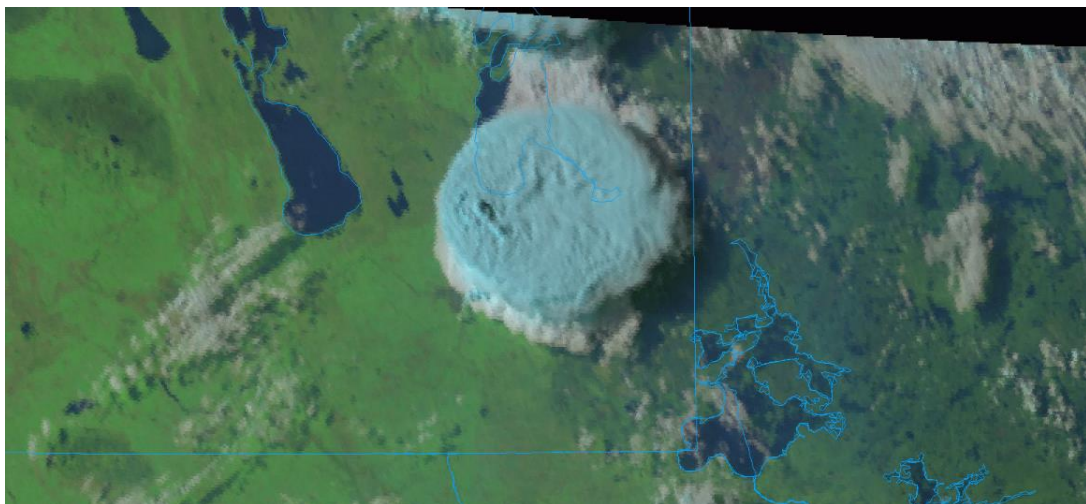


Top Ten  
Weather Stories of  
**2023**  
in the  
Winnipeg Area  
By Julien Corriveau

## Table of Contents

<b>1 Year of Hailstorms</b> .....	3
<b>May 10 Severe Thunderstorms</b> .....	3
<b>July 25 All-Night Thunderstorms</b> .....	4
<b>July 26 Supercells Dump Huge Hail North of Winnipeg</b> .....	5
<b>August 24 Hailstorm in Northeast Winnipeg</b> .....	7
<b>2 Warmest May-June Period on Record</b> .....	9
<b>3 Strong El Nino Brings Very Mild and Dry December</b> .....	12
<b>4 Wet and Humid October with Heavy Thunderstorms and a White Halloween</b> .....	15
<b>5 Warm and Smoky Year with a Long Growing Season</b> .....	18
<b>6 March Without a Thaw Highlights Cold Start to Spring</b> .....	20
<b>7 4<sup>th</sup> Hottest September Day Highlights 5<sup>th</sup> Warmest Sept</b> .....	22
<b>8 11 Consecutive Drier Than Normal Months</b> .....	22
<b>9 Coldest July Since 2009 a Result of Chilly Nights</b> .....	23
<b>10 August 1 Morning Thunderstorm with Magnificent Shelf Cloud</b> .....	24
<b>Honourable Mentions</b> .....	26
<b>Daily Temperature Departures Graph</b> .....	26
<b>Daily Lightning Flashes Graphs (May to Sep)</b> .....	27
<b>Acknowledgement of Sources</b> .....	28
<b>Pictures</b> .....	28



*Visible satellite image of the monster supercell thunderstorm over Selkirk on July 26 which dropped baseball sized hail.*

# 1 Year of Hailstorms

2023 was one of the most damaging and costly years on record in the province for hail claims. Numerous hailstorms struck the province, including around the Winnipeg area where at least four significant hailstorms caused damage. Almost 12,000 hail claims were made to MPI for the year up to early September. The worst storm was on August 24, when large hail combined with damaging winds in northeastern Winnipeg. This storm alone accounted for about a third of the year's hail claims. On July 26, a supercell which blew up north of Winnipeg dumped baseball sized hail in the Selkirk area. On May 10, loonie sized hail fell in Winnipeg. Each event is summarized below.

## May 10 Severe Thunderstorms

An upper-level wave moving through southern Manitoba kicked off the season's first severe thunderstorm outbreak. Instability and wind shear worked perfectly together to form well-organised thunderstorms with large hail, gusty winds, and torrential downpours. Although it isn't unheard of to see severe weather that early in the season, it was a little unusual to see as much hail as was witnessed. Pretty much every single thunderstorm that developed produced hail, and often as large as quarters and loonies. A few isolated stronger storms dropped hail as large as ping pong balls or even golf balls. Winnipeg was hit by at least two severe thunderstorms with hail up to loonie sized. The first storm moved along Portage Avenue from Headingley to downtown. The second hailstorm moved through the southern portion of the city. There was some minor damage to plants and vehicles, and apparently two dealerships in the St James area had damage.



*St James Winnipeg. Elisha Dacey/Twitter*



*Golf ball sized hail at Hallboro (south of Neepawa). By Lorri Pederson on Facebook*

One storm even exhibited super cellular characteristics in southwestern Manitoba. Tornado warnings were issued. A funnel cloud was observed near Hamiota, with no evidence of a touchdown.

The storms dropped highly variable amounts of rain, ranging from 1 to 45 mm. Ste Rose du Lac suffered significant street flooding from the heavy downpours. In Winnipeg,

amounts ranged from a few mm to over 20 mm. Localized wind gusts over 80 km/h were observed, particularly in the Interlake and southeastern Manitoba. The maximum gust recorded was 87 km/h in Petersfield.

## July 25 All-Night Thunderstorms

It was a noisy night in the Red River Valley on July 25 as training elevated thunderstorms from the northwest brought several hours of thunderstorms. In Winnipeg, thunderstorms began after 11pm on the 24th and continued right through to mid morning. That's over 8 hours of thunderstorms. With that amount of rain and thunder, it was difficult to sleep.

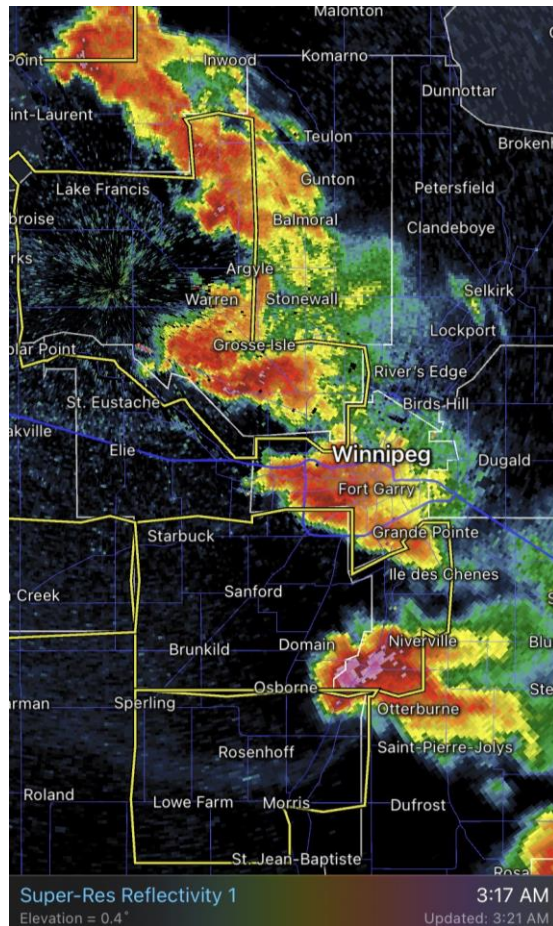
The thunderstorms were mostly heavy rain and prolific lightning producers, but some stronger cells did produce large hail and gusty winds. Southwestern portions of Winnipeg received the brunt of the more intense cells, with reports of hail as large as 3 cm in diameter. Rainfall amounts of 50 to 70 mm also fell along a stretch from Charleswood southeastward to St Norbert. Eastern parts of the city only received as little as 10 to 20 mm. The highest rainfall amounts were mostly along a narrow swath from Woodlands through southwestern Winnipeg, southeastward to Sundown in southeastern Manitoba.

The swath of large hail also passed southeast of Winnipeg, affecting the St Pierre, Rosa and Otterburne areas. Hail up to about nickel sized also caused some damage to vehicles and gardens in Portage la Prairie. Zhoda recorded a wind gust of 100 km/h and 45 mm of rain in an hour.



*(Left) Hail in Charleswood, Winnipeg. By Barbara Kauk, Facebook. (Right) Hail in Portage la Prairie. By Portage Online*





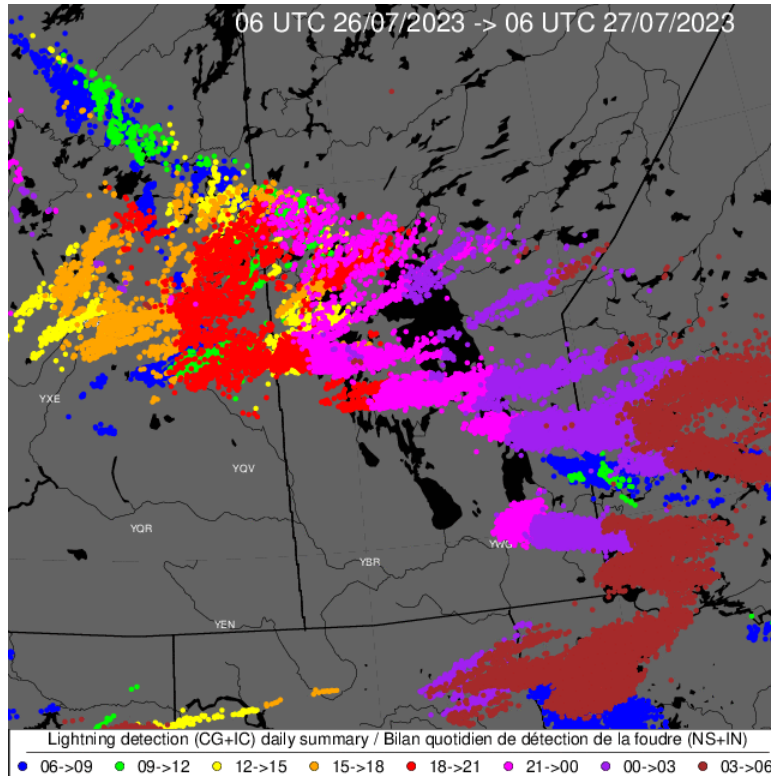
Radar image at 3:17am July 25 showing trailing storm and potentially elevated supercells

## July 26 Supercells Dump Huge Hail North of Winnipeg

Very hot and humid weather culminated in explosive discrete supercell thunderstorms in the Interlake and southeastern Manitoba late in the day on July 26. Dewpoint temperatures reached as high as 26°C in the Red River Valley along with temperatures between 30 and 35°C. This provided ample instability for explosive thunderstorms. A passing cold front with much drier, but still hot air, provided the trigger.

