MONTHLY WATER INVENTORY REPORT FOR OHIO

February 2010

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

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PRECIPITATION during February was above normal in the eastern half of the state and below normal in the western half. The state average was 2.23 inches, 0.03 inch below normal. Regional averages ranged from 2.81 inches, 0.69 inch above normal, for the Northeast Region to 1.62 inches, 0.22 inch below normal, for the Northwest Region. Chardon (Geauga County) reported the greatest amount of February precipitation, 4.33 inches. Hoytville (Wood County) reported the least amount, 0.87 inches.

Precipitation during February fell as rain and snow, although most of it fell as snow as colder than normal temperatures prevailed across the state much of the month. Snowfall for the month was above normal statewide as a series of winter storms impacted the state during February, resulting in impressive amounts of snow. Much of the state received record or near-record snow totals for February (see Notes and Comments on the last page of this report). The first of these storms occurred during February 5-6. Snow fell across the state with generally 8-20 inches reported. Lesser amounts fell in northwestern Ohio, and in areas of southern Ohio the precipitation began as rain and then changed to snow. Precipitation amounts (liquid) during this storm ranged from 1.50 inches in southeastern Ohio tapering to less than 0.25 inch in extreme northwestern Ohio. The next storm occurred during February 9-10 with 5-12 inches of snow (0.50-0.75 inch liquid) covering most of the state. With this storm, the greatest snow amounts fell in northwestern Ohio. Southern Ohio received the least amount of snow as the precipitation there began as rain. A third storm impacted the state on February 15-16 with another 5-10 inches of snow with the greatest amount falling from southwestern to northeastern Ohio, tapering to around 1 inch in northwestern Ohio. Following this storm, temperatures moderated for a few days. Precipitation during February 21-22 began as snow or a wintry mix in northern Ohio, but changed to rain throughout the state. Precipitation amounts were generally 0.25-0.50 inch (liquid) in eastern and northwestern Ohio, and less than 0.25 inch elsewhere. Colder temperatures and snow returned to Ohio during the last 5 days of the month. Most of the snow was light, with generally 2-4 inches falling during this period. However, 8-12 inches of snow fell throughout the northeastern third of Ohio with more than 2 feet reported in the snowbelt counties east of Cleveland. Precipitation amounts (liquid) were generally 0.50-1.5 inches in northeastern Ohio and less than 0.50 inch elsewhere. At the end of the month, a significant amount of snow remained on the ground throughout much of the state.

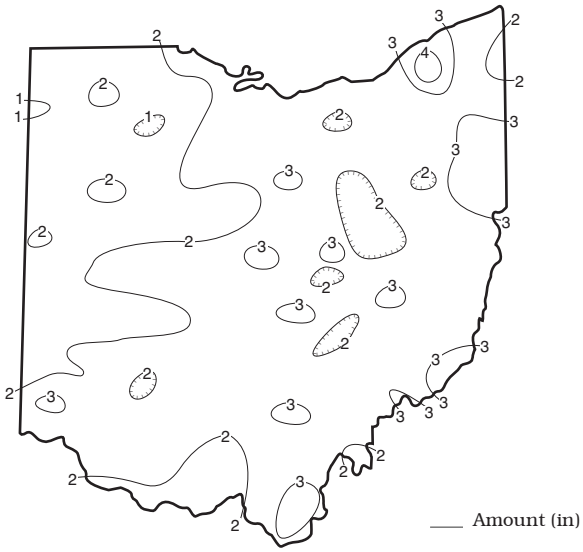
(continued on back)

