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And
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Indiana State Climate Office
Monthly Weather Report
http://www.iclimate.org

May 9, 2014

April 2014 Climate Summary

Month Summary

April was slightly warmer but much wetter than normal. Heavy rainfall on April 3rd led to flood warnings in 40 counties. Roads were closed in 5 counties and 8 water rescues were required around the state. Up to 6 inches of rain deluged southwest Indiana in this event. Another round of heavy rainfall occurred in this same area on April 28th. Winter finally surrendered with the last ground covering snowfall of the season on April 15th.

The April state average temperature of 52.5°F is 1.1°F above normal. This is the first month since October with an above normal state average temperature. Yet April 2014 was one of the coolest Aprils in Indiana since 2000. Only the Aprils of 2007, 2009, and 2013 since 2000 were cooler. Some recent warm Aprils include 2010 with its 57.3°F temperature, the 2nd warmest April on record. April 2001 ranks in 4th place with a 56.6°F average. The 55.9°F of April 2006 marks the 10th warmest of record. The warmest April on record in Indiana had 57.6°F in 1896. The day split in April 2014 had 11 days of below normal temperature, 18 days above normal, and 1 day at normal. The state average temperature was 10°F or more below normal on 2 days. There were also 2days when the daily temperature was 10°F or more above normal. The highest cooperative network temperature of the month was 84°F at Tell City recorded on April 28th. The coldest temperature was 18°F on 3 dates at 3 locations: on April 7th at Kokomo, at Garrett on April 8th, and at Angola on April 16th.

April state precipitation averaged 5.88 inches, or 1.94 inch above normal. This is the 14th wettest April on record since 1895. Some recent wetter Aprils have 1998 in 10th spot with 6.07 inches and 2013 with 6.60 inches, ranking in 6th place. The wettest April on record was a few years ago in 2011 when the state average precipitation was 9.42 inches. Regionally March 2014 precipitation was about 95% of normal in northern Indiana, 145% of normal in the central third of the state, and 200% of normal in the south. Normal April precipitation ranges between 3.5 inches in northeast Indiana to 4.4 inches in the southwest. The highest single day precipitation report in the cooperative network this month was 5.37 inches in Evansville on April 4th. In the CoCoRaHS network the highest daily value was 6.28 inches that same day at nearby Evansville 1.3 SSE. Widespread precipitation fell on about 16 days this month.

Snowfall on April 15th covered about two thirds of the state. Generally less than an inch fell in central Indiana. Snowfall trended heavier to northwest counties near Lake Michigan. The largest reported total was 7.0 inches taken by the cooperative observer located a mile north of Crown Point. Among CoCoRaHS observers 5.0 inches was measured by two volunteers near Crown Point and by

another at North Judson. This was the only snow day in April and these amounts are also the monthly snowfall total.

Water rescues on April 3rd were concentrated in Hamilton and Blackford counties. Two counties in northern Indiana issued travel advisories due to flooded roadways. No reports of emergency response were noted in the April 28th storm.

April 1st – 7th

Unlike most of March temperatures this week were moderate, not excessively warm or cold. Precipitation was not moderate, however, with torrential rainfall in central and south central areas of the state. The phasing out of winter with a snow free week was good news for most Indiana residents. The bad news was extensive flooding replaced the snowfall, requiring several water rescues.

Two storm systems moved through the state this week. The first system was a mature occluded storm far north of Indiana. The warm and cold fronts of a developing low center south of the occlusion sailed quickly through the state on April 1st. The state average temperature drifted higher by only a degree as a high pressure ridge stretched from Minnesota to Indiana, following on the heels of the storm.

The second storm originated in Oklahoma and moved to northern Illinois. The storm's warm front passed through Indiana. Moist unstable warm air streamed into Indiana from the Gulf of Mexico, fuel for heavy downpours in thunderstorms. The state temperature didn't budge, holding at 2°F above normal. On April 5th the cold front at the rear of the storm raced across Indiana to the Atlantic coast. High pressure arrived immediately afterward carrying mild Pacific air into the state rather than the usual polar air out of Canada. The state temperature fell only slightly that day to 2°F below normal. The Pacific high center remained overhead Indiana on April 6th as it attempted to expand eastward.

