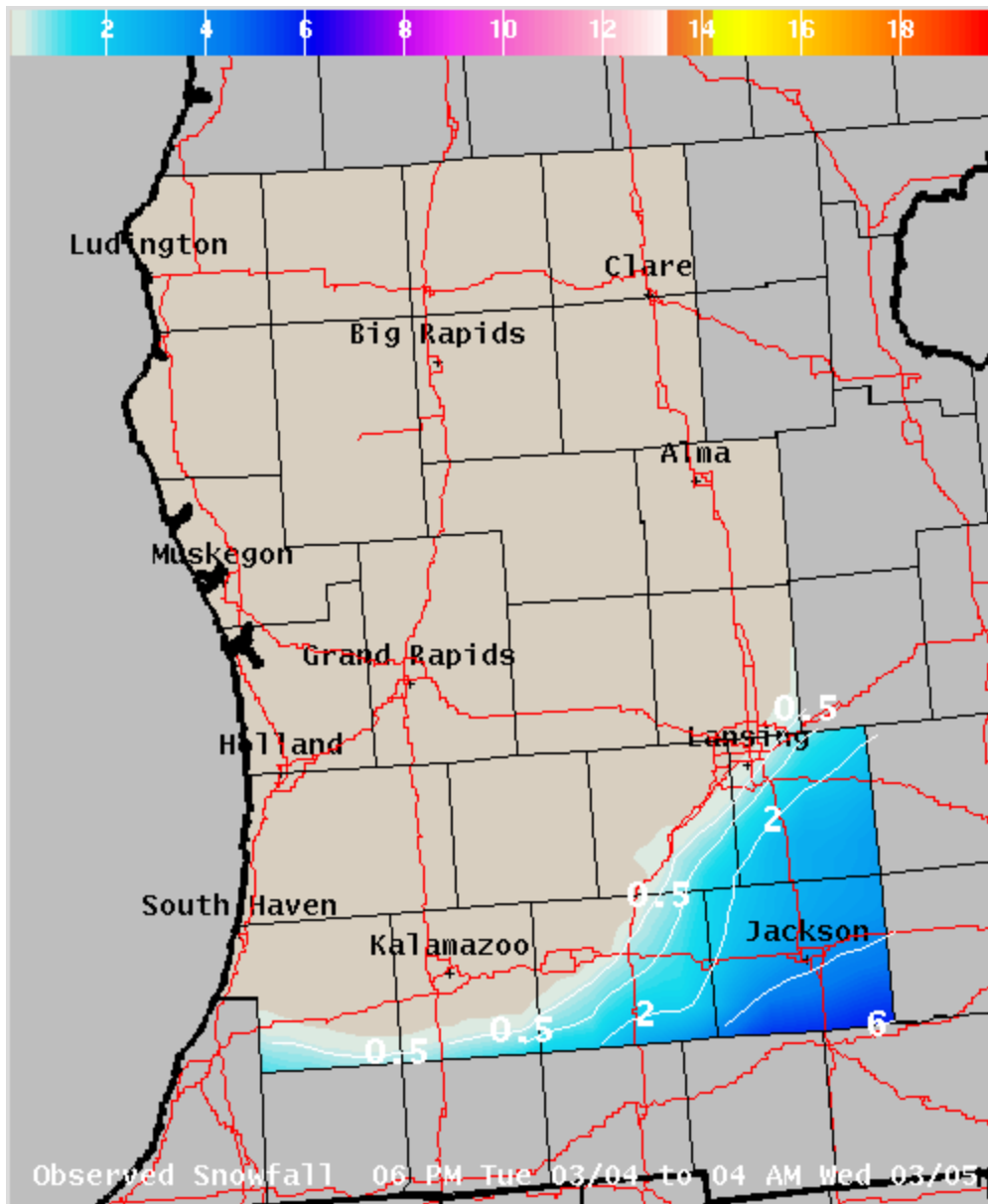


Figure 10: Snowfall totals for March 4th into the 5th 2008.

The first snow event of the month was mostly over Jackson County. The event began the evening of the 4th and continued into the morning of the 5th before ending. Up to 6 inches of snow were reported in extreme southeast Jackson County. One thing to note here is that most of the precipitation and snowfall from this event was south and east of the Grand Rapids County Warning area.

