MONTHLY WATER INVENTORY REPORT FOR OHIO

May 2005

http://www.dnr.state.oh.us/water/pubs/newsltrs/mwirmain.htm
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PRECIPITATION during May was below normal across most of the state with only a few locations in east-central Ohio having above normal rainfall. The average for the state as a whole was 2.51 inches, 1.40 inches below normal. Regional averages ranged from 3.22 inches, 0.68 inch below normal, for the Northeast Hills Region to 1.56 inches, 1.93 inches below normal, for the Northwest Region. This was the 7th driest May during the past 111 years for the Northwest Region and the 11th driest for the North Central Region. Dillon Dam (Muskingum County) reported the greatest amount of May precipitation, 5.34 inches. Tiffin (Seneca County) reported the least amount, 1.03 inches.

The weather during May was generally dry with below average temperatures. The first 10 days of the month were extremely dry statewide with only meager amounts of precipitation reported. The first significant precipitation of the month fell during May 11-14 when showers and thunderstorms crossed the state with most areas reporting between 0.50-1.50 inches of rain. Showers and thunderstorms on May 19 brought rain to mainly the southwestern two-thirds of the state with amounts of 0.50-1.0 inch reported. However, heavier downpours across sections of central Ohio resulted in more than 1.5 inches falling locally. Widely scattered showers and thunderstorms during several of the last 10 days of the month generally produced amounts of less than 0.50 inch across western Ohio and 0.50-1.5 inches elsewhere.

Precipitation for the 2005 calendar year is above normal throughout the state with only a few locations in south-central Ohio having below normal precipitation. The average for the state as a whole is 18.55 inches, 3.06 inches above normal. Regional averages range from 21.45 inches, 5.09 inches above normal, for the Southeast Region to 13.80 inches, 0.40 inches above normal, for the Northwest Region.

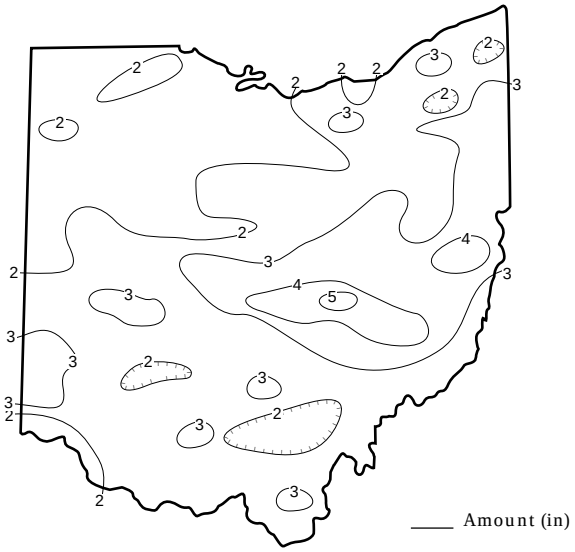
Precipitation for the 2005 water year is above normal statewide. The average for the state as a whole is 28.22 inches, 4.52 inches above normal. Regional averages range from 31.42 inches, 6.78 inches above normal, for the Southeast Region to 21.96 inches, 0.97 inch above normal, for the Northwest Region.

