



# MONTHLY WATER INVENTORY REPORT FOR OHIO

October 2001

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

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Hydrologists  
Water Inventory Unit

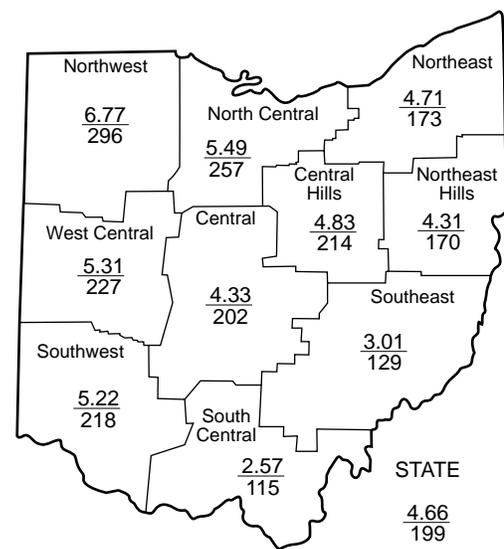
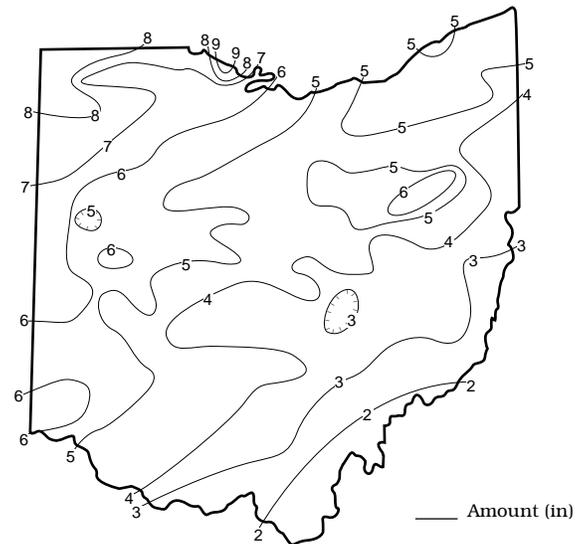
**PRECIPITATION** during October was notably above normal statewide except in the counties adjacent to the Ohio River in southeastern Ohio where it was below normal. The state average was 4.66 inches, 2.32 inches above normal. For the state as a whole, this was the 9<sup>th</sup> wettest October during the past 119 years. Regional averages ranged from 6.77 inches, 4.48 inches above normal, for the Northwest Region to 2.57 inches, 0.33 inch above normal, for the South Central Region. This ranked as the wettest October of record for the Northwest Region and the 2<sup>nd</sup> wettest for the North Central Region. Other regions which ranked among their wettest October of record include: West Central and Southwest, 5<sup>th</sup> wettest; Central Hills, 8<sup>th</sup> wettest; Central, 12<sup>th</sup> wettest; Northeast, 13<sup>th</sup> wettest; Northeast Hills, 17<sup>th</sup> wettest. Crane Creek State Park (Ottawa County) reported the greatest amount of October precipitation, 9.12 inches. Gallipolis Lock and Dam (Gallia County) reported the least amount, 1.15 inches.

Precipitation during October fell in an atypical pattern being greatest in northwestern Ohio and decreasing in amount to the south and east. The first rain of the month fell around October 5-6 with storm totals of 0.25-0.50 inch common in central and southeastern Ohio and generally 0.50-1.0 inch reported elsewhere. Several quick moving weather systems impacted the state during October 12-16. Soaking rains fell across Ohio during this period with 1-2 inches reported statewide and as much as 3 inches reported in northwestern Ohio where minor lowland flooding occurred. Light showers fell across the northern half of Ohio during October 21-22 bringing generally 0.25-0.50 inch of rain. Precipitation returned to the entire state during October 23-24 when steady rains and a few severe thunderstorms occurred statewide. Storm totals during this period ranged from 0.5-1.0 inch in extreme southeastern Ohio to typically 1-2 inches across most of the state with as much as 3 inches in southwestern Ohio. Minor urban and small stream flooding was reported at a few locations in northeastern Ohio. High winds were associated with this storm system, resulting in numerous reports of damage from several areas of the state.

Precipitation for the 2001 calendar year is generally below normal in the eastern two-thirds of the state and above normal in the western third. The state average is 31.47 inches, 0.87 inch below normal. Regional averages range from 36.44 inches, 1.97 inches above normal, for the Southwest Region to 27.20 inches, 4.25 inches below normal, for the Northeast Region.

