

Central Indiana October 2021 Climate Summary

11th Warmest on record at Indianapolis

4th Wettest on record at Indianapolis

Temperatures

October 2021's unseasonable warmth averaged about 6 to 7 degrees above normal across central Indiana, which included both anomalously warm conditions through the **14th** and overall slightly above normal weather for the remainder of the month. Daily temperatures averaged 10+ degrees above normal for most locations on the **3rd**, **7th-11th**, and **14th**. This was the warmest October for the Indianapolis Area since 2007. Synoptically, the month's upper pattern featured longer waves and a predominant ridge over the Mid-West for most of the month's first half, which drove the unseasonable warmth for many days. The second half of October was a mix of generally slowly-passing ridges and troughs, which promoted more modest warmth between cooler multi-day periods of rain and dampness.

All 1st-order airports were 5+ degrees above normal for the first 14 days of the month, with the **10th**, **11th**, and **14th** being the most unseasonable per near-record warm morning lows. The morning of the **10th** saw thermometers only drop to 70F at the Shoals 8 S COOP site (Martin Co.), while West Lafayette 6 NW (Tippecanoe Co.) and the Muncie Airport were both held to 69F. After the exceedingly warm start, the month's maximum was then reached on the **10th** at most locations, with 80s commonplace across the region and temperatures reported as high as 88F at Shoals 8 S and 86F at several other sites, including Washington 1 W (Daviess Co.) and Tipton 5 SW (Tipton Co.). Isolated locations reached their highest mark either on the **1st**: 89F at Perrysville 4 WNW (Vermillion Co.) and 86 at Vincennes 5 NE (Knox Co.) ... or the **9th**: 88F at Columbus (Bartholomew Co.).

Much cooler, crisp, Canadian air finally infiltrated the region via the **26th's** northerly breezes, as essentially all locations then reported their lowest reading on the morning of the **27th**. The coldest spots also recorded their first freeze of the season this morning, including 27F at Farmland 5 NNW (Randolph Co.), 28F at New Castle 3 SW (Henry Co.), with several other sites reaching 32F: Crawfordsville 6 SE (Montgomery Co.), Rockville (Parke Co.), Tipton 5 SW, and

West Lafayette 6 NW. Indianapolis dropped to **38F**, making it the third latest sub-40F occurrence on record, matching 10/27/1941 and being bested only by 10/29/1897 and 10/28/1919. The Frost Advisory issued for the night of the **26th-27th** was the only such product issued before the frost/freeze season was ended on October 31st.

October 2021's well above normal temperatures exemplified the trend from September 2021's warmth, but was in contrast to the near-normal readings observed in October 2020.

Site	October 2021 Average Temp	October 2021 Dep from Nml	Highest Temperature	Lowest Temperature
Indianapolis Int'l Airport	60.9	+5.4	82 on 10 th	38 on 27 th
Lafayette (*)	58.9	+5.2	83 on 1 st , 9 th	33 on 27 th
Muncie	62.9	+7.1	87 on 10 th	35 on 27 th
Terre Haute	61.5	+6.6	85 on 10 th	35 on 27 th
Bloomington (*)	61.6	+6.3	83 on 10 th , 14 th	35 on 27 th
Shelbyville	63.1	+7.0	86 on 10 th	34 on 27 th
Indianapolis Eagle Creek	61.5	+6.0	84 on 10 th	35 on 27 th

(*) – Lafayette's data is missing for October 10th; and Bloomington's data is missing October 13's maximum temperature

At Indianapolis, October 2021's daily average temperatures were above normal on 24 days and below normal on 6 days. It was the **11th warmest** October for the Indianapolis Area since weather records began in 1871, placing it in the 93 percentile.

Precipitation

While not typically quite as dry as September, October normally sees only ~2.90-3.70" of precipitation across central Indiana. October 2021, however, once again contrasted this climatological pattern, with **4.00-9.00"** totals common across the region, including **7.74"** at Indianapolis International Airport, which was an astounding **224% of normal**. Most far southern and southeastern counties saw near normal precipitation, while some of the all-time records across northwestern counties were 3-4 times normal levels. When compared to the ample precipitation that fell on central Indiana last October ... most areas south of the I-70 corridor had less rainfall in October 2021, most places along I-70 had comparable rains, and nearly all locations north of the I-70 corridor had greater totals this October. In fact, most northern locales had the wettest October in 20 years.

