



# MONTHLY WATER INVENTORY REPORT FOR OHIO

December 2000

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

Compiled By David H. Cashell and Scott Kirk

Hydrologists  
Water Inventory Unit

**PRECIPITATION** during December was above normal across most of the state, except for a few locations along the Ohio River in southeastern Ohio and areas in north-central Ohio where it was below normal. The state average was 3.06 inches, 0.48 inch above normal. Regional averages ranged from 3.54 inches, 0.58 inch above normal, for the South Central Region to 2.32 inches, 0.04 inch above normal, for the North Central Region. Chardon (Geauga County) reported the greatest amount of precipitation for December, 5.40 inches. Hannibal Lock and Dam (Monroe County) reported the least amount for the month, 1.09 inches.

Precipitation fell mainly as rain during the first half of the month and as snow during the second half. Snowfall for the month was above normal across most of the state with some areas receiving significant amounts. Several locations received more than 20 inches for the month including Chardon (Geauga County), 49 inches, Dorset (Ashtabula County), 38 inches and Toledo Express Airport (Lucas County), 26 inches, a record amount for December. Also, it was one of the coldest Decembers on record with temperatures averaging below normal throughout most of the month. The first 10 days were rather dry across Ohio. The only notable precipitation during this period occurred around December 7-8 when moderate snow fell across the northern half of the state with accumulations of 3-6 inches (0.25-0.50 inch liquid precipitation). A series of fast moving weather disturbances moved through the area during the next week. The first of these systems affected the state during December 11-12 with a mix of rain and snow in the northern half of the state and mostly rain in the southern half. Storm totals ranged up to 1 inch (liquid precipitation) in the northern half of the state with lesser amounts in the southern half. The next system moved through the area during December 13-14. With it came a wintry mixture of rain, snow and freezing rain. Another 3-6 inches of snow fell across the northern half of the state while the southern half received mostly rain and freezing rain. The most significant weather event of the month occurred around December 16 when moderate to occasional heavy rain fell. The storm produced 0.50-1.0 inch of rain in the northwestern half of Ohio and generally 2-3 inches in the southeastern half. Following this storm, most streams and rivers were running at bankfull with some minor low-land flooding reported in southern and eastern Ohio. Light snow fell on several days during the remainder of the month where it remained frozen on the ground at the end of the year.

Precipitation for the 2001 water year is below normal across most of Ohio, but above normal in central and northeastern areas of the state. The average for the state as a whole is 7.17 inches, 0.40 inch below normal. Regional averages range from 8.64 inches, 0.40 inch above normal, for the Northeast Region to 5.99 inches, 1.98 inches below normal, for the South Central Region.

Precipitation for the 2000 calendar year was above normal statewide except for a few scattered locations, especially in southeastern Ohio, where it was slightly

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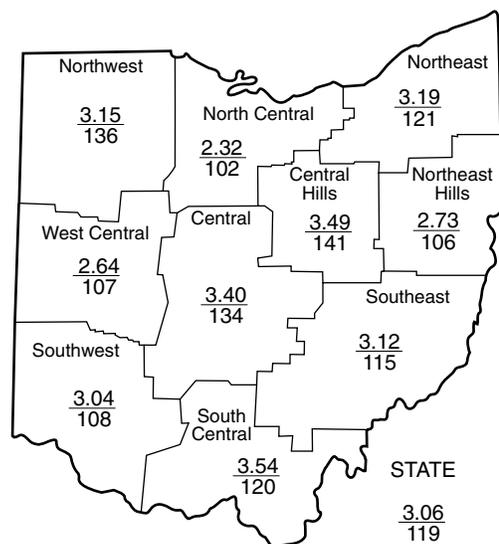
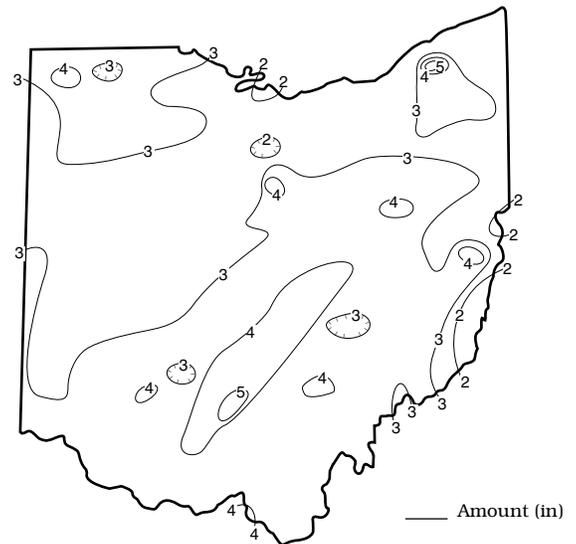
## PRECIPITATION