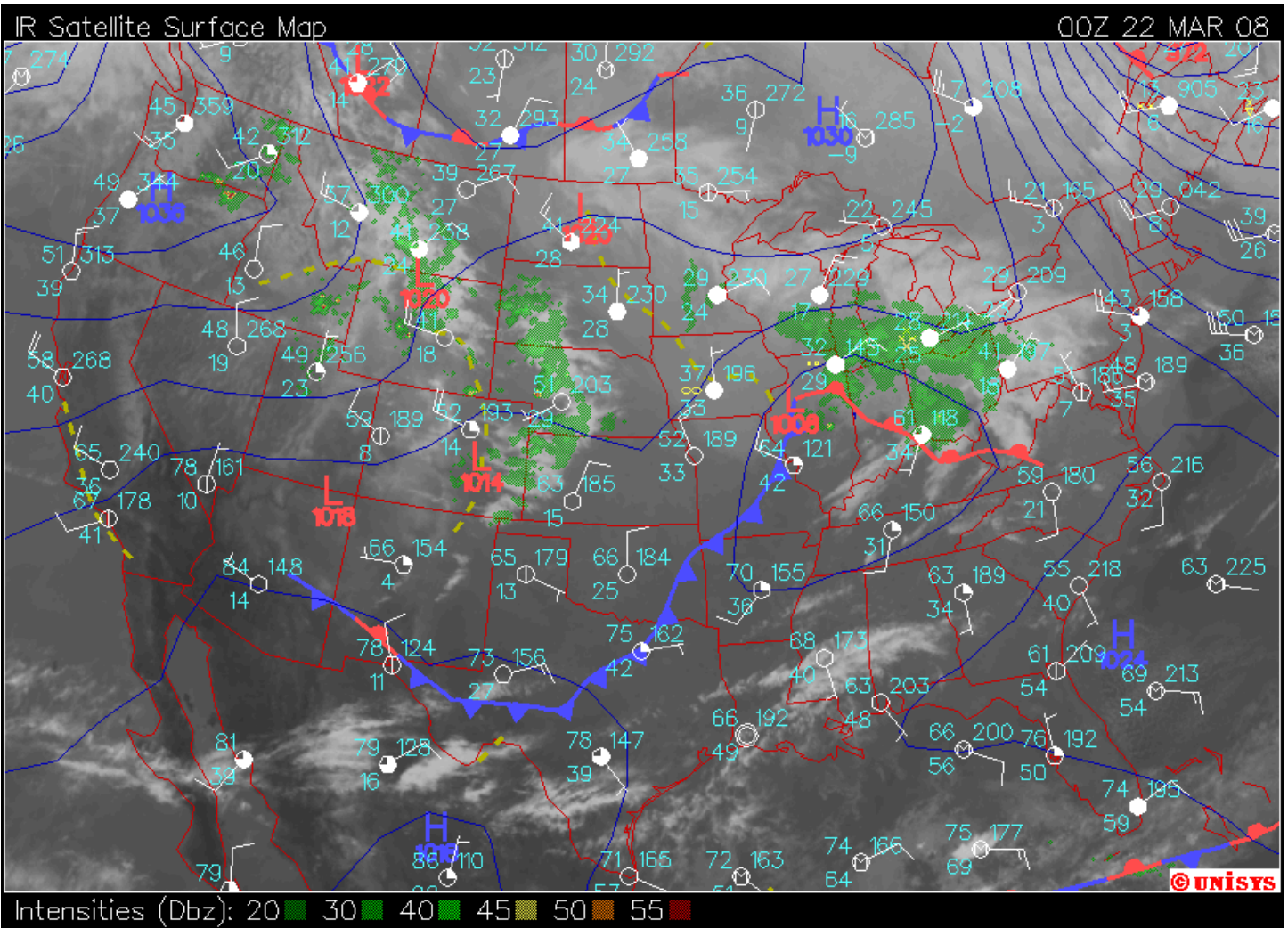


Figure 11: Heaviest Snowstorm of the Month is Underway at 8 PM on the 22nd.

