

Fall 2007 Summary

By William Marino and David Beachler

The fall of 2007 in southwest Lower Michigan was unusually warm and dry.

Normals September - November		Grand Rapids	Muskegon	Lansing
Temperature	<i>High:</i>	58.9°	58.2	59.3
	<i>Low:</i>	40.8°	41.0	39.2
	<i>Mean:</i>	49.9°	49.6	49.2
Precipitation	<i>Average:</i>	10.43"	9.55"	8.43"
Snowfall	<i>Average:</i>	8.3"	9.3"	5.5"

Fall 2007 Data		Grand Rapids	Muskegon	Lansing
High Temp (September - November Average)	<i>2007 Observed</i>	63.9°	62.0	61.9
	<i>Departure from Normal</i>	+5.0°	+3.8	+2.6
Low Temp (September - November Average)	<i>2007 Observed</i>	44.9°	44.5	43.8
	<i>Departure from Normal</i>	+4.1°	+3.5	+4.6
Mean Temp (September - November Average)	<i>2007 Observed</i>	54.4°	53.2	52.8
	<i>Departure from Normal</i>	+4.5°	+3.6	+3.6
Precipitation (September - November Totals)	<i>2007 Observed</i>	5.40"	5.17"	6.58"
	<i>Departure from Normal</i>	-5.03"	-4.38"	-1.85"
Snowfall (September - November)	<i>2007 Observed</i>	2.9"	0.1"	3.0"
	<i>Departure from Normal</i>	-5.4"	-9.2"	-2.5"
		38.7°	3.23	8.7
		-0.2°	-2.73	-8.6

Discussion:

The fall of 2007 was the 10th warmest and 15th driest on record for all of southwest Lower Michigan. Given that our data base dates back to 1895, and that the fall of 2007 was 3.4 degrees warmer than the 1971 to 2000 normal, this was clearly an unusually warm fall. For the entire period of record, 67 percent of the seasonal departures from normal were within 1.8 degrees. That 3.4 degrees was nearly double that. What makes this more impressive yet is that all of our long term climate stations across southwest Michigan were used to come up these figures.

Beyond just that this past fall of 2007 was so much warmer than normal; consider Figure 1, which shows 8 of the past 10 falls were also warmer than normal. None of the recent 10 falls were colder than normal. A trend line was added to the chart to show the trend clear. Looking at the trend, this current period of warm falls is significantly warmer than the previous series of warm falls in the early to mid 1980s. Note that the fall of 1971 was unusually warm; the falls prior to that in the 1960s were more like the fall in the mid 1970s.

Figure 2 shows the fall of 2007 was warmer than normal across all of Michigan.

The northwest part of Lower Michigan had the largest positive departures relative to normal, being over 4 degrees above normal. The southeast section of the state was closest to normal, being only around 2 degrees above normal. Figure 3 shows that while the north had the largest positive departures, the southern row of counties had the highest actual average temperature for the fall.

The months of September and October, for the most part, drove the unusual warmth of fall 2007. The record heat wave (see figure 5) across the area during the first week of October was a major player in October's warmth. In Grand Rapids, October was over 8 degrees above normal while Lansing was over 7 degrees warmer than normal. Figures 4 and 5 together show four major warm periods. After the severe weather on October 19th, the weather become cooler, relative to normal and stayed that way the rest of the month. Figure 6 shows that cooler weather trend that started in late October continued through November, the daily temperatures stayed closer to normal through November.

