



MONTHLY WATER INVENTORY REPORT FOR OHIO

August 2003

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

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Water Inventory Unit

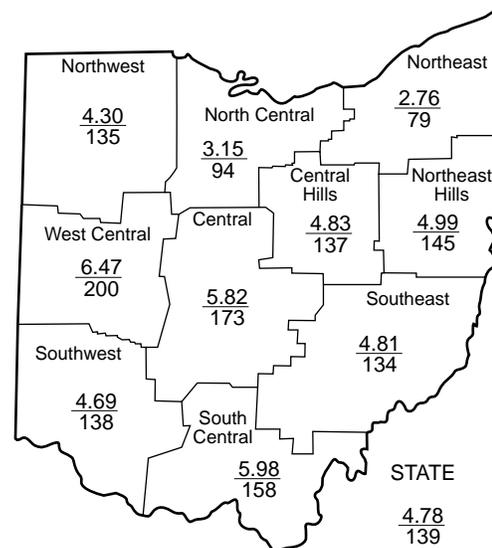
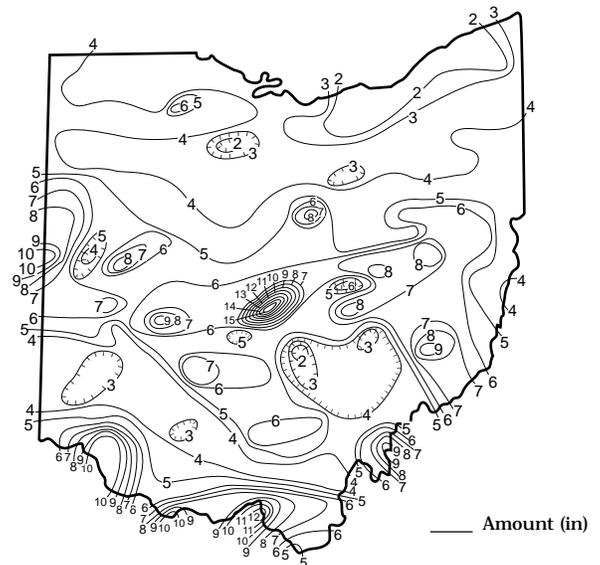
PRECIPITATION during August was above normal across most of the state, but below normal in much of northeastern Ohio. The average for the state as a whole was 4.78 inches, 1.34 inches above normal. Regional averages ranged from 6.47 inches, 3.23 inches above normal, for the West Central Region to 2.76 inches, 0.73 inch below normal, for the Northeast Region. For the state as a whole this was the 15th wettest August during the past 121 years. Regionally, this was the 3rd wettest August for the West Central Region, the 9th wettest for the Central Region and the 10th wettest for the South Central Region. The Columbus Hap Cremean Water Treatment Plant (Franklin County) reported the greatest amount of August precipitation, 15.06 inches. LaGrange (Lorain County) reported the least amount of August precipitation, 1.32 inches.

While conditions during August were considerably drier for some areas of the state, the wet pattern that has existed for much of the summer continued across a large percent of the state, most notably in west-central, central and south-central Ohio. Slow moving showers and thunderstorms were common during August. Numerous storms during the first week of the month brought generally 1-2 inches of rain across most of the state with areas in the central third receiving up to 4 inches. The next 9 days were typical of summer with hit and miss storms, which were most common across the southern half of Ohio. Several of these storms produced more than one inch of rain. However, some areas, especially in northeastern Ohio, received little rain during this period. The greatest amount of rain from these storms fell in central Ohio where isolated amounts of 3-6 inches from slow moving storms were reported. After more than a week of dry weather, rain returned to the state beginning on August 26. From this date through the end of the month a series of storms crossed the state and were heaviest across the central third of the state with 2-5 inches of rain reported. The remainder of the state generally received 0.25-1.0 inch of rain from these storms. Urban and small stream flooding occurred on several days during the month at various locations throughout the state, especially across the central third and south-central Ohio (see *August Storms Add Counties To Disaster Declaration* under Notes and Comments on the last page of this report).

Precipitation for the 2003 calendar year is above normal statewide. The average for the state as a whole is 31.73 inches, 4.87 inches above normal. Regional averages range from 36.85 inches, 7.59 inches above normal, for the South Central Region to 26.85 inches, 2.35 inches above normal, for the North Central Region.

