



# MONTHLY WATER INVENTORY REPORT FOR OHIO

October 2003

<http://www.dnr.state.oh.us/water/pubs/newsltrs/mwirmain.html>

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**PRECIPITATION** during October was above normal across most of the state, but below normal in much of central, northwestern and southwestern Ohio. The average for the state as a whole was 2.61 inches, 0.14 inch above normal. Regional averages ranged from 3.04 inches, 0.06 inch above normal, for the Northeast Region to 1.95 inches, 0.34 inch below normal, for the Central Region. Marietta State Nursery (Washington County) reported the greatest amount of October precipitation, 4.76 inches. The Wilmington National Weather Service Office (Clinton County) reported the least amount, 0.99 inch.

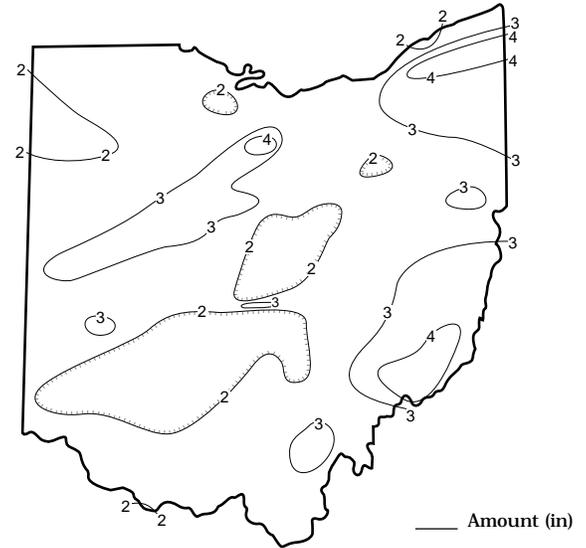
Precipitation during October fell mainly as rain with just a few snow showers reported in northeastern Ohio. Showers during October 3-4 produced 0.25-0.50 inch of rain in the northern half of the state and less than 0.25 inch elsewhere. Widespread precipitation during October 14 generally brought 1-2 inches of rain to much of western and eastern Ohio and 0.5-1.0 inch in central Ohio. Unsettled weather during October 25-28 resulted in 0.5-1.0 inch of rain across much of the state with up to 2 inches falling in scattered areas, especially in eastern Ohio. The heaviest of these rains fell during October 25-26.

Precipitation for the 2003 calendar year is above normal statewide. The average for the state as a whole is 40.59 inches, 8.31 inches above normal. Regional averages range from 44.29 inches, 9.64 inches above normal, for the South Central Region to 35.33 inches, 5.56 inches above normal, for the North Central Region.

The 2004 water year (October 1, 2003 to September 30, 2004) is off to a good start across much of the state as far as precipitation is concerned. Near normal precipitation during the next several months should bode well for continued improvement in ground water storage during the upcoming recharge season.

Correction: The 112 percent of normal precipitation for the state as shown on the Total Precipitation 2003 Water Year map on the last page of the September 2003 issue of this report was incorrect. The correct percent of normal precipitation should be 122.