The Pacific ridge moved off the Atlantic shore on April 7th. A new storm system in our southern states began to drive new moisture northward into Indiana. As the moisture overtopped the existing air mass, rain started to fall again in southern Indiana. The state average temperature had not moved in the past 3 days, closing the week at 2°F below normal. Overall for the week the state temperature averaged right at normal. Typically for the opening of April daily maximum temperatures should vary between 55°F in far northern Indiana to 64°F in the southwest corner. Normal daily minimums should range between 35°F and 41°F north to south across the state.

Significant rainfall was reported on the mornings of April 3rd and 4th due to the second storm. A first regional look at averages shows typical rainfall varied between 0.6 inch and 1.6 inch north to south across Indiana in the April 3rd reports, and between 1.2 inch and 2.1 inches the next morning. Rain fell every day this week but added minor amounts to the downpours noted on April 3rd and 4th. For the week regional rainfall totals trended heavier southward, from about 2.0 inches in northern Indiana, to 2.9 inches in central, and 4.3 inches across the south. These totals ran at nearly 240% of normal in the north, 340% of normal in central, and 470% of normal in southern Indiana.

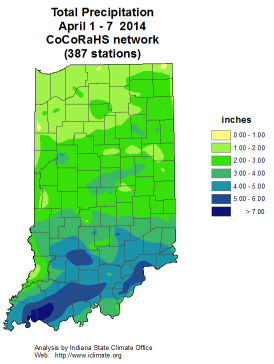
A local view highlights the extreme rainfall in this storm system. The heaviest single day rainfall reports on the morning of April 4th show two CoCoRaHS volunteers at Evansville measured 6.28

and 5.85 inches. Nearby Boonville was deluged with 5.81 inches while 5.60 inches was received at Stendal and 5.47 inches in Newburgh. Southwest Indiana also noted the heaviest weekly rainfall totals in the state. Over the 7 days two Boonville reporters had 6.94 and 6.62 inches. The Chandler observer tallied 6.68 inches. In Newburgh two rain gages had accumulated 6.56 and 6.45 inches this week.

Storm water overwhelmed sewers in counties that experienced downpours on the morning of April 3rd. State roads were closed in Tippecanoe, Martin, Lawrence, and Bartholomew counties due to high water. Carroll and Newton county officials issued travel advisories. Eventually flood warnings were issued for 40 of Indiana's 92 counties.

At least 8 water rescues were performed around the state that day. A Hamilton county woman was rescued by boat after her home was surrounded by water. Sandbags were handed out to residents there and in neighboring Boone county. In Blackford county two elderly women were rescued from their car when their vehicle stalled on a state highway. Other drivers trying to bypass stalled vehicles themselves became stalled on the flooded roads. Meanwhile in Indianapolis a few major city streets had to be closed due to high water. Fortunately there were no major injuries reported during these heavy storms.

Indiana farmers were disappointed but not panicked by the rewetting of fields awaiting spring tillage and planting. It remains early in the planting season and there is still time to make up for the weather delays.



April 8th – 14th

A warm week was enjoyed in Indiana with state average temperatures above normal on all 7 days. Not to be forgotten winter said a final goodbye on April 14th, complete with measurable snowfall in much of the northeast two-thirds of the state. Rainfall amounts were moderate throughout the week until snow returned at the very end.
High pressure south of Indiana on April 8th began the transport of warmer air northward. The state average temperature was 1°F above normal. The next day high pressure sprawled to cover all states east of the Rocky Mountains. On April 10th a storm system in western Canada moved east and

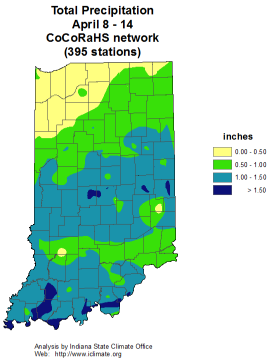
greatly intensified over Hudson Bay. The storm's cold front dropped out of this system and raced from Washington State east to Iowa. Indiana found itself inside a strengthening warm sector east of the front. Departing high pressure shoved warm air ahead of the cold front into the state, lifting temperatures to 3°F above normal, then 10°F above normal by April 10th.