(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 | +1.11 | +3.68 | +5.13 | +3.04 | +5.82 | +2.0 |
| North Central | -0.20 | +2.06 | +3.16 | +3.01 | +6.04 | +0.5 |
| Northeast | -0.73 | +4.56 | +6.43 | +6.53 | +6.65 | +3.1 |
| West Central | +3.23 | +8.53 | +9.06 | +10.47 | +13.31 | +3.0 |
| Central | +2.45 | +3.21 | +4.12 | +6.20 | +6.87 | +2.0 |
| Central Hills | +1.31 | +2.99 | +3.80 | +3.34 | +4.08 | +1.5 |
| Northeast Hills | +1.56 | +4.71 | +5.26 | +6.31 | +4.54 | +2.2 |
| Southwest | +1.28 | +3.87 | +3.68 | +7.53 | +12.21 | +2.7 |
| South Central | +2.20 | +5.36 | +6.43 | +11.03 | +10.71 | +3.0 |
| Southeast | +1.23 | +3.60 | +2.60 | +6.03 | +4.82 | +2.0 |
| State | +1.34 | +4.25 | +4.96 | +6.33 | +7.47 | |

*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

| 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 | 209 | 238 | 239 | 199 | 116 |
| Great Miami River at Hamilton | 3,630 | 3,915 | 339 | 243 | 162 | 128 |
| Huron River at Milan | 371 | 128 | 140 | 139 | 172 | 141 |
| Killbuck Creek at Killbuck | 464 | 414 | 294 | 173 | 137 | 93 |
| Little Beaver Creek near East Liverpool | 496 | 1,053 | 774 | 301 | 155 | 100 |
| Maumee River at Waterville | 6,330 | 7,052 | 723 | 250 | 169 | 112 |
| Muskingum River at McConnelville | 7,422 | 6,942 | 239 | 208 | 162 | 77 |
| Scioto River near Prospect | 567 | 414 | 916 | 222 | 182 | 136 |
| Scioto River at Higby | 5,131 | 4,794 | 363 | 159 | 133 | 107 |
| Stillwater River at Pleasant Hill | 503 | 388 | 549 | 218 | 144 | 95 |

STREAMFLOW during August was noticeably above normal statewide. Flows were high enough to be considered excessive throughout most of the state. Flows during August decreased seasonally from the July flows across most of Ohio.

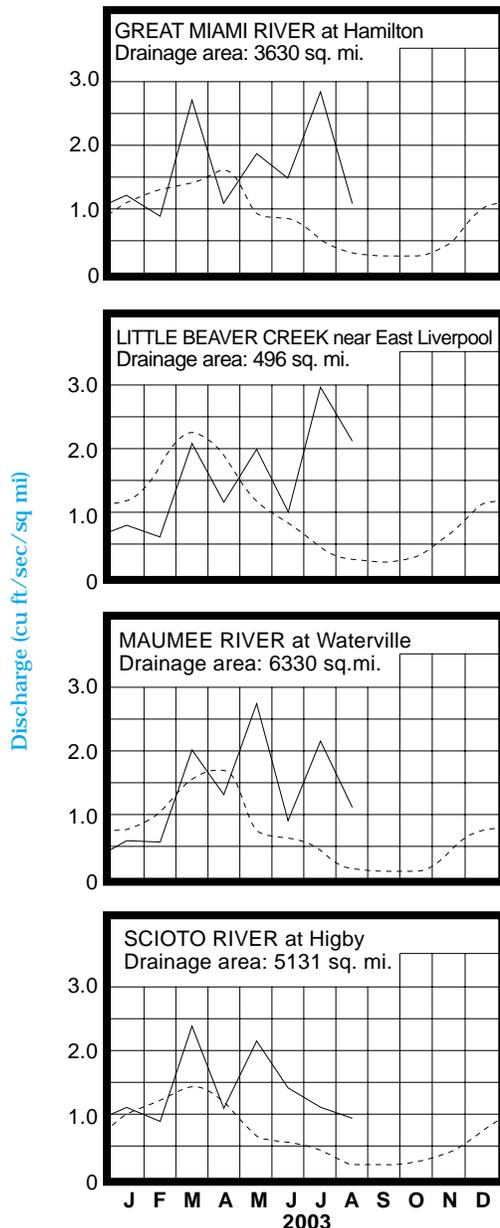
Flows at the beginning of the month were above normal statewide. Greatest flows for the month varied due to the isolated nature of rainfall at various times during the month. However, greatest flows generally occurred during August 5-6 in the western half of the state, around August 10 in northeastern Ohio and near the end of the month in the remainder of the state. Low flows for the month occurred during August 25-30 statewide, just prior to the precipitation that fell near the end of the month.

