



MONTHLY WATER INVENTORY REPORT FOR OHIO

November 2013

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<http://www.ohiodnr.gov/tabid/4191/Default.aspx>

PRECIPITATION during November was generally above normal in the eastern half of Ohio and below normal in the western half. The state average was 3.02 inches, 0.06 inch below normal. Regional averages ranged from 3.55 inches, 0.13 inch above normal, for the Northeast Region to 2.21 inches, 0.62 inch below normal, for the Northwest Region. Chardon (Geauga County) reported the greatest amount of November precipitation, 5.78 inches. Bowling Green (Wood County) reported the least amount, 1.01 inches.

Precipitation during November fell as rain and snow. Snow amounts were near or above normal across most of the state with the exception of northwestern Ohio, where very little snow was reported. The month started with several days of precipitation during the first week. Precipitation totals for the period ranged from 0.5 to 1 inch across most of the state; however, areas in northwestern Ohio received less than 0.25 inch during this period. Storms on November 1 were a continuation of the storms that occurred at the end of October. Several storms were severe with four confirmed tornadoes in the west-central and central areas of the state. Rain and snow fell during November 11-12 with 0.25-0.50 inch of precipitation reported across most of the state and around 0.75 inch in the counties bordering Lake Erie in northeastern Ohio. Snow accumulations were light across most of the state, but areas in northeastern Ohio reported 3-5 inches. The heaviest and most widespread precipitation during the month occurred on November 17 with 0.75-1.25 inches reported throughout most of Ohio and more than 2 inches reported in some areas in southwestern Ohio. Some of the storms were severe with several reports of wind damage. Five tornadoes were confirmed in northwestern Ohio; several homes and buildings in the path of these storms were damaged or destroyed. Scattered showers during November 21-22 brought 0.25-0.50 inch to most of the state. A storm system moving through the region during November 25-27 brought precipitation to the southeastern half of the state with amounts generally between 0.25 and 0.50 inch reported; more than 1 inch of rain was reported in extreme eastern and southeastern Ohio. Most of this precipitation fell as snow in southwestern, central and northeastern Ohio with 2-5 inches common and as much as 10 inches observed in northeastern Ohio. Much of northwestern Ohio received little or no precipitation from this storm.

Precipitation for the 2013 calendar year is above normal throughout most of the state; only the South Central Region has received below normal precipitation. The state average is 37.99 inches, 1.86 inches above normal. Regional averages range from 41.25 inches, 4.79 inches above normal, for the Northeast Region to 35.29 inches, which is normal for the West Central Region.

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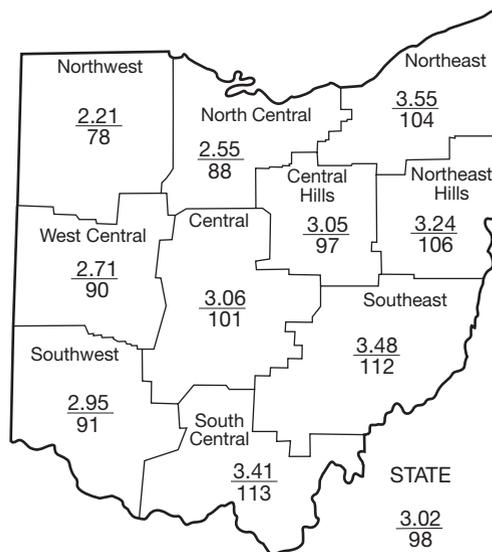
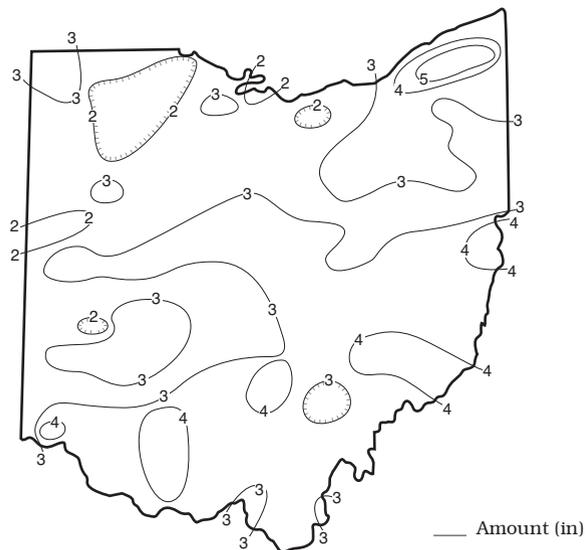
PRECIPITATION

