



# MONTHLY WATER INVENTORY REPORT FOR OHIO

## December 2005

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

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**PRECIPITATION** during December was below normal across most of the state, but above normal in northwestern Ohio. The state average was 1.87 inches, 0.89 inch below normal. Regional averages ranged from 2.98 inches, 0.52 inch above normal, for the Northwest Region to 1.27 inches, 1.48 inches below normal, for the Northeast Hills Region. This was the 9<sup>th</sup> driest December during the past 111 years for the Northeast Hills Region. Chardon (Geauga County) reported the greatest amount of December precipitation, 3.53 inches. The Wooster Experimental Station (Wayne County) reported the least amount, 0.65 inch.

Precipitation during December fell as both rain and snow. Snow amounts for the month were generally above normal in northern Ohio and near normal elsewhere. Most of the precipitation during the first 14 days of December fell as snow. The greatest amounts of snow fell in the northern half of the state where totals from 6-12 inches were reported. The northeastern Ohio snowbelt counties received as much as 50 inches of snow. Chardon (Geauga County), located in the snowbelt, reported 60 inches of snow for the month, more than twice the average amount for December. Precipitation on December 15 was mainly snow in northern Ohio and a mix in southern Ohio. Generally, 0.50-1.0 inch fell across southwestern Ohio, decreasing to less than 0.25 inch in northeastern Ohio. Dry weather prevailed across the state during the next 8 or 9 days. Precipitation returned to Ohio on Christmas Day and fell mostly as rain. Generally, most of the state received between 0.25 and 0.50 inch, but less than 0.25 inch fell in northeastern Ohio. Light precipitation occurred during December 28-31 across the state, nearly all of which fell as rain. While most of the state received around 0.25 inch during this period, heavier precipitation brought as much as 1 inch to areas in northwestern Ohio.

Precipitation for the 2006 water year is generally below normal across northern and southwestern Ohio. The average for the state as a whole is 8.18 inches, 0.03 inch below normal. Regional averages range from 9.04 inches, 0.76 inch above normal, for the Southeast Region to 7.39 inches, 0.71 inch below normal, for the Central Hills Region.

Precipitation for the 2005 calendar year was above normal throughout most of the state, but below normal in the Southwest and South Central regions. The average for the state as a whole was 41.11 inches, 3.09 inches above normal. Regional averages ranged from 45.52 inches, 8.62 inches above normal, for the West Central Region to 35.37 inches, 1.09 inches above normal, for the Northwest Region (see Precipitation table, departure from normal, past 12 months column). This was the 7<sup>th</sup> wettest year during the past 111 years for the West Central Region. Chardon (Geauga County) reported the greatest amount of precipitation for the year, 54.33 inches. Other stations reporting more than 50 inches for the year were Bellefontaine and Lakeview (both Logan County), Buckeye Lake (Licking County)

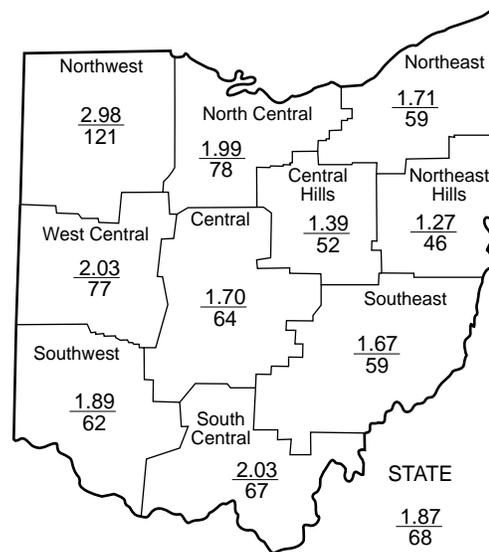
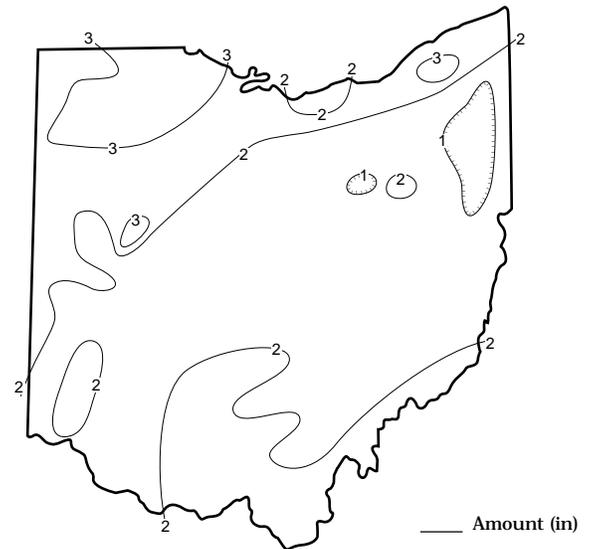
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### PRECIPITATION

