



MONTHLY WATER INVENTORY REPORT FOR OHIO

July 2003

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

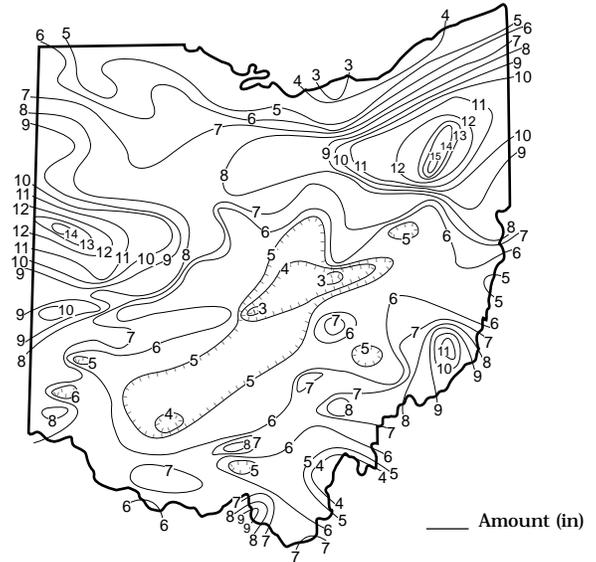
Compiled By David H. Cashell and Scott Kirk

Hydrologists
Water Inventory Unit

PRECIPITATION during July was noticeably above normal across most of the state, but near or below normal in areas of central and southeastern Ohio. The average for the state as a whole was 6.91 inches, 2.83 inches above normal. Regional averages ranged from 9.65 inches, 5.54 inches above normal, for the West Central Region to 4.96 inches, 0.81 inches above normal, for the Central Region. For the state as a whole this was the 4th wettest July during the past 121 years. Regionally, this was the 2nd wettest July for both the Northeast and West Central regions; the 4th wettest for the Northwest Region; the 6th for the Central Hills Region; the 7th for the Northeast Hills and Southwest regions; and the 10th for the Southeast Region. Louisville (Stark County) reported the greatest amount of July precipitation, 15.48 inches. Michael Kirwin Reservoir (Portage County) and Celina (Mercer County) reported 14.53 and 14.21 inches, respectively. Cooperdale (Coshocton County) reported the least amount of July rainfall, 2.75 inches. Columbus International Airport reported 2.94 inches, the only other location reporting less than 3 inches for the month.

A period of unsettled weather affected the state, especially the northern half, from July 4-11, canceling many holiday festivities across the state. Many of the thunderstorms during this period were severe and contained copious amounts of rain. Generally, 1-3 inches of rain fell across the southern half of the state and 3-6 inches fell across most of northern Ohio during this period. The greatest amount of rain fell in northwestern and west-central Ohio where some areas received in excess of 10 inches of rain. Celina (Mercer County) reported 10.52 inches during this period. Radar estimates indicated some areas received more than 15 inches of rain. Showers and thunderstorms on July 15 were most numerous in southern Ohio with generally 1-2 inches of rain falling. Isolated but severe storms were most numerous in the southeastern third of Ohio on July 18, bringing 0.5-2.0 inches of rain with lesser amounts elsewhere. Another slow moving weather system affected the state from July 21-23. Thunderstorms, many severe with heavy rains, were most notable in northeastern Ohio during this period. Precipitation generally ranged from 0.5-1.5 inches in southern Ohio to 1-3 inches across most of northern Ohio with some areas in northeastern Ohio receiving in excess of 5 inches. Storms were again most numerous across northern Ohio on July 27-28. While most of the state received less than 0.50 inch of rain, some areas of northeastern Ohio received as much as 4 inches from these storms (see Notes and Comments on the last page of this report).

