



# MONTHLY WATER INVENTORY REPORT FOR OHIO

April 1998

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

Compiled By David H. Cashell  
Hydrologist  
Water Inventory Unit

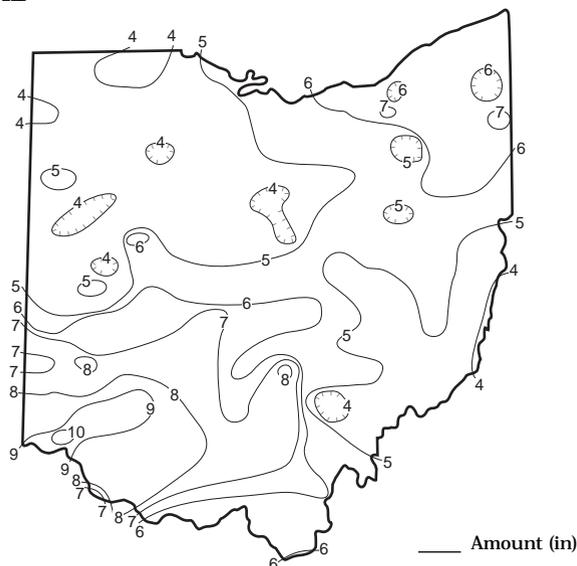
**PRECIPITATION** during April was above normal throughout the state. The state average was 5.52 inches, 2.01 inches above normal. This ranks as the seventh wettest April for the state as a whole during the past 116 years. Regional averages ranged from 7.70 inches, 3.89 inches above normal, for the Southwest Region to 4.28 inches, 0.97 inch above normal, for the Northwest Region. This was the second wettest April of record for the Northeast and Southwest regions, the fourth wettest for the South Central Region, and the eighth wettest for the Central Region. Cheviot (Hamilton County) reported the greatest amount of precipitation for the month, 10.23 inches. Hanibal Locks and Dam (Monroe County) reported the least amount, 3.06 inches.

Precipitation during April fell mainly as showers, often from slow-moving cyclonic systems as they passed near or through the state. Light showers fell during April 1 and 3-4 with accumulations totaling around 0.25 to 0.5 inch statewide. The first in a series of the larger storms passed through the state during April 7-9. Precipitation totals were between 1 and 2 inches nearly everywhere with some areas in western and southwestern Ohio receiving more than 2 inches of rain. The next storm, the biggest for the month in most areas, crossed the state during April 15-17. Although less than 1 inch of rain fell in northwestern Ohio, most areas from southwestern up through northeastern Ohio received more than 2 inches of rain with some spotty locations in southwestern Ohio reporting more than 3 inches. Scattered showers continued to fall on and off from April 19 through the end of the month keeping soils wet and delaying most spring agricultural planting activities. A few heavier showers fell during April 19-22, especially in northeastern Ohio, where up to 0.75 inch of rain was reported. Heavier showers were once again reported in northeastern Ohio during April 26-27 when more than 1 inch of rain fell in some locations. Light, widely scattered showers fell during April 30 across the state.

Precipitation for the 1998 calendar year is above normal throughout the state. The state average is 14.33 inches, 2.44 inches above normal. Regional averages range from 17.36 inches, 3.38 inches above normal, for the South Central Region to 12.65 inches, 1.15 inches above normal, for the Central Hills Region

Precipitation for the 1998 water year (October 1, 1997 to September 30, 1998) is above normal in most areas of Ohio, but slightly below normal in the Central Hills and West Central regions. The state average is 20.68 inches, 1.22 inches above normal. Regional averages range from 23.88 inches, 1.93 inches above normal, for the South Central Region to 18.52 inches, 0.32 inch below normal, for the Central Hills Region. The above normal precipitation during April greatly improved the 1998 water year recharge season.

