



# MONTHLY WATER INVENTORY REPORT FOR OHIO

## September 2003

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

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**PRECIPITATION** during September was noticeably above normal statewide. The average for the state as a whole was 6.10 inches, 3.15 inches above normal. Regional averages ranged from 6.95 inches, 3.99 inches above normal, for the Northeast Hills Region to 5.16 inches, 2.21 inches above normal, for the South Central Region. For the state as a whole this was the 2<sup>nd</sup> wettest September during the past 121 years of record. Regionally, this was the 2<sup>nd</sup> wettest September for the Central Hills Region, the 3<sup>rd</sup> wettest for the Northeast and Northeast Hills regions, the 4<sup>th</sup> for the Northwest, West Central and Central regions, 5<sup>th</sup> for the Southeast Region, the 6<sup>th</sup> for the North Central and Southwest regions, and the 7<sup>th</sup> wettest for the South Central Region. Mohawk Dam (Coshocton County) reported the greatest amount of September precipitation, 9.86 inches. Findlay Waste Water Treatment Plant (Hancock County) reported the least amount, 3.64 inches.

Most of the September precipitation fell during the first 3 days and the last week of the month, except for rain from the remnants of Hurricane Isabel that fell across eastern Ohio during September 19. Widespread precipitation on September 1-3 produced 1-2 inches with as much as 3 inches reported across the central third of the state. This rain, on top of the rain that fell near the end of August, resulted in localized flooding across mainly central and southwestern Ohio. Following these rains, much needed dry weather arrived and lasted for about 2 weeks. On the 19<sup>th</sup>, rain from the remnants of Hurricane Isabel affected mainly the eastern half of the state where amounts of 1-3 inches fell, decreasing rapidly westward to around 0.25 inch in central Ohio and none in western Ohio. Rain returned to the entire state during September 22 and was heaviest in the southeastern half with 1-2 inches reported, decreasing to 0.50-1.0 inch in northwestern Ohio. Showers and thunderstorms during September 26-27 brought generally 1-2 inches of rain across most of the state with some areas receiving in excess of 3 inches from heavier downpours.

Precipitation for the 2003 calendar year is above normal statewide. The average for the state as a whole is 37.97 inches, 8.16 inches above normal. Regional averages range from 41.60 inches, 9.39 inches above normal, for the South Central Region to 32.32 inches, 4.82 inches above normal, for the North Central Region.

Precipitation for the 2003 water year was above normal statewide. The average for the state as a whole was 46.49 inches, 8.46 inches above normal. Regional averages ranged from 52.51 inches, 11.89 inches above normal, for the South Central Region to 39.54 inches, 4.40 inches above normal, for the North Central Region (see Precipitation table, departure from normal, past 12 months column). South Point (Lawrence County) reported the greatest amount of precipitation for the water year, 61.24 inches. Elyria (Lorain County) reported the least amount, 32.90 inches. An isohyetal map and regional averages with percentages of normal precipitation for the 2003 water year appear on the last page of this report.

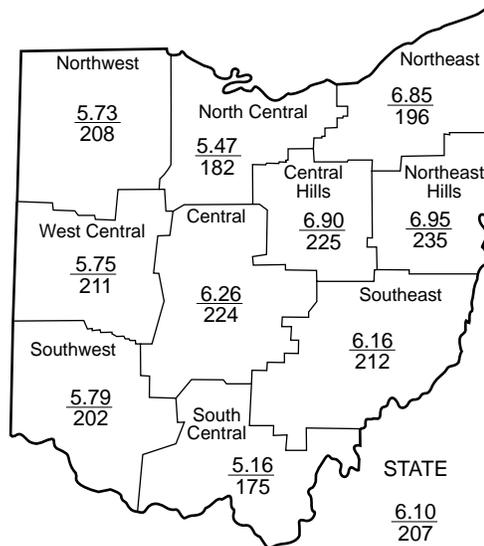
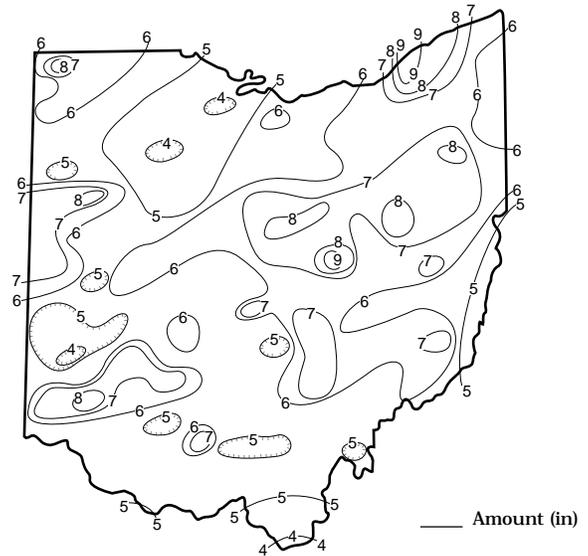
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### PRECIPITATION

