

moderate drought, 29% in moderate drought (D2 class), 65% as abnormally dry (D1 class), and 5% as not in drought status. This is generally a two-class improvement all around. (Weekly county drought maps are shown near the end of this report.).

With few weather fronts passing through Indiana this month severe weather events were very limited. Some trees toppled during high winds near Bedford on November 22nd while trees and a garage fell in Edwardsport on November 24th. Some fencing came down that same day near Hope.

Open burn bans in Indiana counties fell along with the heavy rainfall. November began with burn bans in force in 59 counties but bans remained in only 5 counties as the month came to a close. Details on these declaration changes are found in the weekly narratives below.

November 1st – 7th

The wild storms of last week were replaced by a much quieter weather pattern as just one cold front moved through Indiana this week. Precipitation was very light again in this continuing drought. The first lake effect snow of the season greeted northern Indiana residents in mid week.

State average daily temperatures were below normal every day this week, a rare event that hasn't occurred in many months. The month opened at 10° below normal then moderated slightly to 6° below normal by mid week. A cold front traversed the state on November 5th, sending temperatures downward to the 10° below normal level for just a day. A warm up was underway at the close of this week as temperatures bounced to 3° below normal, the warmest day of the week. Daily temperatures overall for the first 7 days of November averaged 7° below normal. Typically daily maximum temperatures range from 56° to 63° north to south across the state while daily minimums normally range between 40° and 42°.

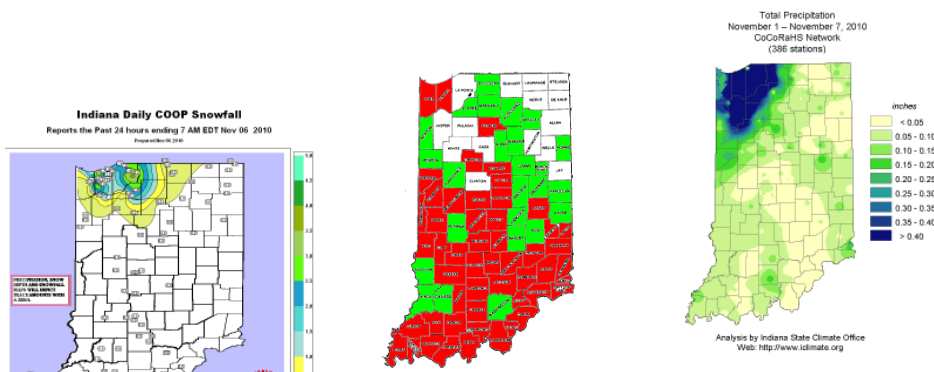
A sprawling high pressure ridge over the Great Lakes region moved gradually northeast by November 3rd, allowing slightly warmer but still below normal temperatures into Indiana the first half of this week. A Midwest cold front whipped across Indiana on November 5th in a race to merge with another front off the Atlantic coast. In the upper atmosphere this feature appeared as a high amplitude pressure trough stretching from Hudson Bay in Canada all the way south to Louisiana. This pattern tends to produce strong north winds that flow down the entire length of Lake Michigan, capturing moisture from the unfrozen lake surface and releasing it as lake effect snow on the Indiana shore line. The lake effect snows continued all day November 5th until the wind changed direction and the snow ended. The CoCoRaHS observer in Walkerton measured 4.5 inches of snow had fallen while the observer at Kingsbury recorded 4.2 inches, Portage noted 3.7 inches, and Laporte observed 3.6 inches. These were the highest snowfall amounts during this event. A map of the lake effect snowcover is shown at the end of this weekly narrative.

Total precipitation includes the melted equivalent of snowfall and rainfall. For the week on average about 0.2 inch of precipitation was recorded across northern Indiana and near 0.05 inch elsewhere across the state. These weekly totals are far below the normal of about 0.8 inch statewide. There were locations which received isolated heavier one day amounts, such as 1.04 inch reported at Kouts, 1.03 inch at Rensselaer, and 0.98 inch at Kingsbury all on November 5th. The heaviest totals for the week include 1.32 inch in Laporte and 1.31 inch at Kingsbury.

With another week of subnormal precipitation the Indiana drought of 2010 continues. The National Drought Monitor describes the areal coverage and intensity of drought across the state as unchanged from a week ago: 14% of Indiana is classified in extreme drought (D3 class), generally the area south of an Aurora to Monroe Reservoir to Boonville line. The remainder of the southern half of Indiana is classified in severe drought (D2 class) which makes up another 37% of the total state area. The northern halves of Lake, Porter, and Laporte county continue drought free. The southern halves of these counties along with Newton county are classified as abnormally dry (D0 class), while the remainder of the northern half of Indiana is classified in the moderate drought category (D1 class), 44% of the Hoosier state area.

