MONTHLY WATER INVENTORY REPORT FOR OHIO

February 2009

http://www.dnr.state.oh.us/tabid/4191/Default.aspx

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Hydrologist

Water Inventory Unit

PRECIPITATION during February was above normal in the northern one-third of Ohio and below normal elsewhere. The state average was 1.97 inches, 0.29 inch below normal. Regional averages ranged from 2.95 inches, 1.11 inches above normal, for the Northwest Region to 1.58 inches, 0.75 inch below normal, for the Northeast Hills Region. Napoleon (Henry County) reported the greatest amount of February precipitation, 4.00 inches. Chesterville (Morrow County) reported the least amount, 0.86 inch.

Precipitation during February fell as both rain and snow. Precipitation during February 3-4 fell as mainly snow and was confined to southwestern and extreme northeastern Ohio. Southwestern Ohio reported 4-7 inches of snow during this period while areas in northeastern Ohio reported as much as 12 inches. Showers and thunderstorms during February 10-12 produced 0.75-1.5 inches of rain across the state with some areas in northwestern Ohio receiving as much as 2.5 inches. Precipitation during February 18-22 was greatest across northern Ohio where 0.50-1.0 inches (liquid) fell, mostly as snow. Precipitation during February 26-27 was widespread with the greatest amount falling over the southeastern half of the state where more than 1 inch fell at some locations. Snowfall for the month was below normal across most of the state; however, some areas in northeastern and southwestern Ohio received above normal snowfall. Chardon (Geauga County), located in northeastern Ohio's snowbelt, reported 16.5 inches of snow for February, bringing their seasonal snow total to 116.5 inches, which is about 33 inches above normal to date.

Precipitation for the 2009 water year is above normal across much of the state, but below normal in the southwestern quarter of Ohio. The average for the state is 13.53 inches, 0.49 inch above normal. Regional averages range from 16.73 inches, 2.86 inches above normal, for the Northeast Region to 12.10 inches, 0.24 inch below normal, for the West Central Region.

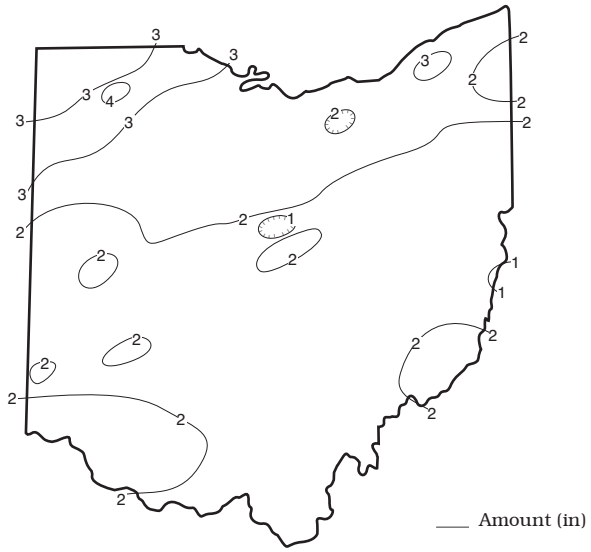
Precipitation for the first 2 months of the 2009 calendar year is above normal in the northern one-third of the state and below normal elsewhere. The average for the state is 4.55 inches, 0.28 inch below normal. Regional averages range from 5.39 inches, 0.75 inch above normal, for the Northeast Region to 3.76 inches, 0.72 inch below normal, for the West Central Region.

