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## Indiana State Climate Office

### Monthly Weather Report

Jan 22, 2013



<http://www.inclimate.org>

## December 2013 Climate Summary

### Month Summary

After a mostly cold and slowly changing start, winter became more active in the second half of December. Widespread snowfall on December 14<sup>th</sup> and heavy rainfall a weekend later set the stage for massive flooding. Later on frequent winter storms made traveling Indiana highways difficult. Two people were killed this month in weather related vehicle accidents, a newlywed in Lake county and a Carroll county man. Commercial shipping on Lake Michigan has slowed due to early season freezes. One benefit of the wet weather this month was the elimination of abnormally dry soils in the state following the local autumn drought.

The December state average temperature of 29.2°F is 1.9°F below normal. This places December 2013 as the 39<sup>th</sup> coldest December on record in Indiana. Some recent colder Decembers include the 24.0°F average of three years ago in 2010, ranking in 11<sup>th</sup> place. The 29.0°F mean temperature of 2008 places that year in the 38<sup>th</sup> coldest spot. In 2005 its 26.8°F reading ties 1924 in 22<sup>nd</sup> place. A chilly 19.3°F number in 2000 was the coldest December in recent years, coming in at 2<sup>nd</sup> place. Recall the ice box of 1989, the coldest December on record with a 18.4°F average? The day split in December 2013 was 17 days with below normal temperature, 14 days above normal, and no days at normal. The state average temperature was 10°F or more below normal on 9 days and 20°F or more below normal on 1 day. There were 5 days when the daily temperature was 10°F or more above normal. The highest temperature of the month was 71°F in Cannelton on December 5<sup>th</sup>. The coldest official temperature was -8°F on December 12<sup>th</sup> at Lowell.

December state precipitation averaged 4.50 inches, a hefty 1.47 inch above normal. This then is the 17<sup>th</sup> wettest December since records began. Some recent wetter Decembers include 2011 with 4.58 inches, ranked in 16<sup>th</sup> place. In 2008 the 5.13 inch state average was good for 8<sup>th</sup> place. A year earlier the 5.14 inch value claimed 7<sup>th</sup> place. The 4.98 inches of December 2006 ranks in 10<sup>th</sup> place. The wettest December on record in Indiana was 7.04 inches in 1990. Regionally December 2013 precipitation was near 95% of normal in northern Indiana, about 160% of normal in central areas, and 170% of normal in the south. Normal December precipitation varies between 2.7 and 3.6 inches north to south. The highest single day precipitation in the cooperative network this month was 5.80 inches on December 21<sup>st</sup> at Princeton. In the CoCoRaHS network the highest daily value was 4.70 inches on December 22<sup>nd</sup> in Petersburg. Widespread precipitation fell on about 17 days this month. Weekly precipitation maps follow each narrative below.

Southern Indiana received their heaviest snow day on December 7<sup>th</sup> when up to 10 inches fell. In northern and central Indiana 3 to 6 inches was common a week later on December 14<sup>th</sup>. Overall

widespread snow fell on about 10 days this month. Snowfall maps are found at the end of each weekly narrative which follows.

Details about the extensive flooding in central and southern Indiana on the weekend of December 21<sup>st</sup> are found in the weekly narratives. Information on the weather related deaths and travel impacts due to snow and ice are also found there.

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

This was just one week but with two very different halves. The first half saw daily state average temperatures climb steadily from 2°F above normal to a peak at 15°F above normal by mid-week. Artic air poured into Indiana over the next 3 days, dropping temperatures to 15°F below normal by the end of the week in a 30°F fall.

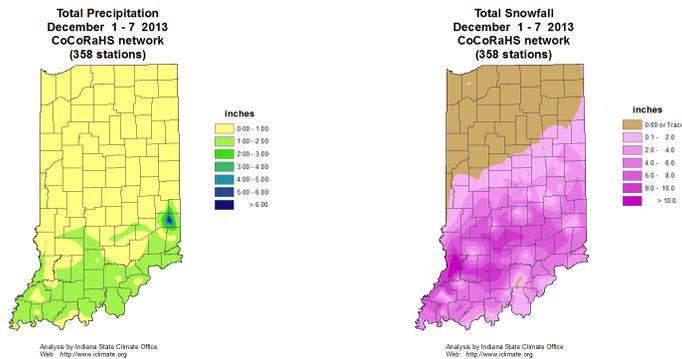
A pair of struggling cold fronts managed to reach Kentucky by December 2<sup>nd</sup>, but there they stalled as a stationary front. The front crept northward into southern Indiana the next day and the state average temperature lifted to 6°F above normal. Warm air ahead of the next storm system fully converted the old front into a warm front which reached Michigan on December 4<sup>th</sup>. State temperatures soared to 15°F above normal.

This storm system was intensifying rapidly as arctic air was drawn in behind it. The storm's strong cold front traveled across Indiana on December 5<sup>th</sup> and temperatures began to tumble, falling below normal later that day. Over the next two days cold air pumped south out of central Canada into Indiana, closing the week with the state temperature at 15°F below normal, the coldest day of the week. Normally for the first week of December daily maximum temperatures vary from 39°F in far northern Indiana to 48°F in the southwest corner of the state. Typical daily minimums range from 26°F to 30°F north to south across the state.