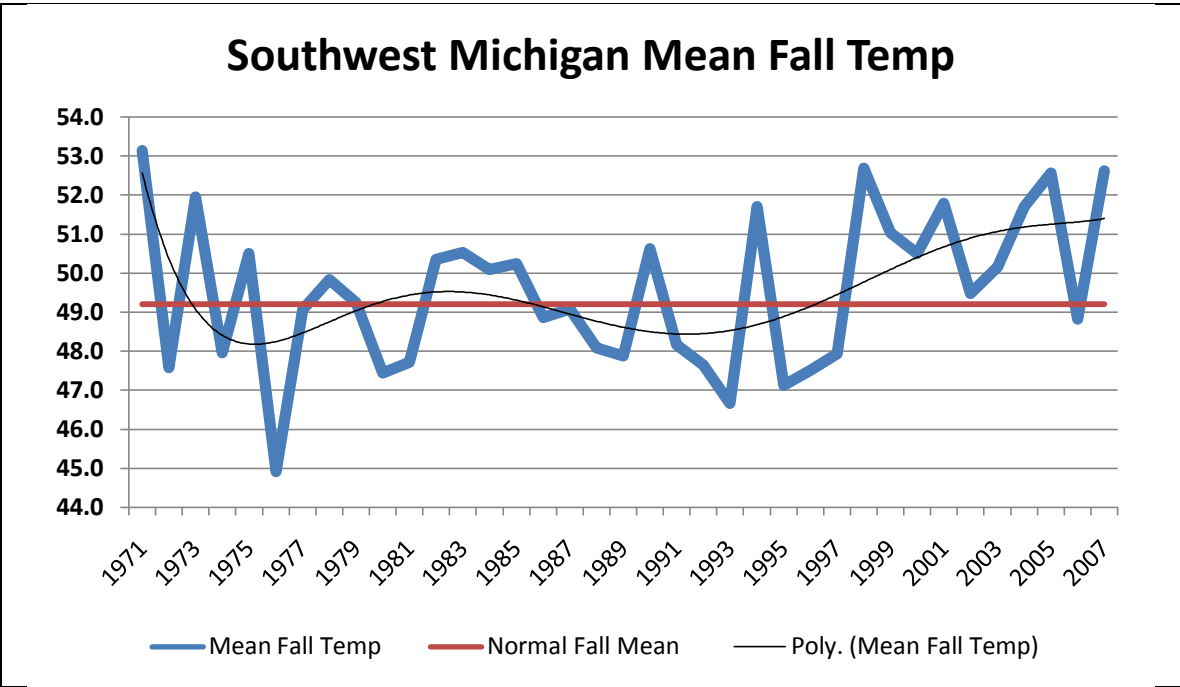
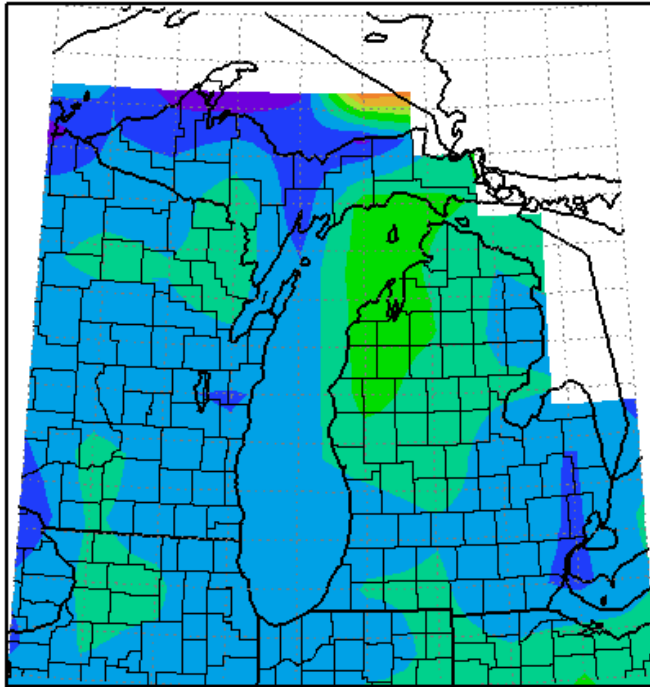


Figure 1

The mean fall temperature for the all the long period of record climate stations in Southwest Michigan in southwest Michigan from 1971 to 2007

Average Temperature Departure from Mean in Degrees F
September 1, 2007 to November 30, 2007

