MONTHLY WATER INVENTORY REPORT FOR OHIO

September 2004

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

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PRECIPITATION during September was noticeably above normal in the eastern half of the state and below normal in the western half. The average for the state as a whole was 4.30 inches, 1.35 inches above normal. Regional averages ranged from 10.25 inches, 7.34 inches above normal, for the Southeast Region to 0.92 inch, 1.81 inches below normal, for the West Central Region. This was the wettest September during the past 110 years for both the Southeast and South Central regions, the 2nd wettest for the Northeast Hills Region and the 16th wettest for the Northeast Region. Conversely, it was the 10th driest in both the West Central and Southwest regions. Roseville (Muskingum County) reported the greatest amount of September precipitation, 13.73 inches. Bowling Green Waste Water Treatment Plant (Wood County) reported the least amount, a scant 0.16 inch.

Nearly all of the precipitation during September fell during two periods. Scattered showers and thunderstorms ahead of a cold front on September 7 brought generally 0.25-0.75 inch of rain across much of northwestern Ohio. Later the same day, the remnants of Hurricane Frances moved into the state from the south, and continued to affect the eastern half of the state through September 9. Precipitation amounts of 3-6 inches were common across eastern areas of the state with radar estimates indicating more than 8 inches fell in the hardest hit area of southeastern Ohio. Precipitation amounts decreased to the north and west to 1-2 inches across central Ohio and to less than 0.10 inch in western Ohio. Locally severe flooding across east-central and southeastern Ohio resulted from these rains. Just 7 days later the remnants from Hurricane Ivan moved into Ohio bringing heavy rain to many of the same areas that were hard hit 1 week earlier. Rain amounts during September 16-17 were again generally 3-6 inches, with locally greater amounts reported across eastern Ohio, decreasing to 1-2 inches across central Ohio and little or no rain in western Ohio. Flooding was again widespread across much of eastern Ohio.

Precipitation for the 2004 calendar year is above normal statewide. The average for the state as a whole is 36.73 inches, 6.92 inches above normal. Regional averages range from 46.29 inches, 16.10 inches above normal, for the Northeast Hills Region to 27.61 inches, 0.92 inch above normal, for the Northwest Region.

Precipitation for the 2004 water year was above normal throughout most of the state, but below normal in a few southwestern Ohio locations. The average for the state as a whole was 45.69 inches, 7.67 inches above normal. Regional averages ranged from 55.83 inches, 16.33 inches above normal, for the Southeast Region to 34.97 inches, 0.69 inch above normal, for the Northwest Region (see Precipitation table, departure from normal, past 12 months column). For the state as a whole, this was the 5th wettest water year during the past 122 years. Regionally, this was the wettest water year of record for both the Northeast Hills and Southeast

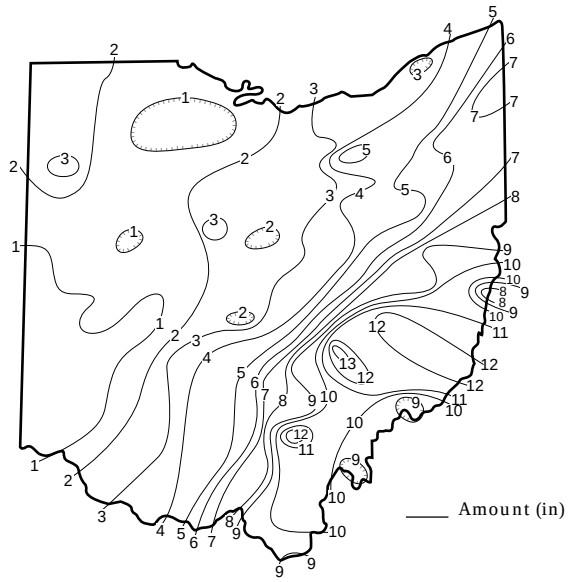
(continued on back)