Precipitation was very light in the warm first half of the week. The bulk of the precipitation came later as the arctic air squeezed moisture out of the atmosphere, totaling for the week near 0.1 inch in northern Indiana, around 0.5 inch in central, and 1.2 inch across the south. These totals equate to about 10% of normal in the north, 75% in central, and 160% of normal in southern Indiana. More than one inch fell generally south of a Sullivan to Liberty line this week with smaller amounts to the north as the storm tracked near the Ohio River. The heaviest one day amounts reported the morning of December 6<sup>th</sup> by CoCoRaHS observers included 1.07 inch at Poseyville and 1.01 inch in Spencer. The next morning the Lawrenceburg gage had captured 1.80 inch, while the Francisco volunteer had 1.16 inch and 1.04 inch was measured at New Pekin. Overall for the week New Pekin totaled 2.08 inches, New Salisbury had 1.87 inch, and Jeffersonville summed to 1.78 inch. The gage at Poseyville had collected 1.77 inch with the Birdseye total at 1.76 inch.

With the storm centered across southern Indiana snow this week fell generally south of a Covington to Fort Wayne line with only a trace or nothing reported to the north. No lake effect snow was ongoing in this event. The heaviest daily snowfall observed in the CoCoRaHS network included 10.8 inches at Bicknell, 10.0 inches in Francisco, and 8.5 inches at Shoals. The Mitchell volunteer reported 7.3 inches while Paoli had 7.1 inches. Total snowfall for the week topped out at 13.8 inches in Bicknell, 10.3 inches at Shoals, and 10.2 inches in Washington. Both the Hazleton and Francisco sites totaled 10.0 inches of snow for the week.

The US Drought Monitor continues to show no change in Indiana soil moisture status since early November. The December 3<sup>rd</sup> map has abnormally dry conditions mostly north of a Clinton to Portland line except for all of 5 counties and parts of 7 counties in northwest Indiana. South of this line the soil moisture status is considered about normal for this time of year. Coverage by abnormally dry soils is still rated at 32% of Indiana area while the remaining 68% holds at normal status. Maps of Indiana weekly precipitation, snowfall, and drought status are found below and near the end of this document.



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

A very warm early half of last week changed abruptly into a cold second half. This week Indiana weather was, well, very cold. Two snowstorms moved through the state but the last one was significant and piled up the most snow over a large area.

High pressure over Wisconsin kept arctic air flowing into Indiana on December 8<sup>th</sup>, the fourth frigid day in a row. Temperatures opened the week at 13°F below normal, rising to 8°F below normal the next day. An Alberta clipper cold front then raced east across the state, keeping the pipeline open to another blast of arctic air into Indiana. Another cold front reinforced the arctic chill as it swept through the state on December 12<sup>th</sup>. State average temperatures continued to sink, from 12°F below normal on December 10<sup>th</sup> to 20°F below normal two days later, the coldest day of the week. For some Indiana cities the December 12<sup>th</sup> minimum temperature was their coldest day since February 2011.

A big weather change was now underway, alleviating cold day after cold day, but allowing more moisture to be carried north with the warmer temperatures. A third cold front attempted to move through the state on December 14<sup>th</sup> but it stalled as a stationary front in central Indiana. The warm moisture heavy air flow into Indiana was persistent and would not be turned back. The state average temperature continued to rise, ending the week at 8°F below normal. Overall for the week the state temperature averaged near 13°F below normal. Indiana temperatures should be much warmer this second week of December. Daily maximum temperatures should range between 36°F and 45°F north to south across the state. Daily minimums normally vary from 24°F in far northern Indiana to 28°F in the southwest corner of the state.

There were two snow storms this week, the first on December 9<sup>th</sup> and 10<sup>th</sup> with the second bigger storm impacting Indiana on December 13<sup>th</sup> and 14<sup>th</sup>.

On the initial day of the first snow storm less than an inch of snow was common in the northern half of the state with about an inch near Lake Michigan. The next day 2 to 3 inches fell in a band between Princeton and Cincinnati tapering to about an inch just to the north and south. This storm wound down on December 11<sup>th</sup> with another inch falling in Lake, Porter, and Laporte counties.

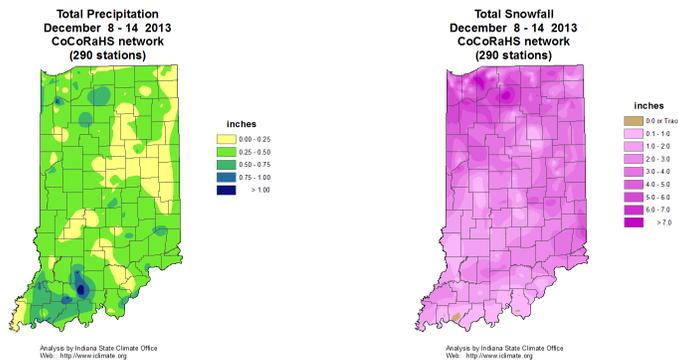
Snow fell heavily for 12 hours during the second snow storm on December 13<sup>th</sup> and 14<sup>th</sup>. Initially heavy snow fell in west central Indiana and in the lake effect region between Laporte and Lagrange counties. Heavy snow continued to expand generally north of a Clinton to Fort Wayne line, especially in Vigo, White, Tippecanoe, and Cass counties and in about 10 counties of extreme northeast Indiana. CoCoRaHS network observers reported their heaviest second day snow accumulations of 6.1 inches at Hanna, 6.0 inches in Plymouth, and 5.5 inches at each of Attica and Demotte.

