



MONTHLY WATER INVENTORY REPORT FOR OHIO

November 2014

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

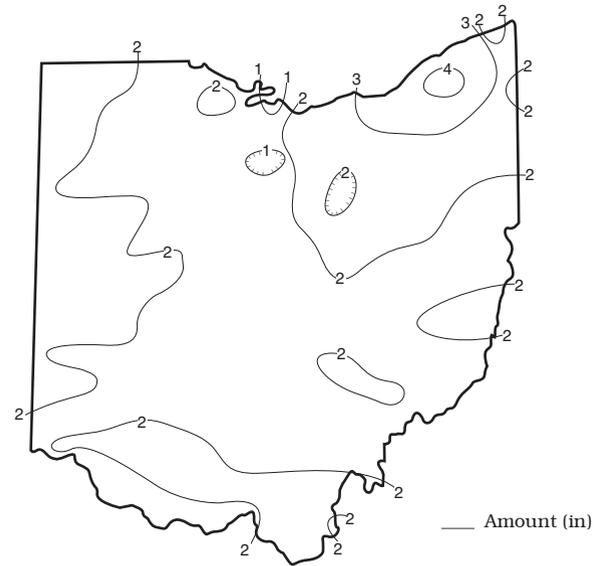
PRECIPITATION during November was below normal throughout most of the state with only a few locations in extreme northeastern Ohio having slightly above normal precipitation. The average for the state was 1.98 inches, 1.10 inches below normal. Regional averages ranged from 2.85 inches, 0.57 inch below normal, for the Northeast Region to 1.48 inches, 1.55 inches below normal, for the Central Region. Chardon (Geauga County) reported the greatest amount of November precipitation, 4.25 inches. Willard (Huron County) reported the least amount, 0.83 inch.

Precipitation during November fell as both rain and snow with temperatures averaging below normal. Snowfall for the month was above normal across most of the state with the greatest amounts falling in northeastern Ohio. Cleveland-Hopkins International Airport reported 19.4 inches of snow for November. Precipitation fell on several days during the first week of the month. While most of the state received around 0.5 inch or less during this period, more than 1 inch fell in areas of northeastern Ohio. Snow fell across northeast portions of the state during November 13-14, with accumulations of 6-12 inches reported. A majority of the remainder of Ohio reported the first measurable snow of the season during November 16-17, with 3-5 inches common. The most widespread precipitation for the month occurred during November 22-24. The precipitation fell as snow in northern Ohio and as rain and snow in southern Ohio. Precipitation amounts of 0.5-1.25 inches were reported during this period in western Ohio, tapering off to 0.25-0.5 inch in eastern Ohio. The remainder of the month was rather dry with some light showers reported on the last day of the month.

Precipitation for the 2014 calendar year is below normal across much of Ohio, but above normal in north-central, northeast and east-central areas of the state. The state average is 36.55 inches, 0.41 inch above normal. Regional averages range from 42.92 inches, 6.46 inches above normal, for the Northeast Region to 32.27 inches, 0.12 inch below normal, for the Northwest Region.

Precipitation for 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 4.87 inches, 0.85 inch below normal. Regional averages range from 6.49 inches, 0.81 inch above normal, for the South Central Region to 3.87 inches, 1.68 inches below normal, for the Central Region.