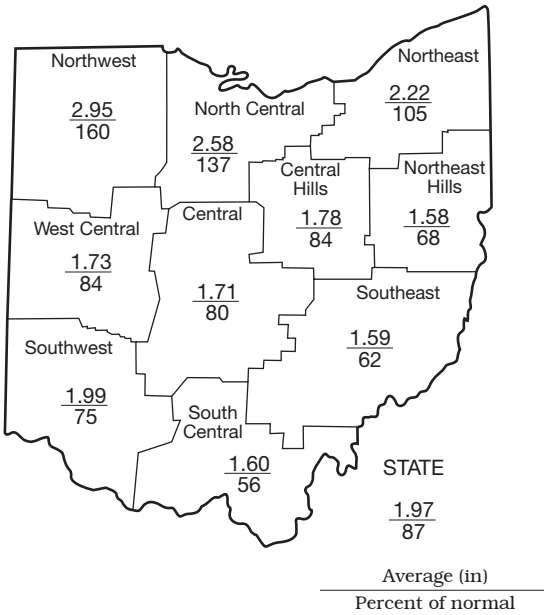
PRECIPITATION

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	+2.45	+2.73	+4.19	+13.40	+3.3
North Central	+0.69	+1.74	+2.90	+5.52	+14.77	+4.1
Northeast	+0.10	+2.25	+3.06	+7.51	+14.43	+4.1
West Central	-0.33	+1.46	-0.98	+3.30	+10.29	+0.8
Central	-0.44	+1.35	-0.81	+3.65	+7.45	+0.1
Central Hills	-0.35	+1.74	+0.27	+0.89	+7.28	+0.7
Northeast Hills	-0.75	+1.45	+0.25	+0.92	+7.48	+0.4
Southwest	-0.65	+0.52	-3.19	+2.14	+0.97	-0.1
South Central	-1.24	+1.18	-2.15	+3.29	+0.45	+0.1
Southeast	-0.98	+2.34	-0.78	+5.09	+5.05	+0.4
State	-0.29	+1.64	+0.12	+3.63	+8.13	

*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 FEBRUARY





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	3,276	193	155	136	138
Great Miami River at Hamilton	3,630	7,067	149	89	78	142
Huron River at Milan	371	1,948	396	193	168	187
Killbuck Creek at Killbuck	464	879	126	84	73	104
Little Beaver Creek near East Liverpool	496	1,086	126	105	88	100
Maumee River at Waterville	6,330	16,750	255	140	111	121
Muskingum River at McConnelsville	7,422	13,677	112	138	121	105
Scioto River near Prospect	567	1,349	207	94	76	135
Scioto River at Higby	5,131	8,382	108	68	60	126
Stillwater River at Pleasant Hill	503	1,113	178	92	75	140

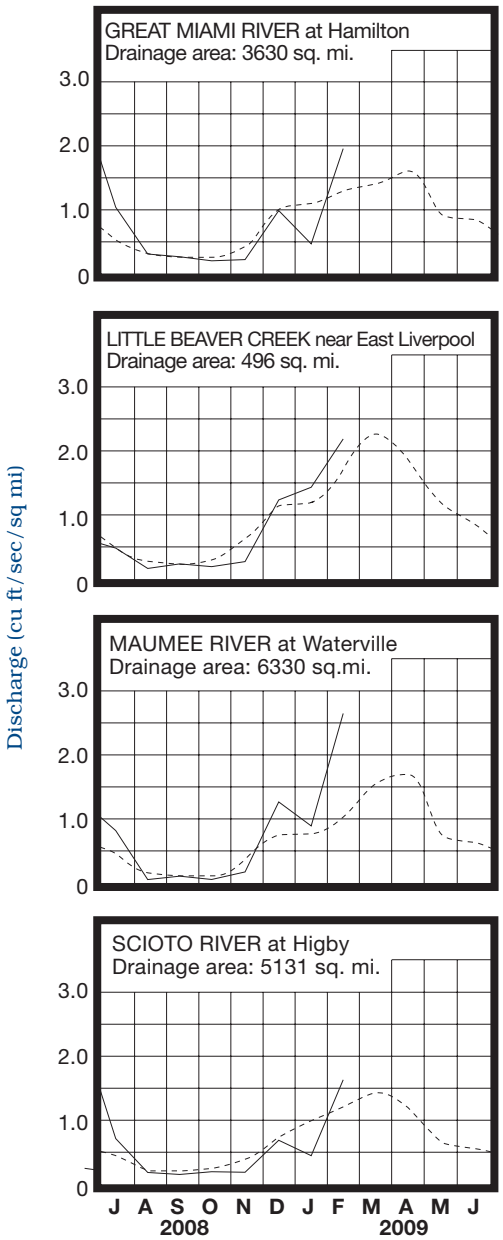
STREAMFLOW during February was above normal across most of the state. Flows were high enough to be considered excessive in several basins, mainly in the northern half of Ohio. Flows during February were greater than those observed during January throughout the state. Preliminary data indicates that for their respective periods of record, this month's mean flow for several gauging stations in northern Ohio ranked in their top 10 greatest for February.