The cold front was slowing but managed to slide through Indiana the next day. The state temperature only fell a few degrees to 8°F above normal. The front stalled then reversed direction as a warm front on April 12th. Meanwhile the cold front of a new Canadian storm system advanced into central Michigan. Indiana was now in a squeeze play between a warm front south of the state and a cold front to the north. The state temperature held nearly steady at 9°F above normal.

On April 13th the two fronts merged into a stationary front over southern Michigan, leaving Indiana still in the warmer air mass. The state temperature rose to 11°F above normal, the warmest of the 7 days. Meanwhile cold air over northwest Canada had been chilling by the day, and entered the Dakotas. On April 14th this much colder air broke through the stationary front and spilled southward all the way to Texas and eventually east to Indiana. The cold air was announced with accumulating snow in northwest Indiana. The state temperature dipped to 6°F above normal to close the week. The overall warmth of the week is evident in the weekly average departure at 7°F above normal. Typically for this second week of April daily maximum temperatures should range between 58°F and 66°F north to south. Daily minimums normally vary from 37°F in far northern counties to 43°F in the southwest corner of the state.

At the conclusion of last week's storm, up to 0.6 inch of rain was recorded on April 8th along the Wabash River corridor with up to an inch east of this area. A quarter to half inch of rain fell over the central third of the Indiana during the first cold frontal passage on April 11th. Around a quarter inch fell in the western quarter of the state and in the south with up to an inch of precipitation in the southwest corner of Indiana by the morning of April 14th. Snowfall was in progress at the close of this week and amounts will be reported for the morning of April 15th in next week's narrative.

Regionally over the April 8th to 14th interval precipitation averaged 0.5 inch across northern Indiana, and near 1.1 inch in central and southern sections. These amounts equate to about 50% of normal in the north and 120% of normal elsewhere in the state. The heaviest single day precipitation was reported on April 8th. The CoCoRaHS volunteer in Elizabeth that morning measured 1.49 inch, Frankfort had 1.27 inch, and Greencastle collected 1.20 inch. Two Jeffersonville observers noted 1.31 and 1.25 inch. For the week Elizabeth precipitation summed to 1.87 inch, while the Holland and Evansville gages captured 1.79 inch. The city of Brownsburg accumulated 1.72 inch while 1.71 inch fell in Boonville.



April 15th – 21st

Snow covered about two-thirds of Indiana to start tax day. The rest of the week was more cheerful with no additional snow and a strong warming trend. State average temperatures rose 23°F from the start of the 7 days to its end. Precipitation was much below normal after the snow event.

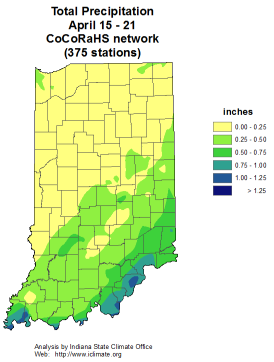
A high pressure ridge was building into Indiana on April 15th, drawing cold 17°F below normal air into the state from Canada. As the high center drifted east of Indiana the next day, its warm return wind flow started the warming trend. By April 17th the warm front of a new storm system had passed through Indiana, driving up state temperatures quickly to just 3°F below normal. The trailing cold front of this storm rushed through Indiana the next day, temporarily slowing the warming trend with temperatures at 1°F below normal.

