

*SOMETIMES CALM...SOMETIMES WILD BUT IN THE END 2008 WAS...NORMAL?
SNOWIEST CALENDAR YEAR ON RECORD SINCE SNOW RECORDS BEGAN*

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It will be a long time before inhabitants of Southeast Lower Michigan forget the Winter of 2007-08 (but then again, Winter of 2008-09 thus far has been a good challenger). A persistent parade of storm centers brought abundant amounts of snowfall to the region, leaving much of the region up in the top five snowiest winters on record (more in the season write-up below). There was certainly nothing "normal" about the piling up of snowfall week and week during the Winter of 2007-08.

Spring 2008 started out cold and snowy with temperatures below normal in March. After, well above normal temperatures came in April only to reverse again to significantly below in May. With this sine-wave temperature pattern, the entire spring averaged just slightly below normal /-0.2/ over Southeast Lower Michigan. What was more noteworthy was the below normal rainfall with a 2½ - 3 inch deficit coming at the worst time to boot, mainly mid to late spring.

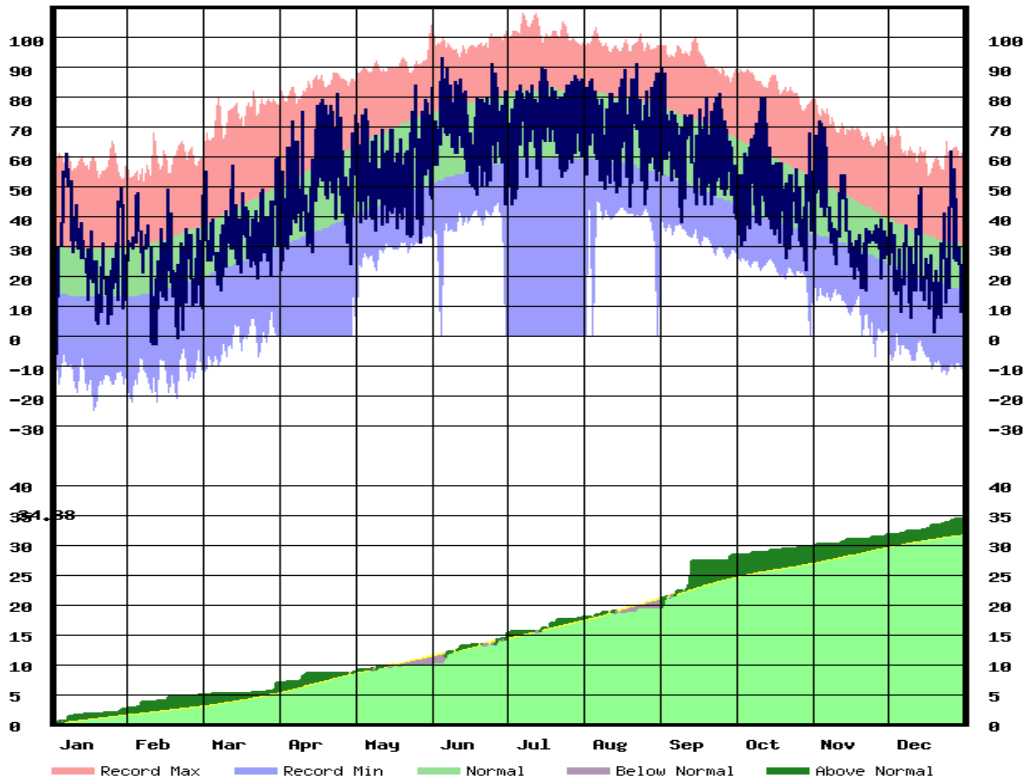
Southeast Lower Michigan had one of its more pleasant summers temperature-wise in 2008. Temperatures averaged just on the higher side of normal. Any warm or hot spells (few that there were) were quickly extinguished by an active parade of cold fronts during the summer. While the fronts brought substantial rains early summer (note rainfall table below), they also brought several storm outbreaks with damaging severe weather. The most notable was the June 8th derecho outbreak that clobbered portions of the Saginaw Valley and Flint area along with Detroit's northern suburbs with winds approaching hurricane strength /74 mph/ (more in season write-up below). The best rains during the summer, relative to normal, fell across the Saginaw Valley.