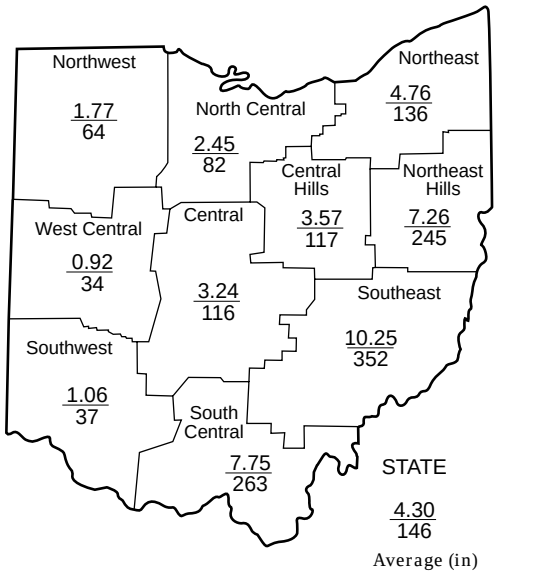
PRECIPITATION

Region	DEPARTURE FROM NORMAL (IN.) Base period 1951-2000					Palmer Drought Severity Index*
	This Month	Past 3 Mos.	Past 6 Mos.	Past 12 Mos.	Past 24 Mos.	
Northwest	-0.99	+1.84	+3.08	+0.69	+7.04	+2.1
North Central	-0.55	+0.24	+5.04	+6.42	+11.22	+2.3
Northeast	+1.27	+2.46	+6.80	+7.65	+17.18	+4.3
West Central	-1.81	-1.71	+1.11	+2.56	+14.67	+1.8
Central	+0.45	+1.30	+6.04	+8.26	+15.67	+2.7
Central Hills	+0.51	+3.21	+8.88	+9.82	+15.65	+4.2
Northeast Hills	+4.30	+8.31	+14.96	+16.46	+25.41	+6.2
Southwest	-1.81	-1.64	+0.30	-0.07	+7.17	+0.5
South Central	+4.80	+3.86	+6.14	+8.67	+19.18	+2.4
Southeast	+7.34	+8.93	+12.98	+16.33	+25.12	+4.7
State	+1.35	+2.67	+6.53	+7.67	+15.75	

*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





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	1,015	580	204	158	137
Great Miami River at Hamilton	3,630	616	63	81	112	132
Huron River at Milan	371	123	269	124	175	174
Killbuck Creek at Killbuck	464	365	326	125	177	147
Little Beaver Creek near East Liverpool	496	2,156	1,891	491	251	186
Maumee River at Waterville	6,330	2,527	327	116	124	110
Muskingum River at McConnelsville	7,422	16,660	679	448	310	151
Scioto River near Prospect	567	75	247	62	189	170
Scioto River at Higby	5,131	2,037	152	102	151	149
Stillwater River at Pleasant Hill	503	35	58	39	84	112

STREAMFLOW during September was above normal across most of the state, but below normal in southwestern Ohio. Flows were high enough to be considered excessive throughout the eastern half of the state. Significant flooding occurred across eastern Ohio during the month. Record September flows were established on streams in eastern Ohio including Little Beaver Creek near East Liverpool and Muskingum River at McConnelsville.

Flows at the beginning of the month were above normal statewide. Greatest flows for the month occurred on September 1 across southwestern Ohio. Greatest flows for the remainder of the state occurred following either the precipitation from Hurricane Frances on September 9 or the precipitation from Hurricane Ivan on September 18. Generally, greatest flows occurred in southeastern Ohio on the 9th and northeastern Ohio on the 18th. Low flows for September occurred on the 7th in eastern Ohio and at or near the end of the month across the remainder of the state.

