

**Ken Scheeringa  
And  
Andy Eggert**

**(765) 494-8105**

## Indiana State Climate Office

### Monthly Weather Report

**Dec 15, 2016**



<http://www.iclimat.org>

## November 2016 Climate Summary

### Month Summary

Unseasonably warm, pleasant, and sunny weather the first half of the month factored large in placing this November as the warmest in Indiana in the past 15 years. The mild temperatures and below normal precipitation led to moderate and severe drought along the Ohio River, a northward extension of the ongoing drought in southeastern states. Outdoor burn bans were eventually declared in 10 southern Indiana counties, then rescinded by the end of the month. Severe weather on November 18<sup>th</sup> unofficially marked the end of the pleasant autumn weather. One person was injured when a tree fell on a vehicle in Kosciusko county that day.

The November state average temperature was 46.9°F. This was a very warm 4.6° above normal and ranks the month as the 6<sup>th</sup> warmest November. September and October 2016 had each also placed in the 6<sup>th</sup> warmest slot. Some recent warmer Novembers happened in 1999 with a 47.8°F average as the 5<sup>th</sup> warmest and in 2001 at 49.0°F, good for 3<sup>rd</sup> place. The warmest November on record had a 49.1°F average in both 1909 and 1931. The day split in November 2016 was 5 days of below normal temperature, 24 days above normal, and 1 day at normal, nearly identical to October. There were 6 days when the mean daily temperature was at least 10°F above normal and 1 day when the daily average was at least 10°F below normal. The highest temperature of the month was 87°F on November 1<sup>st</sup> at Newburgh and the coolest was 17°F on November 22<sup>nd</sup> at the Dubois Forage Farm.

November state precipitation averaged 2.62" which is 0.97" below normal, landing as the 48<sup>th</sup> driest November on record. Some recent drier Novembers include 2002 with 2.35", the 39<sup>th</sup> driest on record. In 2008 its 2.11" average fills the 31<sup>st</sup> driest slot. The next year a 1.46" state average tied 1962 and 1980 in the 16<sup>th</sup> position. In the drought year of 2012 only 0.98" was measured, coming in as the 4<sup>th</sup> driest November. The driest was in 1904 when just 0.36" was recorded. The heaviest one day precipitation among cooperative stations in November 2016 was 2.23" on November 2<sup>nd</sup> at the NWS office near North Webster. The highest in the CoCoRaHS network was 3.30" on the next day at Chesterton 4.2e. The largest month total precipitation in the cooperative network was 4.21" at Avilla 3sw. In the CoCoRaHS network the heaviest was 5.25" at Chesterton 4.2e once again. Widespread precipitation fell on about 7 days this month.

The greatest daily snowfall reported in the cooperative network was 1.0" on November 20<sup>th</sup> at Kokomo 3sw. In the CoCoRaHS network 1.7" was tallied that same day at Elkhart 4.8sw. Snow was not widespread across the state in November but on this day covered several towns in north central and central Indiana.

Regionally November 2016 precipitation was near 90% of normal in northern Indiana, about 70% in central Indiana, and near 60% of normal across the south. Normal November precipitation ranges from 3.0" in northeast Indiana to 4.3" in the southwest.

### **November 1<sup>st</sup> – 7<sup>th</sup>**

The opening days of November were unseasonably warm. The second half of the week was a little cooler. Yet daily state temperatures averaged above normal all week long. Rain fell on just 2 days in the now familiar pattern of heavier amounts in northern Indiana trending to nothing near the Ohio River. Soils in southern counties rated as abnormally dry or in moderate drought by the USDM expanded further north of the river this week as widespread drought in southeastern states intensified and spread. Dry weather benefited Indiana farmers wanting to wrap up the summer crop harvest.

On November 1<sup>st</sup> the state temperature stood at a very mild 10°F above normal. Indiana was positioned inside a warm air sector bounded by a warm front in Ohio and its paired cold front in Wisconsin and Iowa. A large ridge along the Atlantic coast was feeding warm air from the Gulf of Mexico to Indiana. The next day the cold front caught the warm front, then paused as a stationary front stretched from Michigan to New Mexico. Warm air continued pumping into Indiana. The state temperature reached its peak for the week at 17°F above normal.

The stationary front drifted slowly southward to central Indiana on November 3<sup>rd</sup>, waiting on a Kansas low pressure system to ride up the front. Meanwhile another cold front had entered Wisconsin and gradually caught up to the Indiana front. In response the Indiana state temperature dipped slightly to 13°F above normal. The next day a Pacific air mass that had crossed the Rocky Mountains spilled into Indiana, advancing the merged cold front across the Gulf states. The Pacific air had now spread over nearly the entire continental USA, cooling Indiana significantly to 6°F above normal.

On November 5<sup>th</sup> the huge ridge split in half with the western portion over the Rocky Mountains and the east ridge over Indiana and the Great Lakes. The Indiana temperature slid to 5°F above normal. The old cold front had reached southern Florida. By the next day the east ridge had strengthened and sprawled over the east half of the country, extending sunny weather to Indiana. The state temperature recovered slightly to 8°F above normal. The nearest storm system was located over Idaho.

The east ridge traveled to the Atlantic coast on November 7<sup>th</sup> while the Idaho storm system moved to the Dakotas. The east ridge segment over New England established a new backflow of warmer Gulf air into Indiana to close out the week, raising the state temperature to 9°F above normal.

