

Winter 2020-2021 in Review

With March comes the end of meteorological winter, a period defined as covering the months of December through February. The following is a review of weather conditions experienced in central Indiana during the winter season of 2020-2021.

Temperatures

DECEMBER

It was a seasonable start to December as highs oscillated between the 30s and 40s for the most part as an extended period of dry weather settled in. After the first week of the month, temperatures warmed as southerly flow developed across the Ohio Valley, peaking on the 10th and 11th as highs rose into the 60s. On the 11th, temperatures threatened record levels at many locations in what would be the warmest temperatures recorded for the entire month.

The passage of a cold front on the 12th would bring temperatures crashing back to seasonably cool levels for mid-month as highs returned largely to the 30s and lows remained in the 20s. Temperatures would again nudge up in the week before Christmas as highs rose into the 40s eventually topping off in the lower and mid 50s on the 23rd. The warmth would again be tempered by a strong cold frontal passage, this one occurring early on the 24th would pave the way for a rapid temperature drop and ultimately the coldest weather of December 2020 coincident with Christmas Eve and Christmas Day. Highs across central Indiana on Christmas Day largely remained in the teens. For Indianapolis, the high of 15° would end up as the coldest Christmas Day in the Circle City since 1985.

The arctic blast that arrived over Christmas was short lived as temperatures modified quickly in the following days after the 25th. Highs rose back into the 50s on the 27th as southerly winds brought milder air back into central Indiana. A frontal passage on the 30th would usher in colder air again as we wrapped up 2020, with highs on New Year's Eve holding in the upper 20s and lower 30s in most areas.

Average temperatures for December would end up 3° to 5° above normal at most locations across central Indiana.

JANUARY

January was a month that saw temperatures above normal but not extensively so as highs in the 30s and 40s were common throughout the month. Temperatures averaged 3 to 6° above normal for January.

The warmest stretch of days occurred in two spots during the month: the first came from the 12th through the 15th where highs consistently warmed into the mid and upper 40s in multiple spots, and the second came about a week later on the 21st which ended up being the warmest day of January with highs ranging from the upper 40s to lower 50s. Low temperatures throughout the month were commonly in the 20s with a few nights in the 30s at times. The coldest temperatures of January were focused primarily during the last 7 to 8 days of the month when temperatures fell into the teens on multiple nights with a few locations dropping into the single digits. No temperatures below zero were recorded across central Indiana in January.

Indianapolis interestingly never recorded a temperature at or above 50° throughout January despite the monthly average temperature finishing up about 3° above normal. This became the first January in 20 years where the temperature had failed to reach 50° or warmer at any time during the month.

FEBRUARY

Much of the first three weeks of February would see a steady dose of colder than normal temperatures as the region remained locked into a cold airmass with multiple opportunities for snowfall. The first several days of the month saw near normal highs generally in the 30s with lows in the 20s. Beginning on the 6th though, the first in a series of blasts of arctic air expanded into the Ohio Valley and would ultimately bring the coldest temperatures of the winter and an extended period of subfreezing temperatures. The first blast of colder air would peak across the region on the 7th with highs remaining in the teens and lows near to just below zero. Wind chills of -20° to -10° were common from late on the 6th into the 8th before warming occurred.

Highs would remain in the 20s with lows in the single digits to teens over the next few days before the arrival of yet another potent surge of cold Arctic air arrived on Valentine's Day and would hold through the 16th in tandem with the biggest snow storm of the season. Highs both on the 15th and 16th held in the teens and the coldest night of the winter followed on the 17th as the combination of a fresh, deep snowpack with clearing skies in the wake of the winter storm enabled temperatures to tumble to below zero over much of central Indiana.

From this point, temperatures would rise slowly as the colder air finally retreated north into the latter part of the month. Highs would remain below freezing over the following few days but gradually warm as the snowpack began to melt. For much of the area, temperatures finally rose above 32° on the afternoon of the 20th, two weeks after first slipping below the freezing mark. For the last week of February, much warmer air spread across the area with highs frequently in the 40s and 50s with the 28th bringing

the warmest day of the year so far as several areas crossed the 60° mark for the first time.

The bitterly cold air that frequented the area for most of the first 20 days of the month kept average temperatures 4-7° below normal for the month, marking the coldest February for the region since 2015. The 14 days Indianapolis spent consistently below freezing from the 6th through the 20th was the longest stretch of subfreezing temperatures in 4 years and only the 4th time since 2000 a subfreezing stretch had been at or longer than 14 consecutive days. In addition, the 52° high recorded on the 23rd would mark the end of the longest sub-50° streak at Indianapolis in 20 years, lasting a total of 55 days.

