

**Ken Scheeringa
and
Kayla Hudson**

Indiana State Climate Office

Monthly Weather Report

Mar 7, 2013



<http://www.iclimat.org>

February 2013 Climate Summary

Month Summary

The monthly statistics suggest that February weather was quite normal in Indiana. But masked by these numbers are the swings in temperature and precipitation as storm systems raced across the state riding a fast jet stream in the upper atmosphere. The hectic pace slowed later in the month as larger storms churned across Indiana and delivered heavier precipitation. Three weather related traffic deaths were noted this month, two in St Joseph county and another on I-65 in White county.

Overall February was slightly cooler than normal. The state average temperature of 29.8°F is nearly identical to January a month ago and just 0.6°F below the February normal. This ties 1966 as the 52nd coolest February since 1895 in Indiana. The most recent cooler February was a 25.2°F reading in 2010 at 21st place in the rankings. Some other recent cooler Februarys include a 28.2°F state average in 2008, good for 41st place, and a chilly 20.4°F recorded in 2007 falling into 5th place. Recall the frigid February 1978 when the monthly temperature was just 16.1°F? That was the coldest February on record in Indiana during the infamous 3-winter cold spell. The day split in February 2013 was tilted slightly to the cold side with 14 days of below normal temperature, 2 days at normal, and 12 days with above normal temperature. The daily state average temperature was 10°F or more above normal on 4 days in balance with 4 days of temperatures at least 10°F below normal. The highest temperature this month was 66°F on February 8th at Dubois, Stendal, and Bedford, and at Boonville the previous day. Wanatah was the cold spot with -3°F on February 2nd.

February precipitation was right about normal. The state average of 2.24 inches is just 0.04 inch drier than normal. This places the month in the middle of the rankings for all Februarys since 1895. The driest February on record was in 1947 with just 0.34 inch. The wettest February had 5.74 inches in 1909. Regionally precipitation this month was about 120% of normal in the north, right at normal in central counties, and near 80% of normal in southern Indiana. The highest daily cooperative station precipitation total this month was 1.89 inch at Poseyville, measured on February 23rd. In the CoCoRaHS network the heaviest single day precipitation amount was 1.80 inch at Burnettsville on February 27th. Precipitation generally fell on about 14 days this month.

Snow totals this month ranged from 4 to 26 inches in the northern third of Indiana with the heaviest totals in the tier of counties bordering Michigan. The city of Granger collected 26.8 inches, the highest February total in the state. Laporte received 20.0 inches for the month. Most of central Indiana had 2 to 4 inch month totals while generally less than 2 inches fell in the south. The largest single day snowfall was 6.0 inches recorded by the CoCoRaHS volunteer at Michigan City on the morning of February 3rd. Significant snows fell on about 6 days this month with additional lighter

events such as dustings in the far north and lake effect region. Snowfall maps of February totals are found later in this report.

At the start of February the US Drought Monitor rated the northern tier of Indiana counties in moderate drought (D1 category) or as abnormally dry (D0 category). The heavier precipitation events helped eliminate the moderate drought category from the state entirely. At the end of February the US Drought Monitor shows 12% of Indiana is abnormally dry, but not in drought. The Monitor calculates the remaining 88% of Indiana area to have returned to normal soil moisture.

Two St Joseph county residents were killed in separate vehicle accidents on February 1st and 2nd due to ice and snow covered roads there. On February 22nd freezing rain, sleet, and snow contributed to a collision which claimed the life of a semi-truck driver on I-65 in White county. In other incidents high winds caused power line damage on February 19th in west central Indiana. Heavy rainfall forced the closure of a state highway in Morgan and Putnam counties on February 26th due to flooding. Details on weather impacts this month can be found in the weekly narratives which follow.

February 1st – 7th

Temperatures in recent weeks have swung widely between extremes of warm and cold. This trend has persisted through the first week of February. The month opened with the state average temperature near 14°F below normal as cold air poured into the state. But a 7-day climb to warmer weather replaced the abnormal cold, with each day warmer than the one before. Another in a series of fast Alberta clipper storm systems, moving at 70 mph, traveled across northern Indiana on February 2nd while triggering snowfall ahead of its warm front. Two cold fronts hurried past Indiana the next day. A high pressure center trailed quickly behind the storm and cut off the return of cold air into the state. State temperatures on February 4th continued to rise, now back to normal.