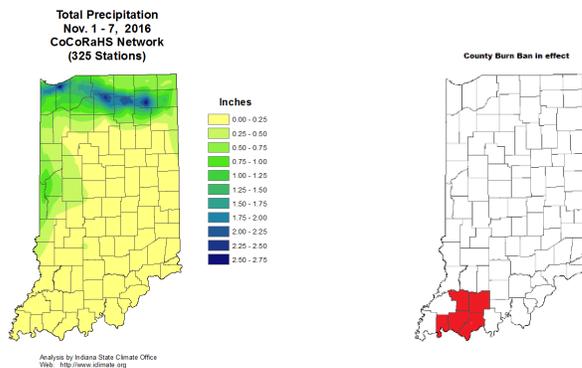
Overall for the week the Indiana state temperature averaged to 10°F above normal. Usually at the start the November daily maximum temperature would range from 54°F in far northern Indiana to 62°F in the southwest corner of the state. Daily minimums normally vary between 37°F and 40°F north to south across the state. The warmest daily temperature among cooperative network stations this week was 86°F at Evansville Airport on November 1<sup>st</sup>. The coolest daily minimum among stations in this same network was 27°F at Greenfield on November 5<sup>th</sup>.

Rain was observed on only November 3<sup>rd</sup> and 4<sup>th</sup> in northern and central Indiana. On the weekly precipitation map amounts were heavy in the northern two tiers of counties, ranging from about 0.5” to 2.75”. There was an area along the Illinois border from Lake to Vigo counties with totals up to about 1” and up to 0.5” in Tippecanoe and Montgomery counties. But the vast majority of the state noted less than 0.25” for the week with many stations reporting zero rainfall. Regionally week totals averaged about 0.6” in northern Indiana, 0.2” in central, and 0.05” across the south. These amounts equate to about 80% of normal in the north, 20% of normal in central, and just 5% of normal in southern Indiana. The heaviest amounts were recorded in the November 3<sup>rd</sup> morning reports with 3.30” around Chesterton, 2.90” near Portage, 2.74” in the Albion vicinity, 2.45” outside Brenan, and 2.28” at Leesburg. For the week the largest totals included 3.30” near Chesterton, 2.90” and 2.23” at Portage, 2.29” in Leesbrug, and 2.25” near North Webster.

The absence of rain in southern Indiana has allowed drought conditions to worsen. The north edge of the southeast states drought has expanded in Indiana. The D0 abnormally dry region has extended into southern Jackson and Jennings counties and into northern Jefferson and Switzerland counties according to the November 8<sup>th</sup> edition of the US Drought Monitor. The USDM has expanded the D1 moderate drought area west to include half of Posey and Gibson counties, south Martin county, and all of Pike, Dubois, and Jefferson counties. The net coverage by moderate drought in Indiana as of November 8<sup>th</sup> is 13% of total land area, with another 7% coverage rated as abnormally dry. The remaining 80% of total land area is considered to be in normal soil moisture status for this time of year.

The November 7<sup>th</sup> edition of the USDA Indiana crop and weather report notes that warm temperatures and little rainfall has put Indiana farmers back on a normal harvest schedule. Corn and soybean harvest are about 90% complete with the slowest progress in wetter northern Indiana. Winter wheat is nearly all planted but emergence in southern Indiana has been hampered by dry soils. Pastures have grown longer than usual due to the warm temperatures which was helpful by delaying the switch in livestock feed stocks to stored hay. .

Five southern Indiana counties have declared bans on open burning this week: Pike, Dubois, Vanderburgh, Warrick, and Spencer. Reports of wild fires in Kentucky have alerted Indiana officials to the potential for fires in Indiana where soils have become very dry and brush for fuel has become plentiful.



## November 8<sup>th</sup> – 14<sup>th</sup>

Indiana temperatures persisted on the warm side of normal for a second week. Rain fell early in the week with the passage of a cold front. A second cold front two days later was dry, delivering no moisture to the state.

The much below normal precipitation allowed dryness in soils along the Ohio River to spread northward. Also a new abnormally dry area developed in northwest Indiana. Most summer field crop harvesting was already done. Livestock were switched to feeding on hay as pastures have gone dormant.

The week began with the state average temperature at a mild 6°F above normal. A ridge over the Appalachians pulled Gulf air northward into Indiana. A slowing cold front just to the west of Indiana edged eastward in advance of another ridge in Nebraska and Colorado. The next day the cold front picked up momentum and raced to the Atlantic coast. Mild air behind the front originated from the Pacific Ocean and only dropped the temperature in Indiana by 3°F. Light rain fell statewide as the cold front moved across the state.

This cold front moved offshore into the Atlantic. The Great Plains ridge spread east over Indiana and its neighbor states to the south on November 10<sup>th</sup>. The Indiana state temperature did not budge, holding steady at 3°F above normal. Meanwhile a new Canadian cold front dipped south into North Dakota and Montana. The cold front ran ahead of strong high pressure from Alberta. The next day the high center muscled its way into the Dakotas and Nebraska, helping to advance the new long cold front from New England to New Mexico, including into Indiana. Before the cold front arrived a quick surge of warmer air lifted the daily Indiana state average temperature to 6°F above normal. This was a dry front and unlike the earlier front no rain was produced.

On November 12<sup>th</sup> the Nebraska ridge sprawled from the Rocky Mountains to the Atlantic coast. Cooler air with sunny skies over Indiana caused temperatures to fall a few more degrees to right about normal. A new trough in the Great Plains split the ridge into an eastern and western half the next day. Indiana was positioned in the backflow of the eastern ridge, nudging the state temperature up to 1°F above normal with continued sunny skies.

On November 14<sup>th</sup> the central trough developed into a cold front over Iowa. The back side of the east ridge eroded away, leaving Indiana with partly cloudy skies. Mild temperatures continued at about 2°F above normal in advance of the cold front.