For the week snow totaled 8.4 inches at Demotte. Plymouth accumulated 8.3 inches and Munster had 8.1 inches. The week sum was 8.0 inches at Westville, and 7.9 inches in Hanna.

Precipitation was noted every day this week but was very light outside of the two heavy snow events. The heaviest single day precipitation, which includes rainfall and melted snowfall, came on December 14<sup>th</sup> with amounts of 1.25 inch in Celestine and 1.00 inch at Demotte. Huntingburg and Shoals each had 1.00 inch a few days earlier on December 10<sup>th</sup>. For the week precipitation averaged near 0.4 inch statewide. Regionally this equates to about 70% of normal across northern Indiana, 60% in central, and 50% of normal across the south. Maps of total weekly snowfall and precipitation are found at the end of this article.

Vehicle accidents which included numerous slide offs, minor vehicle damage, and injuries were impacts of the second storm. But likely the most tragic occurred in Lake county where a just married groom was killed when he stopped to help a traveler who had slid off the interstate. Three cars skidded on the icy road and into the groom and stuck traveler, killing them both. The bride remained inside another car and survived.

There was no change again this week in the Indiana drought map according to the US Drought Monitor.



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

What a difference a week makes! Last week's persistent arctic cold was followed by 7 days of constant upward movement on the thermometer. From start to finish this week the state average temperature soared 30°F! Heavy snow cover a weekend ago vanished, replaced by local torrential rainfall and flooding to end this week.

The state average temperature was already chilly at 11°F below normal when a cold front quickly crossed Indiana on December 15<sup>th</sup>. The next day an Alberta clipper system dashed southeast to Missouri, extending its stationary front across southern Indiana and lifting the state temperature a bit to 8°F below normal. The clipper storm continued east to Ohio on December 17<sup>th</sup>, reactivating the stationary front into a cold front that dipped into Kentucky. But the cold front had already lost its punch and had no impact on Indiana temperature which continued its ascent to 4°F below normal. High pressure moved overhead Indiana near ground level while in the upper atmosphere unseasonably warm and moist air was being transported eastward into the Midwest. The state temperature continued to warm to 1°F above normal on December 18<sup>th</sup>, finally breaking the long cold snap.

The warm up now accelerated. The high pressure center crept east of Indiana enabling southerly winds to push the temperature higher to 6°F above normal. A new cold front was nearby but struggled to enter northern Indiana. Competing high pressure centers in South Dakota and South Carolina slowed the front to a stall over Indiana. Waves of low pressure rode northeast on top of the stretched front, transporting warmth and a huge supply of Gulf of Mexico moisture into Indiana. State average temperatures climbed rapidly and peaked at 19°F above normal to close out the week. The relentless warming from much below to much above normal temperature calculated to a weekly average temperature at 3°F above normal. Typically for this third week of December daily maximum temperatures should range between 34°F and 43°F north to south across the state. Daily minimums should vary from 22°F degrees in far northern counties to 26°F in extreme southwest Indiana.

The significant snow storm of the previous weekend gradually departed Indiana. CoCoRaHS reports on the morning of December 15<sup>th</sup> showed snow had piled high in northeast Indiana counties the day before. In Lagrange and Hudson new snow was 7.0 inches deep. Six inches was measured

at each of Auburn, Angola, Kendallville, and Hamilton that morning. The greatest snowfall totals for the week were also all found in northeast Indiana. The CoCoRaHS observer at Lagrange had accumulated 8.8 inches, Hudson 8.3 inches, and Columbia City 8.0 inches. In Angola the snow total was 7.9 inches while 7.8 inches was tallied at Leesburg.

Ripples of low pressure in the upper atmosphere kept snow showers going in the northern half of Indiana over the next 3 days. These showers added less than a quarter inch of new moisture to the weekly total liquid precipitation. The mid-week snow showers challenged Indiana drivers. There were so many slide off accidents that some county roads were closed for a time while vehicles could be removed.

The other major weather story this week was the heavy rain event that started on December 20<sup>th</sup> and by the end of the next day had contributed the bulk of this week's precipitation. Local rainfall was torrential in spots. A few miles west of Indianapolis 4.85 inches was measured by a CoCoRaHS observer on the morning of December 21<sup>st</sup>. Some other locally heavy amounts that morning were noted in Willow Branch with 2.88 inches and 2.80 inches at each of New Castle and Fortville. The observer in Newburgh collected 2.76 inches while 2.74 inches was found in the Hazleton rain gage. Some of the highest weekly precipitation totals included 3.30 inches at Fortville, 3.25 inches in Castleton, and 3.02 inches in New Palestine.

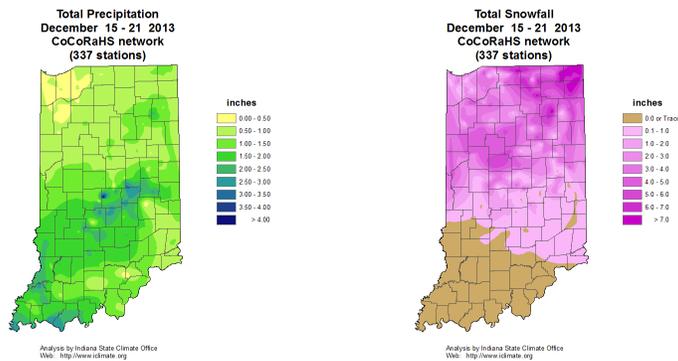
When all rain and melted snow are accounted for this week on average about 0.9 inch of precipitation fell in northern Indiana, near 1.8 inch across central Indiana, and 1.6 inch in the south. These totals are nearly double the normal amount expected in northern and southern counties, and almost triple normal in central Indiana.

