MONTHLY WATER INVENTORY REPORT FOR OHIO

January 2010

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

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PRECIPITATION during January was below normal throughout most of the state. Only a few areas in eastern and southeastern Ohio had above normal precipitation. The state average was 1.76 inches, 0.81 inch below normal. Regional averages ranged from 2.65 inches, 0.13 inch below normal, for the Southeast Region to 0.82 inch, 1.22 inches below normal, for the Northwest Region. Warren (Trumbull County) reported the greatest amount of January precipitation, 3.58 inches. Bowling Green (Wood County) reported the least amount, 0.41 inch. Most stations in northwestern Ohio reported less than 1 inch of precipitation for the month.

Precipitation fell mostly as snow during the first half of January and as rain during the second half. Snowfall for the month was near normal across most of the state, but above normal in northeastern Ohio. Chardon (Geauga County) reported 51 inches of snow for the month, which is about 22 inches above normal. Snow was reported on several days during the first half of the month, but daily amounts were generally light across much of the state. An exception was during January 7-8 when 3-6 inches of snow fell across most of Ohio. The "January Thaw" began around mid-month with temperatures warming to the mid 40's to low 50's across most of the state, melting any snow that was on the ground. Rain arrived with the warmer temperatures on January 17 across southeastern Ohio with amounts of 0.25-0.75 inch reported. Rain returned to the state on January 21 with 0.25-0.50 inch falling in southern Ohio and lesser amounts in northern Ohio. The most widespread precipitation for the month occurred during January 24-25 with 1.5 inches of rain reported across southeastern Ohio, tapering to less than 0.25 inch in northwestern Ohio. The month ended with colder temperatures and a return of light snow across the state.

Precipitation for the 2010 water year is below normal throughout most of Ohio. The state average is 10.10 inches, 0.68 inch below normal. Regional averages range from 11.03 inches, 0.72 inch below normal, for the Northeast Region to 8.21 inches, 1.64 inches below normal, for the North Central Region.

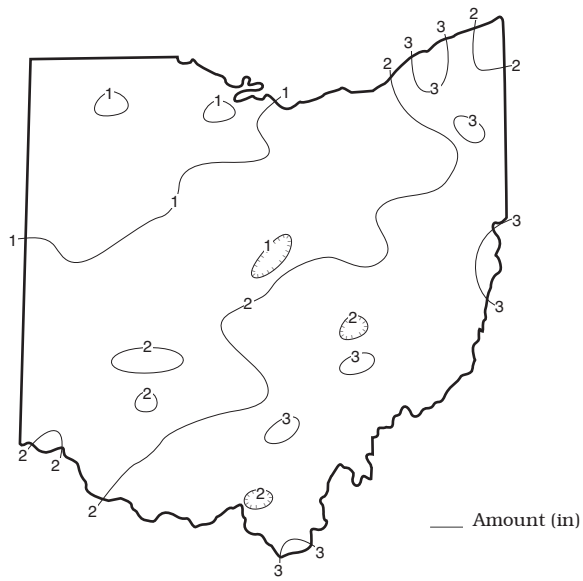
The 2010 calendar year is off to a rather dry start across most of the state. However, near normal precipitation during the next several months should be adequate for replenishing the state's water supplies.