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	+0.52	-0.09	+3.22	+1.09	+2.83	+1.6
North Central	-0.55	-0.07	+4.76	+5.54	+11.86	+2.5
Northeast	-1.20	-0.99	+2.26	+4.33	+12.42	+2.3
West Central	-0.61	+0.99	+4.59	+8.62	+11.37	+3.1
Central	-0.97	+0.60	+2.89	+5.25	+14.82	+1.6
Central Hills	-1.30	-0.71	+1.94	+3.57	+15.00	+1.4
Northeast Hills	-1.48	+0.52	+2.54	+3.49	+20.79	+0.8
Southwest	-1.14	-0.82	-0.03	-0.51	+2.36	+1.2
South Central	-1.01	-0.53	-1.25	-3.77	+4.32	-2.3
Southeast	-1.17	+0.76	+0.60	+3.26	+19.07	+0.5
State	-0.89	-0.03	+2.16	+3.09	+11.48	

\*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 DECEMBER



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	2,252	164	125	122	145
Great Miami River at Hamilton	3,630	4,551	124	144	122	143
Huron River at Milan	371	403	165	136	102	173
Killbuck Creek at Killbuck	464	307	73	82	81	122
Little Beaver Creek near East Liverpool	496	512	91	83	73	110
Maumee River at Waterville	6,330	8,858	187	119	98	111
Muskingum River at McConnelsville	7,422	6,443	59	143	138	116
Scioto River near Prospect	567	735	275	203	165	163
Scioto River at Higby	5,131	4,069	89	93	82	148
Stillwater River at Pleasant Hill	503	754	203	182	136	156

**STREAMFLOW** during December was above normal in most areas of the state, but below normal in eastern and southeastern Ohio drainage basins. Flows were high enough to be considered excessive in some basins, mainly in northern Ohio. Flows during December were greater than the November flows across most of the state.

Flows at the beginning of the month were above normal statewide. Basins in the eastern third of the state had their greatest flows for December at the beginning of the month. Except for some temporary increases noted around mid-month, flows generally decreased during the first three weeks of December. The combination of melting snow and widespread rain on Christmas Day brought a rapid rise in flows statewide. Lowest flows for the month occurred just prior to these rises, generally between December 20 and 24. Flows continued to increase during the last

few days of the month in response to precipitation that fell across the state. Greatest flows for the month occurred during December 29-30 throughout the western two-thirds of Ohio. Excessive runoff near the end of the month resulted in minor flooding across areas of the state, most notably in basins in northwestern Ohio. Streamflow at the end of December was above normal throughout much of the state, but below normal in eastern and southeastern Ohio.

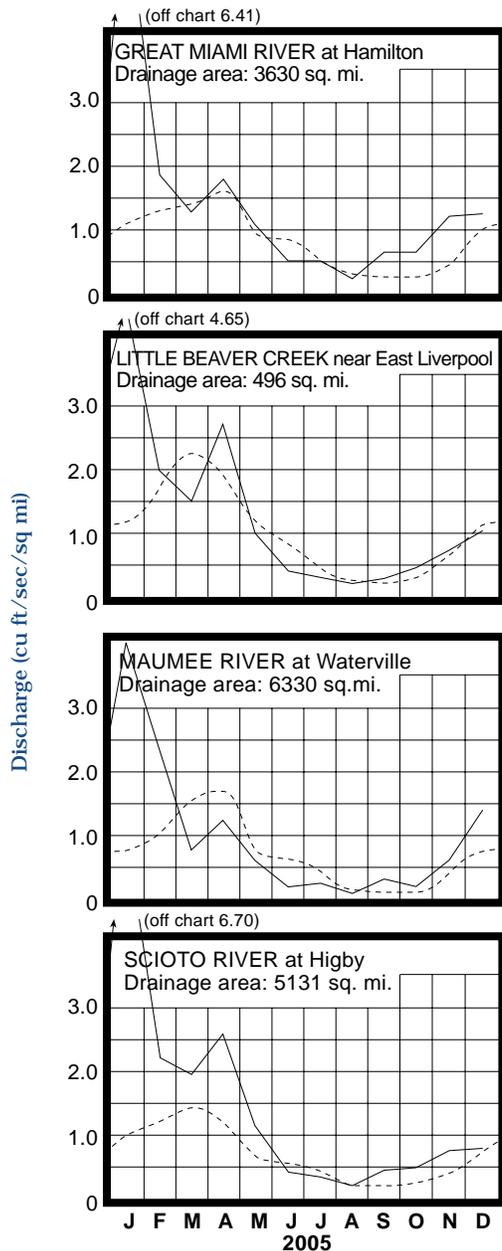
Calendar year 2005 streamflow was above normal throughout the state (see Mean Stream Discharge table, percent of normal, past 12 month column). January flows were notably above normal in response to the much above normal precipitation that fell during the month. Widespread flooding occurred, closing roads and prompting evacuations. Flows remained above normal through much of February, but fell to below normal by the end of the month. Flows during March were below normal across most of the state, but were above normal during April. Flows were generally below normal during the next 4 months, reflecting the droughty conditions that existed at various locations across the state. However, flows increased rapidly to above normal across all but northwestern Ohio at the end of August due to the precipitation from the remnants of Hurricane Katrina. Flows remained above normal across most of the state during the last 4 months of 2005. Although no additional major flooding occurred during 2005, some minor flooding was observed following locally heavy rains during April, June, July, August and December.

