

Central Indiana

October 2023 Climate Summary

42nd Warmest October on record at Indianapolis (Tied)

75th Driest (78th Wettest) October on record at Indianapolis

Temperatures

October 2023 continued September's ~2.0-degree above normal trend for the first such tandem so warm relative to normal since the anomalously mild January-February 2023. Outside of an overall near-normal period during the **11th-23rd** it was a month of stronger extremes, with 11 other days at least 10 degrees above or below normal at Indianapolis. While several of these warmer/cooler trends lasted generally ~4 days each (warmer **1st-4th**, **24th-27th**; cooler **7th-11th**, **29th-31st**), warm anomalies were overall twice as deviant from normal than coolest days, guiding the month's overall trend. Widespread **moderate drought** conditions continuing through most of the month promoted eight days with diurnal ranges of ~30 degrees or greater for most locations, mainly during the 1st and 3rd week's warmer periods.

October started with unseasonable warmth continuing through the **4th**, while moderating mornings lasted into the **5th**; despite low to moderate humidity, mainly light southeasterly winds and plentiful sunshine promoted impressive diurnal spreads of ~30-35 degrees across much of the region, between lows trending from the 50s to low 60s and highs in the mid to upper 80s. Maximums, amid overall subtle variation, were generally highest on the **2nd** and **3rd**, with readings led on the **1st** by **87F** at Lafayette and the Perrysville 4 WNW (Vermillion Co.) and Vincennes 5 NE (Knox Co.) COOP sites, on the **2nd** by **90F** at the Tipton 5 SW (Tipton Co.) COOP station, on the **3rd** by **90F** at the three aforementioned COOP sites as well as the Shoals 8 S (Martin Co.) COOP station, and on the **4th** by **89F** at Vincennes 5 NE; Indianapolis meanwhile peaked ~5 degrees shy of record highs, with 84F, 85F, 86F, and 85F, respectively. Highest daily minimums were mainly observed on the **4th**, with readings as high as **65F** at the Vincennes 5 NE, Lafayette 8 S (Tippecanoe Co.) and Shakamak State Park (Sullivan Co.) COOP sites, while Indianapolis dropped to 63F; although the **5th** brought a slightly milder morning to most locations before the calendar day's low late in the evening. Terre Haute observed the greatest diurnal variations through the **1st-3rd**: **+35**, **+36**, and **+37** degrees, respectively, while Muncie climbed **35** degrees on the **2nd**.

A cold front crossed Indiana late on the **5th** ahead of much colder Canadian high pressure that plunged into the central United States on the **6th**, before bringing quite cool conditions to the

region during the 7th-10th and into the morning of the 11th. While several northern-tier locations had measured their first heating degree-days (daily average temperature under 65F) of the season through the final days of September, Indianapolis followed suit on the 6th. The greatest ~50-hour downward temperature trends were from the afternoon of the 4th to very early on the 7th: dropping 43 degrees at Muncie and 42 degrees at the Rockville (Parke Co.) COOP station. Highs in the upper 50s to mid-60s then prevailed while mornings brought the first 30s and areas of frost across the region; daytime readings were lowest on the 8th with maximum temperatures as low as 53F at both the Frankfort Disposal (Clinton Co.) and Carmel 3 E (Hamilton Co.) COOP stations, while Indianapolis, Shelbyville and Eagle Creek Airpark recorded their coldest daytime of the month's first four weeks, only reaching 55F, 57F and 54F, respectively; coldest mornings were generally on the 10th and (especially the) 11th as isolated first-freezing readings occurred at Lafayette (31F both mornings), with 33F also reported on the 10th at Terre Haute and the Rockville and North Vernon 2 ESE (Jennings Co.) COOP stations, before Rockville followed with 32F on the 11th when the Perrysville 4 WNW and New Castle 3 SW (Henry Co.) COOP sites dropped to 33F; Indianapolis meanwhile observed 38F and 39F, respectively.