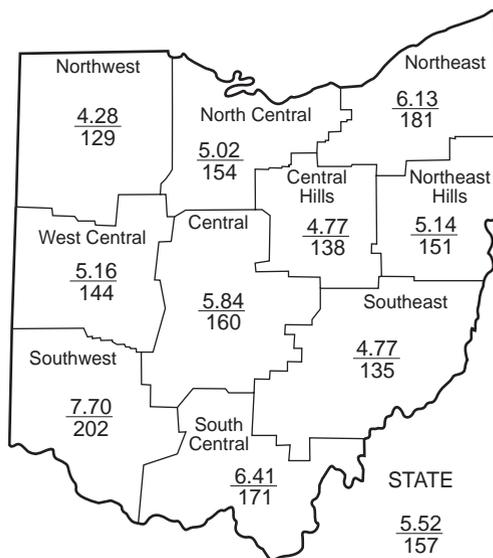
## PRECIPITATION APRIL



## PRECIPITATION

Region	DEPARTURE FROM NORMAL (IN.)					Palmer Drought Severity Index*
	This Month	Past				
		3 Mos.	6 Mos.	12 Mos.	24 Mos.	
Northwest	+0.97	+2.77	+3.10	+9.83	+11.84	+4.8
North Central	+1.77	+2.92	+4.01	+8.11	+14.08	+3.8
Northeast	+2.74	+1.79	+3.04	+3.57	+13.72	+2.9
West Central	+1.58	+0.87	+0.57	+1.00	+6.13	+0.9
Central	+2.18	+1.22	+0.93	+4.20	+7.67	+2.3
Central Hills	+1.32	+0.84	+0.56	+2.25	+6.76	+1.4
Northeast Hills	+1.74	+0.78	+1.97	+1.78	+7.28	+2.1
Southwest	+3.89	+2.15	+1.73	+1.72	+10.83	+2.1
South Central	+2.67	+2.64	+2.55	+2.00	+11.24	+2.3
Southeast	+1.23	+1.04	+2.01	+4.43	+10.46	+3.3
State	+2.01	+1.71	+2.06	+3.89	+10.01	+3.3

\*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	2,554	178	91	97	102
Great Miami River at Hamilton	3,630	8,777	165	94	92	104
Huron River at Milan	371	884	171	142	163	178
Killbuck Creek at Killbuck	464	765	101	77	82	94
Little Beaver Creek near East Liverpool	496	1,439	160	106	125	119
Maumee River at Waterville	6,330	12,708	133	126	146	162
Muskingum River at McConnelsville	7,422	14,580	96	86	98	105
Scioto River near Prospect	567	986	121	86	97	110
Scioto River at Higby	5,131	12,752	181	99	104	131
Stillwater River at Pleasant Hill	503	928	130	77	78	100

**STREAMFLOW** during April was above normal in nearly all areas of the state. Flows in central, southwestern, and northeastern Ohio were high enough to be considered excessive. April flows were greater than the flows recorded during March in all drainage basins with the exception of those in northwestern Ohio which had the greatest in the state flows during March.

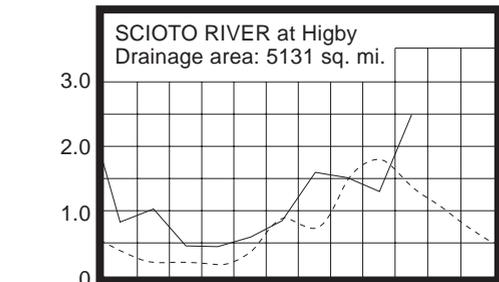
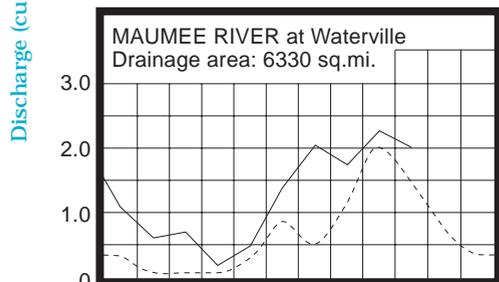
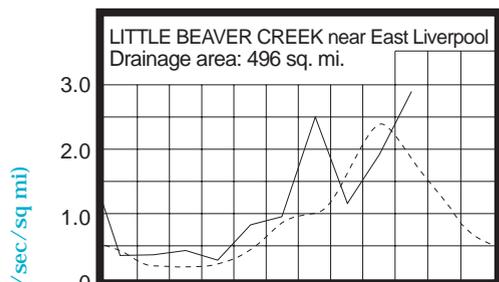
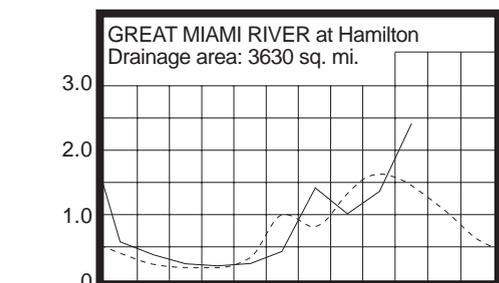
Flows at the beginning of the month were below normal in nearly all areas of the state with only northwestern Ohio having slightly above normal flows. Flows declined during the first week of April with the lowest flows for the month occurring during April 7-8. Precipitation during April 7-9, the first in a series of storms during the month, brought flows