The fast and complete snow melt on December 19<sup>th</sup> combined with the heavy rainfall to cause rivers to flood starting on December 21<sup>st</sup>. Roads, farmland, and residential areas are beginning to be impacted. Hamilton and Marion counties are already offering sandbags to residents in preparation for urban flooding. High water signs are ready to go for roads that may need to be closed.

Thunderstorms in far southern and southeast Indiana caused wind damage on the evening of December 21<sup>st</sup>. Trees were toppled in Crawford, Floyd, Ripley, Dearborn, and Union counties. Some of the trees in Ripley county fell on roads and tore down power lines.

The December 17<sup>th</sup> edition of the US Drought Monitor does not account for the heavy weekend rainfall. No new changes were made in the Indiana soil moisture depiction, keeping the map the same as it has been since early November 2013. Changes are expected in the December 24<sup>th</sup> edition to reflect the much wetter recent conditions in northern Indiana.

The December cold has greatly impacted ship travel on the Great Lakes. Ice sheets have grown larger and much earlier than usual. In southern Lake Michigan the managers of lake harbors have been working to protect their docks from ice buildup. Meanwhile in northern Lake Michigan the US Coast Guard is already busy breaking through ice to open up shipping lanes to Great Lakes industrial shippers.



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

Temperatures were on the move these final 10 days of the month. The state average temperature started very warm but within two days had plummeted 26°F to its coldest point. Then in a near complete rebound temperatures soared almost to where they started before stumbling again to close out the month. The impact of the heavy rain late last week became very evident in the widespread flooding to start this 10 day run. But snowy and icy roads caused havoc in the end with one fatality on the roadways.

A strong cold front moved through Indiana on December 22<sup>nd</sup>, forcing the state average temperature to plunge from 13°F above normal to 13°F below normal over two days. A narrow ridge passed over the state on December 24<sup>th</sup>, then moved east of Indiana on Christmas Day. A gradual warm up was underway.

A new storm system pushed its warm front through Indiana on December 26<sup>th</sup>, boosting temperatures to 3°F above normal. A team of southern high pressure centers stretched across the country pumped warm air into the Midwest through December 28<sup>th</sup>, forcing an approaching cold front into retreat. The state average temperature had now climbed to 10°F above normal.

A new storm system moved out of the Dakotas and helped push a new cold air intrusion through Indiana on December 29<sup>th</sup>. On New Year's Eve yet another Alberta clipper system quickly moved its cold front into Indiana but this time was halted midway across the state. Temperatures fell to 9°F below normal on December 30<sup>th</sup> before rising slightly to 7°F below normal to close out the year. The year ended with the stationary front locked in over central Indiana. Overall for the 10 days the rigorous warming and cooling balanced the state temperature to right about normal. Typically for these final 10 days of the year daily maximum temperatures should range from about 33°F in far northern Indiana to 42°F in the far southwest. Daily minimums normally vary from 20°F to 25°F north to south across the state.

Heavy precipitation that began December 20<sup>th</sup> had eased up when December 22<sup>nd</sup> rolled around. Rain gage measurements that morning generally ranged between 1.1 and 1.9 inches but amounts in southwest Indiana were still quite heavy according to the CoCoRaHS network. The Newburgh volunteer measured 4.92 inches and Petersburg 4.70 inches while Franklin had 4.56 inches. At

Darmstadt 4.38 inches was received while the Plainville observer noted 4.37 inches. Precipitation the remainder of the month was considerably lighter, with less than 0.1 inch generally noted on each day. Regionally 10 day totals were about 1.2 inches in northern Indiana, 1.9 inches in central counties, and 2.5 inches in the south. These equate to about 130% of normal in the north, 190% of normal in central sections, and 230% of normal across the south. The heaviest 10 day totals were tallied at Newburgh with 4.92 inches, in Petersburg with 4.80 inches, and at Darmstadt with 4.48 inches. Plainville had 4.44 inches and 4.42 inches was summed at Washington.

Snow expanded from lake effect pockets on December 23<sup>rd</sup> and 24<sup>th</sup> to most of northern Indiana by December 26<sup>th</sup>. A new snow event on December 30<sup>th</sup> spread to most of the northern half of the state the next day before intensifying in far northern counties as the calendar turned to 2014. The heaviest snow of the 10 day interval was in this last event of 2013, depositing 2.5 inches in Trail Creek and Hobart according to CoCoRaHS reports. About 2.0 inches was common on December 31<sup>st</sup>, including at Chesterton, Westville, and Kingsbury. Over the full 10 days the highest snow totals in the state were 4.0 inches at Laporte, 3.8 inches at Chesterton and Valparaiso, and 3.5 inches in Hobart.

The key weather story of the 10 day interval was the extensive flooding in central and southern Indiana. A fast and strong warm up on December 19<sup>th</sup> made a quick mess of the snowpack left over from a week earlier. Then came two days of heavy rain, which along with the melt water, drove the pre-Christmas flood. Rainfall totaled to 7 inches a few miles south of Vincennes, the heaviest amount recorded over the wet December 21<sup>st</sup> weekend in the state.

On December 21<sup>st</sup> the flood havoc began. A levee broke in Gibson county, forcing the closure of a state highway. Thirteen water rescues were made for people trapped in their vehicles. In neighboring Pike county a man was saved from flood waters as he clung to a bridge for 3 hours after he was dumped from his floating vehicle. In nearby Evansville a Lloyd expressway ramp was closed as water ran over the highway.

