



# MONTHLY WATER INVENTORY REPORT FOR OHIO

November 1999

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

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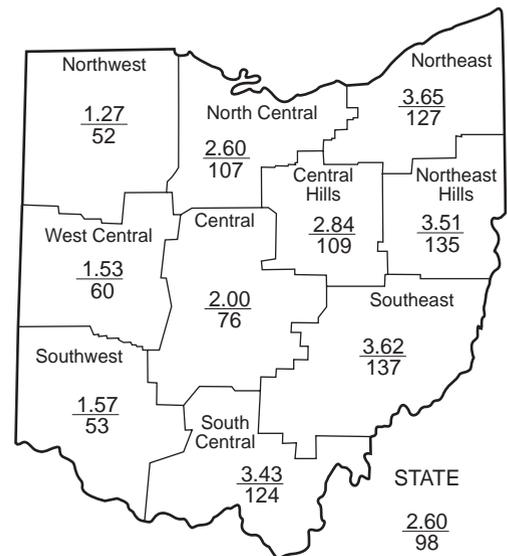
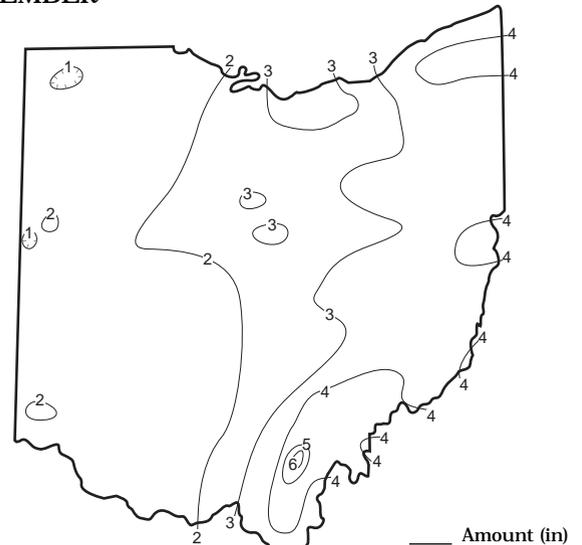
**PRECIPITATION** during November was above normal in the eastern half of the state and below normal in the western half. The state average was 2.60 inches, 0.05 inch below normal. Regional averages ranged from 3.65 inches, 0.77 inch above normal, for the Northeast Region to 1.27 inches, 1.16 inches below normal, for the Northwest Region. Salem Center (Meigs County) reported the greatest amount of precipitation for November, 6.01 inches. Ft. Recovery (Mercer County) reported the least amount for the month, 0.59 inch.

Nearly all of the precipitation during November fell early or late in the month. A storm system during November 2-3 brought rain to the entire state and the first measurable snowfall of the season, mainly in northeastern Ohio (Chardon, Geauga County, reported 8 inches of snow for November). Precipitation amounts of 0.5-1.0 inch fell across the western half of the state while 1-2 inches were common in the eastern half. A few scattered locations in the eastern half of the state reported amounts in excess of three inches from this storm system. The next three weeks or so were very dry throughout the state with only a few light, spotty showers reported on a couple of days. Showers returned to Ohio around November 26 producing generally 0.5 inch of rain across the western half of the state and 1.0 inch across the eastern half. Some heavier bands of precipitation moved through parts of southeastern Ohio where storm totals of up to 2.5 inches were reported. Conditions were rather dry the last few days of the month.

Precipitation for the 1999 calendar year is below normal throughout most of the state, with only northeastern Ohio averaging slightly above normal precipitation. The average for the state as a whole is 30.93 inches, 4.07 inches below normal. Regional averages range from 34.70 inches, 0.37 inch above normal, for the Northeast Region to 27.03 inches, 10.42 inches below normal, for the Southwest Region.

Precipitation for the 2000 water year is generally above normal in the eastern half of the state and below normal in the western half of Ohio. The state average is 4.77 inches which is 0.22 inch below normal. Regional averages range from 6.46 inches, 0.86 inch above normal, for the Northeast Region to 3.33 inches, 1.57 inches below normal, for the West Central Region.