Despite the low precipitation totals this week the moisture which fell on November 5th in the form of rain and snow encouraged some Indiana counties to lift their open burn bans. One county decided to reinstate the ban it had lifted earlier. Counties which lifted their open burn bans this week include: Newton, Miami, and Rush counties on November 2nd; Putnam and Daviess counties on November 3rd; Whitley and Marshall counties on November 5th; and Benton county on an unspecified date. Vigo county decided to reinstate their open burn ban. The net result of this week's changes was a net loss of 7 counties with open burn bans in force. The updated count of counties with open burn bans in effect as of November 7th is now 52 counties.

Counties declaring open burn bans as of Nov 7th



November 8th – 14th

A week ago it was cold with subnormal temperatures every day. This oddity within a warm 2010 ended abruptly as a new warm spell took hold on November 8th. State daily temperatures averaged 6° above normal at the start of this week and peaked at 15° above normal by mid week. Temperatures then slid a bit to end the week at 10° above normal. Overall the week filled with warm days averaged 9° above normal. Typical this time of year is for daily maximum temperatures to range from about 51° to 58° north to south across our state. Daily minimum temperatures normally vary between 35° and 38°.

While temperature anomalies performed a major flip since a week ago precipitation trends certainly did not. The persistent sparse rainfall of recent months sustained the drought into another week. Rain fell on only the last two days of the week as a cold front barreled through Indiana. Totals were very light, averaging just about a tenth inch in northern Indiana, and two tenths in central and

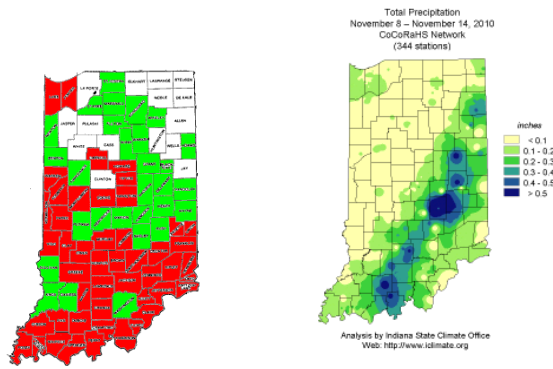
southern sections. Compare this to the 0.8 inch usually expected in the northern area and 0.9 inch elsewhere in the state, that is, less than 25% of the normal weekly total fell. Even totals in those spots with isolated heavier rainfall were not impressive. The CoCoRaHS observers at Dubois and Valparaiso captured 0.70 inch totals in their gages for the week with Shelbyville close behind at 0.69 inch. These weekly totals represent just one rain day this week, the Valparaiso amount measured on November 8th and the other sites on November 14th.

Only one front managed its way all across Indiana this week on November 13th and so offered just one chance for rainfall. Storm systems along both ocean coasts forced a wedge of high pressure between themselves over the Midwest, discouraging the formation of clouds and rain in our region. Two fronts did try to enter northern Indiana during this time but lost their momentum against the high pressure ridge and stalled each time. The slow migration of the ridge in the upper atmosphere eastward of Indiana near the end of this week finally allowed a push of colder air into Indiana to generate the light weekend rainfall.

With scarce rainfall the Indiana drought picture changed little this week according to the National Drought Monitor. All parts of Lake, Porter, and Laporte county, which represents 4% of the total Indiana area, are now identified as abnormally dry (D0 class) rather than only the offshore areas as defined a week ago. All of Newton and Benton counties have joined the moderate drought (D1 class) category as compared to abnormally dry (D0 class) last week. The updated classification for Indiana now reads: 14% of Indiana in extreme drought (D3 class), generally the area south of an Aurora to Monroe Reservoir to Boonville line; the rest of the southern half of Indiana in severe drought (D2 class) which makes up another 37% of the total state area; all but 3 counties of the northern half of Indiana in the moderate drought category (D1 class), that is, 45% of the Hoosier landscape, and the remaining 4% of Indiana in the abnormally dry category (D0 class).

With little movement in the local drought status not much changed on the county open burn ban map as well. Four counties decided to lift their burn bans perhaps more so because of the past week of cooler temperatures than changes in soil moisture. Counties which lifted their bans this week were: Hendricks on November 9th; Fulton and Marion on November 12th, and Henry on November 13th. With this net loss of 4 counties the updated count is 48 counties with open burn bans remaining in effect as of November 14th.

