

**Ken Scheeringa
and
Kayla Hudson**

Indiana State Climate Office

Monthly Weather Report

Jan 9, 2012



<http://www.iclimat.org>

December 2012 Climate Summary

Month Summary

According to the calendar winter began on December 21st. Based on Indiana weather conditions this month the calendar was nearly on target! Temperatures were unusually warm the first three weeks of the month and snowfall was limited. Was this the start of another easy Indiana winter? Reality returned the last third of the month with subnormal cold and frequent snow storms, including a blizzard the day after Christmas. Up to 13 inches of snow fell that day in Monroe county and two multi-vehicle pileups near Lafayette shut down I-65 nearly all day. Seven people were killed this month in weather related incidents around the state, two during the blizzard.

The state average temperature this month was 37.3°F, a hefty 6.2°F above normal, to tie as the 9th warmest December on record since 1895. This ends a four month cool cycle begun in August. December hasn't been this warm in 28 years, when the month average was 38.1°F in 1984, the 6th warmest December on record. Go back another two years to the El Nino event of 1982 to find the 40.4°F reading in 2nd place. The warmest December on record in Indiana was a 40.6°F average temperature in 1923. The day split in December 2012 was lopsided as expected with only 5 days of below normal temperature, 1 day at normal, and 25 days with above normal temperature. The state average temperature was at least 10°F above normal on 11 days and at least 20°F above normal on 2 days. On New Year's Eve the state temperature was at least 20°F below normal. The highest official temperature this month was 75°F on December 2nd at Bedford and the coldest was 1°F recorded at Terre Haute on December 30th.

The state precipitation total was about where it should be for a December at 3.22 inches, just 0.16 inch above normal. This ranks December 2012 near the middle of the pack at the 43rd wettest December on record. December 2011 was much wetter at 4.58 inches, good for 16th place. A string of wet Decembers occurred in 2006, 2007, and 2008 which fall into 10th, 7th, and 8th place in the rankings. The wettest December on record was a 7.04 inch amount in 1990. Regionally precipitation this month was about 90% of normal in northern Indiana, 110% of normal in central, and 120% of normal in southern counties. The highest daily cooperative station precipitation total this month was 3.01 inches at Poseyville, measured on December 26th. In the CoCoRaHS network the heaviest single day precipitation amount was 2.55 inches at Stendal on December 10th. Precipitation generally fell on about 17 days in Indiana this month.

Snow totals piled up late in the month. The highest snowfall total for December at a CoCoRaHS station was 20.5 inches at Spencer. Snow fell on about 7 days this month. A snowfall totals map is found later in this monthly report

Dense fog on December 2nd contributed to the crash of a small plane near Greensburg on December 2nd, killing all 4 passengers. A woman was killed in a car rollover during heavy rain on December 20th outside Brook. Two riders on a scooter were killed in Evansville during the blizzard. Details on these and other weather impacts are found within the weekly narratives which follow.

December 1st – 8th

Apparently the lazy weather days of November are behind us. The pace of weather change has definitely picked up with one warm front, three cold fronts, and three stationary fronts on the Indiana weather map in the space of eight days! Winds in the upper atmosphere were mostly zonal and moderate over Indiana but wind speeds were increasing late in the week as the jet stream aimed closer to our area.

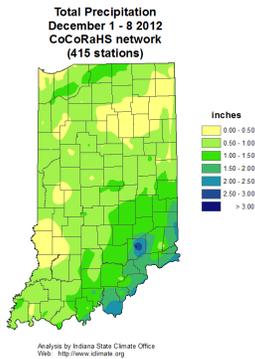
Temperatures went on a wild ride from unseasonably warm early in the week to a little warmer than normal later, yet never crossed the line to below normal. December opened very mild at 12°F above normal, then leaped two days later to 24°F above normal. A stationary front at the start lifted north of Indiana on December 2nd, placing Indiana squarely inside a pocket of very warm air. A cold front the next day couldn't overpower the warm air mass and slowed to a stall. State average temperatures barely fell a few degrees. On December 4th the front regained its footing and completed its journey southward across Indiana as a cold front. Much cooler air arrived and temperatures tumbled to 3°F above normal.

A second cold front moved through the state the next day and reinforced the cooler air already in place. High pressure behind the two cold fronts moved quickly east of Indiana and warm southerly winds returned. Temperatures lifted to 7°F above normal. A weak cold front tried but failed to pass through Indiana to close the week, evolving into the third stationary front of the week. This front did nothing to stop the warming trend as temperatures closed the week at 12°F above normal. Overall for the week state temperatures averaged an impressive 13°F above normal. Usually to start December daily maximum temperatures should range from 39°F in far northern Indiana to 47°F in extreme southwest counties. Daily minimums normally vary between 26°F and 30°F north to south across the state.