Temperature Data for Sites in Central Indiana

Site	Winter 2020-21 Temperature	Normal Temperature	Diff. From Normal
Indianapolis Int'l Airport	30.7	30.5	+0.2
Lafayette	30.6	29.1	+1.5
Muncie	31.2	28.9	+2.3
Terre Haute	30.8	30.7	+0.1
Bloomington	31.5	31.5	0.0
Shelbyville (*)	32.6	30.7	+1.9
Indianapolis – Eagle Creek	30.6	30.6	0.0

(*) Shelbyville temperature data missing for 2/6 and 2/7.

Winter Extremes Across Central Indiana

Site	Warmest Temperature	Coldest Temperature
Indianapolis Int'l Airport	65 on 12/11	0 on 2/7
Lafayette	64 on 2/28	-4 on 2/17
Muncie	64 on 12/11 and 2/28	-5 on 2/17
Terre Haute	64 on 12/10 and 12/11	-8 on 2/17
Bloomington	66 on 12/11	-7 on 2/17
Shelbyville	65 on 12/11	-4 on 12/17
Indianapolis-Eagle Creek	65 on 12/11	-4 on 2/17

Precipitation and Snowfall

DECEMBER

December was a dry month for Indiana. The month ended with below normal precipitation nearly everywhere, with much of the central Indiana area winding up between one and two inches below normal. A small area in southeast Indiana ended December between two and three inches below normal, an area near Lafayette was near normal to an inch below normal, and a swath from Indianapolis to Terre Haute was similar. This swath from Vincennes to Terre Haute to Indianapolis saw two to three inches of precipitation. It was surrounded by an area of 1.5 to 2 inches, with one to 1.5 inches over both northeastern and southeastern parts of central Indiana. The month was also relatively warm, with most locations ending the month just over three degrees above normal. Despite the lack of precipitation, drought and abnormally dry conditions remained relatively stable over the state for the course of December, likely due to lack of demand. While temperatures averaged above normal for the month, there was some snowfall and mixed precipitation events. Snowfall amounts ranged from a tenth of an inch across southernmost parts of the state, to one to four inches across most of central Indiana, to a swath over central parts of northern Indiana of five to ten inches in a lake effect snow favored zone.

A few different storm systems rolled through during the month of December. The first 10 days of the month were dry at Indianapolis. Late on the 11th and lasting into the 13th though, a low pressure system moved through Illinois into central and northern Indiana and brought widespread rain and gusty winds. Rainfall amounts with this event ranged from three quarters of an inch to an inch over northwest parts of central Indiana, down to less than a quarter inch over southeastern portions of the area.

On December 16th, a low pressure system moving through the Ohio valley brought snow to central Indiana. Indianapolis received it's highest snowfall for the month with 1.8 inches. A system arriving on the 23rd brought widespread rain to the area. As temperatures dropped with the passage of a cold front on the 24th, rain changed over to snow, and snowflakes hung around into Christmas Day. On December 30th, a frontal system moving through the area brought more rain to central Indiana. There was also a precipitation mix associated with this system after the cold front went through. Precipitation totals ranged from nearly an inch and a half along the Ohio River, to three quarters of an inch to an inch along the southern counties of the forecast area, to 0.3 to 0.5 inches along and north of I-70. Snow was observed at the Indianapolis International Airport 5 times during December, with measurable snow occurring on the 16th, 24th and 30th.

JANUARY

January was a relatively dry and temperate month. Northeastern parts of the state were the driest, with only 1 to 1.5 inches of precipitation for the month. Central and northwestern parts of the state saw 1.5 to 2 inches. South of I-70 received 2 to 3 inches, while some locations along the Ohio River topped out the state at 3 to 4 inches. Most of the state ranged from near normal to around an inch below normal, while some areas in eastern Indiana near the Ohio state line were 1 to 2 inches below normal. Total snowfall for the month ranged from over a foot in portions of north central Indiana, to around 2 inches in the south. In Indianapolis, the month ended with 7.9 inches of snow. For temperatures, the month ended nearly three degrees above normal at Indianapolis, but the high temperature never reached 50 degrees during the month while the lowest minimum temperature was 12 degrees.

One of the heavier precipitation events for the month occurred on January 1st with widespread areas of around an inch of rain. Portions of north central Indiana received light snow in addition to the rain. This rain would lead to rises on the White river with a flood warning issued for the White River near Petersburg. The river would end up cresting just below flood stage, but would remain elevated for several days before returning closer to normal.

