MONTHLY WATER INVENTORY REPORT FOR OHIO

December 2002

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

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PRECIPITATION during December was below normal across much of the state, but above normal in southwestern and extreme northeastern Ohio. The average for the state as a whole was 2.70 inches, 0.06 inch below normal. Regional averages ranged from 3.59 inches, 0.56 inch above normal, for the Southwest Region to 2.14 inches, 0.32 inch below normal, for the Northwest Region. Cincinnati Fernbank (Hamilton County) reported the greatest amount of December precipitation, 4.73 inches. Hicksville (Defiance County) reported the least amount, 1.29 inches.

Precipitation during December fell as rain, snow and a wintry mix. Snowfall for the month was near or slightly above normal statewide. Conditions were rather dry during the first 10 days of December with the precipitation falling as snow. Only meager amounts of snow were reported across most of the state during this period. However, on December 2-3 heavier snow fell across extreme northern Ohio with 4-8 inches (0.25-0.50 inch liquid, melted) reported. A wintry mix of precipitation fell on December 11 and 13 bringing 0.5-1.0 inch of precipitation to the state, except in northwestern Ohio where a lesser amount fell. Widespread rain on December 19 was greatest in southwestern Ohio where up to 2 inches was reported. Precipitation amounts generally decreased to the north and east with around 0.50 inch reported in northeastern Ohio. Precipitation during December 24-25 was greatest over the northern half of the state where 0.5-1.0 inch (liquid, melted) fell while 0.25 inch or less fell in southern Ohio. Precipitation during this period fell as a wintry mix in the southern half of the state and as snow in the northern half. Snow accumulations ranged from 1-2 inches in southern Ohio to 5-10 inches across northern Ohio. Showers during December 30-31 produced 0.5-1.0 inch of rain across most of the state, except in northwestern Ohio where around 0.25 inch was reported.

Precipitation for the 2003 water year is above normal across the southern two-thirds of Ohio and below normal in the northern third. The average for the state as a whole is 8.52 inches, 0.31 inch above normal. Regional averages range from 10.91 inches, 2.50 inches above normal, for the South Central Region to 6.47 inches, 1.12 inches below normal, for the Northwest Region (see Precipitation table, departure from normal, past 3 months column).

Precipitation for the 2002 calendar year was generally above normal in the southern half of the state and below normal in the northern half. The average for the state as a whole was 38.20 inches, 0.18 inch above normal. Regional averages ranged from 45.27 inches, 4.42 inches above normal, for the Southwest Region to 30.81 inches, 3.47 inches below normal, for the Northwest Region (see Precipitation table, departure from normal, past 12 months column). Wilmington (Clinton County) reported the greatest of precipitation for the year, 53.14 inches. Bowling Green (Wood County) reported the least amount, 28.94 inches.

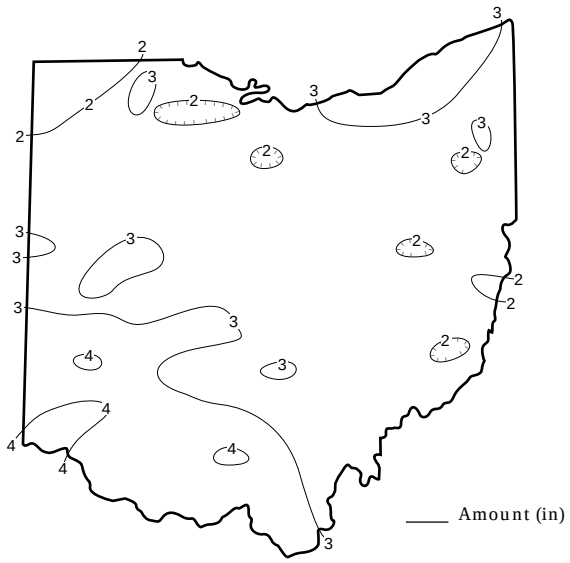
(continued on back)