PRECIPITATION JULY

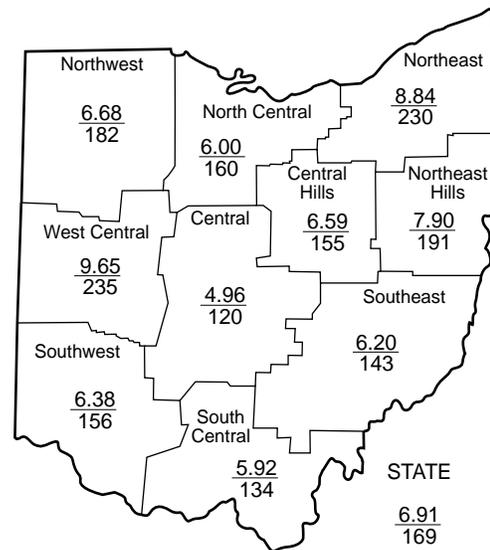


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PRECIPITATION

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	+3.01	+5.45	+4.15	+0.82	+4.80	+2.4
North Central	+2.26	+4.79	+3.32	+2.71	+5.95	+1.2
Northeast	+5.00	+8.81	+7.68	+6.10	+7.49	+3.2
West Central	+5.54	+7.17	+6.48	+6.25	+11.64	+2.9
Central	+0.81	+3.46	+2.33	+2.52	+4.30	+1.5
Central Hills	+2.34	+4.33	+2.85	+1.55	+3.20	+1.6
Northeast Hills	+3.77	+6.14	+4.26	+3.94	+1.88	+1.5
Southwest	+2.28	+5.31	+3.21	+4.34	+11.96	+2.8
South Central	+1.51	+6.80	+6.66	+6.69	+7.19	+2.9
Southeast	+1.85	+4.39	+2.86	+2.36	+3.85	+2.0
State	+2.83	+5.66	+4.37	+3.71	+6.19	

*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

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	1,120	563	238	173	115
Great Miami River at Hamilton	3,630	10,340	552	204	140	120
Huron River at Milan	371	400	374	165	166	138
Killbuck Creek at Killbuck	464	678	348	179	116	87
Little Beaver Creek near East Liverpool	496	1,471	631	204	114	86
Maumee River at Waterville	6,330	13,650	493	251	138	103
Muskingum River at McConnelsville	7,422	6,809	139	202	136	72
Scioto River near Prospect	567	1,066	670	233	153	129
Scioto River at Higby	5,131	5,708	209	156	114	101
Stillwater River at Pleasant Hill	503	1,636	1,010	179	121	89

STREAMFLOW during July was noticeably above normal statewide. Flows were high enough to be considered excessive in most basins, particularly those basins in western and northeastern Ohio. Flows during July increased unseasonably from the June flows across most of the state, but decreased seasonally in southeastern Ohio. Record July flows were established at many gauging stations including: Great Miami River at Hamilton; Grand River at Painesville; Maumee River at Waterville; and Stillwater River at Pleasant Hill. Record daily flows for July were also established on some streams. Significant flooding occurred across several areas of the state during the month (see Notes and Comments on the last page of this report).

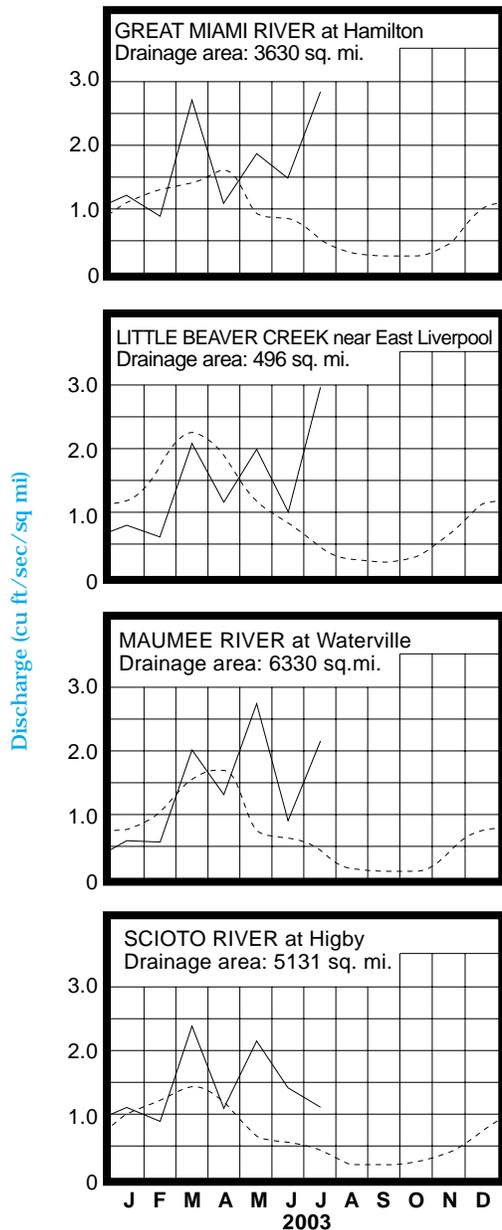
Flows at the beginning of the month were below normal statewide. Low flows for the month were observed during the first few days of July across most of the state. Flows rose quickly statewide, peaking during July 9-12 in response to precipitation from storms that began on July 4. Flows during this period were the greatest for the month throughout all but northeastern Ohio. Flows generally decreased statewide during the next ten days following these peaks, except for some temporary rises noted following local precipitation. Flows rose across the state during July 21-23, most notably in northeastern Ohio. However, as flows began declining across much of the state, flows in many basins in northeastern Ohio continued rising, some through July 28, as persistent storms remained in the area. Greatest flows for the month in northeastern Ohio basins occurred between July 23-28. Flows declined during the remainder of the month, but remained above normal throughout most of the state at the end of July.

