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Indiana State Climate Office

Monthly Weather Report



<http://www.iclimat.org>

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December 2009 Climate Summary

Summary

A series of massive winter storms highlighted the national weather scene in December. Indiana barely escaped the broad reach of these storms with weather impacts that were not unusual for this first month of winter. Unlike recent months Indiana temperatures did not persist warmer or colder than normal for long periods of time but fluctuated widely and often with each passing storm system. These rapid temperature changes slowed later in the month. When all the warm and cold days were thrown into the mix the net result was a December with a statewide average temperature of 30.1F degrees, just 1F degree below normal. This places December 2009 as the 42nd coldest December on record since 1895. One year ago December averaged 29.0F degrees and in 37th place while December 2005 was still colder at 26.8F degrees and placed 21st among all Decembers. But it was a chilly 19.3F degrees state average temperature in December 2000 that ranks near the top in 2nd place.

December precipitation in Indiana typically changes to rain, freezing rain, snow, or sleet as temperatures swing above and below freezing. This was also the case in December 2009 with many wintry mix events. Monthly snowfall totals in counties near Lake Michigan ranged from 7 to 17 inches with wide variation over short distances. Elsewhere 7 to 12 inches of snow fell in the remainder of northern Indiana, while 3 to 8 inches was recorded in central Indiana. In southern Indiana snowfall totaled 3 inches or less. December precipitation summed to near 2.9 inches in northern Indiana, 3.4 inches in central, and averaged from 3.1 to 4.1 inches across southern Indiana. Overall statewide precipitation averaged 3.30 inches for the month, a quarter inch above normal. This total ranks December 2009 as the 40th wettest December on record since 1895. The previous two Decembers were among the wettest Decembers on record in Indiana. December 2008 with its 5.13 inches ranks as the 8th wettest December and December 2007 with 5.14 inches is the 7th wettest since 1895.

The primary impact of adverse December weather in Indiana was numerous traffic accidents and fatalities caused by slick roads as precipitation alternated between liquid and frozen states. Frigid temperatures and strong winds behind deep broad storm systems made repair of downed power lines a real challenge in communities across the state this month.

December 1st – 7th

The warmth of November came to an abrupt end this week. Near normal temperatures the first day of December were eclipsed by a strong cold front that barreled through Indiana the next day.

Statewide averaged temperatures dived to 10F degrees below normal on December 3rd and 4th as a high pressure system moved into the state behind this storm. As the high center moved eastward an approaching new storm system stalled over Illinois. This allowed temperatures to recover a few degrees by the end of the week yet still below normal. Overall for the week statewide temperatures averaged 4F degrees below normal. Typically in the first week of December maximum temperatures range from 40F in the far north to 49F degrees in the south end of the state. Minimums usually vary from 27F to 32F degrees north to south.

The early month cold front squeezed about a half inch of rain from the clouds statewide. This was followed by three dry days as much colder air settled over Indiana. The second storm of the week produced a light mix of rain and snow on December 7th. For the week precipitation totaled about 0.4 inch in northern Indiana and 0.5 inch in central and southern sections. On December 3rd two CoCoRaHS reporters, at Patoka and Owensville in Gibson county, reported the highest one day totals for the week at 1.08 inch each. Normally about 0.65 inch of precipitation would be expected in northern Indiana the first week of December, 0.60 inch in central, and 0.75 inch in southern Indiana.

Light rain changed to snow in the predawn hours of December 7th. Busy highways became slick as traffic turned the snow into sheets of ice. A semi truck which came upon an earlier 4-car accident on I-65 near Frankfort struck and killed a motorist who had left his car to investigate the damage.

December 8th – 14th

A massive storm system which occupied half the nation's area and touched 46 states during its journey sent Indiana temperatures on a rollercoaster ride this week. At the start of the week statewide averaged temperatures ran 3F degrees above normal in a warm wind flow ahead of this storm system. On December 9th the huge storm moved quickly from Colorado to Michigan, pulling a strong cold front across our state. Wind gusts exceeded 50 mph into the following day along with sharply falling temperatures. Outside working conditions were miserable on December 10th with temperature departures averaging 16F degrees below normal. A strong ridge of high pressure followed quickly behind the exiting low pressure center, gradually quieting the winds and allowing temperatures to quickly rebound. By the end of the week state averaged temperatures had reached the warmest of the week, 10F degrees above normal and 26F degrees warmer than just 5 days earlier. For the week statewide temperatures averaged about 2F degrees below normal. Typically in the second week of December normal daily maximum temperatures would range from 33F degrees to 46F degrees north to south across Indiana. Normal daily minimums would vary from 20F to 27F across the state.