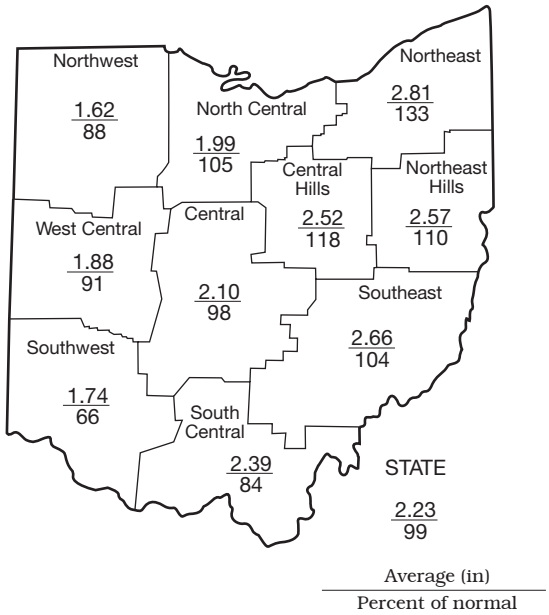
PRECIPITATION

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	-0.22	-1.17	-1.67	-0.95	+3.24	-0.5
North Central	+0.10	-1.04	-2.74	-2.59	+2.70	-0.4
Northeast	+0.69	+0.71	-0.59	+0.13	+7.55	+2.6
West Central	-0.18	-1.30	-1.86	-3.51	-0.38	-0.5
Central	-0.05	-0.46	+0.29	-1.23	+2.43	+0.3
Central Hills	+0.39	-0.17	-0.37	-1.73	-0.82	+0.4
Northeast Hills	+0.24	+0.41	-1.74	-4.10	-3.29	+1.3
Southwest	-0.90	-1.98	-1.29	-2.35	-0.12	+0.2
South Central	-0.45	-0.44	-0.61	+1.11	+4.13	+1.0
Southeast	+0.09	+0.61	-0.41	-2.37	+2.73	+0.7
State	-0.03	-0.49	-1.10	-1.77	+1.79	

*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	839	50	91	74	77
Great Miami River at Hamilton	3,630	2,290	48	72	75	76
Huron River at Milan	371	83	17	30	29	62
Killbuck Creek at Killbuck	464	370	53	67	69	63
Little Beaver Creek near East Liverpool	496	1,089	126	106	89	76
Maumee River at Waterville	6,330	1,910	29	50	51	87
Muskingum River at McConnelsville	7,422	5,878	48	99	100	57
Scioto River near Prospect	567	173	26	52	52	55
Scioto River at Higby	5,131	3,421	44	71	79	67
Stillwater River at Pleasant Hill	503	199	32	58	52	68

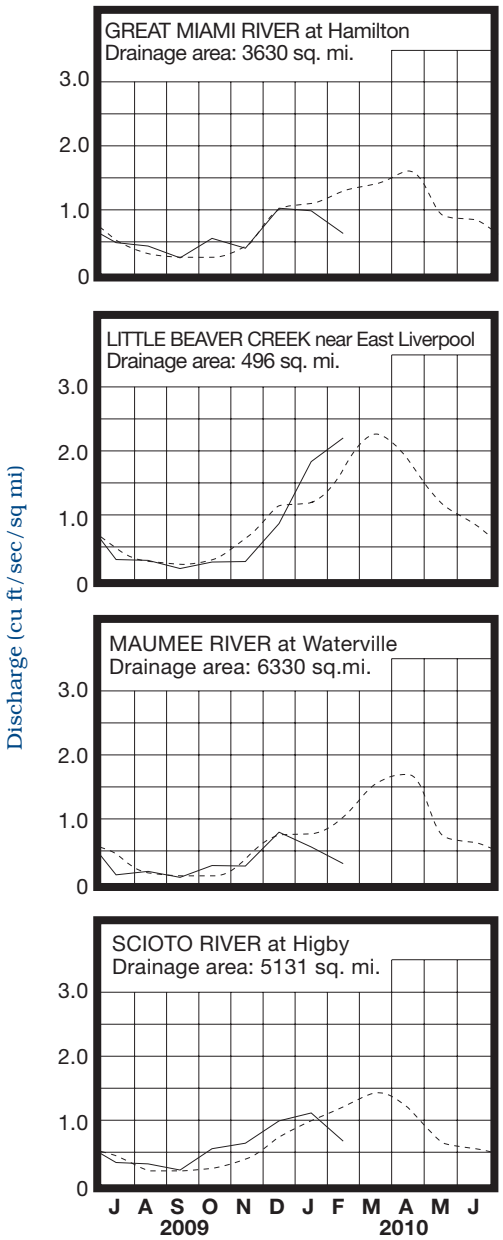
STREAMFLOW during February was below normal throughout most of the state, but above normal in east-central Ohio. Flows were low enough to be considered deficient in all but east-central Ohio. February flows were lower than the flows recorded during January throughout most of the state. Preliminary data indicates the Huron River at Milan gauging station recorded its second lowest monthly flow for February.