For the week the state temperature averaged to 3°F above normal. Usually at this point in November daily maximum temperatures should range between 51°F and 59°F north to south across the state. Daily minimums normally vary from 35°F in the northern tier of counties to 38°F near the Ohio River in southwest Indiana. The maximum daily temperature this week among cooperative network stations was 74°F at multiple locations on November 8<sup>th</sup> and 9<sup>th</sup>. The minimum temperature among stations in this same network was 21°F at Dubois Forage Farm on November 13<sup>th</sup> and at New Castle 3sw on November 14<sup>th</sup>.

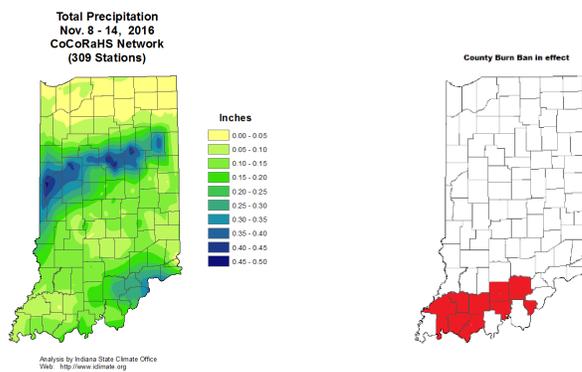
Rainfall was recorded only during the first cold front on the mornings of November 8<sup>th</sup> and 9<sup>th</sup>. Regional amounts averaged just 0.1" in northern Indiana and near 0.2" in central and southern sections of the state. This equates to 10% of normal in the north and 20% of normal in central and

southern Indiana. On the weekly precipitation map the heaviest band of rain had 0.4” to 0.5” stretching from Warren and Vermillion counties east to Tippecanoe, then on to Wells county. Some of the lightest amounts fell south of a Crown Point to Rochester to Fort Wayne line where only a few hundredths of an inch fell. In other areas rainfall totaled under a quarter inch. The heaviest local daily amounts were noted in the morning reports of November 9<sup>th</sup> when 0.49” was measured near Kokomo, 0.47” at Covington and West Lafayette, and 0.43” in La Fontaine and Galveston. These amounts and places matched the heaviest weekly totals.

The nearly dry week allowed for a big expansion in abnormally dry D0 and moderate drought D1 areas across the state. Even a sliver of severe drought D2 reached into southern Harrison, Floyd, and Clark counties this week. Last week’s D1 coverage expanded slightly mostly northward in southern Indiana. The D1 area was relocated generally south of a Decker to St Leon line. The D0 area generally moved a half county north of the previous week, or roughly one county north of the D1 region. A new D0 region was designated in northern Indiana, bounded roughly on the west edge by Newton, Benton, and Warren counties and on its east by Wabash county. The net result of all changes was an increase in moderate drought coverage from 13% to 16% of Indiana land area, an expansion of abnormally dry soils from 7% to 21% of total area, and a reduction of land in normal soil moisture status from 80% to 62% this week. The new introduction of severe drought claimed 1% of total Indiana land.

The November 14<sup>th</sup> edition of the USDA crop and weather bulletin notes that the first statewide freeze of the autumn season has allowed farmers to finish their harvest in fields that were difficult to access. Some fields remained but these were too wet to harvest. Meanwhile grazing of livestock continued as recent warm weather has extended the growing season for pastures. Harvest of the summer crops of corn and soybeans were 95% complete and wheat planting was also 95% finished.

As the drought continues 4 additional counties have declared outside burn bans. Crawford, Floyd, Gibson, and Washington counties joined the list for a total of 10 counties in the ban.



## November 15<sup>th</sup> – 21<sup>st</sup>

Pleasant warm days this month ended abruptly after November 18<sup>th</sup>. The state average temperature tumbled 22°F in a single day, interrupting an unusual November sequence of sunny day after sunny day in Indiana. The rest of the week was much colder. Rain and snow had fallen on two days while temperatures nose-dived but the rest of the week was nearly dry. It was windy on November 18<sup>th</sup> with widespread gust damage across the northern half of the state. Farmer fields in northern Indiana ponded this week while drought continued in southern counties. Livestock were switched to feeding of hay as pasture growth had now stopped. Burn bans were lifted in 4 counties this week.

The Indiana state average temperature began the week at a mild 6°F above normal. Storm systems crossed Indiana in rapid sequence. On November 15<sup>th</sup> a cold front traversed the state. Warm air ahead of the next storm system in line provided no time for a cool down behind the first front. Instead temperatures rose to 8°F above normal the next day followed immediately by a second weaker cold front. This front also had no impact on Indiana. High pressure over the southeast states pulled still warmer air northward to Indiana on November 17<sup>th</sup> ahead of the next storm system over Iowa. The state average temperature bounced to 14°F above normal.

On November 18<sup>th</sup> the south ridge stretched north up the Atlantic coast from Georgia to Maine. The storm system in Iowa intensified and formed a warm air sector east of the Mississippi River. Southerly winds inside the warm sector lifted Indiana temperatures still higher to 16°F above normal, the warmest of the week. Maximum temperatures reached into the 70's statewide except near Angola. Temperatures exceeded 80°F in the southwest corner of the state. The daily maximum reached 75°F in Indianapolis, the warmest day so late in the year there since 1942.

A major weather change occurred into the afternoon and evening. Rain fell statewide and high winds damaged areas in the northern half of Indiana. High temperatures across the state on November 19<sup>th</sup> occurred very early in the morning and dropped during the day. As a strong cold front whipped east across Indiana the daily state average temperature crashed to 6°F below normal. The warm sector was swept east to the Appalachian Mountains.