The huge storm system this week was comparable to a category 2 hurricane. While it caused blizzard conditions west of Indiana, light snow and blowing snow were the major impacts in our state. In Laporte county near Lake Michigan 9 inches of snow fell this week while 2 to 3 inches was common elsewhere in the northern tier of counties. Less than an inch fell in much of northern Indiana with little to no snowfall in central and southern areas. Despite the size and intensity of the storm the total precipitation this week was not unusually heavy in the colder air. Precipitation fell nearly every day. Waldron in Shelby county reported 1.78 inch on December 13th, the highest one day precipitation amount for the week among all CoCoRaHS stations. Overall total amounts for the

week ranged from 1.0 inch in northern Indiana, 1.6 inch in central, to about 1.8 inch in the south. Normal precipitation this week would vary from 0.6 in northern Indiana to about 0.9 inch in the south.

The strong winds on December 9th caused power outages across Indiana. Power crews struggled to return service to 10,000 homes and businesses while working in the cold blustery weather conditions.

December 15th – 21st

Temperatures fell sharply across Indiana at the start of this week as a huge dome of high pressure expanded to cover the eastern two-thirds of the country. Statewide averaged temperatures skidded to 11F degrees below normal on December 16th. The cold air did not stay long. Just two days later temperatures recovered quickly to the plus side at 5F degrees above normal as the high center moved east and a new storm system approached Illinois. This storm raced southeast where it merged with a stronger storm center in North Carolina. The merged system exploded in intensity and became a major blizzard that paralyzed New England on December 20th. Back in Indiana another in a series of Alberta clipper systems this month swept the state carrying with it a wintry mix as the week came to an end. Temperatures changed little the last few days of the week, averaging about 2F degrees above normal. For the week temperatures averaged just 1F degree below normal. In mid-December normal daily maximum temperatures vary from 32F to 39F degrees north to south across the state. Typical daily minimums would range from 21F in northern Indiana to 26F degrees in the far south.

Precipitation in Indiana this week was much below normal. The massive high pressure dome early in the week kept our state mostly dry. Light amounts of mixed precipitation fell the last half of the week as fringe moisture that wrapped around the blizzard low traveled westward into eastern Indiana. Clipper systems from Canada generally yield little moisture but the one late in the week did manage to drop the first inch snow of the season on central Indiana. Precipitation totals for the week averaged around a quarter inch statewide, well below the half to three quarter inch amounts normally expected this week in December. The heaviest snow total this week was 5 inches in the Fort Wayne and Auburn regions of northeast Indiana with 3 to 5 inches elsewhere in this northeast area. In the rest of northern Indiana 2 to 3 inches of snowfall was common with 1 to 2 inches in most of central Indiana and less than an inch in the south.

There were many minor traffic accidents around Indiana due to repeated episodes of light freezing rain combined with snowfalls. The light precipitation on roadways can be more dangerous than heavier snows as motorists are caught unaware of the very slick road conditions.

December 22nd – 31st

For the third week in a row Indiana sidestepped the fury of a massive storm system, this time as a Christmas Day blizzard churned to our west. While Oklahoma and Iowa were buried in snow drifts, our state experienced only fringe effects of light snowfall and moderate winds. This storm was replaced a few days later on December 28th by a brief first wave of cold Canadian air. The high pressure system which ushered in the cold blast left quickly for the Atlantic coast. As the year came

to a close a more intense and possibly longer duration Arctic cold air mass rushed into Indiana and claimed the Midwest on December 31st.

Temperatures around Indiana at the start of this final interval of 2009 were quite mild in the warm air sector ahead of the Iowa storm. Statewide averaged temperatures in our state peaked at 13F degrees above the daily normals by December 24th. Colder air filtered in behind the intense storm and by December 28th Indiana temperature departures had fallen to 7F degrees below normal. A slow warm up the final days of the month lifted departures to 2F degrees below normal. Overall for the ten days Indiana temperatures averaged 2F degrees below normal. Usually near the end of December daily maximum temperatures would average from 32F to 42F degrees north to south across the state. Daily minimums should vary from 20F in northern Indiana to 28F degrees in the far south.

