



MONTHLY WATER INVENTORY REPORT FOR OHIO

December 2011

<http://www.ohiodnr.gov/tabid/4191/Default.aspx>

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PRECIPITATION during December was above normal throughout most of the state, but slightly below normal in the South Central Region. The state average was 4.34 inches, 1.58 inches above normal. This was the seventh wettest December during the past 129 years for the state as whole. Regional averages ranged from 5.84 inches, 2.81 inches above normal, for the Southwest Region to 2.86 inches, 0.18 inch below normal, for the South Central Region. This was the third wettest December of record for the Southwest and Central Hills regions. Cheviot (Hamilton County) reported the greatest amount of December precipitation, 7.40 inches. Portsmouth-Sciotoville (Scioto County) reported the least amount, 2.23 inches.

Most of the precipitation during December fell as rain. Snow amounts were below normal statewide with temperatures averaging above normal. Most areas of the state received at least 1 inch of rain during December 4-7 with amounts of 2-3 inches reported in a wide area from southwestern to northeastern Ohio. Showers fell during December 14-15; between 0.50 and 1.0 inch was reported across most of the state. Precipitation during December 19-23 was again greatest from southwestern to northeastern Ohio with 1-2 inches reported and lesser amounts to the north and south of this line. Showers on December 27 produced about 0.50 inch of precipitation throughout much of the state. The month ended with just a few light showers on December 30 and 31.

Precipitation for the first three months of the 2012 water year is above normal throughout Ohio. The average for the state is 14.27 inches, 6.06 inches above normal. Regional averages range from 16.22 inches, 7.36 inches above normal, for the Southwest Region to 13.20 inches, 4.79 inches above normal, for the South Central Region.

Precipitation for the 2011 calendar year was markedly above normal statewide. The state average was 56.76 inches, 18.74 inches above normal. This ranks 2011 as the wettest year in 129 years of records, surpassing the previous record of 51.36 inches set in 1990. Regional averages ranged from 60.92 inches, 20.07 inches above normal, for the Southwest Region to 52.57 inches, 18.29 inches above normal, for the Northwest Region (see precipitation table, departure from normal, past 12 months column). Eight of the state's 10 climatic regions set new annual precipitation records while Central Hills and Northeast Hills regions reported their second wettest calendar year of record. Cheviot (Hamilton County) reported the greatest amount of precipitation for the year, 76.32 inches, easily surpassing the previous state record of 70.82 inches set in 1870 at Little Mountain (Lake/Geauga County). Other areas reporting more than 70 inches of precipitation for the year are Miamitown, Fernbank (both in Hamilton County), and Chardon (Geauga County). Toledo Express Airport (Lucas County) reported the least amount, 48.92 inches. An isohyetal map and regional averages with percentages of normal precipitation for the 2011 calendar year appear on the last page of this report.

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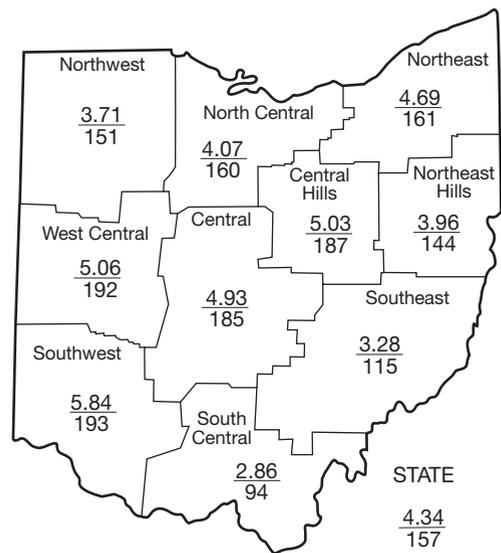
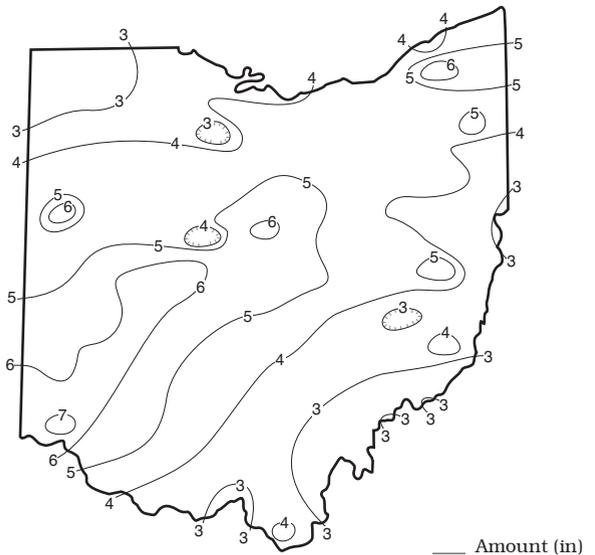
PRECIPITATION