Precipitation for the 2002 water year is off to a good start. Abundant precipitation during the month improved soil moisture and bodes well for future recharge to ground water supplies. Near-normal precipitation during the next several months, the 2002 water year recharge season, will be needed to continue the optimistic outlook for sustained recovery in ground water storage throughout the state. The Ohio Agricultural Statistics Service reports that near the end of October soil moisture was rated as being short or very short in 8 percent of the state, adequate in 48 percent of the state and surplus in 44 percent of the state.

## PRECIPITATION OCTOBER



## PRECIPITATION

Region	This Month	DEPARTURE FROM NORMAL (IN.)				Palmer Drought Severity Index*
		Past				
		3 Mos.	6 Mos.	12 Mos.	24 Mos.	
Northwest	+4.48	+6.17	+6.44	+3.63	+6.56	+2.8
North Central	+3.35	+4.31	+1.81	-2.47	+4.89	+2.1
Northeast	+1.99	+2.43	-0.79	-4.15	+0.66	0.0
West Central	+2.97	+5.82	+8.68	+3.77	+5.78	+3.4
Central	+2.19	+1.46	+3.07	-0.13	+3.64	+0.9
Central Hills	+2.57	+2.73	-0.53	-3.86	+0.71	+1.3
Northeast Hills	+1.78	+0.62	-1.34	-4.53	-0.61	-1.1
Southwest	+2.83	+4.58	+8.16	+1.37	+3.91	+2.7
South Central	+0.33	-2.31	+1.16	-4.98	-1.96	-0.6
Southeast	+0.68	-0.34	+0.96	-0.76	+0.82	+0.5
State	+2.32	+2.54	+2.76	-1.20	+2.45	

\*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.)	Mean Discharge (CFS)	% of Normal	% of Normal Past		
				3 Mos.	6 Mos.	12 Mos.
Grand River near Painesville	685	268	77	30	29	66
Great Miami River at Hamilton	3,630	6,826	899	386	180	100
Huron River at Milan	371	149	442	122	51	82
Killbuck Creek at Killbuck	464	168	169	89	69	68
Little Beaver Creek near East Liverpool	496	150	125	74	48	59
Maumee River at Waterville	6,330	12,850	2,110	550	188	104
Muskingum River at McConnelsville	7,422	2,248	119	78	70	77
Scioto River near Prospect	567	488	1,176	321	131	85
Scioto River at Higby	5,131	2,352	255	110	145	90
Stillwater River at Pleasant Hill	503	1,328	2,239	937	239	90

**STREAMFLOW** during October was above normal across most of the state, but was below normal in some extreme northeastern Ohio basins. Flows were high enough to be considered excessive in many basins in the western two-thirds of Ohio. Flows in the Maumee River at Waterville and Stillwater River at Pleasant Hill were the greatest ever recorded for October.

Streamflow at the beginning of October was generally above normal in the western half of the state and below normal elsewhere. Flows were relatively stable or declined slightly during the first 5 days of the month. Low flows for the month were recorded statewide during these first days of October with the majority occurring on October 4 and 5. Flows began to increase late on the 5<sup>th</sup> as rain spread across the state. Flows during the remainder of the month were above normal across most of the

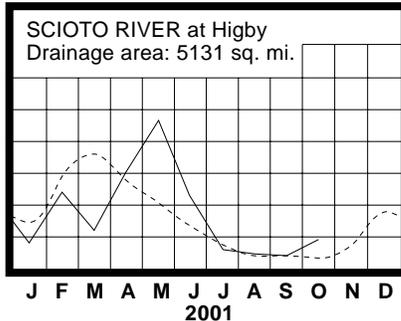
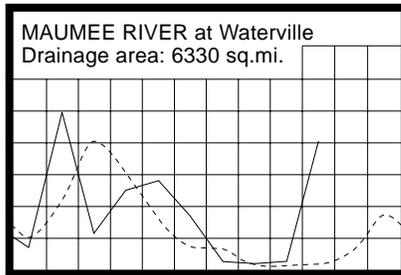
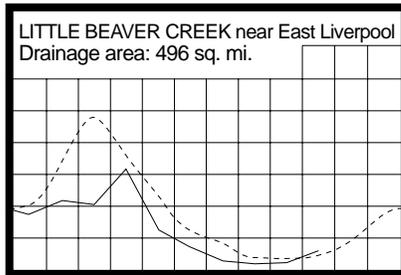
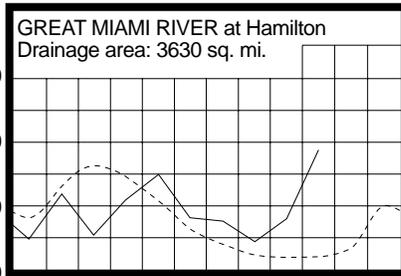
state buoyed from a series of storms with abundant precipitation. Greatest flows for October occurred late in the month, generally between October 24-28, following the widespread and heavy rains that fell across the state on October 23-24. Some minor urban and lowland flooding was reported across scattered areas of northeastern Ohio. Although flows decreased from their highs during the last days of October, streamflow at the end of the month remained above normal statewide.

