MONTHLY WATER INVENTORY REPORT FOR OHIO

July 2004

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

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PRECIPITATION during July was above normal across much of Ohio, but below normal in portions of west-central and south-central Ohio and in other scattered areas across the state. The average for the state as a whole was 4.60 inches, 0.52 inch above normal. Regional averages ranged from 5.51 inches, 1.16 inches above normal, for the Southeast Region to 3.80 inches, 0.31 inch below normal, for the West Central Region. This was the 12th wettest July during the past 110 years for the Northwest Region and the 20th wettest for both the Northeast and Southeast regions. Van Wert (Van Wert County) reported the greatest amount of July precipitation, 9.45 inches. Jackson (Jackson County) reported the least amount of July precipitation, 1.78 inches.

Precipitation during July fell in a typical summer pattern of scattered showers and thunderstorms, with some of these storms accompanied by locally heavy downpours. The first half of the month was much drier than the second half across most of the state. Widely scattered showers and thunderstorms occurred on a few days during the first half of July, with most of the state receiving less than 1 inch of rain during this period. Most of this precipitation fell during July 10-12 and included a few heavier downpours producing up to 2 inches of rain across isolated areas, mainly in southwestern and east-central Ohio. Most of the state received rain on several days during the second half of the month. Scattered showers and thunderstorms during July 16-17 were most numerous in the eastern half of the state, where generally 0.50-1.0 inch of rain fell with some locations reporting as much as 2-3 inches. Scattered storms during July 22-27 brought another 1-2 inches of rain across most of the state, except in much of northeastern Ohio where less than 1 inch fell. The greatest amounts of rain during this period fell on July 25-26 in an area from south-central to east-central Ohio, where more than 3 inches were reported. Storms were common during July 30-31 in many areas of the state, with the heaviest amounts of rain of 1 inch to as much as 3 inches falling in a line from southwestern to northeastern Ohio. Generally lesser amounts of rain fell south and north of this line.

Precipitation for the 2004 calendar year is above normal statewide. The average for the state as a whole is 28.24 inches, 4.82 inches above normal. Regional averages range from 31.88 inches, 8.08 inches above normal, for the Northeast Hills Region to 21.44 inches, 0.70 inch above normal, for the Northwest Region.

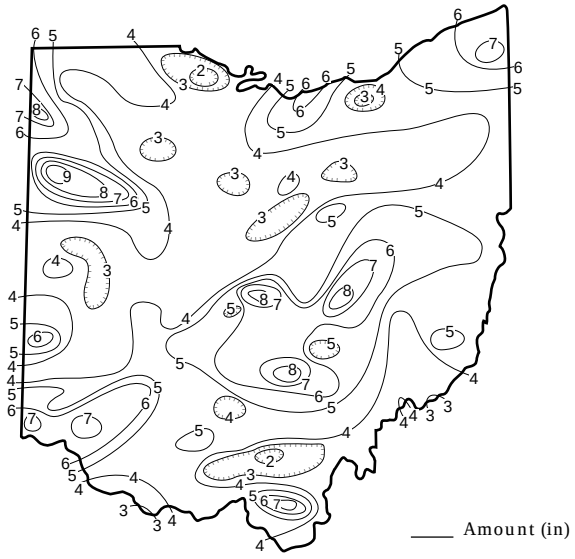
Precipitation for the 2004 water year is also above normal statewide. The average for the state as a whole is 37.21 inches, 5.58 inches above normal. Regional averages range from 41.63 inches, 8.62 inches above normal, for the Southeast Region to 28.80 inches, 0.47 inch above normal, for the Northwest Region.