Precipitation also flipped from its dry November pattern. Only 2 days recorded no precipitation this week but light amounts were widespread and frequent on several days. Regionally for the week about 0.6 inch was measured in northern Indiana, 0.8 inch in central sections, and 1.1 inch across the south. These totals equate to near 80% of normal in northern Indiana, and about 120% of normal elsewhere across the state. The highest daily local precipitation noted was 1.00 inch at North Vernon on December 4th. At the end of the week the CoCoRaHS observer in Elizabeth measured 0.94 inch while 0.87 inch was collected in the Jeffersonville gage. South central Indiana towns also recorded the highest totals for the week, including 2.45 inches and 1.93 inch at two locations in Jeffersonville, 2.26 inches at Elizabeth, and 2.21 inches at Mauckport.

A disaster likely caused by weather conditions occurred this week. Warm moist air pushed northward across Indiana on December 2nd. Light rain in southeast Indiana ended in the morning and fog developed by mid-afternoon. By early evening visibility had dropped considerably as two private planes attempted to land near Greensburg. One pilot aborted a landing attempt and flew to a safe landing in Columbus. The other plane attempted the Greensburg landing in heavy local fog but crashed, killing all 4 people on board.

At the end of November moderate drought (D1 category) had returned to northern Indiana generally north of a Lake Village to Fort Wayne line. There was no change in this classification in early December, still accounting for 16% coverage in Indiana according to the US Drought Monitor (USDM). Also in the December 4th edition of USDM there was no change in the size and location of three bands of abnormally dry (D0 category) areas across the remainder of Indiana. About 35% of Indiana area is now rated in this abnormally dry category. Half of Indiana is considered to be in normal soil moisture status. Indiana maps of weekly drought status for all December weeks can be found at the end of this monthly summary.



December 9th – 15th

Though not as warm as last week temperatures this week remained above normal through all 7 days. As of mid-month all December days have had average temperatures that were warmer than normal.

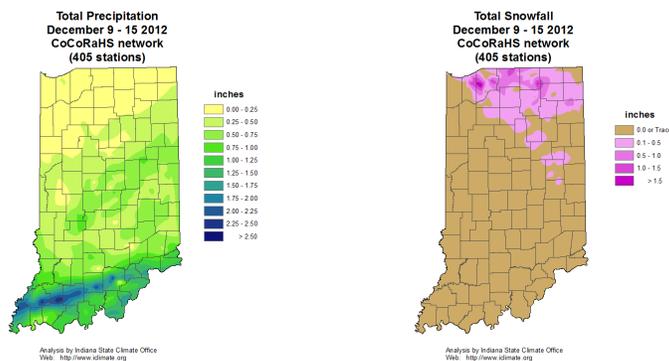
Temperatures were at their warmest at the start of the week at 14°F above normal. A warm front was on the map just south of Indiana causing areas of rain north of the front. But a strong cold front the next day pushed its way across the state forcing the warmer air to our east. Temperatures fell quickly to 5°F above normal that day, before bottoming out to 1°F above normal by December 11th. High pressure moved in behind the cold front causing a blustery cloudy day. Sunshine returned the next day as this high center passed us by but it remained cold. This high pressure system then strengthened on December 13th and held back a cold front approaching Indiana. Our temperatures began to recover, rising to 5°F above normal with the help of warm southwest winds behind the ridge. On December 14th the cold front tried once more to reach Indiana but was stalled again, this time in Michigan. As the week closed Indiana was boxed into a warm sector with a stationary front to our north and a cold front in Nebraska. Warm air continued to flow into the state, lifting temperatures to 8°F above normal. Overall for this week daily state temperatures averaged about 5°F above normal. Usually in this second week of December daily maximum temperatures should vary from 36°F to 45°F north to south. Daily minimums normally range between 24°F in far northern counties to 28°F in the southwest corner of the state.

