



MONTHLY WATER INVENTORY REPORT FOR OHIO

September 2013

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

PRECIPITATION during September was below normal throughout most of the state, but above normal in the West Central and Southwest regions. The state average was 2.64 inches, 0.53 inch below normal. Regional averages ranged from 3.41 inches, 0.37 inch above normal, for the Southwest Region to 1.99 inches, 1.21 inches below normal, for the Southeast Region. Springfield North (Clark County) and Xenia (Greene County) reported the greatest amount of September precipitation, 4.68 inches. Zanesville (Muskingum County) reported the least amount, 1.28 inches.

Most of the precipitation fell during the middle of the month as the first ten days and last nine days of September were rather dry across most of the state. Widely scattered showers during the first two days of the month produced some heavy downpours across parts of eastern and southeastern Ohio, but the majority of the state received no rain at all. The first significant precipitation for the month at most locations occurred during September 11-13. Showers and thunderstorms crossed the state with some storms producing heavy downpours. Several areas, especially in the northern half of Ohio, received 0.5-1.0 inch of rain during this period; however, most other locations received less than 0.25 inch. The greatest and most widespread precipitation of the month occurred during September 19-21. Most areas of the state received at least 1 inch of rain from this system with more than 3 inches reported at some locations in southwestern Ohio. The remainder of the month was dry with just some light showers reported near the end of the month, mainly in western Ohio.

Precipitation for the 2013 calendar year is generally above normal in the northern and southeastern areas of the state, and below normal elsewhere. The state average is 31.14 inches, 0.72 inch above normal. Regional averages range from 33.35 inches, 5.24 inches above normal, for the North Central Region to 28.70 inches, 1.06 inches below normal, for the West Central Region.

Precipitation for the 2013 water year was above normal throughout most of the state, but below normal in the West Central and Southwest regions. The state average was 41.09 inches, 2.07 inches above normal. Regional averages ranged from 45.68 inches, 6.10 inches above normal, for the Northeast Region to 36.05 inches, 1.03 inches above normal, for the Northwest Region (see Precipitation table, departure from normal, past 12 months column). Dorset (Ashtabula County) reported the greatest amount of precipitation for the water year, 59.29 inches. Napoleon (Henry County) reported the least amount of precipitation for the water year, 31.54 inches. An isohyetal map and regional averages with percentages of normal for the 2013 water year appear on the last page of this report.

The 2013 water year started on a positive note as far as water supplies are concerned with above normal precipitation during October. However, November followed with noticeably below normal precipitation; this was the fourth driest

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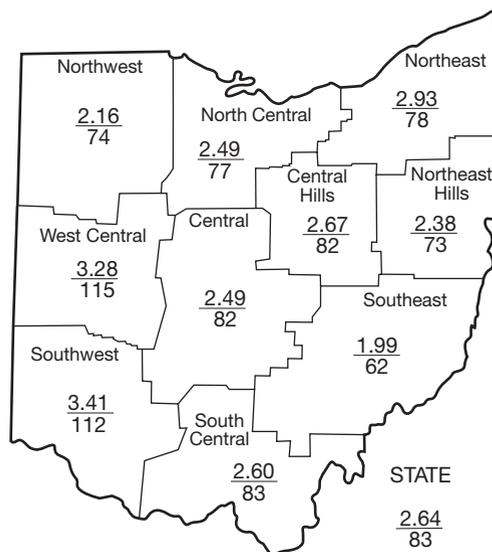
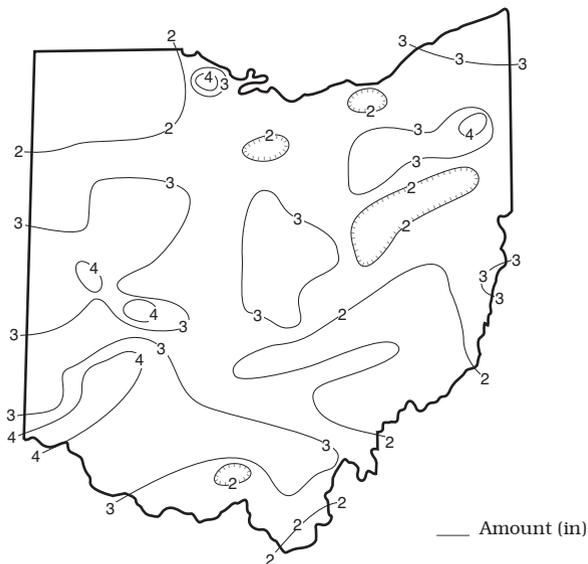
PRECIPITATION