Counties declaring open burn bans as of Nov 14th



November 15th – 21st

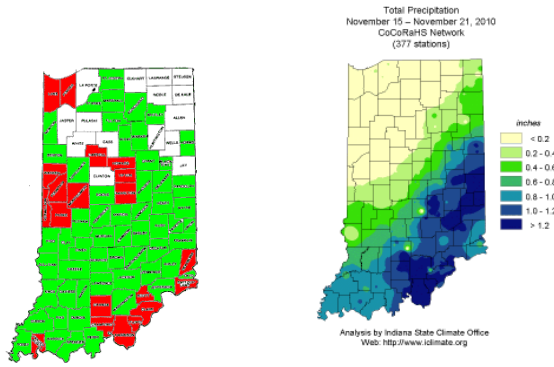
Temperatures seem to have latched onto a weekly cycle this month. The first seven days of November were all on the cold side of normal. The second week flipped to a seven day sequence of above normal temperatures. This third week of the cycle was cut short by just one day, as six days of below normal temperatures were interrupted by a closing warm day. The cooling trend this week was not steady as daily state average temperatures danced between near normal and 7° below normal on individual days. The cool cycle ended early as the week closed at 8° above normal on the final day. Overall for the week daily state temperatures averaged 2° below normal. Usually for mid November we would expect daily maximum temperatures to range between 50° and 57° north to south across Indiana. Daily minimums typically vary between 34° and 38°.

On November 17th a low pressure system swept to the south of Indiana on its journey from Mississippi to New York, delivering nearly all of the week's precipitation to our state. A cold front passed through Indiana on November 19th but another cold front two days behind it stalled in far northern Indiana. Neither of these fronts generated any additional badly needed rainfall. Weekly rainfall totaled about 0.2 inch in northern Indiana, nearly 0.7 inch in central, and almost 0.9 inch across the south. While northern Indiana rainfall still lagged far behind at about 40% of normal, totals in central and southern Indiana were right about normal. The heaviest one day amounts were also more impressive this week as the CoCoRaHS observer at Connersville measured 1.48 inch on the morning of November 17th. The Richmond observer found 1.45 inch in the rain gauge that day, while Milltown received 1.43 inch and Portland 1.40 inch. For the week the CoCoRaHS observer in New Albany noted 1.82 inch. All around these heavier rainfall amounts provide some encouragement to Hoosiers during the current drought.

The National Drought Monitor has determined the intensity and pattern of drought in Indiana is unchanged from a week ago as rainfall struggles to achieve normal amounts. The classification for Indiana remains: 14% of Indiana in extreme drought (D3 class), generally the area south of an Aurora to Monroe Reservoir to Boonville line; the rest of the southern half of Indiana in severe drought (D2 class) which makes up another 37% of the total state area; all but 3 counties of the northern half of Indiana in the moderate drought category (D1 class), that is, 45% of the Hoosier landscape, and the remaining 4% of Indiana in the abnormally dry category (D0 class).

While there was no change in the Indiana drought map classification this week there was lots of action on the county burn ban map. This week 32 counties decided to lift their open burn ban on the news of increased rainfall in central and southern Indiana and the forecast of cooler and wetter weather ahead. Counties which lifted their open burn bans this week were: Bartholomew and Greene on November 15th; Clay, Decatur, Dubois, Gibson, Jackson, Lawrence, and Vigo on November 16th; Brown, Fayette, Franklin, Jennings, Johnson, Martin, Morgan, Perry and Ripley on November 17th; Delaware, Jefferson, Madison, Owen, Posey, Spencer, Union, and Wabash on November 18th; Boone, Monroe, and Warrick on November 19th, and Pike and Tippecanoe counties on November 21st. With this net loss of 32 counties the updated count is 16 counties with open burn bans remaining in effect as of November 21st.

Counties declaring open burn bans as of Nov 21st



November 22nd – 30th

There were hints last week that the months-long drought of 2010 may finally be breaking down in Indiana. Precipitation amounts a week ago had improved to near normal across central and southern Indiana although northern Indiana continued its dry ways. But things are changing these final days of November. Four cold fronts and an occluded front each passed through Indiana these last 10 days rather than the lone front more common in recent weeks. The La Nina storm track is shifting its location towards our state and into its more typical winter position over the country, which usually brings more moisture to Indiana.

Temperatures this week have been more erratic than earlier this month, now alternating rapidly between very warm and very cool in just a few days time rather than the prior slow weekly swings. State average temperatures plummeted from 18° above normal on November 22nd to right at normal by the next day. A few days later on November 26th temperatures took another plunge to 11° below normal, the coldest day of the week. This cold spell was short lived. After a few more days the daily state average temperature quickly rebounded to 8° above normal to finish out the month. For the 10 day interval this temperature roller coaster averaged to 1° above normal. Normal daily maximum temperatures over this time ranges between 45° and 53° north to south across Indiana. Daily minimums typically vary from 31° to 36° across the state.

