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**Ken Scheeringa  
and  
Matt Price**

## Indiana State Climate Office

### Monthly Weather Report

**Aug 5, 2013**



<http://www.iclimat.e.org>

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## July 2013 Climate Summary

### Month Summary

July temperatures were often cooler than normal. Only the third week of the month featured the heat and humidity Indiana summers are famous for. Field corn pollination and air conditioning costs benefited greatly from the cooler temperatures. Some of our weather systems moved irregularly at times, traveling in reverse: east to west, across the region this month.

July continued the 5 month trend of alternating wet and dry months in Indiana: March, May, and July were drier than normal; April and June wetter. After a very active June significant severe weather was limited to just one July day. An EF-1 tornado struck near Peru in Miami county on July 10<sup>th</sup>, resulting in 2 injuries, no deaths, but with much damage. That same day high wind damage was reported in 20 Indiana counties with one person injured at the Howard county fair.

The July state average temperature of 72.6°F was 2.1°F below normal. This places the month as the 22<sup>nd</sup> coolest July in Indiana since state records began in 1895. The most recent July cooler than this was the 69.0°F average posted in 2009. Some other recent cooler Julys include 2007 at 71.7°F, tied for 8<sup>th</sup> coolest, and three years earlier, a 72.1°F average in 2004 in a 4-way tie for 14<sup>th</sup> place. July 2000 came in 10<sup>th</sup> place with a 71.8°F state average. The day split in July 2013 was 17 days of below normal temperature, 10 days above normal, and 4 days right at normal. The daily state average temperature was 10°F or more below normal on one day. The warmest official temperature in the state this month was 99°F recorded at Poseyville on July 15<sup>th</sup>. Wanatah captured honors as the cold spot in the state with a 42°F reading on July 28<sup>th</sup>.

July state precipitation was 3.37 inches, or 0.73 inches below normal, which ranks as the 47<sup>th</sup> driest July on record. The most recent drier July was during the 2012 drought with a 2.62 inch state average, the 21<sup>st</sup> driest July on record. The year prior 2.91 inches fell in July 2011, good for 26<sup>th</sup> place. In July 2007 the state number was 3.30 inches, coming in at 44<sup>th</sup> driest. The all-time driest July had a scant 1.29 inch recorded in 1901 and again in 1974. Regionally July 2013 precipitation was about 75% of the 3.8 inch normal in northern Indiana and 4.3 inch normal in central counties. In the south precipitation was very close to its 4.2 inch normal. The highest single day cooperative station precipitation this month came on July 22<sup>nd</sup> at Boonville when 3.95 inches was recorded. The heaviest CoCoRaHS single day precipitation amount was 4.86 inches measured at Syracuse that same day. Widespread rain fell on about 17 days this month.

Storms producing damage occurred on July 2<sup>nd</sup>, 10<sup>th</sup>, 13<sup>th</sup>, 20<sup>th</sup>, and 23<sup>rd</sup>. The most significant of these was on July 10<sup>th</sup> when an EF-1 tornado touched down in Miami county and high wind gusts impacted property in 20 counties. Three persons were injured on this day but there were no deaths.

Minor storm damage was reported on the other listed dates. Details on all these storms can be found in the weekly narratives which follow.

The effects of the hot and humid third July week have become evident. Abnormally dry soil conditions (D0 category) in six east central Indiana counties appeared in the July 23<sup>rd</sup> and July 30<sup>th</sup> editions of the weekly US Drought Monitor. This is the first abnormally dry area classified in Indiana since the April 9<sup>th</sup> edition. This is considered a short term event and drought conditions are not expected to develop in Indiana as August gets underway.

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

The calendar says July but the weather certainly doesn't feel like it. Temperatures were below normal all week long until the last day. The rain hasn't stopped either. The last day it did not rain anywhere in Indiana was a month ago on June 5<sup>th</sup>! The current jet stream path in the upper atmosphere is forming a strong high pressure ridge in our western states and a low pressure trough in the east. The western ridge has brought relentless heat and dryness out west and dismal cloudy, cool, and rainy weather to Indiana. The rotating low center over us was visible on radar as a circular pattern of rain showers moving westward in northern Indiana and eastward in southern counties.