The synoptic set-up between a deep cut-off trough near the Ontario-Quebec border and surface high pressure over both the Upper Midwest and Gulf of Mexico coast promoted low relative humidity and large diurnal variations on the 10th-12th that moderated Indiana back to near-normal readings. On the 10th, Lafayette and Terre Haute both led the way, climbing +33 degrees into the mid-60s; the 11th's increase was most pronounced with the same two airports boosted +40 degrees, with several other noteworthy spreads -- +38 at Rockville, +36 at Bloomington, and +35 at the Washington 1 W (Davies Co.) COOP station, with most sites reaching the low to mid-70s; warmth then plateaued in mainly the upper 70s to low 80s on the 12th following diurnal variations as great as +35 at Bloomington and +34 at Terre Haute; Indianapolis saw respective daily spreads of +26, +31, and +27, resulting in corresponding highs of 64F, 70F, and 78F. The region's highest temperature on the 11th was 76F at Vincennes 5 NE, before the 12th was led by 82F at Perrysville 4 WNW and Shoals 8 S, while 81F was observed at several far southern sites and the Columbus (Bartholomew Co.) COOP station.

A storm system crossed the Midwest on the night of the 13th, before northerly winds around approaching high pressure brought increasingly cooler days over the 14th-15th, with 1-day downward trends in temperatures of -18 degrees at Muncie and -17 degrees at North Vernon 2 ESE. Overall seasonably cool temperatures were the rule during the 14th-23rd under a combination of passing upper troughs and Canadian surface high pressure. At times cooler weather was led on the 15th-16th by daytimes only reaching the 50s, and over the 21st-23rd by mornings in mainly the 30s to low 40s. The lowest maximum temperatures of October's first four weeks were observed on the 15th at Farmland 5 NNW (53F) and Bloomington and Muncie (both 57F), and on the 16th at several northern and east-central locations who all reported 54F, as well as Lafayette (55F) and Terre Haute (57F). The rainy 19th featured the lowest daily temperature range of the month, with most 1st-order airports only changing 5 degrees, including Indianapolis' spread from 52F to 57F. Coldest mornings were then led by New Castle 3 SW, from 34F on both the 21st and 22nd, to the station's first freeze (30F) on the 23rd; with other first freezes on the 23rd at the Martinsville 2 SW (Morgan Co.) COOP station (31F) and

Muncie and Columbus (both 32F). Greater diurnal spreads also returned for the 21st ... 23rd ... and 24th, led by +37 at Terre Haute ... +38 at Terre Haute, Shelbyville and Washington 1 W ... and +34 at Bloomington and Shelbyville, respectively; Indianapolis' greatest daily increase of the month was +33 degrees on the 21st, from 40F to 73F. The 24th's strong moderation was a pattern transition, with much of the region boosted from the upper 40s to upper 70s, including 82F at both Muncie and Tipton 5 SW.

The 24th-27th brought anomalous warmth led by very mild mornings that reached record levels on the 27th. After the very warm 24th, high temperatures retreated slightly through the 70s, yet rebounded again for the 27th with 81F at Shoals 8 S, 80F at several southwestern sites, and 77F at Indianapolis. Morning lows were the bigger story amid increasing humidity, with low 60s (more indicative of early September) common on the 25th and 26th, and readings as high as 64F on the 25th at both Muncie and the Farmersburg TV-2 (Sullivan Co.) COOP station, while Indianapolis only dropped to 61F. The 27th's morning minimums in the low to mid-60s were as high as 66F at Muncie and 65F at Eagle Creek Airpark, Shelbyville, Rockville, and Shoals 8 S; Indianapolis' low of 64F, a record (old 62F, 1991) was the only minimum in the 153-year record between October 26 and March 22 to surpass 63F. A strong, yet somewhat prolonged, transition to near-record cold began with a cold frontal passage during the 27th overnight, with calendar-day minimums occurring late in the evening across western counties, to as low as 51F at Lafayette.