The many fronts which passed through Indiana this week kept the precipitation falling. Light to moderate rain fell each day early in the week until a large storm dumped 1 to 4 inches across Indiana on Thanksgiving Day with the heaviest totals in the south. Up to another inch fell across Indiana in another wet storm near the end of the month. On average for the 10 days about 3.0 inches of precipitation was measured across northern Indiana, 4.0 inches in central, and 5.4 inches in southern Indiana. These totals are roughly 3 times normal in northern Indiana, 3.6 times normal in central, and 3.8 times normal across the south over the 10 day interval. Normally 1.0 inch would be expected across northern Indiana, 1.1 inch in central, and 1.4 inch in southern Indiana for the final 10 days of November.

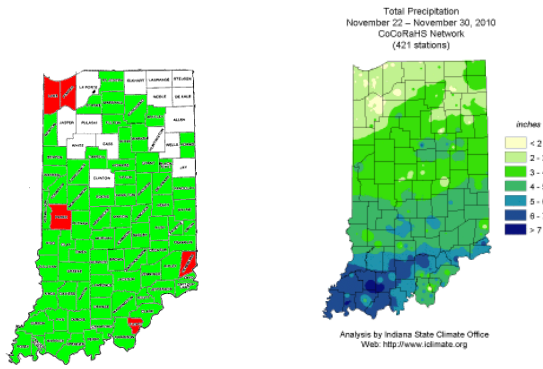
Thunderstorms produced isolated heavy rainfall amounts and scattered wind damage in southern Indiana. On the morning after Thanksgiving the CoCoRaHS observer in Huntingburg measured 4.11 inches in his gauge, while Dubois recorded 3.60 inches and Hanover noted 3.20 inches. The 10 day totals were also impressive with Huntingburg measuring 8.02 inches, Stendal 7.86 inches,

Holland 7.74 inches, Melody Hill 7.30 inches, and Darmstadt 7.28 inches. Wind brought a few trees down in Bedford, took down a backyard fence in Hope, and blew down a garage in Edwardsport. Very light snow did fall in some counties as cold air followed behind these storms this week but all amounts were less than 0.3 inch. A light wintry mix of freezing rain and sleet fell in some cities but no significant traffic problems were noted.

The heavy rainfall allowed a significant improvement in Indiana drought conditions since a week ago. The National Drought Monitor shows a two category improvement in most Indiana counties due to the heavy precipitation, a welcome and dramatic change. The extreme (D3 class) and severe (D2 class) drought categories have been virtually eliminated from the Indiana drought map in 10 days time. The previous area of extreme drought in far southern Indiana has now improved to moderate drought (D1 class) status. Several counties in west central and north central Indiana are now also classified in moderate drought (D1 class) status. Drought has ended in about six counties in far eastcentral Indiana while all remaining areas of the state are now classified as abnormally dry (D0 class). The maps at the end of this report detail the areal coverage.

In response to the change in soil moisture, 17 Indiana counties have ended their open burn bans. Burn bans remain in only a handful of counties and these bans are expected to be lifted within the next week. The 17 counties and the dates the bans were lifted are: Carroll, Hamilton, Ohio, Scott, and Tipton counties on November 22nd; Fountain, Montgomery, Orange, Vermillion, and Warren counties on November 23rd; Harrison, Howard, Miami, Switzerland, and Vanderburgh counties on November 24th; Clark county on November 26th, and Crawford county on November 30th.

Counties declaring open burn bans as of Nov 30th



November Temperature

Region	Temperature	Normal	Deviation
Northwest	41.4	40.5	0.9
North Central	40.7	40.4	0.3
Northeast	40.1	40.1	0.0
West Central	42.4	42.1	0.3
Central	42.3	41.9	0.3
East Central	41.7	41.3	0.4
Southwest	45.8	45.4	0.4
South Central	45.6	45.0	0.6
Southeast	44.8	44.3	0.5
State	42.8	42.4	0.4

Region	Precipitation	Precipitation		
		Normal	Deviation	Percent of Normal
Northwest	3.07	3.16	-0.08	97
North Central	3.43	3.16	0.28	109
Northeast	3.88	3.02	0.85	128
West Central	4.29	3.60	0.69	119
Central	5.22	3.63	1.59	144
East Central	5.30	3.36	1.94	158
Southwest	6.48	4.27	2.21	152
South Central	6.64	4.09	2.55	162
Southeast	6.28	3.70	2.57	170
State	4.96	3.59	1.37	138

Autumn 2010 (September - November)

Region	Temperature	Temperature	
		Normal	Deviation
Northwest	53.7	52.7	1.1
North Central	53.2	52.2	1.0
Northeast	53.0	51.8	1.2
West Central	55.0	54.0	1.0
Central	54.9	53.6	1.4
East Central	54.5	52.8	1.7
Southwest	58.2	56.8	1.4
South Central	57.7	56.2	1.6
Southeast	57.1	55.4	1.7
State	55.3	54.0	1.3

