



# MONTHLY WATER INVENTORY REPORT FOR OHIO

September 2014

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

**PRECIPITATION** during September was below normal across much of the state with only the Northwest and North Central regions having above normal precipitation. The state average was 2.18 inches, 0.99 inch below normal. Regional averages ranged from 4.78 inches, 1.85 inches above normal, for the Northwest Region to 1.10 inches, 2.10 inches below normal, for the Southeast Region. Bryan (Williams County) reported the greatest amount of September precipitation, 6.10 inches. Coshocton Agricultural Research Station (Coshocton County) reported the least amount, 0.28 inch. Many locations in the eastern half of the state reported less than one inch of precipitation in September.

The majority of the September precipitation fell during the first half of the month. During September 1-2, showers and thunderstorms produced less than 0.5 inch of rain in most areas of the state, but some locations in southern Ohio reported around 1 inch. Showers and storms on September 5 and 6 moved across the northern third of the state with periods of heavy rain. Most of this region received between 0.5 and 1.0 inch of rain with some locations reporting around 2 inches. Strong storms moved into the state ahead of a cold front on September 10, with several being severe in northern Ohio with heavy rain and damaging winds. One tornado touched down causing some damage along its path in Wayne, Summit and Portage counties. Most of western and northern Ohio received between 0.5 and 1.5 inches of rain from these storms with the greatest amounts of more than 3 inches reported in areas of northwestern Ohio. The storms weakened as they moved east across the state and as a result much of central, east-central and southeastern Ohio received less than 0.25 inch of rain. Showers during September 15-16 were again most numerous across the northern third of Ohio with amounts between 0.25 and 0.5 inch common, but little or no rain elsewhere. The second half of the month was very dry in most areas of the state. Farmers and other participants had ideal weather for visiting this year's Farm Science Review held in Madison County during September 16-18. Additionally, the dry conditions allowed farmers several days to begin harvesting crops. Some rain fell across the northern third of the state during September 21-22 with generally 0.25 to 0.5 inch amounts common. A few light showers fell across the state on the last day of the month.

Precipitation for the 2014 calendar year is generally above normal in the northern two-thirds of the state and below normal in the southern one-third. The state average is 31.68 inches, 1.27 inches above normal. Regional averages range from 36.45 inches, 6.49 inches above normal, for the Northeast Region to 28.23 inches, 1.06 inch above normal, for the Northwest Region.

Precipitation for the 2014 water year is above normal throughout most of Ohio with only the South Central Region having slightly below normal precipitation. The state average was 42.64 inches, 3.61 inches above normal. Regional averages ranged from 48.67 inches, 9.09 inches above normal, for the Northeast Region to 37.55 inches, 2.53 inches above normal, for the Northwest Region (see

(continued on back)

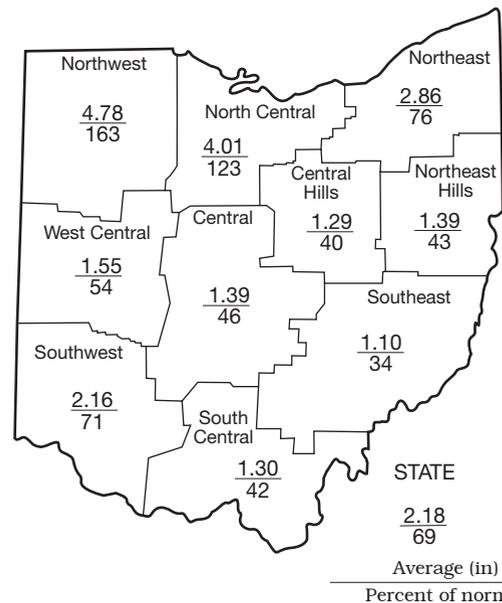
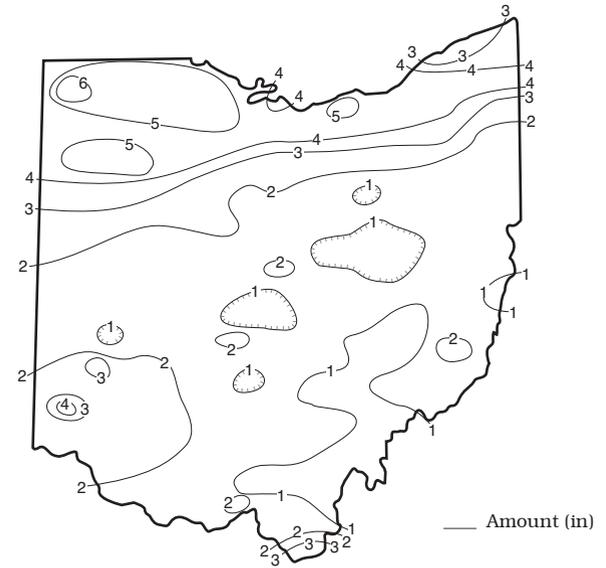
## PRECIPITATION