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	+1.25	+6.53	+10.66	+18.29	+16.95	+5.6
North Central	+1.53	+6.11	+12.13	+20.82	+21.81	+7.1
Northeast	+1.78	+5.81	+11.16	+22.19	+23.08	+6.2
West Central	+2.42	+6.72	+9.81	+19.37	+17.58	+5.3
Central	+2.26	+6.37	+9.67	+18.02	+16.60	+4.2
Central Hills	+2.34	+6.53	+9.24	+16.26	+15.05	+4.5
Northeast Hills	+1.21	+5.24	+8.16	+16.32	+15.86	+2.8
Southwest	+2.81	+7.36	+9.08	+20.07	+15.12	+4.7
South Central	-0.18	+4.79	+6.96	+19.16	+21.31	+4.3
Southeast	+0.44	+5.17	+7.84	+16.96	+16.22	+4.5
State	+1.58	+6.06	+9.46	+18.74	+17.98	

*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

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	2,596	189	201	194	179
Great Miami River at Hamilton	3,630	16,880	459	361	247	221
Huron River at Milan	371	1,230	504	407	279	240
Killbuck Creek at Killbuck	464	1,676	401	263	192	170
Little Beaver Creek near East Liverpool	496	983	174	142	117	144
Maumee River at Waterville	6,330	25,950	547	395	280	191
Muskingum River at McConnelsville	7,422	24,860	228	376	292	143
Scioto River near Prospect	567	2,736	1,025	531	448	270
Scioto River at Higby	5,131	20,350	443	306	233	204
Stillwater River at Pleasant Hill	503	1,901	512	299	194	189

STREAMFLOW during December was noticeably above normal throughout the state. Flows during the month were seasonally higher than they were during November and high enough to be considered excessive statewide. Preliminary data indicates that several of the gauging stations cited in this report set record or near-record flows for December: Great Miami River at Hamilton, Killbuck Creek at Killbuck, Maumee River at Waterville, Scioto River near Prospect and Scioto River at Higby had the greatest December flows for their respective periods of record. The Great Miami River at Hamilton also established a new record for highest daily mean flow for December on December 6.

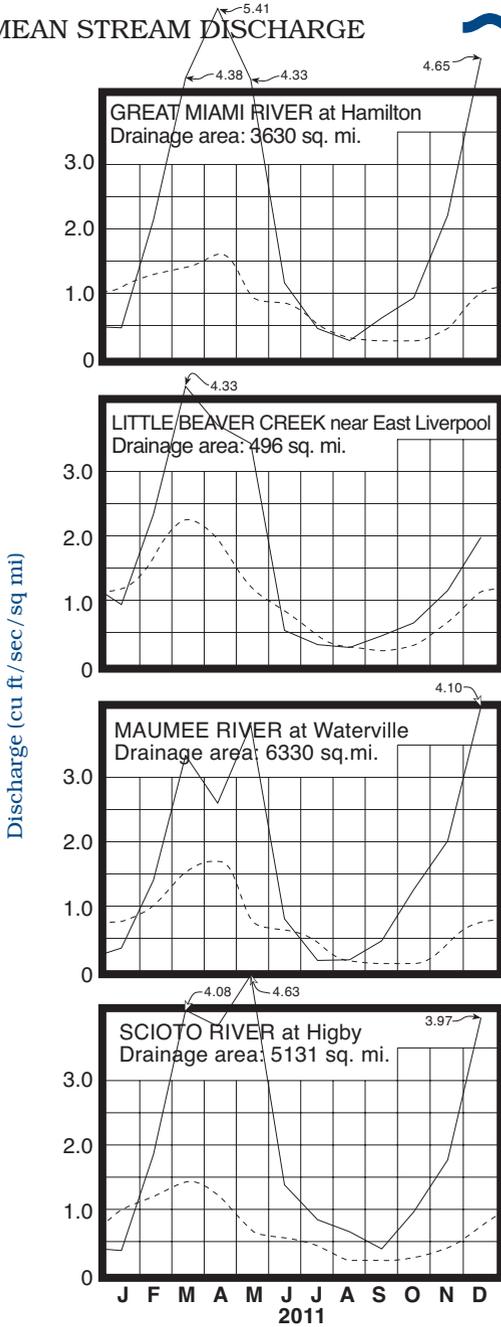
Flows at the beginning of the month were above normal statewide. Flows declined during the first few days of December, then increased throughout the state in response to widespread precipitation

that fell during the first week of the month. Greatest flows for the month occurred around December 6-8 across most of the state. Small stream and urban flooding was widespread as a result of heavy rainfall. Flows generally declined from these peaks during the next two weeks. Lowest flows for the month were reached statewide sometime during the December 13-21 period. Streamflow increased during the next week due to several days of precipitation. Greatest flows for the month occurred in areas of eastern and southeastern Ohio around December 23 and 24. Flows at the end of the month were excessive throughout most of the state and well above normal.

