

2009 FLINT/SAGINAW ANNUAL

**2009 WAS A RELATIVELY COOL YEAR THAT CALMED DOWN WITH TIME
AS A COOL SUMMER HELD SEVERE WEATHER AT BAY**

**MARKED DIFFERENCE IN RAINFALL BETWEEN FLINT AND SAGINAW AS FLINT GETS HIT
TWICE WITH TORRENTIAL RAINS DURING THE SUMMER**

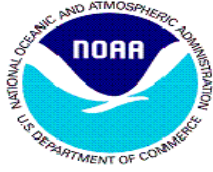
January 31st 2010

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Overview:

It was a relatively cool year across Southeast Lower Michigan in 2009 with temperatures averaging about a half degree below normal at both Flint /46.3 degrees/ and Saginaw /46.4/. It really made no difference where you were in Southeast Michigan, that 1/2 degree below normal departure was recorded at all three locations (Flint, Saginaw and Detroit), heat island or not. It was the coolest year since 2003 at both Saginaw and Detroit, and the coolest since 1997 at Flint. One of the biggest factors in the cool year was our unseasonably cool summer when Southeast Michigan averaged about two degrees below normal. The Summer of '09 basically was the coolest summer since the [cold summer of 1992](#).

Now on to the subject of precipitation, there were some significant differences in rainfall amounts across portions of Southeast Lower Michigan in 2009. Ironically, one of the largest differences occurred between two relatively close climate sites, Flint and Saginaw (or more to the point, between Flint Bishop Airport and Tri Cities Airport - which actually is in Freeland). Flint recorded nearly six and three quarters inches /+6.67"/ more rain for the year than Saginaw! On average, both cities (being fairly close to one another) generally receive the same amount /31.61"/ for an annual average. Most of this rainfall difference /6.35"/ actually occurred (when you'd expect it) during summer, because of convective rains (to see what caused the big difference look to Severe Weather 2009 below). Among the three climate sites, Flint saw the most rainfall (relative to normal) with nearly four inches above its norm (35.40/+3.79), while Tri Cities Airport received much less rain at nearly three inches below the normal (28.73/-2.88). Rainfall ranges approached nine inches across portions of Southeast, East-Central and the Thumb Region of Lower Michigan (Figure -1) with the largest differences within a small area: downtown Saginaw, Tri Cities Airport /Freeland/ and Midland. Other below normal rainfall areas include, Bad Axe and Harbor Beach (the Thumb Region), while above normal rainfall extended in a strip from Owosso, through Flint, Lapeer into the Blue Water area of Port Huron.