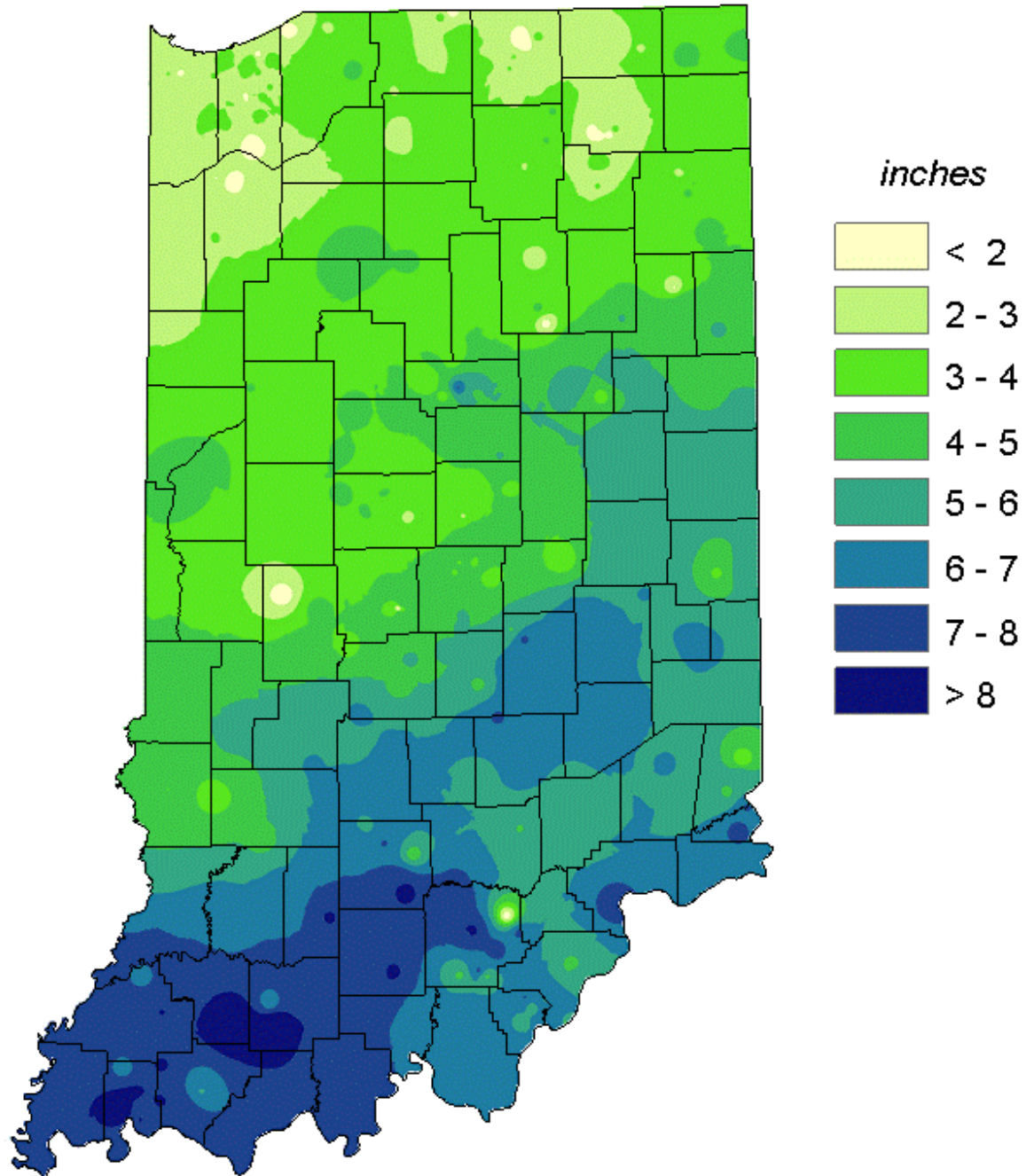
Region	Precipitation	Precipitation		Percent of Normal
		Normal	Deviation	
Northwest	7.03	9.29	-2.26	76
North Central	6.82	9.41	-2.59	72
Northeast	6.88	8.92	-2.04	77
West Central	7.19	9.53	-2.34	75
Central	7.18	9.44	-2.26	76
East Central	7.52	8.88	-1.36	85
Southwest	8.49	10.45	-1.96	81
South Central	8.43	10.21	-1.79	83
Southeast	8.11	9.66	-1.54	84
State	7.51	9.58	-2.07	78

2010 Annual to date

Region	Temperature	Temperature	
		Normal	Deviation
Northwest	53.8	52.2	1.5
North Central	53.5	51.8	1.7
Northeast	53.4	51.4	2.0
West Central	55.1	53.8	1.3
Central	55.0	53.4	1.6
East Central	54.4	52.6	1.8
Southwest	58.5	57.0	1.6
South Central	57.7	56.4	1.3
Southeast	56.9	55.5	1.4
State	55.4	53.9	1.6