Streamflow at the beginning of February was below normal across most of the state. Flows were steady or declined during the first week of the month statewide. Lowest flows for the month were observed at the end of the first week in most basins. Exceptions were noted in basins in northwestern and northeastern Ohio where low flows for the month occurred around February 24-26. Precipitation and runoff from melting snow during the second week of the month resulted in a rapid rise in streamflows across the state, resulting in minor flooding along several streams, mainly in northern Ohio. Ice jams along many streams also contributed to some of the flooding. Greatest flows for the month occurred during this time throughout the state, generally between February 12 and 14. Flows declined from these peaks during the next week and a half, then increased again near the end of the month in response to widespread precipitation. At the end of February, streamflow was above normal throughout most of the state.

RESERVOIR STORAGE during February increased in both the Mahoning and Scioto river basins. At the end of February, storage remained above normal in the Mahoning River basin and below normal in the Scioto River basin.

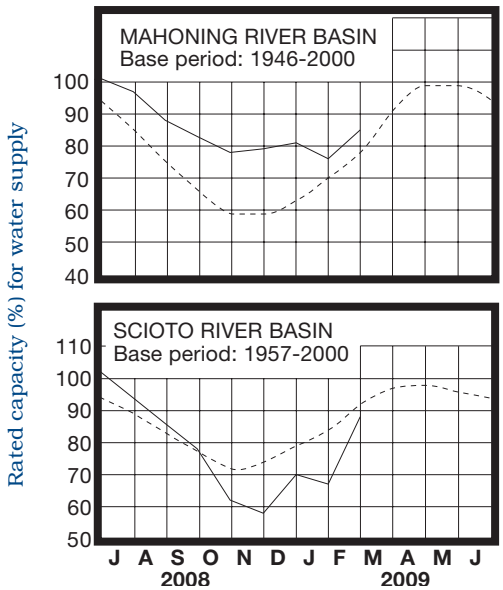
Reservoir storage at the end of February in the Mahoning basin index reservoirs was 85 percent of rated capacity for water supply compared with 76 percent for last month and 83 percent for February 2008. Month-end storage in the Scioto basin index reservoirs was 88 percent of rated capacity for water supply compared with 67 percent for last month and 94 percent for February 2008. Surface water supplies continue to be in a favorable position across the state.

MEAN STREAM DISCHARGE



Base period for all streams: 1971-2000

RESERVOIR STORAGE FOR WATER SUPPLY



Normal – – – – Current ———

GROUND-WATER LEVELS

GROUND WATER levels during February rose in most aquifers across Ohio. Most of the improvement can be attributed to recharge from melting of the snow that covered the ground at the start of the month and widespread rain near the middle and end of the month. Levels in most unconsolidated aquifers declined during the first week of February, rose during the next week and a half before they declined again through the remainder of the month. Levels in consolidated aquifers were rather stable or declined slightly during the first week of February and then rose steadily during the remainder of the month.