Precipitation was light and fell mostly during the cold frontal passage in the first part of the week. Regional totals for the 7 days were about 0.3 inch in northern Indiana, 0.6 inch in central counties,

and near 1.0 inch across the south. These totals equate to about 40% of normal in the north, 70% in central Indiana, and 110% of normal in southern areas. CoCoRaHS observers in southwest Indiana measured the heaviest daily precipitation on the morning of December 10th. Some of these reports included 2.55 inches in Stendal, 2.40 inches at Fort Branch, 2.33 inches at Holland, and 2.29 inches in Paoli. Not much additional precipitation fell on the other days of the week. The highest weekly totals are only slightly more with 2.48 inches in Fort Branch, 2.40 inches at Holland, and 2.30 inches in Paoli. The Salem volunteer noted 2.29 inches for the week while the Poseyville gauge collected 2.27 inches.

A day after the cold front moved through the state snow fell in northeastern Indiana. Up to 2 inches covered the northern tier of counties generally between Valparaiso and Elkhart. Lesser amounts were recorded mostly northeast of a Valparaiso to Muncie line. Some of the single day amounts observed on the morning of December 11th included 2.0 inches at Westville, and 1.5 inch at Millersburg, Chesterton, and Kingsbury.

There has been a slight improvement in the Indiana drought picture over the past week according to the December 11th edition of the US Drought Monitor. While there was no change in the moderate drought area (D1 category) in far northern counties, part of south central Indiana has improved to normal soil moisture status. There was no change in coverage in the abnormally dry (D0 category) area adjacent to the moderate drought region in the far north. The net result this week is a 10% improvement in abnormally dry region coverage, shifting into normal soil moisture status. About 60% of Indiana area now belongs to the normal soil moisture category. Weekly maps of the Indiana Drought Monitor can be seen at the end of this monthly report.



December 16th – 22nd

A December long warm spell was broken late this week. State average temperatures had soared to 15°F above normal on December 16th and held at least 13°F above normal over the next four days. Back to back cold fronts had passed through Indiana on December 16th and 17th but did little to change state temperatures. A mostly zonal upper atmospheric wind pattern blocked the transport of cold air from Canada into the state. The second cold front did trigger thunderstorms in south central Indiana which produced small hail in Washington county. A weak cold front crossed the state on December 19th but stalled in Kentucky.

A low pressure system in the upper atmosphere now moved east out of the Rocky Mountains and greatly intensified in Missouri. At ground level two low pressure systems merged into a strong storm system in Illinois. A warm front formed over Indiana on December 20th with an occluded front close behind in Missouri. The occlusion raced eastward to New York as it wrapped far ahead of the main storm system which moved into Michigan the next day. Much colder air poured into Indiana, dropping temperatures about 13°F. The week ended with state temperatures about 1°F below normal as high pressure moved into the state to clear the region of this major storm. Overall for the week state temperatures averaged about 10°F above normal. Usually at this time of year daily maximum temperatures should range from 34°F in northern Indiana counties to 43°F in the far southwest. Daily minimums normally vary from 21°F to 26°F north to south across the state.

Rainfall was light early in the week, averaging less than a tenth of an inch each day in the warmer air. Moderate rain fell on December 20th, averaging about 0.3 inch across southern Indiana to 0.6 inch in the northern part of the state. The rain changed to snow late in the day. Another 0.3 inch to 0.5 inch of precipitation fell generally around Indiana the next day but this time in the form of snow. For the week regional precipitation totaled about 1.3 inch in northern Indiana, 1.1 inch in central areas, and 0.9 inch in the south. These totals equate to nearly 3 times normal in northern sections, double normal in central Indiana, and 120% of normal across southern counties. Locally heavy precipitation fell in spots around northern Indiana ahead of the cold front. Some of the heaviest CoCoRaHS precipitation reports on the morning of December 21st included 2.00 inches at Fortville, 1.25 inch in Valparaiso, and 1.21 inch at South Bend. The highest weekly total was 2.90 inches measured by the CoCoRaHS observer in Fortville. The Valparaiso rain gage collected 1.86 inch while the Columbia City volunteer noted 1.81 inch for the week.

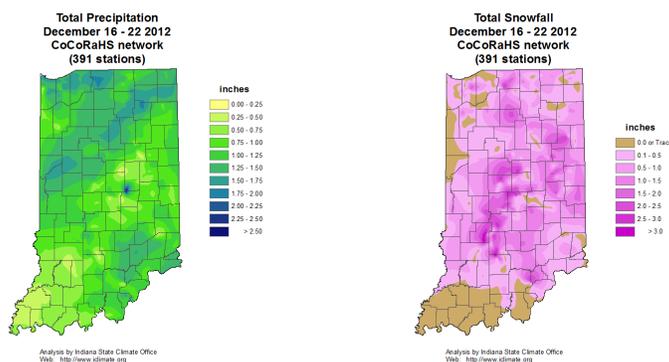
Snow began late on December 20th with the heaviest amounts falling in a southwest to northeast band across central Indiana. CoCoRaHS reporters at Bedford, Spencer, and Indianapolis all recorded 3.5 inches the morning of December 21st, which were also their totals for the week. To the north Hartford City and Lebanon totaled 3.0 inches of snow. Two to three inches fell in local areas of north central and southeast Indiana. One to two inches was common in northwest Indiana. Indiana precipitation and snowfall total maps for the week are found below this summary.