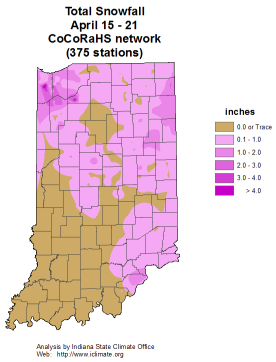
A new ridge of high pressure stretched from Hudson Bay to Arkansas on April 19th, settling over Indiana and holding the state temperature constant for an extended day. The ridge slid east to New York by April 20th and the warm up in Indiana commenced, rising to 3°F above normal. The ridge spread and dominated the east half of the country the next day, slowing the progress of a Michigan cold front headed toward Indiana. This allowed the state temperature another boost, ending the week at 6°F above normal. The long duration of below normal temperature is reflected in the weekly average at 4°F below normal. Typically for mid-April daily maximum temperatures should range between 61°F in the far northern part of the state to 69°F in the far southwest. Normal daily minimums should vary between 40°F and 45°F north to south across the state.

Snow which fell late on April 14th was generally measured by observers the next morning. Two CoCoRaHS volunteers in Crown Point each recorded 5.0 inches as did an observer in North Judson. This was the highest daily amount noted during the week in Indiana. Two reporters from Lakes of the Four Seasons saw 4.5 and 4.0 inches in this snow event. No snow fell later in the week so these amounts are also the highest state totals over the 7 days. The snow pattern indicated on the map below shows the heaviest amounts were tallied in far northwest and northeast Indiana with very light trace amounts in the north central region of the state. Where snow did fall amounts up to an

inch were common outside of the areas already mentioned. The exception is the southwest third of Indiana which escaped with just a dusting or no snow at all in this storm.

Most precipitation recorded over the 7 days in northern cities was accounted for by the April 15th snow data. Rain that day in extreme southeast Indiana contributed up to another inch in that part of the state. Less than a tenth inch of additional moisture fell around Indiana over the remaining 6 days. For the week the highest precipitation total in the CoCoRaHS network was 1.21 inch collected by the rain gage in Evansville. Charlestown accumulated 1.13 inch there while Elizabeth had 1.03 inch, Jeffersonville 0.96 inch, and Galena 0.95 inch, all located near the Ohio River. Regionally precipitation averaged about a tenth inch across northern Indiana, 0.2 inch in central, and 0.4 inch in the south. These totals equate to about 15% of normal in the northern third of the state, 25% of normal in central counties, and just 40% of normal in the southern third of Indiana.





April 22nd – 30th

Despite a cool start and finish the last 9 days of April were generally warmer than normal. Rain fell gently and often in Indiana the first several days. Then thunderstorms drenched Ohio River towns with heavy rain near the end of the interval.

State temperatures on April 22nd were right about normal. A cold front pushed quickly across the state ahead of high pressure tracking southeast through the Dakotas. The ridge slid eastward and sprawled across much of the eastern half of the country the next day. Indiana temperatures slid as well to 6°F below normal, the last cold day of the month. Warmer air returned on the back side of the ridge on April 24th, lifting the state temperature to 1°F below normal.

A Pacific air mass entered the Midwest on April 25th. The state temperature continued to warm to 4°F above normal, largely unaffected by the warm and cold front pair which crossed Indiana ahead of the air mass change. Another cold front, this one from central Canada, traveled south through the state on April 26th. But this front was weak and stalled as a stationary front along the Ohio River the next day. With no cold air push behind it Indiana temperatures held nearly steady at 3°F above normal.

