



MONTHLY WATER INVENTORY REPORT FOR OHIO

December 2003

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

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PRECIPITATION during December was above normal across most of the state, but below normal in southwestern Ohio. The average for the state as a whole was 2.85 inches, 0.09 inch above normal. Regional averages ranged from 3.31 inches, 0.77 inch above normal, for the North Central Region to 2.26 inches, 0.77 inch below normal, for the Southwest Region. Chardon (Geauga County) reported the greatest amount of December precipitation, 4.69 inches. Troy (Miami County) reported the least amount, 1.12 inches.

Precipitation during December fell as both rain and snow and occurred during every week of the month. Precipitation on December 5 fell as mostly rain in southern Ohio and as snow in northern Ohio. Precipitation amounts of 0.25-0.50 inch fell across most of the state with slightly higher amounts in northeastern Ohio where snow accumulated to between 3 and 8 inches. Widespread precipitation around December 10 brought generally 0.5-1.0 inch of rain with somewhat lesser amounts in extreme western and northeastern Ohio. Several days of light precipitation, falling mostly as snow, occurred during December 13-19, with amounts ranging from 0.25-0.50 inch (liquid, melted) across all but northeastern Ohio, where 0.50-1.0 inch was common. Heavy lake-effect snow fell in the northeast Ohio snowbelt counties during December 18-20 where 1-2 feet of snow was reported in some areas. Precipitation on December 23 began as rain statewide and ended as snow in northern Ohio on December 24-25. Generally, 0.25-0.50 inch fell across southern Ohio and 0.50-1.0 inch across northern Ohio. Rain on December 29-30 brought around 0.50 inch to most of the state. Snowfall for the month was above normal in northeastern Ohio and near normal elsewhere. Chardon (Geauga County) reported 41.5 inches of snow, which is about 160 percent of normal. Several stations in northeast Ohio reported more than double their normal December snowfall.

Precipitation for the 2004 water year is above normal across most of the state with only the Northwest, Southwest and Central Hills regions having below normal precipitation. The average for the state as a whole is 8.96 inches, 0.75 inch above normal. Regional averages range from 11.06 inches, 2.65 inches above normal, for the South Central Region to 7.36 inches, 0.23 inch below normal, for the Northwest Region.

Precipitation for the 2003 calendar year was above normal statewide. The average for the state as a whole was 46.55 inches, 8.53 inches above normal. This ranks 2003 as the 5th wettest year during the past 121 years of record. Regional averages ranged from 51.28 inches, 10.66 inches above normal, for the South Central Region to 41.19 inches, 6.91 inches above normal, for the Northwest Region (see Precipitation table, departure from normal, past 12 months column). Regionally, 9 of the state's 10 climatic regions ranked in their top 10 wettest years of record

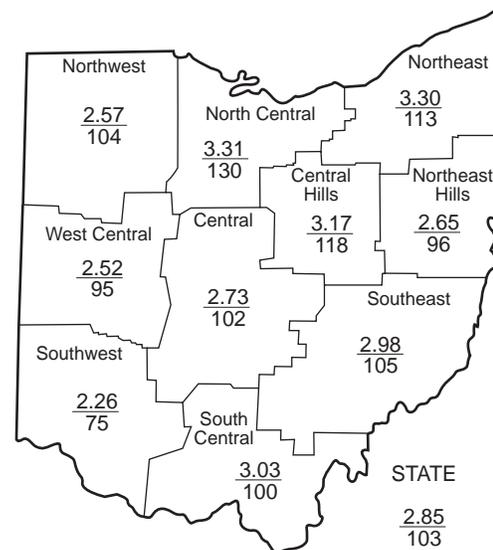
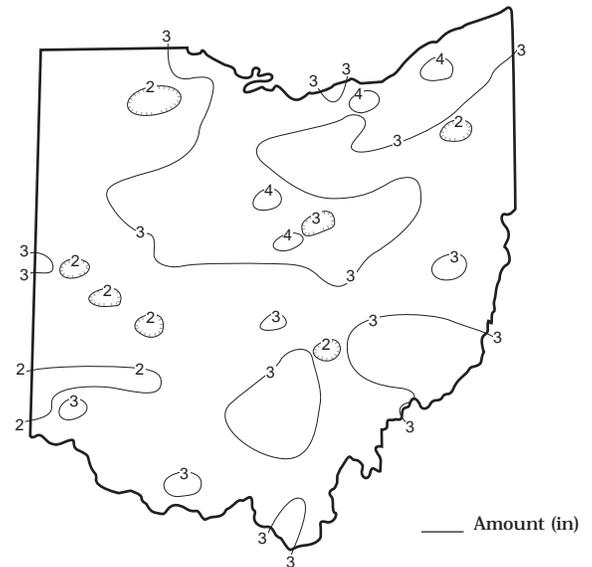
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PRECIPITATION