The week began with the state average temperature at 5°F below normal. A cold front surged through Indiana before slowing to a stall in Kentucky. The state temperature barely fell to 6°F below normal in response to the weak cold front. High pressure behind the front was able to sustain a flow of cool air into our state. Meanwhile the Bermuda ridge in the Atlantic Ocean was growing stronger by the day. Its westward expansion countered the eastward moving Canadian high pressure ridge. With the clash of the opposing ridges a stationary front formed between them over Indiana, a favored setup for more wet weather.

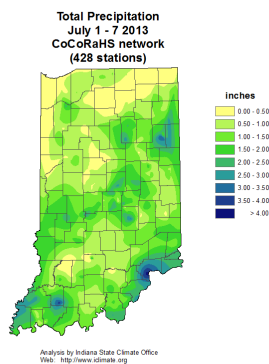
On July 5<sup>th</sup> the Bermuda ridge was beginning to win out. The frontal boundary in Indiana had washed away and the old Canadian ridge was absorbed into the Bermuda ridge which now extended its dominance over the eastern half of the country. Indiana was now in the warm backside flow of this ridge system and daily temperatures had inched up slowly to 3°F below normal. By the end of the week the state average temperature had returned to normal. Overall for the week the state temperature had averaged to about 4°F below normal. Typically this first week of July daily maximum temperatures should range between 83°F and 89°F north to south across the state. Daily minimums vary from 63°F in far northern Indiana to 68°F in the far southwest.

While the battle of the ridges was ongoing, so was the daily rainfall. The heaviest rain fell early in the week with the passage of the cold front. Rainfall then tapered off to very light amounts for the remainder of the week. On average weekly total rainfall was about 0.7 inch in northern Indiana, 1.3 inch in central, and 1.8 inch across the south. These totals equate to right at normal in the north, 130% of normal in central counties, and about 170% of normal in southern Indiana. The highest single day rainfall came early in the week with 2.57 inches recorded by the CoCoRaHS observer in Bluffton on the morning of July 1<sup>st</sup>. The next day the Stendal volunteer measured 3.80 inches while 2.85 inches was noted at Fort Branch. On July 3<sup>rd</sup> the heaviest rain amount was collected at Oolitic with 3.50 inches while in Indianapolis 2.11 inches was received. The highest weekly rainfall totals included 4.29 inches at Hanover, 3.62 inches in Bluffton, and 3.16 inches at Shelbyville. The

Jeffersonville CoCoRaHS reporter had 2.76 inches while 2.73 inches had accumulated in the Poseyville rain gage.

Only one severe weather day occurred this week in minor incidents. On July 2<sup>nd</sup> wind gusts snapped trees which fell on Jay county roadways. In Hamilton county several trees were also reported down.

With the continued wet weather farmers were worried about finishing the wheat harvest. According to the latest Weekly Crop Report of the Indiana Ag Statistics Office, drier conditions are also needed soon to cover the delay in baling straw and planting double crop soybeans. However the recent plentiful moisture has benefited the corn crop as it is growing rapidly and tasseling has begun in a few fields.



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

Indiana was warm and humid to start the week as surface high pressure expanded westward into the Midwest from the Northeast states. State average temperatures were on the rise, peaking for the week at 3°F above normal by July 9<sup>th</sup>. Cooler air had been building in western Canada and began to make its move towards Indiana. Its leading edge was a stationary front sagging south on the Michigan border. The front then pushed forcefully through Indiana as a cold front on July 10<sup>th</sup>. The eviction of the humid air mass by the refreshingly cooler air triggered violent weather across Indiana that afternoon and evening. A tornado was observed in Miami county, widespread wind damage across the state, and some larger hail in northwest counties.

Cooler more pleasant air poured into Indiana, dropping temperatures to 3°F below normal the next day and to 5°F below normal by July 12<sup>th</sup>, the coolest day of the week. The high pressure center from west Canada was now overhead Indiana, then drifted to New England on July 13<sup>th</sup>. Fair weather continued over our state as winds now turned from the south and temperatures rebounded a few degrees.

The New England high center began to retrograde westward towards the Midwest, curiously as the previous one had done before it. The movement of pressure centers in the upper atmosphere was also atypical. The remnants of the mid-week storm center trekked backwards to its southwest while

the upper ridge slipped westward around it to its north. Meanwhile at ground level state average temperatures had returned to normal as the week came to a close. Usually in this second week of July daily maximum temperatures should average between 83°F in far northern counties to 89°F in far southwest Indiana. Daily minimums should vary between 63°F and 68°F north to south across the state.