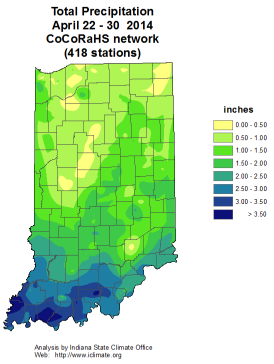
The stationary front drifted slightly north on April 28th into southwest Indiana, triggering heavy thundershowers in this region. An approaching Missouri storm transformed the stationary front into a warm front which advanced into Michigan by April 29th. Indiana was now positioned inside a warm air sector. The state temperature rose to 5°F above normal, the warmest day in over a week. When the final day of April arrived so did the cold front side of this storm, cooling the state average temperature to 1°F below normal. Overall these last 9 days of April averaged slightly warm, at 1°F above normal. Typically over this interval daily maximum temperatures should range between 64°F and 71°F north to south across the state. Daily minimums normally vary from 42°F in far northern Indiana to 48°F in the extreme southwest.

Rainfall was light prior to April 28th. Up to a half inch fell in northwest Indiana as recorded April 22nd while no rainfall was noted the next day. A few hundredths were common on April 24th with up to a half inch tallied the next morning. Less than a quarter inch was collected in rain gages on April 26th with a few hundredths falling near Lake Michigan the day after.

Significant rainfall of the 9 day interval was observed the morning of April 28th. Amounts of 2 to 3 inches were measured along the Ohio River in the vicinity of the stationary front as it transitioned into a warm front. But little rain fell in northern Indiana. A quarter to half inch of rain was scattered across Indiana in April 29th readings with a few tenths recorded on the last day of the month. Regionally over the 9 days near 0.8 inch was summed in northern Indiana, about 1.3 inch in central counties, and 2.6 inches in southern Indiana. These amounts equate to about 80% of normal across the north, 120% of normal in central areas, and double the normal across southern Indiana.

The heaviest single day rainfall amounts on April 28th were recorded along the Ohio River. The CoCoRaHS observer at Milltown noted 2.98 inches while the Newburgh volunteer had 2.89 inches. At Poseyville 2.78 inches had fallen while Darmstadt measured 2.66 inches. The Tell City gage captured 2.62 inches. Over all 9 days two Newburgh observers totaled 4.14 and 4.01 inches of rainfall. In Poseyville 3.97 inches was summed while Milltown and Boonville had 3.82 inches.

High wind damage on April 28th and 29th was reported on the Kentucky and Ohio sides of the border but no storm reports were filed in Indiana over the 9 day interval.



April 2014

Temperature

Region	Temperature	Normal	Deviation
Northwest	49.1	49.5	-0.4
North Central	48.9	48.9	-0.0
Northeast	48.6	48.5	0.1
West Central	52.7	51.5	1.2
Central	52.8	50.9	1.9
East Central	52.2	49.9	2.3
Southwest	56.2	54.9	1.3
South Central	56.1	54.2	1.8
Southeast	55.1	53.1	2.0
State	52.5	51.4	1.1

Precipitation

Region	Precipitation	Normal	Deviation	Percent of Normal
Northwest	3.00	3.60	-0.60	83
North Central	3.27	3.59	-0.31	91
Northeast	3.76	3.47	0.29	108
West Central	4.89	3.88	1.01	126
Central	5.77	3.91	1.86	148
East Central	6.03	3.78	2.26	160
Southwest	9.03	4.45	4.58	203
South Central	9.38	4.42	4.96	212
Southeast	7.42	4.21	3.21	176
State	5.88	3.94	1.94	149

Spring so far (March - April)

Temperature

Region	Temperature	Normal	Deviation
Northwest	39.4	43.9	-4.5
North Central	38.9	43.3	-4.5
Northeast	38.2	42.8	-4.6
West Central	43.4	46.0	-2.6
Central	43.5	45.4	-1.9
East Central	42.7	44.4	-1.7
Southwest	47.6	49.7	-2.2
South Central	47.4	49.1	-1.8
Southeast	46.4	48.1	-1.7
State	43.1	46.0	-2.8

Precipitation

Region	Precipitation	Normal	Deviation	Percent of Normal
Northwest	4.56	6.52	-1.96	70
North Central	4.84	6.37	-1.53	76
Northeast	5.18	6.18	-1.00	84
West Central	6.93	7.23	-0.31	96
Central	7.97	7.19	0.77	111
East Central	8.16	6.85	1.30	119
Southwest	11.32	8.68	2.64	130
South Central	11.93	8.59	3.34	139
Southeast	9.78	8.16	1.62	120
State	7.90	7.34	0.56	108