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	-0.77	+0.53	+1.87	+1.03	+3.62	-0.6
North Central	-0.76	+3.96	+6.11	+7.84	+13.54	+2.3
Northeast	-0.82	+1.88	+3.90	+6.10	+10.18	+0.8
West Central	+0.42	-0.44	-0.92	-0.83	+1.53	-1.7
Central	-0.55	+1.19	+1.74	+1.80	+4.47	-1.0
Central Hills	-0.57	+0.98	+3.48	+3.51	+6.72	-1.0
Northeast Hills	-0.87	-0.10	+0.83	+0.55	+0.48	-2.4
Southwest	+0.37	-0.01	+0.02	-1.61	+0.07	-1.4
South Central	-0.53	+0.97	-0.78	+0.03	+1.17	-1.4
Southeast	-1.21	+3.01	+2.35	+2.25	+4.95	-0.5
State	-0.53	+1.19	+1.84	+2.07	+4.65	

*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	362	315	253	124	110
Great Miami River at Hamilton	3,630	756	86	101	95	100
Huron River at Milan	371	57	87	377	164	153
Killbuck Creek at Killbuck	464	124	114	224	132	107
Little Beaver Creek near East Liverpool	496	123	122	143	89	83
Maumee River at Waterville	6,330	388	44	128	120	97
Muskingum River at McConnelsville	7,422	1,953	104	191	106	88
Scioto River near Prospect	567	48	146	310	164	150
Scioto River at Higby	5,131	862	80	163	97	91
Stillwater River at Pleasant Hill	503	39	85	37	82	95

STREAMFLOW during September was above normal in the eastern half of the state and below normal in the western half. Flows during September were less than the flows reported during August.

Flows at the beginning of the month were above normal in eastern Ohio and below normal in western Ohio. Generally, streamflow declined during the first 10-12 days of the month and then increased following widespread precipitation that fell during September 11-13. Lowest flows were observed just prior to the arrival of this precipitation. Greatest flows for the month occurred following the September 19-21 precipitation throughout most of the state. Flows declined from these peaks during the remainder of the month and were below normal across most of Ohio at month's end.

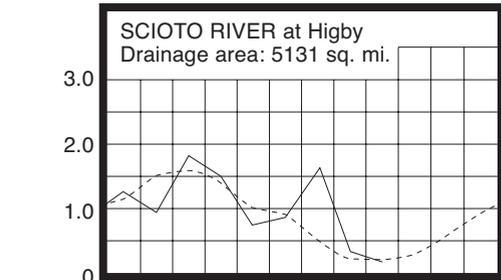
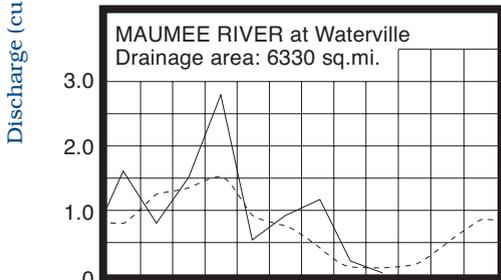
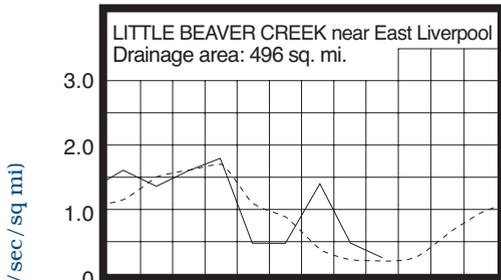
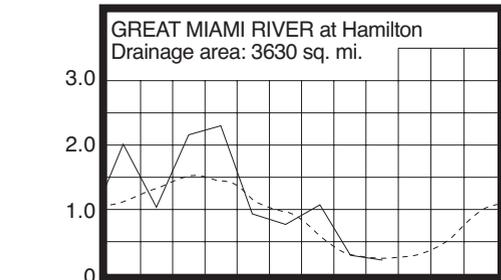
Streamflow for the 2013 water year was generally above normal in southwestern, central, north-central and northeastern Ohio basins, and below normal elsewhere (see Mean Stream Discharge table, past 12 months column). The first four months of the water year had above normal flows across most of the state. Minor flooding was observed in some areas of northwestern Ohio during January. Flows the next four months were mostly below normal as only April had above normal flows throughout most of the state. Minor flooding was reported in areas of southern Ohio during March and in northern Ohio during April with some moderate flooding observed in northwestern Ohio. Flows from June-August were generally above normal across most of the state. Locally heavy downpours during these months caused small stream and urban flooding locally, especially in July. Several gauges recorded near-record flows during July. September flows were above normal in eastern Ohio, but fell to below normal levels across most of the state by the end of the month.