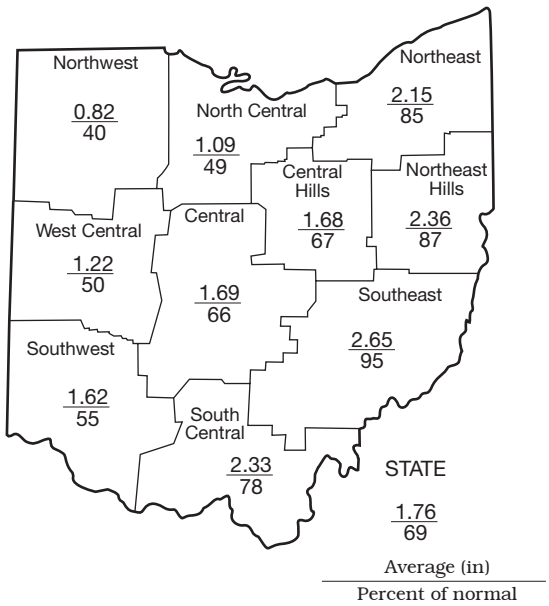
PRECIPITATION

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	-1.22	-2.66	-1.75	+0.39	+6.81	-0.5
North Central	-1.12	-3.26	-3.69	-2.05	+6.39	-0.6
Northeast	-0.37	-1.86	-1.41	-0.45	+10.32	+2.1
West Central	-1.20	-3.04	-2.06	-3.66	+2.95	-0.4
Central	-0.86	-2.55	+0.38	-1.64	+4.64	+0.5
Central Hills	-0.84	-2.37	-0.05	-2.47	+1.83	+0.4
Northeast Hills	-0.36	-1.68	-1.27	-5.14	-0.52	+1.1
Southwest	-1.31	-3.43	-0.95	-2.10	+2.79	+0.6
South Central	-0.65	-1.84	-0.75	+0.34	+6.03	+1.3
Southeast	-0.13	-1.26	-1.85	-3.46	+4.50	+0.7
State	-0.81	-2.40	-1.34	-2.04	+4.55	

*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 JANUARY





MEAN STREAM DISCHARGE

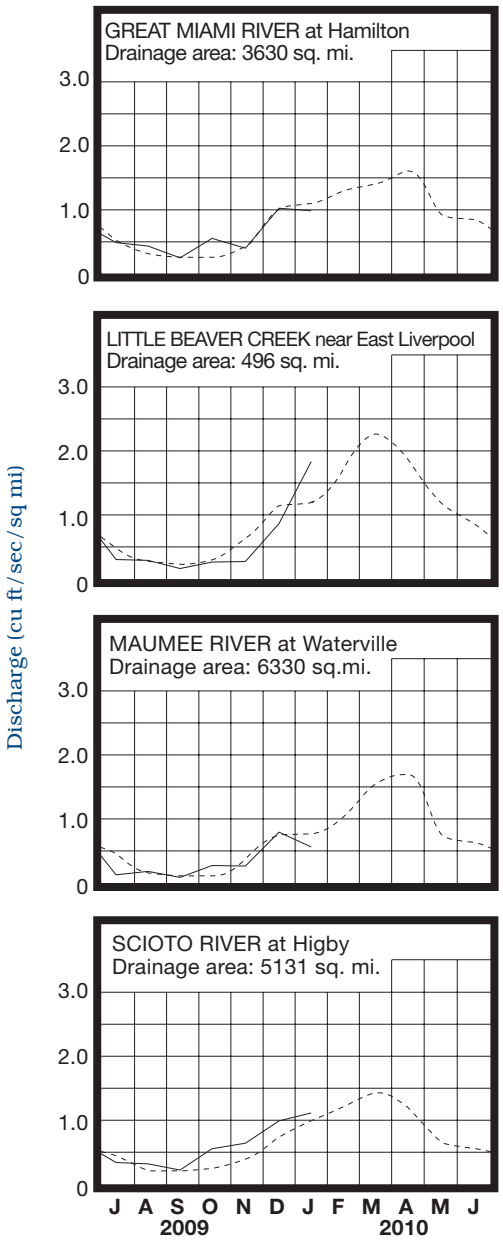
This Month

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	2,145	142	90	80	95
Great Miami River at Hamilton	3,630	3,581	90	80	86	86
Huron River at Milan	371	213	50	37	33	105
Killbuck Creek at Killbuck	464	499	95	76	76	71
Little Beaver Creek near East Liverpool	496	908	154	82	76	76
Maumee River at Waterville	6,330	3,524	72	61	63	107
Muskingum River at McConnelsville	7,422	8,410	91	110	112	64
Scioto River near Prospect	567	510	102	63	64	73
Scioto River at Higby	5,131	5,756	91	89	91	74
Stillwater River at Pleasant Hill	503	459	102	65	59	82

STREAMFLOW during January was generally below normal across northwestern, southwestern and southeastern Ohio and above normal elsewhere. Flows during January were greater than the December flows in nearly all areas of the state.

Streamflow at the beginning of the month was below normal statewide. Flows generally declined during the first half of January. Lowest flows for the month occurred near the beginning of January in most northeastern Ohio basins and at various times during January 10-16 across most of the remainder of the state. Flows then began to increase due to melting ice and snow, and an increase in precipitation. Greatest flows for the month occurred during January 25-26 following the month's heaviest and most widespread precipitation. Flows declined from these peaks during the last few days of January and were below normal throughout most of the state at the end of the month. A few exceptions were noted in some eastern and southeastern Ohio basins where flows at the end of January were above normal.