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	+1.85	+0.23	+0.90	+2.53	+3.49	+0.7
North Central	+0.76	-1.74	+2.96	+4.11	+11.93	+2.0
Northeast	-0.89	+1.85	+7.37	+9.09	+15.43	+2.0
West Central	-1.31	-2.03	+2.33	+4.28	+3.47	-1.3
Central	-1.65	-2.62	+1.90	+2.83	+4.63	-1.5
Central Hills	-1.95	-1.73	+4.46	+5.26	+8.79	-1.0
Northeast Hills	-1.86	+1.92	+7.20	+7.40	+7.95	-0.7
Southwest	-0.88	-1.48	+0.42	+1.76	+0.15	-1.7
South Central	-1.83	-2.97	-1.74	-0.93	-0.90	-3.1
Southeast	-2.10	-2.55	-0.57	+0.43	+2.66	-2.8
State	-0.99	-1.13	+2.48	+3.61	+5.67	

\*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 SEPTEMBER



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	312	271	169	153	123
Great Miami River at Hamilton	3,630	863	99	71	134	137
Huron River at Milan	371	53	81	54	141	171
Killbuck Creek at Killbuck	464	124	114	136	182	133
Little Beaver Creek near East Liverpool	496	133	132	126	154	113
Maumee River at Waterville	6,330	2,165	245	75	113	119
Muskingum River at McConnelsville	7,422	2,480	132	131	155	112
Scioto River near Prospect	567	23	70	43	139	139
Scioto River at Higby	5,131	1,718	158	118	139	120
Stillwater River at Pleasant Hill	503	56	122	52	117	118

**STREAMFLOW** during September was above normal across most of the state, but below normal in the central and north-central areas of Ohio. September flows were less than the August flows in the southern two-thirds of the state and greater in the northern third.

Flows at the beginning of the month were generally above normal in the southern two-thirds of Ohio and below normal in the northern third. Much of the state had their greatest flows for September during the first two days of the month. Basins in the northern third and west central areas of Ohio had their greatest flows during September 11-12 following the precipitation that fell on September 10 and 11. Flows decreased from these peaks through the end of the month in most basins; however, flows in several basins increased slightly on the last day of September in response to precipitation on that day. Most areas had their lowest flows

for the month at or near the end of September. The exception was in some northwestern and north-central Ohio basins where the month's lowest flows occurred during the first week of September. At the end of the month, flows were below normal throughout most of the state.

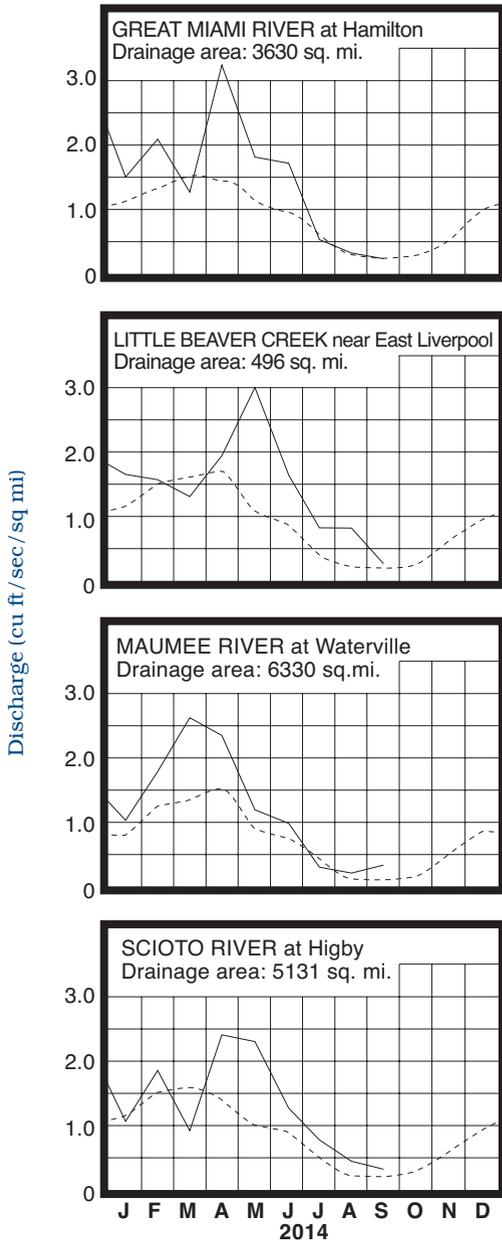
Streamflow for the 2014 water year was above normal throughout the state (see Mean Stream Discharge table, percent of normal, past 12 months column). Flows were generally above normal throughout most of the state nearly every month of the 2014 water year. The exceptions were during March, with below normal flows in the southern two-thirds of the state, and July, with below normal flows in the western half of Ohio. Flooding during the 2014 water year was mostly minor, but occurred during several months. Minor flooding during October was the result of heavy rains from the remnants of Tropical Storm Karen. Occurrences of flooding during December, January and February were most numerous in northern Ohio and were the result of a combination of rain, melting snow, frozen soils and ice jams on many streams. April showers resulted in some minor flooding and severe storms during May resulted in moderate flooding in areas of northeastern and west-central Ohio. Several locally severe thunderstorms during the summer months caused small stream and urban flooding as well as some flash flooding.

