



# MONTHLY WATER INVENTORY REPORT FOR OHIO

August 2007

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

Compiled By Scott C. Kirk

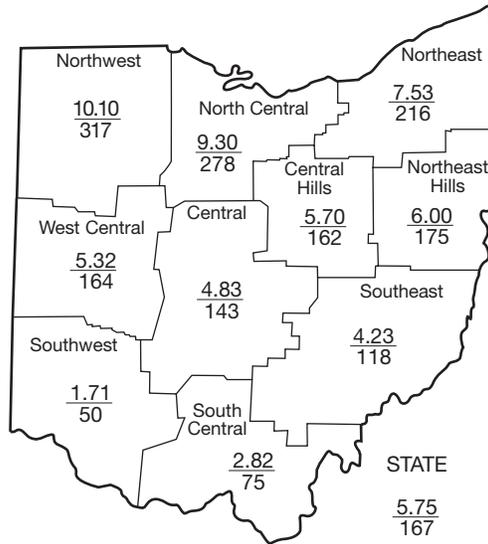
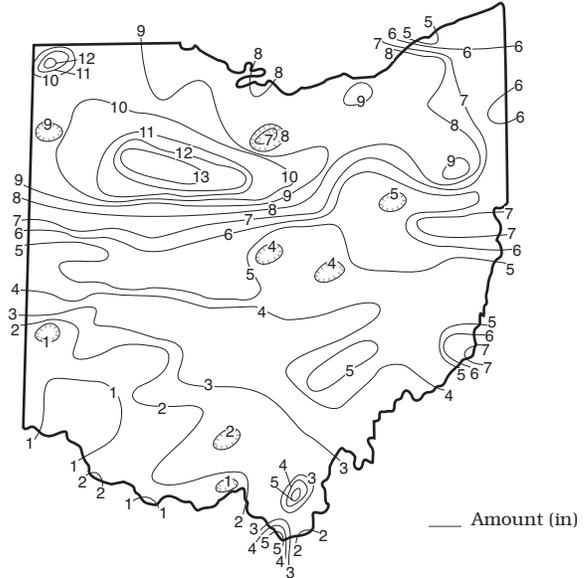
Hydrologist  
Water Inventory Unit

**PRECIPITATION** during August was above normal throughout most of the state, but below normal in the Southwest and South Central regions. The state average was 5.75 inches, 2.31 inches above normal. Regional averages ranged from 10.10 inches, 6.91 inches above normal, for the Northwest Region to 1.71 inches, 1.70 inches below normal, for the Southwest Region. For the state as a whole, this was the 7th wettest August during the past 125 years. Regionally, this was the wettest August of record for the Northwest, North Central and Northeast regions. Conversely, this was the 6th driest August for the Southwest Region. Upper Sandusky (Wyandot County) reported the greatest amount of August precipitation, 13.77 inches; Pandora (Putnam County) reported 13.61 inches. Radar estimates show that localized areas in Wyandot County probably received more than 15 inches of rain for the month with unofficial reports indicating more than 17 inches fell. In sharp contrast, several stations in southwestern Ohio reported less than 1 inch of rain for August, with Eaton (Preble County) reporting the least amount, a scant 0.37 inch.

Precipitation during August fell as showers and thunderstorms and varied greatly across the state. While notably above normal precipitation fell across northern Ohio, erasing all drought concerns, areas of southwestern Ohio continued to experience exceptionally dry conditions. Showers and thunderstorms fell on many days throughout August. Some of these storms were severe and accompanied with heavy rain and high winds. The first significant rain of the month occurred on August 5. Showers and thunderstorms were most numerous from northwestern to southeastern Ohio where generally 0.5-1.5 inches of rain was reported. Less than 0.25 inch was reported across southwestern Ohio. Periods of heavy rain fell across northern Ohio during August 7-9 where 1.5-3.0 inches of rain were common and as much as 5 inches reported at some locations. Much of southwestern Ohio again received less than 0.25 inch during this time. After a few dry days, storms returned to the state on August 15 and for the next week and a half, numerous showers and thunderstorms crossed the state. The most significant precipitation fell during August 19-22 with most of the northeastern two-thirds of Ohio receiving between 1 and 3 inches of rain. A large area in northwestern and north-central Ohio received 3-5 inches of rain with as much as 8-10 inches reported at some locations. Flash flooding occurred across several northern Ohio counties (see Notes And Comments on the last page of this report). Once again, areas of southwestern Ohio received less than 0.25 inch of rain during this period. A few widely scattered showers and