The storm that produced the largest hail reports was near Fisher River First Nation in the Interlake where hail up to 10 cm in diameter fell. The storm also produced a tornado north of Riverton.

A supercell thunderstorm also developed just north of Winnipeg and moved east southeastward. It dropped golf-ball sized hail around Selkirk and southeastwards to Falcon Lake. Localized reports of baseball sized hail were also received (7 cm diameter). A tornado warning was issued, but no tornadoes were reported.



Lightning map for July 26, 2023, showing discrete supercell tracks. Map produced internally at Environment Canada

As can be imagined with such large hail, damage was substantial. Some of the damages included smashed windshields, damaged siding, and even cracked metal roofs. In the Whiteshell, campgrounds were badly damaged, including trailers and tents.

Although hail was the main story with the storms, localized damaging wind gusts in downbursts occurred as well. Beausejour was particularly hard hit by the wind gusts, making people believe a tornado went through. Investigation showed it was a downburst. The wind was enough to rip shingles off some buildings, rip off siding and down some trees and power poles.



Near Fisher Bay, by Michael Nowak



Ominous looking wall cloud west of St Andrews

## August 24 Hailstorm in Northeast Winnipeg

A weak trough or cold front moving through southern Manitoba sparked off several severe thunderstorms with damaging hail and winds in the afternoon and evening of August 24, 2023. It had been a warm and humid afternoon with highs in the high twenties along with dewpoints around 20°C. In the morning, it was mostly cloudy with fog patches after some light rain the day before. Skies cleared out by the late morning or early afternoon, making way for thunderstorm development.

Severe thunderstorms initially developed around the Riding and Turtle Mountains and pushed eastward. More severe storms developed in the Red River Valley and Interlake by late afternoon and evening.



*(Left) Robert C. Peters on Facebook. (Right) Hail fog in Kildonan Park. Susan Chartier on Facebook*

One severe storm formed just northwest of Winnipeg Airport and moved through the northern and northeastern portions of the city. It moved through Amber Trails, Garden City, the Kildonans, Transcona and Dugald east of the city. It was one of the worst storms to strike the city in years, dropping immense amounts of large hail ranging from nickel to golf ball sized. Damaging winds and torrential downpours accompanied the hail, causing widespread and significant damage and near-zero visibility during the storm. A wind gust of 133 km/h was recorded at Dugald by Manitoba Agriculture. Trees were uprooted and large branches were knocked down, causing damage to vehicles and buildings. Windows in buildings and cars were smashed or dented. One dealership alone in eastern Winnipeg reported more than 200 cars damaged. The hail caused holes in siding and gazebos. Gardens were flattened and fences knocked down. Some street signs were snapped, and a semi truck was knocked over by the wind. There was so much hail that it had remained on the ground for at least 3 hours after the storm. Patchy hail fog was also witnessed. It was reported that about 10,000 people lost power during the storms, and a few thousand still were without power the following morning.

The storms also dropped golf-ball sized hail in Alonsa. Additional storms pushed through the Interlake and eastern Manitoba through the overnight hours, dropping more large hail in spots. Wind gusts of 89 km/h in Oak Point and 88 km/h in Inwood were also recorded.

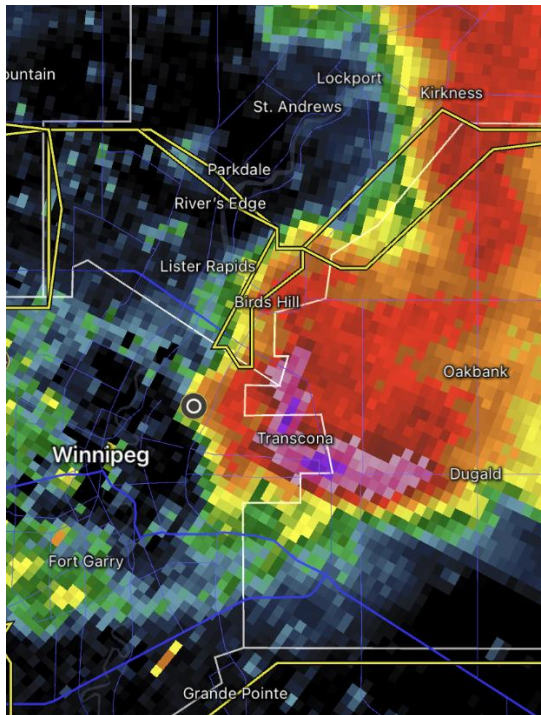


Rainfall amounts were generally not very impressive. The Winnipeg storm dropped between 15 and 25 mm, enough to cause some localized street flooding. Some fields were under water as well. Unofficial rainfall amounts of 100 mm were recorded in the Selkirk area, where there was significant street flooding reported. A private Weather Underground station in Tyndall recorded about 46 mm. One farmer near Selkirk reported a total loss to his canola field due to hail.



Selkirk. Arlene Cross on Facebook

In Winnipeg, the storm was localized. No rain fell in southern and western parts.



(Left) 6:53 pm radar showing hail core over Transcona. (Right) Tree knocked down. Allison Reimer on Facebook



(Left) Car window smashed. Margaret Mullin on Facebook. (Right) From Hwy 15 at Hwy 207, taken by myself.

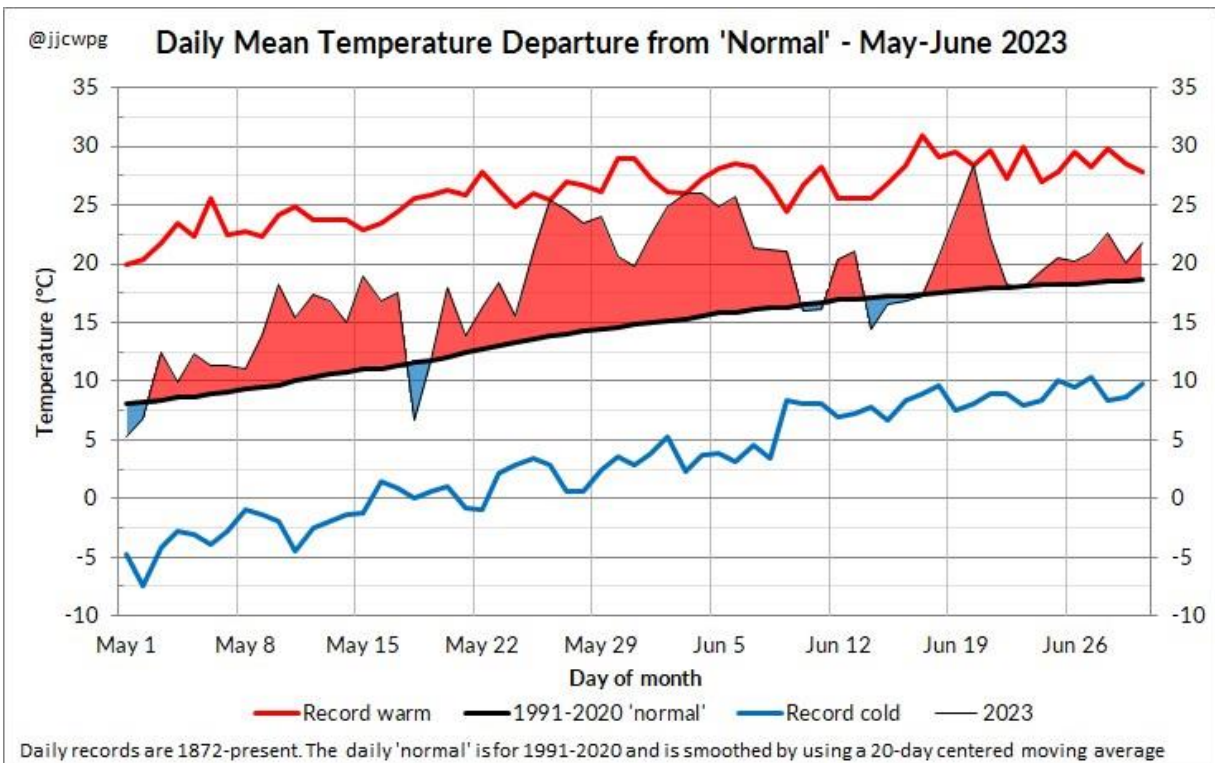


## 2 Warmest May-June Period on Record

Despite a late start to spring in 2023, summer still came early, and it was one of the hottest starts to summer on record. The May-June period was tied warmest on record since 1872.

18.4°C	1988, 2023
17.3°C	1977
17.2°C	1919
17.1°C	2018
16.9°C	1922, 1987
16.8°C	1991

The long stretch of warmth began on May 3<sup>rd</sup> with the first 20°C of the year, about 11 days later than normal. From then on, it remained above normal almost every day through to the start of July. The last spring frost at the Airport occurred on May 4, the earliest since 1991 and 2<sup>nd</sup> earliest since 1938 at the location. This was also three weeks earlier than normal. The green-up of plants occurred very quickly because of a very cold April followed by the sudden switch to summer. We started May with no green grass and barely any budding on trees. Only three weeks later, trees were mostly fully leaved, and grass was green by the May Long Weekend.