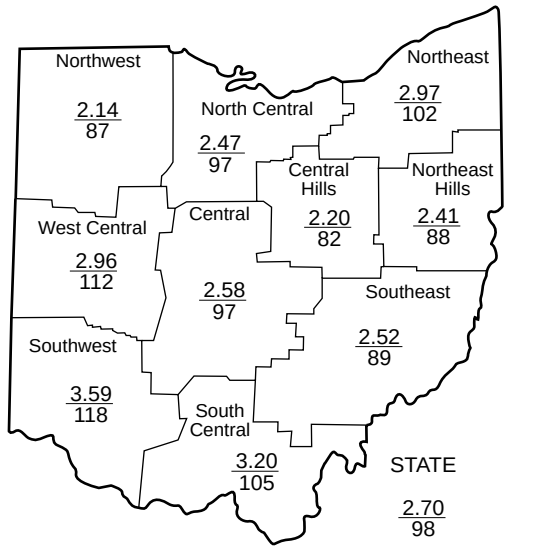
PRECIPITATION

Region	DEPARTURE FROM NORMAL (IN.) Base period 1951-2000					Palmer Drought Severity Index*
	This Month	Past 3 Mos.	Past 6 Mos.	Past 12 Mos.	Past 24 Mos.	
Northwest	-0.32	-1.12	-3.14	-3.47	-0.59	-1.9
North Central	-0.07	-0.42	-1.23	-0.22	-2.75	+1.3
Northeast	+0.06	-0.55	-2.51	-0.77	-6.71	+0.6
West Central	+0.32	+0.17	-2.12	-0.41	+4.29	+1.2
Central	-0.09	+0.26	+0.49	+0.70	+1.60	+2.4
Central Hills	-0.49	-0.62	-3.01	-1.69	-5.45	-0.3
Northeast Hills	-0.34	+0.32	-2.57	-2.63	-5.89	+0.8
Southwest	+0.56	+0.92	+0.84	+4.42	+6.99	+3.0
South Central	+0.16	+2.50	+0.93	+4.61	+0.64	+2.8
Southeast	-0.32	+1.64	-0.42	+1.51	+2.11	+2.3
State	-0.06	+0.30	-1.29	+0.18	-0.61	

*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



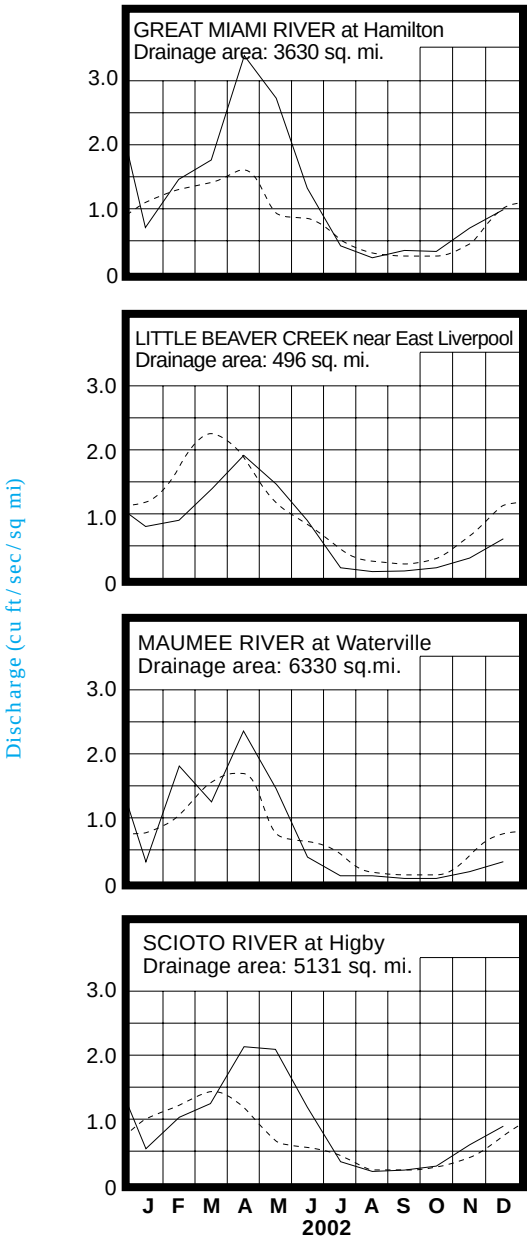


MEAN STREAM DISCHARGE

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	860	63	39	32	77
Great Miami River at Hamilton	3,630	3,575	97	93	82	117
Huron River at Milan	371	515	211	109	74	84
Killbuck Creek at Killbuck	464	204	49	44	39	71
Little Beaver Creek near East Liverpool	496	310	55	41	36	63
Maumee River at Waterville	6,330	2,034	43	29	27	77
Muskingum River at McConnelsville	7,422	4,671	43	85	79	73
Scioto River near Prospect	567	488	183	79	59	88
Scioto River at Higby	5,131	4,507	98	80	67	88
Stillwater River at Pleasant Hill	503	215	58	29	26	91

MEAN STREAM DISCHARGE



Base period for all streams: 1971-2000

STREAMFLOW during December was below normal across much of the state, but was above normal in north-central, central and south central Ohio basins. Flows were low enough to be considered deficient in some eastern Ohio basins.

