

Winter 2021-2022 Review

of Weather Conditions Experienced in Central Indiana

Tied for 36th Warmest on record at Indianapolis

41st Wettest on record at Indianapolis

30th Least Snowiest on record at Indianapolis

Temperatures

DECEMBER 2021

December 2021 was exceedingly mild, averaging 8.5 to 9.5 degrees above normal across central Indiana. This included anomalous warmth on 8 of the month's first 16 days, a seasonably cool week leading up to Christmas, before 8 consecutive unseasonably mild days ended the year. Below normal temperatures were rare, although six consecutive days of near-normal readings occurred during the 17th - 22nd. December 2021 continued the last three Decembers' (2018-2020) pattern of above normal temperatures while also exemplifying it, as it was the warmest December since 2015 (which averaged 42.6°F at Indianapolis). December 2021 was the second-warmest at Indianapolis since 1923. By contrast, December 1983 and December 1989's average temperatures were 13.3 and 14.7 degrees below current (1991-2020) Indianapolis normals, respectively. December 2021 was 0.3 to 2.5 degrees warmer than November 2021 at all 1st-order sites, excepting Muncie (0.1°F cooler), this being the first such occasion at Indianapolis since 1959.

The first three weeks' progressive pattern of several upper-level troughs digging across the central U.S., and the resultant storm systems that deepened over the Middle Mississippi Valley before tracking northeastward through the Great Lakes, promoted rather quick temperature changes between near normal and unseasonable to near-record warmth. These abundantly warmer periods were courtesy of several multiple-day stretches of generally southerly winds over the region, as developing storm systems passed to the northwest and then north. Mainly seasonable readings then prevailed for the week preceding the Christmas holiday weekend amid a predominantly zonal upper-level pattern, with slightly below normal temperatures across the northern counties and slightly above normal observations along the region's southern tier. The same unseasonably warm pattern then returned to end the month, with four of the eight final days of 2021 (the 24th, 25th, 27th, and 31st) averaging more than 20 degrees above normal for all but the far northwestern corner of central Indiana. Indianapolis recorded a record greatest tally of December days reaching 60F or above, with **11**. Greater frequency of 60F+ days was found at Bloomington (12), Shelbyville (13).

DECEMBER 2021 TEMPERATURES (con't...)

Highs reached the upper 50s to 60s on both December 2nd and 3rd, with the highest reported temperatures both days at the Shoals 8 S (Martin Co.) COOP station, 69F and **70F**, respectively. Lows during the 2nd's calendar day were highest at the Oolitic Purdue Farm (Lawrence Co.), **47F**. On the 5th, mild conditions returned, as highs in the mid-50s to mid-60s were commonplace, and Shoals 8 S peaked at **67F**. Early on the 6th, Bloomington's high temperature of **63F** occurred just after midnight before a strong arctic cold front crossed the region. Throughout the 6th, staunch 24-hour temperature drops around 35 degrees were the rule, and Indianapolis Int'l Airport led this trend, plummeting 38 degrees from 61F to 23F. The subsequent arctic air mass, while only briefly in Indiana, brought the only two days with below normal temperatures within a 22-day period (11/30-12/21) at Indianapolis. The 7th was the coldest for all of central Indiana as morning lows dropped to 15-20F for most locations, with 13F at the Beck Agricultural Center 6 miles northwest of West Lafayette (Tippecanoe Co.), and **11F** in Rockville (Parke Co.). The 7th's high temperatures only reached the mid- to upper 20s, with the lowest maximum at Frankfort Disposal (Clinton Co.), **23F**, while Lafayette reached 24F and Indianapolis 26F. These values marked both the coldest morning and coldest daytime for nearly the entire region since the third week of February 2021.

A steady moderation during the second week of December preceded two more brief periods of near-record warmth. Robust southerly winds strengthened late evening on the 10th before a cold front crossed the region pre-dawn on the 11th, with strong gusts boosting both temperatures and dewpoints into the anomalously-high 60s across the entire region, while also fueling scattered severe thunderstorms (see below). Shoals 8 S reported the highest mark, **71F**, while **68F** was recorded at Terre Haute, Bloomington, Indianapolis – Eagle Creek Airpark, and the Washington 1 W (Daviess Co.) COOP station; all high temperatures were reached during the overnight hours. Indianapolis Int'l Airport's high of **66F** at 240 a.m. on the 11th tied the day's **record high** (from 1931), yet perhaps more impressive was the rate of (nocturnal) warming – with the mercury climbing 4 degrees over the preceding 2.7 hours of warm winds. Highest minimum temperatures were found for the 1-day periods that ran midnight-to-midnight, with Hardin Ridge Recreation Area (Monroe Co.) and the Seymour 1 WSW (Jackson Co.) COOP station only dropping **51F** on the 10th.

The overall unseasonably mild start to December had one final abnormally warm period during the 14th-16th, even though readings fell just short of the month's maximum on the 10th-11th for most locations. On the 15th, high temperatures reaching the low to mid-60's were once again led by Shoals 8 S' **67F**, while Muncie, Shelbyville, Indianapolis – Eagle Creek Airpark, and Washington 1 W all hit 65F. Low temperatures for the 15th's calendar day were near 50F, although readings only dropped to **60F** at Shoals 8 S for the 1-day period through 700 a.m. on the 16th. Maximums on the 16th were near 60F for most locations, with Shoals 8 S and Washington 1 W both reaching **64F**. Indianapolis Int'l Airport was **63F** both days.

Seasonably cool weather prevailed during the 17th-23rd before December closed with the most persistent set of anomalously warm days. More storm systems crossed over, or to the north of the region, promoting stronger southerly winds upon their approach. The Christmas holiday brought the low to mid 60s back to most locations by late evening on the 24th, with 60s

flourishing early on Christmas Day before a cold front crossed the region. Shoals 8 S topped at **74F** on the **25th**...while Indianapolis reached **63F** twice, between periods of rain, at both 137AM and 1150AM. This tied 1982 for the 2nd warmest Christmas Day, just behind the record high of 64F (from 1893).