RESERVOIR STORAGE for water supply during September declined seasonally in the Mahoning and Scioto river basins. Storage remained above normal in both basins.

Reservoir storage at the end of September in the Mahoning basin index reservoirs was 82 percent of rated capacity for water supply compared with 91 percent for last month and 57 percent for September 2012. Month-end storage in the Scioto basin index reservoirs was 90 percent of rated capacity for water supply compared with 94 percent for last month and 74 percent for September 2012.

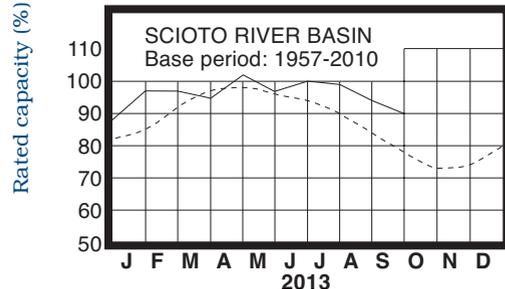
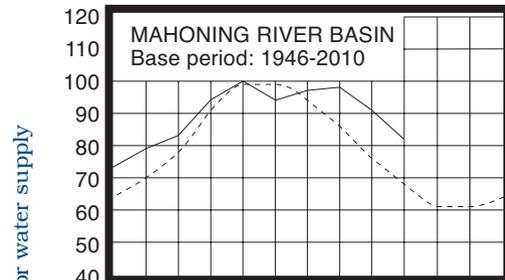
Surface water supplies were favorable during the 2013 water year as storage was near or above normal throughout the year. Above normal precipitation during the summer months resulted in ample streamflow and helped to reduce demand during this high water-use time of the year. As a result of the much above normal precipitation during July, many flood control and recreational reservoirs utilized available storage to minimize downstream flooding. Storage remains above normal at the end of the 2013 water year.

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

GROUND WATER levels during September declined in all aquifers throughout the state. Levels generally declined steadily throughout the month except for some temporary rises observed around mid-month in some aquifers. Net declines during September from last month's levels ranged from about normal to more than three times what is normally observed.

Precipitation during June and July was noticeably above normal this year throughout much of Ohio and as a result, ground water levels are higher than those observed last year across most of the state. Ground water levels are below normal in many areas of the state, but continue to be at above normal levels in many aquifers in northwestern, central and southeastern Ohio.

Ground water storage during the 2013 water year was adequate in most areas of Ohio; however, storage in southwestern and northeastern Ohio was below normal throughout most of the year. Noticeably below normal precipitation during November delayed the beginning of any significant recharge to ground water supplies across most of the state. Index observation well Fa-1 near Washington Court House (Fayette County) representing limestone aquifers in south-central and southwestern Ohio, reached a record low level for December and January. Below normal precipitation during the late winter and spring months resulted in ground water levels remaining below normal throughout most of the state; only some consolidated aquifers in northwestern Ohio had above normal levels during this period. Much above normal precipitation during June and July was beneficial for the state's ground water supplies. By the end of August, storage in most aquifers in Ohio had improved to near or above normal levels. However, by the end of September, storage across much of the state was at below normal levels, but remained above normal in aquifers in northwestern, central and southeastern Ohio.

