



MONTHLY WATER INVENTORY REPORT FOR OHIO

April 2008

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

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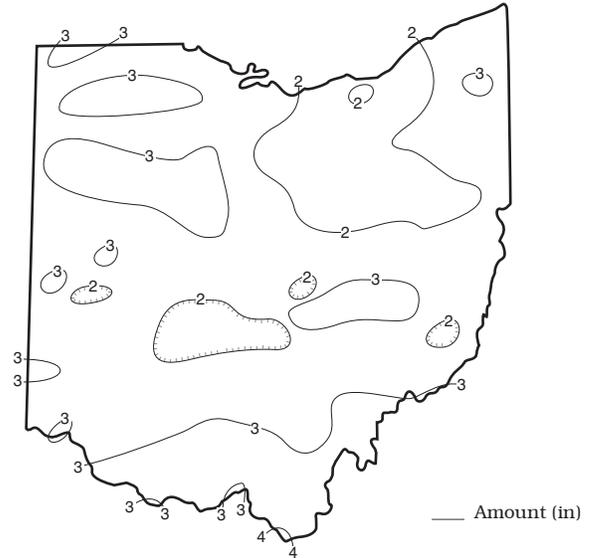
PRECIPITATION during April was below normal throughout most of the state. Only a few areas, mainly in northwestern Ohio, reported above normal precipitation. The state average was 2.53 inches, 1.05 inches below normal. Regional averages ranged from 3.13 inches, 0.25 inch below normal, for the Northwest Region to 2.02 inches, 1.66 inches below normal, for the Central Hills Region. South Point (Lawrence County) reported the greatest amount of April precipitation, 4.40 inches. Millport (Columbiana County) reported the least amount, 1.27 inches.

Most of the April precipitation fell as rain with just a few snow showers reported at some locations. Rain during April 2-3 accumulated to 1-2 inches across southern Ohio, tapering to 0.25-0.50 inch in northern Ohio. Precipitation during April 11-13 amounted to another 0.50-1.0 inch of rain across much of the state with the greatest amounts this time falling across northwestern Ohio. The following two weeks were relatively dry across most of the state with only some light showers falling. The next weather system that affected the state occurred around April 27-29 and brought 0.25-0.50 inch of precipitation across most of the state with a few locations in a band stretching from northwestern to southeastern Ohio reporting as much as 1 inch.

Precipitation for the 2008 calendar year is above normal statewide. The average for the state is 16.26 inches, 4.68 inches above normal. Regional averages range from 18.20 inches, 4.96 inches above normal, for the Southwest Region to 14.90 inches, 4.99 inches above normal, for the Northwest Region.

Precipitation for the 2008 water year is also above normal statewide. The average for the state is 27.52 inches, 7.73 inches above normal. Regional averages range from 31.03 inches, 8.93 inches above normal, for the Southwest Region to 24.86 inches, 7.36 inches above normal, for the Northwest Region.

PRECIPITATION APRIL

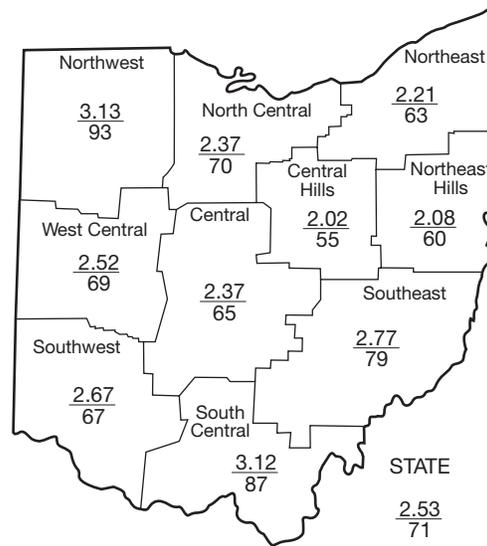


PRECIPITATION

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	-0.25	+4.63	+7.70	+9.79	+20.66	+4.3
North Central	-1.02	+5.51	+7.88	+10.06	+23.11	+5.3
Northeast	-1.32	+5.47	+9.12	+8.77	+22.82	+4.1
West Central	-1.14	+5.46	+7.75	+6.15	+20.47	+2.4
Central	-1.26	+5.01	+5.84	+4.70	+16.58	+2.0
Central Hills	-1.66	+4.25	+5.33	+6.78	+16.28	+2.5
Northeast Hills	-1.38	+4.47	+6.00	+6.68	+15.92	+1.3
Southwest	-1.29	+5.80	+6.64	+2.84	+11.12	+2.4
South Central	-0.47	+3.93	+6.84	+1.45	+5.21	+1.6
Southeast	-0.74	+4.75	+6.71	+2.32	+7.62	+1.7
State	-1.05	+4.94	+6.98	+5.93	+15.94	

