



# MONTHLY WATER INVENTORY REPORT FOR OHIO

September 2011

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

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**PRECIPITATION** during September was above normal throughout nearly the entire state. The state average was 6.03 inches, 3.08 inches above normal. This was the second wettest September during the past 129 years for the state as a whole. Regional averages ranged from 7.60 inches, 4.87 inches above normal, for the West Central Region to 4.85 inches, 1.89 inches above normal, for the Northeast Hills Region. This September ranked in the top 10 wettest of record for seven of the state's 10 climatic regions, including the second wettest for the West Central Region. Dayton International Airport (Montgomery County) reported the greatest amount of September precipitation, 10.84 inches. Laurelville (Hocking County) reported the least amount, 2.72 inches.

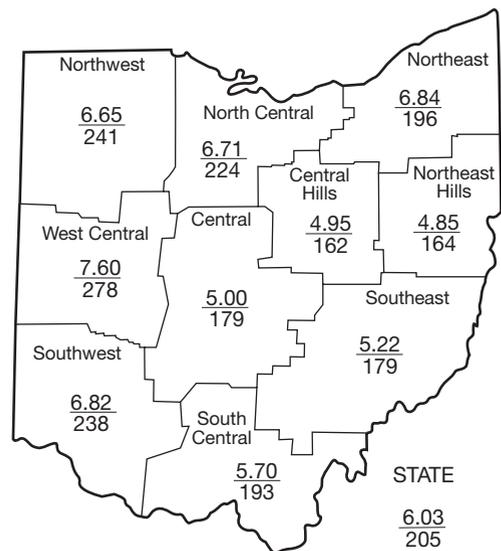
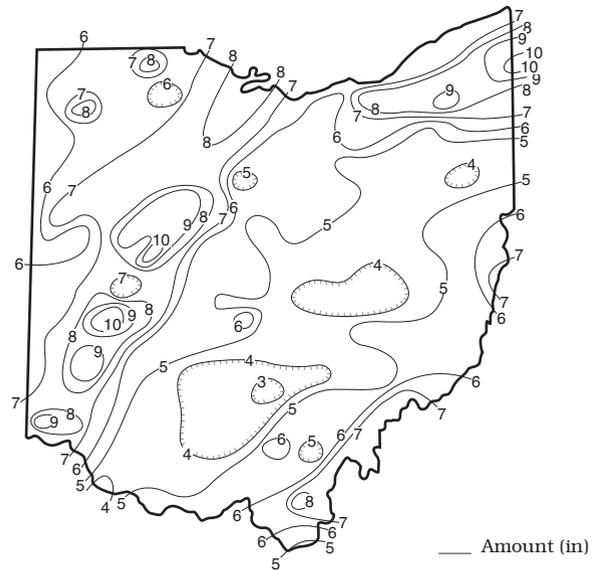
Precipitation during September fell as showers and thunderstorms. Locally severe storms during September 3-4 produced 1-3 inches of precipitation across much of western Ohio and 0.50-1.0 inch elsewhere. These storms were closely followed by the remnants of Tropical Storm Lee. The heaviest rain from this storm fell across southeastern Ohio with amounts greater than 2 inches reported across much of this area. Isolated showers and thunderstorms fell during the September 9-15 period, with most of the state reporting 0.50-1.0 inch of precipitation and a few areas reporting more than 2 inches. Precipitation during September 19-21 was widespread with most of Ohio receiving another 0.50-1.0 inch. Most areas of the state received at least 1 inch of rain during the last week of the month. The heaviest rain during this period occurred on September 25-26 as storms produced 1-3 inches of rain across the western half of the state, with several locations receiving in excess of 4 inches. Some localized flooding was observed following this precipitation.

Precipitation for the 2011 calendar year is above normal statewide. The average for the state is 42.45 inches, 12.64 inches above normal. Regional averages range from 46.74 inches, 14.53 inches above normal, for the South Central Region to 38.45 inches, 11.76 inches above normal, for the Northwest Region.

Precipitation for the 2011 water year (October 1, 2010 to September 30, 2011) was noticeably above normal statewide. The average for the state was 50.68 inches, 12.66 inches above normal. This ranks the 2011 water year as the wettest during the past 129 years of records, surpassing the previous record of 49.80 inches set during the 1890 water year. Regional averages ranged from 56.62 inches, 18.11 inches above normal, for the Northeast Region to 44.49 inches, 10.21 inches above normal, for the Northwest Region (see precipitation table, departure from normal, past 12 months column). Cheviot (Hamilton County) reported the greatest amount of precipitation for the water year, 67.50 inches. Hicksville (Defiance County) reported the least amount, 37.53 inches. An isohyetal map and regional averages with percentages of normal precipitation for the 2011 water year appear on the last page of this report.