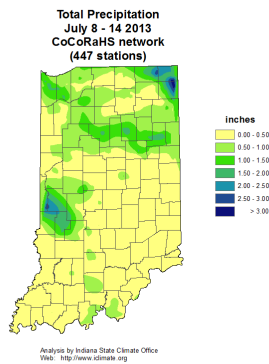
Rain fell on 5 of 7 days this week and was generally heavier across northern Indiana and in some far west central Indiana spots than elsewhere. Regional amounts averaged near 0.8 inch in the north and about 0.4 inch in central and southern Indiana. These totals equate to near normal in northern Indiana and 40% to 50% of normal elsewhere. Locally heavy amounts were reported on the morning of July 8<sup>th</sup> in the northeast corner of the state. Two CoCoRaHS observers in Hamilton noted 2.12 and 1.83 inches that day. The strong cold front on July 10<sup>th</sup> dumped heavy rain in parts of north central and west central Indiana. The next morning the CoCoRaHS volunteer at Clinton had 2.80 inches while in nearby Reelsville 1.99 inches was measured. The gauge in Wabash had collected 2.05 inches. The largest totals for the week all came out of northeast Indiana. The two Hamilton observers had 3.41 and 3.25 inches, while other totals included 2.89 inches in Lagrange, 2.48 inches in Angola, and 2.03 inches at Bluffton.

An EF-1 tornado touched down near Peru in Miami county on July 10<sup>th</sup>. This tornado continued for 3.5 miles and resulted in 2 injuries but no deaths. A woman was rescued from an overturned van at a local business parking lot. The tornado uprooted or snapped numerous trees all along its path. Some of these trees damaged the roofs of homes and businesses. Windows were blown out of 8 mobile homes, some of which were also shifted off their foundations. Power lines were torn down in some areas and a medical center, two businesses, and a local park suffered minor damage.

Elsewhere wind gusts at 60 to 70 mph toppled trees in 20 Indiana counties. One injury occurred at the Howard county fair when high winds blew a tent away. Trees fell on a garage in Marshall county and on a house in Kosciusko county. Trees yanked down power lines in Miami, Cass, Jay, Madison, and Monroe counties, and fell on a mobile home in Tippecanoe county. A few hundred customers lost power in each of Tippecanoe, Carroll, and Clinton counties. Throughout Indiana an estimated 20,000 people lost power. Power poles were down in Jay county. There were several reports of trees falling and blocking roads in Huntington, Grant, and Jay counties. Flash flood warnings were posted in Carroll county while high winds flattened corn there and in Hamilton county. Counties with only tree damage or high winds reported included Whitley, Blackford, Wayne, Marion, Parke, Greene, Washington, Clark, and Harrison.

Hail of diameter 1.75 inch fell in Lake county while 1.50 inch hail fell in neighboring Porter county.

Wind damage on July 13<sup>th</sup> was much more localized, impacting only a single county. Reports from Knox county indicate wind gusts of 40 to 50 mph with some trees down and a car port blown into a fence.



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

Two weeks ago the weather didn't feel very much like July. But the heat and humidity of a real Indiana summer finally arrived in full force this week. State average temperatures held above normal nearly all week long until the very end when normal levels returned. Daily maximum temperatures were in the low to middle 90s F statewide on most days with dew points in the middle 70s F. Heat index values approached 100°F at several locations.

Daily state average temperatures were on the rise from near 4°F above normal on July 15<sup>th</sup> to a peak around 7°F above normal by July 18<sup>th</sup>. During this time Indiana was in the southerly backside flow of a massive high pressure ridge that dominated the eastern half of the country. This ridge had an interesting history in that after its typical migration last week from western Canada to New England, the ridge retrograded westward in an unusual return to Indiana by July 16<sup>th</sup>. The next day the ridge was directly overhead our state, then expanded its coverage still further, stretching from Virginia to Oklahoma on July 18<sup>th</sup>. In the upper atmosphere this ridge extended coast to coast, enabled by the jet stream which had finally retreated north of the Canadian border. The surface ridge placement amplified the transfer of hot and humid air from the Gulf states into the Great Lakes region.