up to more typical levels with some streams in western and northwestern Ohio having their greatest flows for the month following this storm. The month's greatest precipitation for most locations fell during April 15-17 with some areas receiving heavy rain on April 16. Nearly all drainage basins had their greatest flows for the month during April 17 following this storm. Minor small stream and low-lying area flooding was reported in several areas, especially in southwestern Ohio. Generally, flows declined through the end of the month, but still remained nearly bank-full in many areas. An exception was in the northwestern section of Ohio where flows had fallen to slightly below normal levels.

**RESERVOIR STORAGE** for water supply during April increased in both the Mahoning and Scioto river basins. Storage remained above normal in both basins.

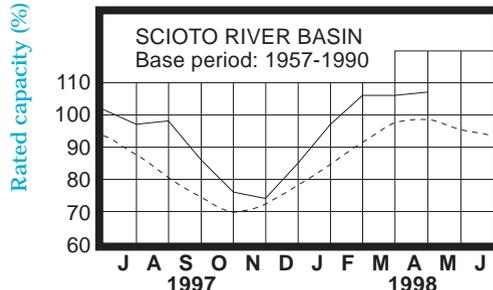
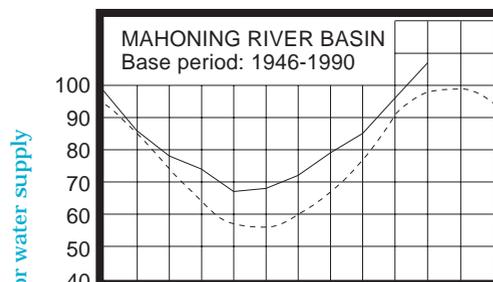
Storage at the end of April in the Mahoning basin index reservoirs was 107 percent of rated capacity for water supply compared with 96 percent for last month and 101 percent for April 1997. Month-end storage in the Scioto basin index reservoirs was 107 percent of rated capacity for water supply compared with 106 percent for last month and 101 percent for April 1997. Surface-water supplies continue to remain in good condition throughout the state.

## MEAN STREAM DISCHARGE



Base period for all streams: 1961-1990

## 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 April showed net improvement in nearly all aquifers throughout the state. Levels showed mixed responses during the first half of the month, but rose during the second half in all aquifers. Generally, even with the above normal precipitation, net rises during April from last month's levels were less than usually observed. However, soil moisture requirements were exceeded during the month and the above normal precipitation during April should result in continued improvement in many aquifers during at least the first half of May. At the end of April, the Ohio Agricultural Statistics Service reports that soil moisture was rated as being adequate in 31 percent of the state and surplus in 69 percent of the state.

Ground water supplies continue to remain adequate statewide even though levels are below normal in many aquifers in eastern and southern Ohio. Current levels are slightly higher than last year's levels in many areas, but noticeably below last year's levels in the northeastern section of the state. Although April's above normal precipitation went a long way toward improving the 1998 water year recharge season, continued near-normal precipitation and other climatic conditions throughout the upcoming growing season would help maintain the adequate position that ground water supplies now occupy.