A third cold front raced through Indiana the next day followed by a stronger high pressure center on February 6th. The cold front only briefly slowed the ascent in state temperature to 6°F above normal. The ridge slid east of Indiana on February 7th, allowing southerly winds to tap into much warmer air. Temperatures at the end of the week jumped to nearly 17°F above normal, about 31°F higher than when the week started. The very cold start and warm ending to this week nearly offset to balance the week average temperature at just 1°F below normal. Typical for this week is a daily maximum temperature range between 32°F and 43°F north to south across the state. Daily minimums normally vary between 18°F in far northern Indiana to 25°F in extreme southwest counties.

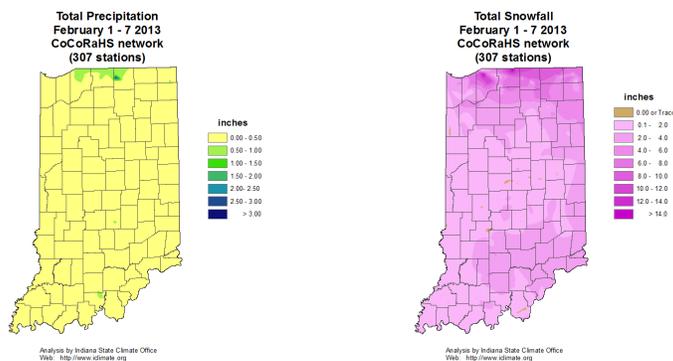
Precipitation fell around Indiana every day except the last this week. Temperatures were cold enough until then that much of the precipitation arrived in the form of snow. The heaviest daily snowfall was measured on the morning of February 3rd in far northern counties. The CoCoRaHS observer in Michigan City noted 6.0 inches of snow that morning while at Demotte and Lagrange 5.0 inches was recorded. Laporte had 4.3 inches that day. The heaviest weekly snowfall total was 16.4 inches in Granger with Trail Creek right behind at 16.0 inches. Two CoCoRaHS sites in Laporte had totals of 12.7 inches and 11.6 inches. Generally areas of northern Indiana away from Lake Michigan received 3 to 8 inches of snow for the week. In central and southern Indiana the week total varied from just a trace of snow to about 3 inches.

The water content of fresh snowfall is counted in precipitation. The highest daily precipitation amount this week was 1.66 inch reported at Syracuse on February 2nd. Syracuse also had the highest weekly total precipitation in the state with 1.90 inch. The precipitation sum at Trail Creek was 1.09 inch. Elkhart noted a 0.85 inch total. Generally around the state about 0.3 inch of precipitation was recorded in northern Indiana, 0.1 inch in central, and 0.2 inch in the south. These totals equate to about 75% of normal precipitation across northern Indiana, 20% in central, and 30% of normal in the southern extent. Maps of Indiana weekly precipitation and snowfall are found at the end of each weekly narrative.

The clipper storm at the top of the month made roadways very slick, contributing to the deaths of two drivers in St Joseph county. On February 1st a car slid on road ice and crashed into another vehicle. The driver of the car died in the accident. The next day a driver lost control on a snowy road in the same county and died in the resulting accident. Slick roads were a hazard all across the state. In far southwest Indiana roads were especially slick in Gibson, Warrick, and Vanderburgh counties. Vehicles slid off numerous roads, embankments, and bridges.

Travelers in northern border counties fared no better on February 4th. About 25 vehicles slid off roads in Elkhart county that day.

At least one benefit of the heavy snowfall in northern Indiana this week was to improve soil moisture conditions in that area. The February 5th edition of the US Drought Monitor has ended the moderate drought (D1 category) in Lake, Porter, Laporte, and St Joseph counties. The improvement extended to the south. A second tier of counties, from Newton in the west to Kosciusko in the east, were lifted from abnormally dry status (D0 category) to normal soil moisture condition. In summary, counties as of February 5th to be classified abnormally dry include: Lake, Porter, Laporte, St Joseph, Elkhart, Lagrange, Steuben, Noble, and DeKalb, representing 12% of all Indiana land area. The remaining 83 counties (88% of total state area) are classified in normal soil moisture status.