On November 20<sup>th</sup> the core of the large storm traveled from upper Michigan to Maine while its leading cold front pushed well off the Atlantic shore. The Indiana state temperature fell to 10°F below normal on the coldest day of the week. The Maine storm was so intense that on the next day a second cold front wrapped around the storm center and trailed through Indiana on November 21<sup>st</sup>, the fourth cold front to pass through Indiana during the week. The deep storm moved on northeast and a ridge of high pressure dove south from Canada into Indiana and states due south. The Indiana state average temperature closed the week slightly warmer at 7°F below normal under cold sunny skies.

For the week the state temperature averaged to 3°F above normal including a 26°F spread over just two days. Typically for mid-November the daily maximum temperature should range from 47°F in far northern Indiana to 55°F in the southwest corner of the state. Daily minimums should range between 32°F and 36°F north to south across the state. The warmest local temperature of the week among stations in the cooperative network was 81°F at Vincennes 5ne on November 18<sup>th</sup>. The coolest local temperature among stations in this same network was 17°F at Dubois Forage Farm on November 21<sup>st</sup>.

Precipitation was recorded on 3 days this week. Two CoCoRaHS stations reported rainfall in northeast Indiana on the morning of November 16<sup>th</sup>, a minor event. The extreme cold front three days later spread rainfall statewide with two snowfall reports near South Bend. As the storm left Indiana the next day scattered rain fell over the northeast half of the state with a few reports of snowfall in the northeast corner. Regionally for the week about 0.4" of precipitation was measured in the northern third of Indiana while about 0.5" was noted in central and southern sections of the state. These amounts equate to about 80% of normal in northern and central Indiana and 60% of normal across the south.

On the weekly precipitation map about a quarter inch of precipitation in southeast Indiana fell generally south of a Leavenworth to Winchester line. More than an inch covered Morgan county, northern Monroe, central Marion, and southern Huntington county. A band of precipitation greater than 0.75" fell from the town of Spencer to Muncie to Huntington. A lighter band surrounded this heavier area in a wide band along an Angola to Evansville line. About a half inch fell in northwest Indiana.

On the weekly snowfall map 1.0" to 1.5" was received in the Elkhart region. Less than a half inch fell east to Angola and south along the Ohio border. There was light snow in Grant and Randolph counties.

The highest daily precipitation during the week was reported on November 19<sup>th</sup> in central Indiana. On the northeast side of Indianapolis a CoCoRaHS volunteer captured 1.75" of precipitation, Brooklyn had 1.47", Warren 1.26", Gosport 1.24", and Muncie 1.19". Among the heaviest daily snowfall reports were 1.7" measured outside Elkhart, 0.8" near Hartford City, 0.6" in the vicinity of Leesburg, and 0.5" near Columbia City and Wakarusa.

Cold air rushed into Indiana late on November 18<sup>th</sup>, transported by gusty winds. Torrential rainfall was reported in Elkhart county where gusts near 60 mph uprooted trees which ripped into power lines. A tree fell on to a vehicle in Kosciusko county, injuring one person inside. A transformer blew up and a metal roof was torn off a building there.

Winds reached 65 mph in Fulton county, interrupting power. In Pulaski county winds rolled over an irrigation system and snapped trees. A tree fell on to a road in Cass county. More power lines came down in Miami county. Trees were snapped or torn down in Grant county and power lines fell on to a car, trapping people inside.

Wind gusts hit 74 mph in Wells county. To the south high winds snapped tree limbs in Hamilton county and took down large limbs in Tippecanoe county. Power poles and trees were downed in Fountain county. A car was blown off the highway in Putnam county. Strong wind gusts were reported as far south as Morgan county.

The ongoing drought in Indiana worsened as another week passed by. Severe drought (D2 category) expanded into half of Harrison county, all of Floyd, most of Clark, and the south fringes of Jefferson and Switzerland counties. There was almost no change in moderate drought (D1 category) this week.

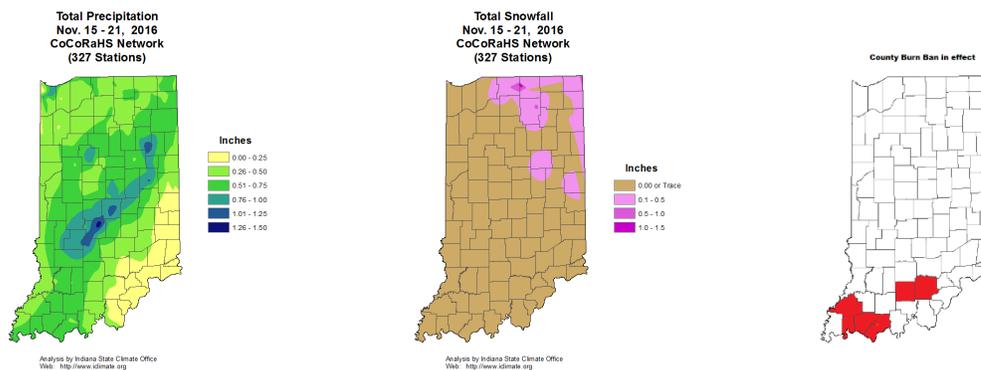
But abnormally dry areas (D0 category) nearly doubled in size to include counties in southeast and east central Indiana. New counties assigned to the D0 category this week included all of Jennings,

Ripley, Dearborn, Franklin, Decatur, Bartholomew, most of Brown, all of Rush, Shelby, Fayette, Union, Wayne, most of Henry, part of Hancock, all of Randolph, Jay, and most of Adams counties.