2014 Annual so far

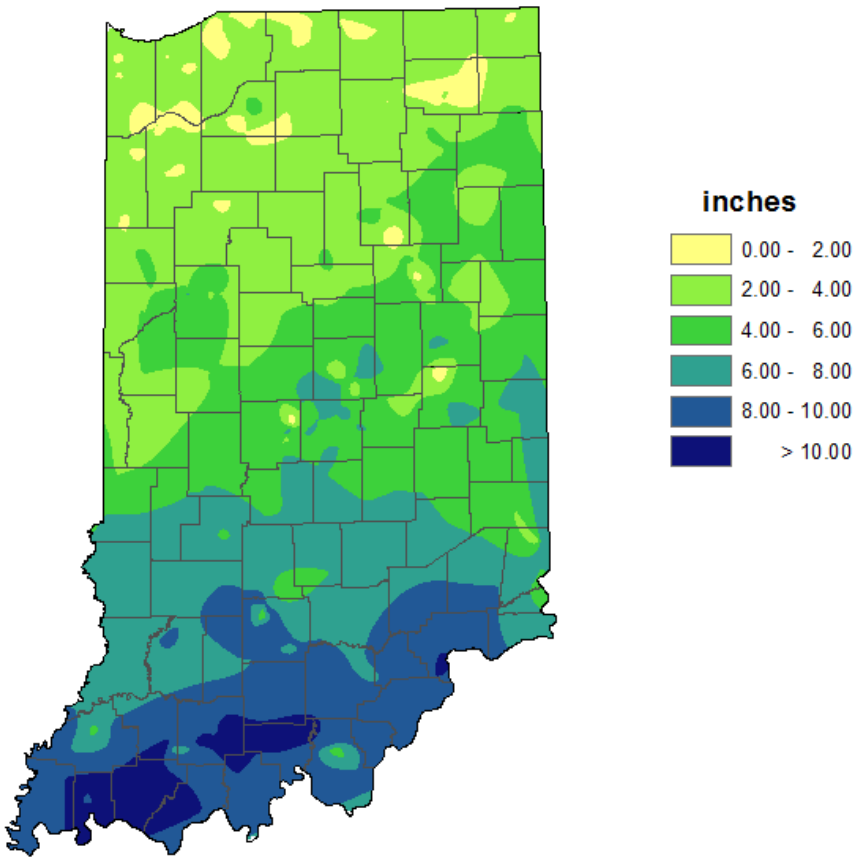
Temperature

Region	Temperature	Normal	Deviation
Northwest	27.7	34.7	-7.0
North Central	27.6	34.4	-6.8
Northeast	27.2	34.0	-6.8
West Central	31.5	36.9	-5.3
Central	32.0	36.5	-4.5
East Central	31.2	35.7	-4.4
Southwest	36.9	41.1	-4.2
Southeast	35.5	39.8	-4.2
State	31.9	37.2	-5.2

