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## Indiana State Climate Office

### Monthly Weather Report

**Sep 4, 2015**



<http://www.iclimat.org>

## August 2015 Climate Summary

### Month Summary

A very active wet summer weather pattern turned much calmer and drier in August. Just five storm systems moved through Indiana this month as evidenced by fewer rainy days and below normal rainfall. Near normal temperatures trended cool late in the month. Severe weather occurred on 7 days with most events localized to a few counties. No weather related injuries or deaths were reported.

August continued the cool trend set in July. The state average temperature for August 2015 was 71.0°F which is 1.6°F below normal. This ties 1903 as the 29<sup>th</sup> coolest August on record. The most recent cooler August was in 2009 with a state average 70.7°F in 26<sup>th</sup> place. Before then the 68.6°F average in 2004 was good for 6<sup>th</sup> coolest. The coldest August on record came in 1927 with its 66.3°F temperature average. The day split in August 2015 was 18 days of below normal temperature, 11 days above normal, and 2 days at normal. There were no days when the state temperature was more than 10°F above or below normal. The highest temperature of the month in the cooperative observer network was 96°F on August 3<sup>rd</sup> in Terre Haute. The coldest minimum was 42°F on August 25<sup>th</sup> in Elnora.

The August state precipitation average of 2.59" was 1.20" below normal, the 29<sup>th</sup> driest August on record. The most recent drier August was in 2013 when a 1.84" average was recorded. This amount tied 2010 for the 5<sup>th</sup> driest August on record in Indiana. The 2.55" value for 2011 comes in at 28<sup>th</sup> driest. In 2008 the average rainfall was calculated at 2.01" in the 9<sup>th</sup> spot. The driest August on record was 1.60" as reported in 1897. The highest single day precipitation among cooperative stations in August 2015 was 3.26" recorded on August 18<sup>th</sup> at Crawfordsville. The highest daily total in the CoCoRaHS network was 6.18" measured that same day at Lakes of the Four Seasons. The highest monthly total in the cooperative network was 7.85" as tallied at Decatur 1n. In the CoCoRaHS network the highest monthly total was 8.94" noted by the volunteer in Portage 2.8e.

Regionally August 2015 precipitation was near 85% of normal in northern Indiana, 55% of normal in central counties, and 70% of normal across the south. Normal August precipitation ranges from 3.6" in east central to 4.0" in west central Indiana. Widespread precipitation fell on about 11 days this month.

## August 1<sup>st</sup> – 8<sup>th</sup>

The opening days of August were slightly warmer than normal but state temperatures the rest of the 8 day interval turned cool. Light to moderate rain fell mostly during this cooler weather. Just one storm system passed through Indiana over the interval but was responsible for severe weather on three consecutive days: August 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup>. Despite a very wet June and July farms with sandy soils dried quickly and some farmers decided to start their irrigation systems.

High pressure moved into Indiana on August 1<sup>st</sup> with state temperatures poised right at normal. The ridge remained overhead the state the next day and coaxed the state average temperature upward to 2°F above normal. A cold front reached Indiana on August 3<sup>rd</sup>. The state temperature nudged barely colder to 1°F above normal. The slowing front crossed the state the next day as temperatures gradually slid to 1°F below normal. The front inched its way into Kentucky on August 5<sup>th</sup>. The cold front stalled then drifted slightly northward as a near stationary front the next day, settling along the Ohio River. The Indiana state temperature fell to 3°F below normal, the coolest of the 8 day interval.

On August 7<sup>th</sup> the stationary front reverted to a cold front and resumed its travel to the southern states. A triplet of low pressure centers gathered in Minnesota, leaving Indiana positioned between the two weather systems. The state temperature held at 3°F below normal. On August 8<sup>th</sup> a minor storm system with its own stationary front reached Chicago while the old southern cold front halted again over the southern states. The 8 days closed with the state temperature at 2°F below normal.