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	+2.97	+7.09	+8.57	+6.22	+7.36	+3.7
North Central	+2.47	+4.53	+6.25	+4.40	+7.50	+3.1
Northeast	+3.36	+7.63	+10.36	+9.41	+10.08	+5.0
West Central	+3.02	+11.79	+12.16	+12.14	+14.78	+4.3
Central	+3.47	+6.73	+8.28	+7.48	+10.50	+3.4
Central Hills	+3.84	+7.49	+8.11	+6.39	+8.02	+3.2
Northeast Hills	+3.99	+9.32	+10.46	+9.39	+8.52	+3.8
Southwest	+2.92	+6.48	+7.64	+7.29	+14.29	+3.9
South Central	+2.21	+5.86	+10.43	+11.89	+13.48	+3.8
Southeast	+3.25	+7.13	+9.93	+10.20	+11.00	+3.2
State	+3.15	+7.39	+9.21	+8.46	+10.52	

\*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 SEPTEMBER



Average (in)  
Percent of normal

## 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	1,097	627	269	178	125
Great Miami River at Hamilton	3,630	7,272	748	382	189	141
Huron River at Milan	371	249	545	179	139	146
Killbuck Creek at Killbuck	464	1,014	905	299	175	110
Little Beaver Creek near East Liverpool	496	1,227	1,076	523	211	117
Maumee River at Waterville	6,330	7,597	984	419	212	123
Muskingum River at McConnelssville	7,422	13,910	567	406	211	89
Scioto River near Prospect	567	1,020	3,355	429	221	151
Scioto River at Higby	5,131	9,241	692	254	158	120
Stillwater River at Pleasant Hill	503	1,254	2,063	489	179	115

**STREAMFLOW** during September was noticeably above normal statewide. Flows were high enough to be considered excessive across most of the state. Flows during September increased from the August flows throughout Ohio. The Great Miami River at Hamilton established a record monthly and daily high flow for September.

Flows at the beginning of the month were above normal statewide. Flows increased statewide early in the month due to the precipitation that occurred late in August and the first 3 days of September. Greatest flows for September in the southern two-thirds of the state occurred during the first 4 days of the month. Minor flooding in isolated areas was reported during this time, especially in central and southwestern Ohio. After peaking, flows declined for about the next 2 weeks as much drier

weather conditions prevailed through the period. Low flows for September generally occurred around September 18 in the eastern half of the state, just prior to the rain from the remnants of Hurricane Isabel that affected this area of the state, and around September 21 in the western half, occurring just prior to widespread rain that fell during September 22. Flows increased statewide following the September 26-27 rainfall. Greatest flows for September in the northern third of the state occurred during September 27-29. Flows were above normal statewide at month's end.

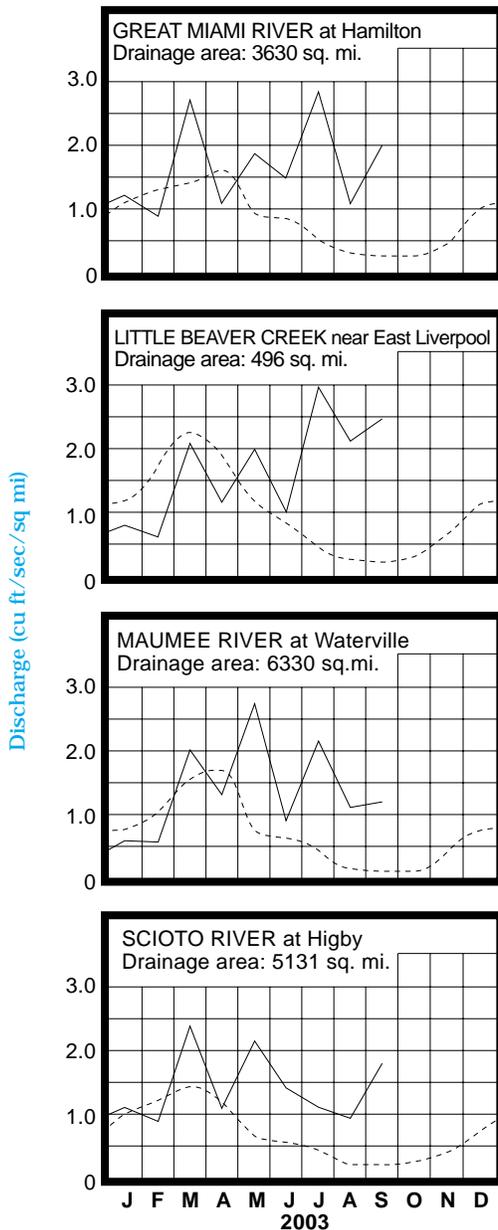
Streamflow during the 2003 water year was above normal across most of the state (see Mean Stream Discharge table, percent of normal, past 12 months column). Flows were below normal in the northern half of the state during October, in eastern and northwestern Ohio during November and much of the state from December through February. Flows were above normal across most of the state during March, but were again below normal nearly statewide during April. Flows during May through September were above normal statewide, and were high enough to be considered excessive during much of this time. Both record high monthly and daily flows were established at several gauging stations during the May-September period. Significant flooding occurred during this period, most notably in western and northeastern Ohio during July and central and south-central Ohio during August. The flooding during these two months prompted a presidential disaster declaration for 20 counties in the state, making flood victims in these counties eligible for federal aid.