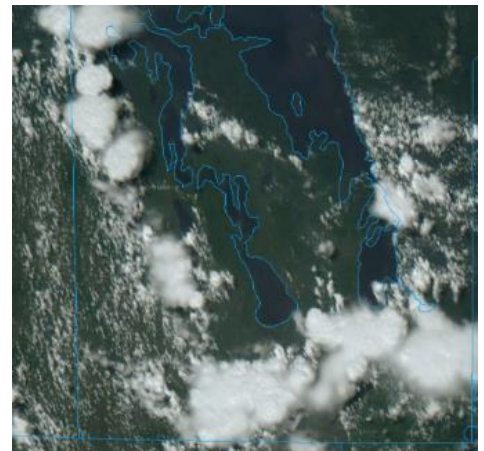


In the end, May was the 2<sup>nd</sup> warmest on record since 1872, behind only 1977. 5 days reached 30.0°C, tied 4<sup>th</sup> most since 1872. All these five days occurred consecutively from the 25<sup>th</sup> to 29<sup>th</sup>, during the hottest part of the month. Parts of southern Manitoba reached over 32°C during this heat wave. 22 days reached 20.0°C, also tied 4<sup>th</sup> most. Despite all the warm weather, only one record was broken: a record high minimum temperature of 18.4°C on May 26.

<b>Warmest Mays in Winnipeg Since 1872</b>	
17.8°C	1977
<b>15.8°C</b>	<b>2023</b>
15.7°C	1922, 1980
14.8°C	1987

The heat continued into June. The first week of June was downright tropical in southern Manitoba. It was hot and sunny with record humidity and daily pop-up thunderstorms. In fact, there were six consecutive days with thunderstorms reported at the Airport, a first since 1953. The previous record was five consecutive days.

It was the 2<sup>nd</sup> warmest June on record since 1872 in Winnipeg with a mean temperature of 21.0°C. It was also the most humid June on record since 1953. Thanks to the humidity, overnight lows were most abnormally warm. The average daily low of 14.6°C tied with 1988 for warmest on record in June. The lowest temperature recorded during the month was 6.8°C, the second highest on record since 1872.



June 4 satellite showing t-storms in southern MB

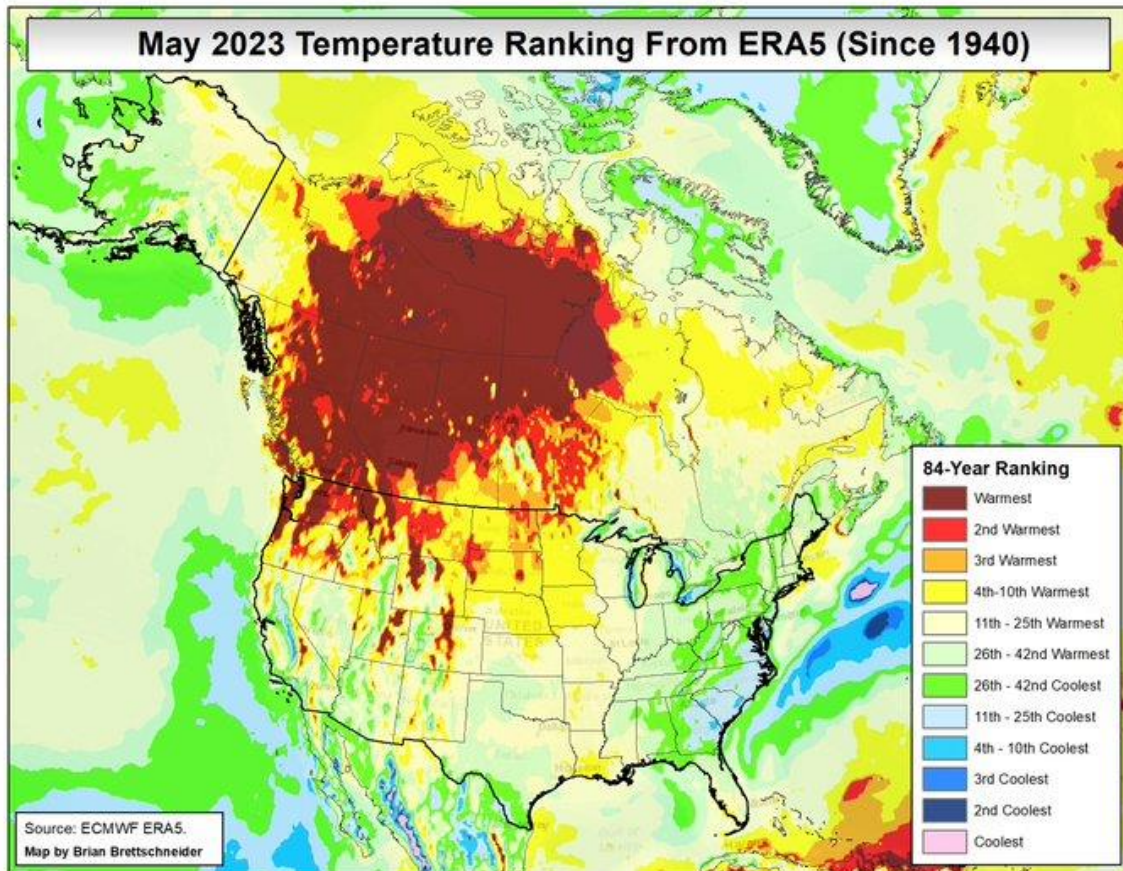
<b>Warmest Junes in Winnipeg Since 1872</b>	
22.1°C	1988
<b>21.0°C</b>	<b>2023</b>
20.3°C	1910
20.2°C	1894, 1956, 1995
20.0°C	1919, 1921, 1932

<b>Most Humid Junes Since 1953 in Winnipeg by Average Dewpoint</b>	
<b>14.3°C</b>	<b>2023</b>
13.5°C	2005
13.0°C	2012
12.8°C	1991, 1995

The month pretty much rewrote the record books for humidity in June. 9 days had dewpoint over 20°C, eclipsing the previous record of 6 days. 7 daily high dewpoint records and 6 daily high minimum dewpoint records were broken. The dewpoint of 22.3°C on the 5<sup>th</sup> was the earliest in the season we have had dewpoint of 22°C since 1953. 3 daily high minimum temperature records were also broken: 18.7°C on the 3<sup>rd</sup>, 20.1°C on the 4<sup>th</sup> and 20.8°C on the 20<sup>th</sup>. In total, 21 daily records were broken for dewpoint, temperature, and humidex.

With the area of warm high pressure that dominated southern Manitoba, it was also tied the calmest June since 1953 in Winnipeg with an average hourly sustained wind of 14 km/h. Given the high-pressure area, thunderstorms that developed were slow-moving, dumping torrential downpours over localized areas. On June 3<sup>rd</sup>, the Airport recorded

53.3 mm in an hour, while some other parts of the city barely received a drop of rain. What's unusual is that the Airport had a similar event just last year.



*A large swath of western Canada had its warmest May since 1940, according to the ERA5. Brian Brettschneider on Twitter.*

The warm weather was not localized to southern Manitoba. In fact, we were just experiencing part of what was one of the warmest starts to summer ever recorded in western Canada. Large sections of the Prairies and Arctic recorded its warmest May, and June was not much different. Unfortunately, the hot weather was also accompanied by drought. This caused a record start to the fire season with numerous fires, particularly in Alberta and the Northwest Territories. Most days were choked with smoke in May and June. Southern Manitoba did receive some of this smoke, but luckily not nearly as bad as out west. Thankfully, much of the smoke remained aloft and could not be seen at the surface. In Alberta, the warm weather could not be enjoyed because of the days and days with thick smoke at the surface. At Winnipeg Airport, it was the 3<sup>rd</sup> smokiest May and 3<sup>rd</sup> smokiest June since 1953 according to the number of hours with smoke reported. There were a combined 43 hours of smoke. On average, there are only around 4 hours. Smoke is reported by the observer when it can be smelled and is causing a reduction in visibility. I personally noted that smoke could be seen aloft on at least 8 days in May, mostly between the 14<sup>th</sup> and 23<sup>rd</sup>, causing a cloudier-looking sky.

South of the border, Fargo had its warmest June on record since 1881 and Grand Forks its 2<sup>nd</sup> warmest since 1893.



### 3 Strong El Nino Brings Very Mild and Dry December

The return of a strong El Nino in the fall and winter helped to delay the arrival of “permanent” winter conditions. The cold snowy weather of late October provided concern that a very early winter was in store, but mild weather in November and early December continually melted any snow that had fallen. As a result, November and early December were very pleasant with mild weather and mostly snow-free ground.



*No snow on the ground December 7 with a record high of 8.6°C. Taken at Winnipeg Airport.*

The ground was completely snow-free in Winnipeg, and most of southern Manitoba, as late as the morning of December 8, allowing golf courses to reopen for rare December golf. A snowstorm beginning in the afternoon on the 8<sup>th</sup> created a snow cover that did not fully melt the remainder of the month in most, but not all, of southern Manitoba.

Temperatures reached double digits on the 6<sup>th</sup> and 7<sup>th</sup> in parts of southern Manitoba. Winnipeg got close with a record high of 8.6°C on the 7<sup>th</sup>. This broke the old daily record of 5.6°C in 1923. It was the 8<sup>th</sup> warmest December day since 1872 and the warmest since 1998. It also reached 6.9°C on the 6<sup>th</sup>. Downslope areas along the escarpment and the Riding and Turtle Mountains reached almost 13°C locally.

