



MONTHLY WATER INVENTORY REPORT FOR OHIO

July 2001

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

Compiled By David H. Cashell and Scott Kirk

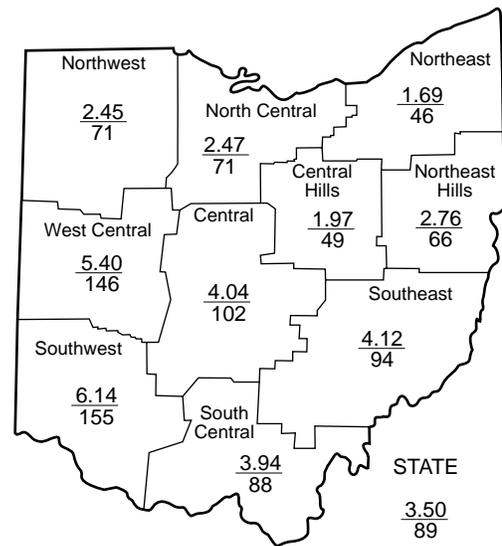
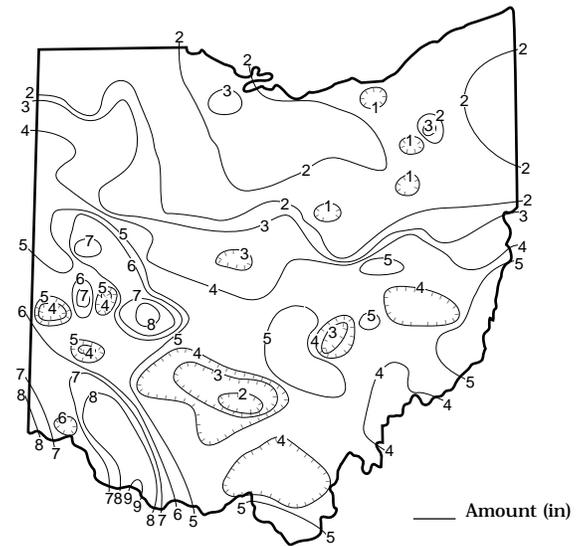
Hydrologists
Water Inventory Unit

PRECIPITATION during July was below normal across much of the state, but was above normal in southwestern, west-central and parts of central Ohio. The state average was 3.50 inches, 0.42 inch below normal. Regional averages ranged from 6.14 inches, 2.17 inches above normal, for the Southwest Region to 1.69 inches, 1.99 inches below normal, for the Northeast Region. This July was the 9th wettest during the past 119 years for the Southwest Region and the 13th wettest for the West Central Region. Conversely, this was the 7th driest July during the past 119 years for the Northeast Region and it was tied for the 8th driest July for the Central Hills Region. Ripley (Brown County) reported the greatest amount of July rainfall, 9.21 inches. Several stations reported more than 8 inches for the month including: Springfield North Water Plant and Springfield Waste Water Treatment Plant (Clark County), 8.86 and 8.22 inches respectively; Milford (Clermont County), 8.27 inches; and Kings Mills (Warren County), 8.04 inches. Several other locations reported in excess of 7 inches of rain for the month, all located in southwestern and west-central Ohio. Cleveland Hopkins International Airport (Cuyahoga County) reported the least amount of July precipitation, 0.68 inch. A few other stations in northeastern Ohio also reported less than 1 inch of precipitation for the month.

Precipitation during July fell in a typical summer pattern of scattered showers and thunderstorms with some storms producing heavy rains. Distribution of rainfall during the month varied greatly across the state with the greatest amounts occurring in southwestern Ohio and decreasing in amount to the north and east. There were several periods with light rain during the first 8 days of the month, but most of the rain fell on July 1 and July 8. Precipitation totals for the period were around 0.5-1.5 inches in the southern half of Ohio and 0.25-0.5 inch the northern half. Strong storms on July 8 in southwestern Ohio brought nearly an inch of rain to the area. Rather dry conditions prevailed statewide during the next 8 days. This trend continued during the second half of the month in the northern half of Ohio where generally only meager amounts of rain fell. However, conditions were much different in most of the southern half of the state where showers and thunderstorms occurred on several days. Some of these storms produced abundant amounts of rain resulting in flooding conditions across some areas in the southern half of the state. The most significant weather event of the month occurred on July 17-18 when strong storms moved through mainly the southwestern half of the state. Rainfall totals were generally less than 1 inch in most areas, with some scattered locations in southeastern Ohio receiving up to 2 inches. However, a series of stronger thunderstorms