Flows at the beginning of the month were below normal across most of the state. Flows decreased during the first 10 days, then increased statewide following precipitation that fell on December 11 and December 13. Low flows occurred across the state just prior to this precipitation. Flows increased rapidly in response to the widespread rain that fell on December 19. As a result of this rain, greatest flows for the month occurred during December 20-22 across the state except in west-central and northeastern Ohio. Following these peaks, flows declined for a few days before increasing again near the end of the month due to melting snow and rain that fell during the last 2 days of December. Greatest flows for the month occurred at month's end in west-central and northeastern Ohio. Due to the precipitation that fell at the end of the month, streamflow in the northwestern half of the state increased to above normal, but it remained below normal elsewhere.

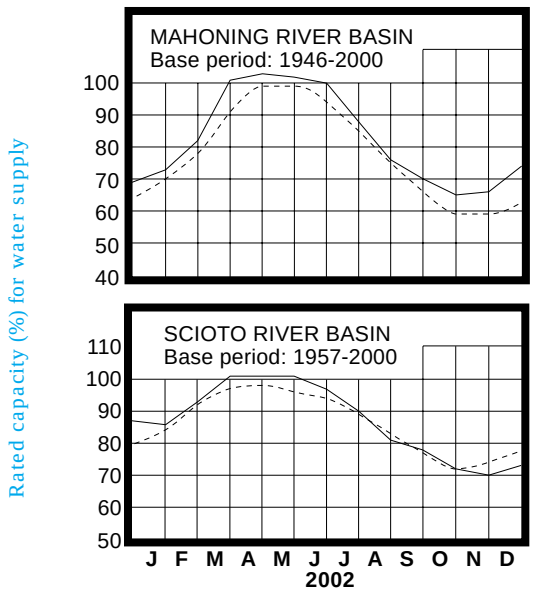
Streamflow for the 2002 calendar year was below normal statewide except in southwestern Ohio where it was above normal (see Mean Stream Discharge table, percent of normal, past 12 months column). Flows were noticeably below normal statewide during January and below normal in the eastern half of Ohio during February and March. However, flows were above normal in the western half of the state during February and March, and included flash flooding in extreme southern Ohio following heavy rains on March 19-20. During April-June, flows were generally above normal throughout the state, but in contrast, were below normal during July-September. Flows were below normal in the northern half of the state during October, in eastern and northwestern Ohio during November and much of the state during December.

RESERVOIR STORAGE during December increased in both the Mahoning and Scioto river basins. Storage at the end of the month was above normal in the Mahoning River basin and below normal in the Scioto River basin.

Reservoir storage at the end of December in the Mahoning basin index reservoirs was 74 percent of rated capacity for water supply compared with 66 percent for last month and 69 percent for December 2001. Month-end storage in the Scioto basin index reservoirs was 73 percent of rated capacity for water supply compared with 70 percent for last month and 87 percent for December 2001.

Surface water supplies were adequate statewide during the 2002 calendar year. Storage in the Mahoning River basin was above normal throughout the year. Storage in the Scioto River basin was above normal through most of the year, but dropped to below normal during late summer and then again during November and December.

RESERVOIR STORAGE FOR WATER SUPPLY



Normal – – – – Current ———

GROUND WATER levels during December generally rose in the southern half of Ohio and declined in the northern half. Levels in most aquifers in southern Ohio rose more than usually observed for December while aquifers in northern Ohio were still anticipating the start of the recharge season. Levels in aquifers across the state were rather stable or declined during the first half of the month and then rose during the second half, most notably after December 19.