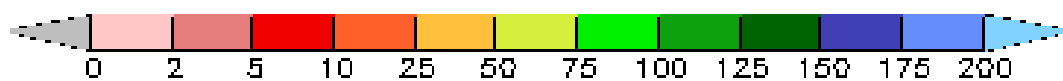
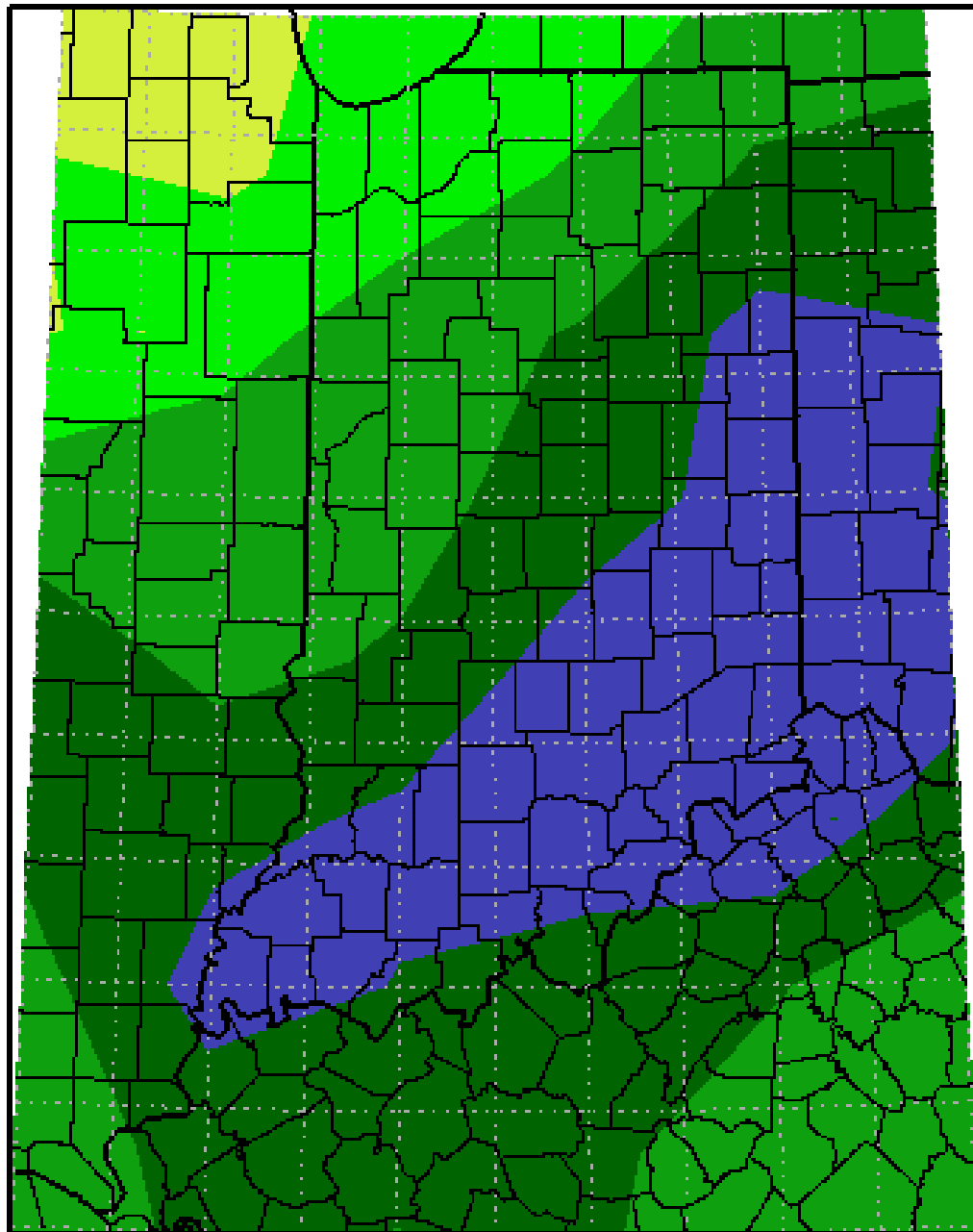
Region	Precipitation	Precipitation		
		Normal	Deviation	Percent of Normal
Northwest	35.17	35.36	-0.18	99
North Central	34.40	35.40	-1.01	97
Northeast	33.53	34.06	-0.54	98
West Central	35.38	38.27	-2.88	92
Central	38.46	37.75	0.71	102
East Central	37.04	36.36	0.68	102
Southwest	37.03	42.02	-4.99	88
South Central	37.19	42.14	-4.95	88
Southeast	36.42	40.71	-4.28	89
State	36.21	38.12	-1.90	95