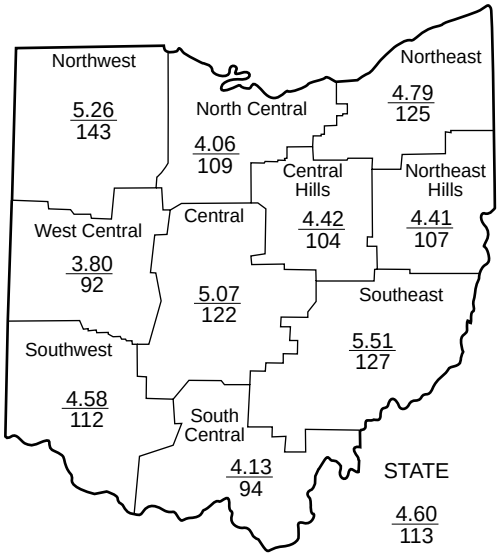
PRECIPITATION

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	+1.59	+5.42	+0.86	+5.05	+5.50	+0.6
North Central	+0.32	+6.12	+4.78	+8.82	+11.83	+2.3
Northeast	+0.95	+5.09	+5.25	+8.79	+15.06	+3.2
West Central	-0.31	+3.91	+0.97	+10.14	+16.44	+2.2
Central	+0.92	+5.89	+5.57	+14.00	+16.54	+3.0
Central Hills	+0.17	+6.32	+6.20	+12.39	+12.97	+2.7
Northeast Hills	+0.28	+5.64	+6.26	+13.99	+17.49	+3.1
Southwest	+0.48	+2.70	+0.25	+5.69	+10.27	+1.3
South Central	-0.28	+1.07	+1.47	+7.53	+13.75	+1.1
Southeast	+1.16	+4.28	+4.72	+13.47	+16.04	+2.8
State	+0.52	+4.64	+3.63	+9.96	+13.53	

*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 JULY





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	203	102	146	132	134
Great Miami River at Hamilton	3,630	2,159	115	148	104	152
Huron River at Milan	371	162	151	223	145	174
Killbuck Creek at Killbuck	464	213	109	198	140	160
Little Beaver Creek near East Liverpool	496	271	116	176	134	172
Maumee River at Waterville	6,330	2,201	79	182	95	123
Muskingum River at McConnelsville	7,422	6,025	123	296	196	147
Scioto River near Prospect	567	105	66	274	149	189
Scioto River at Higby	5,131	2,693	99	179	130	163
Stillwater River at Pleasant Hill	503	123	76	123	78	137

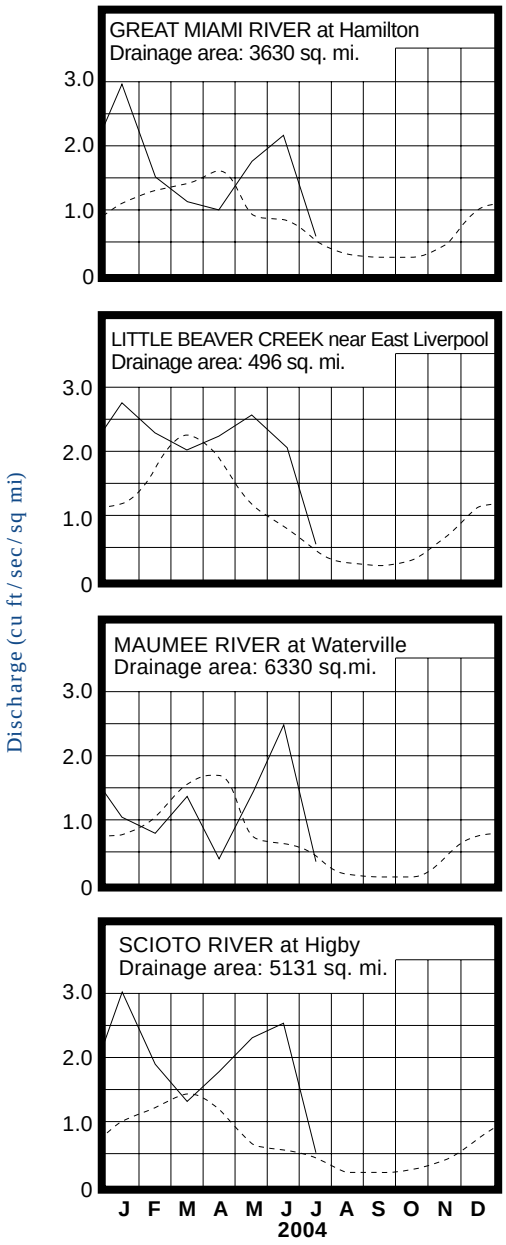
STREAMFLOW during July was generally above normal in eastern and southwestern Ohio and below normal elsewhere. Flows during July decreased seasonally from the June flows statewide.

