



# MONTHLY WATER INVENTORY REPORT FOR OHIO

July 1999

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

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**PRECIPITATION** during July was above normal in the northern half of the state and below normal in the southern half. The state average was 3.81 inches, 0.11 inch below normal. Regional averages ranged from 4.73 inches, 1.05 inches above normal, for the Northeast Region to 2.42 inches, 1.55 inches below normal, for the Southwest Region. This was the 16th driest July of record for the Southwest Region and the 17th driest for the South Central Region. Millersburg (Holmes County) reported the greatest amount of rain for July, 9.27 inches. Kings Mills (Warren County) reported the least amount for the month, 0.97 inch.

During July, the northern half of Ohio generally received more widespread rains while in the southern half, hit and miss showers were the norm with some areas receiving little rain for the month. Storms during July 1 produced a narrow band of heavy rain through the central part of the state from northeast of Dayton and north of Columbus into northeast Ohio. As much as 3 inches were reported from this area with amounts decreasing the further you moved away from this line to near zero in northwest and south-central Ohio. Rain returned to the northern half of the state on July 6 when 0.5-1.0 inch was reported in this area with as much as 2 inches falling in scattered areas in north-central Ohio. A frontal system crossing the state during July 9-10 was responsible for bringing widespread rain across most of Ohio with amounts of 0.5-1.5 inches generally reported. However, areas in central Ohio received little or no rain. Conditions across the state were hot and dry during the next week, intensifying drought conditions in many areas. The last two weeks of the month were marked by several days with scattered showers and thunderstorms. Many of the storms were strong and accompanied by locally heavy rain. The most notable of these included storms on July 21, 23 and 28. On July 21, light showers fell over the northern half of the state with an area of from 1-3 inches of rain falling in a portion of northwest and west-central Ohio. Little or no rain fell in the southern half of the state from this storm. On July 23, the northern half of the state again received light to moderate rain with the heaviest amounts of as much as 4 inches reported in northwestern and west-central Ohio. Storms on July 28 produced rain in the eastern half of the state with the greatest amounts falling on the northeast quarter of the state where totals of 1.5-2.0 inches occurred. Although there were several days with rain during the last two weeks of the month, the rains were rather spotty and the heavier showers were very isolated. Many areas in Ohio, especially in the southern half, received little rain during this period (see "Sixty-six Ohio Counties Receive Agricultural Disaster Declaration" on the last page of this report).

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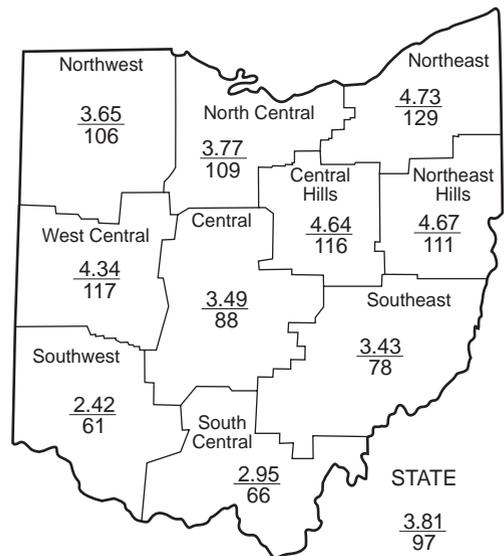
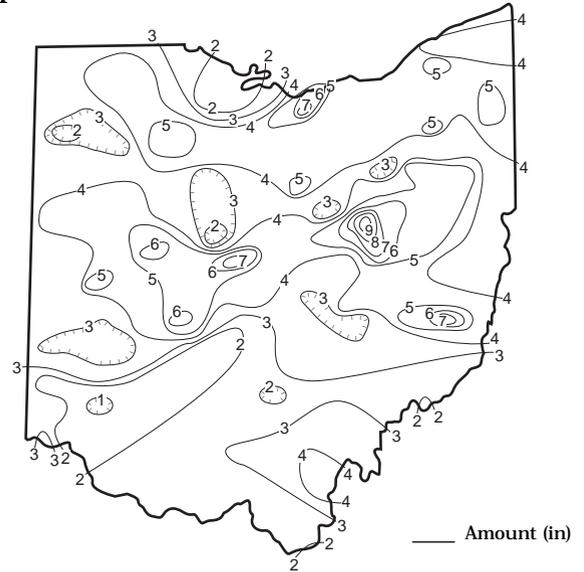
## PRECIPITATION

