

A WET AND WARM 2006 ACROSS SOUTHEAST LOWER MICHIGAN

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**Cold and Wet Start to Winter Warmed Quickly and Was Followed By a Warm and Wet Spring
Warm and Wet Regime Persists Through Much of the Summer But Cools Off in the Fall**

	DETROIT	2006	STATS
-	TEMP		PCPN
	2006		2006
JAN	35.3		3.24
FEB	29.8		2.71
MAR	38.1		3.21
APR	52.2		2.71
MAY	60.7		4.6
JUN	69.3		3.95
JUL	76.1		4.38
AUG	72.9		2.05
SEP	62		1.73
OCT	49.7		4.11
NOV	42.6		2.9
DEC	37.4		3.65
AVE	52.2	TOTAL	39.24
DEP	2.5		6.35
RANK	4TH		12TH

Additional statistical data for 2006 can be obtained at:

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

The weather across Southeast Lower Michigan for the year of 2006 was notably warm and wet with both categories ranking in the top 20 warmest and wettest. With an average temperature of 52.2 degrees in Detroit for 2006, the year ranked the 4th warmest year on record since 1871 (records began November 1870 in Downtown Detroit). Out of the 12 months, only two months (September and October), averaged below normal! The last time a year was this warm or warmer was back in 1998 (our warmest year on record) with 53.5 degrees. It should be mentioned, however, that while not quite as warm as this year, a 51.6 degree average in 2001 was our 6th warmest, a 51.3 in 1999 was The 10th warmest and 51 degrees even in 2000 ranked 17th warmest. So, we've had some warm years lately with five in the last ten years ranking in the top 20! Looking back the last **20 years** (1986-2006) brings three more top 20 warm years (see chart-1 below). Therefore, eight out of top 20 warmest years in Detroit have occurred the last 20 years (1986-2006) or 40% of the top 20 warmest years since 1871. **It is very important to point out that the Detroit area urban heat island has expanded and is now includes Detroit Metro Airport. Its most notable affect is on overnight lows and thus, is influencing the overall mean temperatures. Research shows the warming affects due to the urban heat island and the expansion of the airport itself, have contributed to the warmth somewhat the past 20 years or so.**

Rank	Detroit Area*			
	Coldest		Warmest	
	Temp	Year	Temp	Year
1	44.1	1875	53.5	1998
2	45.6	1917	52.9	1931
3	46.1	1904	52.6	1921
4	46.3	1888	52.0	1991
5	46.5	1912	52.2	2006
6	46.6	1907	51.9	1953
7	46.6	1872	51.6	2001
8	46.8	1873	51.4	1987
9	46.9	1893	51.4	1949
10	46.9	1979	51.3	1955
11	47.0	1926	51.3	1999
12	47.1	1876	51.3	1990
13	47.1	1924	51.2	1964
14	47.1	1885	51.2	1941
15	47.2	1980	51.2	1946
16	47.3	1978	51.1	1881
17	47.3	1895	51.0	1933
18	47.3	1972	51.0	2002
19	47.5	1940	50.9	1882
20	47.5	1883	50.9	1952

Rank	Detroit Area*			
	Driest		Wettest	
	Total	Year	Total	Year
1	20.49	1963	47.69	1880
2	21.06	1889	45.44	1881
3	21.58	1934	43.49	1878
4	21.73	1958	42.64	1990
5	22.79	1971	42.18	2000
6	23.17	1933	40.80	1959
7	23.45	1941	40.65	1909
8	23.86	1953	40.40	1876
9	24.39	1924	40.08	1985
10	24.65	1944	39.83	1957
11	24.95	1872	39.46	1950
12	24.98	1910	39.26	1926
13	25.04	1895	39.24	2006
14	25.39	1946	38.28	1987
15	25.40	1871	38.08	1932
16	25.74	1894	37.78	1951
17	25.94	1930	37.65	1983
18	26.22	1984	37.61	1986
19	26.23	1955	37.45	1879
20	26.41	1899	37.35	1925