It was even warmer in North Dakota where temperatures reached the high teens. Fargo had its 2<sup>nd</sup> warmest December day on record on the 7<sup>th</sup> with a high of 16.7°C, shattering its daily record of 11.7°C in 1939. Grand Forks reached 12.8°C. Some parts of southwestern North Dakota reached 18°C on the 6<sup>th</sup>. Parts of southern Saskatchewan were also warmer, with highs up to 16°C in Maple Creek. Calgary reached 17.0°C.

On the 14<sup>th</sup>, Thunder Bay reached a new all-time December high of 13.7°C.

High Temperatures Dec 6, 2023		High Temperatures Dec 7, 2023	
12.8°C	Drifting River & Laurier	12.3°C	Deloraine
12.6°C	Eden	11.3°C	Boissevain
11.7°C	Alonsa	10.7°C	Cartwright
11.2°C	McCreary	10.3°C	Clearwater
10.9°C	Ste Rose	10.2°C	Baldur
10.8°C	Winkler	9.9°C	Pilot Mound
10.7°C	Neepawa	9.6°C	Ninette & Killarney
10.3°C	Morden	8.6°C	Steinbach & Winnipeg Airport

There was much chatter throughout the month about the potential of a brown Christmas in Winnipeg, but in the end, it did not materialize. The ground was white on Christmas morning as it is almost every single year, but the snow was noticeably thinner than in recent years with only 2 cm on the ground, the thinnest since 2011.

Some parts of southern Manitoba did see a brown Christmas, such as in western parts of the Red River Valley and in the southern Interlake. These snow-free areas were continually warmer than areas with snow. On December 27, it once again reached over 5°C in some areas, while Winnipeg only reached 0.7°C. McCreary reached 10.4°C, while Pipelake (northwest of Dauphin) reached 9.8°C, Winkler 8.5°C, and Eden (northeast of Minnedosa) 9.3°C. Winkler (Mb Ag station) apparently reached 10.7°C on the 28<sup>th</sup>, though it seems suspiciously high. McCreary reached 9.1°C on the 28<sup>th</sup> and Ethelbert 7.8°C.

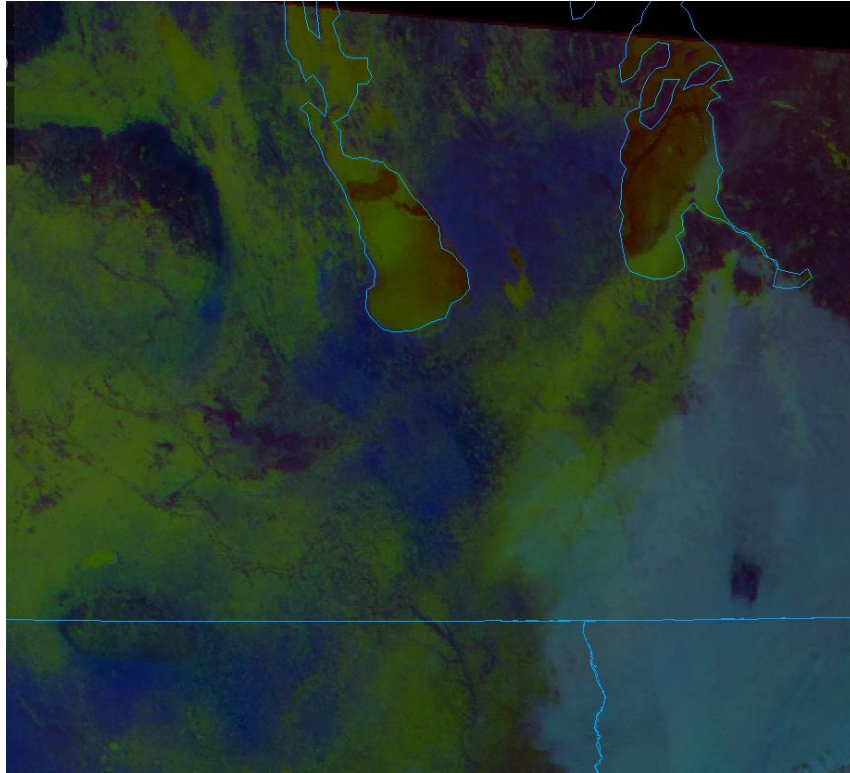
Much of southern Saskatchewan and Alberta had a brown Christmas, including Saskatoon, Regina, and Edmonton. Thunder Bay also had a brown Christmas.

In the days leading up to Christmas, it was very mild and foggy with periodic drizzle on the 22<sup>nd</sup> and 23<sup>rd</sup>. It felt more like the Maritimes than Manitoba. We had the rainiest Christmas Eve on record with about 1.7 mm at the Airport early in the morning. A switchover to snow in the morning sealed the deal so to speak with respect to a white Christmas. The rain and warm temperatures melted much of the snow that was on the ground beforehand, exposing some grass, before switching to snowfall. Winnipeg only reached 1°C during the warm spell because of the cloud cover. Areas that got sunshine west of the Red River Valley got warmer. The warmest spot was north of the Turtle Mountains where, on the 23<sup>rd</sup>, Deloraine reached 8.8°C, Boissevain 8.5°C and Killarney 7.4°C.

Even heavier rain fell in southeastern Manitoba on Christmas Eve. Sprague received about 12 mm of rain. Generally, 5 to 10 mm of rain fell in a swath from Sprague-Menisino to Falcon Lake-Prawda.

Ducks were witnessed on the Red River in Winnipeg on Christmas Eve. The river mostly froze over during the month, but some sections did not fully freeze.

Six days had fog at Winnipeg Airport, making it one of the foggiest Decembers on record. It was the foggiest since at least the 1950s.



*December 27 visible satellite showing snow cover in green. Largely snow-free in western RRV and southern Interlake.*

December overall averaged  $-5.8^{\circ}\text{C}$  at Winnipeg Airport, the 3<sup>rd</sup> warmest since 1872, and  $7^{\circ}\text{C}$  above normal. Only 1877 and 1997 were warmer. Daily high temperatures averaged  $-1.2^{\circ}\text{C}$ , the 2<sup>nd</sup> warmest on record. 30 of 31 days were warmer than normal. The warmest areas were along the escarpment where daytime highs averaged above freezing, such as in McCreary ( $1.8^{\circ}\text{C}$ ), Morden ( $0.6^{\circ}\text{C}$ ), Deerwood ( $0.6^{\circ}\text{C}$ ), Portage and Carman ( $0.3^{\circ}\text{C}$ ). At Winnipeg Airport, 11 days exceeded the freezing mark, tied with 1890, 1939 and 2020 for 6<sup>th</sup> most on record since 1872. McCreary had 19 days above freezing and Morden 18.

The first  $-20^{\circ}\text{C}$  of the season did not arrive until December 18, tied 6<sup>th</sup> latest since 1872 and about three weeks later than normal. Only 1 day dipped below  $-20^{\circ}\text{C}$  in December, tied 2<sup>nd</sup> fewest since 1872. The monthly minimum temperature of  $-20.6^{\circ}\text{C}$  was the 3<sup>rd</sup> highest. Only 1877 ( $-18.3^{\circ}\text{C}$ ) and 1959 ( $-20.0^{\circ}\text{C}$ ) had higher minimum temperatures.

The mild start to winter was welcomed by many after the previous two winters which were long. However, winter enthusiasts were not impressed by the lack of snow. Snowmobilers and cross-country skiers would have liked more snow. In addition, sales of winter equipment were down significantly, and ski hills could not open as early as usual.

In eastern North Dakota, there was also a severe long-duration ice storm which dumped 50 to 80 mm of rain in southeastern parts of the state from December 23 to 26, including around Fargo. Ice accumulated to over two inches, downing hundreds of power poles and causing much damage to trees. The storm left thousands without power and shut down interstates. The rain was so heavy that even some basements were reported flooded, and river levels were expected to rise to minor flood levels along the Red River. NWS Grand Forks issued their first flood warning on record (since 2003) in December in the Fargo



area. The amount of rain that fell on mostly frozen ground in December was possibly unprecedented for the area. Luckily, the system completely dodged Manitoba, leaving us with mostly sunny skies and calm weather during the holidays. Fargo had its wettest December on record, with over 75 mm, thanks to the event.

## **4 Wet and Humid October with Heavy Thunderstorms and a White Halloween**

October finally broke the streak of dry months which began in November of 2022 at Winnipeg Airport. In fact, October was the wettest month of the year in 2023, only the second time on record that that has happened. 1949 was the only other year where October was the wettest month of the year. About 79 mm of precipitation fell at the Airport, the 10th wettest on record since 1872. 65.4 mm of this was rain, making it the 14<sup>th</sup> rainiest October.

Most of the rain fell in the first week of October when a wave of warm and very humid weather moved into southern, and especially southeastern Manitoba. Southern Manitoba was, in fact, in the battle zone of air masses with temperatures over 30°C in southeastern Manitoba and below 20°C in southwestern Manitoba because of a nearly stationary front. On the 1<sup>st</sup>, highs of 31.0°C in Menisino, 30.4°C in Emerson and 30.0°C in Sprague were recorded. Sprague then reached 28.1°C and 27.4°C the following two days.

High humidity sent dewpoints to incredible values above 20c in southeastern Manitoba as well. The heat and humidity combined resulted in humidex values in the mid to high thirties. The highest calculated humidex was 38 in St Pierre and Menisino. Usually, hot weather in October is dry in southern Manitoba. This combination of heat and humidity was very rare as a result. Winnipeg Airport (CXWG) reached a dewpoint of 18.8°C on the 3<sup>rd</sup>, a new record for the month of October, beating 18.6°C in 1997. In fact, daily dewpoint records were broken three days in a row, both the 1<sup>st</sup> and 3<sup>rd</sup> seeing values over 18°C.