Precipitation

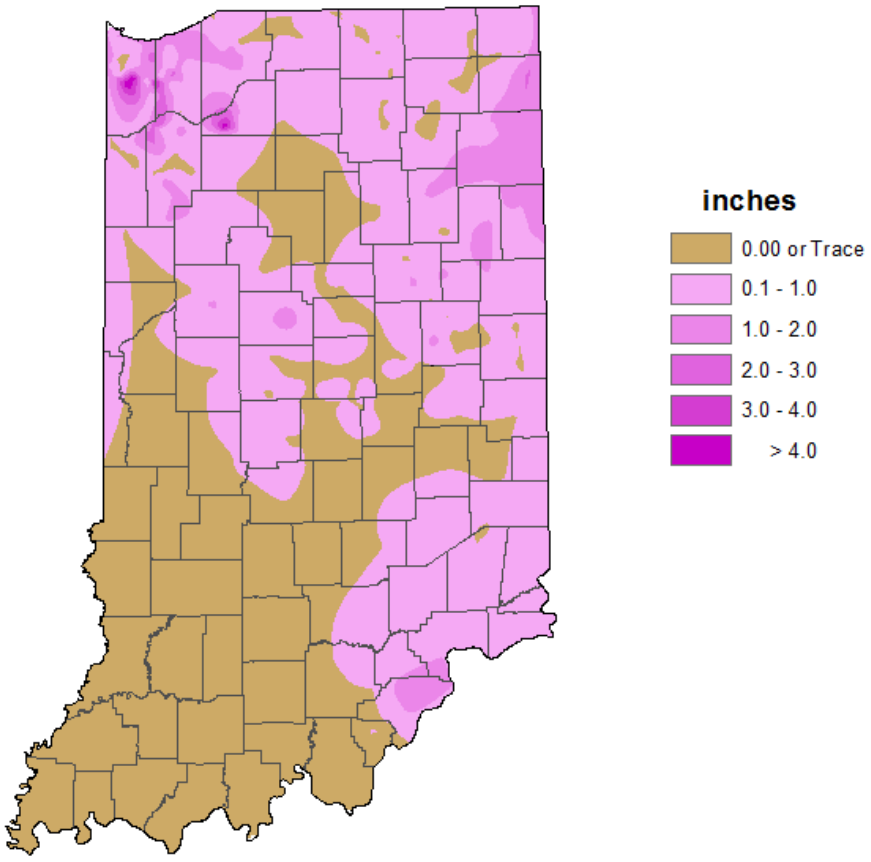
Region	Precipitation	Normal	Deviation	Percent of Normal
Northwest	9.61	10.08	-0.47	95
North Central	10.34	10.21	0.12	101
Northeast	10.75	9.95	0.81	108
West Central	12.07	11.68	0.39	103
Central	13.07	11.80	1.26	111
East Central	12.88	11.29	1.59	114
Southwest	15.71	14.55	1.16	108
South Central	17.03	14.61	2.42	117
Southeast	14.55	13.96	0.58	104
State	12.93	12.05	0.88	107

Total Precipitation
April 2014
CoCoRaHS network
(423 stations)



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

Total Snowfall
April 2014
CoCoRaHS network
(423 stations)



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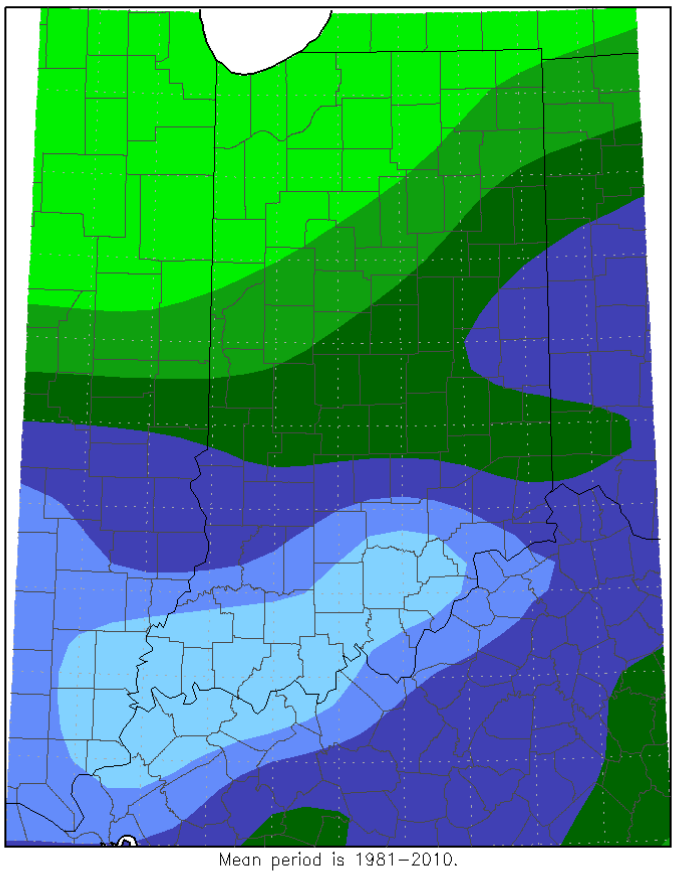
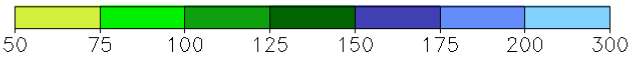
Accumulated Precipitation: Percent of Mean
April 1, 2014 to April 30, 2014