(Continued on back)

## PRECIPITATION SEPTEMBER



## PRECIPITATION

Region	DEPARTURE FROM NORMAL (IN.) Base period 1951-2000					Palmer Drought Severity Index*
	This Month	Past				
		3 Mos.	6 Mos.	12 Mos.	24 Mos.	
Northwest	+3.89	+4.13	+10.00	+10.21	+11.39	+2.7
North Central	+3.71	+6.02	+11.87	+15.27	+15.18	+4.7
Northeast	+3.35	+5.48	+12.34	+18.11	+17.01	+4.2
West Central	+4.87	+3.11	+9.28	+12.50	+11.43	+2.5
Central	+2.21	+3.30	+9.56	+11.58	+11.17	+1.9
Central Hills	+1.89	+2.59	+6.85	+9.66	+8.63	+1.1
Northeast Hills	+1.89	+2.92	+8.16	+11.37	+9.42	+0.1
Southwest	+3.95	+1.72	+11.29	+12.09	+8.15	+1.0
South Central	+2.75	+2.33	+12.45	+14.22	+16.93	+1.0
Southeast	+2.31	+2.55	+8.83	+11.41	+10.27	+1.3
State	+3.08	+3.41	+10.07	+12.66	+11.99	

\*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	1,114	637	186	192	147
Great Miami River at Hamilton	3,630	2,234	230	86	222	164
Huron River at Milan	371	148	324	77	218	181
Killbuck Creek at Killbuck	464	163	146	84	157	133
Little Beaver Creek near East Liverpool	496	224	196	72	157	130
Maumee River at Waterville	6,330	3,004	389	75	180	125
Muskingum River at McConnelsville	7,422	2,516	103	142	232	112
Scioto River near Prospect	567	893	2,938	301	260	187
Scioto River at Higby	5,131	2,017	151	125	218	154
Stillwater River at Pleasant Hill	503	86	141	32	188	144

**STREAMFLOW** during September was above normal throughout the state. Flows were high enough to be considered excessive across much of Ohio. September flows were greater than the August flows across most of the state, but less in basins in southeastern Ohio. Preliminary data indicates that flows for several of the gauging stations used in this report ranked in the top ten greatest for September, including the 3rd greatest for the Scioto River near Prospect and the 5th greatest for the Grand River near Painesville.

Flows at the beginning of the month were below normal across much of the state, but above normal in northwestern, northeastern and central Ohio. Most basins recorded their lowest flows for September during the first week of the month. Streamflow increased statewide following precipitation from a cold front and the remnants

of Tropical Storm Lee that fell during the end of the first week and second week. After peaking, flows declined steadily during the next week or so. Flows increased rapidly during the last week of the month following widespread precipitation on September 25 and 26. Most drainage basins in Ohio had their greatest flows for the month following this rain. Streamflow at the end of the month was above normal throughout the state.