(continued on back)

## PRECIPITATION AUGUST



Average (in)  
Percent of normal

## 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	+6.91	+4.41	+3.28	+9.13	+14.00	+2.7
North Central	+5.95	+4.59	+3.75	+11.14	+15.66	+2.6
Northeast	+4.04	+2.26	+0.73	+7.64	+12.59	+0.8
West Central	+2.08	+0.18	+1.15	+8.31	+14.87	-1.0
Central	+1.46	+0.02	-0.62	+8.28	+9.92	-2.2
Central Hills	+2.18	+2.35	+1.19	+6.27	+7.94	+1.5
Northeast Hills	+2.57	+2.52	+2.05	+6.19	+8.73	-0.3
Southwest	-1.70	-3.58	-6.75	+0.73	+0.78	-3.9
South Central	-0.96	-1.77	-6.81	+1.47	-4.08	-4.1
Southeast	+0.65	-0.66	-2.88	+3.05	+1.60	-3.1
State	+2.31	+1.02	-0.49	+6.21	+8.19	

\*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

## 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	424	31	19	150	149
Great Miami River at Hamilton	3,630	959	83	45	117	151
Huron River at Milan	371	749	820	161	147	169
Killbuck Creek at Killbuck	464	456	323	86	102	114
Little Beaver Creek near East Liverpool	496	611	449	88	99	121
Maumee River at Waterville	6,330	12,540	1,286	135	121	155
Muskingum River at McConnellsville	7,422	5,084	175	98	146	109
Scioto River near Prospect	567	391	865	52	132	168
Scioto River at Higby	5,131	1,663	126	35	94	135
Stillwater River at Pleasant Hill	503	64	91	25	129	148

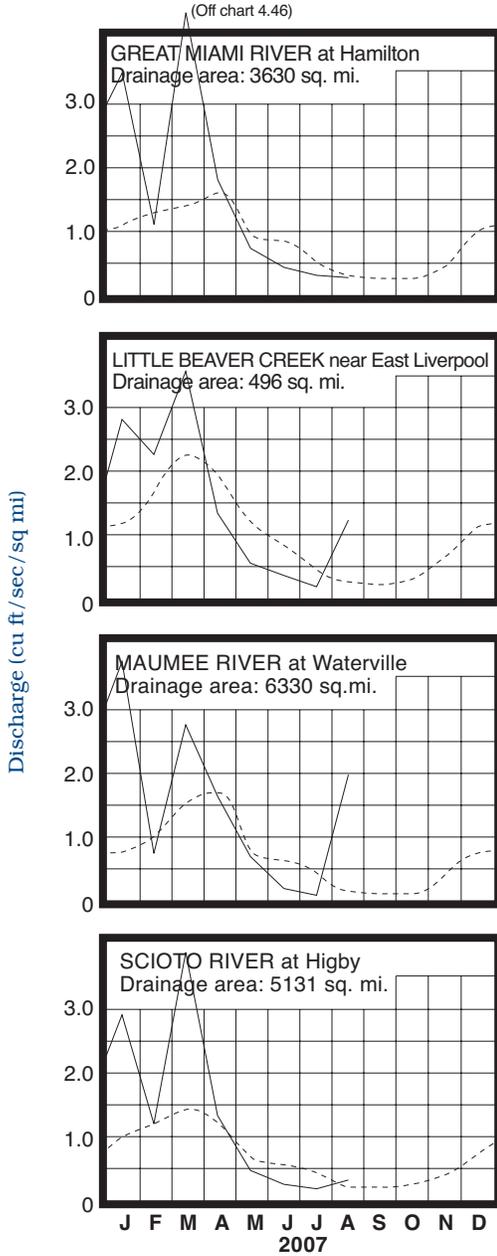
**STREAMFLOW** during August was noticeably above normal throughout much of Ohio, but below normal in west-central and southwestern Ohio. Flows were high enough to be considered excessive in the northeastern half of the state. August flows in most drainage basins increased substantially from those flows recorded during July, except in west-central and southwestern Ohio where flows were seasonally lower. Preliminary data indicates that for the period of respective records, this month's mean monthly flow for the Maumee River at Waterville was the greatest recorded for August and for the Huron River at Milan it matched the highest recorded for August.