RESERVOIR STORAGE during July increased notably in the Mahoning River basin and decreased slightly in the Scioto River basin. Storage at the end of the month was above normal in both basins.

Reservoir storage at the end of July in the Mahoning basin index reservoirs was 115 percent of rated capacity for water supply compared with 100 percent for last month and 88 percent for July 2002. Month-end storage in the Scioto basin index reservoirs was 97 percent of rated capacity for water supply compared with 98 percent for last month and 90 percent for July 2002.

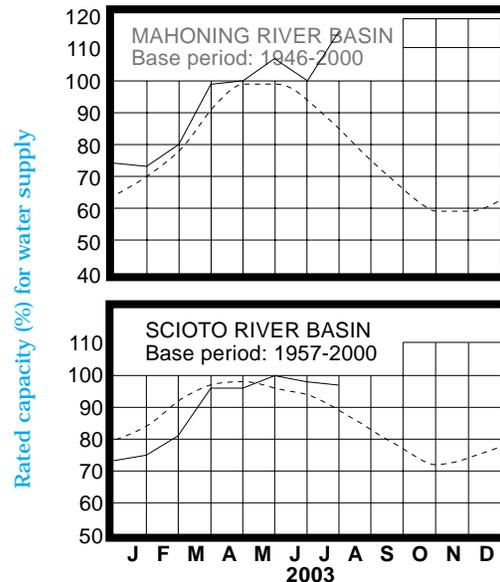
The noticeably above normal precipitation and resulting streamflow during July was beneficial for surface water supplies. Reservoirs across the state are near or above seasonal levels and remain above normal statewide during the summer high-use period. Storage capacity in many flood control reservoirs was utilized during the month.

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 July declined less than normally expected, and even rose in a few aquifers. A few exceptions were noted in areas where near or slightly below normal precipitation fell. Levels declined during the first few days of the month and then rose across most of the state as a result of the rain from the July 4-11 period. Generally, levels rose until around mid-month then declined the remainder of the month, except in some northeastern Ohio aquifers where levels tended to rise or remain relatively stable through month's end.

The above normal precipitation across most of Ohio during July was beneficial for ground water supplies. Levels in consolidated aquifers remain above normal throughout much of the state, especially in northern Ohio. Observation well Hn-2A (Hardin County), representing the carbonate aquifers of northwestern Ohio, reached a record-high level for July. However, levels in most unconsolidated aquifers remain below normal across Ohio, but are much improved from their levels observed earlier in the year. Current levels are higher than they were during July 2002 statewide.

Ground water supplies are adequate statewide. Above-normal precipitation during the past few months, combined with cooler than normal temperatures across much of the state, has helped reduce the overall demand on ground water supplies during the current summer high-use period. With continued near-normal precipitation and other climatic conditions, the outlook for ground water supplies should remain positive. The Ohio Agricultural Statistics Service reports that near the end of July, soil moisture was rated as being short or very short in 3 percent of the state, adequate in 77 percent of the state, and surplus in 20 percent of the state.