Two more abnormally mild days were in store for most of central Indiana as 2021 came to a close. A warm front advancing north into the region on the **27th** brought the warmest readings of the month, **approaching 70F** across several southern sites ... while 50s held over northern and northeastern zones. On the **31st**, a small surface low sliding east along a stationary front stretched over the region, brought enough southerly flow to boost temperatures into the low 60s along and south of Interstate 70 during the evening. This evening warming gave Indianapolis its 11th 60F+ day in the final hours of the month, passing 1889 for the greatest number on record. However, this record tally of days was aided by several of the rather brief 60F+ periods straddling two calendar days: at Indianapolis the high temperatures on the **5th-6th**, **10th-11th**, and **24th-25th** were all within a couple hours of only three midnights.

December 2021's above normal temperatures continued the warm trend from December 2020, yet were in contrast to the rather cool conditions during November 2021. For Indianapolis, this was only the sixth year since 1871 where December was warmer than November, and the first occasion since 1959. The 1.6°F increase was the greatest such trend since 1889.

At Indianapolis, December 2021's daily average temperatures were above normal on an astounding **28 days** and below normal on only 3 days. It was the **5th warmest** December for the Indianapolis Area since weather records began in 1871, placing it in the 97th percentile.

JANUARY 2022 TEMPERATURES

January 2022 was consistently cold, averaging 2.0 to 4.0 degrees below normal across central Indiana. The prevailing synoptic pattern included numerous upper-level troughs crossing the Mid-West whilst spinning around an upper low near Hudson Bay. This generally northwest flow kept Indiana moisture-starved while not favoring winter storm development. The passing upper troughs brought associated arctic surface high pressure. The troughs passing central Indiana did so at a quicker pace during the second half of the month, bringing more frequent tandems of light accumulating snow and subsequent very cold mornings. Unseasonable conditions were uncommon, with very mild temperatures only recorded on the **1st** and **12th**, and the cold only dropping to frigid levels on the **6th-7th**, **25th-26th** and **28th-29th**. January 2022 continued the cooling trend from January 2020's well above normal, and January 2021's above normal temperatures; it was the coldest January since 2018 (which averaged only 25.1°F at Indianapolis). January 2022 was the fourth-coldest at Indianapolis of the last ten years. By contrast, January 2017's and January 2020's average temperatures were 6.4 and 6.5 degrees above current (1991-2020) normals at Indianapolis, respectively.

January 2022's first two weeks saw temperatures see-saw between very mild and quite cold levels, while the remainder of the month was more consistently cold with the last week featuring occasionally clear conditions that promoted large diurnal spreads and a couple

JANUARY 2022 TEMPERATURES (con't...)

mornings near or below 0F. Most locations recorded 30 of 31 minimums at or below freezing; historically the Indianapolis Area only sees this in one of every 5 Januarys. Days held below freezing ranged from 10 at Terre Haute to 15 at both Lafayette and Muncie, with Indianapolis recording 12 maximums of 32F or lower. Such days at COOP stations ranged from only **6** at both Elnora (Daviess Co.) and Shoals 8 S (Martin Co.) to **22** at the Beck Agricultural Center 6 miles northwest of West Lafayette (Tippecanoe Co.).

The **1st** was unseasonably warm for all but northwestern counties, if only due to the anomalously high early morning maximum temperatures that occurred just ahead of an approaching cold front. Bloomington hit **63F** at 12:10 a.m. before Shelbyville peaked at **65F** at 1:45 a.m. The **2nd – 5th** was seasonably cool, although all 1st-order airports were held below freezing on the **3rd**; Indianapolis only reached 31F and the lowest observed maximum was **27F** at several COOP stations, including the Davis Purdue Ag center 5 miles NNW of Farmland (Randolph Co.). An arctic blast then impacted the region from late on the **5th – 7th**, with Indianapolis' drop from 41F to 15F representing most other locations; the Columbus COOP site (Bartholomew Co.) saw the greatest reported change, (-) 29F. The **6th's** maximums only reached the upper teens, with **18F** at Indianapolis, while the coldest daytime, **14F**, was recorded at both the Rockville (Parke Co.) and Tipton 5 SW (Tipton Co.) COOP sites. The **7th** was the coldest morning since February 2021, with most spots north of Interstate 70 near **0F**; sub-zero readings included **-4F** in Rockville, **-2F** at Shakamak State Park (Sullivan Co.), and **-1F** at West Lafayette 6 NW. The **7th's** highs reached only the upper teens to near 20F over most locales; Indianapolis reached 19F, while Rockville was held to **13F**.

The **8th** brought moderation amid broad warm advection, with most locations rising from the low- to mid-teens to near 40F; Bloomington reported the largest change, (+) 29F. Soon after, the next arctic air mass built into the United States, with readings dropping significantly from dawn on the **9th** to dawn on the **10th**; the greatest reported change was at Shakamak State Park, (-) 34F. Subsequent cold included the **10th's** sub-freezing highs, which were as low as **25F** at the Kokomo 3 WSW (Howard Co.) COOP site; and the **11th's** morning lows that were near 10F, and as low as **3F** at Rockville. Temperatures rebounded once again on the **11th** as a warm frontal zone crossed the Mid-West, with most locations increasing 25-30 degrees, into the 30s by late evening. The **12th-13th** was rather mild amid generally light southwesterly breezes, with the **12th's** morning lows in the 30-35F range for most locales, and afternoon maximums as high as **50F** at Bloomington and Terre Haute, while Shoals 8 S reached **56F**. Seasonably chilly conditions were the rule during the **15th-18th**.

A rather consistent flow of arctic high pressure promoted below normal readings for the entire region on 9 of the month's final 14 days. The next arctic air mass infiltrated central Indiana on the **19th-20th** with West Lafayette 6 NW and Shakamak State Park both dropping from 45F to 8F for the largest change, (-) 37F. The **20th-22nd** then featured morning lows generally in the low to mid teens, with lowest observations: **20th**, Rockville **3F**; **21st**, West Lafayette 6 NW **5F**; **22nd**, North Vernon 2 ESE (Jennings Co.) **5F**. Meanwhile high temperatures were held to the mid 20s for most locations through the **21st**. The **23rd-24th** was seasonably chilly.