The winter storm which approached Indiana on December 20th caused many travel hazards, resulting in one death. A young woman was killed in Newton county when her car apparently hydroplaned and overturned on a county road near Brook. High winds caused power outages which impacted 8000 customers across Indiana. Wind speeds reached 40 to 65 mph in Lake, Newton, Porter, Laporte, and Jasper counties. Semi-trucks were banned on the Indiana Toll Road. In central Indiana a utility pole was snapped by high winds near Edinburgh, closing US 31. Wind speeds of 25 to 45 mph were noted in Gibson, Posey, Vanderburgh, and Warrick counties. Trees came down in Dubois, Harrison, and Crawford counties.

As temperatures fell late on December 20th high winds blew snowfall across rain soaked pavement, icing over many Indiana highways. Travel became treacherous late that day and into the next, causing numerous traffic accidents. Three semi-trucks collided in Clinton county on I-65 as high winds overturned one of the vehicles. Later in that same area a semi-driver jackknifed on SR 28 while trying to avoid the traffic mess on I-65. In Tippecanoe county a car slid off I-65 and was pinned under a lamp post. Several miles of SR 29 were closed in Carroll county after high winds

and traffic accidents brought down power lines on to that highway. There were some injuries but no other reported deaths during the two-day winter storm.

There was no change in the status of Indiana drought over the past week according to the December 18th edition of the US Drought Monitor.



December 23rd – 31st

Genuine winter cold and snow arrived in Indiana last week right when the calendar said it should - at the winter solstice. Now winter came full force these last days of December with the coldest temperatures of the month and two snow storms: a post-Christmas blizzard in central and southern Indiana, and a second significant event a few days later.

The sequence of these big storms can be traced on the weather map. A weak cold front had moved through Indiana on December 23rd but nearly slowed to a stop along the Ohio River on Christmas Eve. With a nudge from high pressure behind it the cold front regained its footing and traveled to the southern states on Christmas Day. Now two storm systems merged over Tennessee while cold air to our west was pulled in behind it. A low pressure wave in the upper atmosphere intensified as it moved northeast toward Kentucky, adding more support to what became a blizzard in Indiana on December 26th. The next day the storm moved east but windy conditions caused blowing snow and hazardous travel conditions around the state. The weather improved briefly on December 28th. Then cold air pulsed into Indiana as three fast low pressure troughs moved across the state, dumping additional snow especially in the southeast. A very cold air mass ahead of a high pressure ridge sprawled into the Midwest, finally clearing away the storminess. To finish the year a new storm had moved into Illinois. A warm front was in Indiana on New Year's Eve.

Temperatures had fallen a week ago when winter arrived but steadied at seasonable levels. This week opened with temperatures about 2°F above normal before actually warming a bit to 5°F above normal by Christmas Day. When the blizzard hit temperatures fell back only slightly to about normal and stayed there over the next few days into December 29th. Now the big chill arrived and Indiana state temperatures plummeted to 7°F below normal a day later, then to 22°F below normal by New Year's Eve.

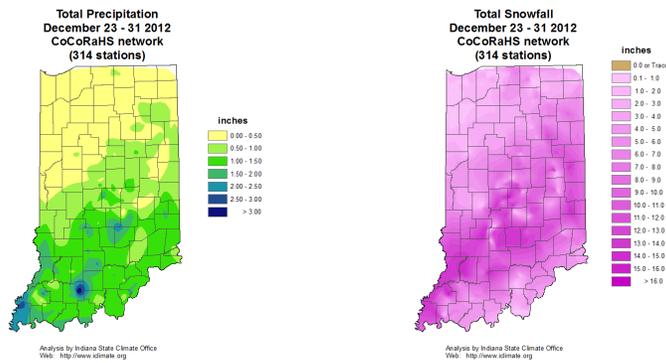
The blizzard itself generated about a half inch of liquid moisture in central Indiana, three quarters inch across southern counties, but little in the north. The second round of precipitation later in the week added lesser amounts. For the week regional precipitation totaled about 0.3 inch across northern Indiana, 0.8 inch in central areas, and near 1.1 inch in the south. These amounts equate to about 40% of normal in northern counties, near 90% in central Indiana, and 110% of normal in the southern region. The blizzard had begun as rain in far southern Indiana with some locally heavy amounts. In the CoCoRaHS network the Celestine volunteer measured 2.10 inches while 2.01 inches was collected in the Poseyville gauge. The Evansville observer recorded 2.00 inches. Some of the higher weekly precipitation totals included 2.68 inches at Poseyville, 2.67 inches in Edinburgh, and 2.35 inches in Francisco.