## PRECIPITATION NOVEMBER



## PRECIPITATION

Region	DEPARTURE FROM NORMAL (IN.)					Palmer Drought Severity Index*
	This Month	Past				
		3 Mos.	6 Mos.	12 Mos.	24 Mos.	
Northwest	-1.16	-2.30	-3.72	-3.43	+1.61	-2.9
North Central	+0.17	-0.23	-1.01	-2.54	+2.20	0.0
Northeast	+0.77	+1.48	+0.64	-0.16	-0.52	+0.9
West Central	-1.03	-3.43	-5.11	-5.56	-2.36	-2.6
Central	-0.62	-1.92	-5.60	-7.06	-6.79	-4.0
Central Hills	+0.23	-0.90	-3.19	-3.71	-1.46	-1.0
Northeast Hills	+0.91	-0.59	-3.47	-2.18	+1.56	-1.3
Southwest	-1.41	-4.01	-7.71	-10.32	-7.03	-3.1
South Central	+0.66	-0.30	-3.42	-6.27	-3.41	-0.6
Southeast	+0.98	-0.56	-3.62	-4.43	-0.71	-0.4
State	-0.05	-1.28	-3.63	-4.58	-1.71	

\*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	866	76	57	44	57
Great Miami River at Hamilton	3,630	470	36	39	47	79
Huron River at Milan	371	87	100	63	61	82
Killbuck Creek at Killbuck	464	136	66	58	47	82
Little Beaver Creek near East Liverpool	496	179	79	52	42	83
Maumee River at Waterville	6,330	406	23	27	50	89
Muskingum River at McConnelsville	7,422	2,484	53	48	41	86
Scioto River near Prospect	567	27	28	32	31	76
Scioto River at Higby	5,131	697	37	41	36	68
Stillwater River at Pleasant Hill	503	60	65	45	51	77

**STREAMFLOW** during November was below normal throughout most of Ohio. Flows were low enough to be considered deficient across the southern half of the state as well as in many drainage basins in northwestern Ohio. Flows for the month increased seasonally from October's flows across most of the state, but were slightly less than last month's flows in western and southwestern Ohio.

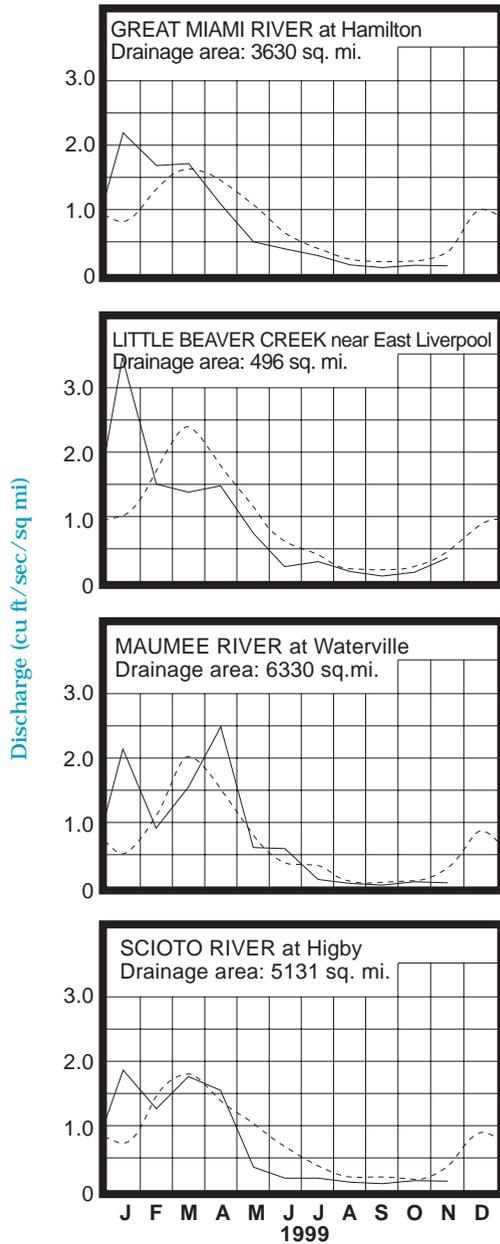
Streamflow at the beginning of the month was below normal statewide and at its lowest flow for November in most areas of the state. Streamflow increased throughout Ohio following the widespread precipitation which occurred on November 2-3. Generally, the greatest flows for the month were reached during November 3-5 across most of the state in response to this precipitation.

After peaking, flows declined steadily during the next three weeks throughout most of the state due to the dry conditions. Flows increased temporarily across the state around November 27-28 responding to additional precipitation. Although streamflow was greater at the end of the month than at the beginning, flows remained below normal statewide.

**RESERVOIR STORAGE** for water supply during November declined in both the Mahoning and Scioto river basins. Storage remained above normal in the Mahoning basin reservoirs and below normal in the Scioto basin reservoirs.