February 8th – 14th

Thermometers finally settled down after a full month of wild temperature swings. The state average temperature spread this week was a mere 5°F. Only one pair of fronts passed through Indiana, not

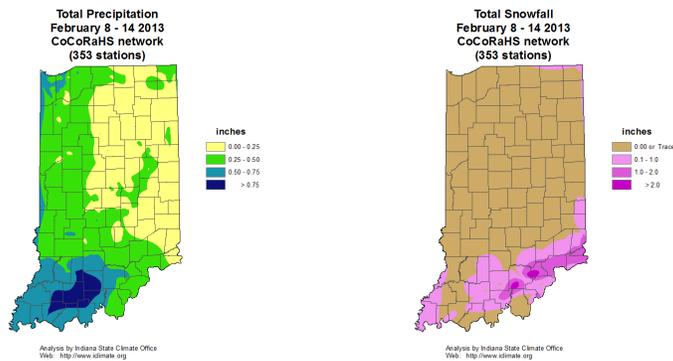
the horse race of past weeks when front after front hurried eastward across the Midwest. In this quieter weather pattern no weather related deaths or injuries were reported this week.

State average temperatures held above normal this entire week. The week began with temperatures about 9°F above normal. A storm system had just passed Indiana and high pressure was moving overhead on February 9th. The high ridge moved east of the state and southerly winds helped lift the state average temperature to its peak at 12°F above normal the next day. A warm front now crossed the state but was quickly followed by the storm's cold front a few hours later. The air mass behind this front originated from the Pacific Ocean rather than the arctic regions of Canada. The state average temperature dropped just a few degrees on February 12th to 7°F above normal as the Pacific ridge stretched eastward over Indiana. A new storm system passed well to the south of Indiana on February 13th, impacting only counties along the Ohio River. The rest of the state was missed by this storm. State temperatures held steady the rest of the week at about 8°F above normal. Overall for the week state temperatures averaged nearly 9°F above normal. Typically for this second week of February daily maximum temperatures should vary from 34°F in far northern Indiana to 45°F in the southwest corner of the state. Daily minimums normally range from 20°F to 26°F north to south across Indiana.

A dusting of snow was reported on February 8th and 9th in the lake effect region of northwest Indiana. Last week's storm moved away and northerly winds ahead of the high pressure ridge brought in some lake moisture. But late this week the southern storm produced moderate snowfall as it brushed Indiana on its way east. Amounts along the Ohio River tallied up to 3 inches. On Valentine's Day morning the CoCoRaHS observers in Fredericksburg and New Salem each reported 3.0 inches of snow. In Milltown and Aurora 2.5 inches was measured while 2.0 inches fell in Jeffersonville. These were also the largest Indiana snowfall totals for the week. No snow fell in far southern Indiana on other days this week.

Precipitation was observed on just 3 days this week. The water equivalent of snowfall was light and for the week generally totaled to about 0.25 inch in northern and central Indiana and 0.45 inch across the south. These amounts are about 80% of normal in northern areas and near 65% of normal in central and southern counties. The highest single day precipitation recorded in the state CoCoRaHS network was 0.51 inch in Jasper, 0.50 inch in Shoals, and 0.45 inch in Martinsville, all measured on February 8th. The greatest weekly total was 0.86 inch, noted by the CoCoRaHS observers in Paoli and Holland. Boonville precipitation summed to 0.80 inch while Evansville collected 0.78 inch. All in all this was not an abnormally wet week.

The light precipitation this week kept soil moisture levels virtually unchanged from a week ago. The entire northern tier of Indiana counties continue to be rated abnormally dry (D0 category) according to the February 12th edition of the US Drought Monitor. In northeast Indiana, Noble and Dekalb counties are included in this drier region. The remaining 88% of total Indiana land area is unchanged with a normal soil moisture classification for this time of year.



February 15th – 21st

Last week's warmth flipped into a mostly colder than normal pattern this week. The second in a pair of cold fronts moved through Indiana on February 15th, sacking the state average temperature from 1°F above normal to 8°F below normal by the next day. A high pressure ridge moved overhead on February 17th. Indiana temperatures rebounded to 2°F above normal as the ridge traveled east of our state and warmer air returned.

