

Central Indiana December 2022 Climate Summary

66th Mildest December on record at Indianapolis (Tied)

72nd Driest December on record at Indianapolis

40th Least Snowiest December on record at Indianapolis (Tied)

Temperatures

December 2022 continued the pattern of frequent unseasonable temperatures that had been seen since mid-September across central Indiana. And as was the case in November 2022, December's overall near-normal average temperatures did not tell the story of these often-anomalous days, including Indianapolis' coldest daytime since 1996. Following zonal see-saw temperatures through the first several days, longer-duration pattern regimes set up through the rest of the month, which was also akin to November. The month's temperatures became progressively more extreme, as 5 of the last 9 days were 21 to 35 degrees off of normal.

December started with a couple cold mornings on the **1st** and **4th** as a progressive zonal pattern brought two rounds of Canadian high pressure whose centers tracked through the Ohio Valley. Lowest temperatures on the **1st** were **11F** at both Perrysville 4 WNW (Vermillion Co.) and Rockville (Parke Co.) while Crawfordsville 6 SE (Montgomery Co.) dropped to **14F**. The **4th** saw **11F** at Farmland 5 NNW (Randolph Co.) and **12F** at Rockville. Indianapolis dropped to 18F on both mornings.

The **6th-15th** found an upper level pattern with a pronounced ridge over the Gulf of Mexico which occasionally built northward into the Midwest, as well as troughs often found over the western United States. This pattern combined to favor southwesterly flow and prolonged above normal temperatures over central Indiana. This warmth featured very small diurnal spreads, led by morning lows in the upper 30s to around 40F. Highs in the 50s (on the **6th**, **14th**, **15th**) made for the mildest days with respect to normal, with the end of this early to mid-month

period including the region's greatest rainfall since late summer over much of the region (see Precipitation section below). Highest marks ranged from maximums of **53F** on the **6th** at both Muncie and Shoals 8 S (Martin Co.), **57F** on the **14th** at Shoals 8 S, and **57F** on the **15th** at Shelbyville ... to minimums on the **6th** of **48F** at Shoals 8 S and **47F** at North Vernon 2 ESE (Jennings Co.), and on the **14th** of **46F** at Washington 1 W (Daviness Co.). Indianapolis' highs and lows were 50F, 52F, 53F and 40F, 40F, respectively.

The middle of December then turned colder, with mainly subfreezing temperatures prevailing through the **18th-19th**. Indianapolis' high of 30F on the **18th** marked the season's first day held below 32F, 15 days later than normal; although the day was coldest at the Shelbyville Sewage Plant (**23F**) and the Beck Purdue Ag Center at West Lafayette 6 NW (**24F**). Minimums in the teens both mornings were lower on the **19th**, with Kokomo 3 WSW (Howard Co.) and Rockville both dropping to **10F**, while Indianapolis measured 16F. Seasonably chilly weather then set in on the **20th** ahead of approaching extreme cold.

A strong cold front crossed Indiana from west to east during the early afternoon to early evening of the **22nd**, ahead of very cold temperatures surrounding a very broad, amplified area of arctic high pressure that was plunging southward through the central United States. Readings around 40F midday on the **22nd** plummeted through PM hours, as the frontal zone's already very narrow temperature gradient tightened while crossing the state. The middle of this zone held the fastest drop, as most locations went from 32F to 20F in about an hour, with Lafayette and Fishers (Hamilton Co.) accomplishing it in 40-45 minutes. Frigid air continued to advance into the region through the evening of the **22nd**, with 5F readings arriving in the Upper Wabash valley around 700pm, and by midnight in the far eastern zones; Lafayette was the fastest of any 1st- or 2nd-order airport from the time of the frontal passage to 5F: a 31-degree drop in 4.4 hours. The NWS Indianapolis office plummeted from 33F at 509pm to 25F at 530pm: a rate of **-23 degrees/hour**. Wet roads courtesy of afternoon light rain to snow quickly "flash froze" causing significant travel impacts across the state.