The timing of the greatest and lowest flows for the month varied across the state due to the scattered nature of the precipitation during July. Greatest July flows across southeastern Ohio occurred at the beginning of the month. Flows then decreased through about July 11-13 statewide, before increasing nearly statewide in response to the precipitation that fell July 10-12. Greatest flows occurred in some basins in west-central and central Ohio during July 11-13 following this precipitation. Greatest flows occurred at the end of July across the remainder of the state following widespread precipitation that fell during the last week of the month. Low flows for the month generally occurred between July 11-16 in western Ohio and around July 25 in eastern Ohio. Flows at the end of the month were above normal across much of the state, but were below normal in northwestern and west-central Ohio.

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

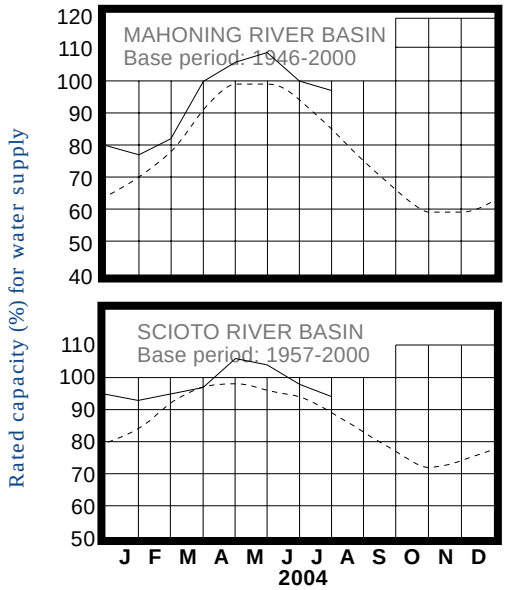
Reservoir storage at the end of July in the Mahoning basin index reservoirs was 97 percent of rated capacity for water supply compared with 100 percent for last month and 115 percent for July 2003. Month-end storage in the Scioto basin index reservoirs was 94 percent of rated capacity for water supply compared with 98 percent for last month and 97 percent for July 2003. Surface water supplies continue at favorable levels throughout the state.

MEAN STREAM DISCHARGE



Base period for all streams: 1971-2000

RESERVOIR STORAGE FOR WATER SUPPLY



Normal – – – – Current ———

GROUND WATER levels during July declined seasonally statewide. Net declines during July from June's levels were greater than usually observed in all aquifers. Levels across the state generally declined throughout most of the month, but ground water levels in western Ohio had begun to rise by the month's end.

Ground water levels remain above normal across much of the state, but tend to be below normal through the southwestern quarter of Ohio. Current levels are higher than they were a year ago in the eastern half of the state and lower than last year in the western half of Ohio. Ground water supplies are currently adequate across the state and with near-normal precipitation and other climatic conditions during the coming months they should remain adequate. The Ohio Agricultural Statistics Service reports that near the end of July, soil moisture was rated as being short or very short in 19 percent of the state, adequate in 74 percent of the state and surplus in 7 percent of the state.

LAKE ERIE level declined during July. The mean level was 571.98 feet (IGLD-1985), 0.10 foot lower than last month's mean level and 0.06 foot above normal. This month's mean level is 0.49 foot higher than the July 2003 level and 2.78 feet above Low Water Datum.

The U.S. Army Corps of Engineers (USACE) reports that precipitation in the Lake Erie basin during July averaged 3.48 inches, which is 0.16 inch above normal. For the entire Great Lakes basin, July precipitation averaged 3.66 inches, which is 0.52 inch above normal. For calendar year 2004 through July, the Lake Erie basin has averaged 21.86 inches of precipitation, 1.48 inches above normal, while the entire Great Lakes basin has averaged 20.50 inches of precipitation, 2.59 inches above 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 continue to range near normal for the foreseeable future. Deviations from the anticipated weather patterns could result in the level of Lake Erie ranging from as high as 8 inches above normal to as much as 12 inches below the normal seasonal average.