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	-0.62	+0.13	+2.97	+2.90	-0.72	+0.7
North Central	-0.36	+0.22	+7.17	+6.42	+10.21	+3.6
Northeast	+0.13	+1.43	+7.66	+6.30	+8.58	+2.0
West Central	-0.31	+1.48	+0.79	+1.05	-1.40	+0.1
Central	+0.03	+0.71	+4.24	+3.75	+1.96	+0.7
Central Hills	-0.08	+0.87	+6.08	+4.72	+4.27	+0.8
Northeast Hills	+0.18	+0.56	+4.36	+1.95	-1.81	-0.7
Southwest	-0.29	+1.84	+2.62	+1.53	-2.56	+1.3
South Central	+0.38	-0.36	+3.15	+1.46	-3.32	+0.1
Southeast	+0.37	-0.86	+5.77	+4.11	+0.90	+0.8
State	-0.06	+0.60	+4.47	+3.39	+1.58	

*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

PRECIPITATION NOVEMBER



Average (in)
Percent of normal

MEAN STREAM DISCHARGE

This Month

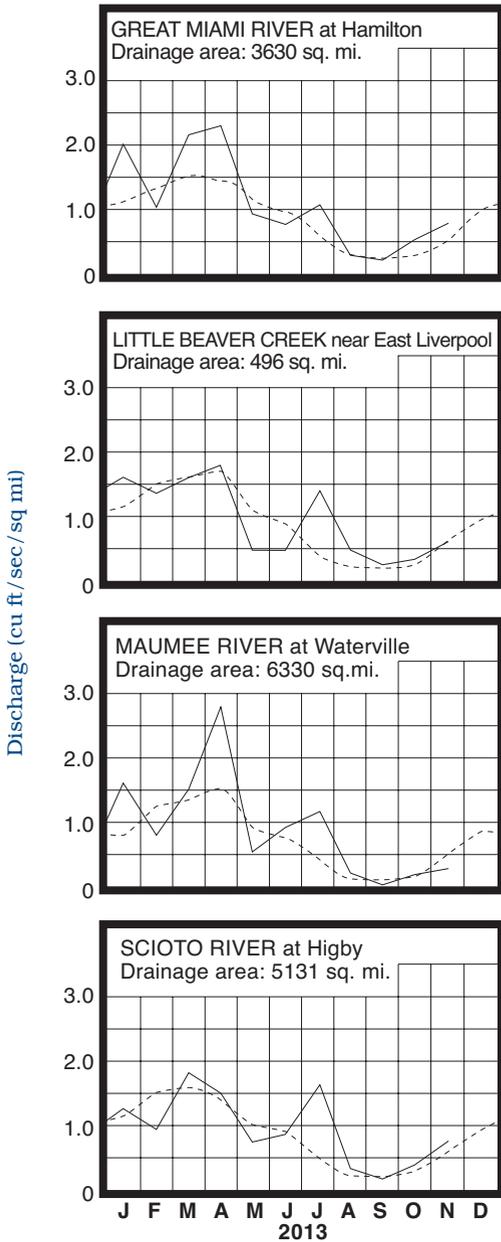
River and Location	Drainage Area (Sq. Mi.)	Mean Discharge (CFS)	% of Normal	% of Normal Past		
				3 Mos.	6 Mos.	12 Mos.
Grand River near Painesville	685	1,459	141	142	188	109
Great Miami River at Hamilton	3,630	2,839	148	98	92	105
Huron River at Milan	371	304	171	139	217	135
Killbuck Creek at Killbuck	464	428	156	116	151	109
Little Beaver Creek near East Liverpool	496	304	97	70	94	84
Maumee River at Waterville	6,330	1,797	55	43	91	98
Muskingum River at McConnelsville	7,422	6,058	117	80	123	89
Scioto River near Prospect	567	516	265	136	188	145
Scioto River at Higby	5,131	3,883	127	95	114	93
Stillwater River at Pleasant Hill	503	213	104	45	53	94

STREAMFLOW during November was above normal throughout most of Ohio, but below normal in the northwestern areas of the state. Flows in some north-central Ohio basins were high enough to be considered excessive. Flows during November were greater than the flows observed during October statewide.

Flows at the beginning of the month were above normal in northeastern, central and southwestern Ohio, and below normal elsewhere. Drainage basins in eastern and southeastern areas of the state had their lowest flows for November during the first few days of the month. Drainage basins in western and south-central areas had their lowest flows near November 16, just prior to the month's most widespread precipitation, while basins in northeastern Ohio had their lowest

flows near the end of the month. Most basins recorded their greatest flows for the month during November 18-20 following the widespread precipitation of November 17. Flows declined from these peaks through the end of the month and were below normal across most of the state at month's end.