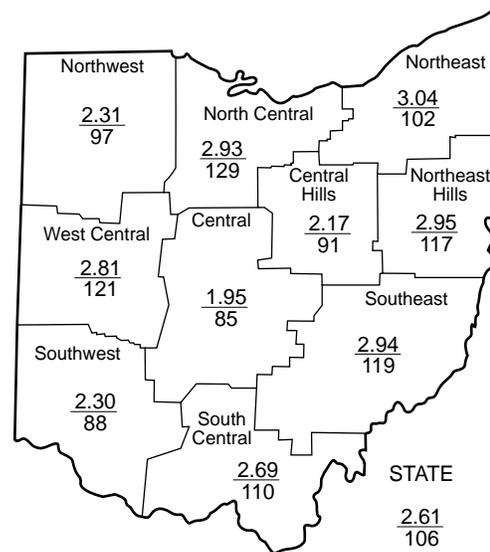
## PRECIPITATION OCTOBER



## 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	-0.06	+4.02	+9.47	+6.98	+2.80	+3.7
North Central	+0.66	+2.93	+7.72	+5.79	+4.94	+3.3
Northeast	+0.06	+2.69	+11.50	+10.34	+8.41	+5.4
West Central	+0.48	+6.73	+13.90	+12.69	+12.29	+4.3
Central	-0.34	+5.58	+9.04	+6.50	+8.22	+3.5
Central Hills	-0.22	+4.93	+9.07	+6.17	+5.36	+3.4
Northeast Hills	+0.42	+5.97	+12.11	+9.19	+7.16	+4.3
Southwest	-0.32	+3.88	+9.19	+6.10	+11.37	+3.7
South Central	+0.25	+4.66	+11.28	+9.74	+13.60	+3.8
Southeast	+0.47	+5.57	+11.12	+8.67	+10.90	+3.6
State	+0.14	+4.69	+10.43	+8.20	+8.47	+3.6

\*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

River and Location	Drainage Area (Sq. Mi.)	This Month			% of Normal Past		
		Mean Discharge (CFS)	% of Normal	3 Mos.	6 Mos.	12 Mos.	
Grand River near Painesville	685	1,022	426	196	219	133	
Great Miami River at Hamilton	3,630	3,421	355	349	244	146	
Huron River at Milan	371	282	664	209	186	153	
Killbuck Creek at Killbuck	464	548	409	319	224	118	
Little Beaver Creek near East Liverpool	496	634	401	484	285	125	
Maumee River at Waterville	6,330	3,850	497	365	285	128	
Muskingum River at McConnelville	7,422	7,288	287	554	297	94	
Scioto River near Prospect	567	569	2,092	582	305	126	
Scioto River at Higby	5,131	4,525	357	312	199	126	
Stillwater River at Pleasant Hill	503	534	850	477	256	124	

**STREAMFLOW** during October was noticeably above normal statewide. Flows were high enough to be considered excessive across most of the state. Flows during October decreased from the September flows across most of Ohio.

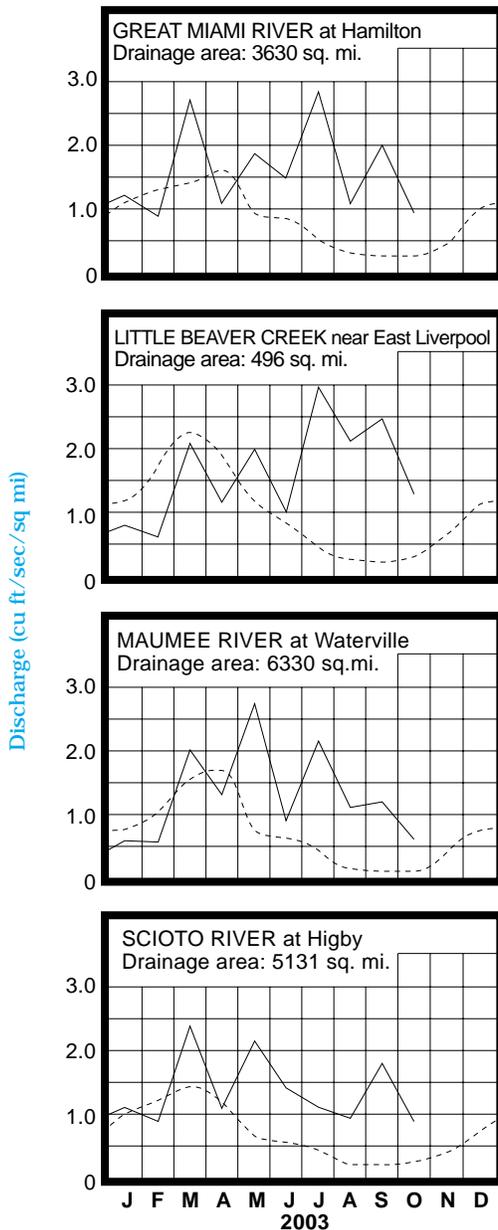
Flows were above normal at the beginning of the month statewide. Greatest flows for the month for most of the eastern half of the state occurred at the beginning of October. After peaking, flows declined during the next 10-14 days as drier conditions prevailed during this period. Low flows for the month were recorded during October 11-14. Flows increased around mid-month in response to widespread precipitation that fell on October 14. As a result, greatest flows for the month across most of western Ohio occurred during