On the **24th-25th**, the next arctic blast had a generally less extreme temperature drop, but Shakamak State Park still saw a (-) 36F change. Some locations recorded their coldest morning of the month on the **26th** – generally the Indianapolis metro and points west and south, with readings dropping to generally -5F to 5F, and West Lafayette 6 NW reporting **-10F**. The Lafayette airport reported a wind chill of -17F, and Castleton 2 S remarked “wind chill at 800 am -13F; sunny skies”. Indianapolis dropped to **0F** for the first time since 2/7/2021; with the last sub-zero reading having occurred on 1/31/2019. The **29th** saw one last frigid morning, as arctic high pressure, now tracking well south of the region, brought most locations their coldest morning of the month. Morning lows of -5F to 5F were again common, with New Castle 3 SW (Henry Co.) dropping to **-10F** and Kokomo 3 WSW **-8F**. Then, plentiful sunshine and modest westerly winds advecting noticeably milder air from the Plains, brought readings back to near freezing, with some of the colder locales rebounding (+) 25-30F. The month ended with seasonably cold temperatures on both the **30th** and **31st**.

January 2022’s below normal temperatures were in sharp contrast to the anomalous warmth during December 2021, as well as the mild readings from January 2021.

At Indianapolis, January 2022’s daily average temperatures were above normal on 10 days, below normal on 19 days, and at normal on 2 days. It was the **55th coldest** January for the Indianapolis Area since weather records began in 1871, placing it in the 63rd percentile.

FEBRUARY 2022 TEMPERATURES

February started out warm with temperatures approaching 60° on the **1st** followed by 50s for most on the **2nd**. Conditions changed quickly, however, as a complex and significant winter storm shifted temperatures to much colder levels for the **3rd** and through the following 3-4 days as much of central Indiana was blanketed by a deep snowpack. The coldest night of the month for much of the area came on the morning of the **5th** under clear skies and light winds combined with the snow on the ground. Several locations over northern portions of central Indiana fell below zero with the rest of the region dropping into the single digits.

Recovery began on the **8th** with a steady decline in the snowpack persisting over the next several days as highs oscillated between the 30s and 40s with mainly dry conditions and plenty of sunshine during the day. A brief cool down arrived from the **12th** through the **14th** with highs largely holding in the 20s. Beginning on the **15th** though, conditions turned much warmer as southerly flow developed across the Ohio Valley. Many locations reached 60° on the **16th** and **17th** before falling back into the 30s as colder air returned in the wake of a strong storm system. For the rest of the month, temperatures fluctuated between periods of colder then warmer aided by storm systems frequently tracking through the Ohio Valley. The warmest days for February came on the **21st** and **22nd** with highs rising into the low and mid 60s before returning yet again to the 30s for several days before rising right at the end of the month.

Despite the up and down nature of the temperatures throughout February, the month ended up cooler than normal with most locations up to 2° degrees below normal for the monthly

average. In Indianapolis, 25 of the 28 days during the month experienced lows below freezing with 13 days seeing lows below 20°. Ten of the days saw highs at or below freezing while nearly half of the days in February experiencing highs above 40°.

February 2022's below normal temperatures continued the trend from both January 2022 and February 2021.

At Indianapolis, February 2022's daily average temperatures were above normal on 11 days, below normal on 16 days, and at normal on 1 day. It was the **70th coldest** February for the Indianapolis Area since complete weather records began in 1872.

Winter 2021-22 Temperature Data for Central Indiana Sites

Site	Winter 2021-22 Av Temperature	Winter Season Normal Temp	Difference From Normal
Indianapolis Int'l Airport	32.8	31.5	+1.3
Lafayette	30.1	28.8	+1.3
Bloomington	34.3	32.8	+1.5
Muncie (**)	32.8	31.5	+1.3
Terre Haute	33.2	31.7	+1.5
Shelbyville	34.8	32.6	+2.2
Indianapolis Eagle Creek AP	33.3	31.6	+1.7

Winter 2021-22 Temperature Extremes Across Central Indiana

Site	Highest Temperature	Lowest Temperature
Indianapolis Int'l Airport	66 on 12/11	0 on 1/26
Lafayette	64 on 12/15	-6 on 1/26
Bloomington	69 on 12/27	-3 on 12/29
Muncie	67 on 12/11	-2 on 1/26, 1/29
Terre Haute	68 on 12/10, 12/11	1 on 1/26
Shelbyville	68 on 12/27	-2 on 1/29
Indianapolis Eagle Creek AP	68 on 12/11	1 on 1/26

** – Temperature data is missing at **Muncie** for the 1/12 maximum temp

Precipitation

DECEMBER 2021

Following the release of the new 30-year climatological normals (1991-2020) earlier this year, December is now typically the second-driest month across most of central Indiana behind February, except for northern counties where January is typically the second-driest. Normally around 2.30-3.30" of precipitation fall across the region in December, which includes a north (drier) to south (wetter) gradient. However, December 2021's totals were above these normal values, with **4.23"** falling at Indianapolis International Airport, **149% of normal**. This was the wettest December at Indianapolis since 2015's 5.59"; with all other 1st-order airports having their wettest December since 2015 or 2018.

Showers and thunderstorms on the night of the **5th** brought 0.50-1.00" to most locations, although southern portions of central Indiana picked up mainly **1.00-2.50"**, with **2.70"** near Scipio (Jennings Co.), and **2.59"** north of Oolitic (Lawrence Co.); patches of isolated **1.00"+** also fell on several of Indianapolis' northern suburbs (led by **1.32"** in Carmel (Hamilton Co.)), as well as Henry and Randolph Counties. **Isolated river flooding** in far southern corners of the region then followed on the **6th**, with Beaver Creek near Shoals (Martin Co.), and both Brush Creek near Nebraska and the Muscatatuck River near Vernon (Jennings Co.), in flood for several hours.

From the evening of the **10th** through early on the **11th**, widespread showers and, at times, severe thunderstorms, dropped 0.50-1.50" on most locales. Several locally heavier rainfall totals were recorded across central and eastern parts of the region, including **1.75"** near Scipio, **1.61"** at both Ellettsville (Monroe Co.) and south of New Castle (Henry Co.), and **1.59"** at the Lebanon 6 W COOP station (Boone Co.).