PRECIPITATION NOVEMBER

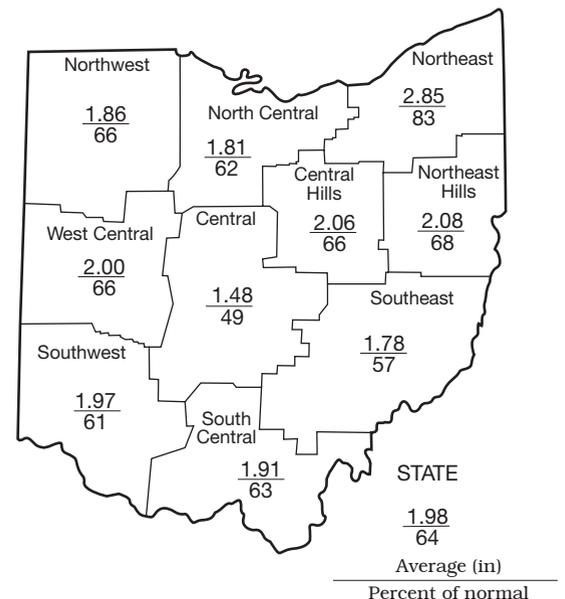


PRECIPITATION

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	-0.97	+0.67	-0.43	+0.45	+3.28	+1.2
North Central	-1.10	-0.24	-0.41	+2.13	+8.53	+2.6
Northeast	-0.57	-0.92	+4.83	+6.81	+13.35	+2.9
West Central	-1.02	-2.82	-1.29	+1.71	+2.78	-1.3
Central	-1.55	-3.33	-2.52	-0.02	+3.64	-1.4
Central Hills	-1.07	-3.07	+0.45	+2.70	+7.44	-0.8
Northeast Hills	-0.98	-2.90	+2.89	+4.93	+6.88	-0.4
Southwest	-1.27	-2.12	-1.82	-0.95	+0.58	-1.0
South Central	-1.12	-1.02	-1.68	-0.29	+1.17	-1.3
Southeast	-1.33	-2.63	-2.30	-0.45	+3.64	-1.6
State	-1.10	-1.84	-0.27	+1.64	+5.04	

*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

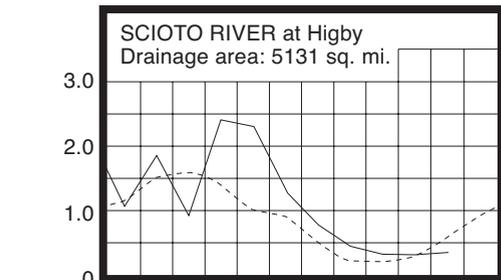
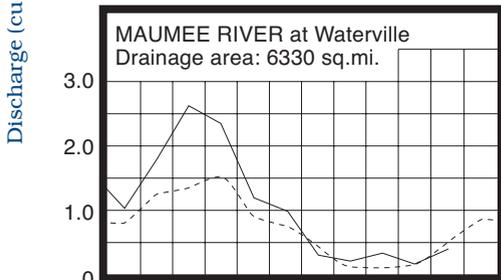
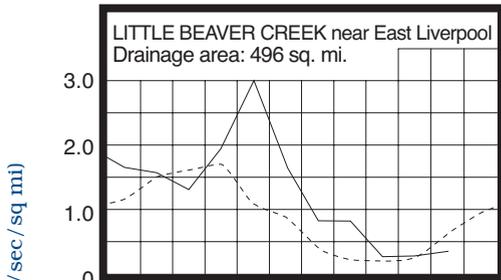
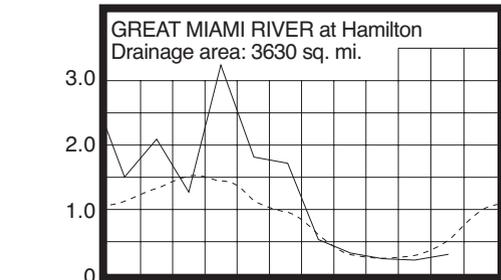
This Month

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	971	94	93	125	115
Great Miami River at Hamilton	3,630	1,089	57	48	83	131
Huron River at Milan	371	68	58	36	123	166
Killbuck Creek at Killbuck	464	157	57	60	134	127
Little Beaver Creek near East Liverpool	496	171	54	53	109	111
Maumee River at Waterville	6,330	2,554	78	72	77	120
Muskingum River at McConnelsville	7,422	3,128	60	56	102	109
Scioto River near Prospect	567	39	20	13	70	127
Scioto River at Higby	5,131	1,812	59	72	96	116
Stillwater River at Pleasant Hill	503	110	54	30	68	116

STREAMFLOW during November was below normal statewide. Flows during November increased seasonally from the flows recorded during October.

Streamflow at the beginning of November was below normal throughout Ohio. Lowest flows for the month occurred at various times, generally during the first week of November across eastern, central and northwestern Ohio; around mid-month in southwestern Ohio; and on November 21 in north-central and west-central Ohio basins. Flows increased statewide following the widespread precipitation that fell during November 22-24. Greatest flows for the month occurred following this precipitation, generally between November 24 and 26. Flows at the end of the month were below normal throughout most of the state.

MEAN STREAM DISCHARGE

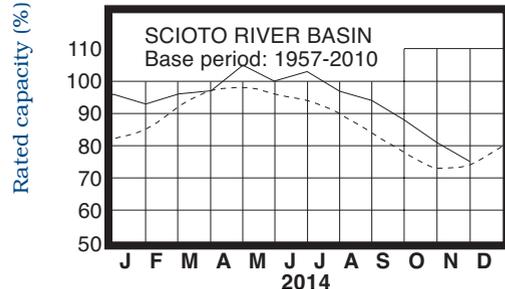
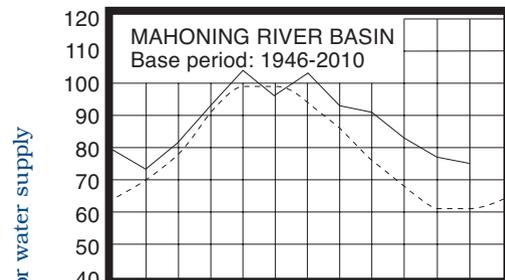


Base period for all streams: 1981-2010

RESERVOIR STORAGE for water supply during November decreased in both the Mahoning and Scioto river basins. Month-end storage remained above normal in both basins.

