



MONTHLY WATER INVENTORY REPORT FOR OHIO

April 2016

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

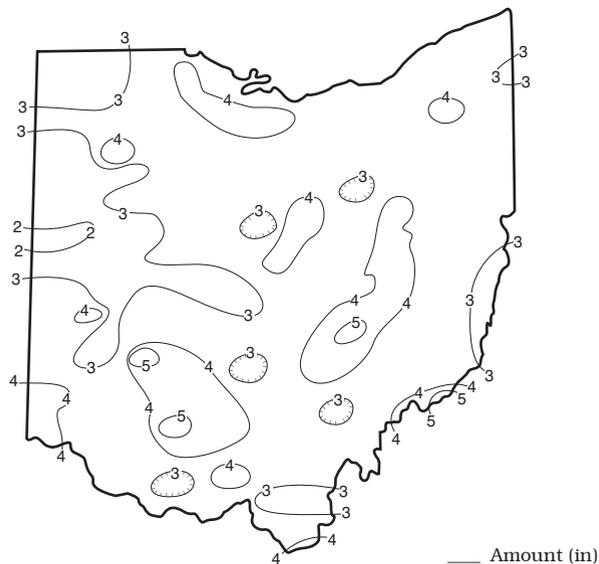
PRECIPITATION during April was near to above normal across much of the state, but was below normal in most of the southwestern quarter of Ohio and other scattered locations. The state average was 3.50 inches, 0.05 inch below normal. Regional averages ranged from 3.83 inches for both the North Central and Southeast regions, 0.52 inch and 0.27 inch above normal respectively, to 2.72 inches, 0.91 inch below normal, for the West Central Region.

Precipitation during April fell mostly as rain, but snow was common during the first nine days of the month across northern Ohio. Light snow fell across northern Ohio on the first couple days of the month while light rain fell across southern Ohio. Precipitation was widespread during April 6-11. Most of the state received more than 1 inch during this period with more than 3 inches reported in areas of north-central Ohio. The precipitation fell as snow on April 8 and 9 across the northern third of the state with amounts of 4-12 inches reported. Some minor flooding was observed following this precipitation, mainly across the northern half of the state. The next 10 days were rather dry throughout the state. Rain returned to Ohio on April 21 and 22 with most of the state receiving 0.25 to 0.5 inch amounts. The last week of April was wet with several days of precipitation. Most of the state received at least 1 inch of rain with the heaviest rain falling in southern Ohio where more than 2 inches fell.

Precipitation for the 2016 water year is above normal throughout most of the state with only the Northeast Hills and Southeast regions having below normal precipitation. The average for the state is 21.23 inches, 1.07 inches above normal. Regional averages range from 25.09 inches, 2.63 inches above normal, for the Southwest Region to 18.59 inches, 0.92 inch above normal, for the Northwest Region.

Precipitation for the 2016 calendar year is above normal across most of the state, but below normal in areas of west-central, south-central and southeastern Ohio. The state average is 12.08 inches, 0.55 inch above normal. Regional averages range from 13.38 inches, 0.15 inch above normal, for the Southwest Region to 11.04 inches, 0.06 inch below normal, for the West Central Region.

