



MONTHLY WATER INVENTORY REPORT FOR OHIO

April 2014

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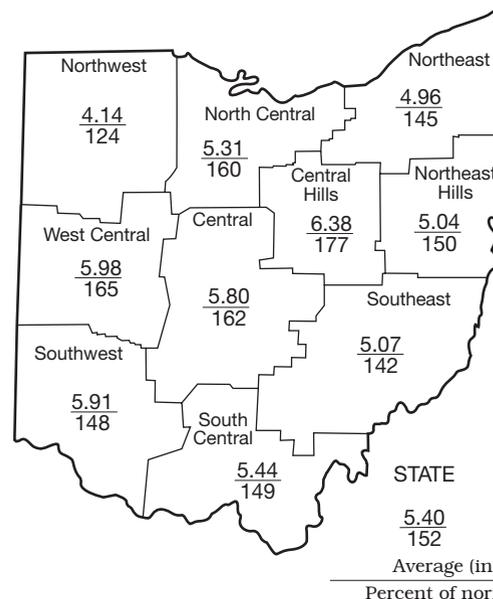
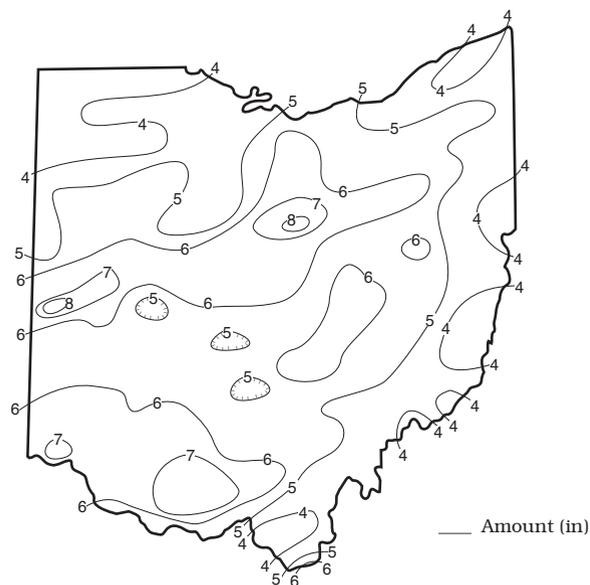
PRECIPITATION during April was above normal across Ohio with only a few locations receiving below normal precipitation. The state average was 5.40 inches, 1.85 inches above normal. This ranks as the tenth wettest April for the state as a whole in the past 132 years. Regional averages ranged from 6.38 inches, 2.77 inches above normal, for the Central Hills Region to 4.14 inches, 0.80 inch above normal, for the Northwest Region. This was the second wettest April on record for the Central Hills Region, the fifth wettest for the North Central Region and the ninth wettest for the West Central Region. Charles Mill Dam (Ashland County) reported the greatest amount of April precipitation, 8.36 inches. Greenville (Darke County) reported 8.31 inches, the only other location reporting more than 8 inches of precipitation for April. Marietta Waste Water Treatment Plant (Washington County) reported the least amount, 3.02 inches.

Precipitation during April fell almost entirely as rain with only light snow amounts reported across much of the state. Many areas of Ohio had numerous days with measureable precipitation throughout the first half of the month. Showers and thunderstorms were widespread during April 1-4, especially in the western areas of the state where some locations reported 2-3 inches of rain. Most of the heaviest rains occurred on April 3 and 4. Additional showers and thunderstorms were widespread during April 7-8 with another 0.50-1.0 inch of rain falling across most of Ohio; areas in extreme southeastern and south-central Ohio received less than 0.25 inch. Showers fell across most of the state on April 10 and 11 with the greatest amount of rain falling in a wide band from west-central to northeastern Ohio. Many areas of the state received between 0.50 and 1.0 inch of precipitation during April 14-15. The next nine days were drier with just some light showers reported on April 22. The last six days of the month were very wet with widespread rain on April 25 and during April 28-30. Most areas of Ohio received between 1 and 2 inches of rain through this period, but some areas, especially in eastern and south-central Ohio, received 3-4 inch amounts, resulting in some localized flooding.

Precipitation for the 2014 water year is above normal statewide. The average for the state is 23.19 inches, 3.03 inches above normal. Regional averages range from 25.73 inches, 3.27 inches above normal, for the Southwest Region to 20.20 inches, 2.53 inches above normal, for the Northwest Region.