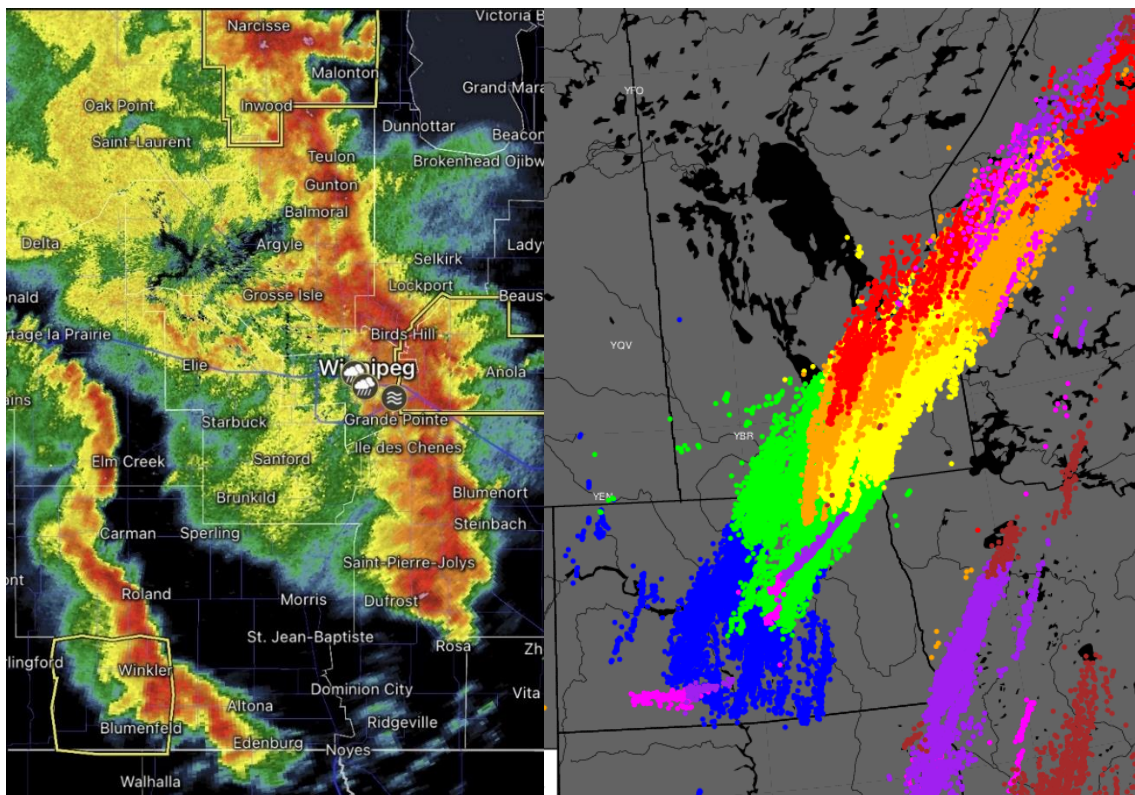
Several waves of thunderstorms moved through southern Manitoba in the first few days of October, aided by anomalously high humidity for that time of year. The most notable event was in the early morning hours of October 3<sup>rd</sup> when a large complex of thunderstorms moved through the Red River Valley. Although thunderstorms are still relatively common in October, they are usually not intense. These storms were of July standards, quite rare for October. For Winnipeg, it was potentially the most intense thunderstorms in October since 1955.

The squall line that moved through Winnipeg just after 7 am on October 3<sup>rd</sup> plunged the city into darkness and produced nearly constant lightning flashes and intense thunder. Rain was very heavy, especially by October standards, and was enough to cause street flooding. The storms lasted about 4 hours. At Winnipeg Airport, a new rainfall rate record for October was broken. 16.0 mm of rain fell in 60 minutes, breaking the previous record

of 10.8 mm in an hour in 1984. 14.8 mm in 30 minutes, exactly doubling the previous record of 7.4 mm in 1968. Even more impressive were the tripling of the 5-min, 10-min and 15-min rainfall rate records.

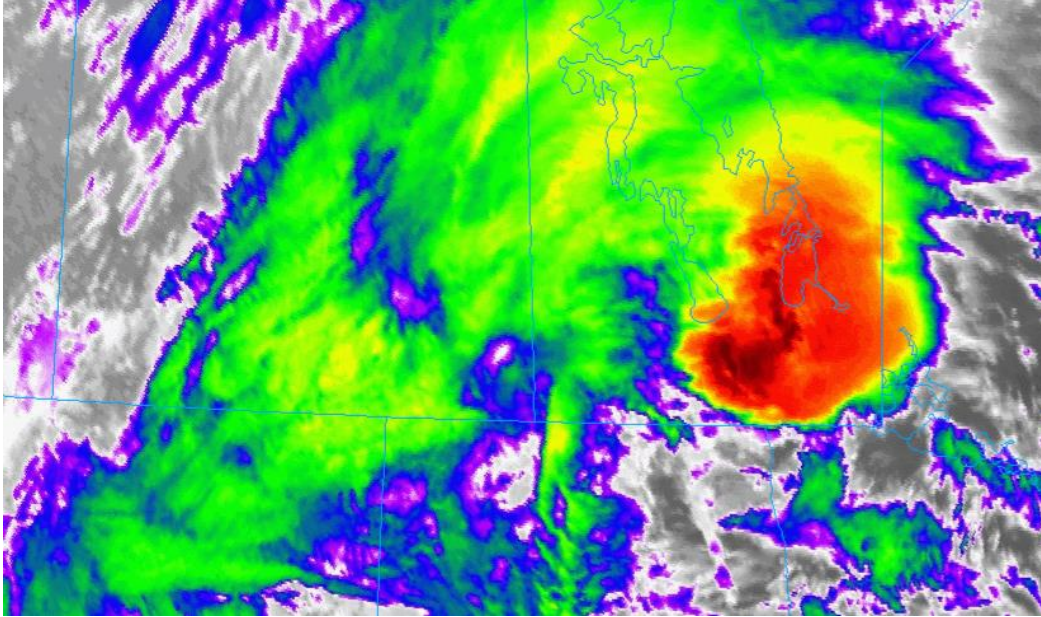
October Rainfall Rate: New Records Set Oct 3		
Rainfall in...	New Record	Old Record
60-min	16.0 mm	10.8 mm in 1984
30-min	14.8 mm	7.4 mm in 1968
15-min	13.8 mm	4.6 mm in 1968
10-min	12.9 mm	3.8 mm in 1960
5-min	9.0 mm	3.3 mm in 1960

Note that these rainfall rate records are specific to the Airport. A heavy thunderstorm event on October 5, 1955, might have been heavier or similarly heavy around downtown, but rainfall rate records were not available there at the time. The storms on that date had lasted about 5 hours and dumped up to 55 mm in St Boniface.



(Left) Radar image at 7:29am Oct 3. Via Radarscope. (Right) Total lightning on Oct 3.

36.2 mm of rain fell in total on October 3 at the Winnipeg Airport, a new daily record, beating 29.2 mm in 1911. Some private stations in western Winnipeg received up to 40 mm. Locally, 40 to 50 mm of rain fell north and northeast of the city.



*Infrared satellite image from October 3rd in the morning showing the storm complex moving through Winnipeg.*



*The atmosphere was quite volatile and unstable the morning of Oct 3 with storms continually redeveloping.*

Just two days later, another low-pressure system brought 20 to 30 mm of rain in the morning. The lakes were so warm that the cooler air moving over them produced lake-effect thunderstorms west and east of Winnipeg, something that is rarely seen in these parts.

There was also another bout of thunderstorms on October 1<sup>st</sup>, which affected mostly western Manitoba through eastern Manitoba. During the late evening, ping pong ball sized hail fell in Oakburn, causing damage to vehicles.

Colder weather did finally arrive in the last week of October. Frequent systems brought bouts of snowfall which left southern Manitoba looking like late November. Winnipeg had its first white Halloween since 2006 with about 7 cm on the ground. It was also a cold



Halloween with morning temperatures of  $-12^{\circ}\text{C}$  and a high of only  $-4^{\circ}\text{C}$ . Parts of southwestern Manitoba and western North Dakota dipped below  $-20^{\circ}\text{C}$ .

In total, 21.6 cm of snow fell in Winnipeg in the last seven days of the month, making it the 11<sup>th</sup> snowiest October since 1872 and snowiest since 2019. From the 25<sup>th</sup> of October, snow remained on the ground for about two weeks. The biggest storm was on the 27<sup>th</sup> when 12 cm fell. Other days ranged from a dusting to 3 cm of new snowfall. Higher snowfall amounts fell in intense snow squalls downwind of the lakes west and east of the city, especially on the 30<sup>th</sup> when locally 20 cm fell around Tyndall and Anola, and the 28<sup>th</sup> when close to 20 cm fell around Woodlands. Berens River had over 30 cm.



*A very white Halloween in Winnipeg, the first since 2006.*

## **5 Warm and Smoky Year with a Long Growing Season**

After a colder than normal year last year, warm weather returned in 2023. With a mean temperature of 4.2, it was tied 11<sup>th</sup> warmest year since 1872 with 2015. Fall was the most anomalously warm season. Fall was tied 13<sup>th</sup> warmest since 1872, and 8<sup>th</sup> warmest for daily low temperatures.

Thanks to warm weather late in the spring and early fall, we had one of the longest growing seasons ever recorded. At Winnipeg Airport, temperatures remained above freezing from May 5 to Oct 7, a total of 156 days, the 2<sup>nd</sup> longest growing season at the station since 1938. Only 1963 had a longer growing season with 157 days.

2023 also had the most consecutive days above 15°C with 139 days from May 19 to October 4. The old record was 133 days in 1987.