The early days of autumn started out extremely wet over Southeast Lower Michigan with the combination of tropical moisture and a slow moving frontal system. The weather quieted down as temperatures cooled off in October and all in all, it was a fairly pleasant month. Indian summer weather graced the landscape in time for Halloween and continued, for the most part, through the first week of November. The second half of the month did a complete reversal with much colder weather and frequent snows as Winter of 2008-09 made a rude and early entrance. This cold and snowy pattern only got worse in December with well above normal snows and below temperatures.

Flint 2008 Temperature and Precipitation Statistics

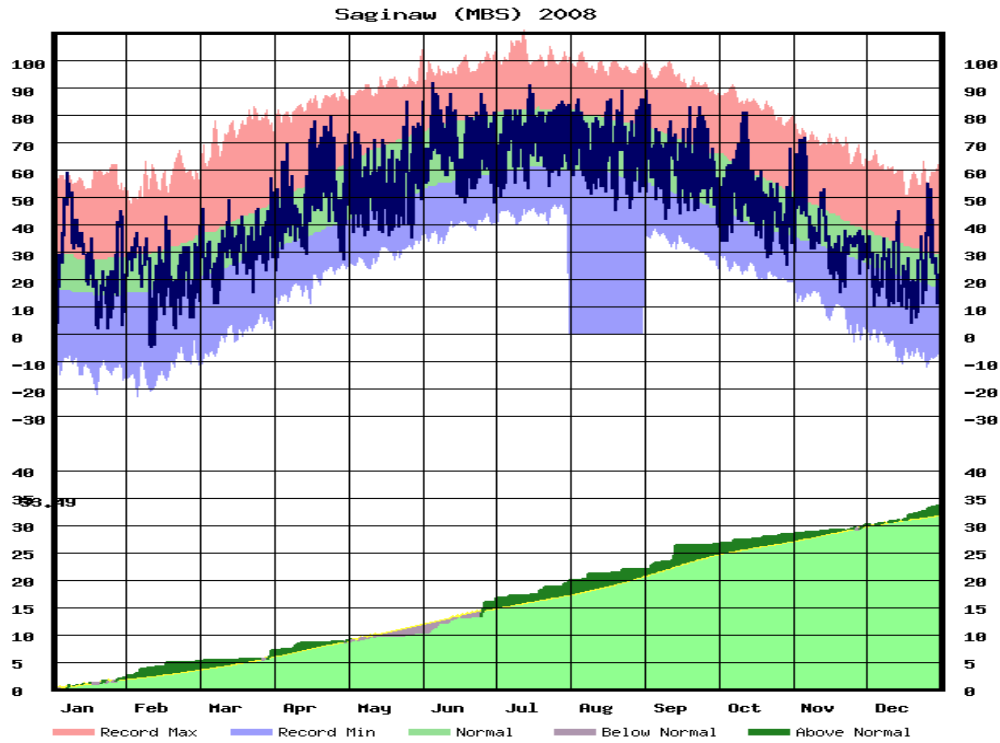
| | <u>FLINT</u> | <u>2008</u> | <u>STATS</u> |
|------------|--------------|-------------|--------------|
| | TEMP | | PCPN |
| | <u>2008</u> | | <u>2008</u> |
| JAN | 26.9 | | 2.49 |
| FEB | 23.7 | | 2.35 |
| MAR | 33.2 | | 2 |
| APR | 51.0 | | 1.6 |
| MAY | 54.6 | | 1.59 |
| JUN | 68.9 | | 4.11 |
| JUL | 70.7 | | 3.56 |
| AUG | 68.6 | | 1.89 |
| SEP | 62.7 | | 8.64 |
| OCT | 47.7 | | 1.26 |
| NOV | 37.3 | | 2.1 |
| DEC | 24.7 | | 2.79 |
| AVE | 47.5 | TOTAL | 34.38 |
| DEP | +0.7 | | +2.77 |