Tippecanoe County had the greatest monthly totals, with most sites reporting over **9.00"**, including **10.42"** on the west side of West Lafayette, **9.20"** at the Purdue University Airport and

9.14" at the Lafayette 8 S COOP site. These were each all-time greatest totals for October, with the airport's sum even surpassing all other Lafayette-area October totals prior to the airport's period of record (1901-1943). Other noteworthy totals across the region's far northern tier included **8.78"** at the Kokomo 3 WSW COOP site (Howard Co.) -- the wettest October since 1919; **8.16"** at the Frankfort Disposal COOP site (Clinton Co.) -- the wettest since 1949; and **8.12"** at the Tipton 5 SW COOP site -- marking the wettest October since records began in 1971.

The first of several significant rainfall events occurred on the **2nd-4th**. 1-day totals through early on the **3rd** included several 1-2" amounts across Tippecanoe County and areas near Bloomington, with up to **2.27"** in West Lafayette, **1.78"** northeast of Freeman (Owen Co.), and **1.75"** at the Vincennes 4 E COOP site (Knox Co.). Additional 1-day rains through early on the **4th** included **1.64"** in Flora (Carroll Co.), **1.53"** near Winchester (Randolph Co.), and **1.38"** at the Oolitic Purdue Farm (Lawrence Co.). The third and final 1-day period through early on the **5th** saw generally lighter rainfall, excepting a heavier patch in Hamilton County, led by **1.07"** in Fishers. 2- to 3-day storm totals were generally **0.50-1.50"**, with locally higher amounts including **2.66"** in western West Lafayette, **2.28"** in Burlington (Carroll Co.), and **2.06"** west of Freeman (Owen Co.).

The **6th** through **early on the 7th** brought many **1.00-2.00"** observations in and near both Indianapolis and Bloomington, especially along the Hendricks-Marion County line courtesy of a heavy rain band pre-dawn on the **7th**. Greatest were **2.71"** at Indianapolis-Eagle Creek Airport (Marion Co.), **2.52"** east of Brownsburg (Hendricks Co.), and **2.00"** on the west side of Bloomington (Monroe Co.). A sharp gradient was observed along the eastern edge of the **7th's** downpour, as the Indianapolis International Airport ASOS caught **0.85"** more than the NWS office about a mile to the southeast. A mix of dry days and scattered light rainfall then filled out the rest of early October ... until the **11th's** fast-moving showers and thunderstorms dropped light rainfall totals on most locations, with as much as **1.42"** in western Vigo County and **1.26"** around Lafayette.

Impressive widespread heavy rainfall returned on the **14th-15th**, with 1-day totals through early on the **15th** totaling **1.00-3.00"** across all but the far western and southern extents of the region. Greatest reports were **3.37"** at Vincennes 4 E, **3.02"** near Strawtown (Hamilton Co.), and **2.64"** near Paragon (Morgan Co.). 2-day storm totals exceeded 2.00" across most northern counties and southward along the I-69 corridor. Highest values were **3.59"** near Strawtown, **3.14"** in Brownsburg, **3.06"** near Noblesville (Hamilton Co.), and **2.98"** near Paragon. Several 1st-order airports also approached **2.00"**: Indianapolis-Eagle Creek's **1.91"**, Lafayette's **1.90"**, and Muncie's **1.85"**. Subsequently, the Wabash River rose to **minor flood stage** at both Lafayette and Montezuma between late day on the **16th** and late morning on the **18th**, although neither site was in flood for greater than 21 hours. Points downriver reached action stage for 3-6 days within the **16th-22nd** timeframe. Meanwhile, several consecutive dry days finally graced the region during the **16th-20th**, with scattered light rainfall returning on the **21st-23rd**.

Heavy rains fell once again onto the well-watered central Indiana on the **24th-25th**, especially along and north of the I-70 corridor. 1-day amounts through early on the **25th** were **1.00-3.00"** for most of the region, with greatest totals ranging from **3.41"** near Anderson (Madison Co.), to **3.31"** in Pence (Warren Co.), **3.19"** near Otterbein (Tippecanoe Co.), with **3.13"** east of Fishers

(Hamilton Co.) and **3.04"** in Parker City (Randolph Co.). Following lighter rains later on the **25th**, 2-day storm totals measured as great as **3.63"** near Anderson.

Widespread minor river flooding then resumed on the upper Wabash River late day on the **25th**, and on the **26th** at Terre Haute and Riverton. Wildcat Creek at Lafayette also reached minor flood, for about 48 hours (25th-27th), although the Wabash's main stem points from both Lafayette to Montezuma, and Terre Haute to Riverton, remained in minor flood through the **31st**. The Wabash's peak crest passed Lafayette the night of the **26th**, slowly reaching Terre Haute by the morning of the **30th**. Meanwhile, half of the White River's forecast points also reached minor flood stage, most for 1-3 days: first at Muncie down to Ravenswood within the 25th-28th timeframe, and then at Spencer down to Edwardsport, with the latter point flooding from early afternoon on the **28th** through the afternoon of the **31st**. None of the East Fork of the White River's points exceeded action stage. Ridgeville (Randolph Co.) was in flood stage from the late evening of the **24th** through the afternoon of the **26th**, and in **moderate flood stage** for most of this duration, cresting 3.7 feet above flood stage. Wildcat Creek at Jerome also reached minor flood for several hours on the night of the **23rd**.