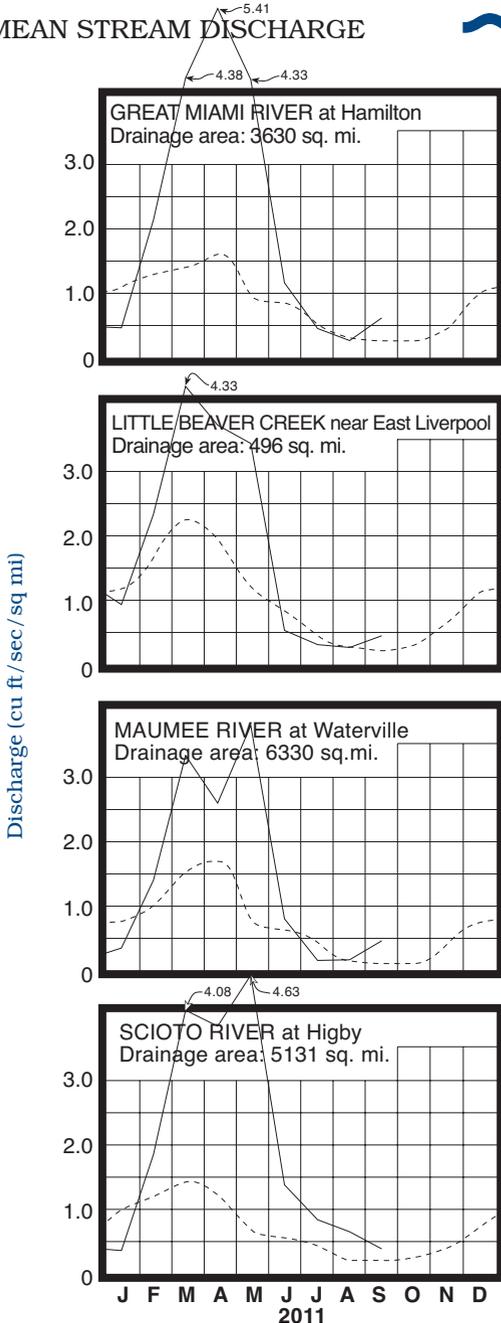
Streamflow was above normal throughout Ohio during the 2011 water year (see Mean Stream Discharge table, percent of normal, past 12 months column). Flows were below normal during the fall and early winter months and were low enough to be considered deficient across much of the state. Beginning in February and continuing through June, flows were above normal statewide. Many flows during this period were high enough to be considered excessive. Record or near-record monthly flows were recorded at several gauging stations during March, April and May. Flows during July and August were generally below normal across western Ohio, but flows were above normal statewide during September. Several occurrences of local flooding were observed during the past eight months. The most notable flooding occurred during February, March, April, May and September.

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

Reservoir storage at the end of September in the Mahoning basin index reservoirs was 79 percent of rated capacity for water supply compared with 80 percent for last month and 77 percent for September 2010. 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 78 percent for September 2010.

Surface water supplies were adequate throughout the 2011 water year. Storage was above normal the entire water year in the Mahoning River basin. Storage at the beginning of the water year was below normal in the Scioto basin reservoirs. Storage in the Scioto basin reservoirs recovered to above normal levels during February and remained above normal during most of the remainder of the water year.

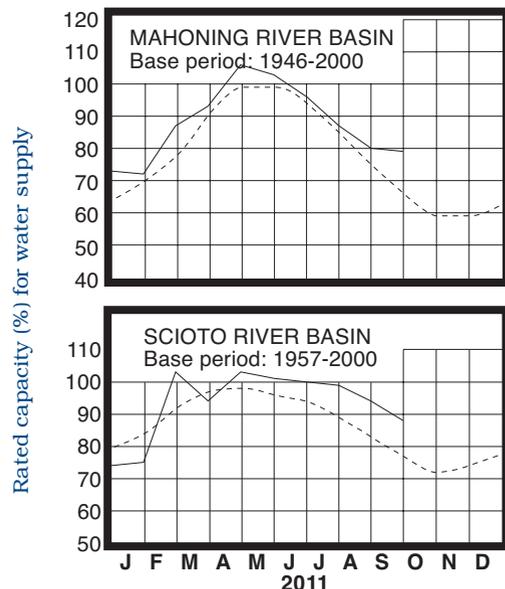
## MEAN STREAM DISCHARGE



Base period for all streams: 1971-2000

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 in most aquifers across the state. Net declines during the month were about what is usually observed for September. Levels in some aquifers declined steadily throughout the month; however, levels in many aquifers rose during the last week of September in response to recharge from locally heavy precipitation.

Ground water levels are above normal in many areas of the state, but continue to remain at below normal levels in aquifers in southwestern Ohio. Current levels are higher than they were a year ago in nearly all aquifers. The above normal precipitation during September has improved soil moisture conditions throughout the state. The Ohio Agricultural Statistics Service reports that near the end of September, soil moisture was rated as being short in 1 percent of the state, adequate in 53 percent of the state and surplus in 46 percent of the state.

Ground water supplies during the 2011 water year were adequate throughout Ohio. Ground water levels at the beginning of the water year were below normal throughout most of the state. The recharge season got off to a slow start as precipitation was below normal during three of the first four months. However, the above normal precipitation from February-May was beneficial for ground water supplies. By early summer, ground water levels across most of the state had improved to above normal levels. Ample precipitation during the summer months reduced demand across most of the state. However, much of west-central and southwestern Ohio received below normal precipitation during July and August, and ground water levels returned to below normal levels in that part of the state. Above normal precipitation during September has been beneficial for ground water supplies across the state, and at the end of the 2011 water year, ground water storage is above last year's levels throughout nearly all of Ohio.