Monthly Precipitation
November 01 – November 30, 2010
CoCoRaHS Network
(427 stations)



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

**Total Precipitation Percent of Mean
November 1, 2010 to November 30, 2010**

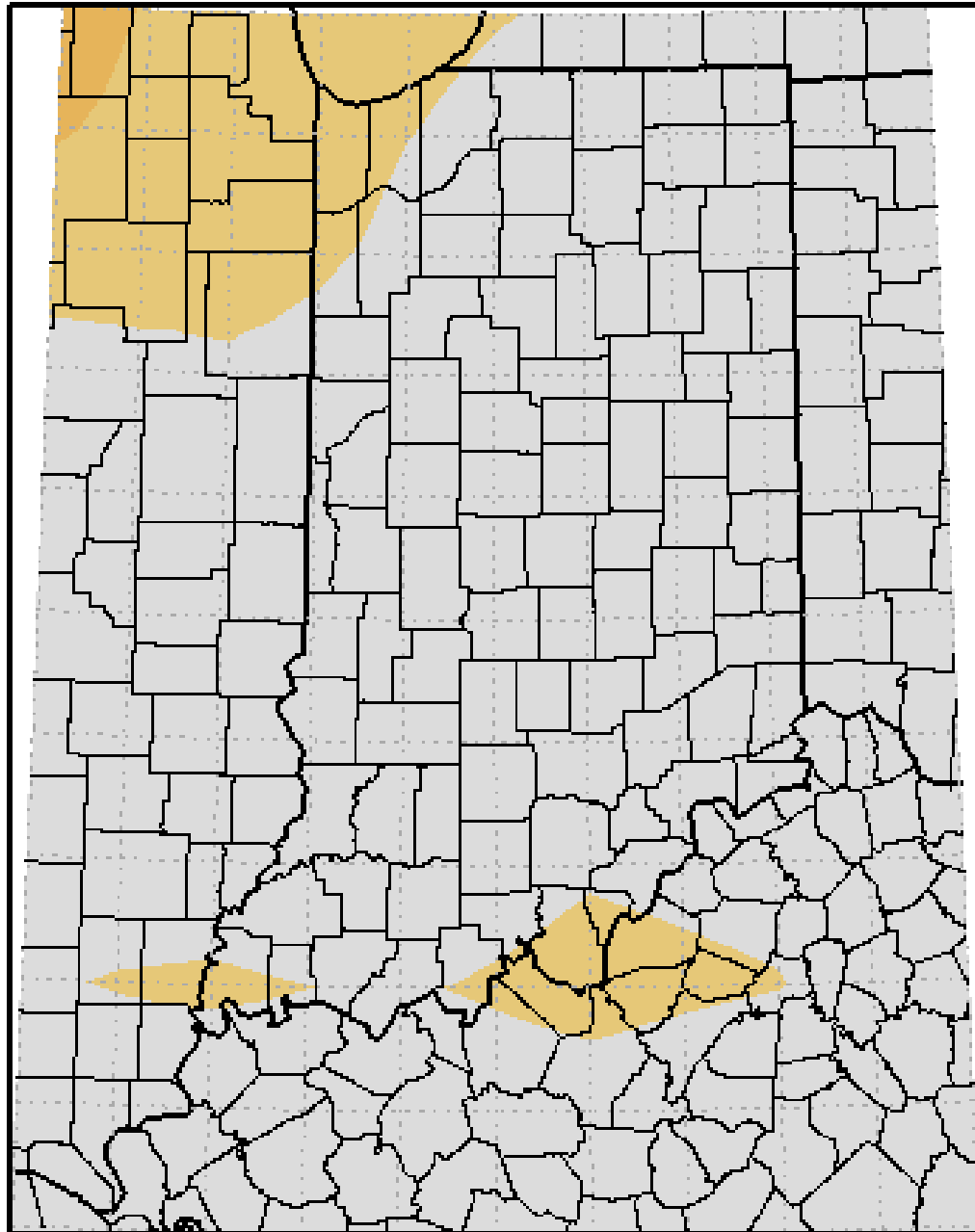


Midwestern Regional Climate Center

Illinois State Water Survey

Champaign, Illinois

**Average Temperature Departure from Mean in Degrees F
November 1, 2010 to November 30, 2010**



Midwestern Regional Climate Center

Illinois State Water Survey

Champaign, Illinois

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 entirely 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.