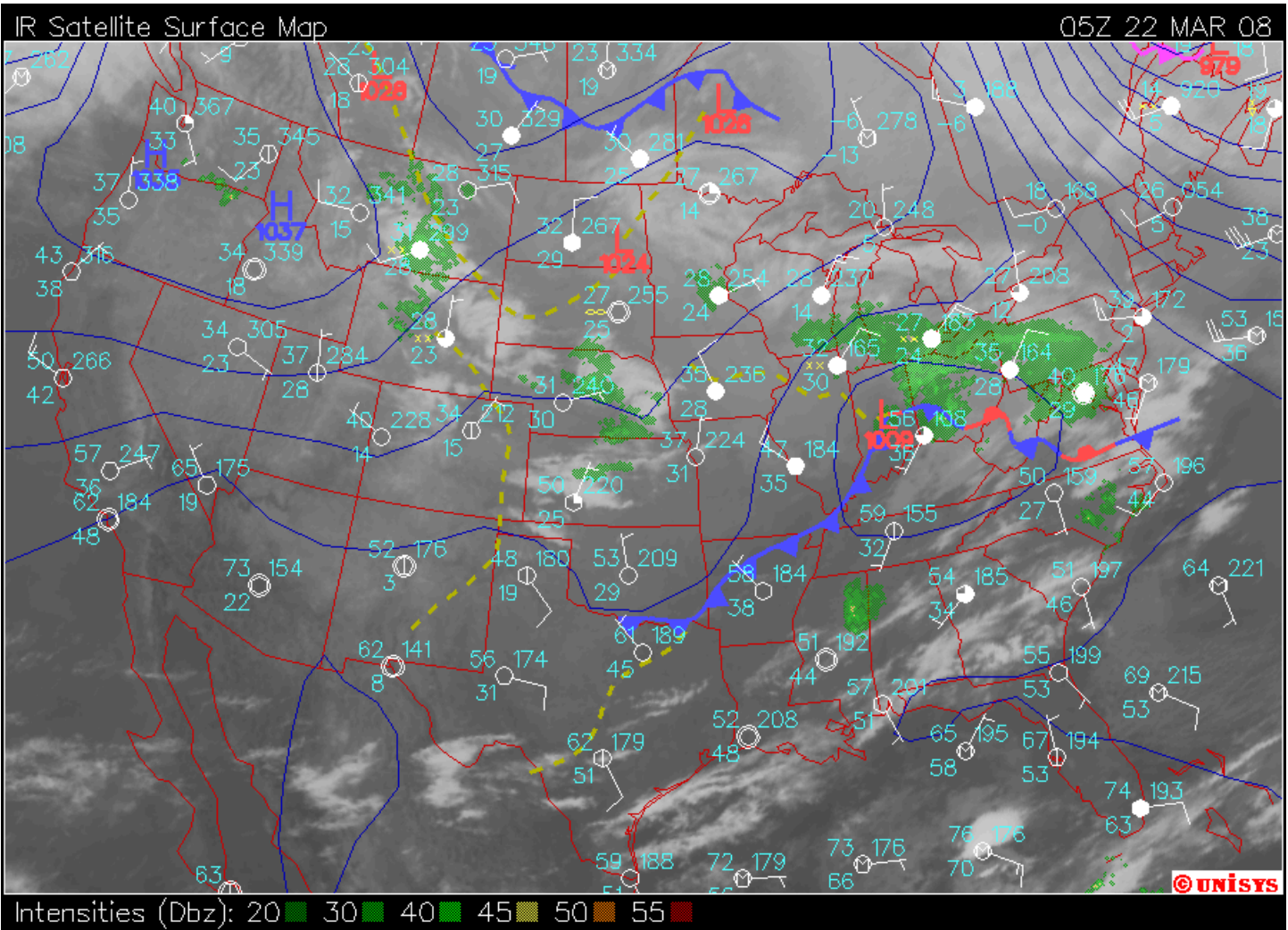


Figure 12: Heaviest Snowstorm of Month near its end at Midnight on the 22nd.