Many rivers rose again on the **11th**, now following 7-day precipitation totals as high as 2.00-4.00", especially over the southern third of the region. Four sites reached **minor flood** stage: the East Fork of the White River at Seymour was in flood the longest, from early evening on the **11th** through pre-dawn on the **13th**; otherwise, brief flooding began on the morning of the **11th**, with durations ranging from 4 hours on Prairie Creek near Lebanon (Boone Co.) to 15 hours on Flatrock Creek near Raleigh (Rush Co.). The Mississinewa River at Ridgeville (Randolph Co.) only flooded for 12 hours, but crested just shy of moderate flood stage. Action stage was reached on several non-main-stem rivers across eastern and far southern portions of the region, as well as all points along the Wabash River.

A third round of adequate rainfall occurred mid-month, from locally potent overrunning courtesy of a lingering frontal zone, and the associated approaching storm system, all of which slid across Indiana from the morning of the **16th** through midday on the **18th**. The first period of generally lighter rainfall fell from early morning to midday on the **16th**, and brought mainly 0.40-0.70" to central and southern counties, with lesser totals to the north. The storm system's passage up the Ohio Valley saw a second, more impressive, period of rainfall from the **17th's** PM hours through daytime on the **18th**, with an additional **1.00-2.00"** over southwest and south-

DECEMBER 2021 PRECIPITATION (con't...)

central counties and mainly 0.40-**1.10"** elsewhere; the greatest report was **1.90"** at Hymera (Sullivan Co.). Three-day precipitation totals for the entire system included **1.50-2.50"** along southern counties, **1.00-1.50"** along the Interstate 70 corridor, and 0.50-1.00" across most northern zones. The top 3-day totals were **2.52"** in Hymera (Sullivan Co.), **2.20"** in Ellettsville (Monroe Co.), **1.90"** at the Southwest Purdue Ag Center northeast of Vincennes (Knox Co.), and **1.58"** in Avon (Hendricks Co.).

Minor flooding returned following the mid-month rains, with the White River flooding at Knox County sites for about 3 days each – starting at Edwardsport early on the **19th** and ending at Hazleton late on the **23rd**. The East Fork of the White River flooded again at Seymour for 2.5 days (late on the **18th** until early on the **21st**). Meanwhile Youngs Creek at Amity (Johnson Co.) flooded for just over 10 hours from late day on the **18th** until very early on the **19th**. All Wabash River points rose to action stage (generally during the **18th-23rd**), with most, at least briefly, nearing flood stage. Action stage was also reached at all other East Fork points below Seymour, for several days (generally the **20th** through the **25th**). The week preceding Christmas was the month's lone dry respite, before persistently damp and often rainy conditions returned for the final week of 2021.

From very late on the **24th** through the afternoon of the **25th**, warm and cold frontal passages, from another storm system tracking from the central Plains to the southern Great Lakes, brought generally 0.50-**1.20"** to the central and northeastern half of the region. Locally heavier observations ranged from **1.21"** at the Reelsville 4 SW COOP station (Putnam Co.), to **2.03"** in Kempton (Tipton Co.) and **1.65"** in Muncie. After light rainfall the night of the **26th-27th**, yet another system crossed Indiana on the **28th** – and actually brought the greatest calendar day rainfall for most sites. Seasonably cool temperatures made for a more typical winter-type rain than the several previous systems, with a broad swath of generally 0.70"-**1.20"** along both sides of the Interstate 70 corridor. Greatest reports ranged from **1.39"** southeast of Shepardsville (Vigo Co.) to **1.79"** south of Noblesville (Hamilton Co.). 5-day rainfall totals encompassing the week's 3 events were mainly **1.00-2.00"** across central and northern counties, with several **2.00-2.50"** reports along far northeastern zones; greatest sums were **2.90"** in Kempton, **2.63"** south of Noblesville, and **2.68"** near Eaton (Delaware Co.).

With the assistance of antecedent soil moisture, a few creeks and many river points then flooded. All Wabash River sites flooded from Lafayette (starting late on the **27th**) down to Riverton (Vigo Co.) (starting on the **29th**), with flooding continuing for all of this long segment when the month ended; the crest was at Covington (Fountain Co.) when 2022 began. Other main stem rivers had later, and more sporadic flooding. The East Fork of the White River flooded at Seymour for 30 hours during the **30th-31st**; the White River began flooding at Elliston (Greene Co.), Edwardsport, and Newberry (Greene Co.) on the **29th**, **30th**, and **31st**, respectively. The Mississinewa River at Ridgeville flooded for about 18 hours on two more occasions, following both of the heavier rain events: **25th-26th** and **28th-29th**, with moderate flood stage reached for about 9 hours amid each period. Youngs Creek at Amity also flooded for 15 hours early on the **29th**.

Winter weather was confined to a few light events. A weak clipper-type disturbance passed to the south of the region late on the **7th**, bringing many flurries through the evening and overnight. A few organized snow showers dropped accumulating snow on far southern counties, with as much as 0.6" reported, east of Mitchell (Lawrence Co.). No other frozen precipitation was reported until the **28th**'s mainly cold rain event, which started as a few flakes or ice pellets for a few locations in and near Indianapolis. Wet snow either mixed with rain or was the main precipitation type over a few far-northern zones, although the warm ground limited accumulations to no more than the 0.3" reported in Burlington (Carroll Co.). Indianapolis' monthly total, a trace, placed the month in the 93rd percentile for least frozen precipitation. This was one of five Decembers since 1889 without measureable snow at Indianapolis, and the first without measurable snow since 1940. Although eight Decembers since totaled only 0.1-0.5 inches, including 0.5" in 2018 and 0.1" in 2014.

December 2021's above normal precipitation was in contrast to November 2021's very dry conditions, as well as other recent Decembers (2016-2020) that were generally near or below normal, (although December 2018 did feature copious precipitation totals across most southern counties). Indianapolis' year 2021 total reached **49.75"**, equating to a **6.12"** surplus for the year. December 2021's frequent, and at times ample, rains led to totals generally 2-3 times those of the dry December 2020, when Indianapolis recorded only 1.63".