Reservoir storage at the end of November in the Mahoning basin index reservoirs was 75 percent of rated capacity for water supply compared with 77 percent for last month and 74 percent for November 2013. Month-end storage in the Scioto basin index reservoirs was 75 percent of rated capacity for water supply compared with 81 percent for last month and 90 percent for November 2013. Surface water supplies remain in good condition across the state in spite of the recent below normal precipitation and below normal streamflow much of the state has experienced.

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 declined throughout most of the state. A few aquifers in the southwestern areas of Ohio showed net improvement, but most aquifers continued to receive inadequate recharge due to below normal precipitation. In most aquifers, net changes during November from the October levels were greater than usually observed.

The below normal precipitation during the past few months across most of the state has not been beneficial for ground water supplies. Current ground water levels throughout most of Ohio are lower than those levels observed last year at this time and levels are below normal across much of the state. However, ground water storage remains adequate throughout Ohio. In addition, there are several months remaining in the current recharge season. Soil moisture remained adequate throughout most of the state. The Ohio Agricultural Statistics Service reports that soil moisture at the end of November was rated as being short in 7 percent of the state, adequate in 68 percent of the state and surplus in 25 percent of the state. Near-normal precipitation and other climatic conditions during the next several months will be necessary for a favorable recharge season.

LAKE ERIE level declined during November. The mean level was 571.36 feet (IGLD-1985), 0.33 foot below last month's mean level and 0.53 foot above normal. This month's level is 0.59 foot above the November 2013 level and 2.16 feet above Low Water Datum.

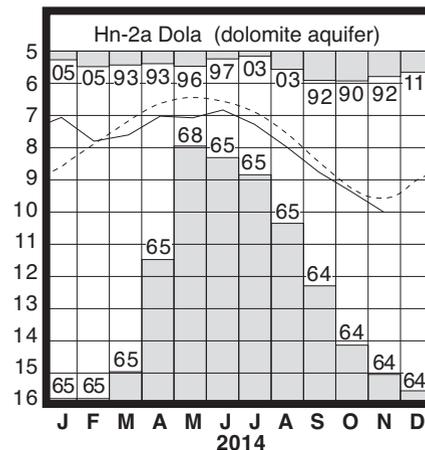
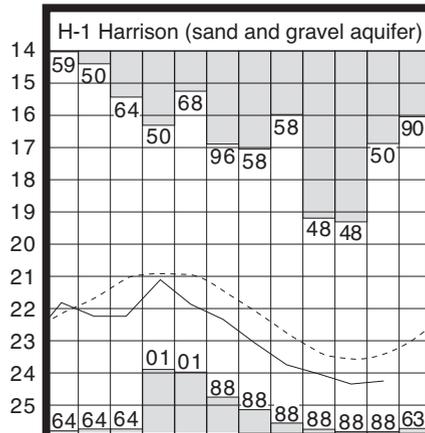
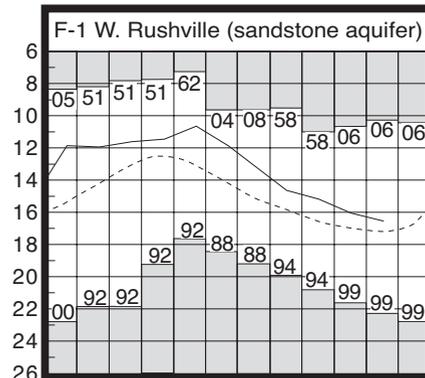
The U.S. Army Corps of Engineers (USACE) reports that precipitation in the Lake Erie basin during November averaged 2.12 inches, 0.74 inch below normal. For the entire Great Lakes basin, November precipitation averaged 2.60 inches, 0.14 inch below normal. For calendar year 2014 through November, precipitation in the Lake Erie basin has averaged 32.68 inches, 0.08 inch below normal, while precipitation in the entire Great Lakes basin has averaged 32.94 inches, 2.67 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 above normal for the foreseeable future. Deviations from the anticipated weather patterns could result in the level of Lake Erie ranging from as much as 20 inches above to about 3 inches below the normal seasonal level.