The warm up was brief. Three storm systems merged into one powerful storm over upper Michigan on February 19th. First a warm front, then a cold front attached to this strong storm passed quickly through Indiana. A new high pressure system behind the fronts tapped into cold Canadian air and state temperatures slid to about 15°F below normal, the coldest to close out the week. Normal daily maximum temperatures usually range from 36°F to 47°F north to south across Indiana. Typical daily minimums this third week of the month vary from about 21°F in far northern Indiana to 28°F in the southwest.

Snowfall was frequent this week, especially in the lake effect region of northern Indiana. The early storm system deposited a dusting of snow in northwest Indiana on February 15th, which continued and spread eastward along the Michigan border the next day. Up to 3 inches of snow fell in the Valparaiso vicinity. On February 17th another inch or so fell in the Laporte area. The lake effect shut down the next day.

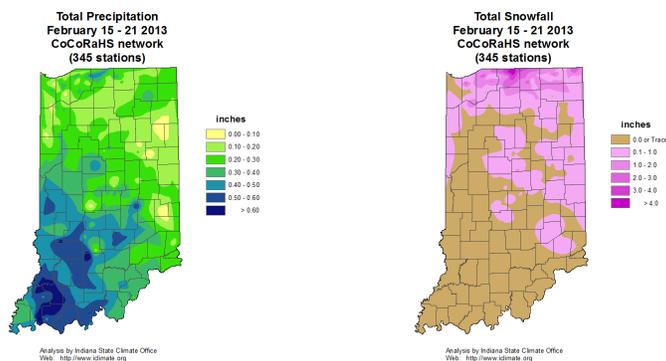
The stronger second storm brought widespread rain to southern Indiana and a dusting of snow to east central and northwest counties. The lake effect snow machine resumed on February 20th, dropping up to 3 inches in the South Bend, Valparaiso, and Granger areas and nearly 2 inches in northeast Indiana and northern Jasper county. To the south a dusting fell in central Indiana. Now add another inch of snow in the Laporte area on February 21st. The largest snowfall totals in Indiana for the week included 4.1 inches at Granger, 3.9 inches in South Bend, and Laporte with 3.2 inches. A map showing snowfall totals around Indiana this week follows this narrative.

Rain fell primarily on February 19th in the second storm system. The CoCoRaHS observers in Elberfeld and Hazleton measured 0.72 inch that morning, the highest one day amount for the week.

The Boonville volunteer recorded 0.68 inch while two Evansville gages each collected 0.67 inch. The many snow events around the state this week were not big contributors to the weekly precipitation total. On average about 0.2 inch of precipitation fell in northern Indiana, 0.3 in central, and 0.4 inch in the south. These amounts calculate to about 45% of normal in northern Indiana, and 65% of normal in central and southern sections. The weekly precipitation map is shown at the end of this narrative.

The powerful storm of February 19th caused scattered wind damage in west central Indiana. In Benton county a few trees were brought down and some power outages were reported. Power lines also fell in Tippecanoe county. In Clinton county a few power lines dropped so low that a state highway had to be closed until crews could repair the pole and hoist the power lines it carried.

There were no significant soil moisture changes in Indiana this week according to the US Drought Monitor. The northern tier of Indiana counties along with Noble and Decatur counties continue to be rated abnormally dry (D0 category) according to the February 19th edition. All other counties are in normal soil moisture status for this time of year.



February 22nd – 28th

Storm systems have rushed through Indiana in recent weeks, limiting the duration of precipitation events. Temperatures have swung wildly and widely high and low. But that changed this last week of February. A large, slow and ever expanding storm system spent three days churning in and near Indiana, producing lots of moisture while lifting temperatures slowly each day.

A storm at the end of the previous week was departing Indiana on February 22nd. The storm left Indiana highways a slippery mess with temperatures at 8°F below normal. A high pressure ridge to our southwest started to build in and warm our state the next day. The ridge moved overhead on February 24th and the state average temperature rose slowly to 4°F below normal. Another ridge carrying Pacific air over the Rocky Mountains tried to link up with our Midwest ridge but could not. Indiana temperatures continued to climb slowly, pausing at seasonally normal levels over the next 3 days.