Streamflow during the 2011 calendar year was markedly above normal statewide (see Mean Stream Discharge table, percent of normal, past 12 months column). During much of the year, flows were high enough to be considered excessive. Several daily and monthly maximum flow records were established during the year. The year began with below normal flows during January. Flows were above normal from February through June. During July flows were below normal in western and eastern Ohio, and above normal in the central one-third, while during August flows were above normal throughout much of the state. Flows from September through December were above normal statewide. Flooding was observed throughout various areas of the state during every month of the year except January. Fortunately, most of the flooding was minor, impacting mainly low-lying areas and land adjacent to streams. The most significant flooding occurred during late February and early March when major flooding occurred across northern Ohio as a result of three major storms impacting the state the last 10 days of February. Significant flooding also occurred during July 18-19 in areas of Medina, Summit and Stark counties following heavy rain. The year ended with flows remaining well above normal.

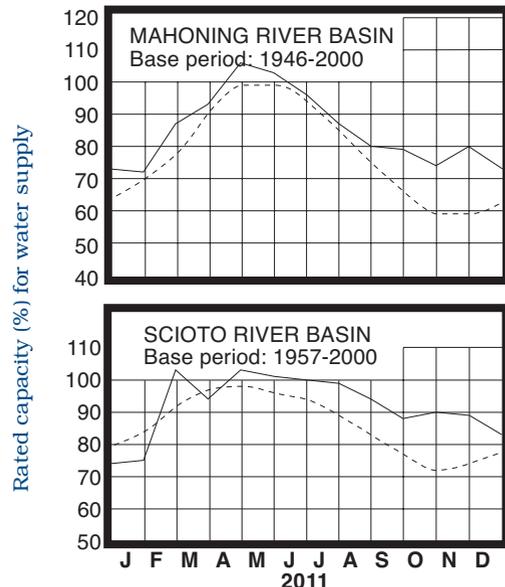
RESERVOIR STORAGE for water supply during December declined in both the Mahoning and Scioto river basins, but remained well above normal in both basins. Reservoir storage in the Mahoning basin index reservoirs was 73 percent of rated capacity for water supply compared with 80 percent for last month and 73 percent for December 2010. Month-end storage in the Scioto basin index reservoirs was 83 percent of rated capacity for water supply compared with 89 percent for last month and 74 percent for December 2010.

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

Surface water supplies were favorable throughout the 2011 calendar year. Storage was above normal the entire year in the Mahoning River basin. Storage was below normal early in the year in the Scioto River basin and then above normal during the last nine months of 2011.

GROUND WATER LEVELS during December rose throughout the state. Generally, levels rose steadily throughout the month in most aquifers. Net changes during December from last month's levels were noticeably greater than usually observed in all aquifers.

The 2012 water year recharge season has been excellent as far as ground water supplies are concerned. Ground water levels are above normal throughout Ohio and current levels continue to remain noticeably higher than the levels observed one year ago. Index observation wells F-1 (Fairfield County), representing sandstone aquifers in eastern and southeastern Ohio, HN-2A (Hardin County), representing carbonate aquifers of northwestern Ohio, and PO-124 (Portage County), representing sandstone aquifers in eastern and northeastern Ohio, reached a record-high level for December.