Temperatures then held near or below zero for ~30-36 hours from around midnight on the **23rd** through dawn on the **24th**. Lowest readings occurred around dawn on the **23rd**, with strong winds facilitating a smooth distribution of observations near -10F, with minimums ranging from **-14F** at Rockville to -3 at Shoals 8 S; while **-11F** was observed at several other COOP sites: Jamestown 2 E (Boone Co.), New Castle 3 SW (Henry Co.), Kokomo 3 WSW, Castleton 2 S (Marion Co.), and Crawfordsville 6 SE. Indianapolis' low of -9F made for the area's coldest *December* morning since Christmas Eve 1989, with an observation this low last seen (in any month) on 1/30/2019. Readings continued their subtle climb through the evening of the **23rd** over much of the region, with daily highs ranging from **-2F** at Kokomo 3 WSW to 4F at the Daviess County Airport. Indianapolis rebounded to 1F during the evening, which tied the **record low maximum** from 1989, yet also tied for the 5th lowest December maximum in the 152-year record (a ~30-year return); and equally impressive: it was the first day held to 1F or lower **since 2/3/1996!**

The frigid cold was accompanied by strong westerly wind gusts following an area of low pressure that deepened on the **23rd** along the departing cold front, while rapidly intensifying into southeastern Canada (see Miscellaneous section below). Extremely low wind chills

bottomed-out on the morning of the **23rd**, with -35F to -40F the rule across central Indiana, **-46F** measured in Westfield (Hamilton Co.), and -40F occasionally reached at Indianapolis from 445 to 515am.

Temperatures then slowly moderated during the **24th-27th**. Another very cold morning on Christmas Eve found most locations near or just below zero, with Shakamak State Park's **-5F** the lowest report. Indianapolis' zero mark brought the first 3-consecutive-day string of 0F or lower minimums (in December) since a record 10-day subzero period in 1989; such a three-peat has only occurred historically in 13 Decembers – a 12-year return; and last occurred (in any month) on January 4-6th, 2018. Christmas Eve and Christmas Day both peaked in the mid-teens at most locations, a mere ~20 degrees below normal. Decreasing clouds on Christmas Eve promoted another frigid overnight, with single digits Christmas morning. The sunniest day of the month (Christmas) allowed readings to rebound into the mid to upper teens, and even 20F at Terre Haute by afternoon. More typical mid-winter chill was felt through the **26th-27th**, with lows in the teens to around 20F and highs trending upwards through the 20s. The freezing mark was finally surpassed on the **28th** and in a big way, with robust south-southwesterly winds boosting temperatures into the mid- to upper 40s, and even the 50F mark at several southern sites. At Indianapolis, this ended 5.7 sub-freezing days, including 71 hours with subzero wind chills, and about 36 hours with wind chills below -20F.

More extremes were in order for December's final days as an anomalously mild and rainy pattern held temperatures generally in the 40s at night while warm winds under cloudy skies promoted highs in the 50s. Warmest days were the **29th** and **30th**, with most locations even surpassing maximums observed on the **2nd-3rd** and **14th-15th**. Extremes across the region included isolated **61F** marks both days: at Shoals 8 S and Spencer (Owen Co.) on the **29th**, and at Shoals 8 S and Bloomington on the **30th**; Indianapolis meanwhile peaked at 58F and 57F, respectively. Daily high minimums were equally impressive, with warmest spots being Perrysville 4 WNW (**54F**) on the **29th** and North Vernon 2 ESE and Washington 1 W (Davies Co.) (both **53F**) on the **30th**; Indianapolis dropped to 45F and 50F, respectively.

Site	December 2022 Average Temp	December 2022 Dep from Nml	Highest Temperature	Lowest Temperature
Indianapolis Int'l Airport	33.4	+0.1	58 on 29 th	-9 on 23 rd
Lafayette	31.3	+0.3	57 on 30 th	-9 on 23 rd
Muncie	33.2	-0.6	57 on 29 th , 30 th	-8 on 23 rd
Terre Haute	34.1	+0.6	58 on 29 th , 30 th	-7 on 23 rd
Bloomington	34.4	0.0	61 on 30 th	-9 on 23 rd
Shelbyville	35.0	+0.6	59 on 29 th	-7 on 23 rd
Eagle Creek Airpark	33.4	-0.1	58 on 29 th	-9 on 23 rd

At Indianapolis, December 2022's daily average temperatures were above normal on 16 days, and below normal on 13 days. It was tied for the **66th mildest** December for the Indianapolis Area since weather records began in 1871, placing it in the 57th percentile.