With huge storms and unsettled weather all around Indiana precipitation fell on all but one day these last ten days of the month. While nearly a half inch of moisture was recorded on Christmas Day only a few hundredths of an inch fell on the remaining days with precipitation. For the interval precipitation totaled about 1.2 inch in northern Indiana and 0.9 inch in central and southern sections. Typically during this time about 0.9 inch is expected around northern Indiana, 1.0 inch in central, and 1.1 inch in the southern third of the state. During the latter colder part of the interval precipitation arrived as snowfall. For the ten days counties in the Lake Michigan snow belt received 6 to 9 inch totals. Snow amounts were highly variable elsewhere across northern Indiana, ranging from 3 to 11 inches, depending on the location relative to the storm centers and wind blown snow. Central Indiana amounts also ranged widely from 4 inches in some spots to 9 inches in others, although heaviest amounts were in western areas. Snow in southern Indiana varied from nothing at all up to 3 inches.

Not surprisingly numerous vehicles slid off Indiana highways and interstates during the wintry mix of rain, freezing rain, and snow in the days just prior to Christmas. Freezing rain was especially a problem across the northern half of Indiana on Christmas Eve until air temperatures warmed late in the day. As colder air returned to the state drivers seemed to have more trouble with the snowfall on December 28th with several vehicle accidents and injuries reported.

December Summary

Temperature

Region	Temperature	Normal	Deviation
Northwest	27.8	28.5	-0.7
North Central	28.0	28.7	-0.7
Northeast	28.0	28.6	-0.6
West Central	29.5	30.4	-0.9
Central	29.7	30.7	-0.9
East Central	29.6	30.2	-0.6
Southwest	33.5	34.5	-1.0
South Central	32.6	34.5	-2.0
Southeast	32.2	34.0	-1.8
State	30.1	31.1	-1.0

Precipitation

Region	Precipitation	Normal	Deviation	Percent of Normal
Northwest	2.74	2.66	0.09	103
North Central	2.82	2.79	0.03	101
Northeast	3.07	2.68	0.39	115
West Central	3.66	2.96	0.70	124
Central	3.40	2.99	0.41	114
East Central	2.97	2.87	0.10	103
Southwest	4.11	3.53	0.57	116
South Central	3.28	3.56	-0.28	92
Southeast	3.18	3.41	-0.23	93
State	3.30	3.06	0.24	108

Winter to date (same as December)

Temperature

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Northwest	27.8	28.5	-0.7
North Central	28.0	28.7	-0.7
Northeast	28.0	28.6	-0.6
West Central	29.5	30.4	-0.9
Central	29.7	30.7	-0.9
East Central	29.6	30.2	-0.6
Southwest	33.5	34.5	-1.0
South Central	32.6	34.5	-2.0
Southeast	32.2	34.0	-1.8
State	30.1	31.1	-1.0

