



MONTHLY WATER INVENTORY REPORT FOR OHIO

December 2004

REVISED

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

Compiled By David H. Cashell and Scott Kirk

Hydrologists
Water Inventory Unit

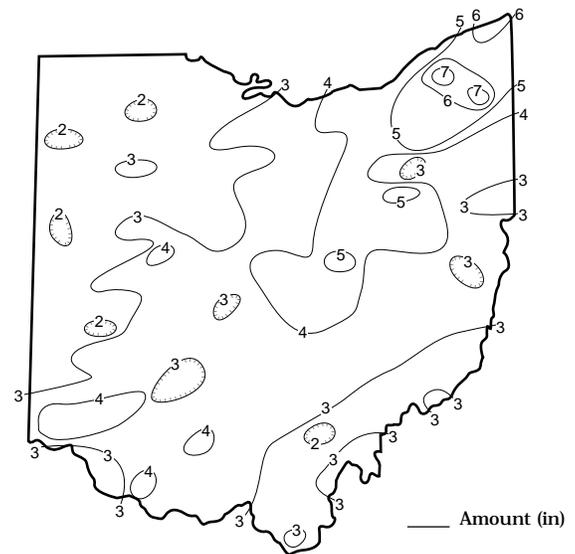
PRECIPITATION during December was above normal across most of the state, but below normal in portions of western and southeastern Ohio. The average for the state as a whole was 3.41 inches, 0.65 inch above normal. Regional averages ranged from 4.90 inches, 1.99 inches above normal, for the Northeast Region to 2.43 inches, 0.03 inch below normal, for the Northwest Region. This was the 3rd wettest December during the past 110 years for the Northeast Region and the 7th wettest for the Central Hills Region. Chardon (Geauga County) reported the greatest amount of December precipitation, 7.48 inches. Both the Dayton J. M. Cox International Airport (Montgomery County) and Carpenter (Meigs County) reported the least amount, 1.62 inches.

Most of the month's precipitation fell during two periods. The first occurred during December 6-10 when rain fell intermittently across the state resulting in amounts of 0.50-1.0 inch. The second period occurred during December 22 and 23 when a strong storm system brought a wintry mix of precipitation across the state. Precipitation fell generally as rain in the southeastern third of the state, as snow in the northwestern third, and as snow and freezing rain in the central third. Amounts of precipitation (liquid) ranged from 0.50-1.0 inch across northwestern and southeastern Ohio to 1-2 inches elsewhere. A band of heavy snow fell from western to north-central Ohio with amounts of nearly 2 feet reported in some areas. In a narrow band southeast of this line the precipitation changed from snow to freezing rain. A heavy accumulation of ice toppled trees, broke branches and snapped power lines, causing extended power outages across the area, leaving thousands of people in the dark over the Christmas holiday. Emergencies were declared by Governor Taft in twenty counties as a result of this storm. In between these 2 periods, several inches of snow fell throughout the northeast Ohio snowbelt counties. Only light precipitation fell elsewhere. Snowfall for the month was above normal across most of the state. Chardon, located in the northeast Ohio snowbelt, reported 54 inches of snow, more than twice the normal December snowfall.

Precipitation for the 2005 water year is above normal statewide. The average for the state as a whole is 9.67 inches, 1.46 inches above normal. Regional averages range from 10.87 inches, 2.01 inches above normal, for the Southwest Region to 8.16 inches, 0.57 inch above normal, for the Northwest Region.

Precipitation for the 2004 calendar year was above normal statewide except for a few locations in northwestern Ohio where it was below normal. The average for the state as a whole was 46.39 inches, 8.37 inches above normal. Regional averages ranged from 55.73 inches, 17.30 inches above normal, for the Northeast Hills Region to 35.92 inches, 1.64 inches above normal, for the Northeast Region (see Precipitation table, departure from normal, past 12 months column). For the state as a whole, 2004 was the 5th wettest year during the past 122 years. Regionally,