**RESERVOIR STORAGE** during September decreased in both the Mahoning and Scioto river basins, but remained notably above normal in both basins.

Reservoir storage at the end of September in the Mahoning basin index reservoirs was 95 percent of rated capacity for water supply compared with 97 percent for last month and 70 percent for September 2002. Month-end storage in the Scioto basin index reservoirs was 100 percent of rated capacity for water supply compared with 109 percent for last month and 78 percent for September 2002.

Surface water supplies were adequate statewide during the 2003 water year. Storage in the Mahoning River basin was above normal throughout the water year. Storage in the Scioto River basin was normal during October, below normal from November through April, and then above normal from May through September.

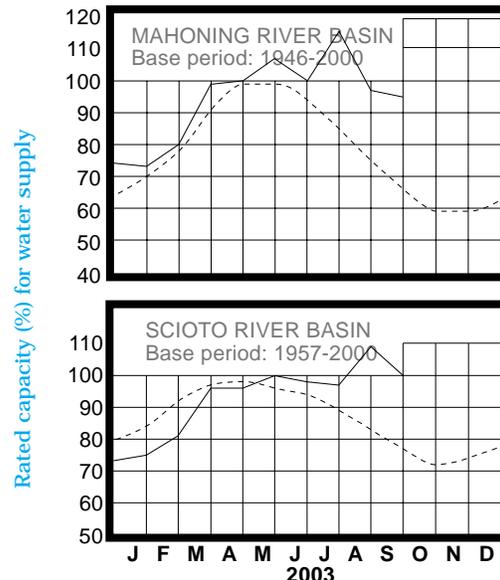
### MEAN STREAM DISCHARGE



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

**GROUND WATER** levels during September declined seasonally in most aquifers. Levels declined less than usually observed during a typical September from the August levels. Levels generally rose during the first week of the month, declined during the next two weeks, and then rose again during the last week of September. However, some aquifers were beginning to decline again at month's end. The above normal precipitation during September was beneficial to ground water supplies across the state, raising ground water supplies to above normal seasonal levels in most aquifers in the state. For some aquifers, this marks the first time in more than five years that they have been above normal. It also marks the first time since December 1996 that six of the seven index observation wells used in this report have been above normal during the same month.

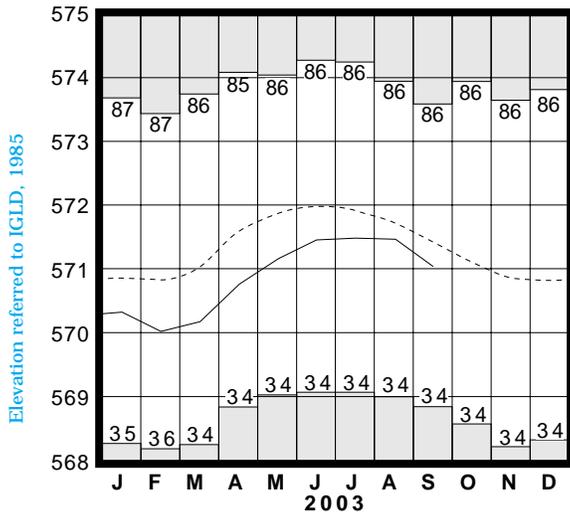
Index Well	Location	Aquifer	Mean This Month	Departure From Normal	Change in feet from:	
					Last Month	Year Ago
F-1	W. Rushville, Fairfield Co.	Sandstone	14.47	+2.49	-0.62	+3.56
Fa-1	Jasper Mill, Fayette Co.	Limestone	8.28	+0.49	+0.11	+3.96
Fr-10	Columbus, Franklin Co.	Gravel	45.92	-1.63	-0.23	+0.83
H-1	Harrison, Hamilton Co.	Gravel	23.19	+0.31	-0.02	+0.98
Hn-2a	Dola, Hardin Co.	Dolomite	6.48	+1.92	-0.47	+4.11
Po-1	Windham, Portage Co.	Sandstone	18.35	+1.86	-0.21	+1.87
Tu-1	Strasburg, Tuscarawas Co.	Gravel	11.54	+2.26	+1.87	+4.46