The wet (or above normal) precipitation regime also persisted all four seasons across the region. Only three out of the 12 months had precipitation below normal and those were April, August and September but none were anywhere near dry enough to influence a below normal season departure. The precipitation amount of 39.24" officially at Detroit Metro Airport made it the 12th wettest year on record. The last time it was this wet in the Detroit area was not that long ago, back in the year 2000 when 42.18" /5th wettest/ of rain fell. Similar to the recent above normal temperature years, if one checks back the past **25 years** for top 20 precipitation years, seven years (or 35%) appear in the top 20 wettest.

Therefore, the two dominant trends of the past year (warmth/wetness) are also fairly represented the past quarter of century over extreme Southeast Lower Michigan.

Seasonal and Monthly Highlights

Winter 2005-06 BRINGS ABOVE NORMAL TEMPERATURES AND PRECIPITATION

Temperatures: Above Normal In the end, **temperatures averaged above normal in the Winter of 2005-06**. It was a wild ride getting there, however, with the first three weeks of December containing bitter cold and temperatures averaging about 10 degrees below normal. Late December into January made a complete about face with temperatures averaging about 10 degrees above normal! This led to one of the top warmest Januarys on record. Things evened out a bit more in February but it still the month ended on the mild side, averaging a couple of degrees above normal. **Generally, all areas of Southeast Lower Michigan averaged two to three degrees above normal for the Winter of 2005-06.**

Precipitation: Above Normal (again)

While this past winter was wet, it was not as wet nor as snowy as the winter of 2004-05 (http://www.crh.noaa.gov/dtx/winter2004-2005_review.php). **Still, both Detroit and Flint managed to make the top twenty wettest winters list again. Detroit placed 18th for the wettest winter (as opposed to 10th place for the winter of 2004-05**

Snowfall: Around Normal

Like the cold, snowfall was on and off again through the winter with December 2005 by far being the snowiest month across Southeast Lower Michigan. The snow season actually got into high gear early in the season, also not unlike the Winter of 2004-05. Significant snows arrived in time for Thanksgiving, lasting right up to just before Christmas. By the end of December, much of the region had already received half of the season's normal snowfall. However, with January's unseasonably mild weather, snowfalls became less frequent but still, we managed to see normal (or slightly below) falls across Detroit's northern suburbs up through Flint and Saginaw. Snowfalls picked up somewhat during February, mainly between the I-69 and M-59 corridor where heavier snows were reported (note: Flint and White Lake each received about 16"). With spring approaching, snowfalls began to fade once again late in the season in most areas but it remained snowy in the Saginaw Valley where another 10" /9.9/ fell at Tri Cities Airport.

All things combined, snowfall over Southeast Lower Michigan for the Winter 2005-06 averaged around normal with areas south of an Ann Arbor- Detroit line seeing slightly below normal snow, while the region north of that line seeing normal to above normal snow. The highest snowfall was concentrated from Detroit's northern suburbs, west into Brighton and Howell and then north, across Flint and Lapeer into the Saginaw Valley and interior Thumb Region (this area roughly falls between I-696 and M-46).

WINTER 2005-06 TEMPERATURES

SITE	DEC	JAN	FEB	WINTER TEMP	
				AVE	DEP
DETROIT	25.8	34.5	29.8	30.0 /	+2.9
FLINT	24.3	31.8	25.1	27.1 /	+3.2 13th
SAGINAW	24.0	30.6	24.5	26.4 /	+2.3
NWS WHITE LAKE	23.8	31.9	25.4	27.1 /	+
DEPART FROM NORM SE MI	B	MA	A	A	

WINTER 2005-06 PRECIPITATION

SITE	DEC	JAN	FEB	WINTER TOTAL PRECIPITATION	
DETROIT	2.52	3.24	2.71	8.47/+2.17/	18th
FLINT	1.77	4.02	1.40	7.19/+2.09/	10th
SAGINAW	1.77	3.00	1.40	6.17/ +0.72	---
NWS WHITE LK	2.28	3.69	2.24	8.21/ +	N/A
DEPART FROM NORMAL SE MI	N	MA	N-A	A-MA	