October 15-17. Flows declined for about the next 10 days before increasing during the last few days of the month in response to precipitation that fell predominately on October 25-26. Greatest flows for the month occurred in central Ohio following these rains. Although declining at the end of the month, streamflow remained above normal statewide.

**RESERVOIR STORAGE** during October decreased in both the Mahoning and Scioto river basins, but remained above normal in both basins.

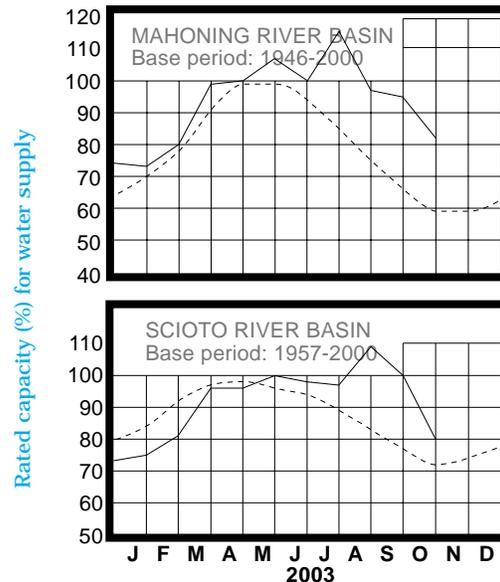
Reservoir storage at the end of October in the Mahoning basin index reservoirs was 82 percent of rated capacity for water supply compared with 95 percent for last month and 65 percent for October 2002. Month-end storage in the Scioto basin index reservoirs was 80 percent of rated capacity for water supply compared with 100 percent for last month and 72 percent for October 2002.

### MEAN STREAM DISCHARGE



Base period for all streams: 1971-2000

### 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 October remained relatively stable or rose slightly across much of Ohio, a month in which levels normally decline statewide. Generally, levels declined throughout the state during the first half of the month, then rose around mid-month and again during the last week of October, responding to the precipitation that fell during those periods.

Ground water storage continues to benefit from the above normal precipitation of the past few months. Levels are above normal in most aquifers across the state and are higher than they were at this time last year. Near normal precipitation and other favorable climatic conditions during the next several months increases the prospects for a favorable recharge season. The above normal precipitation has also elevated soil moisture across the state, a condition that also bodes well for continued improvement in ground water storage. The Ohio Agricultural Statistics Services reports that at the end of October, soil moisture was rated as being short in 1 percent of the state, adequate in 76 percent of the state and surplus in 23 percent of the state.

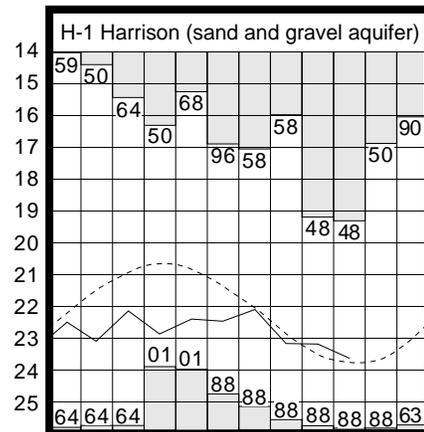
**LAKE ERIE** level declined during October. The mean level was 570.64 feet (IGLD-1985), 0.39 foot lower than last month's mean level and 0.46 foot below normal. This month's mean level is 0.09 foot lower than the October 2002 level and 1.44 feet above Low Water Datum.