Erosion of the mighty ridge began at its western edge on July 19<sup>th</sup> but not yet in the east. In the upper atmosphere a mid-Canada trough of low pressure formed and dipped southward to slice the continental ridge into halves. This promoted a collapse of the surface ridge on July 20<sup>th</sup> as a cold front started moving across Indiana, tempering the heat wave and lowering state average temperatures to 3°F above normal. A second but weak cold front followed immediately attempting to reinforce the cooler air. As the week closed the two cold fronts merged over central Indiana, then stalled there on July 21<sup>st</sup> awaiting the exit of the strong ridge eastward into the Atlantic. Overall for the week state temperatures averaged to 5°F above normal. Typically in the middle of July daily maximum temperatures should vary between 83°F and 88°F north to south across Indiana. Normal daily minimums range between 63°F in far northern areas to 68°F in our far southwest corner.

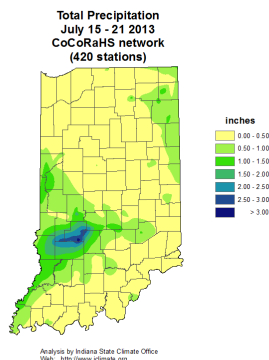
Little to no rain fell across Indiana this week prior to the cold fronts. Light amounts fell as the two cold fronts merged and became stationary over the state over the remaining few days. Overall for the week rain totaled around 0.4 inch in northern and central Indiana and about 0.7 inch in the

south. These totals equate to about 40% of normal in northern and central regions and 75% of normal in southern counties. As is common in summer thunderstorms dumped heavy rain in local spots, this time especially in Owen and Clay counties, as reported on July 21<sup>st</sup>. On that morning three CoCoRaHS volunteers in Spencer measured 3.25, 2.89, and 2.65 inches. The Gosport rain gage caught 2.72 inches that day while Jasonville had 2.66 inches. Over the entire week 3.32 inches had fallen at Spencer but no more rain was added in the following days at these same locations.

Storms which erupted during the passage of the July 20<sup>th</sup> cold fronts produced minimal wind damage in the state. Power lines and trees fell on major roads in Vigo county. Trees were reported down in Hendricks, Johnson, and Wayne counties.

Last summer the heat misery had begun earlier and the public was somewhat conditioned to such extremes by the time July temperatures soared to triple digits. In contrast this is perhaps the first real heat wave this year. Yet despite the onset of high temperatures and humidity no reports were received of significant heat related illnesses or deaths. This is also county fair time and exhibitors are aware to take special care of their animals during the current heat wave.

The Indiana Crop and Weather Report issued by the USDA concurs the hot and mostly dry weather has caused stress to both crops and livestock. Crops are now in their critical reproductive stages. The hot temperatures have accelerated soil moisture loss this week, especially in some northwest and east central counties. The weekly soil moisture survey indicated 20% of topsoil moisture is now short or very short of moisture and 14% of subsoils are rated in this condition. Farmers were running irrigation systems on soils vulnerable to quick dryness. On a positive note dry conditions have helped farmers to catch up the lagging winter wheat harvest.



## July 22<sup>nd</sup> – 31<sup>st</sup>

A major shift to a new weather pattern occurred shortly into this final stretch of July. Before then, last week's heat and humidity had given way to 3 days of near normal temperature. A stationary front over Indiana on July 22<sup>nd</sup> lifted north of the state the next day as a weak warm front.

In the upper atmosphere a big change was underway. A semi-permanent region of low pressure near Hudson Bay in Canada spawned waves of low pressure that plunged to the Dakotas, then

rotated eastward through Indiana on its way towards New England. In this 10 day interval, three such trough pulses moved across Indiana, recognized at ground level as 3 cold fronts.

The first cold front traversed Indiana on July 24<sup>th</sup>, lowering temperatures to 9°F below normal, but pleasant compared to the typical July heat. High pressure behind the front drifted overhead Indiana on July 25<sup>th</sup>, clearing our skies, but keeping temperatures unseasonably cool. As this ridge moved east of Indiana the next day, temperatures rose slightly to about 7°F below normal.

The second upper atmospheric pulse was stronger and its surface front still colder. State average temperatures plunged to 12°F below normal as the second cold front moved across Indiana on July 27<sup>th</sup> and 28<sup>th</sup>. This was the coldest day of the month.

The third cold front approached Indiana on June 29<sup>th</sup> but by this time the second upper atmospheric trough was weakening and leaving the state. The third cold front was weak and was washed away by July 30<sup>th</sup>. State temperatures were already on the rebound, rising slightly to 8°F below normal. The third upper atmospheric pulse was now forming as July was ending.