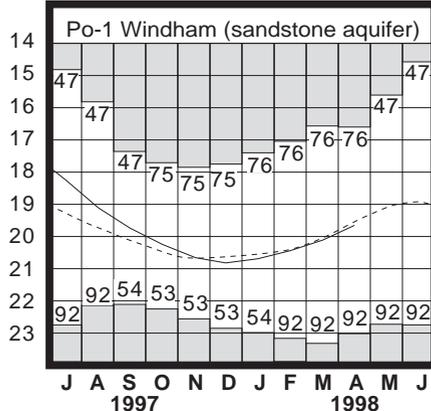
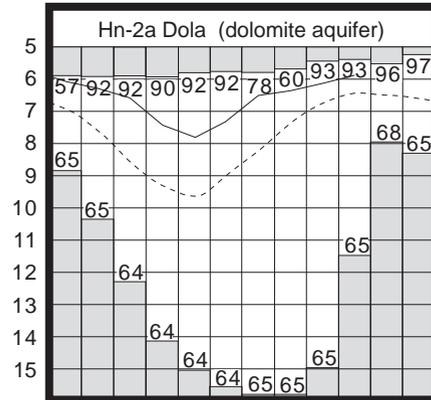
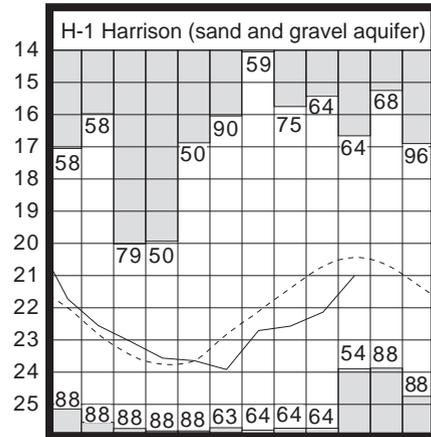
**LAKE ERIE** level rose seasonally during April. The mean level was 573.72 feet (IGLD-1985), 0.33 foot above last month's mean level and 2.33 feet above normal. This month's level is 0.03 foot higher than the April 1997 level and 4.52 feet above Low Water Datum.

Significant flooding occurred along the southwestern shore of Lake Erie during April 9-10. The storm that passed through the Ohio area during April 7-9 produced strong northeasterly winds as it moved eastward. This resulted in one of the worst storms and storm surge setups in the Lake Erie basin during the past 25 years. The level in the western basin of Lake Erie rose to record levels at Toledo and Sandusky. At Toledo, the lake level peaked late on April 9 at 8.32 feet above Low Water Datum (577.52 feet, IGLD-1985). Waves from 10 to 14 feet high were reported from the Sandusky area (Erie County) westward to Toledo (Lucas County). At least 10 homes were destroyed and more than 150 homes received major damage. Governor Voinovich declared Erie, Lucas and Sandusky counties disaster areas.

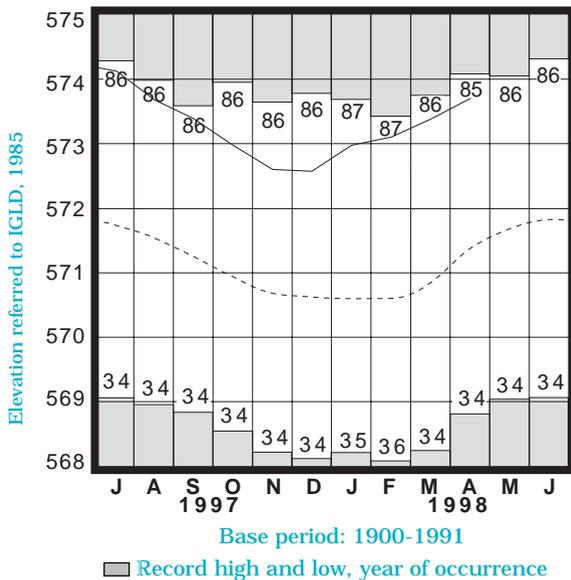
The U. S. Army Corps of Engineers reports that precipitation in the Lake Erie basin during April averaged 4.2 inches, 1.1 inches above normal. The entire Great Lakes basin averaged 2.0 inches of precipitation during April, 0.5 inch below normal. For calendar year 1998 through April, the Lake Erie basin has averaged 14.4 inches of precipitation, 4.0 inches above normal, and the entire Great Lakes basin has averaged 10.4 inches, 1.8 inches above normal.