National Weather Service Detroit/Pontiac



2009 Rainfall Totals

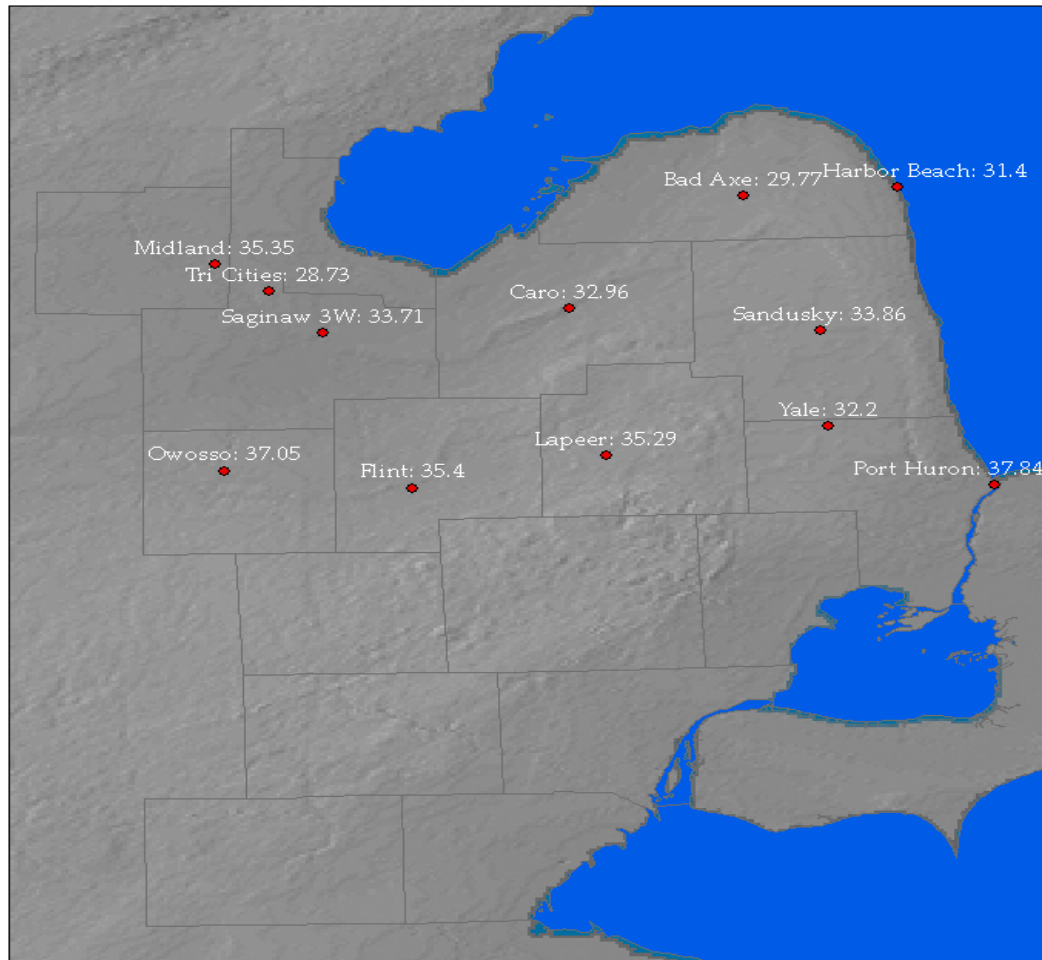


Figure-1: Annual precipitation totals at some selected sites.

The year of 2009 started out like that of 2008 with yet another, ongoing busy winter across Southeast Lower Michigan. There were, however, two main differences between the two winters (winter of 2008-09 and the Winter of 2007-08). 1) The worst of the Winter of 2008-09 was early to mid winter whereas in 2007-08, it was mid to late winter. 2) The Winter of 2008-09 was considerably colder and more brutal than in 2007-08. Using the three main locations (Detroit, Flint and Saginaw) the average winter temperature for 2008-09 in Southeast Lower Michigan came in at 22.5 degrees +/-2.5/. The average winter temperature for all of Southeast Lower Michigan is 25 degrees.

The snowfall across the region was even more notable than temperature (especially coming after our very snowy winter of 2007-08) and ranged from four feet to seven feet across Southeast Lower Michigan, which were generally one to three feet above normal. Officially at Flint, 72.8" /+24.8"/ of snow fell making it the 8th snowiest winter on record (after 71.7" and 4th snowiest in 2007-08). At Saginaw, 79.4" /+34.5/ was nearly three feet above normal, the 4th for snowiest winter, after trudging through basically the same amount (80.0" and 3rd snowiest)/ in the winter of 2007-08.

After our cold and snowy winter, Spring of 2009 was slow to arrive across the region with a slow green-up. The slow green-up certainly wasn't the result of a lack of moisture. With melting snow and some moderate to heavy rains, it was also a wet spring with precipitation totals of 10.66/+2.57 at Flint and 9.30/+1.17 at Saginaw (12.42" here at the NWS White Lake). Rainfall departures were all above normal across the region.