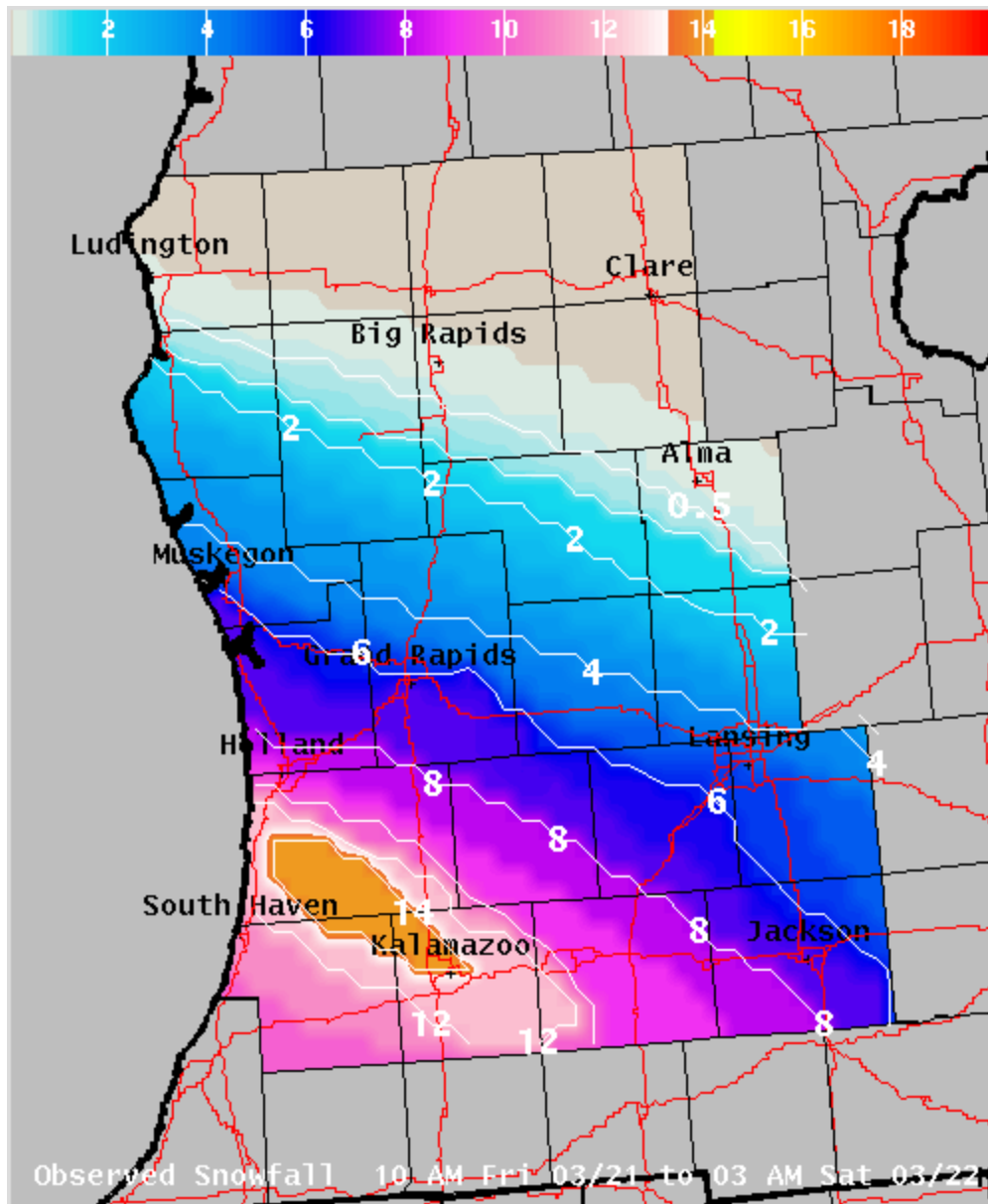


Figure 13: Snowfall totals from March 21st to 22nd.

The biggest snowstorm of the month began on the morning of the 21st and continued into the early morning hours of the 22nd. Eight to fourteen inches of snow fell south of a line from Holland to Jackson. Areas south of a line from Hart to Lansing had four or more inches of snow. Unlike the storm on the 4th into the 5th, most of the precipitation from this event was over Lower Michigan.

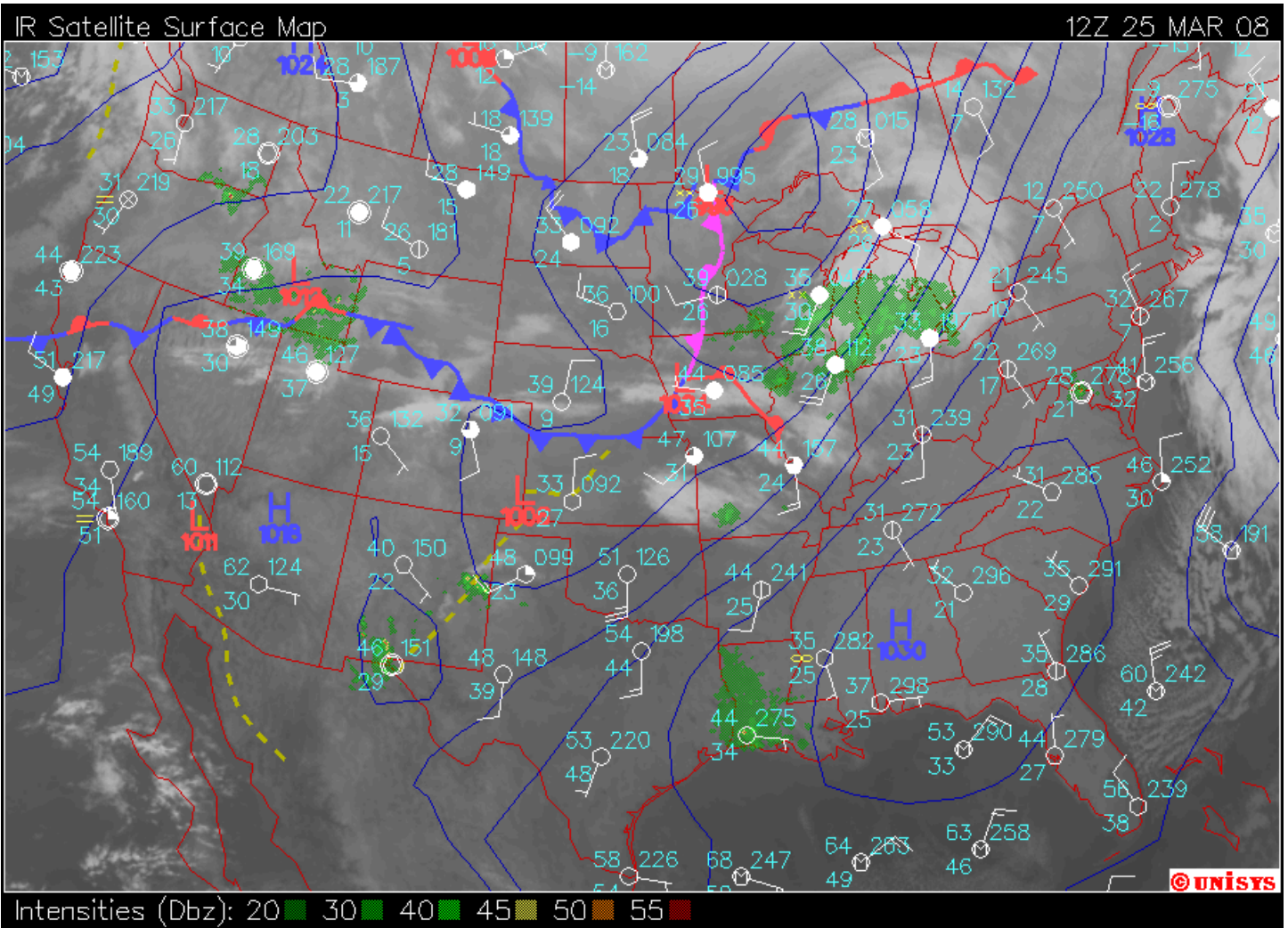


Figure 14: Snow Storm on the 25th was well underway at 8 AM.