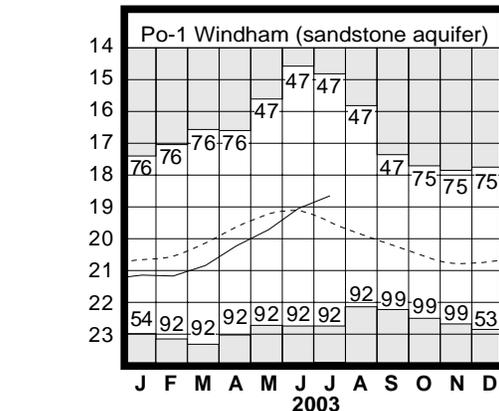
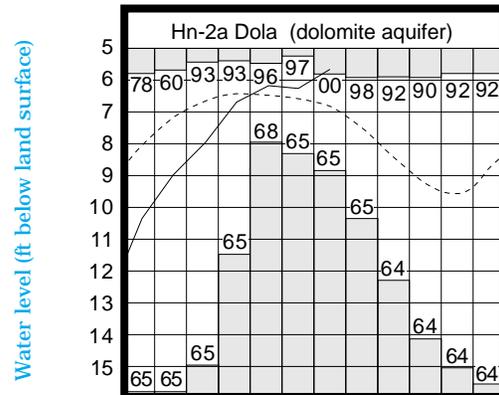
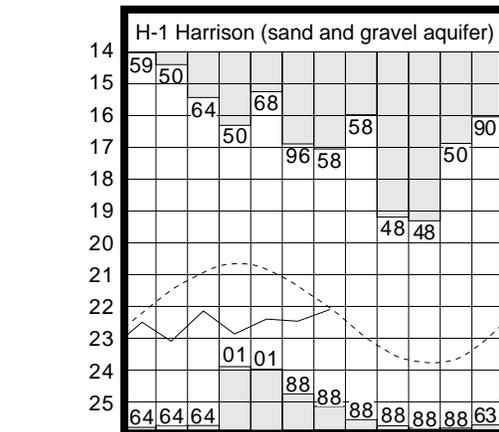
LAKE ERIE level rose during July. The mean level was 571.49 feet (IGLD-1985), 0.03 foot higher than last month's mean level and 0.43 foot below normal. This month's mean level is 0.20 foot lower than the July 2002 level and 2.29 feet above Low Water Datum.

The U.S. Army Corps of Engineers (USACE) reports that precipitation in the Lake Erie basin during July averaged 2.92 inches, which is 0.41 inch below normal. The entire Great Lakes basin averaged 3.02 inches, which is 0.12 inch below normal. For calendar year 2003 through July, the Lake Erie basin has averaged 18.95 inches, 1.50 inches below normal, while the entire Great Lakes basin has averaged 16.74 inches, 1.16 inches below normal.

In addition, 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 5-9 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 as high as 2 inches above normal to as much as 20 inches below the normal seasonal level.

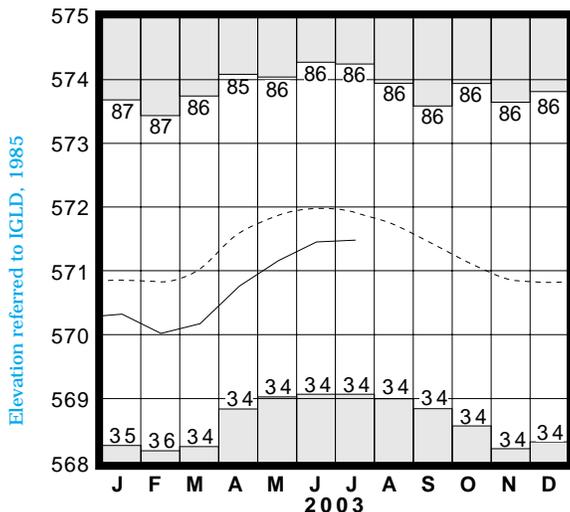
Index Well	Location	Aquifer	Mean This Month	Departure From Normal	Change in feet from:	
					Last Month	Year Ago
F-1	W. Rushville, Fairfield Co.	Sandstone	13.03	+2.39	-0.36	+1.89
Fa-1	Jasper Mill, Fayette Co.	Limestone	8.11	-0.29	-0.08	+2.60
Fr-10	Columbus, Franklin Co.	Gravel	45.11	-1.83	-0.84	+0.14
H-1	Harrison, Hamilton Co.	Gravel	22.10	-0.05	+0.37	+0.70
Hn-2a	Dola, Hardin Co.	Dolomite	5.66	+1.17	+0.60	+1.56
Po-1	Windham, Portage Co.	Sandstone	18.65	+0.84	+0.42	+0.41
Tu-1	Strasburg, Tuscarawas Co.	Gravel	13.36	-0.62	-0.25	+1.01

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)

Precipitation for the 2003 calendar year is above normal statewide. The average for the state as a whole is 26.95 inches, 3.53 inches above normal. Regional averages range from 30.87 inches, 5.39 inches above normal, for the South Central Region to 23.70 inches, 2.55 inches above normal, for the North Central Region.