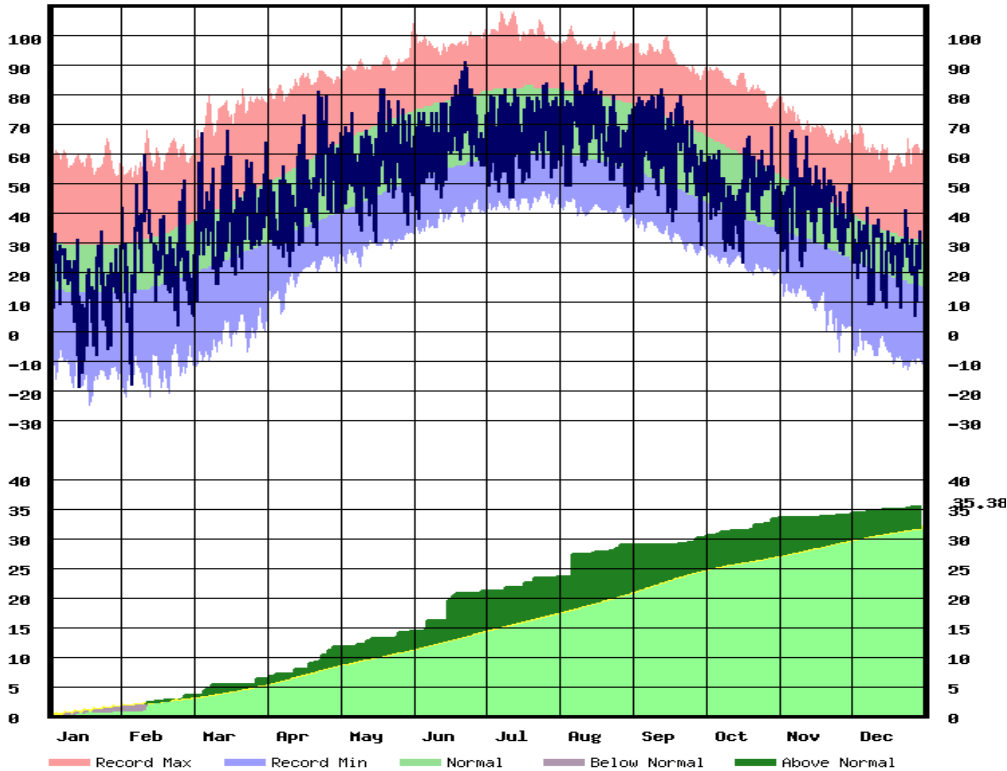
The trend of our summers getting cooler continued in 2009 with the summer being the coolest around these parts in years. Even though the summer was exceptionally cool it was comfortable for most people. Few days contained the heat and humidity usually associated with a typical summer in these parts. All of Southeast Michigan averaged at least a solid 2 degrees below normal, something seen quite infrequently for a summer; maybe 10-15% of the time since records began. Overall, with the dominant cooler weather, it was a relatively calm summer severe weather-wise with our strongest event actually coming in April.

The Autumn of 2009 weather pattern over the country brought primarily a mild, pleasant and dry fall to Southeast Lower Michigan. It wasn't all nice by any means, as our mild fall contained one cold miserable heart, coming during the first half of October. A strong amplified upper air pattern brought pre-season Polar cold resulting in temperatures hovering in record cold territory during the first half of October. November's weather more than made up for the premature Polar intrusion of October with unseasonably mild and dry weather...and no snow! With the mild November and normal temperatures in December, the Winter of 2009-10 started off slowly (for a change) with normal snowfalls and below normal rains from the Flint area, north into Saginaw and the Thumb.