A 3 day period of light rain and snow from January 15th through the 17th brought additional snow accumulations to much of central Indiana. Over the course of the 3 days, precipitation amounted to between a quarter and half inch of liquid equivalent from 2-4 inches of snow. Snow remained light and with relatively warm ground temperatures, accumulations were generally limited to the overnight hours with little accumulation during the daytime. During the evening hours of January 27th, a system brought snow to much of south central and southern Indiana. Most areas saw 1-3 inches of snow with isolated amounts of over 4 inches in portions of Martin County. Areas north of this swath of snow received a light dusting of snow with 0.5 inches at the NWS office in Indianapolis.

The biggest snowfall event of the month occurred during the weekend of January 30th to 31st. During the late afternoon and evening hours of Saturday January 30th, an area of rain arrived across southwest Indiana. As this initial band moved to the northeast, it would transition to snow bringing periods of heavy snow starting around 6 PM that continued through 10 PM. Snow fell across several bands with additional light snow falling through the night. During the initial period of snow, the heaviest amounts fell generally along and immediately south of I-74. During the overnight hours into Sunday, snow began to accumulate more heavily across north central Indiana. Snow would transition back to rain during the overnight hours of Saturday into Sunday for much of the area before transitioning back to snow during the early afternoon hours of Sunday. Additional light snow accumulations occurred Sunday and Sunday night. Total snowfall ranged from 9 inches in Tippecanoe County to around 4 inches across much of the I-74 corridor. Amounts then decreased further to the southwest.

FEBRUARY

February 2021 was a cold month with frequent precipitation. There were 21 days of the month when at least a trace of precipitation was observed at Indianapolis, and 13 of these days had measurable precipitation. Despite the frequency, the precipitation total for Indianapolis for the month finished at 1.84 inches, which was 0.48 inches below normal. Overall precipitation amounts across the area ranged from 1.5 to 2.5 inches along and north of I-70, to 3.5 to 5 inches across the southern portions of the forecast area (approximately Sullivan to Martinsville to Greensburg and points south). Indianapolis ended the month with 11.8 inches of snowfall, which was 5.3 inches above normal. This over doubled the snowfall for meteorological winter and brought it to 0.2 inches above normal. As far as temperatures were concerned, Indianapolis ended the month with an average temperature of 25.9 degrees, which was 6.2 degrees below normal. This made it the coldest and snowiest February since 2015. The cold prompted concerns about the development of ice jams on area rivers, and while significant amounts of river ice did develop, the relatively low flow at the time and a more moderate warmup over a few days later in the month helped the ice to melt and break up without impact.

The beginning of the month was relatively benign, with the first 5 days seeing temperatures near normal and a few occasions of light precipitation. On the 6th temperatures dropped well below normal and then stayed there until the 21st.

The first major snowfall of the month occurred across south central Indiana on the evening of February 8th into the morning of the 9th. Some areas received over 6" of snow. This snow came as an upper level wave interacted with a very moist air mass near the surface with brief periods of intense snow banding across Lawrence, Martin, and Daviess counties. With most of the snow falling during the overnight hours, impacts were fairly minimal other than school closures the following day. Further north, little to no snow fell with amounts generally between 1 and 2 inches across the I-70 corridor and points to the north.

The biggest snow to fall for most areas in central Indiana in almost three years came during the middle of the month. From late Valentine's night through the early morning hours of the 16th, much of central Indiana saw snowfall totals from 8 to 12 inches. The event came in two waves, the first being the night/overnight of the 14th. Around half an inch to 2 inches of snow came to the area during that wave. After a brief lull of no snow to light snow during the morning of the 15th, heavy snow moved in across the area during the afternoon and into the night as strong upper forcing interacted with some Gulf moisture aloft and very cold temperatures at the surface (temperatures ranged from the single digits to the mid teens). The widespread and prolonged nature of the event taxed snow removal crews. Many counties across central Indiana issued travel watches and travel warnings on the 15th that ran through the day on the 16th and even longer as blowing and drifting continued to make snow removal difficult, with drifts making numerous roads impassable. As a result, many local school districts across central Indiana either cancelled school or held e-learning days for much of the week. Another quick hitting wave moved through on the 18th, bringing another 1 to 2 inches across

parts of the area, in some cases on streets or roads that still hadn't been cleared from the previous event.