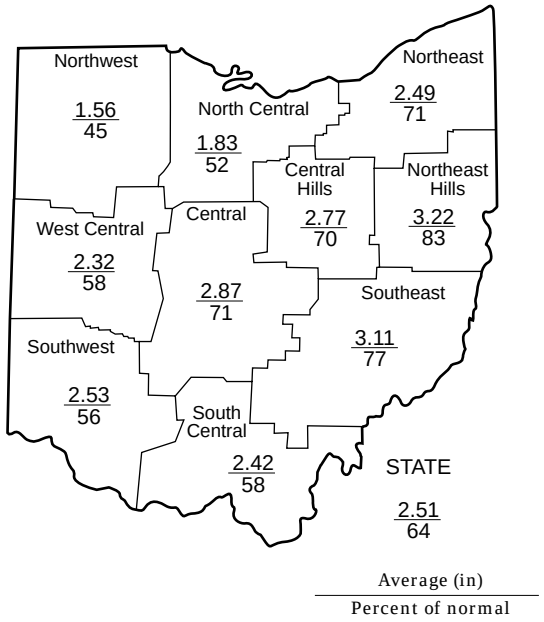
PRECIPITATION

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	-1.93	-3.49	+0.37	+3.87	+8.72	+0.1
North Central	-1.68	-1.04	+3.49	+5.38	+15.34	+1.8
Northeast	-1.02	-0.25	+5.61	+7.10	+19.80	+3.0
West Central	-1.68	-1.31	+5.76	+7.20	+21.02	+1.8
Central	-1.20	-0.48	+5.56	+9.04	+21.10	+2.1
Central Hills	-1.19	-1.23	+4.76	+10.44	+21.13	+2.6
Northeast Hills	-0.68	-0.06	+4.59	+16.01	+29.91	+4.1
Southwest	-1.95	-1.97	+1.55	+1.71	+10.21	+0.8
South Central	-1.74	-0.71	-0.02	+5.10	+16.87	+1.0
Southeast	-0.91	+0.83	+5.51	+15.68	+30.38	+3.8
State	-1.40	-0.97	+3.71	+8.15	+19.40	

*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	499	96	120	160	144
Great Miami River at Hamilton	3,630	3,946	116	90	158	142
Huron River at Milan	371	155	70	121	207	204
Killbuck Creek at Killbuck	464	501	109	101	149	147
Little Beaver Creek near East Liverpool	496	577	99	101	148	184
Maumee River at Waterville	6,330	3,850	80	59	130	138
Muskingum River at McConnelsville	7,422	9,717	105	140	233	164
Scioto River near Prospect	567	285	76	83	173	170
Scioto River at Higby	5,131	5,905	140	121	184	176
Stillwater River at Pleasant Hill	503	350	90	86	180	147

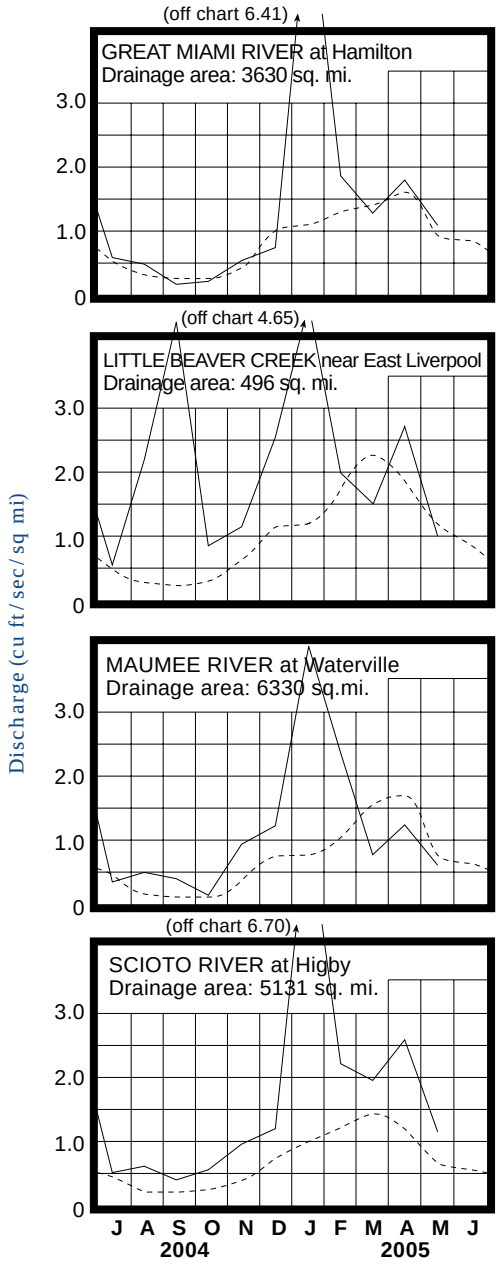
STREAMFLOW during May was generally below normal across northern Ohio and above normal in southern Ohio. May flows were seasonally less than the flows recorded during April throughout the state.

Streamflow at the beginning of May was above normal across most of Ohio. Greatest flows for the month occurred at the beginning of May across most of the state as basins were still responding to the precipitation that fell during the last 11 days of April. Flows declined from these peaks during the first 2 weeks of the month, then increased during the 3rd week in response to precipitation. Greatest flows for the month occurred in southwestern Ohio basins on May 20 following the rain that fell during May 19. Flows declined during the remainder of the month, bottoming out at below normal levels at or near the end of May statewide.