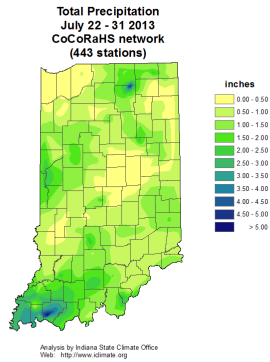
As the month closed Indiana temperatures continued to recover slowly to 5°F below normal. Overall for the 10 day interval state temperatures averaged almost 7°F below normal. Such a cool ending to July is almost unprecedented, at least in a cursory search of the state climate records. Several towns and cities failed to reach 80°F after July 23<sup>rd</sup>. Normal daily maximum temperatures near the end of July range between 82°F in far northern parts of the state to 88°F in far southern Indiana. Typical daily minimums should vary between 63°F and 67°F north to south across the state.

The stationary front at the start of the 10 day interval triggered moderate rainfall, generally just over a half inch as recorded on the morning of July 22<sup>nd</sup>. Yet very heavy amounts fell in parts of northeast and southwest Indiana that day. In northeast Indiana two CoCoRaHS volunteers in Syracuse had 4.86 and 3.29 inches in their gages. In the southwest a Newburgh observer recorded 4.55 inches while Chandler had 3.19 inches and Boonville collected 3.04 inches. Rainfall was frequent but light the rest of the month with just 3 dry days noted. Over the full 10 days rainfall totaled about 0.9 inch in northern and central Indiana and a little more at 1.6 inch across the south. These totals equate to about 70% of normal in northern and central sections and 120% of normal in southern counties. The wet spots included 10 day totals of 5.58 inches in Newburgh, 4.92 inches in Syracuse, and 4.40 inches at Chandler. Two Boonville locations had 4.37 inches and 3.80 inches.

In advance of the first cold front 60 mph wind gusts caused tree and power line damage, mostly in central Indiana on July 23<sup>rd</sup>. Trees or limbs were reported down in Greene, Monroe, Bartholomew, Ripley, and Wayne counties. Roads were blocked by trees or power lines in Bartholomew, Ripley, and Wayne counties.

The mid-July heat and recent light rainfalls have some Indiana soils lacking in moisture. The July 23<sup>rd</sup> edition of the US Drought Monitor has brought back the first D0 rating, abnormally dry, to Indiana since April 9<sup>th</sup> of this year. Six counties, which constitute 6% of Indiana land area, are rated D0, including Fayette, Hancock, Henry, Rush, Union, and Wayne. The D0 rating was continued into the July 30<sup>th</sup> edition of the Drought Monitor. Note a D0 rating does not place a county in drought status. That occurs if and when a D1 category is posted. The current D0 status in Indiana is classified as short term and is not expected to persist.

The July 29<sup>th</sup> edition of the USDA Indiana Crop and Weather Report notes that the recent cooler temperatures have benefited crops and livestock. Corn has now pollinated and the timing of the cooler temperatures was excellent. Farmers continue to run irrigation in dry areas of the state. But drier weather has helped wind up the harvest of winter wheat. The report noted that in their survey 22% of topsoils are now rated as short of very short of moisture. About 18% of subsoils are placed into these same categories.





## July 2013

Region	Temperature	Temperature	
		Normal	Deviation
Northwest	71.3	73.6	-2.4
North Central	71.4	73.1	-1.8
Northeast	71.6	72.8	-1.2
West Central	72.1	74.8	-2.7
Central	72.2	74.3	-2.1
East Central	72.1	73.5	-1.3
Southwest	74.4	77.1	-2.7
South Central	74.1	76.3	-2.2
Southeast	73.7	75.5	-1.8
<b>State</b>	72.6	74.6	-2.1

Region	Precipitation	Precipitation		
		Normal	Deviation	Percent of Normal
Northwest	2.25	3.86	-1.61	58
North Central	2.54	3.80	-1.26	67
Northeast	3.45	3.66	-0.21	94
West Central	3.80	4.39	-0.58	87
Central	2.50	4.26	-1.75	59
East Central	3.14	4.10	-0.97	76
Southwest	4.78	4.26	0.52	112
Southeast	3.82	4.32	-0.50	89
Southeast	4.45	4.12	0.33	108
<b>State</b>	3.37	4.10	-0.73	82