(continued on back)

PRECIPITATION JULY



PRECIPITATION

Region	DEPARTURE FROM NORMAL (IN.)					Palmer Drought Severity Index*
	This Month	Past				
		3 Mos.	6 Mos.	12 Mos.	24 Mos.	
Northwest	-0.99	+0.19	-1.11	-0.39	-1.71	-1.2
North Central	-0.99	-2.20	-4.37	-4.58	-0.07	-2.1
Northeast	-1.99	-3.22	-5.55	-6.00	-1.52	-3.5
West Central	+1.69	+2.66	-0.25	-0.17	-3.51	+0.6
Central	+0.08	+1.61	-0.26	-0.44	+0.34	-0.8
Central Hills	-2.02	-3.24	-5.34	-4.73	-3.30	-2.7
Northeast Hills	-1.45	-1.96	-3.39	-4.32	-3.12	-2.8
Southwest	+2.17	+3.62	-0.51	-2.02	-4.20	+1.4
South Central	-0.52	+3.47	-0.16	-2.33	+0.20	+0.1
Southeast	-0.25	+1.21	+0.83	-0.58	+0.08	-0.4
State	-0.42	+0.21	-2.01	-2.56	-1.69	

*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	% of Normal Past		
				3 Mos.	6 Mos.	12 Mos.
				This Month		
Grand River near Painesville	685	90	31	34	64	68
Great Miami River at Hamilton	3,630	2,756	188	135	78	83
Huron River at Milan	371	30	41	32	62	98
Killbuck Creek at Killbuck	464	78	43	63	59	71
Little Beaver Creek near East Liverpool	496	70	33	41	56	62
Maumee River at Waterville	6,330	835	37	144	98	90
Muskingum River at McConnsville	7,422	2,123	49	80	75	79
Scioto River near Prospect	567	42	41	108	74	77
Scioto River at Higby	5,131	1,532	77	176	87	91
Stillwater River at Pleasant Hill	503	117	85	112	66	60

STREAMFLOW during July was below normal across most of the state, except in southwestern Ohio where it was noticeably above normal due to the excessive rainfall in that area of the state. Flows were low enough to be considered deficient in much of northern and eastern Ohio.

Flows at the beginning of July were below normal throughout most of the state, except in southwestern Ohio where flows were above normal. Flows increased state-wide early in the month following precipitation that occurred at the beginning of July. Greatest flows for the month in the north-central and northeastern Ohio basins were recorded during this period. In these areas, flows declined steadily the remainder of the month, except for some

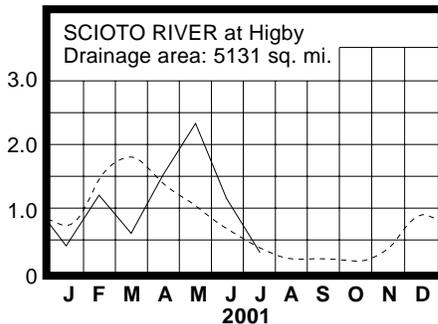
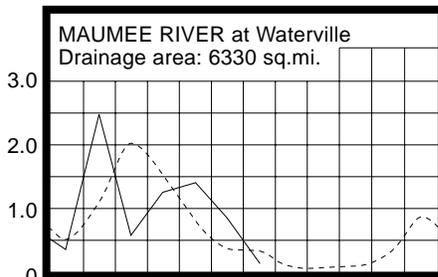
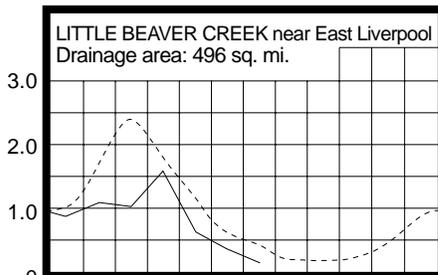
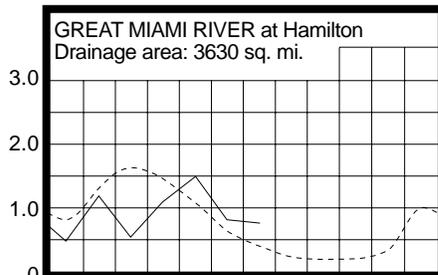
slight, temporary rises around July 25. Monthly low flows were recorded at the end of July in these basins. In southwestern, south-central and west-central Ohio, lowest flows for July occurred around mid-month and in the remainder of Ohio around July 24, all occurring just prior to shower and thunderstorm activity in those respective areas of the state. Greatest monthly flows in southwestern Ohio basins occurred on July 18 following heavy rainfall. Flash floods struck many small streams and urban areas with numerous flooded roadways (see "Flash Floods Strike Southwest Ohio" under Notes and Comments section). The remainder of Ohio experienced their greatest monthly streamflow near the end of the month. Flows were below normal at the end of July across most of the state, except for basins in southwestern, south-central and west-central Ohio, where they were above normal.