*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

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	1,189	81	165	154	131
Great Miami River at Hamilton	3,630	6,596	113	218	191	139
Huron River at Milan	371	564	94	250	226	210
Killbuck Creek at Killbuck	464	698	88	172	156	131
Little Beaver Creek near East Liverpool	496	633	69	169	157	126
Maumee River at Waterville	6,330	10,560	99	175	187	162
Muskingum River at McConnelsville	7,422	18,110	107	235	215	112
Scioto River near Prospect	567	620	68	221	214	164
Scioto River at Higby	5,131	8,222	108	202	171	127
Stillwater River at Pleasant Hill	503	827	113	215	205	143

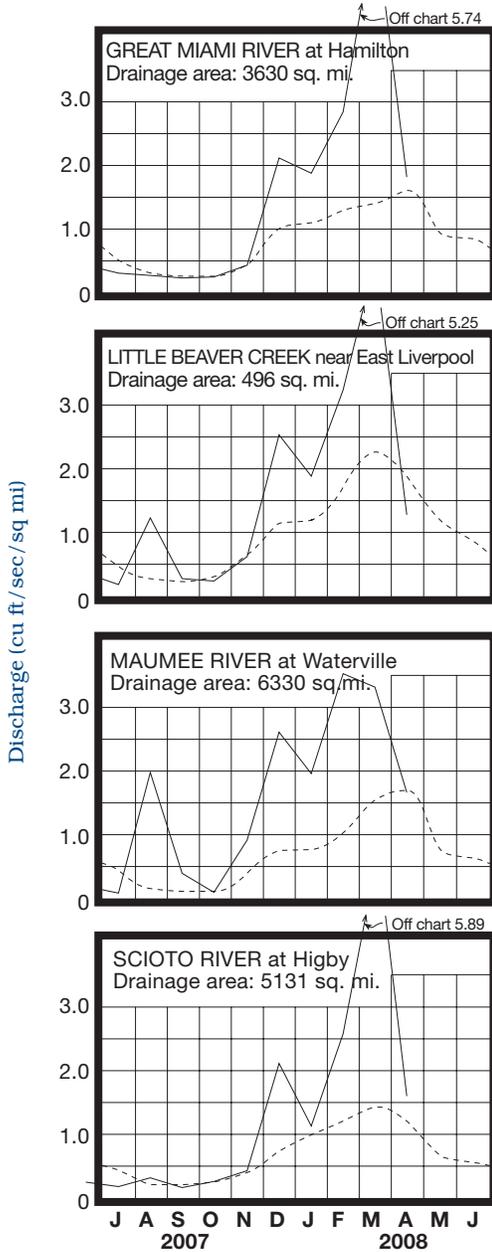
STREAMFLOW during April was above normal in the southern half of the state and below normal in the northern half. Flows across Ohio in April were seasonally less than the flows recorded during March.

Flows at the beginning of the month were above normal throughout the state. Most drainage basins across the state recorded their greatest flows for April during the first week of the month, still responding to the much above normal precipitation that fell during March. Flows generally declined from these peaks throughout the remainder of the month, except for some temporary increases noted following local precipitation. Low flows for April occurred near or at the end of the month statewide, and by the end of April streamflow was below normal throughout Ohio.

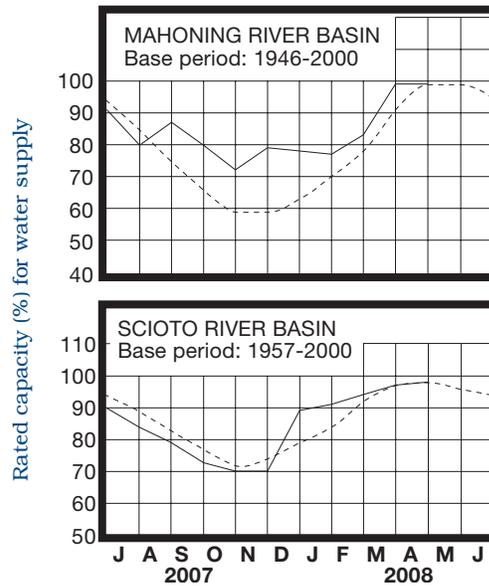
RESERVOIR STORAGE during April was unchanged in the Mahoning River basin and increased slightly in the Scioto River basin. At the end of April, surface water supplies in both basins were normal.

Reservoir storage at the end of April in the Mahoning basin index reservoirs was 99 percent of rated capacity for water supply compared with the same for last month and 103 percent for April 2007. Month-end storage in the Scioto basin index reservoirs was 98 percent of rated capacity for water supply compared with 97 percent for last month and 101 percent for April 2007. Surface water supplies continue to remain in good condition throughout the state.