Although storage in most aquifers was below normal throughout most of the 2003 water year, ground water supplies were adequate across the state. Conditions during the first seven months of the 2003 water year were not particularly favorable for ground water supplies, but conversely conditions were beneficial during the next five months. The water year began with ground water storage at below normal levels statewide. Below normal precipitation during much of the winter and spring months provided little opportunity for sustained recharge and ground water levels remained below normal across most of the state. However, the ground water situation in Ohio began to improve with the above normal precipitation during May. Above normal precipitation during the May-September period occurred statewide, effectively reducing the demand on water supplies. Ground water responded favorably to the above normal precipitation and by the end of the 2003 water year levels were above the normal seasonal levels across most of the state. Levels in a few aquifers, most notably in northern Ohio, were higher in September than they were in April, unusual in that ground water levels normally decline throughout this period. Observation well HN-2A (Hardin County), representing the carbonate aquifers of northwestern Ohio, reached a monthly record-high level during July and August. Current levels are higher than they were during September 2002 statewide. With near normal precipitation and other climatic conditions during the next several months, the prospects for future improvement during the upcoming recharge season seem favorable. The Ohio Agricultural Statistics Service reports that, near the end of September, soil moisture was rated as being short in 1 percent of the state, adequate in 79 percent of the state and surplus in 20 percent of the state.

**LAKE ERIE** level declined during September. The mean level was 571.03 feet (IGLD-1985), 0.43 foot lower than last month's mean level and 0.39 foot below normal. This month's mean level is the same as the September 2002 level and 1.83 feet above Low Water Datum.

Lake Erie level was below normal throughout the entire 2003 water year. This trend should continue as the U. S. Army Corps of Engineers predicts that based on the current condition of the Great Lakes basin and anticipated weather conditions, the level of Lake Erie should range between 4-9 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 near normal to as much as 21 inches below the normal seasonal level.

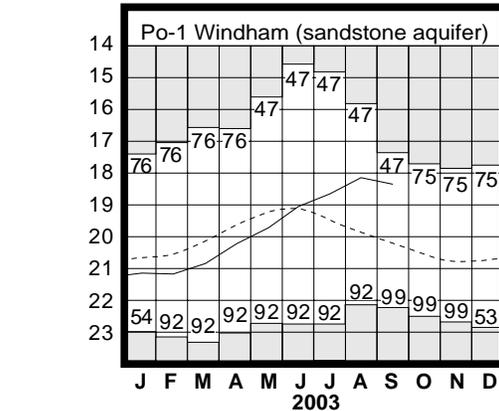
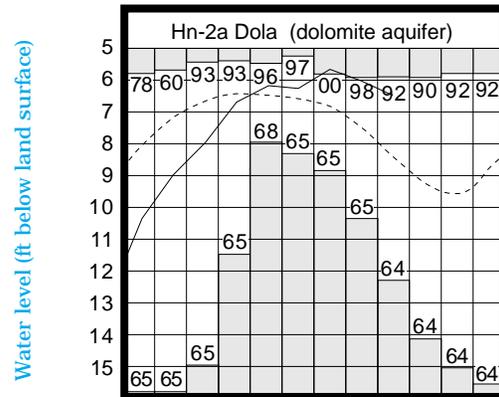
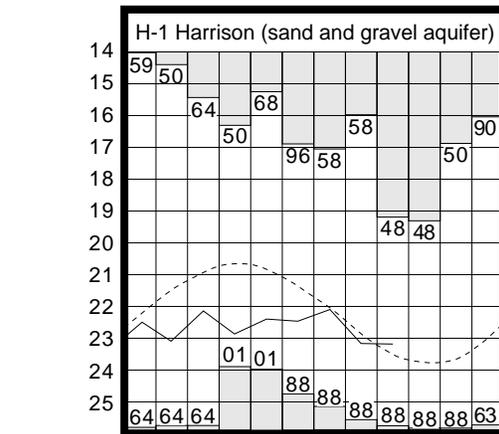
### LAKE ERIE LEVELS