Over the 8 day interval the state temperature averaged to 1°F below normal. Typically in this first week of August the daily maximum temperature should range between 82°F in far northern Indiana to 88°F in the far southwest corner of the state. The daily minimum normally varies between 63°F and 67°F north to south across the state. The warmest daily maximum temperature in the cooperative station network during the interval was 96°F at Terre Haute on August 3<sup>rd</sup>. The coolest daily minimum in this same network was 51°F at Shoals 5s on August 2<sup>nd</sup>.

Rainfall was light the first few August days then became heavier once the cold front stalled along the Ohio River. More than 2 inches fell over the 8 day interval generally along a southwest to east central Indiana line between Gibson and Union counties. Less than a half inch was measured across much of west central Indiana. The heaviest single day amounts were noted in central Indiana in the CoCoRaHS morning reports of August 7<sup>th</sup>. On that day the Taylorsville volunteer measured 2.73” while three Columbus observers collected 2.35”, 2.10”, and 1.90” in their rain gages. In Greensburg 2.07” was recorded that morning.

Over the full 8 days Richmond tallied 3.11” and Taylorsville had 2.91”. An observer 9 miles outside Columbus noted 2.71”, Plainville had 2.59”, and in Evansville 2.31” was summed. Regionally about 0.8” was common across northern and central Indiana while near 1.50” was typical across the south. These totals equate to near 80% of normal in northern Indiana, 90% of normal in central areas, and 120% of normal in the south.

Wind damage occurred in a handful of Indiana counties on August 2<sup>nd</sup>. In Fulton county the roof of a round barn was damaged and fallen trees caused power outages. Nearby in Miami county several trees fell on to a chicken coop. Wind gusts to 60 mph tore down sparking power lines in Porter and Laporte counties on to roadways below. In Porter county a dozen trees were uprooted in a city park

with several more trees down in a neighborhood nearby, one landing on a house causing damage. Wind gust damage was reported throughout the city of Valparaiso. Uprooted trees in Laporte and Steuben counties blocked roadways.

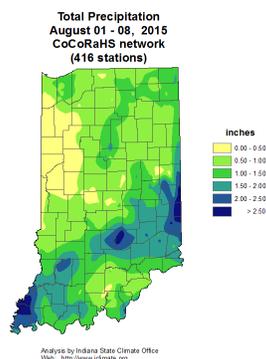
Large hail was reported in 5 counties of east central Indiana the next day. Hail to 1.25” in diameter was noted in Randolph county with 1.75” stones in Delaware county. One inch hail was noted in Randolph and Wayne counties. Still larger hail with sizes of 1.75” and 2.00” were recorded in Union county while hail to 2.50” was observed in Fayette county. Meanwhile thunderstorm winds leveled several trees in Wayne and Union counties.

Severe weather was limited to two far southern Indiana counties on August 4<sup>th</sup>. A few trees were taken down by storms in Spencer and Harrison counties with one tree reported on a local roadway.

The August 10<sup>th</sup> edition of the USDA Indiana crop bulletin reports recent warmer weather has dried remaining wet spots in fields. Some farmers in sandy soils have commenced irrigation to keep crops from drying out further where crops were showing light to moderate stress. Soybeans have recovered more quickly than corn after the heavy summer rains. Many corn plants were still yellow with the tips of ears aborting kernels due to lack of nitrogen. Corn ears were reported small while soybeans were showing fewer nodes. Weeds were competing greatly with soybeans for space and nutrients. Overall less than half the Indiana crop of corn and soybeans is rated in excellent to good condition. Livestock condition remained good due to adequate pastures.

Some long term impacts from the rainy early summer are easing. Reservoir water levels in Miami county were dropping about 1 foot per day yet remain above normal. Water levels are expected to return to normal by early September. Most recreational facilities remained closed.

Heavy rainfall this summer has hampered other projects. Officials in Blackford, Delaware, and Henry counties reported that patching thousands of street potholes had fallen far behind due to the summer rainfall and the sheer number of roads needing repair work after the rough winter. County roads in many Indiana counties were rated in deplorable condition.