Unfortunately, with the warm and dry weather that dominated western Canada and the Arctic in 2023, fire and smoke were problematic, from late spring to early fall. Although the fire season was not exceptional in Manitoba, it was record breaking out west with numerous fires in the Northwest Territories, Alberta, Saskatchewan, and British Columbia. Smoke from these fires choked skies across the Prairies on several days. In Winnipeg, much of the smoke thankfully remained aloft, giving hazy skies, but we still got our fair share of smoky surface conditions. In terms of the absolute number of hours with smoke reducing visibility at the Airport, May and June were the 3<sup>rd</sup> smokiest on record and September was the smokiest. The year as a whole saw 125 hours with smoke, the smokiest since 2021, the second smokiest since the early 1960s, and the 11<sup>th</sup> smokiest since 1953.



*Hazy and smoky skies were a common feature of summer 2023.*

Both winters were mild as well. There were notably fewer days below -20°C in 2023 than normal. Only 28 days dipped below -20°C, the fewest since 1987 and the 3<sup>rd</sup> fewest on record since 1872. Both January (7 days) and December (1 day) tied for 2<sup>nd</sup> fewest days below -20°C.

130 days rose above 20°C in 2023, tied 7<sup>th</sup> most since 1872. Because of colder weather in March, April and November, the number of days above 10°C was slightly below normal for the year.

# 6 March Without a Thaw Highlights Cold Start to Spring

It wasn't a particularly harsh winter like the previous winter, but it was just as prolonged. We can almost always count on thawing weather conditions in March, but 2023 was an exception. Not a single day exceeded the freezing mark at Winnipeg Airport in March, only the second time that that has occurred in Winnipeg since 1872. The other time was in 1899. The highest the Airport got in March was  $-0.8^{\circ}\text{C}$ , the second lowest monthly maximum since 1872. This was about eleven degrees below the normal maximum of  $10^{\circ}\text{C}$ . Note that areas around downtown did see a few thaws thanks to the urban heat island. The Forks reached a monthly maximum of  $1.7^{\circ}\text{C}$ .

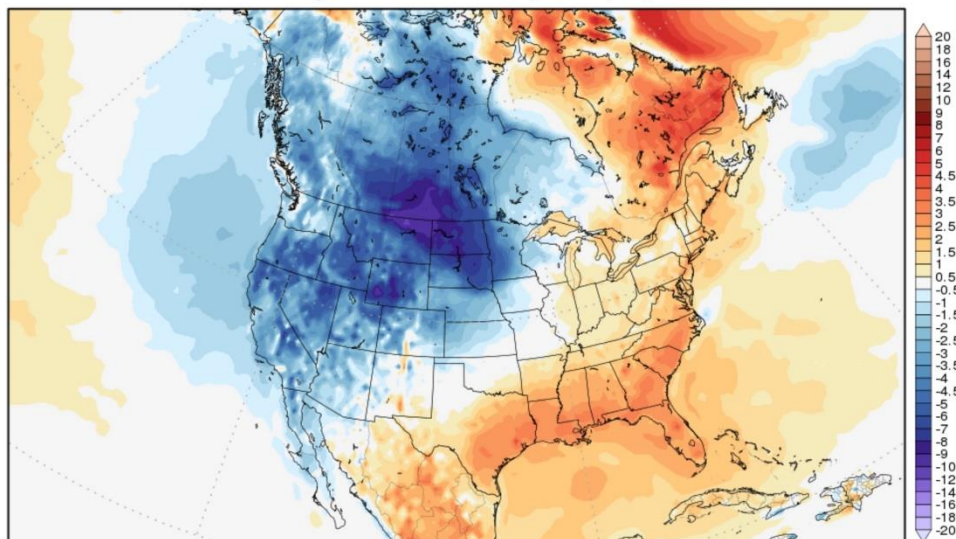
Lowest Monthly Maximum Temperature in March	
$-1.7^{\circ}\text{C}$	1899
$-0.8^{\circ}\text{C}$	2023
$0.0^{\circ}\text{C}$	1872
$1.1^{\circ}\text{C}$	1965
$1.7^{\circ}\text{C}$	1940

Overall, it wasn't a particularly cold March, however, only tied 34<sup>th</sup> coldest on record. This was the coldest since 2014 and about five degrees below normal. It was consistently moderately below normal. 27 days dipped below  $-10^{\circ}\text{C}$ , the most since 1970. Some would even say it was a pleasant March because of abundant sunshine and generally quiet weather. There was only about 3 mm of precipitation, the 5<sup>th</sup> driest on record. Not a single drop of liquid precipitation fell (drizzle or rain). The last time this happened was in 1956.

NCEP GFS forecast vs CFSR reanalysis @0.5deg  
Run: 31 Mar 2023 18z

Monthly mean (Mar) to date  
Reference: 31 Mar 2023 18z

Temperature anomaly 2m ( $^{\circ}\text{C}$ )



Model reanalysis product showing temperature anomaly for the month of March.



Winnipeg was lucky, however, as a strong storm system brought a blizzard to southwestern Manitoba on March 11 and dropped 10 to 20 cm of snow along the US border. Winnipeg only received about 6 cm, the only day with any substantial precipitation in March. This, along with a very snowy winter, and more snow April 4-5 and April 19-21, produced an extensive and deep snowpack across southern Saskatchewan into North Dakota, making it very difficult to warm up. This extensive snowpack was certainly a factor delaying the arrival of spring in southern Manitoba as it acted like a localized freezer preventing warm air from advancing northeastward.

The snowpack in parts of North Dakota did not fully melt until late April. Fargo had its 6<sup>th</sup> longest period with snow depth over 2 cm with 148 days. The effects of this snowpack were most evidenced on April 11 when very warm air aloft moved over the region. Snow-free areas of western North Dakota reached 30°C, while snow covered portions of eastern North Dakota only reached up to 7°C. Winnipeg reached the low teens, while forested areas in the Whiteshell reached as high as 20°C.

It was the 11<sup>th</sup> coldest March in Fargo, 6<sup>th</sup> coldest in Bismarck and 4<sup>th</sup> coldest in Grand Forks.



*It was a pleasant, but cold March with no general thaw. Picture taken March 20 in St Norbert.*

The chilly weather continued into April, before the weather pattern flipped to warmer than normal weather in early May. It was the 31<sup>st</sup> coldest April. The first 5°C of the year was April 8, tied 8<sup>th</sup> latest. The monthly maximum in April was 14.3°C, the 9<sup>th</sup> lowest.

The spring was so delayed that outdoor skating rinks were still in use in the first week of April. The maple syrup season was severely delayed as well. Snowmobilers were happy.

## 7 4<sup>th</sup> Hottest September Day Highlights 5<sup>th</sup> Warmest Sept

It was another warm September in Winnipeg. With a mean temperature of 16.2°C, it was the 5<sup>th</sup> warmest September on record and the warmest since 2009. Overnight lows were most abnormally warm, averaging 9.9°C, the 2<sup>nd</sup> warmest on record.

The hottest weather was the in the first three days of the month during the Labour Day long weekend when temperatures soared above 30°C. On the 2<sup>nd</sup>, temperatures exceeded 35°C in the Red River Valley, making it one of the hottest September days in years. Winnipeg Airport reached 36.6°C, the 4<sup>th</sup> hottest September day on record.

Hottest September Days Since 1872	
38.8°C	Sep 2, 1983
37.2°C	Sep 1, 1929 Sep 7, 1906
<b>36.6°C</b>	<b>Sep 2, 2023</b>
36.2°C	Sep 5, 1978

The coldest day of September had a high temperature of 15.4°C. This was the highest on record since 1872. The lowest temperature of the month was 1.5°C, the 9<sup>th</sup> highest.

## 8 11 Consecutive Drier Than Normal Months

In sharp contrast to last year, which was the wettest year on record, 2023 was largely dry not only in Winnipeg but across southern Manitoba. It was not nearly as dry as the 2017 to 2021 drought, but this was mostly a result of regular thunderstorms in the summer and leftover moisture from last year and a delayed spring melt. It did not really feel like a dry year as a result, given the muted impacts. The main impact was on Manitoba Hydro, which reported a larger deficit than forecast, because of lower water levels leading to lesser electricity generation. Some burn bans were put in place by some municipalities in the late spring.

The driest conditions were in the winter and spring. Winnipeg Airport had its driest January to May period on record, as shown in the table below. The precipitation amounts in the table are raw data (not quality controlled). My quality-controlled amount for 2023 is 54.5 mm (adjusted for snowfall under catch at the Airport), which would still be the driest. This was essentially a complete flip from last year which had the 2<sup>nd</sup> wettest January to May period.

Driest January to May, Since 1872	
48.8 mm	2023
59.1 mm	2020
59.5 mm	1900
59.7 mm	1952
65.1 mm	1917

The overall dry pattern did not fully break until October when the Winnipeg Airport recorded its first wetter than normal month since October of last year. With 11 consecutive drier than normal months, it was tied 2<sup>nd</sup> longest streak on record since 1872. It tied with October 2017 to August 2018. Here are some statistics from the dry spell:

- 19<sup>th</sup> driest January
- 12<sup>th</sup> driest February
- 14<sup>th</sup> driest winter (December to February)
- 5<sup>th</sup> driest March (only 3.4 mm of precipitation)
- 7<sup>th</sup> driest spring and 12<sup>th</sup> least rainy (about one third of normal precipitation)
- 18<sup>th</sup> driest May
- 8<sup>th</sup> driest December
- 9<sup>th</sup> driest year on record with about 373 mm of precipitation, 142 mm below normal.

## 9 Coldest July Since 2009 a Result of Chilly Nights

Extreme warmth in June reversed to cooler than normal weather in July. Nighttime temperatures were the coldest relative to normal and this was in large part due to lower-than-normal humidity. The average daily low temperature of 10.9°C was tied 11<sup>th</sup> coldest on record since 1872 and was 2.3°C below normal. 12 days dipped into the single digits, tied 8<sup>th</sup> most since 1873. This made the month feel more like early fall, especially after a hot June. The month overall was 15<sup>th</sup> coldest on record with a mean temperature of 17.9°C. This also made it the coldest July since 2009. These conditions were, in fact, welcomed by some residents, because it made for a much more comfortable July than usual. It was even cool enough for the development of lake-effect showers on the 16<sup>th</sup>.

