



MONTHLY WATER INVENTORY REPORT FOR OHIO

December 2014

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<http://soilandwater.ohiodnr.gov/water-use-planning/water-inventory-levels>

PRECIPITATION during December was generally below normal in northern Ohio and above normal in southern Ohio. The average for the state was 2.48 inches, 0.43 inch below normal. Regional averages ranged from 3.41 inches, 0.45 inch above normal, for the Southeast Region to 1.41 inches, 1.22 inches below normal, for the Northwest Region. Racine Locks and Dam (Meigs County) reported the greatest amount of December precipitation, 4.51 inches. Napoleon (Henry County) reported the least amount, 0.91 inch.

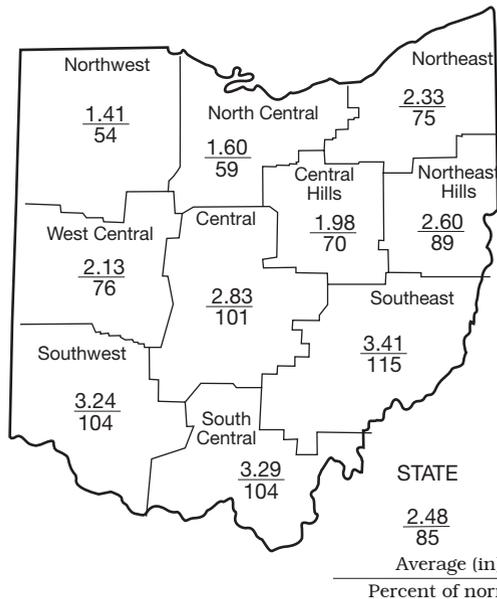
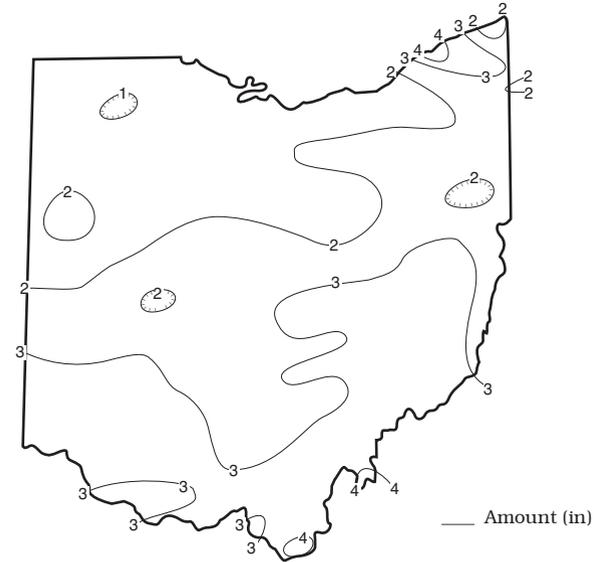
Most of the precipitation during December fell as rain. Above normal temperatures throughout much of the month kept snowfall to a minimum with many locations receiving no measureable snow. Chardon (Geauga County), located in the northeastern Ohio snowbelt, reported 1.7 inches of snow for December, about 25 inches below normal. Precipitation fell on a few days during the first week of the month. Rain on December 1 and 2 was heaviest across extreme southern Ohio with 0.5-1.0 inch falling, decreasing to the north and west to little or no rain in northwestern areas of the state. Precipitation during December 5-6 was widespread except in extreme northwestern Ohio where little rain fell. Southern Ohio received the greatest amount of precipitation with 1-2 inches reported across much of the area. Precipitation between December 15 and 16 was also widespread, but generally on the light side with amounts of 0.25-0.5 inch common. Precipitation fell on a few days during the last week of the month. The most notable occurred on December 24 as a strong cold front brought a line of brief heavy rain along with damaging winds across the state. A tornado briefly touched down in Fairfield County, resulting in some minor damage. Precipitation amounts of 0.25-0.5 inch of precipitation were common with this weather system. More precipitation fell December 27 and 28 with between 0.25 and 0.5 inch falling from southwestern Ohio to northeastern areas of the state.