Streamflow at the beginning of the month was below normal across most of Ohio. Flows decreased during the first 5 days of the month and were at their lowest monthly flow across most of the state during this time. Streamflow increased in response to precipitation that fell near the end of the first week and beginning of the second week of the month and were excessive across much of northern Ohio. Flows decreased from these peaks and in western and southwestern Ohio were at their monthly lowest flow during August 14-16. Flows increased as storms crossed much of the state during August 19-22. Greatest flows for the month occurred statewide during the August 21-26 period following these storms. Heavy rain caused locally severe flooding in several counties in northern Ohio (see Notes and Comments on the last page of this report). Flows at the end of the month remained above normal in eastern Ohio but were below normal in western Ohio.

**RESERVOIR STORAGE** during August increased in the Mahoning River basin and decreased in the Scioto River basin. Storage increased to above normal seasonal levels in the Mahoning basin reservoirs, but remained below normal in the Scioto basin reservoirs.

Reservoir storage at the end of August in the Mahoning basin index reservoirs was 87 percent of rated capacity for water supply compared with 80 percent for last month and 87 percent for August 2006. Month-end storage in the Scioto basin index reservoirs was 79 percent of rated capacity for water supply compared with 84 percent for last month and 92 percent for August 2006. Generally, surface water supplies remain adequate across the state.

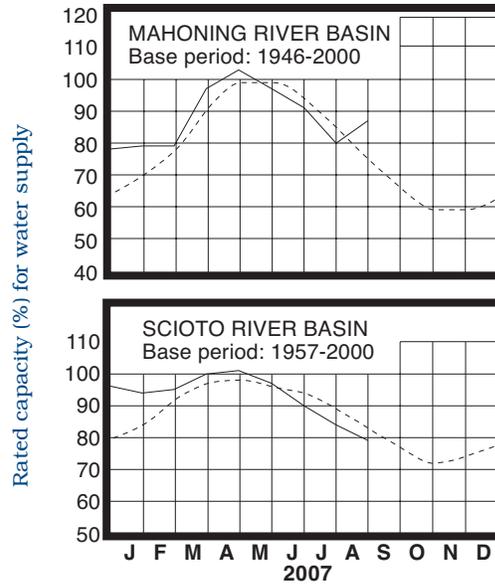
### MEAN STREAM DISCHARGE



Base period for all streams: 1971-2000

Normal - - - - Current ———

### RESERVOIR STORAGE FOR WATER SUPPLY



## 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	16.21	-0.17	-0.76	-2.34
Fa-1	Jasper Mill, Fayette Co.	Limestone	10.15	-1.83	-0.89	-1.08
Fr-10	Columbus, Franklin Co.	Gravel	45.54	-1.74	-0.48	-1.74
H-1	Harrison, Hamilton Co.	Gravel	24.45	-1.58	-0.49	-1.58
Hn-2a	Dola, Hardin Co.	Dolomite	8.13	-0.64	-0.62	-0.64
Po-1	Windham, Portage Co.	Sandstone	17.81	+2.06	-0.42	+2.06
Tu-1	Strasburg, Tuscarawas Co.	Gravel	14.68	-1.27	-0.30	-1.27

**GROUND WATER** levels during August declined seasonally statewide. Aquifers in southern Ohio steadily declined throughout the month while aquifers in northern Ohio declined during the first half of August, then rose during the second half of the month in response to the much above normal precipitation.