Flint Bishop (FNT) 2008

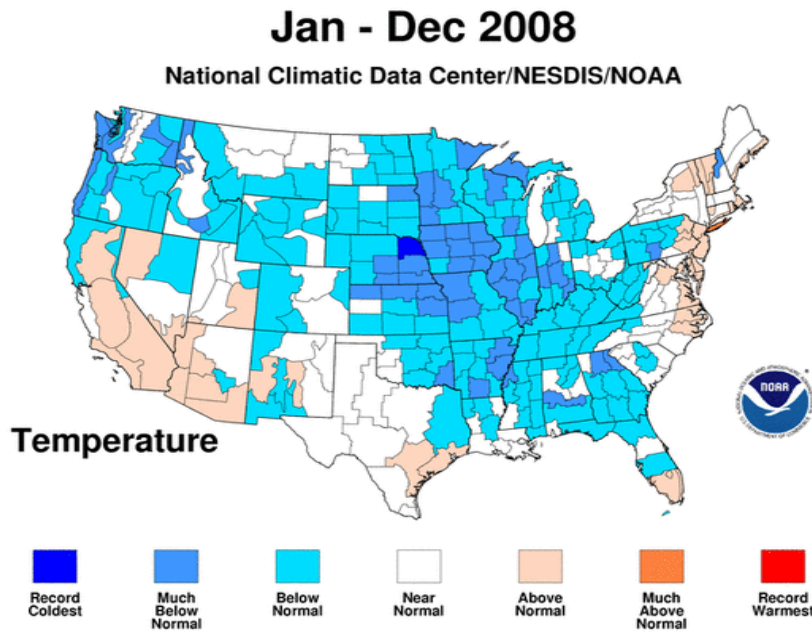


SAGINAW 2008 Temperature and Precipitation Statistics

| | SAGINAW | 2008 | STATS |
|------------|----------------|--------------|--------------|
| | TEMP | | PCPN |
| | 2008 | | 2008 |
| JAN | 26.1 | | 2.02 |
| FEB | 20.8 | | 3.13 |
| MAR | 30.6 | | 1.98 |
| APR | 49.1 | | 1.57 |
| MAY | 54.6 | | 1.63 |
| JUN | 68.3 | | 5.65 |
| JUL | 70.6 | | 3.27 |
| AUG | 67.6 | | 2.72 |
| SEP | 62.8 | | 4.55 |
| OCT | 48.5 | | 1.72 |
| NOV | 37.8 | | 1.47 |
| DEC | 23.7 | | 3.77 |
| AVE | 46.7 | TOTAL | 33.48 |
| DEP | -0.3 | | +1.87 |