Region	DEPARTURE FROM NORMAL (IN.)					Palmer Drought Severity Index*
	This Month	Past				
		3 Mos.	6 Mos.	12 Mos.	24 Mos.	
Northwest	+0.21	-1.14	-0.36	+1.70	+6.72	-1.9
North Central	+0.31	-2.07	-1.65	-2.65	+3.29	-1.8
Northeast	+1.05	-1.53	-1.64	-2.51	-1.56	-1.9
West Central	+0.63	-2.62	-2.23	-3.42	+0.05	-2.1
Central	-0.47	-5.21	-5.27	-7.03	-3.58	-3.1
Central Hills	+0.65	-3.63	-3.67	-2.82	-1.14	-1.2
Northeast Hills	+0.46	-2.77	-3.27	-0.57	+3.20	-1.9
Southwest	-1.55	-4.77	-6.13	-8.38	-4.29	-3.2
South Central	-1.51	-6.04	-8.41	-10.99	-5.24	-2.8
Southeast	-0.94	-5.03	-6.06	-6.37	+1.40	-2.8
State	-0.11	-3.48	-3.86	-4.31	-0.12	-2.8

\*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



Average (in)  
Percent of normal

# MEAN STREAM DISCHARGE

River and Location	Drainage Area (Sq. Mi.)	This Month		% of Normal Past		
		Mean Discharge (CFS)	% of Normal	3 Mos.	6 Mos.	12 Mos.
Grand River near Painesville	685	77	27	27	58	49
Great Miami River at Hamilton	3,630	1,030	70	51	74	84
Huron River at Milan	371	114	156	54	76	103
Killbuck Creek at Killbuck	464	110	60	41	67	89
Little Beaver Creek near East Liverpool	496	149	71	46	65	86
Maumee River at Waterville	6,330	780	35	79	92	107
Muskingum River at McConnelsville	7,422	1,652	38	44	77	92
Scioto River near Prospect	567	46	45	35	64	79
Scioto River at Higby	5,131	910	46	33	58	73
Stillwater River at Pleasant Hill	503	101	73	52	73	82

**STREAMFLOW** during July was below normal throughout most of the state except in north-central Ohio where it was above normal. Flows were low enough to be considered deficient in the southern half of the state and also in extreme northeast Ohio. Flows for the month were less than the June flows except in the northeast quarter of Ohio where flows were slightly higher than the June flows.

Streamflow was below normal statewide at the beginning of July but quickly increased following rains on July 1. Greatest flows for the month were reached during the first week of July except for streams in northwest Ohio where they occurred later. During the next two weeks flows steadily declined except for some slight, temporary increases in southern and eastern Ohio

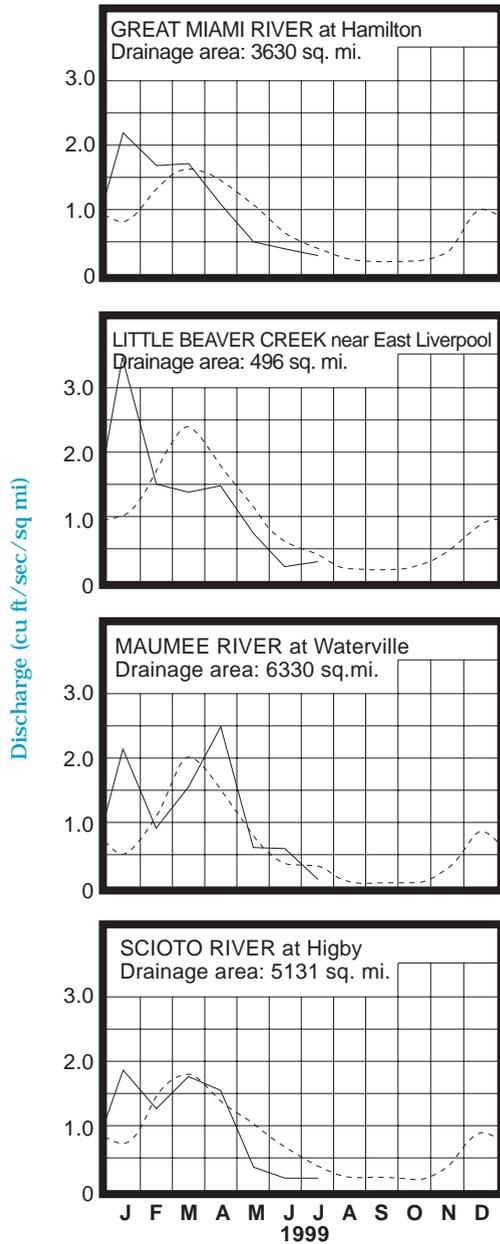
around July 10-11. Lowest flows for the month were established generally between July 17-19 in all basins except those in northeastern Ohio. Flows increased for a few days beginning on July 20 as a result of scattered showers and isolated heavier downpours that crossed the state. Greatest flows for the month were reached in northwest Ohio streams around July 26. Flows declined during the next couple of days and reached their lowest point for the month at this time in northeast Ohio, just before rain and strong storms during the last few days of the month pushed streamflow higher in the eastern half of the state. Streamflow at the end of July remained below normal statewide except in north-central areas of the state where streamflow was above normal.