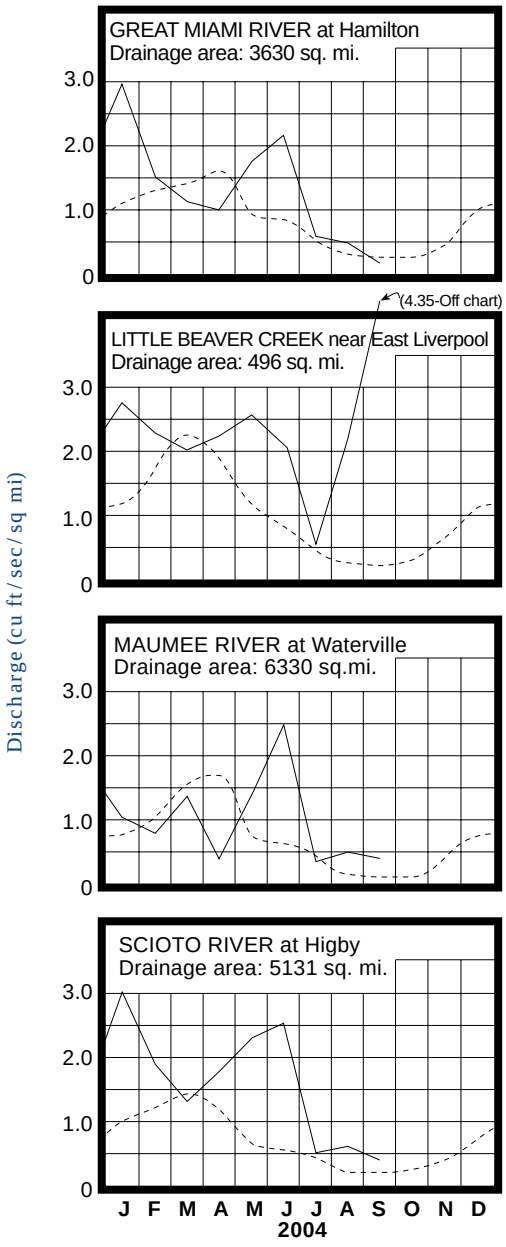
Streamflow during the 2004 water year was above normal statewide (see Mean Stream Discharge table, percent of normal, past 12 month column). Flows during the first 4 months of the water year were above normal statewide. Flows during the next 3 months (February-April) were generally above normal in eastern Ohio and below normal in western Ohio. Above normal flows occurred statewide during May-August. September flows were above normal across most of the state, but below normal in southwestern Ohio. Flows throughout much of the 2004 water year were high enough to be considered excessive with moderate or severe flooding occurring several times during the water year. The gauging station on Little Beaver Creek near East Liverpool, recorded the greatest annual (water year) flow during the past 90 years. Presidential Disaster declarations were declared in central, east-central and southeastern Ohio for flooding during January, areas of eastern Ohio for flooding and severe storm damage during the second half of May and first half of June, and eastern Ohio for severe flooding during late August and September.

RESERVOIR STORAGE during September decreased in both the Mahoning and Scioto river basins. Storage continues to be above normal in both basins.

Reservoir storage at the end of September in the Mahoning basin index reservoirs was 86 percent of rated capacity for water supply compared with 95 percent for both last month and September 2003. Month-end storage in the Scioto basin index reservoirs was 92 percent of rated capacity for water supply compared with 97 percent for last month and 100 percent for September 2003.

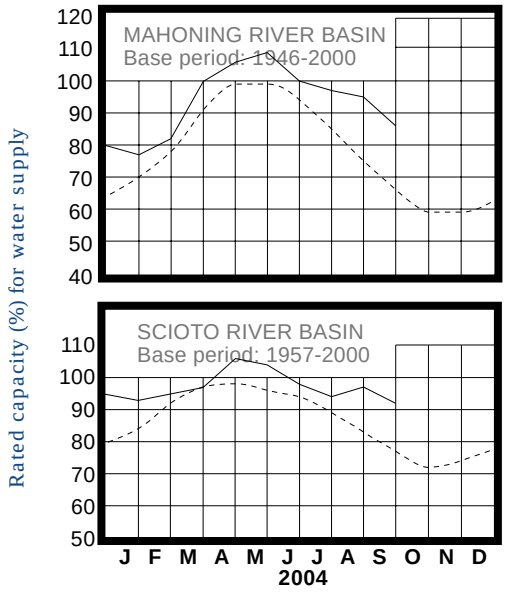
Surface water supplies were adequate statewide during the 2004 water year. Storage in the Mahoning and Scioto river basins was above normal the entire water year.

MEAN STREAM DISCHARGE



Base period for all streams: 1971-2000

RESERVOIR STORAGE 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	13.97	+2.99	-0.31	+0.50
Fa-1	Jasper Mill, Fayette Co.	Limestone	9.16	-0.39	-0.38	-0.88
Fr-10	Columbus, Franklin Co.	Gravel	45.11	-0.82	-0.27	+0.81
H-1	Harrison, Hamilton Co.	Gravel	24.03	-0.53	-0.53	-0.84
Hn-2a	Dola, Hardin Co.	Dolomite	7.13	+1.27	-0.43	-0.65
Po-1	Windham, Portage Co.	Sandstone	18.66	+1.55	-0.24	-0.31
Tu-1	Strasburg, Tuscarawas Co.	Gravel	11.66	+2.14	+0.50	-0.12

GROUND WATER levels during September declined seasonally throughout most of the state; however, some unconsolidated aquifers in eastern Ohio rose in response to the above normal precipitation that fell in that area. Net declines during September from last month's levels were less than usually observed nearly statewide. Generally, aquifers in eastern Ohio declined during the first half of September and then rose or remained steady during the second half while aquifers in western Ohio declined steadily throughout the month. Ground water levels remain above normal across most of Ohio but continue to be below normal in the southwestern quarter of the state. Current levels are lower than they were a year ago across most of Ohio.