SUMMARY

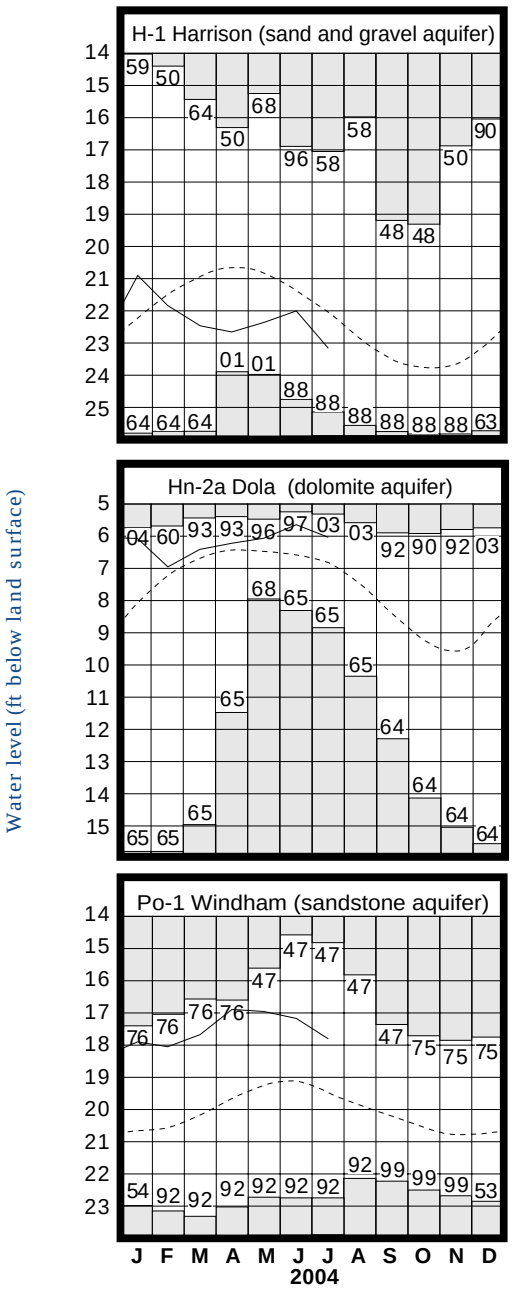
Precipitation during July was above normal across much of the state, but below normal in portions of west-central and south-central Ohio and in other scattered areas across the state. Streamflow was above normal in eastern and southwestern Ohio. Reservoir storage decreased but remained above normal. Ground water levels declined statewide. Lake Erie level declined 0.10 foot and was 0.06 foot above the long-term July average.

GROUND-WATER LEVELS

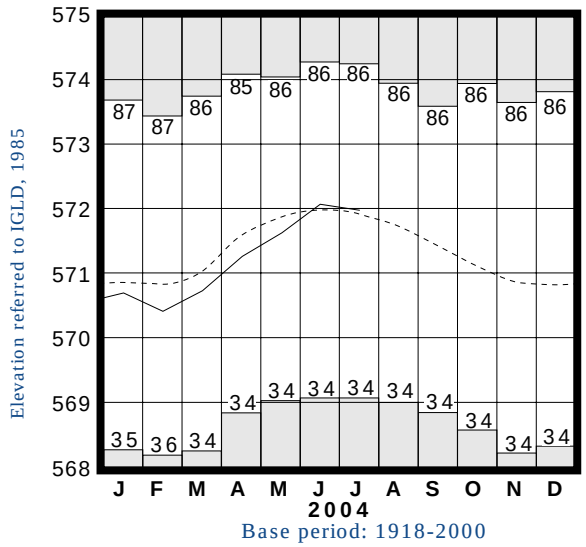
Based on daily lowest level in feet below land-surface datum

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	12.32	+3.10	-2.08	+0.71
Fa-1	Jasper Mill, Fayette Co.	Limestone	8.68	-0.86	-0.68	-0.57
Fr-10	Columbus, Franklin Co.	Gravel	44.13	-0.85	-0.84	+0.98
H-1	Harrison, Hamilton Co.	Gravel	23.13	-1.08	-1.13	-1.03
Hn-2a	Dola, Hardin Co.	Dolomite	6.03	+0.80	-0.38	-0.37
Po-1	Windham, Portage Co.	Sandstone	17.80	+1.69	-0.62	+0.85
Tu-1	Strasburg, Tuscarawas Co.	Gravel	11.19	+1.55	-0.68	+2.17