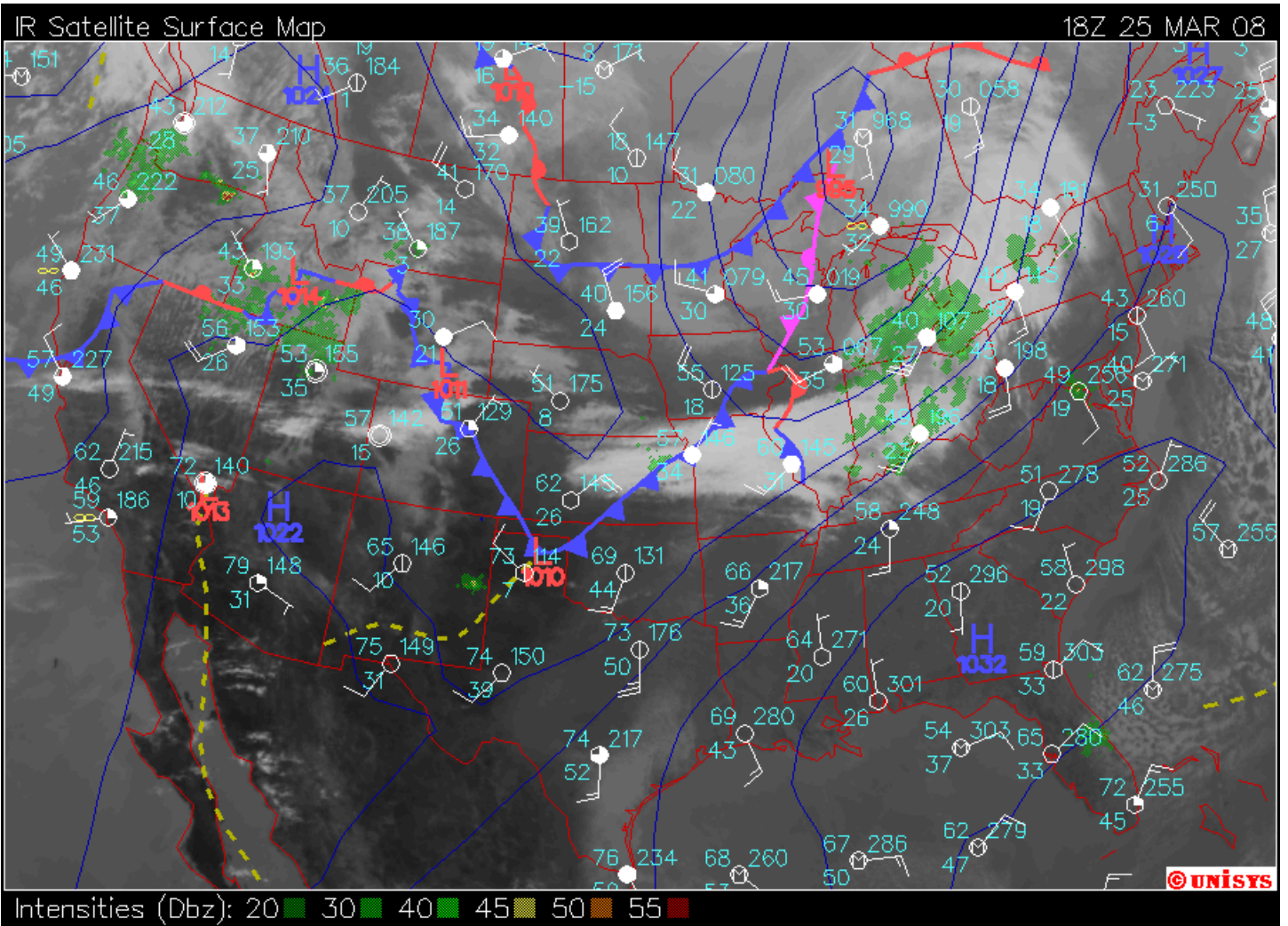


Figure 15: Snow Storm on the 25th about to end around 2 PM.