Precipitation

December 2022 brought the fourth consecutive month with below normal precipitation for most of central Indiana, although nearly all counties finished December with a noticeable improvement from the unseasonably dry October-November 2022 period – especially in frequency of light precipitation, and for many locations also total rainfall. Moderate to heavy rain events on the **14th-15th** and **30th-31st** accounted for generally 75-90% of December's rainfall, and therefore drove the month's precipitation distribution. Outside of these greater events, scattered light rain occurred on several days through the early month, snow showers were common through several mid-month days, and two additional light rain/snow events bookended the late month record cold. Nevertheless the damage done through the very dry autumn led weekly U.S. Drought Monitor updates where **Moderate Drought (D1)** conditions both prevailed and expanded across most of central Indiana throughout December.

The December **6th** Drought Monitor update (released on December 8th) was essentially status quo from the end of November: roughly 75% of central Indiana was in **Moderate Drought (D1)** while the milder **Abnormally Dry (D0)** conditions held on over roughly the northwestern quarter of the region, with a solid majority of Marion County and most of Vermillion County in **D1**, while **D0** protruded as far south as the Putnam-Morgan County line and also the northeast corner of Howard County. The **6th-9th** featured several weak waves crossing the Ohio Valley, each bringing periods of light rain to most of the region. Rain coverage and intensity was greatest during PM hours of the **6th**, all hours of the **8th**, and during the daytime on the **9th**. Greatest 1-day rainfall totals were the **6th's** general 0.50-0.80" that fell across southern counties, which led the 0.50-1.05" 4-day totals across these zones, and an embedded **~1.10"** along Interstate 69 from northern Daviess County to southern Monroe County. Central and northern counties totaled a modest 0.10-0.40" through this generally damp period.

The December **13th** drought update showed no changes from the previous week. A rainy period during the **14th-15th** brought the greatest rainfall in 3 to 4 months for much of the region. Pre-dawn rain on the **14th** totaled as much as 0.82" southeast of Washington (Daviess Co.) while 0.15-0.50" was measured for most locations amid a north-south gradient. Light rains ended in the morning before a soaking evening rain tapered to additional light amounts overnight. Additional 1-day totals through dawn on the **15th** were 0.40-0.90" for most locales, while reports approaching **1.15"** were received from Clear Creek (Monroe Co.), as well as east of Shoals and southwest of Williams (both in Martin Co.). Storm total observations of **0.70-1.40"** were common; an overall maximum south and west of Bloomington was focused between Washington and Bedford, with **2.08"** at Shoals 8 S, and **1.72"** as far north as Owensburg (Greene Co.). First-order airport totals ranged from 0.48" at Muncie to **1.25"** at Bloomington while Indianapolis recorded **1.11"**; this was the greatest 2-day rainfall at Bloomington since September 5-6th, 2022's 1.40", and for Marion County airports since the solid **~2.00"** that graced the Metro area during August 29-30th, 2022.

Immediately following the soaking rain, a broad upper trough slowly crossed the Great Lakes, dragging waves along its southern periphery and across the Midwest. From late on the **15th** through the **17th**, several rounds of (mainly snow) showers graced the north-central and

northeastern counties, while occasional flurries fell over the rest of the region. 3-day snowfall totals were led by **1.3"** at Kokomo 3 WSW and **1.0"** at the Muncie WWTP (Delaware Co.) COOP site; elsewhere north and east of I-70 and I-65 were a score of 0.3-0.6" observations, with 0.6" reported from Burlington (Carroll Co.) to as far south as the east side of Fishers (Hamilton Co.). The December **20th** drought update displayed two small changes along the region's perimeter: deterioration to **Severe Drought (D2)** had occurred along extreme eastern Henry County, while an improvement to **D0** occurred for the southwestern tip of Knox County and extreme southern Martin County. The remainder of the region stayed status quo: mainly **D1**, with **D0** around the northwestern counties.