PRECIPITATION APRIL

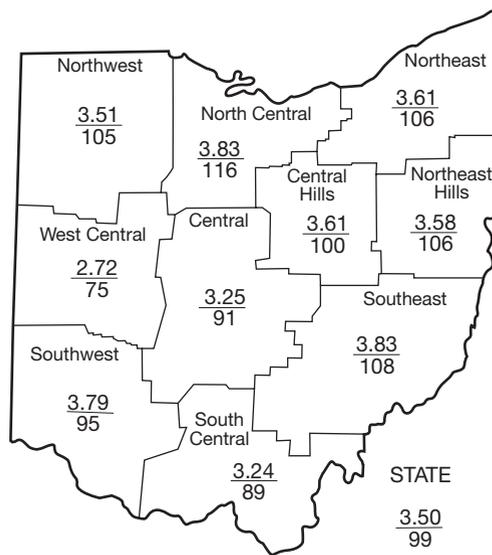


PRECIPITATION

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	+0.17	+1.87	+1.30	+9.62	+5.49	+1.3
North Central	+0.52	+2.57	+1.77	+5.16	+3.35	+1.9
Northeast	+0.19	+2.71	+1.08	+4.23	+8.62	-0.5
West Central	-0.91	+0.97	+1.40	+6.21	+4.53	-0.2
Central	-0.34	+1.79	+1.43	+2.41	+0.50	-0.3
Central Hills	0.00	+1.99	+0.94	+1.82	+2.54	+0.3
Northeast Hills	+0.21	+1.70	-0.41	+0.70	+5.08	-1.2
Southwest	-0.19	+1.78	+1.96	+4.47	+3.20	+0.3
South Central	-0.40	+0.98	+0.60	+1.48	+1.50	-1.1
Southeast	+0.27	+1.21	+0.03	+0.44	+0.70	-1.7
State	-0.05	+1.76	+1.01	+3.64	+3.53	

*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



Average (in)
Percent of normal

MEAN STREAM DISCHARGE

This Month

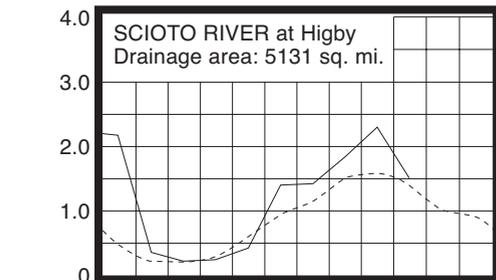
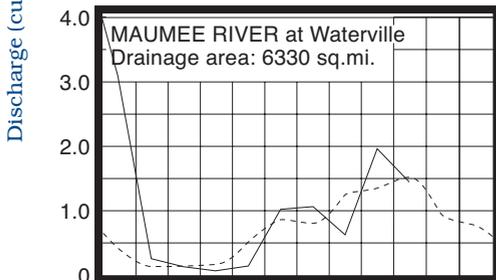
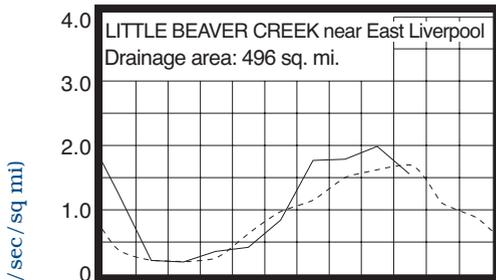
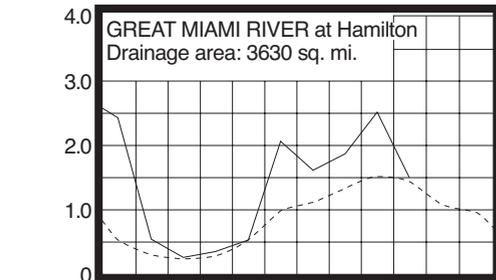
River and Location	Drainage Area (Sq. Mi.)	Mean Discharge (CFS)	% of Normal	% of Normal Past		
				3 Mos.	6 Mos.	12 Mos.
Grand River near Painesville	685	1,222	83	101	84	101
Great Miami River at Hamilton	3,630	5,442	104	121	124	140
Huron River at Milan	371	685	117	100	96	117
Killbuck Creek at Killbuck	464	831	117	97	88	90
Little Beaver Creek near East Liverpool	496	772	92	99	94	94
Maumee River at Waterville	6,330	9,187	96	87	83	143
Muskingum River at McConnelsville	7,422	14,410	116	101	85	85
Scioto River near Prospect	567	551	65	96	96	143
Scioto River at Higby	5,131	7,770	108	115	110	120
Stillwater River at Pleasant Hill	503	555	83	112	118	138

STREAMFLOW during April varied across the state. Generally, flows were above normal in southern, southeastern and north-central Ohio and below normal in western, central and northeastern areas of the state. Flows in some central Ohio drainage basins were low enough to be considered deficient. April flows were less than the flows recorded during March in most drainage basins in the state.

Flows at the beginning of the month were above normal in western Ohio and below normal in eastern Ohio. Flows increased during the first half of the month. Greatest flows for April occurred between April 12 and 14 throughout most of the state. Flows declined from these peaks during the second half of April as drier conditions prevailed for much of this period.

Lowest flows for the month occurred between April 23 and 25 in the northern third of the state and between April 26 and 30 in the southern two-thirds. Flows at the end of April were below normal statewide.