On the evening of December 21<sup>st</sup> in Greene county, passengers were trapped inside a van awaiting rescue. Fireman evacuated a mobile home park in Marion county when a nearby creek flooded. Major Indianapolis streets were closed due to high water. The Johnson county fire department had already rescued residents in low-lying areas in their area. Eventually these officials declared a county emergency due to flood damage to roads, homes, and businesses. Shelby county residents in low areas were evacuated to the local high school but a pet black bear, rescued from an evacuated person's home, was brought out safely later. The Red Cross opened shelters for displaced residents here, as well as in Delaware, Henry, and Morgan counties.

In southeast Indiana, street flooding was so extensive in Bartholomew county that officials ran out of road closed signs. Rush county posted high water signs at 50 locations as they received 5 to 6 inches of rain in 36 hours time. In Clark county more than 1100 customers had lost power with lesser outages in Crawford, Floyd, and Scott counties.

Flooding continued into the next afternoon. In Central Indiana there was a slew of road closures, evacuations, and dramatic water rescues. A family of four was rescued from their flooded vehicle in Marion county. In east central Indiana, three homes were evacuated in Albany and travel advisories were issued elsewhere in Randolph county. Residents of 25 homes in Eaton were strongly urged to evacuate. Jay county had at least 24 road closures and 8 blocks of downtown

Portland had significant flooding. Sand bags were deployed there. Delaware county made self-serve sandbags available and ordered essential travel only starting the evening of December 22<sup>nd</sup> and continuing into late the next day. Meanwhile in Gibson county a truck washed off a road. Jefferson county had multiple roads closed and evacuations were underway.

By December 23<sup>rd</sup> power was out and roads washed out or closed in the town of Ellettsville in Monroe county. This is the fourth flood in the town since 1992. Flood weary residents are considering moving the town hall to higher ground.

Up to 600 homes had now been evacuated in Shelby county. Travel advisories were declared in Hamilton county. Johnson county issued a local emergency for flooding and a shelter was opened in Franklin. In Henry county a trailer park was evacuated when trailers became flooded. Many roads were closed in Wayne county due to widespread flooding. In Lawrence county roads were flooded and power was out in Bedford. Indianapolis drivers had to dance around road closures to find an open route to work on December 23<sup>rd</sup>.

The State of Indiana encouraged victims to report their flood damages online should the state consider petitioning for a federal disaster declaration to recoup losses incurred during the December 19<sup>th</sup> – 22<sup>nd</sup> event. Residents in northern Indiana were grateful they were largely spared the impacts of this flood event, especially urban areas in close proximity to rivers, streams, and creeks.

In retrospect the flooding was caused by a very moist plume of air pulled across the Ohio Valley in advance of a developing low pressure center. When its front stalled across Indiana, waves of low pressure rippled up this boundary, wringing out more moisture.

A few days later non-flood winter storm events impacted the state. A Carroll county man died the morning of December 26<sup>th</sup> when he lost control of his vehicle on a state road covered in black ice. He and numerous other drivers were surprised by the slick road surfaces and slid off highways in this same area. In nearby White county officers responded to at least 16 serious slide off crashes among other weather related accidents. There were at least 24 slide offs that morning in neighboring Tippecanoe county, some with minor injuries.

On December 31<sup>st</sup> freezing rain caused several vehicle accidents on icy roads in Lake county.

As expected the heavy rainfall on the December 21<sup>st</sup> weekend had a major impact on the Indiana drought status. The December 24<sup>th</sup> edition of the US Drought Monitor has removed all hints of remaining dryness from Indiana. The abnormally dry region (D0 category) in northern Indiana has been eliminated and all counties of Indiana are now rated to be in normal soil moisture status for this time of year.

**Total Precipitation**  
December 22 - 31 2013  
CoCoRaHS network  
(356 stations)



**inches**

0.00 - 1.00
1.00 - 2.00
2.00 - 3.00
3.00 - 4.00
4.00 - 5.00
5.00 - 6.00
> 6.00

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

**Total Snowfall**  
December 22 - 31 2013  
CoCoRaHS network  
(356 stations)



**inches**

0.0 or Trace
0.1 - 1.0
1.0 - 2.0
2.0 - 3.0
3.0 - 4.0
> 4.0

Analysis by Indiana State Climate Office  
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## December 2013

Region	Temperature	Temperature	
		Normal	Deviation
Northwest	24.6	28.5	-4.0
North Central	25.4	28.7	-3.3
Northeast	26.1	28.6	-2.5
West Central	28.2	30.4	-2.2
Central	29.6	30.7	-1.0
East Central	29.8	30.2	-0.3
Southwest	32.7	34.5	-1.8
South Central	33.3	34.5	-1.2
Southeast	33.7	34.0	-0.2
<b>State</b>	29.2	31.1	-1.9

Region	Precipitation	Precipitation		
		Normal	Deviation	Percent of Normal
Northwest	2.20	2.66	-0.46	83
North Central	2.71	2.79	-0.08	97
Northeast	2.93	2.68	0.24	109
West Central	3.73	2.96	0.77	126
Central	5.04	2.99	2.05	169
East Central	5.19	2.87	2.32	181
Southwest	6.78	3.53	3.25	192
South Central	6.24	3.56	2.68	175
Southeast	5.16	3.41	1.76	151
<b>State</b>	4.50	3.06	1.44	147