The U.S. Army Corps of Engineers (USACE) reports that precipitation in the Lake Erie basin during October averaged 3.05 inches, which is 0.30 inch above normal. For October, the entire Great Lakes basin averaged 2.65 inches, which is 0.18 inch below normal. For calendar year 2003 through October, the Lake Erie basin has averaged 31.13 inches of precipitation, 1.60 inches above normal, while the entire Great Lakes basin has averaged 27.04 inches, 0.24 inch below normal.

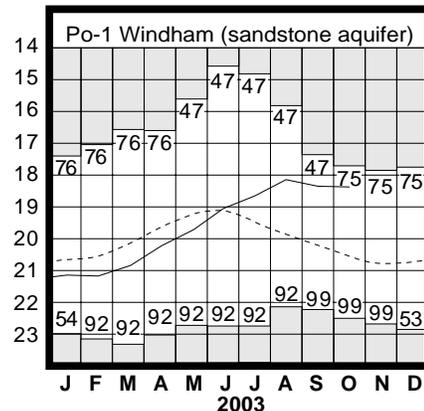
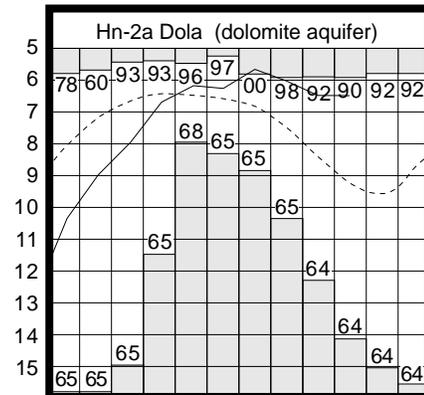
In addition, the USACE predicts that based on the current condition of the Great Lakes basin and anticipated weather conditions, the level of Lake Erie should range between 6-9 inches below the long-term seasonal average for the foreseeable future. Deviations from the anticipated weather patterns could result in the level of Lake Erie ranging from near normal to as much as 21 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	14.01	+3.43	+0.46	+4.51
Fa-1	Jasper Mill, Fayette Co.	Limestone	8.11	+0.97	+0.17	+3.69
Fr-10	Columbus, Franklin Co.	Gravel	45.78	-1.55	+0.14	+0.62
H-1	Harrison, Hamilton Co.	Gravel	23.63	+0.13	-0.44	+0.57
Hn-2a	Dola, Hardin Co.	Dolomite	6.49	+2.74	-0.01	+5.96
Po-1	Windham, Portage Co.	Sandstone	18.38	+2.17	-0.03	+2.33
Tu-1	Strasburg, Tuscarawas Co.	Gravel	11.40	+2.56	+0.14	+4.84

## GROUND-WATER LEVELS

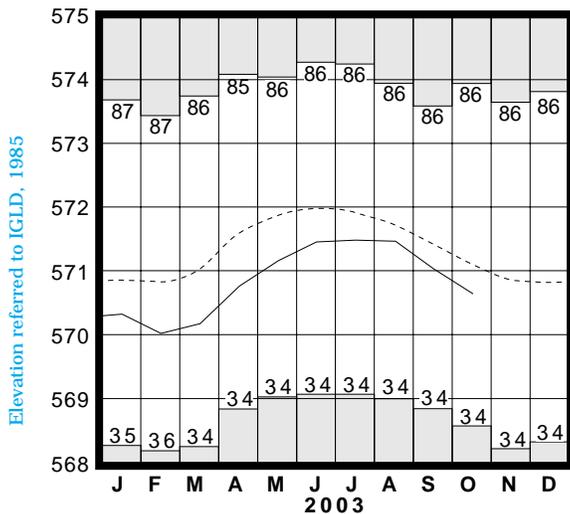


Water level (ft below land surface)