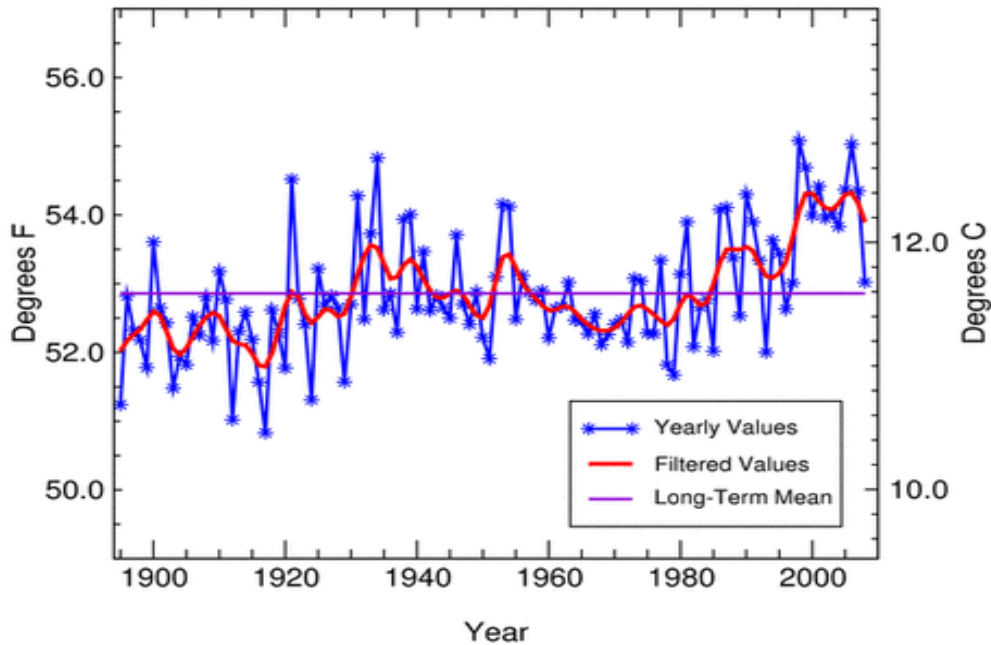


Here's a national view of the cooler temperature pattern in 2008



Quite a plunge from the recent National temperature trend

National (Contiguous U.S.) Temperature 1895 - 2008



National Climatic Data Center / NESDIS / NOAA

[Snowiest year on record since snow records began in Flint/Saginaw](#)

Arguably, the most notable weather story for 2008 was the record annual snowfall measured at all three major climate locations (Detroit, Flint and Saginaw). Keep in mind, this is not a winter season but a calendar year.

Flint measured 98.3" of snow for 2008, the previous record was 84.0" in 1975. Saginaw topped a 100" with 102.5", the previous highest for a calendar year was 77.0" in 1947. At Detroit, 82.6" of snow was measured from January 1st through December 31st, 2008, the most in a calendar year. Here at the NWS in White Lake the annual snowfall for 2008 was also our highest snowfall for a calendar year (since records began the Winter of 1995-96) with 114.0"!

RECORD ANNUAL SNOWFALLS

| DETROIT | 2008 | FLINT | 2008 | SAGINAW | 2008 |
|----------------|-------------|--------------|-------------|----------------|--------------|
| JAN | 13.8 | JAN | 22.8 | JAN | 18.9 |
| FEB | 24.2 | FEB | 29.4 | FEB | 34.2 |
| MAR | 21 | MAR | 7.3 | MAR | 1.5 |
| APR | T | APR | 0.5 | APR | T |
| OCT | 0 | OCT | T | OCT | T |
| NOV | 2.2 | NOV | 9.2 | NOV | 8.8 |
| DEC | 21.4 | DEC | 29.1 | DEC | 39.1 |
| TOTAL | <u>82.6</u> | TOTAL | <u>98.3</u> | TOTAL | <u>102.5</u> |

Additional statistical data for 2008 can be obtained at:
<http://www.weather.gov/climate/index.php?wfo=dtx>

[Seasonal and Monthly Highlights](#)

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

[Winter 2007-08:](#)

Incredible Stormy Winter Brings Widespread Record Territory Snowfalls

Temperatures fluctuated energetically up and down throughout the winter. When all was said and done (and partly because of those wide temperature

fluctuations), the Winter of 2007-08 went down statistically as just slightly above normal temperature-wise, but well above normal for both rain and snow.

Using the three main locations (Detroit, Flint and Saginaw) the average temperature for Southeast Lower Michigan averaged around 26.0 degrees, or a degree /+1.0/ above normal. And strictly speaking, a degree above normal is still comfortably within the "normal" or average range. And, while temperatures averaged within the normal range, snowfall did not! With storm after storm pushing northeast into the southern Great Lakes during the winter of 2007-08, a surplus of snow and rain was seen throughout the Winter of 2007-08 which continued into the spring.

