

# Winter 2017-2018 in Review

With March 1 comes the end of meteorological winter, a period defined as covering the months of December through February. The winter of 2017-18 was a colder winter season than recent winters, but the late surge in unusual warmth in late February enabled most of central Indiana to end up slightly above normal for the winter, generally less than a degree above normal on average.

After a relatively normal December, temperatures turned sharply colder around Christmas Day and lingered through the end of the month. The cold continued into January as Central Indiana experienced one of the coldest starts to a calendar year on record. Temperatures remained well below freezing through the first week of January. New Year's Day was the second coldest in recorded history at Indianapolis, eclipsed only by January 1, 1928. Temperatures would modify during the latter part of January, followed by a period of seasonable temperatures into mid-February before a surge of warmth arrived for the second half of February. This included record warmth on February 20<sup>th</sup> as temperatures surged into the lower and middle 70s. Indianapolis recorded their warmest temperature ever in February with a high of 77°

After experiencing a mixture of precipitation types through most of December, precipitation fell primarily as snow from late December through the first two weeks of January. With a storm track suppressed well south of the area, primary snowfall came from quick moving low pressure systems that would deposit a few inches of snow at a time. Freezing rain and drizzle became more prevalent through the second half of January, including on the morning of January 24<sup>th</sup>, when an extended period of freezing drizzle caused substantial impacts on roads during the morning commute across central Indiana. A transition to a much more active and wetter pattern in late February brought heavier rainfall, with much of the area experiencing more than half of their seasonal precipitation during the last 10 days of February.

Overall snowfall was below normal across central Indiana, and well below normal along the Interstate 70 corridor including the Indianapolis metro area. Once again, larger and more impactful snow storms seemed to pass largely north and south of central Indiana through the winter. Indianapolis finished the three month period with just 9.0" of snowfall, less than half of normal for the period. Snowfall totals over northern portions of central Indiana were generally 20-25", much closer to a typical winter season but still below normal.

The following is a review of weather conditions experienced in central Indiana during the winter season of 2017-2018.

# **Temperatures**

## **DECEMBER**

December began warm as high temperatures rose into the 50s and 60s through the first few days of the month. Highs peaked in the mid 60s across central Indiana on the afternoon of the 4<sup>th</sup>, a solid 20 to 25 degrees above normal. The passage of a cold front brought temperatures back to more typical levels for December as highs were mainly in the 30s and 40s with lows in the teens and 20s beginning on the 6<sup>th</sup> and continuing through the middle of the month.

Temperatures warmed again beginning on the 16<sup>th</sup> and would remain above normal for much of the following week, with highs most commonly in the upper 40s and lower 50s. The arrival and passage of a strong cold front late on the 22<sup>nd</sup> and early on the 23<sup>rd</sup> ushered in a shift to much colder air that would culminate with one of the coldest finishes to a year in recent memory. Temperatures fell below 30 degrees on Christmas Eve, then fell below 20 degrees on Christmas Day as a progressively deeper Arctic airmass expanded across central Indiana. The last six days of the month saw much of the area not climb above 20 degrees as highs remained in the teens and lows were in the single digits or below zero. New Year's Eve was one of the coldest on record with highs only in the single digits and teens, and lows near or below zero. Indianapolis tied their coldest high on record for New Year's Eve, matching the 11 degrees reached on the final day of the year in 1976.

The result of the very cold temperatures over the last week of the month led to average temperatures for December running generally 1 to 3 degrees below normal. At Indianapolis, the average temperature of 30.2 degrees ended up just a tenth of a degree colder than December 2016, and the coldest December since 2013.

## **JANUARY**

2018 began on a bitterly cold note highlighted by the second coldest New Year's Day on record for Indianapolis and the coldest start to a year for the region in 90 years. Highs struggled to rise into the single digits after starting the year well below zero.

Temperatures would remain bitterly cold over much of the first week of the month with many locations unable to get above freezing until the 7<sup>th</sup>. Lows through this first week were often below zero. The average temperature for the first 6 days of the month at Indianapolis was a brutally cold 3.2°, marking the coldest start to a year through the first 6 days on record. The warmer temperatures on the 7<sup>th</sup> ended a 12 day stretch dating back to December 26 in Indianapolis where temperatures failed to rise above 20°, a new record.

Temperatures recovered to near normal levels from the 7<sup>th</sup> through the 9<sup>th</sup>, then briefly surged to well above normal levels on the 10<sup>th</sup> and 11<sup>th</sup> as highs rose into the upper 50s and largely removed the snowpack that had been built up in late December and the first

week of January. Much colder air once again returned in the wake of a winter storm that brought a mixture of wintry precipitation to the area beginning late on the 11<sup>th</sup> and continuing into the 12<sup>th</sup>. High temperatures once again dropped back below freezing from the 13<sup>th</sup> through the 18<sup>th</sup>, with the coldest air coming on the 16<sup>th</sup> in the wake of a fresh snow cover as a renewed surge of Arctic air overspread the Ohio Valley. Highs were just in the single digits on the 16<sup>th</sup>, with subzero lows again impacting the region.