Region	This Month	DEPARTURE FROM NORMAL (IN.)				Palmer Drought Severity Index*
		Past				
		3 Mos.	6 Mos.	12 Mos.	24 Mos.	
Northwest	+0.84	-0.14	+1.18	+4.07	+1.95	+2.2
North Central	+0.04	-0.60	+2.35	+6.14	+4.68	+3.0
Northeast	+0.55	+0.40	+1.07	+4.18	+4.58	+2.3
West Central	+0.17	-0.18	+0.70	+2.69	-2.25	+1.7
Central	+0.87	+0.74	+1.18	+4.43	-2.53	+1.4
Central Hills	+1.02	+0.21	+1.11	+4.80	+1.01	+1.4
Northeast Hills	+0.15	-0.95	+0.71	+2.75	+0.36	+1.5
Southwest	+0.22	-0.50	+0.91	+3.20	-7.09	+1.2
South Central	+0.58	-1.98	+0.24	+1.26	-4.31	+0.8
Southeast	+0.40	-1.01	-1.64	+0.11	-3.52	+0.4
State	+0.48	-0.40	+0.78	+3.36	-0.73	

\*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

## PRECIPITATION DECEMBER



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	1,503	89	64	61	82
Great Miami River at Hamilton	3,630	3,533	96	124	106	80
Huron River at Milan	371	842	569	350	307	155
Killbuck Creek at Killbuck	464	583	156	132	104	91
Little Beaver Creek near East Liverpool	496	500	113	100	85	83
Maumee River at Waterville	6,330	4,697	87	87	108	84
Muskingum River at McConnellsville	7,422	9,556	134	114	95	92
Scioto River near Prospect	567	444	169	149	94	86
Scioto River at Higby	5,131	5,872	128	132	114	91
Stillwater River at Pleasant Hill	503	318	79	103	86	71

**STREAMFLOW** during December was above normal in the eastern two-thirds of the state and below normal in the western third. Flows were high enough to be considered excessive in some north-central Ohio basins. The December flows increased from the November flows statewide.

Streamflow at the beginning of the month was below normal across most of the state except for basins in north-central and north-eastern Ohio where they were above normal. Lowest flows for the month occurred between December 9-11 across most of the state as a result of the rather dry conditions which prevailed through the first week and a half of the month. Widespread precipitation during several days of the next week increased streamflow

statewide. Greatest flows for the month were recorded at the end of this wet period, generally between December 17-19, with some minor flooding in eastern and southern Ohio. Flows declined gradually during the remainder of the month and were below normal across most of the state as the year ended, except in north-central and parts of northeastern Ohio where they were above normal.

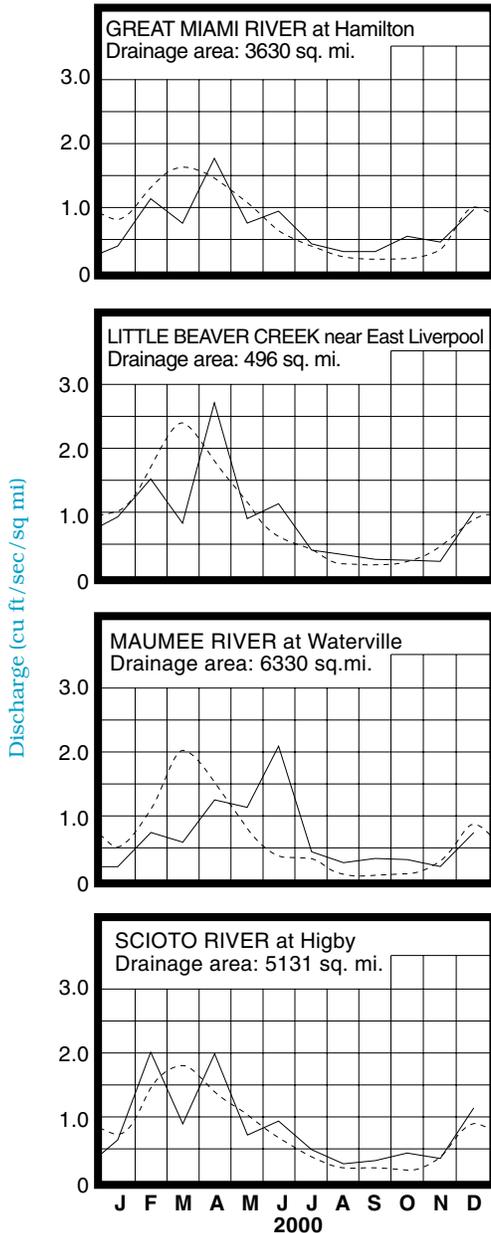
Streamflow for calendar year 2000 was below normal statewide except for basins in north-central Ohio where they were above normal (see Mean Stream Discharge table, percent of normal, past 12 months column). Below-normal flows were recorded during the first 3 months of the year with flows during March being low enough to be considered deficient statewide. Flows were generally above normal across much of the state from April through October, except during July when they were below normal in the eastern half of the state. Flows were below normal in most of Ohio during November and above normal in most of the state in December.