## August 9<sup>th</sup> – 15<sup>th</sup>

August weather was rather quiet this week. The state average temperature held within 3°F of normal as, like the week before, just one weather system passed through the state. The week began and ended slightly warmer than normal with temperatures a bit cooler than normal in mid-week. Rainfall followed the temperature trend with dry weather on cool days and precipitation falling during warmer days. Severe weather was localized to one county which reported wind damage at the end of the week.

The week opened with the state average temperature right at normal. High pressure was retreating east of Indiana on August 9<sup>th</sup>. A storm system from Kansas approached the state later in the day. The storm's warm front crossed into central Indiana the next day, lifting the state temperature to 3°F above normal, the warmest day of the week. The cold front side of the storm moved through and beyond Indiana on August 11<sup>th</sup>, replacing rainy days with sunny skies.

Over the next 4 days a large ridge of high pressure settled overhead the state. The arrival of cooler air on August 12<sup>th</sup> forced the state temperature down to 3°F below normal. The ridge sprawled northeast of Indiana over the next 4 days, slowly raising the state temperature to 2°F below normal on August 13<sup>th</sup>, then to 1°F below normal the next day. On August 15<sup>th</sup> the ridge started its exit to the east of Indiana. The state temperature continued to rise to wrap up the week at 1°F above normal.

Overall the state temperature averaged to right about normal this week. Typically at this point in August the daily maximum temperature should range between 81°F and 88°F north to south across Indiana. Daily minimums should vary from 62°F in far northern Indiana to near 66°F in the southwest corner of the state. The warmest maximum temperature this week in the cooperative station network was 91°F at Terre Haute on August 11<sup>th</sup> and at Farmersburg on August 15<sup>th</sup>. The coolest minimum temperature in this same network was 53°F at several locations on August 13<sup>th</sup> and 14<sup>th</sup>.

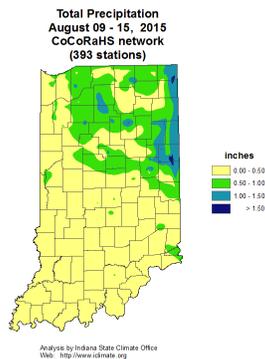
Generally only the northeast quarter of the state received more than a half inch of rain this week. Within this area only far eastern communities bordering Ohio received the heaviest totals of 1" to 2" of rainfall. Regionally for the week about 0.7" of rain dropped in northern Indiana, 0.4" fell in central counties, and about 0.2" wet the ground in the south. These amounts equate to about 80% of normal across the north, 50% of normal in the central section of the state, and 30% of normal in southern Indiana. The heaviest single day amounts were found in northern Indiana in the August 15<sup>th</sup> morning reports. In the CoCoRaHS network the Urbana observer collected 1.65" while 1.28" was measured near Wanatah. In Hamilton a volunteer noted 1.04" while 1.02" fell outside Rochester. Over the full week northeast and north central Indiana reports were largest with the Hamilton observer tallying 1.74", Urbana 1.67", Albany 1.61", Portland 1.51", and Angola 1.46".

Severe weather was limited to just one county on one day this week. A localized storm in Dubois county on August 15<sup>th</sup> downed trees and power poles there. No other reports of damages or injuries were received from across the state.

There was good news for Indiana farmers this week. On August 12<sup>th</sup> the USDA declared farms in 53 Indiana counties were eligible for federal aid due to the heavy rain and flooding experienced in

June and July. The declaration permits farmers in these counties to apply for low interest emergency loans through their county Farm Service Agency office.

Sunny and dry weather is extracting moisture from Indiana soils according to the August 17<sup>th</sup> edition of the USDA Indiana crop bulletin. Irrigation systems are running in some of the drier areas. The report said corn was finally greening up and soybeans were filling pods in response to the past 3 weeks of warm temperatures and light precipitation. But low levels of nitrogen and potassium are still a concern in some fields. Late cuttings of hay were underway while livestock are in good condition despite some minor heat stress. Still less than half of Indiana corn and soybean crops are rated in good to excellent condition.