Not to be outdone, this anomalously wet October finished with a final **0.50-1.50"** or so of precipitation across most spots on the **28th-30th**, with as much as **1.76"** at the Franklin WWTP (Johnson Co.), **1.43"** in Ellettsville (Monroe Co.), and up to **~1.33"** in Delaware, Henry, and Madison Counties. As **minor flooding continued** on the Wabash River, these comparatively lighter rains led to a second, lower crest, which reached Lafayette by the morning of the **31st**.

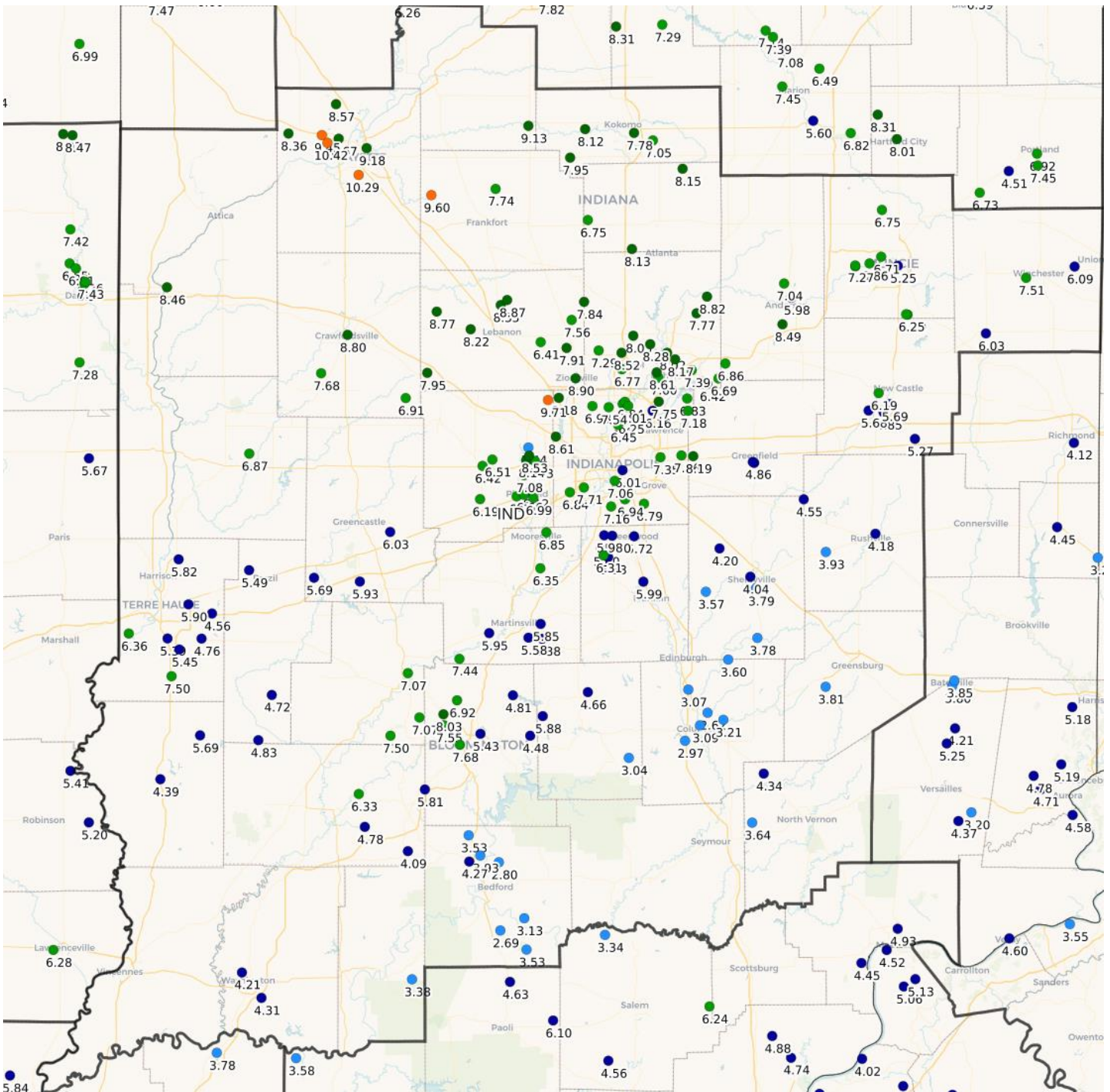
October 2021's near to well above normal precipitation continued the same overall pattern from September 2021, although spatially the departure from normal trend was flipped – as the greatest totals flipped from southern to northern zones. The copious October rainfall boosted Indianapolis' year-to-date total to **44.30"**, increasing the corresponding surplus to **7.74"** above normal. October 2021's wet trend actually followed that of October 2020, when Indianapolis recorded 5.35", coming out of September 2020's record dry period.