## Summer so far (June - July)

<b>Region</b>	<b>Temperature</b>	<b>Temperature</b>	
		<b>Normal</b>	<b>Deviation</b>
Northwest	70.3	71.9	-1.6
North Central	70.3	71.3	-1.1
Northeast	70.4	71.0	-0.5
West Central	71.5	73.1	-1.6
Central	71.5	72.5	-1.0
East Central	71.3	71.7	-0.4
Southwest	73.8	75.2	-1.4
South Central	73.5	74.4	-0.9
Southeast	72.9	73.5	-0.6
<b>State</b>	71.8	72.8	-1.1

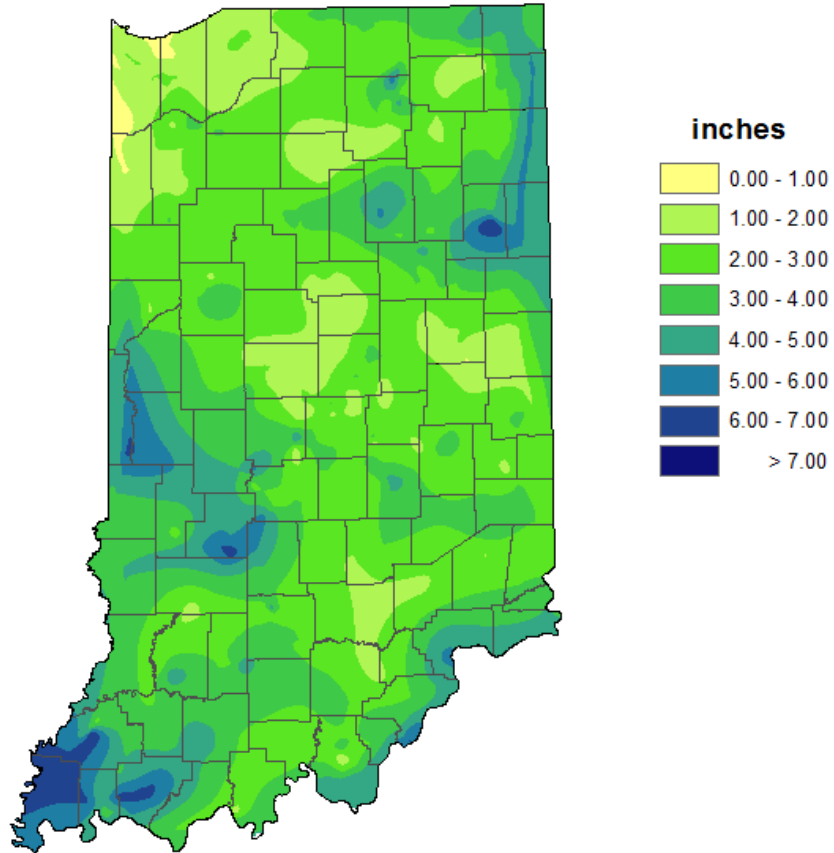
<b>Region</b>	<b>Precipitation</b>	<b>Precipitation</b>		
		<b>Normal</b>	<b>Deviation</b>	<b>Percent of Normal</b>
Northwest	8.45	8.20	0.26	103
North Central	9.72	8.10	1.61	120
Northeast	9.99	7.74	2.25	129
West Central	9.14	8.72	0.42	105
Central	7.76	8.36	-0.60	93
East Central	8.07	8.33	-0.27	97
Southwest	12.32	8.37	3.96	147
South Central	11.61	8.41	3.21	138
Southeast	10.27	8.34	1.94	123
<b>State</b>	9.69	8.30	1.40	117

## 2013 Annual (through July)

Region	Temperature	Temperature	
		Normal	Deviation
Northwest	48.3	49.2	-0.9
North Central	48.2	48.8	-0.6
Northeast	48.1	48.4	-0.3
West Central	50.3	51.0	-0.8
Central	50.3	50.6	-0.3
East Central	49.9	49.7	0.2
Southwest	53.3	54.4	-1.0
South Central	53.0	53.8	-0.8
Southeast	52.3	52.9	-0.6
<b>State</b>	50.5	51.1	-0.6