## August 16<sup>th</sup> – 22<sup>nd</sup>

Mostly tranquil weather persisted into this third week of August. Only one weather system each week thus far has passed through Indiana this month. Early this week warm air on the front side of the single weather system brought warmer than normal temperatures into the state. Cooler than normal temperatures behind the system's cold front finished off the final 3 days. Light to moderate rain fell on all but the last day, making for a wetter than normal week. Two northern Indiana counties reported local wind damage on August 17<sup>th</sup> as the lone weather system moved closer to the state. Local soil dryness is forcing crop dry down to begin in some farmer fields where crops were planted early.

Strong high pressure in West Virginia transported warm air into Indiana from the Gulf states. The state average temperature held at 3°F above normal on August 16<sup>th</sup> and 17<sup>th</sup>. The storm system slowed to a halt near Chicago on August 18<sup>th</sup>, unable to proceed against the high pressure block over Indiana and eastern states. The state temperature edged lower to 2°F above normal. The storm retrograded but strengthened the next day, planting its warm front in northern Michigan and its cold front in Illinois. Indiana was positioned firmly inside the storm's warm sector.

On August 20<sup>th</sup> the cold front finally pushed through Indiana, tapping into colder Canadian air and dropping the state temperature to 5°F below normal. Cold high pressure behind the front lingered

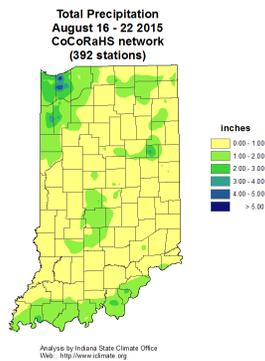
over Ohio and Indiana the next day. The high center passed to the east of Indiana on August 22<sup>nd</sup>, setting up a weak backside flow into the state to nudge the state temperature to 4°F below normal.

Over the 7 days the state temperature averaged to 1°F below normal. Usually in the third week of August daily maximum temperatures should range from about 81°F in far northern counties to 88°F in the southwest corner of the state. Daily minimums should vary between 62°F and 65°F north to south across the state. The warmest temperature of the week among cooperative stations was 92°F at Elnora on August 16<sup>th</sup> and at Vincennes 5ne on August 17<sup>th</sup>. The coolest temperature in this same network was 48°F at West Lafayette 6nw on August 21<sup>st</sup> and at New Castle 4sse on August 22<sup>nd</sup>.

Rain fell every day somewhere in Indiana until the cold front passed through and cleared Indiana skies. Generally more than an inch of rain accumulated north of a Fowler to South Bend line and in the southern tier of counties bordering the Ohio River. Rainfall was very heavy in Porter county. Regionally about 1.0" fell across northern and southern Indiana and about 0.7" across the central part of the state. These amounts equate to about 120% of normal in the north, right at normal in central Indiana, and 140% of normal across the south. The heaviest single day rainfall was revealed in the daily morning reports of August 18<sup>th</sup>. Two CoCoRaHS network volunteers at the Lakes of the Four Seasons measured 6.18" and 5.05" that day. Nearby in Portage 4.54" was recorded while 4.48" was noted outside the city of Valparaiso. A Syracuse gage in Kosciusko county collected 5.03". Over the full week the Portage observer summed 6.44" of rain while three Valparaiso area residents tallied 4.83", 3.97", and 3.89" for the week. A Mount Ayr volunteer noted 4.11".

Wind gust damage was reported in Kosciusko and Miami counties on August 17<sup>th</sup>. In Kosciusko county trees were uprooted with one tree falling on to a roadway. The heavy rainfall also flooded a garage there. In Miami county a few trees were toppled by the wind and scattered power outages were noted.