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2009 Annual

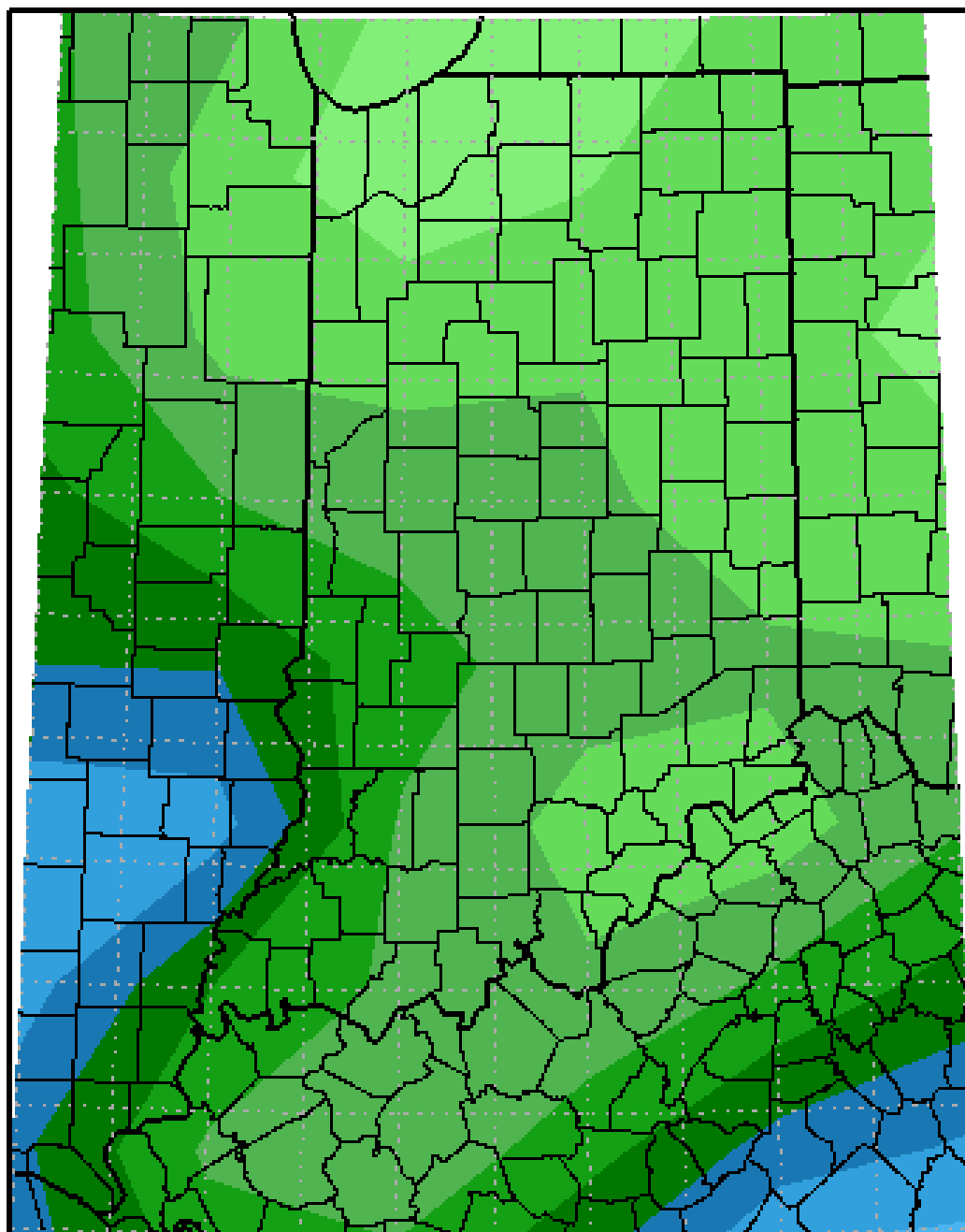
Temperature

Region	Temperature	Normal	Deviation
Northwest	49.3	50.2	-0.9
North Central	49.0	49.8	-0.8
Northeast	48.9	49.5	-0.5
West Central	51.3	51.9	-0.6
Central	51.0	51.5	-0.5
East Central	50.5	50.7	-0.2
Southwest	54.8	55.1	-0.3
South Central	53.5	54.5	-1.0
Southeast	53.0	53.7	-0.7
State	51.3	51.9	-0.6

Precipitation

Region	Precipitation	Normal	Deviation	Percent of Normal
Northwest	43.34	38.01	5.33	114
North Central	42.49	38.19	4.30	111
Northeast	41.28	36.75	4.54	112
West Central	48.66	41.23	7.43	118
Central	45.54	40.74	4.80	112
East Central	37.17	39.23	-2.07	95
Southwest	54.65	45.56	9.09	120
South Central	54.64	45.70	8.94	120
Southeast	49.39	44.12	5.28	112
State	46.85	41.18	5.67	114