The blizzard aimed its heaviest snowfall at south central Indiana. Snowfall rates were measured at 3 inches per hour in some spots with winds between 30 and 40 mph. The deepest Indiana storm snowfall was measured at 13 inches in Ellettsville in Monroe county. Amounts tapered off to the north and south. In northern Indiana 2 to 4 inches of snow fell with the lightest amounts near the Michigan border. Snowfall in the center of the state was measured at almost 8 inches. Just to the south snowfall increased rapidly with distance to the maximum 13 inches in Monroe county. Continuing southward amounts decreased to about 8 inches along the Ohio River with the heavier amounts in the far southwest corner of the state.

The second storm on December 28th produced far less snow, from less than a half inch in northwest Indiana up to 6 inches in the southeast. Very narrow almost stationary snow bands between Terre Haute and Muncie dumped heavy snowfall before moving to the south overnight. A map of the weekly snowfall accumulation throughout Indiana follows this narrative.

The storm of December 26th barely qualified by definition as a blizzard but did result in two fatalities and several major traffic accidents. The storm began before daylight in Ohio River counties in the form of rain, sleet, and freezing rain before transforming into snow around dawn. Thunder snow was seen in Dubois county, a thunderstorm producing heavy snow showers. The storm expanded north and east throughout the day. Two major pileups on I-65 just north of Lafayette shut down northbound traffic much of the day. Fortunately no serious injuries were reported. This accident had already backed up morning traffic for miles when another accident three hours later involving 2 semi-trucks and 6 other vehicles shut down the highway again. Other accidents plagued I-74, including crashes, vehicles stuck on the road, and more than 70 slide offs. In Evansville a man and woman were killed when their scooter went out of control on a snowy street and they were hit by a pickup truck. Meanwhile major malls in the Indianapolis area were shut down to shoppers after the Christmas holiday due to the poor weather conditions.

According to the US Drought Monitor there has been no change in Indiana drought status over the past 4 weeks. Snow is less effective in recharging soil moisture than rainfall so it can be difficult to assess the impact of snowfall on soil moisture changes in the winter months.



December 2012

Region	Temperature		
	Temperature	Normal	Deviation
Northwest	35.5	28.5	7.0
North Central	35.0	28.7	6.3
Northeast	34.8	28.6	6.2
West Central	36.7	30.4	6.2
Central	37.0	30.7	6.3
East Central	36.7	30.2	6.6
Southwest	40.5	34.5	6.0
South Central	40.1	34.5	5.5
Southeast	39.3	34.0	5.3
State	37.3	31.1	6.2

Region	Precipitation			
	Precipitation	Normal	Deviation	Percent of Normal
Northwest	2.28	2.66	-0.37	86
North Central	2.61	2.79	-0.18	93
Northeast	2.47	2.68	-0.21	92
West Central	3.03	2.96	0.07	102
Central	3.22	2.99	0.24	108
East Central	3.57	2.87	0.70	124
Southwest	3.32	3.53	-0.21	94
South Central	4.19	3.56	0.63	118
Southeast	4.81	3.41	1.40	141
State	3.22	3.06	0.16	105

Winter (same as December so far)

Region	Temperature	Temperature	
		Normal	Deviation
Northwest	35.5	28.5	7.0
North Central	35.0	28.7	6.3
Northeast	34.8	28.6	6.2
West Central	36.7	30.4	6.2
Central	37.0	30.7	6.3
East Central	36.7	30.2	6.6
Southwest	40.5	34.5	6.0
South Central	40.1	34.5	5.5
Southeast	39.3	34.0	5.3
State	37.3	31.1	6.2