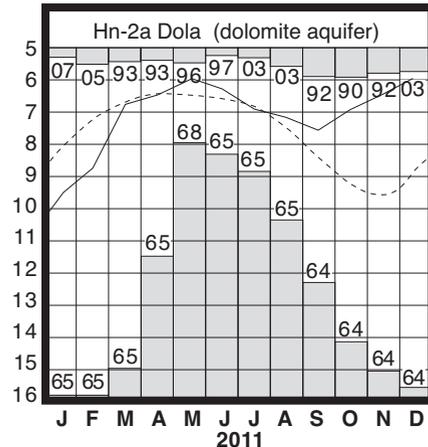
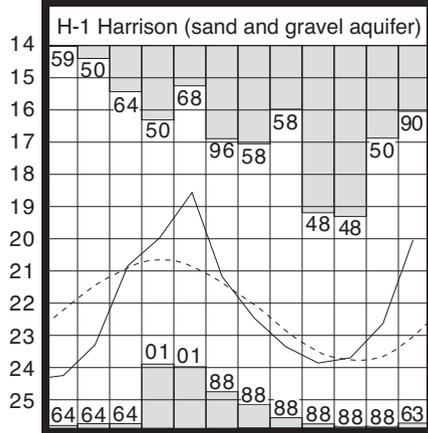
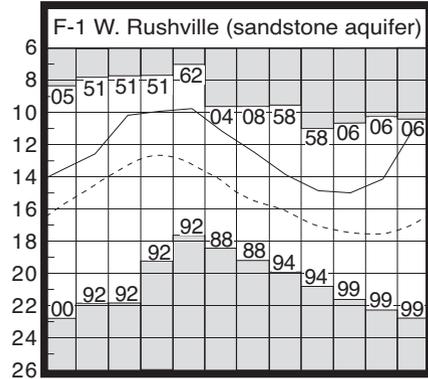
Ground water storage improved considerably during 2011. At the beginning of the year, ground water levels were below normal across most of the state. Levels rose steadily through May as ground water responded favorably to the record spring precipitation. Levels declined seasonally during the summer months, then responded favorably to the above normal autumn precipitation. The 2012 water year recharge season began during October across much of the state, a month in which ground water levels normally decline statewide. At the end of 2011, ground water levels are noticeably higher than they were a year ago, ranging from 1.5 to as much as 5 feet higher than the December 2010 levels. Ground water storage is at above normal levels statewide by as much as 6 feet and at or near record seasonal levels in several aquifers. At the end of calendar year 2011, ground water supplies are in excellent condition throughout the state.

LAKE ERIE level rose during December. The mean level was 572.18 feet (IGLD-1985), 0.62 foot higher than last month's mean level and 1.35 feet above normal. This month's mean level is 1.77 feet above the December 2010 level and 2.98 feet above Low Water Datum.

Lake Erie's level was below normal during the first four months of the year then rose sharply from March through May as precipitation in the Lake Erie basin from February-May averaged 9 inches above normal. The lake rose to above normal level during May and remained above normal through the end of 2011. It is predicted to remain above normal for the foreseeable future based on the present condition of the lake basin and anticipated future weather conditions. After reaching its yearly low of 570.05 feet (IGLD-1985) during February, the level of Lake Erie rose nearly 2.75 feet at its peak during June. This is more than twice the normally observed rise for this period. The level of Lake Erie declined seasonally during the next five months, but the declines during the autumn months were less than usually observed as a result of the above normal precipitation that fell in the Lake Erie basin. The lake level rose during December as above normal precipitation continued to fall across the Lake Erie basin. The U.S. Army Corps of Engineers reports that precipitation in the Lake Erie basin during December averaged 3.59 inches, 0.92 inch above normal. For calendar year 2011, precipitation in the Lake Erie basin averaged 51.42 inches 16.0 inches above normal.

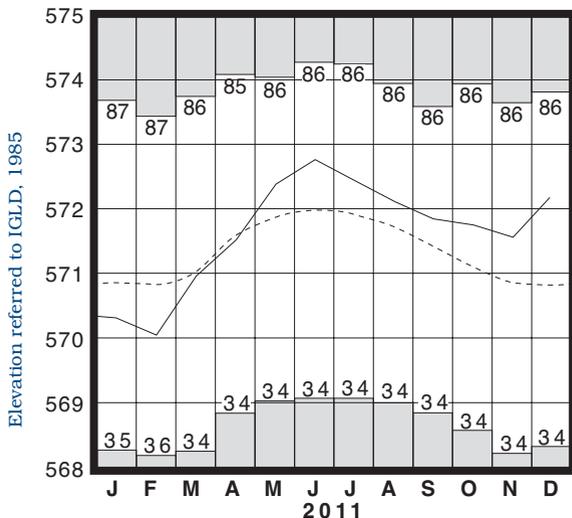
Index Well	Location	Aquifer	Mean This Month	Departure From Normal	Change in feet from:	
					Last Month	Year Ago
F-1	W. Rushville, Fairfield Co.	Sandstone	11.09	+6.00	+3.05	+3.43
Fa-1	Jasper Mill, Fayette Co.	Limestone	7.19	+1.00	+1.24	+4.27
Fr-10	Columbus, Franklin Co.	Gravel	43.03	+0.92	+0.61	+2.08
H-1	Harrison, Hamilton Co.	Gravel	20.10	+2.94	+2.53	+4.26
Hn-2a	Dola, Hardin Co.	Dolomite	5.97	+2.91	+0.49	+4.92
Po-124	Freedom, Portage Co.	Sandstone	76.27	+2.14	+0.33	+1.46
Tu-1	Strasburg, Tuscarawas Co.	Gravel	11.92	+1.57	+2.21	+2.62