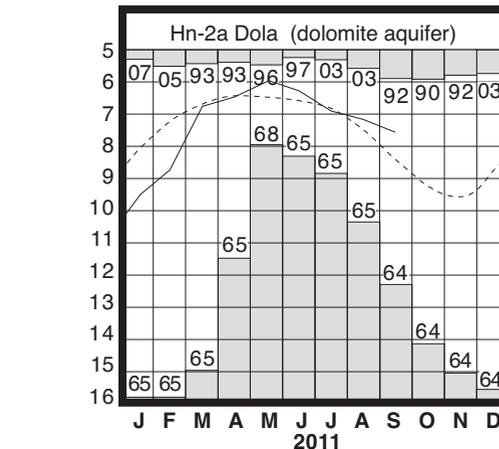
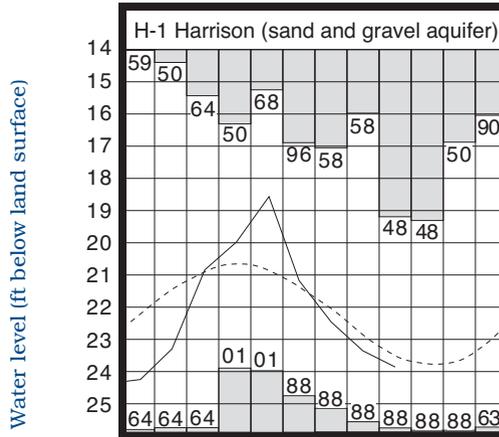
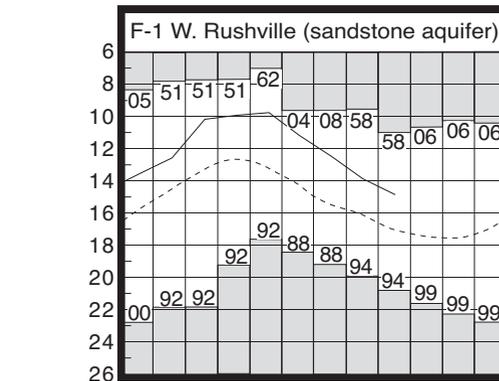
**LAKE ERIE** level declined during September. The mean level was 571.85 feet (IGLD-1985), 0.26 foot lower than last month's mean level and 0.43 foot above normal. This month's mean level is 0.92 foot above the September 2010 level and 2.65 feet above Low Water Datum.

The U.S. Army Corps of Engineers (USACE) reports that precipitation in the Lake Erie basin during September averaged 6.00 inches, 2.80 inches above normal. For the entire Great Lakes basin, September precipitation averaged 3.82 inches, 0.41 inch above normal.

Lake Erie was below normal during the first seven months of the 2011 water year. The level rose sharply during the March-June period in response to above normal precipitation over the Lake Erie basin. As a result the Lake Erie level rose to above normal during May. The lake level declined seasonally from July through September, but remained above normal throughout the last five months of the 2011 water year. The USACE predicts that, based on the current condition of the Great Lakes basin and anticipated weather conditions, 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 around 10 inches above to around 10 inches below the normal seasonal average.

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	14.87	+2.09	-0.99	-0.99
Fa-1	Jasper Mill, Fayette Co.	Limestone	9.47	-0.70	-0.43	+1.35
Fr-10	Columbus, Franklin Co.	Gravel	44.03	+0.26	-0.44	+1.31
H-1	Harrison, Hamilton Co.	Gravel	23.86	-0.36	-0.51	+0.36
Hn-2a	Dola, Hardin Co.	Dolomite	7.57	+0.83	-0.40	+1.44
Po-124	Freedom, Portage Co.	Sandstone	77.00	+1.17	-0.23	+0.15
Tu-1	Strasburg, Tuscarawas Co.	Gravel	14.71	-0.91	-0.47	+0.37

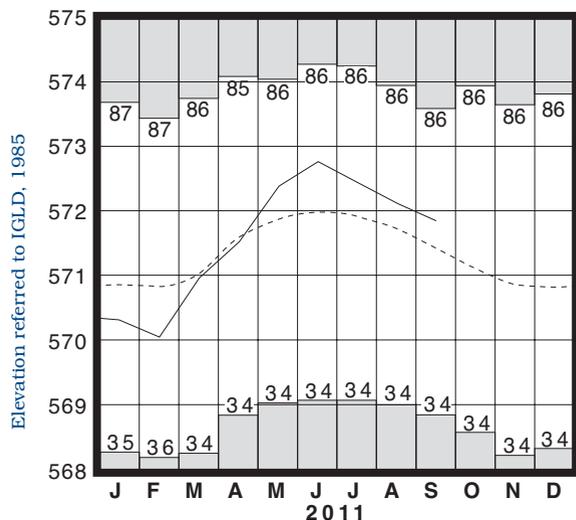
## GROUND-WATER LEVELS



Base periods: F-1, 1947-2000 H-1, 1951-2000.