Precipitation for the 2014 calendar year is above normal throughout most of the state with only the Northeast Hills Region having below normal precipitation. The average for the state is 12.20 inches, 0.67 inch above normal. Regional averages range from 13.59 inches, 0.46 inch above normal, for the South Central Region to 10.82 inches, 1.00 inch above normal, for the Northwest 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	+0.80	+0.85	+1.01	+2.67	+1.10	+0.2
North Central	+2.00	+1.36	+1.97	+7.73	+10.99	+3.5
Northeast	+1.54	+0.97	+1.14	+7.37	+8.99	+1.3
West Central	+2.35	+1.52	+2.93	+1.90	+2.74	+0.3
Central	+2.21	+1.21	+1.91	+3.96	+2.17	+0.5
Central Hills	+2.77	+1.79	+2.05	+5.87	+5.63	+1.0
Northeast Hills	+1.67	+0.35	+0.62	+2.53	-0.31	+0.7
Southwest	+1.93	+0.63	+1.51	+3.42	-1.52	+0.6
South Central	+1.80	+1.38	+2.82	+3.35	+1.89	+0.6
Southeast	+1.51	+0.94	+2.53	+5.75	+3.85	+0.7
State	+1.85	+1.10	+1.84	+4.44	+3.52	+0.7

*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	1,953	133	99	104	121
Great Miami River at Hamilton	3,630	11,740	225	134	143	126
Huron River at Milan	371	977	167	176	161	182
Killbuck Creek at Killbuck	464	1,248	175	105	114	115
Little Beaver Creek near East Liverpool	496	963	114	89	102	89
Maumee River at Waterville	6,330	14,790	154	145	127	118
Muskingum River at McConnellsville	7,422	18,090	146	93	102	98
Scioto River near Prospect	567	1,432	169	116	134	147
Scioto River at Higby	5,131	12,290	171	104	112	108
Stillwater River at Pleasant Hill	503	1,459	218	120	133	106

STREAMFLOW during April was above normal statewide. Flows across much of the state were high enough to be considered excessive. Flows in most areas of Ohio during April were greater than the flows observed during March.

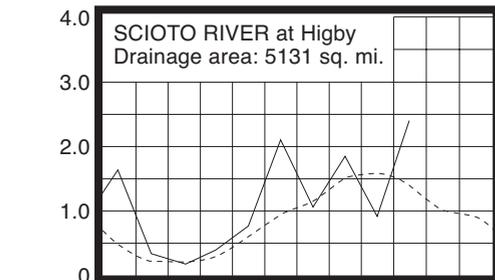
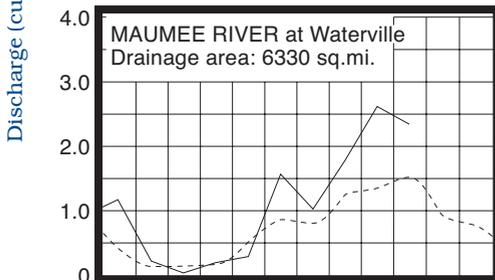
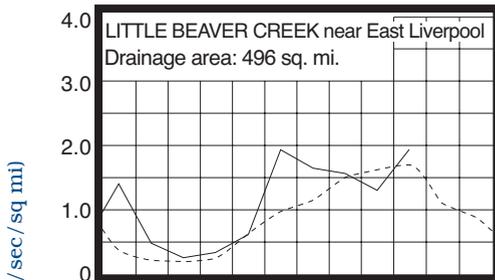
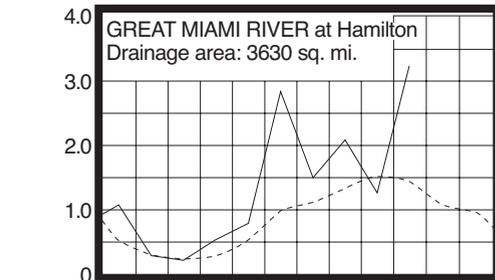
Flows at the beginning of April were generally above normal in southern and northeastern Ohio and below normal elsewhere. Streamflow increased the first week of the month in response to widespread precipitation. Drainage basins in the western half of the state and some basins in northeastern Ohio recorded their greatest flows for the month during April 4-8. Minor flooding of low-lying areas, especially in western Ohio, occurred as a result of widespread precipitation. Flows declined slightly from these peaks through

mid-month, then declined more rapidly as drier conditions moved into the state. Lowest flows for the month were recorded between April 24 and 28. Flows increased from these lows as precipitation moved back into the state. Greatest flows were recorded on the last day of the month in drainage basins in east-central and southeastern Ohio as a result of this precipitation. Some small stream and urban flooding was reported in the eastern half of Ohio at the end of the month. Flows were above normal nearly statewide as April ended with just a few basins in northwestern Ohio being below normal.