PRECIPITATION DECEMBER

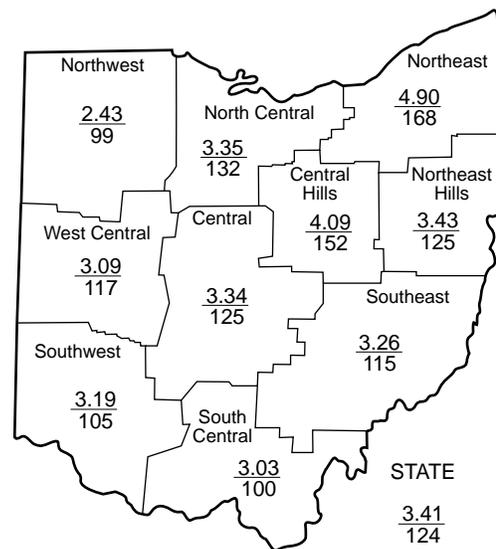


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PRECIPITATION

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	-0.03	+0.57	+2.56	+1.64	+8.88	+3.6
North Central	+0.81	+1.63	+1.52	+6.09	+12.92	+4.1
Northeast	+1.99	+0.66	+3.12	+8.09	+18.39	+5.4
West Central	+0.45	+1.75	+0.05	+2.75	+16.26	+2.7
Central	+0.67	+1.63	+2.70	+9.57	+16.81	+3.8
Central Hills	+1.40	+1.39	+4.60	+11.43	+17.66	+5.3
Northeast Hills	+0.68	+1.20	+9.51	+17.30	+26.29	+6.5
Southwest	+0.16	+2.01	+0.68	+2.87	+8.57	+2.7
South Central	-0.01	+2.07	+5.93	+8.09	+18.75	+4.2
Southeast	+0.42	+1.69	+10.51	+15.81	+25.06	+5.3
State	+0.65	+1.46	+4.12	+8.37	+16.90	

*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	This Month		
				% of Normal Past		
				3 Mos.	6 Mos.	12 Mos.
Grand River near Painesville	685	2,289	167	95	117	128
Great Miami River at Hamilton	3,630	2,701	73	70	75	109
Huron River at Milan	371	680	279	163	148	156
Killbuck Creek at Killbuck	464	610	146	95	107	133
Little Beaver Creek near East Liverpool	496	1,263	224	171	282	183
Maumee River at Waterville	6,330	7,807	165	123	121	103
Muskingum River at McConnelsville	7,422	15,830	145	262	331	151
Scioto River near Prospect	567	525	197	97	84	139
Scioto River at Higby	5,131	6,158	134	124	115	141
Stillwater River at Pleasant Hill	503	423	114	65	55	83

STREAMFLOW during December was above normal across most of the state, but below normal in southwestern Ohio. Flows were high enough to be considered excessive in many northeastern Ohio basins.

Flows at the beginning of December were above normal across most of the state, but below normal in some southwestern Ohio basins. Greatest flows for the month occurred at the beginning of the month in southeastern Ohio. Except for temporary increases noted during December 9-12 following local precipitation, flows generally decreased during the first 3 weeks of the month. Widespread precipitation during December 22-23 resulted in an increase in flows statewide. This precipitation fell as mainly snow and freezing rain across the northwestern two-thirds of the state. Greatest flows for December across this area of the state

occurred at the end of the month as warmer temperatures melted the frozen precipitation, resulting in a rapid rise in streamflow. Flows at the end of the month were above normal across nearly the entire state.

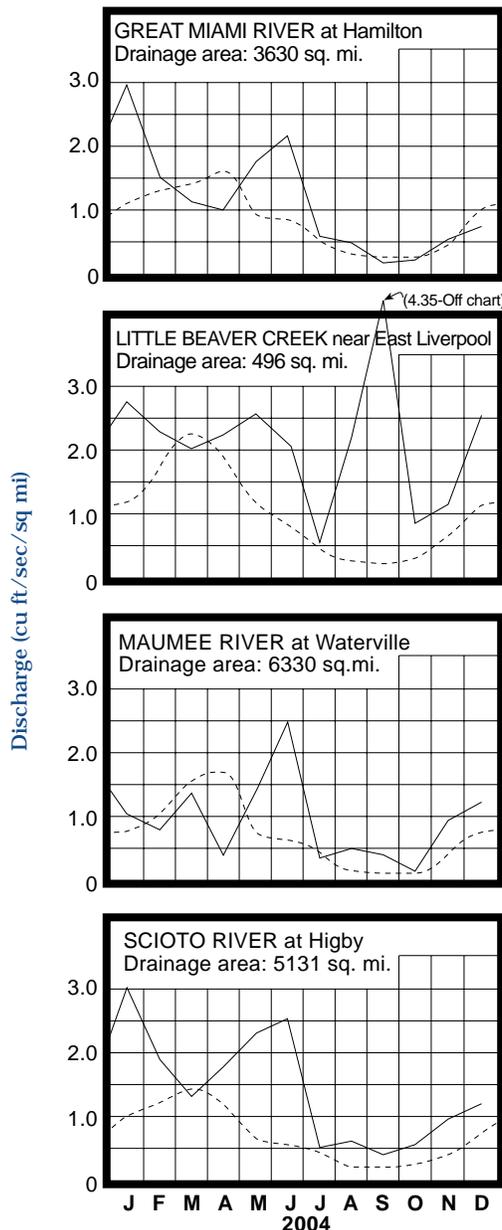
Streamflow during the 2004 calendar year was above normal across most of the state (see Mean Stream Discharge table, percent of normal, past 12 month column). Flows during January were above normal statewide as widespread flooding occurred in the central two-thirds of Ohio. Flows during February through April were generally above normal in eastern Ohio and below normal in western Ohio. Above normal flows occurred statewide during May-August. Flooding occurred in areas of eastern Ohio from the May storms and again near the end of August from torrential downpours. Flows during the last 4 months of the year were generally above normal across most of the state, but below normal in western and southwestern Ohio. Major flooding during September across eastern Ohio was the result of remnants from Hurricanes Frances and Ivan that passed through the state one week apart.