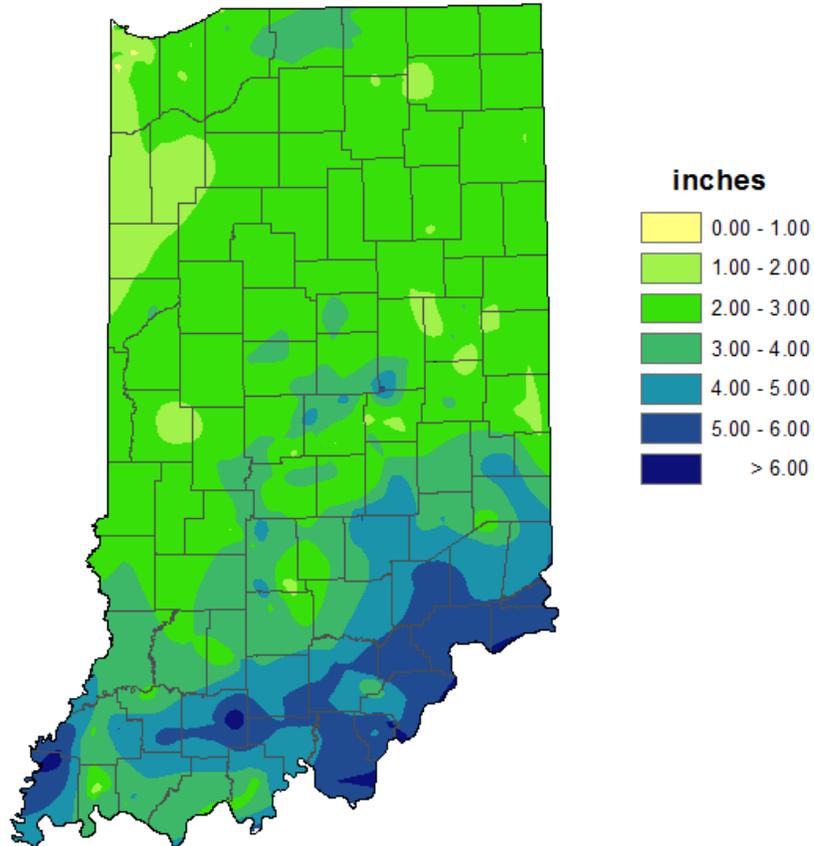
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South Central	4.19	3.56	0.63	118
Southeast	4.81	3.41	1.40	141
State	3.22	3.06	0.16	105

2012 Annual

Region	Temperature	Temperature	
		Normal	Deviation
Northwest	53.2	50.2	3.0
North Central	52.8	49.8	3.1
Northeast	52.6	49.4	3.2
West Central	54.9	51.8	3.1
Central	54.7	51.4	3.2
East Central	54.0	50.6	3.4
Southwest	58.2	55.0	3.2
South Central	57.4	54.5	2.9
Southeast	56.4	53.7	2.7
State	55.0	51.9	3.1

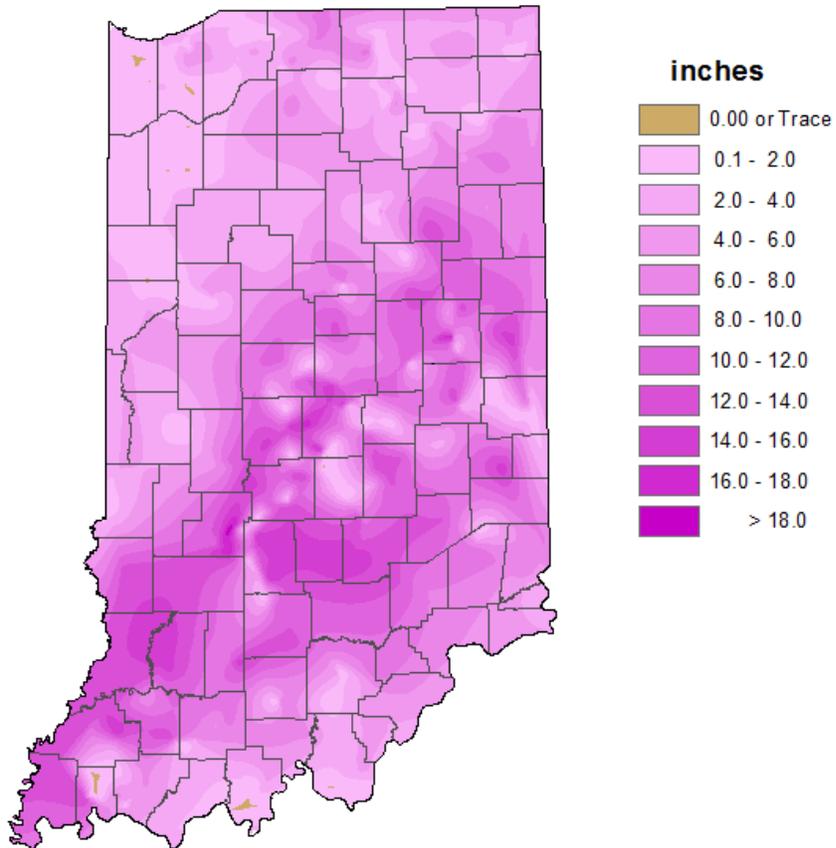
Region	Precipitation	Precipitation		
		Normal	Deviation	Percent of Normal
Northwest	31.23	38.04	-6.81	82
North Central	30.60	38.22	-7.62	80
Northeast	28.85	36.75	-7.90	78
West Central	34.14	41.24	-7.10	83
Central	38.04	40.74	-2.70	93
East Central	36.30	39.24	-2.94	93
Southwest	35.71	45.56	-9.85	78
South Central	39.48	45.71	-6.23	86
Southeast	39.27	44.12	-4.85	89
State	34.91	41.19	-6.28	85