Site	October 2021 Precipitation	October 2021 Diff. from Normal	Wettest Day	Longest Dry Stretch
Indianapolis Intl AP	7.74	+4.52	1.41 on 24 th	4 days, 17 th -20 th
Lafayette	9.20	+6.29	2.52 on 24 th	3 days, 17 th -19 th
Muncie	5.17	+2.08	2.06 on 24 th	5 days, 17 th -21 st
Terre Haute (*)	3.50INC	M	M	5 days, 26 th -30 th
Bloomington	5.88	+2.18	1.38 on 15 th	4 days, 17 th -20 th
Shelbyville (*)	4.84INC	M	1.25 on 6 th	4 days, 17 th -20 th
Indy – Eagle Creek	8.48	+5.23	1.71 on 6 th	4 days, 17 th -20 th

(*) – Terre Haute's precipitation data is incomplete during October 11-23;
Shelbyville's precipitation data is incomplete October 25-29

October 2021 was the **4th wettest** for the Indianapolis Area since weather records began in 1871, placing it in the 97 percentile.

October 2021 Total Precipitation, Through the Morning of 11/1 As Reported By Central Indiana CoCoRaHS Observers



For the period 700 AM EDT 10/1/2021 -to- 700 AM EDT 11/1/2021. Data is unofficial.

Rainfall totals were greatest (6.00"+) across the northern half of the region, and immediately west of Bloomington, with over **9.00"** around Lafayette...although virtually the entire region was above normal.

Severe Weather

October 2021's occasional, embedded thunderstorms were non-severe excepting one evening.

Through the late afternoon and evening of the **11th**, the impressive gradient ahead of a slowly-approaching cold front promoted a strong southerly low-level jet stream (LLJ), which in turn provided the high shear environment that produced multiple lines of thunderstorms across western and north-central counties. The strongest embedded cells brought the LLJ's winds to the surface.

An initial line of thunderstorms brought an estimated **65 mph** wind gust to New Goshen (Vigo Co.), toppling a nearby 50 to 60-foot tree ... followed by an observed **60 mph** wind gust in Rockville (Parke Co.) ... before the most intense damage occurred within Attica (Fountain Co.): numerous downed trees, including onto 3 houses causing **one minor injury**, as well as roof and water damage at the high school. A brief, stronger cell caused marginally-severe, **1.00" hail** to fall at Lake Holiday (Montgomery Co.). Further early evening severe weather was reported across Tippecanoe County, including: a metal pole barn blown down in Otterbein, a measured **60 mph** wind gust at WLF1 in West Lafayette, and finally numerous trees and branches toppled from Battleground to Dayton. Tree damage was also reported in western Carroll County.

Later in the evening, another squall line with weak rotation downed numerous tree limbs within Frankfort (Clinton Co.) before blowing over 10 trees across eastern portions of Carroll County.

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

The month's maximum wind gust at the Indianapolis International Airport was 38 mph (from the southwest) on the 3rd. Greater peak wind gusts at other 1st-order airports all occurred on the 11th: 54 mph at Lafayette (from the west-southwest), 50 mph at Terre Haute (from the west-southwest) and 40 mph at Shelbyville (from the south-southeast).

Fog was quite common across central Indiana, with frequency ranging from 16 days at Muncie to 28 days at Lafayette (every day except the 16th, 20th, and 26th). Fog was observed on 21 days at Indianapolis. Dense fog was frequent at several sites: 8 days at Indianapolis-Eagle Creek and 4-6 days at Bloomington, Lafayette, Shelbyville, and Terre Haute. Dense fog occurred at 4 or more of these sites on both the 8th and 13th, and was recorded on 3 consecutive days at Shelbyville (4th-6th). Dense fog was not reported at Indianapolis Int'l Airport.

Thunder was reported on 9 days at both Indianapolis and Bloomington, 8 days at Muncie and Indianapolis-Eagle Creek and elsewhere 6 days or less, although all sites reported thunder on the 11th and 25th.

November 2021 Outlook

The outlook also indicates equal chances of above, below or near normal temperatures for central Indiana ... with a slightly greater chance of above normal temperatures for far northeastern portions of the region. The normal November temperature for Indianapolis is **43.3** degrees.

The official outlook for November 2021 from the Climate Prediction Center indicates an equal chance of above, below or near normal precipitation for central Indiana. 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*