Flows at the beginning of the month were below normal statewide. Flows generally declined during the first 3 weeks of the month with some slight increases noted, especially in southern Ohio, around February 6. The combination of snow and below normal temperatures during the first 3 weeks of the month resulted in little runoff. Low flows throughout most of the state occurred generally around February 19-20, just prior to warmer temperatures and rain entering the state. This rain, combined with melting snow, helped push streamflow rates higher, resulting in greatest flows for the month around February 24-25 nearly statewide. Following these peaks, flows decreased during the last few days of the month as colder temperatures and snow returned to the state. Flows at the end of February were below normal throughout all but extreme northeastern Ohio.

RESERVOIR STORAGE for water supply during February decreased in the Mahoning River basin and increased slightly in the Scioto River basin. Storage fell to below normal for the first time in more than 2 years in the Mahoning River basin and the first time in nearly a year in the Scioto River basin. Storage fell below normal in part due to the combination of snowfall and below normal temperatures throughout most of the month, which greatly reduced runoff. In addition, storage in many reservoirs was adjusted in anticipation of the expected runoff from the melting snow pack across the region.

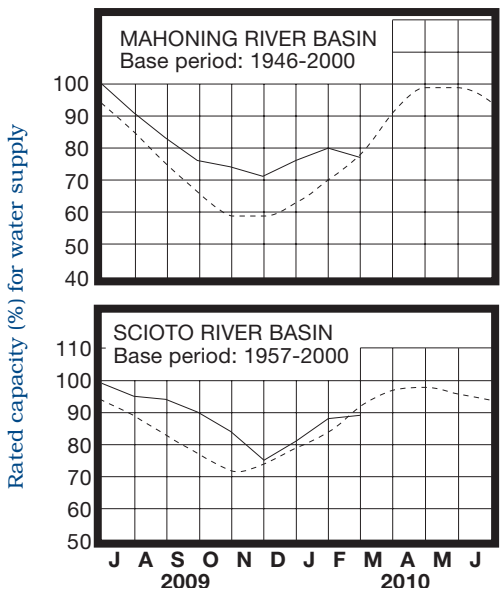
Reservoir storage at the end of February in the Mahoning basin index reservoirs was 77 percent of rated capacity for water supply compared with 80 percent for last month and 85 percent for February 2009. Storage at the end of February in the Scioto basin index reservoirs was 89 percent of rated capacity for water supply compared with 88 percent for both last month and February 2009. Surface water supplies remain in good shape throughout the state.

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	11.59	+2.98	+0.55	+1.26
Fa-1	Jasper Mill, Fayette Co.	Limestone	8.23	-1.06	+0.25	+1.25
Fr-10	Columbus, Franklin Co.	Gravel	44.21	-1.33	+0.47	+0.19
H-1	Harrison, Hamilton Co.	Gravel	22.80	-1.30	-0.02	+0.40
Hn-2a	Dola, Hardin Co.	Dolomite	10.25	-3.02	+1.79	-1.01
Po-124	Freedom, Portage Co.	Sandstone	76.56	+1.66	+0.10	+0.05
Tu-1	Strasburg, Tuscarawas Co.	Gravel	15.56	-3.12	+0.57	-1.63

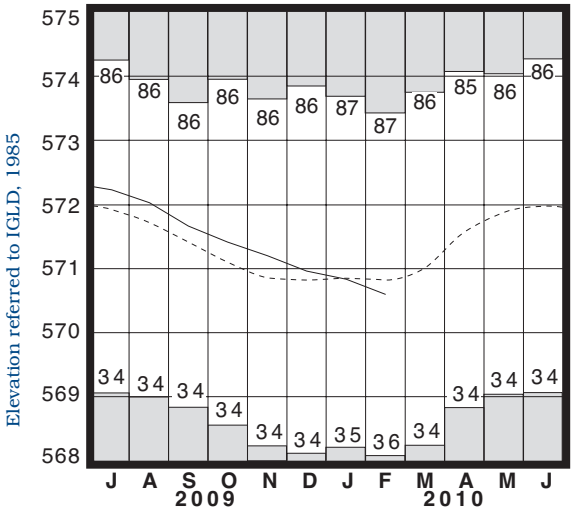
GROUND WATER levels during February rose in most aquifers in the state. Net changes from last month's levels were less than usually observed in most aquifers. Generally, levels in consolidated aquifers in northern Ohio rose steadily throughout the month while in southern Ohio, they rose during the first week, declined the next 2 weeks before rising again during the last week of February. Levels in unconsolidated aquifers generally declined during the first 3 weeks of the month and then rose during the last week of February.