Although storage in many aquifers was below normal throughout the year, ground water supplies across the state were adequate during 2002. The year began with ground water storage at below normal levels across most of the state with just a few aquifers in western Ohio having above normal levels. Below normal precipitation during the winter months provided little opportunity for significant recharge and ground water levels remained below normal across most of the state. Above normal precipitation during the late spring was beneficial to ground water supplies statewide, raising levels to above normal in western Ohio. However, levels quickly returned to below normal across most of the state as unusually dry conditions prevailed during the summer months. In southern Ohio, ground water levels rebounded from their seasonal lows during the last 3 months of 2002 as above normal precipitation during the second half of September and October in that area of the state had a positive impact. Conversely, ground water levels in northern Ohio have not rebounded as persistent below normal precipitation created unfavorable conditions for any sustained recharge. At the end of 2002, ground water levels remain below normal across most of the state, ranging from near normal in some aquifers in southern Ohio to nearly 4 feet below normal in the carbonate aquifers of northwestern Ohio. With near normal precipitation and other climatic conditions during the next several months, the prospects for a favorable recharge season would be enhanced.

LAKE ERIE level declined during December. The mean level was 570.28 feet (IGLD-1985), 0.09 foot lower than last month's level and 0.55 foot below normal. This month's mean level is 0.19 foot lower than the December 2001 level and 1.08 feet above Low Water Datum.

The U.S. Army Corps of Engineers (USACE) reports that precipitation in the Lake Erie basin during December averaged 3.13 inches, which is 0.52 inch above normal. The entire Great Lakes basin averaged 1.67 inches during December, which is 0.66 inch below normal. For calendar year 2002, the Lake Erie basin averaged 35.14 inches of precipitation, 0.15 inch above normal, while the entire Great Lakes basin averaged 31.79 inches, 0.57 inch below normal.

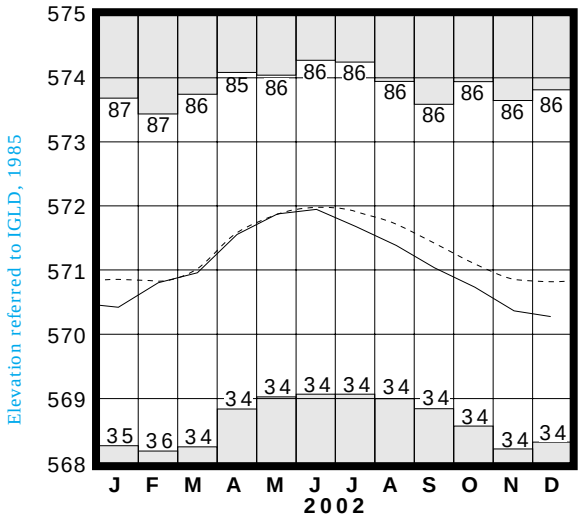
Lake Erie level was below normal nearly the entire 2002 calendar year. The lake level rose to near normal during late spring as the entire Great Lakes basin benefited from above normal precipitation that fell during the spring months. However, as precipitation amounts fell short of normal in the Great Lakes basin during the summer and fall months, the seasonal decline of Lake Erie's level was greater than normal during this period. As a result, levels remained below normal through the end of the year. The 2002 levels of Lake Erie were higher than the 2001 levels during most of the year, buoyed initially by the autumn 2001 precipitation and then further by the spring 2002 precipitation. But by the end of the year the level of Lake Erie had declined to a level lower than the 2001 year-end level.

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	17.01	+0.08	+0.92	+0.64
Fa-1	Jasper Mill, Fayette Co.	Limestone	8.59	-0.40	+1.17	-0.19
Fr-10	Columbus, Franklin Co.	Gravel	45.67	-1.72	+0.41	+0.16
H-1	Harrison, Hamilton Co.	Gravel	23.34	-0.30	+0.24	-2.11
Hn-2a	Dola, Hardin Co.	Dolomite	12.82	-3.94	+0.36	-6.08
Po-1	Windham, Portage Co.	Sandstone	21.28	-0.54	-0.22	+0.11
Tu-1	Strasburg, Tuscarawas Co.	Gravel	16.28	-2.79	-0.01	-0.28