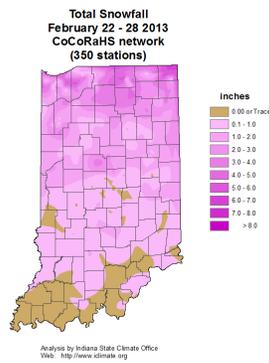
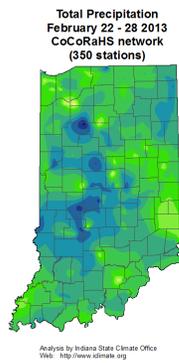
On February 26th a new storm in Texas worked its way north towards Indiana, delivering warm moist air and continuous rainfall as it greatly intensified along the way. The next day this storm's occluded front crossed our state, replacing the warm air flow with colder air behind it, changing rainfall to all day snow showers. On February 28th the storm was weakening rapidly, its core expanding outward like a giant pin wheel. Eventually the storm's precipitation bands stretched over 1000 miles, from the Mississippi River to the Atlantic coast. Indiana temperatures cooled very slightly, ending the week at just 1°F below normal. Overall for the week the state temperature averaged 3°F below normal. At this time of year Indiana daily maximum temperatures should vary from about 38°F in far northern Indiana to 49°F in the southwest corner of the state. Daily minimums normally range from 23°F to 30°F north to south.

A mix of sleet and a thin coating of freezing rain fell on February 22nd. The freezing line moved northward across Indiana during the day as the frozen precipitation changed over to rain with warming temperatures. About 0.3 inch of precipitation fell during this storm. The second storm of the week, a 3-day event, began as an all-day rain on February 26th. Rainfall reports from around Indiana the next morning averaged about 0.9 inch but some CoCoRaHS volunteers measured locally higher amounts, including 1.80 inch at Burnettsville and 1.49 inch in Lafayette. The rain gage in Frankfort caught 1.44 inch while the Brownsburg observer had 1.40 inch. The rain transformed into snow and show showers which continued throughout the next day. The storm exited Indiana with flurries on February 28th. Over the full week precipitation totals were greatest in central and west central Indiana. In Plainfield a 2.46 inch total was recorded. The CoCoRaHS observer in Greencastle measured 2.28 inches, while Frankfort noted 2.04 inches, Spencer 2.03 inches, and 2.00 inches was totaled in Granger. On average about 1.3 inch to 1.5 inch was measured across Indiana. This is about 220% of normal in northern and central counties and 160% of normal across the south.

Most of the week's snow came during the first storm on February 22nd. Northwest Indiana received the heaviest daily amounts in Indiana, including 4.0 inches at Portage, 3.5 inches in Westville, and two reports of 3.4 inches and 3.2 inches at Laporte. Angola had 3.3 inches that day. After tallying in snowfall from the later storm, weekly snowfall totals come to 6.4 inches at Granger, 6.1 inches in Angola, and 6.0 inches in Hudson. Chesterton had 5.7 inches and Westville 5.5 inches for the week. Maps showing this week's distribution of precipitation and snowfall totals are found at the end of this narrative.

The freezing rain, sleet, and snow on February 22nd caused many traffic accidents on Indiana highways. A chain reaction crash involving 3 trucks on I-65 in White county killed the driver of the last truck who failed to slow for the 2 trucks slowing down in front of him. The interstate was closed for 7 hours to clear the scene. The heavy rain on February 26th caused different kinds of problems. A state highway in Morgan and Putnam counties had to be closed for 6 miles due to flood waters covering the roadway. In northeast Indiana ice accumulation caused power outages in Allen, Blackford, Grant, Wells, and Delaware counties until warming temperatures arrived later in the day.

There were no changes made to the US Drought Monitor since the previous week. Weekly Indiana drought maps from the Drought Monitor product are found at the end of this monthly summary.