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	+0.11	-0.23	+7.12	+7.24	+3.77	+4.2
North Central	+0.77	+1.63	+6.48	+6.85	+6.63	+4.2
Northeast	+0.39	+0.30	+7.88	+10.38	+9.61	+5.2
West Central	-0.12	+1.53	+13.02	+13.47	+13.06	+5.6
Central	+0.06	+0.09	+6.66	+7.24	+7.94	+4.7
Central Hills	+0.48	-0.52	+6.66	+5.93	+4.24	+4.1
Northeast Hills	-0.10	+0.36	+9.38	+8.99	+6.36	+4.9
Southwest	-0.77	-0.62	+5.58	+5.70	+10.12	+4.6
South Central	-0.01	+2.65	+7.18	+10.66	+15.27	+4.8
Southeast	+0.14	+2.10	+8.98	+9.25	+10.76	+5.4
State	+0.09	+0.75	+7.87	+8.53	+8.71	

*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

PRECIPITATION DECEMBER



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	1,987	145	128	156	149
Great Miami River at Hamilton	3,630	6,866	187	204	279	161
Huron River at Milan	371	973	399	265	232	173
Killbuck Creek at Killbuck	464	864	207	170	221	133
Little Beaver Creek near East Liverpool	496	1,037	184	190	307	146
Maumee River at Waterville	6,330	10,690	225	161	256	146
Muskingum River at McConnelsville	7,422	14,940	137	256	312	108
Scioto River near Prospect	567	1,510	566	273	329	184
Scioto River at Higby	5,131	8,848	193	168	203	136
Stillwater River at Pleasant Hill	503	765	206	232	334	151

STREAMFLOW during December was above normal statewide. Flows were high enough to be considered excessive throughout most of the state. Flows during December increased seasonally from the November flows across most of Ohio.

Flows at the beginning of December were above normal statewide. Greatest flows occurred generally on the first day of the month across the southern half of Ohio following precipitation that fell near the end of November. Flows decreased during the next 9 days before increasing statewide around December 10 in response to precipitation. Flows were generally stable statewide during the remainder of the month with rises noted following precipitation, most notably around December 17, 24 and 29. Greatest flows for the month in northern Ohio occurred during December 24-30. Low flows for the month occurred December 22-24 throughout most of the state, just prior to precipitation that fell on December 23. Flows statewide remained noticeably above normal at the end of the month.

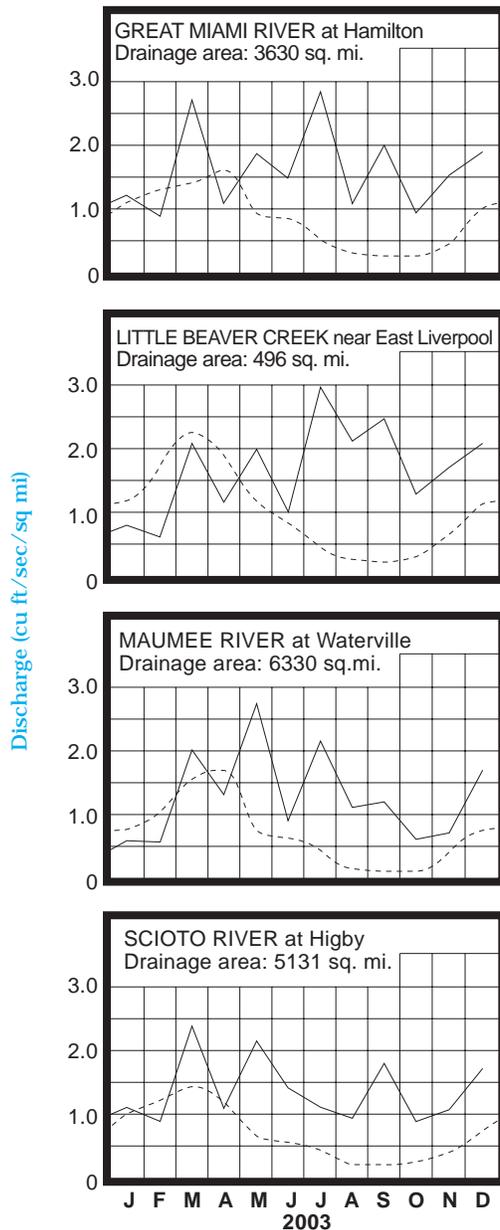
Streamflow during the 2003 calendar year was above normal statewide (see Mean Stream Discharge table, percent of normal, past 12 months column). Flows were below normal across most of the state during January and February. Flows were above normal across most of Ohio during March, but were again below normal nearly statewide during April. Beginning in May, streamflow was above normal statewide or nearly statewide every month during the remainder of the year. During much of this time, flows were high enough to be considered excessive. Record-high monthly flows were established at several gauging stations during the May-September period. Significant flooding occurred during this period, most notably in western and northeastern Ohio during July and central and south-central Ohio during August. This flooding prompted a presidential disaster declaration for 20 Ohio counties.