GROUND-WATER LEVELS



LAKE ERIE LEVELS



NOTES AND COMMENTS

Governor Taft Announces Draft Annex Implementing Agreements

The Draft Annex Implementing Agreements, recommendations for binding agreements that address Great Lakes basin protection issues ranging from water consumption to diversion, have been made available to the public for their review. On July 19, Governor Bob Taft, representing 8 Great Lakes state governors and 2 Canadian provincial premiers, announced historic draft agreements for the protection of Great Lakes waters at the annual meeting of the National Governors Association. A 90-day public review period has been started for the agreements that were created to update the way the Great Lakes and the waters of the Great Lakes basin are managed and protected. The review period will extend until October 18, 2004. The draft documents are available through the Ohio Department of Natural Resources (ODNR) web page at: www.ohiodnr.com/water/. Public meetings will be held throughout the Great Lakes region in August and September to explain these agreements and elicit public comment. A list of the dates and locations for public meetings in Ohio is also available through the ODNR web page. The public may comment by writing to: Annex Comments, ODNR Division of Water, 1939 Fountain Square Court, Bldg. E., Columbus, OH 43224 or by e-mail to: annexcomments@dnr.state.oh.us. After the 90-day review period is complete and all public comments considered, the draft agreements will be refined and presented to the 8 Great Lakes governors and premiers from Ontario and Quebec for their final approval and signature.

ODNR Director Speck Is Honored By Nation's Governors

The nation's governors presented their Distinguished Service Award to Ohio Department of Natural Resources (ODNR) Director Sam Speck during the National Governors Association's (NGA) annual meeting. Ohio Governor Bob Taft had nominated Speck for the award. Among the accomplishments that helped earn this award for Director Speck were his service as a state representative and state senator from southeastern Ohio, an associate director of the Federal Emergency Management Agency, former president of Muskingum College, director of ODNR since 1999, current chair of the Great Lakes Commission and his leadership of the Water Management Work Group of the Council of Great Lakes Governors. The NGA award is presented annually to public officials who exemplify distinguished service to state government.

NEW PUBLICATION

The Hydrometeorological Design Studies Center (HDSC) of NOAA's National Weather Service announces the availability of the following publication:

NOAA Atlas 14 Volume 2 - Precipitation Frequency Estimates for Ohio River Basin and Surrounding States

This publication contains updated precipitation frequency estimates for the Ohio River Basin and surrounding states (Delaware, Illinois, Indiana, Kentucky, Maryland, New Jersey, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Virginia, West Virginia, and the District of Columbia). Rainfall estimates have been determined to cover the range for durations from 5 minutes to 60 days and for average recurrence intervals from 2 to 1000 years. **NOAA Atlas 14 Volume 2** replaces 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 ODNR Division of Water's web page at: http://www.dnr.state.oh.us/water/waterinv/precip_frequency.htm. For further information on this publication please contact the HDSC at: HDSC.Questions@noaa.gov.

50-Year Anniversary Highlights

Notable July Events From The Past 50 Years

July 4-5, 1969: Severe storms produced very heavy rains, tornadoes and straight-line winds of up to 100 mph in the northern half of the state resulting in some of the worst summer flooding ever seen in Ohio. The storms produced record floods in many drainage basins in the affected areas. A large area of northern Ohio received 4-11 inches of rain, with north-central Ohio receiving the greatest amounts. Unofficial amounts of more than 14 inches were reported from isolated areas. These storms caused 41 deaths and more than $65 million in damages.

July 1986: Lake Erie reached a record high July mean level. The July level was down slightly from the all-time record high mean level set the previous month.

July 1992: Severe weather and record rainfall caused substantial damage in many parts of Ohio. Strong storms on July 12 spawned several tornadoes and damaging straight-line winds in northern Ohio and heavy rains in central and western Ohio caused moderate to severe small stream and urban flooding. The 28 tornadoes that occurred this day were the most ever recorded in a single day in the state and the 44 tornadoes that occurred this July were the most ever recorded in one-month in Ohio. On July 26, heavy rains caused near flash-flood conditions in the Indian Creek watershed at Massieville (Ross County). Several mobile homes were destroyed, homes and businesses damaged and two lives were lost. The 8.83 inches of precipitation for the state as a whole during July 1992 still rank as the wettest July of record.

July 2003: Heavy rains cause flooding, most notably across the northern half of Ohio. More than 15 inches of rain was reported at some locations. Flows on several streams rose to record July levels. Hardest hit areas were in west-central, northwestern and northeastern Ohio. More than 1000 homes were destroyed or severely damaged and 4 people lost their lives.

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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