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

Reservoir storage at the end of September in the Mahoning basin index reservoirs was 83 percent of rated capacity for water supply compared with 91 percent for last month and 82 percent for September 2013. Month-end storage in the Scioto basin index reservoirs was 88 percent of rated capacity for water supply compared with 94 percent for last month and 90 percent for September 2013.

Surface water supplies were adequate throughout the 2014 water year. Storage was near or above normal throughout the year. Surface water supplies are in excellent condition throughout Ohio as the 2015 water year begins.

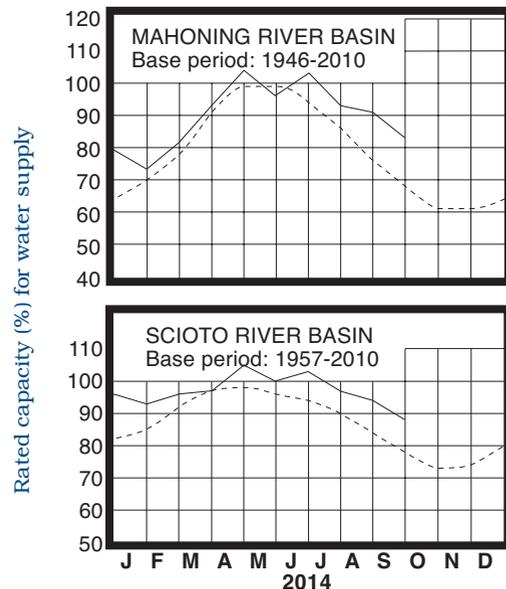
## MEAN STREAM DISCHARGE



Base period for all streams: 1981-2010

Normal - - - - Current ———

## RESERVOIR STORAGE FOR WATER SUPPLY



## GROUND-WATER LEVELS

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

**GROUND WATER** levels during September declined seasonally from last month's levels in most areas of the state. A few exceptions were observed in some aquifers in areas where ground water levels responded to the much above normal precipitation that fell during August, most notably in east-central Ohio. Net declines during September from the August levels were about equal to what is usually observed in most aquifers. Ground water storage remains above normal in most eastern Ohio aquifers and below normal in western Ohio aquifers. This month's levels are higher than the levels of a year ago in the state's unconsolidated aquifers while levels are lower in most consolidated aquifers.