MEAN STREAM DISCHARGE



Base period for all streams: 1971-2000

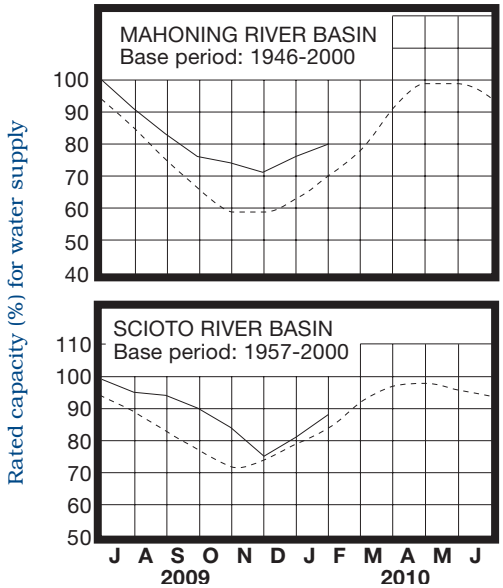
RESERVOIR STORAGE for water supply during January increased in both the Mahoning and Scioto river basins. Storage remained above normal in both basins.

Reservoir storage at the end of January in the Mahoning basin index reservoirs was 80 percent of rated capacity for water supply compared with 76 percent for both last month and January 2009. Storage at the end of January in the Scioto basin index reservoirs was 88 percent of rated capacity for water supply compared with 81 percent for last month and 67 percent for January 2009. Surface water supplies continue to remain in good condition throughout the state.

GROUND WATER levels during January showed net improvement in most aquifers throughout the state. Exceptions were noted in a few aquifers in southern Ohio where levels declined contra-seasonally. Generally, ground water levels declined during the first half of the month, and then rose during the second half in response to melting snow and ice, increased precipitation and thawing soils.

Ground water supplies remain adequate throughout most of the state. However, after a positive start to the current recharge season, climatic conditions during the past 3 months have not been particularly favorable for replenishing the state's ground water supplies. Ground water levels are below normal across much of the state with the exception of some consolidated aquifers in eastern Ohio where they are above normal. Current levels in most aquifers in southern Ohio are higher than they were at this time last year, but in northern Ohio levels are lower than they were during January 2009. Soil moisture conditions improved around mid-month, thus the potential for recharge is favorable. Near-normal

RESERVOIR STORAGE FOR WATER SUPPLY



Normal – – – – Current ———

precipitation and other climatic conditions during the next several months should allow adequate replenishment to the state's ground water supplies.

LAKE ERIE water level declined during January. The mean level was 570.83 feet (IGLD-1985), 0.14 foot lower than last month's mean level and 0.04 foot below normal. This month's mean level is 0.18 foot lower than the January 2009 level and 1.63 feet above Low Water Datum.

The U.S. Army Corps of Engineers (USACE) reports that precipitation in the Lake Erie basin during January averaged 1.33 inches, 1.14 inches below normal. For the entire Great Lakes basin, January precipitation averaged 0.90 inch, 1.30 inches 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 near normal for the foreseeable future. Deviations from the anticipated weather patterns could result in the level of Lake Erie ranging from around 7 inches above to as much as 11 inches below the normal seasonal level.

SUMMARY

Precipitation during January was below normal throughout most of the state. Streamflow was generally below normal in northwestern, southwestern and southeastern Ohio, and above normal elsewhere. Reservoir storage increased and remained above normal in both the Mahoning and Scioto river basins. Ground water levels showed net improvement in most aquifers across the state. Lake Erie level declined 0.14 foot and was 0.04 foot below the long-term January average.