Late October's extremes shifted to anomalous cold through the month's final days as the eastern extents of a broad polar air mass steadily built into Indiana over the 28th-30th, before a small yet potent wave crossed the northern Midwest on the 31st ahead of a reinforcement of near-record cold. Highs trended from the 60s to near 70F during the transitional 28th to mainly low 50s on the 29th, and a decreasing trend through the 40s over the 30th-31st; greatest drops in consecutive highs were across the 28th-29th into the 50s, and as great as -24 and -23 degrees at Columbus and Rushville, respectively, while Indianapolis observed a corresponding -18 degree trend. October's coldest daytimes then closed out the month, with the 30th only bringing 44F to several stations between Lafayette and Indianapolis, including the Jamestown 2 E (Boone Co.) COOP station, before maximums on the 31st as low as 37F at both the Crawfordsville 6 SE (Montgomery Co.) COOP station and Lafayette 8 S, while Indianapolis reached a respective 46F and 41F. Meanwhile, daily minimum readings displayed two distinct ~15 degree downward steps: across the 27th-28th with the initial frontal zone (with a change as great as -26 degrees at Rockville down to a more seasonable 39F), and then through the 29th-30th as the center of the air mass built into the region (with a change as great as -20 degrees at Bloomington, down to 28F). First freezing temperatures had been widely scattered across central Indiana, including isolated northwest locations on the 10th and/or 11th, and a few south-central and northeastern stations on the 23rd; a widespread freeze, however, hit the region on the night of the 30th, with observations dropping to 28-33F before the end of the calendar day, (giving most locations their first freeze), before all reporting stations recorded a hard freeze by Halloween morning, led by 22F at Bloomington, New Castle 3 SW and Washington 1 W, while Indianapolis observed 25F – one degree shy of the record low. Indianapolis' normal first freeze and first hard freeze dates are 10/21 and 11/5, respectively, which put 2023's respective occurrences 9 days later and 5 days earlier than normal.

October 2023's temperatures were influenced by a combination of various progressive troughs and several broad, slower-passing ridges, with a resultant mix of both near-normal and unseasonable readings. Anomalous warmth through both the month's start and much of the 4th week drove the above-normal trend, which was partially countered by a potent blast of near-record cold to end the month. Widespread **moderate drought** through most of the month guided more than a week's worth of ~30+ degree diurnal spreads that were focused within the warmest periods; although Indianapolis' milder mornings set-up mainly ~25-30 degree differences on these days. The month's extremes ranged from **90F** on the **3rd** at several sites and **22F** at Bloomington and Washington 1 W on the **31st**. Most locations dropped to/below **32F** on two days (**30th**, **31st**), with a third such morning observed at a few of the typically-colder locales on the **23rd**; Lafayette tallied 4 days that fell below freezing per this isolated anomaly on the **10th** and **11th**, with Eagle Creek Airpark and Shelbyville only freezing on the **31st**. October normally sees 2 days fall below freezing at Marion County sites and 3-4 days elsewhere; October 2023's totals were overall about 1 day below normal, yet at normal for Indianapolis. Indianapolis' average temperature through 2023's first 10 months (58.8F) is the 4th highest since 1998 and 7th **highest all-time**, placing it at the **95th percentile**; however, if omitting this year's anomalously mild January-February, 2023's following eight months are actually the **2nd coolest since 2015**, while at the (all-time) 79th percentile.

Site	October 2023 Avg Temp	October 2023 Dep from Nml	Highest Temperature	Lowest Temperature
Indianapolis Int'l Airport	57.5	+2.0	86 on 3 rd	25 on 31 st
Lafayette	55.7	+2.0	88 on 2 nd , 3 rd	23 on 31 st
Muncie	57.7	+1.9	88 on 3 rd , 4 th	27 on 31 st
Terre Haute	57.3	+2.4	89 on 3 rd	24 on 31 st
Bloomington	57.3	+2.0	87 on 4 th	22 on 31 st
Shelbyville	58.7	+2.6	90 on 3 rd	26 on 31 st
Eagle Creek Airpark	57.5	+2.0	86 on 3 rd	26 on 31 st

At Indianapolis, October 2023's daily average temperatures were above normal on 16 days, below normal on 13 days and at normal on 2 days. October 2023 tied for the Indianapolis Area's **42rd warmest** October since weather records began in 1871, placing it in the **73rd percentile**.

Precipitation

October 2023's overall slightly below to near normal precipitation brought a partial improvement to moderate drought conditions while Indianapolis continued to sport the driest rolling-12 month period in nearly 30 years. October normals are generally 2.90-3.60" across the typical north to south gradient, although 2023's distribution ranged over 1.90-5.20" in an opposite (wetter to the north) direction, with most locations observing the lower amounts of this range. Overall sub-normal precipitation totals were driven by the lack of downpours from

strong or severe thunderstorms, with instead a greater than normal number of days with very light rainfall and any few days with heavier amounts contained to northern counties.