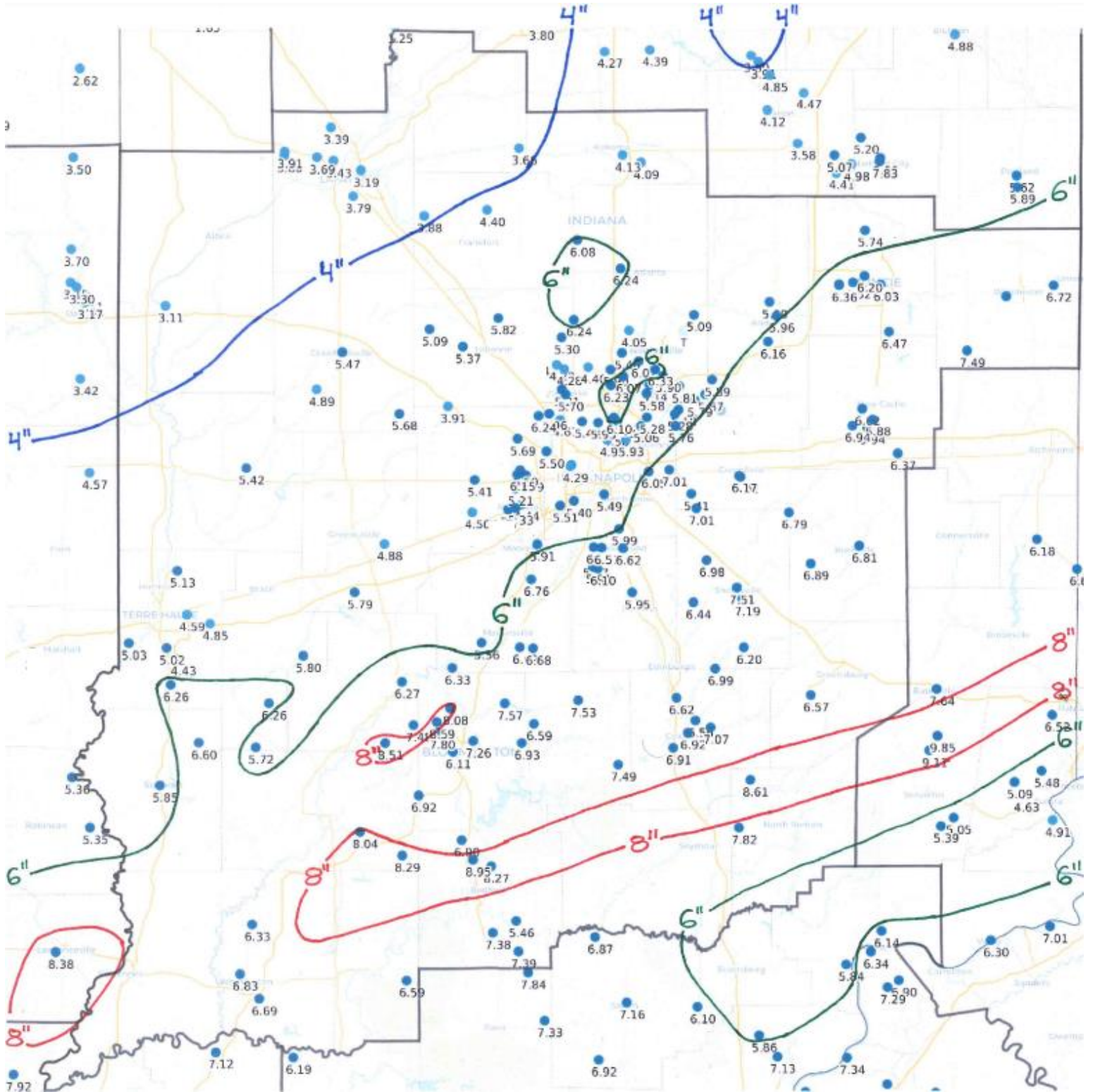
JANUARY 2022 PRECIPITATION

Following the release of the new 30-year (1991-2020) climatological normals, January is now normally the third-driest month across most of central Indiana. Normally around 2.15-3.50" of precipitation falls across the region in January, which includes the typical north (drier) to south (wetter) gradient. However, January 2022's totals were well below these normal values, with only **1.13"** falling at Indianapolis International Airport, **36% of normal**. This was the driest January at Indianapolis since 2001's 0.74"; with all other 1st-order airports having their driest January since 2009 (Lafayette), 2010 (Muncie) or 2016 (rest).

2022 started as a rain event was spreading northward through central Indiana. Widespread light to moderate rain fell through most of the **1st**, which tapered off to scattered light showers of rain and wet snow overnight, before ending early on the **2nd**. Two-day precipitation totals through early on the **2nd** of 0.50-**1.50"** were common, with greatest observations along southern and eastern counties: from **1.72"** at Owensburg (Greene Co.) to **1.30"** at Farmland 5 NNW. While the totals south of Interstate 70 do include rain that fell late on 12/31/2021, 75% or more of these totals occurred within January. The wet snow prior to dawn on the **2nd** brought scattered light coatings, to mainly north-central and northeastern zones, with as much as 0.3" reported at both the Danville 3 SW (Hendricks Co.) COOP station and north of Anderson (Madison Co.).

As a significant snow event crossed Kentucky on the **5th**, the system's northern periphery brought snow showers during the midday and afternoon hours to southern counties, with a few

**December 2021 - Mid January 2022 Total Precipitation, Thru the Morning of 1/17
As Reported By Central Indiana CoCoRaHS Observers**



reports of a thin coating, led by 0.4" at Shoals 8 S. Scattered flurries then crossed northern and central zones that evening as arctic air infiltrated the region, with a couple 0.1" reports in southern Hamilton County. The 8th saw a brief ice-to-rain event, where low-level warming was initially delayed with southerly winds arriving from an upstream Kentucky snowpack. A brief period of afternoon or late day freezing rain occurred along and west of the Interstate 69 corridor, with the greatest impacts across Knox and Vigo Counties. All rain prevailed by late evening. Rainfall totals by early on the 9th epitomized the typical north-south precipitation gradient, ranging from around 0.15" in far northwestern counties to generally **1.00-1.30"** across south-central and southeastern zones, with **1.47"** south of Harrodsburg (Lawrence Co.) being the greatest report.