MEAN STREAM DISCHARGE

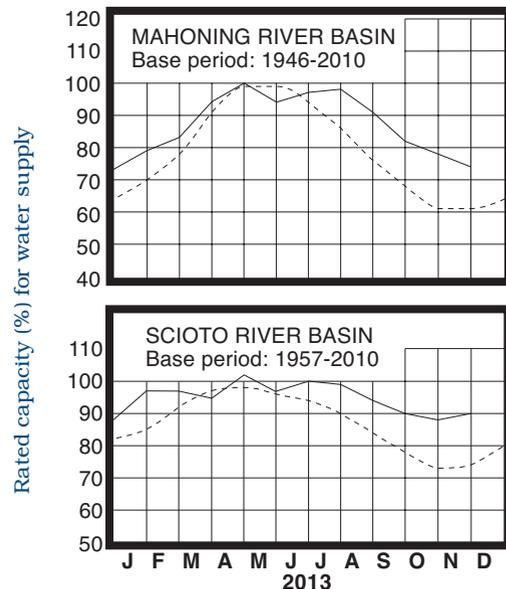


Base period for all streams: 1981-2010

RESERVOIR STORAGE for water supply during November declined in the Mahoning River basin and increased in the Scioto River basin. Storage remained above normal in both basins.

Reservoir storage at the end of November in the Mahoning basin index reservoirs was 74 percent of rated capacity for water supply compared with 78 percent for last month and 66 percent for November 2012. Month-end storage in the Scioto basin index reservoirs was 90 percent of rated capacity for water supply compared with 88 percent for last month and 76 percent for November 2012. Surface water supplies remain in excellent condition throughout the state.

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 November showed some improvement in most aquifers across the state. Generally, levels either were rather stable throughout the month or were stable during the first half of the month and rose slightly during the second half. Positive net changes from last month's levels were noted in several aquifers with less than normal declines observed in most other aquifers.

Although ground water levels continue to remain below normal across much of Ohio, ground water supplies are adequate throughout the state. Current levels are higher than they were a year ago statewide, ranging from about 0.25 foot to more than 5 feet higher than the November 2012 levels. Current conditions favor a beneficial recharge season. The Ohio Agricultural Statistics Service reports that soil moisture near the end of November was rated as being short in 1 percent of the state, adequate in 70 percent of the state, and surplus in 29 percent of the state. Near-normal precipitation and other climatic conditions throughout the current recharge season should provide conditions favorable for the state's ground water supplies.

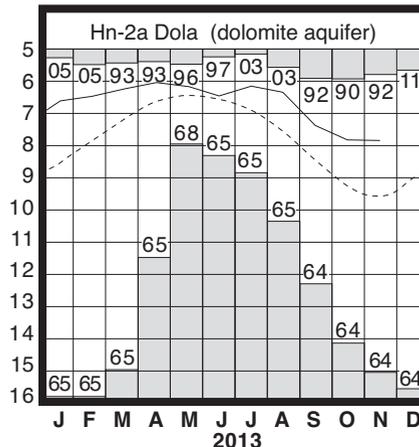
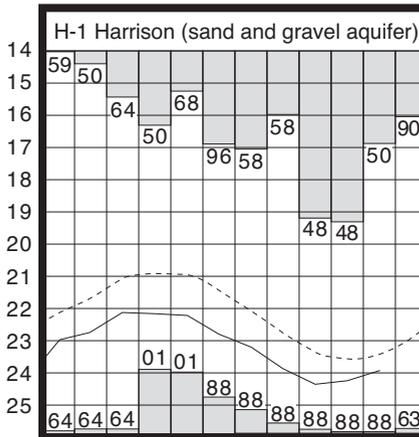
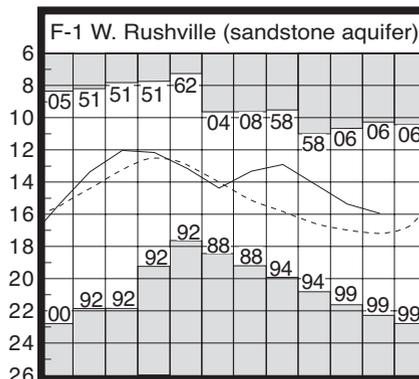
LAKE ERIE level declined during November. The mean level was 570.77 feet (IGLD-1985), 0.33 foot below last month's mean level and 0.06 foot below normal. This month's level is 0.43 foot above the November 2012 level and 1.57 feet above Low Water Datum.