## Winter so far (same as December)

Region	Temperature	Temperature	
		Normal	Deviation
Northwest	24.6	28.5	-4.0
North Central	25.4	28.7	-3.3
Northeast	26.1	28.6	-2.5
West Central	28.2	30.4	-2.2
Central	29.6	30.7	-1.0
East Central	29.8	30.2	-0.3
Southwest	32.7	34.5	-1.8
South Central	33.3	34.5	-1.2
Southeast	33.7	34.0	-0.2
<b>State</b>	29.2	31.1	-1.9

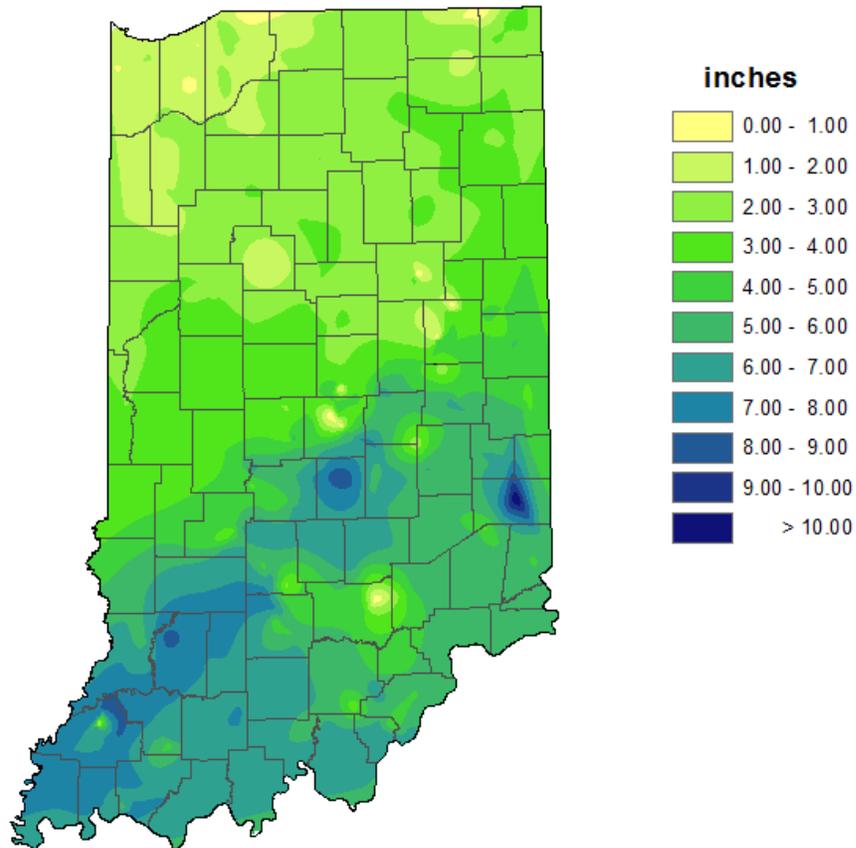
Region	Precipitation	Precipitation		
		Normal	Deviation	Percent of Normal
Northwest	2.20	2.66	-0.46	83
North Central	2.71	2.79	-0.08	97
Northeast	2.93	2.68	0.24	109
West Central	3.73	2.96	0.77	126
Central	5.04	2.99	2.05	169
East Central	5.19	2.87	2.32	181
Southwest	6.78	3.53	3.25	192
South Central	6.24	3.56	2.68	175
Southeast	5.16	3.41	1.76	151
<b>State</b>	4.50	3.06	1.44	147

## 2013 Annual

Region	Temperature	Temperature	
		Normal	Deviation
Northwest	49.2	50.2	-1.1
North Central	49.1	49.8	-0.8
Northeast	49.0	49.5	-0.5
West Central	51.1	51.9	-0.8
Central	51.3	51.5	-0.2
East Central	50.9	50.7	0.2
Southwest	54.2	55.1	-0.9
South Central	53.9	54.5	-0.6
Southeast	53.3	53.7	-0.4
<b>State</b>	51.4	51.9	-0.6