Overall the D0 category increased from 21% of total land area to 35% of Indiana a week later. There was a 1% coverage reduction of the D1 category from 16% to 15%, transferred into the D2 category which then totaled 2%. Indiana land in normal soil moisture status decreased from 62% a week ago to 48%, a reduction to just under half of total state area.

Despite the loss of territory of normal soil moisture for this time of year, four counties decided to lift their burn ban declarations. Dubois, Crawford, Pike, and Floyd counties dropped their bans, leaving 6 counties which continue to ban open burning due to high fire risk.

According to the USDA Indiana crop and weather bulletin the drought in southern Indiana did not improve. Harvest was nearly complete with just scattered corn and soybean fields remaining. A contrast was drawn between ponding northern Indiana fields while drought persisted in the south. Pastures had turned dormant and livestock were being fed by hay stocks.



## November 22<sup>nd</sup> – 30<sup>th</sup>

Indiana temperatures recovered from a cold snap at the end of last week. The next five days through November 27<sup>th</sup> held slightly warmer than normal. Then a warm resurgence closed out the last few days of the month. Rain fell on 7 of the final 9 days of November with the bulk of the moisture falling during the late warmup. There was a slight improvement in Indiana drought status. Harvest of summer field crops was declared finished for the year by the final USDA Indiana crop and weather bulletin of 2016.

High pressure stretched from Lake Superior to North Carolina on November 22<sup>nd</sup>, including overhead Indiana. Yet skies remained cloudy as a deep storm system spun just north of Maine. A complex frontal system stretched from North Dakota to Texas. It was still cold in Indiana with the state temperature at 5°F below normal. The next day a storm system moved east into Missouri and draped its stationary front over far southwest Indiana. As warmer air approached the Indiana state temperature rose to 1°F above normal and rain began to fall.

On Thanksgiving Day the Missouri storm moved to Michigan, dragging a brief warm front through Indiana followed immediately by its paired cold front. High pressure followed close behind. The state temperature lifted to 3°F above normal.

The next day the high pressure center drifted to the southern states but Indiana skies remained cloudy. The state temperature fell a few degrees to 1°F above normal. The old fronts approached the Atlantic Ocean. The Missouri high center expanded over the Midwest but could not kick out persistent cloud cover hanging in Indiana skies, a condition known as a “dirty high”. The clouds held Indiana temperatures steady at 1°F above normal. The dirty high drifted east to Virginia on November 27<sup>th</sup> allowing Indiana sunshine to return. But the state temperature actually fell to 1°F below normal.

A complex storm system in the Rockies moved to South Dakota and greatly intensified into an occluded low center. This western system slammed into the Virginia dirty high which was squeezed along the Atlantic coast by old fronts to its east. The air compression between these west and east systems set up windy conditions over Indiana, transporting in much warmer air on southerly winds. The state temperature jumped to 7°F above normal on November 28<sup>th</sup>.

The west storm core traveled slowly into Minnesota but its occluded front swept far ahead through Indiana and to near Pennsylvania by the next morning. Warm air was churned around the deep Minnesota low and into Indiana, spiking the state average temperature to 16°F above normal to its peak for the 9 day interval. Finally on November 30<sup>th</sup> a secondary low center from Oklahoma was drawn into the core storm system into Indiana. Its cold front was pruned into the occluded front. This occluded front of the core system crossed through Indiana and was followed immediately by the cold front. The entry of colder air into the state from the joined storm caused the state temperature to drop to 8°F above normal to close out the month.

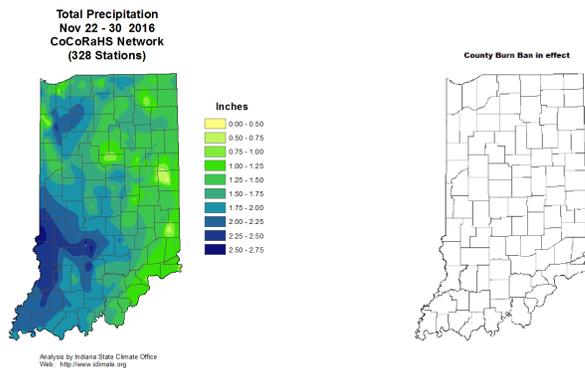
The near normal temperatures in the first half of the 9 day interval were followed by significant warmth later in the week. The net result was a state temperature average of 3°F above normal for the final 9 day interval. Typically in late November daily maximum temperatures should range between 43°F and 51°F north to south across the state. Daily minimums should vary from 29°F in far northern Indiana to 33°F in the southwest corner of the state. The warmest daily temperature over the 9 days among cooperative network stations was 68°F at Shoals 8s on November 30<sup>th</sup>. The coolest daily temperature among stations in this same network was 17°F at Dubois Forage Farm and Shoals 8s on November 22<sup>nd</sup>.

Rain fell primarily in two events, both during an influx of warmer air into the state. Coverage was statewide on two dates, November 24<sup>th</sup> and 29<sup>th</sup>, and nearly statewide according to CoCoRaHS reports on the mornings of November 23<sup>rd</sup> and 28<sup>th</sup>. No rain was reported on November 22<sup>nd</sup> and 27<sup>th</sup>. Regionally about 1.7” of rain fell across all sections of the state which equated to 170% of normal in northern Indiana, 150% in central counties, and 120% of normal in the southern third of the state. On the weekly rainfall map 2” to 3” was totaled in southwest and south central Indiana, generally west of a Covington to Nashville to Boonville line. About 1.5” was received in the west half of the state with some lighter spots. Less than a half inch was noted in Randolph and Franklin counties. The heaviest rainfall was measured in the morning reports of November 29<sup>th</sup> when Ellettsville had 1.65”, Oolitic 1.62”, and two Bloomington volunteers had 1.60” and 1.53”. Locations with the largest 9 day totals included 2.67” at Oolitic, 2.55” near Spencer, 2.54” outside Bloomington, 2.35” in Washington, and 2.35” nearby to Ellettsville.