RESERVOIR STORAGE during May decreased in both the Mahoning and Scioto river basins. Storage remains above normal in both basins.

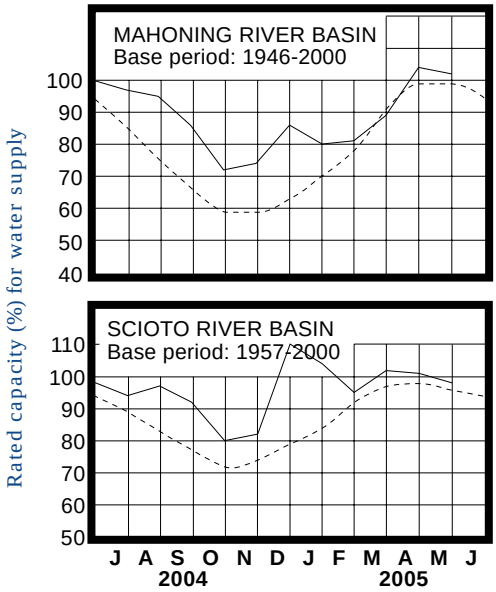
Reservoir storage at the end of May in the Mahoning basin index reservoirs was 102 percent of rated capacity for water supply compared with 104 percent for last month and 109 percent for May 2004. Month-end storage in the Scioto basin index reservoirs was 98 percent of rated capacity for water supply compared with 101 percent for last month and 104 percent for May 2004. Surface water supplies remain adequate throughout the state in spite of the below normal precipitation most of Ohio has received during 3 of the past 4 months.

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	Change in feet from: Year Ago
F-1	W. Rushville, Fairfield Co.	Sandstone	11.29	+1.93	-1.08	-0.16
Fa-1	Jasper Mill, Fayette Co.	Limestone	7.96	-0.89	-0.20	0.0
Fr-10	Columbus, Franklin Co.	Gravel	42.34	0.0	-0.24	+0.86
H-1	Harrison, Hamilton Co.	Gravel	22.15	-1.32	-0.29	+0.21
Hn-2a	Dola, Hardin Co.	Dolomite	5.91	+0.58	+0.04	+0.17
Po-1	Windham, Portage Co.	Sandstone	17.45	+1.81	+0.08	-0.50
Tu-1	Strasburg, Tuscarawas Co.	Gravel	12.17	-0.74	-0.57	-0.53

GROUND WATER levels during May declined in most of the state's aquifers, except in a few consolidated aquifers where levels rose slightly due to delayed recharge from precipitation falling in late April. Levels steadily declined throughout the month with some temporary rise noted in unconsolidated aquifers following precipitation, most notably around May 14 and 20. In most aquifers, the net declines during May from the April levels were greater than usually observed.

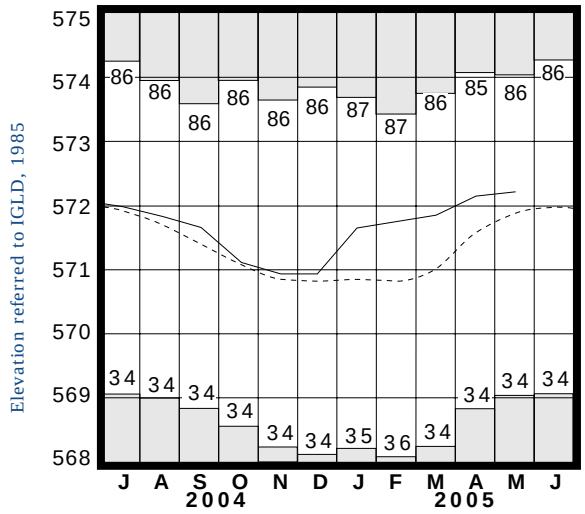
It appears that with the below normal precipitation during May across most of the state, the 2005 recharge season has come to an end. Little recharge can normally be expected during the summer months. The 2005 recharge season was adequate for ground water supplies across the state. Current levels in most aquifers in western Ohio are higher than they were a year ago while aquifer levels are lower in eastern Ohio. Ground water levels generally remain above normal in most of the consolidated aquifers, but are near or below normal in many of the state's unconsolidated aquifers. Near-normal precipitation and other climatic conditions should help keep ground water supplies in a favorable position as we enter the summer high use season. The Ohio Agricultural Statistics Service reports that near the end of May, soil moisture was rated as being short in 3 percent of the state, adequate in 85 percent of the state and surplus in 12 percent of the state.