The late-month arctic outbreak included light precipitation surrounding its arrival on the **22nd** – rain and drizzle prior to the late-day changeover to light snow, which tapered off quickly during the overnight hours. Totals through dawn on the frigid **23rd** included generally 0.10-0.35" total liquid, with observations approaching 0.45" at both in Anderson (Madison Co.) and southwest of Greensburg (Decatur Co.); a **1-3"** blanket of snowfall had graced most of the region, with greatest reports around the region's edge, including **3.5"** at North Vernon 2 ESE, and **3.0"** at both Modoc (Randolph Co.) and Elnora (Davies Co.). More notable were the several days of blowing snow that greatly reduced visibility (see Miscellaneous section, below). The **26th**'s light morning snowfall across mainly southern counties tapered off to PM flurries and freezing drizzle, with the latter most noticeable across the far northern zones. Measurable snow was mainly contained south of the I-70 corridor, with **2.0"** north of Mitchell (Lawrence Co.) and several readings around **1.0"** along the US-50 corridor; meanwhile 0.5" was measured as far north as Rushville, and a 0.3" report came in from northeast of Mooresville (Morgan Co.). Icy roadways impacted travel on I-65 just north of Tippecanoe County, yet the freezing drizzle caused little or no impacts across the local region. The December **27th** drought update saw the month's only substantive change as **D1** finally expanded northward, enveloping the entire northwest quadrant of counties. The very subtle areas of **D2** and **D0** that were introduced in the preceding update remained.

The **29th-31st** found another 48-hour rainfall of equal magnitude to the mid-month event. Light rain began on the night of the **29th** and past a narrow band of 0.60-0.70" from near Rockville to Crawfordsville, only light totals were reported through dawn on the **30th**. Periods of rain followed, with the morning and evening of the **30th** yielding the most precipitation. Additional 1-day totals into dawn on the **31st** showed a compliment to the system from two weeks prior: the greatest observations within the general 0.60-**1.20"** range were found around Marion County and points north and east, including **1.35"** in Augusta (Marion Co.), **1.23"** northwest of Fortville (Hamilton Co.), and **1.15"** in Yorktown (Delaware Co.). Following additional light rainfall through the morning of the **31st** along and east of the I-69 corridor, storm totals ranged from 0.60-**1.00"** along and south of the I-70 corridor (outside of the Indianapolis Metro) to **1.00-1.25"** from Crawfordsville to Greenwood and points north and east. Greatest 48-hour totals included **1.47"** in Williams Creek (Marion Co.), **1.41"** northwest of Carmel (Hamilton Co.), and **1.32"** west of Crawfordsville.

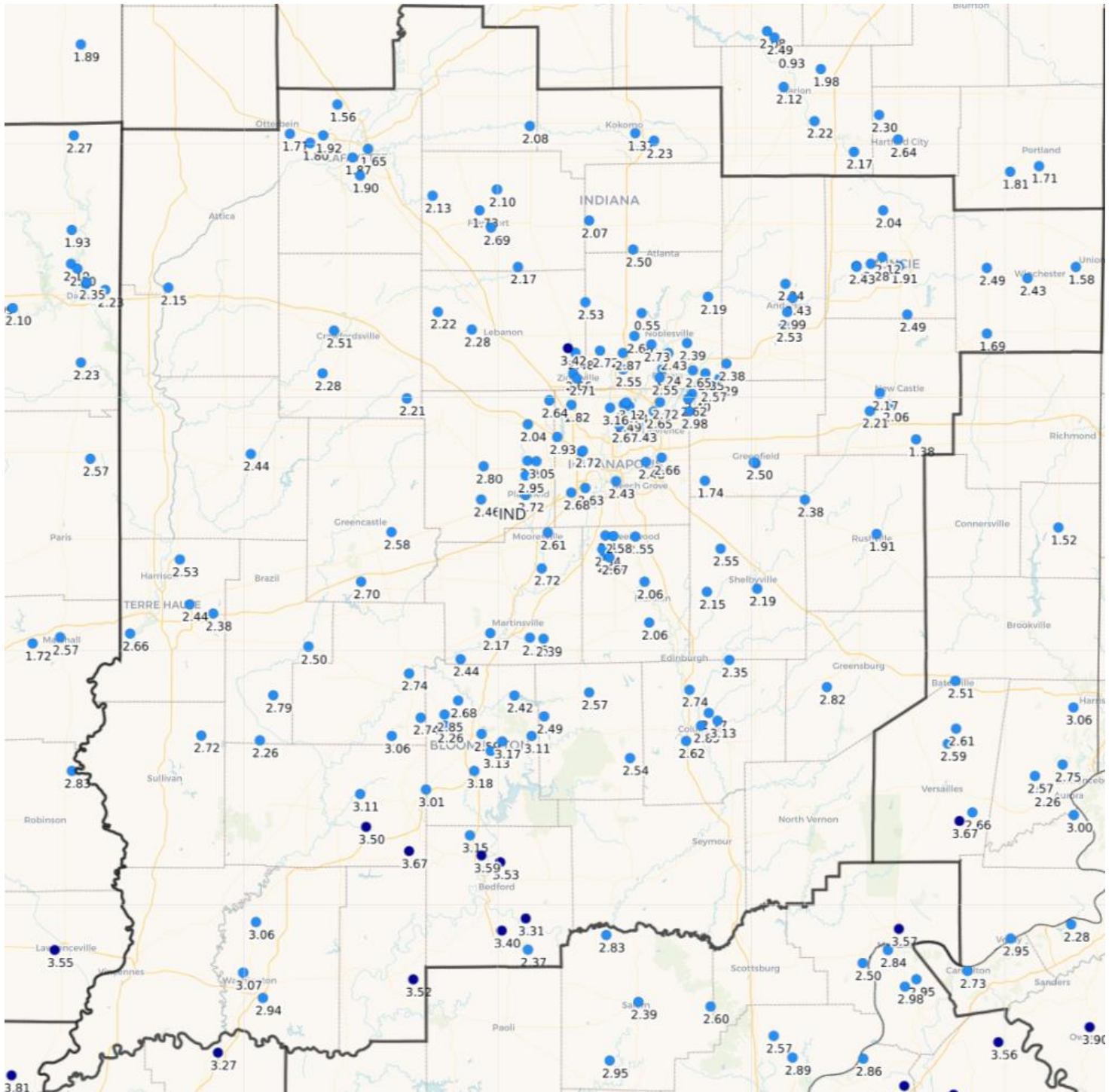
No flooding was observed in central Indiana during December 2022.