WINTER 2005-06 SNOWFALL

SITE	NOV	DEC	JAN	FEB	MAR	APR	SEASON SNOWFALL
DETROIT	4.3	19.8	5.0	3.8	3.4	T	36.3/ - 7.7
FLINT	5.7	22.2	9.6	15.7	2.1	0.6	55.9/+ 8.1/10th
SAGINAW	2.3	18.5	10.1	7.9	9.9	1.0	49.7/ 5.2
NWS WHITE LAKE	5.8	25.8	11.1	16.5	1.4	1.1	61.7/ +
DEPART FROM NORM SE MI	N	MA	N	B-A	B-A	B-N	B-A (avgd N)

THE MILD AND WET SPRING OF 2006

After having one of the driest springs on record last year (Spring 2005), the Spring of 2006 was one of our wetter (placing just below or in the top 20 wettest springs list). The spring was also somewhat warmer than the Spring of 2005. Rainfall averaged generally two to three inches above normal for spring and considerably higher when compared to last spring. Note the chart below, for some stark differences and comparisons:

2005/2006 - SPRING PRECIPITATION COMPARISONS IN SOUTHEAST MI

Year	Detroit	Flint	Saginaw	White Lk
2005	4.25	3.75	4.78	5.07
2006	10.52	10.28	10.90	11.69

March was an interesting month being it was predominantly cool (with two thirds of the month averaging mainly below normal) and yet, even with the preponderance of cool weather, the average temperature for the month actually

averaged +1.2 degrees above normal. This was almost solely due to a 6-day stretch of warm weather from the 8th - 13th and then again on the 31st when temperatures averaged a huge 14-15 degrees above normal. It was quite a variable month too (but isn't March usually), with its share of storms and sun which led to above normal rainfall everywhere. There was a downright cold reception for the first full day of spring /21st/ with temperatures averaging about ten degrees below the norm along with scattered snow showers. March left like a lion as deep low pressure system pushed northeast through the northern Great Lakes and brought widespread thunderstorms and severe weather. Strong winds and hail resulted in scattered reports of trees or large branches downed over across the region along with widely scattered power outages.

All in all, the month of April gave the best weather show of the spring with above normal temperatures and a break from the wetter than normal conditions that actually commenced late last fall. Temperatures averaged some three to four degrees above normal, while rainfall ranged from normal to nearly an inch below normal in some areas. April 2006 made the top 20 warmest list at all three stations and the last time April was close to being this warm was back in 1991. The warmest day of the month /14th/, brought readings into the mid 70s to around 80 and at Detroit, a record high on the 14th when the mercury rose to 81 at Detroit. The biggest above normal departure day of the month also occurred on the 14th when the mean temperatures averaged at least 15 to 20 degrees above normal. On the other side of the coin, it was a chilly morning on the 9th when readings fell well down into the 20s. A cold air mass also late in the month dropped temperatures once again into the 20s and brought out the Frost/freeze advisories.

The month of May was an impressive month weather-wise with basically two types of weather, cool and rainy and hot and sunny. *But ask* most people about May's weather and they'd probably say "cool and wet with a hot Memorial Day weekend." At mid month, a series of cool upper low pressure systems over the region brought unseasonably cool and rainy weather. By the end of the third week, monthly temperature averages dropped off considerably and averaged 2 1/2 to three degrees below normal. All three cities (Detroit, Flint and Saginaw) either flirted with/or placed in the top 20 coldest Mays list. One exceptionally cool, wet and dreary period ran from the 10th -19th at Detroit. It rained every day with a tenth of an inch /.10/ or more of rain accumulating from the 10th-18th...or 9 days. The old record for number of days with a tenth of an inch (or more) at Detroit was just six days. Near the end of the unseasonably cool spell, clear skies and light winds allowed temperatures to drop into the 30s across all area from the 20th-23rd.