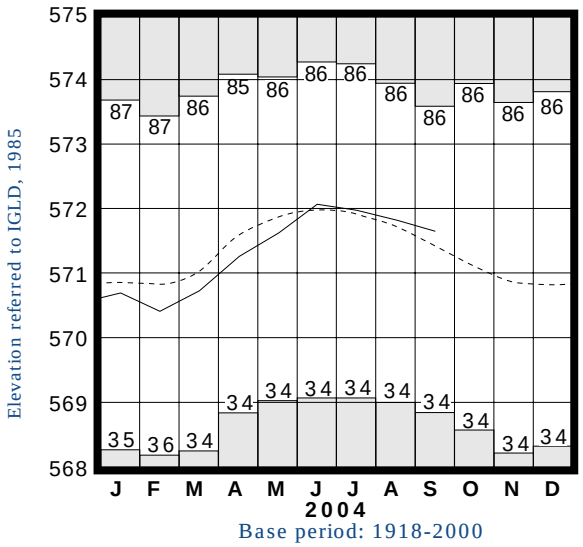
Ground water supplies during the 2004 water year were adequate statewide. Ground water levels during the first 3 months of the water year were above normal nearly statewide with only some unconsolidated aquifers in central Ohio below normal. Following the noticeably below normal precipitation in February, levels fell to below normal in unconsolidated aquifers, but remained above normal in most consolidated aquifers. Ground water levels maintained this pattern through May, but then improved during the second half of May, and in June improved to above normal levels across all but southwestern Ohio. Ground water storage remained above normal across most of the state through the end of the water year, except in southwestern Ohio where it remained below normal, reflecting the below normal precipitation the region received during 6 of the last 8 months of the water year.

LAKE ERIE level declined seasonally during September. The mean level was 571.65 feet (IGLD-1985), 0.17 foot lower than last month's mean level and 0.23 foot above normal. This month's mean level is 0.62 foot higher than the September 2003 level and 2.45 feet above Low Water Datum.

The U.S. Army Corps of Engineers (USACE) reports that precipitation in the Lake Erie basin during September averaged 2.10 inches, 1.05 inches below normal. For the entire Great Lakes basin, September precipitation averaged 2.10 inches, 1.31 inches below normal. For calendar year 2004 through September, the Lake Erie basin has averaged 27.14 inches of precipitation, 0.42 inch above normal, while the entire Great Lakes basin has averaged 25.75 inches, 1.28 inches above normal.

Lake Erie level was below normal during the first 8 months of the 2004 water year. Noticeably above normal precipitation during May reversed this trend and by June, the Lake Erie level had risen to above normal for the first time since October 2000. Near normal precipitation during the last 3 months of the 2004 water year helped maintain the above-normal level. 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 continue to range near normal for the foreseeable future. Deviations from the anticipated weather patterns could result in the level of Lake Erie ranging from as high as 9 inches above normal to as much as 13 inches below the normal seasonal average.