Ground water supplies remain adequate throughout most of the state. However, ground water levels continue to be below normal throughout most of the state with the exception of some consolidated aquifers in eastern Ohio. Also, current levels are higher than they were a year ago in aquifers in southern Ohio, but lower in northern Ohio. Climatic conditions were not particularly favorable for sustained recharge in most aquifers during February. The combination of snow, frozen soils and below normal precipitation in western Ohio had a negative impact on recharge rates. However, a significant amount of snow remained on the ground across most of the state at the end of the month. As this snow melts, it should help replenish soil moisture, especially if it melts slowly, thus increasing the potential for significant ground water recharge. In addition, near normal precipitation and other climatic conditions during the next few months would improve the prospect of adequate recharge to the state's ground water supplies.

LAKE ERIE water level declined during February. The mean level was 570.60 feet (IGLD-1985), 0.23 foot lower than last month's mean level and 0.23 foot below normal. This month's mean level is 0.51 foot lower than the February 2009 level and 1.40 feet above Low Water Datum.

The U.S. Army Corps of Engineers (USACE) reports that precipitation in the Lake Erie basin during February averaged 1.93 inches, 0.14 inch below normal. For the entire Great Lakes basin, February precipitation averaged 1.05 inches, 0.72 inch 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 below normal for the foreseeable future. Deviations from the anticipated weather patterns could result in the level of Lake Erie ranging from about 5 inches above to as much as 13 inches below the normal seasonal average.

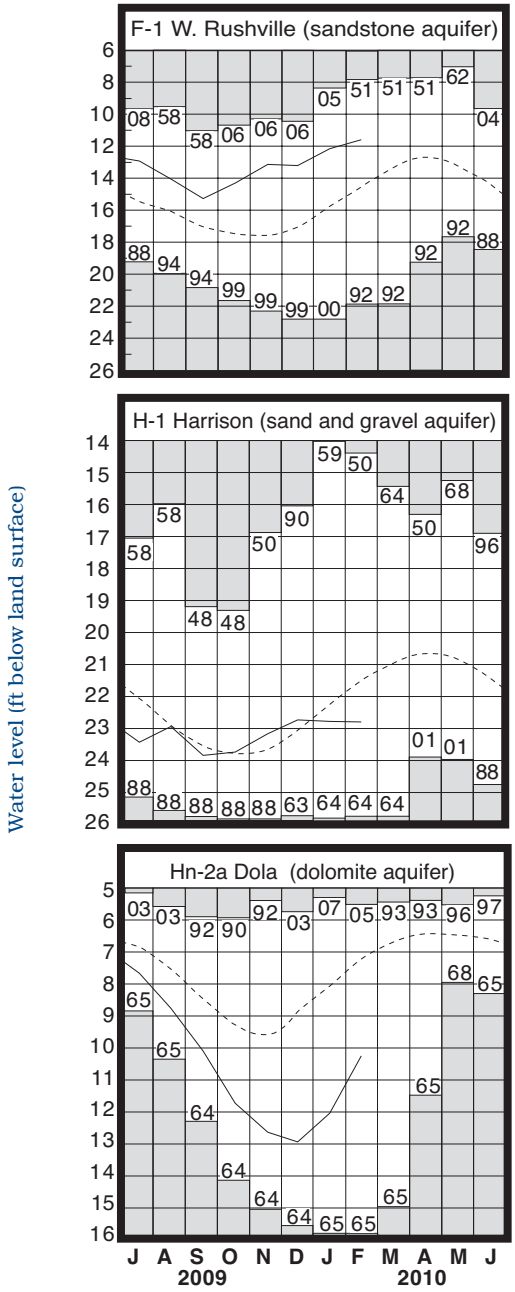
LAKE ERIE LEVELS



Base period: 1918-2000

Record high and low, year of occurrence

GROUND-WATER LEVELS



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

Normal – – – – Current ———

(Precipitation continued from front)

Precipitation for the 2010 water year is below normal throughout the state except for a few areas in northeastern Ohio where it is above normal. The state average is 12.33 inches, 0.71 inch below normal. Regional averages range from 13.84 inches, 0.03 inch below normal, for the Northeast region to 10.20 inches, 1.54 inches below normal, for the North Central Region.