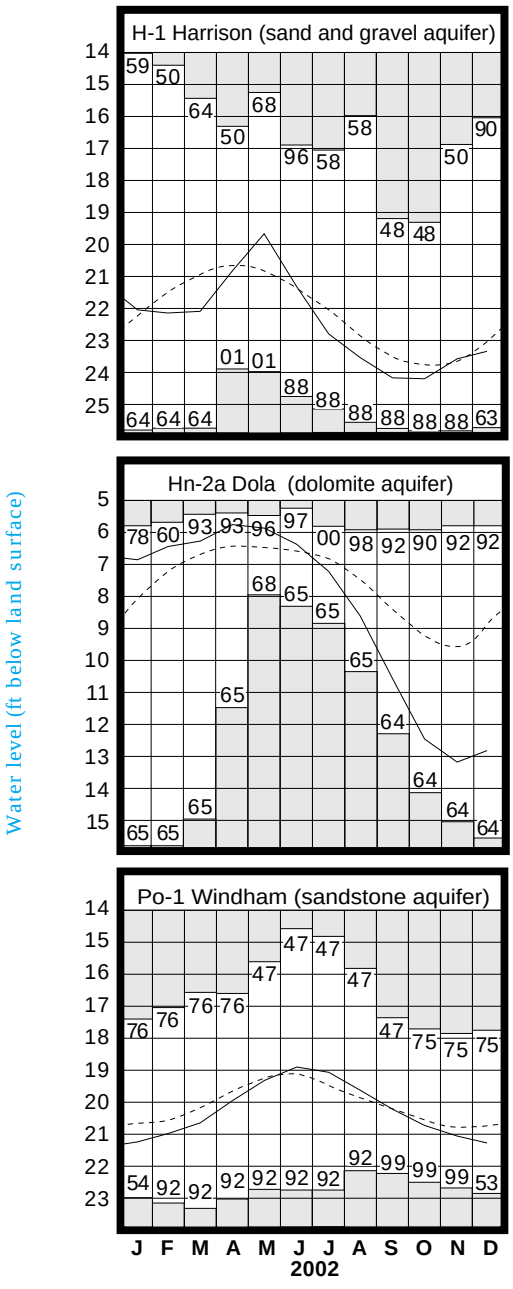
LAKE ERIE LEVELS



Base period: 1918-2000

Record high and low, year of occurrence

GROUND-WATER LEVELS



Base periods: H-1, 1951-2000. Hn-2a, 1955-2000. Po-1, 1947-2000

Record high and low, year of occurrence

Normal– – – – Current———

(Precipitation continued from front)

The 2002 calendar year got off to a rather dry start across most of the state during January and in all but northern Ohio during February. It was the 10th driest February during the past 107 years for the South Central Region and the 14th driest for the Southeast Region. Above normal precipitation prevailed during the spring months with this being the 13th wettest spring (March-May) during the past 120 years for the state as a whole. Regionally, 8 of Ohio's 10 climatic regions' spring precipitation total ranked among the top 20 wettest for the period of record. Conversely, the summer season (June-August) was among the driest on record with 8 of the state's 10 climatic regions precipitation totals ranking in the top 20 driest for the period of record. The dry conditions continued during the first half of September, but noticeably above normal precipitation fell during the second half. October precipitation was above normal across much of the state, but was below normal in the northern third. It was the 11th wettest October for the Southeast Region and the 13th wettest for the South Central Region. November precipitation was near normal across much of the state. December precipitation was below normal across much of the state, but above normal in southwestern and extreme northeastern Ohio. The 2002 calendar year was adequate, but not exceptional, for water supplies. However, agricultural concerns were hampered by the contrasting conditions that existed during 2002. The wet conditions during late spring delayed spring planting. Then, the unusually dry conditions during the heart of the growing season adversely affected crop and pasture development, greatly reducing yields.

PRECIPITATION 2002 CALENDAR YEAR

SUMMARY

Precipitation during December was below normal across much of the state, but above normal in southwestern and extreme northeastern Ohio. Streamflow was below normal throughout most of the state, but above normal in north-central, central and south central Ohio. Reservoir storage increased statewide. Ground water levels rose in southern Ohio and declined in northern Ohio. Ground water levels remain below normal across most of the state. Lake Erie level declined 0.09 foot and was 0.55 foot below the long-term December average.

Precipitation for the 2002 calendar year was generally above normal in the southern half of Ohio and below normal in the northern half. The year was one of contrast, being noticeably wet during the spring and exceptionally dry during the winter and summer. Streamflow was below normal statewide except in southwestern Ohio where it was above normal. Reservoir storage was above normal the entire year in the Mahoning River basin, and the Scioto River basin was above normal most of the year, but dropped to below normal by year's end. Ground water storage was below normal for much of the year statewide. Lake Erie level was higher during most of 2002 than last years level, but by the end of the year had declined to a level lower than the 2001 year-end level.

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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