Base periods: H-1, 1951-2000. Hn-2a, 1955-2000.  
Po-1, 1947-2000 □ Record high and low, year of occurrence

## LAKE ERIE LEVELS



## SUMMARY

Precipitation during October was above normal across most of the state, but below normal in much of central, northwestern and southwestern Ohio. Streamflow was above normal statewide. Reservoir storage decreased in both the Mahoning and Scioto river basins, but remained above normal. Ground water levels were relatively stable or rose slightly and were above normal across most of the state. Lake Erie level declined 0.39 foot and was 0.46 foot below the long-term October average.

## NOTES AND COMMENTS

### New Publications

The Ohio Department of Natural Resources (ODNR), Division of Water, announces the availability of the following new publication:

### **Ohio's Water Withdrawal Facility Registration Program: 2002** *Compiled by Jason Remich and Frank Fugitt*

This four-page report depicts on a statewide basis the amount of water withdrawn by registered facilities during 2002. Also, it details on a county basis the water withdrawals for each of 5 categories. Those categories are: power, public water supply, industrial, agriculture/irrigation (includes golf courses) and miscellaneous.

Owners of all facilities (surface and/or ground water sources) with the capacity to withdraw 100,000 gallons of water or more per day are required pursuant to Section 1521.16 of the Ohio Revised Code to register their facilities with the ODNR Division of Water and to submit annual reports listing actual withdrawals. Copies of the 2002 annual withdrawal report are available from the ODNR Division of Water, 1939 Fountain Square, Building E-1, Columbus, Ohio, 43224, phone (614) 265-6744. This report is also available in a Portable Document Format (PDF) through the Division of Water's web page at: <http://www.dnr.state.oh.us/water/waterinv/wwfrprog/wwfrprog.default.html>.

The Water Resources Division of the U.S. Geological Survey (USGS) announces the availability of the following new report:

### **Techniques for Estimating Flood-Peak Discharges of Rural, Unregulated Streams in Ohio, Second Edition** (U.S. Geological Survey Water-Resources Investigations Report 03-4164)

*By Greg F. Koltun*

This report, prepared in cooperation with the Ohio Department of Transportation and the U.S. Department of Transportation, Federal Highway Administration, provides equations for estimating flood-peak discharges at ungaged sites on rural, unregulated streams in Ohio. This data can be used in the design of bridges, culverts, dams and spillways to help ensure that those structures contain or convey design flow conditions without failure or unnecessary flooding. Flood-frequency data are also used in flood-insurance studies to determine the altitude and boundaries of the water surface associated with prescribed peak-flow conditions.

The most recent report presenting flood-frequency data and estimation techniques relating to Ohio streams was published in 1990 (Koltun and Roberts). This new report includes an additional 10 years of peak-flow data and locations which flood-frequency characteristics had not been previously determined.

Copies of this new report are available from the USGS, Water Resources Division, 6480 Doubletree Avenue, Columbus Ohio, 43229 or call Mike Eberle at (614) 430-7718. You may also view an abstract of the report or download the report as a PDF file by visiting the USGS web page at: <http://oh.water.usgs.gov/reports/abstract.html>.

### **Long Time ODNR Employee Retires**

Ella Hardman, an Administrative Assistant with the Division of Water, Water Management Section, retired October 31, 2003 after more than 14 years of service to ODNR. Ella began her ODNR career at the Division of Parks and Recreation in 1989. She transferred to the Division of Natural Areas and Preserves in 1991 and came to the Division of Water in 1993. Ella, who worked in the Floodplain Management Program, was a dedicated employee whose work ethic and influence is still felt, though her presence is greatly missed by all her ODNR family.

## ACKNOWLEDGMENTS

This report has been compiled from Division of Water 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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