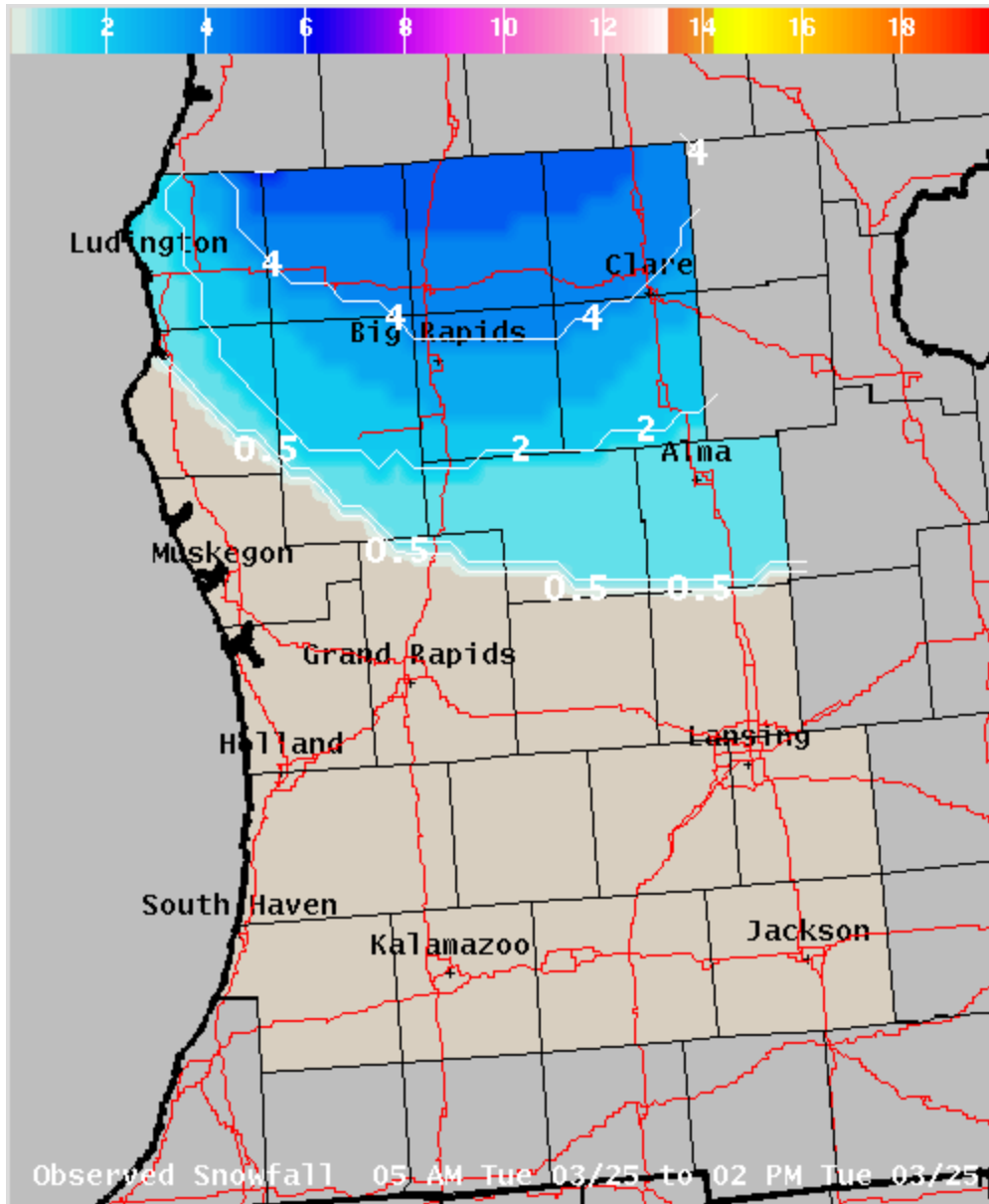


Figure 16: Snowfall totals for March 25th.

The final snow storm of the month, on the 25th, was the result of an Alberta Clipper, which brought an occluded front through the area. Most of the snow from this event fell north and east of Grand Rapids. This storm dumped 4 to 6 inches north of Route 10 and west of Scottville.