February 2013

Region	Temperature		
	Temperature	Normal	Deviation
Northwest	26.9	27.7	-0.8
North Central	26.6	27.3	-0.7
Northeast	26.1	26.8	-0.7
West Central	29.8	30.0	-0.1
Central	29.3	29.7	-0.3
East Central	28.7	28.7	0.0
Southwest	34.2	34.7	-0.6
South Central	33.7	34.5	-0.8
Southeast	32.4	33.4	-1.1
State	29.8	30.4	-0.6

Region	Precipitation			
	Precipitation	Normal	Deviation	Percent of Normal
Northwest	2.06	1.68	0.38	123
North Central	1.96	1.79	0.17	109
Northeast	2.09	1.78	0.30	117
West Central	2.68	2.16	0.52	124
Central	2.13	2.27	-0.14	94
East Central	1.80	2.15	-0.35	84
Southwest	2.68	2.88	-0.20	93
South Central	2.45	2.92	-0.47	84
Southeast	2.03	2.80	-0.77	73
State	2.24	2.28	-0.04	98

Winter (December 2012 - February 2013)

Region	Temperature	Temperature	
		Normal	Deviation
Northwest	29.7	26.4	3.3
North Central	29.5	26.4	3.2
Northeast	29.4	26.2	3.2
West Central	31.7	28.5	3.2
Central	31.7	28.5	3.2
East Central	31.4	27.8	3.5
Southwest	35.9	33.0	2.9
South Central	35.6	32.9	2.7
Southeast	34.7	32.1	2.6
State	32.2	29.1	3.1

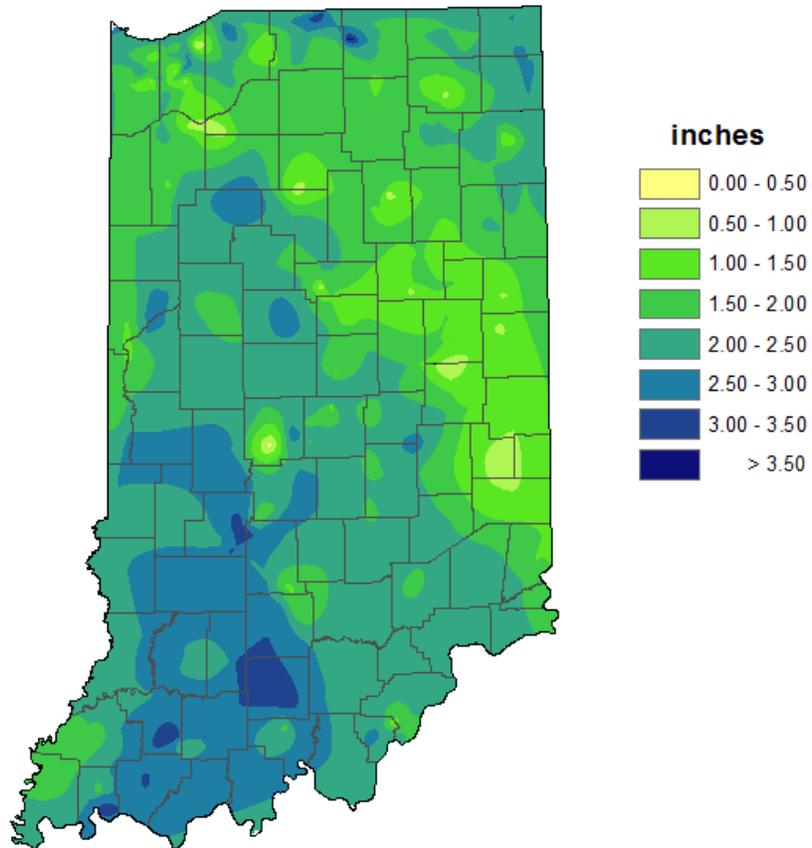
Region	Precipitation	Precipitation		
		Normal	Deviation	Percent of Normal
Northwest	7.90	6.21	1.68	127
North Central	8.50	6.63	1.87	128
Northeast	7.90	6.45	1.46	123
West Central	10.72	7.41	3.31	145
Central	10.83	7.60	3.23	143
East Central	9.52	7.31	2.21	130
Southwest	12.29	9.41	2.88	131
South Central	12.59	9.58	3.00	131
Southeast	11.21	9.22	2.00	122
State	10.27	7.77	2.50	132

2013 Annual (through February)

Region	Temperature	Temperature	
		Normal	Deviation
Northwest	26.8	25.3	1.5
North Central	26.8	25.1	1.6
Northeast	26.6	24.9	1.7
West Central	29.2	27.4	1.7
Central	29.0	27.4	1.6
East Central	28.7	26.6	2.1
Southwest	33.6	32.2	1.4
South Central	33.4	32.1	1.4
Southeast	32.4	31.2	1.3
State	29.7	28.1	1.6