RESERVOIR STORAGE for water supply during April increased in both the Mahoning and Scioto river basins. Storage was above normal in both basins.

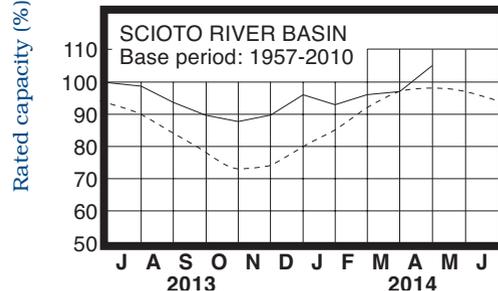
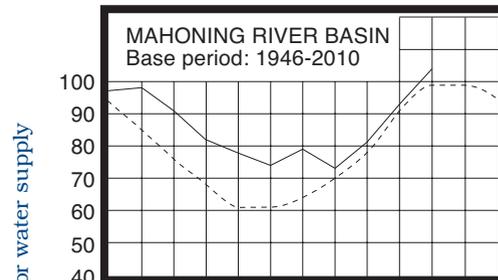
Reservoir storage at the end of April in the Mahoning basin index reservoirs was 104 percent of rated capacity for water supply compared with 93 percent for last month and 100 percent for April 2013. Month-end storage in the Scioto basin index reservoirs was 105 percent of rated capacity for water supply compared with 97 percent for last month and 102 percent for April 2013. Surface water supplies are in excellent condition throughout the state. Most reservoirs in Ohio are near capacity as the summer season approaches.

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

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	11.59	+0.92	+0.05	+0.59
Fa-1	Jasper Mill, Fayette Co.	Limestone	8.67	-1.66	+0.16	-0.03
Fr-10	Columbus, Franklin Co.	Gravel	41.90	+0.64	+0.41	+1.20
H-1	Harrison, Hamilton Co.	Gravel	21.10	-0.19	+1.12	+1.07
Hn-2a	Dola, Hardin Co.	Dolomite	7.01	-0.41	+0.60	-0.96
Po-124	Freedom, Portage Co.	Sandstone	76.63	-0.38	+0.40	+0.19
Tu-1	Strasburg, Tuscarawas Co.	Gravel	12.20	-0.69	+1.04	+0.39

GROUND WATER levels during April rose in all aquifers throughout the state. In most areas, the net rise during April was less than usually observed. Generally, ground water levels rose during the first half of the month and declined during the second half, but began to rise again near the end of the month.

Ground water supplies continue to be adequate throughout the state. The above normal precipitation during April was a benefit for ground water supplies in Ohio. Also, this year's levels are higher than they were at this time last year in most aquifers.

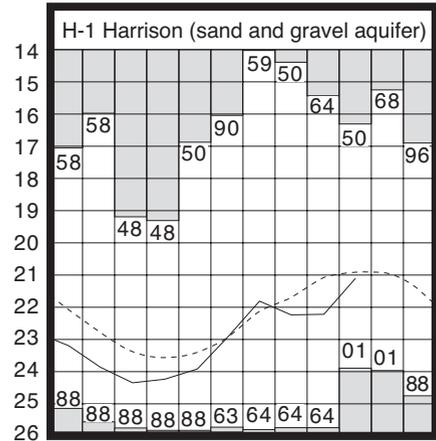
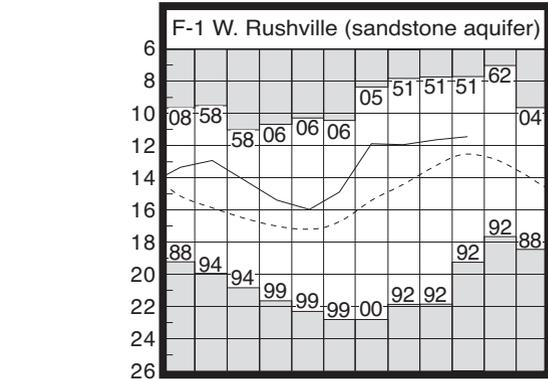
However, ground water storage continues to remain at below normal levels across much of the state. Current soil conditions favor additional recharge to ground water supplies. The Ohio Agricultural Statistics Service reports that soil moisture near the end of April was rated as being short in 1 percent of the state, adequate in 66 percent of the state, and surplus in 33 percent of the state. With near normal precipitation, ground water supplies should maintain a favorable position as the summer season of high-use and increased evapotranspiration approaches.