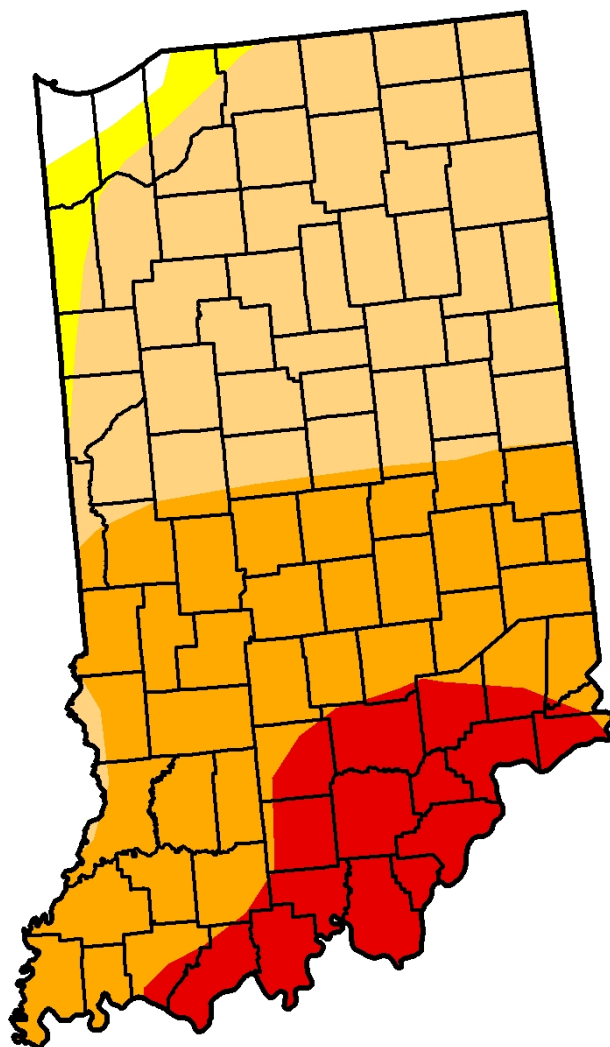
For example, November 9th has 1.4% of Indiana under no drought, and 98.6% of Indiana under at *least* D0 through D4 drought status. This is followed by 95.2% as D1 through D4 status. To obtain the amount that is D0 status, simply subtract the D1-D4 column from the D0-D4 column, thus giving you the percentage of area with abnormally dry conditions (3.4%) . Please note, however, that these areas are not exact, and much of this drought map has been created from reports throughout the state and estimation, so use this information as a general view rather than for specifics.

Intensity:

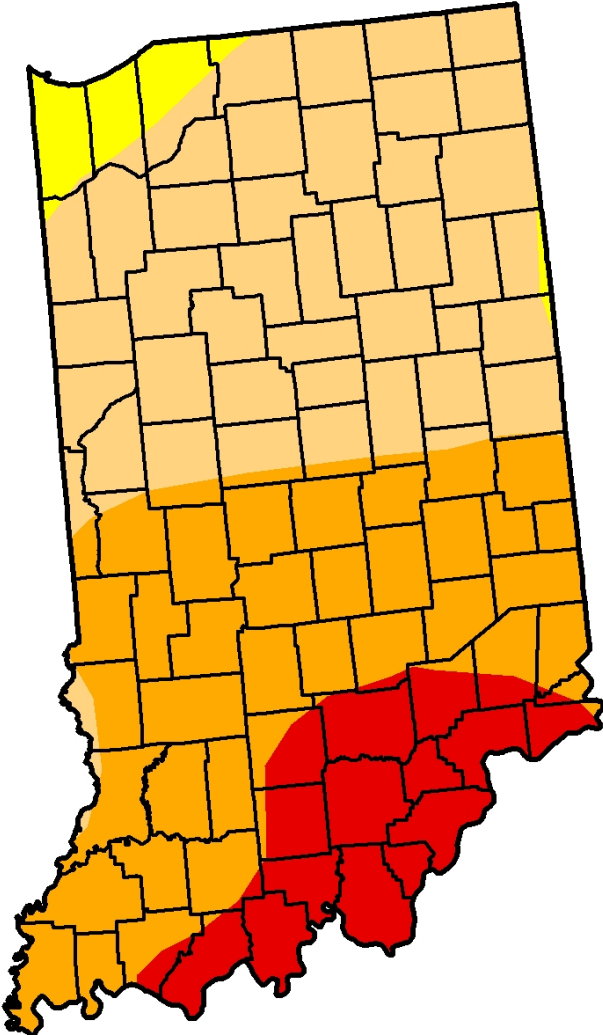
- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Week	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
11/30/10	4.58	95.42	29.87	0.92	0.00	0.00
11/23/10	0.00	100.00	96.22	51.49	14.37	0.00
11/16/10	0.00	100.00	96.22	51.49	14.37	0.00
11/09/10	1.39	98.61	95.19	51.49	14.37	0.00

November 9th Drought Summary



November 16th Drought Summary



November 30th Drought Summary