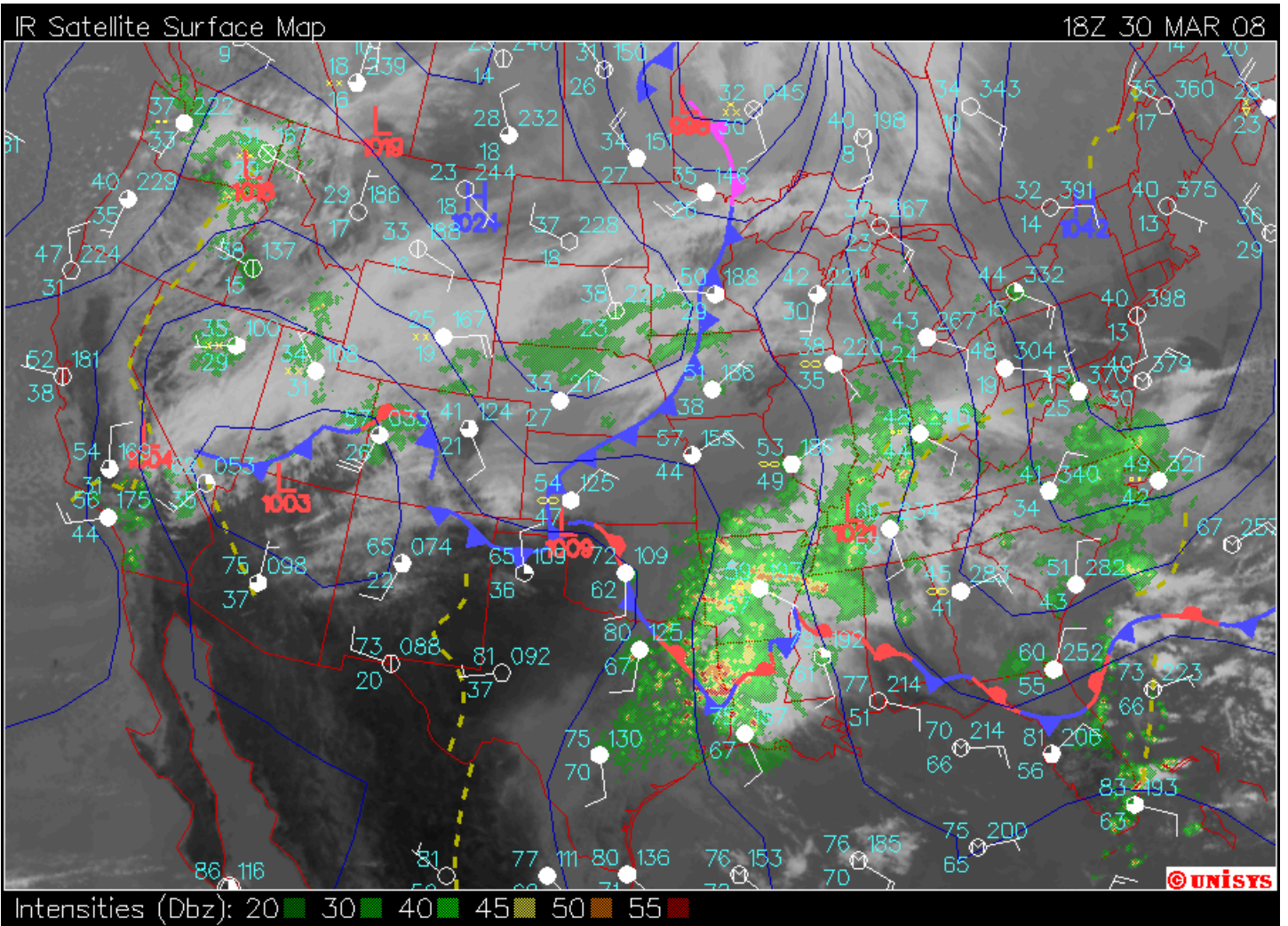


Figure 17: Northern Stream Cold front intersecting moisture from the Gulf sets the stage for Southwest Michigan Heavy Rain Event.