RESERVOIR STORAGE for water supply during July decreased in both the Mahoning and Scioto river basins. Month-end storage remained below normal in the Mahoning River basin and above normal in the Scioto River basin.

Reservoir storage at the end of July in the Mahoning basin index reservoirs was 77 percent of rated capacity for water supply compared with 90 percent for last month and 97 percent for July 2000. Month-end storage in the Scioto basin index reservoirs was 90 percent of rated capacity for water supply compared with 98 percent for last month and 87 percent for July 2000.

MEAN STREAM DISCHARGE

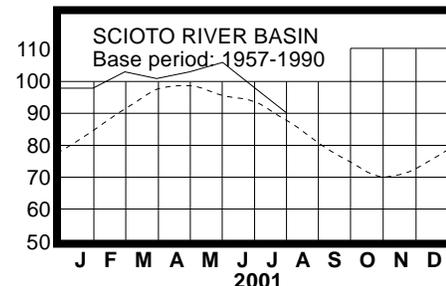
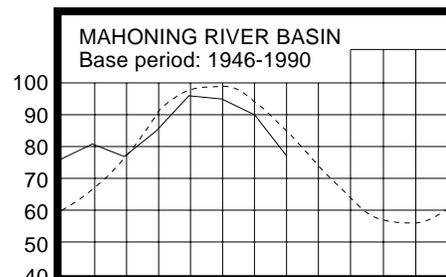
Discharge (cu ft/sec/sq mi)



Base period for all streams: 1961-1990

RESERVOIR STORAGE FOR WATER SUPPLY

Rated capacity (%) 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	15.60	-0.48	-1.96	+0.77
Fa-1	Jasper Mill, Fayette Co.	Limestone	8.17	-0.37	-0.66	-0.32
Fr-10	Columbus, Franklin Co.	Gravel	45.49	-2.03	-0.94	+0.35
H-1	Harrison, Hamilton Co.	Gravel	22.59	-0.63	+0.14	+0.68
Hn-2a	Dola, Hardin Co.	Dolomite	7.01	-0.06	-0.60	-0.94
Po-1	Windham, Portage Co.	Sandstone	20.35	-1.06	-0.34	+0.26
Tu-1	Strasburg, Tuscarawas Co.	Gravel	14.88	-2.36	-0.96	-0.52

GROUND WATER levels during July declined in most aquifers. An exception was in some shallow, unconsolidated aquifers in southwestern Ohio where they rose slightly in response to the above normal rainfall in that area. Net declines during the month were greater than usually observed for this time of the year. Ground water levels in most aquifers declined gradually throughout the month. The one exception was in some unconsolidated aquifers in the southern half of the state where levels rose temporarily just after mid-month in response to the precipitation that occurred around that time.