The overall dry pattern seen since mid-August continued into October, albeit on the heels of a couple days of scattered showers and thunderstorms near the end of September that had totaled 0.50-2.00" over most of the region. The October 3rd Drought Monitor update (released October 5th) showed overall subtle changes, with only an increase in intensity from **Abnormally Dry (D0)** to **Moderate Drought (D1)** over a patch through most of Putnam, Owen and Monroe Counties, as well as much of Sullivan and Warren Counties; this was the first time the entire 39-county region was in **D1** (or worse) **since 8/7/2012** ... although *nearly* all of central Indiana was in at least **D1** at times during Nov-Dec 2022 when the region was experiencing an overall worse drought.

Showers returned on the 5th, increasing in coverage through morning hours ahead of a slowly approaching cold front, with much-needed widespread afternoon rains lingering into the evening; totals of 0.40-**1.00"** were common, while lesser amounts fell over portions of the Wabash Valley and far southern counties, with isolated **1.00"+** reported over northeastern zones, including **1.14"** southwest of McCordsville (Marion Co.), and **1.05"** in Kokomo, Anderson (Madison Co.) and northern Delaware County. The October 10th Drought Monitor update exhibited no changes with essentially all of central Indiana maintaining **D1** intensity.

The evening of the 11th found a few thunderstorms tracking east between the Bloomington and Indianapolis areas before late night showers crossed far north-central zones; radar estimates indicated locally **1.00"+** fell over far northeastern Monroe County and far northern Brown County. The 13th's approaching storm system and cold front brought evening rain ahead of showers that continued overnight, which altogether produced the region's best 24-hour rainfall in two months; moderate to heavy rainfall north of I-70 was led by a local bulls eye over southern Tipton County where **1.82"** was measured at Tipton 5 SW, meanwhile the fall's drier trend continued over the region's south-southeastern half where a modest 0.10-0.40" was common; other noteworthy observations included **1.46"** at the Pence 1 SW (Warren Co.) COOP site and up to **1.40"** reported in both Boone and Clinton Counties, while Indianapolis recorded a modest 0.42". Two further rounds of mainly light showers crossed the region during the 14th daytime and the 15th's evening and overnight, with greatest 1-day report the 0.21" through the morning of the 16th in Kilmore (Clinton Co.), while 2-day totals were as great as 0.27" southwest of Greensburg (Decatur Co.).

The October 17th Drought Monitor update showed improvements in drought intensity across small portions of central Indiana's northern tier with a downgrade from **D1** to **D0** seen over essentially all of Clinton, Howard and Tipton Counties and portions of Carroll and Warren Counties; while **D1** continued over the remaining ~90% of the region. The 19th-20th then featured a more prolonged rain-to-scattered showers episode that lasted almost 36 hours within the two calendar days: steadier rain on the 19th was again greatest north/west of Indianapolis, with an isolated late-day thunderstorm along the Howard-Tipton County line contributing to estimated local totals in excess of **1.00"**, the 20th's couple rounds of slowly progressing showers were then focused along the northern tier, with up to 0.25-0.60" in northeastern counties; the region's overall totals were greatest (0.77-0.80") near both Young