Precipitation for the first three months of the 2015 water year is below normal throughout most of the state with only the South Central Region having above normal precipitation. The state average is 7.35 inches, 1.28 inches below normal. Regional averages range from 9.78 inches, 0.95 inch above normal, for the South Central Region to 5.50 inches, 2.35 inches below normal, for the Northwest Region.

Precipitation for the 2014 calendar year was below normal across much of the state, but above normal in the northeastern quarter of Ohio. The state average was 38.98 inches, 0.04 inch below normal. Regional averages ranged from 45.04 inches, 5.46 inches above normal, for the Northeast Region to 33.73 inches, 1.29 inches below normal, for the Northwest Region (see Precipitation table, departure from normal, past 12 months column). Dorset (Ashtabula County) reported the greatest amount of precipitation for the year, 57.66 inches. Other stations reporting more than 50 inches of precipitation for the year were Chardon (Geauga County), 53.73 inches, and Berlin Reservoir (Portage County),

(continued on back)

PRECIPITATION DECEMBER



PRECIPITATION

Region	DEPARTURE FROM NORMAL (IN.) Base period 1961-2010					Palmer Drought Severity Index*
	This Month	Past				
		3 Mos.	6 Mos.	12 Mos.	24 Mos.	
Northwest	-1.22	-2.35	-2.12	-1.29	+2.21	+1.2
North Central	-1.11	-2.05	-4.06	-0.28	+7.01	+2.9
Northeast	-0.79	-0.82	+0.82	+5.46	+10.84	+3.0
West Central	-0.68	-2.14	-4.17	-1.08	+0.99	-0.6
Central	+0.03	-1.65	-4.27	-1.39	+1.69	-0.4
Central Hills	-0.85	-2.13	-3.51	+1.22	+5.54	+0.5
Northeast Hills	-0.32	-1.36	+0.56	+3.75	+4.78	+0.6
Southwest	+0.11	-1.13	-2.78	-2.47	-0.71	+0.7
South Central	+0.14	+0.95	-2.13	-2.46	-2.46	-0.5
Southeast	+0.45	-0.09	-2.65	-1.89	+0.83	-0.1
State	-0.43	-1.28	-2.43	-0.04	+3.03	

*Above +4 = Extreme Moist Spell
3.0 To 3.9 = Very Moist Spell
2.0 To 2.9 = Unusual Moist Spell
1.0 To 1.9 = Moist Spell
0.5 To 0.9 = Incipient Moist Spell
0.4 To 0.4 = Near Normal

-0.5 To -0.9 = Incipient Drought
-1.0 To -1.9 = Mild Drought
-2.0 To -2.9 = Moderate Drought
-3.0 To -3.9 = Severe Drought
Below -4.0 = Extreme Drought

MEAN STREAM DISCHARGE

This Month

River and Location	Drainage Area (Sq. Mi.)	Mean Discharge (CFS)	% of Normal	% of Normal Past		
				3 Mos.	6 Mos.	12 Mos.
Grand River near Painesville	685	1,028	78	81	100	107
Great Miami River at Hamilton	3,630	2,480	69	51	58	113
Huron River at Milan	371	113	33	28	36	138
Killbuck Creek at Killbuck	464	230	58	51	83	116
Little Beaver Creek near East Liverpool	496	347	74	54	78	102
Maumee River at Waterville	6,330	2,782	51	49	58	109
Muskingum River at McConnelsville	7,422	5,391	61	54	80	101
Scioto River near Prospect	567	88	20	13	23	100
Scioto River at Higby	5,131	2,732	57	55	77	103
Stillwater River at Pleasant Hill	503	247	72	36	42	92

STREAMFLOW during December was below normal throughout the state. Flows in some basins, especially in north-central and northeastern Ohio, were low enough to be considered deficient. Flows during December increased seasonally from the flows recorded during November.