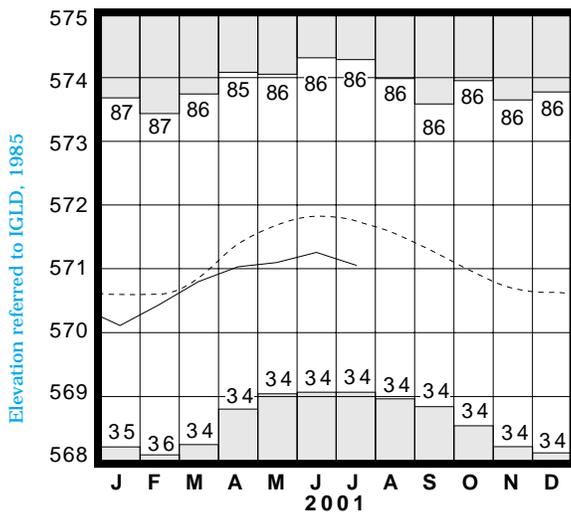
Ground water levels are below normal across most of the state, ranging from just below normal to nearly 2.5 feet below the long-term July average. Current ground water levels are higher than last year's levels across much of the state, however, they are below the July 2000 levels in some consolidated aquifers, especially those in the northern half of Ohio. Although at below-normal levels, ground water supplies remain adequate across the state. Supplies are expected to remain adequate, but below normal precipitation, especially in the northern half of the state, could result in an increase in demand and also accelerate the seasonal decline through the autumn months. The Ohio Agricultural Statistics Service reports that near the end of July soil moisture was rated as being short or very short in 44 percent of the state, adequate in 51 percent of the state and surplus in 5 percent of the state. Thus, water supply managers with ground water sources should continue to monitor their respective situations closely throughout the summer and autumn months.

LAKE ERIE levels declined during July. The mean level was 571.06 feet (IGLD-1985), 0.20 foot lower than last month's mean level and 0.69 foot below normal. This month's mean level is 0.76 foot lower than the July 2000 level and 1.86 feet above Low Water Datum.

The U.S. Army Corps of Engineers (USACE) reports that precipitation in the Lake Erie basin during July averaged 1.44 inches, 1.89 inches below normal. The entire Great Lakes basin averaged 1.60 inches of precipitation during July, which is 1.54 inches below normal. For calendar year 2001 through July, the Lake Erie basin has averaged 16.70 inches, 3.76 inches below normal, while the entire Great Lakes basin has averaged 16.70 inches of precipitation, which is 1.20 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 around 12-14 inches below the long-term seasonal average for the foreseeable future. However, deviations from the expected weather patterns could result in the lake level ranging from a few inches to nearly 2 feet below the normal seasonal levels.

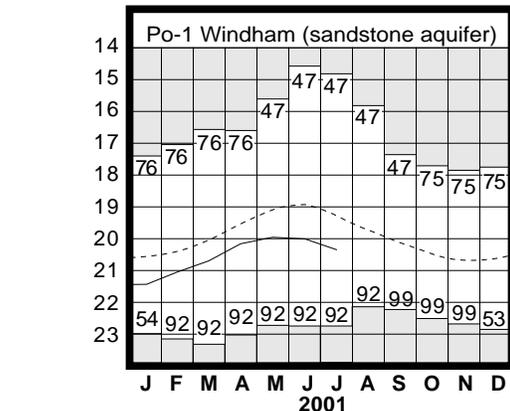
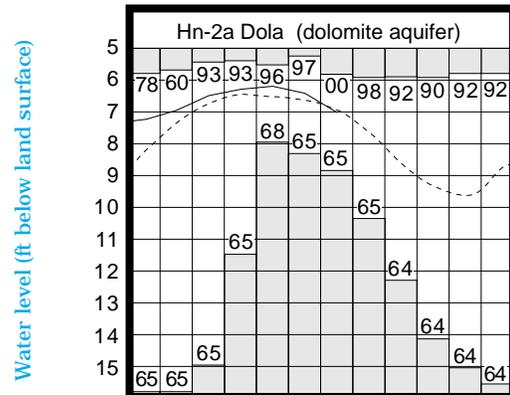
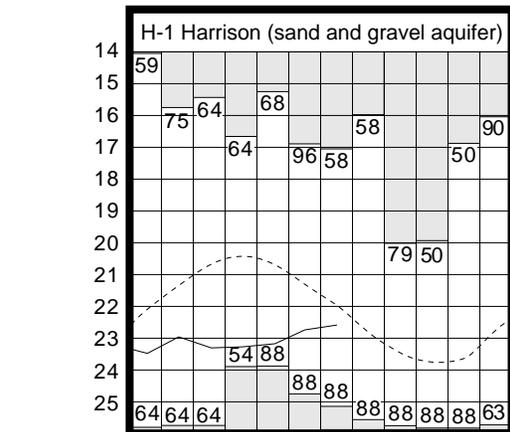
LAKE ERIE LEVELS at Fairport



Base period: 1900-1991

Record high and low, year of occurrence

GROUND-WATER LEVELS



Base periods: H-1, 1951-1990. Hn-2a, 1955-1990.