Beginning on the 19<sup>th</sup>, the dominant upper level trough which had enabled repeated shots of bitterly cold air to overspread the eastern U. S. since late December finally relaxed and would not return for the rest of the month. The result was near to occasionally above normal temperatures through the end of January with highs largely above freezing. Highs flirted with 60° on the 26<sup>th</sup> as gusty southwest winds brought much warmer air into central Indiana. Arguably, the best weather day of the entire month came just two days later on the 28<sup>th</sup> as temperatures rose during the afternoon into the 50s under bright, sunny skies and with little wind.

Indianapolis had subzero lows on 8 nights in January, matching 1994 and 2014 for the most subzero nights in January over the last 35 years. Indianapolis has now had 11 subzero nights so far in the 2017-2018 winter.

## **FEBRUARY**

February transitioned back to colder weather after the milder finish to January. High temperatures through much of the first half of the month were routinely in the 20s and 30s with lows in the teens and 20s. The coldest morning of the month came on the 5<sup>th</sup> as lows dropped to near 0° in most areas and highs were only in the teens and lower 30s. The colder pattern coincided with the bulk of the snowfall occurring across the region during the first half of February.

The shift back to milder temperatures began on Valentine's Day as temperatures surged into the 50s, followed by lower and middle 60s on the 15<sup>th</sup> as a frontal boundary set up just north of central Indiana with much warmer air to the south across the region. Once that front shifted back south of the area, temperatures dropped back to near normal briefly on the 17<sup>th</sup> before another, more significant push of warmer air overspread the Ohio Valley.

For the rest of the month, high temperatures were routinely above 50°, with a record breaking surge of warmth lifting into the Ohio Valley on the 20<sup>th</sup> as a slow moving cold front aligned to the northwest of the area. High temperatures broke the 70° mark for the first time in 2018 across much of central Indiana, highlighted by a high of 77° in Indianapolis, establishing the warmest temperature ever recorded in Indianapolis in the month of February. Even more impressive, lows in the lower 60s were common on the morning of the 20<sup>th</sup>. Indianapolis shattered their record warmest low for the date by a whopping 10°. While not anywhere near as warm as February 2017, the surge of late month warmth enabled average temperatures to finish largely between 3 and 7 degrees above normal.

## *Temperature Data for Sites in Central Indiana*

Site	Winter 2017-18 Temperature	Normal Temperature	Diff. From Normal
Indianapolis Int'l Airport	30.8	30.5	+0.3
Lafayette	27.3	29.1	-1.8
Muncie	31.3	28.9	+2.4
Terre Haute	30.8	30.7	+0.1
Bloomington	32.4	31.5	+0.9
Shelbyville	31.5	30.7	+0.8
Indianapolis – Eagle Creek (*)	31.1	30.6	+0.5

(\*) – High temperature and average temperature missing at Indy-Eagle Creek on 1/23 and 1/24.

## *Winter Extremes Across Central Indiana*

Site	Warmest Temperature	Coldest Temperature
Indianapolis Int'l Airport	77 on 2/20	-12 on 1/2
Lafayette	69 on 2/20	-19 on 1/2
Muncie	77 on 2/20	-10 on 1/1 and 1/2
Terre Haute	74 on 2/20	-9 on 1/6 and 1/16
Bloomington	75 on 2/20	-9 on 1/2 and 1/6
Shelbyville	77 on 2/20	-14 on 1/2
Indianapolis-Eagle Creek	76 on 2/20	-12 on 1/2

## *Precipitation*

### **DECEMBER**

Monthly melted precipitation for December was slightly below normal to below normal for Indiana. Monthly totals ranged from one-half of an inch in portions of northwest and central Indiana to slightly over 3 inches in southern Indiana. Most areas in southern Indiana received between 1.50 and 3.00 inches of melted precipitation while only 0.50 to 1.50 inches fell in much of northern and central Indiana.

Almost all of the rainfall during December fell on the 5<sup>th</sup> and from the 22<sup>nd</sup> through the morning of the 23<sup>rd</sup>. For both rain events, rainfall of 1 to 2 inches fell along the Ohio River in southern Indiana and decreased to less than a quarter of an inch in northern Indiana. Central Indiana received from 0.25 to 0.50 inches on the 5<sup>th</sup> and from 0.25 to 1.00 inches on the 23<sup>rd</sup>.