Flint 2009 Temperature and Precipitation Statistics

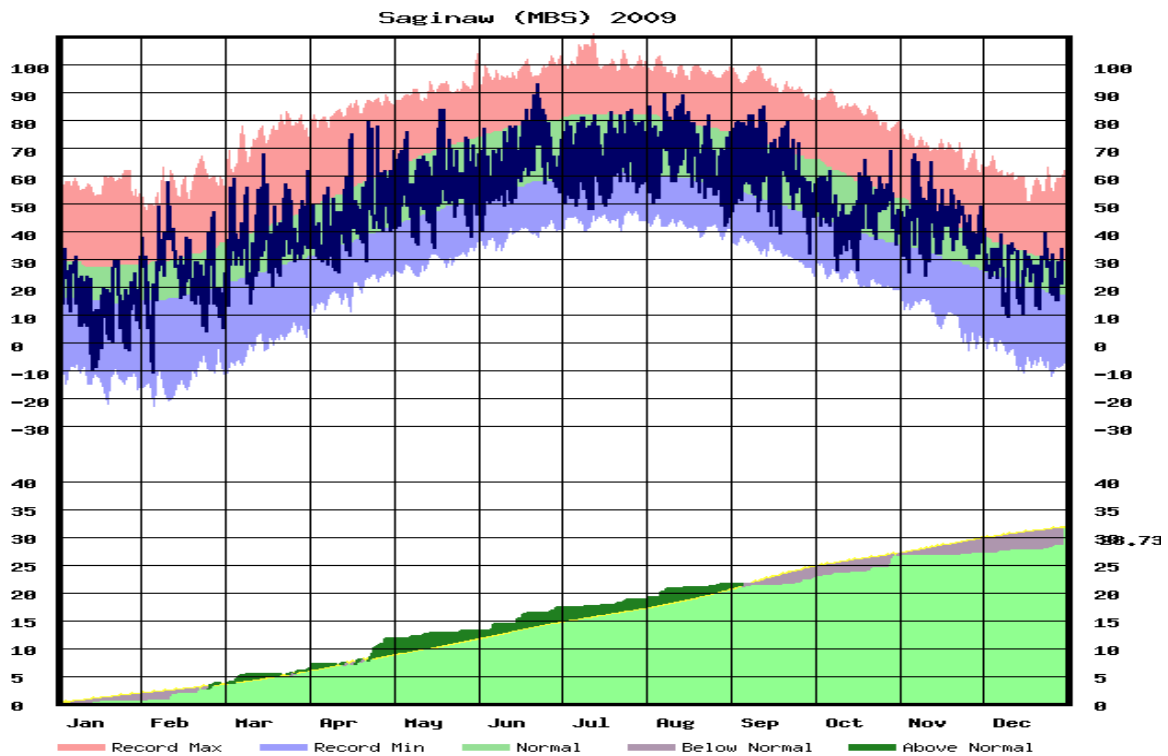
	<u>FLINT</u>	<u>2009</u>	<u>STATS</u>
	<u>TEMP</u>		<u>PCPN</u>
	<u>2009</u>		<u>2009</u>
JAN	14.5		0.94
FEB	26.2		2.57
MAR	35.5		2.71
APR	46.5		5.42
MAY	56.3		2.53
JUN	64.9		6.57
JUL	65.7		2.64
AUG	67.7		5.47
SEP	66.9		1.18
OCT	47.4		3.35
NOV	42.4		0.59
DEC	26.8		1.47
AVE	46.3	TOTAL	35.40
DEP	-0.5		+3.79