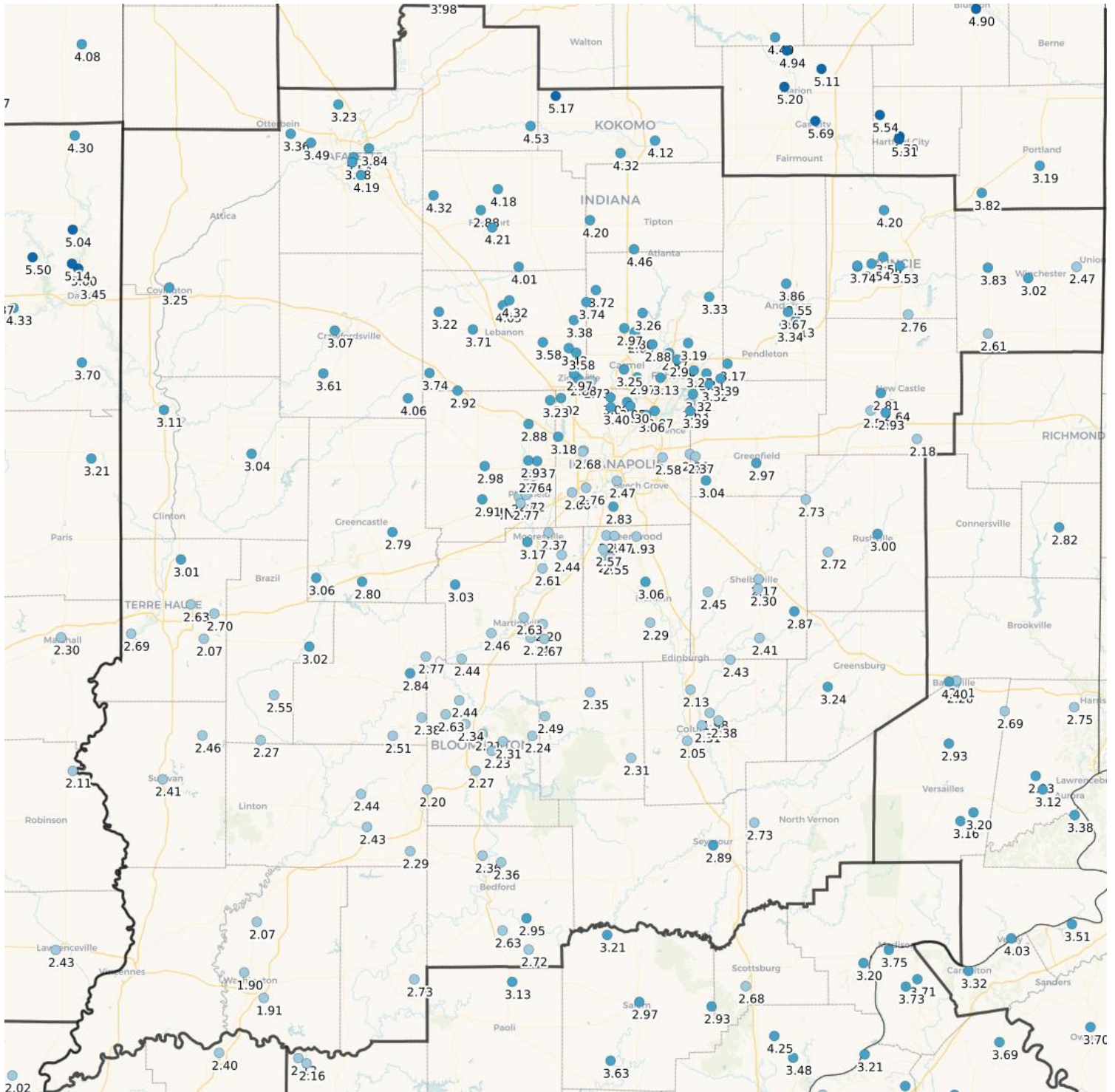
America, Farmland (Randolph Co.) and in Homer (Rush Co.), while most central and southern counties picked up 0.30-0.50".

The October 24th Drought Monitor update showed drought intensity removed from much of northern Indiana, although the only noteworthy local improvement was **D0** ending over most of Howard County, while the widespread combination of **D0** (and more predominant) **D1** still prevailing across central Indiana. Occasional scattered showers crossed the region through mainly morning hours on the 25th, the 26th's afternoon, and across southern counties on the morning of the 27th, with resultant light rainfall again greatest over northwest counties; with two COOP sites leading 36-hour totals: 0.72" at Pence 1 SW and 0.65" at Perrysville 4 WNW, while 0.40" was observed southwest of Greensburg.