**RESERVOIR STORAGE** for water supply during July declined in both the Mahoning and Scioto river basins. Storage remains below normal in both basins.

Reservoir storage at the end of July in the Mahoning basin index reservoirs was 80 percent of rated capacity for water supply compared with 90 percent for last month and 87 percent for July 1998. Month-end storage in the Scioto basin index reservoirs was 77 percent of rated capacity for water supply compared with 84 percent for last month and 100 percent for July 1998.

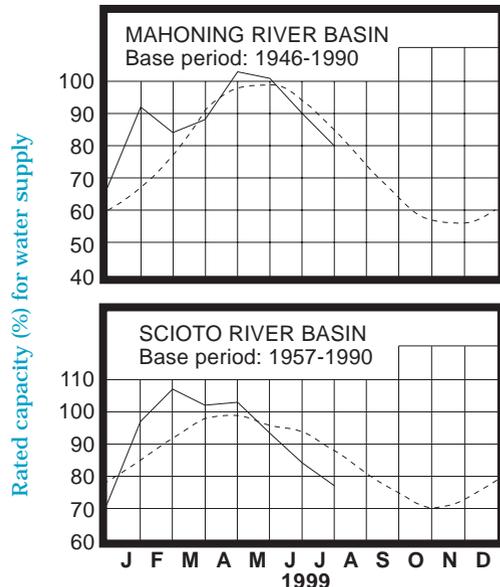
Surface water supplies remain adequate statewide. However, local water-supply managers with surface-water sources should continue to monitor their respective situations closely.

## MEAN STREAM DISCHARGE



Base period for all streams: 1961-1990

## RESERVOIR STORAGE FOR WATER SUPPLY



## GROUND-WATER LEVELS

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

**GROUND WATER** levels during July declined throughout the state. In most aquifers the declines were greater than normally observed for July. Levels in most aquifers declined steadily throughout the month with only a few exceptions in some shallow aquifers where levels stabilized temporarily around July 10 and again late in the month following the rain during those periods.

Ground water levels are below normal statewide with levels generally ranging from 0.5 foot to nearly 3.5 feet below the long-term seasonal average. Current levels are also lower than they were at this time last year by 1 to almost 3.5 feet. Levels in most aquifers are currently higher than they were in July 1988; however, some aquifers in central and south-central Ohio are lower than they were during this period, the most recent benchmark year for droughts in Ohio. Even with near-normal precipitation and other climatic conditions during the next several months, little recharge can be expected. The Ohio Agricultural Statistics Service reports that near the end of July soil moisture was rated as being short or very short in 75 percent of the state and adequate in 25 percent of the state.

Ground water levels are expected to continue to decline seasonally through mid or late autumn. With ground water levels currently below normal statewide, water supply managers with ground water sources are urged to continue to monitor their respective situations closely.