**Total Precipitation in Inches
December 1, 2009 to December 31, 2009**

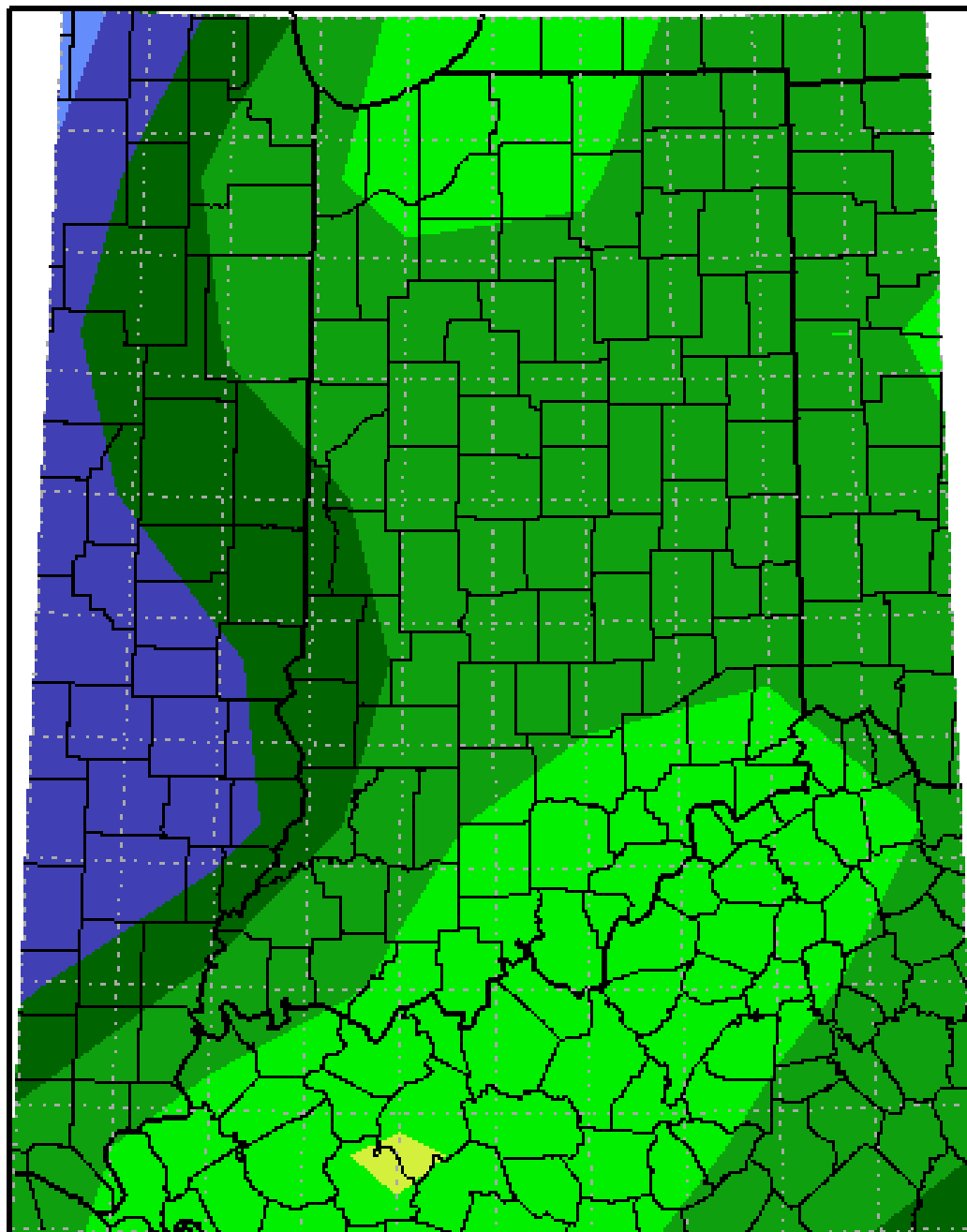


NOAA Midwestern Regional Climate Center

Illinois State Water Survey

Champaign, Illinois

**Total Precipitation Percent of Mean
December 1, 2009 to December 31, 2009**

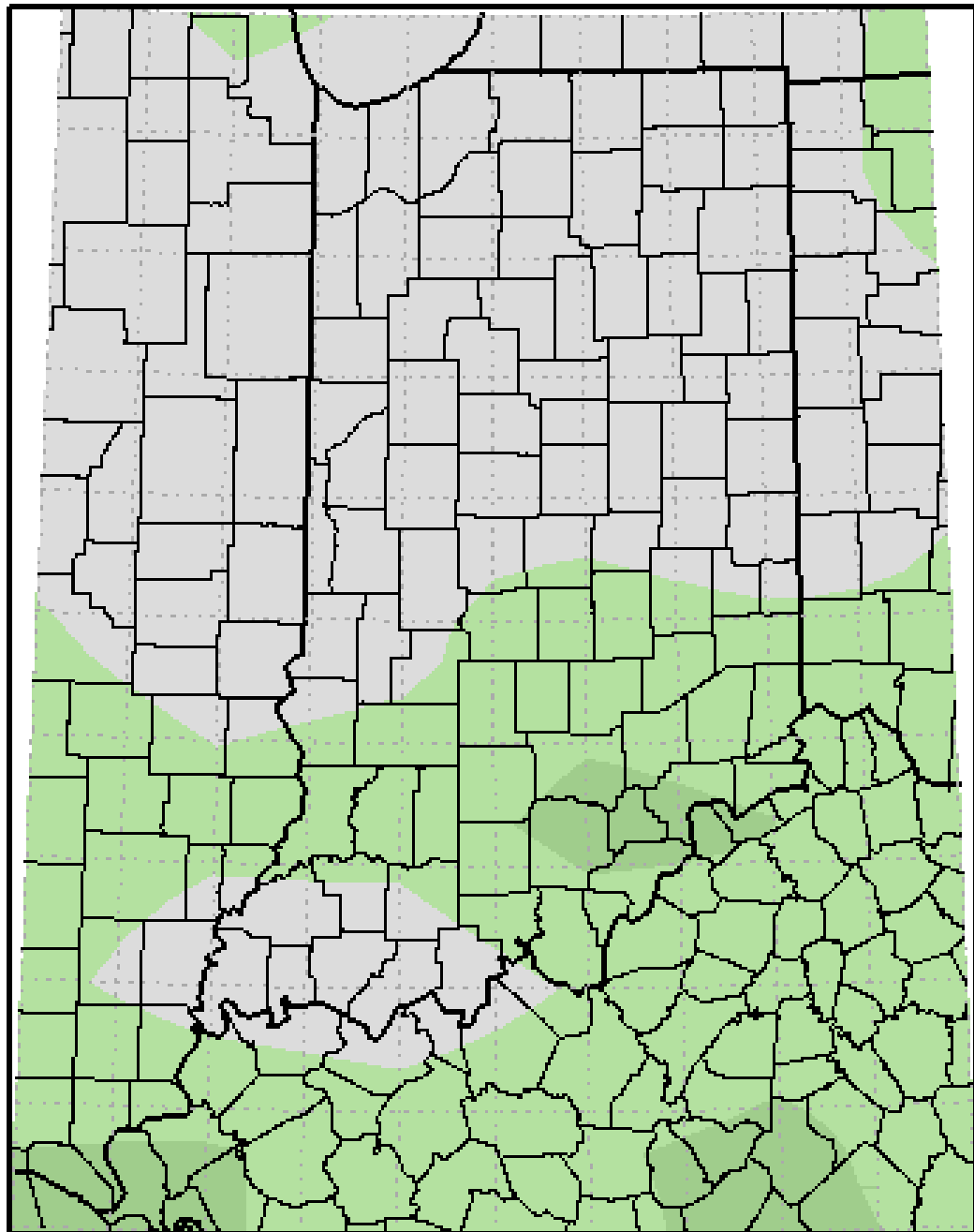


NOAA Midwestern Regional Climate Center

Illinois State Water Survey

Champaign, Illinois

**Average Temperature Departure from Mean in Degrees F
December 1, 2009 to December 31, 2009**



**NOAA 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, December 1st has 100.0% of Indiana under no drought, and 0.0% of Indiana under at *least* D0 through D4 drought status. This is followed by 0.0% 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 (0.0%). 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
12/29/09	100.00	0.00	0.00	0.00	0.00	0.00
12/22/09	100.00	0.00	0.00	0.00	0.00	0.00
12/15/09	100.00	0.00	0.00	0.00	0.00	0.00
12/08/09	100.00	0.00	0.00	0.00	0.00	0.00
12/01/09	100.00	0.00	0.00	0.00	0.00	0.00

December 1st Drought Summary



December 8th Drought Summary



December 15th Drought Summary



December 22nd Drought Summary



December 29th Drought Summary