Following the rains of December 2021, **minor flooding** was prevalent on central Indiana's main stem rivers through at least the first week of January. Flooding ended on the Wabash River from Lafayette to Riverton on the 5th to 8th, respectively, concluding 8-10 days above flood stage. The East Fork of the White River flooded at Seymour from the 1st to very early on the 5th, and then at Rivervale from the 5th to late on the 6th. The White River flooded into the first week of 2022 in Greene and northern Knox/Daviess Counties, with duration in flood ranging from just under 3 days at Newberry to nearly 8 days at Edwardsport. Lower points on the White began flooding from late on the 1st...and following the 8th-9th's rainfall...remained in flood at Petersburg and Hazleton through the 12th and 13th, respectively. The Wabash at Mount Carmel, Illinois, just below the confluence of the White River, also reached minor flood stage from early on the 3rd through the 8th. Non-main stem river points, Youngs Creek at Amity (Franklin Co.) and the Mississinewa River at Ridgeville, also flooded from the 1st through the morning of the 2nd, although moderate flood stage was not reached at Ridgeville.

A slowly developing winter storm curled around the southern edges of the region from late on the 14th through the 16th. When first plunging southward, it brought snow showers early on the 15th, with around 0.5" recorded across several counties west of Interstate 65, including the Lafayette, Terre Haute, Indianapolis and Bloomington areas; the greatest observation was 0.6" near Lake Lemon (Monroe County). Although the outer edge of the departing storm system's snowfall stayed just southeast of central Indiana on the 16th...a weak wave crossing the Mid-West on the 17th brought another round of pre-dawn snow showers to the southwest quadrant of the region; with reports as great as 1.0" in Knox and Daviess Counties.

The remainder of January 2022 found the flow of arctic short waves from the northwest bringing several periods of usually moisture-starved flurries and snow showers to mainly northern parts of the state. These light events did trend, however, towards greater and more expansive snowfall through the last two weeks of the month. The 19th saw isolated flurries; before snow showers on the 20th dropped a thin coating along the I-65 corridor to the north and west of Indianapolis, with greatest observations including 0.7" at Klondike (Tippecanoe Co.) and 0.4" at Danville 3 SW. More organized snow showers then fell both early in the morning on the 23rd ... and throughout the day on the 24th, while including mixed precipitation types south of I-70. 2-day accumulations totaled 1.0-2.0" over north-central and northeast counties, with the greatest report, 2.5", near Kokomo, while 0.8" was recorded as far south as Rushville (Rush Co.). An additional coating of snow came to most locations between snow showers during the

JANUARY 2022 PRECIPITATION (con't...)

day on the **27th**; and a rather steady light to moderate snow from pre-dawn to midday hours on Friday, the **28th**, where 2-day totals ranged from **2.8"** in Greenfield (Hancock Co.) and 2.7" in Carmel (Hamilton Co.) to even 1.7" near Mitchell (Lawrence Co.) and 1.1" at the Elnora COOP station (Daviess Co.).

As the month ended, two-thirds of the official winter season, and the majority of the snow season were completed; yet central Indiana's total snowfall was well below normal. Indianapolis had totaled 1.7", or only 11% of normal through January 31st. This was the first total-to-date to fall short of 5.3" since 1987-88, and actually the third lowest to-date of all 138 years on record. At IND, measurable snow had only fallen on five days, and had yet to exceed 0.5" for any single day. This would place the 2021-2022 season into at least the 5th-latest recorded first 1.0" for the Indianapolis Area, or the 96 percentile. (The latest first-inch on record was March 17th in 1973). While greater seasonal snowfall had been observed across other parts of the region -- about 5.0" near Lafayette and portions of Carroll and Anderson Counties, and even 4.7" in Carmel and 3.5" in Castleton (Marion Co.) -- all of central Indiana was well below normal.

By the **29th** the upper Wabash River had some ice floes but was only frozen solid in places along its banks. Meanwhile the Tippecanoe River was ice free and Wildcat Creek was frozen over.

January 2022's below normal precipitation was in contrast to December 2021's ample rainfall, yet in accordance with the below normal pattern shown in most other Januaries since 2007. January 2022 also continued the more recent downward trend in January precipitation following the wet January 2020 and slightly below normal January 2021.

FEBRUARY 2022 PRECIPITATION

February 2022's liquid precipitation was above normal, and exceedingly so for far southern counties, as the Shoals (Martin Co.) COOP site's **7.00"** made for its 2nd-wettest February on record (since 1909). The month featured an active upper-level pattern, with several troughs plunging through the central United States. This encouraged slowly-passing frontal boundaries and surface weather systems over the Mid-West and/or Ohio Valley, which focused moisture from the Gulf of Mexico into central Indiana. The most notable events were the **2nd-3rd**, **17th**, and **22nd**.

The month began with a multi-day rain to snow event, centered on the **2nd-3rd**, which came in two phases, and featuring a prolonged period of mixed precipitation south of the Interstate 70 corridor. Thankfully the lull in organized precipitation between the system's earlier and later phases helped to limit ice accumulation across much of the region. Storm total precipitation ranged from around 1.50" over northern counties to around 2.50" for southern zones. This included appreciable snow and/or ice accumulation: snowfall totals were as high as **15.5"** in both Camden (Carroll Co.) and West Lafayette, with 12"+ also reported in Clinton, Fountain, Howard, Montgomery, Warren and Tipton counties. Indianapolis officially recorded **7.6"**, with

7.3" falling on the 3rd – a daily record. Indy's storm total was a fair representation of other reports along the I-70 corridor, and a rough median of the strong snowfall gradient from north to south across the region. Southern counties saw noticeably less frozen precipitation as the changeover to all snow was delayed until later on the 3rd. Greatest ice accumulation (as much as ~0.10-0.25"), was found along and south of the US-50 corridor, which contributed to the tight gradient in total snow/sleet here, as Elnora (northern Daviess Co.) reported 5.7", while Shoals 8 S (southern Martin Co.) observed only 2.5".