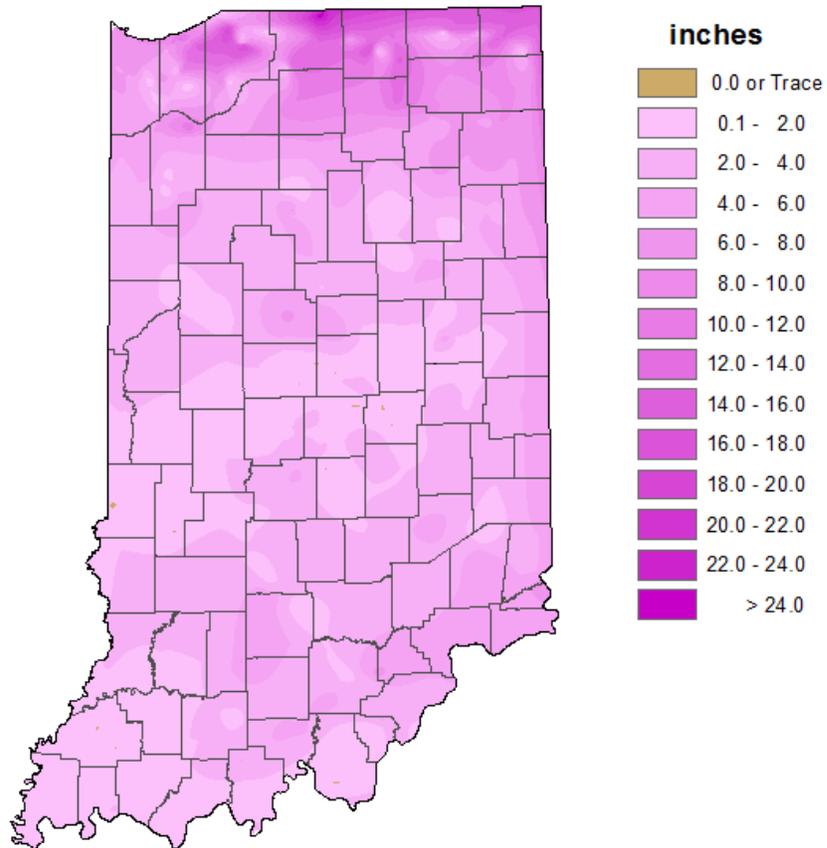
Region	Precipitation	Precipitation		
		Normal	Deviation	Percent of Normal
Northwest	5.61	3.56	2.06	158
North Central	5.89	3.84	2.05	153
Northeast	5.50	3.77	1.74	146
West Central	7.65	4.44	3.21	172
Central	7.40	4.61	2.79	160
East Central	5.97	4.44	1.53	134
Southwest	8.88	5.88	3.00	151
South Central	8.16	6.02	2.13	135
Southeast	6.23	5.81	0.42	107
State	6.97	4.71	2.26	148

**Total Precipitation
February 2013
CoCoRaHS network
(350 stations)**



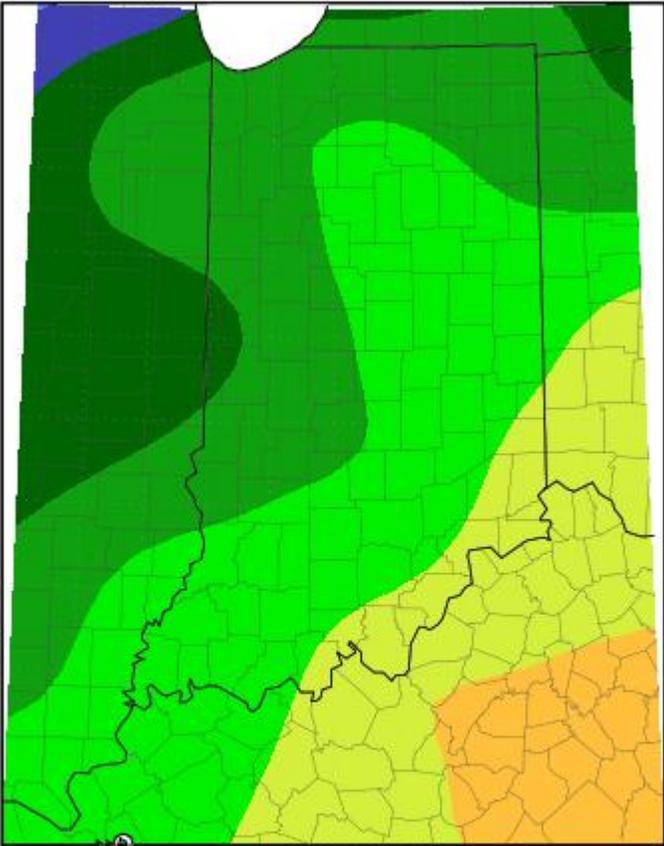
Analysis by Indiana State Climate Office
Web: <http://www.iclimat.org>