Flint Bishop (FNT) 2009



Saginaw 2009 Temperature and Precipitation Statistics

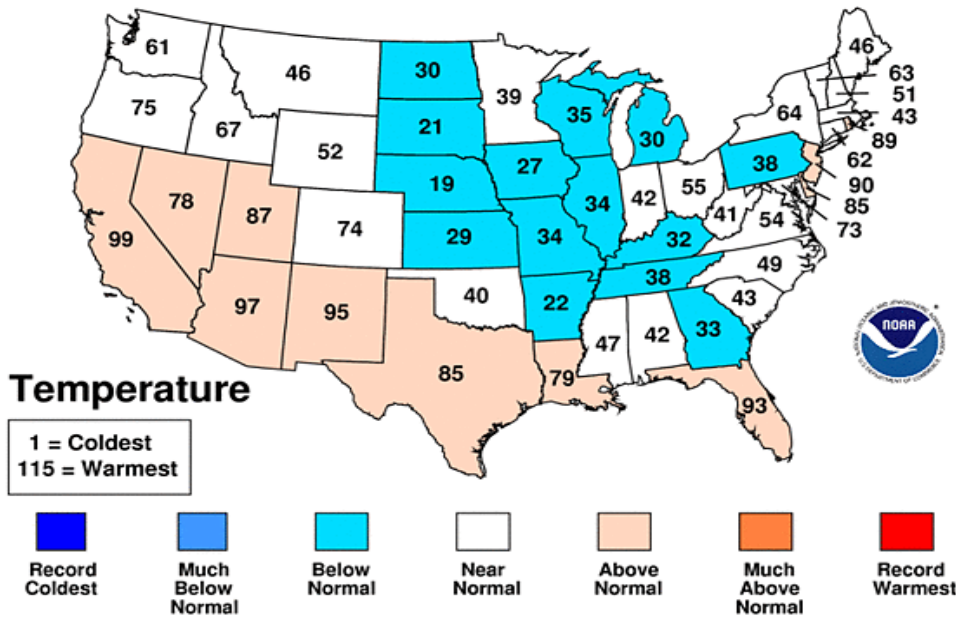
	<u>SAGINAW</u>	<u>2009</u>	<u>STATS</u>
	TEMP		PCPN
	<u>2009</u>		<u>2009</u>
JAN	14.9		0.77
FEB	25.5		3.03
MAR	35.2		2.20
APR	45.4		5.61
MAY	56.2		1.49
JUN	65.3		3.60
JUL	66.0		1.95
AUG	67.8		2.78
SEP	62.7		1.09
OCT	47.7		4.19
NOV	43.2		0.55
DEC	26.9		1.47
AVE	46.4	TOTAL	28.73
DEP	-0.6		-2.88



Here's a national view of the temperature pattern in 2009

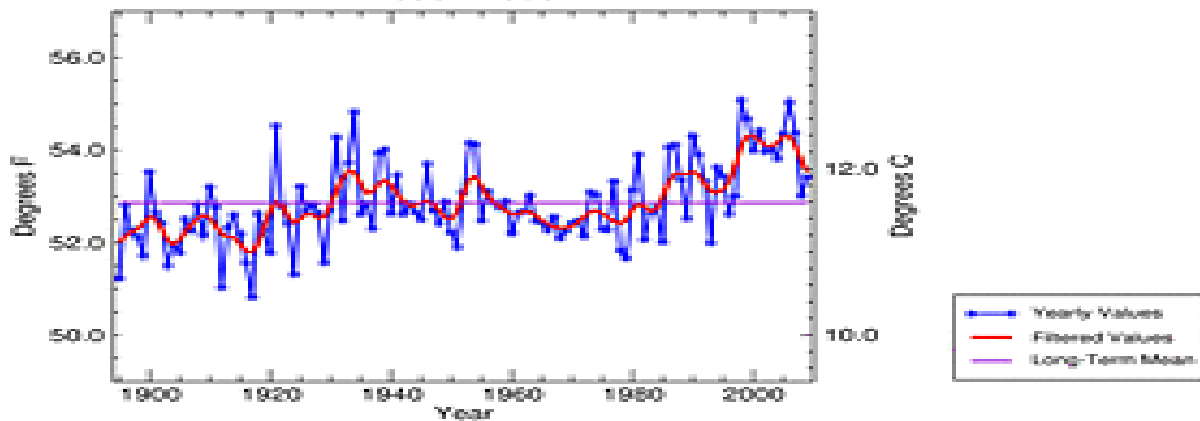
January-December 2009 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA



Quite a plunge from the recent National temperature trend

National (Contiguous U.S.) Temperature 1895 - 2009

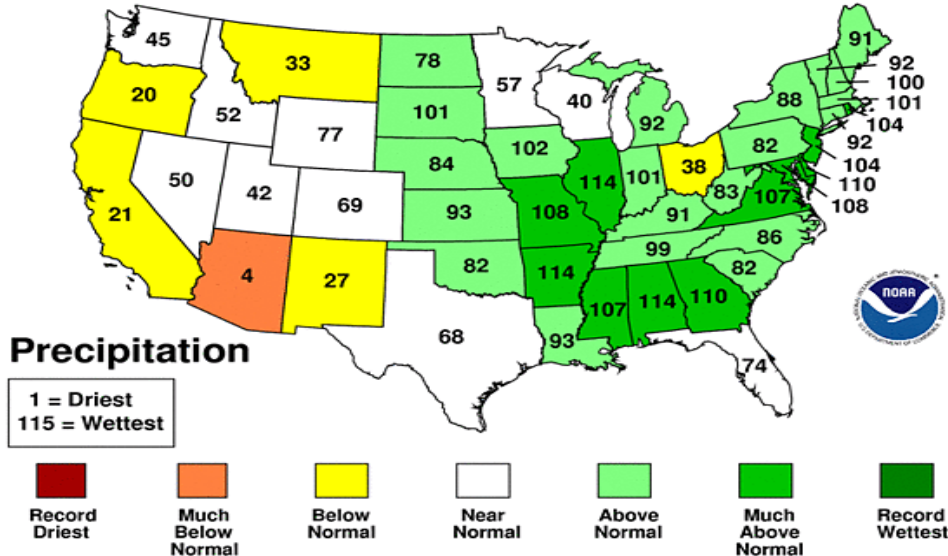


National Climatic Data Center / NESDIS / NOAA

Here's a national view of the precipitation pattern in 2009

January-December 2009 Statewide Ranks

National Climatic Data Center/NESDIS/NOAA



Preliminary Significant U.S. Weather and Climate Events for 2009



Additional statistical data and updates for 2009 (across the US or World can be obtained at: <http://www.ncdc.noaa.gov/climate-monitoring/>)

Seasonal and Monthly Highlights

Much more information is included in the full [season write-ups](#) .

Winter 2008-09

A stormy, snowy cold winter was tale for the Winter of 2008-09 as the upper wind pattern was quite conducive in spawning low pressure systems in the southern Plains and Texas region which hooked northeast into the Great Lakes and Northern Ohio Valley. Many of our storms developed off a split flow pattern that allowed varying degrees of phasing in the Midwest and Lakes. At the same time, colder air (than seen the past few winters) was able to push further south into the region. While December and February were normal to slightly below temperature-wise, the real chill came January when readings averaged in the teens, well below the norms.

VERY IMPRESSIVE SNOWFALLS PAST TWO WINTER SEASONS INSTIGATES A NEW TOP FIVE CATEGORY IN BACK TO BACK SNOWFALL SEASONS

The snowfalls across Southeast Lower Michigan the past two winters /2007-08 & 2008-09/ are without precedence in amounts (back to back winters) at Saginaw and vie for a close second place at Flint. Here at White Lake, the last two winters easily made the top spot with 180.5” the two winters.