Overall, December 2022's precipitation was generally near to slightly below normal, with monthly totals of 1.75–3.00" common across central Indiana, although above normal values of 3.00–3.70" were the rule south and west of Bloomington. The typical north-south gradient was therefore exemplified, with several sub-2.00" readings across Tippecanoe County as well as east of Muncie. Extremes ranged from **1.46"** at Farmland 5 NNW to **3.86"** at Shoals 8 S and **3.87"** at the Williams 3 SW COOP site on the Martin-Lawrence County line. Locations that received lesser amounts generally saw their driest December since 2017. Across 1st-order airports with complete data, monthly totals (see below) ranged from **72%** of normal at Shelbyville to 103% of normal at Eagle Creek Airpark. At Indianapolis, this was only the driest December since 2020. The year-to-date total at Indianapolis rose to a meager **34.88"**, with the year's deficit finishing at **8.75"** below normal. Indianapolis finished with the driest year since 2010 (33.85") and the 2nd-driest since 1999 (32.37"). Yearly rainfall under 35" has occurred 23 times in the 152-year record – an overall 7-year return.

Site	December 2022 Precipitation	December 2022 Dep from Nml	Wettest Day	Longest Dry Stretch
Indianapolis Intl AP	2.63	-0.29	0.97 on 14 th	3 days, 11 th –13 rd & 19 th –21 st
Lafayette	0.75INC	M	M on 30 th	4 days, 4 th –7 th
Muncie	1.94	-0.63	0.76 on 30 th	3 days: 11 th –13 rd , 19 th –21 st & 27 th –29 th
Terre Haute	2.20	-0.29	0.93 on 14 th	3 days, 19 th –21 st & 27 th –29 th
Bloomington	2.54	-0.75	1.15 on 14 th	3 days, 11 th –13 rd & 19 th –21 st
Shelbyville	2.14	-0.83	0.73 on 14 th	3 days, 19 th –21 st
Eagle Creek Airpark	2.75	+0.08	1.12 on 30 th	3 days, 11 th –13 rd & 19 th –21 st

December 2022 was the **72nd driest** December in the Indianapolis Area since weather records began in 1871, placing it near the median amount at the **47th percentile**. This continued the dry trend seen so far through autumn 2022, yet countered the wetter than normal December 2021.

December 2022 Total Precipitation, Through the Morning of 1/1/2023 As Reported By Central Indiana CoCoRaHS Observers



For the period 700 AM EDT 12/1/2022 -to- 700 AM EST 1/1/2023. Data is unofficial.

Noticeably greater precipitation fell during December than either of the two preceding months, although totals were still generally ~0.50" below normal. Extremes ranged from **1.50-2.00"** near Lafayette and south/east of Muncie...to **3.00-3.75"** south of Bloomington.