RESERVOIR STORAGE during December increased in both the Mahoning and Scioto river basins. Storage in both basins remained above normal.

Reservoir storage at the end of December in the Mahoning basin index reservoirs was 86 percent of rated capacity for water supply compared with 74 percent for last month and 80 percent for December 2003. Month-end storage in the Scioto basin index reservoirs was 110 percent of rated capacity for water supply compared with 82 percent for last month and 95 percent for December 2003.

Surface water supplies were adequate statewide during the 2004 calendar year. Storage in both the Mahoning and Scioto river basins was above normal throughout the calendar year.

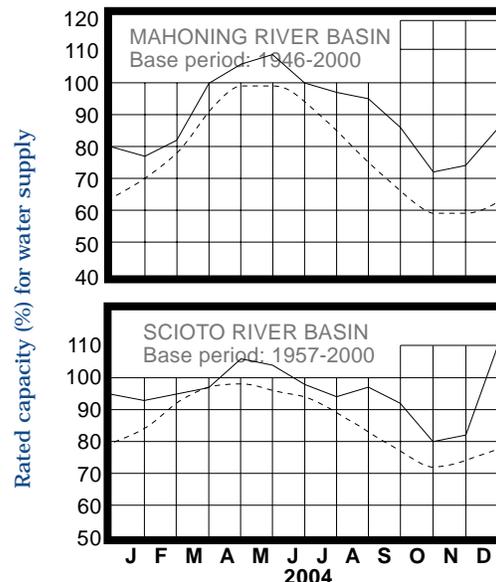
MEAN STREAM DISCHARGE



Base period for all streams: 1971-2000

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 improved statewide. Generally, levels in most aquifers were rather stable throughout the month, except in unconsolidated aquifers where levels rose during the last week of December.

The 2005 recharge season is off to a good start as far as ground water is concerned. Net changes during December from last month's levels were greater than usually observed across all but southwestern Ohio. Ground water levels remain above normal across most of the state, but continue below normal in the unconsolidated aquifers of southwestern Ohio.

The 2004 calendar year was generally favorable for ground water supplies. The calendar year started with ground water levels at above-normal levels in most aquifers across the state. Index observation well HN-2A (Hardin County), representing the carbonate aquifers of northwestern Ohio, reached a record-high level for January. Following below normal precipitation from February through late spring, levels had fallen to below normal across much of the state, especially in unconsolidated aquifers. The much above normal precipitation during May reversed the trend and by the end of the year ground water levels were above normal across most of the state. Index observation well F-1 (Fairfield County), representing sandstone aquifers in eastern and southeastern Ohio, reached a record-high level for November. However, precipitation in western Ohio during the year was not as favorable, keeping levels in unconsolidated aquifers in southwestern Ohio below normal.