NOTES AND COMMENTS

National Ground Water Awareness Week

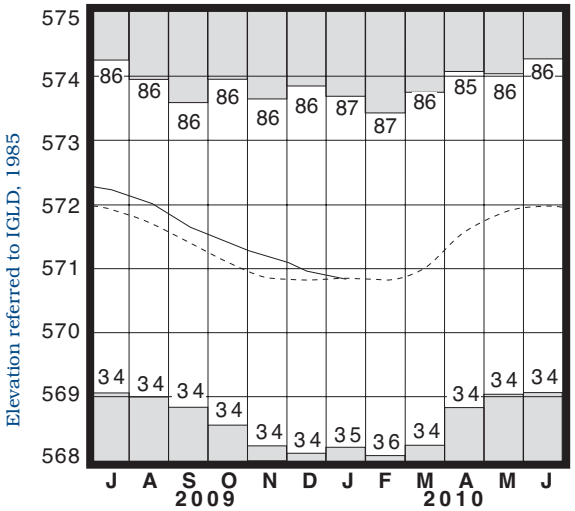
The week of March 7-13, 2010 is National Ground Water Awareness Week. During this week, Ohioans are urged to learn more about the state's ground water resources, from wise use to protection. The ODNR, Division of Soil and Water Resources, Water Resources Section collects, researches, interprets and disseminates information on 140 ground water observation wells located across the state. Division hydrologists and geologists produce several types of ground water maps, addressing various aspects of ground water resources in the state including availability, pollution potential and horizontal direction of ground water flow; and collects water use data on all facilities that have the capacity to withdraw over 100,000 gallons of water per day. To learn more about these and other programs at the Division of Soil and Water Resources, please visit our website at: www.dnr.state.oh.us/tabid/21817/Default.aspx.

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	12.14	+3.65	+1.06	+2.62
Fa-1	Jasper Mill, Fayette Co.	Limestone	8.48	-0.96	-0.15	+1.62
Fr-10	Columbus, Franklin Co.	Gravel	44.68	-1.34	+0.48	+0.07
H-1	Harrison, Hamilton Co.	Gravel	22.78	-0.55	-0.06	+1.16
Hn-2a	Dola, Hardin Co.	Dolomite	12.04	-3.96	+0.90	-1.16
Po-124	Freedom, Portage Co.	Sandstone	76.66	+1.66	+0.06	-0.07
Tu-1	Strasburg, Tuscarawas Co.	Gravel	16.13	-3.01	+0.30	-1.48