Miscellaneous – Winds, Thunder, Fog & More

December 2022's strongest observed wind gusts occurred on several days: the **2nd**, **3rd**, **15th**, and **23rd**, although (as highlighted in the severe section below) the only severe-magnitude gust at any 1st-order airport was at Lafayette on the **15th**. On the **2nd**, Terre Haute gusted to **52 mph** while Muncie and Indianapolis followed with 51 mph and 49 mph, respectively. All 1st-order sites peaked at 45 mph or stronger on the **3rd**, with Indianapolis gusting to **54 mph**, and 52 mph recorded at both Lafayette and Shelbyville. The **15th** also brought 47 mph to Marion County sites; while the **23rd** included the majority of the winter storm's strongest gusts, with **56 mph** at Muncie, 52 mph at Lafayette, and 50 mph at Indianapolis. Strong winds on the **23rd** were coupled with sub-zero temperatures, with most areas recording peak gusts at 40-50 mph, with several **50+ mph** observed across the northern tier and down through the western side of the Indianapolis Metro.

Most 1st-order sites also gusted to 25 mph or greater on the **1st**, **9th**, **13th-18th**, **22nd-25th**, **27th-30th**, or ultimately more than half the month. Frequency of days with gusts to 30 mph or stronger was greatest at Lafayette, Muncie and Shelbyville (12), while Indianapolis observed 30+ mph on 11 days. Among the frequently-breezy conditions were several periods of quiescence: no 1st-order site reported a wind gust in excess of 22 mph during the **4th-7th**, **10th-12th**, nor **19th-21st**.

Days with fog were persistent at times – through mainly the month's first full week and again from the **21st** onward. Overall frequency across the month ranged from 15 days at Indianapolis and Shelbyville to 18 days at Eagle Creek Airpark, with all other sites observing fog on 16 days. All 1st-order airports reported fog on the **6th-11th**, **14th**, **15th**, **21st**, **22nd**, **26th**, **27th**, and **31st**; while fog occurred at most sites on the **30th**. Shelbyville reported fog on 9 of 10 days during the **2nd-11th**. Dense fog frequency ranged from no occurrence at both Lafayette and Shelbyville to 4 days at Muncie and 5 days at Bloomington. Dense fog was reported at 3 of the 7 1st-order airports on both the **10th** and **31st**; while Bloomington observed dense fog 4 out of the 5 days during the **6th-10th**.

Thunder was essentially non-existent, only being observed on the **6th** at Bloomington...and around midnight spanning the **29th-30th** along western portions of the Indianapolis Metro.

Relative humidity (RH) across the 1st-order sites was rarely low, although drier conditions were occasionally observed through the first week: minimum daily values were as low as 28% at both Marion County airports on the **1st**, and on the **4th** as low as 24% at Muncie and 26% at Bloomington.

The somewhat rare phenomena of blowing snow did occur throughout the late December storm. Stronger winds promoted blowing snow intense enough to lower visibility late on the **22nd** at Indianapolis, Lafayette and Terre Haute; and at all 1st-order sites on the **23rd-24th**. Lowest reported visibility at both 1st and 2nd-order airports dropped, at least briefly, to generally $\frac{1}{2}$ to $\frac{3}{4}$ miles. One-quarter mile visibility was observed briefly at both Bloomington and Terre Haute, and occasionally through the AM and midday hours of the **23rd** at the Kokomo Municipal Airport (Howard Co.).

Severe Weather

December 2022's only severe wind observation occurred at the Lafayette airport (**61 mph** from the west) very early on the **15th** when a passing front allowed stronger winds aloft to reach the surface.

See the Temperature section (above) for details regarding the extremely low wind chill values on the **23rd**. A more thorough summary of the December 22nd-24th winter storm can be found at <https://www.weather.gov/ind/December23WinterStorm>.

For info on severe weather in other areas during December, visit the Storm Prediction Center "Severe Weather Event Summaries" website at [spc.noaa.gov/climo/online](https://www.spc.noaa.gov/climo/online)

January 2023 Outlook

The official outlook for January 2023 from the Climate Prediction Center indicated slightly greater chances of both above normal temperatures and above normal precipitation across central Indiana. The normal January temperature at Indianapolis is **28.5** degrees. The normal January precipitation at Indianapolis is **3.12"**, and the normal January snowfall at Indianapolis is **8.8"**.

*Data prepared by the Indianapolis Weather Forecast Office's State Climate Team
Questions should be referred to nws.indianapolis@noaa.gov*