Streamflow rose during the first week of August across the state. After peaking, flows generally decreased until late in the month, except for some temporary increases noted following local precipitation, most notably around mid-month. Flows increased statewide near month's end as a result of the precipitation that fell late in the month. Flows at the end of August were above normal across most of the state. Although no widespread flooding occurred during the month, there was small stream and urban flooding on several days, most notably in central and south-central Ohio.

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

Reservoir storage at the end of August in the Mahoning basin index reservoirs was 97 percent of rated capacity for water supply compared with 115 percent for last month and 76 percent for August 2002. Month-end storage in the Scioto basin index reservoirs was 109 percent of rated capacity for water supply compared with 97 percent for last month and 81 percent for August 2002. Surface water supplies remain in excellent condition throughout the state.

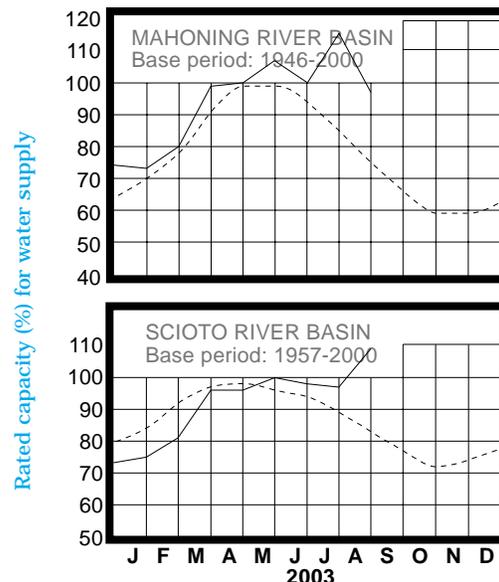
MEAN STREAM DISCHARGE



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 | 13.85 | +2.19 | -0.82 | +3.05 |
| Fa-1 | Jasper Mill, Fayette Co. | Limestone | 8.39 | -0.07 | -0.28 | +3.50 |
| Fr-10 | Columbus, Franklin Co. | Gravel | 45.69 | -1.89 | -0.58 | +0.48 |
| H-1 | Harrison, Hamilton Co. | Gravel | 23.17 | -0.30 | -1.07 | +0.36 |
| Hn-2a | Dola, Hardin Co. | Dolomite | 6.01 | +1.48 | -0.35 | +2.60 |
| Po-1 | Windham, Portage Co. | Sandstone | 18.14 | +1.73 | +0.51 | +1.48 |
| Tu-1 | Strasburg, Tuscarawas Co. | Gravel | 13.41 | 0 | -0.05 | +1.98 |

GROUND WATER levels during August declined seasonally throughout most of the state. Net changes during August were less than usually observed from July's levels in northern Ohio. Levels in unconsolidated aquifers rose during the first week of August, then declined until late in the month when they began rising again in response to precipitation. Levels in consolidated aquifers rose until mid-month and then declined the remainder of August.

The above normal precipitation across most of Ohio during August continues to benefit ground water storage. Levels in consolidated aquifers are above normal across most of the state while levels in unconsolidated aquifers are near normal in northern Ohio, but still below normal in the southern half of the state. Observation well Hn-2A (Hardin County), representing the carbonate aquifers of northwestern Ohio, reached a record-high level for August. Ground water storage currently is in a better position than it was last year at this time. Current levels are above the August 2002 levels statewide.

Ground water supplies are adequate statewide. The above normal precipitation during the summer has improved favorably the ground water storage outlook in the state. With near-normal precipitation and other climatic conditions in the coming months, the outlook for ground water supplies should remain positive. The Ohio Agricultural Statistics Services reports that at the end of August, soil moisture was rated as being short in 14 percent of the state, adequate in 76 percent of the state and surplus in 10 percent of the state.