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	12.85	+1.72	+1.91	-1.16
Fa-1	Jasper Mill, Fayette Co.	Limestone	9.48	-2.31	+0.62	-1.12
Fr-10	Columbus, Franklin Co.	Gravel	44.40	-1.52	+0.35	-0.48
H-1	Harrison, Hamilton Co.	Gravel	23.20	-1.70	+0.74	-1.43
Hn-2a	Dola, Hardin Co.	Dolomite	9.24	-2.01	+1.64	-2.92
Po-124	Freedom, Portage Co.	Sandstone	76.61	+1.61	-0.02	+0.60
Tu-1	Strasburg, Tuscarawas Co.	Gravel	13.93	-1.49	+0.72	-2.05

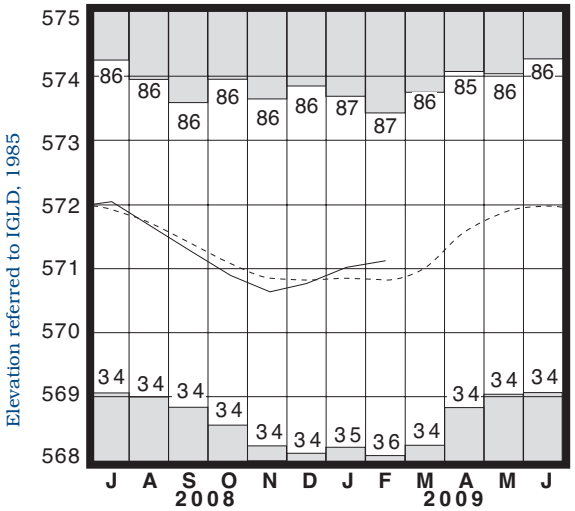
Ground water supplies continue to be adequate throughout most of Ohio even though levels remain below normal across much of the state. Exceptions are in some consolidated aquifers in eastern Ohio where levels have remained above normal for some time. Also, current levels are lower than they were at this time last year in most aquifers. With near-normal precipitation and other hydrologic conditions during the next few months, ground water storage should remain adequate throughout the state.

LAKE ERIE level rose during February. The mean level was 571.11 feet (IGLD-1985), 0.10 foot higher than last month's mean level and 0.28 foot above normal. This month's mean level is 0.08 foot lower than the February 2008 level and 1.91 feet above Low Water Datum.

The U.S. Army Corps of Engineers (USACE) reports that precipitation in the Lake Erie basin during February averaged 2.94 inches, 0.87 inch above normal while the entire Great Lakes basin averaged 2.18 inches, 0.41 inch above normal. For calendar year 2009 through February, precipitation in the Lake Erie basin is above normal while across the entire Great Lakes basin precipitation averages below normal.

In addition, 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 above normal through early summer, and then fall slightly below normal during late summer. Deviations from the anticipated weather patterns could result in the level of Lake Erie ranging from about 8 inches above to as much as 11 inches below the normal seasonal levels.