The following represents the top 5 season snowfalls for Detroit, Flint and Saginaw in their perspective record keeping.

Top 20 Snowless/Snowiest Seasons in Southeast Lower Michigan

| Rank | Detroit Area* | | | | Flint Bishop** | | | | Saginaw Area*** | | | |
|------|---------------|---------|----------|---------|----------------|---------|----------|---------|-----------------|---------|----------|---------|
| | Snowless | | Snowiest | | Snowless | | Snowiest | | Snowless | | Snowiest | |
| | Total | Year | Total | Year | Total | Year | Total | Year | Total | Year | Total | Year |
| 1 | 12.9 | 1936-37 | 93.6 | 1880-81 | 17.6 | 1948-49 | 82.9 | 1974-75 | 7.8 | 1941-42 | 87.2 | 1966-67 |
| 2 | 13.2 | 1881-82 | 78.0 | 1925-26 | 17.6 | 1944-45 | 82.8 | 2007-08 | 18.5 | 1976-77 | 83.5 | 1951-52 |
| 3 | 13.7 | 1948-49 | 74.0 | 1981-82 | 21.7 | 1943-44 | 78.6 | 1966-67 | 20.0 | 1952-53 | 80.0 | 2007-08 |
| 4 | 15.2 | 1918-19 | 71.7 | 2007-08 | 23.4 | 1952-53 | 76.6 | 1975-76 | 21.0 | 1920-21 | 75.5 | 2004-05 |
| 5 | 15.4 | 1965-66 | 69.1 | 1899-00 | 24.2 | 1957-58 | 75.3 | 1951-52 | 21.4 | 1901-02 | 75.4 | 1996-97 |

Spring 2008:

Temperatures Oscillated While the Landscape Dried Out

Spring started out cold and snowy with temperatures below normal in March, after, well above normal temperatures came in April only to reverse again to significantly below in May. With this sine-wave temperature pattern, the entire spring averaged just slightly below normal /-0.2/ over Southeast Lower Michigan. What was more noteworthy below normal was the precipitation with a 2½ - 3.0 inch deficit and coming at the worst time to boot, mainly mid to late spring.

Summer 2008:

Even Though a Comfortable Summer it was Not without its Temper Tantrums

General comments heard about the Summer of '08 was how comfortable it was and indeed, Southeast Lower Michigan had one of its more pleasant summers. Temperatures averaged just on the higher side of normal. Any warm or hot spells (few that there were) were quickly extinguished by an active parade of cold fronts during the summer. When using our three main climate stations in our Outlook, the area averaged an even 70 degrees or a half degree /+0.5/ above normal. The warmest weather (relative to normal) during the summer months occurred mainly early in the summer. While June averaged around two degrees above normal, July and August averaged normal to below.

Severe Weather

While the active fronts brought copious rain early, they also brought several storm outbreaks with damaging severe weather. Severe weather and resulting scattered heavy rainfall in June and July was the main news of the summer. The projected upper air and associated surface pattern materialized with a vengeance early in summer, resulting in numerous severe weather events. Severe weather materialized on June 6th and 8th (8th being the most notable). Severe storms plowed through the region late afternoon and evening bringing a large dose of severe weather. On the 6th, severe storms blossomed over the region during the evening hours and blew trees branches and power lines down. Some locations that had damage included Saginaw, Grand Blanc, Bad Axe, Sanford, Coleman, Gagetown and Caro. Wind gusts were measured or estimated upwards to around 70 mph. If that wasn't enough, another strong squall line intensified into a derecho as it surged through southeast lower Michigan on the 8th. While the worst area hit extended across Detroit's northern suburbs, power lines were also downed across much of the Saginaw Valley, Flint area and Thumb Region. Large trees were uprooted and a flag pole snapped in Bad Axe. Also, wind gusts up to 80 mph were reported at Unionville, Chesaning and Montrose. Between 250,000 and 300,000 Locations lost power in Southeast Lower Michigan at the final tally because of this derecho. More can be read [here](#) on the entire event from the severe storms prediction center.