Precipitation for the 2010 calendar year is below normal throughout most of the state with only the Northeast Region having above normal precipitation. The state average is 3.99 inches, 0.84 inch below normal. Regional averages range from 5.31 inches, 0.04 inch below normal, for the Southeast Region to 2.44 inches, 1.44 inches below normal, for the Northwest Region.

SUMMARY

Precipitation during February was above normal in the eastern half of the state and below normal in the western half. Streamflow was below normal throughout most of the state, but above normal in east-central Ohio. Reservoir storage decreased in the Mahoning River basin and increased slightly in the Scioto River basin. Reservoir storage was below normal in both basins. Ground water levels rose in most aquifers, but remained below normal across most of the state. Lake Erie level declined 0.23 foot and was 0.23 foot below the long-term February average.

NOTES AND COMMENTS

Record February Snowfall

February 2010 will be remembered for the record snowfall that fell throughout much of the state. There were several days where light snow fell throughout Ohio in addition to the snow that fell during the storms previously mentioned on the first page of this report, which added to the already impressive snowfall totals for the month. The Mansfield Lahm Regional Airport (Richland County) reported 49.2 inches, not only setting a February snowfall record for the site, but also establishing a new all-time monthly snowfall record, surpassing the 42.1 inches that fell during January 1978. This months snow total at Mansfield was 39.3 inches above normal. Other February monthly snowfall records were established at: Akron-Canton Airport (Summit County), 37.2 inches, Youngstown Regional Airport (Trumbull County), 36.3 inches; Port Columbus International Airport (Franklin County), 30.1 inches; and Greater Cincinnati Airport (located in Covington, Kentucky), 26.1 inches. The 31.4 inches at Cleveland Hopkins International Airport (Cuyahoga County), 23.0 inches at Dayton International Airport (Montgomery County), and 23.9 inches at Toledo Express Airport (Lucas County) rank as the second greatest amount of February snowfall for those respective locations. Chardon, located in the snowbelt of northeastern Ohio, reported a record 57.7 inches for the month. For the snow season thus far, Chardon has received 122.7 inches, 36 inches above normal.

Recent Earthquakes Make Their Mark In Ohio

On January 12, 2010 at 4:53 pm EST, an earthquake measuring 7.0 on the open-ended Richter scale hit Haiti causing extensive damage and the loss of more than 200,000 lives. On February 27, 2010 at 1:34 am EST, an earthquake measuring 8.8 on the open-ended Richter scale hit Chile, also causing extensive damage and the loss of several hundred lives. Shock waves radiating out from the epicenter of these quakes traveled through rock formations and reached Ohio. Seismic waves pass through rock formations and cause alternating compression and expansion of the rock. Water levels in some wells completed in certain rock formations may rise and fall with the passing of these waves. Several wells in the Ohio observation well network respond to earthquakes in the Western Hemisphere. Minimum Richter scale readings of 6.5 to 7.0, depending on the earthquakes location, are usually necessary for wells in Ohio to show any response. The most sensitive well in Ohio's observation well network is VW-1, located in Van Wert (Van Wert County). Seismic waves from the Haiti earthquake caused a 0.3 foot fluctuation of water level in this well, while the Chile earthquake caused a 0.4 foot fluctuation. The most notable earthquake related fluctuation in the observation well network occurred in VW-1 on March 27, 1964, when the water level changed 5.8 feet following the Alaskan Good Friday earthquake that measured 8.4 on the Richter scale.

Suggested Reading on Observation Wells:

Fact Sheet: Ground Water Level Monitoring (Chart of 1964 quake)
www.dnr.state.oh.us/tabid/4103/Default.aspx

Errata: The precipitation map on page one of the *January 2010 Monthly Water Inventory Report For Ohio* was inadvertently titled December. Please correct existing copies. The on-line version is correct at the Division of Soil and Water Resources website (http://www.dnr.state.oh.us/tabid/4191/Default.aspx). The data presented in the maps is the correct data for January.

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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