**RESERVOIR STORAGE** during December increased in the Mahoning and Scioto river basins. Storage remained above normal in both basins.

Reservoir storage at the end of December in the Mahoning basin index reservoirs was 82 percent of rated capacity for water supply, compared with 78 percent for last month and 80 percent for December 2004. Month-end storage in the Scioto basin index reservoirs was 85 percent of rated capacity for water supply, compared with 81 percent for last month and 95 percent for December 2004.

Reservoir storage was at above normal seasonal levels throughout most of 2005. Storage in the Mahoning basin index reservoirs was slightly below normal during March, while storage in the Scioto basin index reservoirs was slightly below normal during June and July. Surface water supplies were adequate statewide, even throughout the droughty conditions that existed during the summer months.

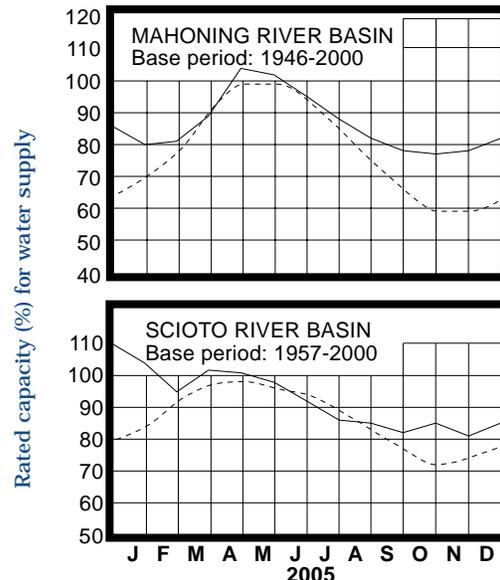
### MEAN STREAM DISCHARGE



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 December rose in most aquifers throughout Ohio. Levels in consolidated aquifers either rose steadily throughout the month or were stable during the first half of the month and then rose during the second half. Levels in most unconsolidated aquifers declined during the first 3 weeks of the month and then rose during the last week.

Ground water supplies during calendar year 2005 were adequate across the state. However, levels in most aquifers were lower at the end of 2005 than they were at the beginning of the year. Ground water levels were above normal statewide at the end of January as a result of the excessive precipitation that fell during the first half of January. New record-high January levels were reached in index observation wells F-1 (Fairfield County), representing sandstone aquifers in eastern and southeastern Ohio and HN-2A (Hardin County), representing the carbonate aquifers of northwestern Ohio. With below normal precipitation during 5 of the next 6 months, levels in most aquifers had declined to below normal by the end of summer. Above normal precipitation throughout most of the state from the end of August through November was beneficial to ground water supplies and by the end of November, levels had risen to above normal in most consolidated aquifers, but remained below normal in unconsolidated aquifers. In spite of the below normal December precipitation, levels at the end of 2005 remained above normal in most consolidated aquifers. However, levels in unconsolidated aquifers across the state remained below normal at the end of the year.