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	16.55	+0.64	-0.52	-0.59
Fa-1	Jasper Mill, Fayette Co.	Limestone	11.14	-1.97	-0.19	-1.71
Fr-10	Columbus, Franklin Co.	Gravel	43.34	+1.21	-0.12	+0.46
H-1	Harrison, Hamilton Co.	Gravel	24.26	-0.85	+0.08	-0.34
Hn-2a	Dola, Hardin Co.	Dolomite	10.00	-0.43	-0.64	-2.16
Po-124	Freedom, Portage Co.	Sandstone	77.17	-0.08	-0.22	-0.02
Tu-1	Strasburg, Tuscarawas Co.	Gravel	14.06	+0.10	-0.74	+0.94

GROUND-WATER LEVELS

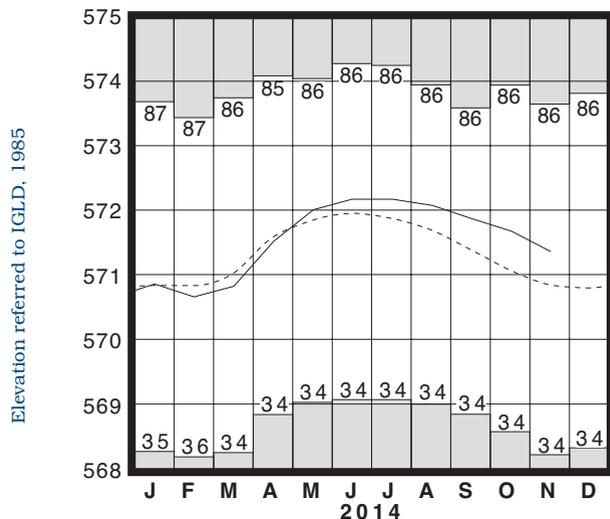
Water level (ft below land surface)



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

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

LAKE ERIE LEVELS



Base period: 1918-2010

■ Record high and low, year of occurrence

Normal - - - - Current ———

SUMMARY

Precipitation during November was below normal throughout most of the state with only a few locations in extreme northeastern Ohio having slightly above normal precipitation. Streamflow was below normal state-wide. Reservoir storage decreased but remained above normal. Ground water storage declined in most aquifers and was below normal in much of the state. Lake Erie level declined 0.33 foot and was 0.53 foot above the long-term November average.

NOTES AND COMMENTS

Ohio Observation Well Network

The Ohio Department of Natural Resources (ODNR), Division of Soil and Water Resources, Water Resources Section is responsible for collecting, researching, interpreting and disseminating hydrologic and ground water resource information for the state of Ohio. An important component of this program is the Ohio Observation Well Network. The Ohio Observation Well Network characterizes Ohio's ground water resources through monitoring and evaluating both short- and long-term trends in ground water level fluctuations throughout the state's various aquifer systems.

Observation wells have been used to monitor an aquifer's response to changing climatic conditions and impacts from man-induced activities since ground water level monitoring in Ohio began in 1938. Monitoring and evaluating long-term trends in ground water levels enables water resource professionals to access the availability and annual replenishment of ground water supplies. The Ohio Observation Well Network is a tool that professionals use to determine the availability of ground water supplies, thus promoting wise management and efficient use of this valuable resource. Currently, the Division of Soil and Water Resources monitors 138 wells distributed across the state. Once field information is gathered from each observation well, it is reviewed and verified for accuracy. The data is then made available on-line through the Division's web page. The web site allows the user to view and/or retrieve data from the Ohio Observation Well Network database. Several options are provided that offer a wide range of flexibility in viewing and/or retrieving current and historical data. Statistical and water quality data are also available through the web site. In addition to the 138 currently active observation wells, ground water level data from an additional 205 historic/inactive observation wells is also available. To visit this web site, go to www.dnr.state.oh.us/water/waterobs/default.asp.

The Ohio Observation Well Network is a successful example of local, state, federal and private partnerships. The U.S. Geological Survey (USGS) has been a cooperative partner with the ODNR since the establishment of the network. As part of that cooperative effort, 12 of the observation wells have been equipped with automated equipment, providing near-real time ground water level information that can be accessed through the division's web site. To view data from the 12 near-real time sites, go to the Division of Water, Water Inventory main page and click on "USGS Near real time data for select observation wells."

For more information about Ohio's Observation Well Network, contact the Division of Water at (614) 265-6740 or e-mail: mike.hallfrisch@dnr.state.oh.us.

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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