The wet trend expanded through October's final days amid a slowly passing and lingering frontal boundary that promoted three more periods of rain. Showers and isolated thunderstorms during the 27th overnight brought locally moderate rainfall in narrow bands from the Upper Wabash Valley to the Interstate 70 corridor, before lighter showers lingered through the morning of the 28th over the region's southeastern half; 18-hour rainfall reported as great as 0.70-0.76" on the south side of Lafayette, east of Ladoga (Montgomery Co.) and in Southport (Marion Co.). The next and main batch of rain brought light rainfall along the US-50 corridor on the afternoon of the 28th before expanding over all counties through the night, leaving broader bands of moderate rainfall north/west of Indianapolis, along a line from Owen to Rush County, and south of US-50; the top reports were 0.90" in Mulberry (Clinton Co.), 0.97" east of Martinsville (Morgan Co.), and **1.06"** in Buddha (Lawrence Co.), with many observations around 0.50" from places in between. The final round fell mainly during the 29th's PM hours, with showers lingering early on the 30th; 0.25-0.50" amounts were common, with up to 0.63" at New Castle 3 SW. 2.5-day totals were 0.80-1.40" for a solid majority of the region with greatest totals including **1.80"** near Young America, up to **1.76"** in Lafayette, **~1.65"** in Buddha and **1.53"** in Southport.

The season's first flakes graced several counties on the morning of the 30th when flurries reached the ground within a triangle between Terre Haute, Bloomington and Vincennes, as well as from Lebanon to Indianapolis; no measurable snowfall was reported. The October 31st Drought Monitor update showed substantial improvements in drought intensity; **D1** finally retreated to south of a Rockville-Shelbyville-Greensburg line, and out of most of the Indianapolis Metro, with all remaining portions of central and northern zones improved by one intensity level (mostly to **D0**, except for several north-central counties that improved to no drought intensity. October 31st amid the arrival of much colder air from robust breezes, saw widespread flakes, scattered flurries and a few stronger snow showers: midday northern tier flurries expanded to north of I-74 later in the day, before the greatest expanse of convective flurries through the evening, which saw visibility drop to 2.5 miles in a snow shower that passed between Lafayette, Frankfort and Noblesville, to even a couple rounds of flurries over the Bloomington and Columbus areas, and flakes observed as far southwest as the Elnora (Davies Co.) COOP station; the only measurable snow reports were **0.2"** in Anderson (Madison Co.), and **0.1"** in both Burlington (Carroll Co.) and Frankfort (Clinton Co.). Indianapolis' normal first trace of snow is November 9th, this year's occurrence was 10 days earlier.

October 2023 Total Precipitation, From Early 10/1/2023 Through Early 11/1/2023 As Reported by Central Indiana CoCoRaHS Observers



For the period 700 AM EDT 10/1/2023 -to- 700 AM EDT 11/1/2023, data is unofficial**

Monthly totals were both near to above normal (north) and below normal (south), with extremes ranging from just **under 2.00"** in much of Daviess County to **~4.00-5.20"** over north-central zones between Lafayette and Muncie.

October's overall slightly below normal precipitation ranged from adequate to ample rains across central Indiana's northern half (totaling 2.80–5.20") to generally more lackluster episodes for most zones south of Interstate 70 (1.90–3.20"); with extremes ranging from **1.90"** in Washington (Daviess Co.) to **5.17"** near Young America. About ~80% of monthly totals came from three periods: moderate rainfalls through both the **5th** and **13-16th**, and a widespread ~**1.00"** or so during the **28-29th**; with the remaining ~20%'s vast majority falling amid lighter rains over the **19-20th**. The frequency of days with 0.10-0.99" was overall near normal, although days with less than 0.10" were more common than usual, while 1.00"+ reports were mainly limited to many of the observation sites north of the I-70 corridor. Muncie measured 0.70"+ on 3 calendar days – **5th**, **13th**, **29th**, but more notably received nearly 1.00" over two 2-day tandems (1.10" on **13th-14th**, 0.99" on **28th-29th**). While the region recorded less precipitation in October 2022, the September-October 2023 tandem continued the overall dry trend for these two months established in 2022. Indianapolis' precipitation over the last 12 months (now November 2022–October 2023) increased over an inch to 36.24", which was still a 7.39" deficit (or only 83% of normal), and the lowest for this 12-month period since 2009-10. The 2023 year-to-date total at Indianapolis (following a very wet March and active summer) rose to **32.19"** (**-5.07"** from normal). Drought Monitor levels that had started as widespread **D1** steadily improved through the mid to late month to ultimately a **D0/D1** split outside of drought-free north-central counties. No river/creek flooding was observed during the month.