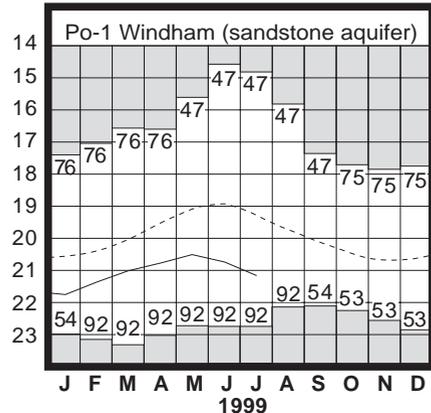
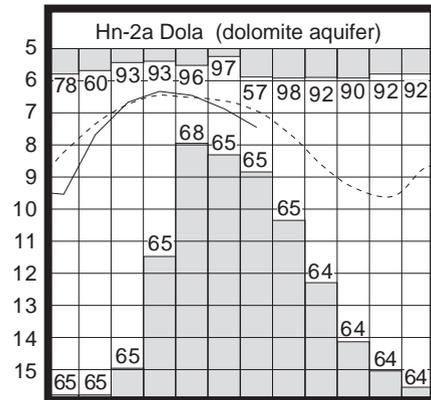
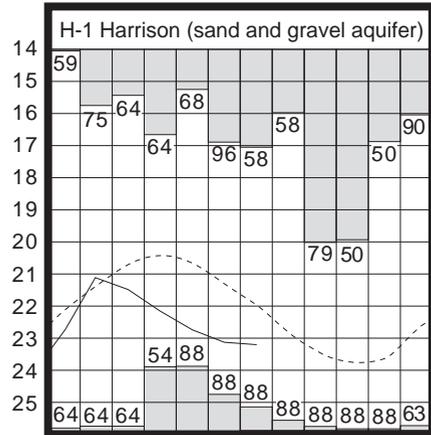
**LAKE ERIE** level declined during July. The mean level was 571.69 feet (IGLD-1985) which is 0.16 foot lower than last month's mean level and 0.06 foot below normal. This month's level is 1.57 feet lower than the July 1998 level and 2.49 feet above Low Water Datum.

The U. S. Army Corps of Engineers (USACE) reports that precipitation in the Lake Erie basin during July averaged 2.3 inches which is 1.0 inch below normal. The entire Great Lakes basin averaged 4.1 inches of precipitation during July which is 1.0 inch above normal. For calendar year 1999 through July, the Lake Erie basin has averaged 19.4 inches of precipitation, 1.0 inch below normal, and the entire Great Lakes basin has averaged 18.9 inches, 1.0 inches above normal.

The level of Lake Erie has fallen to below normal during the summer boating season for the first time in more than 30 years. The USACE predicts that, based on the current condition of the Great Lakes basin and anticipated future weather conditions, the level of Lake Erie should range from near to slightly below the long-term seasonal average for the foreseeable future.

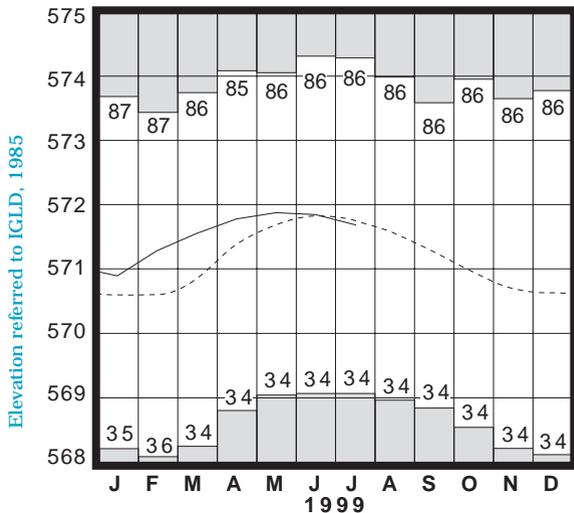
Index Well	Location	Aquifer	Mean This Month	Departure From Normal	Change in feet from:	
					Last Month	Year Ago
F-1	W. Rushville, Fairfield Co.	Sandstone	18.46	-3.34	-1.13	-2.79
Fa-1	Jasper Mill, Fayette Co.	Limestone	9.22	-1.42	-0.86	-1.76
Fr-10	Columbus, Franklin Co.	Gravel	45.76	-2.30	-0.87	-3.30
H-1	Harrison, Hamilton Co.	Gravel	23.20	-1.24	-0.08	-1.97
Hn-2a	Dola, Hardin Co.	Dolomite	7.45	-0.50	-0.56	-0.88
Po-1	Windham, Portage Co.	Sandstone	21.16	-1.87	-0.42	-1.50
Tu-1	Strasburg, Tuscarawas Co.	Gravel	14.89	-2.37	-0.79	-2.72