Streamflow at the beginning of the month was below normal throughout the state. Most drainage basins had their lowest flows for the month during December 4-5, but a few basins had slightly lower flows around December 23-24. Flows increased at the end of the first week following widespread precipitation that fell during December 4-6. Most basins recorded their greatest flows for the month between December 6 and 8. Flows declined from these peaks until the last week of the month, then increased in response to precipitation. However, flows remained below normal throughout the state at the end of the month.

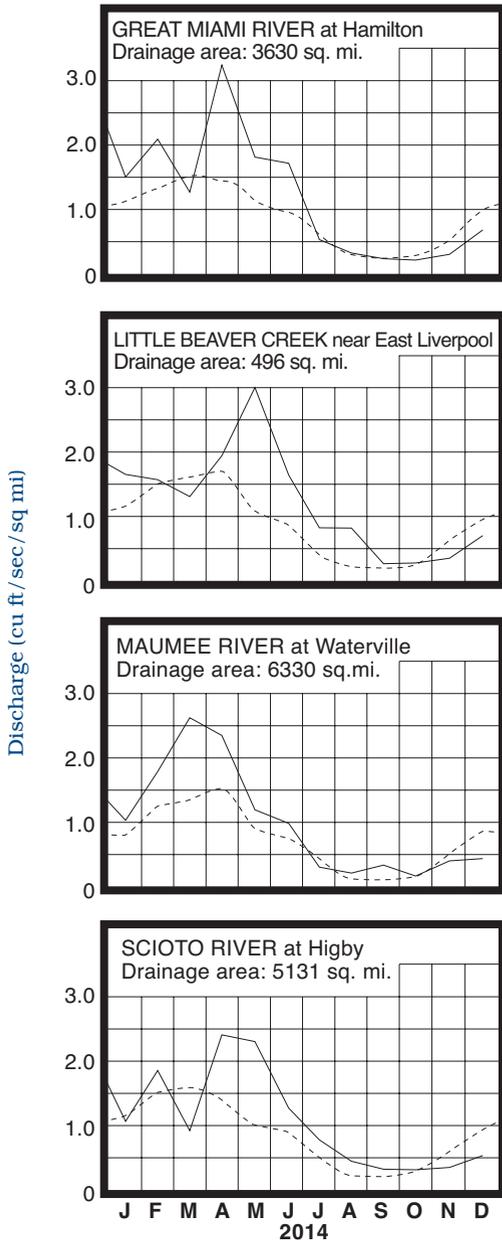
Streamflow for the 2014 calendar year was above normal throughout most of the state (see Mean Stream Discharge table, past 12 months column). Generally, streamflow in Ohio was above normal during the first nine months of the year and below normal during the last three months of 2014. Flooding occurred during several months, but was mostly minor. The January and February flooding occurred mainly in northern Ohio and was caused by a combination of rain, melting snow, frozen soils and ice jams on many streams. The flooding in the spring and summer months was the result of excessive rainfall. The most notable flooding in 2014 occurred during May as heavy rains resulted in flash flooding in areas of northeastern and west-central Ohio.

RESERVOIR STORAGE for water supply during December increased slightly in the Mahoning River basin and was nearly unchanged in the Scioto River basin. Storage remained above normal in the Mahoning basin index reservoirs, but fell to below normal in the Scioto basin index reservoirs.

Reservoir storage at the end of December in the Mahoning basin index reservoirs was 76 percent of rated capacity for water supply compared with 75 percent for last month and 79 percent for December 2013. Month-end storage in the Scioto basin index reservoirs was 75 percent of rated capacity for water supply compared with the same for last month and 96 percent for December 2013.