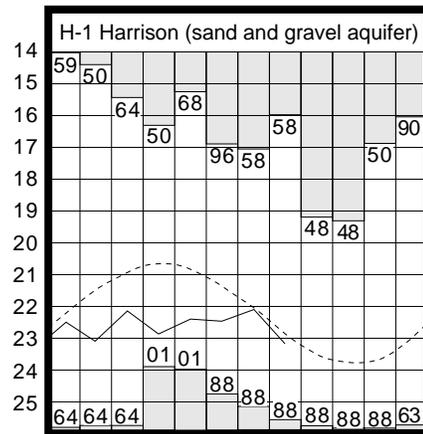
LAKE ERIE level declined during August. The mean level was 571.46 feet (IGLD-1985), 0.03 foot lower than last month's mean level and 0.26 foot below normal. This month's mean level is 0.07 foot higher than the August 2002 level and 2.26 feet above Low Water Datum.

The U. S. Army Corps of Engineers (USACE) reports that precipitation in the Lake Erie basin during August averaged 2.34 inches, which is 0.83 inch below normal. The entire Great Lakes basin averaged 2.71 inches, which is 0.43 inch below normal. For calendar year 2003 through August, the Lake Erie basin has averaged 22.74 inches of precipitation, 0.88 inch below normal, while the entire Great Lakes basin has averaged 20.22 inches, 0.82 inch below normal.

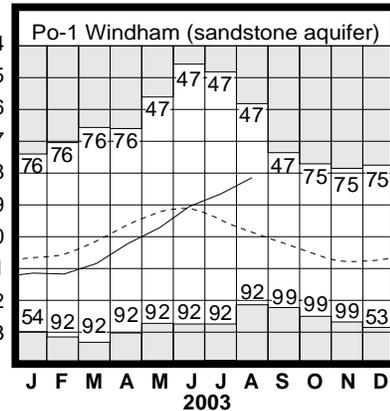
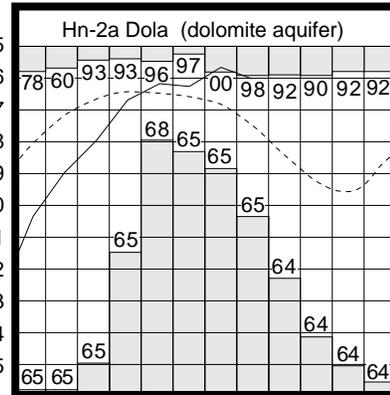
In addition, the USACE predicts that based on the current condition of the Great Lakes basin and anticipated weather conditions, the level of Lake Erie should range between 3-9 inches below the long-term seasonal average for the foreseeable future. Deviations from the anticipated weather patterns could result in the level of Lake Erie ranging from as high as 2 inches above to as much as 20 inches below the normal seasonal level.

Note: The July precipitation data as reported in the July issue of this report have been revised by the USACE. Precipitation in the Lake Erie basin during July averaged 4.37 inches, 1.04 inches above normal. The entire Great Lakes basin averaged 3.79 inches, 0.65 inch above normal.

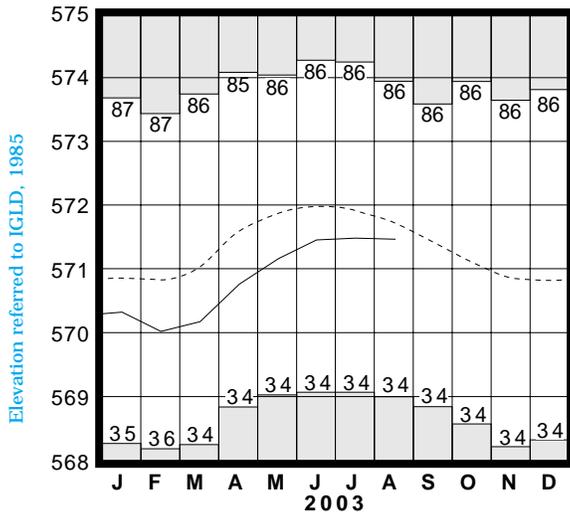
GROUND-WATER LEVELS



Water level (ft below land surface)



LAKE ERIE LEVELS



Base period: 1918-2000

□ Record high and low, year of occurrence

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)

Precipitation for the 2003 water year is also above normal statewide. The average for the state as a whole is 40.25 inches, 5.18 inches above normal. Regional averages range from 47.76 inches, 10.09 inches above normal, for the South Central Region to 34.07 inches, 1.93 inches above normal, for the North Central Region.