## GROUND-WATER LEVELS



Water level (ft below land surface)

## LAKE ERIE LEVELS at Fairport



Base period: 1900-1991

■ Record high and low, year of occurrence

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

■ Record high and low, year of occurrence

(continued from front page)

Precipitation for the 1999 calendar year is below normal statewide except in the Northwest Region where it is above normal. The average for the state as a whole is 21.18 inches, 2.35 inches below normal. Regional averages range from 23.20 inches, 0.66 inch below normal, for the Northeast Hills Region to 19.40 inches, 4.48 inches below normal, for the Central Region.

Precipitation for the 1999 water year is below normal statewide. The state average is 27.93 inches, 3.16 inches below normal. Regional averages range from 30.99 inches, 0.58 inch below normal, for the Northeast Hills Region to 24.72 inches, 3.20 inches below normal, for the North Central Region.

**SUMMARY**

Precipitation during July was above normal in many areas in the northern half of the state, but continued the below normal trend of the past 2 months in southern Ohio. Streamflow was below normal in most drainage basins. Reservoir storage declined and although at below-normal levels, remained adequate statewide. Ground water levels declined and are below normal statewide. Lake Erie declined 0.16 foot and was 0.06 foot below the long-term July average. Drought conditions have had adverse impacts on agricultural crops and livestock, but water supplies remain adequate statewide.

**NOTES AND COMMENTS**

**Sixty-six Ohio Counties Receive Agricultural Disaster Declaration**

At the request of Governor Bob Taft, U. S. Department of Agriculture Secretary Dan Glickman has declared 66 Ohio counties agricultural disaster areas. This declaration will make low-interest loans available to eligible drought-stricken farmers in the declared counties and in counties contiguous to those receiving the declaration. This results in 86 of Ohio's 88 counties eligible for assistance.

The counties receiving the declaration are:

Adams	Hamilton	Perry
Ashland	Harrison	Pickaway
Athens	Henry	Pike
Auglaize	Highland	Portage
Belmont	Hocking	Richland
Brown	Holmes	Ross
Butler	Jackson	Sandusky
Carrroll	Jefferson	Scioto
Clark	Knox	Seneca
Clermont	Lawrence	Stark
Clinton	Licking	Summit
Columbiana	Lucas	Trumbull
Coshocton	Madison	Tuscarawas
Defiance	Mahoning	Union
Fairfield	Marion	Van Wert
Fayette	Medina	Vinton
Fulton	Meigs	Wayne
Gallia	Monroe	Warren
Greene	Morgan	Washington
Guernsey	Muskingum	Williams
Hancock	Noble	Wood
	Ottawa	Wyandot

This disaster declaration was requested based on existing and anticipated economic hardships in the agricultural community as a result of drought-related stress to crops and livestock. This situation is compounded with low market values for the farm commodities.

Precipitation during the past 3 months has been below normal in most areas of Ohio, and noticeably below normal in much of the southern half of the state (see precipitation table, departure from normal, past 3 months column). For the state as a whole, precipitation has averaged about 70 percent of normal during this period, ranking as the 9th driest May - July during the past 117 years. Regionally averaged precipitation for these 3 months ranges from about 50 to 70 percent of normal in the southern half of the state. This has been the 3rd driest May-July period in the South Central Region, the 5th driest in the Central and Southeast regions, the 6th driest in the Central Hills Region, and the 8th driest in the Southwest Region.

Governor Taft has convened the Ohio Drought Executive and Drought Assessment committees. Both committees include representatives from several state and federal agencies with wide-ranging programs and responsibilities for responding to increasingly severe drought conditions. The committees are closely monitoring the on-going situation and providing reports to the Governor's office as needed. Ohio Department of Natural Resources Director Sam Speck recently issued a directive that provided guidelines for the use of ODNR owned or controlled waters for emergency livestock water supply to drought-stricken farmers, emergency public water supply and for emergency fire fighting.

**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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