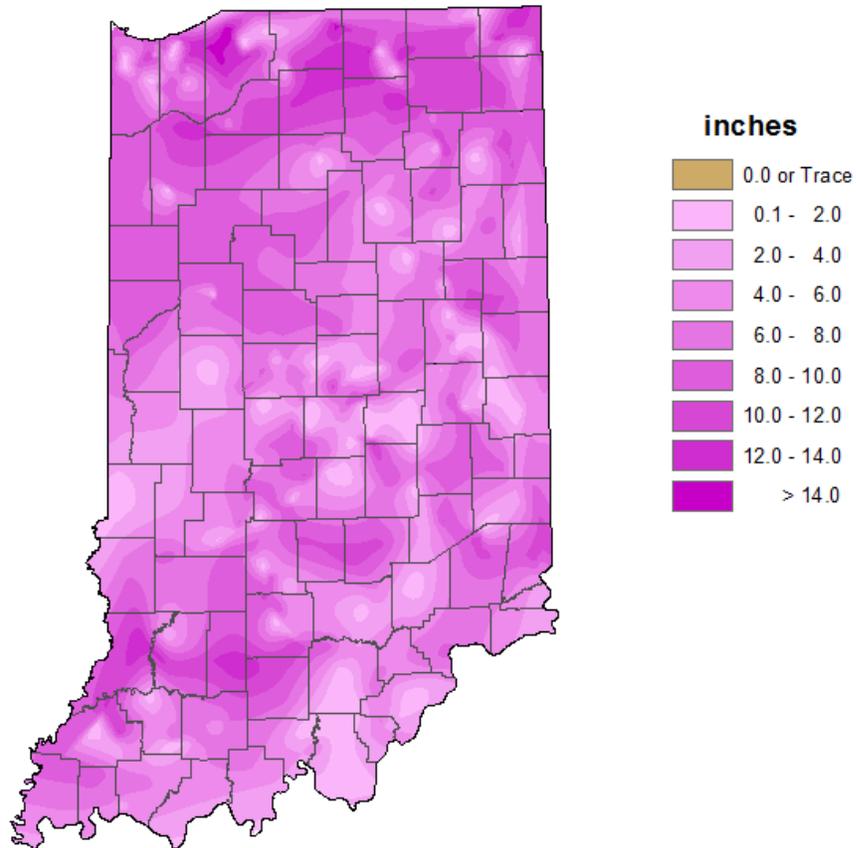
Region	Precipitation	Precipitation		
		Normal	Deviation	Percent of Normal
Northwest	40.33	38.01	2.32	106
North Central	42.20	38.19	4.00	110
Northeast	38.70	36.75	1.96	105
West Central	45.04	41.23	3.81	109
Central	45.16	40.74	4.42	111
East Central	42.37	39.23	3.13	108
Southwest	54.81	45.56	9.25	120
South Central	52.00	45.70	6.30	114
Southeast	47.48	44.12	3.36	108
<b>State</b>	45.70	41.18	4.52	111

**Total Precipitation  
December 2013  
CoCoRaHS network  
(361 stations)**



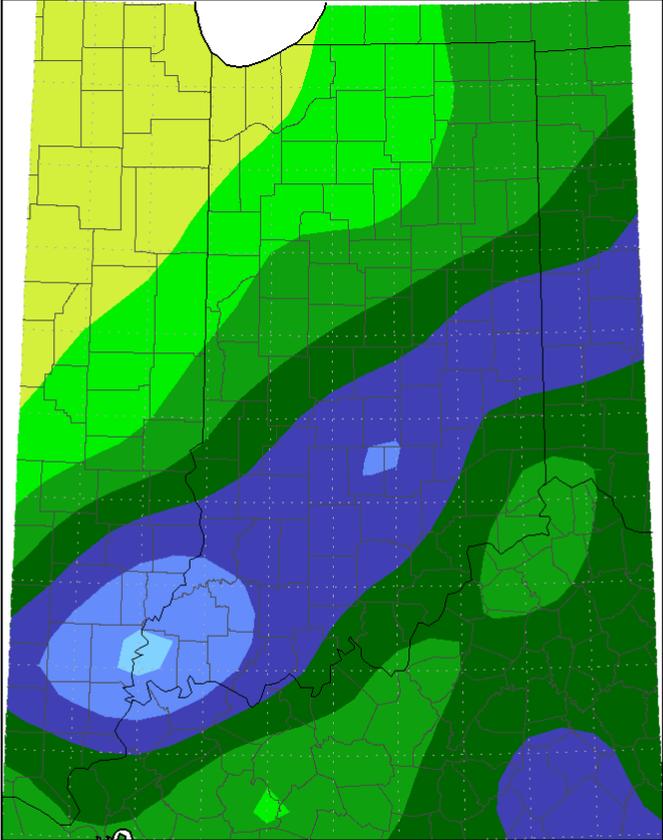
Analysis by Indiana State Climate Office  
Web: <http://www.iclimate.org>

**Total Snowfall  
December 2013  
CoCoRaHS network  
(361 stations)**

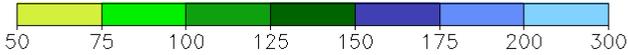


Analysis by Indiana State Climate Office  
Web: <http://www.iclimat.org>

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

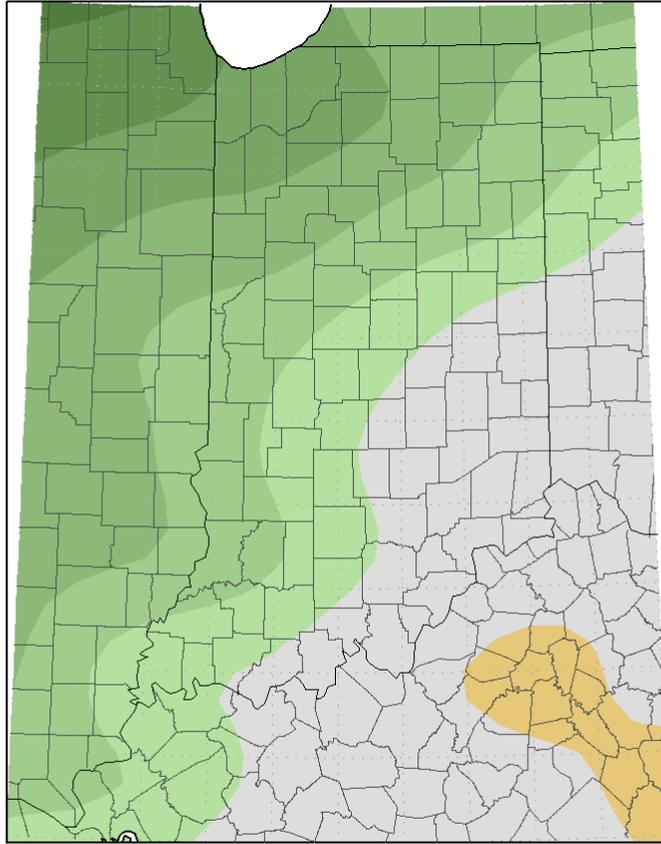


Mean period is 1981-2010.