Po-1, 1947-1990 Record high and low, year of occurrence

Normal - - - - Current ———

(Precipitation continued from front)

moved through southwestern Ohio producing 3-7 inches of rain, resulting in flash flooding across the area (see "Flash Floods Strike Southwest Ohio" under Notes and Comments). Showers and scattered thunderstorms again affected areas mostly in the southern half of the state on several days between July 19-30. The rain on July 25 was the most widespread of the month with nearly all areas of the state receiving some rain. Most of the rain was light or moderate, but there were isolated areas of heavier downpours in central, southwest and west-central Ohio where up to three inches were reported. Generally, storm totals from this weather system in other areas of the state ranged from little or no rain, especially in northeastern and east-central Ohio to around 1 inch. Urban and small stream flooding across various areas of central Ohio resulted from the downpours associated with storms on July 19, 24 and 25.

Precipitation for the 2001 calendar year is below normal across nearly the entire state of Ohio. The average for the state as a whole is 20.09 inches, 3.43 inches below normal. Regional averages range from 25.01 inches, 0.06 inch below normal, for the Southeast Region to 15.21 inches, 5.86 inches below normal, for the North Central Region.

Precipitation for the 2001 water year is below normal statewide. The average for the state as a whole is 27.25 inches, 3.84 inches below normal. Regional averages range from 31.69 inches, 1.07 inches below normal, for the Southeast Region to 21.46 inches, 6.46 inches below normal, for the North Central Region. Many areas of the state have received below normal precipitation during several months in the 2001 water year. The northeastern quarter of the state has been impacted the most by these dry conditions. This is reflected by the Palmer Drought Severity Index (PDSI) that, near the end of July, rated the Northeast Region as being in severe drought conditions. The Central Hills, North Central and Northeast Hills regions are rated as being in a moderate drought according to the PDSI.

SUMMARY

Precipitation during July was below normal across much of the state, but was above normal in southwestern, west central and parts of central Ohio. Streamflow was below normal across most of the state, except in southwestern Ohio where flows were above normal with several areas experiencing small stream and urban flooding. Reservoir storage decreased statewide. Ground water levels declined in most aquifers and are below normal across most of the state. Lake Erie level declined 0.20 foot and was 0.69 foot below the long-term July average.

NOTES AND COMMENTS

New Fact Sheet Available

The Ohio Department of Natural Resources, Division of Water announces the availability of the new publication:

Understanding Your Water Well (Fact Sheet Number 62)

This fact sheet contains answers to many of the frequently asked questions concerning problems people have experienced with their water wells. The fact sheet defines and discusses terms such as static water level, drawdown, cone of depression and pumping water level. This fact sheet will be of interest to homeowners and others who would like a better understanding of the operation and efficiency of their well. This new fact sheet is one in a series of fact sheets the Division of Water has prepared concerning a wide range of topics. You may request a single copy of this new fact sheet, or any of the other fact sheets, from the Ohio Department of Natural Resources, Division of Water, Water Resources Section, 1939 Fountain Square, Building E-1, Columbus, OH., 43224-1336 or by calling (614) 265-6740. You may also obtain a copy by visiting the Division of Water web site at <http://www.dnr.state.oh.us/odnr/water/> and selecting publications.

Flash Floods Strike Southwest Ohio

A series of strong thunderstorms with copious amounts of rain fell across southwest Ohio resulting in flash flooding. The storms began during the evening hours of July 17 and continued through the early morning hours of July 18. Rain amounts of 3-7 inches fell across this area in a relatively short period of time. Small streams and sewers could not handle the large volume of water these storms dumped on this area. Scattered areas of wind damage, mainly downed trees and power lines, were also associated with these storms. The northern suburbs of Cincinnati were particularly impacted with Duck and Sycamore Creeks among the streams that were especially hard hit. Tragically, it was along these streams that three people lost their lives, directly attributable to the flooding. Around 1000 structures, including homes and businesses, as well as many roadways received damage of some kind due to the flooding. Early estimates speculate that damages will run in the millions of dollars. Governor Taft declared Butler, Hamilton and Clermont counties state disaster areas. The Small Business Administration made a disaster declaration for Butler and Hamilton counties, making people impacted by the floods in these counties and the contiguous counties of Clermont, Montgomery, Preble and Warren eligible for low-interest loans and other assistance.

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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