The August 24<sup>th</sup> edition of the USDA Indiana crop bulletin reports that the dry down process for early planted corn and soybeans has started early in response to recent cool and mostly dry weather conditions. The sudden transition from very wet weather has left some corn stunted or nutrient deficient with below average filling of ears. Less than half of all corn and soybeans continues to be rated in excellent or good condition. Some of the poor corn was being harvested for silage. Growth in other crops has also slowed due to the cooler weather. Diseases are becoming more apparent. Some pastures are starting to show brown grasses due to lack of moisture but livestock condition remains good.



## August 23<sup>rd</sup> – 31<sup>st</sup>

The final 9 days of August marked the coldest time of the month. The state average temperature exceeded normal on only the last 2 of these 9 days. Rainfall totals were generally well below normal. Just two storm systems rolled through the state as August weather remained rather tranquil. One county reported wind damage on August 23<sup>rd</sup>, the only severe weather report in these closing days of the month.

The state average temperature on August 23<sup>rd</sup> was 2°F below normal. A strong cold front in Illinois swept quickly through Indiana and raced to Pennsylvania by the next morning. Indiana temperatures dipped to 7°F below normal on August 24<sup>th</sup>. Cold air funneled into the state the next day as rainfall stopped and high pressure took over, clearing the skies. The state temperature fell to 9°F below normal, the coldest of the month. The high pressure ridge drifted slowly overhead Indiana on August 27<sup>th</sup> and slid to the east a day later. The state temperature slowly rebounded to 6°F below normal by August 28<sup>th</sup> as southerly winds behind the ridge tapped into warmer air.

On August 29<sup>th</sup> an Iowa storm system set a stationary front just north of Indiana and a slowing cold front in Missouri and Kansas. Warm air flow ahead of this storm helped bump the Indiana temperature to 2°F below normal. The next day the cold front stalled as a stationary front that extended from Oklahoma into northern Indiana. Yet the transport of warm air continued, lifting the state temperature to 3°F above normal. The front dissolved later in the day as warmer air mixed well north and south of the front. High pressure behind the fizzled front pushed east of Indiana on August 31<sup>st</sup>, allowing warming to continue. The state temperature on the last August day rose to 4°F above normal.

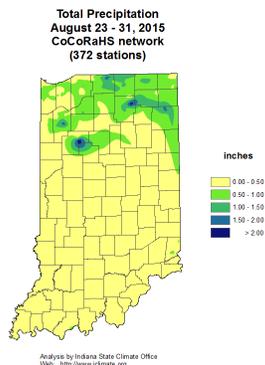
Over these 9 days the state temperature averaged to 4°F below normal. Typically in the final days of August the daily maximum temperature would range between 80°F and 87°F north to south across the state. Normal daily minimums should vary from 60°F in far northern counties of the state to 64°F in southwest Indiana. The warmest temperature among cooperative network stations over the 9 day interval was 92°F at Terre Haute on August 31<sup>st</sup>. The coolest temperature in this same network was 42°F at Elnora on August 25<sup>th</sup>.

Rain fell mostly at the very start and end of the 9 days with dry conditions in the colder middle of the interval. Less than a half inch accumulated across central and southern Indiana. Near 1" was common in the north with isolated spots receiving more than 2". On August 24<sup>th</sup> the CoCoRaHS reporter at Leesburg measured 1.57" while in Leo 1.46" was collected. Six days later early on August 30<sup>th</sup> the Monticello volunteer read 2.20" in the gage. Two Rensselaer observers noted 1.85" and 1.31" that morning. The highest 9 day totals included 2.48" at Monticello, 1.83" in Leo, 1.73" at North Webster, and 1.31" in Granger. Regionally about 0.6" fell across the northern third of Indiana with about 0.1" in central and southern parts of the state. These totals equate to near 60% of normal in the north but just 10% of normal in the rest of Indiana.

Only Allen county reported damage due to severe weather. On August 23<sup>rd</sup> part of a barn roof was torn off and tree limbs were ripped down in local storm gusts.

On August 31<sup>st</sup> Governor Pence requested federal grants from FEMA for nonprofit and government organizations in 19 counties that were impacted by the summer flooding. The grants would pay 75% of eligible expenses for damage to structures such as roads, bridges, utilities, building contents and equipment, water control facilities, parks and recreational facilities, and for debris removal and emergency actions such as traffic control and rescue operations.