Soil moisture status did not change much in the 9 day interval. According to the November 29<sup>th</sup> edition of the US Drought Monitor, there was no improvement in the severe drought (D2 category) region. All of Vanderburgh, Posey, Gibson, and Daviess counties did improve from moderate drought (D1 category) to abnormally dry (D0 category) conditions. The north half of Pike county also returned to the D0 category. Several abnormally dry areas have returned to normal soil moisture status including the west half of Pulaski, north Tippecanoe, south Jasper, north White, all of Knox, the west half of Daviess, and central Adams counties. The net result is that severe drought (D2 category) continued at 2% of total area, moderate drought (D1 category) has improved from 15% to 11% coverage, abnormally dry (D0 category) coverage is unchanged at 35%, and normal soil moisture status areas have increased from 48% to 51% coverage, that is, about half of Indiana was unaffected by dry soils.

The November 28<sup>th</sup> edition of the USDA crop and weather bulletin was less optimistic, claiming that drought had actually spread since one week earlier. While the bulletin noted that most areas did get rain, the southern counties were not helped. Rain in northern counties slowed fieldwork but statewide the harvest of summer crops is essentially finished.

Soil moisture had improved sufficiently by the end of the month that the remaining 6 counties with burn bans removed those prohibitions on outdoor burning. Wildfire development across the state is no longer considered a significant risk.



## November 2016

<b>Region</b>	<b>Temperature</b>	<b>Temperature</b>	
		<b>Normal</b>	<b>Deviation</b>
Northwest	45.9	40.5	5.3
North Central	45.5	40.4	5.1
Northeast	45.2	40.1	5.1
West Central	47.0	42.1	4.9
Central	46.7	41.9	4.8
East Central	46.1	41.3	4.9
Southwest	49.1	45.4	3.7
South Central	48.7	45.0	3.6
Southeast	47.8	44.3	3.6
<b>State</b>	46.9	42.4	4.6

<b>Region</b>	<b>Precipitation</b>	<b>Precipitation</b>		
		<b>Normal</b>	<b>Deviation</b>	<b>Percent of Normal</b>
Northwest	3.02	3.16	-0.14	96
North Central	2.90	3.16	-0.25	92
Northeast	2.72	3.02	-0.30	90
West Central	2.94	3.60	-0.67	82
Central	2.59	3.63	-1.04	71
East Central	1.77	3.36	-1.60	52
Southwest	2.71	4.27	-1.56	64
South Central	2.46	4.09	-1.63	60
Southeast	1.89	3.70	-1.81	51
<b>State</b>	2.62	3.59	-0.97	73

## Autumn (Sep - Nov)

Region	Temperature	Temperature	
		Normal	Deviation
Northwest	57.5	52.7	4.8
North Central	57.0	52.2	4.8
Northeast	56.5	51.8	4.7
West Central	59.1	54.0	5.0
Central	58.7	53.6	5.1
East Central	58.2	52.8	5.4
Southwest	61.3	56.8	4.6
South Central	60.9	56.2	4.7
Southeast	60.2	55.4	4.8
<b>State</b>	58.9	54.0	4.9

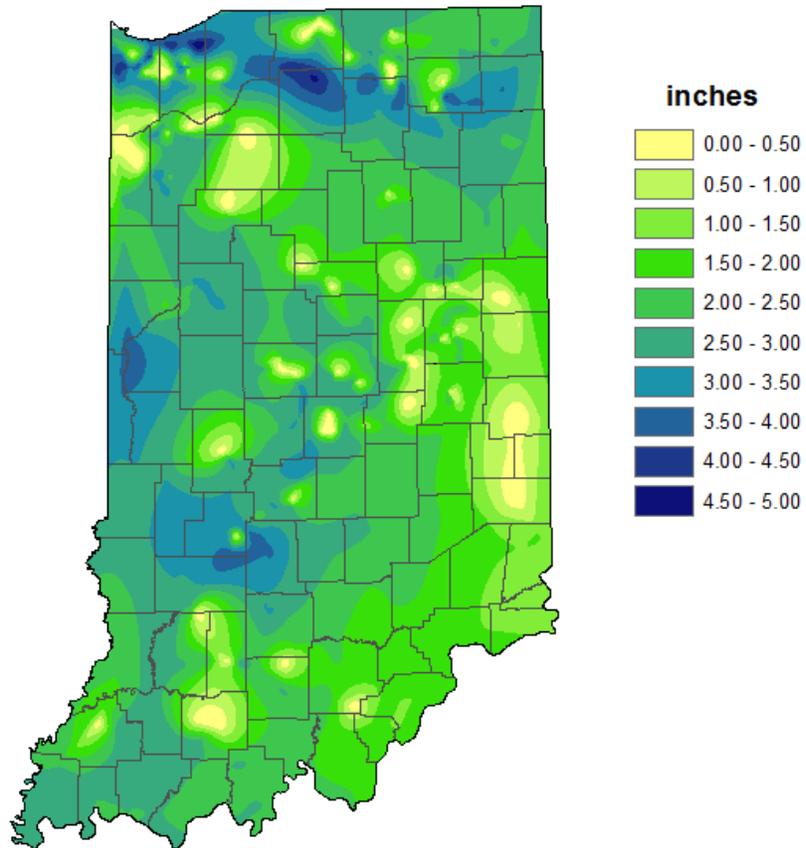
Region	Precipitation	Precipitation		
		Normal	Deviation	Percent of Normal
Northwest	9.76	9.29	0.47	105
North Central	10.05	9.41	0.64	107
Northeast	9.69	8.92	0.77	109
West Central	9.32	9.53	-0.21	98
Central	9.74	9.44	0.30	103
East Central	8.04	8.88	-0.84	91
Southwest	7.23	10.45	-3.21	69
South Central	7.04	10.21	-3.17	69
Southeast	7.50	9.66	-2.16	78
<b>State</b>	8.79	9.58	-0.79	92