A week later, record heat was the story and this time Detroit made the record books with a 92 degrees on Memorial day /29th/ (the hottest Memorial Day occurred 5/30/42 with 93). Incredibly, the temperatures for the month of actually averaged above normal and this was almost solely due to the heat over Memorial Weekend.

2006 - SPRING AVERAGE TEMPERATURE AND RAINFALL/DEPARTURES

	Detroit	Flint	Saginaw	White Lk
MAR(T)	38.1/+1.2	34.5/+0.8	34.5/ +1.0	34.8/ +
(P)	3.21/+.61	2.83/+.61	2.86/+.44	3.28/ +
APR (T)	52.2/+4.1	48.2/+2.8	48.9/+3.4	49.1/ +
(P)	2.71/-.34	2.18/-.95	2.39/-.43	2.86/ N
MAY (T)	60.7/+0.9	57.8/ +0.7	57.8/+0.2	57.5/N
(P)	4.60/+2.17	5.27/+2.53	5.65/+2.76	5.55/+
Ave (T)	50.3/+2.0-9 th w	46.8/+1.4-18 th w	47.1/+1.6-18 th w	
Total (P)	10.52/+1.90	10.28/+2.19-11 th w	10.90/+2.77-15 th w	11.69/+

Note: White Lake has no official normals at this time, the - /N/+ just denotes an estimate of above/normal/below (--/++ much below/above). W=warmest or wettest

THE OVERALL, AGREEABLE SUMMER OF 2006

Some stifling hot and humid days, some chilly cool days, plenty of sunny and warm days – and let’s not forget the refreshing cooler breaks interspersed amongst them - pretty well sums up the Summer of 2006 when it comes to temperatures. All in all, just about everyone had to be satisfied (within reason) during this summer, at some point with their particular type of summer preference. The number of 90 degree days, always a quick and popular gauge on how hot the summer felt was right up there near the normal /12/ with 11 at Detroit. Just to get an idea what was on people’s minds about the weather during the Summer of 2006, when asked how they felt about the summer, the nearly universal comment was it was a generally a nice or *good* summer!

Not only were the temperatures somewhat variable and thus, overall pleasing, so was the rainfall pattern. Nearly all sections of Southeast Lower Michigan received plentiful (in some scattered cases, too plentiful) rainfall during the summer growing season. This more than adequate rainfall actually carried over from the spring and resulted in, for the most part, a good growing season across Southeast Lower Michigan. There were just two seasonably dry periods during the summer. One extended early to mid June (4 -17th), while the other appeared early to mid August (strangely enough, about the same dates, give or take a few days depending on location).

The summer statistics actually don’t lie this time and pretty well reflect the type of summer we experienced across Southeast Lower Michigan.

LOCATION.....JUNE.....JULY.....AUGUST.....SUMMER 2006 SUMMER 2005

	Temp / Pcpn	Temp / Pcpn	Temp / Pcpn	Temp / Pcpn	Temp / Pcpn
Detroit	69.3 / 3.95	76.1 / 4.38	72.9 / 2.05	72.8 / 10.38	74.8 / 8.66
Norms	69.0 / 3.55	73.5 / 3.16	71.8 / 3.10	71.4 / 9.81	71.4 / 9.81
Departures	+0.3 / +.40	+2.6 / +1.22	+1.1 / -1.05	+1.4 / +.57	+3.4 / -1.15
Flint	65.9 / 3.30	71.7 / 4.26	68.8 / 3.14	68.8 / 10.70	71.6 / 8.31
Norms	66.2 / 3.07	68.4 / 3.17	68.5 / 3.43	68.4 / 9.67	68.4 / 9.67
Departures	-0.3 / +.23	+1.1 / +1.09	+0.3 / -.29	+0.4 / +1.03	+3.2 / -1.36
Saginaw	66.1 / 1.65	73.5 / 3.42	69.9 / 3.43	69.8 / 8.50	70.9 / 8.96
Norms	66.8 / 3.06	71.2 / 2.50	68.7 / 3.38	68.9 / 8.94	68.9 / 8.94
Departures	-0.7 / -1.41	+2.3 / +0.92	+1.2 / +.05	+0.9 / -0.44	+2.0 / +.02
				70.5 / 9.86	
AVE:SE MICH				69.6 / 9.47	
				+0.9 / +.39	
White Lk	64.8 / 4.49	71.3 / 4.1	68.7 / 3.11	68.2 / 11.57	70.5 / 9.77