LAKE ERIE level rose during May. The mean level was 572.21 feet (IGLD-1985), 0.06 foot higher than last month's mean level and 0.33 foot above normal. This month's mean level is 0.59 foot higher than the May 2004 level and 3.01 feet above Low Water Datum.

The U.S. Army Corps of Engineers (USACE) reports that precipitation in the Lake Erie basin during May averaged 1.68 inches, which is 1.60 inches below normal. For the entire Great Lakes basin, May precipitation averaged 2.03 inches, which is 0.92 inch below normal. For calendar year 2005 through May, the Lake Erie basin has averaged 13.03 inches, 0.71 inch below normal, while the entire Great Lakes basin has averaged 9.82 inches, 1.79 inches below 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 is expected to fall from its current position of 4 inches above to 3 inches below its long-term seasonal average by the end of the 2005 boating season. Deviations from the anticipated weather patterns could result in the level of Lake Erie ranging from as high as 5 inches above to as much as 11 inches below the normal seasonal average.

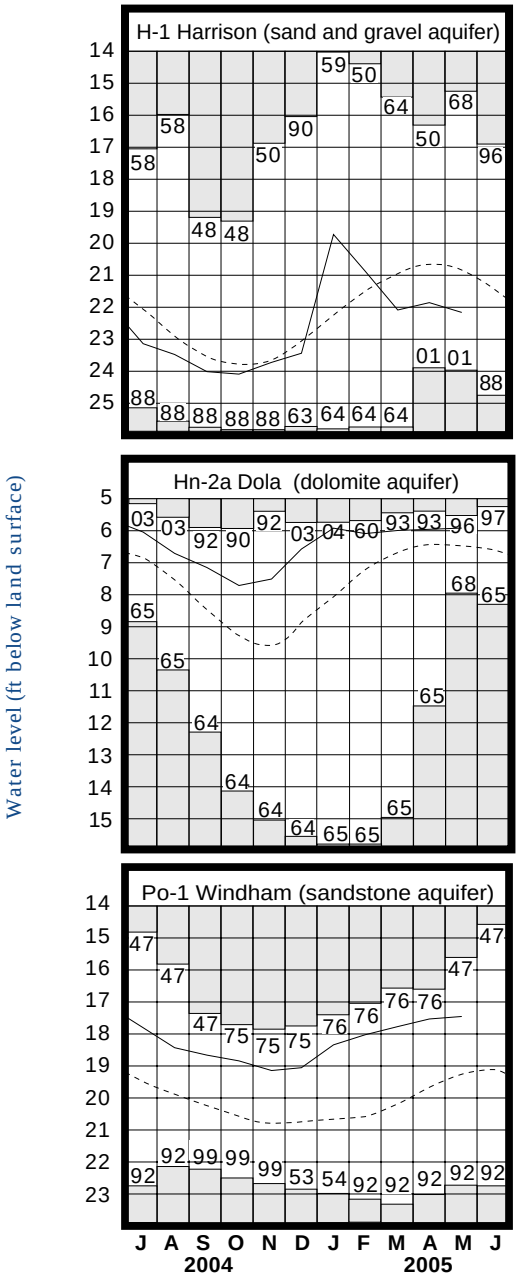
LAKE ERIE LEVELS



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———

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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SUMMARY

Precipitation during May was below normal across most of the state with only a few locations in east-central Ohio having above normal rainfall. Streamflow was generally below normal in northern Ohio and above normal in southern Ohio. Reservoir storage decreased in both the Mahoning and Scioto river basins, but remained above normal. Ground water levels declined in most of the state's aquifers. Lake Erie level rose 0.06 foot and was 0.33 foot above the long-term May average.