Temperatures remained below to well below normal for the first 3 weeks of the month with only 1 above normal day in Indianapolis on February 4th. Towards the end of the month it began to slowly warm for a few days before climbing into the 50s to lower 60s with dew points well above freezing at times starting the 22nd and lasting through the end of the month. The initial slow warmup helped the snow to start to slowly melt at a rate of around an inch a day, but the big climb prompted a more rapid melt, with snow depth dropping from around 3 to 7 inches across the area on the 21st to near 0 in a matter of 3 days. Frost depth was 11 inches decreasing only a bit to 10 inches with 1 inch of thaw during that same time at Indianapolis (and likely similar in surrounding locations) so most of the water content went into runoff. Fortunately with streams being abnormally low before this, this initial snowmelt did not result in flooding but an increase to near or above normal flow.

February ended on a very wet note, with heavy rain moving in during the night on the 27th and lasting through around midday on the 28th. While the heaviest rain fell south of the Ohio River, southern parts of central Indiana received between 1.5 and over 2 inches of rain with lesser amounts to the north. This fell on already saturated ground, and the runoff went into rivers and streams that had come up from their previously lower levels due to the snowmelt from the big mid-February snow. This brought rapidly rising conditions on many area waterways, bringing some into flood and many headed in that direction, and prompted an areal flood advisory for many of the southern counties on the 28th.

Winter Precipitation Data for Sites in Central Indiana

Site	Winter 2020-21 Precipitation	Normal Precipitation	Diff. From Normal
Indianapolis Int'l Airport	5.86	8.15	-2.29
Lafayette	4.97	6.13	-1.16
Muncie	3.22	7.42	-4.20
Terre Haute	5.86 (*)	7.34	-1.48
Bloomington	7.40	9.61	-2.21
Shelbyville	5.72 (**)	8.02	-2.30
Indianapolis – Eagle Creek	5.04	7.42	-2.38

(*) Terre Haute precipitation data missing for 2/15.

(**) Shelbyville precipitation data missing for 2/6 and 2/7.

Severe Weather

No severe weather occurred across central Indiana through the winter 2020-2021 season.

For information on severe weather in other areas during the winter, visit the Storm Prediction Center “Severe Weather Event Summaries” website at <http://www.spc.noaa.gov/climo/online/>.

Indianapolis Data

INDIANAPOLIS DECEMBER 2020 SUMMARY

	Average Temperature	Total Precipitation	Total Snowfall	Highs below freezing
December 2020	34.7	1.63	2.5	1
Normal December	31.6	3.17	6.9	8
Difference from Normal	+3.1	-1.54	-4.4	-7

December 2020 All-Time Ranks:
Temperature: Tied for 46th Warmest
Precipitation: 30th Driest
Snowfall: Tied for 57th Least Snowiest

INDIANAPOLIS JANUARY 2021 SUMMARY

	Average Temperature	Total Precipitation	Total Snowfall	Highs below freezing
January 2021	31.0	2.39	7.9	4
Normal January	28.1	2.66	8.6	12
Difference from Normal	+2.9	-0.27	-0.7	-8

January 2021 All-time Ranks
Temperature: 51st Warmest
Precipitation: Tied for 76th Driest
Snowfall: Tied for 46th Snowiest

INDIANAPOLIS FEBRUARY 2021 SUMMARY

	Average Temperature	Total Precipitation	Total Snowfall	Highs below freezing
February 2021	25.9	1.84	11.8	14
Normal February	32.1	2.32	6.5	7
Difference from Normal	-6.2	-0.48	+5.3	+7

February 2021 All-Time Ranks:

Temperature: 25th Coldest

Precipitation: Tied for 56th Driest

Snowfall: 20th Snowiest

INDIANAPOLIS 2020-2021 WINTER SEASON SUMMARY

	Average Temperature	Total Precipitation	Total Snowfall	Highs Below Freezing	Lows Below Zero
Winter 2020-2021	30.7	5.86	22.2	19	0
Normal Winter	30.5	8.15	22.0	27	6
Difference from Normal	+0.2	-2.29	+0.2	-8	-6

Winter 2020-2021 All-Time Ranks

Temperature: Tied for 78th Warmest

Precipitation: 32nd Driest

Snowfall: 35th Snowiest

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

Spring 2021 Outlook

The official outlook for meteorological spring (March-May 2021) from the Climate Prediction Center indicates a greater chance for above normal temperatures and precipitation. At Indianapolis, the average temperature for the spring season is 52.6 degrees. 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.