**RESERVOIR STORAGE** during October was nearly unchanged in both the Mahoning and Scioto river basins. Month-end storage was above normal in both basins.

Reservoir storage at the end of October in the Mahoning basin index reservoirs was 62 percent of rated capacity for water supply compared with the same for last month and 78 percent for October 2000. Month-end storage in the Scioto basin index reservoirs was 77 percent of rated capacity for water supply compared with 78 percent for last month and 77 percent for October 2000.

## MEAN STREAM DISCHARGE

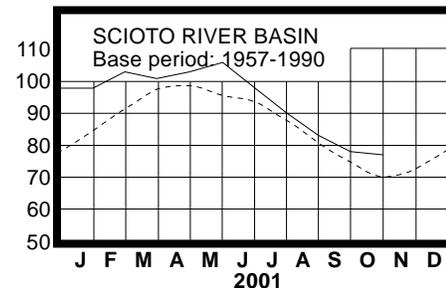
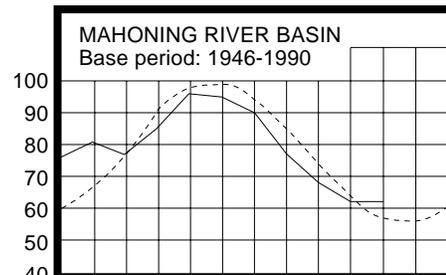
Discharge (cu ft/sec/sq mi)



Base period for all streams: 1961-1990

## RESERVOIR STORAGE FOR WATER SUPPLY

Rated capacity (%) 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	18.58	-1.69	-0.38	+0.08
Fa-1	Jasper Mill, Fayette Co.	Limestone	10.13	-1.12	-0.49	-1.53
Fr-10	Columbus, Franklin Co.	Gravel	46.70	-2.26	-0.22	-0.27
H-1	Harrison, Hamilton Co.	Gravel	22.61	+1.15	+0.75	+1.37
Hn-2a	Dola, Hardin Co.	Dolomite	8.00	+1.33	+0.52	-0.41
Po-1	Windham, Portage Co.	Sandstone	21.43	-0.96	-0.28	-0.21
Tu-1	Strasburg, Tuscarawas Co.	Gravel	16.46	-2.85	-0.23	-1.11

**GROUND WATER** levels during October declined seasonally across most of Ohio. However, levels in some aquifers in the western half of the state rose in response to the notably above normal precipitation. Generally, ground water levels were stable or declined steadily during the first three weeks of the month with some slight, temporary rises noted following precipitation in a few shallow, unconsolidated aquifers. Improvements in water levels were observed late in the month in most aquifers following the precipitation that fell across Ohio on October 23-24.

Ground water levels remain below normal across much of the state ranging up to nearly 3 feet below the long-term October average. However, the above normal precipitation during October had a positive impact on aquifers in the western half of the state where levels currently are above normal in some aquifers, both consolidated and unconsolidated. Current ground water levels are lower than last year's levels across most of the state with only southwestern Ohio having higher levels. Index observation well Tu-1, near Strasburg (Tuscarawas County), representing sand and gravel aquifers in eastern and northeastern Ohio, reached a record-low level during October, reflecting the drier conditions that have persisted in that region for some time.

**LAKE ERIE** levels declined seasonally during October. The mean level was 570.34 feet (IGLD-1985), 0.10 foot lower than last month's mean level and 0.62 foot below normal. This month's mean level is 0.66 foot lower than the October 2000 level and 1.14 feet above Low Water Datum.