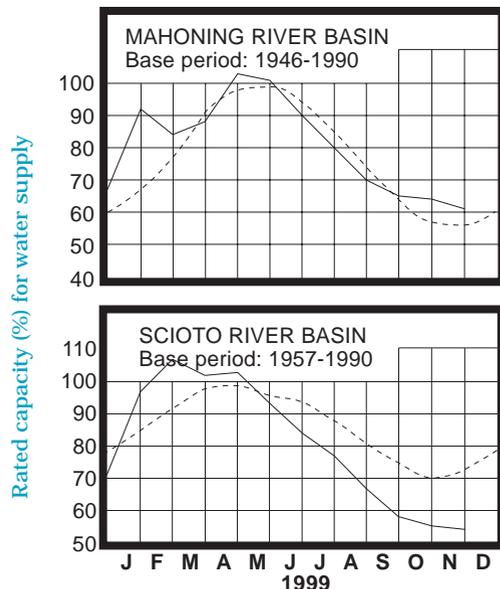
Reservoir storage at the end of November in the Mahoning basin index reservoirs was 61 percent of rated capacity for water supply compared with 64 percent for last month and 68 percent for November 1998. Month-end storage in the Scioto basin index reservoirs was 54 percent of rated capacity for water supply compared with 55 percent for last month and 74 percent for November 1998.

## 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 November declined throughout most of Ohio. An exception was in some unconsolidated aquifers in the southern half of the state where levels were stable or rose slightly. Net declines were greater than usually observed for November in consolidated aquifers statewide. Although levels in unconsolidated aquifers usually begin their seasonal rise during November, most were still declining or relatively stable this month. Generally, levels in consolidated aquifers declined steadily throughout the month while levels in unconsolidated aquifers rose slightly at the beginning of November and then were stable or declined steadily the remainder of the month.

Ground water levels are below normal statewide with levels generally ranging from about 1 foot to more than 5 feet below normal. Current levels are also lower than they were at this time last year ranging from 1 foot to more than 3.5 feet below the November 1998 levels. Ground water levels in many aquifers in eastern and southern Ohio continue to reach record-low levels. Index observation well Po-1 near Windham (Portage County), representing sandstone aquifers in eastern and northeastern Ohio, reached a record-low level for November. Of even greater significance, index observation wells F-1 near West Rushville (Fairfield County), representing sandstone aquifers in eastern and southeastern Ohio, Fa-1 near Washington Court House (Fayette County), representing limestone aquifers in south-central and southwestern Ohio, and Tu-1 near Strasburg (Tuscarawas County), representing sand and gravel aquifers in eastern and northeastern Ohio, all reached the lowest levels ever observed in these wells.

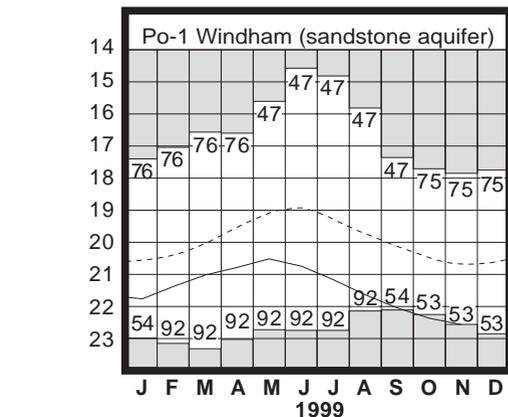
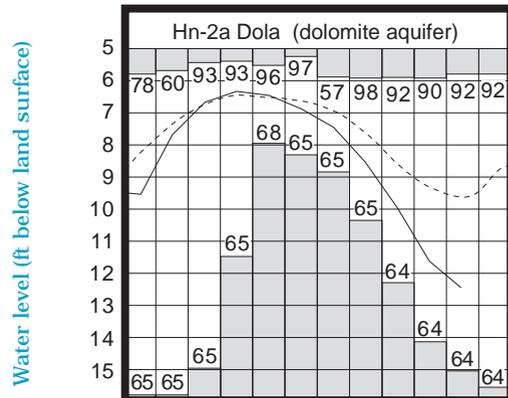
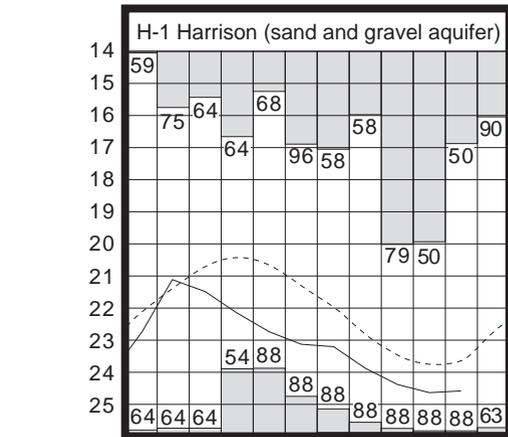
Although ground water levels continued to decline across most of Ohio during November, conditions favorable for recharge have improved considerably in the eastern half of the state due to the above normal precipitation the area received. Although conditions are still not favorable in the western half of Ohio, near-normal precipitation and other climatic conditions during the next several months would provide ample opportunity for needed recharge. Water supply managers statewide with ground water sources should continue to monitor their situations closely throughout the recharge season.