MEAN STREAM DISCHARGE



RESERVOIR STORAGE FOR WATER SUPPLY



Normal - - - - Current ———

GROUND WATER levels during April showed mixed responses around the state, generally showing net improvement in aquifers in northern Ohio and declining in aquifers in southern Ohio. Water levels in aquifers statewide normally show net rises during April. This April, however, net rises from last month's levels were less than usually observed and, as mentioned above, in many cases net declines were recorded. The below normal precipitation during April was not enough to sustain the high levels that were observed in March. Most aquifers rose or remained relatively stable during the first two weeks of the month, then declined the remainder of the month.

Ground water supplies are in a favorable position throughout the state as the growing season approaches. Ground water storage continues to remain above normal across most of the state and current ground water levels are higher than they were a year ago across much of the state. With near-normal precipitation and other climatic conditions during the next month or two, some improvement in ground water storage could still occur. The Ohio Agricultural Statistics Service reports that near the end of April, soil moisture was rated as being short in 1 percent of the state, adequate in 76 percent of the state and surplus in 23 percent of the state. The recent wet conditions have delayed field activities for many of Ohio's farmers. However, the drier conditions during April provided farmers an opportunity to get into their fields.

LAKE ERIE level rose during April. The mean level was 572.18 feet (IGLD-1985), 0.43 foot higher than last month's mean level and 0.59 foot above normal. This month's mean level is 0.23 foot higher than the April 2007 level and 2.98 feet above Low Water Datum.

The U.S. Army Corps of Engineers (USACE) reports that precipitation in the Lake Erie basin during April averaged 1.98 inches, 1.18 inches below normal. For the entire Great Lakes basin, April precipitation averaged 2.72 inches, 0.20 inch above normal. For calendar year 2008 through April, the Lake Erie basin has averaged 13.92 inches of precipitation, 3.46 inches above normal, while the entire Great Lakes basin has averaged 10.50 inches, 1.84 inches above normal.

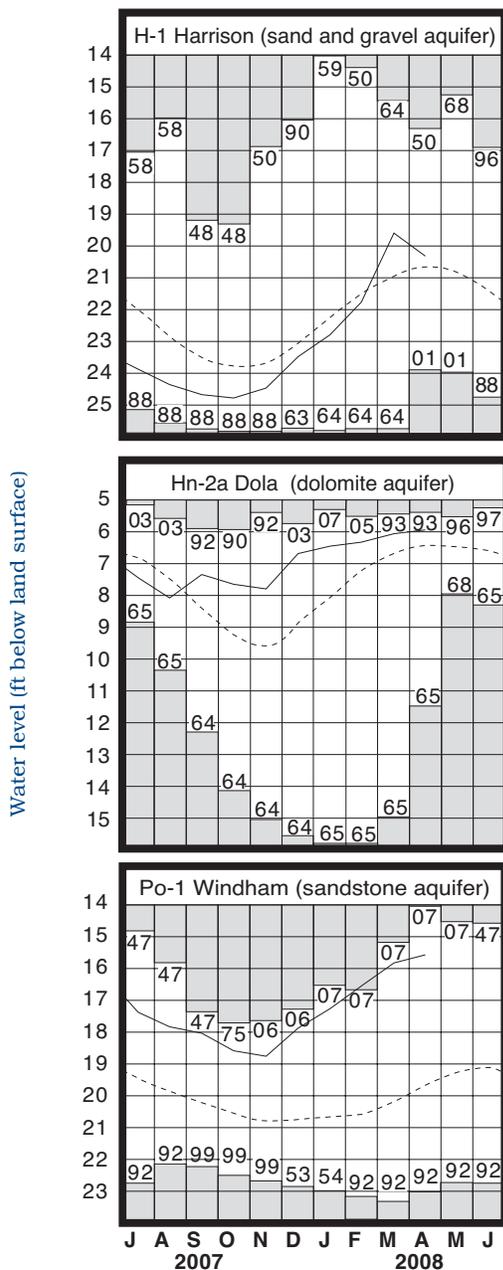
In addition, the USACE reports that based on the current condition of the Great Lakes basin and anticipated weather conditions, the level of Lake Erie should remain above normal through late spring or early summer, and then fall to below normal. Deviations from the anticipated weather patterns could result in the level of Lake Erie ranging from 5 inches above normal to as much as 12 inches below the normal seasonal average.