## 2016 Annual so far (Jan - Nov)

Region	Temperature		
	Temperature	Normal	Deviation
Northwest	54.7	52.2	2.5
North Central	54.3	51.7	2.6
Northeast	54.2	51.3	2.9
West Central	56.6	53.8	2.8
Central	56.4	53.3	3.1
East Central	55.9	52.5	3.4
Southwest	59.4	56.9	2.5
South Central	59.0	56.3	2.6
Southeast	58.3	55.5	2.8
<b>State</b>	56.6	53.8	2.8

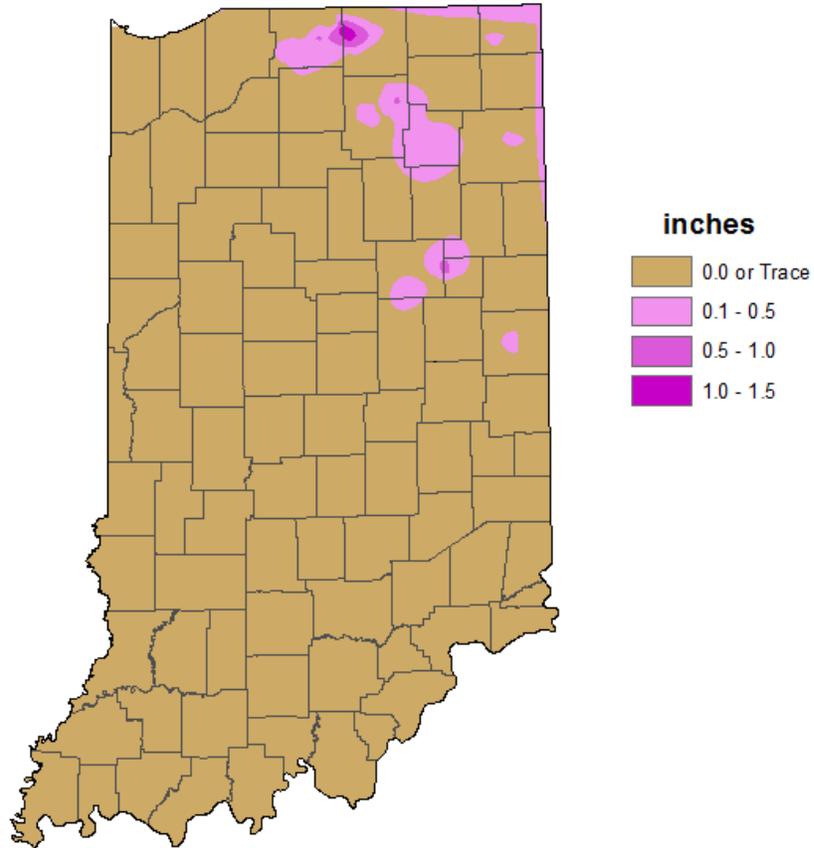
Region	Precipitation			
	Precipitation	Normal	Deviation	Percent of Normal
Northwest	40.30	35.38	4.92	114
North Central	37.56	35.43	2.13	106
Northeast	34.51	34.07	0.44	101
West Central	39.63	38.27	1.36	104
Central	44.14	37.76	6.38	117
East Central	37.98	36.37	1.61	104
Southwest	44.61	42.03	2.58	106
South Central	46.47	42.15	4.33	110
Southeast	42.79	40.71	2.07	105
<b>State</b>	41.30	38.13	3.17	108

**Total Precipitation  
November 2016  
CoCoRaHS network  
(336 stations)**



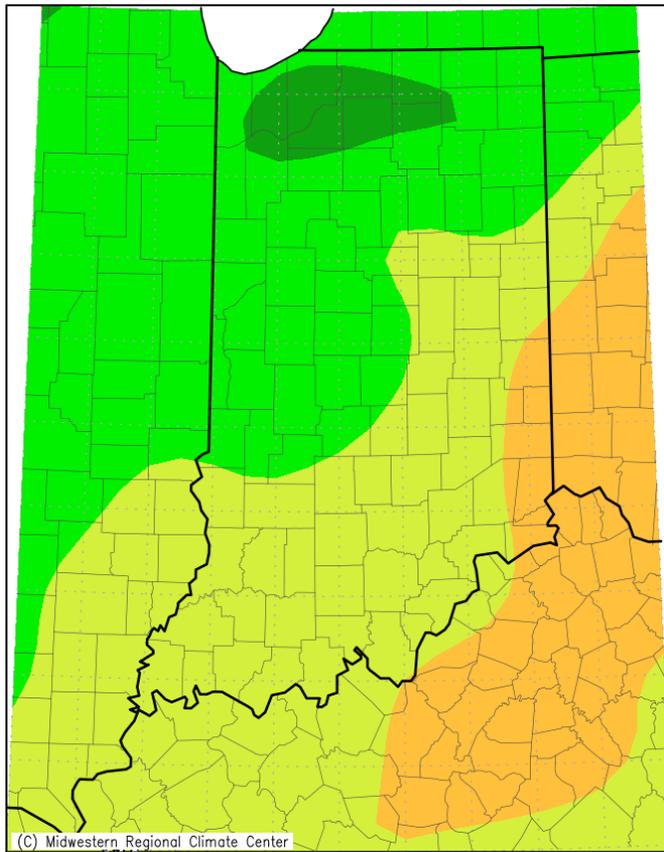
Analysis by Indiana State Climate Office  
Web: <http://www.iclimat.org>