**RESERVOIR STORAGE** for water supply during December was unchanged in the Mahoning River basin and increased in the Scioto River basin. Month-end storage remained above normal in both basins.

Reservoir storage at the end of December in the Mahoning basin index reservoirs was 76 percent of rated capacity for water supply compared with 76 percent for last month and 66 percent for December 1999. Month-end storage in the Scioto basin index reservoirs was 98 percent of rated capacity for water supply compared with 80 percent last month and 64 percent for December 1999.

Surface water supplies during 2000 were adequate throughout the state. Storage was above normal the entire year in the Mahoning River basin. Storage in the Scioto River basin was above normal during most of the year, but was slightly below normal during January, July and August.

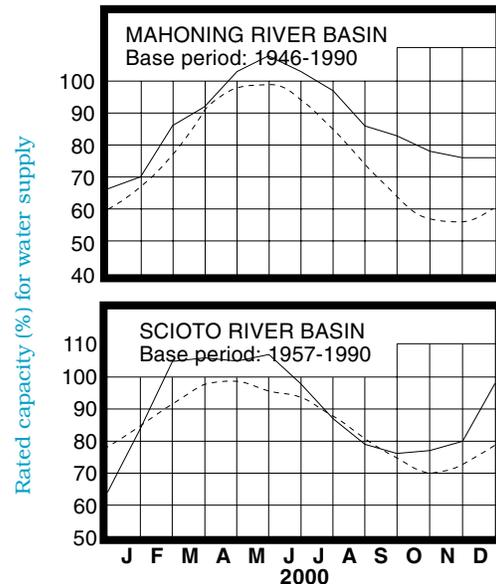
### MEAN STREAM DISCHARGE



Base period for all streams: 1961-1990

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 December remained nearly steady or rose throughout the state. Net changes in levels in unconsolidated aquifers were typical of December, while in consolidated aquifers, increases were less than usually observed. Ground water levels declined during the first half of the month and rose in response to precipitation during the second half statewide.

The 2000 calendar year was beneficial for ground water supplies. Although recharge early in the year was only average, adequate precipitation throughout most of the late spring and summer eased demand on ground water usage statewide. In addition, ample precipitation during the late summer and early fall months reduced the natural rate of decline and set the stage for some early season recharge. Because of this, ground water supplies are much improved from last year. Current levels range up to 6.5 feet higher than they were in December 1999. Although ground-water supplies recovered markedly this year from the drought induced levels of 1999, they remained below normal across most of the state the entire year. An exception was some carbonate aquifers in western Ohio where supplies improved to above-normal levels in early summer. At the beginning of 2000, ground water levels were as much as 6.5 feet below normal with some aquifers at or near record-low levels. At the end of the year, levels ranged to just over 2 feet below normal. Additional improvement is expected as conditions favor a beneficial recharge season. With near normal precipitation and other climatic conditions in the coming months, ground water supplies should be adequate across the state.

