MONTHLY WATER INVENTORY REPORT FOR OHIO

May 2004

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

Compiled By David H. Cashell and Scott Kirk
Hydrologists
Water Inventory Unit

PRECIPITATION during May was markedly above normal statewide. The average for the state as a whole was 7.01 inches, 3.10 inches above normal. Regional averages ranged from 8.09 inches, 4.58 inches above normal, for the North Central Region to 6.31 inches, 2.15 inches above normal, for the South Central Region. For the state as a whole this was the 2nd wettest May during the past 122 years. Regionally, this ranked as the wettest May of record for the North Central Region. Also, this was the 2nd wettest May for the Northeast Region, 3rd wettest for the Central Hills Region, 4th wettest for the Central Region, 5th wettest for the Northwest and Northeast Hills regions, tied for the 6th wettest for the Southeast Region, 7th wettest for the West Central Region, 9th wettest for the Southwest Region and 12th wettest for the South Central Region. Danville (Knox County) reported the greatest amount of May precipitation, 11.78 inches. Maumee State Forest (Fulton County) reported the least amount, 4.11 inches.

Precipitation occurred during every week of May with locally severe storms on several days. Showers and thunderstorms on May 1 and a soaking rain on May 2 produced 1-2 inches statewide. The next 8 days were drier with widely scattered showers producing generally 0.25 inch of rain or less across most of the state. Precipitation that fell on May 10 marked the beginning of an extremely wet spell across the state with some locations reporting measurable precipitation on nearly every day during the remainder of the month. Widely scattered showers and thunderstorms during May 10-14 and steady rain on May 15 brought 0.5-1.0 inch across most of the state with a few locations receiving up to 1.5 inches. The next week was marked with numerous thunderstorms, many severe with copious amounts of rain. Strong storms during May 17-18 and again on May 21 brought generally 1 inch of rain to northwestern and southwestern Ohio and in excess of 2 inches across the remainder of the state. Locally heavier storms dumped larger amounts of rain at some locations across mainly northeastern and southeastern Ohio with amounts accumulating up to 6 inches during this period. Automated rain gauges indicated nearly 3 inches of rain fell in one hour across isolated areas of southeastern Ohio. This pattern of scattered showers and thunderstorms repeated on several days during the last week of the month with the greatest amounts of rain falling in the southern half of the state. Generally, around 1 inch of rain fell in northern Ohio and 1-2 inches elsewhere with amounts of 3.0-4.5 inches reported in southwestern Ohio.

Precipitation for the 2004 calendar year is above normal across all but northwestern Ohio. The average for the state as a whole is 18.77 inches, 3.28 inches above normal. Regional averages range from 21.64 inches, 5.28 inches above normal, for the Southeast Region to 11.54 inches, 1.86 inches below normal, for the Northwest Region.

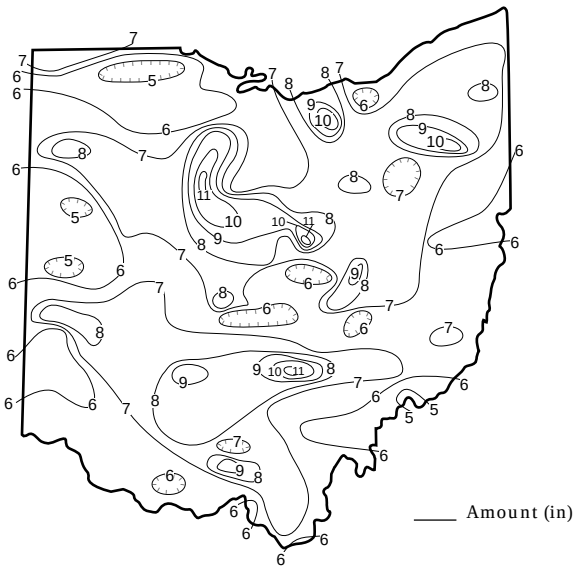
(continued on back)