On the 11<sup>th</sup>, some patchy frost was recorded in southwestern Manitoba. Baldur dipped to 0.0°C. There were several lows around 1°C.

The reduction in summer heat continued somewhat in August. It was the second consecutive August without reaching 30°C, a streak which had not occurred since the 1903 to 1905 period. However, August overall was around normal. It was mostly an absence of the very hot days we usually see in mid-summer.

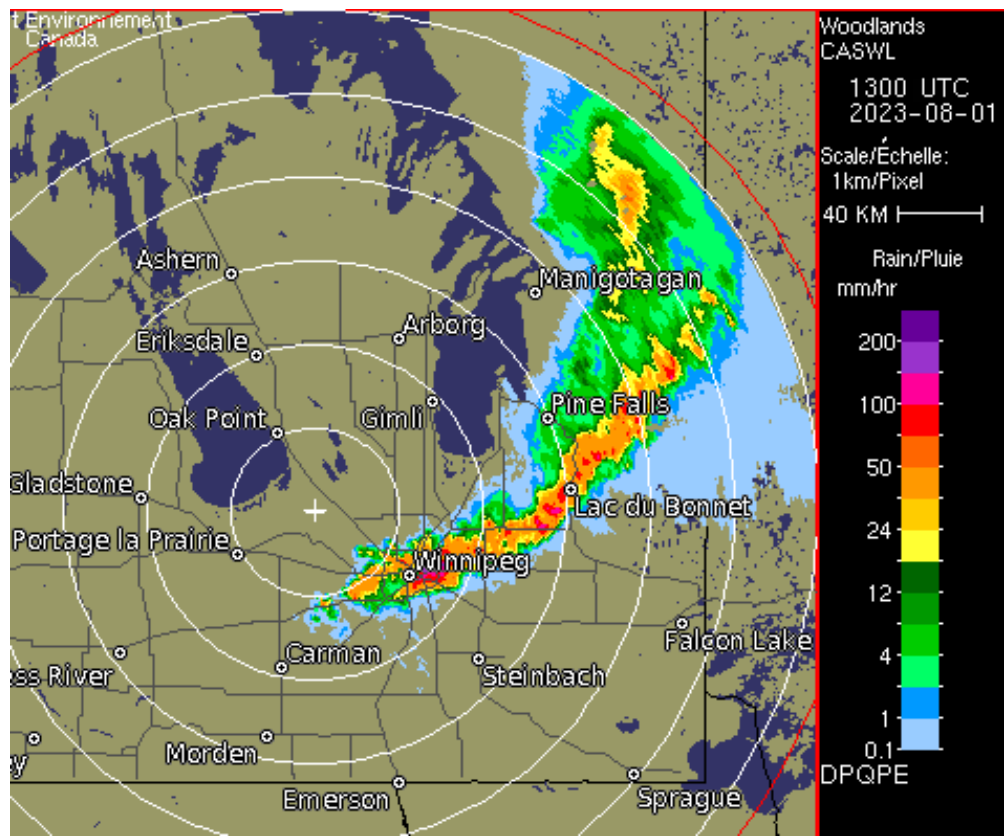


# 10 August 1 Morning Thunderstorm with Magnificent Shelf Cloud

A thunderstorm complex that developed in eastern Saskatchewan August 31 kept on trucking in the night through the Interlake and eventually southeastern Manitoba by morning. The storm complex hit Winnipeg just in time for the morning rush around 8 am.

The main story with the storm complex was the stunning shelf cloud that raced through as the storm moved in. As the shelf cloud moved through Winnipeg, it plunged the city into darkness and brought gusty winds which blew some dust around. It also exhibited magnificent blue-green colours. As the storm moved through, frequent lightning and a torrential downpour swept through. Hail fell but was only up to dime sized. The torrential rain was enough to flood some streets. Some parts of the city received about 20 mm of rain in only 20 minutes. Central, eastern, and southeastern parts of Winnipeg received the highest reported rainfall from the storms with 20 to 30 mm. Other areas only received 5 to 20 mm.

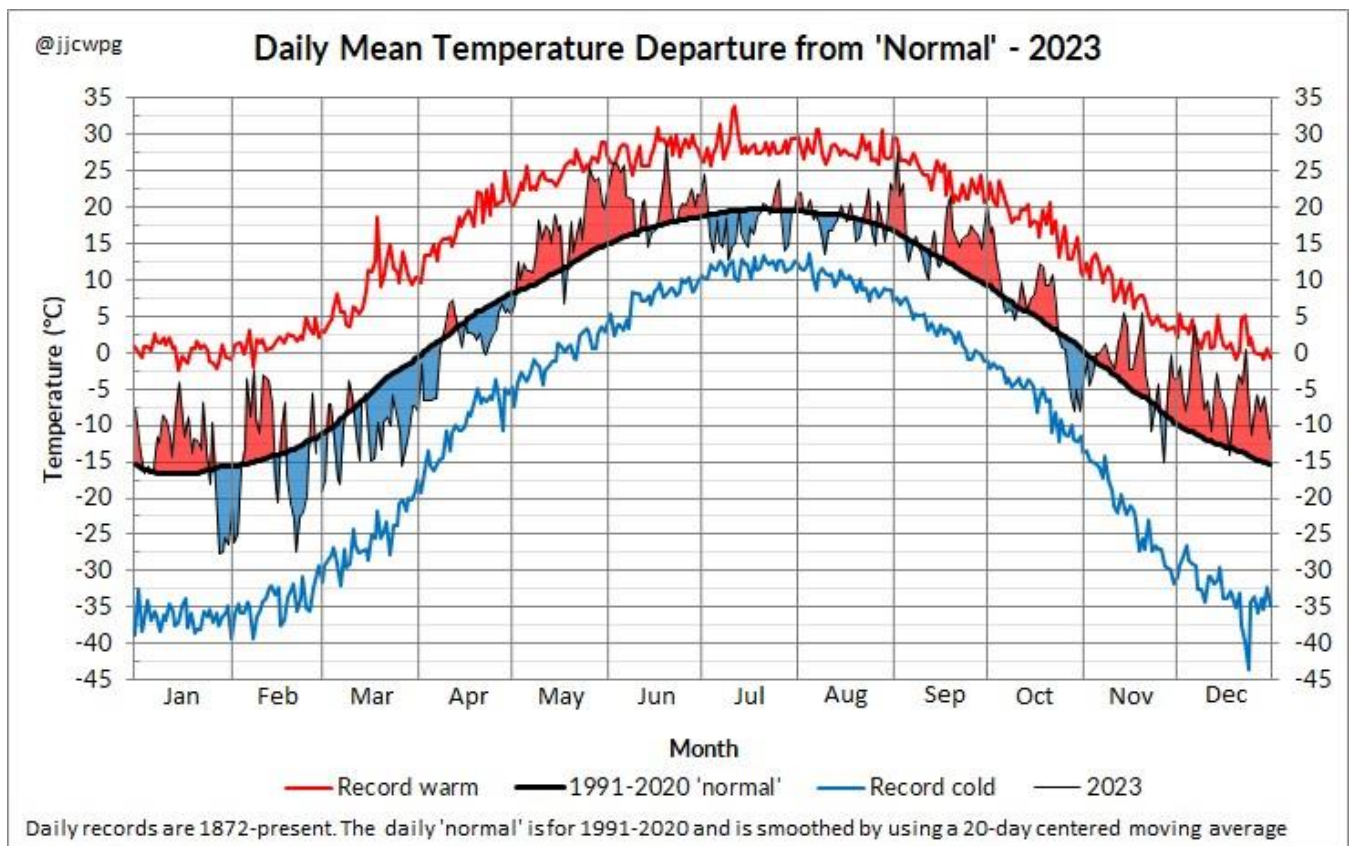




## Honourable Mentions

- Pleasant January: 25<sup>th</sup> warmest January, a full week of fog and rime ice on the trees in the first week, tied second calmest winds.
- Sudden blizzard conditions with a cold front on February 14 strand evening commuters in the ditch on highways
- March 11 snowstorm only drops 6 cm in Winnipeg, but over 20 cm along US border. Brandon and Estevan record official blizzards. North Dakota virtual shut down by the storm.
- Blowing snow closes the Perimeter March 14 and 17.
- April 4-5 Colorado Low drops 13-16 cm in Winnipeg, but 25 cm in SE Mb.
- 6<sup>th</sup> consecutive cold April, with the 9<sup>th</sup> lowest maximum temperature and tied 8<sup>th</sup> latest first 5°C of the year.
- April 20-21 Colorado Low again spares Winnipeg but dumps up to 30 cm along US border and SW Mb.
- July 2 hailstorms - 5 cm diameter hail in Newton, Oakville areas (SE of Portage). One man died in campground when tree falls on tent in storm in Whiteshell.
- August 16 wind gusts of 70-80 km/h knock down some trees in Winnipeg.
- Thick fog and magnificent rime ice all day on December 22.