LAKE ERIE level rose during April. The mean level was 571.52 feet (IGLD-1985), 0.69 foot above last month's mean level and 0.07 foot below normal. This month's level is 0.59 foot above the April 2013 level and 2.32 feet above Low Water Datum.

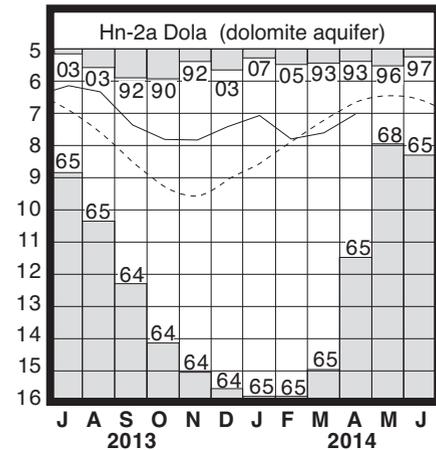
The U.S. Army Corps of Engineers (USACE) reports that precipitation in the Lake Erie basin during April averaged 3.46 inches, 0.30 inch above normal. For the entire Great Lakes basin, April precipitation averaged 3.09 inches, 0.54 inch above normal. For calendar year 2014 through April, precipitation in the Lake Erie basin has averaged 9.60 inches, 0.90 inch below normal while precipitation in the entire Great Lakes basin has averaged 7.82 inches, 0.87 inch below 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 during the next six months. Deviations from the anticipated weather patterns could result in the level of Lake Erie ranging from about 8 inches above normal to around 9 inches below the normal seasonal level.

GROUND-WATER LEVELS



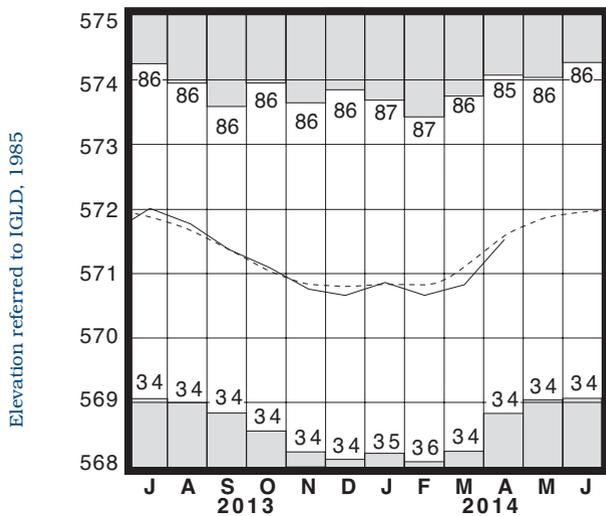
Water level (ft below land surface)



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 above normal across most of Ohio. Streamflow was above normal statewide and high enough to be considered excessive across most of the state. Reservoir storage increased and was above normal throughout Ohio. Ground water levels rose, but storage remains below normal across much of the state. Lake Erie level rose 0.69 foot and was 0.07 foot below the long-term April average.

NOTES AND COMMENTS

Recent Earthquakes Leave Their Mark In Ohio

Recent earthquakes have left their mark on Ohio. On April 1, 2014 at 19:46 EDT, an earthquake with a magnitude of 8.2 on the open-ended Richter scale struck 59 miles northwest of Iquique in northern Chile. On April 18, 2014 at 10:27 EDT, an earthquake with a magnitude of 7.2 occurred near the Pacific coast of Mexico, 170 miles southwest of Mexico City, Mexico. Then on April 23, 2014 at 23:10 EDT, an earthquake with a magnitude of 6.6 hit 58 miles south of Port Hardy, Canada. Shock waves radiating from the epicenter of these earthquakes 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 Western Hemisphere earthquakes. 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 northern Chile earthquake caused a 0.20 foot fluctuation of water level in this well. Seismic waves from the Mexico earthquake caused a slight 0.06 foot fluctuation, while the earthquake in Canada caused a 0.15 foot fluctuation of water level in VW-1. 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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