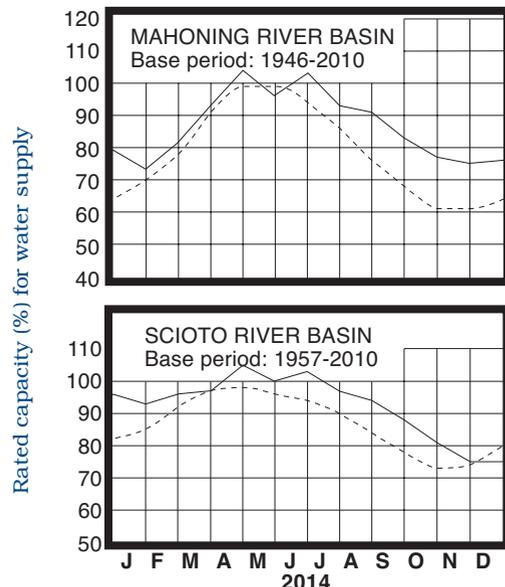
Reservoir storage was at near or above normal seasonal levels throughout most of 2014. Surface water supplies in both on and off-stream reservoirs were adequate statewide, even during the summer high-use period. Although reservoir storage dropped to below normal levels during December in the Scioto River basin, surface water supplies were favorable statewide at the end of the year.

MEAN STREAM DISCHARGE



Base period for all streams: 1981-2010

RESERVOIR STORAGE FOR WATER SUPPLY



Normal - - - - Current ———

GROUND-WATER LEVELS

Based on daily lowest level in feet below land-surface datum

GROUND WATER LEVELS during December showed mixed responses across the state. Ground water storage improved in most western Ohio aquifers and declined in most eastern Ohio aquifers. Declines in ground water levels are an exception to the norm for December. In aquifers where levels rose, the net changes from last month's levels were less than usually observed.

Ground water supplies during 2014 were adequate throughout most of the state. The year began with ground water storage at above normal levels across most of Ohio. Recharge during the winter months was less than usually expected due to the combination of below normal precipitation and frozen soils that limited the rate of recharge. As a result, ground water levels fell to below normal during February. Late spring and early summer precipitation was beneficial and aquifers in eastern Ohio improved to above normal; aquifers in western Ohio remained below normal through the remainder of the year. A dry fall limited any recharge during the current recharge season and as a result, ground water storage across most of the state is at below normal levels at the end of 2014. Also at the end of 2014, ground water levels are lower than they were at this time last year throughout most of Ohio. A return to more normal precipitation and other climatic conditions would be favorable to the replenishment of the state's aquifers during the 2015 recharge season.

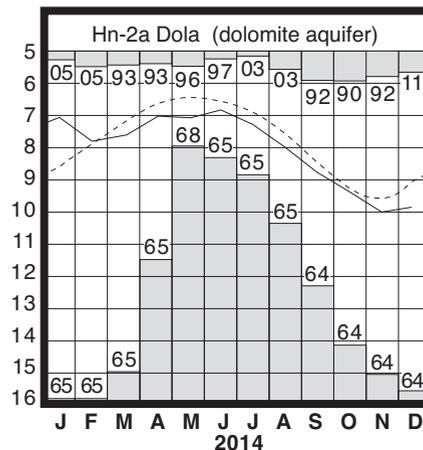
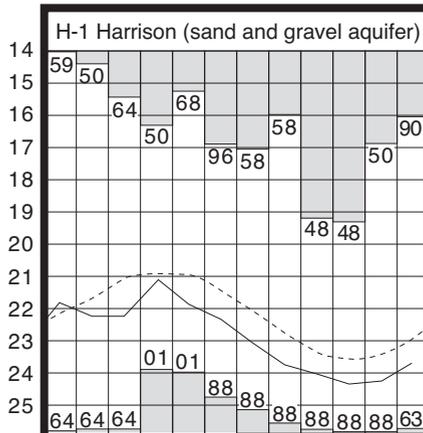
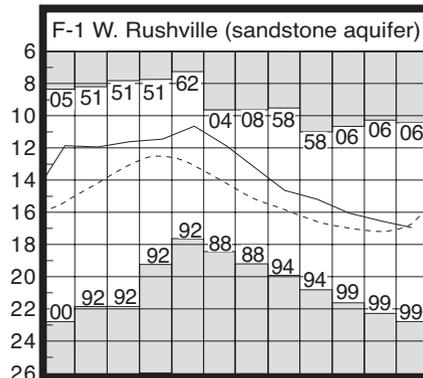
LAKE ERIE level rose during December. The mean level was 571.42 feet (IGLD-1985), 0.06 foot higher than last month's mean level and 0.62 foot above normal. This month's mean level is 0.75 foot above the December 2013 level and 2.22 feet above Low Water Datum.