**LAKE ERIE** level declined during November. The mean level was 570.67 feet (IGLD-1985) which is 0.16 foot lower than last month's mean level and 0.03 foot below normal. This month's level is 0.66 foot lower than the November 1998 level and 1.47 feet above Low Water Datum.

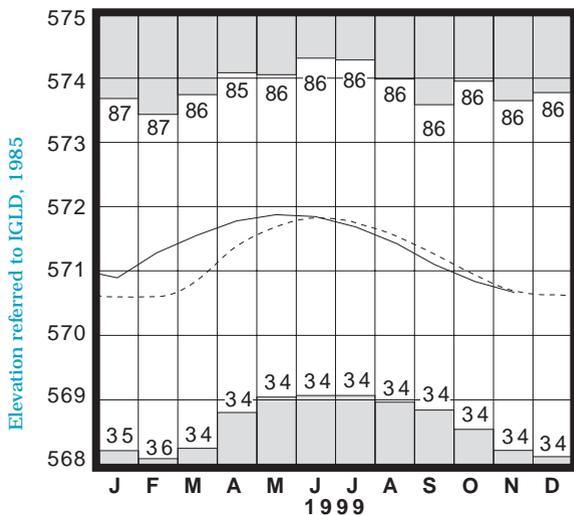
The U. S. Army Corps of Engineers reports that precipitation in the Lake Erie basin during November averaged 2.5 inches, which is 0.3 inch below normal. The entire Great Lakes basin averaged 1.9 inches of precipitation during November which is 0.9 inch below normal. For calendar year 1999 through November, the Lake Erie basin has averaged 29.1 inches of precipitation, 3.2 inches below normal, and the entire Great Lakes basin has averaged 30.3 inches, 0.3 inch 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	21.90	-4.64	-0.67	-3.13
Fa-1	Jasper Mill, Fayette Co.	Limestone	14.28	-5.33	-0.72	-3.58
Fr-10	Columbus, Franklin Co.	Gravel	46.49	-2.20	+0.16	-1.70
H-1	Harrison, Hamilton Co.	Gravel	24.58	-0.92	+0.04	-0.99
Hn-2a	Dola, Hardin Co.	Dolomite	12.44	-2.81	-0.83	-3.62
Po-1	Windham, Portage Co.	Sandstone	22.57	-1.89	-0.20	-1.17
Tu-1	Strasburg, Tuscarawas Co.	Gravel	16.36	-2.80	-0.06	-1.25

## GROUND-WATER LEVELS



## LAKE ERIE LEVELS at Fairport



Base period: 1900-1991

■ Record high and low, year of occurrence

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

■ Record high and low, year of occurrence

## SUMMARY

Precipitation during November was above normal in the eastern half of the state and below normal in the western half. Streamflow was below normal throughout most of the state. Reservoir storage declined statewide and remained above normal in the Mahoning basin reservoirs and below normal in the Scioto basin reservoirs. Ground water levels declined in most aquifers and are noticeably below normal statewide. Lake Erie level declined 0.16 foot and is 0.03 foot below the long-term November average.

## NOTES AND COMMENTS

### Ohio Has Updated Dam Safety Standards

The Ohio Department of Natural Resources Division of Water has promulgated modified and new administrative standards in the Ohio Administrative Code for the state's dam safety program. The effective date for the new rules is December 9, 1999. Changes to the rules include the following:

- Updates to the classification criteria for dams to clarify the potential hazard measures and to be in line with federal standards.
- Modifications to the standards for spillway and flood storage design to allow for reduction of the inflow design flood when failure of the dam during a flood will cause no additional damage in the downstream areas. This design flood standard is known as the critical flood. Calculations to determine the critical flood are based on a quantitative and relative impact analysis.
- An operation, maintenance and inspection manual is now required for all Class I, II and III dams. Also, the amended rules require emergency action plans for all Class I, II and III dams. The emergency action plan for all Class I and some Class II and III dams must include an inundation map.
- New rules have been promulgated for two sections of the Ohio Revised Code that were added in 1987. These rules provide standards for the exemption of existing dams from regulatory jurisdiction and for the dam safety annual fee.
- New standards for approval of repair construction for existing dams have been added. These standards are based on the existing approval criteria for new dam construction.

The dam safety administrative rules, and an introduction to the new rules, can be viewed on the Internet through the Division of Water's web site at: <http://www.dnr.state.oh.us/odnr/water>. You can obtain a copy of the rules or additional information by contacting the Division of Water, Dam Safety Engineering Program at (614) 265-6731 or by e-mail at [water@dnr.state.oh.us](mailto:water@dnr.state.oh.us).

## 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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