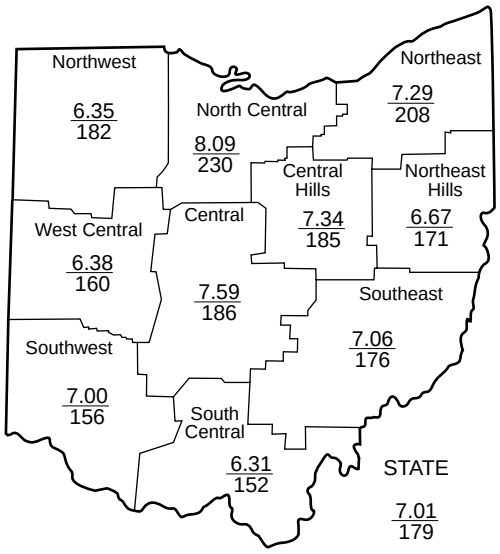
PRECIPITATION

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	+2.86	-0.30	-1.75	+4.82	+0.53	-1.1
North Central	+4.58	+4.50	+4.05	+9.87	+7.70	+2.9
Northeast	+3.78	+5.10	+4.99	+12.77	+11.19	+4.1
West Central	+2.38	+0.61	+0.79	+13.83	+11.20	+1.1
Central	+3.52	+3.67	+5.77	+12.35	+13.36	+2.2
Central Hills	+3.38	+3.84	+5.08	+10.64	+7.53	+2.7
Northeast Hills	+2.77	+3.71	+5.11	+13.91	+11.35	+2.9
Southwest	+2.52	+1.27	+1.45	+8.17	+9.15	+1.4
South Central	+2.15	+3.33	+2.87	+11.67	+15.46	+2.3
Southeast	+3.04	+3.95	+5.42	+14.76	+14.79	+4.0
State	+3.10	+2.97	+3.37	+11.25	+10.17	

*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 MAY





MEAN STREAM DISCHARGE

River and Location	Drainage Area (Sq. Mi.)	This Month: Mean Discharge (CFS)	This Month: % of Normal	% of Normal Past: 3 Mos.	% of Normal Past: 6 Mos.	% of Normal Past: 12 Mos.
Grand River near Painesville	685	1,872	361	144	135	150
Great Miami River at Hamilton	3,630	6,375	187	84	123	165
Huron River at Milan	371	854	388	149	155	170
Killbuck Creek at Killbuck	464	1,037	226	136	135	156
Little Beaver Creek near East Liverpool	496	1,274	218	129	142	182
Maumee River at Waterville	6,330	9,156	189	73	88	126
Muskingum River at McConnelsville	7,422	17,020	185	174	203	137
Scioto River near Prospect	567	1,684	450	136	153	184
Scioto River at Higby	5,131	11,870	281	116	140	159
Stillwater River at Pleasant Hill	503	542	139	58	93	149

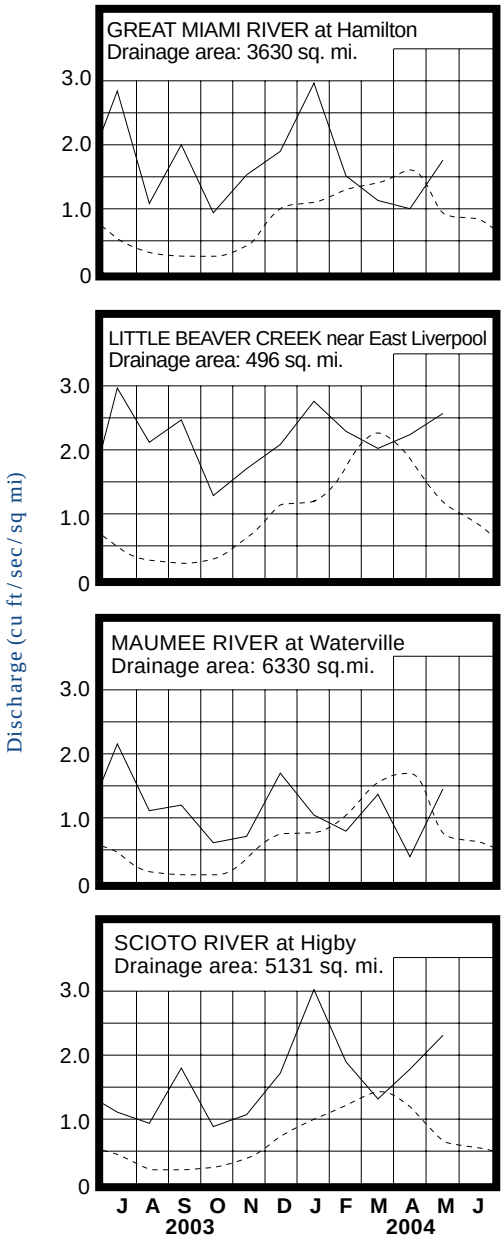
STREAMFLOW during May was above normal across the state. Flows were high enough to be considered excessive statewide.