The 17th's system dropped 1.25-2.00" liquid precipitation on most locations, with greatest storm totals found in west-central counties: 2.52" in Ladoga (Montgomery Co.), and 2.40" near Terre Haute. The 22nd found additional heavy rains, focused on southern counties where several locations approached 1.50", with as much as 1.52" recorded near Mitchell (Lawrence Co.). Soon after, the 24th's system brought yet another 1.00-1.40" to several southern-tier sites, with 1.85" reported east of Columbus (Bartholomew Co.). Despite receiving less-impressive (yet ample) liquid precipitation, northwestern counties saw additional light snows through the month's second half: on the 17th generally 1-3" fell in the Lafayette Area, with a widespread light coating across the rest of the region; the 24th had several reports of 1.0-2.5" from Hamilton County and points north and west. Indianapolis, following 0.3" snow on the 12th-13th, and another 0.3" between the 17th and 24th, finished the month with 8.3" of snowfall. While only 2.3" above normal, it was still the 2nd snowiest February of the last seven years (behind last February's 11.8" snow total).

Widespread minor river flooding occurred through latter parts of February from the combination of frozen ground, melting snow, and the additional precipitation events. Most flooding began with the 17th's rain, with several sites remaining in minor flood through the end of the month. **Moderate flood** stage was also reached at a few sites across the region. The Wabash River entered flood on the 17th from Lafayette down to Riverton, with Vincennes and Mount Carmel also entering flood on the 19th. Lafayette fell out of flood hours before month's end, while flooding continued into March at all points downstream. A dual crest occurred from Lafayette down to Montezuma -- the 18th and then the 23rd -- with the 18th's at a higher stage. Points downriver saw only a single crest, flowing from Terre Haute on the 24th to Mount Carmel on the 28th. Lafayette had crested in **moderate flood** for over 2 days from late on the 17th to pre-dawn on the 20th, while Mount Carmel was in **moderate flood** from the morning of the 25th through the end of the month, due in part to the additional discharge from both the White River and East Fork of the White. Most White River sites flooded for ~1-3 days between the 17th and the evening of the 20th; and Spencer flooded twice: on the 18th-22nd and again on the 23rd-26th; while prolonged flooding occurred from Elliston to points downriver, with ~10 days of minor flooding ending at Elliston and Newberry late on the 27th, and flooding continuing into March along Knox County. The crest flowed from Muncie on the 18th to Hazleton on the 26th; with a secondary crest observed at both Spencer (night of the 23rd) and Newberry (on the 25th). **Moderate flooding** was also reached at Petersburg for almost 2 days from the 25th through early on the 27th. Most of the East Fork of the White River flooded, with a lull in the minor flooding observed prior to the 22nd's event for portions from Shelby to Bartholomew County. These upriver sites flooded for ~1-3 days between pre-dawn on the 18th and late on the 21st ... before another ~1-5 days of minor flooding occurred within late on the 22nd and the evening of

the 27th. Flooding was meanwhile continuous downriver from Rivervale to Williams, with both sites still in flood at month's end. Shoals was mainly in flood from midday on the 23rd into March. No **moderate flooding** was observed on the East Fork, although Seymour crested inches shy of this stage on both the 18th and 25th. Eleven of the region's 19 site specific sites also reached flood stage between the evening of the 16th and midday on the 19th, with the Mississinewa River at Ridgeville cresting in **moderate flood** for 24 hours over the 17th-18th. A second, less significant period of minor flooding occurred on the 22nd-23rd at both Ridgeville and Youngs Creek at Amity.

February 2022's above normal precipitation was in contrast to both January 2022's and February 2021's below normal totals.

Winter 2021-22 Precipitation Data for Central Indiana Sites

Site	Winter 21-22 Precipitation	Winter Season Normal Precip	Diff. From Normal	Greatest Daily Precipitation
Indianapolis Int'l Airport	9.94	8.47	+1.47	1.64 on 2/17
Lafayette	6.82	6.26	+0.56	1.22 on 2/17
Bloomington	11.96	9.34	+2.62	1.62 on 2/17
Muncie (*)	5.93INC	7.36	M	M
Terre Haute	9.50	7.11	+2.39	2.20 on 2/17
Shelbyville	11.40	8.36	+3.04	1.39 on 2/17
Indianapolis Eagle Creek AP (*)	8.18INC	7.33	M	1.71 on 2/17

* – Precip data is missing at **Indianapolis Eagle Creek AP** on 1/8, 1/15, 1/23-28, 2/11, 2/22–2/24; and incomplete at **Muncie**

Severe Weather

DECEMBER 2021 was decidedly active for severe weather, with the 10th-11th event reflecting the strong low-level winds that overspread the region when potent storm systems deepened while passing to the north and west of the region.

A line of marginally severe thunderstorms dropped quarter-sized (1.00") hail north of North Vernon (Jennings Co.) at midnight on the 6th.

Anomalously strong low-level winds, and the resulting vertical wind shear and unseasonably humid conditions, on the evening of the 10th produced numerous thunderstorms with damaging winds. Severe reports were widespread north of Interstate 70 and scattered to the south, including many downed trees and power lines. The worst damage included grain bins blown over in Kingman (southern Fountain Co.) and trees blown into houses in both Monroe County and Selma (Delaware Co.). The strongest measured wind gusts were 65 mph in northwestern Marion County, 61 mph south of Clarksville (Hamilton Co.), and 59 mph at several 1st-order airports (see below). Isolated sub-severe hail was also observed, with penny-sized (0.75") hailstones west of Carmel (Hamilton Co.). Highest rainfall amounts, around 1.50" led to minor areal flooding in New Ross (Montgomery Co.) and localized urban flooding in Albany (Delaware Co.).

JANUARY 2022's generally light precipitation events were devoid of severe weather – making it the fourth January in the last decade with this distinction (following 2015, 2016, and 2021).

FEBRUARY 2022 saw no severe weather across central Indiana. Scattered thunderstorms early on the morning of the 22nd did produce small hail in spots.