Precipitation for the 2003 water year is above normal statewide. The average for the state as a whole is 35.47 inches, 3.84 inches above normal. Regional averages range from 41.78 inches, 7.89 inches above normal, for the South Central Region to 30.47 inches, 2.14 inches above normal, for the Northwest Region.

SUMMARY

Precipitation was noticeably above normal across most of the state. Streamflow was excessive throughout most of the state and flows on several streams increased to record July levels. Reservoir storage increased notably in the Mahoning River basin and decreased slightly in the Scioto River basin. Reservoir storage was above normal in both basins. Ground water levels declined less than usually observed for July in most aquifers, and in some aquifers the level rose. Levels are generally above normal in consolidated aquifers and below normal in unconsolidated aquifers. Lake Erie level rose 0.03 foot and was 0.43 foot below the long-term July average.

NOTES AND COMMENTS

July Floods

Severe storms during July wreaked havoc throughout much of Ohio. Heavy rains caused flooding, most notably across the northern half of the state. More than 14 inches of rain was reported at some locations and flows on several streams rose to record July levels. Governor Taft's request to have 11 counties declared federal disaster areas was approved making them eligible for federal and state disaster assistance.

Two periods of storms and floods were especially noteworthy. The first was during July 4-11 as a series of storms moved across the state. The heaviest rain was centered in northwestern and west-central Ohio where amounts in excess of 10-12 inches fell by the time the storms exited the state. Runoff from these storms brought small streams and rivers out of their banks, inundating roads, homes and businesses. President Bush declared the worst hit area of Auglaize, Darke, Logan, Mercer, Shelby and Van Wert counties a federal disaster area. The declaration provides opportunity for federal aid to flood-stricken residents and businesses. The flooding caused extensive property damage including several hundred homes and businesses, many of which were destroyed or left uninhabitable.

The second significant period was July 21-28. Storms were most numerous across the northern half of the state. The hardest hit was an area of northeastern Ohio where severe storms containing copious amounts of rain left their mark. This area received 3-7 inches of rain during the July 21-23 storms, which resulted in flash flooding. Rescues and evacuations took place in several communities. On July 21 a tornado touched down on the east side of Youngstown damaging several homes and businesses and the Youngstown Municipal Airport received 4.65 inches of rain for the day. Another round of strong storms moved through the area during July 27-28 dumping more than 4 inches of rain in some areas. The Akron-Canton Regional Airport received 3.98 inches of rain on July 27, of which 3.78 inches fell in three hours. Many streams had not yet receded from the earlier rains. Once again people had to be rescued and evacuated as flooding conditions in many areas worsened. President Bush declared the hardest hit area of Mahoning, Medina, Portage, Summit and Trumbull counties a federal disaster area, making flood victims eligible for federal aid. Preliminary reports indicate that more than one thousand homes were destroyed or severely damaged with hundreds more receiving minor damage. Many businesses and roads also received significant damage from floodwaters.

The floods tragically claimed four lives in northern Ohio. Storm damage totals are still being calculated, but are estimated to exceed several million dollars in economic loss to both public and private property. It is too early to determine the overall impact on agricultural concerns. While some crops in low-lying areas were damaged or destroyed, others on higher ground have fared better during the wet conditions.

Taft Announces Plan For Protection And Wise Use Of Ohio's Water Resources

Governor Bob Taft recently announced the release of a four-year strategic plan outlining key issues and actions to help maintain and protect Ohio's water resources. The plan was developed by the Ohio Water Resources Council (OWRC), a ten-member board appointed by the Governor to ensure that the state's water resources are wisely used to protect Ohio's environment, safeguard public health, and promote economic development and recreation. Major issues affecting the use of the state's water resources and the steps needed to ensure that the issues are addressed are covered in this strategic plan. The plan contains 29 objectives for action which are designed to strengthen collaboration between state, local and federal partners and to advance their efforts addressing improvements in areas such as water quality and quantity, watershed protection, regulatory programs, public and private water systems, water-based recreation and citizen involvement. For more information on the plan, visit the OWRC home page at: www.dnr.state.oh.us/owrc/ and click on the Strategic Plan brochure to view or download the plan as a pdf file.

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

Bob Taft
Governor

Samuel W. Speck
Director

Dick Bartz
Chief

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