NOTES AND COMMENTS

Record 24-Month Precipitation Favorable For Water Resources

The precipitation that has fallen in Ohio during the past 2 years is noteworthy. For the May 2003-April 2005 period, the average for the state as a whole was 99.59 inches, 23.55 inches above normal. Regionally, the Southeast Region reported 112.42 inches of precipitation, 33.42 inches above normal, while the Northeast Hills Region reported 110.44 inches, 33.58 inches above normal. Other regions reporting more than 100 inches during this period were: South Central Region, 103.41 inches; Central Hills Region, 101.46 inches; Northeast Region, 101.36; and the Central Region, 100.13 inches. This was the wettest 24-month period for the state as a whole during the past 123 years and the wettest for most areas of the state except northwestern and southwestern Ohio. Although regressing from these peaks due to the below normal May 2005 precipitation, the June 2003-May 2005 period is still noteworthy as well. The average for the state as a whole was 95.44 inches. Regions reporting more than 100 inches during the period were the Southeast Region, 109.38 inches and Northeast Hills Region, 106.77 inches.

The above normal precipitation during the past 2 years has been beneficial to Ohio's water supplies. The wet weather pattern began during May 2003 when it was the 3rd wettest May for the state as a whole. At that time, ground water levels were below normal across nearly the entire state and surface water supplies were near or slightly below normal. The above normal precipitation began having a favorable impact on water supplies. Ground water levels soon began to rise and have generally improved since May 2003, peaking throughout most of the state at above normal levels following the above normal precipitation that fell during January 2005. Record monthly-high water levels were reached in observation well F-1 (Fairfield County), representing sandstone aquifers in eastern and southeastern Ohio, during November 2004 and again in January 2005, and in observation well HN-2A (Hardin County), representing carbonate aquifers of northwestern Ohio, during both January and February 2005. Since then, drier conditions have prevailed and some aquifers have declined to below normal seasonal levels, but remain above the spring 2003 levels. In addition, current levels across most of the state are also higher than they were during the pre-drought month of May 1998. However, levels in most aquifers across southwestern Ohio continue to lag below these pre-drought levels and have generally remained below normal since the 1998-1999 drought. During the past 2 years, reservoir storage has also remained above normal. Lake Erie level has rebounded from its low of about 11 inches below normal in March 2003 to around 11 inches above normal in February 2005. Although Lake Erie has continued its seasonal rise, the rate of rise has been less than normal the past 3 months. However, the Lake Erie level remains above normal by about 4 inches and more than 1 foot higher than the May 2003 level. Although the above normal precipitation benefited water supplies, it also resulted in numerous occasions of flooding in many areas of the state during the past 2 years.

NOAA Atlas 14 Volume 2 Update

The Hydrometeorological Designs Studies Center (HDSC) of NOAA's National Weather Service has completed a review process and has finalized and published new documentation for *NOAA Atlas 14 Volume 2: Precipitation-Frequency for the Ohio River Basin and Surrounding States* (Delaware, District of Columbia, Illinois, Indiana, Kentucky, Maryland, New Jersey, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Virginia, West Virginia). This publication contains precipitation estimates for a wide range of durations from 5 minutes to 60 days and for average recurrence intervals from 2 to 1000 years. **NOAA Atlas 14 Volume 2** replaced the estimates contained in **Technical Paper No. 40** *Rainfall Frequency Atlas of the United States for Durations from 30 Minutes to 24 Hours and Return Periods from 1 to 100 Years*, **NWS Hydro-35** *Five-to-60-Minute Precipitation Frequency for the Eastern and Central United States*, and **Technical Paper No. 49** *Two-To-Ten-Day Precipitation For Return Periods Of 2 To 100 Years In The Contiguous United States*. *NOAA Atlas 14 Volume 2* is available through the Ohio Department of Natural Resources, Division of Water's web page at: http://www.dnr.state.oh.us/water/waterinv/precip_frequency.htm. For additional information on this publication please contact the HDSC at: HDSC.Questions@noaa.gov.

Additional Historic/Inactive Observation Well Data On-Line

Ground water level data from an additional 152 historic/inactive observation wells are now available on-line through the Division of Water's web page. The Ohio Observation Well Network web application allows the user to view and/or download data for these 152 inactive wells in addition to the other inactive wells and 128 active wells already available. Several options are provided that offer flexibility in viewing and/or retrieving historical data, both graphically and numerically. To visit this web site, go to the Division of Water's home page and click on "Observation Well Records" or go directly to the application using this address: http://www.dnr.state.oh.us/water/waterobs/. Once you are at the web site, you can navigate to the inactive wells by clicking on the Inactive Observation Well Map tab.