Hn-2a, 1955-2000 ■ Record high and low, year of occurrence

## LAKE ERIE LEVELS



Base period: 1918-2000

■ Record high and low, year of occurrence

(Precipitation continued from front)

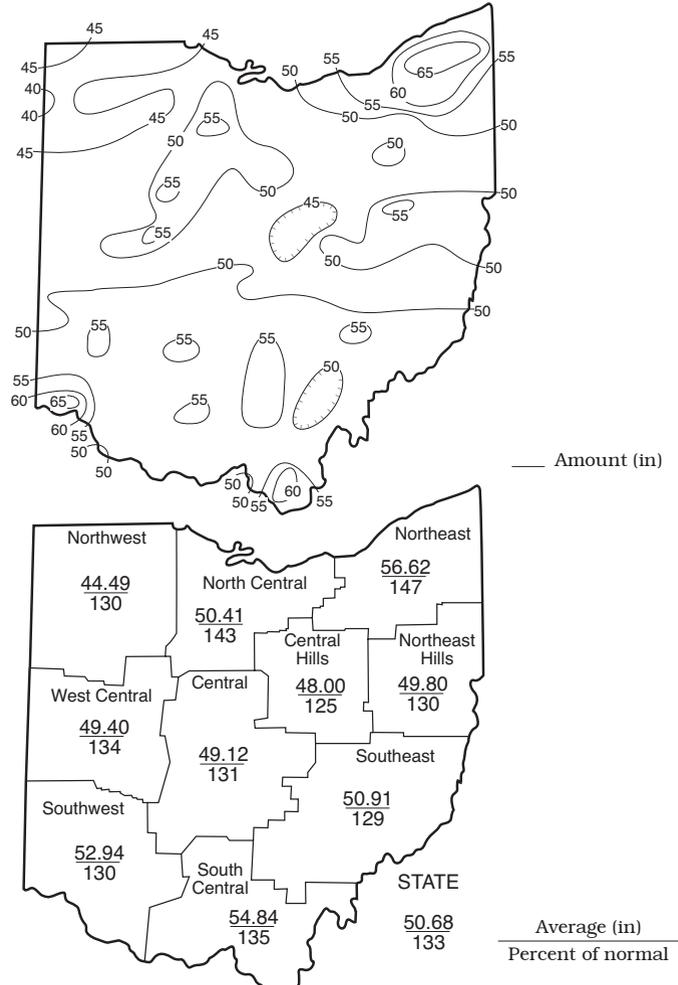
Precipitation for the 2011 water year was generally below normal during the first four months and above normal the last eight months. The water year began with below normal precipitation during October, followed by above normal during November. December's and January's precipitation was below normal. Precipitation during February-May was above normal with noticeably above normal amounts during February and April. This was the wettest April during the past 129 years for the state as a whole. June precipitation was above normal across the southeastern half of the state, while precipitation varied greatly during July and August. Generally, precipitation was below normal across much of the state during July and above normal across much of the state during August. The water year ended with noticeably above normal precipitation during September throughout most of Ohio. The above normal precipitation during the 2011 water year has been beneficial for water supplies.

**SUMMARY**

Precipitation during September was above normal throughout most of the state. Streamflow was above normal statewide and high enough to be considered excessive across much of Ohio. Reservoir storage decreased but remained above normal. Ground water levels declined seasonally statewide. Lake Erie level declined 0.26 foot and was 0.43 foot above the long-term September average.

The 2011 water year was favorable for water supplies across the state. Precipitation was above normal statewide. Streamflow was above normal during the last eight months of the water year and were at record or near-record monthly flows at several gauging stations during March, April, May and September. At the end of the water year, reservoir storage was above normal and ground water levels were above normal throughout much of the state. Lake Erie level was below normal the first seven months and above normal the last five months of the 2011 water year.

**PRECIPITATION 2011 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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