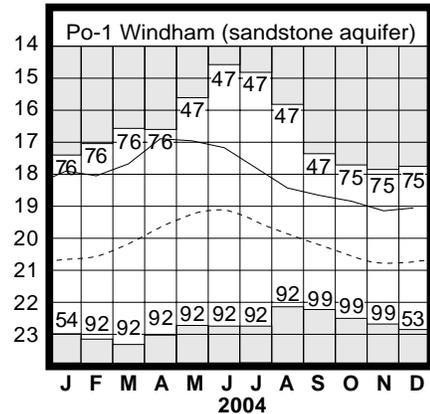
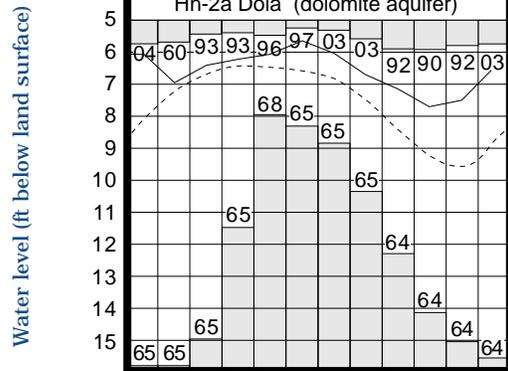
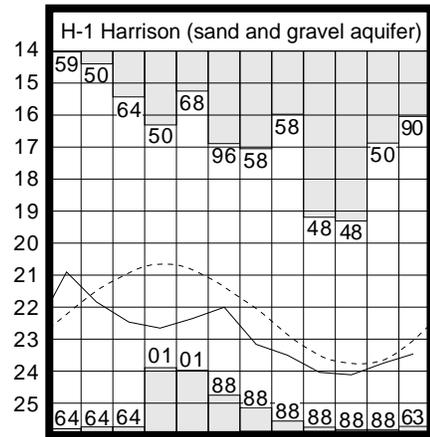
LAKE ERIE level was stable during December. The mean level for December was 570.93 feet (IGLD-1985), which is unchanged from last month's mean level and 0.10 foot above normal. This month's mean level is 0.39 foot higher than the December 2003 level and 1.73 feet above Low Water Datum.

The U.S. Army Corps of Engineers (USACE) reports that precipitation in the Lake Erie basin during December averaged 3.68 inches, which is 1.08 inches above normal. For the entire Great Lakes basin, December precipitation averaged 3.14 inches, which is 0.81 inch above normal. For calendar year 2004, the Lake Erie basin averaged 36.42 inches of precipitation, 1.52 inches above normal, while the entire Great Lakes basin averaged 34.84 inches, 2.47 inches above normal.

Lake Erie level was below normal during the first 5 months of the 2004 calendar year. Much above normal precipitation during May throughout the entire Great Lakes basin helped reverse the below normal trend and by June, the level of Lake Erie had risen to above normal for the first time since October 2000. Lake levels remained above normal throughout the remainder of the year. 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 near normal for the foreseeable future. Deviations from the anticipated weather patterns could result in the level of Lake Erie ranging from as high as 9 inches above normal to as much as 12 inches below the normal seasonal average.

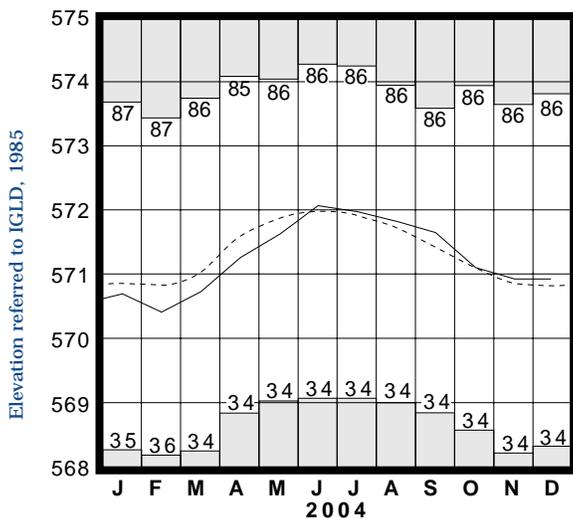
Index Well	Location	Aquifer	Mean This Month	Departure From Normal	Change in feet from:	
					Last Month	Year Ago
F-1	W. Rushville, Fairfield Co.	Sandstone	10.70	+6.39	+1.59	+1.53
Fa-1	Jasper Mill, Fayette Co.	Limestone	7.70	+0.49	+0.44	-0.04
Fr-10	Columbus, Franklin Co.	Gravel	44.35	-0.40	+0.46	+0.66
H-1	Harrison, Hamilton Co.	Gravel	23.44	-0.40	+0.31	-0.74
Hn-2a	Dola, Hardin Co.	Dolomite	6.56	+2.32	+0.94	-0.52
Po-1	Windham, Portage Co.	Sandstone	19.06	+1.68	+0.08	-0.82
Tu-1	Strasburg, Tuscarawas Co.	Gravel	12.85	+0.64	+0.70	-0.13