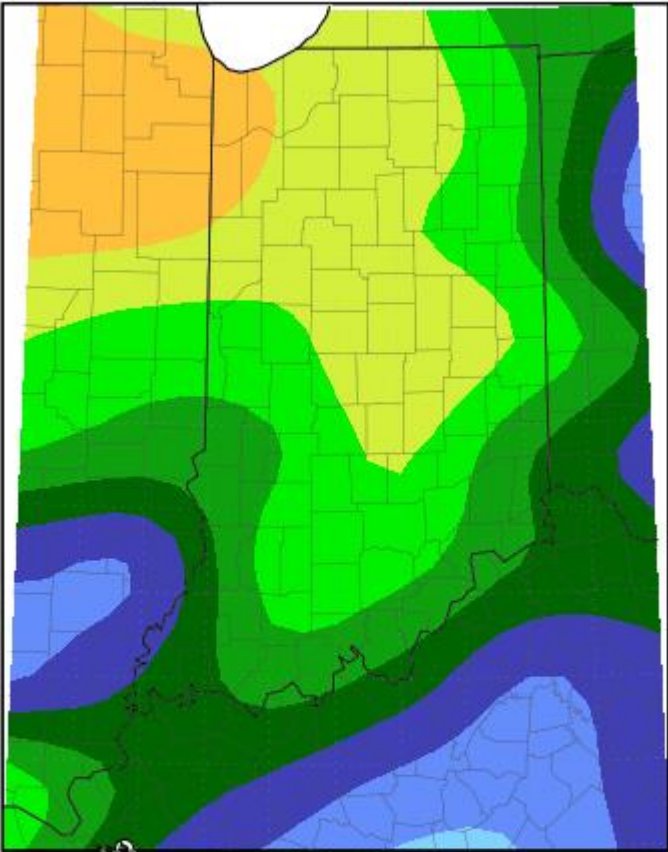
Region	Precipitation	Precipitation		
		Normal	Deviation	Percent of Normal
Northwest	26.46	22.25	4.21	119
North Central	28.08	22.17	5.91	127
Northeast	26.16	21.46	4.70	122
West Central	31.11	24.78	6.33	126
Central	29.15	24.56	4.59	119
East Central	25.33	23.93	1.40	106
Southwest	35.05	27.91	7.14	126
South Central	33.15	28.02	5.14	118
Southeast	29.08	27.15	1.93	107
<b>State</b>	29.63	24.75	4.88	120

**Total Precipitation  
July 2013  
CoCoRaHS network  
(430 stations)**

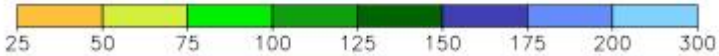


Analysis by Indiana State Climate Office  
Web: <http://www.iclimat.org>

Accumulated Precipitation: Percent of Mean  
July 1, 2013 to July 31, 2013

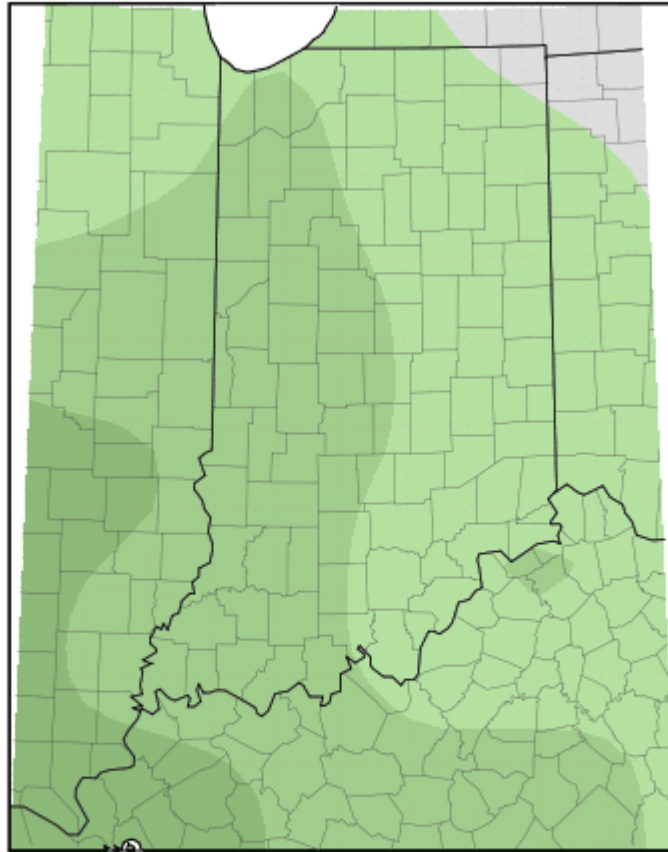


Mean period is 1981-2010.