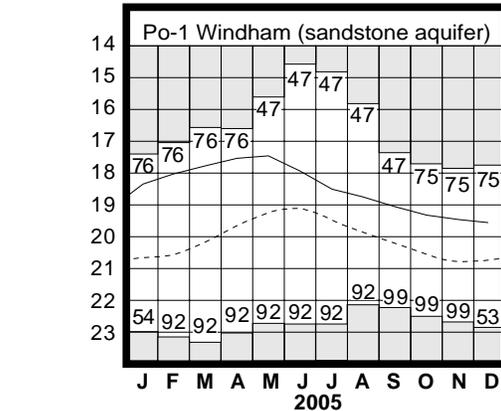
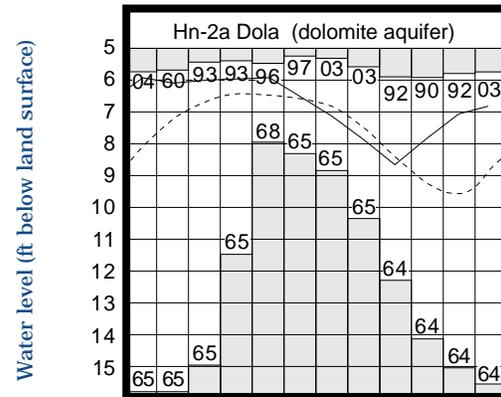
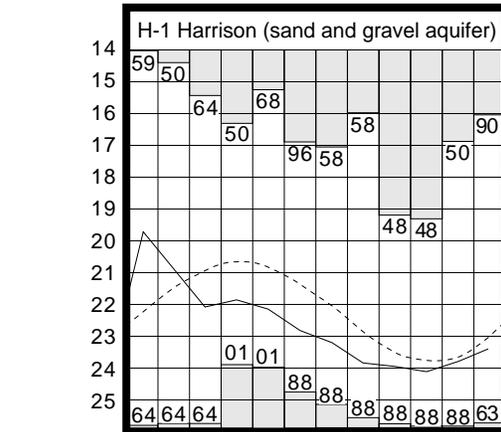
**LAKE ERIE** level declined during December. The mean level was 570.41 feet (IGLD-1985), 0.10 foot lower than last month's mean level and 0.42 foot below normal. This month's mean level is 0.52 foot lower than the December 2004 level and 1.21 feet above Low Water Datum.

The U.S. Army Corps of Engineers (USACE) reports that precipitation in the Lake Erie basin during December averaged 2.57 inches, 0.03 inch below normal. For the entire Great Lakes basin, December precipitation averaged 2.02 inches, 0.31 inch below normal. For calendar year 2005, the Lake Erie basin averaged 33.55 inches of precipitation, 1.47 inches below normal, while the entire Great Lakes basin averaged 30.11 inches, 2.30 inches below normal.

Lake Erie level was above normal during the first 5 months of the 2005 calendar year. However, following the above normal precipitation during January, precipitation in the Great Lakes basin was below normal during the next 9 months. As a result, and combined with other Great Lakes basin hydrologic conditions, the mean level of Lake Erie fell to below normal during June where it remained the remainder of the 2005 calendar year. The USACE reports that based on the current condition of the Great Lakes basin and anticipated weather conditions, 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 3 inches above to as much as 18 inches below the normal seasonal average.

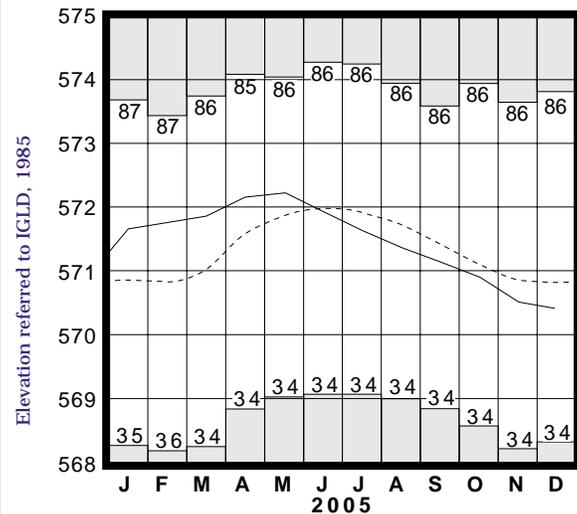
Index Well	Location	Aquifer	Mean This Month	Departure From Normal	Change in feet from:	
					Last Month	Year Ago
F-1	W. Rushville, Fairfield Co.	Sandstone	14.24	+2.85	+1.18	-3.54
Fa-1	Jasper Mill, Fayette Co.	Limestone	9.80	-1.61	+1.76	-2.10
Fr-10	Columbus, Franklin Co.	Gravel	44.56	-0.61	+0.24	-0.21
H-1	Harrison, Hamilton Co.	Gravel	23.40	-0.36	+0.39	+0.04
Hn-2a	Dola, Hardin Co.	Dolomite	6.81	+2.07	+0.25	-0.25
Po-1	Windham, Portage Co.	Sandstone	19.55	+1.19	-0.08	-0.49
Tu-1	Strasburg, Tuscarawas Co.	Gravel	13.94	-0.45	+0.12	-1.09

## GROUND-WATER LEVELS



Base periods: H-1, 1951-2000. Hn-2a, 1955-2000.  
Po-1, 1947-2000 □ Record high and low, year of occurrence

## LAKE ERIE LEVELS



Base period: 1918-2000

□ Record high and low, year of occurrence

Normal - - - - Current ———

(Precipitation continued from front)

and Dillon Dam (Muskingum County). Maysville Dam (Brown County) reported the least amount, 29.71 inches. An isohyetal map and regional averages with percentages of normal precipitation for the 2005 calendar year appear below.