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

Reservoir storage at the end of December in the Mahoning basin index reservoirs was 80 percent of rated capacity for water supply compared with 85 percent for last month and 74 percent for December 2002. Month-end storage in the Scioto basin index reservoirs was 95 percent of rated capacity for water supply compared with 89 percent for last month and 73 percent for December 2002.

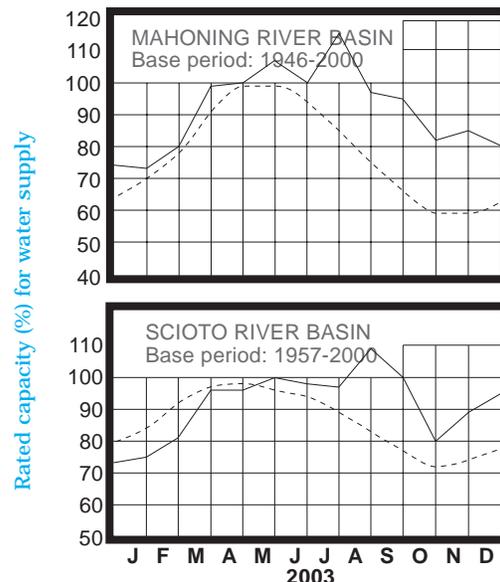
Surface water supplies were adequate statewide during the 2003 calendar year. Storage in the Mahoning River basin was above normal the entire year. Storage in the Scioto River basin was below normal from January through April, and then above normal from May through year's end.

MEAN STREAM DISCHARGE



Base period for all streams: 1971-2000

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 December rose seasonally statewide. Levels in most aquifers remained relatively stable or rose slightly the entire month, declining only temporarily in some unconsolidated aquifers between periods of precipitation.

Ground water levels at the end of 2003 were much improved from those at the end of 2002, ranging up to nearly 7 feet above the December 2002 levels. However, following a less than favorable recharge season, ground water levels remained below normal across most of the state during the first 5 months of the year. The ground water situation began to improve with the much above normal precipitation that fell during May. The May-September period was unusually wet, reducing the demand on water supplies during the summer high-use period. By the end of September, ground water levels had rebounded to above normal across most of the state. The lasting affects of this wet period combined with the normally expected precipitation during the last 3 months of the year has enhanced the 2004 recharge season to this point, enabling ground water supplies to remain above normal across nearly the entire state. Observation well HN-2A (Hardin County), representing the carbonate aquifers of northwestern Ohio, reached a monthly record-high level during July, August and December. Conditions appear favorable for continued improvement in ground water storage during the remainder of the current recharge period provided precipitation and other climatic conditions are near normal.