**Total Snowfall  
November 2016  
CoCoRaHS network  
(336 stations)**



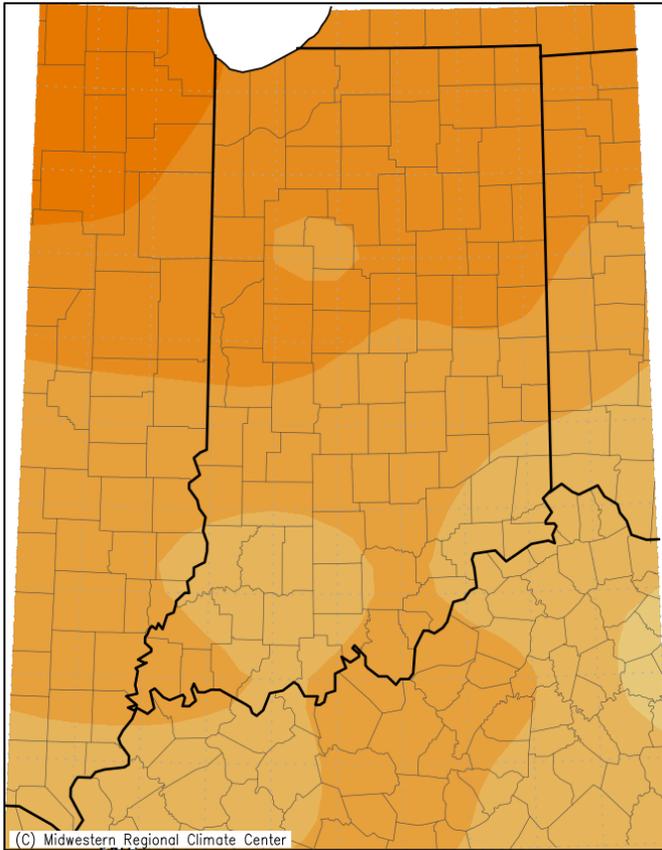
Analysis by Indiana State Climate Office  
Web: <http://www.iclimate.org>

Accumulated Precipitation: Percent of Mean  
November 1, 2016 to November 30, 2016



Midwestern Regional Climate Center  
cli-MATE: MRCC Application Tools Environment  
Generated at: 12/14/2016 2:40:12 PM CST

Average Temperature (°F): Departure from Mean  
November 1, 2016 to November 30, 2016



Mean period is 1981-2010.



Midwestern Regional Climate Center  
cli-MATE: MRCC Application Tools Environment  
Generated at: 12/14/2016 2:41:18 PM CST

## Drought Summary from the U.S. Drought Monitor

Below is a drought summary for the state of Indiana from the U.S. Drought Monitor. Areas in white are not experiencing any drought. Yellow areas are abnormally dry, but not considered a drought. Drought begins when the moisture levels become more severe, with beige, orange, red, and brown indicating increasing levels of drought (moderate, severe, extreme, and exceptional, respectively). The table below indicates what percentage of the state is drought free, and how much of the state is in drought by degree of severity (D1 - D4 category).

Indiana Statistics type: Categorical Percent Area

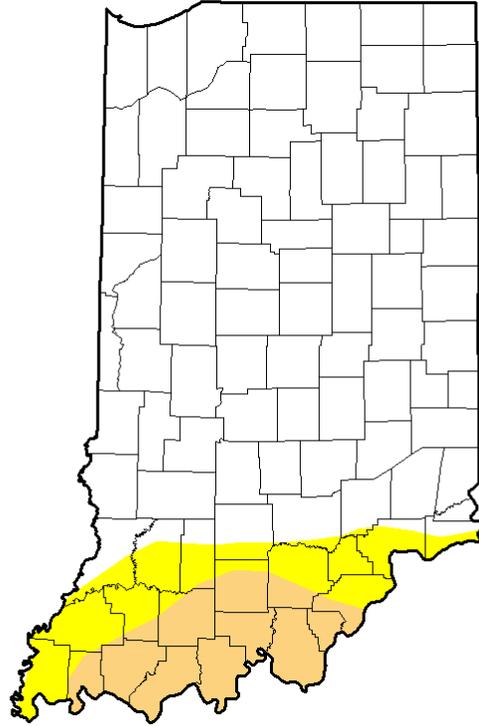
### Percent Area in U.S. Drought Monitor Categories

Show 25 entries

Search:

Week	None	D0	D1	D2	D3	D4
2016-12-06	51.61	34.30	11.66	2.43	0.00	0.00
2016-11-29	50.91	35.22	11.39	2.48	0.00	0.00
2016-11-22	47.62	35.18	14.72	2.48	0.00	0.00
2016-11-15	61.75	21.05	16.47	0.73	0.00	0.00
2016-11-08	79.64	7.41	12.94	0.00	0.00	0.00
2016-11-01	81.07	9.36	9.57	0.00	0.00	0.00

*Nov 1<sup>st</sup> Drought Summary*





*Nov 15<sup>th</sup> Drought Summary*