<u>FNT</u>	Most Snowfall in Two Consecutive Winters		
1-	1974-75	82.9	
	1975-76	76.6	159.5
2-	2007-08	82.8	
	2008-09	72.8	155.6
3-	2004-05	73.0	
	2005-06	55.9	128.9
4-	1958-59	61.5	
	1959-60	60.1	121.6
5-	1966-67	78.6	
	1967-68	40.8	119.4

MBS Most Snowfall in Two Consecutive Winters

1-	2007-08	80.0	
	2008-09	79.4	159.4
2-	1995-96	68.4	
	1996-97	75.4	143.8
3-	1966-67	87.2	
	1967-68	47.4	134.6
4-	1907-08	61.3	
	1908-09	72.4	133.7
5-	1903-04	74.9	
	1904-05	58.1	133.0

DTX Most Snowfall in Two Consecutive Winters

1-	2007-08	91.7	
	2008-09	88.8	180.5
2-	2004-05	62.6	
	2005-06	101.0	163.6

Spring 2009:

After a cold and snowy winter, spring arrived very slowly across Southeast Lower Michigan with the green up taking its time. This was in spite of temperatures averaging above normal both March and April (but this was mainly due to just a handful of large above normal departure days). Heavy snows of the winter along with a fairly saturated soil condition led to a cool ground that was slow to warm through April. Not to mention, a wet April and a slightly cooler May didn't help matters in warming the soil. April's rainfall was well above normal across the entire region and was primarily responsible for the wet spring. April also contained a strong severe weather event during an early mini-heat wave on the 25th. The main thrust of severe weather moved south of the Saginaw and Flint region.

Severe thunderstorms organized in lines (with a strong punch) while surging across Southeast Lower Michigan. This was almost exclusively a wind event with numerous reports of 50 to 70 mph wind gusts across central and northern Oakland, Macomb and St Clair Counties. Some of the same areas hit with June 8th's 2008 derecho were under the gun this time too. The storms also brought heavy driving rains which only aggravated some of the already high rivers and lowlands with more flooding. Spring precipitation totals ranged from better than nine inches /9.30"/ at Saginaw to better than ten and a half inches /10.66"/ at Flint (12.42" here at the NWS White Lake). Of course, all rainfall departures were above normal, ranging from one to nearly four inches (the highest being around the metro Detroit area). This was in stark contrast to the Spring of 2008 when below normal precipitation (a 2½ - 3.0 inch deficit and coming at the worst time to boot, mid to late spring) affected the region. Another interesting fact, Spring 2008 (when just using the three stations), Southeast Lower Michigan averaged 2.45" below normal, whereas this spring we averaged 2.39 above. Yes, Mother Nature does have a way of balancing things out ;-)

Summer 2009:

The summer of 2009 will go down in the weather books as an exceptionally cool but fairly nice for most people. Few days contained the heat and humidity usually associated with a typical summer in these parts. All the region saw less than half /4-5/ the usual /8-12/ of 90 degree days along with many days feeling more comfortable due to lower humidity. All of Southeast Michigan averaged a solid 2 degrees below normal, something that has happened only about 13% of the time. So cool was the summer, many of the hot and humid weather lovers would call "2009" the year without the summer. Flint, with an average of 66.1 /normal 68.4/ secured 2ndth coldest spot for a summer and Saginaw with 66.4 /normal 68.9/, came in 8th for coldest.

Impressive July Cold:

The most outstanding summer month in our cool summer goes to July with temperatures averaging some five degrees below normal with Southeast Lower Michigan average temperature of 66.8 (when the three main climate stations are used). Flint's July temperatures averaged 65.6/-5.0 while Saginaw recorded 66.0/-5.2 degrees. There were no 90 degree days in July, a month that typically has a good proportion of the summer 90s. A good testament for the persistence and resiliency of the cool (or below normal) weather in July was the amount of below normal departure days. Both Flint and Saginaw had just one above normal day and thus, basically nearly the entire month contained below normal departure days!

Summer Rains and Lack of Severe Weather

Overall, rainfall was plentiful while severe weather was not. The summer started out on the wet side over most of Southeast Lower Michigan from a Flint to Port Huron line /roughly I-69/ south to the Ohio border seeing above normal rains in June. The problem was (and a problem seen many summer months) that the majority of the rain that fell in June, fell on a couple of days. As an example, Flint received 3.46" of its 6.57" of rain on one day /17th/ with another 1.76" on the 8th. Therefore, 5.22" of rain fell on just two days...or about 80% of the month's rain.