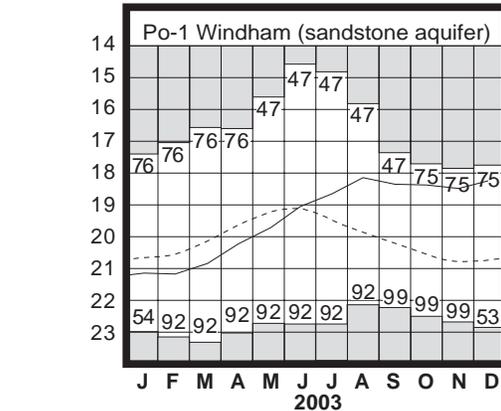
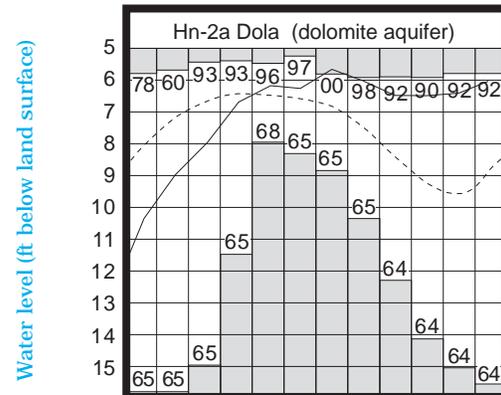
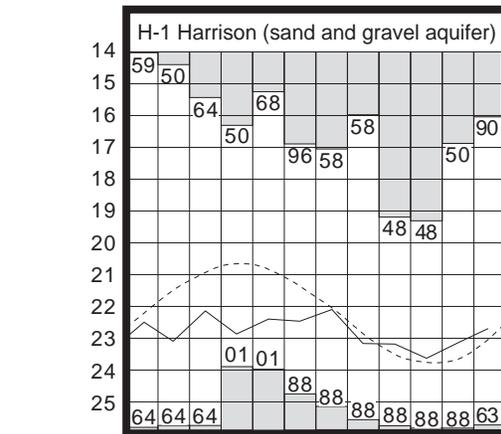
LAKE ERIE level rose during December. The mean level was 570.54 feet (IGLD-1985), 0.10 foot higher than last month's mean level and 0.29 foot below normal. This month's mean level is 0.26 foot higher than the December 2002 level and 1.34 feet above Low Water Datum.

The U. S. Army Corps of Engineers (USACE) reports that precipitation in the Lake Erie basin during December averaged 3.21 inches, which is 0.60 inch above normal. For the entire Great Lakes basin, December precipitation averaged 2.25 inches, which is 0.09 inch below normal. For calendar year 2003, the Lake Erie basin averaged 37.67 inches of precipitation, which is 2.68 inches above normal, while the entire Great Lakes basin averaged 32.98 inches, which is 0.61 inch above normal.

Lake Erie level was below normal throughout the entire 2003 calendar year. This trend should continue as the USACE predicts that based on the current condition of the Great Lakes basin and anticipated weather conditions, the level of Lake Erie should range between 3-6 inches below the long-term seasonal average for the foreseeable future. Deviations from the anticipated weather patterns could result in the level of Lake Erie ranging from 4 inches above to 17 inches below the normal seasonal level.

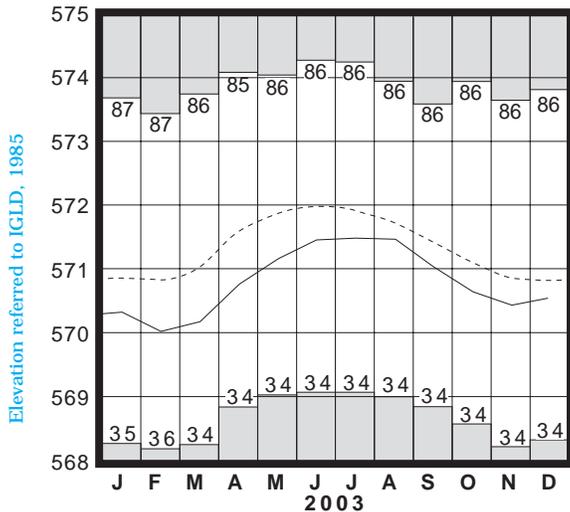
Index Well	Location	Aquifer	Mean This Month	Departure From Normal	Change in feet from:	
					Last Month	Year Ago
F-1	W. Rushville, Fairfield Co.	Sandstone	12.23	+4.86	+1.93	+4.78
Fa-1	Jasper Mill, Fayette Co.	Limestone	7.66	+0.53	+0.27	+0.93
Fr-10	Columbus, Franklin Co.	Gravel	45.01	-1.06	+0.50	+0.66
H-1	Harrison, Hamilton Co.	Gravel	22.70	+0.34	+0.43	+0.64
Hn-2a	Dola, Hardin Co.	Dolomite	6.04	+2.84	+0.37	+6.78
Po-1	Windham, Portage Co.	Sandstone	18.24	+2.50	+0.25	+3.04
Tu-1	Strasburg, Tuscarawas Co.	Gravel	12.72	+0.77	+0.16	+3.56

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



Base period: 1918-2000
Record high and low, year of occurrence

Normal - - - - Current ———

(Precipitation continued from front)

including: 2nd wettest for the West Central Region; 3rd wettest for the Northeast Region; 4th wettest for the Northeast Hills and South Central regions; 5th wettest for the Northwest Region; and the 6th wettest for the Southeast Region. South Point (Lawrence County) reported the greatest amount of precipitation during 2003, 61.80 inches. Lancaster (Fairfield County) reported the least amount, 34.37 inches. An isohyetal map and regional averages with percentages of normal precipitation for the 2003 calendar year appear below.