Farmers are concerned about the pending harvest season if cool and dry weather persists according to the August 31<sup>st</sup> edition of the USDA Indiana weekly crop report. The report notes that crop maturity has slowed. Cool weather can cause underfill of corn kernels and soybean pods. Due to extreme early summer rains root systems are shallow and are susceptible to drought and root diseases. The drier weather has been beneficial for hay cutting and livestock were in very good condition the report states.



## August 2015

<b>Region</b>	<b>Temperature</b>	<b>Temperature</b>	
		<b>Normal</b>	<b>Deviation</b>
Northwest	70.2	71.6	-1.4
North Central	69.7	71.0	-1.3
Northeast	69.6	70.6	-1.1
West Central	70.9	72.8	-1.8
Central	70.5	72.2	-1.7
East Central	70.0	71.4	-1.4
Southwest	73.1	75.2	-2.1
South Central	72.7	74.5	-1.8
Southeast	72.0	73.8	-1.8
<b>State</b>	71.0	72.7	-1.6

<b>Region</b>	<b>Precipitation</b>	<b>Precipitation</b>		
		<b>Normal</b>	<b>Deviation</b>	<b>Percent of Normal</b>
Northwest	2.82	3.81	-0.99	74
North Central	3.10	3.83	-0.73	81
Northeast	3.42	3.68	-0.27	93
West Central	1.69	3.96	-2.27	43
Central	2.17	3.75	-1.59	58
East Central	2.45	3.55	-1.09	69
Southwest	2.59	3.67	-1.08	71
South Central	2.58	3.91	-1.33	66
Southeast	2.90	3.90	-1.00	74
<b>State</b>	2.59	3.79	-1.20	68

## Summer (June - August)

Region	Temperature	Temperature	
		Normal	Deviation
Northwest	70.4	71.8	-1.4
North Central	69.9	71.2	-1.4
Northeast	69.6	70.9	-1.3
West Central	71.8	73.0	-1.2
Central	71.5	72.4	-0.9
East Central	70.9	71.6	-0.7
Southwest	74.8	75.2	-0.4
South Central	74.2	74.4	-0.2
Southeast	73.3	73.6	-0.4
<b>State</b>	71.9	72.8	-0.9

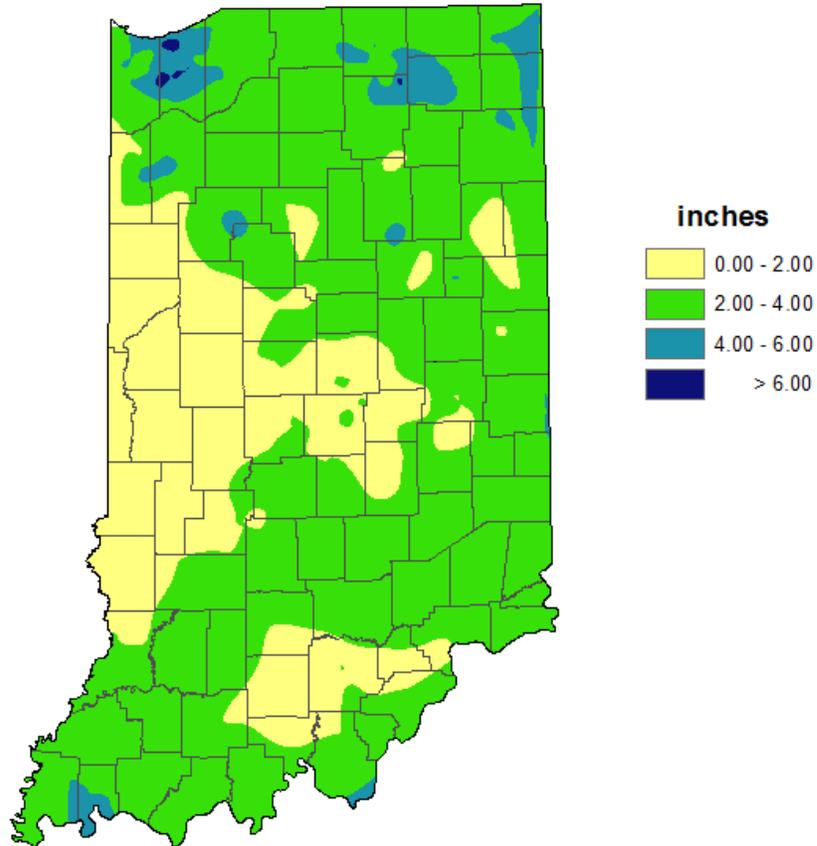
Region	Precipitation	Precipitation		
		Normal	Deviation	Percent of Normal
Northwest	18.07	12.01	6.06	150
North Central	17.28	11.93	5.35	145
Northeast	18.50	11.42	7.08	162
West Central	17.18	12.68	4.50	135
Central	18.79	12.11	6.68	155
East Central	17.75	11.88	5.87	149
Southwest	16.45	12.04	4.41	137
South Central	17.66	12.32	5.34	143
Southeast	17.81	12.23	5.57	146
<b>State</b>	17.74	12.08	5.65	147