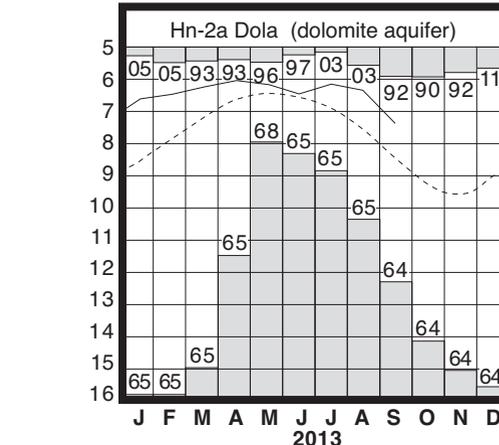
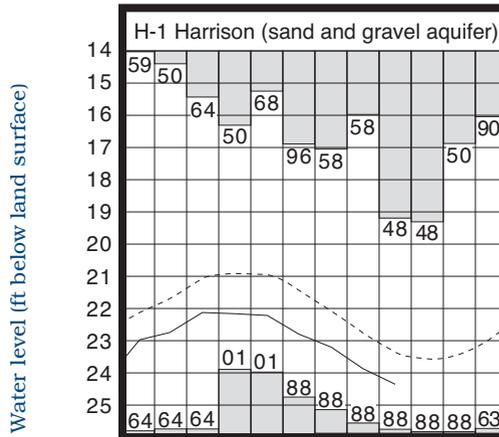
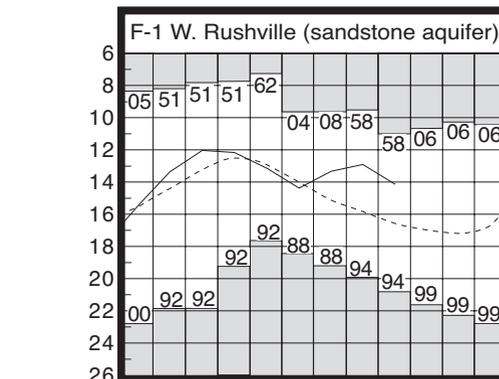
LAKE ERIE level declined during September. The mean level was 571.39 feet (IGLD-1985), which is normal and 0.39 foot lower than last month's mean level. This month's mean level is 0.69 foot above the September 2012 level and 2.19 feet above Low Water Datum.

The U.S. Army Corps of Engineers (USACE) reports that precipitation in the Lake Erie basin during September averaged 2.98 inches, 0.21 inch below normal. For the entire Great Lakes basin, September precipitation averaged 2.78 inches, 0.63 inch below normal. For calendar year 2013 through September, the Lake Erie basin has averaged 29.29 inches of precipitation, 2.17 inches above normal, while the entire Great Lakes basin has averaged 26.90 inches, 2.24 inches above normal.

Lake Erie's level was below normal during the first nine months of the 2013 water year. Following the above normal precipitation that fell across the Great Lakes basin in June and July, the level of Lake Erie rose to above normal during July and remained above normal during August. Lake Erie level declined during September and was at the long-term seasonal average. The USACE reports that based on the current condition of the Great Lakes basin and anticipated weather conditions, the level of Lake Erie should range from near-normal to about 3 inches below 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 as much as 14 inches below the normal seasonal level.

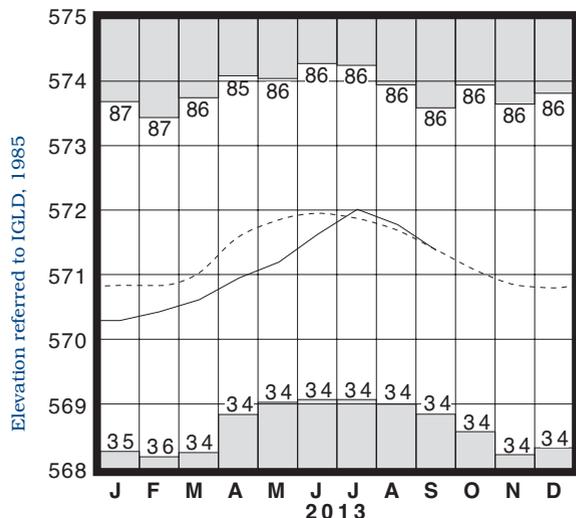
Index Well	Location	Aquifer	Mean This Month	Departure From Normal	Change in feet from:	
					Last Month	Year Ago
F-1	W. Rushville, Fairfield Co.	Sandstone	14.13	+2.36	-1.23	+2.96
Fa-1	Jasper Mill, Fayette Co.	Limestone	10.78	-1.77	-1.19	+1.64
Fr-10	Columbus, Franklin Co.	Gravel	44.25	+0.52	-0.77	+0.93
H-1	Harrison, Hamilton Co.	Gravel	24.33	-0.98	-0.45	-0.02
Hn-2a	Dola, Hardin Co.	Dolomite	7.39	+1.07	-1.06	+2.84
Po-124	Freedom, Portage Co.	Sandstone	76.96	-0.09	-0.26	+0.11
Tu-1	Strasburg, Tuscarawas Co.	Gravel	14.38	-0.51	-1.11	+1.44