The U.S. Army Corps of Engineers (USACE) reports that precipitation in the Lake Erie basin during December averaged 1.40 inches, 1.26 inches below normal. For the entire Great Lakes basin, December precipitation averaged 1.56 inches, 0.82 inch below normal. For calendar year 2014, the Lake Erie basin averaged 34.08 inches, 1.34 inches below normal, while the entire Great Lakes basin averaged 34.50 inches, 1.85 inches above normal.

The level of Lake Erie began the year at slightly above normal levels. With the below normal precipitation during the first three months of the year, the level of Lake Erie fell to below normal during February and remained below normal through April. However, Lake Erie rose to above normal during May as precipitation across the Great Lakes basin averaged more than 4 inches above normal during the April through October period. The lake remained above normal through the end of 2014. The USACE predicts that the level of Lake Erie will remain above normal for the foreseeable future based on the present condition of the lake basin and anticipated future weather conditions.

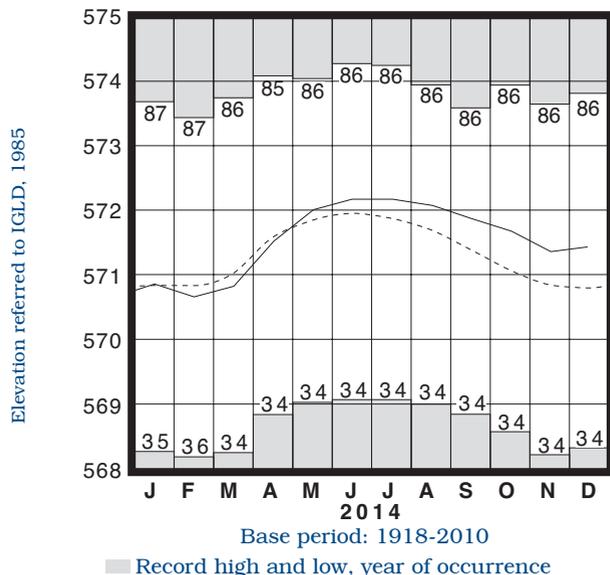
Index Well	Location	Aquifer	Mean This Month	Departure From Normal	Change in feet from:	
					Last Month	Year Ago
F-1	W. Rushville, Fairfield Co.	Sandstone	16.92	-0.21	-0.37	-2.05
Fa-1	Jasper Mill, Fayette Co.	Limestone	10.78	-2.15	+0.36	-2.11
Fr-10	Columbus, Franklin Co.	Gravel	43.27	+0.97	+0.07	+0.08
H-1	Harrison, Hamilton Co.	Gravel	23.70	-0.75	+0.56	-0.76
Hn-2a	Dola, Hardin Co.	Dolomite	9.86	-0.78	+0.14	-2.44
Po-124	Freedom, Portage Co.	Sandstone	77.25	-0.22	-0.08	-0.30
Tu-1	Strasburg, Tuscarawas Co.	Gravel	14.09	-0.28	-0.03	+0.58

GROUND-WATER LEVELS



Water level (ft below land surface)

LAKE ERIE LEVELS



Base periods: F-1, 1947-2010; H-1 1951-2010.

Hn-2a, 1955-2010 ■ Record high and low, year of occurrence

Normal - - - - Current ———

(Precipitation continued from front)

52.41 inches. Marion (Marion County) reported the least amount of precipitation, 27.86 inches. An isohyetal map and regional averages with percentages of normal precipitation for the 2014 calendar year appear below.