As mentioned, early-midsummer was busy in the severe weather department and more information on the June (or any other month) in regard to many specific severe weather events can be found in the

monthly climate report in the monthly weather summary /CLM/ under products. The numerous bouts of storms translated to a wet month across Southeast Lower Michigan. Numerous locations received four or more Inches of rain including the 5.65" at Saginaw which ranked it the fourth wettest June on record. Flint's rainfall total of 4.11" matched 1976 for the 16th wettest June. All in all, June 2008 was most notable in the summer for being wet and stormy! Saginaw received nearly a three inch /2.70"/ surplus of rain than a typical in the summer while Flint measured normal amounts (see more in season write-ups)

Autumn – Early Winter 2008:

Early Autumn of 2008 also started out extremely wet across Southeast Lower Michigan with the combination of tropical moisture and a slow moving frontal system. Days of heavy rain, led to the third wettest on record at Flint with 8.64" of rain but lesser intense rains fell at Saginaw, a little more than half that amount /4.55/. Detroit saw its sixth wettest September on record with 5.99 inches

The worst of the rains came on the 13-14th when a slow moving cold front encountered a tropical plume of moisture laden air left over from tropical storms Lowell and Ike. Rainfall, periodically falling in torrential downpours, occurred much of the two day period. Officially at Flint Bishop Airport, 2.04" fell on the 13th which established the second daily, rainfall record in the month. Then, if that wasn't enough, on the 14th the Flint area was deluged again with even more rain leading to another daily record rainfall with 2.63". At the same time in Saginaw, over an inch of rain /1.11"/ fell on the 13th, while another one and three quarter inches /1.77"/ created a daily rainfall record on the 14th. In a roughly 52 hour time span, from 3pm Friday until 7PM Sunday, numerous locations in Southeast Lower Michigan recorded several inches of rain. Some of the highest totals were found across the Saginaw Valley region with over 8" of rain at Montrose. More about the storm and map of the rainfall can be found at:

www.crh.noaa.gov/dtx/?n=sept08rain.

In October weather quieted down, temperatures cooled off and all in all, it was a fairly pleasant month. Though a bit on the cool side, the month still contained its share of warm days. Frost and freezes came at their normal times and became more widespread by the third week. The warmest time of the month came during the second week /8th-15th/when readings topped out around the 80 degree mark!

Indian summer weather graced the landscape in time for Halloween and continued, for the most part, through the first week of November. The beautiful Indian summer weather peaked temperatures into the lower 70s by the 4th and 5th. Both Flint and Saginaw sneaked out a record high on the 4th with 72 degrees at Flint and 71 at Saginaw. The second half of the month did a complete reversal with much colder weather and frequent snows. Nearly all the days from the 16th on, averaged below normal.

A very impressive cold and stormy December befell the inhabitants of Southeast Lower Michigan. Much of the month (up to about the 27th) averaged four to six degrees below normal before a dramatic warm-up after erased over half that departure. Frequent snows through much of the month brought well above normal snow amounts to all of Southeast Lower Michigan. Officially at Flint, 29.1" of snow fell during the month and this was about three times the normal and ranked second place for snowiest December. Saginaw had even more snow this December with 39.1" and this too placed second in snowiest December on record. Here at the NWS in White Lake (and one of the higher amounts in the Detroit northern suburbs), nearly three feet /34.6"/ was measured for December

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 2008...worldwide!

<http://www.ncdc.noaa.gov/img/climate/research/2008/ann/significant-extremes2008.gif>