SUMMARY

Precipitation during August was above normal across most of the state, but below normal in much of northeastern Ohio. Streamflow was excessive throughout most of the state. Reservoir storage decreased in the Mahoning River basin and increased noticeably in the Scioto River basin. Reservoir storage is above normal in both basins. Ground water levels declined seasonally. Levels are near or above normal in all but the unconsolidated aquifers in southern Ohio. Lake Erie level declined 0.03 foot and was 0.26 foot below the long-term August average.

NOTES AND COMMENTS

August Storms Add Counties To Disaster Declaration

Severe storms and flooding rains once again left their mark on Ohio during August, although not as numerous or widespread as during July. Many of these storms were slow moving and produced very heavy rainfall in a short period of time. The August rains continued a wet pattern that has generally been in place in Ohio since May, and in some cases has produced record rainfall.

Rain fell on nearly everyday during the first week of August. Heavy rains during this period prompted flood warnings in western, northwestern, central and east-central Ohio as well as other small stream and urban flood warnings scattered across other areas of the state. The next couple of weeks were much drier, but very heavy rains through the 16th from isolated, nearly stationary storms caused significant flooding across scattered areas of Ohio, most notably in central Ohio. Unofficial reports of more than 4 inches of rain falling in a 2-hour period were received from areas in Franklin County on August 12 and again on August 15, resulting in small stream and urban flooding, closing roads and flooding more than 250 homes and several businesses. Severe storms during August 26-31 produced heavy rains and damaging winds across a wide area of the state, prompting flood warnings to be issued throughout many areas of the state. Once again the hardest hit area was the central third of the state with rain amounts ranging as high as 5 inches. Franklin and Jefferson counties were among the hardest hit areas during this latest round of flooding. The heavy rains during August and subsequent flooding prompted a presidential disaster declaration for Franklin, Jefferson, Monroe and Carroll counties in Ohio, making flood victims in these counties eligible for federal aid. This brings the number of counties eligible for federal assistance due to flooding and severe storms during the past 2 months to 20. In addition to the 11 counties listed in the Presidential Disaster Declaration in July, Crawford, Pike, Cuyahoga, Columbiana and Stark counties were added to the list as a result of the July floods.

This past May-August period has been among the wettest on record for the state. For the state as a whole, preliminary data indicates this May-August period averaged 22.28 inches of precipitation, surpassed only by the 22.34 inches reported during May-August 1958. All 10 climatic regions in the state ranked in the top 10 wettest May-August periods on record. This was the wettest May-August period for the Northeast Region; the 2nd wettest for the West Central, South-Central and Northeast Hills regions; the 3rd wettest for the Northwest and Southwest Regions; the 5th wettest for the North Central Region; the 6th wettest for the Central Hills Region; the 7th wettest for the Southeast Region; and the 8th wettest for the Central Region.

New Fact Sheet Available

The U. S. Geological Survey (USGS) recently announced the availability of the following fact sheet:

Collecting Peak-Flow Data In Ohio Through The Use Of Crest-Stage Gages (FS-059-03)

This fact sheet discusses the importance of obtaining peak-flow data from streams with smaller drainage basins where little or no flood data are currently available. The Ohio Crest-Stage Gages Network, operated by the USGS in cooperation with the Ohio Department of Natural Resources and the Ohio Department of Transportation, consists of 18 crest-stage gages at sites with drainage areas of less than 100 square miles, located throughout Ohio where peak-flow data are either minimal or nonexistent. Data collected from this network will provide much needed flood magnitude and frequency data, which is crucial for flood-related planning and emergency response. The method to determine the magnitude and frequency of peak-flow data on streams is to collect data for a period of at least 10 years at sites with little or no data. These peak-flow data can be incorporated into a regional flood-frequency analysis. Crest-stage gages, which record only peak flows, can be used to collect these data in an efficient and cost-effective manner.

For more information on the Ohio Crest-Stage Gage Network or to receive a copy of the fact sheet, contact Bernie Sroka, USGS, 6480 Doubletree Avenue, Columbus, Ohio 43229-1111, phone (614) 430-7779 or e-mail bnrsroka@usgs.gov. You may also view or download the fact sheet in a Portable Document Format (PDF) by visiting the USGS web page at: <http://oh.water.usgs.gov/reports> and clicking on Recent Report Products, then selecting FS-059-03.

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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