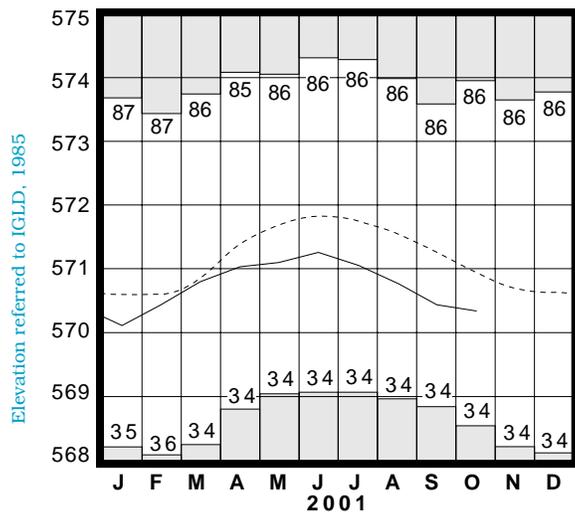
The U. S. Army Corps of Engineers (USACE) reports that precipitation in the Lake Erie basin during October averaged 6.03 inches, 3.28 inches above normal. The entire Great Lakes basin averaged 4.87 inches of precipitation, 2.04 inches above normal. For calendar year 2001 through October, the Lake Erie basin has averaged 29.62 inches of precipitation, 0.08 inch above normal, while the entire Great Lakes basin has averaged 28.98 inches which is 1.70 inches above normal.

This month's Lake Erie level was the lowest autumn level since 1966. The USACE predicts that based on the current condition of the Great Lakes basin and anticipated weather conditions, the level of Lake Erie should continue to range from 6-10 inches below the long-term seasonal average for the foreseeable future. However, deviations from the expected weather patterns could result in the lake level ranging from about 4 inches above to 18 inches below the normal seasonal levels.

### SUMMARY

Precipitation during October was notably above normal statewide except in the Ohio River counties of southeastern Ohio where it was below normal. Streamflow was above normal across most of the state. Reservoir storage was nearly unchanged and was above normal in both the Mahoning and Scioto River basins. Ground water levels declined in most aquifers, but rose in some aquifers in the western half of the state. Lake Erie level declined 0.10 foot and was 0.62 foot below the long-term October average.

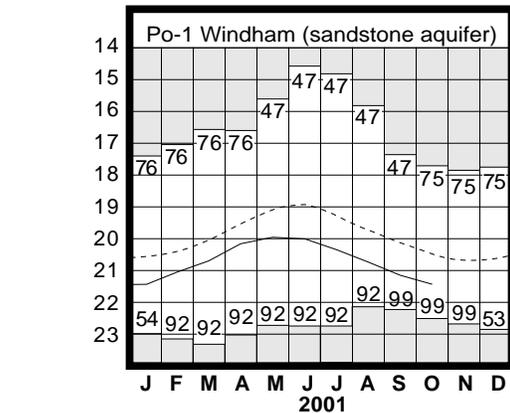
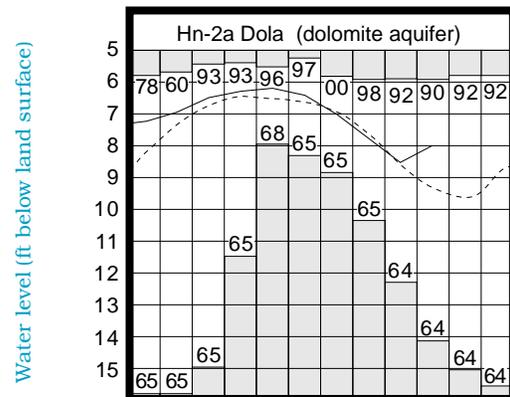
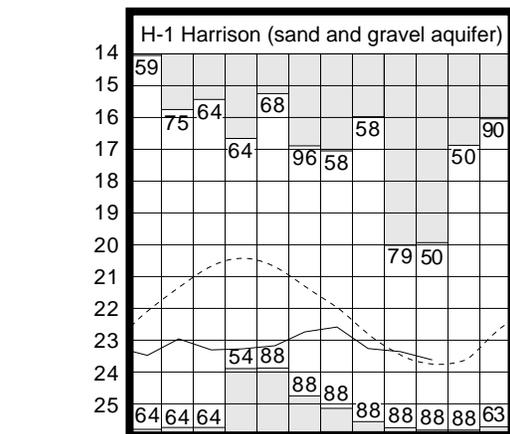
### LAKE ERIE LEVELS at Fairport



Base period: 1900-1991

Record high and low, year of occurrence

### GROUND-WATER LEVELS



Base periods: H-1, 1951-1990. Hn-2a, 1955-1990.