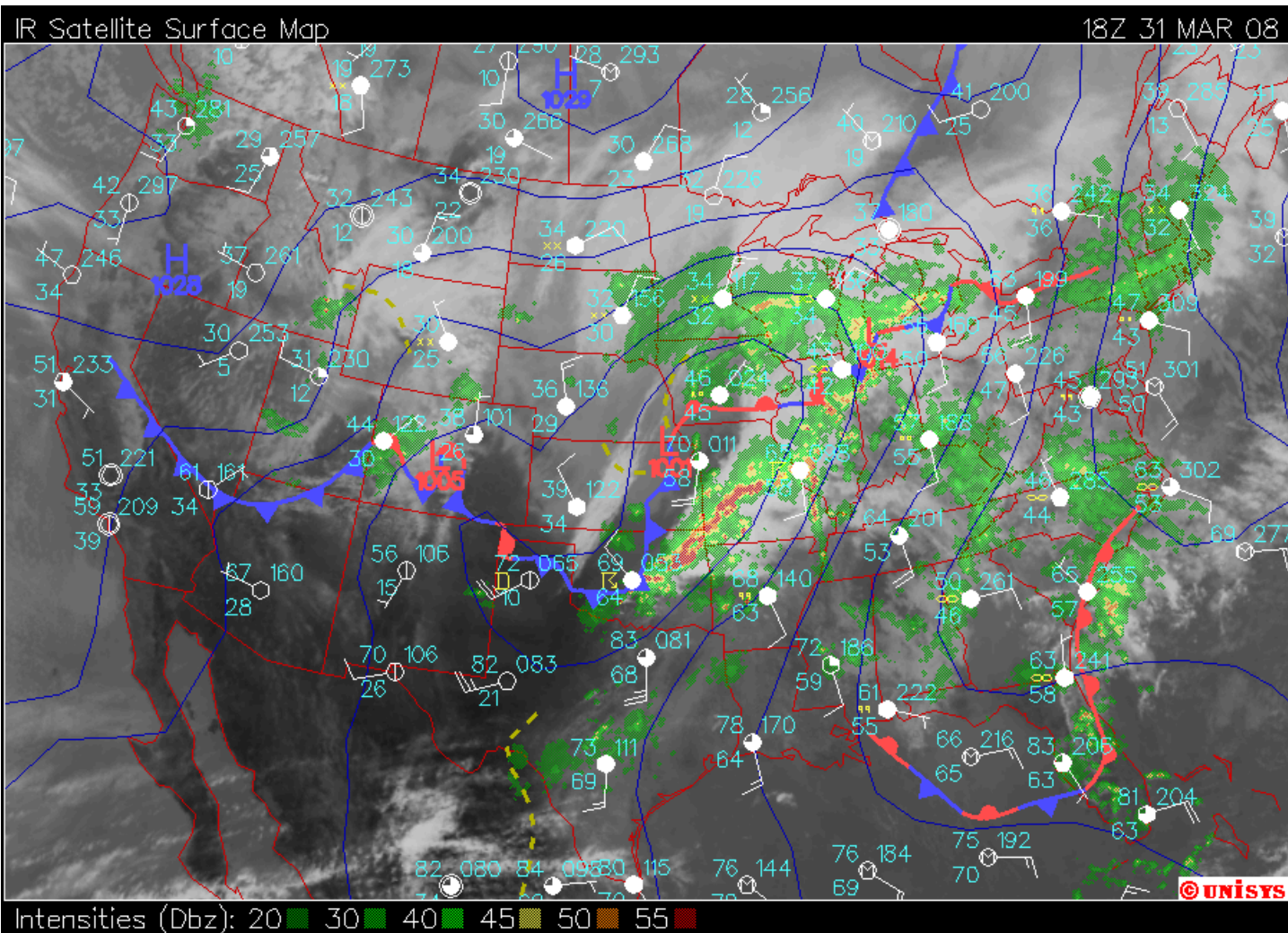


Figure 18: Gulf Moisture and Cold Front comes together for Heavy Rain event.

Total Precipitation in Inches
March 30, 2008 to April 1, 2008

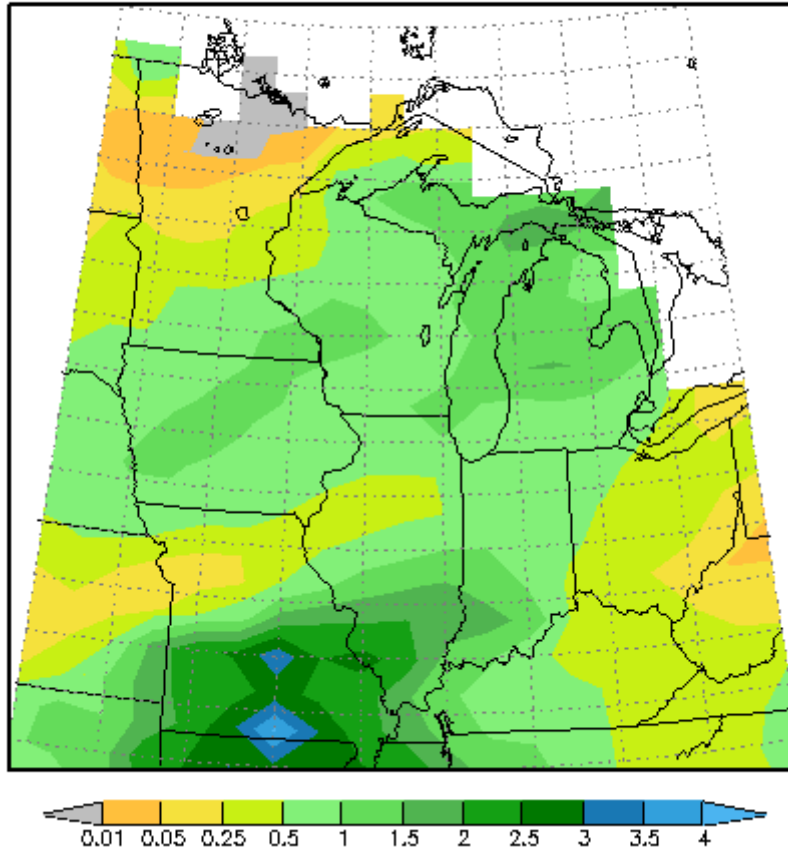


Figure 19: Heavy Rainfall March 30th through the night of the 31st, 2008.

Finally during the last two days of the month, A strong storm developed in the southern plains and headed northeast across central Lower Michigan during the late evening hours of the 31st (Figures 17 and 18). That storm pushed a strong warm front into Lower Michigan by the morning of the 31st. The front then stalled near Interstate 96 from mid morning until late evening on the 31st. That produced a 10 mile wide band of very heavy rainfall in which around 2 inches of rain fell from north of Holland to just south of Rockford to Alma. Most of the remainder of the area had between a half inch and an inch of rainfall from the event. This was the heaviest rain event of the Month across the area.