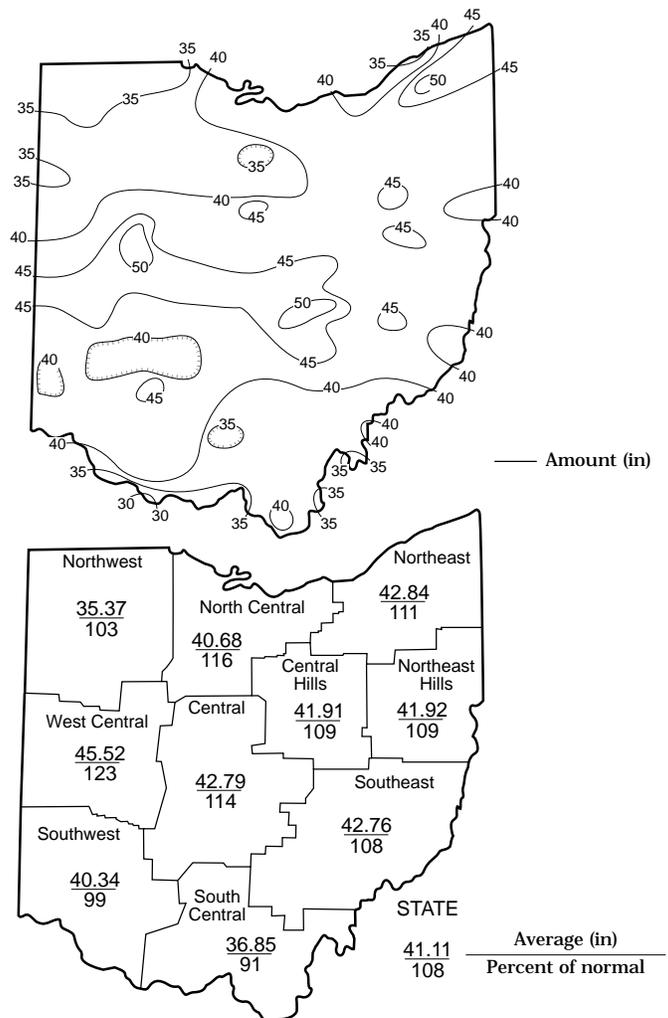
Precipitation during the 2005 calendar year started with exceptionally wet conditions during January. It was the 4<sup>th</sup> wettest January during the past 123 years for the state as a whole and regionally, 9 of the state's 10 climatic regions ranked in their top 5 wettest January's. February and March precipitation was below normal across most of the state, while April precipitation was above normal. Drought-like conditions developed during May across areas of the state. May and June precipitation was below normal statewide and was the 3<sup>rd</sup> driest June for the state as a whole. July precipitation was above normal in northern Ohio, but remained below normal in southern Ohio. Precipitation during the last week of August, including the remnants from Hurricane Katrina, helped ease the drought-like conditions in most areas of the state. Precipitation from late August through November was above normal throughout most of Ohio. This above normal precipitation got the new water supply recharge season off to a good start. Even with the below normal precipitation across most of the state in December, water supplies remain favorable at the end of the 2005 calendar year.

**SUMMARY**

Precipitation during December was below normal across most of the state, but above normal in northwestern Ohio. Streamflow was above normal throughout most of the state. Reservoir storage increased and was above normal in both the Mahoning and Scioto river basins. Ground water levels rose in most aquifers across Ohio. Lake Erie mean level declined 0.10 foot and was 0.42 foot below the long-term December average.

Precipitation for the 2005 calendar year was above normal throughout most of the state, but below normal in the Southwest and South Central regions. Streamflow was above normal statewide. Surface water supplies were above normal most of the calendar year. Ground water supplies were adequate, but were below normal most of the year in unconsolidated aquifers. Lake Erie level was above normal the first 5 months of the year and below normal the last 7 months.

**PRECIPITATION 2005 CALENDAR 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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