**Total Precipitation
December 2012
CoCoRaHS network
(395 stations)**



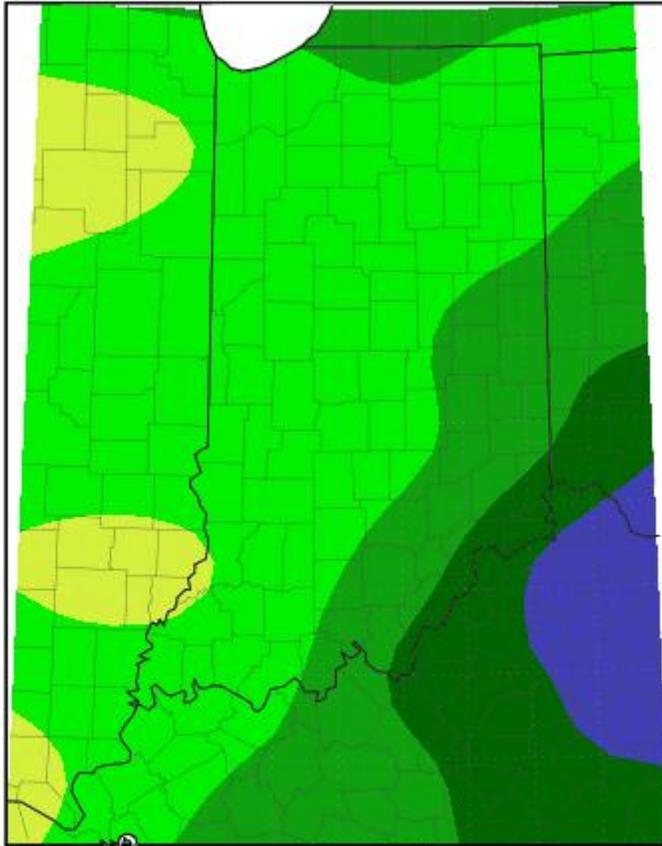
Analysis by Indiana State Climate Office
Web: <http://www.iclimat.org>