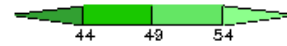
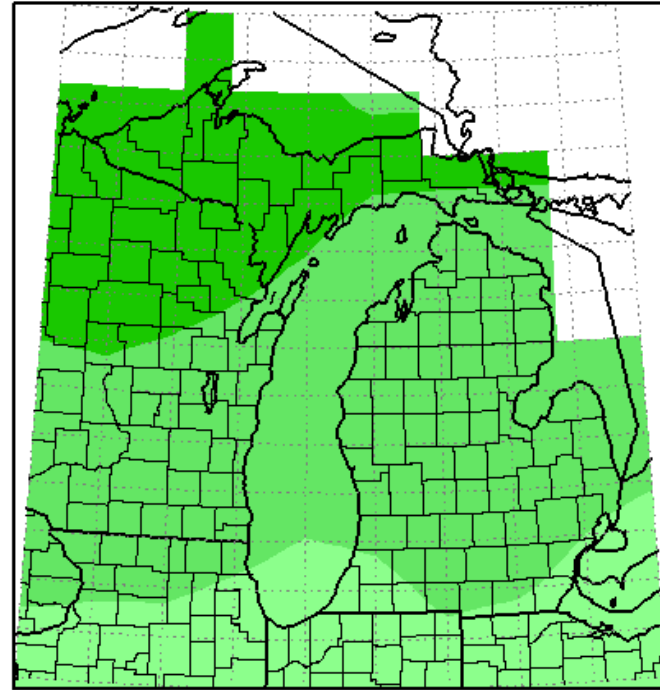


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Illinois State Water Survey
Champaign, Illinois

Figure 1

Departure from normal for the fall of 2007

Average Temperature in Degrees F
September 1, 2007 to November 30, 2007



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Figure 2

Mean Fall Temperature for 2007

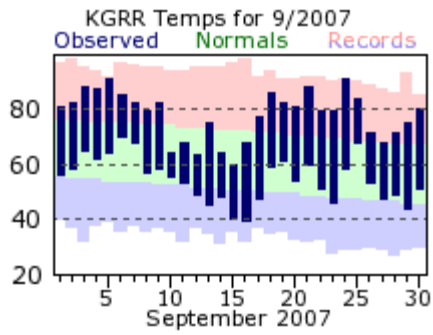


Figure 3
Grand Rapids Daily Temperature
September 2007

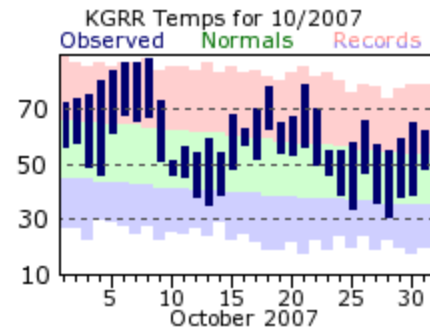


Figure 4
Grand Rapids Daily Temperature
October 2007

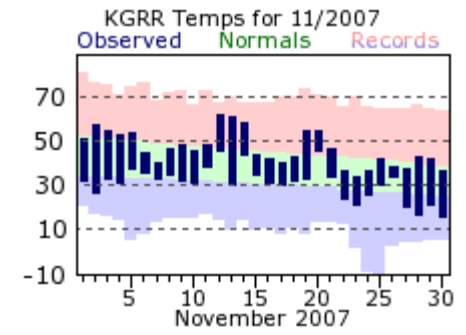
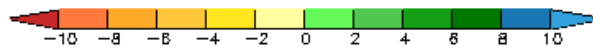
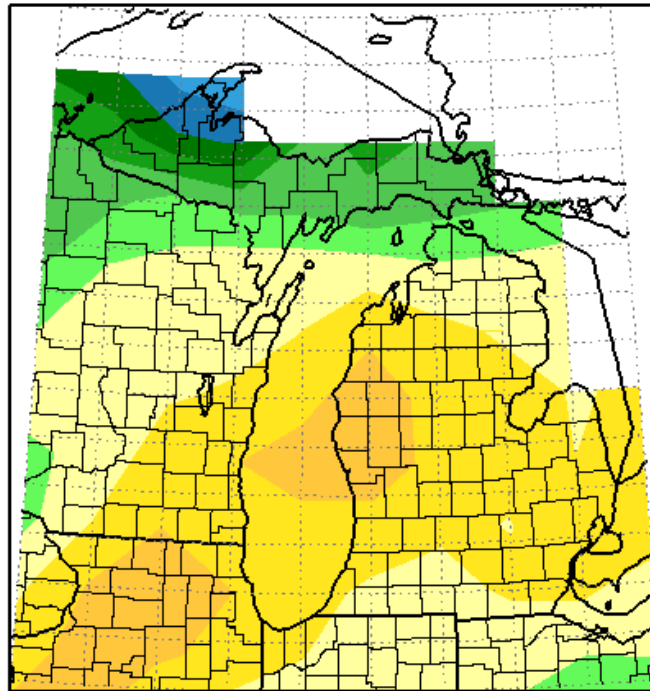