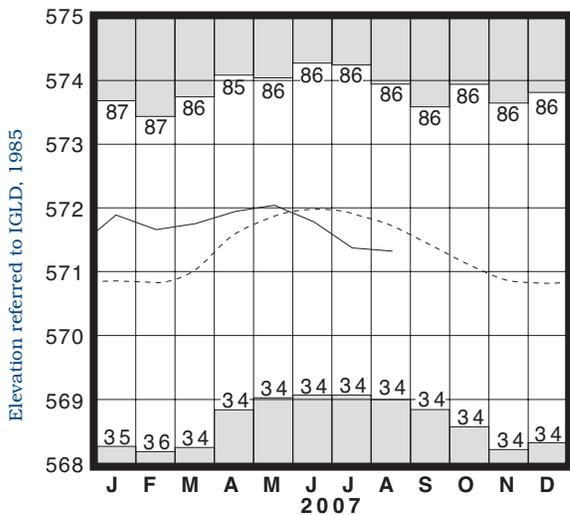
Ground water levels continue to remain below normal and are lower than they were during August 2006 across most of the state. The only exception continues to be in some of the consolidated aquifers in eastern Ohio where levels are above normal and nearly 1 foot higher than the August 2006 levels. Ground water supplies remain adequate throughout the state, including southern Ohio where unusually dry conditions have existed the past few months. A return to near-normal climatic conditions across southern Ohio would help reduce concerns of any worsening of these conditions. However, a continuation of the dry conditions through the fall months in southern Ohio could have an adverse effect on ground water supplies, especially in areas that have been the driest in recent months. Thus, ground water managers in southern Ohio should continue to monitor their respective situations closely. The Ohio Agricultural Statistics Service reports that at the end of August, soil moisture was rated as being short or very short in 32 percent of the state, adequate in 59 percent of the state, and surplus in 9 percent of the state.

**LAKE ERIE** level declined during August. The mean level was 571.33 feet (IGLD-1985), 0.06 foot lower than last month's mean level and 0.39 foot below normal. This month's mean level is 0.32 foot lower than the August 2006 level and 2.13 feet above Low Water Datum.

The U.S. Army Corps of Engineers reports that precipitation in the Lake Erie basin during August averaged 6.44 inches, 3.25 inches above normal. For the entire Great Lakes basin, August precipitation averaged 3.15 inches, which is normal. For calendar year 2007 through August, the Lake Erie basin has averaged 24.17 inches of precipitation, 0.47 inch above normal, while the entire Great Lakes basin has averaged 18.93 inches, 2.14 inches below normal.

In addition, the USACE reports that based on the current condition of the Great Lakes basin and anticipated weather patterns, the level of Lake Erie should remain below normal for the foreseeable future. Deviations from the anticipated weather patterns could result in the level of Lake Erie ranging from about 2 inches above to as much as 17 inches below the normal seasonal average.

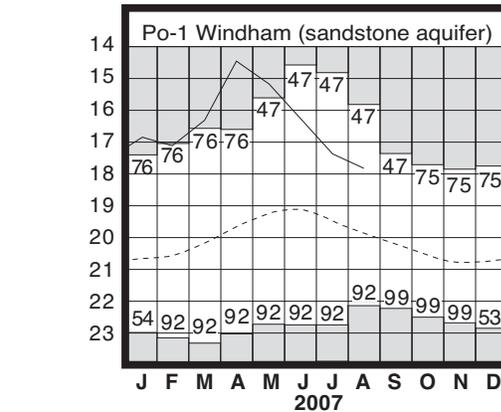
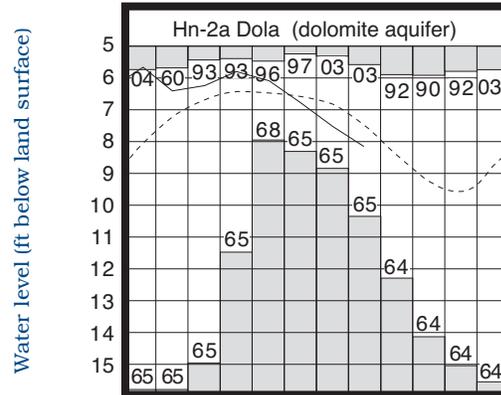
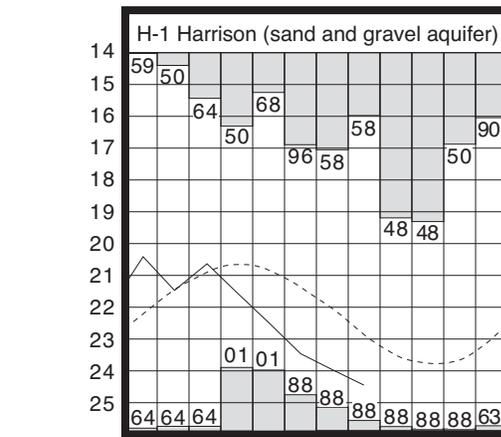
### LAKE ERIE LEVELS



Base period: 1918-2000

■ Record high and low, year of occurrence

### GROUND-WATER LEVELS



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

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

Normal - - - - Current - - - -

(Precipitation continued from front)

thunderstorms near the end of the month brought temporary relief from the dry conditions across south-central Ohio, but most areas in southwestern and south-central Ohio remained extremely dry.