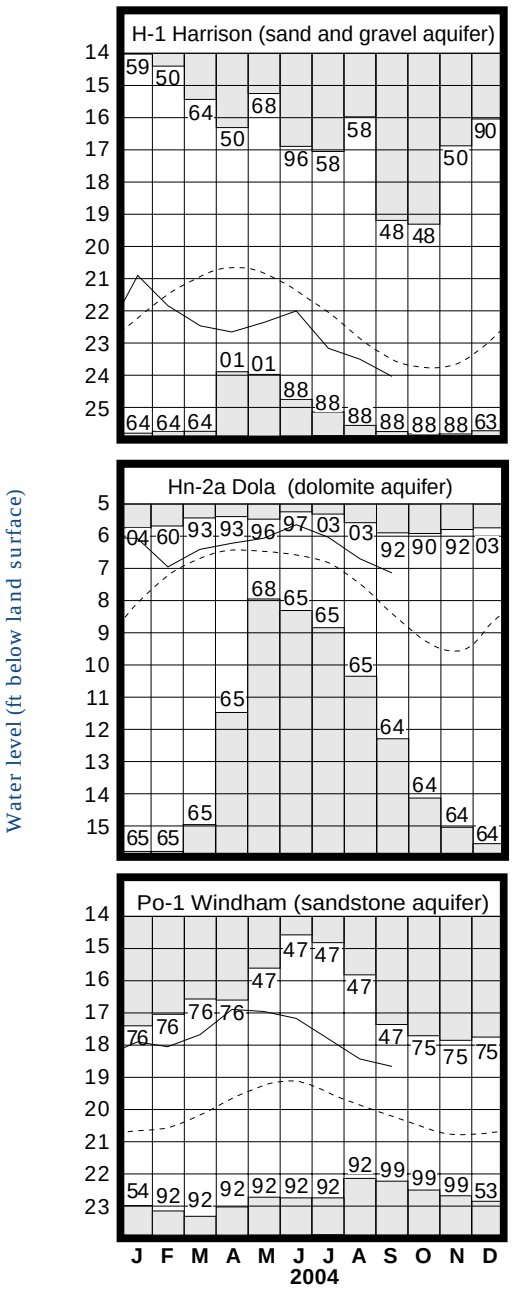
LAKE ERIE LEVELS



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)

regions. Hannibal Locks and Dam (Monroe County) reported the greatest amount of precipitation for the water year, 66.99 inches. Toledo Express Airport (Lucas County) reported the least amount of precipitation for the water year, 29.75 inches. An isohyetal map and regional averages with percentages of normal precipitation for the 2004 water year appear below.

The 2004 water year got off to a wet start during October across much of the state, but below normal precipitation fell in central, northwestern and southwestern Ohio. Precipitation during the next 3 months was above normal statewide except in northwestern Ohio where it was below normal. Rain, locally heavy at times, during the first 4 days of January brought widespread moderate flooding, resulting in a Presidential Disaster Declaration in 14 counties in central, east-central and southeastern areas of the state. Precipitation during February was below normal statewide and it was the 5th driest of record for the Northwest Region, the 7th driest for the North Central Region and the 9th driest for the Northeast Region. Precipitation during March and April was generally below normal in western Ohio and above normal in eastern Ohio. It was the 2nd driest April of record for the Northwest Region. Precipitation during May was markedly above normal statewide ranking as the 2nd wettest for the state as a whole. Regionally, 9 of the state's 10 climatic regions ranked in their top 10 wettest Mays of record, including the wettest of record for the North Central Region. Eight counties in northeastern and southeastern Ohio were declared disaster areas due to flooding and wind and hail damage from severe storms. Precipitation during June, July and August was above normal across all but southwestern and south-central Ohio. The water year ended with greatly varying September precipitation amounts ranking from markedly above normal in eastern Ohio to noticeably below normal in western Ohio. The heavy rain and subsequent flooding in eastern Ohio lead to a Presidential Disaster Declaration for 20 eastern and southeastern Ohio counties. Hundreds of homes, businesses, roads and other infrastructure were severely damaged. Damage estimates are still being calculated, but are expected to total to several million dollars.

TOTAL PRECIPITATION 2004 WATER YEAR

SUMMARY

Precipitation during September was noticeably above normal in the eastern half of the state and below normal in the western half. Streamflow was above normal across most of the state, but below normal in southwestern Ohio. Reservoir storage decreased in both the Mahoning and Scioto river basins, but remained above normal in both basins. Ground water levels declined seasonally across most of the state. Lake Erie level declined 0.17 foot and was 0.23 foot above the long-term September level.

Precipitation for the 2004 water year was above normal nearly statewide. Streamflow was above normal across Ohio. Reservoir storage was above normal throughout the water year in both the Mahoning and Scioto river basins. Ground water levels were above normal across much of the state throughout the water year, but were below normal in southwestern Ohio during the last 8 months. Lake Erie level was below normal through the first 8 months of the water year and above normal the last 4 months. The 2004 water year was good for water supplies, but also included serious flooding resulting in millions of dollars in damages and Presidential Disaster declarations.

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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