River and stream flooding was absent in central and southern Indiana during December. Streamflow remained below seasonal levels through the month. The prolonged cold weather from the 25<sup>th</sup> through the 31<sup>st</sup> caused ice formation on streams and rivers.

Monthly snowfall for December ranged less than an inch in southern Indiana to over 24 inches in the lake effect areas of northern Indiana. Central Indiana received from 3 to nearly 8 inches of snow for the month. Monthly snowfall was below normal in southern Indiana while near normal to above normal in central and northern Indiana.

Snowfall was the dominate form of precipitation from the 5<sup>th</sup> through the 15<sup>th</sup> and again from the 23<sup>rd</sup> through the 31<sup>st</sup>. Much of the snow in central and northern Indiana fell on the 9<sup>th</sup>, the 24<sup>th</sup> through early on the 25<sup>th</sup> and the 29<sup>th</sup> through early on the 30<sup>th</sup>. An additional light snow accumulation early on New Year's Eve morning brought a half inch to just over an inch near and just south of Indianapolis. Northern Indiana and much of central Indiana had a white Christmas.

As December ended, snow depth ranged from 3 inches in central Indiana to over a foot in northern Indiana. Frost depth in central Indiana exceeded 5 inches.

## **JANUARY**

Monthly melted precipitation for January ranged from around an inch in northern Indiana to slightly over 4 inches in southwest Indiana. Precipitation was normal to below normal in much of the state with totals above normal in southwest Indiana and small portions of central and south central Indiana. Much of the northern half of the state received 1 to 2 inches while lake effect areas in extreme northern Indiana and most of southern Indiana received 2 to 4 inches of melted precipitation.

Rains and melting snow and ice brought brief lowland flooding along portions of rivers streams twice in January. The first occurrence was after the rains on the 11<sup>th</sup> and the second was following the rains on the 22<sup>nd</sup>. Minor ice jams flooding did occur on several streams.

As January ended, streams were receding and only trace amounts of snow remained in northern Indiana. The frost depth reached 12 inches in central Indiana on the 8<sup>th</sup> and 9<sup>th</sup>. Temperatures largely above normal since the 19<sup>th</sup> have completely thawed the ground.

Monthly snowfall for January measured from 2 inches in portions of west central Indiana to more than 30 inches in LaPorte County in northwest Indiana. Monthly total of 8 to 24 inches were common in the lake effect areas of northern Indiana while the remainder of Indiana received between 2 and 8 inches of snow.

Monthly snowfall was below normal for most of central Indiana, normal to above normal in northern Indiana and above normal in southern Indiana. Much of the snow in northern Indiana was lake effect snow and fell from the 1<sup>st</sup> through the 8<sup>th</sup>. Winter disturbances from the 12<sup>th</sup> through the 16<sup>th</sup> brought much of January's snow to central and southern Indiana. A combination of freezing rain and snow caused significant impacts for much of central Indiana throughout the 12<sup>th</sup> as progressively colder air came into the region on the back side of a low pressure system.

A disruptive icy event occurred late on the evening of the 23<sup>rd</sup> into the morning of the 24<sup>th</sup> as a combination of freezing mist and drizzle combined to create a thin layer of black ice on numerous untreated roads with ground temperatures below freezing. Interestingly, precipitation amounts were a trace to a hundredth of an inch.

## **FEBRUARY**

Record monthly melted precipitation fell in northern and southern Indiana during February with totals in central Indiana well above normal. Monthly amounts ranged from 3.5 inches in east central Indiana to over 11 inches in south central Indiana near the Ohio River. Nearly all of the state received between 4 and 10 inches of precipitation in February. Most of this rain fell between the 14<sup>th</sup> and the 25<sup>th</sup>.

Heavy rains of 2 to more than 6 inches fell in northern Indiana from the 19<sup>th</sup> through the 21<sup>st</sup>. The largest totals of 4 to more than 6 inches combined with snowmelt brought record to near record flooding to much of northwest and north central Indiana in the Illinois and St. Joseph River Basins. Significant to major flooding occurred in the upper portions of the Wabash and Maumee River Basins.

The heavy rainfall moved south on the 21<sup>st</sup> where 2 to 8 inches fell in central and southern Indiana from the 21<sup>st</sup> through the 24<sup>th</sup>. The heaviest rains of 6 to 8 inches fell along the Ohio River in southern Indiana. Widespread significant river flooding followed in southern and portions of central Indiana. Flooding along the Tippecanoe River in northern Indiana was the worst since January 2008. The Ohio River from Cincinnati to Evansville crested at its highest levels since March 1997.

As February ended, significant river flooding continued in southwest Indiana and southeast Illinois. Rivers continued to rise in southwestern Indiana and again in portions of northern and central Indiana after rains at the end of the month. Stream flow was above normal for late February. Soils remained very wet because of the recent rainfall.