MEAN STREAM DISCHARGE

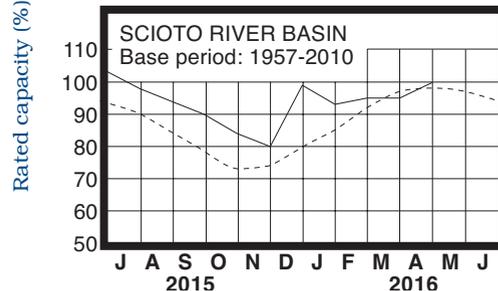
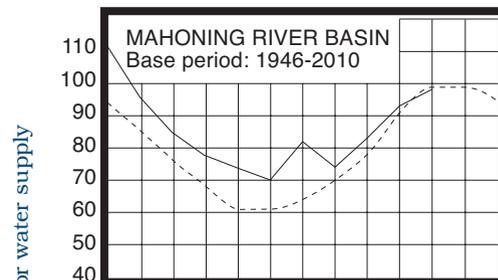


Base period for all streams: 1981-2010

RESERVOIR STORAGE for water supply during April increased in both the Mahoning and Scioto river basins. Storage fell to below normal in the Mahoning River basin while storage in the Scioto River basin increased to above normal.

Reservoir storage at the end of April in the Mahoning basin index reservoirs was 98 percent of rated capacity for water supply compared with 93 percent for last month and 95 percent for April 2015. Month-end storage in the Scioto basin index reservoirs was 100 percent of rated capacity for water supply compared with 95 percent for last month and 98 percent for April 2015.

RESERVOIR STORAGE FOR WATER SUPPLY



Normal - - - - Current ———

GROUND-WATER LEVELS

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

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	11.18	+1.33	+0.17	+0.15
Fa-1	Jasper Mill, Fayette Co.	Limestone	8.16	-1.15	-0.09	+0.16
Fr-10	Columbus, Franklin Co.	Gravel	41.09	+1.45	+0.29	+0.63
H-1	Harrison, Hamilton Co.	Gravel	21.70	-0.79	-0.60	-0.25
Hn-2a	Dola, Hardin Co.	Dolomite	6.51	+0.09	+0.13	+0.32
Po-124	Freedom, Portage Co.	Sandstone	77.09	-0.84	+0.29	-0.69
Tu-1	Strasburg, Tuscarawas Co.	Gravel	12.33	-0.82	+0.87	-1.51

GROUND WATER levels during April rose in most aquifers in the state. However, these increases were less than usually observed for this time of the year and in a few aquifers, levels actually declined slightly for the month. Most aquifers showed some improvement during the first half of April in response to some of the month's heaviest and most widespread precipitation. While levels in most aquifers declined during the second half of April, levels in some deeper aquifers continued to rise through the end of the month.

Generally, ground water storage continues to remain at above normal levels in consolidated aquifers and deeper, unconsolidated aquifers in central, southeastern and northwestern Ohio. Most other aquifers across the state are at below normal levels. Current levels are higher than they were last year at this time in most aquifers, but are lower in many aquifers in eastern and northeastern Ohio. Ground water supplies are adequate across the state. Current conditions favor some improvement during the next month provided there is ample precipitation. The Ohio Agricultural Statistics Service reports that soil moisture near the end of April was rated as being short in 1 percent of the state, adequate in 57 percent of the state, and surplus in 42 percent of the state. However, the 2016 recharge season is nearing its end and in some areas of the state where April precipitation was below normal, the current recharge season may already have ended. Ample precipitation during the next few months will slow the natural rate of decline in ground water storage.