Mean period is 1981–2010.



Midwestern Regional Climate Center
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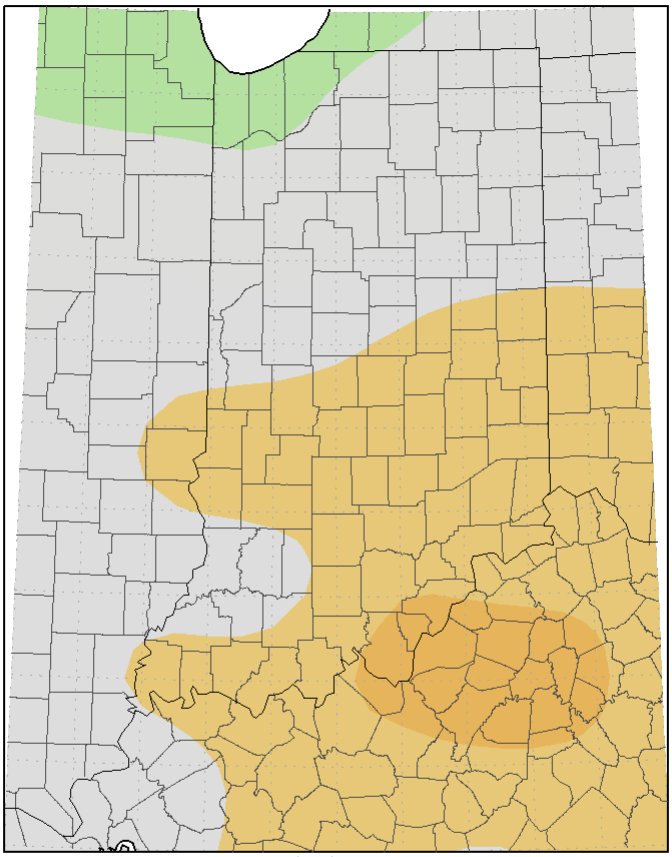
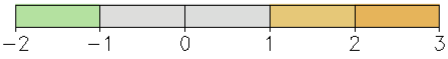
Average Temperature (°F): Departure from Mean
April 1, 2014 to April 30, 2014



Mean period is 1981–2010.



Midwestern Regional Climate Center
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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: Traditional (D0-D4, D1-D4, etc.) Categorical (D0, D1, etc.)

Percent Area in U.S. Drought Monitor Categories

Week	Nothing	D0-D4	D1-D4	D2-D4	D3-D4	D4
5/6/2014	100.00	0.00	0.00	0.00	0.00	0.00
4/29/2014	100.00	0.00	0.00	0.00	0.00	0.00
4/22/2014	100.00	0.00	0.00	0.00	0.00	0.00
4/15/2014	100.00	0.00	0.00	0.00	0.00	0.00
4/8/2014	100.00	0.00	0.00	0.00	0.00	0.00
4/1/2014	100.00	0.00	0.00	0.00	0.00	0.00

April 1st Drought Summary

April 8th Drought Summary

April 15th Drought Summary

April 22nd Drought Summary

April 29th Drought Summary