**Total Snowfall
February 2013
CoCoRaHS network
(350 stations)**



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

Accumulated Precipitation: Percent of Mean
February 1, 2013 to February 28, 2013

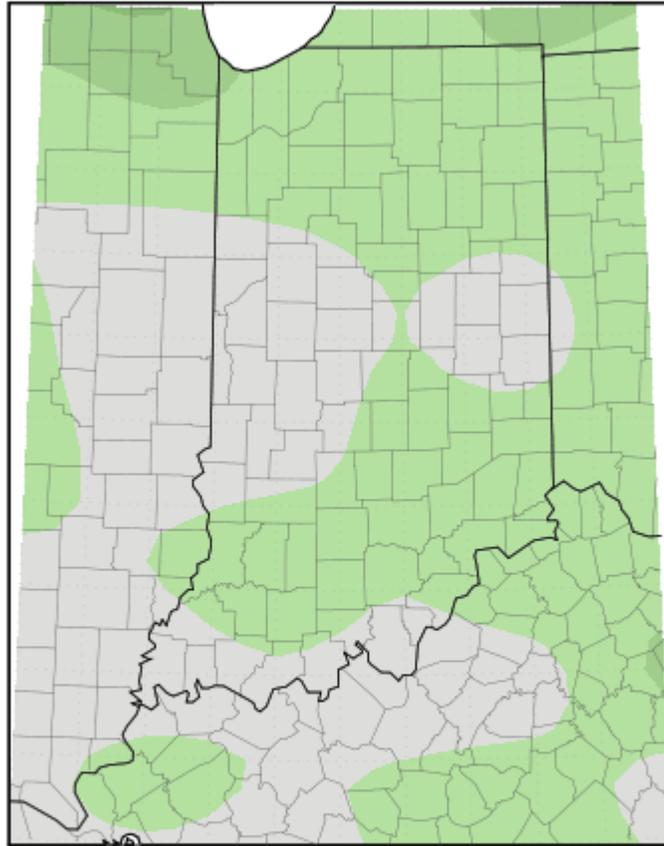


Mean period is 1981-2010.



Midwestern Regional Climate Center
MRCC Applied Climate System
Generated at: 3/5/2013 12:54:03 PM CST

Average Temperature (°F): Departure from Mean
February 1, 2013 to February 28, 2013



Mean period is 1981–2010.



Midwestern Regional Climate Center

MRCC Applied Climate System

Generated at: 3/5/2013 12:55:01 PM CST

Drought Summary from the U.S. Drought Monitor

Below is a drought summary for the state of Indiana from the U.S. drought monitor. Areas in white are not experiencing any drought. Yellow areas are abnormally dry, but not considered a drought. Drought begins when the moisture levels become more severe, with beige, orange, red, and brown indicating increasing levels of drought (moderate, severe, extreme, and exceptional, respectively). The table below indicates 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, February 26th has 11.8% 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	D1 Drought - Moderate	D2 Drought - Severe	D3 Drought - Extreme	D4 Drought - Exceptional
Week	Nothing	D0-D4	D1-D4	D2-D4	D3-D4	D4
February 26, 2013	88.22	11.78	0.00	0.00	0.00	0.00
February 19, 2013	88.22	11.78	0.00	0.00	0.00	0.00
February 12, 2013	88.22	11.78	0.00	0.00	0.00	0.00
February 5, 2013	88.13	11.87	0.00	0.00	0.00	0.00

February 5th Drought Summary



February 12th Drought Summary



February 19th Drought Summary



February 26th Drought Summary