GROUND-WATER LEVELS



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

LAKE ERIE LEVELS



□ Record high and low, year of occurrence

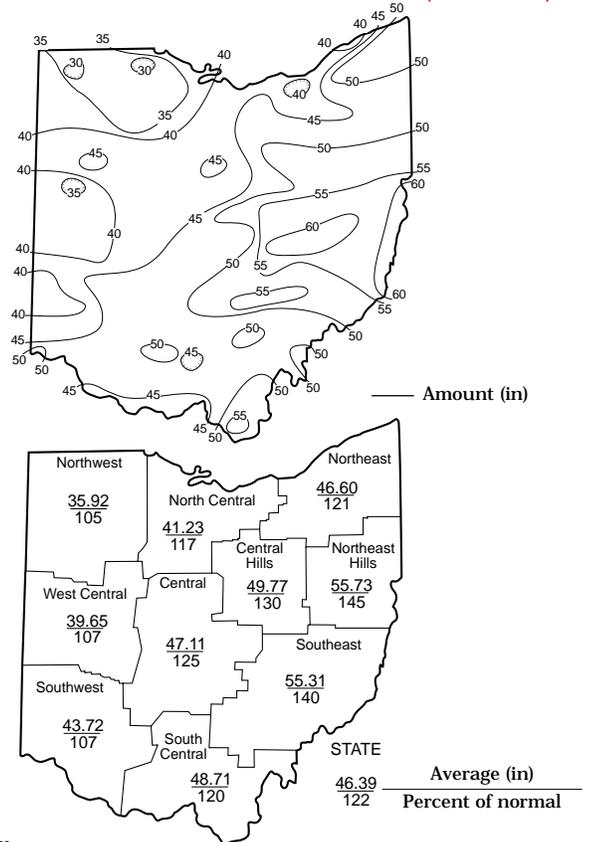
Normal - - - - Current ———

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this was the wettest year of record for both the Northeast Hills and Southeast regions. It was also the 2nd wettest for the Central Hills Region, the 4th wettest for the Central Region and the 5th wettest for the Northeast Region. Dillon Dam (Muskingum County) reported the greatest amount of precipitation for the 2004 calendar year, 61.72 inches. Toledo Express Airport (Lucas County) reported the least amount of precipitation, 29.56 inches. An isohyetal map and regional averages with percentages of normal precipitation for the 2004 calendar year appear below.

The 2004 calendar year got off to a wet start as locally heavy rain during early January brought widespread moderate flooding, resulting in a Presidential Disaster Declaration in 14 central, east-central, and southeastern Ohio counties. Precipitation was below normal statewide during February and in western Ohio during March and April. Precipitation during May was noticeably above normal ending as the 2nd wettest May of record for the state as a whole. Eight counties in northeastern and southeastern Ohio were declared disaster areas due the flooding and related storm damage from storms during the month. Precipitation during June, July, and August was above normal across all but southwestern and south-central Ohio. Torrential downpours near the end of August resulted in flash flooding across portions of the Northeast Hills Region. September precipitation was markedly above normal in eastern Ohio, but much below normal in western Ohio. This was the wettest September of record for both the Southeast and South Central regions and the 2nd wettest for the Northeast Hills Region, while in contrast it was the 10th driest in the West Central and Southwest regions. Major flooding occurred in eastern Ohio during September from the passage of remnants from Hurricanes Frances and Ivan, resulting in a Presidential Disaster Declaration for 20 eastern and southeastern Ohio counties. Total precipitation during the last 3 months of 2004 was above normal statewide. The above normal precipitation during 2004 was beneficial for water supplies across the state. However, for the second year in a row, it also resulted in considerable property damage from the subsequent flooding and other storm related damages.

PRECIPITATION 2004 CALENDAR YEAR (REVISED)



SUMMARY

Precipitation during December was above normal across most of the state, but below normal in portions of western and southeastern Ohio. Streamflow was above normal throughout most of the state. Reservoir storage increased and remained above normal in both the Mahoning and Scioto river basins. Ground water levels rose statewide and were above normal across most of Ohio. Lake Erie level was unchanged and was 0.10 foot above the long-term December average.

Precipitation during the 2004 calendar year was above normal nearly statewide and was the 5th wettest for the state as whole during the past 122 years. Streamflow was above normal across most of Ohio. Reservoir storage was above normal the entire year in both the Mahoning and Scioto river basins. Ground water levels began and finished the year above normal in most aquifers across the state. Lake Erie level rose during the year and ended 2004 above normal.

ACKNOWLEDGMENTS



Division of Water
2045 Morse Rd., Bldg E-1
Columbus, Ohio 43229-6693



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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