The U.S. Army Corps of Engineers (USACE) reports that precipitation in the Lake Erie basin during November averaged 1.77 inches, 1.09 inches below normal. For the entire Great Lakes basin, November precipitation averaged 2.53 inches, 0.21 inch below normal. For calendar year 2013 through November, the Lake Erie basin has averaged 35.29 inches of precipitation, 2.53 inches above normal, while the entire Great Lakes basin has averaged 33.48 inches, 3.19 inches above normal.

In addition, the USACE reports that based on the current condition of the Great Lakes basin and anticipated weather patterns, the level of Lake Erie should remain near normal for the foreseeable future. Deviations from the anticipated weather patterns could result in the level of Lake Erie ranging from about 9 inches above normal to as much as 13 inches below the normal seasonal average.

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	15.96	+1.23	-0.60	+1.75
Fa-1	Jasper Mill, Fayette Co.	Limestone	9.43	-0.26	+0.92	+5.39
Fr-10	Columbus, Franklin Co.	Gravel	43.80	+0.75	+0.28	+1.13
H-1	Harrison, Hamilton Co.	Gravel	23.92	-0.51	+0.32	+0.35
Hn-2a	Dola, Hardin Co.	Dolomite	7.84	+1.73	-0.02	+0.14
Po-124	Freedom, Portage Co.	Sandstone	77.15	-0.06	-0.03	+0.28
Tu-1	Strasburg, Tuscarawas Co.	Gravel	15.00	-0.84	+0.29	+0.23

GROUND-WATER LEVELS



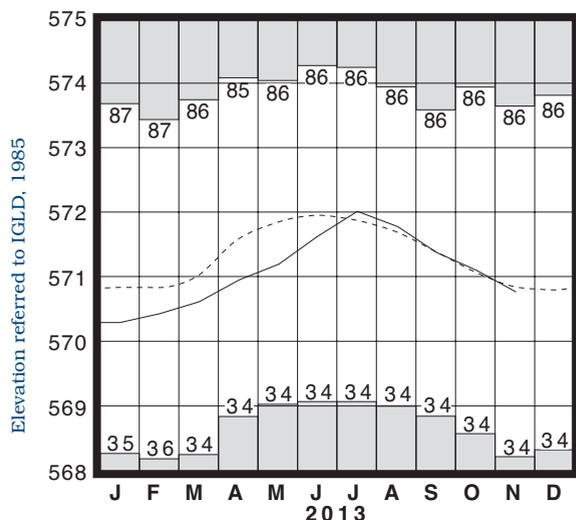
Water level (ft below land surface)

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

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

Normal - - - - Current ———

LAKE ERIE LEVELS



Base period: 1918-2010

■ Record high and low, year of occurrence

(Precipitation continued from front)

Precipitation for the first two months of the 2014 water year is above normal throughout most of Ohio. The state average is 6.85 inches, 1.13 inches above normal. Regional averages range from 8.75 inches, 2.25 inches above normal, for the Northeast Region to 5.85 inches, 0.17 inch above normal, for the South Central Region.

SUMMARY

Precipitation during November was generally above normal in the eastern half of Ohio and below normal in the western half. Streamflow was above normal throughout most of the state. Reservoir storage declined in the Mahoning River basin, increased in the Scioto River basin, and remained above normal in both basins. Ground water levels showed some improvement in most aquifers, but remained below normal across much of the state. Lake Erie level declined 0.33 foot and was 0.06 foot below the long-term November average.

NOTES AND COMMENTS

Division of Soil and Water Resources Has New Leadership

Ohio Department of Natural Resources (ODNR) director James Zehringer recently announced the appointment of Mike Bailey as the new chief of the ODNR Division of Soil and Water Resources (DSWR). Mike had been serving as the deputy chief of the division since 2012. Prior to coming to ODNR, Mike worked at the Ohio Department of Agriculture for eight years. He served as executive director of the Office of Farmland Preservation, where he oversaw the administration of the Clean Ohio Agricultural Easement Purchase Program, the Ohio Agricultural Easement Donation Program and the Ohio Agricultural Security Area Program. Mike also served as the executive director of the Ohio Livestock Care Standards Board. His role included coordinating all the legal, legislative, communications and administrative functions in support of the board's efforts to lead the nation in creating sound and comprehensive standards of care for livestock.

Mr. Bailey has earned both a bachelor's and master's degree in agricultural economics from The Ohio State University. Mike follows Karl Gebhardt who will continue to serve in his role as deputy director for the department. Congratulations to Mike on his appointment as chief of the DSWR.

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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