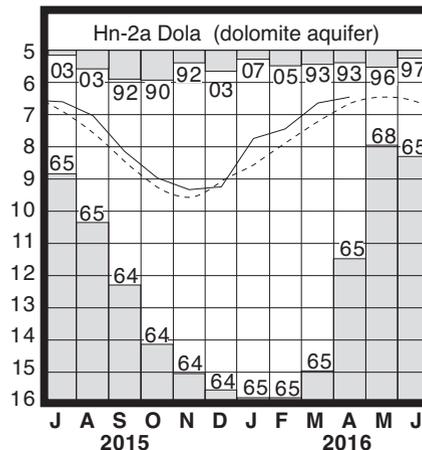
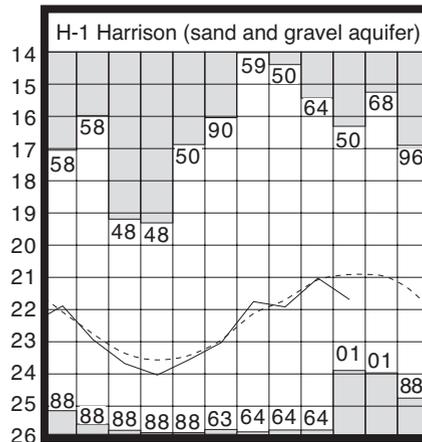
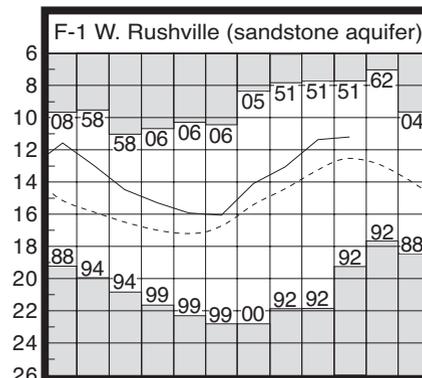
LAKE ERIE level rose during April. The mean level was 572.83 feet (IGLD-1985), 0.62 foot above last month's mean level and 1.24 feet above normal. This month's level is 1.24 feet above the April 2015 level and 3.63 feet above Low Water Datum.

The U.S. Army Corps of Engineers (USACE) reports that precipitation in the Lake Erie basin during April averaged 2.67 inches, 0.52 inch below normal. Precipitation in the entire Great Lakes basin during April was 2.01 inches, 0.55 inch below normal. For calendar year 2016 through April, precipitation in the Lake Erie basin has averaged 11.58 inches, 1.06 inches above normal, while the entire Great Lakes basin has averaged 10.20 inches, 1.50 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 little as 4 inches above to as much as 21 inches above the normal seasonal average.

GROUND-WATER LEVELS

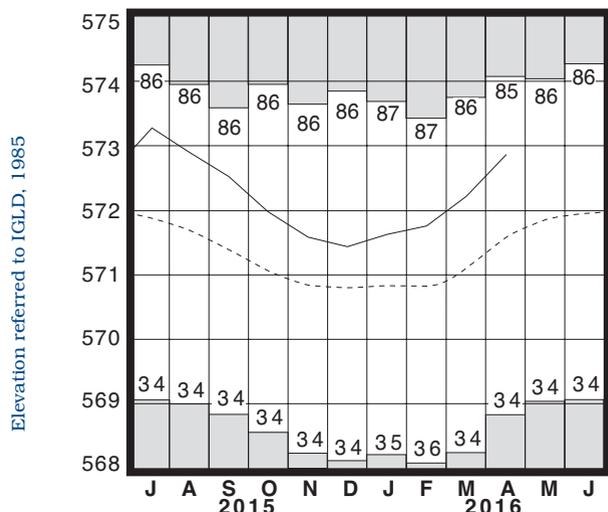
Water level (ft below land surface)



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 April was near to above normal across much of the state, but below normal in the southwestern quarter of Ohio and other scattered locations. Streamflow varied across the state but was generally above normal in southern, southeastern and north-central areas of Ohio. Reservoir storage increased and ground water levels rose throughout most of the state. Lake Erie level rose 0.62 foot and was 1.24 feet above the long-term April average.

NOTES AND COMMENTS

Major Earthquake Makes Its Mark In Ohio

A major earthquake measuring 7.8 on the open ended Richter scale occurred in Ecuador at 19:58 EDT on April 16, 2016. The quake was centered about 17 miles south-southeast of Muisne, Ecuador. Shock waves radiating from the epicenter of this earthquake traveled through rock formations and reached Ohio. Seismic waves passing through rock formations cause an alternating compression and expansion of the rock. Water levels in some wells finished in certain rock formations can rise and fall with the passage of these waves. Several wells in Ohio's observation well network respond to earthquakes, especially earthquakes located in the western hemisphere. Minimum Richter scale readings of 6.5 to 7.0, depending on the earthquake's location, are usually necessary for wells in Ohio to show any response. The most sensitive well to these phenomena in Ohio's observation well network is VW-1, located in Van Wert (Van Wert County). Seismic waves from the Ecuador earthquake caused a 0.12 foot fluctuation of the water level in this well. The most notable fluctuation caused by an earthquake in VW-1 occurred March 27, 1964 when the water level changed 5.8 feet following the Alaskan Good Friday earthquake which had a Richter scale magnitude of 8.4.

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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