GROUND-WATER LEVELS



Base periods: F-1, 1947-2000 H-1, 1951-2000.
Hn-2a, 1955-2000

LAKE ERIE LEVELS



Base period: 1918-2000

■ Record high and low, year of occurrence

Normal - - - - Current ———

(Precipitation continued from front)

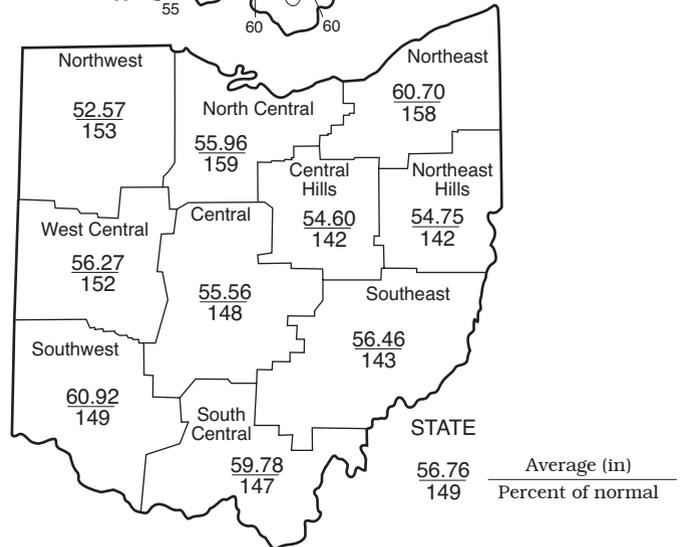
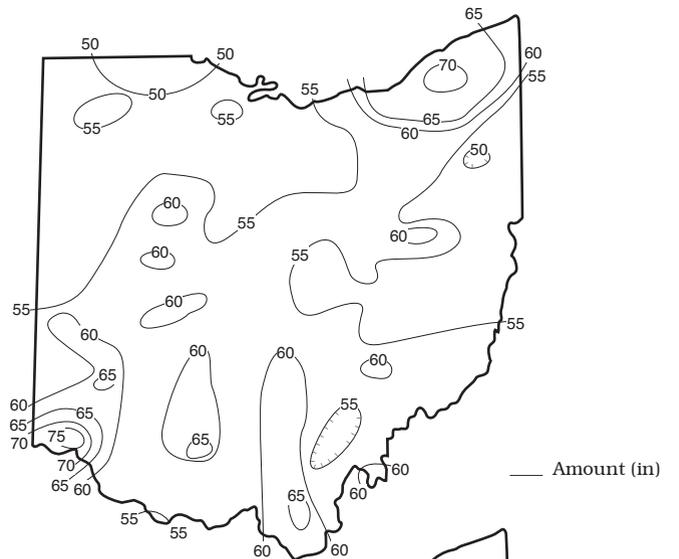
The record-setting precipitation that fell during 2011 was beneficial for water supplies throughout Ohio. It was also a year with recurring floods across many areas of the state. The above normal precipitation challenged Ohio's farmers as they endured the wettest spring on record. This hampered spring planting and a record wet autumn delayed the fall harvest. January was the only month during 2011 when precipitation was below normal statewide. Above normal precipitation occurred during the next four months including the wettest April for the state as a whole. Combined with the tenth wettest February and sixth wettest May, February-May was the wettest four month period for the state during the past 129 years. Precipitation during June was above normal in the southeastern half of the state, and below normal across much of the state in July. Precipitation from August through December was notably above normal. For the state as a whole, this was the second wettest September of record, the thirteenth wettest October, the fifth wettest November and the seventh wettest December. Combined, this was the wettest September-December period for the state during the past 129 years.

SUMMARY

Precipitation during December was above normal throughout most of the state. Streamflow was excessive with several basins experiencing record or near-record December flows. Reservoir storage and ground water levels are above normal statewide. Lake Erie level rose 0.62 foot and is 1.35 feet above normal.

Precipitation during the 2011 calendar year was the wettest on record. Streamflow was markedly above normal with flows often high enough to be considered excessive. Flooding was a recurring problem during much of the year. Reservoir storage was above normal throughout most of 2011. Ground water levels rose during the year and were above normal statewide at the end of the year. Lake Erie's level was above the long-term average for the last eight months of the year.

PRECIPITATION 2011 CALENDAR YEAR



ACKNOWLEDGMENTS

This report has been compiled from Division 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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