Precipitation for the 2007 calendar year is above normal in the northern two-thirds and below normal in the southern third of Ohio. The average for the state as a whole is 28.38 inches, 1.52 inches above normal. Regional averages range from 31.00 inches, 6.50 inches above normal, for the North Central Region to 23.05 inches, 6.21 inches below normal, for the South Central Region.

Precipitation for the 2007 water year is above normal across most of the state, but below normal in the Southwest and South Central regions. The average for the state as a whole is 39.51 inches, 4.44 inches above normal. Regional averages range from 43.13 inches, 10.99 inches above normal, for the North Central Region to 33.99 inches, 3.68 inches below normal, for the South Central Region.

## SUMMARY

Precipitation during August was above normal throughout most of Ohio, but below normal in the Southwest and South Central regions. Streamflow was noticeably above normal throughout much of the state, but below normal in west-central and southwestern Ohio. Locally severe flooding occurred in several counties in northern Ohio. Reservoir storage increased in the Mahoning River basin and was above normal. Storage decreased in the Scioto River basin and was below normal. Ground water levels declined and were below normal across most of the state. Lake Erie level declined 0.06 foot and was 0.39 foot below the long-term August average.

## NOTES AND COMMENTS

### August Flooding Results In Disaster Declaration

At the request of Ohio Governor Ted Strickland, President Bush has issued a Disaster Declaration for 8 northern Ohio counties that suffered damage from severe storms and floods during August 20-26. The counties included in the declaration are Allen, Crawford, Hancock, Hardin, Putnam, Richland, Seneca and Wyandot counties. The federal declaration enables storm victims in these counties to apply for assistance provided by the federal government.

August started with exceptionally dry conditions across most of the state. By the end of the month, record August precipitation amounts were established at several stations in northern Ohio including Upper Sandusky, 13.77 inches, Mansfield Lahm Municipal Airport, 10.32 inches, and Cleveland Hopkins International Airport, 9.03 inches. Conditions began to change early in the month in northern Ohio as heavy rain fell across the region during August 5-9. Most of northern Ohio received between 1.5 and 3.0 inches of rain with some locations receiving nearly 5 inches during this period. Flooding of homes, businesses and roadways occurred across parts of northern Ohio, especially northeastern Ohio. In addition to the heavy rain, many of the storms were accompanied by damaging winds and 3 tornadoes occurred on August 9. After a few dry days, storms moved back into the state during the evening hours on August 15. Storms were most numerous from northwestern to east-central Ohio where 0.5-1.5 inches of rain fell. During August 19-22 a nearly stationary front extended from west to east across northern Ohio. Moisture laden air drawn northward with the remnants of Tropical Storm Erin moved along this front, dumping heavy rain across the region. Rain on August 19 was heaviest from Toledo to Cleveland with 1-2 inches common. Storms developed along this front on August 20-21 bringing torrential rain to the area. A large portion of northern Ohio received 3-5 inches of rain with more than 5 inches reported in an area from Van Wert County east to Summit and Holmes counties. Within this area, Allen, Crawford, Hancock, Putnam, Richland and Wyandot counties were especially hard hit with more than 6 inches of rain reported and preliminary indications of 8-10 inches falling at several locations. For some locations, the amount of rain that fell exceeded the 1000-year recurrence interval for a 24-hour period. The rain fell on ground saturated from earlier storms, causing streams in the area to quickly rise out of their banks. Major flooding occurred throughout this area, inundating roads, homes and businesses, forcing evacuations and several rescues. Findlay (Hancock County), Ottawa (Putnam County), Shelby (Richland County) and Bucyrus (Crawford County) are some of the areas that were severely impacted by the flooding. Each city had flooding in their downtown districts for an extended period of time. Significant flooding occurred in several other communities in northern Ohio as well. Some streams in the region reached record August flows for their respective periods of record. In some communities, the severity of the flooding was similar to that of the March 1913 flood. In addition to the heavy rain, some of the storms during this time were severe with damaging winds.

Damage assessments are on going at the writing of this report. Early estimates of economic loss to public and private property are more than 40 million dollars. Thus far, more than 6,800 applications have been filed for various types of disaster assistance. The number of structures affected by floodwaters will be in the thousands with many suffering substantial damage.

## 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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