Figure 5
Grand Rapids Daily Temperature
November 2007

Precipitation:

The precipitation for the fall of 2007 was drier than normal (Figure 7) across all but the northwest part of the western Upper Peninsula of Michigan. Locations with the largest negative departures were near and west of US-131 and north of Holland. These areas were more than 4 inches below normal in total rainfall. Grand Rapids and Muskegon each had about half their normal precipitation in the fall of 2007. Most of the remainder of southwest Michigan was between 1 to 3 inches from normal. Both September and November were unusually dry months; October's precipitation was the closest to normal.

Total Precipitation Departure from Mean in Inches
September 1, 2007 to November 30, 2007



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Figure 6

Departure from Normal of the Total Fall of 2007 Precipitation

In figure 8, which shows the total precipitation for the fall of 2007, areas north of Holland and south of Frankfort had the least total precipitation. Curiously, just to the south of that, areas south of South Haven and west of US-131 had the greatest total fall precipitation. Even there with nearly 10 inches of rain, that was still below normal. The general lack of precipitation across the region has allowed the level of Lake Michigan to fall to near record low levels (Figure 9). Lake levels have continued to fall in general since 1998.

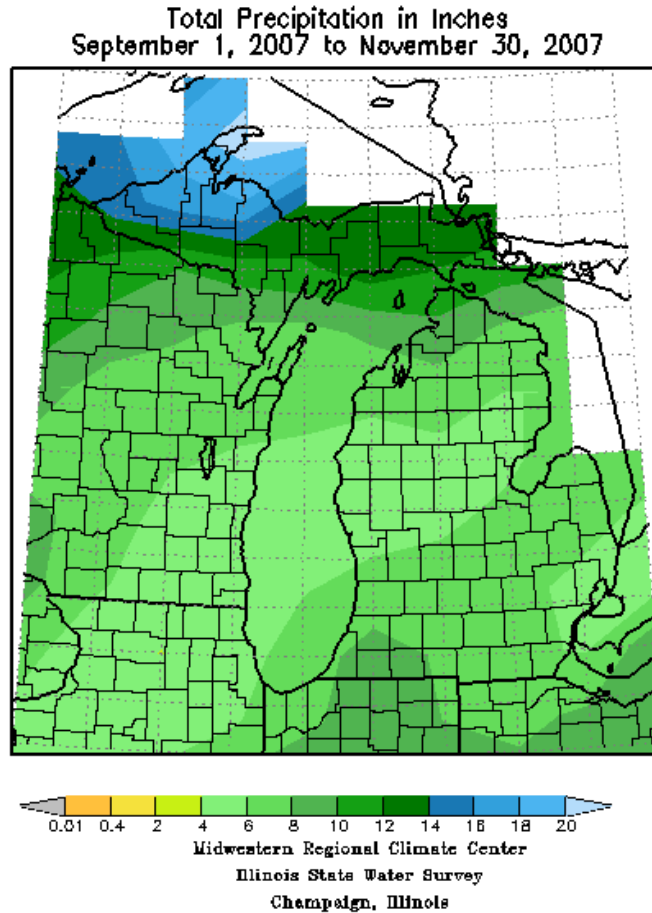


Figure 7
Precipitation Totals for the fall of 2007

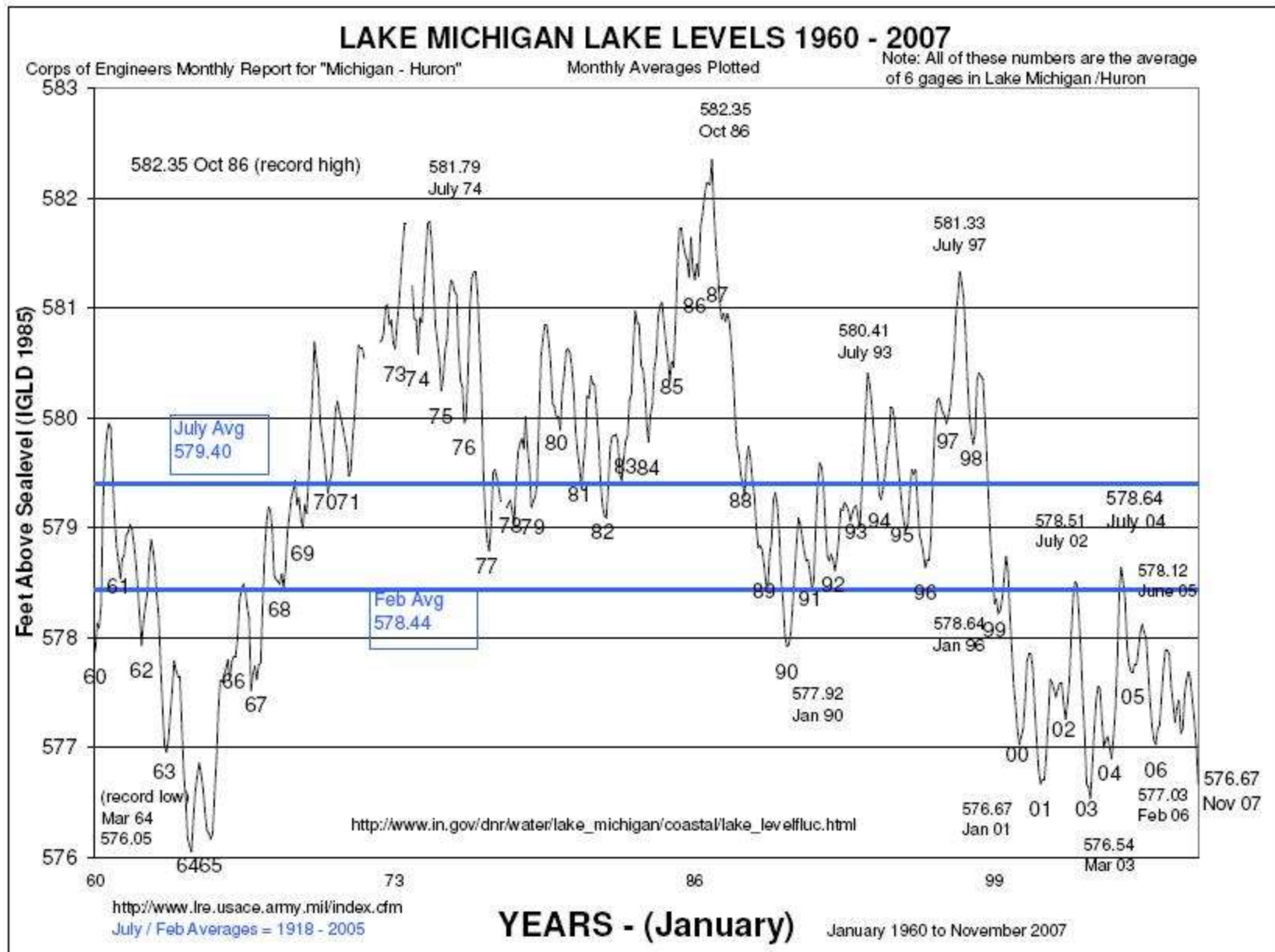


Figure 8
Lake Michigan Water Levels

Snowfall:

The snowfall for the fall of 2007 was below normal across Southwest Lower Michigan (figure 10). That would make sense since just about all the snowfall in Southwest Michigan in the fall of 2007 fell during the mid to late part of November. The first snowfall in southwest Michigan was on November 7th, over the extreme northwest part of southwest Michigan. There was another light snowfall over areas near and north of route 10 around November 17th. However, the first general snowfall was around Thanksgiving when most of Lower Michigan had measurable snowfall. Van Buren County reported up to 4 inches, as did parts of Mason County. Most other areas had between 1 to 3 inches of snowfall from the event.