A COOL AND WET AUTUMN (BUT NOT AS MUCH AS YOU MIGHT THINK).

As most inhabitants of Southeast Lower Michigan would attest, the Fall of 2006 was basically cool, wet and somewhat dreary but still, it contained at least a few bright spots - most notably the beautiful Indian Summer that arrived at the end of November.

Interestingly, both September and October averaged about two to three degrees below normal, while November averaged two to three degrees above. While September's weather did not place in any list for Detroit it was noticeably dry (considering, overall wet fall) with just 1.73" out of 3.24" normal falling / -1.54/. October 2006 was arguably the most disappointing fall month weather-wise with several days of cool and/or wet weather. All three cities averaged below normal in temperatures and above normal rain. The most dismal weather seemed to come at the peak autumn color show across the region. No doubt the worst of weather in October (and likely the fall) came mid-month on the 12th with a record breaking cold blast of Arctic air. The storm had an uncanny resemblance to very old record setting storm itself, back on October 13th 1909. Both systems contained impressively deep centers / around 29.00"/ and air straight out of cold core depths of the Arctic. They also took similar tracks and blasted same region with heavy snow, lake effect snow and again, exceptional cold for October. Blustery heavy snow showers bombarded the land with visibilities, at times, dropping to white out conditions.

SOUTHEAST LOWER MICHIGAN AUTUMN 2006 STATISTICS							
	MONTH	SEP	OCT	NOV	AUTUMN	NORMS	DEPART
DETROIT	Temp	62	49.7	42.6	51.4	52.2	-0.8
	Pcpn	1.73	4.11	2.9	8.74	8.16	0.58
FLINT	Temp	58.7	46	41.1	48.6/16th	49.3	-1.3
	Pcpn	3.19	3.59	2.47	9.25/18th	8.75	0.5
SAGINAW	Temp	59.1	46.1	40.4	48.5	49.4	-0.9
	Pcpn	2.29	5.08	3.09	10.46	9.09	1.37
WHITE Lk	Temp	58.5	45.9	40.7	48.3	N/A	
	Pcpn	4.67	4.75	2.51	11.93	N/A	

On the flipside, one of the nicest stretches of the fall (if not the nicest), arrived just in time to be thankful for it – basically, from Thanksgiving to the 30th. Considerable sunshine and warming temperatures brought smiles on many faces. The combination of sunshine and southerly breezes brought an impressive record high of 67 and record high minimum of 54 on the 29th at Detroit and thus, set the stage for the warmest overall Nov 29th. The average temperature of 61 on the 29th is now the third warmest day /by average/ so late in the season!

The year of 2006 closed on an exceptionally mild (but wet) note with December ranking the fifth warmest December and 20th wettest. And, had it not been so cold during the first week (and thus...temperatures averaged normal), the monthly average would have come in at about 38.8...or 9.2 above normal (third warmest). Continuously warm December days the remainder of the month brought the average temperature up to 37.4 degrees, nearly eight degrees /7.8/ above normal. The last time it was as warm (or warmer) in December was back in another El Nino winter (albeit stronger) and that was winter of 1982-83. Total snow for the month of just 2.4" also made this December the 14th /tied with 1918/ snowless December since 1880.

*(additional, more detailed climate information can be found at:
<http://www.weather.gov/climate/index.php?wfo=dtx> and
<http://www.crh.noaa.gov/dtx/climate/local.php>)*