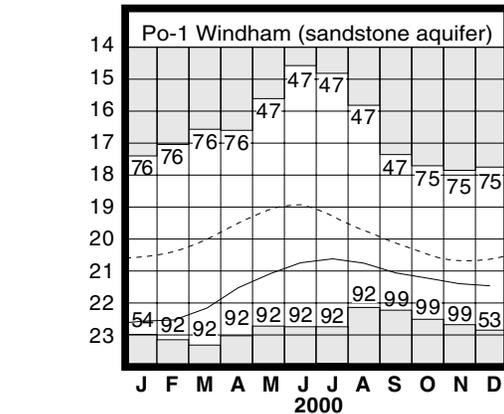
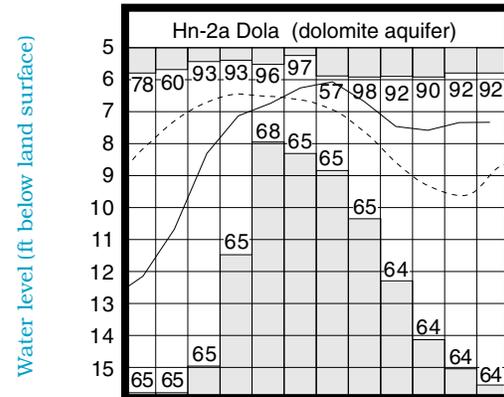
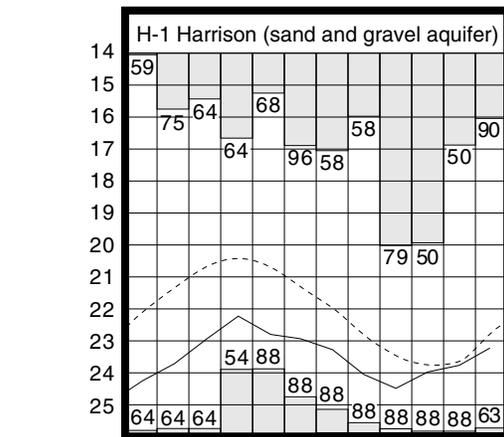
**LAKE ERIE** level declined seasonally during December. The mean level was 570.41 feet (IGLD-1985), 0.19 foot lower than last month's level and 0.22 foot below normal. This month's mean level is 0.10 foot lower than the December 1999 level and 1.21 feet above Low Water Datum.

The U. S. Army Corps of Engineers (USACE) reports that precipitation in the Lake Erie basin during December averaged 3.45 inches, 0.84 inch above normal. The entire Great Lakes basin averaged 2.47 inches, 0.13 inch above normal. Precipitation for calendar year 2000 averaged 41.36 inches, 6.37 inches above normal, for the Lake Erie basin and 34.59 inches, 2.22 inches above normal, for the entire Great Lakes basin.

Lake Erie water levels were below normal during the first half of 2000. From July through October levels rebounded and were near or slightly above normal. Lake levels fell back to below normal during November and remained there through December. The USACE predicts that, based on the current condition of the Great Lakes basin and anticipated future weather conditions, the level of Lake Erie should continue to range from near normal to about 1.5 feet below the long-term average for the foreseeable future.

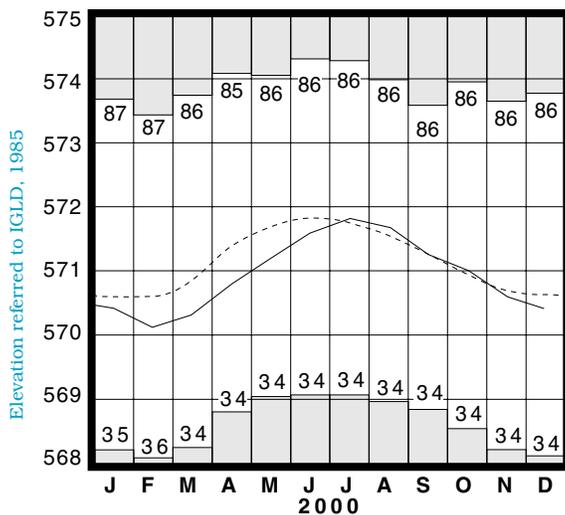
Index Well	Location	Aquifer	Mean This Month	Departure From Normal	Change in feet from:	
					Last Month	Year Ago
F-1	W. Rushville, Fairfield Co.	Sandstone	19.13	-2.28	+0.05	+3.38
Fa-1	Jasper Mill, Fayette Co.	Limestone	8.12	+0.04	-0.01	+6.58
Fr-10	Columbus, Franklin Co.	Gravel	45.81	-1.71	+0.25	+0.30
H-1	Harrison, Hamilton Co.	Gravel	23.22	-0.40	+0.55	+1.59
Hn-2a	Dola, Hardin Co.	Dolomite	7.33	+1.61	+0.01	+5.42
Po-1	Windham, Portage Co.	Sandstone	21.46	-0.85	-0.06	+1.20
Tu-1	Strasburg, Tuscarawas Co.	Gravel	15.38	-2.10	+0.31	+1.09