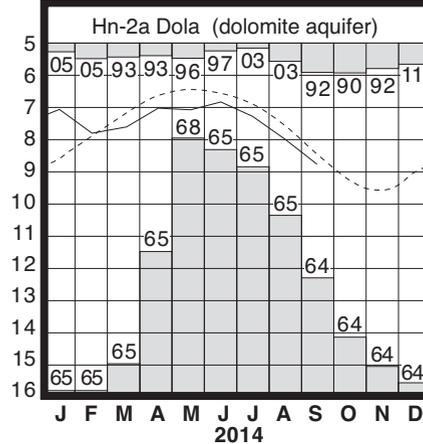
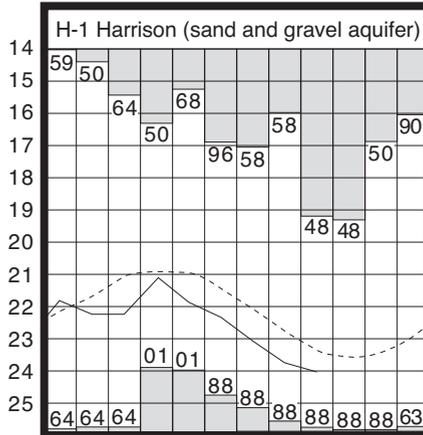
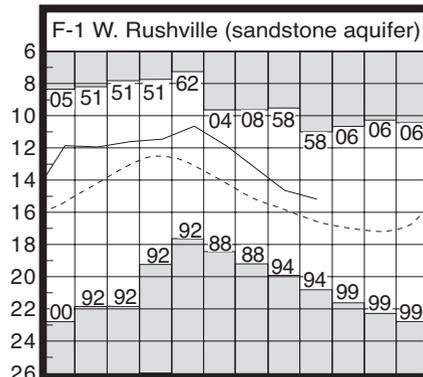
Ground water supplies during the 2014 water year were adequate throughout Ohio. Ground water storage at the beginning of the water year was below normal across most of the state. The 2014 recharge season got off to a good start with above normal precipitation during the first three months. As a result, storage improved and during December had risen to above normal levels across most of the state. However, the combination of below normal precipitation during the next three months and frozen soils during much of January and February limited the rate of recharge. Ground water levels fell to below normal levels across most of the state during February. Late spring and summer precipitation was much above normal in most areas of eastern Ohio which helped slow the natural seasonal decline of ground water levels; levels in most eastern Ohio aquifers improved to above normal during June and continued at these levels throughout the summer months. Precipitation was not quite as favorable across most of western Ohio and ground water levels remained below normal throughout the remainder of the water year. At the end of the 2014 water year, levels continue to be generally above normal across eastern Ohio and below normal in western Ohio. The Ohio Agricultural Statistics Service reports that near the end of September, soil moisture was rated as being short or very short in 27 percent of the state, adequate in 66 percent of the state and surplus in 7 percent of the state.

**LAKE ERIE** level declined during September. The mean level was 571.88 feet (IGLD-1985), 0.20 foot below last month's mean level and 0.49 foot above normal. This month's level is 0.49 foot above the September 2013 level and 2.68 feet above Low Water Datum.

The level of Lake Erie fluctuated between above and below normal during the first four months of the 2014 water year, being slightly above normal during October and January, and slightly below normal during November and December. The lake level fell to below normal during February and remained below normal through April. However, with above normal precipitation in the Lake Erie basin during April, the lake level increased to above normal during May and remained above normal throughout the remainder of the 2014 water year. At the end of the 2014 water year, the level of Lake Erie was about 6 inches above the seasonal average. 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 19 inches above to around 4 inches below the normal seasonal level.

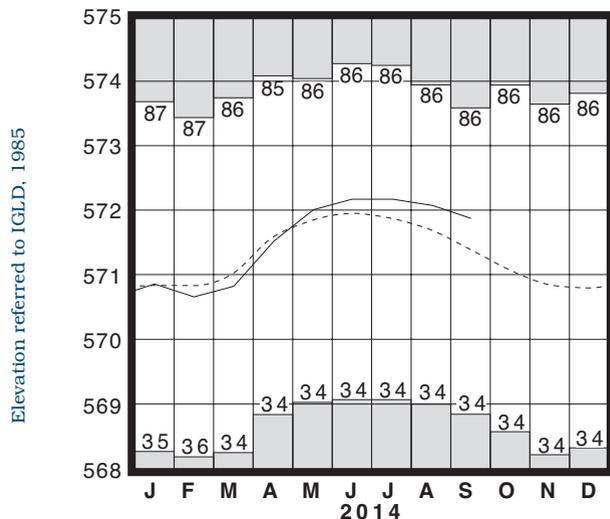
Index Well	Location	Aquifer	Mean This Month	Departure From Normal	Change in feet from:	
					Last Month	Year Ago
F-1	W. Rushville, Fairfield Co.	Sandstone	15.19	+1.30	-0.58	-1.06
Fa-1	Jasper Mill, Fayette Co.	Limestone	10.31	-0.97	-0.77	+0.47
Fr-10	Columbus, Franklin Co.	Gravel	43.13	+1.64	-0.72	+1.12
H-1	Harrison, Hamilton Co.	Gravel	24.01	-0.66	-0.26	+0.32
Hn-2a	Dola, Hardin Co.	Dolomite	8.77	-0.31	-0.78	-1.38
Po-124	Freedom, Portage Co.	Sandstone	76.88	-0.01	-0.31	-0.04
Tu-1	Strasburg, Tuscarawas Co.	Gravel	11.66	+2.21	+0.10	+2.72