Po-1, 1947-1990 Record high and low, year of occurrence

Normal - - - - Current ———

**NOTES AND COMMENTS**

**Ohio Observation Well Network Data Now On-Line**

Ground water level data from the Ohio Observation Well Network are now available on-line through the Division of Water's web page. This new Internet application allows the user to view and/or retrieve data from the Ohio Observation Well Network Database. Several options are provided that offer a wide range of flexibility in viewing and/or retrieving current and historical data, both graphically and numerically. Data from some well sites are available from the late 1930s to present. In addition, a table of summary statistics is also provided for each observation well.

Observation wells are used to monitor an aquifer's response to changing climatic conditions and the impacts from man-induced activities. Monitoring and evaluating long-term trends in ground water levels allows water resource professionals to assess the availability and annual replenishment of ground water supplies, thus promoting the wise management and efficient use of this valuable resource. Currently, the Division of Water actively monitors 116 wells scattered throughout the state. Data have been collected at nearly 300 sites throughout the years.

To visit this new web site, go to the Division of Water's home page and click on "On-Line Observation Well Records" or go directly to the application using this address: <http://www.dnr.state.oh.us/water/waterobs/>

**New Publication**

The Division of Water announces availability of the following new publication:

*Use of Streamflow Records and Basin Characteristics to Estimate Ground-Water Recharge Rates in Ohio* (Bulletin 46)

by Denise H. Dumouchelle, U. S Geological Survey, and Michael C. Schiefer, Ohio Department of Natural Resources Division of Water

This new Division of Water bulletin presents ground-water recharge rates for selected basins in Ohio with drainage areas ranging from 1 to 730 square miles. The recharge estimates are based on analysis of streamflow records and range from about 3 to 13 inches per year.

Estimates of ground-water recharge, discharge, and mean baseflow index for 103 basins with long-term daily discharge records were made with the aid of computer programs. Relations found between ground-water recharge, discharge, mean baseflow index, basin characteristics, and low-flow statistics were then used to estimate ground-water recharge for 63 basins with short-term daily discharge records and 28 basins with low-flow partial records. For basins with no streamflow records, relations are presented to estimate a range of ground-water recharge rates based on precipitation rates, soil infiltration rates, and glacial geology.

This project was supported in part through a nonpoint source implementation grant from the Ohio Environmental Protection Agency under provisions of Section 319 of the Clean Water Act, as amended in 1987.

Copies of the new 45-page report (including appendixes) cost \$5.00 each and are available from: The Ohio Department of Natural Resources, Division of Water, 1939 Fountain Square, Building E-1, Columbus, Ohio 43224-1385, phone: (614) 265-6739. The report is also available on-line as a PDF file through the Division of Water's web page at: <http://www.dnr.state.oh.us/water/pubs/default.htm#bulletin46>.

Make checks payable to the ODNR-Division of Water. If publications are ordered through the mail, please be sure to include the correct postage and handling charges as shown below. Payments can also be made with Visa or MasterCard.

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**ODNR Honors Pioneering Geologists**

Alfred C. Walker and James J. Schmidt, retired Division of Water hydrogeologists, have been awarded the William W. Mather Medal by the Ohio Department of Natural Resources (ODNR), recognizing their outstanding contributions to the advancement of the knowledge of Ohio geology. The Mather Medal, sponsored by the ODNR, Division of Geological Survey, is named for Ohio's first state geologist who served from 1837 to 1838.

During their combined 77-year careers with ODNR, Walker and Schmidt had an important impact on the understanding of Ohio's ground water resources. They were pioneers in the mapping process of Ohio's ground water resources. During their joint careers at ODNR, Al and Jim published ground water resource maps for 55 of Ohio's 88 counties. Both men also authored many reports and articles during their distinguished careers.

Jim Schmidt retired from the ODNR, Division of Water in June 1985. Al Walker retired from the Division of Water in January 1986. Division of Water employees congratulate both men on receiving this distinguished award.

**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, Miskisungum 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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