**Total Snowfall
December 2012
CoCoRaHS network
(395 stations)**

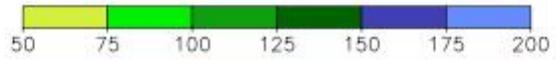


Analysis by Indiana State Climate Office
Web: <http://www.iclimate.org>

Accumulated Precipitation: Percent of Mean
December 1, 2012 to December 31, 2012

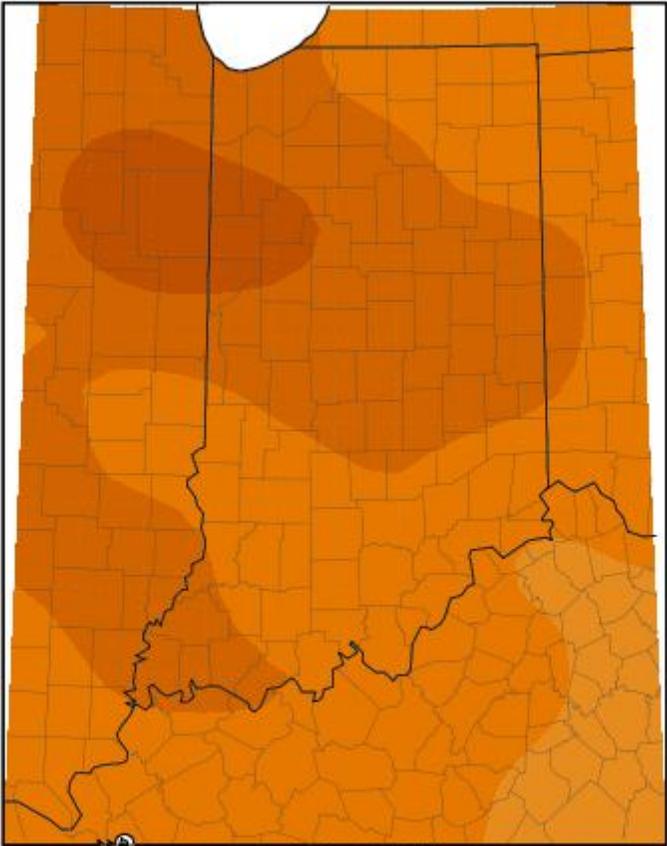


Mean period is 1981-2010.



Midwestern Regional Climate Center
MRCC Applied Climate System
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Average Temperature (°F): Departure from Mean
December 1, 2012 to December 31, 2012



Mean period is 1981-2010.



Midwestern Regional Climate Center
MRCC Applied Climate System
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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 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.

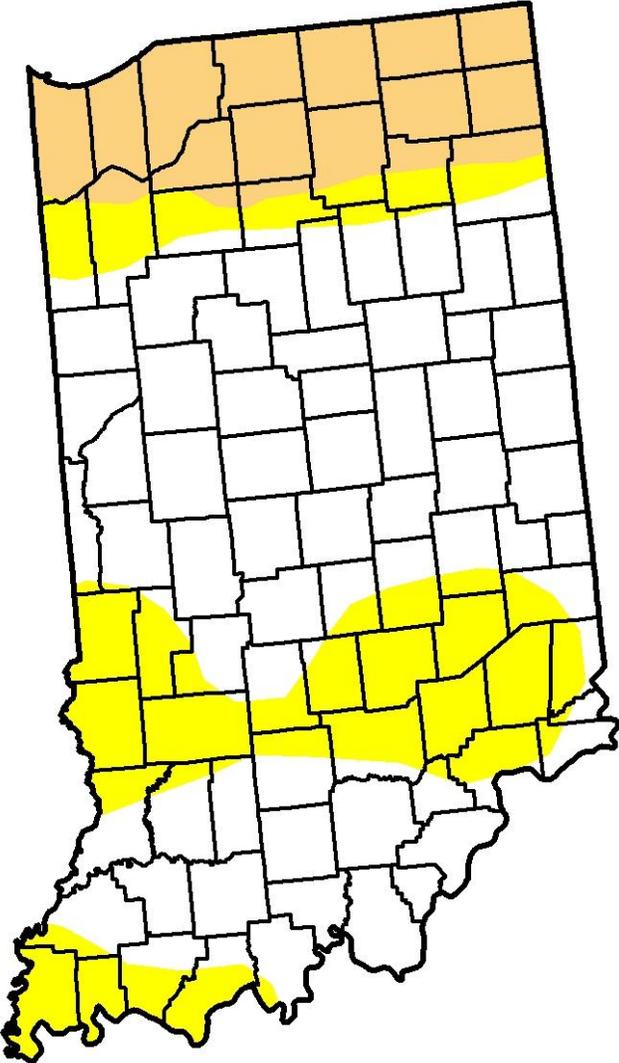
For example, December 4th has 16.0% of Indiana under at *least* D1- D4 drought status and 50.9% under at *least* D0-D4 status. Subtracting the D1-D4 category (16.0%) from the D0-D4 category (50.9%), tells us that 34.9% of Indiana is in the D0 category alone (abnormally dry). Please note, however, that these areas are not exact, and much of this drought map has been created from reports throughout the state and in estimation, so use this information as a general view rather than for specifics.

Indiana		Drought Severity				
		D0 - Abnormally Dry	D1 Drought - Moderate	D2 Drought - Severe	D3 Drought - Extreme	D4 Drought - Exceptional
Week	Nothing	D0-D4	D1-D4	D2-D4	D3-D4	D4
January 1, 2013	59.11	40.89	16.01	0.00	0.00	0.00
December 25, 2012	59.11	40.89	16.01	0.00	0.00	0.00
December 18, 2012	59.11	40.89	16.01	0.00	0.00	0.00
December 11, 2012	59.11	40.89	16.01	0.00	0.00	0.00
December 4, 2012	49.15	50.85	16.01	0.00	0.00	0.00

December 4th Drought Summary



December 18th Drought Summary



December 25th Drought Summary