## GROUND-WATER LEVELS



Water level (ft below land surface)

## LAKE ERIE LEVELS



Base period: 1918-2010

■ Record high and low, year of occurrence

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)

Precipitation table, departure from normal, past 12 months column). Dorset (Ashtabula County) reported the greatest amount of precipitation for the 2014 water year, 59.78 inches. Hoytville (Wood County) reported the least amount, 30.95 inches. An isohyetal map and regional averages with percentages of normal precipitation for the 2014 water year appear below.

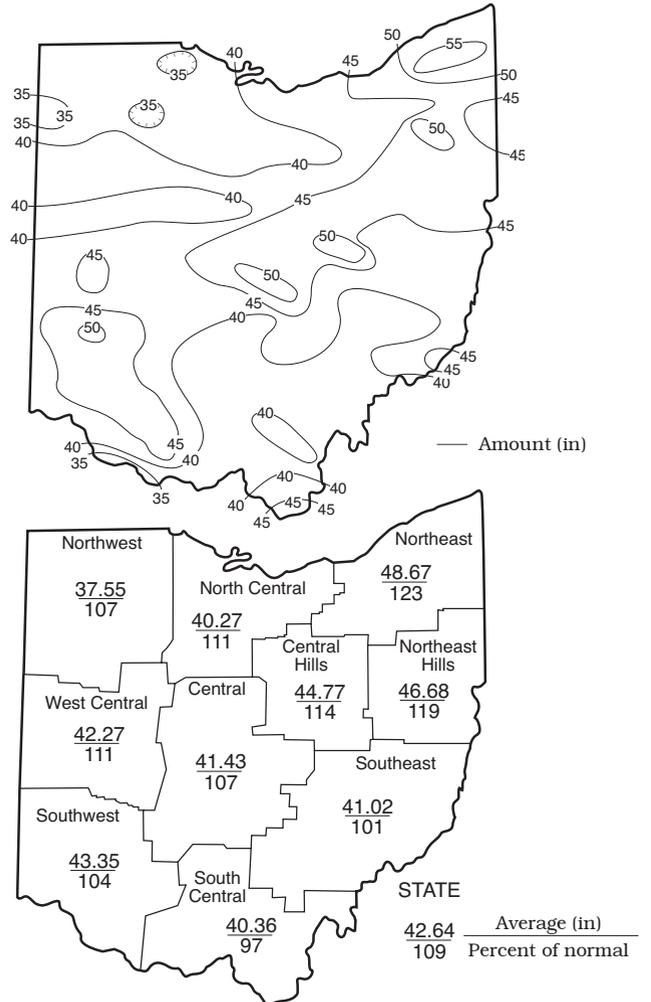
The 2014 water year started off with above normal precipitation across most of the state in October followed by above normal precipitation in the eastern half of Ohio during November. Strong storms at the end of October and in November caused significant damage to several areas of the state; nine tornadoes touched down in parts of western and central Ohio. December's precipitation was above normal, but precipitation during the January through March period was below normal. April was wet and was the tenth wettest April on record. Precipitation during May was below normal in the western one-third and southeastern areas of Ohio, followed by above normal across most of the state during June. Precipitation during July was below normal throughout most of the state, but above normal in much of northeastern and east-central Ohio. Conditions varied greatly during August, but precipitation was much above normal across a large part of eastern Ohio. The water year ended with dry conditions across most of Ohio during September, but above normal in much of the northern third of the state.

**SUMMARY**

Precipitation for September was below normal across much of the state with only the Northwest and North Central regions having above normal precipitation. Streamflow was above normal except in central and north-central Ohio drainage basins. Reservoir storage decreased but remained above normal. Ground water levels declined and are above normal in most aquifers in eastern Ohio but below normal in western Ohio. Lake Erie level declined 0.20 foot and was 0.49 foot above the long-term September average.

Precipitation for the 2014 water year was above normal throughout most of the state with only the South Central Region being slightly below normal. Streamflow was above normal statewide. Surface water and ground water supplies were adequate throughout the water year.

**PRECIPITATION 2014 WATER 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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