## 2015 Annual (through August)

Region	Temperature	Temperature	
		Normal	Deviation
Northwest	49.9	52.1	-2.2
North Central	49.4	51.6	-2.3
Northeast	48.9	51.2	-2.3
West Central	52.1	53.8	-1.7
Central	52.1	53.3	-1.2
East Central	51.3	52.5	-1.2
Southwest	55.8	57.0	-1.2
South Central	55.4	56.4	-1.1
Southeast	54.5	55.6	-1.1
<b>State</b>	52.2	53.8	-1.6

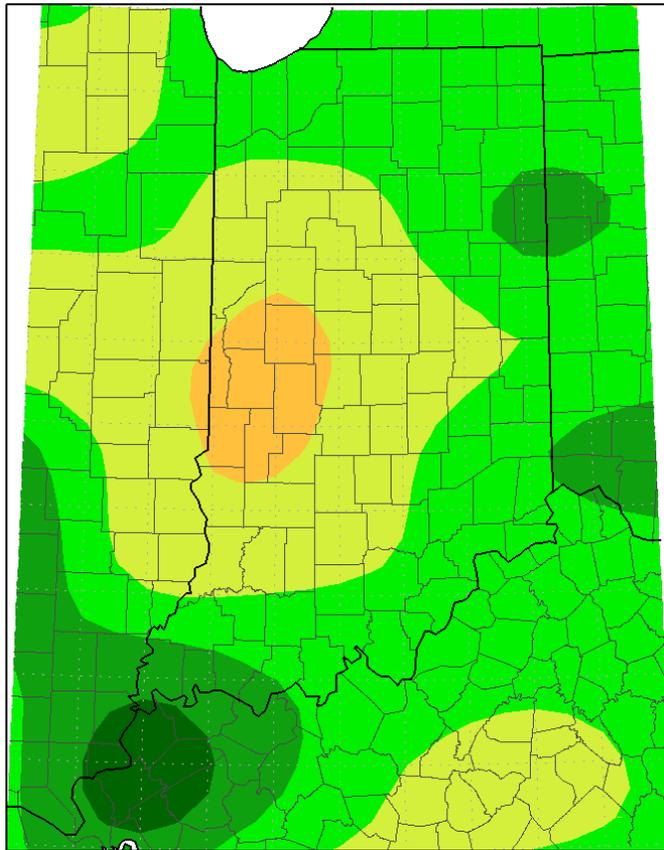
Region	Precipitation	Precipitation		
		Normal	Deviation	Percent of Normal
Northwest	30.59	26.06	4.53	117
North Central	29.72	26.00	3.72	114
Northeast	30.45	25.15	5.31	121
West Central	31.92	28.74	3.18	111
Central	33.99	28.31	5.67	120
East Central	33.53	27.48	6.04	122
Southwest	38.27	31.58	6.69	121
South Central	40.14	31.93	8.21	126
Southeast	36.40	31.05	5.35	117
<b>State</b>	33.97	28.54	5.43	119