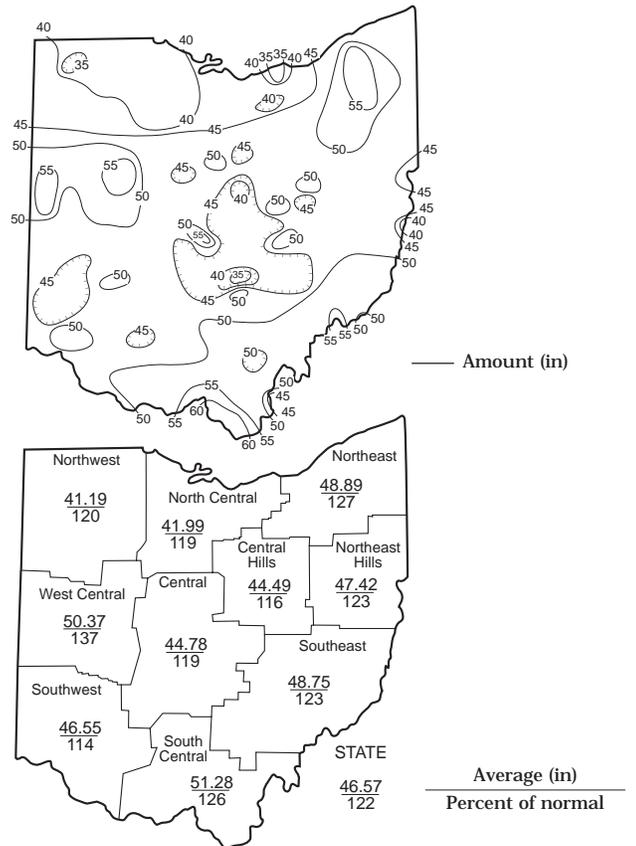
The 2003 calendar year got off to a dry start with only February receiving above normal precipitation during the first 4 months of the year. March was the 7th driest during the past 109 years for the Southeast Region and the 11th driest for the South Central Region. Precipitation was notably above normal statewide during May, ranking as the 3rd wettest May for the state as a whole. Regionally, all 10 of the state's climatic regions ranked in their top 20 wettest May's of record, including 8 ranking in the top 10. June precipitation was above normal across much of Ohio, but below normal in northwestern and east-central Ohio. Precipitation during July was above normal throughout most of the state, ranking as the 4th wettest July for the state as whole. Seven of the state's 10 climatic regions ranked in the top 10 wettest July's on record. August precipitation was above normal across all but northeastern Ohio and was the 17th wettest for the state as a whole. It was the 3rd wettest August for the West Central Region and the 9th wettest for the Central Region. Precipitation during September was noticeably above normal statewide and was the 2nd wettest for the state as a whole. Regionally, all 10 of the state's climatic regions ranked in the top 10 wettest September's of record. The May-September 2003 period ranked as the wettest of record for the state as a whole. All 10 of the state's climatic regions ranked in the top 3 wettest May-September periods of record. Precipitation during the last 3 months of the year was above normal across most of the state, but generally below normal in the Northwest, Southwest and Central Hills regions. The above normal precipitation during 2003 was beneficial for water supplies, but also resulted in considerable property damage from extensive flooding.

SUMMARY

Precipitation during December was above normal across most of the state, but below normal in southwestern Ohio. Streamflow was above normal statewide and was high enough to be considered excessive across most of the state. Reservoir storage decreased in the Mahoning River basin, increased in the Scioto River basin and remained above normal in both basins. Ground water levels rose statewide and were above normal throughout most of the state. Lake Erie level rose 0.10 foot and was 0.29 foot below the long-term December average.

Precipitation and streamflow during the 2003 calendar year were noticeably above normal statewide. Surface water supplies were in good shape throughout the year. Ground water levels at the end of 2003 improved considerably during the year and were above normal across most of the state. Lake Erie level was below normal the entire year.

PRECIPITATION 2003 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, Miskisungum 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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