Site	October 2023 Precipitation	October 2023 Dep from Nml	Wettest Day	Longest Dry Stretch
Indianapolis Intl	2.47	-0.75	0.78 on 5 th	4 days, 1 st -4 th , 9-12 th , 21 st -24 th
Lafayette	3.20	+0.29	0.67 on 29 th	4 days, 1 st -4 th , 7-10 th
Muncie	3.47	+0.51	0.84 on 13 th	4 days, 1 st -4 th
Terre Haute	2.36	-1.08	0.59 on 13 th	4 days, 1 st -4 th , 21 st -24 th
Bloomington	2.01	-1.69	0.63 on 29 th	4 days, 1 st -4 th , 9-12 th , 21 st -24 th
Shelbyville	2.58	-0.62	0.75 on 29 th	4 days, 1 st -4 th , 21 st -24 th
Eagle Creek Arpk	2.91	-0.34	0.83 on 5 th	4 days, 1 st -4 th , 21 st -24 th

October 2023 was the 75th driest (78th wettest) October in the Indianapolis Area since weather records began in 1871, placing it in the 49th percentile for precipitation of all recorded Octobers. This was a trend towards normalcy following the very dry months September 2023 and October 2022.

Severe Weather

No severe weather nor flooding occurred within central Indiana during November 2023.

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

Miscellaneous – Winds, Fog, Thunder & More

Strong or severe gusts were not recorded at any of the seven 1st-order airports in October, although quiescent days were also infrequent. Five airports observed their greatest peak wind gust on the **6th**, ranging from 40 mph at Indianapolis to 35 mph at both Shelbyville and Terre Haute; next in line were the **21st**'s greatest gusts at Lafayette (37 mph) and Bloomington (35 mph), and the **31st** when Eagle Creek Airpark matched its 36 mph peak from the **1st**, and all sites gusted to at least 32 mph. Several other breezier days, where most airports gusted as high as 27-32 mph, included the **7th, 10th, 14th, 18th, 20th, 26th, and 27th**. Several quiescent days also occurred, especially through very early October; as airports gusted no higher than 17 mph on both the **2nd** and **17th**, with most gusting under 20 mph on the **1st, 3rd, 12th, 23rd, and 29th**.

Fog was seasonably frequent and most common through both the mid-month and October's final week; 1st-order sites ranged from 10 days at Indianapolis to 20 days at Lafayette, although the majority of locations observed fog on 12-14 days. Fog was recorded at all sites on the **5th, 14th, 19th, 20th, 28th, and 29th**; and at most airports on the **1st, 2nd, 13th, 15th, 16th, 18th, and 30th**. Fog was reported on 8 consecutive days at Bloomington (**13th-20th**) and on 7 days in a row at Lafayette (**25th-31st**), and ironically at Eagle Creek Airpark on the **9th** and **11th** when observed at no other 1st-order station. The rather dry conditions promoted less dense fog, as it was limited to Terre Haute and Bloomington on both the **1st** and **2nd**, Bloomington again on the **6th** and **18th** **29th**, and Lafayette on the **20th-21st**.

Thunder was sparse throughout October, limited to only Indianapolis, Bloomington and Eagle Creek Airpark on the **11th**, Lafayette on the **19th** and **28th**, and also Shelbyville on the **28th**.

Humidity extremes were modest with no 1st-order site observing a relative humidity lower than the 26% seen at Lafayette and Muncie on the **10th**. Moderate humidity did return to central Indiana on the **5th, 13-14th, and 27th**, with dewpoints at Terre Haute briefly as high as 65F on the **5th** and 67F on the **27th**, with Bloomington's dewpoint also peaking at 65F on the **27th**. Any fires from farm equipment sparking on rocks, etc. were brief and small with no wildfires observed.

November 2023 Outlook

The official outlook for November 2023 from the Climate Prediction Center indicates equal chances in above, below, or near normal temperatures across central Indiana. The normal October temperature at Indianapolis is **43.3** degrees.

The outlook also indicates chances leaning to below normal precipitation for the region. The normal November precipitation at Indianapolis is **3.45"**.

Data prepared by the Indianapolis Weather Forecast Office's State Climate Team

Questions should be referred to nws.indianapolis@noaa.gov