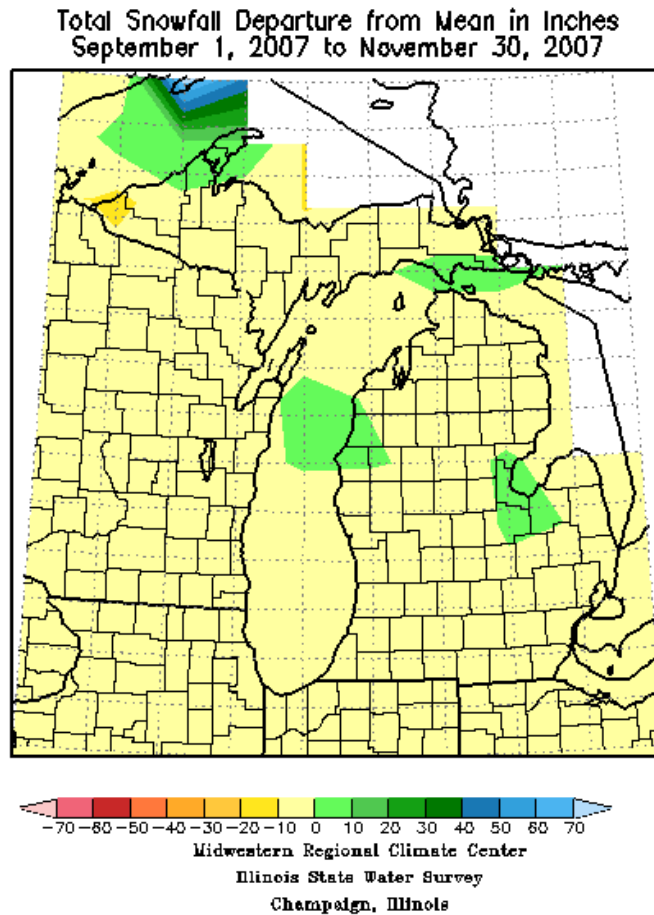


Figure 9
Fall Snowfall Anomaly

Figure 11 below shows the heaviest snowfall for the fall was over areas near and north of Route 10. That of course would be expected, since that is the area of the highest terrain and being the farthest north, the coldest.

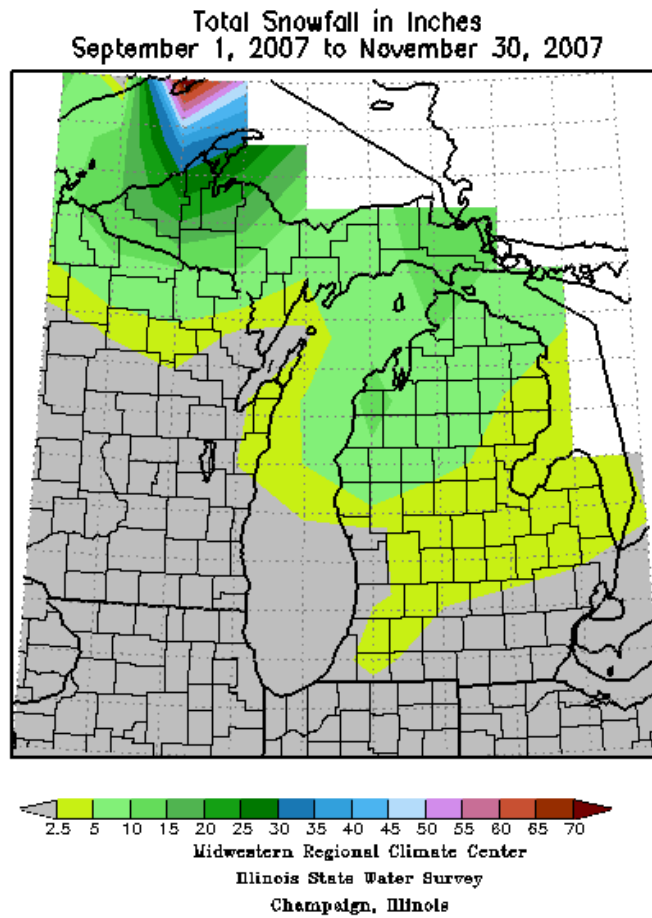


Figure 10
Fall Total Snowfall

Conclusion:

The fall of 2007 continued the general trend of warmer of much warmer than normal falls, which started in the late 1990s. The dry weather of the summer of 2007 continued through the fall of 2007. The combination of the warm, dry weather has increased the evaporation from Lake Michigan and has allowed the level of Lake Michigan drop to near record low levels.