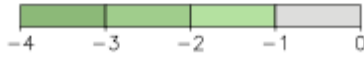


Midwestern Regional Climate Center  
MRCC Applied Climate System  
Generated at: 8/5/2013 10:51:59 AM CDT

Average Temperature (°F): Departure from Mean  
July 1, 2013 to July 31, 2013



Mean period is 1981–2010.



Midwestern Regional Climate Center

MRCC Applied Climate System

Generated at: 8/5/2013 10:53:32 AM CDT

## *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 how much of the state is not under drought conditions, and also how much of the state is under drought conditions from its respective column upwards.

For example, July 30<sup>th</sup> has 5.8% of Indiana under at *least* D0- D4 status. There were no other drought categories active at this time so there are no calculations to be made. The D0 category (abnormally dry) is not a drought category in and of itself. Therefore there was no drought anywhere in Indiana on this date.

Indiana ▼

**Drought Severity**  
 D0 - Abnormally Dry
  D2 Drought - Severe
  D4 Drought - Exceptional  
 D1 Drought - Moderate
  D3 Drought - Extreme

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Week	Nothing	D0-D4	D1-D4	D2-D4	D3-D4	D4
July 30, 2013	94.18	5.82	0.00	0.00	0.00	0.00
July 23, 2013	94.18	5.82	0.00	0.00	0.00	0.00
July 16, 2013	100.00	0.00	0.00	0.00	0.00	0.00
July 9, 2013	100.00	0.00	0.00	0.00	0.00	0.00
July 2, 2013	100.00	0.00	0.00	0.00	0.00	0.00

*July 2<sup>nd</sup> Drought Summary*





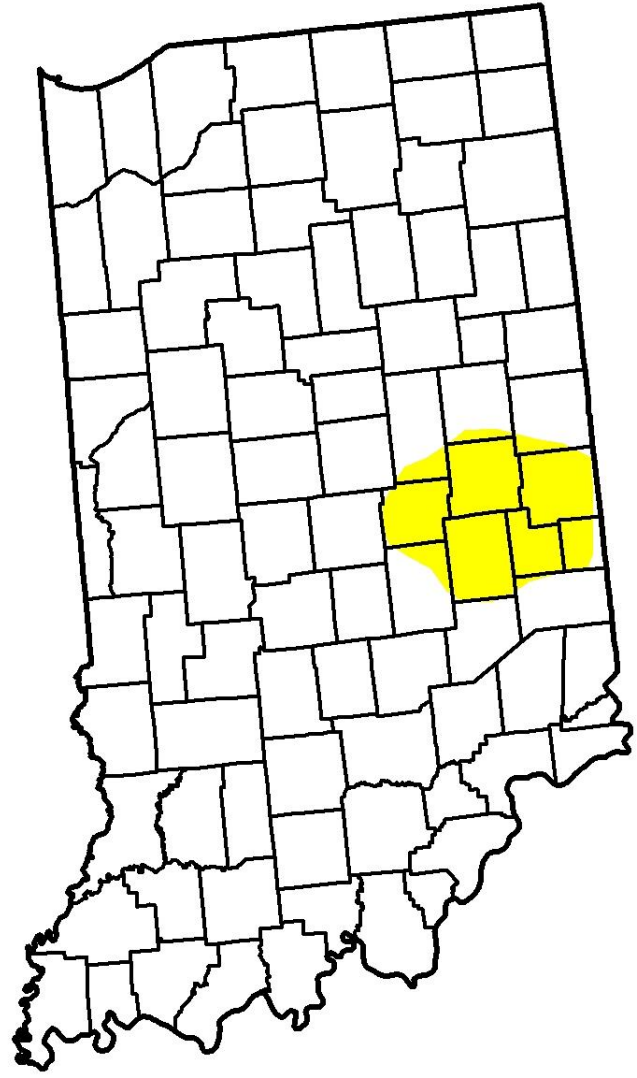
*July 9<sup>th</sup> Drought Summary*



*July 16<sup>th</sup> Drought Summary*



*July 23<sup>rd</sup> Drought Summary*



*July 30<sup>th</sup> Drought Summary*