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	13.19	-0.76	-0.04	+0.70
Fa-1	Jasper Mill, Fayette Co.	Limestone	6.99	-0.25	+0.13	+0.34
Fr-10	Columbus, Franklin Co.	Gravel	41.77	+0.63	+0.36	-0.83
H-1	Harrison, Hamilton Co.	Gravel	21.00	-0.57	+1.14	+0.18
Hn-2a	Dola, Hardin Co.	Dolomite	5.90	+0.57	+0.24	+0.17
Po-1	Windham, Portage Co.	Sandstone	19.68	-0.16	+0.44	-1.77
Tu-1	Strasburg, Tuscarawas Co.	Gravel	14.11	-3.31	-0.02	-1.51

## GROUND-WATER LEVELS



### LAKE ERIE LEVELS at Fairport



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

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

## SUMMARY

Precipitation was above normal throughout the state with the state average of 5.52 inches ranking as the seventh wettest during the past 116 years. Streamflow was above normal in nearly all drainage basins. Minor flooding occurred in some small streams and low-lying areas and along the southwestern Lake Erie shore. Reservoir storage increased and remained above normal. Ground water levels rose in most aquifers. Lake Erie level rose 0.33 foot and was 2.33 feet above the long-term April average.

## NOTES AND COMMENTS

### WMAO ANNUAL SPRING CONFERENCE

The Water Management Association of Ohio (WMAO) will hold its annual spring conference on June 9, 1998 at the Holiday Inn Columbus East hotel. The meeting is being presented by the Groundwater Division of WMAO. This year's spring meeting will be a ground water technical conference covering ground water studies, tools, and technology.

The cost of the conference is \$35,00 which includes lunch and a copy of the proceedings. Registration must be made by May 29, 1998. For more information, contact:

Jeff deRoche  
Water Resources Division  
975 West Third Avenue  
Columbus, Ohio 43212-3192  
ph: (614) 469-5553 ext. 1114  
e-mail: jderoche@usgs.gov

or Mike Baker  
Division of Drinking and Ground Waters  
1800 Watermark Drive  
P. O. Box 1049  
Columbus, Ohio 43216-1049

## NEW PUBLICATION

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

The Water Resources of Perry County, Ohio  
by Paul N. Spahr

This 105-page report (includes appendices) presents a portion of the results and findings of the parent project "An Assessment of Ground Water Quantity, Quality, and Vulnerability to Nonpoint Source Contamination in Perry County, Ohio." The publication describes the geology, hydrogeology, and quality of the water resources of the county. The geology of the county is documented by glacial, bedrock, and structure contour maps that were generated during the project. Well logs and drilling reports, whose locations were mapped during the project, were used to evaluate the regional water-transmitting characteristics of the major aquifers. The water quality was characterized through the collection and analysis of several hundred samples obtained from residential and domestic wells throughout the county. Samples were analyzed to detect the concentrations of calcium, magnesium, sodium, potassium, iron, bicarbonate, sulfate, and chloride. Appendices provide raw data tables of the water quality data.

Information gathered during this project can be used to support the use, protection, and restoration of the ground water resources of Perry County. In addition, the data can serve as a basis for identifying priority ground water protection needs. This publication was prepared in cooperation with the Ohio Department of Natural Resources, Division of Mines and Reclamation, Division of Geological Survey, Division of Real Estate and Land Management, and the Perry County Health Department. The publication was financed in part through a grant from the Ohio Environmental Protection Agency under provisions of Section 319 (h) of the Clean Water Act as amended in 1987.

The cost for this new publication is \$7.00. A limited number of the reports are available from: ODNR Division of Water, Water Resources Section, 1939 Fountain Square Drive, Building E-1, Columbus, Oh, 43224-1336. If ordered through the mail, please be sure to include the postage and handling charge as shown below. Make checks payable to ODNR Division of Water. Payments may also be made with Visa or MasterCard. This report is also available free of charge from our web site as a 4.6 megabyte PDF file. The URL is, <http://www.dnr.state.oh.us/odnr/water/maptechs/npsrpts/npsrpts.html>

### Postage and Handling Charges

Cost of Publications	Add
under \$10.01	\$2.50
\$10.01 - \$20.00	\$3.75
\$20.01 - \$50.00	\$6.00
\$50.01 - \$100.00	\$8.50
\$100.01 and over	\$10.00

## 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.*



George V. Voinovich  
Governor

Donald C. Anderson  
Director

Michele Willis  
Chief

An Equal Opportunity Employer-M/F/H

DIVISION OF WATER  
1939 FOUNTAIN SQUARE  
COLUMBUS, OHIO 43224