Due to the isolated nature of much of the precipitation during May, the greatest and lowest flows for the month occurred at various times across the state. Generally, low flows for the month were on May 1 in the northwestern quarter of Ohio. Flows increased rapidly due to precipitation that occurred at the beginning of the month, then decreased gradually until around mid-month. Low flows for the month across the remainder of the state occurred between May 13 and 17. Greatest flows were reported throughout all but southwestern Ohio during May 22-24 following several days of precipitation. Locally heavy rain during this period resulted in flooding, most notably in areas of eastern Ohio (see Notes and Comments section on the last page of this report). Greatest flows occurred in the southwestern quarter of the state during May 28-29 following heavy rains that fell across the region during May 27-28. Streamflow at the end of May remained above normal statewide.

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

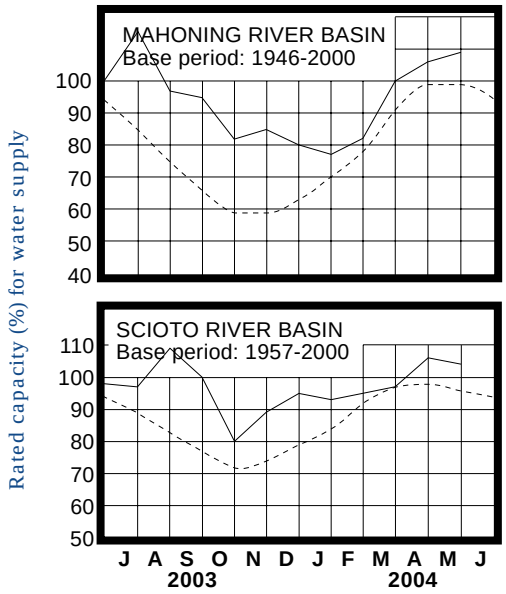
Reservoir storage at the end of May in the Mahoning basin index reservoirs was 109 percent of rated capacity for water supply compared with 106 percent for last month and 102 percent for May 2003. Month-end storage in the Scioto basin index reservoirs was 104 percent of rated capacity for water supply compared with 106 percent for last month and 101 percent for May 2003. Surface-water supplies are adequate statewide as the summer high use and recreation period begins.

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

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	11.13	+2.09	-0.10	+2.33
Fa-1	Jasper Mill, Fayette Co.	Limestone	7.96	-0.89	-0.07	-0.07
Fr-10	Columbus, Franklin Co.	Gravel	43.20	-0.86	+0.08	+1.16
H-1	Harrison, Hamilton Co.	Gravel	22.36	-1.53	+0.30	+0.04
Hn-2a	Dola, Hardin Co.	Dolomite	6.08	+0.41	+0.15	+0.10
Po-1	Windham, Portage Co.	Sandstone	16.95	+2.31	-0.08	+2.78
Tu-1	Strasburg, Tuscarawas Co.	Gravel	11.64	-0.21	-0.13	+1.67

GROUND WATER levels during May showed mixed responses throughout the state. After initially rising at the beginning of the month, ground water levels declined for much of the first half of May and then rose during the second half in response to widespread abundant precipitation. Due to the excessive rainfall during May the recharge season has been extended in some areas of the state. However, the intensity at which much of the rain fell during the month often resulted in excessive runoff and thus limited the amount of recharge that could have occurred. Still, net improvement in ground water levels was greater than usually expected during May across most of the state.