For info on severe weather in other areas during the winter season, visit the Storm Prediction Center "Severe Weather Event Summaries" website at spc.noaa.gov/climo/online

Miscellaneous Weather

DECEMBER 2021's maximum wind gust was brought to most 1st-order airports by the 11th's thunderstorms (from the west, unless noted) to most airports, including 55 mph at Indianapolis, **59 mph** at both Bloomington (from the southwest) and Muncie, and 56 mph at Lafayette. Terre Haute's peak gust, 51 mph from the south, occurred on the 16th; Indianapolis and Bloomington also recorded gusts of 51 and 50 mph, respectively, on this date.

Fog was once again common across central Indiana throughout the month, with 1st-order airport frequency ranging from 15 days at Muncie to 21 days at Bloomington. All seven airports

reported fog on the **16th - 18th** , and all sites observed fog on essentially every day from Christmas to New Year's Eve. Dense fog frequency ranged from 2 days at Lafayette to 5 days at Muncie, with all non-Marion County sites recording FG+ on the **10th**, as well as most sites on the **28th and 31st**. Fog on the night of the **9th-10th** was noted as dense by several COOP observers, from Kokomo 3 WSW (Howard Co.) to Perrysville 4 WNW (Vermillion Co.) and Lebanon 6 W (Boone Co.).

Thunder was reported on 3 to 5 days, including all 1st-order airports on the **11th** and most locations on the **6th, 10th, and 27th**.

Daily observations from COOP observers included several insightful remarks. On the **4th**, Pence 1 SW (Warren Co.) noted freezing fog. On the **20th-22nd** Spencer (Owen Co.) reported frost on three consecutive mornings. At Vincennes 4 E (Knox Co.), the **20th** brought frost so heavy it looked like snow in the moonlight.

JANUARY 2022's maximum daily wind gust was caused by the gradient from a strengthening surface cyclone crossing the Great Lakes on the **5th** ... at all 1st-order airports, from mainly southerly to westerly directions, including 43 mph at Indianapolis, Muncie and Terre Haute ... and 47 mph at Lafayette. While no 1st-order site observed a daily peak gust in excess of 40 mph thereafter, 15 of the following 26 days did record gusts to 25-40 mph at Indianapolis, surrounding the consistent flow of arctic frontal passages.

Fog was somewhat common across central Indiana throughout the month, with frequency at 1st-order airports ranging from 8 days at Muncie to 15 days at Lafayette, while Indianapolis reported fog on 12 days. Fog occurred for essentially all sites on the **1st, 2nd, 4th, 8th, 9th, 13th, 14th, 28th, and 31st**. The **1st** found "heavy morning fog" at Kokomo 3 WSW; while ten COOP sites reported fog on the **14th**, albeit not dense.

Dense fog was reported on the **1st** at Muncie, the **2nd** at Lafayette, and the **14th** at Bloomington. No thunder was reported from any of the seven 1st-order airports.

Several additional insightful remarks from COOP observers helped described this cold start to 2022, including the arctic air's occasional ample sunshine. On the **11th** Castleton 2 S noted "[month's] highest barometer 30.57", sunny", while Lebanon 6 W reported "milder, sunny, windy day; on the **16th and 30th** Castleton 2 S remarked "lots of sunshine"; with notes then from both sites across the **25th and 26th** regarding the continued cold, yet sunny conditions. Perrysville 4 WNW (Vermillion Co.) noted the sunny or mostly sunny skies for 16 of the 31 days.

FEBRUARY 2022's maximum wind gust at the Indianapolis International Airport was 46 mph from the south on the **16th and 17th** and from the west-northwest on the **19th**. Fog or haze was reported at Indianapolis on 12 days during the month. Freezing rain or drizzle was reported on 4 days, with ice pellets occurring on the **2nd and 17th**. Thunder was reported on the early morning of the **22nd**. Blowing snow occurred in the wake of the early February snowstorm on the **3rd and 4th**.

Indianapolis Winter 2021-2022 Monthly Data

INDIANAPOLIS DECEMBER 2021 SUMMARY

	Average Temp	Precipitation	Highs $\leq 32^{\circ}$	Lows $< 20^{\circ}$
December 2021	42.1	4.23	1	1
Normal December	33.3	2.92	7	8
Diff from Normal	+8.8	+1.31	-6	-7

December 2021 All-Time Ranks...

Precipitation: **34th Wettest**

Temperature: **5th Warmest**

Snowfall: **2nd Least Snowiest** (Tied)

INDIANAPOLIS JANUARY 2022 SUMMARY

	Average Temp	Precipitation	Highs $\leq 32^{\circ}$	Lows $< 20^{\circ}$
January 2022	25.5	1.13	12	19
Normal January	28.5	3.12	12	13
Diff from Normal	-3.0	-1.99	0	+6

January 2022 All-Time Ranks...

Precipitation: **17th Driest** (Tied)

Temperature: **55th Coldest**

Snowfall: **19th Least Snowiest** (Tied)

INDIANAPOLIS FEBRUARY 2022 SUMMARY

	Average Temp	Precipitation	Highs $\leq 32^{\circ}$	Lows $< 20^{\circ}$
February 2022	30.8	4.58	10	13
Normal February	32.5	2.43	7	8
Diff from Normal	-1.7	+2.15	+3	+5

February 2022 All-Time Ranks...

Precipitation: **17th Wettest** (Tied)

Temperature: **70th Coolest**

Snowfall: **29th Snowiest**

INDIANAPOLIS WINTER 2021-2022 SUMMARY

	Average Temp	Precipitation	Highs $\leq 32^{\circ}$	Lows $< 20^{\circ}$
WINTER 2021-2022	32.8	9.94	23	33
Normal Winter	31.5	8.47	26	29
Diff from Normal	+1.3	+1.47	-3	+4

Winter 2021-2022 All-Time Ranks...

Precipitation: **41st Wettest**

Temperature: **36th Warmest** (Tied)

Snowfall: **30th Least Snowiest**

Spring 2022 Outlook for Central Indiana

The official outlook for the 2022 spring season (March-May) from the Climate Prediction Center, indicates greater chances for both above normal temperatures and above normal precipitation across central Indiana.

At Indianapolis, the normal spring temperature is **53.2°F** and the normal spring precipitation is **12.78"**.

*Data prepared by the NWS Indianapolis Weather Forecast Office's Indiana State Climate Team
Questions should be referred to w-ind.webmaster@noaa.gov*