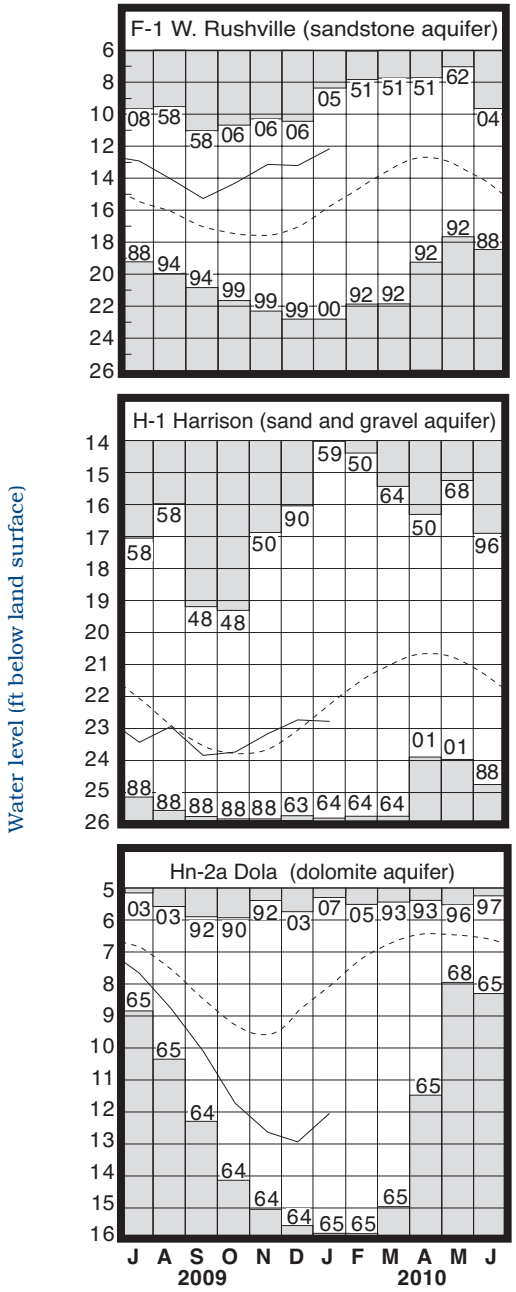
LAKE ERIE LEVELS



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 ———

ODNR State Hydrologist Retires

David Cashell retired on February 1, 2010 after more than 31 years of service to the Ohio Department of Natural Resources (ODNR), serving 23 of those years as the State Hydrologist for the Division of Water and Supervisor of the Water Inventory Unit. Dave started his career at ODNR in January 1979 as an Environmental Technician, servicing the 75 observation wells operated by the Division of Water and assisting with the tabulation of other hydrologic data for publication and dissemination. He authored or co-authored the "Monthly Water Inventory Report For Ohio" (MWIR) for about 25 years. When Dave assumed full responsibility for the publication, one of the first innovations he conceived was the expansion of the MWIR into its current format. That new format was developed after the extreme drought conditions in 1987-88 revealed the need for additional climatologic and hydrologic data for timely evaluation and dissemination to address Ohio's water supply situation. The new format provided cumulative precipitation departures for several periods, streamflow statistics for 10 index stations (4 originally) as well as cumulative streamflow information, Palmer Drought Severity Index values, ground water level data for 7 index sites (3 originally), topsoil moisture information, Lake Erie basin and Great Lakes basin precipitation and a forecasted range of levels for Lake Erie. Dave was extremely proud to have co-authored the MWIR for its 50th anniversary edition in March 2004.

Dave worked with the Ohio Observation Well Network during his entire 31-year career. During his leadership, the network expanded from about 75 sites operated by ODNR in 1979 to 140 sites operated in 2010. Also, many special projects were instrumented for ground water level collection throughout Ohio for periods ranging from several months to 5-6 years. During his career, he directed the complete transition from analog (chart) recorders to electronic data recorders for all the observation wells as well as instrumenting 10 observation wells for which the data is available in near real time via USGS satellite telemetry. Dave also oversaw the transition from having the data only available in a paper format to a complete electronic format for 345 observation wells for their respective periods of record. This database now includes more than 2.7 million days of record. He is extremely proud of his design and development of the observation well web application which makes all the Ohio Observation Well Network data available as well as offering graphs and statistics.

Dave administered the cooperative program with USGS for more than 16 years. This program not only includes the stream gauging networks, but also has included ground water level networks and water use information. During his tenure, a new low-flow network was reinstated to define the low flow characteristics for more than 185 sites around Ohio. In addition, a crest-stage network was instigated, which is used to define high flow statistics at ungauged sites across the state, and many full-time regular stream gauging sites for National Weather Service flood forecasting and low-flow index sites were established. Also during Dave's tenure, many jointly funded reports were published documenting all aspects of streamflow characteristics, important flooding events and other aspects of Ohio's hydrologic conditions and data collection networks.

Dave also oversaw the Ohio Water Withdrawal Facility Registration Program for more than 10 years. He was instrumental in bringing automated STORMS (State of Ohio Rain/Snow Monitoring System) to many ODNR facilities following the 1990 Shadyside flooding disaster. STORMS sites provide real-time rain monitoring and are used by the National Weather Service for issuing flash flood warnings. Most recently, he worked with the National Weather Service to establish COCORAHS (Community Collaborative Rain, Hail & Snow Network) in Ohio as part of a nation-wide network of volunteer precipitation observers.

Dave served on many committees, work groups, and task forces throughout his career. Of note was Governor Voinovich's Blue Ribbon Task Force for Water Resources Planning and Development where he served as a professional staff resource member. Another was the Seasonal Variations Workgroup for the ODNR Division of Mineral Resources Management (DMRM) where he worked to develop a standardized methodology for sampling both surface and ground water resources during the permitting process for coal mining in Ohio. The methodology was later incorporated into a DMRM policy document.

Dave spent most of his career tracking and evaluating the changing hydrologic conditions across Ohio and how they were impacting water supplies. This knowledge was often put to good use while representing the ODNR at the Drought Task Force meeting several times during the past 20 years. The Drought Task Force as part of the State Drought Plan was established after the extreme drought of 1987-88. Dave typically served as spokesman for the ODNR when drought information was disseminated and also for most responses concerning storms, floods and Lake Erie level information.

Dave, a graduate of The Ohio State University, was among the first Ohio state government managers to earn the Certified Public Manager designation. He was honored and proud to have worked with and learned from highly renowned colleagues at the Division of Water; Al Walker, Jim Schmidt and especially Lenny Harstine, his predecessor and mentor. Dave and his wife Barb will be very busy in retirement taking care of their apple orchard and large garden as well enjoying life and many other interests and family. The entire division staff wishes Dave the best in his retirement years. His expertise and advice will be missed.

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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