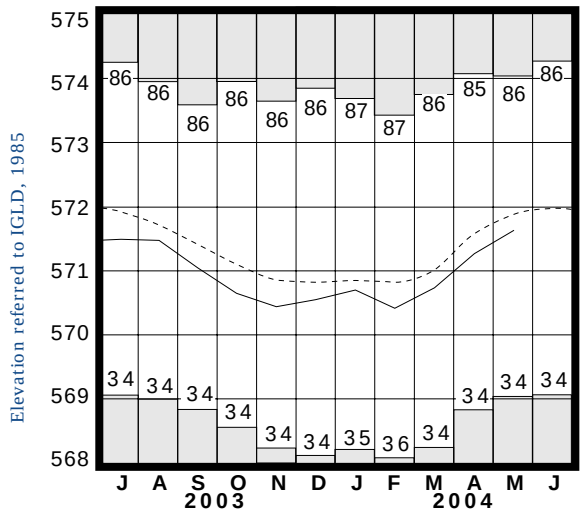
Although the above normal rainfall during May was beneficial for ground water supplies throughout the state, levels in many aquifers remain below normal. Generally, ground water levels are above normal in consolidated aquifers while levels tend to be below normal in unconsolidated aquifers. Current levels are higher than they were a year ago nearly statewide. With near-normal precipitation and other climatic conditions during the next few months, ground water supplies should remain adequate across the state. The Ohio Agricultural Statistics Service reports that near the end of May, soil moisture was rated as being adequate in 35 percent of the state and surplus in 65 percent of the state.

LAKE ERIE level rose during May. The mean level was 571.62 feet (IGLD-1985), 0.36 foot higher than last month's mean level and 0.26 foot below normal. This month's mean level is 0.46 foot higher than the May 2003 level and 2.42 feet above Low Water Datum.

The U.S. Army Corps of Engineers (USACE) reports that precipitation in the Lake Erie basin during May averaged 6.40 inches, which is 3.19 inches above normal. For the entire Great Lakes basin, May precipitation averaged 5.73 inches, 2.78 inches above normal. For calendar year 2004 through May, the Lake Erie basin has averaged 15.22 inches of precipitation, 1.61 inches above normal, while the entire Great Lakes basin has averaged 14.08 inches of precipitation, 2.51 inches above normal.

In addition, the USACE reports that based on the current condition of the Great Lakes basin and anticipated weather conditions, the level of Lake Erie should range from near-normal to as much as 3 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 5 inches above normal to as much as 11 inches below the normal seasonal level.

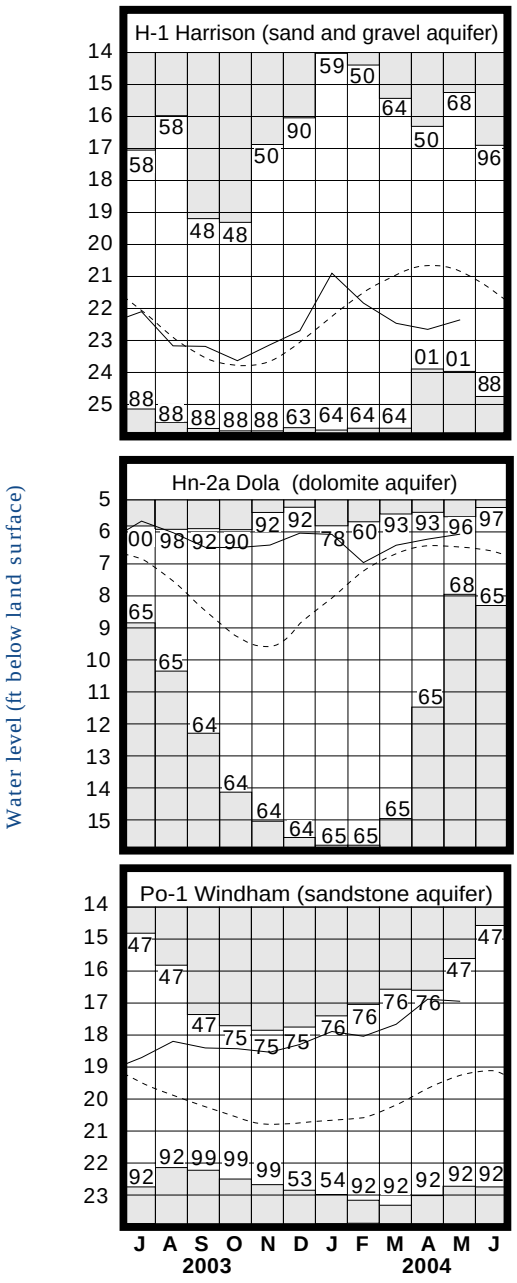
LAKE ERIE LEVELS



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)

Precipitation for the 2004 water year is also above normal across all but northwestern Ohio. The average for the state as a whole is 27.74 inches, 4.04 inches above normal. Regional averages range from 32.02 inches, 7.38 inches above normal, for the Southeast Region to 18.90 inches, 2.09 inches below normal, for the Northwest Region.