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)*

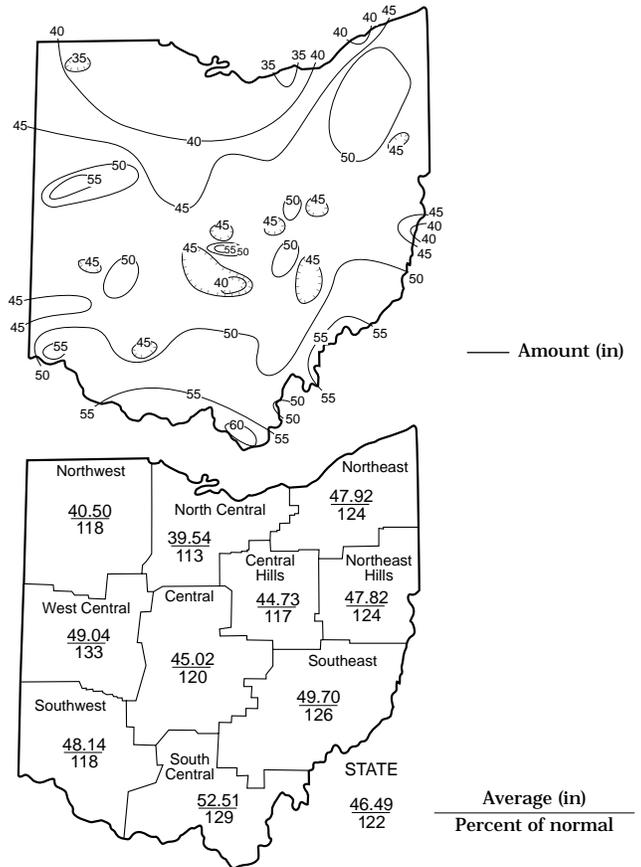
The 2003 water year got off to a wet start in the southern two-thirds of the state, but below normal precipitation fell in the northern third. November precipitation was near normal across the state, while December and January precipitation was below normal throughout much of Ohio. February precipitation was above normal nearly statewide with most of the precipitation falling as snow. March and April precipitation was below normal statewide. It was the 7<sup>th</sup> driest March for the Southeast Region and the 11<sup>th</sup> driest for the South Central Region. Precipitation was notably above normal statewide during May, ranking as the 3<sup>rd</sup> wettest May for the state as a whole. Regionally, all 10 of the state's climatic regions ranked in their top 20 wettest May's of record, including eight ranking in the top 10. June precipitation was generally above normal across most of Ohio, but below normal in northwestern and east-central Ohio. Precipitation during July was noticeably above normal across most of the state, ranking as the 4<sup>th</sup> wettest July for the state as a whole. Seven of the state's 10 climatic regions ranked in the top 10 wettest July's on record, including the 2<sup>nd</sup> wettest for both the Northeast and West Central regions. August precipitation was above normal across most of the state, but below normal in northeastern Ohio. It was the 15<sup>th</sup> wettest August for the state as a whole and regionally it ranked as the 3<sup>rd</sup> wettest for the West Central Region and 9<sup>th</sup> wettest for the Central Region. For the state as a whole the May-September 2003 period ranked as the wettest of record. Regionally, this period ranked as the wettest of record for the Northwest, Northeast, West Central and Southeast regions and the 2<sup>nd</sup> wettest for the remaining six climatic regions in the state. The above normal precipitation has been favorable for water supplies, but has resulted in considerable property damage from extensive flooding.

**SUMMARY**

Precipitation during September was noticeably above normal statewide. Streamflow was noticeably above normal throughout the state. Reservoir storage decreased but remained above normal. Ground water levels declined seasonally in most aquifers and are above normal across most of Ohio. Lake Erie level declined 0.43 foot and was 0.39 foot below the long-term September average.

Precipitation for the 2003 water year was above normal statewide. Streamflow was above normal across most of Ohio. Significant flooding occurred during July and August, prompting a presidential disaster declaration for 20 counties. Record monthly and daily high flows were established at several gauging stations during May-September. Reservoir storage in the Mahoning River basin was above normal the entire water year while in the Scioto River basin it was below normal for most of the first seven months and above normal from May-September. Ground water storage was below normal for most of the water year, but improved to above normal across most of the state by the end of September. Lake Erie levels were below normal throughout the water year.

**TOTAL PRECIPITATION 2003 WATER YEAR**



**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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