GROUND-WATER LEVELS

Based on daily lowest level in feet below land-surface datum

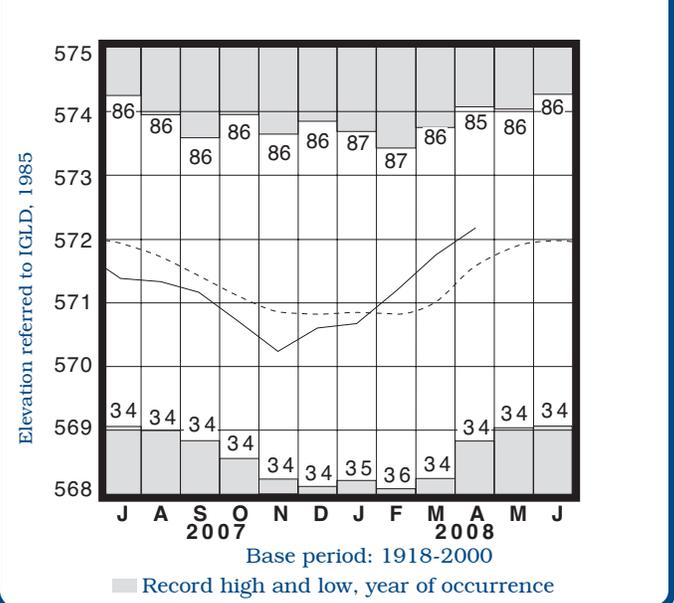
Index Well	Location	Aquifer	Mean This Month	Departure From Normal	Change in feet from:	
					Last Month	Year Ago
F-1	W. Rushville, Fairfield Co.	Sandstone	9.83	+2.86	-0.51	+0.05
Fa-1	Jasper Mill, Fayette Co.	Limestone	7.79	-0.96	-0.24	+0.10
Fr-10	Columbus, Franklin Co.	Gravel	42.37	-0.10	+0.76	-0.43
H-1	Harrison, Hamilton Co.	Gravel	20.31	+0.36	-0.71	+1.27
Hn-2a	Dola, Hardin Co.	Dolomite	5.94	+0.49	+0.13	-0.14
Po-1	Windham, Portage Co.	Sandstone	15.58	+4.08	+0.23	-1.12
Tu-1	Strasburg, Tuscarawas Co.	Gravel	9.72	+1.44	-0.28	+1.89

GROUND-WATER LEVELS



Water level (ft below land surface)

LAKE ERIE LEVELS



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

Po-1, 1947-2000 ■ Record high and low, year of occurrence

Normal - - - - Current ———

SUMMARY

Precipitation during April was below normal across most of the state. Streamflow was above normal in the southern half of Ohio and below normal in the northern half. Reservoir storage was unchanged in the Mahoning River basin and increased slightly in the Scioto River basin. Storage was normal in both basins. Ground water levels showed mixed responses but remained above normal throughout most of the state. Lake Erie level rose 0.43 foot and was 0.59 foot above the long-term April average.

NOTES AND COMMENTS

The Hydrologic Cycle

The hydrologic cycle is the recycling movement of water above, on and below the surface of the earth. It is an ever-fluctuating dynamic system that assures a reliable water supply by annually replenishing the state's water resources. The hydrologic cycle basically consists of 4 segments; precipitation, evaporation, runoff and storage. Constant changes occur in the amount of water located in the various segments of the cycle. Many of these fluctuations relate to seasonal changes. The amount of precipitation, effects of temperature on evaporation, and the uptake of water by plants during the growing season all affect how much water will be available in any segment of the water cycle. To better understand the effect the hydrologic cycle has on Ohio's water resources and to predict or estimate quantities of water available, a water budget is used. Ohio averages about 38 inches of precipitation per year. Of this, 10 inches run off the land surface directly to streams and rivers, 2 inches are temporarily retained on the surface in puddles, and 26 inches infiltrate into the ground. Of these 26 inches, 20 inches are returned to the atmosphere by surface evaporation or transpiration. The remaining 6 inches infiltrate into the aquifer. Of these 6 inches, 4 inches are absorbed by the soil and eventually returned to the atmosphere through evaporation and transpiration. This leaves 2 inches from the original 38 inches that will replenish the state's ground water supplies. Although this does not seem like a lot when compared to the 38 inches that fall annually, 2 inches spread across the state translates into 1.43 trillion gallons of water that normally infiltrate Ohio's aquifers annually. The replenishment of ground water can occur at any time during the year. However, most of the replenishment occurs during the winter and spring months when the amount of water available for replenishment exceeds the amount of water removed from an aquifer. This is referred to as the recharge season. Usually, very little if any recharge occurs during the summer and fall months because water removal normally exceeds the amount of water available for recharge.

Portions of this article were previously published in the Division of Water publications *Drill Bits* and Fact Sheet #18 *The Hydrologic Cycle*, and were written by David H. Cashell, a hydrologist with the Division of Water, Water Resources Section. For more information and illustrations on the hydrologic cycle and Ohio's water budget, visit the Ohio Department of Natural Resources, Division of Water website at: www.dnr.state.oh.us/water/. Click on publications and select Fact Sheet #18 *The Hydrologic Cycle*, under Water Inventory Publications.

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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