GROUND-WATER LEVELS



Base periods: F-1, 1947-2010; H-1 1951-2010.
Hn-2a, 1955-2010

LAKE ERIE LEVELS



Base period: 1918-2010

■ Record high and low, year of occurrence

Normal - - - - Current ———

(Precipitation continued from front)

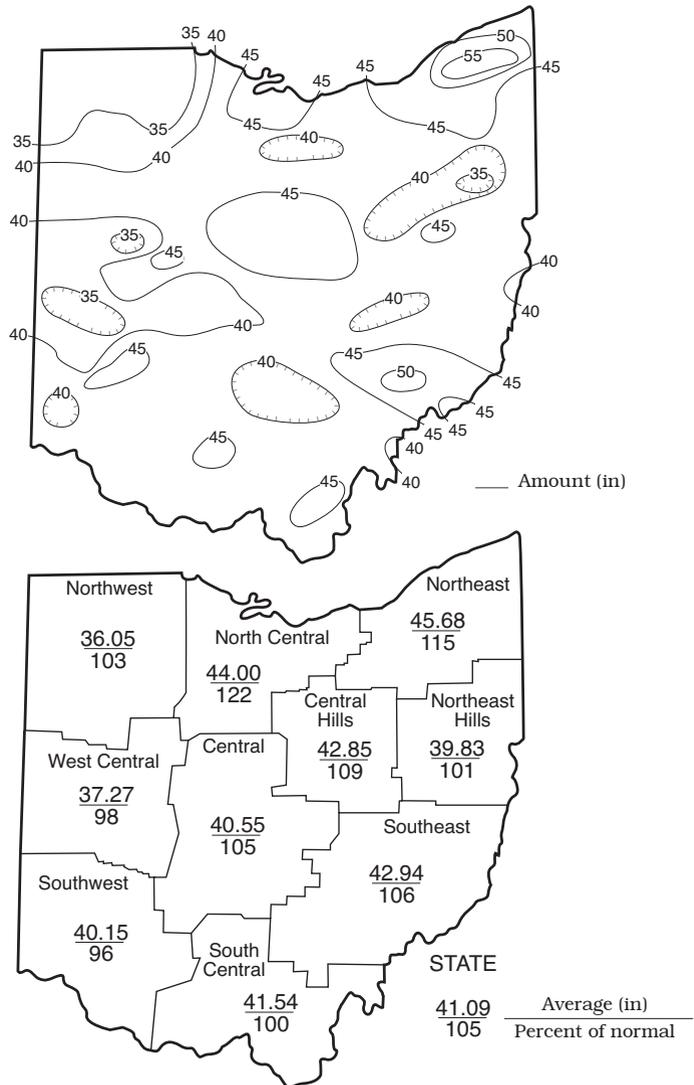
November for the state during the past 130 years. Precipitation was above normal throughout most of Ohio during December and in the western half of the state during January. Below normal precipitation during three of the next four months reduced the rate of recharge to the state's water supplies; only April had above normal precipitation in the northern two-thirds of Ohio. Above normal precipitation across most of the state during June and July greatly benefitted water supplies and resulted in a satisfactory growing season for farmers in most areas of Ohio. This was the wettest June of record for the Northeast Region, and the fourth wettest July for the state during the past 131 years, including the wettest for the North Central Region. Precipitation during the last two months of the water year was below normal throughout most of Ohio.

SUMMARY

Precipitation during September was below normal across most of the state. Streamflow was above normal in eastern Ohio and below normal in western Ohio. Reservoir storage declined but remained above normal in both the Mahoning and Scioto river basins. Ground water levels declined in aquifers throughout the state. Lake Erie level declined 0.39 foot and was at the long-term September average.

Precipitation for the 2013 water year was above normal across most of the state; only the Southwest and West Central regions had below normal precipitation. Streamflow was generally above normal in southwestern, central, north-central and northeastern Ohio basins. Reservoir storage was near or above normal levels during the water year. Lake Erie level was below normal the first nine months of the water year, above normal during July and August, and at the normal seasonal average during September.

PRECIPITATION 2013 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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