As of the end of June, many areas across Southeast Lower Michigan saw rainfall amounts of four to as much as six inches above the norm for the first six months of the year. The precipitation slacked off in July with all regions seeing below average rainfalls, though not terribly so. The main dry streak came early-mid July with just a couple of days of rain. More generous rains returned in August and again, mainly from the Flint to Port Huron and areas south (with the Saginaw Valley and Thumb Region drier).

As stated, severe weather was quite limited during the 2009 season. This resulted in Southeast Lower Michigan having the least amount of severe weather seen since start of White Lake's statistics /1995/ (not long after the inception of Doppler radar). Severe weather was limited the most during the summer with one of our worst, if not the worst outbreak coming late April (mentioned above).

Arguably the most notable "severe weather" of the summer at Flint came in a double dose. Flint got hit with extremely heavy rain in that June event mentioned above (3.46" of rain in a "cloudburst") on June 17th. Basically, the storm continued to generate over the same region (Flint area) dumping copious amounts of rain. Less than two months later on August 17th, thunderstorms with tropical-like rains dumped nearly four inches /3.89"/ of rain over the same general location, Flint Bishop Airport. Therefore, the rainfall total from these two days is an unprecedented 7.35"! Checking back over Flint's records for the summer months /since 1921/ only six times had near that much rain (over three inches) fallen on a single day and NEVER had that much rain fallen TWICE in the same SUMMER, or YEAR for that matter.

Autumn – Early Winter 2009:

Our Autumn 2009 weather pattern over the country brought primarily a mild, pleasant and dry fall. One glaring exception to our mild fall was that it contained one cold miserable heart, coming during the first half of October. Also, our weather this fall was jumbled up as far as the typical trend seen with one month's weather better suited for another's. September's weather was the most pleasant relative to normal (with November's coming in a close second). September's weather contained above normal temperatures, considerable sunshine and below normal rainfall. In fact, September's weather represented summer's typical weather (albeit, a few degrees shy of the normal) better than some of our actual summer did.

With a change in month, came the abrupt temporary change in autumn's overall pattern. A strong amplified upper air pattern brought pre-season Polar cold resulting in temperatures hovering in record cold territory during the first half of the October. Most areas saw a killing frost/freeze by the second weekend of October (roughly a week ahead of schedule, depending on location) but interestingly (especially considering the strength of the cold) none of the three official climate sites reported snow in October. Temperatures moderated impressively during the remainder of the month. As it turned out, October's weather was much better suited for November than it was for October. October's late temperature moderation was the start of bigger and better things as November played out with mainly unseasonably mild and rather dry (not unlike the overall fall) weather. All areas saw temperatures average close to 5 degrees above normal with only the first week containing weakly below normal departures. The mild Indian summer weather (at times) came at the classic time period for the phenomenon, mid-late fall. There were no November gales this November, a November that was also unusually nice with atypical light winds.

Only a trace of snow was observed at both cities late in the November, a month that usually sees about three inches. Flint's and Saginaw's snow records shows, Flint /since 1921/ has had 16 Novembers without measurable snow and Saginaw /since 1898/, has had 14 without measurable snow. One other unusual or rare November 2009 item was the lack of wind. Yes, there were no November gales this November with the average wind 7.0 - 7.5 mph, well below the average of 11.2 mph.

Our first official winter month was fairly typical for December with temperatures averaging close to normal. Snowfall also averaged around normal while overall precipitation was below.

Again, additional climate information LOCAL AND NATIONAL can be found at:

<http://www.weather.gov/climate/index.php?wfo=dtx>

If you are web surfing, check out NCDC site for the highlights and extremes in the weather for 2009...worldwide!

<http://www.ncdc.noaa.gov/img/climate/research/2009/ann/significant-extremes2009.gif>