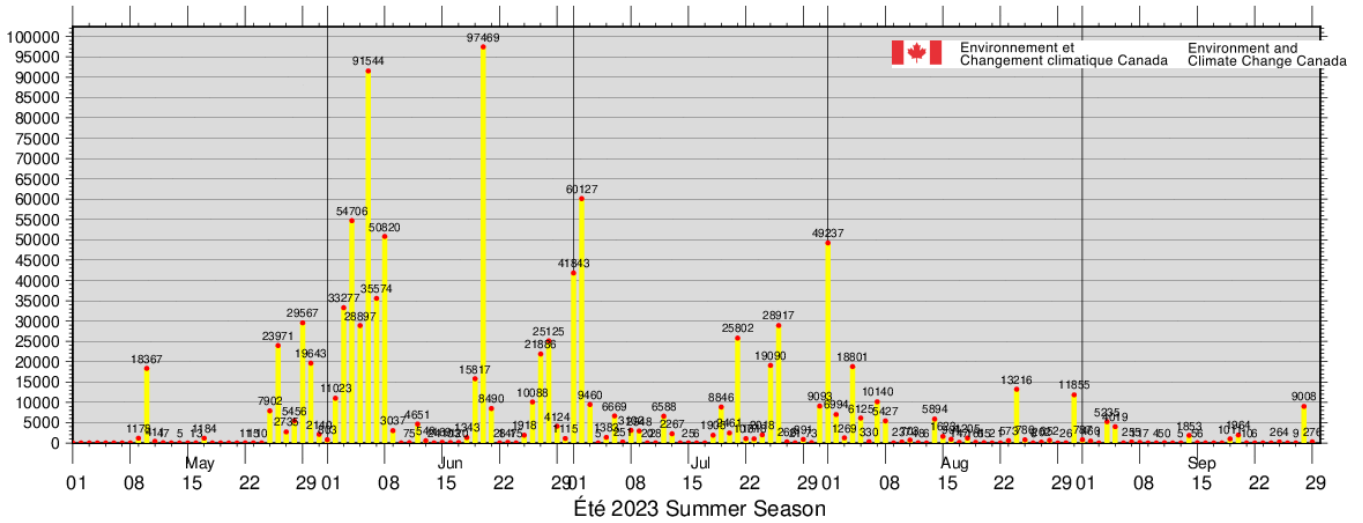
## Daily Temperature Departures Graph



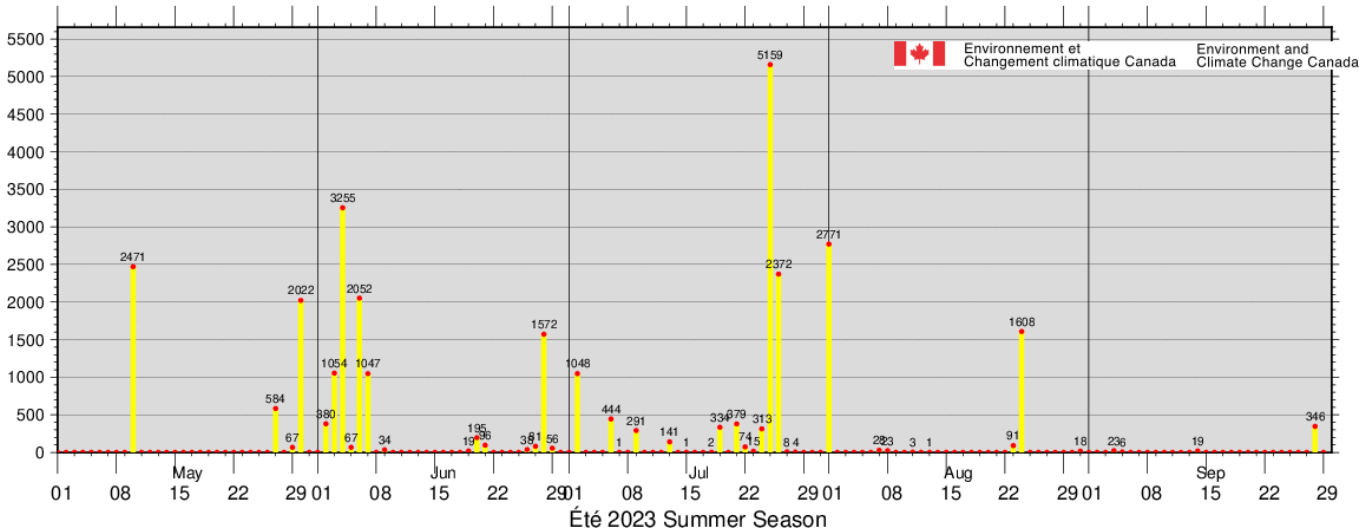


# Daily Lightning Flashes Graphs (May to Sep)

## Daily flashes (CG+IC) / Éclairs par jour (NS+IN) - Manitoba



## Daily flashes (CG+IC) / Éclairs par jour (NS+IN) - Région de Winnipeg (ywg) Area



## Acknowledgement of Sources

This summary document contains information from a variety of sources, including CBC, Twitter, Facebook, ECCC, Brandon Sun, CoCoRaHS, the government of Manitoba, the City of Winnipeg, Weather Underground, CTV, Global News, Radarscope, NOAA, College of Dupage, NDAWN, Valley News Live, Grand Forks Herald, Inforum and Steinbach Online. Any other sources are mentioned in the document itself.

## Pictures

Extra photos from the year 2023 taken by me.



*January 4 rime ice after fog at La Barrière Park.*



*January 6 rime ice on trees from fog at La Barrière Park.*



*March 5 at La Barrière Park.*



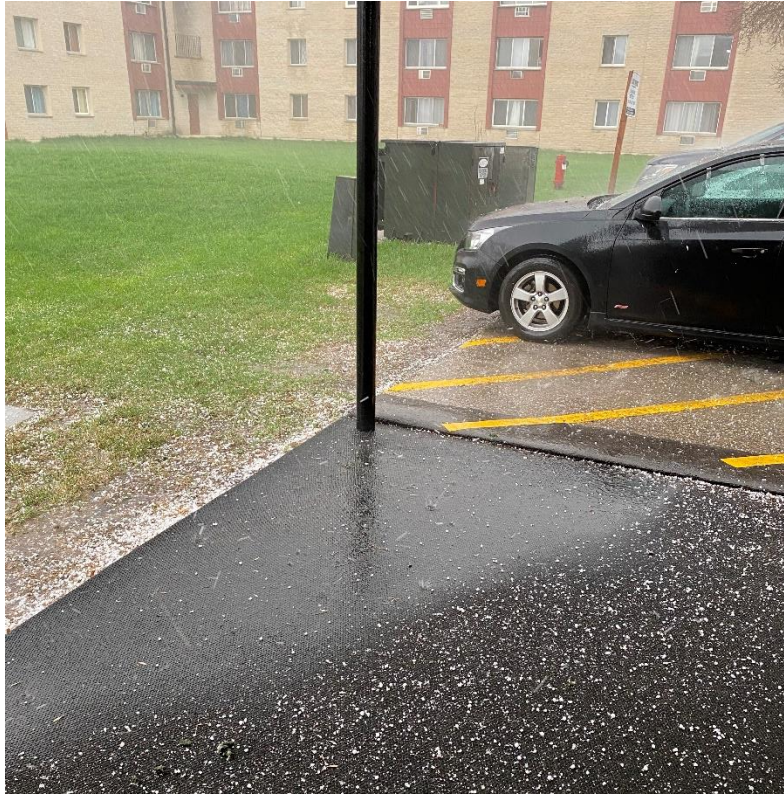


*April 14 at La Barrière Park.*

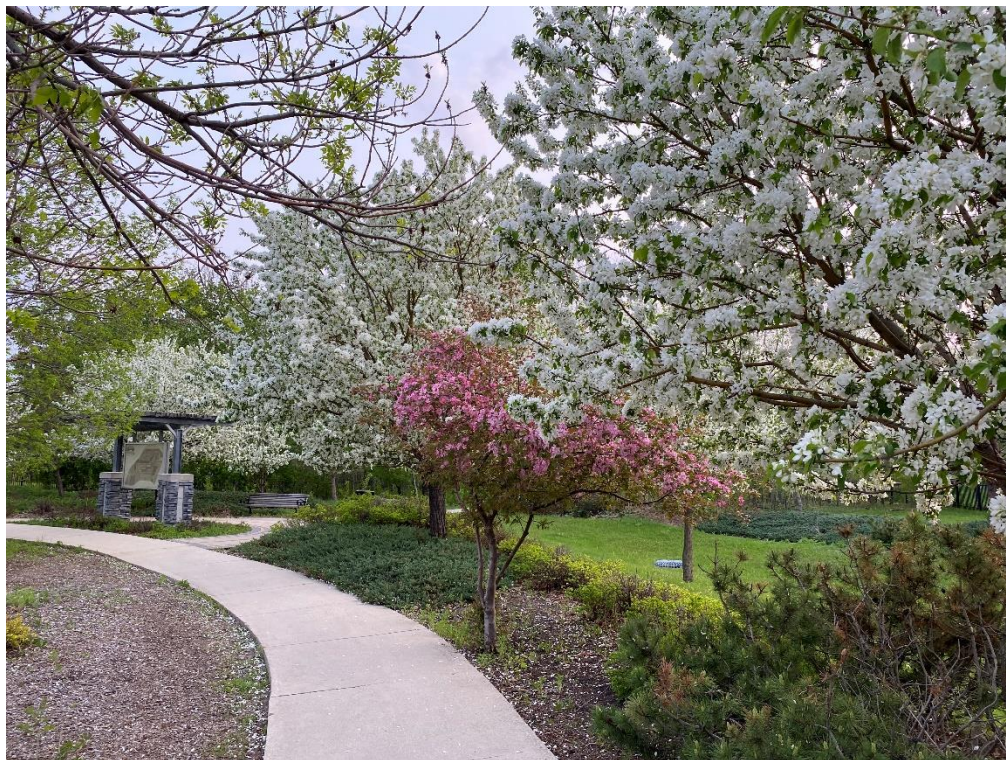


*April 29 showers near the Brady Landfill.*





*May 10 hailing during thunderstorm in Richmond West.*



*May 23 blossoms in Waverley West.*





*June 4 thunderstorms viewed from Waverley West.*



*July 26 supercell thunderstorm viewed from St Andrews area.*





*October 15.*



*October 25.*





*November 14 in Island Lakes.*



*November 19, the Red River near the University of Manitoba.*



*December 4 rime ice from fog in Assiniboine Park.*



*December 21 sunset in Island Lakes.*





*December 22 thick fog and rime ice.*



*December 24 bare fields around Portage la Prairie.*



*December 28 rime ice from fog during the night, along the Seine River.*