SUMMARY

Precipitation during May was markedly above normal statewide. Streamflow was above normal and high enough to be considered excessive statewide. Reservoir storage remains above normal in both the Mahoning and Scioto river basins. Ground water levels showed mixed responses. Lake Erie level rose 0.36 foot and was 0.26 foot below the long-term May average.

NOTES AND COMMENTS

President Bush Grants Governor Taft's Request For Federal Disaster Assistance

Heavy rains during the second half of May and the subsequent flooding, along with severe storms producing damaging winds and large hail, have lead to a Presidential Disaster Declaration for eight Ohio counties. Governor Bob Taft's request for federal assistance for Athens, Columbiana, Cuyahoga, Lorain, Medina, Noble, Perry and Summit counties was approved by President Bush, making flood victims in these counties eligible for federal aid.

Although severe weather was prevalent on several days during the second half of May at various locations throughout the state, the most significant period occurred during May 17-21. Numerous thunderstorms on May 17-18 and again on May 21 were widespread across the state. The strongest storms and greatest amount of rainfall occurred in the eastern half of the state where 2-3 inches of rain were widespread with isolated locations reporting as much as 6 inches, most notably across areas of northeastern and southeastern Ohio. One of the hardest hit areas was Athens and Perry counties in southeastern Ohio where automated rain gauges received nearly 3 inches of rain in 1 hour. The heavy rains and consequent flooding hit Athens and Perry counties especially hard. The flooding forced the evacuation of residents in several communities in these counties and the high water closed many roads, including several state routes. Governor Taft declared a state of emergency in both Athens and Perry counties. Flooding in northeastern Ohio also lead to the evacuation of residents. In addition, high winds during these storms toppled trees onto homes, cars and power lines. At one point it was estimated that 400,000 customers were without power in northeastern Ohio. Several homes and businesses were either destroyed or significantly damaged as a result of these storms. Investigators are still in the field surveying the damage and until their reports are complete it is too early to determine the full impact and economic loss suffered from the flooding and related storm damage.

New Publication

The Division of Water announces the availability of the following new bulletin:

Basin Descriptions And Flow Characteristics Of Ohio Streams (Bulletin 47)
By Michael C. Schiefer

This bulletin details descriptions of drainage basins and characteristics of flow for streams in Ohio. Descriptions for all the major drainage basins in the state where systematic streamflow records have been collected are presented in this bulletin. The descriptions focus primarily on factors affecting regimen of flow and are discussed generally for the state as a whole and specifically for each drainage basin. Streamflows are characterized by the use of selected flow statistics that provide information about mean annual runoff, base flows, flow duration and frequency of flow events. Comparisons between streams and the probable causes for variations in their respective flow characteristics are identified. Information presented in Bulletin 47 is intended to provide background material for detailed studies and general understanding of Ohio's streams.

Bulletin 47 is available only as a download in PDF format through the Division of Water's web site at http://www.dnr.state.oh.us/water/.

50-Year Anniversary Highlights

Notable May Events From The Past 50 Years

May 1968: The 7.71 inches of precipitation for the state as a whole during May 1968 still rank as the wettest May of record. Heavy rains during May 23-27 in the southern half of Ohio result in significant damage from flooding and the death of 4 people. Areas in southern Ohio received as much as 13 inches of rain during the month.

May 31,1985: Severe thunderstorms and several tornadoes ravage northeastern Ohio. One of the hardest hit areas is Trumbull County as an F5 tornado kills 11. This was the largest outbreak of tornadoes in the state since April 1974.

May 1988: Drought conditions continue across the state. The drought began in 1986 in southern Ohio, and was affecting the entire state in 1988. Southern Ohio was impacted the most with the South Central Region accumulating a precipitation deficit of nearly 24 inches during the preceding 30 months.

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