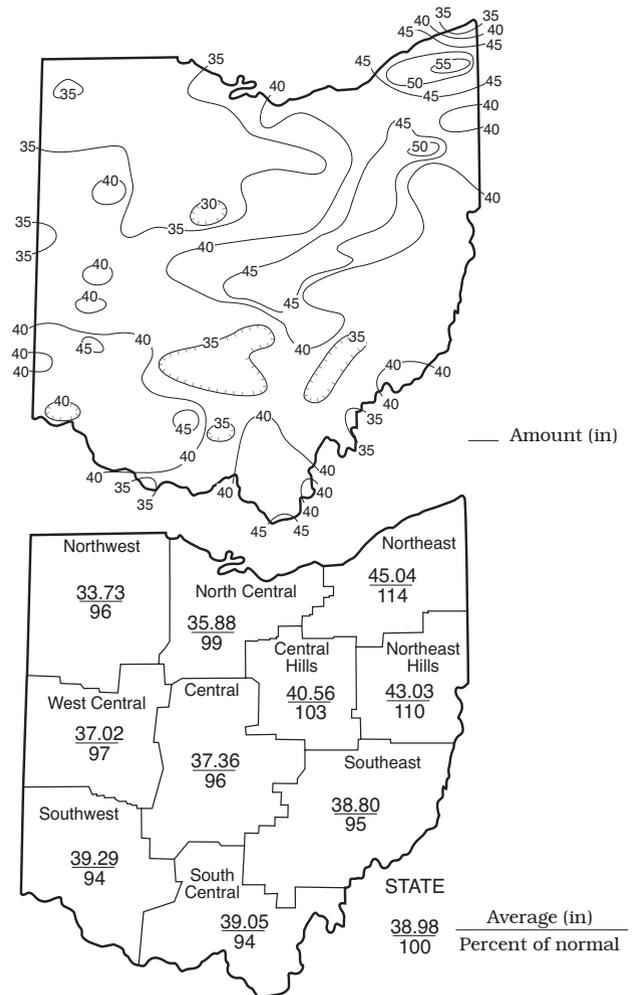
Precipitation during the 2014 calendar year was generally below normal during the first three months of the year, above normal during the next three months, and then below normal the last six months. The year began with much below normal temperatures and below normal precipitation, but above normal snowfall during January. Temperatures in February were also much below normal, but precipitation was above normal across much of the state and snowfall was again above normal. Precipitation during March was below normal. Precipitation during April was above normal across the state and above normal throughout most of the state during May and June. This was the tenth wettest April on record for the state and regionally was the second wettest for the Central Hills Region. Precipitation during the April-June period averaged more than 6 inches above normal for the Central Hills Region and more than 5 inches above normal for the Northeast and Northeast Hills regions. Precipitation was below normal throughout most of the state during July, September and November, followed by below normal precipitation across the northern half of the state during December. The below normal conditions of the last few months have not been favorable for recharge to the state's water supplies.

SUMMARY

Precipitation during December was below normal in northern Ohio and above normal in southern Ohio. Streamflow was below normal statewide. Reservoir storage increased slightly in the Mahoning River basin and was nearly unchanged in the Scioto River basin. Ground water levels showed mixed responses and are below normal across most of the state. Lake Erie level rose 0.06 foot and was 0.62 foot above the long-term December average.

Precipitation during the 2014 calendar year was below normal throughout most of the state, but above normal in the northeastern quarter of Ohio. Streamflow was above normal in nearly all drainage basins. Reservoir storage was at above normal levels throughout most of the year, but fell to below normal in the Scioto River basin during December. Ground water supplies were adequate but were at below normal levels in most aquifers across the state at the end of the year. Lake Erie was above its long-term average for much of the year.

PRECIPITATION 2014 CALENDAR YEAR



ACKNOWLEDGMENTS

This report has been compiled from Division data and from information supplied by the following:

Precipitation data:

U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service; The Miami Conservancy District; U.S. Army Corps of Engineers, Muskingum Area.

Streamflow and reservoir storage data:

U.S. Geological Survey, Water Resources Division.

Lake Erie level data:

U.S. Army Corps of Engineers, Detroit District.

Palmer Drought Severity Index:

U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service.



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