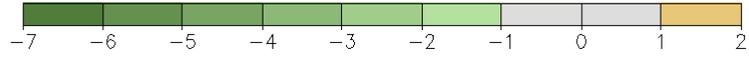


Midwestern Regional Climate Center  
cli-MATE: MRCC Application Tools Environment  
Generated at: 1/22/2014 10:12:25 AM CST

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



Mean period is 1981-2010.



Midwestern Regional Climate Center  
cli-MATE: MRCC Application Tools Environment  
Generated at: 1/22/2014 10:14:03 AM 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 what percentage of the state is drought free, and how much of the state is in drought by degree of severity (D1 - D4 category).

Indiana

**Drought Severity**

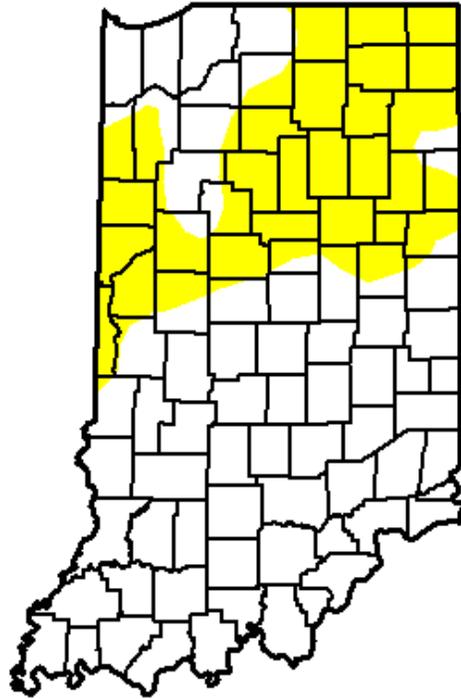
- D0 - Abnormally Dry
- D2 Drought - Severe
- D4 Drought - Exceptional
- D1 Drought - Moderate
- D3 Drought - Extreme

**Statistics type:**  Traditional (D0-D4, D1-D4, etc.)  Categorical (D0, D1, etc.)

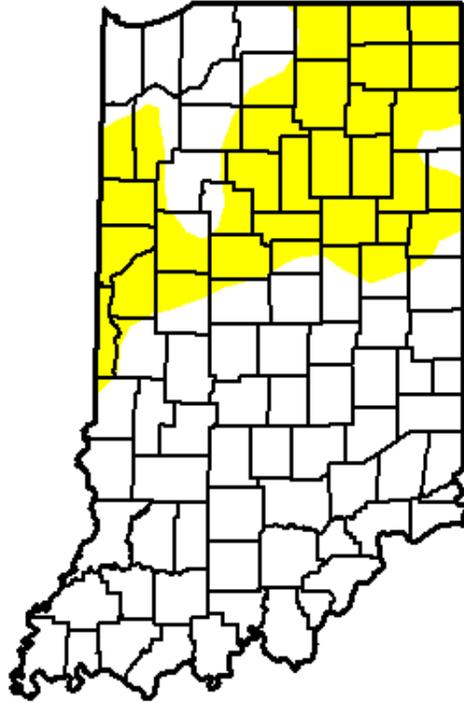
### Percent Area in U.S. Drought Monitor Categories

Week	Nothing	D0-D4	D1-D4	D2-D4	D3-D4	D4
12/31/2013	100.00	0.00	0.00	0.00	0.00	0.00
12/24/2013	100.00	0.00	0.00	0.00	0.00	0.00
12/17/2013	68.10	31.90	0.00	0.00	0.00	0.00
12/10/2013	68.10	31.90	0.00	0.00	0.00	0.00
12/3/2013	68.10	31.90	0.00	0.00	0.00	0.00

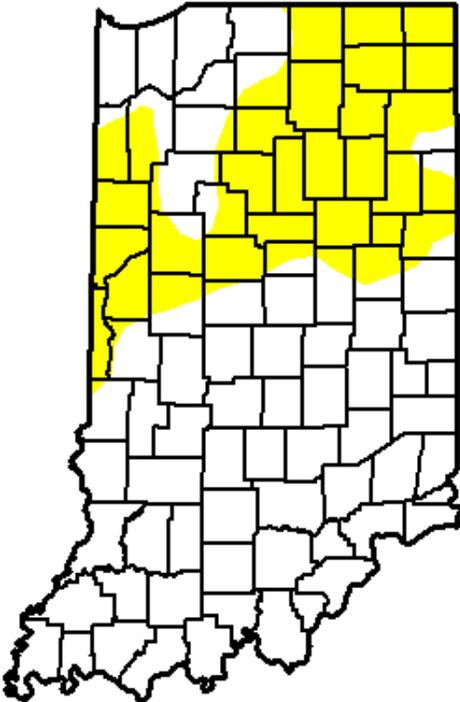
*December 3<sup>rd</sup> Drought Summary*



*December 10<sup>th</sup> Drought Summary*



*December 17<sup>th</sup> Drought Summary*



*December 24<sup>th</sup> Drought Summary*



*December 31<sup>st</sup> Drought Summary*