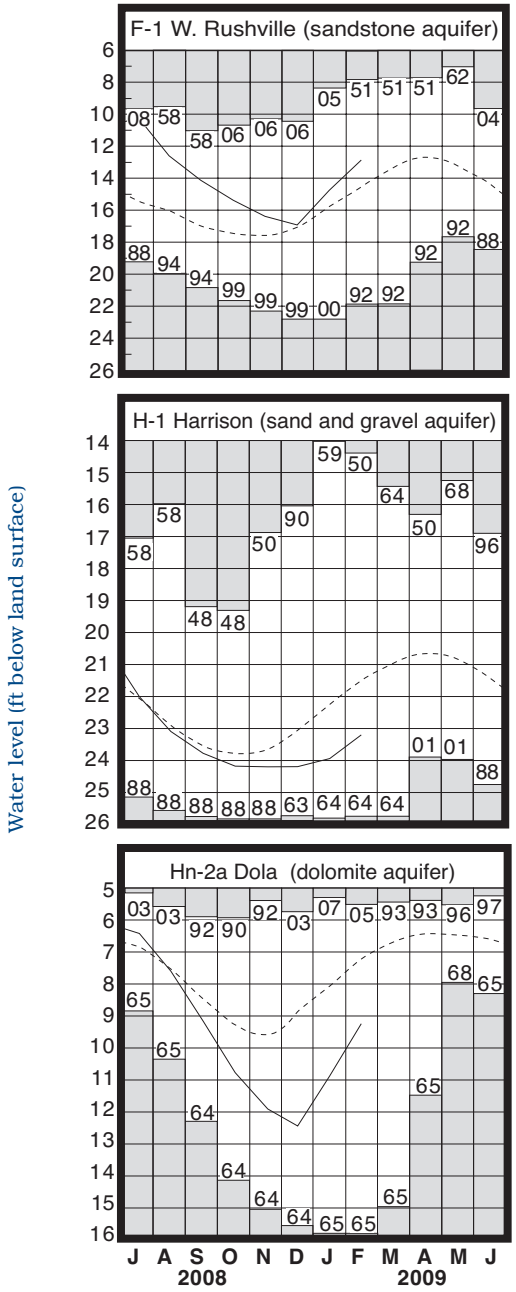
LAKE ERIE LEVELS



Base period: 1918-2000

Record high and low, year of occurrence

GROUND-WATER LEVELS



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

Normal – – – – Current ———

SUMMARY

Precipitation during February was above normal in the northern one-third of Ohio and below normal elsewhere. Streamflow was above normal across most of the state. Reservoir storage increased and was above normal in the Mahoning River basin, but below normal in the Scioto River basin. Ground water levels rose in most aquifers. Lake Erie level rose 0.10 foot and was 0.28 foot above the long-term February average.

NOTES AND COMMENTS

Potentiometric Surface Map GIS Files Now Available

Five new GIS shape files, in additon to the map PDF files, are now available from the ODNR, Division of Water website at: http://www.dnr.state.oh.us/tabid/3623/default.aspx. The newly added shape files are for Hardin, Hancock, Logan, Marion, and Shelby counties.

A potentiometric surface map is a contour map that represents the top of the ground water surface in an aquifer. The contour lines illustrate the potentiometric surface much like the contour lines of a topographic map represent a visual model of the ground surface. Potentiometric surface maps are being created for bedrock (consolidated formations) and sand & gravel (unconsolidated formations) aquifers. County-based maps are available as PDF images and as GIS ArcView Shape files.

Potentiometric surface maps can be used to determine the direction and gradient of ground water flow, to determine ground water recharge and discharge areas, and as input data into ground water modeling programs. These maps can also be used to assist in preparing water resources plans and technical studies, in the mapping of stress areas, and in possible ground water diversion issues. Since these maps were created using existing data collected over a fifty-year period, field verification of the ground water flow direction should be conducted before the drilling of monitoring wells to satisfy compliance monitoring. If you have any questions concerning these maps, please contact Jim Raab at jim.raab@dnr.state.oh.us or (614) 265-6747.

Division Of Water Funding For Stream Gauging Ends

Due to budgetary decisions, effective January 1, 2009, the Division of Water is unable to continue funding stream gauging in Ohio. Discussions are under way to find other sources of funding for this important on-going program.

Stream gauges across Ohio (and most other states) are typically operated by the US Geological Survey (USGS) and are funded through their Cooperative Funding Program where local funds can be matched up to 100% with federal funds. Currently there are about 30 separate state, county, local and federal agencies that contribute funds for Ohio's current 153 stream gauges. Of those, the Division of Water was the largest non-federal supporter in Ohio, providing funds for 52 of the 65 state-supported stream gauges. The US Army Corps of Engineers is the largest federal supporter in Ohio, providing funds for an additional 39 sites, mostly upstream or downstream from their large reservoirs.

Data from stream gauges are vital for the protection, safety, and general welfare of all sectors of the population. Data are used by both the public and private sectors in various application, such as: issuing flood warnings to protect lives and reduce property damage; planning, designing, operating, and maintaining our multipurpose water management systems; monitoring environmental conditions and protecting aquatic habitats; protecting water quality and regulating pollutant discharges; designing highways and bridges; mapping floodplains; managing water rights and transboundary water issues; and education, research and recreational uses.

The value of data from a stream gauging site increases over time. Sites with long, uninterrupted periods of record provide the most valuable dataset to calculate a valid statistical representation to form a baseline for comparison with future conditions. Since most stream gauging sites provide data for multiple uses, in the future both the number of data users and the ways in which the data are being used is expected to increase.

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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