Monthly snowfall totals for February measured from less than an inch in portions of central and southern Indiana to nearly 30 inches in northern Indiana. Monthly totals of 8 to 24 inches were common in the lake effect areas of northern Indiana with 2 to 4 inches in central Indiana and a trace to 2 inches in southern Indiana. Almost all of the frozen precipitation fell before the 12<sup>th</sup>.

## **Winter Precipitation Data for Sites in Central Indiana**

<b>Site</b>	<b>Winter 2017-18 Precipitation</b>	<b>Normal Precipitation</b>	<b>Diff. From Normal</b>
Indianapolis Int'l Airport	7.77	8.15	<b>-0.38</b>
Lafayette	6.89	6.13	<b>+0.76</b>
Muncie	6.36	7.42	<b>-1.06</b>
Terre Haute	6.82	7.34	<b>-0.52</b>
Bloomington	9.36	9.61	<b>-0.25</b>
Shelbyville	9.30	8.02	<b>+1.28</b>
Indianapolis – Eagle Creek	6.95	7.42	<b>-0.47</b>

## **Severe Weather**

Very little in the way of severe weather occurred across central Indiana through the winter season. Scattered strong thunderstorms on the evening of January 22<sup>nd</sup> produced small hail and wind gusts peaking near 55 mph which knocked down a few trees. A line of strong thunderstorms impacted areas primarily near and south of Interstate 70 on the evening of February 15<sup>th</sup> ahead of a cold front. The storms produced wind gusts up to 40 to 45 mph.

## **Indianapolis Data**

### **INDIANAPOLIS DECEMBER 2017 SUMMARY**

	<b>Average Temperature</b>	<b>Total Precipitation</b>	<b>Total Snowfall</b>	<b>Highs below freezing</b>
<b>December 2017</b>	<b>30.2</b>	<b>1.12</b>	<b>3.9</b>	<b>7</b>
<b>Normal December</b>	<b>31.6</b>	<b>3.17</b>	<b>6.9</b>	<b>8</b>

Difference from Normal	-1.4	-2.05	-3.0	-1
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**December 2017 All-Time Ranks:**

Temperature: 49<sup>th</sup> Coldest

Precipitation: 17<sup>th</sup> Driest

Snowfall: Tied for 66<sup>th</sup> Snowiest

**INDIANAPOLIS JANUARY 2018 SUMMARY**

	Average Temperature	Total Precipitation	Total Snowfall	Highs below freezing
January 2018	25.1	2.00	3.7	13
Normal January	28.1	2.66	8.6	12
Difference from Normal	-3.0	-0.66	-4.9	+1

**January 2018 All-time Ranks**

Temperature: Tied for 50<sup>th</sup> Coldest

Precipitation: Tied for 57<sup>th</sup> Driest

Snowfall: Tied for 47<sup>th</sup> Least Snowiest

**INDIANAPOLIS FEBRUARY 2018 SUMMARY**

	Average Temperature	Total Precipitation	Total Snowfall	Highs below freezing
February 2018	37.7	4.65	1.4	6
Normal February	32.1	2.32	6.5	7
Difference from Normal	+5.6	+2.33	-5.1	-1

**February 2018 All-Time Ranks:**

Temperature: Tied for 17<sup>th</sup> Warmest

Precipitation: Tied for 13<sup>th</sup> Wettest

Snowfall: Tied for 24<sup>th</sup> Least Snowiest

**INDIANAPOLIS 2017-2018 WINTER SEASON SUMMARY**

	Average Temperature	Total Precipitation	Total Snowfall	Highs Below Freezing	Lows Below Zero
Winter 2017-	30.8	7.77	9.0	26	9

2018					
Normal Winter	30.5	8.15	22.0	27	6
Difference from Normal	+0.3	-0.38	-13.0	-1	+3

**Winter 2017-2018 All-Time Ranks**  
**Temperature: Tied for 74<sup>th</sup> Warmest**  
**Precipitation: 69<sup>th</sup> Driest**  
**Snowfall: 43<sup>rd</sup> Least Snowiest**

*Temperature and precipitation records at Indianapolis go back to 1871. Snowfall records go back to 1884.*

## **Spring 2018 Outlook**

The official outlook for meteorological spring (March-May 2018) from the Climate Prediction Center indicates an equal chance of near, above or below normal temperatures. At Indianapolis, the average temperature for the spring season is 52.6 degrees. The outlook also calls for greater chance of above normal precipitation. The average spring season precipitation is 12.42 inches along with 2.8 inches of snowfall, most of which typically falls during the month of March.

***Data prepared by the NWS Indianapolis Forecast Office.***