## GROUND-WATER LEVELS



Base periods: H-1, 1951-1990. Hn-2a, 1955-1990. Po-1, 1947-1990

## LAKE ERIE LEVELS at Fairport



Base period: 1900-1991

Normal - - - - Current - - - -

(Precipitation continued from front)

below normal. The average for the state as a whole was 40.93 inches, 3.36 inches above normal. Regional averages ranged from 43.47 inches, 3.20 inches above normal, for the Southwest Region to 37.89 inches, 4.07 inches above normal, for the Northwest Region (see Precipitation table, departure from normal, past 12 months column). Kincaid Fish Hatchery (Pike County) reported the greatest amount of precipitation for the year, 51.62 inches. Hicksville (Defiance County) reported the least amount of precipitation, 32.80 inches. An isohyetal map and regional averages with percentages of normal precipitation for the 2000 calendar year appear below.

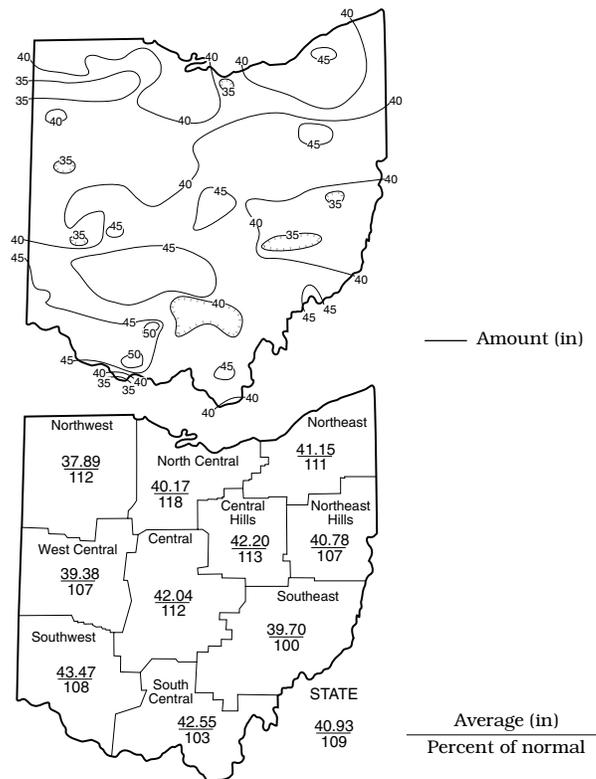
The 2000 calendar year began with above-normal precipitation during January and February across most of the state. March was noticeably dry statewide. April through June precipitation was above normal across most of Ohio. It was the 4<sup>th</sup> wettest May of record for the North Central Region, the 5<sup>th</sup> wettest May for the Northwest Region and the 8<sup>th</sup> wettest May for the Northeast Region. For June, it was the 5<sup>th</sup> wettest of record for the Northwest Region and the 7<sup>th</sup> wettest June for the North Central Region. July precipitation was above normal in areas of north-central, northeastern, south-central and southwestern Ohio, but generally below normal elsewhere. August and September precipitation was above normal throughout most of the state. Precipitation during October was above normal in much of western, central and northeastern Ohio and below normal in most of the remainder of the state. November precipitation was below normal statewide. The year ended with above normal precipitation across most of the state during December. The year's above-normal precipitation was beneficial for both water supplies and agricultural concerns statewide.

**SUMMARY**

Precipitation during December was above normal across most of the state. Streamflow was above normal in the eastern two-thirds of the state and below normal in the western third. Reservoir storage was unchanged in the Mahoning River basin and increased in the Scioto River basin. Month-end storage remained above normal in both basins. Ground water levels were nearly steady or rose throughout the state and remain below normal across most of the state. Lake Erie level declined 0.19 foot and was 0.22 foot below the long-term December average.

Precipitation during the 2000 calendar year was above normal statewide except for a few scattered locations where it was slightly below normal. Streamflow was below normal across most of the state with only a few basins in north-central Ohio having above normal flows. Reservoir storage was above normal throughout most of the year. Ground water levels were much improved from the 1999 levels. However, ground water levels in most aquifers remained below normal during the entire year with only some carbonate aquifers in western Ohio improving to above normal. Lake Erie levels were below normal during the first half of the year, at or slightly above normal from July through October, and below normal during the last two months of the year.

**PRECIPITATION 2000 CALENDAR YEAR**



**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.



DIVISION OF WATER  
 1939 FOUNTAIN SQUARE  
 COLUMBUS, OHIO 43224

- Bob Taft  
 Governor
- Samuel W. Speck  
 Director
- James R. Morris P.E.  
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