**Total Precipitation  
August 2015  
CoCoRaHS network  
(404 stations)**

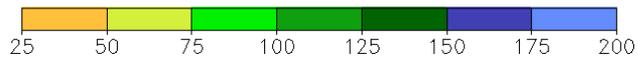


Analysis by Indiana State Climate Office  
Web: <http://www.iclimate.org>

Accumulated Precipitation: Percent of Mean  
August 1, 2015 to August 31, 2015

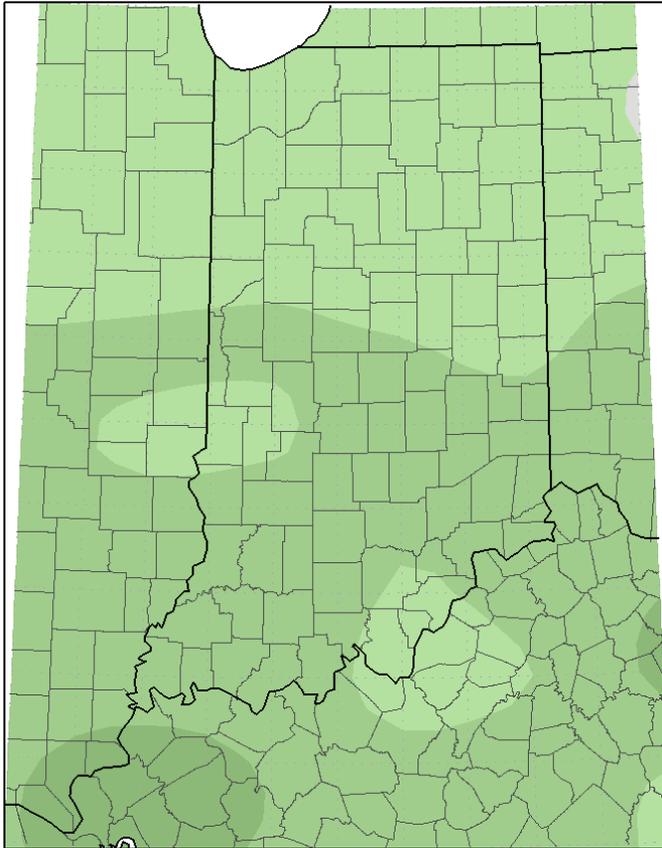


Mean period is 1981-2010.

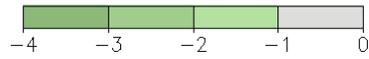


Midwestern Regional Climate Center  
cli-MATE: MRCC Application Tools Environment  
Generated at: 9/3/2015 3:13:07 PM CDT

Average Temperature (°F): Departure from Mean  
August 1, 2015 to August 31, 2015



Mean period is 1981-2010.



Midwestern Regional Climate Center  
cli-MATE: MRCC Application Tools Environment  
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## *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).

▼
Statistics type: Categorical Percent Area ▼
Indiana ▼

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

Show 25 ▼ entries

Search:

Week ▼	None	D0	D1	D2	D3	D4
2015-09-01	100.00	0.00	0.00	0.00	0.00	0.00
2015-08-25	100.00	0.00	0.00	0.00	0.00	0.00
2015-08-18	100.00	0.00	0.00	0.00	0.00	0.00
2015-08-11	100.00	0.00	0.00	0.00	0.00	0.00
2015-08-04	100.00	0.00	0.00	0.00	0.00	0.00

*August 4<sup>th</sup> Drought Summary*



*August 11<sup>th</sup> Drought Summary*



*August 18<sup>th</sup> Drought Summary*



*August 25<sup>th</sup> Drought Summary*



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

